SUZUKI

GS1000

SERVICE MANUAL

99000-85850-4E

FOREWORD

The new GS1000 Suzuki is the fastest, best handling and most thoroughly engineered Suzuki has ever produced. The GS1000 is a continuation of Suzuki's world famous standards of technical engineering, and superior products.

This service manual has been produced primarily for experienced mechanics whose job it is to inspect, adjust, repair and service Suzuki motorcycles. Apprentice mechanics and do-it-yourself mechanics, will also find this manual an extremely useful guide.

IMPORTANT

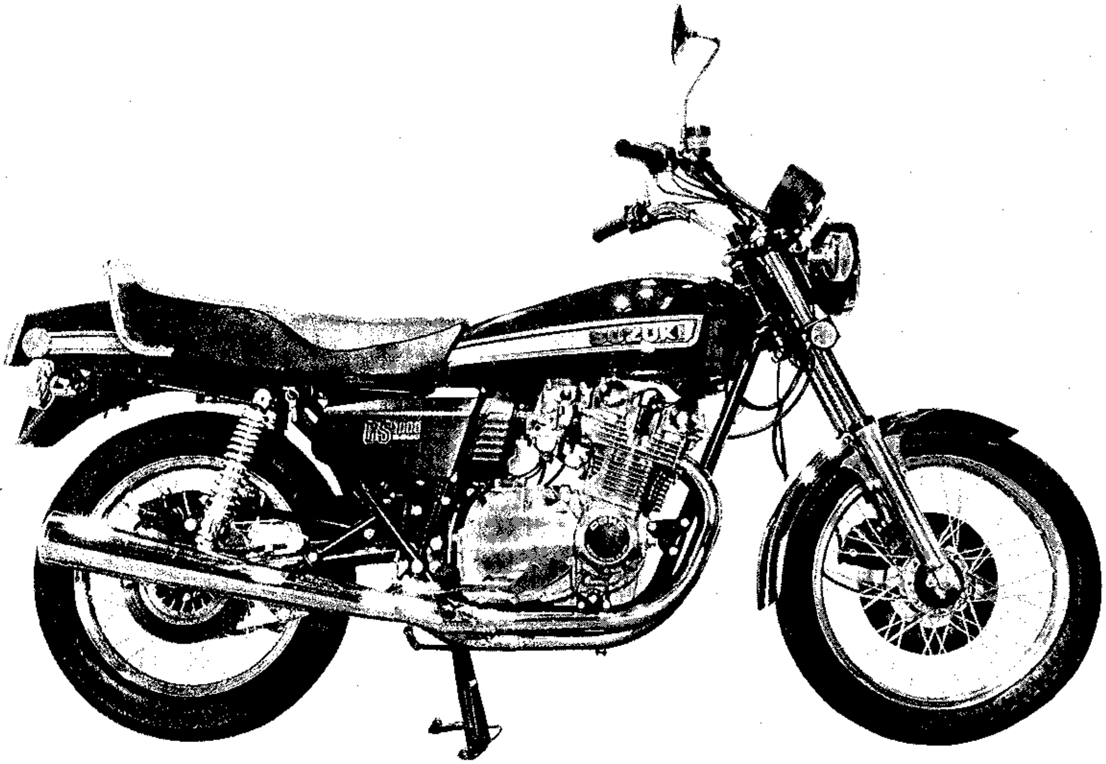
All Suzuki motorcycles manufactured on or after January 1, 1978 are subject to Environmetal Protection Agency emission regulations. These regulations set standards for emission control, and also set specific servicing requirements. This manual contains all of the necessary information that is required to properly inspect and service the GS1000 and GS1000E in accordance with the EPA regulations.

Primarily, the emission components which can effect the emission output of the GS1000 consist of the carburetors and crankcase breather device. Emission control information is contained in the Fuel System chapter and the Emission Control chapter. However, we strongly suggest that the chapter on Emission Control be 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.

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

VIEW OF SUZUKI GS1000



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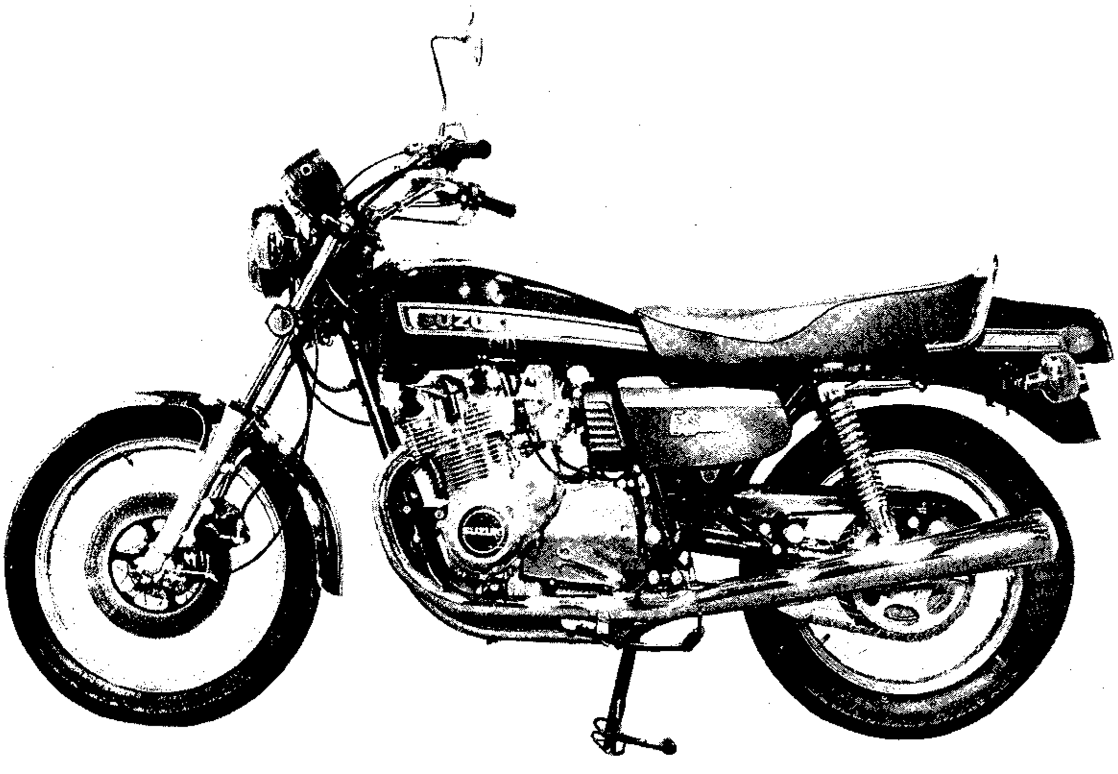

Left side

GROUP INDEX

GENERAL INFORMATION

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GENERAL INFORMATION

IDENTIFICATION TABLE

SERIAL NUMBER LOCATION

The frame serial number ① is stamped on the steering head pipe. The engine serial number ② is located on the right side of the crankcase. These numbers are required especially for registering the machine and ordering spare parts.

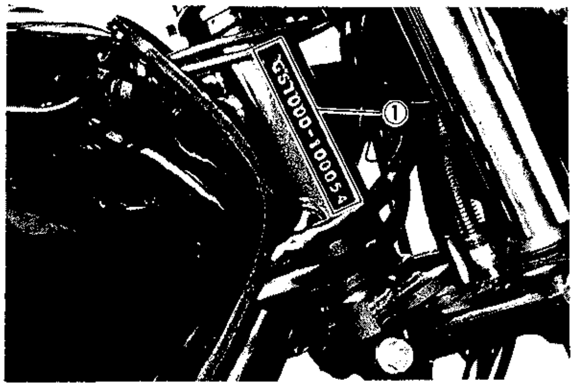


Fig. 1-1.

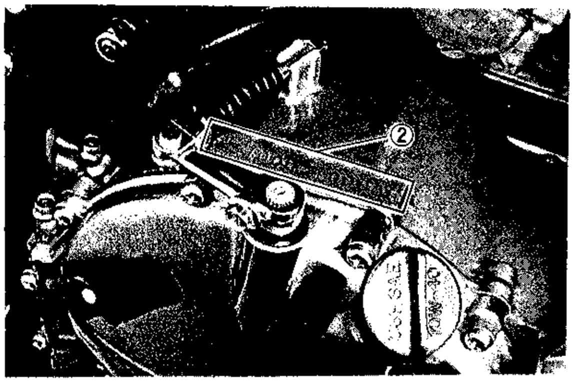


Fig. 1-2.

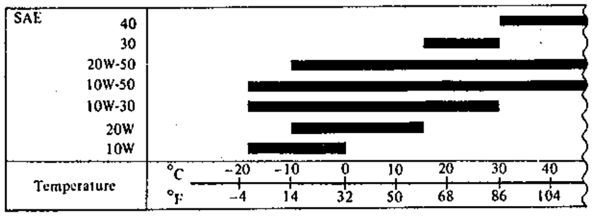
FUEL, OILS AND BREAKING-IN PROCEDURE

FUEL

Use only unleaded or low-lead type gasoline of at least 85 ~ 95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research method. If engine pinging is experienced, substitute another brand as there are differences between brands.

ENGINE OIL

Using a premium quality four stroke motor oil will increase the service life of your motorcycle. Use only oils which are rated SE under the API classification system. The viscosity rating should be SAE 10W-40. If the SAE 10W-40 motor oil is not available, select an alternate according to the following chart.



BRAKE OIL (for front and rear brakes)

Specification and classification	DOT 3, DOT 4

NOTE:
1) Since the brake system of this motorcycle is filled with a glycol-based brake fluid by the manufacture, 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.
2) Do not use any brake fluid taken from old or used or unsealed containers.
3) Never re-use brake fluid left over from the previous servicing and stored for a long period.

FRONT FORK OIL

SAE 10W/20

BREAKING-IN PROCEDURE

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:

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

Initial 500 miles (800 km)	Below 4,000 rpm
Up to 1,000 miles (1,600 km)	Below 6,000 rpm
Over 1,000 miles (1,600 km)	Below 8,500 rpm

2. 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 8,500 rpm at any time.

ORIENTATION

CYLINDER IDENTIFICATION

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

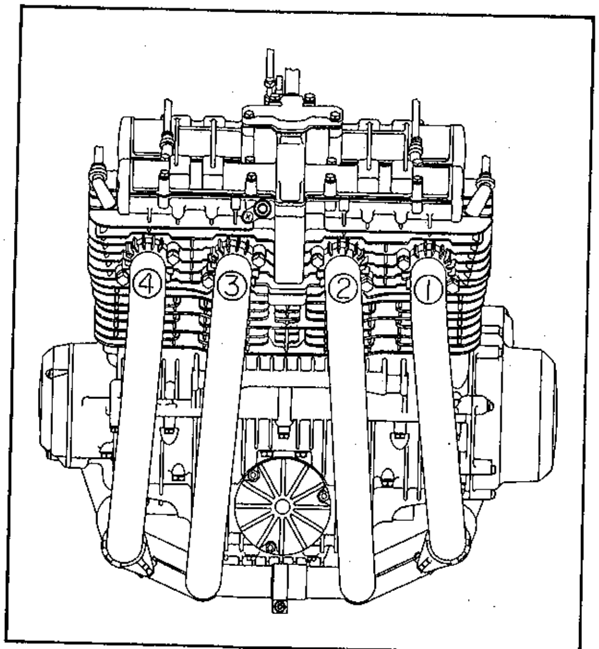


Fig. 1-3.

LOCATION OF PARTS

1. Tachometer
2. Ignition switch
3. Front brake lever
4. Throttle grip
5. Rear brake pedal
6. Foot rests
7. Speedometer
8. Clutch lever
9. Fuel tank cap
10. Gear shift lever

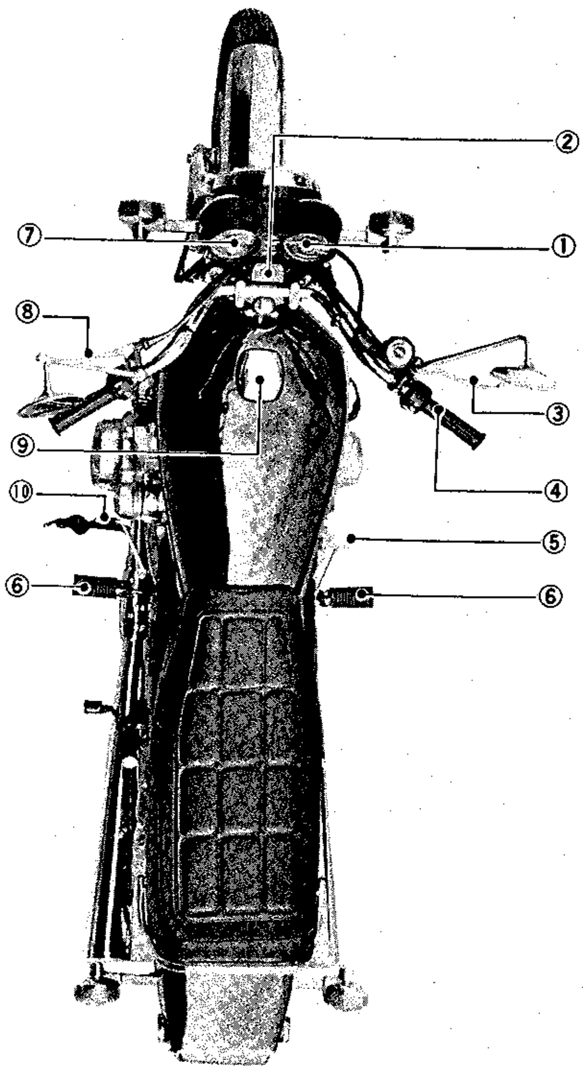


Fig. 1-4.

Left ⟷ Right

SERVICE SPECIFICATIONS

DIMENSIONS AND WEIGHT

Overall length	2,225 mm (87.6 in.)
Overall width	850 mm (33.5 in.)
Overall height	1,165 mm (45.9 in.)
Wheelbase	1,505 mm (59.3 in.)
Ground clearance	155 mm (6.1 in.)
Dry mass	230 kg (507 lbs.)
Gross vehicle weight rating	419 kg (924 lbs.)

ENGINE

Type	Four-stroke cycle, air-cooled, DOHC
Number of cylinder	4
Bore	70.0 mm (2.756 in.)
Stroke	64.8 mm (2.551 in.)
Piston displacement	997 cm^3 (60.8 cu.in.)
Compression ratio	9.2 : 1
Carburetor	MIKUNI VM26SS, 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	TAKASAGO RK630GSO, 96 links DAIDO D.I.D.630 YL, 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	63°
Trail	113 mm (4.45 in.)
Turning radius	2.62 m (8.5 ft.)
Front brake	Disc brake
Rear brake	Disc brake
Front tire size	3.25V19 4PR
Rear tire size	4.00V18 4PR
Front tire pressure	175 kPa 1.75 kg/cm^2 (25 psi) (Normal solo riding)
Rear tire pressure	200 kPa 2.00 kg/cm^2 (28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Battery ignition
Ignition timing	17° B.T.D.C. below 1,500 rpm and 37° B.T.D.C. above 2,500 rpm
Spark plug	NGK B-8ES or NIPPON DENSO W24ES
Spark plug gap	0.6 ~ 0.8 mm both NGK and NIPPON DENSO
Battery	12V 14Ah/10 Hous
Generator	Three-phase A.C. generator
Fuse	10/10/10/15A

CAPACITIES

Fuel tank including reserve	19 L (5.0 US.gal)
	4.0 L (4.2 US.qt.)
Engine oil change	3.4 L (3.6 US.qt.)
change filter	3.8 L (4.0 US.qt.)
overhaul	4.2 L (4.4 US.qt.)
Front fork air pressure	0.8 kg/cm^2 (11.4 psi)
Front fork oil (At time of overhaul and replacement)	241 ml (8.15 US.oz.) in each leg

* Specifications are subject to change without notice.

— MEMO —

SERVICE SPECIFICATIONS

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CONTENTS

SERVICE SPECIFICATIONS

ENGINE TOP END

Unit: mm (in.)

Valves + Guides		Standard	Service Limit
Tappet Clearance (Cold Engine)		0.03 ~ 0.08 (0.001 ~ 0.003)	—
Valve Stem Dia. O.D.	IN	6.960 ~ 6.975 (0.2740 ~ 0.3746)	6.90 (0.271)
	EX	6.945 ~ 6.960 (0.2734 ~ 0.2740)	6.80 (0.267)
Valve Stem Deflection		—	0.05 (0.002)
Valve Head Dia.	IN	38 (1.496)	—
	EX	32 (1.259)	—
Valve Thickness		—	0.5 (0.0197)
Valve Seat Width	IN/EX	1.1 ~ 1.3 (0.04 ~ 0.05)	—
Valve Guide I.D.	IN/EX	7.000 ~ 7.015 (0.2756 ~ 0.2762)	—
Valve Stem to Guide Clearance	IN	0.025 ~ 0.055 (0.0009 ~ 0.0022)	0.090 (0.0035)
	EX	0.040 ~ 0.070 (0.0016 ~ 0.0028)	0.200 (0.0039)
Valve Spring Free Length	INNER	35.3 ~ 37.0 (1.39 ~ 1.46)	33.9 (1.33)
	OUTER	43.00 ~ 43.25 (1.692 ~ 1.702)	41.3 (1.63)
Valve Spring Tension	INNER	29.3 ~ 34.0 kg/23 mm (64.59 ~ 74.96 lbs./0.91 in.)	—
	OUTER	50.4 ~ 58.3 kg/27 mm (111.11 ~ 128.53 lbs./1.06 in.)	—
Camshaft			
Cam Lift	IN	8.0 (0.31)	—
	EX	7.5 (0.30)	—
Cam Height	IN	36.325 ~ 36.355 (1.4301 ~ 1.4313)	36.030 (1.4185)
	EX	35.775 ~ 35.805 (1.4085 ~ 1.4096)	35.480 (1.3968)
Camshaft Journal Holder I.D.		22.000 ~ 22.013 (0.8661 ~ 0.8667)	—

	Standard	Service Limit
Camshaft Journal O.D.	21.960 ~ 21.975 (0.8646 ~ 0.8652)	—
Camshaft/Journal Clearance	0.025 ~ 0.053 (0.0010 ~ 0.0021)	0.150 (0.0059)
Camshaft Runout	—	0.10 (0.004)
Cam Chain Tensioner Guide Roller Wear	—	2.5 (0.098)
Camshaft Chain Size	D1D219FTS	—
Number of Chain Links	120	—
Cam Chain 20-pitch Length	—	157.80 (6.213)
Pistons + Rings + Cylinders		
Compression Pressure	9 ~ 13 kg/cm² (128 ~ 184 psi)	7 kg/cm² (100 psi)
Difference between Cylinders	—	2 kg/cm² (28.5 psi)
Cylinder Bore Dia.	70.000 ~ 70.015 (2.7559 ~ 2.7565)	70.080 (2.7590)
Cylinder and Cylinder Head Distortion	—	0.2 (0.008)
Piston Dia./Measured at	69.945 ~ 69.960 (2.7537 ~ 2.7543) (15 (0.59) above skirt end)	69.880 (2.7512)
Piston/Cylinder Clearance	0.050 ~ 0.060 (0.0020 ~ 0.0024)	0.120 (0.0047)
Piston Ring Free End Gap (Top and 2nd)	Approx. 8.5 (0.33)	6.8 (0.27)
Piston Ring End Gap (Top and 2nd)	0.15 ~ 0.35 (0.006 ~ 0.014)	0.70 (0.028)
Piston Ring Thickness — Top	1.175 ~ 1.190 (0.0463 ~ 0.0469)	—
Piston Ring Thickness — 2nd	1.170 ~ 1.190 (0.0461 ~ 0.0469)	—
Piston Ring Groove Width (Top, 2nd and Oil-Ring) — TOP	1.21 ~ 1.23 (0.047 ~ 0.048)	—
Piston Ring Groove Width (Top, 2nd and Oil-Ring) — 2nd	1.21 ~ 1.23 (0.047 ~ 0.048)	—
Piston Ring Groove Width (Top, 2nd and Oil-Ring) — Oil-ring	2.51 ~ 2.53 (0.099 ~ 0.100)	—
Piston Ring to Groove Clearance (Top, 2nd and Oil-Ring) — Top	0.020 ~ 0.055 (0.0008 ~ 0.0022)	0.180 (0.0071)
Piston Ring to Groove Clearance (Top, 2nd and Oil-Ring) — 2nd	0.020 ~ 0.060 (0.0008 ~ 0.0024)	0.150 (0.0059)
Piston Pin O.D.	17.995 ~ 18.000 (0.7085 ~ 0.7087)	—
Piston Pin Bore I.D.	18.002 ~ 18.008 (0.7087 ~ 0.7090)	—

	Standard	Service Limit
Piston Pin/Bore Clearance	0.002 ~ 0.013 (0.0001 ~ 0.0005)	0.120 (0.0047)

ENGINE LOWER END

Crankshaft	Standard	Service Limit
Connecting Rod Small End Bore	18.006 ~ 18.014 (0.7089 ~ 0.7092)	—
Connecting Rod Deflection	—	3 (0.11)
Connecting Rod Big End Side Clearance	0.10 ~ 0.65 (0.004 ~ 0.026)	1.00 (0.039)
Crankshaft Runout	—	0.10 (0.004)

LUBRICATION SYSTEM

Oil Pump	Standard	Service Lmit
Trochoid Oil Pump — Discharge rate (Lit/HR/rpm)	1.85/min/500	—
Output Pressure	1 kg/cm^2 (14.22 psi)	—
Cranking Speed	862 rpm	—
Operational Speed Reduction Ratio	1.723	—
Tip Clearance	—	0.2 (0.008)
Outer Rotor Clearance	—	0.25 (0.010)
Side Clearance	—	0.15 (0.006)
Oil Pressure (60°C, 92°F)	Over 0.1 kg/cm^2 (1.42 psi) at 3 000 rpm Below 0.5 kg/cm^2 (7.11 psi)	

CLUTCH

	Standard	Service Limit
Clutch Drive Plate Thickness	2.7 ~ 2.9 (0.10 ~ 0.11)	2.4 (0.09)
Clutch Drive Plate Distortion	—	0.2 (0.008)
Clutch Drive Plate Claw Width	15.6 ~ 15.8 (0.61 ~ 0.62)	14.8 (0.58)

	Standard	Service Limit
Clutch Driven Plate Thickness	–	1.6 (0.06)
Clutch Driven Plate Distortion	–	0.1 (0.004)
Clutch Spring/Free Length	39.0 ~ 40.5 (1.54 ~ 1.59)	37.1 (1.46)

TRANSMISSION

		Standard	Service Limit
Gear Ratios	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)	
Primary Drive – Driven Gears Backlash		0 ~ 0.03 (0 ~ 0.001)	0.08 (0.003)
Gear Backlash	1st, 2nd and 3rd	0 ~ 0.04 (0 ~ 0.002)	0.09 (0.004)
	4th and Top	0.05 ~ 0.10 (0.002 ~ 0.004)	0.15 (0.006)
Shift Fork Thickness		4.95 ~ 5.05 (0.195 ~ 0.199)	–
Shift Fork – Groove Clearance		0.4 ~ 0.6 (0.016 ~ 0.024)	0.8 (0.031)
Shift Fork Groove Width		5.45 ~ 5.55 (0.215 ~ 0.219)	–
Countershaft Ass'y Length		109.4 ~ 109.5 (4.307 ~ 4.311)	–
Drive chain Size		RK630GSO, 96 links (TAKASAGO MAKE)	

FUEL SYSTEM

Idle rpm's	900 ~ 1 100 rpm
Carb Type	MIKUNI VM26SS
Carb I.D. Number	49020
Bore Size	26 (1.023)
Float Height	23 ~ 25 (0.90 ~ 0.98)
Fuel Level	3 ~ 5 (0.12 ~ 0.20)
Air Screw	PRE-SET (DO NOT DISTURB)

Pilot Screw	PRE-SET (DO NOT DISTURB)
Pilot Air Jet	1.2
Pilot Jet	#15
Cut-a-Way	1.5
Jet Needle	5DL36-3
Needle Jet	O-2
Main Air Jet	1.5
Main Jet	#95
Throttle Cable Free Play	1.0 ~ 1.5 (0.039 ~ 0.059)
Air Filter–Type	Paper Element

IGNITION SYSTEM

	Standard	Service Limit
Ignition Timing	17° B.T.D.C. below, 1 500 rpm and 37° B.T.D.C above 2 500 rpm	
Spark Plug Heat Range	NGK: B-8ES NIPPON DENSO : W24ES	–
Spark Plug Gap	0.6 ~ 0.8 (0.024 ~ 0.031)	–
Ignition Point Gap	0.3 ~ 0.4 (0.012 ~ 0.016)	–
Ignition Point Dwell	180°	–
Spark Performance (over–mm at 1 atm.)	7 (0.28)	–
Condenser Capacity Mfd.	0.18 ±0.02	–
Ignition Coil Resistance Primary	Approx. 4Ω	–
Ignition Coil Resistance Secondary	Approx. 15kΩ	–

CHARGING SYSTEM

Alternator Output	14V, 18A/5,000 rpm	
Battery Capacity/Code Number/Specific Gravity at 20°C	12V, 14Ah/12N14-3A/1.280 at 20°C	
Blush Length	12 ~ 13 (0.47 ~ 0.51)	6 (0.24)
Commutator Undercut	0.6 (0.023)	0.2 (0.008)
DC Line "no-load" Voltage	More than 16.5V at 5 000 rpm	

LAMP WATTAGE

Fuse	10/10/10/15A
Headlamp	12V 50/40W
Tail/Brake Lamp	12V 8/23W (3/32 cp)
Turn Signal Lamp	12V 23W (32 cp)
License Plate Lamp	12V 8W (3 cp)
Speedometer Lamp	12V 3.4W
Tachometer Lamp	12V 3.4W
Neutral Indicator Lamp	12V 3.4W
High Beam Indicator Lamp	12V 3.4W
Turn Signal Pilot Lamp	12V 3.4W
Oil P. Indicator Lamp	12V 3.4W

BRAKES + WHEELS

		Standard	Service Limit
Brake Disc Thickness	Front	6.5 ~ 6.9 (0.26 ~ 0.27)	Under 6.0 (0.24)
	Rear	6.5 ~ 6.9 (0.26 ~ 0.27)	Under 6.0 (0.24)
Brake Disc Runout		—	0.30 (0.012)
Brake Caliper Piston Dia. Front		42.82 (1.686)	Under 42.77 (1.684)
Brake Caliper Cylinder Dia. Front		42.85 (1.687)	Over 42.89 (1.689)
Brake Caliper Piston Dia. Rear		38.15 (1.502)	Under 38.13 (1.501)
Brake Caliper Cylinder Dia. Rear		38.18 (1.503)	Over 38.19 (1.504)
Brake Master Cylinder Piston Dia. Front		13.96 (0.550)	Under 13.94 (0.549)
Brake Master Cylinder Dia. Front		14.00 (0.551)	Over 14.05 (0.553)
Brake Master Cylinder Piston Dia. Rear		13.96 (0.550)	Under 13.94 (0.549)
Brake Master Cylinder Dia. Rear		14.00 (0.551)	Over 14.05 (0.553)
Wheel Rim Runout—Axial, Radial	Front and Rear		Axial 2.0 (0.08) / Radial 2.0 (0.08)
Axle Runout	Front and Rear	—	0.25 (0.010)

Tire Size	Front	3.25V19 4PR	
	Rear	4.00V18 4PR	
Front Wheel Tread Depth		—	1.6 (0.06)
Rear Wheel Tread Depth		—	2.0 (0.08)

TIRE PRESSURE

Cold inflation tire pressure	Normal riding				High speed riding			
	Solo		Dual		Solo		Dual	
	kg/cm^2	psi	kg/cm^2	psi	kg/cm^2	psi	kg/cm^2	psi
Front	1.75	25	2.00	28	2.00	28	2.25	32
Rear	2.00	28	2.25	32	2.25	32	2.80	40

SUSPENSION + FRAME + STEERING

	Standard	**Service Limit**
Fork Fluid Viscosity and Fork Oil Capacity	SAE 10W/20, 241 cc (8.15 US.oz.) in each leg	
Front Fork Air Pressure	0.8 kg/cm^2 (11.4 psi)	—
Fork Oil Level	140 (5.51)	—
Front Fork Spring	421 (16.6)	416 (16.4)

TORQUE TABLE

ENGINE

	Thread dia.	kg-m	lb-ft
Camshaft holder bolt	6	1.0	7.0
Cylinder head bolt	6	0.9 ~ 1.4	6.5 ~ 10.0
Cylinder head nut	10	3.7	27.0
Cylinder head cover bolt	6	0.9	6.5
Crankcase bolt	6	1.0	7.0
Crankcase bolt	8	2.0	14.5
Starter motor bolt	5	0.2 ~ 0.4	1.5 ~ 3.0
Oil pan bolt	6	0.6 ~ 0.9	4.5 ~ 6.5
Engine mounting bolt	8	2.5	18.0
Engine mounting bolt	10	3.5	25.5
Primary drive rear bolt	6	1.5 ~ 2.0	11.0 ~ 14.5
Starter clutch bolt	6	1.5 ~ 2.0	11.0 ~ 14.5
Camshaft sprocket bolt	6	0.8 ~ 1.1	6.0 ~ 8.0
Cam chain guide bolt No. 4	6	0.4 ~ 0.7	3.0 ~ 5.0
Cam chain tensioner bolt	8	0.9 ~ 1.4	6.5 ~ 10.0
Cam chain tensioner adjuster bolt	6	0.4 ~ 0.7	3.0 ~ 5.0
Air cleaner bolt	6	0.4 ~ 0.7	3.0 ~ 5.0
Exhaust pipe bolt	8	0.9 ~ 1.4	6.5 ~ 10.0
Muffler bolt	10	1.8 ~ 2.8	13.0 ~ 20.0
Pressure switch housing	6	0.6 ~ 0.9	4.5 ~ 6.5
Clutch spring bolt	6	1.1 ~ 1.3	8.0 ~ 9.5
Clutch sleeve hub nut	24	5.0 ~ 7.0	36.0 ~ 50.5
Clutch release arm bolt	6	0.6 ~ 1.0	4.5 ~ 7.0
Gear shifting cam stopper spring holder bolt holder		1.8 ~ 2.8	13.0 ~ 20.0
Gear shift arm stopper		1.5 ~ 2.3	11.0 ~ 16.5
Gear shift lever bolt	8	1.3 ~ 2.3	9.5 ~ 16.5
Engine sprocket nut		9.0 ~ 10.0	65.0 ~ 72.5
Generator rotor bolt	12	9.0 ~ 10.0	65.0 ~ 72.5

CHASSIS

	Thread dia.	kg-m	lb-ft
Handle holder bolt	8	1.2 ~ 2.0	8.5 ~ 14.5
Steering stem head center side bolt	8	1.5 ~ 2.5	11.0 ~ 18.0
Front fork tube upper pinch bolt (R, L)	10	2.0 ~ 3.0	14.5 ~ 21.5
Front fork tube lower pinch bolt (R, L)	8	1.5 ~ 2.5	11.0 ~ 18.0
Steering stem head center bolt	12	3.6 ~ 5.2	26.0 ~ 37.5
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
Swinging arm pivot shaft nut	16	5.0 ~ 8.0	36.0 ~ 58.0

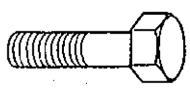
	Thread dia.	kg-m	lb-ft
Rear torque link nut	10	2.0 ~ 3.0	14.5 ~ 21.5
Rear axle nut	18	8.5 ~ 11.5	61.5 ~ 83.0
Rear shock absorber bolt	10	2.0 ~ 3.0	14.5 ~ 21.5
Rear shock absorber nut	10	2.0 ~ 3.0	14.5 ~ 21.5
Front step bolt	10	2.7 ~ 4.3	19.5 ~ 31.0
Front brake caliper mounting bolt	10	2.5 ~ 4.0	18.0 ~ 29.0
Front and rear brake disc plate bolt	8	1.5 ~ 2.5	11.0 ~ 18.0
Front brake caliper axle bolt	10	2.5 ~ 3.5	18.0 ~ 25.5
Front brake master cylinder mounting bolt	6	0.5 ~ 0.8	3.5 ~ 6.0
Front and rear brake hose union bolt	10	1.5 ~ 2.5	11.0 ~ 18.0
Front and rear brake fluid bleeder bolt	7	0.6 ~ 0.9	4.5 ~ 6.5
Rear brake caliper mounting bolt	10	2.0 ~ 3.0	14.5 ~ 21.5
Rear brake caliper axle bolt	10	2.5 ~ 3.5	18.0 ~ 25.5
Rear brake master cylinder mounting bolt	8	1.5 ~ 2.5	11.0 ~ 18.0
Chain adjuster support bolt	8	1.0 ~ 1.5	7.0 ~ 11.0

TIGHTENING TORQUE CHART

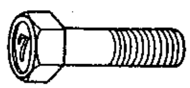
For other bolts and nuts not listed above, refer to this chart:

Tightening Torque

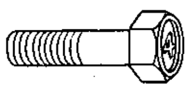
Thread Diameter (mm)	Conventional or "4" Marked Bolt		"7" Marked Bolt	
	kg-m	lb-ft	kg-m	lb-ft
5	0.2 ~ 0.4	1.5 ~ 3.0	0.3 ~ 0.6	2.0 ~ 4.5
6	0.4 ~ 0.7	3.0 ~ 5.0	0.7 ~ 1.0	5.0 ~ 7.0
8	0.9 ~ 1.4	6.5 ~ 10.0	2.0 ~ 2.5	14.5 ~ 18.0
10	1.8 ~ 2.8	13.0 ~ 20.0	3.5 ~ 4.0	25.5 ~ 29.0



Conventional Bolt



"7" Marked Bolt



"4" Marked Bolt

PERIODIC MAINTENANCE

CONTENTS

PERIODIC MAINTENANCE

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

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

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

PERIODIC MAINTENANCE SCHEDULE

INTERVAL: THIS INTERVAL SHOULD BE JUDGED BY ODOMETER READING OR MONTHS WHICHEVER COMES FIRST	Mile	600	4000	7500	11000	15000
	Km	1000	6000	12000	18000	24000
	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 3000 km (2000 miles), and replace every 12000 km (7500 miles).				
Tappet clearance		I	I	I	I	I
Spark plug		—	C	R	C	R
Fuel line		Replace every two years.				
Contact breaker point		I	I	I	I	I
Ignition timing		I	I	I	I	I
Engine oil		Change oil at initial 1000 km (600 miles) and initial 3000 km (2000 miles), and thereafter change every 3000 km (2000 miles).				
Engine oil filter		R	R	R	R	R
Carburetor idle rpm		A	A	A	A	A
Clutch		I	I	I	I	I
Drive chain		I	I	I	I	I
		Clean and lubricate every 1000 km (600 miles).				
Brake hose		Replace every two years.				
Brake		I	I	I	I	I
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, A=Adjust, I=Inspect, R=Replace, C=Clean

PERIODIC MAINTENANCE PROCEDURES

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

BATTERY

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

1. Remove air cleaner case to check battery.
2. Check that the vent pipe is tightly secured and undamaged, and is routed as shown below.
3. 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 charge condition.

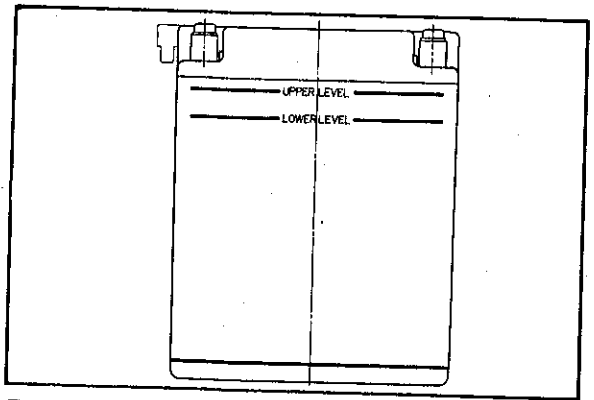


Fig. 3-1.

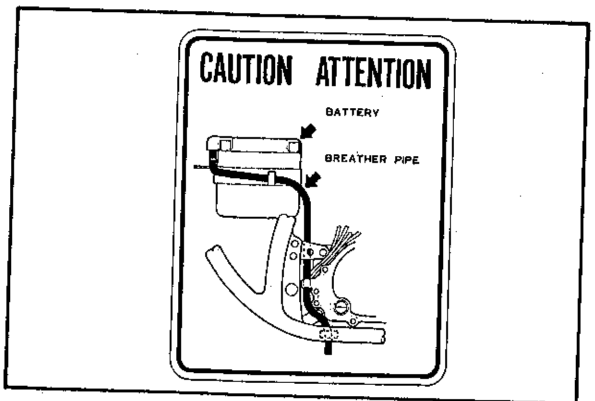


Fig. 3-2.

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 off the machine: take it off and charge it from a recharger. Charging the battery in place from the recharger can lead to rusting or even repture of the rectifier.

CYLINDER HEAD NUTS AND EXHAUST PIPE BOLTS

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

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

Cylinder head nut tightening torque	3.7 kg-m (27.0 lb-ft)

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

Head bolt tightening torque	0.9 ~ 1.4 kg-m (6.5 ~ 10.0 lb-ft)

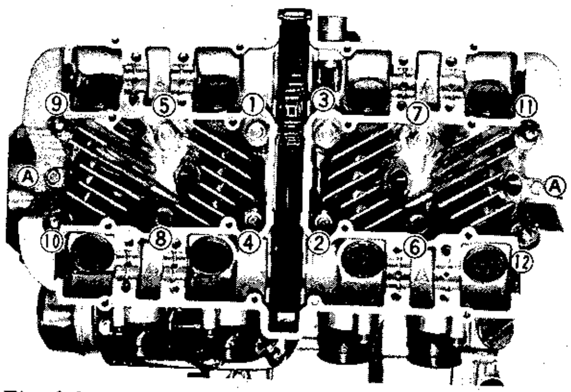


Fig. 3-3.

2. EXHAUST PIPE
   Tighten the exhaust pipe bolts to the specified torque with a torque wrench.

Exhaust pipe bolt tightening torque	0.9 ~ 1.4 kg-m (6.5 ~ 10.0 lb-ft)

AIR CLEANER ELEMENT

Clean every 3 000 km (2 000 miles), and replace every 12 000 km (7 500 miles).

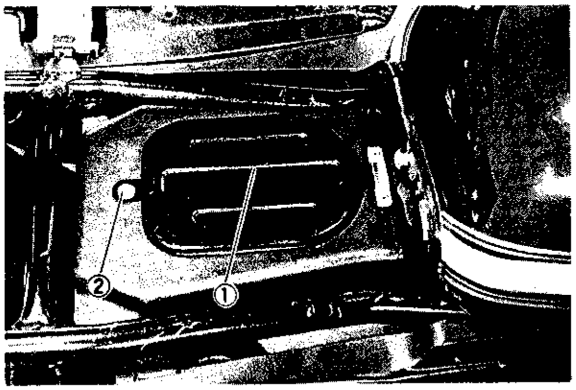


Fig. 3-4.

The air cleaner element is a paper type. If the air cleaner element is clogged with dust, intake resistance will increase with a resultant decrease in power output and increase in fuel consumption. Check and clean the air cleaner element every 2,000 miles (3,000 km) observing the following procedures.

1. Open the seat and remove the air cleaner case cover ① by unscrewing the fixing screw ②.
2. Take out the air cleaner element by pulling up the spring retainer bracket ③.

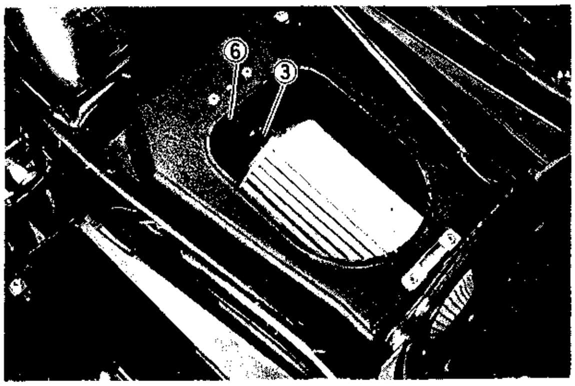


Fig. 3-5.

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

CAUTION:
Always use air pressure ④ on the inside of the cleaner element. If air pressure is used on the outside ⑤ dirt will be force into the pores of the cleaner element thus restricting air flow through the cleaner element.

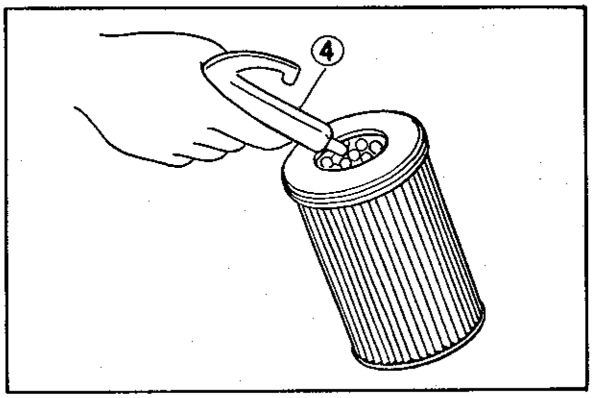


Fig. 3-6.

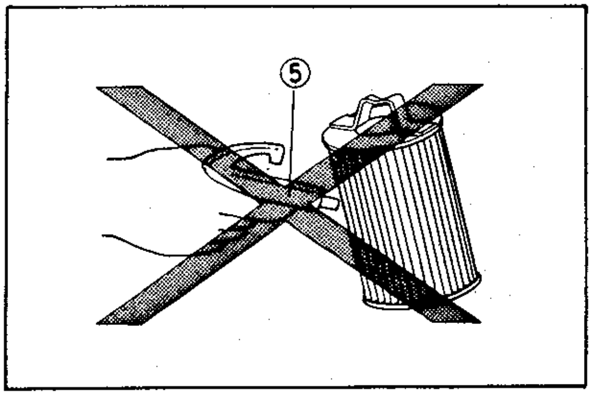


Fig. 3-7.

4. Reinstall the cleaned or new cleaner element in the reverse order of removal making sure that the spring bracket ③ is properly engaged with the securing spring ⑥.

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!

TAPPET CLEARANCE

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

CHECKING AND ADJUSTING THE TAPPET CLEARANCE

The tappet clearance specification is the same for both intake and exhaust valves. Too small a tappet clearance may reduce the engine power; too large a tappet clearance increases valve noise and hastens valve and seat wear. When the tappets are set to the specified clearance, the engine will run without excessive noise from the valve mechanism and will deliver full power. In this engine, the tappet clearance is increased or decreased by replacing the shim disc, made of a special wear-resistant material, fitted to the top of the tappet. The shim discs are easy to remove and refit. Tappet clearance adjustment must be checked and adjusted 1) at the time of periodic inspection, 2) when the valve mechanism is serviced, and 3) when the camshafts are disturbed by removing them for servicing.

CHECKING THE TAPPET CLEARANCE

Tappet clearance specification (for both intake and exhaust valves)	0.03 ~ 0.08 mm (0.001 ~ 0.003 in.)

NOTE:
1) The cam must be at position Ⓐ or Ⓑ in order to check the tappet clearance or to remove the shim disc. Clearance readings should not be taken with the cam in any other position than these two positions.
2) The clearance specification is for COLD state.
3) To turn the crankshaft for clearance checking, be sure to use a 19-mm wrench and to rotate in normal running derection.

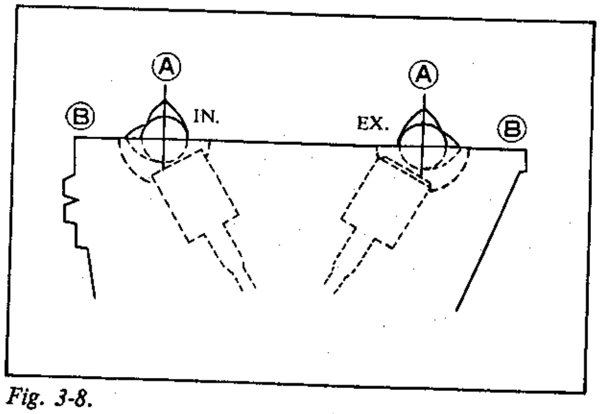


Fig. 3-8.

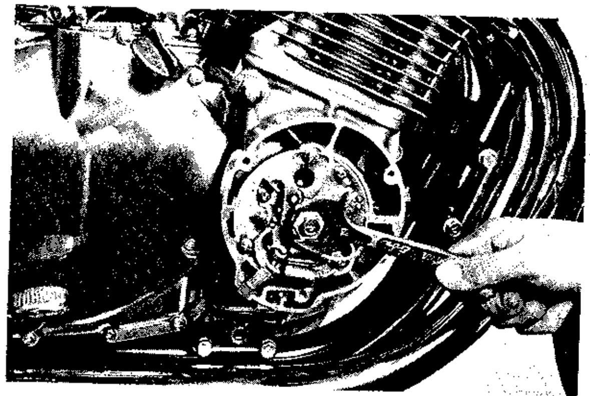


Fig. 3-9.

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

09900-20803	Thickness gauge

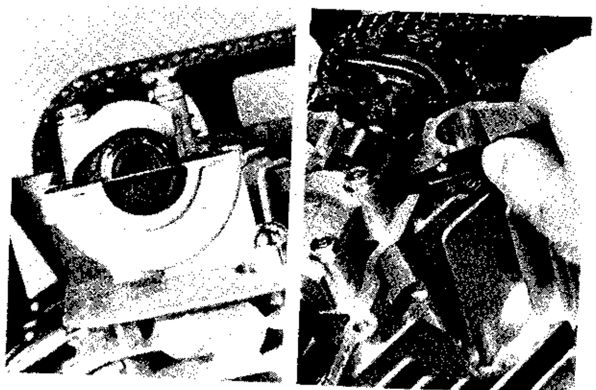


Fig. 3-10.

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

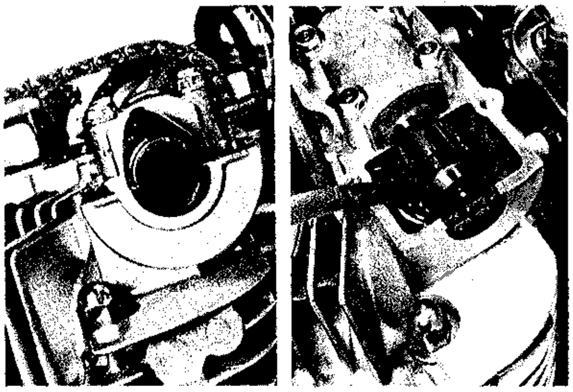


Fig. 3-11.

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

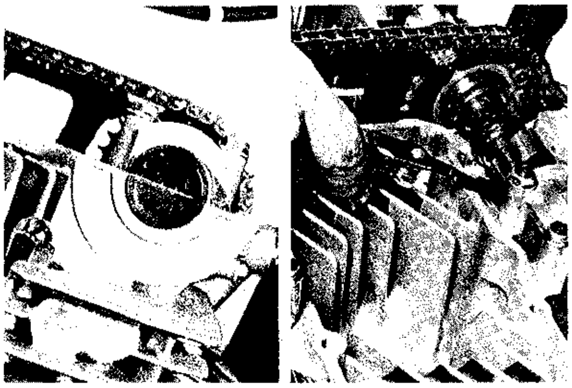


Fig. 3-12.

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

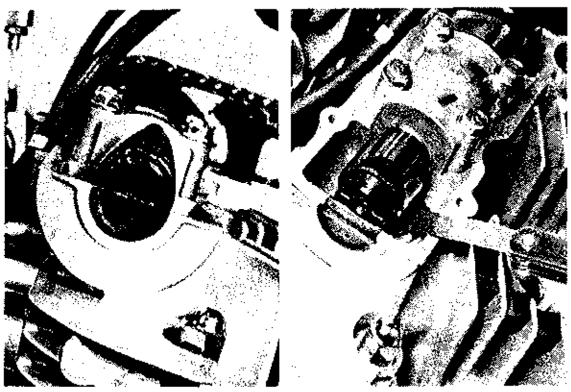


Fig. 3-13.

TAPPET CLEARANCE ADJUSTMENT

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

1. Put your fingertips to the tappet, and turn it in place to bring its notch ① to the position indicated.

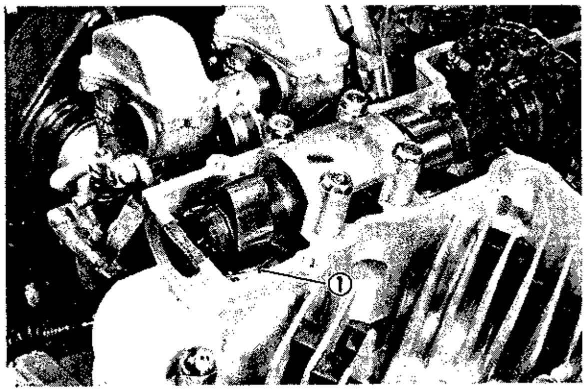


Fig. 3-14.

2. Using the tappet depressor, push down the tappet.

09916-64510	Tappet depressor

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

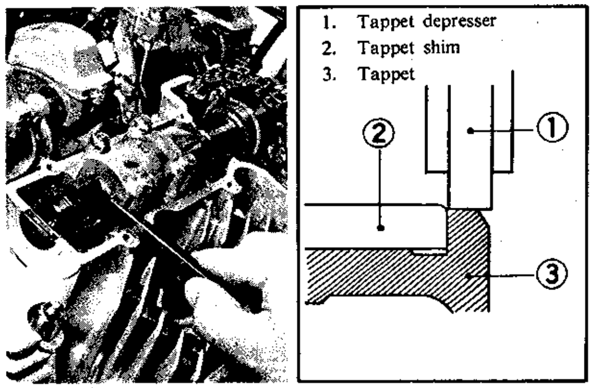


Fig. 3-15.

3. Pick out the tappet shim from the tappet, using a pair of forceps.

09916-84510	Forceps

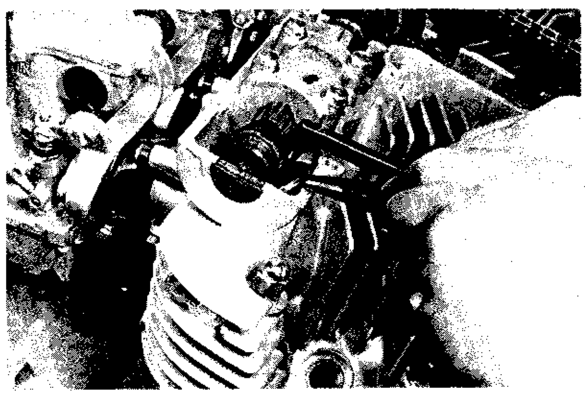


Fig. 3-16.

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

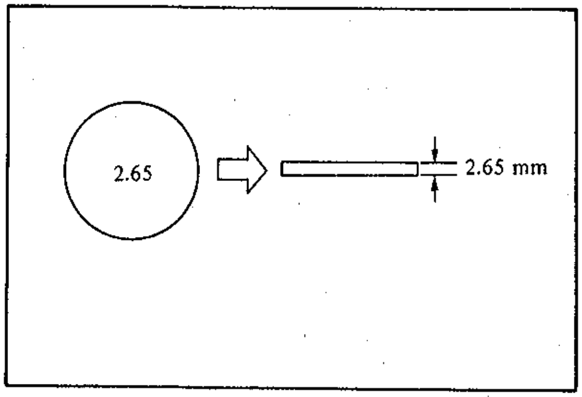


Fig. 3-17.

5. Select a replacement shim that will provide a clearance coming without the specified range (0.03 ~ 0.08 mm). For the purpose of this adjustment, a total of 20 sizes of tappet shim are available ranging from 2.15 to 3.10 mm in steps of 0.05 mm each. Fit the selected shim to the tappet.

Tappet shim size chart

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

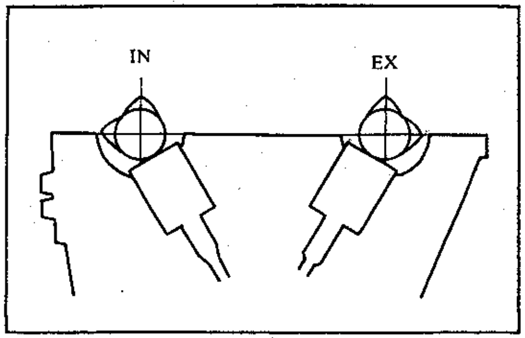
NOTE:
Before fitting the tappet shim to the tappet, be sure to oil its top and bottom faces with engine oil.

6. After replacing the tappet shim, check the clearance again to make sure that it is within the specified range.

SHIM SELECTION CHART

PART NUMBER — PREFIX 12892

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



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

EXAMPLE

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

SPARK PLUG

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

At initial 6,000 km, remove the carbon deposits with a wire or pin and adjust the spark plug gap to 0.6 ~ 0.8 mm (0.024 ~ 0.031 in.) by measuring with a thickness gauge.

Replace the plugs every 12,000 km and remove the carbon deposits and adjust the gap every 6,000 km after replacing the plugs.

Whenever removing the carbon deposits, be sure to observe the appearance of the plug, noting the color of the carbon deposit. The color observed tells whether the standard plug is suitable for your usage. If the standard plug is apt to get wet, the hotter plug should be used. If the standard plug is apt to overheat, with the porcelain having a whitish appearance, replace with the colder one.

	NGK	NIPPON DENSO
Hot type	B7ES	W22ES
Standard	B8ES	W24ES
Cold type	B9ES	W27ES

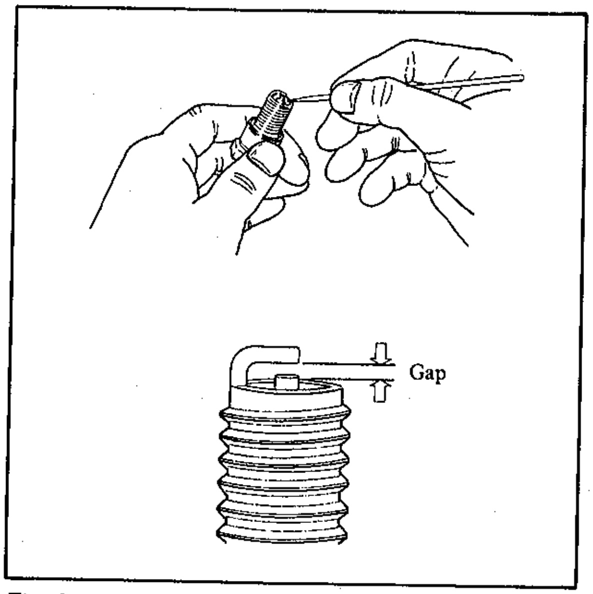


Fig. 3-18.

FUEL LINE (Replace every two years)

Replace the fuel hose every two years.

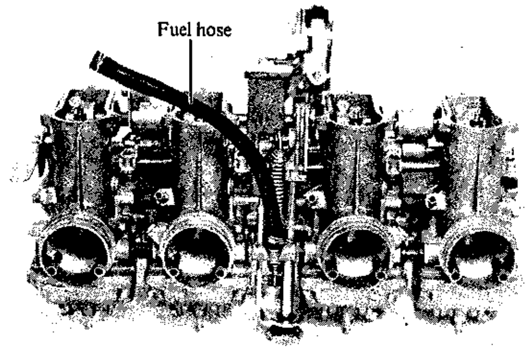


Fig. 3-19.

CONTACT BREAKER POINTS

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

Check and adjust the contact points as outlined in the next page. Inspect the contact points for wear and burning. If the point faces are dirty, wipe them clean with a clean and dry cloth.

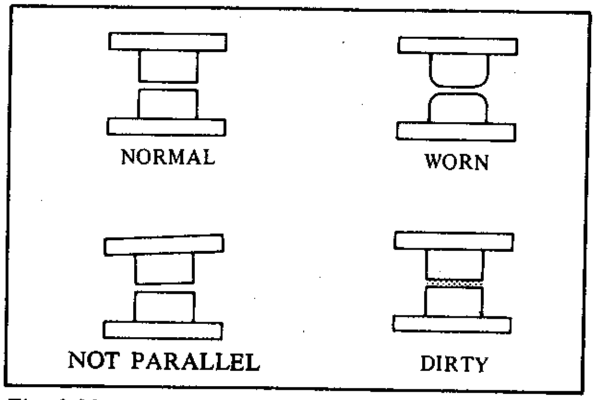


Fig. 3-20.

IGNITION TIMING

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

Ignition timing specifications

Point gap	0.35 ±0.05 mm (0.014 ±0.01 in.)
Spark plug gap	0.6 ~ 0.8 mm (0.024 ~ 0.031 in.)
Ignition timing	17° B.T.D.C. below 1,500 rpm and 37° B.T.D.C. above 2,500 rpm

NOTE:
1) Be sure to use a 19-mm wrench to turn over crankshaft in the direction shown.
2) Remove all four plugs until all adjustment is completed.

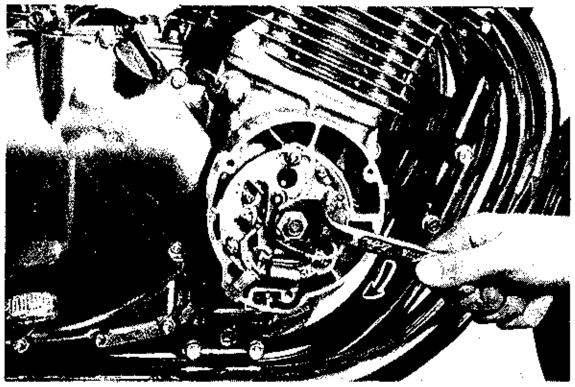


Fig. 3-21.

TIMING ADJUSTMENT FOR NOS. 1 AND 4 CYLINDERS

1. Set the contact point gap ① to 0.35 mm in the Nos. 1-4 breaker. To adjust the gap, loosen screw ② and displace terminal ③.
2. Connect the timing tester (09900-27003) between the (+) terminal of the same breaker and ground.

09900-27003	Timing tester

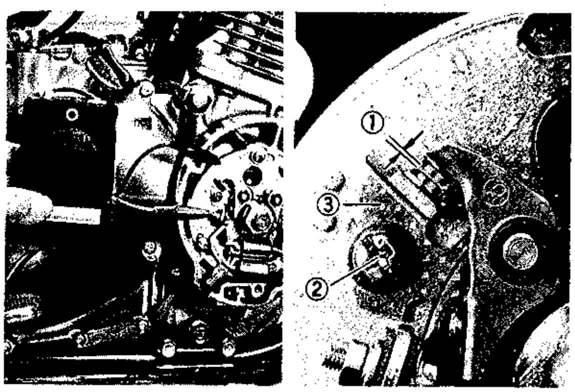


Fig. 3-22.

3. Slowly turn over crankshaft in normal direction until index mark ② (on the Nos. 1-4 side of the advance governor) comes into register with timing mark ④.
   ①: Corresponding to T.D.C. of Nos. 1-4 pistons
   ②: Timing index mark
   ③: Ignition advance timing mark

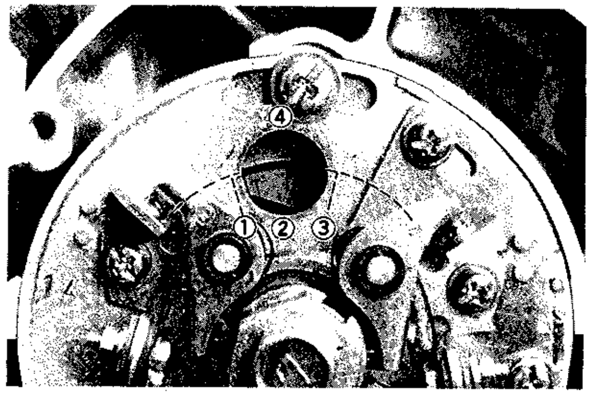


Fig. 3-23.

4. With the pistons brought to the specified B.T.D.C. position in Nos. 1 and 4 cylinder, as above, loosen the three screws ⑤ securing the breaker plate and turn the plate slowly counterclockwise until the contact points begin to separate. Secure the plate in that position by tightening the screws ⑤.
5. To check, turn over crankshaft slowly while paying attention to the timing tester. If the breaker begins to open its contact just when mark ② comes into register with mark ④, then it means that the adjustment is correct and that the ignition is timed as specified for Nos. 1 and 4 cylinders.

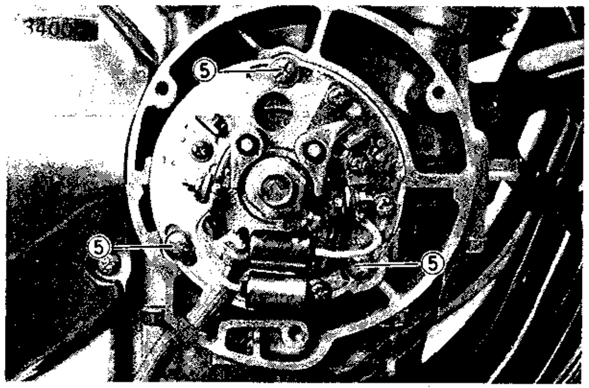


Fig. 3-24.

TIMING ADJUSTMENT FOR NOS. 2 and 3 CYLINDERS

The procedure is identical to the foregoing except for two points:

1. Bring mark "F" (on Nos. 2 ~ 3 side in the advance governor) into register with the timing mark.

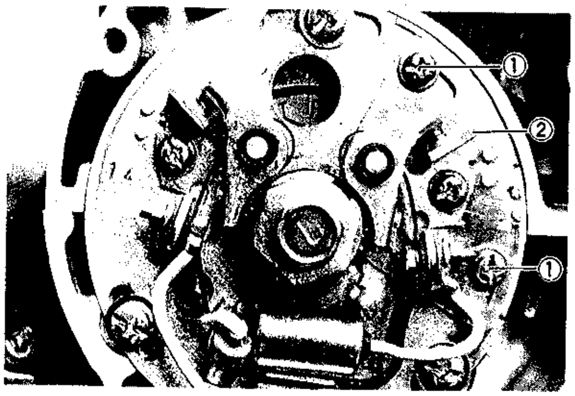


Fig. 3-25.

2. Loosen two screws ① and move plate ② counterclockwise to determine its position for the beginning of opening action.

CHECKING THE IGNITION TIMING WITH THE TIMING LIGHT

After setting the contact points of the twin breaker by adjusting in the above-described manner, check the performance of the timing mechanism by using the electro tester (09900-28106). Illuminate the advance governor with the timing light of this tester and vary the engine speed to see if the ignition is correctly timed or not. Here's the procedure:

09900-28106	Electro tester

1. Run the engine in the speed range not exceeding 1 500 rpm. Under this condition, "F" mark and timing mark should be in perfect alignment: if not, readjust the twin breaker referring to these marks in the advance governor.

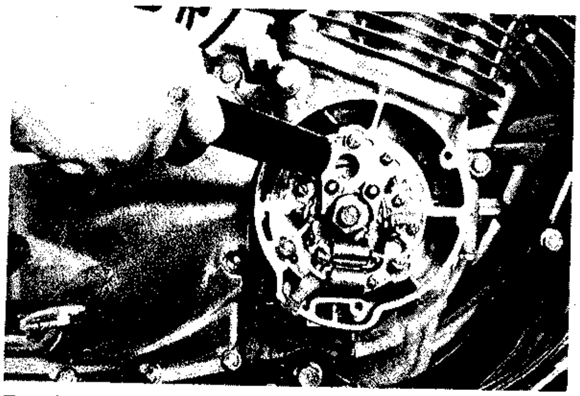


Fig. 3-26.

2. Run the engine in the speed range above 2,500 rpm; and similarly observe the position of mark ③ relative to mark ④. If the two marks are in register, it means that the ignition is properly advanced.

3. Carry out the above steps 1, 2 for Nos. 2 and 3 cylinders.

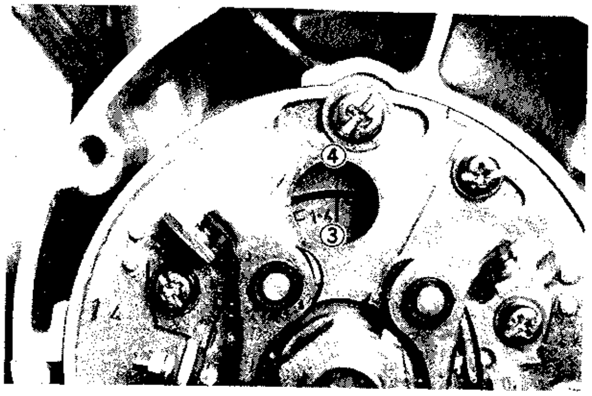


Fig. 3-27.

ENGINE OIL

Change oil at initial 1 000 km (600 miles) and initial 3 000 km (2 000 miles), and thereafter change every 3 000 km (2 000 miles).
The oil should be changed with the engine hot.
The procedure is as follows:

- Keep the motorcycle upright, supported by the center stand.
- Place an oil pan below the engine and drain out the oil by removing the drain plug ① and filler cap ②.

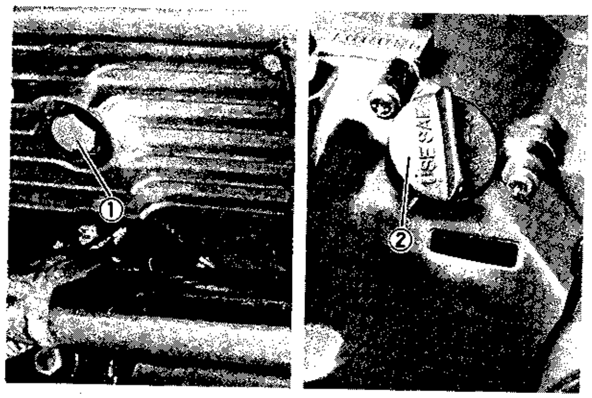


Fig. 3-28.

- Fit the drain plug ① securely, and add fresh oil through the filler. The oil pan will hold about 3.4L. (3.6 US.qt) of oil.
  Use API SE 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 in the level gauge ③. If the level is below "F" mark, add oil to reach the level.

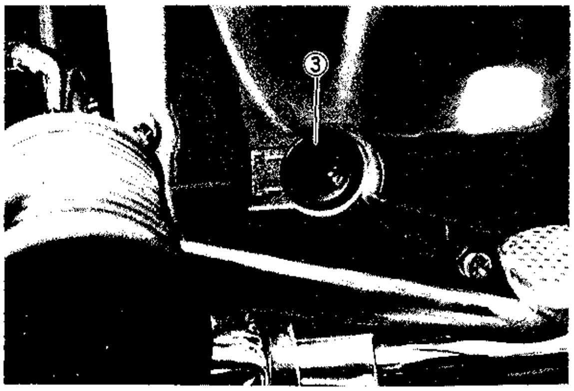


Fig. 3-29.

NOTE:
- *When replacing the oil filter, the amount of oil to be replaced is 3.8 L (4.0 US.qt).*
- *When performing engine overhaul, the amount of oil to be replaced is 4.2 L (4.4 US.qt).*

ENGINE OIL FILTER

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

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

1. Remove three nuts ① securing the filter cap ②.
2. Take off the cap ②, pull out the old element ③ and replace with a new one.
3. Put on the cap ② and secure it tightly.

NOTE:
Pour about 3,800 ml (4.0 US.qt) of engine oil into oil pan only when changing oil and replacing oil filter at the same time.

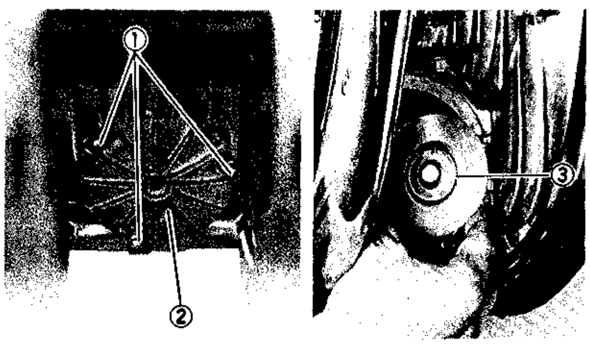


Fig. 3-30.

CARBURETOR IDLE RPM

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

1. Start up the engine and warm it up by running it at 1,500 rpm for 10 minutes in summer, when ambient temperature is 30°C (86°F), or for 20 minutes in winter, when ambient temperature is down to approx. −5°C (23°F).
2. After engine warms up, turn the throttle stop screw in or out so that engine runs at 900 ~ 1100 rpm.

CAUTION:
No adjustment except the procedure mentioned above is necessary because calibration is performed by carburetor manufacturer.

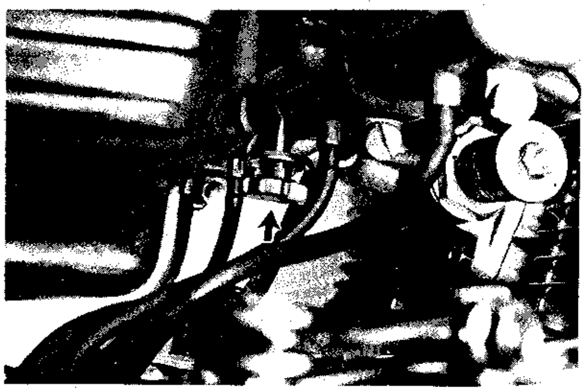


Fig. 3-31.

At the same intervals, adjust the throttle cable play in the following way:

THROTTLE CABLE ADJUSTMENT

A twin throttle cable system is used in your GS1000: One cable Ⓑ is for pulling and the other cable Ⓐ for returning.

Pulling cable play

The throttle cable should be adjusted to have a slack ① of 3 ~ 5 mm (0.12 ~ 0.20 in.) at the middle point between adjusting holder ② and throttle cable end ③ of the carburetor side.

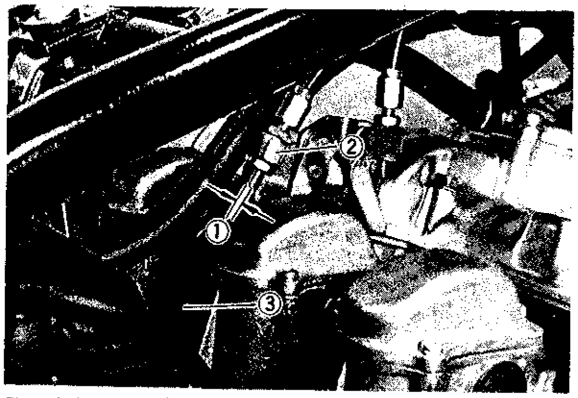


Fig. 3-32.

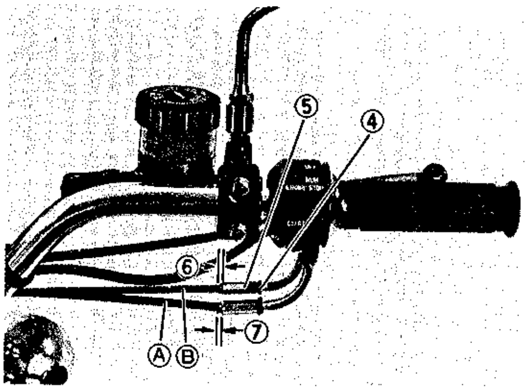


Fig. 3-33.

> *NOTE:*
> *Inspect the cable slack at times, and if necessary, adjust it to the specified value. The cable end could come out when the sag is excessive.*

1. Loosen lock nut ④.
2. Turn adjusting nut ⑤ to introduce a cable play ⑥ of 1.0 ~ 1.5 mm (0.04 ~ 0.06 in.).
3. Tighten lock nut ④.

Returning cable play

1. Reduce the play ⑦ to zero by turning its adjusting nut, and securely tighten the lock nut.

CLUTCH

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

CLUTCH CABLE ADJUSTMENT

Loosen lock nut ① at the lever side of clutch cable and screw adjusting nut ② fully into the clutch lever side.

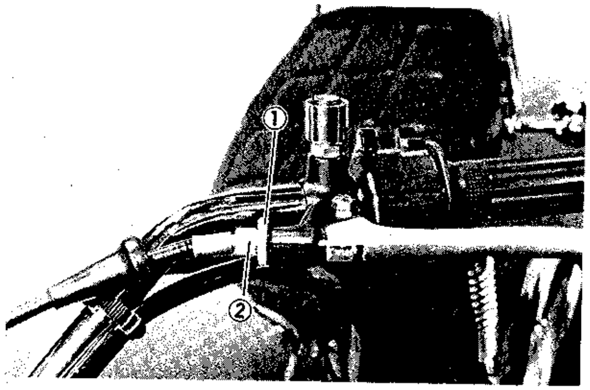


Fig. 3-34.

Loosen the lock nut for the cable, tighten the adjusting nut and provide play to outer cable. Adjust the play of the cable with adjusting nut ② until the play ① of the clutch lever becomes 2 ~ 3 mm. Next, firmly secure lock nut ③.

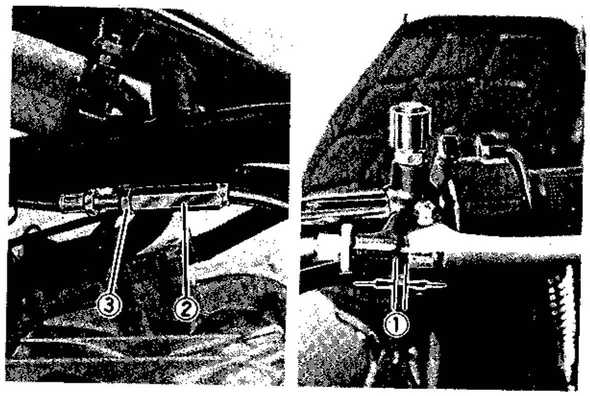


Fig. 3-35.

When the adjustment can not be attained by the adjusting nut ② shown in the above drawing, carry out the adjustment using the adjust nut on the clutch lever side.

DRIVE CHAIN

Inspect

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

Clean and lubricate

.... every 1 000 km (600 miles).

Check the drive chain for wear and adjust the chain tension as follows:

- Loosen axle nut ① after pulling out cotter pin ②.
- Adjust the drive chain by turning the right and left chain adjuster bolts ③ after loosening the lock nut ④. Turning adjuster bolt in tightens chain.

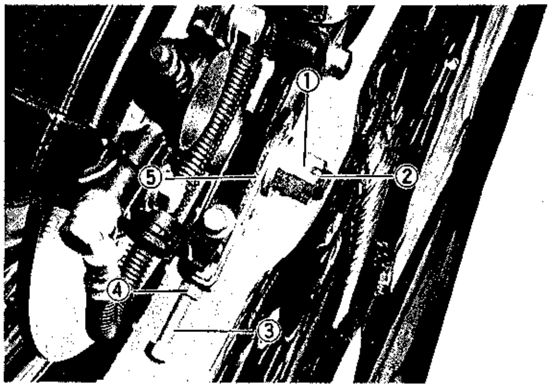


Fig. 3-36.

Chain slack (at the middle of two sprockets)	20 mm (0.8 in.)

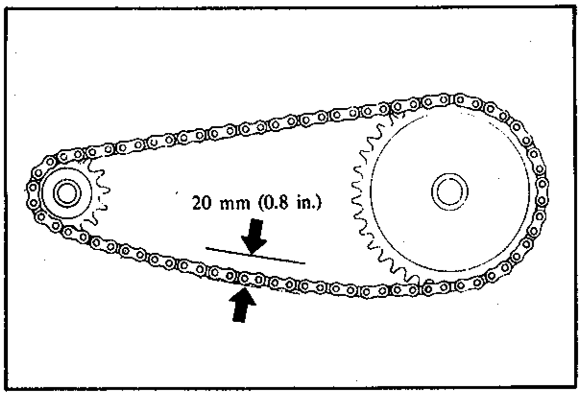


Fig. 3-37.

- Mark ⑤ on both chain adjusters must indicate the same position to show that the front and rear wheels are correctly aligned.
- After adjusting the drive chain tighten the axle nut securely and lock it with a cotter pin ②. Be sure to use a new cotter pin.

> *NOTE:*
> *If the indicator mark ① on chain adjuster aligns with the end of swing arm ②, replace the drive chain with a new one.*

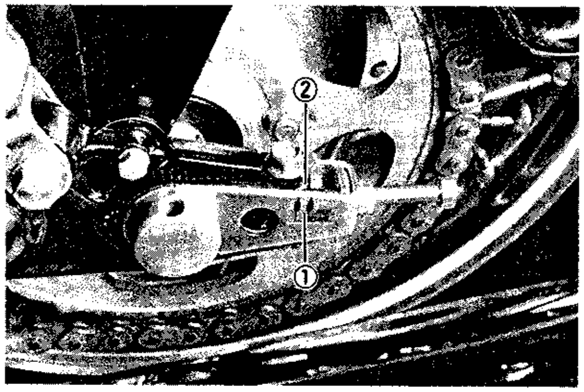


Fig. 3-38.

> *CAUTION:*
> *Never allow the chain slack to exceed 50 mm (2 in.).*

> *CAUTION:*
> *The standard drive chain is TAKASAGO RK630 GSO. SUZUKI recommends that the above-mentioned standard drive chain be used for the replacement.*

The number of pitches and links of the GS1000 drive chain is the same as for the GS750 drive chain. However, as they differ from each other in precision and material, do not use the GS750 drive chain for the GS1000.

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

1. Loose pins
2. Damaged rollers
3. Dry or rusted links
4. Kinked or binding links
5. Excessive wear
6. Improper chain adjustment

CHAIN CLEANING AND OILING

At intervals of 1,000 km, clean and lubricate the chain, as follows:

Cleaning by washing

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.

Oiling

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

CAUTION:
Do not use any oil sold commercially as "drive chain oil". Such oil too can spoil the "O" rings.

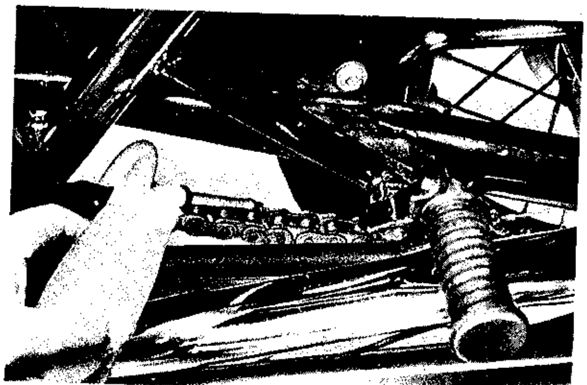


Fig. 3-39.

BRAKE HOSES (Replace every two years)

Replace the brake hoses by new ones.

TIRES

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

Inspect the tire for wear and damage and check the tire tread depth as shown. Replace a badly worn or damaged tire. A tire with its tread worn down to the limit (in terms of tread depth) must be replaced.

Tread depth service limit	
Front	1.6 mm (0.06 in.)
Rear	2.0 mm (0.08 in.)

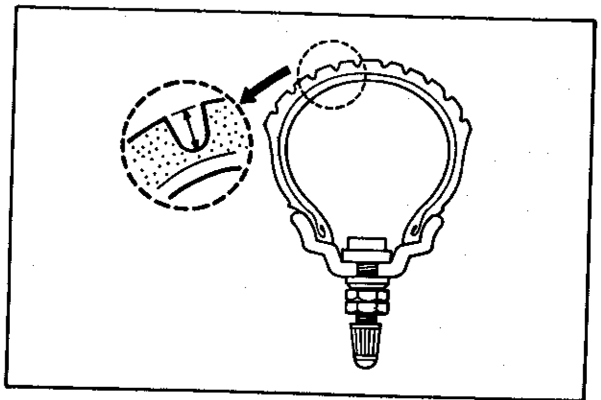


Fig. 3-40.

Check the tire inflation pressure, and examine the valve for evidence of air leakage.

Cold Inflation Tire Pressure		Solo Riding		Dual Riding	
		psi	kg/cm^2	psi	kg/cm^2
Normal Riding	Front	25	1.75	28	2.00
	Rear	28	2.00	32	2.25
Continuous High Speed Riding	Front	28	2.00	32	2.25
	Rear	32	2.25	40	2.80

BRAKES

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

Check the front and rear brake systems for the following items:
1. Insufficient brake power
2. Brake squeaking
3. Excessive brake lever stroke
4. Leakage of brake fluid

If these troubles are detected, repair or replace the damaged parts as indicated in the chart below.

Symptom and possible cause	Countermeasure
INSUFFICIENT BRAKE POWER	
1) Leakage of brake fluid from hydraulic system	Repair or replace
2) Worn pads	Replace
3) Oil adhesion on engaging surface of pads	Clean disc and pads
4) Worn disc	Replace
5) Air entered into hydraulic system	Bleed air
BRAKE SQUEAKING	
1) Carbon adhesion on pad surface	Repair surface with sandpaper
2) Tilted pad	Modify pad fitting
3) Damaged wheel bearing	Replace
4) Loosened front-wheel axle or rear-wheel axle	Tighten to regular torque
5) Worn pads	Replace
6) Foreign substance entered into brake fluid	Replace brake fluid
7) Clogged return port of master cylinder	Disassemble and clean master cylinder
EXCESSIVE BRAKE LEVER STROKE	
1) Air entered into hydraulic system	Bleed air
2) Insufficient brake fluid	Replenish fluid to normal level; bleed air
3) Improper quality of brake fluid	Replace by correct fluid
LEAKAGE OF BRAKE FLUID	
1) Insufficient tightening of connection joints	Tighten to specified torque
2) Cracked hose	Replace

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.
1. Steering stem head center bolt ①.
2. Handlebar holder bolts ②.
3. Upper and lower pinch bolts ③, ④.

Tightening torque	
Steering stem head center bolt	3.6 ~ 5.2 kg-m (26.0 ~ 37.5 lb-ft)
Handlebar holder bolt	1.2 ~ 2.0 kg-m (8.5 ~ 14.5 lb-ft)
Upper pinch bolt	2.0 ~ 3.0 kg-m (14.5 ~ 21.5 lb-ft)
Lower pinch bolt	1.5 ~ 2.5 kg-m (11.0 ~ 18.0 lb-ft)

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.

1. Wear of the races ⑤, ⑥.
2. Wear or damage of bearings ⑦.
3. Distortion of steering stem ⑧.

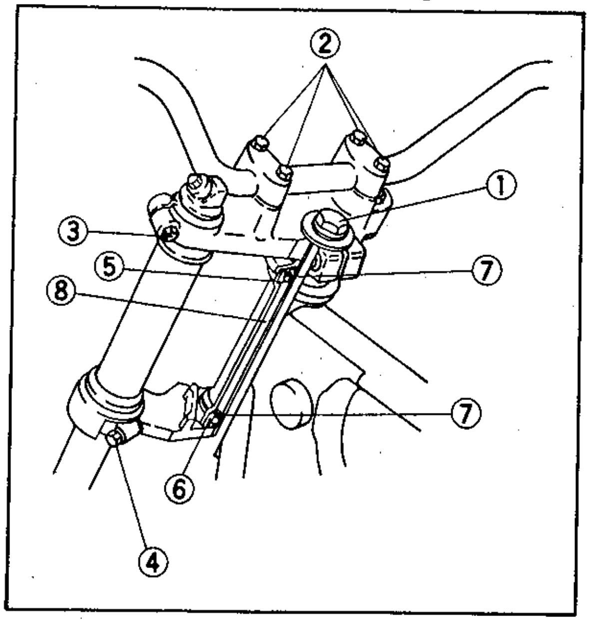


Fig. 3-41.

FRONT FORKS

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

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

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

Specified air pressure	0.8 kg/cm^2 (11.4 psi)

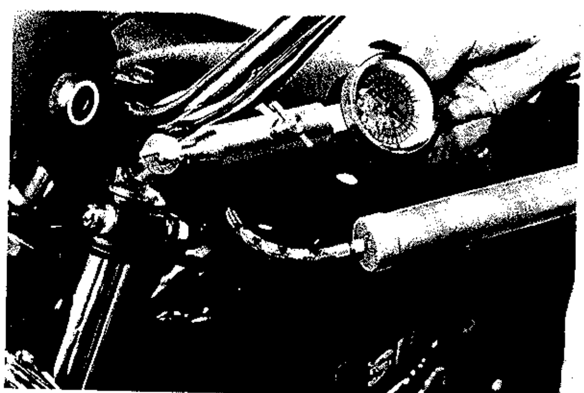


Fig. 3-42.

3. If necessary, inject water-free hand pump through the valve until the pressure gauge reads the specified value.

NOTE:
1) Just before charging with air, see if the valve is tightened.
2) Try to equalize the air pressure of the right and left forks as closely as possible. The maximum permissible difference is 0.1 kg/cm^2.

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 3-19 for the position of the following bolts and nuts on the motorcycle.)

1) Handlebar holder bolt	1.2 ~ 2.0 kg-m (8.5 ~ 14.5 lb-ft)
2) Steering stem center locking bolt	1.5 ~ 2.5 kg-m (11.0 ~ 18.0 lb-ft)
3) Front fork tubes upper pinch bolt (R and L)	2.0 ~ 3.0 kg-m (14.5 ~ 21.5 lb-ft)
4) Steering stem head center bolt	3.6 ~ 5.2 kg-m (26.0 ~ 37.5 lb-ft)
5) Brake hose union bolt	1.5 ~ 2.5 kg-m (11.0 ~ 18.0 lb-ft)
6) Master cylinder bolt	0.5 ~ 0.8 kg-m (3.5 ~ 6.0 lb-ft)
7) Front fork tubes lower pinch bolt (R and L)	1.5 ~ 2.5 kg-m (11.0 ~ 18.0 lb-ft)
8) Caliper air bleeder bolt	0.6 ~ 0.9 kg-m (4.5 ~ 6.5 lb-ft)
9) Caliper axle bolt	2.5 ~ 3.5 kg-m (18.0 ~ 25.5 lb-ft)
10) Rear torque link nut	2.0 ~ 3.0 kg-m (14.5 ~ 21.5 lb-ft)
11) Rear shock absorber nut	2.0 ~ 3.0 kg-m (14.5 ~ 21.5 lb-ft)
12) Rear shock absorber bolt	2.0 ~ 3.0 kg-m (14.5 ~ 21.5 lb-ft)
13) Rear axle nut	8.5 ~ 11.5 kg-m (61.5 ~ 83.0 lb-ft)
14) Swinging arm pivot nut	5.0 ~ 8.0 kg-m (36.0 ~ 58.0 lb-ft)
15) Disc bolt	1.5 ~ 2.5 kg-m (11.0 ~ 18.0 lb-ft)
16) Front axle holder nut	1.5 ~ 2.5 kg-m (11.0 ~ 18.0 lb-ft)
17) Front axle nut	3.6 ~ 5.2 kg-m (26.0 ~ 37.5 lb-ft)

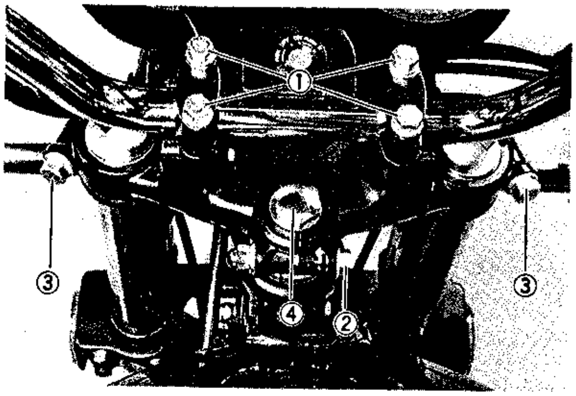


Fig. 3-43.

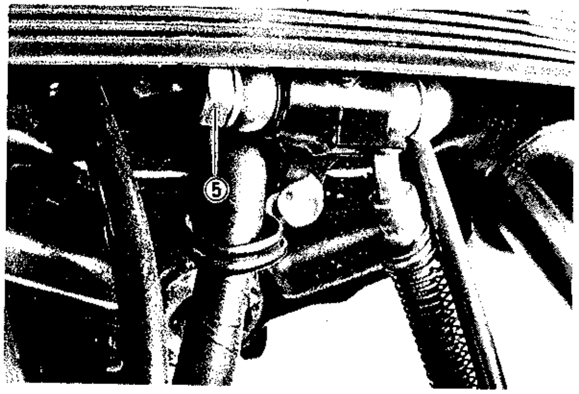


Fig. 3-44.

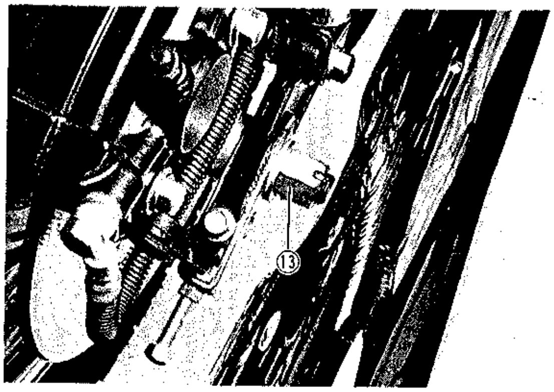


Fig. 3-45.

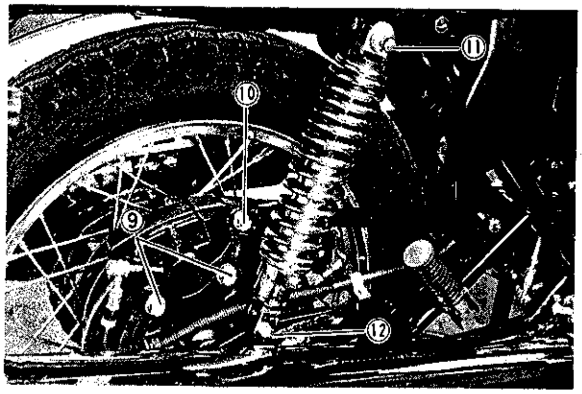


Fig. 3-46.

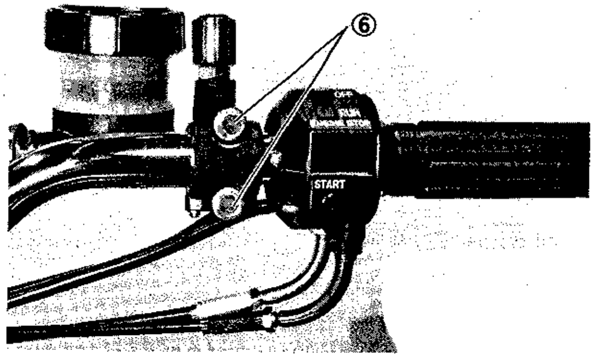


Fig. 3-47.

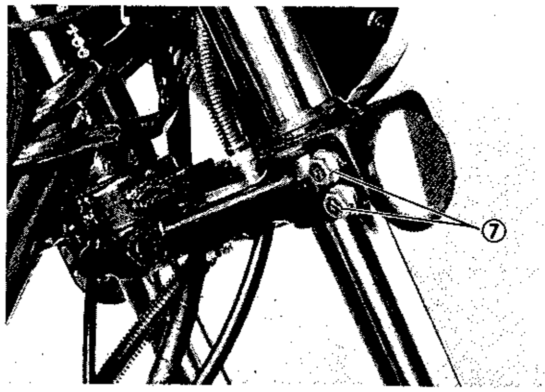


Fig. 3-48.

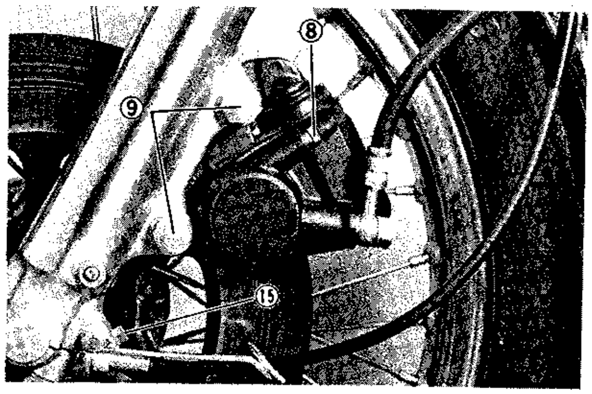


Fig. 3-49.

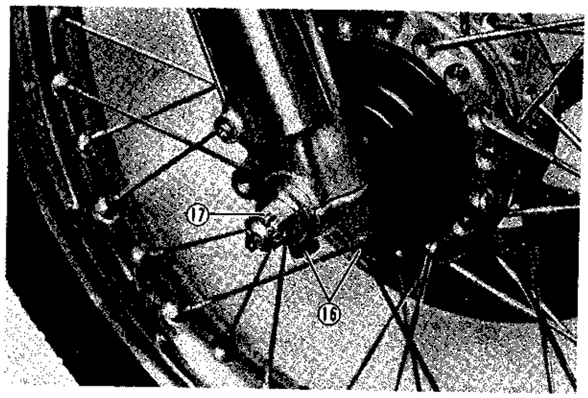
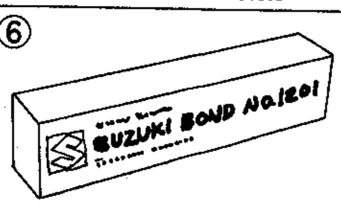
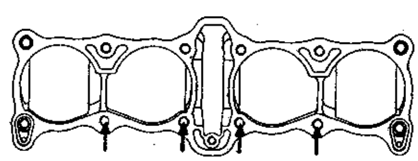


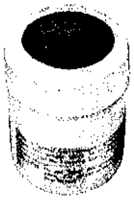
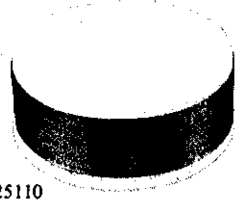
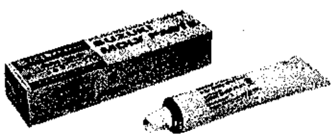
Fig. 3-50.

— MEMO —

SPECIAL MATERIALS

The materials listed below are needed for maintenance work on the GS1000, and should be kept on hand for ready use. They supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them are described in the text of this manual.

	Part	See page	Part	See page
①  99000-32040 THREAD LOCK CEMENT	Cylinder head cover cap screw .... 8 pcs. Cylinder stud bolt .... 12 pcs. Oil filter cover nut .... 3 pcs. Carburetor bracket bolt .... 8 pcs. Front fork allen bolt .... 2 pcs. Carburetor set screw .... 8 pcs.	 7-39 8- 7		
②  99104-32050 THREAD LOCK "1363C"	Gearshift cam guide screw .... 2 pcs. Gearshift cam pawl screw .... 2 pcs. Countershaft B/g retainer screw..... 3 pcs. Drive shaft plate screw .... 4 pcs. Engine oil pump screw .... 4 pcs. Generator stator screw .... 3 pcs. Generator stator lead guide screw.. 2 pcs. Oil gallery plate screw .... 3 pcs. Oil sump filter screw .... 3 pcs.	7-40 7-40 7-40 7-40 7-38 7-28 7-28 7-40 7-39	Starter motor securing bolt........... 2 pcs.	7-40
③  99104-32090 THREAD LOCK SUPER "1332B"	Rotor bolt	7-30		
④  99104-32020 THREAD LOCK SUPER "1361A"	Starter clutch allen bolt .... 3 pcs. Cam chain guide bolt .... 1 pce. Cam chain guide screw........ 2 pcs. Cam sprocket allen bolt........ 4 pcs. Primary drive gear bolt........ 2 pcs.	7-29 7-14		
⑤  99104-32030 THREAD LOCK SUPER "1363A"	2nd drive gear	7-42		
⑥  99104-31100 SUZUKI BOND No. 1201	Mating surfaces of upper and lower crankcase Cylinder stud bolt .... 4 pcs. (Apply a small quantity to the threads of cylinder stud bolts.)			

	Part	See page	Part	See page
⑦  99000-25100 SUZUKI SILICONE GREASE	Apply to the outer periphery of brake pad			
⑧  99000-25110 SUZUKI PBC GREASE	Apply to caliper axle shaft			
⑨  99000-25140 SUZUKI MOLY PASTE	• Valve stem • Cam shaft journal • Chain tensioner adjuster shaft	7-13 7-14 7-23		

Use of Genuine Suzuki Parts

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

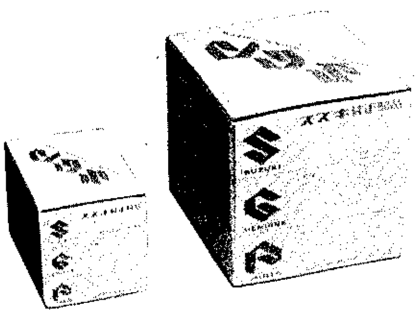
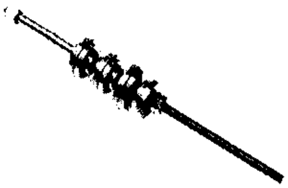
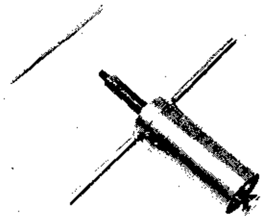


Fig. 4-1.

SPECIAL TOOLS

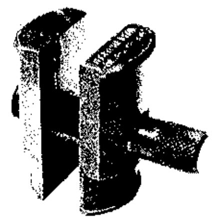
The special tools listed hereunder are designed to facilitate maintenance work — disassembly, reassembly, servicing, checking, etc. — on the GS1000, and protect the parts and components of the motorcycle against damage. Each shop is advised to keep these special tools as standard shop equipment.

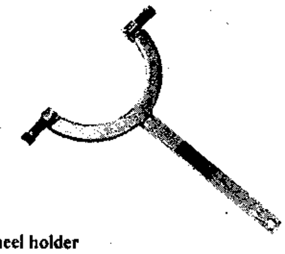
①

Steering inner race and swing arm bearing installer (*09941-34511)

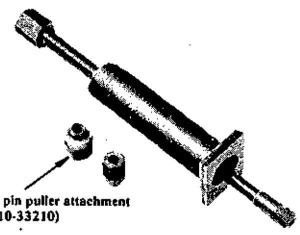
②

Swing arm bearing puller (*09941-44910)

③

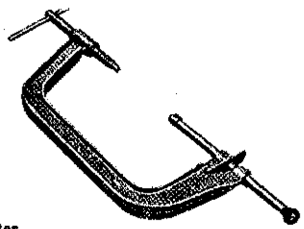
Steering nut socket wrench (*09940-14910)

④

Steering stem inner race remover (*09941-54910)

⑤

Flywheel holder (*09930-44910)

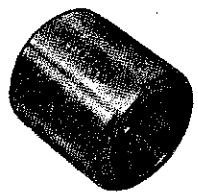
⑥


Piston pin puller (09910-34510)

⑦

Valve lifter (09916-14510)

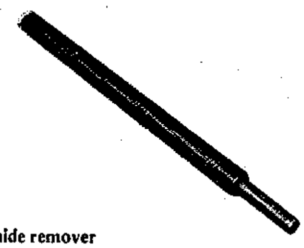
⑧

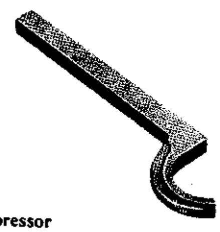
Valve stem seal and valve guide installer handle (09916-57320)

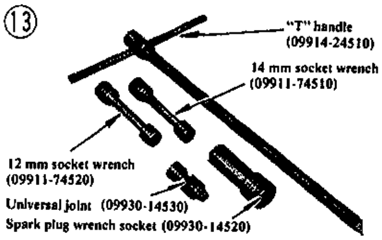
⑨

Valve stem seal installer attachment (09911-94530)

⑩

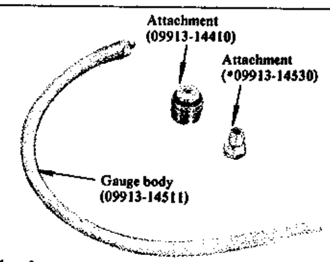
Valve guide installer attachment (09916-54530)

⑪

Valve guide remover (09916-44510)

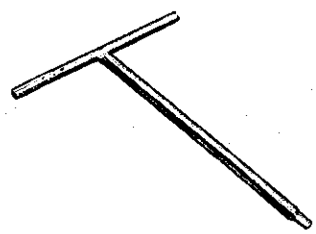
⑫

Tappet depressor (09916-64510)

⑬


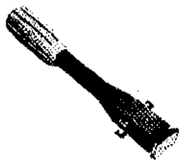
Cylinder head nut and spark plug wrench set (09930-14511)

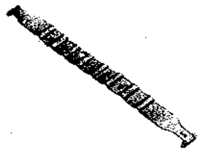
⑭


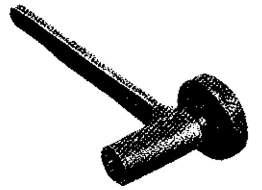
Fuel level gauge set (09913-14540)

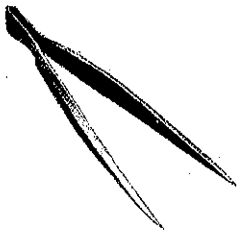
⑮

"T" type hexagon wrench (6 mm) (09914-25811)

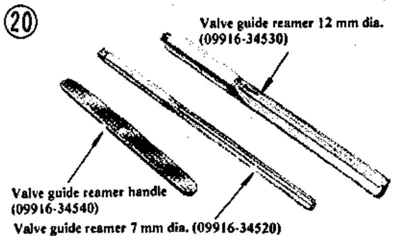
NOTE: Asterisked (*) tools are exclusively for GS1000.

⑯

Piston ring holder body
(09916-74520)

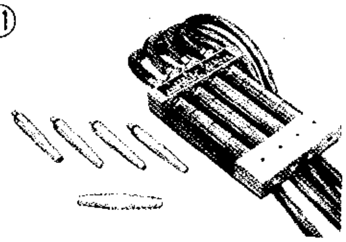
⑰

Piston ring holder band
(09916-74540)

⑱

Carburetor throttle valve adjust wrench
(09913-14520)

⑲

Forceps
(09916-84510)

⑳


Valve guide reamer set
(09916-34510)

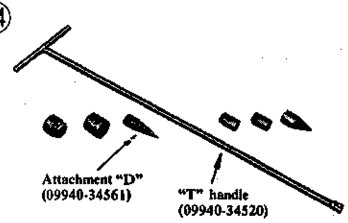
㉑

Carburetor balancer
(09913-13121)

㉒

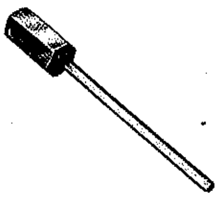
Oil pressure gauge
(09915-74510)

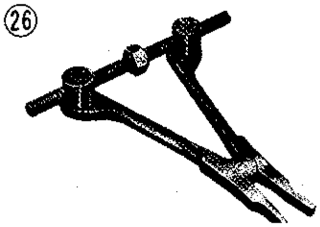
㉓

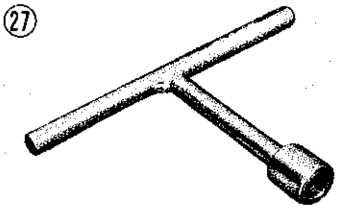
Compression gauge
(09915-64510)

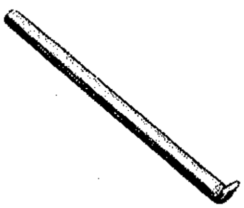
㉔


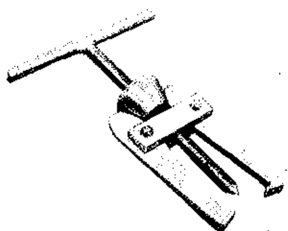
Front fork assembling tools set
(09940-34512)

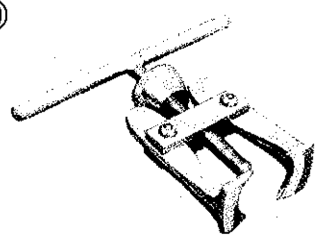
㉕

Hexagon wrench (4 mm)
(09911-70130)

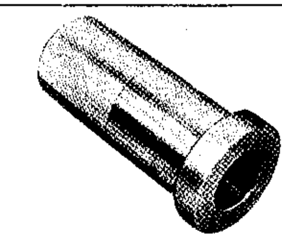
㉖

Cylinder disassembling tool
(09912-34510)

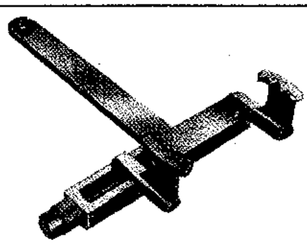
㉗

10 mm stud bolt installing tool
(09910-11510)

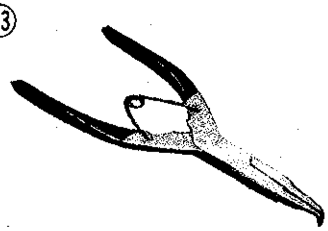
㉘

Oil seal remover
(09913-50110)

㉙

Bearing puller
(09913-60910)

㉚

Bearing puller (55 mm)
(09913-61110)

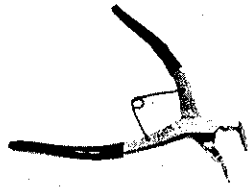
㉛

Bearing and oil seal installing tool
(09913-85210)

㉜

Clutch sleeve hub holder
(09920-53710)

㉝

Snap ring pliers (angle open)
(09900-06104)

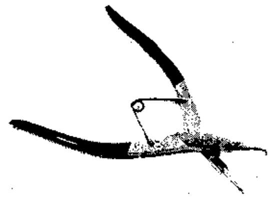
NOTE: Asterisked (*) tools are exclusively for GS1000.

(34)



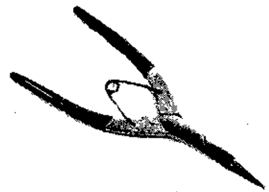
Snap ring pliers (angle closed: large size)
(09900-06105)

(35)



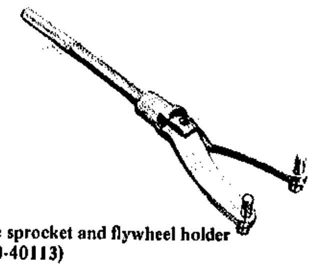
Snap ring pliers (angle closed: small size)
(09900-06106)

(36)



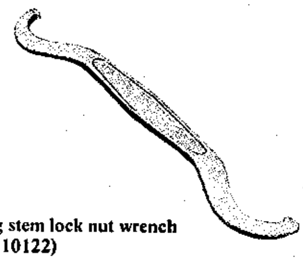
Snap ring pliers (straight open)
(09900-06107)

(37)



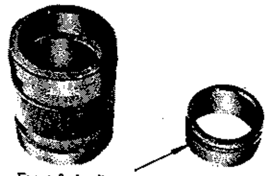
Engine sprocket and flywheel holder
(09930-40113)

(38)



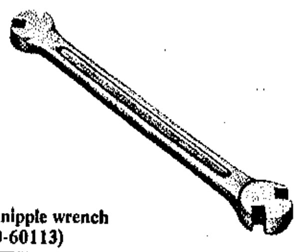
Steering stem lock nut wrench
(09940-10122)

(39)



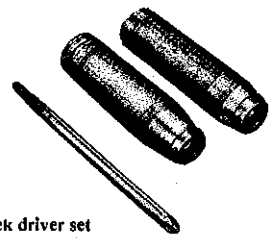
Front fork oil seal installing tool
(*09940-54910)

(40)



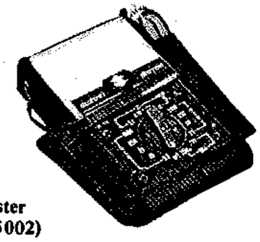
Spoke nipple wrench
(09940-60113)

(41)



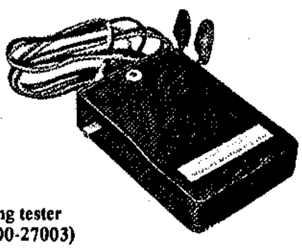
Shock driver set
(09900-09002)

(42)



Pocket tester
(09900-25002)

(43)

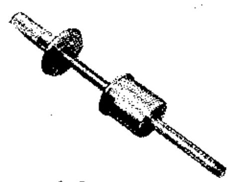


Timing tester
(09900-27003)

(44)

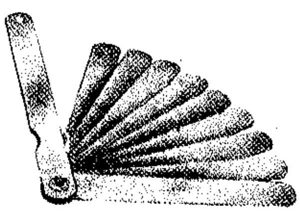
Electro tester
(09900-28106)

(45)



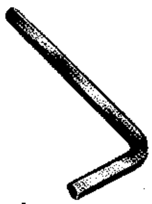
Rotor remover shaft set
(09930-30102)

(46)



Thickness gauge
(09900-20803)

(47)

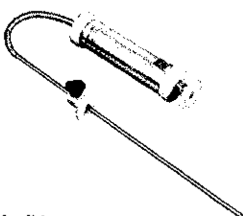


8 mm hexagon wrench
(09911-71510)

(48)

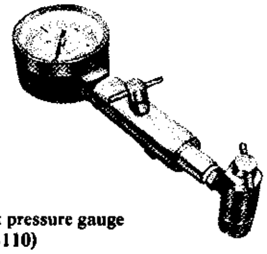
Front fork oil seal remover
(*09941-64910)

(49)



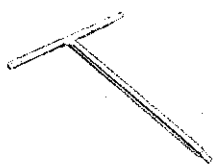
Front fork oil level gauge
(09943-74111)

(50)



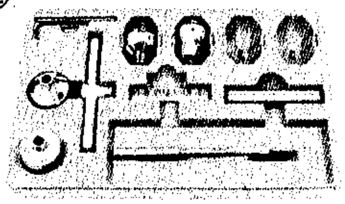
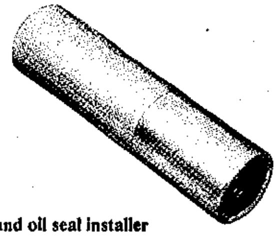
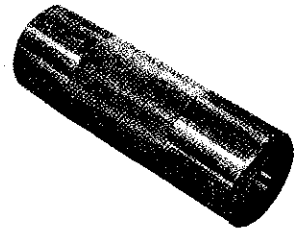
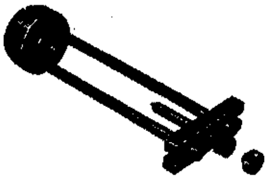
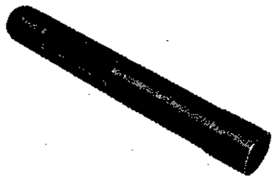
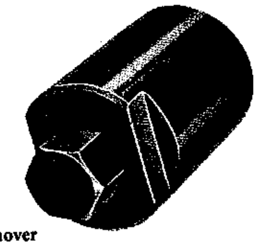
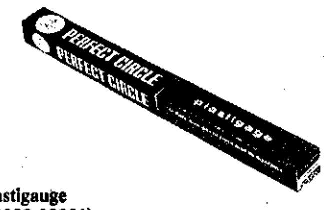
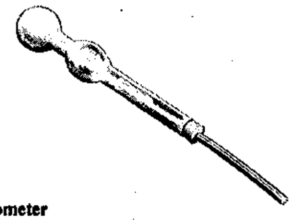
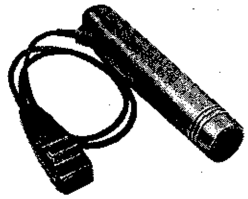
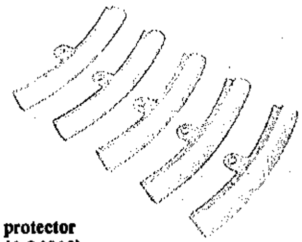
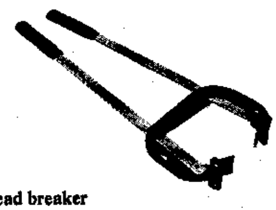
Front fork pressure gauge
(09940-44110)

(51)



"T" type hexagon wrench 5 mm
(09911-73730)

NOTE: Asterisked (*) tools are exclusively for GS1000.

52  **Valve seat cutter set** **(99103-45011)**	53  **Bearing and oil seal installer** **(09913-80111)**	54  **Bearing and oil seal installer** **(09914-79610)**
55  **Steering stem bearing puller** **(*09941-84910)**	56  **Race and bearing driver** **(*09941-74910)**	57  **Rotor remover** **(*09930-34910)**
58  **Plastigauge** **(09900-22301)**	59  **Hydrometer** **(09900-28403)**	60  **Timing light** **(09900-27311)**
61  **Rim protector** **(09941-94510)**	62  **Tire bead breaker** **(09950-74510)**	

NOTE: Asterisked (*) tools are exclusively for GS1000.

TROUBLE SHOOTING

CONTENTS

6

TROUBLE SHOOTING

ENGINE AND CHASSIS

Complaint	Symptom and possible causes	Remedy
Engine will not start, or is hard to start.	**Compression too low**	
	1. Tappet clearance out of adjustment.	Adjust.
	2. Worn valve guides or poor seating of valves.	Repair, or replace.
	3. Valves mistiming.	Adjust.
	4. Piston rings excessively worn.	Replace.
	5. Worn-down cylinder bores.	Replace, or rebore.
	6. Starter motor cranks but too slowly.	Consult "electrical complaints".
	Plugs not sparking	
	1. Fouled spark plugs.	Clean.
	2. Wet spark plugs.	Clean and dry.
	3. Contact points dirty.	Clean.
	4. Improper gaps on contact points.	Adjust.
	5. Ignition timing out of adjustment.	Adjust.
	6. Defective ignition coil.	Replace.
	7. Open or short in high-tension cords.	Replace.
	8. Ruptured condenser.	Replace.
	No fuel reaching the carburetors	
	1. Clogged hole in the fuel tank cap.	Clean.
	2. Clogged or defective fuel cock.	Clean or replace.
	3. Defective carburetor float valve.	Replace.
	4. Clogged fuel pipe or suction cock pipe.	Clean.
Engine stalls easily.	1. Fouled spark plugs.	Clean.
	2. Dirty contact points.	Clean.
	3. Ignition timing out of adjustment.	Adjust.
	4. Clogged fuel pipe.	Clean.
	5. Clogged jets in carburetors.	Clean.
	6. Tappet clearance out of adjustment.	Adjust.
Noisy engine	**Excessive tappet chattes**	
	1. Tappet clearance too large.	Adjust.
	2. Weakened or broken valve springs.	Replace.
	Noise appears to come from pistons	
	1. Pistons or cylinders worn down.	Replace.
	2. Combustion chambers fouled with carbon.	Clean.
	3. Piston pins worn.	Repalce.
	Noise seems to come from timing chain	
	1. Stretched chain.	Replace.
	2. Worn sprockets.	Replace.
	3. Tension adjustor not working.	Repair or replace.
	Noise seems to come from clutch	
	1. Worn splines of countershaft or hub.	Replace.
	2. Worn teeth of clutch plates.	Replace.
	3. Distorted clutch plates, driven and drive.	Repair or replace.
	Noise seems to come from crankshaft	
	1. Rattling bearings due to wear.	Replace.
	2. Big-end bearings worn and rapping.	Replace.
	Noise seems to come from transmission	
	1. Gears worn or rubbing.	Replace.
	2. Badly worn splines.	Replace.
	3. Primary gears worn or rubbing.	Replace.

Complaint	Symptom and possible causes	Remedy
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.	Adjust. 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.	Adjust. Replace. Replace.
Transmission will not shift	1. Broken gearshift cam. 2. Distorted gearshift forks.	Replace. Replace.
Transmission will not shift back.	1. Broken return spring on shift shaft. 2. Shift shafts are rubbing or sticky.	Replace. Repair.
Transmission jumps out of gear.	1. Worn shifting gears on drive shaft or countershaft. 2. Distorted or worn gearshift forks. 3. Weakened stopper spring on gearshift cam.	Replace. Replace. Replace.
Engine idles poorly.	1. Tappet clearance out of adjustment. 2. Poor seating of valves. 3. Defective valve guides. 4. Ignition timing out of adjustment. 5. Improper gaps on contact points. 6. Spark plug gaps too wide. 7. Defective ignition coil or condenser resulting in weak sparking. 8. Float-chamber fuel level out of adjustment in carburetors.	Adjust. Replace. Replace. Adjust. Adjust. Adjust or replace. Replace. Adjust.
Engine runs poorly in high-speed range.	1. Valve springs weakened. 2. Valve timing out of adjustment. 3. Spark plug gaps too narrow. 4. Ignition not advanced sufficiently due to poorly working advancer. 5. Weakened springs on breaker arms. 6. Defective ignition coil. 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 suction cock pipe.	Replace. Adjust. Repair. Repair. Replace. Replace. Adjust. Clean. Clean, and prime. Clean.
Dirty or heavy exhaust smoke.	1. Too much lube 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.	Check with level gauge; drain out excess oil. Replace. Replace. Replace. Replace. Replace.
Engine lacks power.	1. Loss of tappet clearance. 2. Weakened valve springs. 3. Valve timing out of adjustment. 4. Worn piston rings or cylinders. 5. Poor seating of valves. 6. Ignition timing out of adjustment. 7. Improper gaps on contact points. 8. Spark plug gaps incorrect. 9. Clogged jets in carburetors.	Adjust. Replace. Adjust. Replace. Repair. Adjust. Adjust. Adjust or replace. Clean.

Complaint	Symptom and possible causes	Remedy
	10. Float-chamber fuel level out of adjustment. 11. Clogged air cleaner element. 12. Carburetor balancing screw loose. 13. Too much engine lube oil.	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. Ignition timing excessively retarded, accompanied by pinging.	Clean. Add oil Repair or clean. Adjust. Adjust.
Handle feels too heavy.	1. Steering stem nut overtightened. 2. Broken bearing in steering stem. 3. Distorted steering stem. 4. Not enough pressure in tires. 5. Overtightened steering races. 6. Insufficient air pressure in front suspension.	Adjust. Replace. Replace. Adjust. Adjust. Adjust.
Wobbly handle	1. Loss of balance between right and left suspension. 2. Distorted front fork. 3. Distorted front axle or cocked tire. 4. Insufficient air pressure in front suspension.	Replace. Repair or replace. Replace. Adjust.
Wobbly front wheel	1. Distorted wheel rim. 2. Worn-down front wheel bearings. 3. Loose wheel spokes. 4. Defective or incorrect tire. 5. Loose nut on axle.	Replace. Replace. Retighten. Replace. Retighten.
Front suspension too soft	1. Weakened springs. 2. Not enough fork oil. 3. Insufficient air pressure in front suspension.	Replace. Refill. Adjust.
Front suspension too stiff	1. Fork oil too viscous. 2. Too much fork oil. 3. Insufficient air pressure in front suspension.	Replace. Remove excess oil. Adjust.
Noisy front suspension	1. Not enough fork oil. 2. Loose nuts on suspension.	Refill. Retighten.
Wobbly rear wheel	1. Distorted wheel rim. 2. Worn-down rear wheel bearings. 3. Loose wheel spokes. 4. Defective or incorrect tire.	Replace. Replace. Retighten. Replace.
Rear suspension too soft	1. Weakened springs. 2. Rear suspension adjustors improperly set.	Replace. Adjust.
Rear suspension too stiff	Rear suspension adjustors improperly set.	Adjust.
Noisy rear suspension	Loose nuts on suspension.	Retighten.
Poor braking (FRONT and REAR)	1. Not enough brake fluid in the reservoir. 2. Air trapped in brake fluid circuit. 3. Pads or linings worn down.	Refill to level mark. Bleed air out. Replace.

ELECTRICAL

Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking	1. Defective ignition coil. 2. Defective spark plugs.	Replace. Replace.
Contact points burn or pit prematurely.	Defective condenser.	Replace.
Spark plugs soon become fouled with carbon.	1. Mixture too righ. 2. Idling speed set too high. 3. Incorrect gasoline. 4. Dirty element in air cleaner. 5. Spark plugs too cold.	Adjust carburetors. Adjust carburetors. Change. Clean. Repalce by hot type plugs.
Spark plugs become fouled too soon.	1. Worn piston rings. 2. Pistons or cylinders worn. 3. Excessive clearance of valve stems in valve guides.	Replace. Replace. Replace.
Spark plug electrodes overheat or burn.	1. Spark plugs too hot. 2. The engine overheats. 3. Ignition timing out of adjustment. 4. Spark plugs loose. 5. Mixture too lean.	Replace by cold type plugs. Tune up. Adjust. Retighten. Adjust carburetors.
Generator does not charge.	1. Open or short in lead wires, or loose lead connections. 2. Shorted, grounded or open generator coils. 3. Silicon diodes punctured. 4. Shorted regulator lead wire.	Repair or replace or retighten. Replace. Replace. Repair or replace.
Generator does charge, but charging rate is below the specification.	1. Lead wires tend to get shorted or open-circuited or loosely connected at terminals. 2. Grounded or open-circuited stator coils of generator. 3. Defective silicon diodes. 4. Defective regulator. 5. Not enough electrolyte in the battery. 6. Defective cell plates in the battery.	Repair, or retighten. Replace. Replace. Replace. Add distilled water to the upper level. Replace the battery.
Generator overcharges.	1. Internal short-circuit in the battery. 2. Coil element in the regulator damaged or defective. 3. Regulator poorly grounded.	Replace the battery. Replace the regulator. 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.	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.	Recharge or replace. Replace. Repair or replace.
Battery "sulfation"	1. Charging rate too low or too high. (When not in use batteries should be recharged at least once a month to avoid sulfation.)	Replace the battery.

Complaint	Symptom and possible causes	Remedy
Battery "sulfation"	2. Battery electrolyte excessive or insufficient, or its specific gravity too high or too low.	Keep the electrolyte up to the prescribed level, or adjust the S.G. by consulting the battery maker's directions.
	3. The battery left unused for too long in cold climate.	Replace the battery, if badly sulfated.
Battery discharges too rapidly.	1. Dirty container top and sides.	Clean.
	2. Impurities in the electrolyte or electrolyte S.G. is too high.	Change the electrolyte by consulting the battery maker's directions.

ENGINE

CONTENTS

ENGINE

ENGINE REMOVAL

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

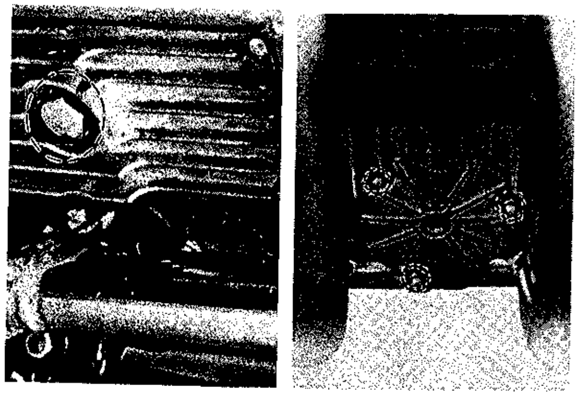


Fig. 7-1.

- Set the fuel cock lever in the "ON" or "RES" position and shift the fuel pipe clip sideways to remove the two pipes from the fuel cock.
- Remove the lead wire of fuel meter sensor located at the left lower side of the fuel tank.

Fig. 7-2.

- Open the seat and remove the bolts at the rear of the fuel tank to remove the tank rearwards.

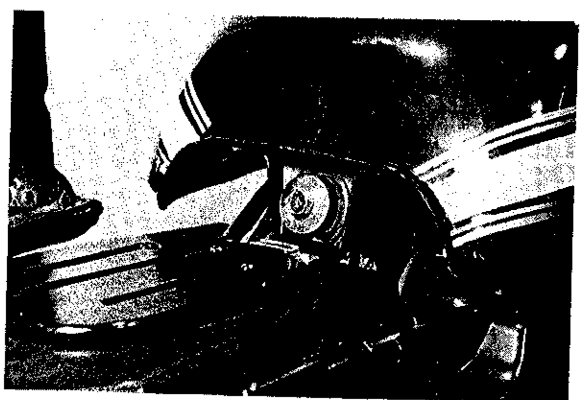


Fig. 7-3.

- Remove mounting bolts ① of air cleaner body.
- Loosen the clamp bolts ② connecting the air cleaner chamber body and air cleaner body to remove the cleaner body upwards.

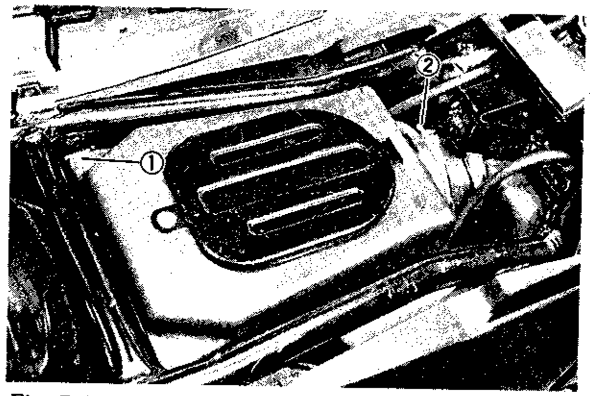


Fig. 7-4.

- Remove the left and right frame side covers.
- Remove the connectors for various lead wires.
- Alternator lead wire.
- Battery ⊖ terminal and battery ⊕ terminal.
- Starter relay ⊖ terminal.
- Contact point lead wire.
- Neutral switch lead wire.
- Oil pressure gauge lead wire.
- Plug cords.

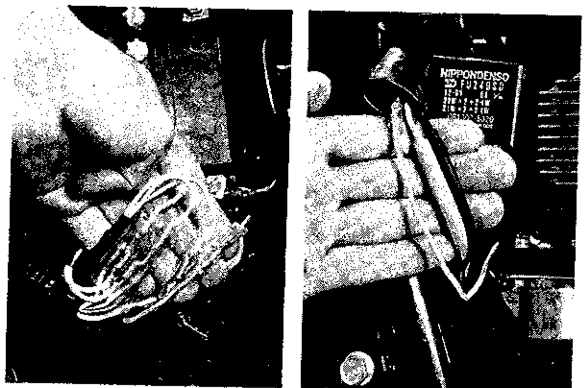


Fig. 7-5.

- Remove tachometer cable from the engine side.
- Remove gear shift pedal and engine sprocket cover.
- Straighten the bent washer on the engine sprocket with a chisel and secure the sprocket with a special tool to remove the mounting nut and the sprocket together with the chain from the drive shaft.

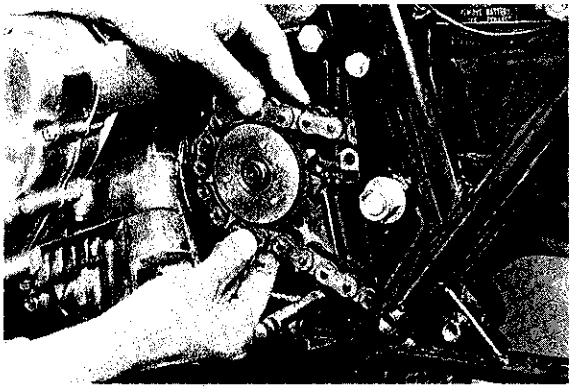


Fig. 7-6.

- Remove the left and right footrests.
- Remove the brake pedal mounting bolts and then return spring while withdrawing the brake pedal toward you.

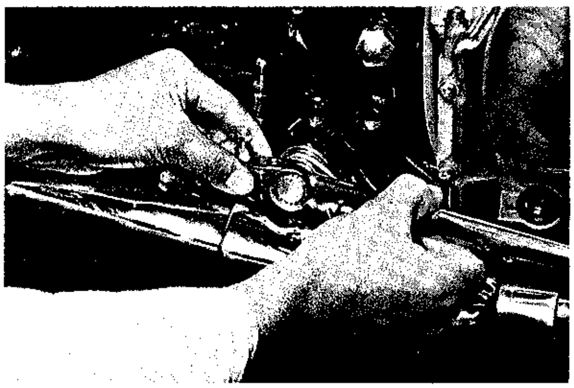


Fig. 7-7.

- Remove the lead wire and mounting bolts of the horn to remove the horn from the body.
- Fully loosen the clutch lock nut and adjuster bolts on the engine side respectively and give the wire some play. Then loosen the clutch release arm bolt and remove the clutch release arm by lifting it upwards.

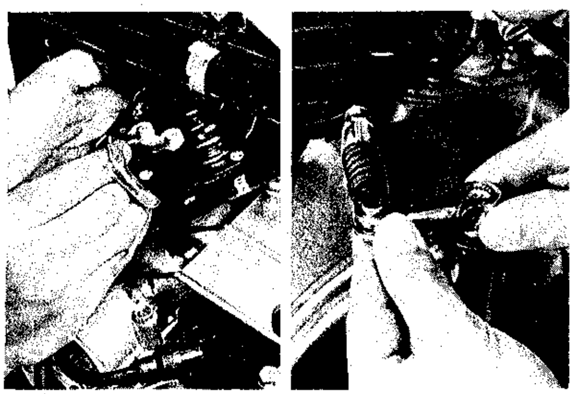


Fig. 7-8.

- Remove two screws securing the air cleaner chamber body.
- Loosen the respective clamps for the air cleaner chamber body and intake manifold to remove carburetor by pulling it towards the rear.
- Loosen the throttle cable mounting nuts on the opening side① and the closing side② to remove the respective cables from the carburetor lever.

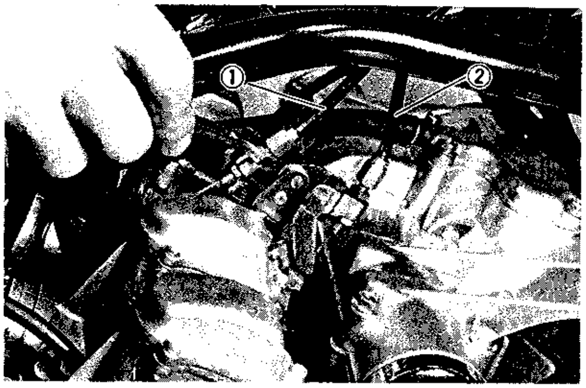


Fig. 7-9.

Shift breather pipe sideways and extract the pipe from the breather to remove the air cleaner chamber body ①.

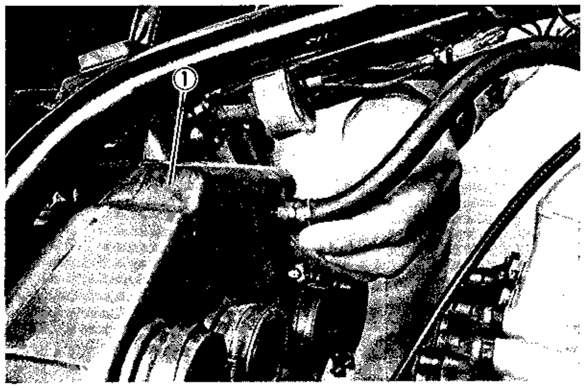


Fig. 7-10.

- Remove the left and right pairs of mufflers, two, at a time. Remove the respective exhaust clamp bolts on the cylinder side. Next loosen bolts connecting No. 2 and 3 exhausts located on the lower part of the engine, and remove the muffler mounting bolts located on the lower part of the rear footrests to extract the muffler toward you.
- Remove breather cover mounted on the top of cylinder head cover.

NOTE:
The frame on the upper portion of the breather cover may be damaged if the engine assembly is mounted and dismounted with the breather cover mounted on the top of the cylinder head cover.

Fig. 7-11.

- Place a jack, etc., under the engine beforehand to remove the engine mounting bolts and nuts.
- Extract front bolts and the upper and lower rear bolts.
- Remove the left and right engine mounting brackets on the front part of the engine.
- Remove only the right engine mounting bracket on the rear part of the engine.
- Remove the right engine mounting bracket on the lower part of the engine.
  (Remove only the mounting bolts on the left side.)

Right side

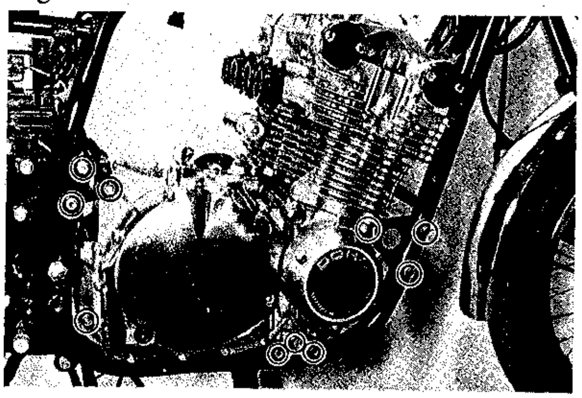


Fig. 7-12.

Left side

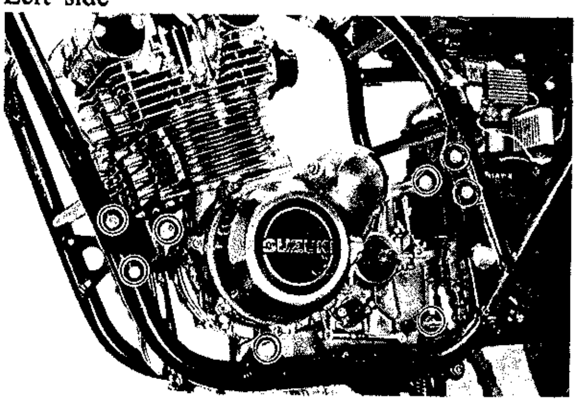


Fig. 7-13.

- 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.

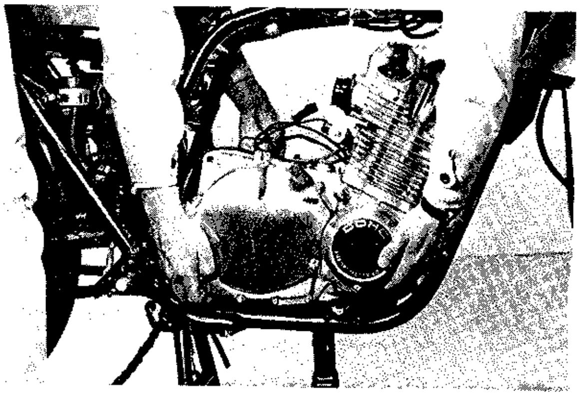


Fig. 7-14.

ENGINE REMOUNTING

Carry out remounting in the reverse order of engine removal.

- Temporarily fasten the engine mounting bracket before inserting the engine mounting bolts.
- After inserting the engine mounting bolts, tighten engine mounting bracket bolts and engine mounting bolts. Insert all three long bolts from the left side and insert the rear upper bolt through the spacer on the left side of the engine.

Tightening torque for engine mounting bolts	
10 mm Dia.	3.5 kg-m (25.5 lb-ft)
8 mm Dia.	2.5 kg-m (18.0 lb-ft)

- The engine sprocket should be installed on the drive shaft beforehand, at the same time as installing the drive chain.
  If it is difficult to assemble the engine sprocket, remove the rear axle cotter pin and loosen the axle nut, torque link mounting nut and chain adjuster bolt to push the wheel forward and give the drive chain some play. After complete tightening of the engine mounting bolts, adjust the drive chain play (see page 3-14).
- Firmly secure the carburetor with the respective clamps. If the carburetor is not firmly secured, gas leakage, incorrect air-fuel ratio and unsatisfactory engine running may result.

- Securely tighten bolts ① connecting exhausts No. 2 and 3 to prevent gas leakage.
- Securely tighten each exhaust bolt by 0.9 ~ 1.4 kg-m (6.5 ~ 10.0 lb-ft).

Exhaust bolt tightening torque	0.9 ~ 1.4 kg-m (6.5 ~ 10.0 lb-ft)

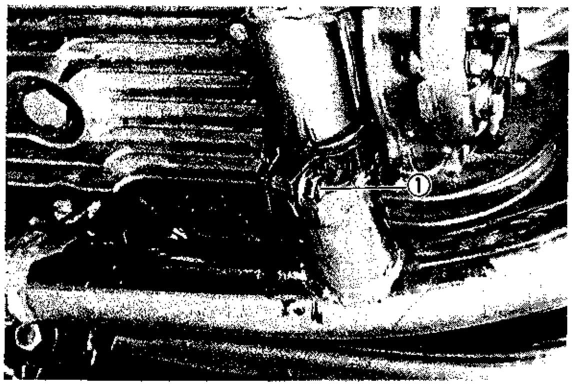


Fig. 7-15.

- 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.

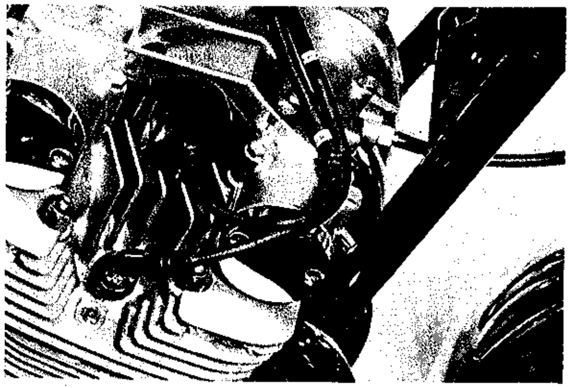


Fig. 7-16.

- Introduce 3.4 lit. of engine oil SAE 10W40 into the engine. Several minutes after starting and stopping the engine, check that the oil level remains between the marks of oil gauge.
- After remounting the engine, adjust the rear brake pedal (page 10-31, 35), brake lamp (page 11-14), clutch (page 3-13) and throttle cable (page 3-12).

ENGINE

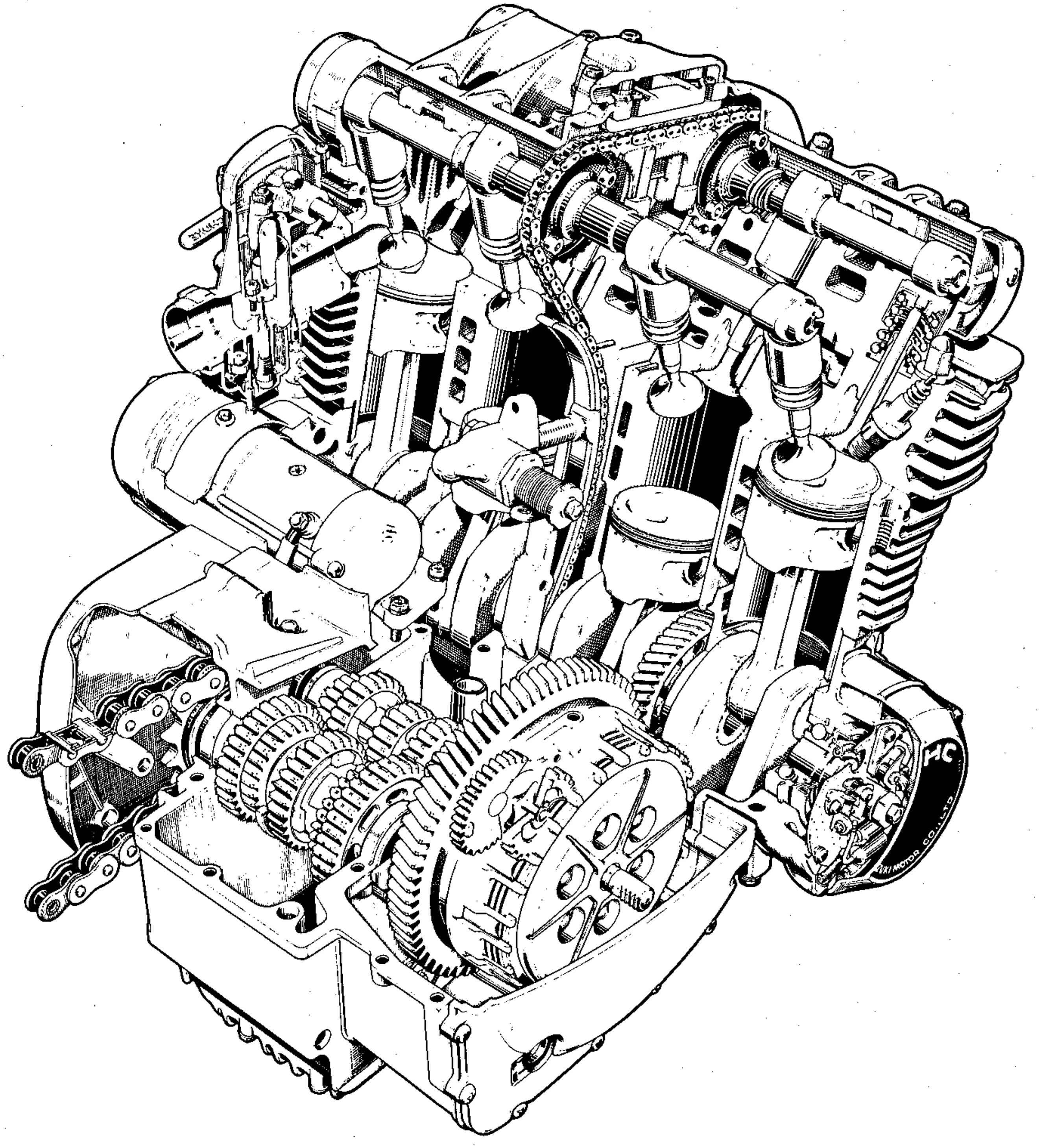


Fig. 7-17.

- Parts to be removably mounted without dismounting engine and their operations.

The following sections describe operational contents from top end to carburetor, following the previous sections dealing with engine removal. Parts which can be removably mounted without dismounting the engine are described here. See reference pages with respect to their operations.

ENGINE LEFT SIDE

	See page
Engine sprocket cover	7-3
Engine sprocket and drive chain	7-4
Generator cover	7-28
Generator rotor	7-29
Gear shift lever	7-35
Gear shift switch body	7-40

ENGINE CENTER

	See page
Fuel tank	7-3
Tachometer cable	7-3
Air cleaner	7-4
Carburetor and throttle cable	7-4
Clutch cable	7-4
Exhaust and muffler	7-4
Horn	7-4
Cylinder head breather cover	7-5
Cam chain tensioner	7-9
Cylinder head cover	7-9
Camshaft	7-10
Cylinder head	7-10
Cylinder	7-24
Oil filter	7-39
Oil pan	7-39
Sump filter	7-39
Starter motor	7-40

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

ENGINE RIGHT SIDE

	See page
Clutch cover	7-32
Primary drive gear	7-32
Gear shifting shaft	7-35
Oil pump ass'y	7-37
Gear shifting pawl and cam drive gear	7-45

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
9-13 kg/cm^2 (128 ~ 184 psi)	7 kg/cm^2 (100 psi)

Max. difference between cylinders	2 kg/cm^2 (28.5 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

When the compression noted is down to or below the value indicated above, the engine must be overhauled, with these five malconditions in mind.

Compression test procedure:

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

1. Remove all spark plugs.
2. Fit the compression gauge ① to one of the plug holes, taking care that the connection is absolutely tight.

①	09915-64510	Compression gauge

3. Twist the throttle grip into full-open position.
4. 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.

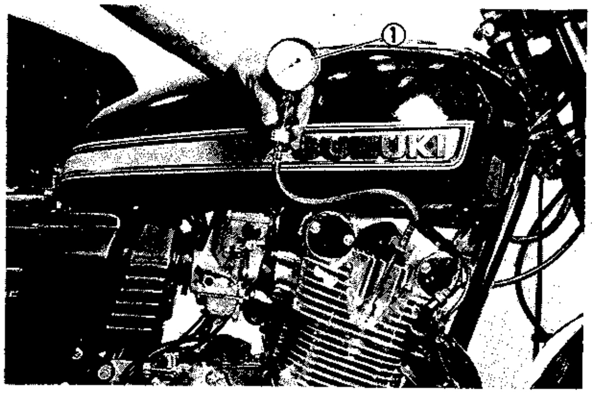


Fig. 7-18.

TOP END – REMOVAL

Cylinder head cover

NOTE:
Breather cover need not be removed.

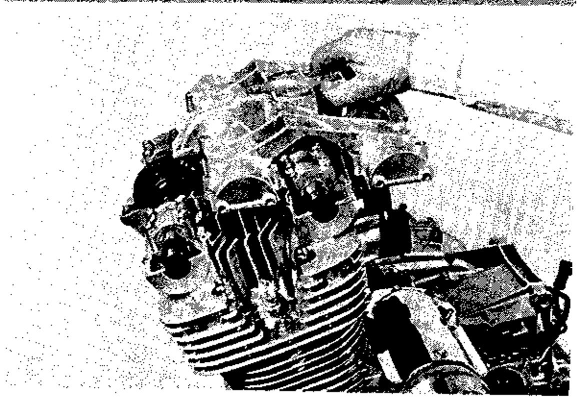


Fig. 7-19.

Chain tensioner adjuster

This is accomplished by first loosening lock nut ① and tightening screw ② and then by removing two mounting bolts ③.

NOTE:
Tightening screw ② locks the spring loaded tensioner pushrod inside.

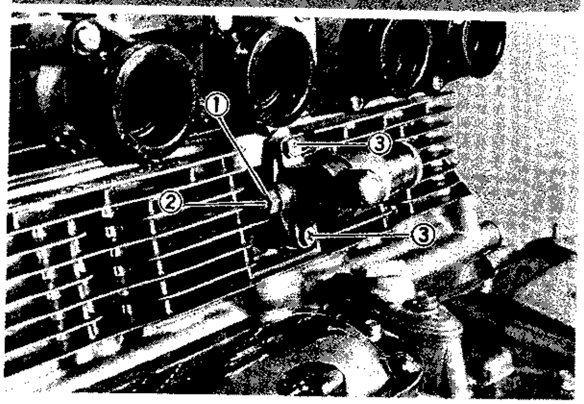


Fig. 7-20.

Camshaft

- Remove the two camshafts, intake and exhaust.

NOTE:
- *Be sure to loosen the four camshaft holder bolts evenly by shifting the wrench diagonally after loosening a bolt.*
- *Hold down each camshaft with vice pliers ①, and remove the bolts securing the camshaft holders, two on each camshaft. Then, remove the pliers and take off the camshaft.*

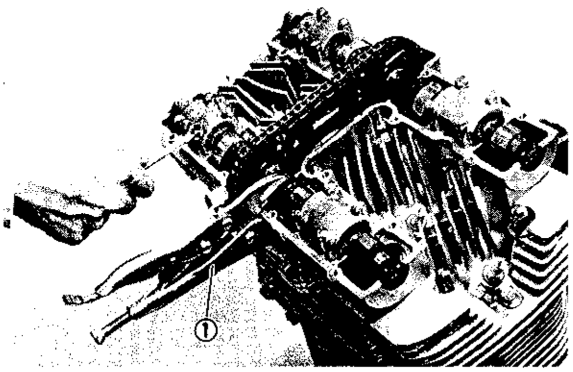


Fig. 7-21.

Cylinder head

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

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.

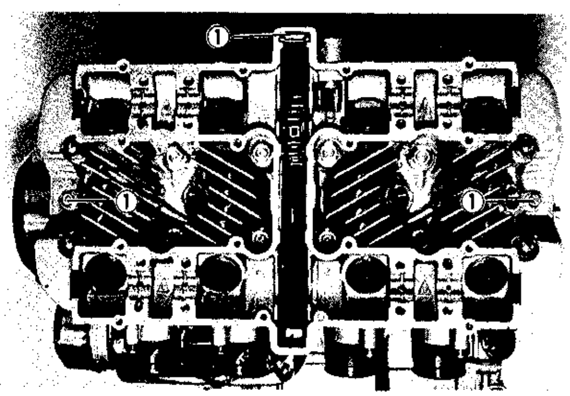


Fig. 7-22.

- Remove tappet shims, using forceps to pick each shim up.
  ①: Tappet shim.

09916-84510	Forceps

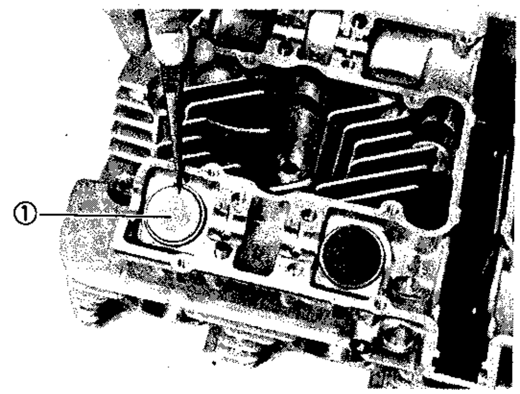


Fig. 7-23.

- Pull out the tappets with your fingers.

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

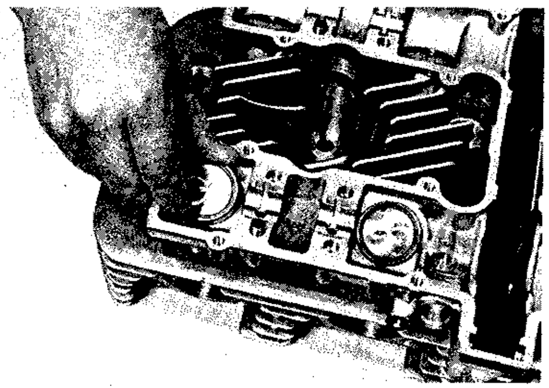


Fig. 7-24.

- Remove each valve in the following manner:
  1. Using the valve lifter, compress the spring.

09916-14510	Valve lifter

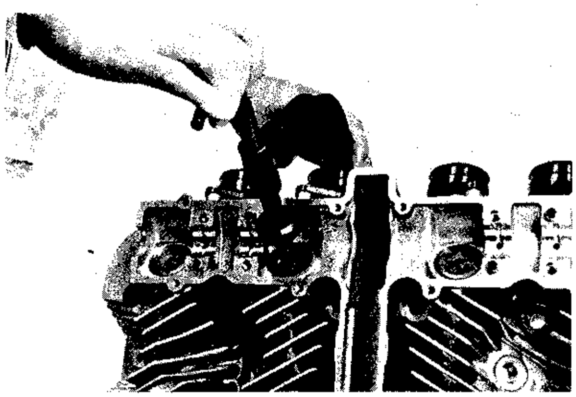


Fig. 7-25.

2. Take off the two cotter halves from the valve stem, using forceps.

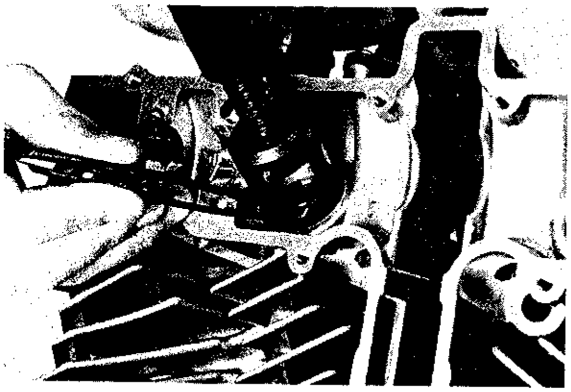


Fig. 7-26.

3. Take out the valve upper seat, inner spring and outer spring.

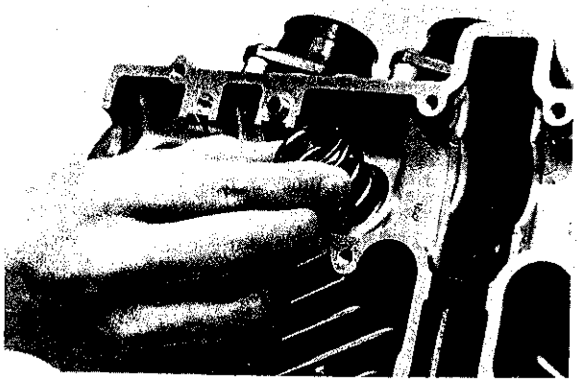


Fig. 7-27.

4. From the other side, pull out the valve.

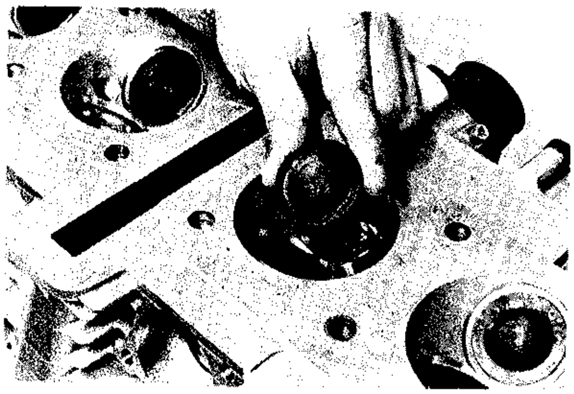


Fig. 7-28.

5. Drive the valve guide out toward camshaft: use the valve guide remover.

09916-44150	Valve guide remover

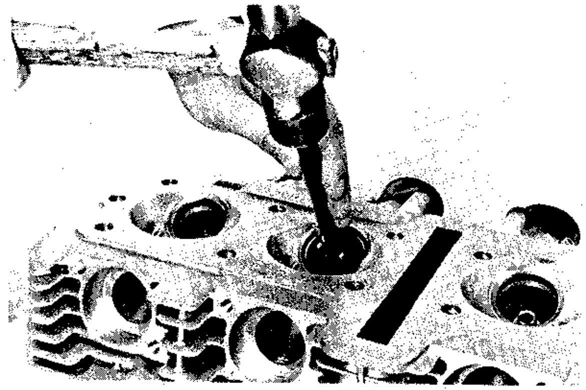


Fig. 7-29.

NOTE:
Discard the removed valve guide subassemblies.
During reassembly, use replacement subassemblies, each consisting of guide ring ①, oil seal ② and valve guide ③.

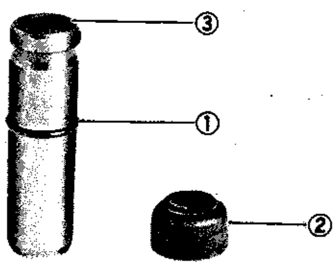


Fig. 7-30.

NOTE:
- *When replacing the valve mechanism parts, be sure to restore each part in its correct position.*
- *For normal reassembling work, steps 1 through 5 of the following procedure may be omitted. These steps are necessary only when valve guides must be removed for replacement.*

TOP END – INSTALLATION

Valve guide hole reaming

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

09916-34530	12.2 mm reamer

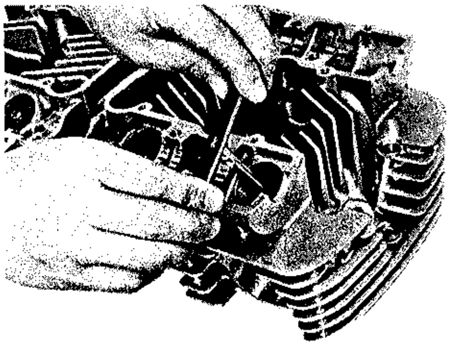


Fig. 7-31.

Valve guide

- Fit a ring to each valve guide. Be sure to use new rings and valve guides. Use of rings and valve guides removed during disassembly is prohibited. Remember that the guide for intake valve ① differs in shape from that of the exhaust valve ②.

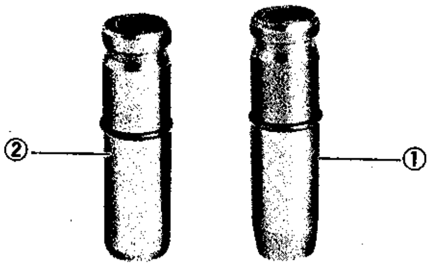


Fig. 7-32.

- Oil the stem hole, too, of each valve guide and drive the guide into the guide hole with the valve guide and stem seal installer attachment. Be sure to use a valve guide installer attachment handle on the pushing face of the installer, as shown, to avoid direct contact between installer and valve guide.

09916-54530	Valve guide and stem seal installer
09916-57320	Valve guide installer attachment handle

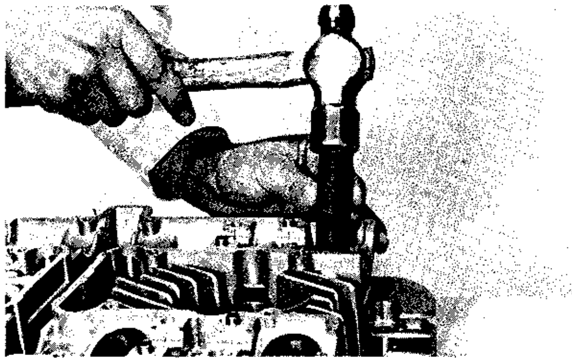


Fig. 7-33.

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

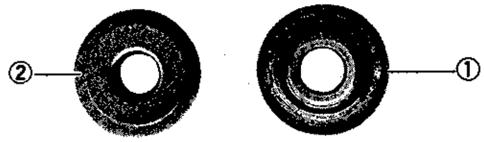


Fig. 7-34.

Valve stem seal

1. Oil each oil seal, and drive them into position with the valve stem seal installer. Be sure to use a valve guide and stem seal installer attachment handle on the pushing face of the installer.

09911-94530	Valve stem seal installer
09916-57320	Valve guide and stem seal installer attachment handle

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

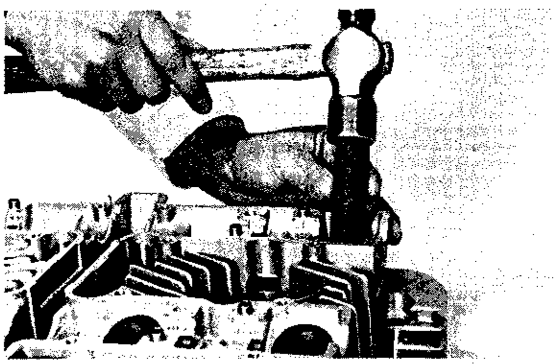


Fig. 7-35.

Valve

2. 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. Similarly oil the lip of the stem seal.

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

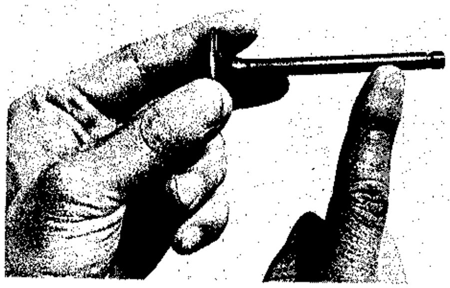


Fig. 7-36.

Valve springs

3. Position valve springs in place, making them rest on lower spring seat ① by their closed-pitch ends ②. Both springs, inner ③ and outer ④, have varied coil pitches: coil turns are progressively closes from one end to the other. Large-pitch portions are indicated as ⑤: small-pitch portions as ⑥.

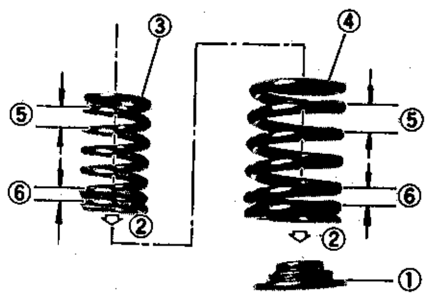


Fig. 7-37.

Valve cotter to valve stem

4. Put on the upper valve seat and, using the valve lifter, press down the springs, fit the two 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.

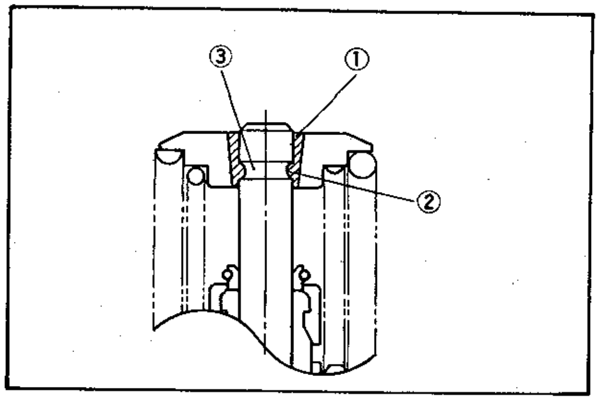


Fig. 7-38.

5. Oil each valve tappet and the bore in which it slides. Push the tappet into the bore with your fingertips. Only a light force is required to push it in.

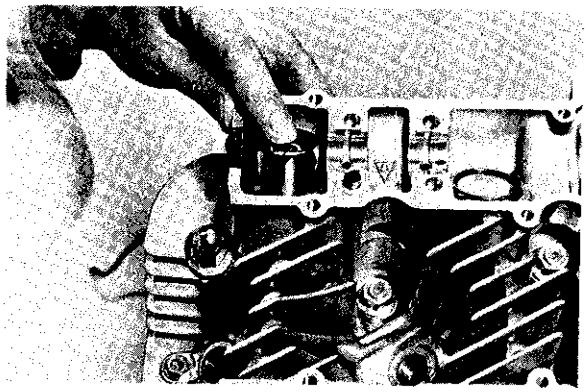


Fig. 7-39.

Cylinder head

- After thus installing the intake and exhaust valves in the cylinder head, mount the head on the cylinder block as follows:
- Be sure to replace cylinder head gasket by new one to prevent gas leakage. Gasket is installed with the wider side of metal ring around cylinder opening toward the cylinder.

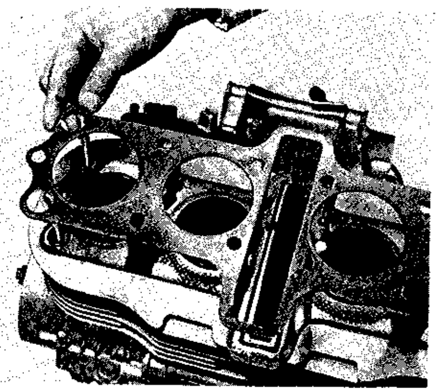


Fig. 7-40.

- Install the four crown nuts and copper washers in the positions Ⓐ (oil passages) indicated.
- With the head snugly seated on the cylinder block, secure it by tightening the twelve 8-mm nuts sequentially in the ascending order of numbers.
- Tighten the twelve 10-mm nuts to the specified torque with a torque wrench sequentially in the ascending order of numbers, when the engine is cold.

Cylinder head nut tightening torque	3.7 kg-m (27.0 lb-ft)

- After firmly tightening the 12 nuts, insert three 6-mm bolts (indicated as B) and tighten them to the following torque value:

Cylinder head bolt tightening torque	0.9 ~ 1.4 kg-m (6.5 ~ 10.0 lb-ft)

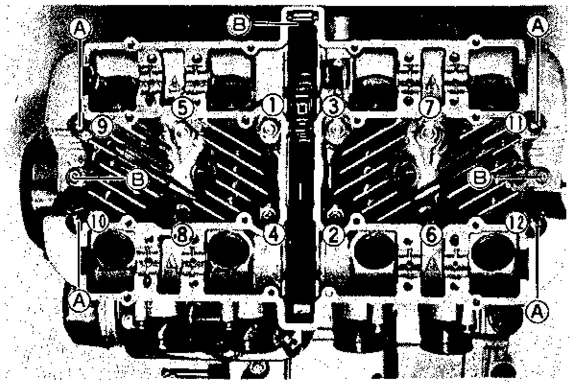


Fig. 7-41.

Sprockets on camshafts

- Exhaust camshaft has its own sprocket, as does the intake camshaft. Do not confuse the two sprockets.

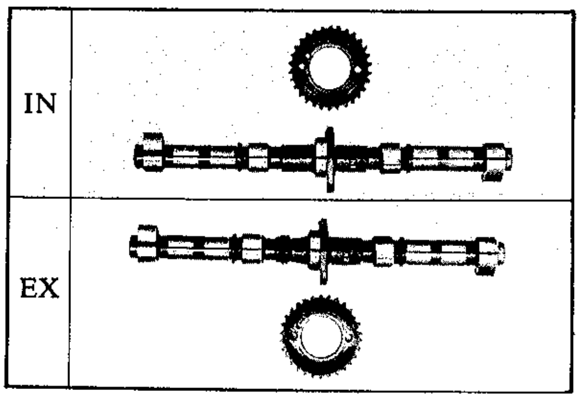


Fig. 7-42.

- It is very important that each sprocket be positioned angularly on its camshaft as illustrated. Its correct position is determined by arrow mark "3" (on INTAKE sprocket) or arrow marks "1" and "2" (on EXHAUST sprocket) located (as shown) in reference to the notch ① in the camshaft end.
- Apply THREAD LOCK SUPER "1361A" to the threads of Allen-head bolts, and tighten them to the following torque value:

99104-32020	THREAD LOCK SUPER "1361A"

Camshaft sprocket bolt tightening torque	0.8 ~ 1.1 kg-m (6.0 ~ 8.0 lb-ft)

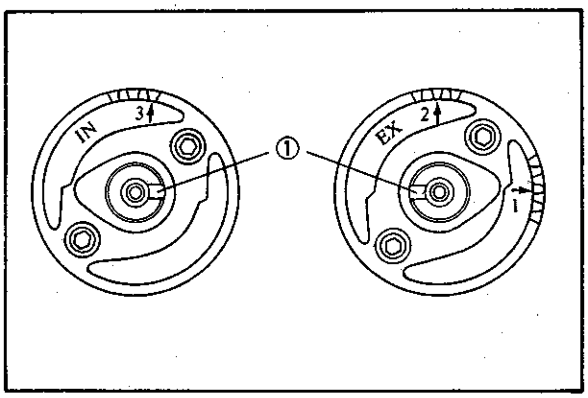


Fig. 7-43.

Positioning camshaft in place

NOTE:
Just before placing the camshaft on the cylinder head, apply high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE: 99000-25140) to its journals, fully coating each journal with the paste taking care not to leave any dry spot. Apply engine oil to the journal bearings.

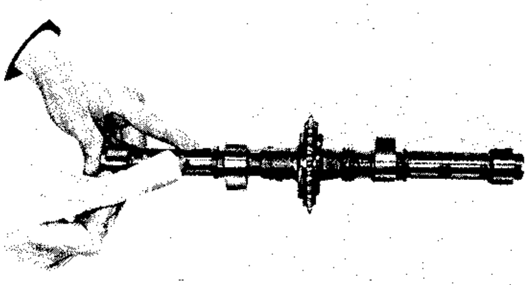


Fig. 7-44.

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

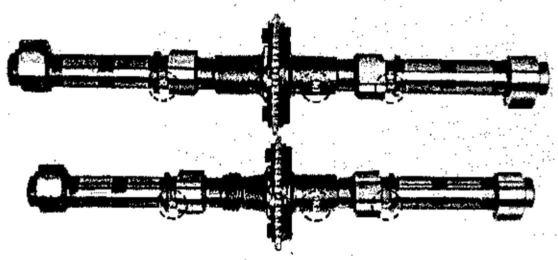


Fig. 7-45.

- While holding down the timing chain, rotate the crankshaft in normal running direction to bring the "T" mark on Nos. 1 and 4 side (of the advance governor) to the timing mark. Use a 19-mm wrench to turn the crankshaft.

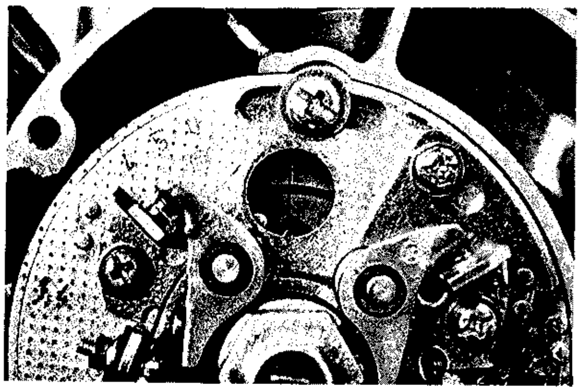


Fig. 7-46.

CAUTION:
To turn over the crankshaft, torque nut ① with a 19-mm wrench. Never try to rotate the crankshaft by putting a 12-mm wrench to bolt ②.

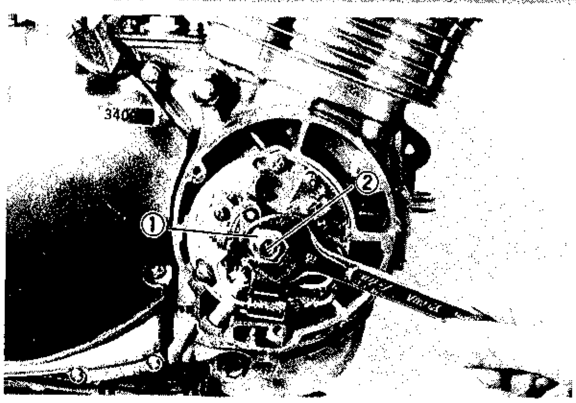


Fig. 7-47.

- With "T" mark accurately lined up with the timing mark, hold the crankshaft steady and lightly pull up the chain to take up the sag between the crank sprocket and exhaust sprocket.

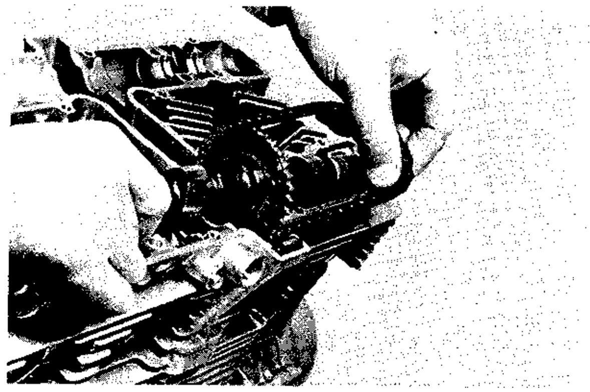


Fig. 7-48.

- Exhaust sprocket bears an arrow mark "1" indicated as ①. Turn over the exhaust camshaft so that the arrow points flush with the joint surface of the cylinder head. Engage the timing chain with this sprocket.

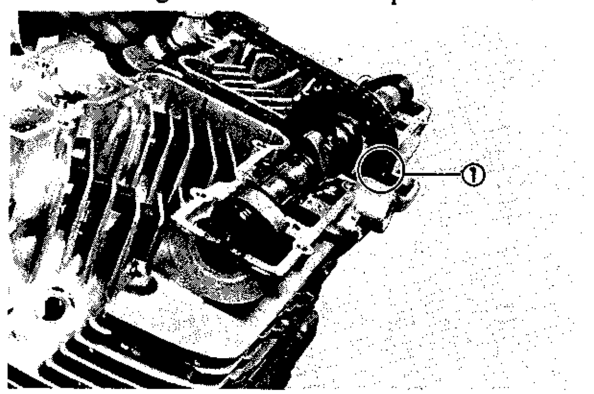


Fig. 7-49.

- The other arrow mark "2" is now pointing straight upward. Count the chain roller pins toward the intake camshaft, starting from the roller pin directly above this arrow mark "2" and ending with the 20th roller pin. Engage the chain with intake sprocket, locating the 20th pin at and above the arrow mark "3" on the intake sprocket.

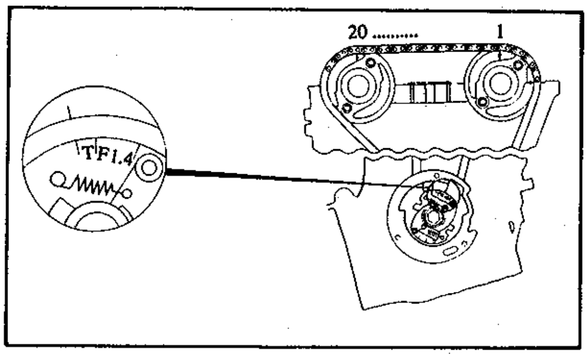


Fig. 7-50.

