YAMAHA

# LB50DAC
# LB80DAC

# SERVICE MANUAL

4RP-28197-20

EB000000

LB50 II AC/LB80 II AC
SERVICE MANUAL

First edition, March 1997

# INDEX

# CHAPTER 1. GENERAL INFORMATION



1

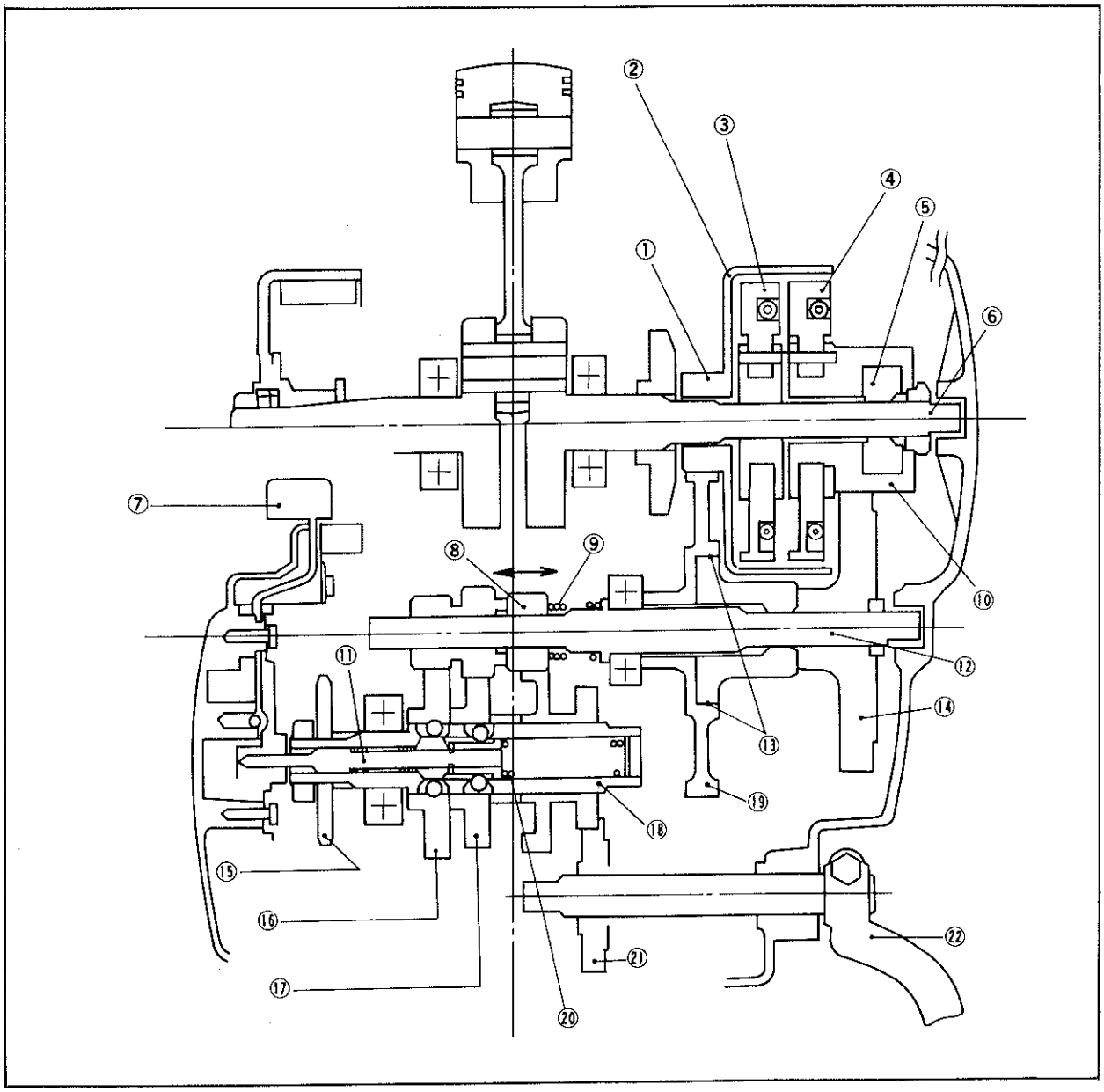
# 1

# CHAPTER 1. GENERAL INFORMATION

## FEATURES

### Automatic mechanism

1. Using a pair of shoe-type centrifugal clutches, the drive ratio is changed automatically.



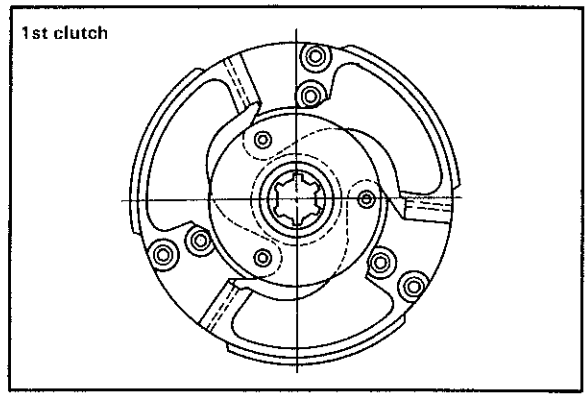

1. 1st drive gear
2. Clutch housing
3. 1st clutch
4. 2nd clutch
5. One-way clutch
6. Crankshaft
7. Shift lever
8. Kick pinion
9. Spring
10. 2nd drive gear
11. Shift rod
12. Main axle
13. One-way clutch
14. 2nd driven gear
15. Sprocket
16. Low range
17. High range
18. Drive axle
19. 1st driven gear
20. Spring
21. Kick gear
22. Kick crank

2. The use of an automatic 2-speed centrifugal clutch relieves the rider from the cumbersome operation of the shift lever. That is, ease of operation and additional safety are ensured for the rider. When starting out, gears are automatically shifted into first, and then into second according to engine load. This will result in a longer life of the engine.

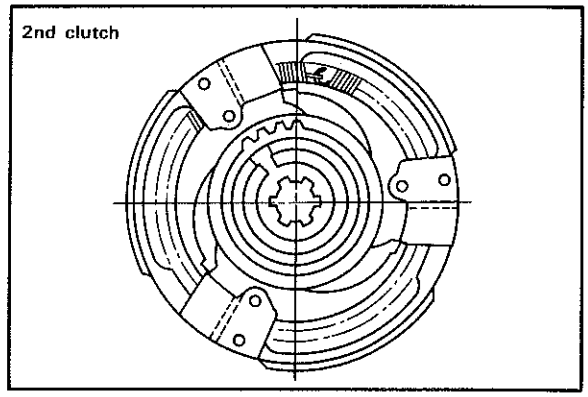
**Automatic transmission mechanism**

The automatic transmission mechanism consists of two shoe-type centrifugal clutches.
1st gear clutch: → For starting out and for 1st gear operation.
2nd gear clutch: → For automatic change to 2nd gear.

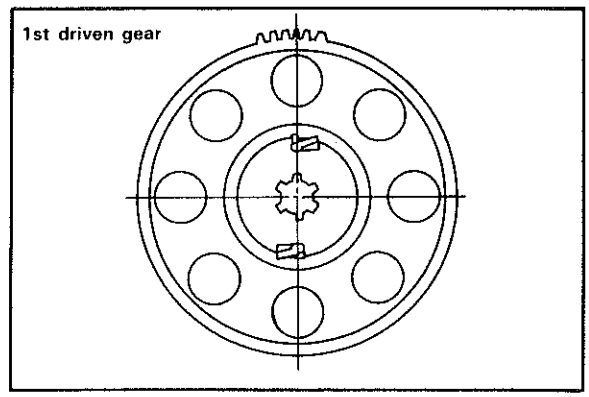
1. Each clutch has three clutch shoes operated by centrifugal force. These shoes are well balanced to minimize the vibration for smooth operation.
   This clutch is provided with linings of high wear-resistance, and thus excellent clutching power is guaranteed. The heat generated by friction between shoes and lining is quickly dissipated through the gear oil to the clutch housing, with which the clutch shoes are in contact.




2. The 2nd gear side is provided with an overrunning clutch.

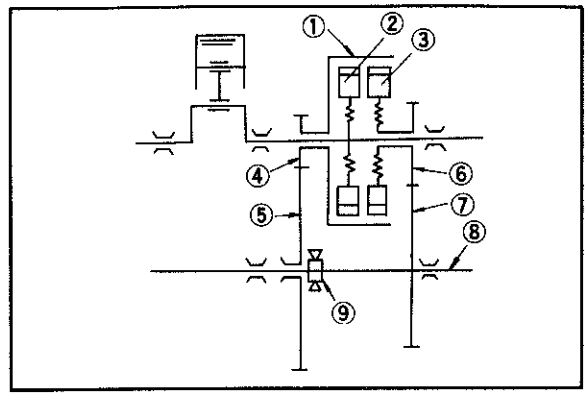



3. An overrunning clutch for starting is built in the hub of driven gear 1. Longer life is ensured by simple construction.



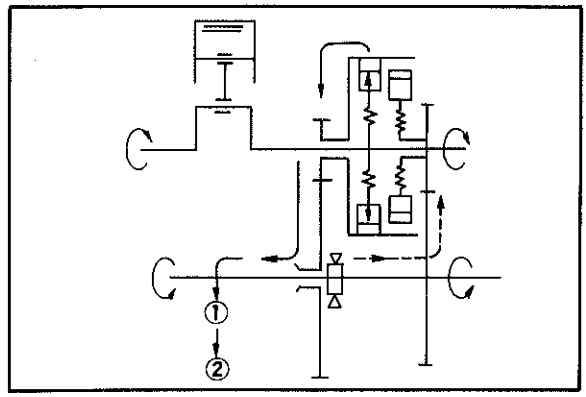
**Theory of operation**

1. Idling
   At idling, the 1st gear side clutch driven by the crankshaft is kept uncoupled by spring force, because of the centrifugal force exerted on the weights.



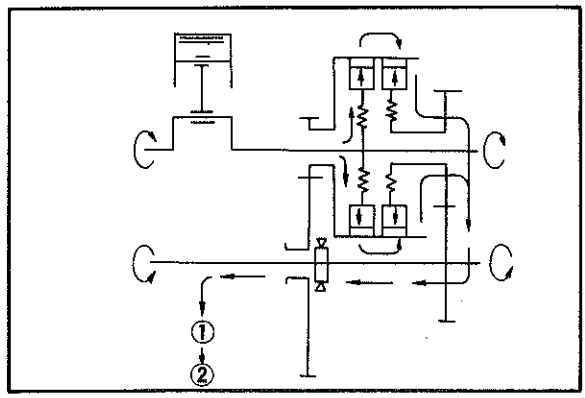

1. Clutch housing
2. 1st clutch
3. 2nd clutch
4. 1st drive gear
5. 1st driven gear
6. 2nd drive gear
7. 2nd driven gear
8. Main axle
9. One-way clutch

2. Starting out with 1st gear
   As the throttle grip is twisted open, the engine speed increases, and the spring force is overcome by the centrifugal force, and the clutch shoes are forced against the clutch housing, causing friction. As the friction increases, the turning force of the engine is transmitted to the main axle through 1st drive and driven gears.



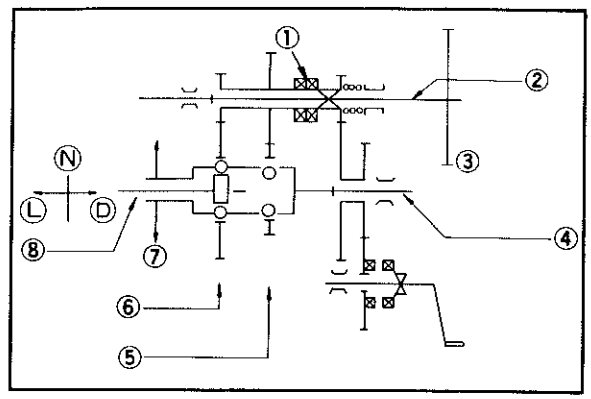

1. Subtransmission
2. Rear wheel

3. Reduction and 2nd gear
   As the throttle grip is further opened, the 2nd side clutch begins to operate. That is, the clutch shoes are forced against the clutch housing by the weights, and thus the engine power is transmitted through 2nd drive and driven gears to the main axle.
   At this stage, the 1st gear side clutch is released because it is an overrunning clutch.



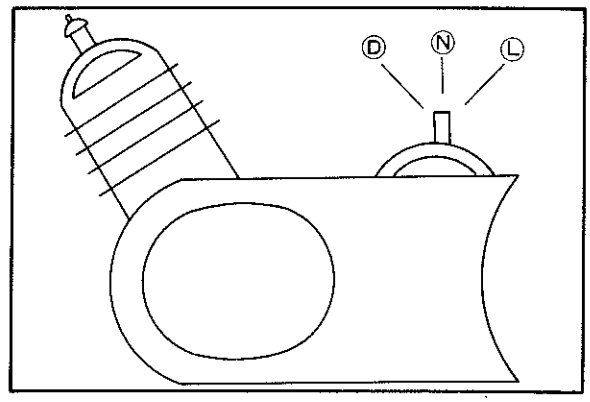

1. Subtransmission
2. Rear wheel

4. Sub-transmission mechanism
   In order to increase the engine torque required for climbing a hill with ease, this motorbike is equipped with a subtransmission.




1. Dock
2. Main axle
3. Driven gear
4. Drive axle
5. Drive range
6. Low range
7. Sprocket
8. Shift rod

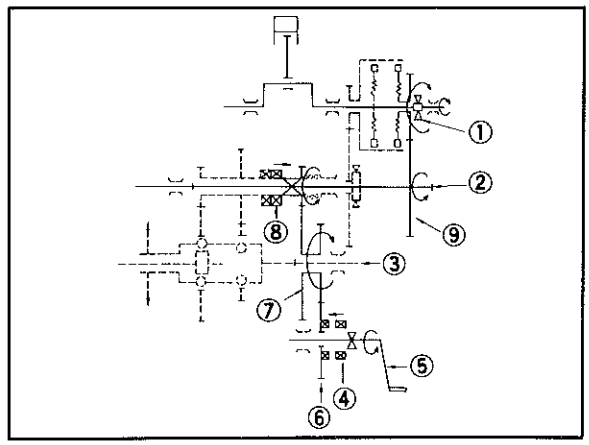
5. Operation of the lever
   D-range:
   Driving on level roads
   N-range:
   Neutral (Engine warming up)
   L-range:
   Climbing up a steep slope




**NOTE:**
1. The shift lever must be operated at idling.
2. In order to change to the "L" range, first push down the stopper lever and then set the shift lever to "L".

## Kick starter mechanism

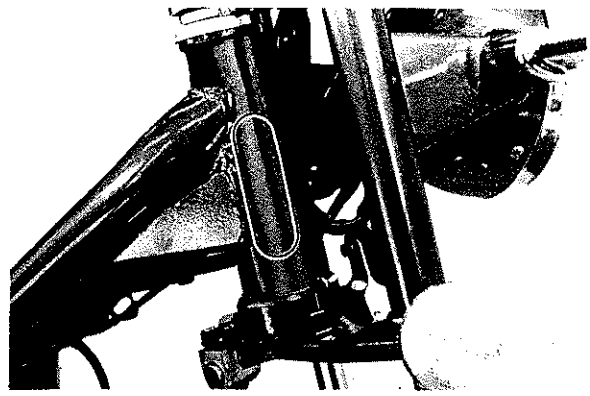
1. Both kick idle gear and kick pinion are helically meshed. When kicked, thrust is exerted on the pinion, thus causing it to move off the drive axle.
2. When the kick crank returns to its home position after the engine is started, the kick pinion is forced back by the return spring.




1. One way clutch
2. Main axle
3. Drive axle
4. Ratchet wheel
5. Kick crank
6. Kick gear
7. Kick idle gear
8. Dock
9. Driven gear

## MACHINE IDENTIFICATION

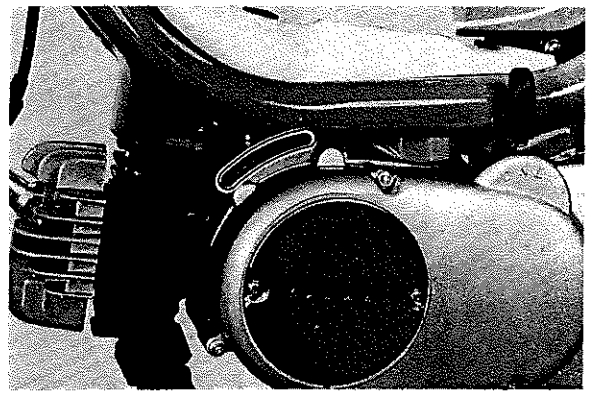
The frame serial number is located on the right-hand side of the headstock assembly. The first three digits identify the model. This is followed by a dash. The remaining digits identify the production number of the unit.



Frame serial number

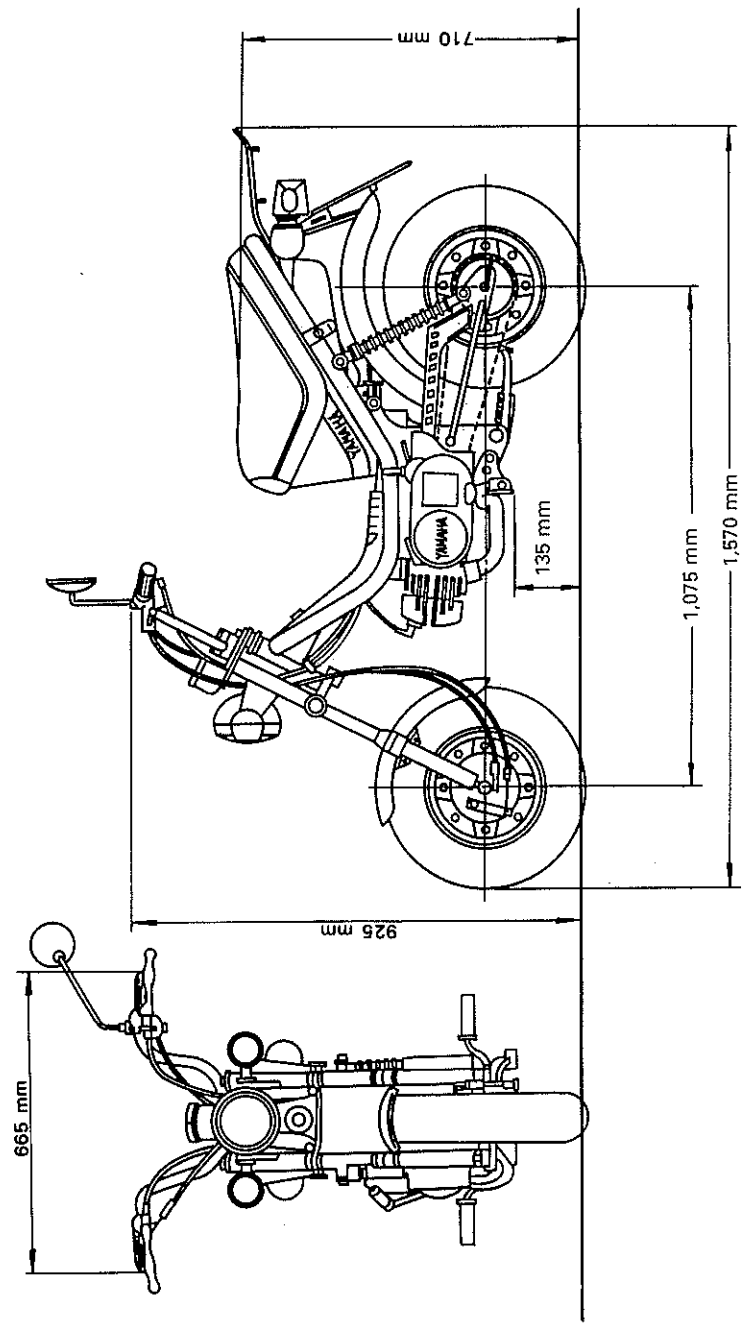
The engine serial number is located on a raised boss on the upper front, left-hand side of the engine. Engine identification follows the same code as frame identification.
Normally, both serial numbers are identical; however, on occasion they may be two or three numbers off.

| Starting Serial Number | |
|---|---|
| 439-1000101 | (LB50 II AC) |
| 34H-010101 | (LB80 II AC) |

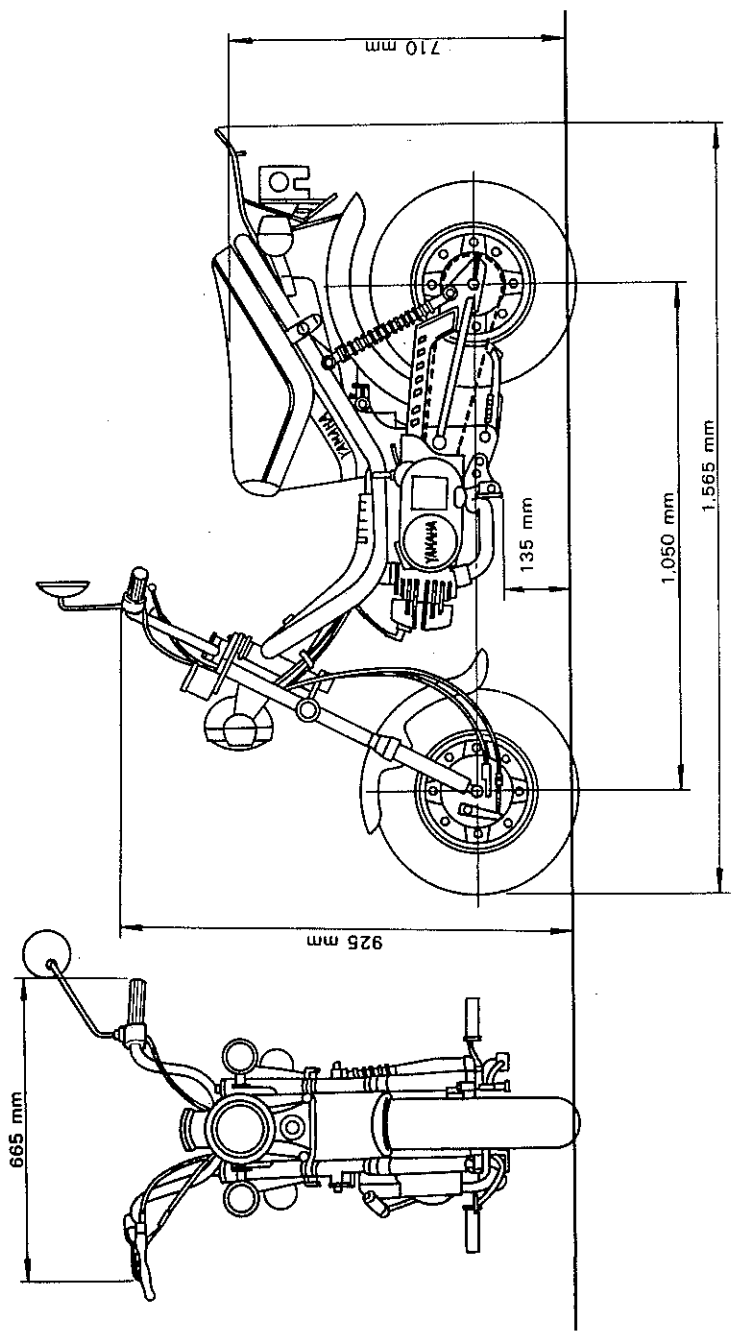


Engine serial number

## EXTERNAL VIEW
## LB50 Ⅱ AC



**LB80ΠAC**



# SPECIFICATIONS

## GENERAL SPECIFICATIONS

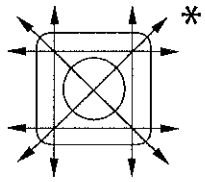
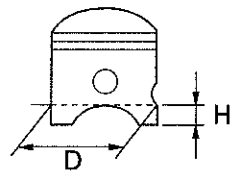
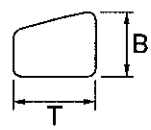
| Model | LB50 II AC | LB80 II AC |
|---|---|---|
| Model code: | 4F4 | 4RP |
| Engine starting number: | 439-1000101 | 34H-010101 |
| Frame starting number: | 439-1000101 | 34H-010101 |
| Dimensions: | | |
| Overall length | 1,570 mm | 1,565 mm |
| Overall width | 665 mm | ← |
| Overall height | 925 mm | ← |
| Seat height | 710 mm | ← |
| Wheelbase | 1,075 mm | 1,050 mm |
| Minimum ground clearance | 135 mm | ← |
| Minimum turning radius | 1,500 mm | ← |
| Basic weight: | | |
| With oil and full fuel tank | 80 kg | 76 kg |
| Engine: | | |
| Engine type | Air cooled 2-stroke | ← |
| Induction system | Torque induction | ← |
| Cylinder arrangement | Single cylinder, forward inclined | ← |
| Displacement | 49 $cm^3$ | 72 $cm^3$ |
| Bore × stroke | 40.0 × 39.7 mm | 47.0 × 42.0 mm |
| Compression ratio | 6.6:1 | 5.8:1 |
| Starting system | Kick starter | ← |
| Lubrication system: | Separate lubrication (Yamaha autolube) | ← |
| Oil type or grade: | | |
| Engine oil | Air cooled 2-stroke engine oil | ← |
| Transmission oil | SAE 10W30 type SE motor oil | ← |
| Oil capacity: | | |
| Oil tank (engine oil) | 1.4 L | ← |
| Transmission oil | | |
| Periodic oil change | 0.65 L | ← |
| Total amount | 0.7 L | ← |
| Air filter: | Wet type element | ← |
| Fuel: | | |
| Type | Regular unlead gasoline | ← |
| Fuel tank capacity | 3.5 L | ← |
| Fuel reserve amount | 0.5 L | 0.3 L |
| Carburetor: | | |
| Type / quantity | VM14SC/1 | VM16/1 |
| Manufacturer | MIKUNI | ← |

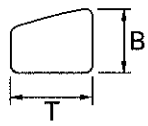
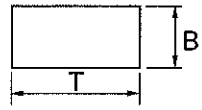
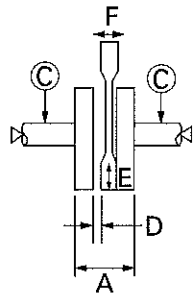
| Model | | LB50 II AC | LB80 II AC |
|---|---|---|---|
| Spark plug: | | | |
| Type | | B6HS | ← |
| Manufacturer | | NGK | ← |
| Spark plug gap | | 0.5 ~ 0.6 mm | ← |
| Clutch type: | | Wet, centrifugal automatic | ← |
| Transmission: | | | |
| Secondary reduction system | | Chain drive | ← |
| Secondary reduction ratio | | 31/14 (2.214) | 30/15 (2.000) |
| Transmission type | | Constant mesh 2-speed automatic | ← |
| Operation | | Centrifugal automatic type | ← |
| Gear ratio | 1st | 69/18 (3.833) | ← |
| | 2nd | 59/28 (2.107) | ← |
| Sub-transmission ratio low | | 39/12 (3.250) | ← |
| Sub-transmission ratio high | | 35/16 (2.188) | 29/15 (1.933) |
| Chassis: | | | |
| Frame type | | Steel tube underbone | ← |
| Caster angle | | 26° | ← |
| Trail | | 45 mm | ← |
| Tire: | | | |
| Type | | With tube | ← |
| Size | front | 4.00-8-4PR | ← |
| | rear | 4.00-8-4PR | ← |
| Manufacturer | front | INOUE | ← |
| | rear | INOUE | ← |
| Tire pressure (cold tire): | | | |
| Loading condition A * | | 0 ~ 70 kg | 0 ~ 74 kg |
| | front | 100 kPa (1.00 kg/cm$^2$, 1.00 bar) | ← |
| | rear | 125 kPa (1.25 kg/cm$^2$, 1.25 bar) | ← |
| Loading condition B * | | 70 ~140 kg | 74 ~ 144 kg |
| | front | 100 kPa (1.00 kg/cm$^2$, 1.00 bar) | ← |
| | rear | 200 kPa (2.00 kg/cm$^2$, 2.00 bar) | 150 kPa (150 kg/cm$^2$, 1.50 bar) |
| Brake: | | | |
| Front brake | type | Drum brake | ← |
| | operation | Right hand operation | ← |
| Rear brake | type | Drum brake | ← |
| | operation | Left hand operation | ← |

* Load is the total weight of cargo, rider, passenger and accessories.

| Model | LB50 II AC | LB80 II AC |
|---|---|---|
| Suspension: | | |
| Front suspension | Telescopic fork | ← |
| Rear suspension | Swingarm | ← |
| Shock absorber: | | |
| Front shock absorber | Coil spring / Oil damper | ← |
| Rear shock absorber | Coil spring / Oil damper | ← |
| Wheel travel: | | |
| Front wheel travel | 75 mm | ← |
| Rear wheel travel | 84 mm | 80 mm |
| Electrical: | | |
| Ignition system | C.D.I. | ← |
| Generator system | Flywheel magneto | ← |
| Battery type | 6N4-2A-2 | ← |
| Battery capacity | 6 V 4 AH | ← |
| Headlight type: | Bulb type | ← |
| Bulb wattage × quantity: | | ← |
| Headlight | 6 V 25 W / 25 W | ← |
| Tail / brake light | 6 V 5.3 W / 17 W | ← |
| Flasher light | 6 V 10 W × 4 | ← |
| Meter light | 6 V 3 W × 1 | ← |
| High beam indicator light | 6 V 3 W × 1 | ← |
| Oil level indicator light | 6 V 3 W × 1 | ← |

# MAINTENANCE SPECIFICATIONS
## ENGINE

| Model | | LB50 II AC | LB80 II AC |
|---|---|---|---|
| Cylinder head: | | | |
| Warp limit | | 0.03 mm | ← |
|  | | | |
| Cylinder: | | | |
| Bore size | | 40.00 ~ 40.02 mm | 47.00 ~ 47.02 mm |
| Taper limit | | 0.05 mm | ← |
| Out of round limit | | 0.01 mm | ← |
| Piston: | | | |
| Piston to cylinder clearance | | 0.025 ~ 0.030 mm | ← |
| <Limit> | | <0.1 mm> | ← |
| Piston size "D" | | 39.94 ~ 40.00 mm | 46.94 ~ 47.00 mm |
|  | | | |
| Measuring point "H" | | 5 mm | ← |
| Oversize | 1st | 40.25 mm | 47.25 mm |
| Oversize | 2nd | 40.5 mm | 47.5 mm |
| Piston off-set | | 0.2 mm | 0.5 mm |
| Piston off-set direction | | EX side | ← |
| Piston pin bore inside diameter | | 12.004 ~ 12.015 mm | ← |
| Piston pin outside diameter | | 11.996 ~ 12.000 mm | ← |
| Piston rings: | | | |
| Top ring: | | | |
|  | | | |
| Type | | Key stone | ← |
| Dimensions (B × T) | | 1.5 × 1.8 mm | 2.0 × 2.1 mm |
| End gap (installed) | | 0.15 ~ 0.35 mm | ← |
| Side clearance (installed) | | 0.03 ~ 0.05 mm | 0.02 ~ 0.06 mm |

| Model | LB50 II AC | LB80 II AC |
|---|---|---|
| 2nd ring:<br>  <br> | | |
| Type | Keystone | — |
| Dimensions (B × T) | 1.5 × 1.8 mm | — |
| End gap (installed) | 0.15 ~ 0.35 mm | — |
| Side clearance | 0.03 ~ 0.05 mm | — |
| 2nd ring:<br>  <br> | | |
| Type | — | Plain |
| Dimensions (B × T) | — | 2.0 × 2.1 mm |
| End gap (installed) | — | 0.15 ~ 0.35 mm |
| Side clearance | — | 0.02 ~ 0.06 mm |
| Crankshaft:<br>  <br> | | |
| Crank width "A" | 37.90 ~ 37.95 mm | ← |
| Runout limit "C" | 0.015 mm | ← |
| Big end side clearance "D" | 0.20 ~ 0.50 mm | ← |
| Big end radial clearance "E" | 0.004 ~ 0.015 mm | 0.004 ~ 0.017 mm |
| Small end free play "F" | 0.8 ~ 2.0 mm | ← |
| Automatic centrifugal clutch: | | |
| Clutch shoe thickness | 2.5 mm | ← |
| <Wear limit> | <2 mm> | ← |
| Clutch-stall revolution | 2,800 ~ 3,200 r/min | 2,700 ~ 3,200 r/min |
| Transmission: | | |
| Main axle deflection limit | 0.015 mm | ← |
| Drive axle deflection limit | 0.015 mm | ← |
| Kick starter: | | |
| Kick starter type | Kick and mesh type | Ratchet type |
| Kick clip friction force | 8.0 ~ 20.0 N<br>(0.8 ~ 2.0 kg) | 8.0 ~ 15.0 N<br>(0.8 ~ 1.5 kg) |

| Model | | LB50 II AC | LB80 II AC |
|---|---|---|---|
| Air filter oil grade: | | Form-air-filter oil or SAE10W30 type SE motor oil | ← |
| Carburetor: | | | |
| I. D. mark | | 2T5 00 | 1F5 01 |
| Main jet | (M.J) | #95 | ← |
| Air jet | (A.J) | 2.5 | ← |
| Jet needle | (J.N) | 3G9 / 3 | ← |
| Needle jet | (N.J) | E-4 | E-8 |
| Cutaway | (C.A) | 2.5 | ← |
| Pilot outlet | (P.O) | 0.9 - 1.5 | ← |
| Pilot jet | (P. J) | #17.5 | #15 |
| Air screw | (A.S) | 1 | 1-3/4 |
| Valve seat size | (V.S) | 1.2 | ← |
| Starter jet | (G.S.1) | #20 | #25 |
| Float heigh | (F.H) | 22.0 ± 2.5 mm | ← |
| Engine idle speed | | 1,250 ~ 1,450 r/min | ← |
| Reed valve: | | | |
| Thickness | | 0.15 mm | ← |
| Valve stopper height | | 6.8 ~ 7.2 mm | ← |
| Valve bending limit | | 0.3 mm | ← |
| Lubrication system: | | | |
| Autolube pump: | | | |
| Plunger diameter | | 3.5 mm | 4.0 mm |
| Color code | | Grey | Brown |
| Minimum stroke | | 0.20 ~ 0.25 mm | 0.25 ~ 0.30 mm |
| Maximum stroke | | 0.55 ~ 0.65 mm | 0.80 ~ 0.95 mm |
| Pulley adjusting mark | | At idle | ← |

## CHASSIS

| Model | | LB50 II AC | LB80 II AC |
|---|---|---|---|
| Steering system: | | | |
| Steering bearing type | | Ball bearing | ← |
| No. / size of steel balls | | | |
| | upper | 22 pcs / 0.1875 in | ← |
| | lower | 19 pcs / 0.25 in | ← |
| Front suspension: | | | |
| Front fork travel | | 75 mm | ← |
| Fork spring free length | | 482 mm | ← |
| Spring rate | (K1) | 8.45 N/mm (0.845 kg/mm) | ← |
| | (K2) | 18.0 N/mm (1.8 kg/mm) | ← |
| Stroke | (K1) | 0 ~ 48 mm | ← |
| | (K2) | 48 ~ 75 mm | ← |
| Optional spring | | No | ← |
| Oil capacity | left | 96 $cm^3$ | ← |
| | right | 120 $cm^3$ | ← |
| Oil grade | | Fork oil 10W or equivalent | ← |
| Rear suspension: | | | |
| Shock absorber travel | | 65 mm | ← |
| Spring free length | | 212 mm | ← |
| Fitting length | | 207 mm | ← |
| Spring rate | (K1) | 21.0 N/mm (2.1 kg/mm) | ← |
| | (K2) | 28.5 N/mm (2.85 kg/mm) | ← |
| Stroke | (K1) | 0 ~ 34 mm | ← |
| | (K2) | 34 ~ 65 mm | ← |
| Optional spring | | No | ← |
| Swingarm: | | | |
| Free play limit | end | 1 mm | ← |
| | side | 0.5 mm | ← |
| Front wheel: | | | |
| Type | | Disc wheel | ← |
| Rim size | | 2.50C × 8 | ← |
| Rim material | | Steel | ← |
| Rim runout limit | radial | 1 mm | ← |
| | lateral | 1 mm | ← |
| Rear wheel: | | | |
| Type | | Disc wheel | ← |
| Rim size | | 2.50C × 8 | ← |
| Rim material | | Steel | ← |
| Rim runout limit | radial | 1 mm | ← |
| | lateral | 1 mm | ← |

| Model | LB50 II AC | LB80 II AC |
|---|---|---|
| Drive chain: | | |
| Type / manufacturer | DK420 / DAIDO | DID420 / DAIDO |
| No. of links | 94 | 88 |
| Chain free play | 20 ~ 30 mm | ← |
| Front drum brake: | | |
| Type | Leading, trailing | ← |
| Brake drum inside diameter | 110 mm | ← |
| <Limit> | <111 mm> | ← |
| Lining thickness | 4 mm | ← |
| <Limit> | <2 mm> | ← |
| Shoe spring free length | 50.5 mm | ← |
| Rear drum brake: | | |
| Type | Leading, trailing | ← |
| Brake drum inside diameter | 110 mm | ← |
| <Limit> | <111 mm> | ← |
| Lining thickness | 4 mm | ← |
| <Limit> | <2 mm> | ← |
| Shoe spring free length | 50.5 mm | ← |
| Brake lever & brake pedal: | | |
| Brake lever free play (at pivot) | 5 ~ 8 mm | ← |
| Brake lever free play (at lever end) | 10 ~ 20 mm | ← |

## Tightening torques

| Part to be tightened | Thread size | Tightening torque | | Remarks |
|---|---|---|---|---|
| | | Nm | m·kg | |
| Handlebar holder (lower) and handlebar holder (upper) | M6 × 1.25 | 12 | 1.2 | |
| Handlebar (lower) and upper bracket | M10 × 1.25 | 21 | 2.1 | |
| Upper bracket and steering stem | M10 × 1.25 | 21 | 2.1 | |
| Upper bracket and inner tube | M10 × 1.25 | 21 | 2.1 | |
| Engine mounting: | | | | |
| Mounting bolt (front upper) | M8 × 1.25 | 18 | 1.8 | |
| Mounting bolt (front side) | M8 × 1.25 | 18 | 1.8 | |
| Mounting bolt (rear upper and rear side) | M8 × 1.25 | 18 | 1.8 | |
| Mounting bolt (rear lower and rear side) | M8 × 1.25 | 18 | 1.8 | |
| Front wheel axle | M10 × 1.25 | 39 | 3.9 | |
| Rear wheel axle | M12 × 1.25 | 60 | 6.0 | |
| Pivot shaft | M10 × 1.25 | 39 | 3.9 | |
| Rear shock absorber and bracket | M12 × 1.25 | 59 | 5.9 | |
| Rear shock absorber and swing arm | M12 × 1.25 | 59 | 5.9 | |
| Tension bar and brake shoe plate | M8 × 1.25 | 18 | 1.8 | |
| Tension bar and swingarm | M8 × 1.25 | 18 | 1.8 | |
| Sprocket and sprocket hub | M8 × 1.25 | 20 | 2.0 | |
| Brake camshaft lever | M6 × 1.0 | 7 | 0.7 | |
| Wheel panel 1 and wheel panel 2 | M8 × 1.25 | 15 | 1.5 | |
| Wheel and sprocket hab | M8 × 1.25 | 23 | 2.3 | |
| Footrest and frame | M8 × 1.25 | 11 | 1.1 | |
| Fuel cock and stay | M6 × 1.0 | 4 | 0.4 | |
| Muffler and frame | M8 × 1.25 | 9 | 0.9 | |
| Front fender | M6 × 1.25 | 5 | 0.5 | |
| Rear fender | M6 × 1.25 | 5 | 0.5 | |
| Turn signal and stay | M8 × 1.25 | 10 | 1.0 | |
| CDI unit | — | 3 | 0.3 | |
| Ignition coil | — | 7 | 0.3 | |
| Kick crank and kick axle | — | 10 | 1.0 | |

## ELECTRICAL

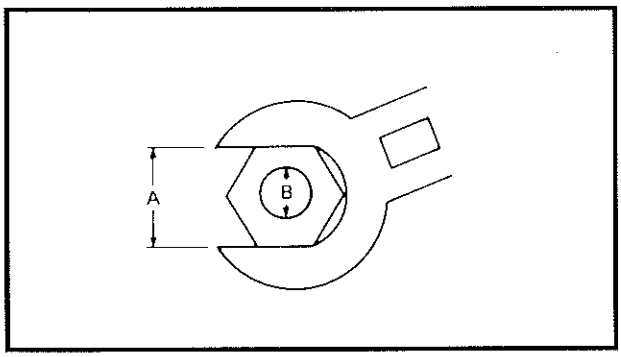
| Model | | LB50 II AC | LB80 II AC |
|---|---|---|---|
| Voltage: | | 6 V | ← |
| Ignition system: | | | |
| Ignition timing (B.T.D.C.) | | 22° at 5,000 r/min | ← |
| CDI: | | | |
| Magneto model / manufacturer | | F4GC / YAMAHA | ← |
| Pickup coil resistance / color | | 16 ~ 24 Ω at 20°C White/Green-Black | ← |
| Source coil resistance / color | | 264 ~ 396 Ω at 20°C Black/Red-Black | ← |
| CDI unit model / manufacturer | | 3UP / YAMAHA | ← |
| Ignition coil: | | | |
| Model / manufacturer | | 4RP / YAMAHA | ← |
| Minimum spark gap | | 5 mm | ← |
| Primary winding resistance | | 0.32 ~ 0.48 Ω at 20°C | ← |
| Secondary winding resistance | | 5.68 ~ 8.52 kΩ at 20°C | ← |
| Spark plug cap: | | | |
| Type | | Resin type | ← |
| Resistance | | 5 kΩ | ← |
| Charging system: | | | |
| Type | | Flywheel magneto | ← |
| Flywheel magneto: | | | |
| Model / manufacturer | | F4GC / YAMAHA | ← |
| Charging current-day | | | |
| | min. | 0.8 A at 3,000 r/min | ← |
| | max. | 2 A at 8,000 r/min | ← |
| Charging current-night | | | |
| | min. | 0.8 A at 3,000 r/min | ← |
| | max. | 2 A at 8,000 r/min | ← |
| Charging coil resistance / color | | 0.30 ~ 0.44 Ω at 20°C White-Black | ← |
| Lighting voltage | | | |
| | min. | 6.2 V at 3,000 r/min | ← |
| | max. | 8 V at 8,000 r/min | ← |
| Lighting coil resistance color | | 0.2 ~ 0.3 Ω at 20°C Yellow/Red-Black | ← |
| Voltage regulator: | | | |
| Model / manufacturer | | EHU01TR33 / MATSUSHITA | ← |
| No load regulated voltage | | 6.1 ~ 7.3 V | ← |
| Capacity | | 8 A | ← |
| Withstand voltage | | 400 V | ← |

| Model | LB50 II AC | LB80 II AC |
|---|---|---|
| Horn: | | |
| Type | Plane type | ← |
| Quantity | 1 | ← |
| Model / manufacturer | GF-6 / NIKKO | ← |
| Maximum amperage | 1.5 A | ← |
| Flasher relay: | | |
| Type | Condenser type | ← |
| Model / manufacturer | FR-2212 / MITSUBA | ← |
| Self cancelling device | No | ← |
| Flasher frequency | 60 ~ 120 cycle/min | ← |
| Wattage | 10 W × 2 | ← |
| Oil level switch: | | |
| Model / manufacturer | 2T5 / STANLEY | ← |
| Circuit breaker: | | |
| Type | Fuse | ← |
| Amperage for individual circuits | | |
| Main | 10 A × 1 | ← |
| Reserve | 10 A × 1 | ← |

EB202001

# GENERAL TORQUE SPECIFICATIONS

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are provided for each chapter of this manual. To avoid warpage, tighten multi-fastener assemblies in a criss-cross fashion, in progressive stages, until the specified torque is reached. Unless otherwise specified, torque specifications require clean, dry threads. Components should be at room temperature.



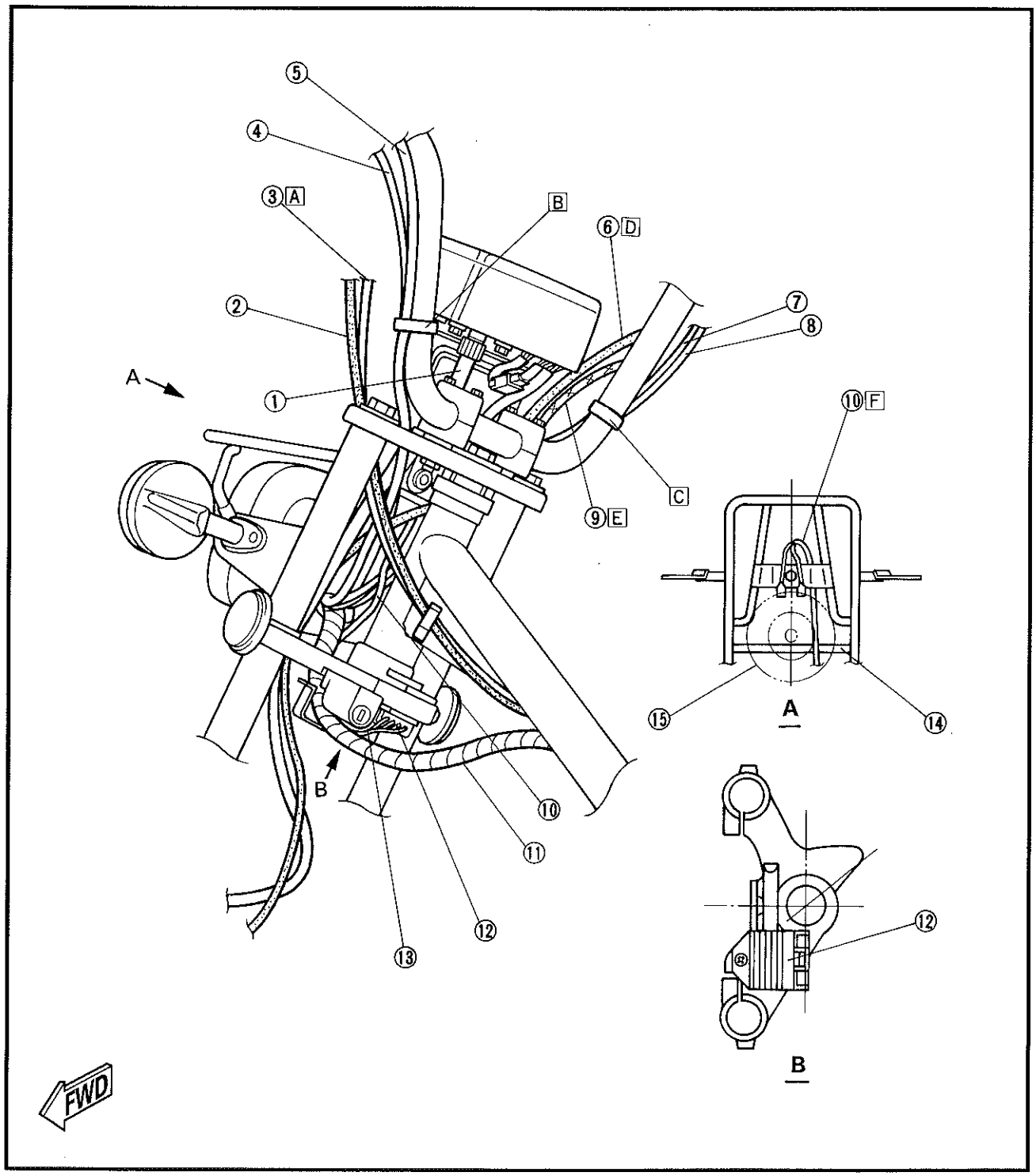

A: Distance between flats
B: Outside thread diameter

| A (nut) | B (bolt) | General torque specifications | |
|---|---|---|---|
| | | Nm | m•kg |
| 10 mm | 6 mm | 6 | 0.6 |
| 12 mm | 8 mm | 15 | 1.5 |
| 14 mm | 10 mm | 30 | 3.0 |
| 17 mm | 12 mm | 55 | 5.5 |
| 19 mm | 14 mm | 85 | 8.5 |
| 22 mm | 16 mm | 130 | 13.0 |

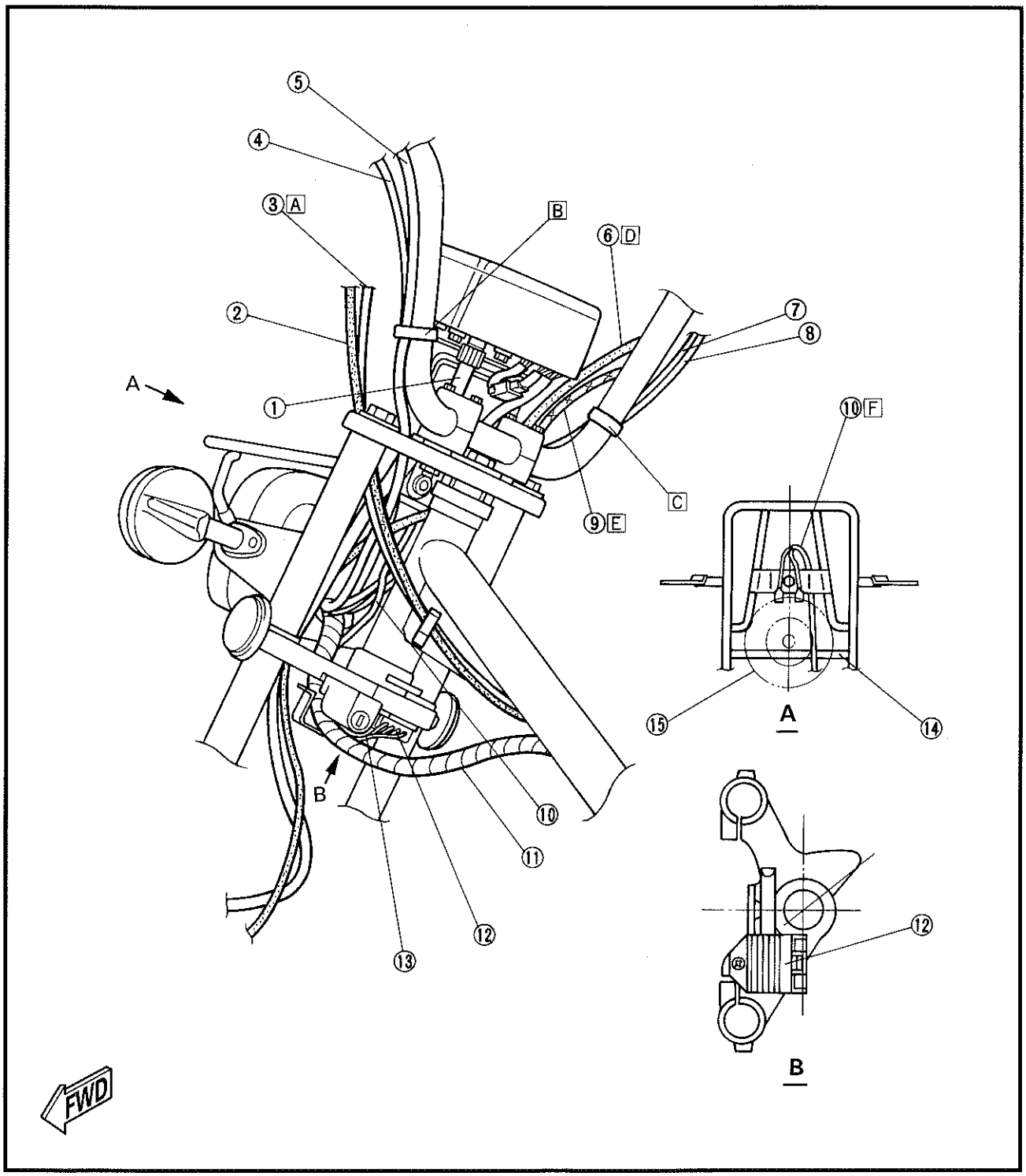
EB206000

# CABLE ROUTING

① Speedometer cable
② Rear brake cable
③ Starter cable
④ Rear brake switch lead
⑤ Left handlebar switch lead
⑥ Front brake cable
⑦ Right handlebar switch
⑧ Front brake switch lead
⑨ Throttle cable #1
⑩ Horn switch lead
⑪ Wire harness
⑫ Rectifier/regulator
⑬ Rectifier/regulator lead
⑭ Cross bar
⑮ Horn

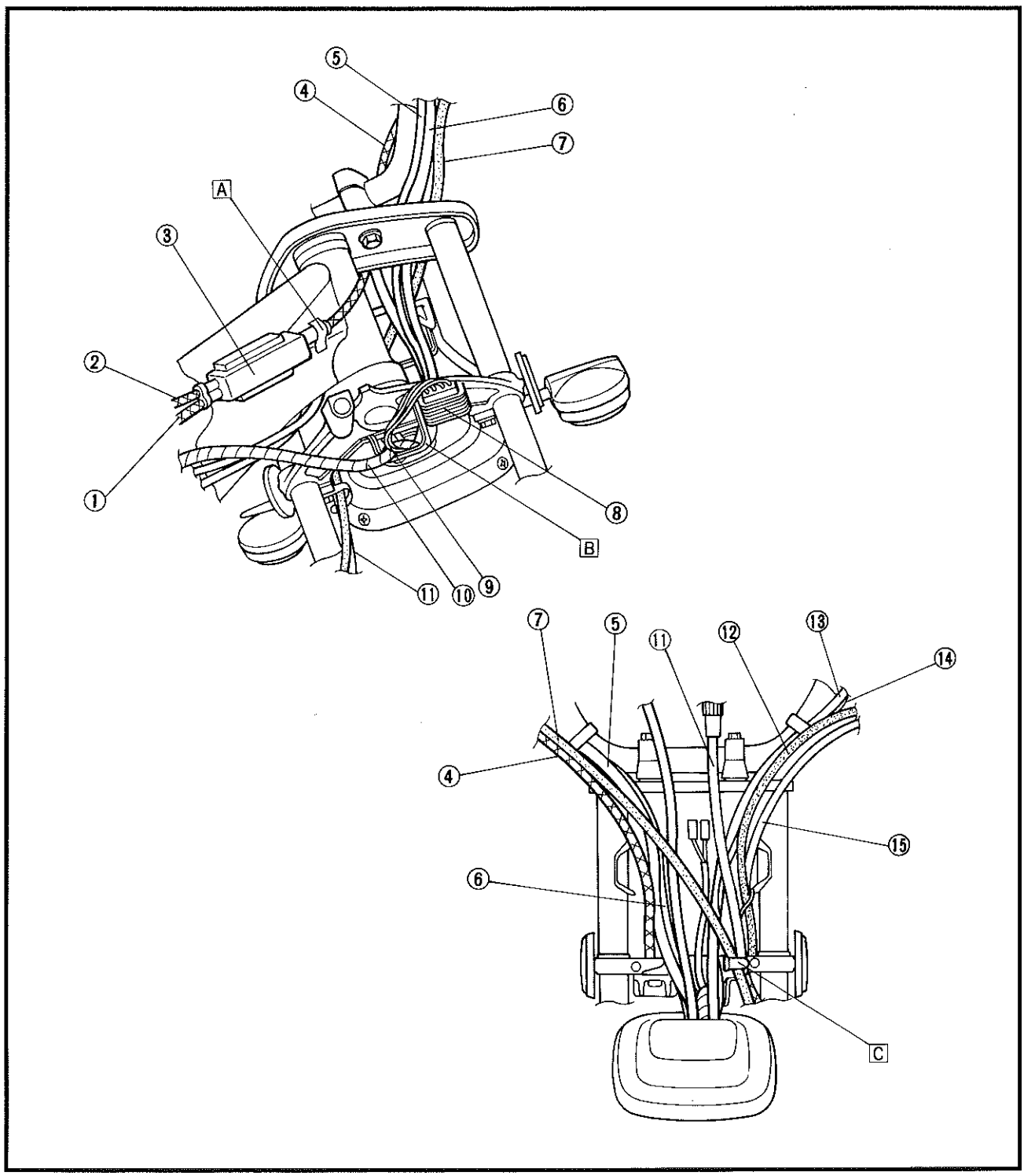


[A] Route the starter cable to the left of the speedometer cable and the left and right handlebar switch leads, and out the upper, left side of the vehicle.
[B] Fasten the rear brake switch lead and left handlebar switch lead with a plastic looking tie.
[C] Fasten the right handlebar switch lead and front brake switch lead with a plastic locking tie.
[D] Route the front brake cable to the right of the speedometer, under the speedometer cable, and out the lower, left side of the vehicle.
[E] Route the throttle cable #1 to the right of the speedometer cable and out the lower, left side of the vehicle.
[F] Route the horn switch lead in front of the cross bar ⑭ and over the horn bracket.



