SUZUKI

# GS500E

# SERVICE MANUAL




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# FOREWORD

*The SUZUKI GS500E has been developed as a new generation motorcycle to the GS-models. It is packed with highly advanced design concepts including a New Twin Dome Combustion Chamber, a crankshaft couter-balancer, a fully transistorized ignition system and a full-floater rear suspension. Combined with precise control and easy handling the GS500E provides excellent performance and outstanding riding com fort.*

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

# IMPORTANT

*All street-legal Suzuki motorcycles with engine displacement of 50 cc or greater are subject to Environmental Protection Agency emission regulations. These regulations set specific standards for exhaust emission output levels as well as particular servicing requirements. This manual includes specific information required to properly inspect and service the GS500E in accordance with all EPA regulations. It is strongly recommended that the chapter on Emission Control, Periodic Servicing and Carburetion be thoroughly reviewed before any type of service work is performed.*

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

**SUZUKI MOTOR CORPORATION**

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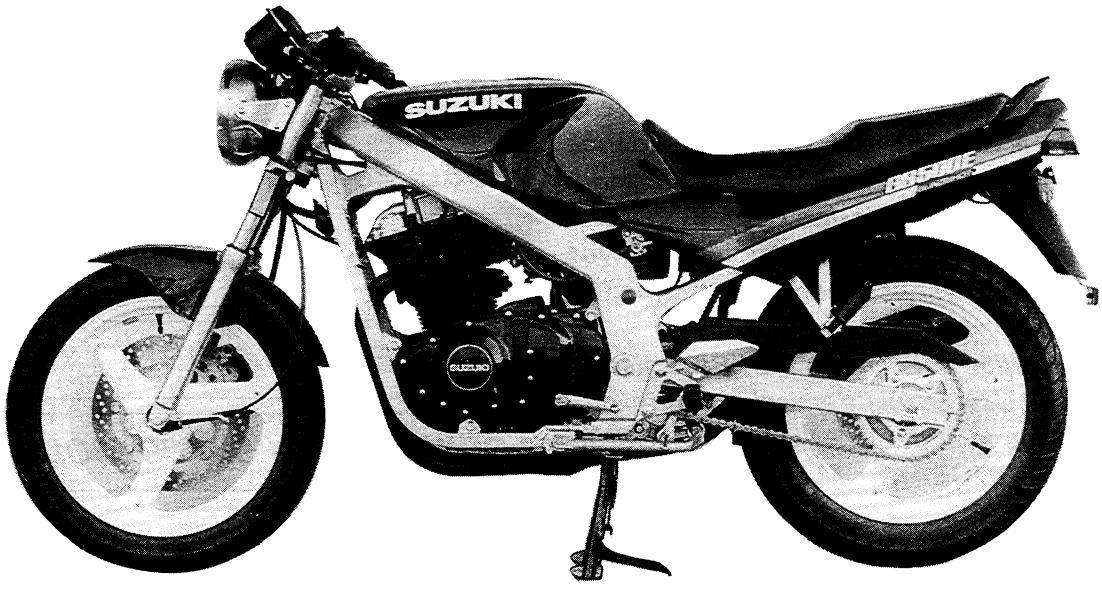

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# VIEW OF GS500E




RIGHT SIDE




LEFT SIDE

* Difference between photographs and actual motorcycle depends on markets.

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# GENERAL INFORMATION

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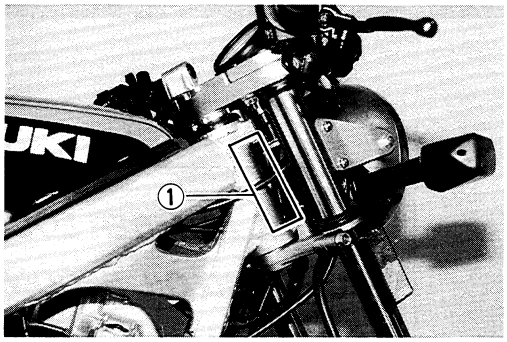
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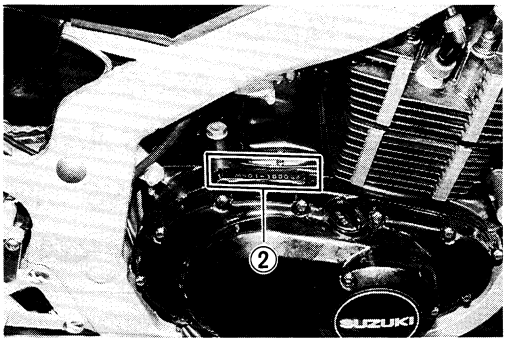

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# SERIAL NUMBER LOCATIONS

The frame number or V. I. N. (Vehicle Identification Number) ① is stamped on the right side of steering head pipe. The engine serial number ② is located on the right side of the crankcase. These numbers are required especially for registering the machine and ordering spare parts.




# FUEL AND OIL RECOMMENDATIONS

## FUEL (For U.S.A. model)

1. Use only unleaded or low-lead type gasoline of at least 85 — 95 pump octane ($\frac{R+M}{2}$)method or 89 octane or higher rated by the research method.
2. Suzuki recommends that customers use alcohol free, unleaded gasoline whenever possible.
3. Use of blended gasoline containing MTBE (Methyl Tertiary Butyl Ether) is permitted.
4. Use of blended gasoline/alcohol fuel is permitted provided that it contains not more than 10% ethanol. Gasoline/alcohol fuel may contain up to 5% methanol if appropriate cosolvents and corrosion inhibitors are present.
5. If the performance of the vehicle is unsatisfactory while using blended gasoline/alcohol fuel, you should switch to alcohol free unleaded gasoline.
6. Failure to follow these guideline could possibly void applicable warranty coverage. Check with your fuel supplier to be sure that the fuel you intend to use meets the requirements listed above.

## FUEL (For Canadian model)

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

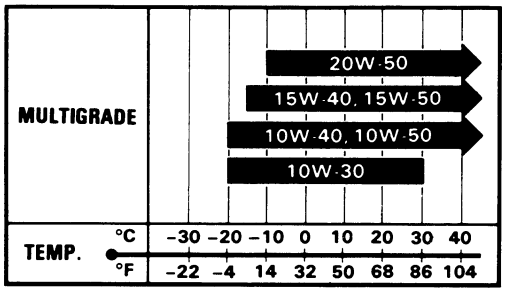
## FUEL (For the other models)

Gasoline used should be graded 85 — 95 octane (Research Method) or higher. An unleaded or low-lead gasoline type is recommended.

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### ENGINE OIL (For U.S.A. model)

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




### ENGINE OIL (For the other models)

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

### FRONT FORK OIL

Use fork oil # 10.

### BRAKE FLUID

**Specification and classification: DOT 4**

**WARNING:**

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

## BREAK-IN PROCEDURES

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

- Keep to these break-in engine speed limits.

**Initial 800 km (500 miles) : Below 5 000 r/min**
**Up to 1 600 km (1 000 miles) : Below 8 000 r/min**
**Over 1 600 km (1 000 miles) : Below 10 000 r/min**

- Upon reaching an odometer reading of 1 600 km (1 000 miles) you can subject the motorcycle to full throttle operation.
  However, do not exceed red zone at any time.

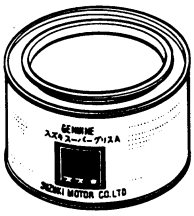
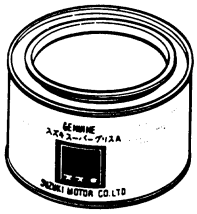
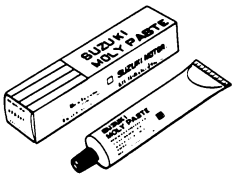
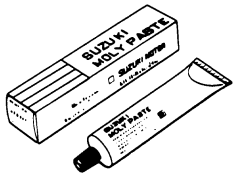
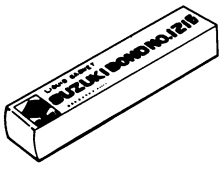
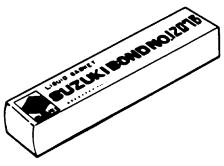
## CYLINDER IDENTIFICATION

The two cylinders of this engine are identified as left-hand and right-hand, as viewed by the rider on the seat.

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# SPECIAL MATERIALS

The materials listed below are needed for maintenance work on the GS500E, and should be kept on hand for ready use. They supplement such standard materials as cleaning fluids, lubricants, emery cloth and the like. How to use them and where to use them are described in the text of this manual.

| MATERIAL | | PART | PAGE |
|---|---|---|---|
| For U.S.A. model | For other models | | |
|  SUZUKI SUPER GREASE "A" 99000-25030 |  SUZUKI SUPER GREASE "A" 99000-25010 | • Driveshaft oil seal<br>• Crankshaft oil seal<br>• Oil filter<br>• Starter motor oil seal<br>• Wheel bearing<br>• Steering stem bearing<br>• Sprocket mounting drum bearing<br>• Swingarm spacer and dust seal cover<br>• Cushion lever bearing and dust seal<br>• Cushion lever rod bearing and dust seal | 3-43<br>3-53<br>2-10<br>5-11<br>6-4<br>6-33<br>6-21<br>6-34<br>6-48<br>6-48<br>6-48 |
|  SUZUKI SILICONE GREASE 99000-25100 |  SUZUKI SILICONE GREASE 99000-25100 | • Brake caliper axle | 6-7 |
|  SUZUKI MOLY PASTE 99000-25140 |  SUZUKI MOLY PASTE 99000-25140 | • Valve stem<br>• Conrod big end bearing<br>• Countershaft and driveshaft<br>• Crankshaft journal bearing<br>• Camshaft journal<br>• Starter motor armature end<br>• Counter-balancer journal | 3-25<br>3-35<br>3-43<br>3-48<br>3-56<br>5-11<br>3-48 |
|  SUZUKI BOND NO. 1207B 99104-31140 |  SUZUKI BOND NO. 1207B 99000-31140 | • Crankcase mating surface<br>• Oil pressure switch<br>• Cam end cap and cylinder head cover | 3-48<br>3-53<br>3-59 |
|  THREAD LOCK SUPER "1303" 99000-32030 |  THREAD LOCK SUPER "1303" 99000-32030 | • Cam sprocket bolt<br>• Cam chain guide bolt and screw<br>• 2nd drive gear<br>• Gearshift cam retainer screw | 3-28<br>3-29<br>3-43<br>3-51 |

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| MATERIAL | | PART | PAGE |
|---|---|---|---|
| For U.S.A. model | For other models | | |
| <br>THREAD LOCK "1360"<br>99000-32130 | <br>THREAD LOCK "1360"<br>99000-32130 | • Disc plate mounting bolt | 6-5<br>6-35 |
| <br>THREAD LOCK "1342"<br>99000-32050 | <br>THREAD LOCK "1342"<br>99000-32050 | • Gearshift cam stopper bolt<br>• Oil pump mounting screw<br>• Countershaft bearing retainer screw<br>• Gearshift fork shaft stopper screw<br>• Generator stator mounting screw<br>• Generator lead wire guide securing screw<br>• Starter motor mounting bolt<br>• Oil separator plate mounting screw<br>• Starter motor housing screw<br>• Front fork damper rod bolt | 3-51<br>3-52<br>3-51<br>3-46<br>5-7<br>5-7<br>3-49<br>3-47<br>5-11<br>6-17 |
| <br>THREAD LOCK SUPER "1303"<br>99000-32030 | <br>THREAD LOCK SUPER "1305"<br>99000-32100 | • Generator rotor mounting bolt<br>• Starter clutch allen bolt | 3-50<br>3-41 |
| <br>SUZUKI BRAKE FLUID<br>DOT3 & DOT4<br>99000-23110 | <br>SUZUKI BRAKE FLUID<br>DOT3 & DOT4<br>99000-23110 | • Brakes | 2-14 |
| <br>SUZUKI FORK OIL # 10<br>99000-99044-10G | <br>SUZUKI FORK OIL # 10<br>99000-99044-10G | | 6-17 |

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| MATERIAL | | PART | PAGE |
|---|---|---|---|
| For U.S.A. model | For other models | | |
|  THREAD LOCK CEMENT 99000-32040 |  THREAD LOCK CEMENT 99000-32040 | • Carburetor set plate screw | 4-11 |

# PRECAUTIONS AND GENERAL INSTRUCTIONS

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

- Do not run engine indoors with little or no ventilation
- Be sure to replace packings, gaskets, circlips, O-rings and cotter pins with new ones.

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

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

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

**WARNING** ..... The personal safety of the rider or bystanders may be involved. Disregarding this information could result in personal injury.
**CAUTION** ..... These instructions point out special service procedures or precautions that must be followed to avoid damaging the machine.
**NOTE**..... This provides special information to make maintenance easier or important instructions clearer.

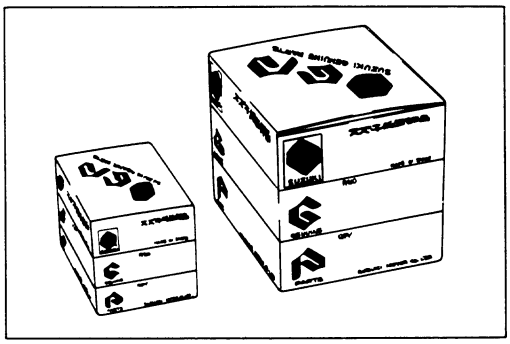
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## REPLACEMENT PARTS

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

***CAUTION:***

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

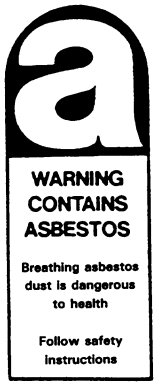


## ASBESTOS INFORMATION

Note the following when handling a supply part with the above WARNING LABEL or any part in the parts list in this section which contains asbestos.

- Operate if possible out of doors in a well ventilated place.
- Preferably use hand tools or low speed tools equipped, if necessary, with an appropriate dust extractor facility. If high speed tools are used, they should always be so equipped.
- If possible, dampen before cutting or drilling.
- Dampen dust and place it in a properly closed receptacle and dispose of it safely.

Any domestic asbestos product to which the above does not apply, but which is likely to release fibres during use should be replaced by new one when worn.




| | |
|---|---|
| 1. | Breather cover gasket |
| 2. | Clutch cover gasket |
| 3. | Generator cover gasket |
| 4. | Starter gear cover gasket |
| 5. | Oil pan gasket |
| 6. | Cam chain tension adjuster gasket |

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# SPECIFICATIONS

## DIMENSIONS AND DRY MASS

| | |
|---|---|
| Overall length | 2 075 mm (81.7 in) |
| Overall width | 725 mm (28.5 in) |
| Overall height | 1 045 mm (41.1 in) |
| Wheelbase | 1 410 mm (55.5 in) |
| Ground clearance | 155 mm (6.1 in) |
| Seat height | 790 mm (31.1 in) |
| Dry mass | 169 kg (373 lbs) |

## ENGINE

| | |
|---|---|
| Type | Four-stroke, air-cooled, DOHC, TDCC |
| Tappet clearance, IN & EX | 0.03 – 0.08 mm (0.0018 – 0.0031 in) |
| Number of cylinders | 2 |
| Bore | 74.0 mm (2.913 in) |
| Stroke | 56.6 mm (2.228 in) |
| Piston displacement | 487 $cm^3$ (29.7 cu, in) |
| Compression ratio | 9.0 : 1 |
| Carburetor | MIKUNI BST33SS, twin |
| Air cleaner | Polyester fiber element |
| Starter system | Electric starter motor |
| Lubrication system | Wet sump |

## TRANSMISSION

| | |
|---|---|
| Clutch | Wet multi-plate type |
| Transmission | 6-speed constant mesh |
| Gearshift pattern | 1-down, 5-up |
| Primary reduction ratio | 2.714 (76/28) |
| Gear ratios, Low | 2.461 (32/13) |
| 2nd | 1.777 (32/18) |
| 3rd | 1.380 (29/21) |
| 4th | 1.125 (27/24) |
| 5th | 0.961 (25/26) |
| Top | 0.851 (23/27) |
| Final reduction ratio | 2.437 (39/16) |
| Drive chain | DID 520V6, 110 links |

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## CHASSIS

| | |
|---|---|
| Front suspension | Telescopic, coil spring, oil damped |
| Rear suspension | Full-floating suspension, oil damped, spring preload 7-way adjustable |
| Front suspension stroke | 120 mm (4.7 in) |
| Rear wheel travel | 115 mm (4.5 in) |
| Caster | 64° 30′ |
| Trail | 95 mm (3.7 in) |
| Steering angle | 35° |
| Turning radius | 2.7 m (8.9 ft) |
| Front brake | Disc |
| Rear brake | Disc |
| Front tire size | 110/70 –17 54H, tubeless |
| Rear tire size | 130/70 –17 62H, tubeless |

## ELECTRICAL

| | |
|---|---|
| Ignition type | Fully Transistorized |
| Ignition timing | 12° B.T.D.C. at 1 200 rpm and<br>40° B.T.D.C. at 4 000 rpm<br>5° B.T.D.C. at 1 200 rpm and<br>40° B.T.D.C. at 4 000 rpm ... California model only |
| Spark plug | NGK: DPR8EA-9 or ND: X24EPR-U9 |
| Battery | 12V 39.6 kC (11Ah)/10HR |
| Generator | Three-phase A.C. generator |
| Fuse | 20A |
| Headlight | 12V 60/55W |
| Parking light | 12V 4W ... except for E-03, 28 and 33 |
| Turn signal light | 12V 21W |
| Tail/brake light | 12V 5/21W |
| Speedometer light | 12V 3.4W |
| Tachometer light | 12V 3.4W |
| Neutral indicator light | 12V 3.4W |
| High beam indicator light | 12V 1.7W |
| Turn signal indicator light | 12V 3.4W |
| Oil pressure indicator light | 12V 3.4W |

## CAPACITIES

| | |
|---|---|
| Fuel tank, including reserve | 17.0 L (4.5/3.7 US/Imp gal) |
| reserve | 3.5 L (3.7/3.1 US/Imp qt) |
| Engine oil, oil change | 2 600 ml (2.7/2.3 US/Imp qt) |
| with filter change | 2 900 ml (3.1/2.6 US/Imp qt) |
| overhaul | 3 200 ml (3.4/2.8 US/Imp qt) |
| Front fork oil | 382 ml (12.9/13.5 US/Imp oz) |

* These specifications are subject to change without notice.