NOTE:
The camshaft chain is now riding on all three sprockets. Be careful not to disturb the crankshaft until the four camshaft holder bolts are secured.

Camshaft holder

- Each camshaft bearing cap is identified with a cast-on letter with a triangle. A matching cast-on symbol appears on the head. Install each cap at it's matching letter, with triangle symbols pointing the same way.

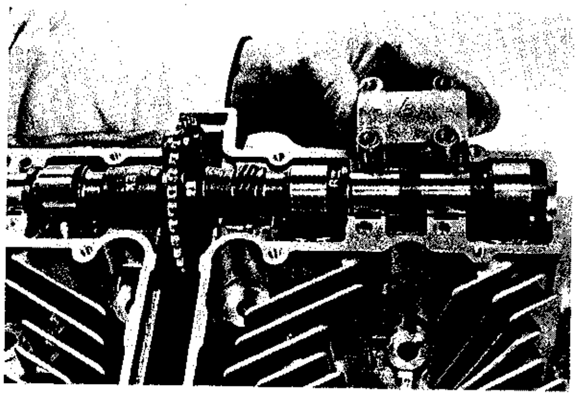


Fig. 7-51.

- Secure the four camshaft holders uniformly by tightening the camshaft holder bolts sequentially in the manner illustrated. Try to equalize the pressure by moving the wrench diagonally from one bolt to another and from one camshaft holder to another. (It is assumed here that the vice pliers ① are used for each camshaft to hold down the tappet interfering with the cams).
  Tighten the camshaft holder bolts (identified by the letter "9" on the bolt head) to the following torque value:

Camshaft holder bolt tightening torque	1.0 kg-m (7.0 lb-ft)

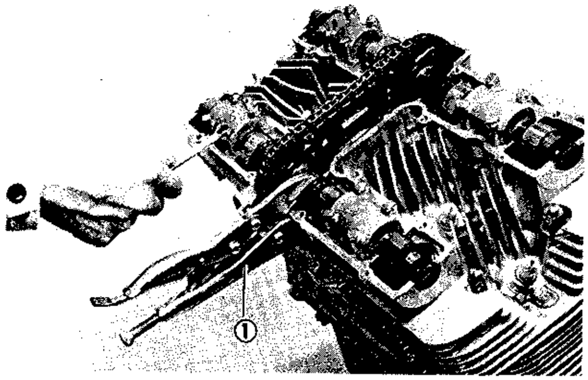


Fig. 7-52.

Cam chain tensioner adjuster

Removal of the tension adjustor is necessary during engine disassembly and also due to removal of camshafts. In either case, re-install the adjustor on the cylinder block after the camshafts have been installed. The procedure is as follows:

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

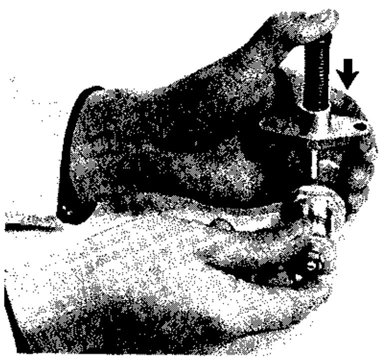


Fig. 7-53.

- Tighten the lock screw to lock the pushrod, so that the pushrod will not plunge out.
- Secure the adjustor to the cylinder block.

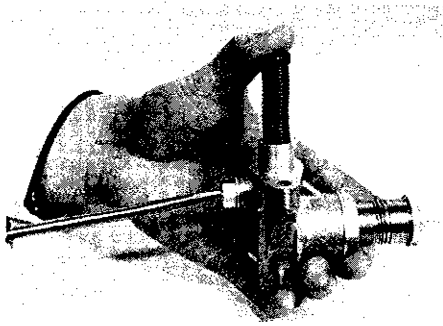


Fig. 7-54.

- 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.

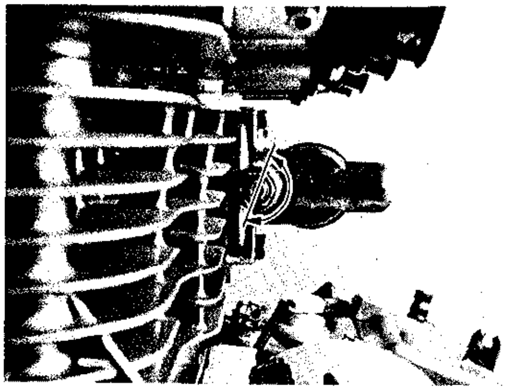


Fig. 7-55.

- Tighten the lock nut.

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

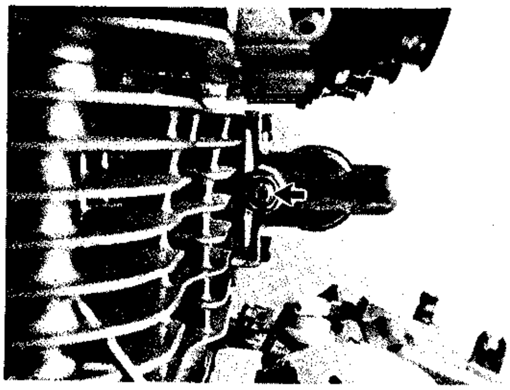


Fig. 7-56.

Tensioning action check

- After installing the tensioner, check its tensioning action according to the following procedures:

CAUTION:
As stated previously, do not attempt to turn over crankshaft by torque bolt ② (which requires a 12-mm wrench): torque nut ① with a 19-mm wrench, instead.

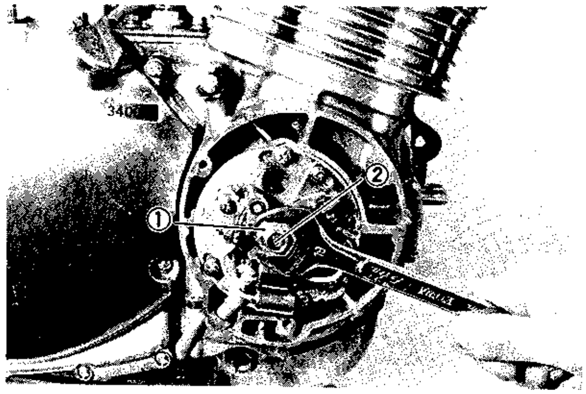


Fig. 7-57.

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

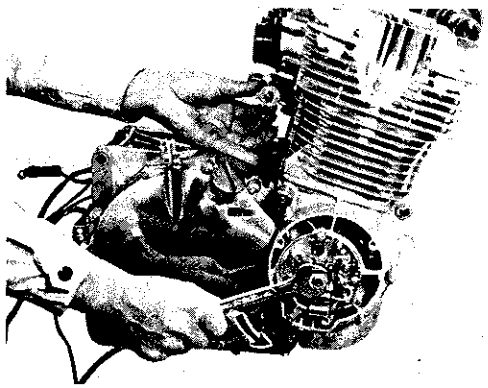


Fig. 7-58.

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

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

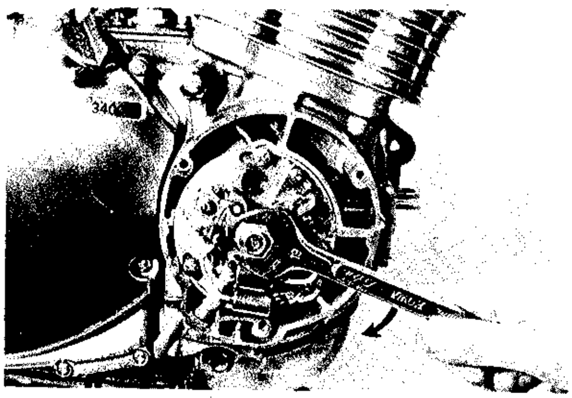


Fig. 7-59.

Tappet clearance adjustment

- After checking tensioning action, check all valves for tappet clearance and, as necessary, adjust the clearance to the specification outlined on page 3-5.

TOP END — INSPECTION

One camshaft is provided for the intake valves and the other for the exhaust valves. Be sure to discriminate between the two. The camshafts should be checked for deflection and also for the wear of cams and journals if the engine has been noted as giving abnormal noise or vibration or to lack power output. Any of these malconditions may be caused by camshafts worn down or distorted to the service limit.

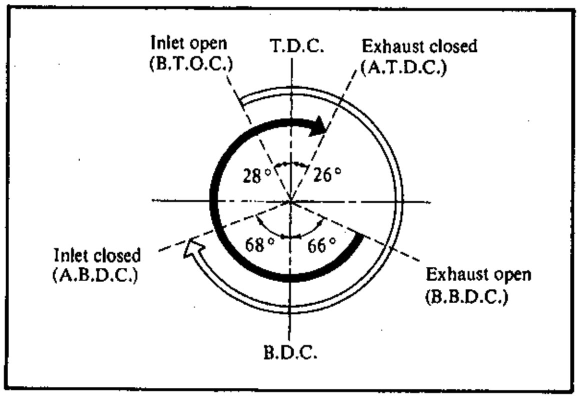


Fig. 7-60.

Camshaft wear

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

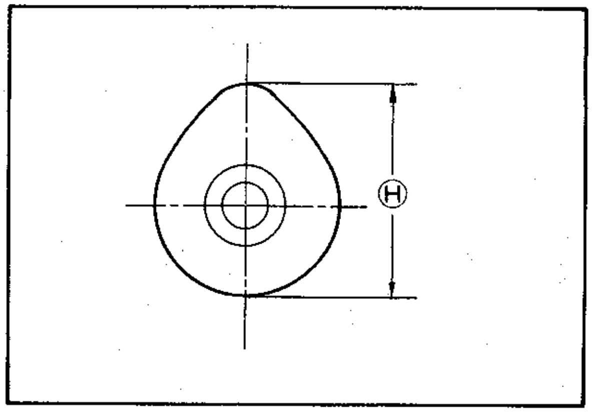


Fig. 7-61.

Cam height specification

Height (H)	Standard	Service limit
Intake cams cames	36.325 ~ 36.355 mm (1.4301 ~ 1.4313 in.)	36.030 mm (1.4185 in.)
Exhaust cams	35.775 ~ 35.805 mm (1.4085 ~ 1.4096 in.)	35.480 mm (1.3968 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 plastigage to read the clearance, which is specified as follows:

Camshaft/Journal clearance

Standard	Service limit
0.025 ~ 0.053 mm (0.0010 ~ 0.0021 in.)	0.15 mm (0.0059 in.)

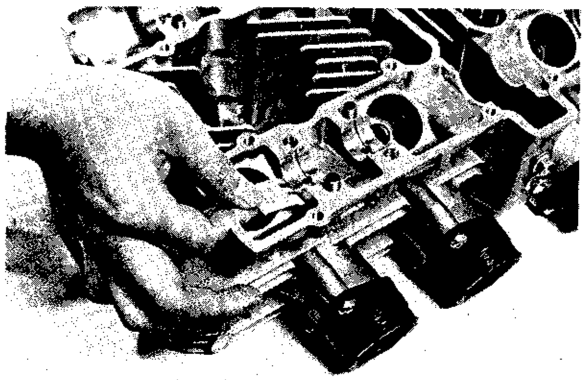


Fig. 7-62.

- Be sure each camshaft is fastened down in place by its camshaft holders. Tighten the camshaft holder bolts to the following torque value:

Camshaft holder bolt tightening torque	1.0 kg-m (7.0 lb-ft)

- If the clearance exceeds the service limit, measure the inside diameter of the camshaft journal holder. If the measured value is more than the service limit, replace it using the cylinder head assembly.

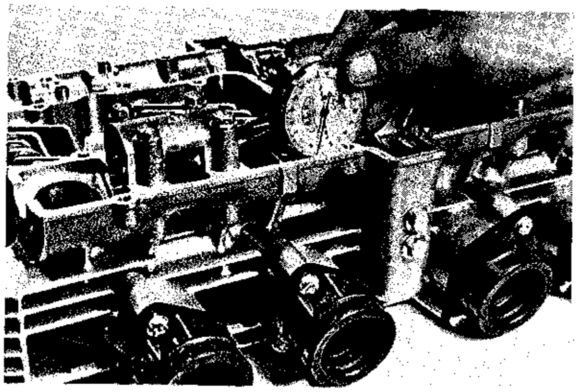


Fig. 7-63.

Camshaft journal holder

I.D. specification

Standard	Service limit
22.000 ~ 22.013 mm (0.8661 ~ 0.8667 in.)	22.100 mm (0.870 in.)

- If the measured value of the outside diameter of the camshaft exceeds the service limit, replace the camshaft.

Camshaft journal

O.D. specification

Standard	Service limit
21.960 ~ 21.975 mm (0.8646 ~ 0.8652 in.)	21.920 mm (0.862 in.)

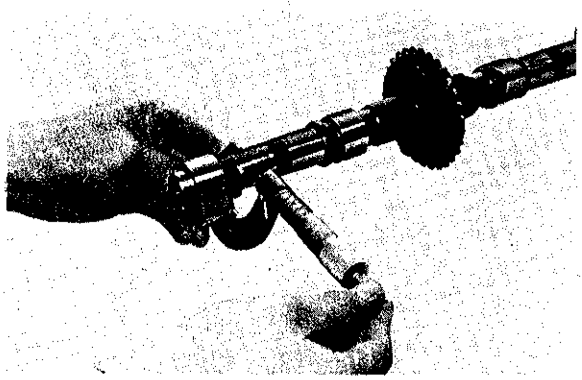


Fig. 7-64.

Camshaft runout

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

Runout specification

Standard	Service limit
0.03 mm (0.0012 in.)	0.10 mm (0.004 in.)

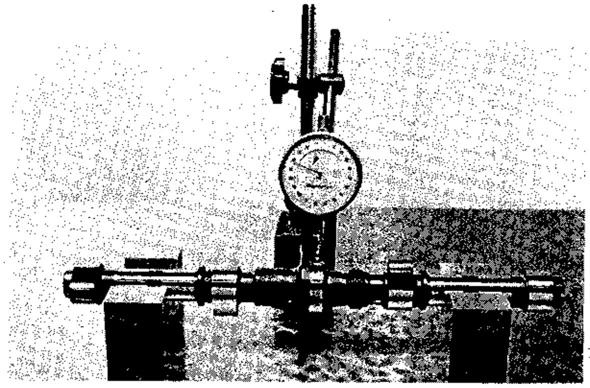


Fig. 7-65.

Valve face wear

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

Valve thickness specification

Standard	Service limit
1.0 ~ 1.4 mm (0.039 ~ 0.055 in.)	0.5 mm (0.020 in.)

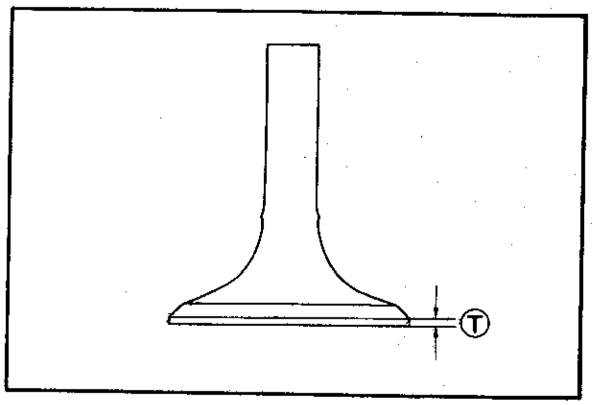


Fig. 7-66.

Valve stem deflection

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

Valve stem deflection specification

Service limit	0.05 mm (0.002 in.)

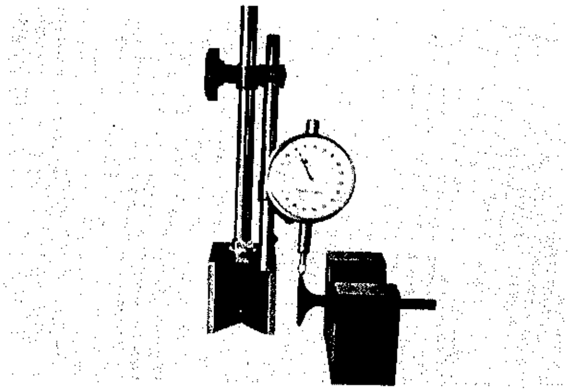


Fig. 7-67.

Valve-to-guide 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 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-to-guide clearance specification

Valve	Standard	Service limit
Intake valves	0.025 ~ 0.055 mm (0.0009 ~ 0.0022 in.)	0.090 mm (0.0035 in.)
Exhaust valves	0.040 ~ 0.070 mm (0.0016 ~ 0.0028 in.)	0.100 mm (0.0039 in.)

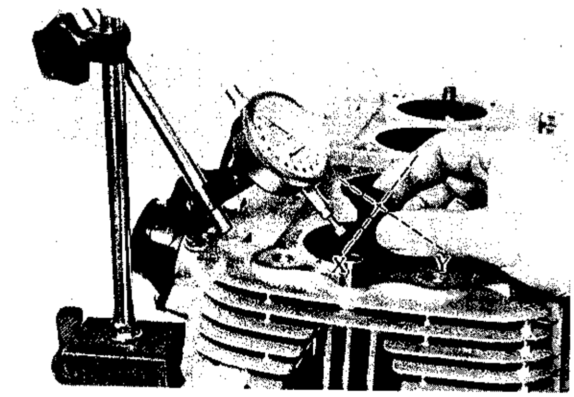


Fig. 7-68.

- 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 above, 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.

Valve stem diameter specification

Valve	Standard	Service limit
Intake valves	6.960 ~ 6.975 mm (0.2740 ~ 0.2746 in.)	6.90 mm (9.271 in.)
Exhaust valves	6.945 ~ 6.960 mm (0.2734 ~ 0.2740 in.)	6.80 mm (0.267 in.)

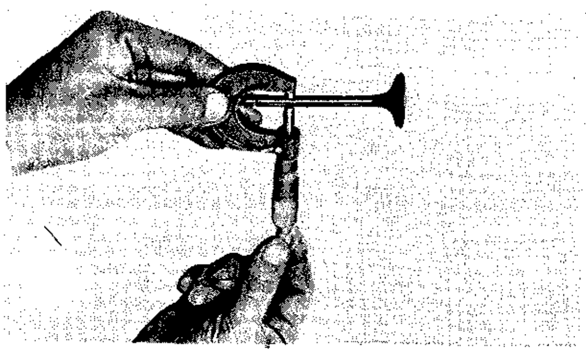


Fig. 7-69.

Valve seat width measurement

- Coat the valve seat with red lead paste 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.

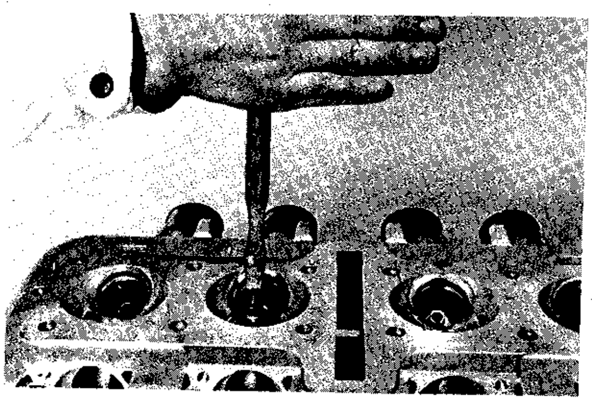


Fig. 7-70.

- The ring-like red lead impression left on the valve face must be continuous — without any break — and, in addition to this requirement, the width of the red-lead ring, which is the visualized seat "width", must be within the following limit:

Valve seat width specification

Seat width	Standard	Wear limit
Ⓦ	1.1 ~ 1.3 mm (0.04 ~ 0.05 in.)	1.6 mm (0.06 in.)

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

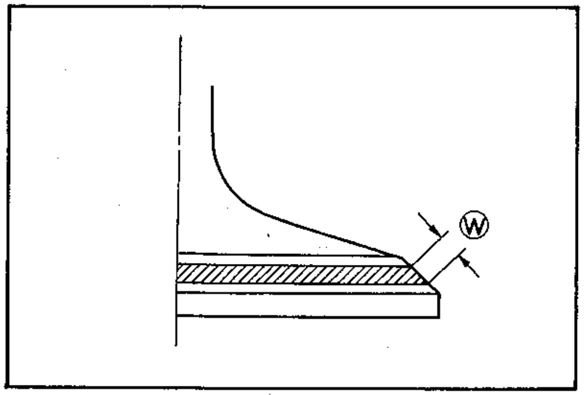


Fig. 7-71.

Valve seat servicing

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

99103-45011	Valve seat cutter set

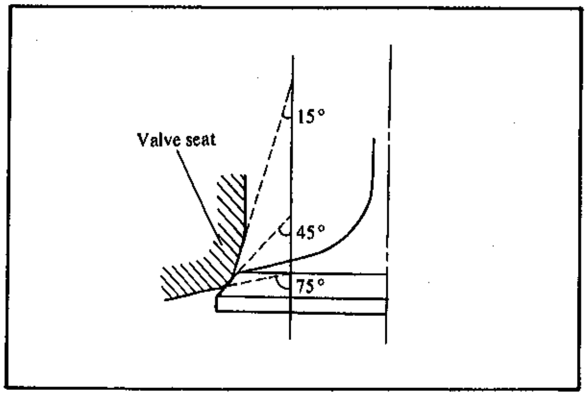


Fig. 7-72.

- Using the 45° cutter No. 635, descale and cleanup the seat with one or two turns.
- Inspect the seat by the previous seat width measurement procedure. If the seat is pitted or burned, additional seat conditioning with the 45° cutter is required.

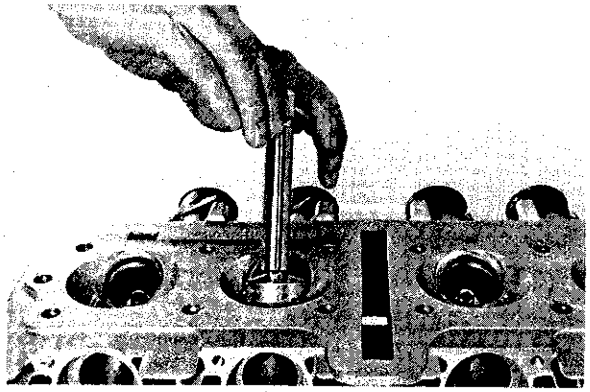


Fig. 7-73.

If the contact area is too low, use 75° cutter No. 216 to raise and narrow the contact area. If the contact area is too high, use 15° cutter No. 635 to lower and narrow the contact area. After cutting the 75° and 15° angles, it is possible that the valve seat (45°) is too narrow.
If so, re-cut the seat to the correct width.

- After the desired seat position and width is achieved, use the 45° cutter very lightly to clean up any burrs caused by the previous cutting operations. DO NOT use lapping compound after the final cut is made. The finished valve seat should have a velvety smooth finish and not a highly polished or shiny finish. This will provide a soft surface for the final seating of the valve which will occur during the first few seconds of engine operation.
- Clean and assemble the head and valve components. Fill the intake and exhaust ports with gasoline to check for leaks. If any leaks occur, inspect the valve seat and face for burrs or other things that could prevent the valve from sealing.

NOTE:
Always use extreme caution when handling gasoline.

NOTE:
After servicing the valve seats, be sure to adjust the tappet clearance after the cylinder head has been reinstalled.

- If, by any chance, too much stock has been removed from the seat during the refacing work resulting in loss of the specified tappet clearance even with the thinnest shim disc, then the only remedy is to grind off the stem end face of the valve with a valve refacer, thereby shortening the overall length of the valve.

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

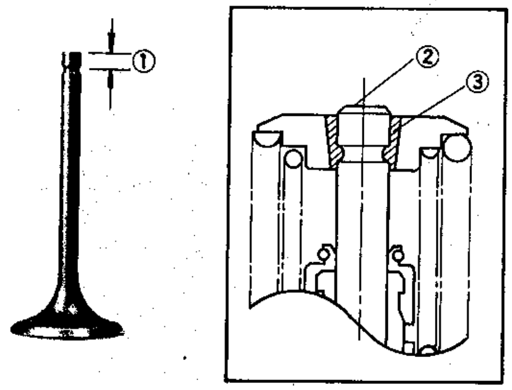


Fig. 7-75.

Valve spring
- 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 below is exceeded by the free length reading or if the measured force does not fall within the range specified, replace with a SUZUKI spring.

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

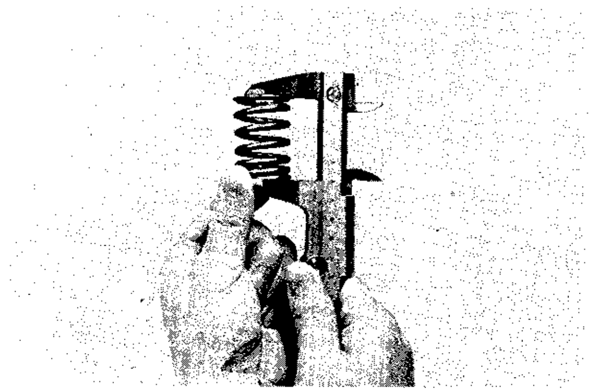


Fig. 7-76.

Free length specification

Spring	Standard	Service limit
INNER	35.3 ~ 37.0 mm (1.39 ~ 1.46 in.)	33.9 mm (1.33 in.)
OUTER	43.00 ~ 43.25 mm (1.692 ~ 1.702 in.)	(41.3 mm (1.63 in.)

Spring tension specification

INNER	29.3 ~ 34.0 kg/23 mm (64.59 ~ 74.96 lb/0.91 in.)
OUTER	50.4 ~ 58.3 kg/27 mm (111.11 ~ 128.53 lb/1.06 in.)

IMPORTANT:
Replace all of the valve springs at a time, if any one of these is found to be less than the limit.

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

Cylinder head distortion specification

Standard	Service limit
0.03 mm (0.001 in.)	0.2 mm (0.008 in.)

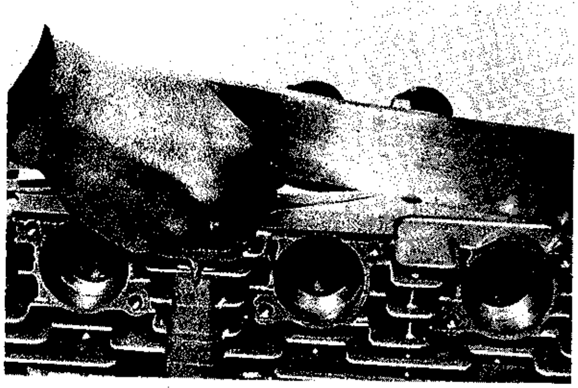


Fig. 7-77.

Cam chain tensioner adjuster

- The tension adjustor used in Model GS1000 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 adjustor is set after installation, there is no need to make any further adjustment.
- The pushrod is prevented from withdrawing. As a result, the pushrod effectively contends with the tendency of the camshaft chain to shake or vibrate during rough driving conditions.

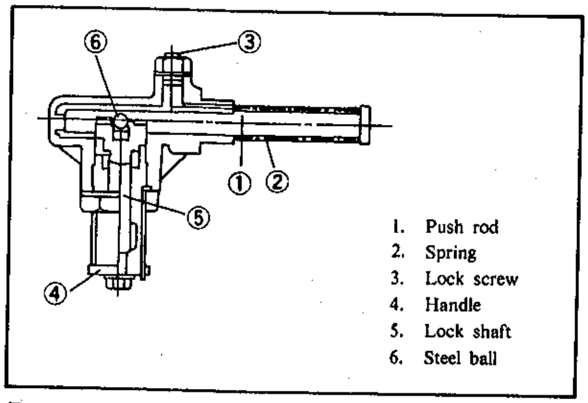


Fig. 7-78.

Reassembling

- Apply some high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) to the pushrod and engine oil to the pushrod guide hole. Match the lock screw to the long groove in the pushrod, as shown, and insert the pushrod by pushing it to the indicated position.

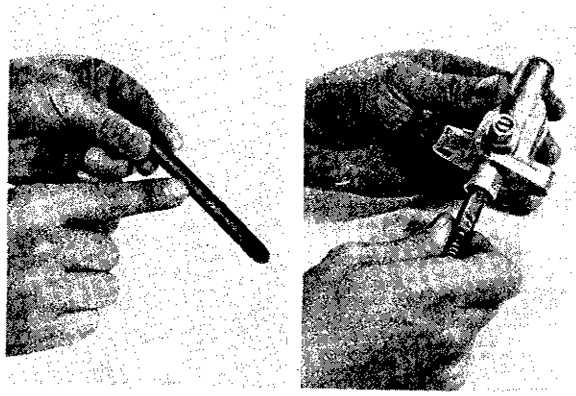


Fig. 7-79.

- Move the pushrod back and forth with fingers to make sure that it moves smoothly.

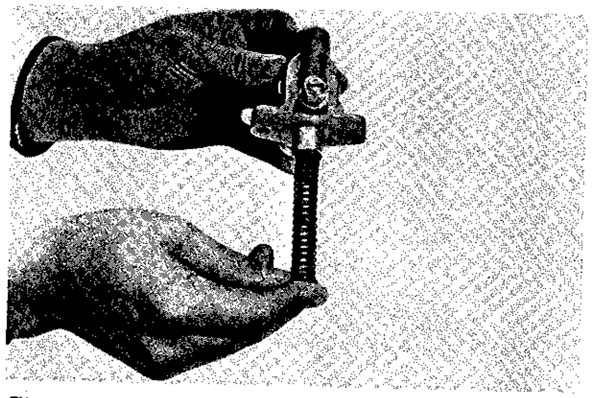


Fig. 7-80.

CYLINDER

REMOVAL

- Remove cylinder block.
  After removing cylinder head, 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, too.

09912-34510	Cylinder disassembling tool

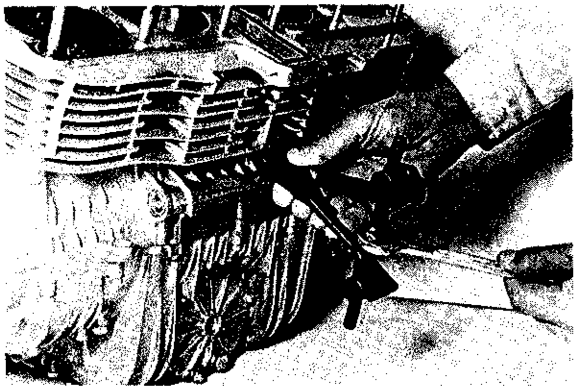


Fig. 7-81.

INSTALLATION

- 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 that the "O" rings ① and ② are accurately positoned in the groove.

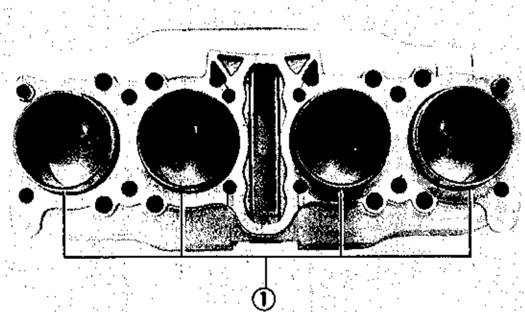


Fig. 7-82.

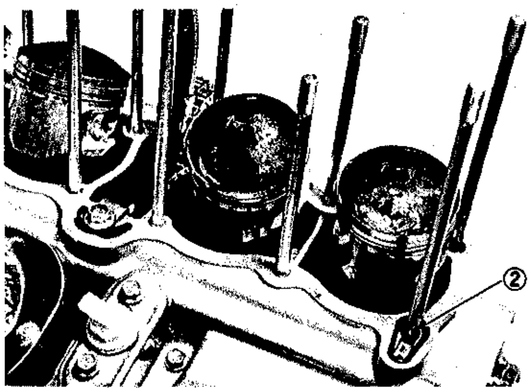


Fig. 7-83.

Distribution of ring gaps

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

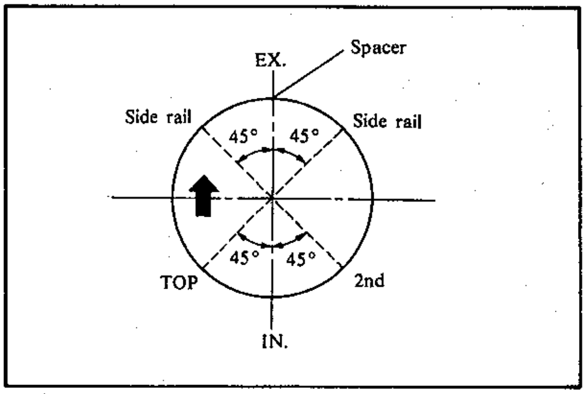


Fig. 7-84.

- Set the ring gaps as shown in Fig. 7-85 on No. 2 and No. 3 pistons, and then install piston ring compressor (special tool) in the manner indicated. 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	Piston ring holder body
09916-74540	Band

NOTE:
- *Do not overtighten the special tool bands or the cylinders will not admit the pistons.*
- *To rotate the crankshaft, hold down the camshaft chain with one hand and torque the shaft in normal running direction with the other hand, using a 19-mm wrench.*

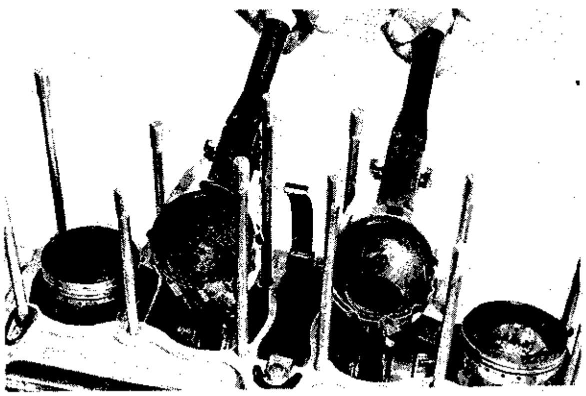


Fig. 7-85.

INSPECTION

Cylinder wear

To check the cylinders for wear, take I.D. readings on each and determine whether they need reworking to the next oversize. For this purpose, use the cylinder gauge (special tool) and take a total of 6 readings at three elevations in longitudinal and transverse directions, two readings at each elevation.

Cylinder I.D. specification

Standard I.D.	Service limit
70.000 ~ 70.015 mm (2.7559 ~ 2.7565 in.)	70.080 mm (2.7590 in.)

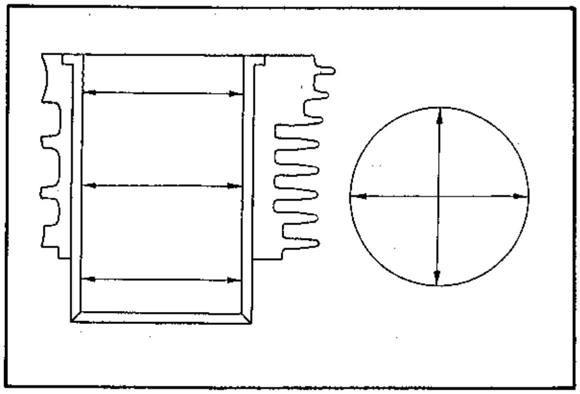


Fig. 7-86.

If any of the readings exceeds the I.D. limit or if the difference between the maximum and the minimum reading exceeds the limit for the difference, or if the bore surface is found to be badly burned or scored, rebore the cylinder to a suitable size according to the available oversize piston.

Piston-to-cylinder clearance	0.050 ~ 0.060 mm (0.0020 ~ 0.0024 in.)

Oversize piston	0.5 mm, 1.0 mm

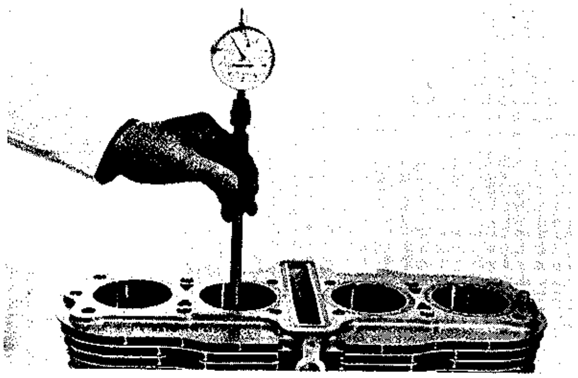


Fig. 7-87.

PISTON AND RINGS

REMOVAL

- Place a waste beneath the piston not to drop the parts in the crank case, and remove the circlip with a pincers.

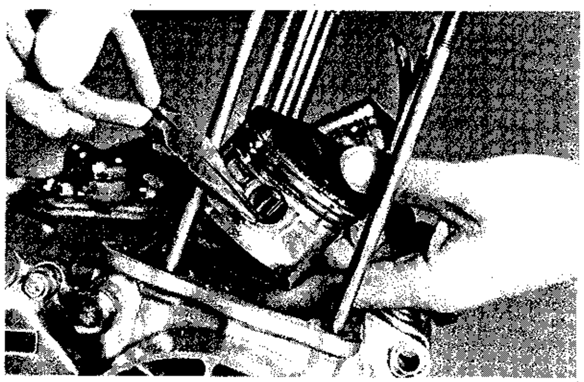


Fig. 7-88.

- Give 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.
  Special tools ①.

09910-34510	Piston pin puller
09910-33210	Puller attachment

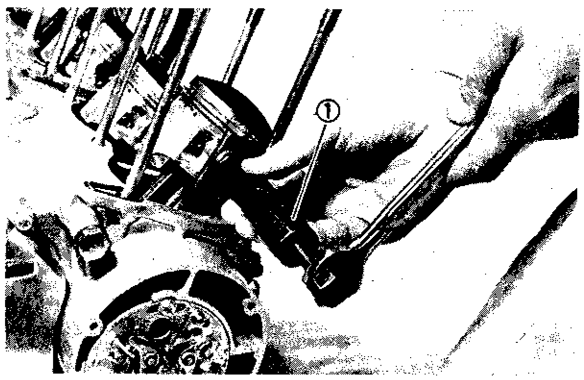


Fig. 7-89.

- In order to remove the piston ring, open its opening with the thumbs of both hands and push it upwards with a forefinger.

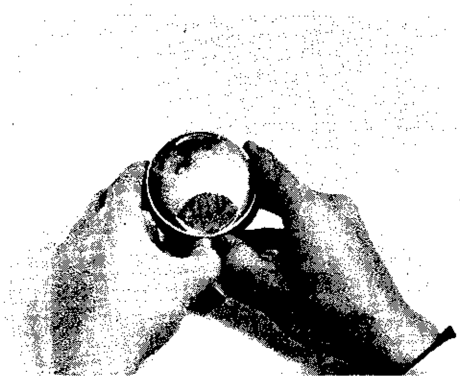


Fig. 7-90.

INSTALLATION

- Mount the piston ring in the order of oil ring, 2nd ring and top ring.
- Three rings should be mounted to the groove of the oil ring. First, mount the spacer ①. Then, mount the side rails ② to the upper and lower portions of the spacer ①.

NOTE:
- *Mounting should be carried out as explained above since the ring groove is so constructed that the spacer may not be inserted if the side rails are mounted first.*
- *Be sure to remove the carbon left in the ring groove before mounting the piston ring.*

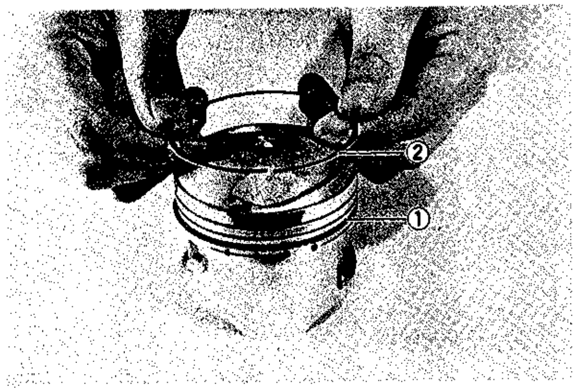


Fig. 7-91.

- Then, mount 2nd ring and the top ring to the piston. Note the following before mounting them.
  ★ The letter "R" is stamped on the respective end surface of 2nd ring and the top ring. Mount them with the stamped end surfaces turned upwards.

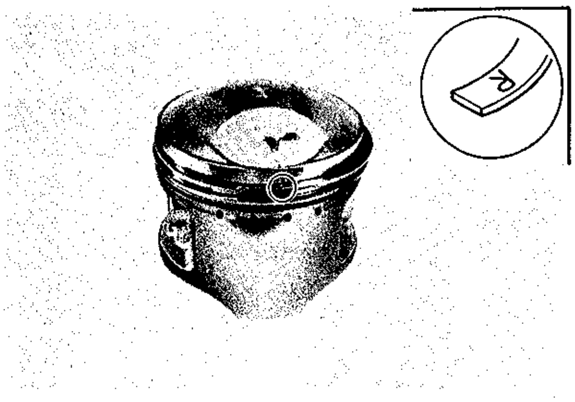


Fig. 7-92.

★ How to discriminate top ring and 2nd ring. Top ring and middle (2nd) ring differ according to the shape of ring face. In addition the face of top ring is chrome-plated whereas that of 2nd ring is not. The color of 2nd ring appears darker than that of the top one.

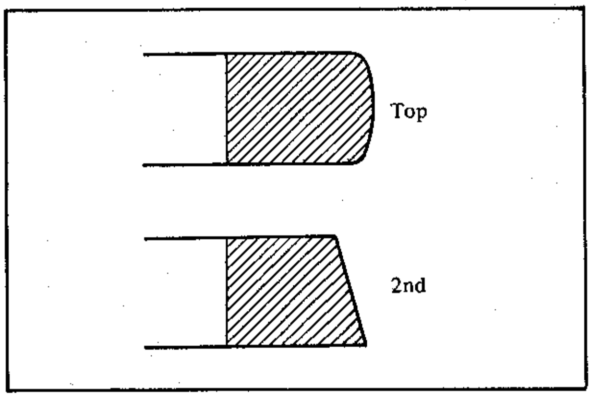


Fig. 7-93.

Piston should be mounted to the connecting rod in the following manner

- Before mounting the piston, be sure to remove the carbon left on the upper part of the piston using a soft metal scraper.
- Coat the piston pin with engine oil, and insert the piston pin into the piston by pushing it by hand, directing the arrow mark on the top of the piston towards the exhaust side.

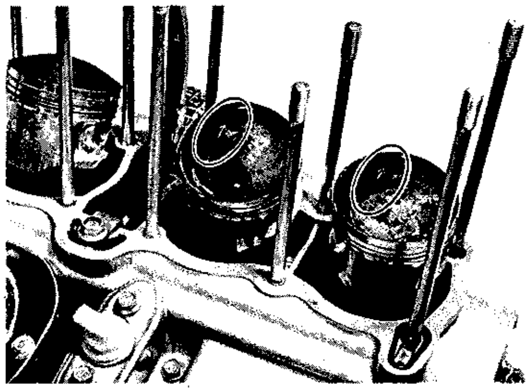


Fig. 7-94.

- Place a waste beneath the piston, and mount the circlip.
- Replace the circlip by a new one. Once removed, the circlip becomes misshapen and loses its tension. It should always be replaced.

- The circlip should be mounted in such a position ① that the mating ends of the circlip do not coincide with the groove portion of the piston.

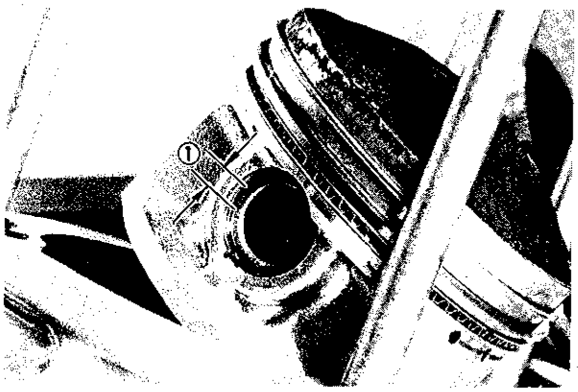


Fig. 7-95.

INSPECTION

Piston wear determination

Measure with a micrometer the piston at the places and in the directions indicated. If the service limit has been reached or exceeded, replace the piston.

Piston diameter specification

Standard	Service limit
69.945 ~ 69.960 mm (2.7537 ~ 2.7543 in.)	69.880 mm (2.7512 in.)

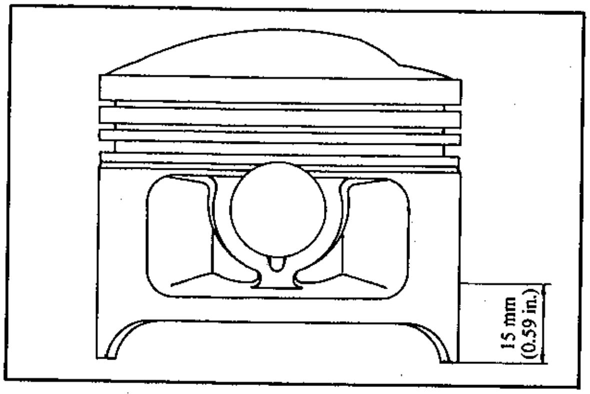


Fig. 7-96.

Piston ring clearance in the groove

Check each ring with a thickness gauge. If any of the three rings exceed the clearance limit, determine whether the ring or the piston should be replaced by measuring the ring thickness and the groove width. Limits are specified for the width and thickness.

Fig. 7-97.

- 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.

0.5 mm	Painted red
1.0 mm	Painted yellow

Ring-to-groove clearance specification

Piston ring	Standard	Limit
TOP	0.020 ~ 0.055 mm (0.0008 ~ 0.0022 in.)	0.180 mm (0.0071 in.)
2ND	0.020 ~ 0.060 mm (0.0008 ~ 0.0024 in.)	0.150 mm (0.0059 in.)

Ring thickness specification

Piston ring	Standard	Limit
TOP	1.175 ~ 1.190 mm (0.0463 ~ 0.0469 in.)	1.10 mm (0.043 in.)
2ND	1.170 ~ 1.190 mm (0.0461 ~ 0.0469 in.)	1.10 mm (0.043 in.)

Ring groove width specification

Ring groove	Standard	Limit
TOP	1.21 ~ 1.23 mm (0.047 ~ 0.048 in.)	1.30 mm (0.051 in.)
2ND	1.21 ~ 1.23 mm (0.047 ~ 0.048 in.)	1.30 mm (0.051 in.)
OIL	2.51 ~ 2.53 mm (0.099 ~ 0.100 in.)	2.60 mm (0.102 in.)

Piston ring gap

Each piston ring, with the exception of oil rings, is required to have its ring gap within the specified range and must be replaced if the limit is exceeded. To measure the gap, fit the ring to the piston at its skirt portion near the end and measure the gap. The specification values indicated here refer to the gap measured in this condition.

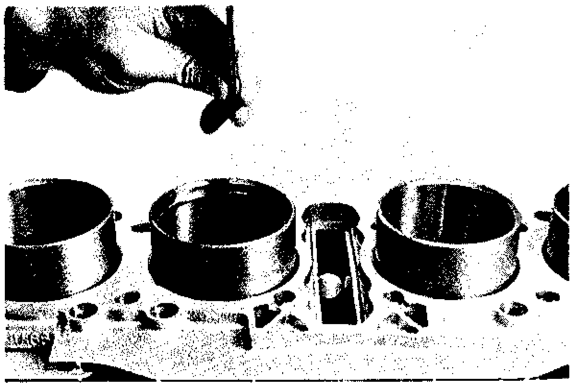


Fig. 7-98.

Ring gap specification

Piston ring	Standard	Limit
TOP and 2ND	0.15 ~ 0.35 mm (0.006 ~ 0.014 in.)	0.70 mm (0.028 in.)

A piston ring where elasticity has been reduced to a critical value must be replaced. For this reason, the limit is specified on free-state ring gap, as follows.

Free-state ring end gap specification

Piston ring	Standard	Limit
TOP and 2ND	Approx. 8.5 mm (0.33 in.)	6.8 mm (0.27 in.)

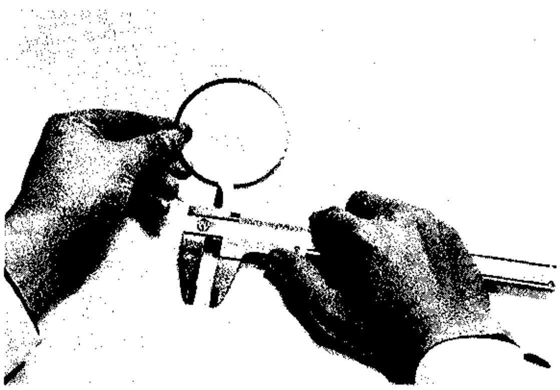


Fig. 7-99.

LOWER END

GENERATOR STATOR

Removal

- Remove two bolts and starter motor cover.
- Place oil pan under generator cover and remove screws to remove generator cover and gasket.

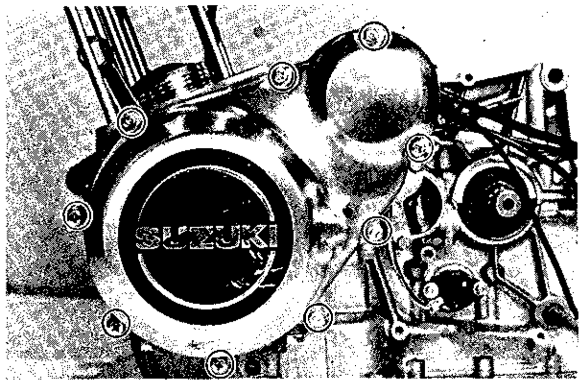


Fig. 7-100.

- Remove two lead wire clamp screws ① and three stator set screws ② to remove stator.

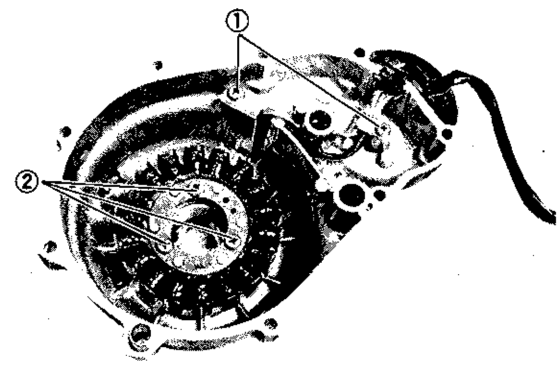


Fig. 7-101.

Installation

- Apply thread lock "1363C" to the stator set screws and guide screws and securely tighten the latter.

99104-32050	Thread lock "1363C"

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

- Mount the lead wire clamp as shown in the drawing.
- Replace gasket by new one to prevent oil leakage, and tighten generator cover screw.

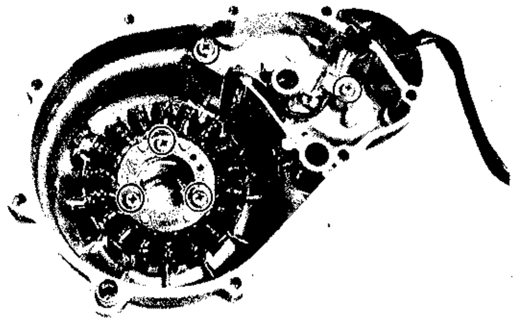


Fig. 7-102.

GENERATOR ROTOR

Removal

- The generator cover is removed in the same manner as the stator.
- Securely fix the rotor with the flywheel holder and loosen the rotor bolt by turning it by two to three turns counterclockwise.

09930-44910	Flywheel holder

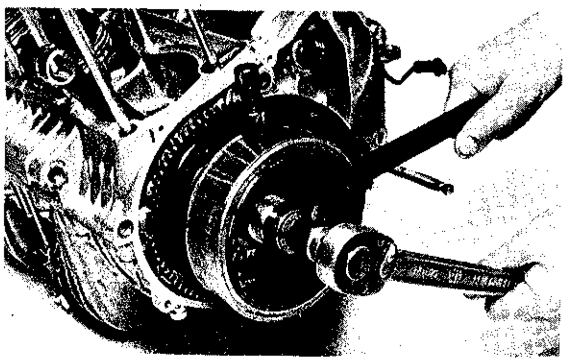


Fig. 7-103.

- Set rotor remover and remove the bolt and rotor.

09930-34910	Rotor remover

NOTE:
Do not hit the rotor with a hammer.

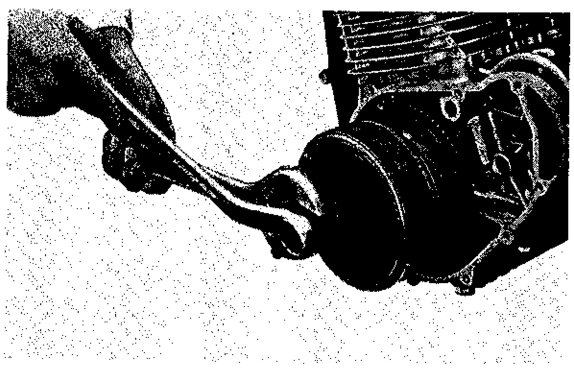


Fig. 7-104.

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

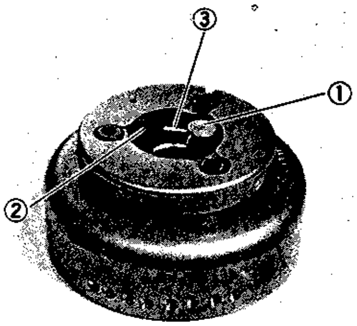


Fig. 7-105.

- Clamp the rotor with a vise taking care not to damage it and separate starter clutch from the rotor using the T type (6 mm) hexagonal wrench.

09914-25811	T type (6 mm) hexagonal wrench

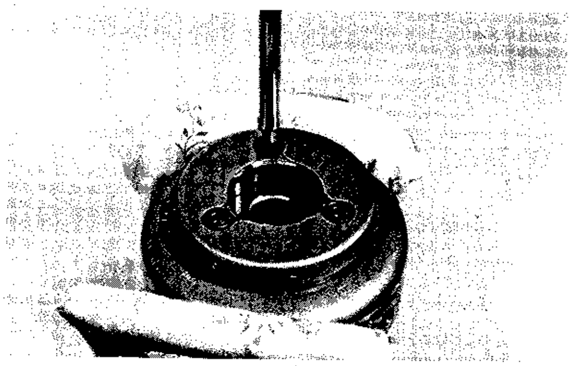


Fig. 7-106.

Installation

- Installation is carried out in the reverse order of removal.
- Apply thread lock super "1361A" screw lock to Allen bolt.

99104-32020	Thread lock super "1361A"

- Thick copper washer ① is mounted with its notch directed towards crankshaft.

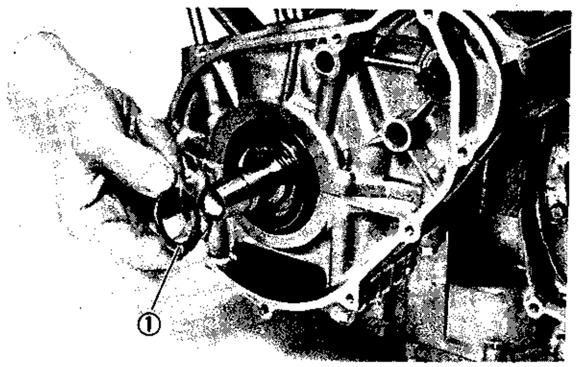


Fig. 7-107.

- Clean the tapered portion of the rotor and also the crankshaft. Use cleaning solvent to wipe off oil or grease so that the surfaces become completely dry.
- After mounting the rotor, secure it by tightening the center bolt to the specified torque value.

99104-32090	Thread lock super "1332B"

Bolt tightening torque	9.0 ~ 10.0 kg-m (65.0 ~ 72.5 lb-ft)

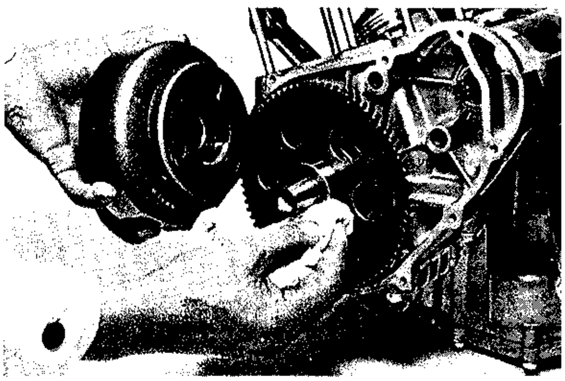


Fig. 7-108.

- Replace gasket by new one to prevent oil leakage.

CONTACT BREAKER POINTS

Removal

- Remove points cover and gasket.
- Remove mounting screws and the points.

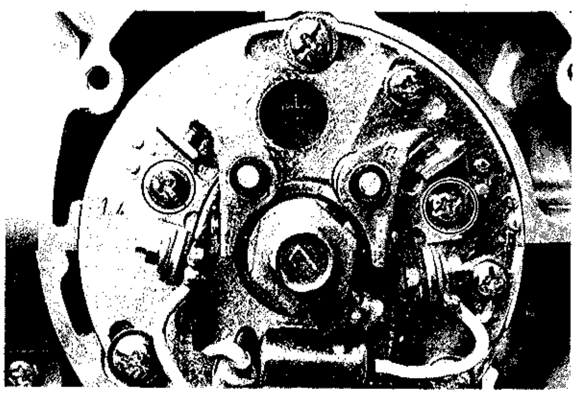


Fig. 7-109.

- Loosen lead wire mounting nut and withdraw condenser and ignition coil lead wires from the points.

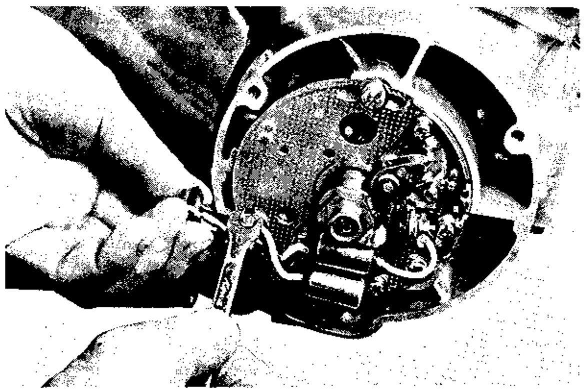


Fig. 7-110.

Installation

- Installation is carried out in the reverse order of removal.
- The condenser and ignition coil lead wires are mounted on the outer side of insulated washer.

CONDENSER

- Remove point cover and gasket.
- Remove condenser mounting screws and then condenser from contact breaker.

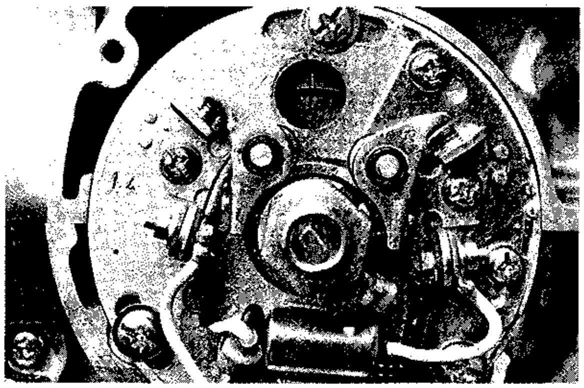


Fig. 7-111.

Installation

- Installation is carried out in the reverse order of removal.
- Condenser lead wire is mounted on the outer side of the insulated washer.

AUTOMATIC ADVANCER FOR CONTACT BREAKER

Removal

- Remove points cover and gasket.
- Apply wrench to crank turning nut to remove automatic advancer mounting bolts and the crank turning nut.

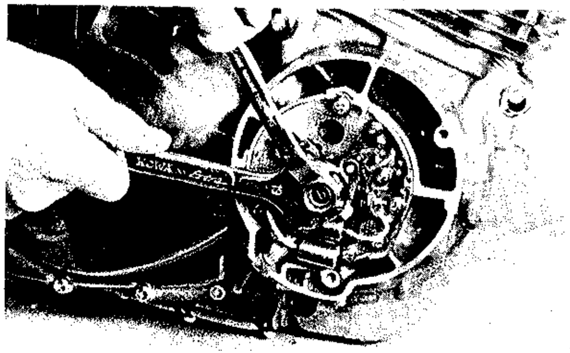


Fig. 7-112.

- Remove mounting screws for contact breaker assembly and then remove the assembly and the automatic advancer.

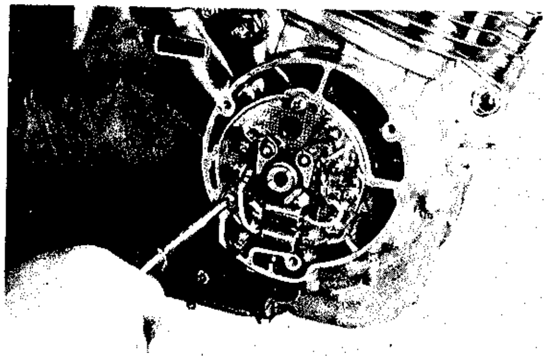


Fig. 7-113.

Installation

- Installation is carried out in the reverse order of removal.
- Make sure to register the groove on the back surface of the automatic advancer with the projection on the pin surface of crankshaft and the groove of the crankshaft turning nut.

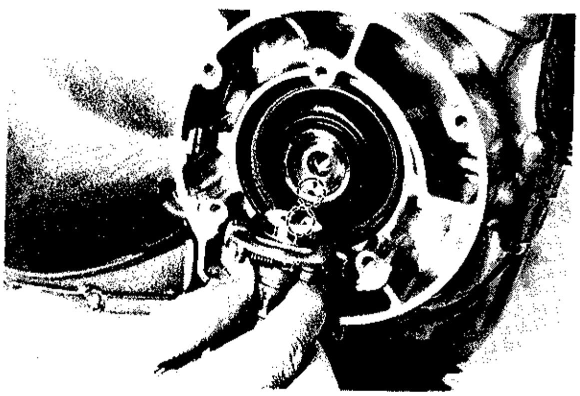


Fig. 7-114.

- Adjust ignition timing (see page 3-9).

Dismantling of automatic advancer

- Extract cam from the automatic advancer body and wipe off dirt, etc., completely from the cam.

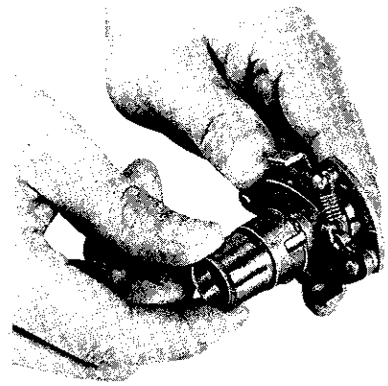
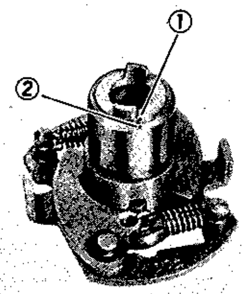


Fig. 7-115.

Assembly

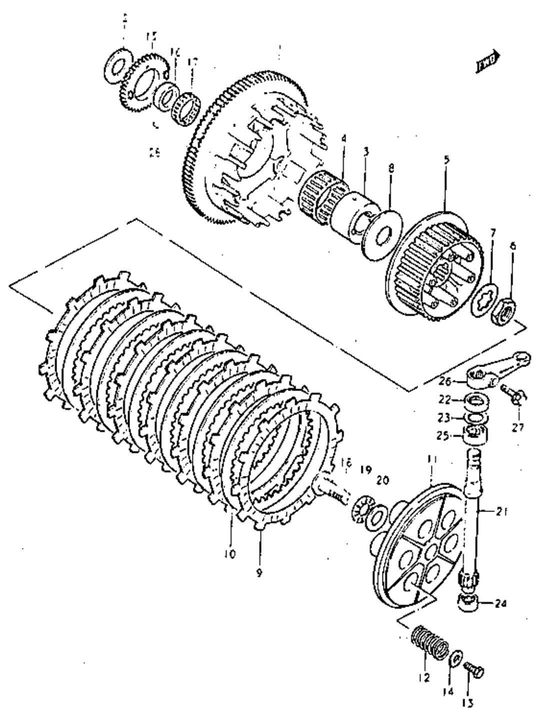
- When installing the cam, the notch on the end face of the cam is aligned with the notch of the automatic advancer body.



① Notch ② Notch

Fig. 7-116.

CLUTCH



1. Primary driven gear assy	15. Oil pump drive gear
2. Washer	16. Spacer
3. Spacer	17. Bearing
4. Bearing	18. Clutch release rack
5. Sleeve hub	19. Thrust bearing
6. Nut	20. Washer
7. Washer	21. Clutch release pinion
8. Washer	22. Oil seal
9. Drive plate	23. Washer
10. Driven plate	24. Bearing (1)
11. Pressure disk	25. Bearing (2)
12. Spring	26. Clutch release arm
13. Bolt	27. Bolt
14. Washer	28. Cushion

Fig. 7-117.

REMOVAL

- Remove the cam lever bolts for clutch cable and cluch cover screw.

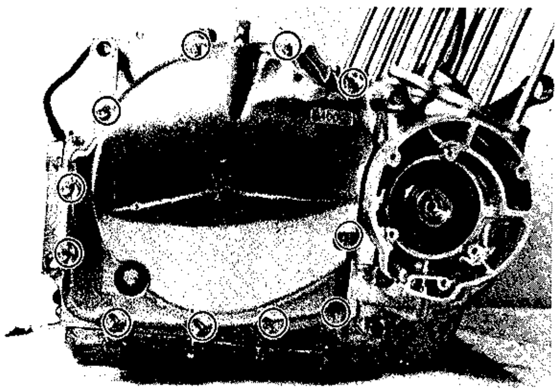


Fig. 7-118.

- Remove clutch cover and gasket.
- Remove clutch spring mounting bolts and remove spring and pressure plate.

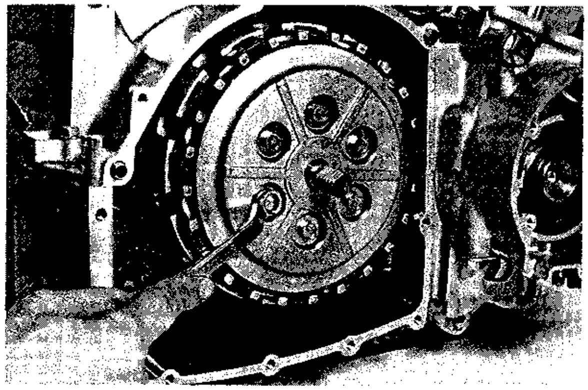


Fig. 7-119.

- Remove clutch release rack ①, needle bearing ② and washer ③ from pressure plate.

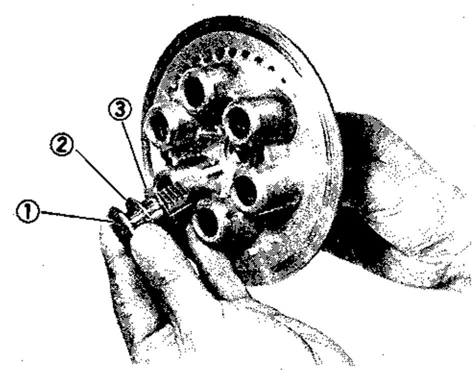


Fig. 7-120.

- After removal of the several sheets of clutch driven plate and drive plate, firmly secure clutch sleeve hub to remove mounting nut with special tool ①.

09920-53710	Clutch sleeve hub holder

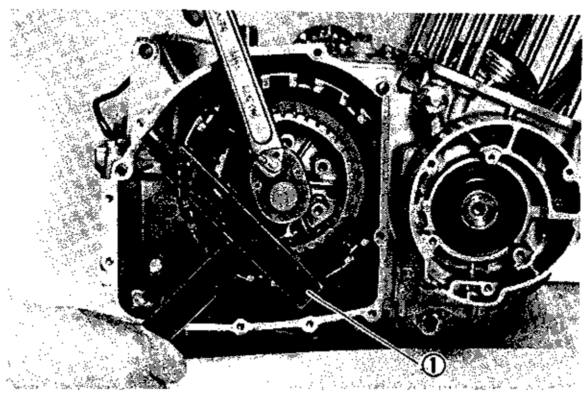


Fig. 7-121.

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

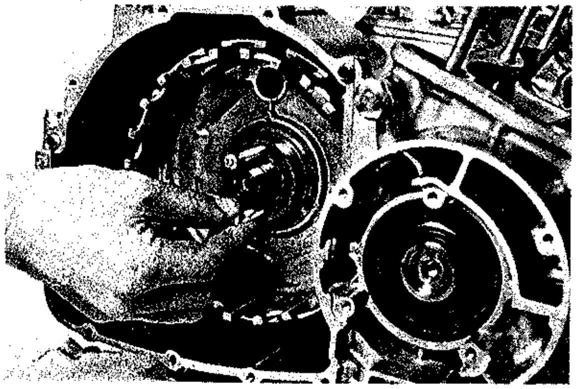


Fig. 7-122.

INSPECTION

Free length of clutch spring

Measure the free length of each coil spring with a caliper rule, and compare the elastic strength of each with the specified limit. Replace any spring not within the limit.

Clutch spring free length specificaion

Standard (when new)	Limit
39.0 ~ 40.5 mm (1.54 ~ 1.59 in.)	37.1 mm (1.46 in.)

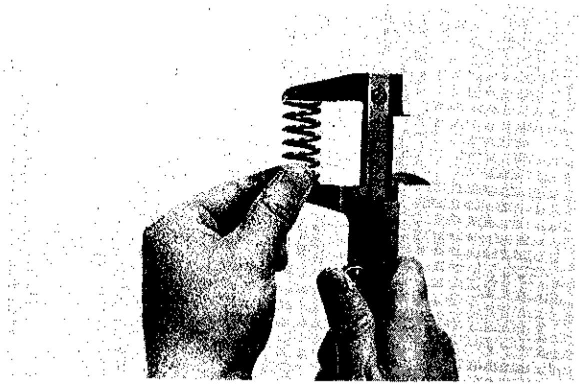


Fig. 7-123.

Clutch drive plate wear

Measure the thickness of each drive plate with a caliper rule. Replace drive plates found to have worn down to the limit.

Drive plate thickness specification

Standard (when new)	Limit
2.7 ~ 2.9 mm (0.10 ~ 0.11 in.)	2.4 mm (0.09 in.)

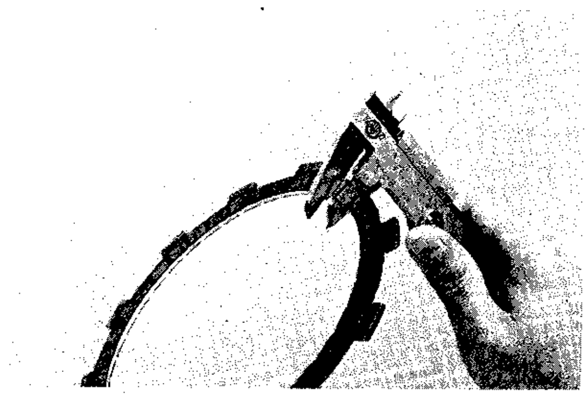


Fig. 7-124.

Clutch plate distortion

Check each plate for distortion by placing it on a surface plate and by inserting a thickness gauge under the clutch plate at several places. The distortion limit in terms of clearance for drive plates and driven plates are specified as follows:

Distortion	Service limit
Drive plate	0.2 mm (0.008 in.)
Driven plate	0.1 mm (0.004 in.)

Be sure to replace any plates exceeding this limit.

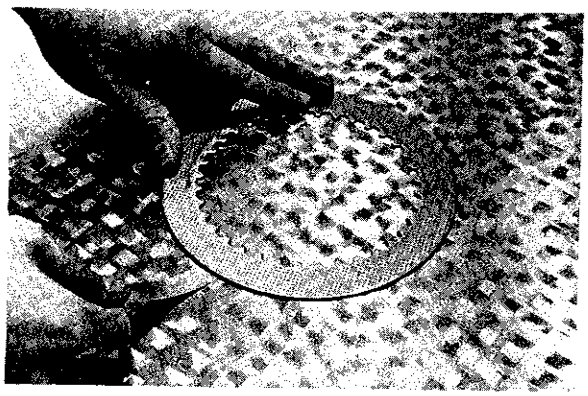


Fig. 7-125.

INSTALLATION

- Fit the projection of oil pump driven gear into the notch of primary driven gear and confirm both parts fit snugly while rotating primary driven gear left and right.

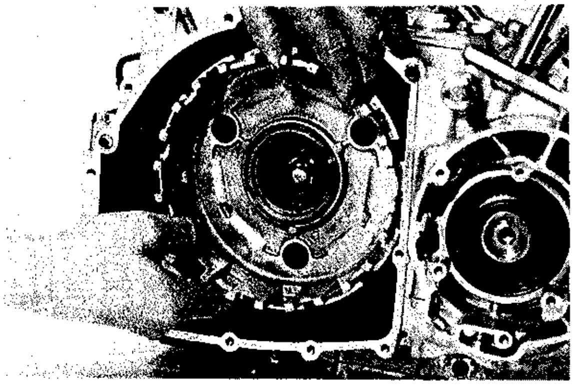


Fig. 7-126.

- After installing the oil pump driven gear and primary driven gear, apply engine oil to needle bearing and spacer to assemble the needle bearing and the spacer in the prescribed order.
- Assemble the primary driven gear and then thrust washer must be installed with the grooved side facing in.

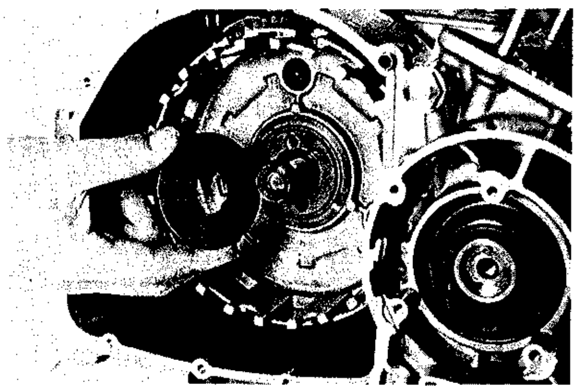


Fig. 7-127.

- 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)

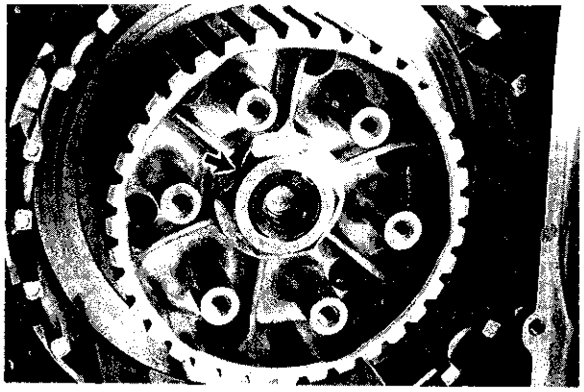


Fig. 7-128.

- Insert clutch driven plate and drive plate one by one into sleeve hub in the prescribed order. Insert clutch release rack into pressure plate and fit pressure plate into sleeve hub.
- Tighten clutch spring bolts in the order shown in the drawing.

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

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

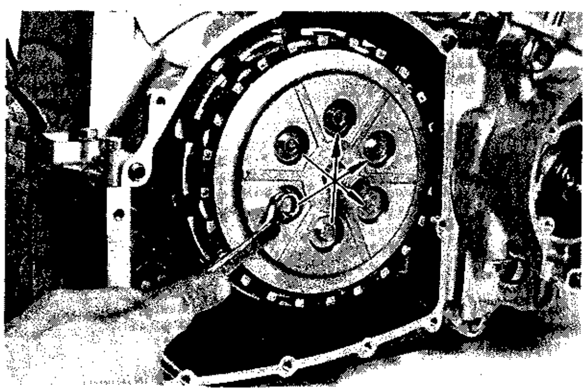


Fig. 7-129.

- Replace gasket by 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. Install them, hammering lightly with plastic hammer and tighten screw.

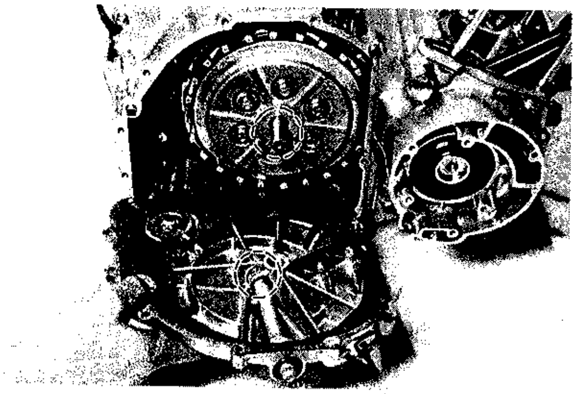


Fig. 7-130.

EXTERNAL MECHANISM FOR GEAR SHIFT

Removal

- Remove gear shift lever.
- Remove engine sprocket cover and engine sprocket (see page 7-3).
- Remove clutch cover and primary driven gear (see page 7-32).
- Remove circlip set at the gear shift lever side using the special tool (09900-06104).
- Extract gear shift shaft from crankcase.

Installation

- Installation is carried out in the reverse order of removal.
- Install the gearshift shafts, with the center of the gear on shaft side matching the center of gearshift cam driven gear.

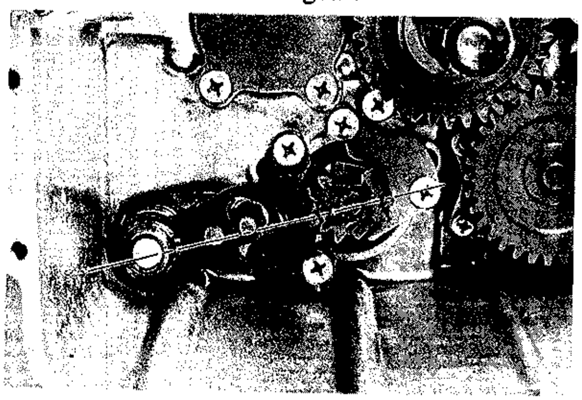
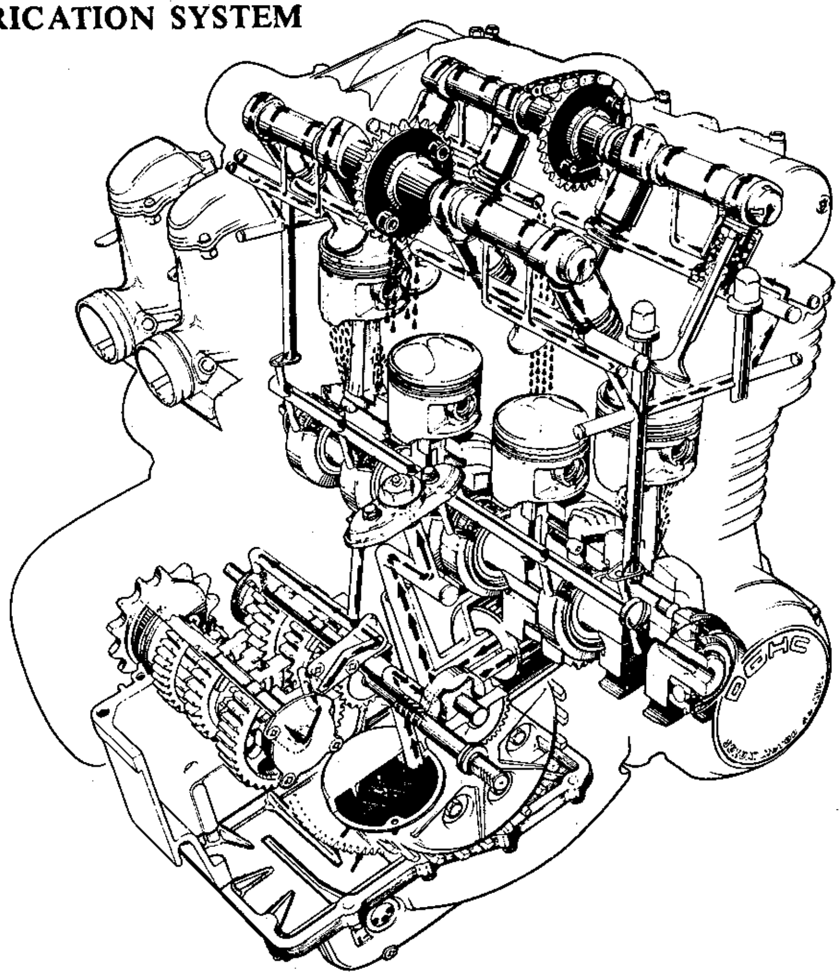


Fig. 7-131.

- Set circlip on the gear shift lever side. Replace the circlip by new one.
- Install clutch driven gear and clutch cover.
- Replace gasket by new one to prevent oil leakage.

ENGINE LUBRICATION SYSTEM



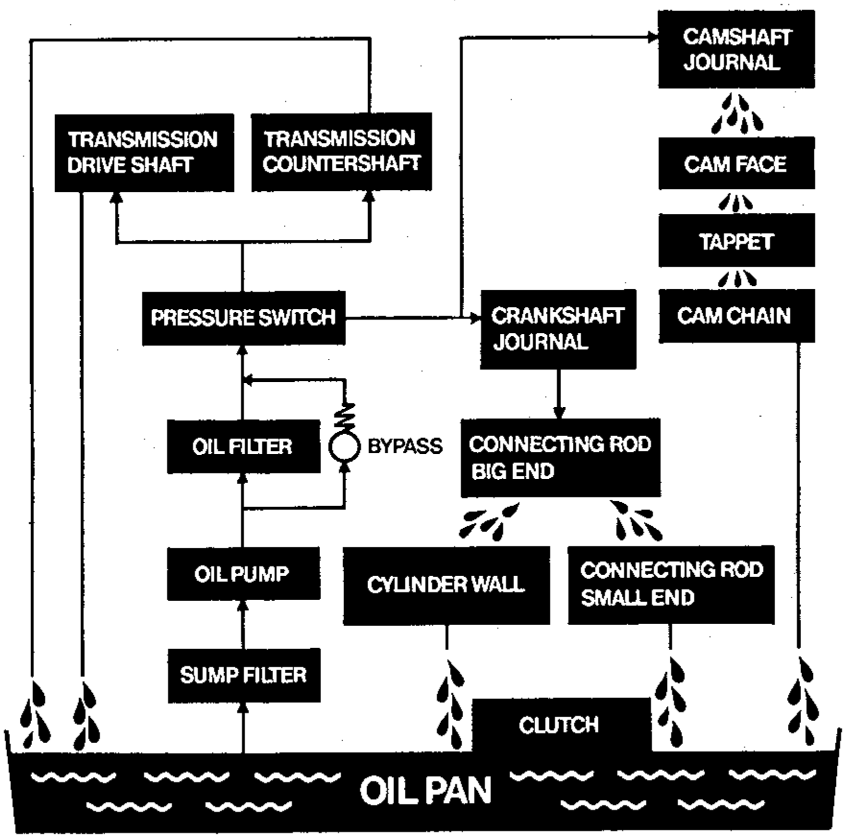


Fig. 7-132.

OIL PUMP

Removal

- Remove clutch cover and primary driven gear (see page 7-32).
- Remove oil pump drive gear, needle bearing and spacer.
- Remove three oil pump mounting bolts and remove oil pump body from crankcase.
- Remove the circlip of oil pump gear and then the gear.
- Remove one screw fastening oil pump body and extract pin securing the lower case and the upper case.

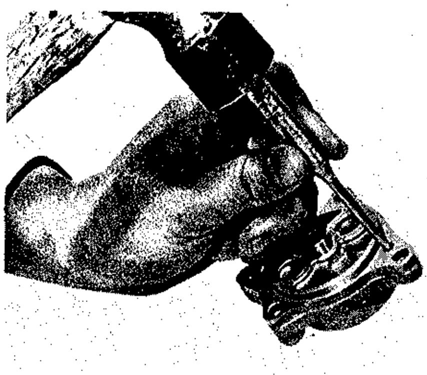


Fig. 7-133.

Outer rotor clearance in the body

Use a thickness gauge.

Outer rotor clearance limit	0.25 mm (0.010 in.)

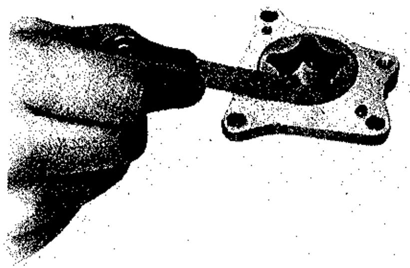


Fig. 7-134.

Tip clearance

This is the clearance between inner rotor and outer rotor. Use a thickness gauge.

Tip clearance limit	0.2 mm (0.008 in.)

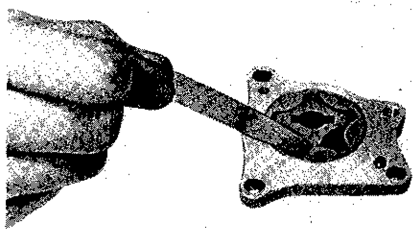


Fig. 7-135.

Side clearance

Put a straightedge to the pump and measure the clearance under the straightedge, as shown.

Side clearance limit	0.15 mm (0.006 in.)

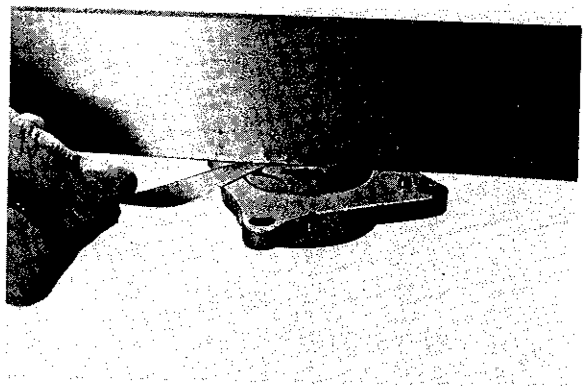


Fig. 7-136.

Installation

- Installation is carried out in the reverse order of removal.
- Thoroughly wash the oil pump, inner and outer rotors and oil pump case with a detergent and apply engine oil to them before inserting them into case.
  Since there are no identification marks for the upper or lower portions of the inner rotor and outer rotor, the rotor can be inserted irrespective of these portions.
- Replace circlip by new one.

- Apply thread lock "1363C" to one screw fastening oil pump body. Wipe off oil completely.

99104-32050	Thread lock "1363C"

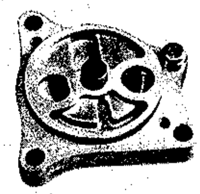


Fig. 7-137.

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

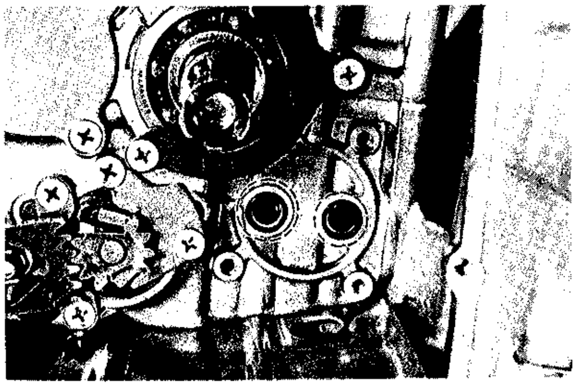


Fig. 7-138.

- Apply screw lock "1363C" (99104-32050) to three screws and fasten oil pump body (wipe oil off completely).
  At this time make sure that oil pump gear rotates smoothly.

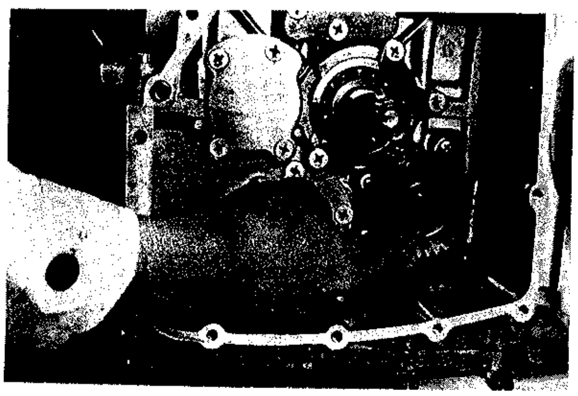


Fig. 7-139.

OIL PUMP PRESSURE TEST

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.

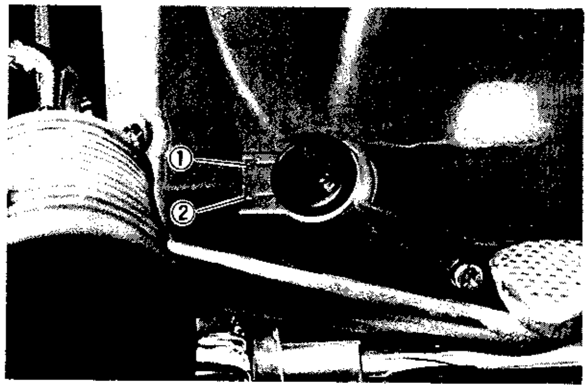


Fig. 7-140.

Start up the engine and warm it up by running it at 2,000 rpm for 10 minutes (in summer where ambient temperature is 30°C (86°F) or thereabouts) or for 20 minutes (in winter where ambient temperature is down to −5°C (23°F) or thereabouts).

Stop the engine, and affix the oil pressure gauge ① at the place indicated.
Restart the engine and run it at 3,000 rpm.
Under this condition, take a pressure reading on the gauge.
This reading should be as follows:

①	09915-74510	Oil pressure gauge

> Oil pump pressure:
> Over 0.1 kg/cm^2 (1.42 psi), below 0.5 kg/cm^2 (7.11 psi) at 3,000 rpm

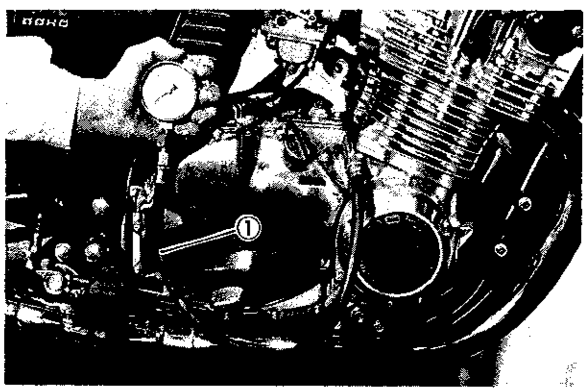


Fig. 7-141.

If the pressure is too low, it means 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.

OIL FILTER

Removal

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

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

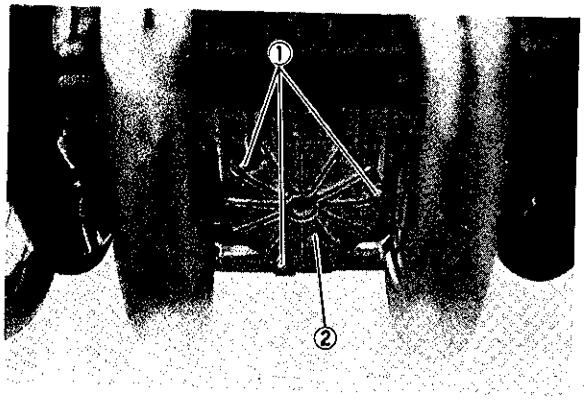


Fig. 7-142.

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 to avoid any chance of dropping or mislocating the ring during the installation work.

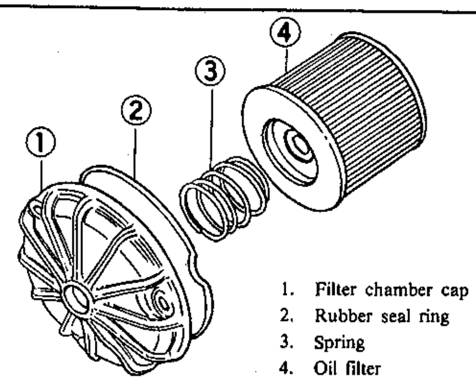


Fig. 7-143.

- Put on the cap ③ and secure it tightly.

> *NOTE:*
> *Pour about 3,800 ml (4.0 US.qt) of engine oil into oil pan only when changing oil and replacing oil filter at the same time.*

SUMP FILTER

Removal

- Remove screws of oil pan ① and remove the oil pan from crank case.

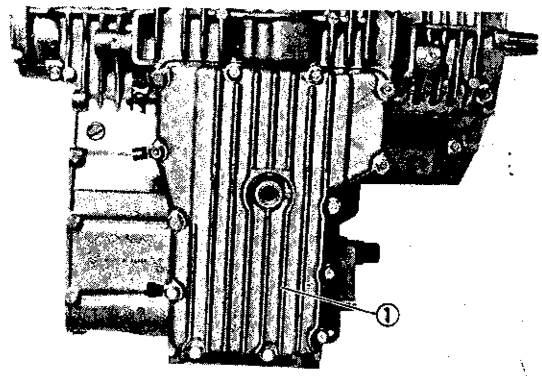


Fig. 7-144.

- Remove three screws and then sump filter.

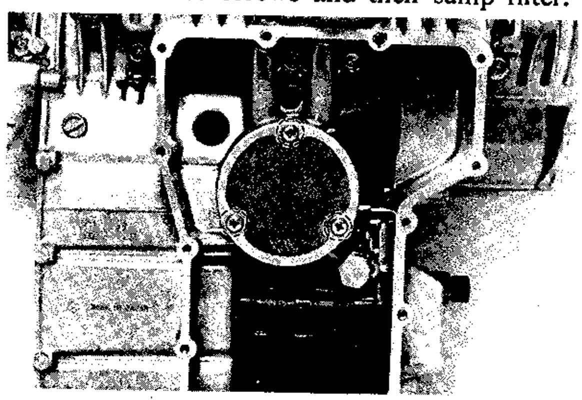


Fig. 7-145.

Installation

- Thoroughly wash the sump filter with detergent and fasten it with three screws.

99104-32050	Thread lock "1363C"

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

Tightening torque	0.6 ~ 0.9 kg-m (4.5 ~ 6.5 lb-ft)

Fig. 7-146.

CRANKCASE

Removal

- Remove two bolts, and lightly hammer the head of starter motor gear with plastic hammer to remove starter motor.

99104-32050	Thread lock "1363C"

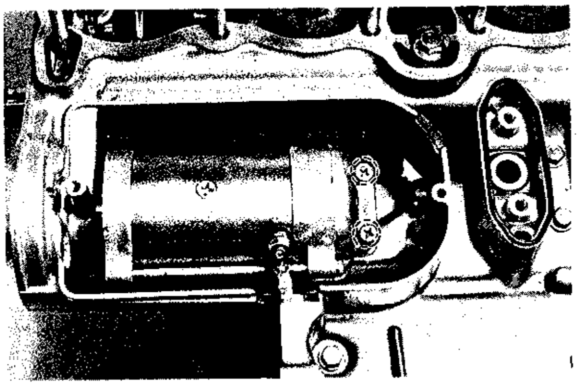


Fig. 7-147.

- Remove two bolts and then oil seal holder.
- Remove two screws and then gear shifting switch body.

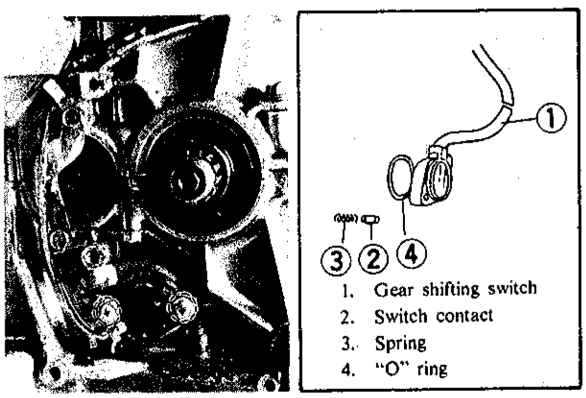


Fig. 7-148.

- Gear shift cam guide screw
  .... 2 pcs. (overall length 12 mm)
  Gear shift pawl screw
  .... 2 pcs. (overall length 12 mm)
  Counter shaft B/g retainer screw
  .... 3 pcs. (overall length 16 mm)
  Drive shaft plate screw
  .... 4 pcs. (overall length 16 mm)
  Oil pump gallery plate screw
  .... 3 pcs. (overall length 16 mm)

99104-32050	Thread lock "1363C"

- Remove cam driven gear shifting pawls No. 1 and No. 2.

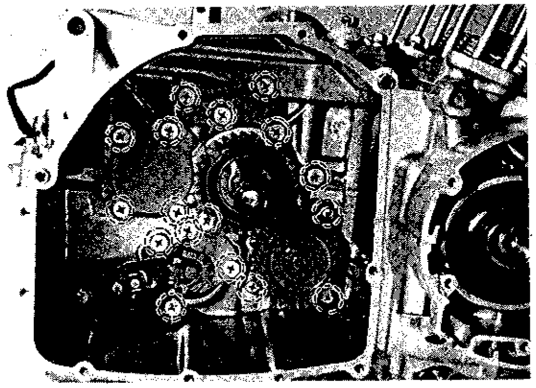


Fig. 7-149.

- Remove upper crankcase tightening bolts.
  6 mm bolt............................. 12 pcs.
  8 mm bolt................................ 1 pc.

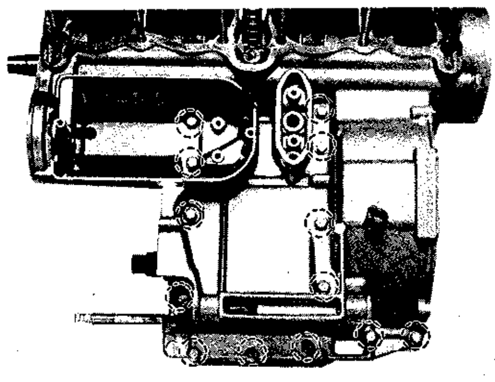


Fig. 7-150.

- Next turn engine upside down to remove oil pan from lower crankcase (see page 7-39).
- After removal of oil pan, remove lower crankcase tightening bolts.
  6 mm bolt............................... 9 pcs.
  8 mm bolt............................. 12 pcs.

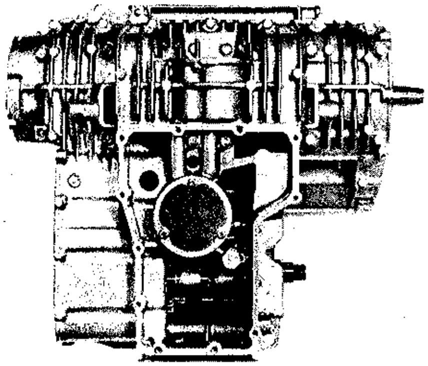


Fig. 7-151.

- Make sure that bolts are removed without fail. Hammer lightly the lower crankcase side with a plastic hammer to separate the upper and lower crankcase halves and then lift the latter.
- Remove the crankshaft sub-assembly, counter shaft gear and drive shaft gear which are all mounted on the upper crankcase. At this time be careful not to drop "C" ring and the like.

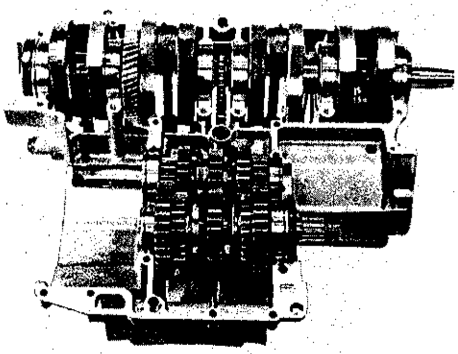


Fig. 7-152.

- Hold gear shifting fork by hand to extract gear shifting fork shaft from the lower crankcase.

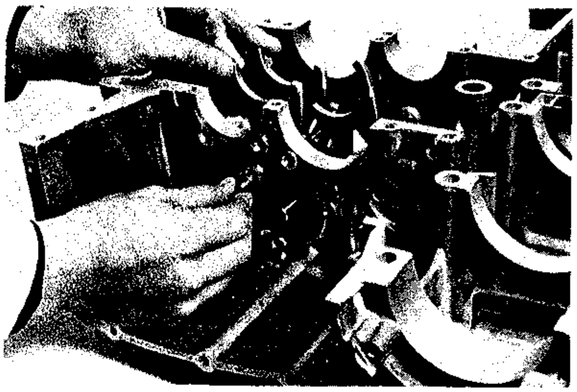


Fig. 7-153.

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

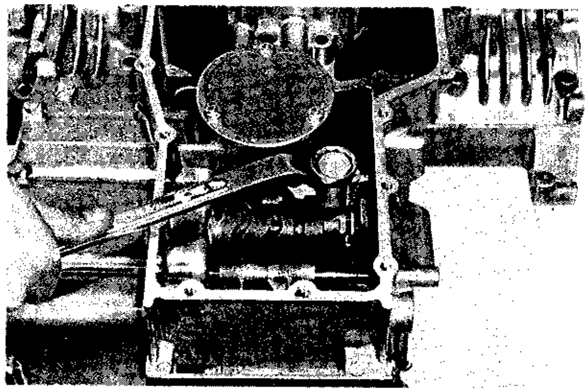


Fig. 7-154.

- Extract gear shifting cam to the right side.

CRANKSHAFT

Crankpin wear and big end side clearance

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

Deflection service limit	3 mm (0.11 in.)

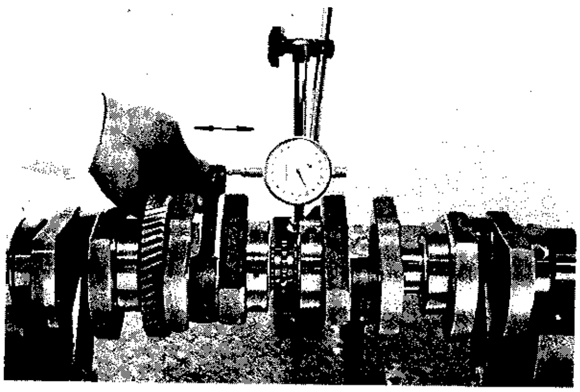


Fig. 7-155.

Push the big end of the connecting rod to one side and measure its side clearance with a thickness gauge.

Big end side clearance specification

Standard	Limit
0.10 ~ 0.65 mm (0.004 ~ 0.026 in.)	1.0 mm (0.039 in.)

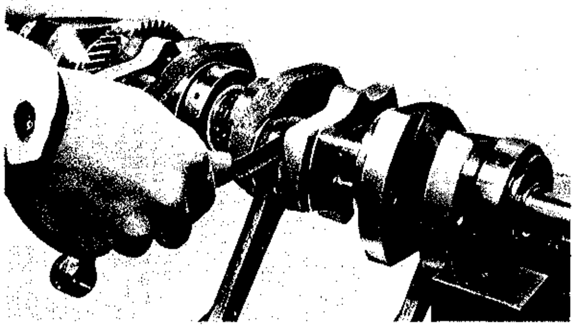


Fig. 7-156.

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 deflection

Support the crankshaft with "V" blocks as shown, with the two end bearings resting on the blocks. Rig up the dial gauge, as shown, and rotate the crankshaft slowly to read the deflection.

Replace the crankshaft if the deflection is greater than the limit.

Crankshaft runout

Service limit	0.10 mm (0.003 in.)

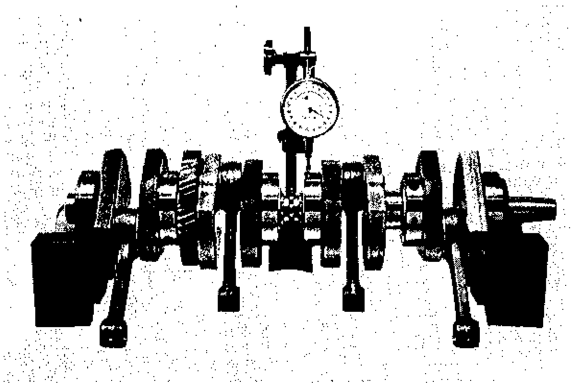
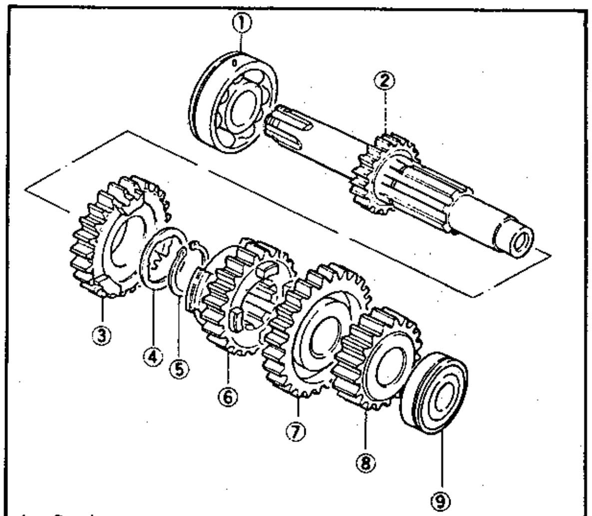


Fig. 7-157.

TRANSMISSION

• Counter shaft gear assembly



1. Bearing
2. Counter shaft
3. 4th drive gear
4. Washer
5. Circlip
6. 3rd drive gear
7. 5th drive gear
8. 2nd drive gear
9. Bearing

Fig. 7-158.

• Refer to the above drawing with respect to each bearing assembly. (Pay attention to each gear's direction.)
• Replace circlip by new one.

Mounting 2nd drive gear on the counter shaft

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

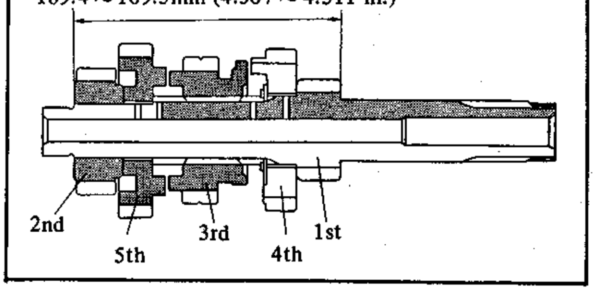


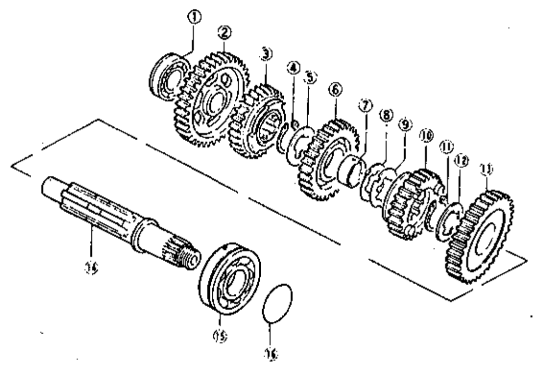
Fig. 7-159.

NOTE:
1) Before mounting 2nd drive gear, apply "THREAD LOCK SUPER 1363A" (99104-32030) to its bore, taking care not to smear 5th drive gear with "SUPER 1363A".
2) After mounting the 2nd drive gear, check that 5th drive gear spins smoothly by moving it with your fingers.

- Press fit bearings at both sides using the special tool.

09913-85210	Bearing and oil seal installing tool

Drive shaft gear assembly



1. Bearing	9. Lock washer No. 2
2. 1st driven gear	10. 5th driven gear
3. 4th driven gear	11. Circlip
4. Circlip	12. Washer
5. Washer	13. 2nd driven gear
6. 3rd driven gear	14. Drive shaft
7. Spacer	15. Bearing
8. Lock washer No. 1	16. "O" ring

Fig. 7-160.

- See the above drawing with respect to the assembly of each gear (pay attention to the gear's direction).

CAUTION:
Spacer ⑦, lock washer No. 1 ⑧, lock washer No. 2 ⑨ and circlip should be mounted in the following manner.

- *Insert lock washer No. 2 ⑨ into the drive shaft, and turn it to fit it into the groove. Then, fit the lock washer No. 1 ⑧ in the lock washer No. 2.*

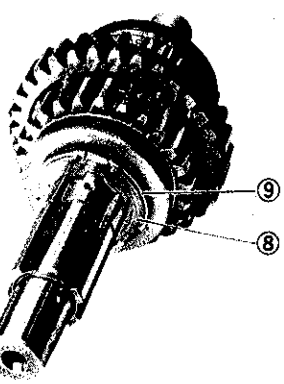


Fig. 7-161.

- *Insert spacer ⑦ into the drive shaft, aligning the hole on the outside periphery of the spacer with that of the drive shaft. (The latter hole is for passing oil.)*

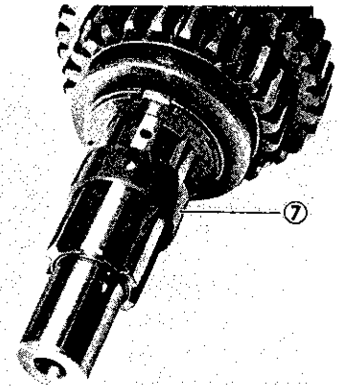


Fig. 7-162.

- *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.*

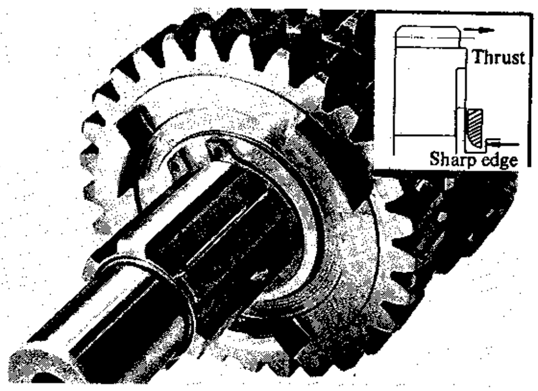


Fig. 7-163.

- Replace circlip by new one.
- Press-fit bearing ⑮ illustrated in the drawing using special tool (09913-85210).
- Fit "O" ring ⑯ in the bearing on the engine sprocket side. (Replace "O" ring by new one.)

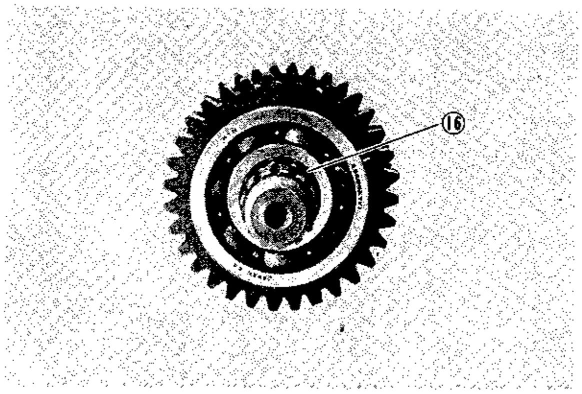


Fig. 7-164.

Gear backlash

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

Transmission gear backlash specification

Gears	Standard	Limit
1st, 2nd and 3rd	0 ~ 0.04 mm (0 ~ 0.002 in.)	0.09 mm (0.004 in.)
4th and 5th	0.05 ~ 0.10 mm (0.002 ~ 0.004 in.)	0.15 mm (0.006 in.)

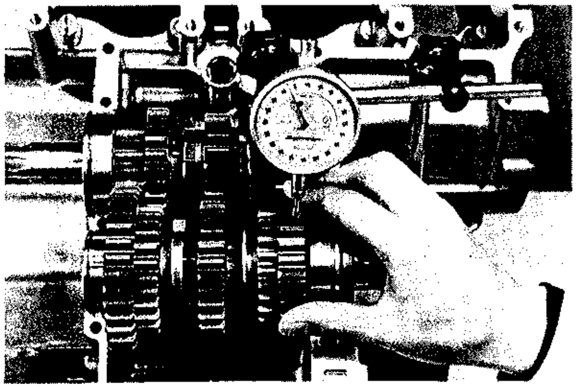


Fig. 7-165.

CAUTION IN INSTALLATION OF TRANSMISSION GEARS AND CRANKSHAFT ON CRANKCASE

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

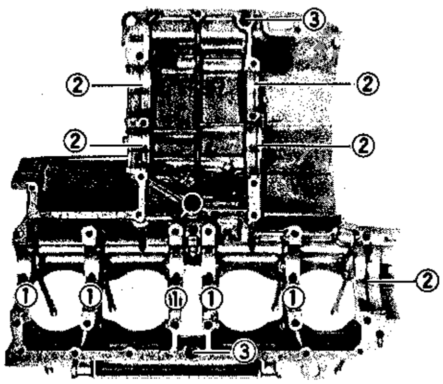


Fig. 7-166.

- Mount crankshaft and transmission gear on the upper case. At this time firmly fit the bearing onto the locating pin with punch mark stamped on the circumference of the bearing directed upwards.

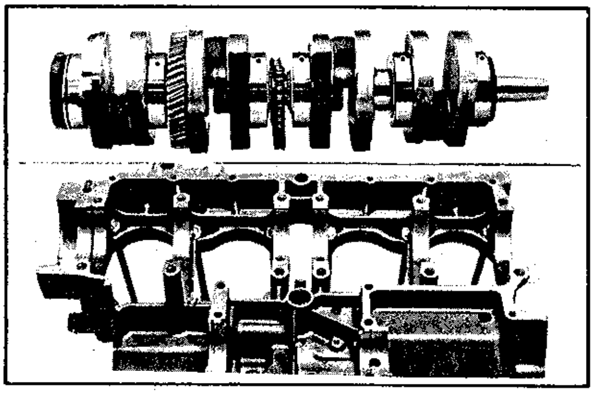


Fig. 7-167.

- Firmly fit the "C" rings for bearings on both sides of transmission gears and mount bearing stopper pin in the position shown in the drawing.

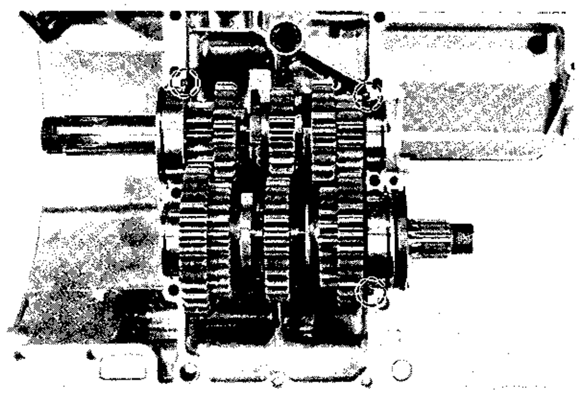


Fig. 7-168.

- Insert gear shifting cam into the lower crankcase. Confirm the neutral position of gear shifting cam, mount cam stopper, spring and cam stopper holder and fasten the cam stopper holder.

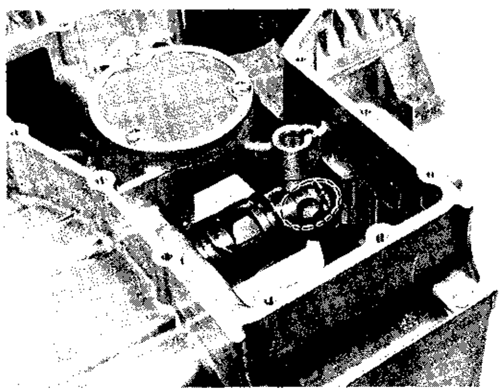


Fig. 7-169.

- Insert gear shifting fork shafts from the right side and mount gear shifting forks and cam stopper as shown in the drawing. At this time, pay attention to the direction of the gear shifting forks.

① Gear shifting fork for 3rd drive gear.
② Gear shifting forks for 4th and 5th driven gears.
③ Cam stopper.

- Apply engine oil to gear shifting forks and gear shifting cam.

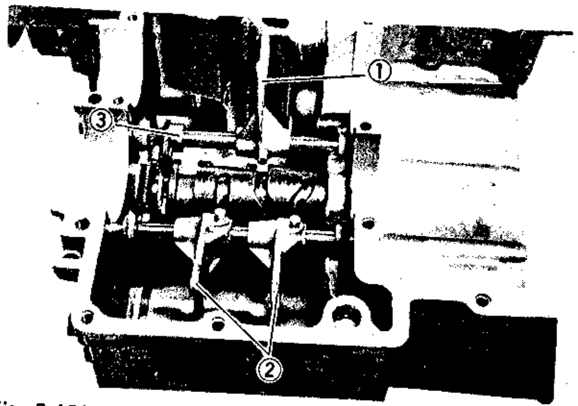


Fig. 7-170.

- Completely wipe off oil on the mating surface of lower crankcase and apply sealing compound uniformly to the mating surface.

99104-31100	SUZUKI BOND No. 1201

- Do not forget "O" ring.

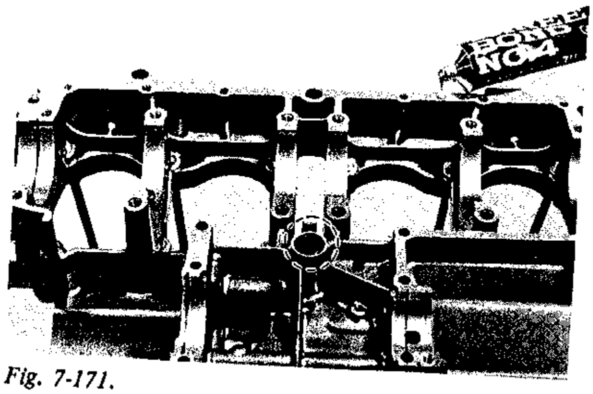


Fig. 7-171.

- Place the lower crankcase on the upper crankcase housing the transmission gears and crankshaft.
- Fasten together the upper and lower crankcase halves using the crankcase fastening bolts.

The lower crankcase fastening bolts must be tightened securely in the order of the numbers embossed on the crankcase.

6 mm bolt .... 9 pcs.
8 mm bolt .... 12 pcs.

Tightening torque for 8-mm bolts	2.0 kg-m (14.5 lb-ft)
Tightening torque for 6-mm bolts	1.0 kg-m (7.0 lb-ft)

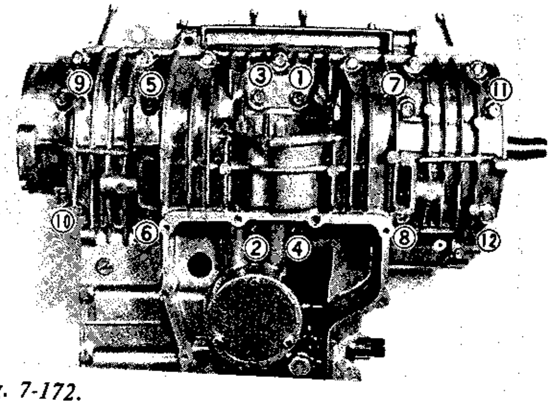


Fig. 7-172.

- Place crankcase with the open side directed upwards and tighten upper crankcase bolts.

6 mm bolt................................ 12 pcs.
8 mm bolt.................................... 1 pc.

Tightening torque for 8-mm bolts	2.0 kg-m (14.5 lb-ft)
Tightening torque for 6-mm bolts	1.0 kg-m (7.0 lb-ft)

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

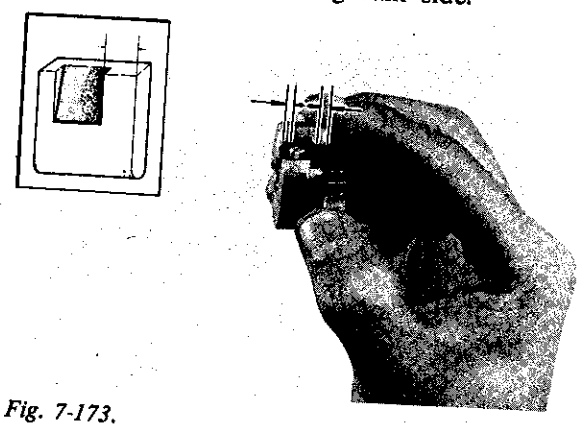
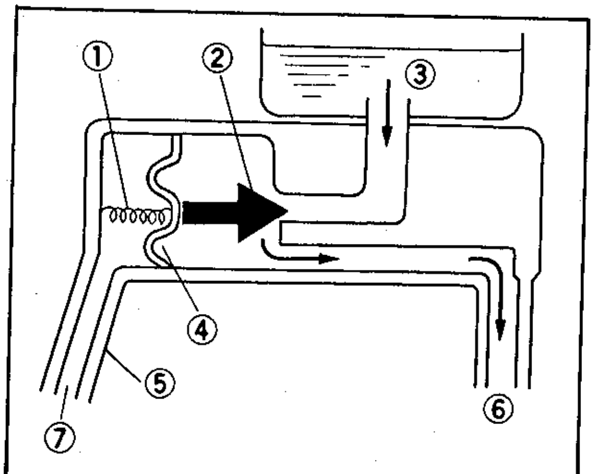


Fig. 7-173.

FUEL COCK

The construction of the diaphragm type auto cock is shown below. When the engine is not running with the lever in the ON or RES position, the valve is kept in the closed position by applying pressure utilizing a spring so that no fuel will flow to the carburetors. When the engine is engaged, a negative pressure is generated in the diaphragm chamber through the vacuum (negative pessure) 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 valve and thus allow the fuel to flow to the carburetors. When the lever is set at the PRI (which stands for priming to supply the fuel to the carburetors of an internal combustion engines) position, the fuel flows to the carburetors not via the diaphragm unit but directly through the RES (reserve) pipe.



1. Spring
2. Valve
3. Fuel tank
4. Diaphragm
5. Vacuum pipe
6. To carburetor
7. Negative pressure from carburetor

Fig. 8-1.

ON: Normally used. Functions as auto cock.

RES: Reserve fuel is used. Functions as auto cock.

PRI: Fuel is directly supplied. Does not function as auto cock.

The PRI position is used when the carburetors have little or no fuel, for example, when filling the fuel tank for the first time, or when the carburetors have been disassembled and repaired. Shift the lever to the ON position when the engine begins to run smoothly.

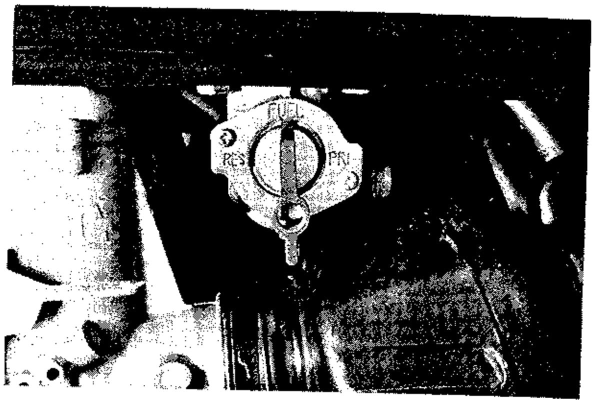


Fig. 8-2.

Cleaning

The fuel cock filter will collect impurities, and therefore must be periodically checked and cleaned.

FUEL TANK

The fuel tank has a cap with an air vent which is necessary for the smooth flow of the fuel to the carburetors. The fuel will not flow if the air vent is clogged. If this occurs, clean the air vent with compressed air.

Install the tank filler cap with the arrow mark facing toward the front.

Cleaning

Clean the fuel tank with flushing oil at the same time the fuel cock filter is being cleaned.

CARBURETORS

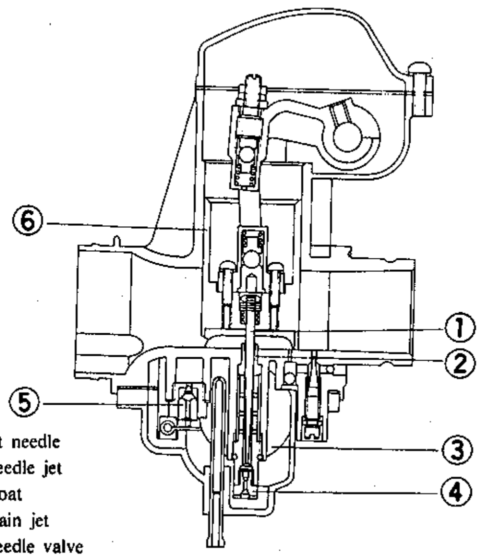
IMPORTANT:
The GS1000 carburetors have been manufactured and adjusted to special precise tolerances in order to meet the EPA emission levels. Before attempting to service or repair the carburetor assemblies, thoroughly read and understand the following instructions contained in this chapter, and also carefully review the information contained in the emission control systems and regulations chapter. It contains very important and specific information on the carburetor components.

DO NOT ADJUST THE AIR SCREW AND PILOT SCREW. Both of these components are pre-set at the factory using very specialized equipment. They can not be reset to the exact setting determined by the factory. Refer to the emission control systems and regulation chapter for further information.

Description

This motorcycle has four carburetors, each of which must be so adjusted properly to assure engine performance.

The link motion is moved by the two throttle cables that are connected to the throttle grip to open or close all carburetor throttle valves at the same time.



1. Jet needle
2. Needle jet
3. Float
4. Main jet
5. Needle valve
6. Throttle valve

Fig. 8-3.

Each carburetor has four units for regulating and supplying fuel. There is the starter unit for supplying a rich fuel-air mixture when starting the engine, a pilot unit for supplying fuel when the engine is idling, a main unit for supplying fuel when the engine is running at medium-or high-speed, and a float unit for maintaining a constant carburetor fuel level. The carburetors mix gasoline with air, and regulates the mixture. Carburetor malfunctioning or trouble generally occurs due to a bad mixing ratio, which is the result of wearing, blocking by foreign matter, or an improper fuel level. The following are some of the symptoms of a faulty carburetor.

Fuel-air mixture too lean

1. The engine becomes overheated.
2. The engine runs well when the starter is opened further.
3. Poor acceleration.
4. The spark plugs become overheated.
5. Engine speed is irregular.
6. Exhaust gas is light.

Fuel-air mixture too rich

1. The engine is sluggish, and does not run smoothly.
2. The engine runs badly when the starter is opened further.
3. The engine runs badly after being warmed up.
4. The engine runs well when the air filter is removed.
5. The spark plugs get soiled with carbon.
6. Exhaust gas is blackish in color.

STARTER UNIT

The starter unit is a starting aid device which supplies a highly concentrated gasoline-air mixture to a cold engine at initial starting. It consists of a starter jet①, starter pipe②, and starter plunger ③. Refer to close the throttle valve, open the starter plunger fully, and switch on the starter, or kick. Then the engine will generate negative pressure to draw the fuel through the fuel injection ports.

The fuel is metered by the starter jet, is mixed with the air coming from the float chamber in the starter pipe, sucked into the starter plunger chamber, where it is mixed with the starter's primary air, and then drawn out into the main bores from the injection ports as a well-atomized and concentrated fuel very suitable for starting purposes. This fuel-air mixture is added to the fuel-air mixture being supplied by the pilot circuit in the carburetors. When using the starter, the throttle valve must be completely closed. If the throttle valve is opened, the negative pressure falls and will not build up at injection ports and the engine will not be able to draw sufficient fuel. The starter plunger has a needle-like tip, which closes the starter unit's fuel passage. If the starter lever is not pulled all the way up, the fuel passage will not open to let the gasoline flow. If the starter pipe's bleed hole is clogged, the fuel will not be atomized properly.

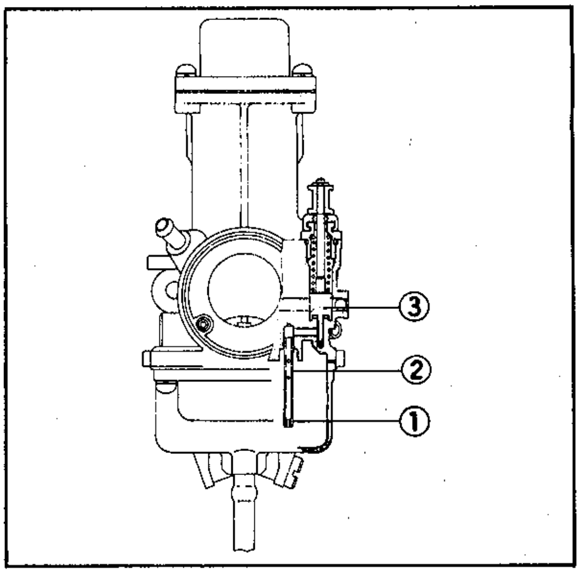


Fig. 8-4.

PILOT CIRCUIT

The pilot unit consists of a pilot jet ①, pilot screw ②, and pilot outlet ③.

The purpose of the pilot unit is to supply the fuel to the engine until it reaches low idling speed. The passage around the needle jet which serves as the main unit's fuel injection port is wide and little gasoline can be drawn out through the needle jet. The passage is narrower near the pilot outlet and this is where the negative pressure builds up. This negative pressure allows a highly concentrated gas mixture to be drawn up from the pilot outlet. The metered fuel and air are mixed together prior going to the pilot fuel-air outlets.

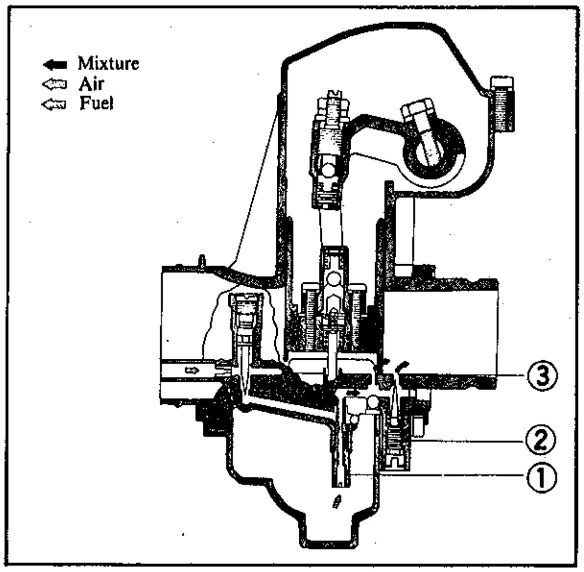


Fig. 8-5.

MAIN CIRCUIT

The main unit consists of a main jet ①, bleed pipe ②, jet needle ③, needle jet ④, throttle valve ⑤, and air jet ⑥. When the throttle valve is opened by more than a quarter, the negative pressure generated near the jet needle builds up and the main unit begins operating. The gasoline runs through the main jet, air bleed pipe, and the clearance between the needle jet and the jet needle, and mixes with the air which flows through the main bore. The air bleed pipe has a bleed hole, into which the air metered by the air jet is introduced to be mixed with the gasoline to help atomization.

The jet needle is attached to the throttle valve, and placed in the needle jet. When the valve opens, the needle is raised from the jet. The needle has a tapered tip so that, when the valve is opened by one quarter, the tapered portion of the needle begins to rise. Thus, the clearance between the needle and the jet increases to allow more gasoline to flow in accordance with the opening of the valve. The throttle valve has a nick called the cutaway, which controls the negative pressure on the needle jet and thus the flow of gasoline at the one-quarter valve opening and thereabouts.

When the throttle valve opened fully, the cross sectional area of the clearance between the needle jet and the jet needle becomes larger than that of the main jet. When the throttle valve is almost in a fully opened position the flow of gasoline will be controlled according to the size of the main jet. If the main unit goes malfunctions, the engine will lose output power at high-speed. If the main jet is clogged, the mixed gas will become lean. If the air jet, the air passage of the air jet, or the bleed hole in the bleeder pipe is clogged, or if the clearance between the needle jet and the jet needle widens due to wearing, or if the bleeder pipe or needle jet becomes loose, then richer mixture of gas will be supplied.

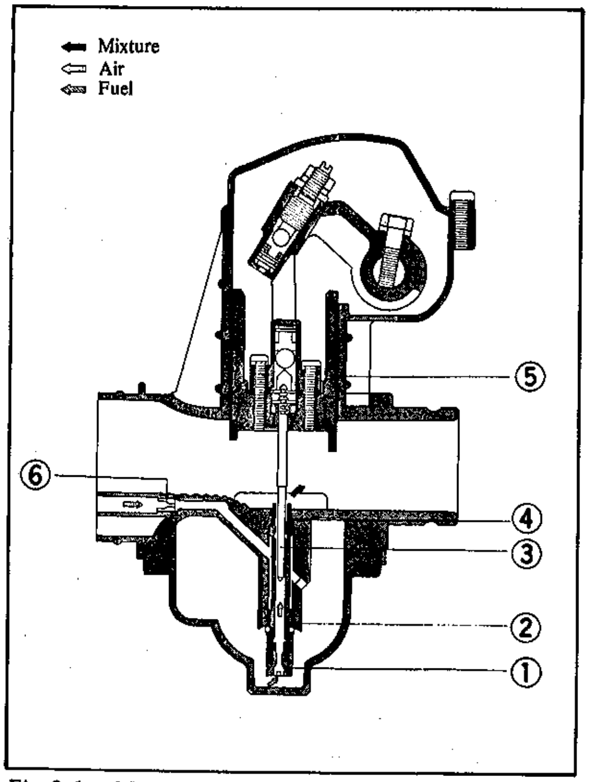


Fig. 8-6. Main system

FLOAT UNIT

The float unit consists of a float①, needle valve ②, etc. The float unit regulates the fuel level in the carburetors to ensure uniform fuel mixing.
If the fuel level is too low, it is difficult to draw the gasoline and the mixed gas will become lean. On the other hand, if the fuel level is too high, it is too easy to draw the gas and the mixed gas will be rich.
Fuel level means the distance from the center of the carburetor's main bore to the surface of the gasoline in the float chamber. It is kept regulated by the opening or closing of the float valve. When the gasoline flows in through the float valve, the fuel level of the float chamber rises and the float goes up at the same time to push the needle up.
When the gasoline reaches the required level, the needle contacts close to the seat completely stopping the flow of gasoline. When the fule level falls as the gasoline is consumed, the float and needle will fall to allow the gasoline to flow in.

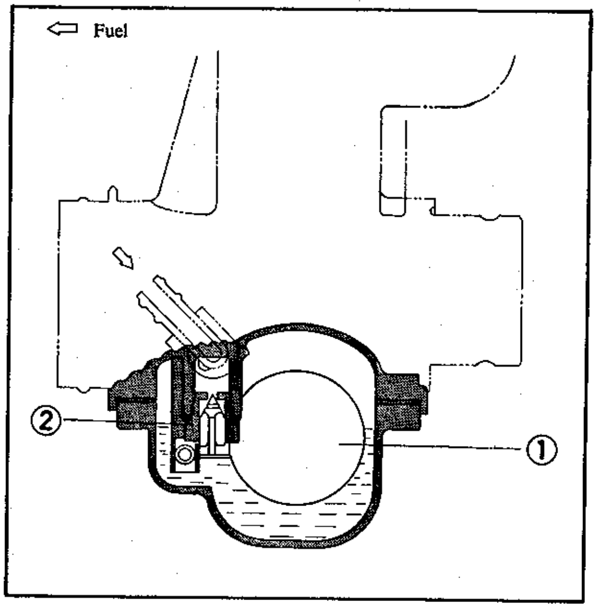


Fig. 8-7. Float system

NEEDLE VALVE

If foreign matter is caught between the valve seat and the needle, the gasoline will continue flowing and overflow. If the seat and needle are worn beyond the permissible limits, similar troubles will occur. Conversely, if the needle sticks, the gasoline will not flow into the float chamber.
To service and inspect, remove the carburetors, float chambers and floats, and clean the float chambers 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.

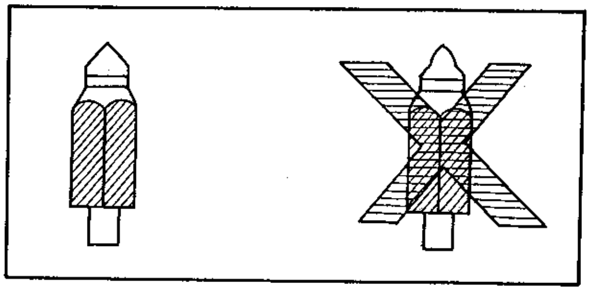
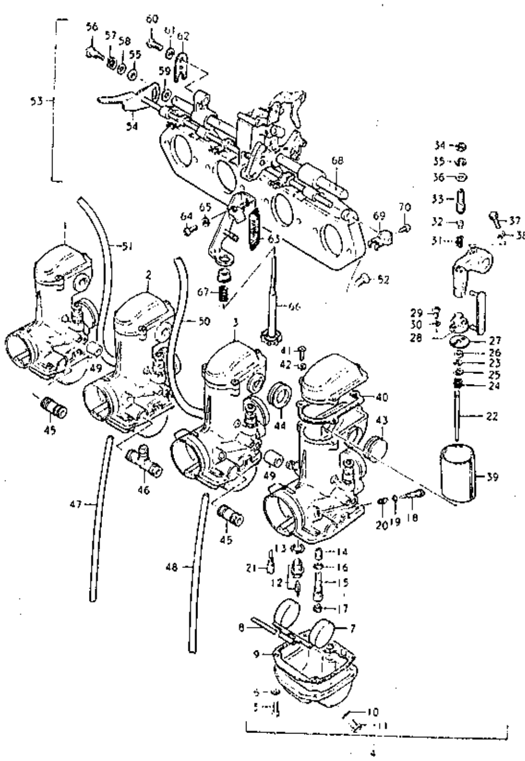


Fig. 8-8.



1.	Carburetor assy, No. 1	36.	Washer
2.	Carburetor assy, No. 2	37.	Bolt
3.	Carburetor assy, No. 3	38.	Lock washer
4.	Carburetor assy, No. 4	39.	Throttle valve
5.	Screw	40.	Gasket
6.	Lock washer	41.	Screw
7.	Float	42.	Lock washer
8.	Float pin	43.	Cap
9.	Gasket	44.	Seal
10.	O ring	45.	Nipple
11.	Screw	46.	Nipple
12.	Needle valve	47.	Hose
13.	Gasket	48.	Hose
14.	Needle jet	49.	Hose
15.	Breader pipe	50.	Hose
16.	O ring	51.	Hose
17.	Main jet	52.	Screw
18.	Adjuster	53.	Control assy
19.	O ring	54.	Starter shaft
20.	Spring	55.	Washer
21.	Pilot jet	56.	Screw
22.	Needle jet	57.	Spring
23.	Needle clip	58.	Washer
24.	Spring	59.	Washer
25.	Plate	60.	Screw
26.	Ring	61.	Lock washer
27.	Plate	62.	Plate
28.	Bracket	63.	Throttel return spring
29.	Screw	64.	Screw
30.	Lock washer	65.	Lock washer
31.	Spring	66.	Throttle stop adjuster
32.	Pin	67.	Spring
33.	Adjuster	68.	Throttle shaft
34.	Nut	69.	Starter lever
35.	Lock washer	70.	Screw

Fig. 8-9.

DISASSEMBLY

- Shift the fuel cock lever to the ON or RES position.
- Disconnect the fuel pipe and negative pressure pipe from the fuel cock.
- Open the seat, remove the fuel tank mounting bolts, and dismount the fuel tank from the frame.
- Remove the air cleaner body and the air cleaner chamber body. (See page 7-3).
- Remove the carburetors. (See page 7-4).
- Disconnect the throttle cables and starter cable from the carburetors. (See page 7-4).
- Remove the carburetor top cover from each carburetor.
- At the right section of the carburetor assembly, unhook the throttle return spring from the pin.

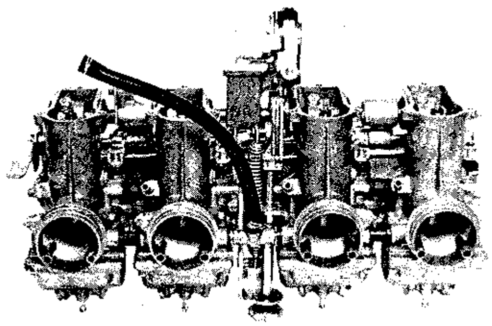


Fig. 8-10.

- Remove five bolts to free the throttle shaft.

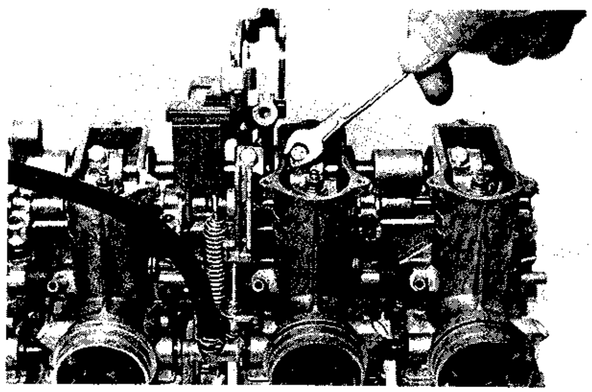


Fig. 8-11.

- Remove the stopper plate and pull out the shaft.

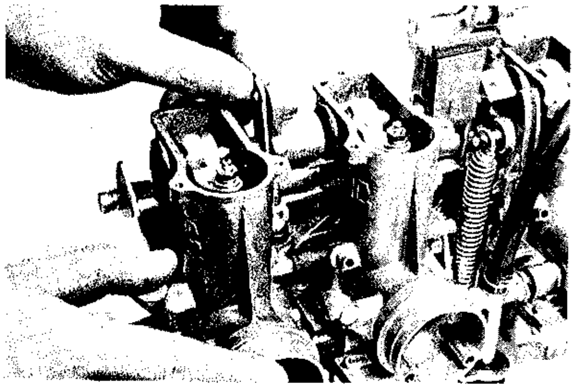


Fig. 8-12.

- Loosen the four cross-recessed screws and also the screw in the slot. Draw out choke shaft.

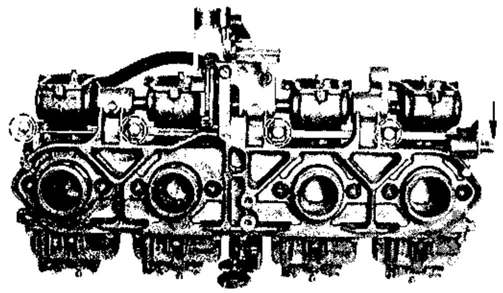


Fig. 8-13.

- Remove the plate. A total of 8 screws must be removed to free this plate for removal.

The foregoing procedure permits the rest of the carburetor assembly to be disassembled further in the usual manner.

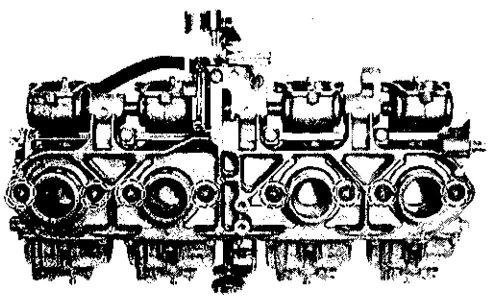


Fig. 8-14.

REASSEMBLY

- Carburetor identification
  Be sure to identify each carburetor for the cylinder which it serves and to mount each in the correct position as indicated:

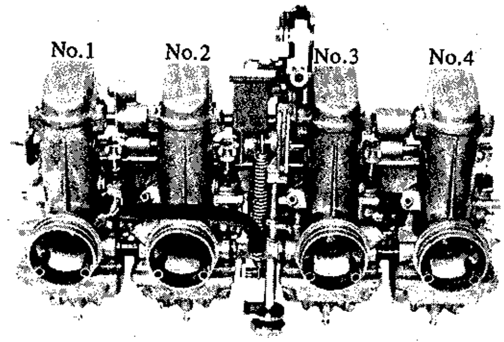


Fig. 8-15.

- Grease throttle shaft, and install it in the carburetor. Leave the throttle shaft screw loose.

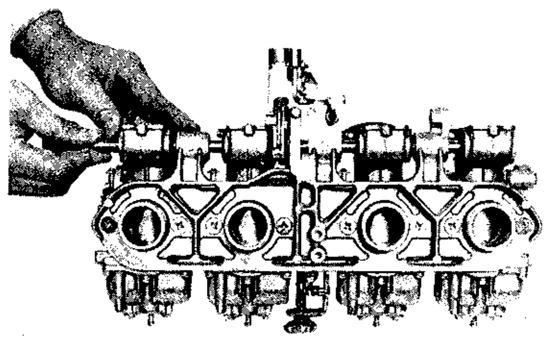


Fig. 8-16.

- Secure the plate by tightening 8 screws. Be sure to apply THREAD LOCK CEMENT to these screws before tightening them.

99000-32040	THREAD LOCK CEMENT

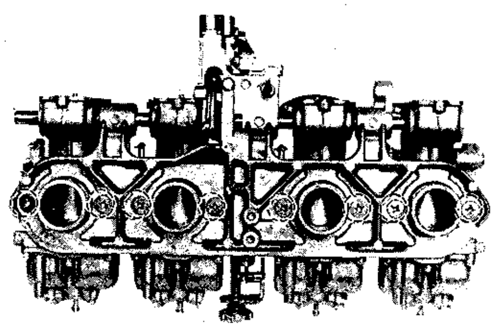


Fig. 8-17.

- Tighten the bolt ① to this torque value:

Bolt ① tightening torque	0.35 kg-m (2.5 lb-ft)

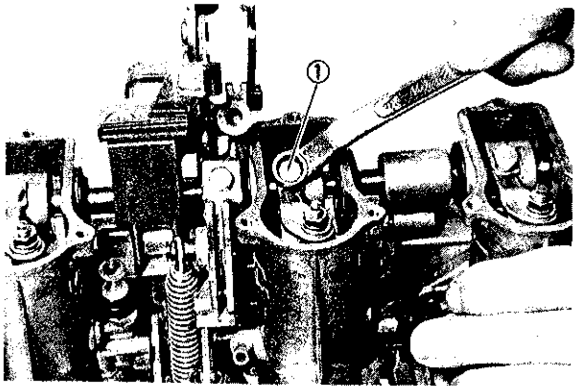


Fig. 8-18.

ADJUSTMENT

Adjusting full-open and full-closed positions of throttle valves and balance the carburetors.

FULL-CLOSED POSITION

Run back the throttle stop screw ① to produce a clearance between the screw and pulley.

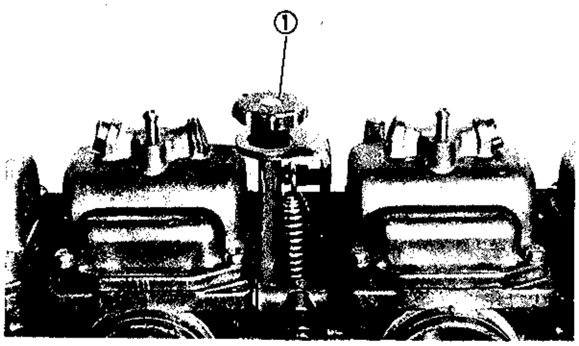


Fig. 8-19.

Loosen lock nut. Turn throttle adjusting screw ① to close the throttle valve fully, and tighten the lock nut ② to secure the screw in that position. Carry out this step uniformity on all four carburetors.

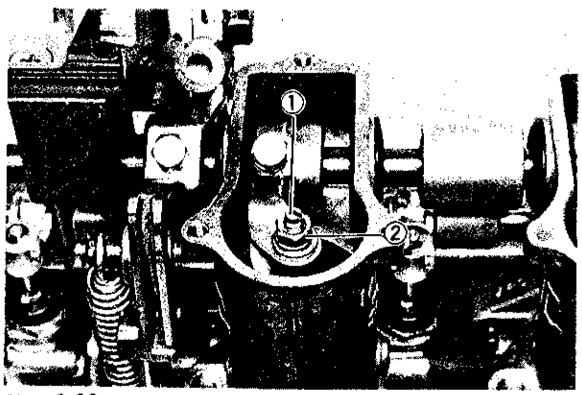


Fig. 8-20.

FULL-OPEN POSITION

Adjust the full-throttle stopper ① in such a way that, when the throttle valve is turned to its full-open position, the valve will come to the position indicated.

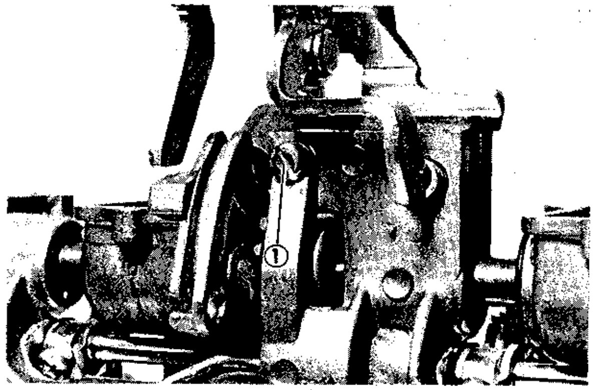


Fig. 8-21.

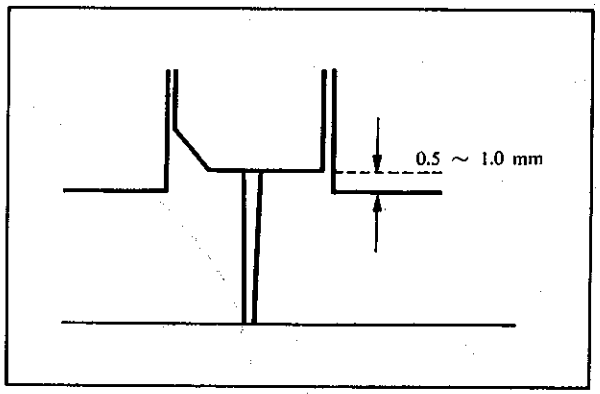


Fig. 8-22.

Checking fuel level in each float chamber

1. Leave fuel cock lever in "ON" or "RES" position.
2. Remove float chamber screw and install the fuel level gauge.

09913-14510	Fuel level gauge

3. Move fuel cock lever to "PRI" position to admit fuel into float chamber.
4. With the float chamber filled with fuel, turn the cock lever back to "ON" position, and start up the engine.
5. Run the engine at the idling speed (900 ~ 1,100 rpm), and measure the distance Ⓐ with the middle line of the level gauge aligned with the mating surface of float bowl as shown in photo. Ⓐ should be within the range specified here.

Distance Ⓐ	3.0~5.0 mm (0.11~0.196 in.)

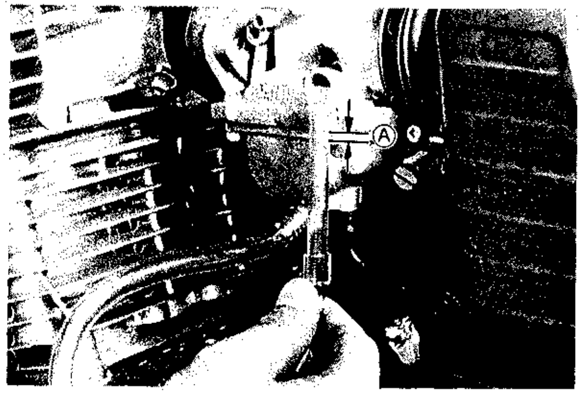


Fig. 8-23.

Fuel level measurement

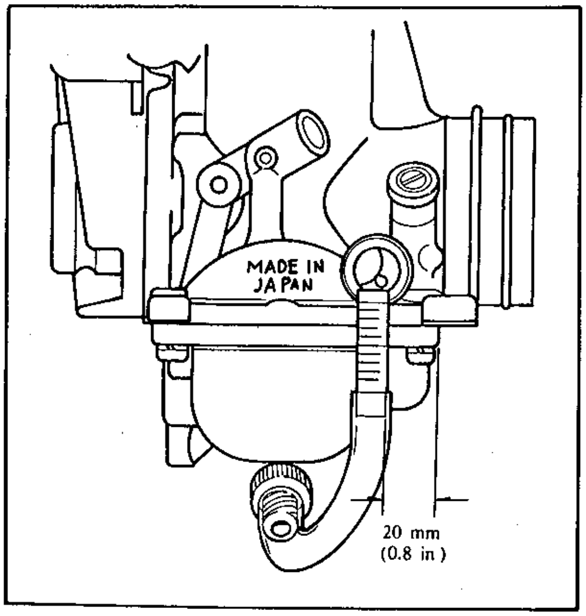


Fig. 8-24.

NOTE:
When checking the fuel level, place the machine on a center stand. The fuel level gauge pipe makes sure to locate at about 20 mm (0.08 in.) off the rear end of the float chamber.

Fuel level adjustment

- If the distance Ⓐ measured is not within the specified range, it means that the float height Ⓗ is off the specification. To adjust this height, proceed as follows:
  Remove float bowl, and bend the float arm to increase or decrease the height to this value:

Float height Ⓗ	23～25 mm (0.90～0.98 in.)

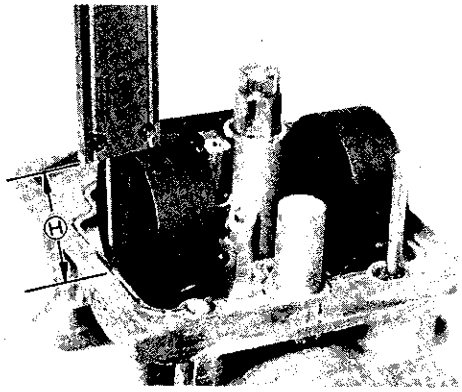


Fig. 8-25.

IMPORTANT:
Be sure to have the gasket removed before measuring the height.

- Bending the arm upward Ⓐ raises the level; being it downward Ⓑ lowers the level (in the inverted condition of the carburetor).

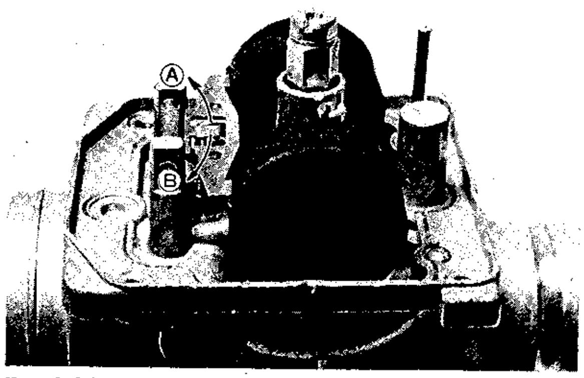


Fig. 8-26.

Balancing carburetors

The four carburetors must be balanced after disassembling the engine or the carburetors. As the first step, calibrate the carburetor balancer gauge as follows:

09913-13121	Carburetor balancer set

1. Remove the vacuum inlet screw (Allen bolt) on No. 4 carburetor or No. 1 carburetor intake pipe by using a 4 mm hexagon wrench (special tool), and install the adaptor (special tool: 09911-70130, hexagon wrench, 4mm) in the screw hole.

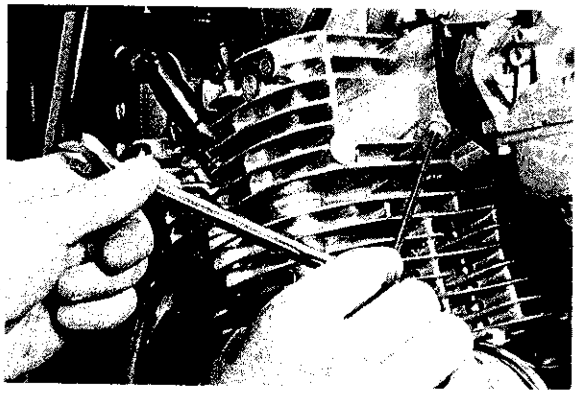


Fig. 8-27.

2. Connect one of the four rubber hoses of the balance gauge to this adaptor.
3. Start up engine, and keep it running at 1 500 ~ 2 000 rpm.

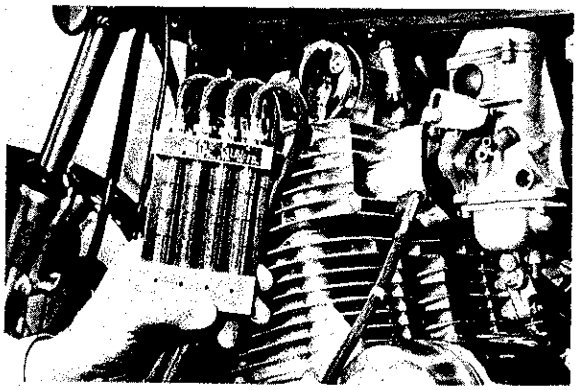


Fig. 8-28.

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

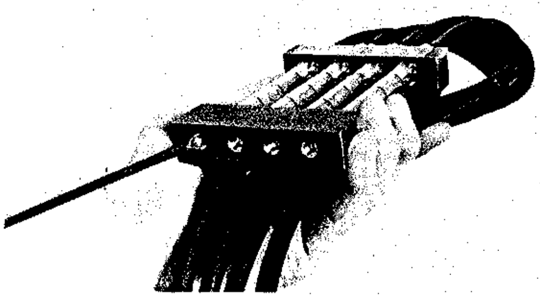


Fig. 8-29.

5. After finishing with one hose, connect the adaptor to the next hose and, by adjusting the next air screw, bring the steel ball in the next tube to the center line.

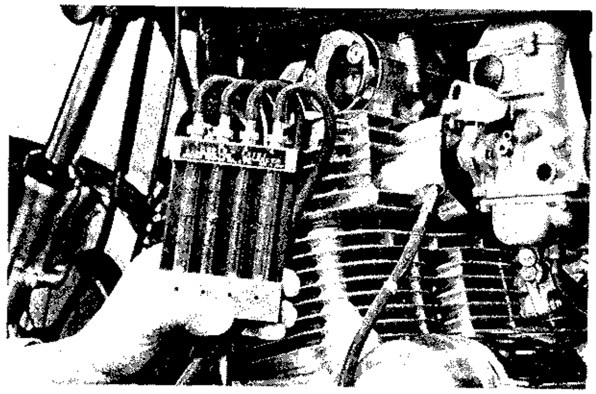


Fig. 8-30.

6. Repeat the process on the third and fourth tubes. The balancer gauge is now ready for use in balancing the carburetors.

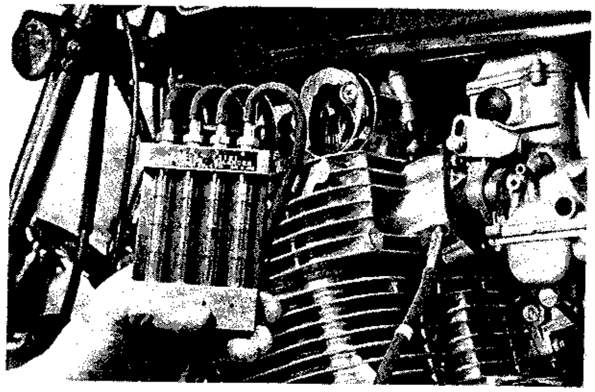


Fig. 8-31.

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

- Start up the engine, and keep it running at 1 500 ~ 2 000 rpm.
- A correctly adjusted carburetor has the steel balls in the first and fourth tubes at the same level, and those in the second and third tubes also at the same level, but lower by one half of the ball diameter than the steel balls in the first and fourth tubes as shown in the diagram below.

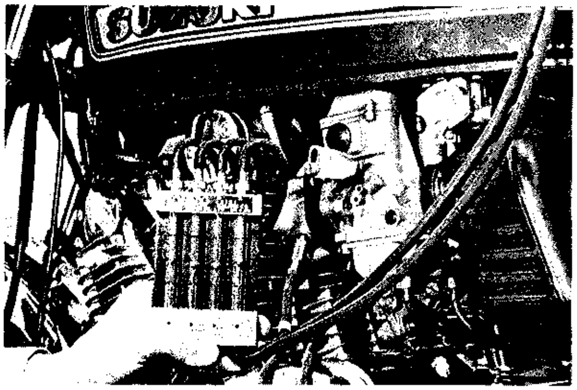


Fig. 8-32.

- If the steel balls are not in the correct positions shown in the above photo, remove the carburetor top cover, and correctly adjust the throttle valve adjusting screw with the special tool ①.

①	09913-13110	Throttle adjusting tool

NOTE:
If an adjustment is required, it is suggested that the fuel tank and the carburetors top covers be removed beforehand.

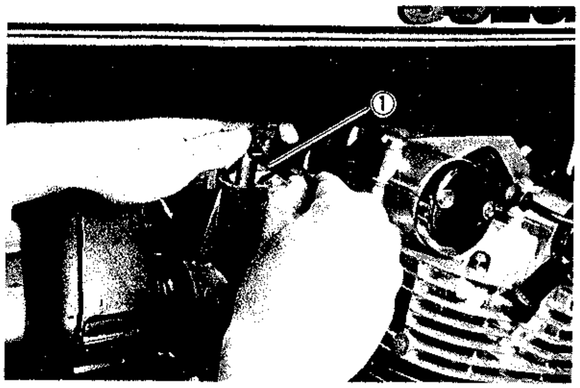


Fig. 8-33.

- After this adjustment, adjust the idling speed to somewhere between 900 and 1,100 rpm with the throttle stop adjusting screw ①.

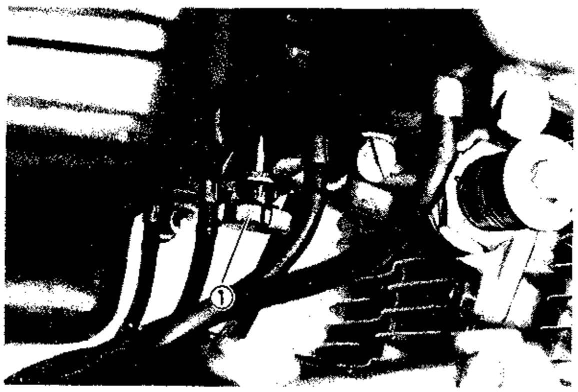


Fig. 8-34.

- Install the top cover on the carburetors which have been adjusted.
- Disconnect the adapter from the intake pipe, and turn the vacuum inlet screw in.

Throttle cable adjustment

- See page 3-12 for throttle cable adjustment.

NOTE:
If engine is run with fuel tank removed, be sure to plug the fuel cock vacuum line.

TROUBLESHOOTING

Before adjusting the carburetors, be sure to check that there is nothing wrong with the engine's compression, ignition timing, and sparker performance.

Symptom	Possible causes	Remedy
Trouble with starting	1. Starter jet is clogged. 2. Starter pipe is clogged. 3. Air leaking from a joint between starter body and carburetor. 4. Air leaking from carburetor's joint or vacuum gauge joint. 5. Starter plunger is not operating properly.	1. Clean. 2. Clean. 3. Check starter body and carburetor for tightness, adjust and replace gasket. 4. Check and adjust. 5. Check and adjust.
Idling or low-speed trouble	1. Pilot jet, pilot air jet are clogged or loose. 2. Air leaking from carburetor's joint, vacuum gauge joint, or starter. 3. Pilot outlet or bypass is clogged. 4. Starter plunger is not fully closed.	1. Check and clean. 2. Check and adjust. 3. Check and clean. 4. Check and adjust.
Medium- or high-speed trouble	1. Main jet or main air jet is clogged. 2. Needle jet is clogged. 3. Fuel leaking due to a broken O-ring in needle jet. 4. Piston valve is not operating properly. 5. Filter is clogged.	1. Check and clean. 2. Check and clean. 3. Replace O-ring. 4. Check piston valve for operation. 5. Check and clean.
Overflow and fuel level fluctuations	1. Needle valve is worn or damaged. 2. Spring in needle valve is broken. 3. Float is punctured or deformed. 4. Float is not working properly. 5. Foreign matter has adhered to needle valve. 6. Fuel level is too high or low.	1. Replace. 2. Replace. 3. Replace. 4. Check and adjust. 5. Clean. 6. See page 8-9.

EMISSION CONTROL & REGULATIONS

CONTENTS

9

EMISSION CONTROL AND REGULATIONS

REGULATION

On February 4, 1977 Federal Emission Regulations for motorcycles took affect. All motorcycles produced after January 1, 1978 must meet specific emission limits. This act establishes three categories of motorcycles and an emission level for each category. The categories are as follows:

50 cc — 170 cc
171 cc — 749 cc
750 cc — Larger

The emission limits for motorcycles produced during 1978 and 1979 are as follows:

1978 — 1979 EMISSION LIMITS

Categories	Hydrocarbons (HC)	Carbon Monoxide (CO)
50 cc — 170 cc	5.0 Grams/Kilometer (8.0 Grams/Mile)	17 Grams/Kilometer (27.4 Grams/Mile)
171 cc — 749 cc	*5.0 — 14.0 Grams/Kilometer (8.0 — 22.5 Grams/Mile)	17 Grams/Kilometer (27.4 Grams/Mile)
750 cc — Larger	14.0 Grams/Kilometer (22.5 Grams/Mile)	17 Grams/Kilometer (27.4 Grams/Mile)

* Dependent upon displacement.

The emission limits for 1980 are more restrictive than the previous two model years. These limits are as follows:

1980 EMISSION LIMITS

Categories	Hydrocarbons (HC)	Carbon Monoxide (CO)
All motorcycles 50 cc — Larger	5.0 Grams/Kilometer (8.0 Grams/Mile)	12 Grams/Kilometer (19.3 Grams/Mile)

This regulation affects all motorcycles that may be licensable for highway operation. This definition of highway-approved motorcycles covers motorcycles equipped with a headlight, taillight, stop light and which have an engine displacement larger than 50 cc.

All testing and certification of emission-controlled motorcycles will be performed by Suzuki Motor Company in compliance with the E.P.A. testing regulations. Motorcycle dealers are not required to certify emission levels on any motorcycle.

This regulation provides for fines of up to $10,000 per motorcycle for individuals who alter, render inoperative or improperly service emission-controlled motorcycles. It is essential that the individual servicing this emission-controlled motorcycle review thoroughly the correct service procedures discussed in this manual. Under no circumstances should the service procedures be deviated from nor adjustments made which are not in accordance with the factory specifications.

EMISSION CONTROL CARBURETOR COMPONENTS

GS1000 machines manufactured on or after January 1, 1978 are equipped with specially manufactured carburetors. These carburetors are installed on machines with the following frame number:

Frame No. GS1000 — 102531

These emission type carburetors require different components and other special adjustments if they are to function properly.

There are seven (7) carburetor mixture control components in each carburetor assembly. Three (3) of these components are machined to much closer tolerances than standard 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.

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 throttle Slide and the Jet Needles are not special tolerance components. Either of these two parts may be replaced by standard tolerance parts provided that they are the same size. The carburetor specifications for the emission-controlled GS1000s are as follows.

Carburetor I.D. No.	Main Jet	Needle Jet	Jet Needle	Cut Away	Pilot Jet	Air Screw	Pilot Screw
49000	#95	0-2	5DL36-3	1.5	#15	PRE-SET	PRE-SET
						DO NOT ADJUST	

DO NOT ADJUST THE AIR SCREW AND PILOT SCREW. Adjusting, interfering with, replacing, or resetting of either of these adjustable metering components may affect the carburetor performance adversely and cause the machine to exceed the emission levels. Tampering with either of these two adjustments may also subject the person to fines under the federal emission regulations and also the state regulations regarding tampering. The air screw and pilot screw are pre-set by the factory by the use of specialized testing and adjusting procedures. It is not possible to duplicate these adjustments. If persons, who are unaware of these special adjustments or the anti-tampering laws, have tampered with the carburetor adjustments the Suzuki dealer should contact the distributor's representative for further technical information and assistance.

GENERAL EMISSION INFORMATION

There are three different types of emissions. They are:

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

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

Hydrocarbons (HC)
Carbon Monoxide (CO)

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

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

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

CARBON MONOXIDE

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

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

CARBURETION MALFUNCTION

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

ENGINE MALFUNCTIONS

1. Valve Seals — Leaking or torn.
2. Valve Guide — Worn and leaking excess oil.
3. Gaskets — Leaking oil into combustion chamber.
4. Oil Pump — CCI pump adjusted too high.

HYDROCARBONS

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

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

IGNITION SYSTEM MALFUNCTIONS

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

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

MIXTURE-RELATED MALFUNCTIONS

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

Engine wear or damage can also cause high HC emissions.

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

— MEMO —

CHASSIS

CONTENTS

HANDLEBAR

REMOVAL

- Remove the left and right rear view mirrors.
- Shift the clutch cover boot towards the cable side.
- Loosen the lock nut ① of clutch lever portion to fully tighten adjuster ②.
- Align the grooves of the adjuster and lock nut with that of the clutch lever to remove clutch cable from the clutch lever.

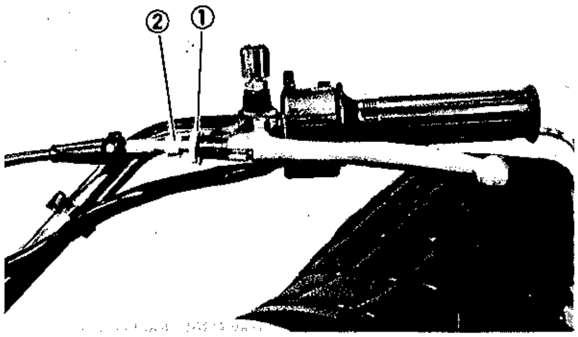


Fig. 10-1.

- Remove vinyl bands from the left and right of the handlebar.
- Remove screws for mounting the left handle bar switch to separate the upper and lower portions of the switch.
- Remove screws for mounting the right handle bar switch to separate the upper and lower portions of the switch.
- Remove the master cylinder clamp bolts.
- Remove together throttle grip and throttle wire from the handlebar.
- Remove the handlebar clamping bolts and remove handle holders.
- To remove the clutch lever from the handlebar, take off the handle grip before loosening the clutch lever bolts.

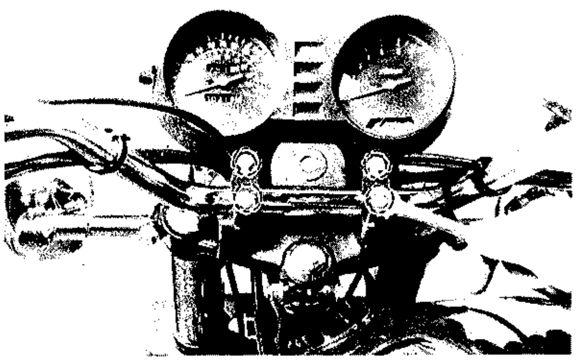


Fig. 10-2.

MOUNTING

- Pass both the throttle grip and the throttle wire through the handlebar from the right side.
  Align punched mark on the handlebar with the upper end of steering upper bracket to mount the handlebar. At this time the front and rear holder bolts must be tightened with the same clearance.
- The tightening torque for the handlebar holder bolt is 1.2 ~ 2.0 kg-m (8.5 ~ 14.5 lb-ft).

Handlebar holder bolt tightening torque	1.2 ~ 2.0 kg-m (8.5 ~ 14.5 lb-ft)

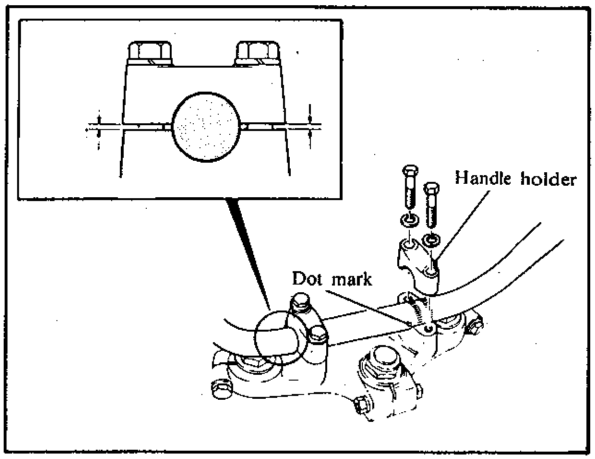


Fig. 10-3.

- Mount the right and left handlebar switches securely on the handlebar fastening them with the screws.
  Mount the master cylinder securely on the handlebar.
- Fix the lead wire from the left and right switch to the handlebar with a vinyl band.
- Mount the left and right rear view mirrors.
- Adjust the clutch play.