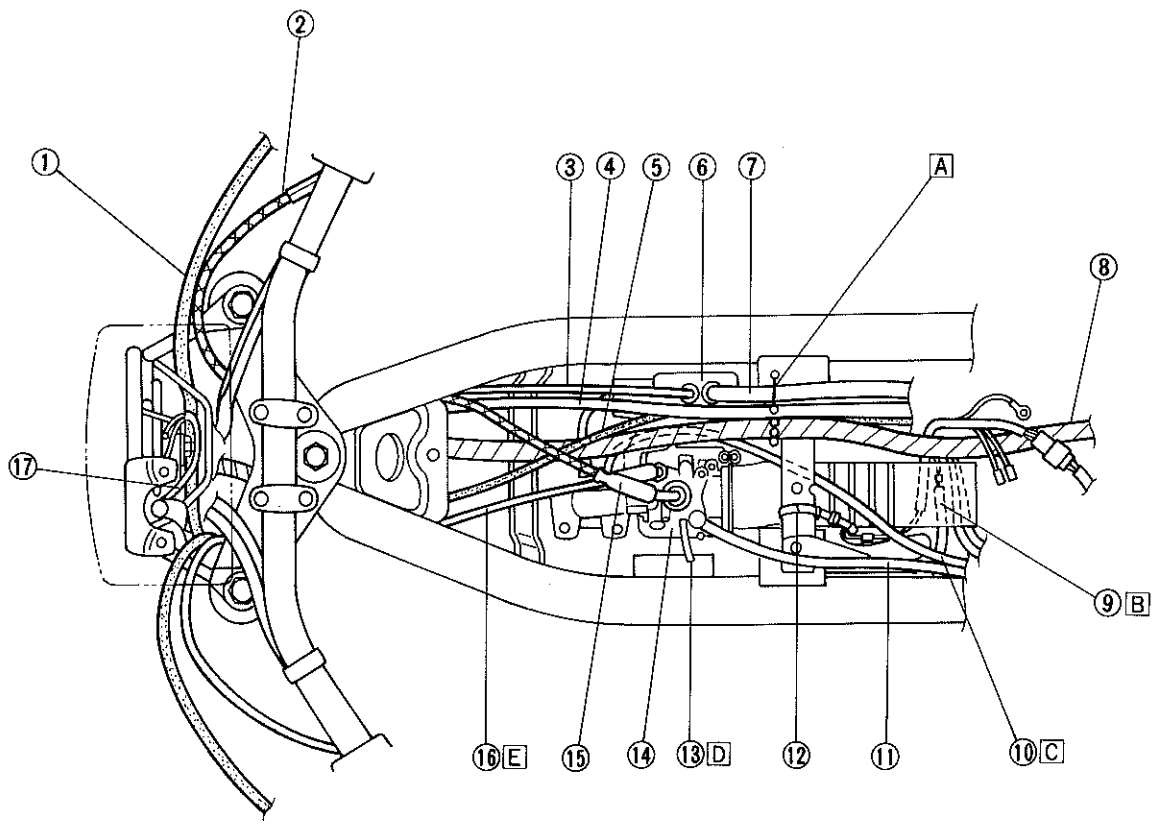
① Autolube pump cable
② Throttle cable #1
③ Throttle cable junction box
④ Throttle cable #2
⑤ Right handlebar switch lead
⑥ Front brake switch lead
⑦ Front brake cable
⑧ Rectifier/regulator
⑨ Rectifier/regulator lead
⑩ Wire harness
⑪ Speedometer cable
⑫ Rear brake cable
⑬ Left handlebar switch lead
⑭ Rear brake switch lead
⑮ Starter cable

[A] Fasten the wire cylinder.
[B] Pass the rectifier/regulator lead and wire harness through the cable guide.
[C] Faster the front brake cable and speedometer cable.

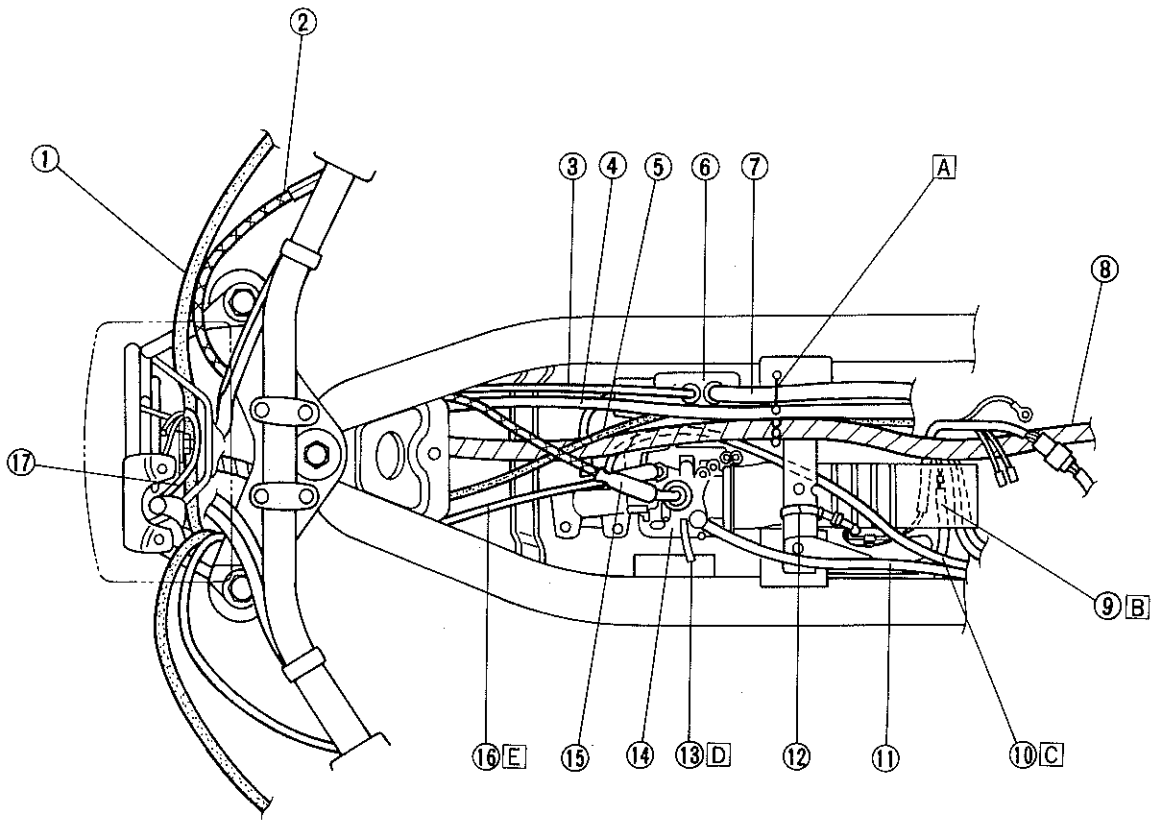


① Front brake cable
② Throttle cable #1
③ Autolube pump cable
④ Spark plug lead
⑤ Rear brake cable
⑥ Autolube pump
⑦ Oil feed hose
⑧ Wire harness
⑨ CDI magneto lead
⑩ Fuel cock vacuum hose
⑪ Fuel hose
⑫ Band
⑬ Mixing chamber air vent hose
⑭ Carburetor
⑮ Throttle cable #2
⑯ Starter cable
⑰ Horn switch lead

[A] Fasten the spark plug lead, rear brake cable, oil feed hose and wire harness with a plastic clip.

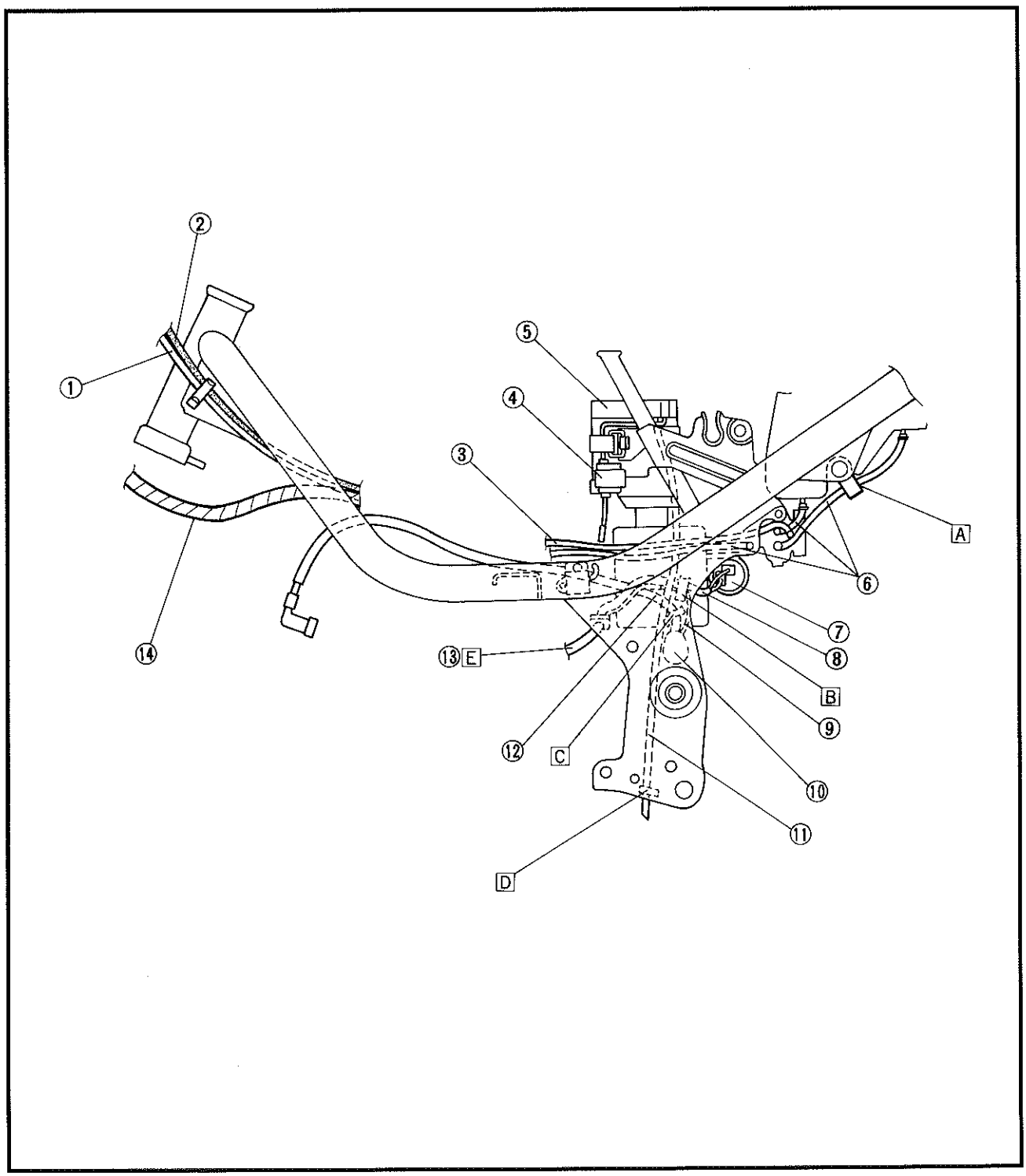


[B] After connecting the CDI magneto lead, route it to the right side.
[C] Route the fuel cock vacuum hose under the frame cross plate.
[D] Pass the inside of slit on the plain of punched on crankcase.
[E] Pass the starter cable under throttle cable #2.

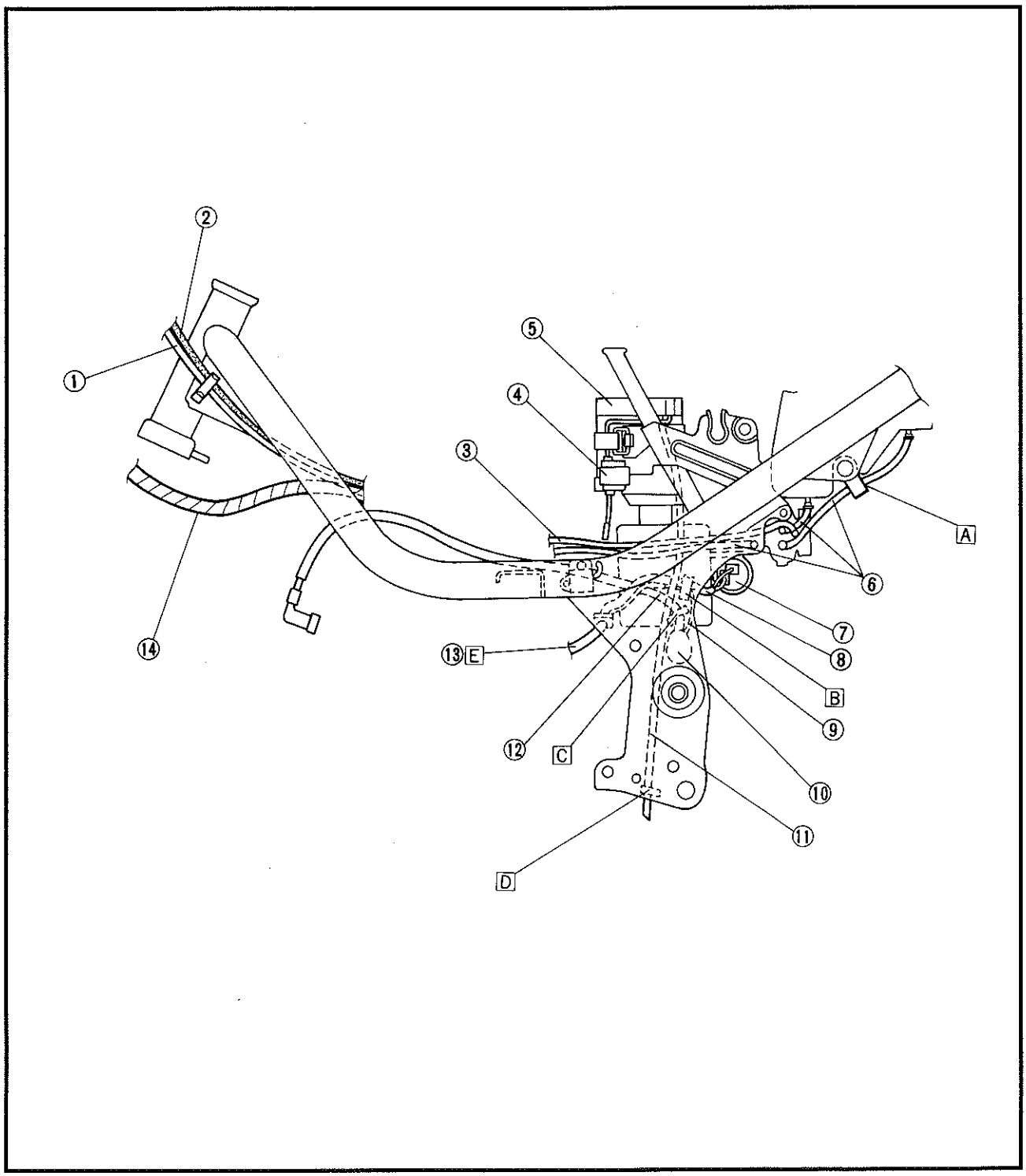


① Starter cable
② Rear brake cable
③ Fuel cock vaccum hose
④ Fuse
⑤ Battery
⑥ Fuel hose
⑦ Flasher relay
⑧ Flasher relay lead
⑨ Ignition coil lead
⑩ Ignition coil
⑪ Battery breather hose
⑫ Spark plug lead
⑬ CDI magneto lead
⑭ Wire harness

[A] Pass the fuel hose through the inside of rear fender bracket.
[B] Fasten the flasher relay lead and ignition coil lead on the left, inside section of frame.
[C] Fasten the spark plug lead on the right, inside section of the frame.

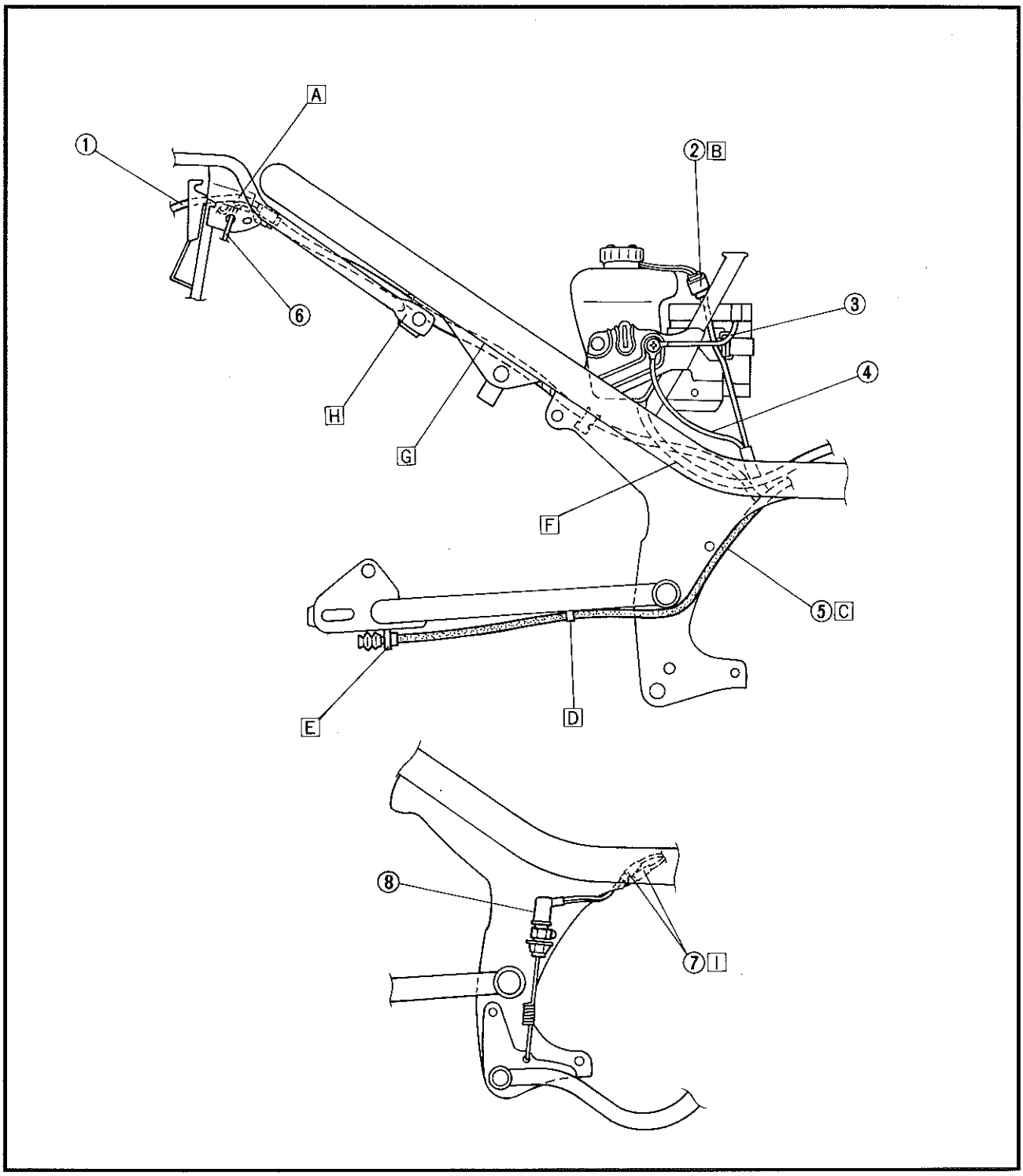


[D] Fasten the battery breather hose on the right, inside section of flame.
[E] Route the CDI magneto lead between the engine and the frame.

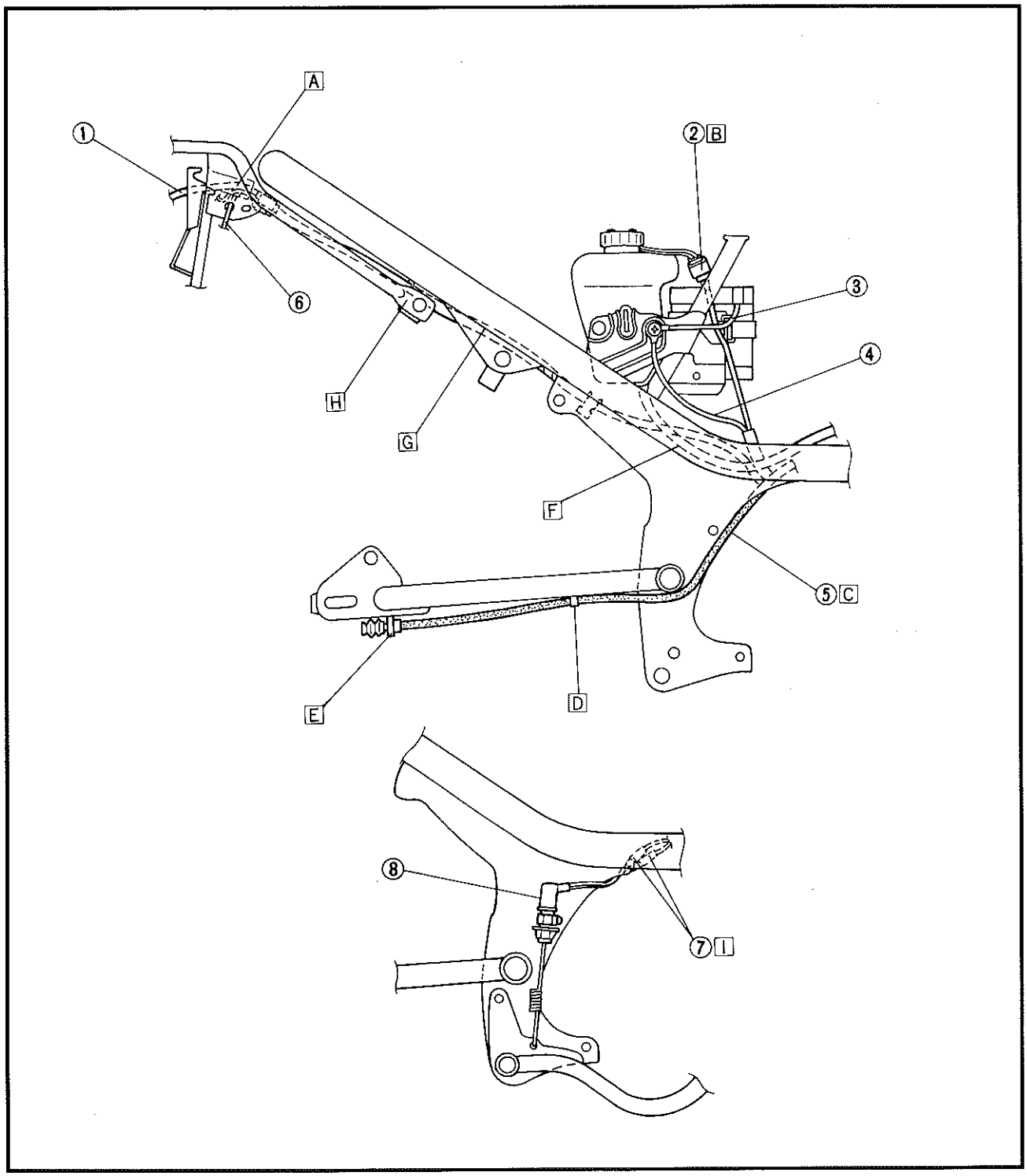


① Tail / brake light switch lead
② Oil level switch coupler.
③ Battery negative (–) lead
④ Wire harness ground lead
⑤ Rear brake cable
⑥ Rear flasher light lead
⑦ Rear brake light switch lead connector
⑧ Rear brake light switch

[A] Fasten the tail / brake light switch lead and rear flasher light switch lead on the right side of the carrier.
[B] After routing the oil level switch lead through the inside of the flame, connect the oil level switch coupler.
[C] Route the rear brake cable between the engine and the frame.
[D] Fasten the rear brake cable.
[E] After installing the rear brake cable, attach the rubber boot.



[F] Make sure that the oil feed hose guide spring sheathe is flush with the base of the oil tank.
[G] Route the tail/brake light lead to inside of the rear shock absorber bracket.
[H] Fasten the tail/brake light lead.
[I] Route the rear brake light switch leads to the inside of the frame.



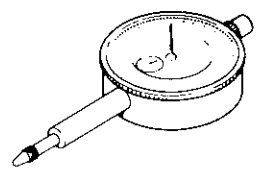
## SPECIAL TOOLS

The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques. The shape and part number used for the special tool differ by country, so two types are provided.

Refer to the list provided to avoid errors when placing an order.

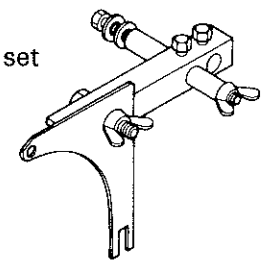
## FOR TUNE UP

1
Dial gauge
P/N. 90890-03097



This tool is necessary for adjusting the autolube pump plunger stroke.

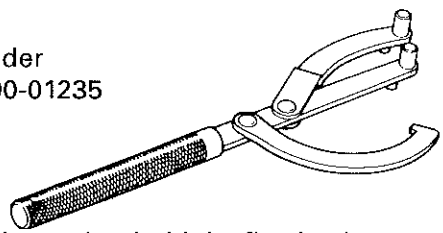
2
Pump adjusting stand set
P/N. 90890-01194



This tool is used to hold the dial gauge when adjusting the autolube pump plunger stroke.

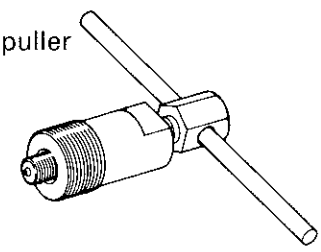
## FOR ENGINE SERVICE

1
Rotor holder
P/N. 90890-01235



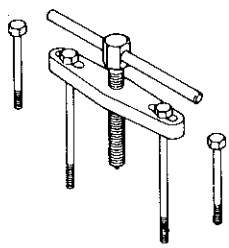
This tool is used to hold the flywheel magneto and clutch assembly when removing or installing the securing nut.

2
Flywheel magneto puller
P/N. 90890-01189



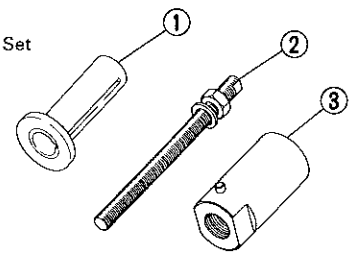
This tool is used to remove the flywheel.

3
Crankcase separating tool
P/N. 90890-01135



This tool is used when removing the crankshaft.

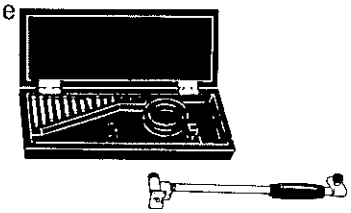
4
Crankshaft Installing Tool Set
Crankshaft Installing Pot
P/N. 90890-01274-①
Crankshaft Installing Bolt
P/N. 90890-01275-②
Adapter
P/N. 90890-01277-③




These tools are used to install the crankshaft.

5

Cylinder bore gauge
(35 ~ 60 mm)
P/N. 90890-03016

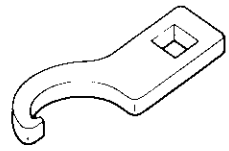


This tool is necessary for adjusting the cylinder bore size.

## FOR CHASSIS SERVICE

1

Ring nut wrench
P/N. 90890-01403

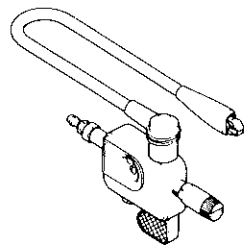


This tool is used to loosen and tighten the steering ring nut.

## FOR ELECTRICAL COMPONENTS

1

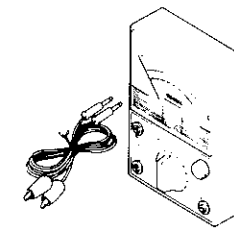
Ignition checker
P/N. 90890-06754



This instrument is necessary for checking the ignition system components.

2

Pocket tester
P/N. 90890-03112



This instrument is invaluable for checking the electrical system.

# CHAPTER 2. PERIODIC INSPECTIONS AND ADJUSTMENTS

# CHAPTER 2. PERIODIC INSPECTIONS AND ADJUSTMENTS

## INTRODUCTION:

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will insure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information not only applies to vehicles already in service, but also to new vehicles that are being prepared for sale. Any service technician performing preparation work should be familiar with this entire chapter.

## SPECIAL TOOLS

1. Dial Gauge
2. Dial Gauge Stand
3. Torque Wrench
4. Steering Nut Wrench
5. Tire Pressure Gauge
6. Fluid Measuring Cup

## MAINTENANCE INTERVALS

| Item | Remarks | Initial (km) | | | | Thereafter every (km) | |
|---|---|---|---|---|---|---|---|
| | | 500 | 1,000 | 1,500 | 3,000 | 1,500 | 3,000 |
| Brake system (complete) | Check/Adjust as required - repair as required | | O | O | | O | |
| Battery | Top-off/Check specification gravity monthly, or → | O | | O | | O | |
| Spark plug | Inspect/Clean or replace as required | O | O | O | | O | |
| Wheels and tires | Pressure/Runout | O | | O | | O | |
| Fittings and fasteners | Tighten before each trip and/or → | O | | O | | O | |
| Drive chain | Tension/Alignment (No. 1) | O | O | O | | O | |
| Engine oil level check | Unit level | O | O | O | | O | |
| Air filter | Wet type - clean/Replace as required (No. 2) | | | O | | O | |
| Fuel petcock(s) | Clean/Flush tank as required | | | O | O | | O |
| Ignition timing | Adjust/Clean or replace parts as required | | O | O | O | | O |
| Carburetor adjustment | Check operation | | O | O | O | | O |
| Carburetor overhaul | Clean/Repair as required/Refit/Adjust | | | | | | 6,000 |
| Decarbonize engine | Includes exhaust system | | | O | | | O |

### Service notes:

No.1. DRIVE CHAIN: In addition to tension and alignment, chain must be lubricated every 500 km. If unit is subjected to extremely hard usage and wet weather riding, chain must be checked constantly. See "Lubrication Intervals" for additional details.

No.2. AIR FILTER: Remove and clean filter at least once per month or every 1,500 km.

## LUBRICATION INTERVALS

| Item | Remarks | Type* | Initial (km) | | | | Thereafter every (km) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 500 | 1,000 | 1,500 | 3,000 | 1,500 | 3,000 | 6,000 |
| Transmission oil change | Warm engine before draining | No. 1 | O | | | O | CHK | O | |
| Drive chain | Lube/Adjust as required | No. 2 | See service notes | | | | | | |
| Drive chain | Remove/Clean/Lube/Adjust | No. 2 | | | O | | O | | |
| Control and meter cables | All-apply thoroughly | No. 3 | | | O | O | | O | |
| Throttle grip and housing | Light application | No. 4 | | | | O | | O | |
| Speedometer gear housing | Light application | No. 4 | | | | O | | | O |
| Rear arm pivot shaft | Zink apply until shows | No. 5 | | | O | | O | | |
| Brake pedal shaft | Light application | No. 4 | | | O | | | O | |
| Stand shaft pivot(s) | Light application | No. 4 | | | O | | | O | |
| Front forks | Drain completely | No. 8 | | CHK | | | CHK | O | |
| Steering ball races | Inspect thoroughly/Pack | No. 6 | | | | O | | CHK | O |
| Point cam lubrication wick | Very light application | No. 7 | | | O | | | | O |
| Wheel bearings | Do not over-pack | No. 6 | | | | O | CHK | O | |

Be sure to check the above points before long-distance touring.

* Recommended lubricant. (See chart on next page)

**Recommended lubricant types**

1. Use Yamalube 4-cycle oil, or SAE 10W/30 type "SE" motor oil.
2. Use Yamaha chain lube or SAE 10W/30 type "SE" motor oil. (If desired, specialty lubricants of quality manufacture may be used.)
3. Use Yamaha cable lube or SAE 10W/30 type "SE" motor oil. (If desired, or at ambient temperature below 0°C, a graphite base "dry" lubricant of quality manufacture may be used.)
4. Light duty: Lithium soap base grease.
   Heavy duty: Standard chassis lube grease. (Do not use chassis lube grease on throttle/throttle housing.)
5. Use a soft chassis lube grease.
6. Medium-weight wheel bearing grease of quality manufacture - preferably waterproof.
7. Light-weight machine oil.
8. Use Yamaha fork oil.

**NOTE:**

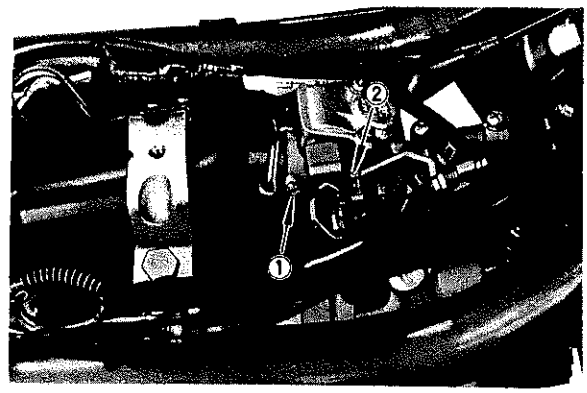
Drive chain must be lubricated every 500 km. If unit is subjected to extremely hard use, chain must be inspected frequently and serviced as required.

## ENGINE

### Carburetor

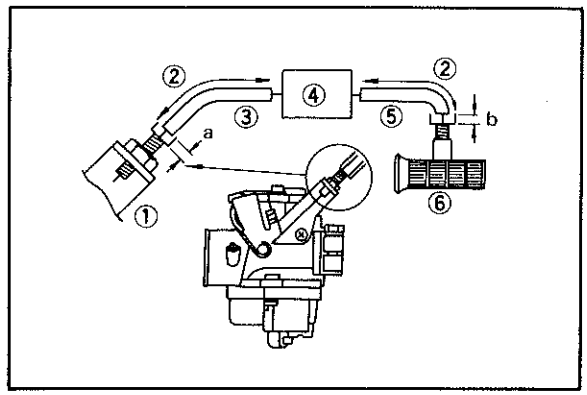
1. Make certain that throttle cable free play is proper.
2. Pilot air screw
   Turn the air adjusting screw (1) until it is lightly seated, then back it out 1 (LB50 II AC) or 1-3/4 (LB80 II AC) turns. This adjustment can be made with the engine stopped.
3. Start the engine and let it warm up.
4. Idle speed screw
   Turn throttle stop screw (2) in or out to achieve smooth engine operation at idle speed specified in Carburetor Setting Table.

   **NOTE:**
   The pilot air and idle speed screws are separate adjustments but they must be adjusted at the same time to achieve optimum operating condition at engine idle speeds.



1. Pilot air screw
2. Idle speed screw

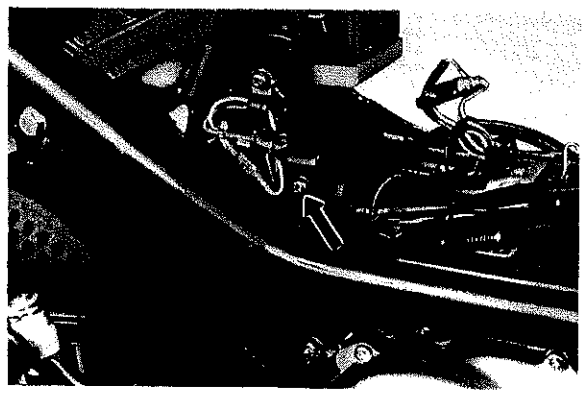
5. Throttle cable
   After engine idle speed is set, make cable free play adjustment at cable adjustor near throttle grip. Loosen locknut and turn adjustor until there is 0.5 ~ 1.0 mm free play between throttle cable housing and cable adjustor. Retighten locknut. Loosen cable adjustor locknut (at top of carburetor) and turn cable adjustor until there is 1.0 mm free play in cable "2". Retighten locknut.



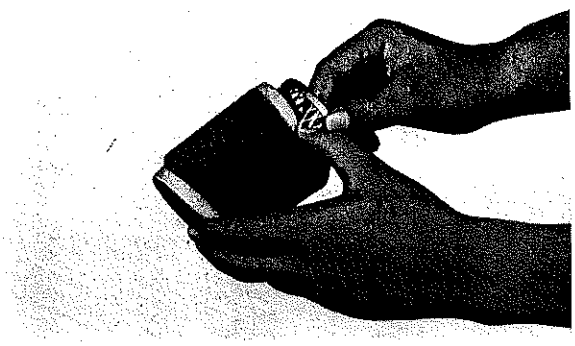

a. 1.0 mm
b. 0.5 ~ 1.0 mm
1. Carburetor
2. Slide
3. Cable 2
4. Junction block
5. Cable 1
6. Throttle grip

### Air cleaner

1. Remove the air cleaner case cap and element assembly.



2. Slip the element off the wire mesh guide.
3. Wash the element gently, but thoroughly, in solvent.
4. Squeeze excess solvent out of element and dry.
5. Pour a small quantity of 30W. motor oil onto cleaner element and work thoroughly into the porous foam material. Element must be damp with oil but not dripping.
6. Re-insert the wire mesh cleaner element guide into the element.
7. Coat the upper and lower edges of the cleaner element with lube grease. (This will provide an air-tight seal between the cleaner case cover and cleaner seat.)
8. Re-install the element assembly, case cover and seat.



**NOTE:**

Each time cleaner element maintenance is performed, check the air inlet to the cleaner case for obstructions. Check the air cleaner joint rubber to the carburetor and manifold fittings for an air-tight seal. Tighten all fittings thoroughly to avoid the possibility of unfiltered air entering the engine.

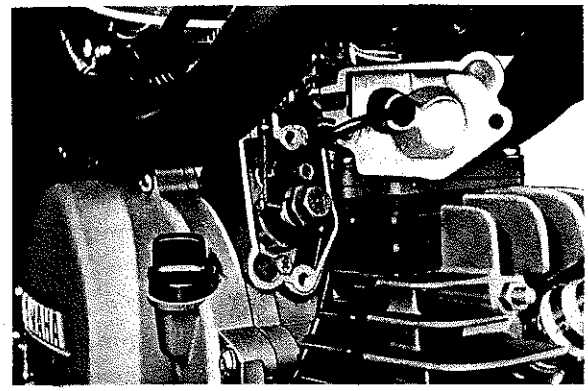
**CAUTION:**

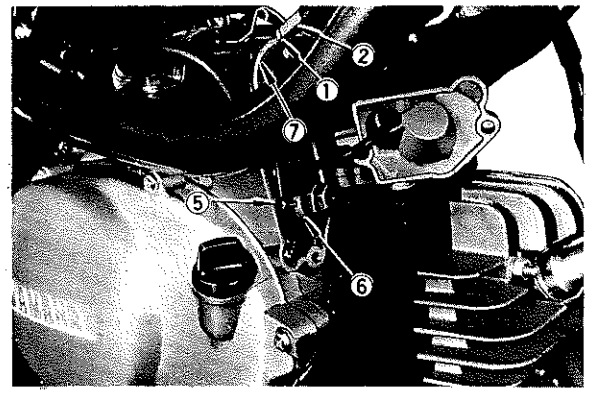
**Never operate the engine with the air cleaner element removed.**
**This will allow unfiltered air to enter, causing rapid wear and possible engine damage. Additionally, operation without the cleaner element will affect carburetor jetting with subsequent poor performance and possible engine overheating.**

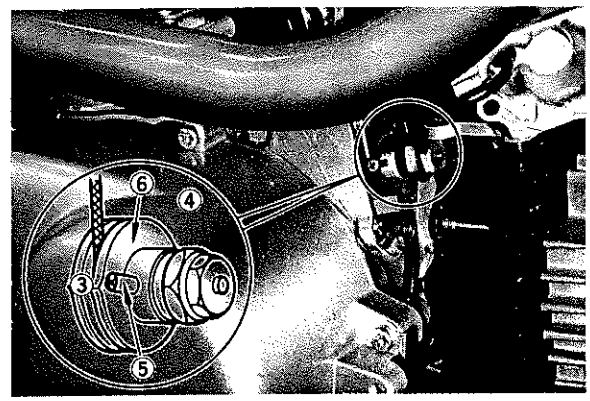
## Autolube pump

1. Air bleeding
   To bleed the oil pump, first remove the bleed screw. Start engine and run at idling speed. Then pull the oil pump wire as much as possible, and continue to run the engine until all air bubbles disappear from the oil flowing out from the bleeder hole.
   Reinstall bleed screw.
2. Oil pump wire adjustment

a. Remove the slack in throttle wire 2 by turning the adjusting screw attached to the carburetor.
b. Loosen the locknut.
c. Turn the adjusting screw so that the mark on the adjusting pulley is aligned with the Phillips head screw attached to the adjusting plate.
d. Screw in the locknut until tight.

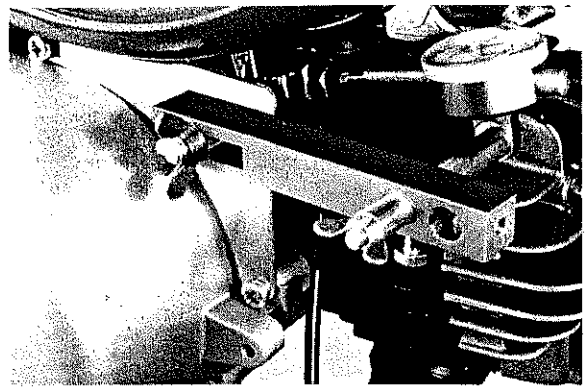


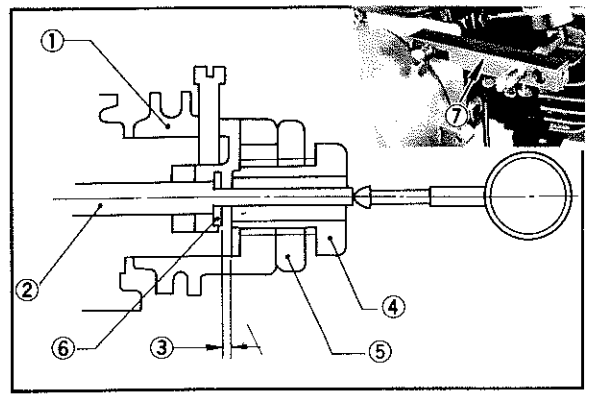



1. Locknut
2. Wire adjusting screw
3. Mark
4. Align on same line
5. Phillips head screw
6. Adjusting pulley
7. Oil pump wire

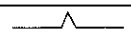
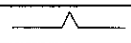
3. Minimum plunger stroke adjustment
   Set the dial gauge as shown in the figure, and check to see if the plunger stroke is correct while keeping the engine idling.
   a. To adjust the plunger stroke, first loosen the locknut.
   b. Turn the adjusting bolt in or out for proper adjustment.
      Turning the adjusting bolt clockwise decreases the plunger stroke; while turning counterclockwise increases the plunger stroke.
   c. When the correct stroke is attained, tighten the locknut.






1. Adjust pulley
2. Plunger
3. Min. stroke
4. Adjusting bolt
5. Locknut
6. Adjusting plate
7. Dial gauge stand (for oil pump)

**Specified stroke:**

| LB50 II AC | LB80 II AC |
|---|---|
| Minimum stroke | |
| 0.20 ~ 0.25 mm | |
| Maximum stroke | |
| 0.55 ~ 0.65 mm | 0.80 ~ 0.95 mm |
| Pulley color code | |
| Gray | Brown |
| Pulley adjust mark | |
|  |  |

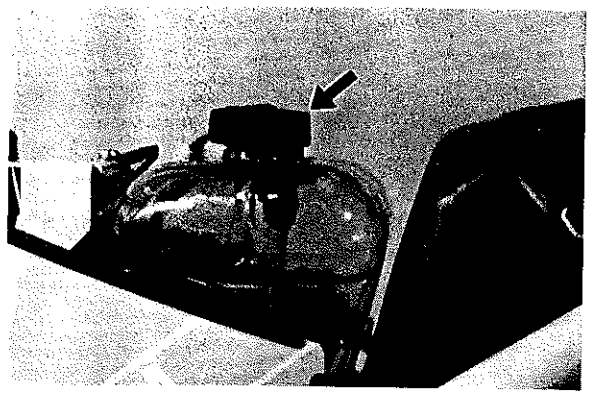
## Engine and transmission oil

1. Engine
   a. Autolube oil
      We recommend that first choice be Yamaha 2-cycle oil. If for any reason you should use another type, the oil should meet or exceed BIA certification "TC-W". Check container top or label for service specification. If above oils are not available, use a 30 or 40 wt 2-stroke oil for air-cooled engines.

**CAUTION:**

**Under extremely cold conditions (0°C or below) 30 and 40 wt oils become very thick and will not flow as readily to the Autolube pump. This may cause oil pump starvation. Yamaha 2-cycle oil will flow normally to the pump at temperatures below 18°C.**

b. Autolube tank
Always check Autolube tank oil level before operating machine.
1) Raise seat.
2) Remove filler cap and top off tank.



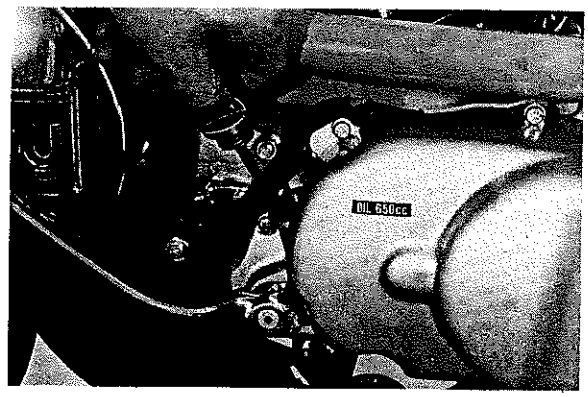
2. Transmission

a. To check level, start the engine and let it run for several minutes to warm and distribute oil. Unscrew the level gauge and wipe clean. Set it on the case threads (do not screw in). Remove the level gauge and check level.