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# COUNTRY OR AREA

The series of symbols on the left stand for the countries and areas on the right.

| SYMBOL | COUNTRY or AREA |
|---|---|
| E-01 | General |
| E-02 | England |
| E-03 | U.S.A. |
| E-04 | France |
| E-15 | Finland |
| E-16 | Norway |
| E-17 | Sweden |
| E-21 | Belgium |
| E-22 | W.Germany |
| E-24 | Australia |
| E-25 | Netherlands |
| E-28 | Canada |
| E-33 | California (U.S.A.) |
| E-34 | Italy |
| E-39 | Austria |
| E-53 | Spain |

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# PERIODIC MAINTENANCE AND TUNE-UP PROCEDURES



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# PERIODIC MAINTENANCE SCHEDULE

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

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

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

## PERIODIC MAINTENANCE CHART

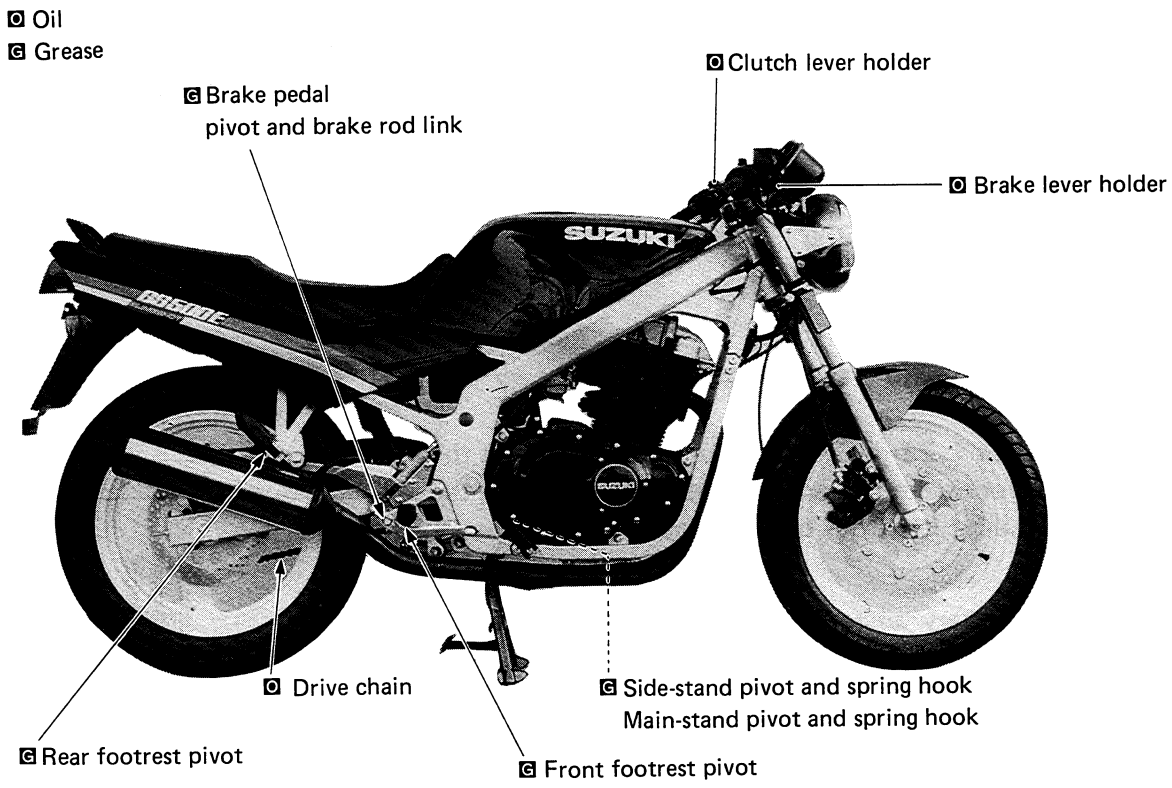
| **INTERVAL: THIS INTERVAL SHOULD BE JUDGED BY ODOMETER READING OR MONTHS WHICHEVER COMES FIRST** | km | 1 000 | 6 000 | 12 000 | 18 000 | 24 000 |
|---|---|---|---|---|---|---|
| | miles | 600 | 4 000 | 7 500 | 11 000 | 15 000 |
| | months | 2 | 12 | 24 | 36 | 48 |
| Battery (Specific gravity of electrolyte) | | — | I | I | I | I |
| Cylinder head nuts & exhaust pipe bolts | | T | T | T | T | T |
| Air cleaner element | | Clean every 3 000 km (2 000 miles) and replace every 12 000 km (7 500 miles) | | | | |
| Tappet clearance | | I | I | I | I | I |
| Spark plugs | | — | I | R | I | R |
| Fuel line (Vapor hose.....California model only) | | I | I | I | I | I |
| | | Replace every four years | | | | |
| Engine oil and filter | | R | R | R | R | R |
| Carburetors (Idle rpm) | | I | I | I | I | I |
| Clutch | | I | I | I | I | I |
| Drive chain | | I | I | I | I | I |
| | | Clean and lubricate every 1 000 km (600 miles) | | | | |
| Brake hoses | | I | I | I | I | I |
| | | Replace every four years | | | | |
| Brake fluid | | I | I | I | I | I |
| | | Replace every two years | | | | |
| Brakes | | I | I | I | I | I |
| Tires | | I | I | I | I | I |
| Steering | | I | I | I | I | I |
| Front forks | | I | — | I | — | I |
| Rear suspension | | I | — | I | — | I |
| Chassis bolts and nuts | | T | T | T | T | T |

*NOTE: T = Tighten, I = Inspect, R = Replace*

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## LUBRICATION POINTS

Proper lubrication is important for smooth operation and long life of each working part of the motorcycle. Major lubrication points are indicated below.




*NOTE:*

** Before lubricating each part, clean off any rusty spots and wipe off any grease, oil, dirt or grime.*

** Lubricate exposed parts which are subject to rust, with oil or grease.*

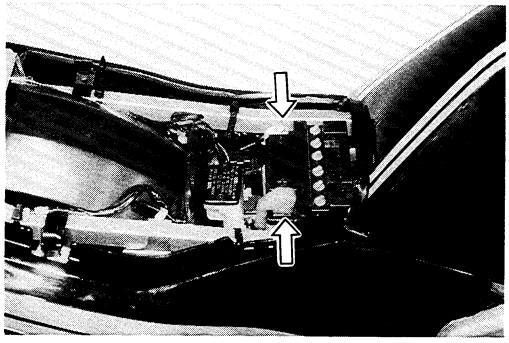
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# MAINTENANCE AND TUNE-UP PROCEDURES

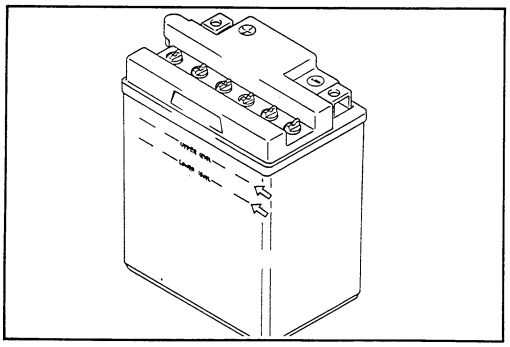
This section describes the servicing procedures for each item of the Periodic Maintenance requirements.

## BATTERY

**Inspect Every 6 000 km (4 000 miles, 12 months).**



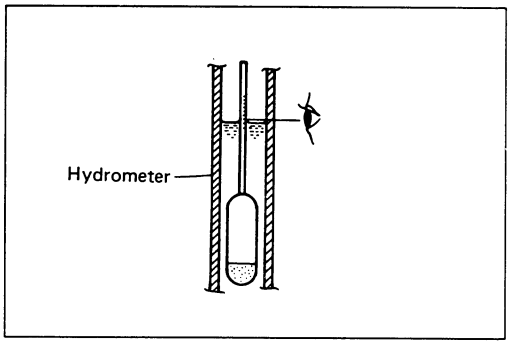
- Remove the seat.
- Remove the battery ⊖ and ⊕ lead wires from the battery terminals.
- Remove the battery from its frame.
- Check the electrolyte for level and specific gravity. Add distilled water, as necessary, to keep the surface of the electrolyte above the MIN. level line but not above the MAX. level line.
- For checking specific gravity, use a hydrometer to determine the charged condition.



**09900-28403 : Hydrometer**

**Standard specific gravity : 1.28 at 20°C (68°F)**

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

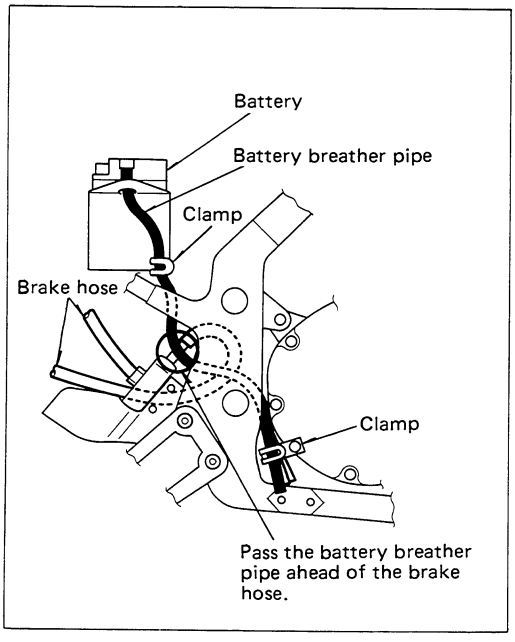



**CAUTION:**
**Never charge a battery while still in the machine as damage may result to the battery or regulator/rectifier.**

- Charge at a maximum of 1.2 amps.
- To install the battery, reverse the procedure described above.

**WARNING:**
**When installing the battery lead wires, fix the ⊕ lead first and ⊖ lead last.**

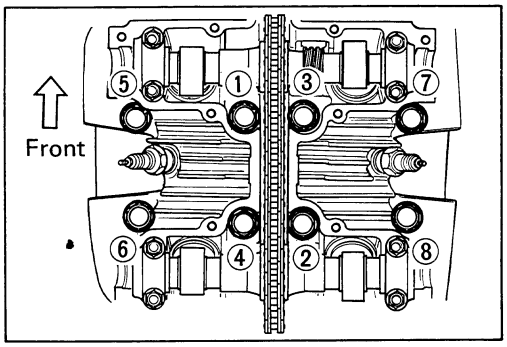
- Make sure that the breather pipe is tightly secured and undamaged, and is routed as shown in the figure.




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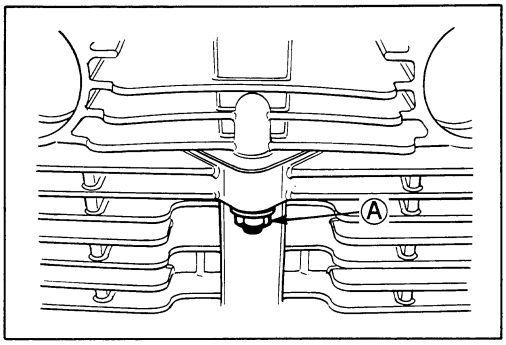
## CYLINDER HEAD NUTS AND EXHAUST PIPE BOLTS

**Tighten at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.**




### CYLINDER HEAD

- Remove the seat.
- Remove the pillion rider grabber and frame covers. (Refer to page 3-4.)
- Remove the fuel tank. (Refer to page 3-4.)
- Remove the cylinder head cover. (Refer to page 3-10.)
- First loosen and retighten the nuts to the specified torque with a torque wrench sequentially in ascending numerical order with the engine cold.




**Tightening torque**
**Cylinder head nut : 35 — 40 N·m**
**(3.5 — 4.0 kg-m, 25.5 — 29.0 lb-ft)**

- After firmly tightening the 8-nuts, tighten the nut (indicated as Ⓐ) to the torque value below:

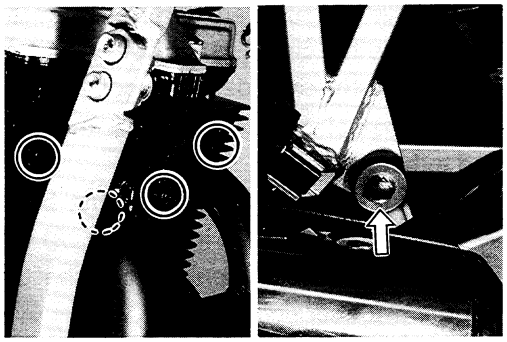
**Tightening torque**
**Cylinder head nut Ⓐ: 7 — 11 N·m (0.7 — 1.1 kg-m, 5.0 — 8.0 lb-ft)**

- When installing the cylinder head cover, apply SUZUKI Bond No. 1207B to the head cover groove and cam end caps. (Refer to page 3-59.)
- Tighten the head cover bolts to the specified torque.

**Tightening torque : 13 — 15 N·m (1.3 — 1.5 kg-m, 9.5 — 11.0 lb-ft)**

### EXHAUST PIPE AND MUFFLER

- Tighten the exhaust pipe clamp bolts and muffler mounting bolt to the specified torque with a torque wrench.



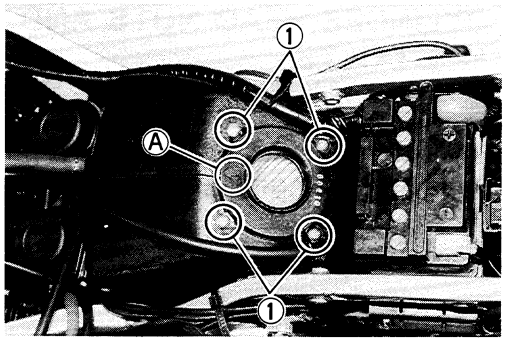
**Tightening torque**
**Exhaust pipe bolt : 9 — 12 N·m**
**(0.9 — 1.2 kg-m, 6.5 — 8.5 lb-ft)**

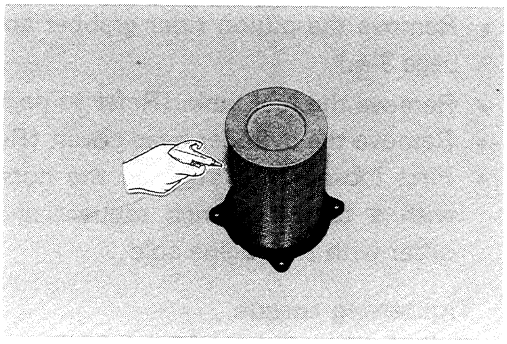
**Muffler mounting bolt : 18 — 28 N·m**
**(1.8 — 2.8 kg-m, 13.0 — 20.0 lb-ft)**

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## AIR CLEANER

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



- Remove the seat.
- Remove the pillion rider grabber and frame covers. (Refer to page 3-4.)
- Remove the fuel tank. (Refer to page 3-4.)
- Remove the air cleaner element by removing four screws ①.
- Carefully use air hose to blow the dust from the cleaner element outside.

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

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

**CAUTION:**
**If driving under dusty conditions, clean the air cleaner element more frequently. The surest way to accelerate engine wear is to use the engine without the element or to use a ruptured element. Make sure that the air cleaner is in good condition at all times. Life of the engine depends largely on this component!**

## TAPPET CLEARANCE

**Inspect at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.**

- Remove the seat.
- Remove the pillion rider grabber and frame covers. (Refer to page 3-4.)
- Remove the fuel tank. (Refer to page 3-4.)
- Remove the signal generator cover.
- Remove the cylinder head cover. (Refer to page 3-10.)

