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/cm²	psi	kPa	kg/cm²	psi	kPa	kg/cm²	psi	kPa	kg/cm²	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)

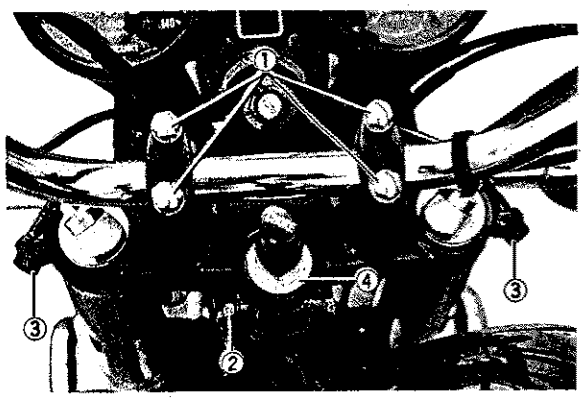


Fig. 14-1.

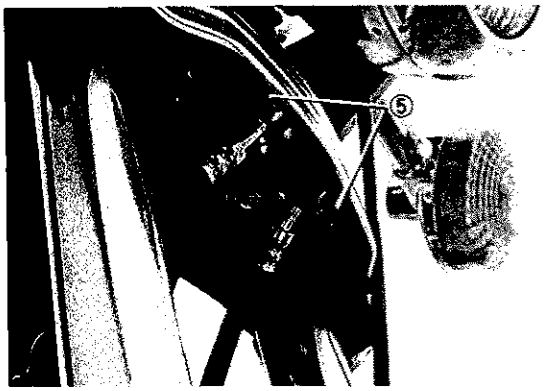


Fig. 14-2.

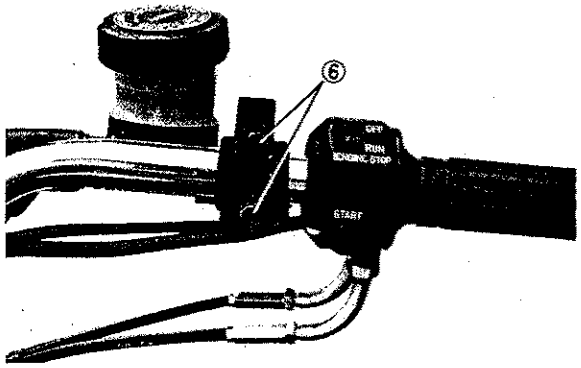


Fig. 14-3.

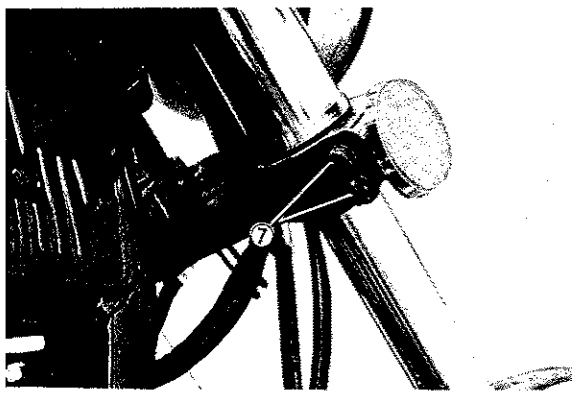


Fig. 14-4.

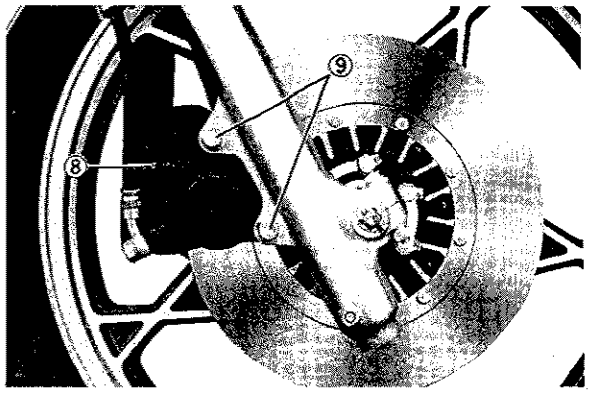


Fig. 14-5.

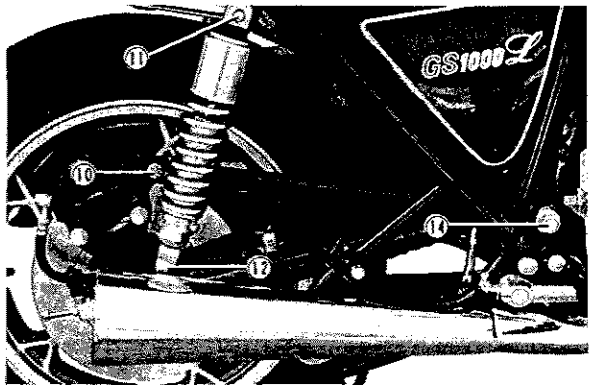


Fig. 14-6.

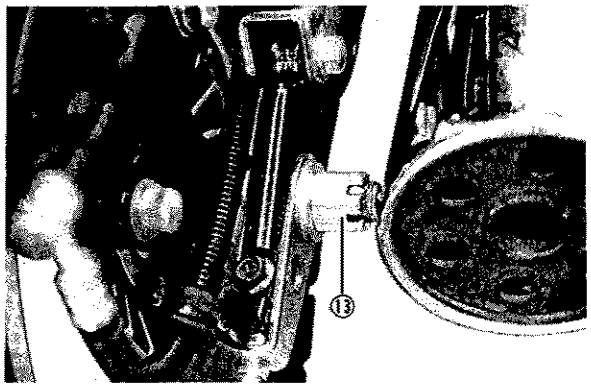


Fig. 14-7.

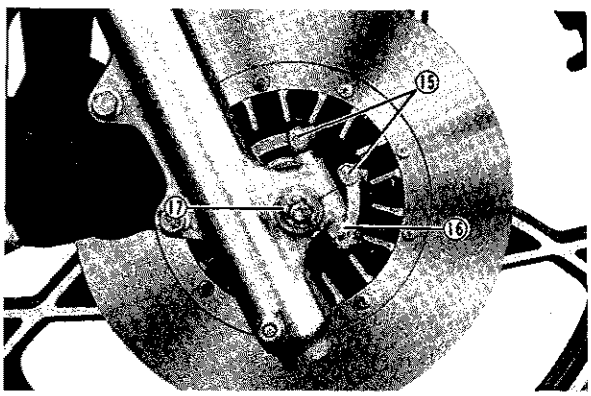


Fig. 14-8.

FUEL LINE

(Replace every two years)

Replace the fuel hose every two years.

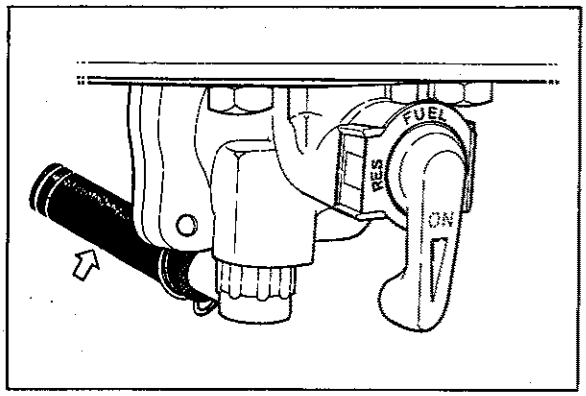


Fig. 14-9.

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.

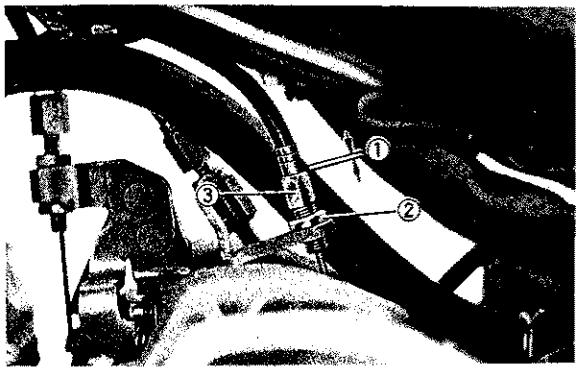


Fig. 14-10.

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.

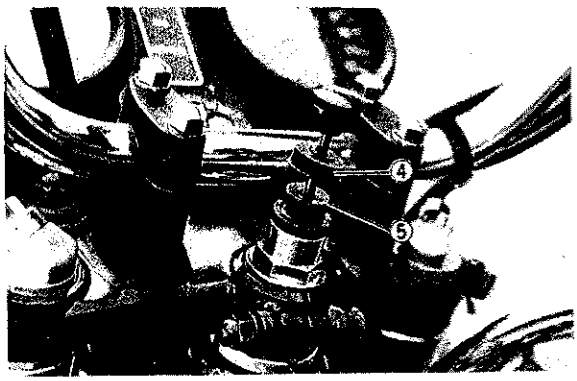


Fig. 14-11.

ENGINE REMOVAL

CARBURETOR REMOVAL

When removing the carburetor, remove the throttle cable ⑥ and ⑦ together with the choke cable ⑧.

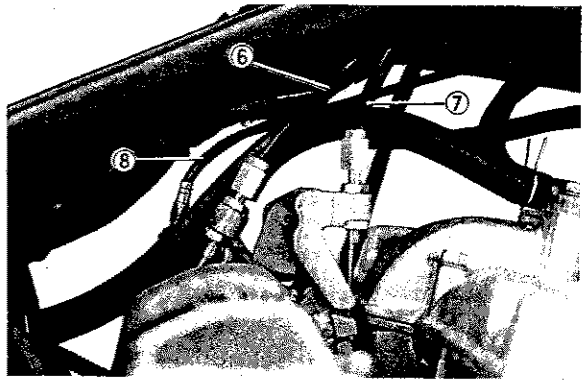


Fig. 14-12.

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.

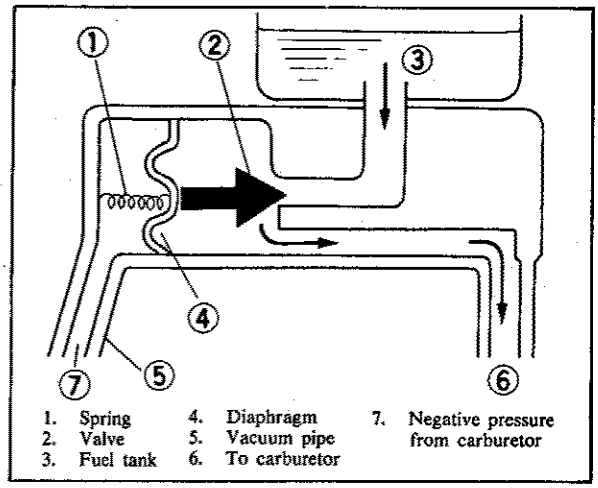


Fig. 14-13.

ON: Normally used. Functions as auto cock.

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

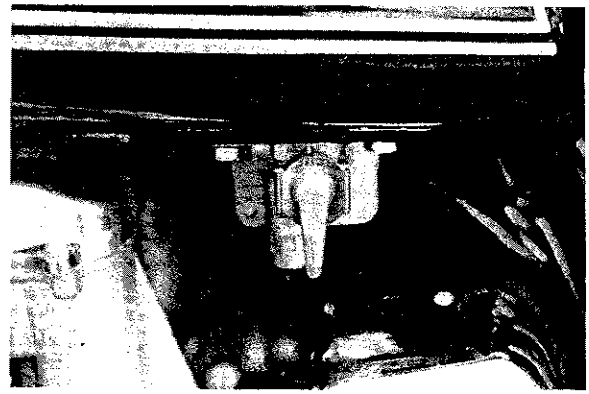
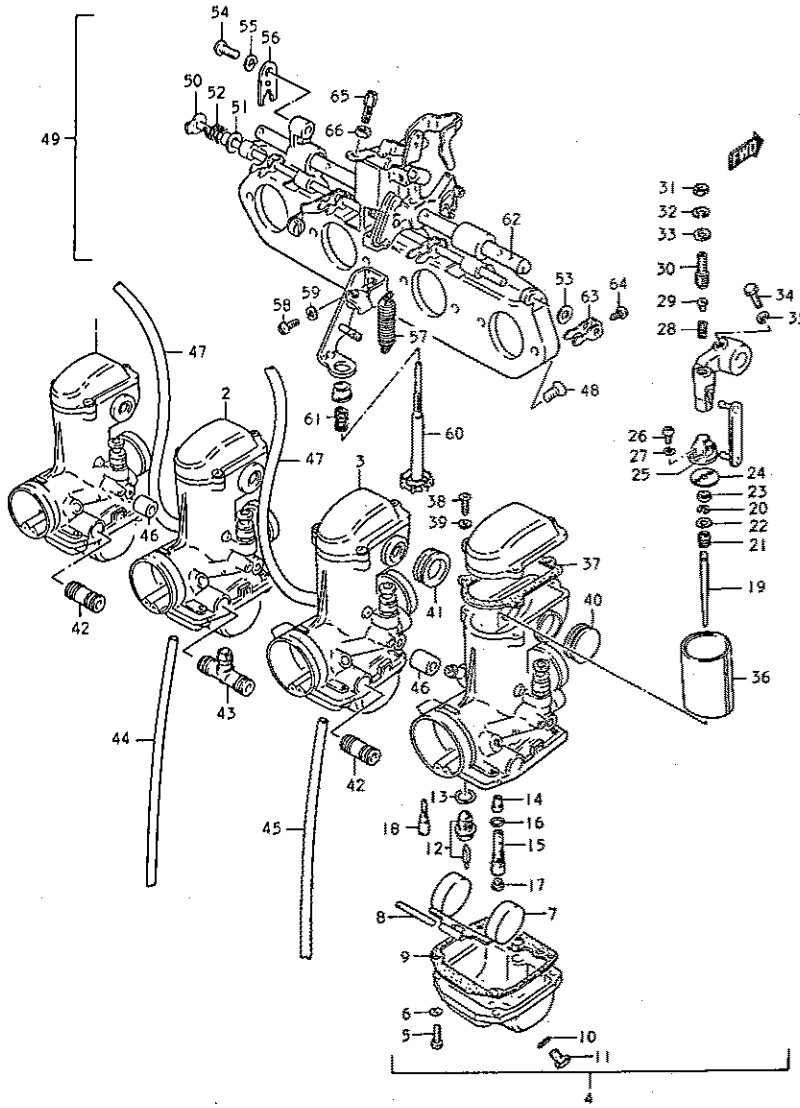


Fig. 14-14.

CARBURETOR DISASSEMBLY



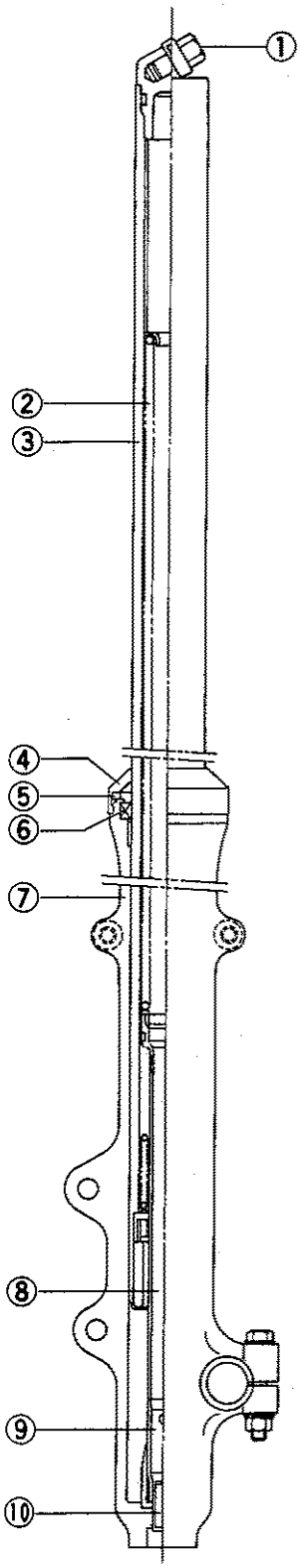
1. Carburetor Assy, No. 1
2. Carburetor Assy, No. 2
3. Carburetor Assy, No. 3
4. Carburetor Assy, No. 4
5. Screw
6. Lock Washer
7. Float
8. Float pin
9. Gasket
10. O ring
11. Screw
12. Needle valve
13. Gasket
14. Needle jet
15. Breader pipe
16. O ring
17. Main jet
18. Pilot jet
19. Jet needle
20. Needle 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.

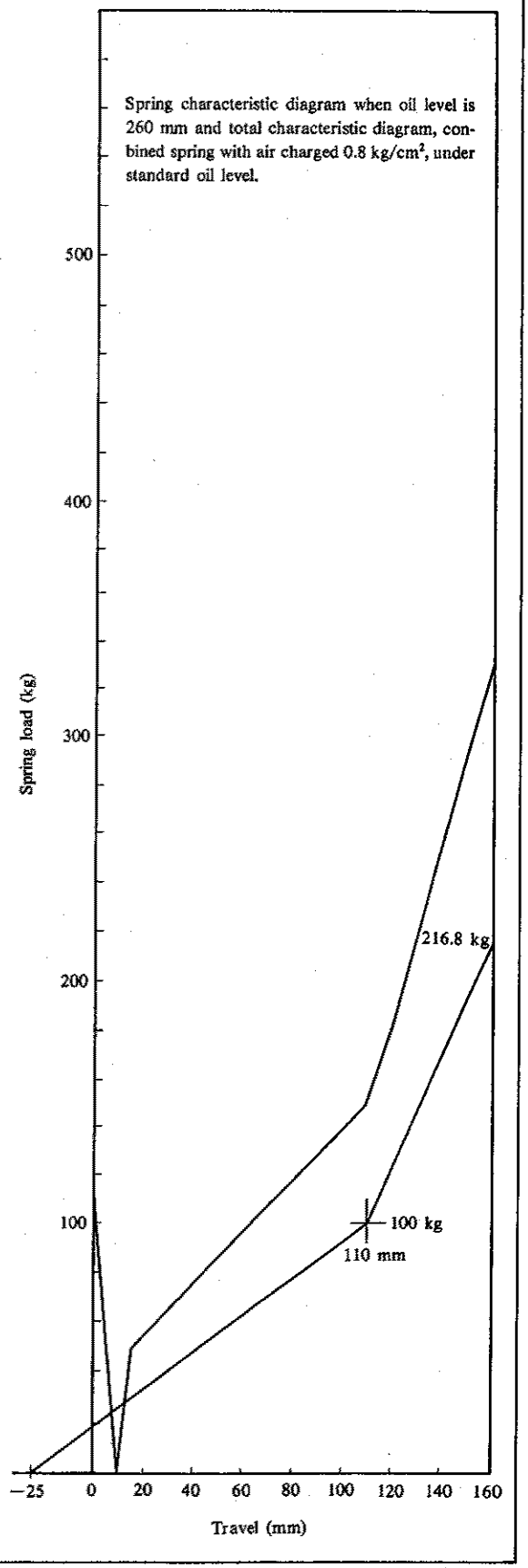
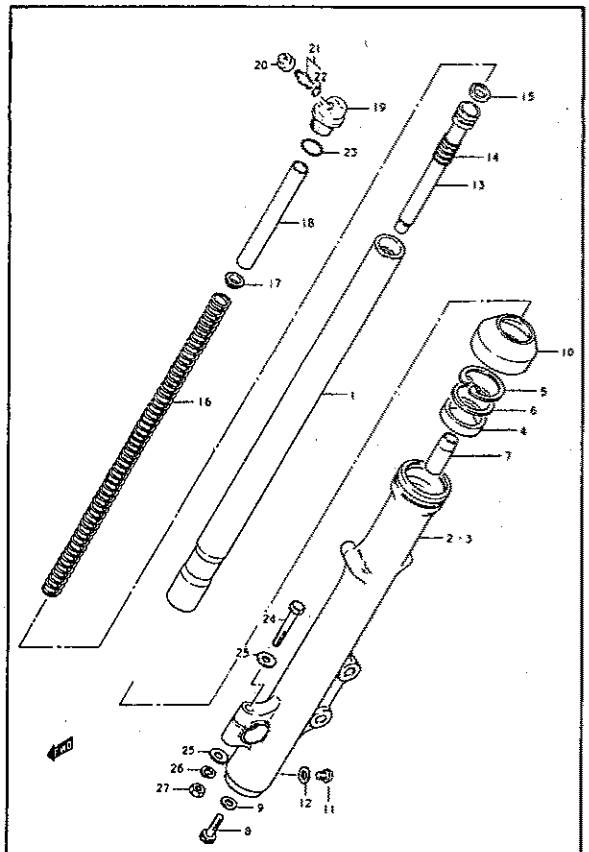


Fig. 14-17.



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.

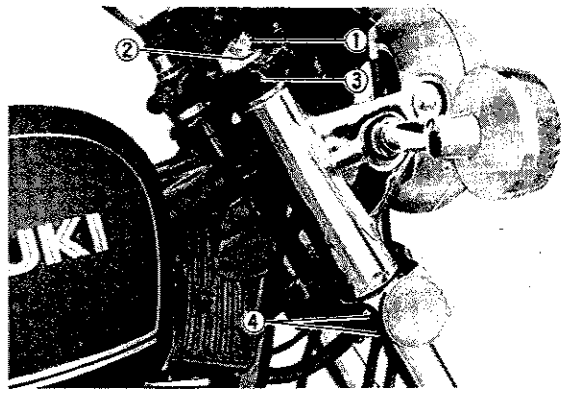


Fig. 14-19.

- 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)

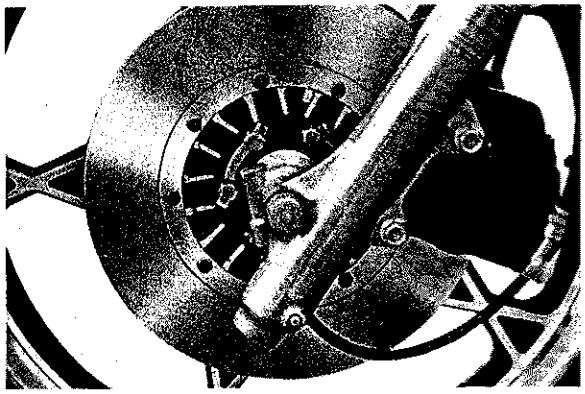
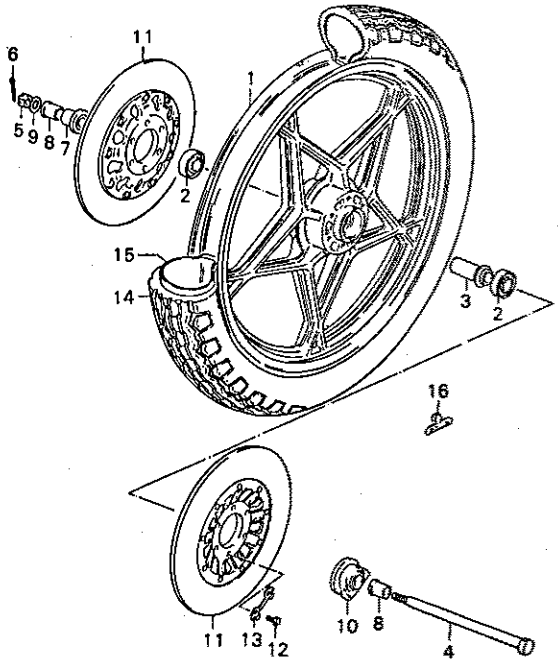


Fig. 14-20.

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.

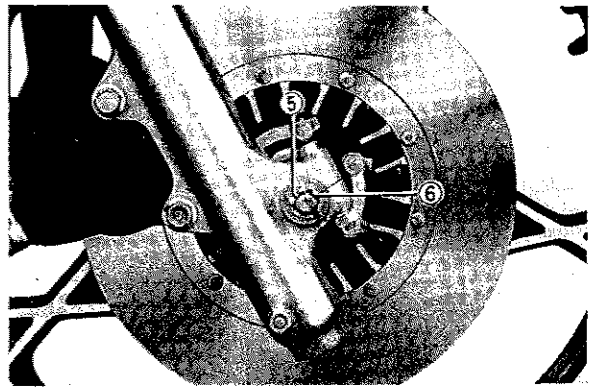


Fig. 14-22.

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.

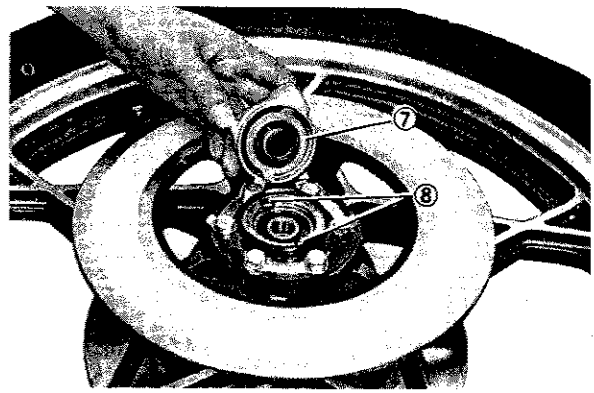


Fig. 14-23.

- 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.

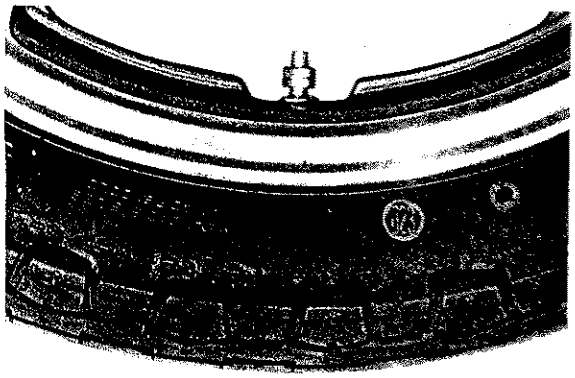


Fig. 14-24.

- 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

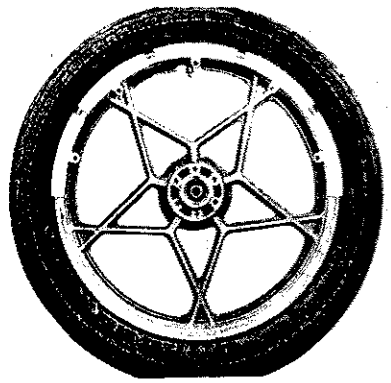


Fig. 14-25.

- 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.

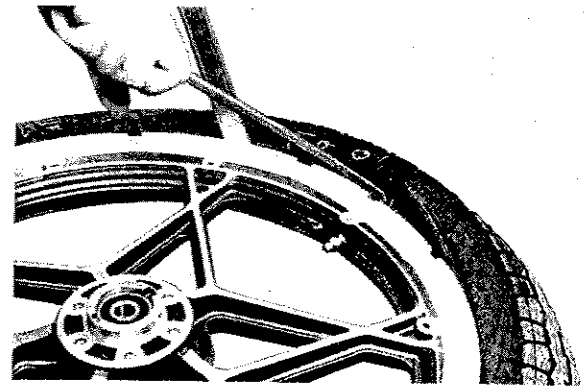


Fig. 14-26.

- Remove the tube.
- Remove the tire from the wheel.

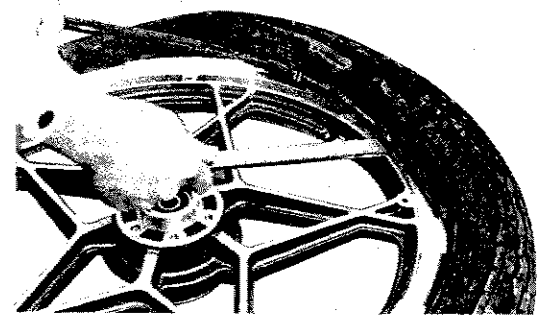


Fig. 14-27.

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.

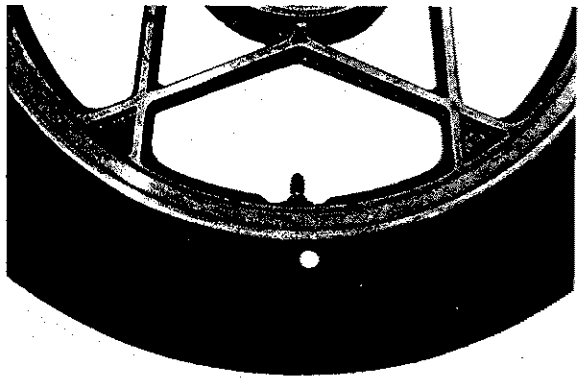


Fig. 14-29.

- 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

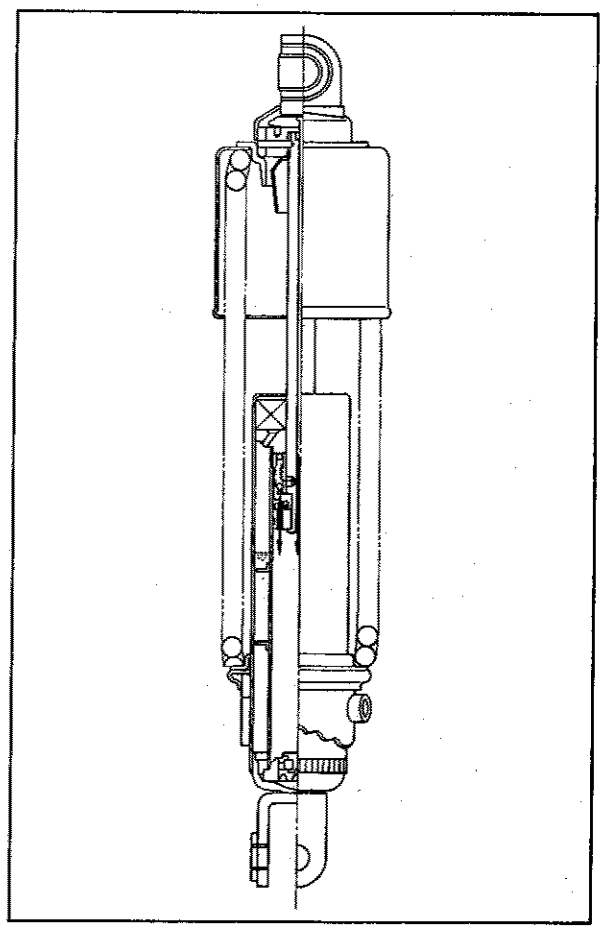


Fig. 14-30.

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

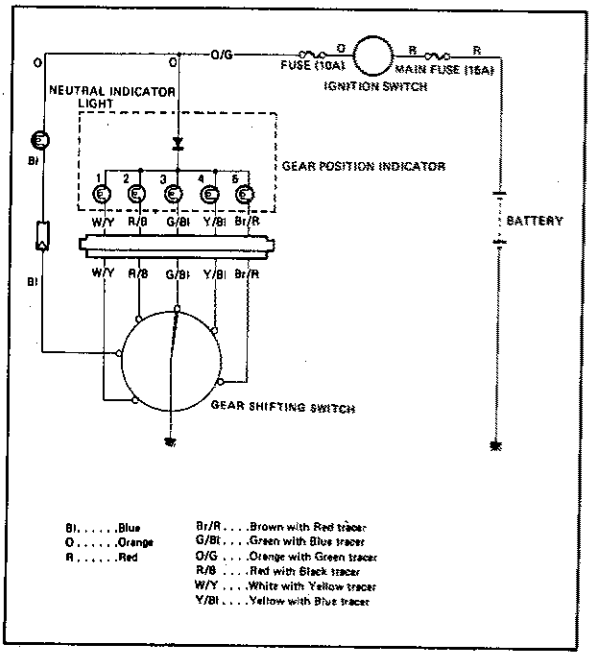


Fig. 14-31.

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.

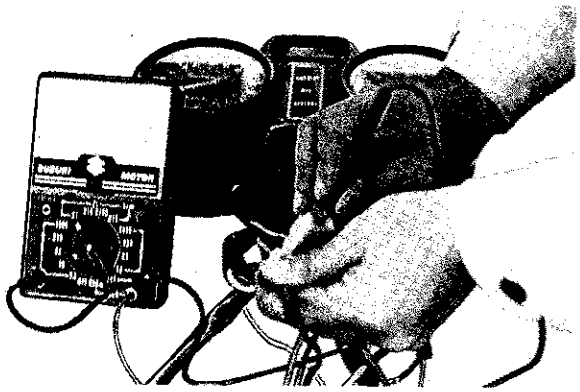


Fig. 14-32.

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.

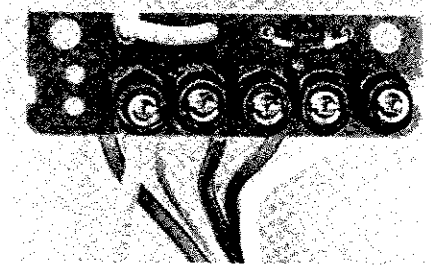


Fig. 14-33.

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.)

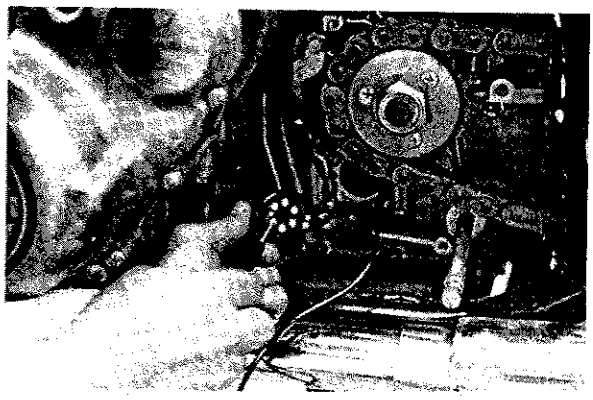


Fig. 14-34.

FUEL GAUGE

Wiring

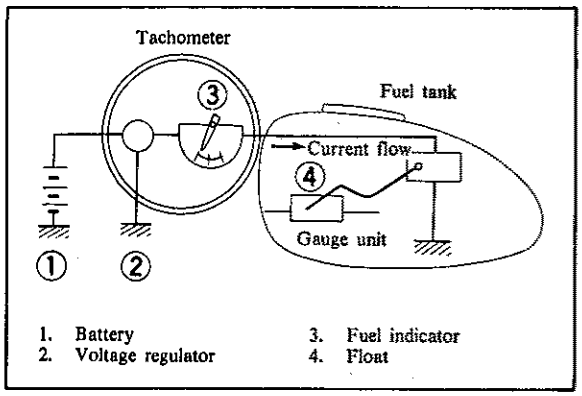


Fig. 14-35.

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.

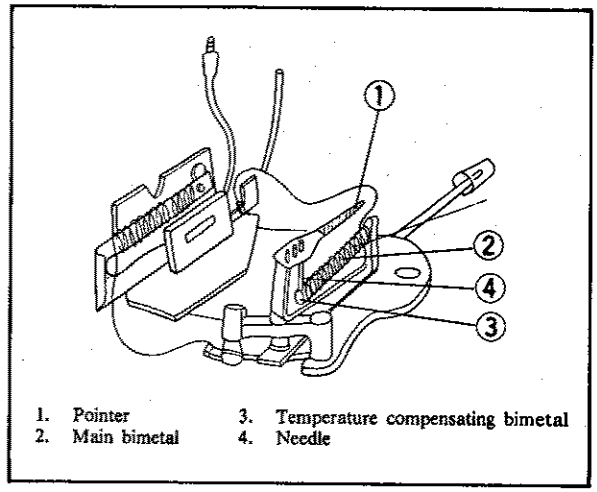


Fig. 14-36.

- 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:

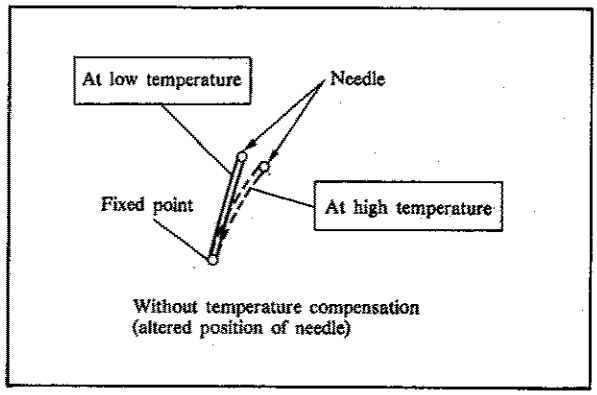


Fig. 14-37.

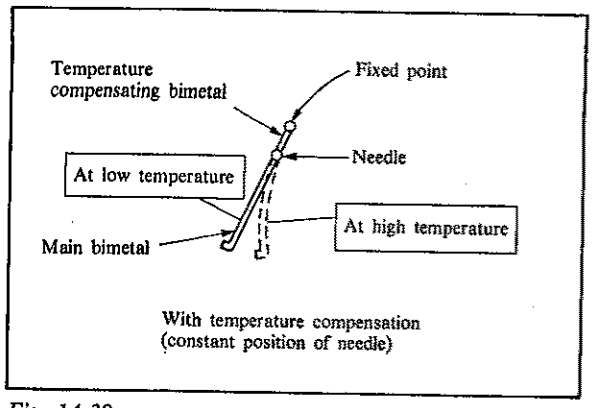


Fig. 14-38.

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

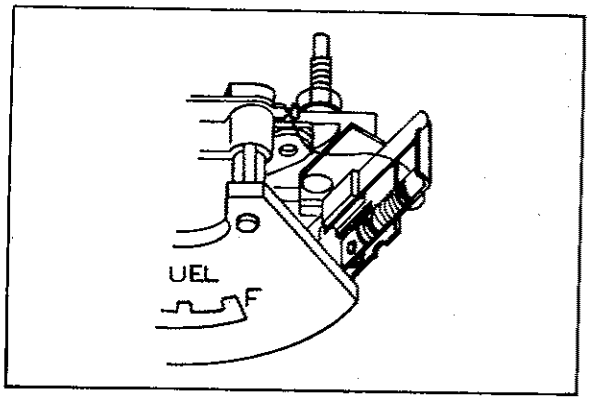


Fig. 14-39.

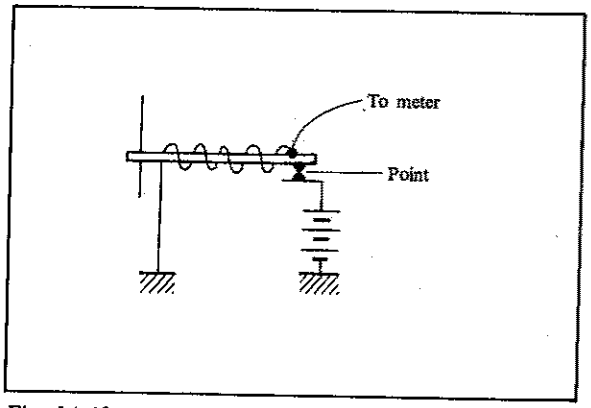


Fig. 14-40.

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.

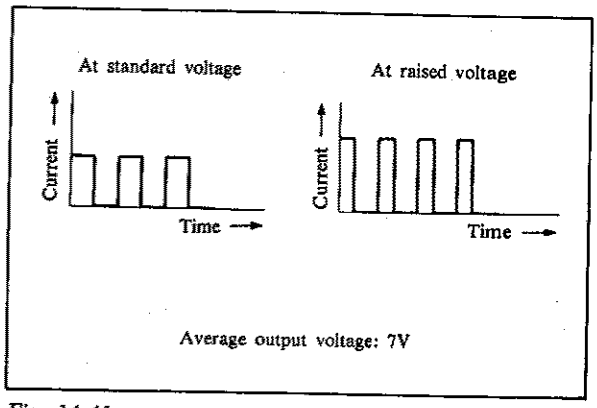


Fig. 14-41.

- 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.

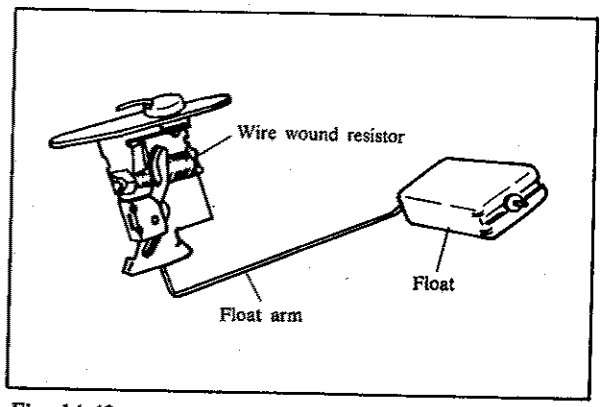


Fig. 14-42.

INSPECTION OF FUEL METER AND GAUGE

The fuel meter is enclosed within the tachometer assembly.

The following table is used for troubleshooting.

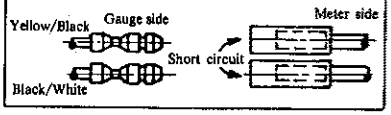
Amount of gasoline (L)	1.6	2.3	5.2	7.4	11.6	12.3
Resistance (Ω)	110	95	50	32.5	7	3

Pointer failure and minus indication

(1) Meter pointer fails to move.
(2) Meter has a substantial minus indication when key is turned on.

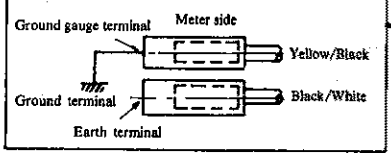
Checking method

(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.



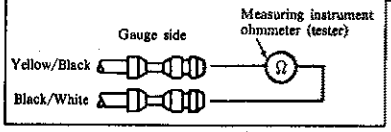
- Meter pointer fails to move → Meter side defective → Check (2)
- Meter pointer swings to extreme position → Gauge defective → Check (3)

(2) Meter check
Ground meter terminal of meter side connector directly to frame and observe meter indication.



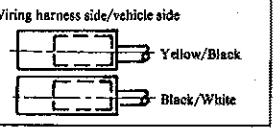
- Meter pointer fails to move → Meter side defective → Check (5)
- Meter pointer swings to extreme position → Wiring harness defective → Check (4)
  (Contact of connector terminal)

(3) Gauge check
Measure resistance value between two terminals of gauge side connector.
(Full→ 1 – 5Ω: Empty → 103 – 117Ω)



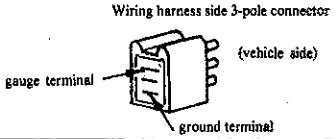
- Large, unstable resistance → Gauge defective → Replace gauge
  (More than 117Ω)
- Normal resistance value → Wire harness defective → Check (4)
  (1 – 117Ω) (Contact of connector terminal)

(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.



- Meter pointer swings to extreme position → Connector contact defective
- Meter pointer fails to move → Meter defective → Change meter

Carry out check (2) at the same time.

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)

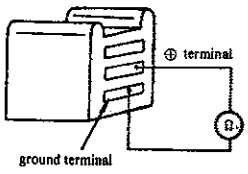
(7) Gauge side check
Measure resistance value of gauge according to (3).

- 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)

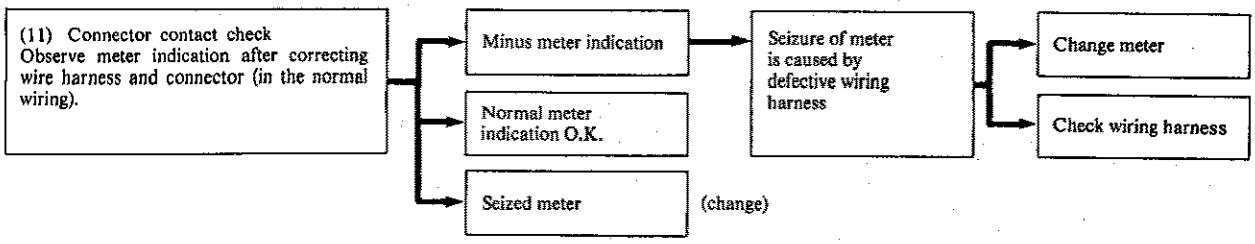
(9) Meter side check
Remove 3-pole meter side connector and measure resistance value between ⊕ terminal and ground terminal.

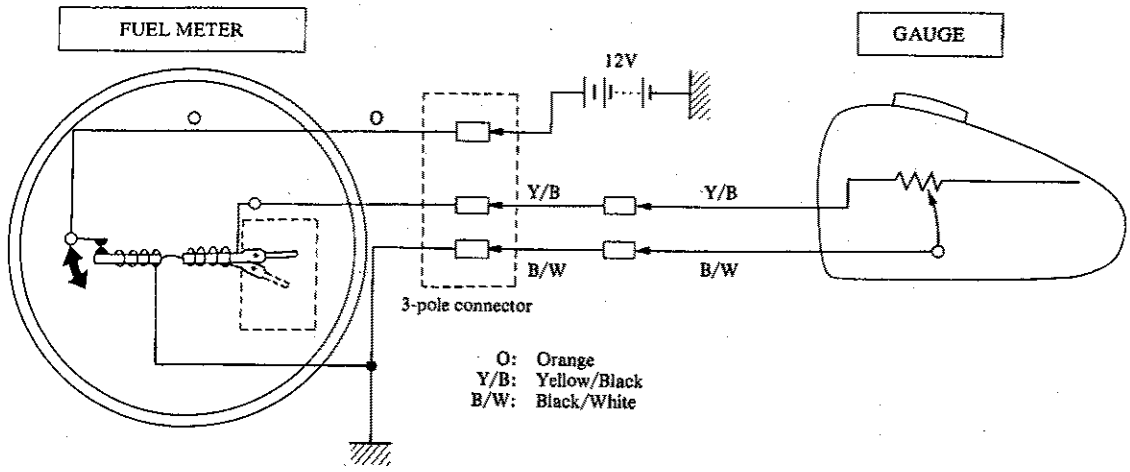


- Large resistance, infinite → Meter defective → Change meter
- Resistance value (55 – 85Ω) → Wire harness defective → Check (10)

(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)





Check resistance value between terminals
Meter side

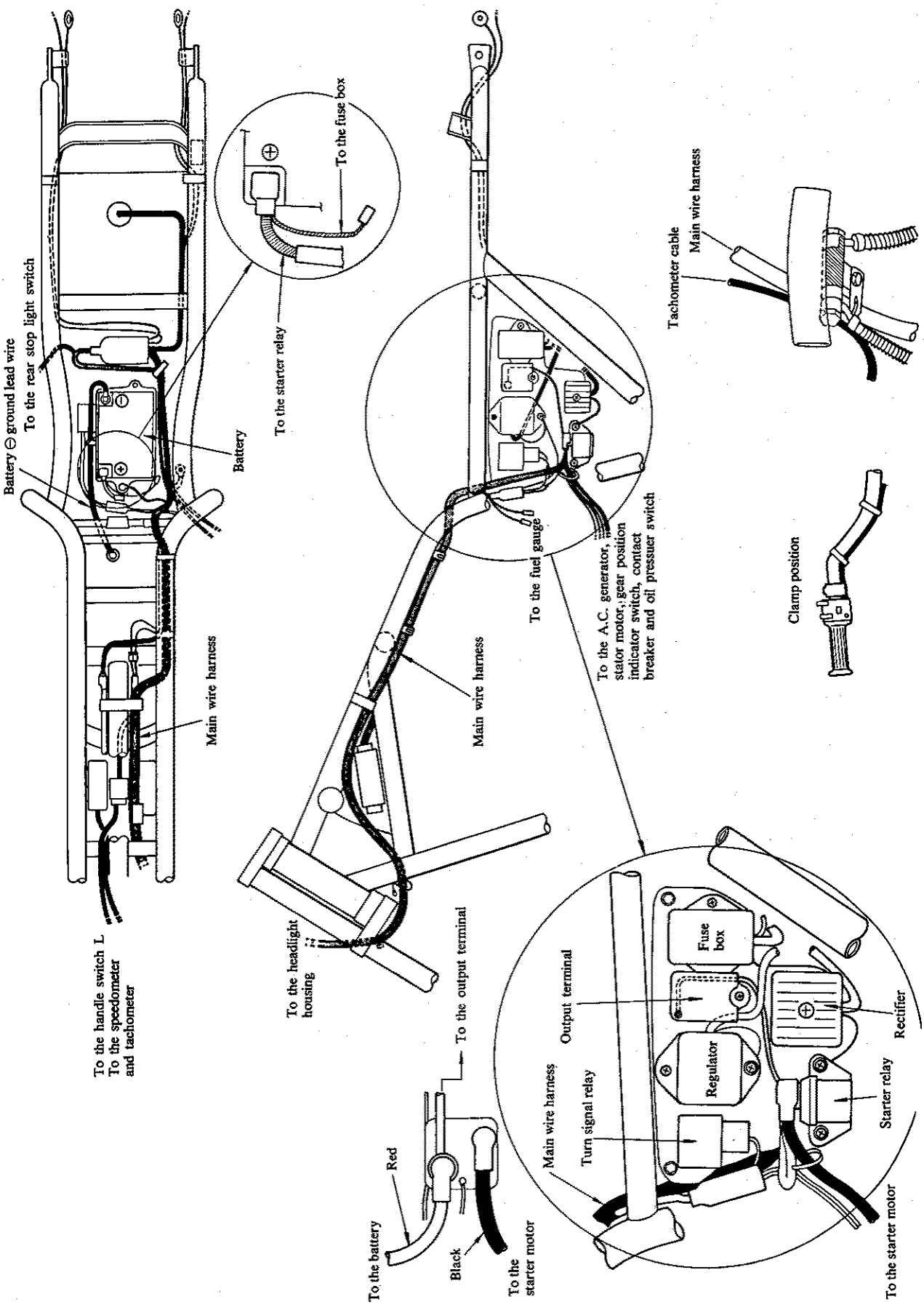
Orange-Yellow/Black 45 — 65Ω
Orange-Black/White 55 — 85Ω

Gauge side

Full	1 — 5Ω
Empty	103 — 117Ω

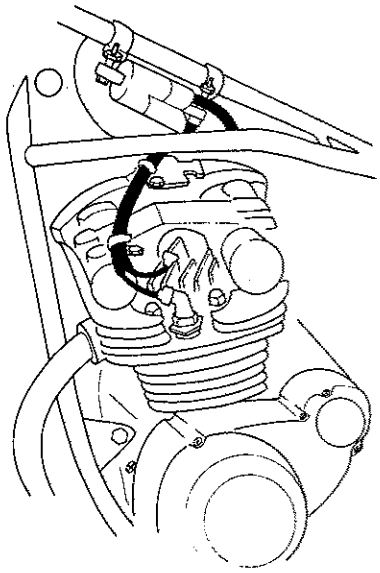
Fig. 14-43.

WIRE AND CABLE ROUTING

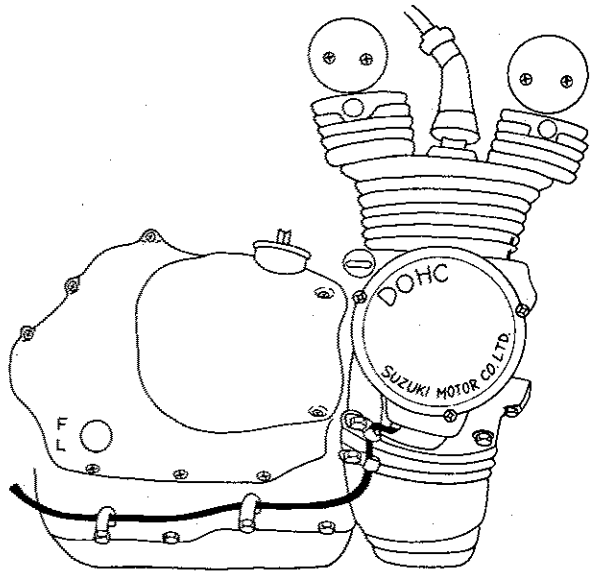


WIRE AND CABLE ROUTING

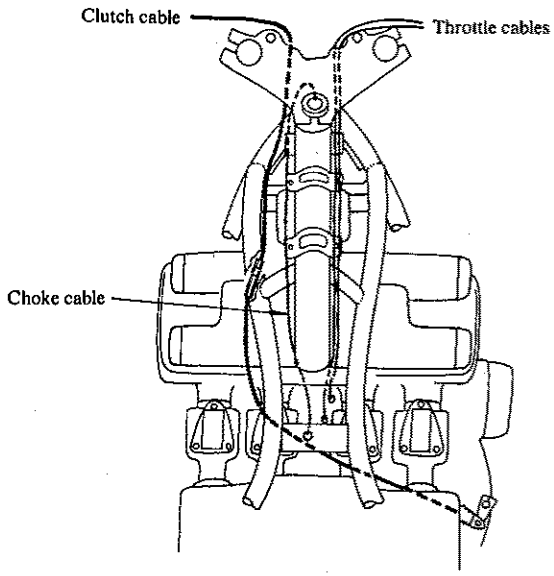
How to set the high-tension cord

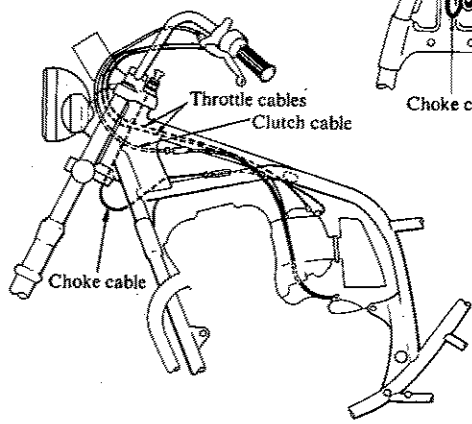


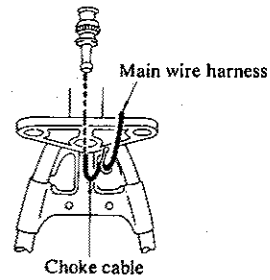
How to set contact breaker lead wire



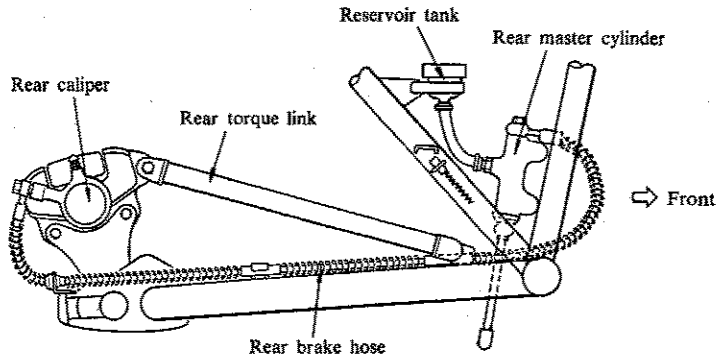
CABLE ROUTING



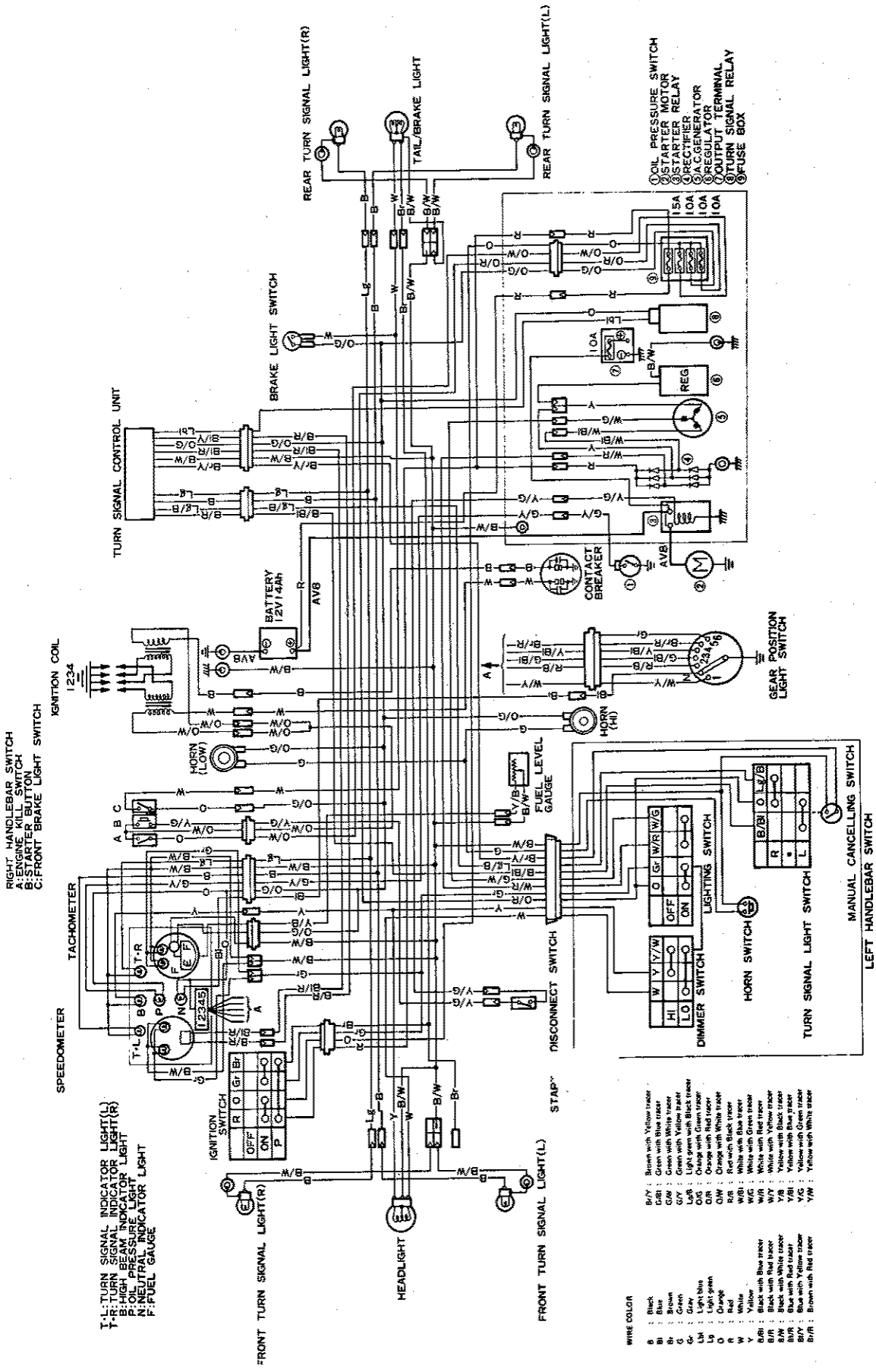




REAR BRAKE HOSE ROUTING



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

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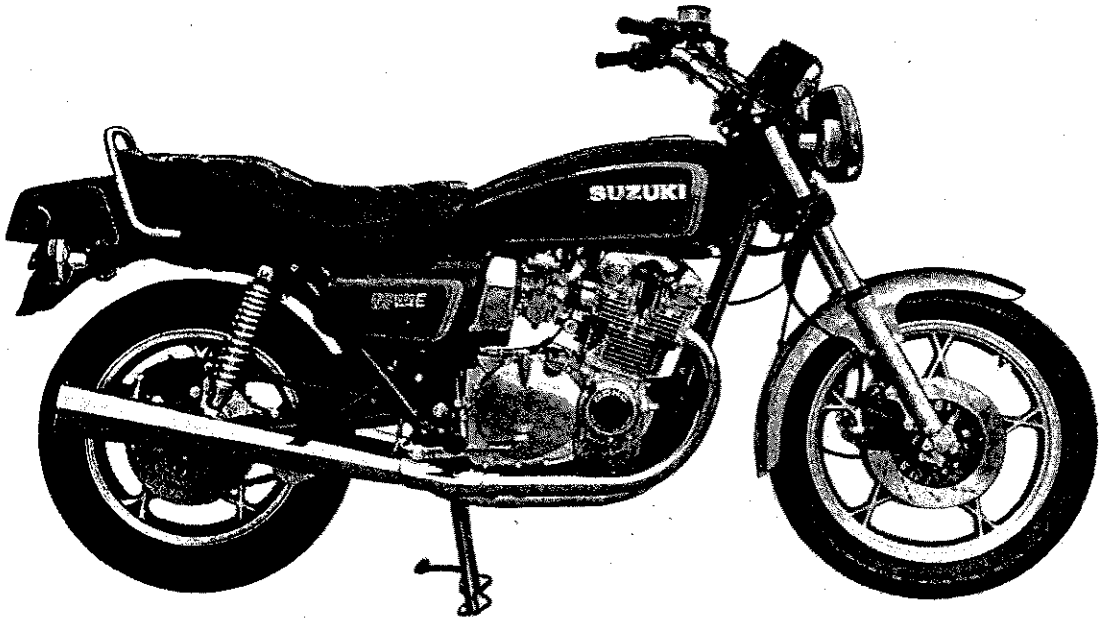
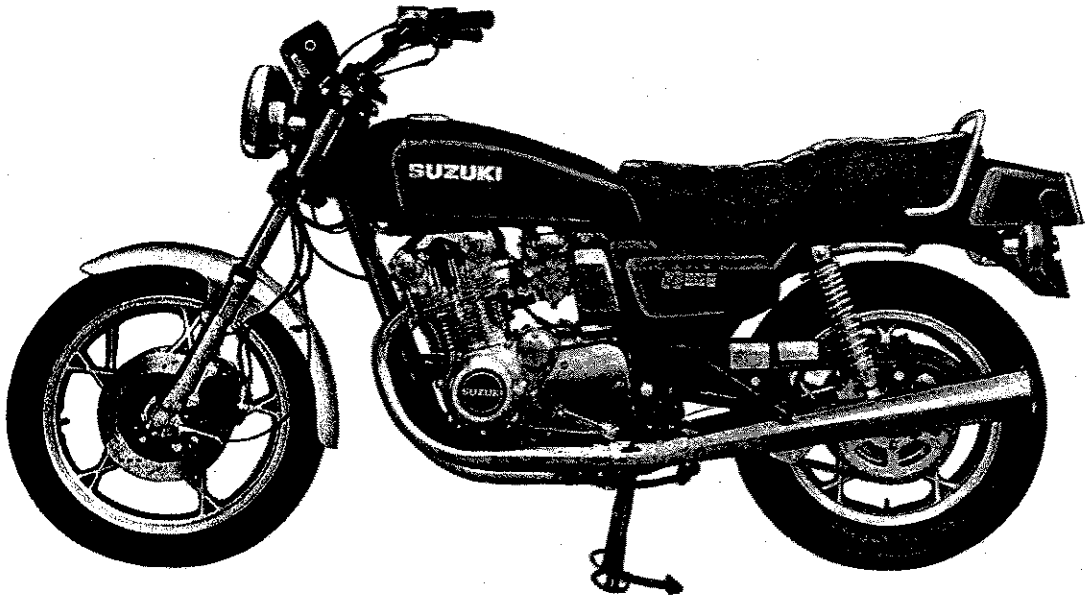
GS1000ET



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/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 (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/cm² (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/cm² (128 — 185 psi)	7 kg/cm² (100 psi)
Compression pressure difference		—	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)

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/cm^2 (1.42 psi) Below 0.5 kg/cm^2 (7.11 psi) at 3000 r/min	–
Tip clearance	–	0.20 (0.008)
Outer rotor clearance	–	0.25 (0.010)
Side clearance	–	0.15 (0.006)

CLUTCH

Unit: mm (in)

Item	Standard	Limit
Clutch cable play	2 – 3 (0.08 – 0.12)	–
Drive plate thickness	2.9 – 3.1 (0.11 – 0.12)	2.6 (0.10)
Drive plate claw width	15.6 – 15.8 (0.61 – 0.62)	14.8 (0.58)
Drive plate distortion	–	0.2 (0.008)
Driven plate thickness	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/cm² (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/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

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

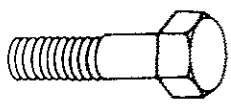
CHASSIS

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

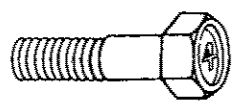
For other bolts and nuts not listed above, refer to this chart:

TIGHTENING TORQUE

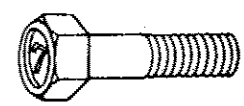
Thread Diameter (mm)	Conventional or "4" Marked Bolt		"7" Marked Bolt	
	kg-m	lb-ft	kg-m	lb-ft
5	0.2 – 0.4	1.5 – 3.0	0.3 – 0.6	2.0 – 4.5
6	0.4 – 0.7	3.0 – 5.0	0.7 – 1.0	5.0 – 7.5
8	0.9 – 1.4	6.5 – 10.0	2.0 – 2.5	14.5 – 18.0
10	1.8 – 2.8	13.0 – 20.0	3.5 – 4.0	25.5 – 29.0



Conventional Bolt



"4" Marked Bolt

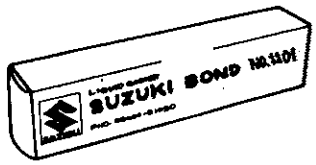
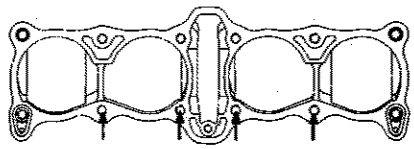
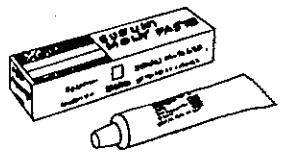


"7" Marked Bolt

SPECIAL MATERIALS

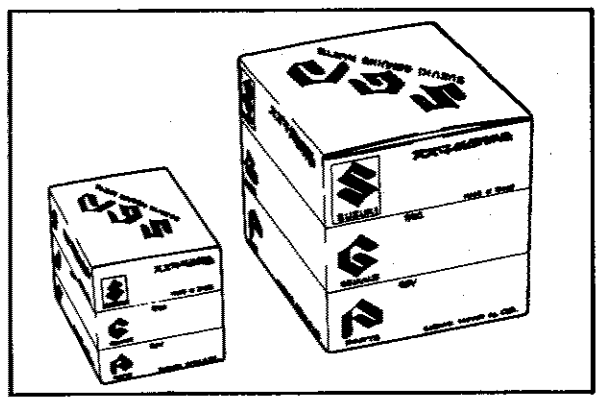
The materials listed below are needed for maintenance work on the GS1000, and should be kept on hand for ready use. They supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and whtere to use them are described in the text of this manual.