CLUTCH CABLE

REMOVAL

- Remove fuel tank.
- See Fig. 10-1. with respect to removal of the clutch cable on the handlebar side.
- Remove cam lever bolt ① on the clutch side to loosen the adjuster lock nut and remove the adjuster.
- Remove the clutch cable from the motorcycle frame.

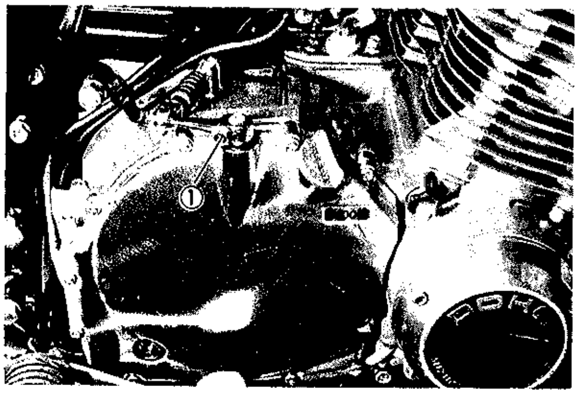


Fig. 10-4.

MOUNTING

- Route the clutch cable between carburetors No. 1 and 2. Next, as shown in the drawing below, route it along the upper left portion of the ignition coil below the upper steering bracket to the left side of the ignition switch through the tacho-speedometer mounting brackets.

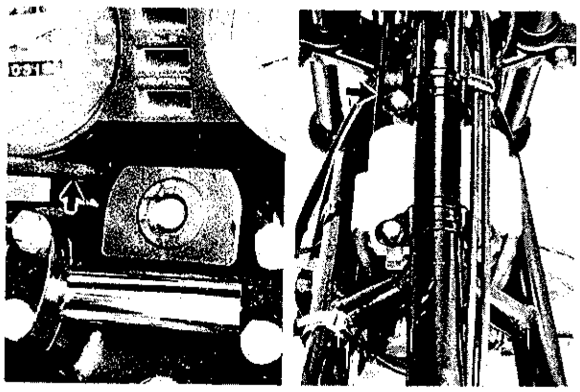


Fig. 10-5.

- Mount the clutch cable on the clutch lever.
- Mount adjuster bolts on the clutch cover side and fasten the cam lever with cam lever bolts.
- Adjust the clutch lever play (see page 3-13).

THROTTLE CABLE

REMOVAL

- Remove the fuel tank.
- Loosen lock nuts for both cables on the throttle grip portion and firmly tighten both cable adjusting nuts to provide sufficient cable play.
- Remove cable adjusters ① from the bracket at the opening and closing ports on the carburetor side to remove the inner cable from lever.

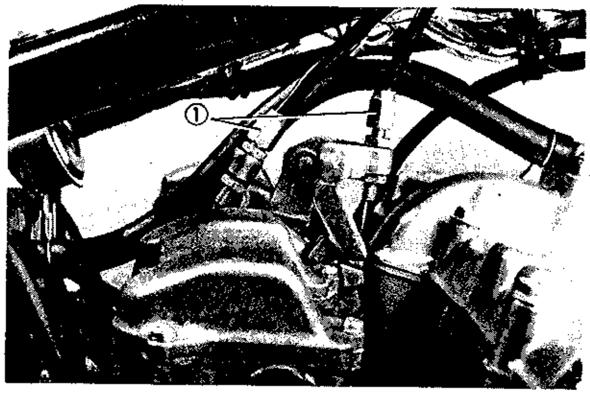


Fig. 10-6.

- A clamp fixing the throttle wire is located in front of the ignition coil. Draw out the throttle wire over the bent clamp.
- Remove the right handlebar switch screws to separate the upper and lower portions of the handle switch.
- Screw back the cable adjusting nut ① at the closing side to remove it from the throttle cable guide, and loosen the cable guide lock nut to remove cable guide ② from the handle bar switch.

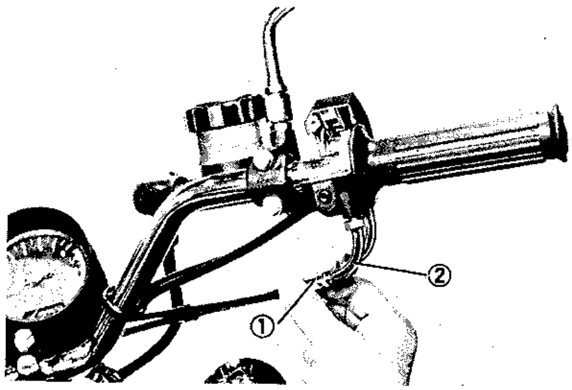


Fig. 10-7.

- Remove throttle inner cable ① at the closing side from the throttle grip and remove the cable.
- Loosen the cable guide lock nut at the opening side and remove the cable guide from the handlebar switch.
- Remove throttle inner cable ② at the opening side from the throttle grip and remove the calbe.

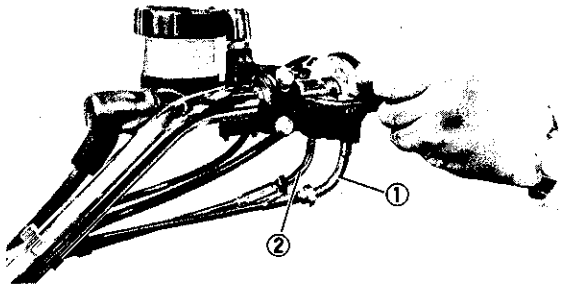


Fig. 10-8.

MOUNTING

- Mount the throttle cable guide ① at the opening side and the throttle cable guide ② at the closing side on the handlebar switch and lightly tighten the lock nuts.

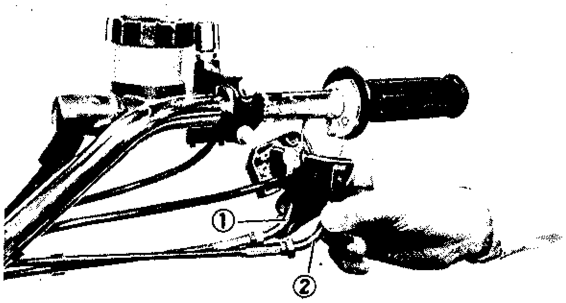


Fig. 10-9.

- Mount the throttle inner cables at the opening and closing sides respectively on the front and rear holes in the throttle grip.
- Fix the right handlebar switch on the handlebar.
- Route both cables through the space between the tachometer and ignition switch and then between the steering head pipe and the right front fork.
- Fix the throttle wire with the clamp on the front of the ignition coil.

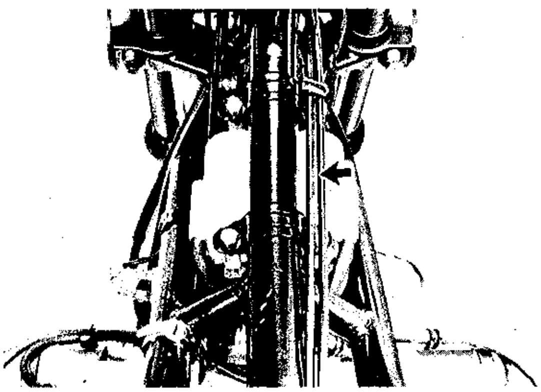


Fig. 10-10.

- Mount the inner cable at the opening side on the lever at the rear side. Mount cable adjuster on the bracket and fix it with the upper and lower nuts.
- Mount the inner cable at the closing side on the lever at the front side and mount the cable adjuster on the bracket to fix it with the upper and lower nuts.
  If it is difficult to mount the inner cable on the lever, turn the throttle grip to the full open position and then mount the inner cable.
- Adjust the throttle cable (see page 3-13).
- Mount the fuel tank.

SPEEDOMETER CABLE

REMOVAL

- Remove both ends of the speedometer cable with pliers and remove the cable from the speedometer gear housing and speedometer from the front hub.

MOUNTING

- Route the speedometer cable to the brake oil hose joint portion and through the cable guide. Mount the cable nut of the upper end on the speedometer and tighten it with pliers.
- Mount the lower end of the cable on the speedometer gear housing. Then rotate the wheel so that the groove at the end of the inner cable meshes with the projection of the speedometer pinion and tighten the cable nut.

TACHOMETER CABLE

REMOVAL

- Remove the tachometer cable from the tachometer side and the cylinder head side with pliers.

MOUNTING

- Route the tachometer cable from the rear portion of the speedometer between the steering head pipe and right front fork and mount it on the cylinder head cover.
  At this time make sure that the inner cable engages with the tachometer gear, and tighten the cable nut.

SPEEDOMETER AND TACHOMETER

REMOVAL

- Remove the speedometer and the tachometer.
- Remove fuel tank.
- Remove headlamp.
- Remove connection coupler connected to the main wire harness on the lower portion of tank for the meter lead wire over the fixed clamp.

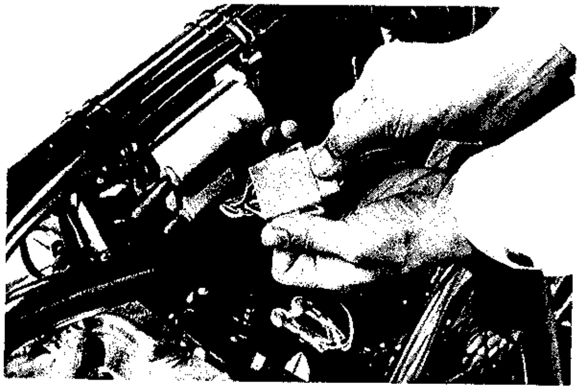


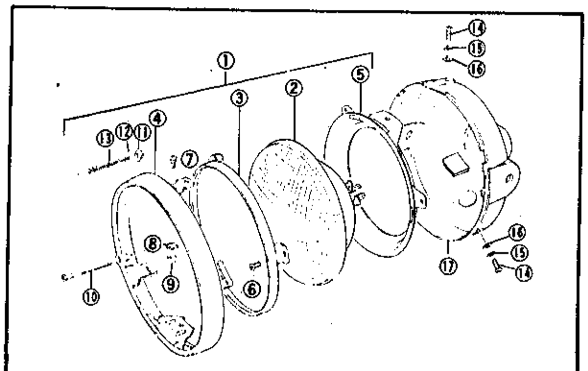
Fig. 10-11.

MOUNTING

- Route the lead wire of the meter between the steering head pipe and the right front fork and clamp it to the fixed clamp on the frame side.
- Fasten the meter with two bolts. Fasten the right side of the meter togetehr with the brake hose guide.
- Mount the speedometer and the tachometer.
- Mount the headlamp.
- Mount the fuel tank.

HEADLAMP

REMOVAL



1. Headlamp ass'y	7. Screw	13. Spring
2. Unit	8. Spacer	14. Screw
3. Rim	9. Nut	15. Lock washer
4. Retainer	10. Adjuster screw	16. Washer
5. Mounting ring	11. Nut	17. Headlamp housing
6. Screw	12. Washer	

Fig. 10-12.

- Remove three screws securing the headlamp.
- Disconnect the headlamp connection coupler.
- Remove the adjusting screw ⑩.
- Remove two screws ⑦ and remove the headlamp unit and ring.
- Remove three screws ⑥ and remove the headlamp from the ring.

CAUTIONS IN MOUNTING

- When installing the adjusting screw, make sure to insert a washer between the spring and bracket.
- When mounting the headlamp, the word "TOP" must face upwards.
- After completion of work, adjust the horizontal angle of the headlamp beam.

ADJUSTMENT OF HORIZONTAL ANGLE

- Turn the adjusting screw ① on headlamp rim to change the direction of the beam. Turning the screw clockwise directs the beam to the left and turning the screw counterclockwise directs the beam to the right.

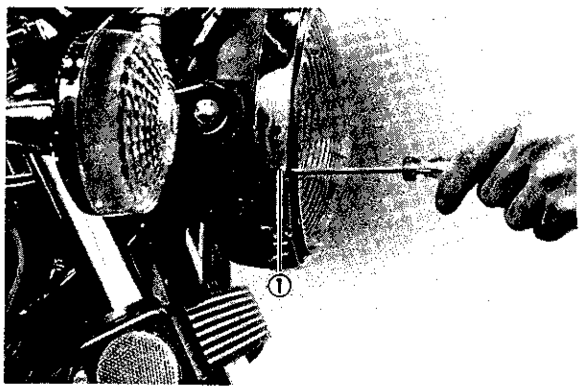


Fig. 10-13.

ADJUSTMENT OF VERTICAL ANGLE

- Loosen the left and right headlamp housing bolts.
- Manually adjust the vertical beam angle of the headlamp and tighten the right and left mounting bolts.

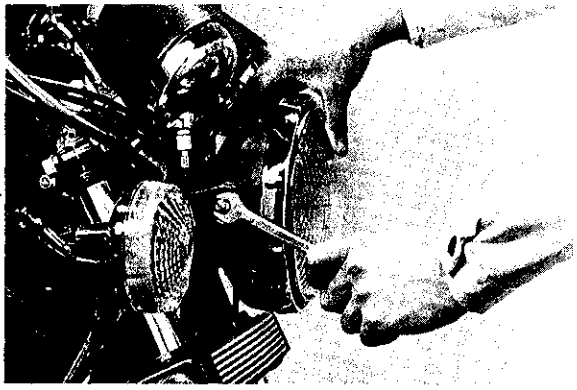


Fig. 10-14.

IGNITION SWITCH

REMOVAL

- Remove the headlamp and then each lead wire connected within the headlamp housing.
- Remove the two headlamp housing bolts and remove the housing.
- Remove two screws with 5 mm Allen wrench and remove the ignition switch.

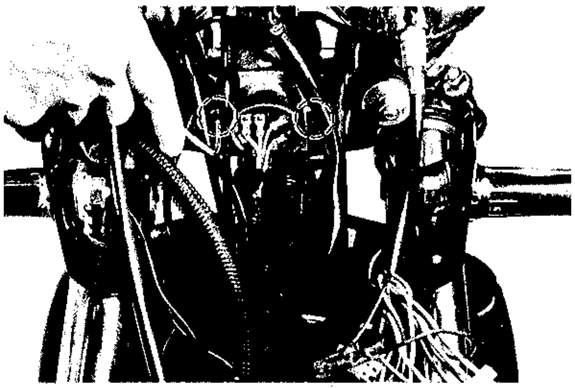


Fig. 10-15.

MOUNTING

- Mount parts in the reverse order to removal.
- Route the lead wires of ignition switch, left handle bar switch, front brake switch and turn signal lamp through the lower hole in the headlamp housing and fasten the headlamp housing with two bolts.
- Connect each lead wire.
  Connect the lead wire of the ignition switch to the coupler ① on the wire harness side.
  Connect the lead wire of the right handle bar switch to the coupler ② on the wire harness side.
  The orange and white lead wires of the front brake switch are to be connected respectively with the orange and white ones on the wire harness side.
  The black/white lead wires of the left and right ground wire for the front turn signal are to be connected respectively with the black/white ones on the wire harness side.
  Also connect the black lead wire of the left turn signal body to the black one on the wire harness, and connect the right side lead wire to the light green one on the wire harness side.
- Connection of headlamp. Connect the connection coupler ③ for the headlamp to the headlamp connection.

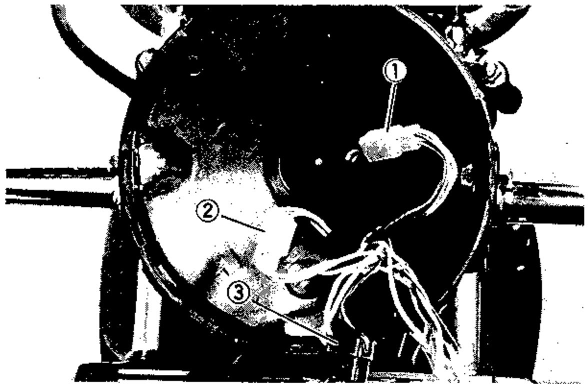
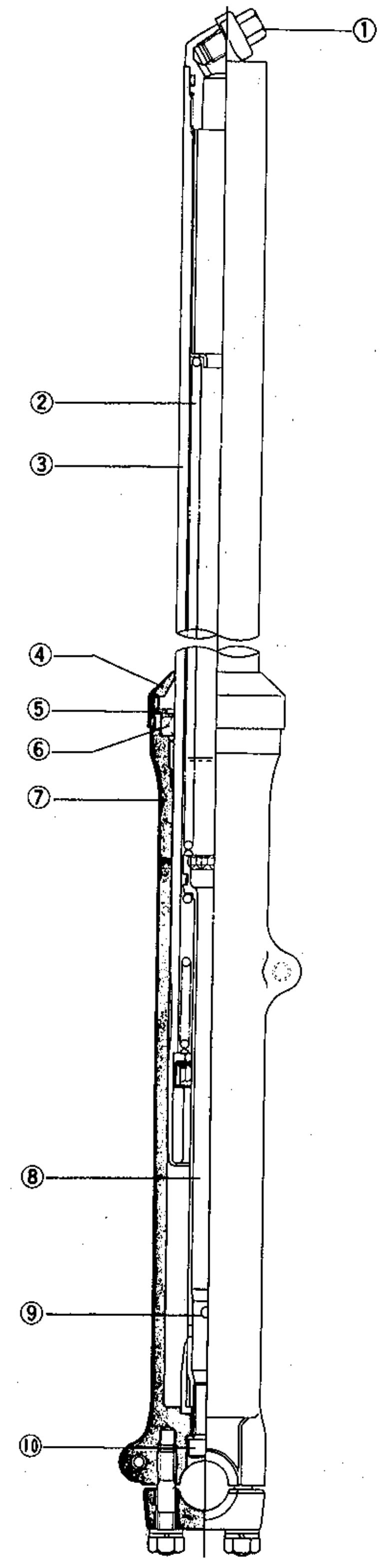


Fig. 10-16.

- Secure the headlamp with three screws.
  Adjust the vertical beam angle of the headlamp (see page 10-5).

FRONT FORK



1. Air valve cap
2. Spring
3. Inner tube
4. Dust seal
5. Oil seal stopper ring
6. Oil seal
7. Outer tube
8. Seat pipe
9. Oil lock piece
10. Bolt

Fig. 10-17.

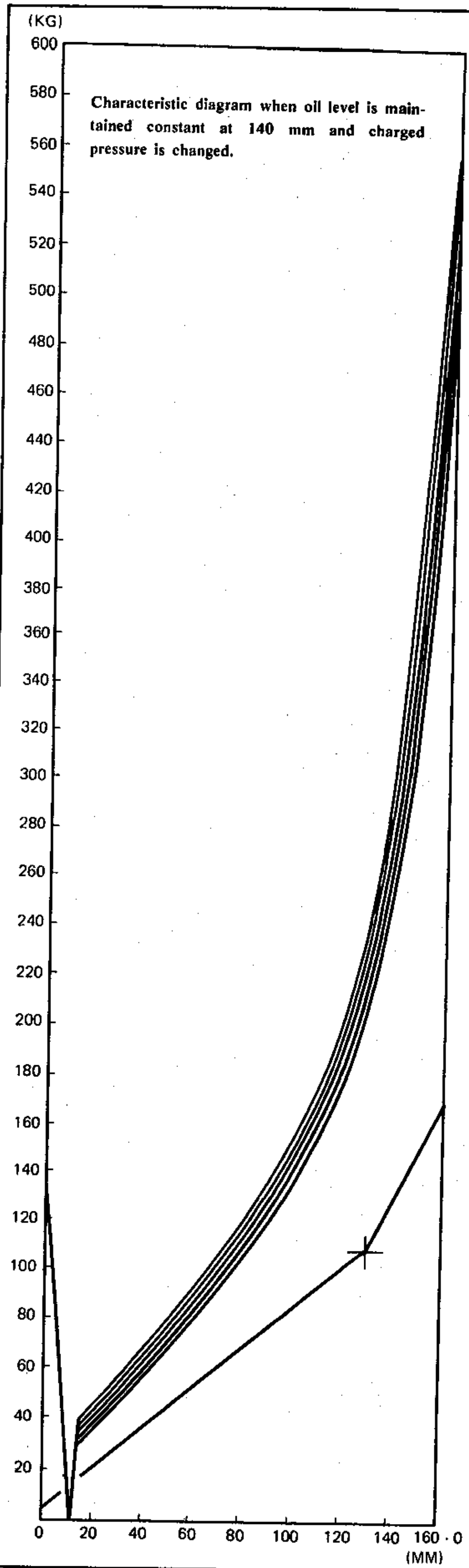
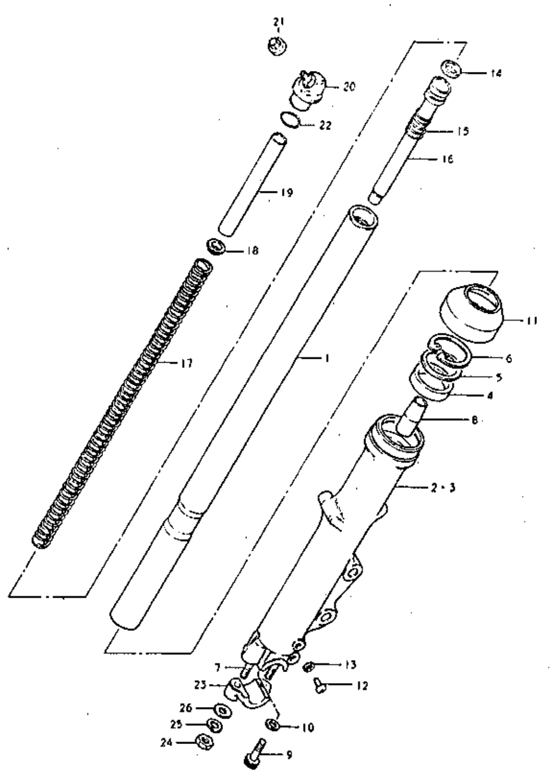


Fig. 10-18 Compression (length)



1.	Inner tube	14.	Washer
2.	Outer tube, RH	15.	Spring
3.	Outer tube, LH	16.	Damper rod
4.	Oil seal	17.	Spring
5.	Washer	18.	Guide, spring
6.	Ring, oil seal stopper	19.	Spacer
7.	Stud bolt	20.	Cap, upper
8.	Piece, oil lock	21.	Cap, valve
9.	Bolt	22.	O ring
10.	Gasket	23.	Holder, axle
11.	Dust seal	24.	Nut
12.	Screw	25.	Lock washer
13.	Gasket	26.	Washer

Fig. 10-19.

REMOVAL

- Place a jack below engine.
- Remove the front wheel and front fender.
- Remove valve cap ① and hold the valve with a pointed tool to bleed air.
- To remove fork, it is preferable to loosen the upper pinch bolt ②.
- Loosen the front fork tube upper pinch bolt ③ and lower pinch bolt ④.

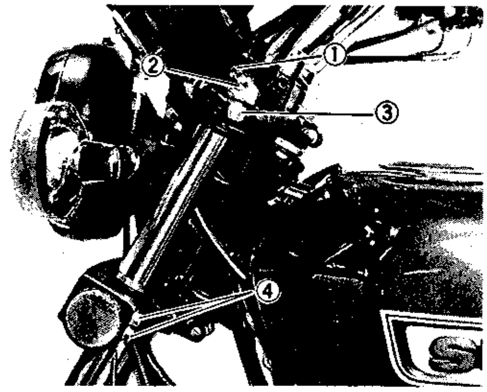


Fig. 10-20.

- When removing the left side front fork, remove the caliper mounting bolt and remove the caliper.
  Hang the caliper from the motorcycle frame using string, etc., taking care not to bend the brake hose.
- Pull down the front fork while rotating it.

MOUNTING

- Mount the front fork so that the upper end of the inner tube in the front fork is flush with the upper surface of the stem head.

Tightening torque	
Upper pinch bolt	2.0～3.0 kg-m (14.5～21.5 lb-ft)
Lower pinch bolt	1.5～2.5 kg-m (11.0～18.0 lb-ft)

- Mount the caliper. The tightening torque of the caliper mounting bolt is as follows;

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

- Mount the front fender on the front fork.
- Mount front wheel.

CAUTION:
- *Fasten the speedometer gear box at the position shown in the drawing below and take care not to bend the speedometer cable excessively.*
- *When securing the front axle holders, check that the clearances, front and back, on each holder are equal. In order to make sure that the two legs, right and left, are parallel, check as follows: Fasten the two axle holders temporarily and loosen the four front fender mounting bolts; under this condition, move the fork up and down several times to make the two legs parallel. Tighten the bolts on axle holders and fender fully after checking in this manner.*

Front axle holder nut tightening torque	1.5～2.5 kg-m (11.0～18.0 lb-ft)

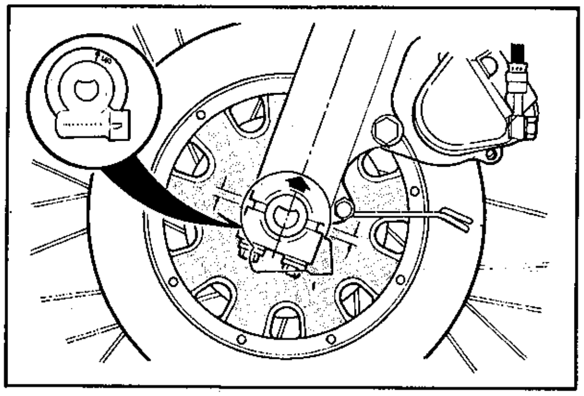


Fig. 10-21.

DISASSEMBLY OF FRONT FORK

- Remove the upper cap bolt and the fork spring.
- Expand and compress the front fork to drain oil.
- Remove dust rail.
- Remove Allen bolt mounted on the lower portion of the front fork using the special tool ①. At this time firmly secure the cylinder using the special tool ② so that the cylinder does not rotate.

①	09911-71510	8 mm hexagon wrench
②	09940-34520	Front fork assembling tool "T" handle
	09940-34561	Front fork assembling tool attachment "D"

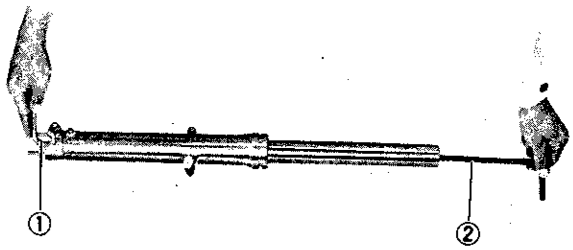


Fig. 10-22.

- Remove the inner tube from the outer tube.
- Remove the cylinder unit from the inner tube.
- To be removed from the outer tube, remove the oil seal stopper ring and the washer. When removing oil seal stopper ring, use special tool ①.

①	09900-06105	Snapring pliers

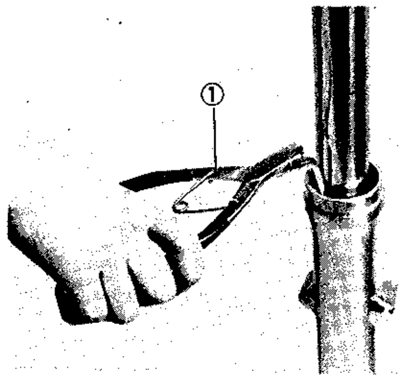


Fig. 10-23.

- Remove the oil seal, using the special tool ① if necessary.

①	09941-64910	Front fork oil seal remover

NOTE:
When using the oil seal remover, use the sliding hammer with it.

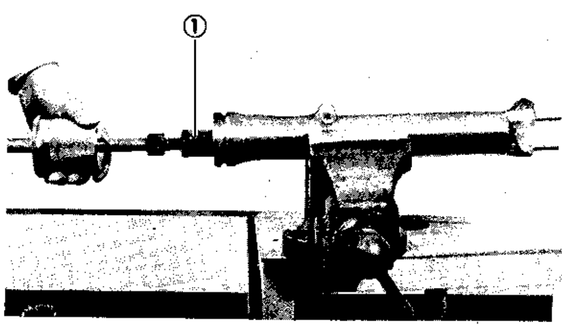


Fig. 10-24.

ASSEMBLY

- Insert the cylinder unit into the inner tube. Apply the thread lock cement (99000-32040) to Allen bolt and firmly secure the cylinder so that it does not rotate with the front fork assembling tool "T" handle and front fork assembling tool attachment "D", and tighten Allen bolt.

Front fork Allen bolt tightening torque	2.0~2.6 kg-m (14.5~19.0 lb-ft)

- After removing the oil seal replace it with a new one mounting it on the outer tube using special tools, i.e. ① front fork oil seal installing tool driver and ② front fork oil seal installing tool attachment after applying oil to the outer periphery of the oil seal.

①	09940-54910	Front fork oil seal installing driver
②	09940-54920	Attachment

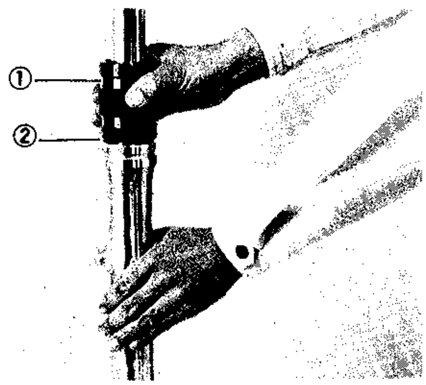


Fig. 10-25.

- Place the washer on the upper surface of the oil seal and fit the oil seal stopper ring, using special tools.
- Mount the dust seal.
- Use SAE 10W/20 oil.

Amount of front fork oil	241 ml on one side (8.15 US. oz.)

MEASURING METHOD OF FORK OIL LEVEL

- Carry out the measurement with front fork damper assembly removed from motorcycle frame.
  In disassembly of the front fork, constantly check the oil level.
- Carry out the measurement using the special tool ① (09943-74111; Front fork oil level gauge) with the front fork spring extracted and the inner tube fully compressed.
- Measure fork oil level by securing adjustable clip ② to the upper end of the inner tube as shown below.

①	09943-74111	Front fork oil level gauge

Front fork oil level	140 mm (5.51 in.)

If the oil is found to be over the level after measurement, drain the oil to the correct level using the oil pump lever.
If the oil is below the level, supply oil using the oil level gauge.

CAUTION:
Exceeding the specified oil level will lead to malfunctioning of the fork resulting in oil leakage, breakage, etc. Always make sure that the oil level is as specified.

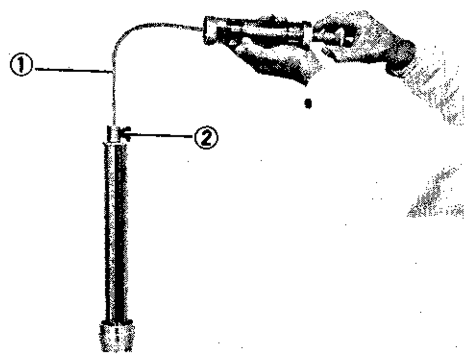


Fig. 10-26.

- Insert the spring into the inner tube with closely coiled portion upward and mount the upper cap bolt.

HANDLING THE FRONT FORK

The GS1000 front fork is mechanical pneumatic type. The fork tubes contain compressed air, and coil springs are used to augment the pneumatic cushioning action. The air pressure is adjustable so that you can obtain a degree of "softness" to suit running condition by raising or lowering the pressure.

ADJUSTING THE AIR FORK

- Stand the motorcycle erect on the center stand, and raise the front end slightly by jacking up the underside of the engine.
- Remove the air valve cap.

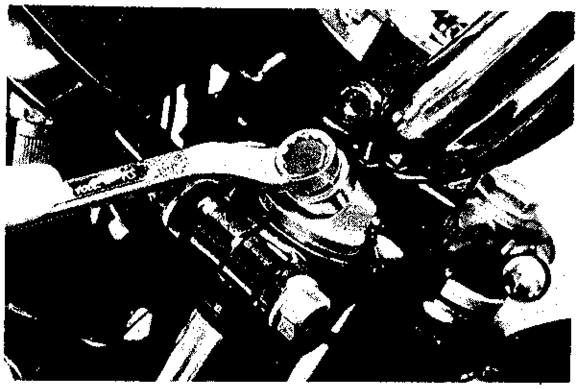


Fig. 10-27.

- Before attaching air pressure gauge on the front fork, turn valve ① clockwise until it locks. Next turn freely valve ② counter-clockwise until it turns freely. Mount valve nut ③ on the air valve of front fork and turn it manually clockwise until it stops. Next turn the valve ② clockwise until it locks. Inject air through air charging port ④ using an air pump (hand pump).

09940-44110	Front fork air gauge

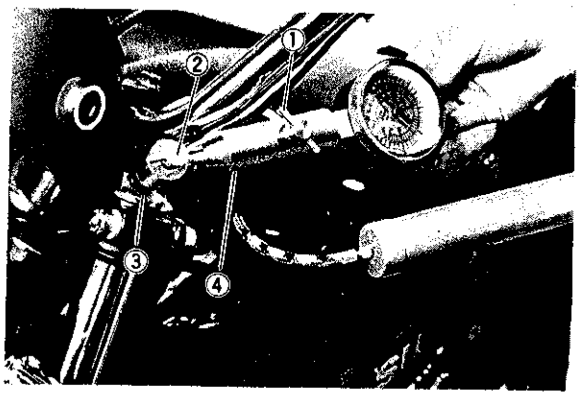


Fig. 10-28.

- Inject 2 to 2.5 kg/cm² of air with the air pump to adjust the pressure to the specified value, carrying out fine adjustment with valve ①.

  When the specified pressure is obtained, turn valve ① clockwise until it locks, loosen valve ②, and remove the gauge.

  Next, loosen valve nut ③ and remove the gauge from the front fork. Finally firmly fasten the valve cap.

CAUTION:

- *Inspect and adjust air pressure when the front fork is cold.*
- *Only air or nitrogen should be used. Never use oxygen or any other gas.*
- *Never allow the charged gas to come into contact with, or near, fire.*
- *The specified pressure of the charged gas is as follows;*

Reference pressure	*0.8 kg/cm² (11 psi)*

However it may be adjusted in the range of 0.8 to 1.2 kg/cm² according to the demand of the customer.

- *Never use an air compressor to inject air. Always supply air with a hand pump.*
- *Adjust the balance of the left and right pressures within 0.1 kg/cm². Before riding, always inspect and if necessary, adjust the pressure to the reference pressure.*
- *The pressure must not exceed the following value.*

Max. charged pressure	*2.5 kg/cm² (35 psi)*

Air charged above the max. valve will damage the fork leading to oil leakage, breakage, etc. Always maintain the specified value.

WARNING:

* *Be sure to balance the front and rear suspension by referring to "MATCHING FRONT FORKS AND REAR*

SHOCKS". Changing the air pressure setting of front fork requires the spring and damper settings of rear suspension to be changed according to the instruction, and vice versa.

** Inspection and adjustment of air pressure without disassembly of front fork should be carried out after completely draining air from the fork. At this time drain the air slowly by degrees. Draining the air all at once may cause hydraulic fluid to be mixed into the oil.*

INSPECTION

- Inspect front fork spring.
  Measure the free length of the fork spring. Replace it by new one if it is less than the service limit.

Standard	Service limit
421 mm (16.6 in.)	416 mm (16.4 in.)

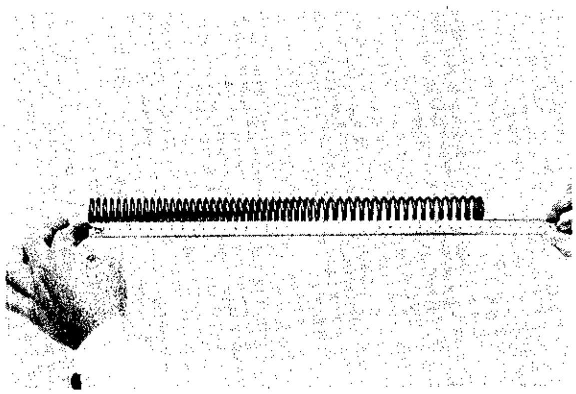
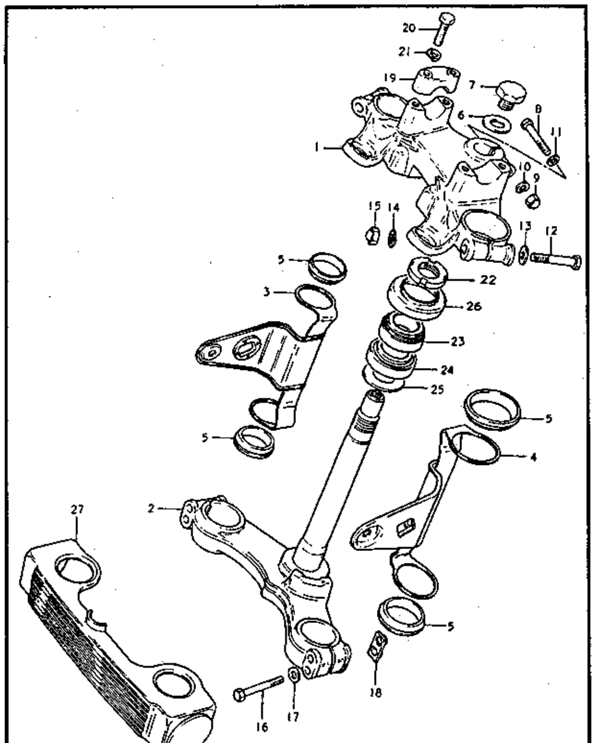


Fig. 10-29.

- Inspect the inner tube.
  Visually inspect the sliding surface of the inner tube. Replace the inner tube by new one if any flaws are found.
- Inspect the outer tube.
  Visually inspect the outer tube to see whether it is dented or damaged.
- Inspection of oil leakage.
  Replace oil seal by new one if oil leakage is found. Leakage is caused by intrusion of dust or abnormal flaws on the inner tube.

STEERING STEM



1.	Steering stem head	15.	Nut
2.	Steering stem set	16.	Bolt
3.	Bracket, headlamp, RH	17.	Washer
4.	Bracket, headlamp, LH	18.	Nut, inner tube
5.	Cushion	19.	Clamp, handlebar upper
6.	Washer	20.	Bolt
7.	Bolt	21.	Lock washer
8.	Bolt	22.	Nut, steering stem
9.	Nut	23.	Bearing, upper
10.	Lock washer	24.	Bearing, lower
11.	Washer	25.	Washer
12.	Bolt	26.	Dust seal, upper
13.	Washer	27.	Cover, front fork
14.	Lock washer		

Fig. 10-30.

REMOVAL

- Remove the fuel tank (see page 7-3).
- Remove the three headlamp retaining screws, draw out the socket connected to the headlamp and remove the headlamp.
- Remove the lead wires connected to the interior of the headlamp.
- Remove the two bolts fastening the headlamp housing and remove the housing from headlamp bracket.
- Remove the tachometer cable and speedometer cable on the meter side.

- Remove the two bolts fastening the meter and remove the meter assembly.
  Remove the connection coupler at the end of lead wire.
- Before removing the front wheel, loosen steering stem head center locking bolt ① and stem head center bolt ②.

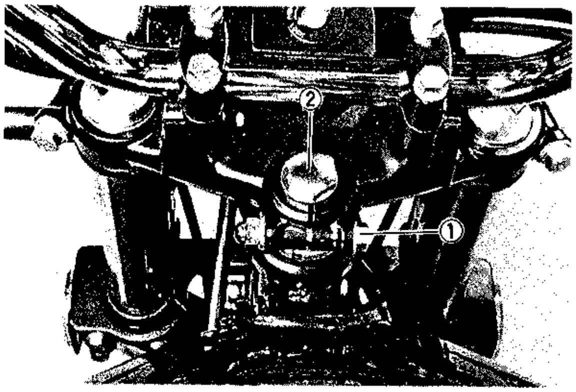


Fig. 10-31.

- Remove the two caliper mounting bolts and remove the caliper assembly from the left front fork.
  Then suspend the removed caliper from the motorcycle frame with string so as not to bend the oil hose.

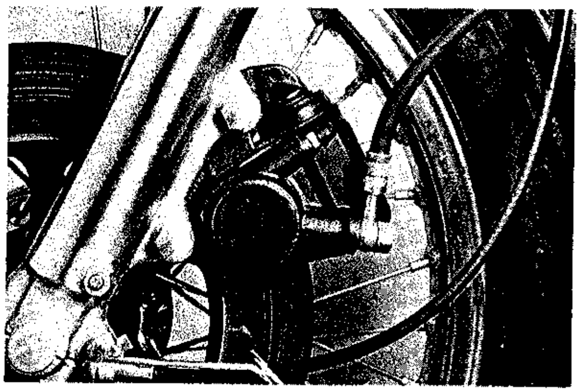


Fig. 10-32.

- Remove the front wheel.
- Remove the front fender.
- Loosen the left and right upper pinch bolt and lower pinch bolt securing the front fork. Draw out the front fork while rotating it. While removing the front fork, hold the left and right headlamp brackets to prevent it falling.

- Remove the front fork cover.

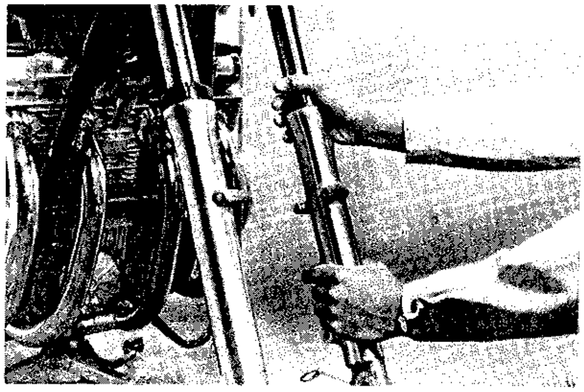


Fig. 10-33.

- Remove the two master cylinder mounting bolts ① on the handlebar.
  At this time take care not to bend the oil hose.

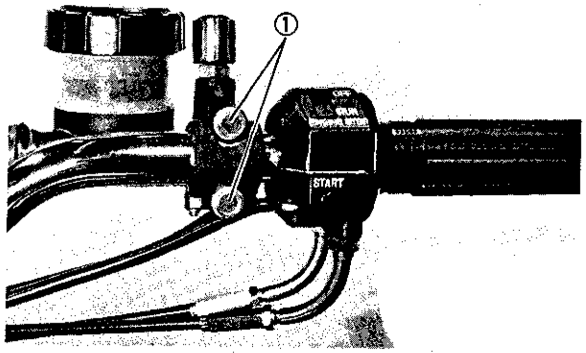


Fig. 10-34.

- Remove one bolt fastening the oil hose joint at the lower portion of the steering stem and remove the oil hose joint from the lower portion of the steering stem.
  The series of parts from the master cylinder to caliper assembly can now be removed.

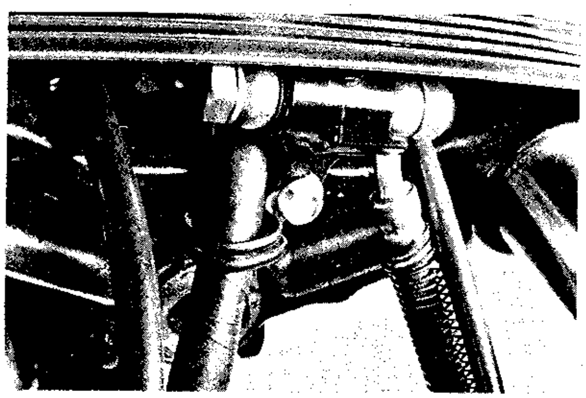


Fig. 10-35.

- Remove the four clamp bolts securing the handlebar and remove the handlebar assembly with grip, cable and handlebar switch together, and place them on the upper part of the motorcycle frame.
- Remove the steering stem head center bolt and remove steering stem head.
- Turn the steering stem nut ① counter-clockwise and remove it using the special tool ②.

②	09940-14910	Steering nut socket wrench

At this time hold the steering stem carefully to prevent it falling.

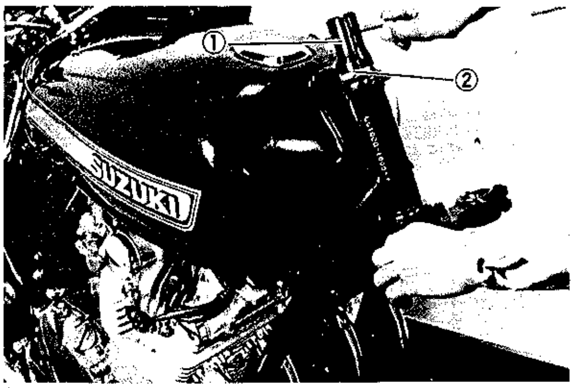


Fig. 10-36.

- Remove the upper dust seal to remove the steering stem.

ASSEMBLY

- Wipe dirt off the upper and lower bearing races with a rag. In addition, thoroughly wash the bearings with detergent.
- Apply a suitable amount of water-resistant chassis grease to the upper and lower bearings.


Fig. 10-37.

- Insert the steering stem into the head pipe from below. Place the upper bearing on the upper portion of the head pipe, place the upper dust seal on the bearing and tighten the steering nut. The nut is tightened using the special tool and torque wrench.

Steering stem nut tightening method

NOTE:
Tighten the steering stem lock nut to a sufficient degree for assembling. It can be changed during subsequent readjustment of the steering.

CAUTION:
The following adjustment procedure applies when the front fork has already been set. Follow the steps below for adjusting and checking the steering stem.

1. Combine the steering nut socket wrench with the torque wrench, and tighten the stem nut to 4.0 ~ 5.0 kg-m (29.0 ~ 36.0 lb-ft).


Fig. 10-38.

2. Move the steering stem back and forth 5 or 6 times to seat the bearings.
3. Loosen the lower steering stem nut approximately 1/4 – 1/2 turn.

NOTE:
This adjustment will vary from motorcycle to motorcycle.

4. Install the steering stem head and temporarily tighten the steering stem head center bolt at 2.0 ~ 3.0 kg-m (14.5 ~ 21.5 lb-ft).

5. Tighten the steering stem head center side bolt at 1.5 ~ 2.5 kg-m (11.0 ~ 18.0 lb-ft).
6. Turn the stem nut back slightly and tighten the steering stem head center bolt to the normal torque of 3.6 ~ 5.2 kg-m (26.0 ~ 37.5 lb-ft). When the front fork is moved back and forth, it must move freely. If there is any play in the forks, loosen the center bolt, tighten the stem nut slightly and retorque the center bolt.

Tightening torque	
Steering stem head center bolt	3.6 ~ 5.2 kg-m (26.0 ~ 37.5 lb-ft)
Steering stem head center side bolt	1.5 ~ 2.5 kg-m (11.0 ~ 18.0 lb-ft)

- Install the handlebar using the two clamps and four bolts.

Handlebars clamp bolt tightening torque	1.2 ~ 2.0 kg-m (8.5 ~ 14.5 lb-ft)

- Push the main wire harness ① through the left lower portion of the steering stem. A bolt fastens the oil hose joint on the lower portion of the steering stem. The holder is fastened by this bolt together with other parts. Firmly secure the wire harness with this holder after assembling the hose joint.
- Route clutch cable ② and lead wires ③, ④ of left and right handlebar switches to the front side of the steering stem head as shown in the photo.

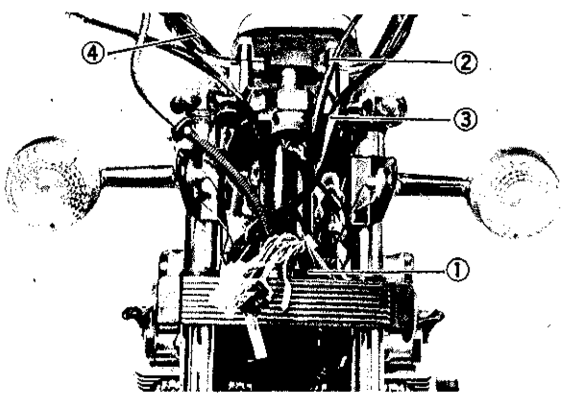


Fig. 10-39.

- Secure the meter assy with two bolts.
- Install tachometer cable ②.
  Now, route the tachometer cable through the bottom of steering stem to the front of steering stem head as shown in the drawing. Install the speedometer cable after mounting the front wheel.

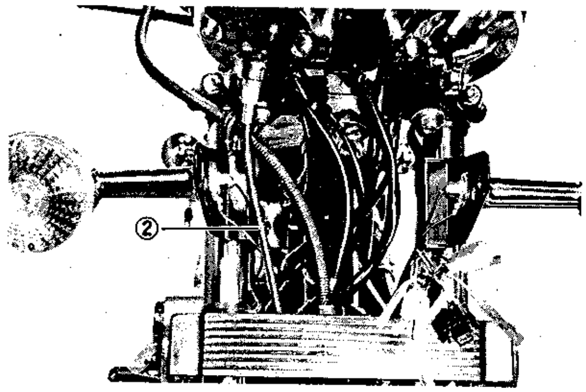


Fig. 10-40.

- Secure the front master cylinder with two bolts ①. Maintain a clearance ② between the right handlebar switch and the master cylinder of 2 mm.

Master cylinder bolt tightening torque	0.5 ~ 0.8 kg-m (3.5 ~ 6.0 lb-ft)

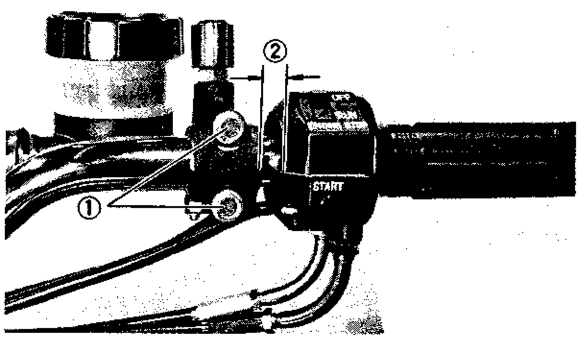


Fig. 10-41.

- Attach the brake hose joint to the lower portion of the steering stem with one bolt. Then tighten the clamp securing the main wire harness. Suspend the caliper from the motorcycle frame by string.
- Fit the headlamp brackets into the intermediate portion between the steering stem head and steering stem without mistaking the left or right positions. Now replace the front fork cover.

- Insert the left and right front forks from the underside of the steering stem and tighten the front fork upper pinch bolt and lower pinch bolt. Then align the end of the inner tube with the upper end of the stem head.

NOTE:
If the cushiones on the upper and lower sides of the headlamp bracket are hard and do not permit the front forks to slide smoothing when they are inserted, apply a small amount of motor oil, etc., to the front forks with your finger.

Tightening torque	
Front fork upper pinch bolt	2.0 ~ 3.0 kg-m (14.5 ~ 21.5 lb-ft)
Front fork lower pinch bolt	1.5 ~ 2.5 kg-m (11.0 ~ 18.0 lb-ft)

- Secure the front caliper assembly to the left front fork by two bolts.

Front brake caliper mounting bolt tightening torque	2.5 ~ 4.0 kg-m (18.0 ~ 29.0 lb-ft)

- Secure the front fender with the four bolts.
- Mount the front wheel.
- Route speedometer cable through the cable guide mounted on the fender and along the brake hose joint through the middle part between the front fork cover and steering stem and mount it on the meter side.
- Confirm that the speedometer gearbox is positioned correctly (see page 10-9).
- Remove the jack from under the engine.
- Route the main wire harness ①, ignition switch lead wire ②, right handlebar switch lead wire ③, front brake switch lead wire ④ and turn signal lamp lead wire ⑤ through the lower hole of the headlamp housing, and fasten them together using the headlamp bracket.

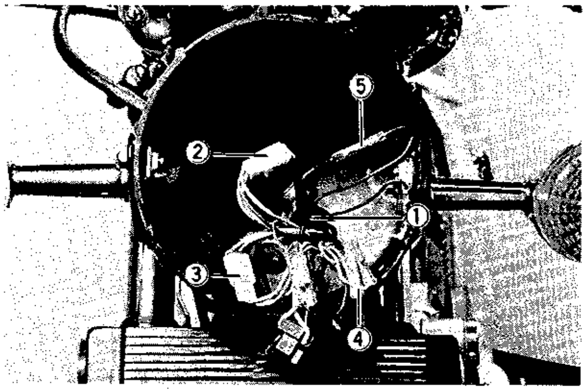


Fig. 10-42.

- Connect each lead wire (see page 10-6).
- Secure the headlamp with the three screws.
- Adjust the vertical angle of the headlamp beam (see page 10-5).

REMOVAL OF STEERING STEM RACE

- Place a jack under the engine.
- Hook special tool ① on the race and use special tool ② to remove the upper and lower races.

①	09941-54910	Steering stem inner race remover
②	09941-74910	Inner race and bearing driver

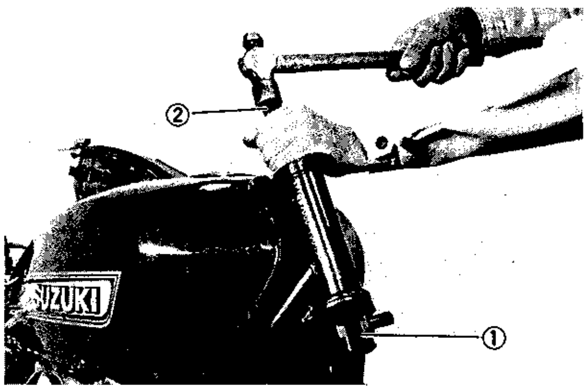


Fig. 10-43.

MOUNTING

- Apply a small amount of motor oil, etc., to the outer periphery of the upper and lower races and start them into head pipe by tapping them lightly with a plastic hammer.
- Press the lower and upper races using the special tool ①.

①	09941-34511	Steering inner race and swinging arm bearing installer

Use of special tool ①

- Two of the four tapered guides set in the special tool ① are to be used. Place the one with larger outer diameter below and the other with smaller outer diameter above and press-fit the race while rotating it.
  Then tighten the nut until it locks completely.

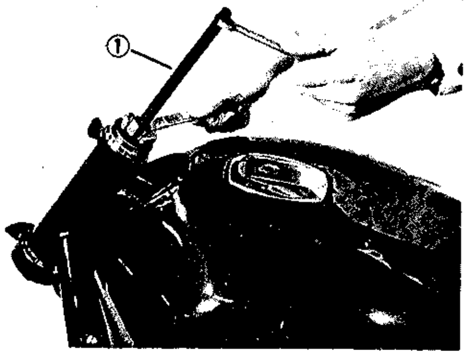


Fig. 10-44.

STEERING STEM BEARING

REMOVAL

- Remove bearing using the special tool ①.

①	09941-84910	Steering stem bearing puller

Use of special tool

- Firmly fit the holder into the roller portion of steering stem bearing. Next, fit the ring into the holder and screw the two shafts into the upper portion of the holder.
  Screw attachment ② into the top of the steering shaft and remove the bearing while rotating the handle.

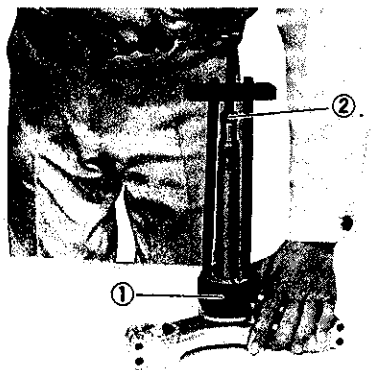


Fig. 10-45.

MOUNTING

- Apply a small amount of motor oil to the inside of the bearing and press it into the steering stem shaft using the special tool ①.

①	09941-74910	Race and bearing driver

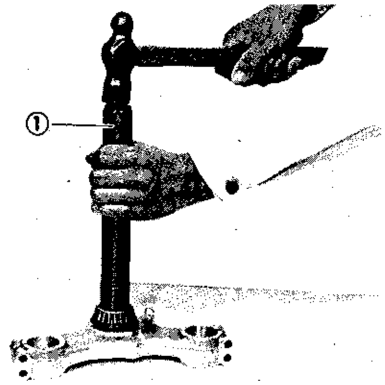
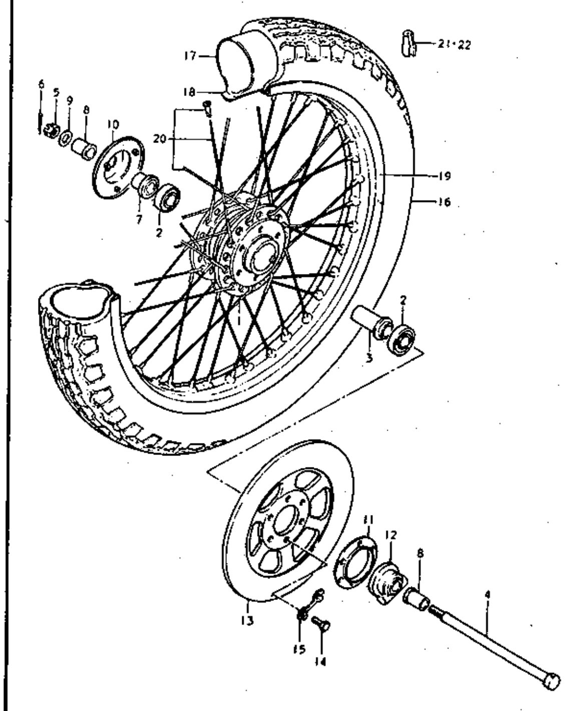


Fig. 10-46.

FRONT WHEEL



1.	Hub	12.	Box ass'y, speedometer gear
2.	Bearing	13.	Disc, front brake
3.	Spacer	14.	Bolt
4.	Axle, front	15.	Lock washer
5.	Nut	16.	Tire
6.	Cotter pin	17.	Tube, inner
7.	Spacer, bearing	18.	Protector
8.	Spacer, axle	19.	Rim
9.	Washer	20.	Spoke set
10.	Cover, RH	21.	Balancer
11.	Dust seal, speedometer gear box	22.	Balancer

Fig. 10-47.

REMOVAL

- Lift the front wheel off the floor by raising up the engine, with the center stand resting firmly on the floor.
- Disconnect the speedometer cable from the wheel.
- Pull off cotter pin ① from the axle nut ②; and loosen the nut. Remove the axle holders, right and left, and take off the wheel.

> *CAUTION:*
> *After removing the front wheel, do not squeeze the front brake lever or the brake pads will move inside the caliper. The pads should be left where they were at the time of wheel removal otherwise difficulty will be encountered in reinstalling.*

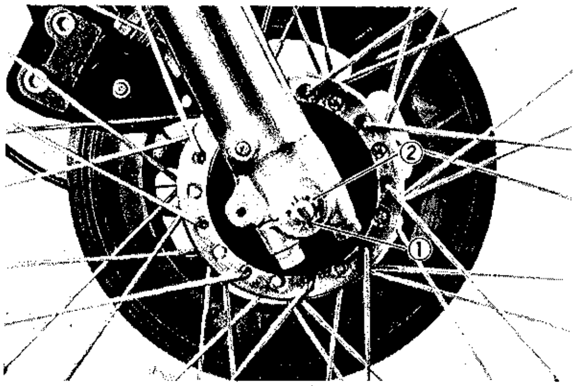


Fig. 10-48.

- Unlock the 6 bolts securing the disc to the wheel hub after straightening the lock washers. Remove the bolts and separate the disc from the wheel.

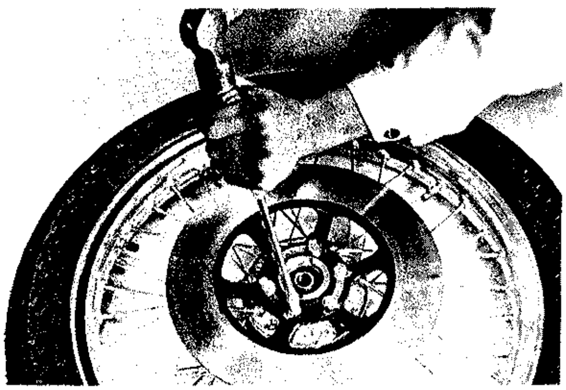


Fig. 10-49.

- Insert an iron bar into the front hub front the speedometer gear box side and tap the circumference of the ball bearing inner race uniformly to remove the bearing.

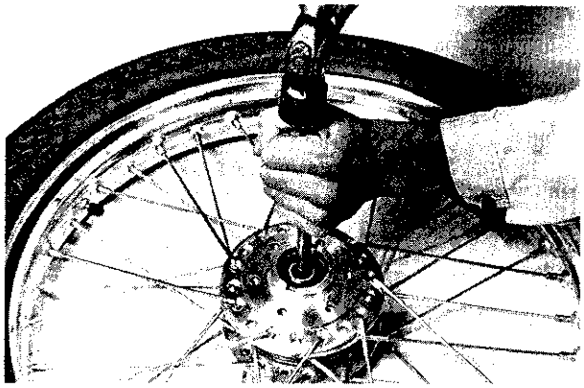


Fig. 10-50.

- Similarly, insert an iron bar into the front hub and uniformly tap the periphery of the ball bearing inner race on the opposite side to remove the bearing.

ASSEMBLY

- Reassemble and remount the front wheel in the reverse order to disassembly and removal and in addition to the following items:
- Use the special tool ① to install the wheel bearings. These bearings are to be driven into the hub bore.

①	09914-79610	Bearing installer

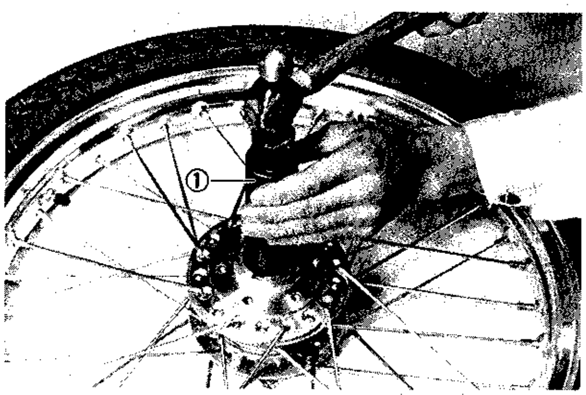


Fig. 10-51.

- Make sure that the brake disc is clean and free from grease. Use only non petro-based cleaner. After securing it in place by tightening its bolts, be sure to lock each bolt by firmly bending down the lock washer tongue.

Brake disc plate tightening torque	1.5 ~ 2.5 kg-m (11.0 ~ 18.0 lb-ft)

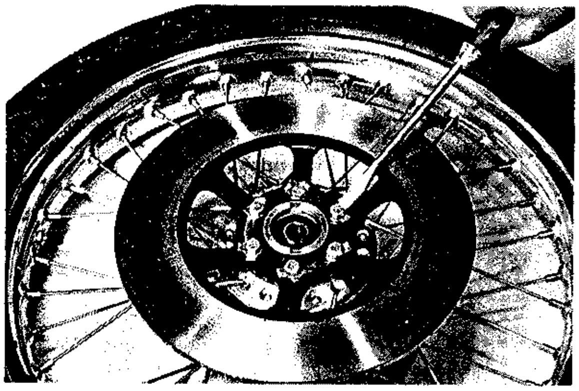


Fig. 10-52.

- Before installing the speedometer gear box ①, grease it and align groove ② (for fitting the two drive pawls to the hub) with the hub to insert the gear box in the wheel.

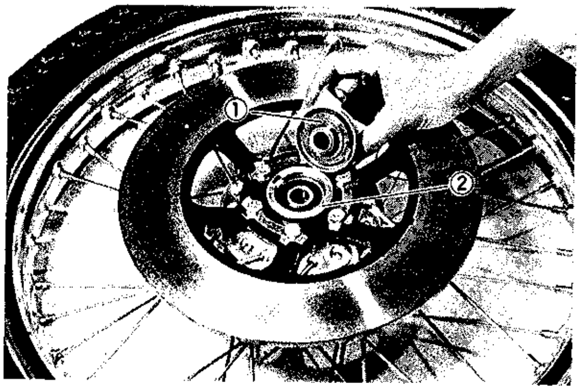


Fig. 10-53.

- Insert an axle spacer into the front wheel and insert the front axle. Next, from the right side, assemble the bearing spacer, cover, axle spacer, washer and nut in the order mentioned and temporarily tighten the axle nut. See page 10-8 with respect to the order of assembly.
- With the axle shaft mounted, place the front wheel under the front fork and lower the jack placed under the engine to move it close to the front fork.
- Do not change the position of the speedometer gear box (see page 10-8).
- Tighten axle nut.

CAUTION:
To prevent the axle shaft rotating while tightening the axle nut, insert a round bar into the head of shaft on the disc plate side. Rotation of the shaft may lead to bending of the speedometer cable.

Axle shaft tightening torque	3.6 ~ 5.2 kg-m (26.0 ~ 37.5 lb-ft)

- Mount the axle holder on the lower portion of the front fork. Maintain uniform clearance between the axle holder and the fork side front and rear (see page 10-9).

Axle holder tightening torque	1.5 ~ 2.5 kg-m (11.0 ~ 18.0 lb-ft)

- Remove the jack under the engine.

INSPECTION

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

Front and rear disc thickness	
Standard	Service limit
6.5 ~ 6.9 mm (0.26 ~ 0.27 in.)	Under 6.00 mm (0.24 in.)

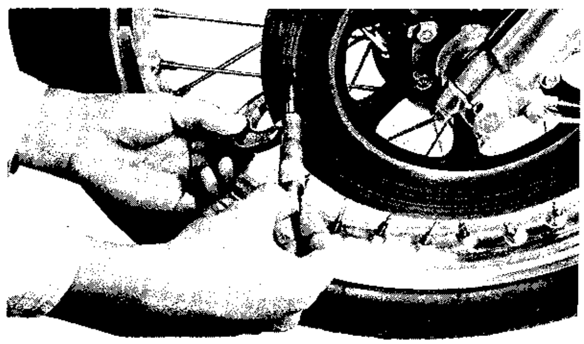


Fig. 10-54.

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

Front and rear disc face runout	
Standard	Service limit
0.1 mm (0.004 in.)	0.3 mm (0.012 in.)

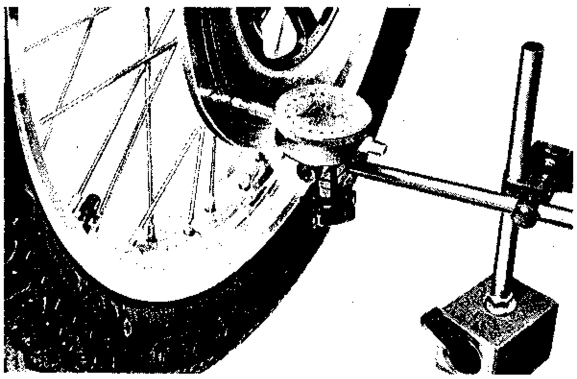


Fig. 10-55.

- Inspect the play of wheel bearing inner race by hands while fixing it in the wheel hub or wheel. Rotate the inner race by hands to inspect whether abnormal noise occures or rotating smoothly. Replace the bearing if there is something unusual.
- Visually inspect the wheel hub bore, from which the bearings have been extracted, for evidence of abnormal wear caused by creeping of bearing outer races.

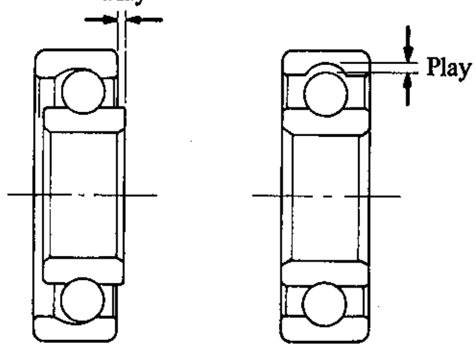


Fig. 10-56.

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

Front and rear axle shaft runout	
Standard	Service limit
0.15 mm (0.006 in.)	0.25 mm (0.010 in.)

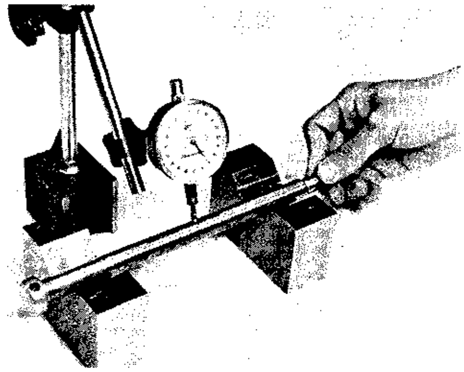


Fig. 10-57.

- Check the spokes for tightness, distortion and damage.
- Inspect the tire for wear and damage, and check the tire tread depth as shown. Replace a badly worn or damaged tire. A tire with its tread worn down to the limit (in terms of tread depth) must be replaced.

Tire tread depth		
Service limit	Front	1.6 mm (0.06 in.)
	Rear	2.0 mm (0.08 in.)

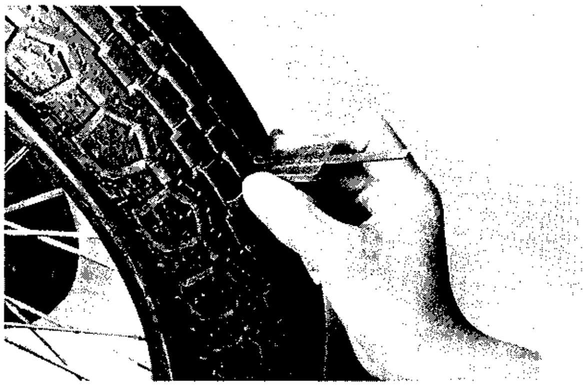


Fig. 10-58.

TIRE WARNING

Check tire inflation and general tire condition frequently. Suzuki recommeds replacement only with the specified size Inoue brand V-rated tire.

Tire Inflation Pressure Model GS1000		Solo Riding		Dual Riding	
		KG/CM²	LB/IN²	KG/CM²	LB/IN²
Normal Riding	Front	1.75	25	2.00	28
	Rear	2.00	28	2.25	32
Continuous High Speed Riding	Front	2.00	28	2.25	32
	Rear	2.25	32	2.80	40
TIRE SIZE : FRONT 3.25V19 4PR			REAR 4.00V18 4PR		

* TIRE PRESSURE SHOULD BE MEASURED WHEN TIRE IS COLD.

- Check the tire pressure, and examine the valve for evidence of air leakage.
- Check the wheel for axial and radial runout. For the axial runout, apply the dial gauge spindle horizontally to the rim; for the latter, point the spindle radially to the inner surface of the rim.
- While holding both ends of the shaft to inspect runout of the rim with a dial gauge, tighten the nipple further, using a spoke wrench to attain the specified value.

09940-60112	Spoke nipple wrench

Front wheel rim runout

Runout	Service limit
AXIAL	2.0 mm (0.08 in.)
RADIAL	2.0 mm (0.08 in.)

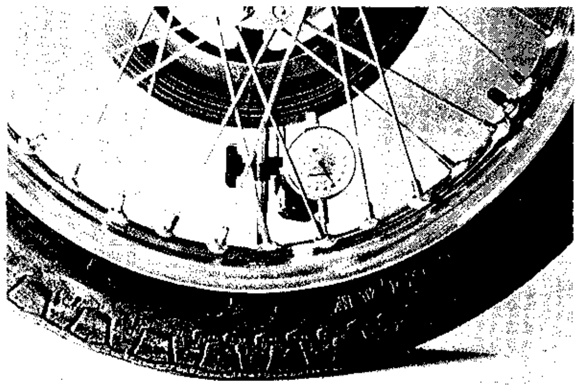


Fig. 10-59.

- Spin the wheel (complete with the brake disc and tire) to check dynamic balance. Use a 20-gram or 30-gram balancing piece, as necessary. Spin the wheel several times and make sure that the wheel comes to a natural halt not in a particular position but in random positions each time.

Wheel balancer	
Weight	Part Number
20 grams (0.04 lbs)	55411-11000
30 grams (0.07 lbs)	55412-11000

IMPORTANT:
Remember, that the wheel will not be dynamically balanced when the tire is replaced or repaired after a puncture: the wheel must be rebalanced each time its mass is altered.

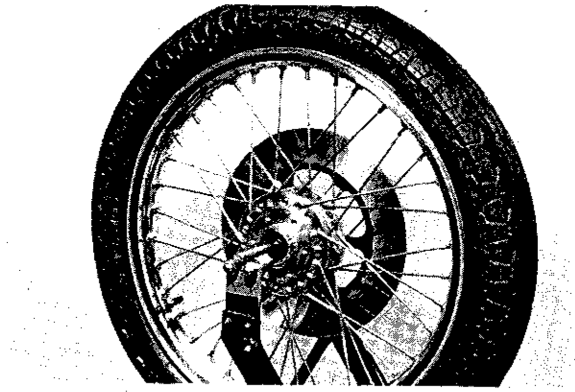


Fig. 10-60.

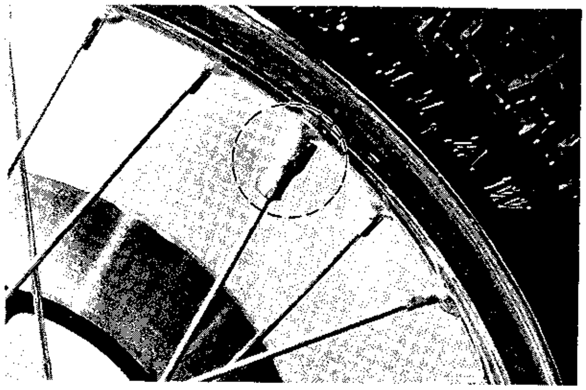


Fig. 10-61.

REMOVAL OF TUBE AND TIRE

- Mark the position of the tires and rotational direction of the valve stem with chalk.
- Remove the valve cap and let out the air.
- Remove the valve fastening nut and fully loosen the bead protector nut.

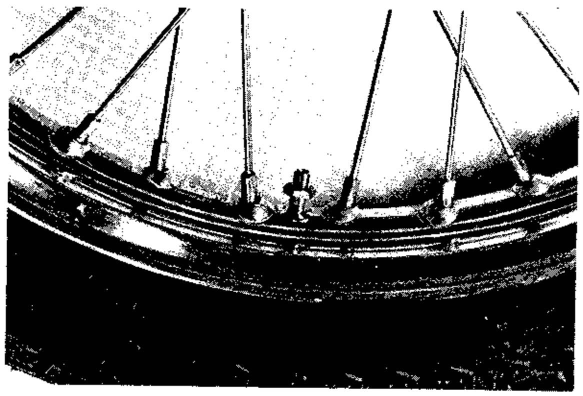


Fig. 10-62.

- Tread on the tire to push down the bead portion and remove one side of the tire from the portion close to the valve using a tire lever.

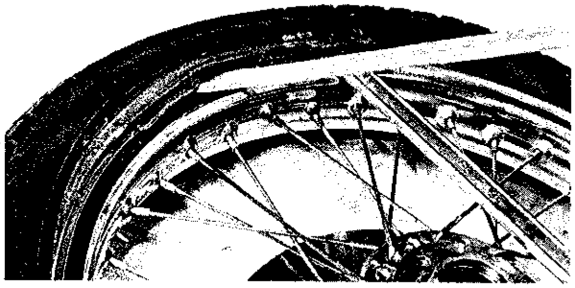


Fig. 10-63.

- Remove the tube.
- Remove the other bead protector from the bead of the tire to remove the tire with tire lever.

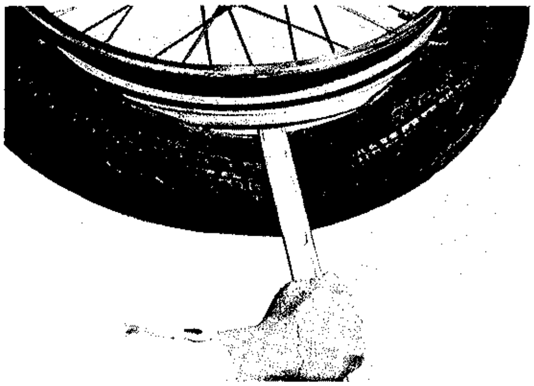


Fig. 10-64.

MOUNTING

- Inflate the tube sufficiently so that the tube does not fold.
- Press the tube into the tire.
- Push one side of the tire beads into the wheel rim. Be sure that the embossed arrow mark on the tire faces toward the rotational direction of the wheel. Next, install the tube, insert the valve into the rim, and tighten the valve nut temporarily. An arrow indicating the rotational direction is marked both front and rear tires. A yellow colored mark is provided on the valve portion to aid checking of the tire balance.

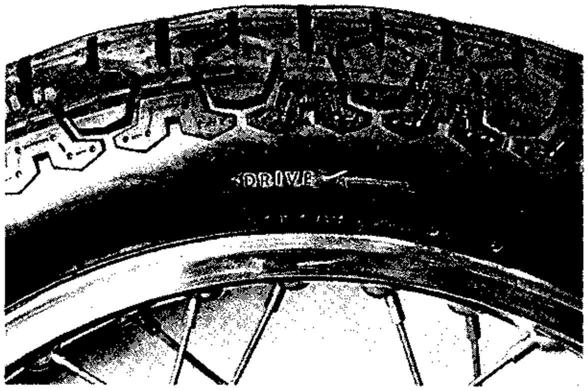


Fig. 10-65.

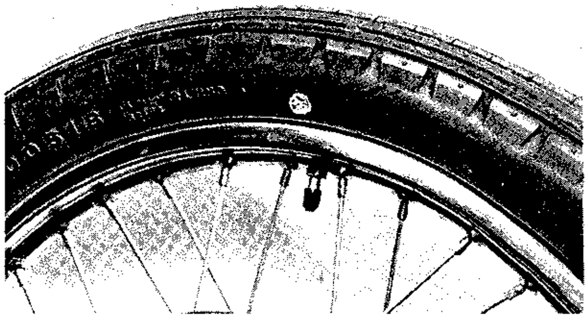


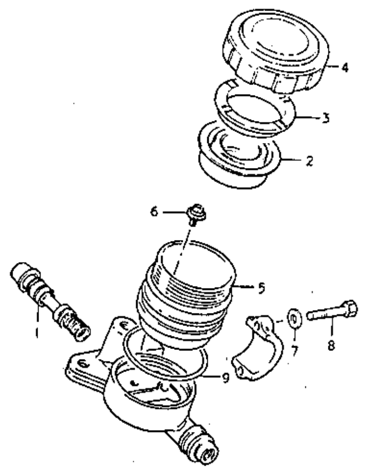
Fig. 10-66.

- Apply soapy water to the tire bead.
- Hook the bead protector on the bead portion of the tire.
- Fit the other side of the tire bead using tire levers in a position well away from the valve.

CAUTION:
Never interfere with the tube by inserting the tire lever too deeply (to avoid damaging the tube).

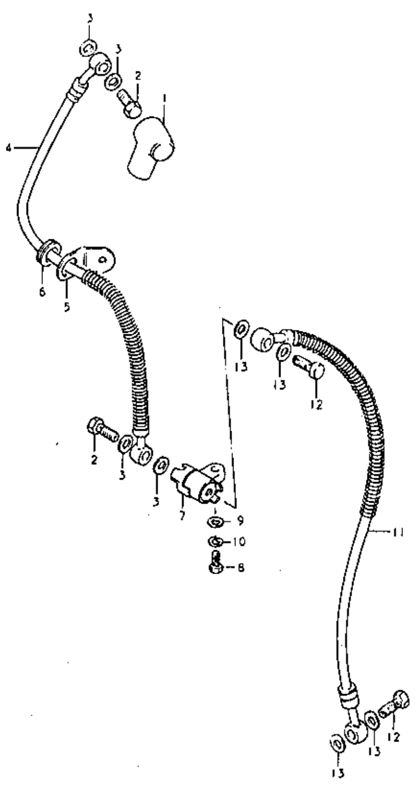
- By pushing the tire, confirm that the tube is not caught between the rim and tire.
- Inflate the tire to the specified pressure (see page 10-20).
- Tighten the bead protector nut and then the valve nut.
- Mount the valve cap.

FRONT BRAKE MASTER CYLINDER



1. Piston/cup set
2. Diaphragm
3. Plate
4. Cap, reservoir
5. Reservoir
6. Screw
7. Washer
8. Bolt
9. "O" ring

Fig. 10-67.



1. Boot, master cylinder
2. Diaphragm
3. Gasket
4. Hose, brake No. 1
5. Guide, hose
6. Grommet
7. Joint, brake hose
8. Bolt
9. Washer
10. Lock washer
11. Hose, brake No. 2
12. Union bolt
13. Gasket

Fig. 10-68.

REMOVAL

- Remove the headlamp.
- Remove the left handlebar switch lead wire and front brake switch lead wire connected within the headlamp housing.
- Remove the union bolt.

CAUTION:
Loosening of the union bolt will cause brake fluid to flow out. Therefore, remove the brake fluid from the brake fluid cup beforehand. Completely wipe off any brake fluid adhering to any part of the motorcycle frame.

MOUNTING

- Mount the master cylinder on the handlebar.

CAUTION:
A clearance of about 2 mm (0.08 in.) ① just be provided between the right-hand handlebar switch and the master cylinder.

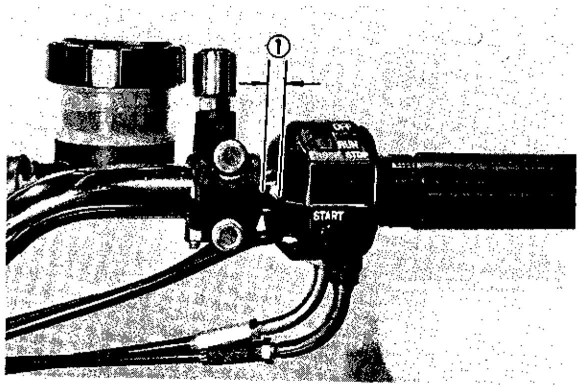


Fig. 10-69.

- Refer to the illustration to reconnect the brake hose to the master cylinder.

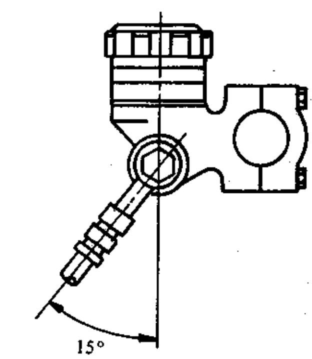


Fig. 10-70.

- Connect the front brake lamp switch lead wire and the left handlebar switch lead wire within the headlamp housing.
- Fasten the headlamp with three screws.

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. Such air is evidenced 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 "HIGH" level line. Replace the reservoir cap to prevent entry of dirt.

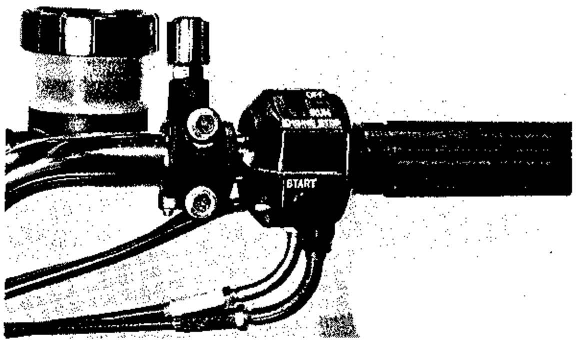


Fig. 10-71.

Bleeder valve tightening torque	0.6~0.9 kg-m (4.5~6.5 lb-ft)

- Attach a pipe to the caliper bleeder valve and insert the free end of the pipe into a receptacle.

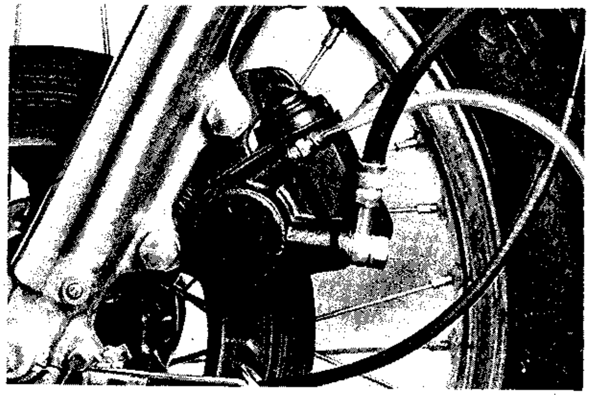


Fig. 10-72.

- 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 one-quarter rotation or so, spilling the brake fluid 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 oil flowing into the receptable 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 up the reservoir to the "HIGH" level line.

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

MASTER CYLINDER DISASSEMBLY

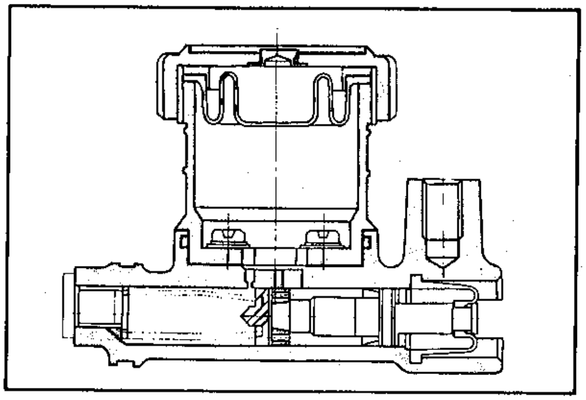


Fig. 10-74.

- Remove the front brake lever: pull off the split pin and remove the nut to free the lever for removal.
  Remove the boot. Pick out the circlip from the bore of the master cylinder with special tool ①.

①	09900-06105	Snap ring pliers

NOTE:
Discard the removed boot. Replace with a new boot in reassembling.

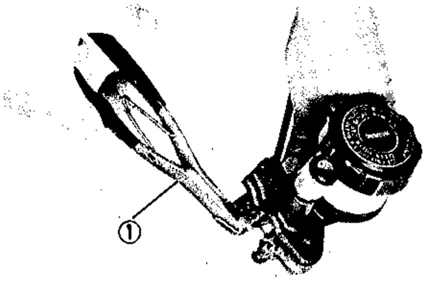


Fig. 10-75.

- Take out the piston, check valve, coil spring and primary cup from the bore.

NOTE:
Using a piece of wood or soft-metal, push out the check valve, coil spring and primary cup. Avoid scratching the bore wall.

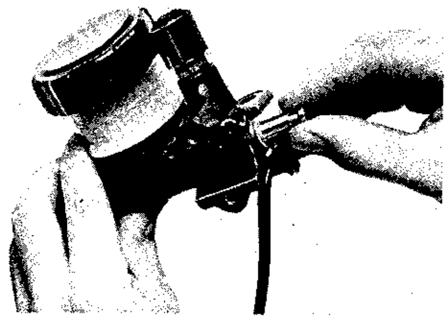


Fig. 10-76.

- Remove the two screws ① securing the reservoir to the master cylinder body, and take off the "O" ring from the body.

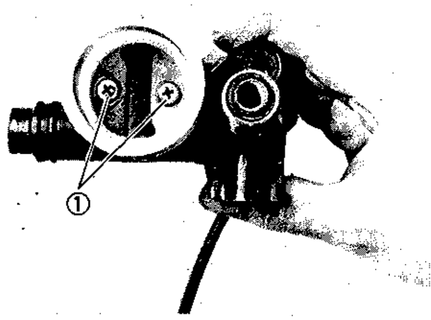


Fig. 10-77.

ASSEMBLY

- Reassemble the master cylinder in the reverse orders of disassembly and by taking the following additional steps:
- Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore. Do not attempt to insert one internal after another into the bore; assemble the primary cup, coil spring and check valve together. Insert this assembly into the bore, taking care not to allow the check valve to become cocked or to unseat the coil spring as it goes into the bore.
- It is advisable, though not essential, to replace the primary cup with a new one in reassembly.

CAUTION:
Always install the circlip with the sharp edge away from the spring.

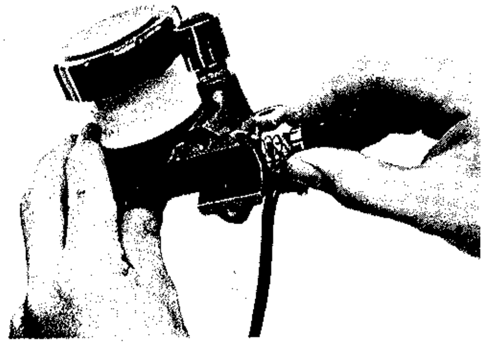


Fig. 10-78.

- After fitting the circlip, try to turn it in place to make sure it is snugly seated in the groove. Replacing the circlip with a new one advisable instead of re-using the circlip removed in disassembly.

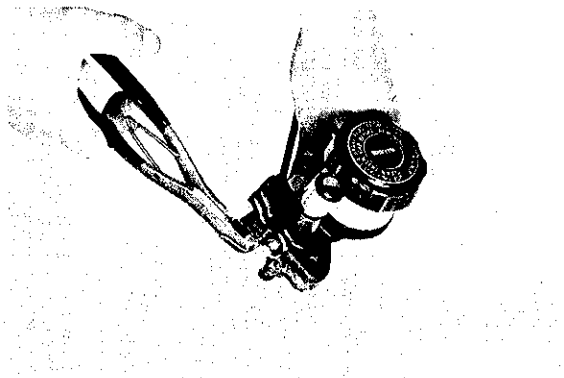


Fig. 10-79.

- Reconnect the brake lever to the master cylinder before mounting the master cylinder on the handlebar.
- Mount to the handlebar as described on page 10-23.

INSPECTION OF MASTER CYLINDER

- Using a micrometer, measure the cylinder bore and piston to check their diameters are within the limits. Replace the cylinder or piston or both if the limit is exceeded.

Diameter	Standard	Service limit
Bore	14.00 mm (0.551 in.)	Over 14.05 mm (0.553 in.)
Piston	13.96 mm (0.550 in.)	Under 13.94 mm (0.549 in.)

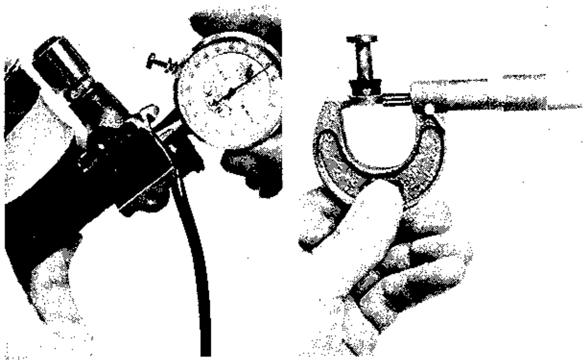


Fig. 10-80.

- Check the fit of the reservoir with the cylinder body. If signs of fluid were noted at the time of disassembly, replace the "O" ring.
- Inspect the primary cup for wear and damage, and replace it with a new one if necessary.

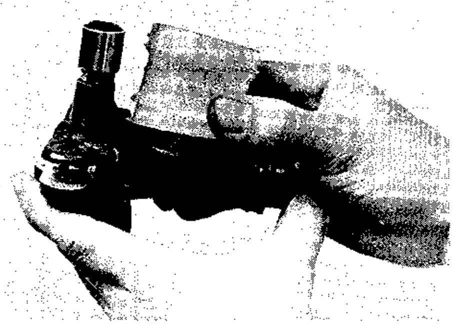
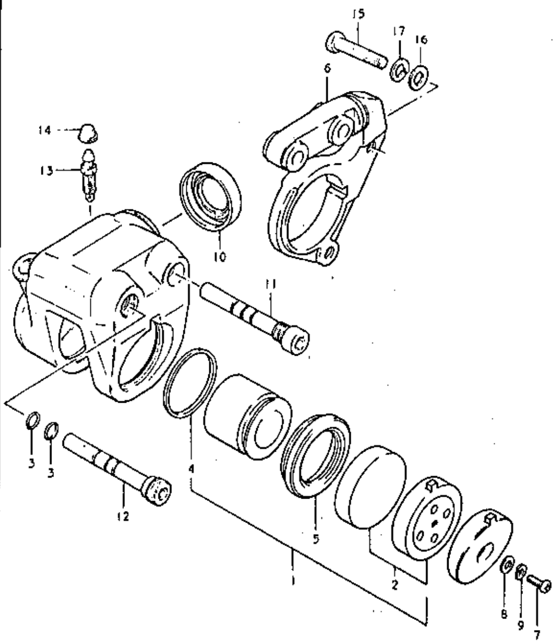


Fig. 10-81.

- Replace the brake hose every two years.

FRONT BRAKE CALIPER



1. Piston/pad set
2. Pad set
3. "O" ring
4. Seal, piston
5. Boot, piston
6. Holder, caliper
7. Screw
8. Washer
9. Lock washer
10. Boot, holder
11. Axle, caliper No. 1
12. Axle, caliper No. 2
13. Breather
14. Cap
15. Bolt
16. Washer
17. Lock washer

Fig. 10-82.

REMOVAL

- Disconnect brake hose No. 2 ① from the caliper, and catch the brake fluid in a suitable receptacle. Squeeze the brake lever to push out the fluid.

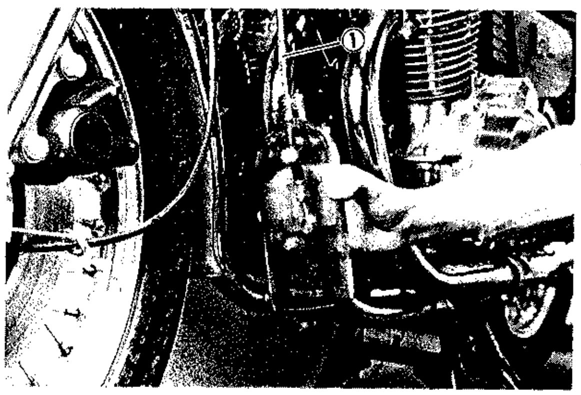


Fig. 10-83.

CAUTION:
Do not splash the brake fluid when removing the caliper assembly.

- Remove two mounting bolts ① securing the caliper to the fork. Take off the caliper assembly.

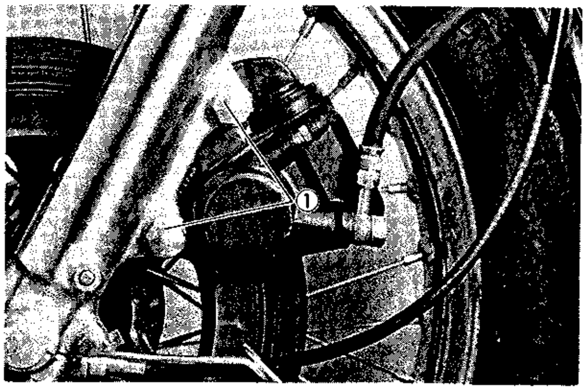


Fig. 10-84.

MOUNTING

- Tighten two caliper mounting bolts.

Caliper mounting bolts tightening torque	2.5 ~ 4.0 kg-m (18.0 ~ 29.0 lb-ft)

- Tighten the brake hose union bolt.

Brake hose union bolt tightening torque	1.5 ~ 2.5 kg-m (11.0 ~ 18.0 lb-ft)

- Pour brake fluid into the reservoir up to the low level.
- See page 10-24 for air bleeding of the caliper and brake hose.

CALIPER

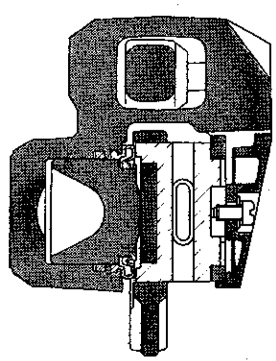


Fig. 10-85.

CALIPER DISASSEMBLY

- Loosen and remove the two caliper axle bolts.

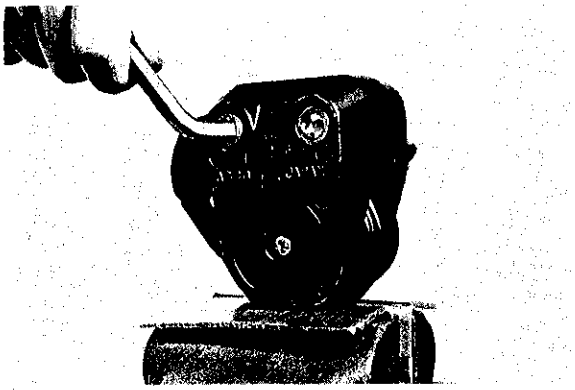


Fig. 10-86.

- Remove screw ① fastening No. 2 pad (stationary) to the caliper body, and take out the pad. Separate the caliper holder from the body.

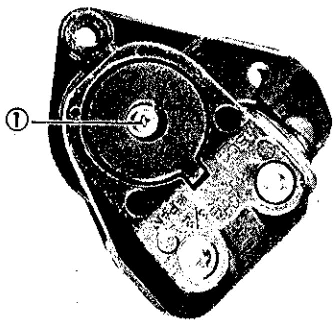


Fig. 10-87.

- Apply compressed air (2.0 kg/cm^2, 28 psi) to the oil hose connection to push out the piston.

NOTE:
Remove the piston boot to facilitate piston removal.

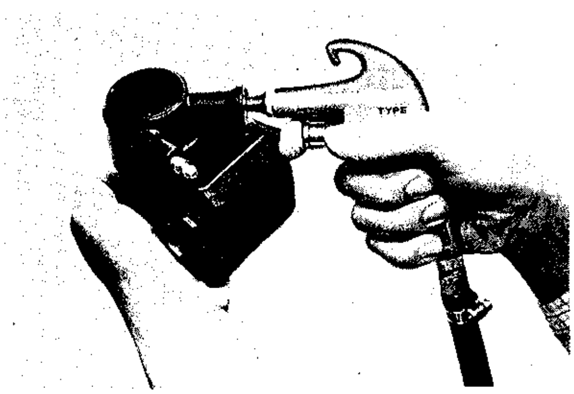


Fig. 10-88.

- After removal of the caliper holder, take out the piston seal, dust seal, piston boot and "O" ring. Wash the piston seal and piston boot clean with fresh brake fluid. Discard the removed dust seal and "O" ring: always use replacement seal and "O" ring in reassembly.

CAUTION:
Do not use such a cleaning fluid as trichlene or even gasoline to wash the piston seal and boot.

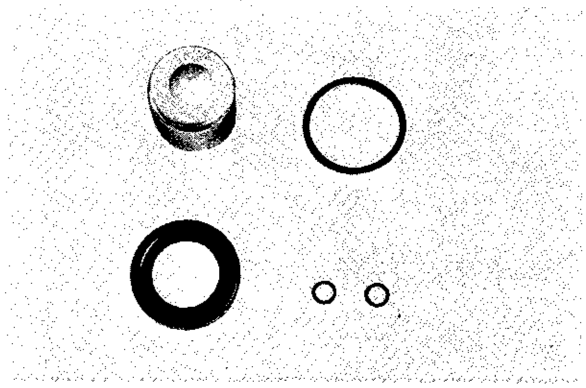


Fig. 10-89.

ASSEMBLY

- Apply brake fluid to the piston seal ① and fit it into the caliper body.

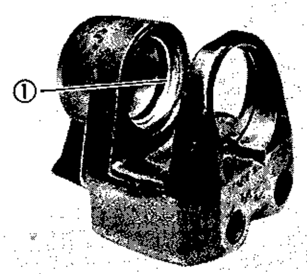


Fig. 10-90.

- Fit the caliper holder ①, to the body, taking care not to damage the dust seal.
- Apply brake fluid to the piston, and insert it into the bore.

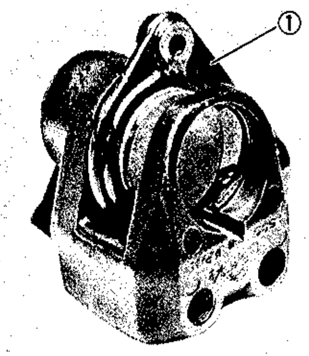


Fig. 10-91.

- Coat caliper axle bolts ① with SUZUKI PBC grease ②, and install the bolts. Mount the caliper assembly, securing it to the front fork. Check that the pads are not in an abnormal dragging condition — dragging excessively on the disc.

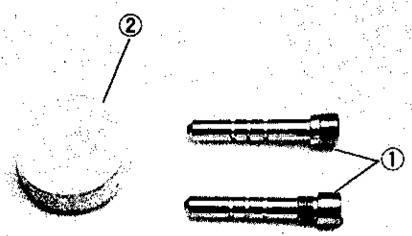
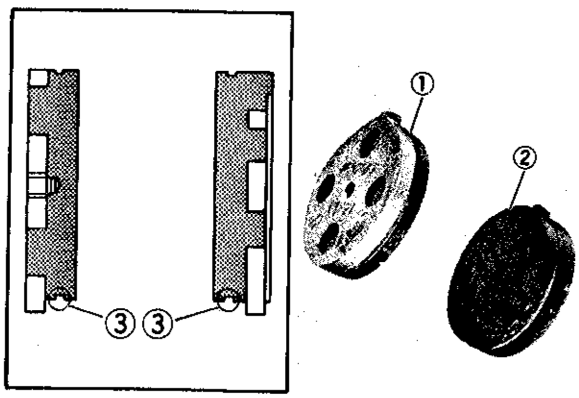


Fig. 10-92.

INSPECTION

- Check brake pads for wear. A pad worn down to the limit (indicated by the red groove on the edge) must be replaced.



1. Pad No. 2
2. Pad No. 1
3. Red groove

Fig. 10-93.

- Using a micrometer, measure the piston and bore to check that their diameters are within the limits. Use a cylinder gauge to take the reading on the bore.

Diameter	Standard	Service limit	
Bore	42.85 mm (1.687 in.)	Over	42.89 mm (1.689 in.)
Piston	42.82 mm (1.686 in.)	Under	42.77 mm (1.684 in.)

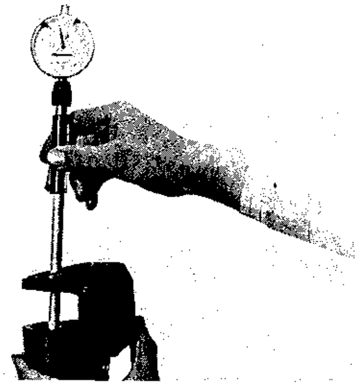


Fig. 10-94.

- Inspect the piston seal and boot for wear and damage.
- Examine the caliper body for damage.

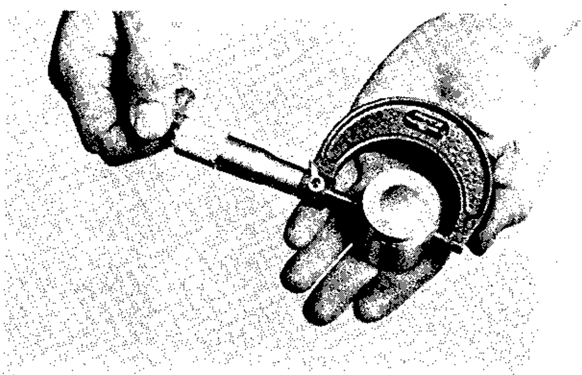


Fig. 10-95.

BRAKE PARTS TO BE PERIODICALLY REPLACED

Brakes are critical safety components which must be maintained in peak condition at all times. In view of this requirement, the following brake parts of the Model GS1000 should all be simultaneously replaced at intervals of two years.

The parts named are subject to wear or deterioration but may continue to work satisfactorily beyond the two-year interval. Experience, however, tells that replacement after each two years is justified from standpoints of safety and economy. Adherence to this rule is strongly recommended.

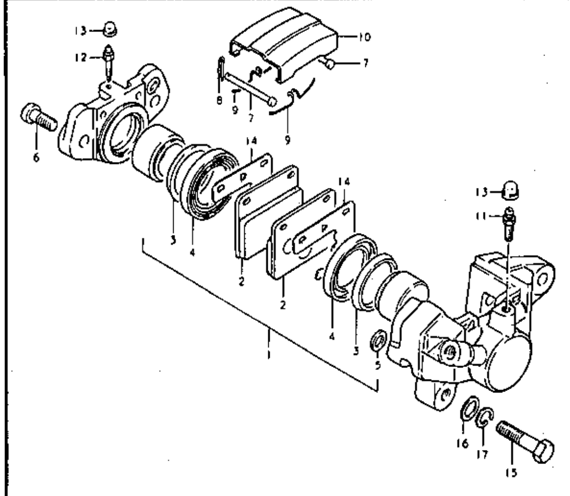
Replacement interval: Two years

- Components of master cylinder assembly (Use Suzuki Genuine parts: Master cylinder cup set)
- Component of caliper assembly (Use Suzuki Genuine parts: Pad and piston set)

NOTE:
Pad and piston set includes two kinds of grease packed in pouch. Grease in the pouch printed "PBC Grease" should be used for the caliper axle and printed "Silicone Grease" for the pad No. 1.

CAUTION:
Be sure to wash all component parts in the above sets with clean brake fluid before installing them into the master cylinder or caliper.

REAR BRAKE CALIPER



1.	Piston and pad set	10.	Dust cover
2.	Pad	11.	Breather, No. 1
3.	Seal, piston	12.	Breather, No. 2
4.	Boot, piston	13.	Cap
5.	Seal, piston	14.	Shim
6.	Bolt, housing	15.	Bolt
7.	Pin	16.	Washer
8.	Clip	17.	Lock washer
9.	Spring		

Fig. 10-96.

REMOVAL

- Remove the oil hose union bolt.

CAUTION:
Loosening the oil hose union bolt ① causes the brake fluid to flow out. Block the brake fluid with a rag, etc., to avoid the brake fluid coming in contact with the motorcycle frame.

- Remove two caliper mounting bolts ②.
- Remove nut ③ together with the rear torque link bolt and rear caliper, and remove the wheel side bolt towards the wheel side.

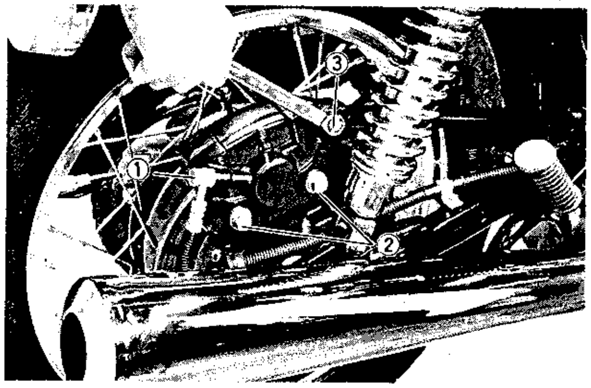


Fig. 10-97.

- Remove the caliper assembly from the motorcycle frame by drawing it upwards.

MOUNTING

- With the disc pad opened, insert the caliper assembly into the upper portion of the brake disc.
- Put the rear torque link bolt from the wheel.
- Secure it with the fastening nut temporarily.
- Next tighten the caliper mounting bolt.

Caliper mounting bolt tightening torque	2.0~3.0 kg-m (14.5~21.5 lb-ft)

- When reconnecting the brake hose to the caliper body, be sure to point the hose in the direction shown to keep the hose away from other parts.

IMPORTANT:
Most of the steps in reassembly of the front-brake caliper assembly are applicable also to the rear-brake caliper assembly.

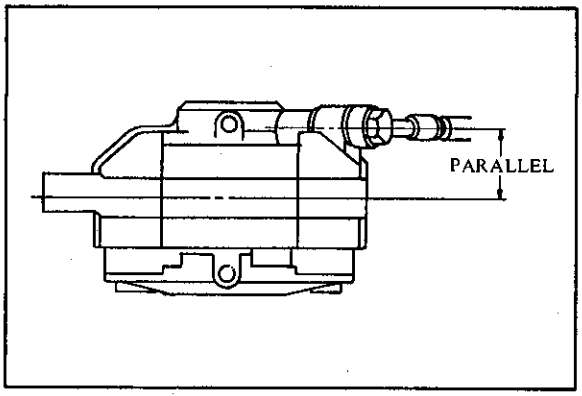


Fig. 10-98.

Brake hose union bolt tightening torque	1.5 ~ 2.5 kg-m (11.0 ~ 18.0 lb-ft)

- Remove the right frame cover.
- Remove the reservoir cap and pour the brake fluid.
- Bleed air from the caliper and the oil hose.

AIR BLEEDING OF THE BRAKE FLUID CIRCUIT

- Refer to the procedure outlined in FRONT-BRAKE ASSEMBLY; the underlying principles are the same. Differences, however, are due to the fact that the master cylinder is actuated by a pedal and that there are two bleeder valves. Bleed air out from the inboard valve first, and then from the outboard valve.
- Operate the pedal in the way the brake lever is operated to drive air out. The pedal being depressed will yield and go down as the fluid is spilled into the receptacle; in the case of the front brake, the lever touches the handlebar. When the pedal is about 40 mm (1.6 in.) from the footrest when depressing, close the bleeder valve and release the pedal. Repeat the process of pumping and depressing the pedal until no air bubbles appear in the receptacle.

Bleeder valve tightening torque	0.6 ~ 0.9 kg-m (4.5 ~ 6.5 lb-ft)

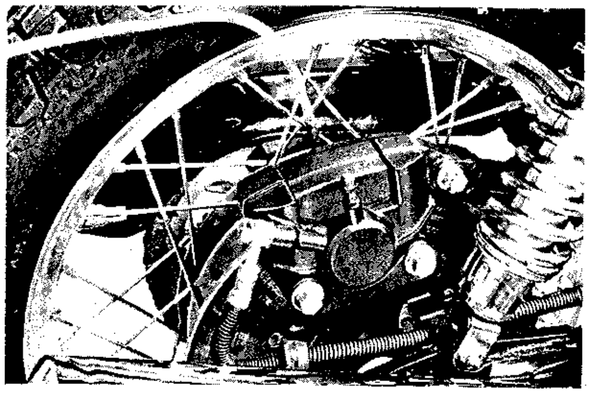


Fig. 10-99.

CAUTION:
As in the case of front-brake caliper assembly, it is essential that the air bleeding operation be carried out after restoring the rear brake system to the operating condition.

- After completion of air bleeding, tighten the rear torque link nut and install retaining pin.

Rear torque link nut tightening torque	2.0 ~ 3.0 kg-m (14.5 ~ 21.5 lb-ft)

BRAKE PEDAL ADJUSTMENT

Adjust the pedal height in the following manner:

- Loosen lock nut ①. Loosen the return stopper bolt ② on the brake pedal.
- Loosen lock nut ③. Rotate the pushrod ④ to bring the pedal to the elevation 10 mm (0.39 in.) below the top face of the footrest; and secure the pedal there by tightening the nut ③.
- Adjust the clearance between pedal arm and return stopper to 0.5 mm (0.02 in.), and tighten lock nut ①.

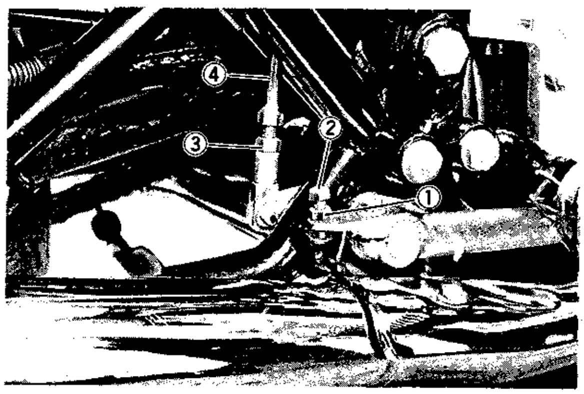
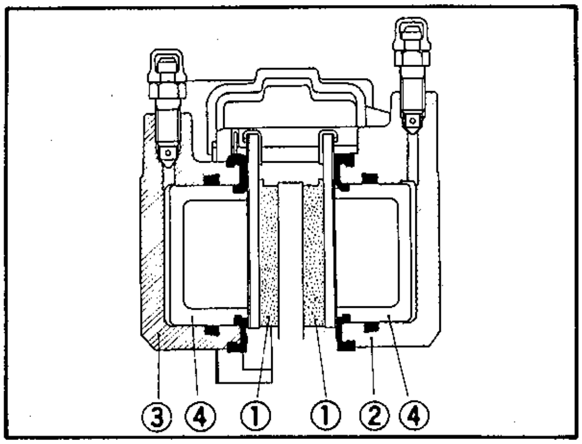


Fig. 10-100.

PAD REPLACEMENT

- The pads can be replaced with the caliper assembly in place, by removing the pins supporting the pads and their stop pins and springs, but this method is not recommendable because the piston boots might-also come off and, it is almost impossible to accurately refit the boot when the assembly is in place. Reliable and accurate replacement is ensured by first removing the caliper assembly.

DISASSEMBLY OF REAR BRAKE CALIPER



1. Pad
2. Left caliper body
3. Right caliper body
4. Piston

Fig. 10-102.

- Remove the pad inspection cap. Draw out the two pins ① supporting each pad: a stop pin ② must be pulled off first from the end of each pin ②. At the same time, remove two springs ③.

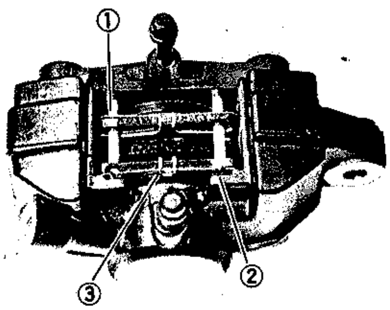


Fig. 10-103.

- Remove the two bolts fastening the two caliper body halves together, and separate the two halves.

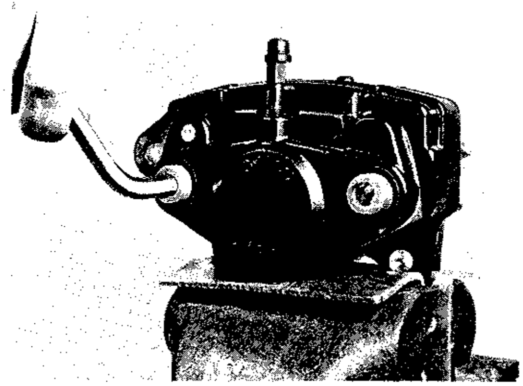


Fig. 10-104.

- Remove the boot from each piston. Apply compressed air (2 kg/cm^2, 28 psi) to the internal fluid passage to force each piston out of the bores.

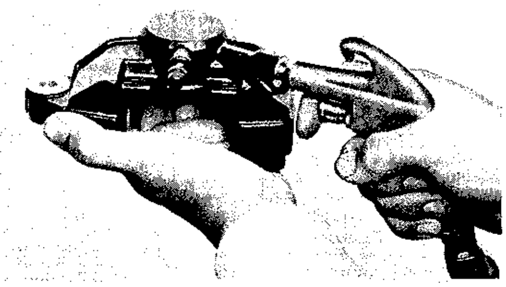


Fig. 10-105.

ASSEMBLY

- Reassemble in the reverse order to disassembly paying attention to the following points.
- Wash the pistons, piston boots, rubber seal and caliper body halves with fresh brake fluid just before reassembling each part : reassemble while washing.

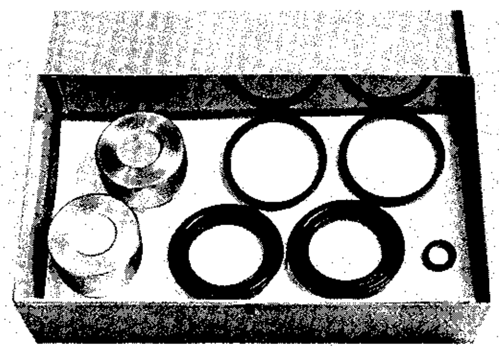


Fig. 10-106.

- Fasten the two body halves, tighten the two bolts to the torque specified below:

Rear brake caliper axle bolt tightening torque	2.5 ~ 3.5 kg-m (18.0 ~ 25.5 lb-ft)

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

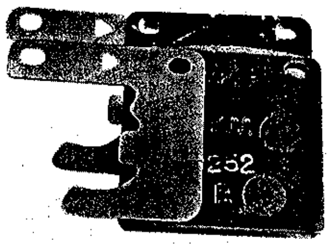


Fig. 10-107.

- Insert the pin into the caliper body from the wheel side.
- Run the pin through shims and pad into the opposite caliper body.
- Hook the two springs onto the lower part of the pin.
- While holding the springs with fingers, insert the other pin through the shims and pad into the caliper body.
- Set the stop pin into the pin hole.
- Place the inspection cap back on the brake pad.
- Bleed the air from the system.

INSPECTION

- Measure the cylinder bore and piston to see whether these diameters are within the limits. Replacement is necessary where the limits are exceeded.

Diameter	Standard	Service limit	
Bore	38.18 mm (1.503 in.)	Over	38.19 mm (1.504 in.)
Piston	38.15 mm (1.502 in.)	Under	38.13 mm (1.501 in.)

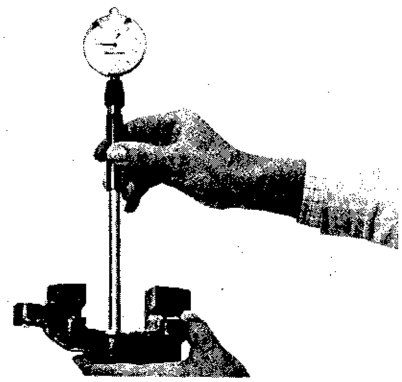


Fig. 10-108.

- Inspect the piston boot and seal of each piston for wear and damage.

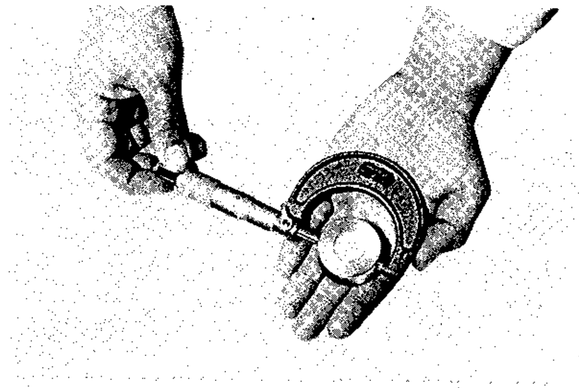


Fig. 10-109.

- Check brake pads for wear. Each pad is stepped at its edge to present two edge faces, one being painted red and the other being 1.5 mm (0.06 in.) ① thick. The pad may be kept in service until this 1.5 mm (0.06 in.) face disappears due to wear.

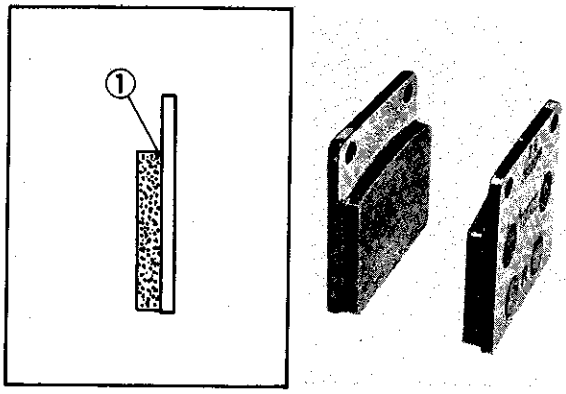
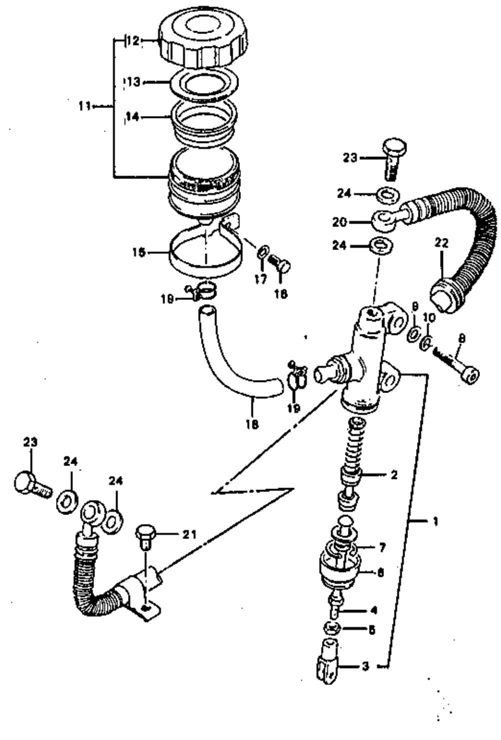


Fig. 10-110.

REAR MASTER CYLINDER



1. Rear master cylinder ass'y	13. Diaphragm plate
2. Piston and cup set	14. Diaphragm
3. Yoke	15. Clamp
4. Push rod	16. Bolt
5. Nut	17. Lock washer
6. Boot	18. Hose
7. Circlip	19. Clamp
8. Bolt	20. Rear brake hose
9. Washer	21. Bolt
10. Lock washer	22. Grommet
11. Reservoir tank ass'y	23. Union bolt
12. Cap	24. Gasket

Fig. 10-111.

REMOVAL

- Remove the right-hand front step ①, and lower the rear brake pedal ②.
- Pull off the split pin ③ from the lower end of pushrod, and disconnect the master cylinder rod from the brake pedal arm.
- Remove the spring for the rear brake lamp switch.
- Remove the right frame cover.

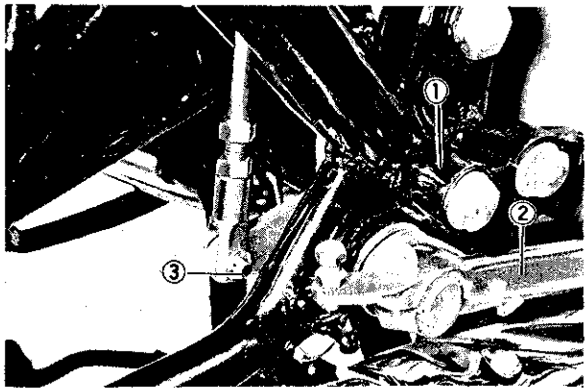


Fig. 10-112.

- Remove the union bolt ① securing the brake hose.

NOTE:
Drain the brake fluid from the reservoir beforehand since the brake fluid will flow out. Take care not to allow the brake fluid coming in contact with the motorcycle frame. If any brake fluid touches the frame, wipe it off completely with a rag.

- Remove the two bolts ② securing the master cylinder to the frame, and lower the cylinder.

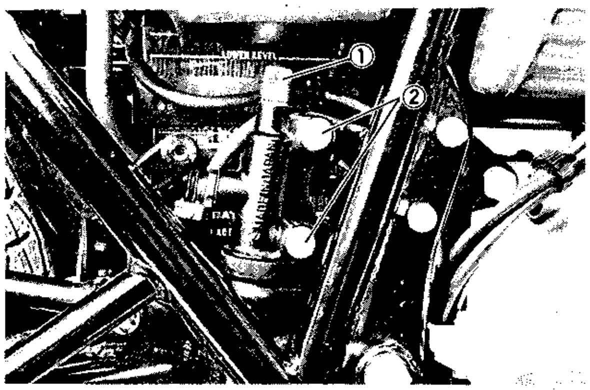


Fig. 10-113.

- Remove bolt ① securing the reservoir and remove the reservoir from the frame.

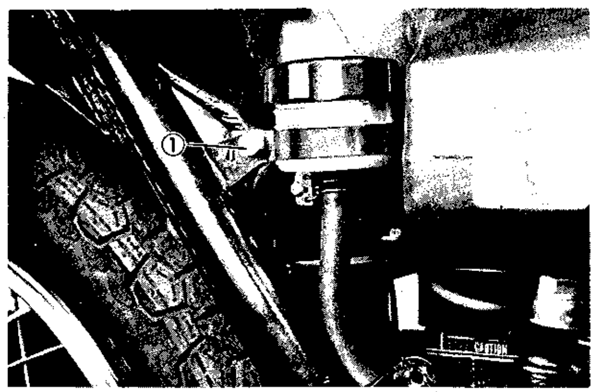


Fig. 10-114.

MOUNTING

- Fasten the reservoir with one bolt.
- Insert the cylinder master rod into the brake arm.
- Fasten the master cylinder with two bolts.

Rear brake master cylinder mounting bolt tightening torque	1.5～2.5 kg-m (11.0～18.0 lb-ft)

- Position the master cylinder rod and the brake arm with a pin and secure them with a split pin.

NOTE:
Insert the pin from the frame side, insert a washer and connect the rod with the arm through the split pin.

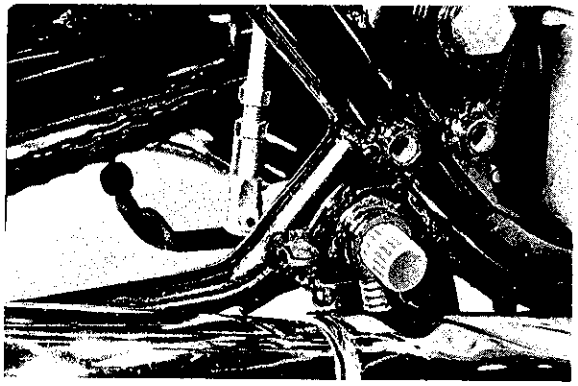


Fig. 10-115.

- When installing the brake pedal, be sure to align the match marks at the pivot part, thereby positioning the pedal correctly. After securing the pedal, install the foot rests.

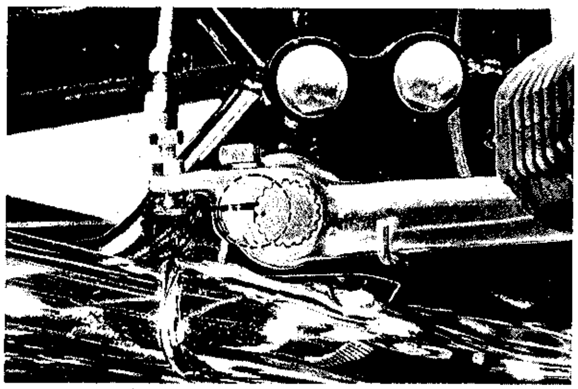
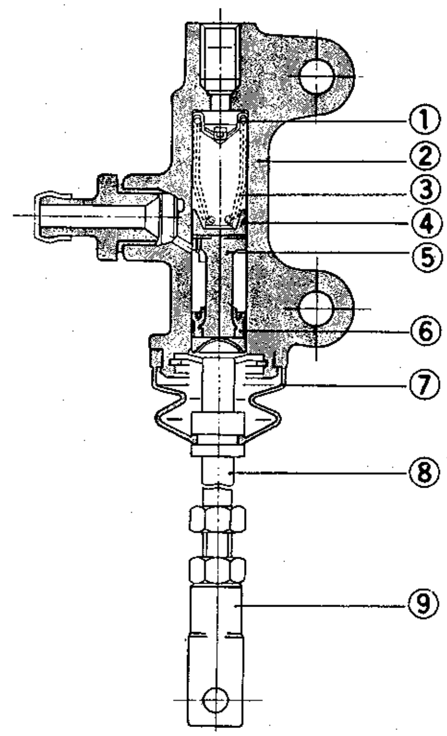


Fig. 10-116.

- Carry out air bleeding operation as indicated previously. (See page 10-31).
- Adjust the brake pedal height as indicated below: (See page 10-31).

DISASSEMBLY OF MASTER CYLINDER



1. Check valve
2. Master cylinder body
3. Spring
4. Primary cup
5. Piston
6. Secondary cup
7. Boot
8. Push rod
9. Yoke

Fig. 10-117.

- Loosen the clip screw on the master cylinder side and extract the brake hose from the master cylinder.
- Take off the boot, and take out the circlip by using the special tool ①.

①	09900-06105	Snaping plier

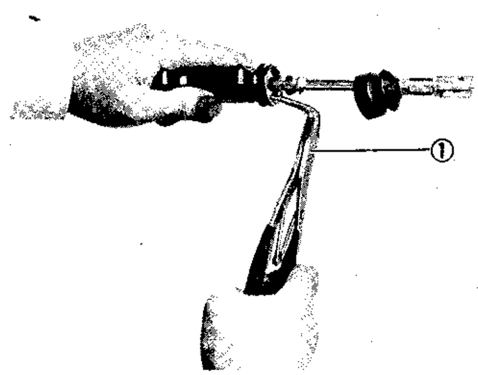


Fig. 10-118.

- Take out piston, check valve, coil spring and primary cup from the cylinder.

> *NOTE:*
> *Using a piece of wood or soft-metal, push these internals out of the cylinder bore, taking care not to nick or scratch the bore wall. Be careful, too, not to damage the parts.*

ASSEMBLY

Reassemble the master cylinder in the reverse order to disassembly with taking the following additional steps:

- Be sure to apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.
- Assemble the check valve, coil spring and primary cup outside the cylinder, and insert the assembly into the bore, taking care not to unseat the coil spring off the check valve. Remember, the spring can easily come off the valve. Be careful not to allow the primary cup to cock inside the bore.
- It is advisable to replace the primary cup unless the cup removed in disassembly is in perfect condition.

> *CAUTION:*
> *Always install the circlip with the sharp edge away from the spring.*

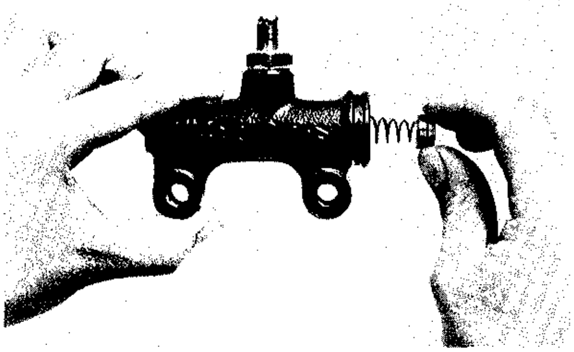


Fig. 10-119.

- After fitting the circlip, try to turn it in place to make sure it is snugly seated in the groove. Use of a replacement circlip is advisable to re-using the one removed in disassembly.

INSPECTION

- Using a micrometer, measure the cylinder bore and piston to see whether their diameters are within the limits; if not, replace the cylinder or piston or both.

Diameter	Standard	Service limit	
Bore	14.00 mm (0.551 in.)	Over	14.05 mm (0.553 in.)
Piston	13.96 mm (0.550 in.)	Under	13.94 mm (0.549 in.)

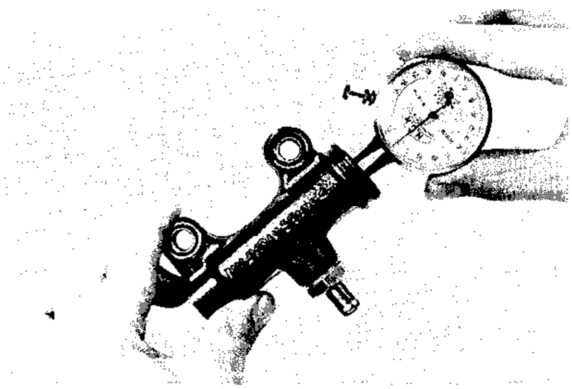


Fig. 10-120.

- Inspect the primary cup and boot for wear and damage and, if necessary, replace them.

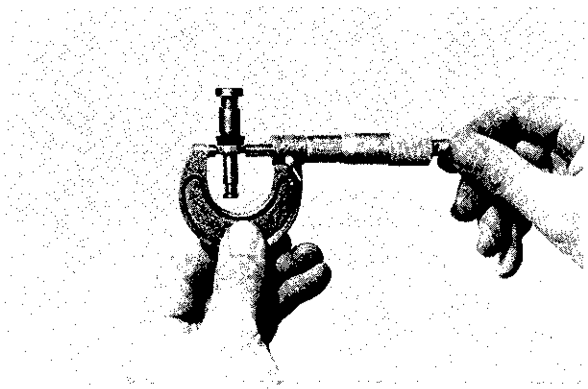
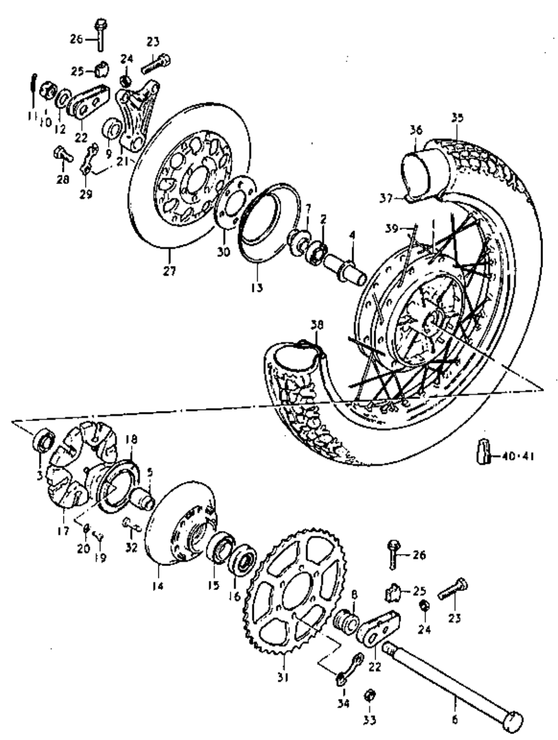


Fig. 10-121.

REAR WHEEL



1.	Hub	22.	Adjuster, chain
2.	Bearing, RH	23.	Bolt
3.	Bearing, LH	24.	Nut
4.	Spacer, bearing	25.	Supporter, chain adjuster
5.	Holder, bearing	26.	Bolt
6.	Axle, rear	27.	Disk, rear brake
7.	Spacer, RH	28.	Bolt
8.	Spacer, LH	29.	Lock washer
9.	Spacer, RH	30.	Shim, disc plate
10.	Nut	31.	Sprocket, rear
11.	Cotter pin	32.	Bolt
12.	Washer	33.	Nut
13.	Cover, hub	34.	Lock washer
14.	Drum, sprocket mounting	35.	Tire
15.	Bearing	36.	Tube, inner
16.	Oil seal	37.	Protector
17.	Cushion	38.	Rim
18.	Plate, cushion	39.	Spoke set
19.	Screw	40.	Balancer
20.	Lock washer	41.	Balancer
21.	Bracket, rear caliper		

Fig. 10-122.

REMOVAL

- Remove the two bolts securing the chain case, and take off the case.

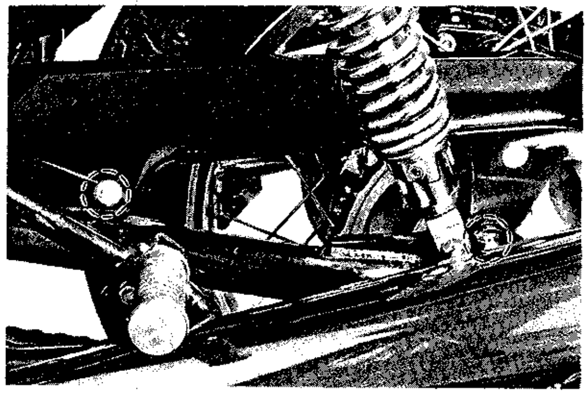


Fig. 10-123.

- Pull the cotter pin ① off the axle nut ②, loosen the nut, and remove the two chain adjustor support bolts ③, right and left.

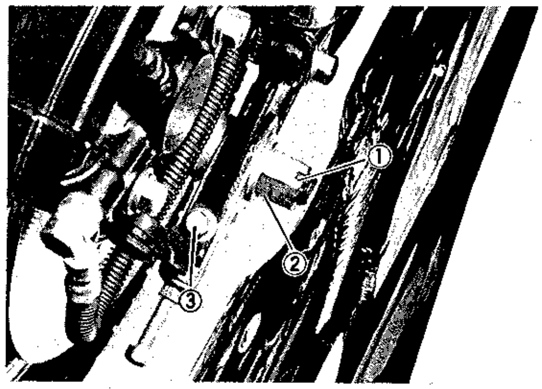


Fig. 10-124.

- Remove the two bolts ① securing the caliper, and also the torque link rear nut ② and split pin ③.

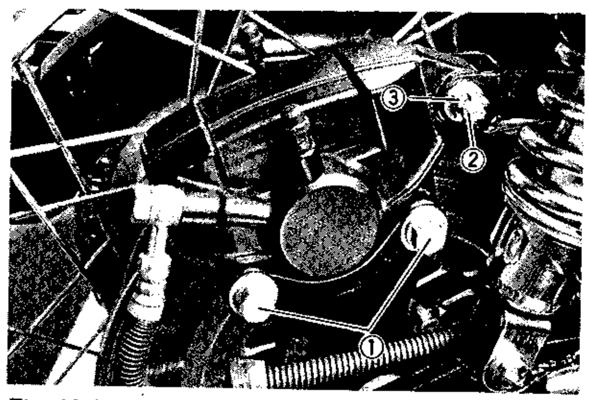


Fig. 10-125.

- Separate the caliper assembly from the disc and take it off the machine.

NOTE:
- *This removal will be greatly facilitated if the caliper assembly is suspended with a sling, as shown, at the time of loosening its securing bolts for removal.*
- *Be careful not to bend the brake hose when taking the caliper assembly out.*

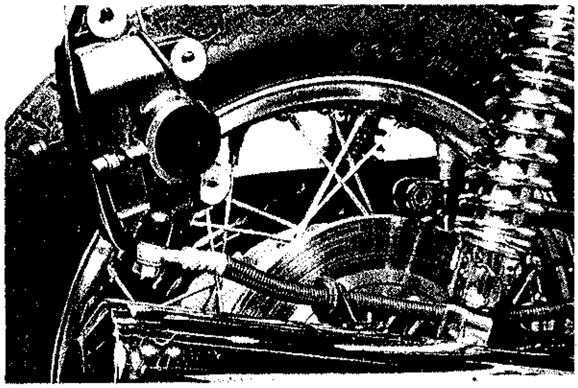


Fig. 10-126.

- Loosen the two chain adjustor bolts, right and left. Turn down both adjustors ①; push the wheel forward; and disengage the drive chain from the sprocket, displacing the chain toward the outer side.

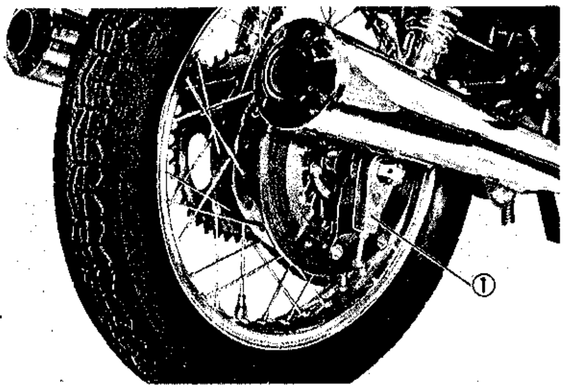


Fig. 10-127.

- Tilt the wheel and withdraw it from the frame.
- Remove the axle nut, and draw the axle off the wheel.

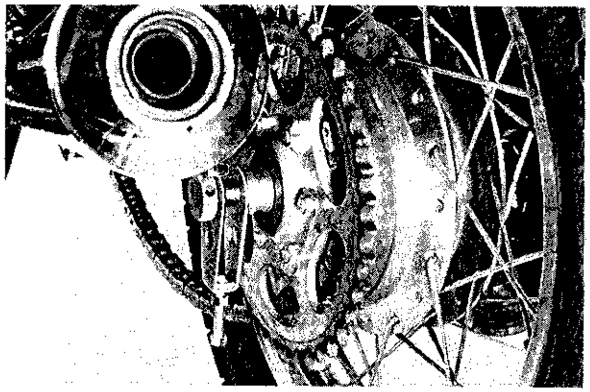


Fig. 10-128.

- The brake disk is secured to the wheel hub by 6 bolts, each being locked with a washer. Bend up the lock washer, remove the bolts and separate the disc from wheel.

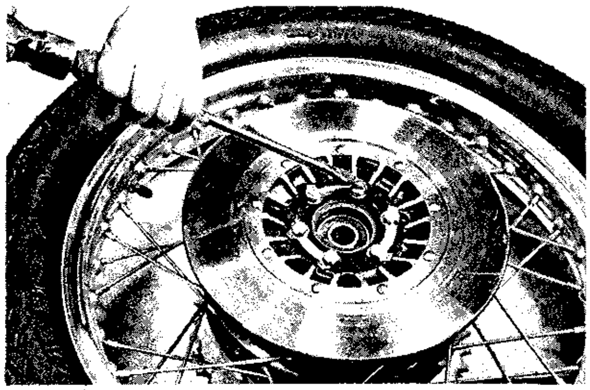


Fig. 10-129.

- Remove the sprocket. This is accomplished by unlocking its 6 securing nuts, and removing the bolts and nuts to free the sprocket.

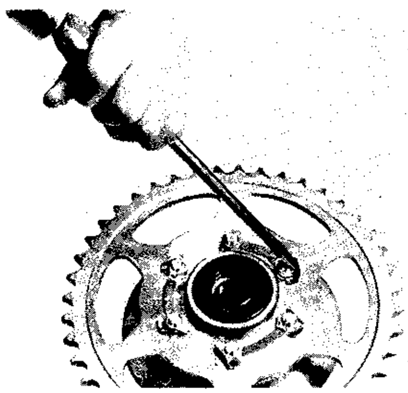


Fig. 10-130.

- Using the special tool ①, remove oil seals and bearings from the sprocket drum.

①	09914-79610	Bearing oil seal installer

NOTE:
Do not re-use the removed oil seal: replace oil seal with new one in reassembly.

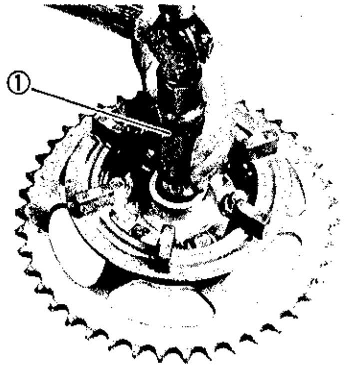


Fig. 10-131.

ASSEMBLY

- Assemble parts in the reverse order of removal.
- Reassemble and remount the rear wheel in the reverse order of removal and disassembly, and by carrying out the following additional steps:
- Before fitting the oil seals to the sprocket drum, be sure to oil the seals.
- Deposit the chain on the inner side of the sprocket before inserting the axle shaft.

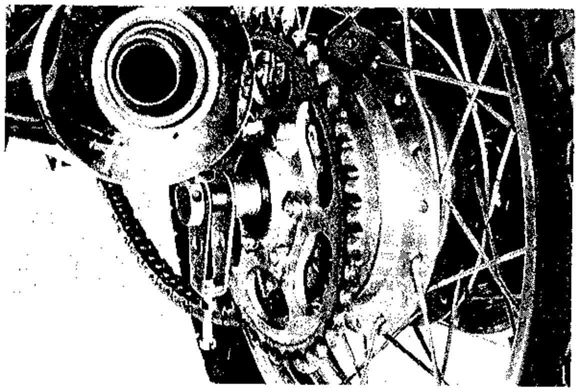


Fig. 10-132.

- After positioning the wheel in place, with the axle inserted, make tighten the axle nut finger-tight. Make sure that each chain adjustor is in place with its graduated scale coming on the outer side: correctly distinguish the right-hand adjustor from the left-hand adjustor.
- After resting the wheel on the swing arm, engage the drive chain with the sprocket, and then insert the chain adjustor supports.
- After setting the chain adjustors in place, fit the torque link rear bolts and nuts and leave them snug-tight.

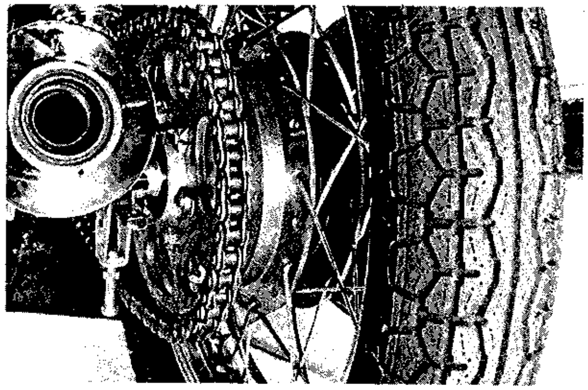


Fig. 10-133.

- Install the caliper assembly, making its securing bolts snug-tight, and then firmly tighten the chain adjustor support bolts. Now the drive chain is ready to be tautened to provide the specified amount of sag.

Drive chain sag	20 mm (0.8 in.)

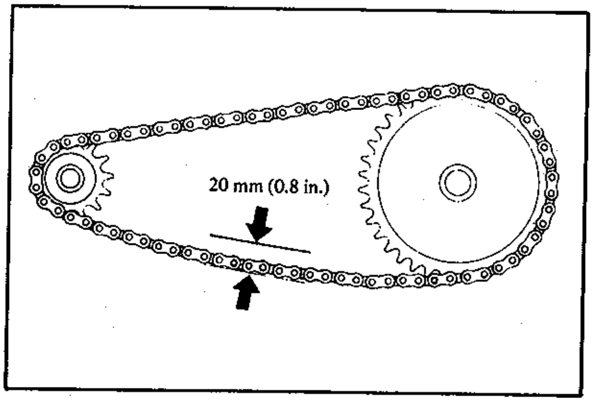


Fig. 10-134.

NOTE:
If the indicator mark ① on chain adjuster aligns with the end of swing arm ②, replace the drive chain with a new one.

CAUTION:
Never allow the chain slack to exceed 50 mm (2 in).

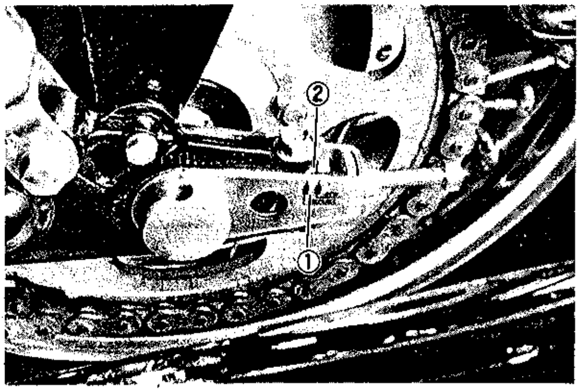


Fig. 10-135.

CAUTION:
The standard drive chain is TAKASAGO RK630 GSO. SUZUKI recommends that the above-mentioned standard drive chain be used for the replacement.

- Further, since the drive chain of GS1000 is different from the one of GS750 in accuracy, material, etc., while similar in pitch and number of links, do not use the drive chain of GS750 for GS1000.
- After firmly tightening the axle nut and locking it by inserting the split pin, spin the rear wheel by hand and apply the brake lightly to "feel" the drag of the brake pads. Adjust the caliper assembly so that its pads exert a minimum of drag, if any, on the disk. With the caliper adjusted to that position, firmly tighten its securing bolts to the specified torque value indicated above.
- Firmly tighten the torque link rear nuts to the specified torque, and lock each nut by inserting a split pin.

Tightening torque

Rear axle shaft nut	8.5 ~ 11.5 kg-m (61.5 ~ 83.0 lb-ft)
Rear brake caliper mounting bolt	2.0 ~ 3.0 kg-m (14.5 ~ 21.5 lb-ft)
Torque link nut	2.0 ~ 3.0 kg-m (14.5 ~ 21.5 lb-ft)
Chain adjuster support bolt	1.0 ~ 1.5 kg-m (7.5 ~ 11.0 lb-ft)

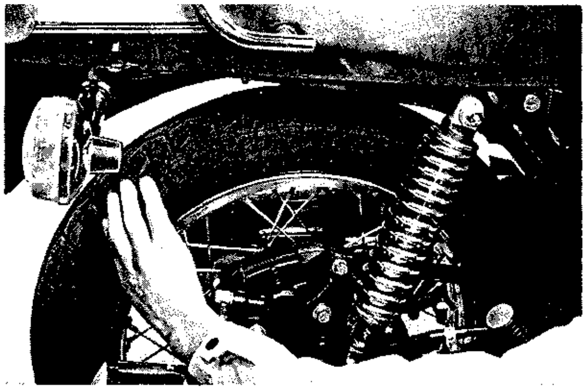


Fig. 10-136.

INSPECTION

CHAIN CLEANING AND OILING

At intervals of 600 miles (1,000 km) clean and oil the chain, as follows:

- **Cleaning by washing**
  Wash the chain with kerosene. If the chain tends to rust faster, the interval must be shortened.
- **Oiling**
  After washing and drying the chain, oil it with heavy motor oil.

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

CAUTION:
Do not use trichlene, gasoline or any similar fluids: these fluids have a dissolving power too high for this chain and, moreover, they can damage the "O" rings sealing the grease in the bush-to-pin clearance. Remember, high durability comes from the presence of grease in that clearance.

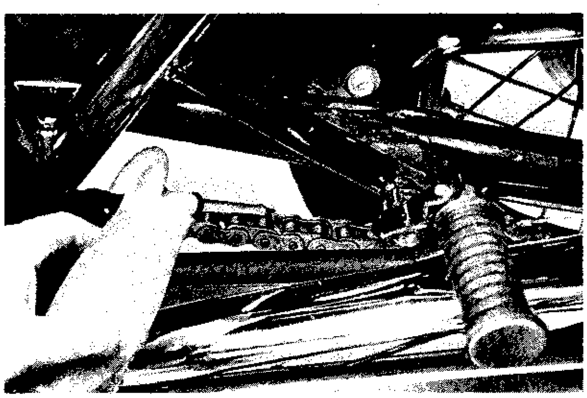


Fig. 10-137.

- There is practically no difference between front wheel and rear wheel as far as the items of inspection and checking are concerned. As to the methods and inspection criteria, refer to "INSPECTION, FRONT WHEEL". Items are as follows:
- Brake disc thickness
- Spoke tightness, distortion and damage
- Wheel tire tread depth
- Wheel rim runouts, radial and axial.
- Wheel bearing wear
- Axle shaft deflection
- Tire inflation pressure
- Wheel dynamic balance
- Wheel hub wear
- Inspect the wheel hub cushion for cracks or any other damage.
- Inspect the sprocket drum oil seal for distortion, wear and damage.

Checking the sprockets for wear

- Sprockets that have become excessively worn cause chain noise and greatly accelerate chain and sprocket wear. The sprockets should be checked for wear when the chain is removed. Visually inspect the sprocket teeth. If they are worn as illustrated, replace the sprocket.

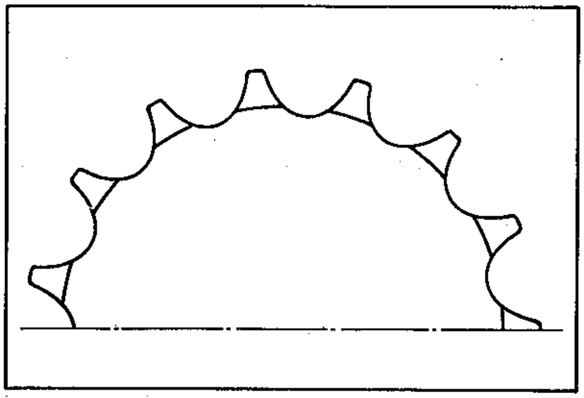


Fig. 10-138. Proper wear condition

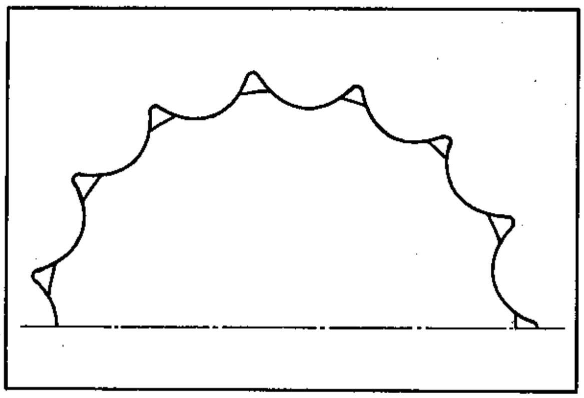


Fig. 10-139. Excessive wear condition

Adjustment of wheel alignment

- Set the alignment gauges (09827-00001) to the rims of the front and rear wheels to check them in the manner shown in the drawing. The difference of alignment between the front and rear wheels shall be within 3 mm (0.01 in.).

09827-00001	Alignment gauge

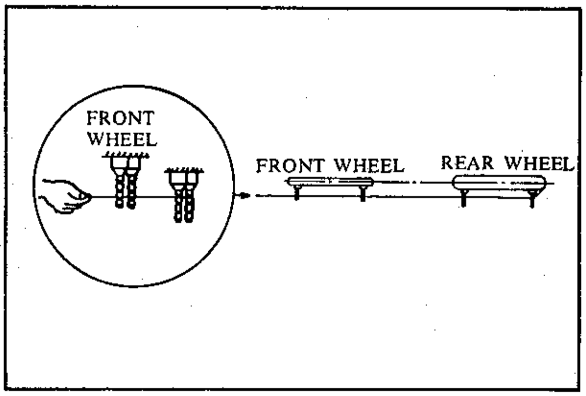


Fig. 10-140.

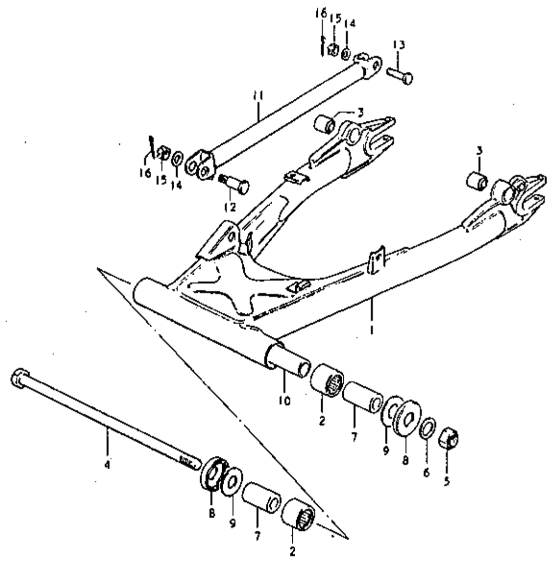
Removal of drive chain

- Remove the drive chain.
  See page 10-42 with respect to the procedure for removing the swinging arm.
- Remove the gearshift lever (see page 7-3).
- Remove the screw to remove the sprocket cover (see page 7-3).
- Remove the nut to remove the engine sprocket (see page 7-4).

MOUNTING

- Mount parts in the reverse order of removal.
- Adjust the play of drive chain (see page 10-39).

SWINGING ARM



1.	Rear swinging arm set	9.	Washer
2.	Bearing	10.	Spacer, center
3.	Bushing, rear	11.	Torque link, rear
4.	Shaft, pivot	12.	Bolt, front
5.	Nut	13.	Bolt, rear
6.	Washer	14.	Washer
7.	Spacer	15.	Nut
8.	Cover, dust seal	16.	Cotter pin

Fig. 10-141.

REMOVAL

- Remove the rear brake caliper (see page 10-30).
- Remove the drive chain case (see page 10-37).
- Remove the rear wheel (see page 10-37).
- Remove the rear brake pedal and front foot rest (see page 10-34).
- Remove the frame left cover and then the rear master cylinder (see page 10-34).
- Loosen the fastening bolts on the lower portion of the rear shock absorber.
- Remove the upper left and right nuts fastening the rear shock absorber to remove the nuts from the motorcycle frame.
- Lift the swinging arm to remove bolts on the lower portion of the absorber to remove it from the motorcycle frame.
- Remove the pivot shaft nut to extract the pivot shaft from the motorcycle frame to the right side.

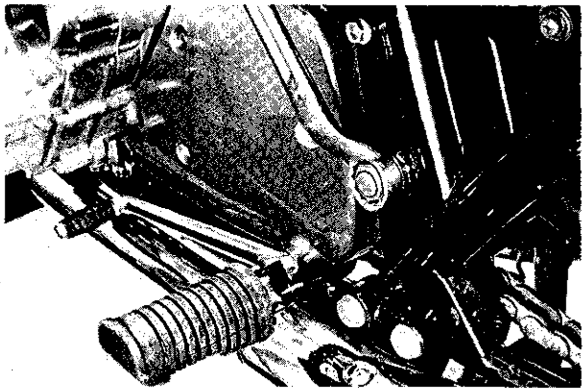


Fig. 10-142.

- From the removed swinging arm, disconnect the torque link, free the brake oil line secured to the arm, and take off the caliper and master cylinder together with the brake oil line.

NOTE:
The swinging arm at this time is complete with the master cylinder and brake caliper. Be careful not to bend or twist the brake hose.

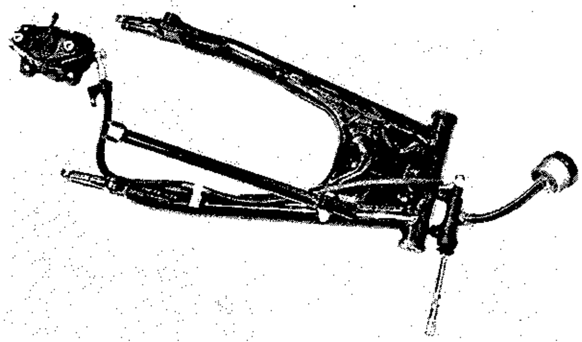


Fig. 10-143.

MOUNTING

- Firmly fit the dust seal on the bearing side.
- Place the master cylinder at the predetermined position.

CAUTION:
Suspend the rear caliper from the motorcycle frame by string so as not to bend the brake hose.

- Set the swinging arm to the predetermined position and insert the pivot shaft into the frame and the swinging arm from the right side.

NOTE:
Since there is a difference in level between the side spacer and the center spacer within the swinging arm, insert the pivot shaft while guiding with screw driver, etc. and tapping it lightly.

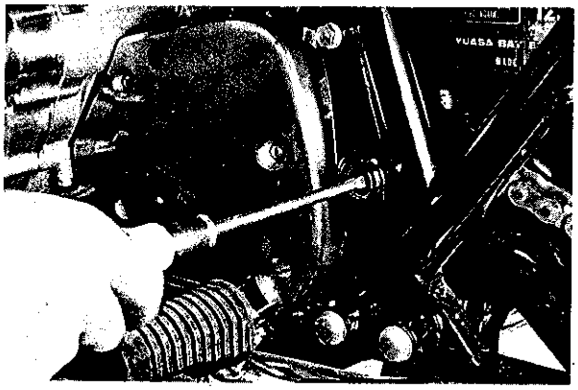


Fig. 10-144.

- Mount nut on the pivot shaft.

Pivot shaft nut tightening torque	5.0 ~ 8.0 kg-m (36.0 ~ 58.0 lb-ft)

- Lift the swinging arm to set the lower portion of the rear shock absorber to the swinging arm and temporarily tighten bolt.

Rear shock absorber bolts tightening torque after temporary securing	2.0 ~ 3.0 kg-m (14.5 ~ 21.5 lb-ft)

- Fit the rear shock absorber into the boss mounting the rear shock absorber on the frame side, put washers (1 pc of 3.2 mm and 2 pcs. of 2.3 mm from the nut side) and fasten the absorber with nut.

Rear shock absorber nuts tightening torque	2.0 ~ 3.0 kg-m (14.5 ~ 21.5 lb-ft)

- Tighten two bolts securing the master cylinder (see page 10-35).
- Mount the rear brake pedal and adjust the brake (see page 10-31).
- Mount the rear wheel (see page 10-39).
- Mount the chain case (see page 10-37).
- Mount the rear brake caliper (see page 10-30).
- Mount the frame cover on the frame and fasten it with one screw.
- Adjust the play of the drive chain (see page 10-39).

DISASSEMBLY OF SWINGING ARM BEARING

- Remove the dust seal at both sides of the swinging arm.
- Pull out by fingers the side spacers at both sides.
- Remove bearings at both sides by the use of special tool ①.

①	09941-44910	Swinging arm bearing puller

USE OF SPECIAL TOOL

- Turn the center screw ② of the tool clockwise to adjust the claw portion to the length of the bearing.
- Hold the end ③ of the tool on the swinging arm to set the handle ④ to the chuck.
- While turning the handle counterclockwise, open the claw portion. Then fix the center screw ② by a wrench to prevent it from turning idly (see Fig. 10-146).

CAUTION:
Take care not to set the claw portion on the bearing and guage. Apply the claw portion to the outside (bearing cage) of bearing.

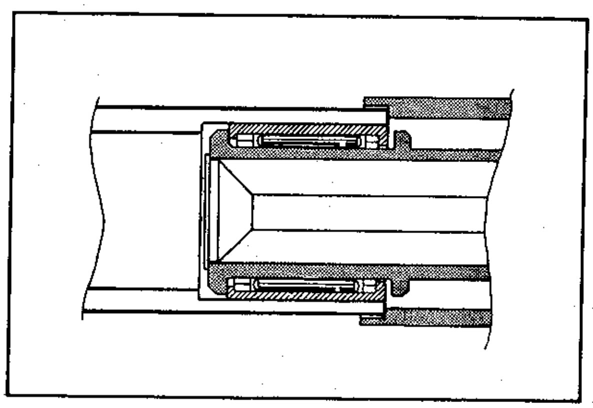


Fig. 10-145.

- After confirming it is firmly secured to the outside of the bearing, pull out the bearing while rotating the handle of the main body clockwise.

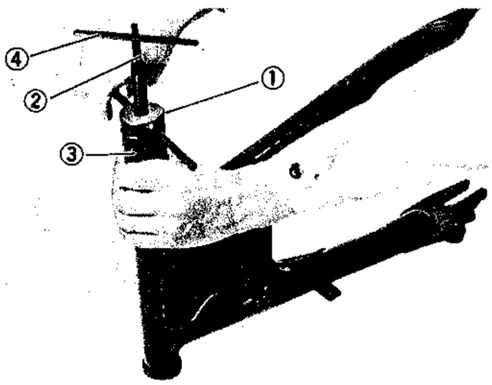


Fig. 10-146.

MOUNTING

- Wipe off fouling on the press fitted bearing portion with a rag, etc.

CAUTION:
Do not reuse the removed bearing. Replace it by a new one.

- Apply motor oil to the outer periphery of the new bearing and the press fitted bearing portion at the swing arm side.
- Apply a proper amount of water-resistant chassis grease to the interior of the bearing.
- Press in the bearing with the engraved mark directed outside.

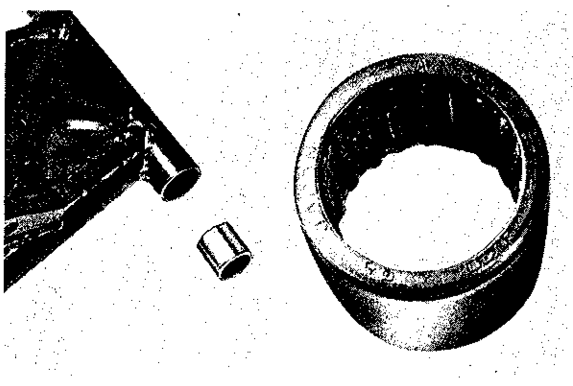


Fig. 10-147.

- Press in the bearings each at one side using the special tool ①.

①	09941-34511	Steering inner race and swing arm bearing installer

USE OF SPECIAL TOOL

- As shown in the drawing, use two tapered guides. Then set the guides with the tapered portion at the outside with reference to the swinging arm.

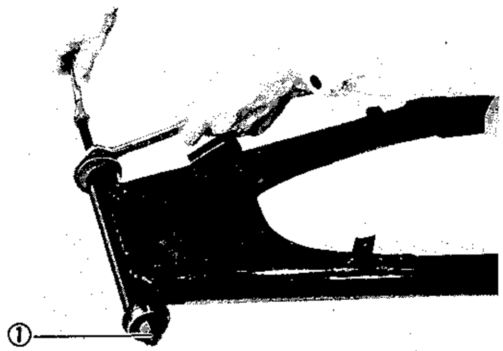


Fig. 10-148.

- Press in the bearing by turning the nut clockwise with a wrench until it locks.
  When it locks, tighten the nut once more to confirm it is locked.
- Insert the center spacer and similarly press in the bearing at the other side.
- After pressing in the bearings, insert the side placer.

NOTE:
Thoroughly wipe off any dirt on the side spacer and apply a proper amount of water-resistant chassis grease to the inside of the spacer.

- Fit the dust seal cover into the swinging arm.

CAUTION:
- *Confirm the absence of cracks or breakages on the lip of the dust seal. If any cracks or breakages are found, replace the dust seal by a new one.*
- *Apply a suitable amount of water-resistant chassis grease to the lip portion.*
- *When fitting the dust seal cover, caseless hammering may result in breakage of the lip.*

REAR SHOCK ABSORBER

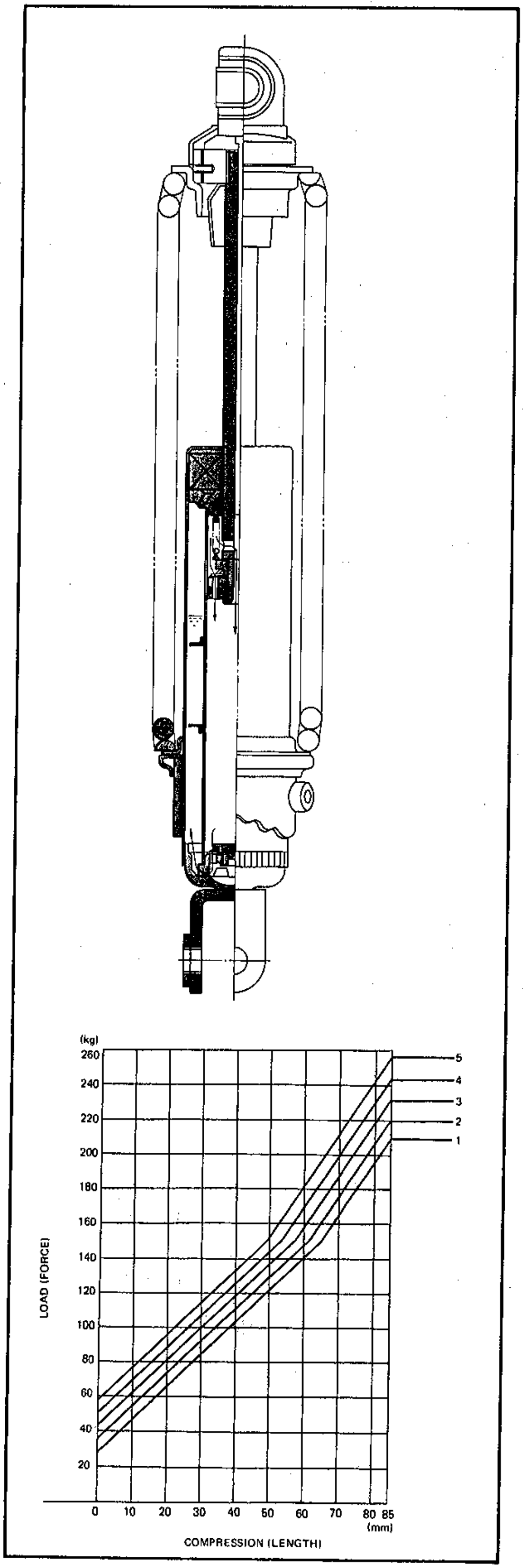


Fig. 10-149.

REAR SHOCK ABSORBERS

- The spring and damper settings of the rear shock absorbers can be varied. Spring preload can be changed in five steps, and damper force in four steps. The two settings provide the user with a choice of rear suspension "softness" to suit running speed and road conditions.

SPRING ADJUSTMENT

- At the bottom of each absorber, turn the spring seat, as shown in the photo, to bring another notch to the supporting lug. This alters the spring tension. The spring seats of both absorbers are factory-set at Notch 1 which is the softest spring setting.

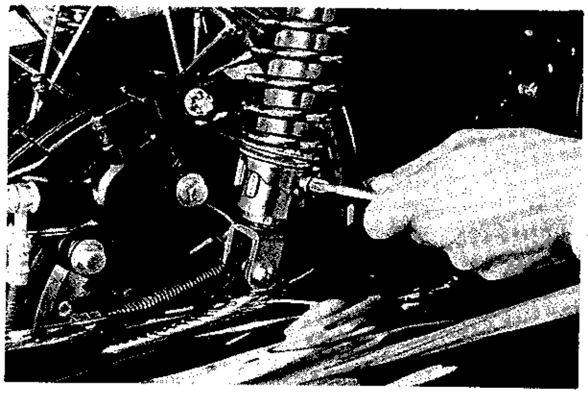


Fig. 10-150.

DAMPER ADJUSTMENT

- Roll up the rubber cap ① at the top end of each absorber to reveal damper force adjuster ②. To increase or decrease the damper force, turn this adjuster as shown in the photo. Numbers, 1 to 4, are engraved on the adjuster. As the adjuster is turned, it is arrested with a "click" at each numbered position.

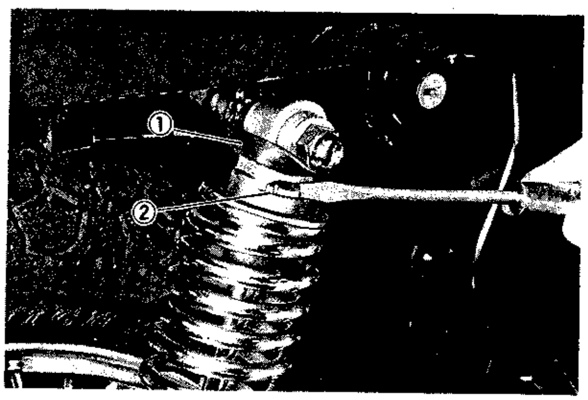


Fig. 10-151.

Be sure to leave the adjuster in a click position. Position 1 is for the smallest damper force, and position 4 for the largest. Position 1 is the factory setting.

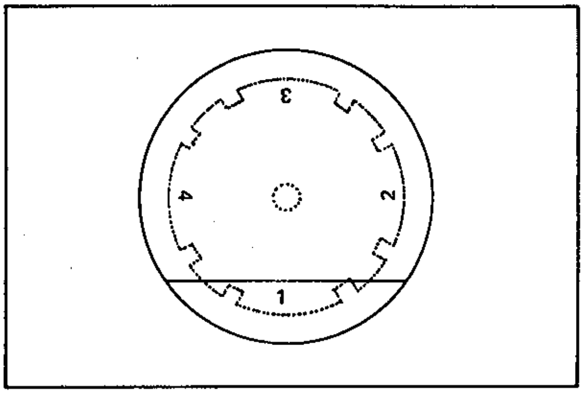


Fig. 10-152.

COMBINATION OF SPRING SETTING AND DAMPER SETTING

- At the factory, both spring and damper in the rear shock absorbers are set for the "softest" suspension, that is, spring in Notch 1 and damper in Position 1. This combination is calculated to provide the best cushioning effect for the average-build rider of 68 kg (150 lbs) for solo riding at about 60 miles/h (95 km/h) on the highway, without any accessories attached to the motorcycle.
- Rear shock absorber must be made "harder" if two persons on the motorcycle, if accessories are fitted to the motorcycle, or if the machine is to be driven over rough terrain. For stable cushioning, both spring and damper must be set similarly. The following is a list of recommended combinations:

Spring setting	Damper setting
I	1 or 2
II	2 or 3
III	3 or 4
IV	3 or 4
V	4

WARNING:
1) Any other combination than the above is dangerous. For safe riding, only use the recommended settings.
2) Be sure to adjust the springs and dampers of the two absorbers equally. Making one absorber harder than the other disturbs the running stability of the machine.
3) Match front suspension to rear suspension for balanced cushioning and for stable and safe riding. Readjusting the rear shock absorbers alone or the front fork alone is dangerous. Set the two suspensions similarly according to the list below:

SUSPENSION MATCH BETWEEN FRONT AND REAR

Spring setting	Damper	Front fork air pressure
I	1	0.8 kg/cm² (11 psi)
I	2	0.8～0.9 kg/cm² (11～13 psi)
II	2	0.8～0.9 kg/cm² (11～13 psi)
II	3	0.8～0.9 kg/cm² (11～13 psi)
III	3	1.0～1.1 kg/cm² (14～16 psi)
III	4	1.0～1.1 kg/cm² (14～16 psi)
IV	3	1.0～1.1 kg/cm² (14～16 psi)
IV	4	1.0～1.1 kg/cm² (14～16 psi)
V	4	1.2 kg/cm² (17 psi)

REMOVAL OF REAR SHOCK ABSORBER

- Remove the left and right nuts securing the rear shock absorber.
- Loosen bolts on the lower portion of the rear shock absorber.
- Remove the upper portion of the rear shock absorber from the boss portion.
- Lift the wheel with a jack so that the bolts on the lower part of the rear shock absorber do not interfere with the muffler.
- Remove the bolts to remove the absorber from the motorcycle frame.