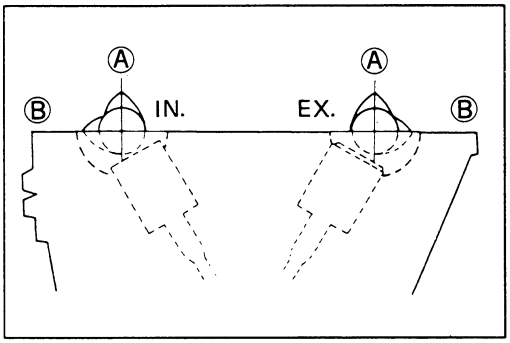
The tappet clearance specification is the same for both intake and exhaust valves.
Tappet clearance adjustment must be checked and adjusted, 1) at the time of periodic inspection, 2) when the valve mechanism is serviced, and 3) when the camshafts are disturbed by removing them for servicing.

**Tappet clearance (when cold) : IN. & EX. 0.03 – 0.08 mm (0.001 – 0.003 in)**

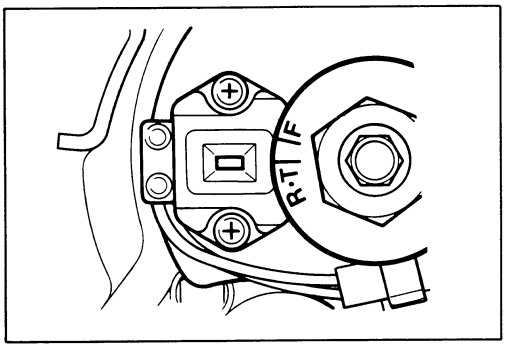
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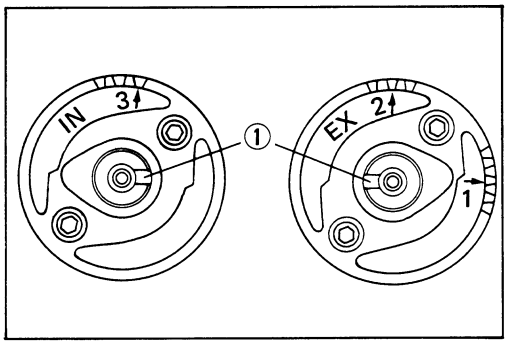
*NOTE:*

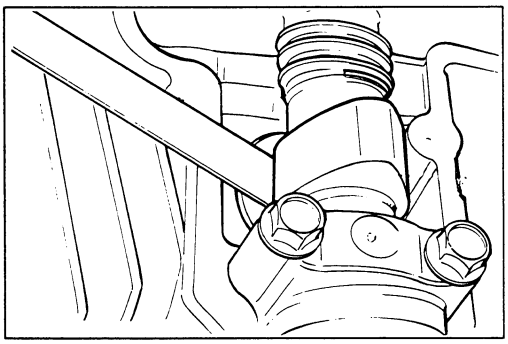
* *The cam must be at positions, Ⓐ or Ⓑ, in order to check the tappet clearance or to adjust tappet clearance. Clearance readings should not be taken with the cam in any other position than these two positions.*
* *The clearance specification is for COLD state.*
* *To turn the crankshaft for clearance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




- Turn crankshaft to bring the "R" and "T" marks on the rotor to the center of left pick-up coil and also to bring the notches ① in the right ends of both camshafts (Ex and In) to the positions shown. In this condition, read the tappet clearance at the valves Ⓒ (In and Ex of right cylinder, and In of left cylinder).



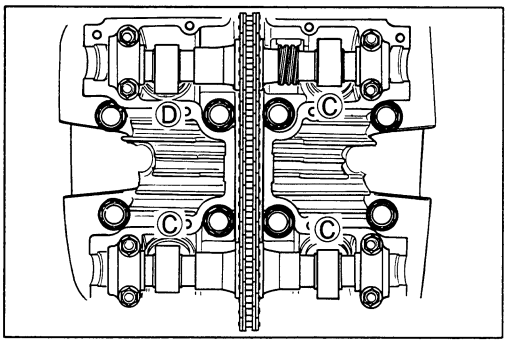



- Use thickness gauge between tappet and cam. If clearance is off the specification, bring it into the specified range by using the special tool.

**09900-20803 : Thickness gauge**

- Turn the crankshaft 360° (one rotation) to bring the notches ① to the positions shown.
- Read the clearance at the remaining valve Ⓓ and adjust the clearance if necessary.

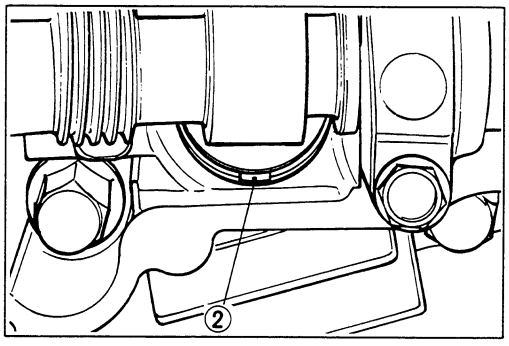



| | Notch ① position | |
|---|---|---|
| Cam Position | Intake Camshaft | Exhaust Camshaft |
| Ⓒ | ◒ | ◒ |
| Ⓓ | ◒ | ◒ |

## TAPPET CLEARANCE ADJUSTMENT

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

- Place a fingertip on the tappet, and turn it in place to bring notch ② to the position indicated.

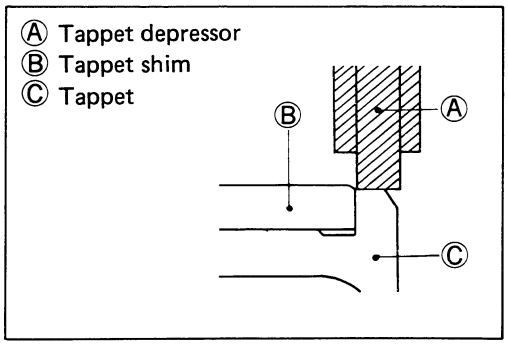



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- Push down the tappet by using the special tool.

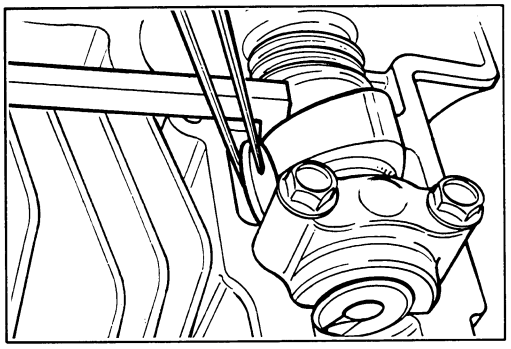
*NOTE:*
*Make sure the tool exerts pressure on the tappet correctly, as shown.*

**09916-64510 : Tappet depressor**

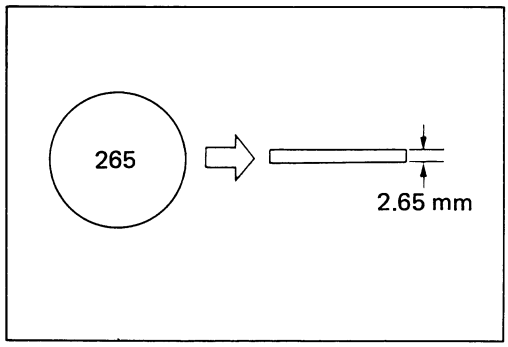



- Remove the tappet shim from the tappet.

**09916-84510 : Tweezers**



- Check the figures printed on the shim. These figures indicate the thickness of the shim, as illustrated.
- Select a replacement shim that will provide a clearance within the specified range (0.03 – 0.08 mm). For the purpose of this adjustment, a total of 20 sizes of tappet shim are available ranging from 2.15 to 3.10 mm in steps of 0.05 mm. Fit the selected shim to the tappet, with numbers toward tappet. Be sure to check shim size with micrometer to insure its size.




*NOTE:*
* *Before fitting the tappet shim to the tappet, be sure to apply engine oil to its top and bottom faces.*
* *When seating tappet shim, be sure to face figure printed surface to the tappet.*

- After replacing the tappet shim, rotate the engine so that the tappet is depressed fully. This will squeeze out oil trapped between the shim and the tappet that could cause an incorrect measurement, then check the clearance again to confirm that it is within the specified range.

Tappet shim size chart

| Thickness (mm) | Part No. |
|---|---|
| 2.15 | 12892-45000-215 |
| 2.20 | 12892-45000-220 |
| 2.25 | 12892-45000-225 |
| 2.30 | 12892-45000-230 |
| 2.35 | 12892-45000-235 |
| 2.40 | 12892-45000-240 |
| 2.45 | 12892-45000-245 |
| 2.50 | 12892-45000-250 |
| 2.55 | 12892-45000-255 |
| 2.60 | 12892-45000-260 |
| 2.65 | 12892-45000-265 |
| 2.70 | 12892-45000-270 |
| 2.75 | 12892-45000-275 |
| 2.80 | 12892-45000-280 |
| 2.85 | 12892-45000-285 |
| 2.90 | 12892-45000-290 |
| 2.95 | 12892-45000-295 |
| 3.00 | 12892-45000-300 |
| 3.05 | 12892-45000-305 |
| 3.10 | 12892-45000-310 |

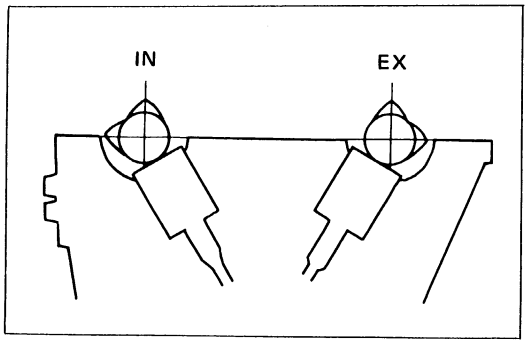
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# SHIM SELECTION CHART

PRESENT SHIM SIZE — mm

| P/N SUFFIX- | 215 | 220 | 225 | 230 | 235 | 240 | 245 | 250 | 255 | 260 | 265 | 270 | 275 | 280 | 285 | 290 | 295 | 300 | 305 | 310 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tappet Clearance (mm) | 2.15 | 2.20 | 2.25 | 2.30 | 2.35 | 2.40 | 2.45 | 2.50 | 2.55 | 2.60 | 2.65 | 2.70 | 2.75 | 2.80 | 2.85 | 2.90 | 2.95 | 3.00 | 3.05 | 3.10 |
| 0.00~0.02 | | 2.15 | 2.20 | 2.25 | 2.30 | 2.35 | 2.40 | 2.45 | 2.50 | 2.55 | 2.60 | 2.65 | 2.70 | 2.75 | 2.80 | 2.85 | 2.90 | 2.95 | 3.00 | 3.05 |
| 0.03~0.08 | SPECIFIED CLEARANCE: NO ADJUSTMENT REQUIRED | | | | | | | | | | | | | | | | | | | |
| 0.09~0.13 | 2.20 | 2.25 | 2.30 | 2.35 | 2.40 | 2.45 | 2.50 | 2.55 | 2.60 | 2.65 | 2.70 | 2.75 | 2.80 | 2.85 | 2.90 | 2.95 | 3.00 | 3.05 | 3.10 | |
| 0.14~0.18 | 2.25 | 2.30 | 2.35 | 2.40 | 2.45 | 2.50 | 2.55 | 2.60 | 2.65 | 2.70 | 2.75 | 2.80 | 2.85 | 2.90 | 2.95 | 3.00 | 3.05 | 3.10 | | |
| 0.19~0.23 | 2.30 | 2.35 | 2.40 | 2.45 | 2.50 | 2.55 | 2.60 | 2.65 | 2.70 | 2.75 | 2.80 | 2.85 | 2.90 | 2.95 | 3.00 | 3.05 | 3.10 | | | |
| 0.24~0.28 | 2.35 | 2.40 | 2.45 | 2.50 | 2.55 | 2.60 | 2.65 | 2.70 | 2.75 | 2.80 | 2.85 | 2.90 | 2.95 | 3.00 | 3.05 | 3.10 | | | | |
| 0.29~0.33 | 2.40 | 2.45 | 2.50 | 2.55 | 2.60 | 2.65 | 2.70 | 2.75 | 2.80 | 2.85 | 2.90 | 2.95 | 3.00 | 3.05 | 3.10 | | | | | |
| 0.34~0.38 | 2.45 | 2.50 | 2.55 | 2.60 | 2.65 | 2.70 | 2.75 | 2.80 | 2.85 | 2.90 | 2.95 | 3.00 | 3.05 | 3.10 | | | | | | |
| 0.39~0.43 | 2.50 | 2.55 | 2.60 | 2.65 | 2.70 | 2.75 | 2.80 | 2.85 | 2.90 | 2.95 | 3.00 | 3.05 | 3.10 | | | | | | | |
| 0.44~0.48 | 2.55 | 2.60 | 2.65 | 2.70 | 2.75 | 2.80 | 2.85 | 2.90 | 2.95 | 3.00 | 3.05 | 3.10 | | | | | | | | |
| 0.49~0.53 | 2.60 | 2.65 | 2.70 | 2.75 | 2.80 | 2.85 | 2.90 | 2.95 | 3.00 | 3.05 | 3.10 | | | | | | | | | |
| 0.54~0.58 | 2.65 | 2.70 | 2.75 | 2.80 | 2.85 | 2.90 | 2.95 | 3.00 | 3.05 | 3.10 | | | | | | | | | | |
| 0.59~0.63 | 2.70 | 2.75 | 2.80 | 2.85 | 2.90 | 2.95 | 3.00 | 3.05 | 3.10 | | | | | | | | | | | |
| 0.64~0.68 | 2.75 | 2.80 | 2.85 | 2.90 | 2.95 | 3.00 | 3.05 | 3.10 | | | | | | | | | | | | |
| 0.69~0.73 | 2.80 | 2.85 | 2.90 | 2.95 | 3.00 | 3.05 | 3.10 | | | | | | | | | | | | | |
| 0.74~0.78 | 2.85 | 2.90 | 2.95 | 3.00 | 3.05 | 3.10 | | | | | | | | | | | | | | |
| 0.79~0.83 | 2.90 | 2.95 | 3.00 | 3.05 | 3.10 | | | | | | | | | | | | | | | |
| 0.84~0.88 | 2.95 | 3.00 | 3.05 | 3.10 | | | | | | | | | | | | | | | | |
| 0.89~0.93 | 3.00 | 3.05 | 3.10 | | | | | | | | | | | | | | | | | |
| 0.94~0.98 | 3.05 | 3.10 | | | | | | | | | | | | | | | | | | |
| 0.99~1.03 | 3.10 | | | | | | | | | | | | | | | | | | | |




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

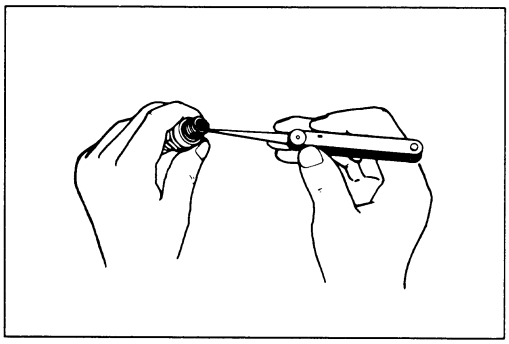
EXAMPLE:
Tappet clearance — 0.55 mm
Existing shim size — 2.40 mm
Shim size to be used — 2.90 mm

- When installing the cylinder head cover, apply SUZUKI Bond No. 1207B to the head cover groove and cam end caps. (Refer to page 3-59.)
- Tighten the cylinder head cover bolts to the specified torque.

**Tightening torque : 13 — 15 N·m**
**(1.3 — 1.5 kg-m, 9.5 — 11.0 lb-ft)**

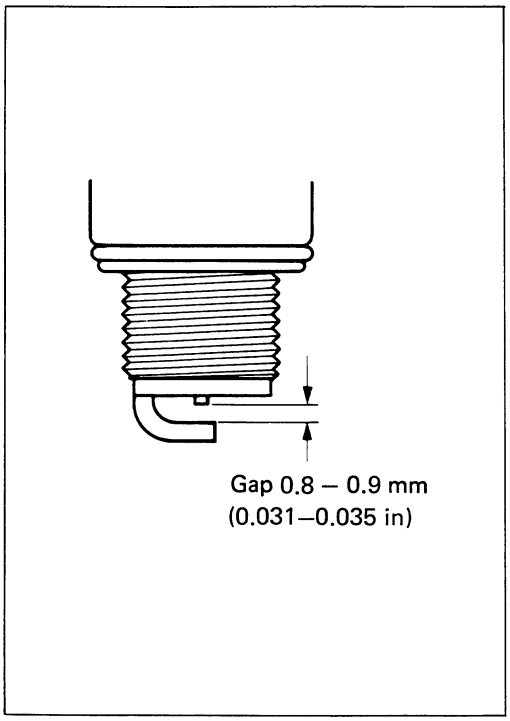
## SPARK PLUGS

**Inspect 6 000 km (4 000 miles, 12 months), 18 000 km (11 000 miles, 36 months) and Replace Every 12 000 km (7 500 miles, 24 months).**



- Remove the spark plugs by using the spark plug wrench.