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

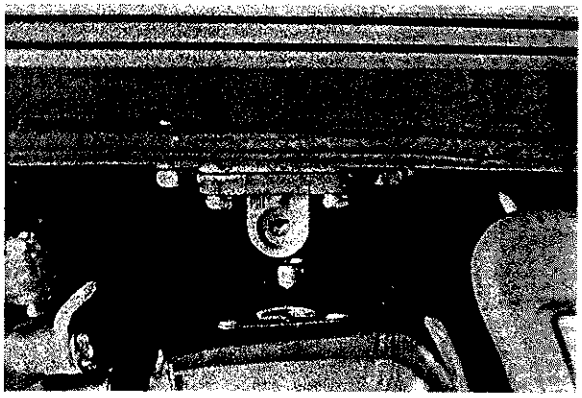
INTERVAL: This interval should be judged by odometer reading or months whichever comes first						
	Mile	600	4000	7500	11000	15000
	km	1000	6000	12000	18000	24000
	Month	2	12	24	36	48
Battery (specific gravity of electrolyte)		—	I	I	I	I
Cylinder head nuts and exhaust pipe bolts		T	T	T	T	T
Air cleaner 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

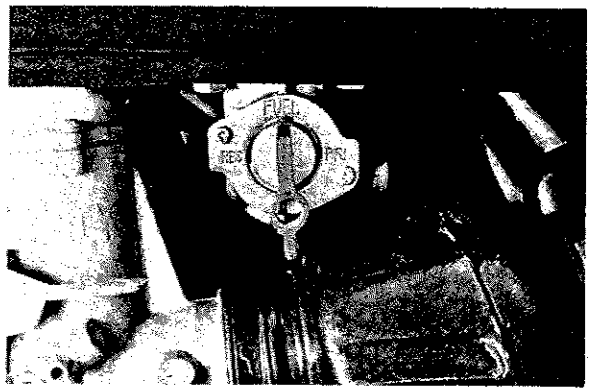
MODIFICATIONS

FUEL SYSTEM

• The fuel cock has been changed as shown below.

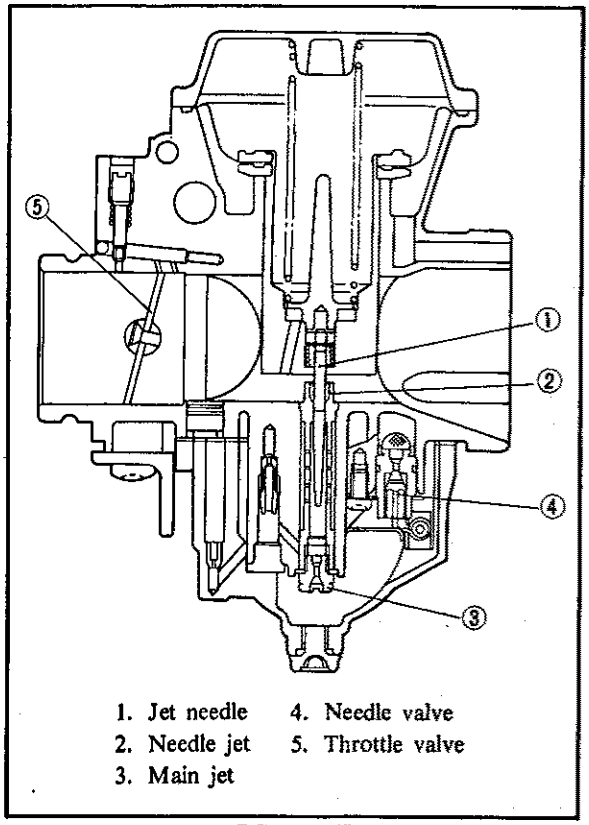


GS1000ET Model



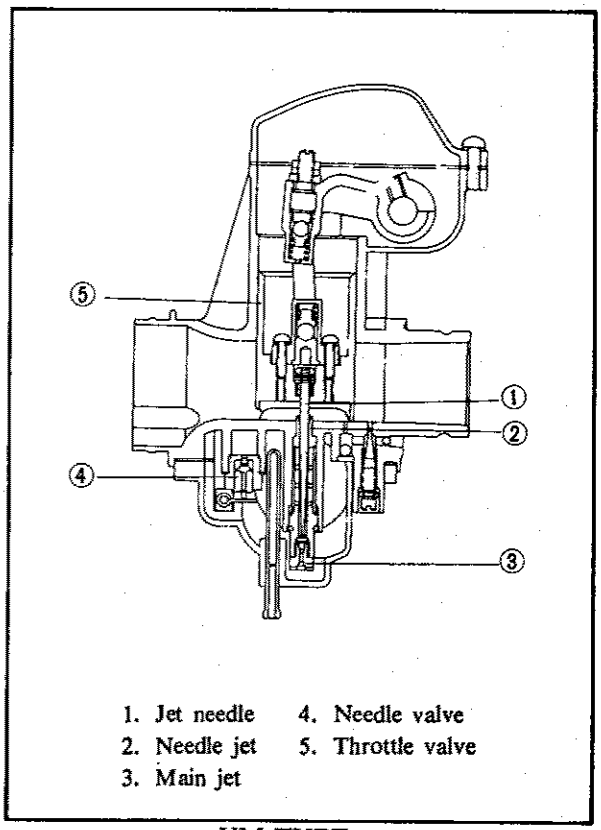
GS1000N Model

• 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

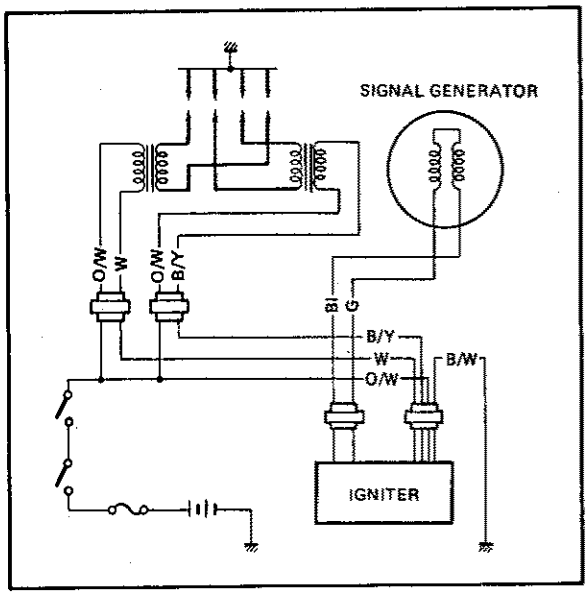


1. Jet needle
2. Needle jet
3. Main jet
4. Needle valve
5. Throttle valve

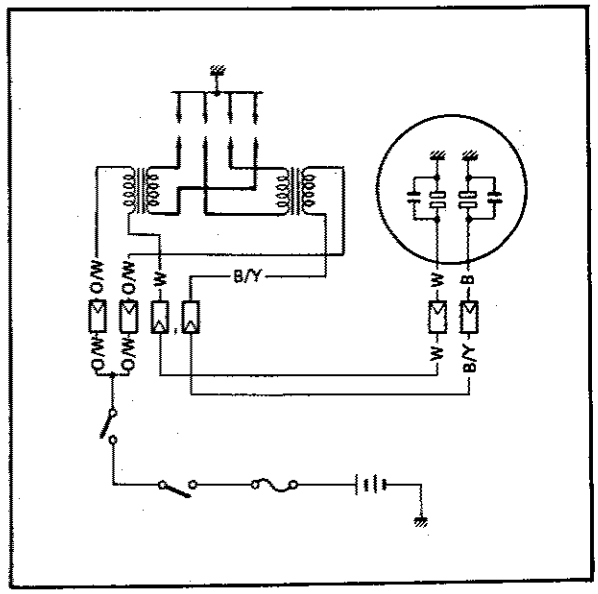
GS1000N Model VM-TYPE

ELECTRICAL

- The ignition system has been changed from the battery ignition system to the maintenance-free transistorized ignition system.

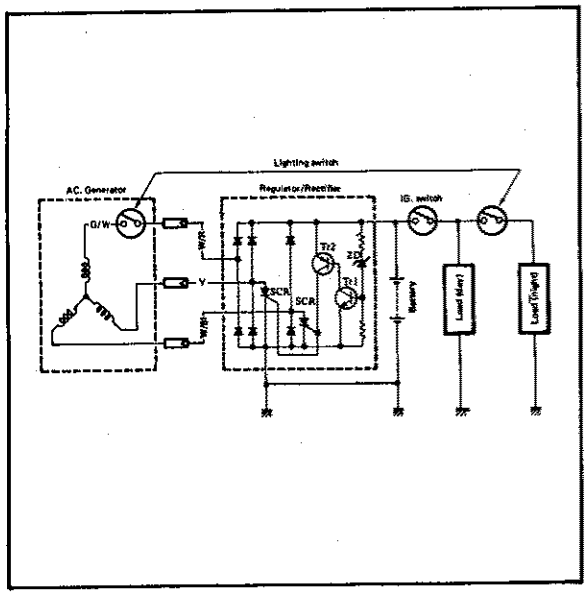


GS1000ET Model

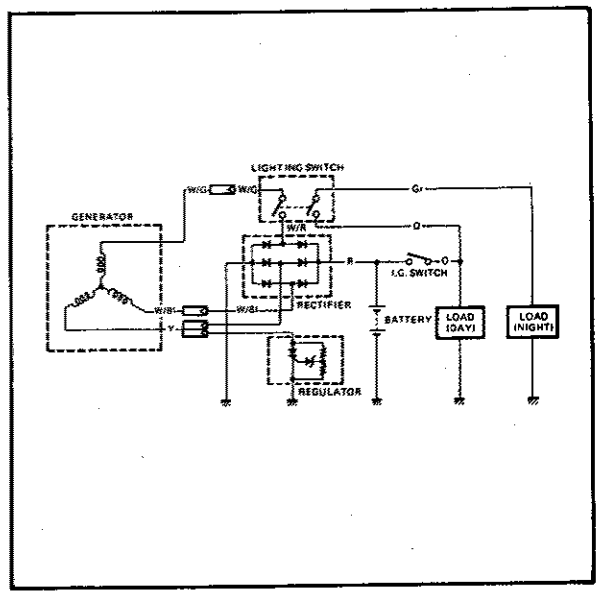


GS1000N Model

- Charging system has been changed as shown below.

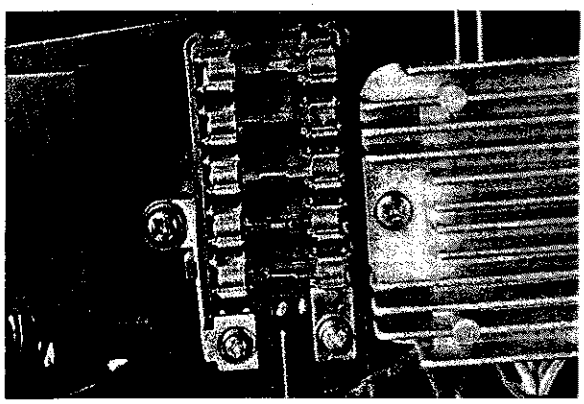


GS1000ET Model

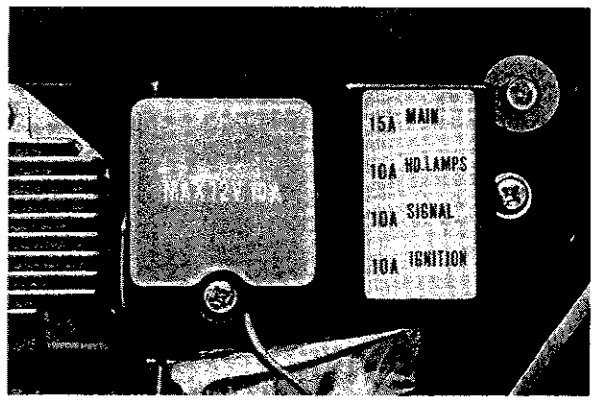


GS1000N Model

- The fuse box and output terminal have been changed from the separate type to the combined type.



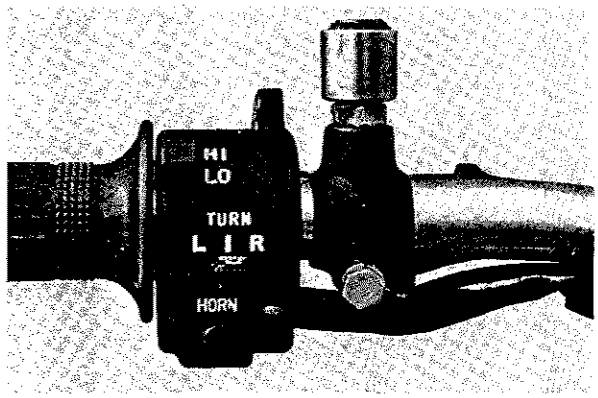
GS1000ET Model



GS1000N Model

- The left handlebar switch has been changed to a multiple type as shown below:

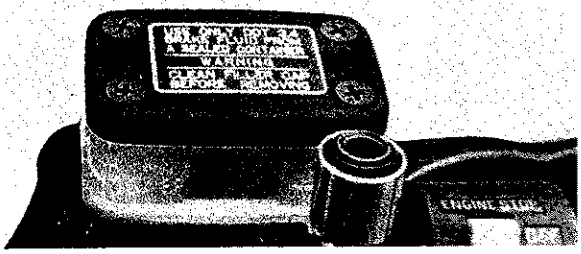
GS1000ET Model



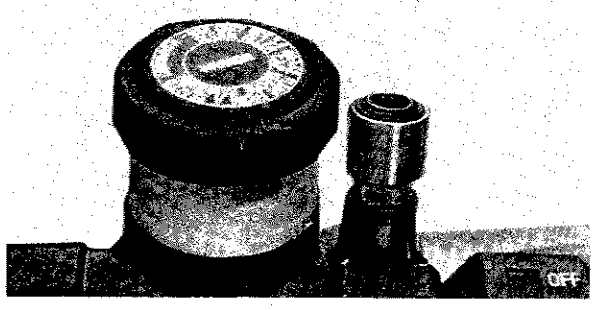
GS1000N Model

CHASSIS

- The front master cylinder cap has been changed from a screwing-in type to 4-screw fastening type.

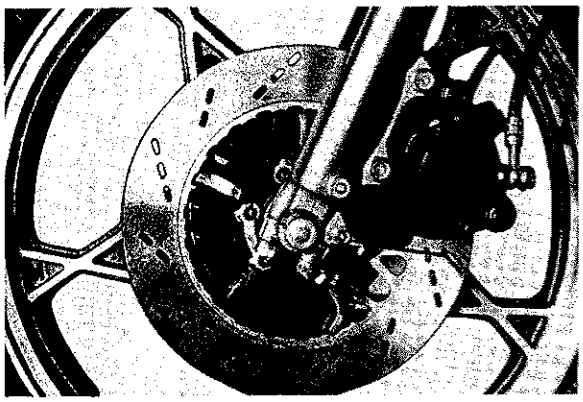


GS1000ET Model

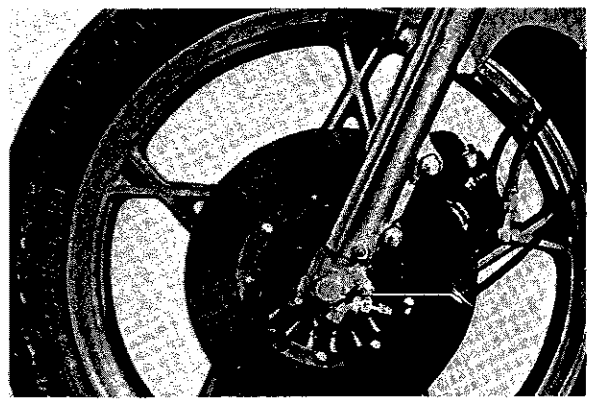


GS1000N Model

- The front and rear brake disc plates are newly provided with holes.

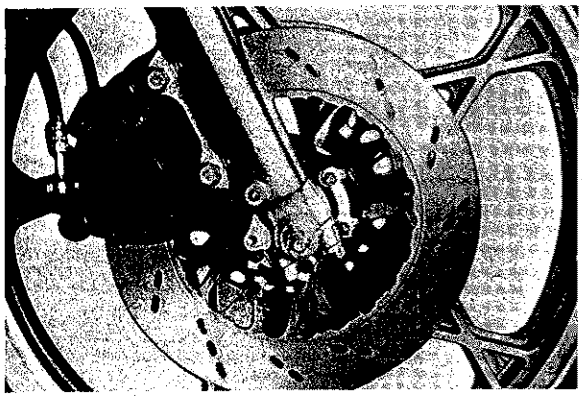


GS1000ET Model

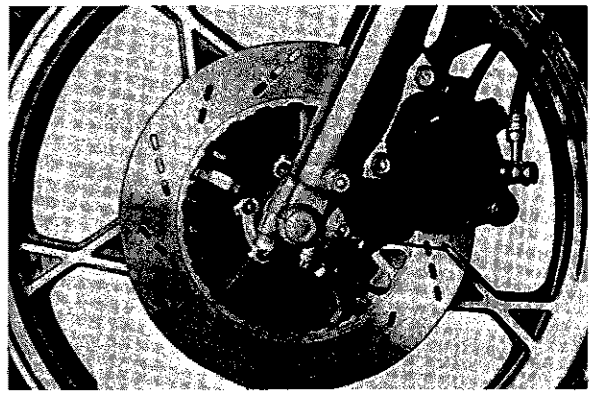


GS1000N Model

CAUTION:
Be careful not to reverse the right and left front disc plates.

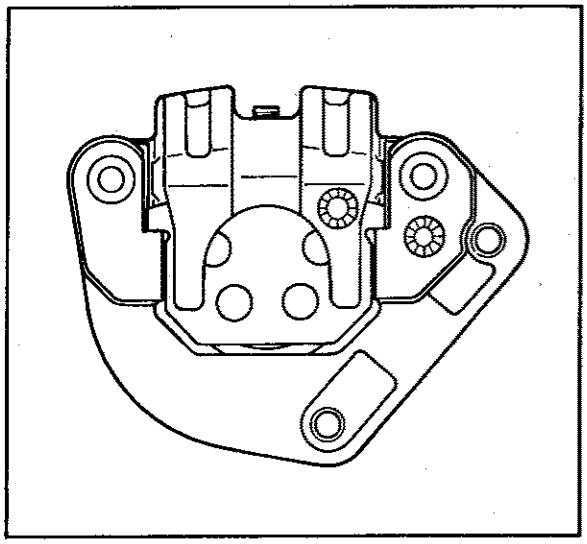


Right front disc plate

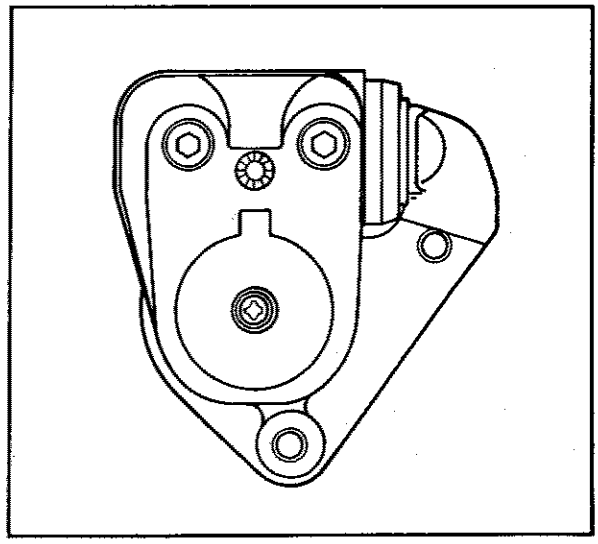


Left front disc plate

- 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

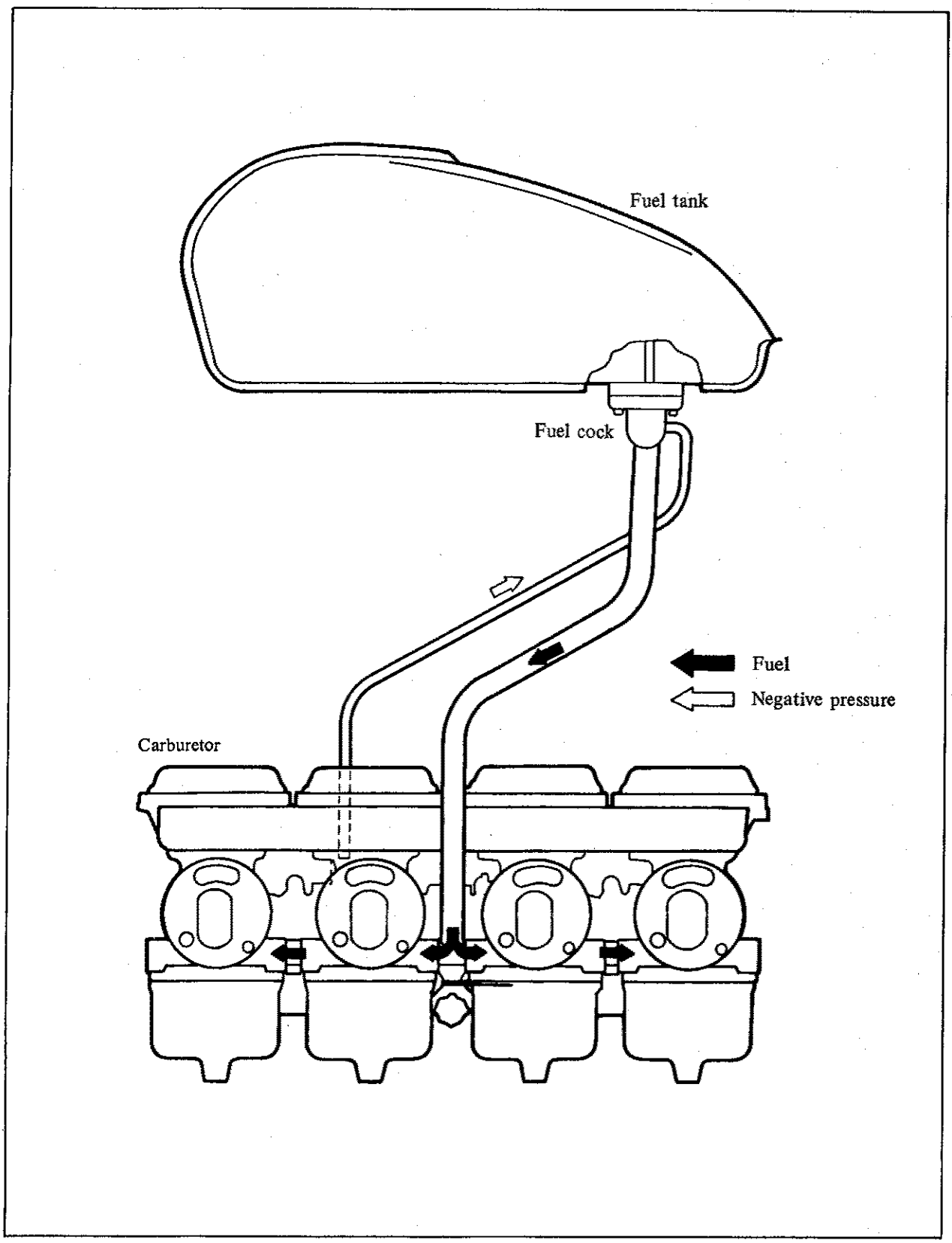
1. Air Cleaner — Dirty, over oiled or torn.
2. Jets — Clogged, restricted or incorrect size.
3. Float Level — Level too low (lean) or too high (rich).
4. Choke — Leaking choke plunger or sticking linkage.
5. Air Leaks — Intake manifolds, engine gaskets and other sealing surfaces.
6. Synchronization —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

Engine wear or damage can also cause high HC emissions.

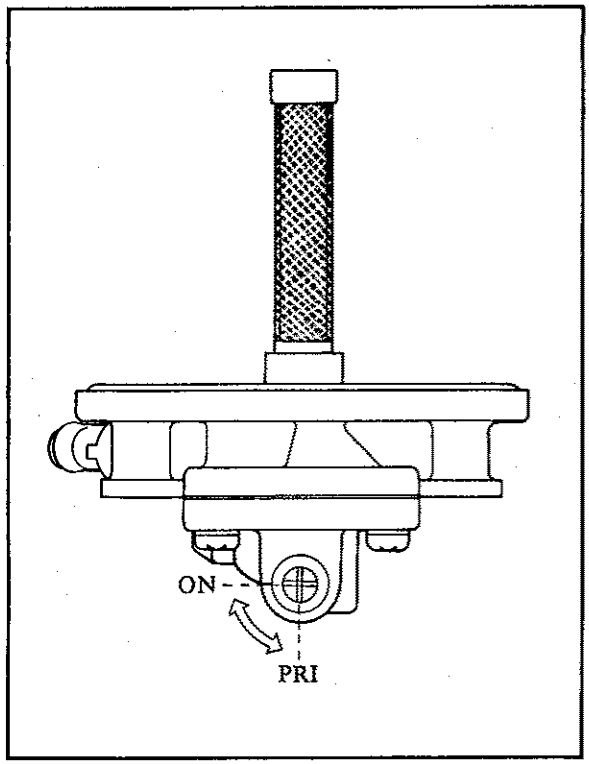
1. Rings — Low compression, leakage into crankcase.
2. Valves — Improper adjustment, bent stem or burnt.
3. Gaskets — Leaking, loss of compression.
4. Crank Seals — Leaking.
5. Oil Consumption — Worn valve guides, worn rings, clogged crankcase breather.
6. Oil — Improper engine oil.

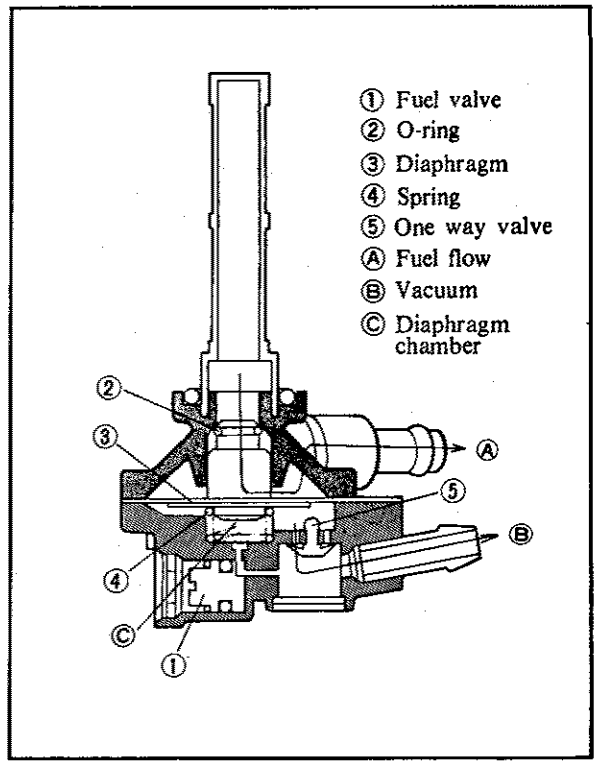
FUEL SYSTEM

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

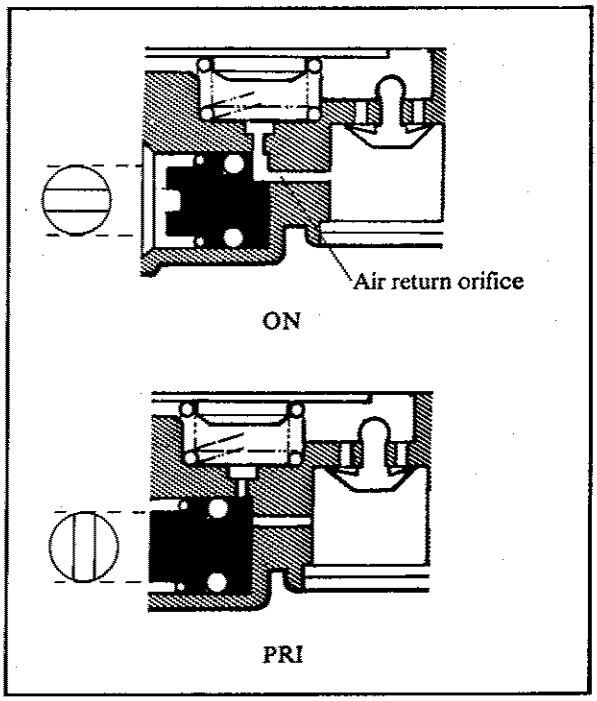




When the engine is not running with the valve in the ON position, the fuel valve is kept in the closed position by applying pressure utilizing a spring so that no fuel will flow to the carburetors. When the engine is engaged, a negative pressure is generated in the diaphragm chamber Ⓒ through the vacuum (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.

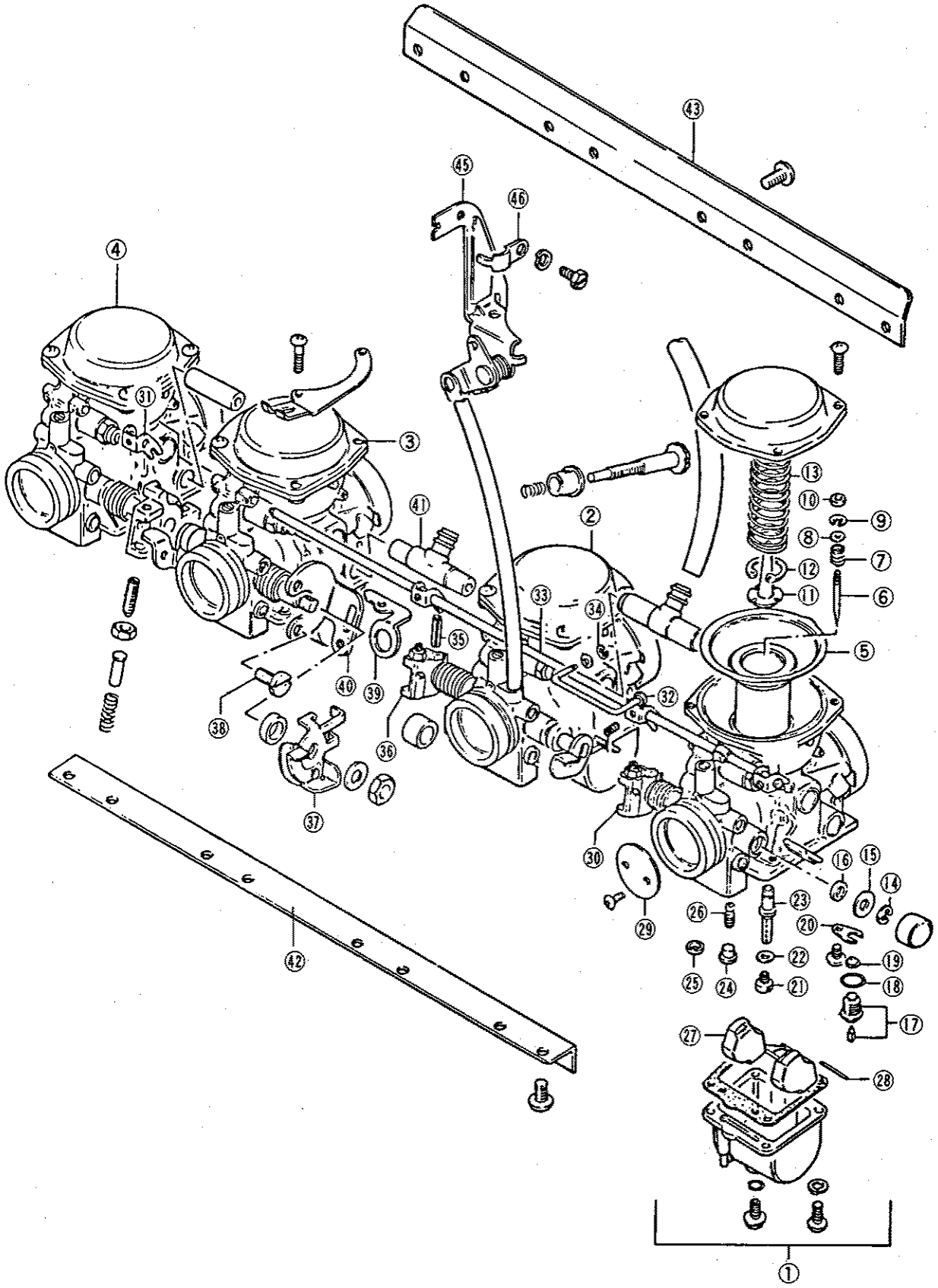
On the other hand, setting the valve in the ON position keeps the air return orifice open. Negative pressure does not accumulate on the diaphragm at the time of engine stopping, and then the spring pressure actuates the diaphragm to move back to its original position and closes the fuel valve.

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

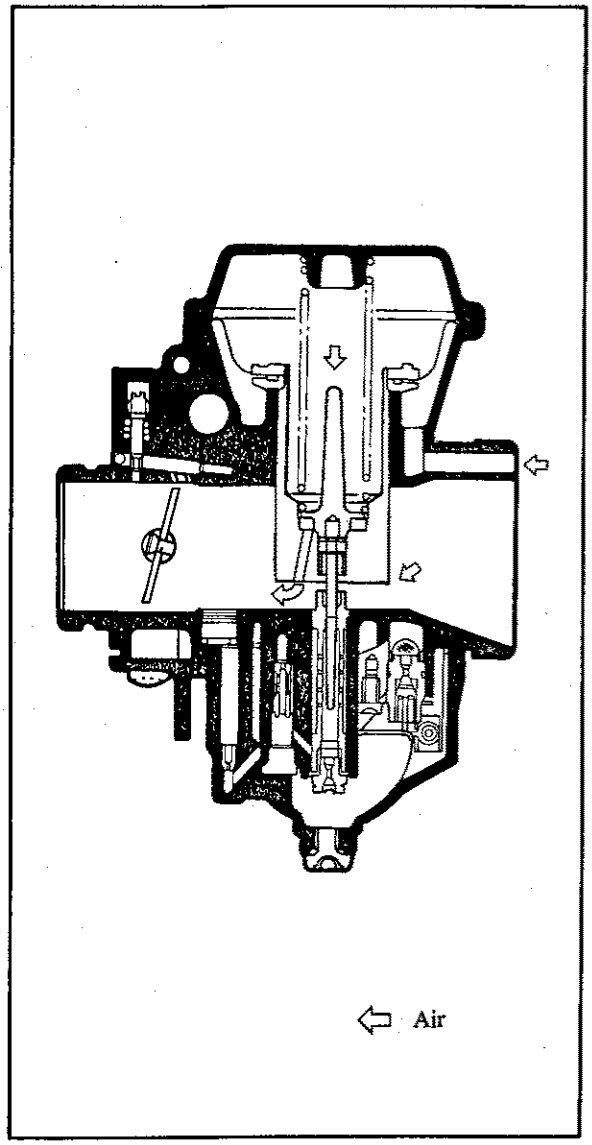
SPECIFICATIONS

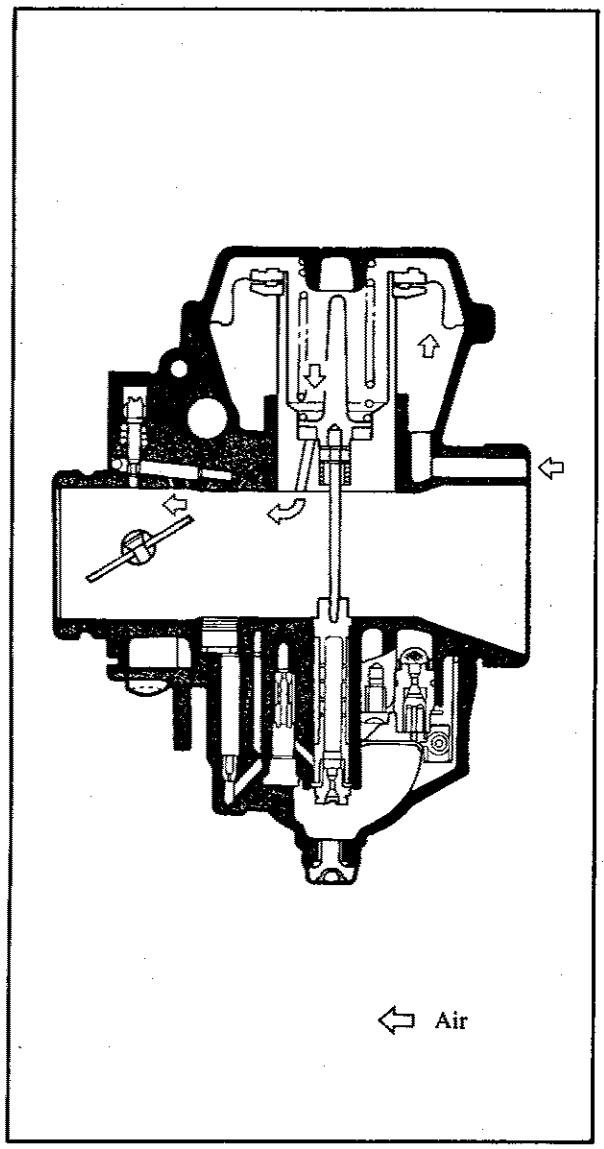
Item	Specification	Item	Specification
Type	MIKUNI BS34SS	Jet needle	5D50
Bore size	34 mm (1.34 in)	Needle jet	X-7
I.D. No.	49100	Pilot jet	#40
Idle r/min	1 050 ± 100 r/min	By pass	0.9, 0.8, 0.8
Fuel level	5.0 ± 0.5 mm (0.20 ± 0.02 in)	Pilot outlet	0.8
Float height	22.4 ± 1.0 mm (0.88 ± 0.04 in)	Valve 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.

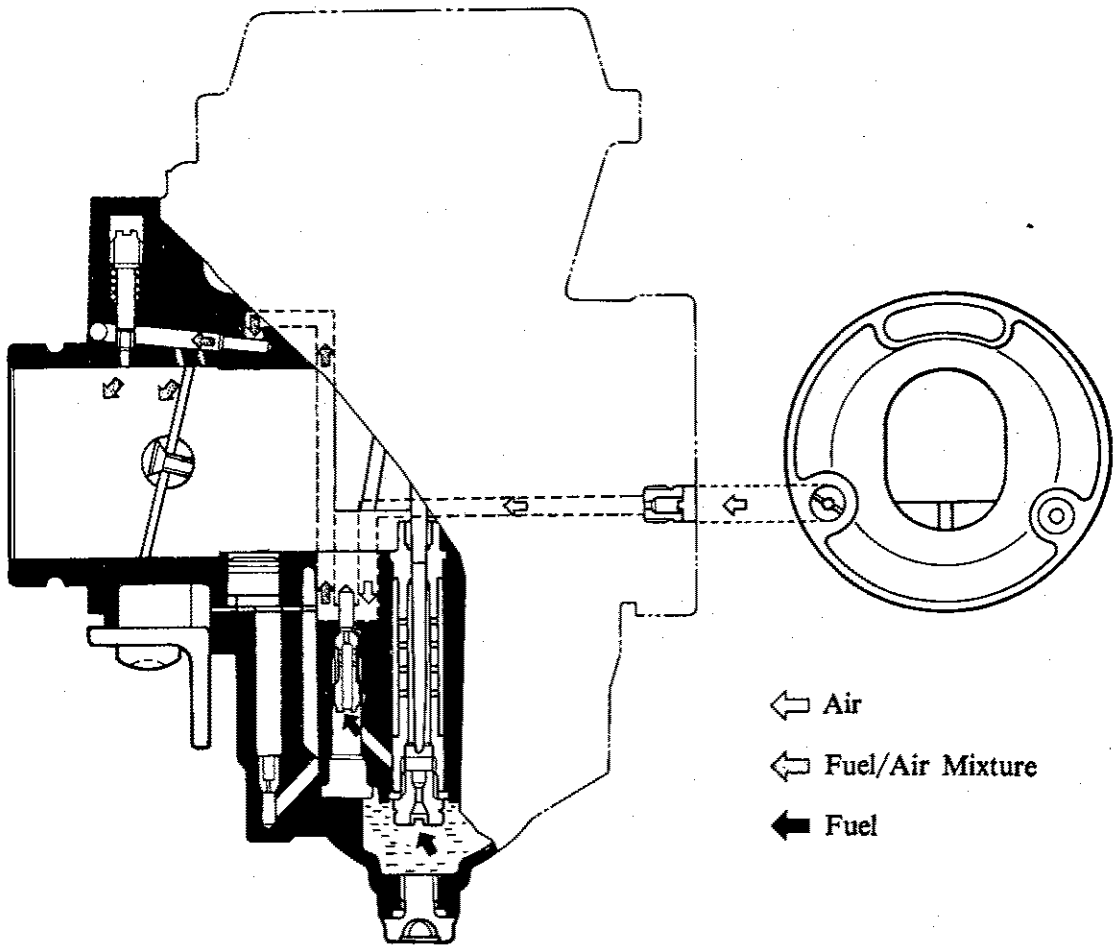
Rising vacuum overcomes the spring force, causing the piston to rise to increase the said area and thus prevent the air velocity from increasing. Thus, air velocity in the venturi passage is kept relatively constant for improved fuel atomization and for securing an optimum ratio of fuel to air in the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



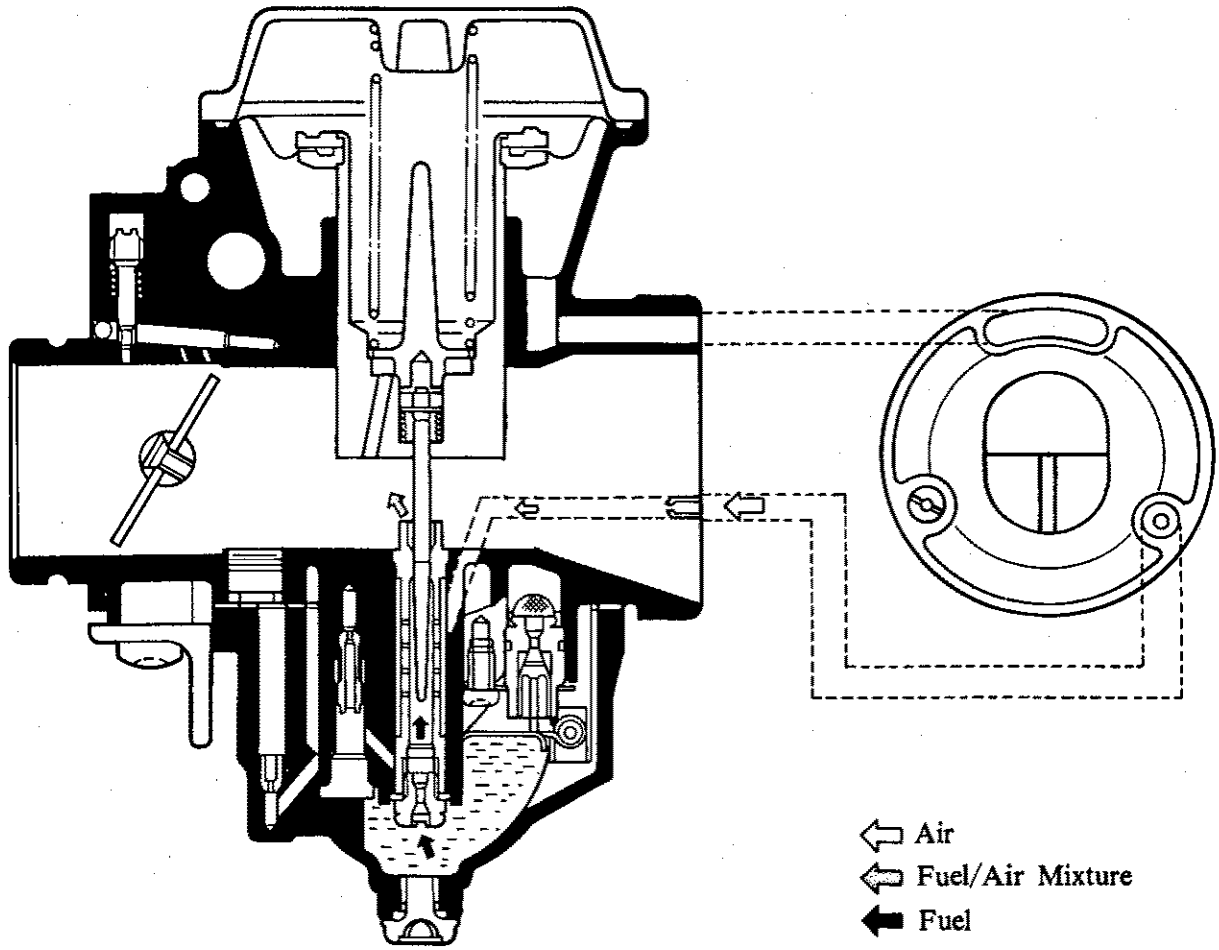
MAIN SYSTEM

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.

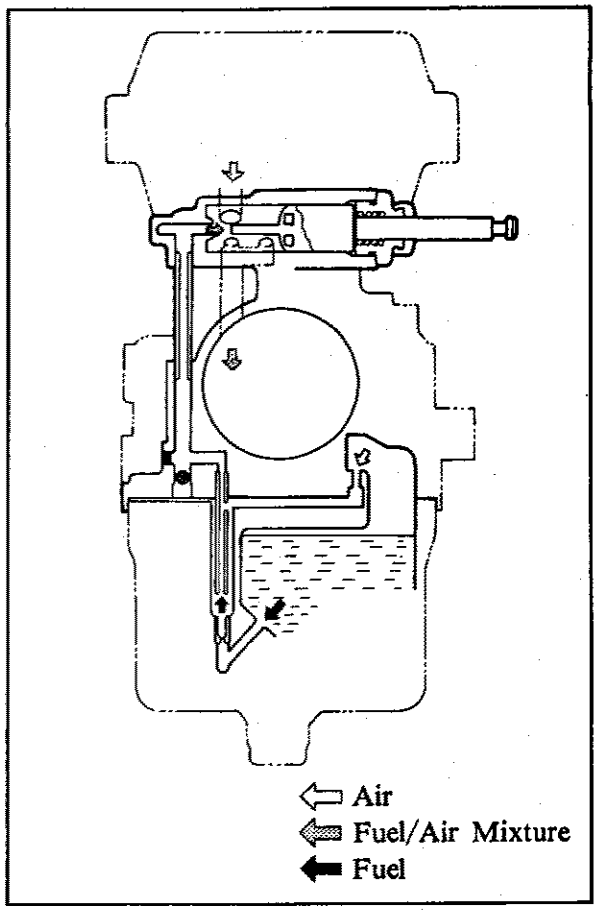
The emulsified fuel then passes through the clearance between needle jet and jet needle, and is discharged into the venturi, in which it meets main air stream being drawn by the engine.

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.



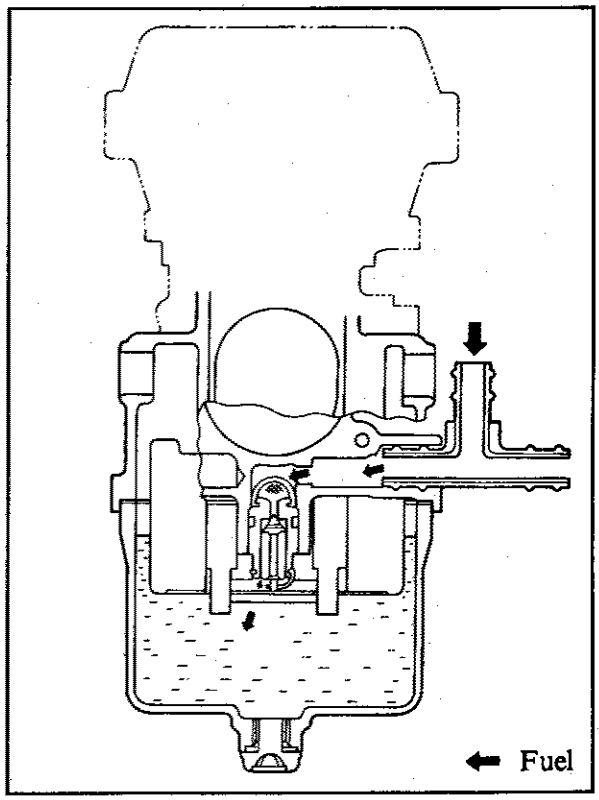
STARTER SYSTEM

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.



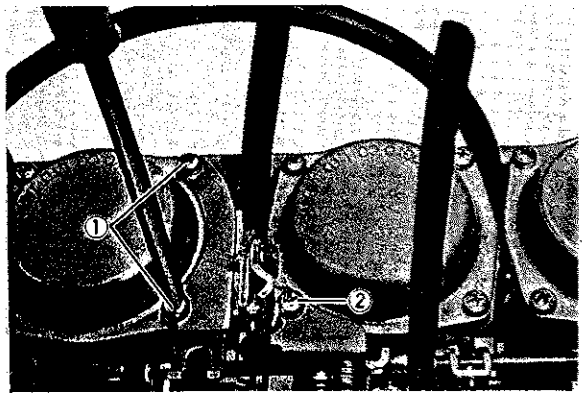
FLOAT SYSTEM

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.

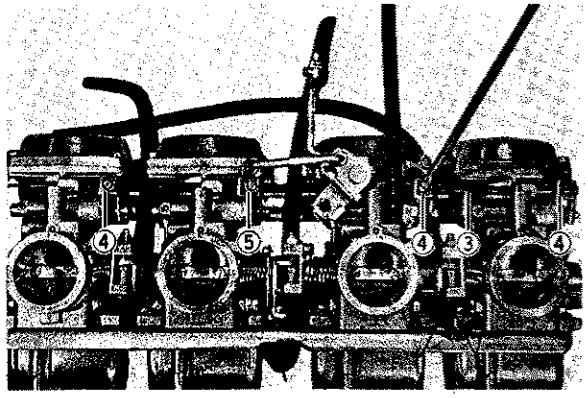


DISASSEMBLY

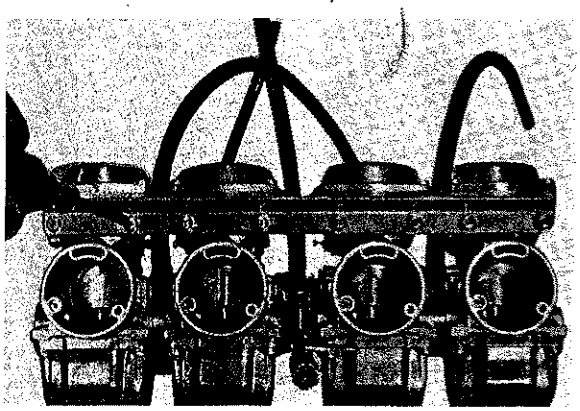
- Remove two throttle bracket screws ① and starter bracket screw ②, and remove brackets.



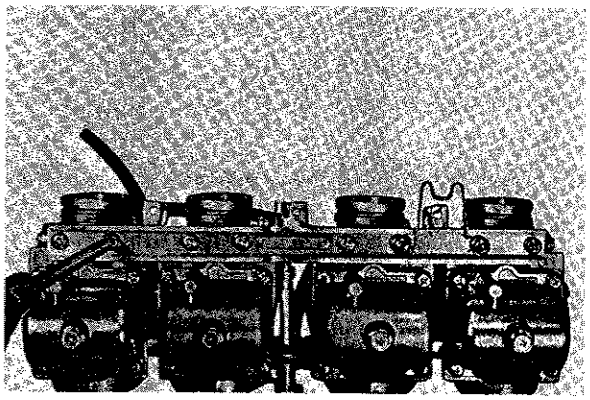
- Loosen four screws, and remove starter shaft ③, three levers ④ and starter bracket lever ⑤.



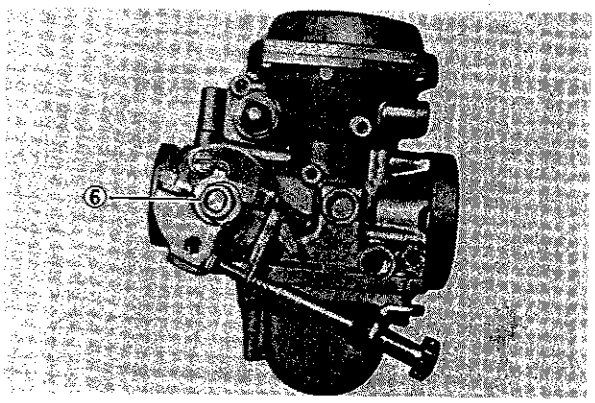
- Remove eight screws and remove the plate.



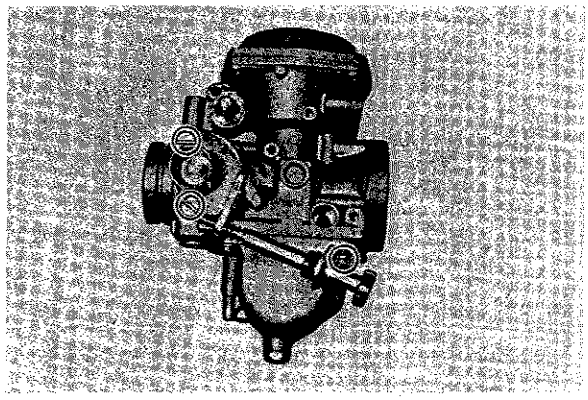
- Remove eight screws and remove the plate.



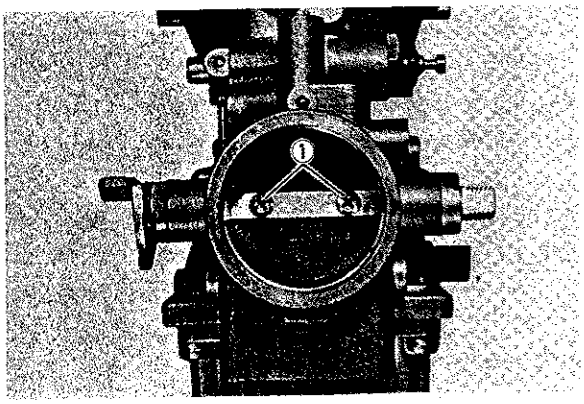
- Separate four carburetors, remove nut ⑥ and remove adjuster lever.



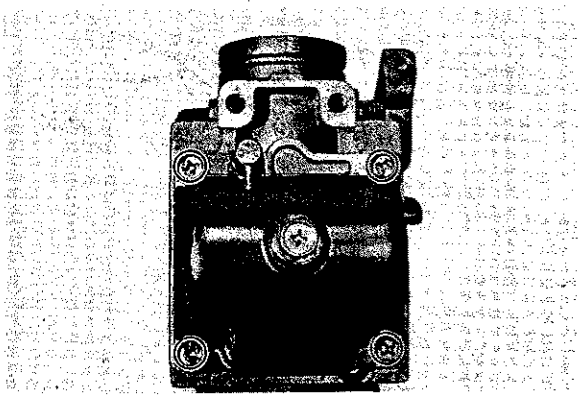
- Remove three screws, and remove adjuster bracket.



- Remove two throttle valve screws ① and pull out the throttle valve by turning throttle valve shaft.

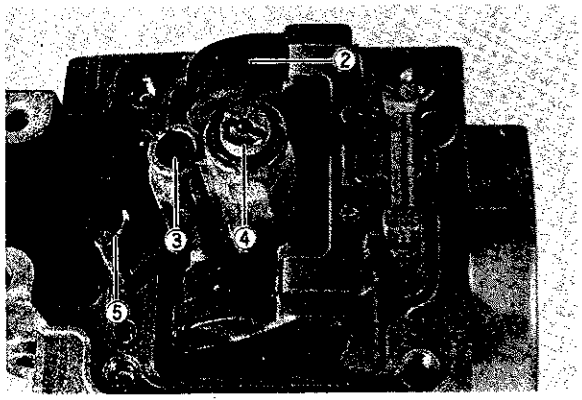


- Remove four screws and remove float chamber.

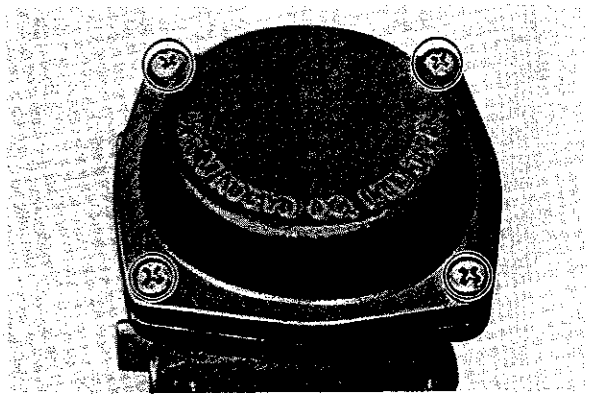


- Remove float ②, pilot jet ③ and main jet ④.