**NOTE:**
Be sure the machine is level and on both wheels.

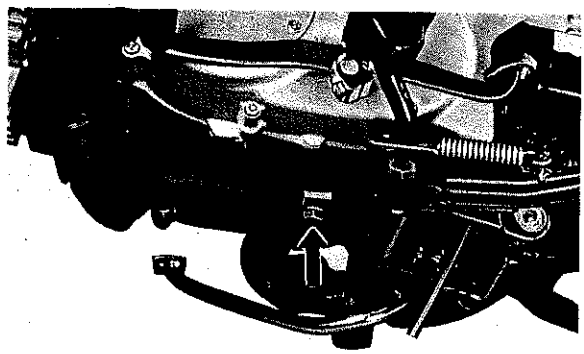
b. The stick has Minimum and Maximum marks. The oil level should be between the two. Top off as required.

| Recommended oil: |
| --- |
| SAE 10W/30 type "SE" motor oil |




c. To change transmission oil, remove the drain plug which is located on the bottom of the crankcase.
With the engine warm, remove the plug and drain oil. Re-install plug and add fresh oil.

| Transmission drain plug torque: |
| --- |
| 20 Nm (2.0 m • kg) |
| Transmission oil quantity: |
| 650 cc |



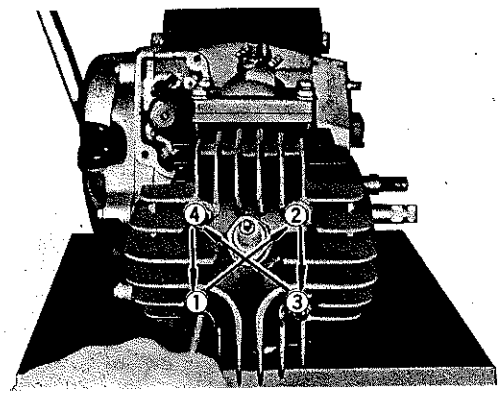
**CAUTION:**

**Under no circumstances should any additives be included with the transmission oil. This oil also lubricates and cools the clutch. Many additives will cause severe clutch slippage.**

### Cylinder head

Check torque of cylinder head holding nuts. Tighten in a crisscross pattern.

| Cylinder head nut torque: |
| --- |
| 10 Nm (1.0 m • kg) |

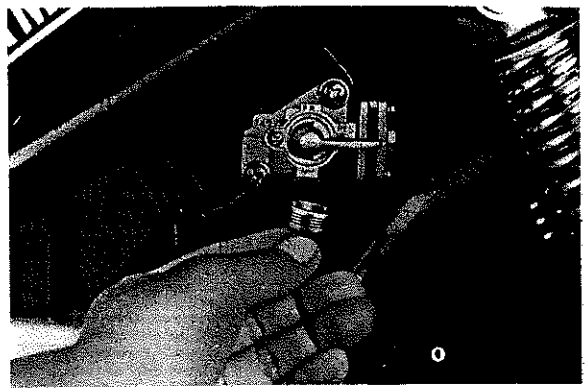


## CHASSIS

### Fuel petcock

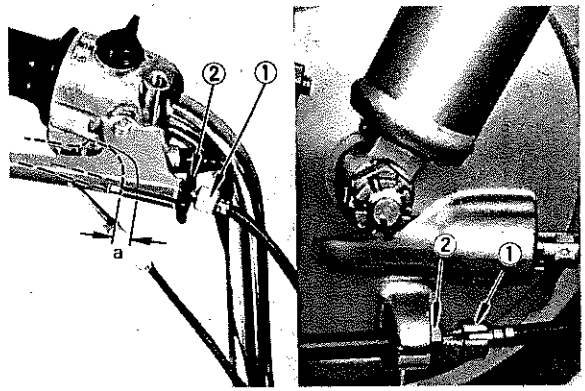
1. Clean fuel filter
a. Turn fuel petcock to "ON" or "RES" position and disconnect fuel pipe.
b. Remove filter cap and clean filter.

**NOTE:**
If filter is damaged, replace.



### Front brake and wheel

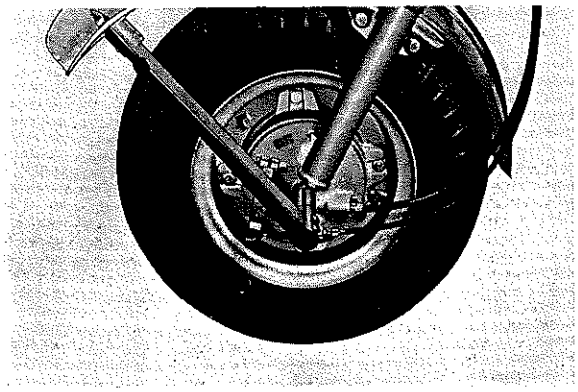
1. Front brake adjustment
Front brake cable free play can be adjusted to suit rider's preference, but a minimum free play of 5 ~ 8 mm should be maintained. Free play can be adjusted at handlebar lever or brake shoe plate.
a. Loosen the adjuster locknut (2).
b. Turn the adjuster (1) in or out until adjustment is suitable.
c. Tighten the adjuster locknut (2).




a. 5 ~ 8 mm
1. Adjuster 2. Locknut

2. Front axle
a. Check axle nut.

| Front axle nut torque: 39 Nm (3.9 m • kg) |
|---|



3. Front tire pressure (cold tire)

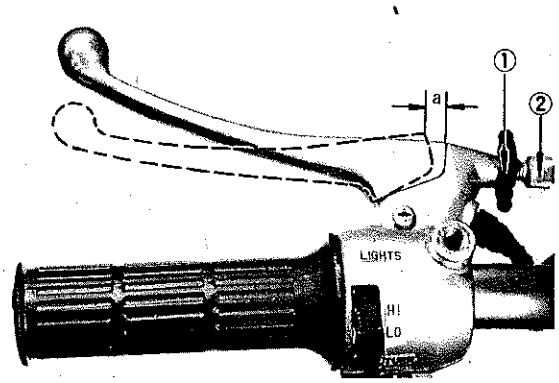
| Model | LB50 II AC | LB80 II AC |
|---|---|---|
| Basic weight: With oil and full fuel tank | 80 kg | 76 kg |
| Maximum load*: | 140 kg | 144 kg |
| Up to 70 kg load* | 100 kPa (1.00 kg/cm$^2$, 1.00 bar) | |
| 70 kg ~ maximum load* | 100 kPa (1.00 kg/cm$^2$, 1.00 bar) | |

* Load is the total weight of the cargo, rider, passenger and accessories.

## Rear brake and wheel

1. Rear brake adjustment
   The rear brake can be adjusted in two ways: (1) using the adjust screws at the rear brake lever or (2) at the rear brake shoe plate. Loosen the locknut and turn the adjust screw to adjust the brake lever. The clearance between the brake lever and the brake lever holder should be 5 ~ 8 mm as shown in the illustration. After adjusting, be sure the locknut is tightened firmly.

   **NOTE:**
   Rear brake adjustment must be checked whenever chain is adjusted or rear wheel is removed and then re-installed.




a. 5 ~ 8 mm

1. Locknut
2. Adjuster

2. Rear axle
   Check axle nut.

| Rear axle nut torque:<br>60 Nm (6.0 m • kg) |
|---|

3. Rear tire pressure (cold tire)

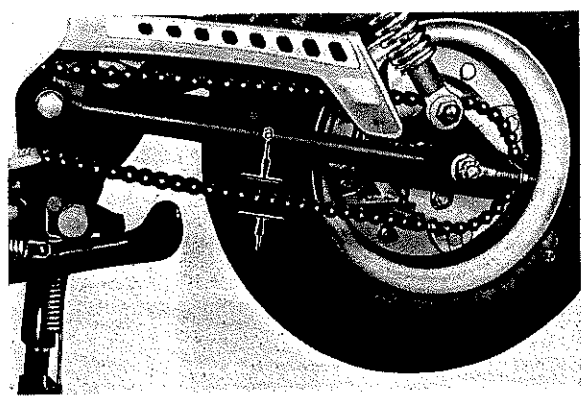
| Model | LB50 II AC | LB80 II AC |
|---|---|---|
| Basic weight: With oil and full fuel tank | 80 kg | 76 kg |
| Maximum load*: | 140 kg | 144 kg |
| Up to 70 kg load* | 125 kPa (1.25 kg/cm$^2$, 1.25 bar) | |
| 70 kg ~ maximum load* | 200 kPa (2.0 kg/cm$^2$, 2.0 bar) | 150 kPa (1.5 kg/cm$^2$, 1.5 bar) |

* Load is the total weight of the cargo, rider, passenger and accessories.

## Drive chain

1. Drive chain adjustment
   To adjust drive chain, proceed as follows:

a. Remove rear axle cotter pin.
b. Loosen rear axle securing nut (3).
c. With rider in position on machine with both wheels on ground, set axle adjusters until there is 20 ~ 30 mm free play in the drive chain at the bottom of the chain at a point midway between the drive and driven axles.



a. 20 ~ 30 mm

d. Turn adjusters (chain puller nuts) both left and right, until axle is situated in same positions as shown by position marks (1) on swing arm axle tabs.
e. Tighten the rear axle securing nut (3).

| Axle nut torque: 60 Nm (6.0 m • kg) |
|---|

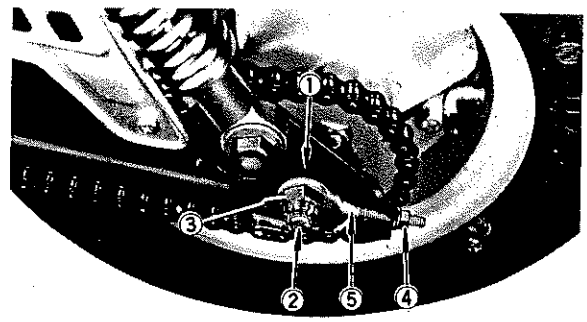
f. Install a new cotter pin and bend the end over.

2. Drive chain maintenance
The chain should be lubricated per the recommendations given in the Maintenance and Lubrication Interval charts. More often if possible. Preferably after every use.

a. Wipe off dirt with shop rag. If accumulation is severe, use wire brush, then rag.
b. Apply lubricant between roller and side plates on both inside and outside of chain. Don't skip a portion as this will cause uneven wear.
Apply thoroughly. Wipe off excess.

**NOTE:**
Choice of lubricant is determined by use and terrain. SAE 20 wt or 30 wt motor oil may be used, but Yamaha chain and cable lube offer more penetration and corrosion resistance for roller protection. In certain areas, semi-drying lubricants are preferable. These will resist picking up sand particles, dust,etc.

c. Periodically, remove the chain. Wipe and/or brush excess dirt off. Blow off with high pressure air.
d. Soak chain in solvent, brushing off remaining dirt. Dry with high pressure air. Lubricate thoroughly while off machine. Work each roller thoroughly to make sure lubricant penetrates. Wipe off excess. Re-install.




1. Position marks
2. Axle shaft
3. Axle nut
4. Adjust nut
5. Chain puller

## Suspension, steering and swing arm

1. Steering head adjustment
   The steering assembly should be checked periodically for any looseness. Do this as follows:

a. Block machine up so that front wheel is off the ground.
b. Grasp bottom of forks and gently rock fork assembly backward and forward, checking for any looseness in the steering assembly bearings.
c. If steering head needs adjustment, loosen steering fitting bolt.
d. Using steering nut wrench, adjust steering head fitting nut until steering head is tight without binding when forks are turned.

**NOTE:**
Excessive tightening of this nut will cause rapid wear of ball bearings and races.
Re-check for looseness and freedom of movement.

e. Tighten steering fitting bolt.

**NOTE:**
After completing steering adjustment, make certain forks pivot from stop to stop without binding. If binding is noticed, repeat adjustment.

2. Suspension

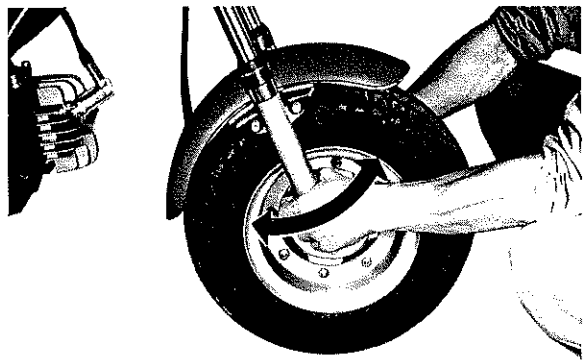
a. Check all suspension for proper operation.
b. Check all suspension for proper tightness.
c. Check rear shocks (R and L) for identical adjustment.

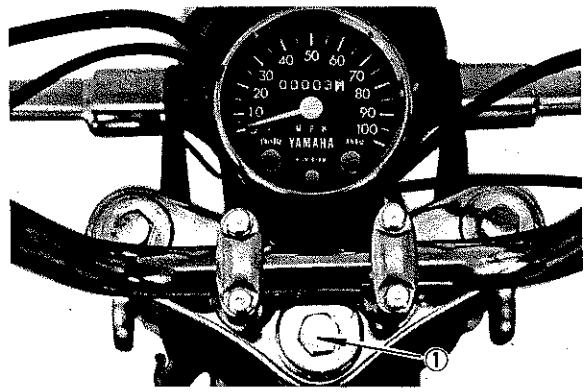
3. Swing arm

a. Check for freedom of up and down movement.
b. Check side to side free play.

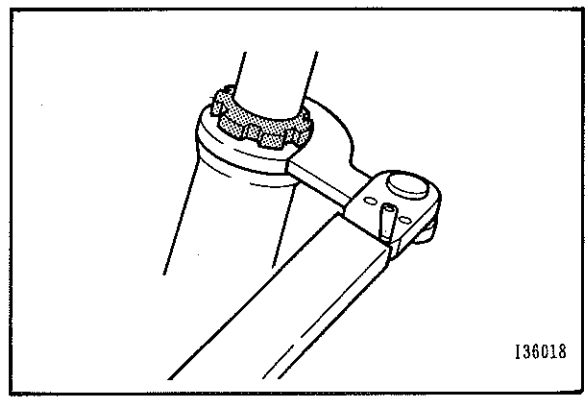
| Swing arm free play: |
| --- |
| 0.5 mm at end of swing arm |

c. Check all securing bolts for proper tightness.
d. Grease swing arm periodically.






1. Steering fitting bolt



## ELECTRICAL

### Spark plug

The spark plug indicates how the engine is operating. If the engine is operating correctly, and the machine is being ridden correctly, then the tip of the white insulator around the positive electrode of the spark plug will be a medium tan color. If the insulator is very dark brown or black color, then a plug with a hotter heat range might be required. This situation is quite common during the engine break-in period.

If the insulator tip shows a very light tan or white color is actually pure white and glazed or if electrodes show signs of melting, then a spark plug with a colder heat range is required.

Remember, the insulator area surrounding the positive electrode of the spark plug must be a medium tan color. If it is not, check carburetion, timing and ignition adjustments.

The spark plug must be removed and checked. Check electrode wear, insulator color, and electrode gap.

| Spark plug gap: |
|---|
| 0.5 ~ 0.6 mm |

Engine heat and combustion chamber deposits will cause any spark plug to slowly break down and erode. If the electrodes finally become too worn, or if for any reason you believe the spark plug is not functioning correctly, replace it.

When installing the plug, always clean the gasket surface, use a new gasket, wipe off any grime that might be present on the surface of the spark plug, torque the spark plug properly.

| Standard Spark Plug | Tightening Torque |
|---|---|
| NGK B-6HS | 2.5 ~ 3.0 m • kg |

---

### Battery

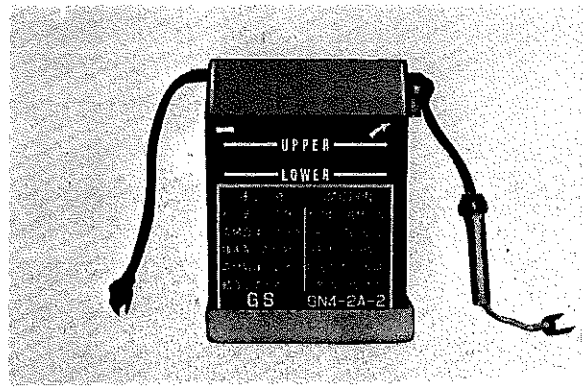
A poorly maintained battery will deteriorate quickly.

The battery fluid should be checked at least once a month.

1. The level should be between the upper and lower level marks. Use only distilled water if refilling is necessary.

   **NOTE:**
   Normal tap water contains minerals which are harmful to a battery; therefore, refill only with distilled water.

2. Always make sure the connections are correct when putting the battery back in the motorcycle. The red lead is for the + terminal and the black lead is for the − terminal. Make sure the breather pipe is properly connected and is not damaged or obstructed.



**NOTE:**

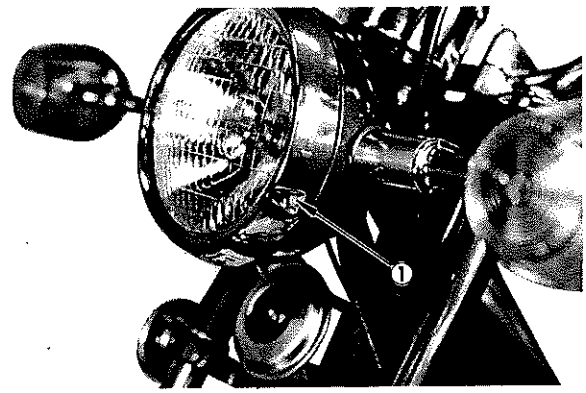
When filled with diluted sulfuric acid (electrolyte), this battery can be put into use immediately. That is, it is a dry-charged battery. It is advisable, however, that the battery be charged as much as possible before using for the first time for maximum performance. This initial charge will prolong the life of the battery.

Charging current: 0.4A
Charging hours: 10 hrs

### Headlight beam adjustment

When necessary, adjust the headlight beam as follows:

1. Adjust horizontally by tightening or loosening the adjusting screw, as in the illustration.
   To adjust to the right: tighten the screw
   To adjust to the left: loosen the screw
2. Adjust vertically by moving the headlight body.




1. Adjusting screw

# CHAPTER 3. ENGINE OVERHAUL



3

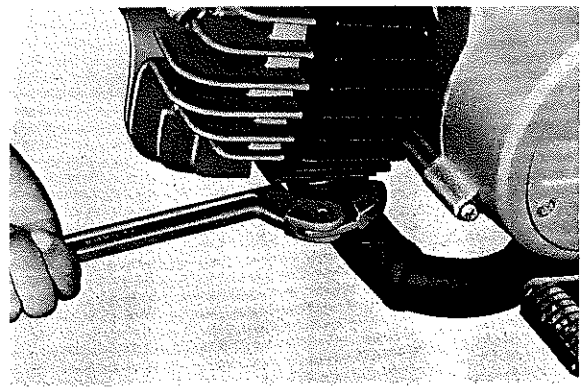
3

# CHAPTER 3. ENGINE OVERHAUL

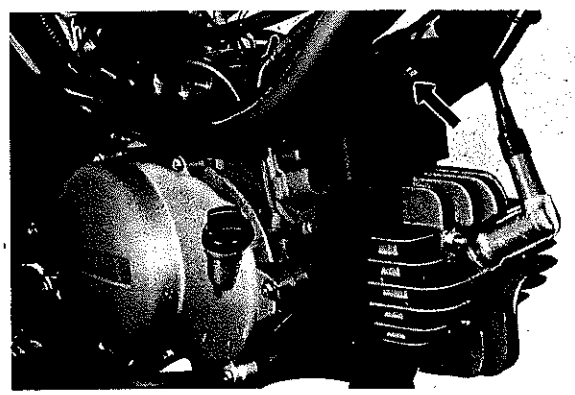
## REMOVAL

### Preparation for removal

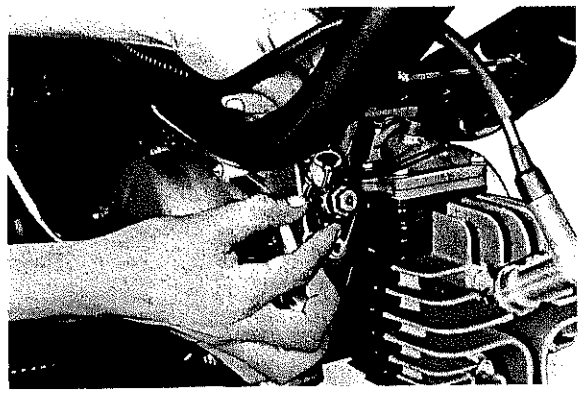
1. All dirt, mud, dust, and foreign material should be thoroughly removed from the exterior of the engine before removal and disassembly. This will prevent any harmful foreign material from entering the interior of the engine assembly.
2. Before engine removal and disassembly, be sure you have proper tools and cleaning equipment so you can perform a clean and efficient job.
3. During disassembly of the engine, clean and place all parts in trays in order of disassembly. This will ease and speed assembly time and insure correct re-installation of all engine parts.
4. Start the engine and warm it for a few minutes; turn off and drain transmission oil.
5. Remove exhaust pipe ring nut.
6. Remove spark plug cap.



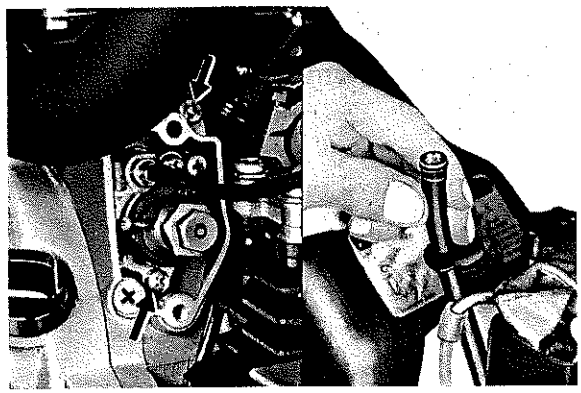
7. Remove panel cover and front cover.



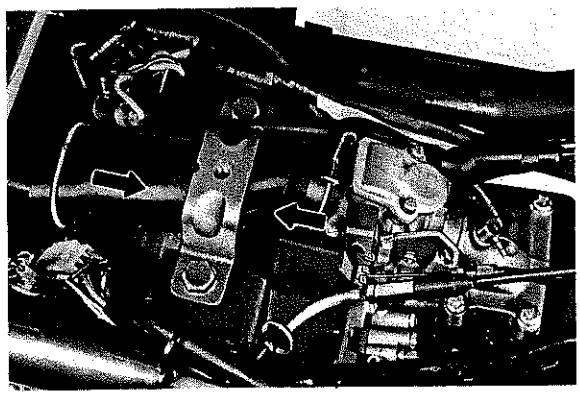
8. Remove pump cover (1) and pump cable.



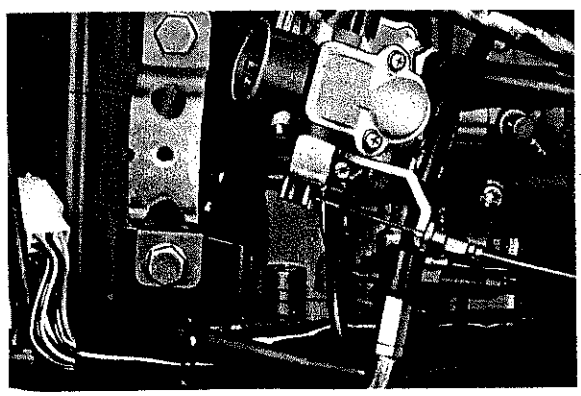
9. Remove pump cover (2) and oil pipe. Screw the oval counter-sunk screw securing pump cover into oil pipe as illustrated, and tentatively place oil pipe over oil tank.



10. Remove air cleaner joint.



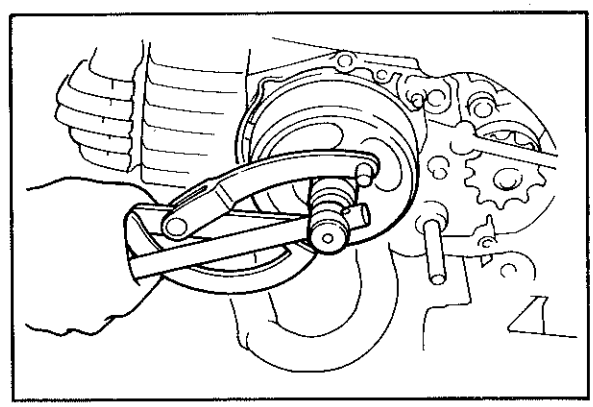
11. Remove the carburetor.

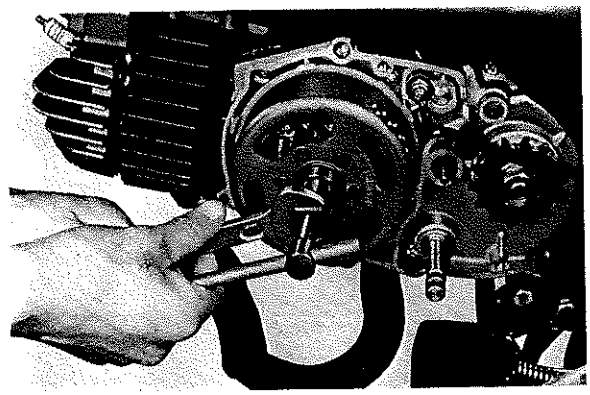


12. Remove fuel cock vacuum pipe from insulator.
13. Remove case cover (L).
14. Remove chain.
15. Remove flywheel securing nut using flywheel holder. Note the position and direction of the washers.
    Install flywheel puller on flywheel and tighten it.

    **NOTE:**
    The puller body has a lefthand thread.

    While holding puller body, tighten push bolt. This will pull flywheel off the tapered end of the crankshaft. Disconnect the magneto lead wires from the main harness.



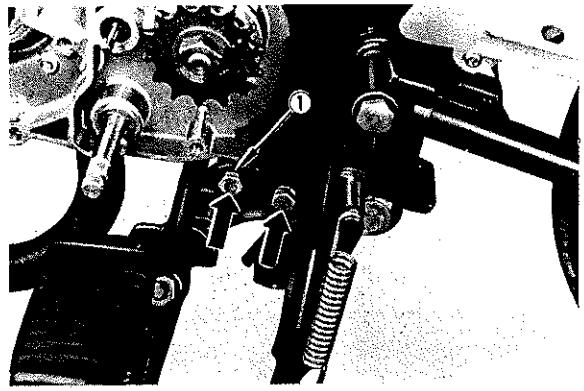


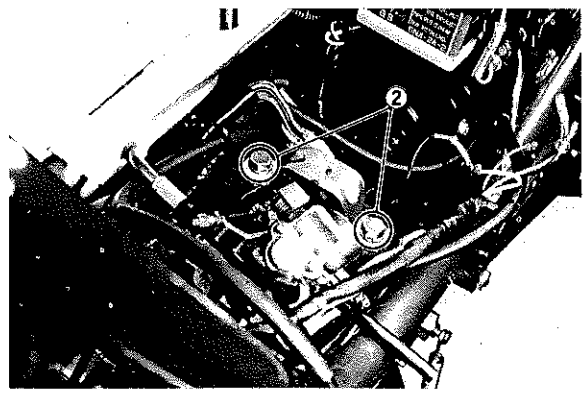
### Removal

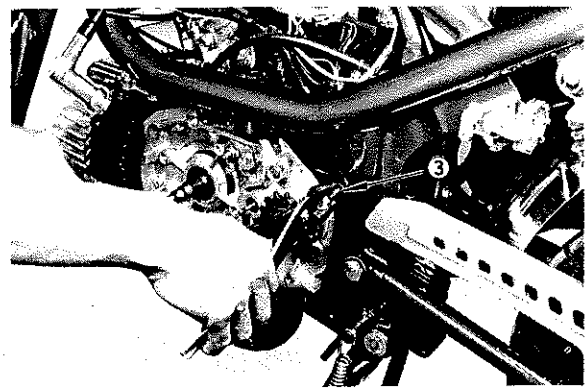
1. Remove two footrest bolts (1) and two bolts (2) in the upper area of the engine, and remove bolt (3).

**NOTE:**

1. The two bolts (2) should be loosened so that they can be screwed out by hand afterward. Holding the engine with your left hand, remove bolts (2), then remove bolt (3).
2. The exhaust pipe should be moved down so that it does not obstruct the removal of the engine.



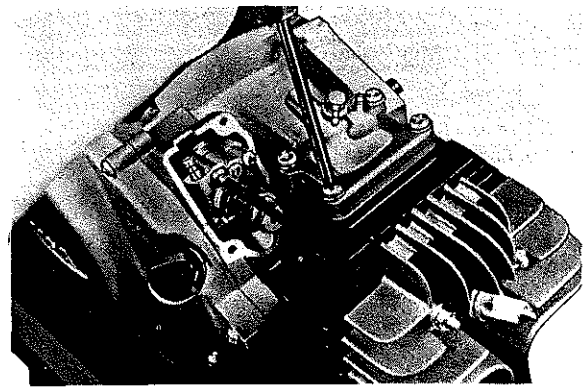




## DISASSEMBLY

Remove engine bracket and kick crank assembly.

### Reed valve assembly

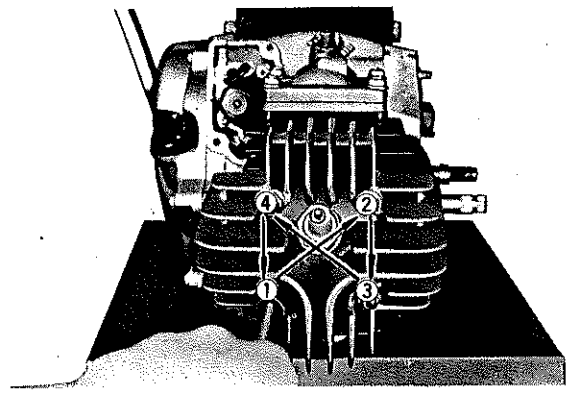
Remove reed valve assembly holding bolts (4), carburetor joint and reed valve assembly.



### Cylinder head and cylinder

Remove cylinder head holding nuts (4) and cylinder head and cylinder.

**NOTE:**
Loosen spark plug before loosening cylinder head.



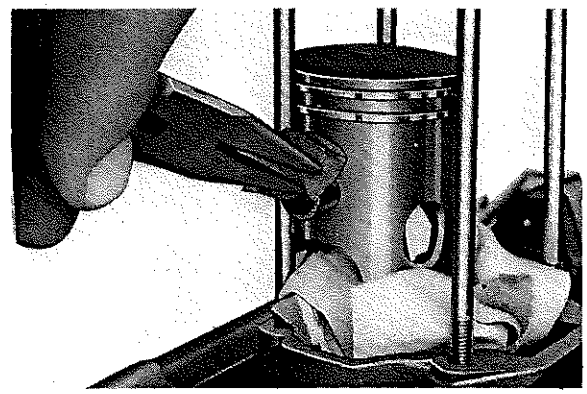

### Piston pin and piston

1. Remove piston pin clip (1) from piston.

   **NOTE:**
   Before removing the piston pin clip, cover the crankcase with a clean rag so you will not accidentally drop the clip into the crankcase.

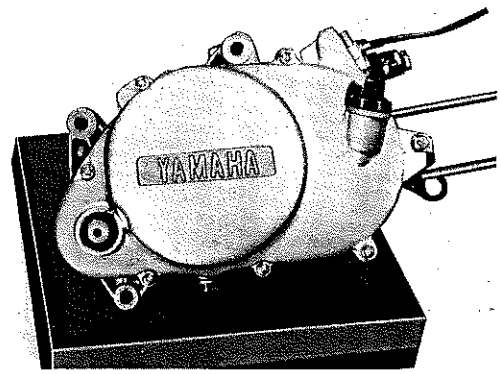
2. Push piston pin from opposite side, then pull out. Protect pin with rag as shown.

   **NOTE:**
   Before removing piston pin, deburr clip groove and pin hole area.



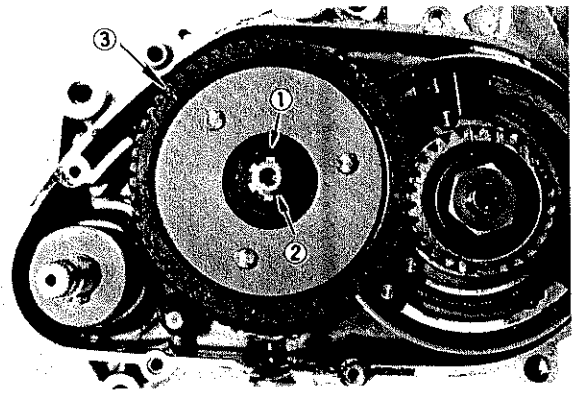
### Crankcase cover, right

Remove crankcase cover (right) holding bolts and the cover.
If the crankcase cover is hard to remove, tap it with a soft-faced hammer.



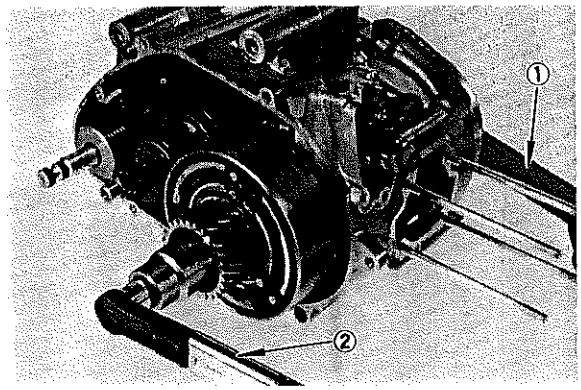
## Clutch assembly and primary gear

1. Remove circlip and gear holders, then remove the primary driven gear.



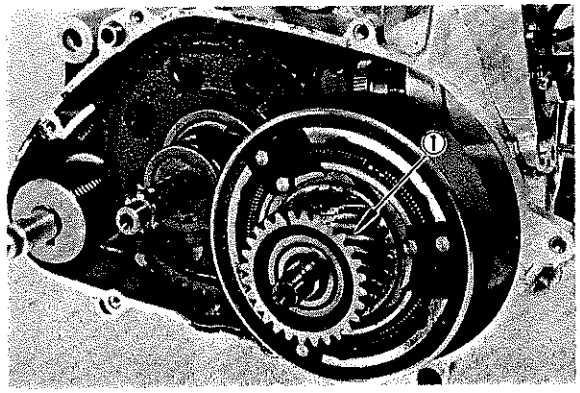

1. Circlip 2. Gear holder 3. Primary drive gear

2. Install the flywheel on the crankshaft temporarily. Then use the flywheel holding tool to hold the flywheel. Loosen the clutch locknut.



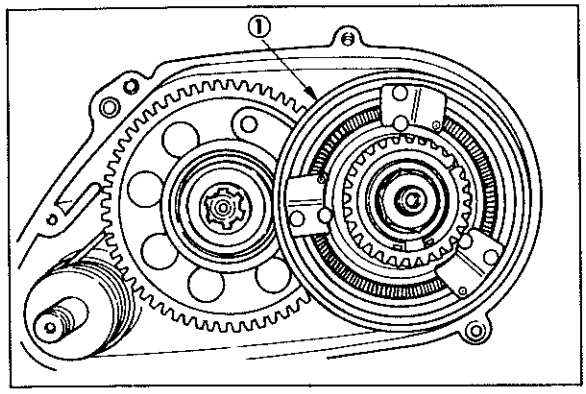

1. Flywheel holding tool 2. Torque wrench

3. Remove 2nd gear clutch assembly.



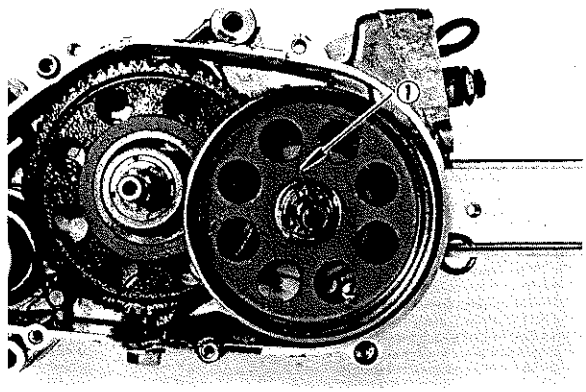

1. 2nd gear clutch assembly

4. Remove 1st gear clutch assembly.



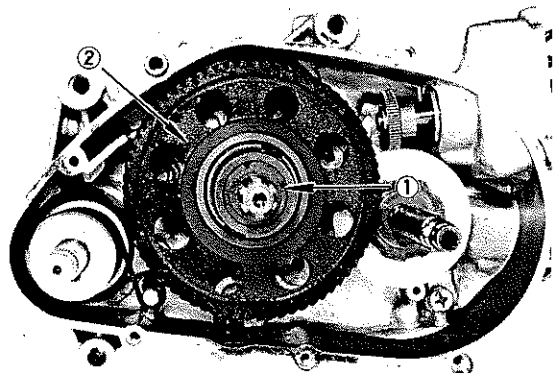

1. 1st gear clutch assembly

5. Remove clutch housing.




1. Clutch housing

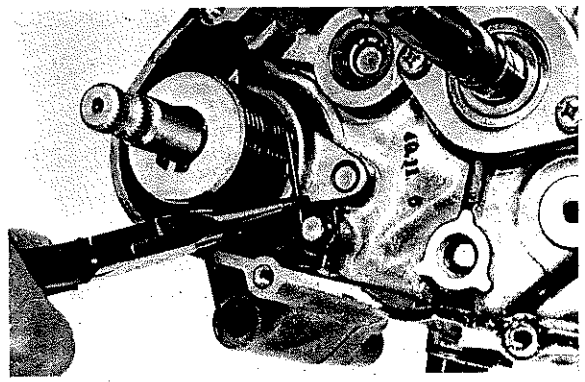
6. Remove one-way clutch and driven gear.




1. One way clutch
2. Driven gear

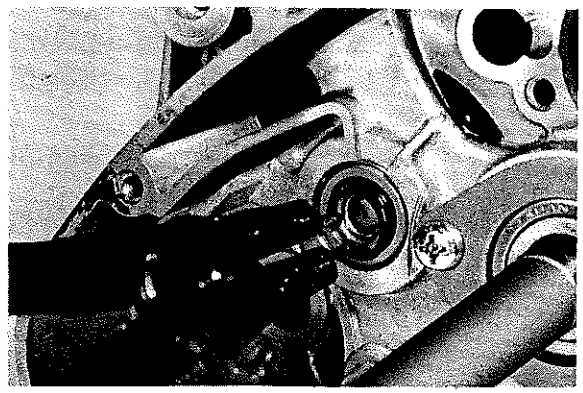
**Kick axle assembly**

Pull straight out the kick axle.



**Shifter rod assembly**

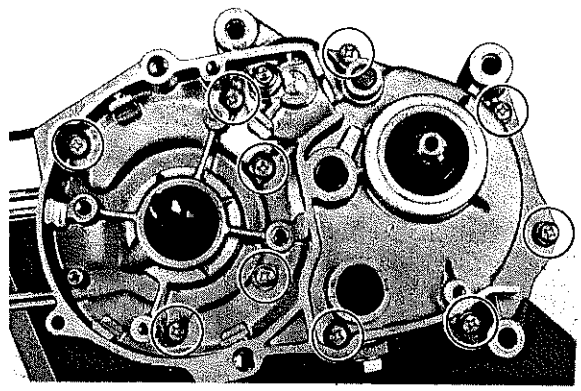
Remove circlip from right side of the drive axle, then remove shift spring, spring retainer and shifter rod assembly.



### Crankcase

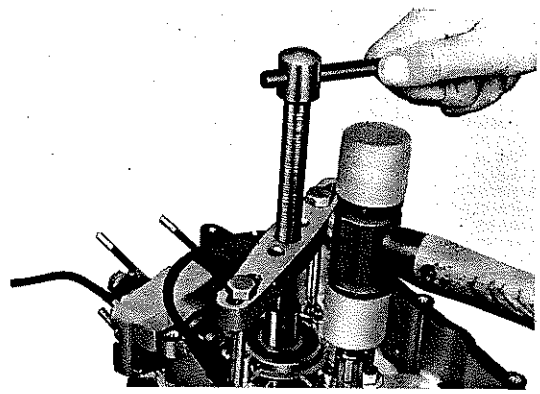
1. Working in a crisscross pattern, loosen Phillips head screws 1/4 turn each. Remove them after all are loosened.
2. Install crankcase separating tool as shown. Use a thick plain washer to protect end of crankshaft.

   **NOTE:**
   Fully tighten the tool securing bolts, but make sure the tool body is parallel with the case. If necessary, one screw may be backed out slightly to level tool body.



3. As pressure is applied, alternately tap on the front engine mounting boss, the transmission shafts and the shift drum.

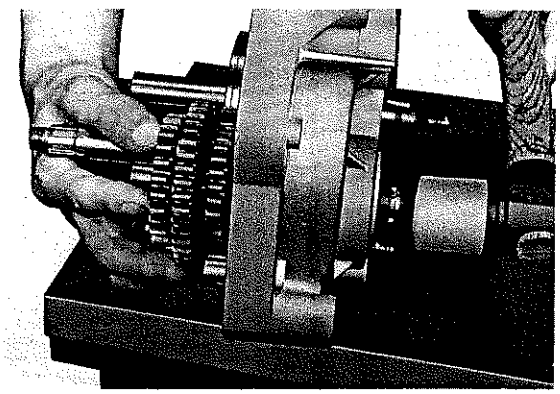
   **CAUTION:**
   **Use soft hammer to tap on the case half. Tap only on reinforced portions of case. Do not tap on gasket mating surface. Work slowly and carefully. Make sure the case halves separate evenly. If one end "hangs up", take pressure off the push screw, realign and start over. If the halves are reluctant to separate, check for a remaining case screw or fitting. Do not force.**



### Transmission

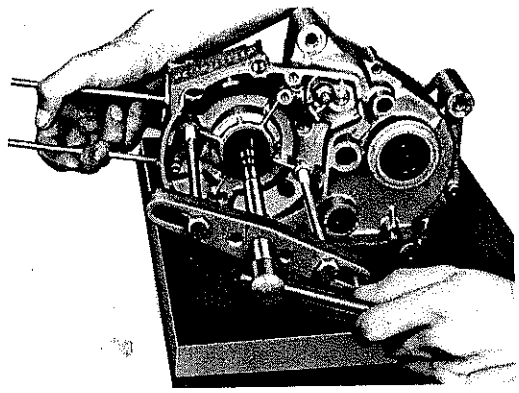
Transmission shafts should be removed as an assembly. Tap lightly on the transmission drive shaft with a soft hammer to remove.

**NOTE:**
Remove assembly carefully. Note the position of each part. Pay particular attention to the location and direction of shift forks.



### Crankshaft assembly

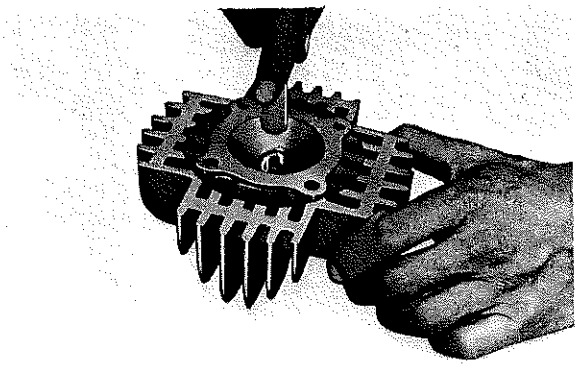
Remove crankshaft assembly with the crankcase separating tool.



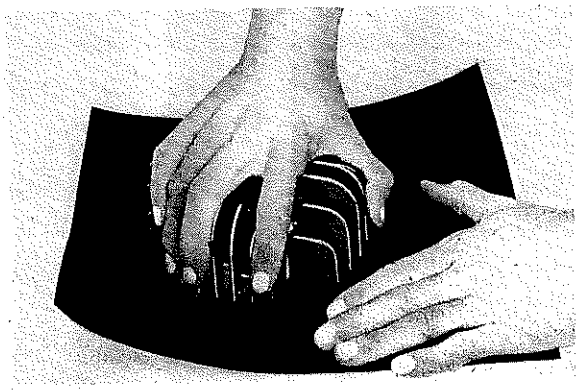
## INSPECTION AND REPAIRING

### Cylinder head

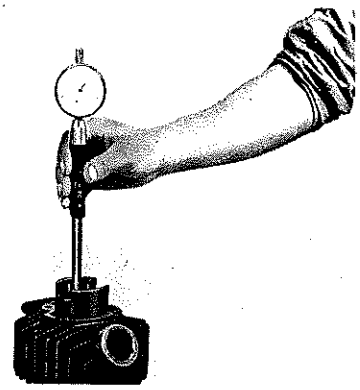
1. Remove spark plug.
2. Using a rounded scraper, remove carbon deposits from combustion chamber. Take care to avoid damaging the spark plug threads. Do not use a sharp instrument; avoid scratching aluminium.



3. Place on a surface plate. There should be no warpage. Correct by re-surfacing as follows:
   Place 400 ~ 600 grit wet sandpaper on surface plate and re-surface head using a figure-eight sanding pattern. Rotate head several times to avoid removing too much material from one side.

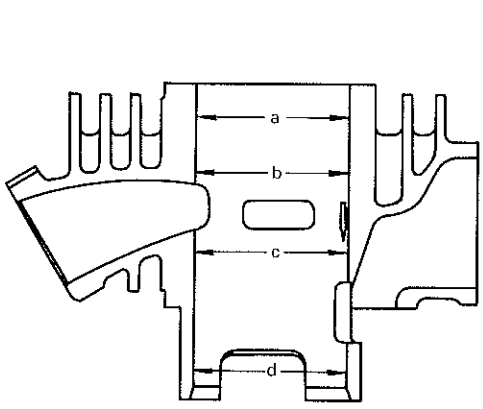


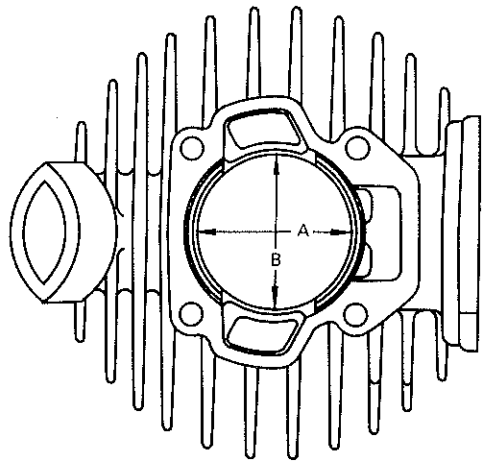
### Cylinder



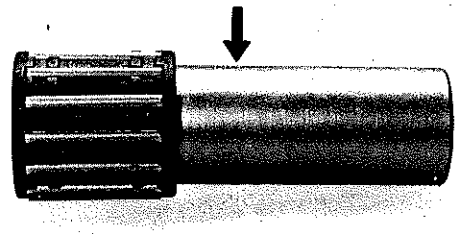
1. Hone cylinder bore using a hone with fine stones. Hone no more than required to remove all wear marks.
2. Using a cylinder gauge set to standard bore size, measure the cylinder. Measure front-to-rear and side-to-side at top, center and bottom just above exhaust port. Compare minimum and maximum measurements. If over tolerance and not correctable by honing, rebore to next over-size.

| |
|---|
| Max. allowable taper:<br>0.05 mm<br>Max. allowable out-of-round:<br>0.01 mm |



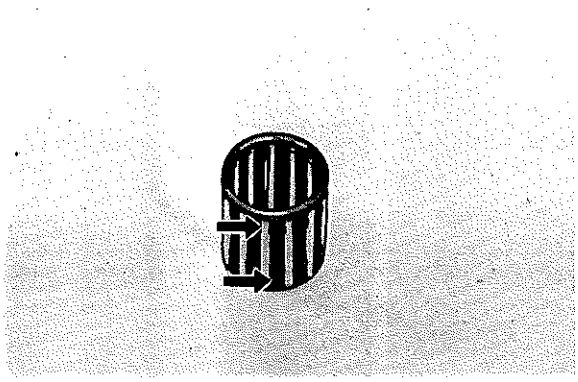

### Piston pin and bearing



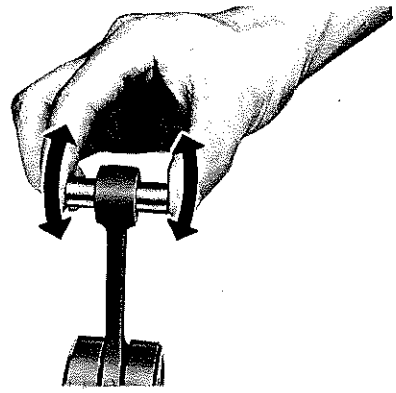
1. Check the pin for signs of wear. If any wear is evident, replace pin and bearing.
2. Check the pin and bearing for signs of heat discoloration. If excessive (heavily blued), replace both.

**NOTE:**
Shiny spots on pin from race wear are normal. Replace pin and bearing only if wear is excessive (indentation on pin, etc.)

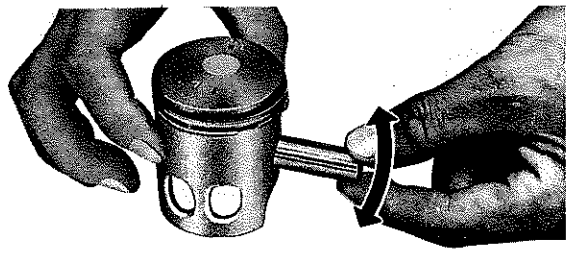
3. Check the bearing cage for excessive wear or damage.
   Check the rollers for signs of flat spots. if found, replace pin and bearing.



4. Apply a light film of oil to pin and bearing surfaces. Install in connecting rod small end. Check for play. There should be no noticeable vertical play. If play exists, check connecting rod small end for wear. (Replace pin and bearing or all as required.)



5. The piston pin should have no noticeable free play in piston. If the piston pin is loose, replace the pin and/or the piston.

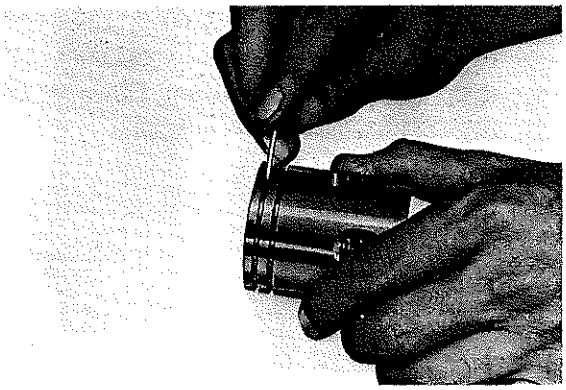


**Piston**

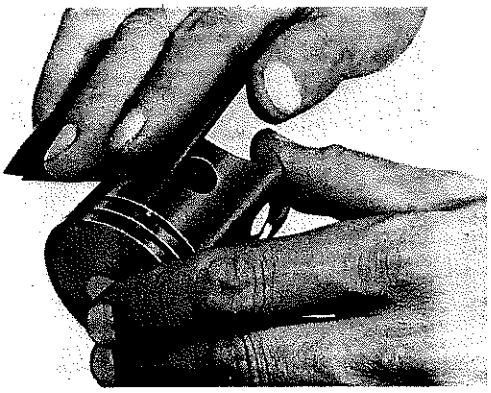
1. Remove piston ring.

2. Remove carbon deposits from piston crown.

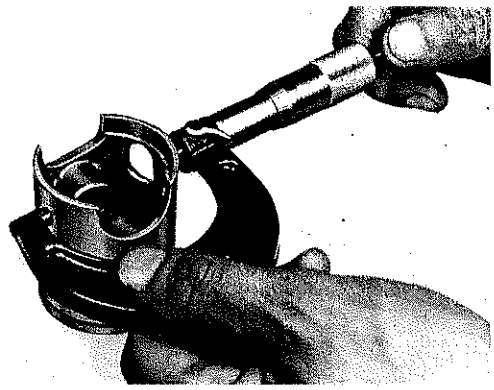
3. Remove carbon deposits from ring grooves.



4. Remove score marks and lacquer deposits from sides of piston using 400 ~ 600 grit wet sandpaper. Sand in a cross-hatch pattern. Do not sand excessively.



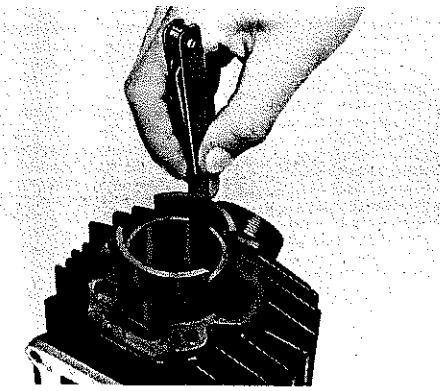
5. Wash piston in solvent and wipe dry.
6. Using an outside micrometer, measure piston diameter. The piston is cam-ground and tapered. The only measuring point is at right angles to the piston pin holes about 10 mm from bottom of piston. Compare piston diameter to cylinder bore measurements.
   Piston maximum diameter subtracted from minimum cylinder diameter gives piston clearance. If beyond tolerance, hone cylinder to tolerance or re-bore to next over-size and fit over-size piston.



| | Min. | Max. |
|---|---|---|
| Piston clearance | 0.025 mm | 0.030 mm |
| Maximum wear limit | 0.1 mm | |

**Piston rings**

1. Check rings for scoring. If any severe scratches are noticed, replace set.
2. Insert each ring into cylinder. Push down approximately 20 mm using piston crown to maintain right-angle to bore. Measure installed end gap. If beyond tolerance, replace set.



| | Min. | Max. |
|---|---|---|
| Top ring end gap, installed | 0.15 mm | 0.35 mm |
| 2nd ring end gap, installed | 0.15 mm | 0.35 mm |

3. With rings installed in grooves, insert feeler gauge between ring side and groove. If beyond tolerance, replace ring and/or piston as required.