The spark plug gap is correctly adjusted to 0.8 — 0.9 mm (0.031 — 0.035 in) by using a thickness gauge. When carbon is deposited on the spark plug, remove the carbon with a spark plug cleaning machine or by carefully using a tool with a pointed end. If the electrodes are extremely worn or burnt, replace the plug. Also replace the plug if it has a broken insulator, damaged thread, etc.
NGK DPR8EA-9 or N.D. X24EPR-U9 should be used as the standard plug. However, the heat range of the plug should be selected to meet the requirements of speed, actual load, fuel, etc. If the plugs need to be replaced, it is recommended that ones having a heat range closest to the standard plug as shown below. Remove the plugs and inspect the insulators. Proper heat range would be indicated if all insulators were light brown in color. If they are apt to get wet (blackened by carbon), they should be replaced by a hot type and if baked white, by a cold type.




**09930-10120 : Spark plug wrench set**
**09900-20803 : Thickness gauge**

**CAUTION:**
**Confirm the thread size and reach when replacing the plug. If the reach is too short, carbon will be deposited on the screw portion of the plug hole and engine damage may result.**

*NOTE:*
*"R" type spark plug is installed for some specifications. "R" type spark plug has a resister located at the center electrode to prevent radio noise.*

**Recommended spark plug**

| | NGK | N.D. |
|---|---|---|
| Standard | DPR8EA-9 | X24EPR-U9 |
| Hot type | DPR7EA-9 | X22EPR-U9 |
| Cold type | DPR9EA-9 | X27EPR-U9 |

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## FUEL LINE

**Inspect at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months). Replace Every four years.**

**VAPOR HOSE ..... CALIFORNIA MODEL ONLY**

## ENGINE OIL AND OIL FILTER

**Replace at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.**

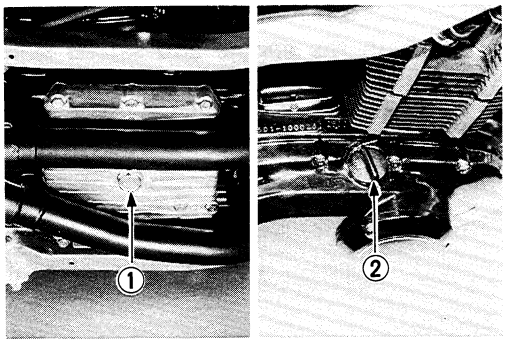
Oil should be changed while the engine is hot. Oil filter replacement at the above intervals should be done together with engine oil change.

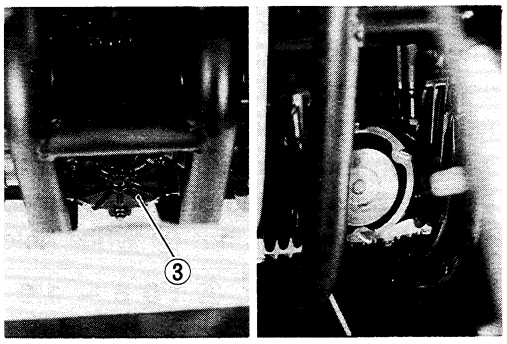
- Keep the motorcycle upright.
- Place an oil pan below the engine and drain oil by removing the drain plug ① and filler cap ②.
- Remove the oil filter cap ③ by removing the three nuts.
- Replace the oil filter with new one.

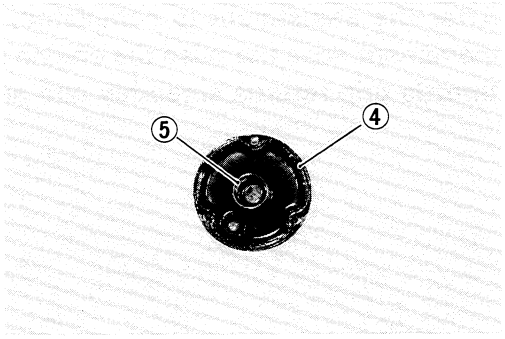
*NOTE:*
*Be sure to take care of O-ring ④ to prevent any damage and be sure that filter spring ⑤ is properly in place.*

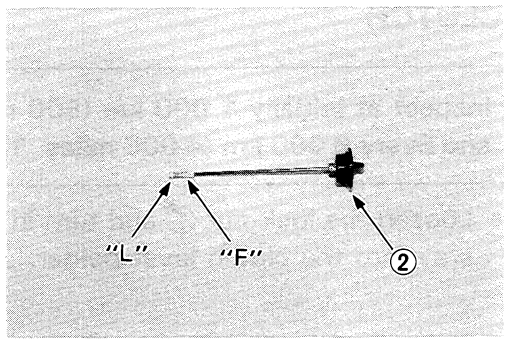
- Apply grease lightly to the O-ring ④ of the oil filter cap ③ before installation.

- Fit the drain plug ① securely, and add fresh oil through the oil filler. The engine will hold about 2.9 L (3.1 US qt) of oil. Use an API classification of SE or SF oil with SAE 10 W/40 viscosity.
- Install the filler cap ②.
- Start up the engine and allow it to run for several seconds at idling speed.
- Turn off the engine and wait about one minute, then check the oil level by removing the filler cap ②. If the level is below mark "F", add oil to that level.




### NECESSARY AMOUNT OF ENGINE OIL

| | |
|---|---|
| Oil change | 2.6 L (2.7 US qt) |
| Filter change | 2.9 L (3.1 US qt) |
| Overhaul engine | 3.2 L (3.4 US qt) |

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## CARBURETORS

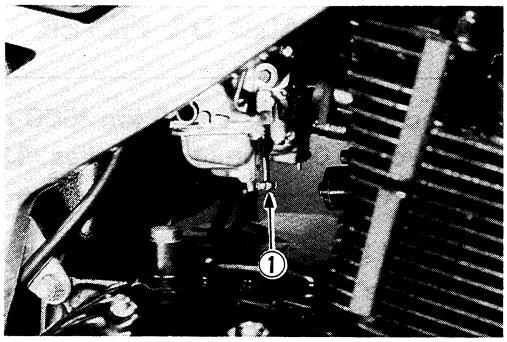
### IDLE R/MIN. (Idling adjustment)

**Inspect at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.**

*NOTE:*
*Make this adjustment when the engine is hot.*

- Connect a tachometer.
- Start up the engine and set its speed at anywhere between 1 000 and 1 300 r/min by turning throttle stop screw ①.

**Engine idle speed : 1 200 ± 100 r/min**

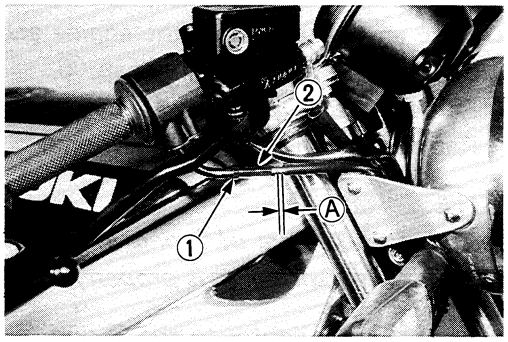



### THROTTLE CABLE PLAY

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

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

**Throttle cable play Ⓐ : 0.5 — 1.0 mm (0.02 — 0.04 in)**

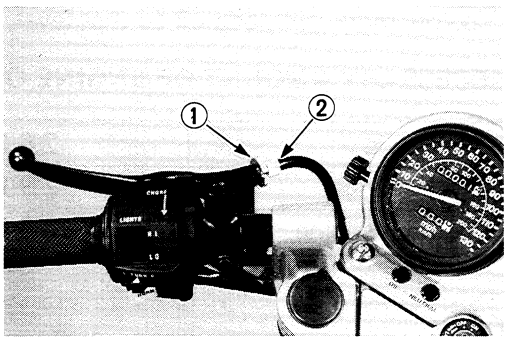



**WARNING:**
**After the adjustment is completed, check that handlebar movement does not raise the engine idle speed and that the throttle grip returns smoothly and automatically.**

## CLUTCH

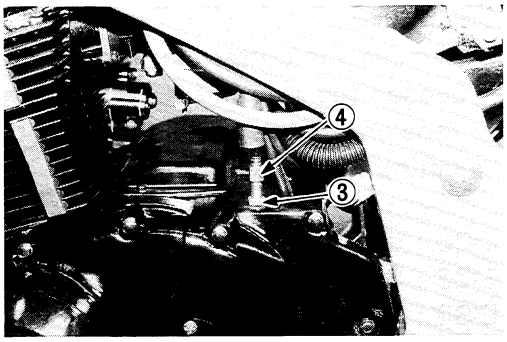
**Inspect at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.**

- Loosen the lock nut ① and turn in the adjuster ② all the way into the clutch lever holder.

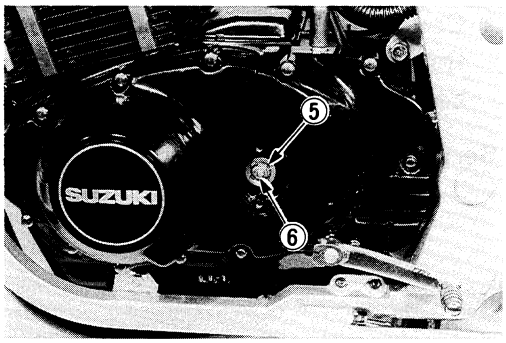



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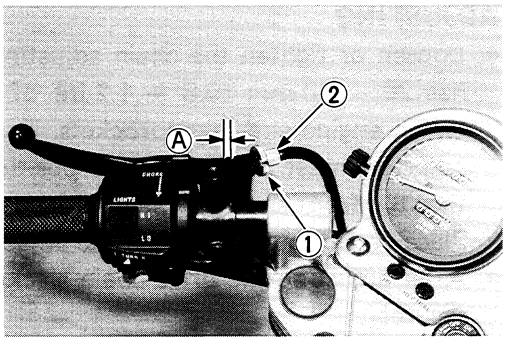
- Loosen the lock nut ③ and, if required, turn the adjuster ④ in place to introduce some play in the clutch lever.
- Remove the clutch release cover.




- Loosen the lock nut ⑤ and back the adjusting screw ⑥ out two or three rotations.
- Slowly turn the adjusting screw in until it begins to meet high resistance to turning.
  From this position, back it out 1/4 – 1/2 rotation and secure the lock nut ⑤.

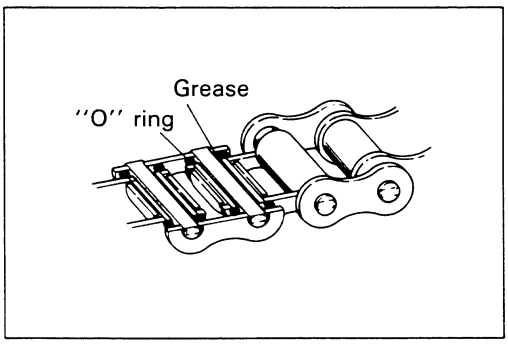



- Reset the adjuster ④ to provide a clutch lever play Ⓐ of 4 mm (0.16 in), and tighten the lock nut ③.
- Lock the adjuster ② using lock nut ①.




## DRIVE CHAIN

**Inspect at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter. Clean and Lubricate Every 1 000 km (600 miles).**



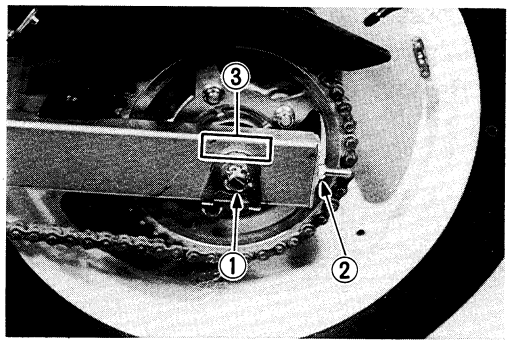

Visually check the drive chain for the listed below possible defects. (Support the motorcycle by center stand, and turn the rear wheel slowly by hand with the transmission shifted to Neutral.)

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

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

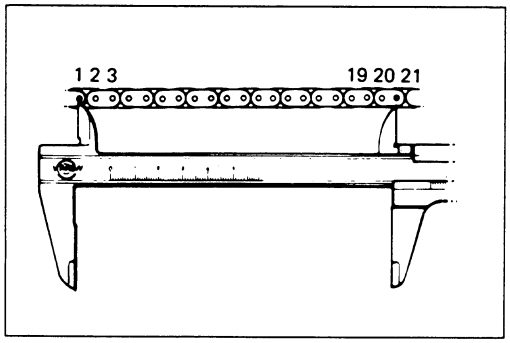
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## CHECKING




- Remove the cotter pin. (For E-03, 28 and 33 models)
- Loosen the axle nut ①.
- Tension the drive chain fully by tightening the chain adjusting nuts ②, left and right.

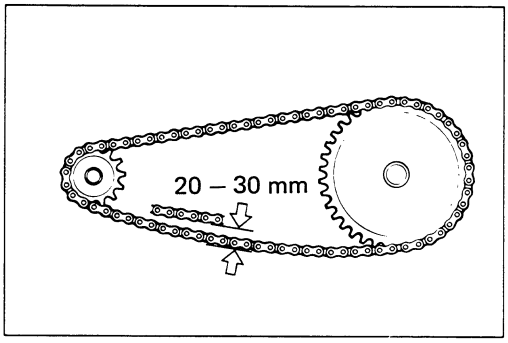
E-03 : U.S.A.
E-28 : Canada
E-33 : California (U.S.A.)




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

**Service Limit : 319.4 mm (12.57 in)**

## ADJUSTING




- Loosen or tighten the chain adjusting nuts ② until the chain has 20 – 30 mm (0.8 – 1.2 in) of slack at the middle between engine and rear sprockets. The mark ③ on both chain adjusters must be at the same position on the scale to ensure that the front and rear wheels are correctly aligned.
  Place on side stand for accurate adjustment.
- After adjusting the drive chain slack, tighten the axle nut ① securely.
- Tighten the chain adjusting nuts securely.

**Tightening torque (Rear axle nut):**
**Normal nut with cotter pin**
**50 – 80 N·m**
**(5.0 – 8.0 kg-m, 36.0 – 58.0 lb-ft)**
**Self-lock nut**
**60 – 96 N·m**
**(6.0 – 9.6 kg-m, 43.5 – 69.5 lb-ft)**

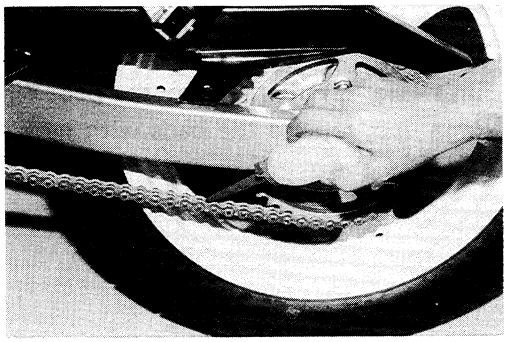
## CLEANING AND LUBRICATING

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

**CAUTION:**
**Do not use trichlene, gasoline or any similar fluids. These fluids have too great a dissolving power for this chain and, what is more important, can damage the ''O'' rings (or seals) confining the grease in the bush to pin clearance. Remember, high durability comes from the presence of grease in that clearance.**

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



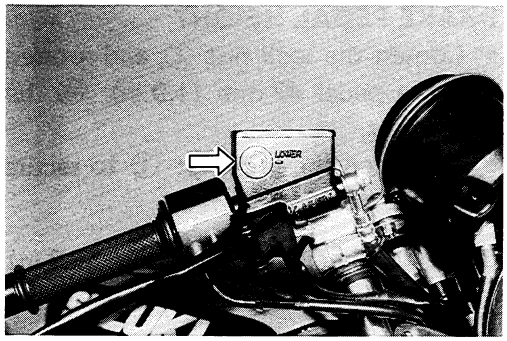
**CAUTION:**

*** Do not use any oil sold commercially as "drive chain oil". Such oil can damage the "O" rings (or seals).**

*** The standard drive chain is DAIDO D.I.D 520V6-110 links. SUZUKI recommends that the above-mentioned standard drive chain be used for the replacement.**

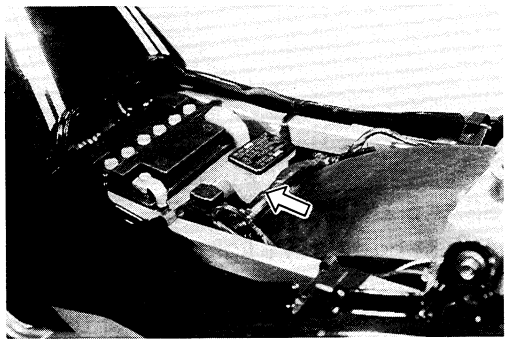
## BRAKES

**Inspect at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.**
**Replace hoses Every four years.**
**Change fluid Every two years.**



### BRAKE FLUID LEVEL

- Keep the motorcycle upright and place the handlebars straight.
- Check the brake fluid level by observing the upper (Only for rear brake) and lower (Both front and rear brake) limit lines on the brake fluid reservoirs.