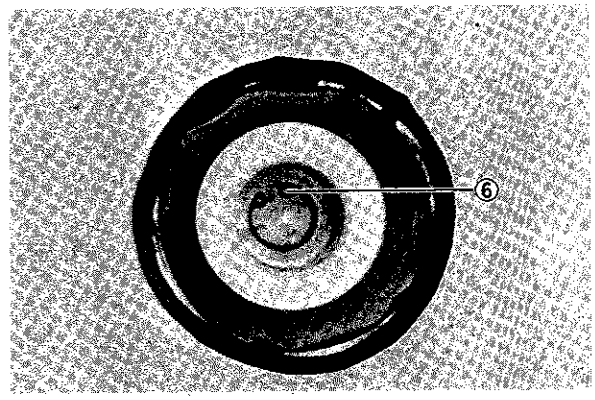
NOTE
Do not drop the O-ring ⑤.



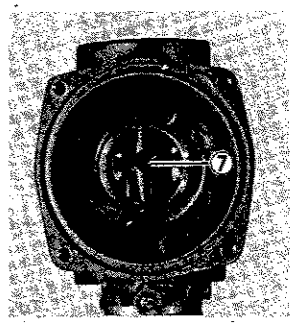
- Remove four screws and remove carburetor cap.

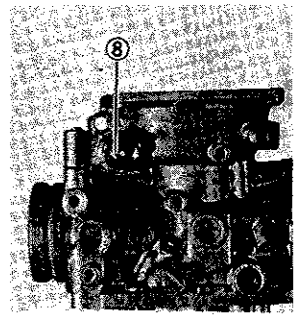


- Remove circlip ⑥ from piston.



- Remove needle jet ⑦ from the top side.
- Remove starter valve housing ⑧.



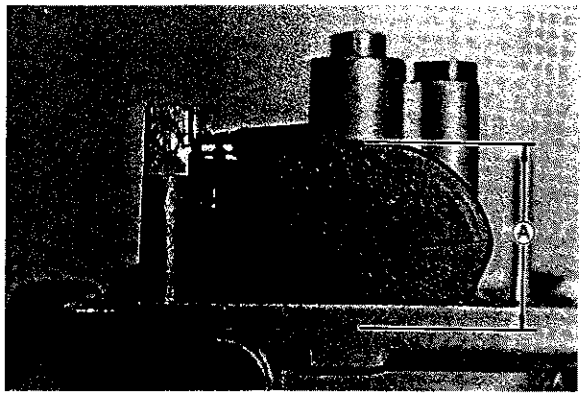


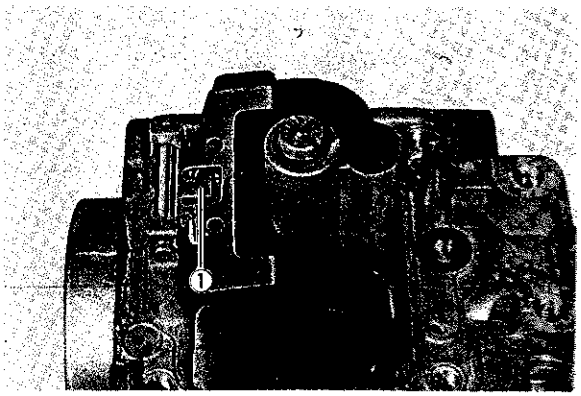
INSPECTION

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)



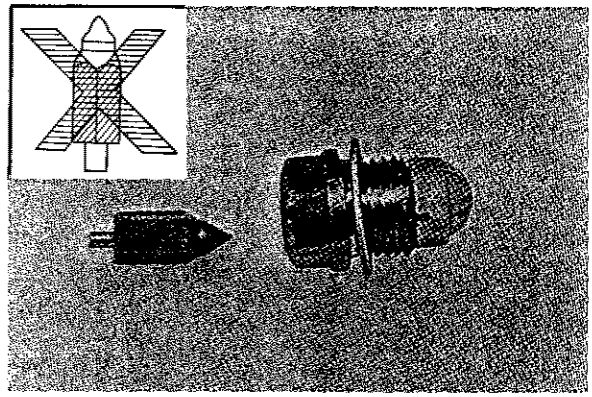


NOTE
Be sure to remove the gasket before measuring the height.

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.

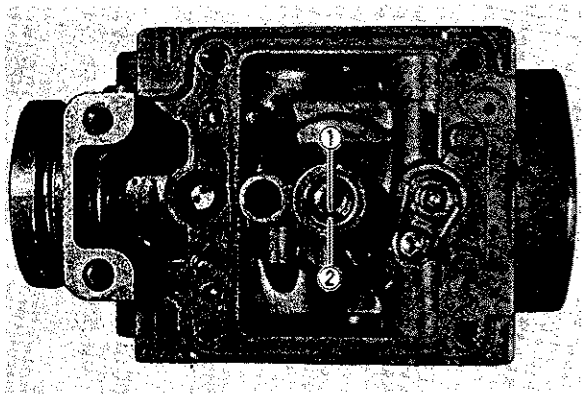


- Check following items for any damage or clogging.

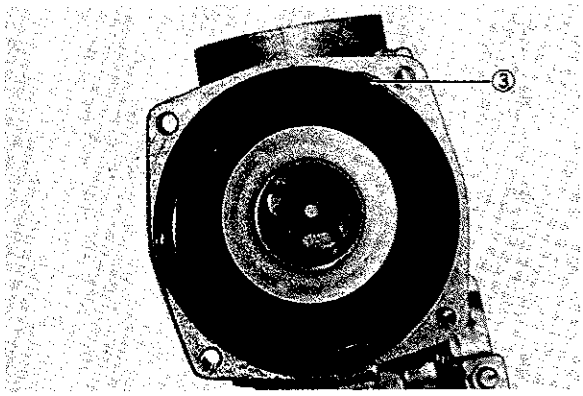
* Pilot jet
* Main jet
* Main air jet
* Pilot air jet
* Needle jet air bleeding hole and O-ring
* Float
* Needle valve mesh
* Diaphragm
* Gasket
* Throttle valve shaft oil seals
* Drain plug O-ring
* Pilot outlet and bypass holes

REASSEMBLY

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



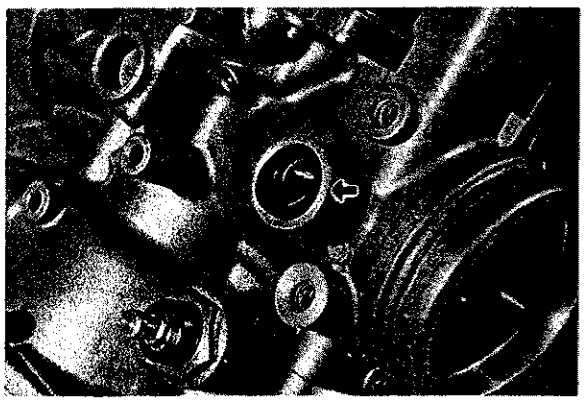
- Place tongue ③ of diaphragm to carburetor body properly.



- Secure carburetor cap and float chamber with screws.

Tightening torque	0.25 – 0.45 kg-m (1.8 – 3.0 lb-ft)

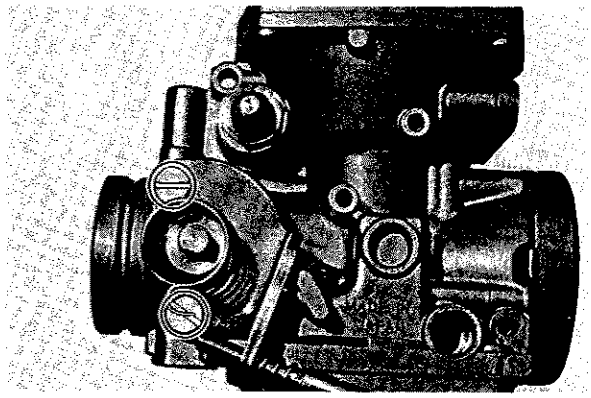
- When fitting throttle valve shaft oil seals, groove should be faced outside.



- 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

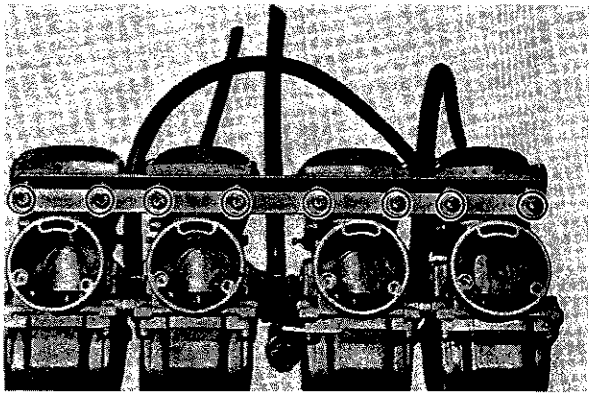
Tightening torque	0.25 – 0.45 kg-m (1.8 – 3.0 lb-ft)



- Secure adjuster lever with nut.

- Connect the carburetors correctly, and secure top of each carburetor to the plate with screws.

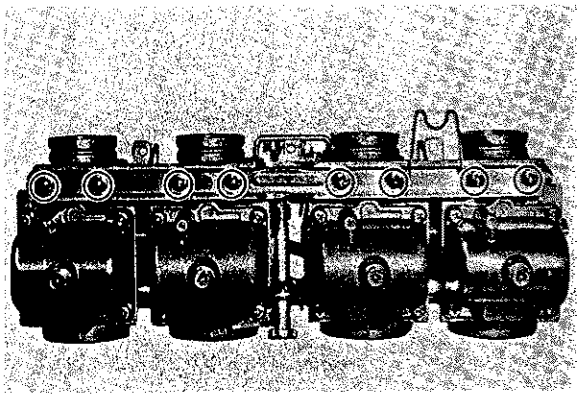
Tightening torque	0.25 – 0.45 kg-m (1.8 – 3.0 lb-ft)



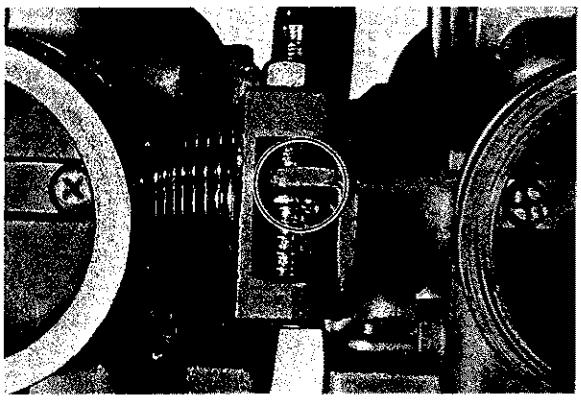
- Secure bottom of each carburetors to the plate with screws. Before tightening the screws, coat it with THREAD LOCK CEMENT.

Thread lock cement	99000-32040

Tightening torque	0.4 — 0.6 kg-m (3.0 — 4.5 lb-ft)

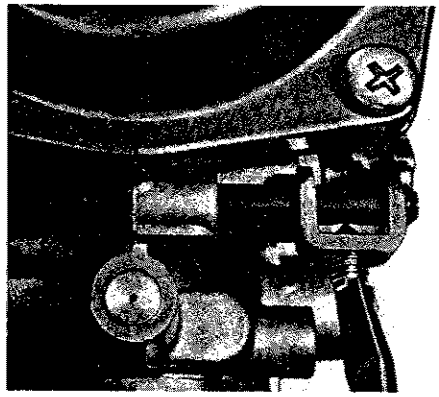


CAUTION:
Make sure the throttle shaft lever is installed as shown in photo.



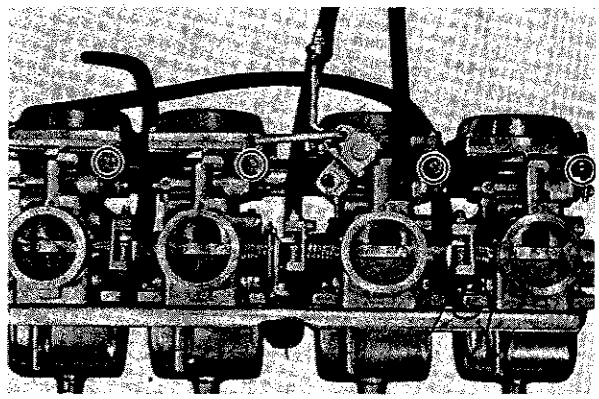
- Pass starter shaft through carburetors and starter levers, and secure starter lever with screws.
  Before tightening the screws, coat it with THREAD LOCK CEMENT.

CAUTION:
Align the end of screw with recess in starter shaft.



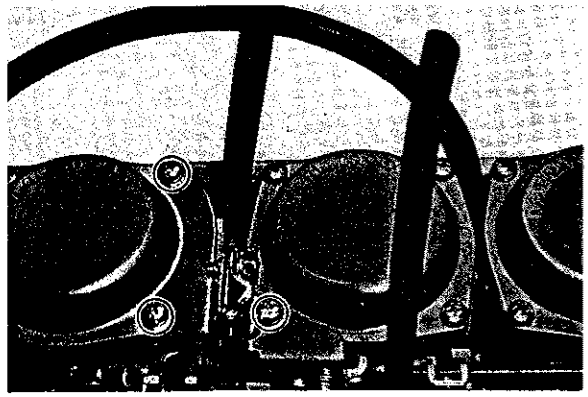
Thread lock cement	99000-32040

Tightening torque	0.06 — 0.10 kg-m (0.4 — 0.7 lb-ft)

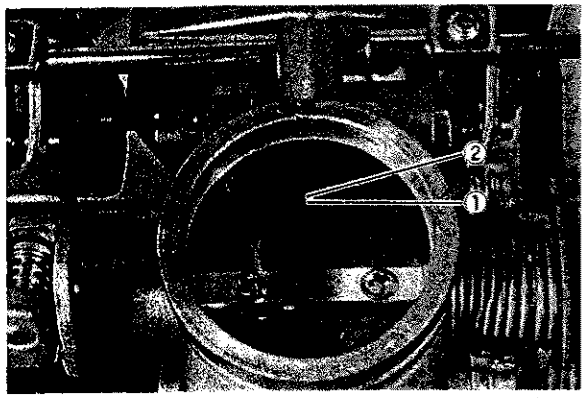


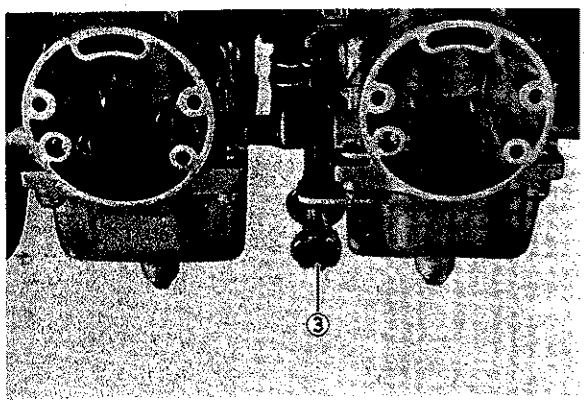
- Secure throttle bracket to No. 3 carburetor, and secure starter bracket to No. 2 carburetor cap, using screws.

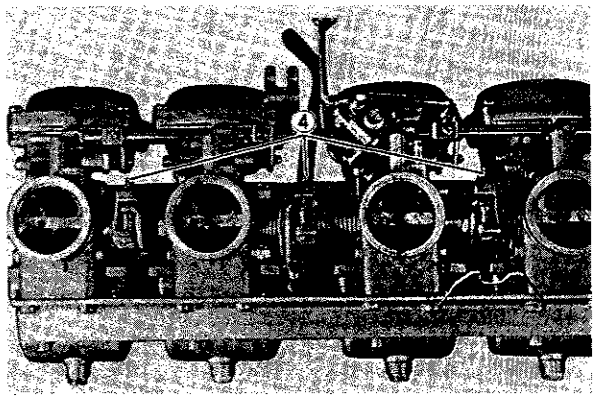
Tightening torque	0.25 — 0.45 kg-m (1.8 — 3.0 lb-ft)



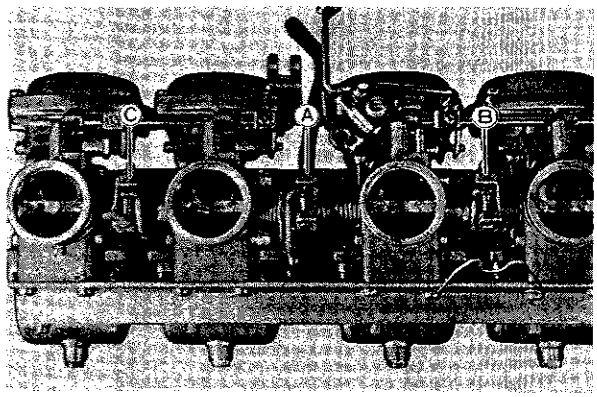
- Set each throttle valve in such a way that its top end ① meets the foremost bypass ②. This is accomplished by turning throttle valve stop screw ③ and balance screw ④.







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

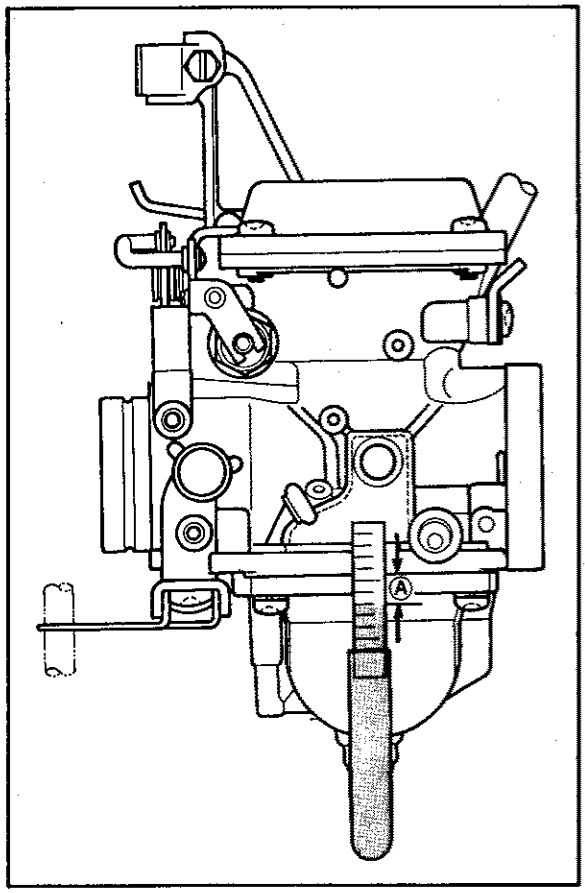
To check the fuel level, proceed as follows:

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.

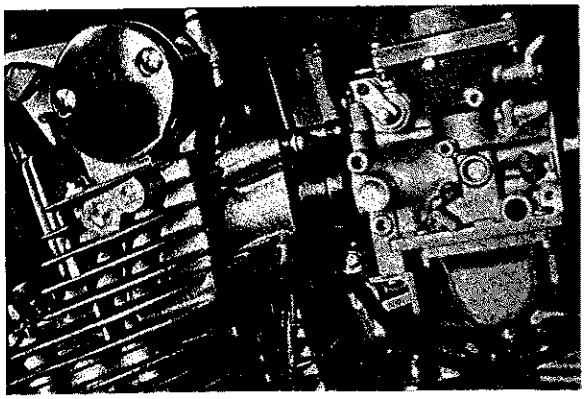
Fuel level adjustment

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

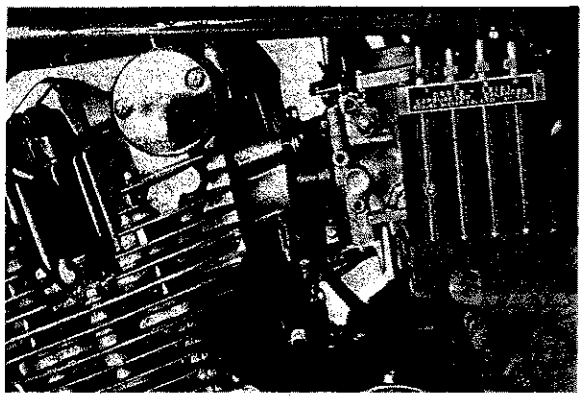
When any carburetor has been disassembled or replaced, check that the negative pressures (vacuum) in four carburetors are well balanced, using the carburetor balancer set in the following manner.

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.

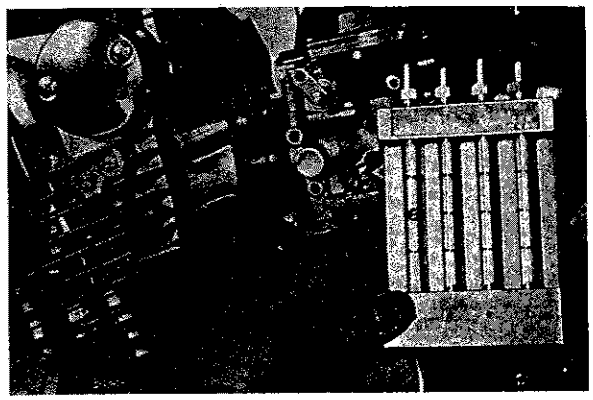


3. Tie one of the four carburetor balancer hoses to the adapter.
4. Start up the engine, and keep it running steadily at 1 500 — 2 000 r/min.

Carburetor balancer set	09913-13121

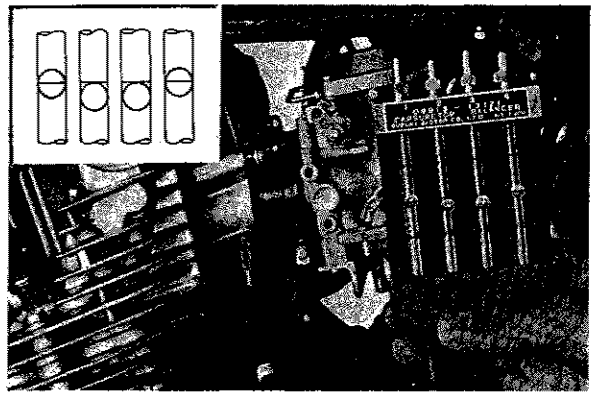


5. Turn the air screw of the gauge so that the vacuum acting on the tube of that hose will bring the steel ball in the tube to the center.



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.

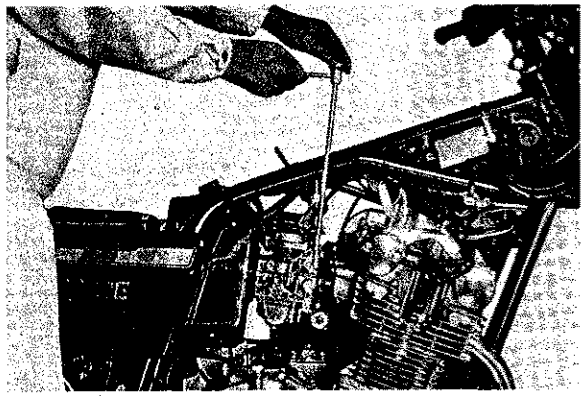
NOTE:
Nos. 2 and 3 must be adjusted with the balls 1/2 their diameters lower for proper idling stability.



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.

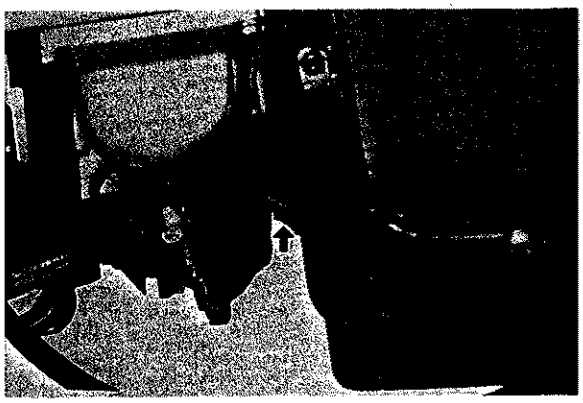
09913-14910	Throttle valve adjusting wrench



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.

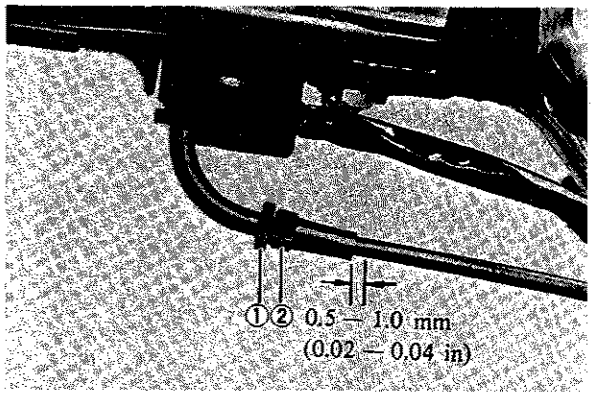


CAUTION:
This check should be done as quick as possible. If adjustment requires a longer time, it is advisable to cool the engine by sending air to prevent engine overheating.

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:

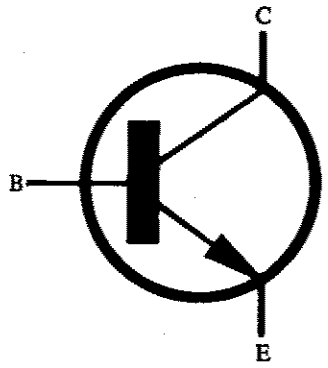
* No engine trouble due to contamination on contact breaker points
* No deviation of the ignition timing with the lapse of time and, therefore, no need of maintenance
* No arcing as with the contact breaker points and, therefore, constant voltage obtainable on the secondary side of the ignition coil
* 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

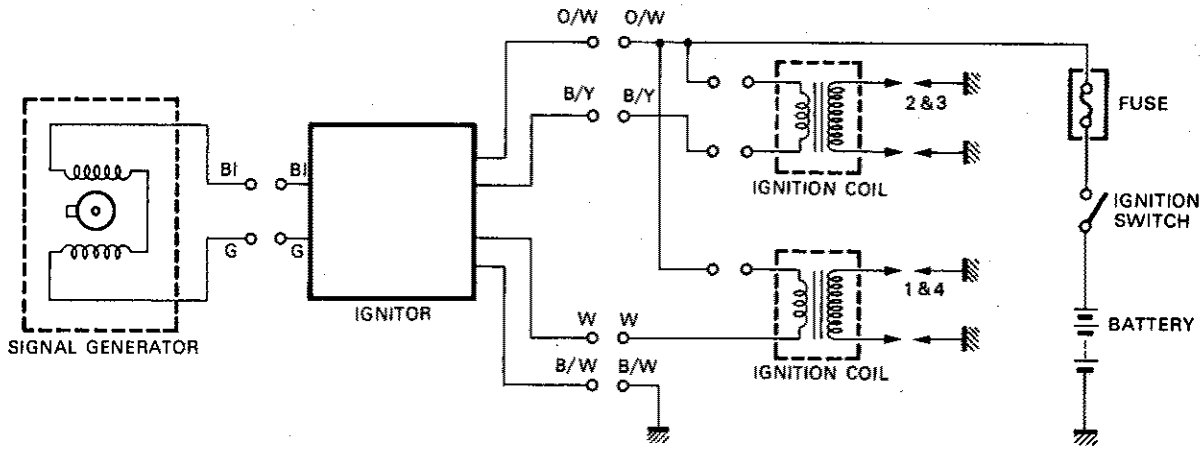
Each transistor has three terminals identified as the Base (B), Collector (C), and Emitter (E), and operation is as follows:
On a NPN type the base is the controling terminal of the transistor operation. On this type, the base utilizes only a positive or incoming signal to do the "ON", or "OFF" switching. 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.

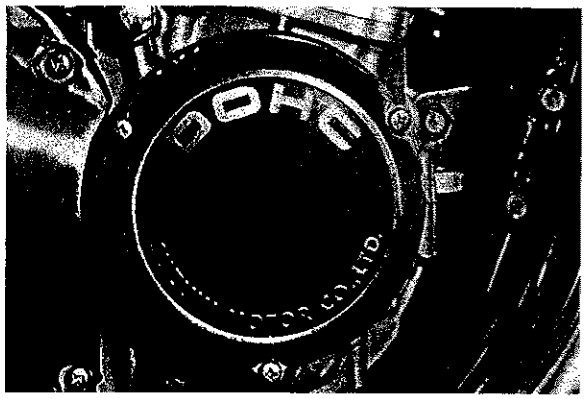
As the rotor tip is turned past the coils, AC current is produced and used for switching within the transistor unit.

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

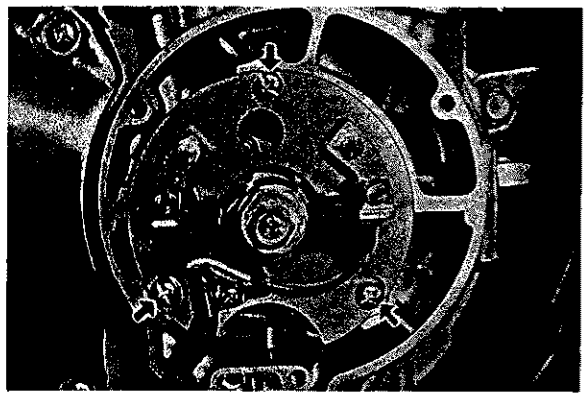


REMOVAL

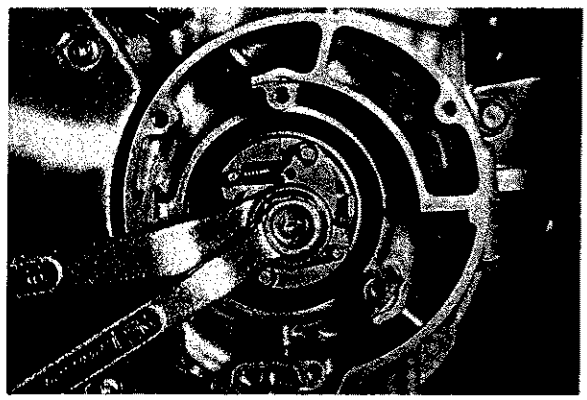
- Remove signal generator cover.



- Remove three screws and then remove the signal generator assembly and timing plate.

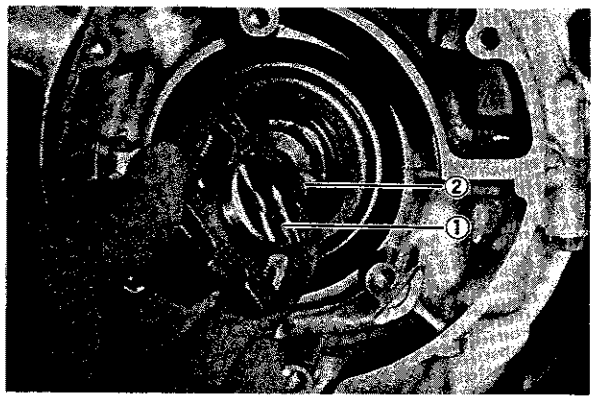


- Apply wrench to crank turning nut to remove automatic advance governor mounting bolts and the crank turning nut.
  Remove signal generator rotor and advance governor.

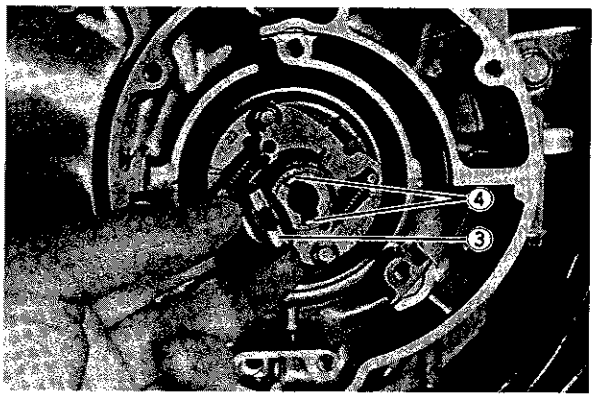


REASSEMBLY

- 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.

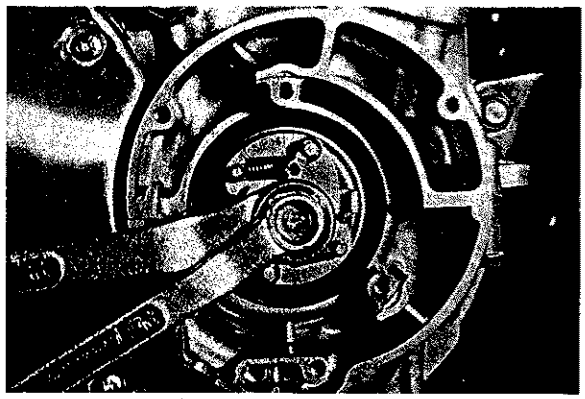


- Fit the groove ③ of the crankshaft turning nut on protrusion ④ of the advance governor body.

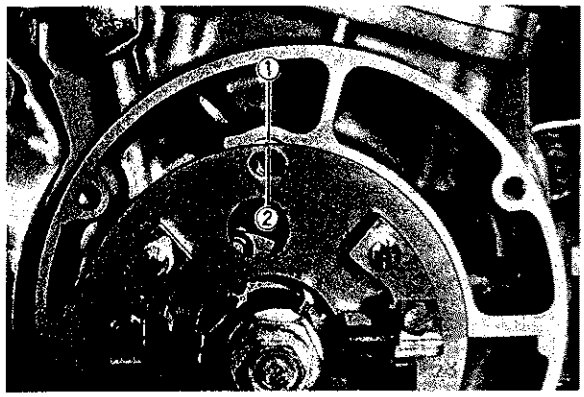


- Hold the crankshaft turning nut and tighten the governor center bolt with specified torque.

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

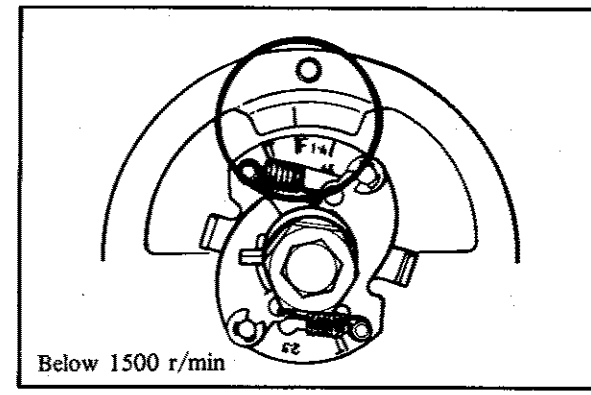
Check the performance of the timing mechanism using the timing light. Illuminate the advance governor with the timing light and vary the engine speed to see if the ignition timing advances properly.

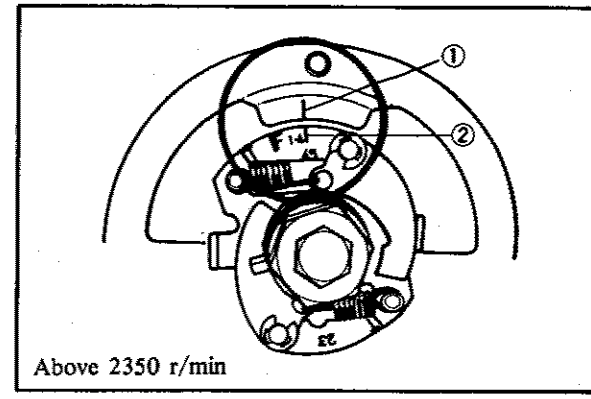
Ignition timing specifications

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.



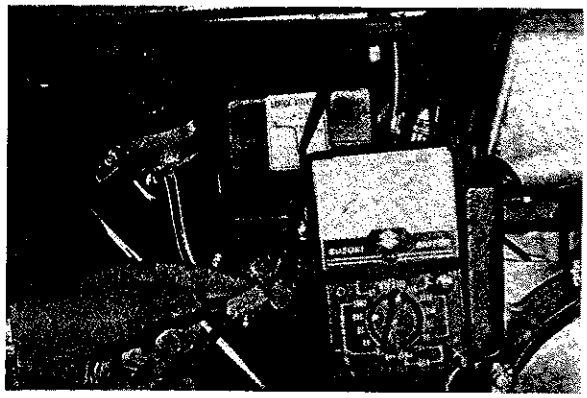


SIGNAL GENERATOR RESISTANCE

Measure the resistance between lead wires.
If the resistance noted to show infinity or too low a resistance value must be replaced.

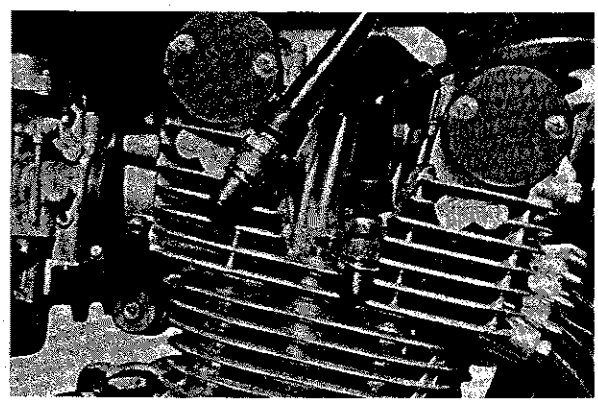
09900-25002	Pocket tester

STD resistance	
BI — G	290 — 360Ω



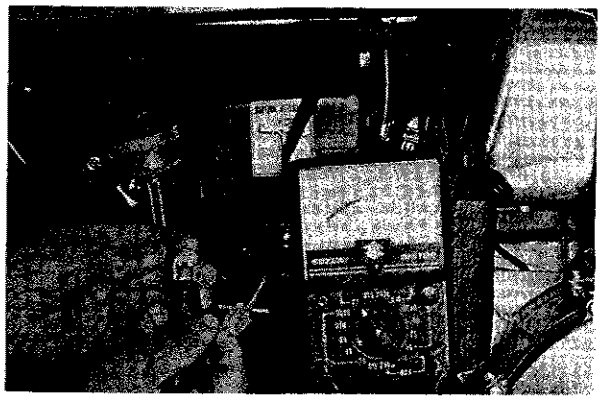
IGNITER

Remove each spark plug of Nos. 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.

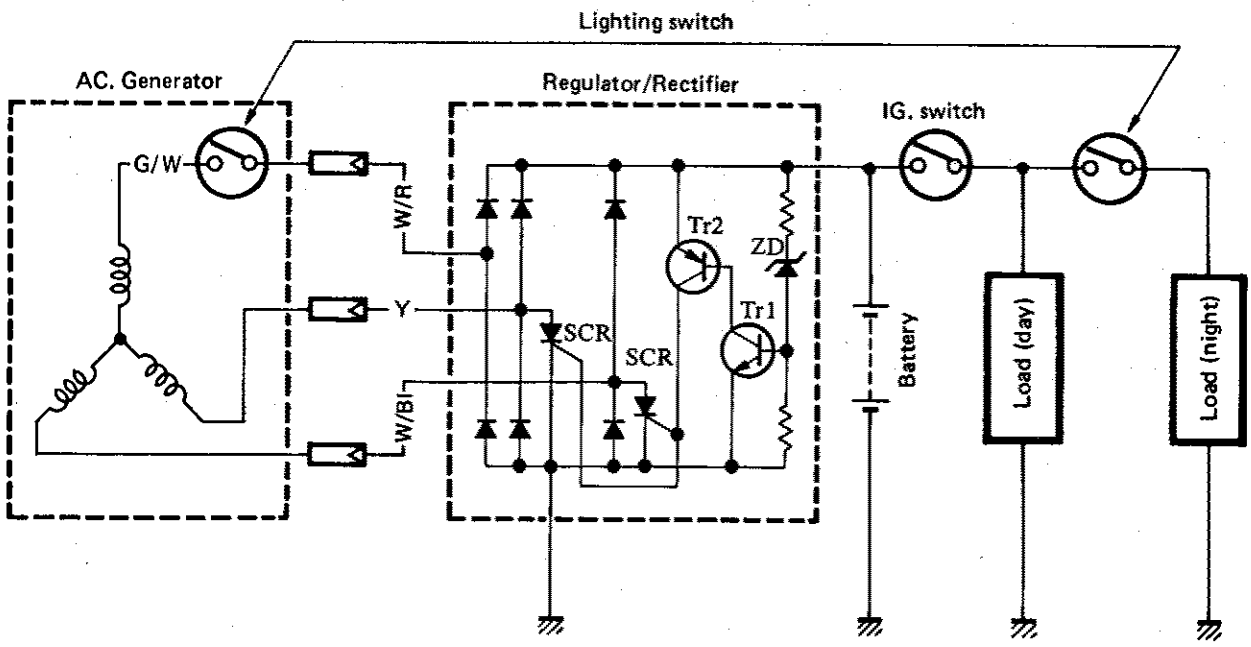


CHARGING SYSTEM

DESCRIPTION

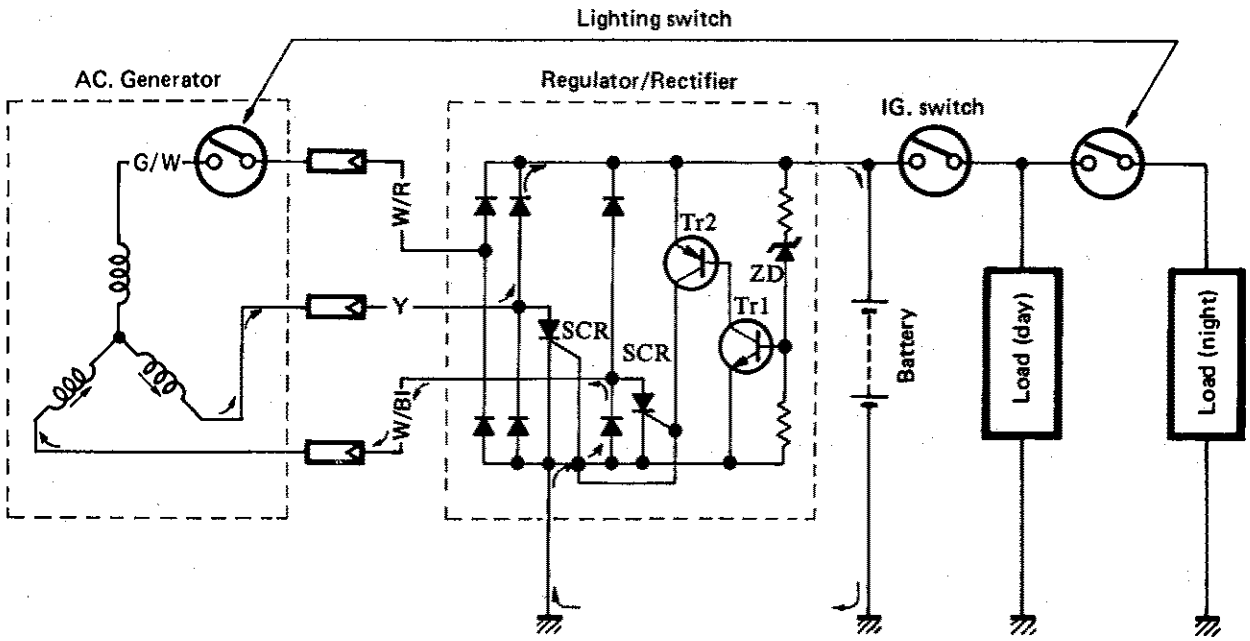
The circuit of the charging system is indicated in figure, which is composed of an AC generator, regulator/rectifier unit and battery.

The AC current generated from AC generator is rectified by rectifier and is turned into DC current, then it charges the battery.

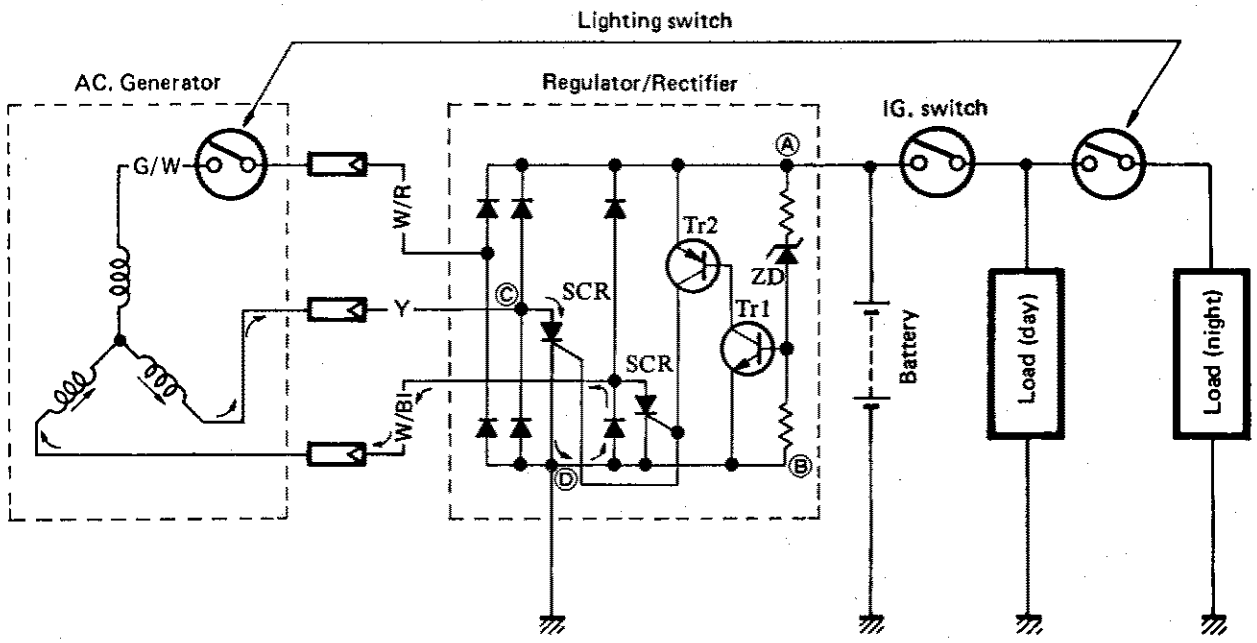


Function of Regulator

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

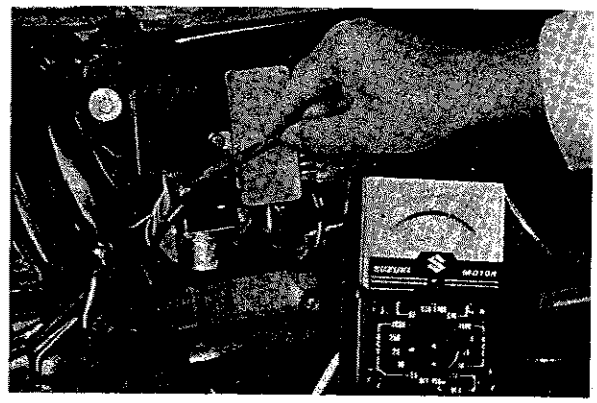
Charging Output Check

- 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.

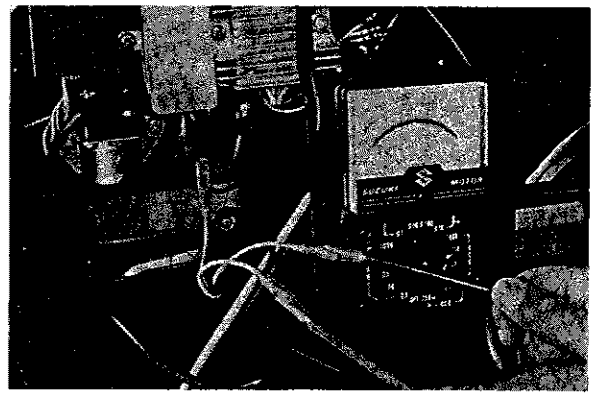
NOTE:
When making this test, be sure that the battery is in a fully-charged condition.

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

09900-25002	Pocket tester



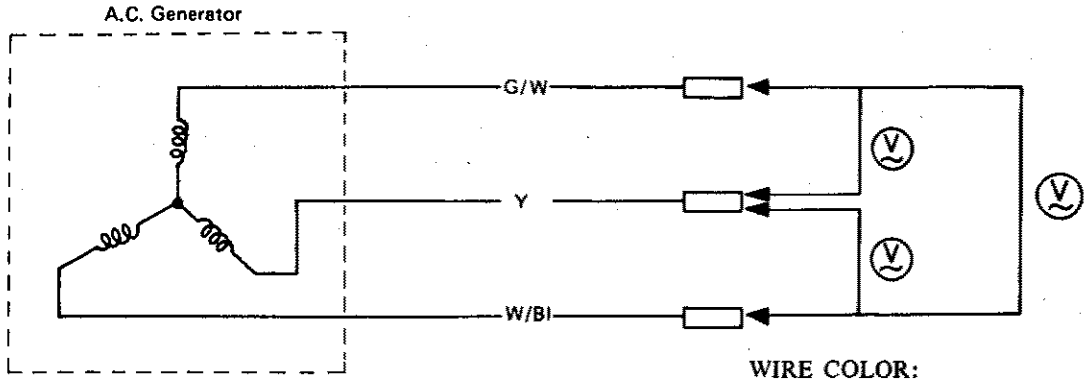
09900-25002	Pocket tester



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



WIRE COLOR:

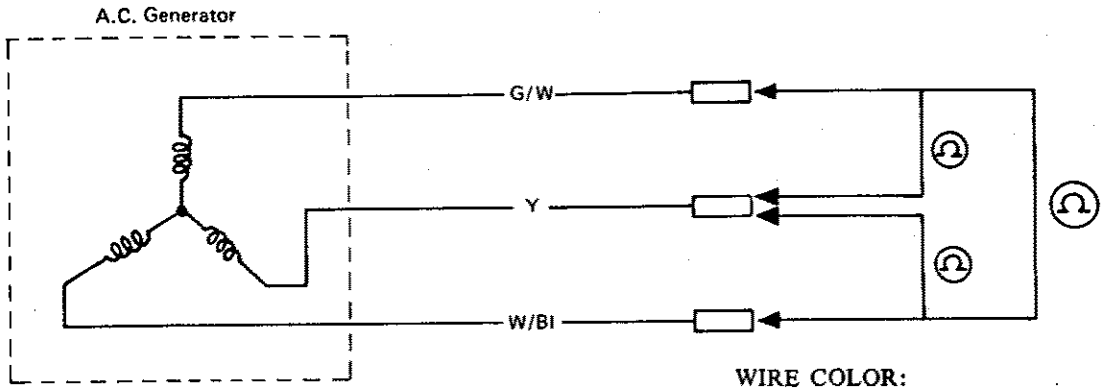
Y ..... Yellow
W/Bl..... White with Blue tracer
G/W ..... Green with White tracer

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

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

09900-25002	Pocket tester

Specification	Approx. 1Ω



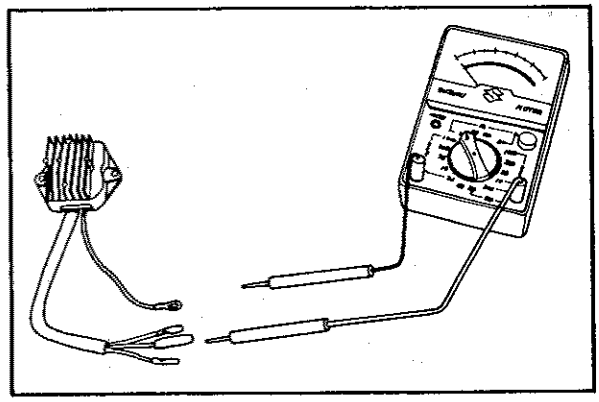
WIRE COLOR:

Y ..... Yellow
W/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.

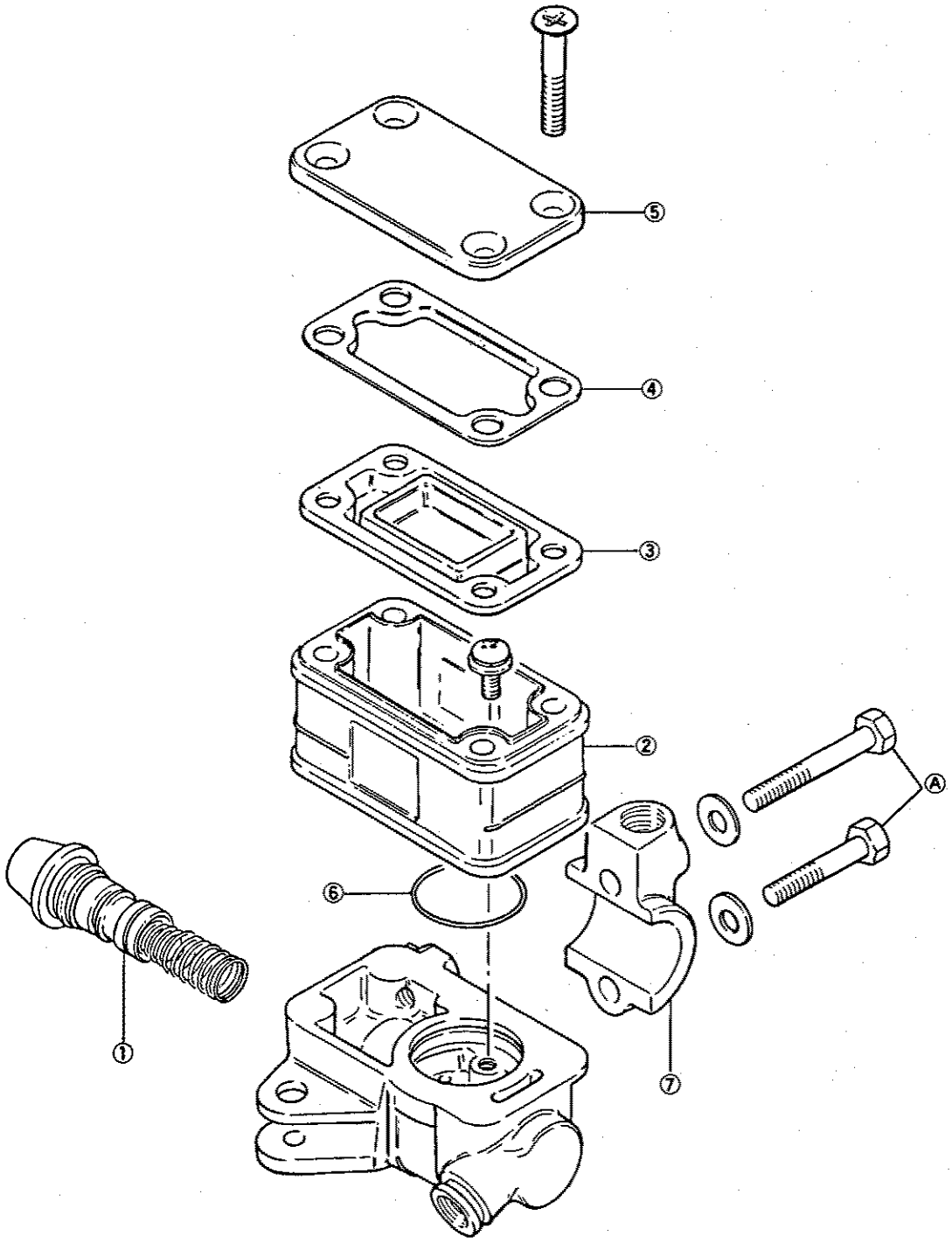
09900-25002	Pocket tester



Unit: Approx. Ω

⊖ Probe of tester to	⊕ Probe of tester to					
		R	W/BI	W/R	Y	B/W
R			∞	∞	∞	∞
W/BI		5 – 7		∞	∞	∞
W/R		5 – 7	∞		∞	∞
Y		5 – 7	∞	∞		∞
B/W		35 – 45	5 – 7	5 – 7	5 – 7	

FRONT MASTER CYLINDER

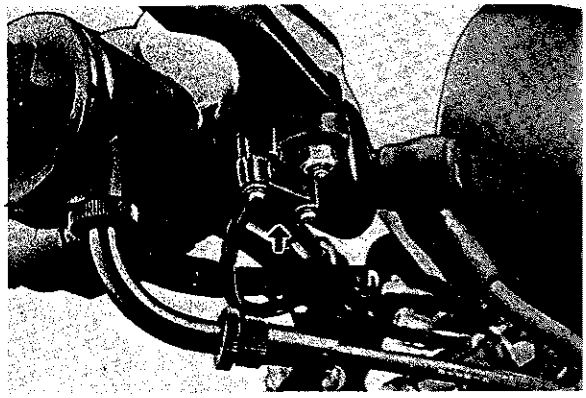


1. Piston and cup set
2. Reservoir
3. Diaphragm
4. Plate
5. Cap
6. O-ring
7. Holder

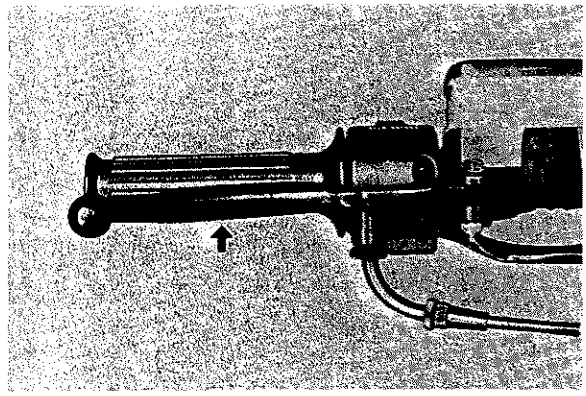
Tightening torque		
	kg-m	lb-ft
Ⓐ	0.5 – 0.8	3.5 – 6.0

MASTER CYLINDER REMOVAL AND DISASSEMBLY

- Take off front brake light switch.

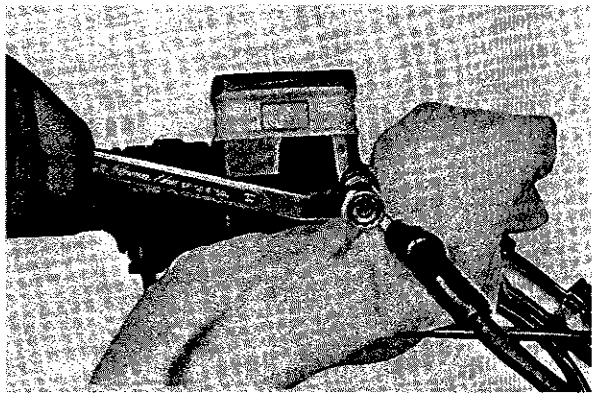


- Remove front brake lever.

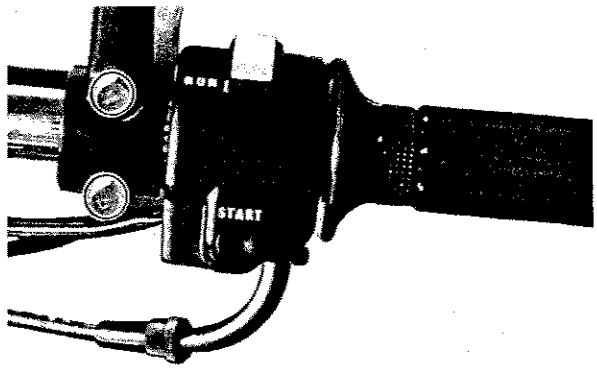


- Place a rag underneath the union bolt on the master cylinder to catch spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose/master cylinder joint.

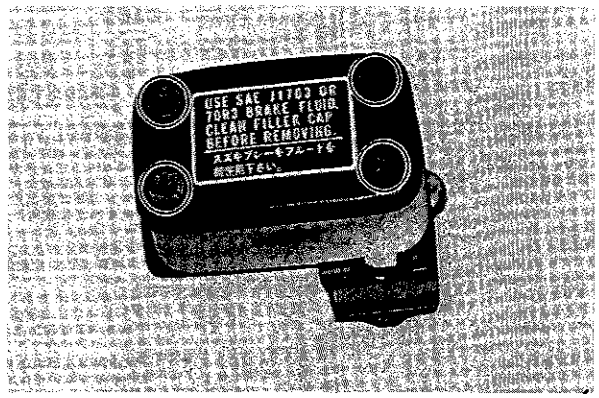
CAUTION:
Immediately and completely wipe off any brake fluid adhering to any part of motorcycle. The fluid reacts chemically with paints, plastics, rubber materials, etc.



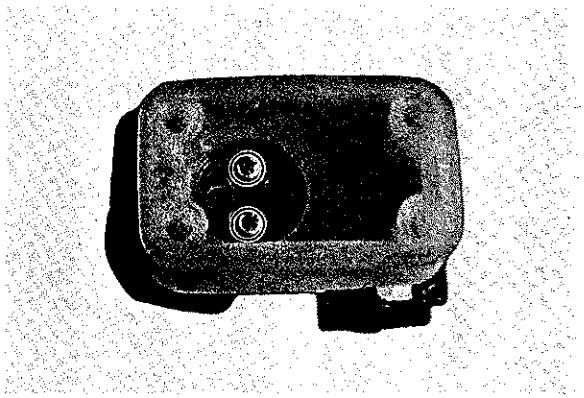
- Remove master cylinder ass'y after removing two fitting bolts.