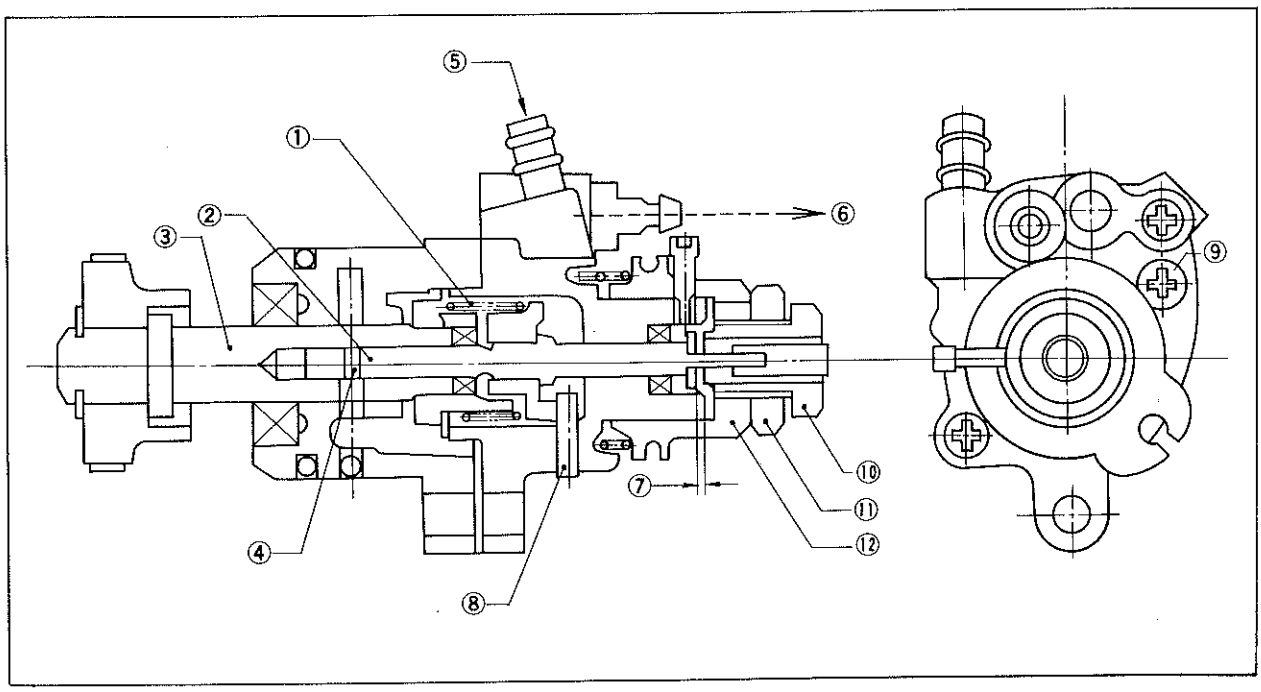
Top/2nd ring side clearance

| | Min. | Max. |
|---|---|---|
| LB50 II AC | 0.03 mm | 0.05 mm |
| LB80 II AC | 0.02 mm | 0.06 mm |

4. Check ring expander. If worn excessively, or broken, replace ring set.

## Autolube pump

1. Construction of the oil pump




1. Plunger return spring
2. Plunger
3. Distributor
4. Chamber for oil charge
5. Inlet
6. Outlet
7. Min. stroke
8. Plunger pin
9. Bleed screw
10. Adjusting bolt
11. Locknut
12. Adjust pulley

2. Function of the oil pump

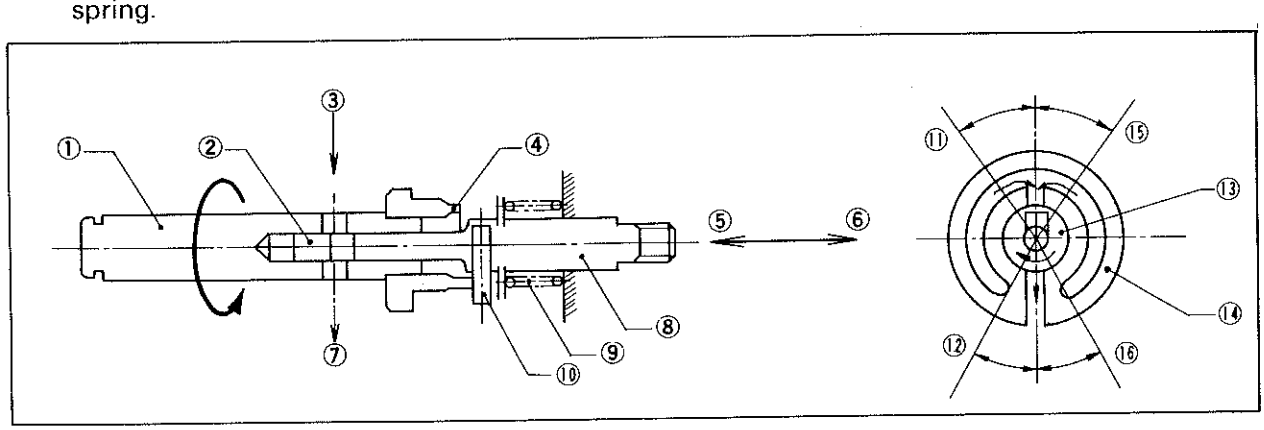
When the plunger begins to reciprocate, oil is drawn in and out from the rotating distributor.

SUCTION OF OIL:

Oil is drawn in by the plunger which is pushed back by the plunger return spring.

DISCHARGE OF OIL:

Oil is forced out by the plunger when it is pushed by the plunger pin contacting the plunger cam. The cam is meshed with the rotating distributor by means of a dog.

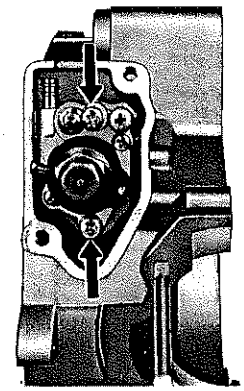



1. Distributor
2. Plug
3. Inlet
4. Plunger cam
5. Outlet
6. Inlet
7. Outlet
8. Plunger
9. Plunger return spring
10. Plunger pin
11. Beginning of suction
12. End of discharge
13. Distributor
14. Pump case
15. End of suction stroke
16. Beginning of discharge

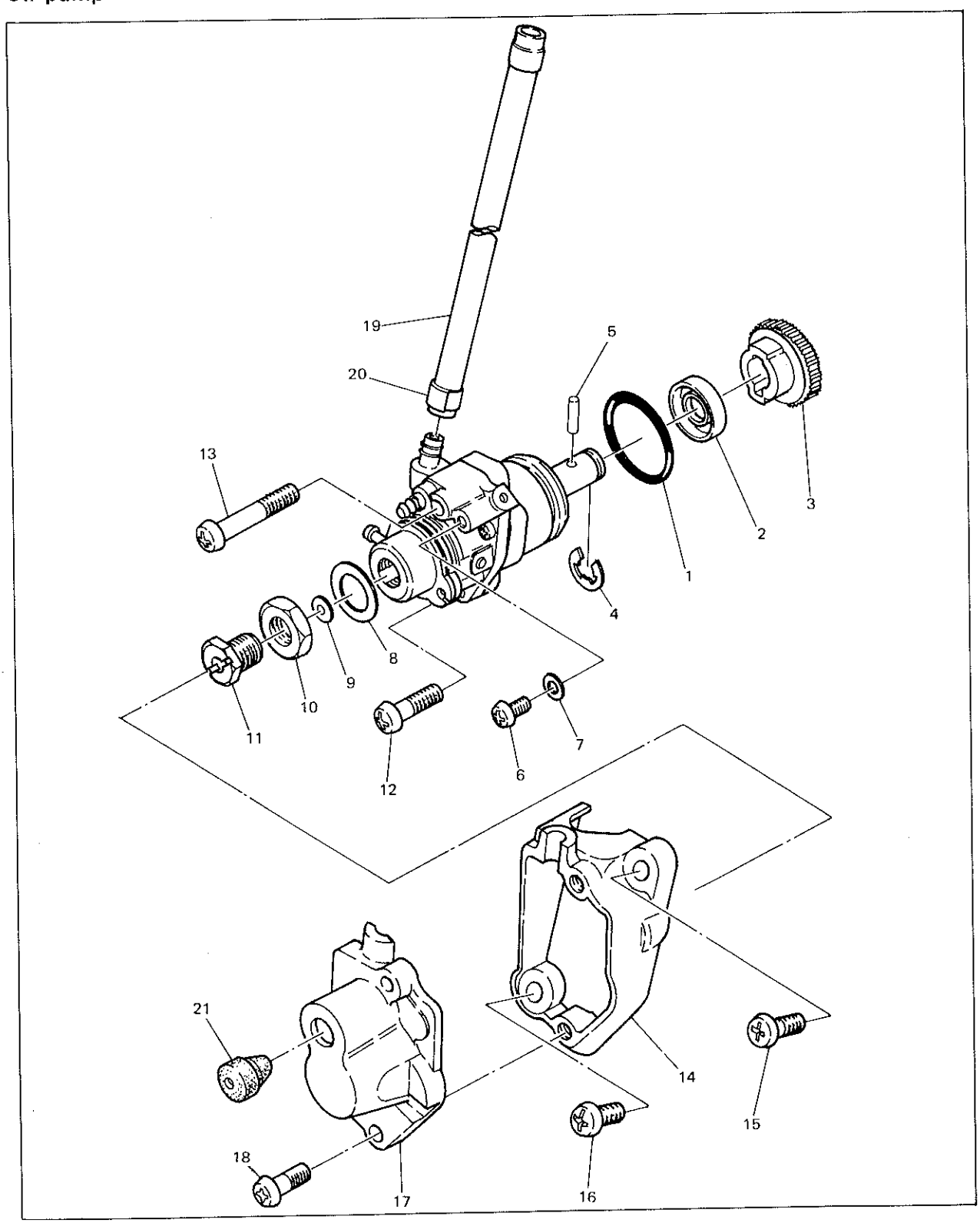
3. Removal and disassembly

a. Remove (two) Phillips screws securing pump to crankcase cover. Remove pump.

b. Disassembly is straight forward and can be accomplished by the parts illustration.



## Oil pump




1. O-ring
2. Oil seal (S-10-21-5)
3. Worm wheel gear (56T)
4. Circlip (E07)
5. Dowel pin (3-14)
6. Bind screw
7. Bleeder bolt gasket
8. Shim
9. Adjusting plate
10. Hexagon nut
11. Adjusting bolt
12. Pan head screw
13. Pan head screw
14. Oil pump cover 1
15. Pan head screw
16. Pan head screw
17. Oil pump cover 2
18. Pan head screw
19. Delivery pipe
20. Delivery pipe clip
21. Grommet

4. Troubleshooting and repair

a. Wear or an internal malfunction may cause pump output to vary from the factory setting. This situation is, however, extremely rare. If output is suspect, check the following:

1) Obstructions in delivery line to pump or from pump to cylinder.
2) Worn or damaged pump body seal or crankcase cover seal.
3) Missing or improperly installed check ball or spring.
4) Improperly installed or routed oil delivery line(s).
5) Loose fitting(s) allowing air entry to pump and/or engine.

b. If all inspections show no obvious problems and output is still suspect, connect the delivery line from the pump to a graduated container (cc). Keep the delivery line short. Remove spark plug. Open throttle to full open position. Operate kick starter continuously and count the oil pump plunger strokes. If output is not to specification, replace pump assembly.

---

**Autolube Pump Specifications**

LB50 II AC:

Maximum Throttle

Min. ..... 0.55 mm
Max. ..... 0.65 mm

Minimum Throttle

Min. ..... 0.20 mm
Max. ..... 0.25 mm

LB80IIAC:

Maximum Throttle

Min. ..... 0.80 mm
Max. ..... 0.95 mm

Minimum Throttle

Min. ..... 0.25 mm
Max. ..... 0.30 mm

---

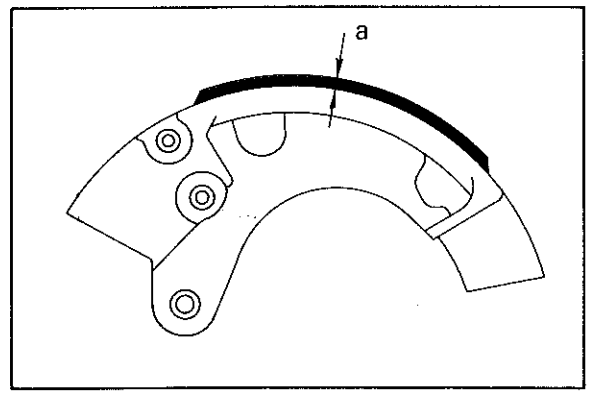
5. Reassembly

Always install a new pump case gasket.

## Clutch

1. Measure the clutch shoes lining thickness. If their minimum thickness exceeds tolerance, replace.

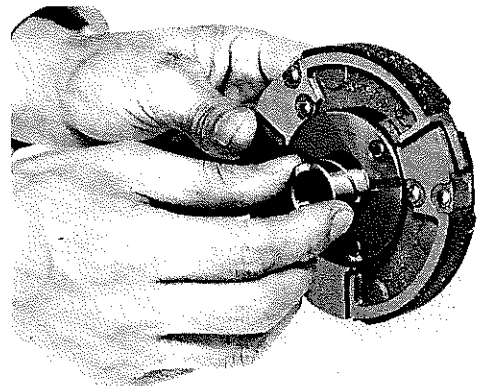
| | New | Wear Limit |
|---|---|---|
| Clutch shoe lining thickness | 2.5 mm | 2.0 mm |



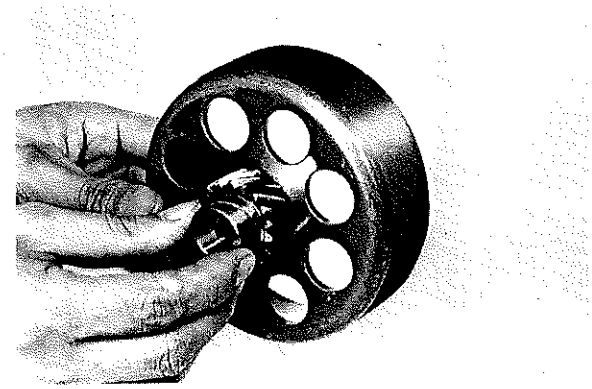

a. 2.5 mm

2. Check scratches on the inner surface of clutch housing. Remove scratches by lightly and evenly polishing with emery cloth.

3. Thoroughly clean the second clutch assembly and spacer. Apply a light film of oil on the bushing surface and spacer. Fit the spacer into the bushing. It should be a smooth, thumb-press-fit. The spacer should rotate smoothly within the bushing.

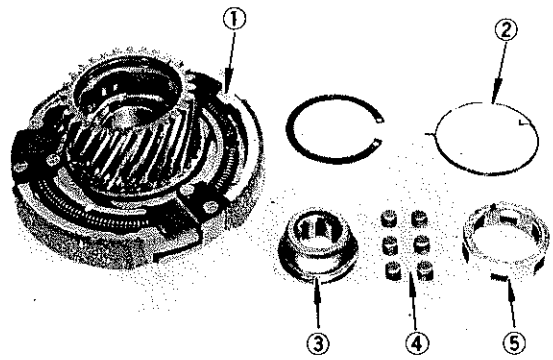


4. Thoroughly clean the clutch housing assembly and spacer. Apply a light film of oil on the spacer into the bushing. It should be a smooth, thumb-press-fit. The spacer should rotate smoothly within the bushing.

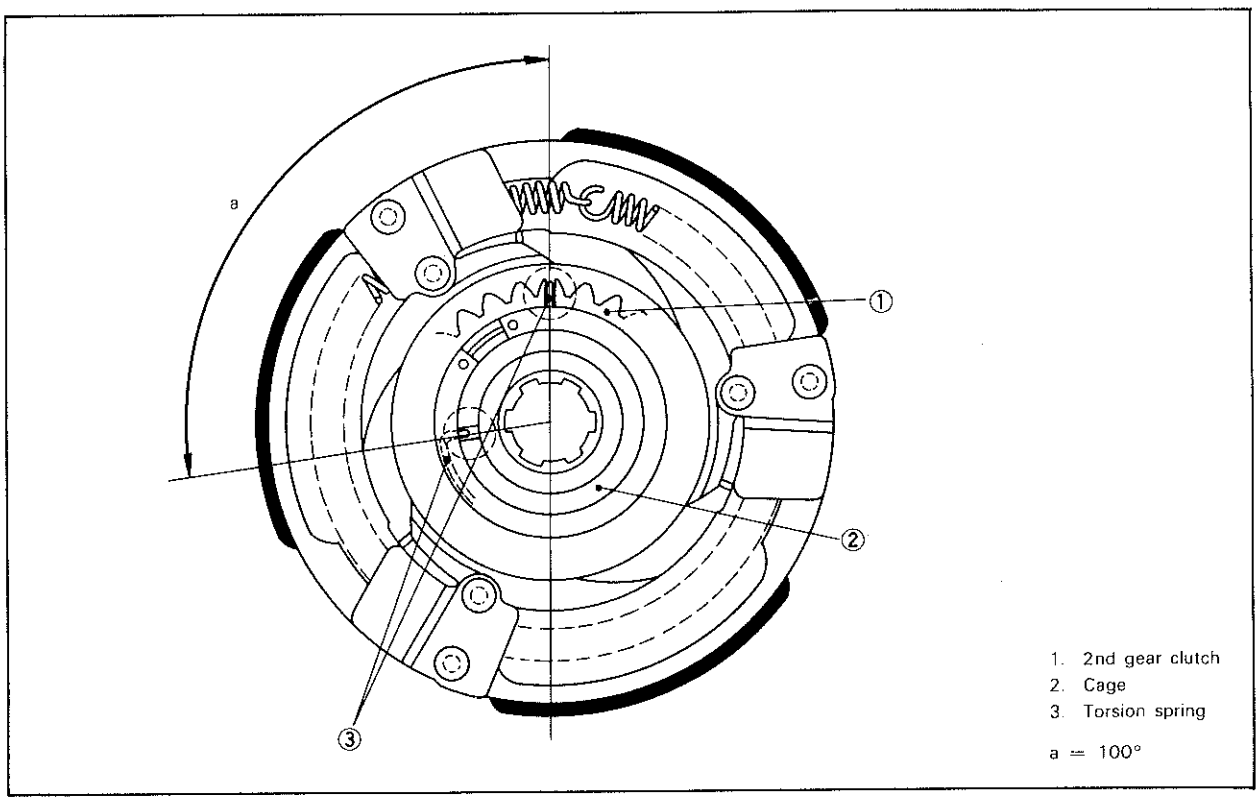


5. Check the bushing, spacer and crank shaft for signs of galling, heat damage, etc. If severe, replace as required.
6. Check the spring, rollers, cage and clutch housing boss for signs of heat damage, wear, etc. If severe, replace as required.

**NOTE:**
The oneway clutch should be installed as illustrated, with the hole in the side of the case directed outward.



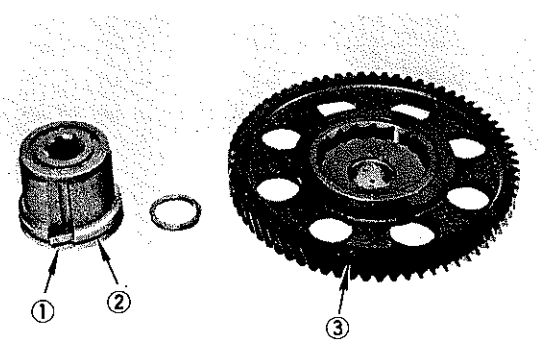

1. 2nd clutch
2. Spring
3. Clutch housing boss
4. Roller
5. Cage




1. 2nd gear clutch
2. Cage
3. Torsion spring

a = 100°

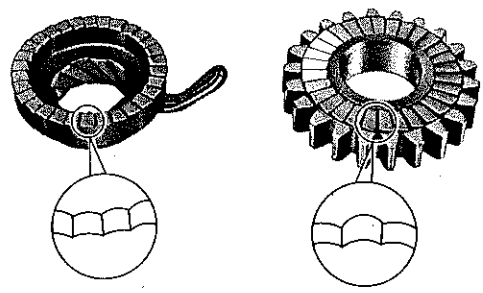
7. Check the oneway pawls, pawl spring and driven gear for signs of wear, heat damage etc. If severe, replace as required.

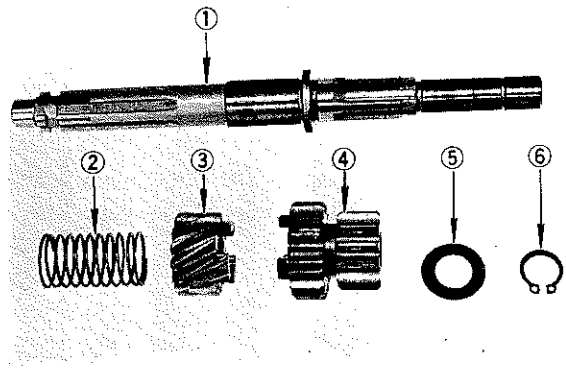



1. Pawl
2. Pawl spring
3. Driven gear

### Kick starter

1. Check the ratchet teeth on the kick gear and ratchet wheel. The mating edges should fit flush against each other. If there is severe rounding off, replace as set.
2. Check to see that the kick gear spins freely on the kick axle. If not, replace either or both as required. Replace if any signs of galling are found.
3. Check to see that the ratchet wheel (splined) slides freely on the kick axle. Check for burrs or other damage. Replace as required.
4. Check axle and wheel splines for wear. The ratchet wheel is a fairly loose fit on splines. However, if wheel is so loose it catches on shaft keeping ratchet wheel spring from forcing it out, replace.
5. Check the ratchet wheel and kick gear for damage, replace as required.
6. Check the kick pinion gear, second pinion gear and spring for damage, scratches, wear and fatigue.

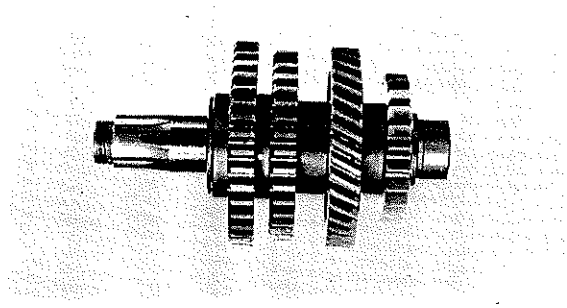




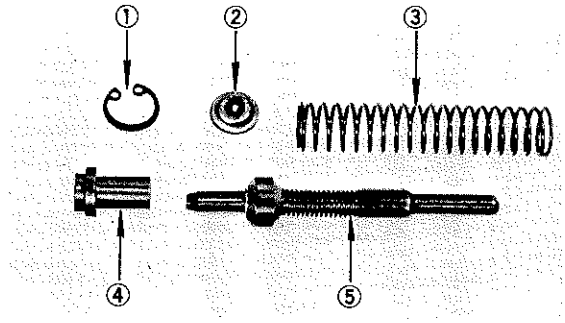

1. Main axle
2. Return spring
3. Kick pinion gear
4. Second pinion gear
5. Shim
6. Circlip

### Sub-Transmission

1. Carefully inspect each gear. Look for signs of obvious heat damage (blue discoloration). Check the gear teeth for signs of pitting, galling or extreme wear. Replace as required.
2. Check to see that each gear moves freely on its shaft.



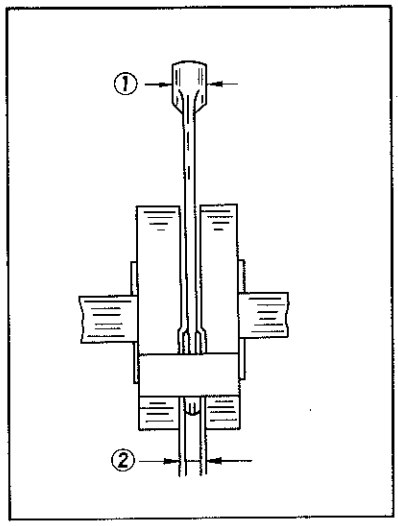
3. Check the shifter rod assembly for damage, wear and fatigue of springs.



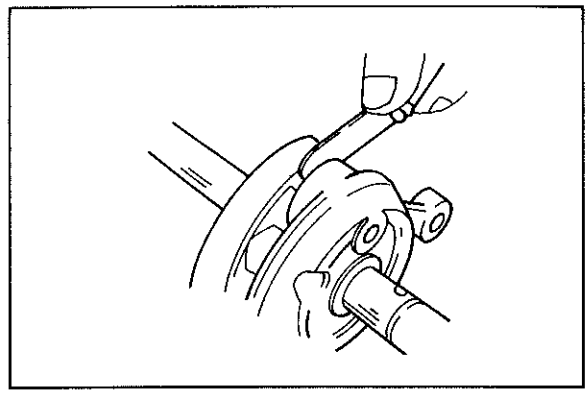

1. Circlip
2. Washer
3. Shift spring
4. Spring retainer
5. Shifter rod

## Crankshaft

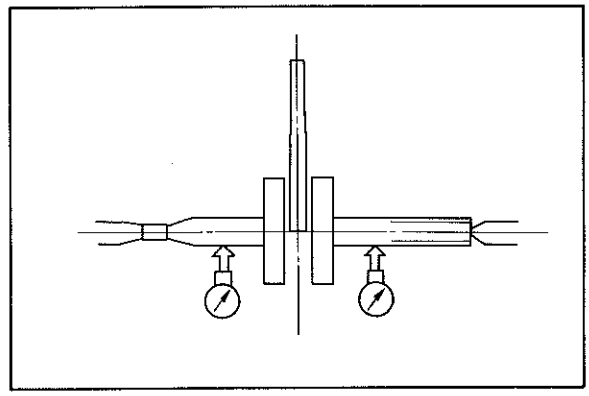
1. The crankshaft requires the highest degree of accuracy in engineering and servicing of all the engine parts.
2. The crankshaft is more susceptible to wear, and therefore, the crank bearings must be inspected with special care.
3. Check crankshaft components per chart.




1. Axial play
2. Side clearance



Checking side clearance



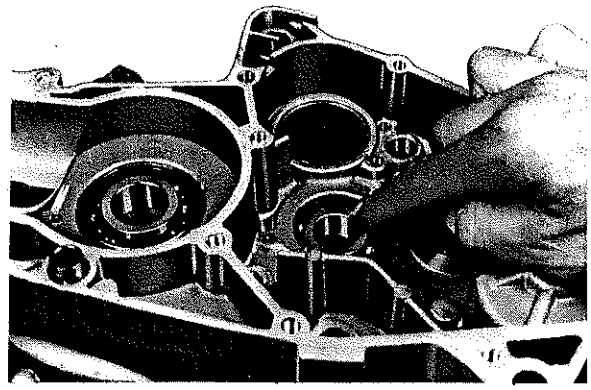
Checking crankshaft runout

| | | |
|---|---|---|
| Check connecting rod axial play at small end (to determine the amount of wear of crank pin and bearing at big end). | Small end play should not exceed 2.0 mm. | If small end play exceeds 2 mm, disassemble the crankshaft, check connecting rod, crank pin and big end bearing. Replace defective parts. Play after reassembly should be within 0.8 ~ 1.0 mm. |
| Check the connecting rod side clearance at big end. | Move the connecting rod to one side and insert a feeler gauge. Big end side clearance play should be within 0.2 ~ 0.5 mm. | If excessive side clearance play is present, 0.6 mm or motor disassemble the crankshaft and replace any worn parts. |
| Check crankshaft assembly runout. (Misalignment of crankshaft parts) | Dial gauge readings should be within 0.02 mm. | Correct any misalignment by tapping the flywheel with a brass hammer and by using a wedge. |

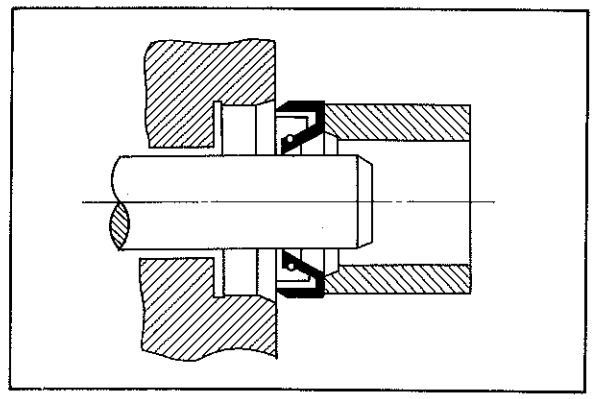
**Bearings and oil seals**

1. Inspection

a. After cleaning and lubricating bearings, rotate inner race with a finger. If rough spots are noticed, replace the bearing.



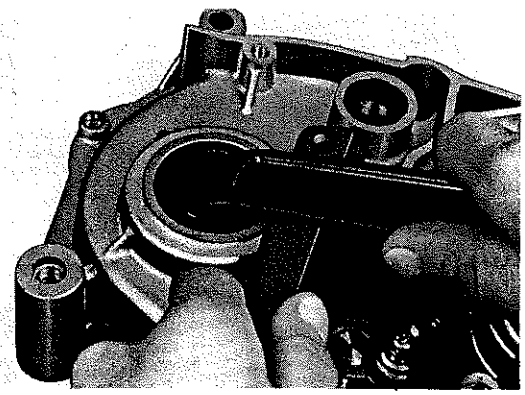
b. Check oil seal lips for damage and wear. Replace as required.



2. Removal

a. Pry oil seal(s) out of place using a slotted head screwdriver.
Always replace all oil seals when overhauling engine.

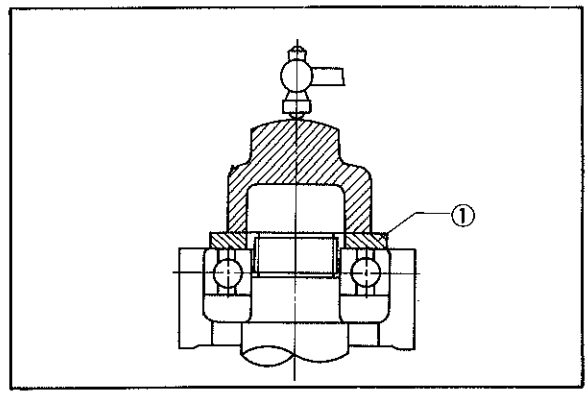
**NOTE:**
Place a piece of wood under the screwdriver to prevent damage to case.



b. Drive out bearing(s) with socket and hammer.

**NOTE:**
Bearing(s) are most easily removed or installed if the cases are first heated to approximately 100°C. Bring the case up to proper temperature slowly. Use an oven.

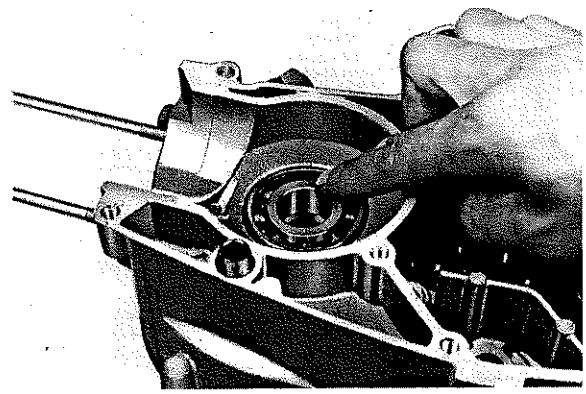
3. Installation
   Install bearing(s) and oil seal(s) with their manufacture's marks or numbers facing outward. (In other words, the stamped letters must be on the exposed view side). When installing bearing(s) or oil seal(s), apply a light coating of light-weight lithium base grease to balls and seal lip(s).




1. Spacer

**Crankcase**

1. Thoroughly wash the case halves in mild solvent.
2. Clean all gasket mating surfaces and crankcase mating surfaces thoroughly.
3. Visually inspect case halves for any cracks, road damage, etc.
4. Check all fittings not previously removed for signs of loosening or damage.
5. If bearings have been removed, check their seats for signs of damage (such as the bearing spinning in the seat, etc.)
6. Check oil delivery passages in transfer ports for signs of blockage.
7. If bearings have not been removed, oil them thoroughly immediately after washing and drying. Rotate the bearings checking for roughness indicating damaged races or balls.
8. Check needle bearing(s) in transmission section for damage. Replace as required.



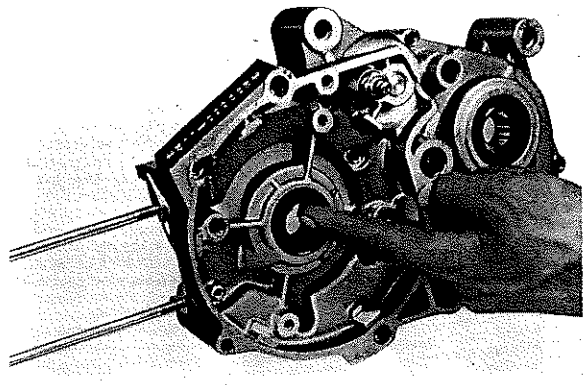
## ENGINE ASSEMBLING AND ADJUSTMENT

### Crankshaft installation

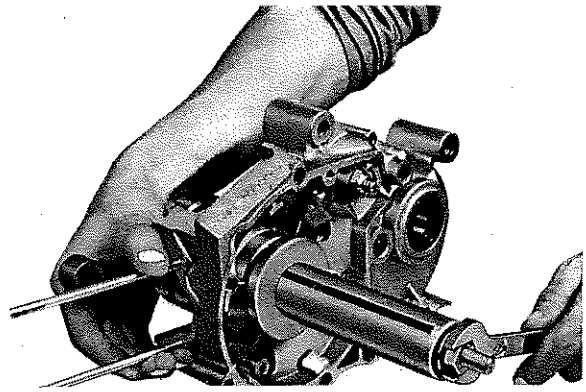
After all bearings and seals have been installed in both crankcase halves, install crankshaft as follows:

**CAUTION:**

**To protect the crankshaft against scratches or to facilitate the operation of installation:**
**Pack the oil seal lips with grease. Apply engine oil to each bearing.**

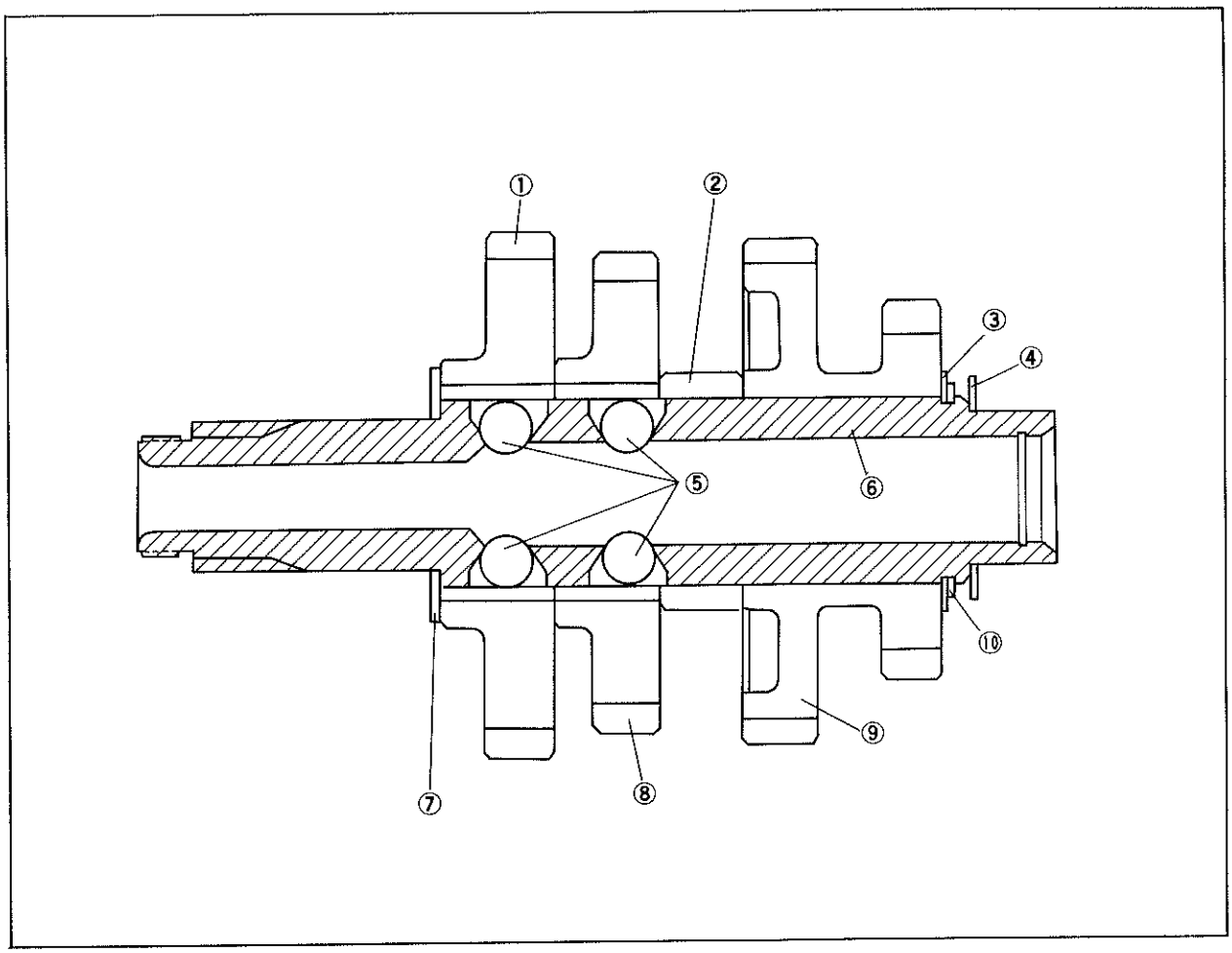


1. Set the crankshaft into left case half and install crankshaft installing tool.
2. Hold the connecting rod at top dead center with one hand while turning the handle of the installing tool with the other. Operate tool until crankshaft bottoms against bearing.

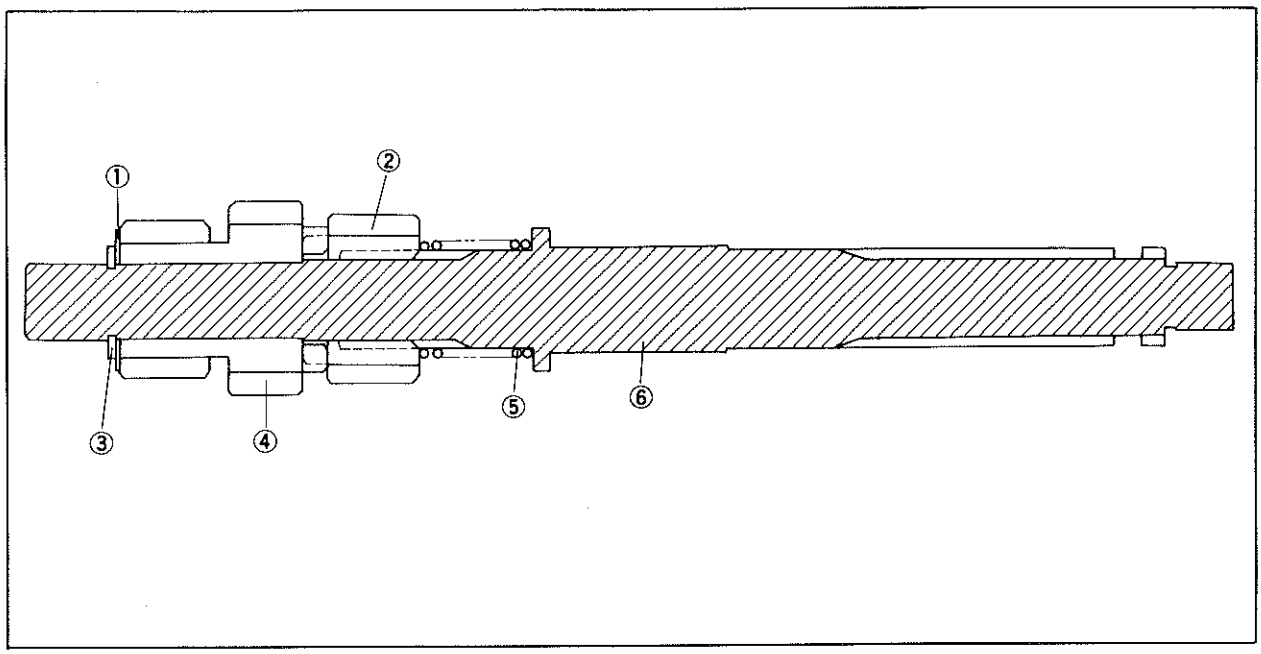


### Sub-Transmission installation

1. Paying particular attention to the illustration, assemble the transmission shafts.



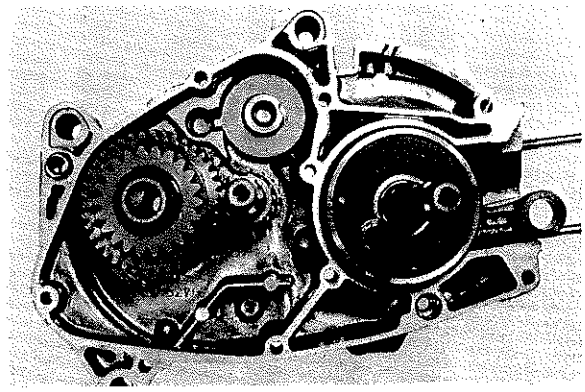

1. 1st wheel gear
2. Distance collar
3. Washer
4. Plate washer
5. Ball
6. Drive axle
7. Drive axle spacer
8. 2nd wheel gear
9. Kick idle gear
10. Circlip



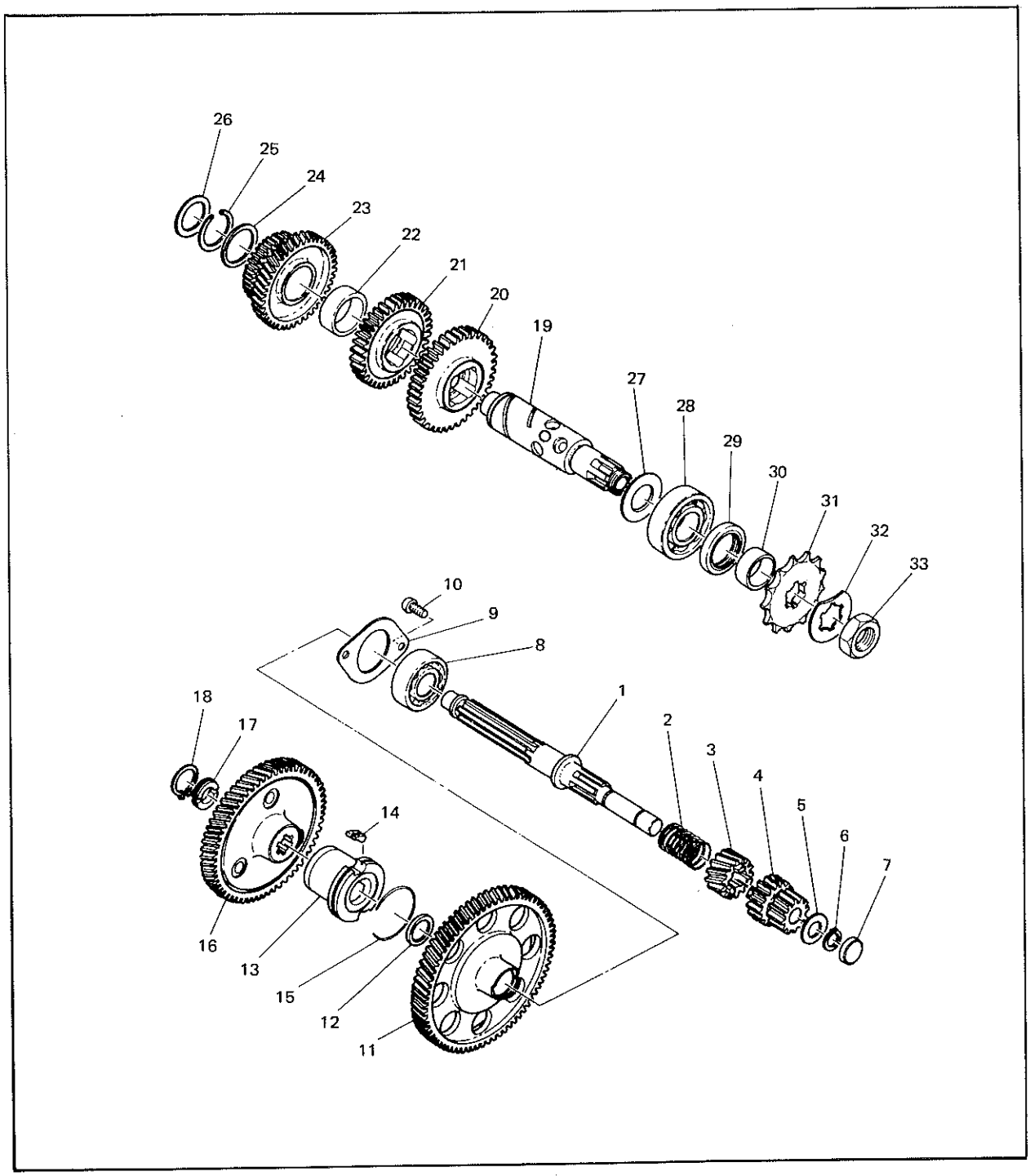

1. Shim
2. Kick pinion gear
3. Circlip
4. 2nd pinion gear
5. Return spring
6. Main axle

2. Install the assembly into the left case half, shafts are fully seated.
3. Check to see that all parts move freely prior to installing right case half. Check for correct sub-transmission operation and make certain that all loose shims are in place.

**NOTE:**
After assembly, apply a liberal amount of gear oil to the gear teeth.

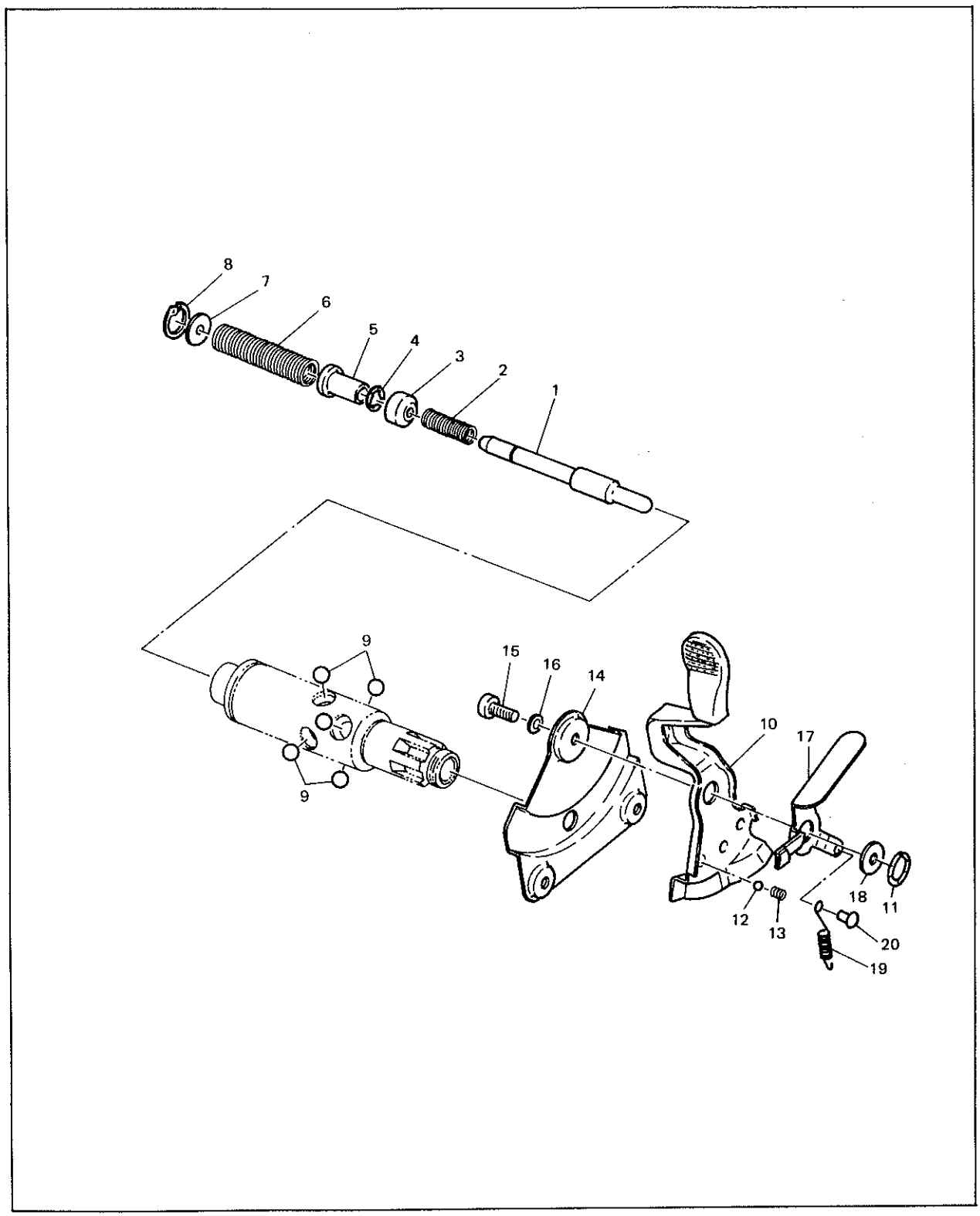


## Transmission




1. Main axle
2. Spring
3. Kick pinion gear
4. 2nd pinion gear
5. Shim
6. Circlip
7. Blind plug
8. Bearing
9. Bearing cover plate
10. Panhead screw
11. Primary driven gear comp. 1
12. Plate washer
13. One way comp. boss
14. One way pawl
15. Pawl spring
16. Primary driven gear comp. 2
17. Kick gear holder
18. Circlip
19. Drive axle
20. 1st wheel gear
21. 2nd wheel gear
22. Distance callar
23. Kick idle gear
24. Washer
25. Circlip
26. Plate washer
27. Drive axle spacer
28. Bearing
29. Oil seal
30. Distance collar
31. Drive sprocket
32. Lock washer
33. Lock nut

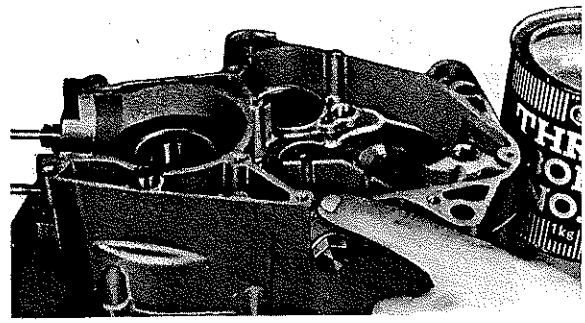
## Shifter



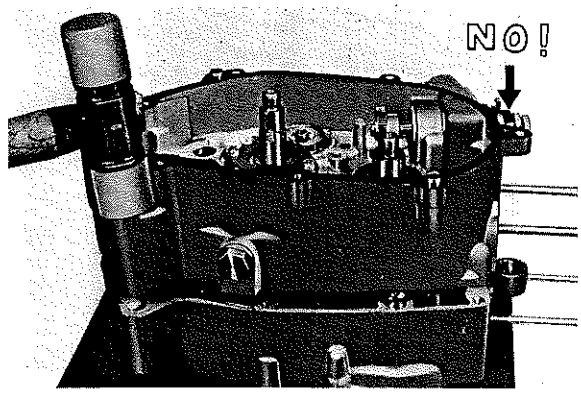

1. Shifter rod
2. Damper spring
3. Shifter head
4. Circlip
5. Spring retainer
6. Shift spring
7. Washer
8. Circlip
9. Ball
10. Shift lever
11. Wave washer
12. Ball
13. Stopper spring
14. Dust seal
15. Panhead screw
16. Spring washer
17. Stopper lever
18. Washer
19. Lever return spring
20. Spring hook

**Crankcase**

1. Apply Yamaha Bond No. 4 to the mating surfaces of case halves. Apply thoroughly, overall mating surfaces.
   It is advisable that the right hand case mating surface be coated.