**Specification and Classification : DOT4**

**99000-23110 : SUZUKI BRAKE FLUID DOT 3 & DOT 4**

**WARNING:**

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

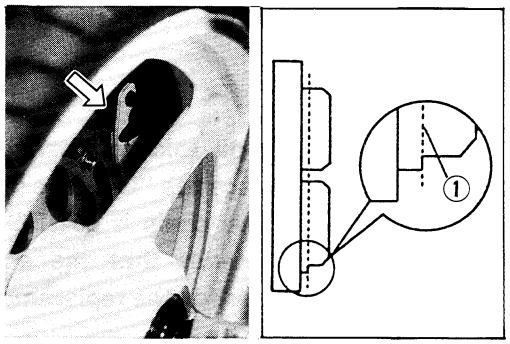
**WARNING:**

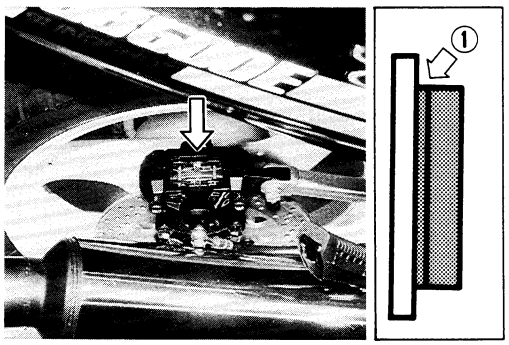
**Brake fluid, if it leaks, will interfere with safe running and immediately discolor painted surfaces.**
**Check the brake hoses and hose joints for cracks and oil leakage before riding.**

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## BRAKE PADS

The extent of brake pad wear can be checked by observing the limit line ① marked on the pad. When the wear exceeds the limit line, replace the pads with new ones. (Refer to pages 6-9 and 6-24.)

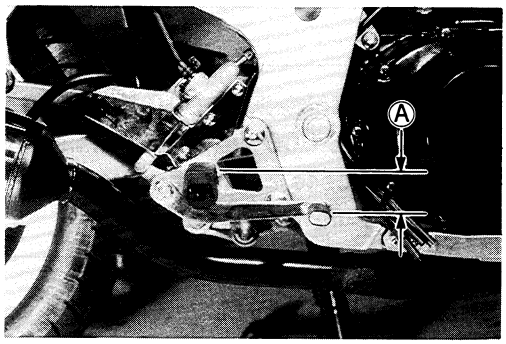


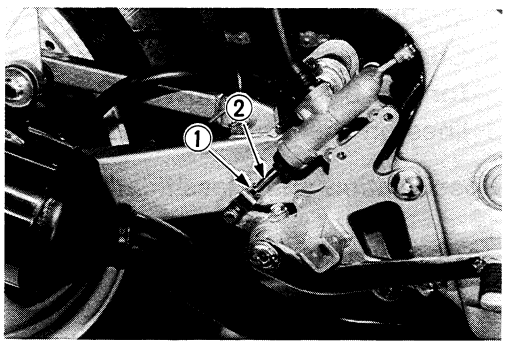




## BRAKE PEDAL HEIGHT

- Loosen the lock nut ①, and rotate the push rod ② to locate brake pedal 47 mm (1.9 in) Ⓐ below the top face of the footrest.
- Retighten the lock nut ① to secure the push rod ② in the proper position.

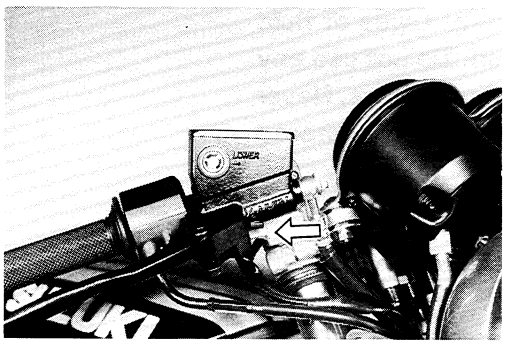
**Brake pedal height Ⓐ : 47 mm (1.9 in)**

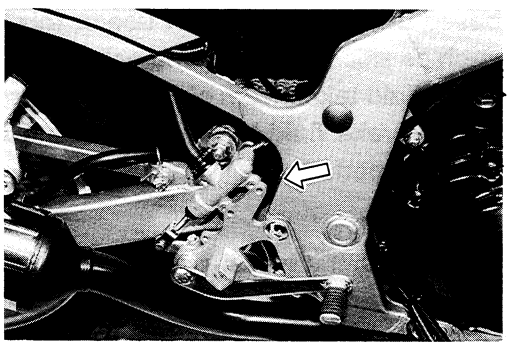



## BRAKE LIGHT SWITCHES

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



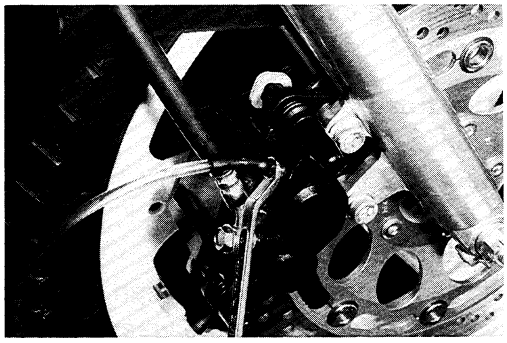


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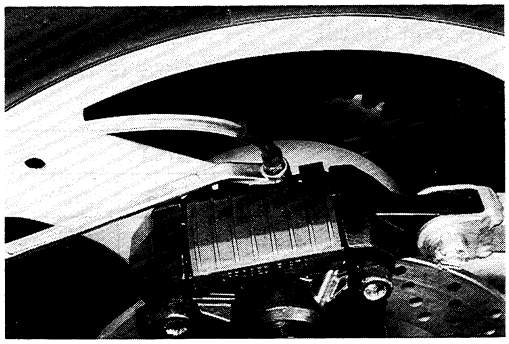
## AIR BLEEDING FROM THE BRAKE FLUID CIRCUIT

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

- Fill up the master cylinder reservoirs to the upper end of the inspection window, (for front brake) and ''UPPER'' line (for rear brake).
  Replace the reservoir cap to prevent entry of dirt.
- Attach a pipe to the caliper bleeder valve, and insert the free end of the pipe into a receptacle.



**Tightening torque (Bleeder valve) :**
**6 — 9 N·m**
**(0.6 — 0.9 kg-m, 4.5 — 6.5 lb-ft)**



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

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

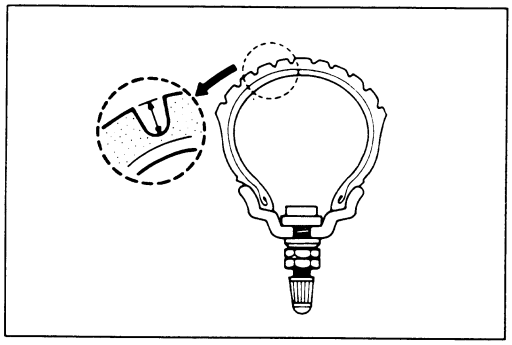
- Close the bleeder valve, and disconnect the pipe. Fill the reservoir to the upper end of the inspection window, (for front brake) and ''UPPER'' line (for rear brake).

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

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

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## TIRES



**Inspect at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.**

### TIRE TREAD CONDITION

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

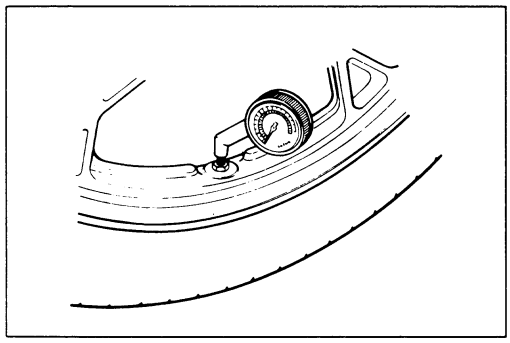
**Tire tread depth limit**
**Front : 1.6 mm (0.06 in)**
**Rear : 2.0 mm (0.08 in)**

### TIRE PRESSURE

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

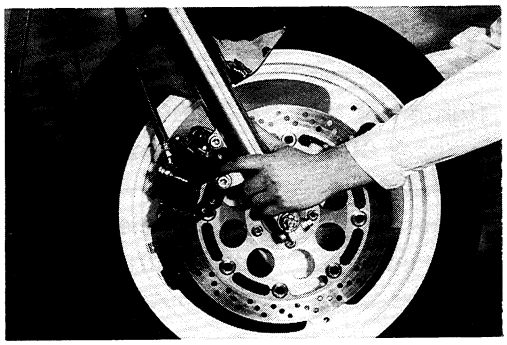
| | FRONT | | | REAR | | |
|---|---|---|---|---|---|---|
| | kg/cm² | kPa | psi | kg/cm² | kPa | psi |
| Solo riding | 2.25 | 225 | 33 | 2.50 | 250 | 36 |
| Dual riding | 2.25 | 225 | 33 | 2.80 | 280 | 41 |

**CAUTION:**
**The standard tire fitted on this motorcycle is 110/70 –17 54H (BRIDGESTONE G547G) for front and 130/70 –17 62H (BRIDGESTONE G550) for rear. The use of tires other than the those specified may cause instability. It is highly recommended to use a SUZUKI Genuine Tire.**



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## STEERING



**Inspect at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months) thereafter.**

Taper roller type bearings are used on the steering system for better handling.
Steering should be adjusted properly for smooth turning of handlebars and safe running. Over tight steering prevents smooth turning of the handlebars and too loose steering will cause poor stability.
Check that there is no play in the front fork assembly by supporting the machine so that the front wheel is off the ground, with the wheel straight ahead, grasp the lower fork tubes near the axle and pull forward. If play is found, perform steering bearing adjustment as described in page 6-19 of this manual.

## FRONT FORKS

**Inspect at Initially 1 000 km (600 miles, 2 months) and Every 12 000 km (7 500 miles, 24 months) thereafter.**

Inspect the front forks for oil leakage, scoring or scratches on the outer surface of the inner tubes. Replace any defective parts, if necessary.
(Refer to page 6-13.)

## REAR SUSPENSION

**Inspect at Initially 1 000 km (600 miles, 2 months) and Every 12 000 km (7 500 miles, 24 months) thereafter.**

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

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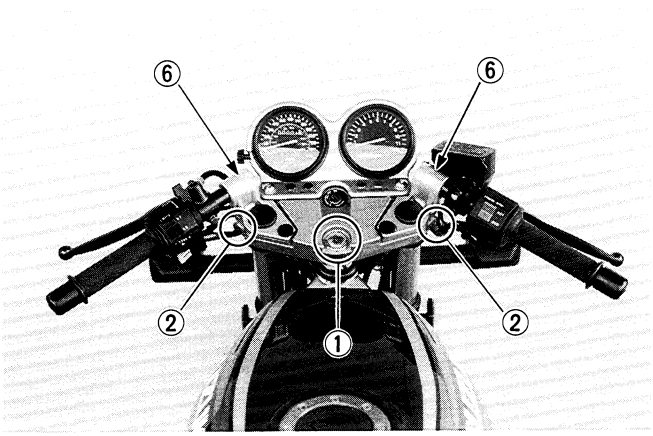
## CHASSIS BOLTS AND NUTS

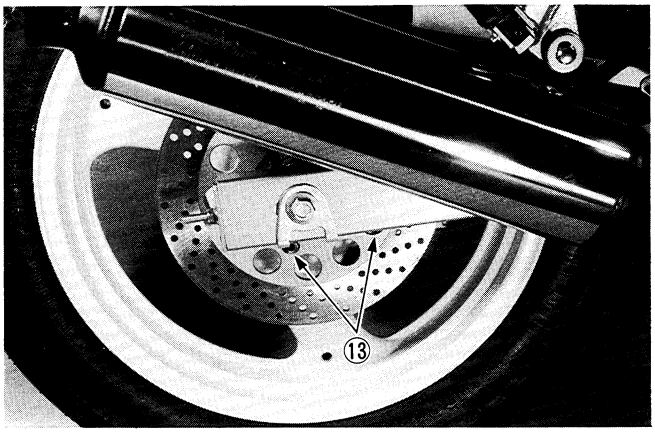
**Tighten at Initially 1 000 km (600 miles, 2 months) and Every 6 000 km (4 000 miles, 12 months).**

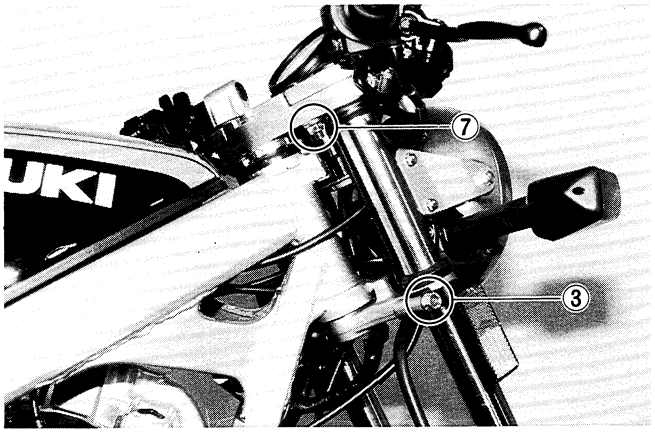
The nuts and bolts listed below are important safety parts. They must be retightened when necessary to the specified torque with a torque wrench. (Refer to page 2-20 for the locations of the following nuts and bolts on the motorcycle.)

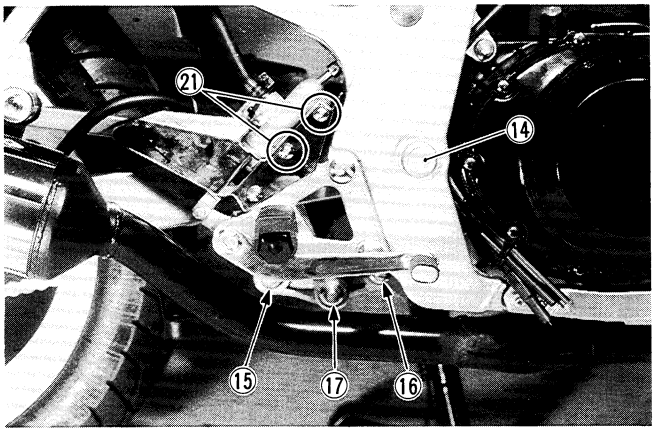
| Item | | N·m | kg-m | lb-ft |
|---|---|---|---|---|
| ① Steering stem head bolt | | 35 – 55 | 3.5 – 5.5 | 25.5 – 40.0 |
| ② Front fork upper clamp bolt | | 18 – 28 | 1.8 – 2.8 | 13.0 – 20.0 |
| ③ Front fork lower clamp bolt | | 25 – 40 | 2.5 – 4.0 | 18.0 – 29.0 |
| ④ Front axle nut | Normal nut with cotter pin | 36 – 52 | 3.6 – 5.2 | 26.0 – 37.5 |
| | Self-lock nut | 40 – 58 | 4.0 – 5.8 | 29.0 – 42.0 |
| ⑤ Front axle pinch bolt | | 18 – 28 | 1.8 – 2.8 | 13.0 – 20.0 |
| ⑥ Handlebar set bolt | | 8 – 12 | 0.8 – 1.2 | 6.0 – 8.5 |
| ⑦ Handlebar holder mounting nut | | 27 – 42 | 2.7 – 4.2 | 19.5 – 30.5 |
| ⑧ Front brake master cylinder mounting bolt | | 8 – 12 | 0.8 – 1.2 | 6.0 – 8.5 |
| ⑨ Front brake caliper mounting bolt | | 30 – 48 | 3.0 – 4.8 | 21.5 – 35.0 |
| ⑩ Front brake caliper housing bolt | | 30 – 36 | 3.0 – 3.6 | 21.5 – 26.0 |
| ⑪ Brake hose union bolt | | 15 – 20 | 1.5 – 2.0 | 11.0 – 14.5 |
| ⑫ Air bleeder valve | | 6 – 9 | 0.6 – 0.9 | 4.5 – 6.5 |
| ⑬ Front and rear disc bolt | | 18 – 28 | 1.8 – 2.8 | 13.0 – 20.0 |
| ⑭ Swingarm pivot nut | | 55 – 88 | 5.5 – 8.8 | 40.0 – 63.5 |
| ⑮ Rear shock absorber upper/lower mounting nut | | 40 – 60 | 4.0 – 6.0 | 29.0 – 43.5 |
| ⑯ Rear cushion lever mounting nut | | 70 – 100 | 7.0 – 10.0 | 50.5 – 72.5 |
| ⑰ Rear cushion lever rod mounting nut (Upper & Lower) | | 70 – 100 | 7.0 – 10.0 | 50.5 – 72.5 |
| ⑱ Rear brake caliper mounting bolt | | 20 – 31 | 2.0 – 3.1 | 14.5 – 22.5 |
| ⑲ Rear brake caliper housing bolt | | 30 – 36 | 3.0 – 3.6 | 21.5 – 26.0 |
| ⑳ Torque link nut (Front & Rear) | | 22 – 35 | 2.2 – 3.5 | 16.0 – 25.5 |
| ㉑ Rear brake master cylinder mounting bolt | | 8 – 12 | 0.8 – 1.2 | 6.0 – 8.5 |
| ㉒ Rear axle nut | Normal nut with cotter pin | 50 – 80 | 5.0 – 8.0 | 36.0 – 58.0 |
| | Self-lock nut | 60 – 96 | 6.0 – 9.6 | 43.5 – 69.5 |
| ㉓ Rear sprocket nut | | 40 – 60 | 4.0 – 6.0 | 29.0 – 43.5 |