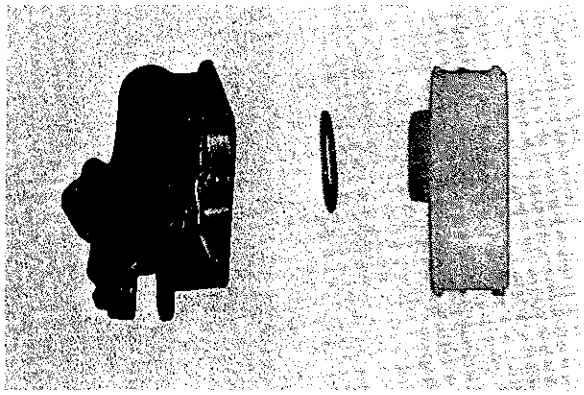
- Remove fillter cap and drain brake fluid.



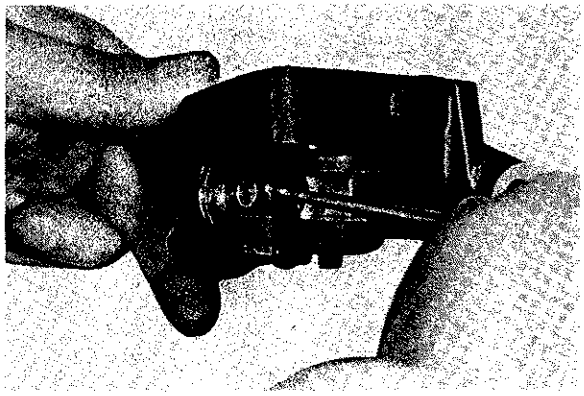
• Remove the two screws.



• Pull out the reservoir and O-ring.

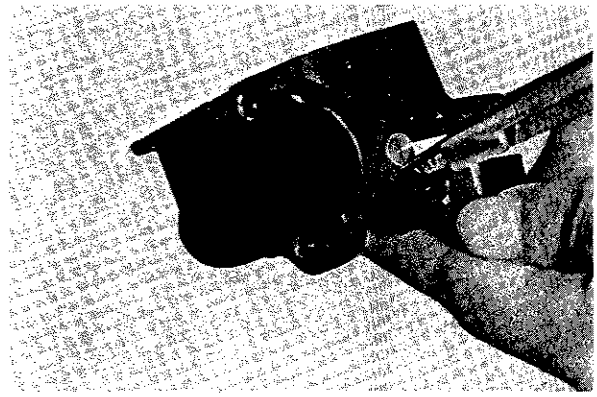


• Draw out dust seal boot.

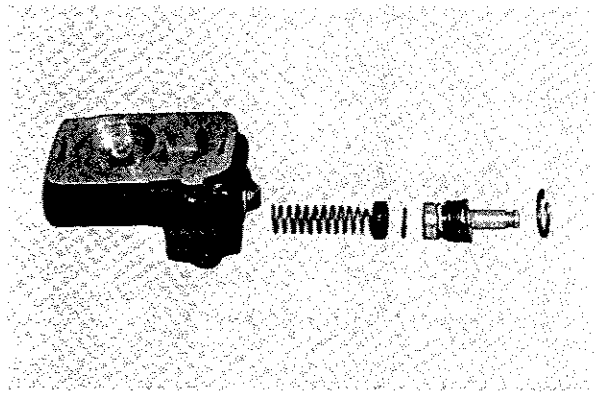


• Remove circlip by using special tool.

09900-06108	Snap ring pliers

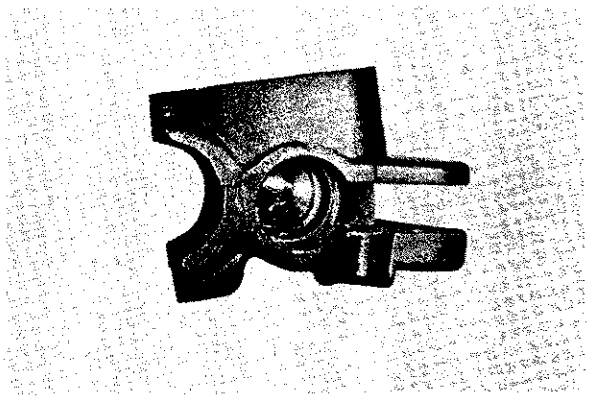


• Pull out piston, primary cup and spring.

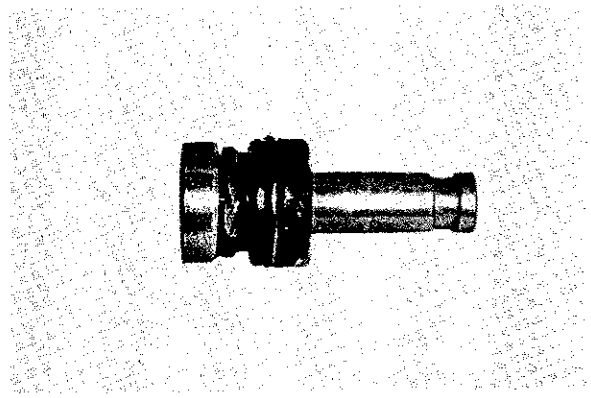


MASTER CYLINDER INSPECTION

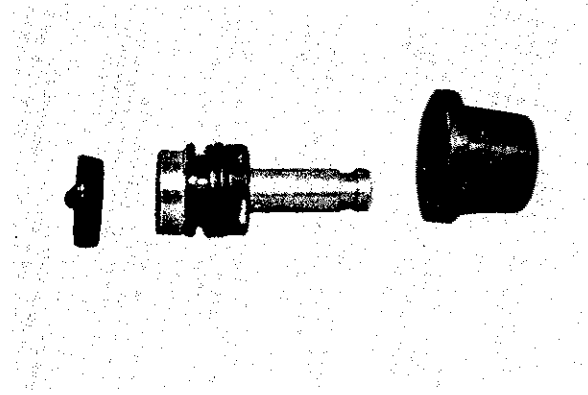
- Inspect the cylinder bore wall for any scratch or other damage.



- Inspect the piston surface for scratch or other damage.



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

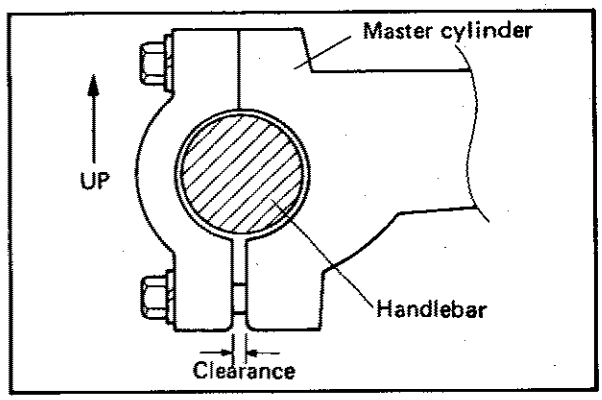


MASTER CYLINDER REASSEMBLY

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

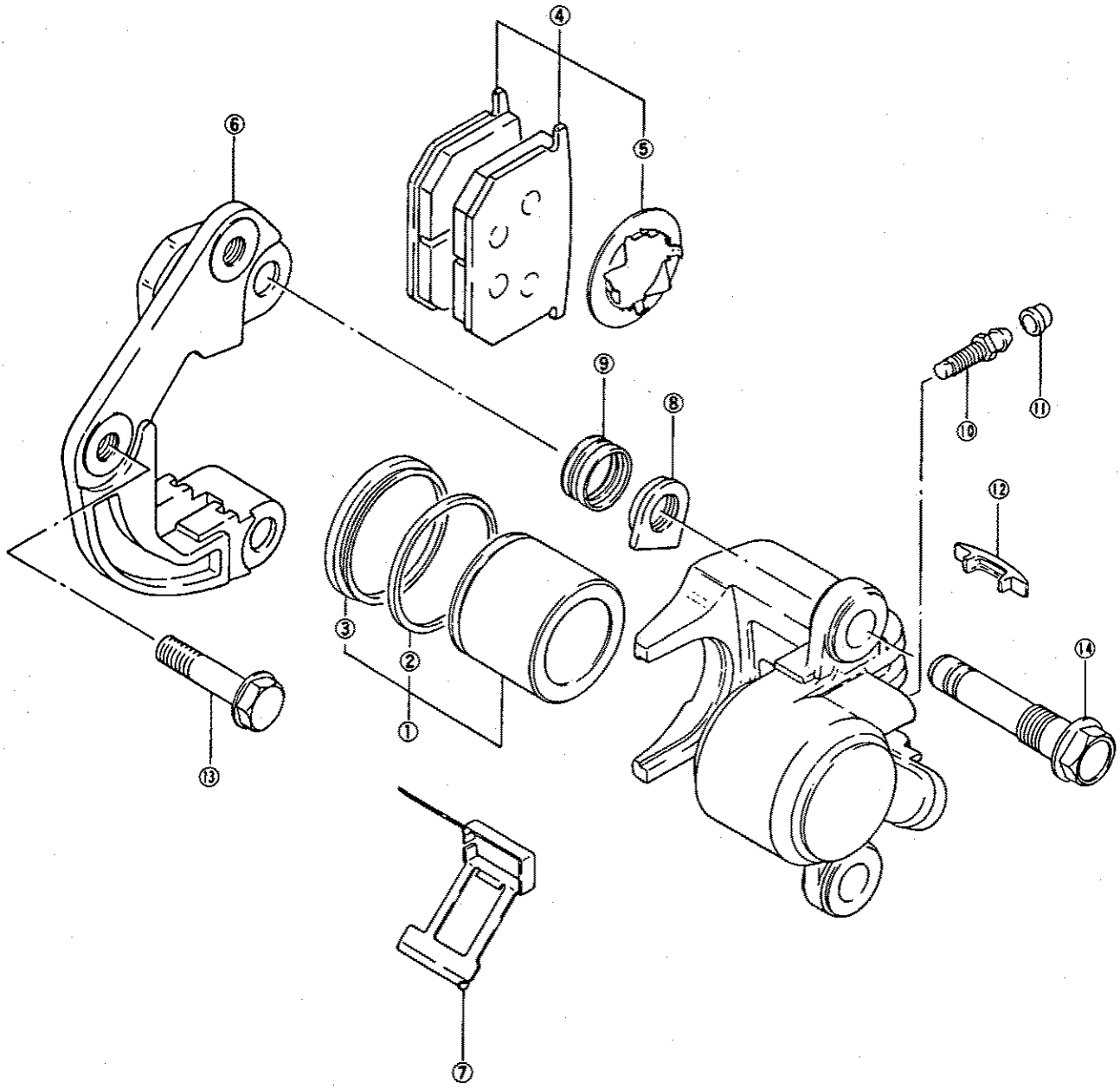
CAUTION:
Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.
Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.

- 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



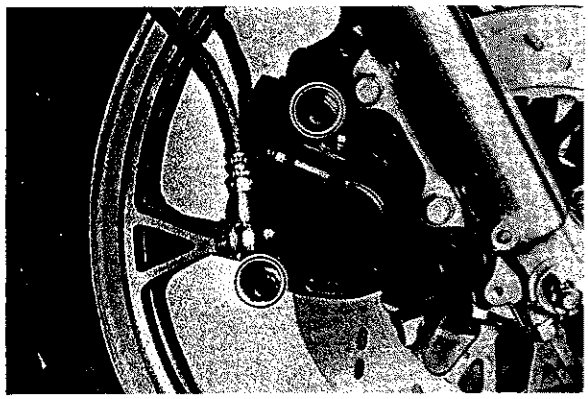
1. Piston set
2. Piston seal
3. Piston boot
4. Pad set
5. Pad shim
6. Caliper holder
7. Spring
8. Nut
9. Boot
10. Bleeder
11. Bleeder cap
12. Cover
13. Bolt
14. Bolt

	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

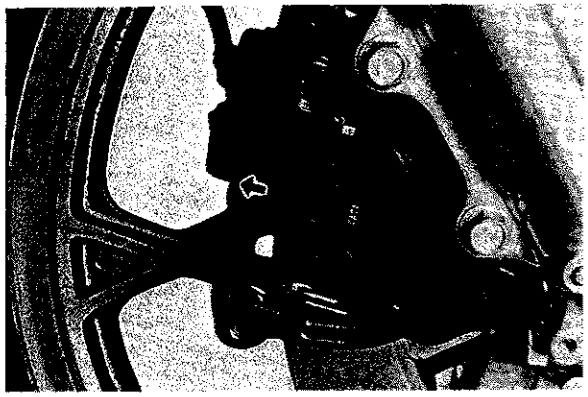
- Remove two bolts and take off caliper.

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

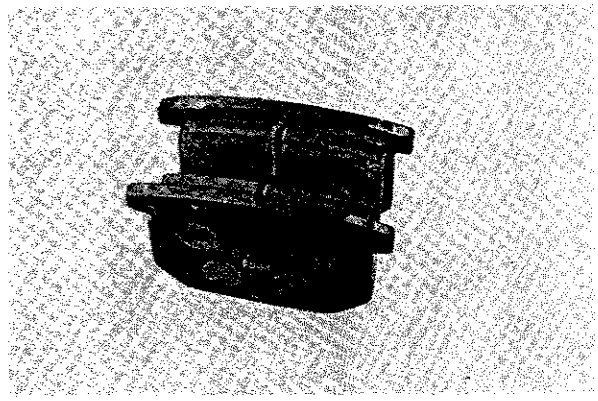


- Pull out brake pads with pad shim.

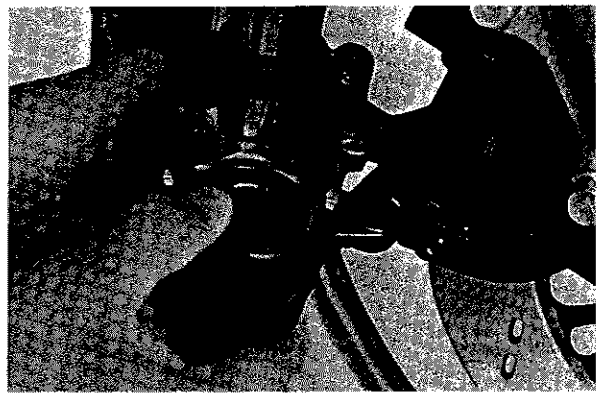
CAUTION:
Replace the brake pad with a set, otherwise braking performance will be adversely affected.



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.

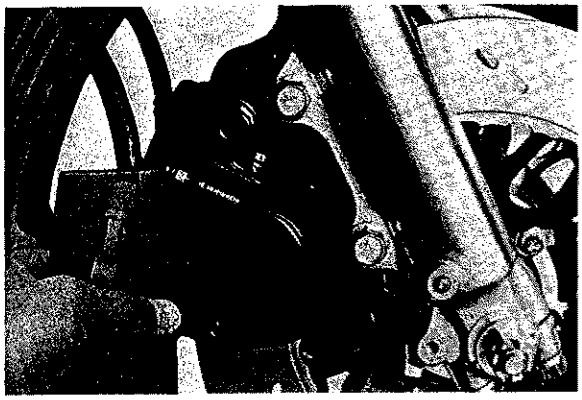


- Tighten the caliper axle bolts with specified torque.

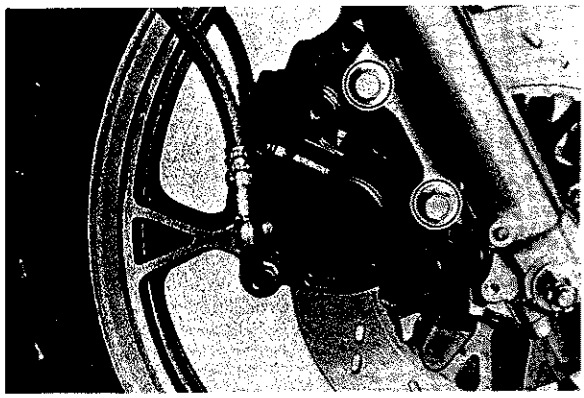
Tightening torque	4.0 — 5.5 kg-m (29.0 — 40.0 lb-ft)

CALIPER REMOVAL AND DISASSEMBLY

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

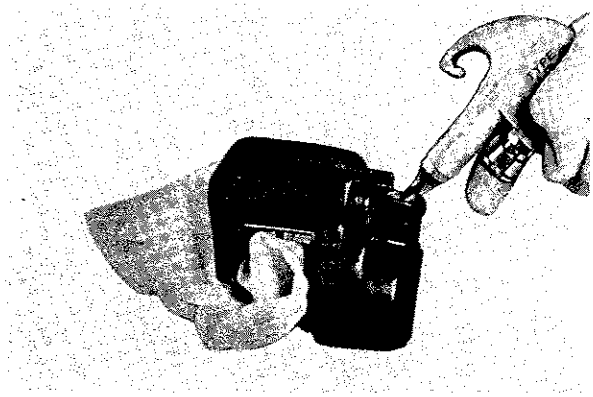


- Remove caliper axle bolts and take off caliper.

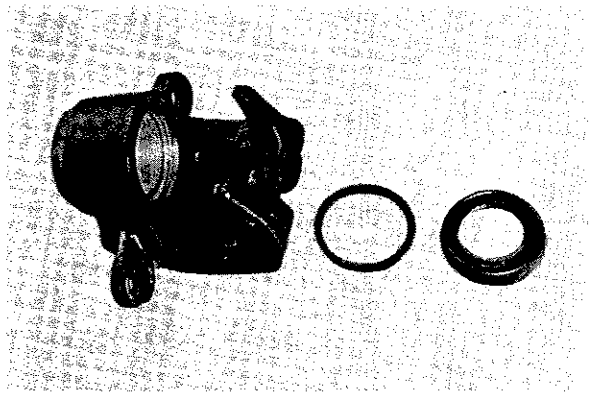


- Place a rag over the piston to prevent popping up. Push out the piston by using air gun.

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

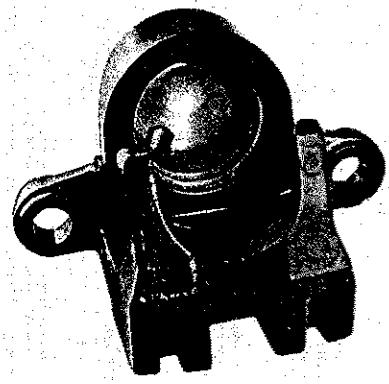


- Remove piston boot and piston seal.

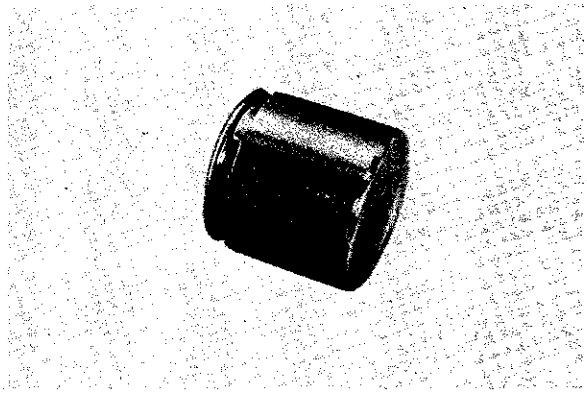


CALIPER AND DISC INSPECTION

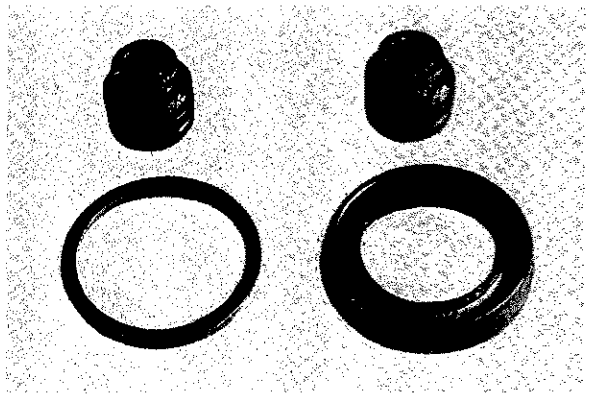
- Inspect the cylinder bore wall for nick, scratch or other damage.



- Inspect the piston surface for any flaw or other damage.



- Inspect the each rubber parts for damage and wear.



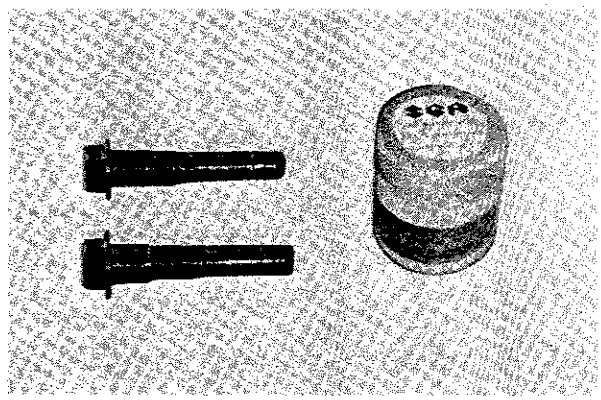
CALIPER REASSEMBLY

- 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.

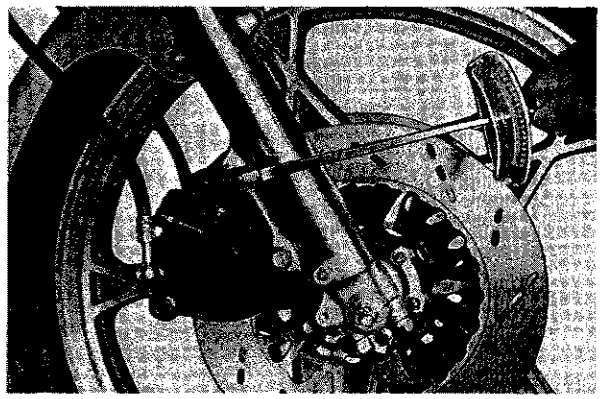
- Apply grease to the cliper axles.

99000-25100	SUZUKI Silicone grease

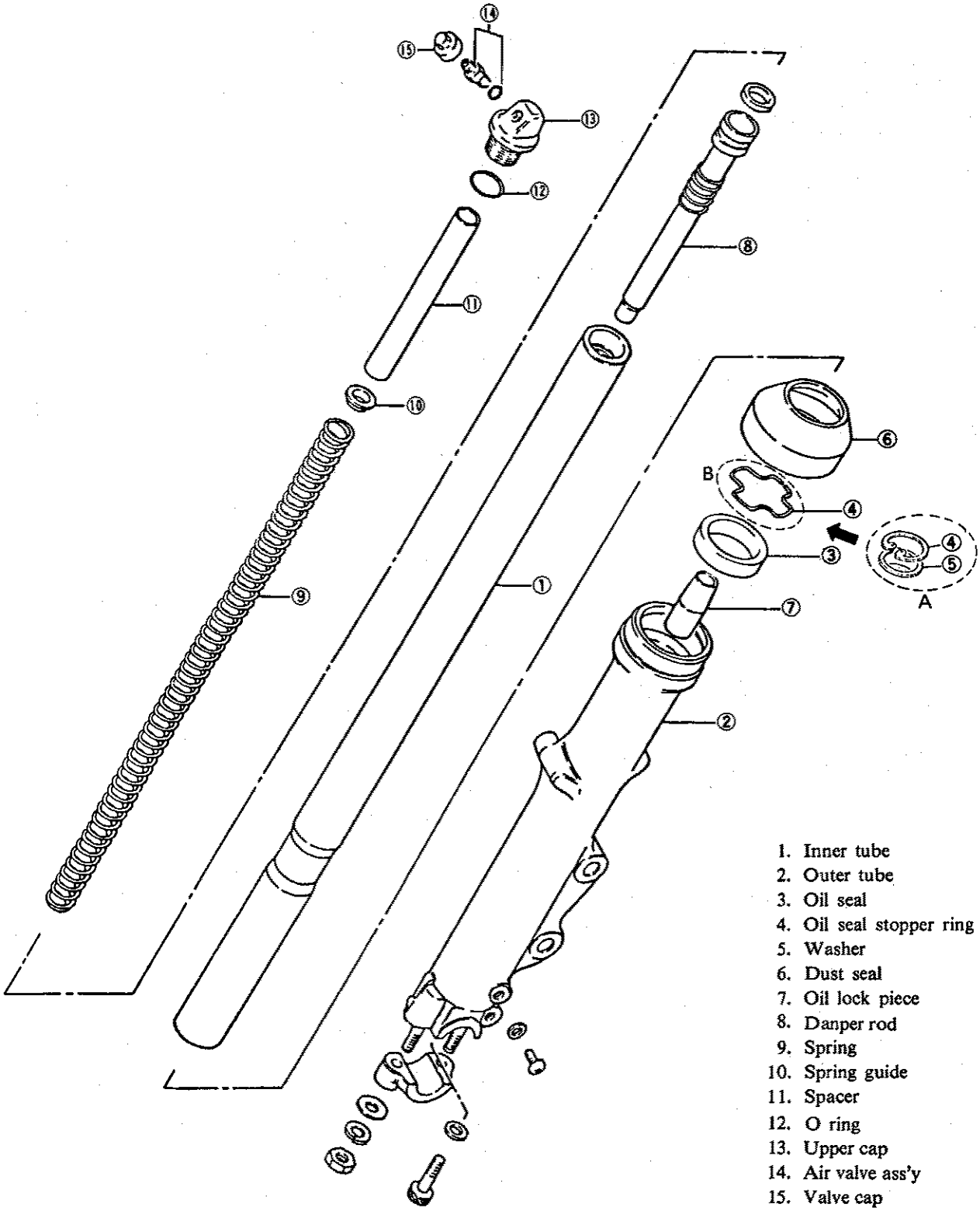


- Tighten the caliper axle nuts and caliper mounting bolts with specified torque.

	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)



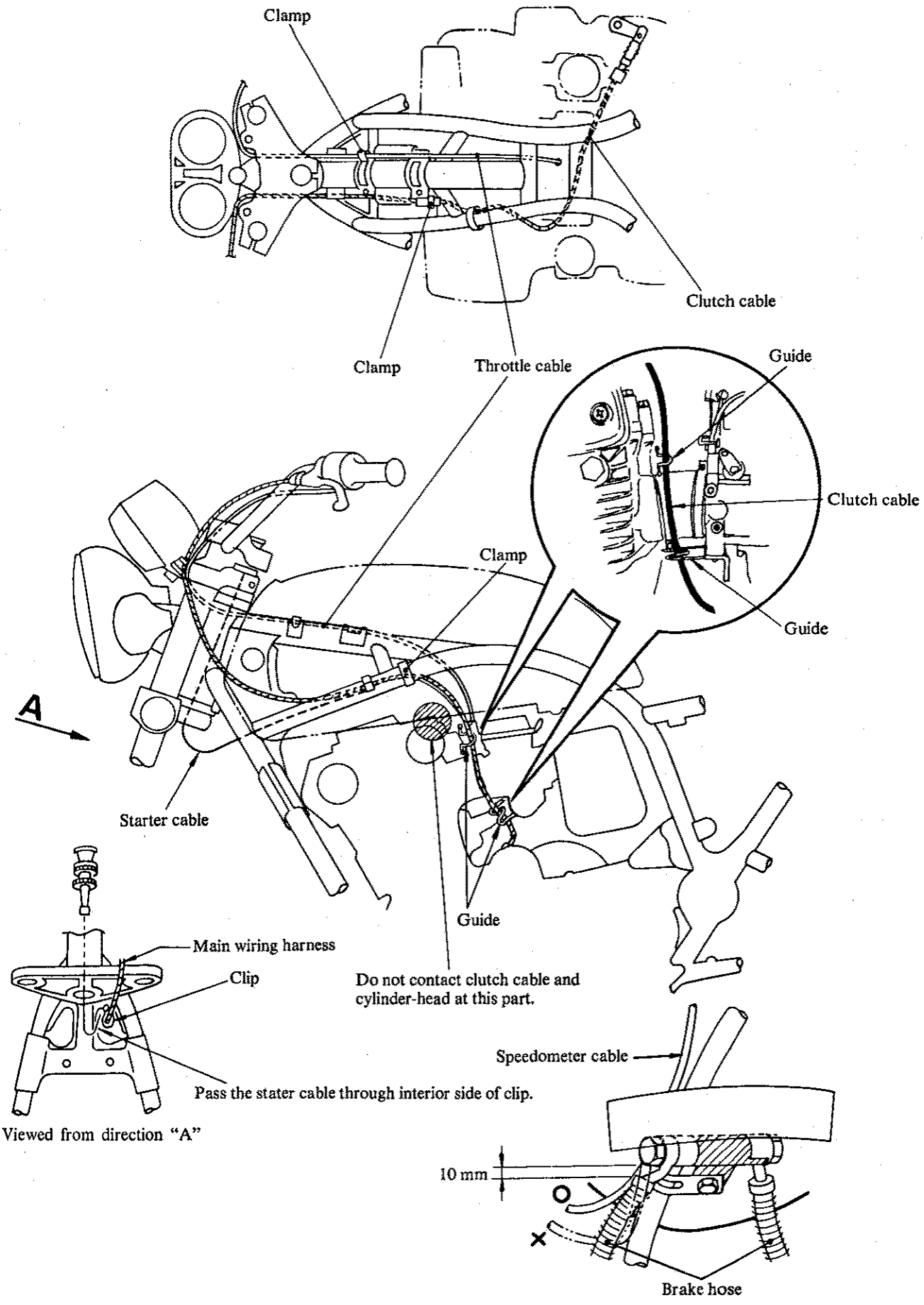
FRONT FORK

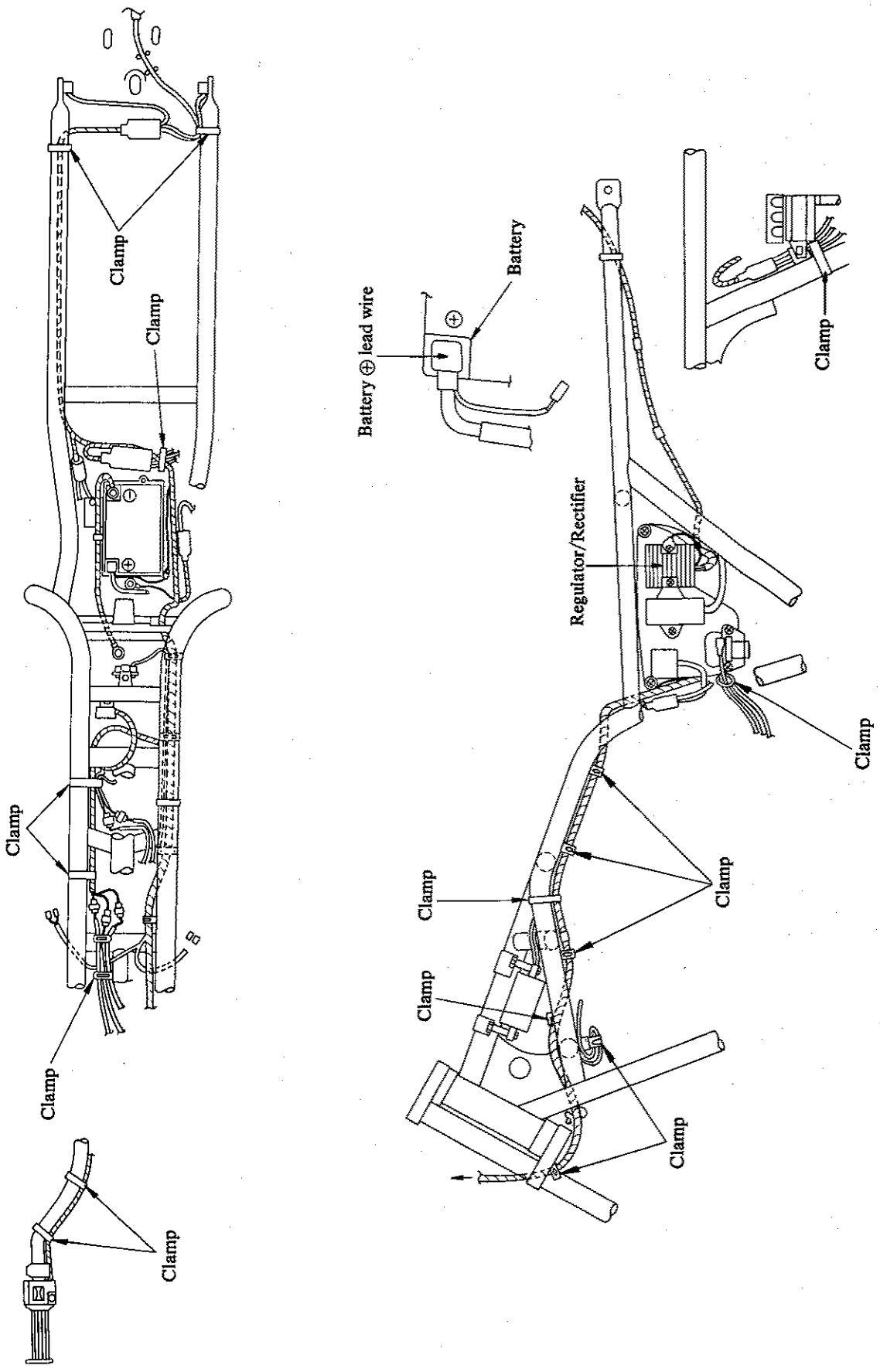


1. Inner tube
2. Outer tube
3. Oil seal
4. Oil seal stopper ring
5. Washer
6. Dust seal
7. Oil lock piece
8. Danper rod
9. Spring
10. Spring guide
11. Spacer
12. O ring
13. Upper cap
14. Air valve ass'y
15. Valve cap

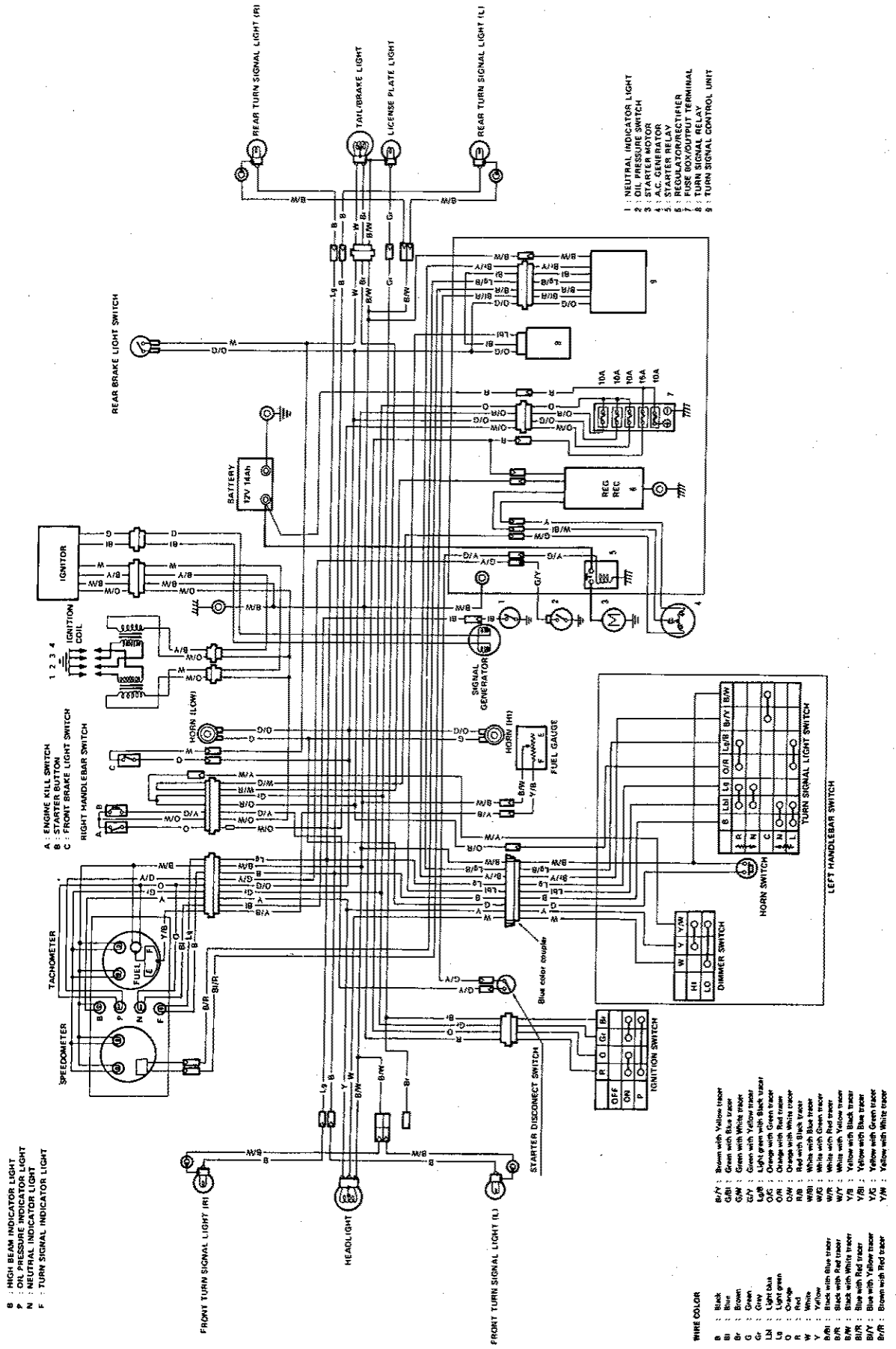
NOTE:
Although the parts for stopping the front fork oil seal have been changed form A to B (as shown in the illustration), the disassembling procedure is the same as that for GS1000 C and N models.

WIRE AND CABLE ROUTING



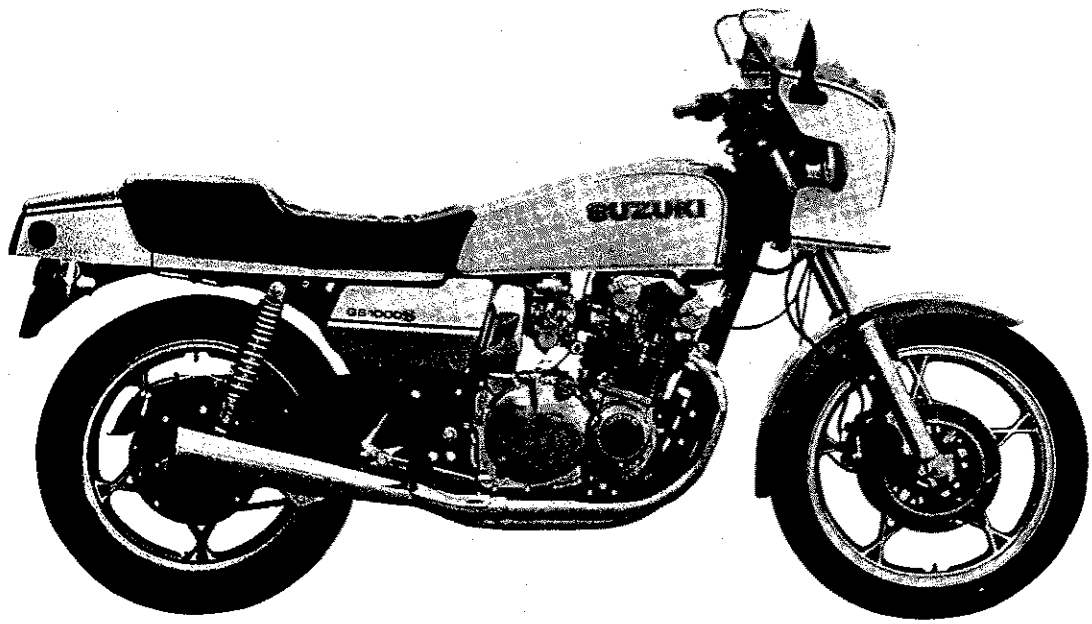

Clamp
Clamp
Clamp
Clamp
Clamp
Battery ⊕ lead wire
Battery
Regulator/Rectifier
Clamp
Clamp
Clamp
Clamp
Clamp
Clamp

WIRING DIAGRAM

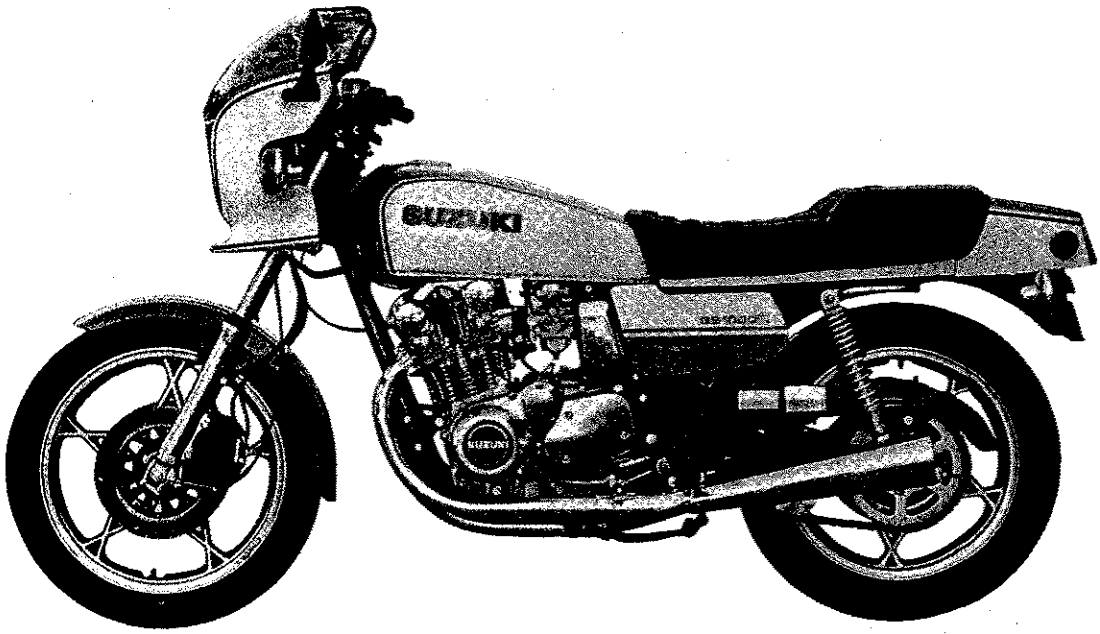


GS1000ST

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/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 (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

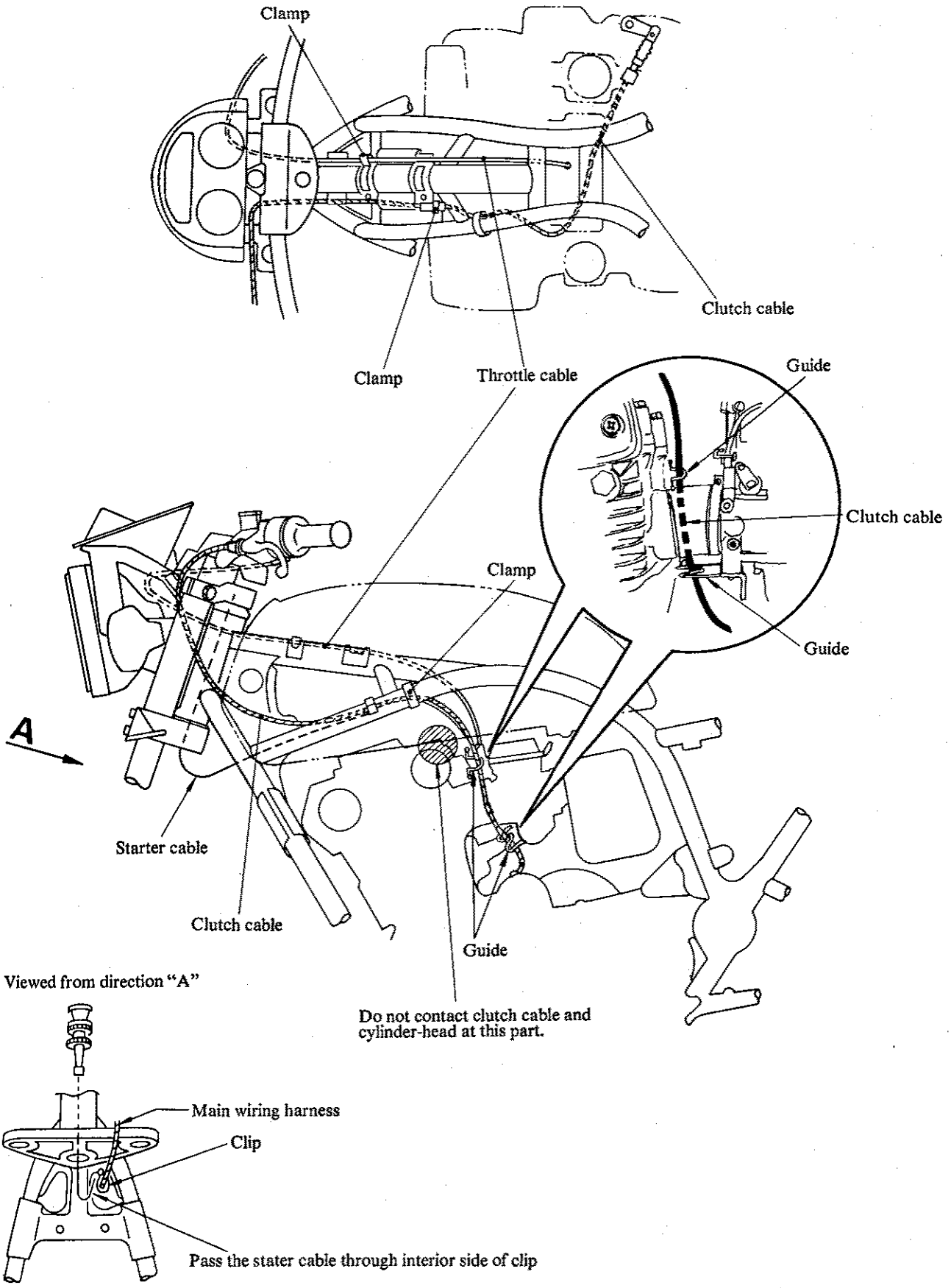
Cold inflation tire pressure	Normal riding				High speed riding			
	Solo		Dual		Solo		Dual	
	kg/cm²	psi	kg/cm²	psi	kg/cm²	psi	kg/cm²	psi
Front	1.75	25	2.00	28	2.00	28	2.25	32
Rear	2.00	28	2.25	32	2.50	36	2.80	40

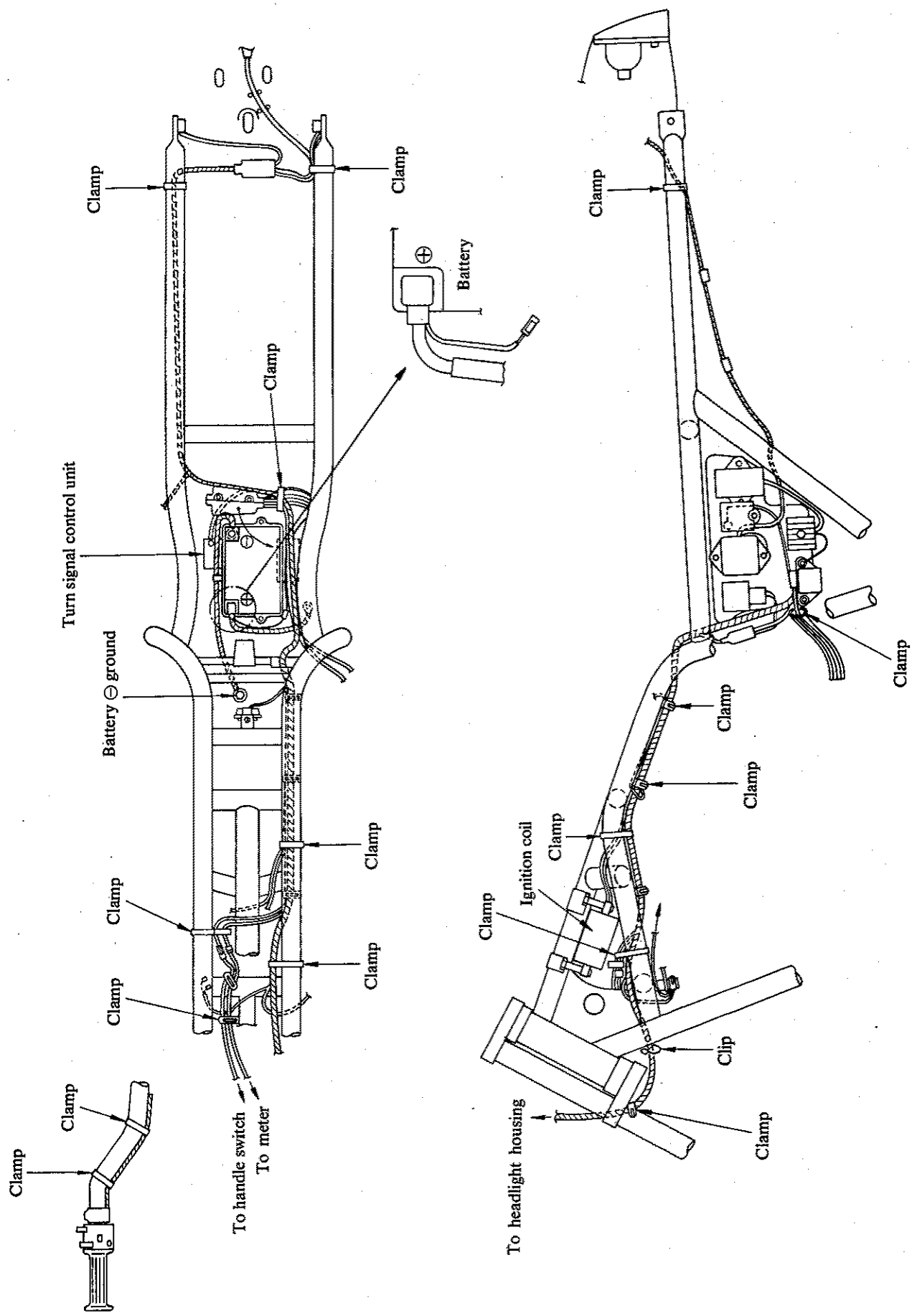
WATTAGE

Unit: W (cp)

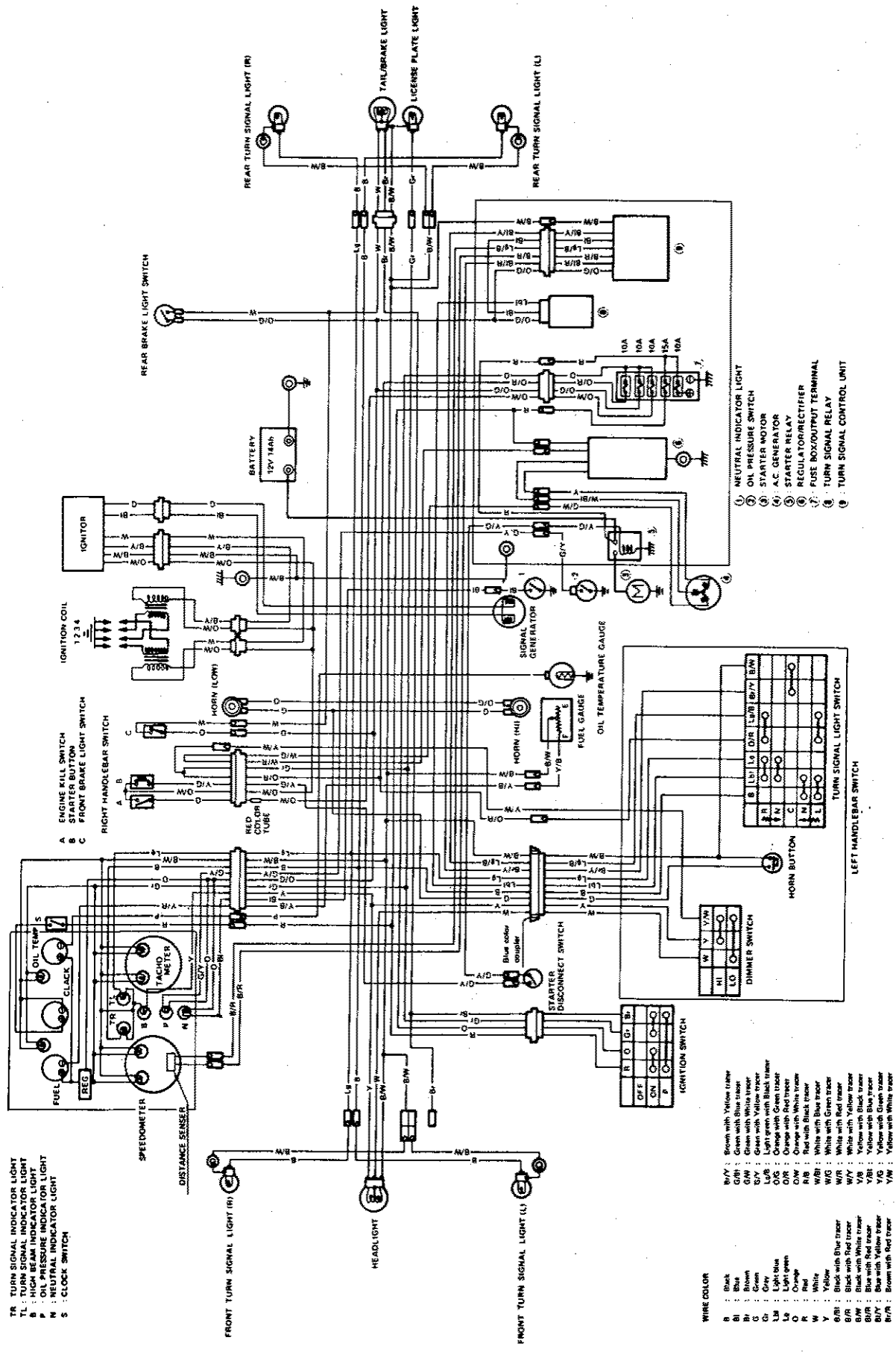
Item	Specification
Headlight	60/55
Tail/Brake light	8/23 (3/32)
Turn signal light	23 (32)
Licence light	8 (4)
Speedometer light	3.4
Tachometer light	3.4
Fuelmeter light	3.4
Oil temperature light	3.4
Clock light	3.4
Neutral indicator light	3.4
High beam indicator light	3.4
Turn signal indicator light	3.4
Oil pressure indicator light	3.4

WIRE AND CABLE ROUTING




Clamp
Clamp
Clamp
Turn signal control unit
Battery ⊖ ground
Clamp
Clamp
Clamp
Clamp
Clamp
Clamp
To handle switch
To meter
Battery
Clamp
Clamp
Clamp
Ignition coil
Clamp
Clamp
Clip
Clamp
To headlight housing
Clamp

WIRING DIAGRAM



Prepared by

SUZUKI MOTOR CO., LTD.

Service Department
Overseas Operations Division

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October, 1979

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Printed in Japan

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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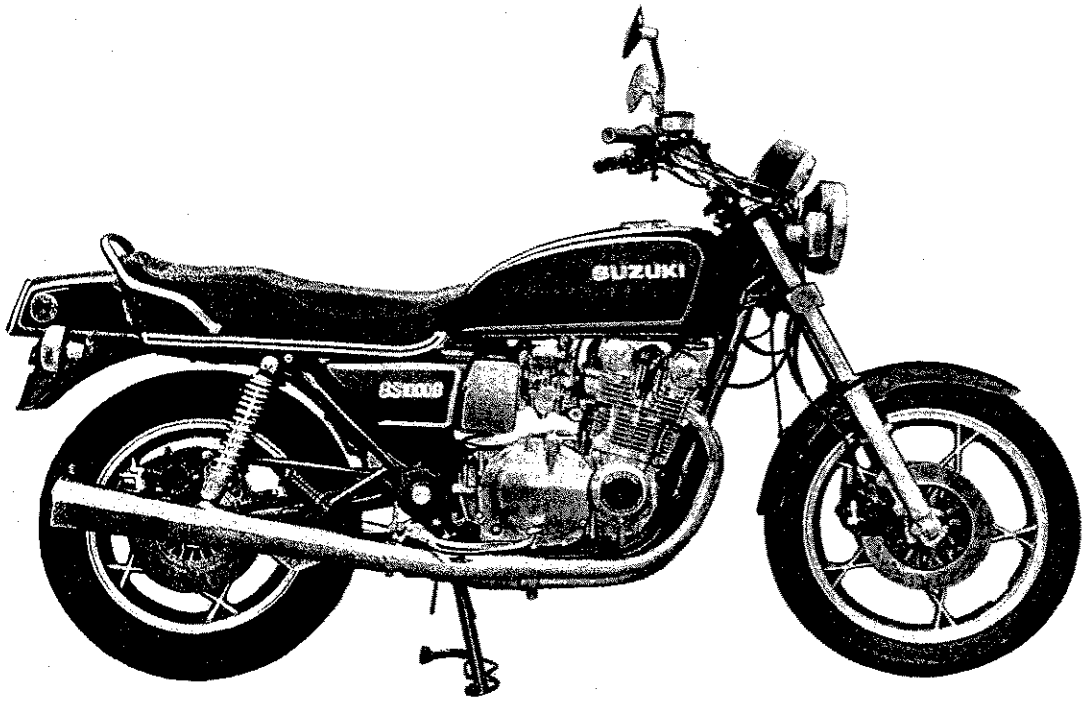
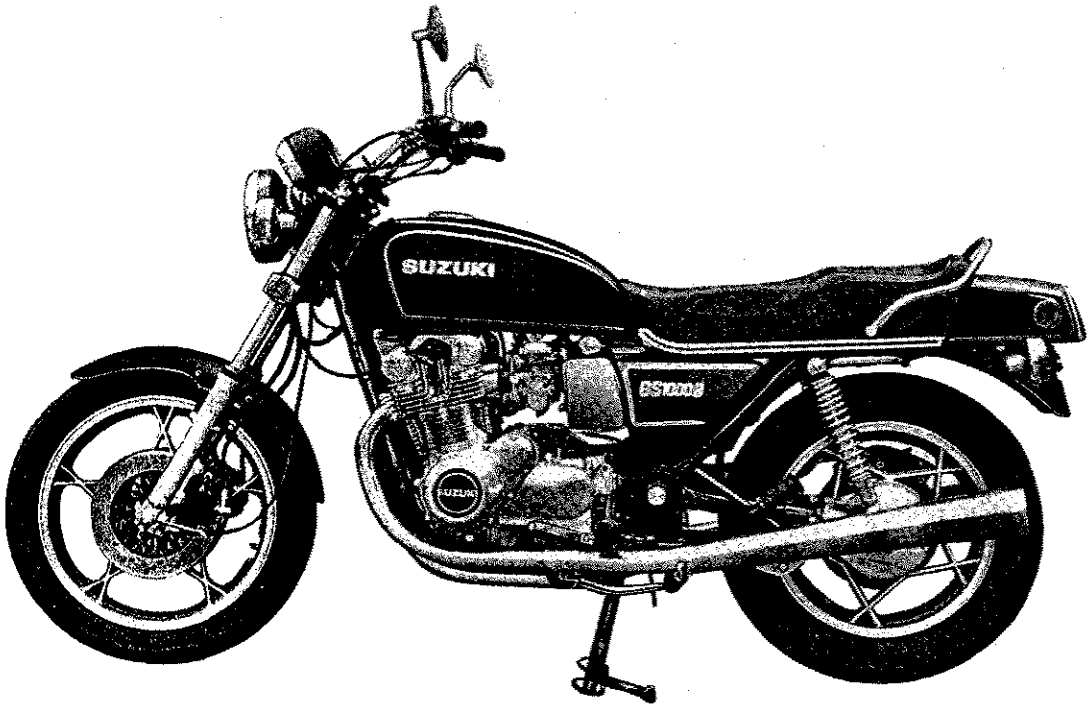
I GS1000GT



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/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

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/cm^2, 1.42 psi) Below 50 kPa (0.5 kg/cm^2, 7.11 psi) at 3 000 r/min.	–
Tip clearance	–	0.20 (0.008)
Outer rotor clearance	–	0.25 (0.010)
Side clearance	–	0.15 (0.006)

CLUTCH

Unit: mm (in)

Item	Standard	Limit
Clutch cable play	2 – 3 (0.08 – 0.12)	–
Drive plate thickness	2.9 – 3.1 (0.11 – 0.12)	2.6 (0.10)
Drive plate claw width	15.6 – 15.8 (0.61 – 0.62)	14.8 (0.58)
Driven plate thickness	2.0 ± 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/cm²	psi	kPa	kg/cm²	psi	kPa	kg/cm²	psi	kPa	kg/cm²	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
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

TIRE PRESSURE

Cold Inflation Tire Pressure	Normal Riding						Continuous High Speed Riding					
	Solo Riding			Dual Riding			Solo Riding			Dual Riding		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi	kPa	kg/cm²	psi	kPa	kg/cm²	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

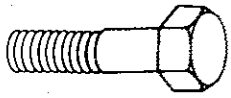
Unit: W(cp)

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)

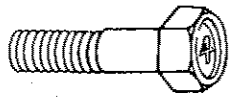
For other bolts and nuts not listed above, refer to this chart:

TIGHTENING TORQUE

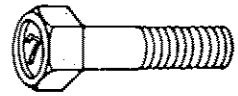
Thread Diameter (mm)	Conventional or "4" Marked Bolt			"7" Marked Bolt		
	N•m	kg•m	lb•ft	N•m	kg•m	lb•ft
4	1.0 – 2.0	0.1 – 0.2	0.7 – 1.5	1.5 – 3.0	0.15 – 0.3	1.0 – 2.0
5	2.0 – 4.0	0.2 – 0.4	1.5 – 3.0	3.0 – 6.0	0.3 – 0.6	2.0 – 4.5
6	4.0 – 7.0	0.4 – 0.7	3.0 – 5.0	8.0 – 12.0	0.8 – 1.2	6.0 – 8.5
8	10.0 – 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

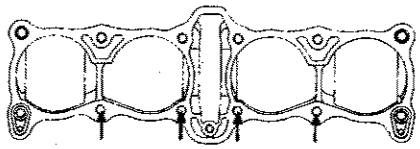
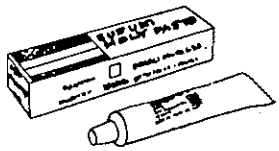
CHASSIS

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

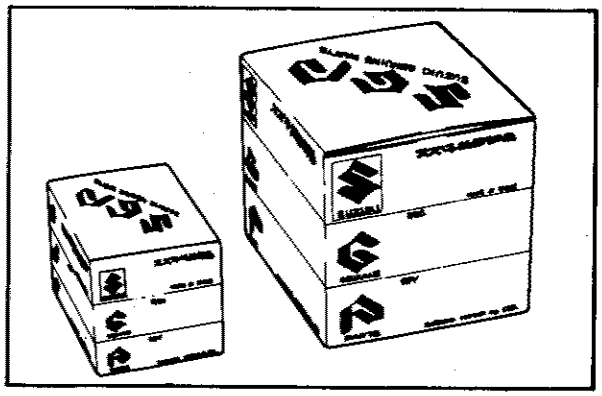
The materials listed below are needed for maintenance work on the GS1000G, and should be kept on hand for ready use. They supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them are described in the text of this manual.