ASSEMBLY

- Carry out assembly in the reverse order to removal.
- Tighten the bolts and nuts to the specified torque (see page 3-18).

Rear shock absorber bolts and nuts tightening torque	2.0 ~ 3.0 kg-m (14.5 ~ 21.5 lb-ft)

INSPECTION

- Inspect the hydraulic damper for evidence of oil leakage.
- Check the piston rod for distortion. Visually inspect the other internals for damage — cracks, dents, galling, etc.

NOTE:
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 need be replaced and the operational time on the remaining shock is minimal.

— MEMO —

ELECTRICAL SYSTEM

CONTENTS

11

ELECTRICAL SYSTEM

IGNITION SYSTEM

There are two ignition coils, two contact breakers and two condensers to produce sparking energy for the four spark plugs. No. 1 breaker is for Nos. 1 and 4 spark plugs; and No. 2 breaker is for Nos. 2 and 3 spark plugs. Each ignition coil is connected to the plugs as shown.

When No. 1 piston is up on its compression stroke, No. 4 piston is up on its exhaust stroke. The sparking action occurring at the same time in Nos. 1 and 4 cylinders present no problem, and the same applies to Nos. 2 and 3 cylinders. Ignition order is 1-2-4-3, as counted from left to right by the rider mounted the machine. It should be noted that Nos. 1 and 2 breakers operate 180 degrees apart in terms of crank angle.

Schematic diagram of ignition system

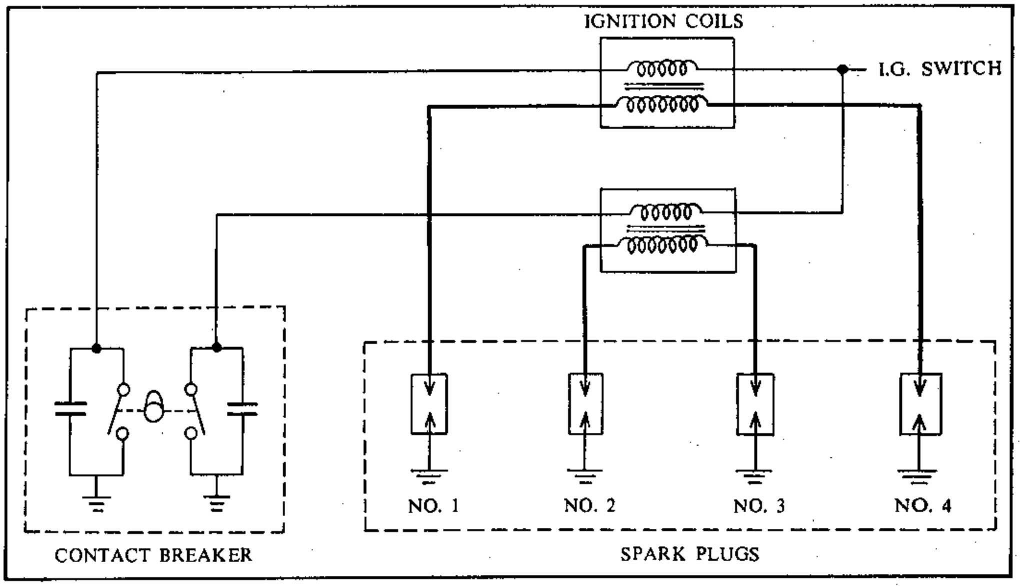


Fig. 11-1.

Ignition system data

Spark Plugs: Type Gap	 NGK B8ES or DENSO W24ES 0.6 ~ 0.8 mm (0.024 ~ 0.031 in.)
Three-Needle Sparking Distance of Ignition Coil	8 mm (0.3 in.) minimum
Contact Point Gap	0.35 mm (0.01 in.)
DENSO	0.18μF
Spark Advancer: Advance angle Beginning of advance End of advance	 20° 1,500 rpm 2,500 rpm
Ignition Coil Resistance: Primary Secondary	 2 ~ 6Ω 11 ~ 17kΩ

Ignition coils

Using the electro tester, test each ignition coil for sparking performance. Test connection is as indicated. Make sure that the three-needle sparking distance is at least of 8 mm (0.3 in.).

09900-28106	Electro tester

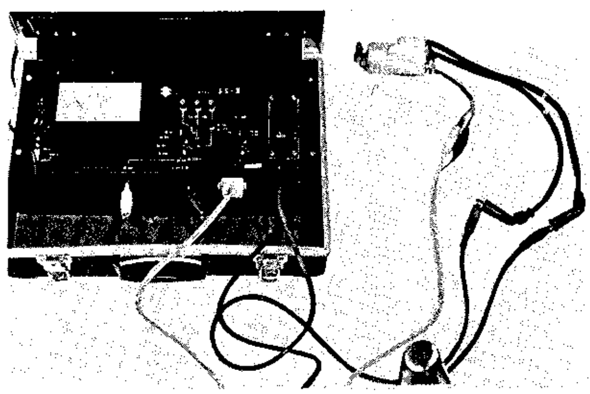


Fig. 11-2.

Contact breakers

Check and adjust the contact points as outlined on page 3-10. Inspect the contact points for wear and burning. If the surface of the points are dirty, wipe them clean with clean, dry cloth.

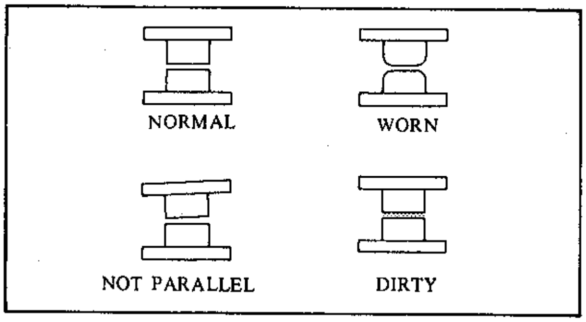


Fig. 11-3.

Condensers

Use the electro-tester to check each condenser for capacitance. When checking, be sure to lift the condenser off the breaker base plate by removing the screws securing it to the base.

Condenser capacitance	0.18 μF

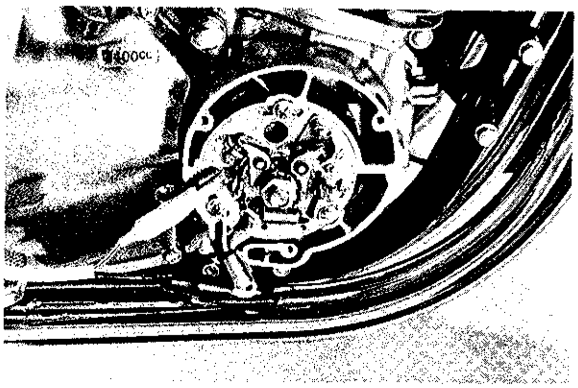


Fig. 11-4.

Checking advancing action

Upon starting up the engine, check engine speeds at which the ignition begins to advance or retard. Use the electro tester.

09900-28106	Electro tester

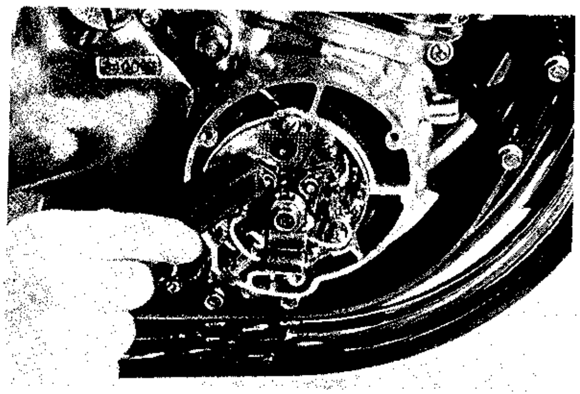


Fig. 11-5.

SPARK PLUG

Spark plugs ignite fuel/air mixture in the cylinder. For effective ignition at the required time, the correct plugs should always be used and they should be properly adjusted and cleaned.

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

NGK B8ES or NIPPON DENSO W24ES listed in the above 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 plug needs to be replaced, it is recommended that one having a heat range closest to the standard plug in the above table be selected.

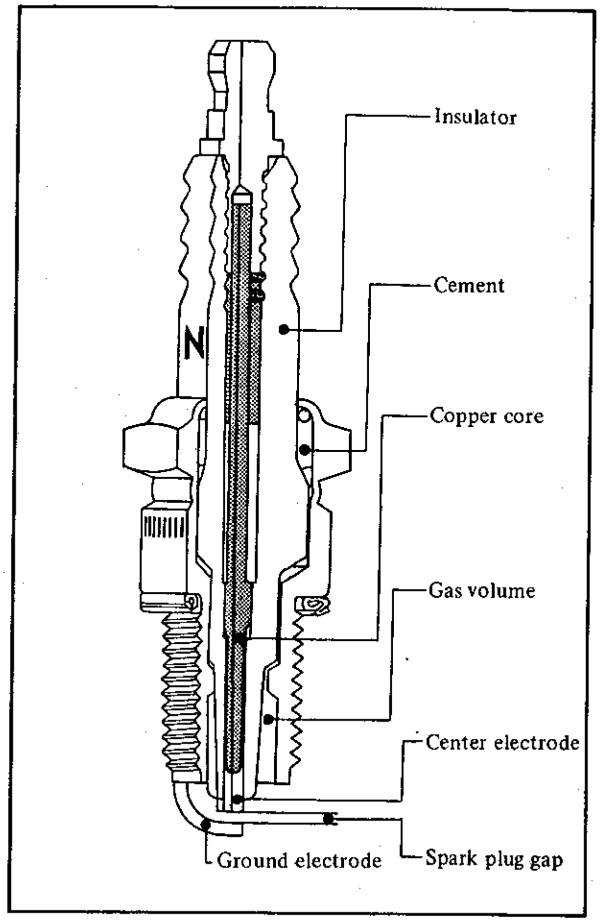


Fig. 11-6.

Remove the plug and inspect the insulator. If the insulator is a light brown color, it is acceptable. If it is blackened by carbon, it should be replaced by a hot type NGK B7ES or NIPPON DENSO W22ES and if baked white, by NGK B9ES or NIPPON DENSO W27ES.

Plugs with high heat range number are used for high speed running. These plugs are designed to be sufficiently cooled to prevent overheating and are called cold type plugs. If a plug with too high a heat value is used, the plug will be overcooled with the result that insufficiently burnt carbon will be deposited on the insulator and electrode.

A large amount of deposited carbon will prevent good sparking. Carbon deposits tend to get red-hot themselves, resulting in pre-ignition or knocking. When the temperature of the engine is relatively low, for example, when the motorcycle is always run in a town or subjected to breaking-in without running at high speed, plugs with low heat range are used. These plugs are designed to prevent heat dissipation and are called hot type plugs. If these plugs are used for high speed running, they may be overheated, resulting in overheating and pre-ignition of the engine.

The plug gap is adjusted to 0.6 ~ 0.8 mm (0.024 ~ 0.031 in.). The gap is correctly adjusted using a thickness gauge (special tool; 09900-20803). When carbon is deposited on the spark plug, remove the carbon with a spark plug cleaning machine or any 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.

09900-20803	Thickness gauge

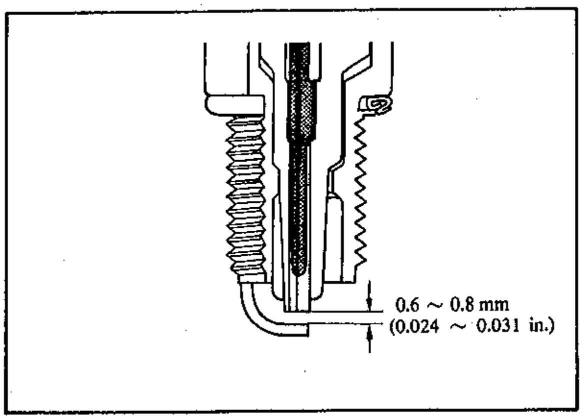


Fig. 11-7.

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 will be damaged.

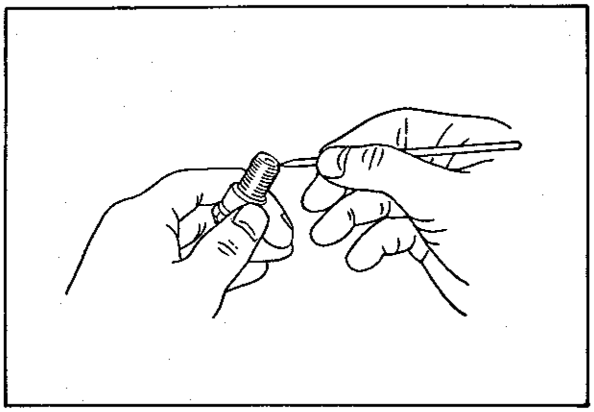


Fig. 11-8.

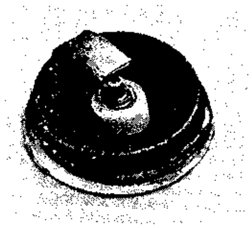


Fig. 11-9. Normal carbon condition

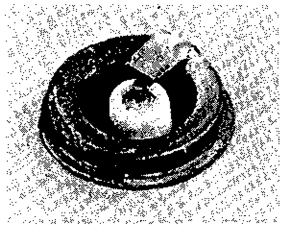


Fig. 11-10. Overheating

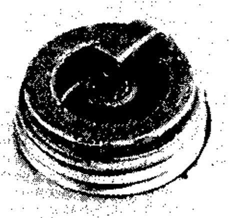


Fig. 11-11. Wet fouling of plug

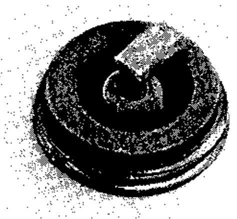


Fig. 11-12. Carbon stained

CHARGING SYSTEM

DESCRIPTION

When the engine is started, the AC generator runs and produces an output current. This current is full-wave rectified by a rectifier, from which the current runs to the battery and the load. If the output power generated by the AC generator rises above the battery and load currents, the battery terminal voltage is raised so that, at or over the specific voltage applied via the rectifier diode, the zener diode DZ is switched on in response to the voltage presented by dividing resistor Ra and Rb. Thus a gate signal is supplied to the thyristor SCR to short the AC terminal of the AC generator. In case of low speed or large load, neither SCR1 nor SCR2 starts operating; and in case of high speed or small load, both SCR1 and SCR2 operate to cover a wider control range.

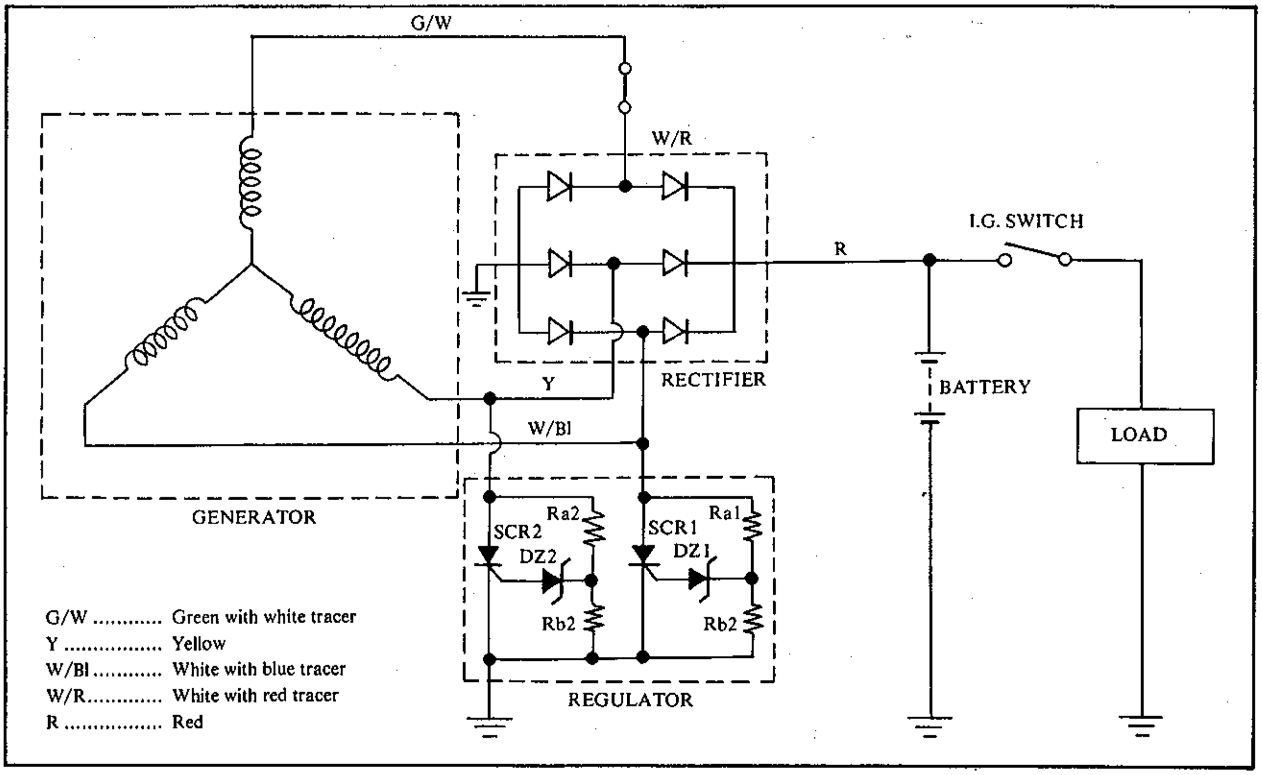


Fig. 11-13.

METHOD OF TESTING RECTIFIER, REGULATOR AND ALTERNATOR

- Before testing them, check the battery voltage. If it is less than 12.5V, recharge the battery. If the battery is discharged or broken, it is not possible to check the rectifier, regulator and alternator to determine whether or not they are normal.
- Set all switches in the OFF position, and remove the headlamp fuse from the fuse box.
- Connect the (+) lead of the tester to the (+) terminal of the battery, and the (−) lead of the tester to the (−) terminal of the battery. Run the engine at 5,000 rpm, and read the tester. If the tester reads 14 to 15.5V, they are normal.
  - ★ If the tester reads more than 15.5V, the regulator is faulty. The regulator is a non-disassembly type so it must be replaced if faulty.
  - ★ If the tester reads less than 14V, the rectifier or the regulator or the alternator is faulty.

INSPECTION OF CHARGING SYSTEM COMPONENTS

Rectifier

A total of 6 semi-conductor elements are connected as shown, for full-wave rectification. They are encapsulated into a mold and contained in a compact case. Each element is conductive in the forward direction and non-conductive in the reverse direction. Check each element for this property of directionality with a tester, as follows:

1. Undo all the terminal connections on the rectifier, disconnecting the lead wires coming from the alternator (YELLOW, WHITE/RED and WHITE/BLUE), from the battery (RED) and from ground (BLACK/WHITE).
2. Put the minus (−) probe pin of the tester on to ground terminal (BLACK/WHITE), and the positive (+) pin on to YELLOW, WHITE/RED and WHITE/BLUE, sequentially in that order. The tester should indicate continuity for each.
   Repeat this process with minus (−) pin and plus (+) pin swapped: the tester should not indicate continuity.

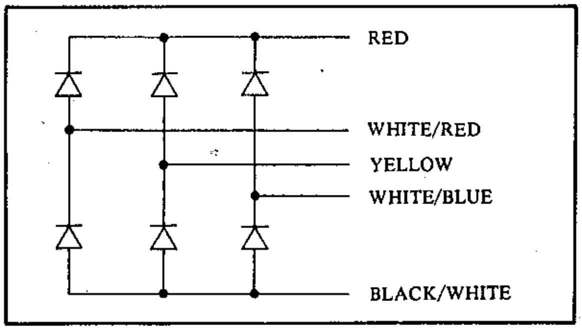


Fig. 11-14.

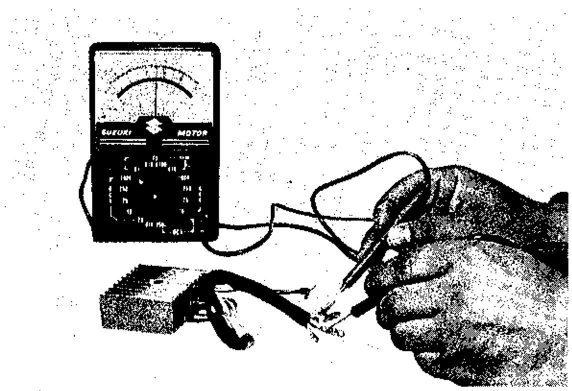


Fig. 11-15.

3. You have just checked the three rectifier elements. Check the other three in the same way by putting one of the probe pins on to the output terminal (RED).
   If any one of the elements is found to be non-conductive in the forward direction or conductive in the reverse direction, replace the rectifier unit.

CAUTION:
1) Be sure to disconnect the output lead wire in order to cut off the rectifier from the battery side. Checking the rectifier with this lead wire connected may cause the element to get burned due to possible grounding.
2) Never use a megger-type instrument to check for continuity. Be sure to use circuit tester. A megger could rupture the rectifier element.
3) Never increase engine speed when the output lead wire (RED) has been disconnected or the rectifier elements will be burnt and damaged.

It should be borne in mind that, when the circuit tester is used for checking ohmic resistance or continuity, its internally contained battery becomes connected to the probe pins: plus (+) polarity appears on negative (−) pin and minus (−) polarity on positive (+) pin.

Alternator

Disconnect the yellow and white blue leads from the regulator.

1. Disconnect the white blue lead from the alternator. Connect the (+) terminal of the tester to the red, and its (−) terminal to the (−) terminal of the battery. The coils ① and ③ are good if the tester reads 16.5V or more at 5,000 rpm.

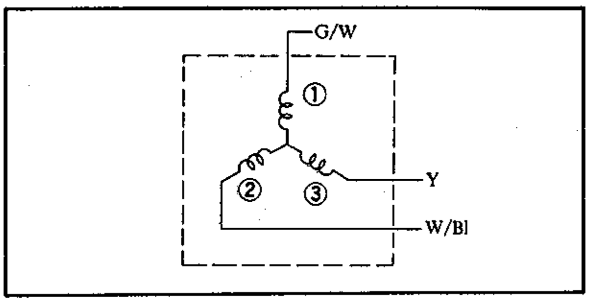


Fig. 11-16.

2. Connect the the W/Bl lead, and disconnect the yellow lead from the alternator. The coils ① and ② are good if the tester reads 16.5V or more at 5,000 rpm.
   If the coils mentioned in items 1 and are in good condition, the alternator and rectifier are in good order. If the tester reads otherwise, replace the alternator.

> *CAUTION:*
> *If all the 3 phases are checked at the same time after disconnecting the regulator lead, the voltage rises to more than about 18V, and possibly damage the battery. Be sure to follow the instructions given above for testing.*

Regulator

Check the regulator for performance, as follows. Restore the three phase circuit to the normal hook-up, placing the switch and regulator back in service. Run the engine and check the voltage again. If the tester reads less than 14V or higher than 15.5V at 5,000 rpm, the cause is faulty regulator. The regulator is not a disassembly type so it must be replaced if faulty.

STARTER SYSTEM

The starter system is shown in the diagram below: namely, the starter motor, relay, starter switch and battery. Depressing the starter button (on the right handle) energizes the relay to close its contact points, thereby connecting the starter motor to the battery. The motor draws about 80 amperes to start the engine.

Starter system diagram

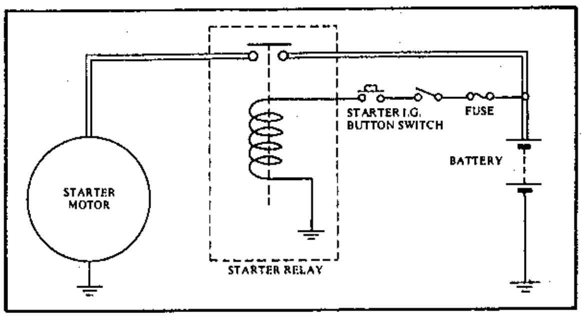
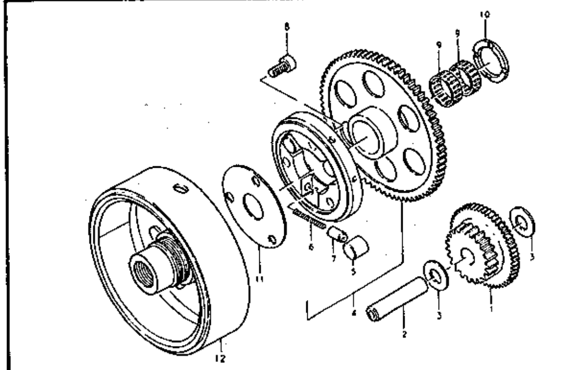


Fig. 11-17.

Starter clutch and generator rotor



1. Starter idle gear	7. Push piece
2. Pin	8. Bolt
3. Washer	9. Bearing
4. Starter clutch gear	10. Washer
5. Roller	11. Shim
6. Spring	12. Rotor

Fig. 11-18.

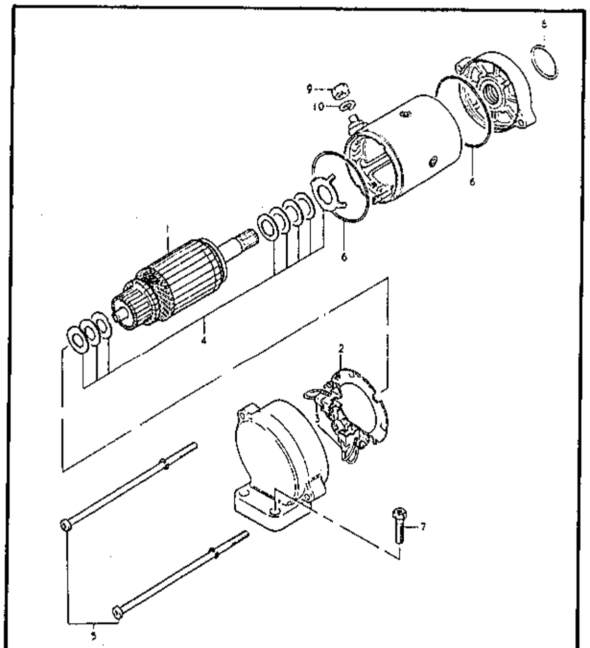
- See page 7-29 with respect to the removal procedures for the rotor and starter clutch.

INSPECTION

Inspect the components to be sure that wiring connections are all tight and that the circuit wires are in good condition. Make sure, too, that each component is securely grounded.

When the system is in good condition, the starter relay will make a single clattering sound as the starter button is depressed and immediately the motor will crank the engine. When this clattering noise is not heard or when the starter motor fails to turn the engine over possibly means that either the relay is not being properly energized due to a run-down battery, or the relay coil is open.

If the relay "clatters" but the motor will not crank, then it is likely that the relay contact points are defective or the motor is internally open-circuited.



1. Starter motor ass'y
2. Armature
3. Shim
4. Oil seal
5. "O" ring
6. Brush
7. Bolt
8. O ring
9. Nut
10. Lock washer

Fig. 11-19.

Starter motor specifications

The motor is mounted on top of the crankcase behind the cylinder block, and drives the engine's crankshaft by a series of gears and a one-way clutch which is mounted on the alternator rotor. The motor either DENSO or MITSUBA is made, and is made to the following electrical specifications:

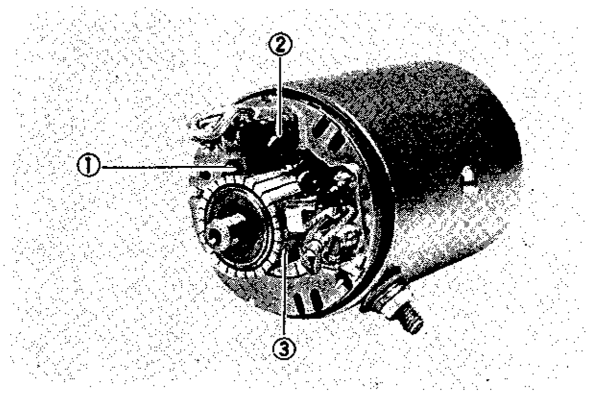
Item	No-load data	Locked-rotor data
Voltage	11 volts	5.5 volts
Current	50 amperes under	280 amperes under
Torque	—	0.35 kg-m over
Speed	4,500 rpm over	—

INSPECTION OF COMPONENTS

Carbon brushes

When the brushes are worn, the motor will be unable to produce sufficient current, and the engine will be difficult to crank over. In order to prevent this, periodically, inspect the length of the brushes, replacing those which are too short.

Brush length specification	
Standard	Service limit
12 ~ 13 mm (0.47 ~ 0.51 in.)	6 mm (0.24 in.)



1. Brush 2. Brush springs 3. Commutator

Fig. 11-20.

Commutator

Inspect the commutator surface for wear, "high mica", burns or grooving. To smooth the surface, sand it down with sandpaper, as shown in armature coil. Undercut the mica to the depth specified.

Standard undercut	0.6 mm (0.023 in.)
Limit on undercut	0.2 mm (0.008 in.)

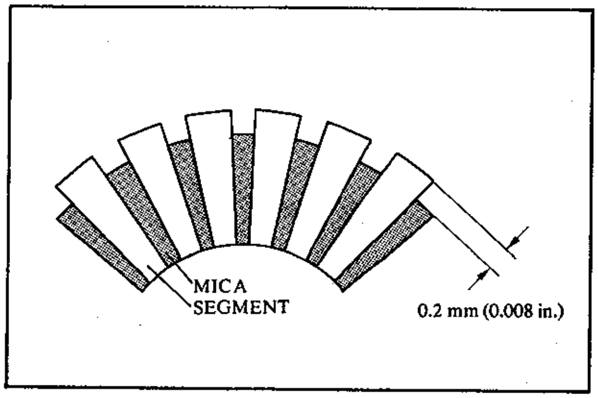


Fig. 11-21.

Armature coil

Using a circuit tester, check the coil for open and ground by putting 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. Continued use of such an armature is will cause the starter motor to suddenly fail.

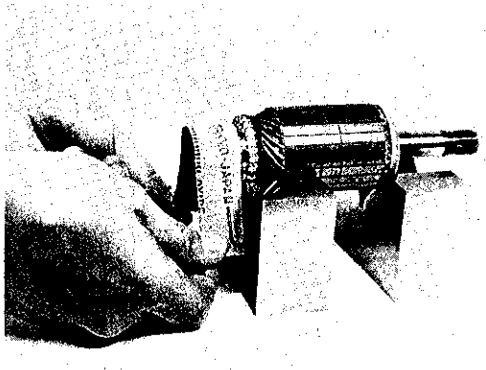


Fig. 11-22.

Relay for starter motor

This relay acts as a solenoid switch and, as such, it is necessary for its coil, contact plunger and contact points to be in good condition. It should be borne in mind that its contact points have to transmit the strong current to the starter motor.

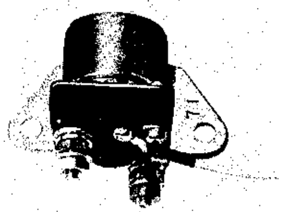


Fig. 11-23.

Check the coil for "open", "ground" and ohmic resistance. The coil is in good condition if its resistance is equal to 3.5 ohms ±0.5.

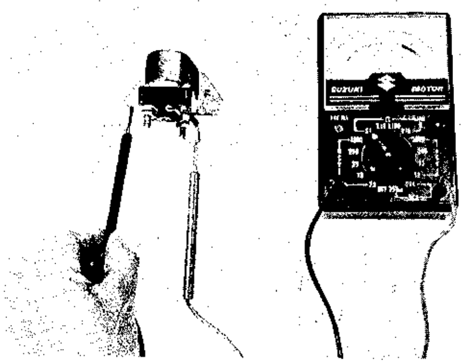


Fig. 11-24.

To see whether the contact points are closing fully to transmit the heavy load of current, operate it in the usual manner (by depressing the button on the right handle) to connect the battery to the motor and measure the voltage between the positive (+) terminal of motor and ground; and also between the positive (+) terminal of battery and ground. If the two readings are equal, it means that the relay contact points are satisfactory.

If the difference between the two is large or if no voltage shows up on the motor side, replace the relay for its contact points are faulty.

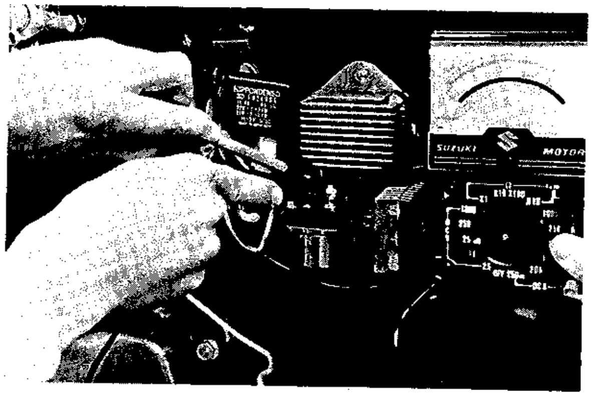


Fig. 11-25.

BATTERY

DESCRIPTION

YUASA and FURUKAWA MAKE 12N14-3A vacuum-sealed dry cell batteries are furnished with every GS1000.

This battery, when properly activated and initially charged, has a capacity of 14 ampere-hours on a 10-hour rating basis. No skill is required in activating this battery and charging it for the first time to place it in initial service; all necessary information is contained in the instructions given under the heading of INITIAL CHARGING METHOD. Battery's serviceable life depends much on the attention it receives thereafter. Each GS1000 user should be reminded of the importance of giving proper care to their batteries.

SPECIFICATIONS

Type designation	12N14-3A
Battery voltage	12 volts
Standard electrolyte S.G.	1.28 (at 20°C or 68°F)

INITIAL CHANGING METHOD

Each new GS1000 motorcycle is delivered with its battery in a "vaccum-sealed dry" condition. This battery can be utilized after conducting the four following steps:

1. Initial electrolyte filling

Take the battery off the motorcycle, and set it down on a battery servicing bench. Fill up each cell to the upper level with electrolyte, which is

— Dilute sulfuric acid solution with acid concentration of 34.6% by weight, having a specific gravity of 1.280 at 20°C (68°F), whose temperature, at the time of filling, should not be higher than 30°C (86°F).

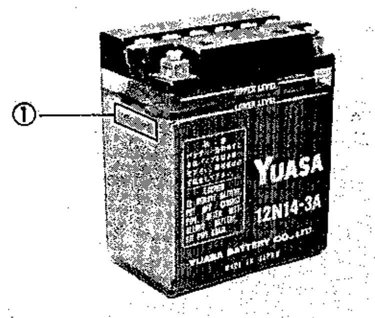
After filling, let the battery sit for about 30 minutes. Then, check electrolyte level in each cell and, if the electrolyte in any cell has fallen then add more electrolyte to bring it back to the same level.

2. Initial charging duration

The acting materials on the cell plates have a store of energy equivalent to 75% of rated capacity, that is, if the battery is one that has just been manufactured and supplied by the battery maker. This stored energy, however, dissipates spontaneously and progressively with the lapse of time, so that, after filling it with electrolyte, the charging duration must be extended if a period of longer than 6 months has elapsed since the date of manufacture (which is indicated on each battery as shown in Fig. 11-26), the standard initial charging duration being 20 hours. The charging time is to be determined according to this schedule:

Age of dry battery (since manufacture)	Charging time
Up to 6 months	20 hours
Over 6 months and up to 9 months	30 hours
Over 9 months and up to 12 months	40 hours
Over 12 months	50 hours

Date of manufacture is indicated by a three-part number, Fig. 11-26, the leftmost part standing for the calendar date, the middle part the month, and the last part the year.



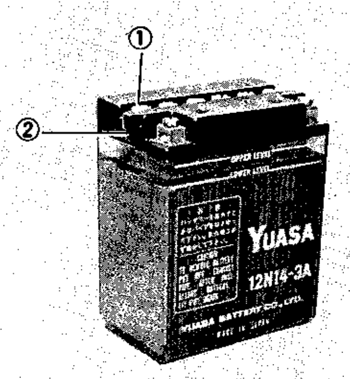
1. Manufacturing date

Fig. 11-26.

3. Initial charging current

The constant-current method of charging is recommended for initial charging, and is carried out by the following procedures:

1) Before turning on the charger, to which the filled battery is connected, remove the seal and cell caps. Be sure that the polarity marks are matched correctly in charging line connections. (Fig. 11-27)
2) Start charging, with the charger set for a charging rate of 3 amperes. While charging, check the electrolyte for S.G. (specific gravity) and also the charging voltage now and then, particularly towards the end of the charging time.
3) Towards the end of the charge, the battery will start releasing gaseous bubbles and the voltage and S.G. will be up and leveling; if not, it is likely that the vacuum seal was damage during transit or in storage. Continue charging, even in excess of the predetermined time, until the voltage and S.G. have leveled for one or two hours, with the battery allowed to continue releasing gaseous bubbles.



1. Seal cap 2. Battery cell cap

Fig. 11-27.

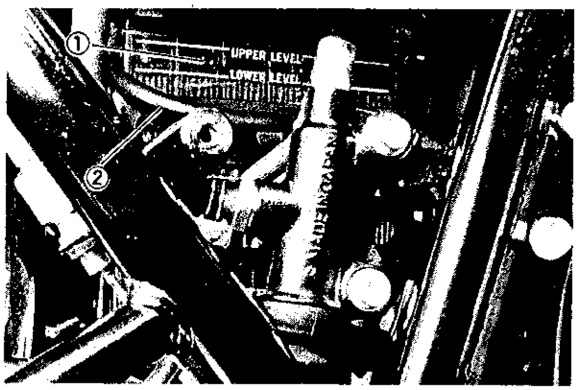
4. Electrolyte adjustment

Upon terminating the charging operation, re-check the electrolyte's S.G. to make sure it is 1.280 as corrected to 20°C (68°F). Add distilled water, as necessary, to adjust the S.G.'s upper level in each cell, as necessary. 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. Open the seat, and disconnect the battery's positive terminal.
2. Remove the right-side frame cover. Pull off the battery vent hose. Disconnect the battery's negative terminal. (Fig. 11-28)
3. Remove the bolts securing the battery plate, take off the plate, and remove the battery.



1. Battery   2. Battery vent hose

Fig. 11-28.

Installation

Before mounting the battery, make sure that the exterior surface of the battery container are dry and free from electrolyte. Be careful not to forget to re-connect the vent hose. The installing procedure is the reverse of the removal procedure.

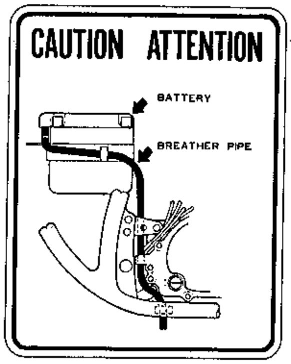


Fig. 11-29.

Inspection

1. Visually inspect the surface of the battery container. If any signs of cracking or electrolyte leakage from the sides of the battery has occurred, 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. Cleck the electrolyte level and add distilled water, as necessary, to raise the electrolyte to each cell's upper level.

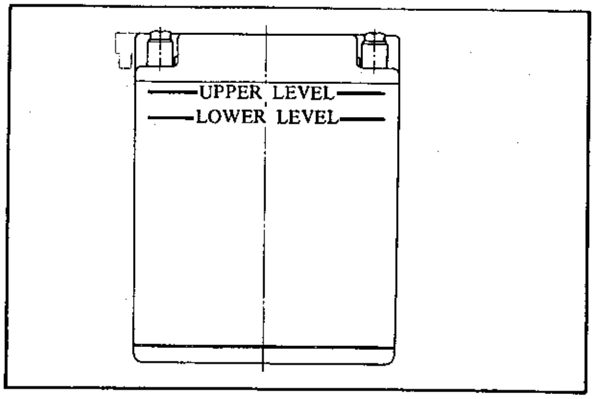


Fig. 11-30.

4. Check the battery for proper charge by taking an electrolyte S.G. reading. If the reading is 1.200 or less, as corrected to 20°C (68°F), it means that the battery is still in a run-down condition and needs recharging.

Recharging operation based on S.G. reading

To correct a S.G. reading to 20°C (68°F), use this formula:

$S_{20} = St + 0.0007\,(t - 20)$,

Where S_{20} = corrected value of S.G. (20°C or 68°F),

St = value of S.G. read at temperature t°C,

0.0007 = temperature coefficient of S.G., and

t = temperature in degrees Centigrade, at which St was read.

To read the S.G. on the hydrometer, bring the electrolyte in the hydrometer to eye level and read the graduations on the float scale bordering on the meniscus (curved-up portion of electrolyte surface), as shown in Fig. 11-30.

Check the reading (as corrected to 20°C) with Fig. 11-31 to determine the recharging time in hours by constant-current charging at a charging rate of 3 amperes (which is a tenth of the capacity of the present battery).

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

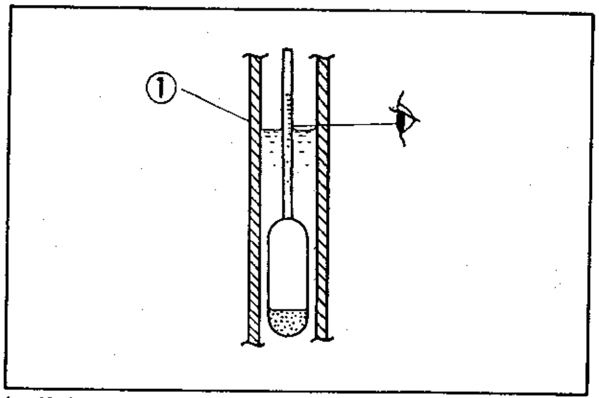
The battery is properly recharged if any three of the following four conditions are met:

Recharging has been carried out to the specification stated in Fig. 11-32's graph.

Electrolyte S.G. rose to 1.260 or higher and has remained there for at least one hour.

The battery terminal voltage rose to 15 ~ 16 volts or higher and has remained there for at least one hour.

Gaseous bubbles are being released in every cell.



1. Hydorometer

Fig. 11-31.

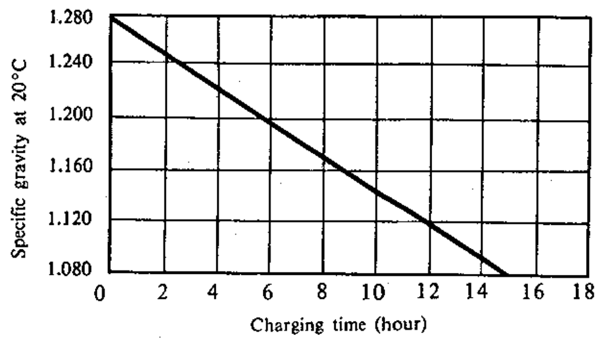


Fig. 11-32.

NOTE:
Constant-voltage charging, otherwise called "quick" charging, is not recommendable for it could shorten the life of the battery. "Quick" charging should be regarded as a last resort, only in case of emergency and, it must be carried out with the following precautions:

Limit the charging current to 14 amperes.

Limit the electrolyte temperature to 55°C (132°F).

Recharge with the battery detached from the motorcycle. Never attempt to "quick" charge the battery in place.

Exercise all common-sense precautions on battery recharging.

Operate the charger in a manner consistent with the directions prescribed for the charger.

TROUBLESHOOTING

Symptom	Possible causes	Remedy
"Sulfation", acidic white powdery substance or spots on surfaces of cell plates.	1. Not enough electrolyte 2. Battery container has cracks. 3. Battery has been left in a run-down condition for a longtime. 4. Adulterated electrolyte (Foreign matter has entered, mixed with the electrolyte, and contaminated it.)	Add distilled water, if the battery has not been damaged, and recharge, if "sulfation" has not advanced too far. Replaced the battery. Replace the battery. If "sulfation" has not advanced too far, try to restore the battery by replacing the electrolyte, recharging it fully with the battery detached from the motorcycle and then adjusting electrolyte's S.G.
Battery runs down easily.	1. The charging system is not set for proper charging operation. 2. Cell plates have lost much of their active material as a result of over-charging. 3. A short-circuit condition exists within the battery due to an excessive accumulation of sediments caused by the electrolyte's high S.G.. 4. Electrolyte's S.G. is too low. 5. Adulterated electrolyte. 6. Battery is too old.	Check the alternator, regulator and circuit connections, and make necessay 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.

UTILITY SWITCHES AND DEVICES

Ignition switch

Be sure that the ignition switch ①, when checked with a circuit tester, shows internal continuity as indicated in the chart below, and replace it if any continuity or non-continuity not indicated in the chart is noted:

Ignition switch continuity chart

Switch position	Terminals			
	RED	ORANGE	GRAY	BROWN
OFF				
ON	O—	—O	O—	—O
P	O—	—	—	—O

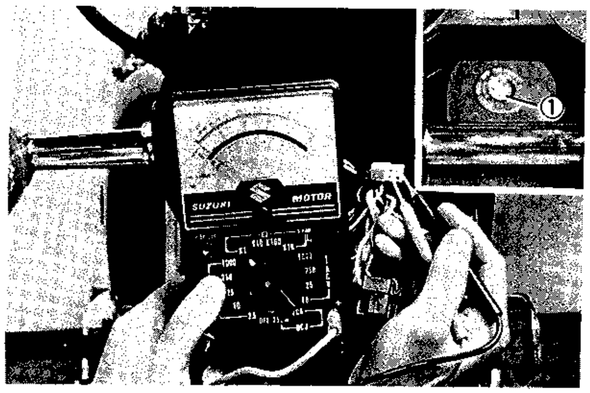


Fig. 11-33.

Front brake lamp switch

See if this switch shows continuity when the front brake lever is squeezed: put the tester probe pins to the WHITE ① and ORANGE ② lead wires of this lamp switch.

NOTE:
To advance or retard the action of this switch for the purpose of adjustment, reposition it in place; this is accomplished by loosening the 2 screws securing the switch to the body ③.

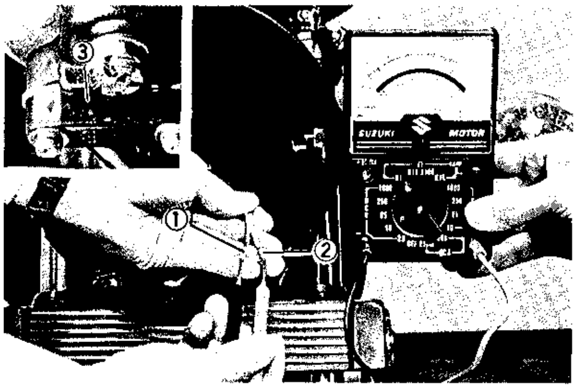


Fig. 11-34.

Rear brake lamp switch
Check this lamp in the same way that the front lamp switch is tested for internal continuity. Its lead wires are WHITE ① and ORANGE with GREEN tracer ②. Press down on the brake pedal, and continuity will be noted.

NOTE:
To make the switch close quicker (turn on the lamp while pressing down on the brake pedal), reposition the switch body ③ upward. Lowering this it retards the action.

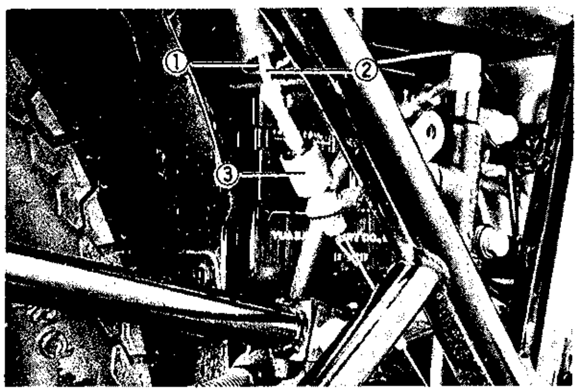


Fig. 11-35.

Left handle switch
This switch operates the lighting, dimmer and turn signal switches. Circuit countinuity through each switch component can be checked by putting the two testing prods or pins of the circuit tester to the switch leads (at the coupler).

Lighting and dimmer switches
The lighting and dimmer switches should exhibit continuity, when checked with the circuit tester, according to this chart:

Dimmer switch

	WHITE	YELLOW	
HI		o	o
LO	o		o

Lighting switch

	ORANGE	GRAY	WHITE/RED	WHITE/GREEN
OFF				
ON	o	o	o	o

If any abnormally high resistance is noted to accompany the continuity indication, it probably means that the contact points in the switch are faulty and need repairing.

Turn signal
Disconnect the lead wires from the winker switch, and check for internal continuity by putting the probe pins of the tester to the LIGHT GREEN and BLACK leads (for right-hand switch) and to the BLACK and BLACK leads (for left-hand switch).

Switch position	BLACK	LIGHT BLUE	LIGHT GREEN
RIGHT		o	o
●			
LEFT	o	o	

Horn
The horn is to be checked for internal continuity and its sound. Use the circuit tester for the former check, and a 12-volt battery for the latter. Make sure that the horn has full volume when its lead wires are put to the battery terminals; if not, replace it.

Switch position	GREEN	ORANGE/GREEN Tracer
OFF		
ON	o	o

Kill switch and starter switch
Check these switches in the same way that the lighting switch is checked.

Kill switch

Switch position	ORANGE	ORANGE/WHITE
OFF		
ON	o	o

Starter switch

Switch position	YELLOW/GREEN	ORANGE/WHITE
OFF		
ON	○	○

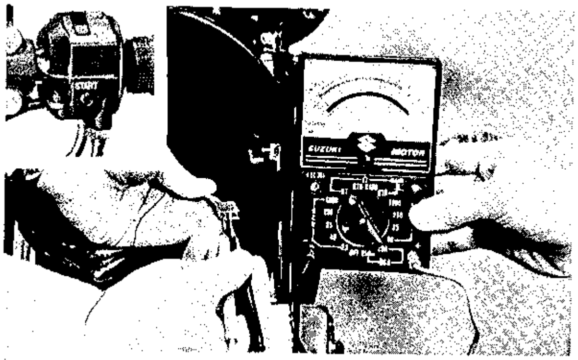
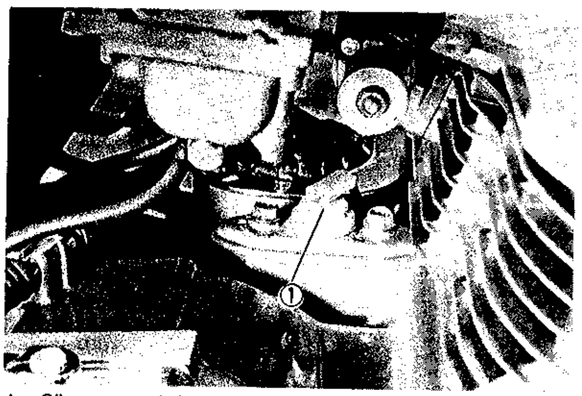


Fig. 11-36.

Oil pressure switch

This switch is located on the discharge side of the lube oil pump and turns the warning lamp on and off in response to the discharge pressure.



1. Oil pressure switch

Fig. 11-37.

The normal function of this switch and its lamp is such that, when the engine is turned off, turning on the ignition switch will light up the lamp (oil pressure indicating lamp), but the lamp will go out immediately as the engine is started, thus signifying that the oil pump is delivering enough lube oil.

Two possibilities must be taken into consideration when the switch and lamp do not operate as stated above. One is that the switch is internally faulty due to an open-circuit or grounding: this can be checked with the circuit tester. The other is a mechanical malfunction — the inability of the switch to respond to the pressure: this can be checked by measuring the oil pressure when the engine is running. If the pressure is low, the oil pump is malfunctioning; if high, the switch is mechanically defective and needs to be replaced.

Lamp wattage data

The lighting system for Model GS1000 uses lamps with the following rated wattage.

Headlamp	12V, 50/40W
Tail/Brake lamp	12V, 8/23W (3/32 cp)
Turn signal lamp	12V, 23W (32 cp)
License plate lamp	12V, 8W (3 cp)
Speedometer lamp	12V, 3.4W
Tachometer lamp	12V, 3.4W
Neutral indicator lamp	12V, 3.4W
High beam indicator lamp	12V, 3.4W
Turn signal pilot lamp	12V, 3.4W
Oil p. indicator lamp	12V, 3.4W

Inspection of headlamp

- Make sure that the bulb is not burnt out.
- Make sure that there is no damaged to the wiring or bad connections.
- Make sure that each connection is tightly fastened.
- Make sure that there is a proper radiation angle.
  See page 10-5 with respect to the adjustment of the irradiation angle.
- Change the headlamp in the sealed beam assembly.

Inspection of tail brake lamps and turn signal lamps

- Make sure that the bulb is not burnt out.
- Make sure that there is no damaged to the wiring or bad connections.
- Defective grounding or a short-circuit exists when the front and rear signal lamps continue to stay lit after the switch has been turned off.
- Make sure that each connection is tightly fastened. Loose connections can shorten the bulb's life due to vibration.

Rear combination lamps

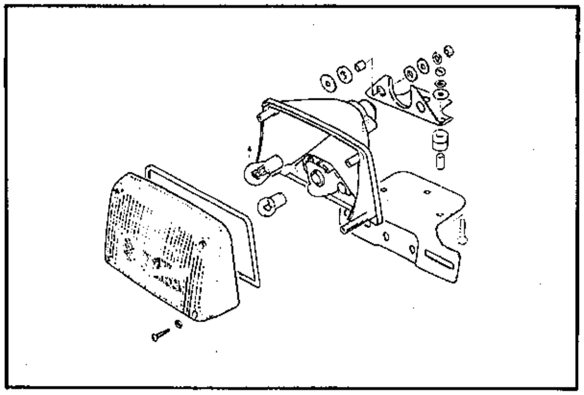


Fig. 11-38.

Turn signal lamps

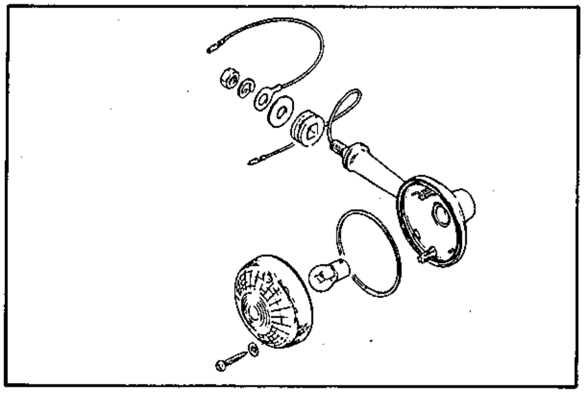


Fig. 11-39.

- A turn signal buzzer is mounted on the lower portion of the fuel tank. Make sure that the buzzer operates properly.

Inspection of speedometer and tachometer

- Replace burnt out bulbs after removal of meters. See page 10-5 with respect to removal procedures.

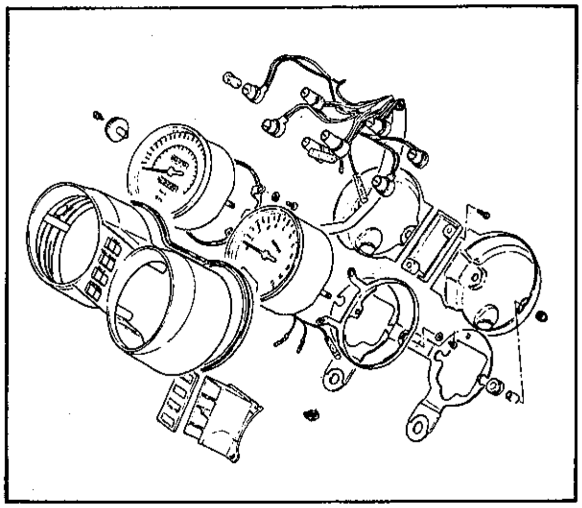


Fig. 11-40.

Fuel gauge

Wiring

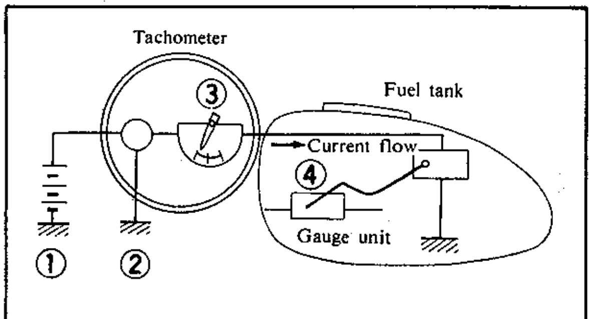


Fig. 11-41.

The above drawing is a schematic for fuel gauge wiring. The internal resistance value of gauge unit is adapted to vary with the height of the float.

Since it is difficult for to pass through the circuit when the resistance value is high, the swing of the meter is small (close to E point).

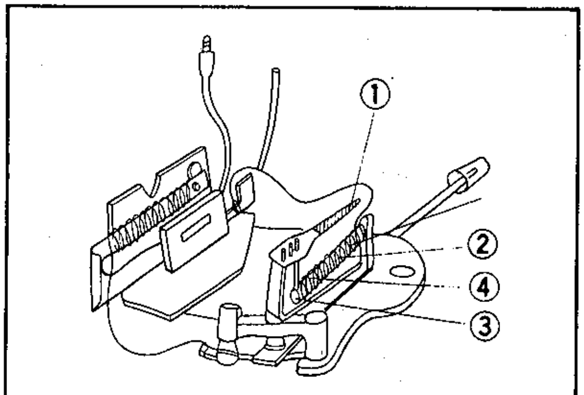
The current passing through the circuit increases the swing of the meter's pointer (close to point F) when the resistance value is low.

2. The relationship between the amount of gasoline and meter indications are as follows:

Amount of gasoline (in liters)	Meter indication
4.2	Point E $-2°30'$
5.0	E
10.8	1/2
17.0	F
17.7	Point F $+5°$

The meter points to E $-2°30'$ when the amount of gasoline is between 0 to 4.2 liters. Also the meter points to F $+5°$ when the amount of gasoline in the tank is between 17.7 liters to full.

3. Construction of each portion and operating meter



1. Pointer
2. Main bimetal
3. Temperature compensating bimetal
4. Needle

Fig. 11-42.

- Main operation
  Current passing through the heat wire makes the main bimetal element deflect causing the pointer to move.
- Auxiliary operation
  (This compensates for variations in temperature and voltage.)
- Auxiliary operation
  A temperature compensating bimetal is provided so that no indication errors will occur due to the temperature changes inside the meter.

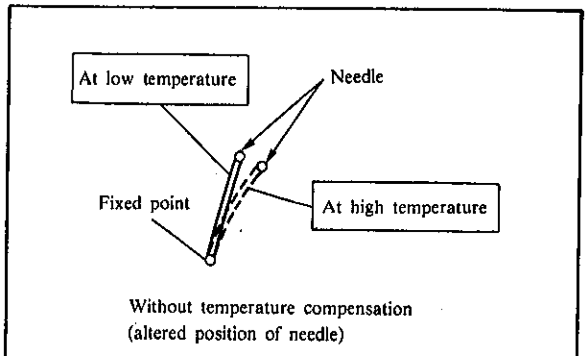


Fig. 11-43.

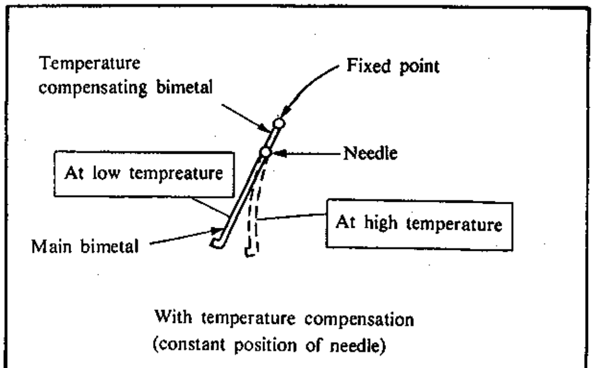


Fig. 11-44.

Even if the temperature should rise inside the meter and cause the main bimetal to deflect as shown in the above drawing, the temperature compensating bimetal will deflect to the same degree as the main bimetal, in the reverse direction, to keep the needle position constant.

- Voltage regulator

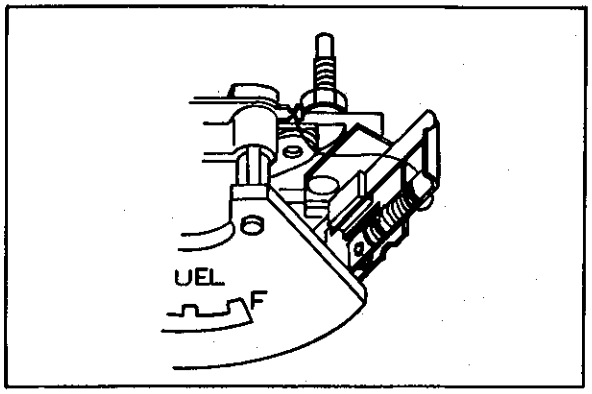


Fig. 11-45.

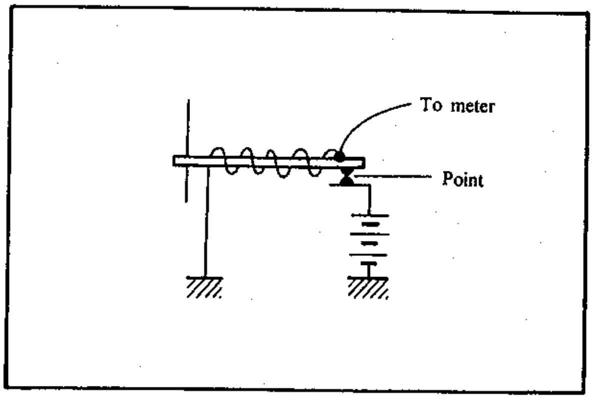


Fig. 11-46.

The passage of current through the heat wire makes the bimetal deflect and causes point separation. This point separation stops the current until the bimetal begins to cool, causing the point to connect again.

Since a lot current passes through the heat wire when the supply voltage is high, the bimetal will quickly deflect, causing point separation. This is illustrated in the following drawing showing that the average current is constant.

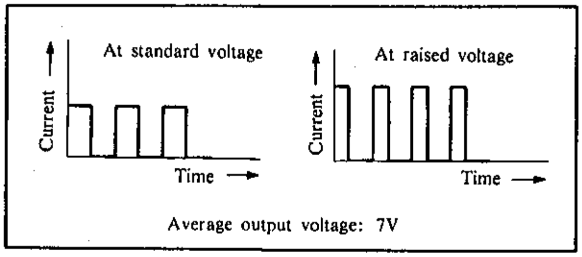


Fig. 11-47.

- Gauge unit
  The displacement of float changes the position of contact plate which slides on a winding resistor to vary the resistance value.

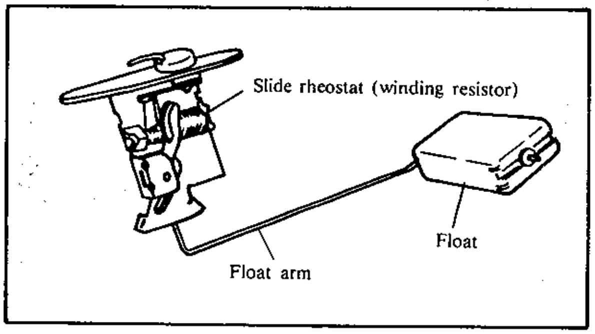


Fig. 11-48.

Inspection of fuel meter and gauge

The fuel meter is enclosed within the tachometer assembly.

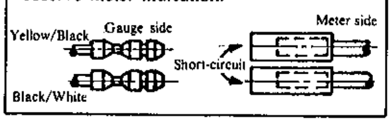
The following table is used for trouble-shooting.

Amount of gasoline (L)	1.5	2.7	6.1	9.3	15.8	16.3
Resistance (Ω)	110	95	52	32.5	7	3

Pointer failure and minus indication
(1) The meter's pointer fails to move.
(2) The meter has a substantial minus indication.

Checking method

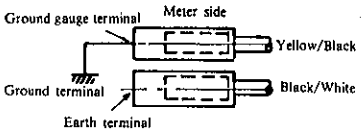
(1) Determine whether the trouble is within the meter or gauge.
Remove the gauge connector to short-circuit the meter side of same connector (make gauge resistance equal to zero Ω), and observe meter indication.



Meter's pointer fails to move → Meter side defective → Check (2)

Meter's pointer swings to extreme position → Gauge defective → Check (3)

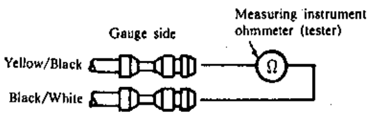
(2) Meter check.
Ground the meter's terminal of meter side connector directly to the body and observe meter indication.



- → Meter's pointer fails to move → Meter side defective → Check (5)
- → Meter's pointer swings to extreme position → Wire harness defective → Check (4)

(Contact of connector terminal)

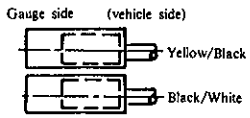
(3) Gauge check.
Measure the resistance value between the two terminals of gauge side connector.
(Full → 0.5~5.5Ω. Empty → 102~118Ω)



- → Large, unstable resistance (More than 118Ω) → Gauge defective → Change gauge
- → Normal resistance value (0.5 ~ 118Ω) → Wire harness defective → Check (4)

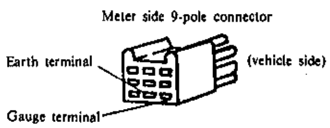
(Contact of connector terminal)

(4) Connector contact check (gauge side).
Strengthen the spring pressure against the terminal at the gauge side connector (to improve contact) and observe meter indication.
(by normal wiring)



→ Normal indication of meter

(5) Connector contact check (meter side).
Strengthen the spring pressure against the terminal of 9-pole connector at the meter side (to improve contact) and observe meter indication.



Carry out check (2) at the same time.

- → Meter's pointer swings to extreme position → Connector contact defective
- → Meter's pointer fails to move → Meter defective → Change meter

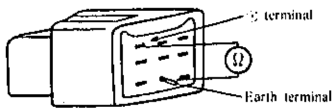
Meter's pointer swings to extreme position and indicates plus.
(1) Swinging-up of pointer.
(2) Substantially plus indication of meter.

Method of checking

(6) Meter side check.
Remove the gauge connector (without connecting the gauge) and observe meter indication.

- With meter indication (operates) → Meter defective → Change meter
- With no meter indication → Check (7)

(7) Gauge side check.
Measure the resistance value of gauge according to (3).



- Small resistance, 0Ω → Defective unit → Change gauge
  (Full → less than 0.5Ω)
  (Empty → less than 102Ω)
- Normal resistance value → Check (8)

(8) Meter side check (operate voltage regulator).
Check the meter voltage between the gauge terminal (yellow/black lead wire) of the meter or the gauge terminal (as it is connected) of connector for gauge and ground.

- Indicates interrupted voltage → Meter defective → Change meter
  (Even when the meter is normal, interrupted voltage can be obtained. However, here, the meter is defective because the pointer swings to extreme position.)
- Indicates constant voltage → Check (9)

(9) Meter side check.
Remove 9-pole meter side connector and measure the resistance value between the ⊕ terminal and ground terminal.

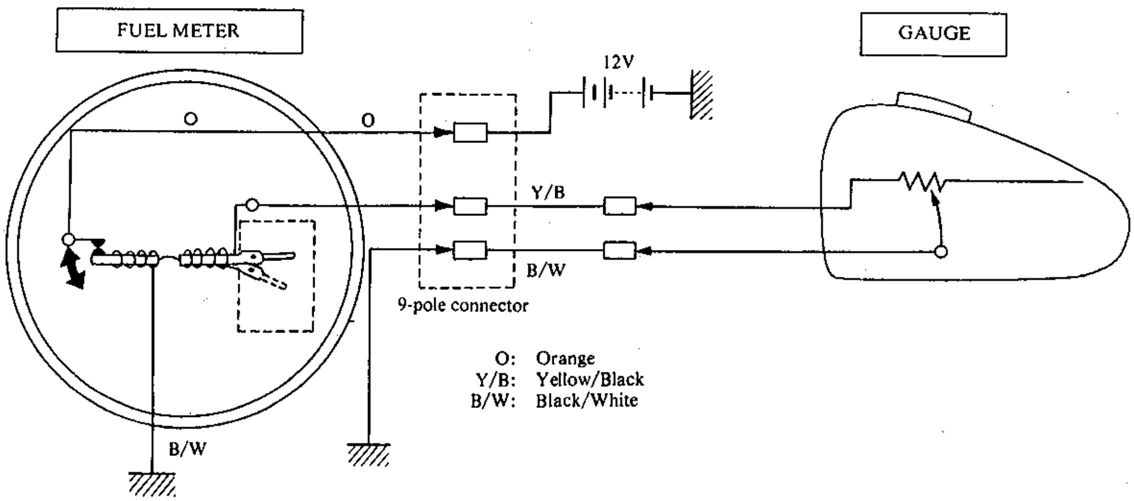
- Large resistance, infinite → Meter defective → Change meter
- Resistance value (55 ~ 85Ω) Orange Yellow/Black → Wire harness defective → Check (10)
- Resistance value 45 ~ 65Ω Orange ⟷ Yellow/Black

(10) Ground connector check.
Check the grounding condition of ground terminal of 9-pole meter side connector at the vehicle side. Measure the resistance value between the ground terminal shown in (5) drawing and body grounding.

- Large resistance, no conductance → Ground wire harness defective → Check (11)
- Resistance 0Ω → Defective contact of meter side connector → Check (11)

(11) Connector contact check.
Observe meter indication after correcting the wire harness and connector (in the normal wiring).

- Minus meter indication → Seizure of meter is caused by defective wire harness → Change meter / Check wire harness
- Normal meter indication O.K.
- Seized meter (change)



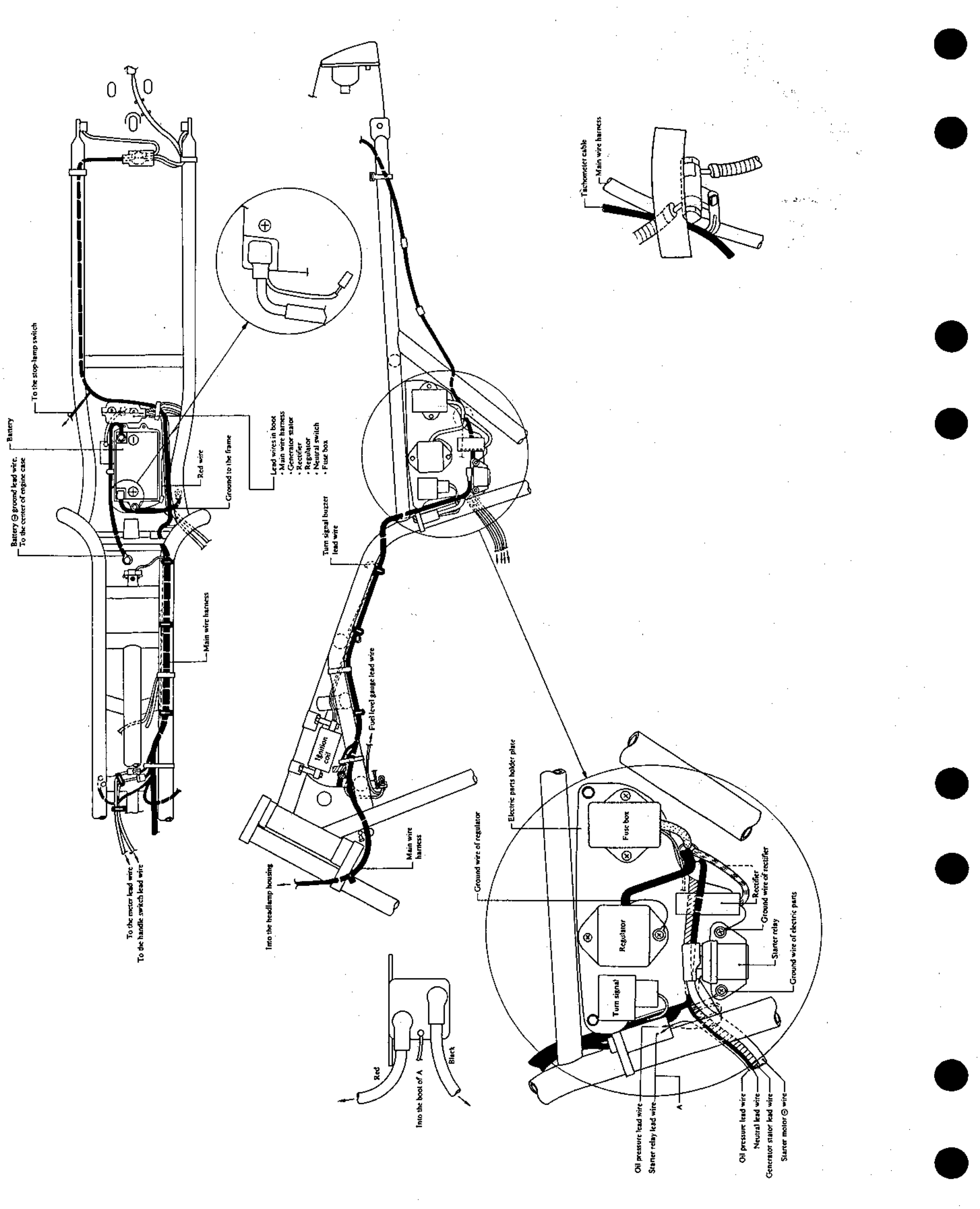
Check of resistance value between terminals
Meter side

Orange ⟷ Yellow/Black 45 ~ 65Ω
Orange ⟷ Black/White 55 ~ 85Ω

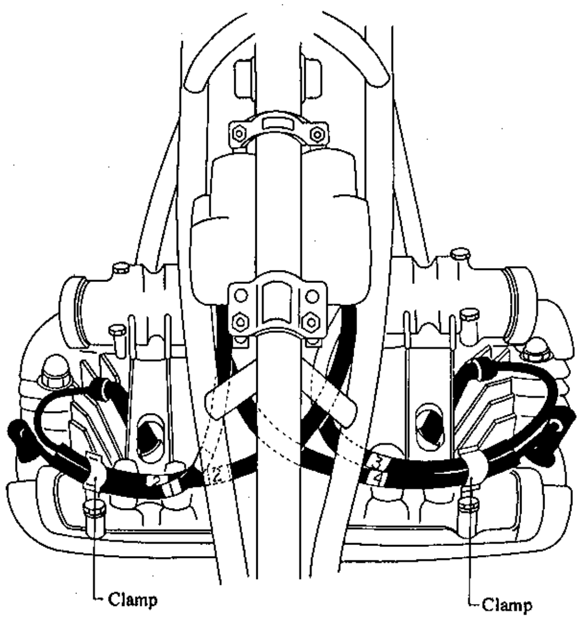
Gauge side

Full 0.5 ~ 5.5Ω
Empty 102 ~ 118Ω

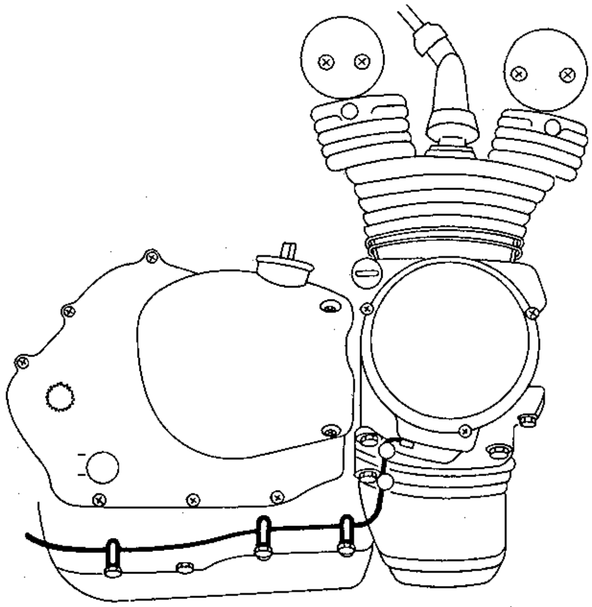
WIRING DIAGRAM



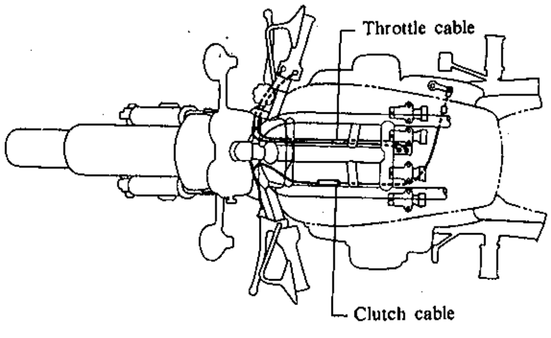
How to set the high-tension cord.

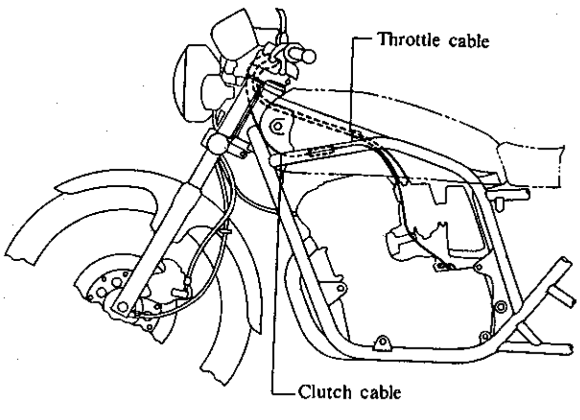


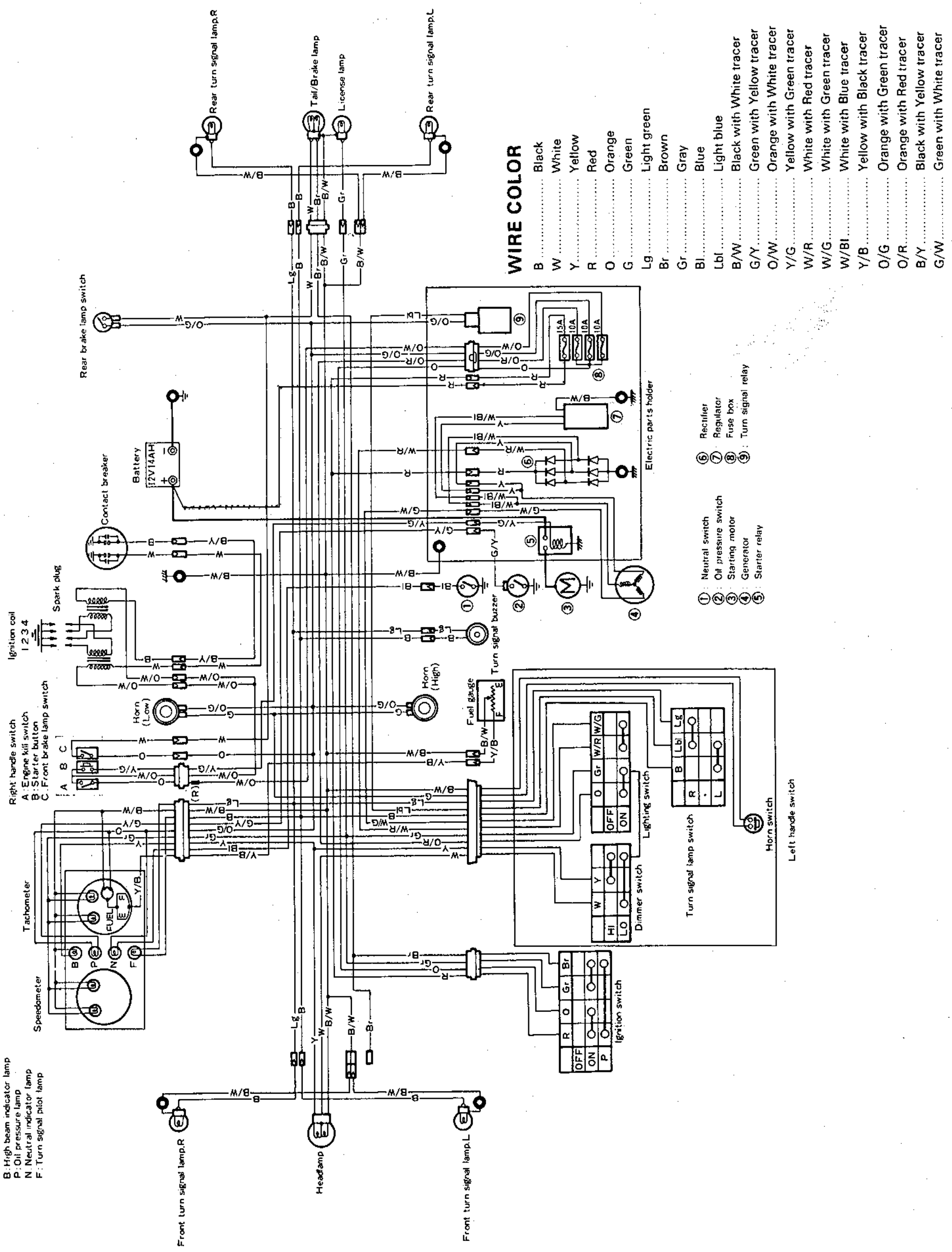
How to set contact breaker lead wire.



CABLE ROUTING







WIRE COLOR
B .... Black
W .... White
Y .... Yellow
R .... Red
O .... Orange
G .... Green
Lg .... Light green
Br .... Brown
Gr .... Gray
Bl .... Blue
Lbl .... Light blue
B/W .... Black with White tracer
G/Y .... Green with Yellow tracer
O/W .... Orange with White tracer
Y/G .... Yellow with Green tracer
W/R .... White with Red tracer
W/G .... White with Green tracer
W/Bl .... White with Blue tracer
Y/B .... Yellow with Black tracer
O/G .... Orange with Green tracer
O/R .... Orange with Red tracer
B/Y .... Black with Yellow tracer
G/W .... Green with White tracer
Rear turn signal lamp.R
Tail/Brake lamp
License lamp
Rear turn signal lamp.L
Rear brake lamp switch
Battery
12V14AH
Contact breaker
Spark plug
Ignition coil
1 2 3 4
Horn (Low)
Horn (High)
Turn signal buzzer
Fuel gauge
Right handle switch
A: Engine kill switch
B: Starter button
C: Front brake lamp switch
Tachometer
Speedometer
B: High beam indicator lamp
P: Oil pressure lamp
N: Neutral indicator lamp
F: Turn signal pilot lamp
Front turn signal lamp.R
Headlamp
Front turn signal lamp.L
Ignition switch
Lighting switch
Dimmer switch
Turn signal lamp switch
Horn switch
Left handle switch
Electric parts holder
15A 10A 10A 10A
① : Neutral switch
② : Oil pressure switch
③ : Starting motor
④ : Generator
⑤ : Starter relay
⑥ : Rectifier
⑦ : Regulator
⑧ : Fuse box
⑨ : Turn signal relay

SUZUKI

GS1000

SUPPLEMENTARY SERVICE MANUAL

e

GS1000E SUZUKI MOTOR CO., LTD. JULY '80 PRINTED IN JAPAN 99000-85850-4E3

GS1000E

CONTENTS

12

This section describes features of the GS1000E not provided on the GS1000.
The major differences are as follows:

1. Double disk front brake
2. Single-piece cast wheels
3. Self-cancelling turn signal

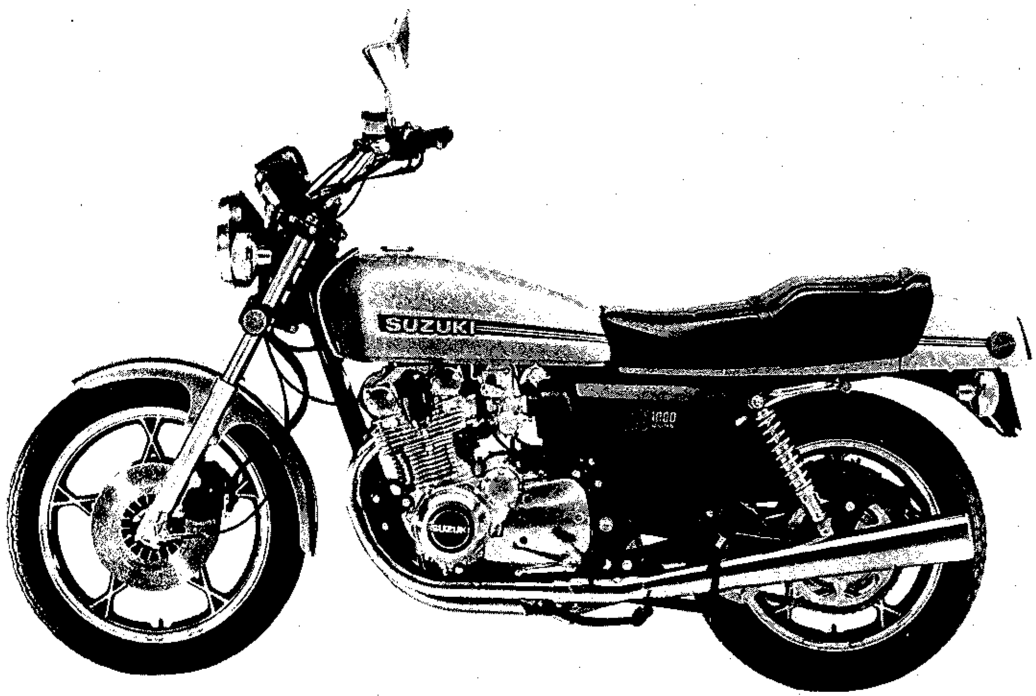


Fig. 12-1. Left side

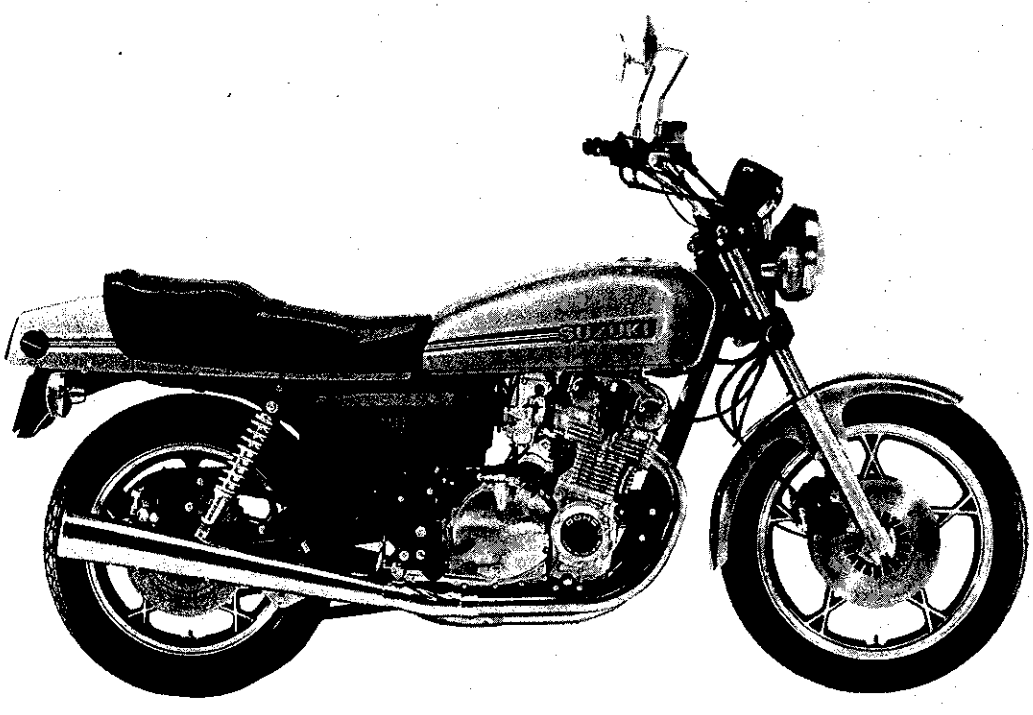


Fig. 12-2. Right side

GENERAL INFORMATION

SERVICE SPECIFICATIONS

DIMENSIONS AND WEIGHT

Overall length	2,225 mm (87.6 in.)
Overall width	850 mm (33.5 in.)
Overall height	1,165 mm (45.9 in.)
Wheelbase	1,505 mm (59.3 in.)
Ground clearance	155 mm (6.1 in.)
Dry mass	234 kg (516 lbs.)
Gross vehicle weight rating	924 lbs.

ENGINE

Type	Four-stroke cycle, air-cooled, DOHC
Number of cylinders	4
Bore	70.0 mm (2.756 in.)
Stroke	64.8 mm (2.551 in.)
Piston displacement	997 cm^3 (60.8 cu.in.)
Compression ratio	9.2 : 1
Carburetor	MIKUNI VM26SS, 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	TAKASAGO #630GSO, 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	63°
Trail	116 mm (4.57 in.)
Turning radius	2.62 m (8.5 ft.)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	3.50V 19 4PR

Rear tire size	4.50V 17 4PR
Front tire pressure	See page 10-20 (Chapter 10)
Rear tire pressure	See page 10-20 (Chapter 10)

ELECTRICAL

Ignition type	Battery ignition
Ignition timing	17° B.T.D.C. below 1,500 rpm and 37° B.T.D.C. above 2,350 rpm
Spark plug	NGK B-8ES or NIPPON DENSO W24EC
Spark plug gap	0.6 ~ 0.8 both NGK and NIPPON DENSO
Battery	12V 14Ah/10 Hours
Generator	Three-phase A.C. generator
Fuse	10/10/10/15A
Headlamp	12V 60/55W
Tail/Brake lamp	12V 8/23W
Turn signal lamp	12V 23W
License plate lamp	12V 8W
Speedometer lamp	12V 3.4W
Tachometer lamp	12V 3.4W
Neutral indicator lamp	12V 3.4W
High beam indicator lamp	12V 3.4W
Turn signal pilot lamp	12V 3.4W
Oil pump indicator lamp	12V 3.4W

CAPACITIES

Fuel tank including reserve	19 L (5.0 US.gal)
reserve	4.0 L (4.2 US.qt)
Engine oil change	3.4 L (3.6 US.qt)
filter change	3.8 L (4.0 US.qt)
overhaul	4.2 L (4.4 US.qt)
Front fork air pressure	0.8 kg/cm² (11.4 psi)
Front fork oil (in each leg) (At time of overhaul and replacement)	241 ml (8.15 US.oz)

TIRE PRESSURE

When tire is cold	Normal riding				High speed riding			
	Solo		Dual		Solo		Dual	
	kg/cm²	psi	kg/cm²	psi	kg/cm²	psi	kg/cm²	psi
Front	1.75	25	1.75	25	2.00	28	2.00	28
Rear	2.00	28	2.25	32	2.25	32	2.80	40

* Specifications are subject to change without notice.

FRONT BRAKE

The master cylinder and caliper differ from those of the single-disc front brake in regard only to the diameters of piston and cylinder bore. This difference is due to the change in brake operating pressure.

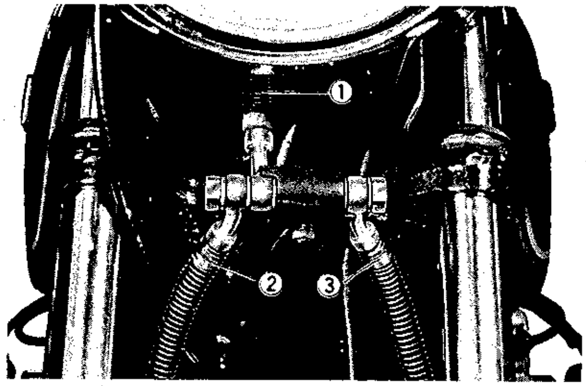


Fig. 12-3.
1. From master cylinder
2. To right caliper
3. To left caliper

MASTER CYLINDER

INSPECTION

The only difference is that the bore diameter is larger. Thus, the servicing instructions (on disassembly, reassembly and inspection) set forth in the GS1000 section already in issue (which is originally for single-disc machines) with respect to the master cylinder are applicable to the subject model.

Diameter	Standard	Service limit
Bore	15.870 ~ 15.913 mm (0.6248 ~ 0.6265 in.)	Over 15.925 mm (0.6270 in.)
Piston	15.811 ~ 15.838 mm (0.6225 ~ 0.6235 in.)	Under 15.799 mm (0.6220 in.)

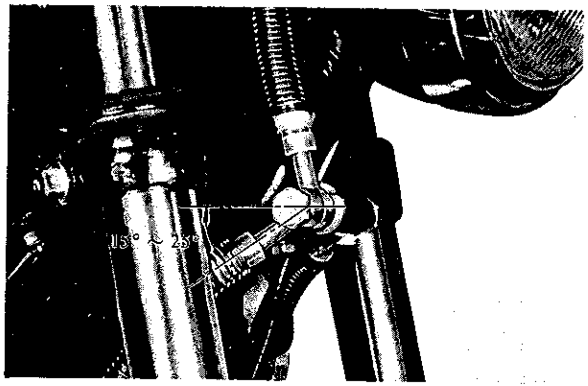


Fig. 12-4.

CALIPER

INSEPCTION

The bore diameter is smaller, there being no other difference as in the case of master cylinder.

Diameter	Standard	Service limit
Bore	38.180 ~ 38.219 mm (1.5031 ~ 1.5047 in.)	Over 38.230 mm (1.5051 in.)
Piston	38.025 ~ 28.050 mm (1.4970 ~ 1.4980 in.)	Under 37.925 mm (1.4931 in.)

REASSEMBLY

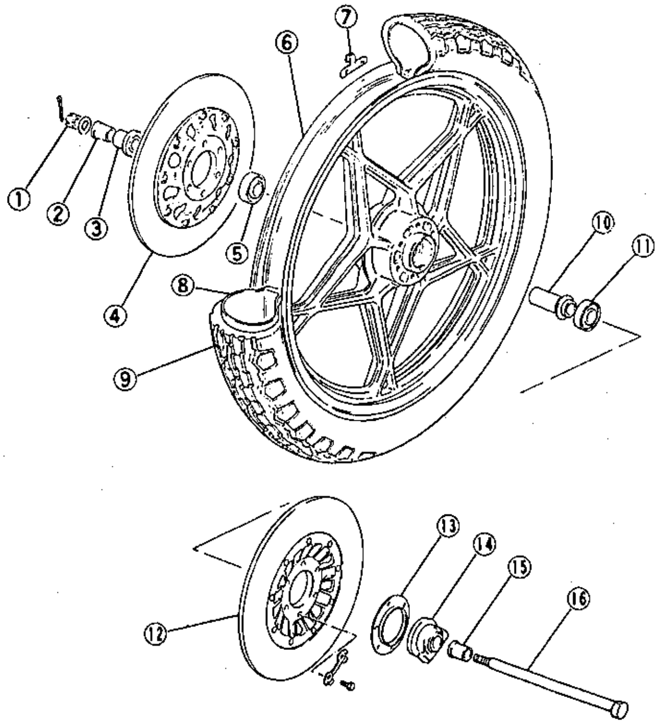
Three brake hoses are tied into the hose joint. One is from master cylinder; one is to the left caliper; and one is to the right caliper.
When connecting the hoses to the joint, be sure to make connections as shown.

AIR BLEEDING FROM BRAKE FLUID CIRCUIT

To bleed air out of the calipers, proceed as described in page 10-24 of the GS1000 section. Bleed out from the left caliper first, and then from the right caliper.

WHEEL

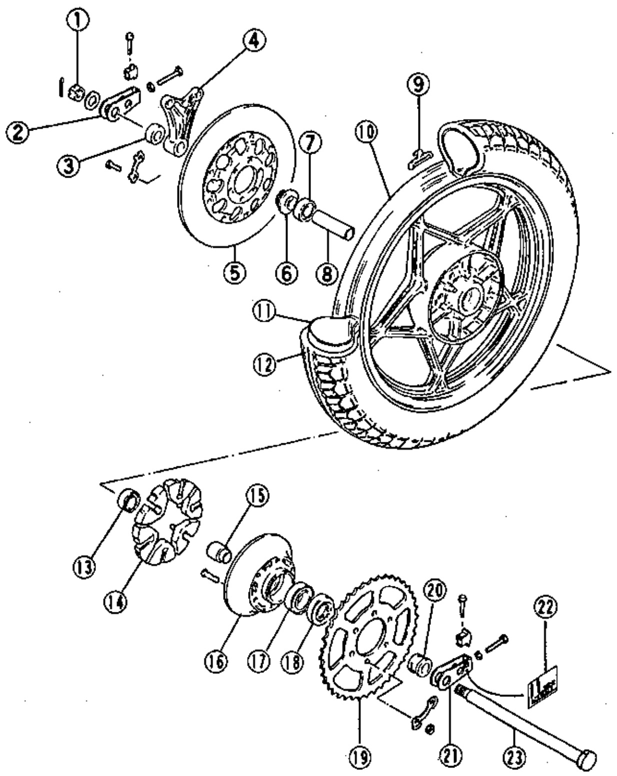
Exploded view of GS1000E front wheel



1. Front axle nut
2. Axle spacer
3. Bearing RH spacer
4. Front brake disc
5. Bearing
6. Front wheel
7. Balance weight
8. Inner tube
9. Front tire
10. Spacer
11. Bearing
12. Front brake disc
13. Dust seal
14. Speedometer gear box
15. Axle spacer
16. Front axle

Fig. 12-5.

Exploded view of GS1000E rear wheel



1. Rear axle nut
2. Chain RH adjuster
3. Spacer
4. Rear calipers bracket
5. Rear brake disc
6. Axle RH spacer
7. RH bearing
8. Spacer
9. Balance weight
10. Rear wheel
11. Inner tube
12. Rear tire
13. LH bearing
14. Rear hub cushion
15. Bearing holder
16. Sprocket mounting drum
17. Bearing
18. Oil seal
19. Rear sprocket
20. Axle LH spacer
21. Chain LH adjuster
22. Chain wear indicator label
23. Rear axle

Fig. 12-6.

DISASSEMBLY

Either right or left caliper must be removed to allow removal of front wheel.

Caliper mounting bolt tightening torque	2.5 ~ 4.0 kg-m (18.0 ~ 29.0 lb-ft)

NOTE:
Be careful in handling the casting wheel as it is made of aluminum alloy and apt to be damaged compared with a general steel wheel.

INSPECTION AND CHECKING

1. Wheel run-out

	Face run-out	Radial run-out
Run-out limit	2 mm (0.08 in.)	2 mm (0.08 in.)

2. Wheel balance
   Check the wheel balance in the same way as in GS1000. Use a balance weight of 20 gr. or 30 gr. when necessary.

Wheel balancer	
Weight	Part No.
20 gr. (0.04 lbs)	55411-47001
30 gr. (0.07 lbs)	55412-47001

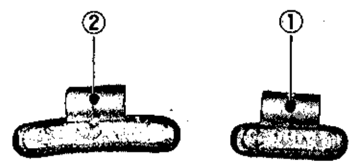


Fig. 12-7. ① 20 gr. ② 30 gr.

NOTE:
When thrusting a balance weight to the wheel (rim section), use a plastic hammer to prevent damage to the wheel. Never use a metallic hammer.

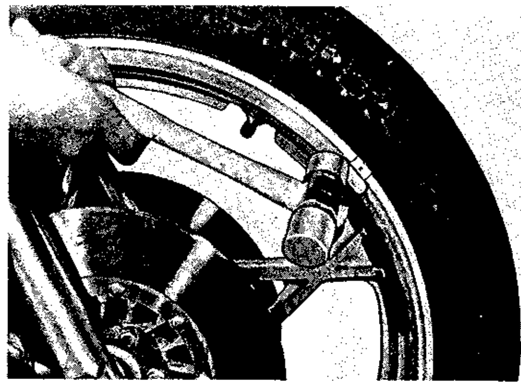


Fig. 12-8.

NOTE:
When removing a balance weight or when cutting it for minute adjustment, use wheel weight pliers.

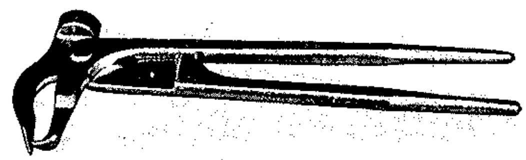


Fig. 12-9. Wheel weight pliers

CHECKING DISC WEAR (Front)

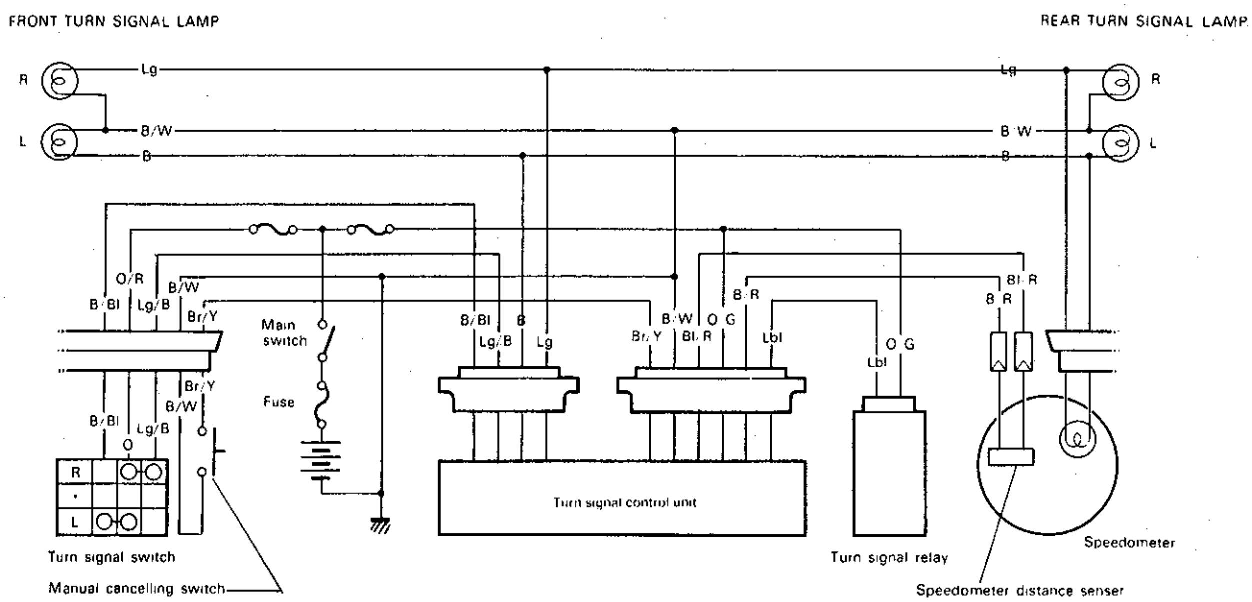
Including Model GS1000E, the front disc of the models equipped with double discs is thinner than those of others.

Front disc thickness	
Standard	Service limit
5.0 mm (0.20 in.)	4.5 mm (0.18 in.)
5.9 ~ 6.1 mm (0.23 ~ 0.24 in.)	5.5 mm (0.22 in.)

SELF-CANCELLING TURN SIGNAL

When the Turn Signal Knob is switched to LEFT or RIGHT, the turn signal lamp starts flashing.
If the motorcycle speed is faster than a certain speed (about 15 km/h), the turn signal lamp is switched off automatically after a certain period of time (about 9 sec).

CIRCUIT DIAGRAM



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

Fig. 12-10.

OPERATION

- When the Turn Signla Knob is switched to LEFT or RIGHT, the turn signal lamp starts flashing.
  If the motorcycle speed is faster than 15 km/h (9.3 mph), flashing will be switched off automatically about 9 sec after the knob is released.
- The timer does not operate when the motorcycle stops or runs at a speed slower than 15 km/h.
  Only when the motorcycle runs at speeds faster than 15 km/h does the timer operate to switch the turn signal off automatically when the total time above that speed exceeds 9 sec.
- When the Turn Signal Knob is switched on again before it is turned off automatically, flashing will go off 9 sec after this time at speeds faster than 15 km/h.
- Flashing can be switched off before it goes off automatically, by pressing the Turn Signal Knob downward.

TROUBLE SHOOTING

Refer to Circuit Diagram, and check the operation at 1 the lead connector of the left handle switch (Turn Signal Knob), 2 the lead of Turn Signal Relay, and 3 the lead of Speed Sensor, according to the following procedure:

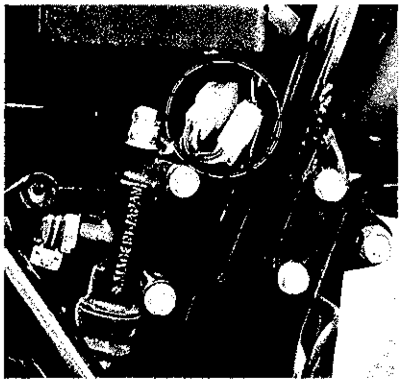


Fig. 12-11.

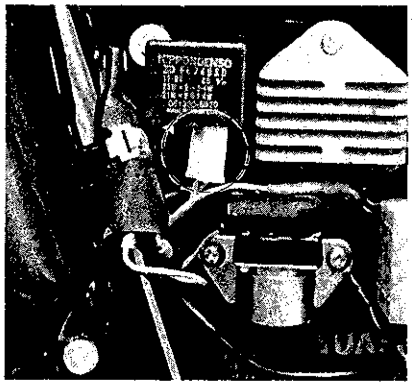


Fig. 12-12.

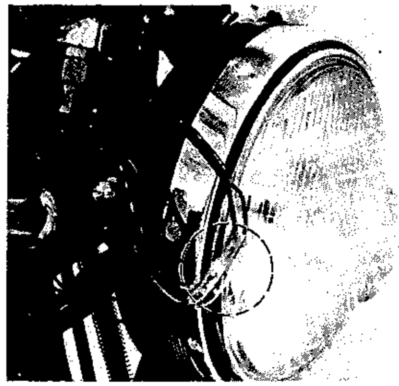


Fig. 12-13.

1. The turn signal lamp does not flash.

Turn on Main Switch

↓

Is there DC 12 ~ 16V across leads O/R(+) and B/W(−)? — NO → Charge the battery.

↓ YES

Is there DC 10 ~ 16V across B(+) and B/W(−) when Turn Signal Knob is switched to LEFT, and across Lg(+) and B/W(−) when Turn Signal Knob is switched to RIGHT? — YES → Break in flashing lamp or wire.

↓ NO

Is there DC 10 ~ 16V across Lbl(+) and B/W(−), when Turn Signal Knob is released? — NO → Defective Turn Signal Relay or leak in wire.

↓ YES

Is the voltage across Br/Y(+) and B/W(−) 0.6 ~ 1.0V? — NO → Defective Manual Cancel Switch or short circuit in Br/Y lead to the body.

↓ YES

Is there more than 10V across B/Bl(+) and B/W(−) when Turn Signal Knob is switched to LEFT, and across Lg/B(+) and B/W(−) when Turn Signal Knob is switched to RIGHT? — NO → Defective Turn Signal Switch.

↓ YES

Defective Control Unit

2. The turn signal lamp lights continuously (does not flash).

Has one of the turn signal lamps blown? — YES → Replace the bulb.

↓ NO

Turn on Main Switch.

↓

Is there more than 11V across Turn Signal Relay lead O/G and B/W? — NO → Charge the battery.

↓ YES

Defective Turn Signal Relay.

3. Flashing does not go off after 9 ± 1 sec at speeds faster than 14 ± 5 km/h

Check Turn Signal Switch, Speed Sensor, and the speedometer calbe in the following manner. If they are found to be normal, Control Unit may be defective.

3-1. Turn Signal Switch

Disconnect wires coming from Control Unit at the harness connector.

Using a multimeter check that continuity is obtained, between leads O/G and B/Bl when Turn Signal Knob is switched to LEFT, and that continuity is not obtained when the knob is released.

Continuity should be obtained between O/G and Lg/B when Turn Signal Knob is switched to RIGHT, and not obtained when the knob is released.

If above conditions are satisfied, Turn Signal Switch is normal.

3-2. Speed Sensor

Remove the meter cable from the speedometer.

Insert a minus screwdriver in the boss of the meter, and slowly turn the screwdriver one turn.

If continuity/no continuity is obtained between leads B/R and Bl/R few times alternatively, i.e. for ON/OFF, ON/OFF, ON/OFF, ON/OFF, then speed sensor is normal.

CAUTION:
The lead relay used in the Speed Sensor is rated at 10 mA max.
Do not exceed the rated current when checking continuity, otherwise contacts may be damaged.

- Check speedometer cable and driving components.

4. Flashing does not go off when Manual Cancel Switch is pressed.

- Check that continuity between leads B/W and Br/Y is obtained when Manual Cancel Switch is pressed.

Turn on Main Switch

↓

Does the voltage across Br/Y(+) and B/W(−) at Control Unit change from 0.6 ~ 1.0V to 0V when Manual Cancel Switch is pressed? — NO → Defective lead wire or connection.

↓ YES

Defective Control Unit.

5. Flashing goes off before 9 ± 1 sec.

Ride the motorcycle at a speed of 20 km/h or more.

↓

Measure the time after Turn Signal Knob is switched to LEFT or RIGHT, and released, until flashing goes off.

↓

Does flashing go off 9 ± 1 sec after the knob is released? — YES → Control Unit is normal.

↓ NO

Is Speed Sensor normal? (See 3-2)
(Also check tighteness of connectors.) — NO → Defective Speed Sensor.

↓ YES

Are speedometer cable and related components normal? — NO → Replace defective component.

↓ YES

Defective Control Unit.

6. Flashing does not go off at the speed of 14 ± 5 km/h or more.

Are speedometer cable and related components normal? — NO → Replace defective component.

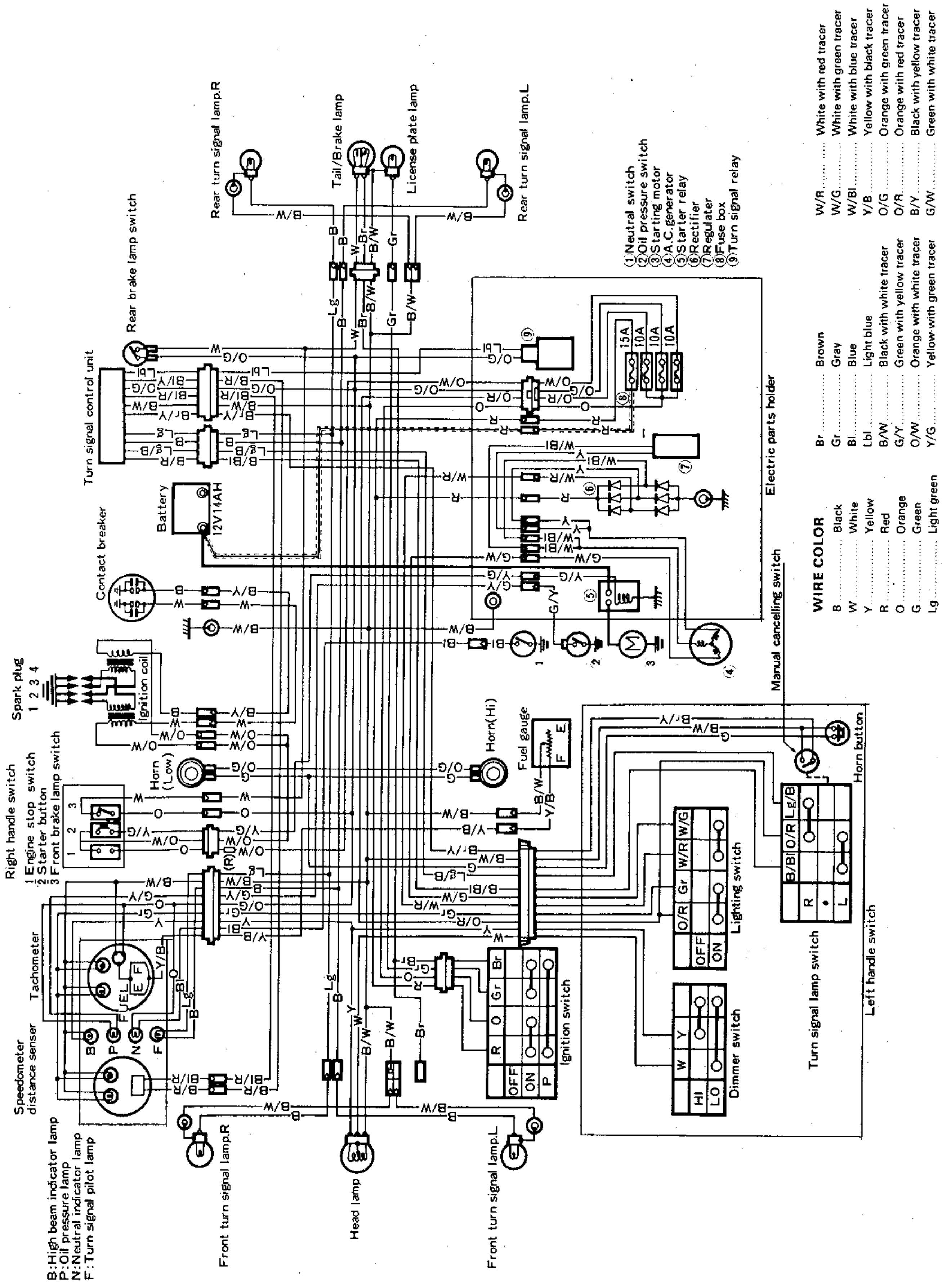
↓ YES

Is Speed Sensor normal? (See 3-2) — NO → Defective Speed Sensor.

↓ YES

Defective Control Unit.

WIRING DIAGRAM



SUZUKI

GS1000

SUPPLEMENTARY SERVICE MANUAL

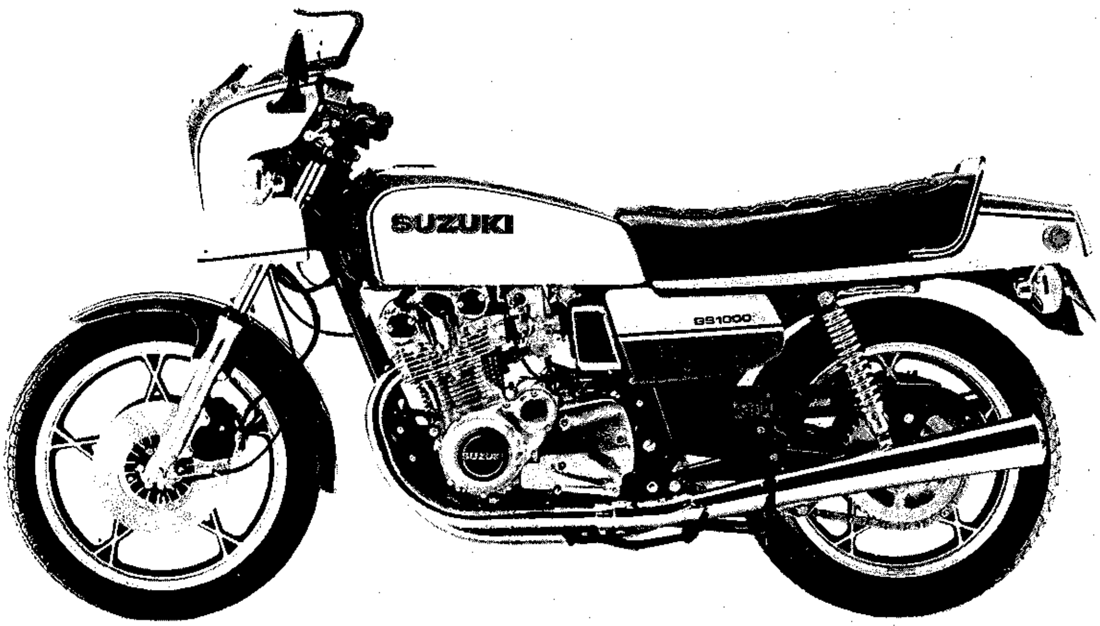
GS1000S SUZUKI MOTOR CO., LTD. JULY '80 PRINTED IN JAPAN 99000-85850-4E3

GS1000S

CONTENTS

This section gives only servicing procedures which differ from those of the GS1000 and describes the new features of the GS1000S.
For the GS1000S servicing procedures of the following parts, refer to the GS1000 and GS1000E sections.

- FRONT BRAKE
- WHEELS
- SELF-CANCELLING TURN SIGNAL



GS1000S

GENERAL INFORMATION

SPECIFICATIONS

DIMENSIONS AND WEIGHT

Overall length	2 225 mm (87.6 in)
Overall width	735 mm (28.9 in)
Overall height	1 255 mm (49.4 in)
Wheelbase	1 505 mm (59.3 in)
Ground clearance	160 mm (6.3 in)
Seat height	840 mm (33.1 in)
Dry mass (weight)	238 kg (525 lbs)

ENGINE

Type	Four-stroke cycle, air-cooled, DOHC
Number of cylinders	4
Bore	70.0 mm (2.756 in)
Stroke	64.8 mm (2.551 in)
Piston displacement	997 cm^3 (60.8 cu.in)
Compression ratio	9.2 : 1
Carburetor	MIKUNI VM26SS, 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, 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	63°00′
Trail	116 mm (4.57 in)
Turning radius	2.50 m (8.2 ft)
Front brake	Disk brake, twin
Rear brake	Disk brake
Front tire size	3.25V19 4PR
Rear tire size	4.00V18 4PR
Front tire pressure	175 kPa (1.75 kg/cm^2, 25 psi) (Normal solo riding)
Rear tire pressure	200 kPa (2.00 kg/cm^2, 28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Battery Ignition
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 500 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES
Battery	12V 50.4 kC (14 Ah)/10 HR
Generator	Three-phase A.C generator
Fuse	10/10/10/15A

CAPACITIES

Fuel tank including reserve	19 L (5.0/4.2 US/Imp gal)
reserve	4.0L (1.1/0.9 US/Imp gal)
Engine oil tank	3.4L (3.6/3.0 US/Imp qt)
Front fork oil	259 ml (8.75/9.12 US/Imp oz)

These specifications are subject to change without notice.

SERVICE DATA

Valves + Guides

Unit: mm (in)

Item		Standard	Service Limit
Valve Lift	IN	8.0 (0.31)	—
	EX	7.5 (0.30)	—
Tappet Clearance or Valve Clearance (cold engine)	IN	0.03 — 0.08 (0.001 — 0.003)	
	EX	0.03 — 0.08 (0.001 — 0.003)	
Valve Guide — Valve Stem Clearance	IN	0.025 — 0.055 (0.0009 — 0.0022)	0.090 (0.0035)
	EX	0.040 — 0.070 (0.0016 — 0.0028)	0.100 (0.0039)
Valve Guide I.D.	IN/EX	7.000 — 7.015 (0.2756 — 0.2762)	—
Valve Stem O.D.	IN	6.960 — 6.975 (0.2740 — 0.2746)	—
	EX	6.945 — 6.960 (0.2734 — 0.2740)	—
Valve Stem Runout	IN/EX	—	0.05 (0.002)
Valve Head Thickness	IN/EX	—	0.5 (0.02)
Valve Seat Width	IN/EX	1.1 — 1.3 (0.04 — 0.05)	
Valve Head Radial Runout	IN/EX	—	0.03 (1.33)
Valve Spring Free Length	INNER	35.3 — 37.0 (1.39 — 1.46)	33.9 (1.33)
	OUTER	43.0 — 43.25 (1.69 — 1.70)	41.3 (1.63)
Valve Spring Tension	INNER	29.3 — 34.0 kg/23.0 mm (64.59 — 74.96 lbs/0.91 in)	—
	OUTER	50.4 — 58.3 kg/27.0 mm (111.11 — 128.53 lbs/1.06 in)	—

Camshaft

Unit: mm (in)

Item		Standard	Service Limit
Cam Height	IN	36.325 — 36.355 (1.4301 — 1.4313)	36.030 (1.4185)
	EX	35.775 — 35.805 (1.4085 — 1.4096)	35.480 (1.3968)

Unit: mm (in)

Item		Standard	Service Limit
Camshaft — Journal Clearance	IN/EX	0.025 — 0.053 (0.0010 — 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	21.960 — 21.975 (0.8646 — 0.8652)	—
Camshaft Runout	IN/EX	—	0.10 (0.004)
Cam Chain 20 Pitch Length		—	157.80 (6.213)

Piston + Ring + Cylinder

Unit: mm (in)

Item		Standard	Service Limit
Compression Pressure		9 — 13 kg/cm^2 (128 — 184 psi)	7 kg/cm^2 (100 psi)
Difference Between Cylinders		—	2 kg/cm^2 (28.5 psi)
Piston — Cylinder Clearance		0.050 — 0.060 (0.0020 — 0.0024)	0.120 (0.0047)
Cylinder Bore		70.000 — 70.015 (2.7559 — 2.7565)	70.080 (2.7590)
Piston Dia./Measurement Point		69.945 — 69.960/15.0 (2.7537 — 2.7543/0.59)	69.880 (2.7512)
Cylinder Distortion		—	0.2 (0.008)
Cylinder Head Distortion		—	0.2 (0.008)
Piston Ring Free End Gap	1st	Approx. 8.5 (0.33)	6.8 (0.27)
	2nd	Approx. 8.5 (0.33)	6.8 (0.27)
Piston Ring End Gap	1st	0.15 — 0.35 (0.006 — 0.014)	0.70 (0.028)
	2nd	0.15 — 0.35 (0.006 — 0.014)	0.70 (0.028)
Piston Ring — Groove Clearance	1st	0.020 — 0.055 (0.0008 — 0.0022)	0.180 (0.0071)
	2nd	0.020 — 0.060 (0.0008 — 0.0024)	0.150 (0.0059)
Piston Ring Groove Width	1st	1.21 — 1.23 (0.047 — 0.048)	—
	2nd	1.21 — 1.23 (0.047 — 0.048)	—
	Oil	2.51 — 2.53 (0.099 — 0.100)	—

Unit: mm (in)

Item		Standard	Service Limit
Piston Ring Thickness	1st	1.175 – 1.190 (0.0463 – 0.0469)	–
	2nd	1.170 – 1.190 (0.0461 – 0.0469)	–
Piston Pin – Pin Bore Clearance		0.002 – 0.013 (0.0001 – 0.0005)	0.120 (0.0047)
Piston Pin Bore I.D.		18.002 – 18.008 (0.7087 – 0.7090)	–
Piston Pin O.D.		17.995 – 18.000 (0.7085 – 0.7087)	–

Crankshaft

Unit: mm (in)

Item	Standard	Service Limit
Con-rod Small End Bore – Piston Pin Clearance	0.002 – 0.013 (0.00008 – 0.00051)	0.080 (0.0031)
Con-rod Small End Bore I.D.	18.006 – 18.014 (0.7089 – 0.7092)	–
Piston Pin O.D.	17.995 – 18.000 (0.7085 – 0.7087)	–
Big End Side Clearance	0.10 – 0.65 (0.004 – 0.026)	1.00 (0.039)
Con-rod Big End Wear	–	0.08 (0.003)
Crankshaft Runout	–	0.10 (0.004)

Oil Pump

Unit: mm (in)

Item	Standard	Service Limit
Oil Pump Reduction Ratio	1.723 (87/49 × 33/34)	
Oil Pressure (for 60°C)	Above 0.1 kg/cm² (142 psi), Below 0.5 kg/cm² (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	Service Limit
Drive Plate Thickness	2.7 ~ 2.9 (0.10 ~ 0.11)	2.4 (0.09)
Drive Plate Distortion	—	0.2 (0.008)
Driven Plate Thickness	1.6 (0.06)	—
Driven Plate Distortion	—	0.1 (0.004)
Drive Plate Claw Width	15.6 — 15.8 (0.61 — 0.62)	14.8 (0.58)
Clutch Spring Free Length	39.0 — 40.5 (1.54 — 1.59)	37.1 (1.46)
Pri. Drive — Driven Gear Backlash	0 — 0.03 (0 — 0.001)	0.08 (0.003)

Transmission

Unit: mm (in)

Item		Standard	Service Limit
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)	
Gear Backlash	1st, 2nd and 3rd	0 — 0.04 (0 — 0.002)	0.09 (0.004)
	4th and Top	0.05 — 0.10 (0.002 — 0.004)	0.15 (0.006)
Shift Fork — Groove Clearance		0.4 — 0.6 (0.016 — 0.024)	0.8 (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)	—
Drive Chain Size		D.I.D 630YL, 96 links	

Carburetor

Unit: mm (in)

Item	Specification
Idle r/min	1000 ±50 r/min
Carburetor Type	MIKUNI VM26SS
I.D. No.	49020
Bore Size	26 (1.0)
Float Height	24.0 ±1.0 (0.94 ±0.04)
Fuel level	4.0 ±1.0 (0.16 ±0.04)
Air Screw	PRE-SET
Cut Away	1.5
Jet Needle	5DL36-3
Pilot Screw	PRE-SET
Pilot AIR Jet	1.2
Pilot Jet	#15
Pilot Outlet	1.5
Needle Jet	0 – 2
By-pass	0.8
Main Jet	#95

Electrical

Unit: mm (in)

Item	Standard	
Ignition Timing	17° B.T.D.C. below, 1500 r/min, 37° B.T.D.C. above, 2500 r/min	
Firing Order	1. 2. 4. 3.	
Spark Plug	NGK B8ES or NIPPON DENSO W24ES	
Spark Plug Gap	0.6 – 0.8 (0.024 – 0.031)	
Contact Point Gap	0.35 ±0.05 (0.014 ±0.002)	
Dwell Angle	180°	
Spark Performance	Over 8 (0.3) at 1 atm	
Condenser Capacity	0.18 ±0.02μF	
Ignition Coil Resistance (Primary)	Approx. 4Ω	
Ignition Coil Resistance (Secondary)	Approx. 15kΩ	
Battery Capacity	12V 50.4 kC (14Ah) 10 HR	
Specific Gravity	1.28 at 20°C	
Regulated Voltage	14.0 – 15.5V	
Fuse Size	15/10/10/10A	
Alternator No-load Data	More than 16.5V (DC) at 5000 r/min	
Starter More Brush Length	12 – 13 (0.47 – 0.51)	6 (0.24)

Brake + Wheel

Unit: mm (in)

Item		Standard	Service Limit
Axle Runout	Front and Rear	—	0.25 (0.010)
Brake Disc Thickness	Front	4.8 – 5.2 (0.19 – 0.20)	4.5 (0.18)
	Rear	6.5 – 6.9 (0.26 – 0.27)	6.0 (0.24)
Brake Disc Runout	Front and Rear	—	0.30 (0.012)
Master Cylinder Dia.	Front	15.87 (0.625)	—
	Rear	14.00 (0.551)	—
Master Cylinder Piston Dia.	Front	15.80 (0.622)	—
	Rear	13.96 (0.550)	—
Brake Caliper Cylinder Bore	Front	42.85 (1.687)	—
	Rear	38.18 (1.503)	—
Brake Caliper Piston Dia.	Front	42.82 (1.686)	—
	Rear	38.15 (1.502)	—
Wheel Rim Runout	Radial and Axial	—	2.0 (0.08)
Tire Size	Front	3.25V19 4PR	
	Rear	4.00V18 4PR	
Tire Tread Depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

Tire Air Pressure

Cold Inflation Tire Pressure	FRONT						REAR					
	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
Normal Riding	175	1.75	25	200	2.00	28	200	2.00	28	225	2.25	32
Continuous High Speed Riding	200	2.00	28	225	2.25	32	250	2.50	36	280	2.80	40

Suspension

Unit: mm (in)

Item	Standard	Service Limit
Front Fork Stroke	160 (6.3)	
Rear Wheel Travel	100 (3.9)	
Fork Spring Free Length	351 (13.8)	346 (13.6)
Fork Oil Level	110 (4.3)	
Swinging Arm Pivot Shaft Runout	—	0.3 (0.012)

Capacity

Item	Specification
Fuel Tank Including Reserve	19 L (5.0/4.2 US/Imp gal)
Fuel Tank Including Reserve	4 L (1.1/0.9 US/Imp gal)
Engine Oil Change:	3.4 L (3.6/3.0 US/Imp qt)
Filter change:	3.8 L (4.0/3.3 US/Imp qt)
Overhaul:	4.2 L (4.4/3.7 US/Imp qt)
Front Fork Oil (each leg)	259 ml (8.75/9.12 US/Imp oz)
Front Fork Air Pressure	0.9 kg/cm^2 (12.8 psi)
Fuel Type	Use only unleaded or low-lead type gasoline of at least 85–95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the research method.
Engine Oil Type	SAE 10W/40
Front Fork Oil Type	SAE 10W/20

PERIODIC MAINTENANCE

CHOKE CABLE ADJUSTMENT

When the choke knob is returned fully, play ① must be 0.5 – 1.0 mm (0.02 – 0.04 in). Loosen lock nut ② and turn the adjuster ③ to obtain the specified play.

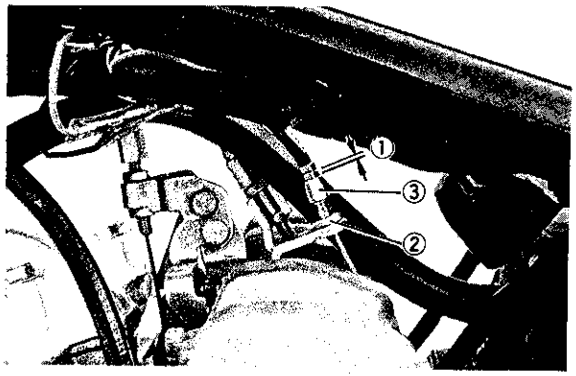


Fig. 13-1.

CHOKE KNOB ADJUSTMENT

When the choke knob is pulled, if it is too stiff or too loose, raise seal cover ④ and turn adjuster ⑤. Turning the adjuster clockwise will make the choke knob harder to turn, and vice versa.

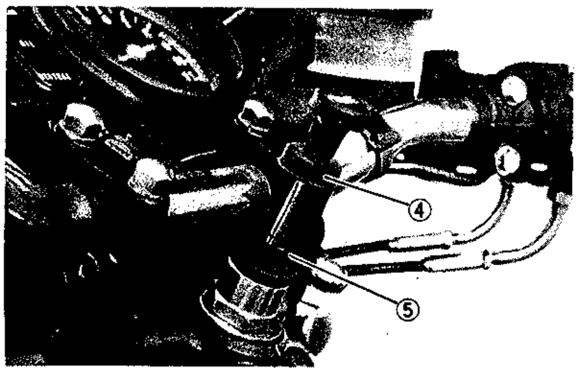


Fig. 13-2.

CLUTCH CABLE ADJUSTMENT

Loosen lock nut ⑥ on the clutch lever side and screw in adjuster ⑦ fully in the direction of the clutch lever.

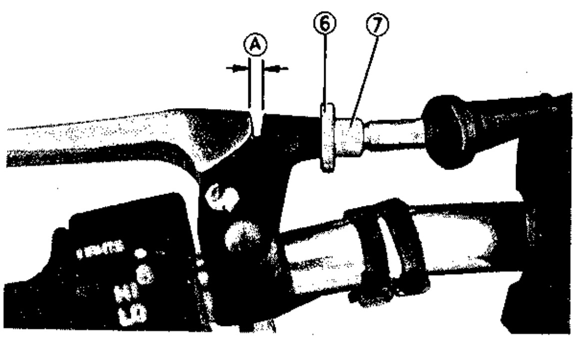


Fig. 13-3.

Remove the fuel tank (refer to Page 13-16) and loosen the lock nut ⑧ of the adjuster located under the left side of the fuel tank.

Turn the adjuster ⑨ so that play Ⓐ should be 2 – 3 mm (0.08 – 0.10 in) at the clutch lever side.

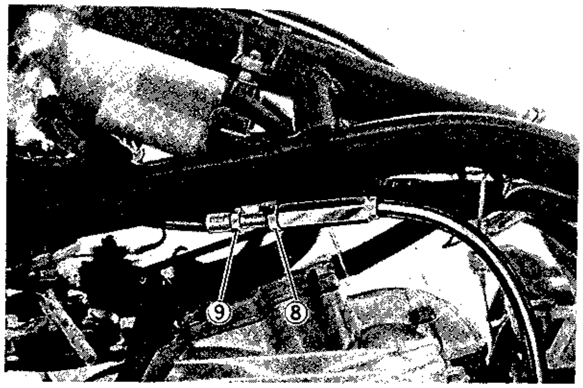


Fig. 13-4.

ENGINE REMOVAL

CARBURETOR REMOVAL

When removing the carburetor, remove the throttle cable ⑩ and ⑪ together with the choke cable ⑫.

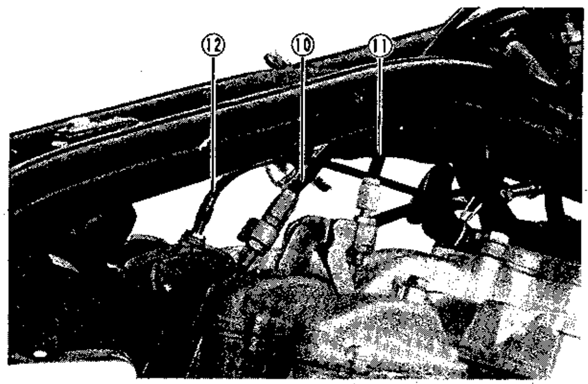


Fig. 13-5.

FUEL SYSTEM

CARBURETOR DISASSEMBLY

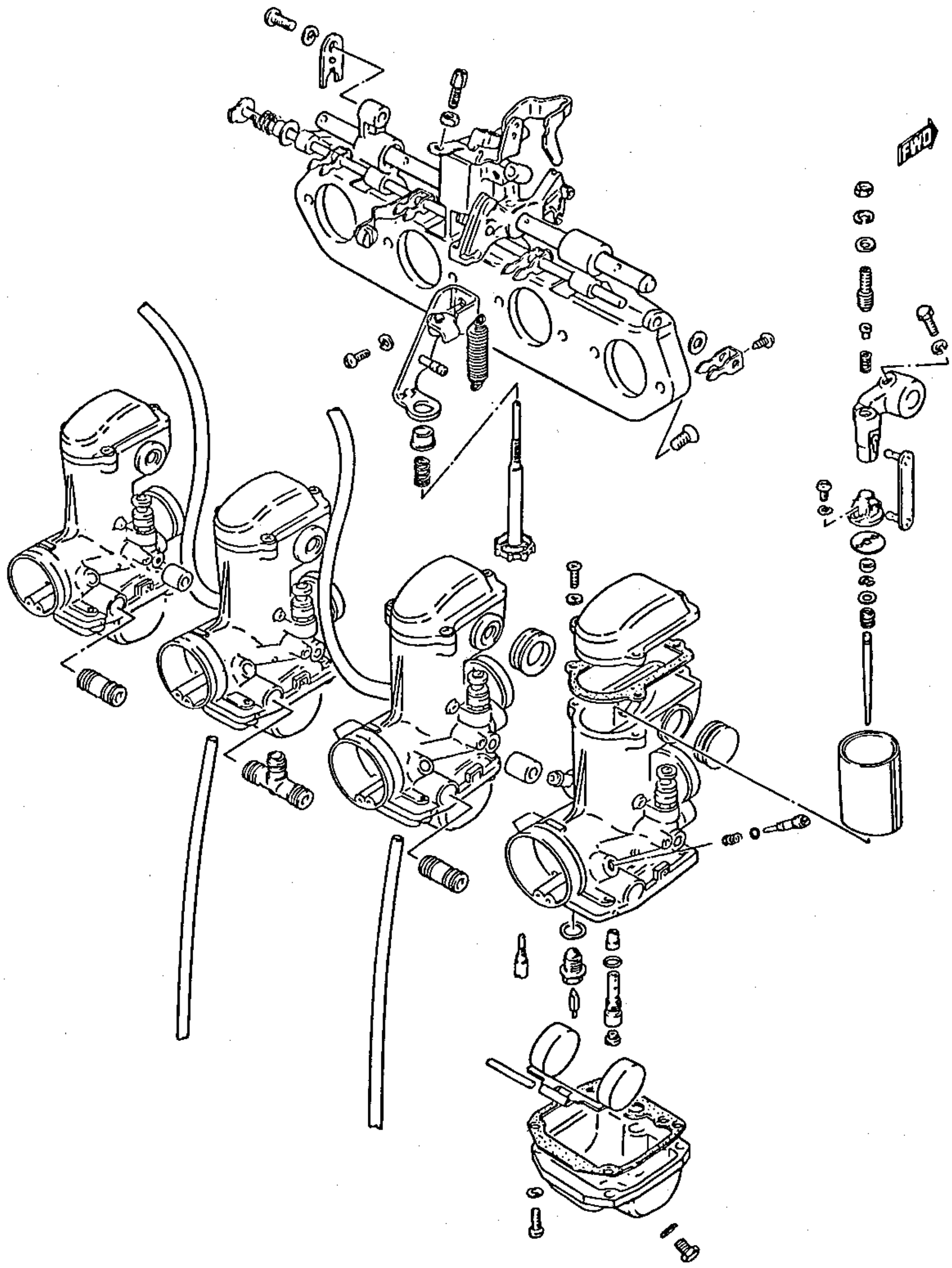


Fig. 13-6.

> *NOTE:*
> *Although the choke lever has been made obsolete on the carburetor ass'y, the disassembling procedure is the same as that for the GS1000.*

CHASSIS

HANDLEBAR

Removal

Before removing the handlebar holders, loosen right and left screws ① and remove the handlebar pad ②.

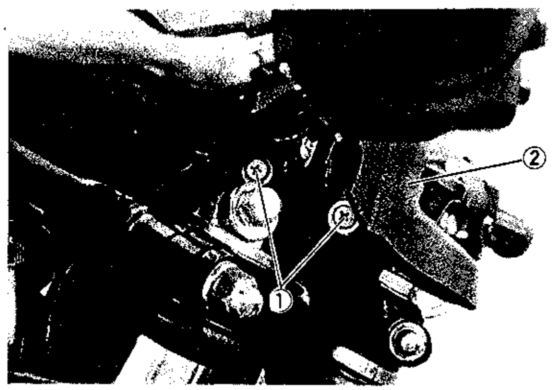


Fig. 13-7.

CHOKE CABLE

Removal

Raise choke lever ③ and remove cable end ④ from the lever. Pull out the cable end from the cable adjuster.

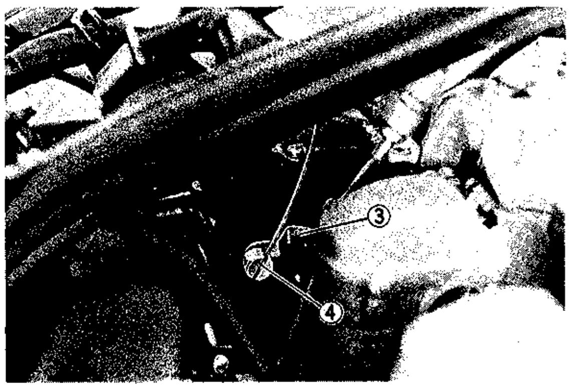


Fig. 13-8.

Remove the handlebar pad, loosen the lock nut ⑤ of the choke knob and turn the choke knob counterclockwise.

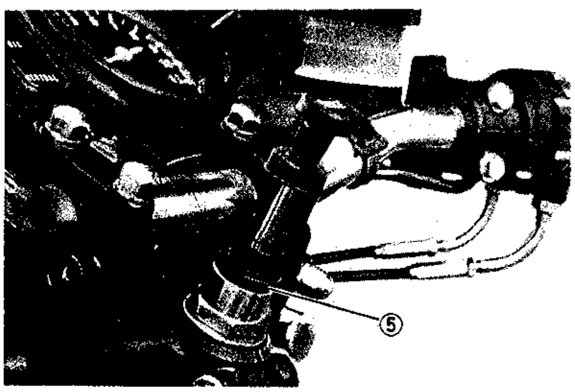


Fig. 13-9.

Installation

Install the choke knob so that the knob direction is as shown in Fig. 13-10.

> *CAUTION:*
> *Tightening the choke knob body and the lock nut excessively may damage them. Avoid tightening them excessively.*

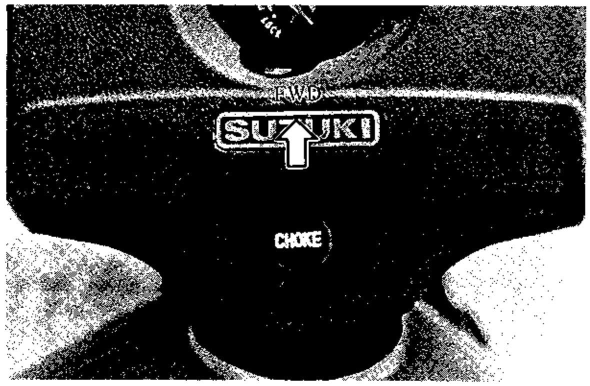


Fig. 13-10.

CLUTCH CABLE

Installation

- Turn the clutch release pinion ⑥ fully in the direction by the arrow.
- Install the clutch release arm ⑦ and the clutch cable ⑧ as shown in Fig. 13-11.
- For cable adjustment, refer to Page 13-12.

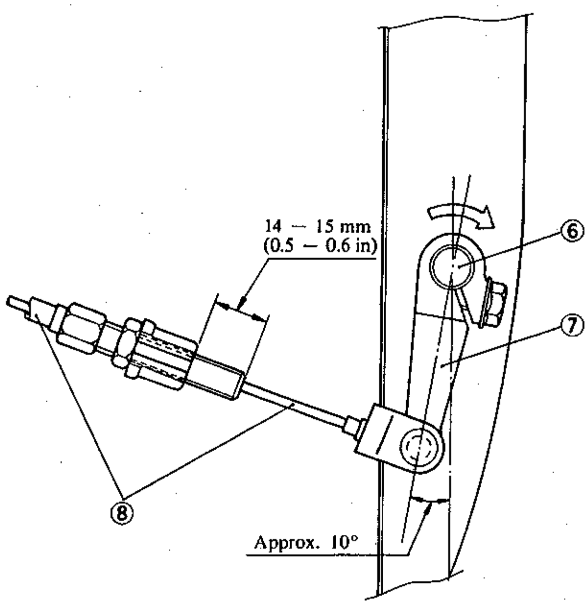


Fig. 13-11.

COWLING

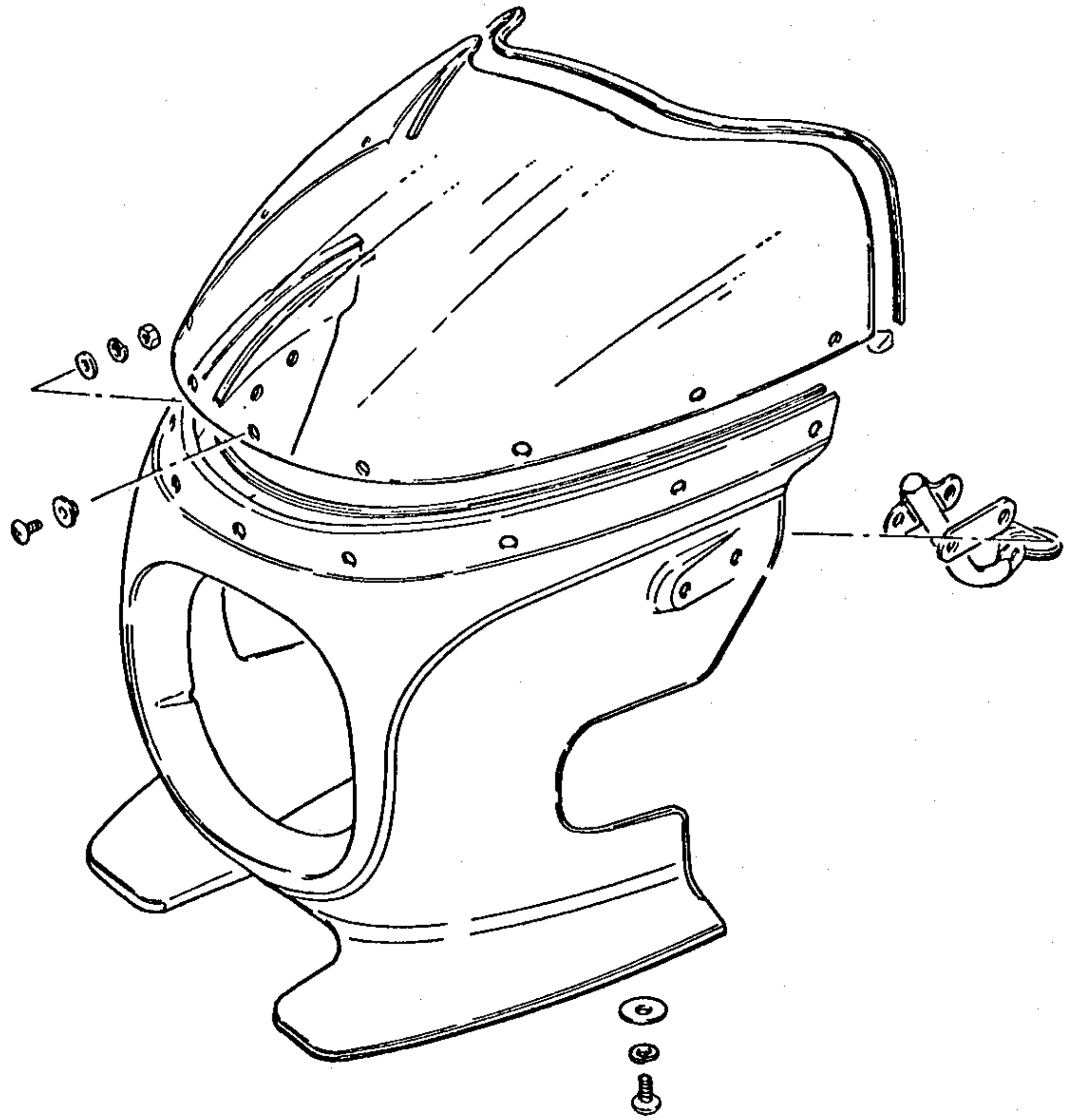


Fig. 13-12.

Removal

- Remove rear view mirrors ① with a 5 mm hexagon wrench.
- Loosen the four screws ② located under the right and left sides of the cowling and remove the cowling.

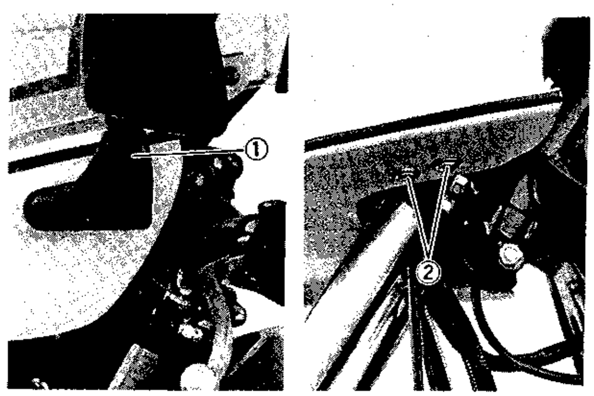


Fig. 13-13.

COMBINATION METER

Removal

- Disconnect the lead wires from the fuel gauge.

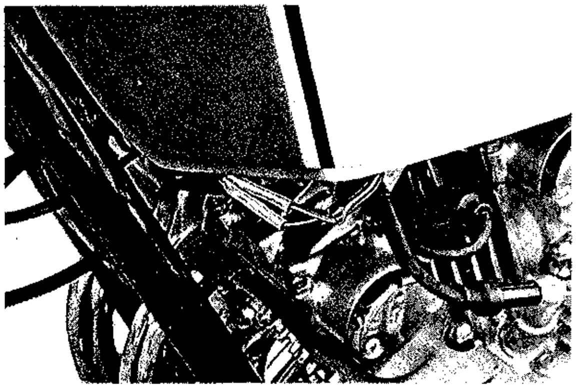


Fig. 13-14.

- Turn the fuel cock to the ON or RES position and remove the fuel hose and vacuum hose.

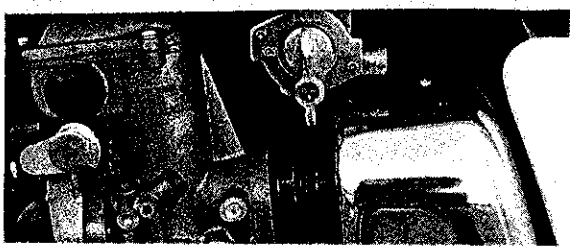


Fig. 13-15.

- Open the seat and loosen the fuel tank retaining bolt ①.
- Remove fuel tank.

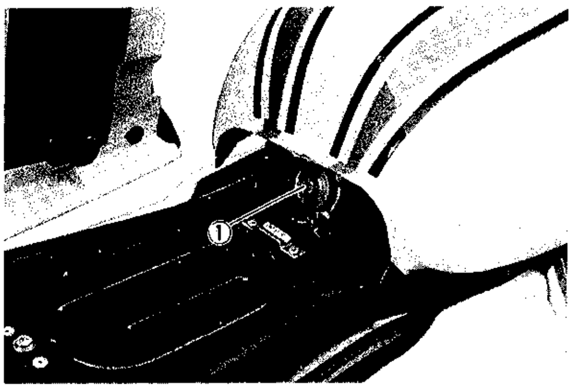


Fig. 13-16.

- Disconnect the lead wires ② from the combination meter.

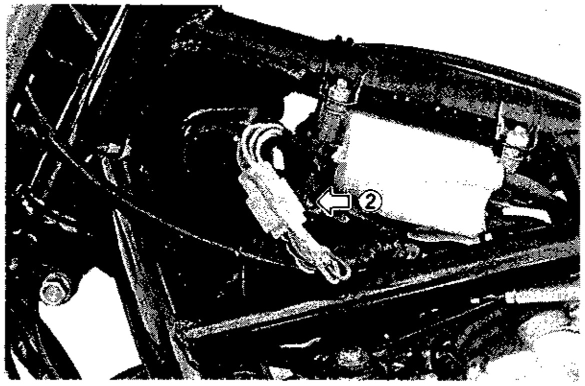


Fig. 13-17.

- Remove the cowling (refer to Cowling item).
- Loosen the three screws ③ and remove the headlight.
- Remove the wires from the headlight housing.
- Loosen the right and left headlight housing retaining screws ④ and remove the headlight housing.

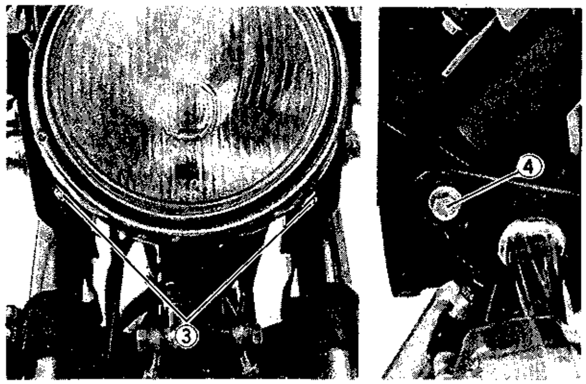


Fig. 13-18.

- Remove the speedometer and tachometer cables ⑤.
- Loosen the two bolts ⑥ and remove the combination meter ass'y.

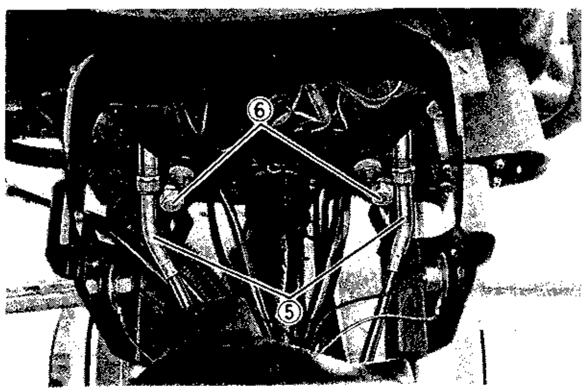


Fig. 13-19.

Installation

- Install the combination meter in the steering stem upper bracket as shown in Fig. 13-20.

> *NOTE:*
> *The right side of part Ⓐ shown in the figure is the brake hose guide and the left side is the washer.*

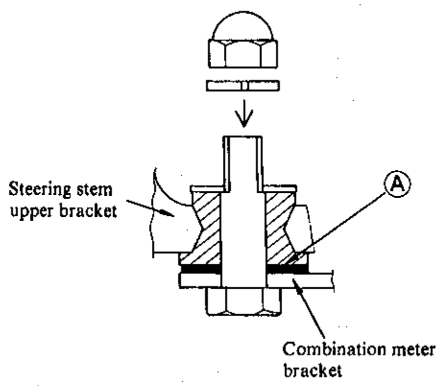


Fig. 13-20.

> *NOTE:*
> *After installing the cowling, align the beam in the horizontal plane and adjust the angle of the beam in the vertical plane.*
> *For this adjustment, refer to Page 10-5.*

TUBE AND TIRE

Removal

- Mark the position of the valve stem and rotational direction of the tires with chalk.
- Remove the valve cap and let out the air.
- Remove the valve fastening nut and fully loosen the bead protector nut.

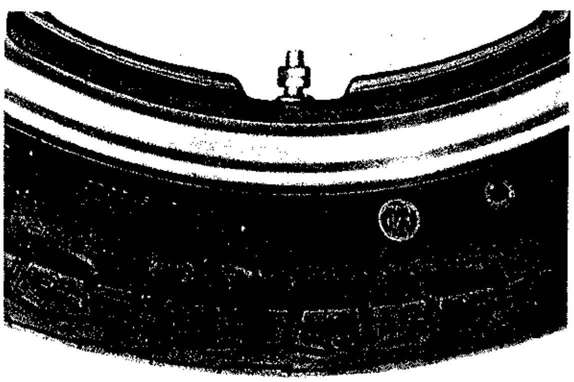


Fig. 13-21.

- Step on the tire bead, push it down as shown below, install the five wheel rim protectors (special tools) on the wheel.

09941-94510	Wheel rim protector
09950-74510	Tire bead breaker

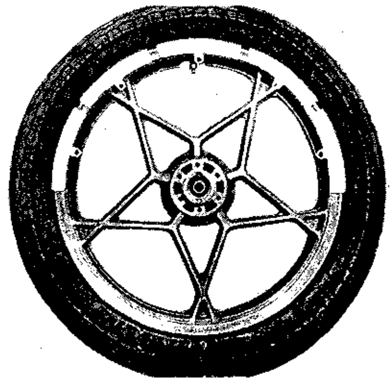


Fig. 13-22.

- Using flat tire levers, work the tire bead over the rim, starting near the valve stem.

> *CAUTION:*
> *1) Always use the wheel rim protectors. If not, the tire rim could be damaged by the tire lever.*
> *2) The tire lever should be applied over the wheel rim protectors.*

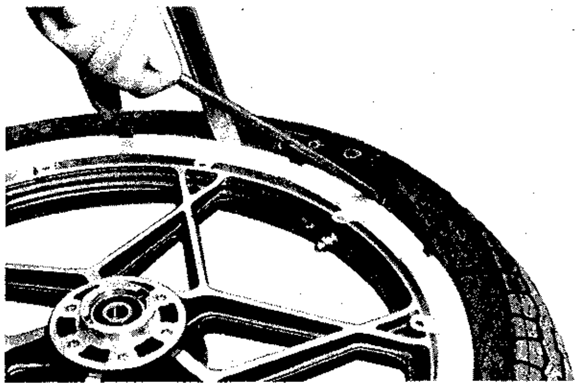


Fig. 13-23.

- Remove the tube.
- Remove the tire from the wheel.

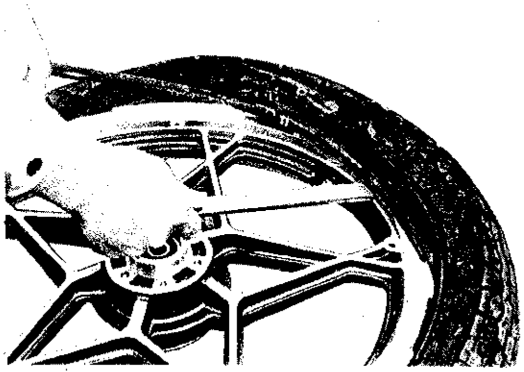


Fig. 13-24.

Mounting

- Inflate the tube sufficiently so that the tube does not fold.
- Press the tube into the tire.
- Push one side of the tire beads into the wheel rim. Be sure that the embossed arrow mark on the tire faces toward the rotational direction of the wheel.

  Next, install the tube, insert the valve into the rim, and tighten the valve nut temporarily. An arrow indicating the rotational direction is marked on the rear tire. A yellow mark is provided on the valve portion to aid checking of the tire balance.

Fig. 13-25.

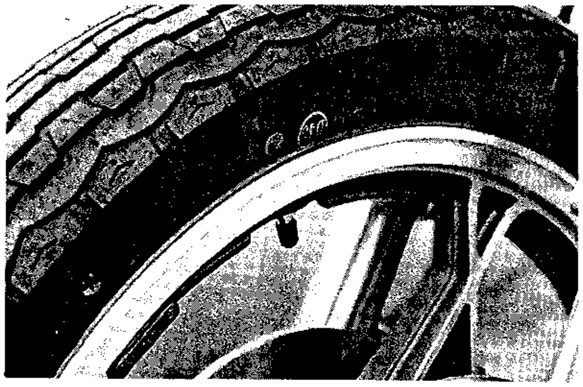


Fig. 13-26.

- Apply soapy water to the tire bead.
- Hook the bead protector on the bead portion of the tire.
- Fit the rest of the tire using tire levers placing them well away from the valve.

CAUTION:
1) Avoid inserting the tire lever too deeply into the tube. (to avoid damaging the tube).
2) As in tire removal, use the wheel rim protectors.

- By pushing the tire, confirm that the tube is not caught between the rim and tire.
- Inflate the tire to the specified pressure (see Page 13-10).
- Tighten the bead protector nut and then the valve nut.
- Mount the valve cap.

ELECTRICAL

COMBINATION METER

Disassembly

- When replacing the bulbs, remove the combination meter. For removal of the combination meter, refer to Page 13-16.

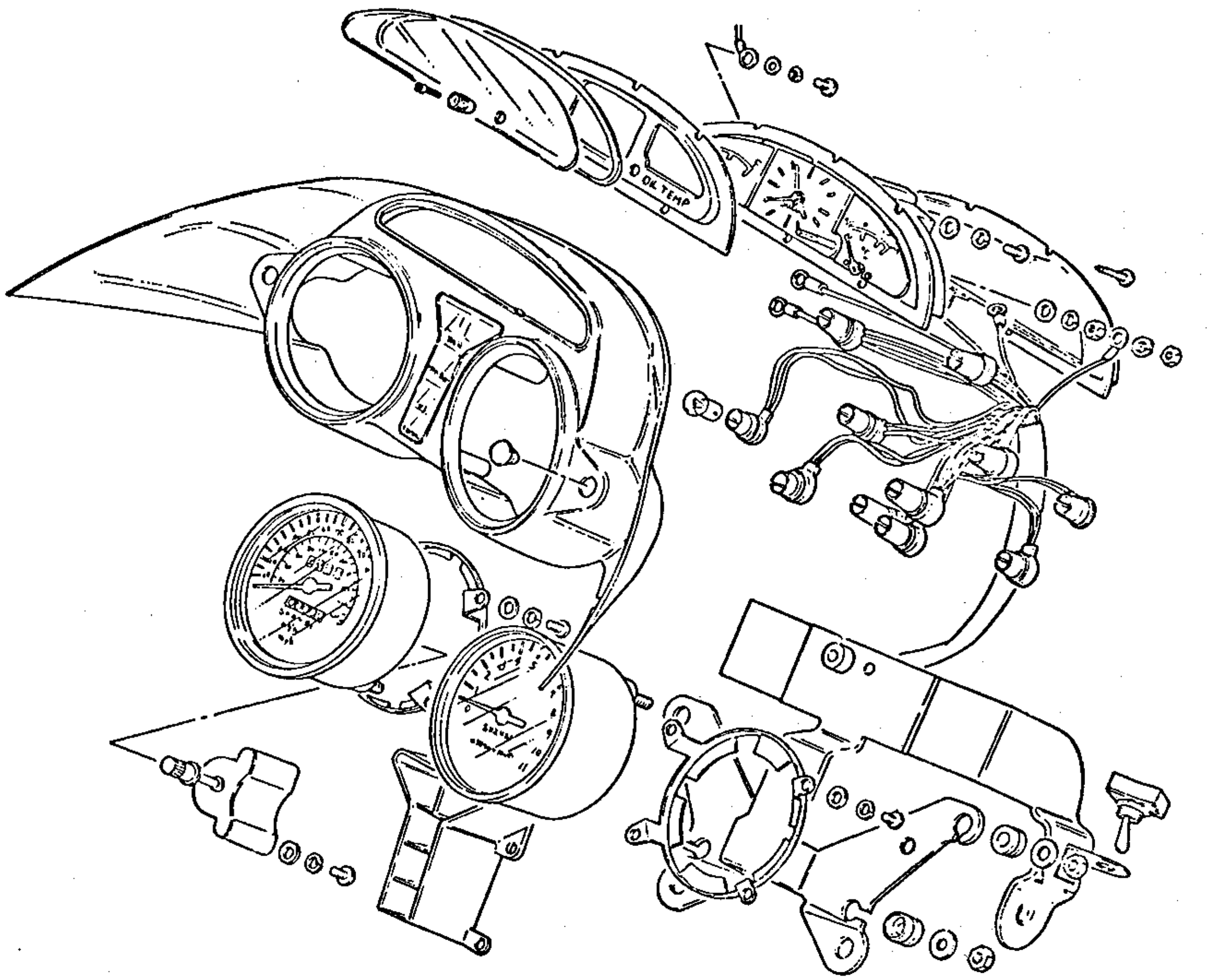


Fig. 13-27.

Assembly

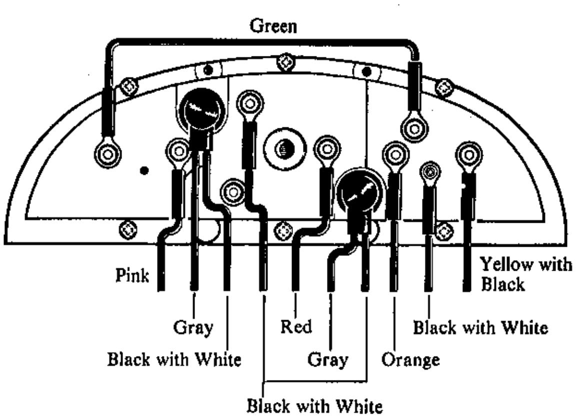


Fig. 13-28.

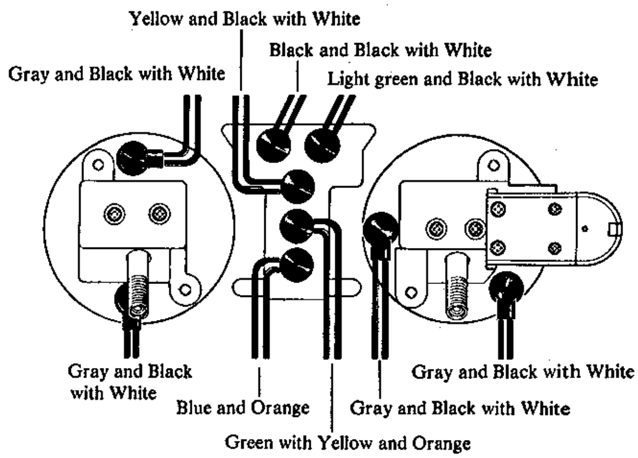


Fig. 13-29.

Inspection of fuel meter and oil temperature meter.

- As shown in Fig. 13-30, the oil meter is connected in parallel with the same fuel meter used in the GS1000.

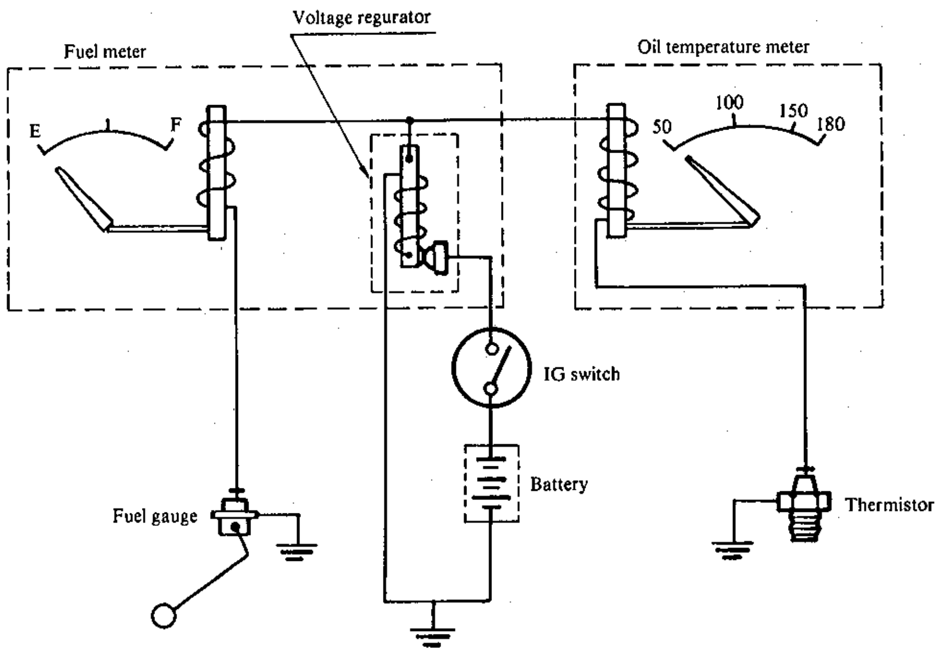


Fig. 13-30.

- The oil temperature meter has the same needle mechanism as the fuel meter. The temperature gauge employs a thermistor, the resistance of which decreases with increasing temperature of the engine oil. The current through the thermistor heats a bimetal strip in the meter section, which moves the meter needle.

Checking the thermistor

To check the thermistor measure its resistance. When the temperature of the engine is 10 ~ 30°C (50 — 86°F) the resistance of the thermostor should be 300 — 900Ω.

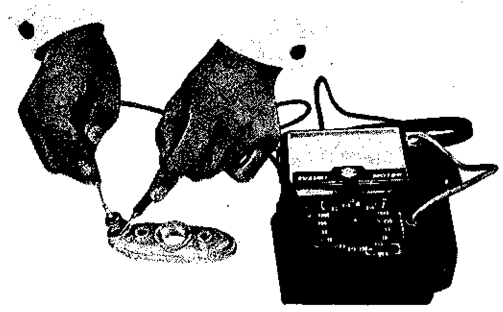


Fig. 13-31.

CAUTION:
When reinstalling the thermistor in the switch housing, apply SUZUKI BOND No. 1201 lightly to the threaded portion of the thermistor.

99104-31100	SUZUKI BOND No. 1201

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

POWER SOURCE TERMINAL

A vacant power source terminal is provided in the left frame cover. When using optional accessories, supply power from this terminal.

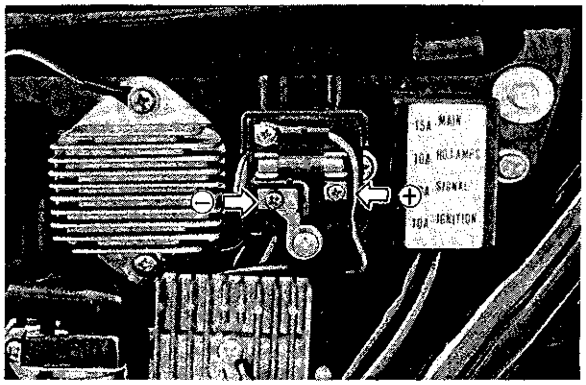
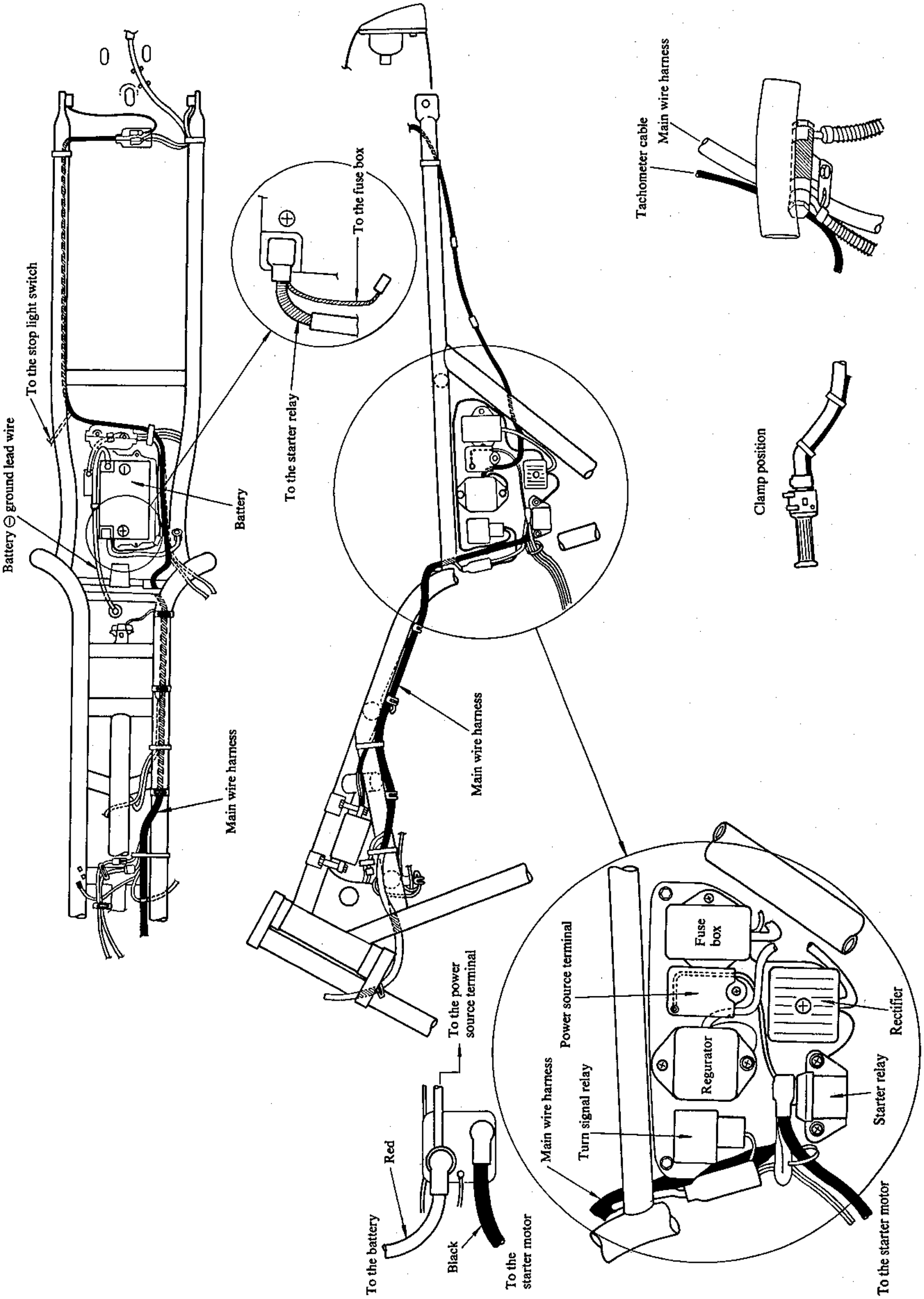


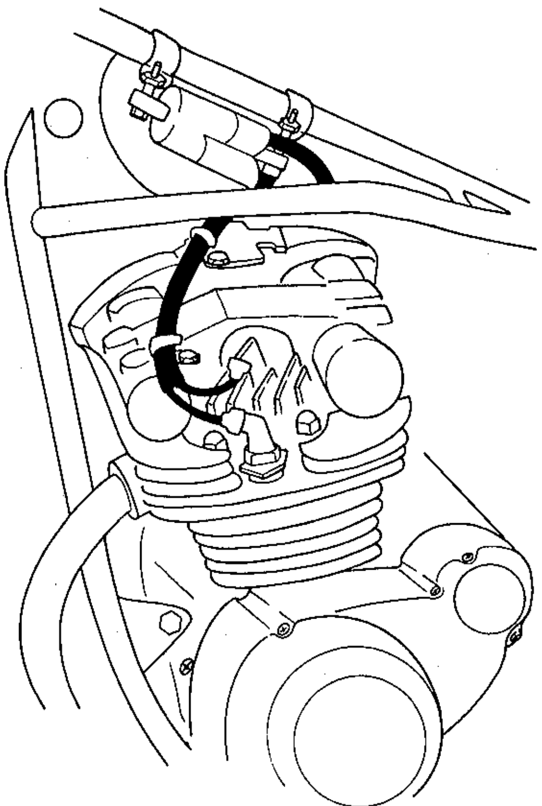
Fig. 13-32.