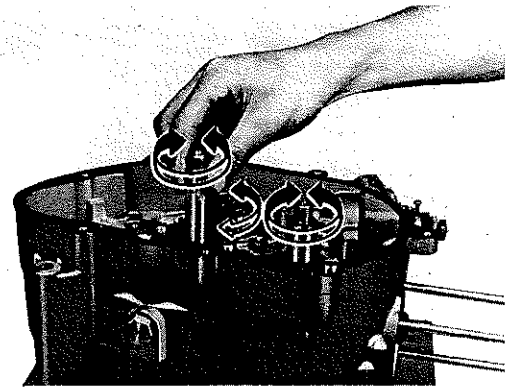


2. Set the crankcase right half onto the shafts and tap lightly on the case with a soft hammer to assemble.

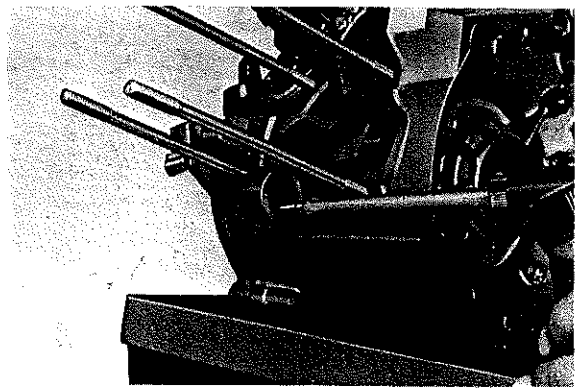



**NOTE:**

Do not tap on machined surface or end of crankshaft.
After putting together both case halves, check the axles, shift cam and crankshaft for smooth rotation by turning by hand.
After tightening the case bolts, check again for smooth rotation.
Interference for all bolts is about 10 mm. Be careful so that all bolts are in correct position.

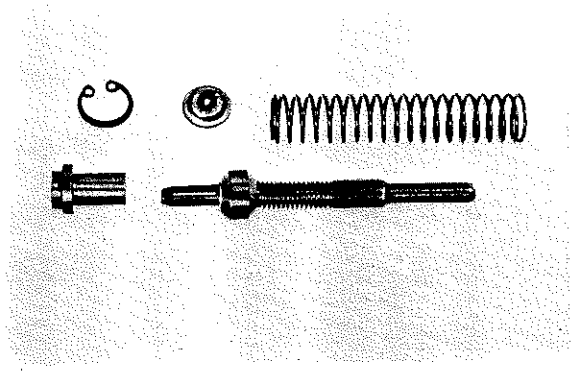


3. Install all crankcase bolts and tighten in stages using crisscross pattern.
4. After reassembly, apply a liberal coating of two-stroke oil to the crank pin and bearing and into each crankshaft bearing oil delivery hole.



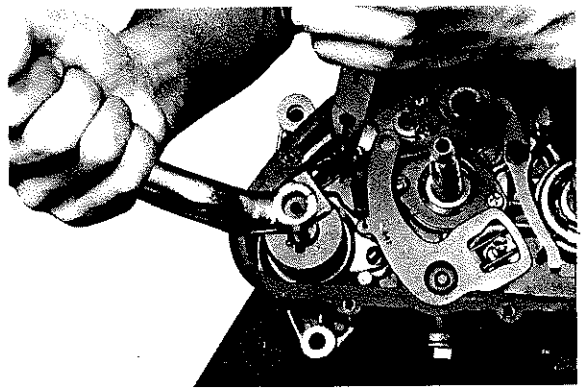
### Shifter

Install the shifter rod, spring retainer, washer and circlip into the drive axle.

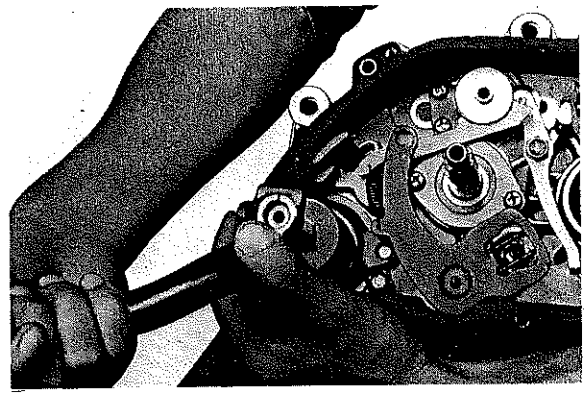


### Kick starter assembly

1. Install the kick axle assembly in place.
2. By turning the kick spring, pull it into the crankcase.
3. Hook the kick spring on to the spring stopper.

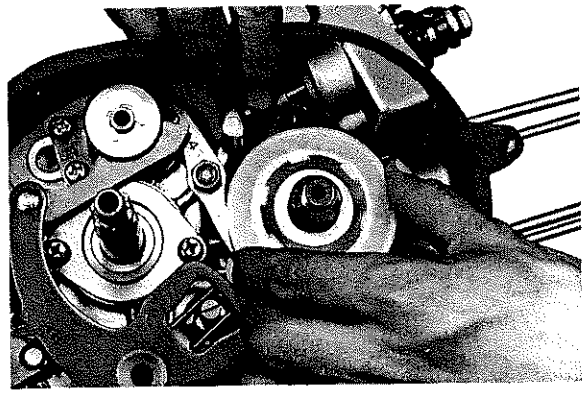


4. By turning the kick crank, push the kick axle into position.



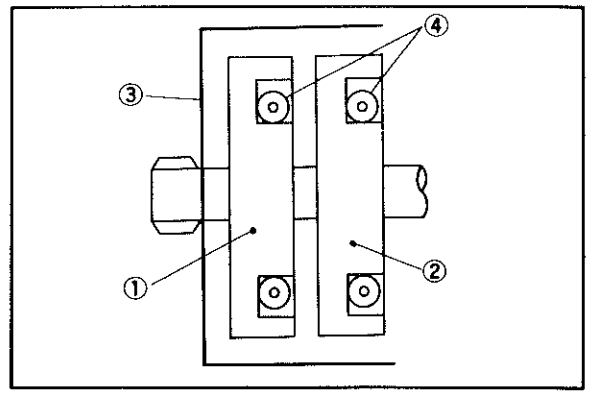
### Pump drive gear and primary drive gear

By turning the oil pump gear with your fingers, install the pump drive gear. Do not forget to install the drive gear locating pin into the crankshaft.



### Primary gears and clutches

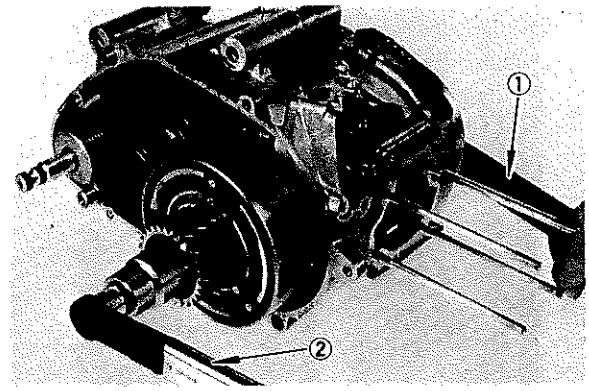
1. Install the driven gear and oneway clutch boss onto the main axle.
2. Install the clutch housing, thrust plate and spacer onto the crank shaft.
3. Install the 1st clutch assembly and 2nd clutch assembly onto the crank shaft as shown in the illustration.




1. 1st clutch
2. 2nd clutch
3. Clutch housing
4. Clutch weight spring

4. Tighten the locknut.

| Tightening torque:<br>28 Nm (2.8 m • kg) |
|---|



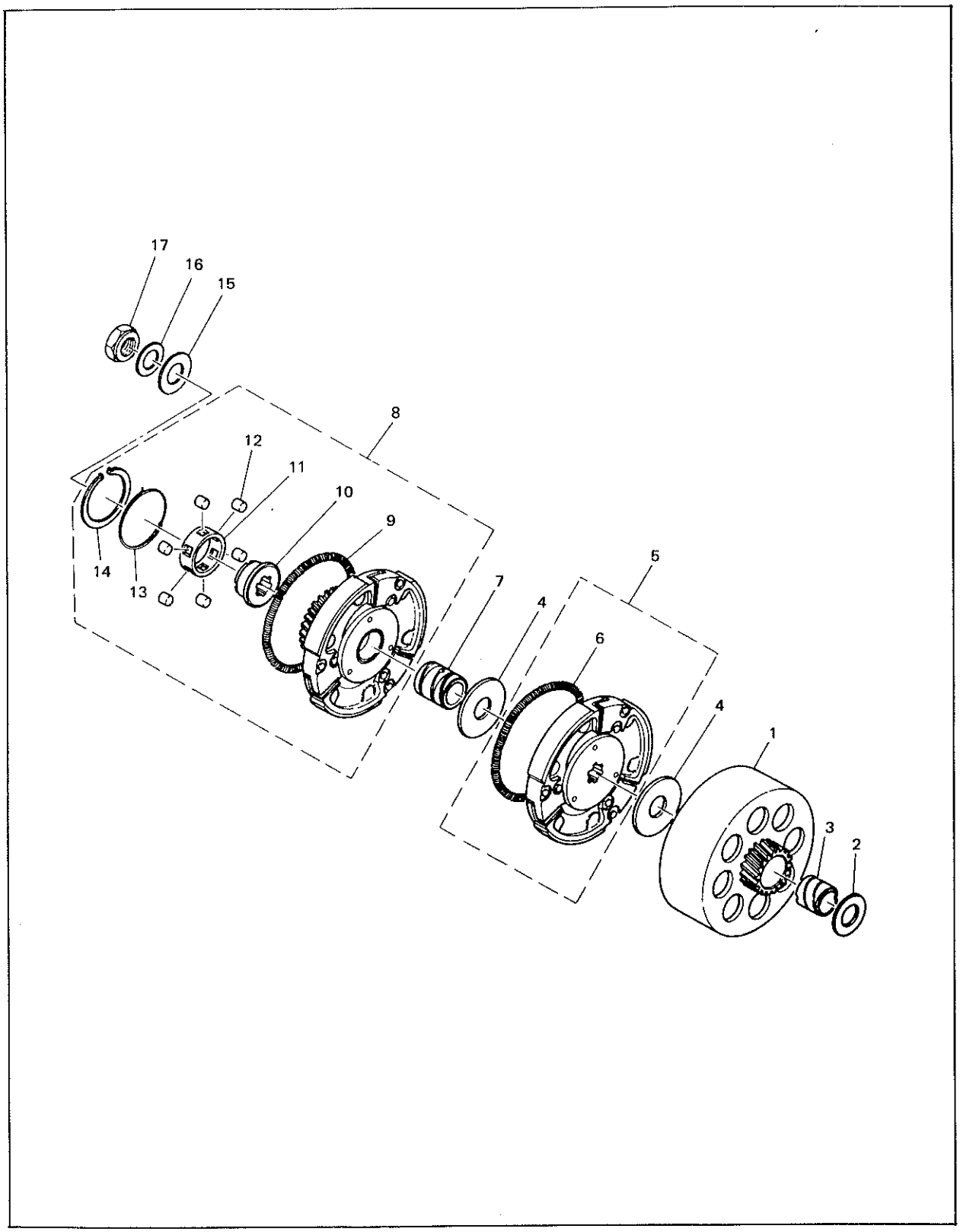

1. Flywheel holding tool
2. Torque wrench

5. Install the primary driven gear onto the main axle.

### Crankcase cover, right

Install crankcase cover (right).

## Clutch




1. Primary gear ass'y
2. Plate washer
3. Spacer
4. Plate washer
5. Clutch carrier ass'y 1
6. Tension spring
7. Spacer
8. Clutch carrier ass'y 2
9. Tension spring
10. Clutch housing boss
11. Cage
12. Dowel pin
13. Spring
14. Clip
15. Plate washer
16. Belleville spring
17. Lock nut

### Piston

1. During reassembly, coat the piston ring grooves, piston skirt areas, piston pin and bearing with two-stroke oil.
2. Install new piston pin clips and make sure they are fully seated in their grooves.

**NOTE:**

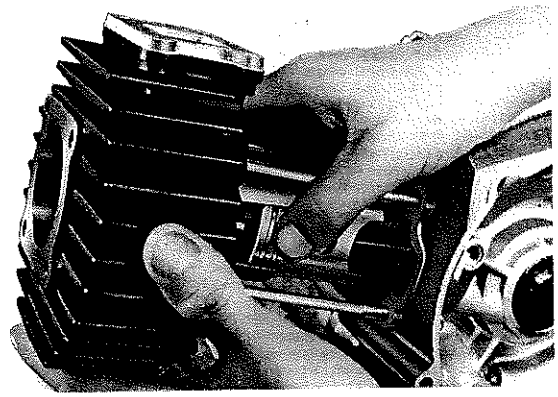
Take care during installation to avoid damaging the piston skirts against the crankcase as the cylinder is installed. Note the two induction holes in the piston skirt. These must be to the rear during installation.

### Cylinder

1. Install a new cylinder base gasket.
2. Install cylinder with one hand while compressing piston rings with other hand.

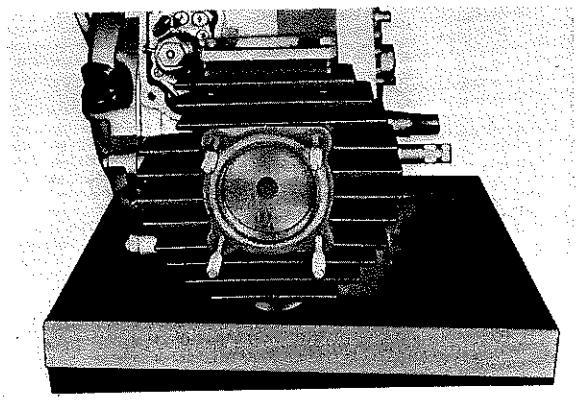
**NOTE:**

Make sure the rings are properly positioned.



### Cylinder head

Install cylinder head gasket and cylinder head.

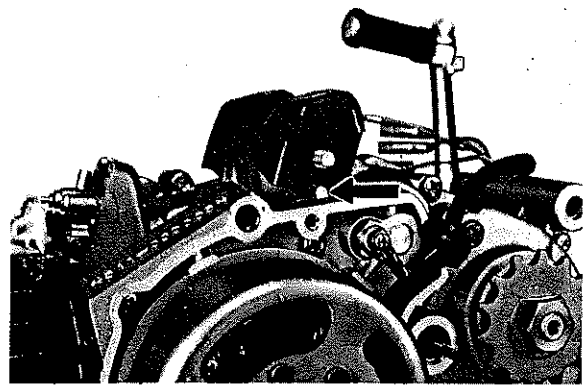


## INSTALLING ENGINE

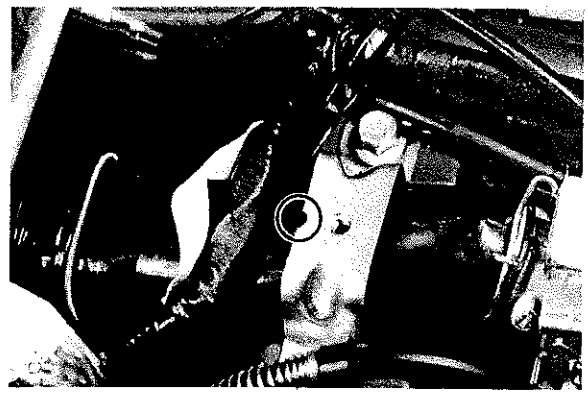
Mount the engine in the frame as follows:

1. Install the engine bracket. Fit the cut on the left side of the bracket over the projection of crankcase, and secure with bolts.
2. Install three engine mounting bolts with proper tightening torque.

| Tightening torque: 18 Nm (1.8 m • kg) |
|---|



3. Install the under cover stay with the round cut on the rear side.



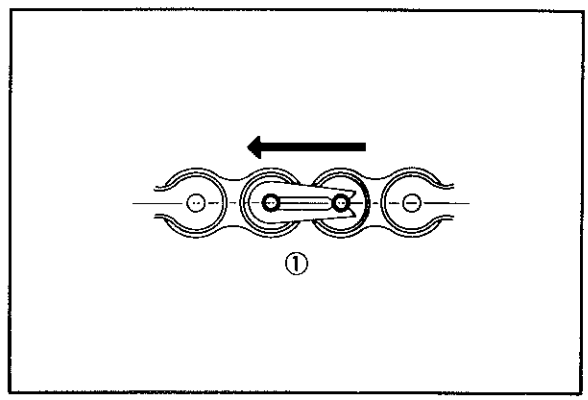
4. Install drive sprocket and chain.

**NOTE:**

Install chain joint in proper direction.

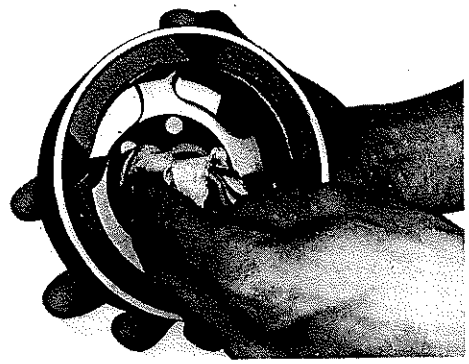
5. Tighten drive sprocket with proper torque.

| Drive sprocket nut torque: 55 Nm (5.5 m • kg) |
|---|




1. Direction of travel

6. Install the flywheel.



**NOTE:**

When installing flywheel, make sure woodruff key is properly seated in keyway of crankshaft. Apply a light coating of lithium soap base grease to tapered portion of crankshaft end. Carefully install flywheel taking care to align for woodruff key. Install bevelled washer, lockwasher and locknut. Tighten carefully to recommended torque value.

Clean the magneto flywheel cam face, and grease it sparingly.

| Flywheel nut torque: |
| --- |
| 50 Nm (5.0 m • kg) |

7. Whenever the flywheel is removed, ignition timing must be re-set.
8. Apply a light coat of molybdenum grease to the shifter rod end.
9. Install crankcase cover (left).
10. Install carburetor assembly and adjust.
11. Install muffler.
12. Install oil pump wire and adjust.

# CHAPTER 4. CARBURETION



4

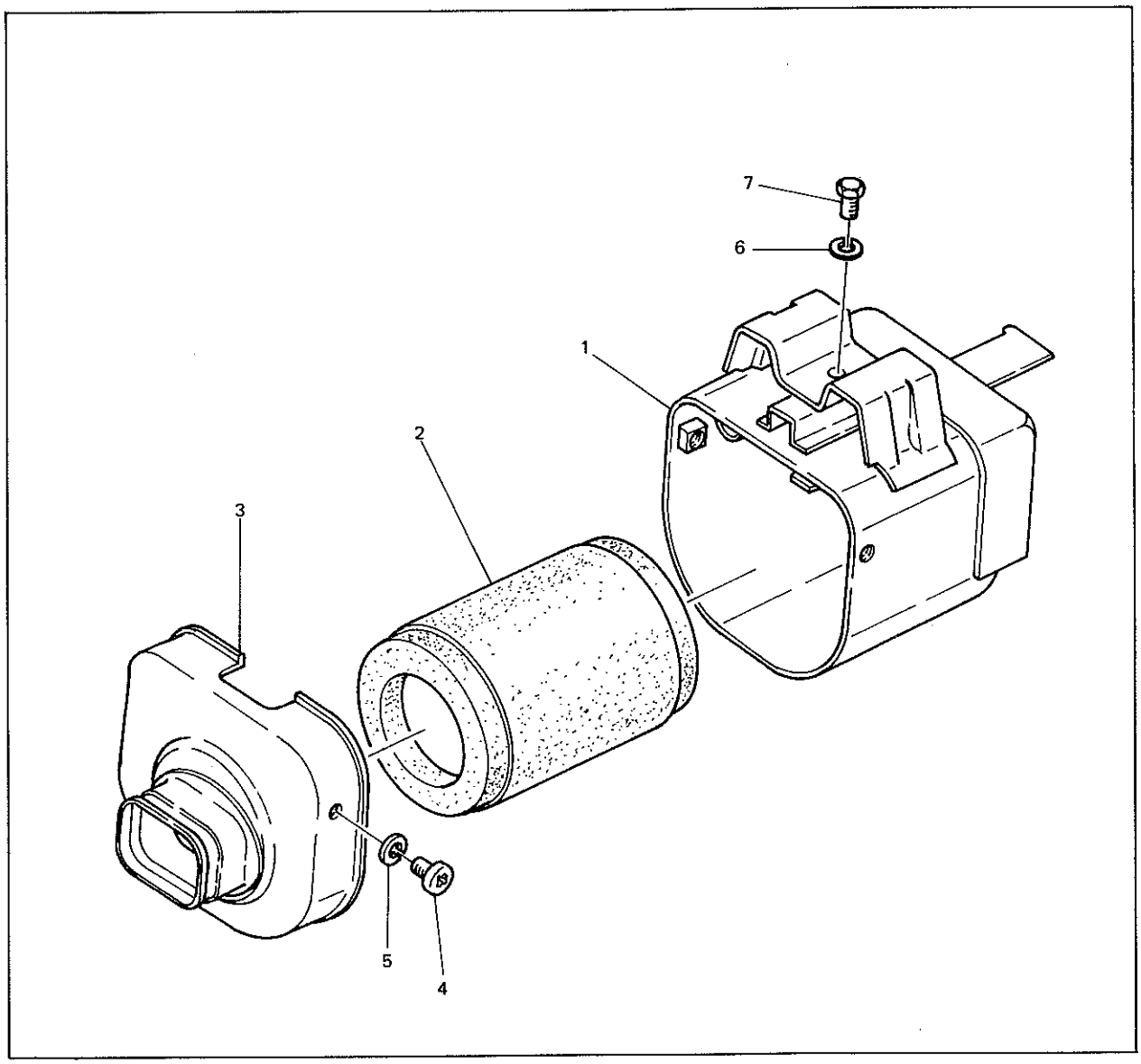
4

# CHAPTER 4. CARBURETION

## AIR CLEANER

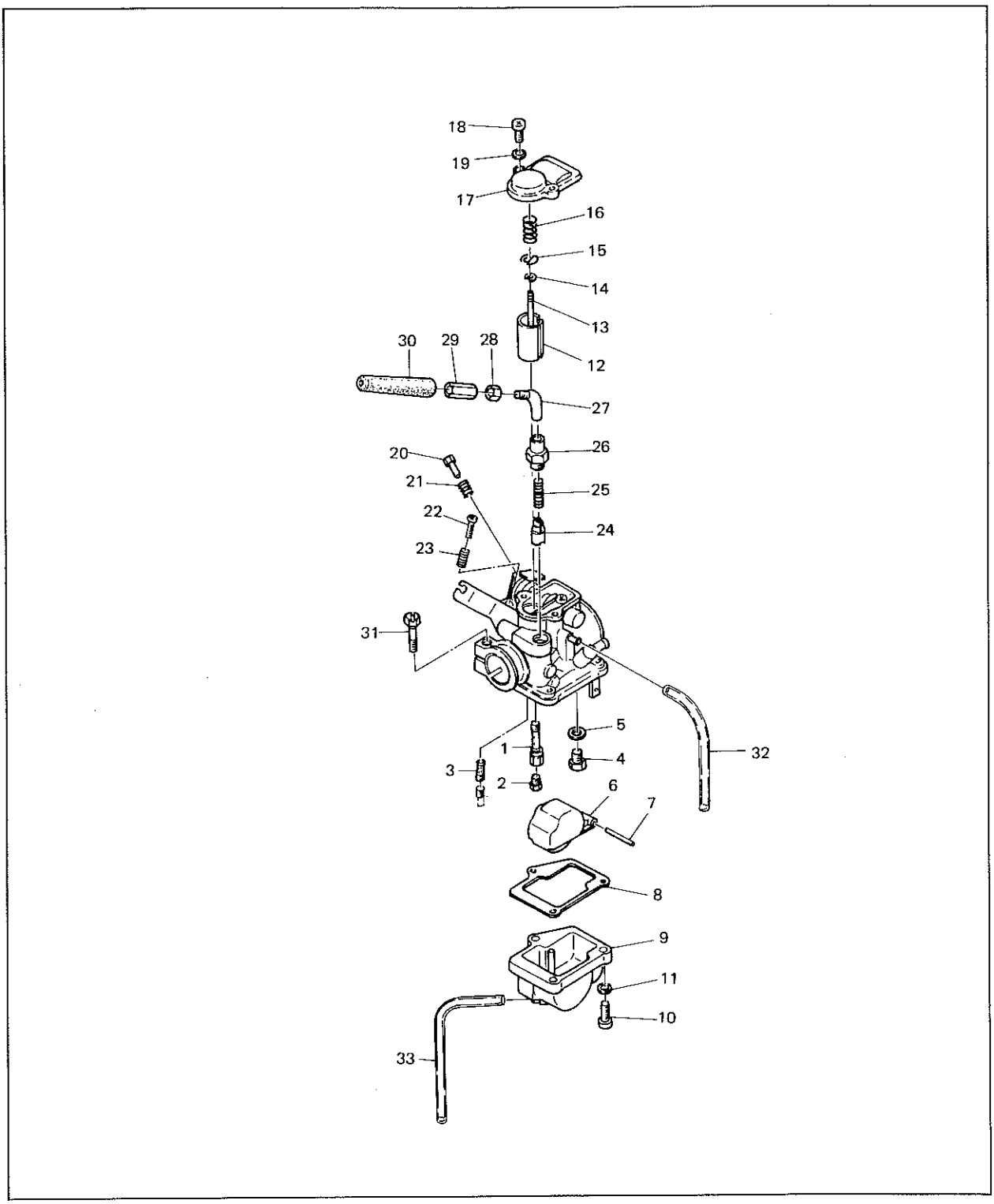
### Description

1. The air filter is housed within a case below the oil tank.
2. The filter is made of polyurethene foam with a stiff bristle covering.
3. For proper function of carburetion, the filter must be in place; must be clean; and must be damp with oil to provide adequate protection to vital engine parts.
4. For air filter maintenance see Chapter 2.




1. Air cleaner case
2. Air cleaner element
3. Air cleaner cap
4. Pan head screw
5. Spring washer
6. Spring washer
7. Bolt

## CARBURETOR




1. Main nozzle
2. Main jet
3. Pilot jet
4. Valve seat
5. Valve seat washer
6. Float
7. Float pin
8. Float chamber gasket
9. Float chamber body
10. Pan head screw
11. Spring washer
12. Throttle valve
13. Needle
14. Clip
15. Spring seat
16. Throttle spring
17. Mixing chamber top
18. Pan head screw
19. Spring washer
20. Air adjusting screw
21. Air adjusting spring
22. Throttle adjusting screw
23. Throttle adjusting spring
24. Starter plunger
25. Plunger spring
26. Plunger cap
27. Cable guide
28. Adjusting nut
29. Adjusting screw
30. Cable cap
31. Screw
32. Air vent pipe
33. Over flow pipe

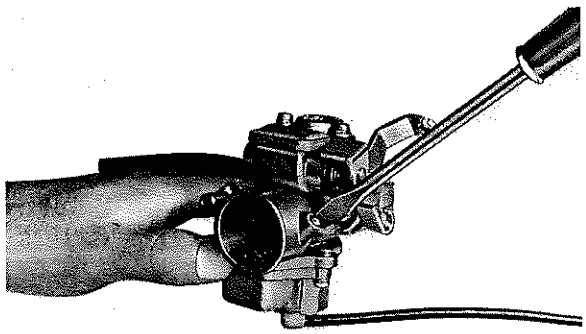
## Description

1. The carburetor is of primary concern to proper engine operation. Considerable care should be taken during disassembly, inspection, and maintenance to see that all circuits are working correctly and that all adjustments properly made.
2. Prior to carburetor disassembly, study the sections on air filter, spark plug, Autolube and ignition timing thoroughly. Each of these components works in conjunction with the carburetor to provide maximum performance and longevity.

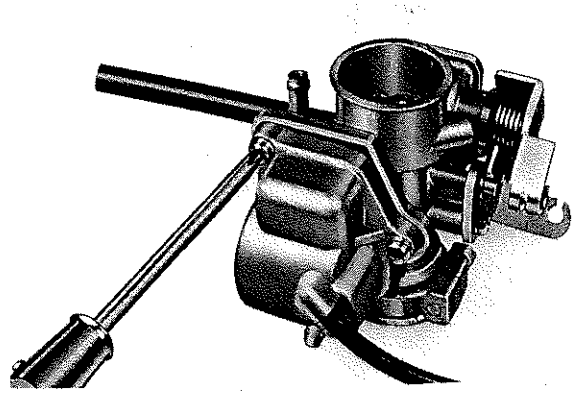
---

## Disassembly

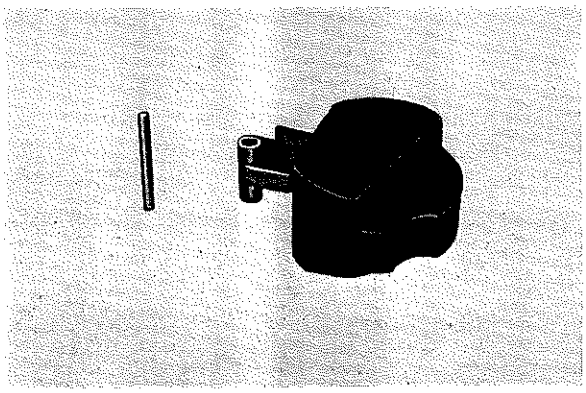
Remove the following parts as shown.



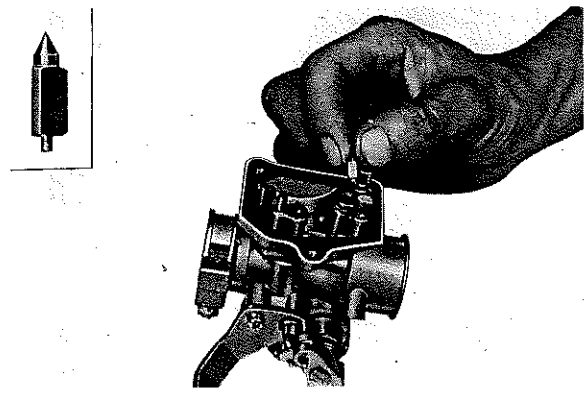
Pilot air screw



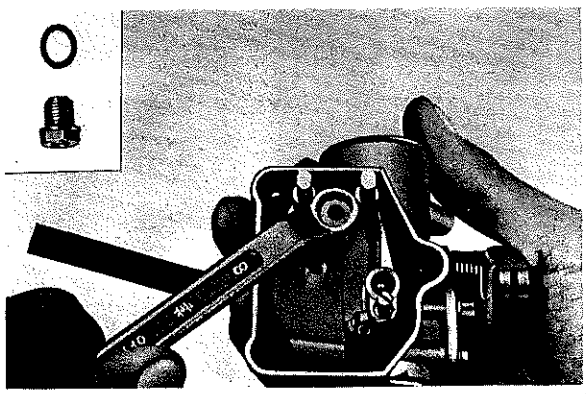
Float chamber



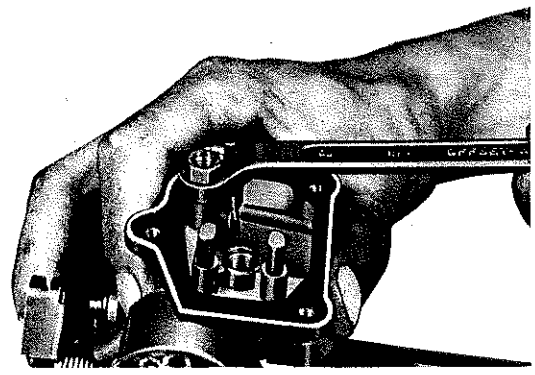
Float



Needle valve

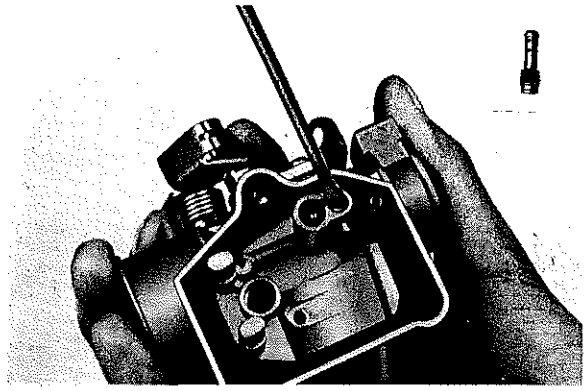


Valve seat



Main nozzle

Main nozzle



Pilot jet

**NOTE:**

1. Banjo bolt holding main jet can be removed without any disassembly.
2. Carefully set body aside and inspect each independent float within the float bowl cavity. Note their installation position. The float arm pin must be at the bottom of the float bowl and pointed in, toward the center.
3. Wash the carburetor in petroleum base solvent. Wash all associated parts.
4. It is rarely necessary to use special carburetor cleaning solutions, if deposits warrant this procedure, remove the Starter Jet Assembly to avoid damaging the neoprene valve seat.
5. Using high pressure air, blow out all passages and jet's.
6. Never direct high pressure air into carburetor with float bowl installed. Damage to floats may occur.
7. Inspect the needle and seat for signs of excessive wear or attached foreign particles. Replace as required. Always replace inlet needle and inlet valve seat as an assembly.
8. Inspect pilot air screw for signs of excessive wear or attached foreign particles. Replace as required.

**Troubleshooting and repair**

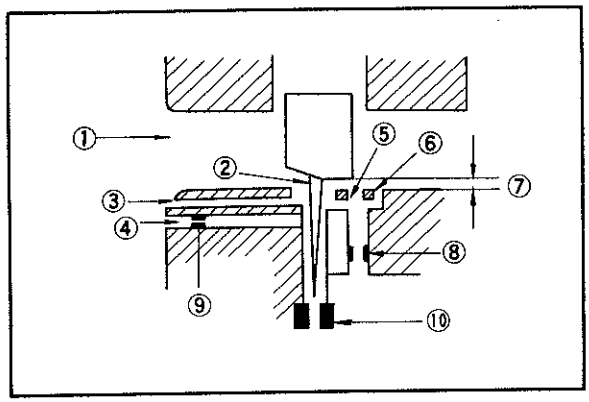
| Carburetor Specifications | | | |
|---|---|---|---|
| Part Name | Abbrev. | Model | |
| | | LB50 II AC | LB80IIAC |
| Manufacturer - Model | — | Mikuni VM14SC | Mikuni VM16/1 |
| I.D. Number | — | 2T5-00 | 1F5-01 |
| Venturi Size | — | 14 mm | 16 mm |
| Main Jet | M.J. | #95 | ← |
| Needle Jet | N.J. | E-4 | E-8 |
| Jet Needle/Clip Position | J.N. | 3G9/3 | ← |
| Cut Away | C.A. | 2.5 | ← |
| Pilot Jet | P.J. | #17.5 | #15 |
| Air Jet | A.J. | Drill 2.5$\phi$ | ← |
| Starter Jet | S.J. | #20 | #25 |
| Air Screw (Turns Out) | A.S. | 1 | 1-3/4 |
| Idle Speed | — | 1,350 ± 100 rpm | ← |
| Float Level | F.L. | 22.0 ± 2.5 mm | ← |

**NOTE:**

Cylinder porting, combustion chamber compression, ignition timing, muffler design, and carburetor size and component selection are all balanced to achieve optimum performance. However, variations in temperature, humidity and altitude, to name a few, will affect carburetion and consequently, engine performance.

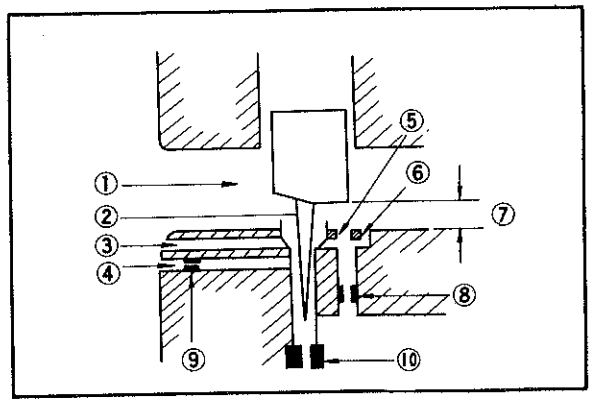
The following list gives each of the major components of the carburetor that can be readily changed in order to modify carburetor performance if required.

1. Pilot air screw
   Controls the ratio of air to fuel in the idle circuit. Turning the screw in decreases the air supply giving a richer mixture.
   OPERATING RANGE MOST AFFECTED BY THIS ADJUSTMENT. ZERO TO 1/8 THROTTLE.
2. Pilot jet
   Controls the ratio of fuel to air in the idle circuit. Changing the jet to one with a higher number supplies more fuel to the circuit giving a richer mixture.
   OPERATING RANGE MOST AFFECTED BY THIS JET: ZERO TO 1/8 THROTTLE.



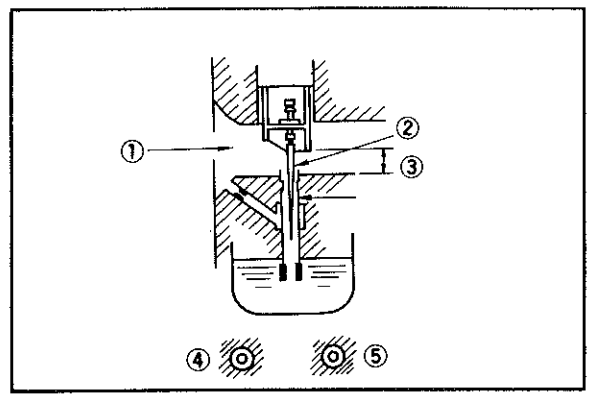

1. Main air
2. Jet needle
3. Pilot air
4. Bleed air
5. Bypass
6. Pilot outlet
7. Opening 0 to 1/8 throttle
8. Pilot jet
9. Air jet
10. Main jet

3. Throttle valve (slide):
   The throttle valve (slide) has a portion of the base cutaway to control air flowing over the main nozzle. A wider angle (more "cutaway") will create a leaner mixture. Throttle valves are numbered according to the angle of the cutaway. The higher the number, the more cutaway, the leaner the mixture.
   OPERATING RANGE MOST AFFECTED BY THE THROTTLE VALVE: 1/8 TO 1/4 THROTTLE.



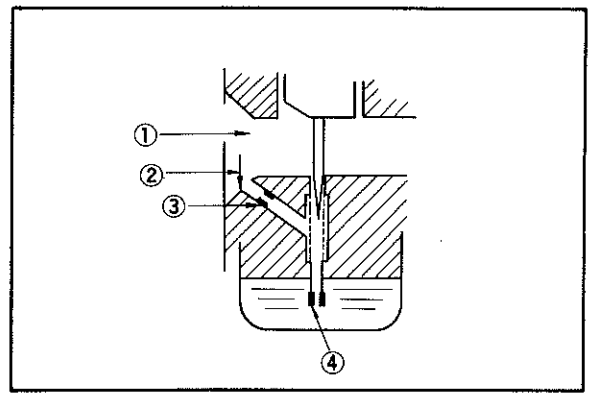

1. Main air
2. Jet needle
3. Pilot air
4. Bleed air
5. Bypass
6. Pilot outlet
7. Opening 1/8 to 1/4
8. Pilot jet
9. Air jet
10. Main jet

4. Jet needle
The jet needle is fitted within the throttle valve. The tapered end of the needle fits into the main nozzle outlet. Raising the needle allows more fuel to flow out of the nozzle outlet giving a richer mixture. There are five circlip grooves at the top of the needle. Moving the needle clip from the first, or top groove, through the fifth, or bottom groove, will give a correspondingly richer mixture.
OPERATING RANGE MOST AFFECTED BY THE JET NEEDLE: 1/4 TO 3/4 THROTTLE.




1. Main air
2. Jet needle
3. Opening 1/4 to 3/4
4. 3/4 throttle
5. 1/4 throttle

5. Main jet
The main jet controls overall fuel flow through the main nozzle.
Changing the jet to one with a higher number supplies more fuel to the main nozzle giving a richer mixture.
OPERATING RANGE MOST AFFECTED BY THE MAIN JET: 3/4 TO FULL THROTTLE.

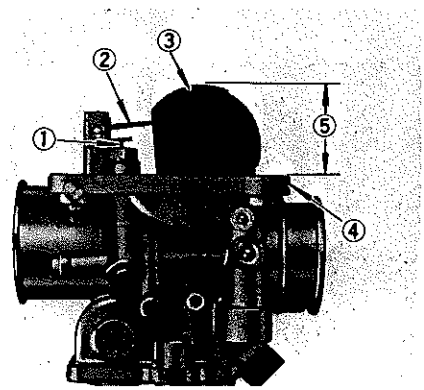



1. Main air
2. Bleed air
3. Air jet
4. Main jet

**NOTE:**
Excessive changes in main jet size can affect overall performance.

**CAUTION:**
**The fuel/air mixture ratio is a governing factor upon engine operating temperature.**
**Any carburetor changes, whatsoever, must be followed by a thorough test of spark plug temperature during actual engine operation.**

6. Float level
a. Float level is one factor within the carburetor which will change with use.
b. If float level within the carburetor float chamber body decreases, the fuel/air mixture ratio will be leaner. If the level increases, mixture will be richer.

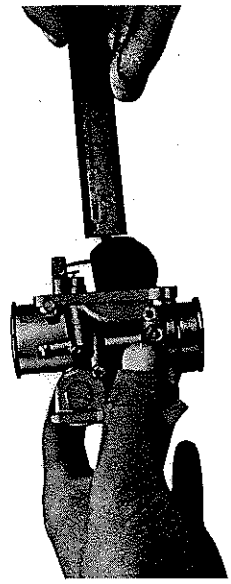



1. Needle
2. Float holding plate
3. Float
4. Edge of mixing chamber
5. Float lever

c. The level is set according to the design of the carburetor and float bowl chamber. Under no circumstances should float level be altered in an attempt to correct a performance problem. Look for the problem in other, related components or carburetor circuits.

d. If the carburetor is placed with the side down, the float arm will contact the float valve end.

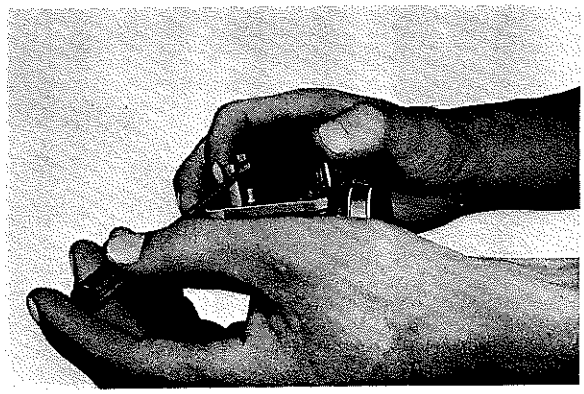
e. Using a vernier caliper, measure the distance of the float arm from the top of the float chamber gasket seat (gasket removed) to the float arm.



| Float level: |
| --- |
| 22.0 ± 2.5 mm |

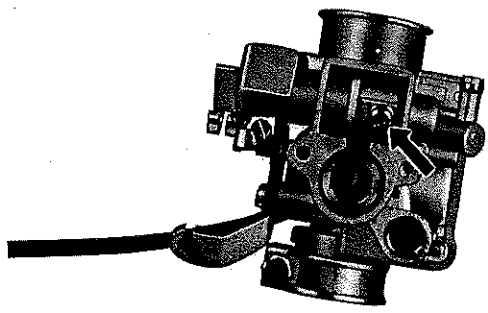
**NOTE:**
The float arm should be just resting on, but not depressing, the spring loaded inlet needle.

f. To correct float arm height, bend the tang a slight amount as required.
Both the right and left sides of the float arm should measure identically.
Correct as required.

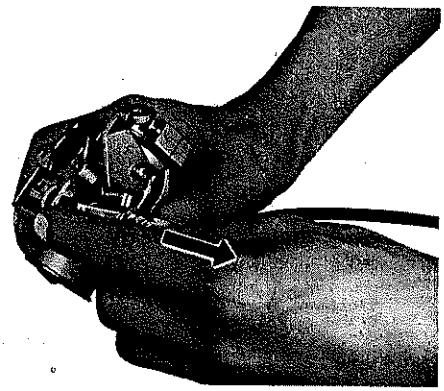


### Disassembling the mixing chamber

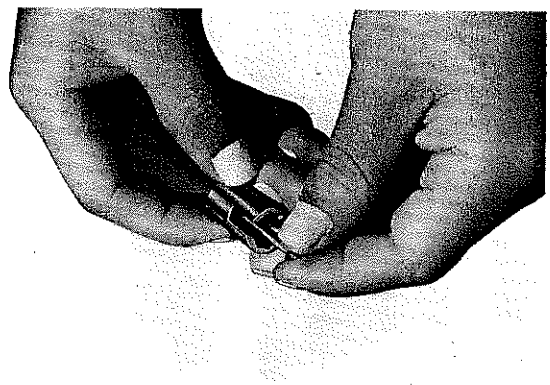
1. Remove the mixing chamber top, and remove the throttle shaft bolt.



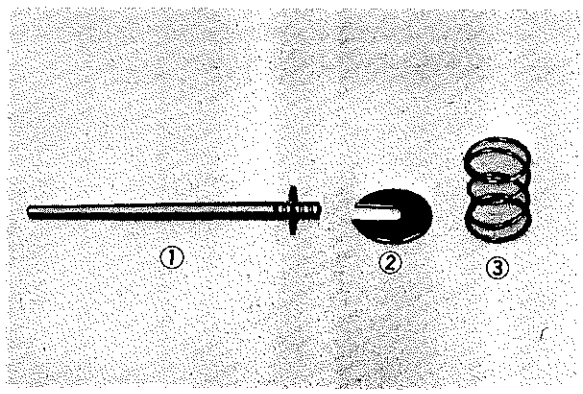
2. Pull out the throttle shaft.



3. Pull out the throttle valve arm pin, and the throttle valve can be removed together with the bushing.



4. Note that the jet needle is held down by the spring and plate.




1. Jet needle
2. Plate
3. Spring

**Reassembly and installation**

1. Install the float bowl and main jet banjo bolt.
2. Moving to machine, push needle out of seat in throttle valve (slide). Inspect for signs of bending scratches or wear. Replace as required.
3. Check needle clip position.
   Clip position is counted starting with the first clip groove at the top of the needle.

| | |
|---|---|
| Jet needle type: | 3G9/3 |
| Clip position: | 3 |

4. Check throttle valve (slide) for signs of wear. Insert into carburetor body and check for free movement. If slide, or body, is out of round causing slide to stick, replace.
5. Install throttle valve, throttle valve opening and closing mechanism, and needle assembly in carburetor mixing chamber. Tighten mixing chamber top as tight as possible by hand.
6. Install the mixing chamber top cover and all overflow and vent tubes. Reinstall carburetor.
   Check position and routing of all tubes. Check tightness of all fittings. Make sure carburetor is mounted in a level position.
7. After installation, re-adjust throttle cable and Autolube pump cable per directions in Chapter 2.

## REED VALVE ASSEMBLY

### Description

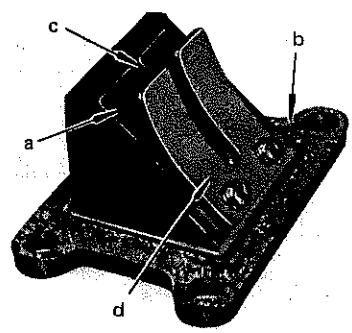
1. Yamaha has designed a unique stainless steel reed valve located between the carburetor and cylinder. The valve works independently on a demand basis. There's no mechanical device, such as a rotary valve or piston skirt to govern its opening and closing.
2. Construction of reed valve assembly.

a. Valve
   The valve is made of special flexible stainless steel and designed to open and close the inlet port.

b. Case
   The case is made of a die-cast aluminum alloy.

c. Gasket
   Made of heat and oil-resisting rubber, the gasket is "welded" to the case by heat.

d. Valve stopper
   The valve stopper is made of highly-durable cold-rolled stainless steel plate, and controls the movement of the valve.



3. Handling the reed valve

a. As explained earlier, the reed valve is operated by changes in crankcase pressure and by the inertia effect of the fuel-air stream. It is a high-precision piece, and therefore, it must be handled with special care.

4. Storage

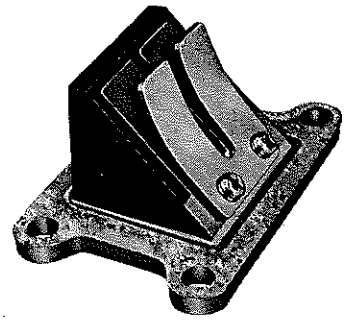
a. The reed valve must be stored in a clean and dry place and must not be exposed to the sun. Particularly, it must be kept free from salt. Avoid touching the valve.

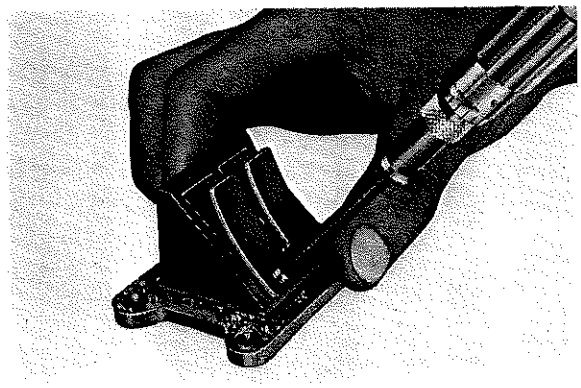
**Removal and assembly**

With carburetor removed, proceed as follows:

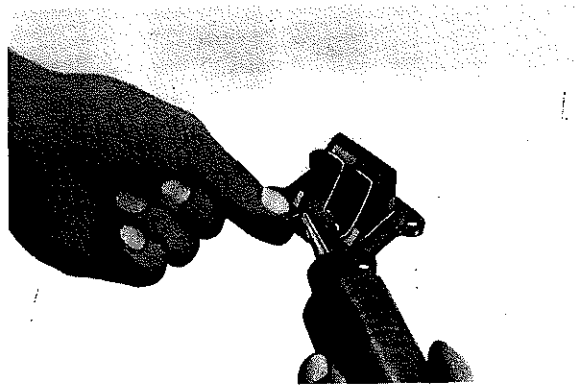
1. Remove the bolts (4) holding the intake manifold and reed valve assembly to cylinder.
   Remove assembly.
2. Inspect reed petals for signs of fatigue cracks. Reed petals should fit flush or nearly flush against neoprene seats. If in doubt as to sealing ability, apply suction to carburetor side of assembly. Leakage should be slight to moderate.
3. If disassembly of the reed valve assembly is required, proceed as follows:

a. Remove Phillips screws (2) securing stopper plate and reed to reed block. Handle reed carefully. Avoid scratches and do not bend.
   Note from which side of the reed block the reed and stopper plate were removed. Re-install on same side.



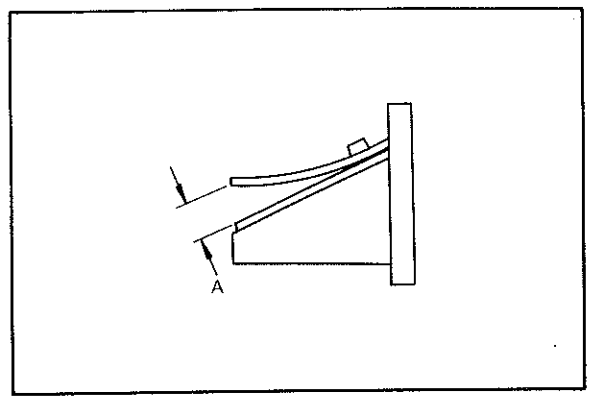


b. During reassembly, clean reed block, reed, and stopper plate thoroughly. Apply a holding agent, such as "Lock-Tite", to threads of Phillips screws. Tighten each screw gradually to avoid warping.