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 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		—	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.

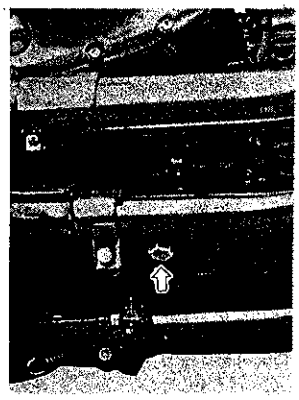
Engine wear or damage can also cause high HC emissions.

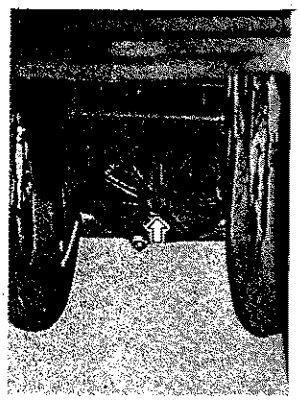
1. Rings — Low compression, leakage into crankcase.
2. Valves — Improper adjustment, bent stem or burnt.
3. Gaskets — Leaking, loss of compression.
4. Crank Seals — Leaking.
5. Oil Consumption — Worn valve guides, worn rings, clogged crankcase breather.
6. Oil — Improper engine oil.

ENGINE REMOVAL AND REMOUNTING

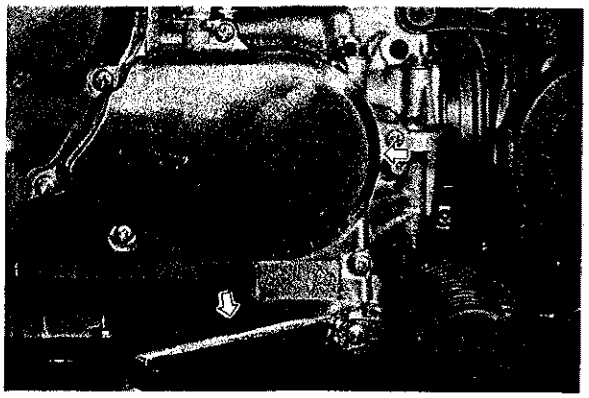
REMOVAL

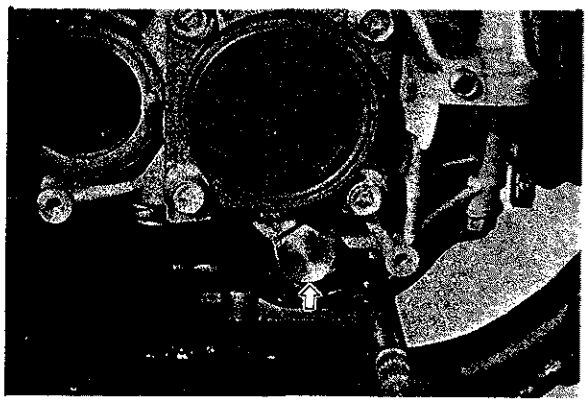
- Place an oil pan under the engine and remove the engine oil drain plug and oil filter cap to drain off engine oil.



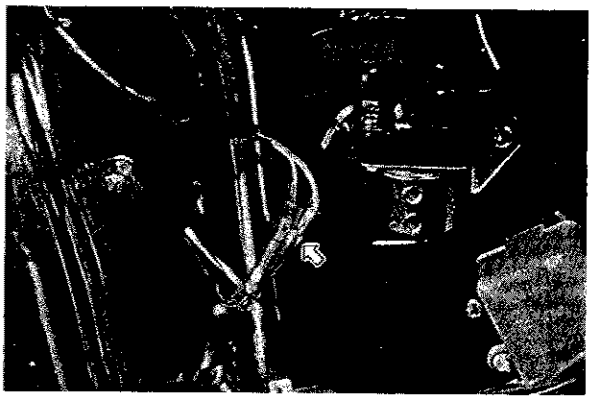


- Place an oil pan under the secondary drive drain plug and remove the gear shifting lever and secondary drive unit cover. Next, remove the drain plug and drain off the secondary gear oil.



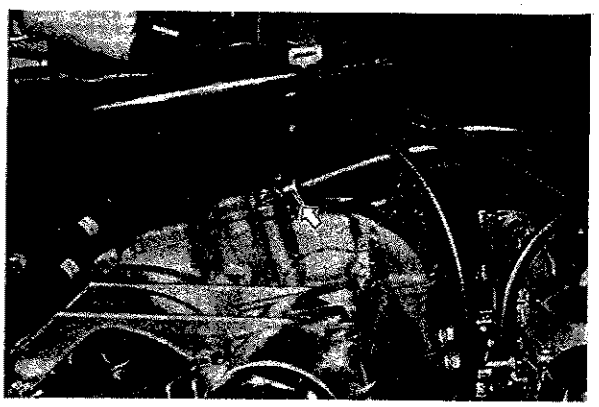


- Set the fuel cock lever to the "ON" or "RES" position and shift the fuel pipe clip sideways to remove the two hoses from the fuel cock.
- Remove the lead wire of fuel meter sensor located at the lower left side of the fuel tank.

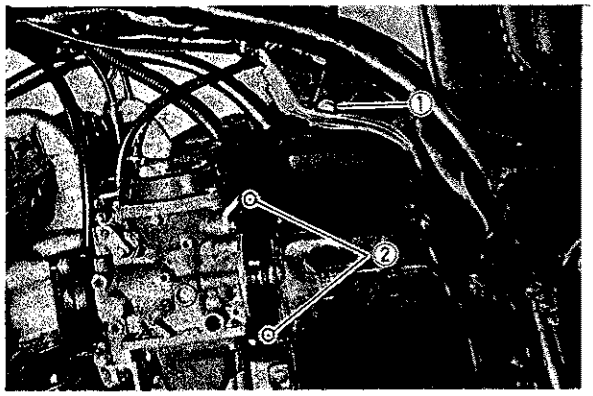


- Open the seat and remove the bolt at the rear of the fuel tank. Remove the tank rearwards.

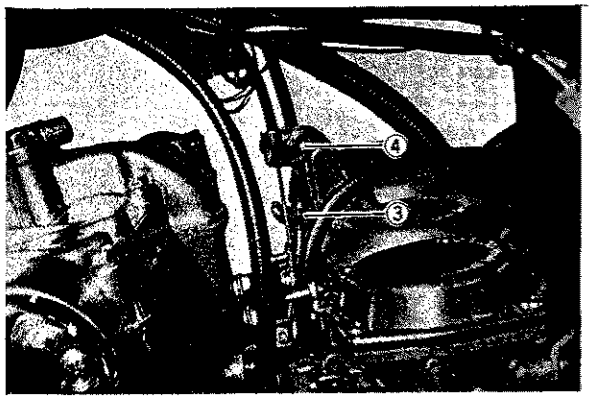
- Move the intake pipe clamp off position and disconnect the intake pipe from the breather cover.



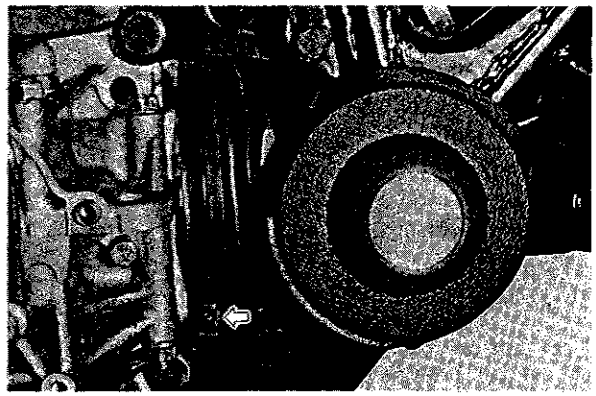
- Remove the left and right frame side covers.
- First of all, remove the battery ⊖ terminal, then remove ⊕ terminal.
- Remove the connectors from various lead wires.
  - AC generator lead wire.
  - Starter relay ⊖ terminal.
  - Signal generator lead wire.
  - Gear position lead wire.
  - Oil pressure 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.



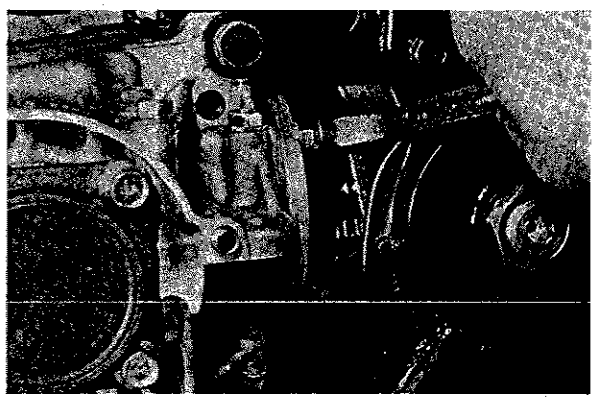
- Loosen the throttle cable lock nut ③, and remove both inner and outer cables from the carburetor lever.
- Loosen the starter cable mounting bolt ④, and remove both inner and outer cables from the carburetor.



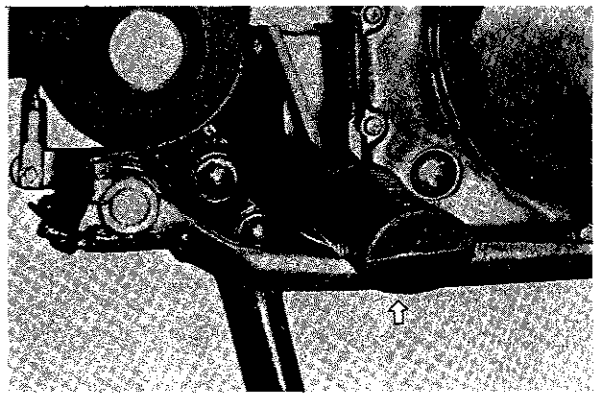
- Loosen the clamps for the intake manifolds and remove the carburetors by pulling toward the rear.
- Loosen the clamp screw securing the propeller shaft boot, and move the propeller shaft boot rearward.



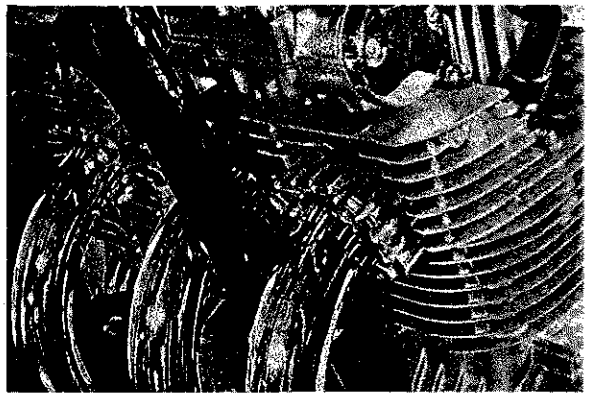
- Remove the four bolts securing the universaljoint flange and propeller shaft.



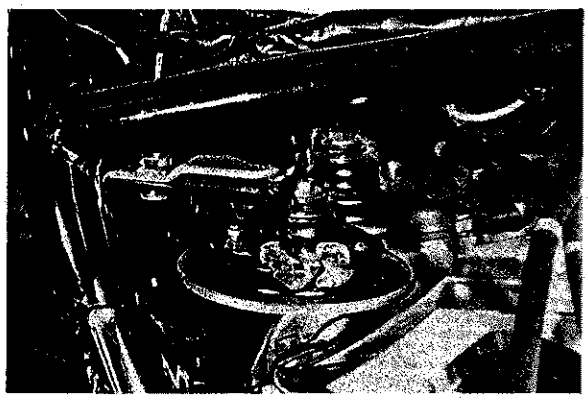
- Remove the brake pedal mounting bolt. Next, move the pedal return spring off the peg, and remove the pedal.
- Remove the right footrest.



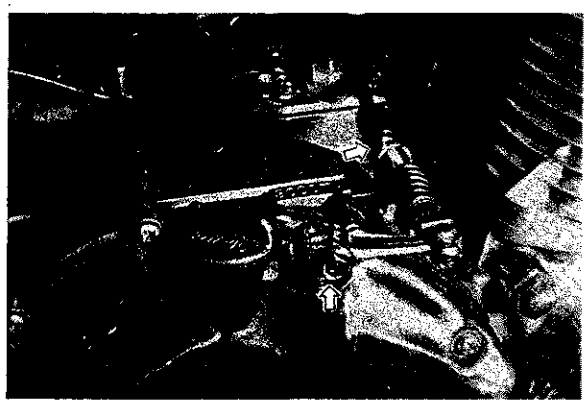
- Remove the exhaust bolts, remove the right and left muffler mounting bolts, and loosen the exhaust coupller bolt and remove the mufflers.



- Remove the lead wires and mounting bolts of the horn mounting brackets, then remove the assembly.

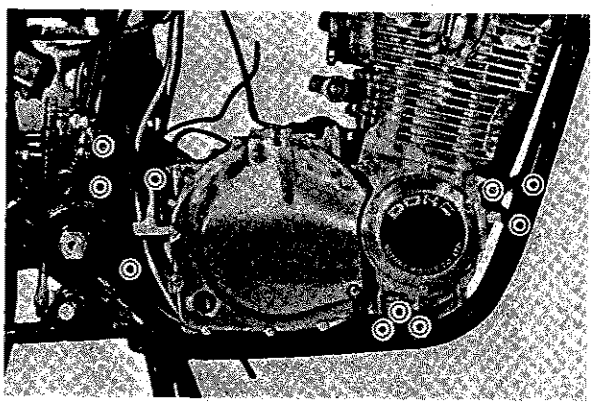


- Fully loosen the clutch cable lock nut and adjuster bolts on the engine side. Then loosen the clutch release arm bolt and remove the clutch release arm by lifting it upward.

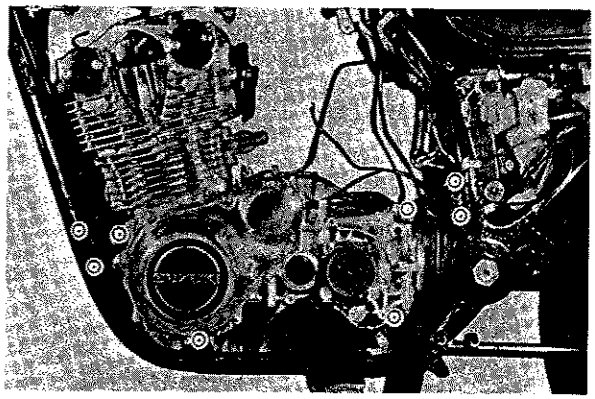


- Remove all of the bolt — on engine mounting brackets.

Right side

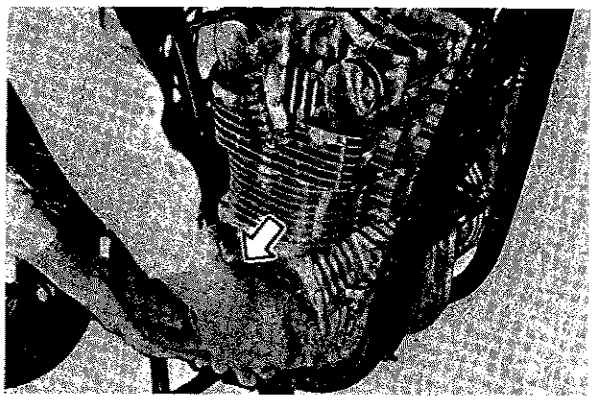


Left side



- 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.

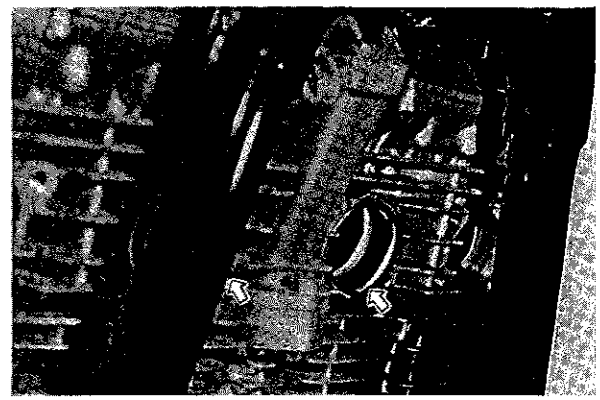
Tightening torque for engine mounting bolts	
10 mm Dia.	35 N·m 3.5 kg·m 25.5 lb·ft
12 mm Dia.	45 — 70 N·m 4.5 — 7.0 kg·m 32.5 — 50.5 lb·ft

- 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.

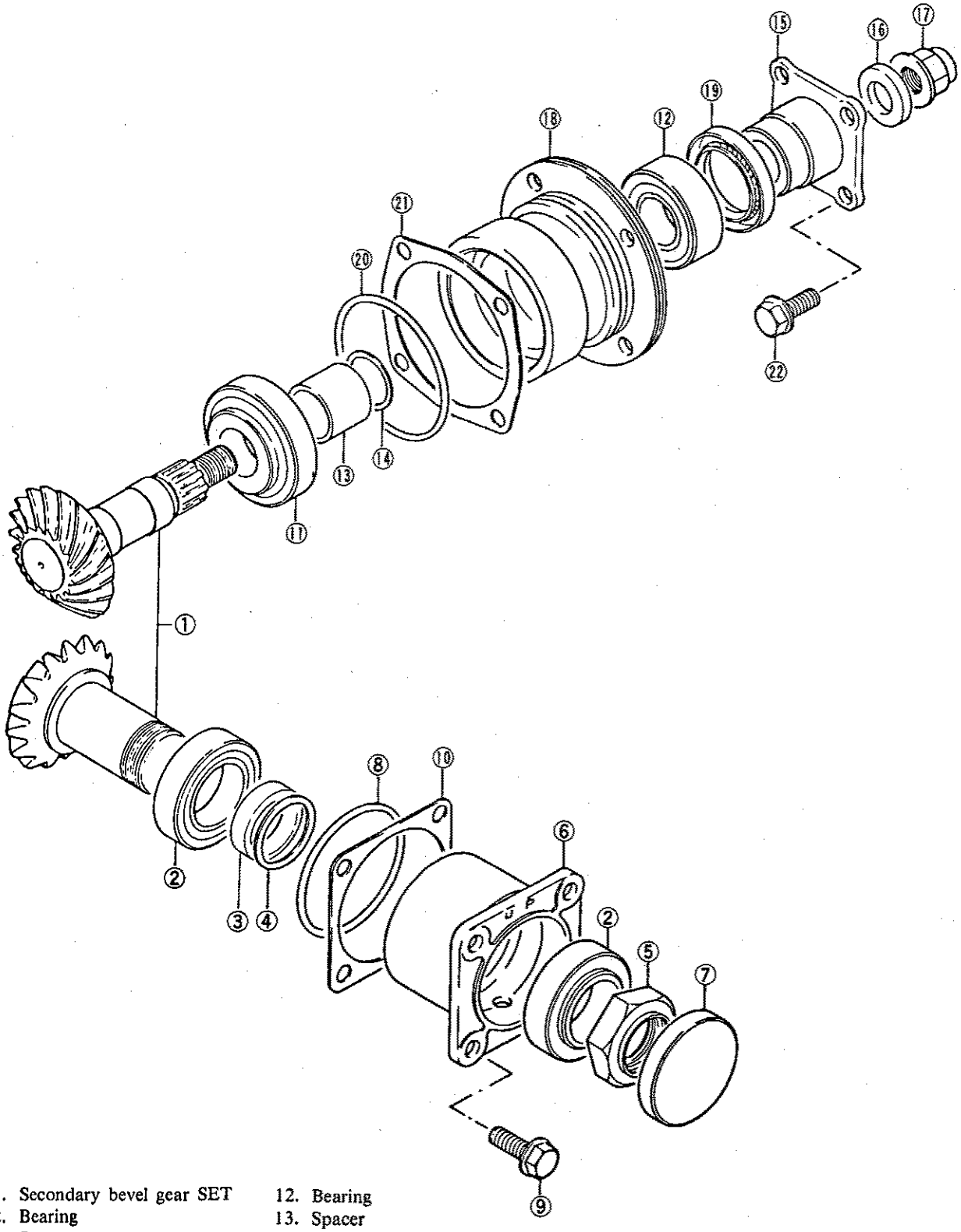
Exhaust pipe bolt tightening torque:	9 — 14 N·m 0.9 — 1.4 kg·m 6.5 — 10.0 lb·ft

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.

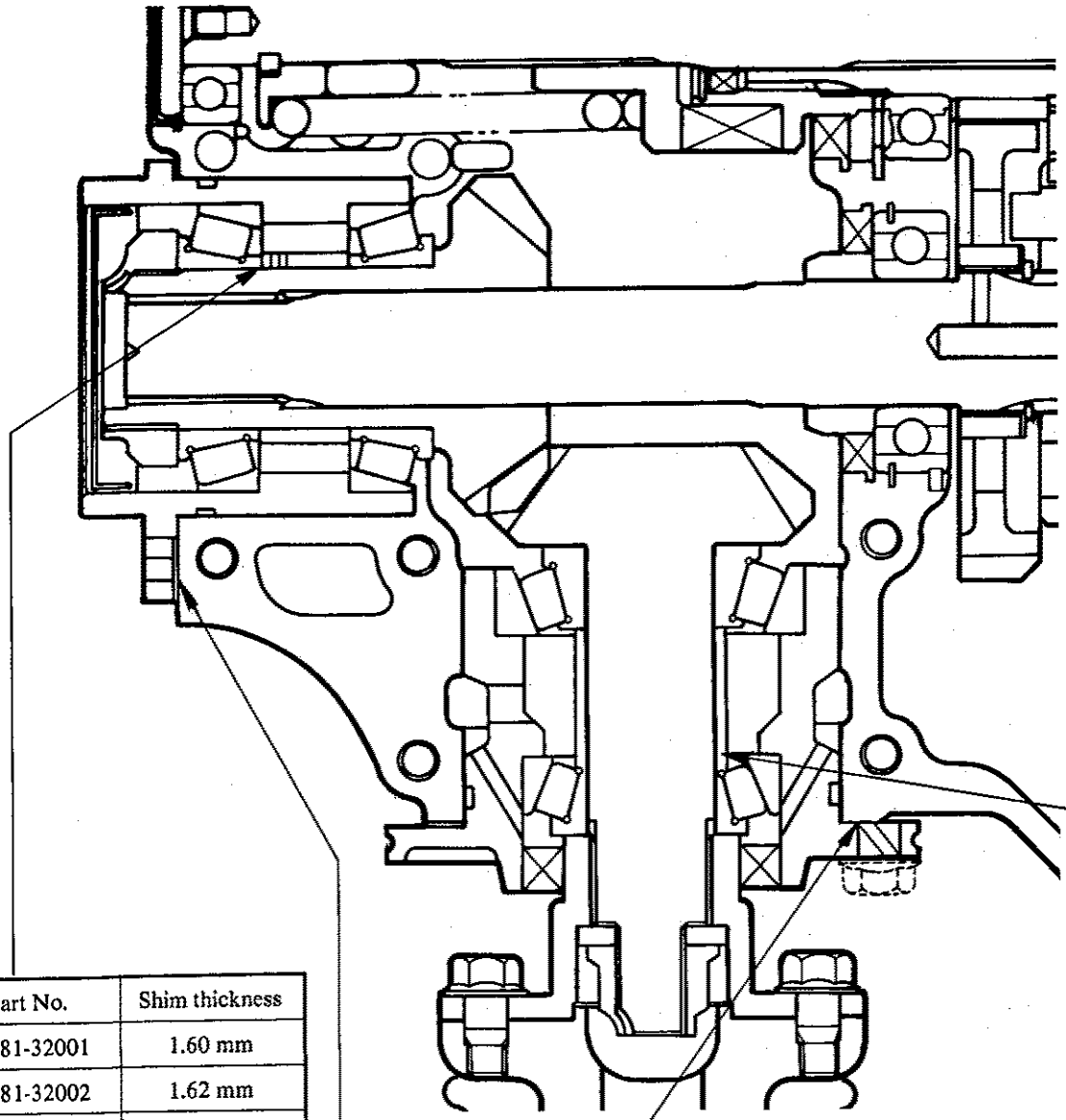
- After remounting the engine, adjust the rear brake pedal, brake light switch, clutch and throttle cable.
- Before starting the engine, make sure the amount of oil required, according to the type of work done, has been put in. Refer to page 14 for quantities.

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

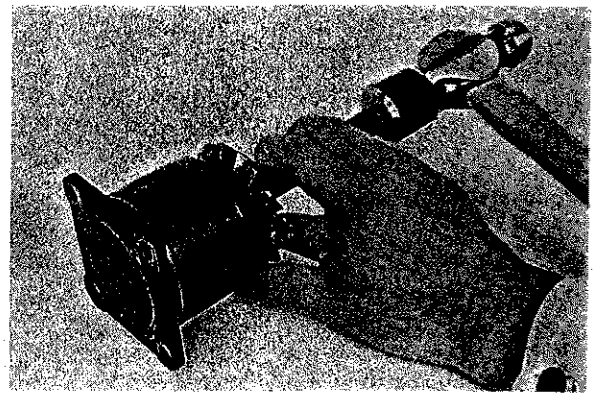
Part No.	Shim thickness
24945-45100	0.35 mm
24945-45102	0.40 mm
24945-45103	0.50 mm
24945-45104	0.60 mm

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

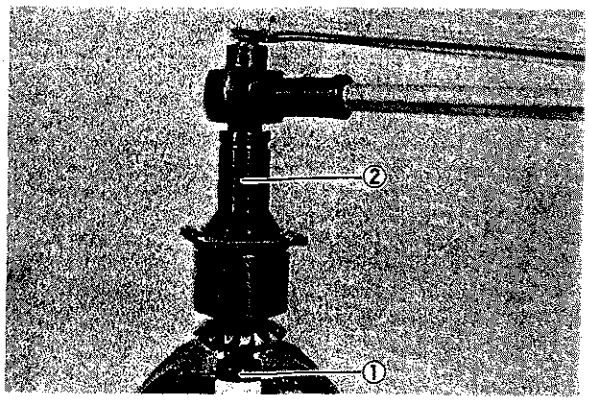
REMOVAL AND DISASSEMBLY

- 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

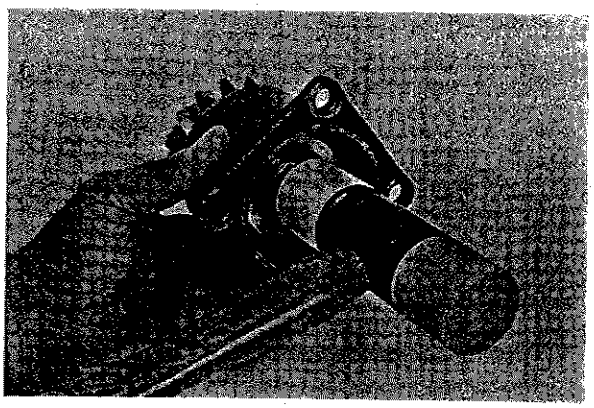


- Straighten the bent area of the nut. Use special tool ① to lock the drive gear, and special tool ② to remove the nut.

①	Secondary drive bevel gear holder	09924-54510
②	41 mm socket wrench	09910-23710

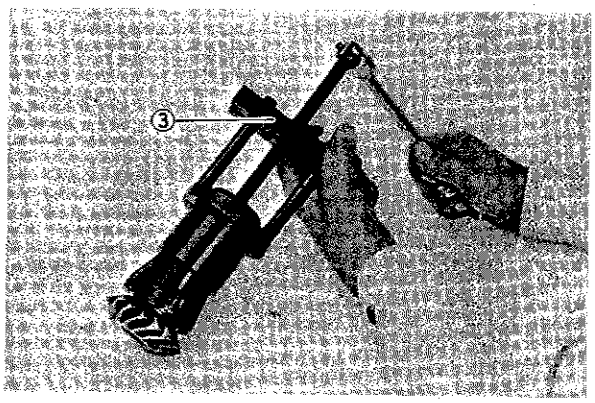


- Tap the drive gear with a plastic hammer to remove it from the housing.



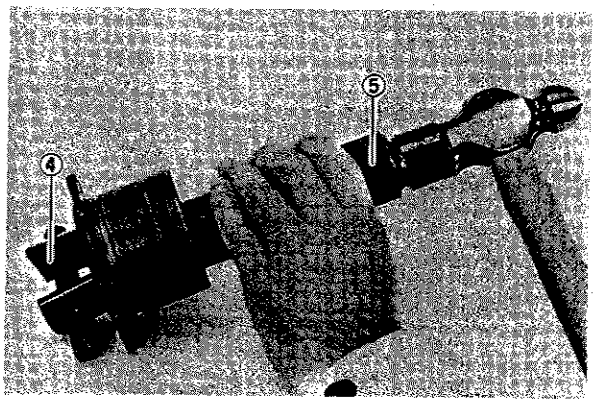
- Remove the shims from the drive gear shaft. Do not discard. Note the location.
- Use special tool ③ to remove the inner bearing race from drive gear.

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



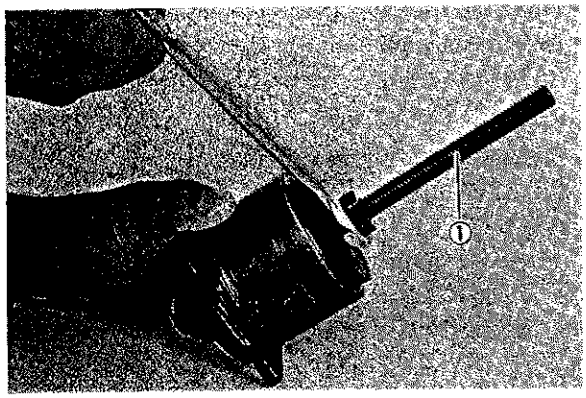
INSPECTION AND REASSEMBLY

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.

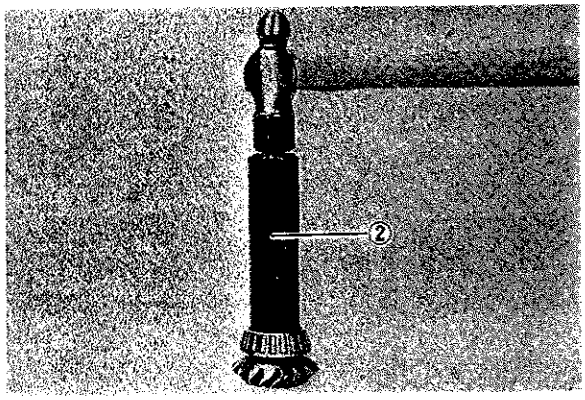
Bearing installer set:	09924-84510



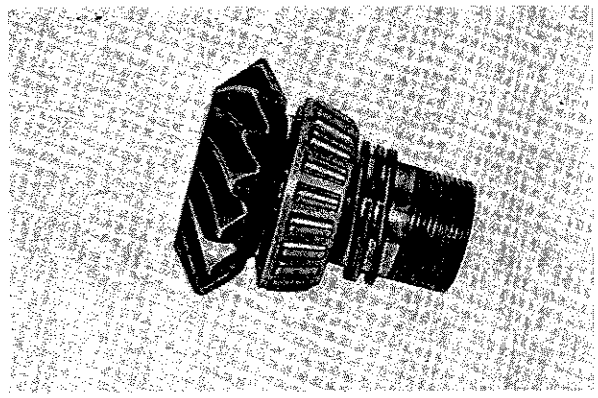
- Use special tool ② to install the inner bearing race on the drive gear shaft.

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.

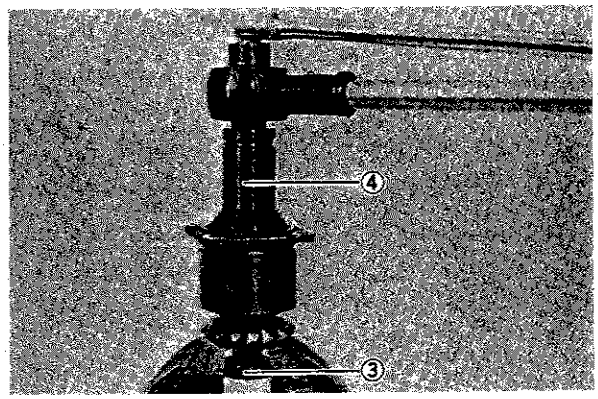


- Install the drive gear into the housing and install the other inner bearing race and nut. Oil the bearings with Hypoid gear oil.
- Use special tool ③ to lock the gear, and special tool ④ to tighten nut to specification.

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

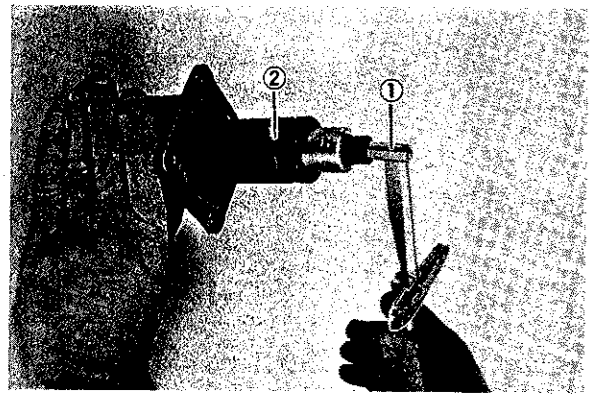


BEARING PRELOAD ADJUSTMENT

- 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.

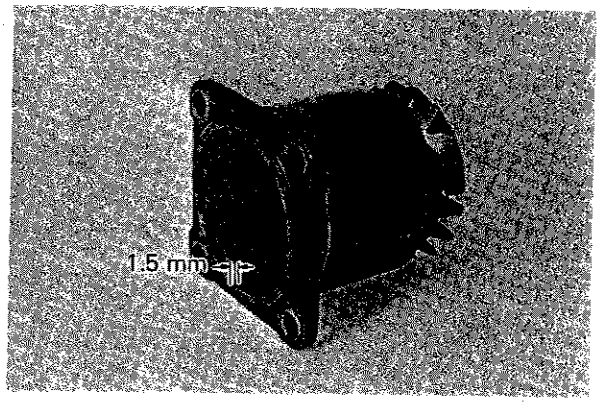
Preload	Adjustment by shim
Under 3 kg•cm	Decrease shim thickness
3 — 5 kg•cm (2.60 — 4.35 lb•in)	Correct
Over 5 kg•cm	Increase shim thickness

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.

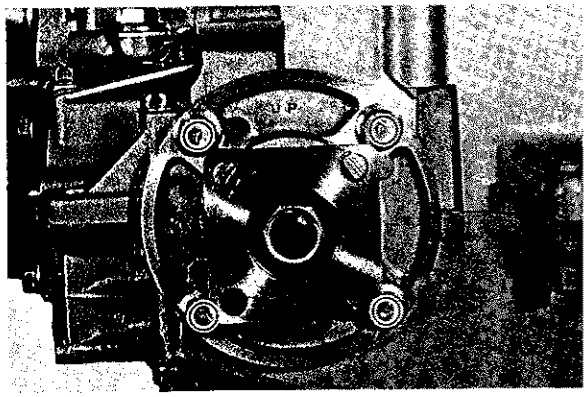


- The secondary drive gear assembly is now ready for installation into the crankcase. For backlash and tooth contact adjustments, see pages 38 and 39.

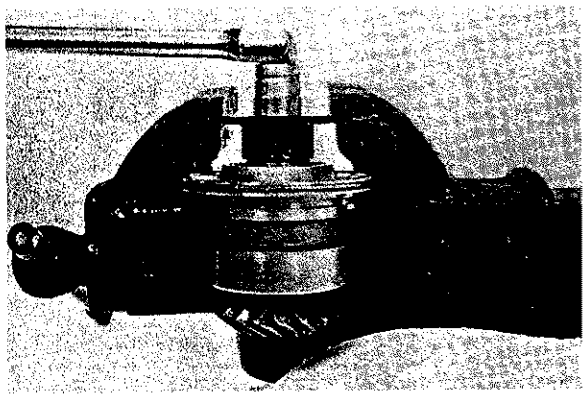
SECONDARY DRIVEN GEAR ASSEMBLY

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.

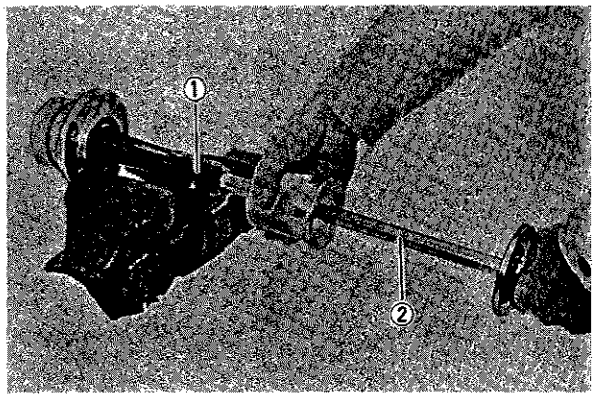


- Secure the propeller shaft flange in a vise and straighten the bent portion of the driven gear nut. Remove the nut.



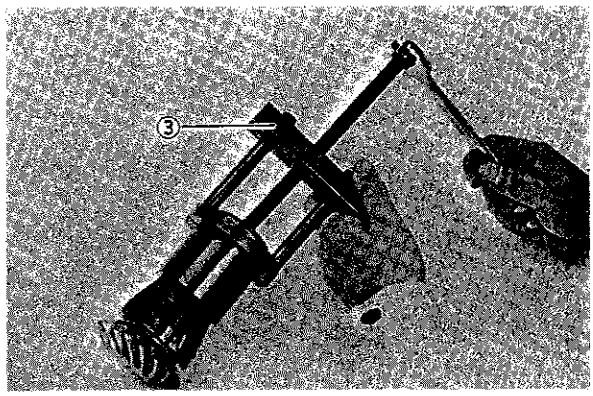
- Remove the flange from the driven gear.
- Tap the driven gear with a plastic hammer to remove it from the housing.
- To remove the oil seal from the housing, use special tools ① and ②.

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



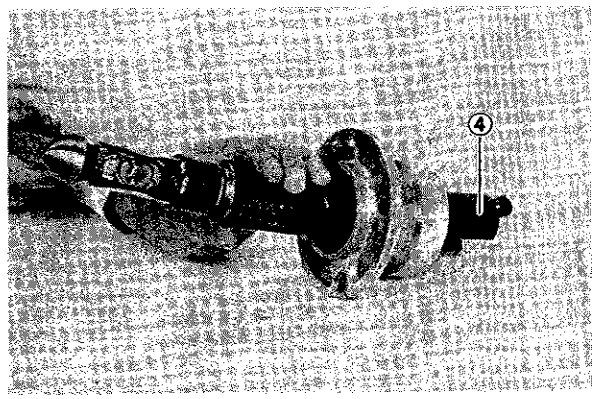
- Remove the spacer and shims from the driven gear shaft. Do not discard them.
- Use special tool ③ to remove the inner bearing race from the driven gear.

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



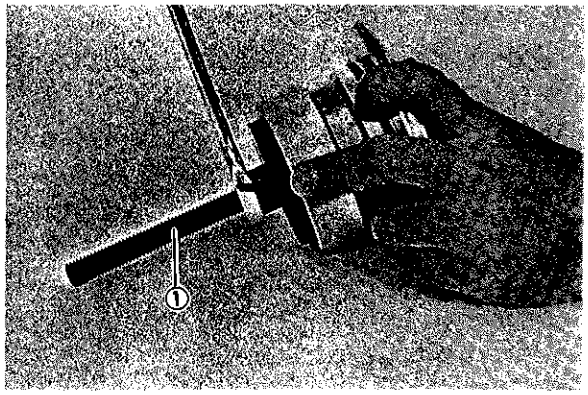
INSPECTION AND REASSEMBLY

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.

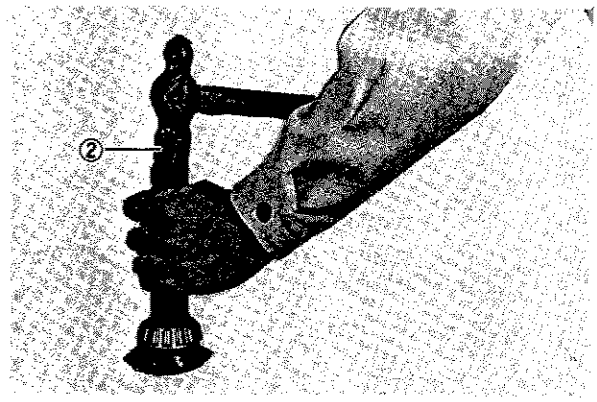
Bearing installer set	09924-84510



- 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.

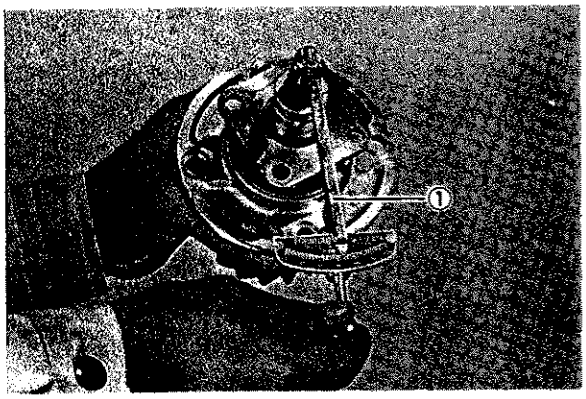
Nut tightening torque	90 — 110 N•m 9 — 11 kg•m 65.0 — 79.5 lb•ft

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

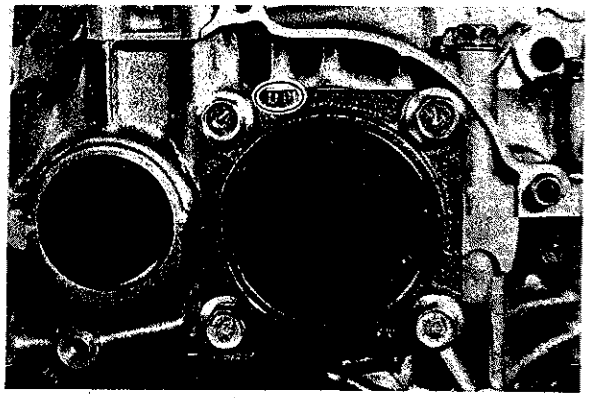


Fig. A

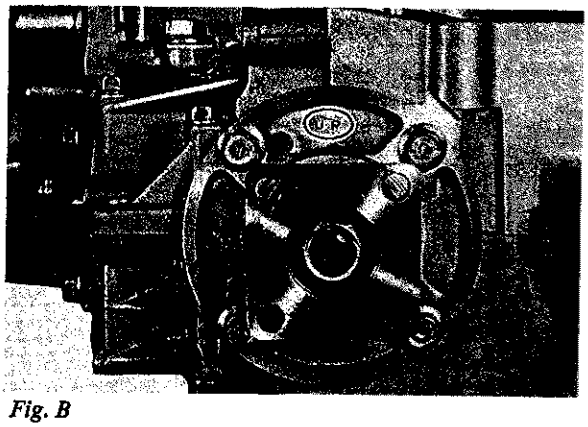
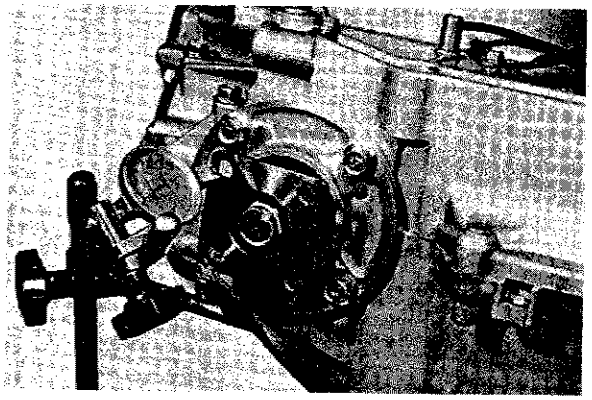


Fig. B

- 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

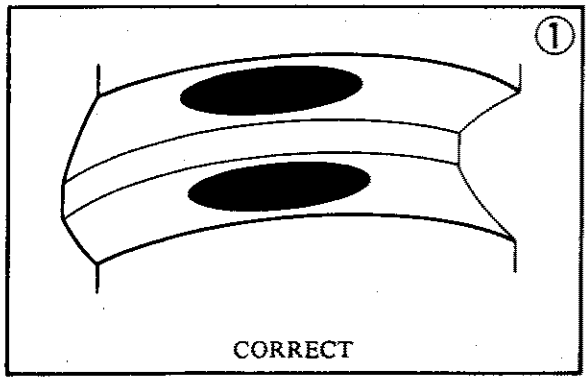
TOOTH CONTACT CHECKING

- 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.

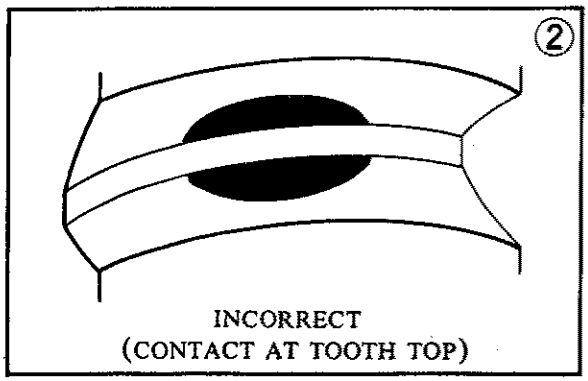
NOTE: No o-ring is used at this stage.

Bolt Tightening Torque	20 — 26 N·m 2.0 — 2.6 kg·m 14.5 — 19.0 ft·lb

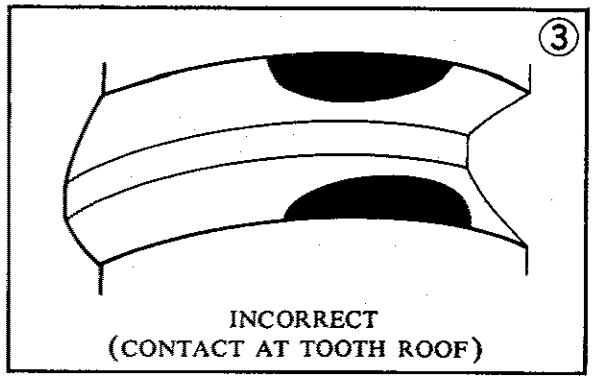
- Turn the secondary driven gear flange several turns in both directions.
- Remove the secondary driven gear housing from the crankcase, and observe the tooth contact pattern made in the dye or paste.
- Compare the tooth contact pattern to the examples as shown in ①, ②, ③.



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

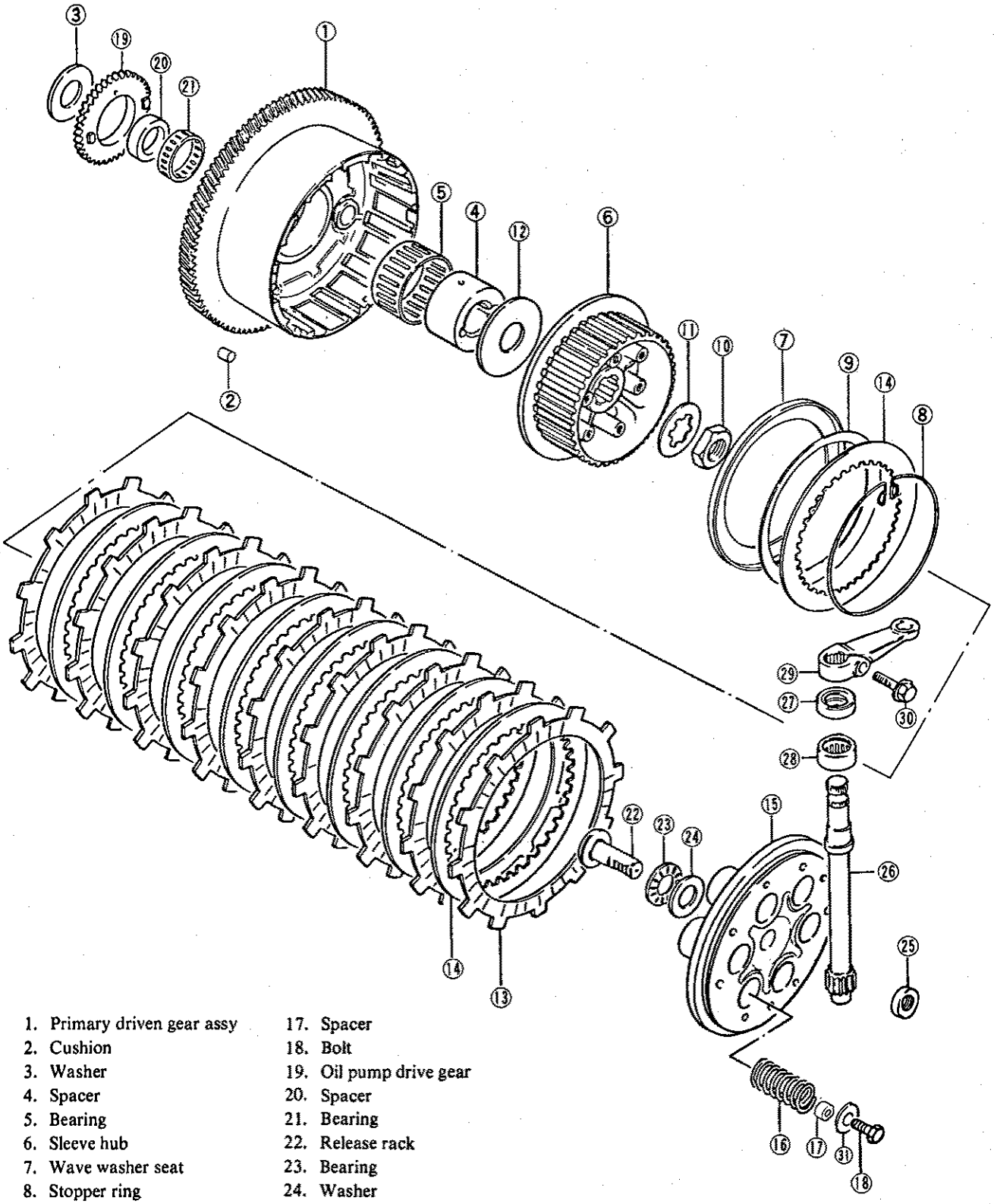
Bolt Tightening Torque	20 — 26 N•m 2.0 — 2.6 kg•m 14.5 — 19.0 ft•lb

- 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

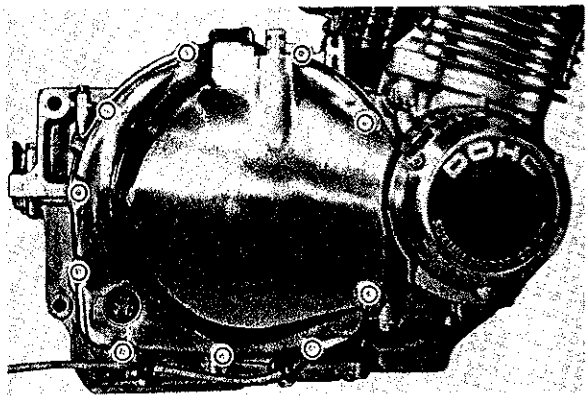


1. Primary driven gear assy
2. Cushion
3. Washer
4. Spacer
5. Bearing
6. Sleeve hub
7. Wave washer seat
8. Stopper ring
9. Wave washer
10. Nut
11. Washer
12. Washer
13. Drive plate
14. Driven plate
15. Pressure plate
16. Spring
17. Spacer
18. Bolt
19. Oil pump drive gear
20. Spacer
21. Bearing
22. Release rack
23. Bearing
24. Washer
25. Oil seal
26. Release pinion
27. Oil seal
28. Bearing
29. Release arm
30. Bolt
31. Washer

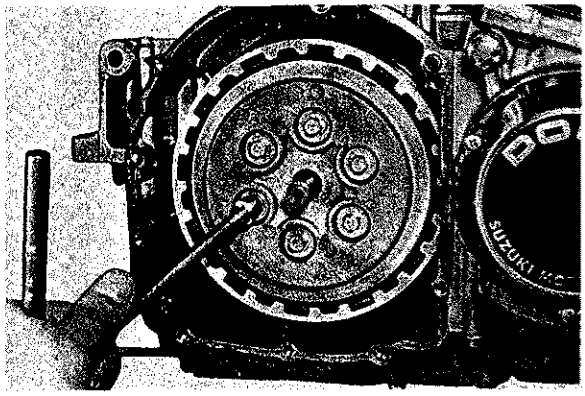
Tightening torque			
	N·m	kg·m	lb·ft
⑩	50 — 70	5.0 — 7.0	36.0 — 50.5
⑱	8 — 12	0.8 — 1.2	6.0 — 8.5
㉚	6 — 10	0.6 — 1.0	4.5 — 7.0

DISASSEMBLY

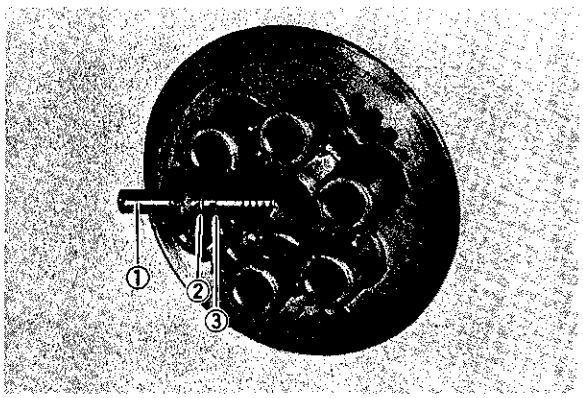
- Remove the cam lever bolts for clutch cable and clutch cover screw.



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

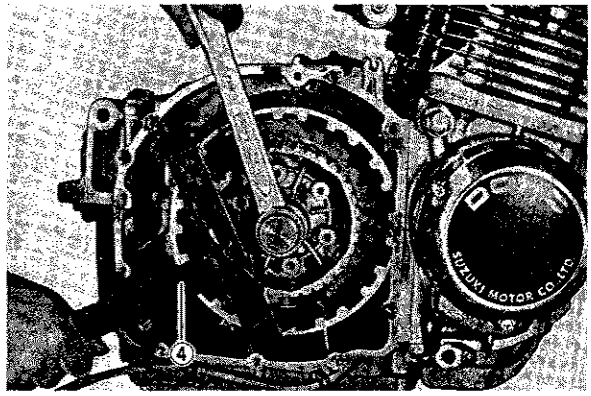


- Remove clutch release rack ①, needle bearing ② and washer ③ from pressure plate.

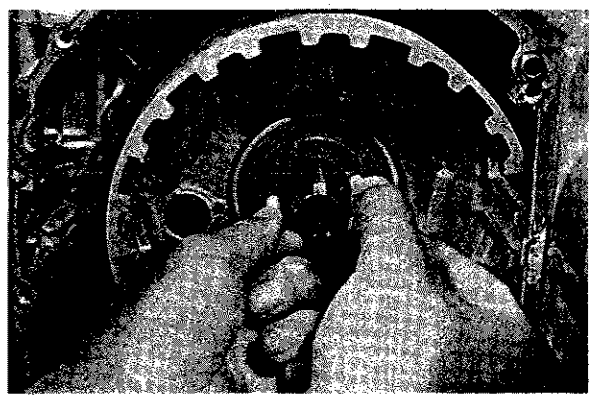


- After removal of several clutch drive and driven plates, firmly secure clutch sleeve hub to remove mounting nut with special tool ④.

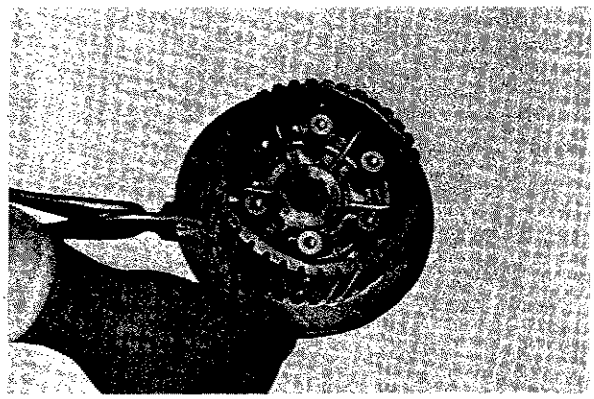
Clutch sleeve hub holder:	09920-53710



- 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.

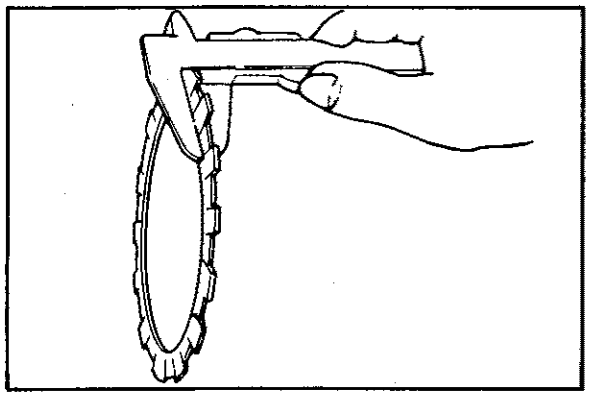


INSPECTION

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)



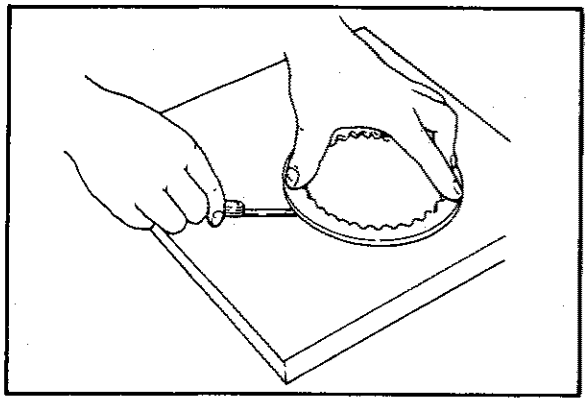
CLUTCH PLATE DISTORTION

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.

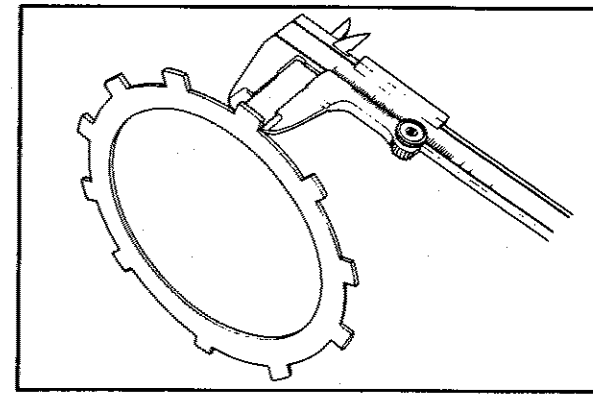


DRIVE PLATE CLAW WIDTH

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)

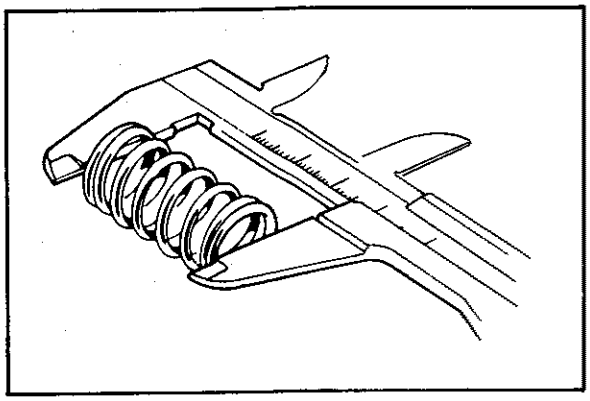


CLUTCH SPRING FREE LENGTH

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.