CAUTION:
Do not install a large capacity optional accessory and do not use the electrical system without operating the engine to prevent the battery running down.

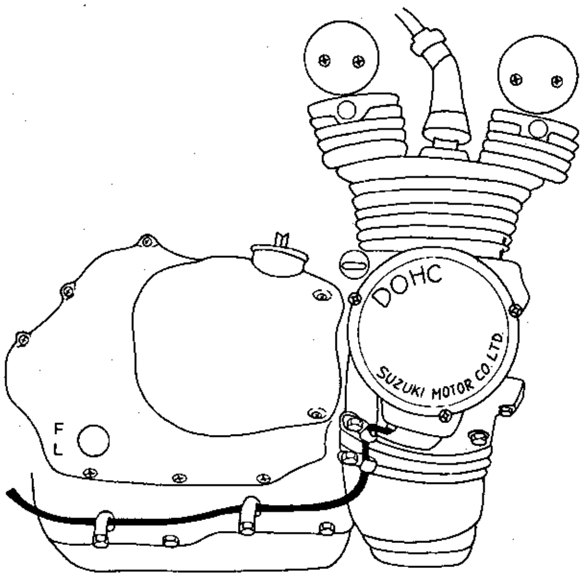
WIRE AND CABLE ROUTING



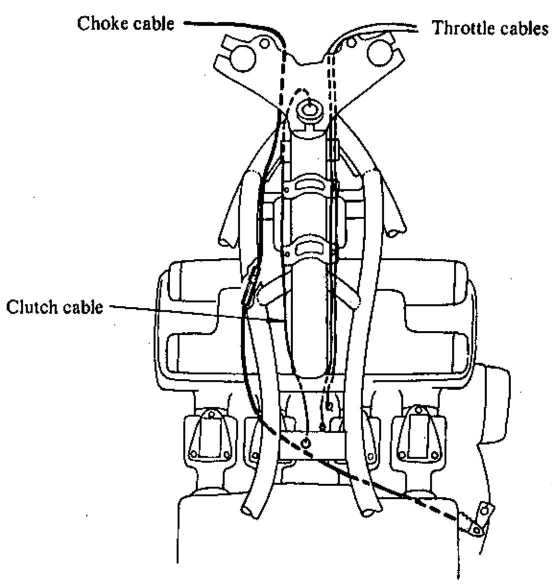
How to set the high-tension cord

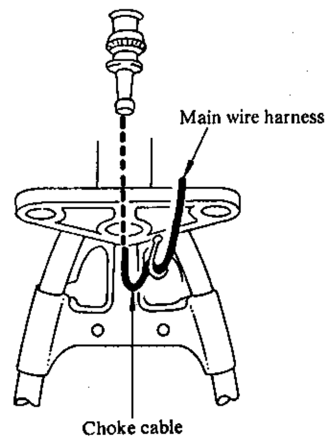


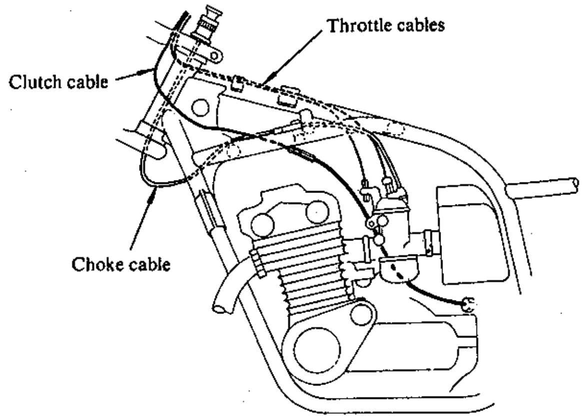
How to set contact breaker lead wire



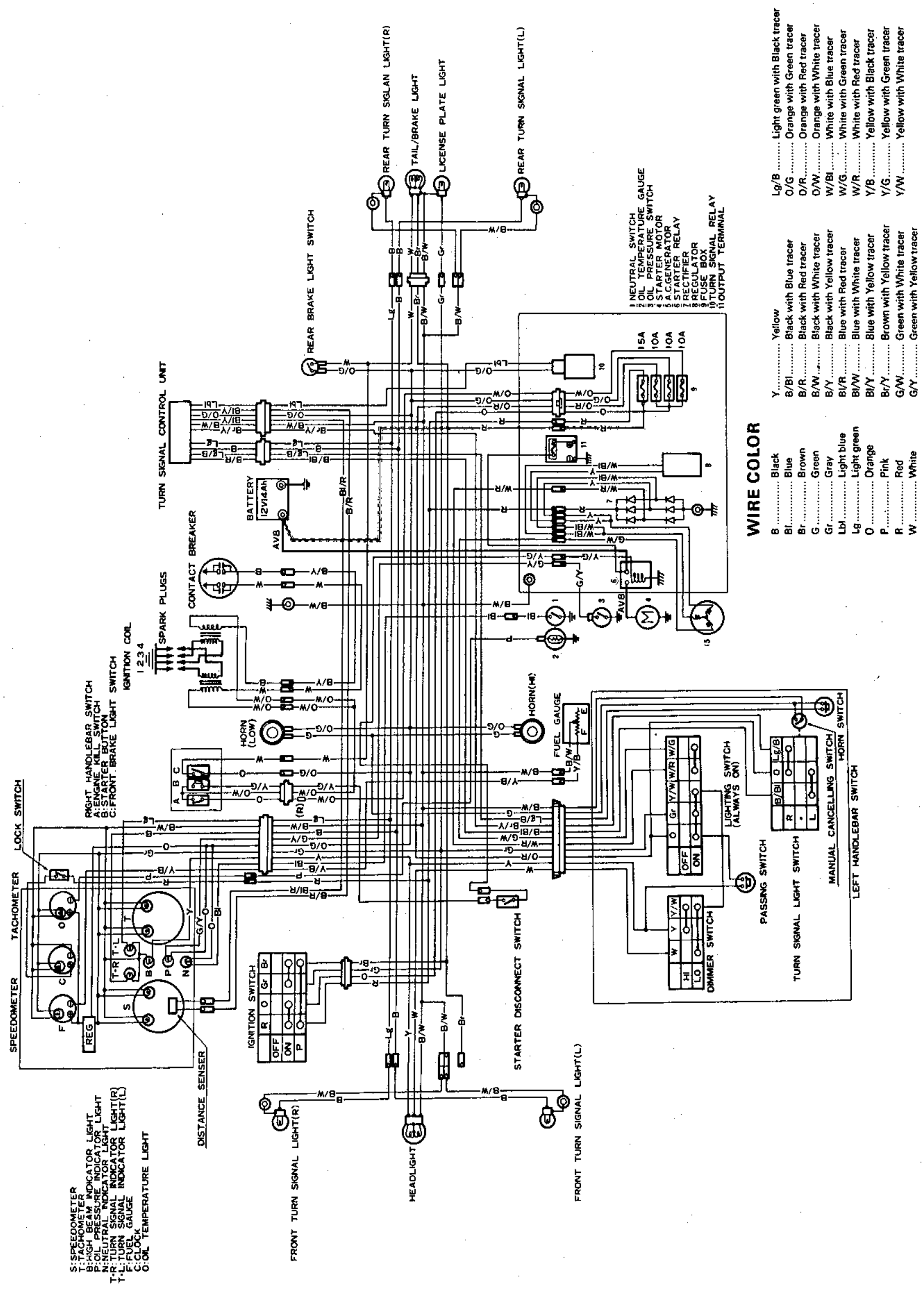
CABLE ROUTING







WIRING DIAGRAM



GS1000L

SUZUKI
GS1000
SUPPLEMENTARY SERVICE MANUAL

GS1000L SUZUKI MOTOR CO., LTD. JULY '80 PRINTED IN JAPAN 99000-85850-4E3

GS1000L

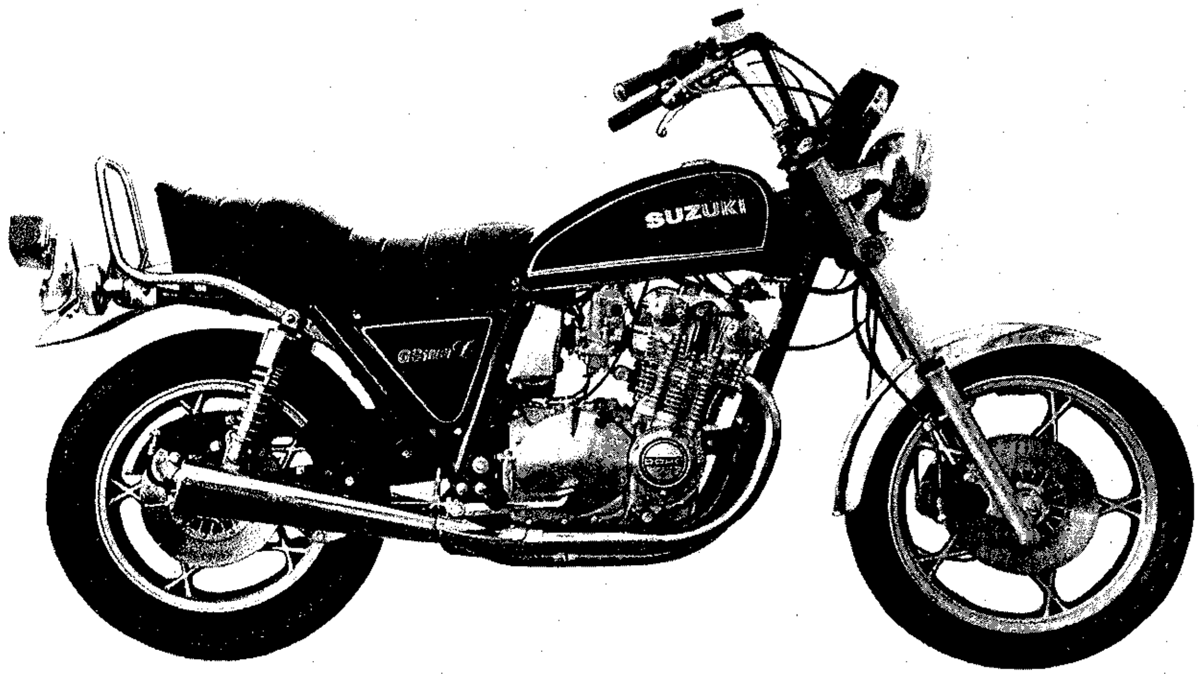
CONTENTS

14

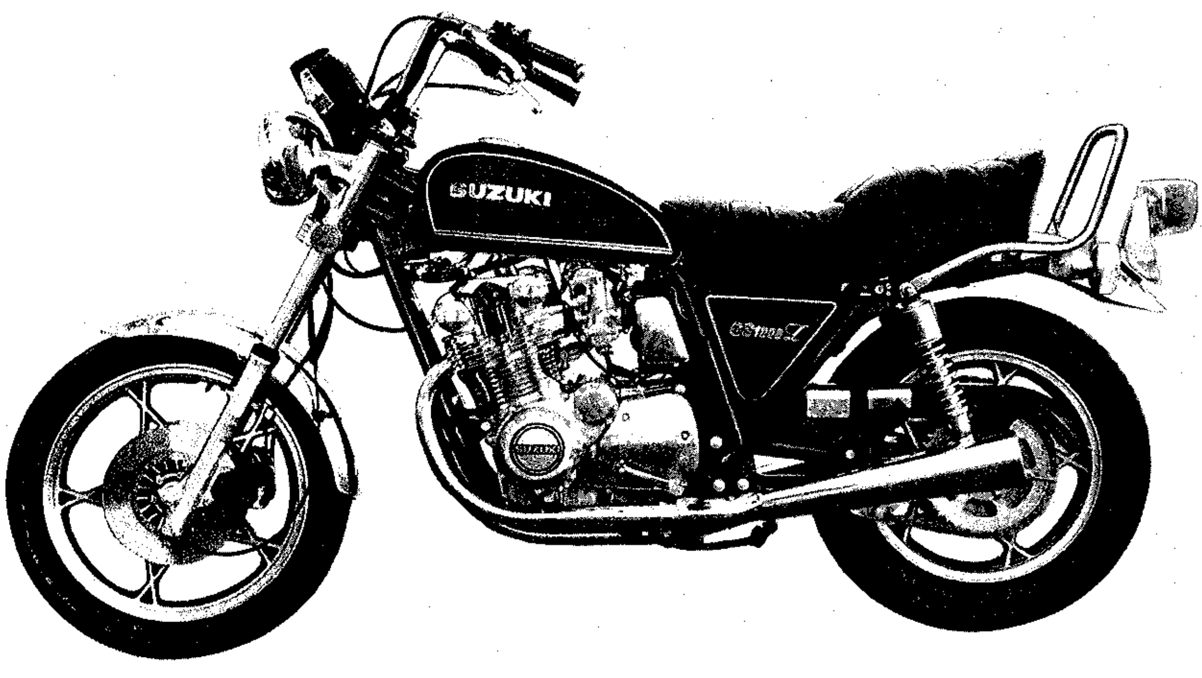
This section gives only servicing procedures which differ from those of the GS1000 and describes the new features of the GS1000L.
For the GS1000L servicing procedures of the following parts, refer to the GS1000 and GS1000E sections.

- FRONT BRAKE
- REAR WHEEL
- SELF-CANCELLING TURN SIGNAL

VIEW OF SUZUKI GS1000L



Right side



Left side

GENERAL INFORMATION

SPECIFICATIONS

DIMENSIONS AND WEIGHT

Overall length	2 265 mm (89.2 in)
Overall width	890 mm (35.0 in)
Overall height	1 245 mm (49.0 in)
Wheelbase	1 535 mm (60.4 in)
Ground clearance	160 mm (6.3 in)
Dry mass (weight)	240 kg (529 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	70.0 mm (2.756 in)
Stroke	64.8 mm (2.551 in)
Piston displacement	997 cm^3 (60.8 cu.in)
Compression ratio	9.2 : 1
Carburetor	MIKUNI VM26SS, 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, 96 links or TAKASAGO RK 630GSO, 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	61°00′
Trail	111 mm (4.37 in)
Turning radius	2.6 m (8.5 ft)
Front brake	Disk brake, twin
Rear brake	Disk brake
Front tire size	3.50V19 4PR
Rear tire size	4.50V17 4PR

Front tire pressure	175 kPa (1.75 kg/cm², 25 psi) (Normal solo riding)
Rear tire pressure	200 kPa (2.00 kg/cm², 28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Battery Ignition
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 500 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES
Battery	12V 50.4 kC (14 Ah)/10 HR FURUKAWA 12N14-3A, YUASA 12N14-3A
Generator	Three-phase A.C. generator
Fuse	15/10/10/10A
Headlight	12V 60/55W
Tail/Brake light	12V 8/23W (3/32 cp)
Turn signal light	12V 23W (32 cp)
Speedometer light	12V 3.4W
Tachometer light	12V 3.4W
Neutral indicator light	12V 3.4W
High beam indicator light	12V 3.4W
Turn signal indicator light	12V 3.4W
Oil pressure light	12V 3.4W
Gear position indcator light	12V 1.1W

CAPACITIES

Fuel tank including reserve	15 L (4.0 US gal)
reserve	3.0 L (3.2 US qt)
Engine oil tank	3.4 L (3.6 US qt)
Front fork oil	241 ml (8.15 US oz)

* Specifications are subject to change without notice.

SERVICE DATA

Valves + Guides

Unit: mm (in)

Item		Standard	Service Limit
Valve Lift	IN	8.0 (0.31)	—
	EX	7.5 (0.30)	—
Tappet Clearance or Valve Clearance (cold engine)	IN	0.03 — 0.08 (0.001 — 0.003)	
	EX	0.03 — 0.08 (0.001 — 0.003)	
Valve Guide — Valve Stem Clearance	IN	0.025 — 0.055 (0.0009 — 0.0022)	0.090 (0.0035)
	EX	0.040 — 0.070 (0.0016 — 0.0028)	0.100 (0.0039)
Valve Guide I.D.	IN/EX	7.000 — 7.015 (0.2756 — 0.2762)	—
Valve Stem O.D.	IN	6.960 — 6.975 (0.2740 — 0.2746)	—
	EX	6.945 — 6.960 (0.2734 — 0.2740)	—
Valve Stem Runout	IN/EX	—	0.05 (0.002)
Valve Head Thickness	IN/EX	—	0.5 (0.02)
Valve Seat Width	IN/EX	1.1 — 1.3 (0.04 — 0.05)	
Valve Head Radial Runout	IN/EX	—	0.03 (1.33)
Valve Spring Free Length	INNER	35.3 — 37.0 (1.39 — 1.46)	33.9 (1.33)
	OUTER	43.0 — 43.25 (1.69 — 1.70)	41.3 (1.63)
Valve Spring Tension	INNER	29.3 — 34.0 kg/23.0 mm (64.59 — 74.96 lbs/0.91 in)	—
	OUTER	50.4 — 58.3 kg/27.0 mm (111.11 — 128.53 lbs/1.06 in)	—

Camshaft

Unit: mm (in)

Item		Standard	Service Limit
Cam Height	IN	36.325 — 36.355 (1.4301 — 1.4313)	36.030 (1.4185)
	EX	35.775 — 35.805 (1.4085 — 1.4096)	35.480 (1.3968)

Unit: mm (in)

Item		Standard	Service Limit
Camshaft — Journal Clearance	IN/EX	0.025 – 0.053 (0.0010 – 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	21.960 – 21.975 (0.8646 – 0.8652)	—
Camshaft Runout	IN/EX	—	0.10 (0.004)
Cam Chain 20 Pitch Length		—	157.80 (6.213)

Piston + Ring + Cylinder

Unit: mm (in)

Item		Standard	Service Limit
Compression Pressure		9 – 13 kg/cm^2 (128 – 184 psi)	7 kg/cm^2 (100 psi)
Difference Between Cylinders		—	2 kg/cm^2 (28.5 psi)
Piston — Cylinder Clearance		0.050 – 0.060 (0.0020 – 0.0024)	0.120 (0.0047)
Cylinder Bore		70.000 – 70.015 (2.7559 – 2.7565)	70.080 (2.7590)
Piston Dia./Measurement Point		69.945 – 69.960/15.0 (2.7537 – 2.7543/0.59)	69.880 (2.7512)
Cylinder Distortion		—	0.2 (0.008)
Cylinder Head Distortion		—	0.2 (0.008)
Piston Ring Free End Gap	1st	Approx. 8.5 (0.33)	6.8 (0.27)
	2nd	Approx. 8.5 (0.33)	6.8 (0.27)
Piston Ring End Gap	1st	0.15 – 0.35 (0.006 – 0.014)	0.70 (0.028)
	2nd	0.15 – 0.35 (0.006 – 0.014)	0.70 (0.028)
Piston Ring — Groove Clearance	1st	0.020 – 0.055 (0.0008 – 0.0022)	0.180 (0.0071)
	2nd	0.020 – 0.060 (0.0008 – 0.0024)	0.150 (0.0059)
Piston Ring Groove Width	1st	1.21 – 1.23 (0.047 – 0.048)	—
	2nd	1.21 – 1.23 (0.047 – 0.048)	—
	Oil	2.51 – 2.53 (0.099 – 0.100)	—

Unit: mm (in)

Item		Standard	Service Limit
Piston Ring Thickness	1st	1.175 – 1.190 (0.0463 – 0.0469)	–
	2nd	1.170 – 1.190 (0.0461 – 0.0469)	–
Piston Pin — Pin Bore Clearance		0.002 – 0.013 (0.0001 – 0.0005)	0.120 (0.0047)
Piston Pin Bore I.D.		18.002 – 18.008 (0.7087 – 0.7090)	–
Piston Pin O.D.		17.995 – 18.000 (0.7085 – 0.7087)	–

Crankshaft

Unit: mm (in)

Item	Standard	Service Limit
Con-rod Small End Bore — Piston Pin Clearance	0.002 – 0.013 (0.0001 – 0.0005)	0.080 (0.0031)
Con-rod Small End Bore I.D.	18.006 – 18.014 (0.7089 – 0.7092)	–
Piston Pin O.D.	17.995 – 18.000 (0.7085 – 0.7087)	–
Big End Side Clearance	0.10 – 0.65 (0.004 – 0.026)	1.00 (0.039)
Con-rod Big End Wear	–	0.08 (0.003)
Crankshaft Runout	–	0.10 (0.004)

Oil Pump

Unit: mm (in)

Item	Standard	Service Limit
Oil Pump Reduction Ratio	1.723 (87/49 × 33/34)	
Oil Pressure (for 60°C)	Above 0.1 kg/cm² (1.42 psi), Below 0.5 kg/cm² (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	Service Limit
Drive Plate Thickness	2.7 — 2.9 (0.10 — 0.11)	2.4 (0.09)
Drive Plate Distortion	—	0.2 (0.008)
Driven Plate Thickness	1.6 (0.06)	—
Driven Plate Distortion	—	0.1 (0.004)
Drive Plate Claw Width	15.6 — 15.8 (0.61 — 0.62)	14.8 (0.58)
Clutch Spring Free Length	39.0 — 40.5 (1.54 — 1.59)	37.1 (1.46)
Pri. Drive — Driven Gear Backlash	0 — 0.03 (0 — 0.001)	0.08 (0.003)

Transmission

Unit: mm (in)

Item		Standard	Service Limit
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)	
Gear Backlash	1st, 2nd and 3rd	0 — 0.04 (0 — 0.002)	0.09 (0.004)
	4th and Top	0.05 — 0.10 (0.002 — 0.004)	0.15 (0.006)
Shift Fork — Groove Clearance		0.4 — 0.6 (0.016 — 0.024)	0.8 (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)	—
Drive Chain Size		DAIDO D.I.D 630YL or TAKASAGO RK 630GSO, 96 links	

Carburetor

Unit: mm (in)

Item	Specification
Idle r/min	1000 ±50 r/min
Carburetor Type	MIKUNI VM26SS
I.D. No.	49050
Bore Size	26 (1.0)
Float Height	24.0 ±1.0 (0.94 ±0.04)
Fuel level	4.0 ±1.0 (0.16 ±0.04)
Air Screw	PRE-SET (DO NOT DISTURB)
Cut Away	1.5
Jet Needle	5DL36-3
Pilot Screw	PRE-SET (DO NOT DISTURB)
Pilot AIR Jet	1.2
Pilot Jet	#15
Pilot Outlet	0.6
Needle Jet	0 – 2
By-pass	0.8
Main Jet	#95

Electrical

Unit: mm (in)

Item	Standard	Service Limit
Ignition Timing	17° B.T.D.C. below, 1500 r/min, 37° B.T.D.C. above, 2500 r/min	
Firing Order	1. 2. 4. 3.	
Spark Plug	NGK B8ES or NIPPON DENSO W24ES	
Spark Plug Gap	0.6 – 0.8 (0.024 – 0.031)	
Contact Point Gap	0.35 ±0.05 (0.014 ±0.002)	
Dwell Angle	180°	
Spark Performance	Over 8 (0.3) at 1 atm	
Condenser Capacity	0.18 ±0.02μF	
Ignition Coil Resistance (Primary)	Approx. 4Ω	
Ignition Coil Resistance (Secondary)	Approx. 15kΩ	
Battery Capacity	12V 50.4 kC (14Ah) 10 HR	
Specific Gravity	1.28 at 20°C	
Regulated Voltage	14.0 – 15.5V	
Fuse Size	15/10/10/10A	
Alternator No-load Data	More than 16.5V (DC) at 5000 r/min	
Starter Motor Brush Length	12 – 13 (0.47 – 0.51)	6 (0.24)

Brake + Wheel

Unit: mm (in)

Item		Standard	Service Limit
Axle Runout	Front and Rear	—	0.25 (0.010)
Brake Disk Thickness	Front	4.8 — 5.2 (0.19 — 0.20)	4.5 (0.18)
	Rear	6.5 — 6.9 (0.26 — 0.27)	6.0 (0.24)
Brake Disk Runout	Front and Rear	—	0.30 (0.012)
Master Cylinder Dia.	Front	15.87 (0.625)	—
	Rear	14.00 (0.551)	—
Master Cylinder Piston Dia.	Front	15.80 (0.622)	—
	Rear	13.96 (0.550)	—
Brake Caliper Cylinder Bore	Front	42.85 (1.687)	—
	Rear	38.18 (1.503)	—
Brake Caliper Piston Dia.	Front	42.82 (1.686)	—
	Rear	38.15 (1.502)	—
Wheel Rim Runout	Radial and Axial	—	2.0 (0.08)
Tire Size	Front	3.50V19 4PR	
	Rear	4.50V17 4PR	
Tire Tread Depth	Front	—	1.6 (0.06)
	Rear	—	2.0 (0.08)

Tire Air Pressure

Cold Inflation Tire Pressure	FRONT						REAR					
	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
Normal Riding	175	1.75	25	175	1.75	25	200	2.00	28	225	2.25	32
Continuous High Speed Riding	200	2.00	28	200	2.00	28	225	2.25	32	280	2.80	40

Suspension

Unit: mm (in)

Item	Standard	Service Limit
Front Fork Stroke	160 (6.3)	
Rear Wheel Travel	100 (3.9)	
Fork Spring Free Length	541 (21.3)	516 (20.3)
Fork Oil Level	260 (10.2)	
Swinging Arm Pivot Shaft Runout	—	0.3 (0.012)

Capacity

Item		Specification
Fuel Tank Including Reserve		15 L (4.0 US gal)
	Reserve	3.0 L (3.2 US qt)
Engine Oil	Change	3.4 L (3.6 US qt)
	Filter Change	3.8 L (4.0 US qt)
	Overhaul	4.2 L (4.4 US qt)
Front Fork Oil (each leg)		241 ml (8.15 US oz)
Front Fork Air Pressure		0.8 kg/cm^2 (11.4 psi)
Fuel Type		Use only unleaded or low-lead type gasoline of at least 85−95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the research method.
Engine Oil Type		SAE 10W/40
Front Fork Oil Type		SAE 10W/20

PERIODIC MAINTENANCE
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 the next page for the position of the following bolts and nuts on the motorcycle.)

1) Handlebar holder bolt	1.2 – 2.0 kg-m (8.5 – 14.5 lb-ft)
2) Steering stem center side nut	1.5 – 2.5 kg-m (11.0 – 18.0 lb-ft)
3) Front fork tubes upper pinch bolt (R and L)	2.0 – 3.0 kg-m (14.5 – 21.5 lb-ft)
4) Steering stem head center nut	8.0 kg-m (58.0 lb-ft)
5) Brake hose union bolt	1.5 – 2.5 kg-m (11.0 – 18.0 lb-ft)
6) Master cylinder bolt	0.5 – 0.8 kg-m (3.5 – 6.0 lb-ft)
7) Front fork tubes lower pinch bolt (R and L)	1.5 – 2.5 kg-m (11.0 – 18.0 lb-ft)
8) Caliper bleeder bolt	0.6 – 0.9 kg-m (4.5 – 6.5 lb-ft)
9) Caliper bolt	2.5 – 4.0 kg-m (18.0 – 29.0 lb-ft)
10) Rear torque link nut	2.0 – 3.0 kg-m (14.5 – 21.5 lb-ft)
11) Rear shock absorber nut	2.0 – 3.0 kg-m (14.5 – 21.5 lb-ft)
12) Rear shock absorber bolt	2.0 – 3.0 kg-m (14.5 – 21.5 lb-ft)
13) Rear axle nut	8.5 – 11.5 kg-m (61.5 – 83.0 lb-ft)
14) Swinging arm pivot nut	5.0 – 8.0 kg-m (36.0 – 58.0 lb-ft)
15) Disk bolt	1.5 – 2.5 kg-m (11.0 – 18.0 lb-ft)
16) Front axle pinch nut	1.5 – 2.5 kg-m (11.0 – 18.0 lb-ft)
17) Front axle nut	3.6 – 5.2 kg-m (26.0 – 37.5 lb-ft)

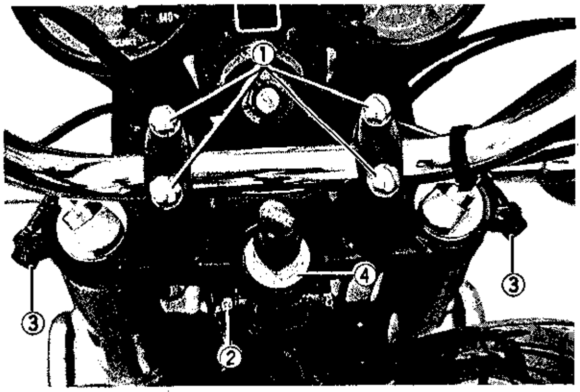


Fig. 14-1.

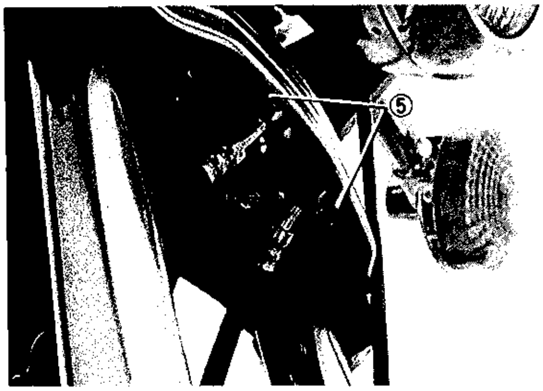


Fig. 14-2.

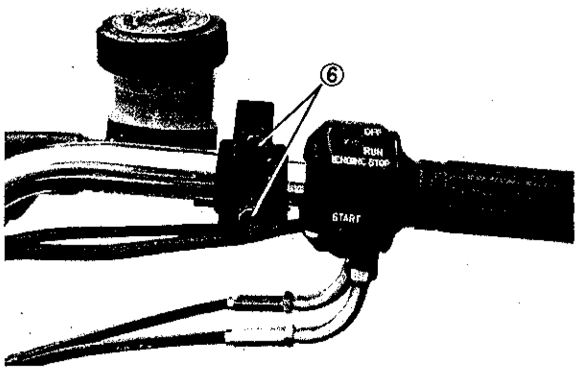


Fig. 14-3.

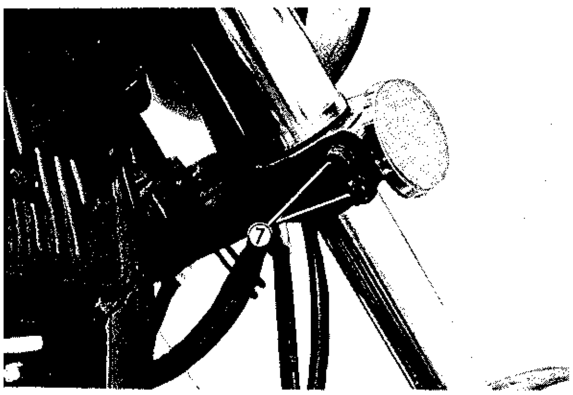


Fig. 14-4.

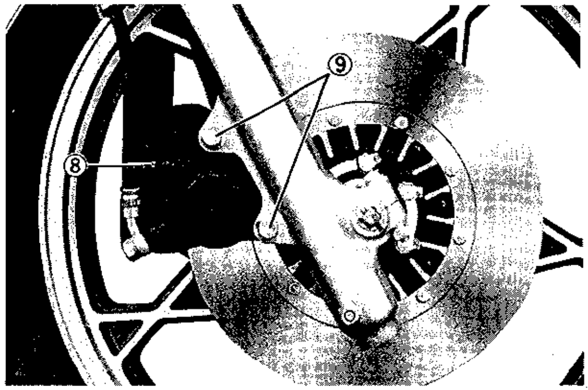


Fig. 14-5.

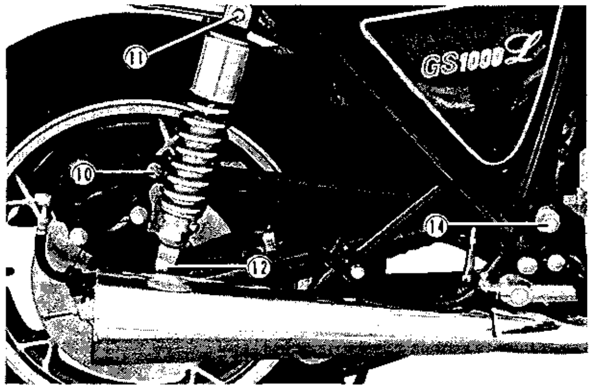


Fig. 14-6.

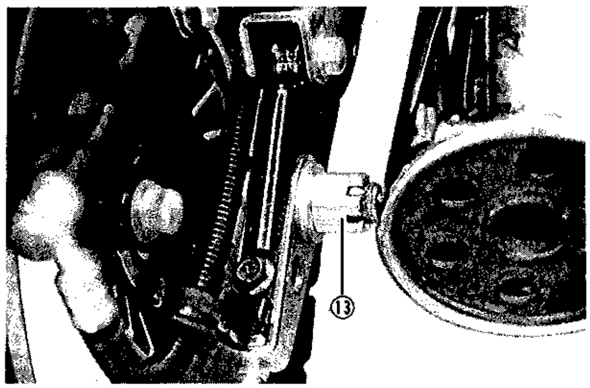


Fig. 14-7.

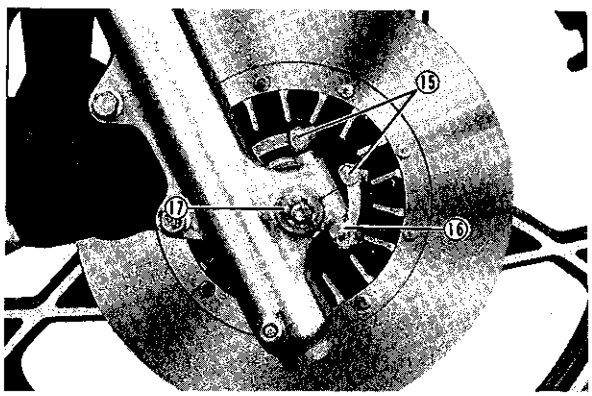


Fig. 14-8.

FUEL LINE
(Replace every two years)
Replace the fuel hose every two years.

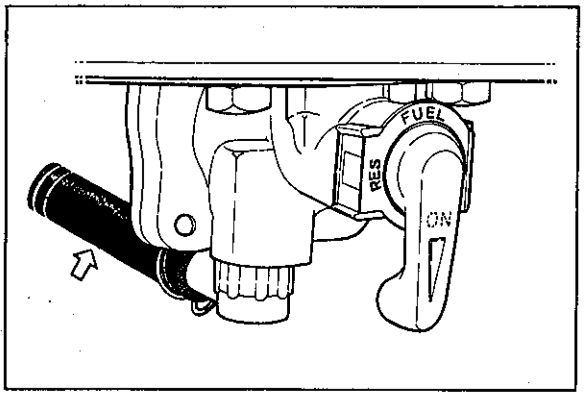


Fig. 14-9.

CHOKE CABLE ADJUSTMENT
When the choke knob is returned fully, play ① must be 0.5 – 1.0 mm (0.02 – 0.04 in). Loosen lock nut ② and turn the adjuster ③ to obtain the specified play.

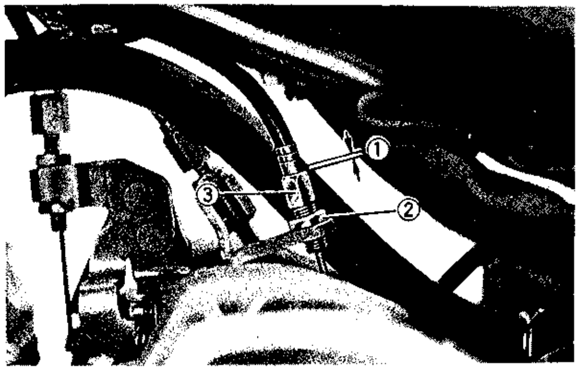


Fig. 14-10.

CHOKE KNOB ADJUSTMENT
When the choke knob is pulled, if it is too stiff or too loose, raise seal cover ④ and turn adjuster ⑤. Turning the adjuster clockwise will make the choke knob harder to turn, and vice versa.

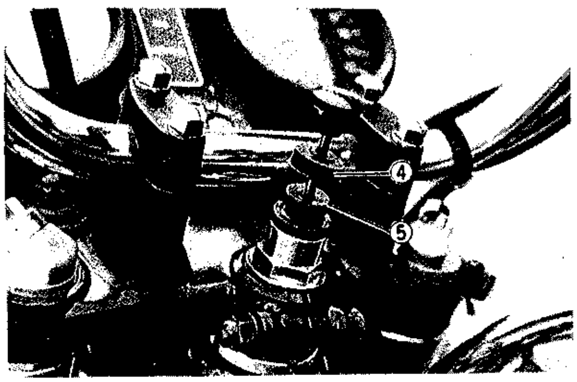


Fig. 14-11.

ENGINE REMOVAL

CARBURETOR REMOVAL
When removing the carburetor, remove the throttle cable ⑥ and ⑦ together with the choke cable ⑧.

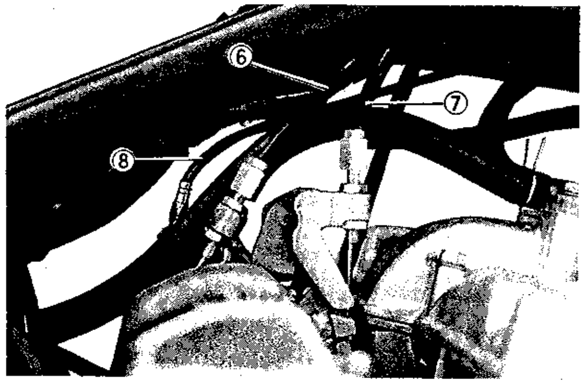
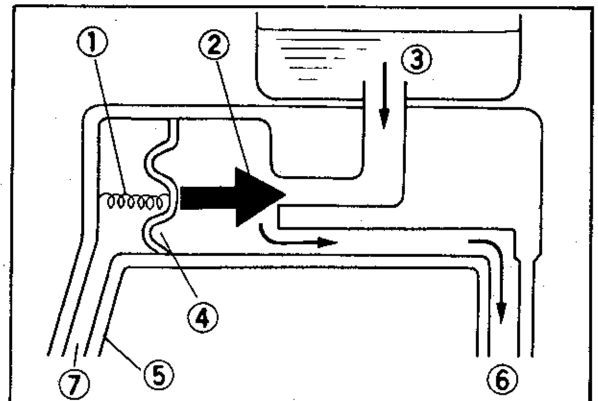


Fig. 14-12.

FUEL SYSTEM AND CARBURETORS

FUEL COCK
The construction of the diaphragm type auto cock is shown below. When the engine is not running with the lever in the ON or RES position, the valve is kept in the closed position by applying pressure utilizing a spring so that no fuel will flow to the carburetors. When the engine is engaged, a negative pressure is generated in the diaphragm chamber through the vacuum (negative pressure) pipe which is connected to the carburetors, and builds up a negative pressure which is higher than the spring pressure so that the diaphragm is forced to open the valve and thus allow the fuel to flow to the carburetors.



1. Spring	4. Diaphragm	7. Negative pressure from carburetor
2. Valve	5. Vacuum pipe	
3. Fuel tank	6. To carburetor	

Fig. 14-13.

ON: Normally used. Functions as auto cock.

RES: Reserve fuel is used. Functions as auto cock.

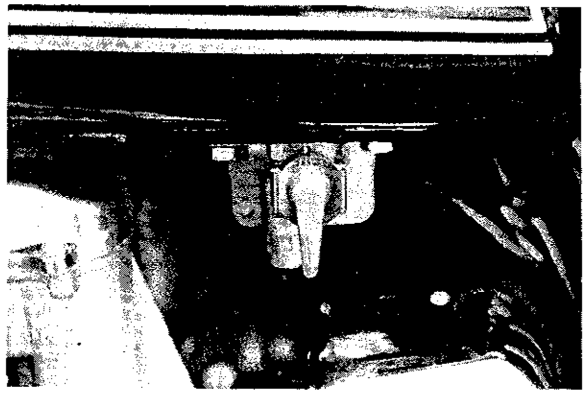
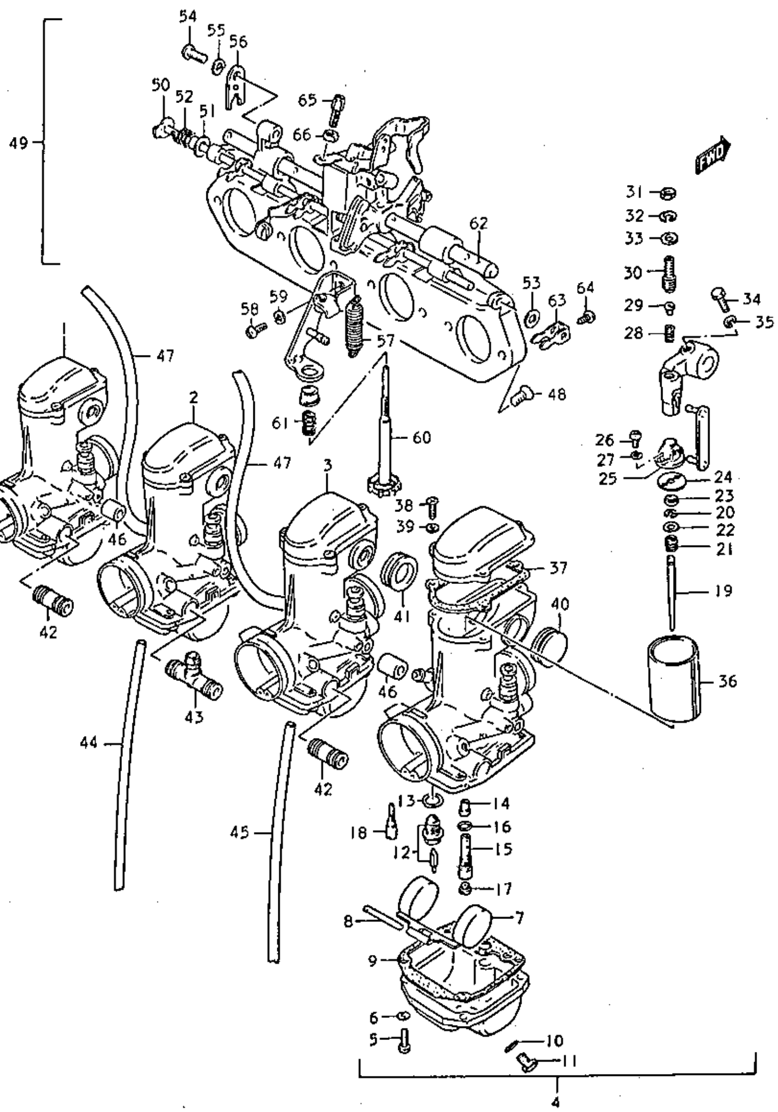


Fig. 14-14.

CARBURETOR DISASSEMBLY



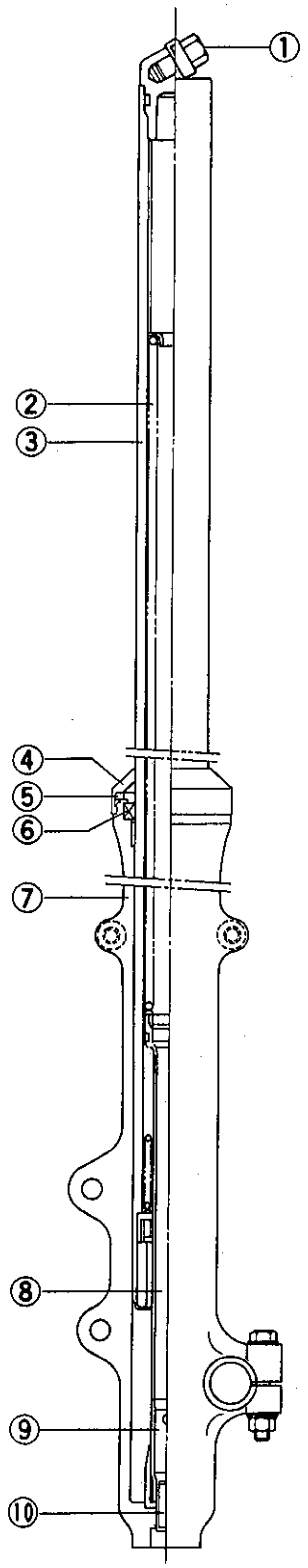
1. Carburetor Assy, No. 1
2. Carburetor Assy, No. 2
3. Carburetor Assy, No. 3
4. Carburetor Assy, No. 4
5. Screw
6. Lock Washer
7. Float
8. Float pin
9. Gasket
10. O ring
11. Screw
12. Needle valve
13. Gasket
14. Needle jet
15. Breader pipe
16. O ring
17. Main jet
18. Pilot jet
19. Jet needle
20. Needle clip
21. Spring
22. Plate
23. Ring
24. Plate
25. Bracket
26. Screw
27. Lock washer
28. Spring
29. Pin
30. Adjuster
31. Nut
32. Lock washer
33. Washer
34. Bolt
35. Lock washer
36. Throttle valve
37. Gasket
38. Screw
39. Lock washer
40. Cap
41. Seal
42. Nipple
43. Nipple
44. Hose
45. Hose
46. Hose
47. Hose
48. Screw
49. Control Assy
50. Starter shaft
51. Washer
52. Spring
53. Washer
54. Screw
55. Lock washer
56. Plate
57. Throttle return spring
58. Screw
59. Lock washer
60. Throttle stop adjuster
61. Spring
62. Throttle shaft
63. Starter lever
64. Screw
65. Adjuster
66. Nut

Fig. 14-15.

NOTE:
Although the choke lever has been made obsolete on the carburetor ass'y, the disassembling procedure is the same as that for the GS1000.

CHASSIS

FRONT FORK



1. Air valve cap
2. Spring
3. Inner tube
4. Dust seal
5. Oil seal stopper ring
6. Oil seal
7. Outer tube
8. Seat pipe
9. Oil lock piece
10. Bolt

Fig. 14-16.

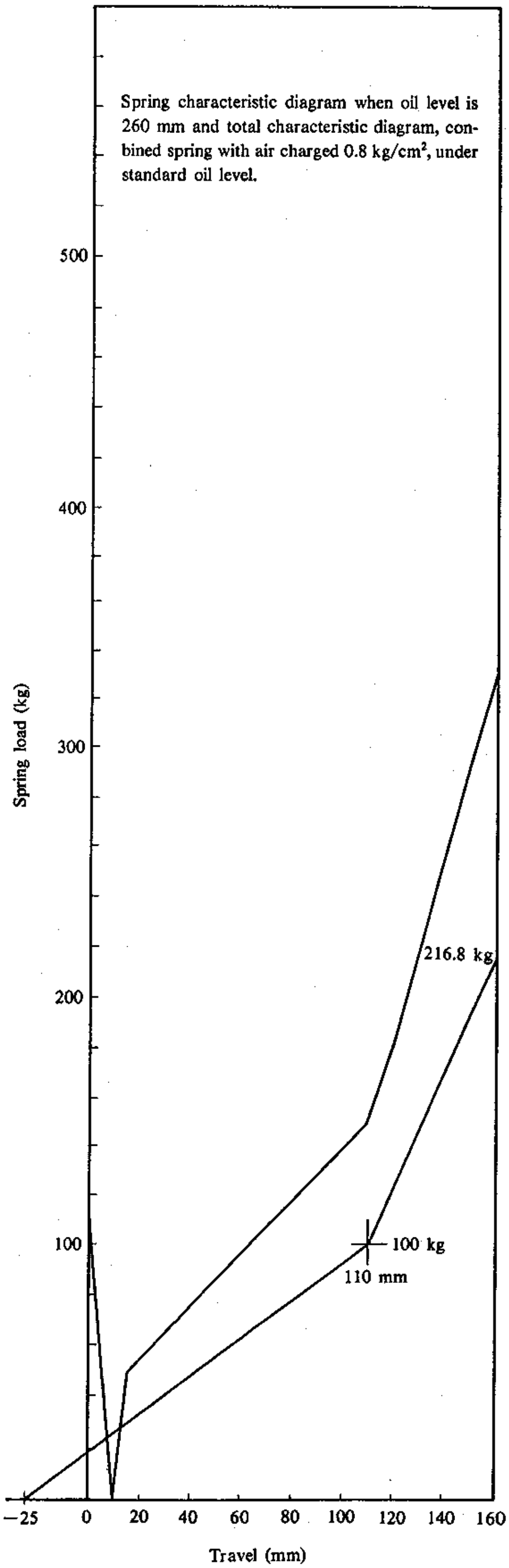
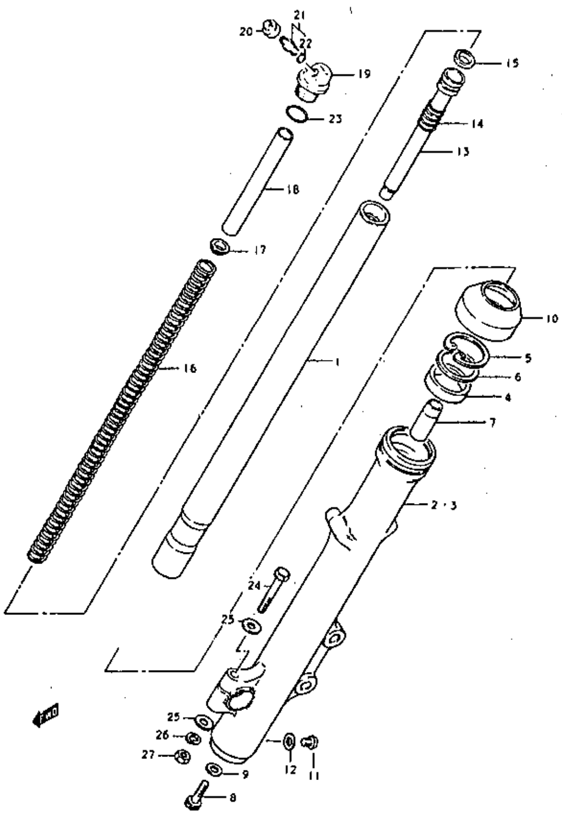


Fig. 14-17.



1. Inner tube
2. Outer tube, RH
3. Outer tube, LH
4. Oil seal
5. Circlip
6. Washer
7. Oil lock piece
8. Bolt
9. Gasket
10. Dust seal
11. Screw
12. Gasket
13. Damper rod
14. Spring
15. Washer
16. Main spring
17. Spring guide
18. Spacer
19. Upper cap
20. Valve cap
21. Valve
22. O ring
23. O ring
24. Bolt
25. Washer
26. Lock washer
27. Nut

Fig. 14-18.

Removal

- Place jack below engine.
- Remove the front wheel and front fender.
- Remove valve cap ① and hold the valve with pointed tool to bleed air.
- In disassembly of fork, it is preferable to loose the upper cap ②.
- Loosen the front fork tube upper pinch bolt ③ and lower pinch bolt ④.

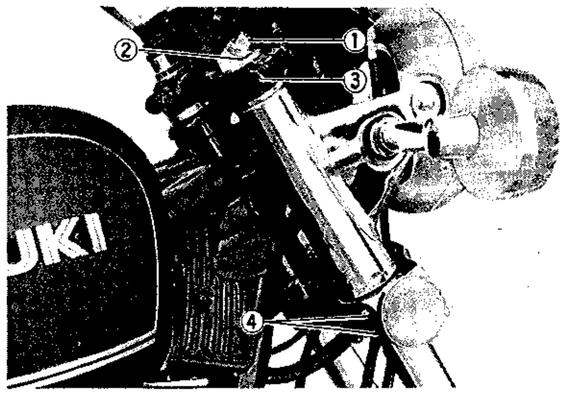


Fig. 14-19.

- When removing the front fork, remove the caliper mounting bolts and remove the right and left calipers.
  Hang the caliper from the motorcycle frame using string, etc., taking care not to bend the brake hoses.
- Pull down the front fork while rotating it.

Mounting

- Mount the front fork so that the upper end of the inner tube in the front fork is flush with the upper surface of the stem head.

Upper pinch bolt tightening torque	2.0 – 3.0 kg-m (14.5 – 21.5 lb-ft)
Lower pinch bolt tightening torque	1.5 – 2.5 kg-m (11.0 – 18.0 lb-ft)

- Mount the caliper. The tightening torque of the caliper mounting bolts are as follows:

Caliper mounting bolt tightening torque	2.5 – 4.0 kg-m (18.0 – 29.0 lb-ft)

- Mount the front fender on the front fork.
- Install the right and left axle spacers to the front fork.
- Mount front wheel.

CAUTION:
Fasten the speedometer gear box at the position shown in the following drawing and take care not to bend the speedometer cable excessively.

Front axle pinch nut tightening torque	1.5 – 2.5 kg-m (11.0 – 18.0 lb-ft)

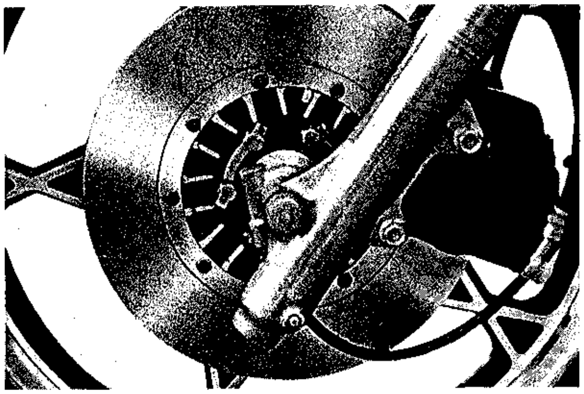
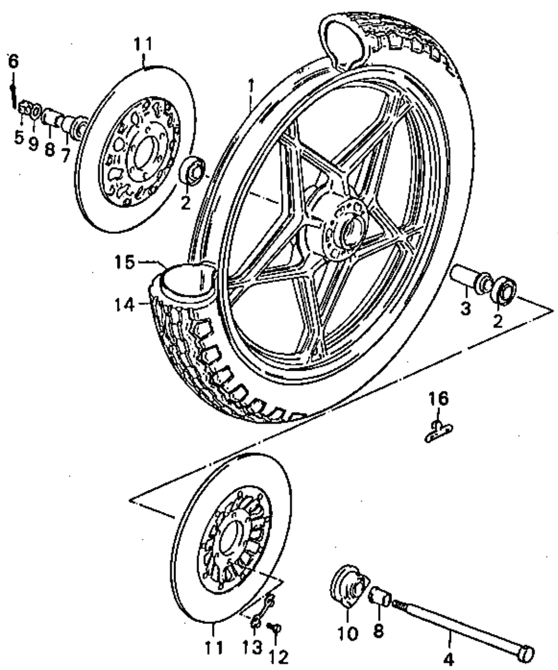


Fig. 14-20.

FRONT WHEEL



1. Front wheel
2. Bearing
3. Spacer
4. Front axle
5. Nut
6. Cotter pin
7. Bearing spacer, RH
8. Axle spacer, RH
9. Washer
10. Speedometer gear box
11. Front brake disk
12. Bolt
13. Washer
14. Tire
15. Inner tube
16. Balancer

Fig. 14-21.

Removal

- Lift the front wheel off the floor by raising up the engine, with the center stand resting firmly on the ground.
- Remove either one of two calipers, left or right, from the fork by unfastening its two mounting bolts.
- Pull off cotter pin ⑤ from axle nut ⑥; and loosen the nut.
- Place a jack or a block under the engine or chassis tubes. Draw out the axle shaft and take off the wheel.

CAUTION:
After removing the front wheel, do not squeeze the front brake lever or the brake pads will move inside the caliper. The pads should be left where they are at the time of wheel removal otherwise difficulty will be encountered in reinstalling.

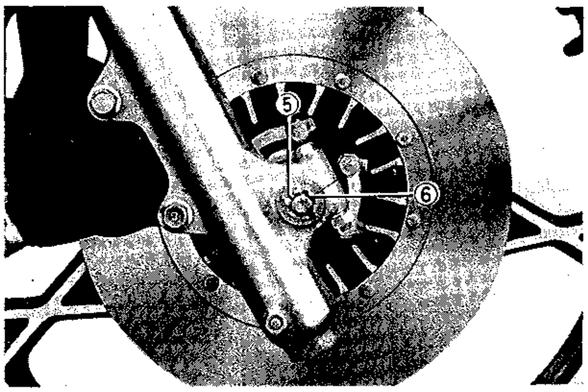


Fig. 14-22.

Mounting

- Before installing the speedometer gear box ⑦, grease it and align groove ⑧ (for fitting the two drive pawls to the hub) with the hub to insert the gear box in the wheel.

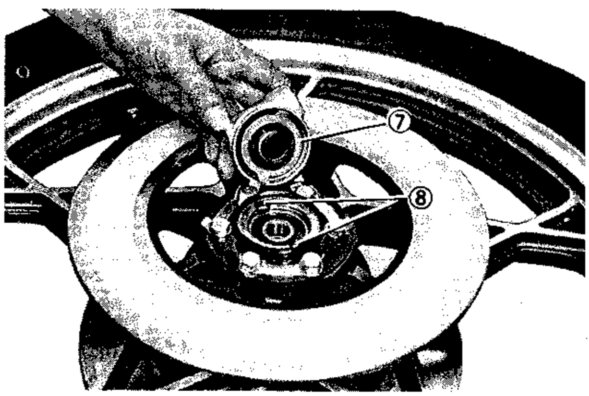


Fig. 14-23.

- Insert the axle through to the left side of the front fork and mount the wheel.
- Do not change the position of the speedometer gear box (see Fig. 14-20).
- Tighten axle nut and fit the new cotter pin.

Front axle nut tightening torque	3.6 – 5.2 kg-m (26.0 – 37.5 lb-ft)

TUBE AND TIRE

Removal

- Mark the position of the valve stem and rotational direction of the tires with chalk.
- Remove the valve cap and let out the air.
- Remove the valve fastening nut and fully loosen the bead protector nut.

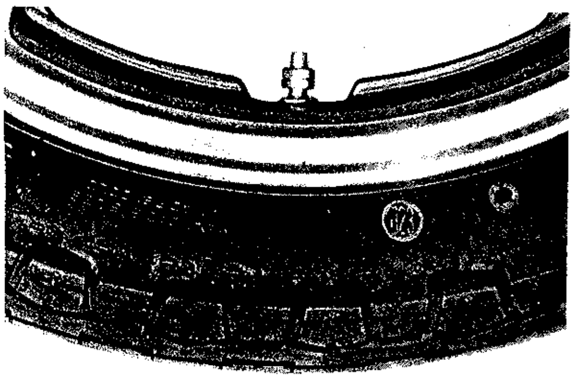


Fig. 14-24.

- Step on the tire bead, push it down as shown below, install the five wheel rim protectors (special tools) on the wheel.

09941-94510	Wheel rim protector
09950-74510	Tire bead breaker

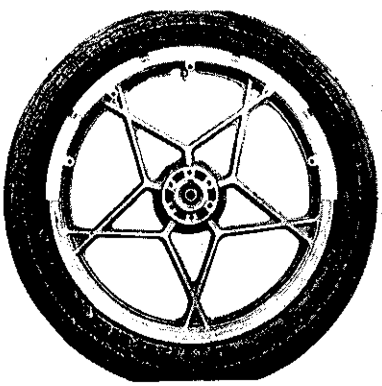


Fig. 14-25.

- Using flat tire levers, work the tire bead over the rim, starting near the valve stem.

CAUTION:
1) Always use the wheel rim protectors. If not, the tire rim could be damaged by the tire lever.
2) The tire lever should be applied over the wheel rim protectors.

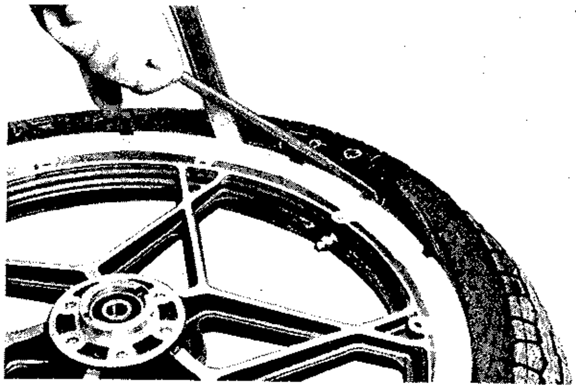


Fig. 14-26.

- Remove the tube.
- Remove the tire from the wheel.

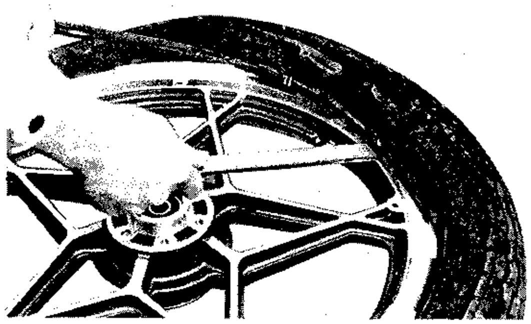


Fig. 14-27.

Mounting

- Inflate the tube sufficiently so that the tube does not fold.
- Press the tube into the tire.
- Push one side of the tire beads into the wheel rim. Be sure that the embossed arrow mark on the rear tire face toward the rotational direction of the wheel.
  Next, install the tube, insert the valve into the rim, and tighten the valve nut temporarily. An arrow indicating the rotational direction is marked on the rear tire. A yellow mark is provided on the valve portion to aid checking of the tire balance.

Fig. 14-28.

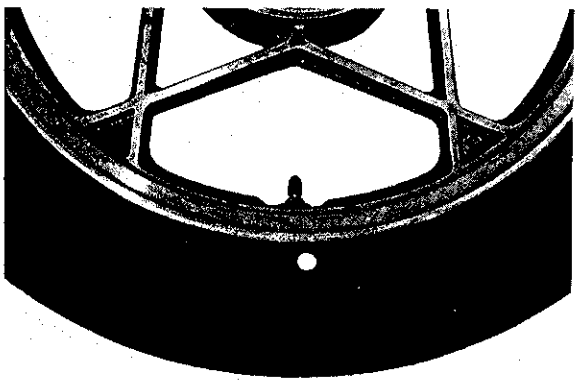


Fig. 14-29.

- Apply soapy water to the tire bead.
- Hook the bead protector on the bead portion of the tire.
- Fit the rest of the tire using tire levers placing them well away from the valve.

CAUTION:
1) Avoid inserting the tire lever too deeply into the tire (to avoid damaging the tube).
2) As in tire removal, use the wheel rim protectors.

- By pushing the tire, confirm that the tube is not caught between the rim and tire.
- Inflate the tire to the specified pressure (see Page 14-10).
- Tighten the bead protector nut and then the valve nut.
- Mount the valve cap.

REAR SHOCK ABSORBER

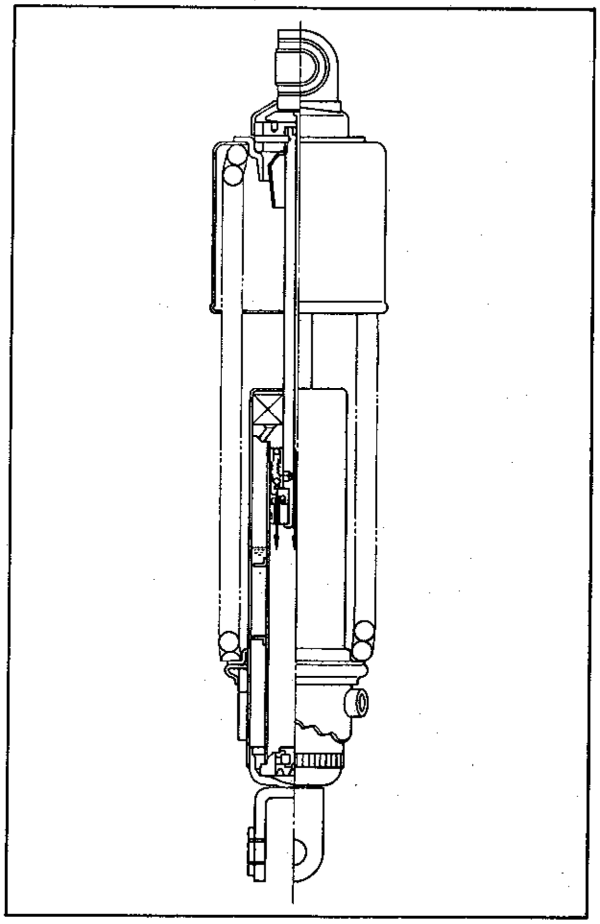


Fig. 14-30.

NOTE:
Although the spring cover is attached on the rear shock absorber, spring adjustment, damper adjustment and etc. are the same as that for the GS1000.

ELECTRICAL

GEAR SHIFTING SWITCH AND GEAR POSITION INDICATOR

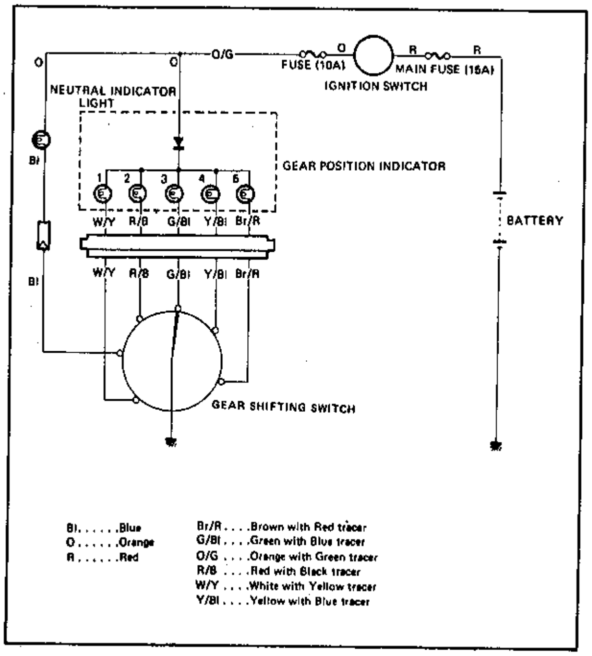


Fig. 14-31.

If the neutral indicator light and gear position indicator light do not come on, disconnect the lead wires coming from the gear shifting switch at the coupler and terminals, and check continuity between the O lead and B1 lead, and also between the W/Y, R/B, G/B1, Y/B1 and Br/R in the coupler using the Pocket Tester.

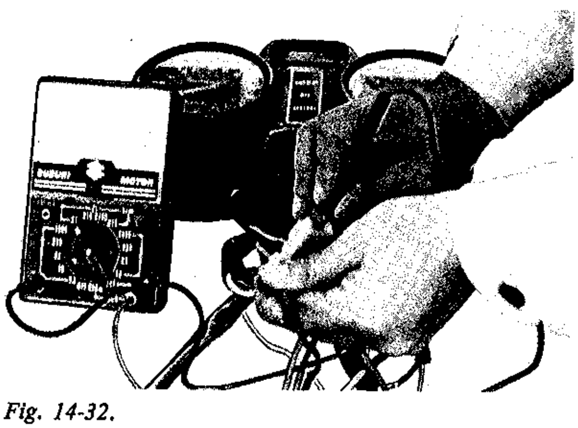


Fig. 14-32.

NOTE:
When checking the continuity of the gear indicator (inside the coupler), connect the positive (+) terminal of the Pocket Tester to the terminal in the coupler, and connect the negative (−) terminal to the orange lead wire (inside the coupler).
If there is no continuity, the indicator light bulb is burnt out and it should be replaced.

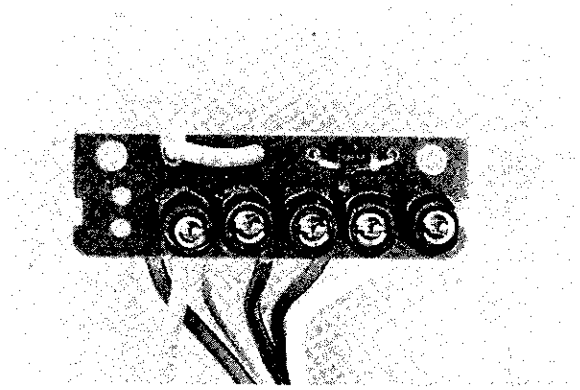


Fig. 14-33.

If the above check reveals no irregularity, remove the gear shifting switch from the crankcase, and using a lead wire of the Pocket Tester, ground one of the gear shifting switch contact points and check the condition of the gear shifting switch. If both neutral and gear position indicator lights turn on, the switch is in good condition. (To make this check, the ignition switch should be turned on with the wiring normal.)

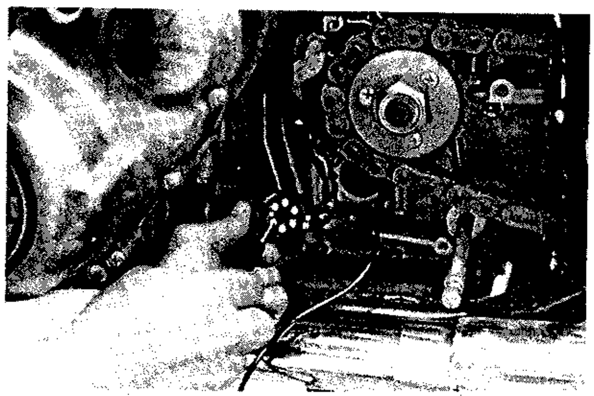


Fig. 14-34.

FUEL GAUGE
Wiring

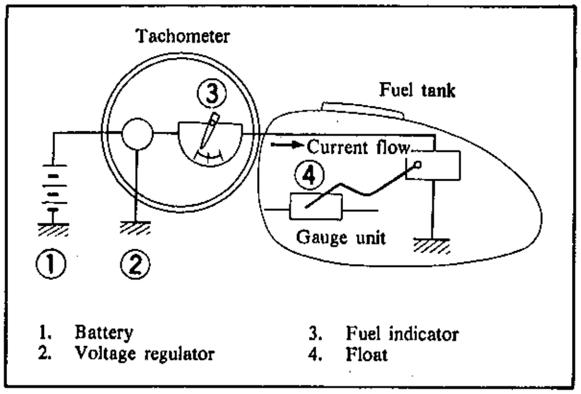


Fig. 14-35.

1. The above drawing is a schematic of fuel gauge wiring. The internal resistance value of the gauge unit is adapted to vary with the height of the float. It is difficult for current to pass through the circuit when the resistance value is high, an consequently the swing of the meter is small (close to point E).
   The more current passes through the circuit, increasing the swing of the pointer (close to point F), when the resistance value is low.
2. The relationships between the amount of gasoline and meter indications are as follows:

Amount of gasoline (in liters)	Meter indication
1.6	Point E − 2°30
2.3	E
5.2	Red zone max. limit
7.4	1/2
11.6	F
12.3	Point F + 5°

The meter points to E − 2°30′ when the amount of gasoline is between 0 to 1.6 liters. Also the meter points to F +5° when the amount of gasoline in the tank is between 12.3 liters and full.

3. Construction of each portion and operating meter.

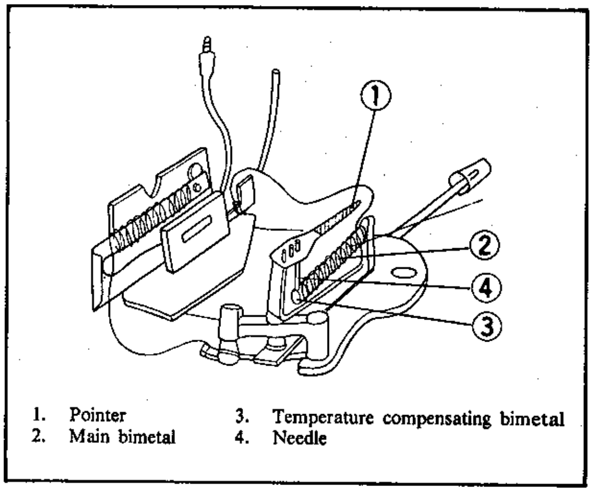


Fig. 14-36.

- Main operation
  Current passing through the heater wire deflects the main bimetal causing the pointer to move.
- Auxiliary operation
  This compensates for variations in temperature and voltage. A temperature compensating bimetal is provided so that no indication errors occur due to temperature changes inside the meter:

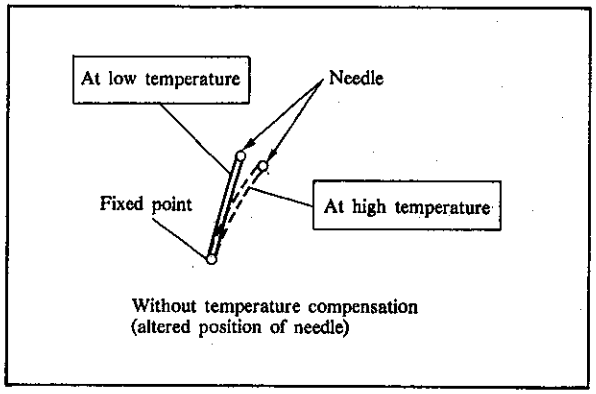


Fig. 14-37.

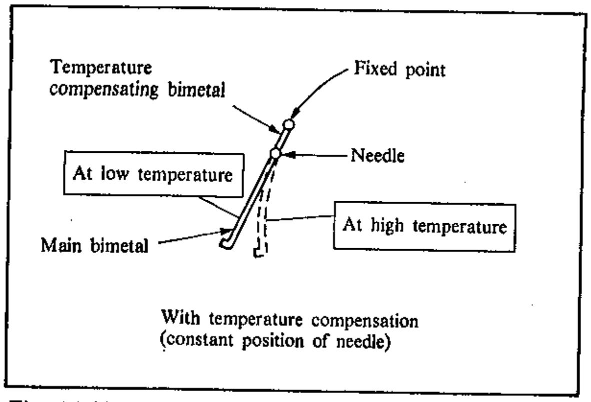


Fig. 14-38.

Even if the temperature rises inside the meter and causes the main bimetal to deflect as shown in the above drawing, the temperature compensating bimetal will deflect to the same degree as the main bimetal, in the reverse direction, to keep the needle position constant.

- Voltage regulator

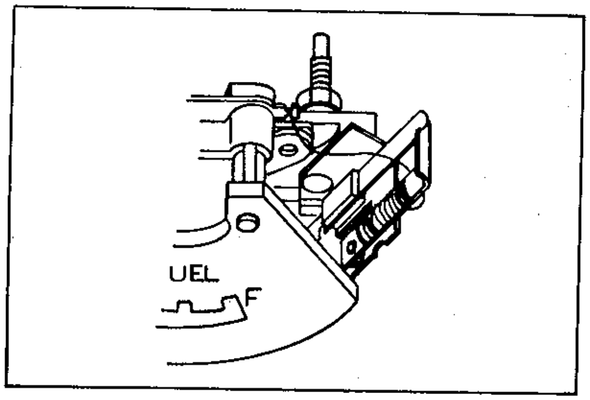


Fig. 14-39.

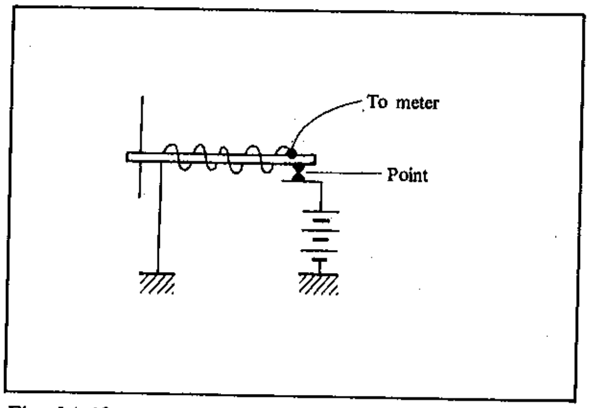


Fig. 14-40.

The passage of current through the heater wire deflects the bimetal and causes point separation. This point separation stops the current until the bimetal begins to cool which causing the point to connect again.

A large amount of current passes through the heater wire when the supply voltage is high, causing the bimetal to deflect quickly, and the points to separate. This is illustrated in the following drawing which shows that the average current is constant.

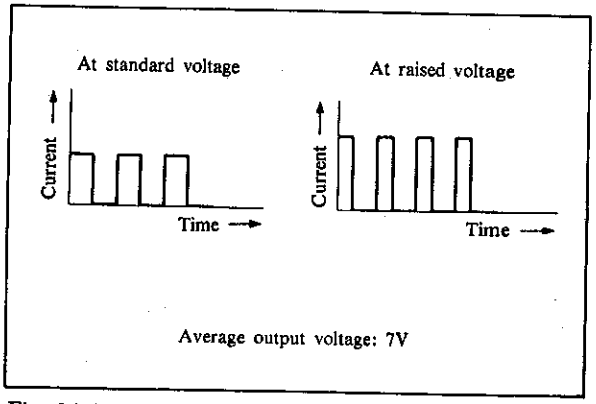


Fig. 14-41.

- Gauge unit

The displacement of the float changes the position of the contact plate which slides on a wire wound resistor causing the resistance value to vary.

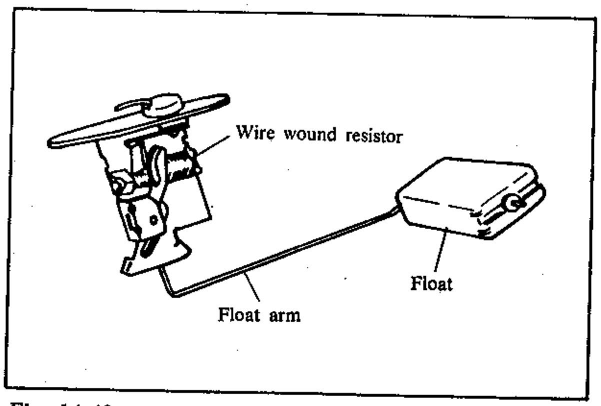


Fig. 14-42.

INSPECTION OF FUEL METER AND GAUGE

The fuel meter is enclosed within the tachometer assembly.

The following table is used for troubleshooting.

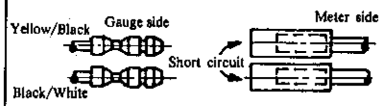
Amount of gasoline (L)	1.6	2.3	5.2	7.4	11.6	12.3
Resistance (Ω)	110	95	50	32.5	7	3

Pointer failure and minus indication

(1) Meter pointer fails to move.
(2) Meter has a substantial minus indication when key is turned on.

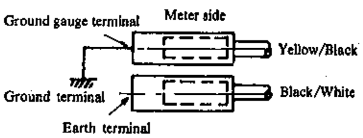
Checking method

(1) Determine whether trouble is within meter or gauge.
Remove gauge connector to short-circuit meter side of same connector (make gauge resistance equal to zero Ω), and observe meter indication.



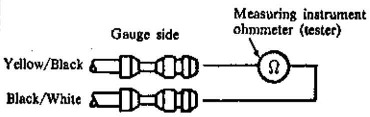
- Meter pointer fails to move → Meter side defective → Check (2)
- Meter pointer swings to extreme position → Gauge defective → Check (3)

(2) Meter check
Ground meter terminal of meter side connector directly to frame and observe meter indication.



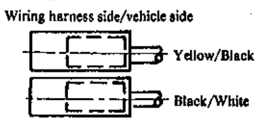
- Meter pointer fails to move → Meter side defective → Check (5)
- Meter pointer swings to extreme position → Wiring harness defective (Contact of connector terminal) → Check (4)

(3) Gauge check
Measure resistance value between two terminals of gauge side connector.
(Full→ 1 – 5Ω: Empty → 103 – 117Ω)



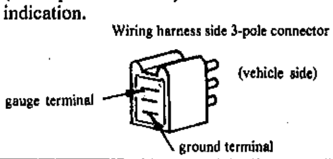
- Large, unstable resistance (More than 117Ω) → Gauge defective → Replace gauge
- Normal resistance value (1 – 117Ω) → Wire harness defective (Contact of connector terminal) → Check (4)

(4) Connector contact check (wiring harness side).
Strengthen spring pressure against terminal at wiring harness side connector (to improve contact) and observe meter indication.
(by normal wiring).



- → Normal indication of meter

(5) Connector contact check (wiring harness side).
Strengthen spring pressure against terminal of 3-pole connector at wiring harness side (to improve contact) and observe meter indication.



Carry out check (2) at the same time.

- Meter pointer swings to extreme position → Connector contact defective
- Meter pointer fails to move → Meter defective → Change meter

Meter pointer swings to extreme position and indicates plus.
(1) Swinging-up of pointer.
(2) Substantially plus indication of meter.

Method of checking

(6) Meter side check
Remove gauge connector (without connecting gauge) and observe meter indication.

- With meter indication (operates) → Meter defective → Change meter
- With no meter indication → Check (7)

(7) Gauge side check
Measure resistance value of gauge according to (3).

- Small resistance, 0Ω → Defective unit → Change gauge

(Full → less than 0.5Ω)
(Empty → less than 102Ω)

- Normal resistance value → Check (8)

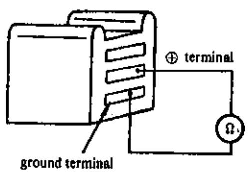
(8) Meter side check (operate voltage regulator).
Check meter voltage between gauge terminal (yellow/black lead wire) of meter or gauge terminal (as it is connected) of connector for gauge and ground.

- Indicates interrupted voltage → Meter defective → Change meter

(Even when meter is normal, interrupted voltage can be obtained. However, here, the meter is defective because the pointer swings to extreme position.)

- Indicates constant voltage → Check (9)

(9) Meter side check
Remove 3-pole meter side connector and measure resistance value between ⊕ terminal and ground terminal.



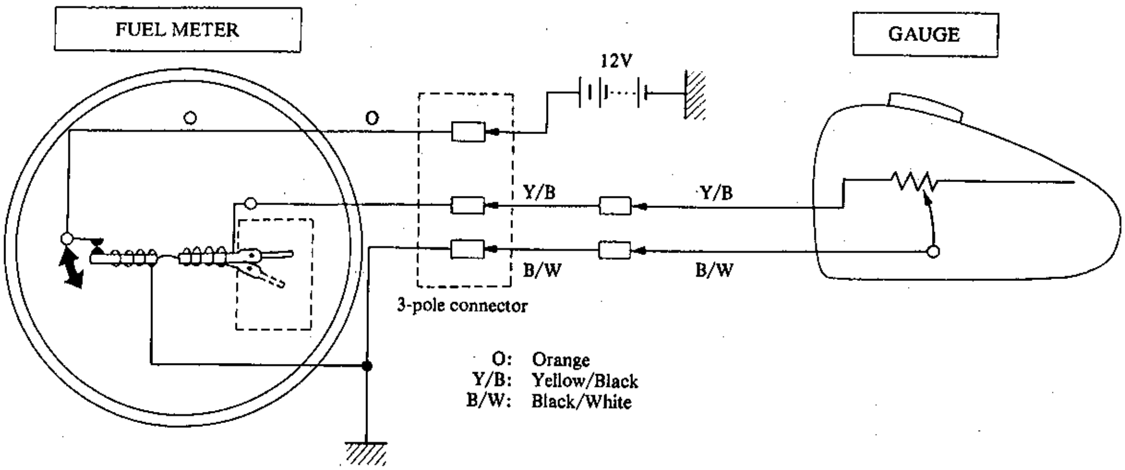
- Large resistance. infinite → Meter defective → Change meter
- Resistance value (55 – 85Ω) → Wire harness defective → Check (10)

(10) Ground connector check
Check grounding condition of ground terminal of 3-pole meter side connector at vehicle side. Measure resistance value between ground terminal shown in drawing (5) and frame grounding.

- Large resistance, no conductance → Ground wire harness defective → Check (11)
- Resistance 0Ω → Defective contact of meter side connector → Check (11)

(11) Connector contact check
Observe meter indication after correcting wire harness and connector (in the normal wiring).

- Minus meter indication → Seizure of meter is caused by defective wiring harness
  - Change meter
  - Check wiring harness
- Normal meter indication O.K.
- Seized meter (change)



Check resistance value between terminals
Meter side

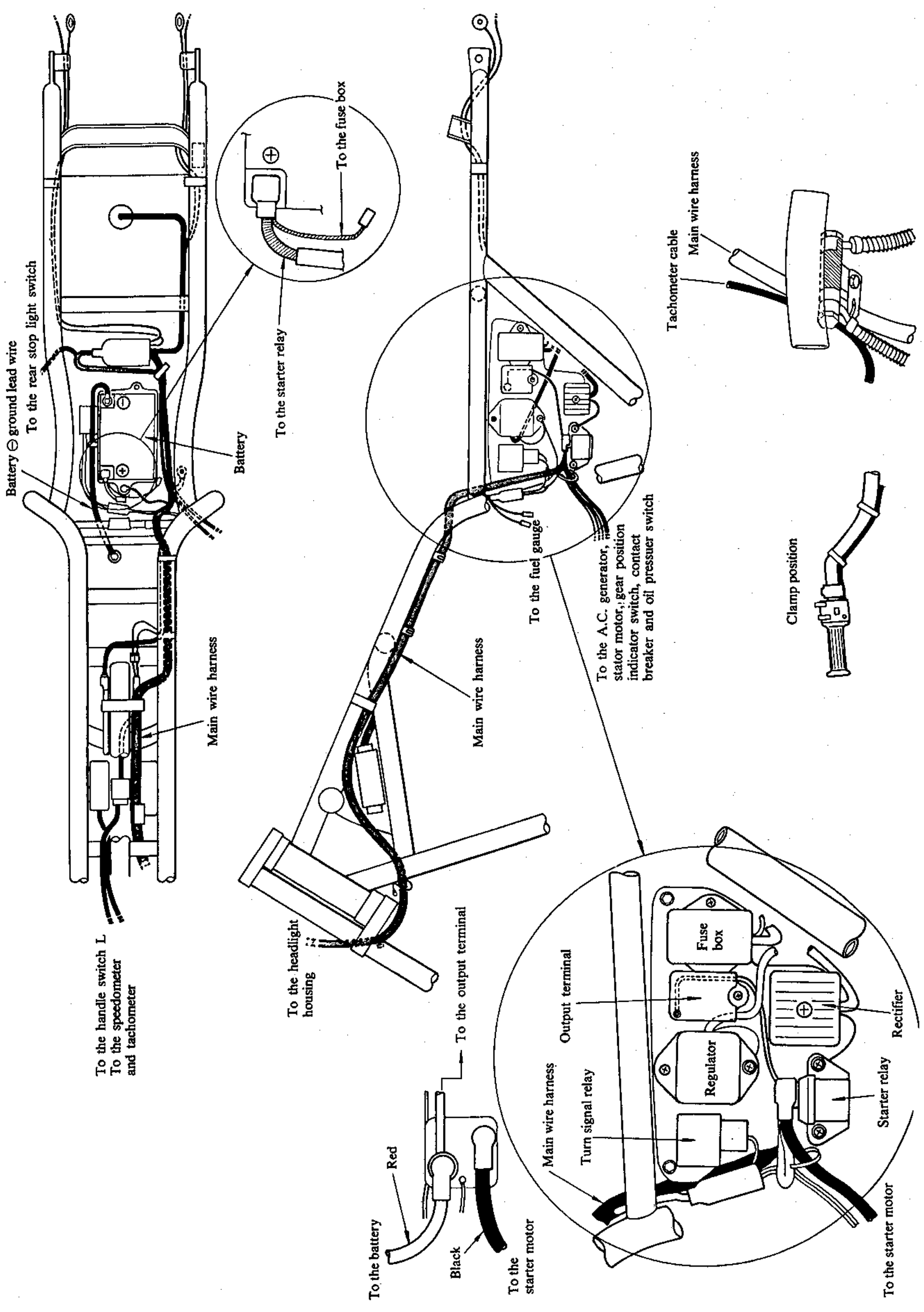
Orange-Yellow/Black 45 — 65Ω
Orange-Black/White 55 — 85Ω

Gauge side

Full 1 — 5Ω
Empty 103 — 117Ω

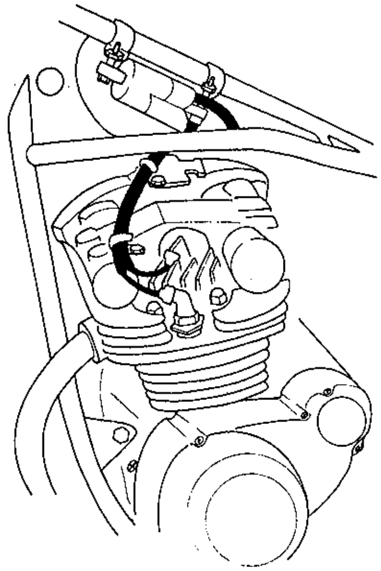
Fig. 14-43.

WIRE AND CABLE ROUTING

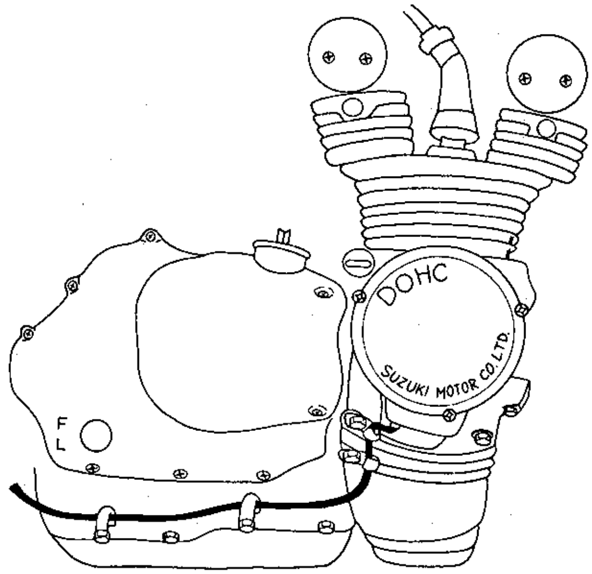


WIRE AND CABLE ROUTING

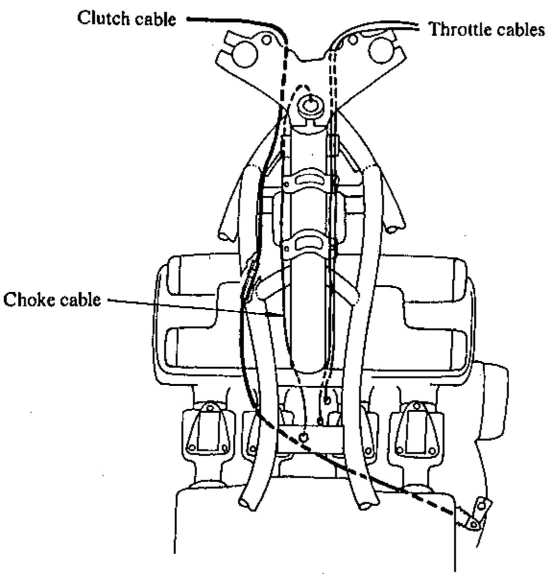
How to set the high-tension cord

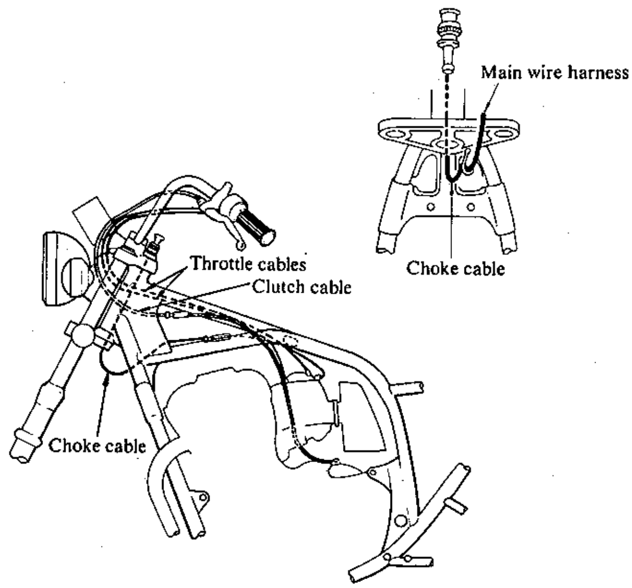


How to set contact breaker lead wire

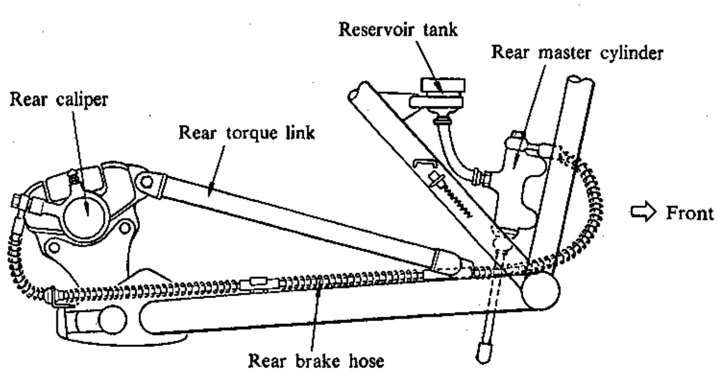


CABLE ROUTING

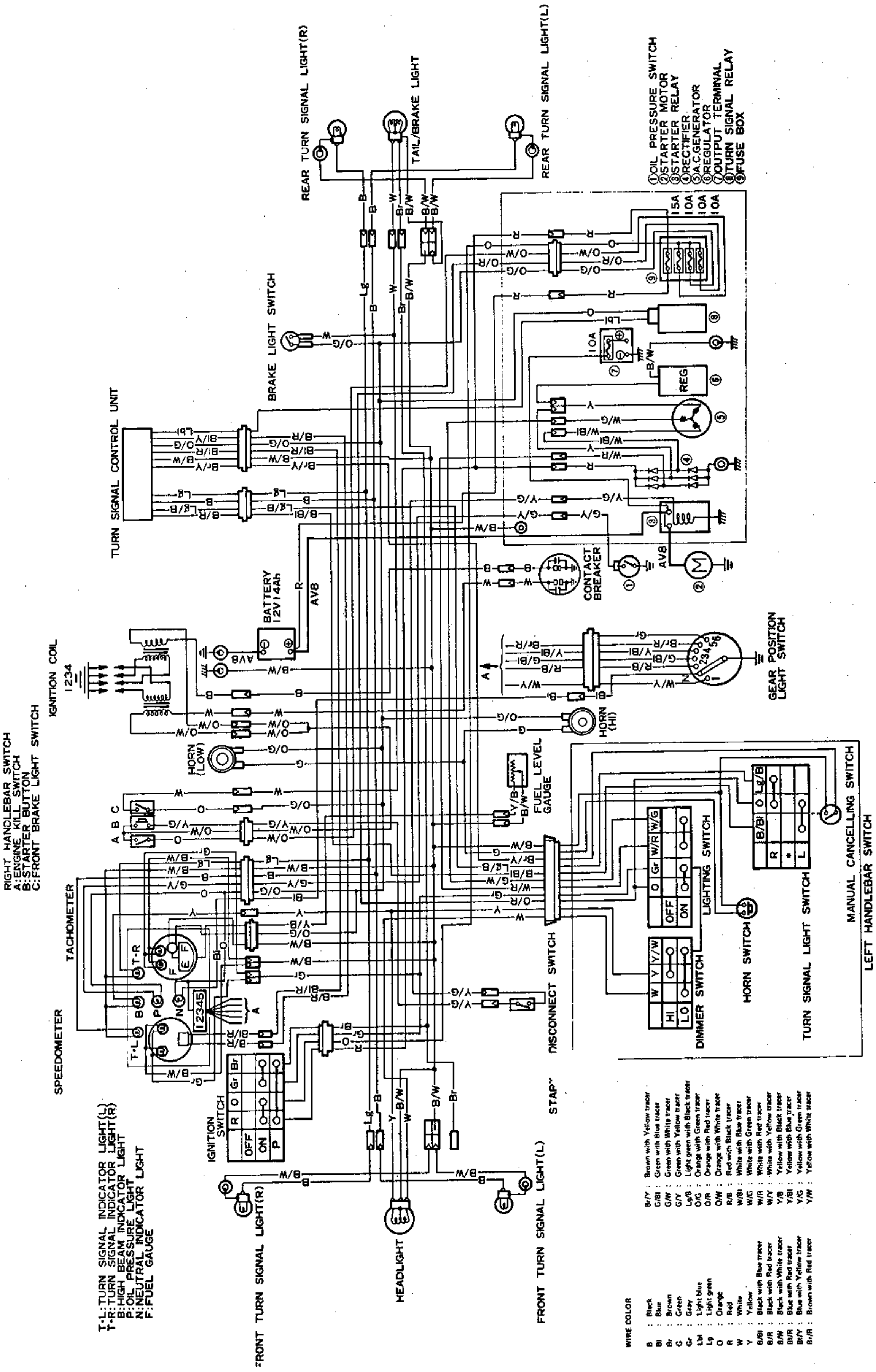




REAR BRAKE HOSE ROUTING



WIRING DIAGRAM



SUZUKI

GS1000

SUPPLEMENTARY SERVICE MANUAL

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GS1000E/S SUZUKI MOTOR CO., LTD. JULY '80 PRINTED IN JAPAN 99000-85850-4E3

FOREWORD

The Suzuki GS1000ET and GS1000ST are new 1980 models and incorporate many refinements and technical changes from the previous model, the GS1000C and GS1000N. This supplementary service manual has been produced to aid Suzuki mechanics in properly maintaining and repairing these model motorcycles, which incorporate so many new and innovative changes. These technical improvements have further enhanced the comfort, handling and overall performance of these outstanding models.

This manual has been written primarily for the experinced 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 GS1000 Service Manual, sections 1 through 14, for all other areas of information not covered in this publication.

IMPORTANT

All Suzuki motorcycles manufactured on or after January 1, 1978, were subject to Environmental Protection Agency emission regulations.
These regulations set specific standards for emission control, and also set new servicing requirement. This manual contains pertinent information that should be carefully studied. Other, vital emission information is also contained in the GS1000 Service Manual and should also be carefully reviewed.

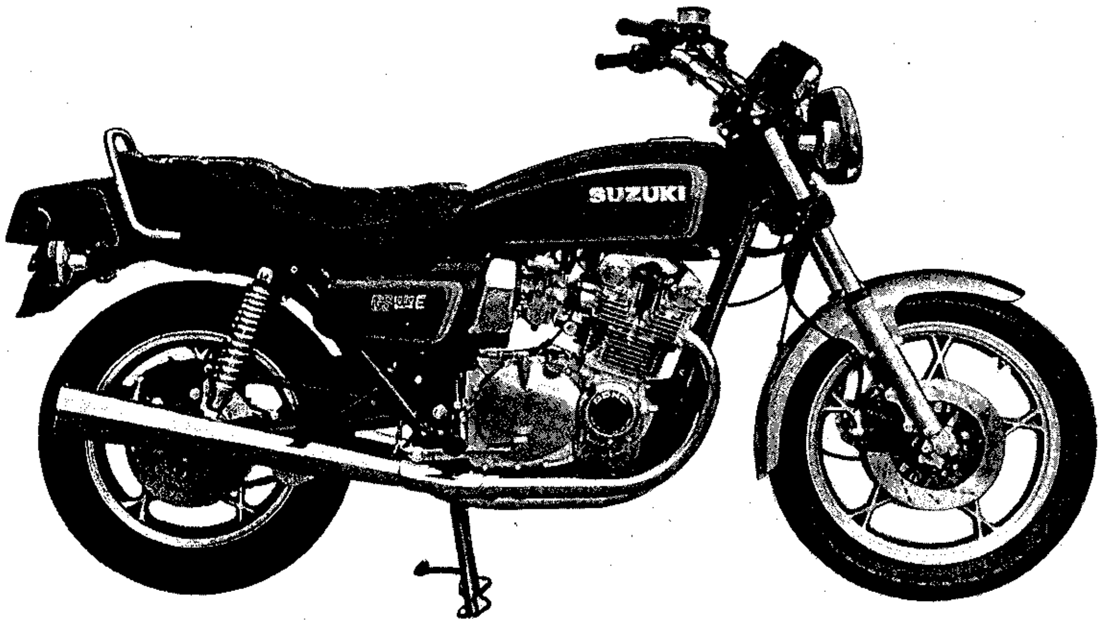
Complete information concerning the EPA emission regulation and U. S. Suzuki's emission control program can be found in the U. S. SUZUKI EMISSION CONTROL PROGRAM MANUAL.

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

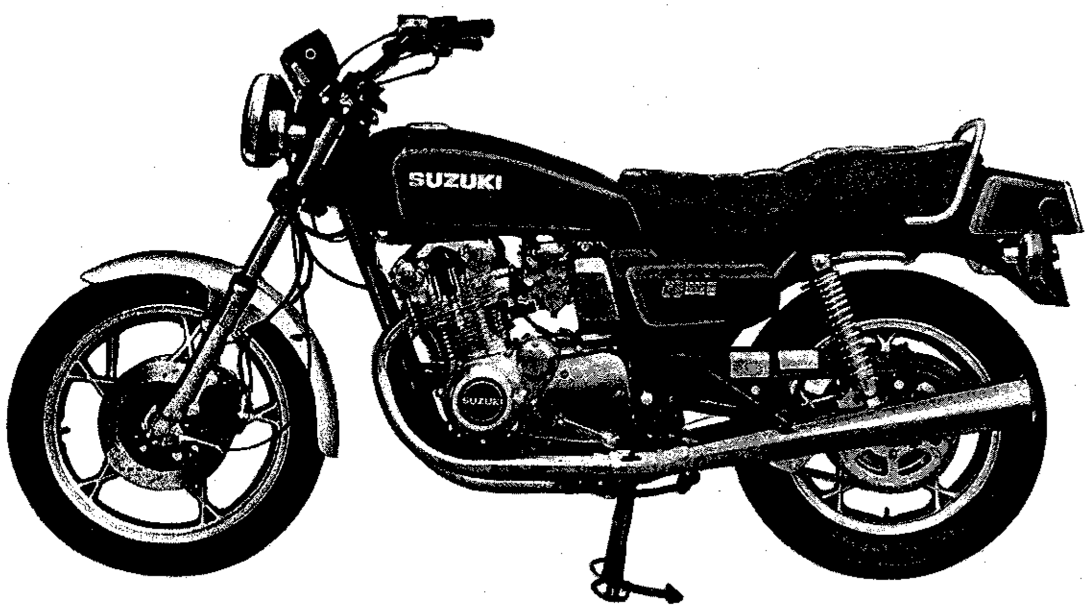
GS1000E/ST

CONTENTS

GS1000ET



Right side



Left side

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	1 505 mm (59.3 in)
Ground clearance	155 mm (6.1 in)
Dry mass	234 kg (516 lbs)
Gross vehicle weight rating	439 kg (968 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	70.0 mm (2.756 in)
Stroke	64.8 mm (2.551 in)
Piston displacement	997 cm^3 (60.8 cu.in)
Compression ratio	9.2 : 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 RK630GSO, 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	63°00′
Trail	116 mm (4.57 in)
Turning radius	2.6 m (8.5 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 (25 psi) (Normal solo riding)
Rear tire pressure	2.00 kg/cm^2 (28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 350 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES-U
Spark plug gap	0.6 – 0.8 mm (0.024 – 0.031 in) both NGK and NIPPON DENSO
Battery	12V 50.4 kC (14 Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CAPACITIES

Fuel tank	19 L (5.0 US gal)
Engine oil change	3.4 L (3.6 US qt)
filter change	3.8 L (4.0 US qt)
overhaul	4.2 L (4.4 US qt)
Front fork air pressure	0.8 kg/cm^2 (11.38 psi)
Front fork oil	241 ml (8.15 US oz) in each leg

* Specifications are subject to change without notice.

SERVICE DATA

VALVES + GUIDES

Unit: mm (in)

Item		Standard	Limit
Valve dia.	IN	37.9 – 38.1 (1.49 – 1.50)	–
	EX	31.9 – 32.1 (1.25 – 1.26)	–
Valve lift	IN	8.0 (0.31)	–
	EX	7.5 (0.30)	–
Tappet clearance (when cold)	IN/EX	0.03 – 0.08 (0.001 – 0.003)	–
Valve guide to Valve stem clearance	IN	0.025 – 0.055 (0.0009 – 0.0022)	0.090 (0.0035)
	EX	0.040 – 0.070 (0.0016 – 0.0028)	0.100 (0.0039)
Valve guide I.D.	IN/EX	7.000 – 7.015 (0.2756 – 0.2762)	–
Valve stem O.D.	IN	6.960 – 6.975 (0.2740 – 0.2746)	–
	EX	6.945 – 6.960 (0.2734 – 0.2740)	–
Valve stem runout	IN/EX	–	0.05 (0.002)
Valve head thickness	IN/EX	–	0.5 (0.02)
Valve seat width	IN/EX	1.1 – 1.3 (0.04 – 0.05)	–
Valve head radial runout	IN/EX	–	0.03 (0.001)
Valve spring free length (IN/EX)	INNER	–	33.9 (1.33)
	OUTER	–	41.3 (1.63)
Valve spring tension (IN/EX)	INNER	29.3 – 34.0 kg (64.59 – 74.96 lbs) at length 23 mm (0.91 in)	–
	OUTER	50.4 – 58.3 kg (111.11 – 128.53 lbs) at length 27 mm (1.06 in)	–

CAMSHAFT + CYLINDER + HEAD

Unit: mm (in)

Item		Standard	Limit
Cam height	IN	36.320 – 36.360 (1.4299 – 1.4315)	36.020 (1.4181)
	EX	35.770 – 35.810 (1.4083 – 1.4098)	35.470 (1.3965)
Camshaft journal oil clearance	IN/EX	0.037 – 0.065 (0.0015 – 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	21.960 – 21.975 (0.8646 – 0.8652)	–
Camshaft runout	IN/EX	–	0.1 (0.004)
Cam chain 20 pitch length		–	157.80 (6.213)
Cam chain pin (at arrow "3")		20th pin	–
Cylinder head distortion		–	0.2 (0.008)

PISTON + RING + CYLINDER

Unit: mm (in)

Item		Standard	Limit
Compression pressure		9 – 13 kg/cm^2 (128 – 185 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		70.000 – 70.015 (2.7559 – 2.7565)	70.080 (2.7590)
Piston dia.		69.945 – 69.960 (2.7537 – 2.7543) Measure the 10 (0.39) from piston skirt end.	69.880 (2.7512)
Cylinder distortion		–	0.2 (0.008)
Piston ring free end gap	1st N	Approx. 8.5 (0.33)	6.8 (0.27)
	2nd N	Approx. 8.5 (0.33)	6.8 (0.27)
Piston ring end gap	1st	0.15 – 0.35 (0.006 – 0.014)	0.7 (0.03)
	2nd	0.15 – 0.35 (0.006 – 0.014)	0.7 (0.03)
Piston ring groove clearance	1st	–	0.180 (0.0071)
	2nd	–	0.150 (0.0059)
Piston ring groove width	1st	1.21 – 1.23 (0.047 – 0.048)	–
	2nd	1.21 – 1.23 (0.047 – 0.048)	–
	Oil	2.51 – 2.53 (0.099 – 0.100)	–
Piston ring thickness	1st	1.175 – 1.190 (0.0463 – 0.0469)	–
	2nd	1.170 – 1.190 (0.0461 – 0.0469)	–
Piston pin bore I.D.		18.002 – 18.008 (0.7087 – 0.7090)	18.030 (0.7098)
Piston pin O.D.		17.995 – 18.000 (0.7085 – 0.7087)	17.980 (0.7079)

CRANKSAHFT

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	—	0.10 (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/cm² (1.42 psi) Below 0.5 kg/cm² (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	1.6 ± 0.06 (0.06 ± 0.002)	—
Driven plate distortion	—	0.1 (0.004)
Clutch spring free length	—	38.5 (1.52)
Primary drive to Driven gear backlash	0 – 0.03 (0 – 0.001)	0.08 (0.003)

TRANSMISSION

Unit: mm (in)

Item		Standard	Limit
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)	—
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		0.4 – 0.6 (0.016 – 0.024)	0.8 (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)		$109.5 ^{+0}_{-0.1}$ ($4.31 ^{+0}_{-0.004}$)	—
Drive chain	Type	D.I.D.: 630YL TAKASAGO: RK630GSO	—
	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.		49100
Idle r/min		1 050 ± 100 r/min
Fuel level		5.0 ± 0.5 (0.20 ± 0.02)
Float height		22.4 ± 1.0 (0.88 ± 0.04)
Main jet	(M.J.)	#107.5
Main air jet	(M.A.J.)	1.7
Jet needle	(J.N.)	5D50
Needle jet	(N.J.)	X-7
Pilot jet	(P.J.)	#40
By pass	(B.P.)	0.9, 0.8, 0.8
Pilot outlet	(P.O.)	0.8
Valve seat	(V.S.)	2.0
Starter Jet	(G.S.)	#45
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		17° B.T.D.C. below, 1 500 ± 150 r/min and 37° B.T.D.C. above, 2 350 ± 150 r/min	
Firing order		1, 2, 4, 3	
Spark plug	Type	NGK: B8ES N.D.: W24ES-U	
	Gap	0.6 – 0.8 (0.024 – 0.031)	
Spark performance		Over 8 (0.3) at 1 atm	
Signal coil resistance		BL-G Approx. 290 – 360Ω	
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: 6 (0.24)
		Commutator under cut	Limit: 0.2 (0.008)
Starter relay resistance		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:		Headlight	10A
		Turn 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 (0.2 ± 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 dia.	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 dia.	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 (0.010)
	Rear	—	0.25 (0.010)
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	—	416 (16.4)
Front fork oil level	140 (5.5)	—
Front fork air pressure S.T.D.	0.8 kg/cm^2 (11.38 psi)	—
Rear wheel travel	100 (3.9)	—
Swinging arm pivot shaft runout	—	0.3 (0.012)

FUEL + OIL + CAPACITY

Item	Specification
Fuel type	Use only unleaded or low-lead type gasoline of at least 85 — 95 pump octance ($\frac{R+M}{2}$ method) or 89 octance or higher rated by the Research method.
Fuel tank	19 L (5.0 US gal)
Engine oil type	SAE 10W/40
Engine oil capacity Change	3 400 ml (3.6 US qt)
Filter change	3 800 ml (4.0 US qt)
Overhaul	4 200 ml (4.4 US qt)
Front fork oil type	Front fork oil #15
Front fork oil capacity (each leg)	241 ml (8.15 US oz)
Brake fluid type	DOT3 or DOT4

TIRE PRESSURE

Cold inflation tire pressure	Normal riding				High speed riding			
	Solo		Dual		Solo		Dual	
	kg/cm^2	psi	kg/cm^2	psi	kg/cm^2	psi	kg/cm^2	psi
Front	1.75	25	1.75	25	2.00	28	2.00	28
Rear	2.00	28	2.25	32	2.25	32	2.80	40

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	kg-m	lb-ft
Camshaft holder bolt	0.8 – 1.2	6.0 – 8.5
Cylinder head bolt	0.9 – 1.4	6.5 – 10.0
Cylinder head nut	3.5 – 4.0	25.5 – 29.0
Cylinder head cover bolt	0.6 – 1.0	4.5 – 7.0
Crankcase bolt (6 mm)	0.6 – 1.0	4.5 – 7.0
Crankcase bolt (8 mm)	1.3 – 2.3	9.5 – 16.5
Starter motor bolt	0.4 – 0.7	3.0 – 5.0
Oil pan bolt	0.6 – 1.0	4.5 – 7.0
Engine mounting bolt (8 mm)	2.5	18.0
Engine mounting bolt (10 mm)	3.5	25.5
Primary drive gear bolt	1.5 – 2.0	11.0 – 14.5
Starter clutch allen bolt	1.5 – 2.0	11.0 – 14.5
Camshaft sprocket bolt	0.6 – 1.0	4.5 – 7.0
Cam chain guide bolt No. 4	0.4 – 0.7	3.0 – 5.0
Cam chain tensioner bolt	0.9 – 1.4	6.5 – 10.0
Cam chain tensioner adjuster bolt	0.4 – 0.7	3.0 – 5.0
Air cleaner bolt	0.4 – 0.7	3.0 – 5.0
Exhaust pipe bolt	0.9 – 1.4	6.5 – 10.0
Muffler bolt	1.8 – 2.8	13.0 – 20.0
Pressure switch housing bolt	0.6 – 0.9	4.5 – 6.5
Clutch spring bolt	0.8 – 1.2	6.0 – 8.5
Clutch sleeve hub nut	5.0 – 7.0	36.0 – 50.5
Clutch release arm bolt	0.6 – 1.0	4.5 – 7.0
Gear shifting cam stopper spring holder bolt	1.8 – 2.8	13.0 – 20.0
Gear shift arm stopper	1.5 – 2.2	11.0 – 16.0
Gear shift lever bolt	1.3 – 2.3	9.5 – 16.5
Engine sprocket nut	9.0 – 10.0	65.0 – 72.5
Generator rotor bolt	9.0 – 10.0	65.0 – 72.5

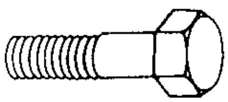
CHASSIS

Item	kg-m	lb-ft
Handlebar clamp bolt	1.2 – 2.0	8.5 – 14.5
Steering stem upper clamp bolt	1.5 – 2.5	11.0 – 18.0
Front fork upper bracket bolt (R, L)	2.0 – 3.0	14.5 – 21.5
Front fork lower bracket bolt (R, L)	1.5 – 2.5	11.0 – 18.0
Steering stem head nut	3.6 – 5.2	26.0 – 37.5
Front fork axle holder nut	1.5 – 2.5	11.0 – 18.0
Front axle shaft nut	3.6 – 5.2	26.0 – 37.5
Swinging arm pivot shaft nut	5.0 – 8.0	36.0 – 58.0
Rear torque link nut	2.0 – 3.0	14.5 – 21.5
Rear axle nut	8.5 – 11.5	61.5 – 83.0
Rear shock absorber bolt and nut	2.0 – 3.0	14.5 – 21.5
Footrest bolt	2.7 – 4.3	19.5 – 31.0
Front brake caliper mounting bolt	2.5 – 4.0	18.0 – 29.0
Front and rear brake disc plate bolt	1.5 – 2.5	11.0 – 18.0
Front brake caliper axle bolt	4.0 – 5.5	29.0 – 40.0
Front brake master cylinder mounting bolt	0.5 – 0.8	3.5 – 6.0
Front and rear brake hose union bolt	1.5 – 2.5	11.0 – 18.0
Front and rear brake bleeder bolt	0.7 – 0.9	5.0 – 6.5
Rear brake caliper mounting bolt	2.5 – 4.0	18.0 – 29.0
Rear brake caliper axle bolt	2.0 – 3.0	14.5 – 21.5
Rear brake master cylinder mounting bolt	1.5 – 2.5	11.0 – 18.0
Chain adjuster support bolt	1.0 – 1.5	7.0 – 11.0

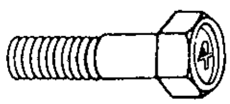
For other bolts and nuts not listed above, refer to this chart:

TIGHTENING TORQUE

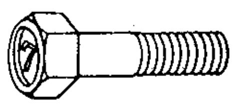
Thread Diameter (mm)	Conventional or "4" Marked Bolt		"7" Marked Bolt	
	kg-m	lb-ft	kg-m	lb-ft
5	0.2 – 0.4	1.5 – 3.0	0.3 – 0.6	2.0 – 4.5
6	0.4 – 0.7	3.0 – 5.0	0.7 – 1.0	5.0 – 7.5
8	0.9 – 1.4	6.5 – 10.0	2.0 – 2.5	14.5 – 18.0
10	1.8 – 2.8	13.0 – 20.0	3.5 – 4.0	25.5 – 29.0



Conventional Bolt



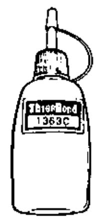
"4" Marked Bolt

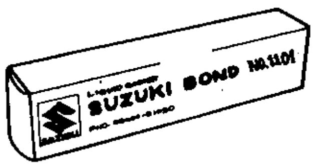
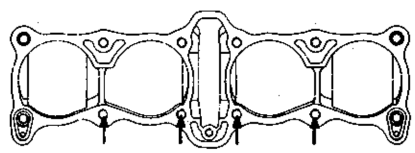
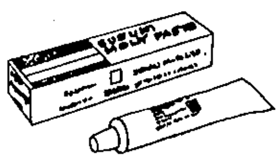


"7" Marked Bolt

SPECIAL MATERIALS

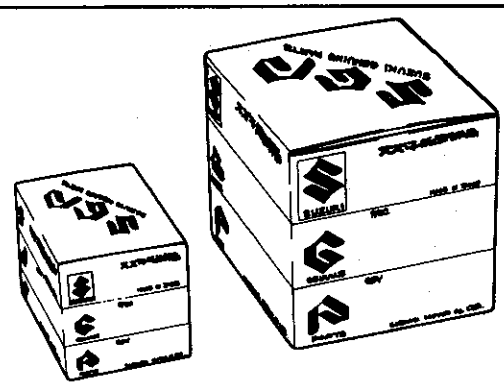
The materials listed below are needed for maintenance work on the GS1000, and should be kept on hand for ready use. They supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and whtere to use them are described in the text of this manual.

Material	Part
①  99000-32040 THREAD LOCK CEMENT	* Cam shaft end cap screw .... 8 pcs * Cylinder stud bolt .... 12 pcs * Oil filter cap nut .... 3 pcs * Carburetor bracket screw .... 8 pcs * Front fork allen bolt .... 2 pcs * Carburetor set screw .... 8 pcs
②  99104-32050 THREAD LOCK "1363C"	* Gearshift cam guide screw .... 2 pcs * Gearshift cam pawl screw .... 2 pcs * Countershaft B/g retainer screw .... 3 pcs * Drive shaft plate screw .... 4 pcs * Engine oil pump screw .... 4 pcs * Generator stator screw .... 3 pcs * Generator stator lead wire guide screw .... 2 pcs * Oil gallery plate screw .... 3 pcs * Oil sump filter screw .... 3 pcs * Starter motor securing bolt .... 2 pcs
③  99104-32090 THREAD LOCK SUPER "1332B"	* Generator rotor bolt
④  99104-32020 THREAD LOCK SUPER "1361A"	* Starter clutch allen bolt .... 3 pcs * Cam chain guide bolt .... 1 pc * Cam chain guide screw .... 2 pcs * Cam sprocket allen bolt .... 4 pcs * Primary drive gear bolt .... 2 pcs * Gear shift stopper .... 1 pc * Muffler cover screw .... 4 pcs

Material	Part
⑤  99104-32030 THREAD LOCK SUPER "1363A"	* 2nd drive gear
⑥  99104-31100 SUZUKI BOND No. 1201	* Mating surfaces of upper and lower crank case. * Cylinder stud bolt... 4 pcs (Apply a small quantity to the threads of cylinder stud bolts.) Front  Rear
⑦  99000-25100 SUZUKI SILICONE GREASE	* Apply to caliper axle shaft.
⑧  99000-25140 SUZUKI MOLY PASTE	* Valve stem. * Cam shaft. * Chain tensioner adjuster shaft. * Counter shaft washer. * Outer counter shaft. * Input cam dog.

USE OF GENUINE SUZUKI PARTS

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



PERIODIC MAINTENANCE

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 enhance the reliability and performance of the motorcycle.

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

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

PEPIODIC MAINTENANCE SCHEDULE

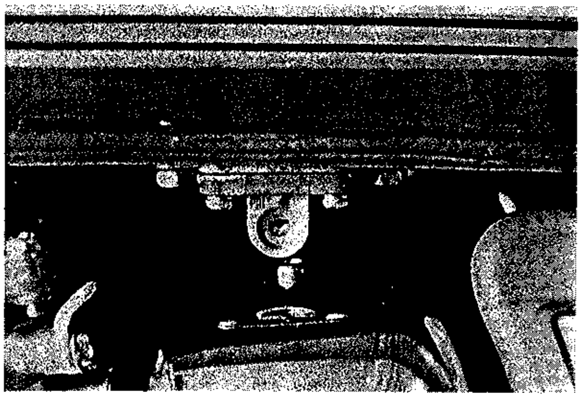
INTERVAL: This interval should be judged by odometer reading or months whichever comes first	Mile	600	4000	7500	11000	15000
	km	1000	6000	12000	18000	24000
	Month	2	12	24	36	48
Battery (specific gravity of electrolyte)		—	I	I	I	I
Cylinder head nuts and exhaust pipe bolts		T	T	T	T	T
Air cleaner element		Clean every 2000 miles (3000 km), and replace every 7500 miles (12000 km)				
Tappet clearance		I	I	I	I	I
Spark plug		—	C	R	C	R
Fuel line			Replace every two years			
Engine oil and oil filter		R	R	R	R	R
Carburetor idle rpm		I	I	I	I	I
Clutch		I	I	I	I	I
Drive chain		I	I	I	I	I
		Clean and lubricate every 600 miles (1000 km)				
Brake hose		Replace every two years				
Brake		I	I	I	I	I
Tire		I	I	I	I	I
Steering stem		I	I	I	I	I
Chassis bolts and nuts		T	T	T	T	T
Front forks		—	—	I	—	I
		Check air pressure every 6 months				

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

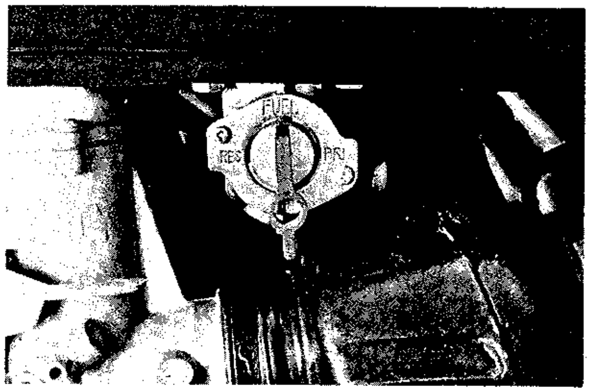
MODIFICATIONS

FUEL SYSTEM

- The fuel cock has been changed as shown below.

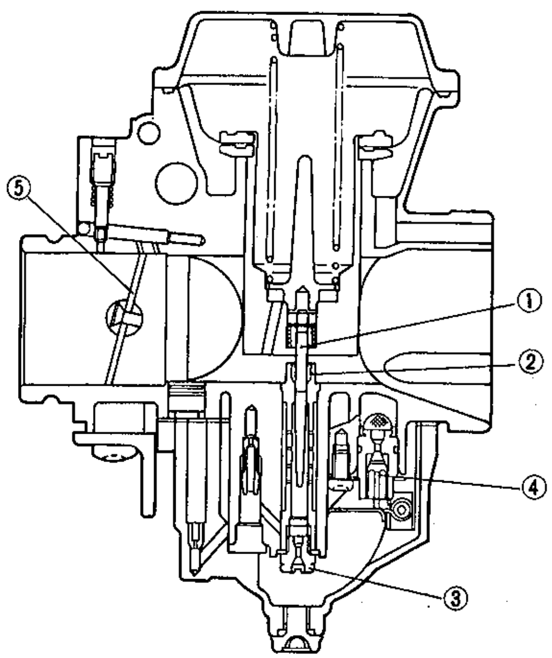


GS1000ET Model



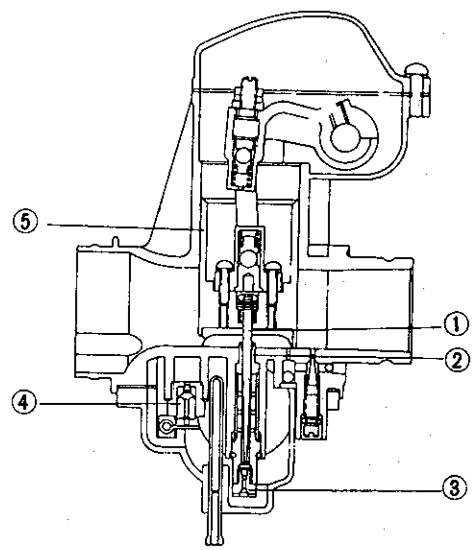
GS1000N Model

- The carburetor has been changed from MIKUNI VM26SS to MIKUNI BS34SS.



1. Jet needle
2. Needle jet
3. Main jet
4. Needle valve
5. Throttle valve

GS1000ET Model BS-TYPE

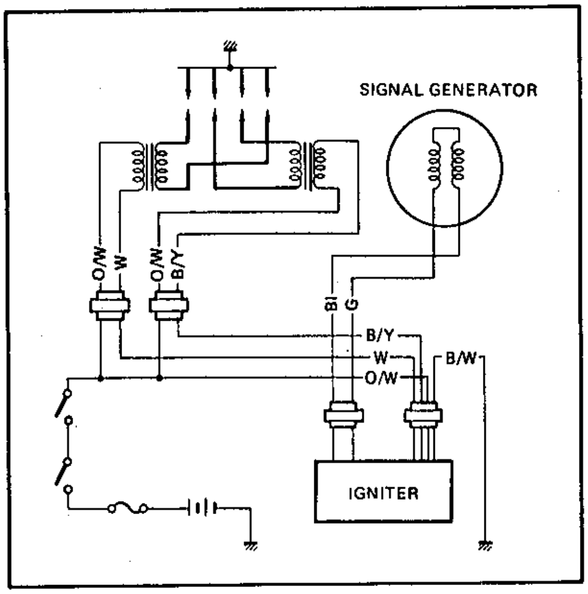


1. Jet needle
2. Needle jet
3. Main jet
4. Needle valve
5. Throttle valve

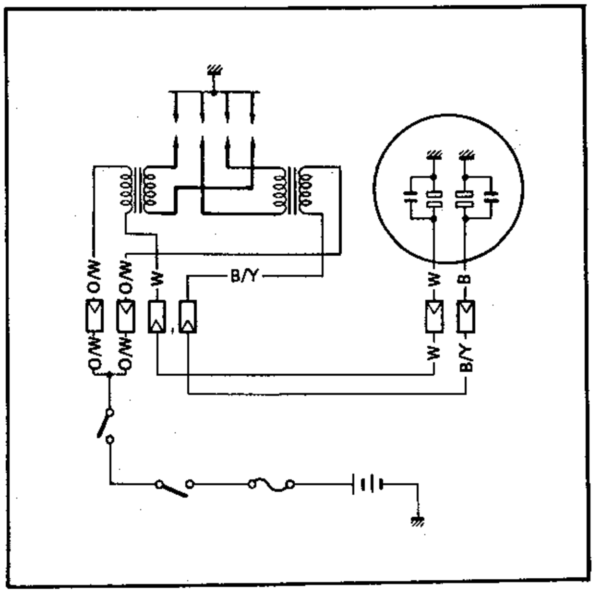
GS1000N Model VM-TYPE

ELECTRICAL

- The ignition system has been changed from the battery ignition system to the maintenance-free transistorized ignition system.

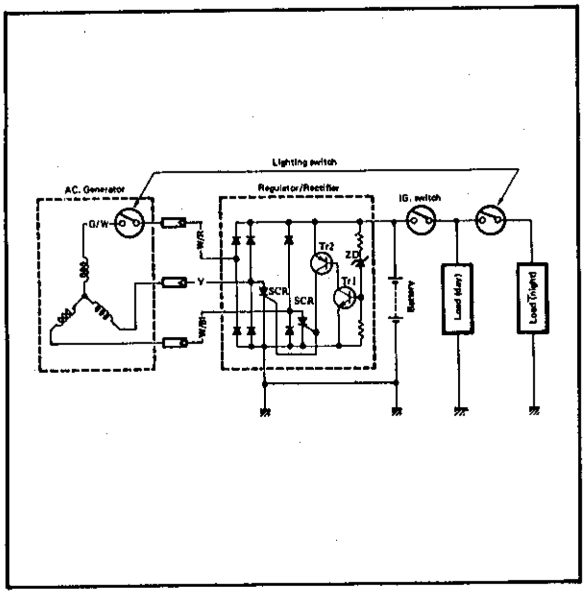


GS1000ET Model

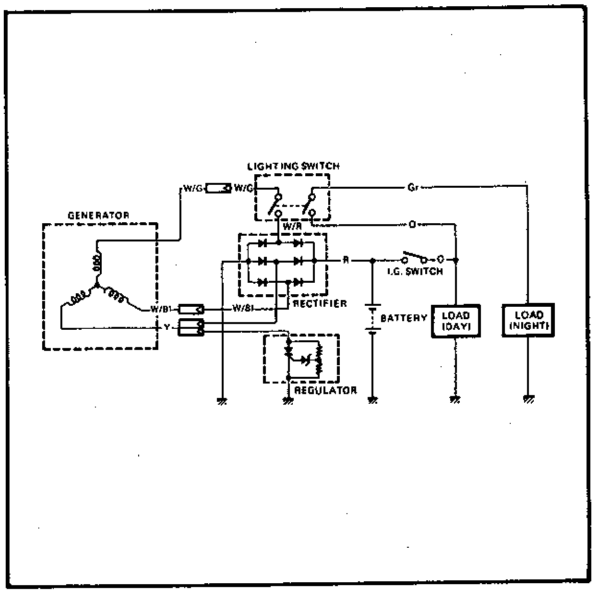


GS1000N Model

- Charging system has been changed as shown below.

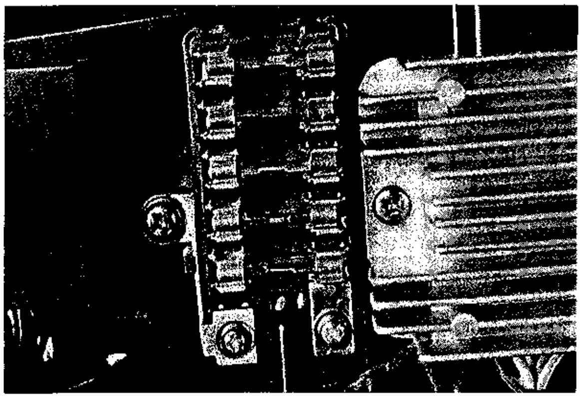


GS1000ET Model

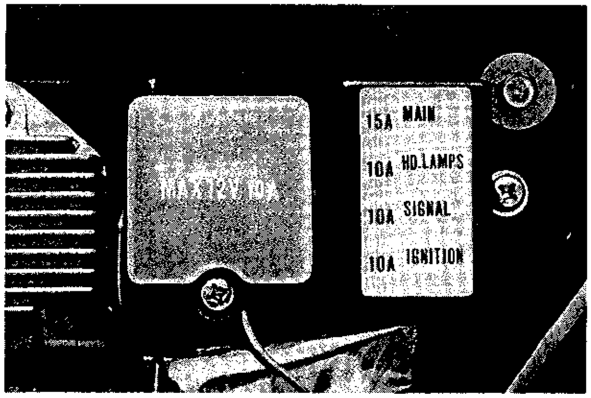


GS1000N Model

- The fuse box and output terminal have been changed from the separate type to the combined type.

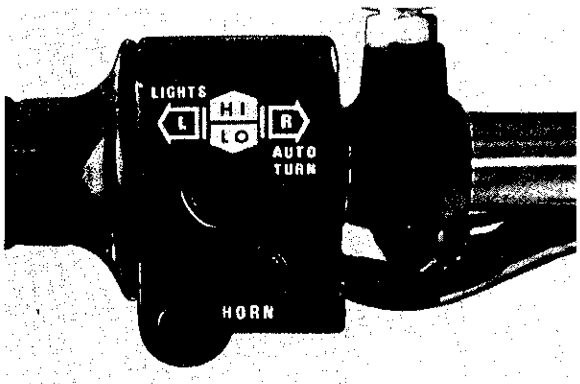


GS1000ET Model

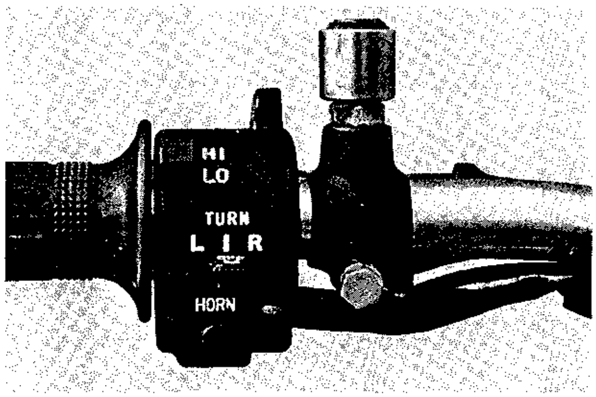


GS1000N Model

- The left handlebar switch has been changed to a multiple type as shown below:



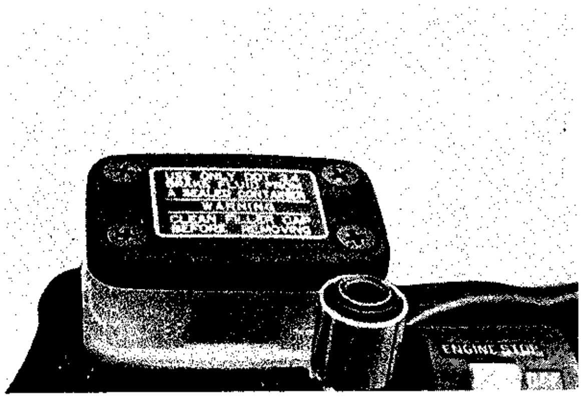
GS1000ET Model



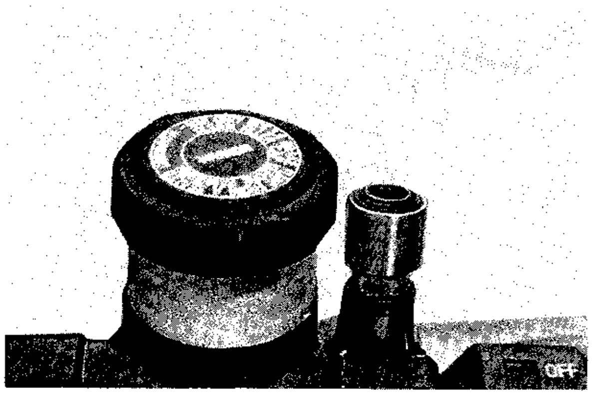
GS1000N Model

CHASSIS

- The front master cylinder cap has been changed from a screwing-in type to 4-screw fastening type.

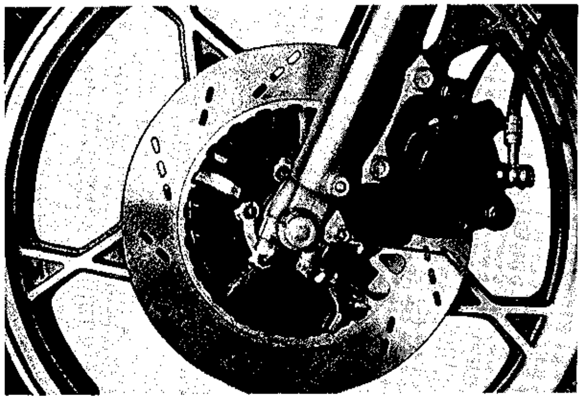


GS1000ET Model

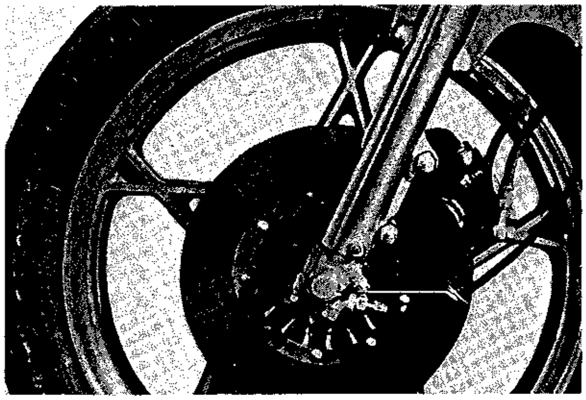


GS1000N Model

- The front and rear brake disc plates are newly provided with holes.

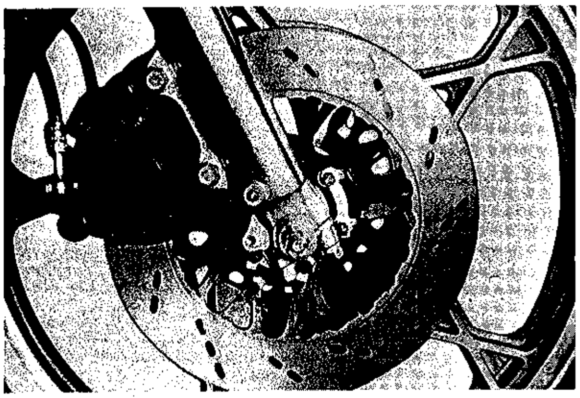


GS1000ET Model

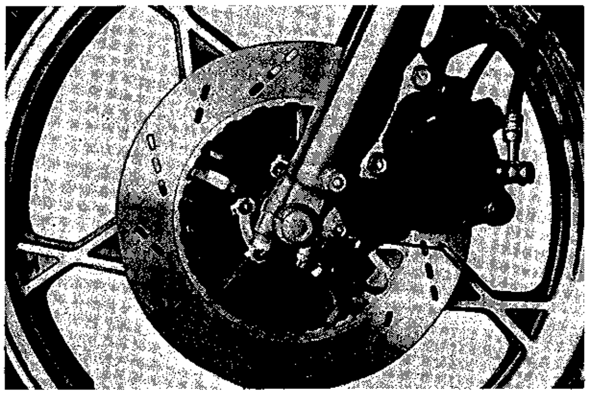


GS1000N Model

CAUTION:
Be careful not to reverse the right and left front disc plates.

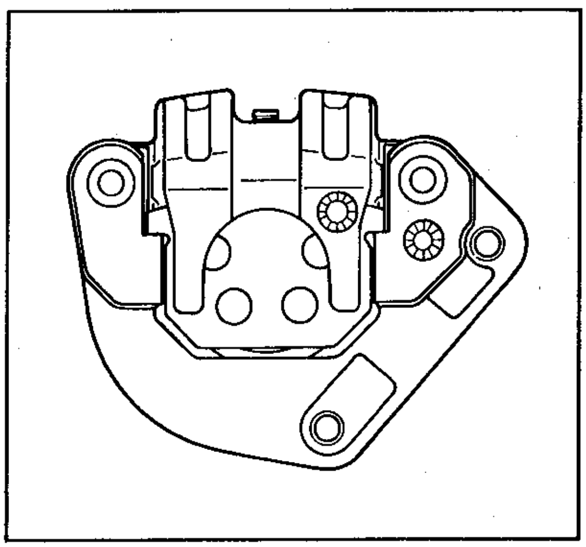


Right front disc plate

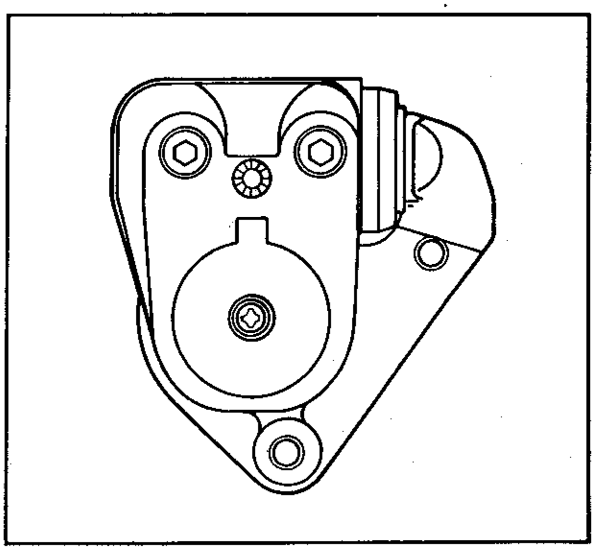


Left front disc plate

- Front brake caliper has been changed as shown below.



GS1000ET Model



GS1000N Model

EMISSION CONTROL AND 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)	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 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

GS1000 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 mixutre 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 GS1000 are as follows.

Carburetor I.D. No.	Main Jet	Needle Jet	Jet Needle	Pilot Jet	Pilot Screw
49100	#107.5	X-7	5D50	#40	PRE-SET DO NOT ADJUST

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

GENERAL EMISSION INFORMATION

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

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

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

Hydrocarbons (HC)
Carbon Monoxide (CO)

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

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

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

Carbon Monoxide

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

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

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

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

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

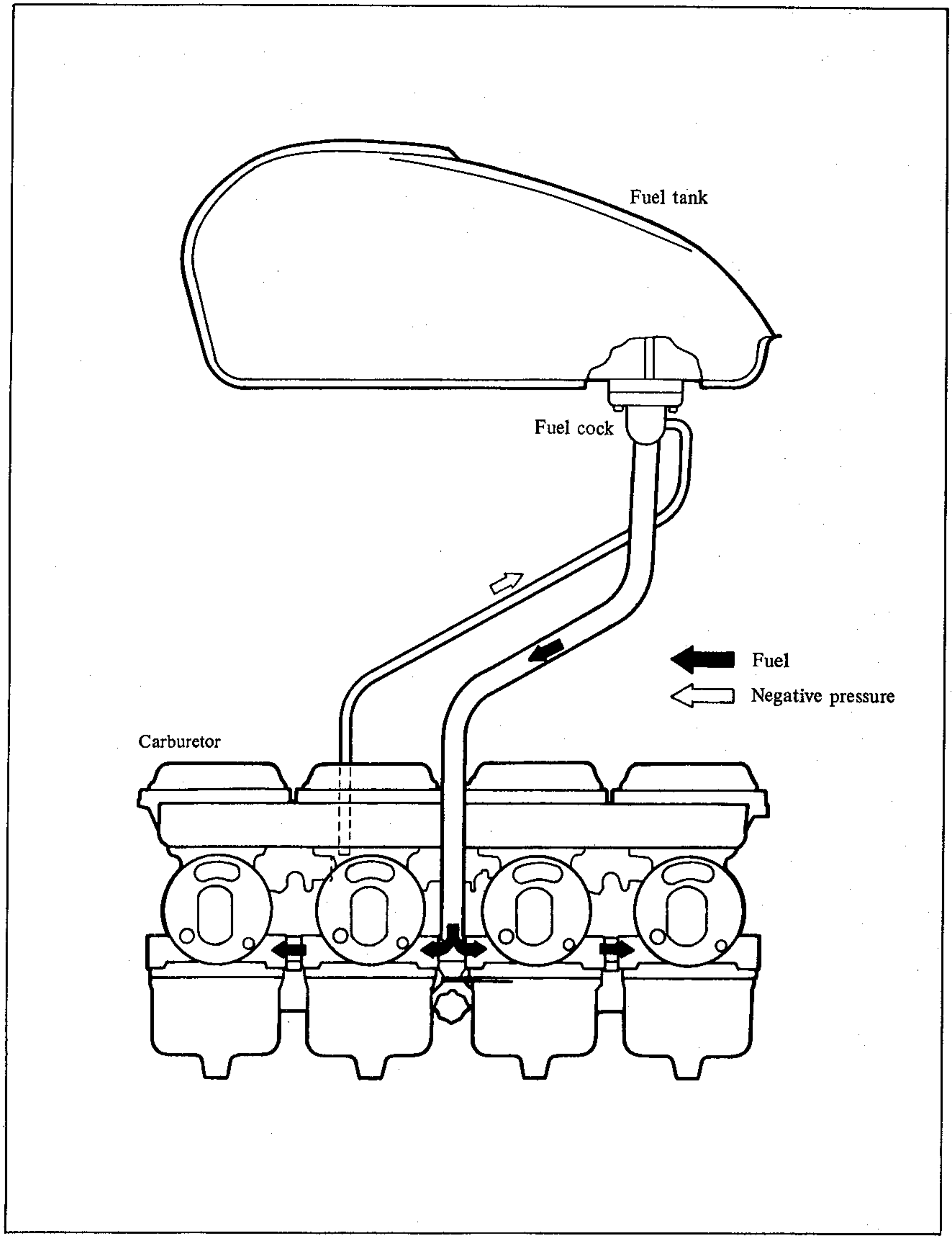
Mixture-related Malfunctions
1. Air Cleaner — Dirty, over oiled or torn.
2. Jets — Clogged, restricted or incorrect size.
3. Float Level — Level too low (lean) or too high (rich).
4. Choke — Leaking choke plunger or sticking linkage.
5. Air Leaks — Intake manifolds, engine gaskets and other sealing surfaces.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

Engine wear or damage can also cause high HC emissions.

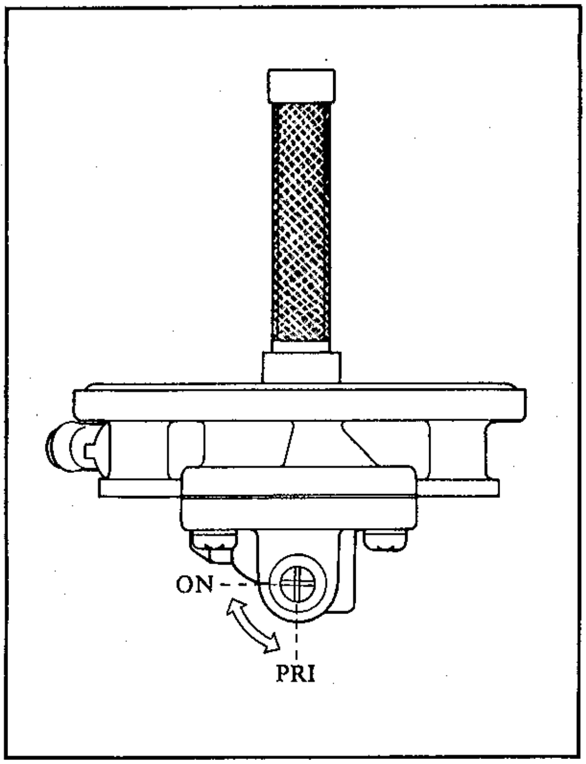
1. Rings — Low compression, leakage into crankcase.
2. Valves — Improper adjustment, bent stem or burnt.
3. Gaskets — Leaking, loss of compression.
4. Crank Seals — Leaking.
5. Oil Consumption — Worn valve guides, worn rings, clogged crankcase breather.
6. Oil — Improper engine oil.

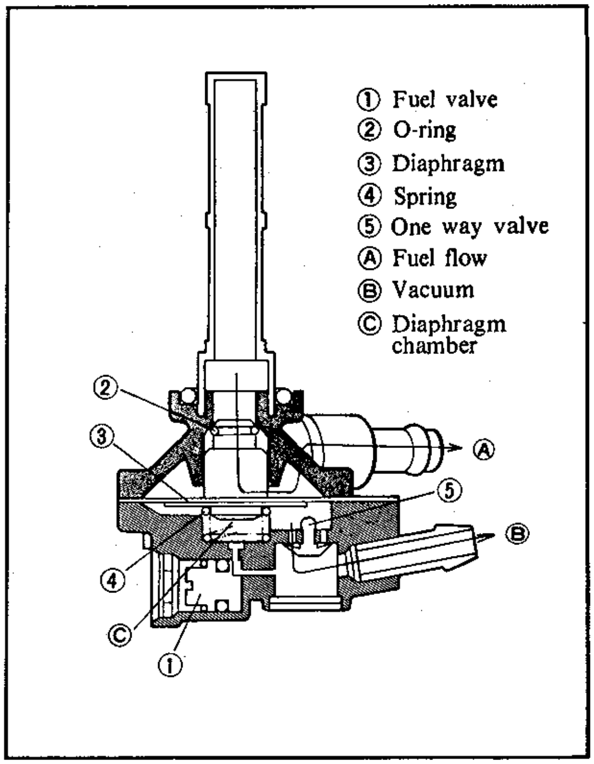
FUEL SYSTEM

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

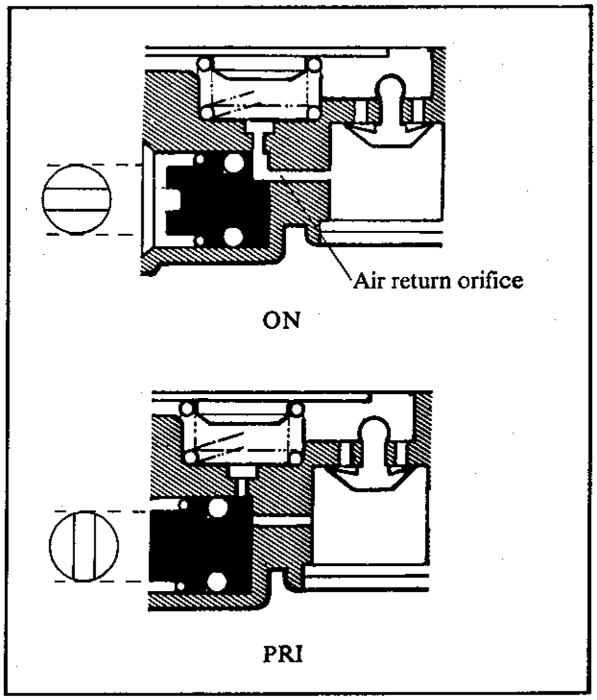


FUEL COCK



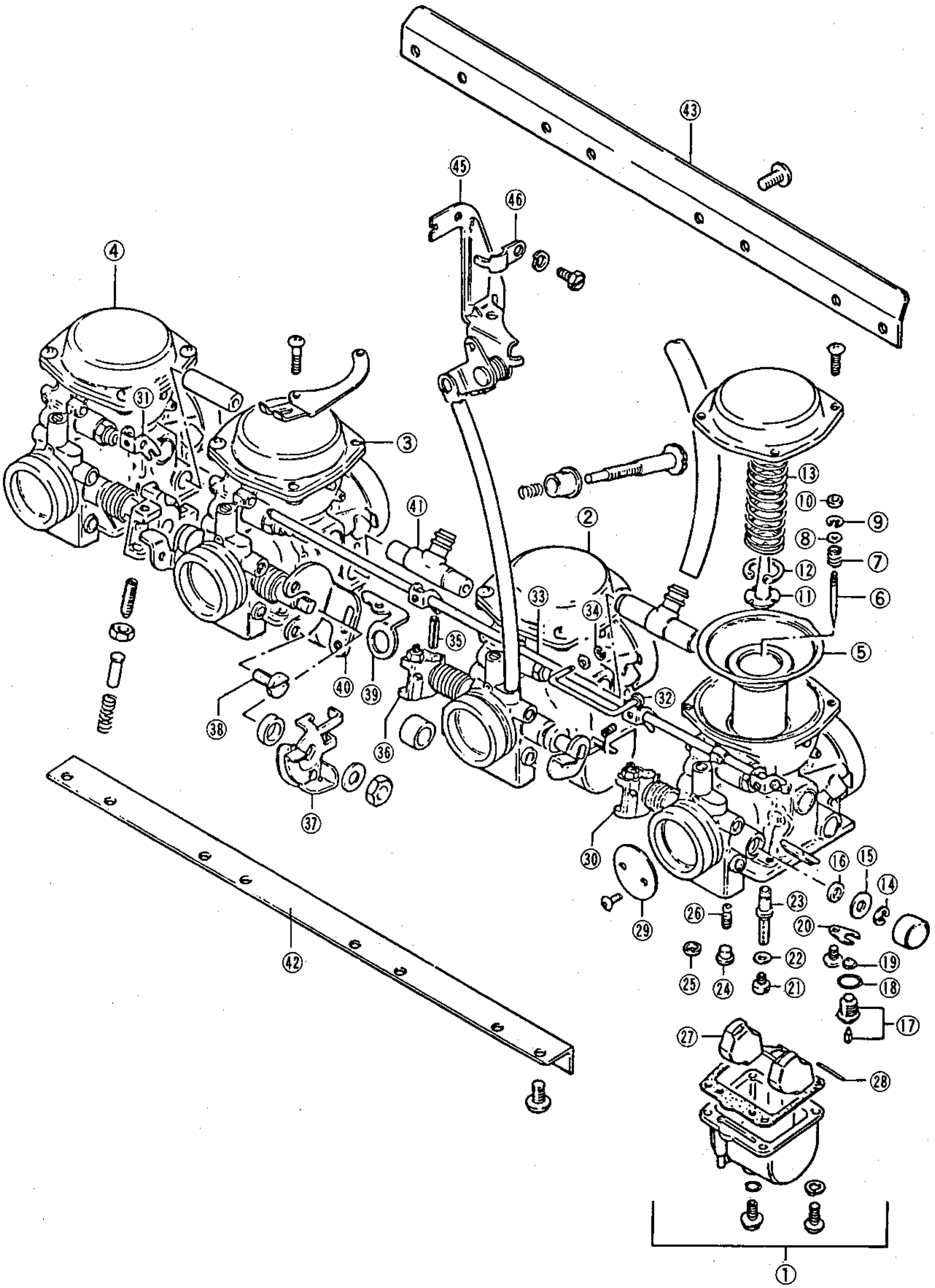


When the engine is not running with the valve in the ON position, the fuel valve is kept in the closed position by applying pressure utilizing a spring so that no fuel will flow to the carburetors. When the engine is engaged, a negative pressure is generated in the diaphragm chamber Ⓒ through the vacuum (negative pressure) pipe which is connected to the carburetors, and builds up a negative pressure which is higher than the spring pressure so that the diaphragm is forced to open the fuel valve and thus allow the fuel to flow to the carburetors.
On the other hand, setting the valve in the ON position keeps the air return orifice open. Negative pressure does not accumulate on the diaphragm at the time of engine stopping, and then the spring pressure actuates the diaphragm to move back to its original position and closes the fuel valve.
However, setting the valve in PRI position with a screwdriver causes the air return orifice to close, resulting in negative pressure in the chamger Ⓒ under the diaphragm. This negative pressure doesn't allow the fuel valve to close and therefore the fuel keeps flowing to the carburetors. The engine must be cranked over to initiate flow, even in the PRI position.



CAUTION:
When starting the engine at PRI position, be sure to change the valve from PRI position to ON position immediately.

CARBURETOR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1 Carburetor, No. 1
2 Carburetor, No. 2
3 Carburetor, No. 3
4 Carburetor, No. 4
5 Diaphragm
6 Jet needle
7 Spring
8 Washer
9 E-ring
10 Ring
11 Guide holder
12 Clip
13 Spring
14 E-ring
15 Gasket
16 Seal
17 Needle valve
18 O-ring
19 Filter
20 Plate
21 Main jet
22 Washer
23 Needle jet
24 Plug
25 Gasket
26 Pilot jet
27 Float
28 Pin
29 Throttle valve
30 Shaft
31 Lever
32 Lever
33 Starter shaft
34 E-ring
35 Pin
36 Lever
37 Lever
38 Screw
39 Bracket
40 Bracket
41 Nipple
42 Plate
43 Plate
44 Bracket
45 Plate

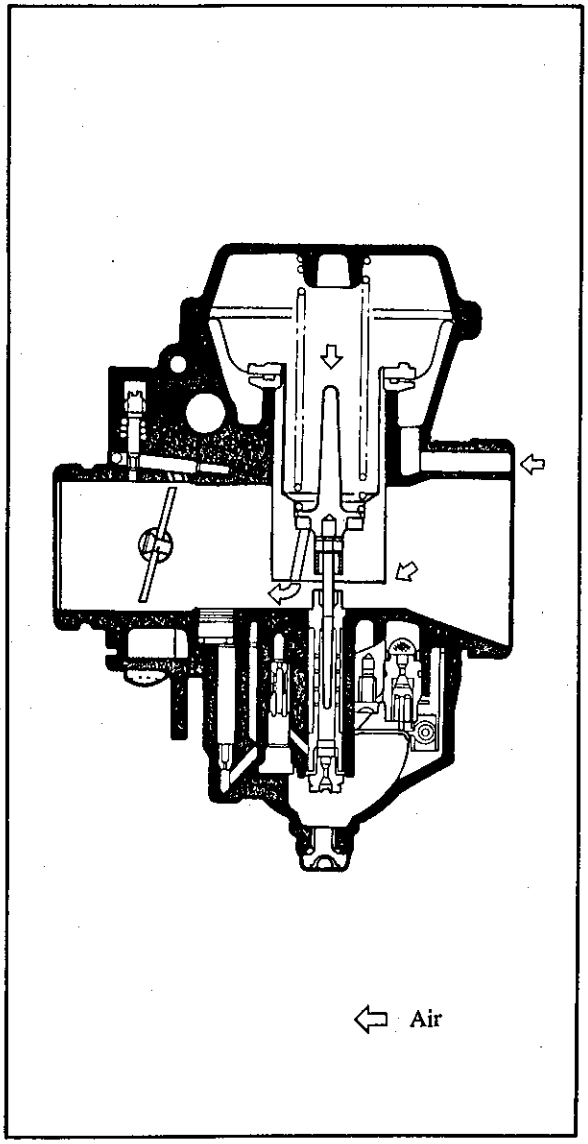
SPECIFICATIONS

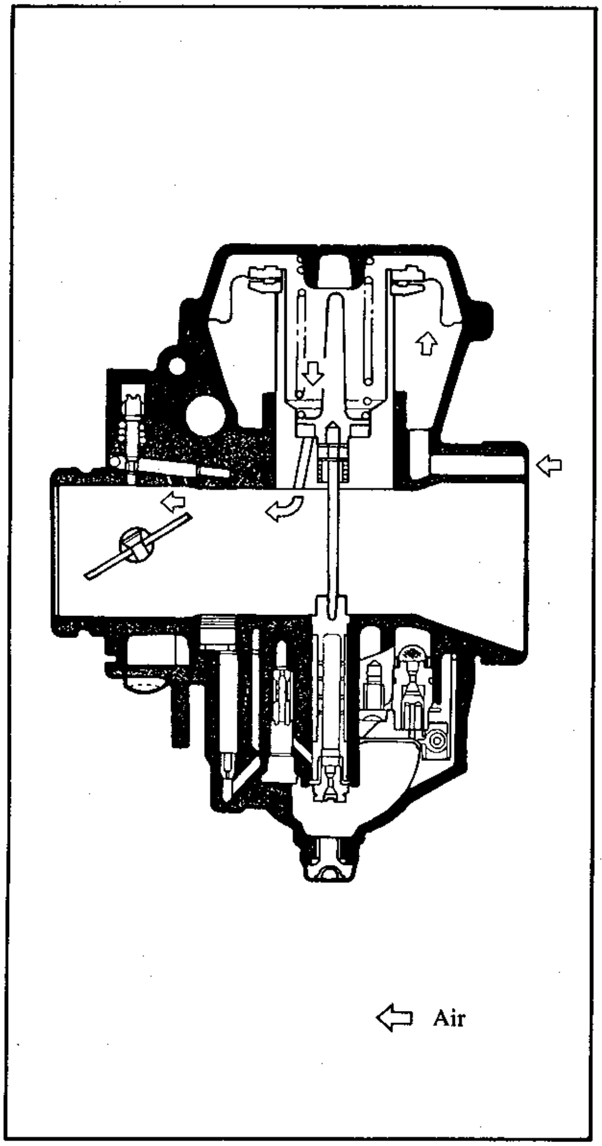
Item	Specification	Item	Specification
Type	MIKUNI BS34SS	Jet needle	5D50
Bore size	34 mm (1.34 in)	Needle jet	X-7
I.D. No.	49100	Pilot jet	#40
Idle r/min	1 050 ± 100 r/min	By pass	0.9, 0.8, 0.8
Fuel level	5.0 ± 0.5 mm (0.20 ± 0.02 in)	Pilot outlet	0.8
Float height	22.4 ± 1.0 mm (0.88 ± 0.04 in)	Valve seat	2.0
Main jet	#107.5	Starter jet	#45
Main air jet	1.7	Pilot screw	PRE-SET

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.

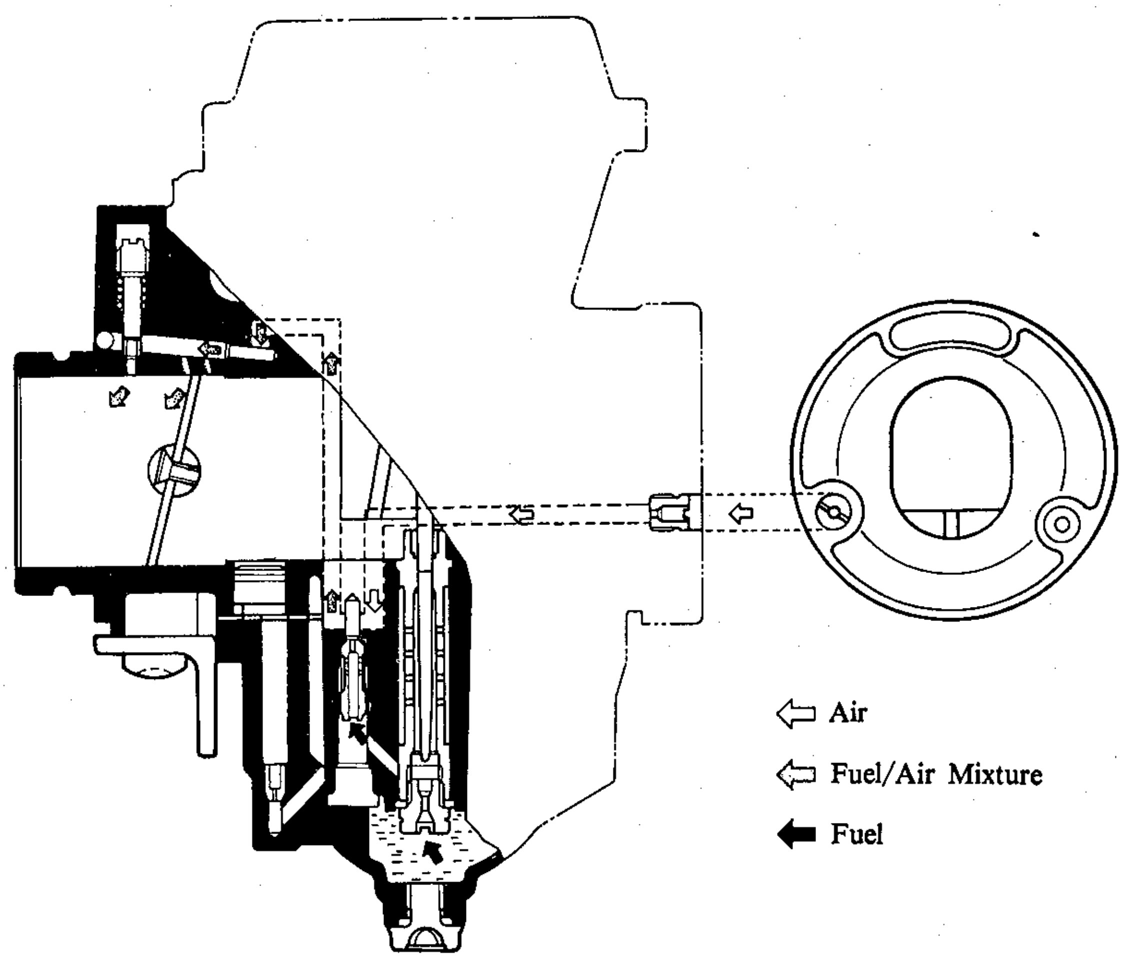
Rising vacuum overcomes the spring force, causing the piston to rise to increase the said area and thus prevent the air velocity from increasing. Thus, air velocity in the venturi passage is kept relatively constant for improved fuel atomization and for securing an optimum ratio of fuel to air in the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



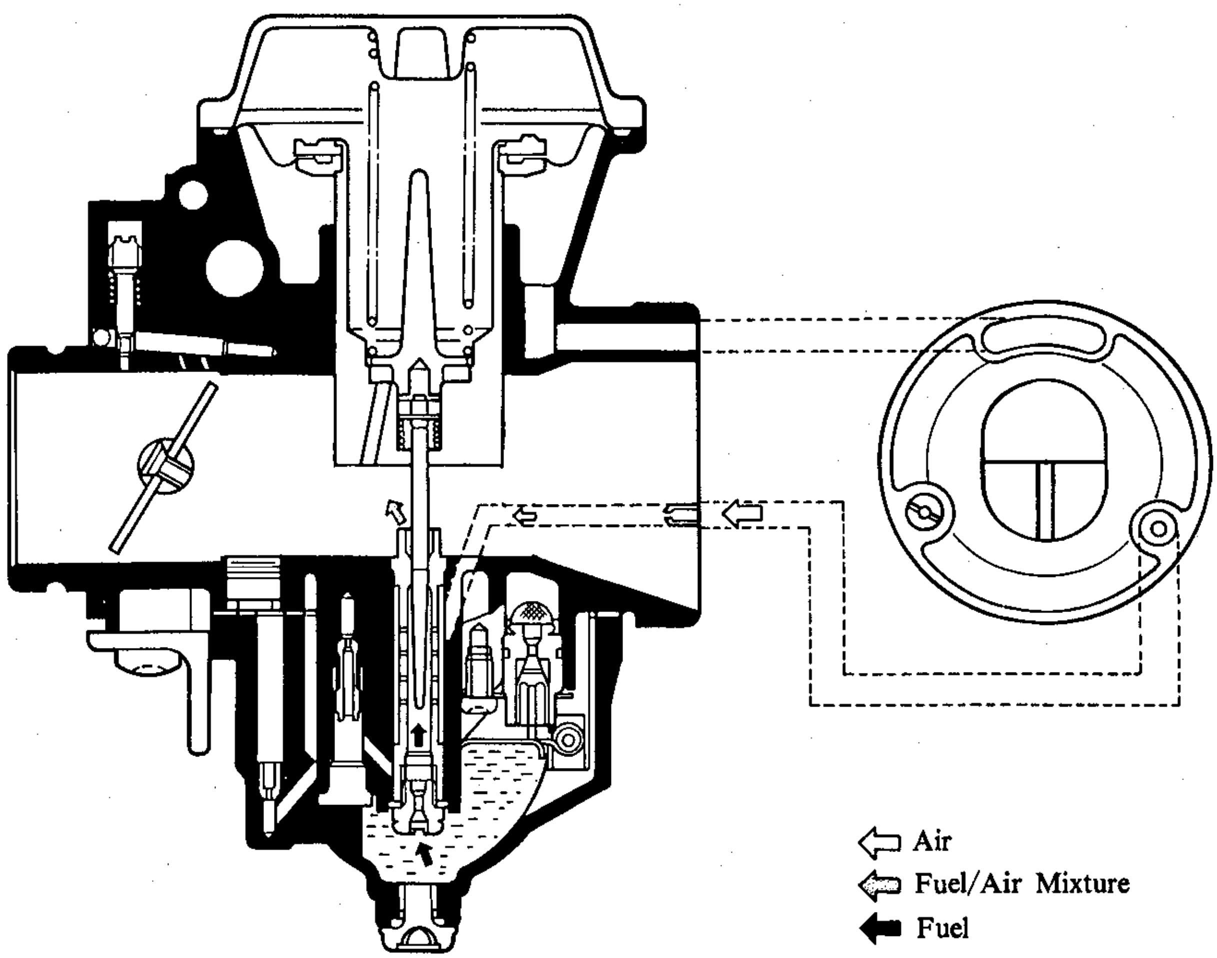
MAIN SYSTEM

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.

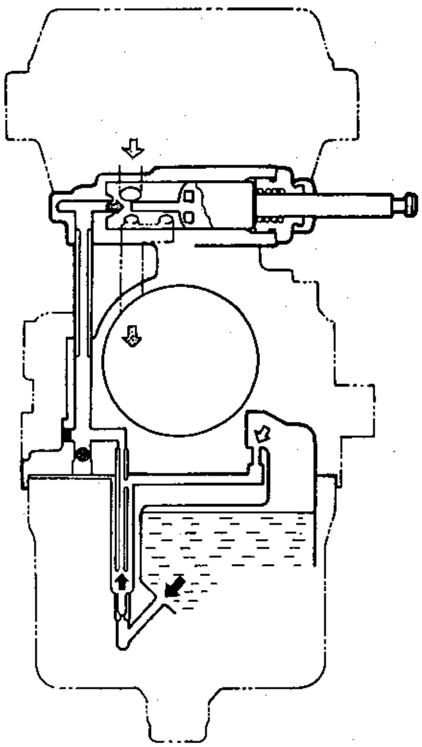


STARTER SYSTEM

Pulling up the choke knob slides starting plunger to draw fuel into the starter circuit from the float chamber through starter jet.

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

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

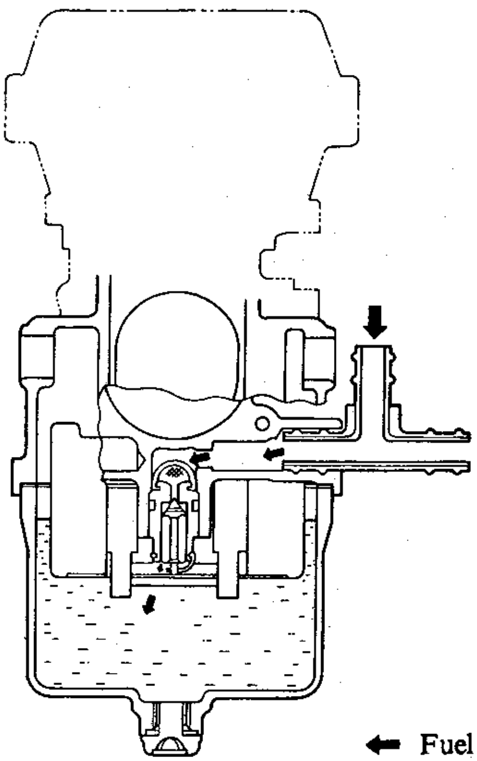


FLOAT SYSTEM

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

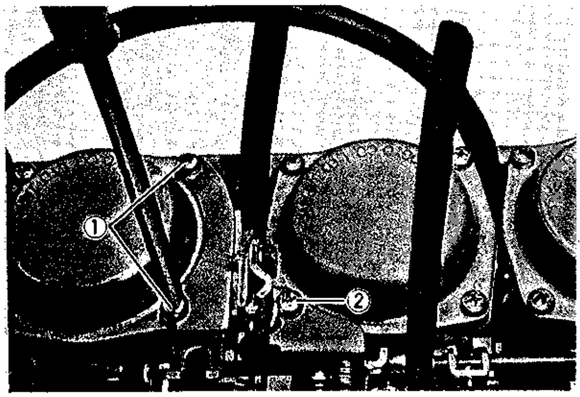
When fuel level is up in float chamber, floats are up and needle valve remains pushed up against valve seat. Under this condition, no fuel enters the float chamber.