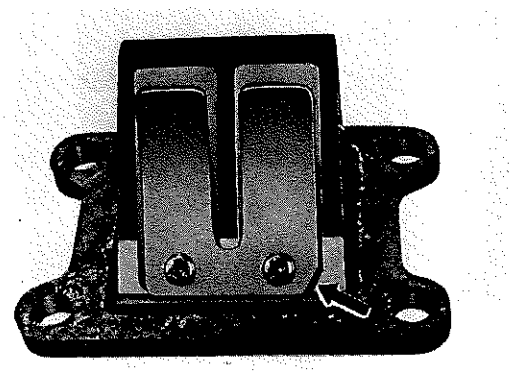
c. Valve stopper
The valve stopper controls the movement of the valve.
Check clearance "A".

| Standard value: |
| --- |
| 6.8 ~ 7.2 mm |




A = 6.8 ~ 7.2 mm

**NOTE:**
During reassembly, note the cut in the lower corner of the reed and stopper plate. Use as aid to direction of reed installation.



4. During reassembly of the reed valve assembly and manifold, install new gaskets and torque the securing bolts gradually and in pattern. Tighten thoroughly.

**Insulator**

Check the insulator mating surfaces for warpage. If any warpage is evident, place sandpaper (#60) on a surface plate, and rub the mating surface against it in a "circle eight movement" with continuous rotation.

# CHAPTER 5. CHASSIS



5

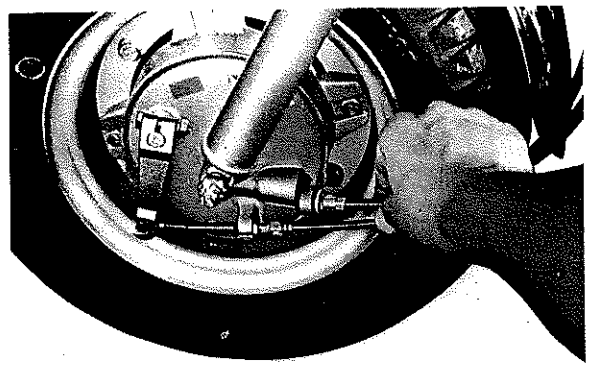
5

# CHAPTER 5. CHASSIS

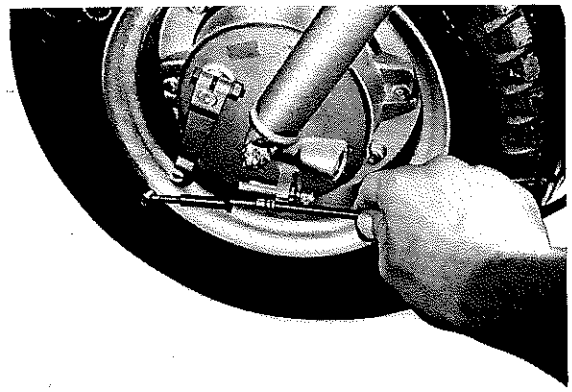
## FRONT WHEEL

### Removal

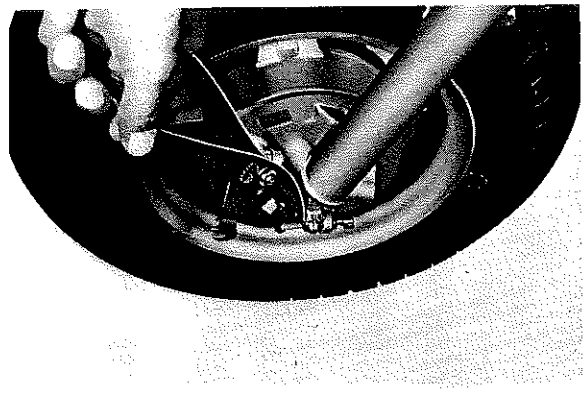
1. Disconnect the brake cable at the front wheel backing plate.



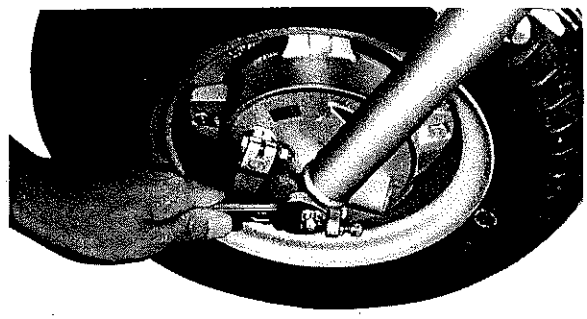
2. Disconnect the speedometer cable from the front wheel backing plate.



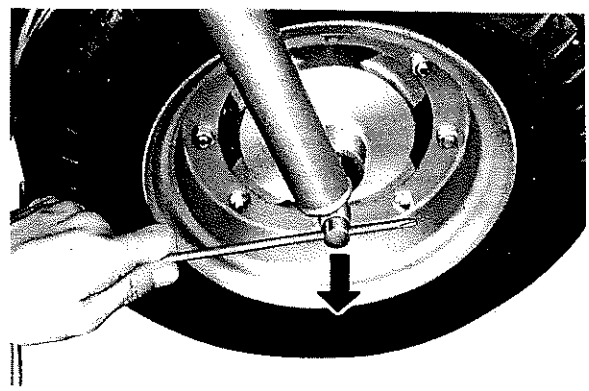
3. Remove cotter pin from front axle.



4. Remove the front axle nut.



5. Remove the front wheel axle by simultaneously twisting and pulling out on the axle. Then remove the wheel assembly.
   (Raise the front of the machine by placing a suitable stand under the engine.)



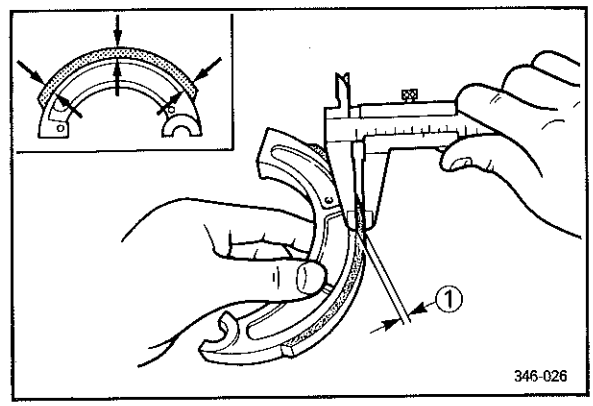
**Front axle**

Remove any corrosion from axle with emery cloth. Then place it on a surface plate and check for bending. If bent, replace.

**Checking the brake lining thickness**

1. Measure the brake lining thickness.

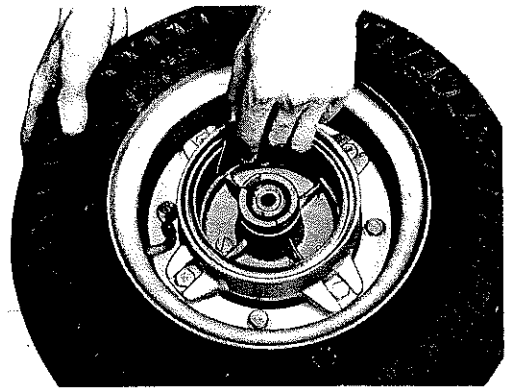
| |
|---|
| Front brake lining thickness:<br>4 mm<br>Replacement limit:<br>2 mm |




2. Remove any glazed areas from brake shoes using coarse sand paper.

### Brake drum

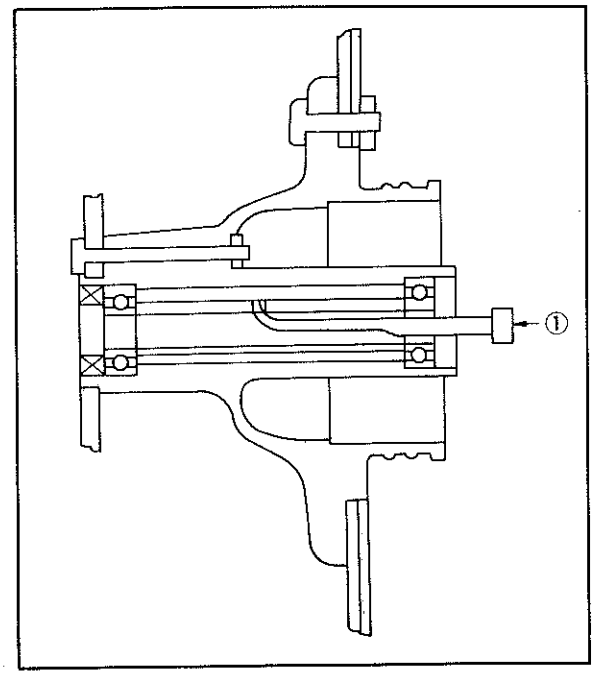
Oil or scratches on the inner surface or the brake drum will impair braking performance or result in abnormal noises. Remove oil by wiping with a rag soaked in lacquer thinner or solvent. Remove scratches by lightly and evenly polishing with emery cloth.



### Replacing wheel bearings

If the bearings allow play in the wheel hub or if wheel does not turn smoothly, replace the bearings as follows:

1. First clean the outside of the wheel hub.
2. Drive the bearing out by pushing the spacer aside (the spacer "floats" between the bearings) and tapping around the perimeter of the bearing inner race with a soft metal drift pin and hammer. Either or both bearings can be removed in this manner.
3. To install the wheel bearing, reverse the above sequence. Be sure to grease the bearing before installation. Use a socket that matches the outside race of the bearing as a tool to drive in the bearing.




1. Tap here

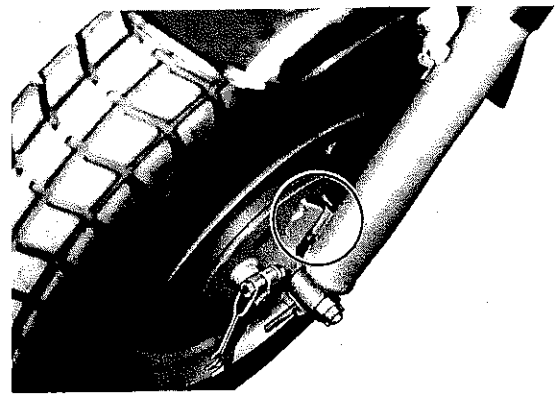
### Installing front wheel

1. After replacing wheel and axle, tighten axle nut FIRST and install a new cotter pin.

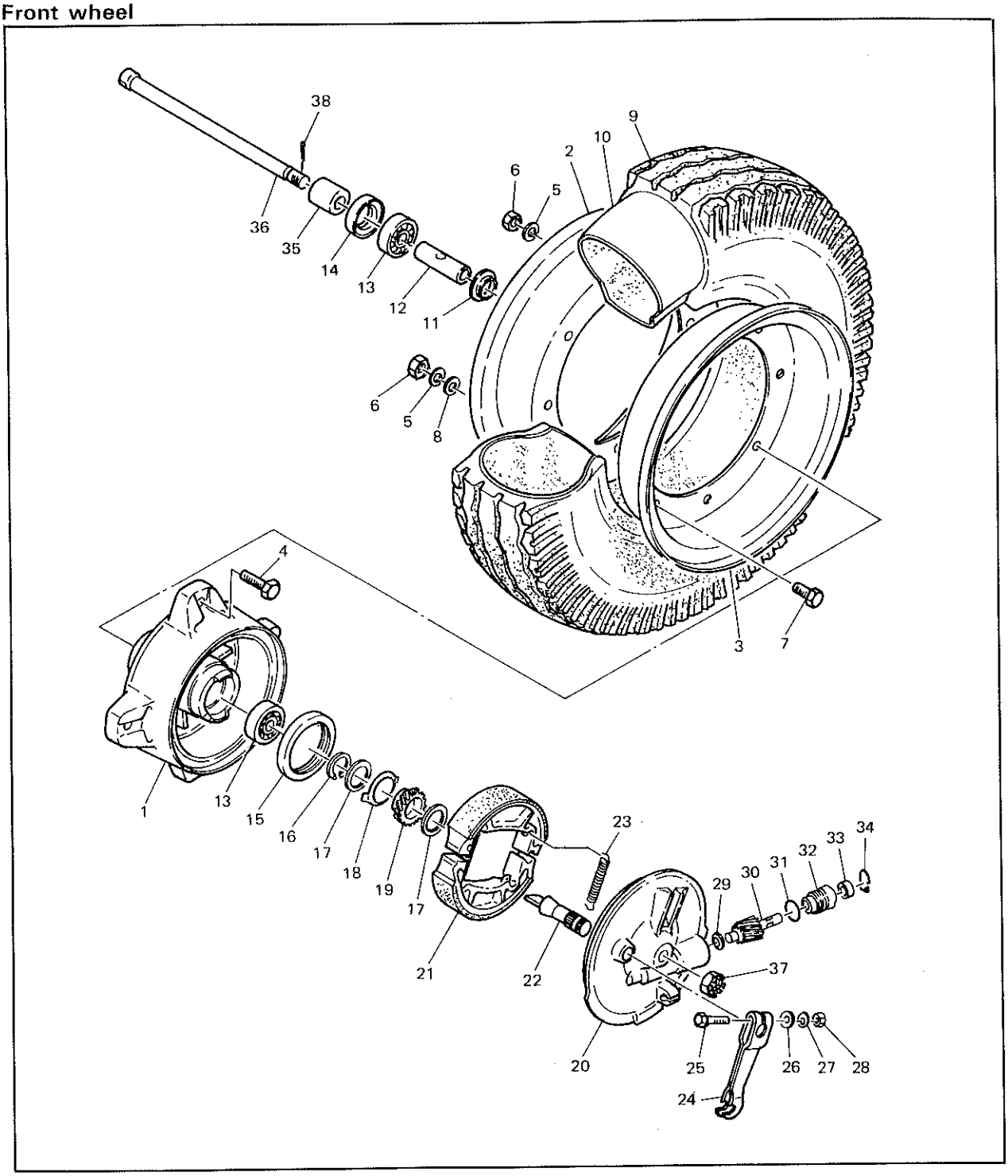
   **NOTE:**
   Align the groove of the spacer and the surface of the holder.
   Position the brake shoe plate stopper groove over the matching metal projection on the front fork leg outer tube.

   Axle nut torque:
   39 Nm (3.9 m • kg)

2. Connect front brake cable and speedometer cable.



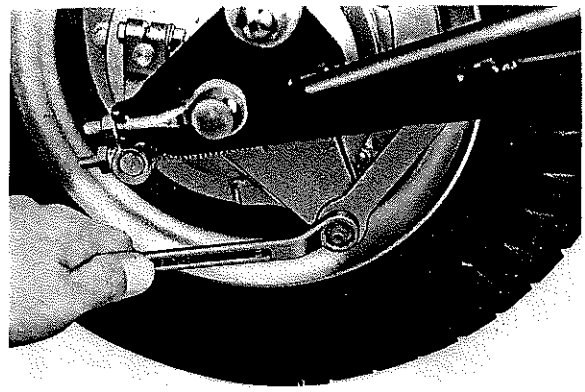
## Front wheel




1. Hub
2. Wheel panel 1
3. Wheel panel 2
4. Bolt
5. Spring washer
6. Nut
7. Bolt
8. Plain washer
9. Tire (400 – 8 – 4PR)
10. Tube
11. Spacer flange
12. Bearing spacer
13. Bearing
14. Oil seal
15. Oil seal
16. Circlip
17. Thrust washer
18. Meter clutch
19. Driven gear (26T)
20. Brake shoe
21. Brake shoe complete
22. Camshaft
23. Return spring
24. Camshaft lever
25. Bolt
26. Plain washer
27. Spring washer
28. Nut
29. Thrust washer
30. Meter gear
31. O-ring
32. Bushing
33. Oil seal
34. Stop ring
35. Wheel shaft collar
36. Wheel shaft
37. Wheel shaft nut
38. Cotter pin

## REAR WHEEL

### Removal



1. Remove the tension bar and brake rod from rear shoe plate.
2. Disconnect the drive chain.
3. Remove cotter pin from rear axle.
4. Remove the rear axle nut.
5. Pull out the rear axle by simultaneously twisting and pulling out.
   (For this step, elevate the wheel by placing a suitable stand under the engine.)
6. Remove the rear wheel assembly.

### Checking the brake lining thickness

See front wheel section.

| |
|---|
| Rear brake lining thickness:<br>4 mm<br>Replacement limit:<br>2 mm |

### Brake drum

See front wheel section.

### Replacing wheel bearings

See front wheel section.

### Installing rear wheel

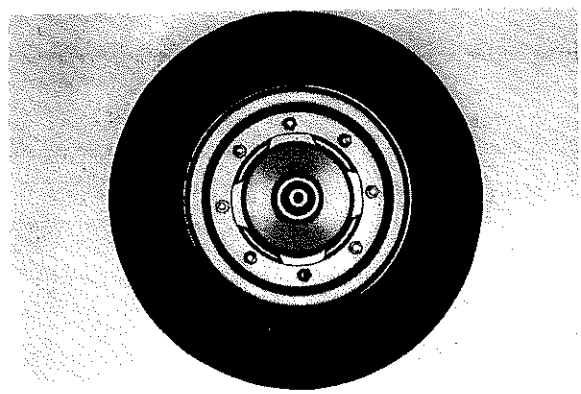
1. Install wheel and axle, and tighten axle nut. Install a new cotter pin.

| |
|---|
| Axle nut torque:<br>60 Nm (6.0 m • kg) |

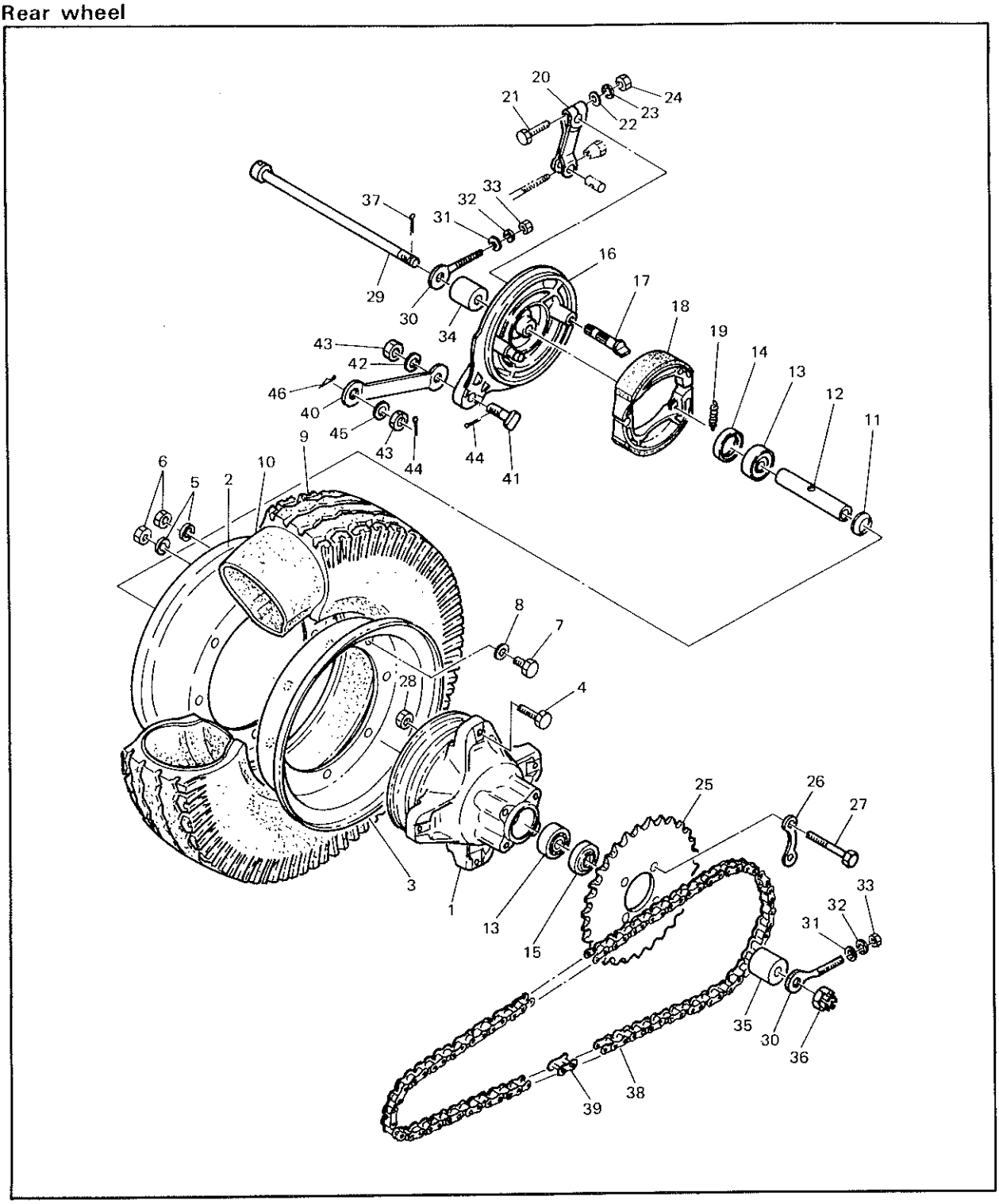
2. Connect drive chain, brake rod and tension bar.
3. Adjust drive chain. (See chapter 2)
4. Adjust rear brake. (See chapter 2)

## FRONT AND REAR WHEELS

To reduce the wheel weight and to facilitate the maintenance work, the disc type is in use. The wheel panels are put together with eight bolts to form the wheel rim.



## Rear wheel




1. Rear hub
2. Wheel panel 1
3. Wheel panel 2
4. Bolt
5. Spring washer
6. Nut
7. Bolt
8. Plain washer
9. Tire (400—8—4PR)
10. Tube
11. Spacer flange
12. Bearing spacer
13. Bearing
14. Oil seal
15. Oil seal
16. Brake shoe plate
17. Camshaft
18. Brake shoe complete
19. Return spring
20. Camshaft lever
21. Bolt
22. Plain washer
23. Spring washer
24. Nut
25. Sprocket wheel gear (21T)
26. Lock washer
27. Fitting bolt
28. Nut
29. Wheel shaft
30. Chain puller
31. Plain washer
32. Spring washer
33. Nut
34. Wheel shaft collar
35. Shaft collar
36. Shaft nut
37. Cotter pin
38. Chain
39. Chain joint
40. Tension bar
41. Tension bar bolt
42. Spring washer
43. Nut
44. Cotter pin
45. Plain washer
46. Tension bar clip

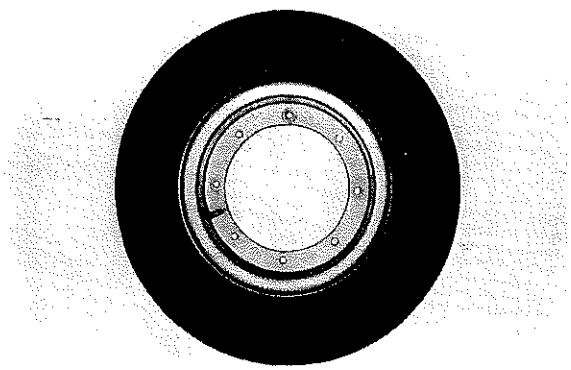
## TIRES AND TUBES

### Removal

1. Remove valve cap, valve core, and valve stem locknut.
2. When all air is out of tube, separate tire bead from rim, (both sides) by stepping on the tire wall with your foot.
3. Remove the eight bolts from the wheel panels, and they can be separated. Now the tire and tube can be removed easily.

**CAUTION:**

**Before removing the bolts, be sure to deflate the tire. Otherwise, the panels will split with a snap.**



### Installation

When putting the tube in the tire, inflate it slightly and place it in the tire, then put the panels together.

**NOTE:**

Because the wheel turns in one direction only, the tube must be installed so the valve stem forms a specific angle with the tire rim.

Finally, torque the eight bolts to specification and inflate tire to specified pressure.

| Tightening torque: 15 Nm (1.5 m • kg) |
|---|

Front tire pressure (cold tire):

| Model | LB50 II AC | LB80 II AC |
|---|---|---|
| Basic weight: With oil and full fuel tank | 80 kg | 76 kg |
| Maximum load*: | 140 kg | 144 kg |
| Up to 150 kg load* | 100 kPa (1.00 kg/cm$^2$, 1.00 bar) | |
| 150 kg ~ maximum load* | 100 kPa (1.00 kg/cm$^2$, 1.00 bar) | |

Rear tire pressure (cold tire):

| Model | LB50 II AC | LB80 II AC |
|---|---|---|
| Basic weight: With oil and full fuel tank | 80 kg | 76 kg |
| Maximum load*: | 140 kg | 144 kg |
| Up to 150 kg load* | 125 kPa (1.25 kg/cm$^2$, 1.25 bar) | |
| 150 kg ~ maximum load* | 200 kPa (2.0 kg/cm$^2$, 2.0 bar) | 150 kPa (1.5 kg/cm$^2$, 1.5 bar) |

* Load is the total weight of the cargo, rider, passenger and accessories.

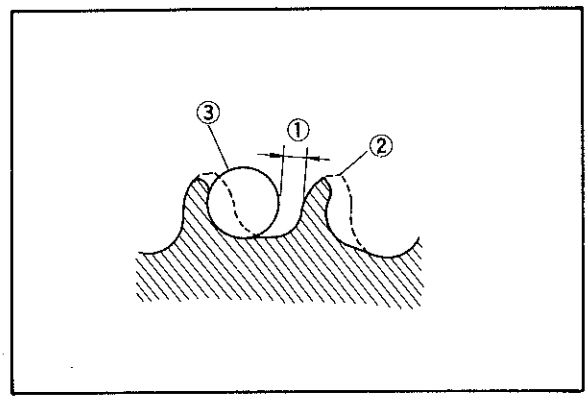
## DRIVE CHAIN AND SPROCKETS

**NOTE:**
Please refer to Maintenance Intervals and Lubrication Intervals charts for additional information.

### Drive sprocket

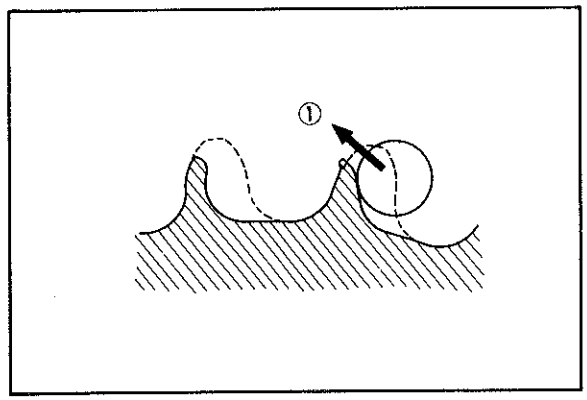
With the left crankcase cover removed, proceed as follows:

1. Using a blunt chisel, flatten the drive sprocket lock washer tab.
2. With the drive chain in place, transmission in gear, firmly apply the rear brake. Remove the sprocket securing nut. Remove the sprocket.
3. Check sprocket wear. Replace if wear decreases tooth width as shown.




1. Wear limit 3 mm (0.118 in)
2. Correct
3. Roller

4. Replace if tooth wear shows a pattern such as that in the illustration, or as precaution and common sense dictate.




1. Slip off

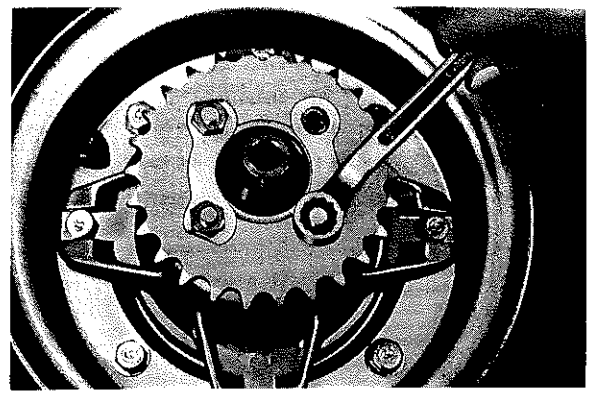
5. During reassembly, make sure the lock washer splines are properly seated on the drive shaft splines. Tighten securing nut to specified torque value. Bend lock washer tab fully against securing nut flats.

| Drive sprocket securing nut torque: 55 Nm (5.5 m • kg) |
|---|

### Driven sprocket

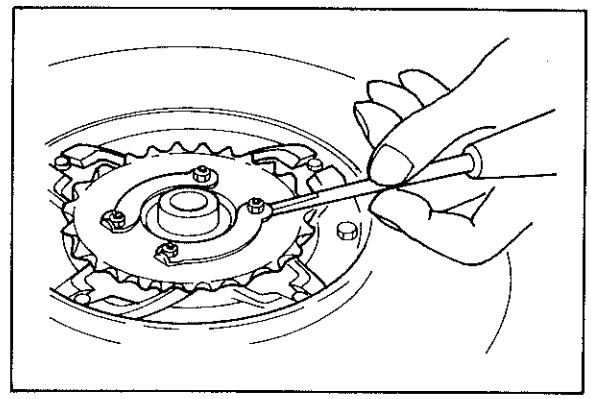
With the rear wheel removed, proceed as follows:

1. Using a blunt chisel, flatten the securing bolt lock washer tabs.
   Remove the securing bolts. Remove the lock washers and sprocket.
2. Check sprocket wear per procedures for the drive sprocket.
3. Check the sprocket to see that it runs true. If bent, replace.



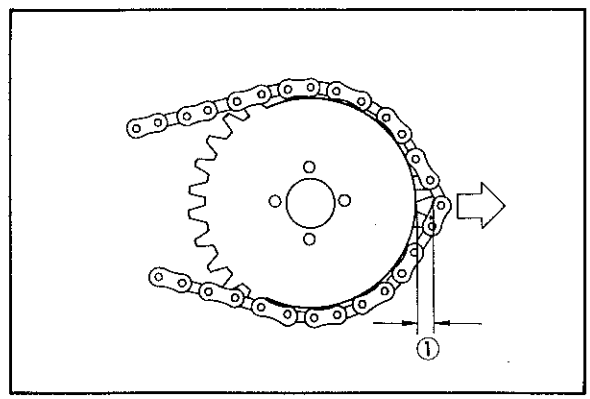
4. During reassembly, make sure that sprocket and sprocket seat are clean. Tighten the securing bolts in a crisscross pattern.
   Bend the tabs of the lock washers fully against the securing bolt flats.

| Driven sprocket securing bolt torque: 20 Nm (2.0 m • kg) |
|---|



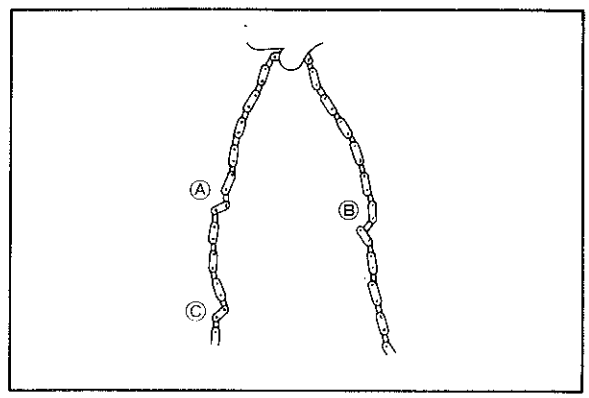
### Chain inspection

1. With the chain installed on the machine, excessive wear may be roughly determined by attempting to pull the chain away from the rear sprocket. If the chain will lift away more than one-half the length of the sprocket teeth, remove and inspect.
   If any portion of the chain shows signs of damage, or if either sprocket shows signs of excessive wear; remove and inspect.
2. Check the chain for stiffness. Hold as illustrated. If stiff, soak in solvent solution, clean with wire brush, dry with high pressure air. Oil chain thoroughly and attempt to work out kinks. If still stiff, replace.
3. Check the side plate for damage. Check to see if excessive play exists in pins and rollers. Check for damaged rollers. Replace as required.




Checking for excessively worn chain

1. 1/2 tooth



### Chain maintenance

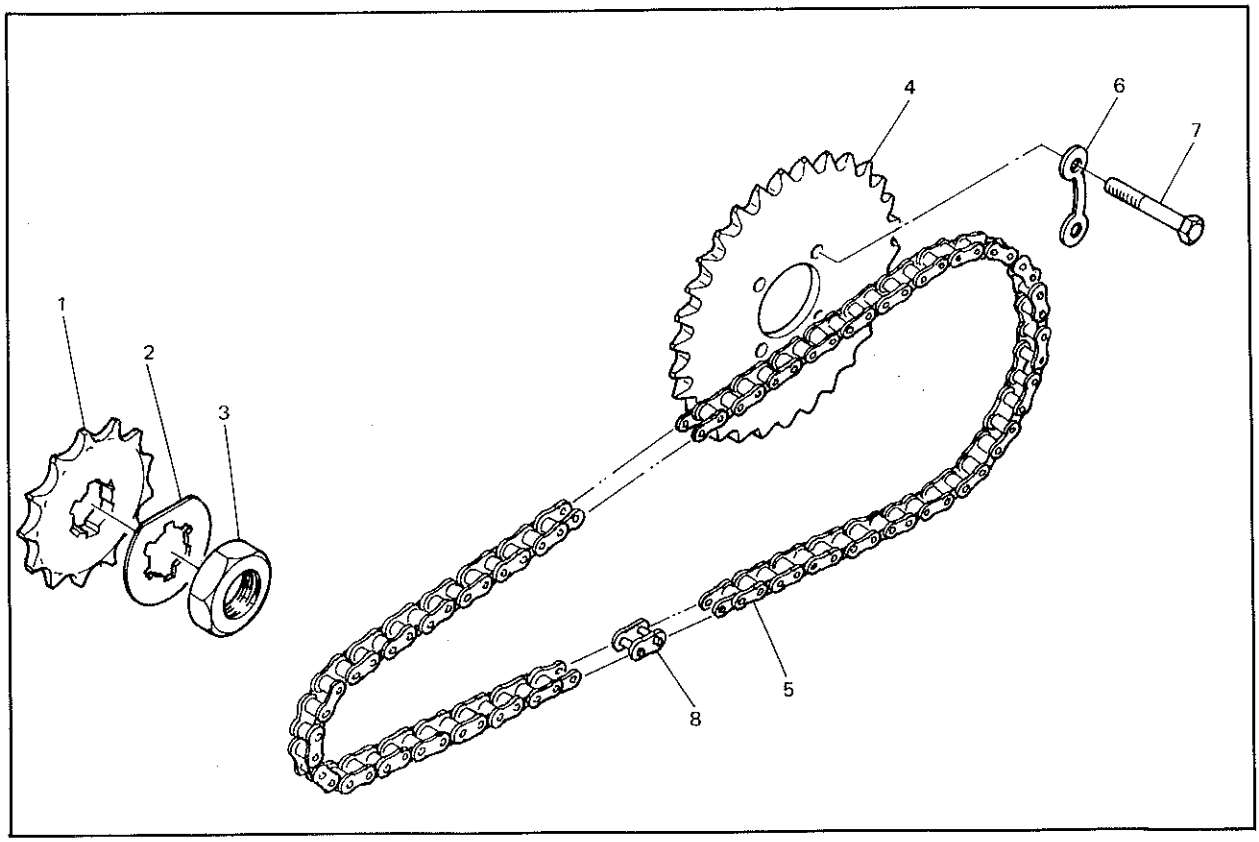
The chain should be lubricated per the recommendations given in the Maintenance and Lubrication Intervals charts. More often if possible. Preferable after every use. See "Chassis and suspension, Swing arm", for additional information regarding chain guide.

1. Wipe off dirt with shop rag. If accumulation is severe, use wire brush, then rag.
2. Apply lubricant between roller and side plates on both inside and outside of chain. Don't skip a portion as this will cause uneven wear. Apply thoroughly. Wipe off excess.

**NOTE:**
Chain and lubricant should be at room temperature to assure penetration of lubricant into rollers.

Choice of lubricant is determined by use and terrain. SAE 20W or 30W oil may be used, but several specialty types by accessory manufacturers such as Yamaha chain and cable lube offer more penetration corrosion resistance for roller protection. In certain areas, semi-drying lubricants are preferable. These will resist picking up sand particles, dust, etc.

3. Periodically, remove the chain. Wipe and/or brush excess dirt off. Blow off with high pressure air.
4. Soak chain in solvent, brushing off remaining dirt. Dry with high pressure air. Lubricate thoroughly while off machine. Work each roller thoroughly to make sure lubricant penetrates. Wipe off excess. Reinstall.

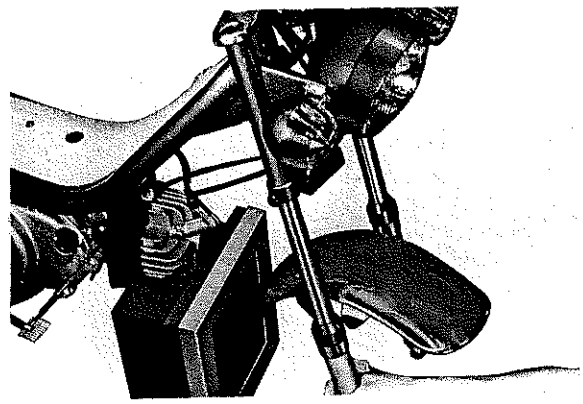



1. Drive sprocket
2. Lock washer
3. Locknut
4. Driven (rear) sprocket
5. Chain
6. Lock washer
7. Fitting bolt
8. Chain joint

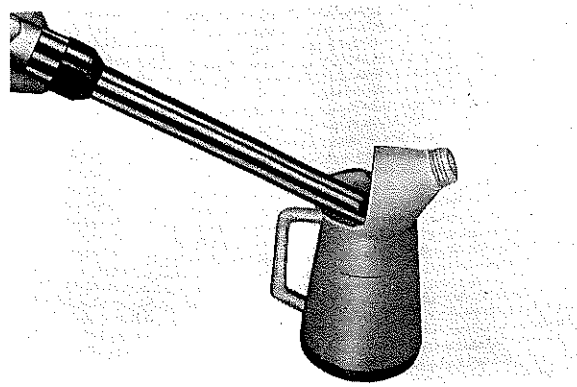
## FRONT FORKS

### Disassembly

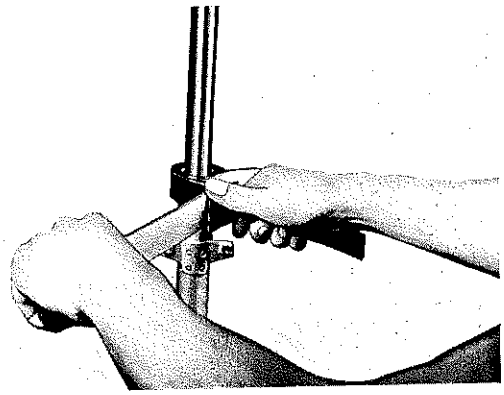
1. With the front wheel, speedometer cable and front brake cable removed, the fork legs can be removed from the upper and lower brackets by loosening upper and lower pinch bolts.



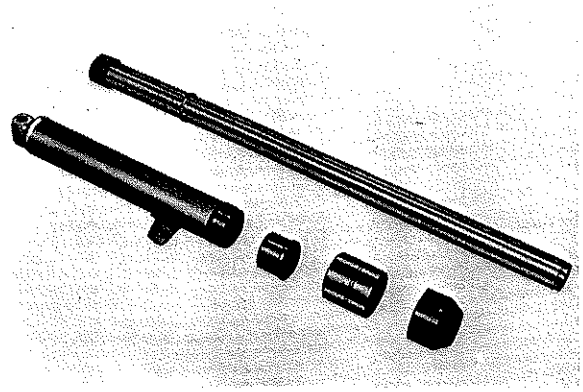
2. Remove the caps and drain the oil from both fork tubes.



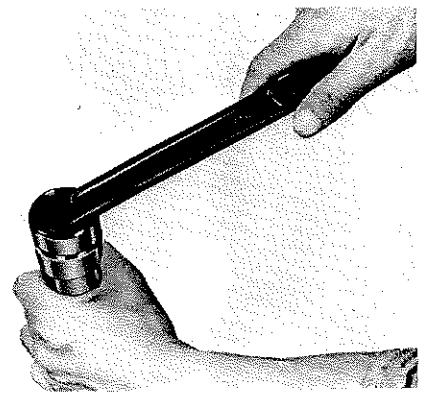
3. Remove the outer tube nut from outer tubes.



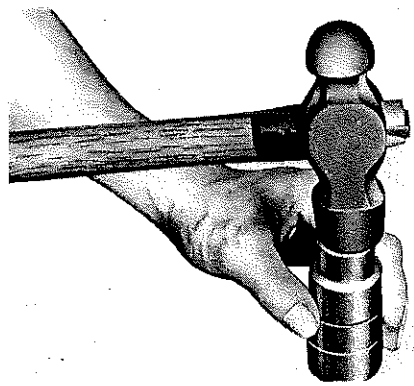
4. Remove slide metal and inner tube from outer tube.



5. Carefully pry out old seal without damageing fork tube.



6. Insert new seal with "open" side down using large socket and soft hammer.



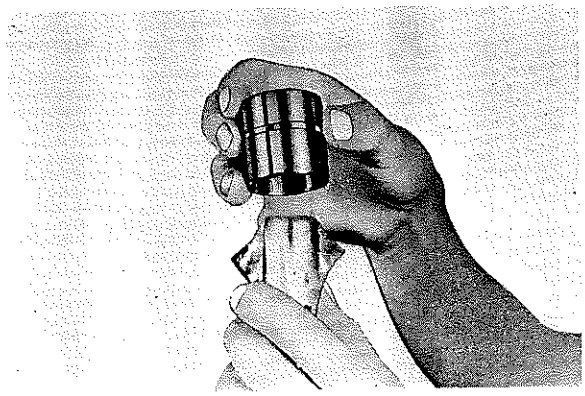
### Inspection

Inspect the inner tube for bends or scratches. If the bend is slight, it can be corrected with a press. It is recommended, however, to replace the tube.
Check the slide metal and piston for wear. If excessively worn, replace them.

### Assembly

1. When assembling the front fork, reverse the order of disassembly.

   **NOTE:**
   When installing the outer nut into the inner tube, cover the inner tube top end with a vinyl sheet to protect the oil seal lip against damage.



2. Installing the front forks.

a. Bring up the front fork to the correct position and partially tighten the underbracket mounting bolt.

b. Pour specified amount of oil into the inner tube through the upper end opening. Use 10W/30 "SE" motor oil.

   **NOTE:**
   Specialty type fork oils of quality manufacture such as Yamaha Fork Oil should be used if available.

| Fork oil capacity: |
| --- |
| L.H.: 96 $cm^3$ |
| R.H.: 120 $cm^3$ |

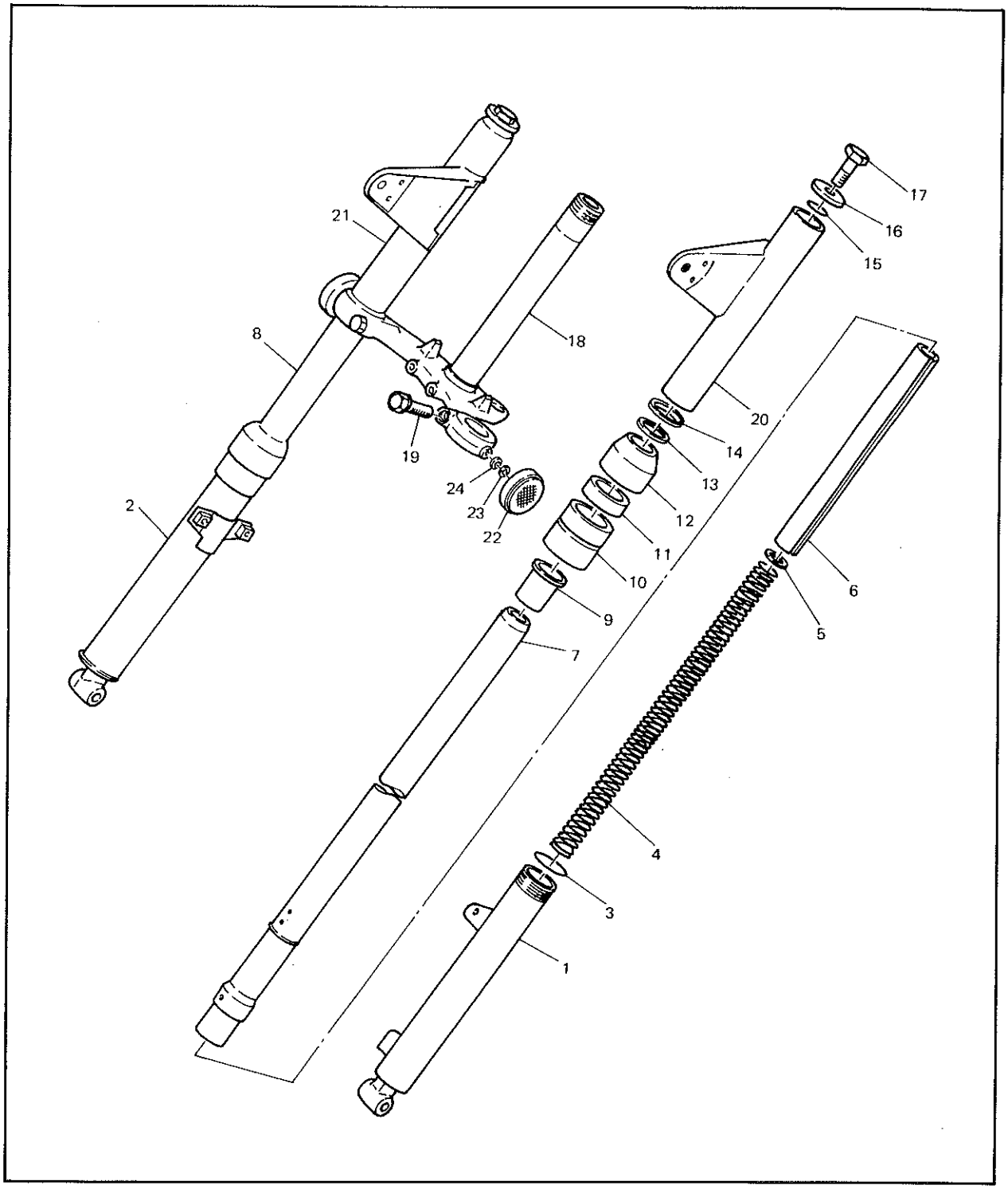
c. Install the inner tube caps.

| Inner tube cap torque: |
| --- |
| 20 Nm (2.0 m • kg) |

d. Tighten underbracket pinch bolts.

| Pinch bolt torque: |
| --- |
| 30 Nm (3.0 m • kg) |

## Front fork




1. Outer tube (left)
2. Outer tube (right)
3. O-ring
4. Spring
5. Washer
6. Spacer
7. Inner tube complete (left)
8. Inner tube complete (right)
9. Slide metal
10. Outer nut complete
11. Oil seal
12. Dust seal
13. Packing
14. Guide bar
15. O-ring
16. Cap washer
17. Bolt
18. Underbracket complete
19. Bolt
20. Upper cover (left)
21. Upper cover (right)
22. Reflector
23. Spring washer
24. Plain washer

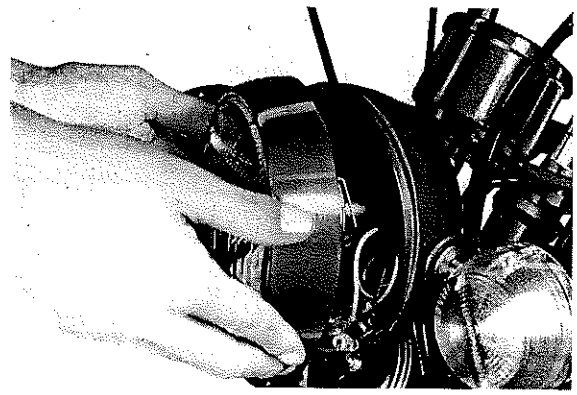
## STEERING HEAD

### Adjustment

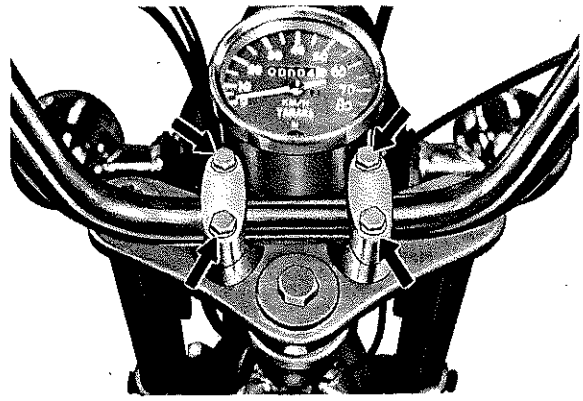
Refer to Chapter 2 for steering head adjustment procedure.

### Disassembly

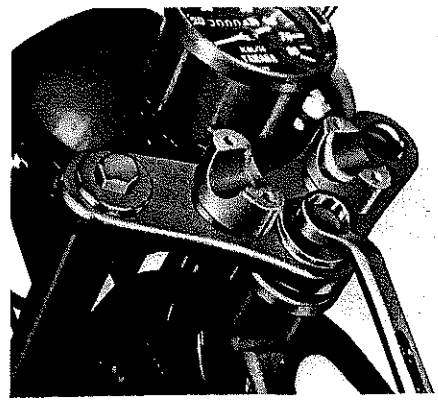
1. After removing front forks, remove headlight from headlight body.
2. Disconnect electrical wires between headlight body and main wiring harness from frame.
3. Disconnect any electrical wires between handlebar switches and main wiring harness in headlight body.
4. Disconnect throttle cables, front and rear brake at handlebars.
5. Disconnect speedometer cables at instruments.



6. Remove handlebars and put aside.



7. Remove stem fitting bolt and crown washer.

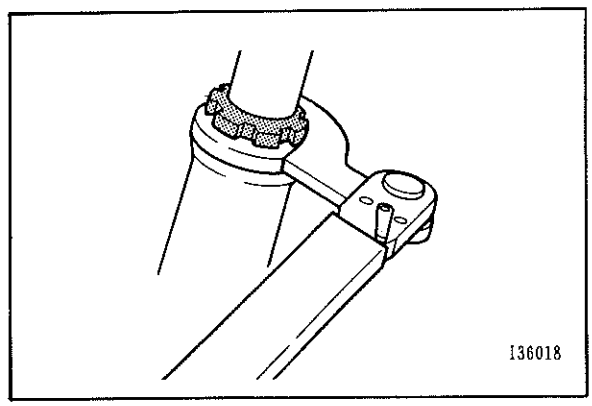


8. Remove handle crown (upper bracket) and instruments, as an assembly.

**NOTE:**
Hold headlight body to keep it from falling.

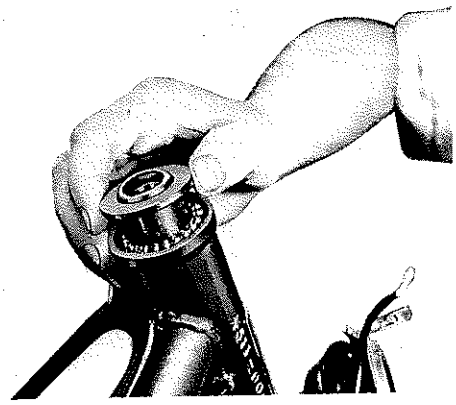
9. Remove steering ring nut with steering nut wrench.

**NOTE:**
Support under-bracket with one hand to hold the bracket up into the headstock so that the loose bearings will not fall out.