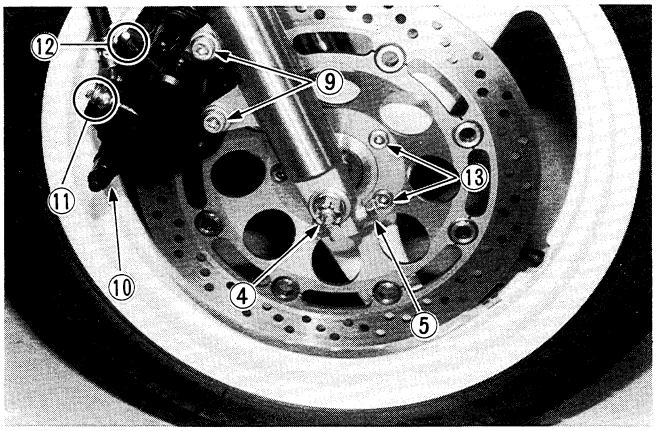
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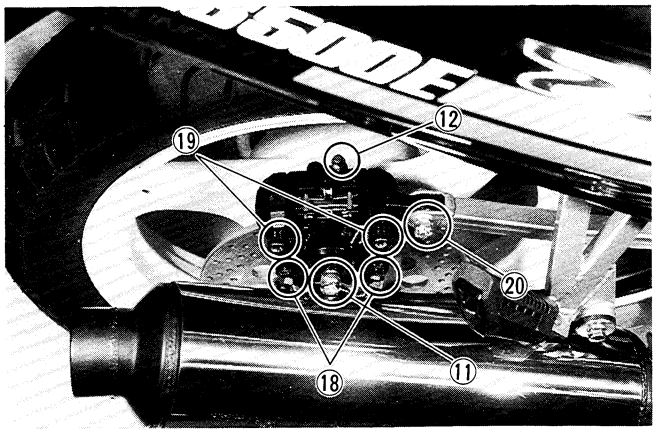


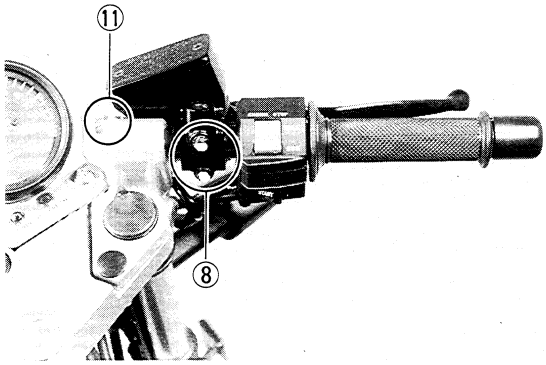



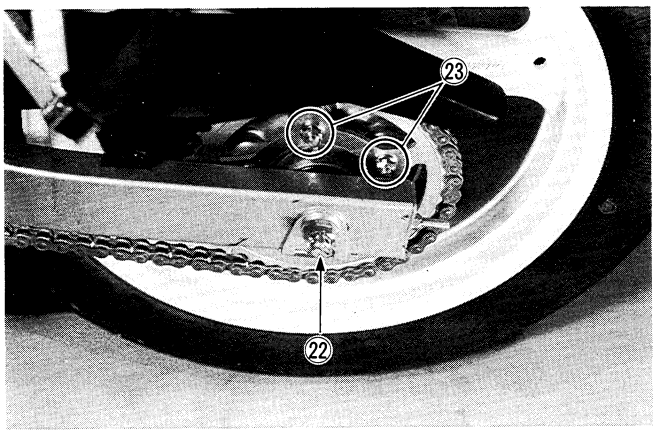




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# ENGINE



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# COMPRESSION PRESSURE CHECK

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

COMPRESSION PRESSURE SPECIFICATION

| Standard | Limit | Difference |
|---|---|---|
| 1 000-1 400 kPa<br>(10-14 kg/cm²)<br>(142-199 psi) | 800 kPa<br>(8 kg/cm²)<br>(114 psi) | 200 kPa<br>(2 kg/cm²)<br>(28 psi) |

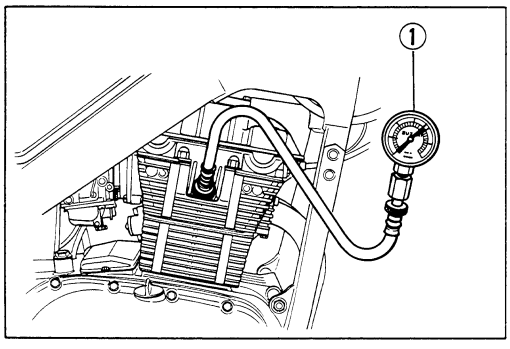
**Low compression pressure can indicate any of the following conditions:**
* Excessively worn cylinder wall
* Worn-down piston or piston rings
* Piston rings stuck in the grooves
* Poor seating of valves
* Ruptured or otherwise defective cylinder head gasket

**Overhaul the engine in the following cases:**
* Compression pressure in one of the cylinders is less than 800 kPa (8 kg/cm², 114 psi).
* Difference in compression pressure between two cylinders is more than 200 kPa (2 kg/cm², 28 psi).
* Both compression pressure are below 1 000 kPa (10 kg/cm², 142 psi) even when they measure more than 800 kPa (8 kg/cm², 114 psi).

## COMPRESSION TEST PROCEDURE

*NOTE:*
* *Before testing the engine for compression pressure, make sure that the cylinder head nuts and bolts are tightened to the specified torque values and valves are properly adjusted.*
* *Have the engine warmed up by idling before testing.*

Remove the parts concerned and test the compression pressure in the following manner.
- Remove the spark plugs.
- Fit the compression gauge ① one of the plug holes, taking care to make the connection tight.
- Keep the throttle grip in full-open position.
- While cranking the engine a few seconds with the starter, record the maximum gauge reading as the compression of that cylinder.
- Repeat this procedure with the other cylinder.




**09915-64510 : Compression gauge**
**09915-63210 : Adaptor**

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# OIL PRESSURE CHECK

To check periodically oil pressure of the oil passage way in the engine needs to judge roughly the conditions of the moving parts.

OIL PRESSURE SPECIFICATION

| | |
|---|---|
| **Above 200 kPa (2.0 kg/cm$^2$, 28 psi)**<br>**Below 500 kPa (5.0 kg/cm$^2$, 71 psi)** | **at 3 000 r/min., Oil temp. at 60° C (140° F)** |

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

**LOW OIL PRESSURE**

* Clogged oil filter
* Oil leakage from oil passage way
* Damaged oil seal
* Defective oil pump
* Combination of above items

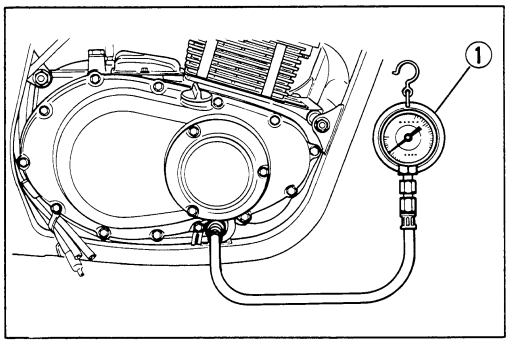
**HIGH OIL PRESSURE**

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

## OIL PRESSURE TEST PROCEDURE

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

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




**09915-74510 : Oil pressure gauge**
**09915-77330 : Meter (for high pressure)**

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# ENGINE COMPONENTS REMOVABLE WITH ENGINE IN PLACE

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

## ENGINE CENTER


| | See page |
|---|---|
| Exhaust pipe/muffler | 3-7 |
| Oil filter | 3-16 |
| Oil pan | 3-16 |
| Sump filter | 3-16 |
| Carburetors | 3-5 |
| Throttle cable | 3-5 |
| Starter cable | 3-5 |
| Cam chain tensioner | 3-10 |
| Cylinder head cover (along with cylinder head breather cover) | 3-10 |
| Camshafts | 3-11 |
| Cylinder head | 3-11 |
| Cylinder | 3-11 |
| Pistons | 3-12 |
| Starter motor | 3-15 |


## ENGINE LEFT SIDE


| | See page |
|---|---|
| Gearshift lever | 3-6 |
| Engine sprocket cover | 3-6 |
| Engine sprocket and drive chain | 3-7 |
| Neutral indicator switch body | 3-14 |
| Generator cover | 3-14 |
| Generator rotor | 3-15 |
| Starter idle gear | 3-15 |
| Starter clutch | 3-41 |


## ENGINE RIGHT SIDE


| | See page |
|---|---|
| Signal generator cover | 3-12 |
| Signal generator | 3-12 |
| Oil pressure switch | 3-53 |
| Clutch cover | 3-12 |
| Clutch pressure, drive and driven plates | 3-13 |
| Clutch sleeve hub | 3-13 |
| Oil pump driven gear and oil pump | 3-13 |
| Primary driven gear and drive gear | 3-13 |
| Gearshift shaft | 3-14 |

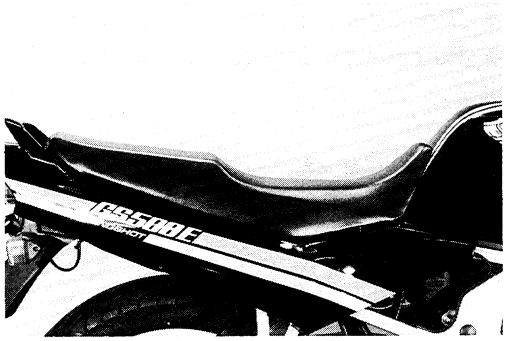

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# ENGINE REMOVAL AND REINSTALLATION

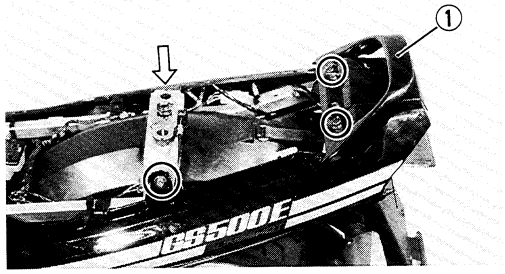
## ENGINE REMOVAL

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

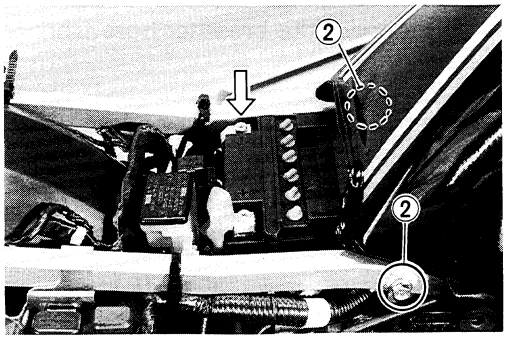
- Remove the seat.



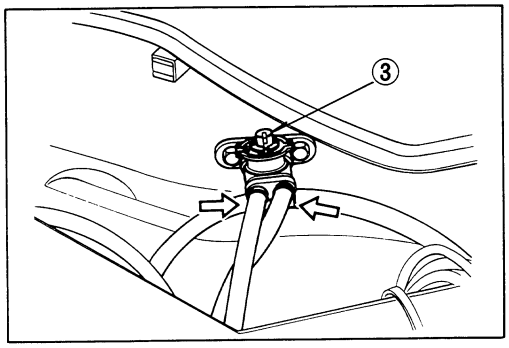
- Remove the pillion rider grabber ① by removing the bolts.
- Remove the left and right frame covers by removing the bolts.



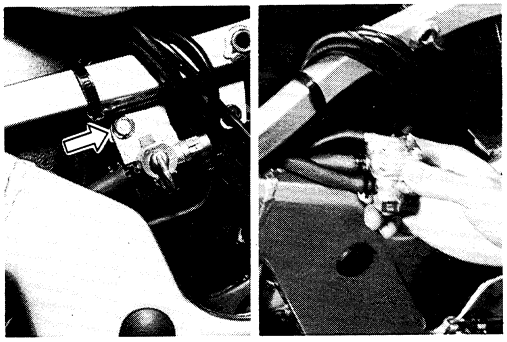

- Disconnect the battery ⊖ lead wire from the battery terminal.
- Remove the fuel tank mounting bolts ②, left and right.




- Lift up the fuel tank and turn the fuel cock ③ to the OFF position.
- Disconnect the fuel hoses from the fuel cock and remove the fuel tank.

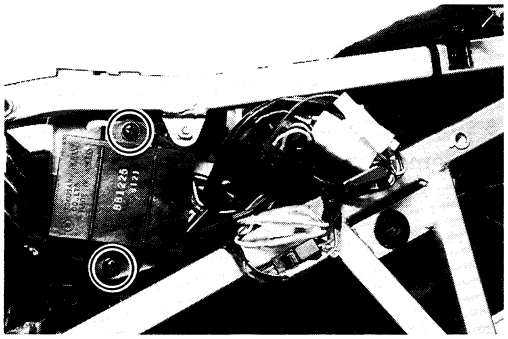



- Remove the fuel cock mounting bolt, and disconnect the fuel hoses and vacuum hose from the fuel cock.

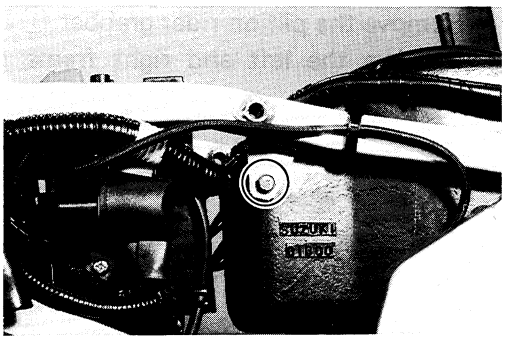


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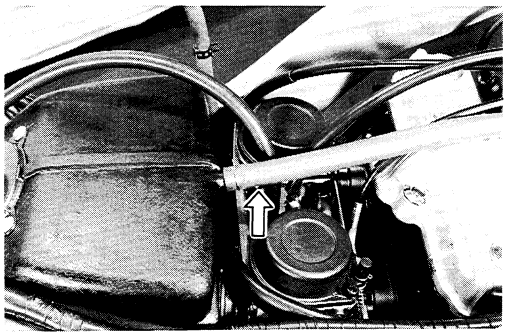
- Disconnect the various lead wires.
- Remove the ignitor unit by removing the screws.



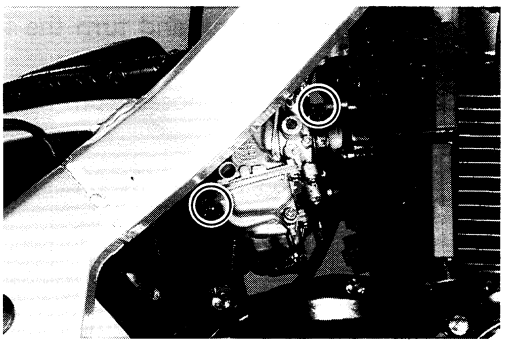
- Remove the air cleaner case mounting bolts, left and right.



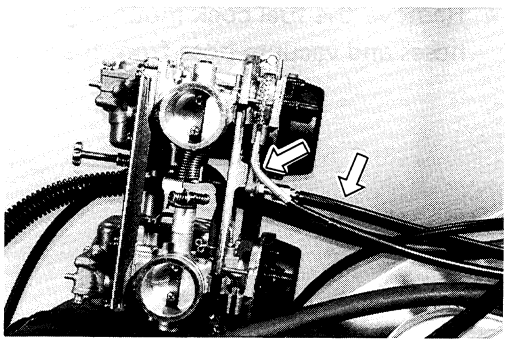
- Disconnect the breather hose from the air cleaner case.