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

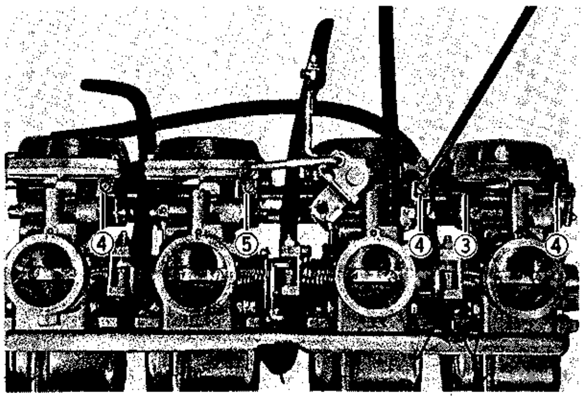


DISASSEMBLY

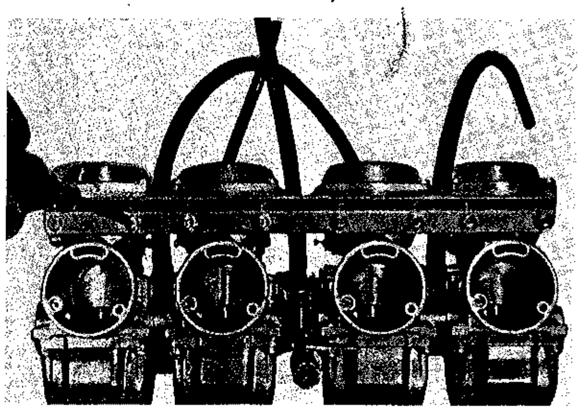
- Remove two throttle bracket screws ① and starter bracket screw ②, and remove brackets.



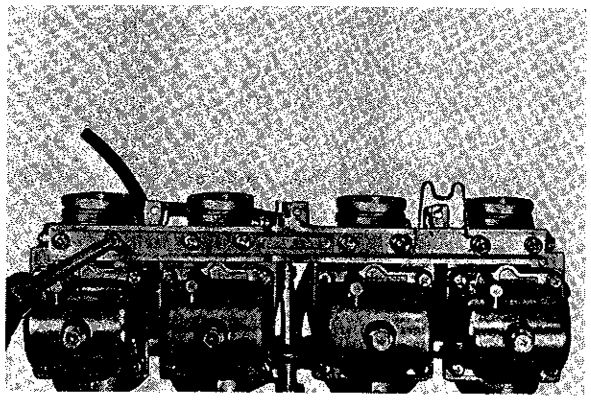
- Loosen four screws, and remove starter shaft ③, three levers ④ and starter bracket lever ⑤.



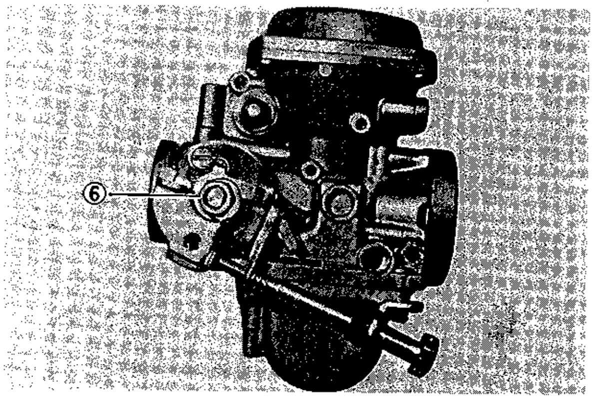
- Remove eight screws and remove the plate.



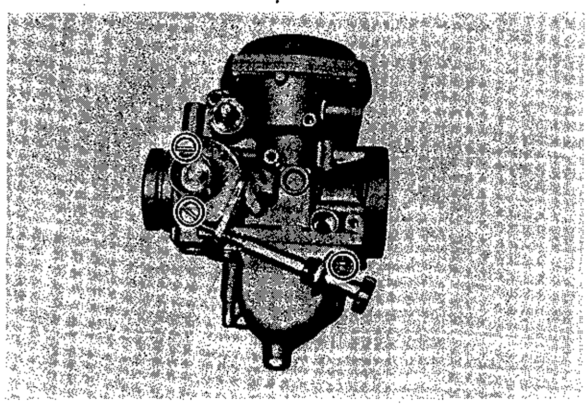
- Remove eight screws and remove the plate.



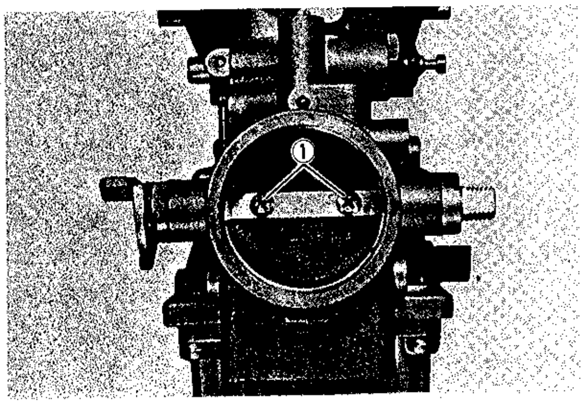
- Separate four carburetors, remove nut ⑥ and remove adjuster lever.



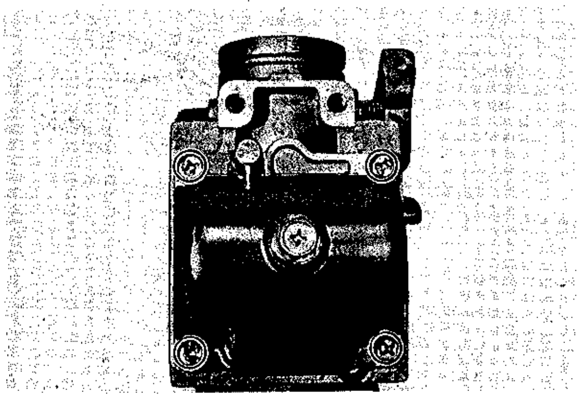
- Remove three screws, and remove adjuster bracket.



- Remove two throttle valve screws ① and pull out the throttle valve by turning throttle valve shaft.

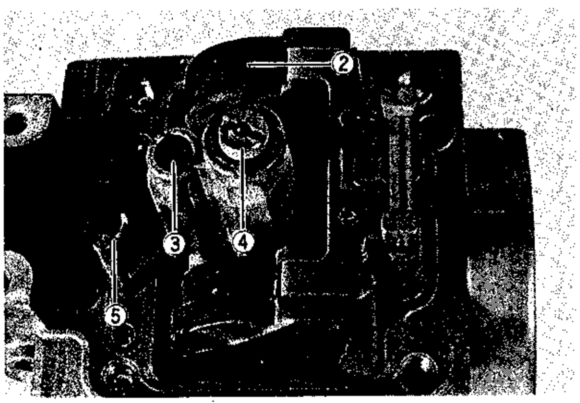


- Remove four screws and remove float chamber.

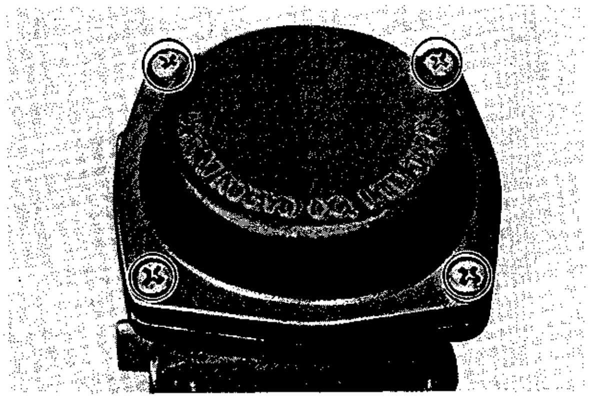


- Remove float ②, pilot jet ③ and main jet ④.

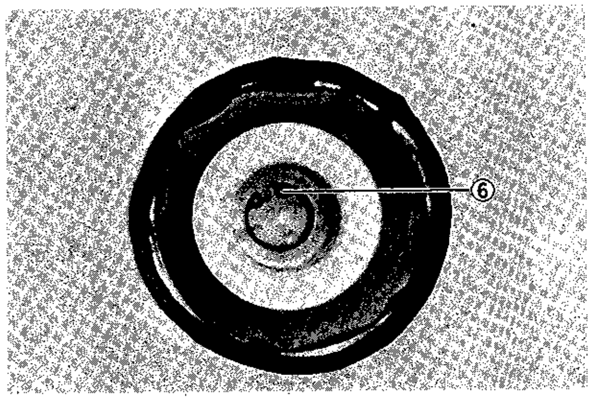
NOTE:
Do not drop the O-ring ⑤.



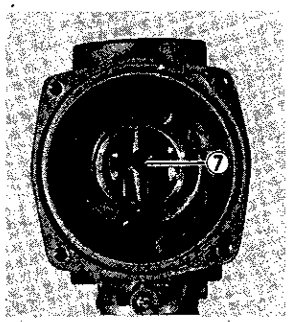
- Remove four screws and remove carburetor cap.

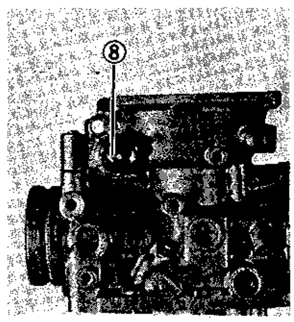


- Remove circlip ⑥ from piston.



- Remove needle jet ⑦ from the top side.
- Remove starter valve housing ⑧.



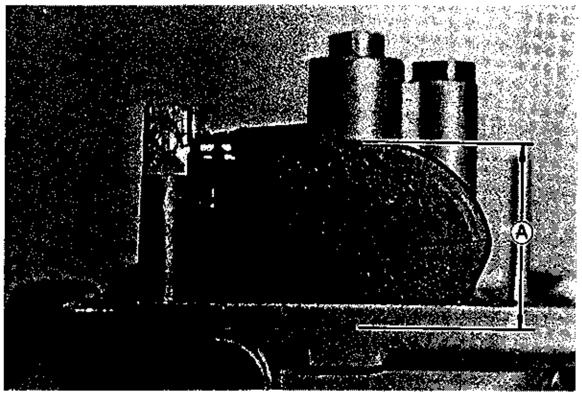


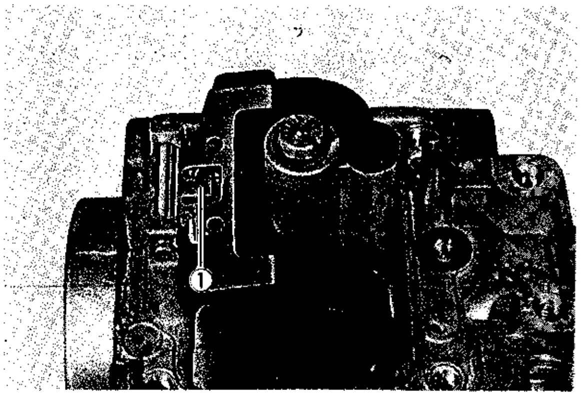
INSPECTION

Float Height Adjustment

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

Float height Ⓐ	22.4 ± 1.0 mm (0.88 ± 0.04 in)



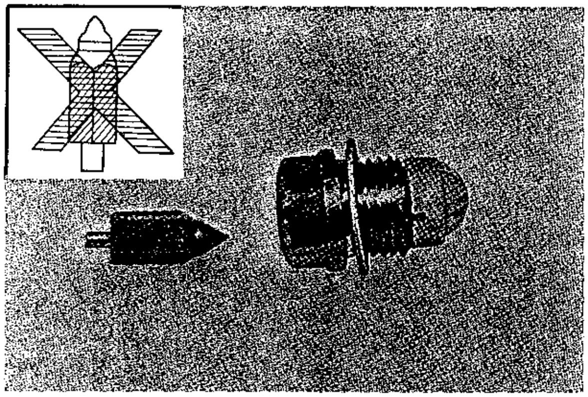


NOTE:
Be sure to remove the gasket before measuring the height.

Needle Valve

If foreign matter is caught between the valve seat and the needle, the gasoline will continue 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.

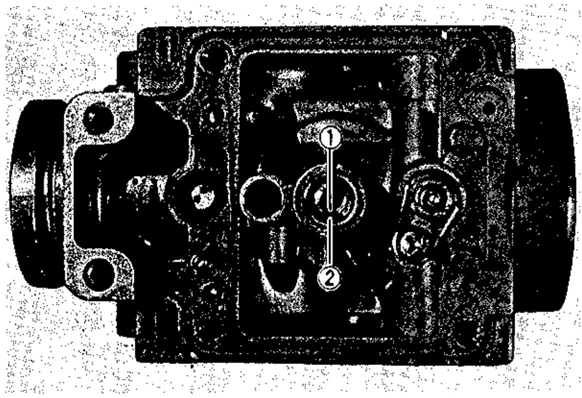


- Check following items for any damage or clogging.

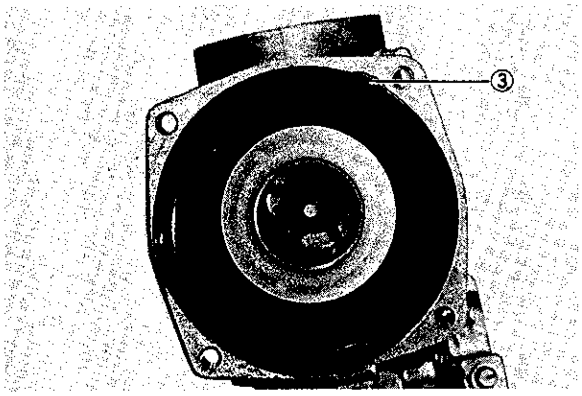
* Pilot jet
* Main jet
* Main air jet
* Pilot air jet
* Needle jet air bleeding hole and O-ring
* Float
* Needle valve mesh
* Diaphragm
* Gasket
* Throttle valve shaft oil seals
* Drain plug O-ring
* Pilot outlet and bypass holes

REASSEMBLY

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



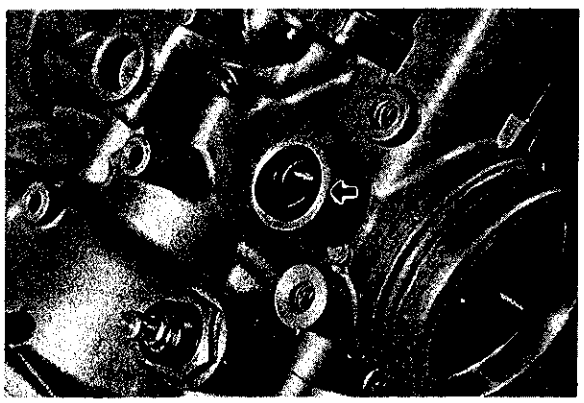
- Place tongue ③ of diaphragm to carburetor body properly.



- Secure carburetor cap and float chamber with screws.

Tightening torque	0.25 – 0.45 kg-m (1.8 – 3.0 lb-ft)

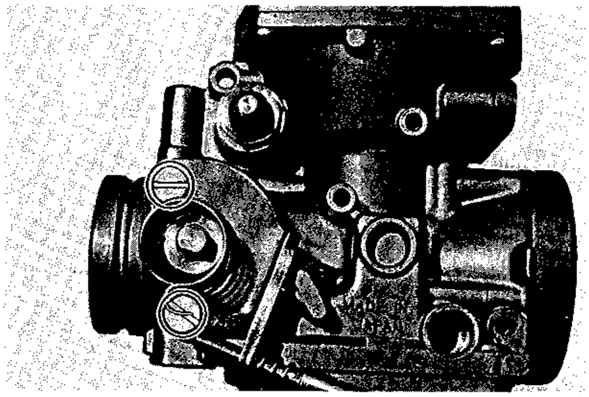
- When fitting throttle valve shaft oil seals, groove should be faced outside.



- Secure adjuster bracket to No. 3 carburetor with two screws.
  Before tightening the screws, coat them with THREAD LOCK CEMENT.

Thread lock cement	99000-32040

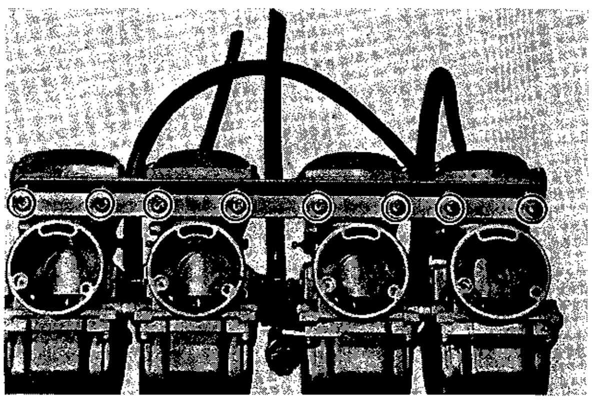
Tightening torque	0.25 – 0.45 kg-m (1.8 – 3.0 lb-ft)



- Secure adjuster lever with nut.

- Connect the carburetors correctly, and secure top of each carburetor to the plate with screws.

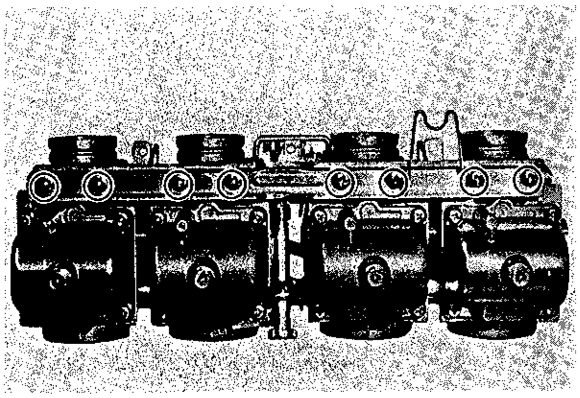
Tightening torque	0.25 – 0.45 kg-m (1.8 – 3.0 lb-ft)



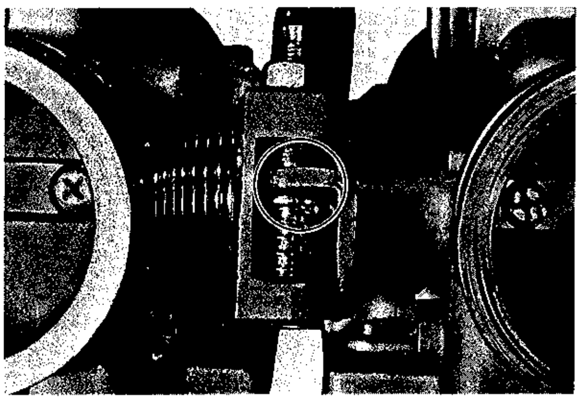
- Secure bottom of each carburetors to the plate with screws. Before tightening the screws, coat it with THREAD LOCK CEMENT.

Thread lock cement	99000-32040

Tightening torque	0.4 – 0.6 kg-m (3.0 – 4.5 lb-ft)

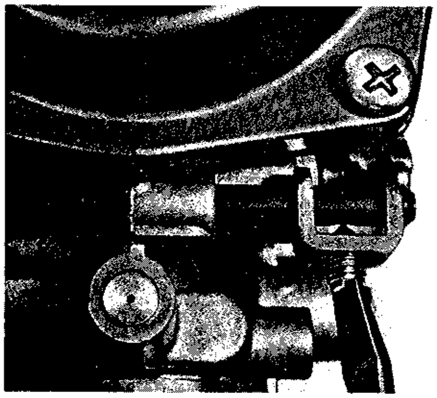


CAUTION:
Make sure the throttle shaft lever is installed as shown in photo.



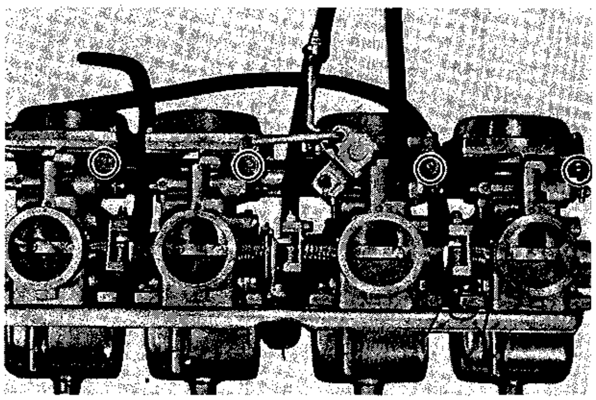
- Pass starter shaft through carburetors and starter levers, and secure starter lever with screws.
  Before tightening the screws, coat it with THREAD LOCK CEMENT.

CAUTION:
Align the end of screw with recess in starter shaft.



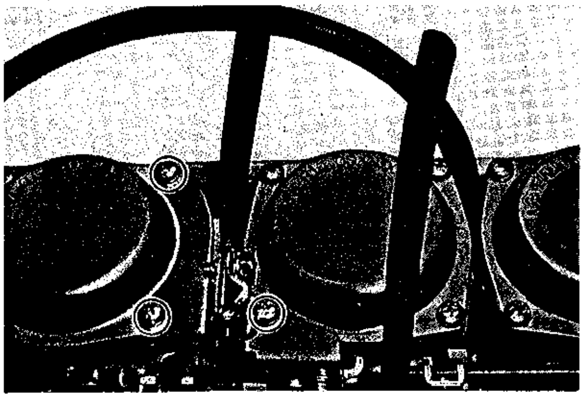
Thread lock cement	99000-32040

Tightening torque	0.06 – 0.10 kg-m (0.4 – 0.7 lb-ft)

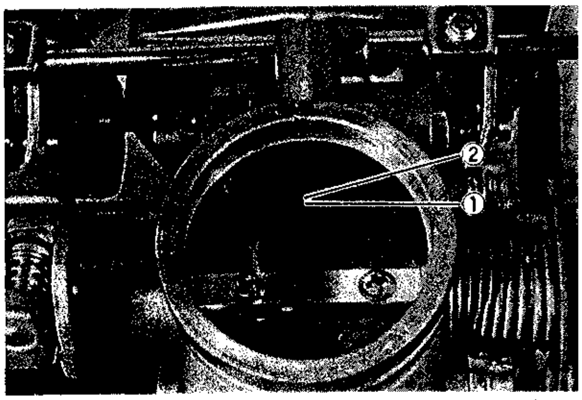


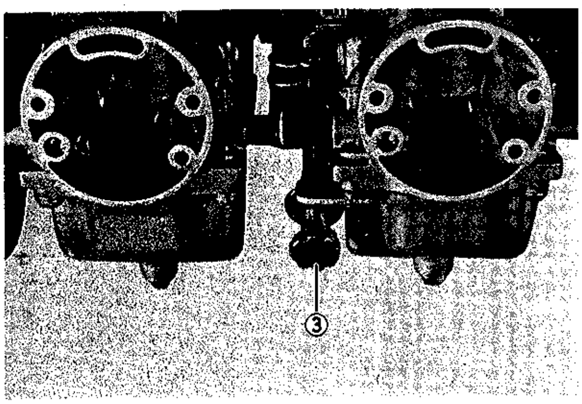
- Secure throttle bracket to No. 3 carburetor, and secure starter bracket to No. 2 carburetor cap, using screws.

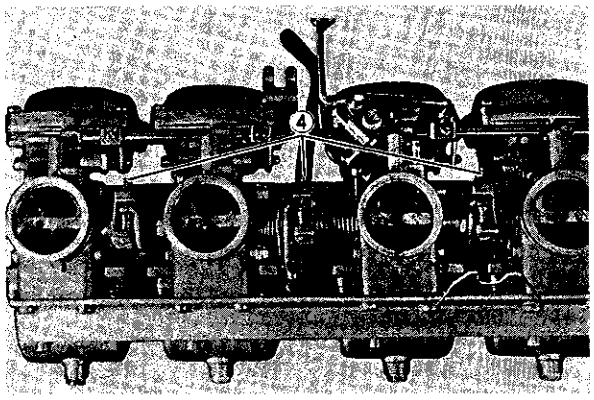
Tightening torque	0.25 – 0.45 kg-m (1.8 – 3.0 lb-ft)



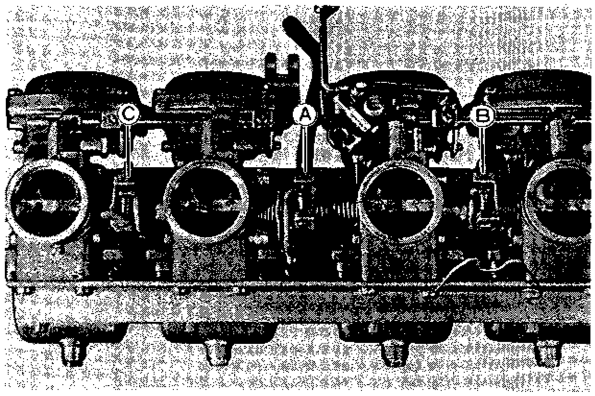
- Set each throttle valve in such a way that its top end ① meets the foremost bypass ②. This is accomplished by turning throttle valve stop screw ③ and balance screw ④.







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



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

* Engine idle r/min
* Throttle cable play
* Balancing carburetor

INSPECTION

Fuel Level Measurement

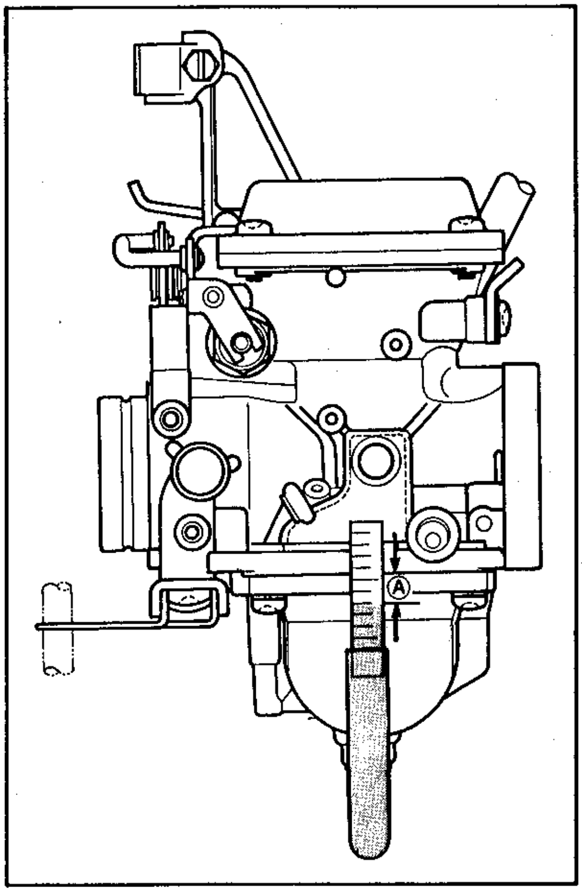
To check the fuel level, proceed as follows:

Checking fuel level in each float chamber

1. Leave fuel cock in "ON" position.
2. Place machine on center stand.
3. Remove float chamber screw and install the special tool.
4. Move fuel valve to "PRI" position to admit fuel into float chamber.
5. With the float chamber filled with fuel, turn the valve back to "ON" position, and start up the engine.
6. Run the engine at the idling speed (950 — 1 150 r/min), and measure distance Ⓐ with the middle line of the level gauge aligned with the mating surface of the float bowl as shown in the illustration Ⓐ should be within the range specified here.

Fuel level gauge	09913-14511

Distance Ⓐ	4.5 — 5.5 mm (0.18 — 0.22 in)



NOTE:
When checking the fuel level, place the machine on the center stand. The fuel level should be center of the float chamber.

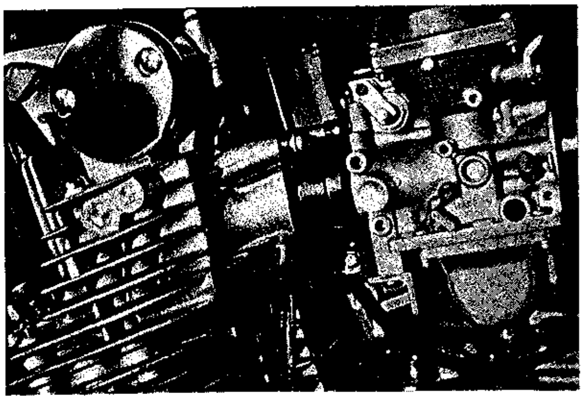
Fuel level adjustment

If distance Ⓐ is not within the specified range, it means that float height is off the specification, to adjust this height, as shown page 15-38.

BALANCING THE CARBURETORS

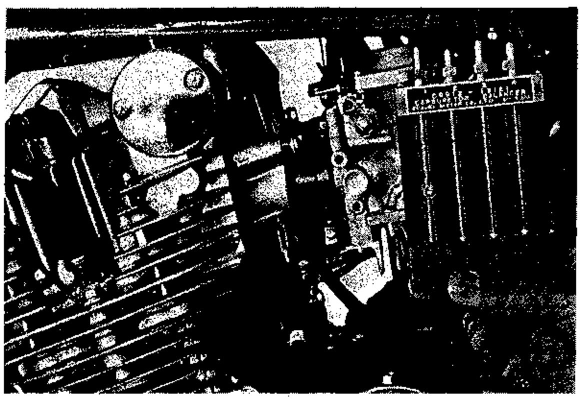
When any carburetor has been disassembled or replaced, check that the negative pressures (vacuum) in four carburetors are well balanced, using the carburetor balancer set in the following manner.

1. Place machine on center stand.
2. After warming up the engine completely, remove either No. 1 or No. 4 vacuum inlet screw, using a 4-mm hexagon wrench.

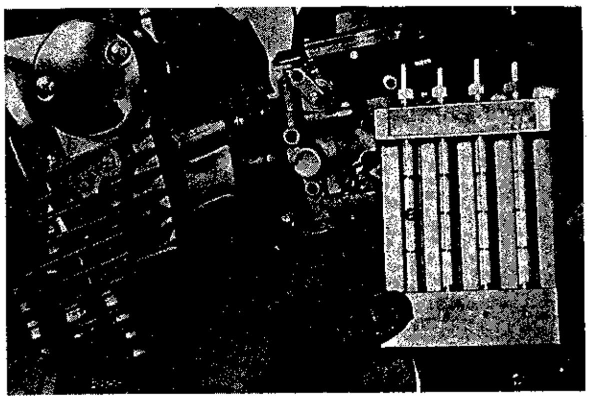


3. Tie one of the four carburetor balancer hoses to the adapter.
4. Start up the engine, and keep it running steadily at 1 500 – 2 000 r/min.

Carburetor balancer set	09913-13121

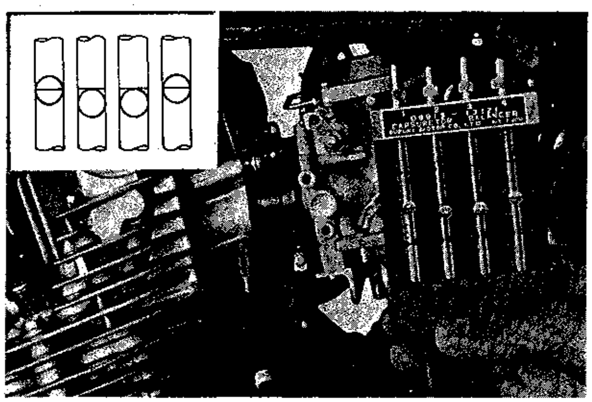


5. Turn the air screw of the gauge so that the vacuum acting on the tube of that hose will bring the steel ball in the tube to the center.



6. On the three other tubes, follow the same procedure as above and calibrate carefully.
7. Remove the respective vacuum inlet screws and insert the adapters in the holes. Connect the balancer gauge hoses to these adapters, one hose to one adapter, and balance the four carburetors as follows:
8. When the balls in Nos. 1 and 4 carburetor balancers are on the same level and the other balls are on the lower position by one half of the ball diameter as shown below, all the four carburetors are well balanced.

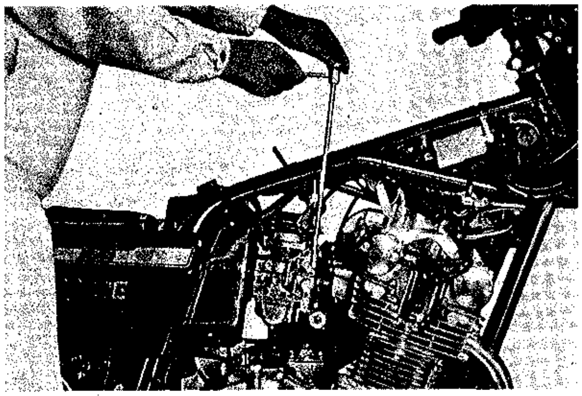
NOTE:
Nos. 2 and 3 must be adjusted with the balls 1/2 their diameters lower for proper idling stability.



If the balls in Nos. 1 and 4 or in Nos. 2 and 3 carburetor balancers are off more than the radius of the ball, make an adjustment as follows:

1. Loosen throttle valve balancing screw lock nut, and by turning balancing screw with special tool, adjust the position of steel ball in balancer gauge.

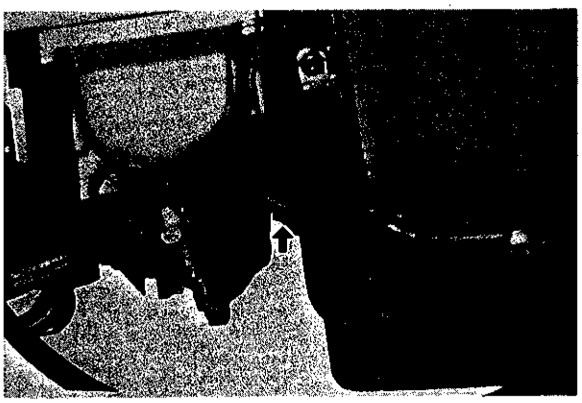
09913-14910	Throttle valve adjusting wrench



Adjusting order

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

2. After adjusting, tighten throttle valve balancing screw lock nut.
3. After this adjustment, adjust the idling speed to somewhere between 950 and 1 150 r/min with throttle stop adjusting screw.

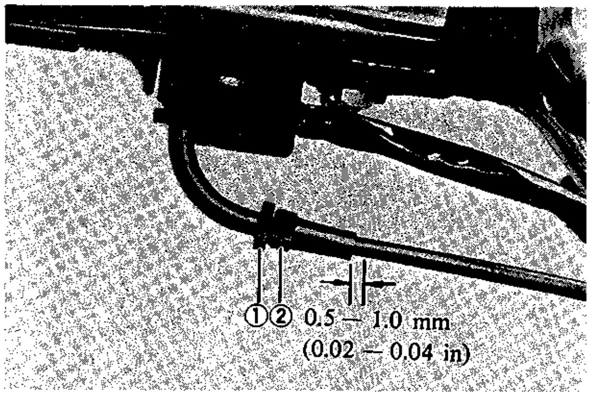


CAUTION:
This check should be done as quick as possible. If adjustment requires a longer time, it is advisable to cool the engine by sending air to prevent engine overheating.

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

THROTTLE CABLE ADJUSTMENT

1. Loosen lock nut ①.
2. Adjust the cable slack by turning adjuster ② in or out to obtain the correct slack 0.5 – 1.0 mm (0.02 – 0.04 in).



3. After adjusting the slack, tighten the lock nut ①.

FULL-TRANSISTORIZED IGNITION SYSTEM

DESCRIPTION

A fully transistorized ignition system is now employed on the GS1000ET. Its primary advantages are:

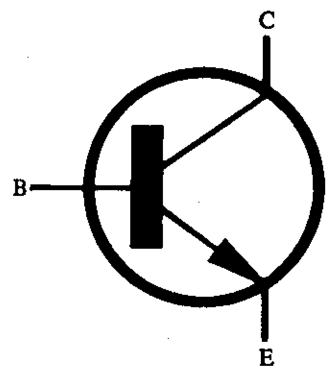
* No engine trouble due to contamination on contact breaker points
* No deviation of the ignition timing with the lapse of time and, therefore, no need of maintenance
* No arcing as with the contact breaker points and, therefore, constant voltage obtainable on the secondary side of the ignition coil
* Longer durability against vibration and water

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 GS1000ET.
Transistors are divided into two groups, those being of the NPN and PNP types, and the transistors used in the GS1000ET model is of the NPN type only, works an amplifier and switching device.



B: BASE
C: COLLECTOR
E: EMITTER

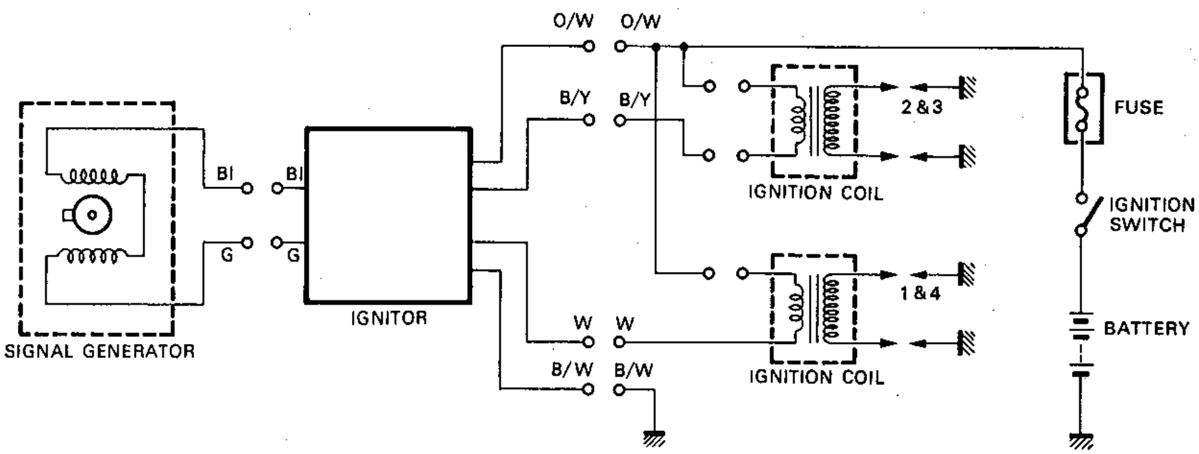
Each transistor has three terminals identified as the Base (B), Collector (C), and Emitter (E), and operation is as follows:
On a NPN type the base is the controling terminal of the transistor operation. On this type, the base utilizes only a positive or incoming signal to do the "ON", or "OFF" switching. The collector is the terminal where voltage is supplied to the transistor and the emitter is the terminal for passing this current for useage 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 GS1000ET 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 or wire and a yoke or coil and is mounted 180° apart on the plate.

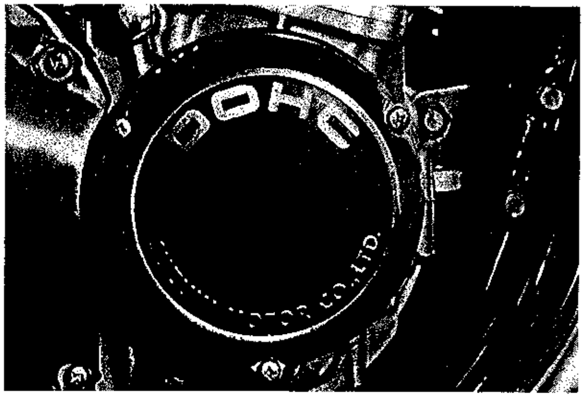
As the rotor tip is turned past the coils, AC current is produced and used for switching within the transistor unit.

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

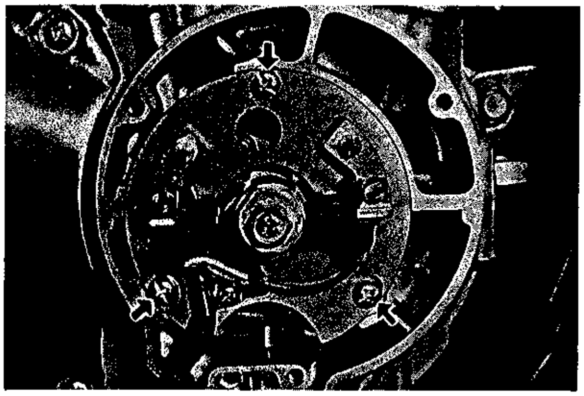


REMOVAL

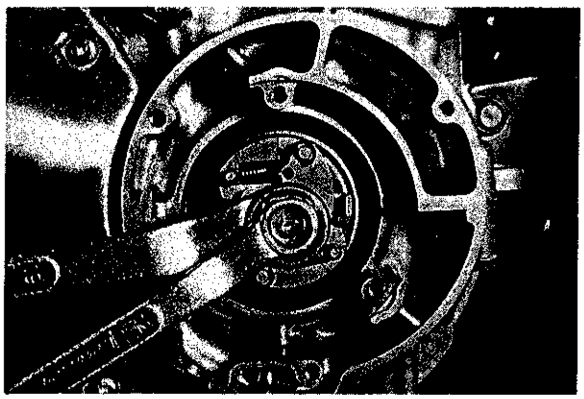
- Remove signal generator cover.



- Remove three screws and then remove the signal generator assembly and timing plate.

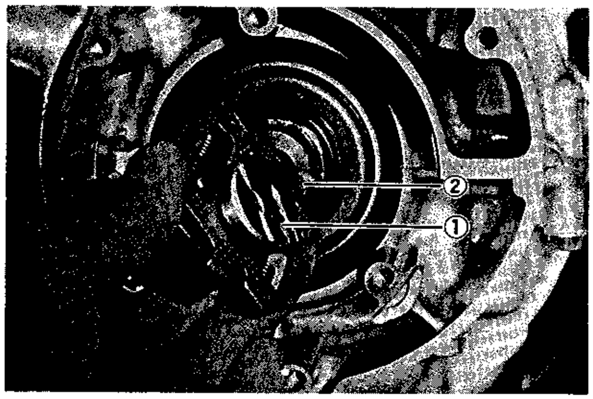


- Apply wrench to crank turning nut to remove automatic advance governor mounting bolts and the crank turning nut.
  Remove signal generator rotor and advance governor.

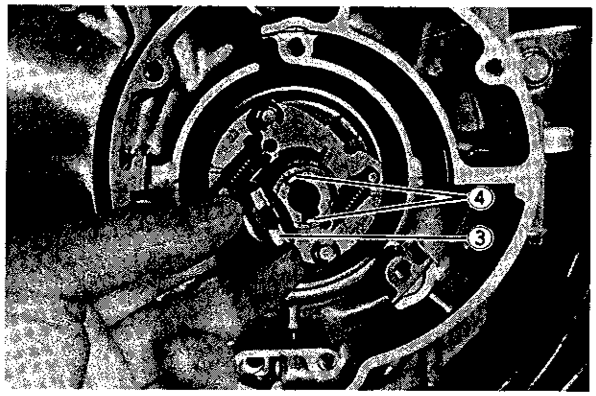


REASSEMBLY

- 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.

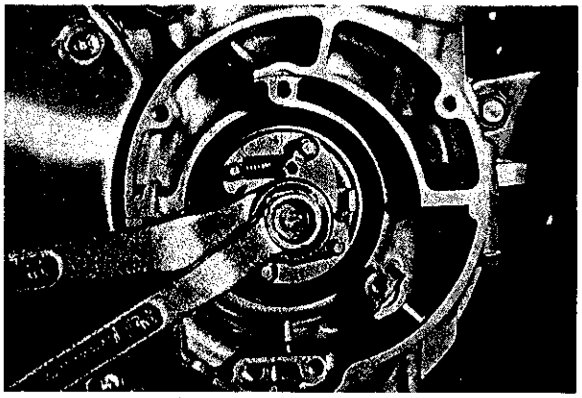


- Fit the groove ③ of the crankshaft turning nut on protrusion ④ of the advance governor body.

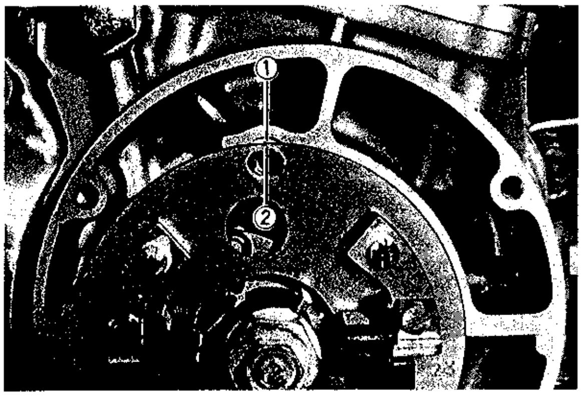


- Hold the crankshaft turning nut and tighten the governor center bolt with specified torque.

Tightening torque	1.3 — 2.3 kg-m (9.5 — 16.5 lb-ft)



- Install the timing plate and signal generator so that the index line ① aligns with the index mark ②.



INSPECTION

IGNITION TIMING

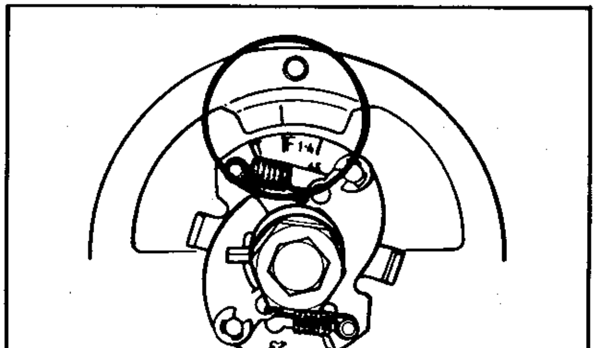
Check the performance of the timing mechanism using the timing light. Illuminate the advance governor with the timing light and vary the engine speed to see if the ignition timing advances properly.

Ignition timing specifications

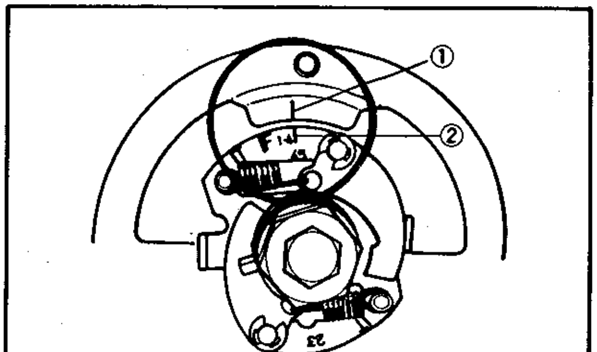
Ignition timing	17° B.T.D.C. below 1500 r/min and 37° B.T.D.C. above 2350 r/min

The procedure is as follows:

- Clip the timing light on the high tension cord of the No. 1 or No. 4 cylinder.
- Run the engine at a speed not exceeding 1,500 r/min. Under this condition, "F" mark on No. 1 and No. 4 cylinder side and timing mark should be in perfect alignment.
- Run the engine in the speed range above 2,350 r/min, and similarly observe the position of mark ① relative to mark ②. If the two marks are in register, it means that the ignition is properly advanced.



Below 1500 r/min



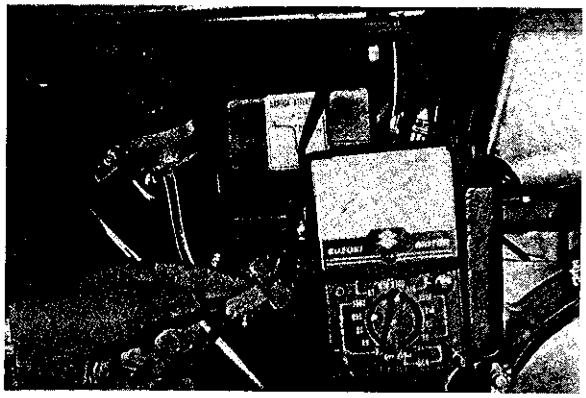
Above 2350 r/min

SIGNAL GENERATOR RESISTANCE

Measure the resistance between lead wires.
If the resistance noted to show infinity or too low a resistance value must be replaced.

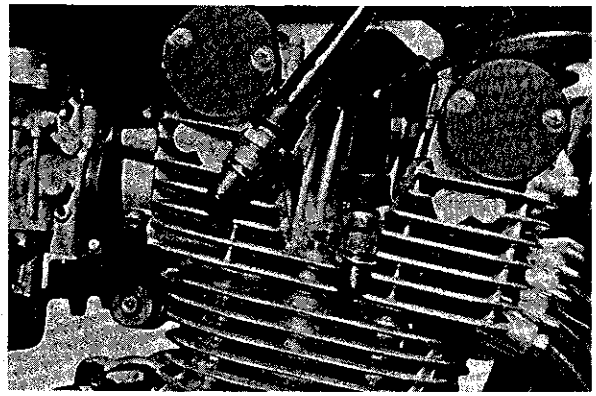
09900-25002	Pocket tester

STD resistance	
Bl — G	290 — 360Ω



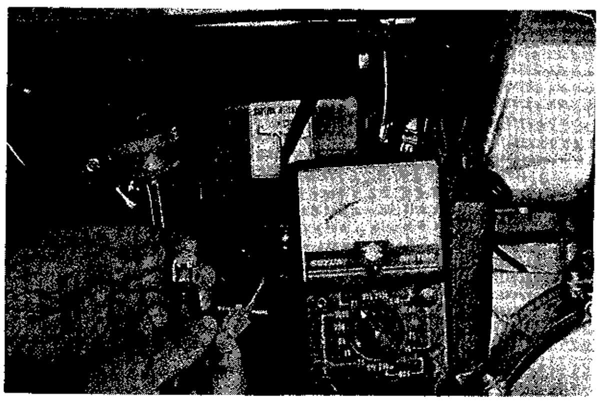
IGNITER

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 (X1Ω range) with Blue lead wire on the igniter side and ⊖ pin with Green lead wire. The igniter is in good condition if the following is observed: The moment the test pins are connected the spark plug of No. 4 cylinder sparks and the moment the tester pins are disconnected the spark plug of No. 3 cylinder sparks.

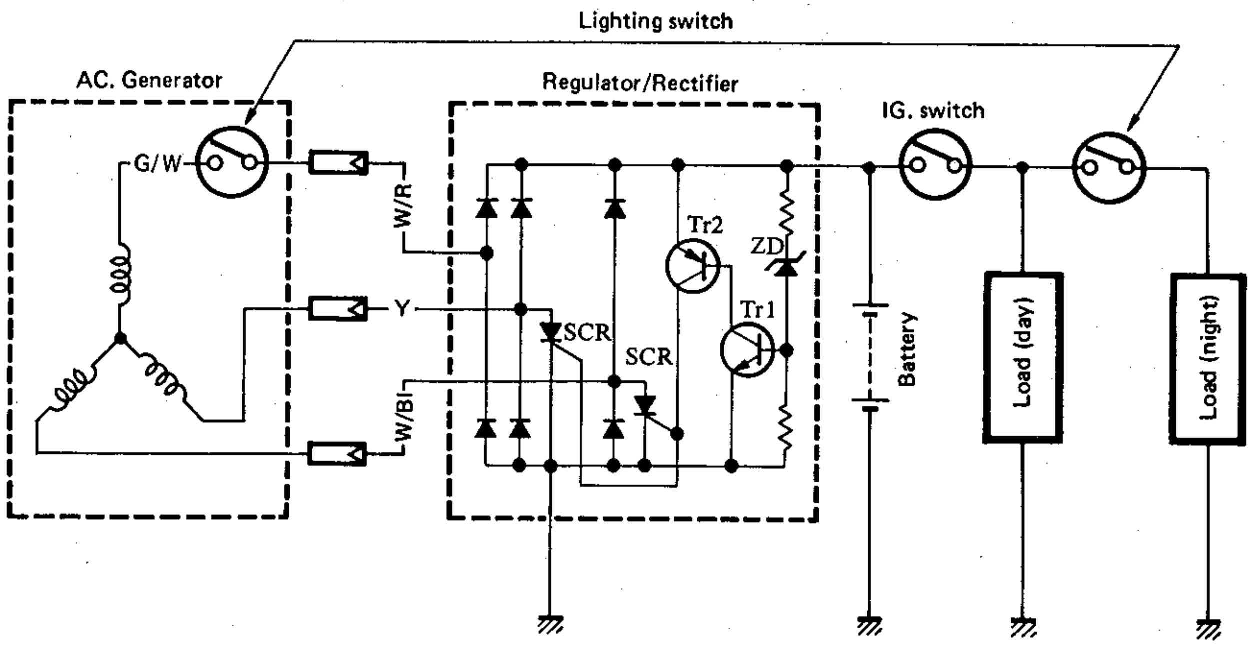
NOTE:
This checking presupposes that the ignition coil used for checking is a good one.



CHARGING SYSTEM

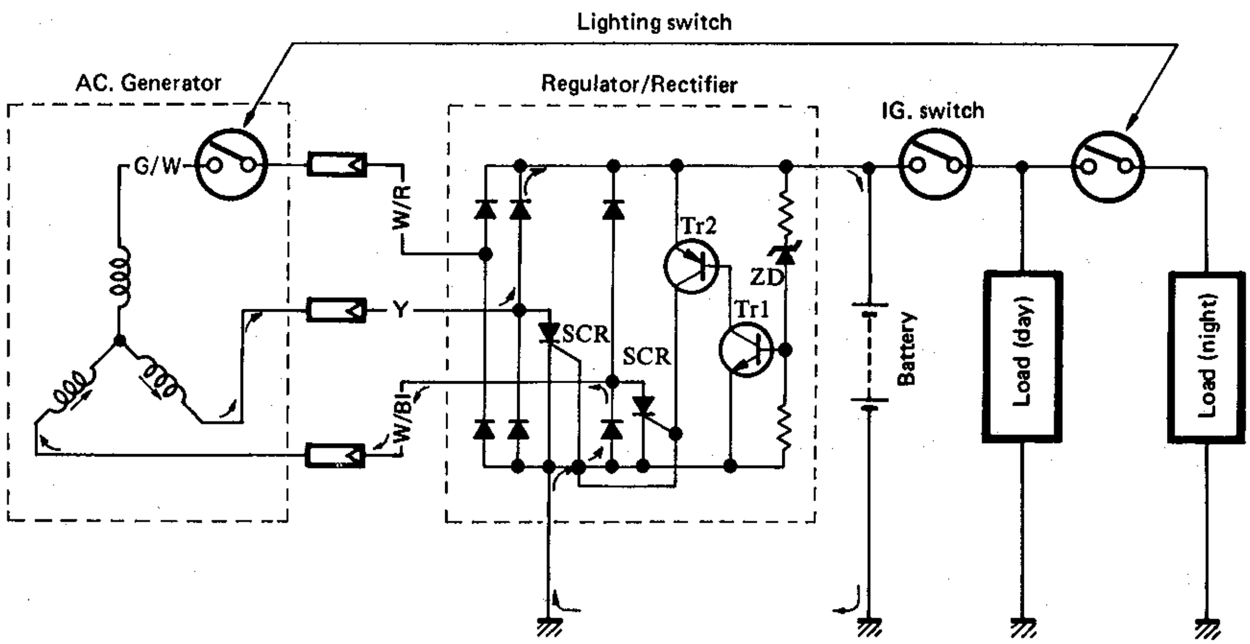
DESCRIPTION

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.

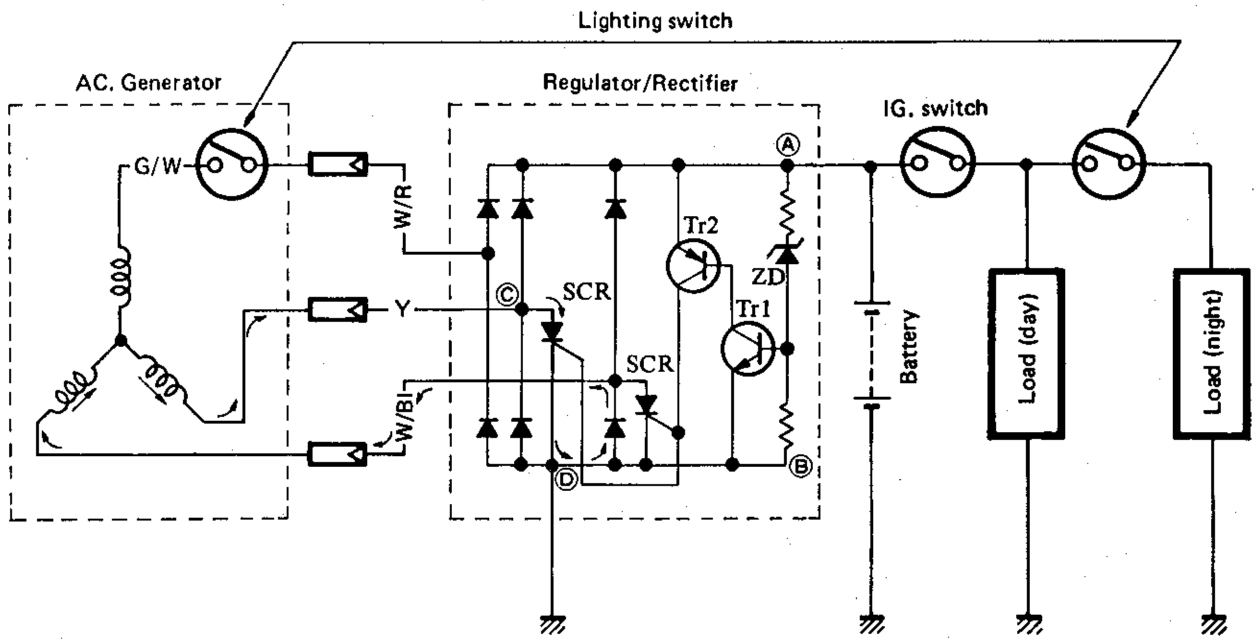


Function of Regulator

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 Ⓐ and Ⓑ 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 Ⓒ to point Ⓓ. 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 Ⓓ, reverse current tends to flow to SCR, then the circuit of SCR turns to OFF mode and beings to charge the battery again. Thus these repetitions maintain charging voltage to the battery constant and protect it from overcharging.



INSPECTION

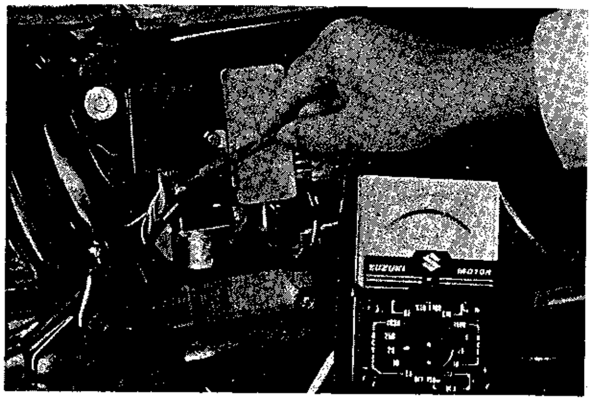
Charging Output Check

- Start the engine and keep it running at 5 000 r/min with the lighting switch turned ON (High position).
- Using pocket tester, measure the DC voltage between the starter relay ⊕ terminal and ground.
- If the tester reads under 14V or over 15.5V, the regulator/rectifier may be faulty.

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

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

09900-25002	Pocket tester

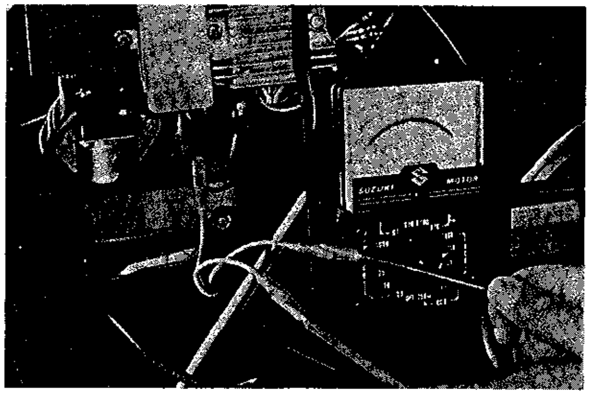


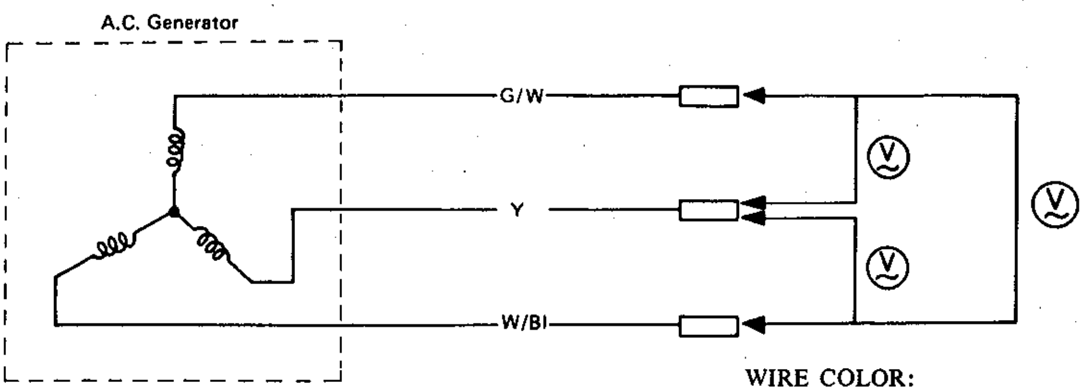
AC GENERATOR NO-LOAD PERFORMANCE

- 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

09900-25002	Pocket tester





WIRE COLOR:

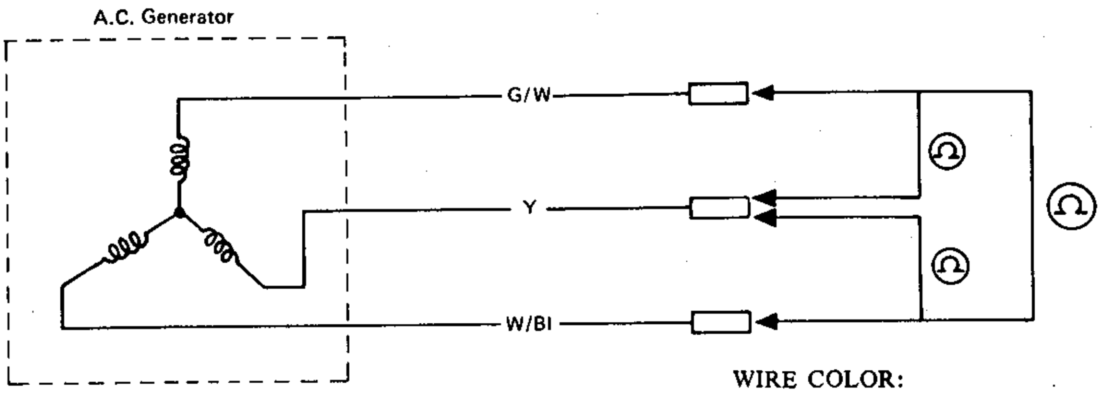
Y .... Yellow
W/BI............ White with Blue tracer
G/W .... Green with White tracer

Using 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

Specification	Approx. 1Ω

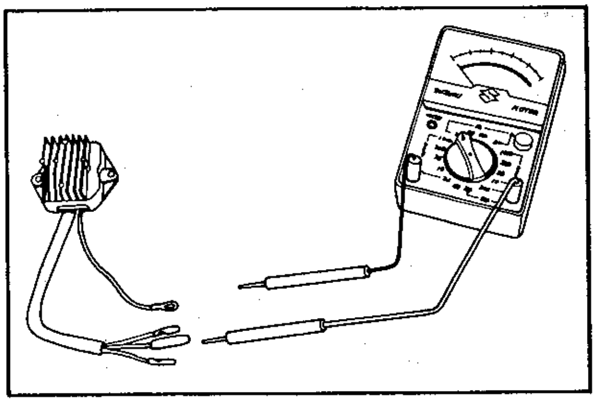


WIRE COLOR:

Y .... Yellow
W/Bl............ White with Blue tracer
G/W .... Green with White tracer

REGULATOR/RECTIFIER

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

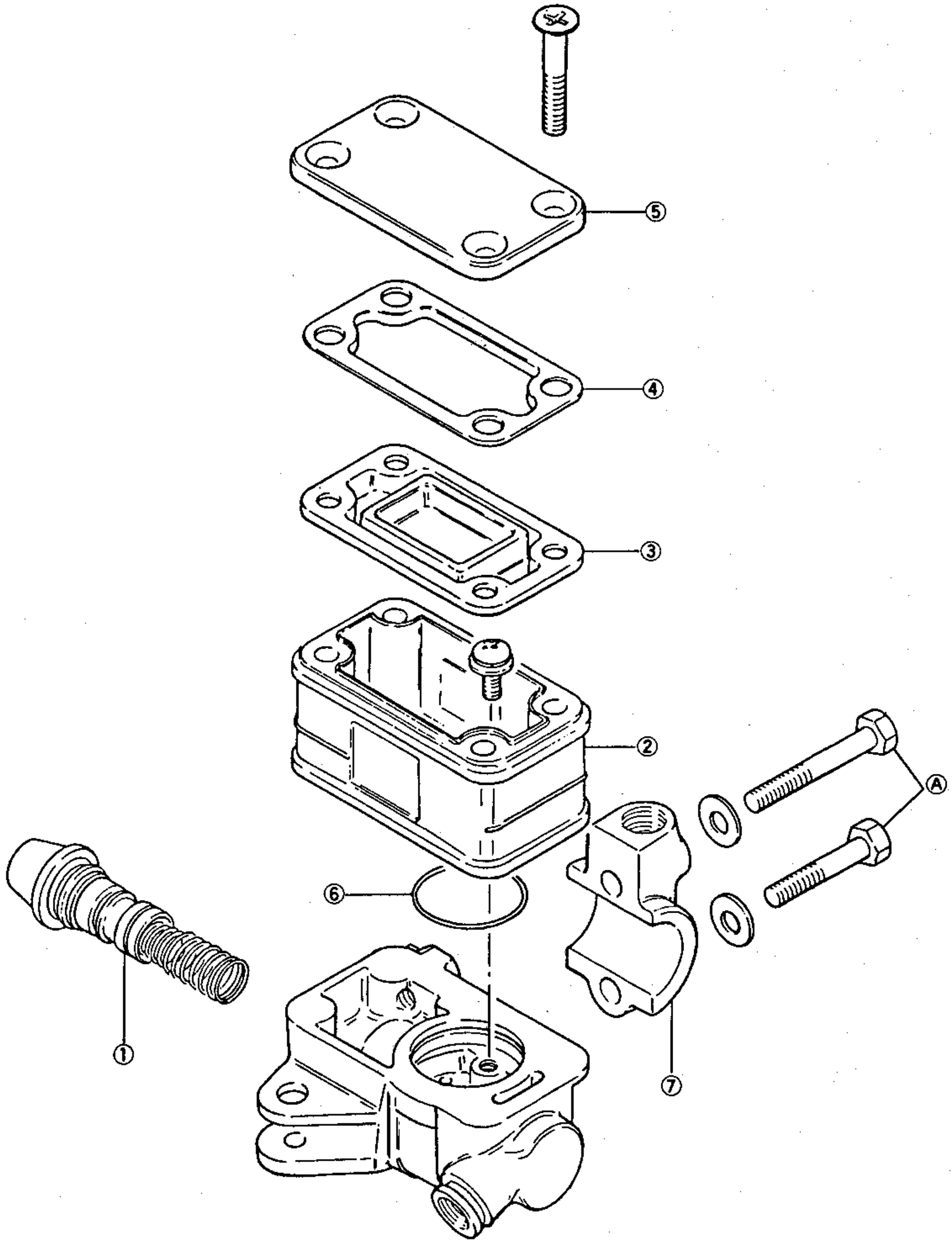


09900-25002	Pocket tester

Unit: Approx. Ω

⊖ Probe of tester to \ ⊕ Probe of tester to	R	W/Bl	W/R	Y	B/W
R		∞	∞	∞	∞
W/Bl	5 − 7		∞	∞	∞
W/R	5 − 7	∞		∞	∞
Y	5 − 7	∞	∞		∞
B/W	35 − 45	5 − 7	5 − 7	5 − 7	

FRONT MASTER CYLINDER

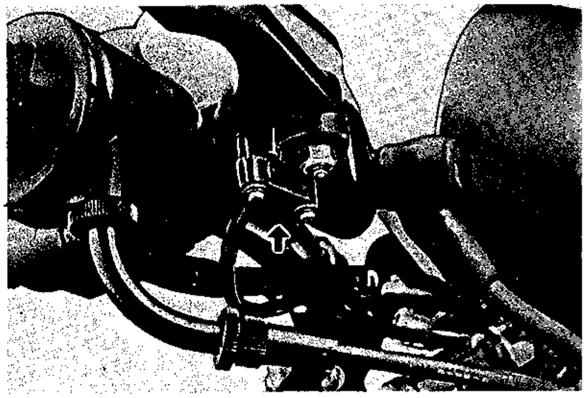


1. Piston and cup set
2. Reservoir
3. Diaphragm
4. Plate
5. Cap
6. O-ring
7. Holder

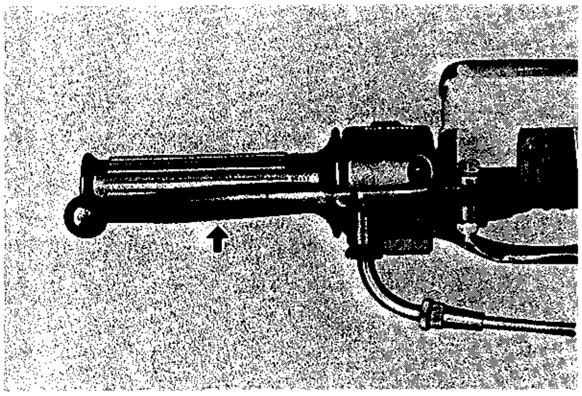
Tightening torque		
	kg-m	lb-ft
Ⓐ	0.5 — 0.8	3.5 — 6.0

MASTER CYLINDER REMOVAL AND DISASSEMBLY

- Take off front brake light switch.

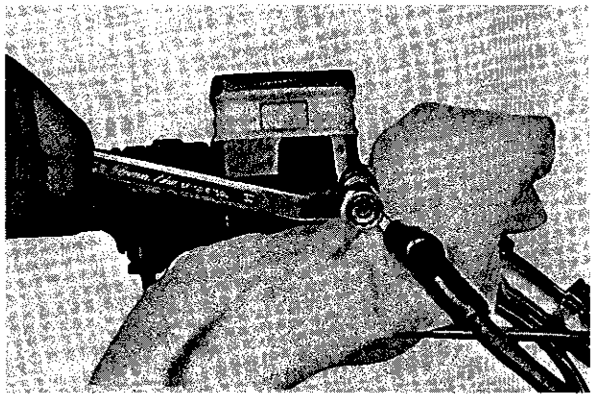


- Remove front brake lever.

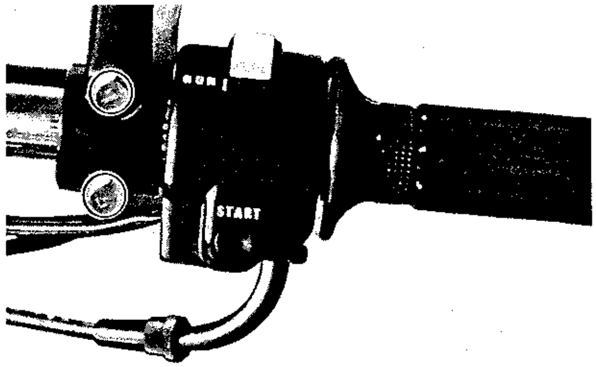


- Place a rag underneath the union bolt on the master cylinder to catch spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose/master cylinder joint.

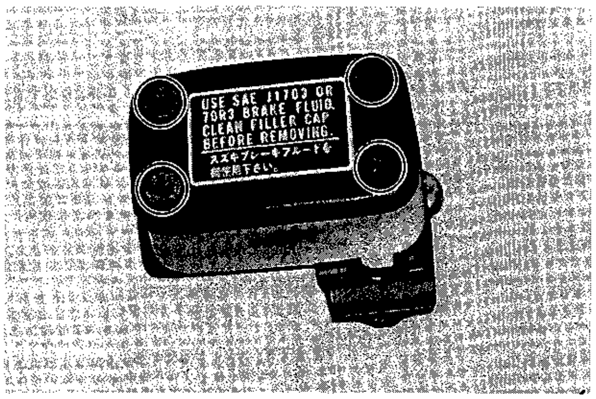
CAUTION:
Immediately and completely wipe off any brake fluid adhering to any part of motorcycle. The fluid reacts chemically with paints, plastics, rubber materials, etc.



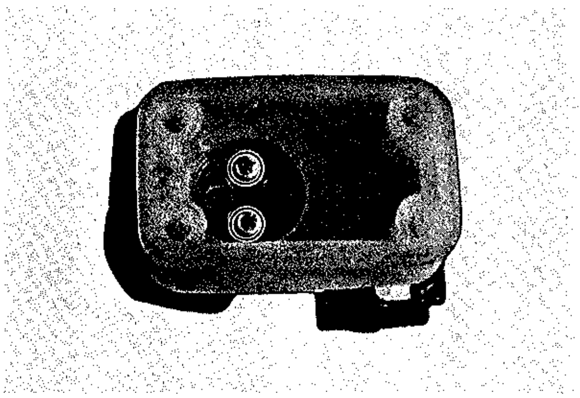
- Remove master cylinder ass'y after removing two fitting bolts.



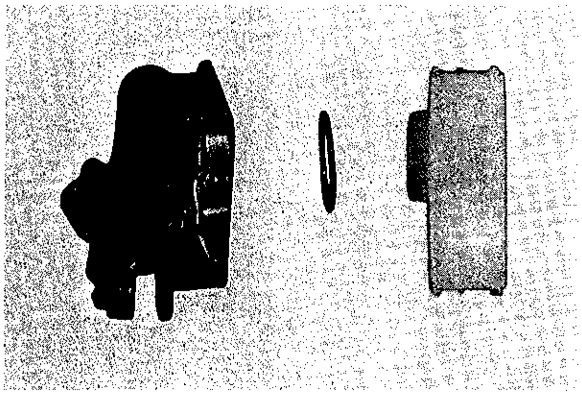
- Remove fillter cap and drain brake fluid.



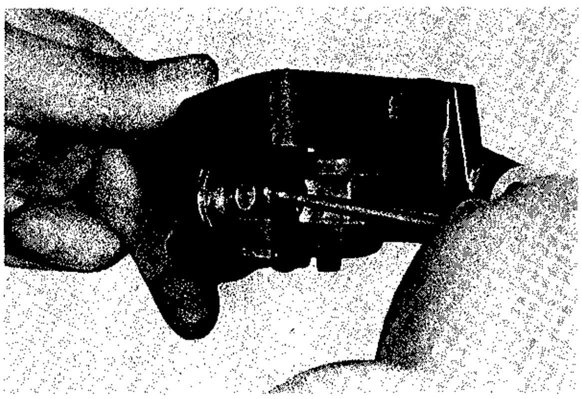
- Remove the two screws.



- Pull out the reservoir and O-ring.

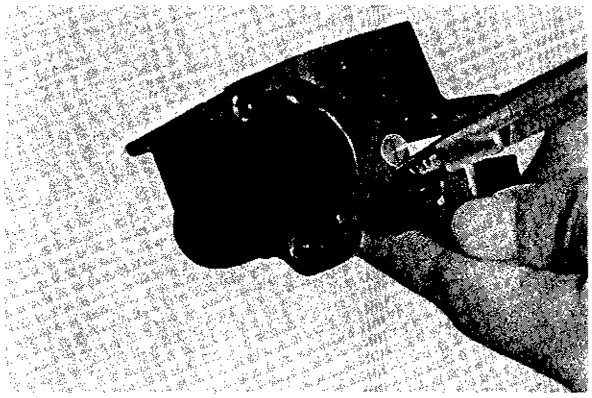


- Draw out dust seal boot.

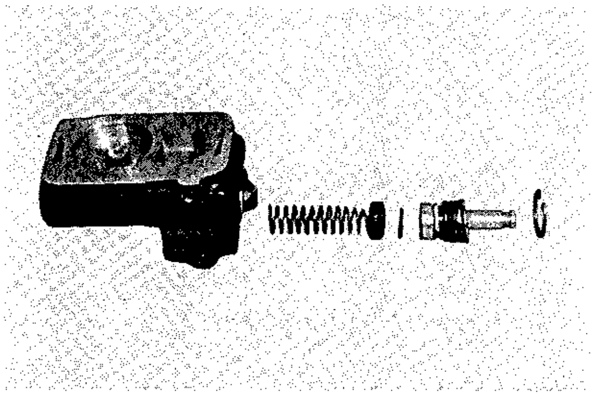


- Remove circlip by using special tool.

09900-06108	Snap ring pliers

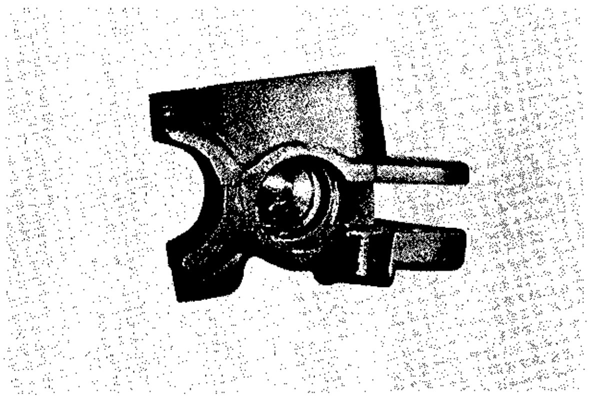


- Pull out piston, primary cup and spring.

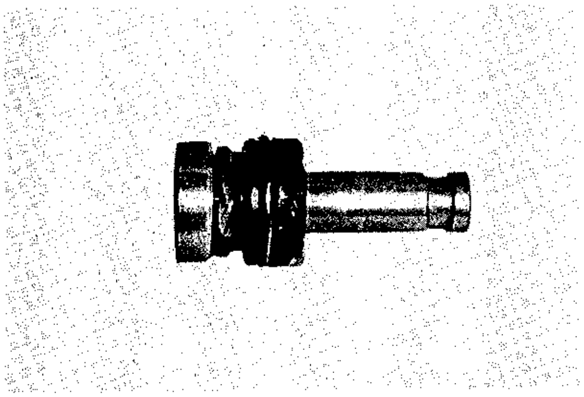


MASTER CYLINDER INSPECTION

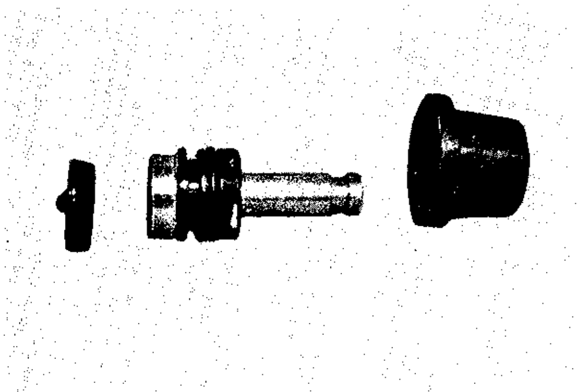
- Inspect the cylinder bore wall for any scratch or other damage.



- Inspect the piston surface for scratch or other damage.



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

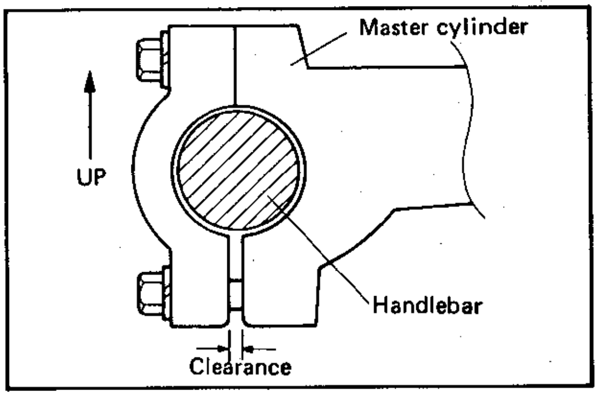


MASTER CYLINDER REASSEMBLY

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

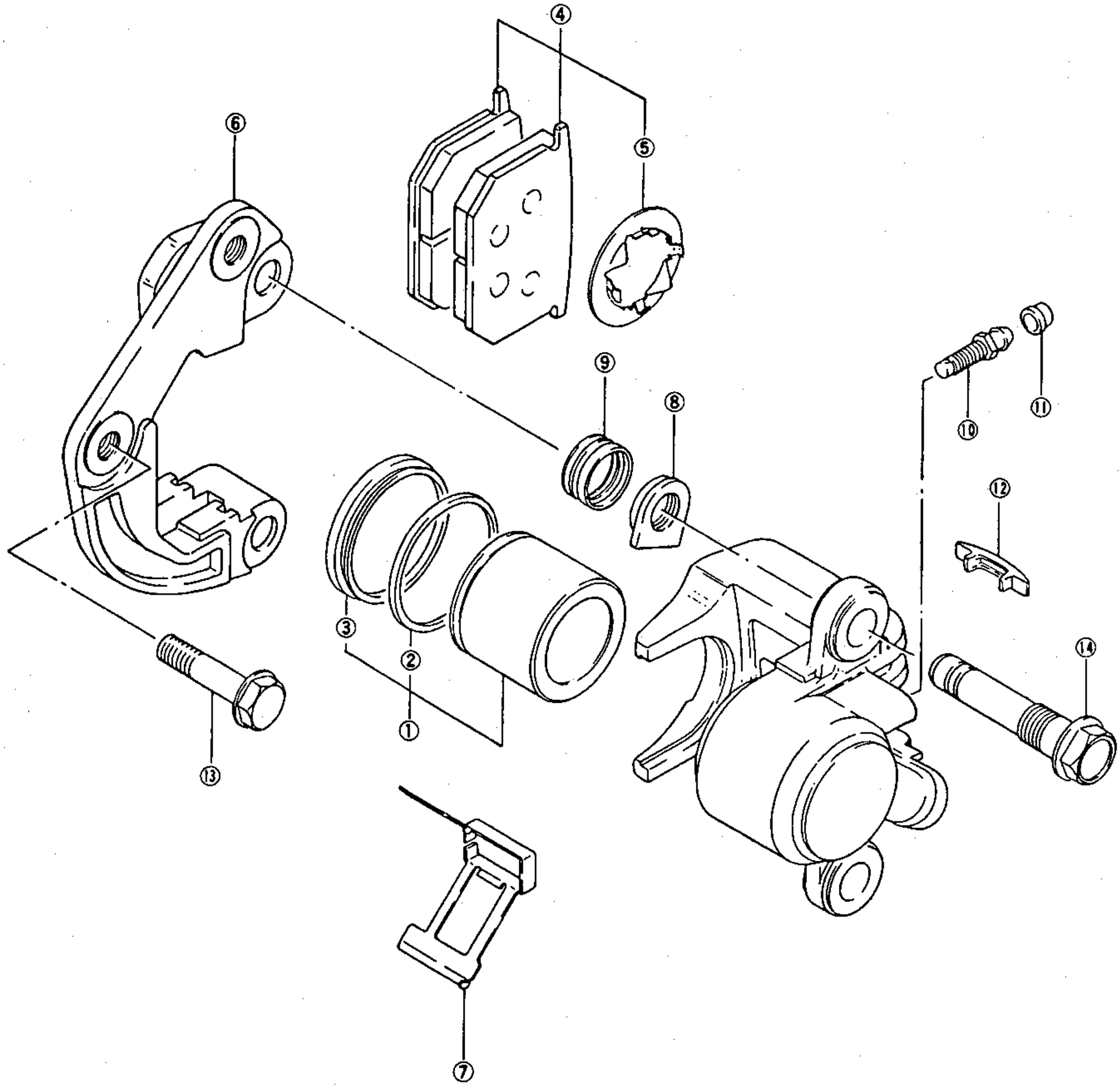
CAUTION:
Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.
Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.

- 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.

FRONT CALIPER



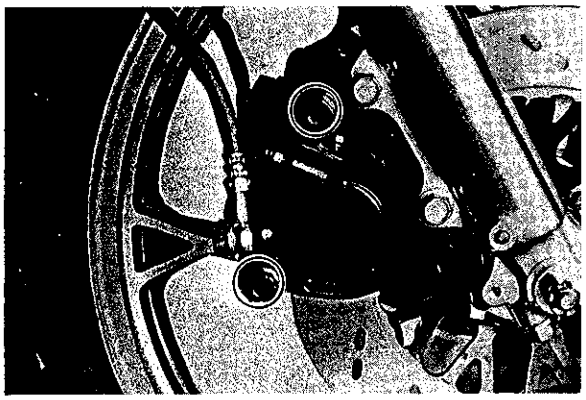
1. Piston set
2. Piston seal
3. Piston boot
4. Pad set
5. Pad shim
6. Caliper holder
7. Spring
8. Nut
9. Boot
10. Bleeder
11. Bleeder cap
12. Cover
13. Bolt
14. Bolt

Tightening torque		
	kg-m	lb-ft
⑬	2.0 – 4.0	14.5 – 29.0
⑭	4.0 – 5.5	29.0 – 40.0

BRAKE PAD REPLACEMENT

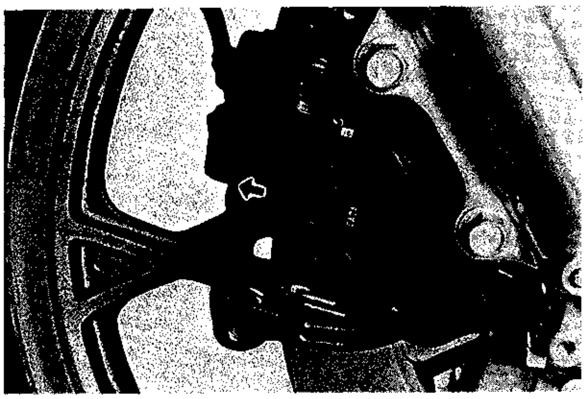
- Remove two bolts and take off caliper.

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

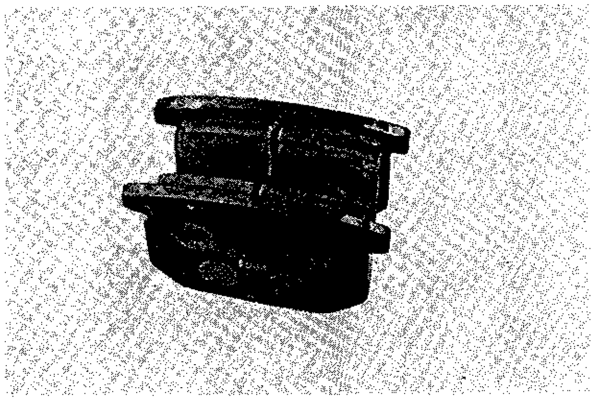


- Pull out brake pads with pad shim.

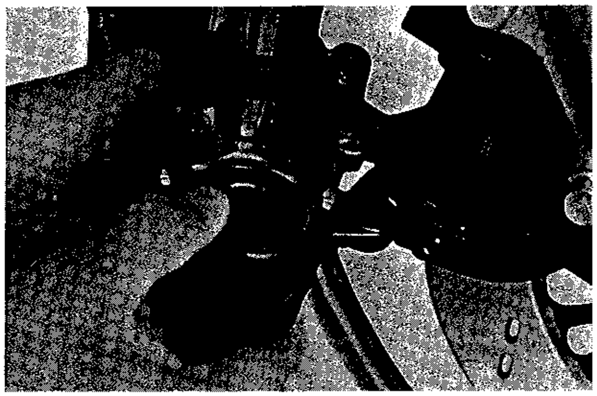
CAUTION:
Replace the brake pad with a set, otherwise braking performance will be adversely affected.



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



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

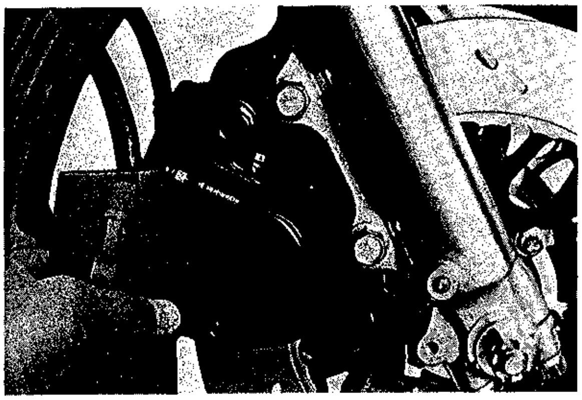


- Tighten the caliper axle bolts with specified torque.

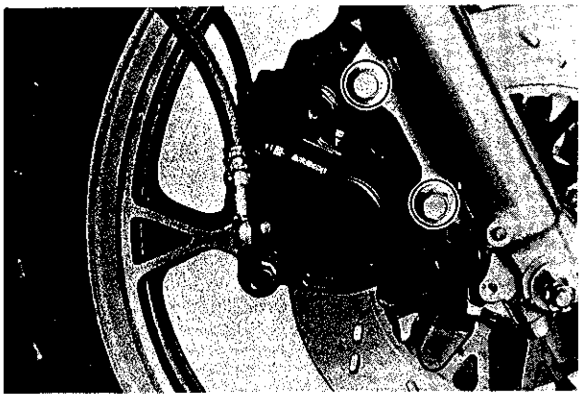
Tightening torque	4.0 — 5.5 kg-m (29.0 — 40.0 lb-ft)

CALIPER REMOVAL AND DISASSEMBLY

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

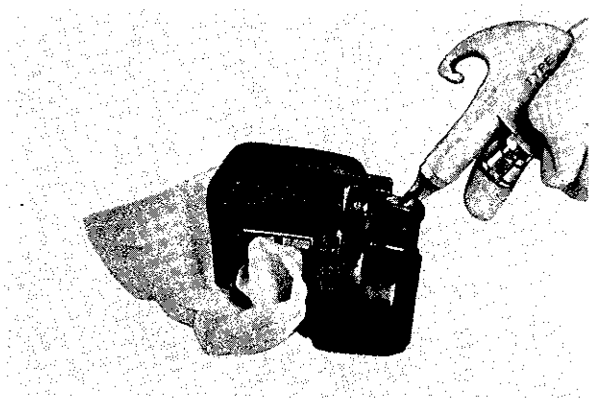


- Remove caliper axle bolts and take off caliper.

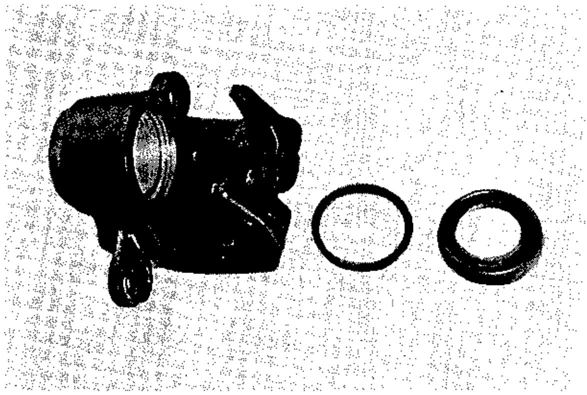


- Place a rag over the piston to prevent popping up. Push out the piston by using air gun.

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

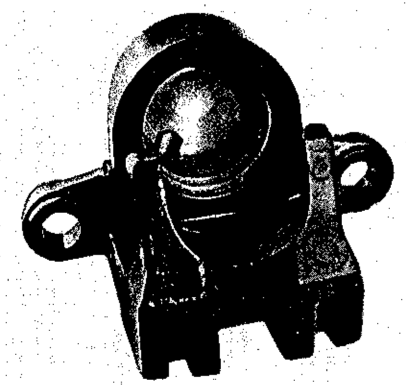


- Remove piston boot and piston seal.

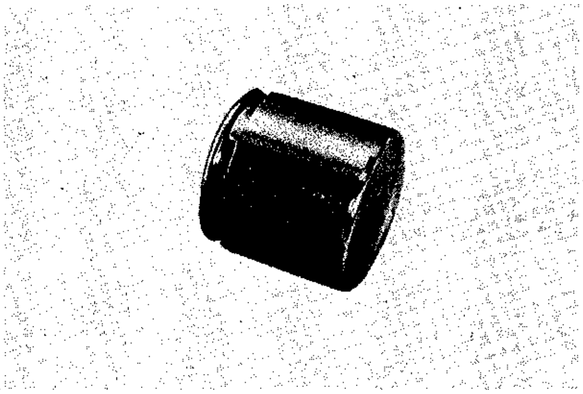


CALIPER AND DISC INSPECTION

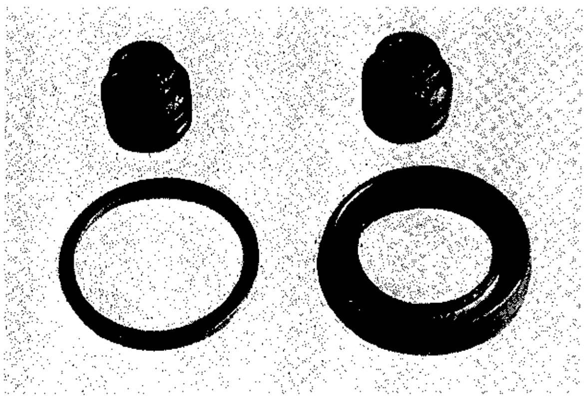
- Inspect the cylinder bore wall for nick, scratch or other damage.



- Inspect the piston surface for any flaw or other damage.



- Inspect the each rubber parts for damage and wear.



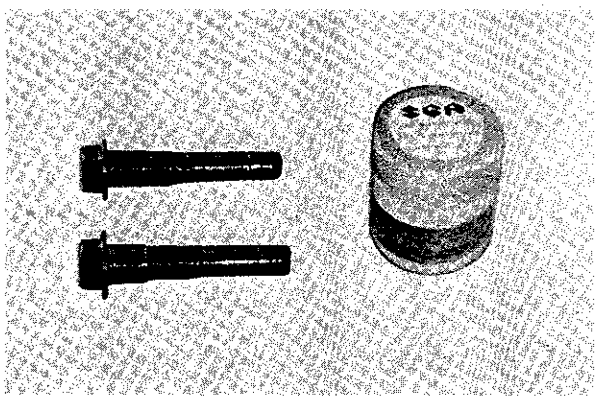
CALIPER REASSEMBLY

- 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 before reassembling.

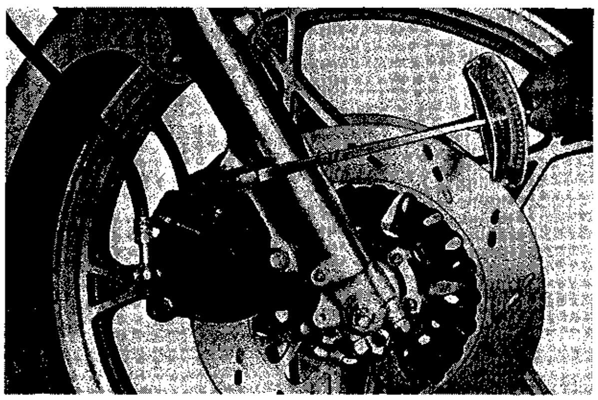
- Apply grease to the cliper axles.

99000-25100	SUZUKI Silicone grease

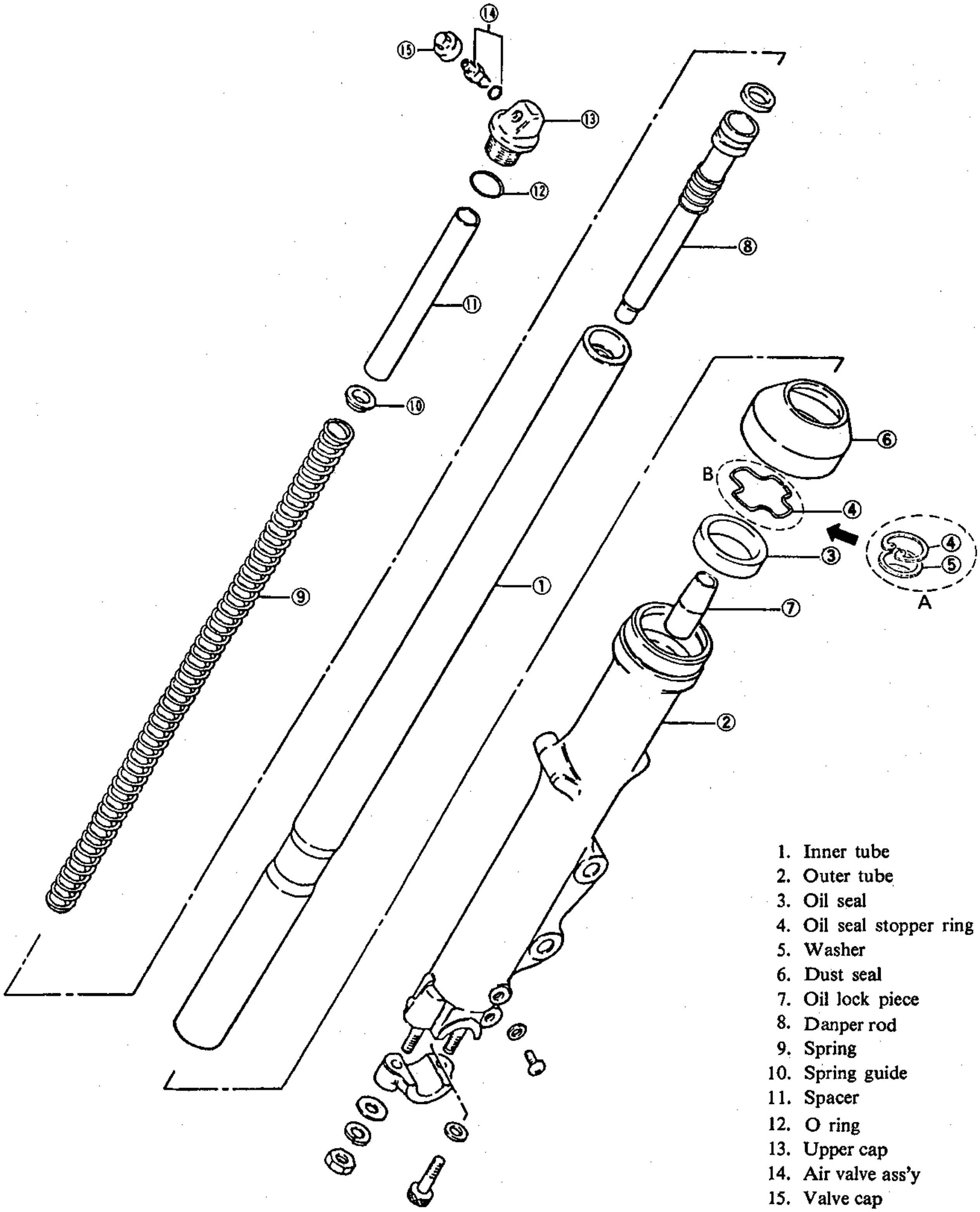


- Tighten the caliper axle nuts and caliper mounting bolts with specified torque.

	Tightening torque
Caliper axle bolt	4.0 – 5.5 kg-m (29.0 – 40.0 lb-ft)
Caliper mounting bolt	2.0 – 4.0 kg-m (14.5 – 29.0 lb-ft)



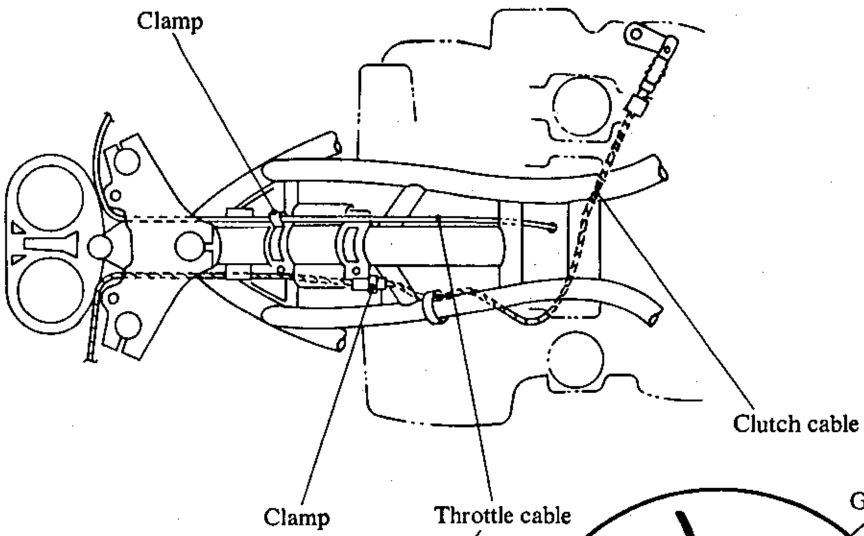
FRONT FORK

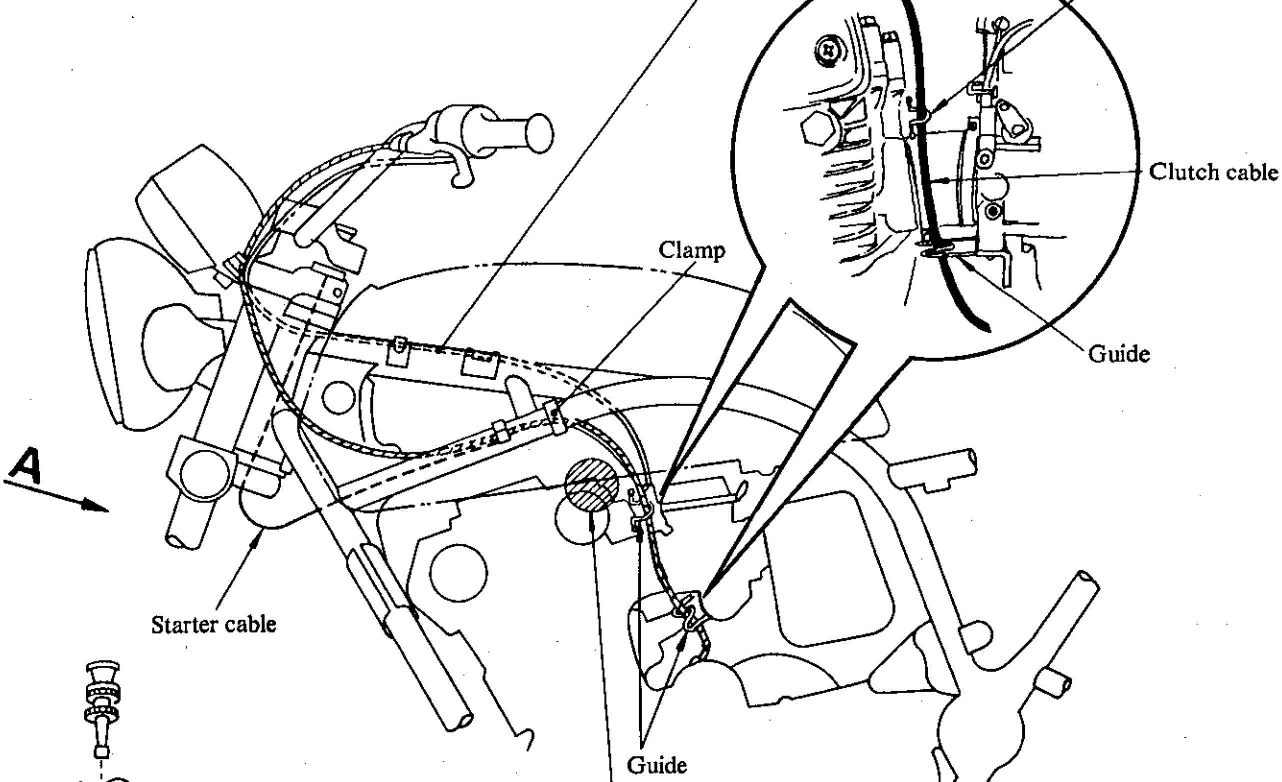


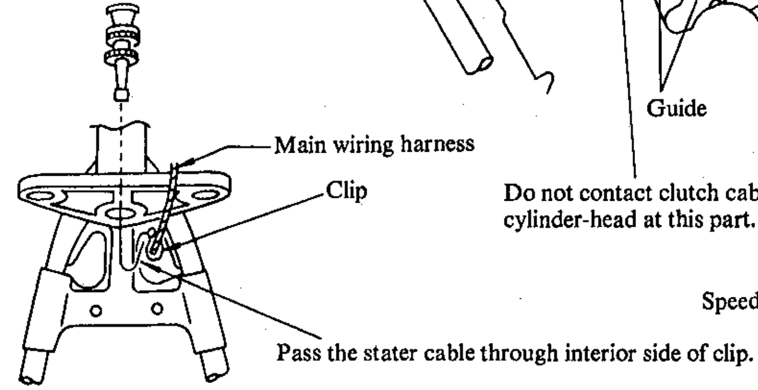
1. Inner tube
2. Outer tube
3. Oil seal
4. Oil seal stopper ring
5. Washer
6. Dust seal
7. Oil lock piece
8. Danper rod
9. Spring
10. Spring guide
11. Spacer
12. O ring
13. Upper cap
14. Air valve ass'y
15. Valve cap

NOTE:
Although the parts for stopping the front fork oil seal have been changed form A to B (as shown in the illustration), the disassembling procedure is the same as that for GS1000 C and N models.

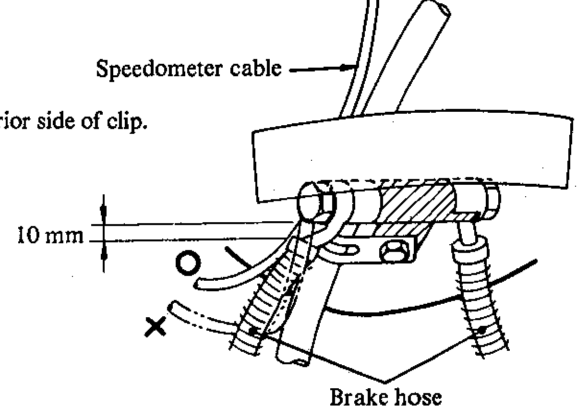
WIRE AND CABLE ROUTING

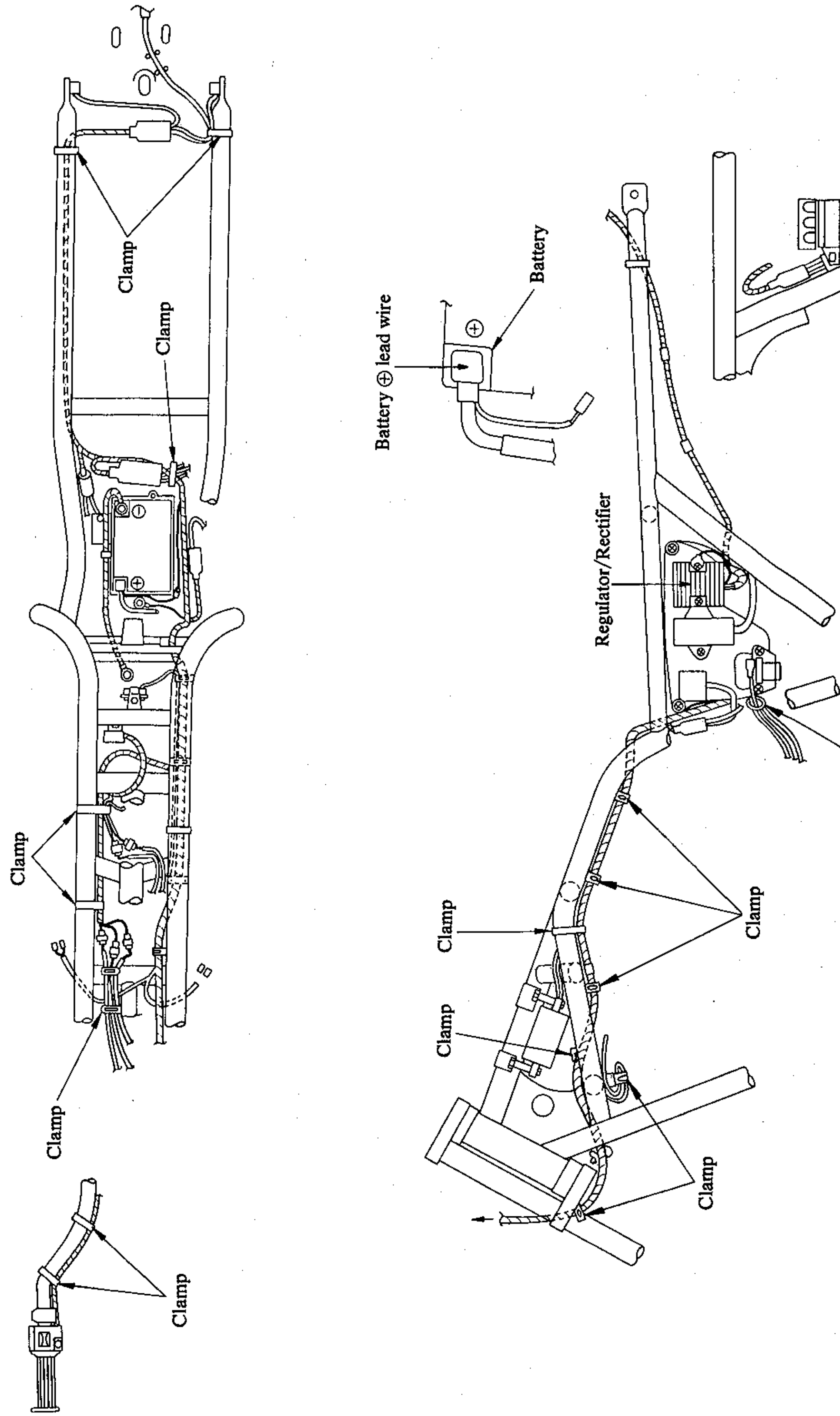






Viewed from direction "A"




Clamp
Clamp
Clamp
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Clamp
Battery ⊕ lead wire
Battery
Regulator/Rectifier
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Clamp
Clamp
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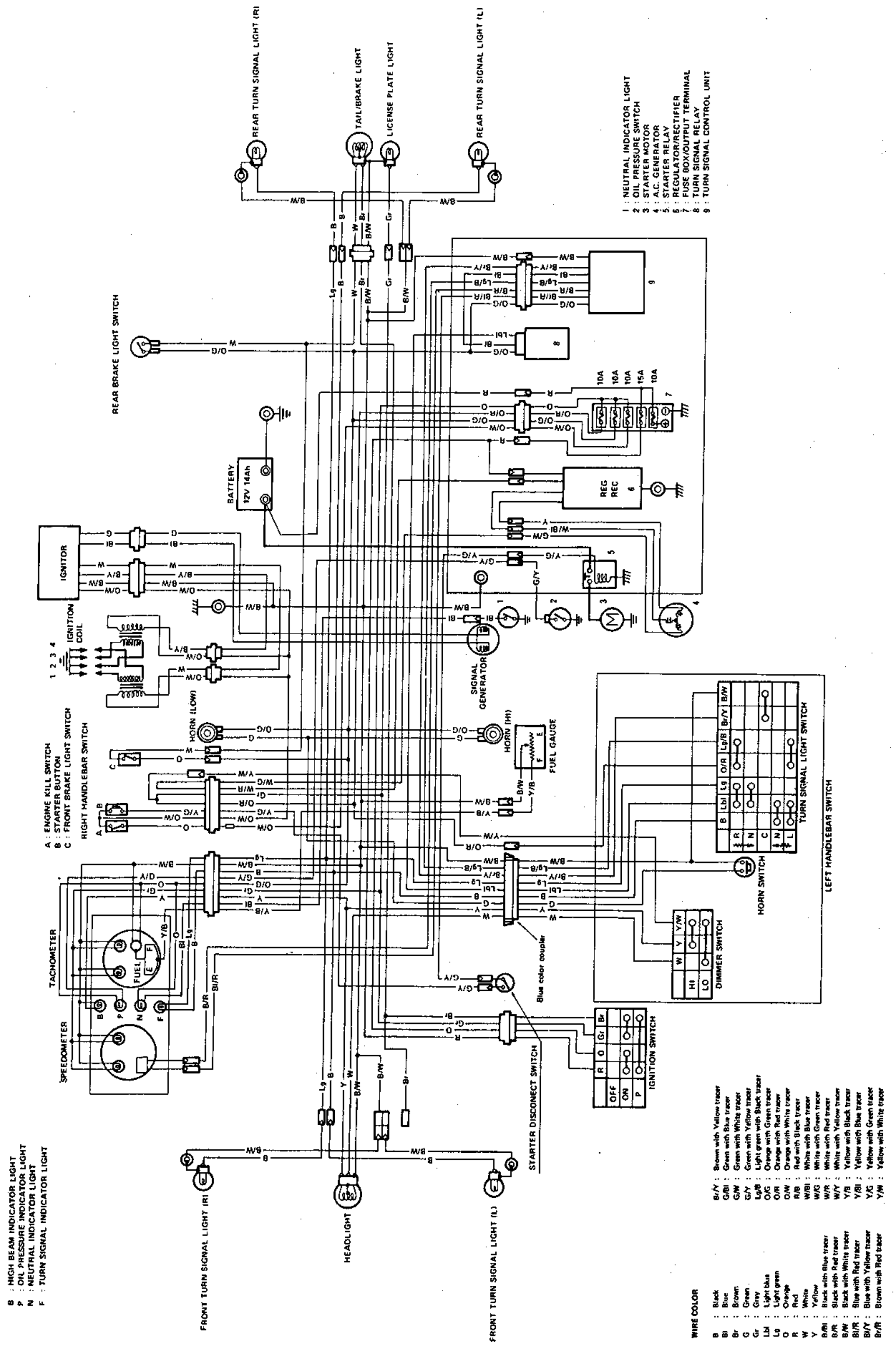
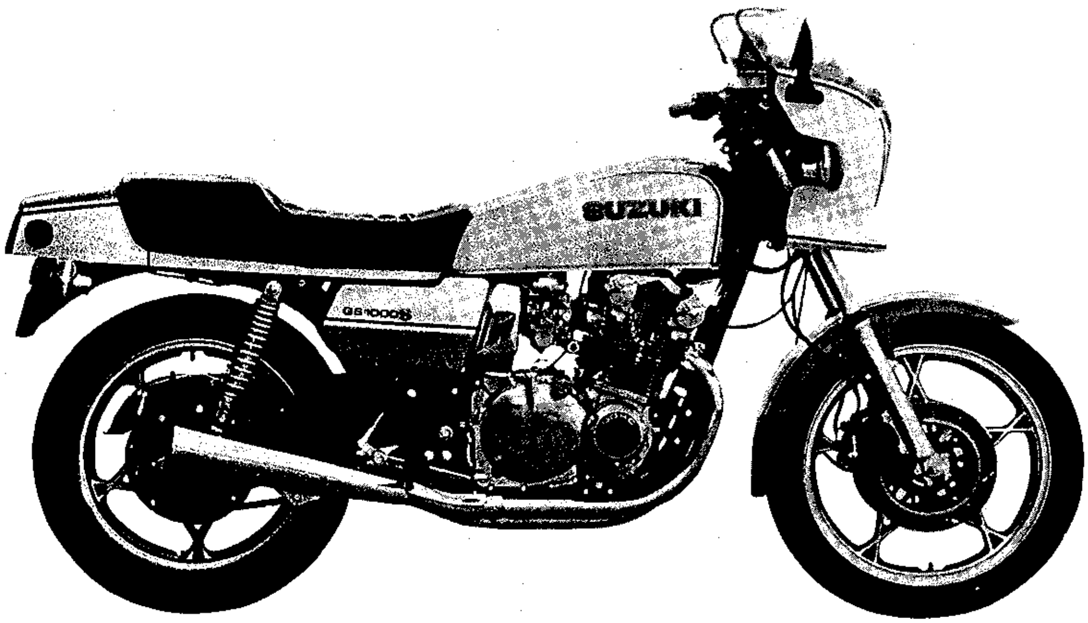
Clamp
Clamp

WIRING DIAGRAM

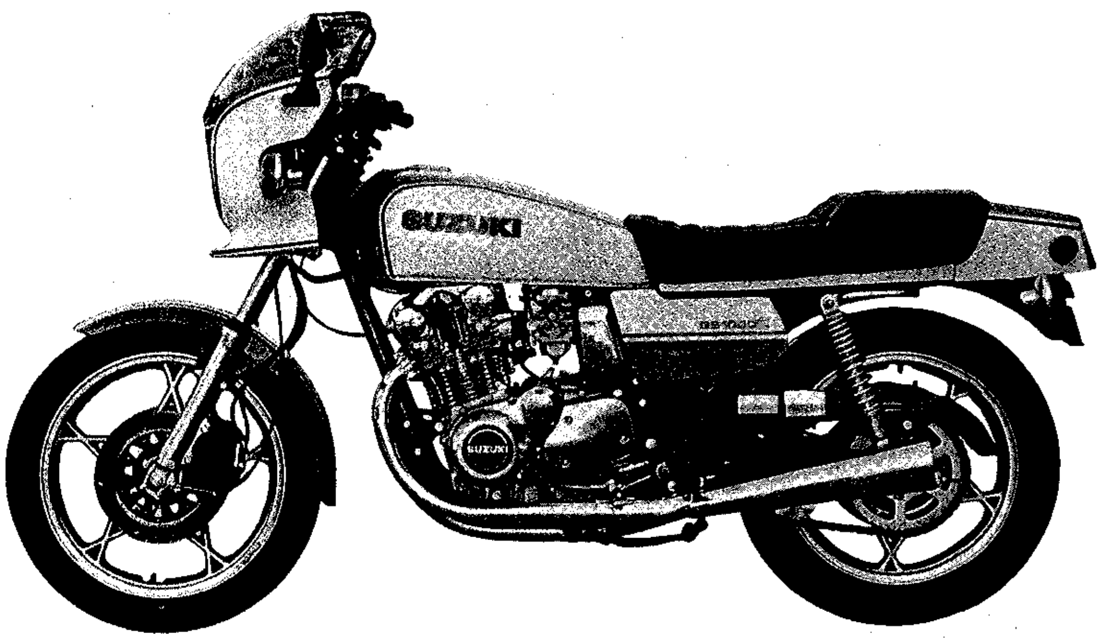


GS1000ST

The information presented in the earlier portion of this manual also pertains to the GS1000ST. It, also, incorporates all of the new, innovative features added to the GS1000, T series of Suzuki motorcycles.



Right Side



Left Side

SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 225 mm (87.6 in)
Overall width	735 mm (28.9 in)
Overall height	1 255 mm (49.4 in)
Wheelbase	1 505 mm (59.3 in)
Ground clearance	155 mm (6.1 in)
Dry mass	237 kg (522 lbs)
Gross vehicle weight rating	420 kg (924 lbs)

ENGINE

Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	70.0 mm (2.756 in)
Stroke	64.8 mm (2.551 in)
Piston displacement	997 cm^3 (60.8 cu. in)
Compression ratio	9.2 : 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 RK630GSO, 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	63° 00'
Trail	116 mm (4.57 in)
Turning radius	2.6 m (8.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	3.25V19 4PR
Rear tire size	4.00V18 4PR
Front tire pressure	1.75 kg/cm² (25 psi) (Normal solo riding)
Rear tire pressure	2.00 kg/cm² (28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 350 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES-U
Spark plug gap	0.6 – 0.8 mm (0.024 – 0.031 in) both NGK and NIPPON DENSO
Battery	12V 50.4 kC (14Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CAPACITIES

Fuel tank	19 L (5.0 US gal)
Engine oil change	3.4 L (3.6 US qt)
filter change	3.8 L (4.0 US qt)
overhaul	4.2 L (4.4 US qt)
Front fork oil	259 ml (8.75 US oz) in each leg

* *Specifications are subject to change without notice.*

SERVICE DATA

Please refer to the service data of GS1000ET except for the service data shown below.

WHEEL

Item	Standard	
Tire Size	Front	3.25V19 4PR
	Rear	4.00V18 4PR

SUSPENSION

Unit: mm(in)

Item	Standard	Limit
Front fork spring free length	—	346 (13.6)
Front fork oil level	110 (4.3)	—
Front fork air pressure	0.9 kg/cm² (12.80 psi)	—

OIL CAPACITY

Item	Specification
Front fork oil capacity (each leg)	259 ml (8.75 US oz)

TIRE PRESSURE

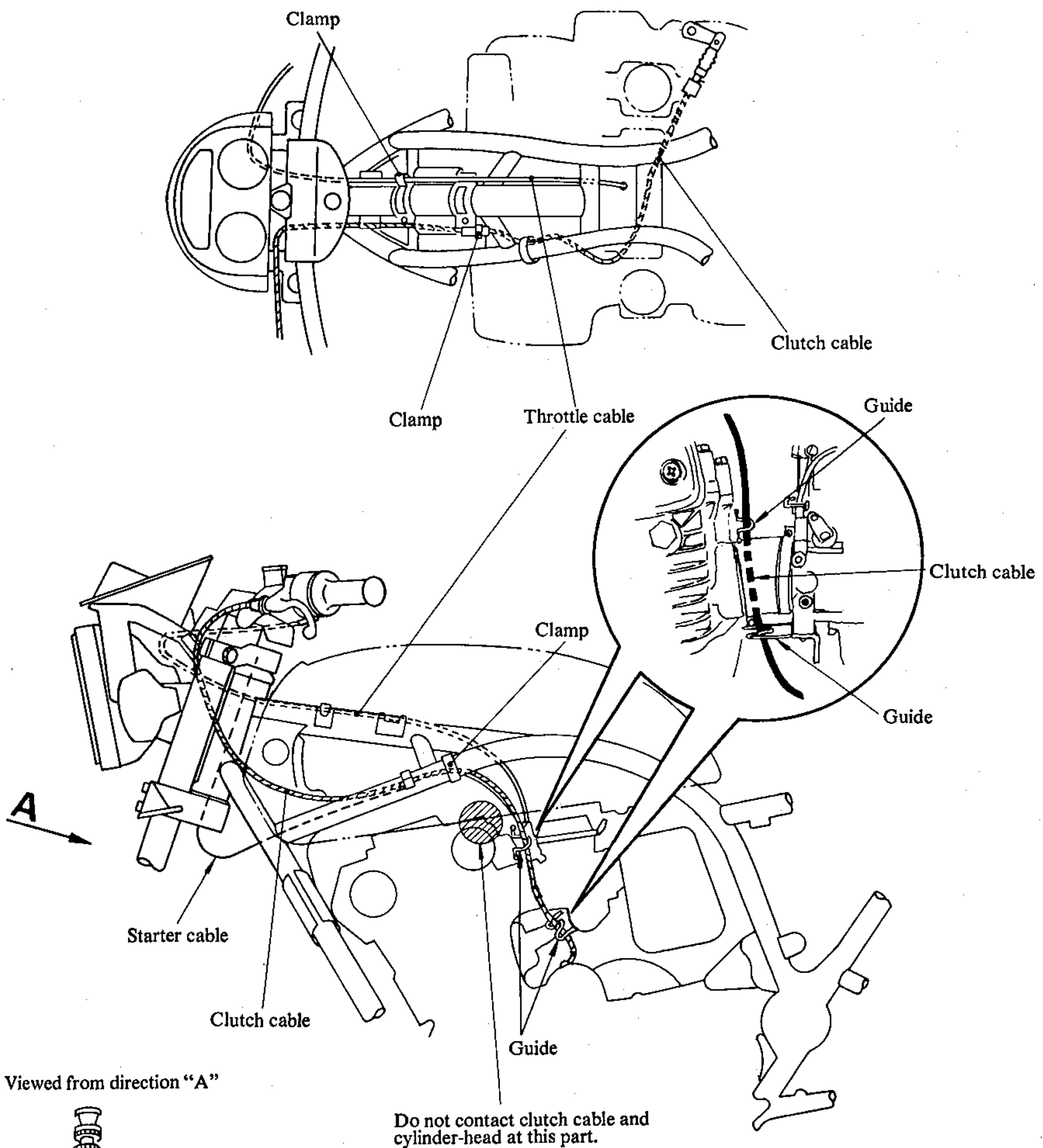
Cold inflation tire pressure	Normal riding				High speed riding			
	Solo		Dual		Solo		Dual	
	kg/cm²	psi	kg/cm²	psi	kg/cm²	psi	kg/cm²	psi
Front	1.75	25	2.00	28	2.00	28	2.25	32
Rear	2.00	28	2.25	32	2.50	36	2.80	40

WATTAGE

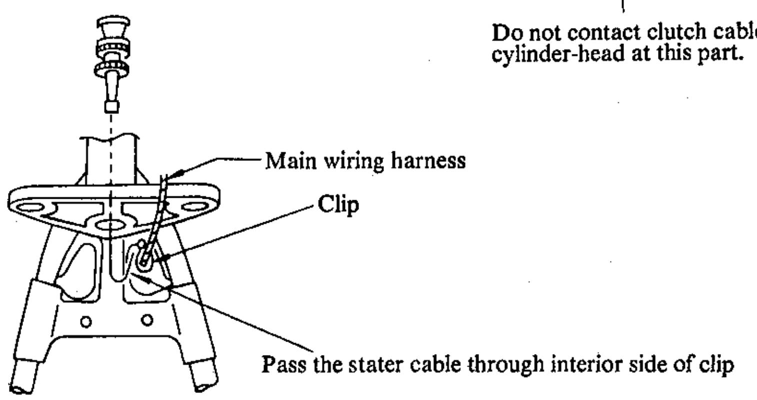
Unit: W (cp)

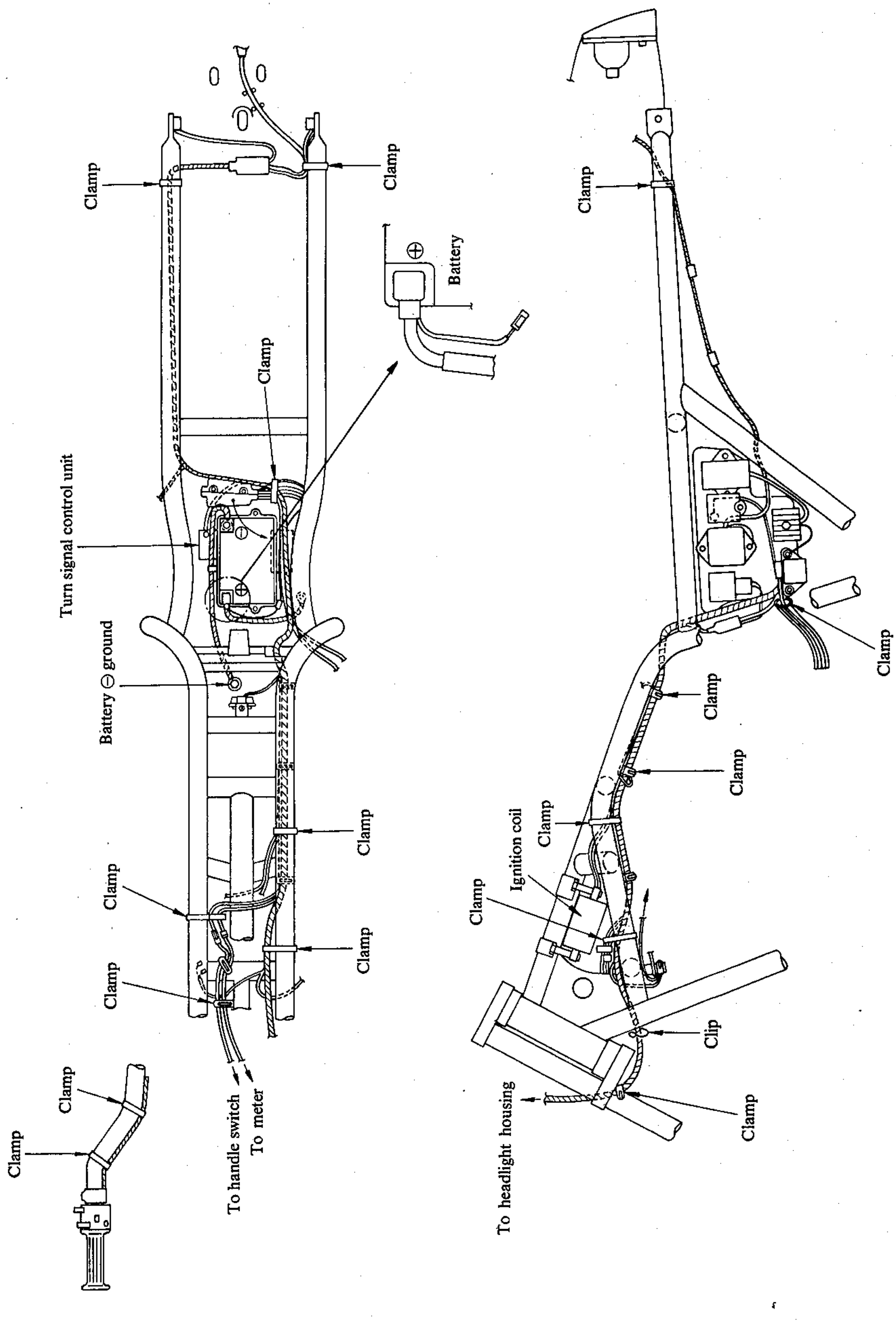
Item	Specification
Headlight	60/55
Tail/Brake light	8/23 (3/32)
Turn signal light	23 (32)
Licence light	8 (4)
Speedometer light	3.4
Tachometer light	3.4
Fuelmeter light	3.4
Oil temperature light	3.4
Clock light	3.4
Neutral indicator light	3.4
High beam indicator light	3.4
Turn signal indicator light	3.4
Oil pressure indicator light	3.4

WIRE AND CABLE ROUTING



Viewed from direction "A"




Clamp
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Battery
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Turn signal control unit
Battery ⊖ ground
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To handle switch
To meter
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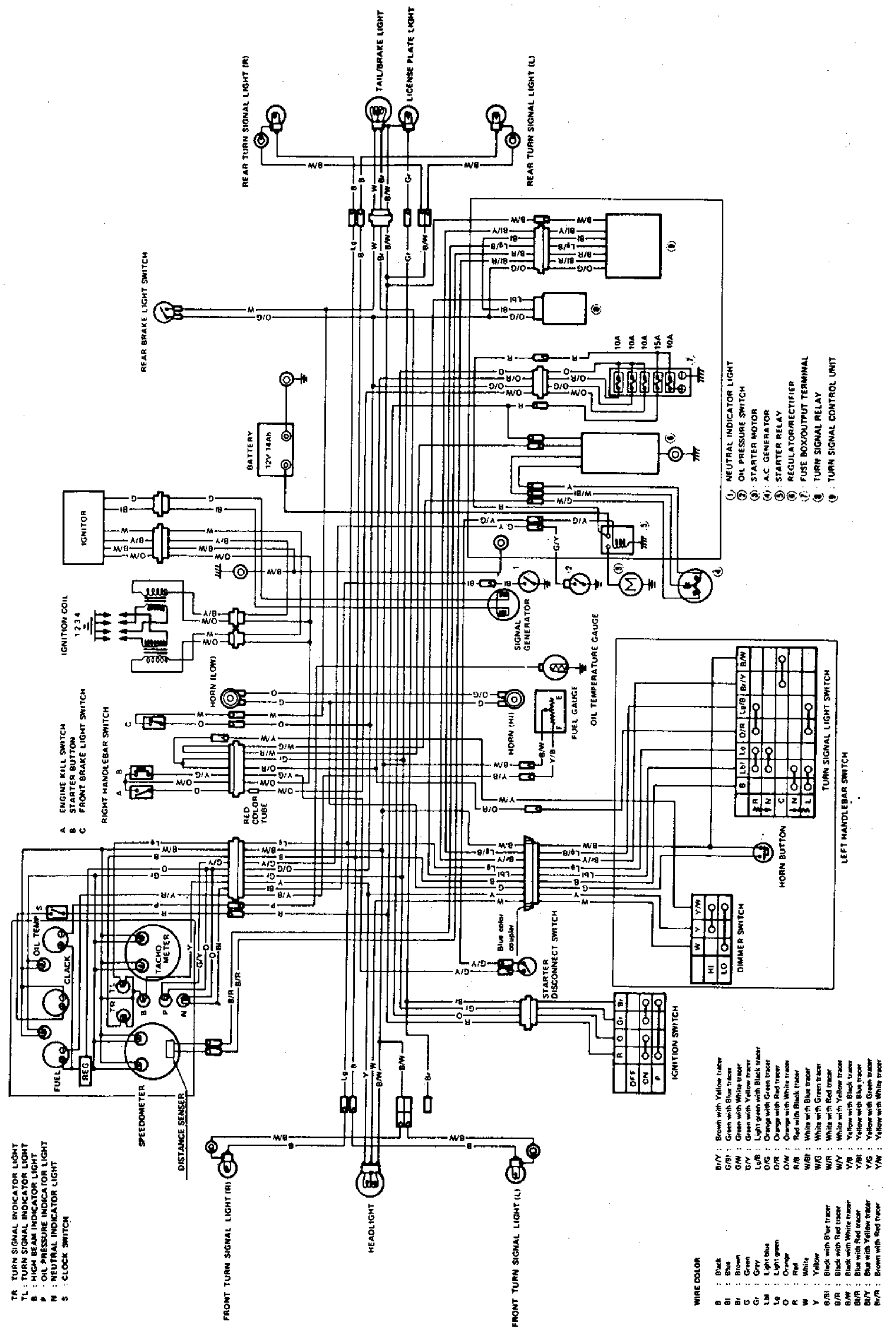
Clamp
Ignition coil
Clamp
Clip
Clamp
To headlight housing

WIRING DIAGRAM



Prepared by

SUZUKI MOTOR CO.,LTD.

Service Department
Overseas Operations Division

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October, 1979

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SUZUKI

GS1000G/L

SUPPLEMENTARY SERVICE MANUAL

SR-8503 (英) E-03
SUPPL-2

GS1000G/L SUZUKI MOTOR CO., LTD. AUGUST, '80 PRINTED IN JAPAN SR-8503 SUPPL-2

FOREWORD

The Suzuki GS1000GT and GS1000GLT are new 1980 models and incorporate many refinements and technical changes such as shaft drive mechanism and transistorized ignition system, from the model, GS1000N. This supplementary service manual has been produced to aid Suzuki mechanics in properly maintaining and repairing these model motorcycles, which incorporate so many new and innovative changes. These technical improvements have further enhanced the comfort, handling and overall performance of these outstandanding models.

This manual has been written primarily for the experinced 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 GS1000 Service Manual for all other areas of information not covered in this publication.

IMPORTANT

All Suzuki motorcycles manufactured on or after January 1, 1978, were subject to Environmental Protection Agency emission regulations.
These regulations set specific standards for emission control, and also set new servicing requirement. This manual contains pertinent information that should be carefully studied. Other, vital emission information is also contained in the GS1000 Service Manual and should also be carefully reviewed.

Complete information concerning the EPA emission regulation and U. S. Suzuki's emission control program can be found in the U. S. SUZUKI EMISSION CONTROL PROGRAM MANUAL.

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

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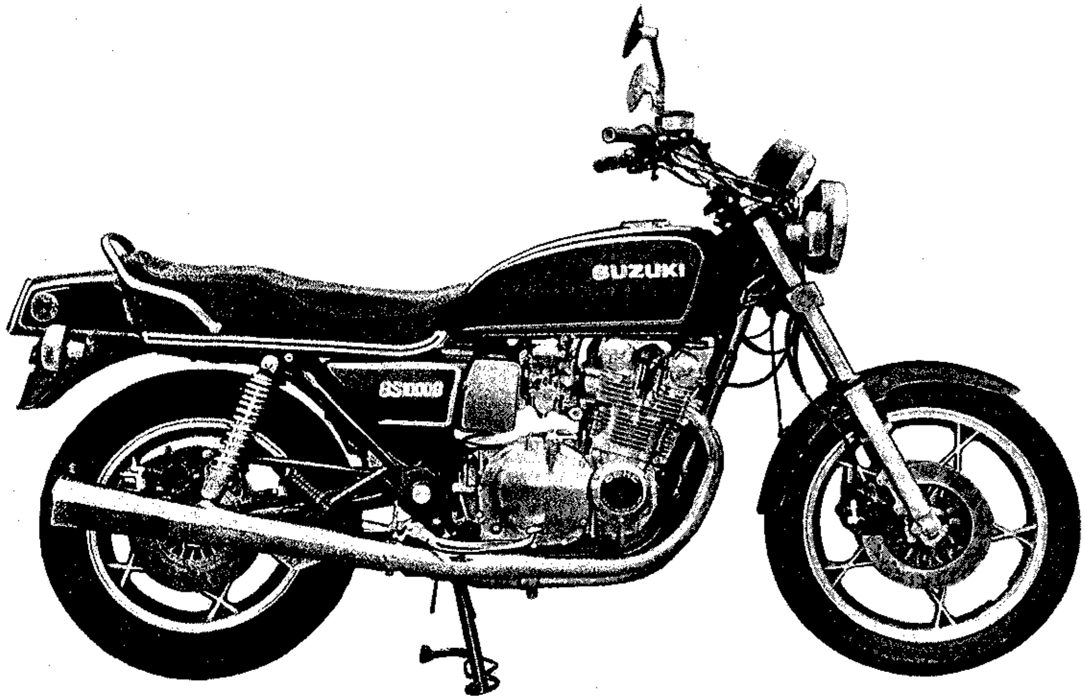
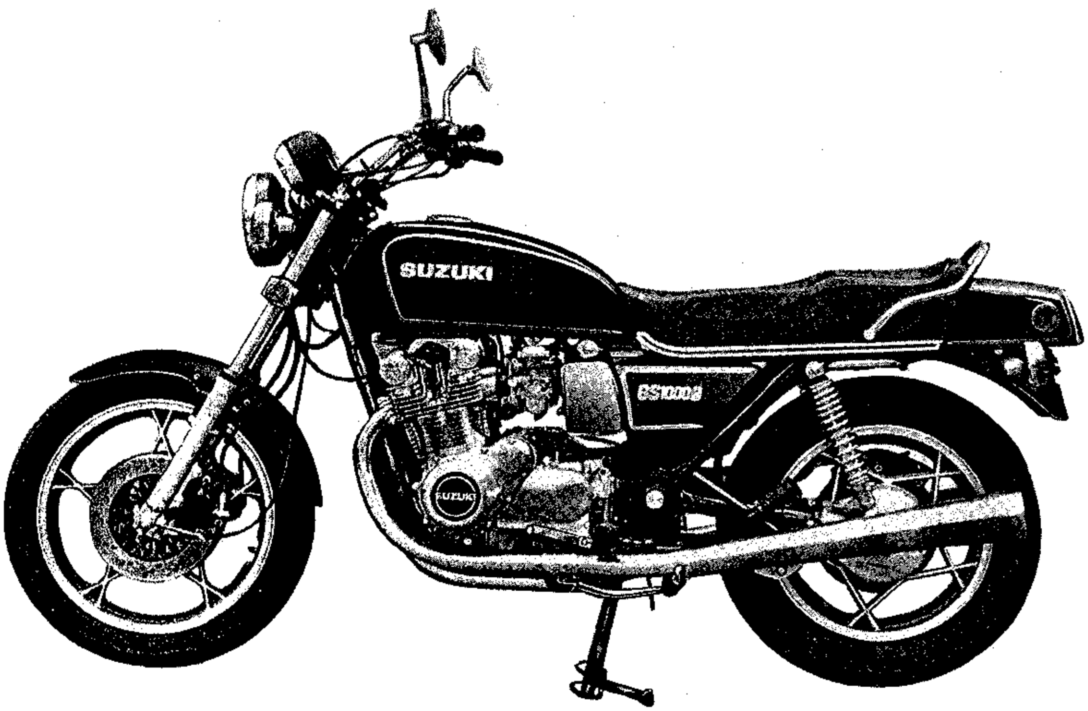
I GS1000GT



Right side



Left side

SPECIFICATIONS

DIMENSIONS AND DRY MASS	
Overall length	2 230 mm (87.8 in)
Overall width	875 mm (34.4 in)
Overall height	1 175 mm (46.3 in)
Wheelbase	1 500 mm (59.1 in)
Ground clearance	150 mm (5.9 in)
Dry mass	255 kg (562 lbs)
Gross vehicle weight rating	504 kg (1 112 lbs)
ENGINE	
Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	70.0 mm (2.756 in)
Stroke	64.8 mm (2.551 in)
Piston displacement	997 cm^3 (60.8 cu. in)
Compression ratio	9.2 : 1
Carburetor	MIKUNI BS34SS, four
Air cleaner	Polyurethane foam element
Starter system	Electric
Lubrication system	Wet sump
TRANSMISSION	
Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	1.775 (87/49)
Gear ratios, Low	2.500 (35/14)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
Top	0.961 (25/26)
SECONDARY DRIVE	
Type	Shaft drive
Secondary reduction	0.941 (16/17)
Final reduction	3.090 (34/11)

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	40° (right and left)
Caster	62° 30′
Trail	112 mm (4.41 in)
Turning radius	2.6 m (8.5 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	175 kPa (1.75 kg/cm², 25 psi) (Normal solo riding)
Rear tire pressure	200 kPa (2.00 kg/cm², 28 psi) Normal solo riding)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D,C. above 2 350 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES-U
Spark plug gap	0.6 – 0.8 mm (0.024 – 0.031 in) both NGK and NIPPON DENSO
Battery	12V 50.4 kC (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	4.2 L (1.1 US gal)
Engine oil Change	3.0 L (3.2 US qt)
filter change	3.3 L (3.5 US qt)
overhaul	3.7 L (3.9 US qt)
Secondary bevel gear oil	340 – 400 ml (11.5 – 13.5 US oz)
Final bevel gear oil	280 – 330 ml (9.5 – 11.2 US oz)
Front fork air pressure	60 kPa (0.6 kg/cm², 8.5 psi)
Front fork oil	251 ml (8.48 US oz) in each leg

Specifications subject to change without notice.

SERVICE DATA

VALVES + GUIDES

Unit: mm (in)

Item		Standard	Limit
Valve dia.	IN.	37.9 – 38.1 (1.49 – 1.50)	–
	EX.	31.9 – 32.1 (1.25 – 1.26)	–
Valve lift	IN.	8.0 (0.31)	–
	EX.	7.5 (0.30)	–
Valve clearance or Tappet clearance (when cold)	IN/EX	0.03 – 0.08 (0.001 – 0.003)	–
Valve guide to Valve stem clearance	IN.	0.025 – 0.055 (0.0009 – 0.0022)	0.090 (0.0035)
	EX.	0.040 – 0.070 (0.0016 – 0.0028)	0.100 (0.0039)
Valve guide I.D.	IN/EX	7.000 – 7.015 (0.2756 – 0.2762)	–
Valve stem O.D.	IN.	6.960 – 6.975 (0.2740 – 0.2746)	–
	EX.	6.945 – 6.960 (0.2734 – 0.2740)	–
Valve stem runout	IN/EX	–	0.05 (0.002)
Valve head thickness	IN/EX	–	0.5 (0.02)
Valve seat width	IN/EX	1.1 – 1.3 (0.04 – 0.05)	–
Valve head radial runout	IN/EX	–	0.03 (0.001)
Valve spring free length IN/EX	INNER	–	33.9 (1.33)
	OUTER	–	41.3 (1.63)
Valve spring tension IN/EX	INNER	29.3 – 34.0 kg (64.59 – 74.96 lbs) at length 23 mm (0.91 in)	–
	OUTER	50.4 – 58.3 kg (111.11 – 128.53 lbs) at length 27 mm (1.06 in)	–

CAMSHAFT + CYLINDER + HEAD

Unit: mm (in)

Item		Standard	Limit
Cam height	IN.	36.320 – 36.360 (1.4299 – 1.4315)	36.020 (1.4181)
	EX.	35.770 – 35.810 (1.4083 – 1.4098)	35.470 (1.3965)
Camshaft journal oil clearance	IN/EX	0.037 – 0.065 (0.0015 – 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	21.960 – 21.975 (0.8646 – 0.8652)	–
Camshaft runout	IN/EX	–	0.1 (0.004)
Cam chain 20 pitch length		–	157.80 (6.213)
Cam chain pin (at arrow "3")		20th pin	–
Cylinder head distortion		–	0.2 (0.008)

PISTON+RING+CYLINDER

Unit: mm (in)

Item		Standard	Limit
Compression pressure		900 — 1 300 kPa (9 — 13 kg/cm², 128 — 185 psi)	700 kPa (7 kg/cm², 100 psi)
Compression pressure difference		—	200 kPa (2 kg/cm², 28 psi)
Piston to Cylinder clearance		0.050 — 0.060 (0.0020 — 0.0024)	0.120 (0.0047)
Cylinder bore		70.000 — 70.015 (2.7559 — 2.7565)	70.080 (2.7590)
Piston dia.		69.945 — 69.960 (2.7537 — 2.7543) Measure the 10 (0.39) from piston skirt end.	69.880 (2.7512)
Cylinder distortion		—	0.2 (0.008)
Piston ring free end gap	1st N	Approx. 8.5 (0.33)	6.8 (0.27)
	2nd N	Approx. 8.5 (0.33)	6.8 (0.27)
Piston ring end gap	1st	0.15 — 0.35 (0.006 — 0.014)	0.7 (0.03)
	2nd	0.15 — 0.35 (0.006 — 0.014)	0.7 (0.03)
Piston ring groove clearance	1st	—	0.180 (0.0071)
	2nd	—	0.150 (0.0059)
Piston ring groove width	1st	1.21 — 1.23 (0.047 — 0.048)	—
	2nd	1.21 — 1.23 (0.047 — 0.048)	—
	Oil	2.51 — 2.53 (0.099 — 0.100)	—
Piston ring thickness	1st	1.175 — 1.190 (0.0463 — 0.0469)	—
	2nd	1.170 — 1.190 (0.0461 — 0.0469)	—
Piston pin bore I.D.		18.002 — 18.008 (0.7087 — 0.7090)	18.030 (0.7098)
Piston pin O.D.		17.995 — 18.000 (0.7085 — 0.7087)	17.980 (0.7079)

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 10 kPa (0.1 kg/cm², 1.42 psi) Below 50 kPa (0.5 kg/cm², 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	2.0 ± 0.06 (0.08 ± 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		1.775 (87/49)	—
Secondary reduction		0.941 (16/17)	—
Final reduction		3.090 (34/11)	—
Gear ratios	Low	2.500 (35/14)	—
	2nd	1.777 (32/18)	—
	3rd	1.380 (29/21)	—
	4th	1.125 (27/24)	—
	Top	0.961 (25/26)	—
Shift fork to Groove clearance		0.4 – 0.6 (0.016 – 0.024)	0.8 (0.031)
Shift fork Groove width		5.45 – 5.55 (0.215 – 0.219)	—
Shift fork thickness		4.95 – 5.05 (0.195 – 0.199)	—

SHAFT DRIVE

Unit: mm (in)

Item	Standard	Limit
Secondary bevel gear backlash	0.08 – 0.13 (0.003 – 0.005)	—
Final bevel gear backlash	0.03 – 0.64 (0.001 – 0.025)	—
Secondary drive bevel gear preload	30 – 50 N•cm (3 – 5 kg•cm, 2.60 – 4.35 lb•in)	—
Secondary driven bevel gear preload	40 – 70 N•cm (4 – 7 kg•cm, 3.45 – 6.05 lb•in)	—
Final drive bevel gear preload	40 – 80 N•cm (4 – 8 kg•cm, 3.45 – 6.95 lb•in)	—

CARBURETOR

Unit: mm (in)

Item		Specification
Carburetor type		MIKUNI BS34SS
Bore size		34 (1.34)
I.D. No.		49150
Idle r/min.		1 050±100 r/min.
Fuel level		5.0±0.5 (0.20±0.02)
Float height		22.4±1.0 (0.88±0.04)
Maint jet	(M. J.)	#115
Main air jet	(M. A. J.)	1.7
Jet needle	(J. N.)	5D50
Needle jet	(N. J.)	X-6
Pilot jet	(P. J.)	#40
By pass	(B. P.)	0.9, 0.8, 0.8
Pilot outlet	(P. O.)	0.7
Valve seat	(V.S.)	2.0
Starter jet	(G. S.)	45
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	17° B. T. D. C. Below 1 500 ± 150 r/min. and 37° B. T. D. C. Above 2 350 ± 150 r/min.	
Firing order	1, 2, 4, 3	
Spark plug	Type	NGK : B8ES N. D. : W24ES-U
	Gap	0.6 – 0.8 (0.024 – 0.031)
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: 6 (0.24)
	Commutator under cut	Limit: 0.2 (0.008)
Starter relay resistance	Approx.	3 – 4Ω
Battery	Type designation	YB14L – A2
	Capacity	12V 50.4kC (14Ah)/10HR
	Standard electrolyte S. G.	1.28 at 20°C (68°F)
Fuse size	Headlight	10A
	Turn 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 (0.2 ± 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 cylinder bore	Front	15.870 – 15.913 (0.6248 – 0.6265)	–
	Rear	14.000 – 14.043 (0.5512 – 0.5529)	–
Master cylinder piston dia.	Front	15.827 – 15.854 (0.6231 – 0.6242)	–
	Rear	13.957 – 13.984 (0.5495 – 0.5506)	–
Brake caliper cylinder bore	Front	38.180 – 38.256 (1.5031 – 1.5061)	–
	Rear	38.180 – 38.256 (1.5031 – 1.5061)	–
Brake caliper piston dia.	Front	38.098 – 38.148 (1.4999 – 1.5019)	–
	Rear	38.098 – 38.148 (1.4999 – 1.5019)	–
Wheel rim runout	Axial	–	2.0 (0.08)
	Radial	–	2.0 (0.08)
Wheel axle runout	Front	–	0.25 (0.010)
	Rear	–	0.25 (0.010)
Tire size	Front	3.50V19 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	–	416 (16.4)
Front fork oil level	140 (5.5)	–
Front fork air pressure	60 kPa (0.6 kg/cm^2, 8.5 psi)	–
Rear wheel travel	100 (3.9)	–

FUEL+OIL+CAPACITY

Unit: mm (in)

Item		Specification
Fuel type		Use only unleaded or low-lead type gasoline of at least 85 – 95 pump octance ($\frac{R+M}{2}$ method) or 89 octance or higher rated by the Research method.
Fuel tank including reserve		22 L (5.8 US gal)
	reserve	4.2 L (1.1 US gal)
Engine oil type		SAE 10W/40
Engine oil capacity	Change	3 000 ml (3.2 US qt)
	Filter change	3 300 ml (3.5 US qt)
	Overhaul	3 700 ml (3.9 US qt)
Front fork oil type		SAE 10W/20
Front fork oil capacity (each leg)		251 ml (8.48 US oz)
Bevel gear oil type		Hypoid Gear oil SAE 90, API grade GL-5
Bevel gear oil capacity	Secondary	340 – 400 ml (11.5 – 13.5 US oz)
	Final	280 – 330 ml (9.5 – 11.2 US oz)
Brake fluide type		DOT3 or DOT4

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	25	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

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	N·m	kg·m	lb·ft
Camshaft holder bolt	8 — 12	0.8 — 1.2	6.0 — 8.5
Cylinder head bolt	9 — 14	0.9 — 1.4	6.5 — 10.0
Cylinder head nut	35 — 40	3.5 — 4.0	25.5 — 29.0
Cylinder head cover bolt	6 — 10	0.6 — 1.0	4.5 — 7.0
Crankcase bolt (6 mm)	6 — 10	0.6 — 1.0	4.5 — 7.0
Crankcase bolt (8 mm)	13 — 23	1.3 — 2.3	9.5 — 16.5
Starter motor bolt	4 — 7	0.4 — 0.7	3.0 — 5.0
Oil pan bolt	6 — 10	0.6 — 1.0	4.5 — 7.0
Engine mounting bolt (10 mm)	35	3.5	25.5
Engine mounting bolt (12 mm)	45 — 70	4.5 — 7.0	32.5 — 50.5
Starter clutch bolt	15 — 20	1.5 — 2.0	11.0 — 14.5
Camshaft sprocket bolt	6 — 10	0.6 — 1.0	4.5 — 7.0
Cam chain guide bolt No. 4	4 — 7	0.4 — 0.7	3.0 — 5.0
Cam chain tensioner bolt	9 — 14	0.9 — 1.4	6.5 — 10.0
Cam chain tensioner adjuster bolt	4 — 7	0.4 — 0.7	3.0 — 5.0
Exhaust pipe bolt	9 — 14	0.9 — 1.4	6.5 — 10.0
Muffler bolt	18 — 28	1.8 — 2.8	13.0 — 20.0
Pressure switch housing bolt	6 — 9	0.6 — 0.9	4.5 — 6.0
Clutch spring bolt	8 — 12	0.8 — 1.2	6.0 — 8.5
Clutch sleeve hub nut	50 — 70	5.0 — 7.0	36.0 — 50.5
Clutch release arm bolt	6 — 10	0.6 — 1.0	4.5 — 7.0
Gear shifting cam stopper spring holder bolt	18 — 28	1.8 — 2.8	13.0 — 20.0
Gear shift arm stopper	15 — 22	1.5 — 2.2	11.0 — 16.0
Gear shift lever bolt	13 — 23	1.3 — 2.3	9.5 — 16.5
Generator rotor bolt	90 — 100	9.0 — 10.0	65.0 — 72.5
Secondary drive gear nut	120 — 150	12.0 — 15.0	87.0 — 108.5
Secondary driven gear nut	90 — 110	9.0 — 11.0	65.0 — 79.5
Secondary drive housing bolt	20 — 26	2.0 — 2.6	14.5 — 19.0
Secondary driven housing bolt	20 — 26	2.0 — 2.6	14.5 — 19.0

TORQUE TABLE

ENGINE

Item	N•m	kg•m	lb•ft
Camshaft holder bolt	8 — 12	0.8 — 1.2	6.0 — 8.5
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Muffler bolt	18 — 28	1.8 — 2.8	13.0 — 20.0
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Clutch spring bolt	8 — 12	0.8 — 1.2	6.0 — 8.5
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Clutch release arm bolt	6 — 10	0.6 — 1.0	4.5 — 7.0
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Secondary drive housing bolt	20 — 26	2.0 — 2.6	14.5 — 19.0
Secondary driven housing bolt	20 — 26	2.0 — 2.6	14.5 — 19.0

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	25	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

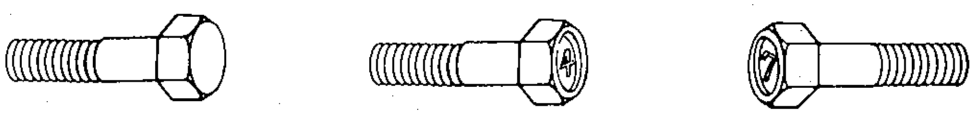
Unit: W(cp)

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)

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

TIGHTENING TORQUE

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



Conventional Bolt "4" Marked Bolt "7" Marked Bolt

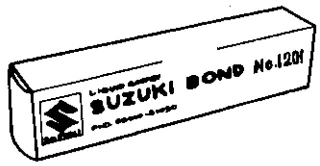
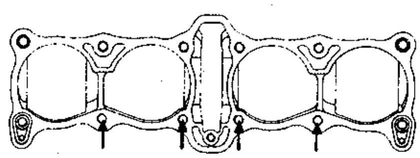
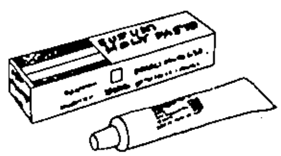
CHASSIS

Item	N·m	kg·m	lb·ft
Handlebar clamp bolt	12 — 20	1.2 — 2.0	8.5 — 14.5
Steering stem upper clamp bolt	15 — 25	1.5 — 2.5	11.0 — 18.0
Front fork upper bracket bolt (R, L)	20 — 30	2.0 — 3.0	14.5 — 21.5
Front fork lower bracket bolt (R, L)	15 — 25	1.5 — 2.5	11.0 — 18.0
Steering stem head nut	35 — 50	3.5 — 5.0	25.5 — 36.0
Front fork axle holder nut	15 — 25	1.5 — 2.5	11.0 — 18.0
Front axle shaft nut	36 — 52	3.6 — 5.2	26.0 — 37.5
Swining arm pivot bolt	3.5 — 4.5	0.35 — 0.45	2.5 — 3.0
Swining arm pivot nut	110 — 130	11.0 — 13.0	79.5 — 94.0
Rear torque link nut	20 — 30	2.0 — 3.0	14.5 — 21.5
Rear axle nut	50 — 80	5.0 — 8.0	36.0 — 58.0
Rear shock absorber nut	20 — 30	2.0 — 3.0	14.5 — 21.5
Footrest bolt	27 — 43	2.7 — 4.3	19.5 — 31.0
Front brake caliper mounting bolt	25 — 40	2.5 — 4.0	18.0 — 29.0
Front and rear brake disc plate bolt	15 — 25	1.5 — 2.5	11.0 — 18.0
Front brake caliper axle bolt	15 — 20	1.5 — 2.0	11.0 — 14.5
Front brake master cylinder mounting bolt	5 — 8	0.5 — 0.8	3.5 — 6.0
Front and rear brake hose union bolt	13 — 18	1.3 — 1.8	9.5 — 13.0
Front and rear brake oil bleeder bolt	6 — 9	0.6 — 0.9	4.5 — 6.5
Rear brake caliper mounting bolt	20 — 30	2.0 — 3.0	14.5 — 21.5
Rear brake caliper axle bolt	25 — 35	2.5 — 3.5	18.0 — 25.5
Rear brake master cylinder mounting bolt	15 — 25	1.5 — 2.5	11.0 — 18.0
Final drive gear nut	90 — 110	9.0 — 11.0	65.0 — 79.5
Final drive gear housing nut	35 — 45	3.5 — 4.5	25.5 — 32.5
Final bevel gear bearing holder screw	8 — 10	0.8 — 1.0	6.0 — 7.0
Propeller shaft bolt	25 — 30	2.5 — 3.0	18.0 — 21.5
Final gear bearing case bolt	20 — 26	2.0 — 2.6	14.5 — 19.0
Final gear case shock mount stud bolt	90 — 110	9.0 — 11.0	65.0 — 79.5
Final case oil filler plug	20 — 30	2.0 — 3.0	14.5 — 21.5
Final case oil drain plug	20 — 30	2.0 — 3.0	14.5 — 21.5

SPECIAL MATERIALS

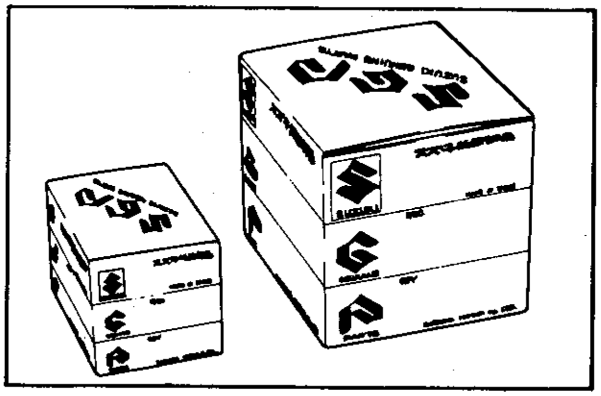
The materials listed below are needed for maintenance work on the GS1000G, and should be kept on hand for ready use. They supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them are described in the text of this manual.

Material	Part
①  99000-32040 THREAD LOCK CEMENT	* Oil filter cover nut .... 3 pcs * Camshaft end cap screw .... 8 pcs * Front fork allen bolt .... 2 pcs * Carburetor adjuster bracket screw .... 2 pcs * Carburetor plate screw .... 8 pcs * Carburetor starter shaft screw .... 4 pcs
②  99104-32050 THREAD LOCK "1363C"	* Gearshift cam guide screw .... 2 pcs * Gearshift pawl screw .... 2 pcs * Gearshift arm stopper .... 1 pc * Counter shaft B/G retainer screw .... 3 pcs * Drive shaft plate screw .... 4 pcs * Generator startor screw .... 3 pcs * Generator lead wire guide screw .... 3 pcs * Engine oil pump screw .... 4 pcs * Oil gallery plate screw .... 3 pcs * Secondary drive bevel gear assy set bolt .... 4 pcs * Secondary driven bevel gear assy set bolt .... 4 pcs * Final bevel gear bearing holder screw .... 3 pcs * Final bearing case bolt .... 10 pcs
③  99104-32020 THREAD LOCK SUPER "1361A"	* Cam sprocket bolt .... 4 pcs * Thread portion of secondary driven gear .... 1 pc * Thread portion of Final drive gear .... 1 pc * Propeller shaft joint bolt .... 4 pcs * Starter clutch allen bolt .... 3 pcs * Cam chain guide bolt .... 3 pcs * Gearshift stopper .... 1 pc
④  99104-32090 THREAD LOCK SUPER "1332B"	* Generator rotor bolt .... 1 pc
⑤  99104-32030 SUZUKI THREAD LOCK SUPER "1363A"	* Driveshaft spacer .... 1 pc * Final gear case shock mount stud bolt .... 1 pc * Final gear case stud bolt .... 3 pcs

Material	Part
⑥  99104-31100 SUZUKI BOND No. 1201	* Mating surfaces of upper and lower crank case. * Final gar case * Joint portion of rear swinging arm and final gear case. * Cylinder stud bolt .... 4 pcs (Apply a small quantity to the threads of cylinder stud bolts.) Front  Rear
⑦  99000-25100 SUZUKI SILICONE GREASE	* Apply to caliper axle shaft
⑧  99000-25140 SUZUKI MOLY PASTE	* Valve stem * Cam shaft * Chain tensioner adjuster shaft * Counter shaft washer * Outer counter shaft * Input cam dog

USE OF GENUINE SUZUKI PARTS

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



PERIODIC MAINTENANCE

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 enhance the reliability and performance of the motorcycle.

> **NOTE:**
> More frequent servicing may be performed on motorcycles that are used under extreme service comditions, however, it is not necessary to ensure emission level compliance.

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

PEPIODIC MAINTENANCE SCHEDULE

INTERVAL: This interval should be judged by odometer reading or months whichever comes first						
	Mile	600	4000	7500	11000	15000
	km	1000	6000	12000	18000	24000
	Month	2	12	24	36	48
Battery (specific gravity of electrolyte)		—	I	I	I	I
Cylinder head nuts and exhaust pipe bolts		T	T	T	T	T
Air cleaner element		—	C	C	C	C
Tappet clearance		I	I	I	I	I
Spark plugs		—	C	R	C	R
Fuel line		Replace every two years				
Engine oil and oil filter		R	R	R	R	R
Carburetor idle rpm		I	I	I	I	I
Clutch		I	I	I	I	I
Secondary and Final Gear oil		Change oil at initial 600 miles (1 000 km) and thereafter every 7 500 miles (12 000 km).				
Brake hoses		Replace every two years				
Brakes		I	I	I	I	I
Tires		I	I	I	I	I
Steering stem		I	I	I	I	I
Chassis bolts and nuts		T	T	T	T	T
Front fork		—	—	I	—	I
		Check air pressure every 6 months				

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

EMISSION CONTROL AND REGULATIONS

EMISSION REGULATIONS

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

1980 EMISSION LIMITS

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

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

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

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

EMISSION CONTROL CARBURETOR COMPONENTS

GS1000G 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 mixutre 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 GS1000G are as follows.

Carburetor I.D. No.	Main Jet	Needle Jet	Jet Needle	Pilot Jet	Pilot Screw
49150	#115	X-6	5D50	#40	PRE-SET DO NOT ADJUST

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

GENERAL EMISSION INFORMATION

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

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

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

Hydrocarbons (HC)
Carbon Monoxide (CO)

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

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

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

Carbon Monoxide

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

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

Carburetion Malfunction

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

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

Ignition System Malfunctions

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

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

Mixture-related Malfunctions

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

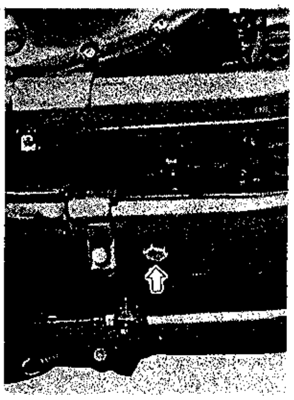
Engine wear or damage can also cause high HC emissions.

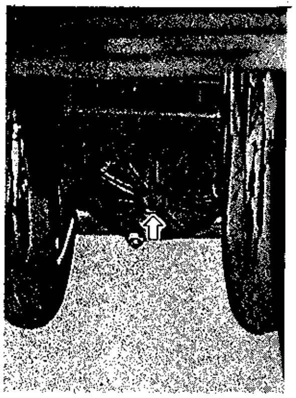
1. Rings — Low compression, leakage into crankcase.
2. Valves — Improper adjustment, bent stem or burnt.
3. Gaskets — Leaking, loss of compression.
4. Crank Seals — Leaking.
5. Oil Consumption — Worn valve guides, worn rings, clogged crankcase breather.
6. Oil — Improper engine oil.

ENGINE REMOVAL AND REMOUNTING

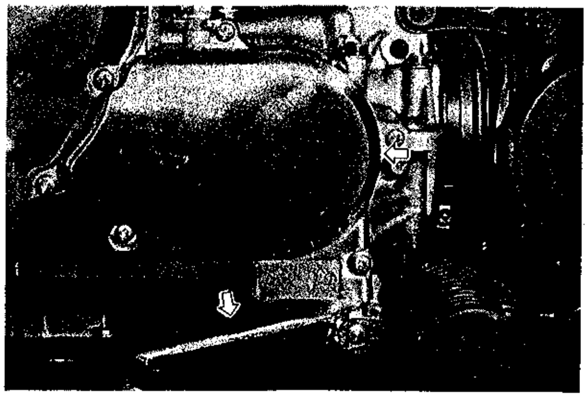
REMOVAL

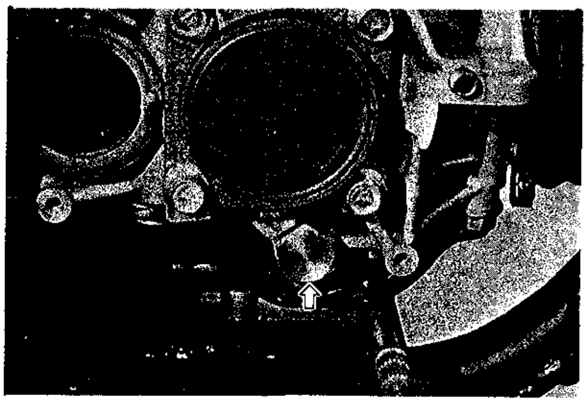
- Place an oil pan under the engine and remove the engine oil drain plug and oil filter cap to drain off engine oil.



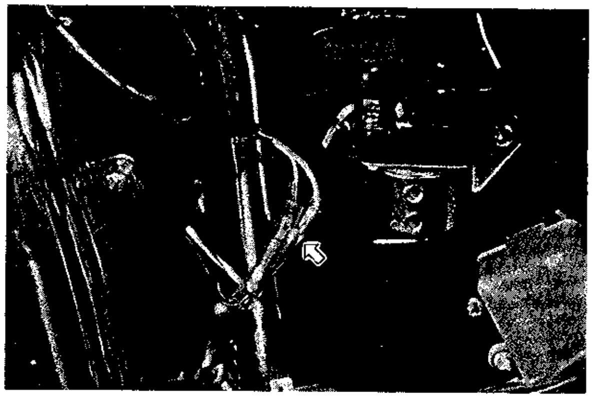


- Place an oil pan under the secondary drive drain plug and remove the gear shifting lever and secondary drive unit cover. Next, remove the drain plug and drain off the secondary gear oil.

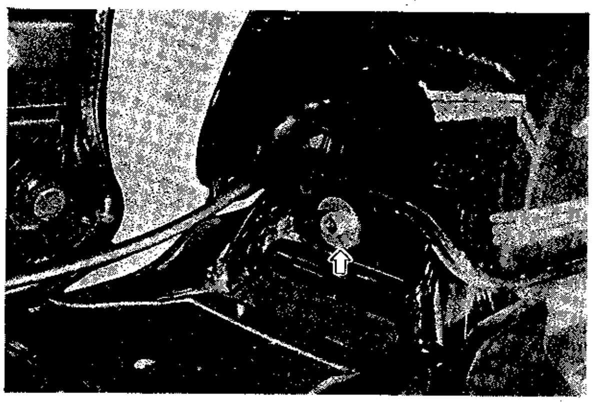




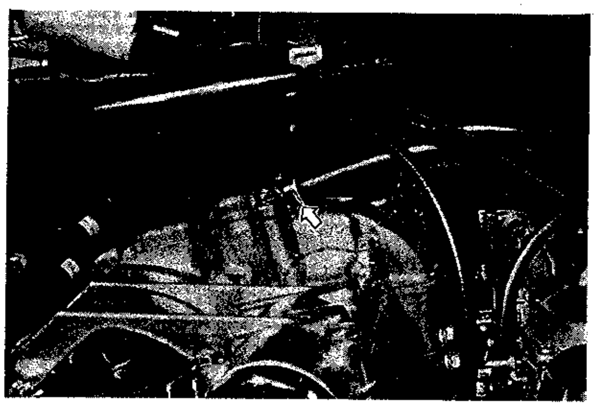
- Set the fuel cock lever to the "ON" or "RES" position and shift the fuel pipe clip sideways to remove the two hoses from the fuel cock.
- Remove the lead wire of fuel meter sensor located at the lower left side of the fuel tank.



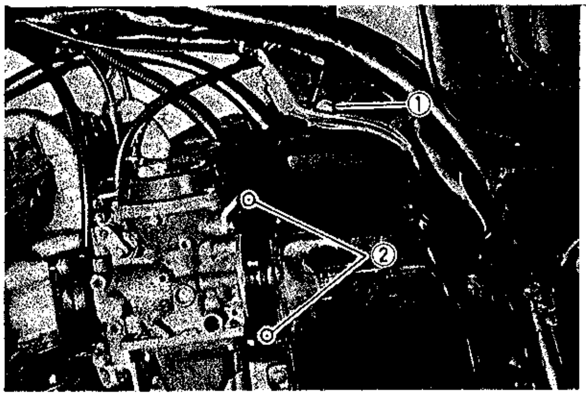
- Open the seat and remove the bolt at the rear of the fuel tank. Remove the tank rearwards.