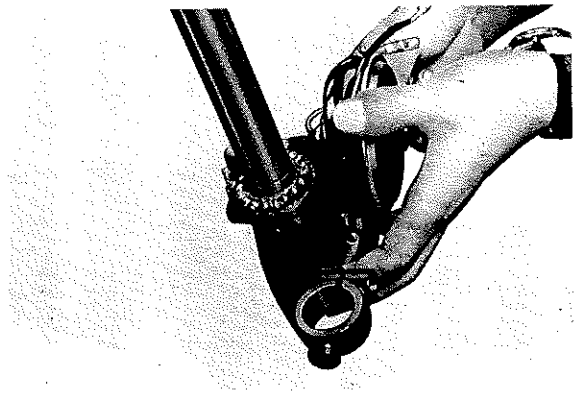

10. While still supporting the under bracket, carefully lift off the upper bearing cover.
11. Lift off the top bearing race and remove all of the ball bearings from the upper bearing assembly.

| Ball quantity/size: 22 pcs, 3/16 in |
|---|



12. Remove bracket while being very careful not to lose any bearings from the lower assembly.

| Ball quantity/size: 19 pcs, 1/4 in |
|---|

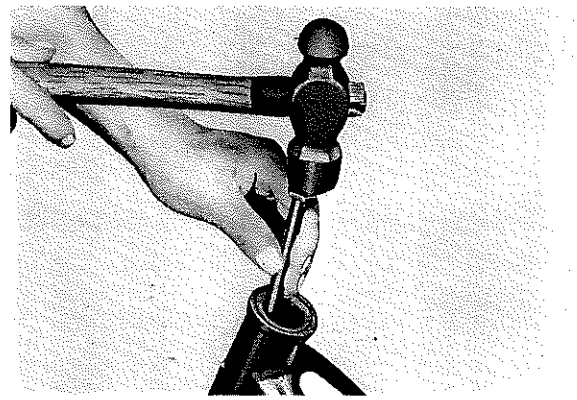


### Inspection

1. Examine all the balls for pits or partial flatness. If any one is found defective, the entire set (including both races) should be replaced. If either race is pitted, shows rust spots, or is damaged in any way, replace both races and all balls.
2. Examine dust seal under lowest race and replace if damaged.
3. Install the fork and handle crown to the under-bracket. If the handle crown is not aligned with the fork, the under-bracket is considered to be bent. If bent more than 10 mm, replace the bracket.

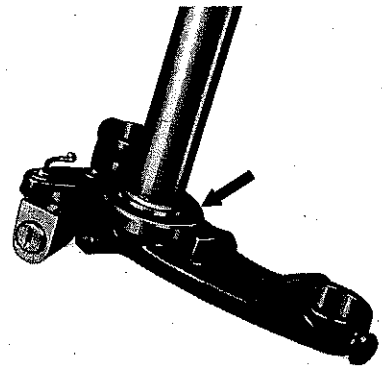
### Removal

1. Remove races from head pipe using drift punch and hammer as shown. Work the race out gradually by tapping lightly around its complete diameter.



2. Remove the bearing race from the lower bracket by tapping around its diameter with a drift punch and hammer.

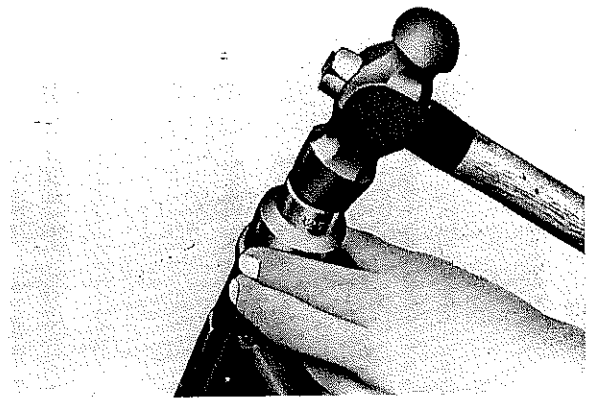
**NOTE:**
Remove dust seal.



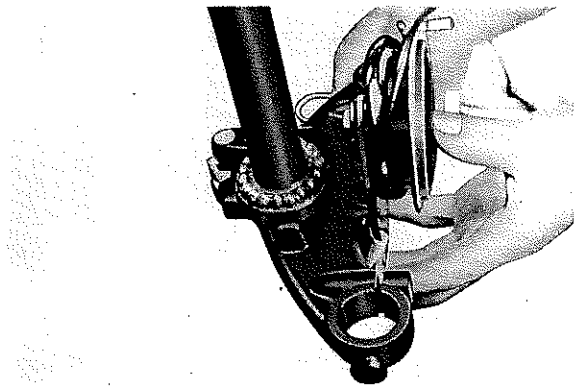
### Installation

1. If pressed-in races have been removed, tap in new races.

   **CAUTION:**
   **If races are not in correct angles to the under-bracket, the handlebars will not turn smoothly at certain angles, thus adversely affecting the stability of the machine.**
   **Any impurities on the race seat will put the race in a tilting position. Thoroughly clean the race seat before installation.**

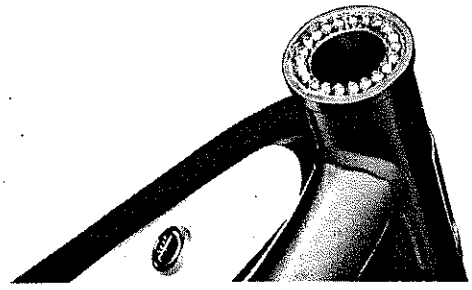


2. Grease the lower ball race of the bottom assembly and arrange the balls around it. Then apply more grease.



3. Grease the lower ball race of the upper assembly and arrange the balls around it. Then apply more grease and set the top race into place.

   **NOTE:**
   Use medium-weight wheel bearing grease of quality manufacturer, preferably waterproof.



4. Carefully slip the underbracket stem up into the steering head. Hold the top bearing assembly in place so the stem does not knock any balls out of position.
5. Set the upper bearing cover on and install the ring nut. Tighten the ring nut so that all freeplay is taken up, but so the bracket can still pivot freely from lock to lock. Recheck for free play after the entire fork unit has been installed. (Refer to Chapter 2, Adjustment procedure.)
   Normally, screw in the ring nut until tight, and back it out 1/4 turn.

6. Install the fork tubes into the under-bracket to ease headlight body installation.
7. Install the headlight body and stays onto the fork tubes with all rubber and steel spacing washers properly in place.
8. Install the upper fork bracket. Tighten steering fitting bolt. Torque to specification.

| Steering fitting bolt torque: 21 Nm (2.1 m • kg) |
|---|

9. Tighten upper fork tube bolts and torque to specification.

| Upper fork tube bolt torque: 21 Nm (2.1 m • kg) |
|---|

| Handlebars mounting bolt torque: 21 Nm (2.1 m • kg) |
|---|

10. Install handlebars and torque to specification.

| 12 Nm (1.2 m • kg) |
|---|

11. Reconnect all electrical wiring and check operation.
12. Install headlight and check operation.
13. Install front wheel.
14. Reconnect speedometer cable.
15. Reconnect front and rear brake and throttle cables and check operation.

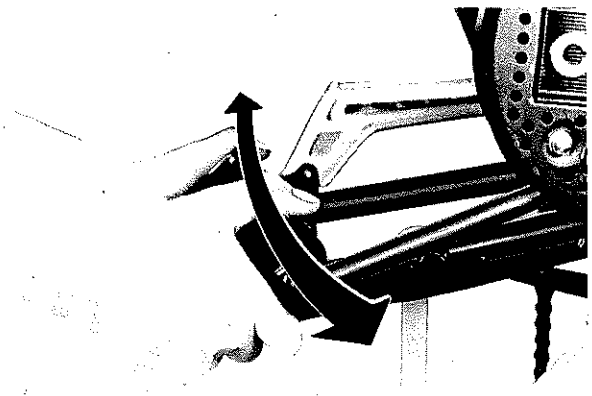
## SWING ARM

### Swing arm inspection

1. With rear wheel and shock absorbers removed, grasp the end of the arm and move from right to left to check for freeplay.

| Swing arm freeplay: |
| --- |
| 1.0 mm |

2. If freeplay is excessive, remove swing arm and replace swing arm bushing.



### Swing arm lubrication

1. Apply grease to pivot shaft.

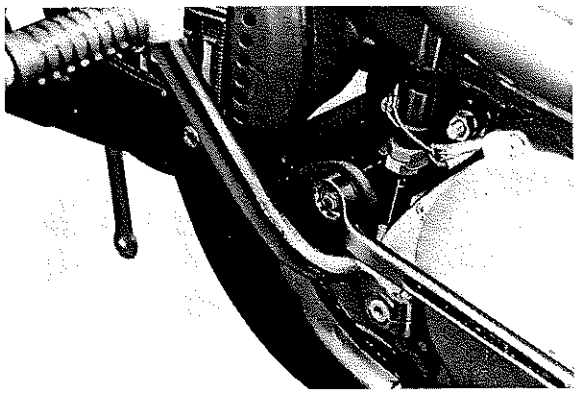
| Recommended lubricant: |
| --- |
| Smooth chassis lube grease |

2. Wipe off excess grease.

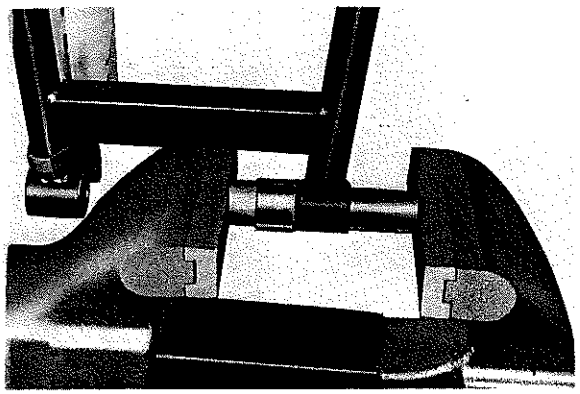
### Swing arm removal

1. Remove nut on swing arm pivot bolt and tap out bolt with a long aluminum or brass rod.

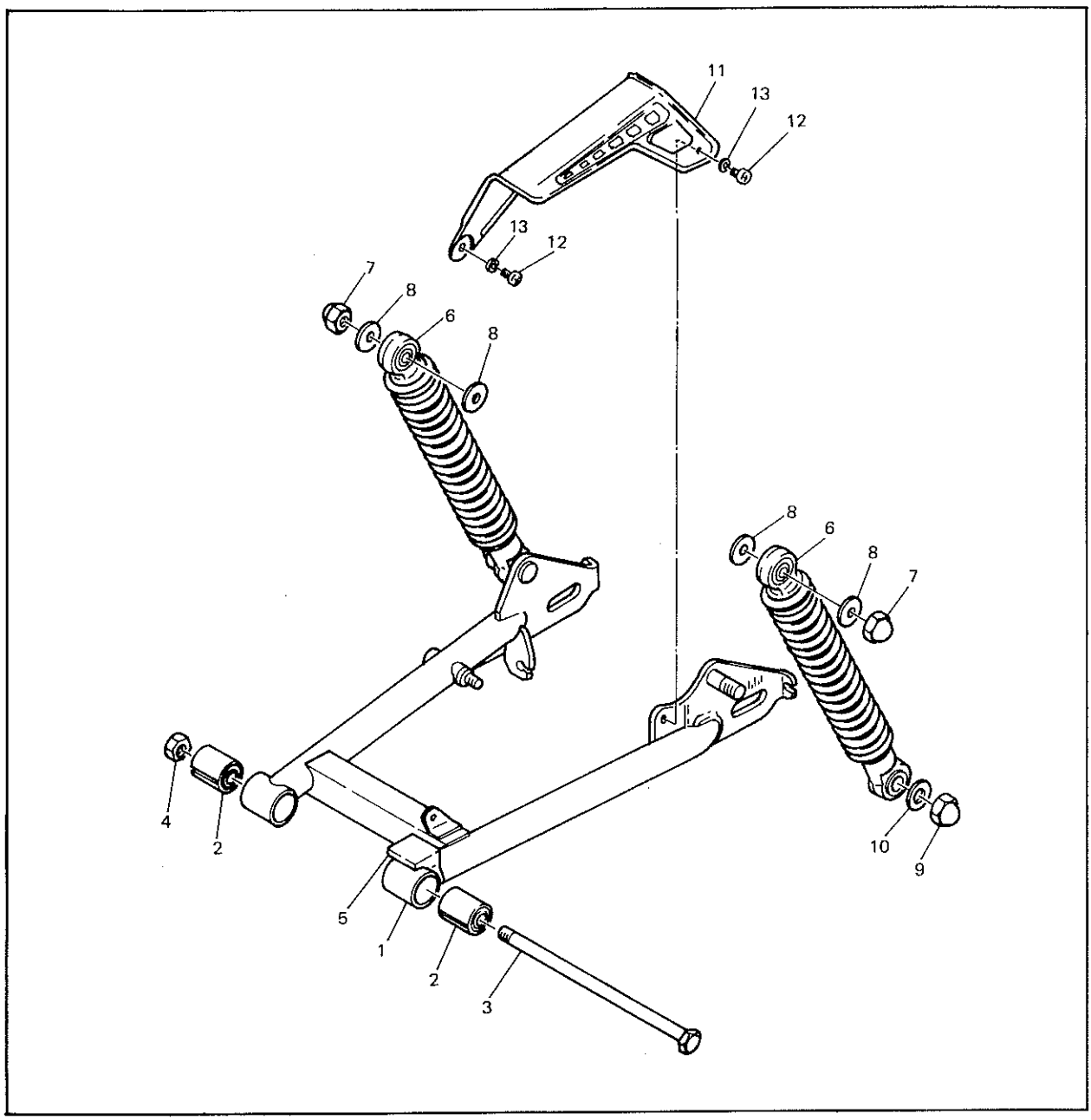
| Pivot bolt torque: |
| --- |
| 39 Nm (3.9 m • kg) |



2. Tap out old bushing from each side of pivot.
3. Install new bushing using a press or hand vise.



## Rear arm




1. Rear arm complete
2. Rear arm bushing
3. Pivot shaft
4. Nut
5. Guard seal
6. Rear shock absorber
7. Crown nut
8. Washer
9. Cap nut
10. Washer
11. Chain case half
12. Pan head screw
13. Spring washer

## AUTO-COCK

The auto-cock is designed to be opened and closed by pressure pulses from the up and down movement of the engine piston.

### Advantages of the auto-cock

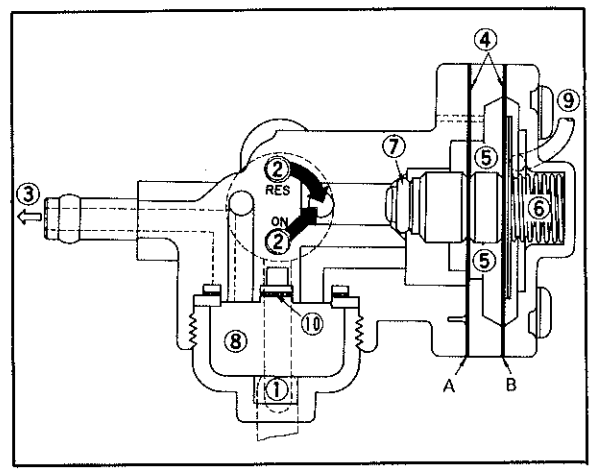
1. Ease of operation
   The valve is actuated by pressure pulses from intake manifold which saves the rider the trouble of manually opening and closing the fuel cock before and after operation.
2. Additional safety
   The auto-cock assures additional safety when the motorcycle is turned over by accident, because fuel leaks very slow.
3. No fuel leakage from carburetor while parking
   Being operated by pressure pulses from the crankcase, the valve automatically closes whenever the engine stops. This prevents the fuel from overflowing thru the carburetor.

### Construction

1. Diaphragm assembly
   The diaphragm assembly consists of diaphragm A, diaphragm B and a valve. The diaphragm B maintains constant fuel pressure on the diaphragm A, thus diaphragm A may act only with negative pressure from intake manifold. In this way, diaphragm B helps diaphragm A to act without receiving fuel pressure from the fuel tank.
2. Handling the auto-cock

a. Do not attempt to disassemble the diaphragm chamber.

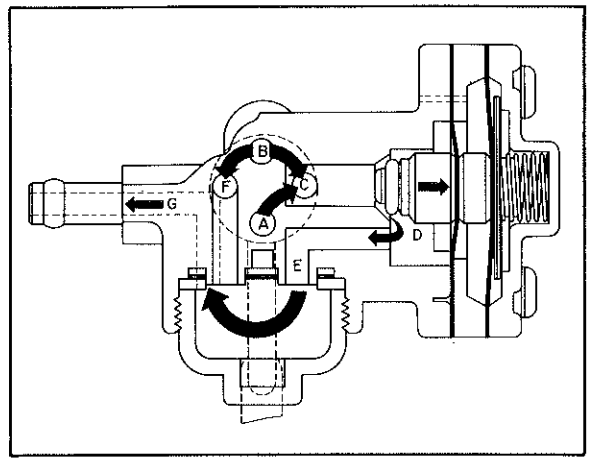
b. Periodically, remove the filter cup and clean the filter.

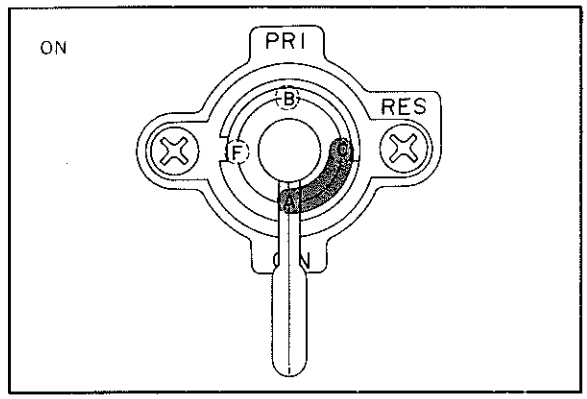



1. Lever
2. From fuel tank
3. To carburetor
4. Diaphragm
5. Air
6. Spring
7. Valve
8. Filter cup
9. Negative pressure pipe
10. Filter

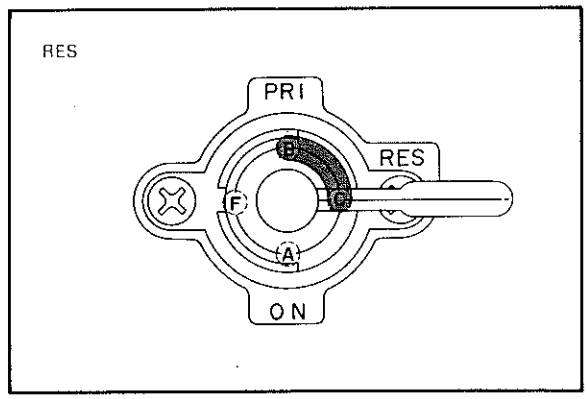
**Position of the cock lever and fuel passages**

1. Cock lever "ON"
   When a vacuum is generated in the intake manifold by the piston moving down, the diaphragm in the cock overcomes the force of the spring, thus causing the diaphragm assembly to move to the right, opening the valve. As the valve opens, the fuel in the tank flows through the A passage and C passage of the main pipe to the cock lever chamber, and passes through the D passage. The fuel from the D passage flows through the opening of the valve to the E passage and enters the filter cup. The fuel is filtered and fed to the carburetor through the G passage and the fuel pipe.

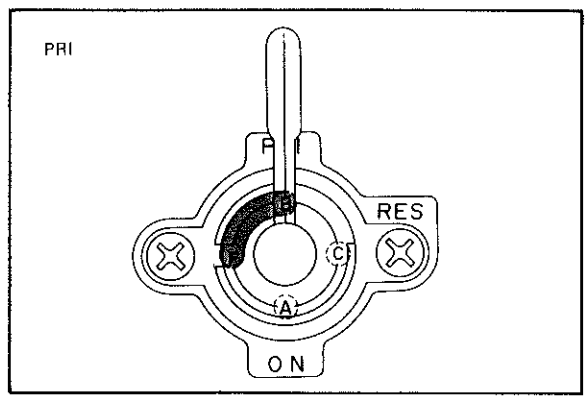



2. Cock lever "RES"
   The fuel flows into the B passage and then into the carburetor through the same passages as in the case of cock lever "ON".




3. Cock lever "PRI"
   The fuel flows into the B passage and then into the filter cup, irrespective of the valve position. The fuel from the filter cup passes through the G passage and enters the carburetor through the fuel pipe.



4. When the engine is stopped
   The pressure in the rubber pipe becomes positive, and the diaphragm assembly is moved to the left by the force of the spring. As a result, the valve is closed, thus stopping the flow of the fuel.

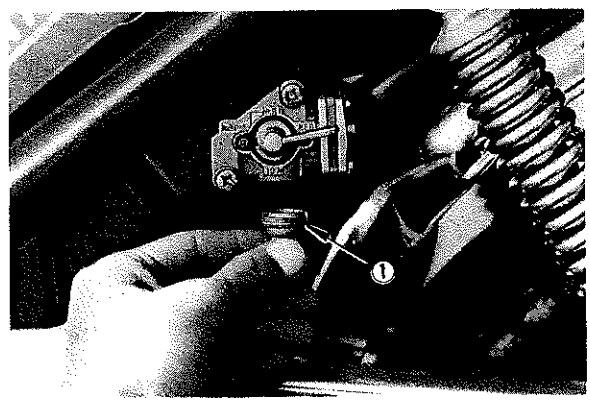
**Check lever position for travelling**

1. On position
   For general travelling and parking, the cock lever should be placed in ON.
2. RES position
   When the fuel has run out with the cock lever in ON, it should be placed in RES. With the fuel cock in RES, the tank should be filled at the first opportunity.
3. PRI position
   To fill the fuel tank of a new motorcycle or one in which the fuel tank or carburetor float chamber is empty, turn the cock lever to PRI. With the cock lever in PRI, the fuel directly enters the filter cup from the fuel tank, bypassing the rubber pipe.
   After filling the tank, turn the cock lever to ON.

**Checking**

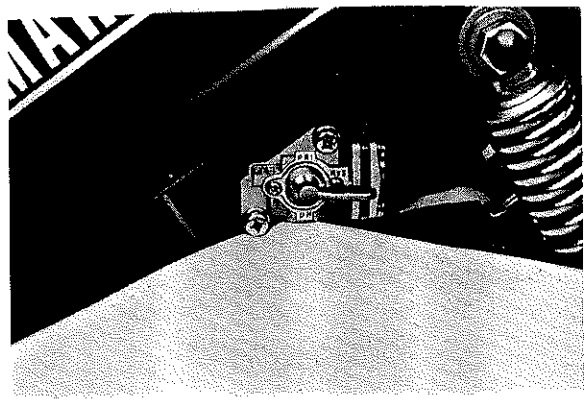
Remove the filter cup, set the auto-cock lever in ON or RES, and kick the kick pedal. When gasoline begins to flow out, stop kicking.
If gas continues flowing, the auto-cock is in bad condition.

1. Gasoline flows out when pedal is not kicked.
   a. The valve O-ring or the valve seat is damaged.

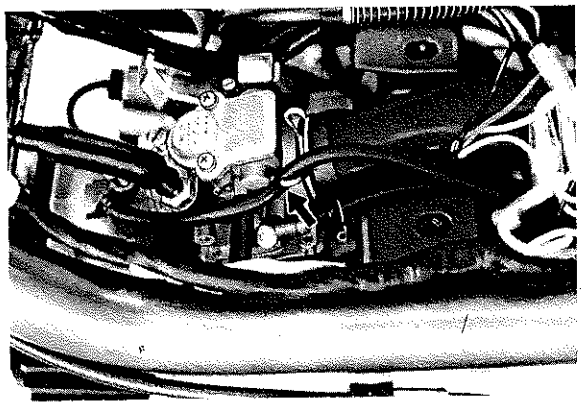



1. Filter cup

b. Dirt exists between the valve seat and valve.



2. Gasoline does not flow out when kick pedal is kicked.
a. The diaphragm is holed or cracked.
b. The vacuum pipe connecting the carburetor to the auto-cock is out of place, bent or holed.
c. The fuel tank is empty.



## CABLES AND FITTINGS

### Cable maintenance

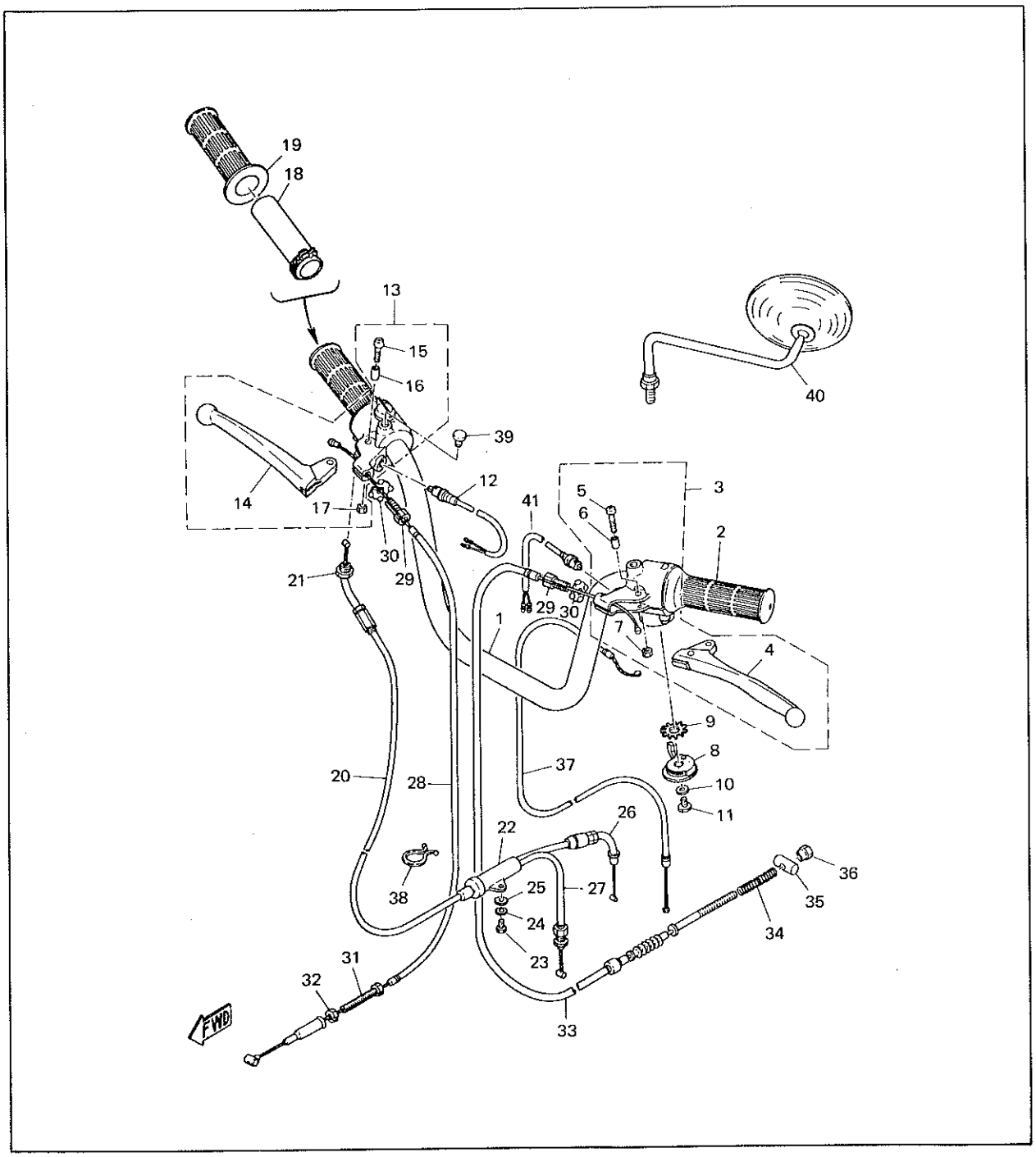
**NOTE:**
See Maintenance and Lubrication Intervals Charts for additional information.

Cable maintenance is primarily concerned with preventing deterioration through rust and weathering and providing proper lubrication to allow the cable to move freely within its housing.
Cable removal is straight-forward and uncomplicated. Removal will not be discussed within this section. For details, see the individual maintenance section for which the cable is an integral part.
Cable routing is of paramount importance. For details of cable routing, see the cable routing diagrams at the general information.

1. Remove the cable.
2. Check for free movement of cable within its housing. If movement is obstructed, check for fraying or kinking of the cable strands. If damage is evident, replace the cable assembly.
3. To lubricate cable, hold in vertical position. Apply lubricant to uppermost end of cable. Leave in vertical position until lubricant appears at bottom end. Allow excess to drain and re-install.

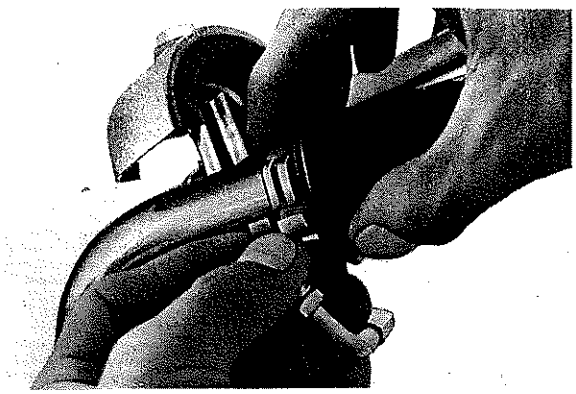
**NOTE:**
Choice of lubricant depends upon conditions and preference. However, a semi-drying chain and cable lubricant such as Yamaha chain and cable lube will probably perform adequately under most conditions.

## Handle, wire




1. Handle
2. Left crip
3. Left lever holder assembly
4. Left lever
5. Panhead screw
6. Lever collar
7. Hexagon nut
8. Starter lever
9. Washer
10. Plate washer
11. Bolt
12. Front stop switch assembly
13. Right lever holder assembly
14. Right lever
15. Panhead screw
16. Lever collar
17. Hexagon nut
18. Guide tube
19. Right grip
20. Throttle wire
21. Hexagon nut
22. Wire cylinder
23. Hexagon bolt
24. Spring washer
25. Plate washer
26. Pump wire
27. Throttle wire 2
28. Brake front wire
29. Bolt
30. Adjusting nut
31. Bolt
32. Nut
33. Brake rear wire
34. Compression spring
35. Pin
36. Nut
37. Starter wire
38. Wire harness clamp
39. Plug
40. Rear view mirror
41. Rear brake switch

### Throttle maintenance



1. Remove the two Phillips head screws from throttle housing assembly and separate two halves of housing.
2. Disconnect cable end from throttle grip assembly and remove grip assembly.
3. Wash all parts in mild solvent and check contact surfaces for burrs or other damage. (Also clean and inspect right-hand end of handlebar.)
4. Lubricate contact surfaces with light coat of lithium soap base grease and reassemble.

   **NOTE:**
   Tighten housing screws evenly to maintain an even gap between the two halves.

5. Check for smooth throttle operation and quick spring return when released and make certain that housing does not rotate on handlebar.

### Cable junction maintenance

The throttle cable cylinder (junction point for Autolube control cable) must be periodically maintained.

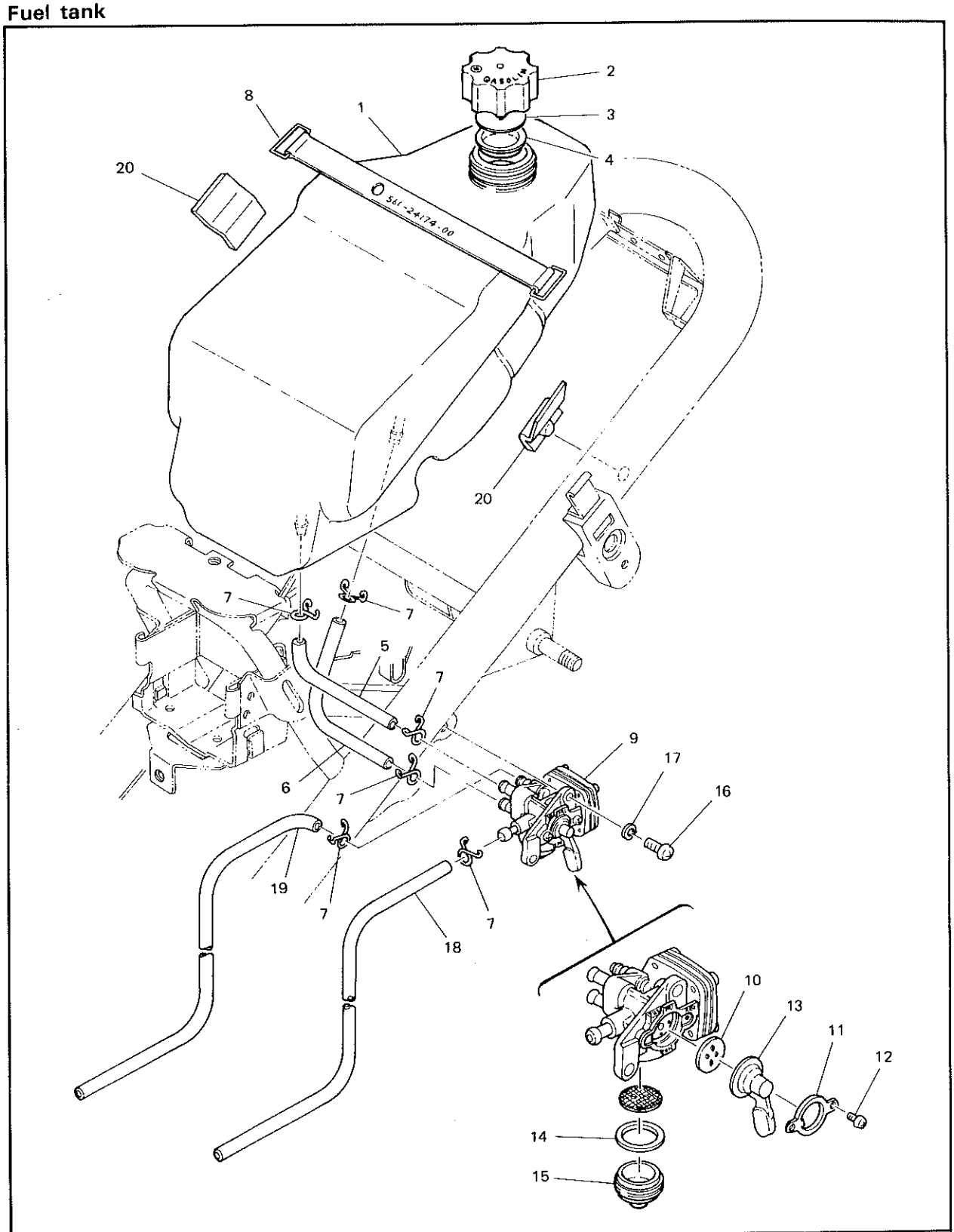
1. Remove throttle cable number one from handlebar housing.
2. Remove throttle cable number two from carburetor mixing chamber top.
3. Remove Autolube pump cable from pump pulley. Remove cable adjustor.
4. Remove seat and fuel tank.
5. Remove cable/cylinder assembly complete.
6. Remove cylinder cap, throttle cable two and Autolube pump cable.
7. Wash assembly thoroughly in solvent.
8. Lubricate all associated cables.
9. Apply a thin coating of lubricant to cylinder walls.

   **NOTE:**
   A small amount of lithium soap base grease may be used in lieu of cable lubricant.
   However, if machine is to be used in extreme cold, use the cable lubricant.

10. Reassembly all cables. Make sure cylinder is sealed from damage due to weather and riding conditions.
    Re-install.
    See cable routing diagrams for correct installtion position. See Mechanical Adjustments Chapter for correct cable adjustment.

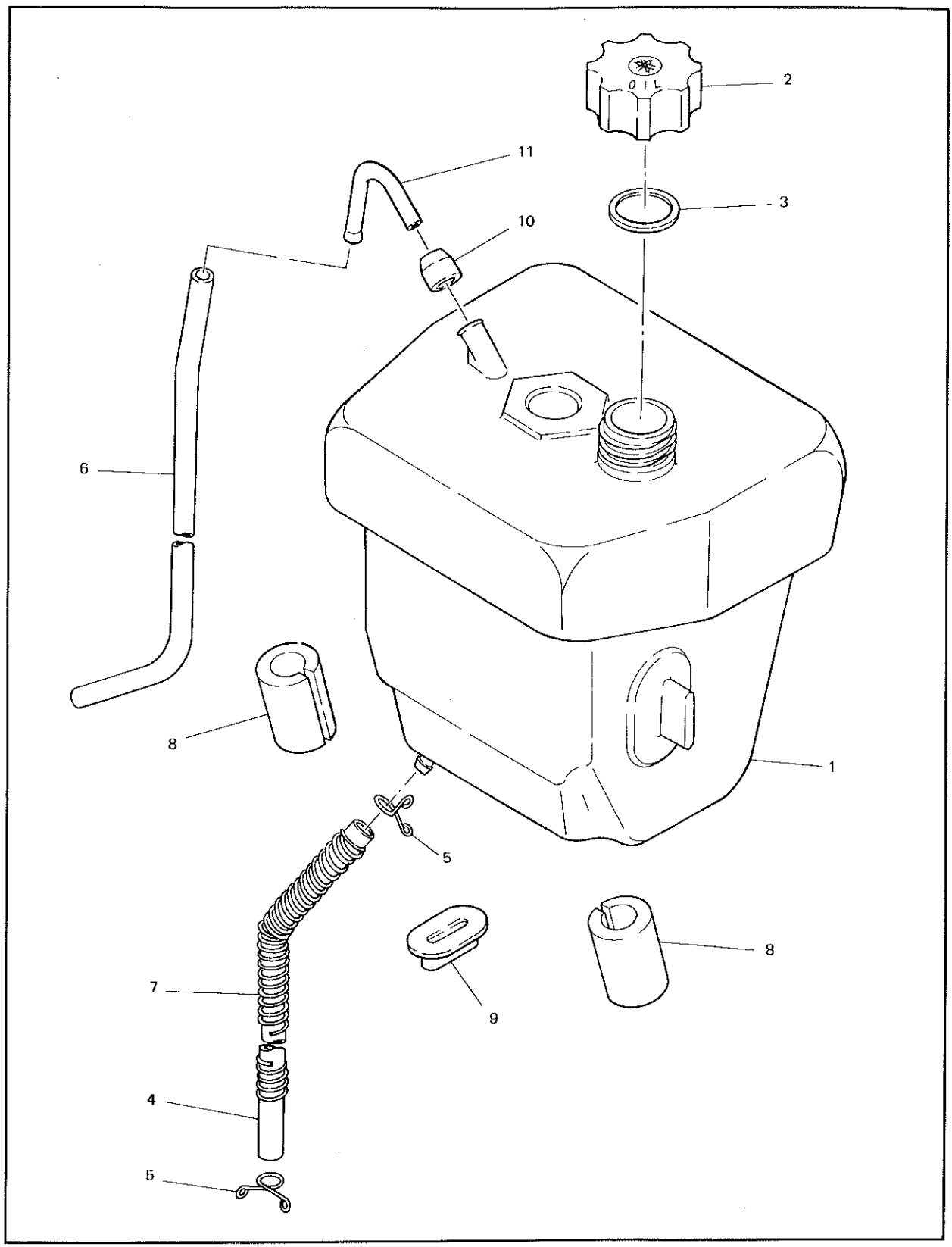
## MISCELLANEOUS CHASSIS COMPONENTS

### Fuel tank




1. Fuel tank
2. Cap body
3. Gasket plate 1
4. Gasket plate 2
5. Fuel pipe
6. Fuel pipe
7. Clip
8. Tank fitting band
9. Fuel cock assembly
10. Packing
11. Spring plate
12. Pan head screw
13. Lever
14. Packing
15. Filter cup
16. Pan head screw
17. Spring washer
18. Hose
19. Pipe
20. Locating damper

## Oil tank




1. Oil tank
2. Cap body
3. Cap gasket
4. Hose
5. Clip
6. Hose
7. Compression spring
8. Locating damper
9. Locating damper
10. Grommet
11. Connector tube

# CHAPTER 6. ELECTRICAL

6

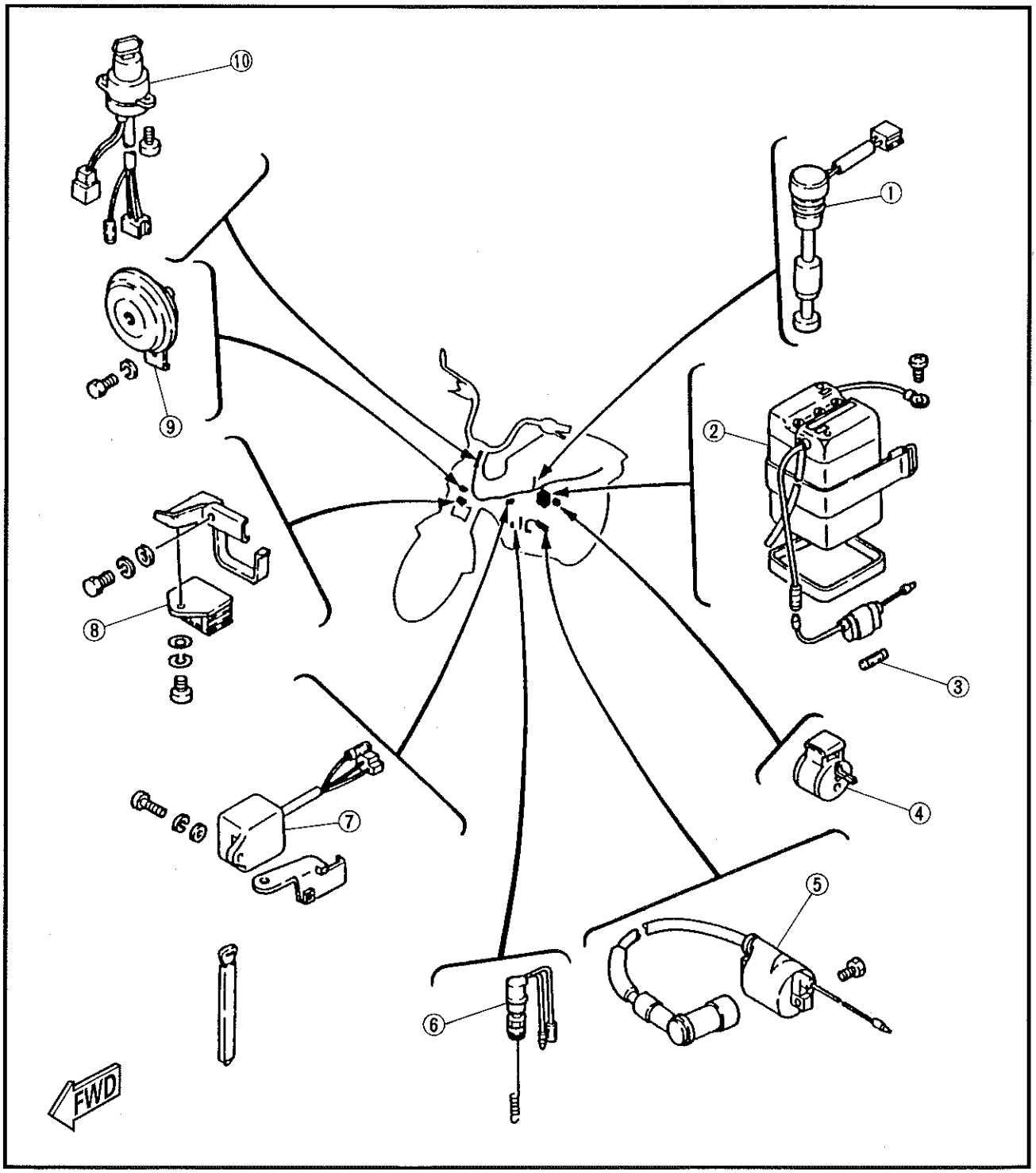
EB800000

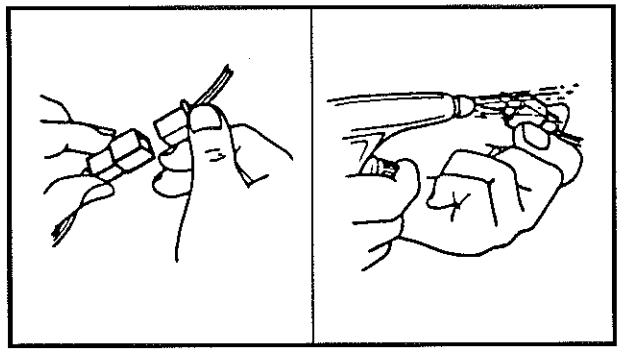
# ELECTRICAL

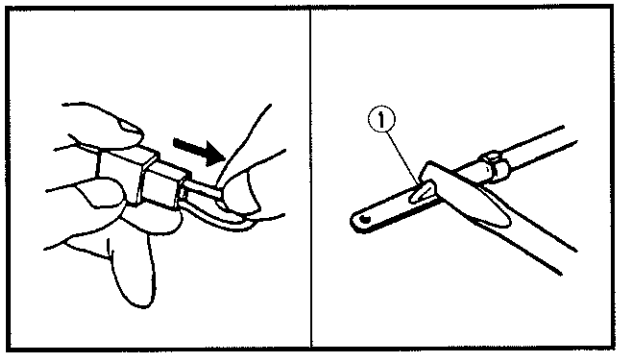
## ELECTRICAL COMPONENTS

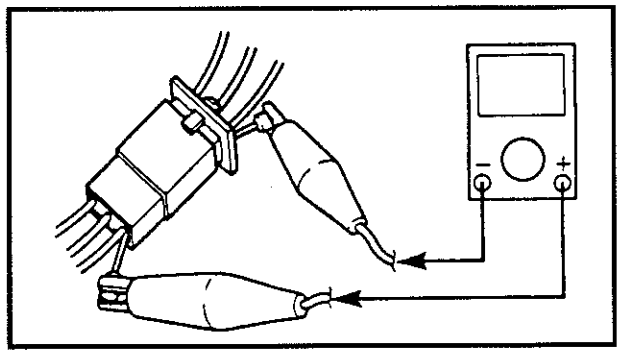
① Oil level gauge
② Battery
③ Fuse
④ Flasher relay
⑤ Ignition coil
⑥ Rear brake switch
⑦ CDI unit
⑧ Rectifier/regulator
⑨ Horn
⑩ Main switch

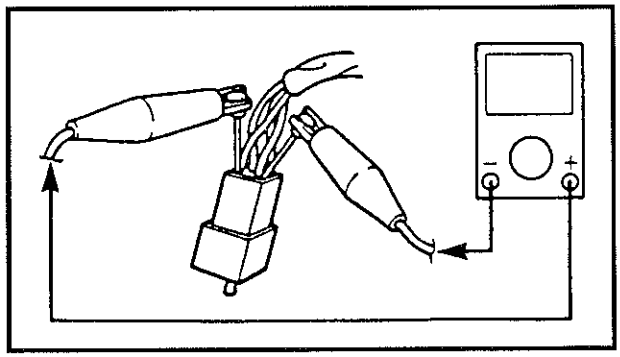
| SPECIFICATIONS | RESISTANCE |
|---|---|
| IGNITION COIL: | |
| PRIMARY | 0.32 ~ 0.48 Ω |
| SECONDARY | 5.68 ~ 8.52 kΩ |
| PICK-UP COIL | 16 ~ 24 Ω |
| SOURCE COIL | 264 ~ 396 Ω |
| CHARGING COIL | 0.30 ~ 0.44 Ω |









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## CHECKING OF CONNECTIONS

Check the connectors for stains, rust, moisture, etc.

1.Disconnect:
- Connector

2.Check:
- Connector

  Moisture → Dry each terminal with an air blower.

  Stains/rust → Connect and disconnect the terminals several times.

3.Check:
- Connector leads

  Looseness → Bend up the pin ① and connect the terminals.

4.Connect:
- Connector terminals

**NOTE:**

The two terminals "click" together.

5.Check:
- Continuity (using a pocket tester)

**NOTE:**
- If there is no continuity, clean the terminals.
- When checking the wire harness be sure to perform steps 1 to 3.
- As a quick remedy, use a contact revitalizer available at most part stores.
- Check the connector with a pocket tester as shown.

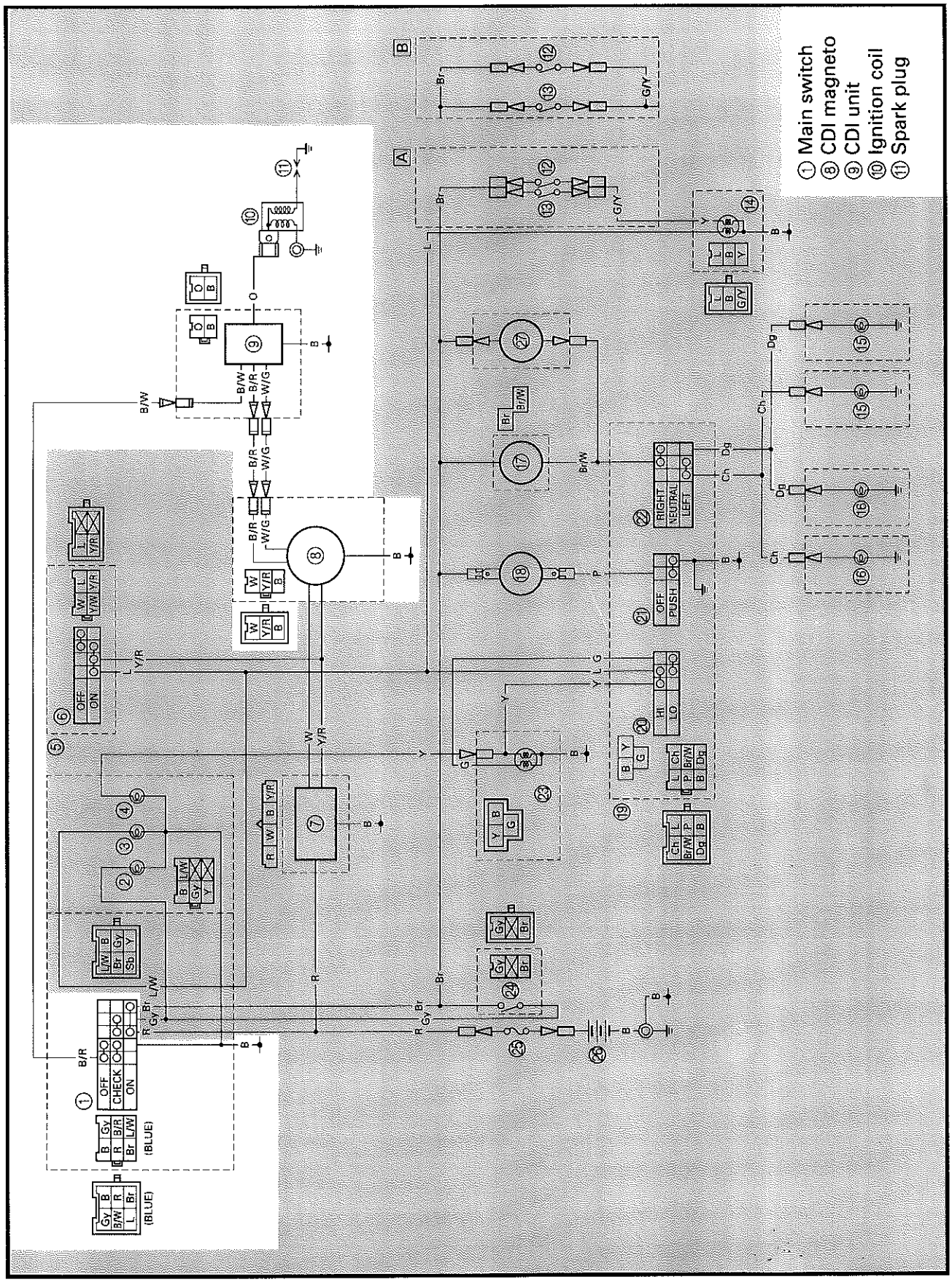
**COLOR CODE**

| | | | |
|---|---|---|---|
| B.....Black | L ..... Blue | Y .....Yellow | W/G .....White/Green |
| Br .....Brown | O..... Orange | B/R .....Black/Red | Y/R.....Yellow/Red |
| Ch.....Chocolate | P .....Pink | B/W ..... Black/White | Y/W..... Yellow/White |
| Dg ..... Dark green | R..... Red | Br/W..... Brown/White | |
| G .....Green | Sb..... Sky blue | G/Y.....Green/Yellow | |
| Gy .....Gray | W.....White | L/W .....Blue/White | |

EB802000

# IGNITION SYSTEM

## CIRCUIT DIAGRAM



EB802010
## TROUBLESHOOTING

**IF THE IGNITION SYSTEM FAILS TO OPERATE (NO SPARK OR INTERMITTENT SPARK):**

**Procedure**

Check:

1. Spark plug
2. Ignition spark gap
3. Spark plug cap resistance
4. Ignition coil resistance
5. Main switch
6. Pickup coil resistance
7. Source coil resistance
8. Wiring connection
   (the entire ignition system)

**NOTE:**

Use the following special tool(s) for trouble-shooting.