- Loosen the respective carburetor clamp screws and move the air cleaner case backward.

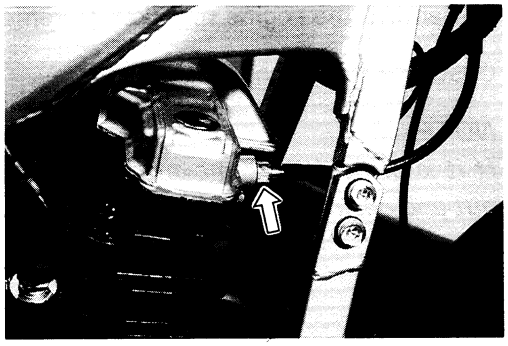


- Remove the carburetor assembly and disconnect the throttle cable and starter cable.

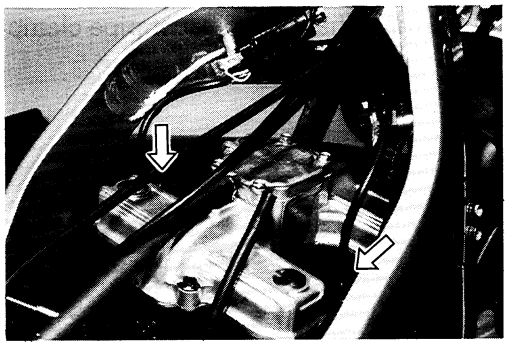


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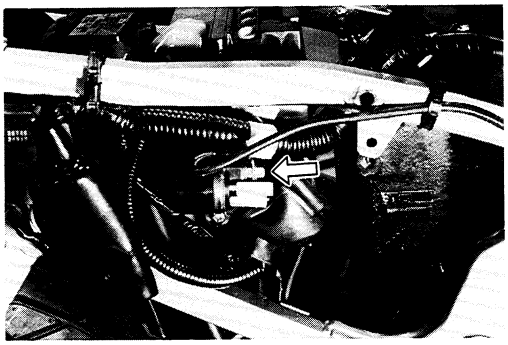
- Disconnect the tachometer cable from the cylinder head.



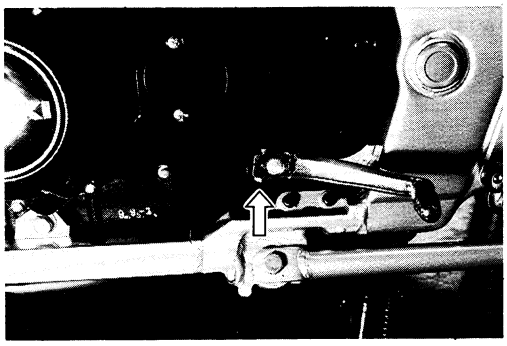
- Disconnect the spark plug caps.



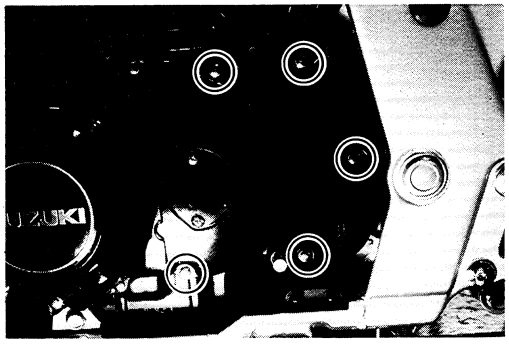
- Disconnect the starter motor lead wire from the starter relay.



- Remove the gearshift lever by removing the bolt.



- Remove the engine sprocket cover by removing the bolts.

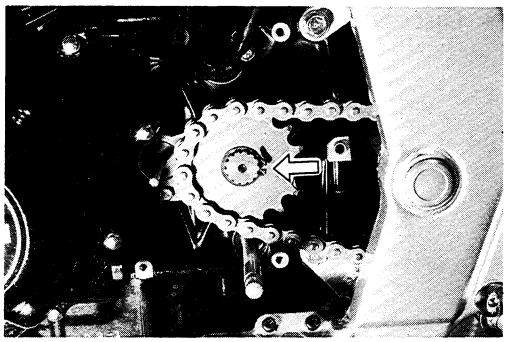


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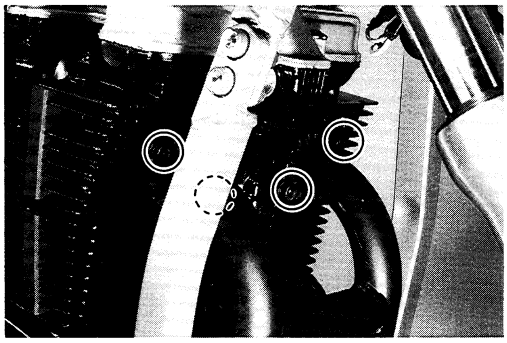
- Remove the engine sprocket by removing the circlip.

**09900-06107 : Snap ring pliers**

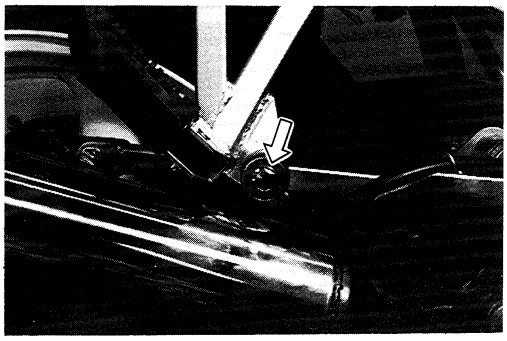
*NOTE:*
*If it is difficult to remove the engine sprocket, loosen the axle nut and chain adjusting nuts to provide additional chain slack.*



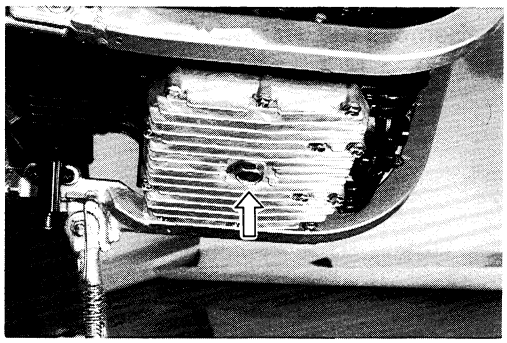
- Remove the four exhaust pipe clamp bolts.



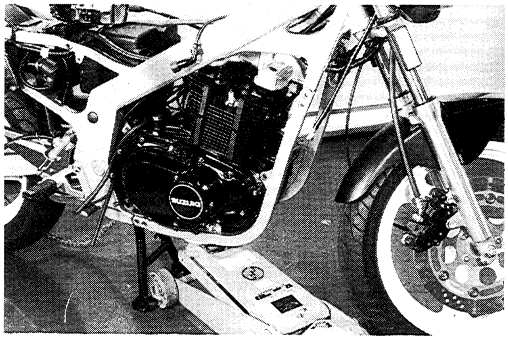
- Remove the muffler mounting bolt, then remove the exhaust pipe/muffler assembly.



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

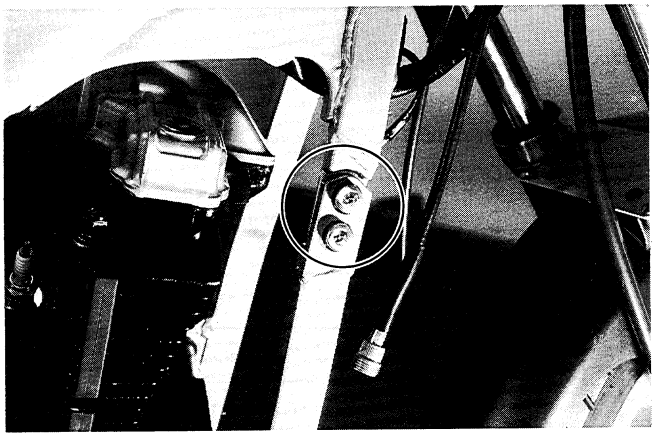


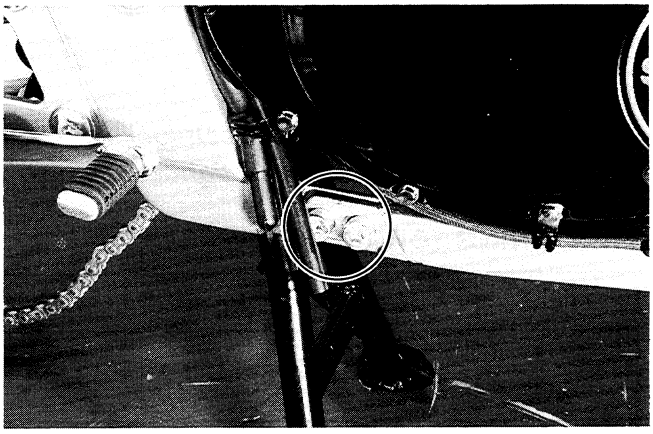
- Support the engine with a proper jack.

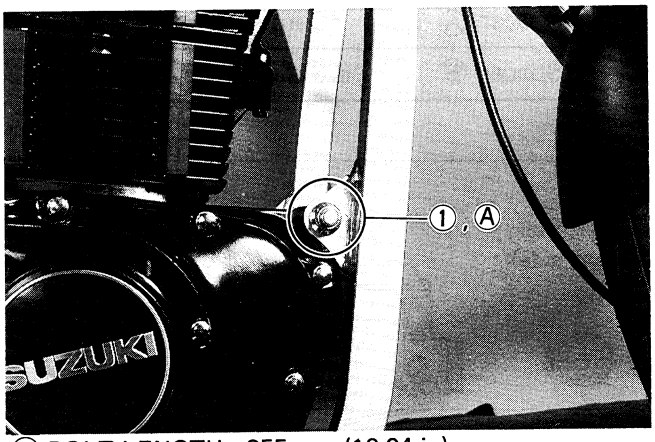


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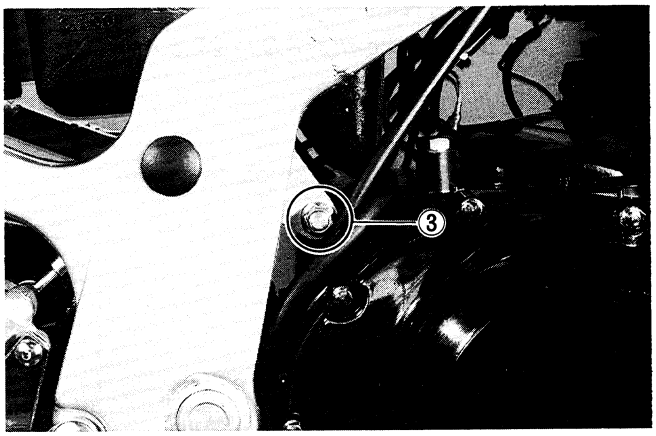
- Remove the right-side of frame down tube by removing the bolts and nuts, then remove the engine mounting bolts and nuts.
- Gradually lower the engine assembly.



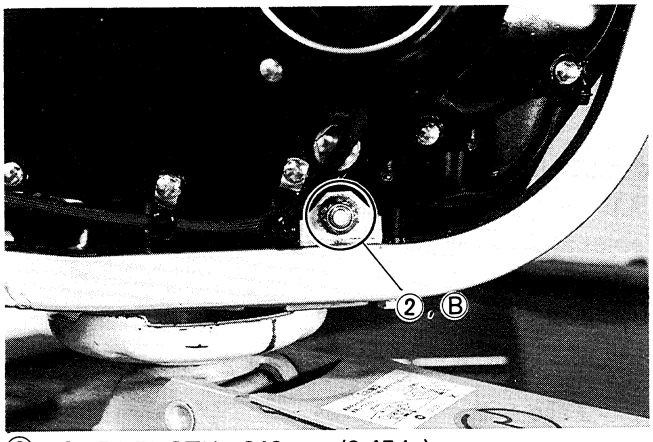




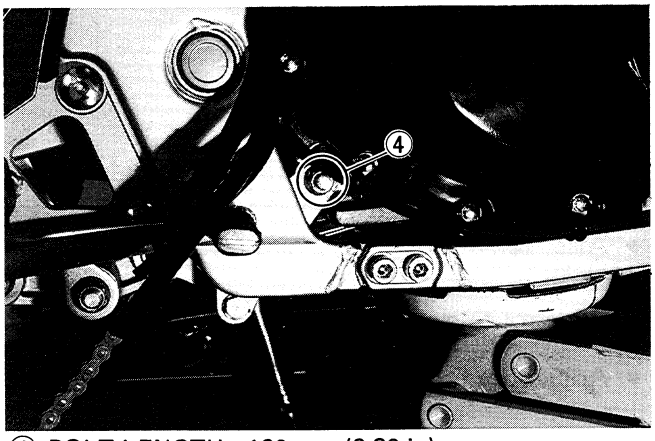

① BOLT LENGTH : 255 mm (10.04 in)
Ⓐ SPACER LENGTH : 65 mm (2.56 in) ... 2 pcs.




③ BOLT LENGTH : 170 mm (6.69 in)




② BOLT LENGTH : 240 mm (9.45 in)
Ⓑ SPACER LENGTH : 16.8 mm (0.66 in) ... 2 pcs.




④ BOLT LENGTH : 160 mm (6.30 in)

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## ENGINE REINSTALLATION

The engine can be installed in the reverse order of removal.

- Insert the two long bolts from left side. Install the bolts, spacers and nuts properly, as shown in the photographs on previous page.

*NOTE:*
*The engine mounting nuts are self-locking. Once the nut has been removed, it is no longer of any use. Be sure to use new nuts and tighten them to the specified torque.*

### TIGHTENING TORQUE

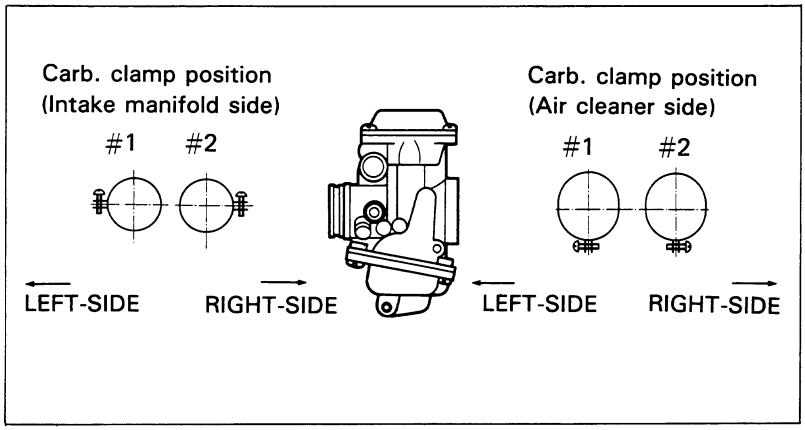
| ITEM | N·m | kg-m | lb-ft |
|---|---|---|---|
| ①, ② ③, ④ | 60 – 72 | 6.0 – 7.2 | 43.5 – 52.0 |

Frame down tube mounting bolts
. . . . . 25 – 38 N·m
(2.5 – 3.8 kg-m, 18.0 – 27.5 lb-ft)

### LENGTH

| | |
|---|---|
| Bolt ① | 255 mm (10.04 in) |
| Bolt ② | 240 mm (9.45 in) |
| Bolt ③ | 170 mm (6.69 in) |
| Bolt ④ | 160 mm (6.30 in) |
| Spacer Ⓐ | 65 mm (2.56 in) 2 pcs. |
| Spacer Ⓑ | 16.8 mm (0.66 in) 2 pcs. |

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

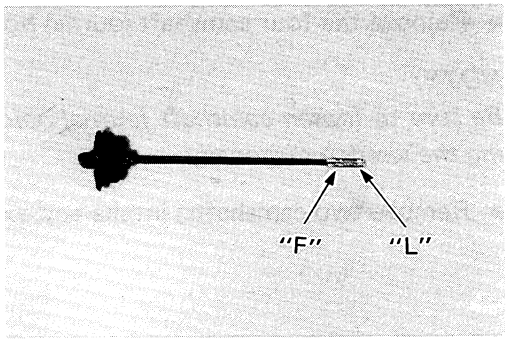



- Tighten the rear axle nut, exhaust pipe bolts and muffler mounting bolt to the specified torque. (See page 7-27.)
- After remounting the engine, route wiring harness, cables and hoses properly by referring to the sections, for wire routing, cable routing and hose routing. (See pages 7-10 through 23.)
- Adjust the following items to the specification.


Page
* Throttle cable . . . . . 2-11
* Drive chain . . . . . 2-12
* Idling adjustment . . . . . 2-11
* Balancing carburetors . . . . . 4-12


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- Pour 3.2L of engine oil SAE 10W/40 under API classification SE or SF into the engine.
  Several minutes after starting and stopping engine, check that the oil level remains between the marks (F and L) of oil filler gauge.