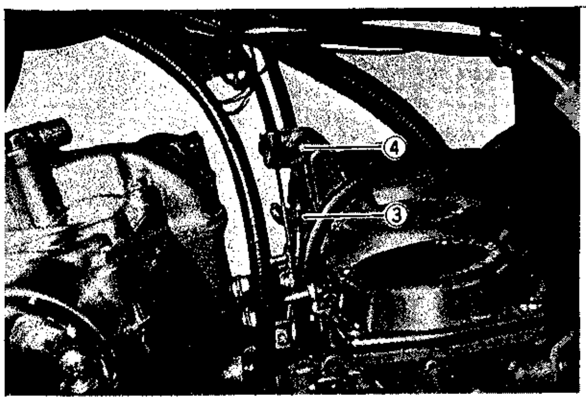
- Move the intake pipe clamp off position and disconnect the intake pipe from the breather cover.



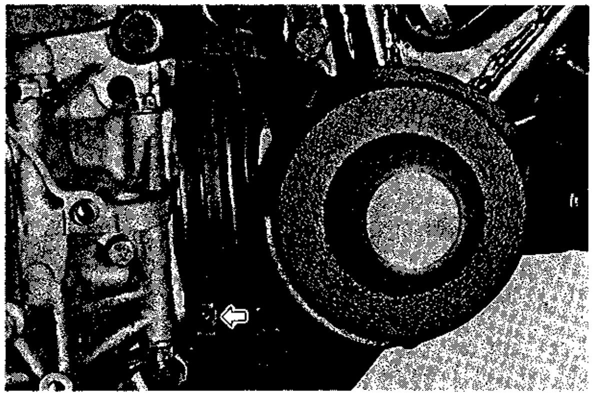
- Remove the left and right frame side covers.
- First of all, remove the battery ⊖ terminal, then remove ⊕ terminal.
- Remove the connectors from various lead wires.
  - AC generator lead wire.
  - Starter relay ⊖ terminal.
  - Signal generator lead wire.
  - Gear position lead wire.
  - Oil pressure gauge lead wire.
  - Plug cords.
- Remove the right and left bolts ① securing the air cleaner body to the frame.
- Loosen the four air cleaner clamp screws ②, move the air cleaner a little rearward, and remove it from the carburetor. Next, remove the air cleaner to the right.



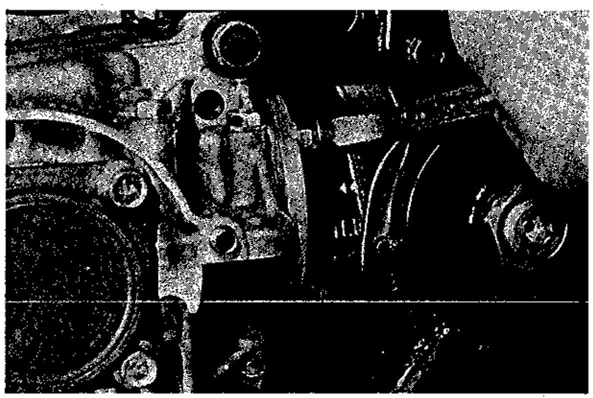
- Loosen the throttle cable lock nut ③, and remove both inner and outer cables from the carburetor lever.
- Loosen the starter cable mounting bolt ④, and remove both inner and outer cables from the carburetor.



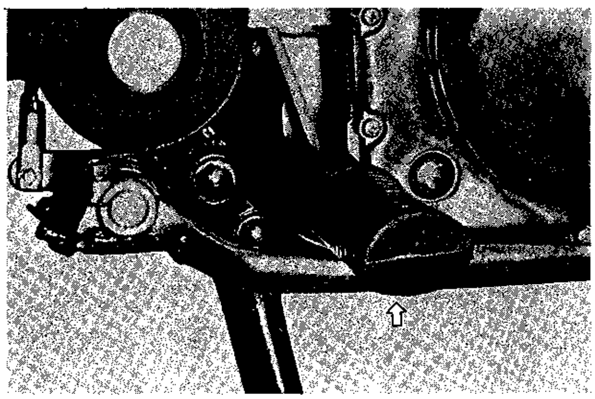
- Loosen the clamps for the intake manifolds and remove the carburetors by pulling toward the rear.
- Loosen the clamp screw securing the propeller shaft boot, and move the propeller shaft boot rearward.



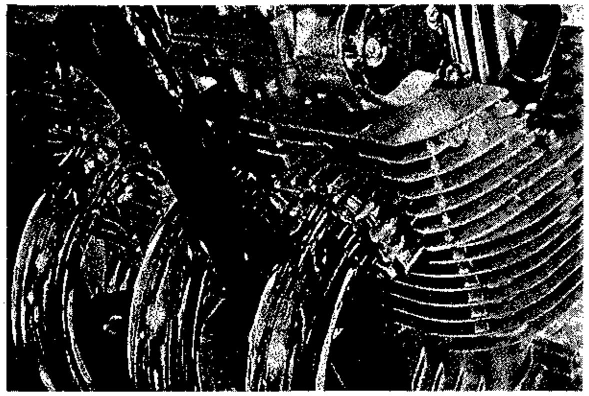
- Remove the four bolts securing the universaljoint flange and propeller shaft.



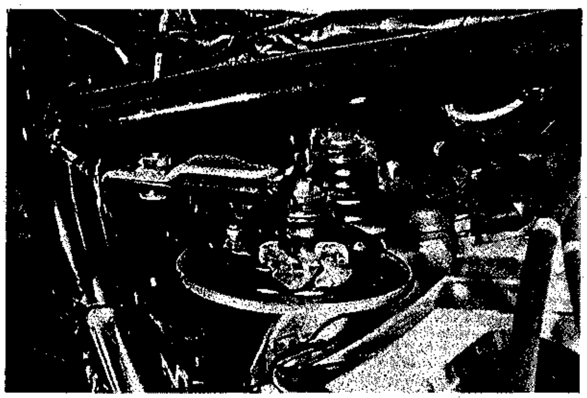
- Remove the brake pedal mounting bolt. Next, move the pedal return spring off the peg, and remove the pedal.
- Remove the right footrest.



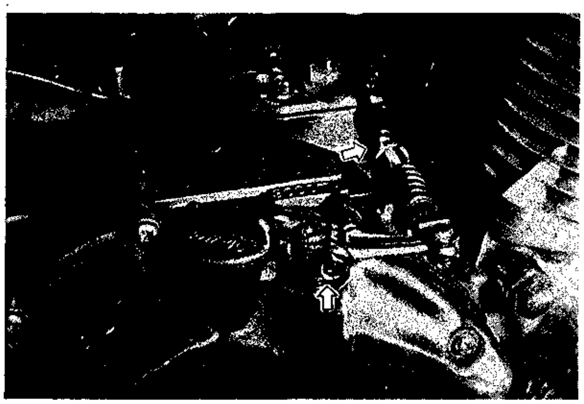
• Remove the exhaust bolts, remove the right and left muffler mounting bolts, and loosen the exhaust coupller bolt and remove the mufflers.



• Remove the lead wires and mounting bolts of the horn mounting brackets, then remove the assembly.

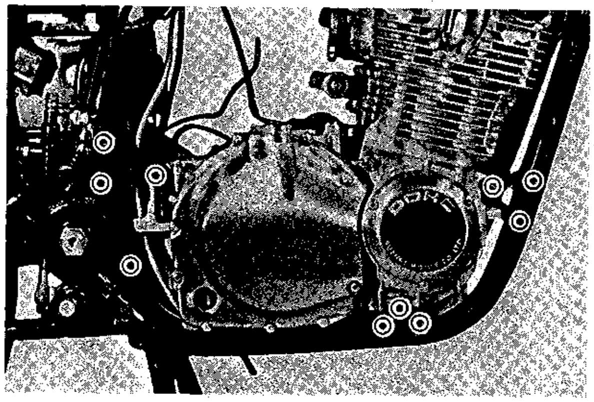


• Fully loosen the clutch cable lock nut and adjuster bolts on the engine side. Then loosen the clutch release arm bolt and remove the clutch release arm by lifting it upward.

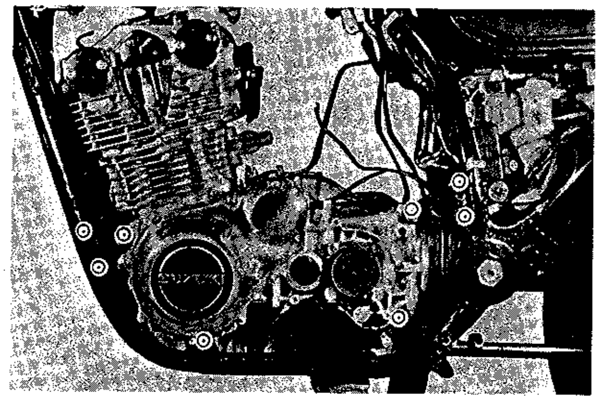


• Remove all of the bolt — on engine mounting brackets.

Right side

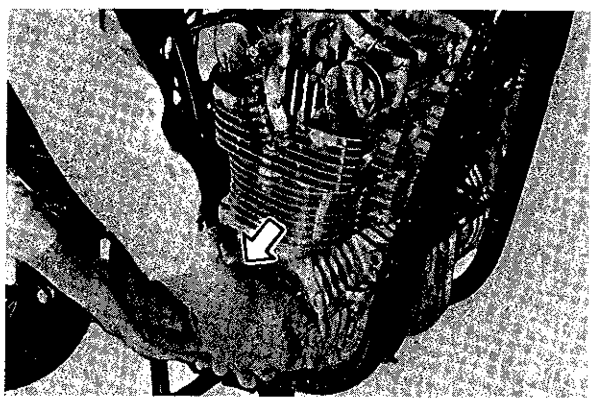


Left side



• Support the weight of engine with a jack or stand and remove the engine mounting bolts and nuts.

• Lift the engine up and out the right side of the frame: be careful not to scar the upper or lower frame tubes.



REMOUNTING

For remounting, reverse the order of engine removal.

> *NOTE:*
> *When remounting the engine assembly, be carefull not to damage the drive shaft rubber boot.*

- Temporarily fasten the engine mounting bracket before inserting the engine mounting bolts.
- After inserting the engine mounting bolts, tighten engine mounting bracket bolts and engine mounting bolts. Insert all three long bolts from the left side.

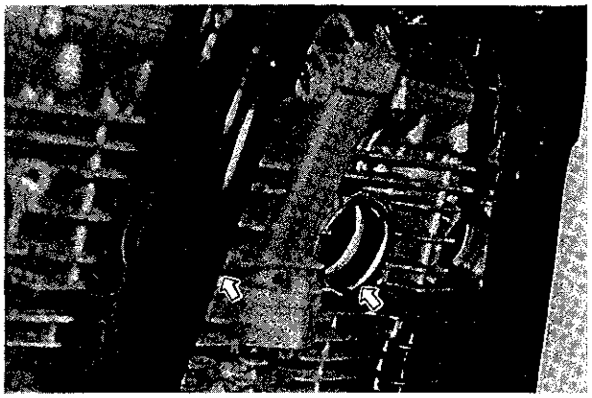
Tightening torque for engine mounting bolts	
10 mm Dia.	35 N·m 3.5 kg·m 25.5 lb·ft
12 mm Dia.	45 – 70 N·m 4.5 – 7.0 kg·m 32.5 – 50.5 lb·ft

- Secure the universal joint flange and propeller shaft with four bolts at four places. Be sure to apply SUZUKI LOCK SUPER "1361A" to the bolts.

Bolt tightening torque:	25 – 30 N·m 2.5 – 3.0 kg·m 18.0 – 21.5 lb·ft

- Install the propeller shaft boot with the clamp (front side) and spring (rear side).
- Firmly secure the carburetor with the clamps. If the carburetor is not firmly scured, gas leakage, incorrect air-fuel ratio and unsatisfactory engine operation may result.
- Firmly secure the air cleaner.
- Install the exhaust pipe and muffler.

> *NOTE:*
> *When installing the exhaust pipe, do not forget to install exhaust pipe plates at the two middle exhaust pipe installing portions.*



- Before tightening the exhaust pipe bolts, install both right and left muffler mounting bolts loosely.
- After tightening the exhaust pipe bolts, tighten both right and left muffler mounting bolts.

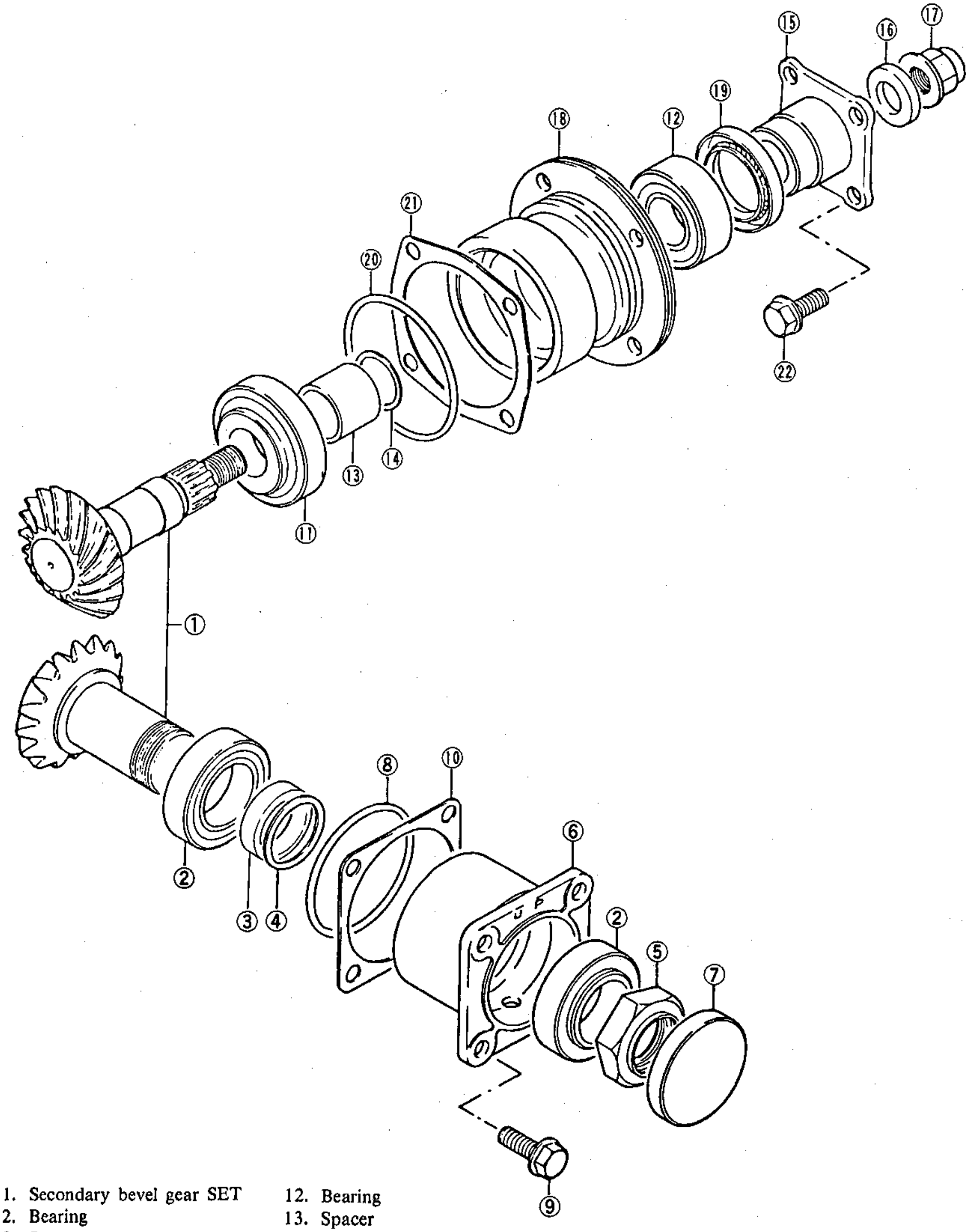
Exhaust pipe bolt tightening torque:	9 – 14 N·m 0.9 – 1.4 kg·m 6.5 – 10.0 lb·ft

Muffler bolt tightening torque:	18 – 28 N·m 1.8 – 2.8 kg·m 13.0 – 20.0 lb·ft

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

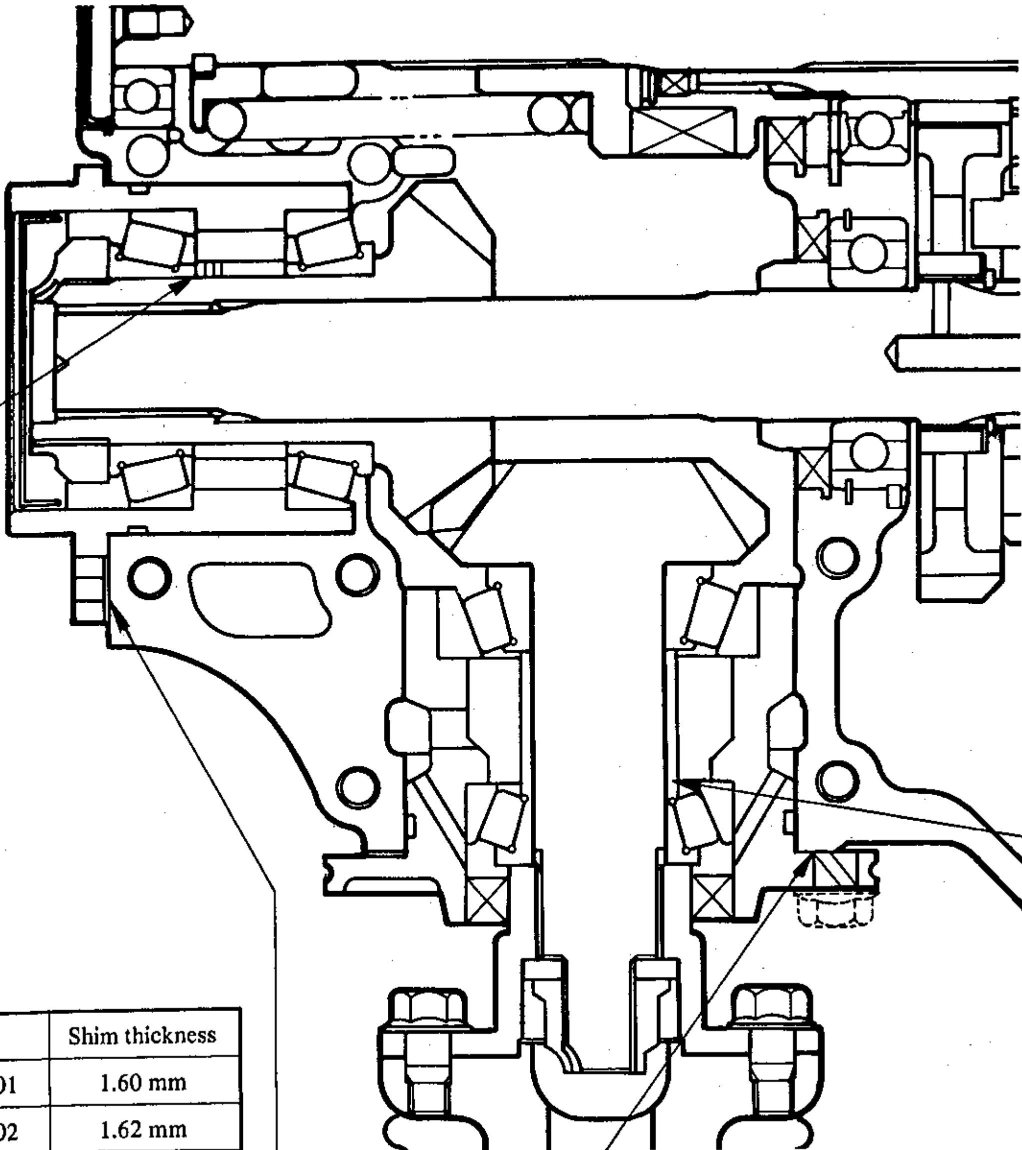
- After remounting the engine, adjust the rear brake pedal, brake light switch, clutch and throttle cable.
- Before starting the engine, make sure the amount of oil required, according to the type of work done, has been put in. Refer to page 14 for quantities.

SECONDARY BEVEL GEAR ASSEMBLY



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

Tightening torque			
	N•m	kg•m	lb•ft
⑤	120 – 150	12.0 – 15.0	87.0 – 108.5
⑨	20 – 26	2.0 – 2.6	14.5 – 19.0
⑰	90 – 110	9.0 – 11.0	65.0 – 79.5
㉒	20 – 26	2.0 – 2.6	14.5 – 19.0



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

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

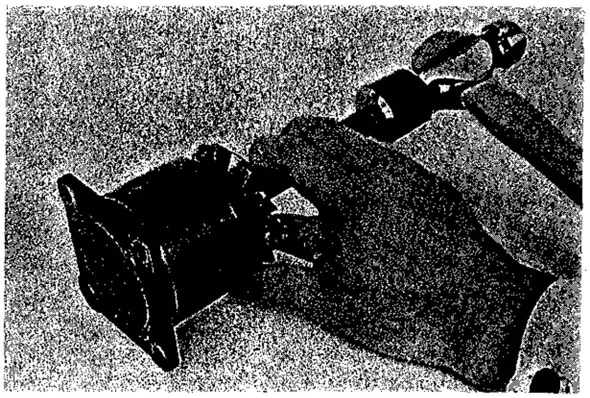
Part No.	Shim thickness
24945-45100	0.35 mm
24945-45102	0.40 mm
24945-45103	0.50 mm
24945-45104	0.60 mm

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

SECONDARY DRIVE GEAR ASSEMBLY

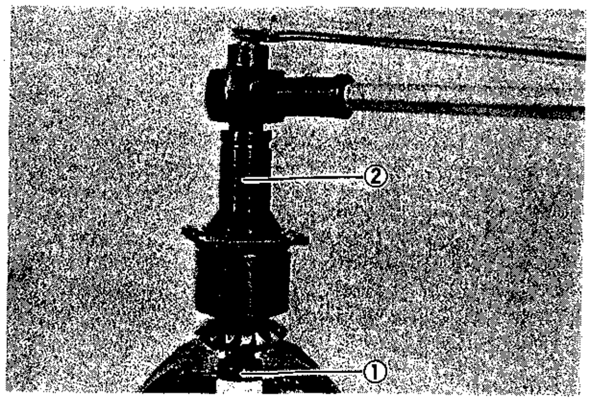
REMOVAL AND DISASSEMBLY

- Remove the secondary unit cover; remove drain plug and drain oil into a pan.
- Remove the four mounting bolts and remove the secondary drive gear housing from the crankcase.
- Using a drift, knock the plug out of the housing

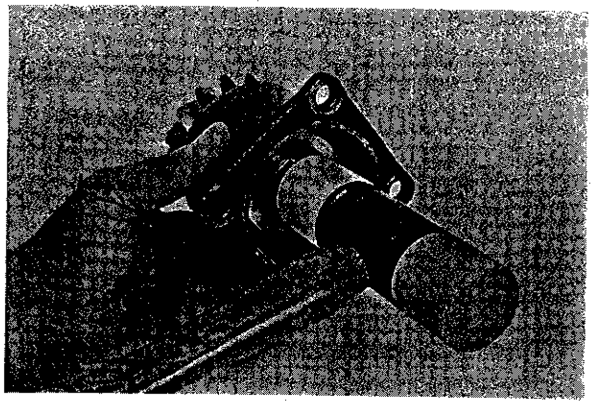


- Straighten the bent area of the nut. Use special tool ① to lock the drive gear, and special tool ② to remove the nut.

①	Secondary drive bevel gear holder	09924-54510
②	41 mm socket wrench	09910-23710

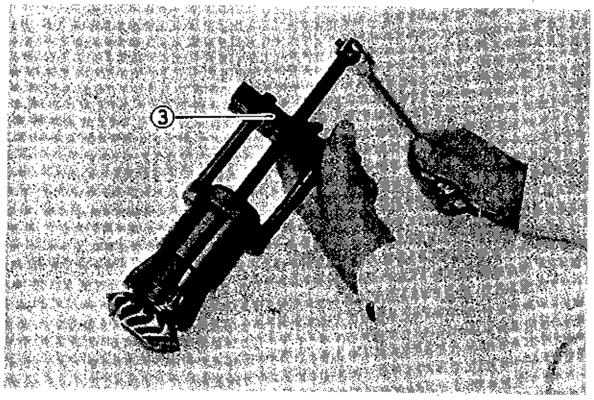


- Tap the drive gear with a plastic hammer to remove it from the housing.



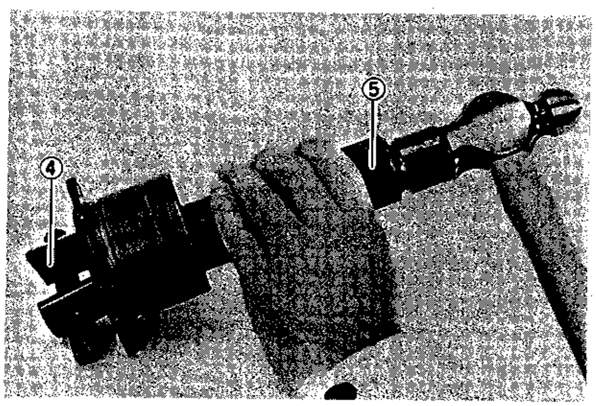
- Remove the shims from the drive gear shaft. Do not discard. Note the location.
- Use special tool ③ to remove the inner bearing race from drive gear.

Bearing inner race remover:	09941-84510



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

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



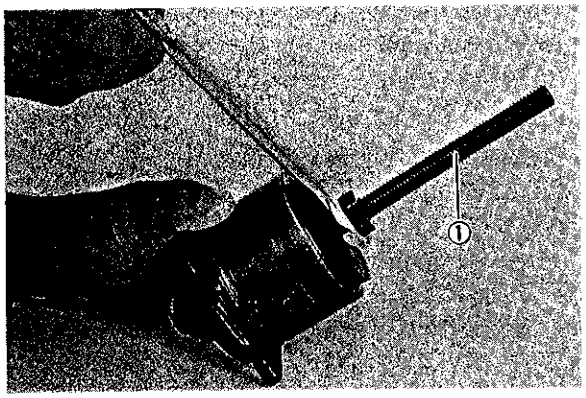
INSPECTION AND REASSEMBLY

> *NOTE:*
> *Before reassembly, clean all parts in solvent.*

> *NOTE:*
> *It will be helpful to have a selection of all shims on hand before beginning bearing preload adjustment.*

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

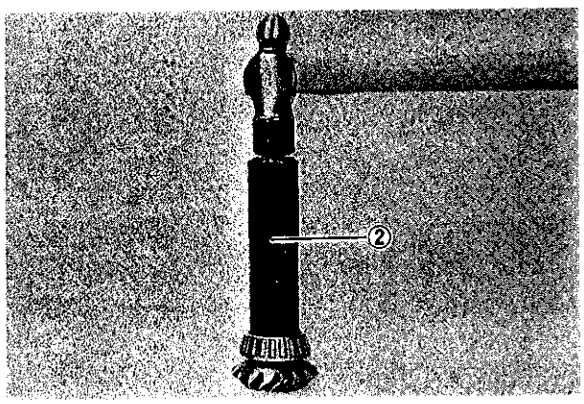
Bearing installer set:	09924-84510



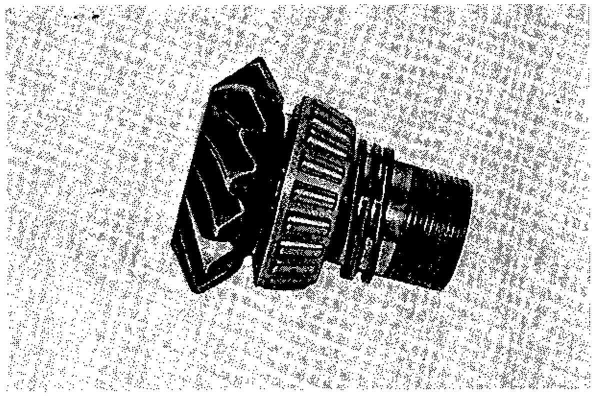
- Use special tool ② to install the inner bearing race on the drive gear shaft.

Bearing installer:	09913-84510

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



- Install all the shims, removed during disassembly, on the drive gear shaft.

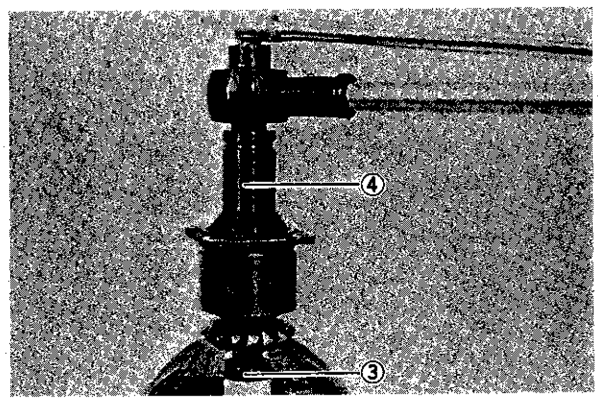


- Install the drive gear into the housing and install the other inner bearing race and nut. Oil the bearings with Hypoid gear oil.
- Use special tool ③ to lock the gear, and special tool ④ to tighten nut to specification.

③	Secondary drive bevel gear holder	09924-54510
④	41 mm socket wrench	09910-23710

> *NOTE:*
> *Always use a new nut.*

Nut tightening torque:	120 — 150 N·m 12 — 15 kg·m 87.0 — 108.5 lb·ft

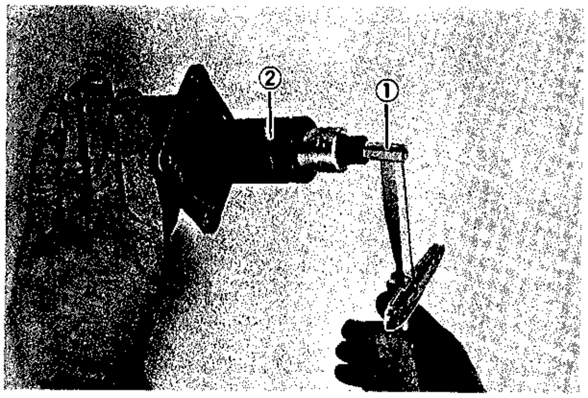


BEARING PRELOAD ADJUSTMENT

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

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

Preload	30 — 50 N•cm 3 — 5 kg•cm 2.60 — 4.35 lb•in



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

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

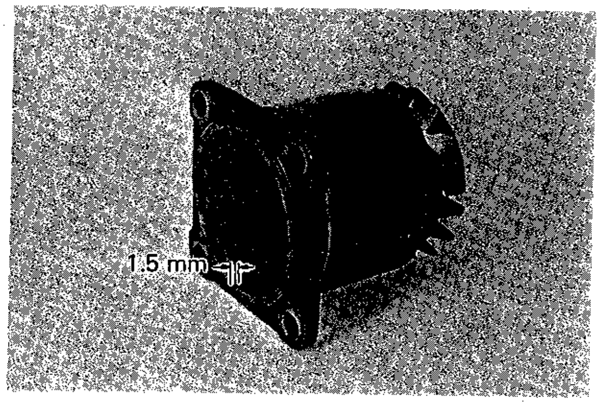
Preload	Adjustment by shim
Under 3 kg•cm	Decrease shim thickness
3 — 5 kg•cm (2.60 — 4.35 lb•in)	Correct
Over 5 kg•cm	Increase shim thickness

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

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

Nut tightening torque	120 — 150 N•m 12 — 15 kg•m 87.0 — 108.5 ft•lb

- Bend the collar of the nut over into the notch in the drive gear shaft.
- Press a new plug into the secondary drive gear housing so that it is 1.5 mm below the housing shoulder.

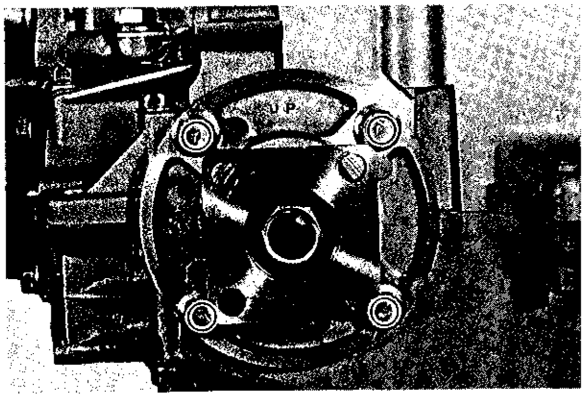


- The secondary drive gear assembly is now ready for installation into the crankcase. For backlash and tooth contact adjustments, see pages 38 and 39.

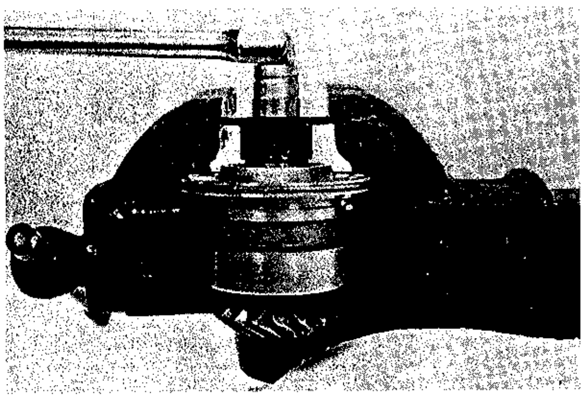
SECONDARY DRIVEN GEAR ASSEMBLY

REMOVAL AND DISASSEMBLY

- Remove engine assembly from the frame.
- Remove drive unit cover and drain secondary gear oil into a pan.
- Remove the four secondary driven gear housing bolts and remove the assembly from the crankcase.

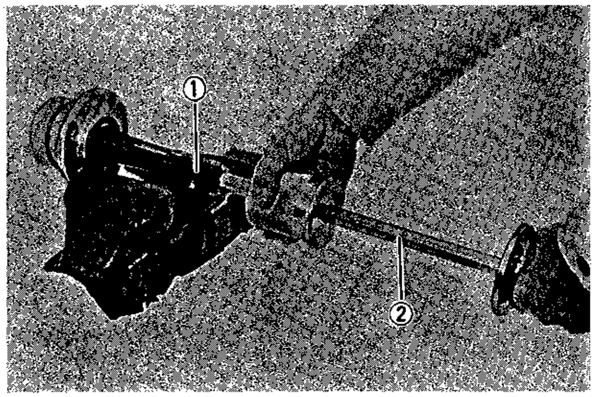


- Secure the propeller shaft flange in a vise and straighten the bent portion of the driven gear nut. Remove the nut.



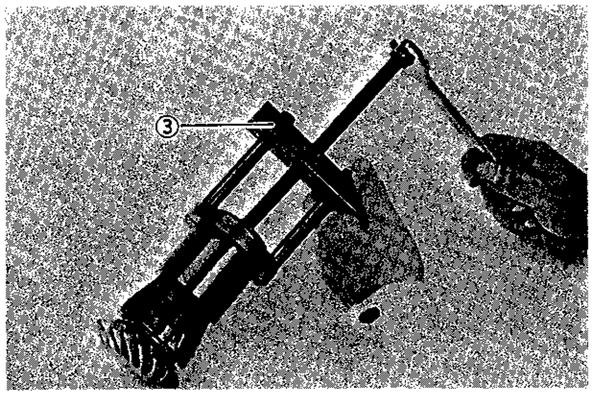
- Remove the flange from the driven gear.
- Tap the driven gear with a plastic hammer to remove it from the housing.
- To remove the oil seal from the housing, use special tools ① and ②.

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



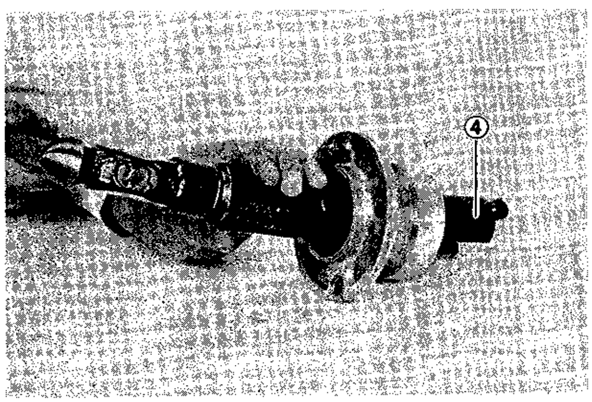
- Remove the spacer and shims from the driven gear shaft. Do not discard them.
- Use special tool ③ to remove the inner bearing race from the driven gear.

Bearing inner race remover	09941-84510



- Use special tool ④ to remove the outer bearing races from the housing.

Bearing outer race remover	09941-54911



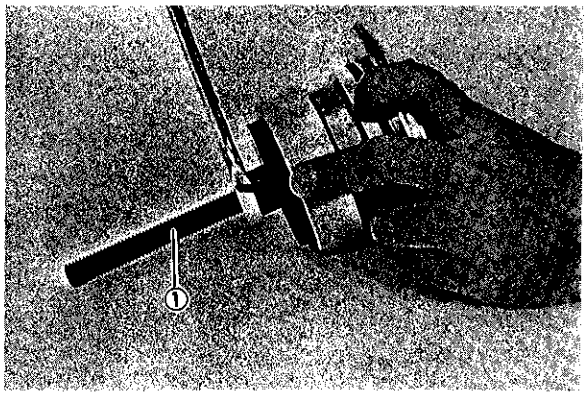
INSPECTION AND REASSEMBLY

NOTE:
Before reassembly, clean all parts in solvent.

NOTE:
It will be helpful to have a selection of all shims available for bearing preload operation.

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

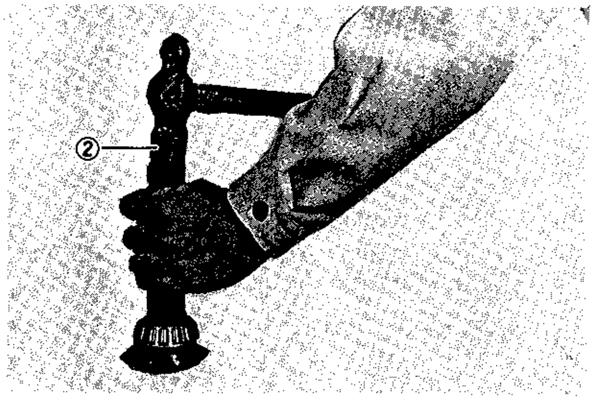
Bearing installer set	09924-84510



- Use special tool ② to install the inner bearing race onto the driven gear.

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

Drive pinion race installer	09913-80112



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

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

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

NOTE:
Always use a new nut.

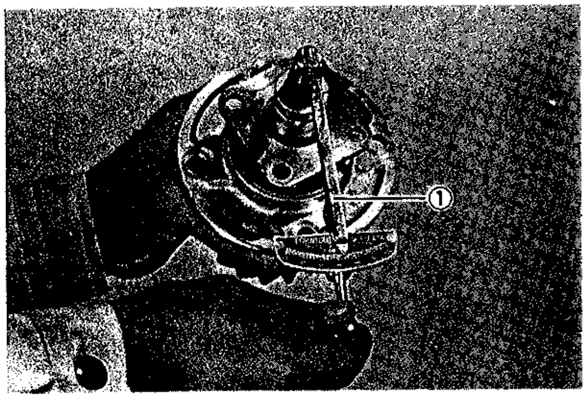
Nut tightening torque	90 – 110 N•m 9 – 11 kg•m 65.0 – 79.5 lb•ft

BEARING PRELOAD ADJUSTMENT

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

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

Preload	40 – 70 N·cm 4.0 – 7.0 kg·cm 3.45 – 6.05 lb·in



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

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

Preload	Shim Adjustment
Under 4 kg·cm	Decrease shim thickness
4 – 7 kg·cm (3.45 – 6.05 lb·in)	Correct
Over 7 kg·cm	Increase shim thickness

List of shims

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

- After the bearing preload has been adjusted to within specification, remove the driven gear nut, washer, and propeller shaft flange.
- Install a new oil seal into the secondary driven gear housing, making it flush with housing shoulder.
- Clean and degrease the driven gear shaft threads, apply a small amount of THREAD LOCK SUPER "1361A" to the threads and install the propeller shaft flange, washer, and nut.
  Tighten the nut to specification.

Thread Lock Super "1361A"	99104-32020

Nut Tightening Torque	90 – 110 N·m 9.0 – 11.0 kg·m 65 – 79.5 lb·ft

- Bend the collar of the nut over into the notch in the driven gear shaft.
- The secondary driven gear assembly is now ready for installation into the crankcase for backlash and tooth contact adjustments as shown below.

SECONDARY GEAR SET CLEARANCING OPERATIONS

BACKLASH

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

> *NOTE:*
> *No o-rings are used at this stage.*

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

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

Bolt tightening torque	20 — 26 N•m 2.0 — 2.6 kg•m 14.5 — 19.0 lb•ft

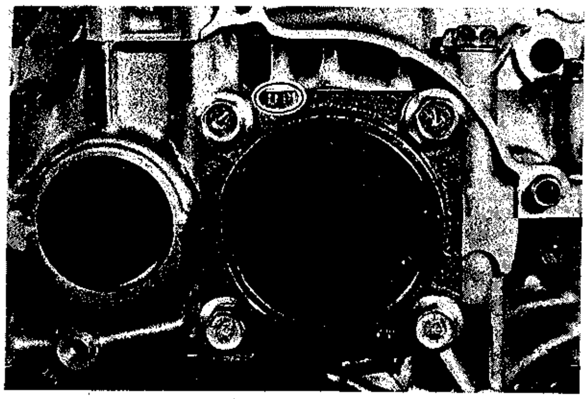


Fig. A

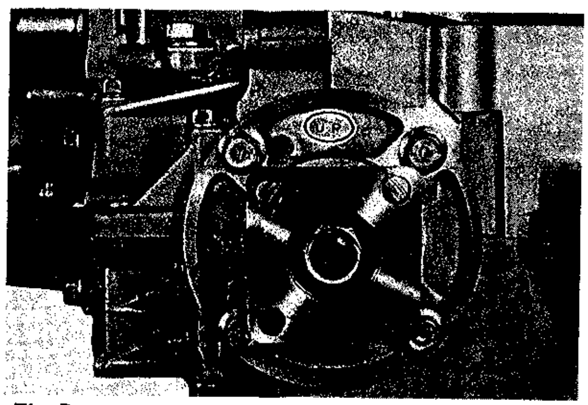
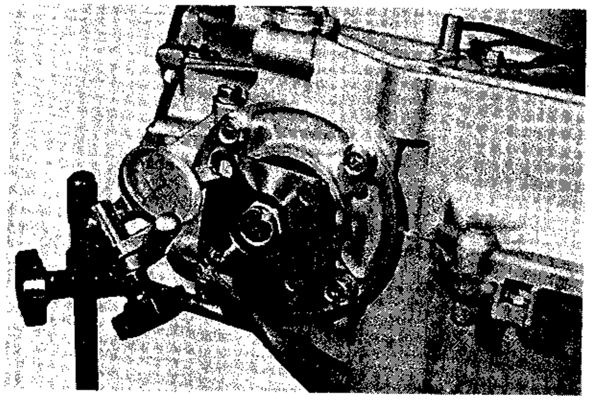


Fig. B

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

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



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

Blacklash	Shim adjustment
Under 0.08 mm	Increase shim thickness
0.08 — 0.13 mm (0.0031 — 0.0051 in)	Correct
Over 0.13 mm	Decrease shim thickness

List of Shims

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

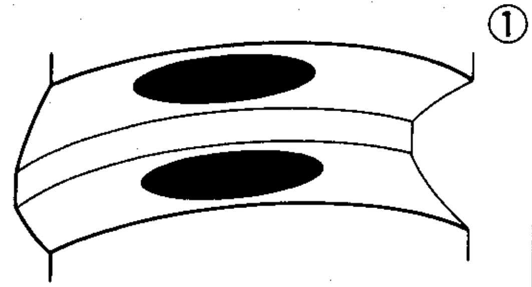
TOOTH CONTACT CHECKING

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

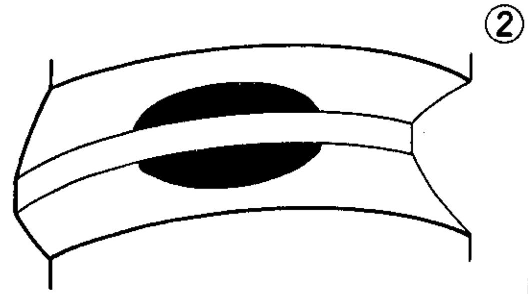
NOTE: No o-ring is used at this stage.

Bolt Tightening Torque	20 – 26 N•m 2.0 – 2.6 kg•m 14.5 – 19.0 ft•lb

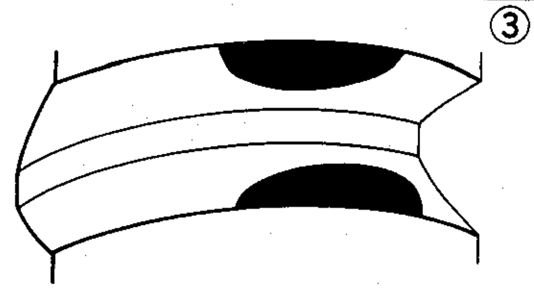
- Turn the secondary driven gear flange several turns in both directions.
- Remove the secondary driven gear housing from the crankcase, and observe the tooth contact pattern made in the dye or paste.
- Compare the tooth contact pattern to the examples as shown in ①, ②, ③.



CORRECT



INCORRECT
(CONTACT AT TOOTH TOP)



INCORRECT
(CONTACT AT TOOTH ROOF)

- If tooth contact is found to be correct, go the Final Assembly sub-section, and complete.
- If tooth contact is found to be incorrect, the shim between the secondary drive gear housing and crankcase must be changed, and tooth contact rechecked, until correct.

Tooth contact	Shim thickness
Contact at tooth top ②	Decrease shim thickness
Contact at tooth roof ③	Increase shim thickness

List of shims

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

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

FINAL ASSEMBLY

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

> *NOTE:*
> *Secondary drive and driven gear housings must be installed with the letters "UP" facing upward, as shown in Fig. A and B (page 38)*

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

Thread Lock "1363C"	99104-32050

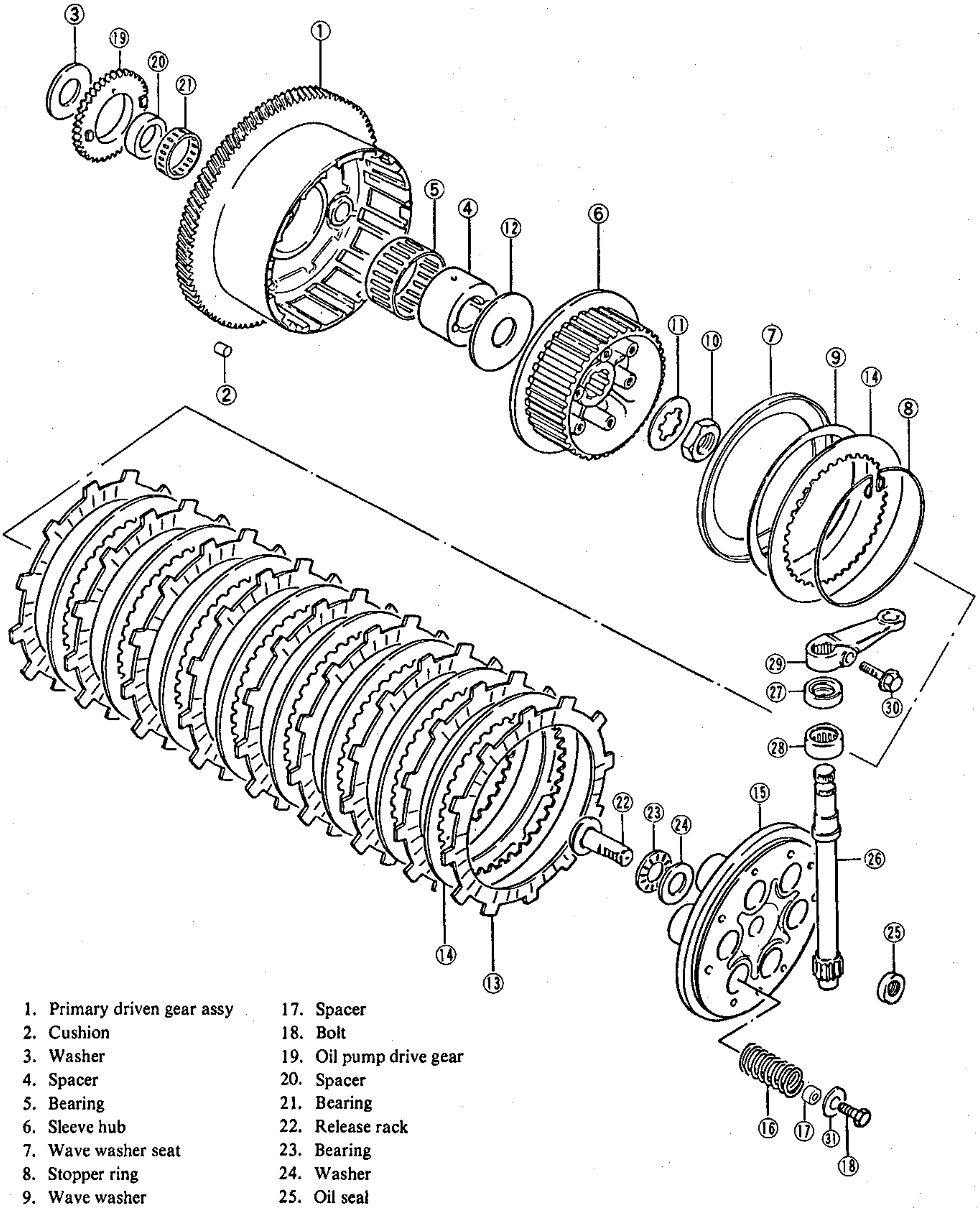
Bolt Tightening Torque	20 – 26 N·m 2.0 – 2.6 kg·m 14.5 – 19.0 ft·lb

- Reinstall secondary gear drain plug and torque to specification.

Drain Plug Torque	20 – 30 N·m 2.0 – 3.0 kg·m 14.5 – 21.5 ft·lb

- Fill the gear cavity to specified capacity, 340 – 400 ml (11.5 – 13.5 US oz) with Hypoid gear oil.
- Remounting engine assembly, see page 29.
- Reinstall secondary drive gear outer cover.

CLUTCH

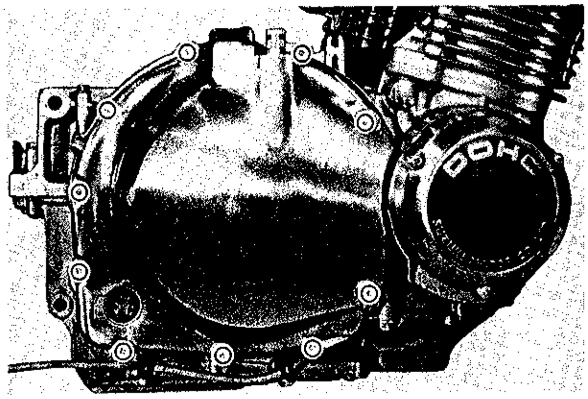


1. Primary driven gear assy
2. Cushion
3. Washer
4. Spacer
5. Bearing
6. Sleeve hub
7. Wave washer seat
8. Stopper ring
9. Wave washer
10. Nut
11. Washer
12. Washer
13. Drive plate
14. Driven plate
15. Pressure plate
16. Spring
17. Spacer
18. Bolt
19. Oil pump drive gear
20. Spacer
21. Bearing
22. Release rack
23. Bearing
24. Washer
25. Oil seal
26. Release pinion
27. Oil seal
28. Bearing
29. Release arm
30. Bolt
31. Washer

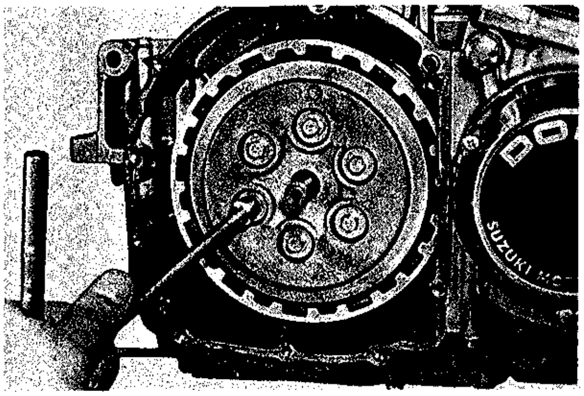
Tightening torque			
	N•m	kg•m	lb•ft
⑩	50 — 70	5.0 — 7.0	36.0 — 50.5
⑱	8 — 12	0.8 — 1.2	6.0 — 8.5
㉚	6 — 10	0.6 — 1.0	4.5 — 7.0

DISASSEMBLY

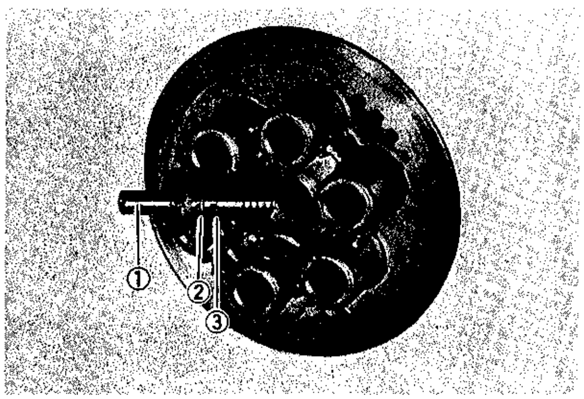
- Remove the cam lever bolts for clutch cable and clutch cover screw.



- Remove clutch cover and gasket.
- Remove clutch spring mounting bolts and remove spring, spacer and pressure plate.

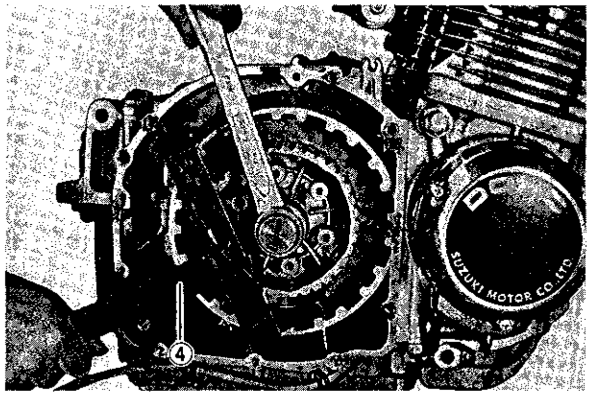


- Remove clutch release rack ①, needle bearing ② and washer ③ from pressure plate.

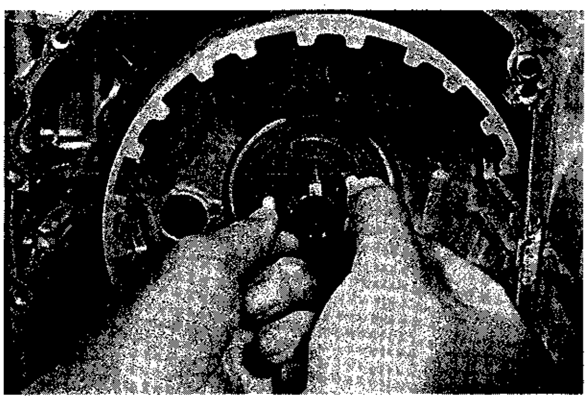


- After removal of several clutch drive and driven plates, firmly secure clutch sleeve hub to remove mounting nut with special tool ④.

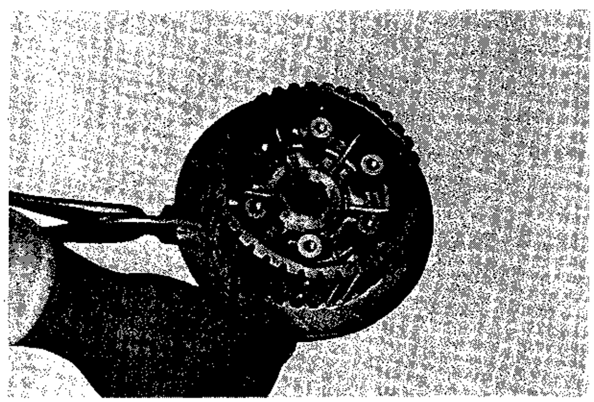
Clutch sleeve hub holder:	09920-53710



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



- Grip the driven plate with pliers and remove the piano wire clip. Next, pull out the driven plate, spring and spring seat from the driven plate, spring and spring seat from the clutch sleeve hub.

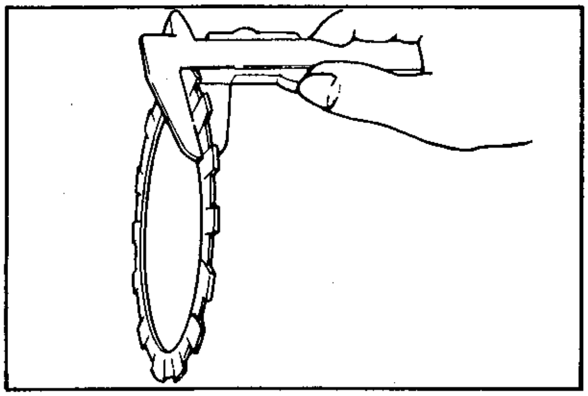


INSPECTION

DRIVE PLATE THICKNESS

Measure the thickness of each drive plate with vernier calipers. Replace drive plates found to have worn down to the limit.

Standard	Limit
2.9 – 3.1 mm (0.11 – 0.12 in)	2.6 mm (0.10 in)



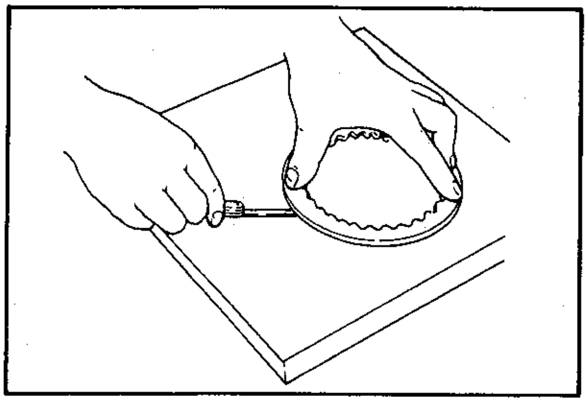
CLUTCH PLATE DISTORTION

Check driven plate for distortion by placing it on a surface plate and by inserting a thickness gauge under the plate at several places.
The distortion limit in terms of clearance specified as follows:

Driven plate distortion

Limit	0.1 mm (0.004 in)

Be sure to replace any plates exceeding this limit.

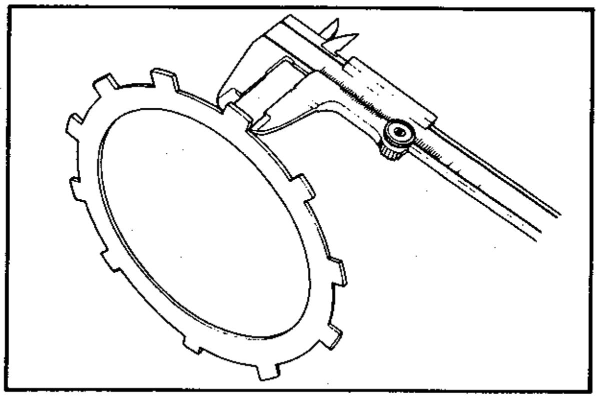


DRIVE PLATE CLAW WIDTH

Using vernier calipers, measure the drive plate claw width. If it measures less than the limit, replace the drive plate.

Drive plate claw width

Standard	Limit
15.6 – 15.8 mm (0.61 – 0.62 in)	14.8 mm (0.58 in)

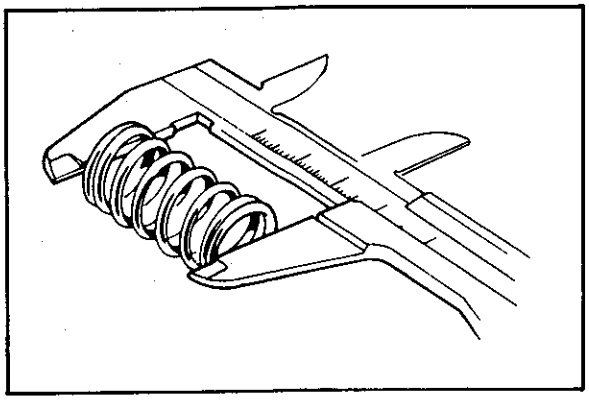


CLUTCH SPRING FREE LENGTH

Measure the free length of each coil spring with vernier calipers and compare the compressed strength of each with the specified limit. Replace any spring not within the limit.

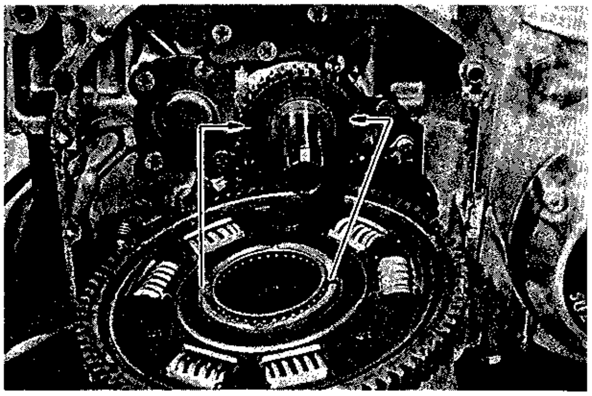
Clutch spring free length

Limit	38.5 mm (1.52 in)

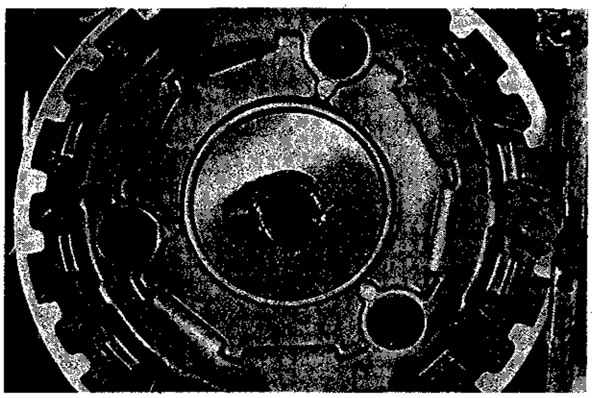


INSTALLATION

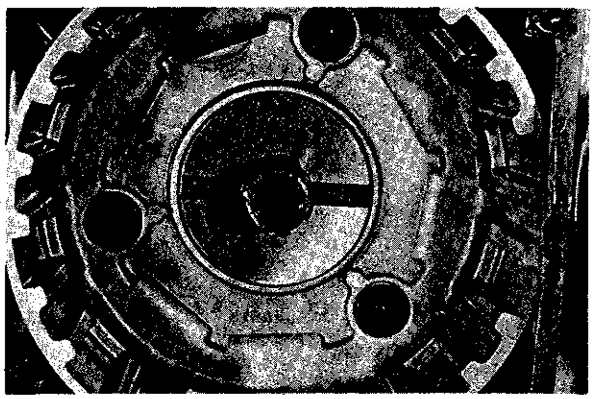
- Fit the projection of oil pump drive gear into the notch of primary driven gear and confirm both parts fit snugly while rotating primary driven gear left and right.



- After installing the oil pump drive gear and primary driven gear, apply engine oil to needle bearing and spacer to assemble the needle bearing and the spacer in the prescribed order.
- Assemble the primary driven gear and then thrust washer must be installed with the grooved side facing in.



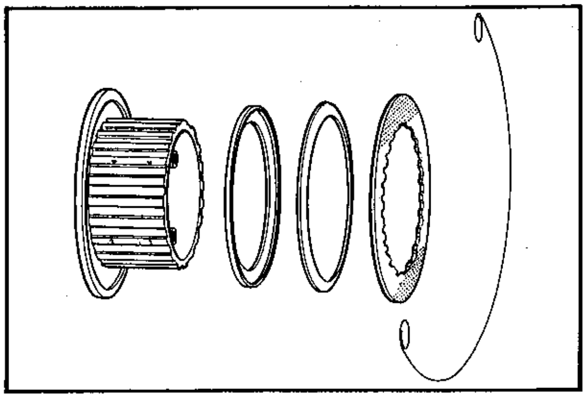
CORRECT



INCORRECT

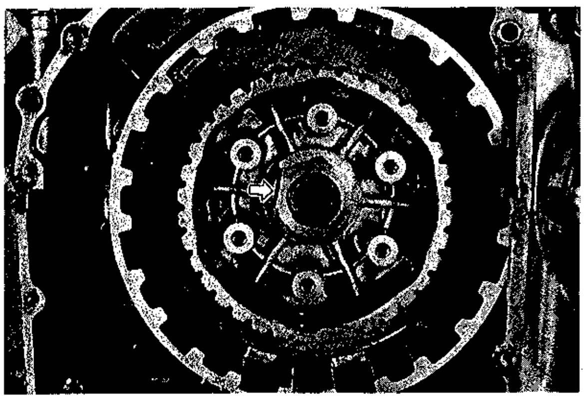
- Install the spring seat, spring and driven plate in the clutch seeve hub. Check that these three parts are positioned correctly as illustrated below.
  While holding the driven plate with pliers, install the piano wire clip.

> *NOTE:*
> *Always use a new piano wire clip.*



- 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	50 — 70 N•m 5.0 — 7.0 kg•m 36.0 — 50.5 lb•ft

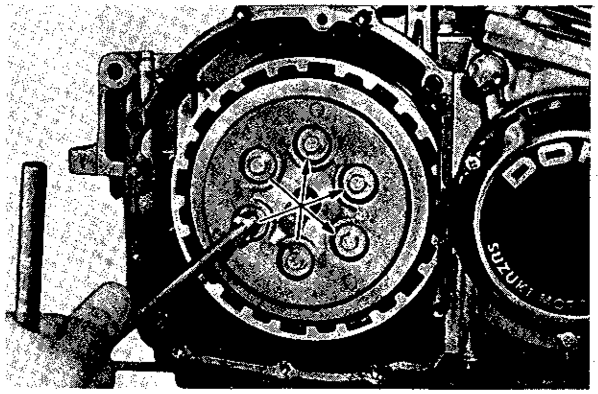


- Insert clutch drive plate and driven plate one by one into sleeve hub in the prescribed order. Insert clutch release rack, bearing and thrust washer into pressure plate, making sure that the thrust washer is between the bearing and the pressure plate, then fit pressure plate into sleeve hub.

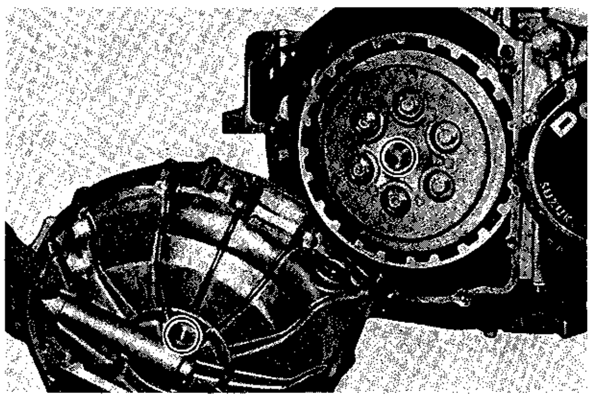
- Tighten clutch spring bolts in the order shown in the photo.

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

Clutch spring bolt tightening torque	11 — 13 N•m 1.1 — 1.3 kg•m 8.0 — 9.5 lb•ft



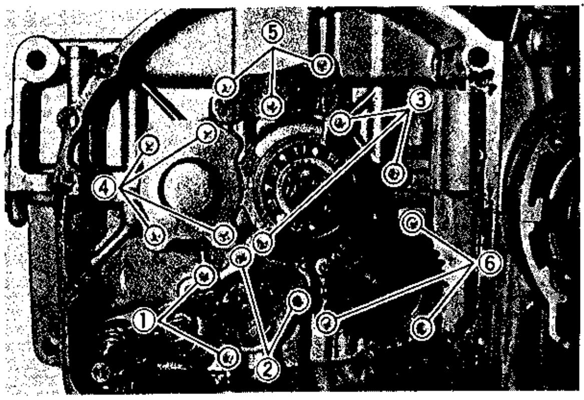
- Replace clutch cover gasket with new one to prevent oil leakage.
- Engage the teeth of clutch release rack with those of pinion gear at the clutch cover side and replace clutch cover. Make sure that the rack and pinion gear engage positively.
  To install cover, tap lightly with plastic hammer and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



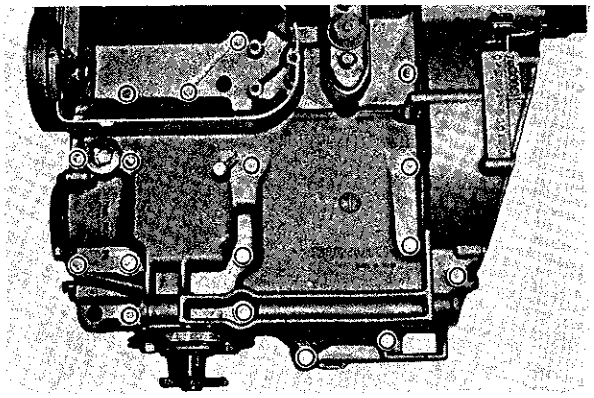
CRANKCASE

DISASSEMBLY

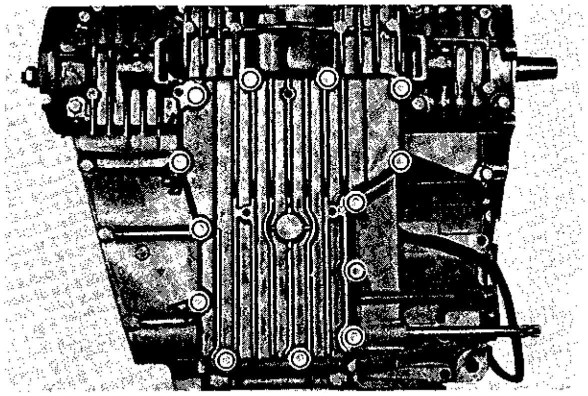
- Remove the cylinder head cover and cylinder head assembly.
- Remove the cylinder and four pistons
- Remove the clutch cover and then remove the clutch assembly.
- Remove the signal generator cover and then remove the signal generator and timing plate.
- Remove the generator cover and then generator rotor.
- Remove the starter motor.
- Gear shift cam guide screw ①
  .... 2 pcs. (overall length 12 mm)
  Gear shift pawl screw ②
  .... 2 pcs. (overall length 12 mm)
  Counter shaft B/g retainer screw ③
  .... 3 pcs. (overall length 16 mm)
  Drive shaft plate screw ④
  .... 4 pcs. (overall length 16 mm)
  Oil pump gallery plate screw ⑤
  .... 3 pcs. (overall length 16 mm)
  Oil pump mounting screw ⑥
  .... 3 pcs. (overall length 25 mm)



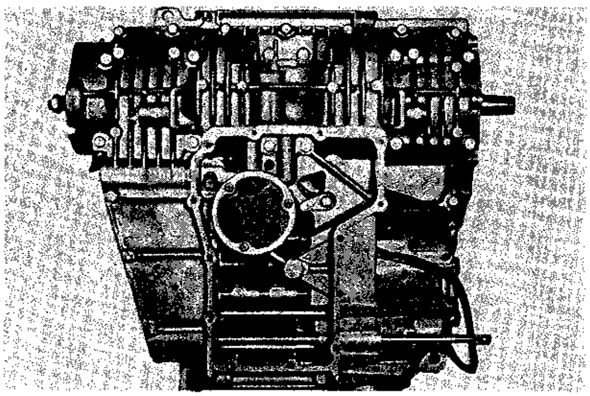
- Remove the gear shifting shaft and then cam driven gear shifting pawls No. 1 and No. 2.
- Remove oil pump
- Remove upper crankcase tightening bolts.
  6 mm bolt .... 12 pcs.
  8 mm bolt .... 5 pcs.



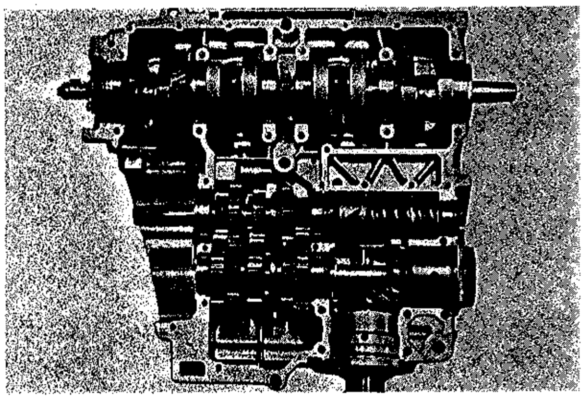
- Next turn engine upside down to remove oil pan from lower crankcase.



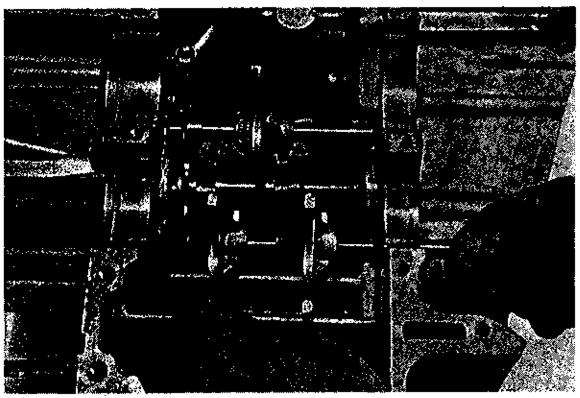
- After removal of oil pan, remove lower crankcase tightening bolts.
  6 mm bolt .... 9 pcs.
  8 mm bolt .... 12 pcs.



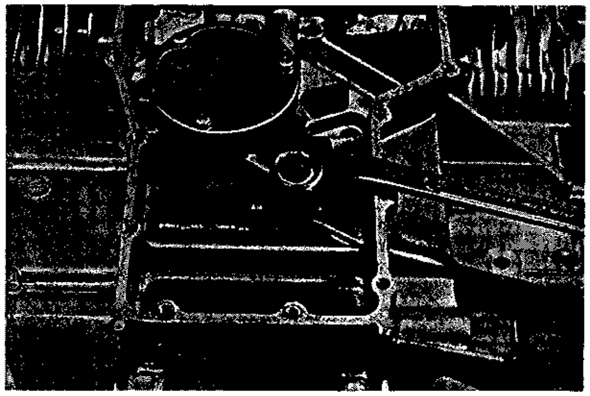
- Make sure that bolts are removed. Lightly hammer the lower crankcase side with a plastic hammer to separate the upper and lower crankcase halves and then lift the latter.
- Remove the crankshaft sub-assembly, counter shaft gear, drive shaft gear, secondary drive bevel gear and secondary driven bevel gear which are all mounted on the upper crank case.
  At this time be careful not to drop "C" rings and the like.



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

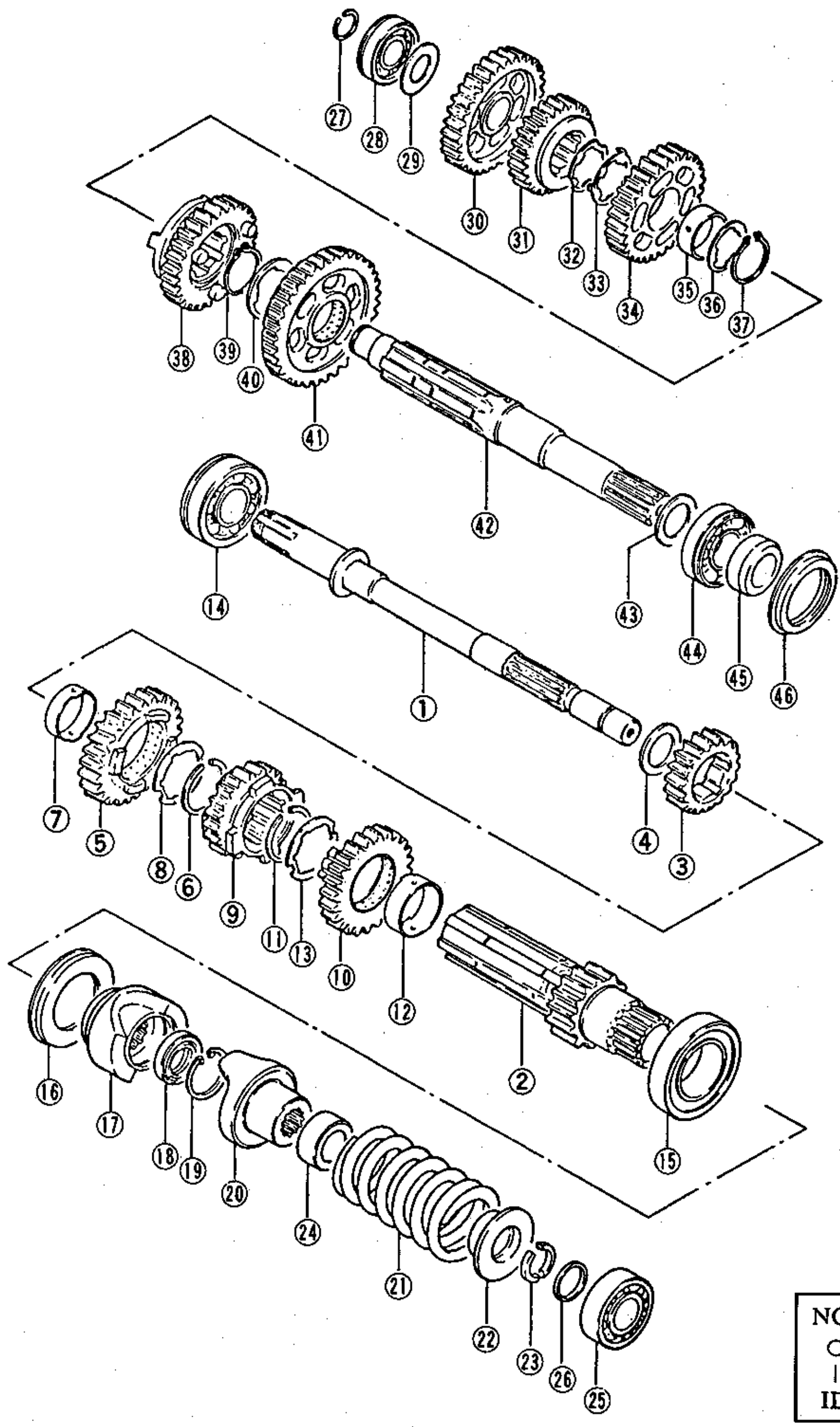


- Remove cam stopper holder to remove cam stopper and spring.



- Extract gear shifting cam to the right side.

TRANSMISSION



NOTE:
○ × ○ × ○
ID OD L

1. Inner countershaft
2. Outer countershaft
3. 2nd drive gear
4. Washer
5. 5th drive gear
6. Circlip
7. Spacer (32 × 36 × 13.4)
8. Lock washer
9. 3rd drive gear
10. 4th drive gear
11. Circlip
12. Spacer (32 × 36 × 13.4)
13. Lock washer
14. Bearing
15. Bearing
16. Oil seat
17. Output cam dog
18. Oil seal
19. Circlip
20. Input cam dog
21. Spring
22. Sliding stopper
23. Stopper
24. Spring guide
25. Bearing
26. Spacer (17 × 21 × 3.5)
27. Circlip
28. Bearing
29. Washer
30. 2nd driven gear
31. 5th driven gear
32. Washer
33. Lock washer
34. 3rd driven gear
35. Bushing
36. Washer
37. Circlip
38. 4th driven gear
39. Circlip
40. Washer
41. 1st driven gear
42. Drive shaft
43. Washer
44. Bearing
45. Spacer
46. Oil seal

INSPECTION

Shift fork — Groove clearance

- Using a thickness gauge, measure the fork groove clearance. If it exceeds the limit, check the amount of wear on both gear and shift fork using vernier calipers, and replace either one that has greater wear.

Shift fork-Groove clearance

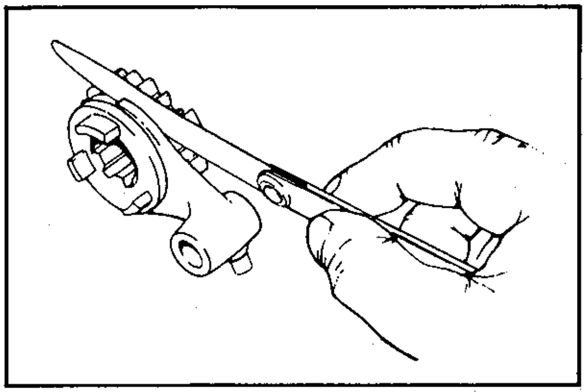
Standard	Limit
0.4 — 0.6 mm (0.016 — 0.024 in)	0.8 mm (0.031 in)

Shift fork groove width

Standard	5.45 — 5.55 mm (0.215 — 0.219 in)

Shift fork thickness

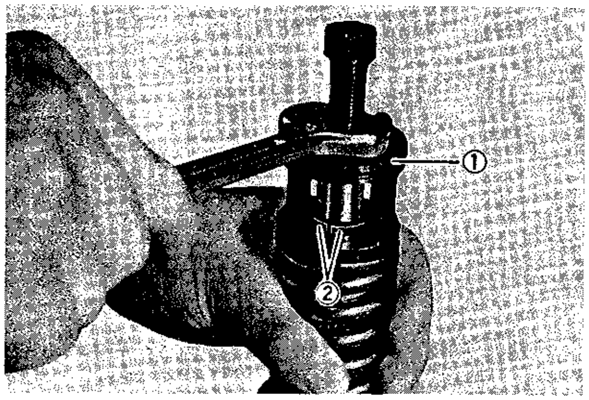
Standard	4.95 — 5.05 mm (0.195 — 0.199 in)



REMOVAL

- Remove the bearing and spacer, compress the spring with the special tool ①, and remove two stoppers ②.

Dog cam stopper set tool	09924-44510



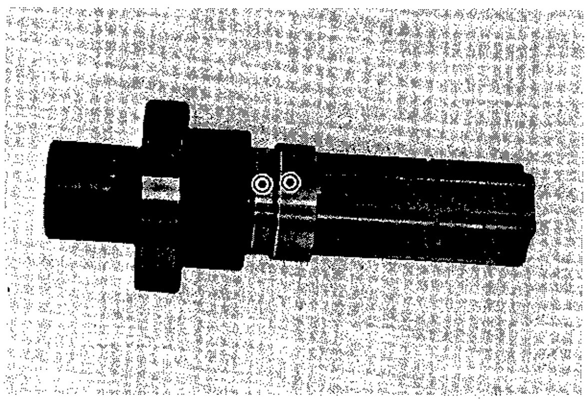
INSTALLATION

Installation is carried out in the reverse order of removal.

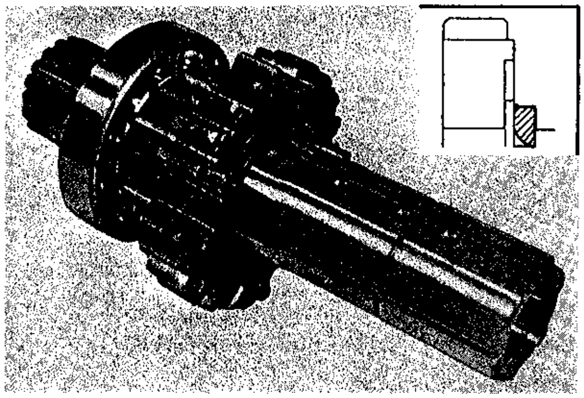
COUNTERSHAFT AND GEARS

> *NOTE:*
> - *Before installing the shafts and gears, wash them in a cleaning solvent.*
> - *Before mounting the gears on the outer shaft, apply the engine oil to the gear bore.*

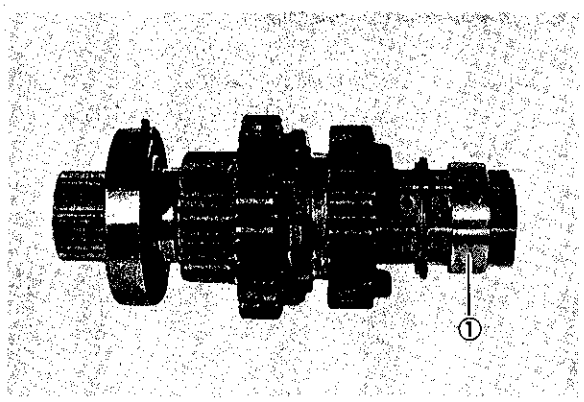
- For gear installation, refer to page 48. (Be sure that the gears, spacers, washers and circlips are correctly mounted facing in the correct direction.)
- Always use new circlips.
- Align the oil hole in the spacer wth that in the outer counter shaft, and mount the spacer on the shaft.



• Install the locating washer to the spacer dogs.
• Take special care so that the circlip is correctly installed, fit it to the side where the thrust is as shown in the figure.

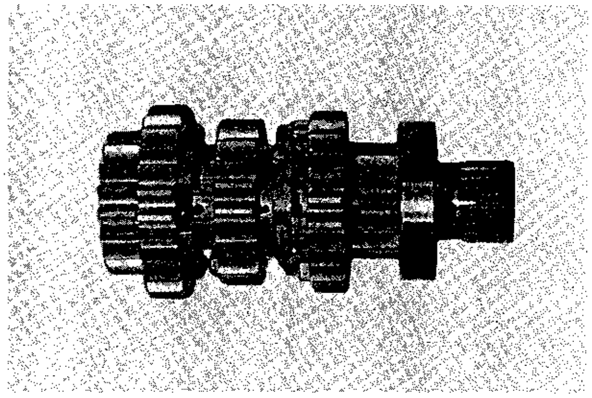


• Before mounting the 5th drive gear on the outer shaft, align the oil hole in the spacer ① with that in the outer shaft.

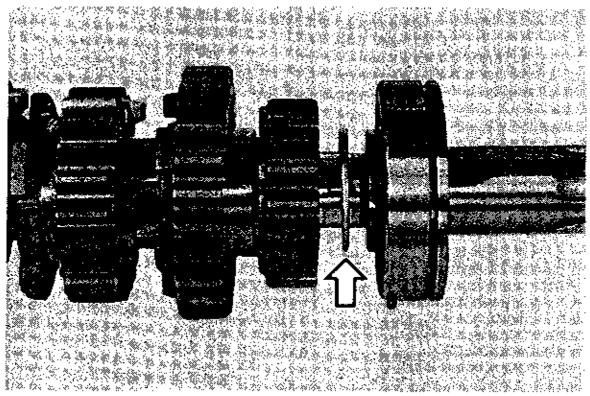


• When installing the 5th drive gear spacer on the outer shaft, be sure that the spacer faces in the correct direction.

> *NOTE:*
> • *Sparingly apply SUZUKI MOLY PASTE (99000-25140) to the area of the outer counter shaft bore, 20 to 30 mm (0.8 — 1.2* in) from each end of the shaft. Oil bearing surfaces on inner countershaft.

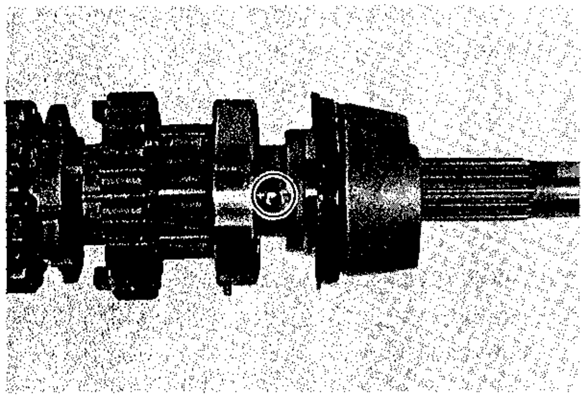


> *NOTE:*
> • *Mount the 2nd drive gear on the outer counter shaft, apply SUZUKI MOLY PASTE (99000-25140) to both surfaces of the washer sparingly, and install the washer.*



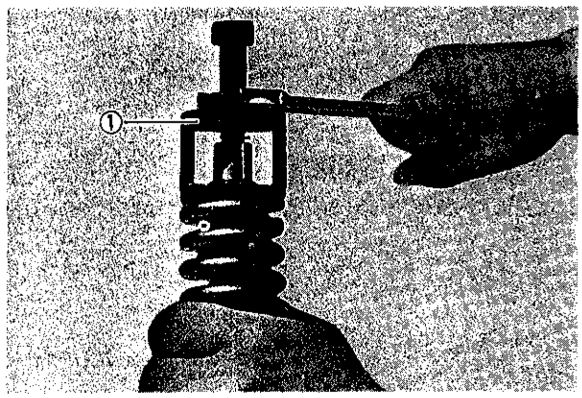
• Now install inner shaft into outer shaft.
• Mount the output cam dog on the outer counter shaft.
Align the cut on the cam dog with the oil hole in the counter shaft.

Next, apply SUZUKI MOLY PASTE (99000-25140) to the splines of the input cam dog, and mount it on the inner counter shaft.



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

Dog cam stopper set tool	09924-44510



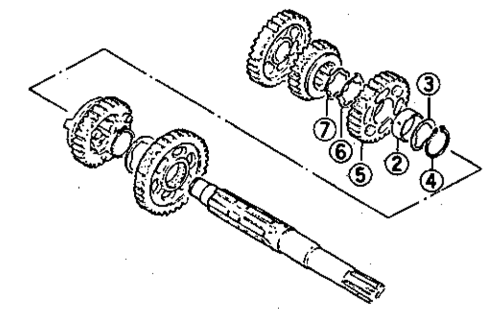
DRIVE SHAFT AND GEARS

> *NOTE:*
> - *Before installing the shaft and gears, wash them in a cleaning solvent.*
> - *Before mounting the gears on the drive shaft, apply the engine oil to the gear bore.*

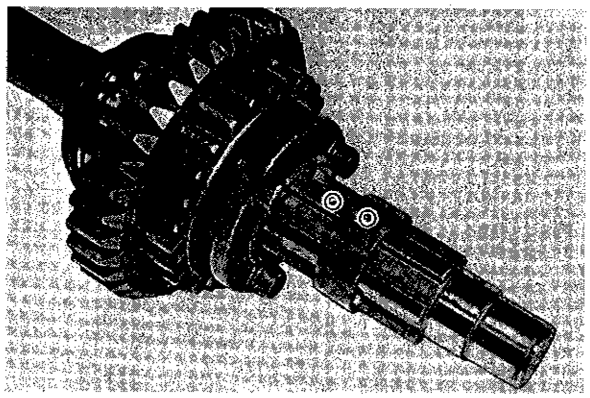
- For gear installation, refer to page 48. (Be sure that the gears, spacer, washers and circlips are correctly mounted facing in the correct direction.)
- Always use new circlips.

> *NOTE:*
> *Order of mounting of spacer ②, washer ③, circlip ④, 3rd driven gear ⑤, lock washer ⑥, and washer ⑦.*

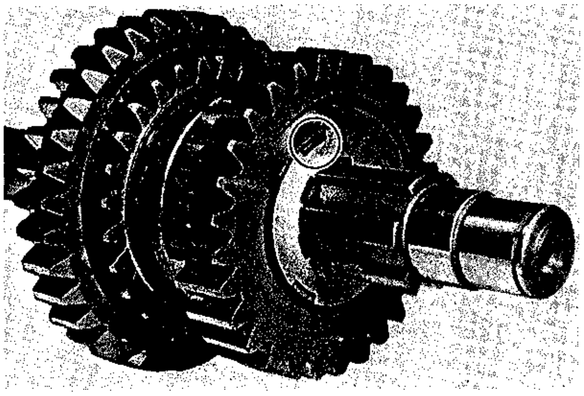
- Mount the circlip ④ and washer ③ on the drive shaft, in that order.
  Temporarily position the circlip beyond the groove.



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

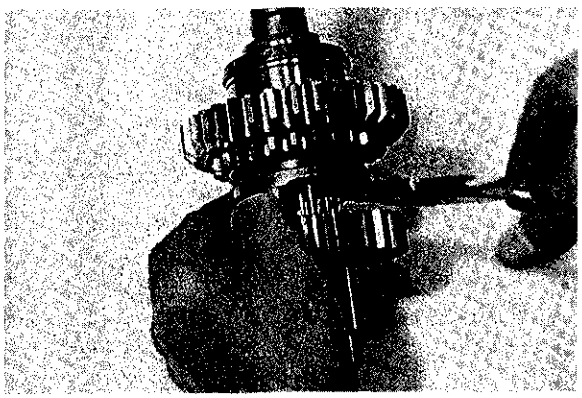


- Mount the lock washer and washer, on the drive shaft, in that order, and by turning the washer in or out, align the lock washer tongue with the cut on the washer.

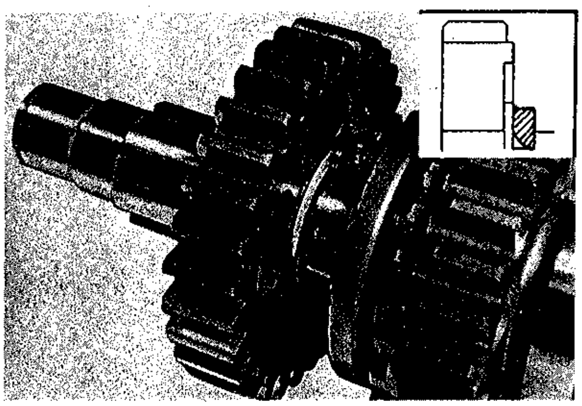


- Fit the circlip in the groove on the driveshaft, using the special tool

Snap ring pliers	09900-06106

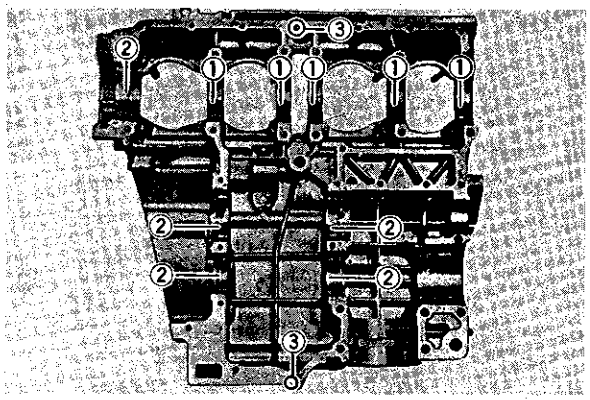


- Take special care so that the circlip is correctly installed.
  Fit it to the side where the thrust is as shown in the figure.

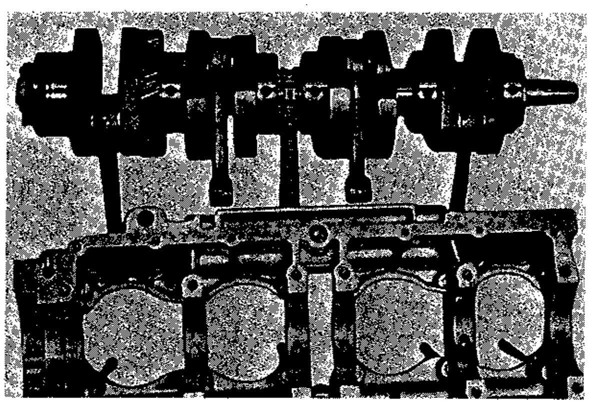


NOTES ON INSTALLATION OF TRANSMISSION GEARS AND CRANKSHAFT IN CRANKCASE

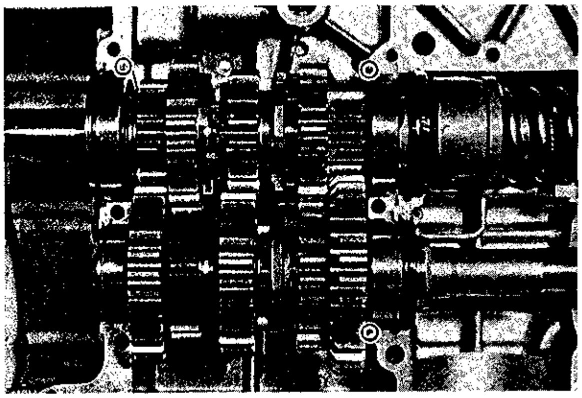
- Thoroughly wash the upper crankcase and the lower crankcase with solvent to remove any sealing compound.
- Firmly insert crankshaft locating "pins" ①, transmission gear locating "C" rings ② for bearings on both sides and locating pin ③.



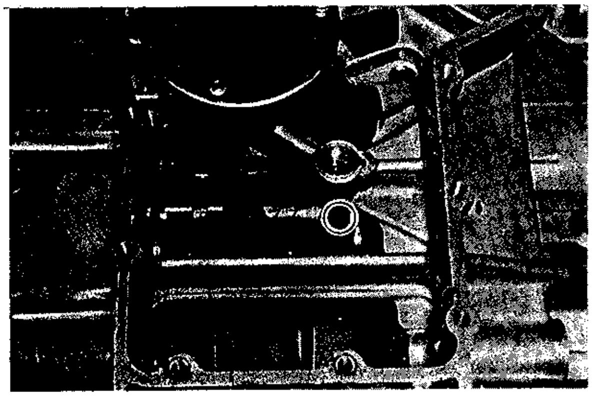
- Mount crankshaft and transmission shaft assemblies on the upper case. At this time firmly fit the bearing races onto the locating pins with punch mark stamped on the circumference of the bearings directed upwards.



- Use the "C" rings and bearings stopper pins to position the bearings as shown in the photo.

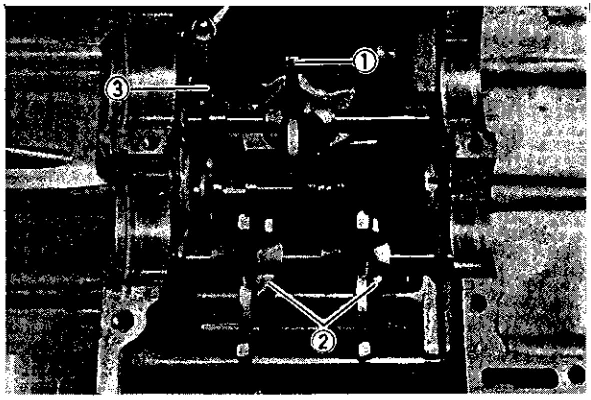


- Insert gear shifting cam into the lower crankcase. Confirm the neutral position of gear shifting cam, mount cam stopper, spring and cam stopper holder and fasten the cam stopper holder.

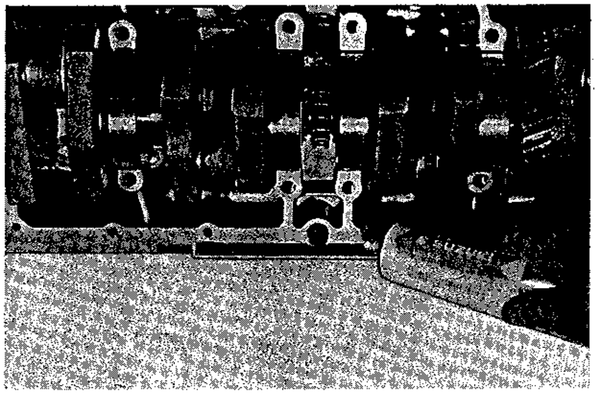


- Insert gear shifting fork shaft from the right side and mount gear shifting fork and cam stopper as shown in the photo.
  At this time, pay attention to the direction of the gear shifting fork.

①Gear shifting fork for 3rd drive gear.
②Gear shifting forks for 4th and 5th driven gears.
③Cam stopper.



- Apply engine oil to gear shifting fork and gear shifting cam.
- Completely wipe off oil on the mating surface of lower crankcase and apply sealing compound (SUZUKI BOND No. 1201: 99104-31100) uniformly to the mating surface.

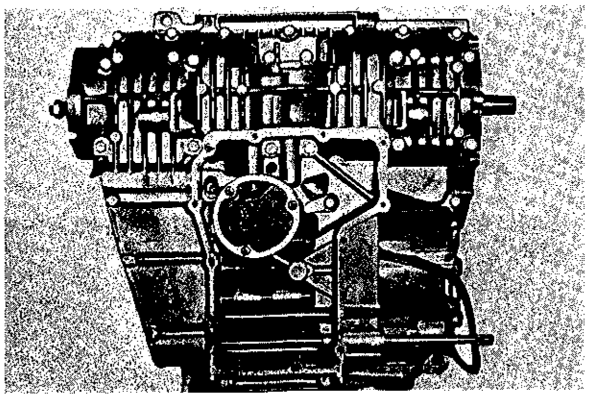


- Place the lower crankcase on the upper crankcase housing the transmission gears and crankshaft. Align shift forks into gears.
- Fasten together the upper and lower crankcase halves using the crankcase fastening bolts.

The lower crankcase fastening bolts must be tightened securely in the ascending order of the numbers embossed on the crankcase.

6 mm bolt .... 9 pcs.
8 mm bolt .... 12 pcs.

Tightening torque for 6 mm bolts	6 – 10 N•m 0.6 – 1.0 kg•m 4.5 – 7.0 lb•ft
Tightening torque for 8 mm bolts	18 – 22 N•m 1.8 – 2.2 kg•m 13.0 – 16.0 lb•ft



- Tighten the oil pan bolts.
- Turn the crankcase over so that the cylinder studs are up and tighten the upper crankcase bolts.

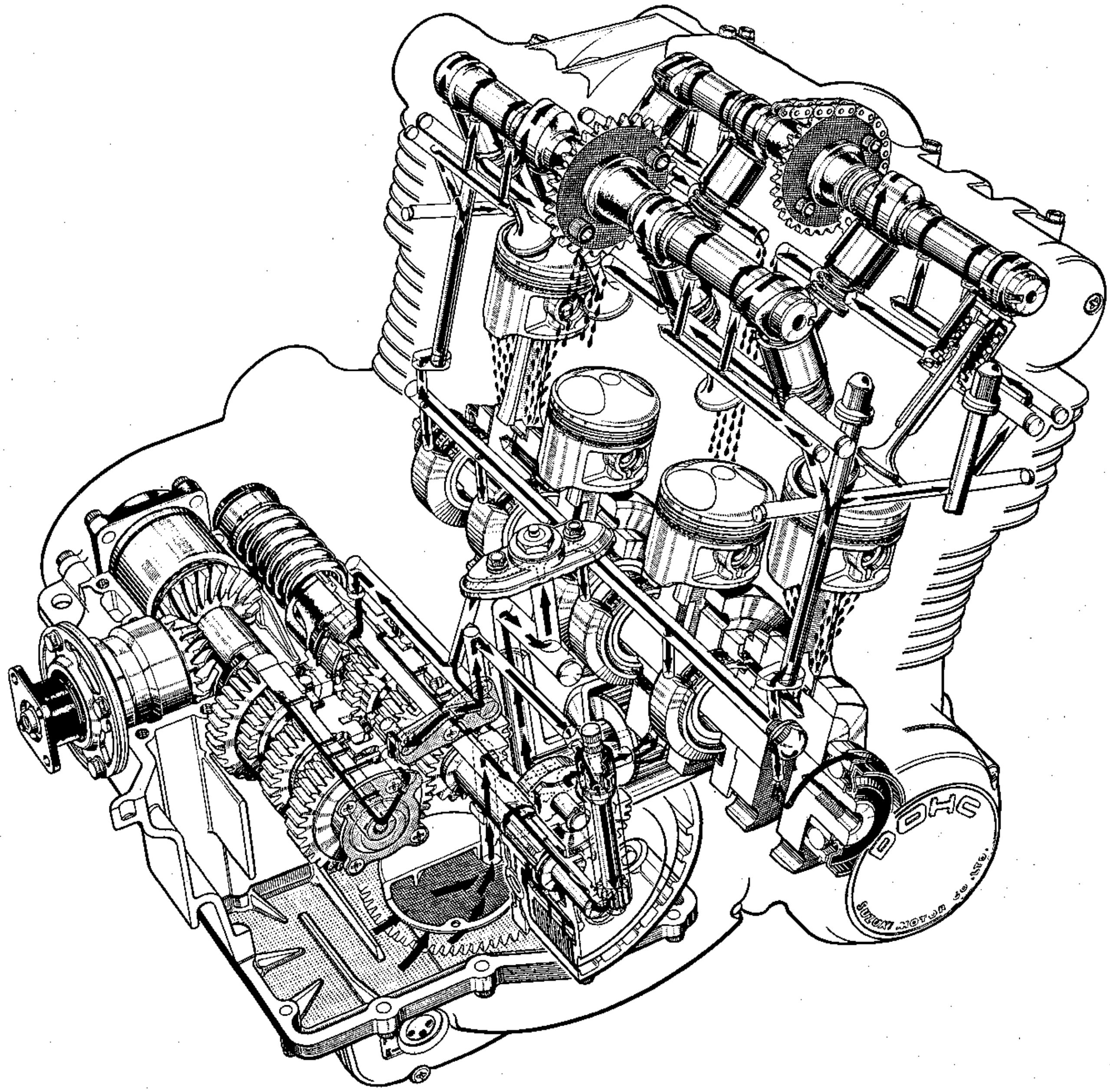
  6 mm bolt .... 12 pcs.
  8 mm bolt .... 5 pcs.

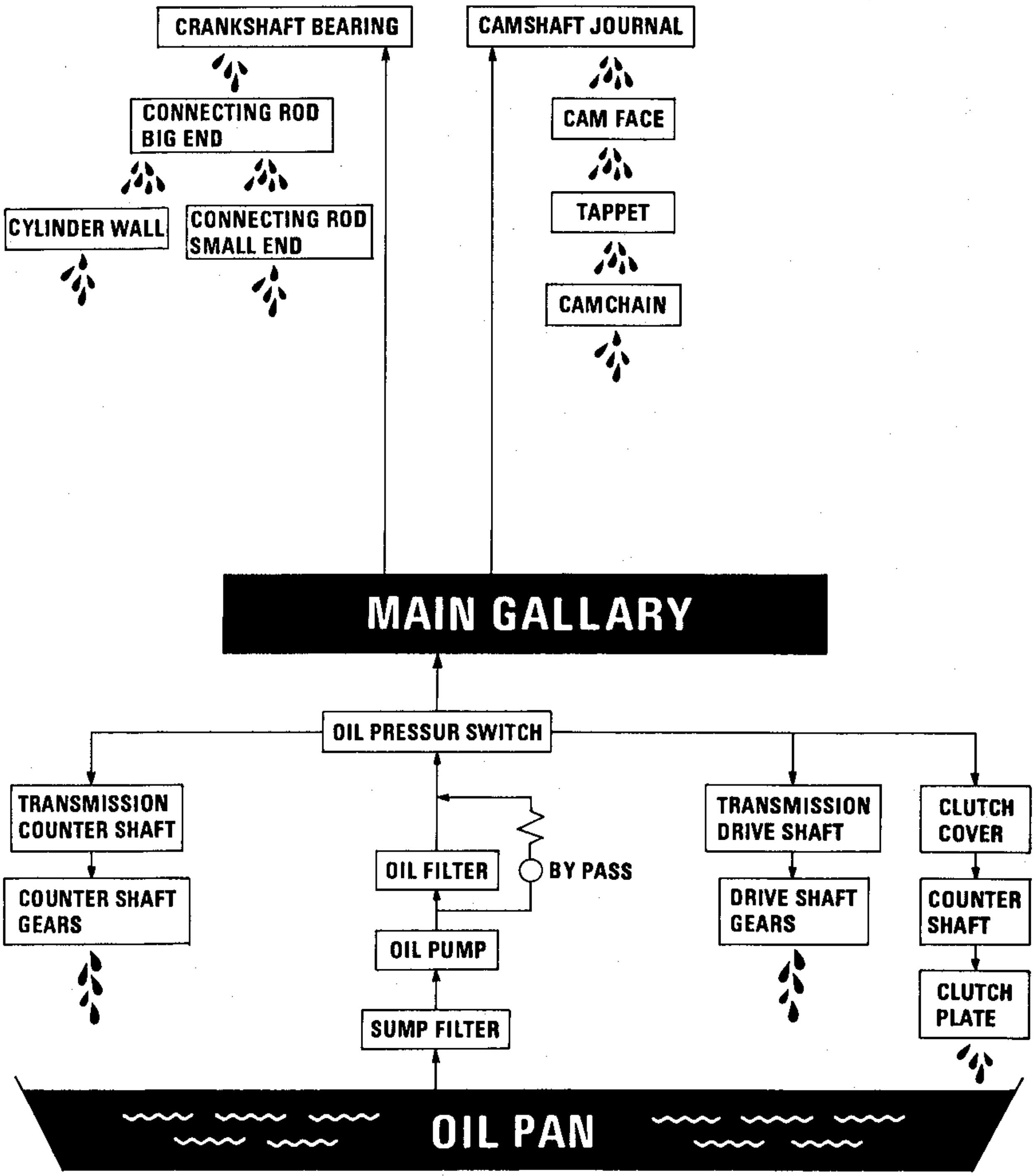
Tightening torque for 6 mm bolts	6 – 10 N•m 0.6 – 1.0 kg•m 4.5 – 7.0 lb•ft
Tightening torque for 8 mm bolts	18 – 22 N•m 1.8 – 2.2 kg•m 13.0 – 16.0 lb•ft

NOTE:

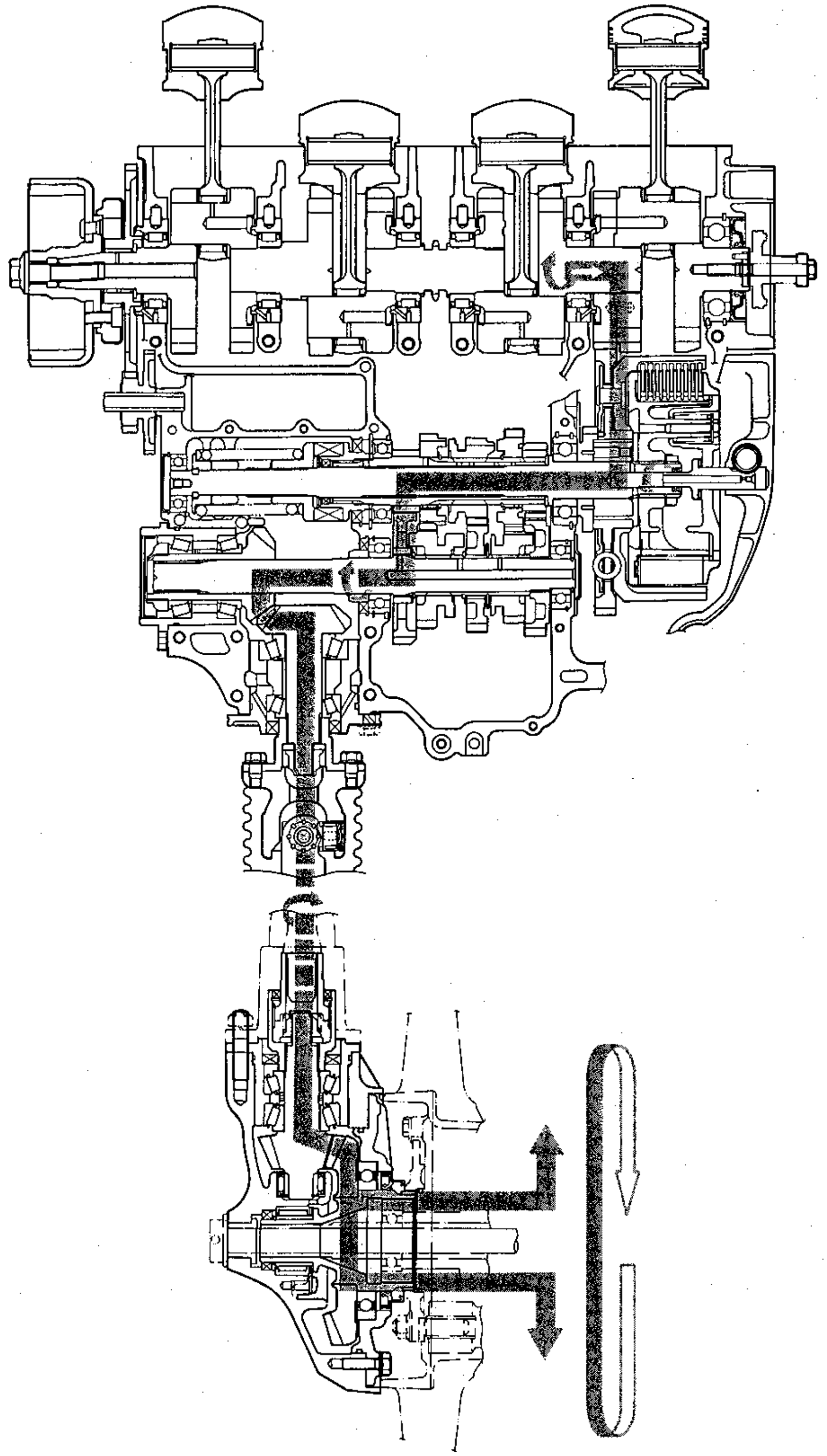
- *When the secondary bevel gear is installed, the offset at the mating surfaces of the crankcase halves, upper and lower, should be 0.1 mm or less.*
- *Thoroughly wipe off any overflow of the sealing compound applied to the mating surfaces of crankcase before installing the secondary bevel gear assemblies.*
  Take special care not to scratch inner surfaces of the crankcase.
- *The shape of each gear shifting pawl is different. Mount the one with the narrower width on the gear shifting cam side.*

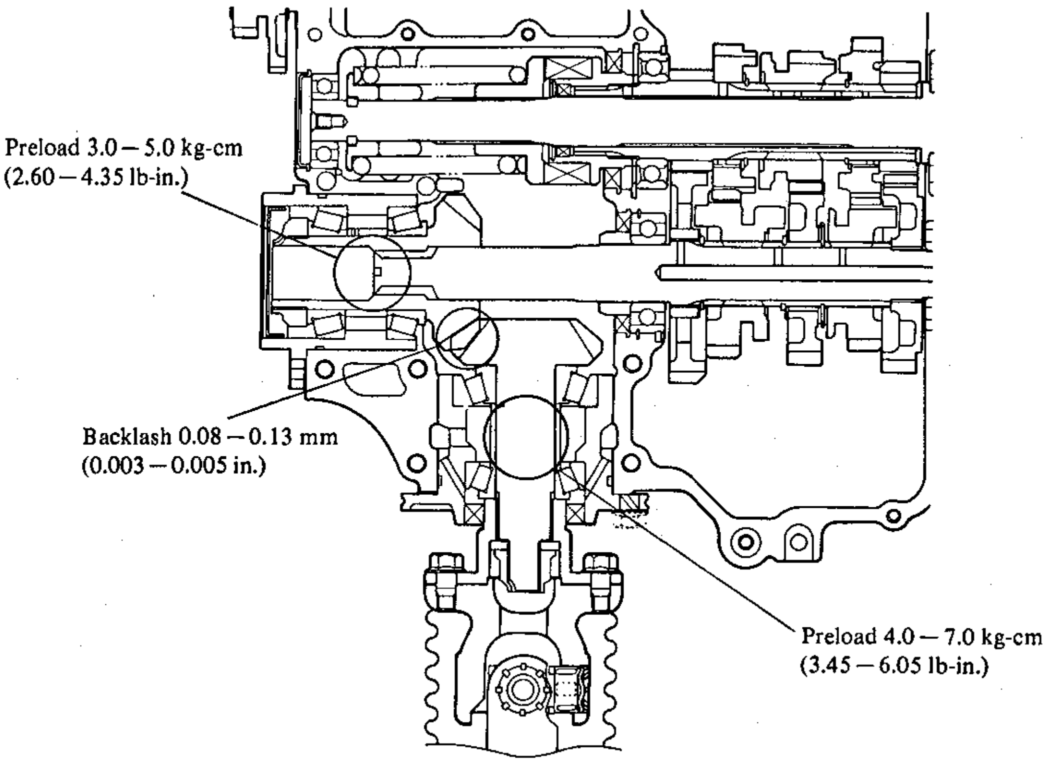
LUBRICATION SYSTEM

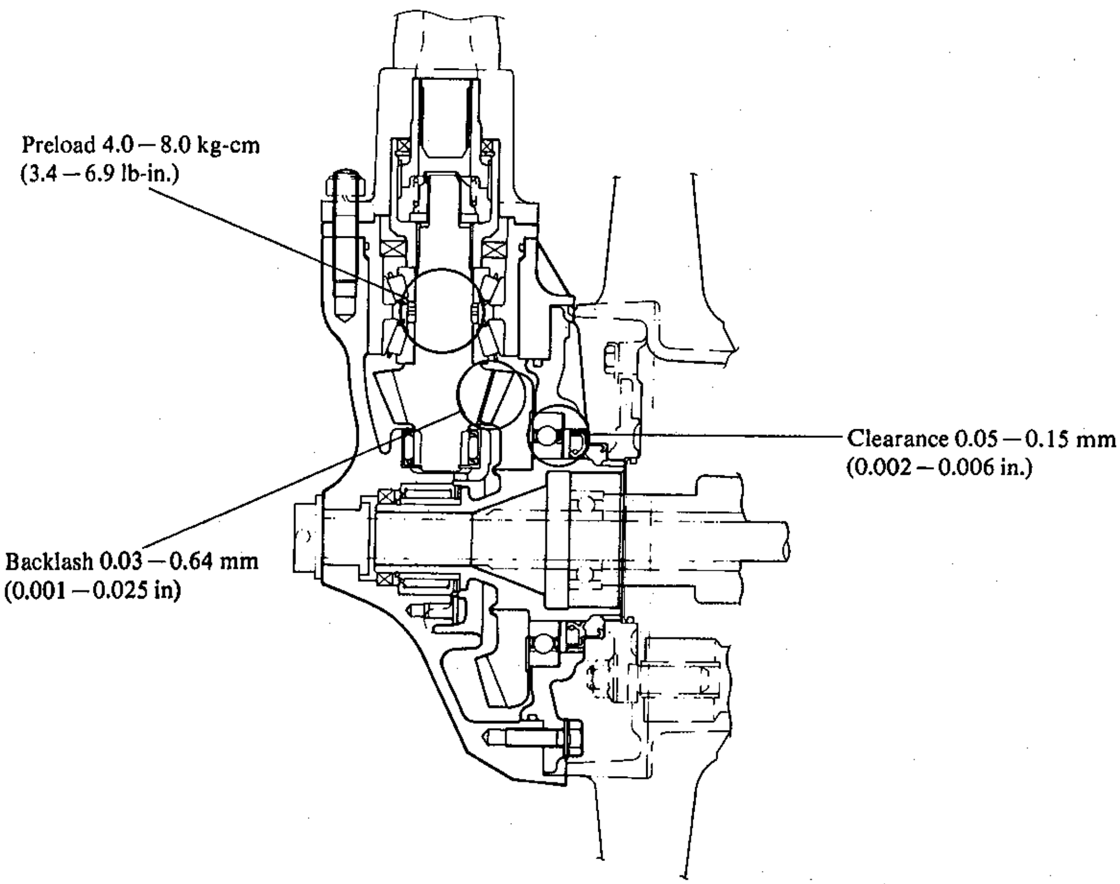



CRANKSHAFT BEARING
CAMSHAFT JOURNAL
CONNECTING ROD
BIG END
CAM FACE
CYLINDER WALL
CONNECTING ROD
SMALL END
TAPPET
CAMCHAIN
MAIN GALLARY
OIL PRESSUR SWITCH
TRANSMISSION
COUNTER SHAFT
TRANSMISSION
DRIVE SHAFT
CLUTCH
COVER
OIL FILTER
BY PASS
COUNTER SHAFT
GEARS
DRIVE SHAFT
GEARS
COUNTER
SHAFT
OIL PUMP
CLUTCH
PLATE
SUMP FILTER
OIL PAN

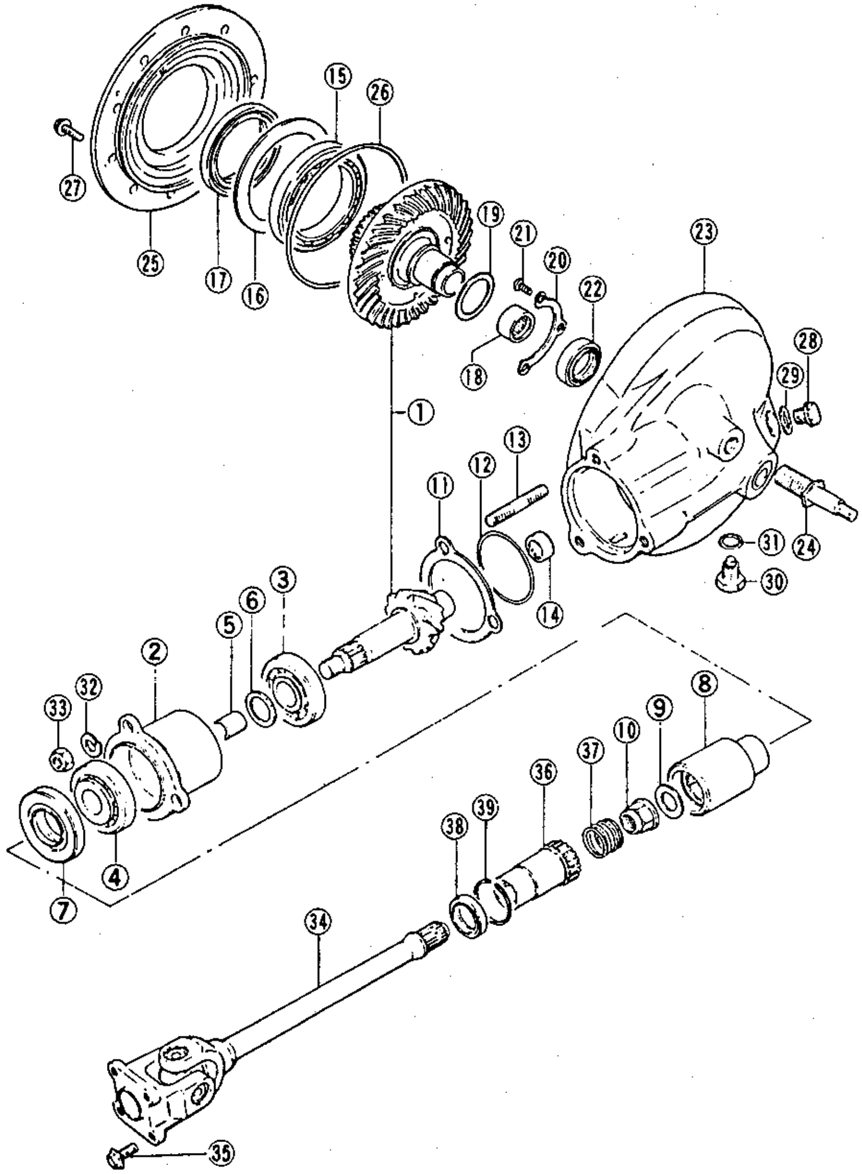
SHAFT DRIVE




Preload 3.0 – 5.0 kg-cm
(2.60 – 4.35 lb-in.)
Backlash 0.08 – 0.13 mm
(0.003 – 0.005 in.)
Preload 4.0 – 7.0 kg-cm
(3.45 – 6.05 lb-in.)


Preload 4.0 – 8.0 kg-cm
(3.4 – 6.9 lb-in.)
Clearance 0.05 – 0.15 mm
(0.002 – 0.006 in.)
Backlash 0.03 – 0.64 mm
(0.001 – 0.025 in)

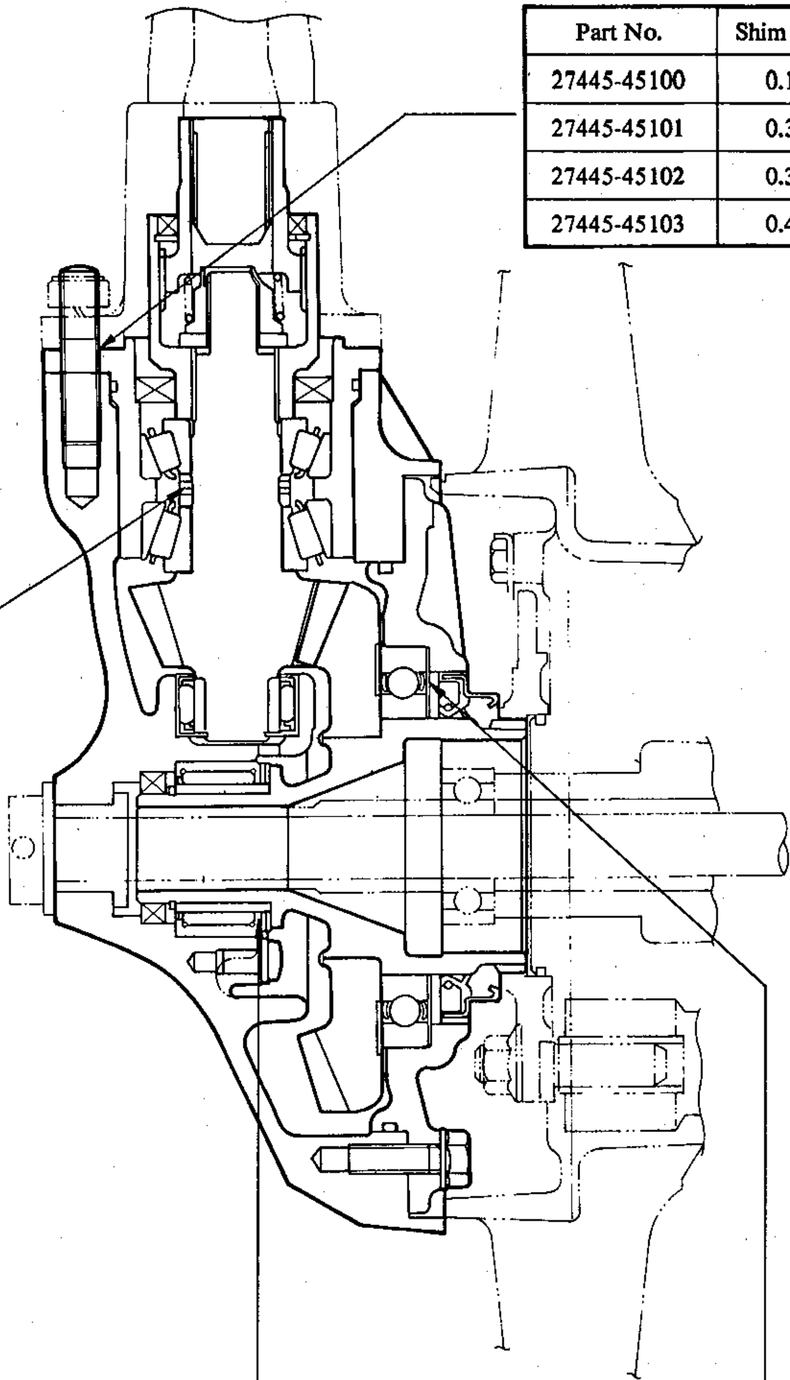
FINAL DRIVE BEVEL GEAR ASSEMBLY



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

	Tightening torque		
	N•m	kg•m	lb•ft
⑩	90 – 110	9.0 – 11.0	65.0 – 79.5
㉑	8 – 10	0.8 – 1.0	6.0 – 7.0
㉔	90 – 110	9.0 – 11.0	65.0 – 79.5
㉗	20 – 26	2.0 – 2.6	14.5 – 19.0
㉘	20 – 30	2.0 – 3.0	14.5 – 21.5
㉚	20 – 30	2.0 – 3.0	14.5 – 21.5
㉝	35 – 45	3.5 – 4.5	22.5 – 32.5
㉟	25 – 30	2.5 – 3.0	18.0 – 21.5

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



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

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

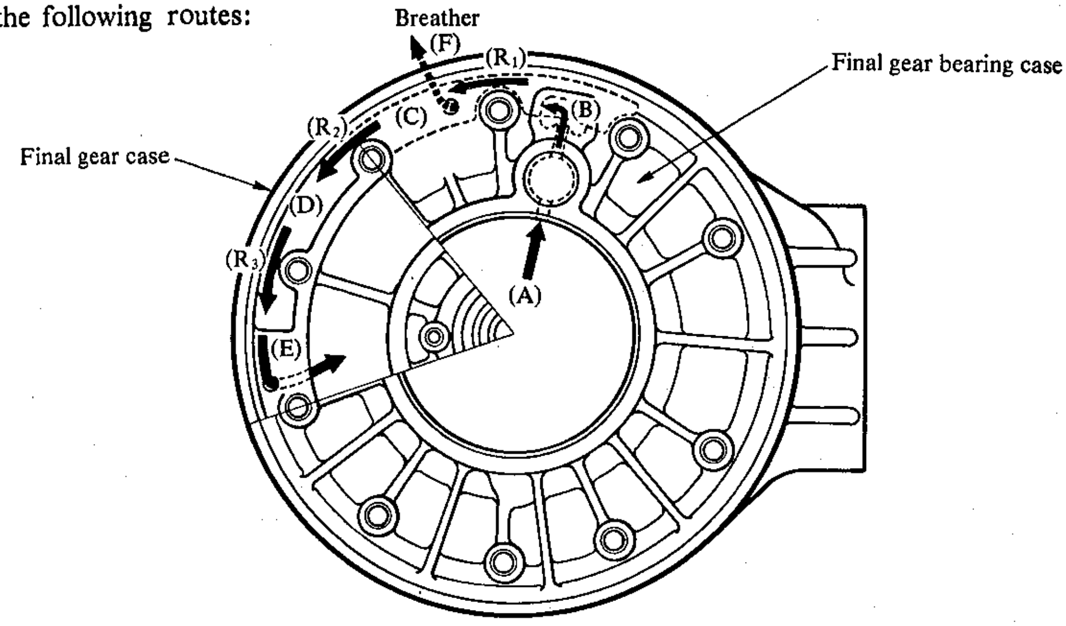
Part No.	Shim thickness
27327-45100	0.35 mm
27327-45102	0.40 mm
27327-45103	0.50 mm
27327-45104	0.60 mm

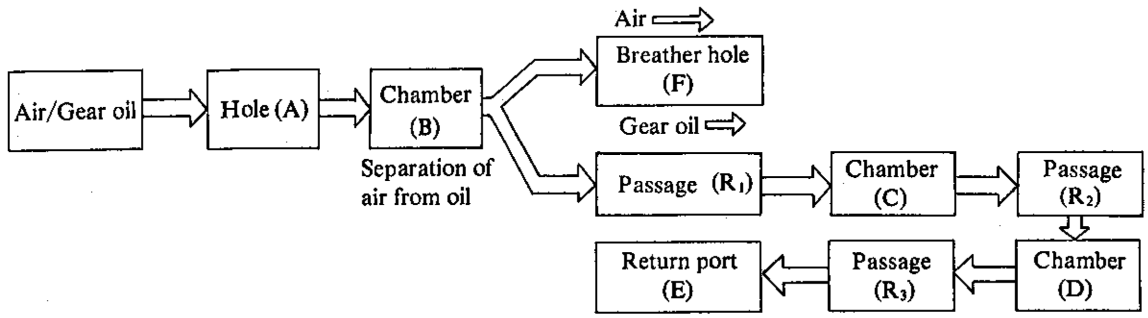
FINAL GEAR CASE BREATHER CIRCUIT

AIR AND GEAR OIL FLOW IN FINAL GEAR CASE BREATHER CIRCUIT

Breather circuit

The GS1000G final gear case breather circuit (passage) consists of the final gear case and final gear bearing case, and air/oil mixed gas flows through the following routes:





Air passage

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

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

Oil passage

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

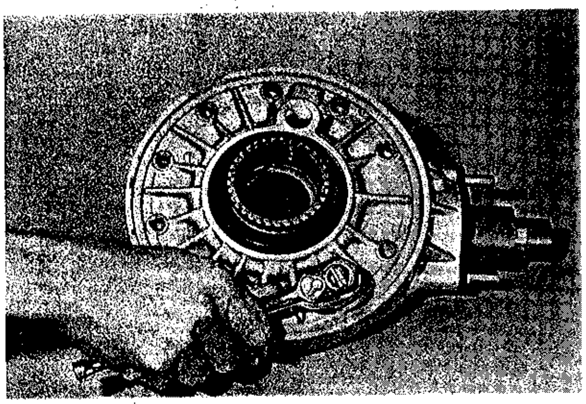
- In this case, the gear oil, which has flown into hole (A), goes into chamber (B), where the oil is separated from the air.
- Then, the air flows through the gap between rib (R_1) and bearing case and goes out through the breather.
- On the other hand, the gear oil, when the gear case pressure is higher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

FINAL DRIVE BEVEL GEAR ASSEMBLY

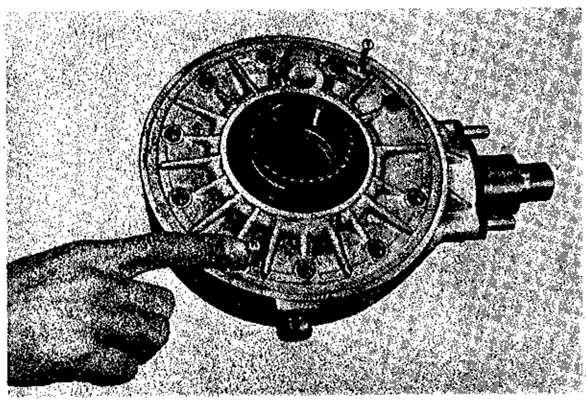
REMOVAL AND DISASSEMBLY

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

- Place an oil pan under the final drive bevel gear assembly, remove the drain plug and drain the oil.
- Remove the rear wheel assembly.
- Remove three nuts attaching the final drive housing to the swing arm, and move the housing to the rear to detach it from the swing arm.
- Remove ten final gear bearing case bolts.

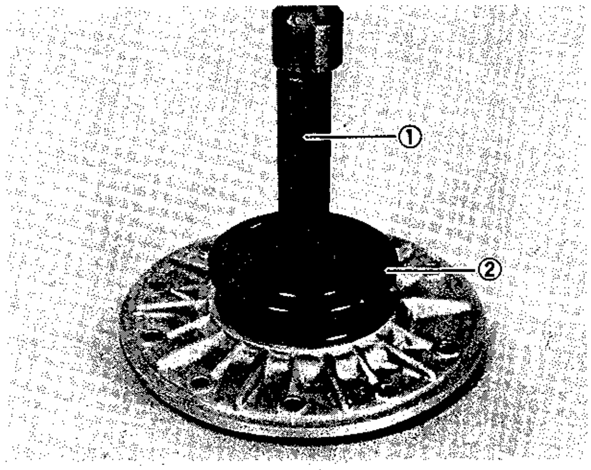


- To remove the final gear bearing cover from the housing, use two 6 mm screws; screw them into the holes provided and draw the cover off evenly.



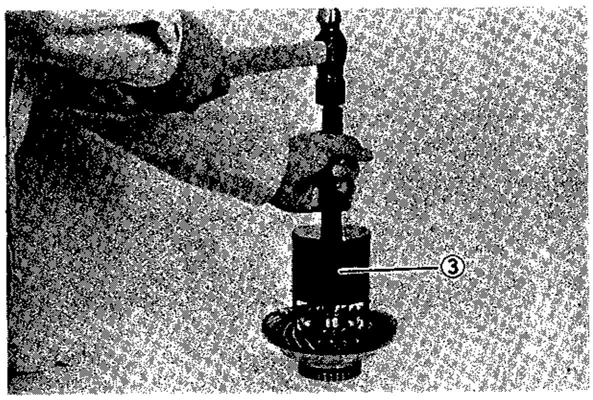
- Using special tools ① and ②, remove the oil seal from the final gear bearing case.

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

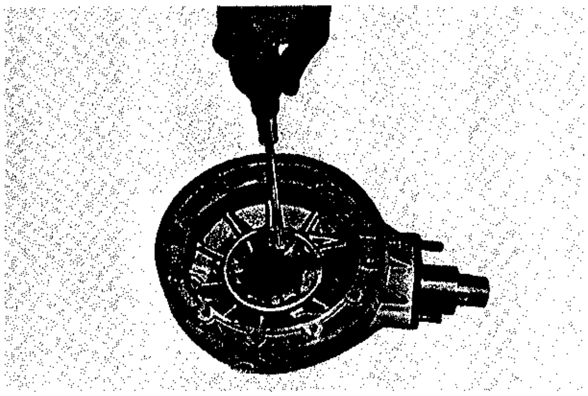


③	Final driven gear bearing installer and remover	09924-74570

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



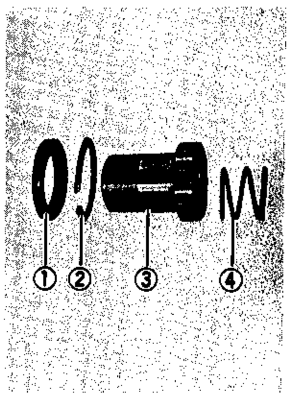
- Remove the three screws and bearing retainer, and shims from the final gear case.

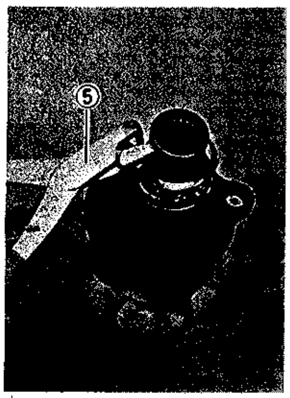


- Remove the final drive gear housing from the final gear case.
- Remove the oil seal ①, circlip ②, propeller shaft coupling ③, and spring ④ from the final drive gear coupling.

⑤	Snap ring plier	09900-06108

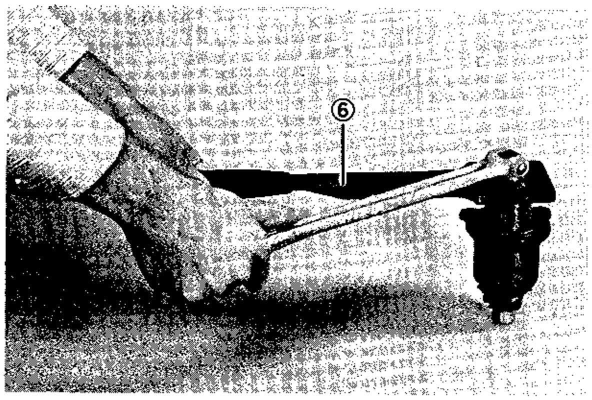
NOTE:
To remove the circlip ②, it will be necessary to push the propeller shaft coupling inwards, to remove spring pressure from the circlip.



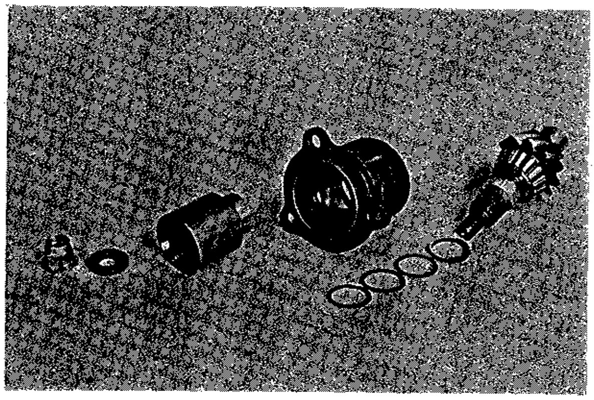


- Straighten the bent portion of the final drive gear nut. Use special tool ⑥ to hold the coupling, and remove the nut.

⑥	Final drive gear coupling holder	09924-64510

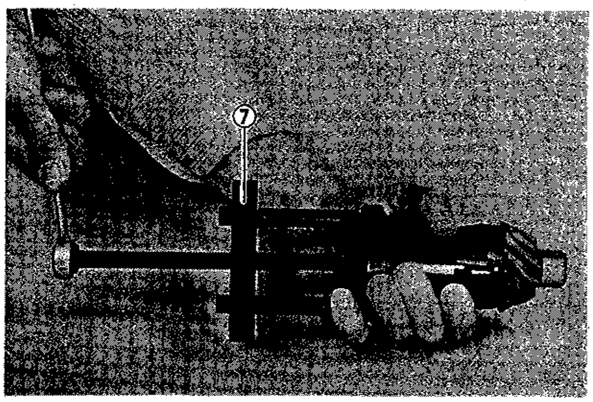


- Remove the washer and coupling, and tap the drive gear shaft with a plastic hammer to remove it from housing. Do not lose the shims and spacer on the final drive gear shaft.



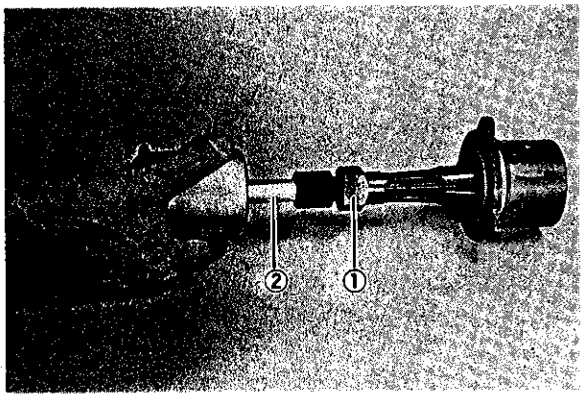
- To remove the inner bearing race from the drive gear shaft, use special tool ⑦.

⑦	Bearing inner race remover	09941-84510



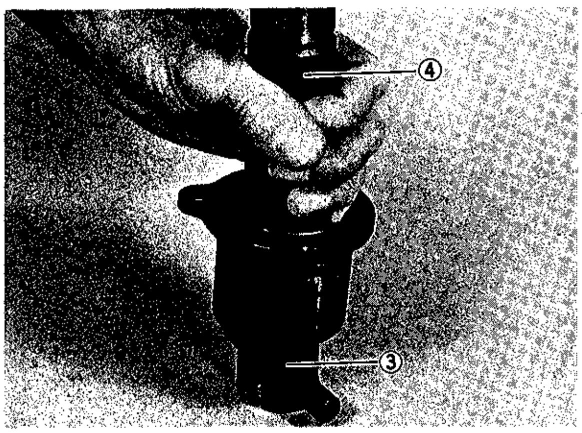
• To remove the oil seal from the housing, use special tools ① and ②.

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



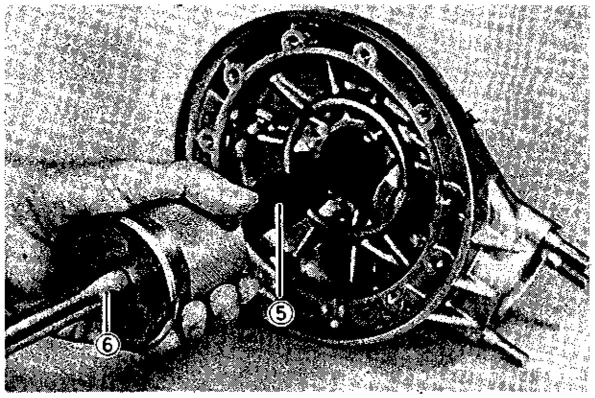
• To remove the outer bearing races from the housing, use special tools ③ and ④ and a hammer.

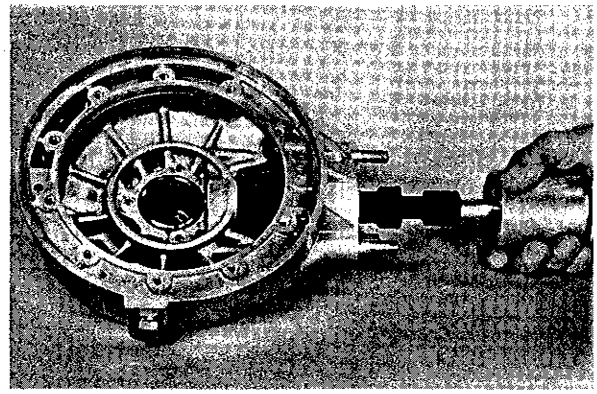
③	Bearing Outer Race Remover	09941-54911
④	Bearing Installer	09913-84510



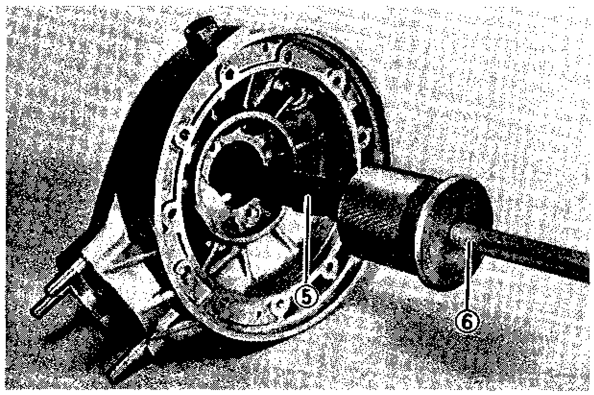
• To remove the two needle roller bearings from the final gear case, use special tools ⑤ and ⑥.

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





• To remove the final gear case oil seal, use special tools ⑤ and ⑥.



• If replaceing the final gear case, remove the three drive housing studs, and shock absorber mounting stud.

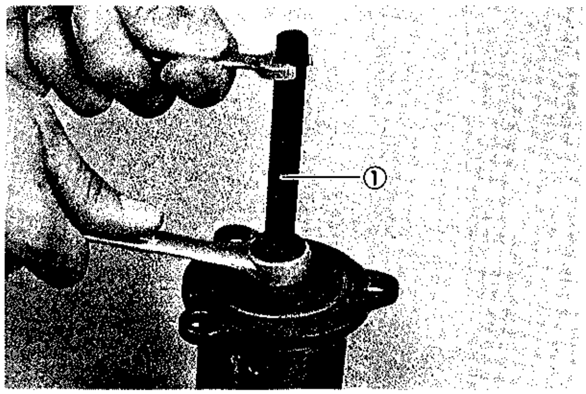
INSPECTION AND REASSEMBLY

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

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

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

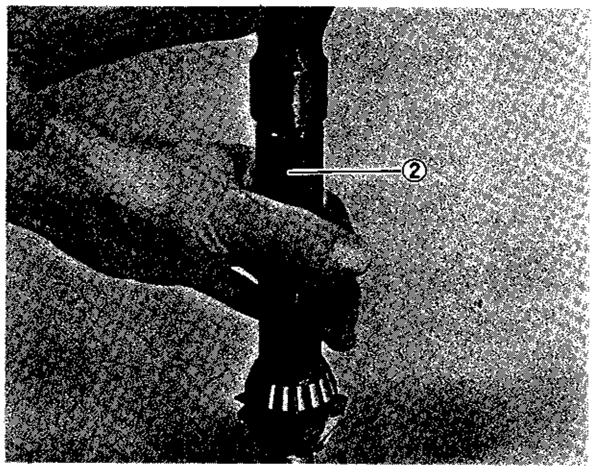
①	Bearing installer set	09924-84510



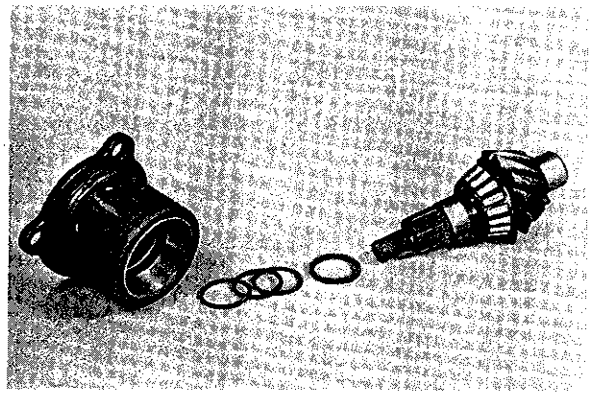
- To install the inner bearing race onto the final drive gear shaft, use special tool ②.

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

②	Bearing installer set	09913-84510



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



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

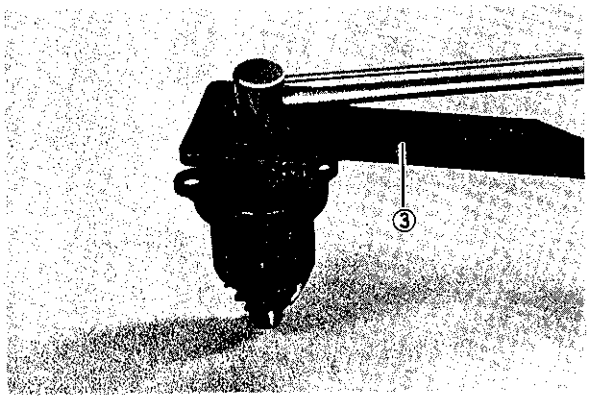
NOTE:
Always use a new nut.

NOTE:
Coat the bearings with Hypoid gear oil.

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

Nut tightening torque	90 — 110 N•m 9.0 — 11.0 kg•m 65.0 — 79.5 lb•ft

③	Final drive gear coupling holder	09924-64510



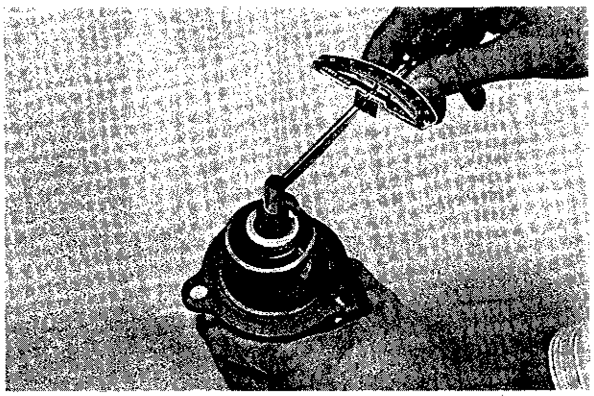
FINAL DRIVE GEAR PRELOAD ADJUSTMENT

- After tightening the final drive gear nut to specification, measure the bearing preload using torque wrench.

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

Preload torque	40 — 80 N•cm 4.0 — 8.0 kg•cm 3.4 — 6.9 lb•in

Torque wrench	09900-21107



- If the preload measured is not correct. (4.0-8.0 kg•cm) remove the final drive gear and change the shims according to the following chart:

Preload	Shim
Under 4 kg•cm	Decrease shim thickness
40 — 80 N•cm 4.0 — 8.0 kg•cm 3.4 — 6.9 lb•ft	Correct
Over 8 kg•cm	Increase shim thickness

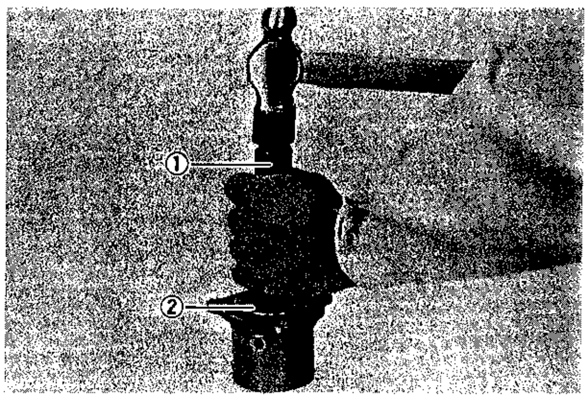
• Re-torque the final drive gear nut to specification, and re-check the preload measurement until it is correct.

List of Shims

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

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

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



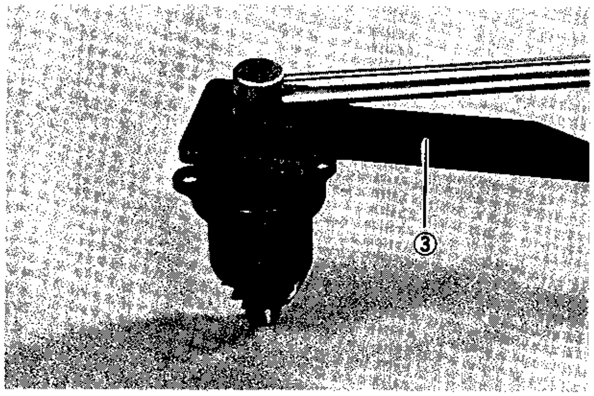
• Liberally coat the bearings with Hypoid gear oil and reinstall the final drive gear into the housing.

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

Thread lock super "1361A"	99104-32020

③	Final drive gear coupling holder	09924-64510

Nut tightening torque	90 — 110 N·m 9.0 — 11.0 kg·m 65.0 — 79.5 lb·ft



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

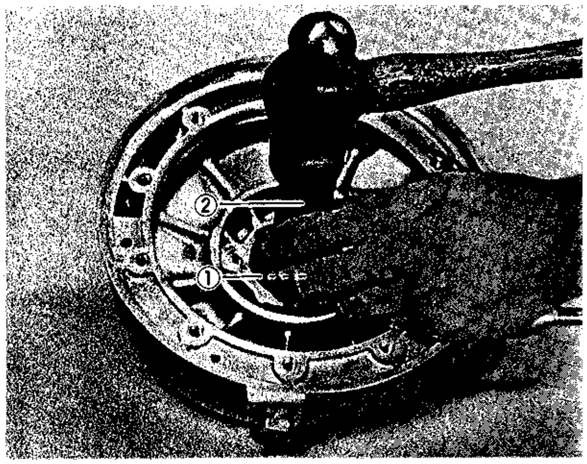
FINAL DRIVEN GAER ASSEMBLY

- To install the final gear case oil seal, use special tools ① and ②.

①	Oil Seal Installer	09924-74550
②	Handle	09924-74510

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

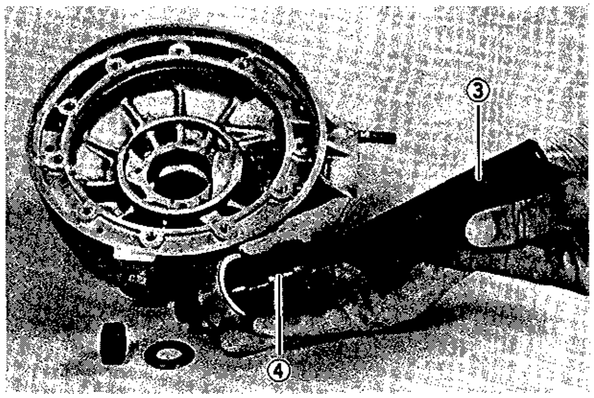
NOTE:
Always use a new oil seal.



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

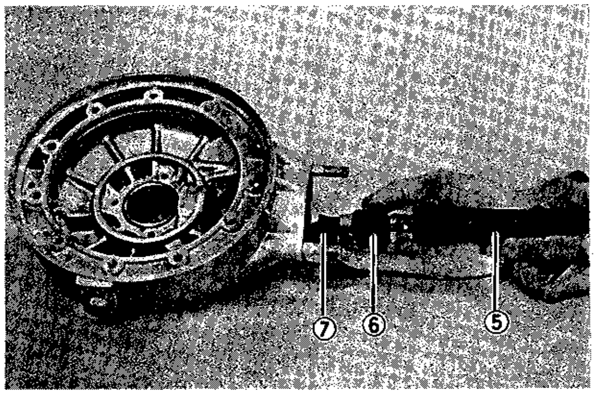
CAUTION:
The bearing case has a stamped mark on one end, which must face inside.

③	Bearing Installer	09913-84510
④	Final Gear Case Bearing Installer	09924-94510



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

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



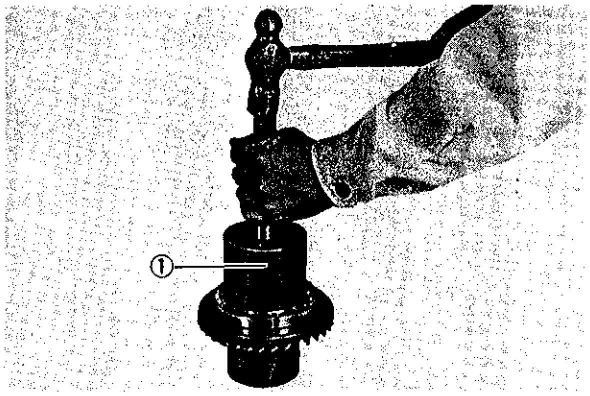
- Install the driven gear needle bearing retainer plate. Use THREADLOCK "1363C" on the screws, and tighten to specification.

99104-32050	Thread Lock "1363C"

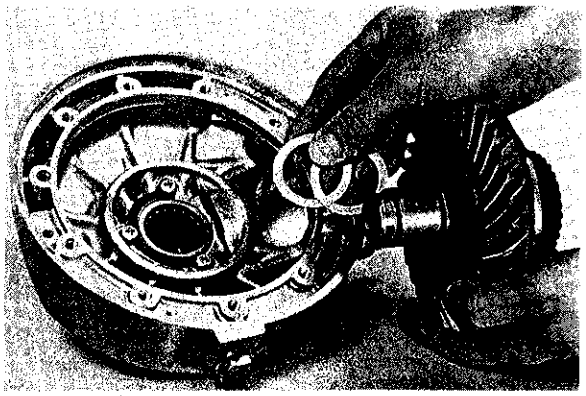
Screw tightening torque	8.0 – 10.0 N•m 0.8 – 1.0 kg•m 6.0 – 7.5 lb•ft

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

①	Final driven gear bearing installer	09924-74570



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



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

Final Gear Bearing Cover Bolt Torque	20 – 26 N•m 2.0 – 2.6 kg•m 14.5 – 19.0 lb•ft

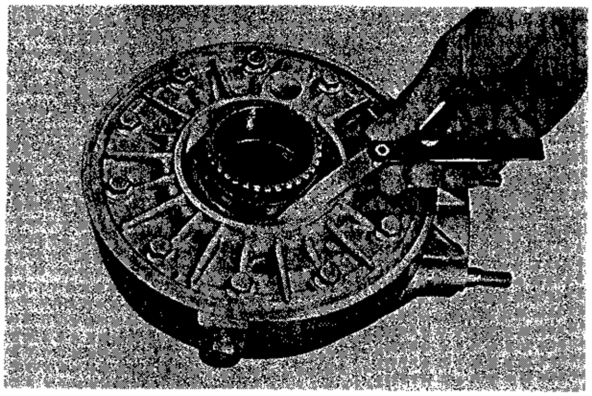
FINAL GEAR BEARING COVER SHIM ADJUSTMENT

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

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

List of Shims

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



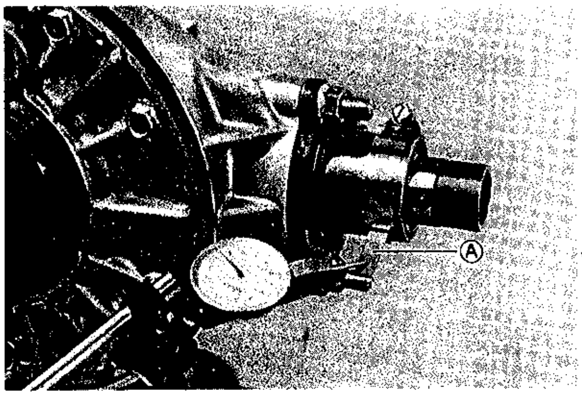
BACKLASH MEASUREMENT

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

①	Final Drive Gear Housing Nut Torque	35 – 45 N•m 3.5 – 4.5 kg•m 25.5 – 32.5 lb•ft
②	Final Gear Bearing Case bolt	20 – 26 N•m 2.0 – 2.6 kg•m 14.5 – 19.0 lb•ft

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

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



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

Final Gear Backlash	0.03 – 0.64 mm (0.001 – 0.025 in)

NOTE:
When measuring the backlash, measure not only one gear tooth but also several teeth after routaiting the drive gear clockwise or counter clockwise completly.
If the backlash is not correct, adjust the all measured backlash within the specified value.

- Remove shims from final gear cover and final gear case, and measure total thickness.
- In order not to change the clearance between the final gear cover and final driven gear bearing, the total thickness of the shims installed after a change is made must equal the original total thickness of shims.
- If backlash is too large:
  a) Install a thinner shim pack between final driven gear and final gear case.
  b) Increase thickness of shims between final gear cover and bearing by an amount equal to the decrease above.
- If backlash is too small:
  a) Install a thicker shim pack between final driven gear and final gear case.
  b) Decrease thickness of shims between final gear cover and bearing by an amount equal to the increase above.

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

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

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

List of Shims - Final Gear to Case

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

List of Shims - Final Gear Cover to Bearing

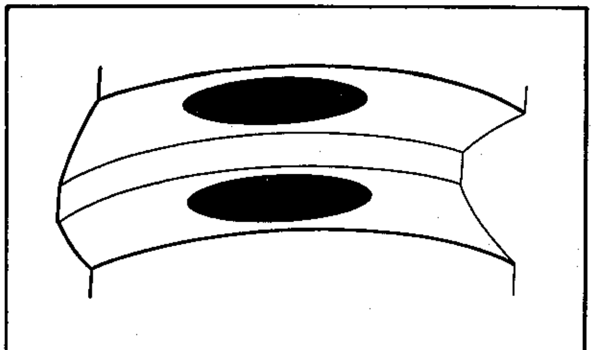
Part Number	Thickness
27327-45100	0.35 mm
27327-45102	0.40 mm
27327-45103	0.50 mm
27327-45104	0.60 mm

TOOTH CONTACT ADJUSTMENT

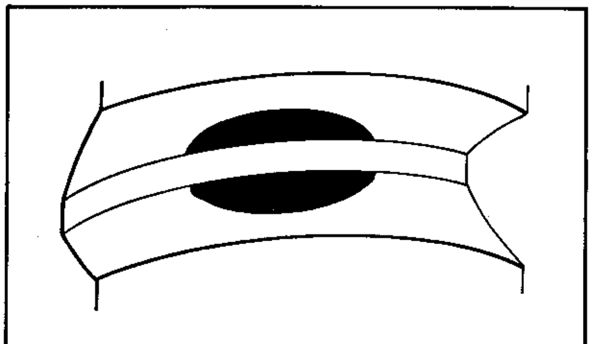
- After backlash adjustment is carried out, the tooth contact must be checked.
- Remove the 10 bolts from the final gear cover, and remove the cover, using the screws from the contact breaker cover (see page 59). Do not misplace the shims.
  Remove the driven gear.
- Clean and de-grease several teeth on the final driven gear. Coat these teeth with machinist's dye (usually available from parts houses) or paste, preferably of a light color.
- Re-install the driven gear with shims in place, positioning the coated teeth so they are centered on the final drive gear.
- Re-install the final gear cover and bolts, and tighten to specification.

Final Gear Cover Bolt Torque	20 – 26 N•m 2.0 – 2.6 kg•m 14.5 – 19.0 lb•ft

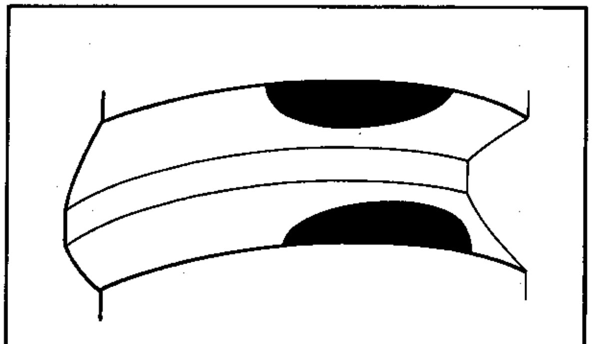
- Using a socket and handle on the final drive gear coupling nut, rotate the final drive gear several turns in each direction, while loading the final driven gear. This will provide a contact pattern on the coated teeth of the driven gear.
- Remove the final gear cover and final gear, and inspect the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


CORRECT

(A)


INCORRECT

(B)


INCORRECT

(C)

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

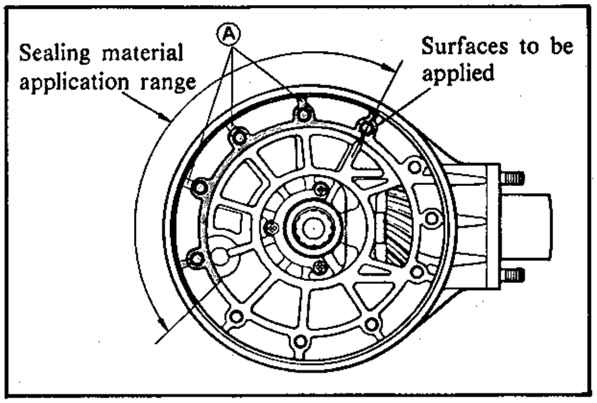
List of Shims - final Drive Gear Housing to Final Gear Case

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

FINAL ASSEMBLY

- After adjusting the backlash tooth contact and clearance between the bearing cover and the bearing, remove the final gear cover, clean the mating surfaces thoroughly, and apply SUZUKI BOND No. 1201 to the final gear case should be limited to the surface shown below.

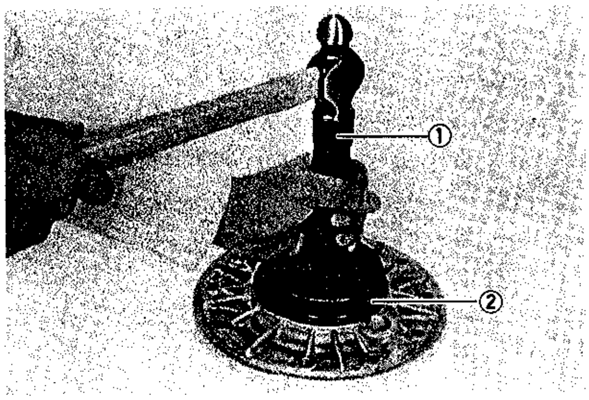
CAUTION:
- *Thoroughly clean mating surfaces of final gear case and bearing case.*
- *Take care not to apply SUZUKI BOND No. 1201 to ribs Ⓐ or not allow it to flow on to ribs.*



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

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

①	Bearing and Oil Seal Installer Handle	09924-74510
②	Oil Seal Installer and remover	09924-74520



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

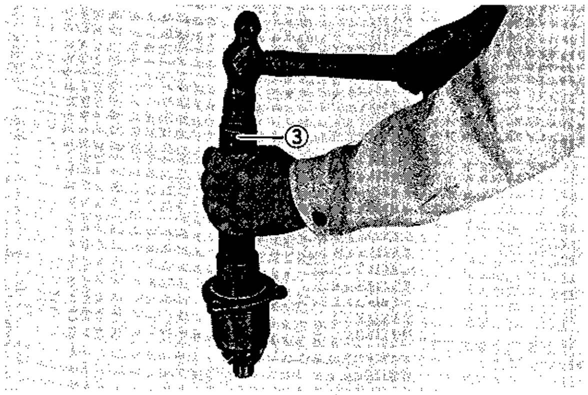
Tightening Torque	20 – 26 kg•m 2.0 – 2.6 kg•m 14.5 – 19.0 lb•ft

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

Snap Ring Pliers	09900-06108

- Using special tool ③, install a new oil seal into the propeller shaft coupling.

Bearing Installer	09913-84510



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

INSTALLATION OF PROPELLER SHAFT AND FINAL DRIVE GEAR ASSEMBLY

- For installation, reverse the procedure for removal.
- Apply SUZUKI BOND No. 1201 (99104-31100) to the end of the swing arm.
- Coat propeller shaft splines with Lithium Base Molybdenum Grease (NLGI #2).
- Install the final driven gear assembly, making sure the propeller shaft splines are aligned into the coupling.
- Torque the attachment nuts to specifications.

Tightening torque	35 – 45 N•m 3.5 – 4.5 kg•m 25.5 – 32.5 lb•ft

- Tighten the final gear case drain plug.

Tightening torque	20 – 30 N•m 2.0 – 3.0 kg•m 14.5 – 21.5 lb•ft

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

FULL-TRANSISTORIZED IGNITION SYSTEM

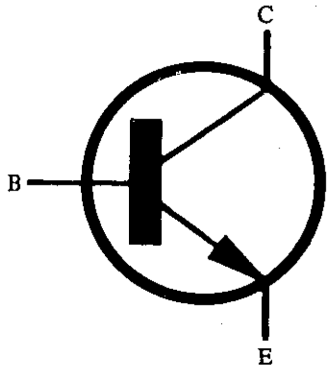
A fully transistorized ignition system is now employed on the GS1000GT. Its primary advantages are:

* Trouble free operation due to elimination of contact breaker points which can become contaminated.
* Ignition timing is maintained properly at all times and require no maintenance.
* Free from arcing and provides the ignition coil with stable secondary voltage.
* Excellent vibration and moisture resistance.

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 GS1000GT.
Transistors are divided into two groups, those being of the NPN and PNP types, and the transistors used in the GS1000GT model is of the NPN type only, works an amplifier and switching device.



B: BASE
C: COLLECTOR
E: EMITTER

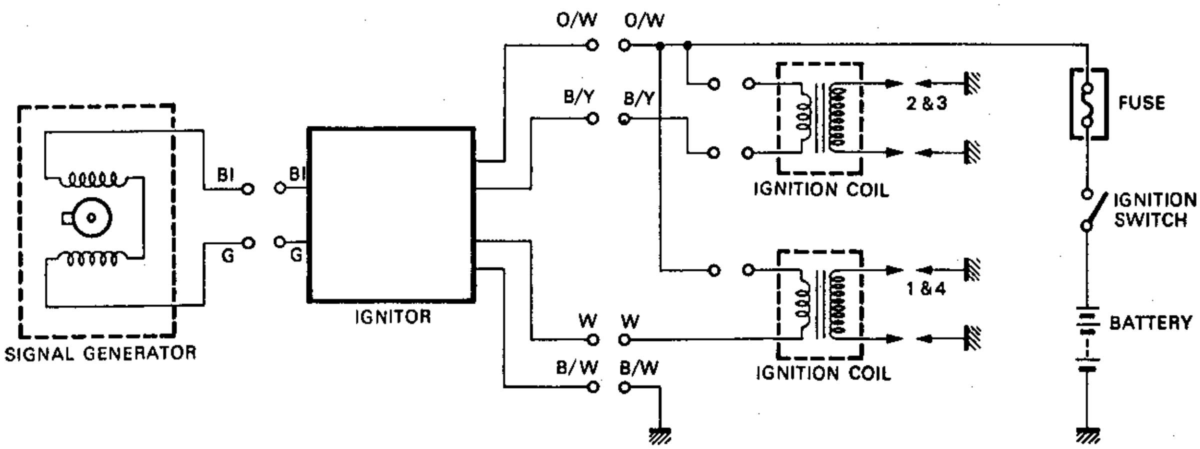
Each transistor has three terminals identified as the Base (B), Collector (C), and Emitter (E), and operation is as follows:
On a NPN type the base is the controling terminal of the transistor operation. On this type, the base utilizes only a positive or incoming signal to do the "ON", or "OFF" switching. The collector is the terminal where voltage is supplied to the transistor and the emitter is the terminal for passing this current for useage 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 GS1000GT is the Nippon Denso brand and consists of a signal generator, which employs a rotor and tow 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 or wire and a yoke or coil and is mounted 180° apart on the plate.

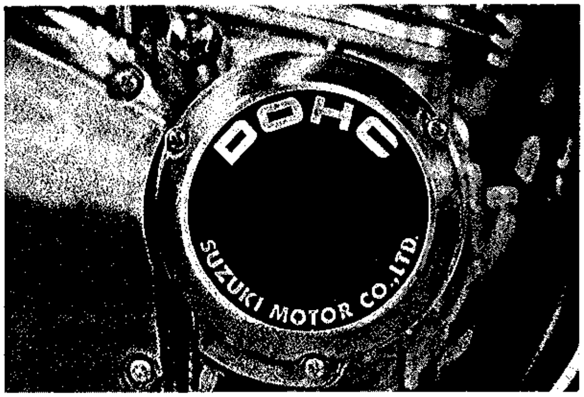
As the rotor tip is turned past the coils, AC current is produced and used for switching within the transistor unit.