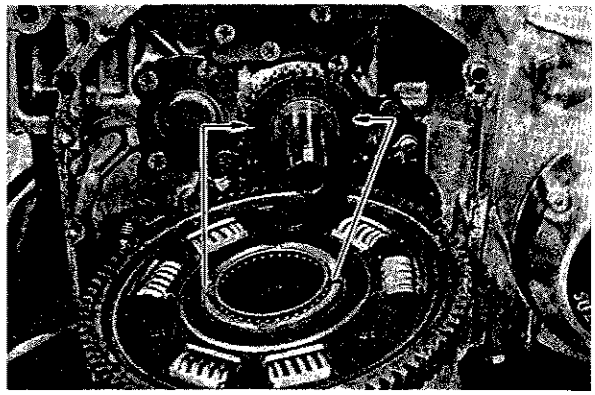
Clutch spring free length

Limit	38.5 mm (1.52 in)

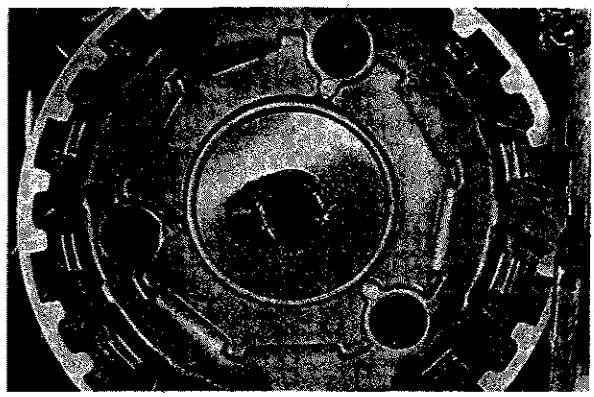


INSTALLATION

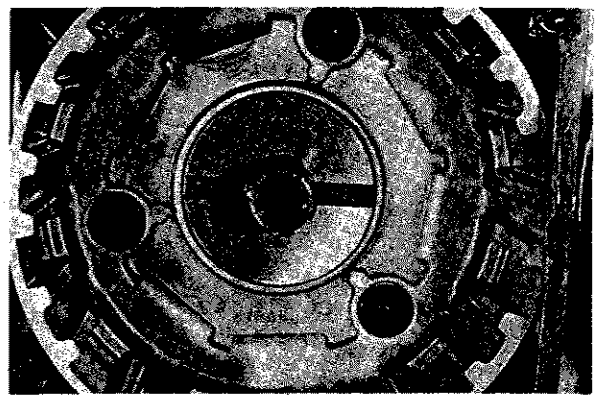
- Fit the projection of oil pump drive gear into the notch of primary driven gear and confirm both parts fit snugly while rotating primary driven gear left and right.



- 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.



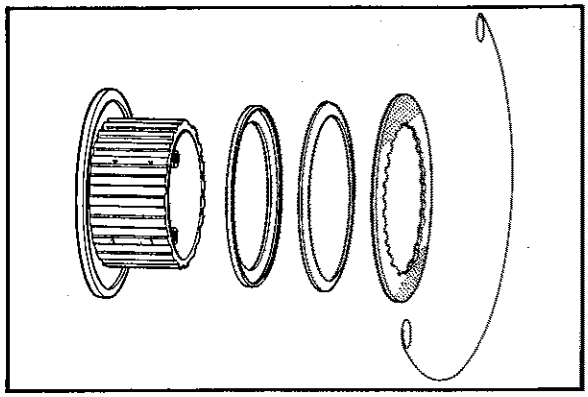
CORRECT



INCORRECT

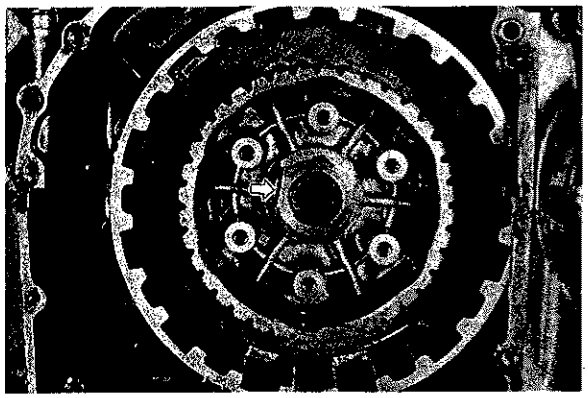
- Install the spring seat, spring and driven plate in the clutch seeve hub. Check that these three parts are positioned correctly as illustrated below.
  While holding the driven plate with pliers, install the piano wire clip.

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

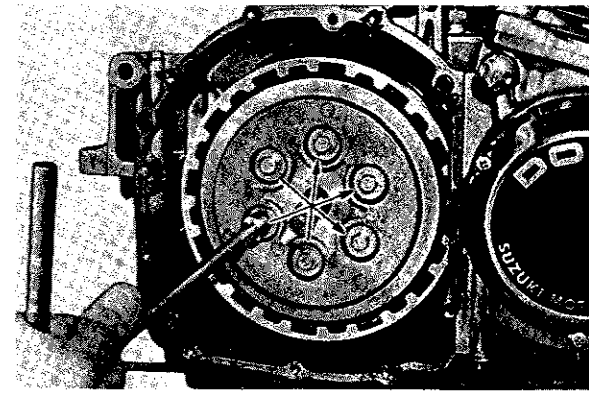


- Insert clutch drive plate and driven plate one by one into sleeve hub in the prescribed order. Insert clutch release rack, bearing and thrust washer into pressure plate, making sure that the thrust washer is between the bearing and the pressure plate, then fit pressure plate into sleeve hub.

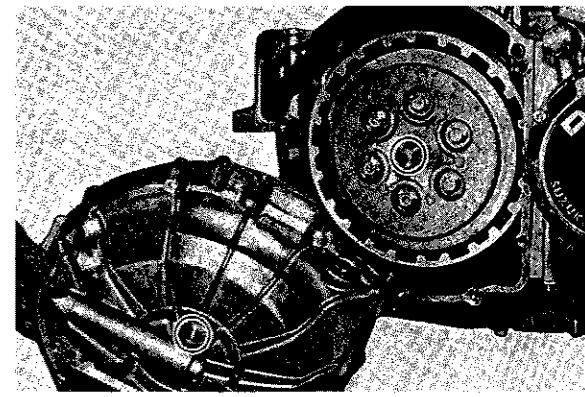
- Tighten clutch spring bolts in the order shown in the photo.

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



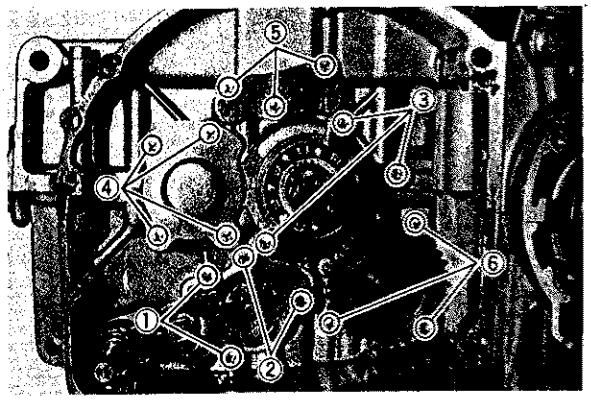
- Replace clutch cover gasket with new one to prevent oil leakage.
- Engage the teeth of clutch release rack with those of pinion gear at the clutch cover side and replace clutch cover. Make sure that the rack and pinion gear engage positively.
  To install cover, tap lightly with plastic hammer and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



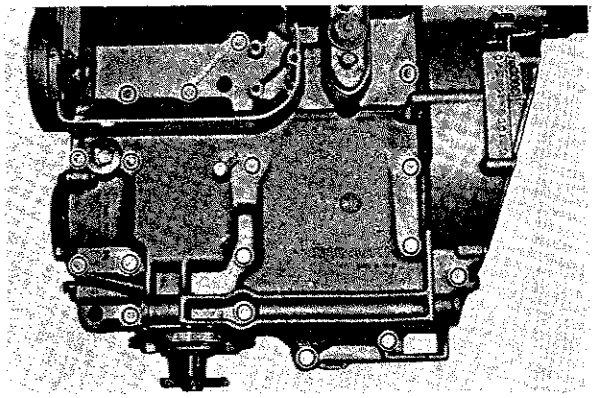
CRANKCASE

DISASSEMBLY

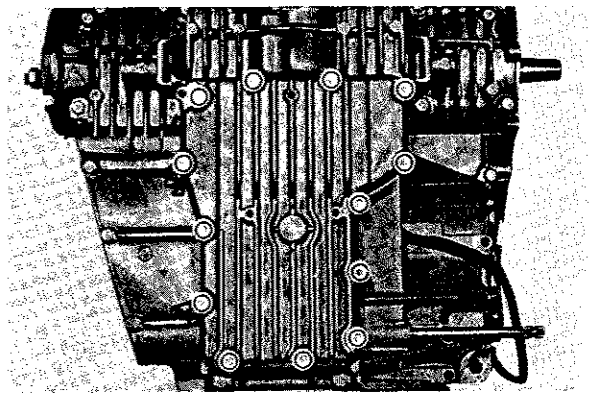
- Remove the cylinder head cover and cylinder head assembly.
- Remove the cylinder and four pistons
- Remove the clutch cover and then remove the clutch assembly.
- Remove the signal generator cover and then remove the signal generator and timing plate.
- Remove the generator cover and then generator 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)



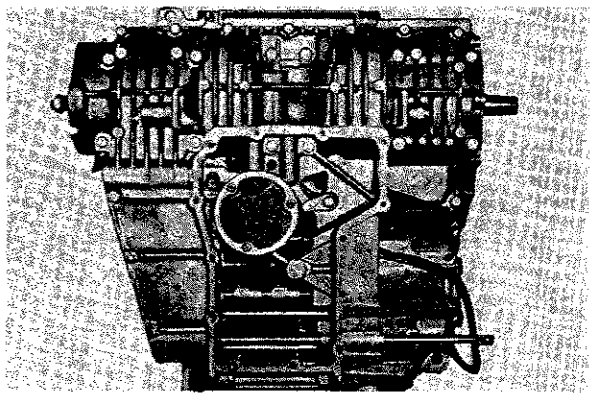
- Remove the gear shifting shaft and then cam driven gear shifting pawls No. 1 and No. 2.
- Remove oil pump
- Remove upper crankcase tightening bolts.
  6 mm bolt ..... 12 pcs.
  8 mm bolt ..... 5 pcs.



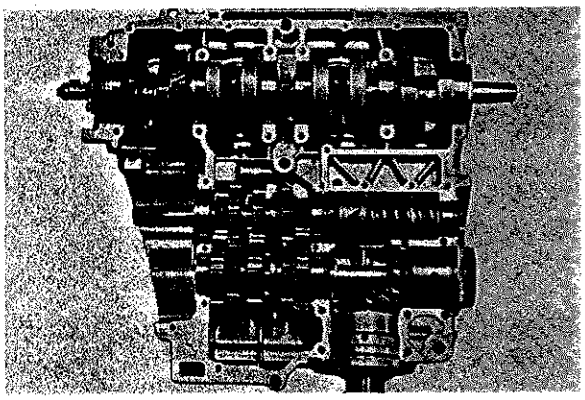
- Next turn engine upside down to remove oil pan from lower crankcase.



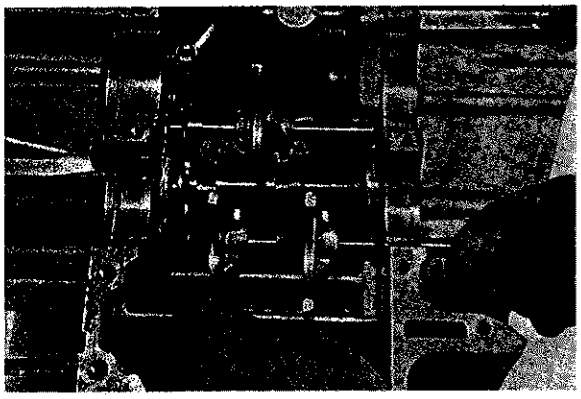
- After removal of oil pan, remove lower crankcase tightening bolts.
  6 mm bolt ..... 9 pcs.
  8 mm bolt ..... 12 pcs.



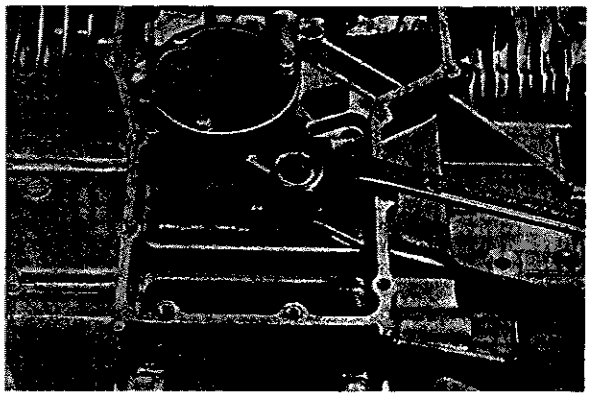
- Make sure that bolts are removed. Lightly hammer the lower crankcase side with a plastic hammer to separate the upper and lower crankcase halves and then lift the latter.
- Remove the crankshaft sub-assembly, counter shaft gear, drive shaft gear, secondary drive bevel gear and secondary driven bevel 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.

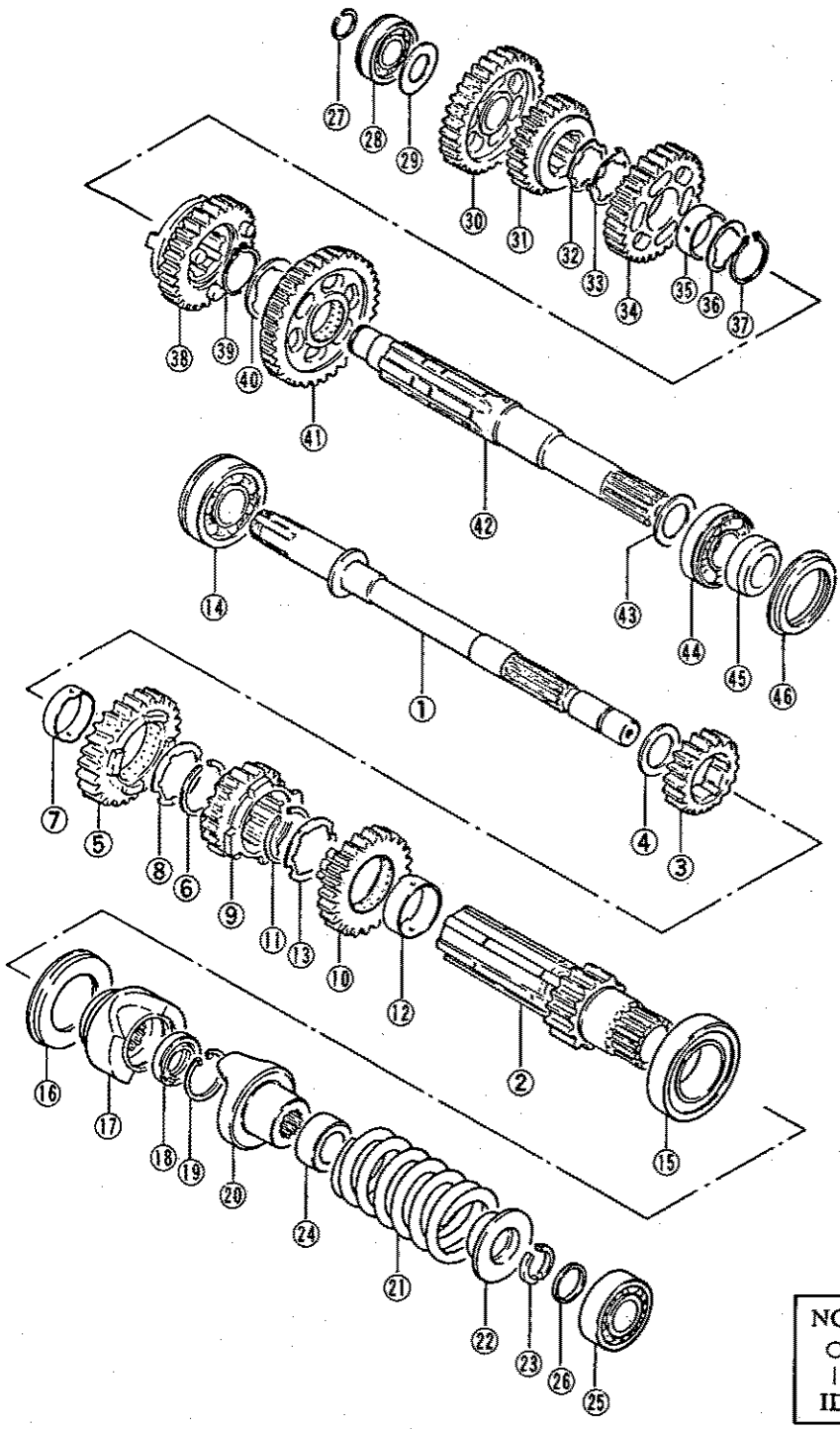


- Remove cam stopper holder to remove cam stopper and spring.



- Extract gear shifting cam to the right side.

TRANSMISSION



NOTE:
O × O × O
| | |
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

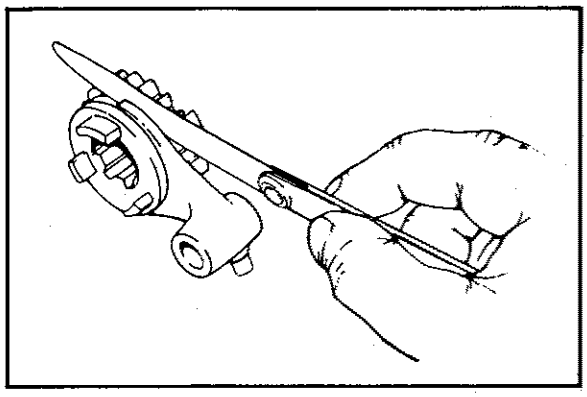
Standard	Limit
0.4 — 0.6 mm (0.016 — 0.024 in)	0.8 mm (0.031 in)

Shift fork groove width

Standard	5.45 — 5.55 mm (0.215 — 0.219 in)

Shift fork thickness

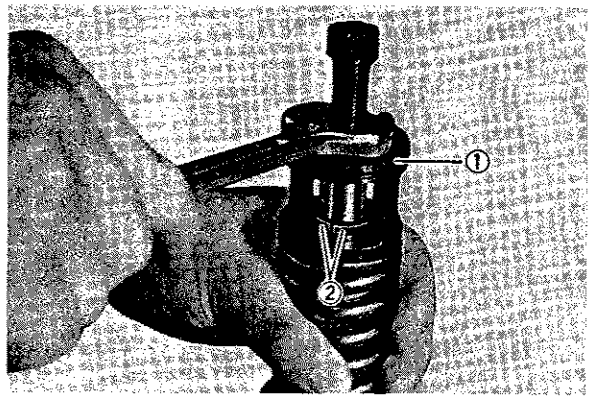
Standard	4.95 — 5.05 mm (0.195 — 0.199 in)



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



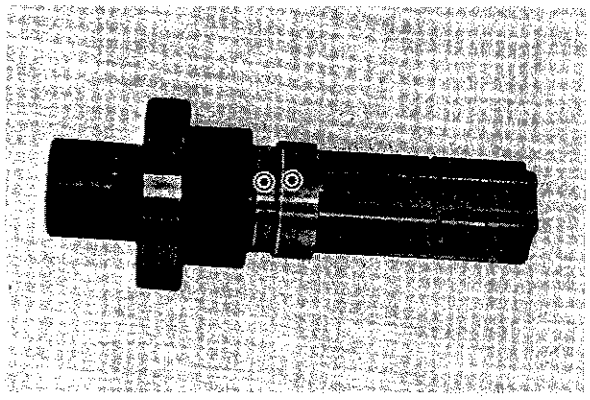
INSTALLATION

Installation is carried out in the reverse order of removal.

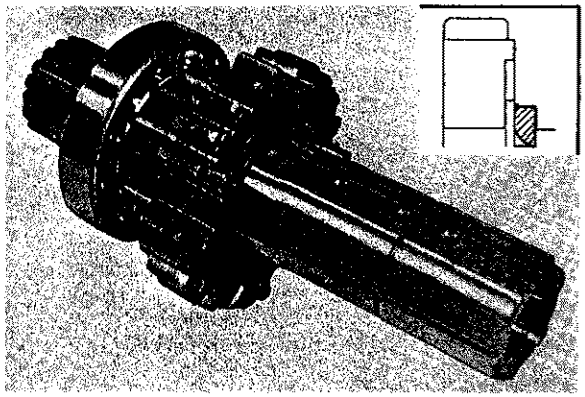
COUNTERSHAFT AND GEARS

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.*

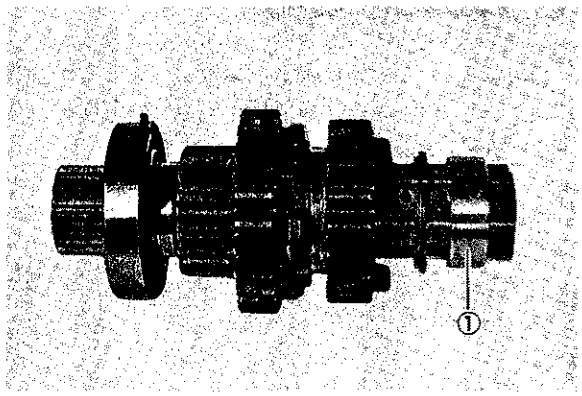
- For gear installation, refer to page 48. (Be sure that the gears, spacers, washers and circlips are correctly mounted facing in the correct direction.)
- Always use new circlips.
- Align the oil hole in the spacer wth that in the outer counter shaft, and mount the spacer on the shaft.



- 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.

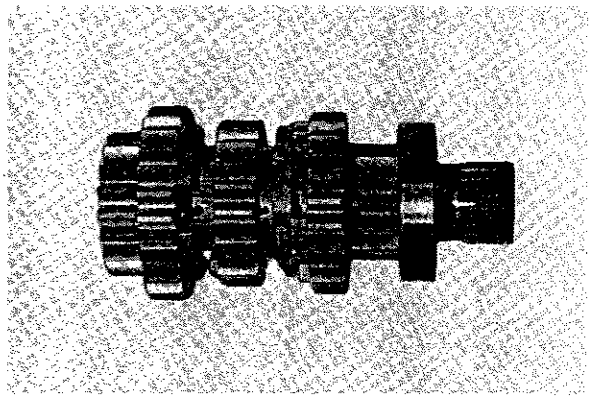


- Before mounting the 5th drive gear on the outer shaft, align the oil hole in the spacer ① with that in the outer shaft.

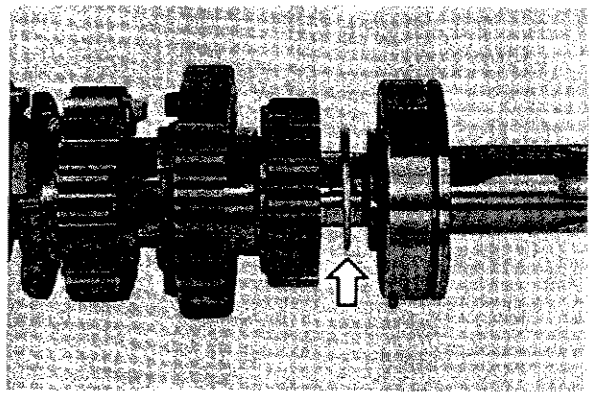


- When installing the 5th drive gear spacer on the outer shaft, be sure that the spacer faces in the correct direction.

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.

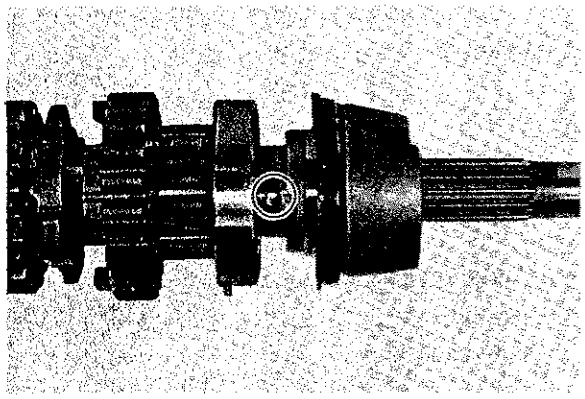


NOTE:
- *Mount the 2nd drive gear on the outer counter shaft, apply SUZUKI MOLY PASTE (99000-25140) to both surfaces of the washer sparingly, and install the washer.*



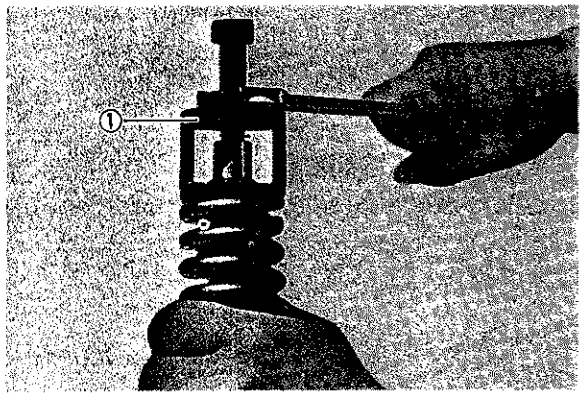
- Now install inner shaft into outer shaft.
- Mount the output cam dog on the outer counter shaft.
  Align the cut on the cam dog with the oil hole in the counter shaft.

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



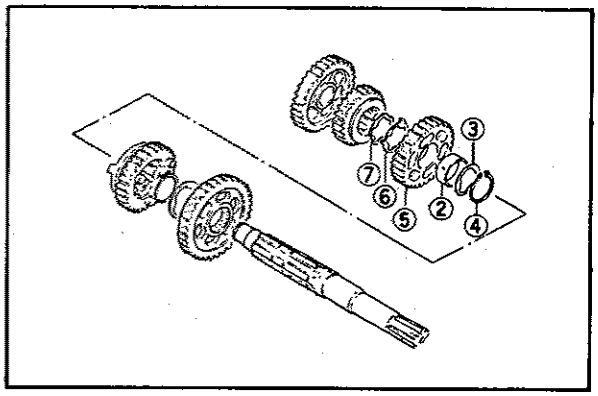
DRIVE SHAFT AND GEARS

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.*

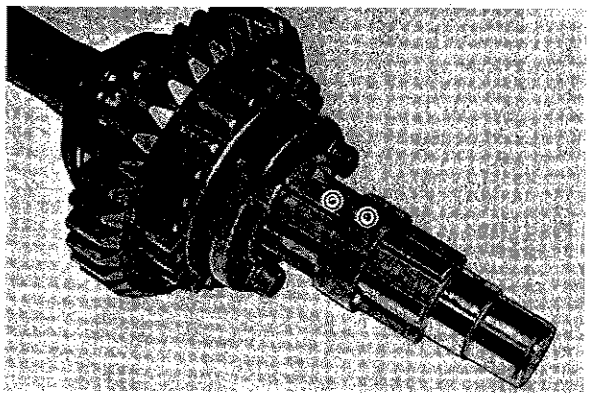
- For gear installation, refer to page 48. (Be sure that the gears, spacer, washers and circlips are correctly mounted facing in the correct direction.)
- Always use new circlips.

NOTE:
Order of mounting of spacer ②, washer ③, circlip ④, 3rd driven gear ⑤, lock washer ⑥, and washer ⑦.

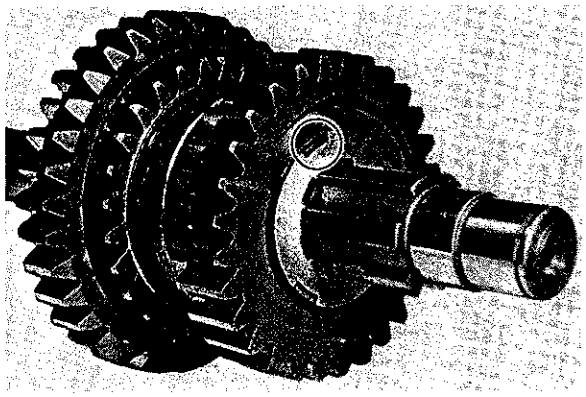
- Mount the circlip ④ and washer ③ on the drive shaft, in that order.
  Temporarily position the circlip beyond the groove.



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

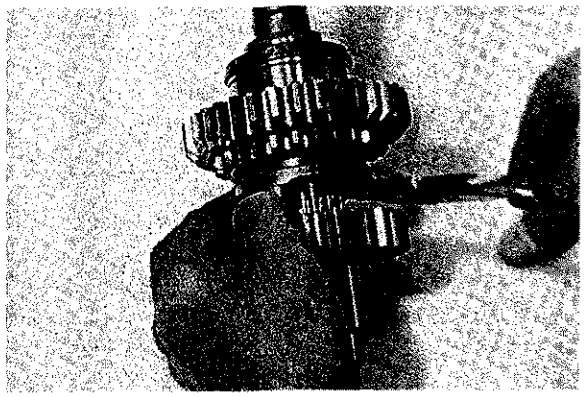


- Mount the lock washer and washer, on the drive shaft, in that order, and by turning the washer in or out, align the lock washer tongue with the cut on the washer.

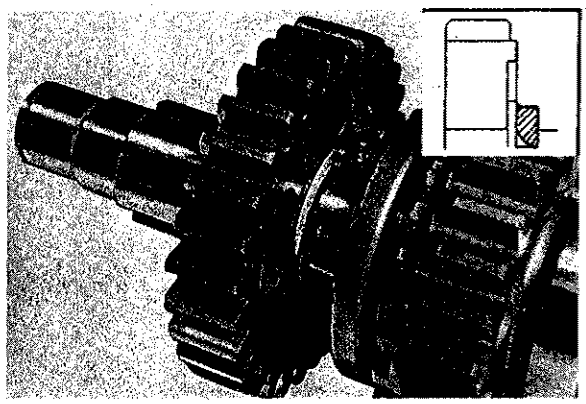


- Fit the circlip in the groove on the driveshaft, using the special tool

Snap ring pliers	09900-06106

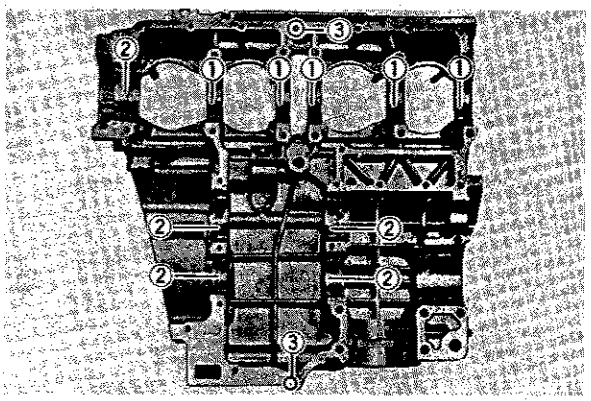


- Take special care so that the circlip is correctly installed.
  Fit it to the side where the thrust is as shown in the figure.

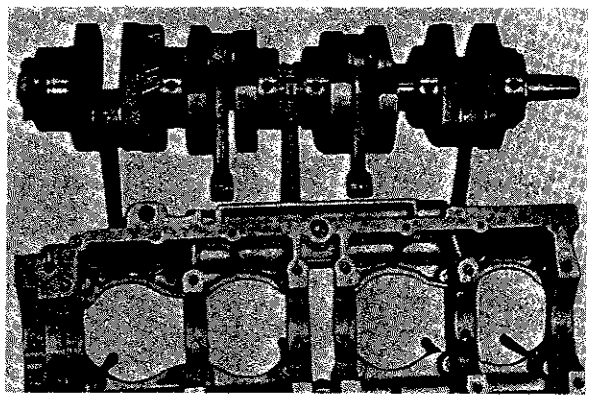


NOTES ON INSTALLATION OF TRANSMISSION GEARS AND CRANKSHAFT IN CRANKCASE

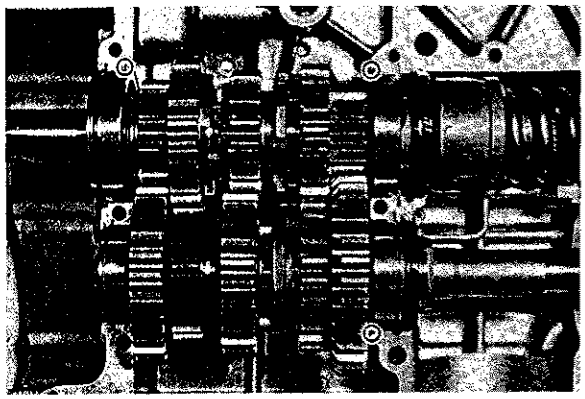
- Thoroughly wash the upper crankcase and the lower crankcase with solvent to remove any sealing compound.
- Firmly insert crankshaft locating "pins" ①, transmission gear locating "C" rings ② for bearings on both sides and locating pin ③.



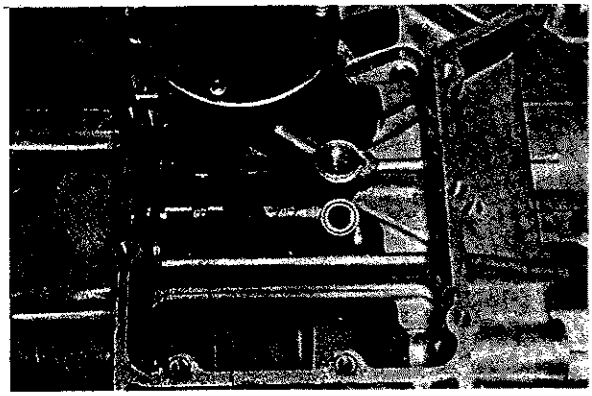
- Mount crankshaft and transmission shaft assemblies on the upper case. At this time firmly fit the bearing races onto the locating pins with punch mark stamped on the circumference of the bearings directed upwards.



- Use the "C" rings and bearings stopper pins to position the bearings as shown in the photo.

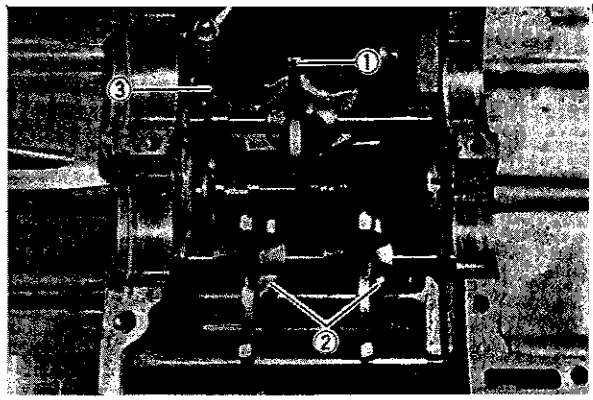


- Insert gear shifting cam into the lower crankcase. Confirm the neutral position of gear shifting cam, mount cam stopper, spring and cam stopper holder and fasten the cam stopper holder.

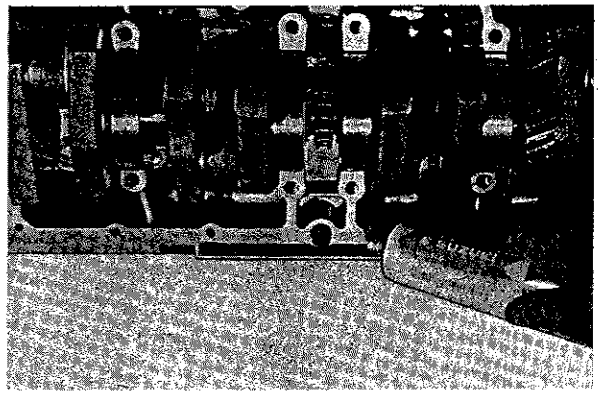


- Insert gear shifting fork shaft from the right side and mount gear shifting fork and cam stopper as shown in the photo.
  At this time, pay attention to the direction of the gear shifting fork.

  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.

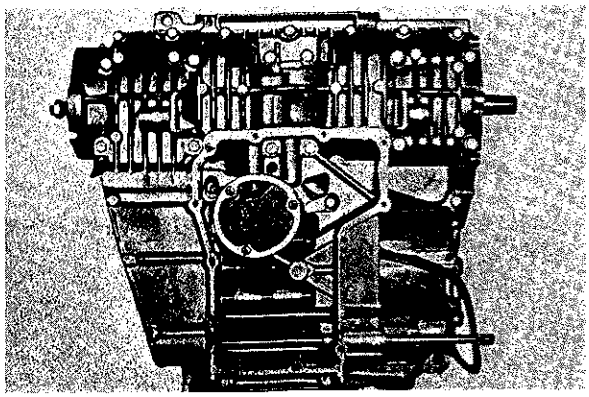


- Place the lower crankcase on the upper crankcase housing the transmission gears and crankshaft. Align shift forks into gears.
- Fasten together the upper and lower crankcase halves using the crankcase fastening bolts.

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.

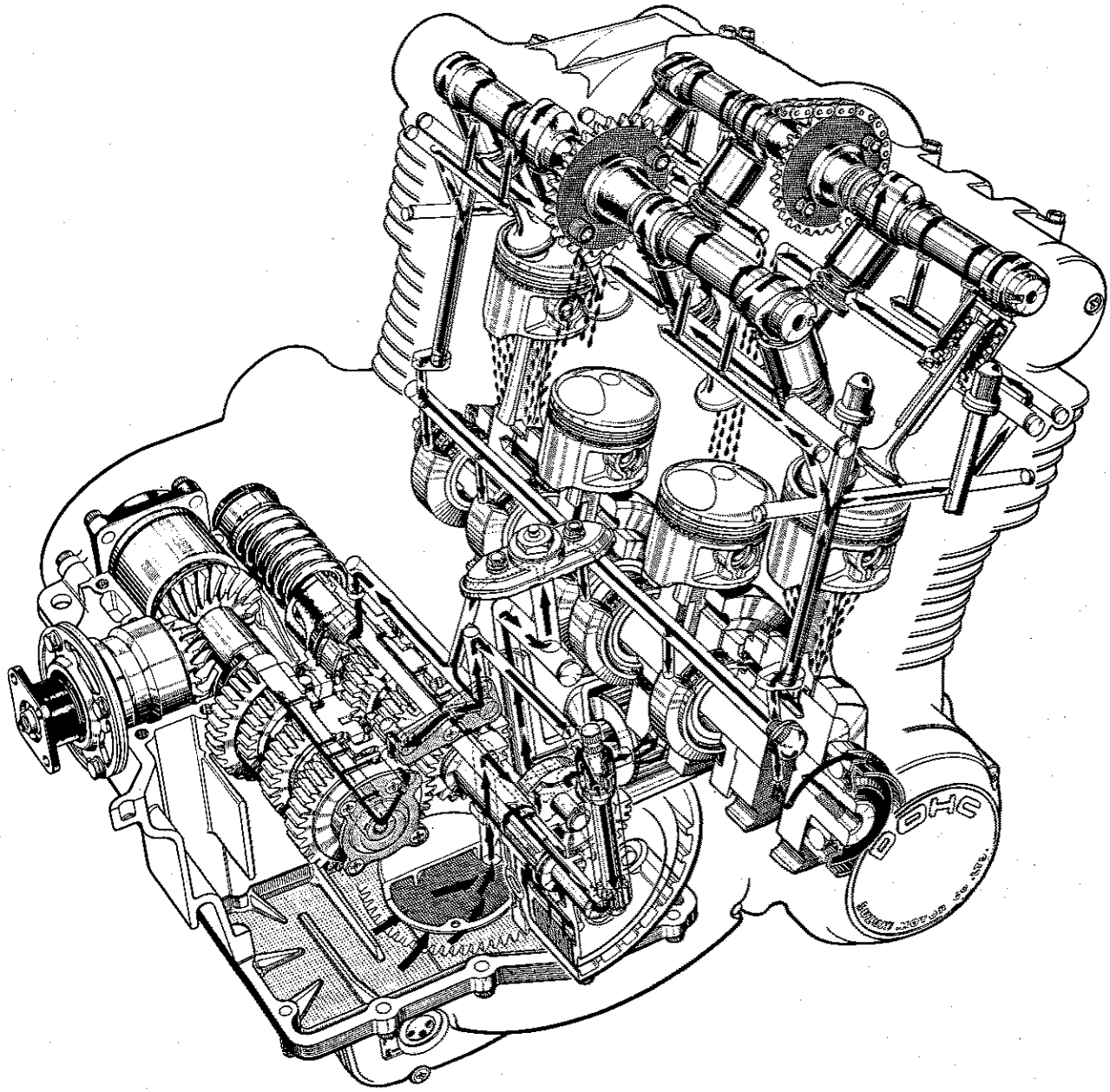
6 mm bolt ..... 12 pcs.
8 mm bolt ..... 5 pcs.

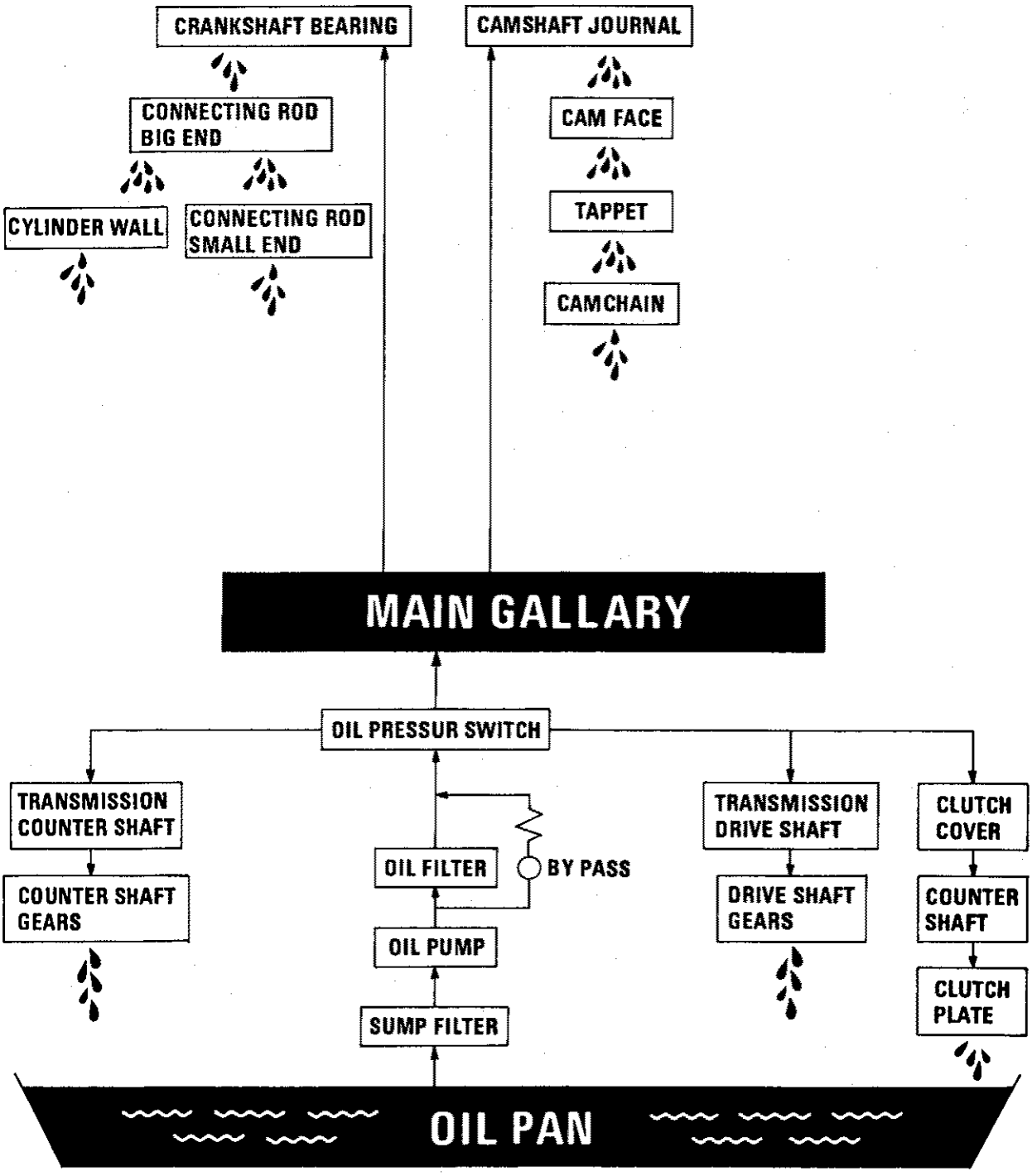
Tightening torque for 6 mm bolts	6 — 10 N•m 0.6 — 1.0 kg•m 4.5 — 7.0 lb•ft
Tightening torque for 8 mm bolts	18 — 22 N•m 1.8 — 2.2 kg•m 13.0 — 16.0 lb•ft

NOTE:

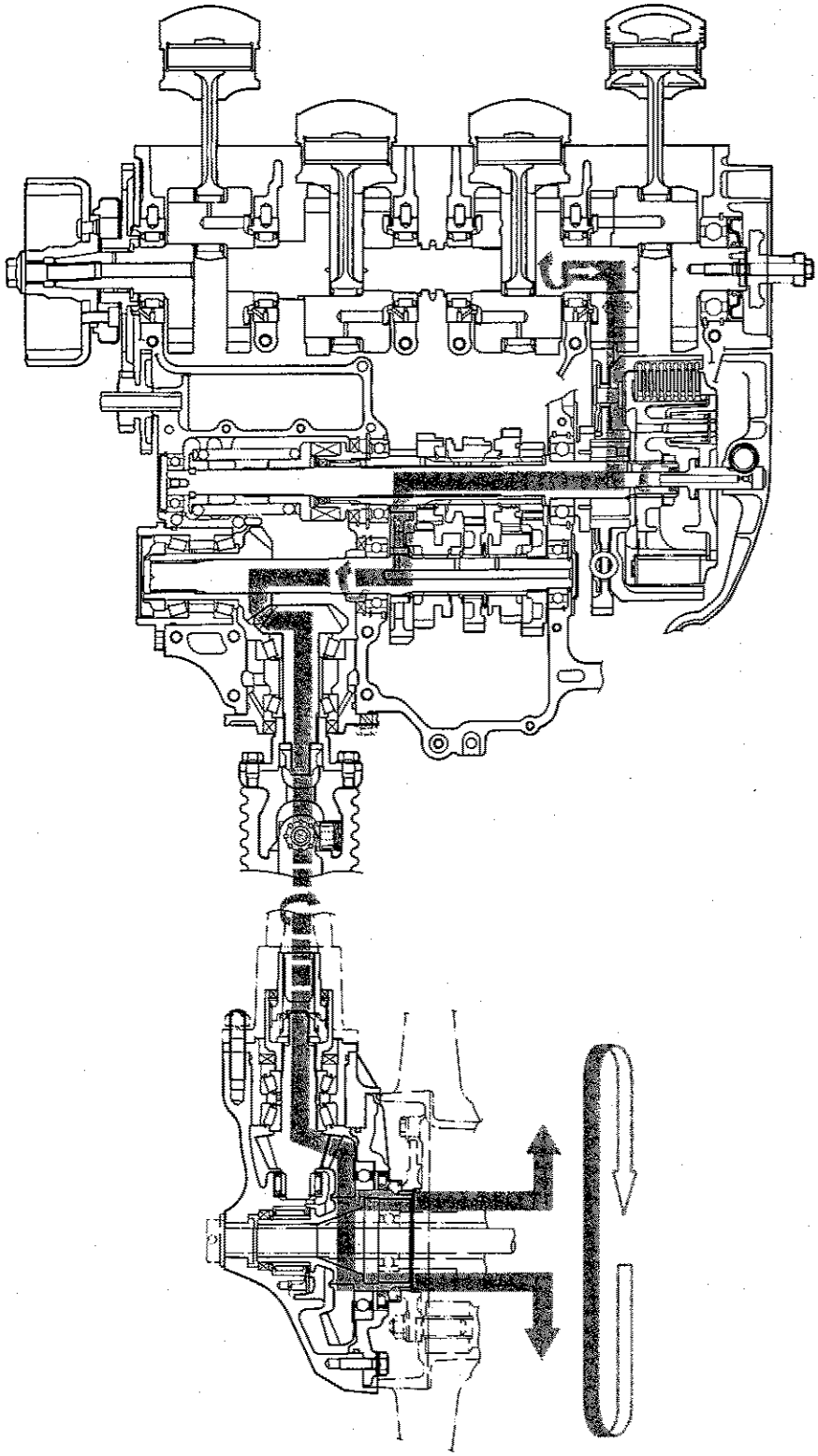
- *When the secondary bevel gear is installed, the offset at the mating surfaces of the crankcase halves, upper and lower, should be 0.1 mm or less.*
- *Thoroughly wipe off any overflow of the sealing compound applied to the mating surfaces of crankcase before installing the secondary bevel gear assemblies.*
  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.*

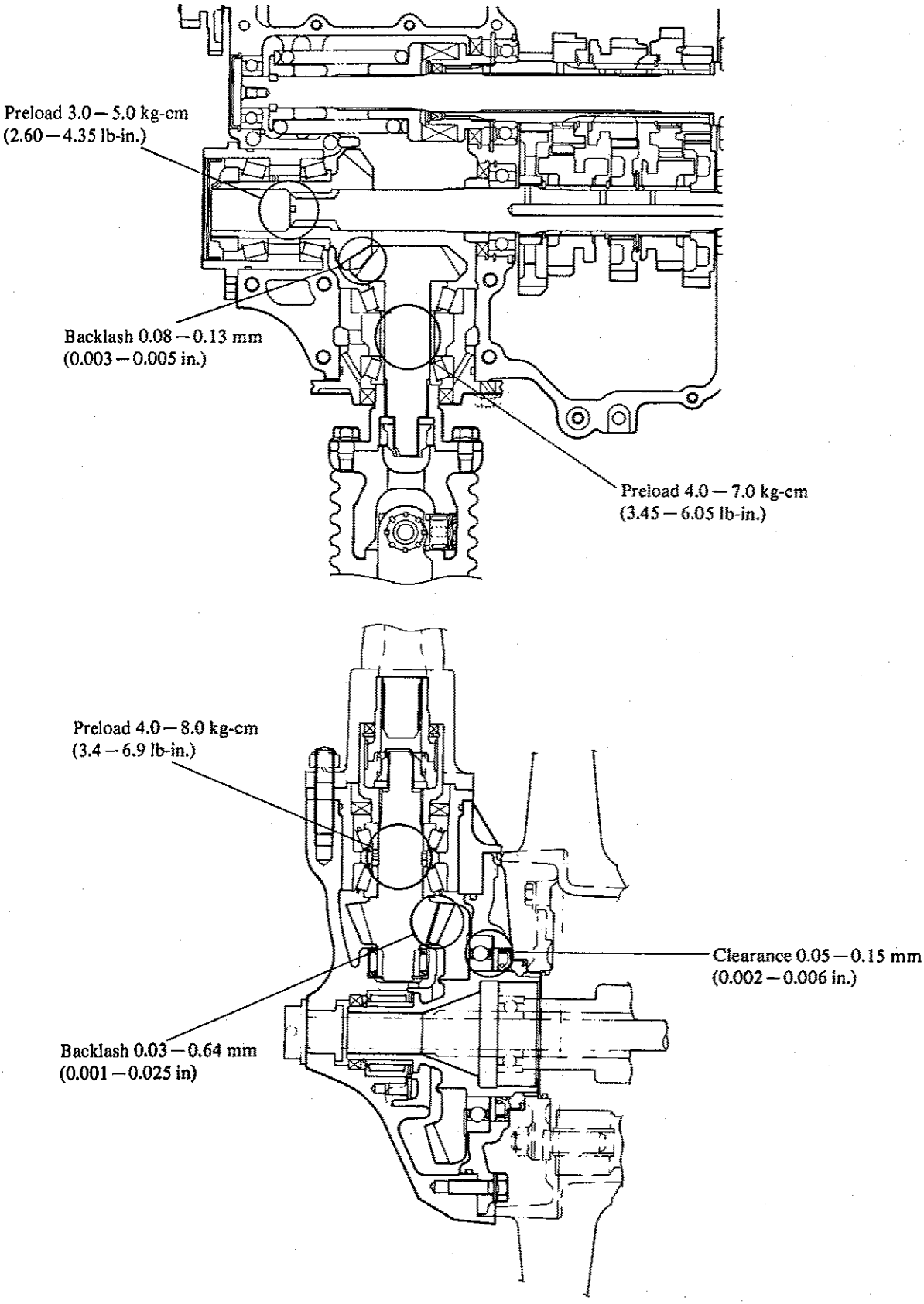
LUBRICATION SYSTEM



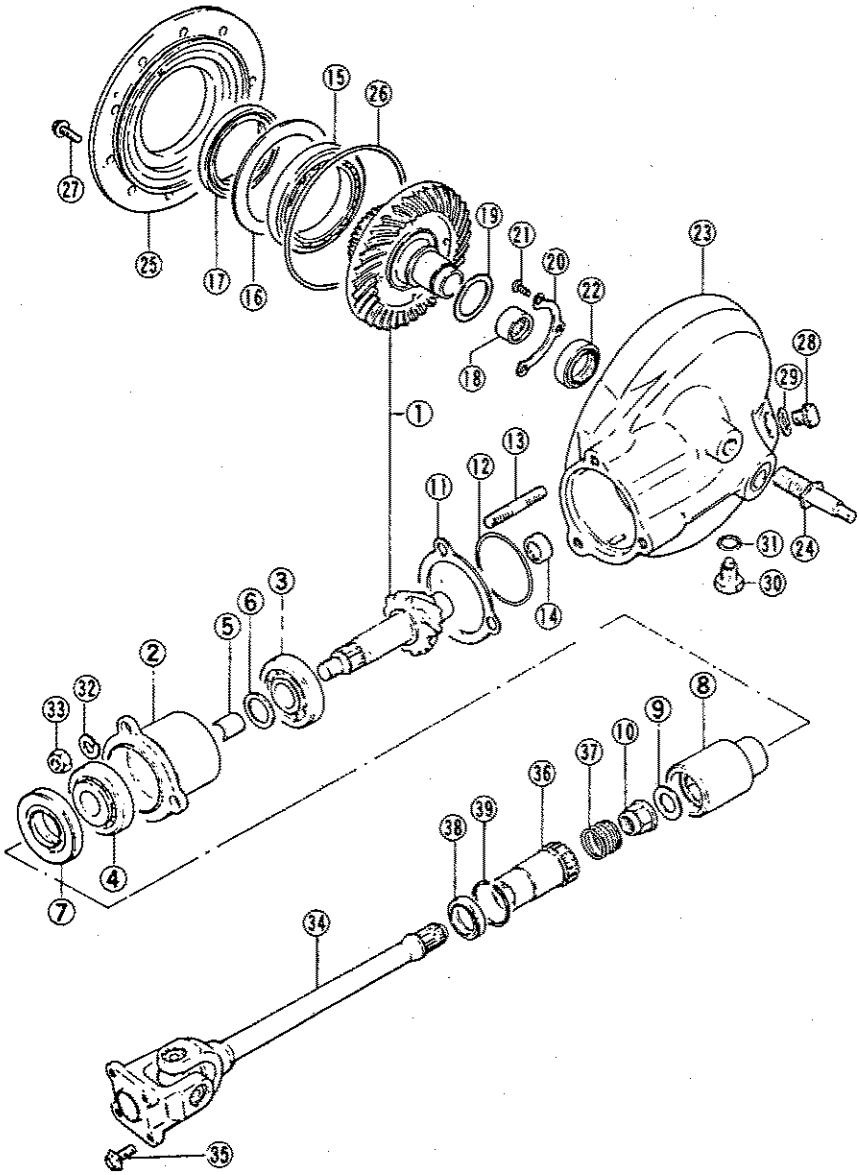

CRANKSHAFT BEARING
CAMSHAFT JOURNAL
CONNECTING ROD BIG END
CAM FACE
TAPPET
CYLINDER WALL
CONNECTING ROD SMALL END
CAMCHAIN
MAIN GALLARY
OIL PRESSUR SWITCH
TRANSMISSION COUNTER SHAFT
TRANSMISSION DRIVE SHAFT
CLUTCH COVER
OIL FILTER
BY PASS
COUNTER SHAFT GEARS
DRIVE SHAFT GEARS
COUNTER SHAFT
OIL PUMP
CLUTCH PLATE
SUMP FILTER
OIL PAN

SHAFT DRIVE



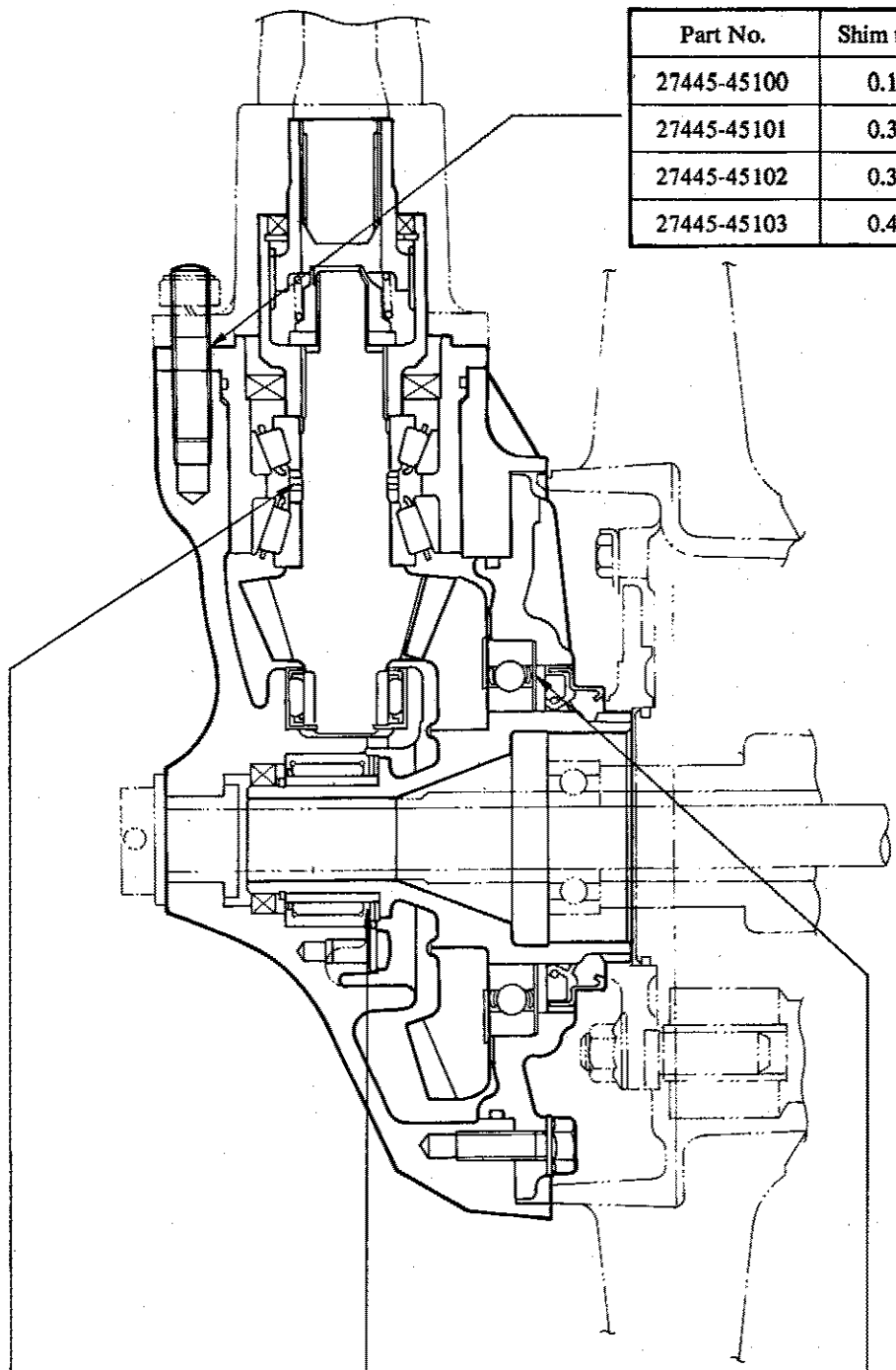

Preload 3.0 – 5.0 kg-cm
(2.60 – 4.35 lb-in.)
Backlash 0.08 – 0.13 mm
(0.003 – 0.005 in.)
Preload 4.0 – 7.0 kg-cm
(3.45 – 6.05 lb-in.)
Preload 4.0 – 8.0 kg-cm
(3.4 – 6.9 lb-in.)
Clearance 0.05 – 0.15 mm
(0.002 – 0.006 in.)
Backlash 0.03 – 0.64 mm
(0.001 – 0.025 in)

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

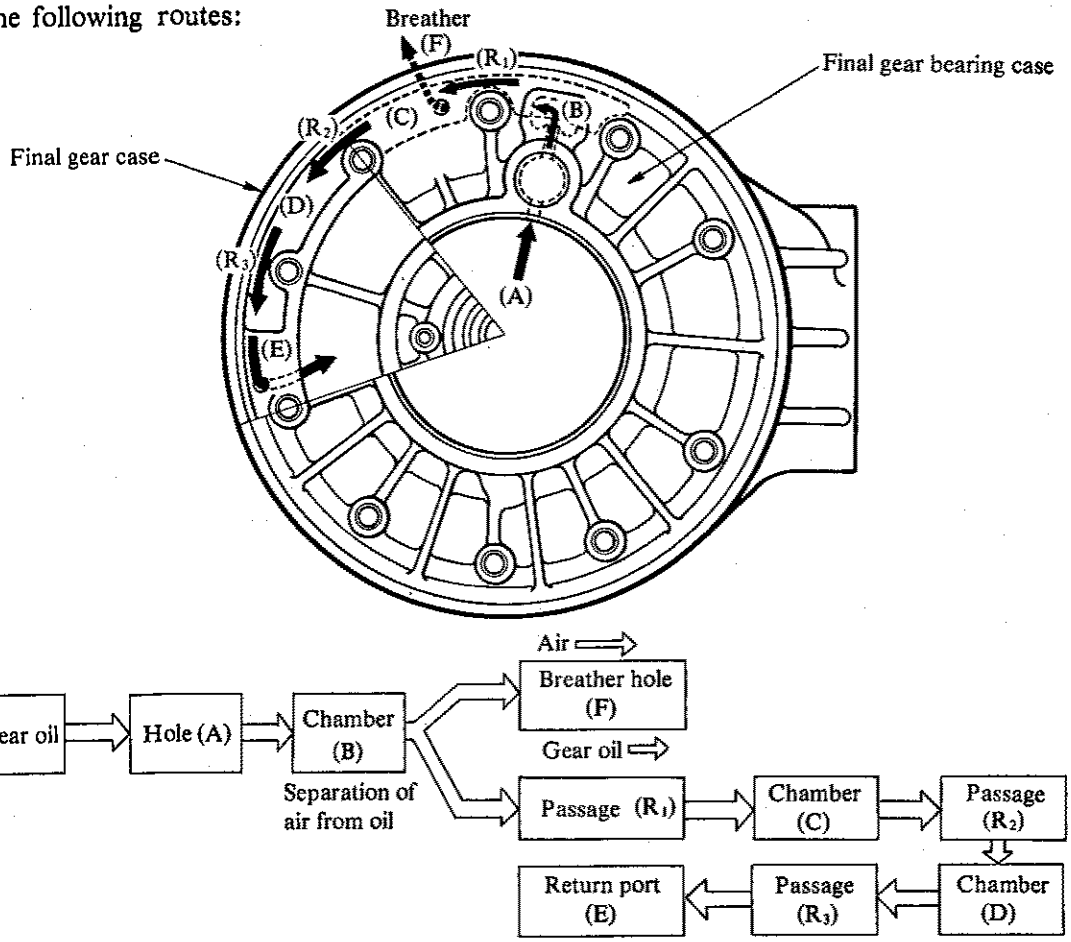
Part No.	Shim thickness
27327-45100	0.35 mm
27327-45102	0.40 mm
27327-45103	0.50 mm
27327-45104	0.60 mm

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.