**Ignition checker:**
**90890-06754**
**Pocket tester:**
**90890-03112**

EB802013

1. Spark plug

- Check the spark plug condition.
- Check the spark plug type.
- Check the spark plug gap.
  Refer to "SPARK PLUG INSPECTION" in CHAPTER 2.

**Standard spark plug:**
**B6HS/NGK**

**Spark plug gap:**
**0.5 ~ 0.6 mm**

INCORRECT

Repair or replace the spark plug.

CORRECT

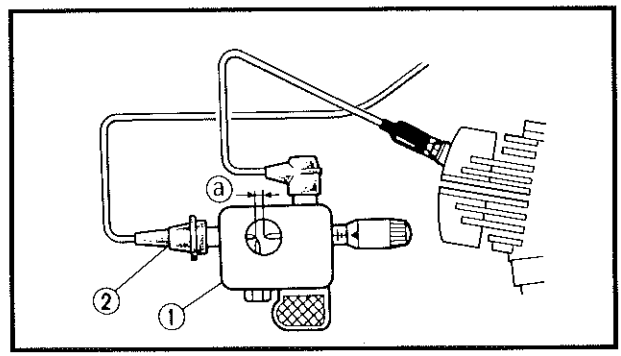
EB802014

2. Ignition spark gap

- Disconnect the spark plug cap from the spark plug.
- Connect the ignition checker ① as shown.

② Spark plug cap

- Turn the main switch to "ON".



- Check the ignition spark gap ⓐ.
- Crank the engine by kick starter, and increase the spark gap until a misfire occurs.

**Minimum spark gap:**
**5.0 mm**

MEETS SPECIFICATION

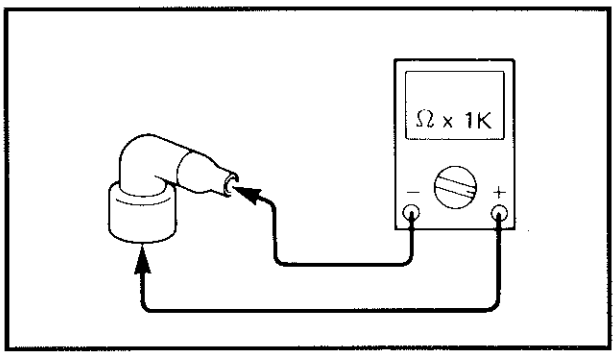
The ignition system is not faulty.

OUT OF SPECIFICATION OR NO SPARK

EB802015

3.Spark plug cap resistance

- Remove the spark plug cap.
- Connect the pocket tester (Ω × 1k) to the spark plug cap.




- Check if the spark plug cap has the specified resistance.

**Spark plug cap resistance:**
**5 kΩ at 20 °C**

OUT OF SPECIFICATION

Replace the spark plug cap.

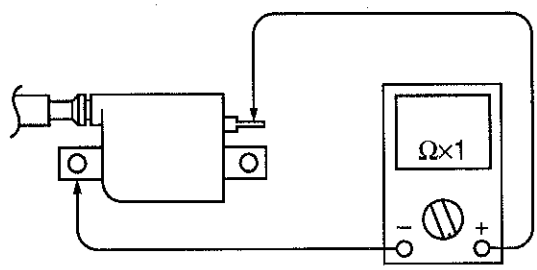
MEETS SPECIFICATION

EB802016

4.Ignition coil resistance

- Disconnect the ignition coil connector from the wire harness.
- Connect the pocket tester (Ω × 1) to the ignition coil.

**Tester (+) lead → Orange lead terminal**
**Tester (–) lead → Ignition coil base**

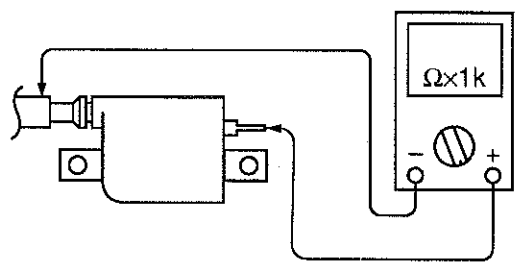


- Check if the primary coil has the specified resistance.

**Primary coil resistance:**
**0.32 ~ 0.48 Ω at 20 °C**

- Connect the pocket tester (Ω × 1k) to the ignition coil.

**Tester (+) lead → Ignition coil base**
**Tester (–) lead → Spark plug lead**




- Check if the secondary coil has the specified resistance.

**Secondary coil resistance:**
**5.68 ~ 8.52 kΩ at 20 °C**

OUT OF SPECIFICATION

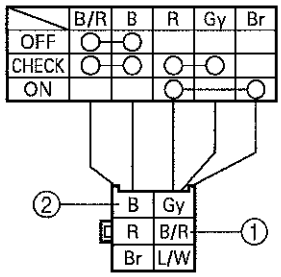
Replace the ignition coil.

MEETS SPECIFICATION

EB802017

5.Main switch

- Disconnect the main switch couplers from the wire harness.
- Check for continuity as follows:
  Black/Red ① – Black ②




NO CONTINUITY

Replace the main switch.

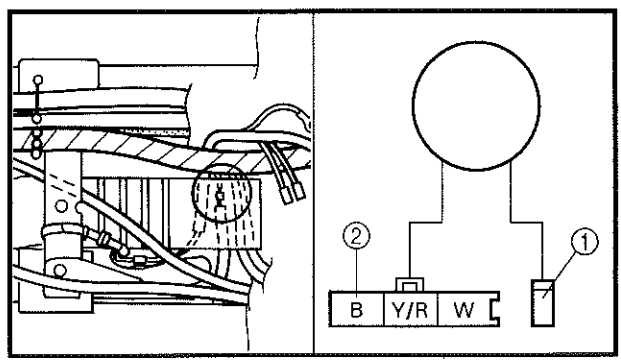
CONTINUITY

EB80201C

6.Pickup coil resistance

- Disconnect the pickup coil coupler from the wire harness.
- Connect the pocket tester (Ω × 100) to the pickup coil terminal.

**Tester (+) lead → White/Green lead ①**
**Tester (–) lead → Black terminal ②**



- Check if the pickup coil has the specified resistance.

**Pickup coil resistance:**
**16 ~ 24 Ω at 20 °C**
**(White/Green — Black)**

OUT OF SPECIFICATION

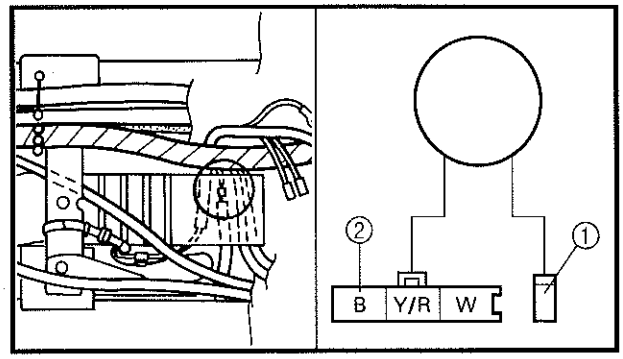
Replace the pickup coil.

MEETS SPECIFICATION

7.Source coil resistance

- Disconnect the source coil leads from the wire harness.
- Connect the pocket tester (Ω × 100) to the source coil terminal.

**Tester (+) lead → Black/Red lead ①**
**Tester (–) lead → Black terminal ②**




- Check the source coil for the specified resistance.

**Source coil resistance:**
**264 ~ 396 Ω at 20 °C**
**(Black/Red — Black)**

OUT OF SPECIFICATION

Replace the source coil.

MEET SPECIFICATION

8.Wiring connection

- Check the connections on the entire ignition system.
  Refer to "CIRCUIT DIAGRAM".

POOR CONNECTION

Properly connect the ignition system.

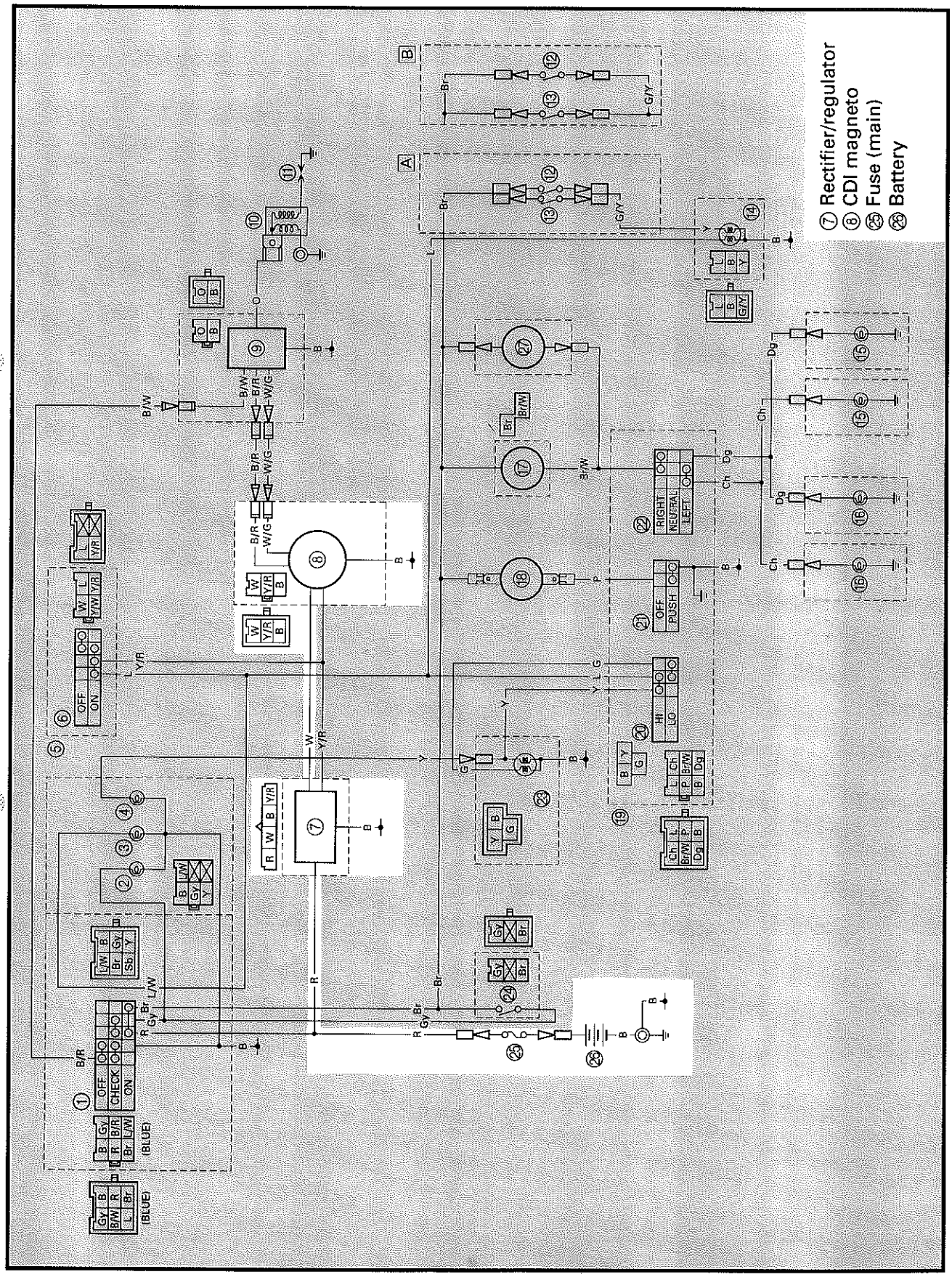
CORRECT

Replace the CDI unit.

EB804000

# CHARGING SYSTEM

## CIRCUIT DIAGRAM

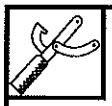


EB804010
## TROUBLESHOOTING

**IF THE BATTERY IS NOT CHARGED:**

**Procedure**
Check:
1.Fuse
2.Battery
3.Charging voltage
4.Charging coil resistance
5.Wiring connections
(the entire charging system)

**NOTE:**
Use the following special tool(s) for trouble-shooting.



**Engine tachometer:**
**90890-03113**
**Pocket tester:**
**90890-03112**

EB802011

1.Fuse

- Remove the fuse.
- Connect the pocket tester (Ω × 1) to the fuse.
- Check the fuse for continuity.

NO CONTINUITY → Replace the fuse.

CONTINUITY ↓

EB802012

2.Battery

- Check the battery condition.
  Refer to "BATTERY INSPECTION" in CHAPTER 2.

**Specific gravity:**
**1.280 at 20 °C**

INCORRECT →
- Add distilled water to the proper level.
- Clean the battery terminals.
- Recharge or replace the battery.

CORRECT ↓

*

*

EB804011

3.Charging voltage

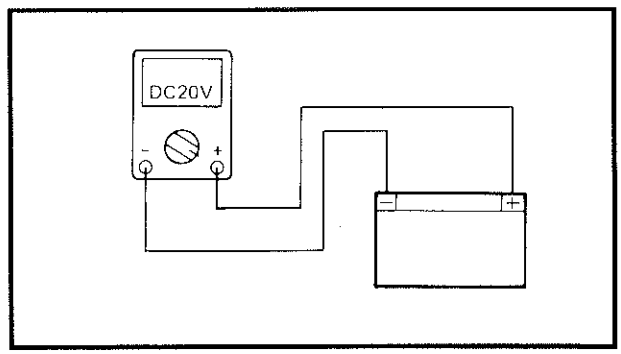
- Connect the engine tachometer to the spark plug lead.
- Connect the pocket tester (DC 20 V) to the battery.

**Tester (+) lead → Battery (+) terminal**
**Tester (–) lead → Battery (–) terminal**

- Start the engine and accelerate to about 8,000 r/min.

**Charging voltage:**
**8.5 V or less at 8,000 r/min**

**NOTE:**
Use a fully charged battery.




MEETS SPECIFICATION

The charging circuit is not faulty.

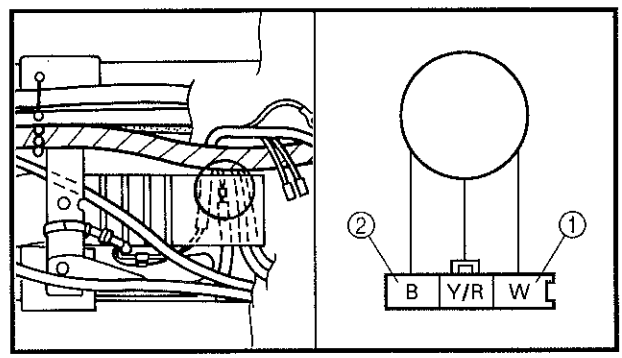
OUT OF SPECIFICATION

EB804012

4.Charging coil resistance

- Remove the generator cover.
- Connect the pocket tester (Ω × 1) to the charging coils.

**Tester (+) lead → White terminal ①**
**Tester (–) lead → Black terminal ②**




- Measure the charging coil resistance.

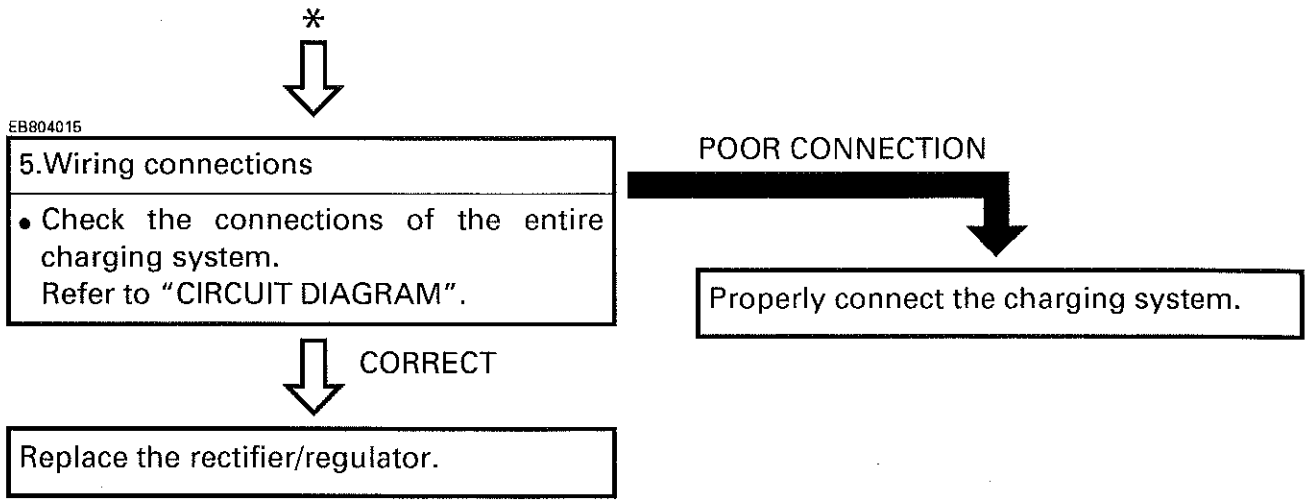
**Charging coil resistance:**
**0.30 ~ 0.44 Ω at 20°C**

OUT OF SPECIFICATION

Replace the charging coil assembly.

MEET SPECIFICATION

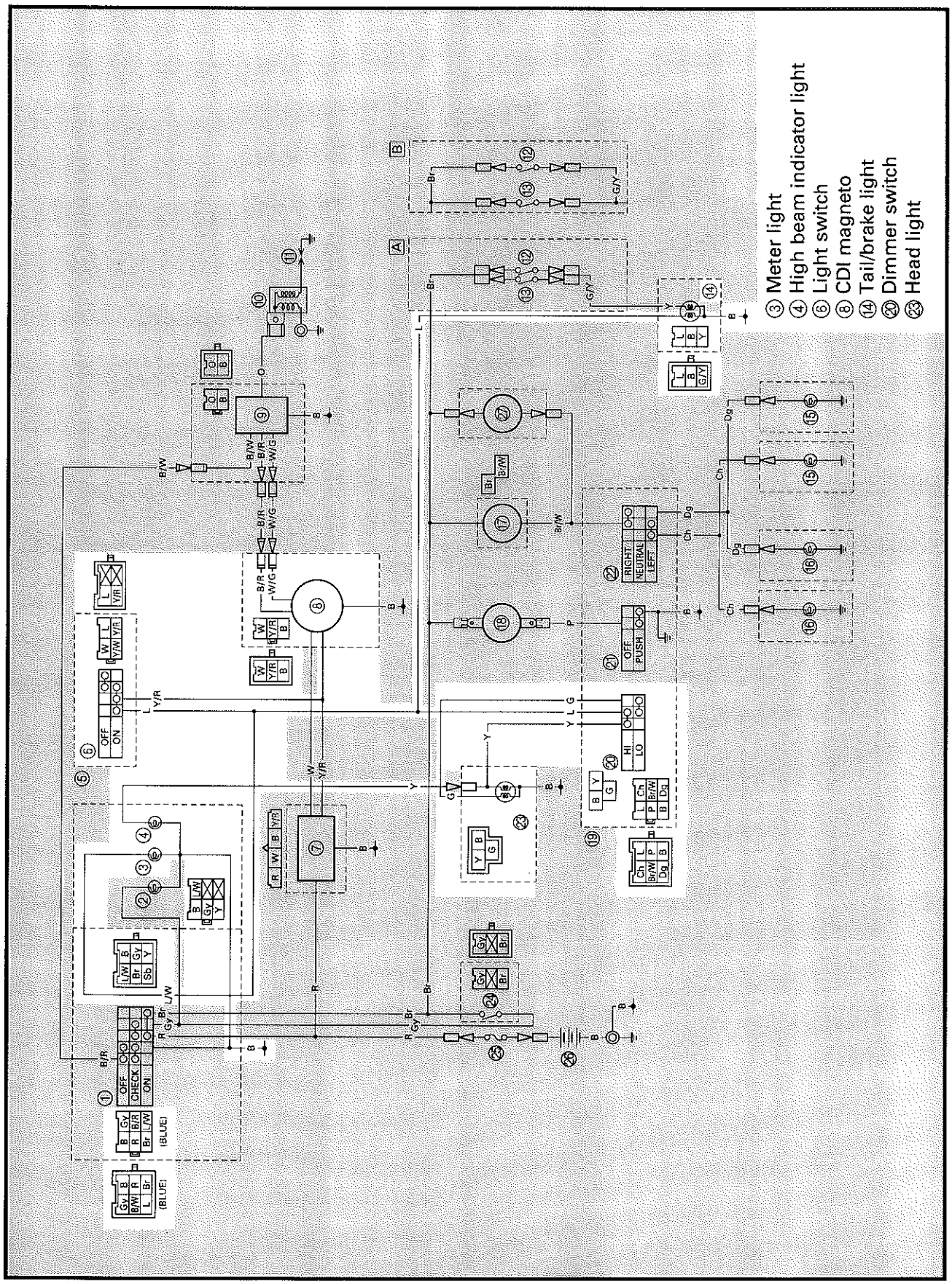
*


*
EB804015
5.Wiring connections
• Check the connections of the entire charging system.
Refer to "CIRCUIT DIAGRAM".
POOR CONNECTION
Properly connect the charging system.
CORRECT
Replace the rectifier/regulator.

EB805000

# LIGHTING SYSTEM

## CIRCUIT DIAGRAM

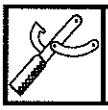


EB805010
## TROUBLESHOOTING

**IF THE HEADLIGHT, HIGH BEAM INDICATOR LIGHT, TAILLIGHT AND/OR METER LIGHT FAIL TO COME ON:**

**Procedure**
Check:
1.Bulb and bulb socket
2.Lighting coil
3.Light switch
4.Dimmer switch
5.Wiring connection
(the entire lighting system)

**NOTE:**
Use the following special tool(s) for trouble-shooting.

| | |
|---|---|
|  | **Pocket tester: 90890-03112** |

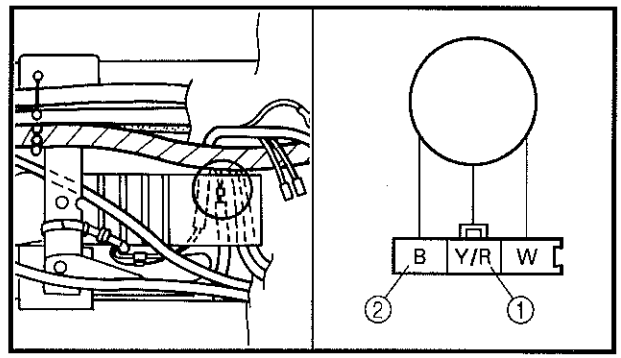
1.Bulb and bulb socket
- Check the bulb and bulb socket for continuity.

NO CONTINUITY → Replace the bulb and/or bulb socket.

CONTINUITY ↓

2.Lighting coil resistance
- Disconnect the CDI magneto coupler from the wire harness.
- Connect the Pocket Tester (Ω × 1) to the lighting coil coupler.

**Tester (+) Lead → Yellow/Red ① Terminal**
**Tester (–) Lead → Black ② Terminal**




- Measure the lighting coil resistance.

| | |
|---|---|
|  | **Lighting coil resistance: 0.2 ~ 0.3 Ω at 20 °C** |

OUT OF SPECIFICATION → Replace the lighting coil.

MEET SPECIFICATION ↓

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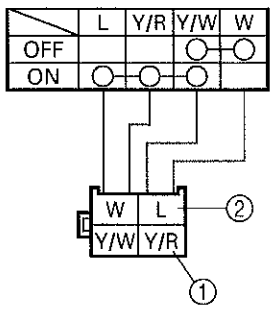
EB805011

**3.Light switch**

- Disconnect the right handlebar switch coupler from the wire harness.
- Turn the light switch to "ON".
- Check for continuity as follows:
  Yellow/Red ① – Blue ②



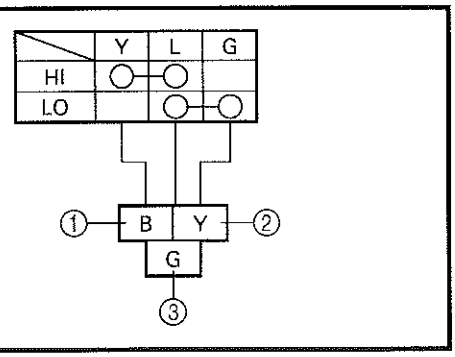

NO CONTINUITY

The light switch is faulty. Replace the right handlebar switch.

CONTINUITY

**4.Dimmer switch**

- Disconnect the left handlebar switch coupler from the wire harness.
- Turn the dimmer switch to "LO".
- Check for continuity as follows:
  Blue ① – Yellow ②
- Turn the dimmer switch to "HI".
- Check for continuity as follows:
  Blue ① – Green ③




NO CONTINUITY

The dimmer switch is faulty.
Replace the left handlebar switch.

CONTINUITY

EB805013

**5.Wiring connections**

- Check the connections of the entire lighting system.
  Refer to "CIRCUIT DIAGRAM".

POOR CONNECTION

Properly connect the lighting system.

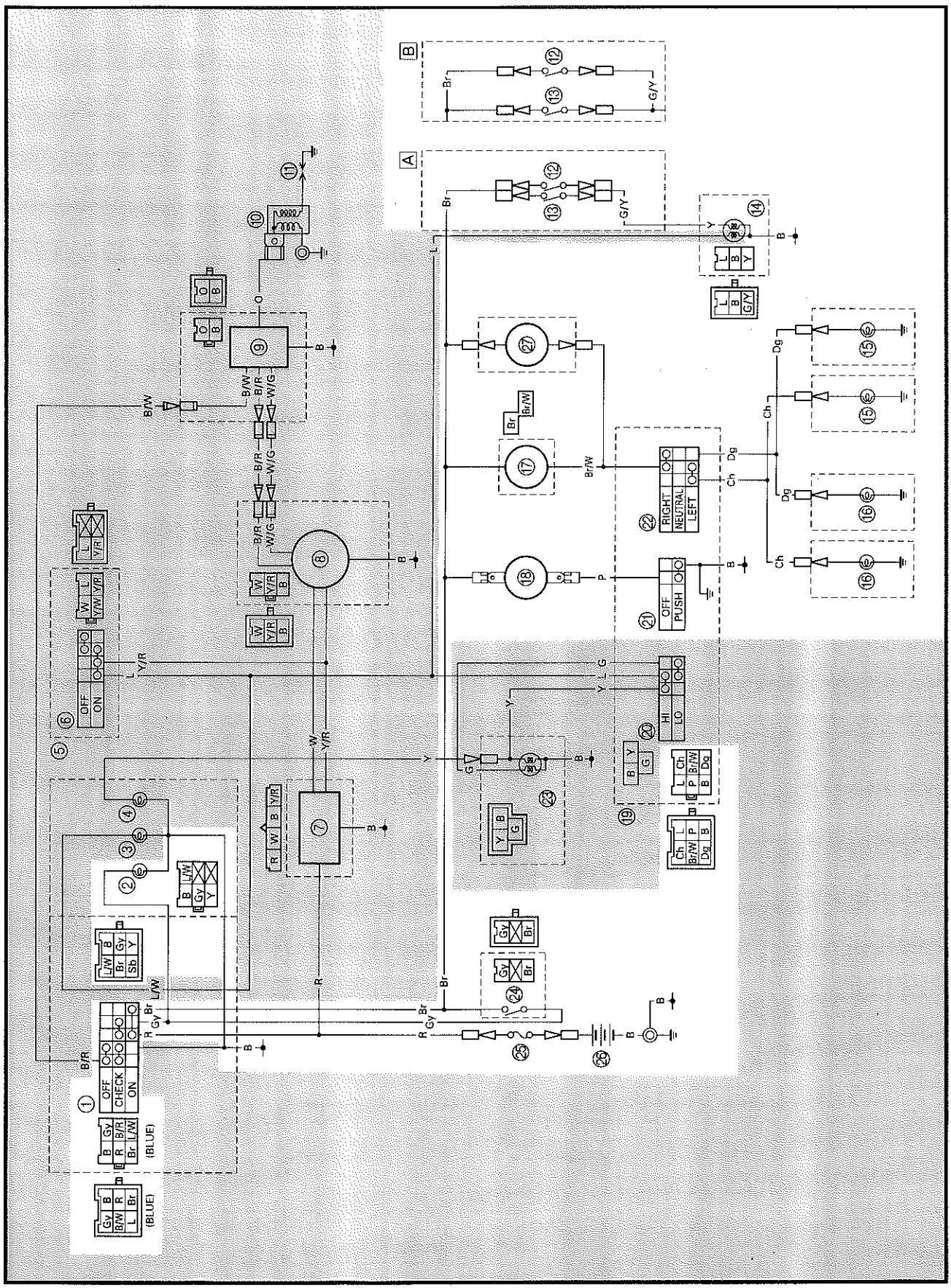
CORRECT

Replace the rectifier/regulator.

EB806000

# SIGNAL SYSTEM

## CIRCUIT DIAGRAM



① Main switch
② Oil level indicator light
⑫ Rear brake switch
⑬ Front brake switch
⑭ Tail/brake light
⑮ Rear turn signal
⑯ Front turn signal
⑰ Flasher relay
⑱ Horn
㉑ Horn switch
㉒ Turn switch
㉔ Oil level gauge
㉕ Fuse
㉖ Battery
㉗ Audio pilot (LB50 II AC)

[A] For LB50 II AC
[B] For LB80 II AC

EB806010
## TROUBLESHOOTING

**IF THE FLASHER LIGHT, BRAKE LIGHT AND/OR INDICATOR LIGHT FAIL TO COME ON:**
**IF THE HORN FAILS TO SOUND:**

**Procedure**
Check:
1.Fuse
2.Battery
3.Main switch
4.Wiring connections (the entire signal system)

**NOTE:**
Use the following special tool(s) for troubleshooting.

**Pocket tester:**
**90890-03112**

EB802011

1.Fuse

- Remove the fuse.
- Connect the pocket tester (Ω × 1) to the fuse.
- Check the fuses for continuity.

NO CONTINUITY → Replace the fuse.

CONTINUITY ↓

EB802012

2.Battery

- Check the battery condition.
  Refer to "BATTERY INSPECTION" in CHAPTER 2.

**Specific gravity:**
**1,280 at 20°C**

INCORRECT →
- Add distilled water to the proper level.
- Clean the battery terminals.
- Recharge or replace the battery.

CORRECT ↓

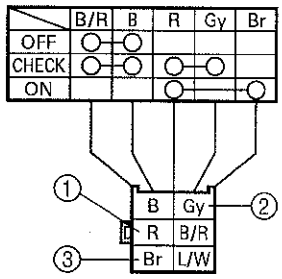
*

*

EB802017

**3.Main switch**

- Disconnect the main switch coupler from the wire harness.
- Check for continuity as follows:
  Red ① – Gray ②
  Red ① – Brown ③




NO CONTINUITY

Replace the main switch.

CONTINUITY

EB806011

**4.Wiring connections**

- Check the connections of the entire signal system.
  Refer to "CIRCUIT DIAGRAM".

POOR CONNECTION

Properly connect the signal system.

CORRECT

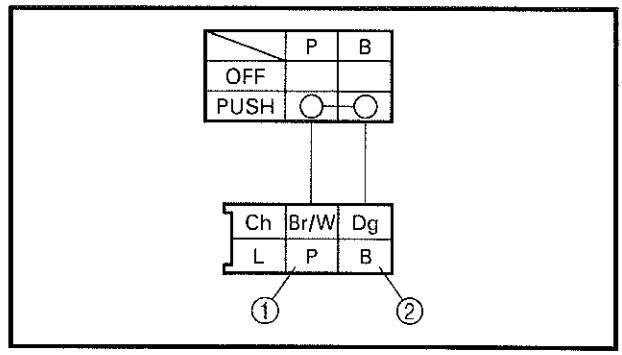
Check the condition of each of the signal system's circuits.
Refer to "SIGNAL SYSTEM CHECK".

EB806020

## SIGNAL SYSTEM CHECK

1.If the horn fails to sound:

**1.Horn switch**




- Disconnect the left handlebar switch coupler from the wire harness.
- Check for continuity as follows:
  Pink ① – Black ②

NO CONTINUITY

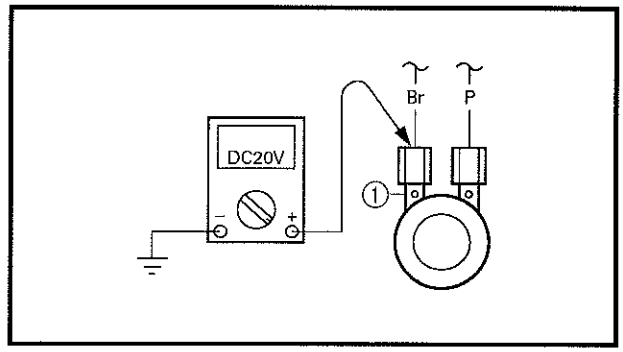
Replace the left handlebar switch.

CONTINUITY

**2.Voltage**

- Connect the pocket tester (DC 20 V) to the horn lead.

**Tester (+) lead → Brown lead ①**
**Tester (–) lead → Frame ground**




- Turn the main switch to "ON".
- Check the voltage (6 V) of the "Brown" lead at the horn terminal.

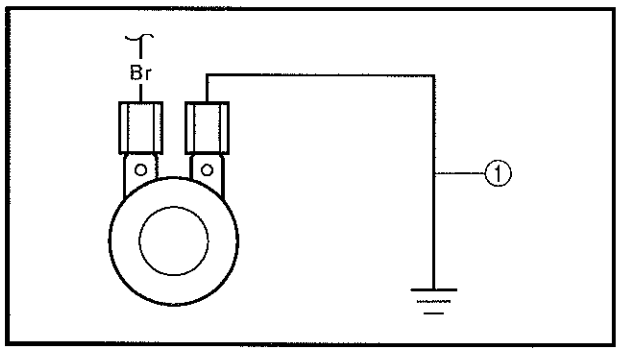
OUT OF SPECIFICATION

The wiring circuit from the main switch to the horn terminal is faulty, repair it.

MEETS SPECIFICATION

**3.Horn**

- Disconnect the "Pink" lead at the horn terminal.
- Connect a jumper lead ① to the horn terminal and ground the jumper lead.
- Turn the main switch to "ON".




HORN SOUNDS

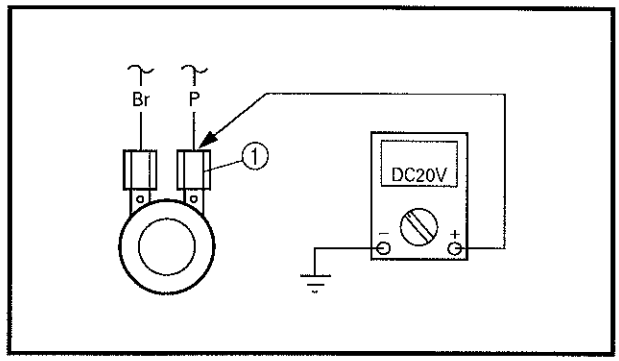
The horn is not faulty.

HORN DOES NOT SOUND

4.Voltage

- Connect the pocket tester (DC 20 V) to the horn at the "Pink" terminal.

**Tester (+) lead → Pink lead ①**
**Tester (–) lead → Frame ground**




- Turn the main switch to "ON".
- Check the voltage (6 V) of the "Pink" lead at the horn terminal.

OUT OF SPECIFICATION

Replace the horn.

MEETS SPECIFICATION

Adjust or replace the horn.

EB806022

2.If the brake light fails to come on:

1.Bulb and bulb socket

- Check the bulb and bulb socket for continuity.

NO CONTINUITY

Replace the bulb and/or bulb socket.

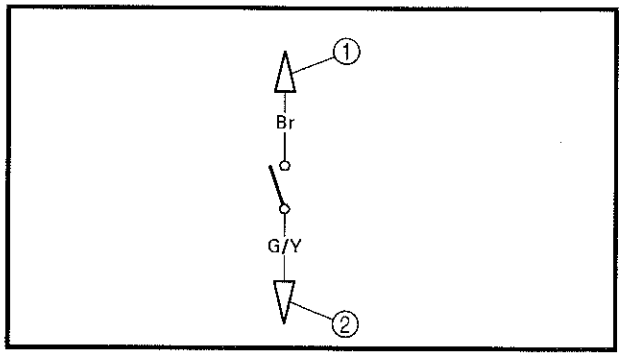
CONTINUITY

*

*

2.Brake switch

- Disconnect the brake switch leads.
- Check for continuity as follows:
  Brown ① – Green/Yellow ②




NO CONTINUITY

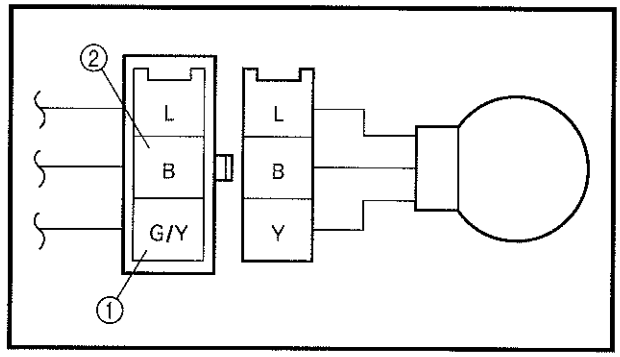
Replace the brake switch.

CONTINUITY

3.Voltage

- Connect the pocket tester (DC 20 V) to the bulb socket connector.

**Tester (+) lead → Green/Yellow terminal ①**
**Tester (–) lead → Black terminal ②**




- Turn the main switch to "ON".
- The brake lever is pulled in or the brake pedal is pressed down.
- Check the voltage (6 V) of the "Green/Yellow" lead on the bulb socket connector.

OUT OF SPECIFICATION

The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.

MEETS SPECIFICATION

This circuit is not faulty.

EB806023

3.If the turn signal fails to blink:

**1.Bulb and bulb socket**

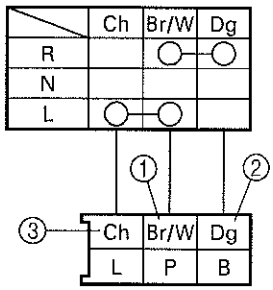
- Check the bulb and bulb socket for continuity.

NO CONTINUITY → Replace the bulb and/or bulb socket.

CONTINUITY ↓

**2.Turn switch**

- Disconnect the left handlebar switch coupler from the wire harness.
- Check for continuity as follows:
  Brown/White ① – Dark green ②
  Brown/White ① – Chocolate ③



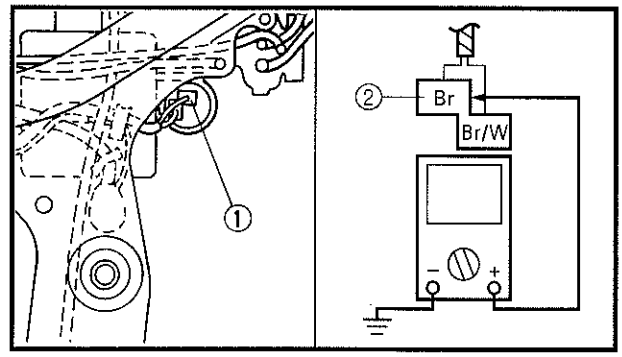

NO CONTINUITY → Replace the left handlebar switch.

CONTINUITY ↓

**3.Voltage**

- Connect the pocket tester (DC 20 V) to the flasher relay coupler ①.

**Tester (+) lead → Brown terminal ②**
**Tester (–) lead → Frame ground**




- Turn the main switch to "ON".
- Check the voltage (6 V) of the "Brown" ① lead at the flasher relay terminal.

OUT OF SPECIFICATION → The wiring circuit from the main switch to the flasher relay connector is faulty, repair it.

MEETS SPECIFICATION ↓

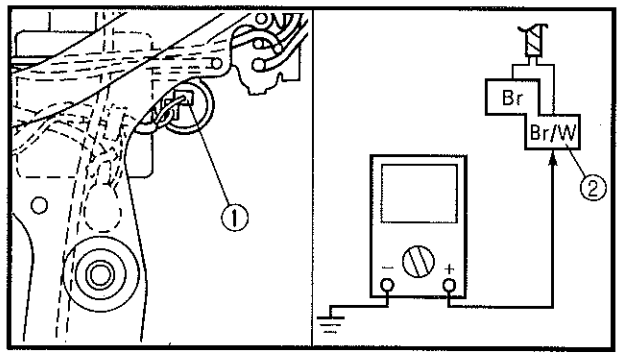
*

*

4.Voltage

- Connect the pocket tester (DC 20 V) to the flasher relay coupler ①.

**Tester (+) lead →**
**Brown/White terminal ②**
**Tester (–) lead → Frame ground**




- Turn the main switch to "ON".
- Turn the turn switch to "L" or "R".
- Check the voltage (6 V) on the "Brown/White" ① lead at the flasher relay terminal.

OUT OF SPECIFICATION

The flasher relay is faulty, replace it.

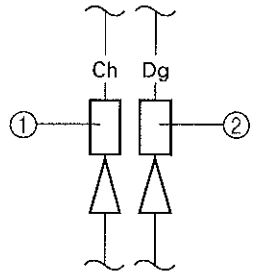
MEETS SPECIFICATION

5.Voltage

- Connect the pocket tester (DC 20 V) to the bulb socket connector.

**At the flasher light (left):**
**Tester (+) lead → Chocolate lead ①**
**Tester (–) lead → Frame ground**

**At the flasher light (right):**
**Tester (+) lead → Dark green lead ②**
**Tester (–) lead → Frame ground**




- Turn the main switch to "ON".
- Turn the turn switch to "L" or "R".
- Check the voltage (6 V) of the "Chocolate" lead or "Dark green" lead on the bulb socket connector.

OUT OF SPECIFICATION

The wiring circuit from the turn switch to the bulb socket connector is faulty, repair it.

MEETS SPECIFICATION

This circuit is not faulty.

EB806025

6.If the oil level indicator light fails to come on:

**1.Bulb and bulb socket**

- Check the bulb and bulb socket for continuity.

NO CONTINUITY

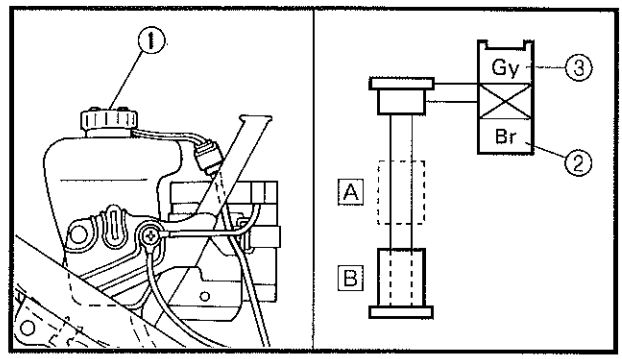
Replace the bulb and/or bulb socket.

CONTINUITY

**2.Oil level gauge**

- Remove the oil level gauge ① from the oil tank.
- Connect the pocket tester (Ω × 1) to the oil level gauge.

**Tester (+) lead → Brown ② terminal**
**Tester (–) lead → Gray ③ terminal**




- Check the oil level gauge for continuity.

| Switch position | | Good condition | Bad condition | | |
|---|---|---|---|---|---|
| A | Upright position | × | ○ | × | ○ |
| B | Upside down position | ○ | × | × | ○ |

○: Continuity ×: Nocontinuity

BAD CONDITION

Replace the oil level gauge.

GOOD CONDITION

**3.Wiring connection**

- Check the connections of the entire signal system.
  Refer to "WIRING DIAGRAM".

# CHAPTER 7. APPENDICES

7

# CHAPTER 7. APPENDICES

## TROUBLESHOOTING GUIDE

The following guide is not complete in itself. If a problem is found within an individual component mentioned within the chart, refer to the section or chapter involved for insepction procedures.

### No start or difficult to start

### Ignition:

| Possible Cause | Remedy |
|---|---|
| No spark | 1. Check ignition main switch<br>2. Check wiring, magneto coil<br>3. Check the pickup coil<br>4. Check high tension lead<br>5. Check spark plug |
| Weak or intermittent spark | 1. Use ignition checker, spark gap test<br>2. Check spark plug<br>3. Check high tension lead<br>4. Check ignition assembly |

### Air/Fuel systems:

| Possible Cause | Remedy |
|---|---|
| No fuel | 1. Check fuel tank<br>2. Check petcock<br>3. Remove main jet, check fuel flow |
| Intermittent or poor fuel flow | 1. Clean fuel tank, check cap vent<br>2. Clean petcock<br>3. Remove carburetor, service |
| Bad fuel | 1. Flush fuel system, complete<br>2. Add fresh fuel, proper grade |
| Blocked air intake or malfunction | 1. Clean and lube filter<br>2. Check reed valve assembly |

### Engine/Exhaust systems:

| Possible Cause | Remedy |
|---|---|
| Incorrect compression pressure | 1. If reading too high, check for excessive carbon<br>2. If reading too low, check:<br>a. Cylinder head gasket<br>b. Cylinder base gasket<br>c. Piston, rings, cylinder |
| Poor bottom end compression | 1. Check crankcase seals L and R |
| Blocked exhaust system | 1. Check muffler<br>2. Check exhaust port carbon formation<br>3. Check exhaust pipe for internal damage |

### Poor idle and/or low speed performance

**Ignition system:**

| Possible Cause | Remedy |
|---|---|
| Spark plug fouled or incorrect gap | Clean and gap or replace if necessary |
| Incorrect ignition timing | Check the ignition system |
| Weak spark | Check ignition coil |

**Air/Fuel systems:**

| Possible Cause | Remedy |
|---|---|
| Tank cap vent plugged | Clean or repair as necessary |
| Fuel petcock plugged | Clean or repair as necessary |
| Carburetor slow speed system inoperative | Clean or repair as necessary |
| Pilot screw out of adjustment or plugged | Clean or repair as necessary |
| Carburetor float level incorrect | Clean or repair as necessary |
| Starter lever on | Starter lever off |
| Air leak | Repair |
| Carburetor not level | Level |

**Engine/Exhaust systems (See "No start")**

### Poor mid-range and high speed performance

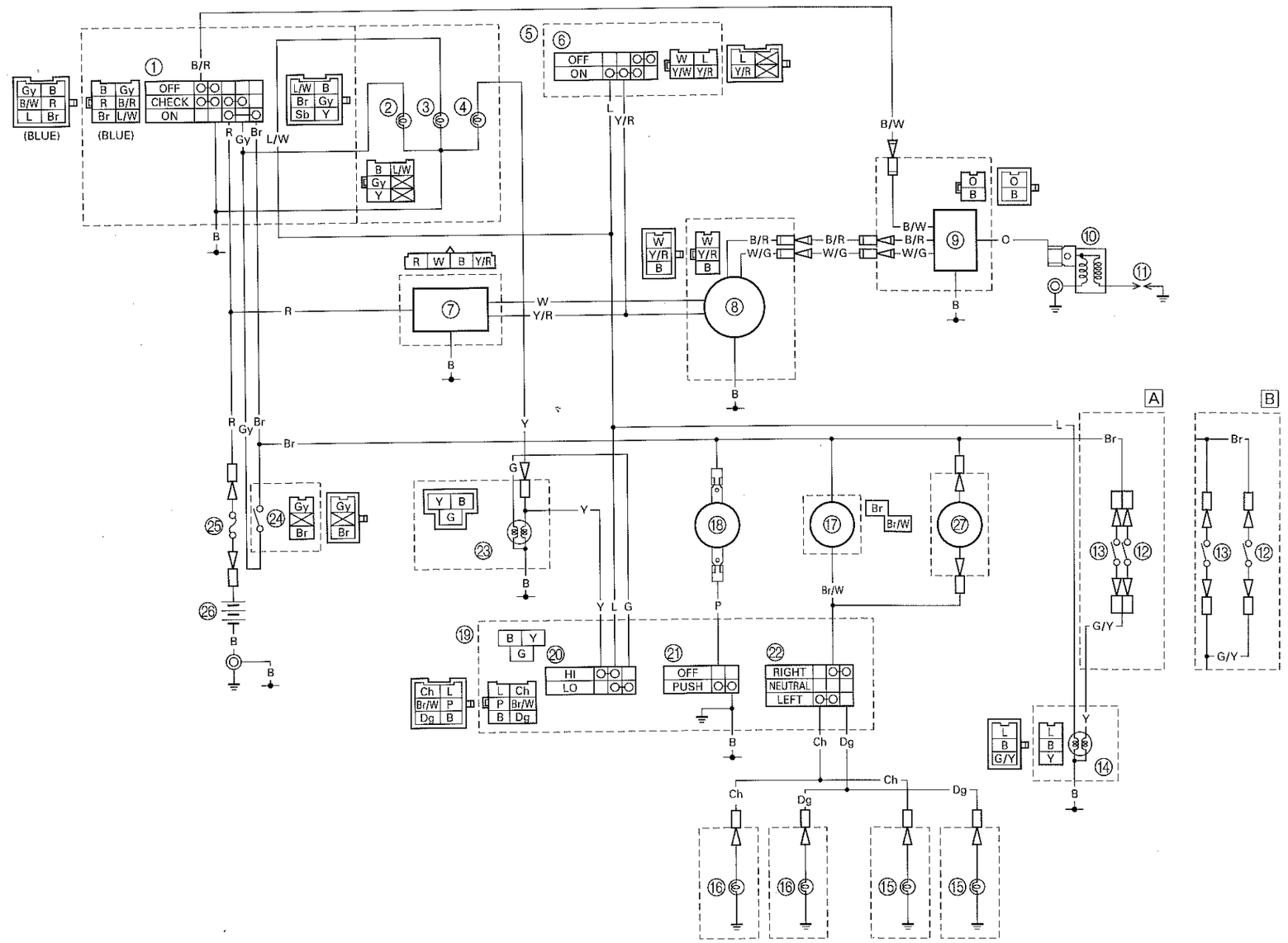
**Ignition system:**

| Possible Cause | Remedy |
|---|---|
| Spark plug incorrect | Clean and gap or change plug if necessary |
| Ignition timing incorrect | Check the ignition system |

**Air/Fuel systems:**

| Possible Cause | Remedy |
|---|---|
| Dirty air filter element | Clean |
| Carburetor float level incorrect | Measure and change if required |
| Incorrect main jet size | Remove jet and check size |
| Incorrect jet needle notch | Check position of clip in needle |
| Cracked or leaking reeds | Replace |
| Carburetor not level | Level |

# LB50 II AC/LB80 II AC WIRING DIAGRAM




① Main switch
② Oil level indicator light
③ Meter light
④ High beam indicator light
⑤ Right handlebar switch
⑥ Light switch
⑦ Rectifier/regulator
⑧ CDI magneto
⑨ CDI unit
⑩ Ignition coil
⑪ Spark plug
⑫ Rear brake switch
⑬ Front brake switch
⑭ Tail/brake light
⑮ Rear turn signal
⑯ Front turn signal
⑰ Flasher relay
⑱ Horn
⑲ Left handlebar switch
⑳ Dimmer switch
㉑ Horn switch
㉒ Turn switch
㉓ Headlight
㉔ Oil level gauge
㉕ Fuse
㉖ Battery
㉗ Audio pilot (for LB50 II AC)

A For LB50 II AC
B For LB80 II AC

**COLOR CODE**

| | | | |
|---|---|---|---|
| B ..... Black | L ..... Blue | Y ..... Yellow | W/G ..... White/Green |
| Br ..... Brown | O ..... Orange | B/R ..... Black/Red | Y/R ..... Yellow/Red |
| Ch ..... Chocolate | P ..... Pink | B/W ..... Black/White | Y/W ..... Yellow/White |
| Dg ..... Dark green | R ..... Red | Br/W ..... Brown/White | |
| G ..... Green | Sb ..... Sky blue | G/Y ..... Green/Yellow | |
| Gy ..... Gray | W ..... White | L/W ..... Blue/White | |