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

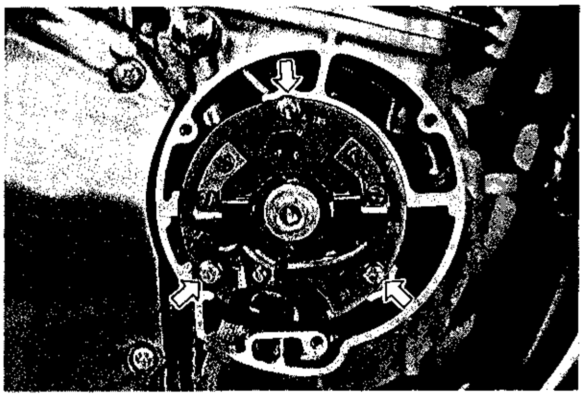


REMOVAL

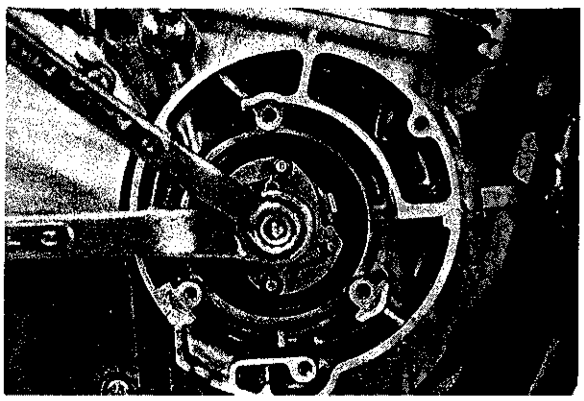
- Remove signal generator cover.



- Remove three screws and then remove the signal generator assembly and timing plate.

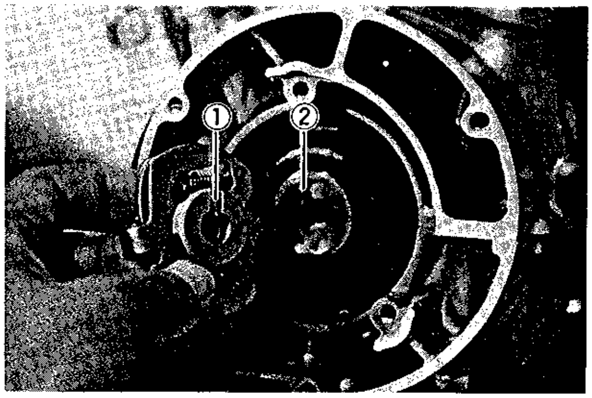


- Apply wrench to crank turning nut to remove automatic advance governor mounting bolts and the crank turning nut.
  Remove signal generator rotor and advance governor.

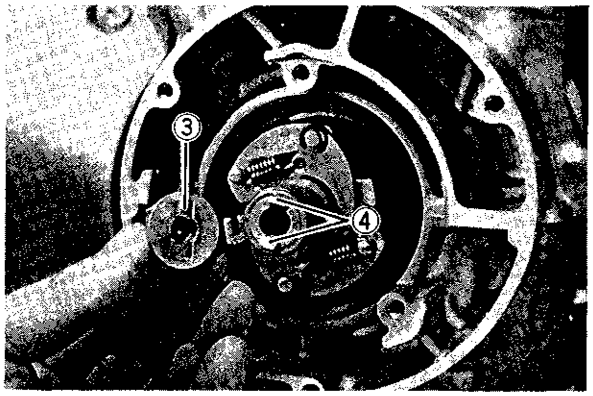


REASSEMBLY

- 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.

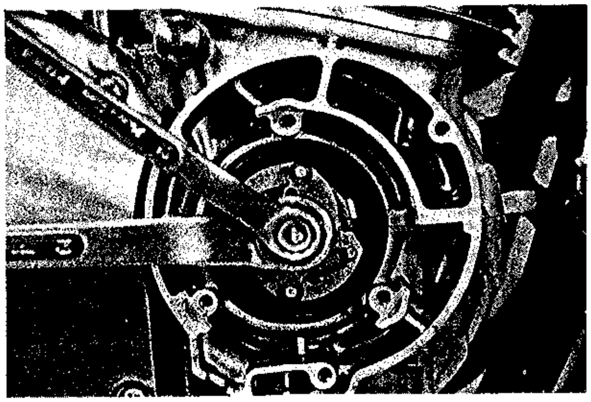


- Fit the groove ③ of the crankshaft turning nut on protrusion ④ of the advance governor body.

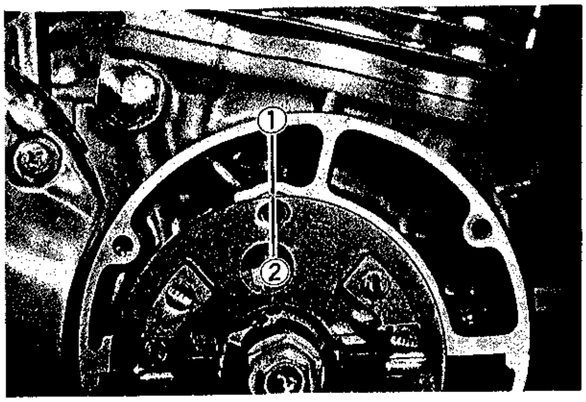


- Hold the crankshaft turning nut and tighten the governor center bolt with specified torque.

Tightening torque	13 — 23 N·m 1.3 — 2.3 kg·m 9.5 — 16.5 lb·ft



- Install the timing plate and signal generator so that the index line ① aligns with the index mark ②.



INSPECTION

IGNITION TIMING

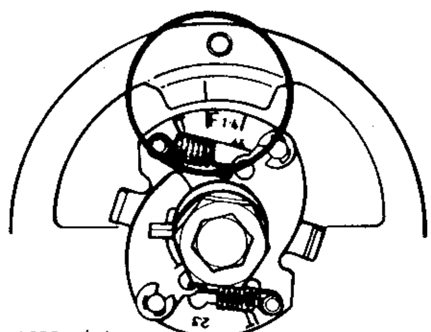
Check the performance of the timing mechanism using the timing light. Illuminate the advance governor with the timing light and vary the engine speed to see if the ignition timing advances properly.

Ignition timing specifications

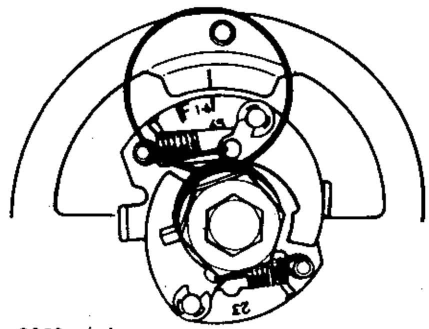
Ignition timing	17° B.T.D.C. below 1500 r/min and 37 – B.T.D.C. above 2350 r/min

The procedure is as follows:

- Clip the timing light on the high tension cord of the No. 1 or No.4 cylinder.
- Run the engine at a speed not exceeding 1500 r/min. Under this condition, "F" mark on No. 1 and No. 4 cylinder side and timing mark should be in perfect alignment.
- Run the engine in the speed range above 2350 r/min, and similarly observe the position of mark ① relative to mark ②. If the two marks are in register, it means that the ignition is properly advanced.



Below 1500 r/min



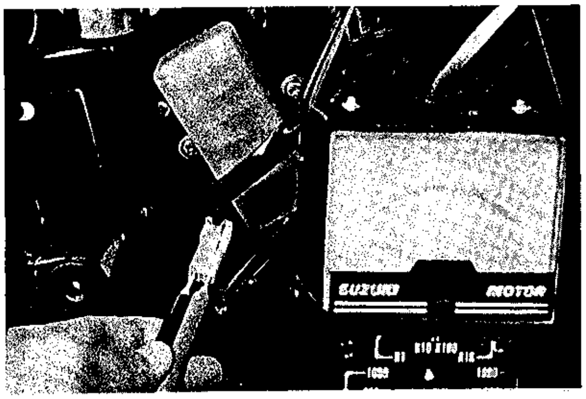
Above 2350 r/min

SIGNAL GENERATOR RESISTANCE

Measure the resistance between lead wires.
If the resistance noted to show infinity or too low a resistance value must be replaced.

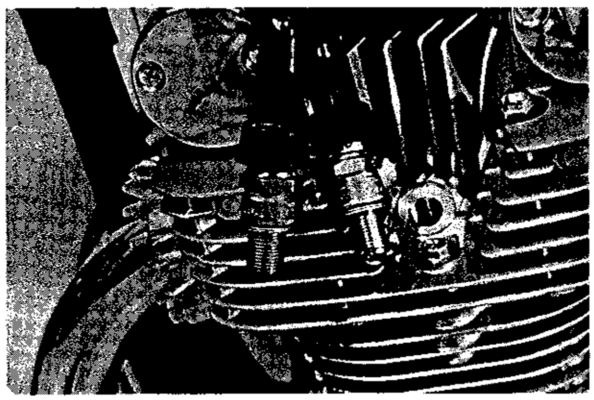
09900-25002	Pocket tester

STD resistance	
BI – G	290 – 360Ω



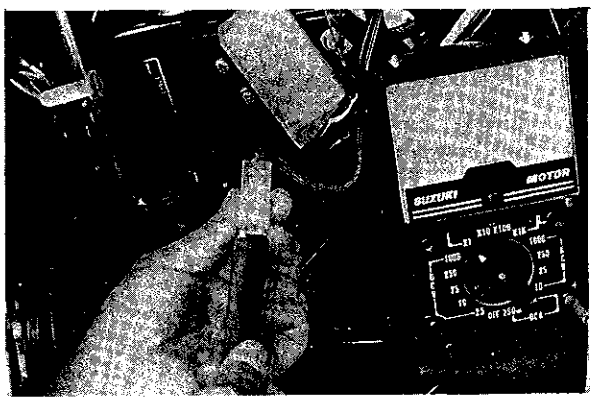
IGNITER

Remove each spark plug of Nos. 1 and 2 cylinders, fit it to respective plug cap and place it on the cylinder head.



Remove the frame cover on the left side and disconnect the lead wire from the signal generator.
Now connect ⊕ pin of SUZUKI Pocket Tester (X1Ω range) with Blue lead wire on the igniter side and ⊖ pin with Green lead wire. The igniter is in good condition if the following is observed: The moment the test pins are connected the spark plug of No. 2 cylinder sparks and the moment the tester pins are disconnected the spark plug of No. 1 cylinder sparks.

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

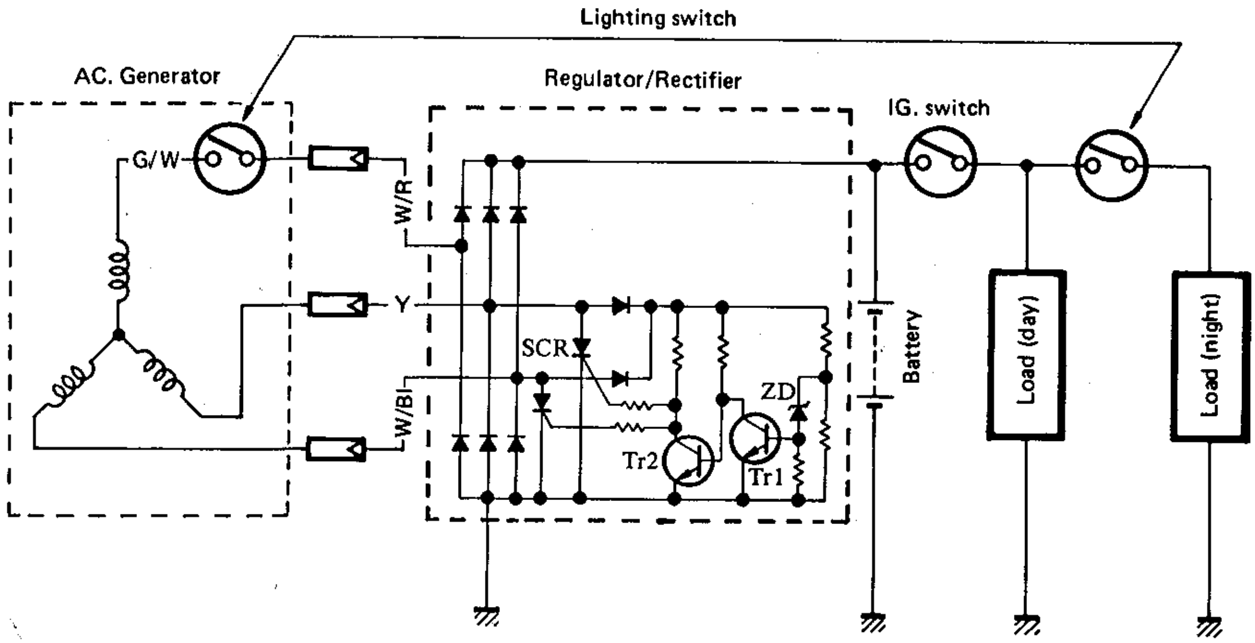


CHARGING SYSTEM

DESCRIPTION

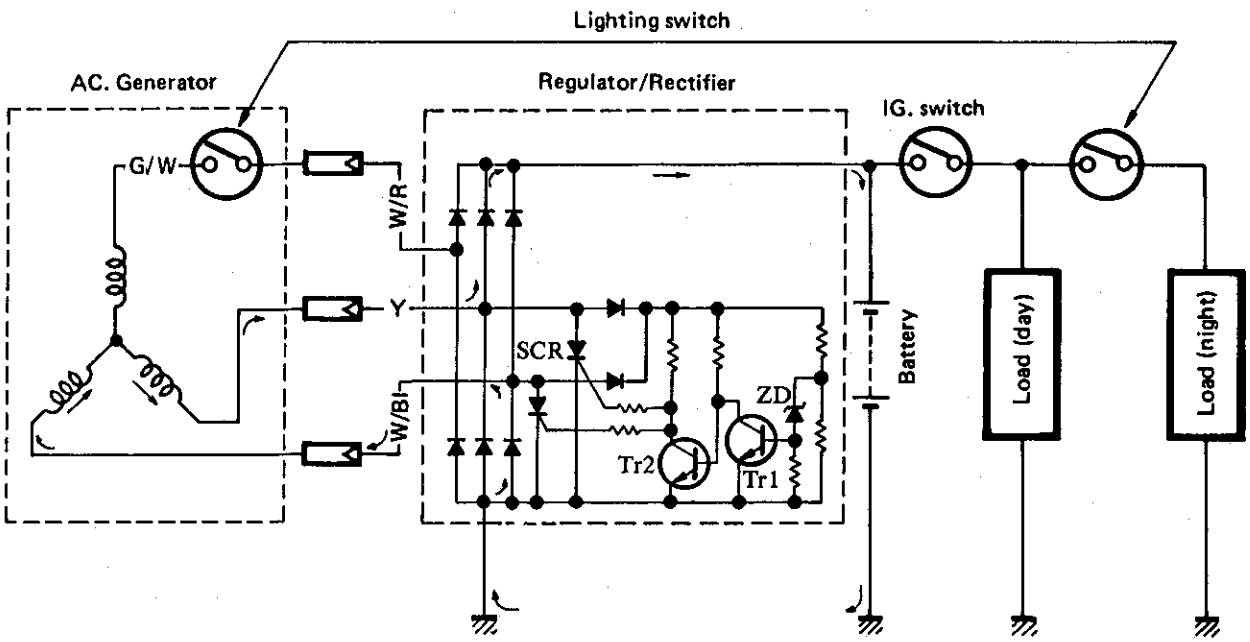
The circuit of the charging system is shown in the figure, is composed of an AC generator, regulator/rectifier unit and battery.

The AC current generated from AC generator is rectified by rectifier and is turned into DC current, then it charges the battery.

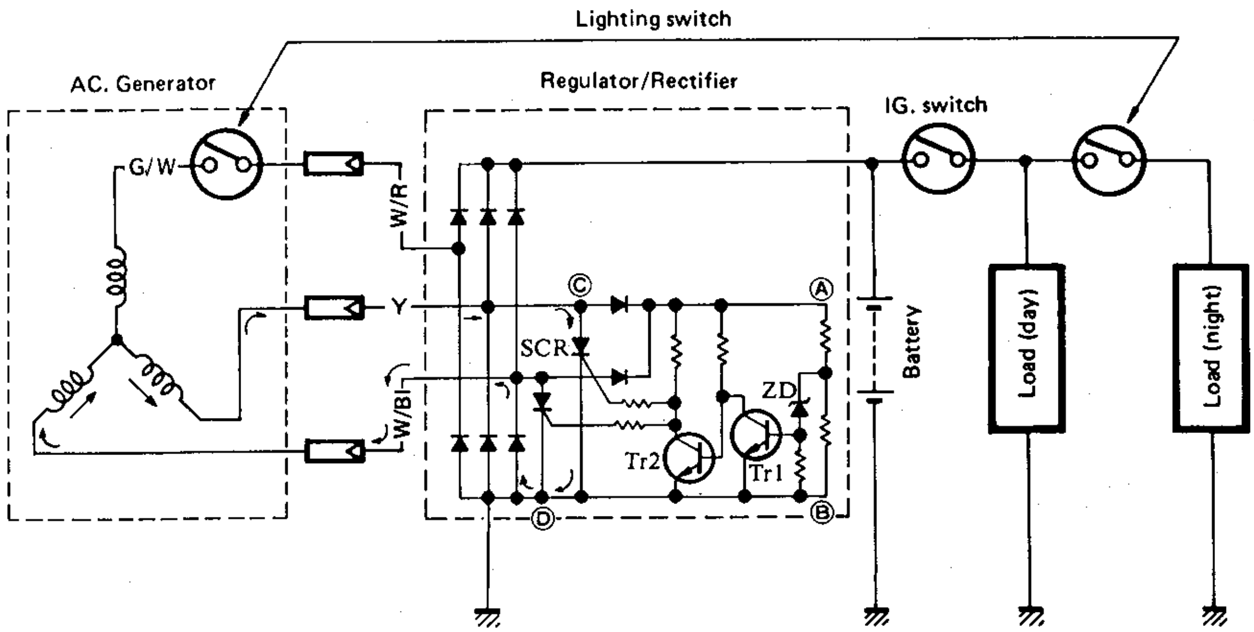


Function of Regulator

While the engine r/min is low and the generated voltage of AC generator is lower than the maximum allowable voltage, the regulator does not function.



When the engine r/min becomes higher, the generated voltage of AC generator also becomes higher and the voltage between points Ⓐ and Ⓑ of regulator become 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 Ⓒ to point Ⓓ. 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 Ⓓ, reverse current tends to flow to SCR, then the circuit of SCR turns to OFF mode and beings to charge the battery again. Thus these repetitions maintain charging voltage to the battery constant and protect it from overcharging.



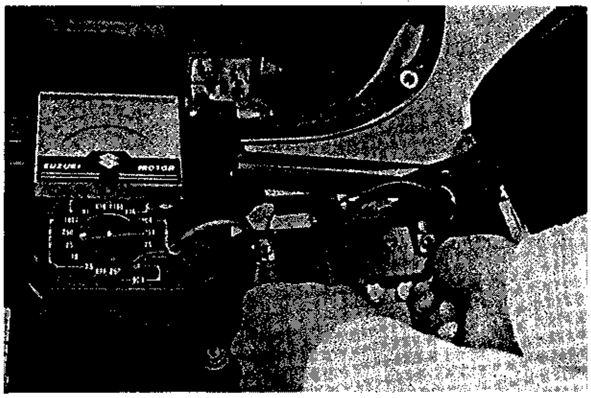
INSPECTION

Charging Output Check

09900-25002	Pocket tester

- Start the engine and keep it running at 5 000 r/min.
- Using pocket tester, measure the DC voltage between the Battery ⊕ and ⊖ terminal.
- If the tester reads under 14V or over 15.5V, the regulator/rectifier may be faulty.

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



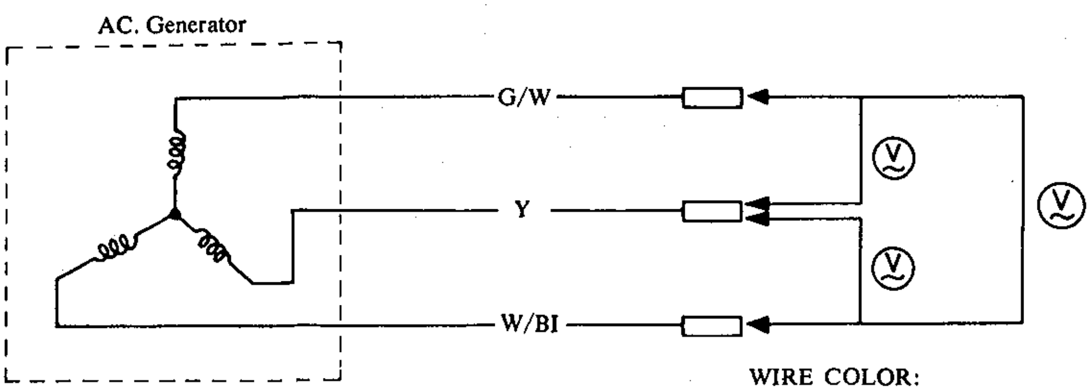
STD charging output
14 – 15.5V (DC) at 5 000 r/min

AC GENERATOR NO-LOAD PERFORMANCE

09900-25002	Pocket tester

- 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



WIRE COLOR:

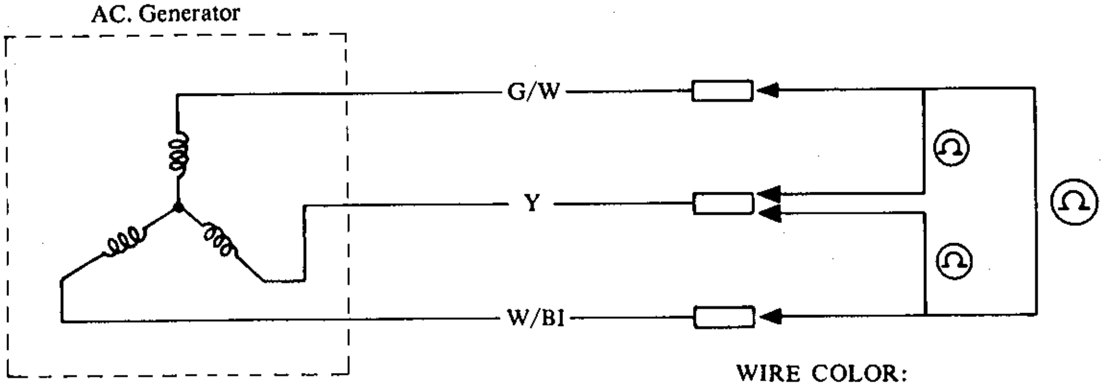
Y .... Yellow
W/Bl............. White with Blue tracer
G/W .... Green with White tracer

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

09900-25002	Pocket tester

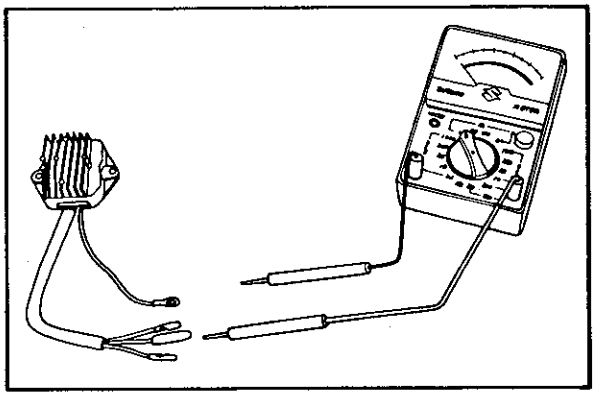
> *NOTE:*
> *When making this test, it is not necessary to remove the AC generator.*

Specification	Approx. 1Ω



WIRE COLOR:
Y .... Yellow
W/BI .... White with Blue tracer
G/W .... Green with White tracer

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

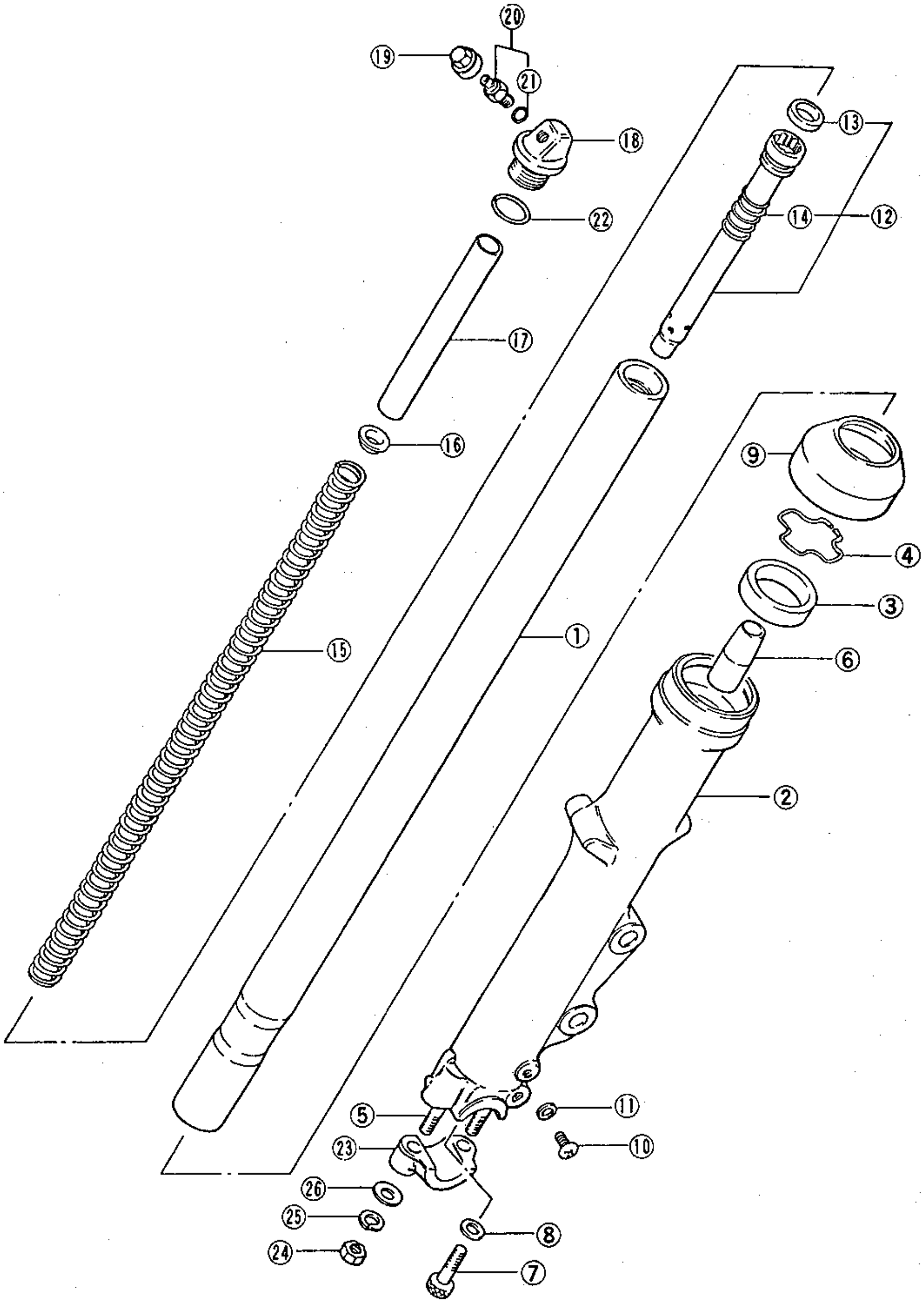


09900-25002	Pocket tester

Unit: Ω

⊖ Probe of tester \ ⊕ Probe of tester	R	W/BI	W/R	Y	B/W
R		∞	∞	∞	∞
W/BI	5－7		∞	∞	Approx. 200
W/R	5－7	∞		∞	∞
Y	5－7	∞	∞		Approx. 200
B/W	35－45	5－7	5－7	5－7	

FRONT FORK



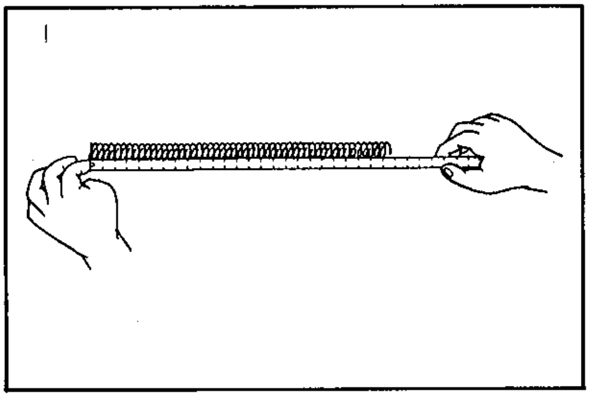
1. Inner tube
2. Outer tube
3. Oil seal
4. Oil seal stopper ring
5. Stud bolt
6. Oil lock piece
7. Bolt
8. Gasket
9. Dust seal
10. Screw
11. Gasket
12. Cylinder
13. Piston ring
14. Spring
15. Spring
16. Spring guide
17. Spacer
18. Upper cap
19. Valve cap
20. Valve
21. O ring
22. O ring
23. Axle holder
24. Nut
25. Lock washer
26. Washer

Tightening torque			
	N•m	kg•m	lb•ft
⑦	20 – 26	2.0 – 2.6	14.5 – 19.0
⑱	15 – 30	1.5 – 3.0	11.0 – 25.5
⑳	10 – 13	1.0 – 1.3	7.0 – 9.5
㉔	15 – 25	1.5 – 2.5	11.0 – 18.0

INSPECTION

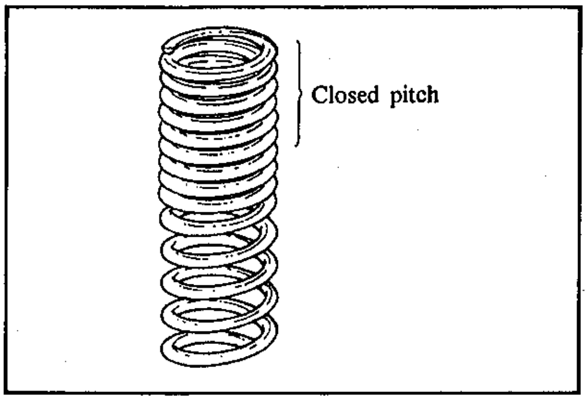
- Inspect front fork spring.
  Measure the free length of the fork spring. Replace it with a new one when it is less than the service limit.

Limit	416 mm (16.4 in)

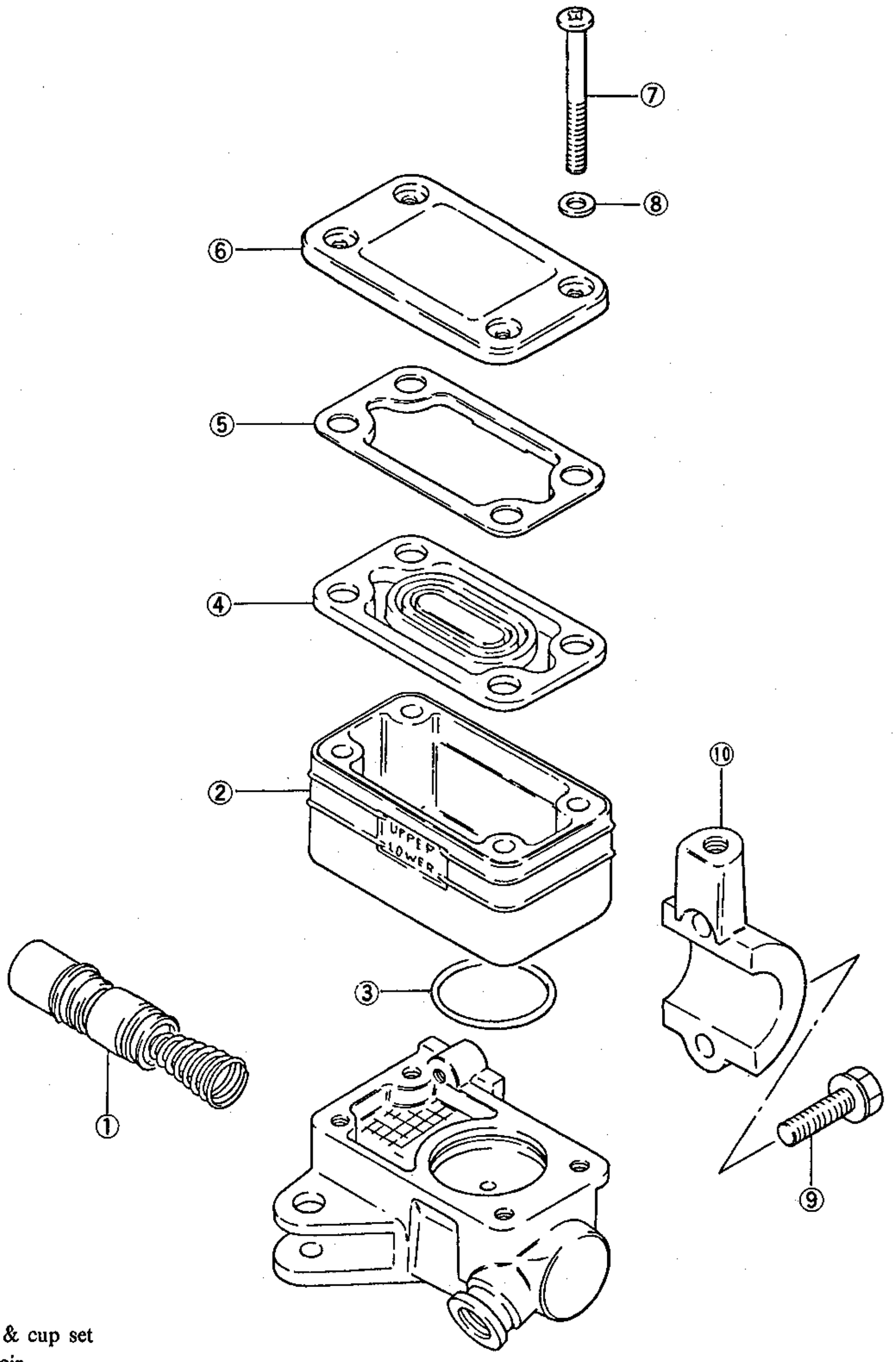


- Inspect the inner tube.
  Visually inspect the sliding surface of the inner tube. Replace the inner tube with a new one if any flaws are found.
- Inspect the outer tube.
  Visually inspect the outer tube to see whether it is dented or damaged.
- Inspection for oil leakage.
  Replace the oil seal with a new one if oil leakage is found. Leakage is caused by intrusion of dust or flaws on the inner tube.

CAUTION:
Install the front fork spring that the closed pitch end is in up side.



FRONT MASTER CYLINDER

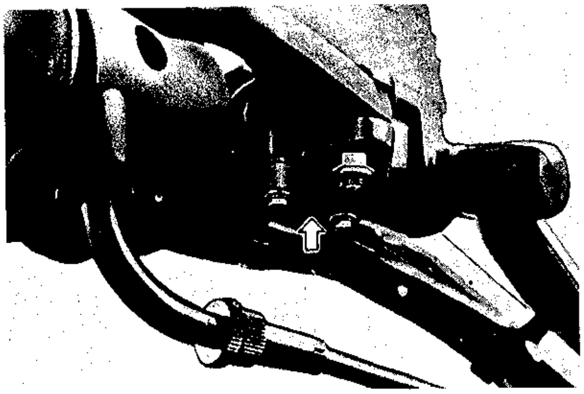


1. Piston & cup set
2. Reservoir
3. O ring
4. Diaphragm
5. Plate
6. Cap
7. Screw
8. Washer
9. Bolt
10. Holder

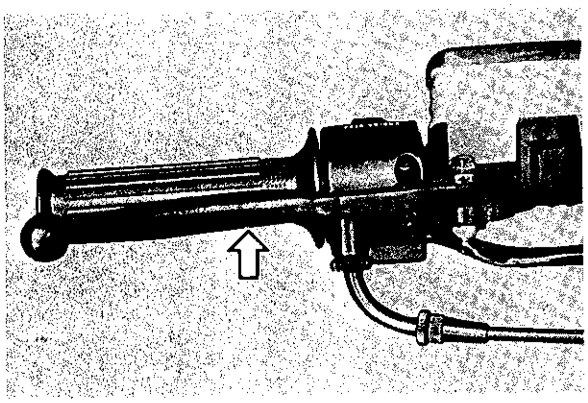
Tightening torque			
	N•m	kg•m	lb•ft
⑨	5 — 8	0.5 — 0.8	3.5 — 6.0

MASTER CYLINDER REMOVAL AND DISASSEMBLY

- Take off front brake light switch.

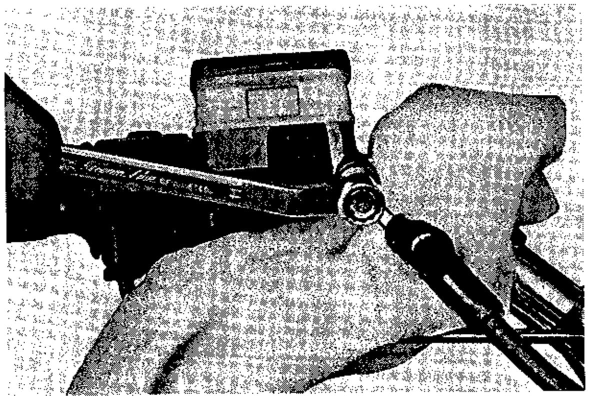


- Remove front brake lever.

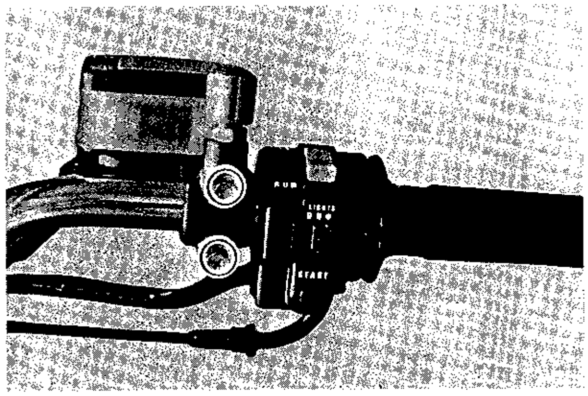


- Place a rag underneath the union bolt on the master cylinder to catch spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose/master cylinder joint.

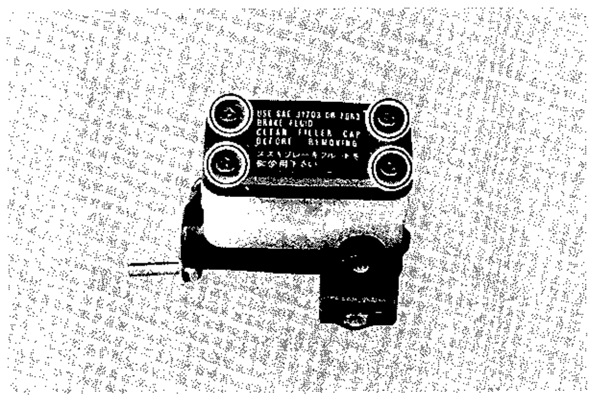
> *CAUTION:*
> *Completely wipe off any brake fluid adhering to any part of motorcycle. The fluid reacts in chemically with paints, plastics, rubber materials, immediately.*



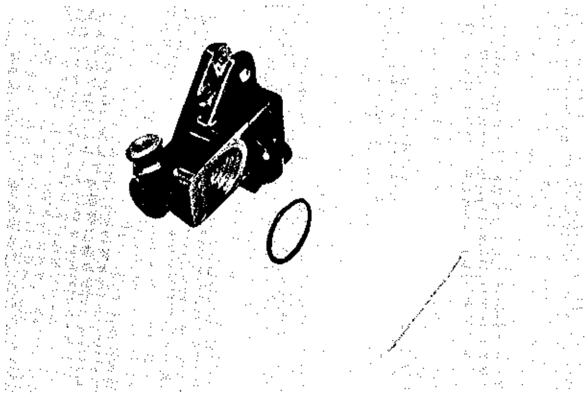
- Remove master cylinder ass'y after removing two fitting bolts.



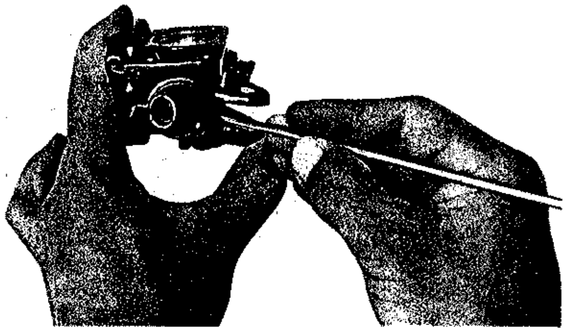
- Remove filler cap and drain brake fluid.



- Pull out the reservoir and O ring.

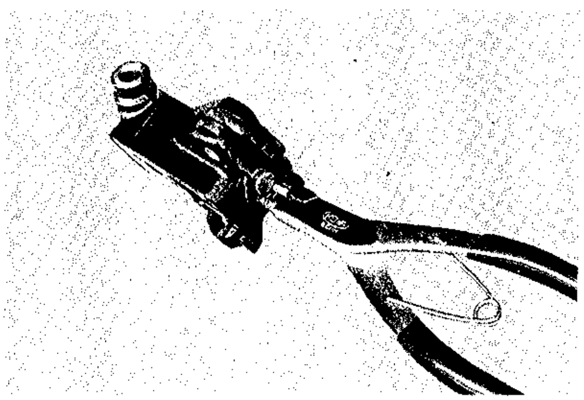


- Draw out dust seal boot.

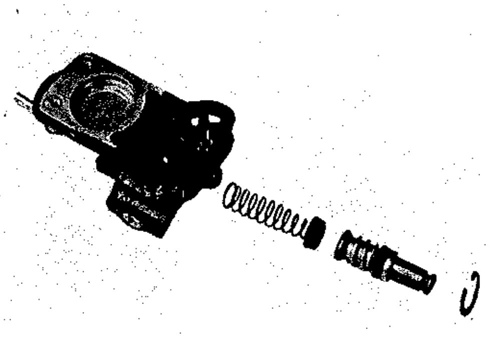


- Remove circlip by using special tool.

09900-06108	Snap ring pliers

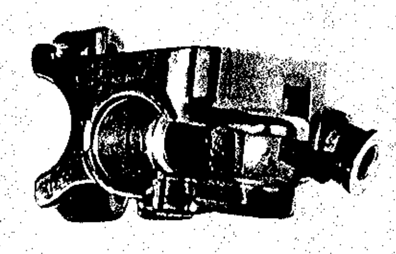


- Pull out piston, primary cup and spring.

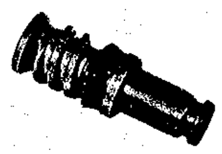


MASTER CYLINDER INSPECTION

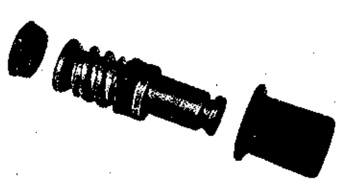
- Inspect the cylinder bore wall for any scratch or other damage.



- Inspect the piston surface for scratch or other damage.



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

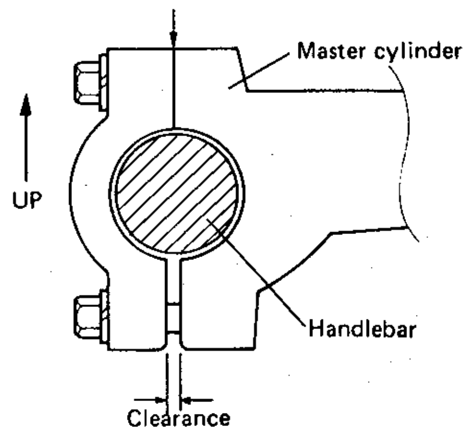


MASTER CYLINDER REASSEMBLY

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

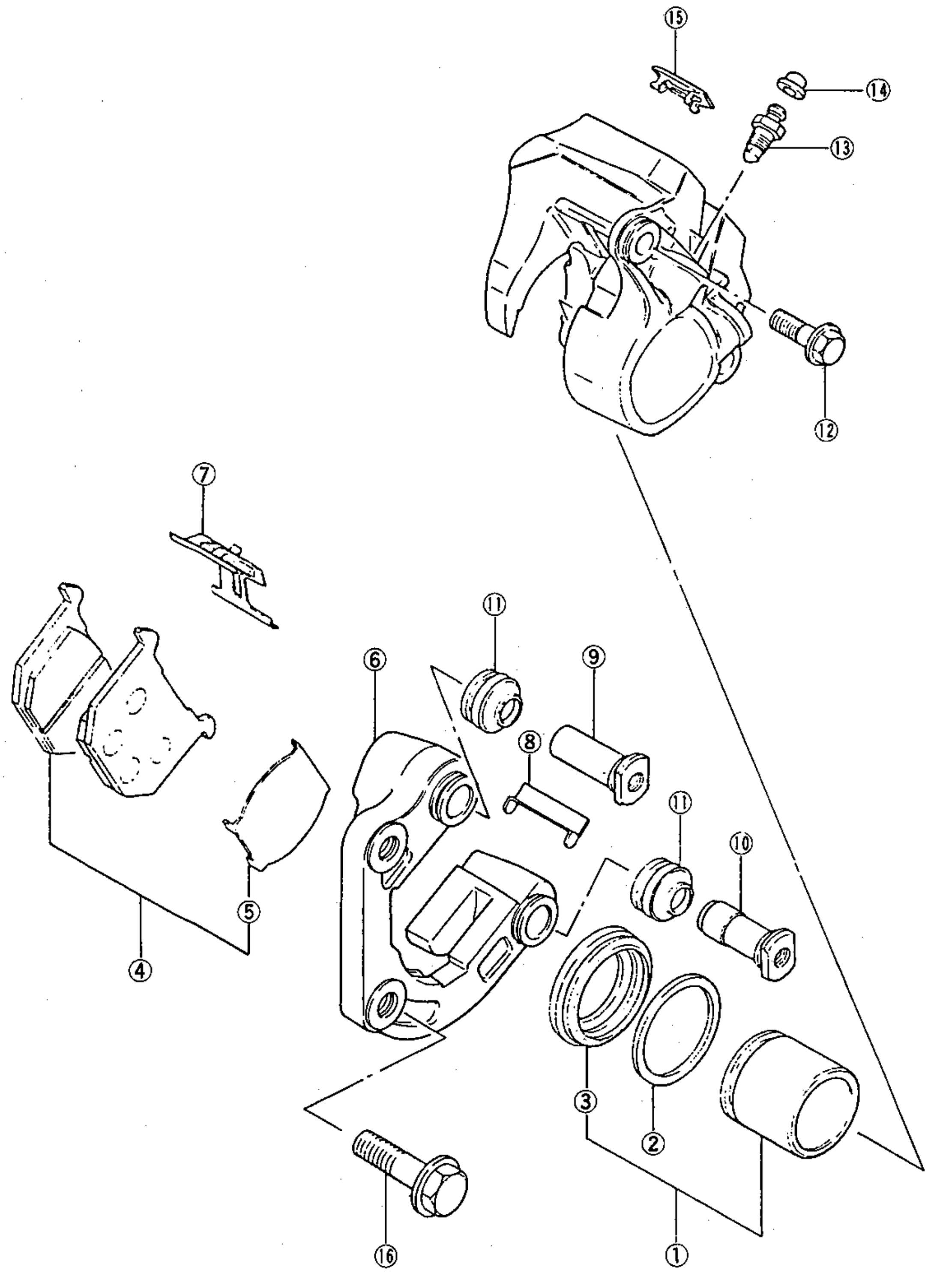
> *CAUTION:*
> *Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.*
> *Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.*

- When remounting the master cylinder to the handlebars, first tighten the clamp bolt for the upper portion as shown.



> *CAUTION:*
> *Adjust the front brake light switch after installation.*
> *Bleed the air after reassembling master cylinder.*

FRONT CALIPER



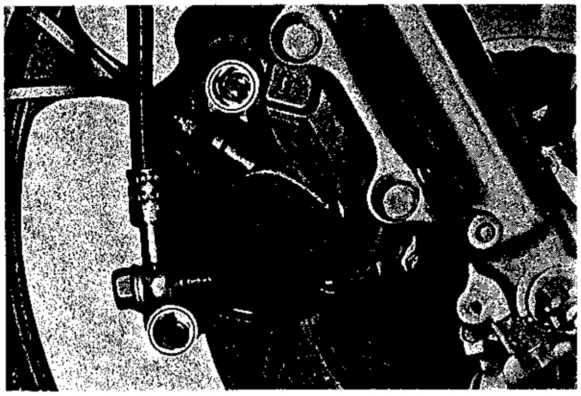
1. Piston set
2. Piston seal
3. Piston boot
4. Pad set
5. Pad shim
6. Caliper holder
7. Pad spring
8. Pad guide
9. Caliper axle No. 1
10. Caliper axle No. 2
11. Axle boot
12. Bolt
13. Bleeder
14. Cap
15. Cover
16. Bolt

Tightening torque			
	N•m	kg•m	lb•ft
⑫	15 — 20	1.5 — 2.0	11.0 — 14.5
⑯	25 — 40	2.5 — 4.0	18.0 — 29.0

BRAKE PAD REPLACEMENT

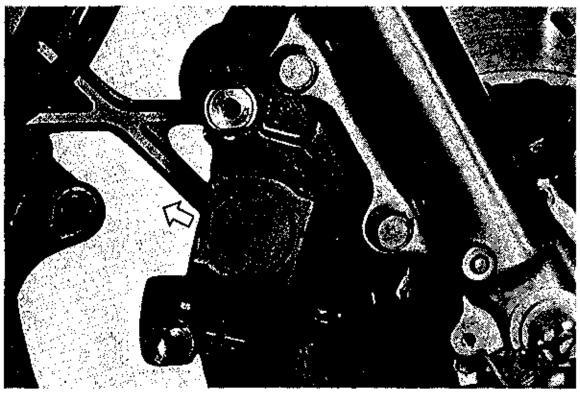
- Remove two bolts and take off caliper.

> *CAUTION:*
> *Do not operate the brake lever when removing the caliper.*

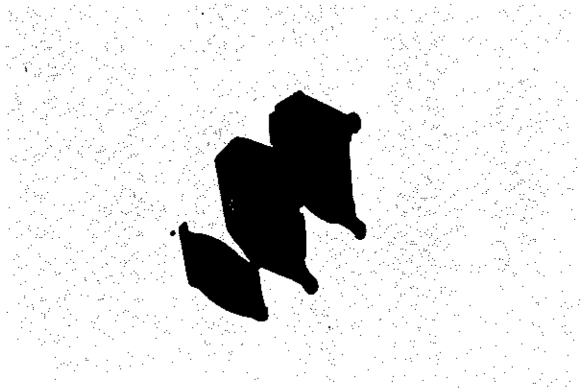


- Pull out brake pads with pad shim.

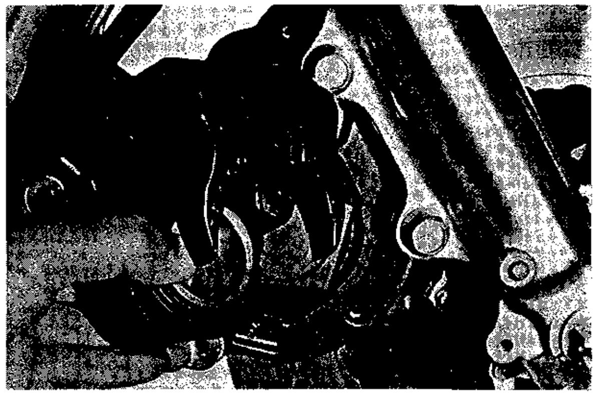
> *CAUTION:*
> *Replace the brake pad with a set, otherwise braking performance will be adversely affected.*



> *CAUTION:*
> *Do not apply pad grease, when installing the brake pads.*



> *NOTE:*
> *Push in the piston all the way before remounting the caliper.*



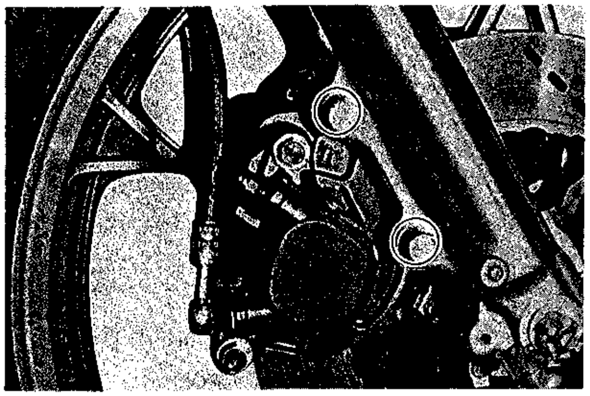
- Tighten the caliper axle bolts with specified torque.

Tightening torque	15 – 20 N·m 1.5 – 2.0 kg·m 11.0 – 14.5 lb·ft

CALIPER REMOVAL AND DISASSEMBLY

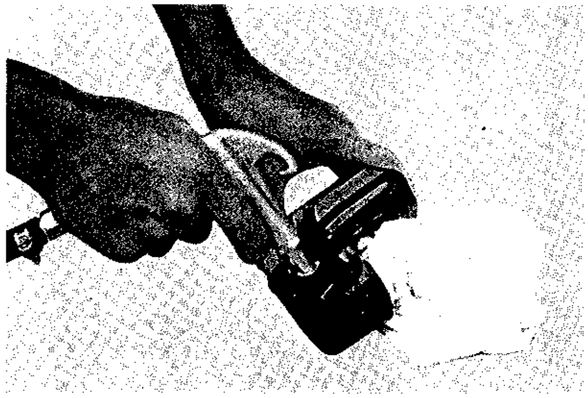
- Disconnect brake hose and catch the brake fluid in a suitable receptacle.

- Remove caliper axle bolts and take off caliper.

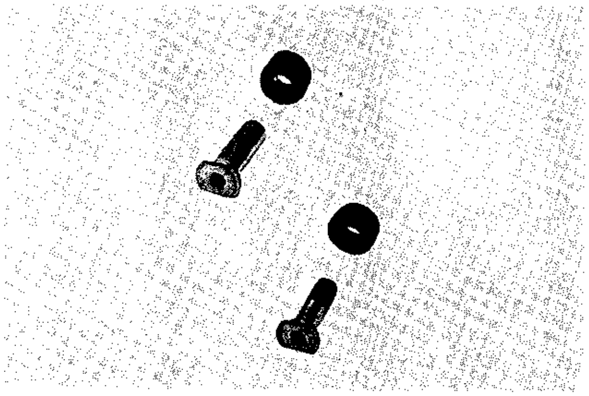


- Place a rag over the piston to prevent popping up. Draw out the piston by using air gun.

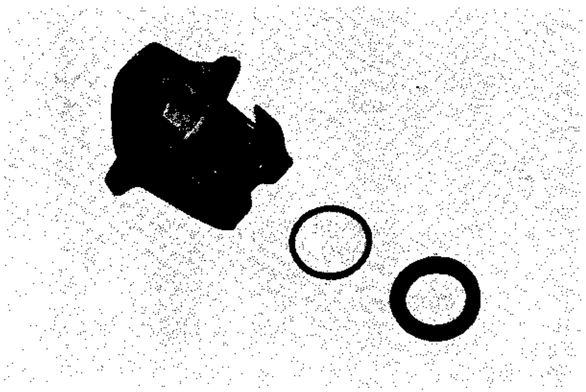
> *CAUTION:*
> *Do not use high pressure air for preventing piston damage.*



- Remove caliper bracket and draw out caliper axles.

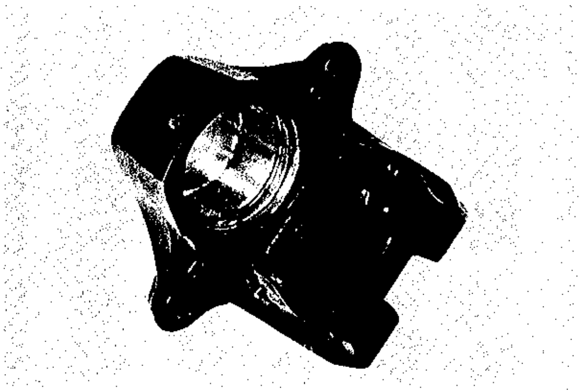


- Remove piston boot and piston seal.

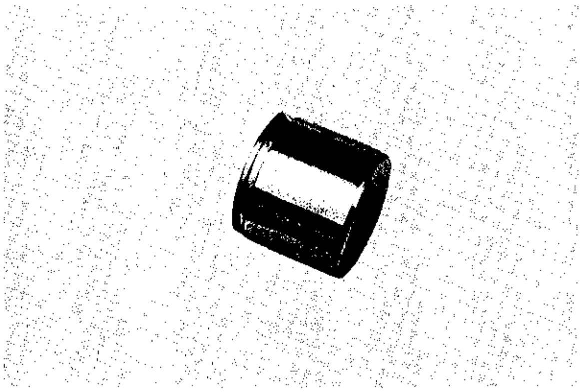


CALIPER AND DISC INSPECTION

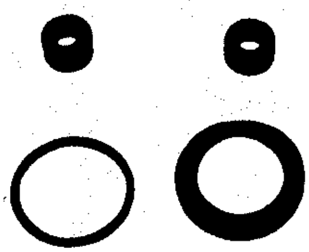
- Inspect the cylinder bore wall for nick, scratch or other damage.



- Inspect the piston surface for any flow or other damage.



- Inspect each rubber part for damage and wear.



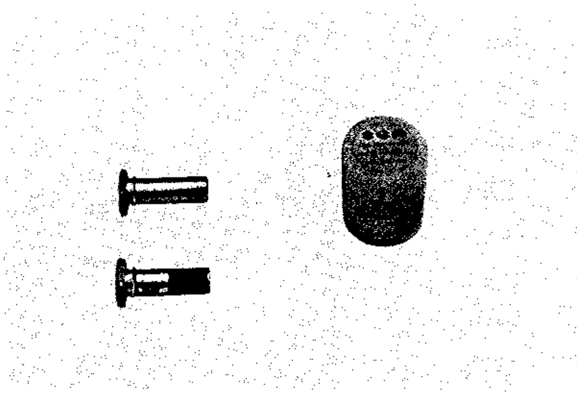
CALIPER REASSEMBLY

- 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.*

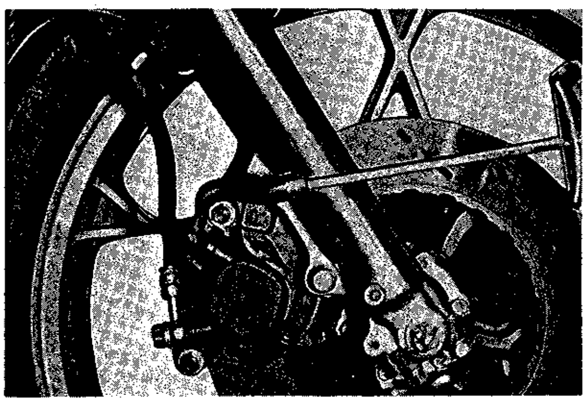
- Apply grease to the caliper axles.

99000-25100	Suzuki silicone grease

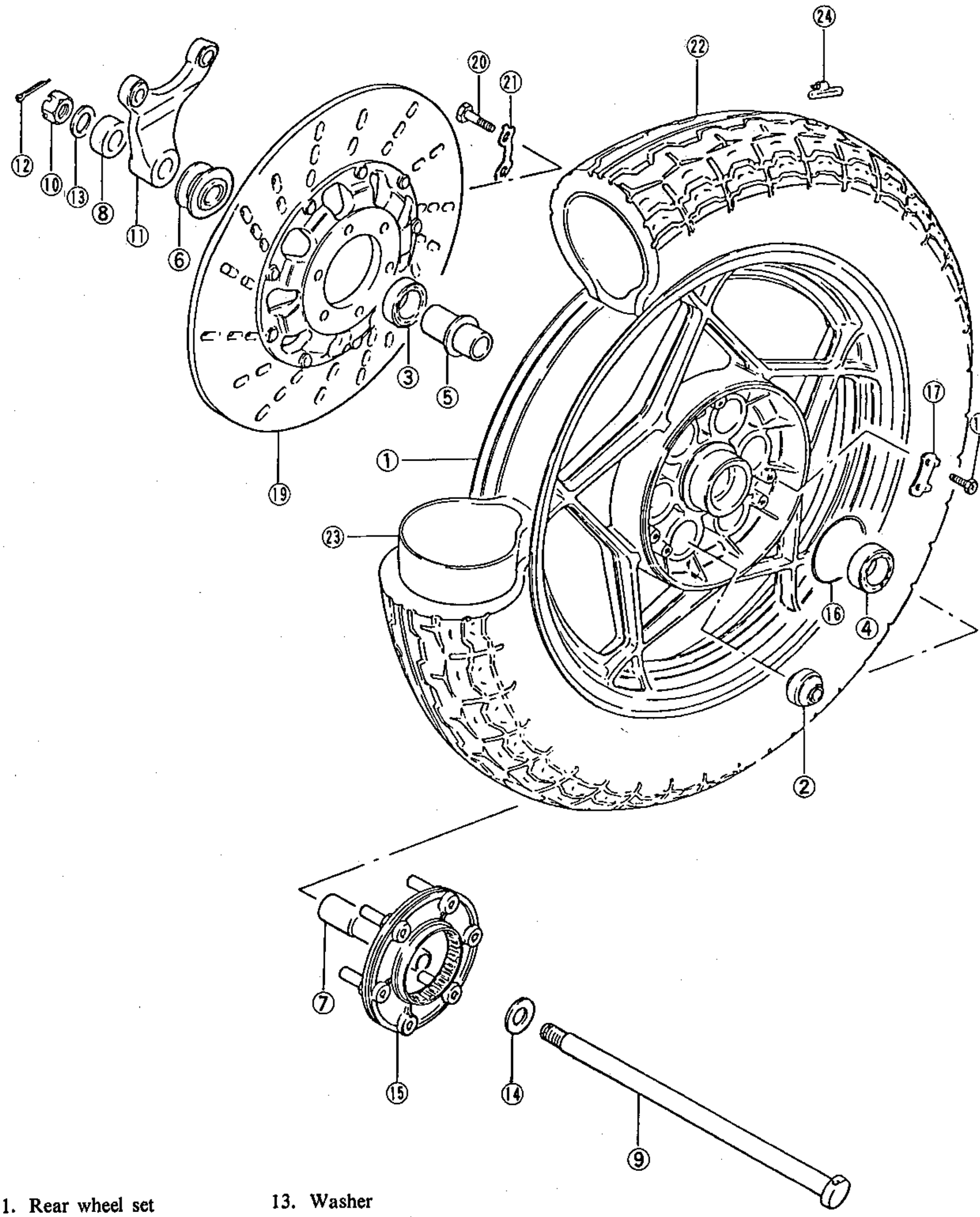


- Tighten the caliper axle nuts and caliper mounting bolts with specified torque.

	Tightening torque
Caliper axle bolt	15 — 20 N•m 1.5 — 2.0 kg•m 11.0 — 14.5 lb•ft
Caliper bolt	25 — 40 N•m 2.5 — 4.0 kg•m 18.0 — 29.0 lb•ft



REAR WHEEL

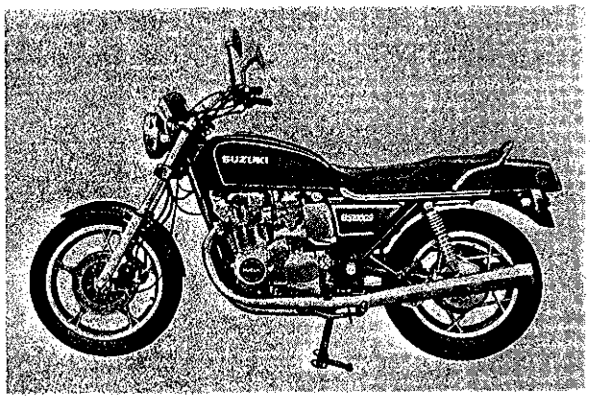


1. Rear wheel set
2. Cushion
3. Bearing, RH
4. Bearing, LH
5. Bearing spacer
6. Spacer RH
7. Spacer, LH
8. Spacer, RH
9. Rear axle
10. Nut
11. Rear caliper bracket
12. Cotter pin
13. Washer
14. Washer, LH
15. Driven joint
16. O ring
17. Washer
18. Bolt
19. Rear brake disc
20. Bolt
21. Washer
22. Rear tire
23. Inner tube
24. Balancer

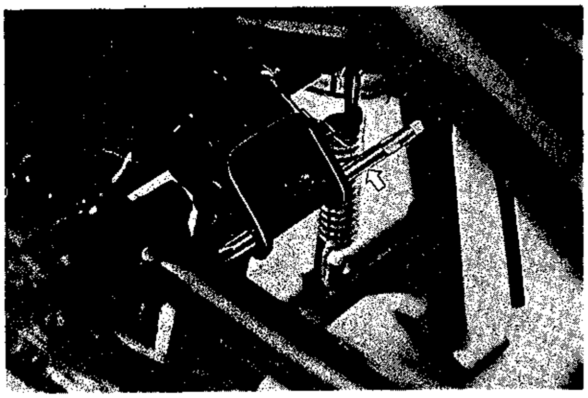
Tightening torque			
	N·m	kg·m	lb·ft
⑩	50 – 80	5.0 – 8.0	36.0 – 58.0
⑳	15 – 25	1.5 – 2.5	11.0 – 18.0

REMOVAL AND DISASSEMBLY

- Locate the motorcycle on level ground and place the motorcycle on the centerstand.

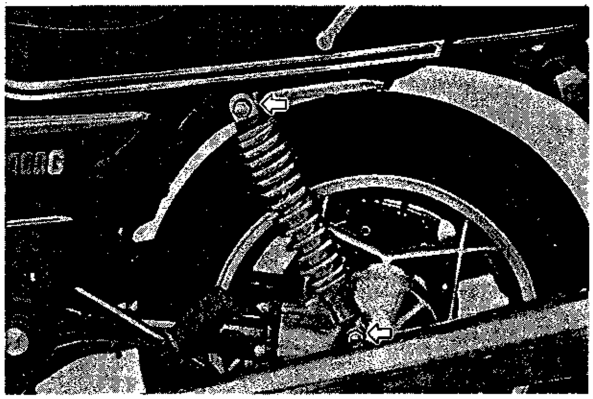


- Insert the crosshead screwdriver into the right side of the centerstand pivot to prevent the motorcycle from tipping off the centerstand.

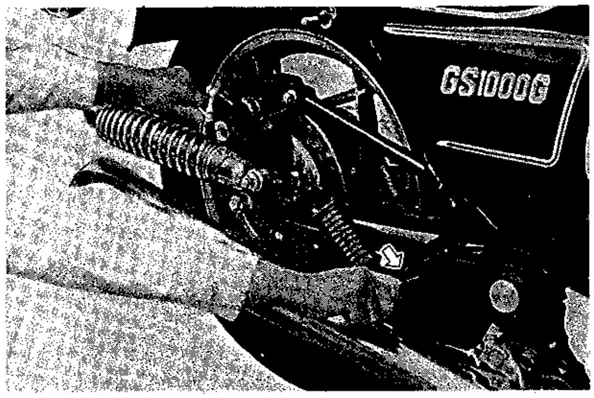


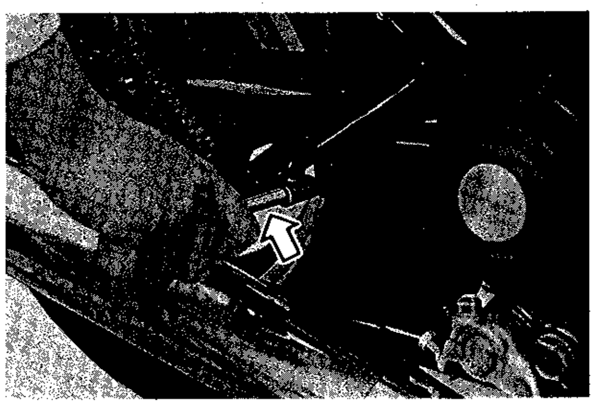
- Remove the upper shock absorber nuts and loosen the lower shock absorbers free from the mounting lugs.
  This will allow the swinging arm/bevel gear assembly to be easily moved.

> *CAUTION:*
> *Take care not to burn yourself if the mufflers are hot.*



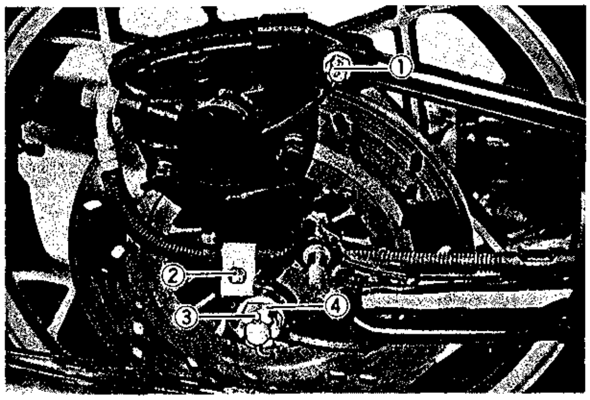
- Lift the swinging arm/bevel gear assembly up by attaching a 14 mm wrench to one of the caliper bolts and use the wrench as a lift handle. While lifting the swinging arm/bevel gear assembly insert a socket wrench handle through the right muffler support and swinging arm hole. This will hold the swinging arm in the correct position for removing the rear wheel axle.





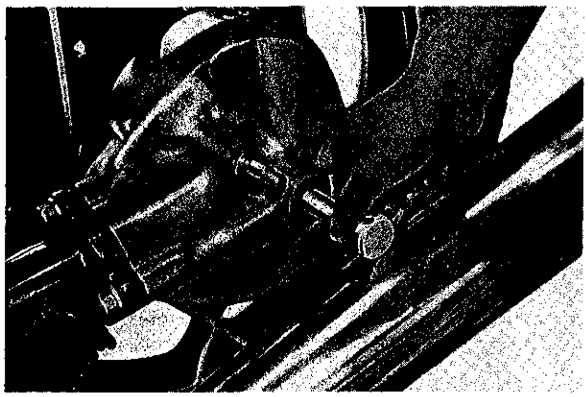
- Remove both right and left rear shock absorbers.

- Remove the rear torque link cotter pin ①, bolt, nut and support bolt ② for brake hose.
- Remove the axle cotter pin ③ and axle nut ④.



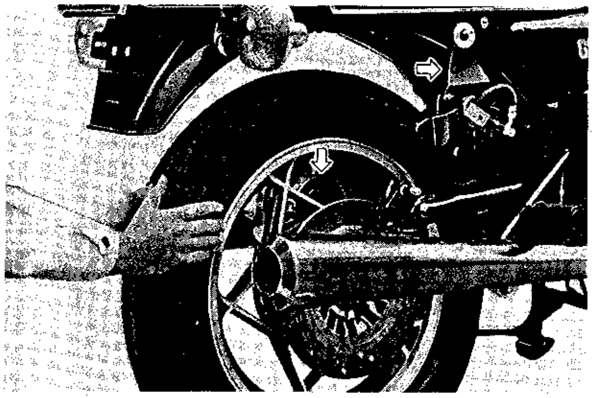
- Remove the axle, while at the same time supporting the caliper assembly.
  After the axle is clear off the caliper, hand the caliper on the upper shock absorber mount stud.

> *CAUTION:*
> *Do not allow the brake hose to touch the hot muffler. Protect it by wrapping the hose with a rag.*

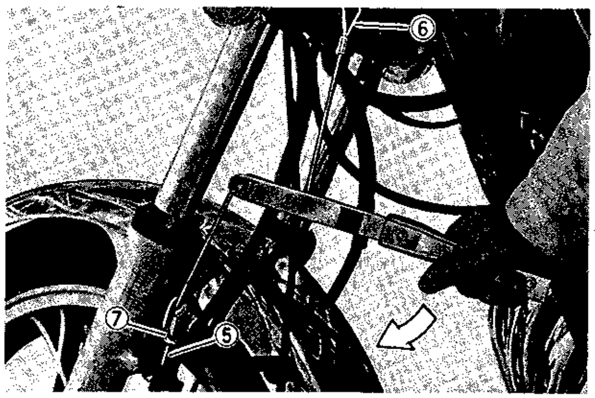


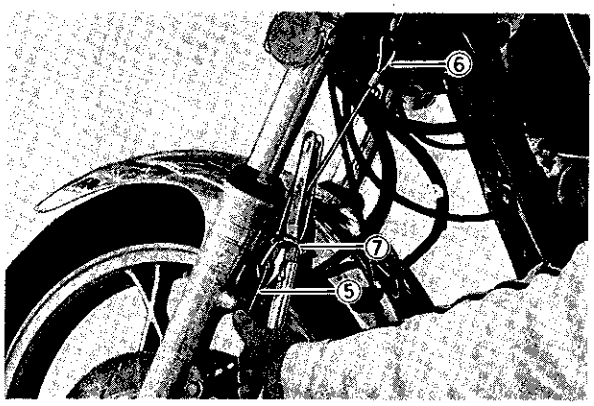
⑧

- Remove the axle from the differential housing. Remove the wheel from the splined drive and set the wheel assembly on the ground.

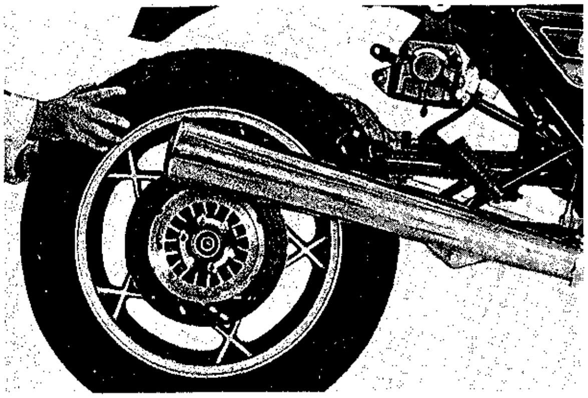


- The front forks must be compressed in order to tilt the back of the motorcycle upward so that the tire can be removed from the fenderwell area. To compress the forks turn the forks to the right fork stop. Hang the front fork compressing tool hook ⑤ on the left front fender boss. Hang the wire loop ⑥ on the left fork stop.
  Pivot the front fork compressing tool handle to compress the forks, then hang the hook ⑦ on the tool lever handle to hold the forks in the compressed position.



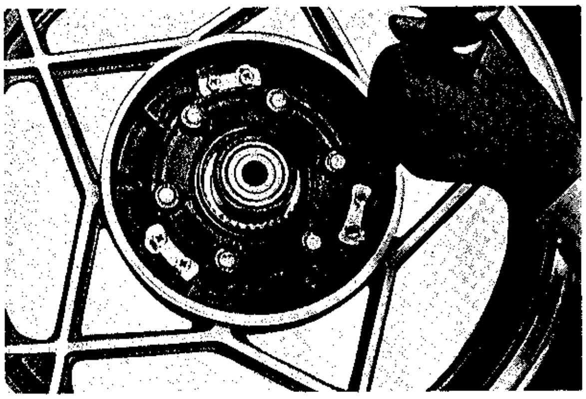


- Remove the rear wheel assembly.



- Bend up the lock washer, remove the bolts and separate the disk from the wheel.

- Bend up the lock washer, remove the bolts and separate the driven joint from the wheel.

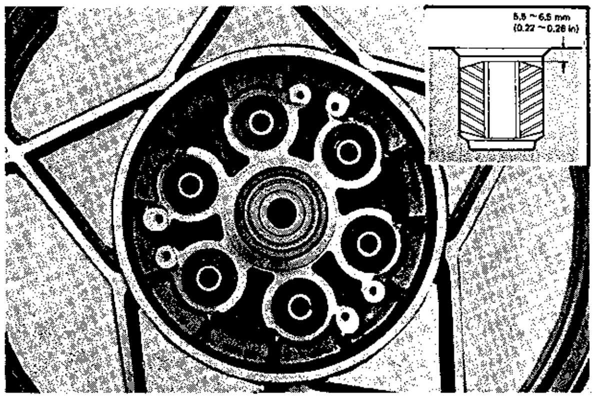


- Remove the bushings from the wheel.

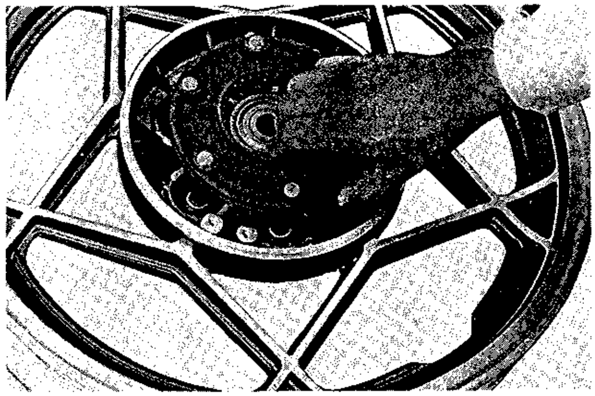
- Remove the right and left bearings.

REASSEMBLY

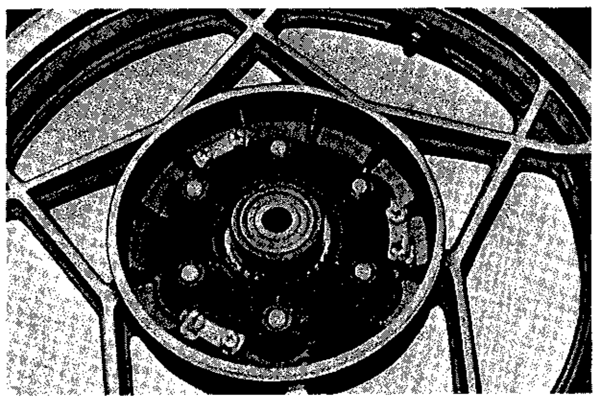
- Drive bushings into the wheel.



- Insert driven joint into wheel busing.



- Place three washers in the groove around the driven joint and tighten six bolts. Then bend washers to lock the bolts.



- Insert the rear wheel assembly under the rear fenderwell area.
- Remove the front fork compressing tool from the front fork.
- Fit the wheel assembly back onto the splined engagement shaft. Insert the axle through to the right side of the swinging arm. Install and tighten the axle nut securely. Fit the cotter pin in the axle nut.

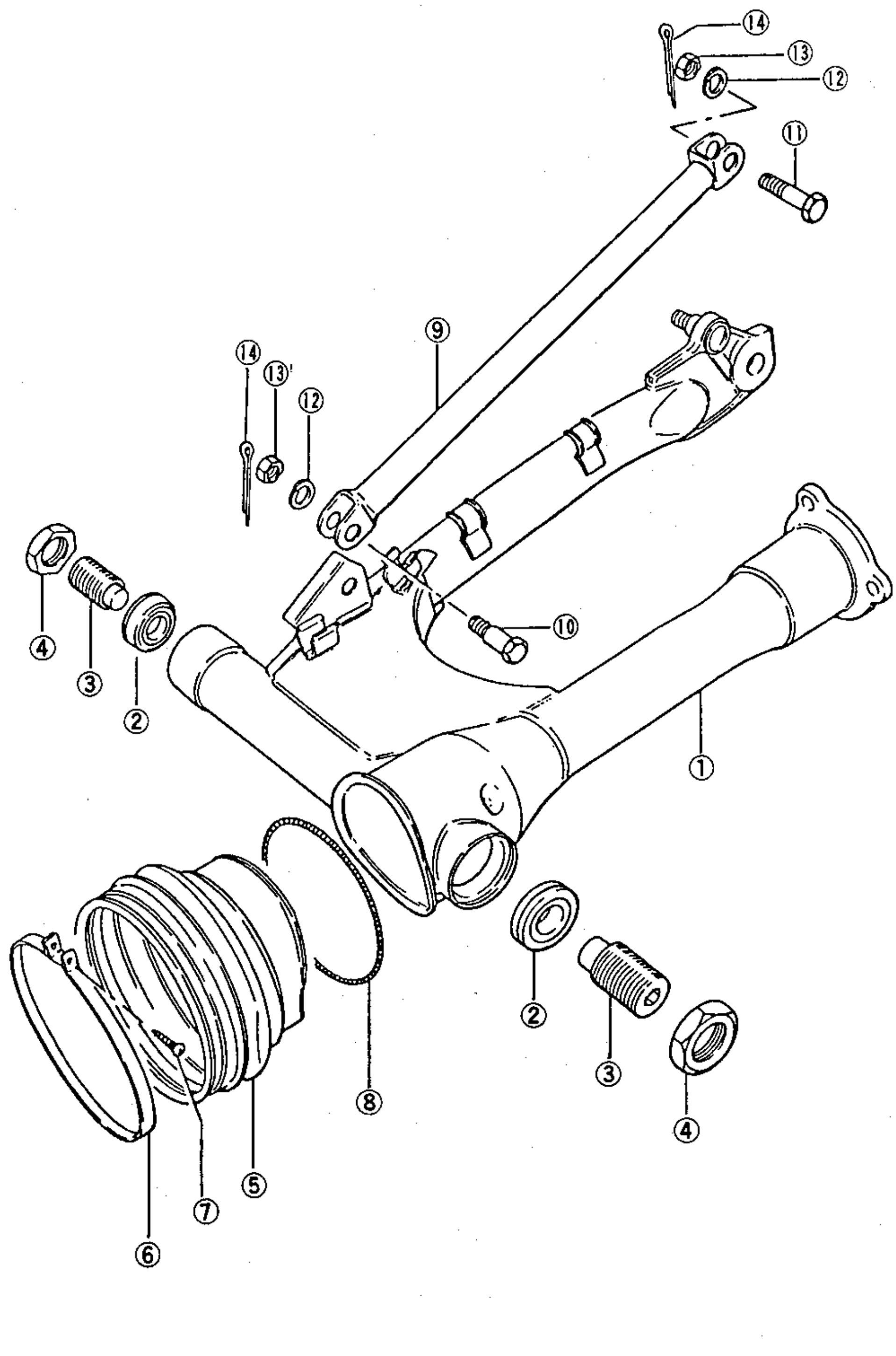
> *CAUTION:*
> *When reinstalling the rear caliper be careful not to twist the brake hose or route it improperly. Never depress the brake pedal with the rear wheel removed as it is very difficult to force the brake pads back into the caliper assembly.*

- Install the rear torque link in the caliper assembly. Remember to reinstall the cotter pin after tightening the bolt and nut.
- Remove the socket wrench handle and replace the shock absorbers. Tighten their securing nuts to specification below.
- Remove the screwdriver from the center stand pivot.

Tightening torque

Rear axle shaft nut	85 — 115 N•m 8.5 — 11.5 kg•m 61.5 — 83.0 lb•ft
Torque link nut	20 — 30 N•m 2.0 — 3.0 kg•m 14.5 — 21.5 lb•ft
Rear shock absorber nut	20 — 30 N•m 2.0 — 3.0 kg•m 14.5 — 21.5 lb•ft

REAR SWINGING ARM



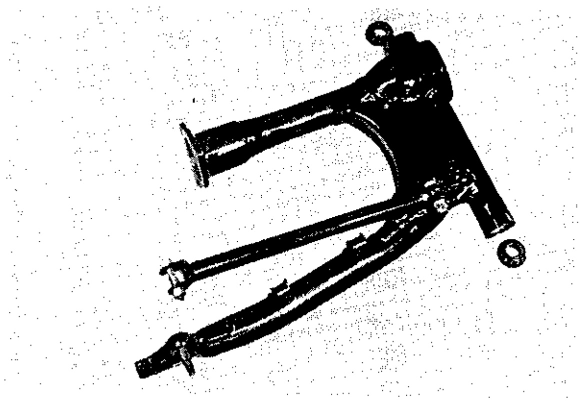
1. Rear swinging arm set
2. Bearing
3. Pivot shaft
4. Nut
5. Drive shaft boot
6. Clamp
7. Screw
8. Spring
9. Rear torque link
10. Front bolt
11. Rear bolt
12. Lock washer
13. Nut
14. Cotter pin

Tightening torque			
	N•m	kg•m	lb•ft
③	3.5 – 4.5	0.35 – 0.45	2.5 – 3.0
④	110 – 130	11.0 – 13.0	79.5 – 94.0
⑬	20 – 30	2.0 – 3.0	14.5 – 21.5

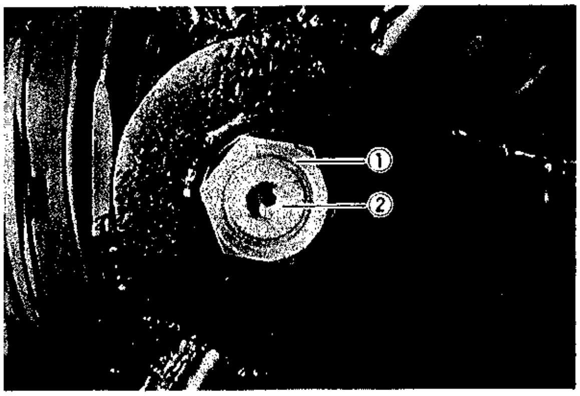
REMOVAL

- Remove the rear wheel (See page 95)
- Remove the brake hose from the clamp on the swinging arm, tie the rear brake caliper with a string and hook it on to the frame.

> *CAUTION:*
> *Be careful not to bend or twist the brake hose.*



- Remove the final drive gear assembly.
- Remove the ring holding the secondary boot and slide the boot to the other side.
- Remove the rear stop light switch.
- Remove the cotter pin from the master cylinder pushrod.
- Remove the rear swinging arm nuts ① and loosen the pivot shafts ②.



- Pull the rear swinging arm rearward and remove it from the frame.

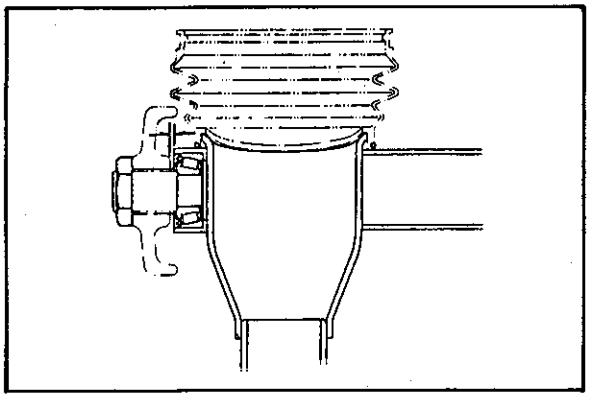
> *CAUTION:*
> *When removing the rear swinging arm, the inner roller bearing on both right and left sides could easily fall off the bearing. Exercise care to prevent this happening.*

MOUNTING

- Install both inner roller bearings, to the rear swinging arm and install the rear swinging arm on the frame.
- Tighten both pivot shafts to specification.

Pivot shaft tightening torque	3.5 – 4.5 N·m 0.35 – 0.45 kg·m 2.5 – 3.0 lb·ft

CAUTION:
The gaps between the frame and rear swinging arm should be even.



- Tighten both lock nuts to specification.

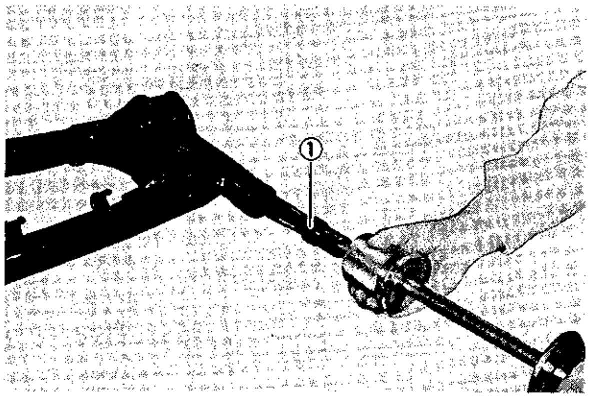
Nut tightening torque	110 – 130 N·m 11.0 – 13.0 kg·m 79.5 – 94.0 lb·ft

- Install the secondary boot.
- Install the final drive bevel gear assembly. (See page 75)
- Install the rear stop light switch.
- Mount the rear wheel.

DISASSEMBLY OF SWINGING ARM BEARING

- Using special tool ①, remove the bearing outer races, both right and left, from the swinging arm.

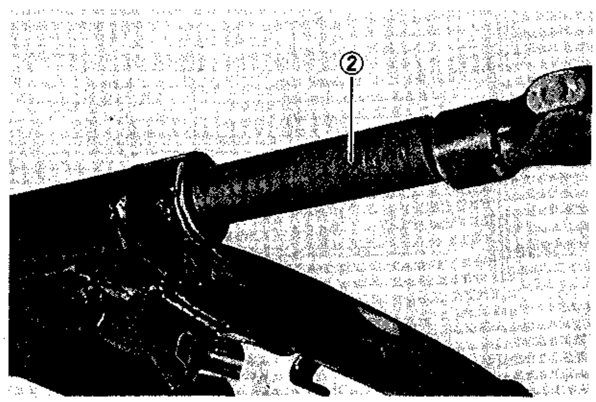
①	Bearing and oil seal remover	09941-64510



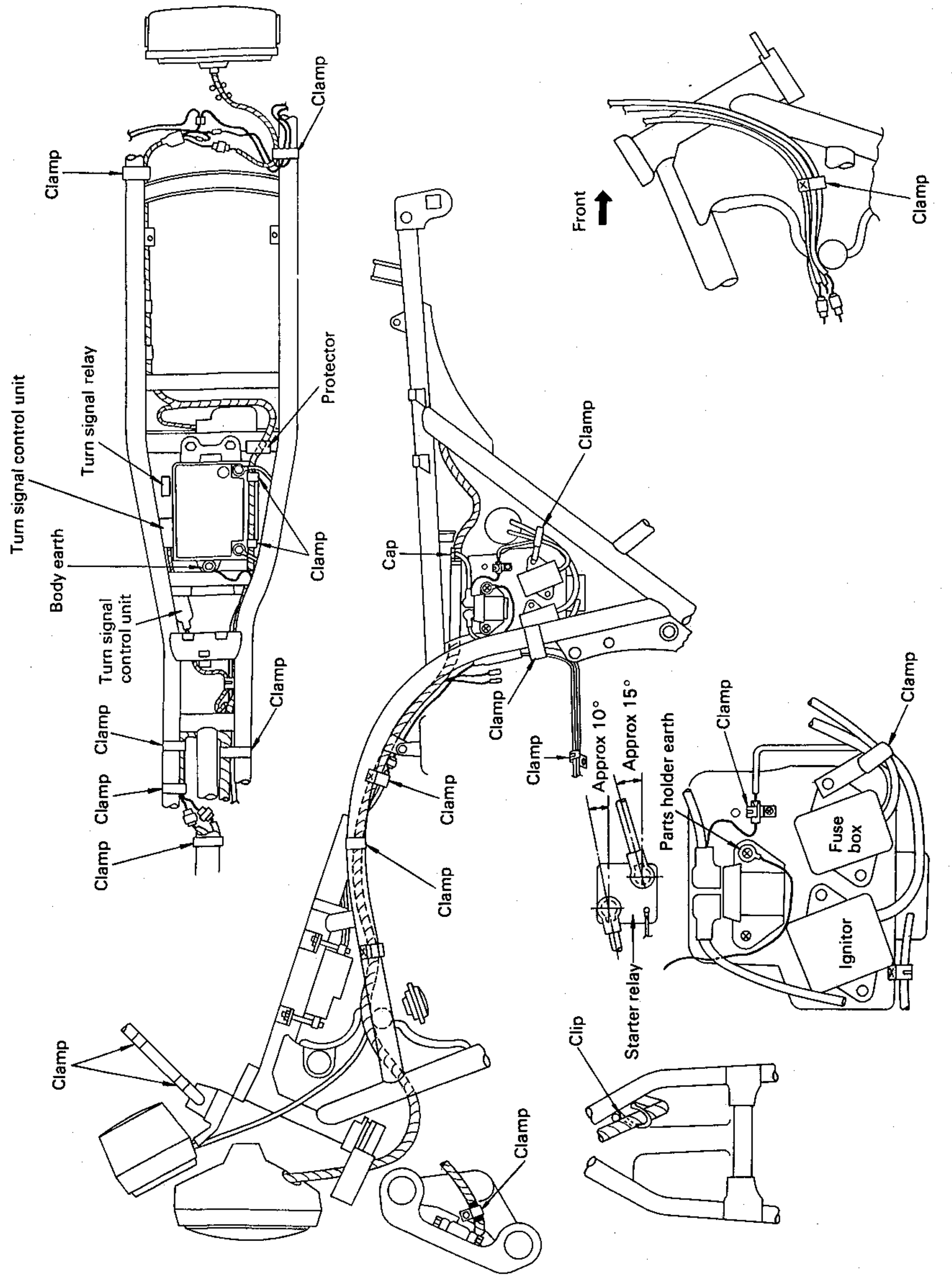
MOUNTING

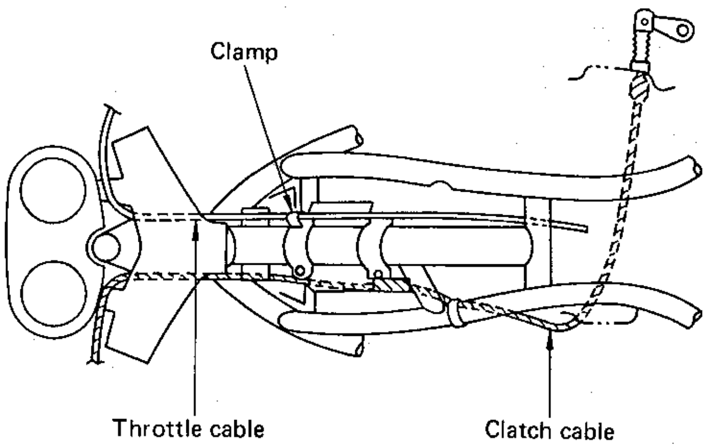
- Using special tool②, force-fit the bearing outer races, both right and left, into the swinging arm.

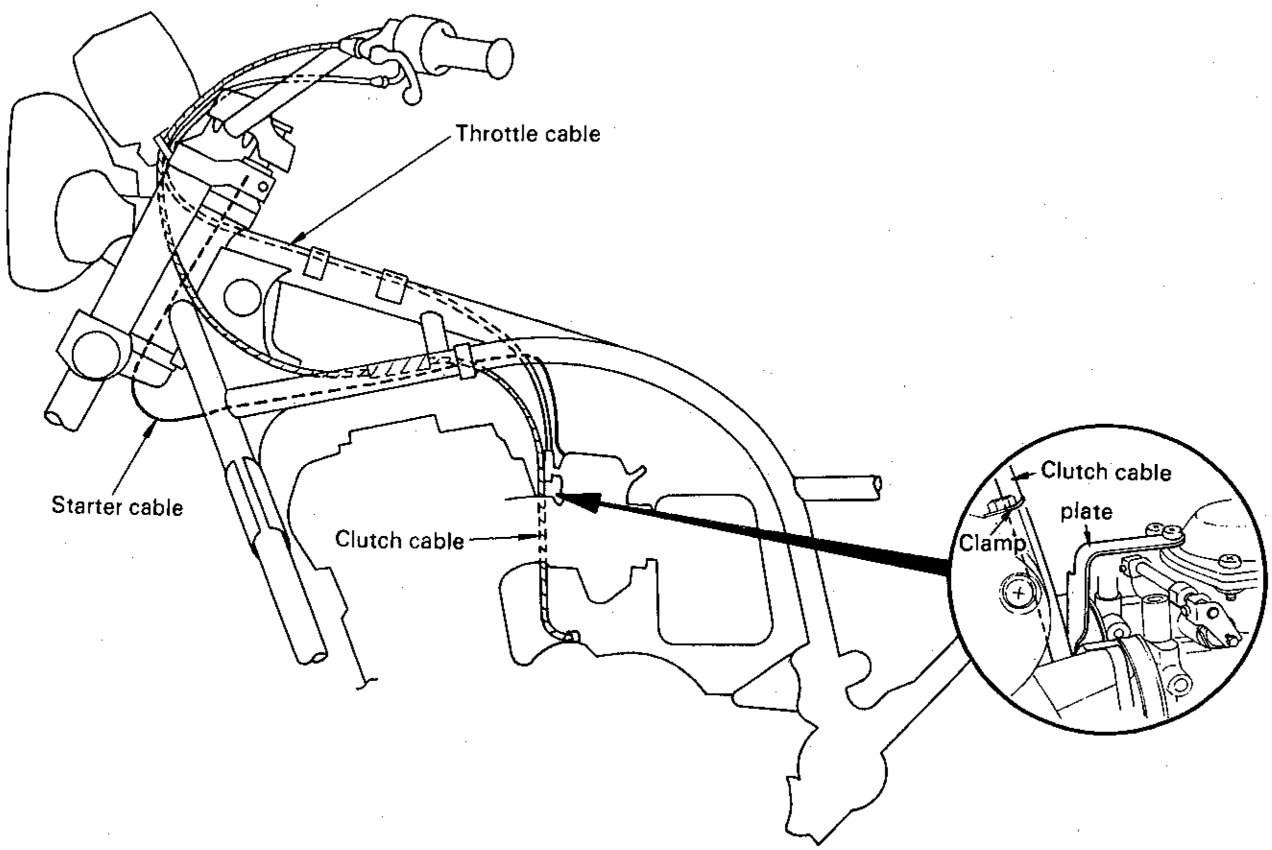
②	Bearing and oil seal handle	09924-74510

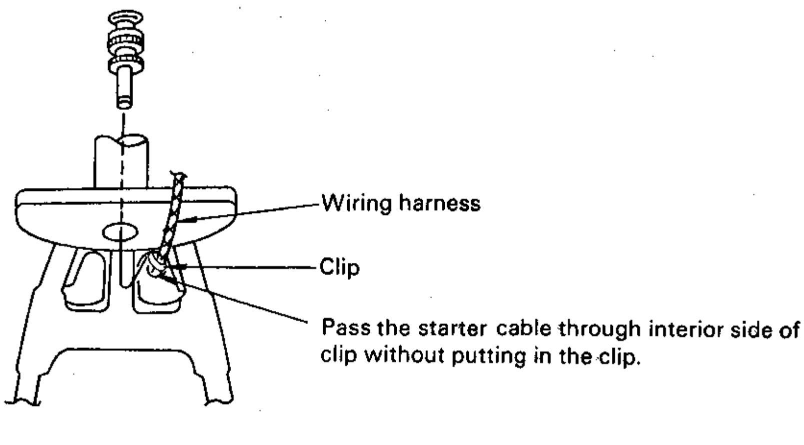


WIRE AND CABLE ROUTING

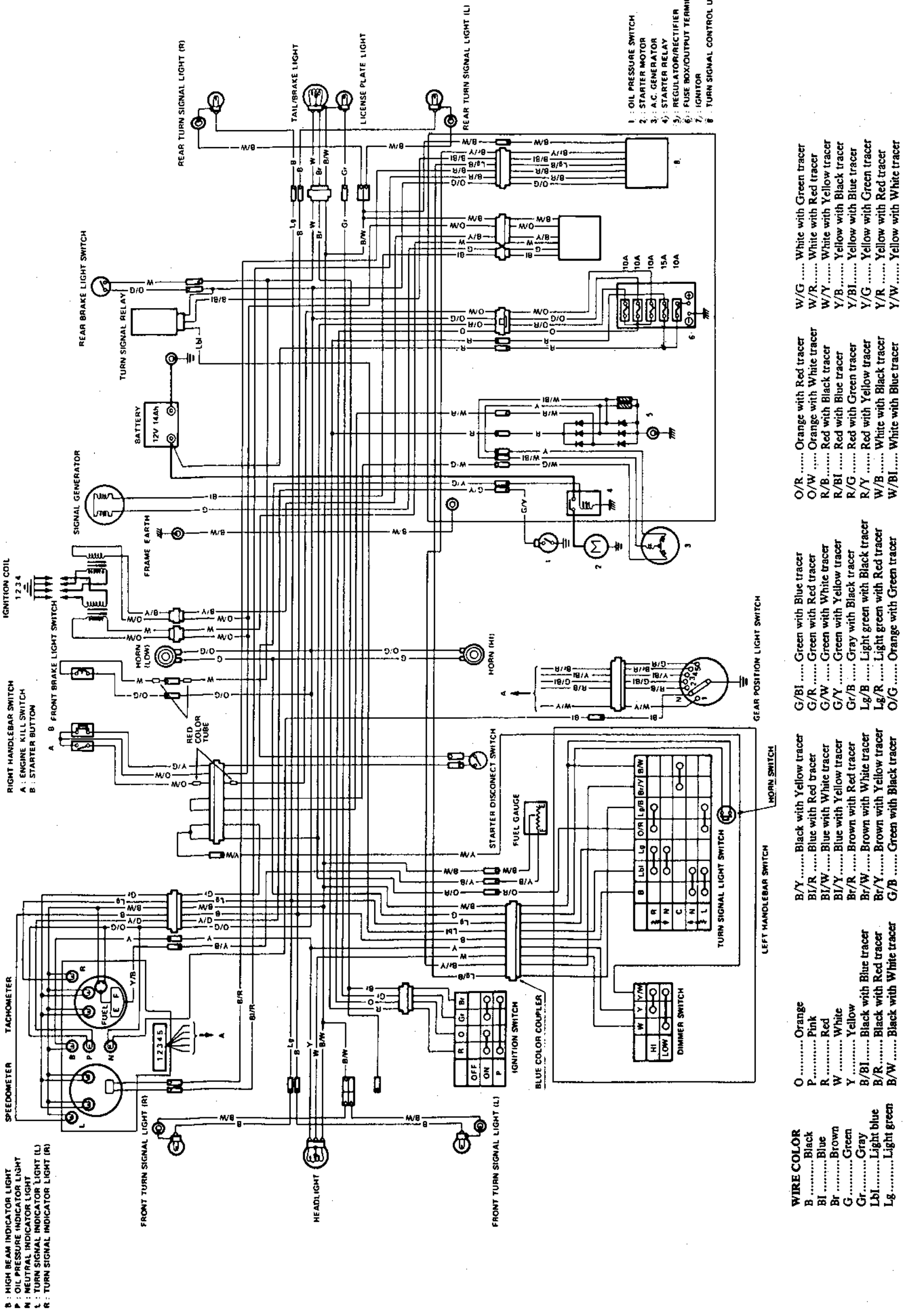



Clamp
Throttle cable
Clatch cable

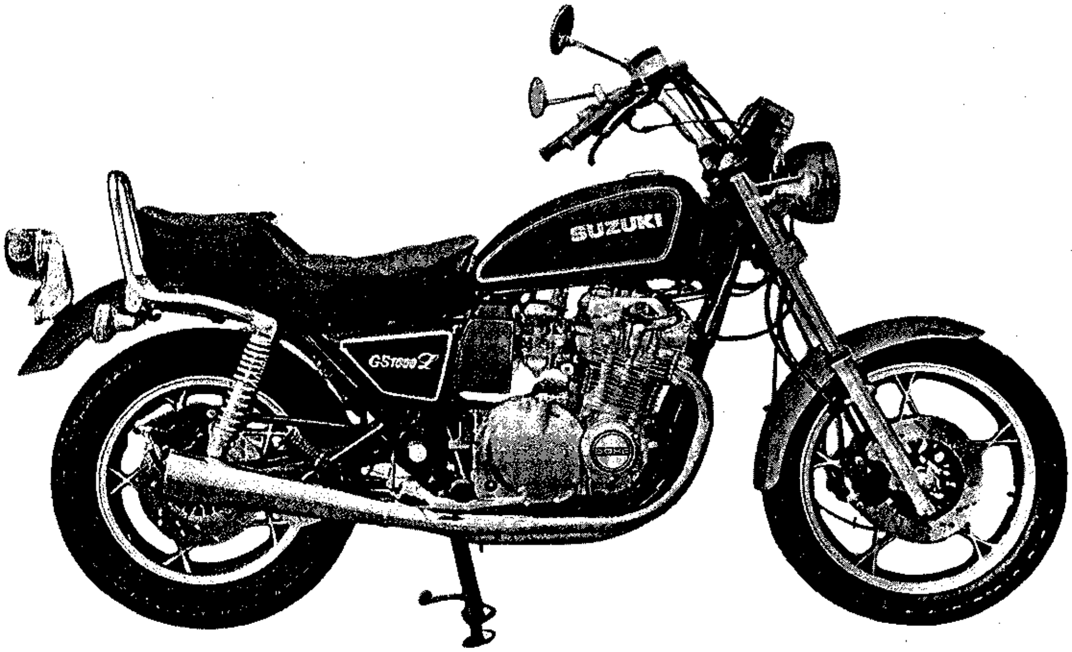

Throttle cable
Starter cable
Clutch cable
Clutch cable
plate
Clamp


Wiring harness
Clip
Pass the starter cable through interior side of
clip without putting in the clip.

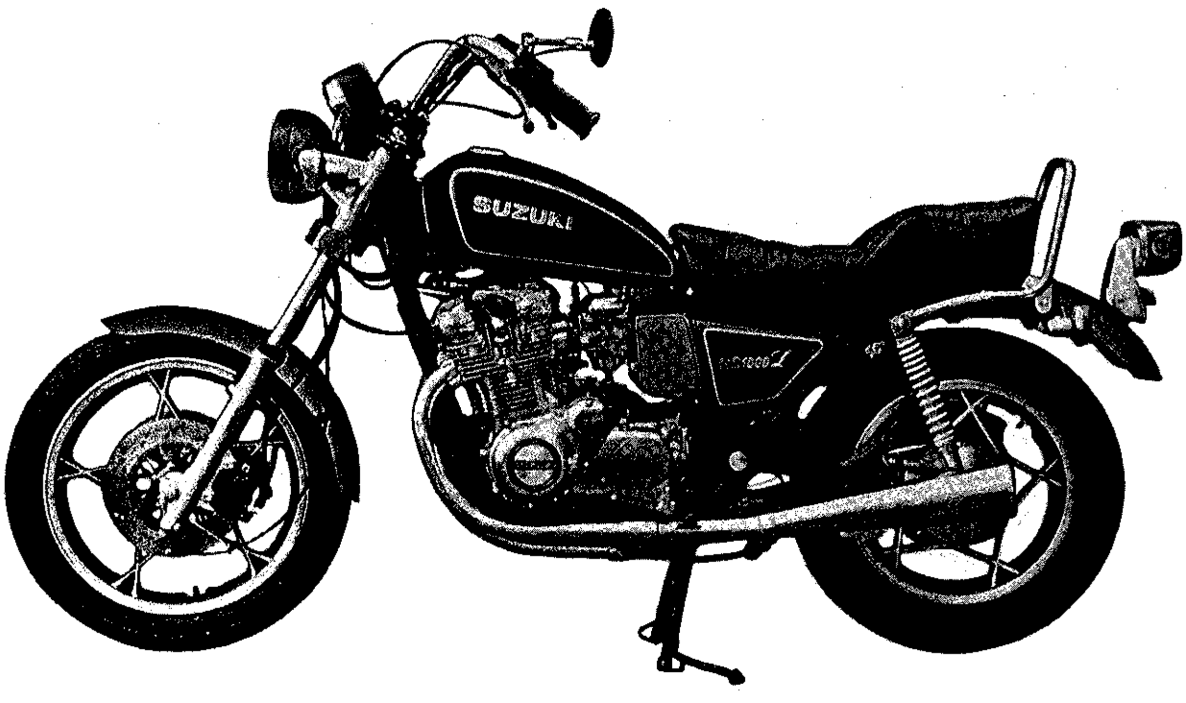
WIRING DIAGRAM



II GS1000GLT



Right side



Left side

SPECIFICATIONS

DIMENSIONS AND DRY MASS	
Overall length	2 275 mm (89.6 in)
Overall width	900 mm (35.4 in)
Overall height	1 230 mm (48.4 in)
Wheelbase	1 500 mm (59.1 in)
Ground clearance	150 mm (5.9 in)
Dry mass	250 kg (551 lbs)
Gross vehicle weight rating	504 kg (1 112 lbs)
ENGINE	
Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	70.0 mm (2.756 in)
Stroke	64.8 mm (2.551 in)
Piston displacement	997 cm^3 (60.8 cu. in)
Compression ratio	9.2 : 1
Carburetor	MIKUNI BS34SS, four
Air cleaner	Polyurethane foam element
Starter system	Electric
Lubrication system	Wet sump
TRANSMISSION	
Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down 4-up
Primary reduction	1.775 (87/49)
Gear ratios, Low	2.500 (35/14)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
Top	0.961 (25/26)
SECONDARY DRIVE	
Type	Shaft drive
Secondary reduction	0.941 (16/17)
Final reduction	3.090 (34/11)

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	40° (right and left)
Caster	62° 00′
Trail	116 mm (4.57 in)
Turning radius	2.6 m (8.5 ft)
Front brake	Disc brake, twin
Rear brake	Disc brake
Front tire size	3.50H19 4PR
Rear tire size	4.50H17 4PR
Front tire pressure	175 kPa (1.75 kg/cm², 25 psi) (Normal solo riding)
Rear tire pressure	200 kPa (2.00 kg/cm², 28 psi) (Normal solo riding)

ELECTRICAL

Ignition type	Transistorized
Ignition timing	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 350 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES-U
Spark plug gap	0.6 – 0.8 mm (0.024 – 0.031 in) both NGK and NIPPON DENSO
Battery	12V 50.4 kC (14Ah)/10HR
Generator	Three-phase A.C. generator
Fuse	10/10/10/10/15A

CAPACITIES

Fuel tank	13 L (3.4 US gal)
Engine oil change	3.0 L (3.2 US qt)
filter change	3.3 L (3.5 US qt)
overhaul	3.7 L (3.9 US qt)
Secondary bevel gear oil	340 – 400 ml (11.5 – 13.5 US oz)
Final bevel gear oil	280 – 330 ml (9.5 – 11.2 US oz)
Front fork air pressure	80 kPa (0.8 kg/cm², 11.38 psi)
Front fork oil	245 ml (8.28 US oz) in each leg

Specifications subject to change without notice.

SERVICE DATA

Please refer to the service data of GS1000GT except for the service data shown below.

WHEEL

Item	Standard		Limit
Tire size	Front	3.50H19 4PR	—
	Rear	4.50H17 4PR	—

SUSPENSION

Item	Standard	Limit
Front fork spring free length	—	516 (20.3)
Front fork oil level	260 (10.2)	—
Front fork air pressure	8.0 kPa (0.8 kg/cm^2, 11.38 psi)	—

FUEL + OIL CAPACITY

Item	Specification
Fuel tank	13 L (3.4 US gal)
Front fork oil capacity (each leg)	245 ml (8.28 US oz)

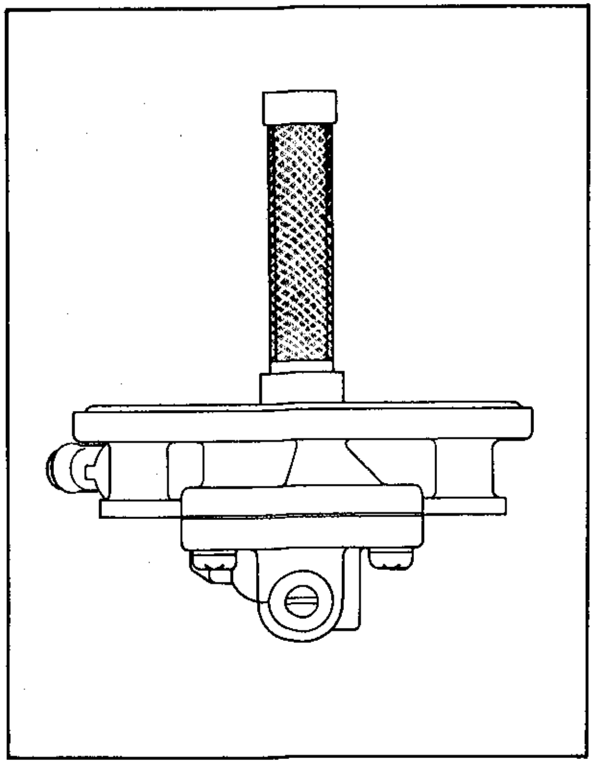
TIRE PRESSURE

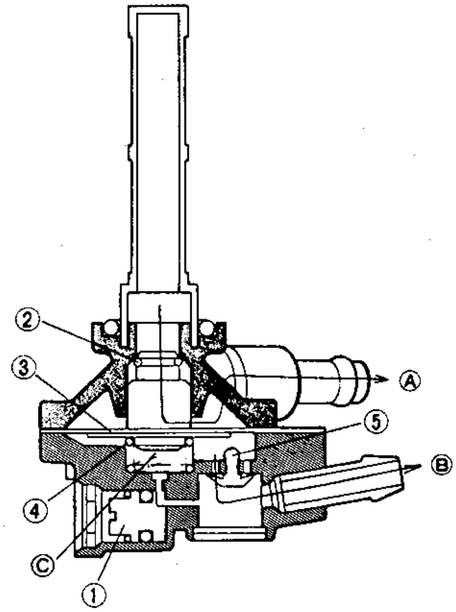
Cold Inflation Tire Pressure	NORMAL RIDING						CONTINUOUS HIGH SPEED RIDING					
	Solo Riding			Dual Riding			Solo Riding			Dual Riding		
	kPa	kg/cm^2	psi	kPa	kg/cm^2	psi	kPa	kg/cm^2	psi	kPa	kg/cm^2	psi
Front	175	1.75	25	175	1.75	25	200	2.00	28	200	2.00	28
Rear	200	2.00	28	225	2.25	32	225	2.25	32	280	2.80	40

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
Fuelmeter light		3.4

FUEL COCK

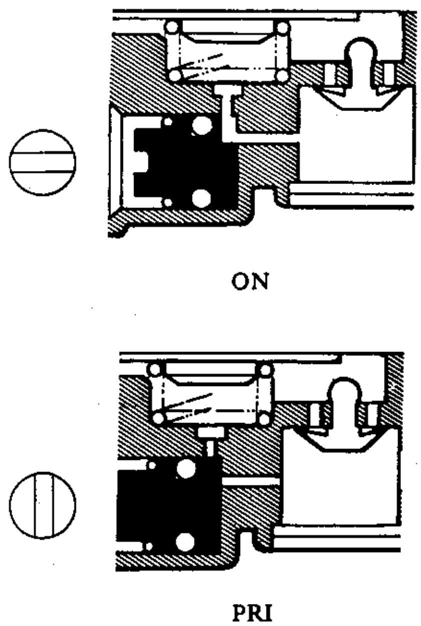




1. Fuel valve
2. O-ring
3. Diaphragm
4. Spring
5. One way valve

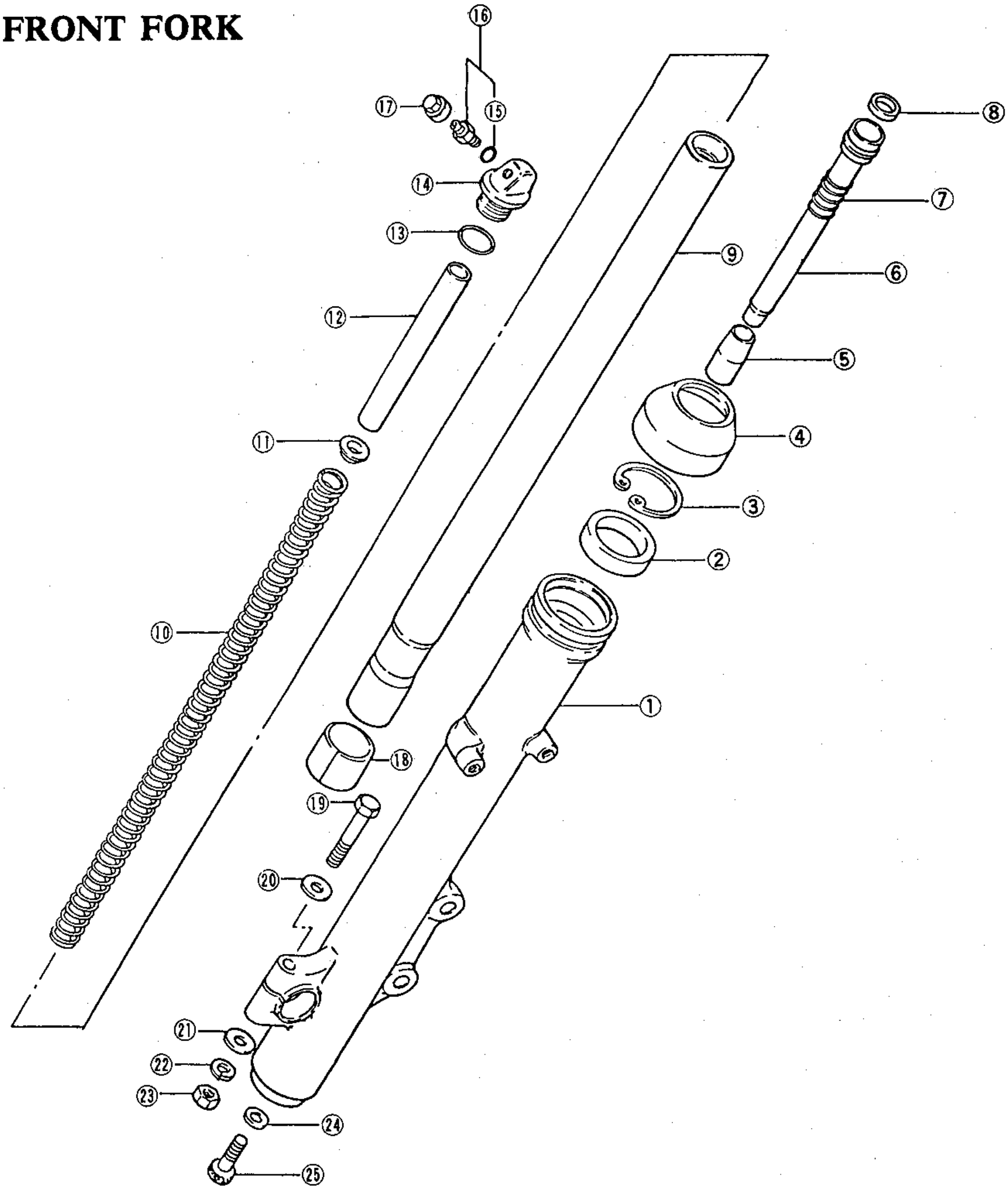
Ⓐ Fuel flow
Ⓑ Vacuum
Ⓒ Diaphragm chamber

When the engine is not running with the valve in the ON positon, the fuel valve is kept in the closed position by applying pressure utilizing a spring so that no fuel will flow to the carburetors. When the engine is engaged, a negative pressure is generated in the diaphragm chamber © through the vacuum (negative pressure) pipe which is connected to the carburetors, and builds up a negative pressure which is higher than the spring pressure so that the diaphragm is forced to open the fuel valve and thus allow the fuel to flow to the carburetors.
On the other hand, setting the valve in the ON position keeps the air return orifice open.
Negative pressure does not accumulate on the diaphragm at the time of engine stopping and then the spring pressure actuates the diaphragm to move back to its original position and closes the fuel valve.
However, setting the valve in PRI position with a screwdriver causes the air return orifice to close, resulting in negative pressure in the chamber © under the diaphragm. This negative pressure doesn't allow the fuel valve to close and therefore the fuel keeps flowing to the carburetors.



CAUTION:
When starting the engine at PRI position, be sure to change the valve from PRI position to ON position immediately.

FRONT FORK

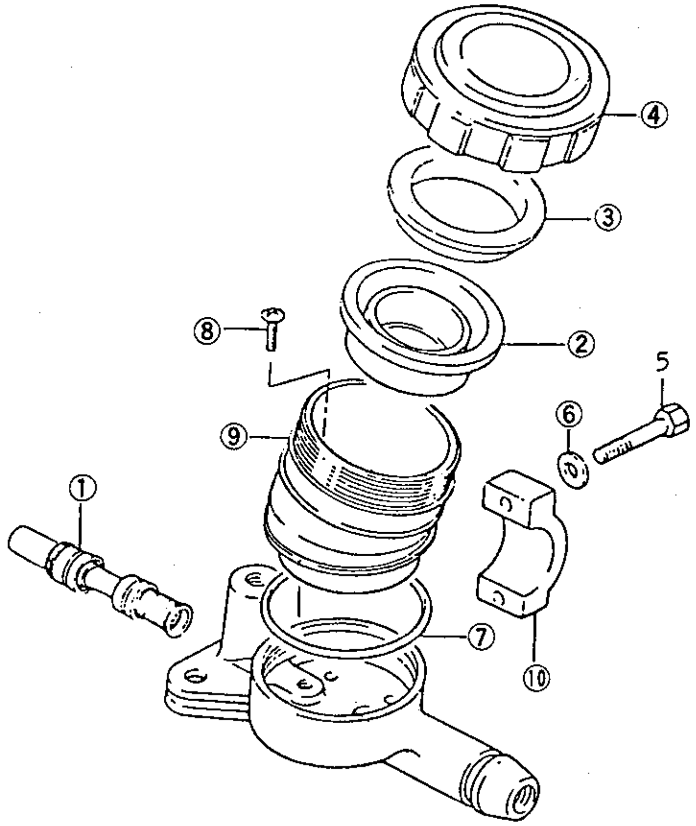


1. Outer tube
2. Oil seal
3. Oil seal stopper ring
4. Dust seal
5. Oil lock piece
6. Cylinder
7. Spring
8. Piston ring
9. Inner tube
10. Spring
11. Spring guide
12. Spacer
13. O ring
14. Upper cap
15. O ring
16. Air valve
17. Valve Cap
18. Slide metal
19. Bolt
20. Washer
21. Washer
22. Lock washer
23. Nut
24. Gasket
25. Bolt

Tightening torque			
	N·m	kg·m	lb·ft
⑭	15–30	1.5–3.0	11.0–25.5
㉓	15–25	1.5–2.5	11.0–18.0

NOTE:
Please refer to the front fork section of GS1000 service manual when disassembling and reassembling the front fork.

FRONT MASTER CYLINDER

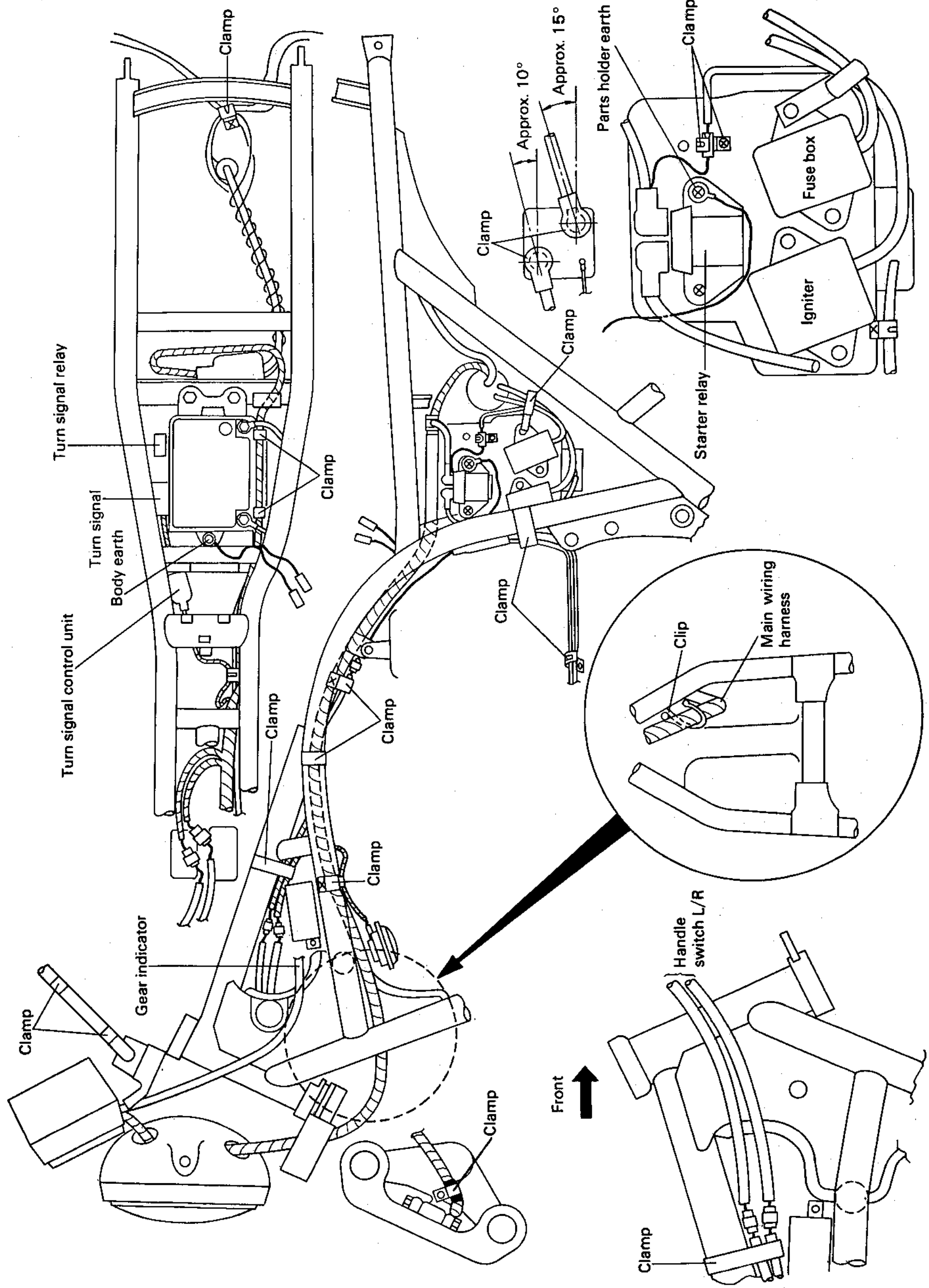


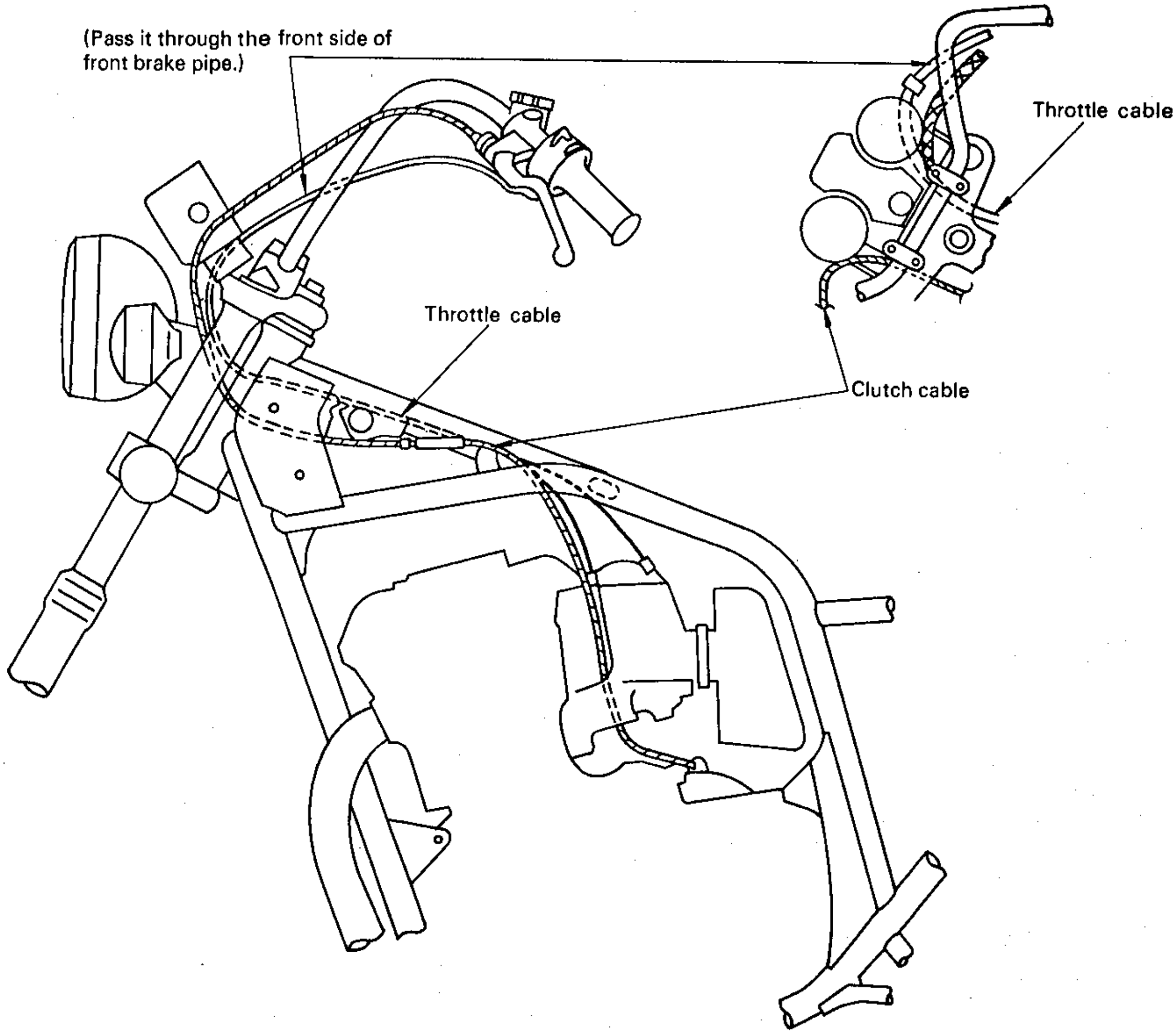
1. Piston and cap set
2. Diaphragm
3. Plate
4. Cap
5. Bolt
6. Washer
7. O ring
8. Screw
9. Reservoir
10. Holder

	Tightening torque		
	N·m	kg·m	lb·ft
⑤	5–8	0.5–0.8	3.5–6.0

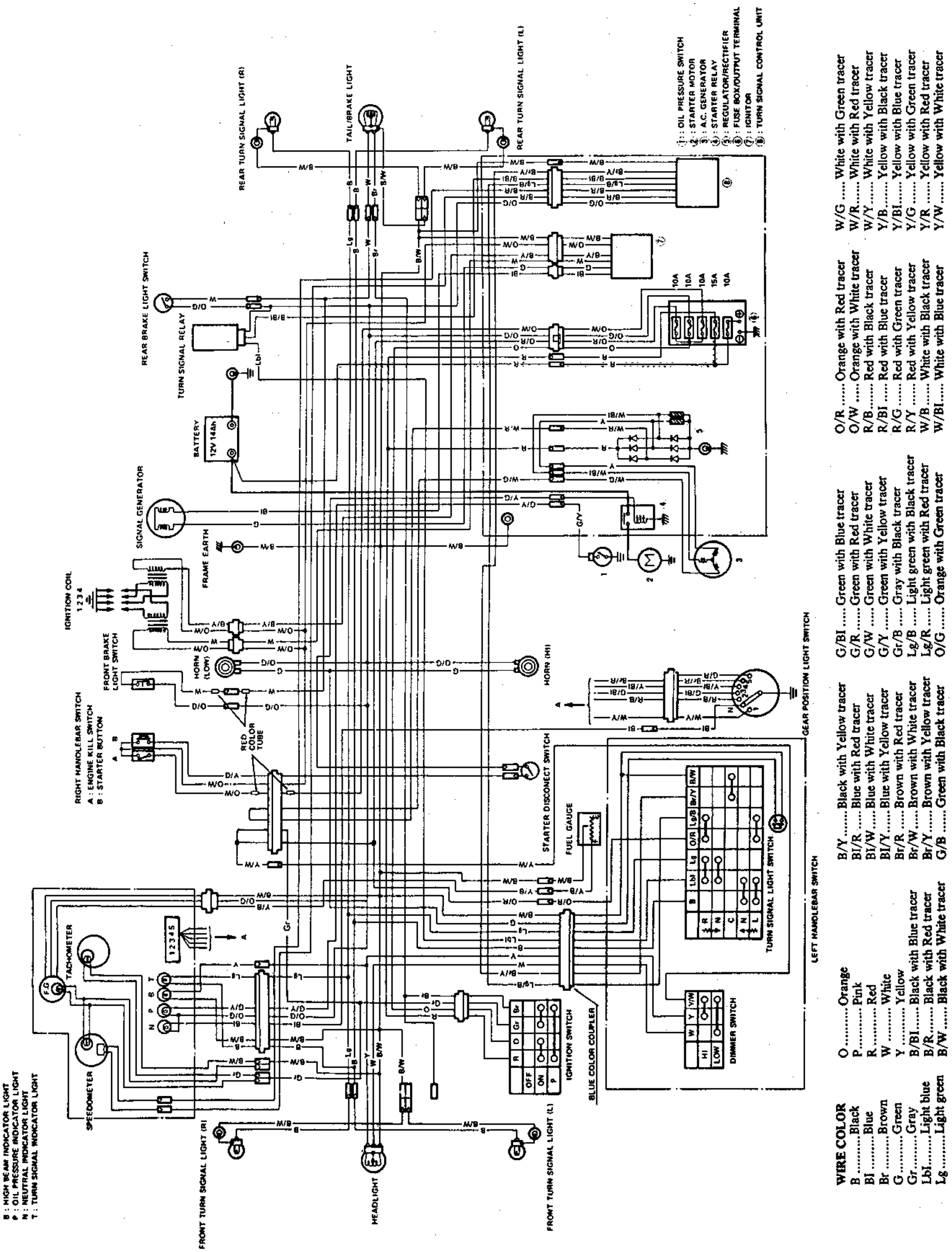
NOTE:
Please refer to the front master cylinder section of GS1000 service manual when disassembling and reassembling the front master cylinder.

WIRE AND CABLE ROUTING




(Pass it through the front side of
front brake pipe.)
Throttle cable
Throttle cable
Clutch cable

WIRING DIAGRAM



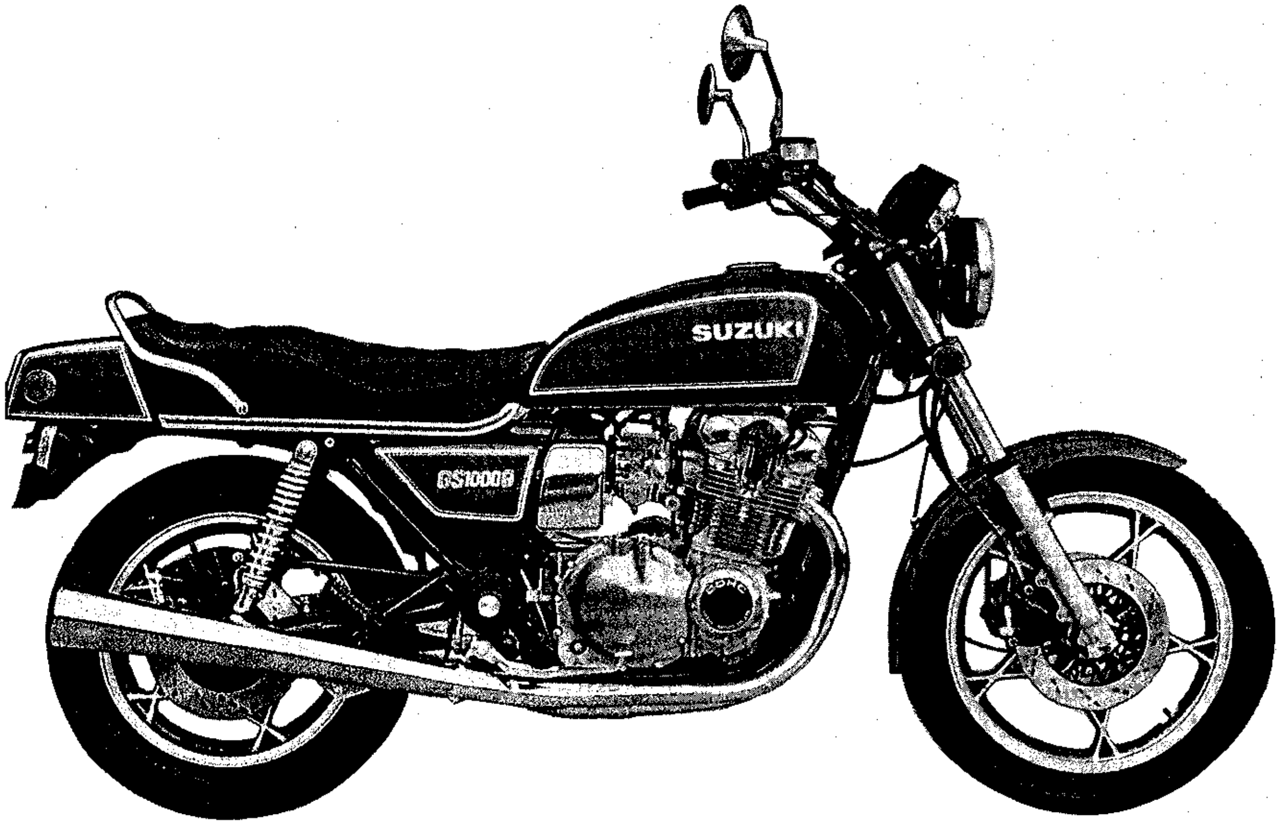
SUZUKI

GS1000G

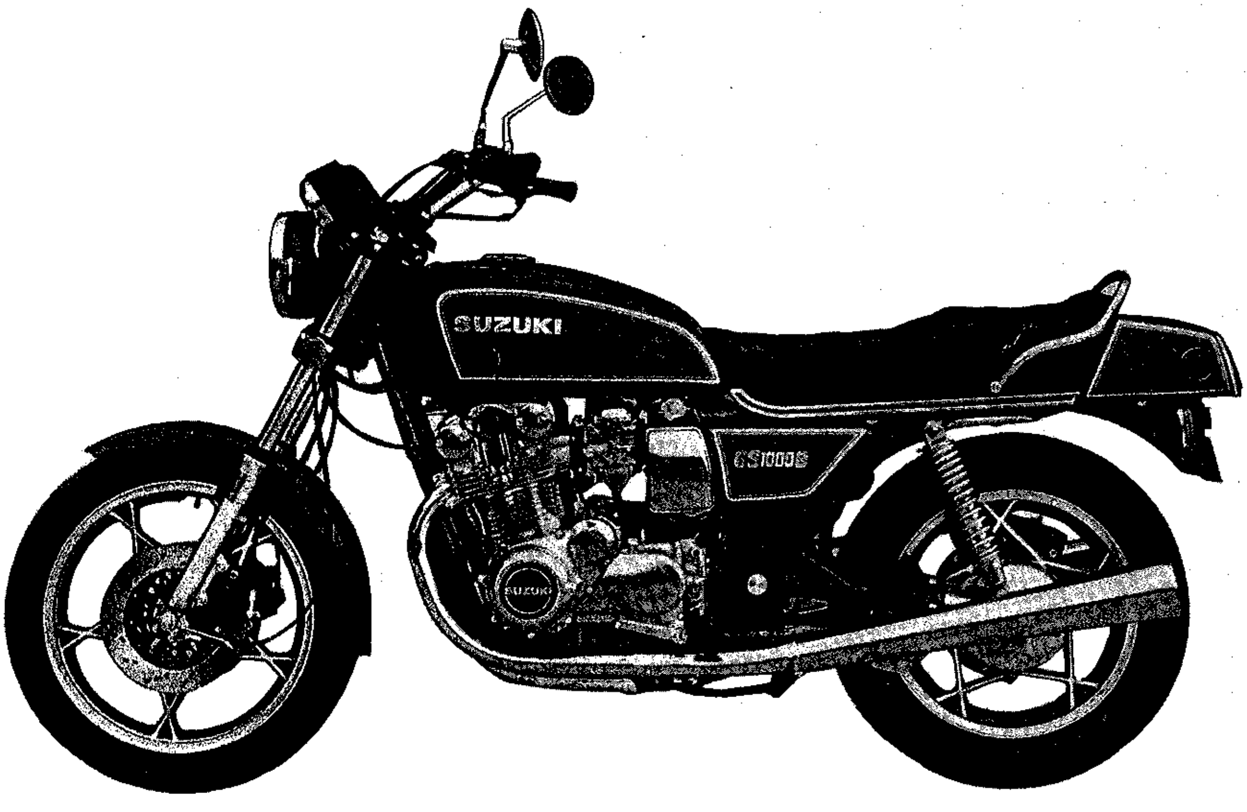
SUPPLEMENTARY SERVICE MANUAL

CONTENTS

GS1000GX



Right Side



Left Side

SPECIFICATIONS

DIMENSIONS AND DRY MASS	
Overall length	2 230 mm (87.8 in)
Overall width	875 mm (34.4 in)
Overall height	1 175 mm (46.3 in)
Wheelbase	1 500 mm (59.1 in)
Ground clearance	150 mm (5.9 in)
Dry mass	255 kg (562 lbs)
Gross vehicle weight rating	504 kg (1 112 lbs)
ENGINE	
Type	Four-stroke, air-cooled, DOHC
Number of cylinders	4
Bore	70.0 mm (2.756 in)
Stroke	64.8 mm (2.551 in)
Piston displacement	997 cm^3 (60.8 cu. in)
Compression ratio	9.2 : 1
Carburetor	MIKUNI BS34SS, four
Air cleaner	Polyurethane foam element
Starter system	Electric
Lubrication system	Wet sump
TRANSMISSION	
Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction	1.775 (87/49)
Gear ratios, Low	2.500 (35/14)
2nd	1.777 (32/18)
3rd	1.380 (29/21)
4th	1.125 (27/24)
Top	0.961 (25/26)
SECONDARY DRIVE	
Type	Shaft drive
Secondary reduction	0.941 (16/17)
Final reduction	3.090 (34/11)

CHASSIS

Front suspension	Telescopic, pneumatic/coil spring, oil dampened
Rear suspension	Swinging arm, oil dampened, damper 4-way/spring 5-way adjustable
Steering angle	40° (right and left)
Caster	62° 30′
Trail	112 mm (4.41 in)
Turning radius	2.6 m (8.5 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	175 kPa (1.75 kg/cm^2, 25 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	17° B.T.D.C. below 1 500 r/min and 37° B.T.D.C. above 2 350 r/min
Spark plug	NGK B8ES or NIPPON DENSO W24ES-U
Spark plug gap	0.6 – 0.8 mm (0.024 – 0.031 in) both NGK and NIPPON DENSO
Battery	12V 50.4 kC (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	4.2 L(1.1 US gal)
Engine oil Change	3.0 L (3.2 US qt)
filter change	3.3 L (3.5 US qt)
overhaul	3.7 L (3.9 US qt)
Secondary bevel gear oil	340 – 400 ml (11.5 – 13.5 US oz)
Final bevel gear oil	280 – 330 ml (9.5 – 11.2 US oz)
Front fork air pressure	60 kPa (0.6 kg/cm^2, 8.5 psi)
Front fork oil	251 ml (8.48 US oz) in each leg

* Specifications subject to change without notice.

SERVICE DATA

Please refer to the service data of GS1000GT except for the service data shown below

WATTAGE

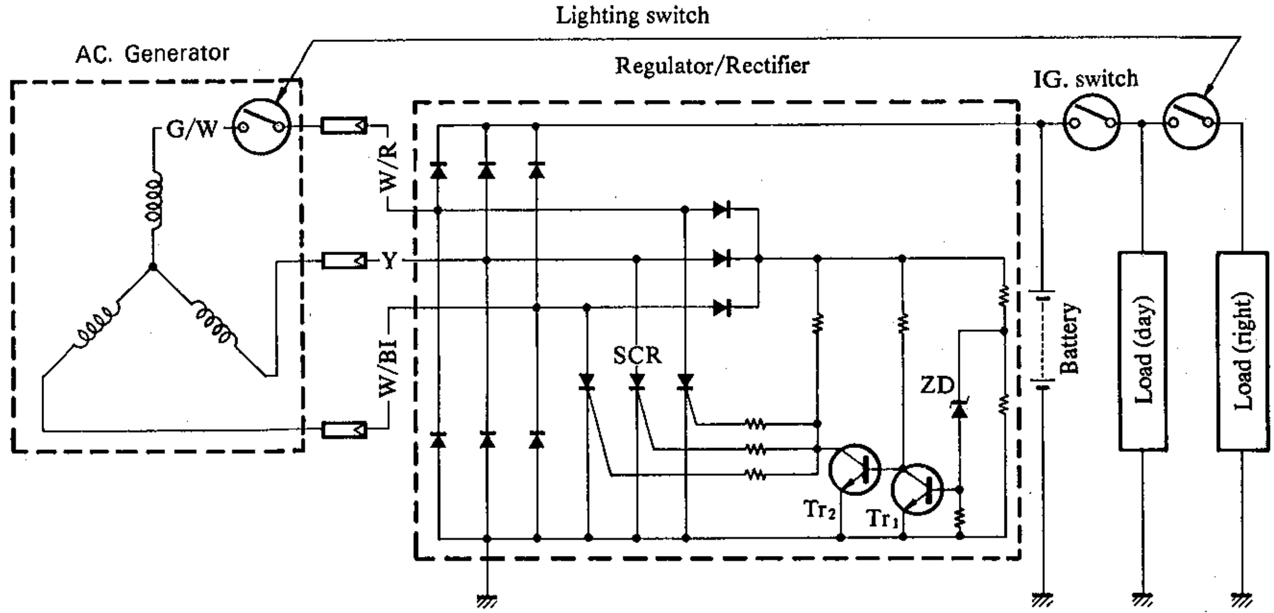
Unit: W(cp)

Item		Specification
Headlight	HI	60
	LO	55
Tail/Brake light		8/23 (3/32)
Running/Front turn signal light		8/23 (3/32)
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)

CHARGING SYSTEM

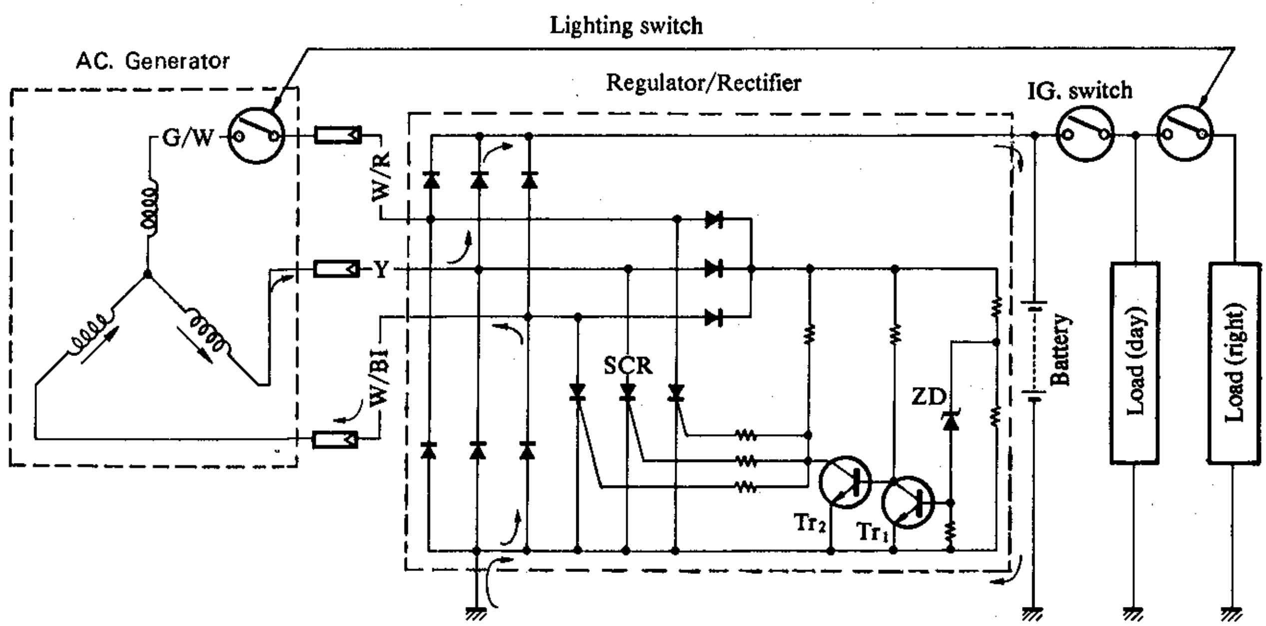
DESCRIPTION

The circuit of the charging system is shown in figure, 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.



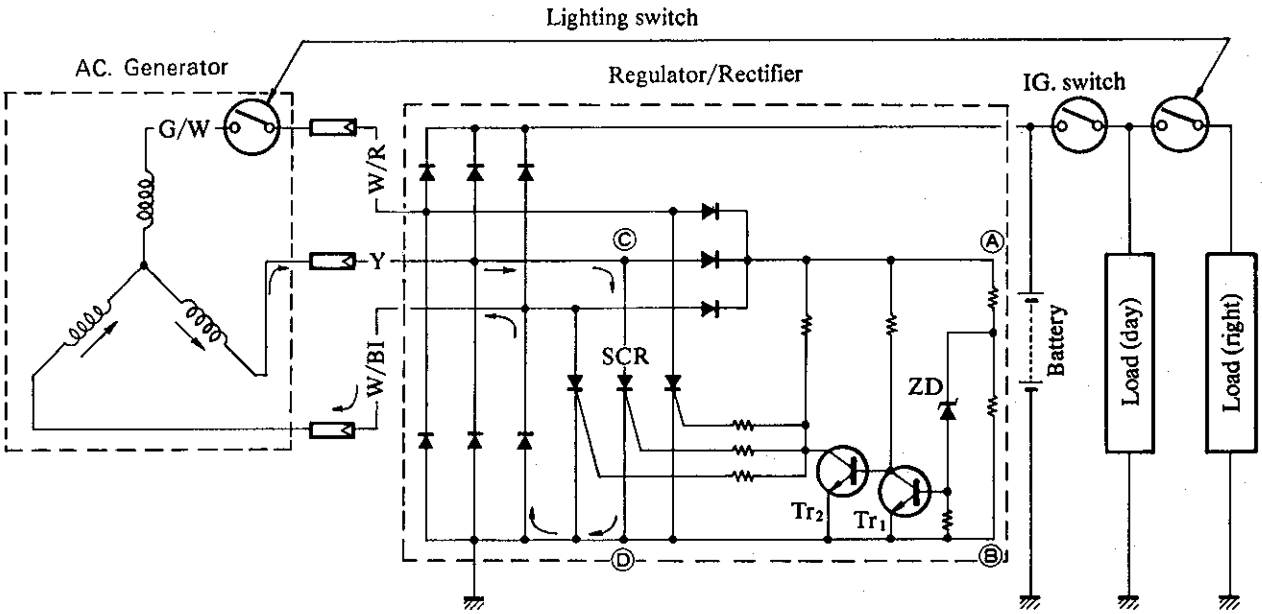
Function of Regulator

While the engine r/min is low and the generated voltage of AC generator is lower than the maximum allowable voltage, the regulator does not function.



When the engine r/min becomes higher, the generated voltage of AC generator also becomes higher and the voltage between points Ⓐ and Ⓑ 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 Ⓒ to point Ⓓ. 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 Ⓓ, reverse current tends to flow to SCR, then the circuit of SCR turns to OFF mode and beings to charge the battery again. Thus these repetitions maintain charging voltage to the battery constant and protect it from overcharging.



INSPECTION

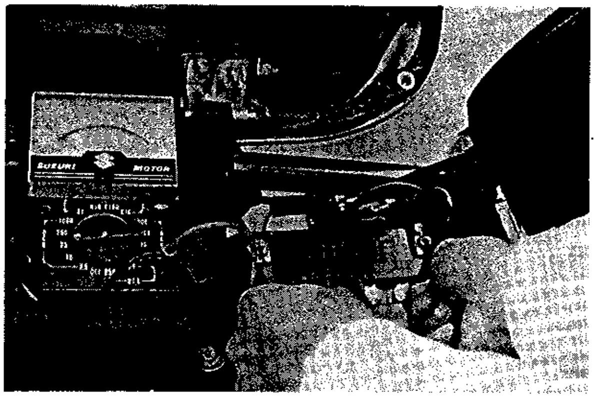
Charging Output Check

- Start the engine and keep it running at 5 000 r/min.
- Using pocket tester, measure the DC voltage between the battery ⊕ and ⊖ terminal.
- If the tester reads under 14V or over 15.5V, the regulator/rectifier may be faulty.

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

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

09900-25002	Pocket tester

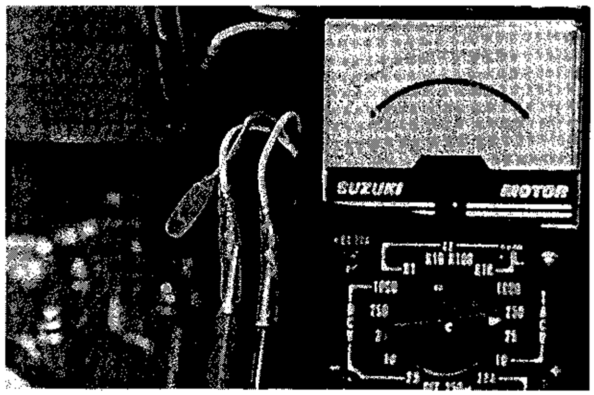


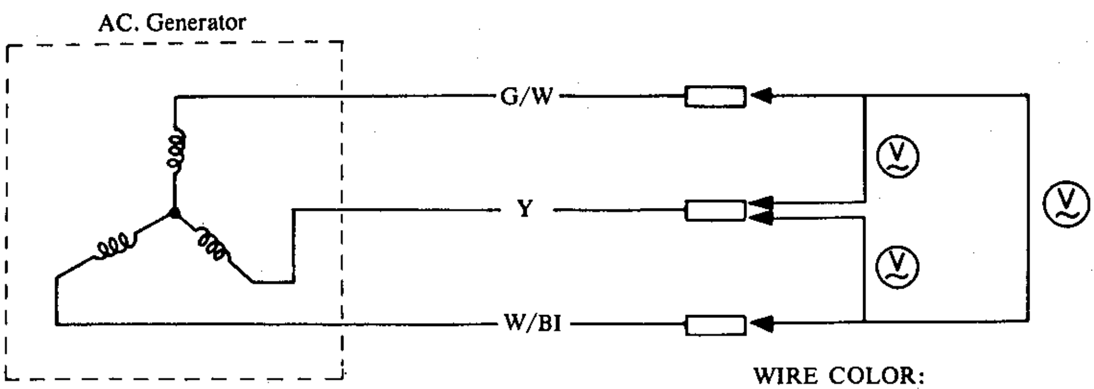
AC GENERATOR NO-LOAD PERFORMANCE

- 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

09900-25002	Pocket tester





WIRE COLOR:

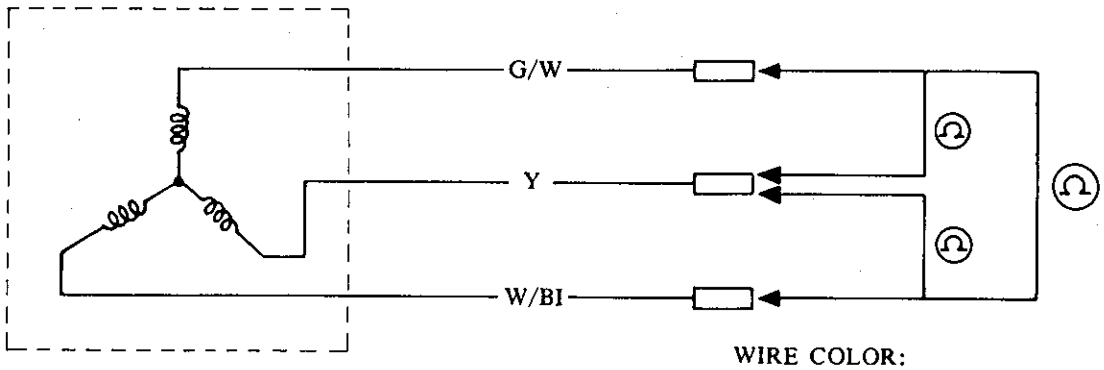
Y .... Yellow
W/BI............ White with Blue tracer
G/W .... Green with White tracer

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

09900-25002	Pocket tester

Specification	Approx.1Ω

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

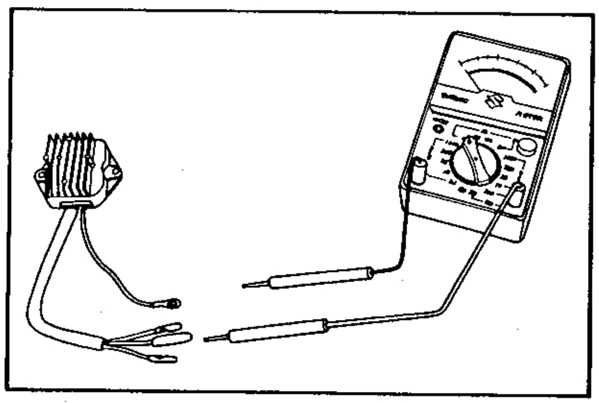


WIRE COLOR:

Y .... Yellow
W/BI............ White with Blue tracer
G/W .... Green with White tracer

REGULATOR/RECTIFIER

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

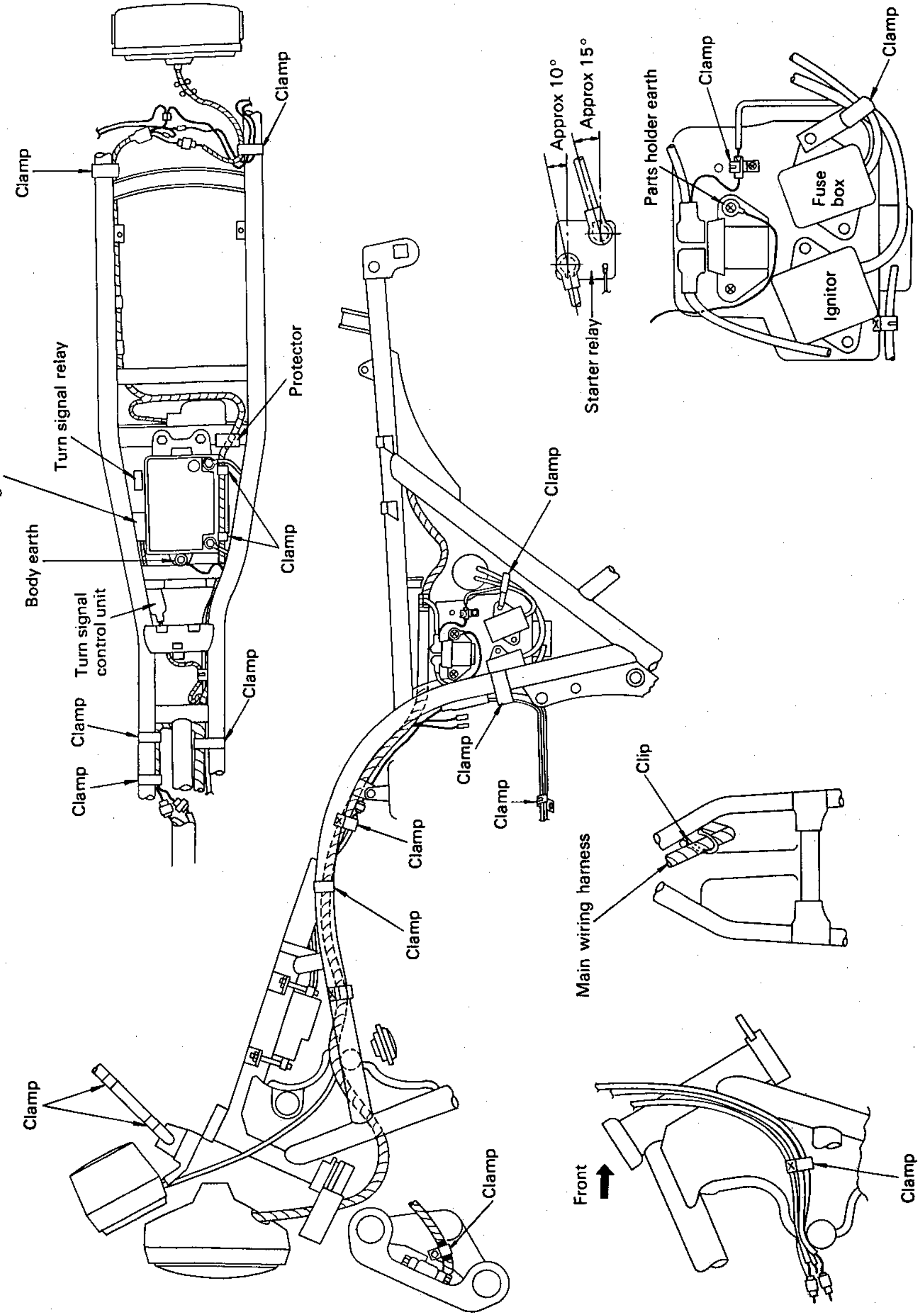


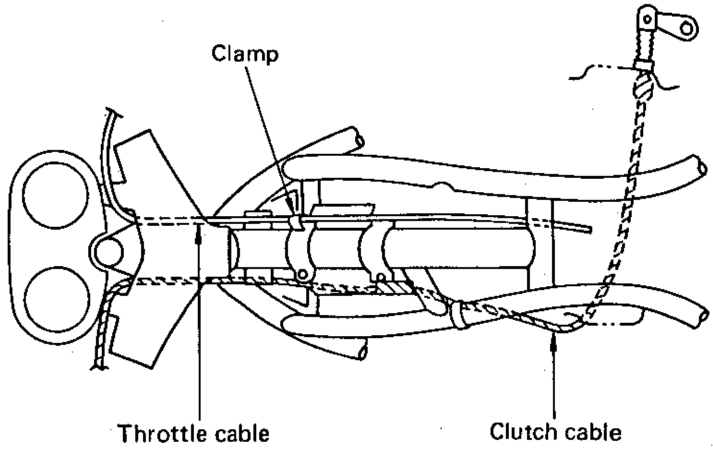
09900-25002	Pocket tester

Unit:Ω

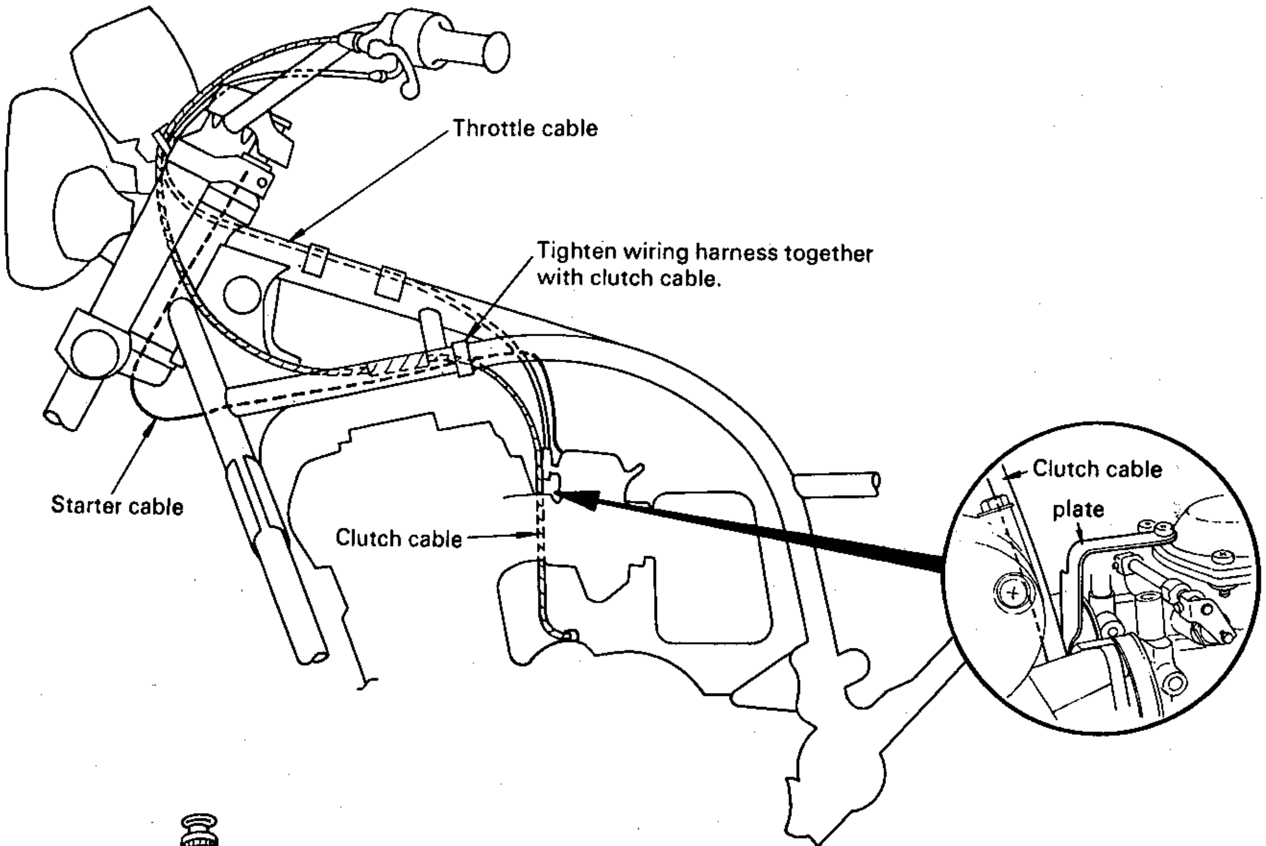
⊖ probe of tester \ ⊕ probe of tester	R	W/BI	W/R	Y	B/W
R		∞	∞	∞	∞
W/BI	5−7		Approx. 500	Approx. 500	Approx. 300
W/R	5−7	Approx. 500		Approx. 500	Approx. 300
Y	5−7	Approx. 500	Approx. 500		Approx. 300
B/W	30−45	5−7	5−7	5−7	

WIRE AND CABLE ROUTING

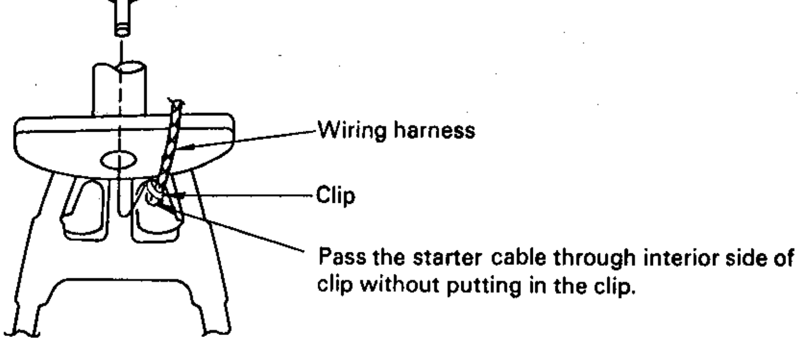




Clamp
Throttle cable
Clutch cable

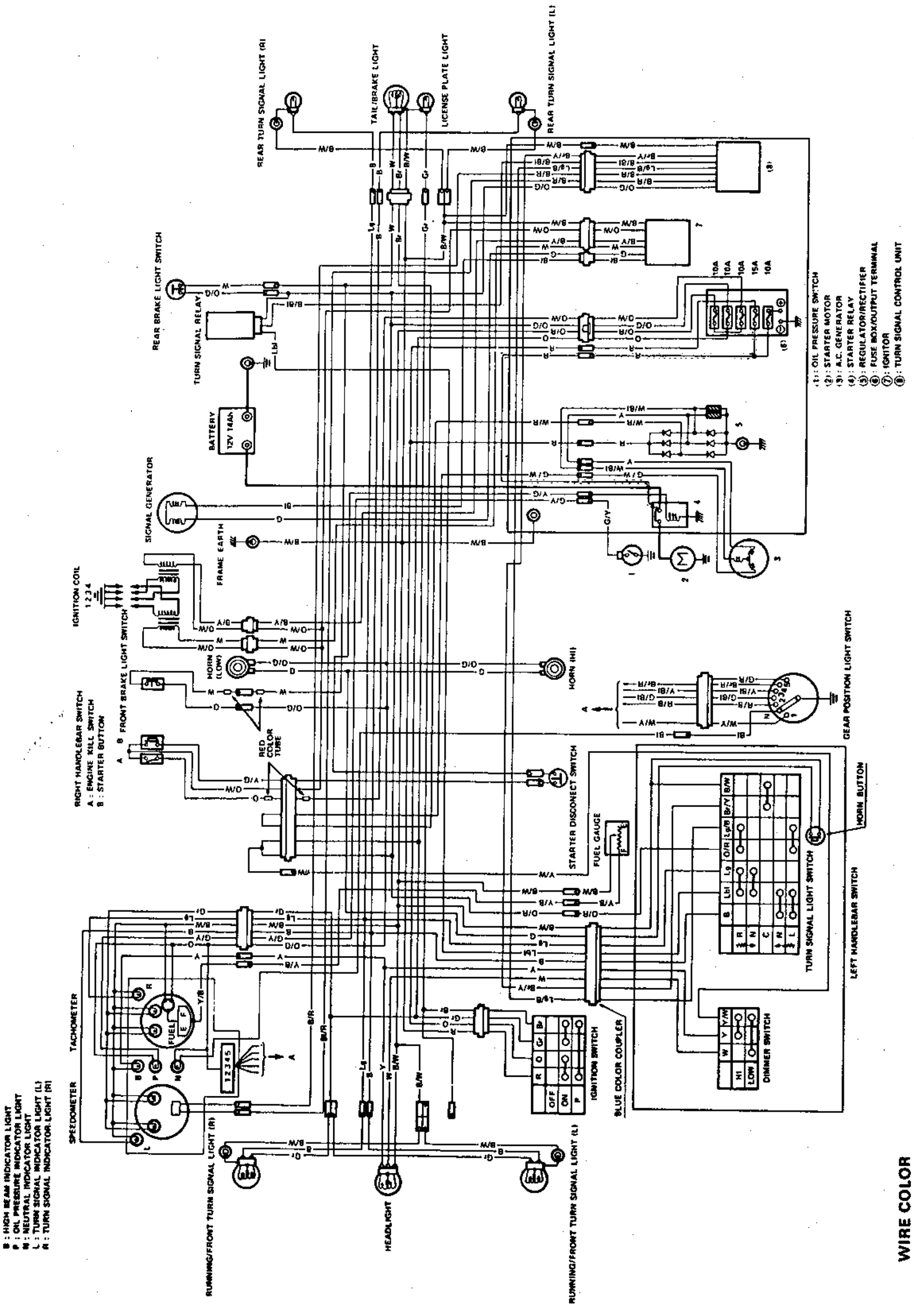


Throttle cable
Tighten wiring harness together with clutch cable.
Starter cable
Clutch cable
Clutch cable plate



Wiring harness
Clip
Pass the starter cable through interior side of clip without putting in the clip.

WIRING DIAGRAM



WIRE COLOR

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

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