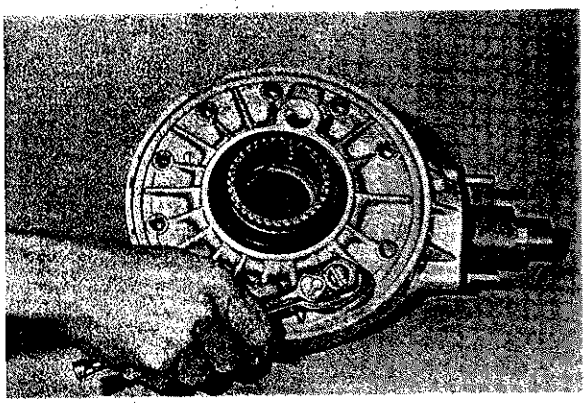
- In this case, the gear oil, which has flown into hole (A), goes into chamber (B), where the oil is separated from the air.
- Then, the air flows through the gap between rib (R_1) and bearing case and goes out through the breather.
- On the other hand, the gear oil, when the gear case pressure is higher 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

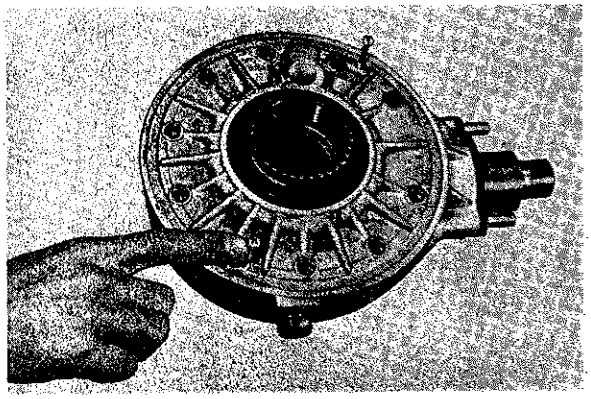
REMOVAL AND DISASSEMBLY

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.

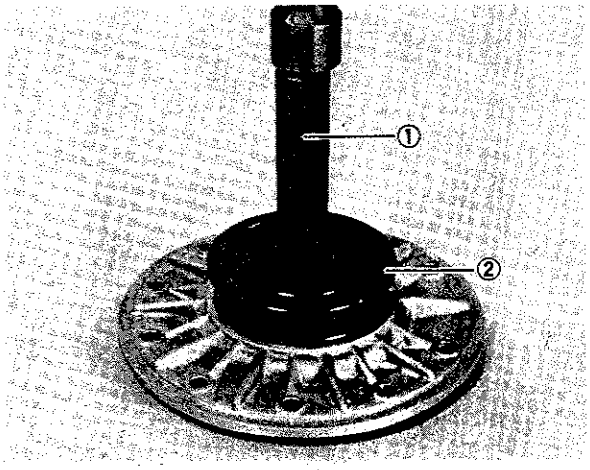


- To remove the final gear bearing cover from the housing, use two 6 mm screws; screw them into the holes provided and draw the cover off evenly.



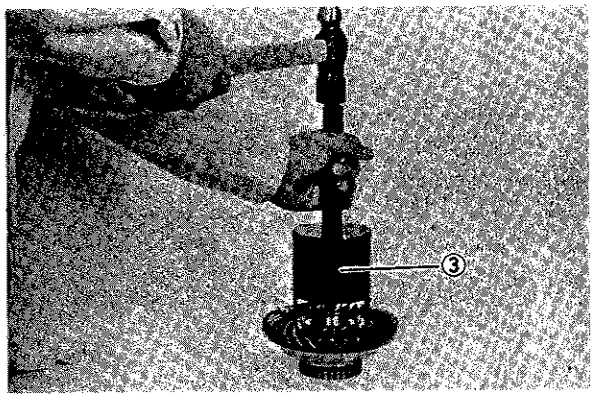
- Using special tools ① and ②, remove the oil seal from the final gear bearing case.

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

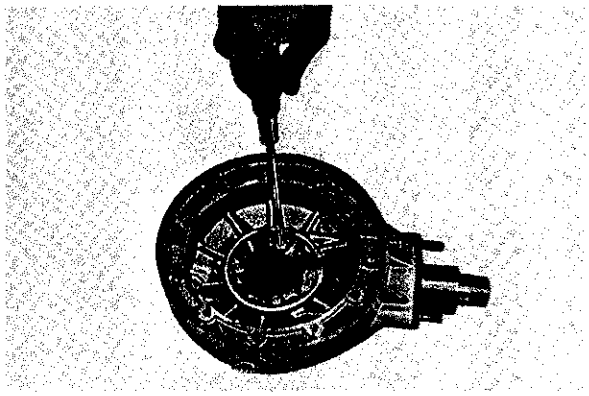


③	Final driven gear bearing installer and remover	09924-74570

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



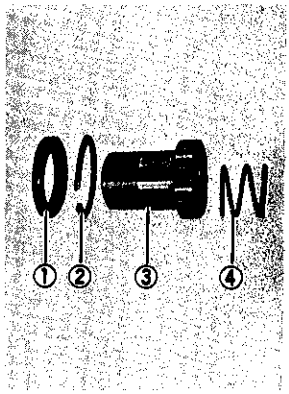
- Remove the three screws and bearing retainer, and shims from the final gear case.

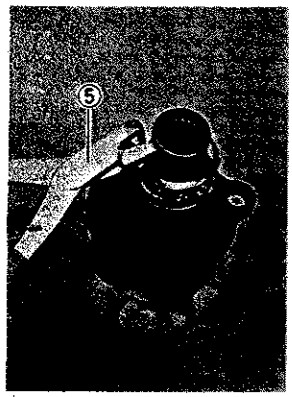


- Remove the final drive gear housing from the final gear case.
- Remove the oil seal ①, circlip ②, propeller shaft coupling ③, and spring ④ from the final drive gear coupling.

⑤	Snap ring plier	09900-06108

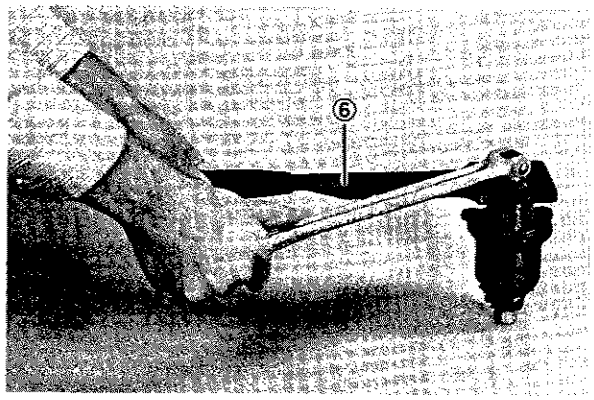
NOTE:
To remove the circlip ②, it will be necessary to push the propeller shaft coupling inwards, to remove spring pressure from the circlip.



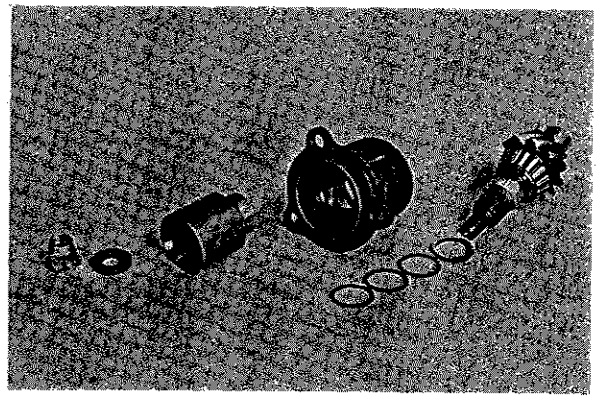


- Straighten the bent portion of the final drive gear nut. Use special tool ⑥ to hold the coupling, and remove the nut.

⑥	Final drive gear coupling holder	09924-64510

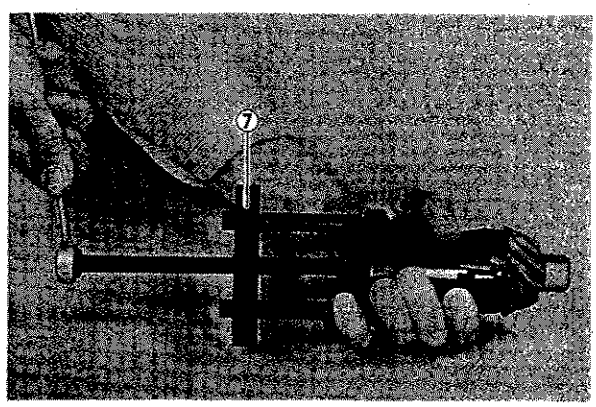


- Remove the washer and coupling, and tap the drive gear shaft with a plastic hammer to remove it from housing. Do not lose the shims and spacer on the final drive gear shaft.



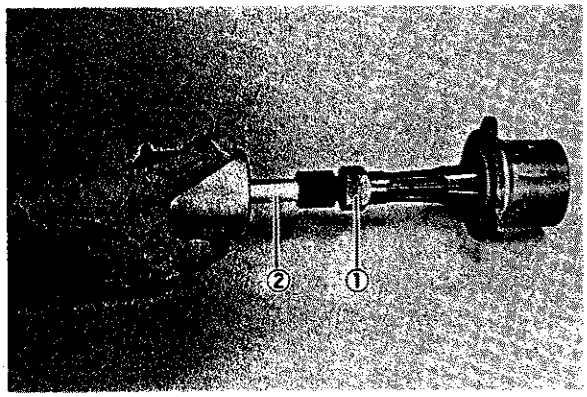
- To remove the inner bearing race from the drive gear shaft, use special tool ⑦.

⑦	Bearing inner race remover	09941-84510



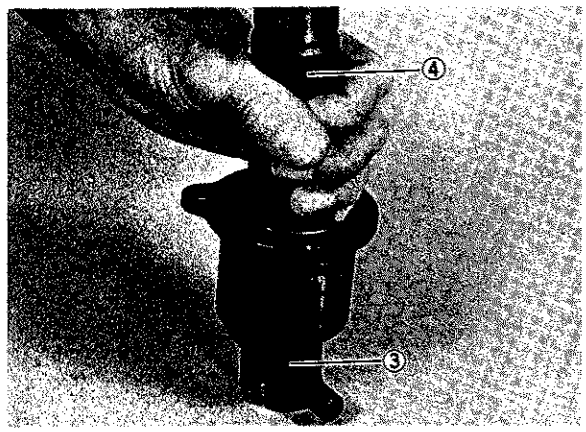
- To remove the oil seal from the housing, use special tools ① and ②.

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



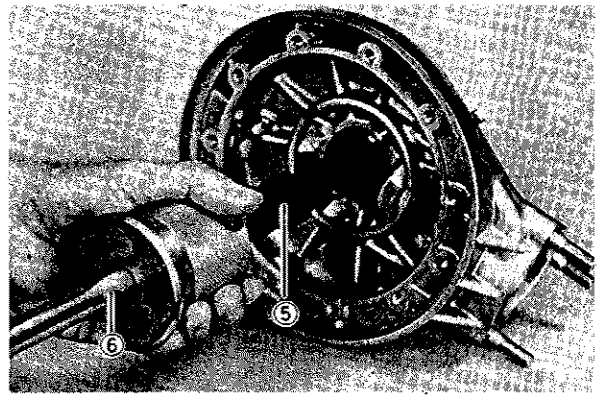
- To remove the outer bearing races from the housing, use special tools ③ and ④ and a hammer.

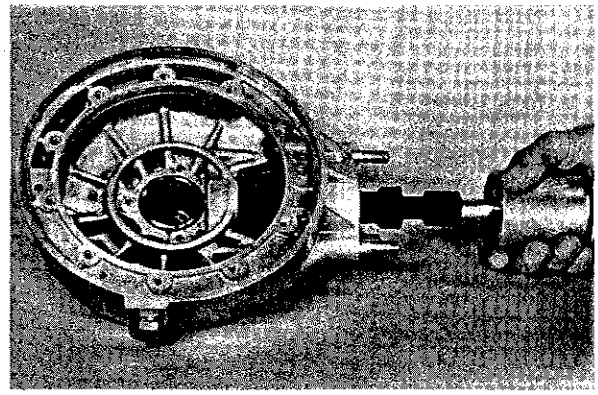
③	Bearing Outer Race Remover	09941-54911
④	Bearing Installer	09913-84510



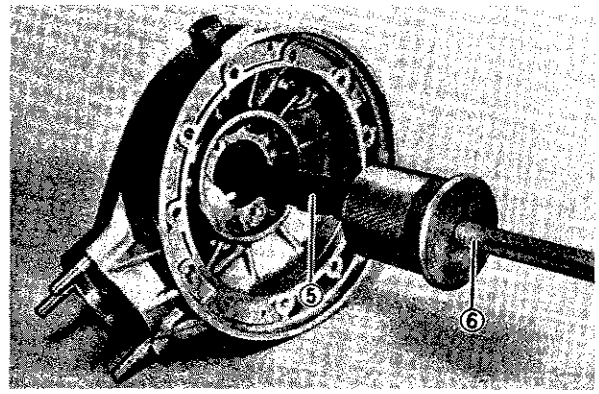
- To remove the two needle roller bearings from the final gear case, use special tools ⑤ and ⑥.

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.

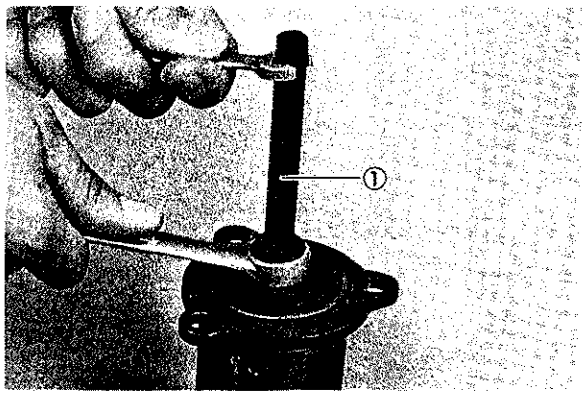
INSPECTION AND REASSEMBLY

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.

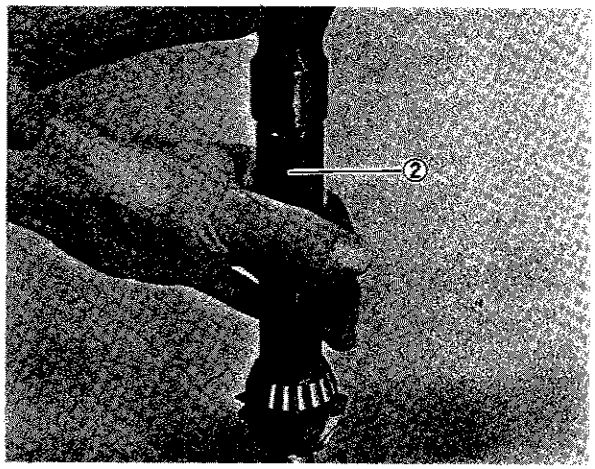
①	Bearing installer set	09924-84510



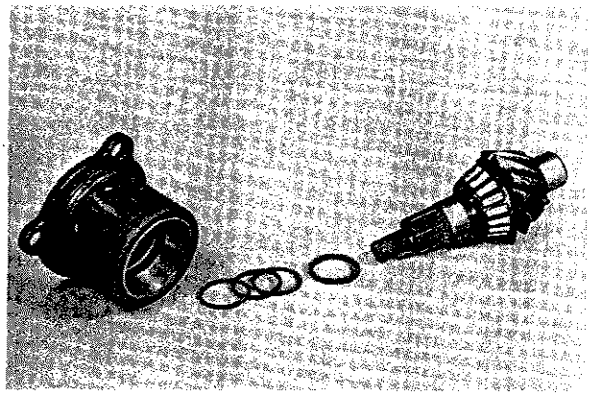
- To install the inner bearing race onto the final drive gear shaft, use special tool ②.

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.

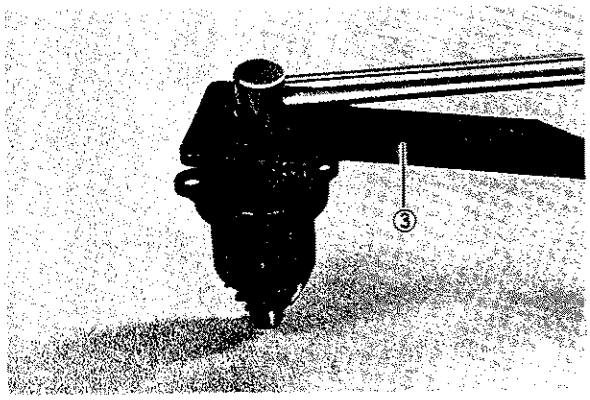
NOTE:
Always use a new nut.

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



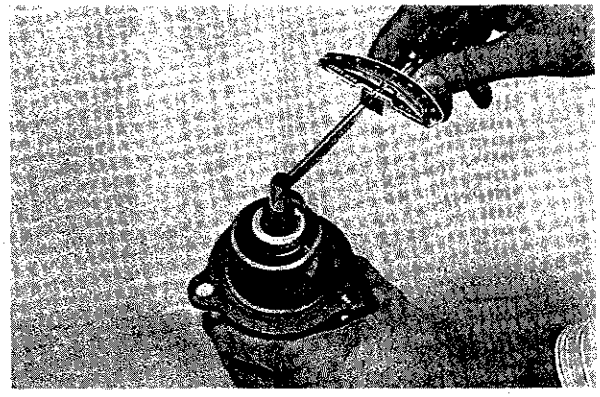
FINAL DRIVE GEAR PRELOAD ADJUSTMENT

- 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

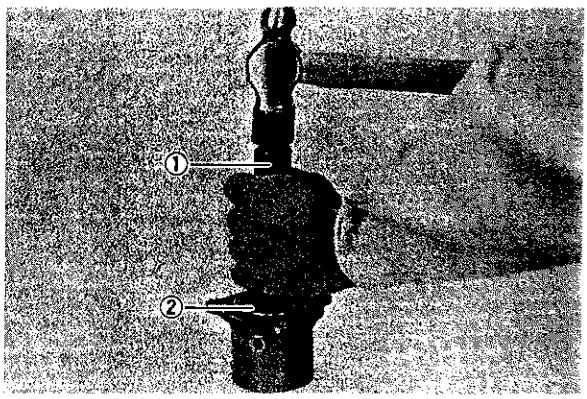
- Re-torque the final drive gear nut to specification, and re-check the preload measurement until it is correct.

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



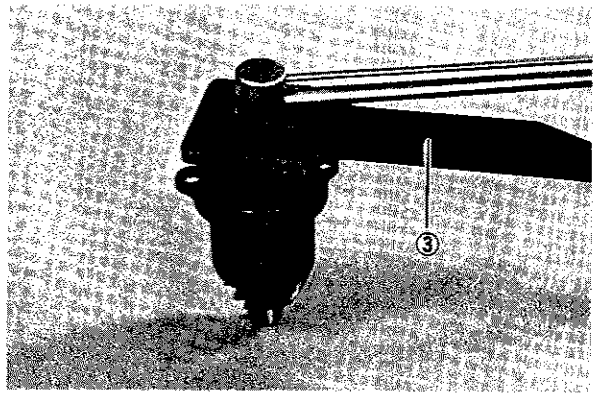
- Liberally coat the bearings with Hypoid gear oil and reinstall the final drive gear into the housing.

- 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.

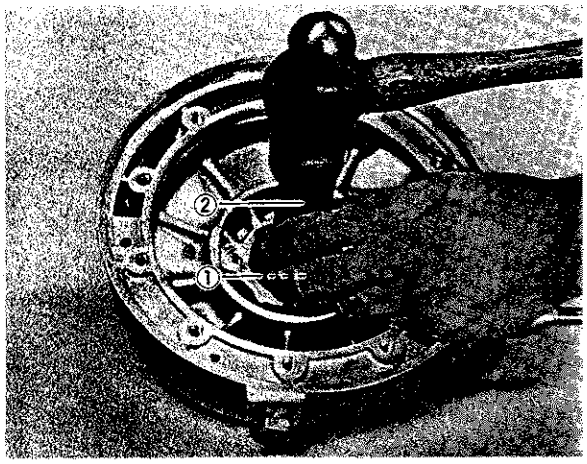
FINAL DRIVEN GAER ASSEMBLY

- 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.

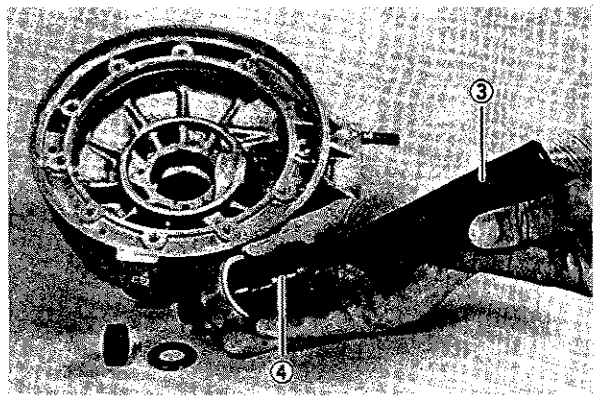
NOTE:
Always use a new oil seal.



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

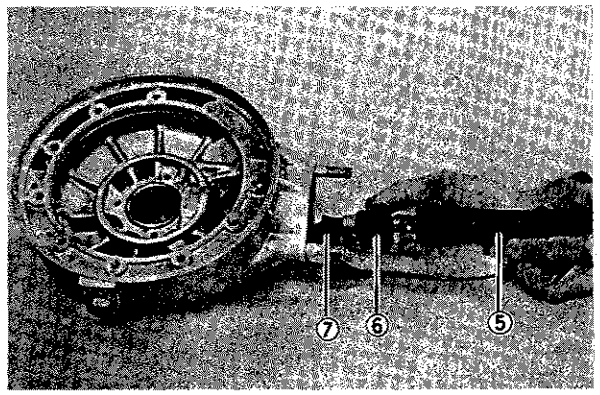
CAUTION:
The bearing case has a stamped mark on one end, which must face inside.

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



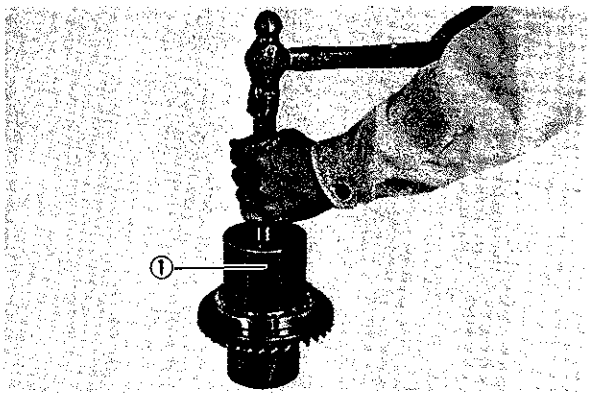
- Install the driven gear needle bearing retainer plate. Use THREADLOCK "1363C" on the screws, and tighten to specification.

99104-32050	Thread Lock "1363C"

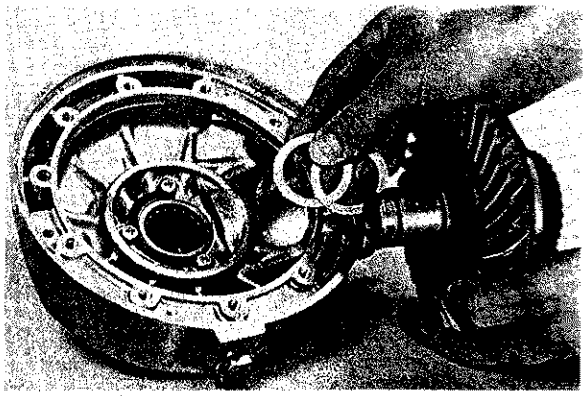
Screw tightening torque	8.0 — 10.0 N•m 0.8 — 1.0 kg•m 6.0 — 7.5 lb•ft

- 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

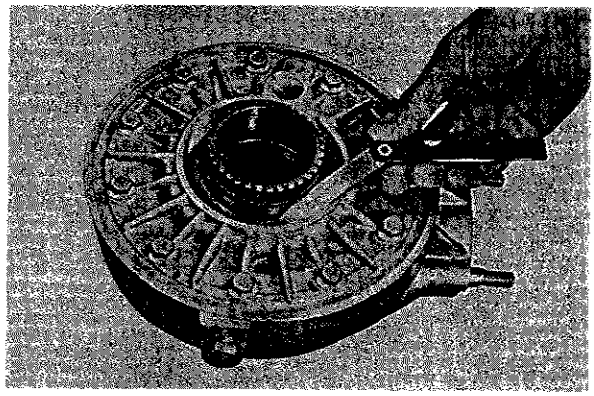
FINAL GEAR BEARING COVER SHIM ADJUSTMENT

- 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



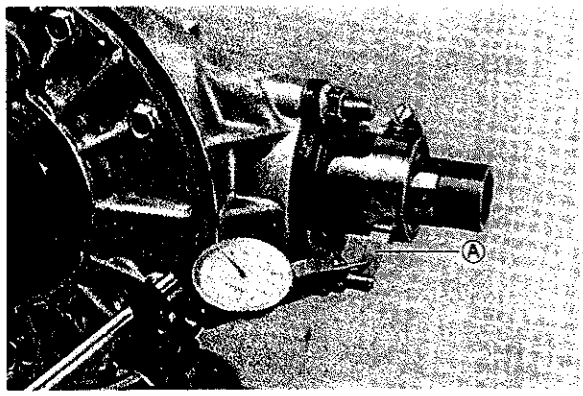
BACKLASH MEASUREMENT

- 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

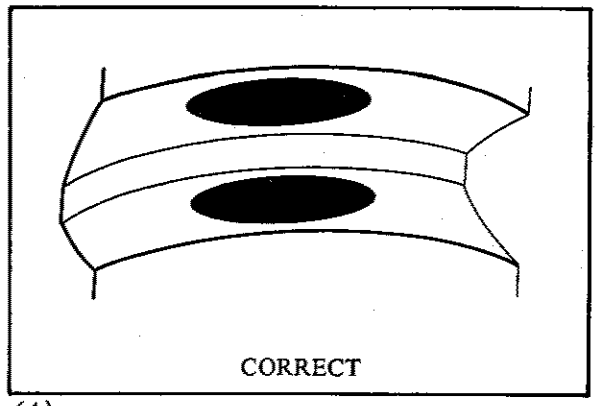
Part Number	Thickness
27327-45100	0.35 mm
27327-45102	0.40 mm
27327-45103	0.50 mm
27327-45104	0.60 mm

TOOTH CONTACT ADJUSTMENT

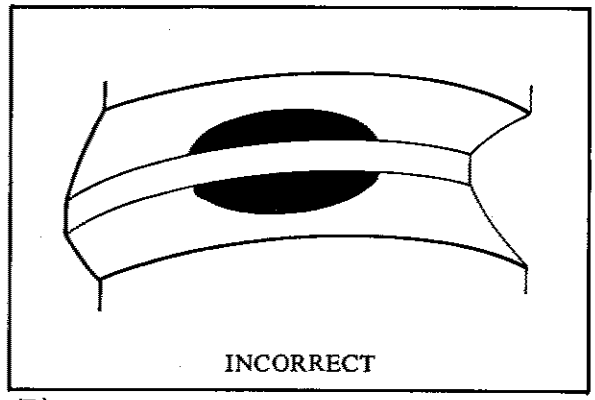
- After backlash adjustment is carried out, the tooth contact must be checked.
- Remove the 10 bolts from the final gear cover, and remove the cover, using the screws from the contact breaker cover (see page 59). Do not misplace the shims.
  Remove the driven gear.
- Clean and de-grease several teeth 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

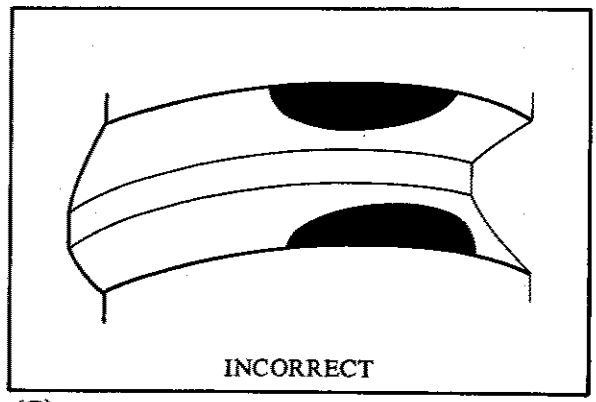
- Using a socket and handle on the final drive gear coupling nut, rotate the final drive gear several turns in each direction, while loading the final driven gear. This will provide a contact pattern on the coated teeth of the driven gear.
- Remove the final gear cover and final gear, and inspect the 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.



(A)



(B)



(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.

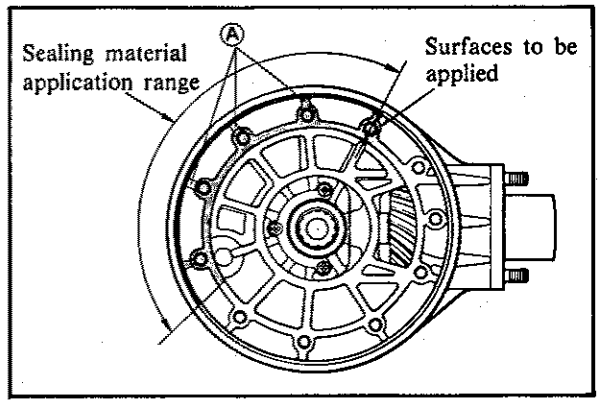
List of Shims - final Drive Gear Housing to Final Gear Case

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.

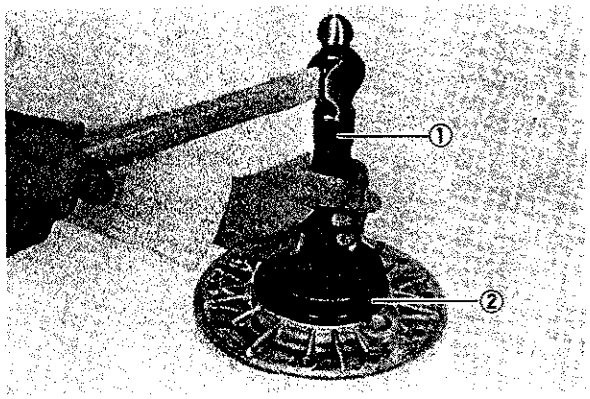
CAUTION:
- *Thoroughly clean mating surfaces of final gear case and bearing case.*
- *Take care not to apply SUZUKI BOND No. 1201 to ribs Ⓐ or not allow it to flow on to ribs.*



- 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

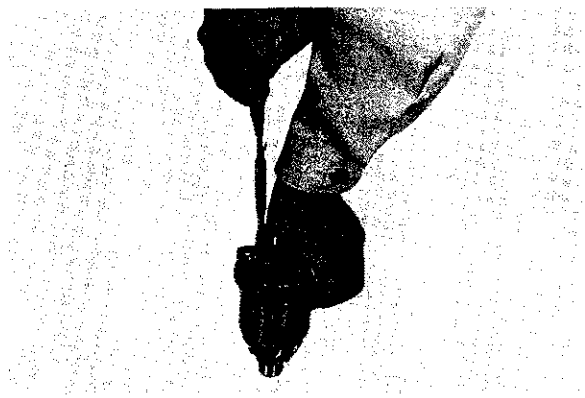


- Install the final gear bearing cover and tighten the 10 bolts to specification. Take care not to damage the seal lip.

Tightening Torque	20 — 26 kg•m 2.0 — 2.6 kg•m 14.5 — 19.0 lb•ft

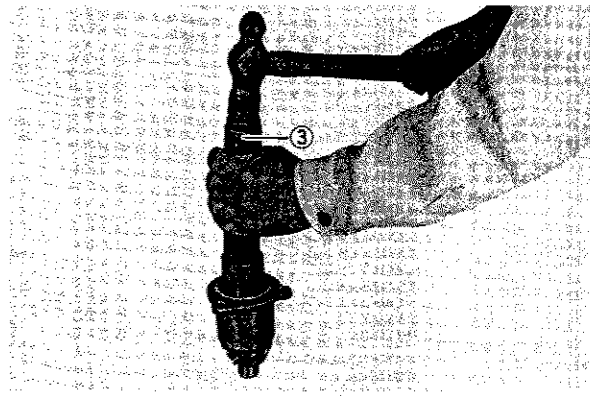
- Remove the final drive gear housing from the final gear case.
- Liberally coat the final drive gear coupling splines with Lithium Base Molybdenum Grease (NLGI #2), and install the propeller shaft coupling spring and propeller shaft coupling.
- Push the coupling in against the spring and install the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

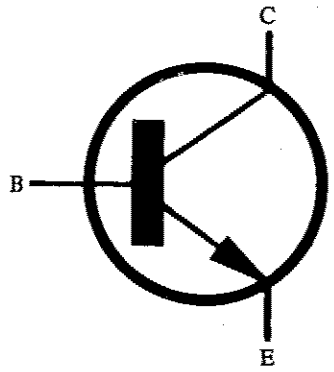
A fully transistorized ignition system is now employed on the GS1000GT. Its primary advantages are:

* 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

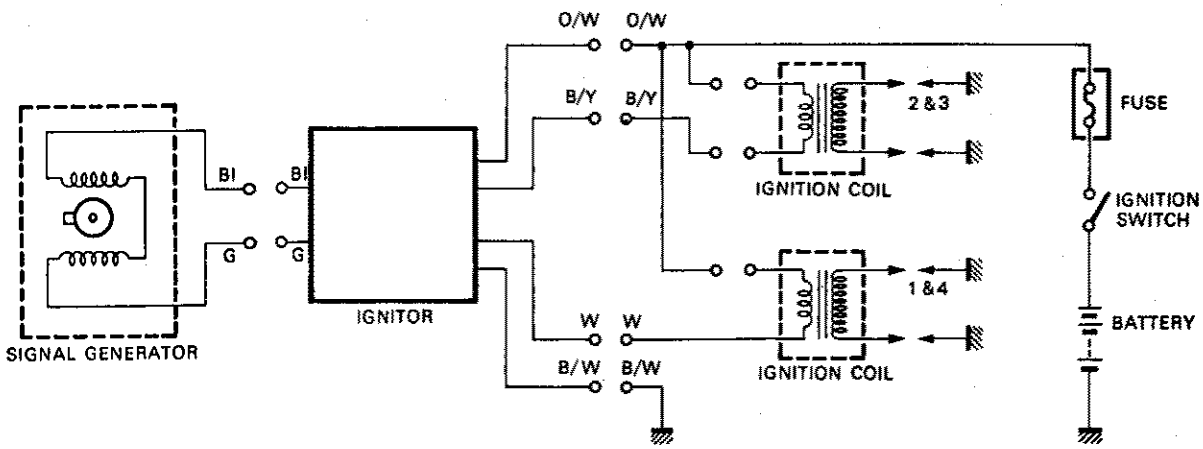
Each transistor has three terminals identified as the Base (B), Collector (C), and Emitter (E), and operation is as follows:
On a NPN type the base is the controling terminal of the transistor operation. On this type, the base utilizes only a positive or incoming signal to do the "ON", or "OFF" switching. 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.

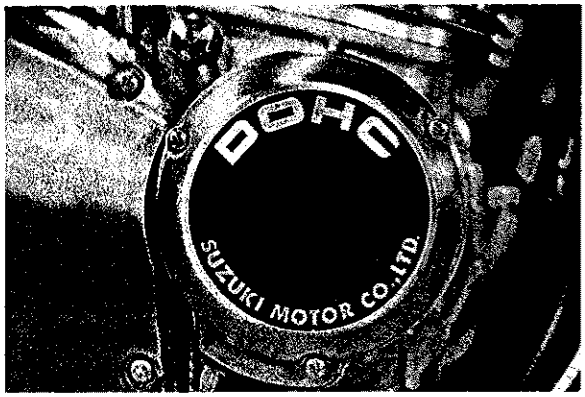
As the rotor tip is turned past the coils, AC current is produced and used for switching within the transistor unit.

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

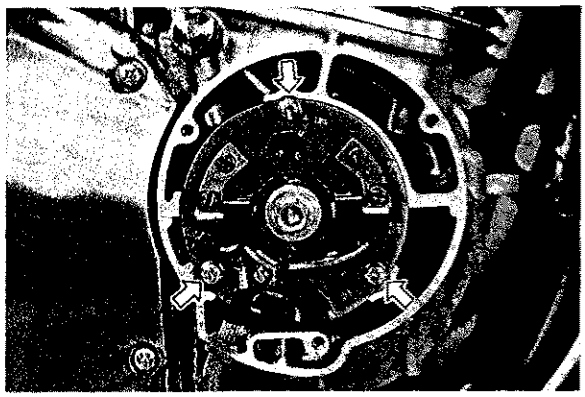


REMOVAL

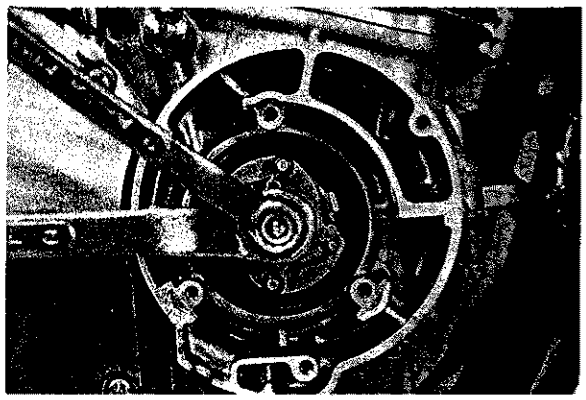
- Remove signal generator cover.



- Remove three screws and then remove the signal generator assembly and timing plate.

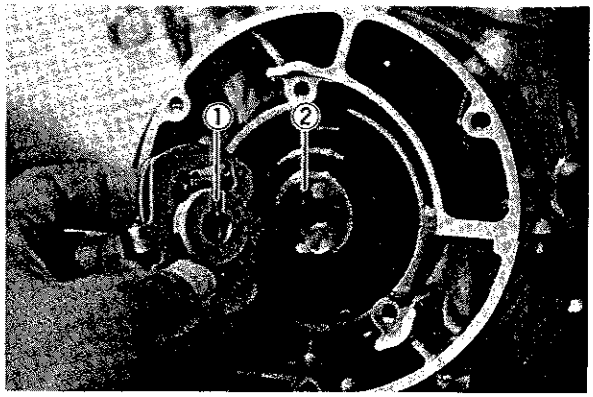


- Apply wrench to crank turning nut to remove automatic advance governor mounting bolts and the crank turning nut.
  Remove signal generator rotor and advance governor.

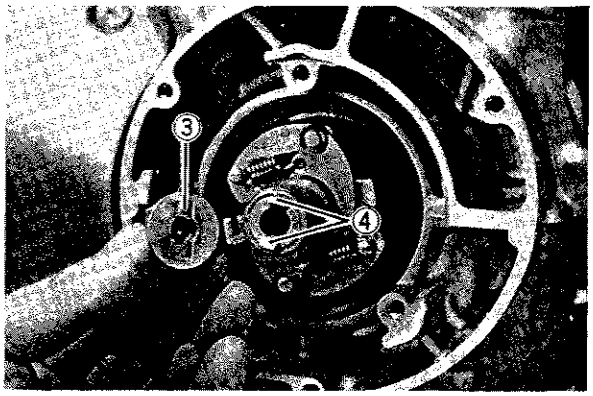


REASSEMBLY

- 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.

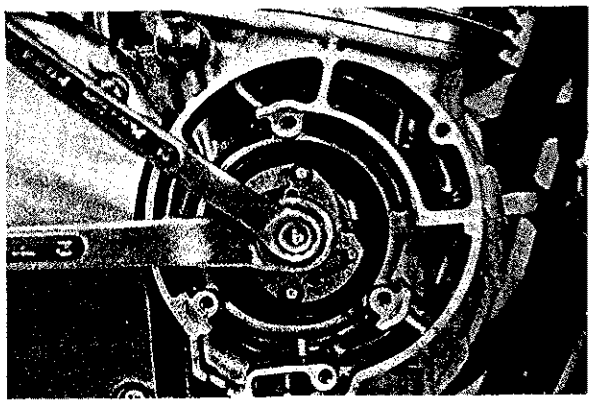


- Fit the groove ③ of the crankshaft turning nut on protrusion ④ of the advance governor body.

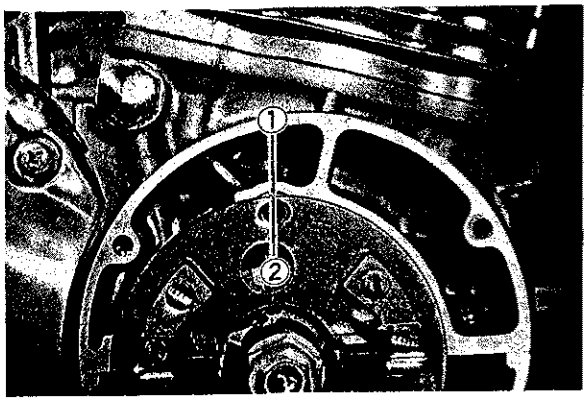


- Hold the crankshaft turning nut and tighten the governor center bolt with specified torque.

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

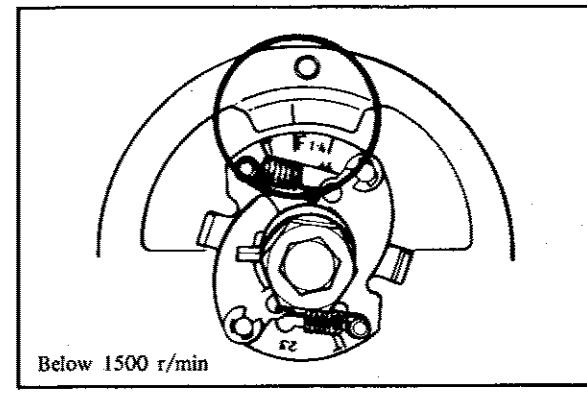
Check the performance of the timing mechanism using the timing light. Illuminate the advance governor with the timing light and vary the engine speed to see if the ignition timing advances properly.

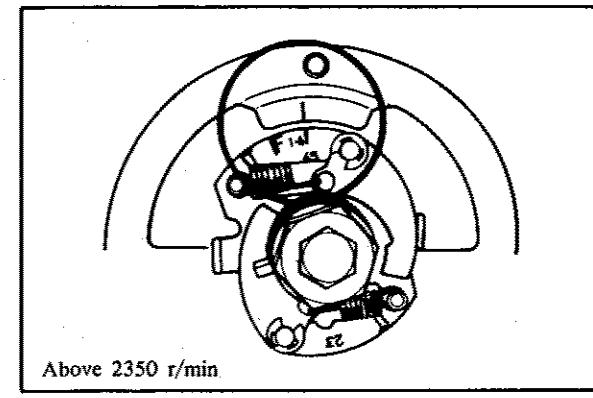
Ignition timing specifications

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

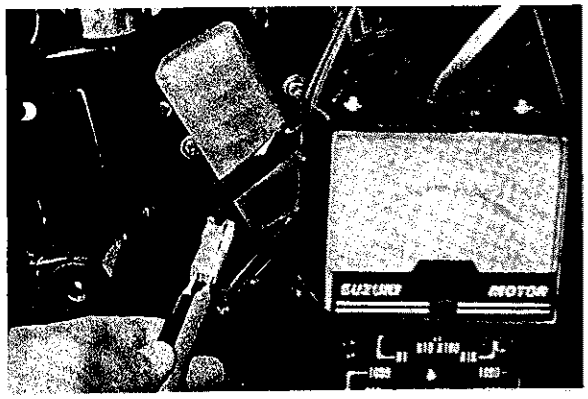

Above 2350 r/min

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.

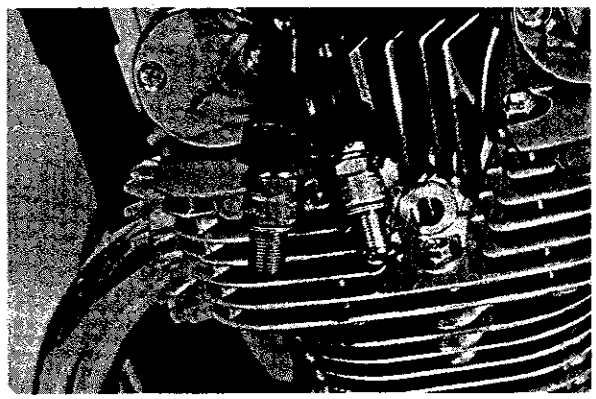
09900-25002	Pocket tester

STD resistance	
BI — G	290 — 360Ω



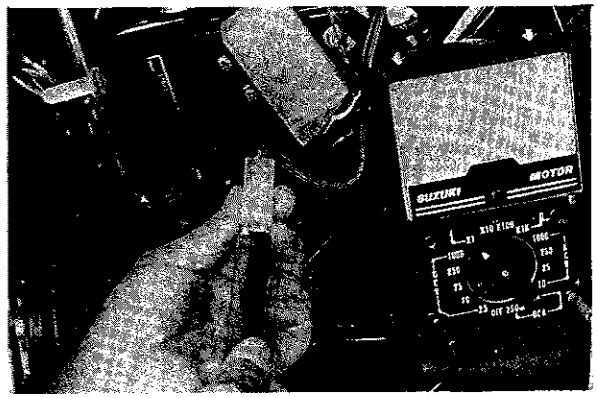
IGNITER

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.

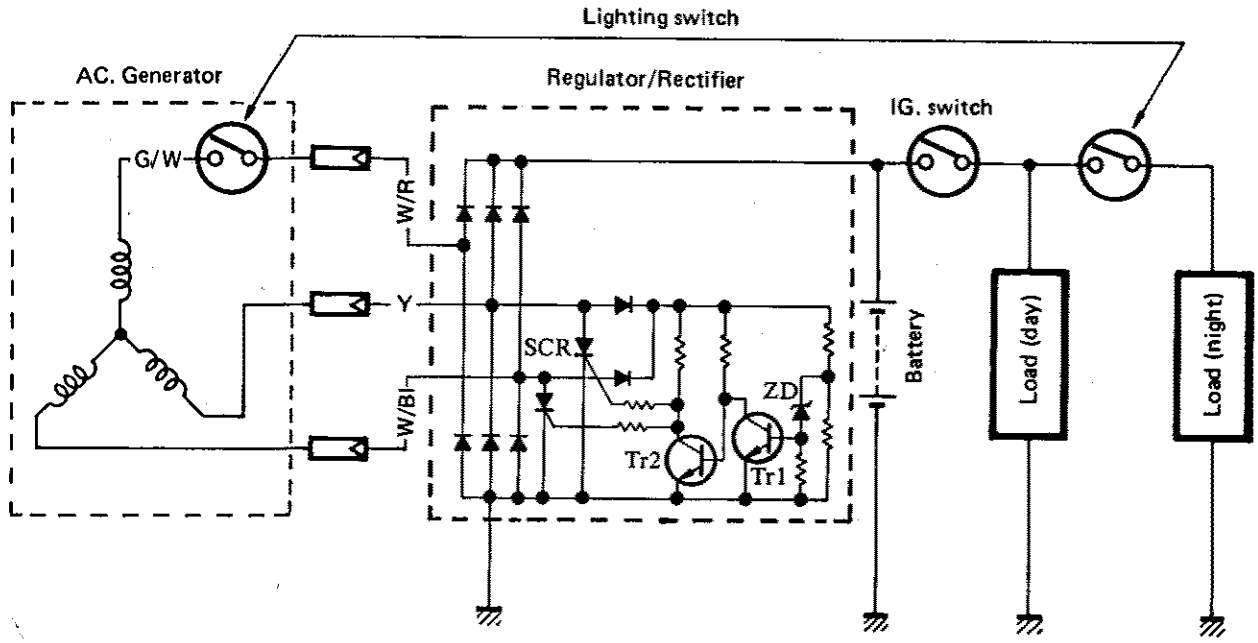


CHARGING SYSTEM

DESCRIPTION

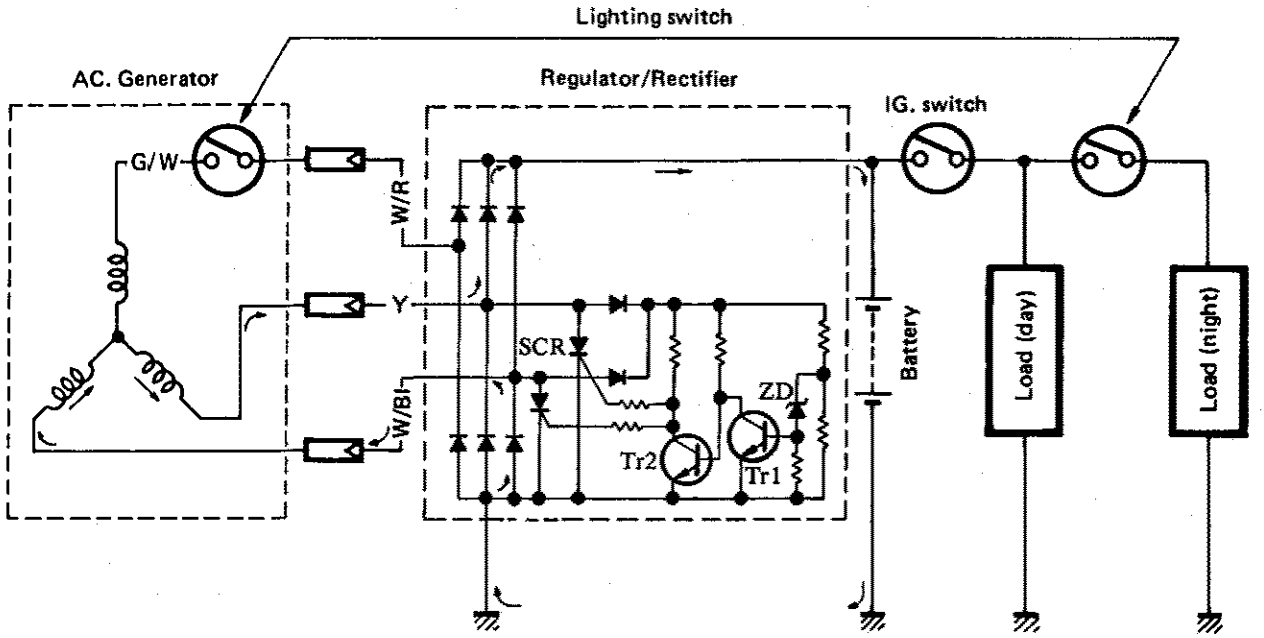
The circuit of the charging system is shown in the figure, is composed of an AC generator, regulator/rectifier unit and battery.

The AC current generated from AC generator is rectified by rectifier and is turned into DC current, then it charges the battery.



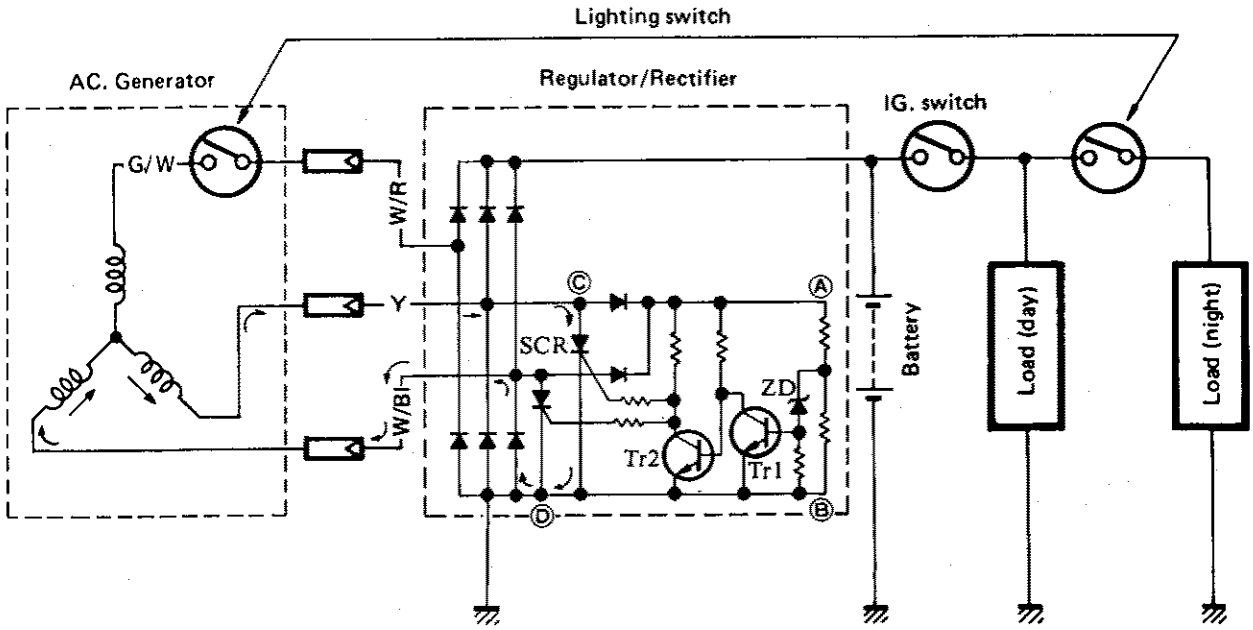
Function of Regulator

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.

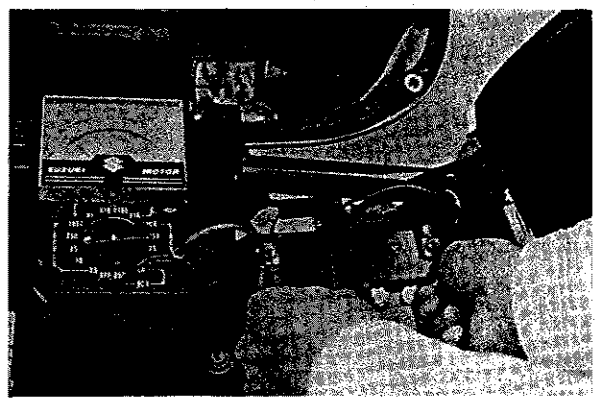


INSPECTION

Charging Output Check

- 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.

09900-25002	Pocket tester



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

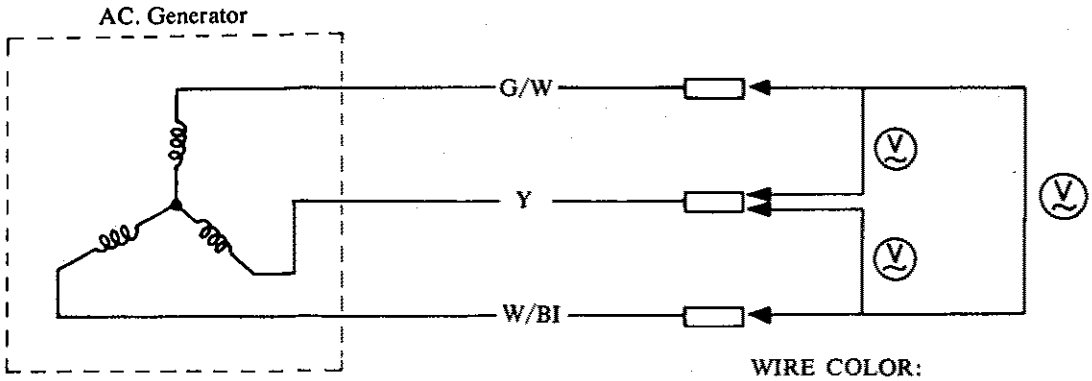
STD charging output
14 — 15.5V (DC) at 5 000 r/min

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:

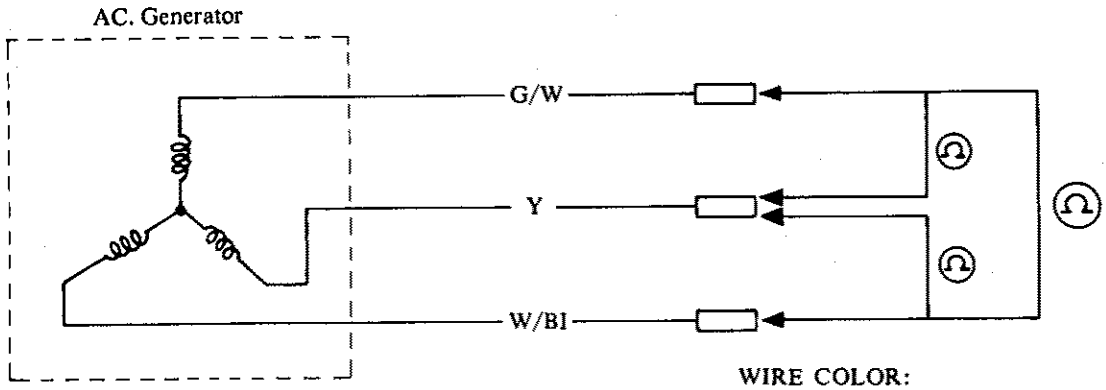
Y ..... Yellow
W/BI ..... White with Blue tracer
G/W ..... Green with White tracer

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.

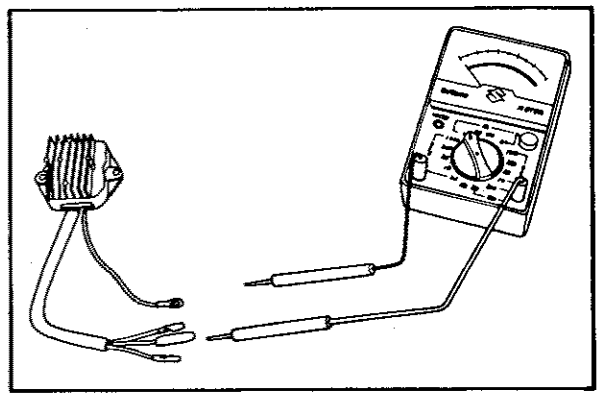


WIRE COLOR:

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.

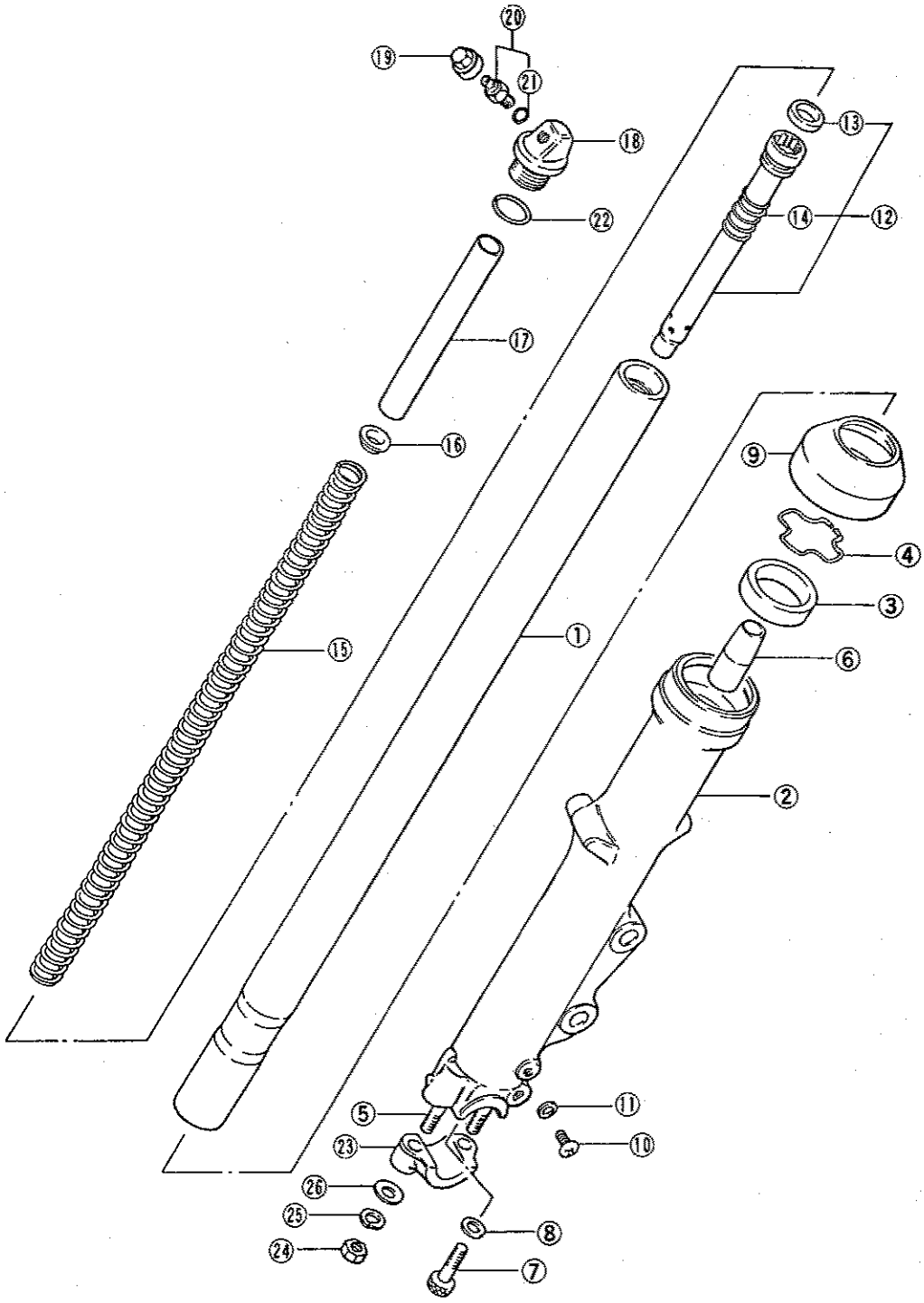


09900-25002	Pocket tester

Unit: Ω

⊖ Probe of tester \ ⊕ Probe of tester	R	W/BI	W/R	Y	B/W
R		∞	∞	∞	∞
W/BI	5 – 7		∞	∞	Approx. 200
W/R	5 – 7	∞		∞	∞
Y	5 – 7	∞	∞		Approx. 200
B/W	35 – 45	5 – 7	5 – 7	5 – 7	

FRONT FORK



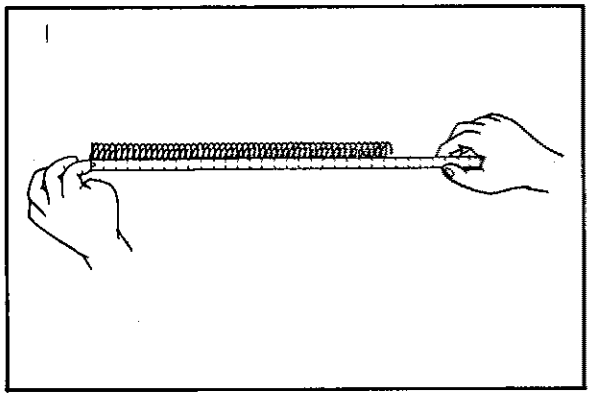
1. Inner tube
2. Outer tube
3. Oil seal
4. Oil seal stopper ring
5. Stud bolt
6. Oil lock piece
7. Bolt
8. Gasket
9. Dust seal
10. Screw
11. Gasket
12. Cylinder
13. Piston ring
14. Spring
15. Spring
16. Spring guide
17. Spacer
18. Upper cap
19. Valve cap
20. Valve
21. O ring
22. O ring
23. Axle holder
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

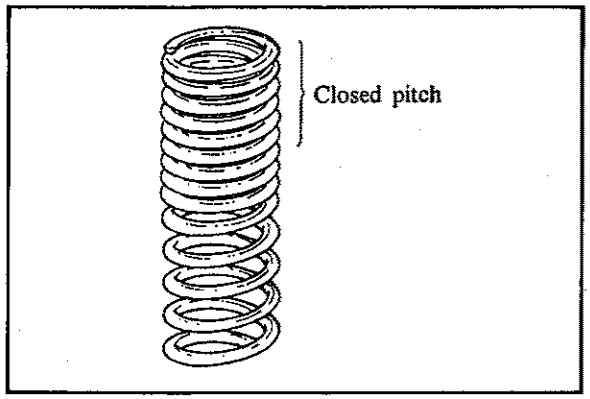
- Inspect front fork spring.
  Measure the free length of the fork spring. Replace it with a new one when it is less than the service limit.

Limit	416 mm (16.4 in)

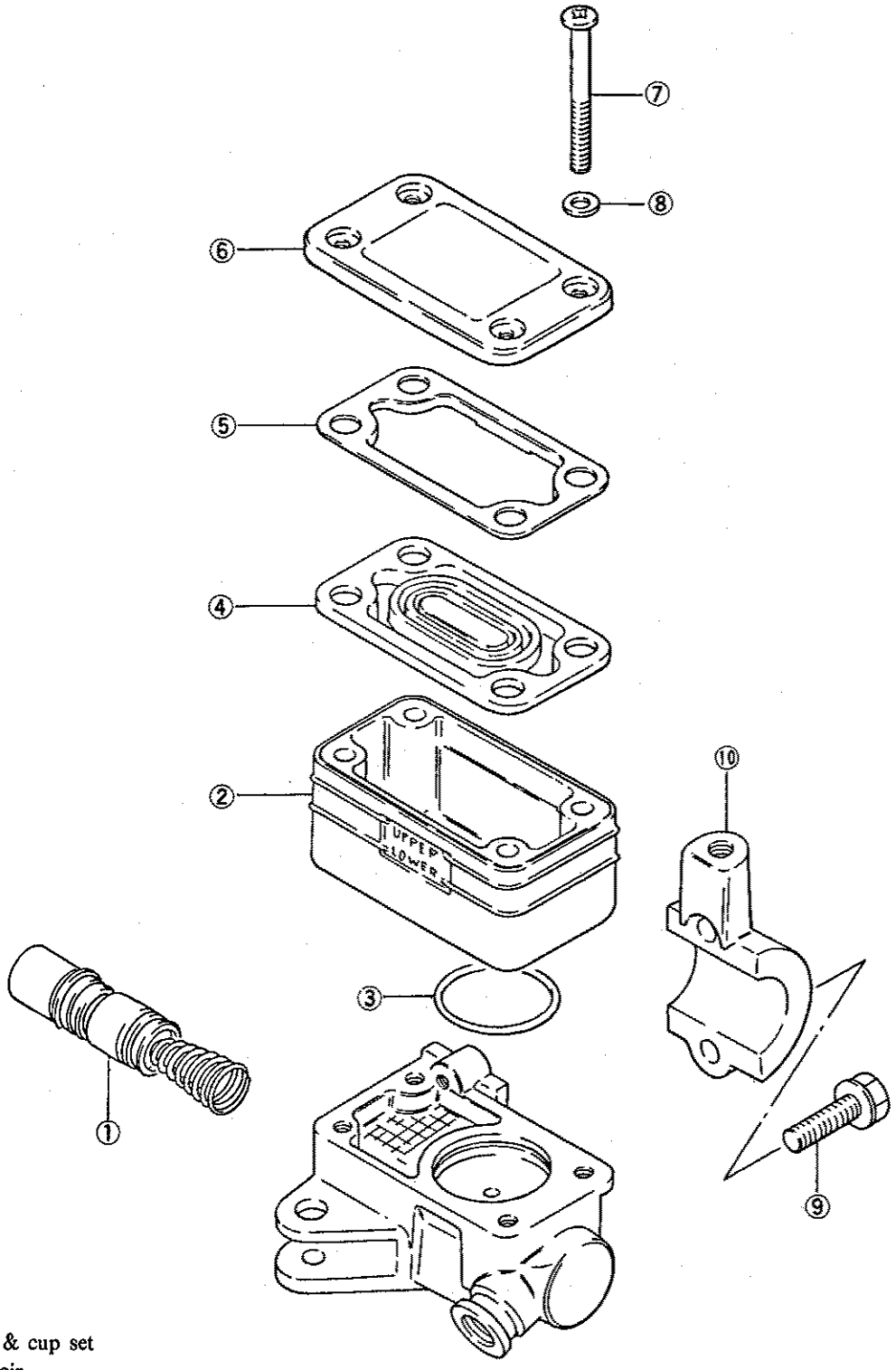


- Inspect the inner tube.
  Visually inspect the sliding surface of the inner tube. Replace the inner tube with a new one if any flaws are found.
- Inspect the outer tube.
  Visually inspect the outer tube to see whether it is dented or damaged.
- Inspection for oil leakage.
  Replace the oil seal with 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

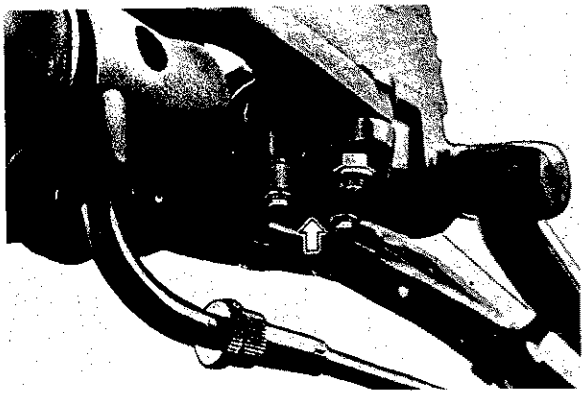


1. Piston & cup set
2. Reservoir
3. O ring
4. Diaphragm
5. Plate
6. Cap
7. Screw
8. Washer
9. Bolt
10. Holder

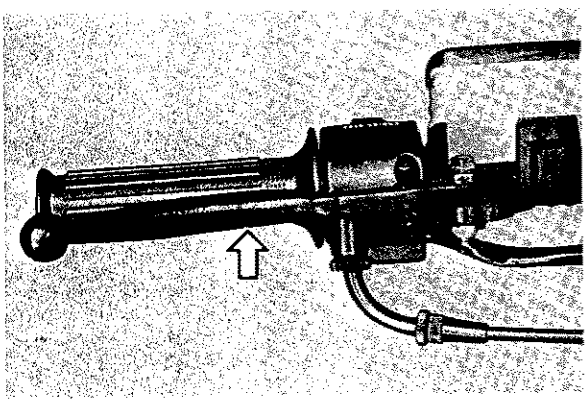
	Tightening torque		
	N·m	kg·m	lb·ft
⑨	5 – 8	0.5 – 0.8	3.5 – 6.0

MASTER CYLINDER REMOVAL AND DISASSEMBLY

- Take off front brake light switch.

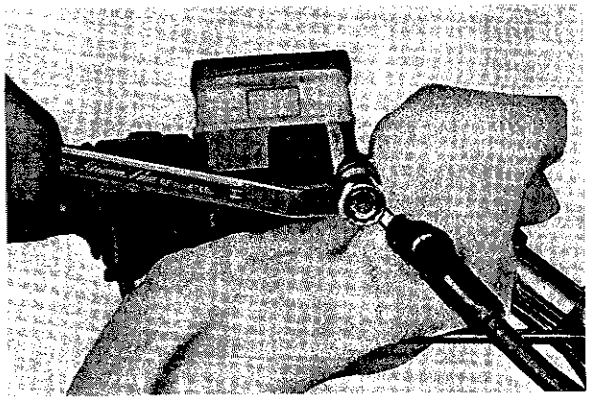


- Remove front brake lever.

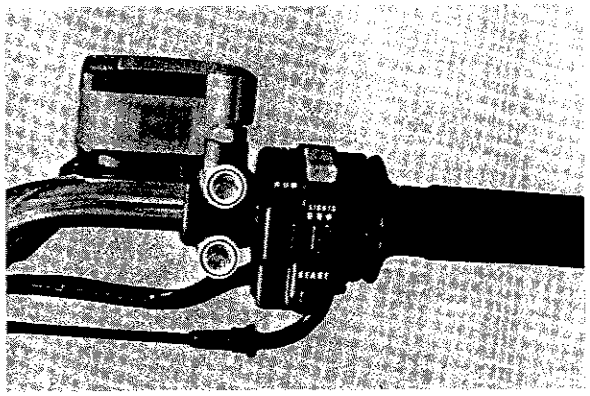


- Place a rag underneath the union bolt on the master cylinder to catch spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose/master cylinder joint.

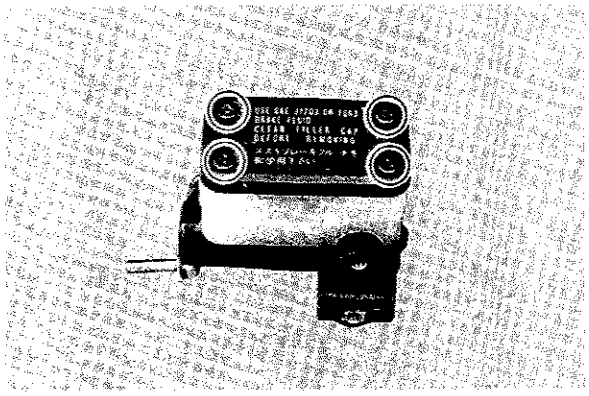
CAUTION:
Completely wipe off any brake fluid adhering to any part of motorcycle. The fluid reacts in chemically with paints, plastics, rubber materials, immediately.



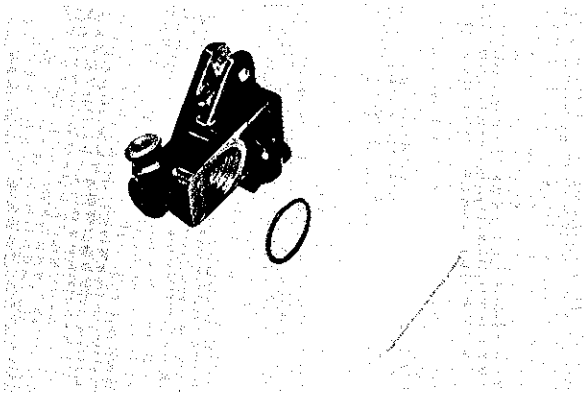
- Remove master cylinder ass'y after removing two fitting bolts.



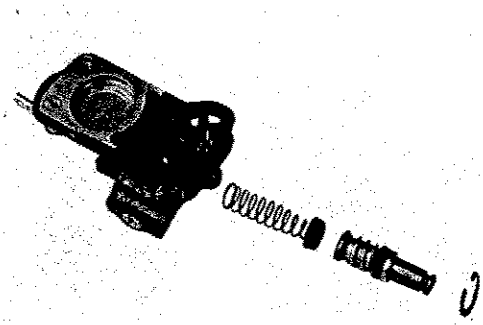
- Remove filler cap and drain brake fluid.



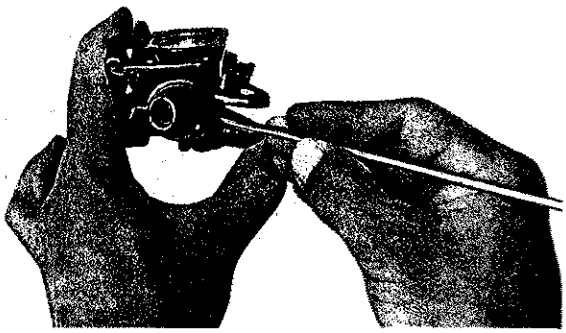
- Pull out the reservoir and O ring.



- Pull out piston, primary cup and spring.

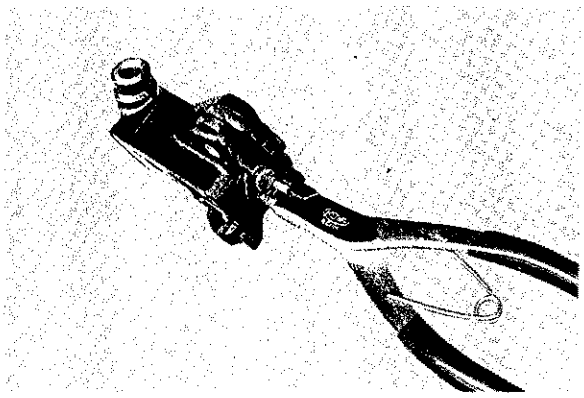


- Draw out dust seal boot.



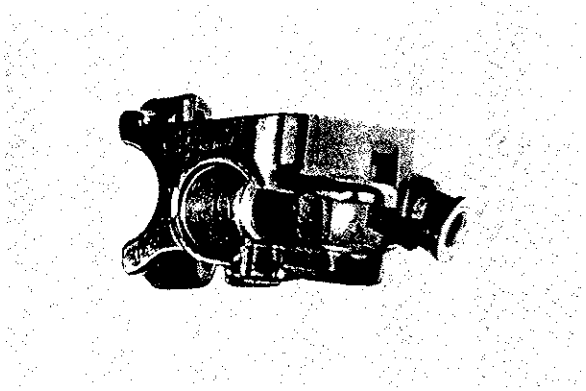
- Remove circlip by using special tool.

09900-06108	Snap ring pliers

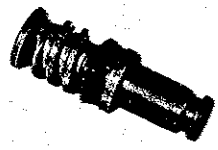


MASTER CYLINDER INSPECTION

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



- Inspect the piston surface for scratch or other damage.



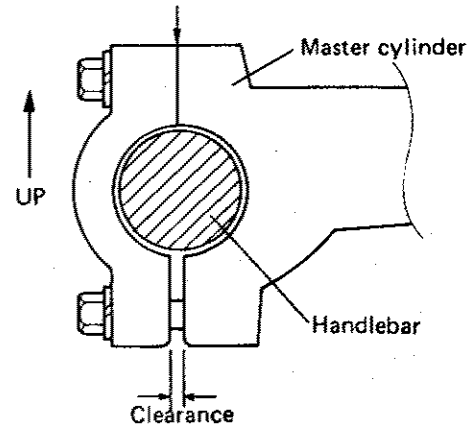
- Inspect the primary cup, secondary cup and dust seal boot for damage.

MASTER CYLINDER REASSEMBLY

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

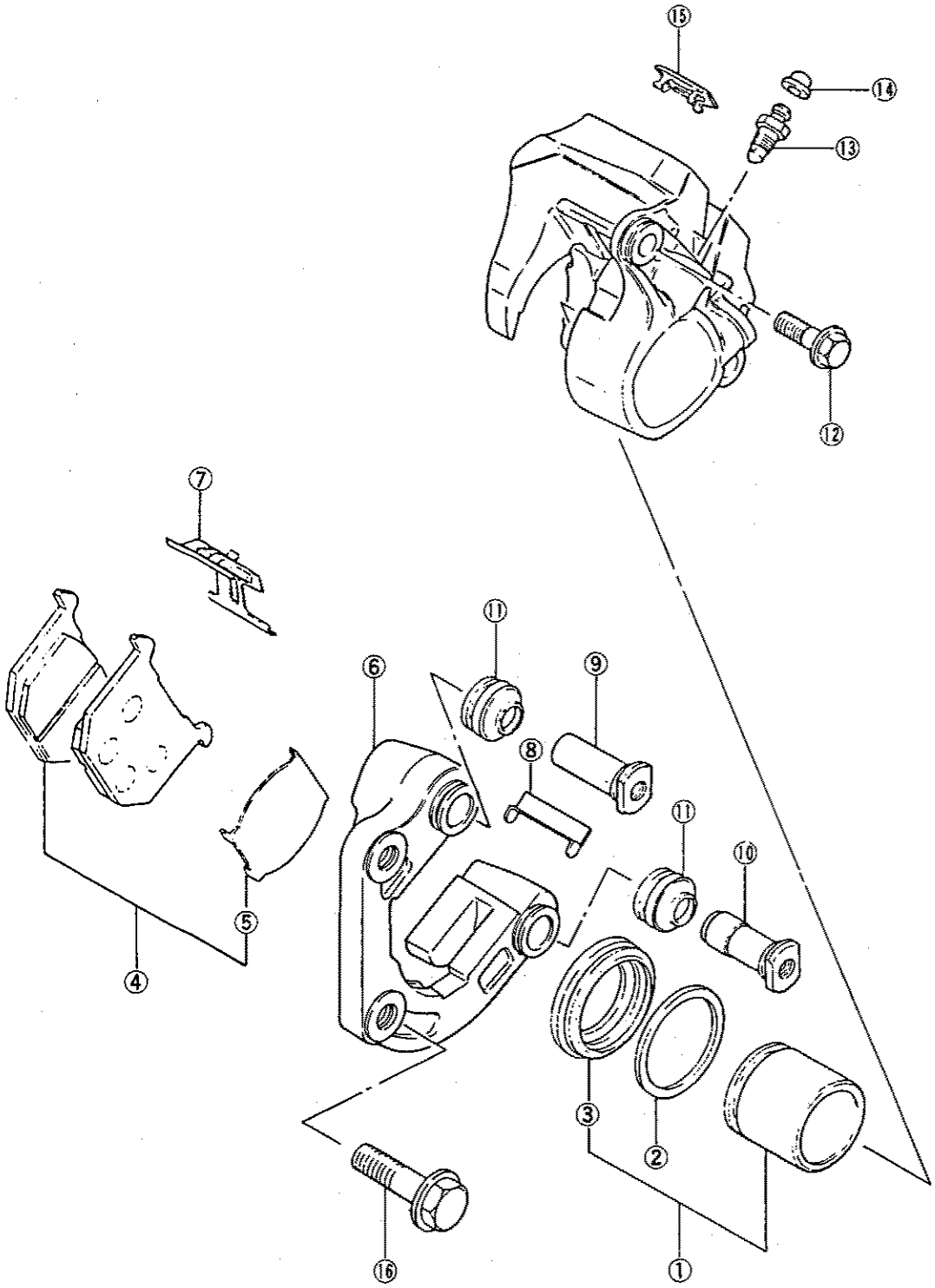
CAUTION:
Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.
Apply brake fluid to the cylinder bore and all the internals to be inserted into the bore.

- 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



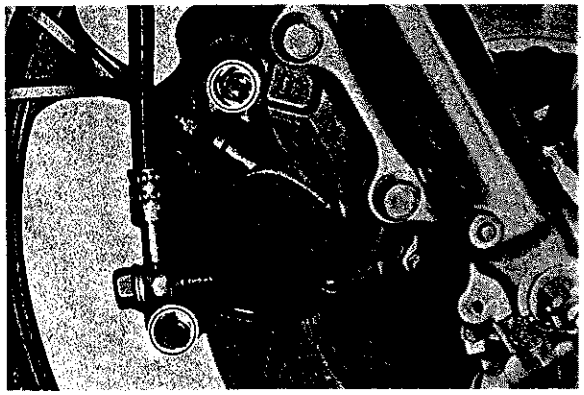
1. Piston set
2. Piston seal
3. Piston boot
4. Pad set
5. Pad shim
6. Caliper holder
7. Pad spring
8. Pad guide
9. Caliper axle No. 1
10. Caliper axle No. 2
11. Axle boot
12. Bolt
13. Bleeder
14. Cap
15. Cover
16. Bolt

	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

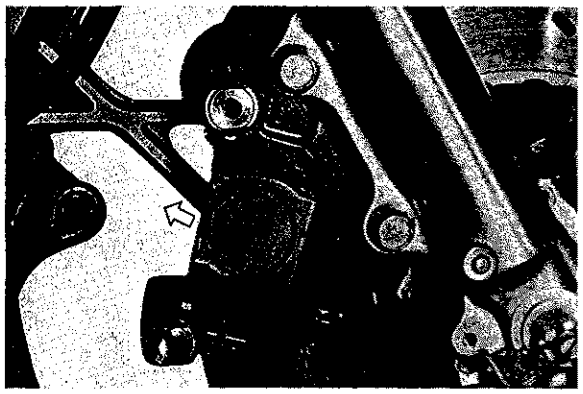
- Remove two bolts and take off caliper.

CAUTION:
Do not operate the brake lever when removing the caliper.

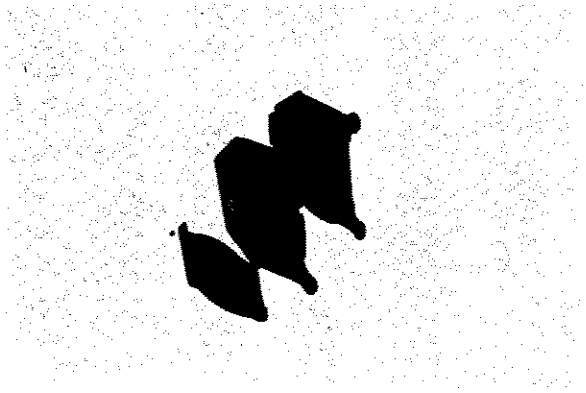


- Pull out brake pads with pad shim.

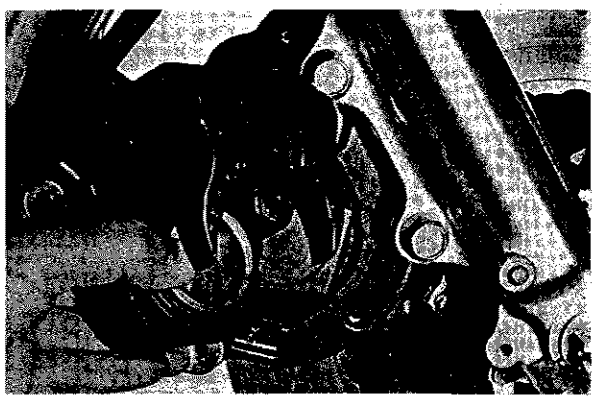
CAUTION:
Replace the brake pad with a set, otherwise braking performance will be adversely affected.



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



NOTE:
Push in the piston all the way before remounting the caliper.



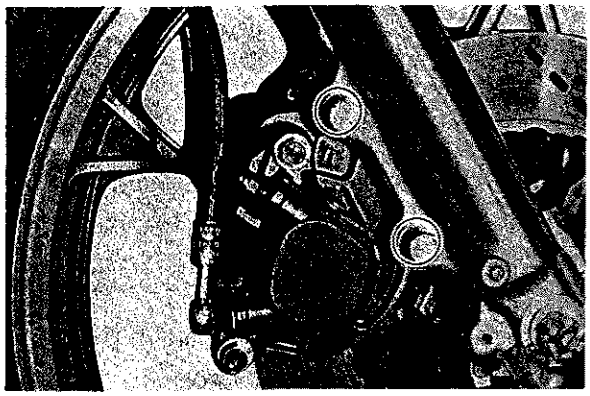
- Tighten the caliper axle bolts with specified torque.

Tightening torque	15 — 20 N•m 1.5 — 2.0 kg•m 11.0 — 14.5 lb•ft

CALIPER REMOVAL AND DISASSEMBLY

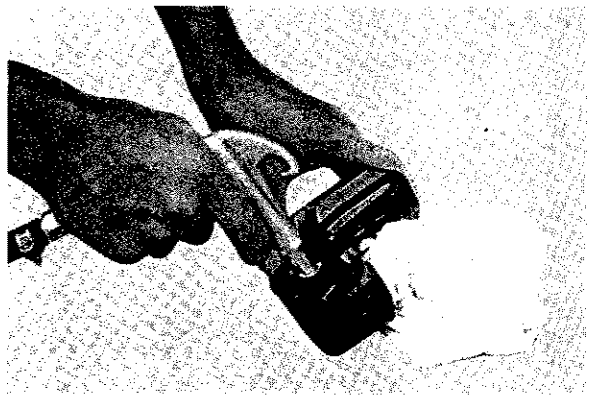
- Disconnect brake hose and catch the brake fluid in a suitable receptacle.

- Remove caliper axle bolts and take off caliper.

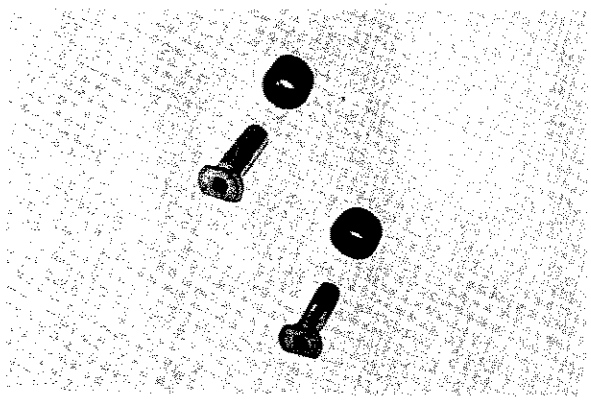


- Place a rag over the piston to prevent popping up. Draw out the piston by using air gun.

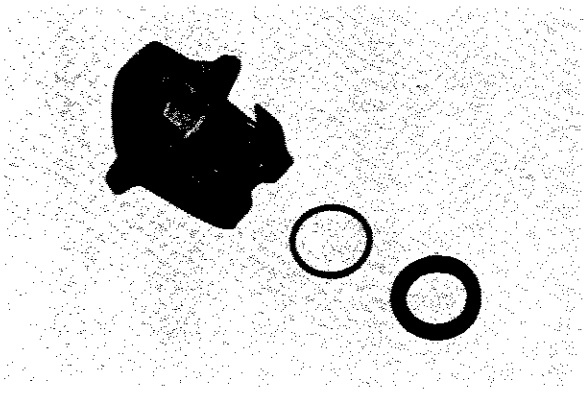
> *CAUTION:*
> *Do not use high pressure air for preventing piston damage.*



- Remove caliper bracket and draw out caliper axles.

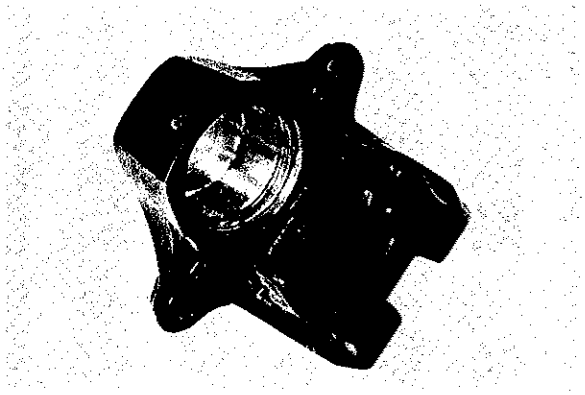


- Remove piston boot and piston seal.

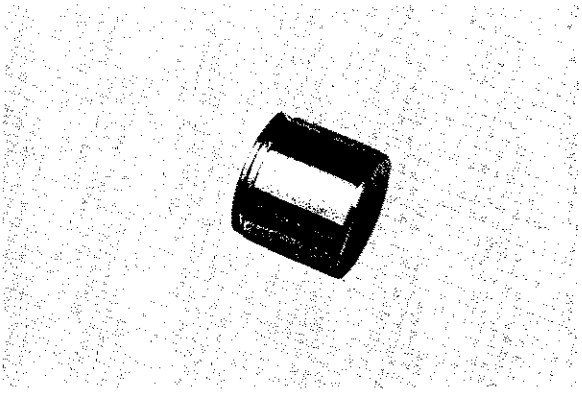


CALIPER AND DISC INSPECTION

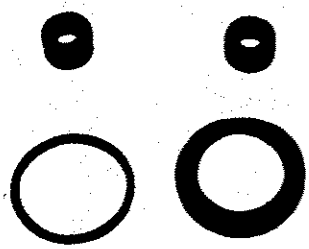
- Inspect the cylinder bore wall for nick, scratch or other damage.



- Inspect the piston surface for any flow or other damage.



- Inspect each rubber part for damage and wear.



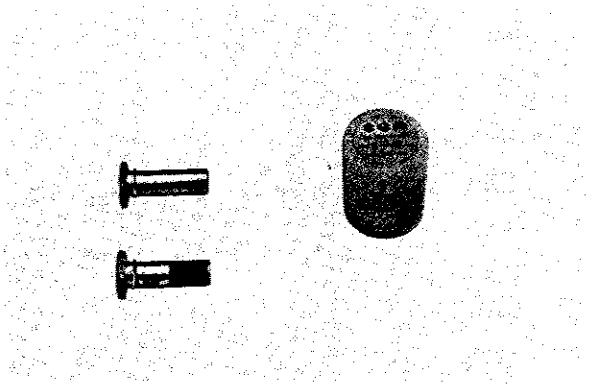
CALIPER REASSEMBLY

- 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.

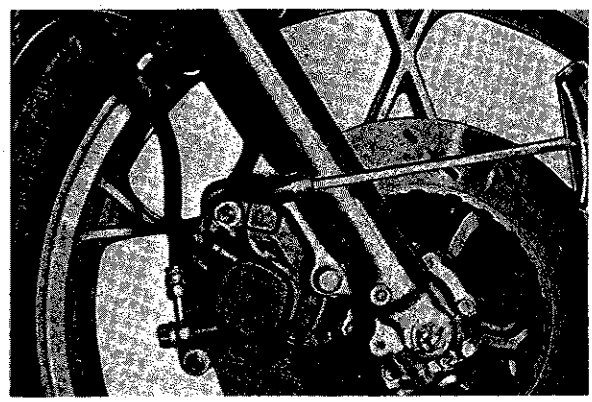
- Apply grease to the caliper axles.

99000-25100	Suzuki silicone grease

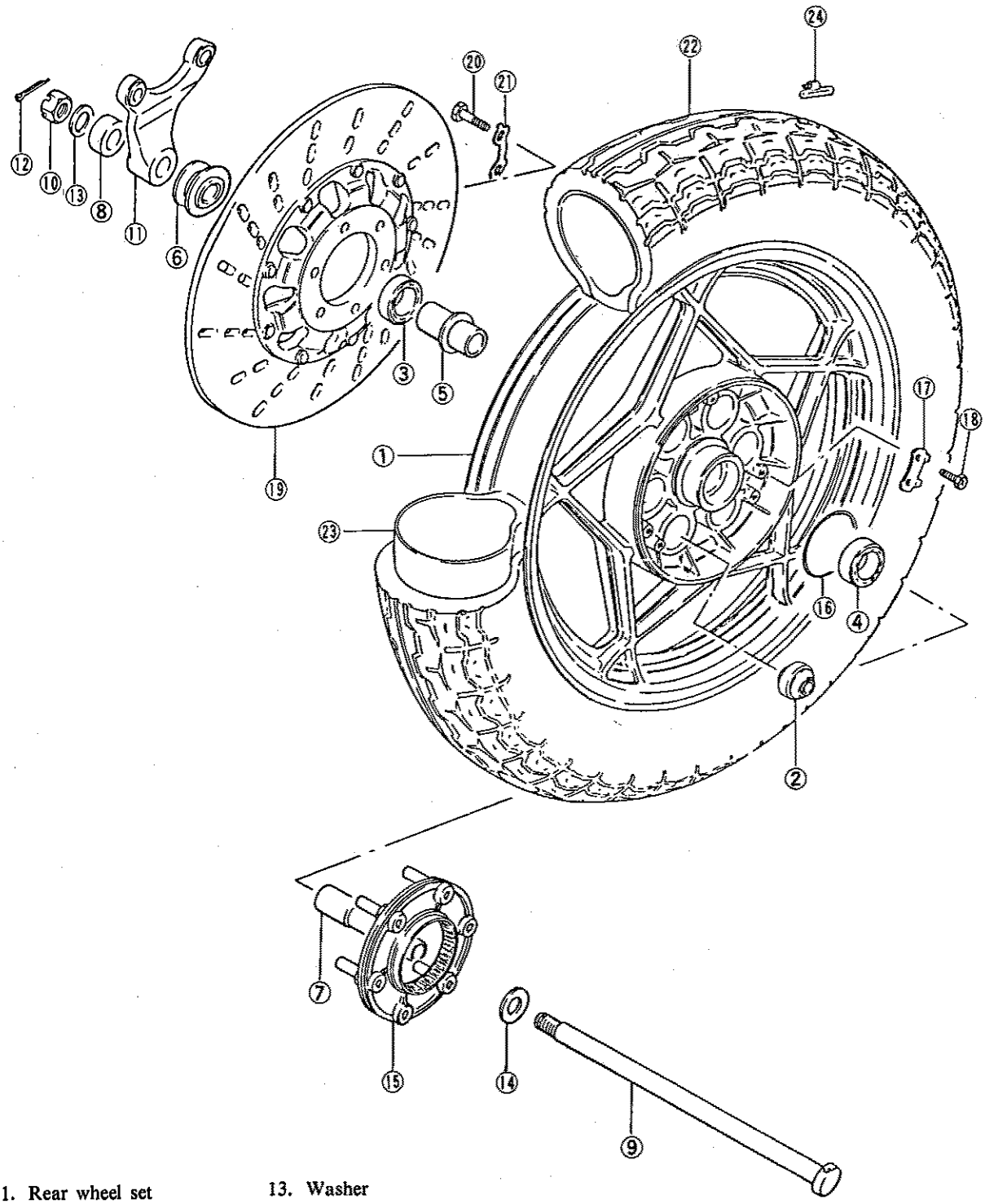


- Tighten the caliper axle nuts and caliper mounting bolts with specified torque.

	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

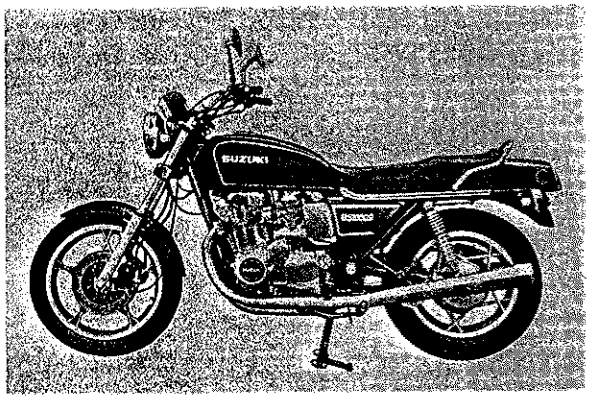


1. Rear wheel set
2. Cushion
3. Bearing, RH
4. Bearing, LH
5. Bearing spacer
6. Spacer RH
7. Spacer, LH
8. Spacer, RH
9. Rear axle
10. Nut
11. Rear caliper bracket
12. Cotter pin
13. Washer
14. Washer, LH
15. Driven joint
16. O ring
17. Washer
18. Bolt
19. Rear brake disc
20. Bolt
21. Washer
22. Rear tire
23. Inner tube
24. Balancer

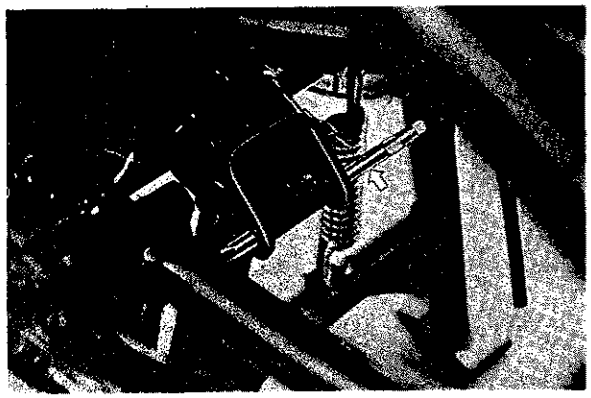
	Tightening torque		
	N·m	kg·m	lb·ft
⑩	50 – 80	5.0 – 8.0	36.0 – 58.0
⑳	15 – 25	1.5 – 2.5	11.0 – 18.0

REMOVAL AND DISASSEMBLY

- Locate the motorcycle on level ground and place the motorcycle on the centerstand.

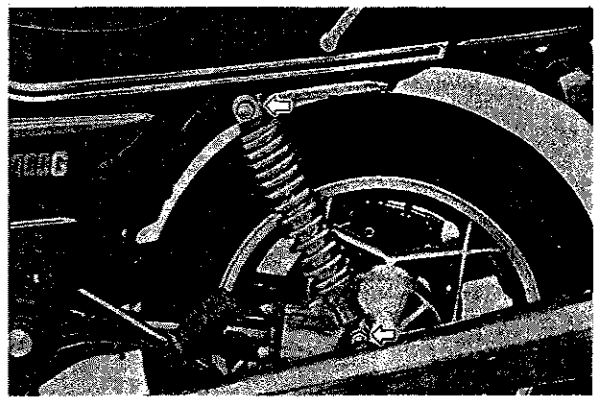


- Insert the crosshead screwdriver into the right side of the centerstand pivot to prevent the motorcycle from tipping off the centerstand.

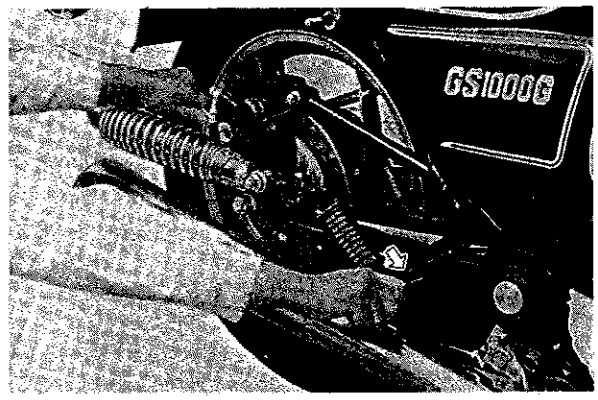


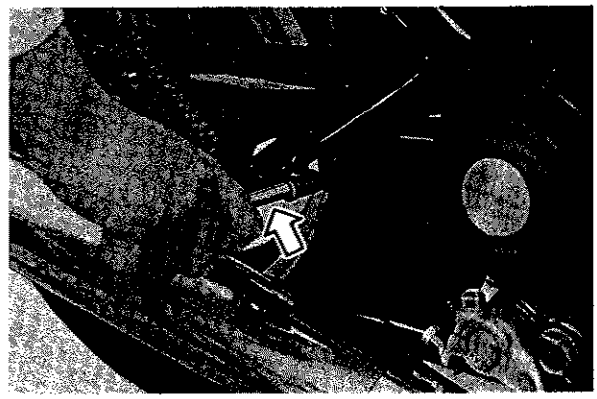
- Remove the upper shock absorber nuts and loosen the lower shock absorbers free from the mounting lugs.
  This will allow the swinging arm/bevel gear assembly to be easily moved.

CAUTION:
Take care not to burn yourself if the mufflers are hot.



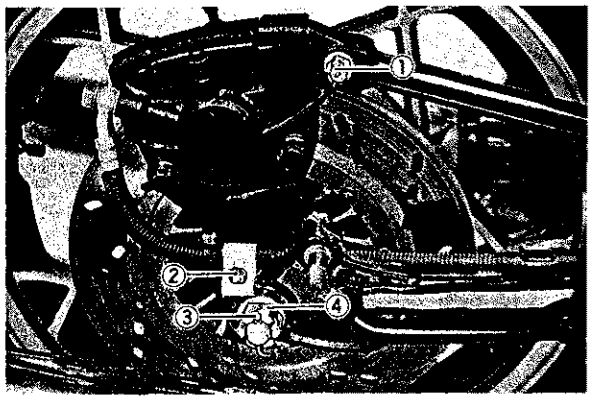
- Lift the swinging arm/bevel gear assembly up by attaching a 14 mm wrench to one of the caliper bolts and use the wrench as a lift handle. While lifting the swinging arm/bevel gear assembly insert a socket wrench handle through the right muffler support and swinging arm hole. This will hold the swinging arm in the correct position for removing the rear wheel axle.





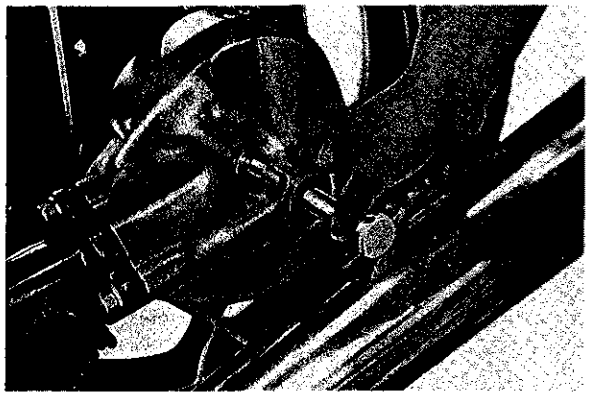
- Remove both right and left rear shock absorbers.

- 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.



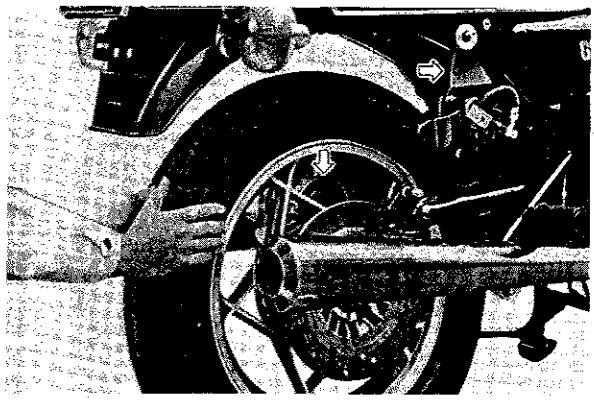
- Remove the axle, while at the same time supporting the caliper assembly.
  After the axle is clear off the caliper, hand the caliper on the upper shock absorber mount stud.

CAUTION:
Do not allow the brake hose to touch the hot muffler. Protect it by wrapping the hose with a rag.

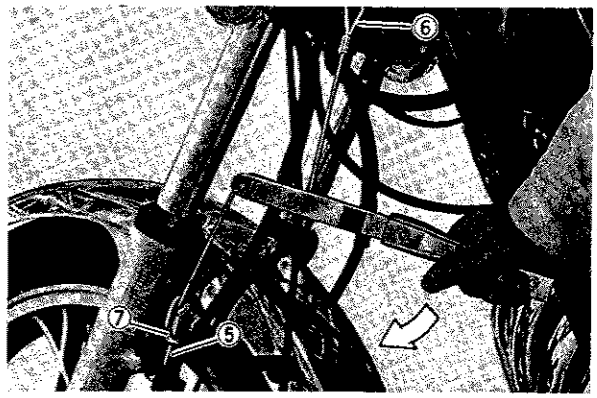


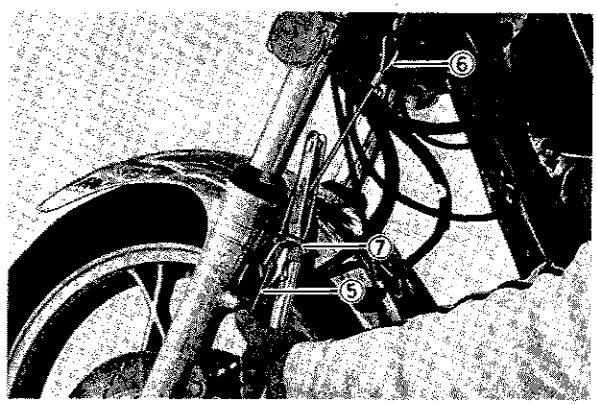
⑧

- Remove the axle from the differential housing. Remove the wheel from the splined drive and set the wheel assembly on the ground.

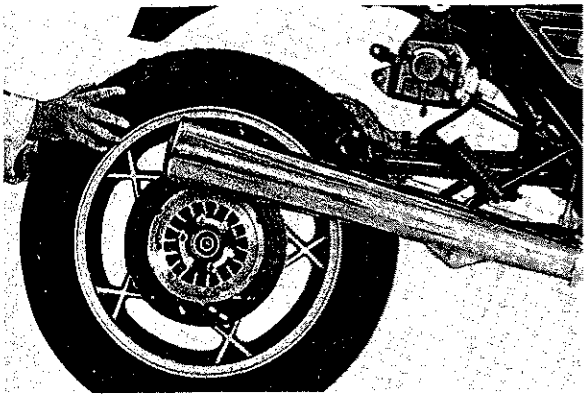


- The front forks must be compressed in order to tilt the back of the motorcycle upward so that the tire can be removed from the fenderwell area. To compress the forks turn the forks to the right fork stop. Hang the front fork compressing tool hook ⑤ on the left front fender boss. Hang the wire loop 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.



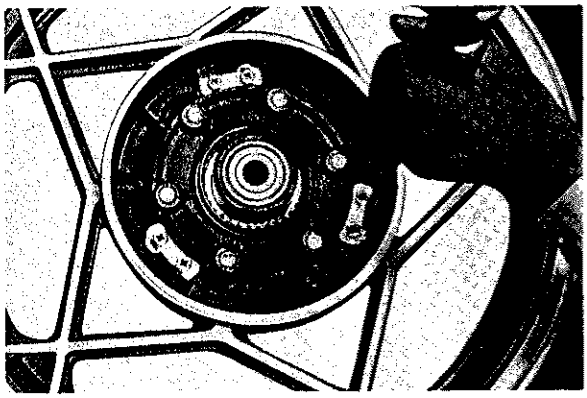


- Remove the rear wheel assembly.



- Bend up the lock washer, remove the bolts and separate the disk from the wheel.

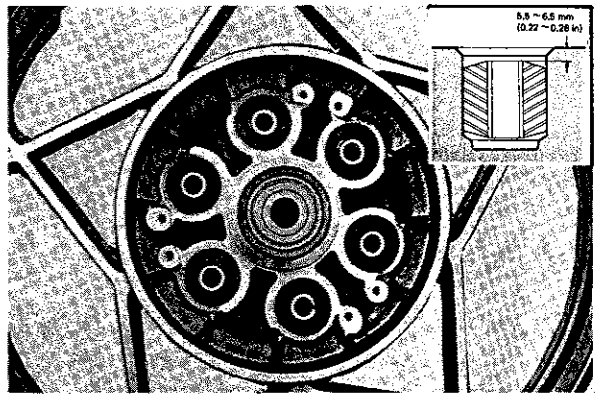
- Bend up the lock washer, remove the bolts and separate the driven joint from the wheel.



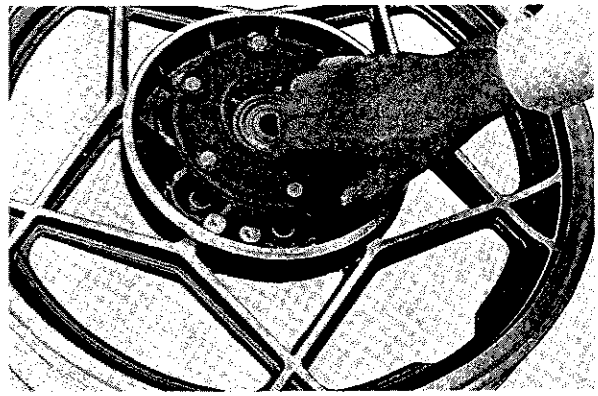
- Remove the bushings from the wheel.
- Remove the right and left bearings.

REASSEMBLY

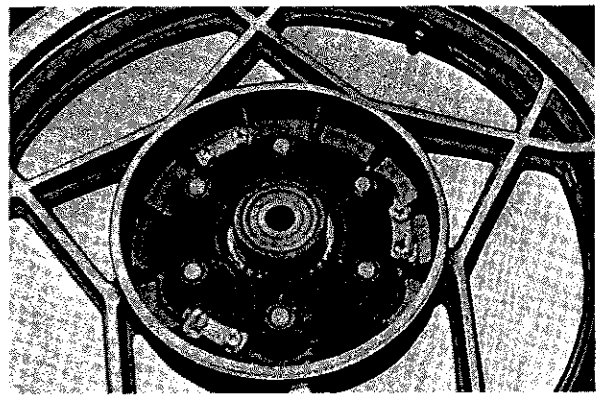
- Drive bushings into the wheel.



- 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.

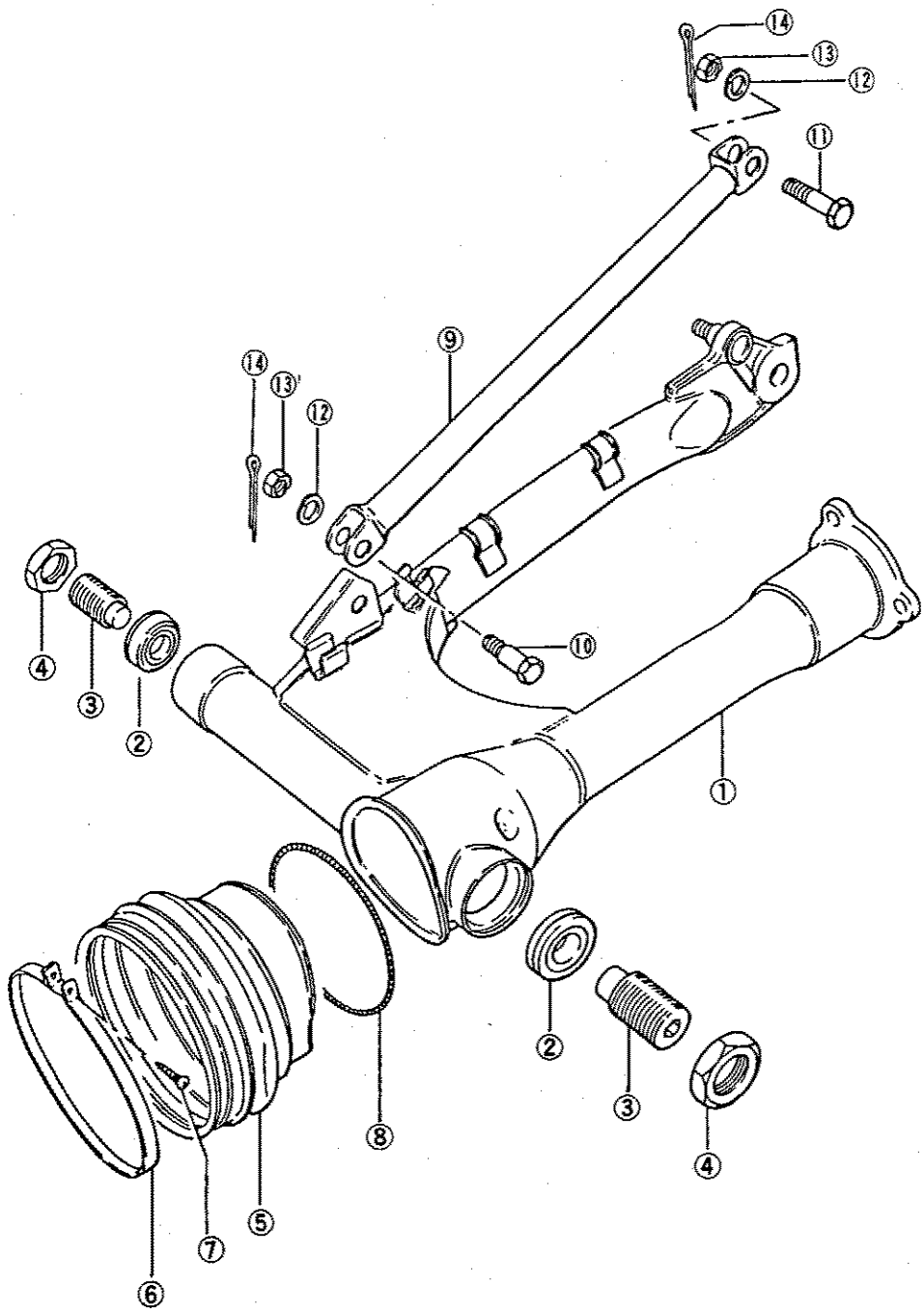
CAUTION:
When reinstalling the rear caliper be careful not to twist the brake hose or route it improperly. Never depress the brake pedal with the rear wheel removed as it is very difficult to force the brake pads back into the caliper assembly.

- 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



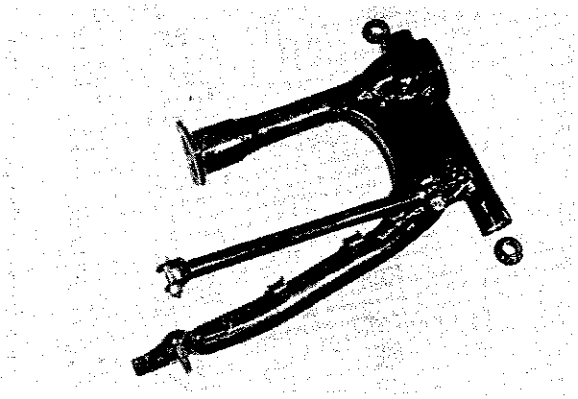
1. Rear swinging arm set
2. Bearing
3. Pivot shaft
4. Nut
5. Drive shaft boot
6. Clamp
7. Screw
8. Spring
9. Rear torque link
10. Front bolt
11. Rear bolt
12. Lock washer
13. Nut
14. Cotter pin

	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

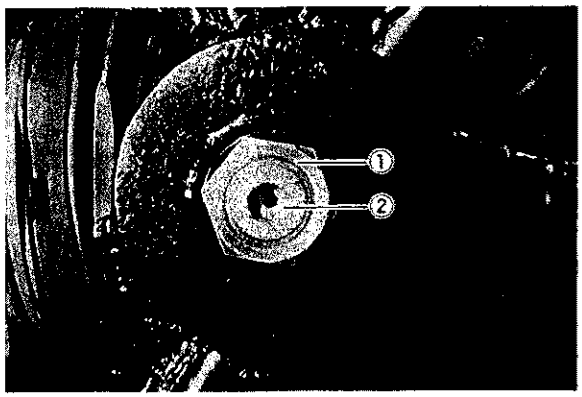
REMOVAL

- 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.

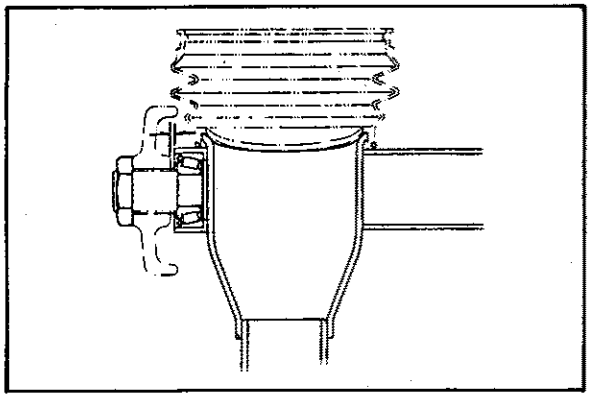
CAUTION:
When removing the rear swinging arm, the inner roller bearing on both right and left sides could easily fall off the bearing. Exercise care to prevent this happening.

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.

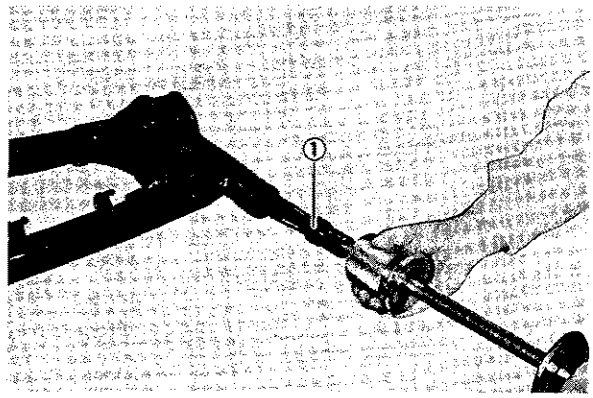
Nut tightening torque	110 — 130 N·m 11.0 — 13.0 kg·m 79.5 — 94.0 lb·ft

- Install the secondary boot.
- Install the final drive bevel gear assembly. (See page 75)
- Install the rear stop light switch.
- Mount the rear wheel.

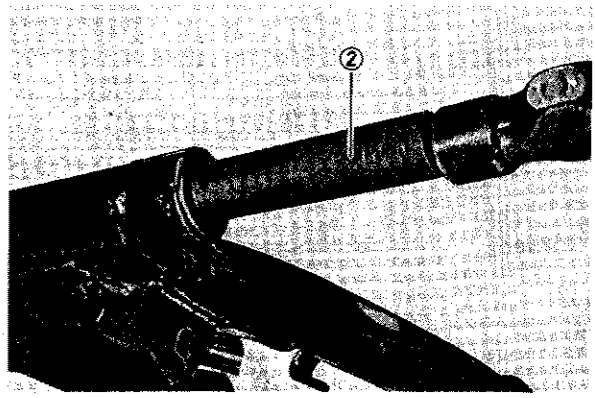
DISASSEMBLY OF SWINGING ARM BEARING

- 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 tool ②, force-fit the bearing outer races, both right and left, into the swinging arm.

②	Bearing and oil seal handle	09924-74510