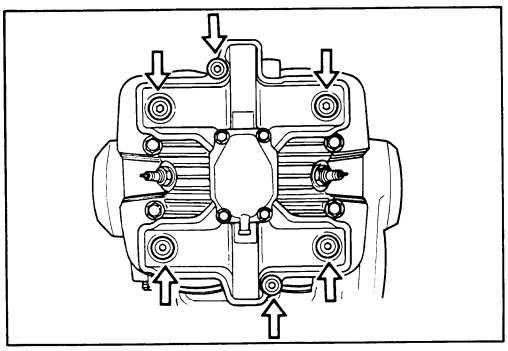



**OIL CHANGE: 2 600 ml (2.7/2.3 US/Imp qt)**
**OIL AND FILTER CHANGE: 2 900 ml (3.1/2.6 US/Imp qt)**
**OVERHAUL: 3 200 ml (3.4/2.8 US/Imp qt)**

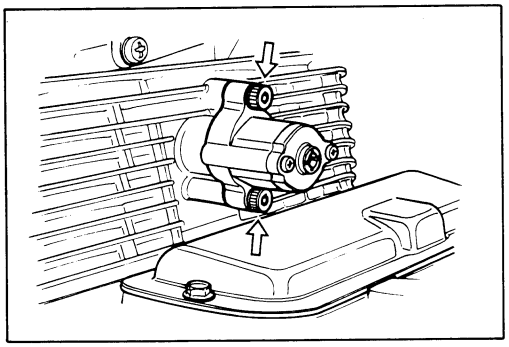
## ENGINE DISASSEMBLY

- Remove the cylinder head cover.

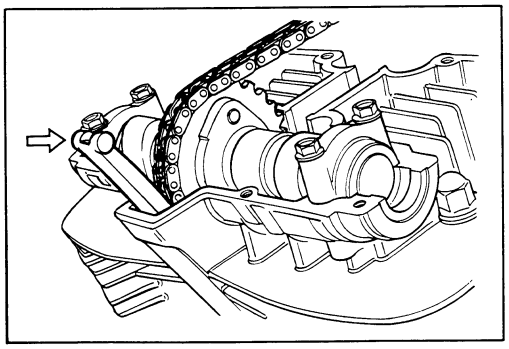
*NOTE:*
*When removing the cylinder head cover, do not remove the breather cover.*



- Remove the cam chain tensioner.



- Pull out the cam chain guide.

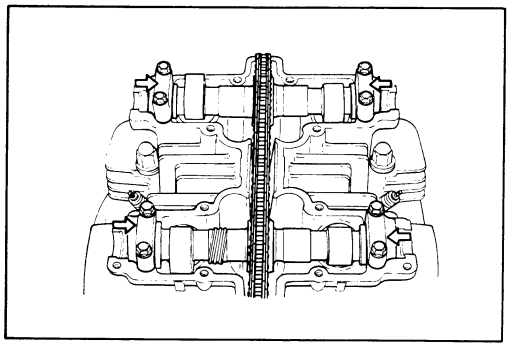


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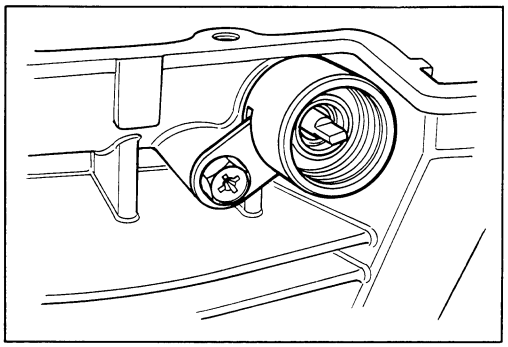
- Remove the four camshaft journal holders.

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

- Remove two camshafts; intake and exhaust.



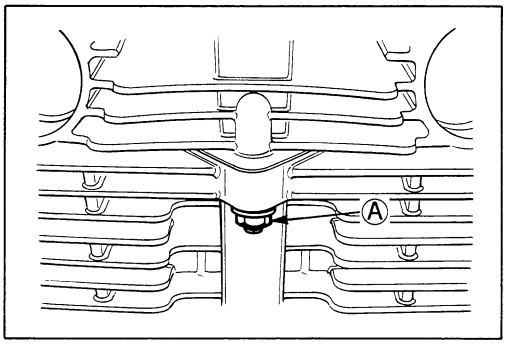
- Remove the tachometer driven gear along with its sleeve.



- The cylinder head becomes free for removal when its one 6-mm nut Ⓐ and eight 10-mm nuts are removed.

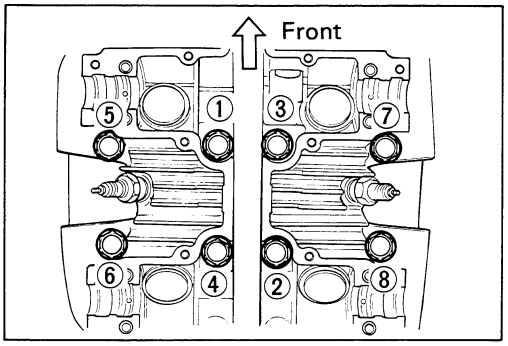
**09911-74510 : Long socket 14 mm**
**09914-24510 : T-handle**

*NOTE:*
*When loosening the cylinder head nuts, loosen each nut little by little in a descending order according to the numbers cast on a cylinder head.*



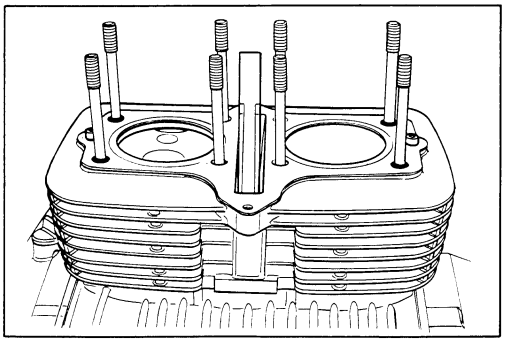

- Lift the cylinder head up to grip its both ends. If it does not come off, lightly tap on the finless portions of it with a plastic mallet.

**CAUTION:**
**Be careful not to damage the fins when removing or handling the cylinder head.**




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

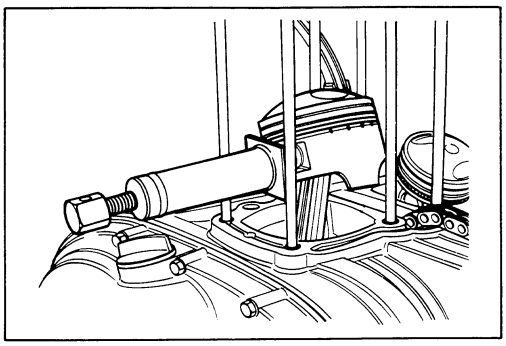
**CAUTION:**
**Be careful not to damage the fins when removing or handling the cylinder block.**



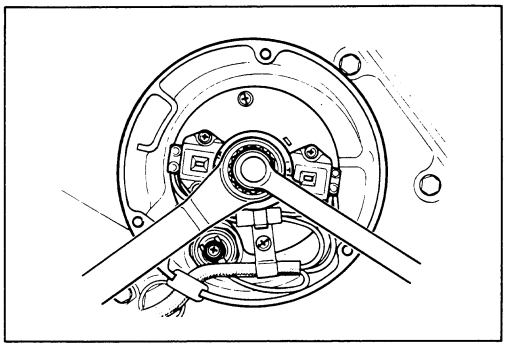
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- Place a cloth beneath the piston so as not to drop any parts in the crankcase, and remove the circlip with long-nose pliers.
- Draw out the piston pin with the special tool. Place each piston pin in the same piston as that it was removed from.

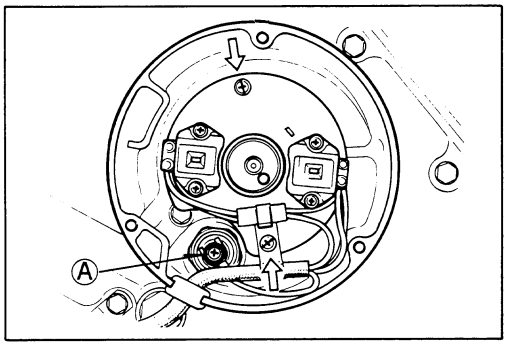
**09910-34510 : Piston pin puller**



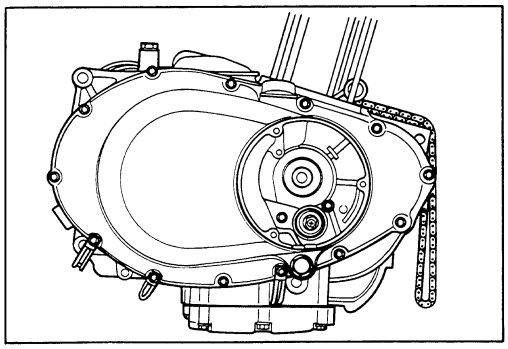
- Remove the signal generator cover.
- Remove the signal generator rotor.



- Disconnect the oil pressure switch lead wire Ⓐ.
- Remove the signal generator stator.



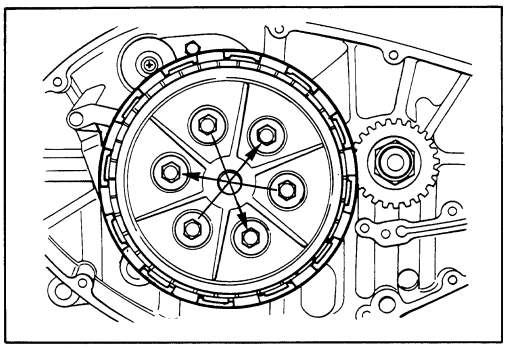

- Remove the clutch cover and its gasket.



- Holding the conrod with a conrod stopper, remove the clutch spring set bolts diagonally.

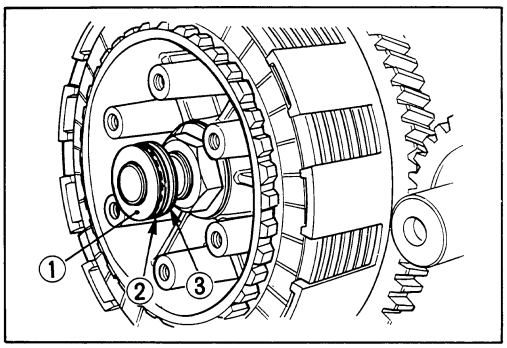
**09910-20116 : Conrod stopper**

- Remove the clutch pressure plate.



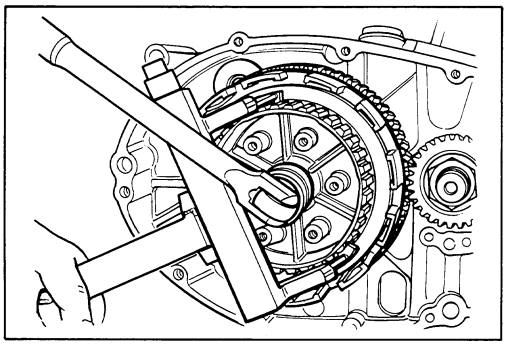
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- Remove the thrust washer ①, bearing ② and clutch push piece ③, and then draw out the clutch push rod.



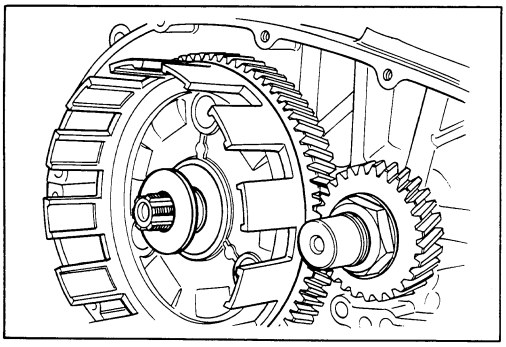

- After removal of clutch drive and driven plates, flatten the lock washer and remove the clutch sleeve hub nut by using the special tool.

**09920-53710 : Clutch sleeve hub holder**



- Remove the thrust washer and primary driven gear assembly.

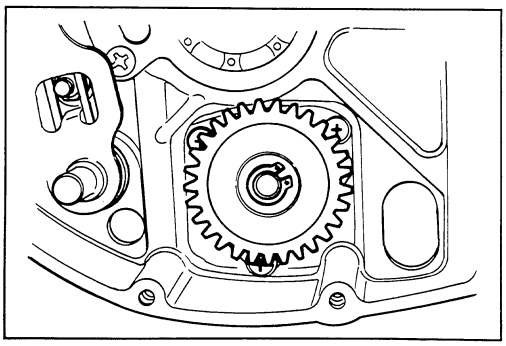
*NOTE:*
*Bear in mind that the thrust washer is located behind the primary driven gear assembly.*



- Remove the oil pump driven gear to remove circlip.

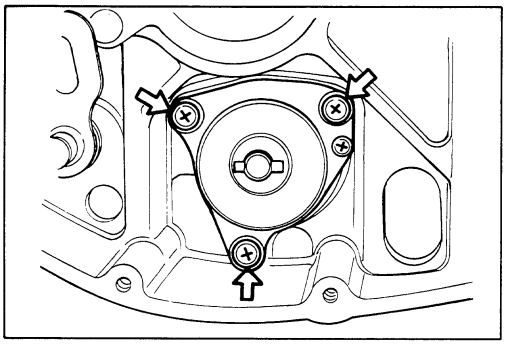
**09900-06107 : Snap ring pliers**

*NOTE:*
*Do not lose the circlip, pin and washer.*



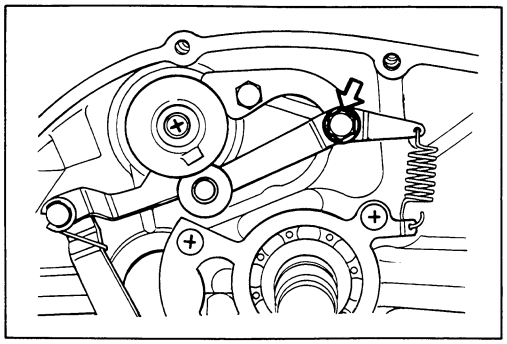
- Remove the oil pump.

*NOTE:*
*Do not lose the oil pump O-rings.*

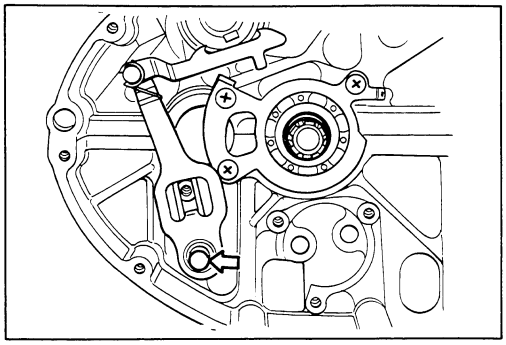


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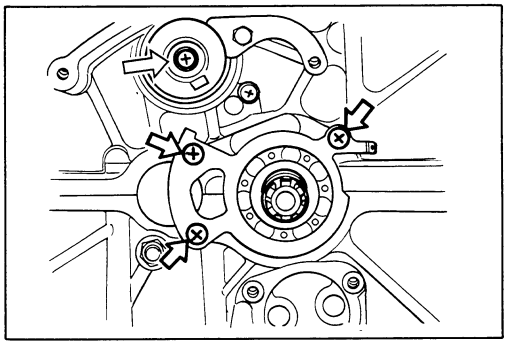
- Remove the gearshift cam stopper.



- Draw out the gearshift shaft assembly.



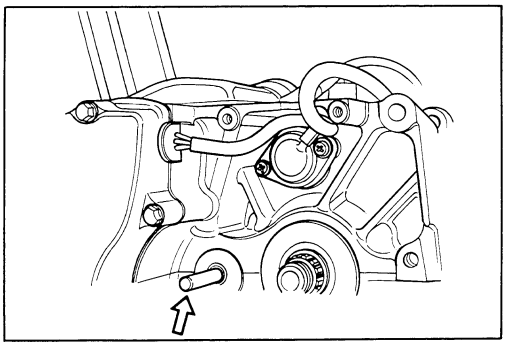
- Remove the bearing retainer.
- Remove the gearshift cam pin retainer.



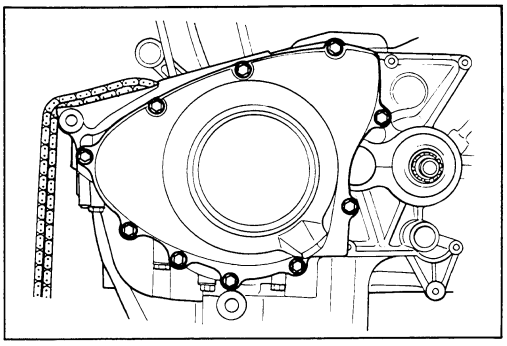
- Remove the neutral position indicator switch.

*NOTE:*
*Do not lose the O-ring, switch contact and its spring.*

- Remove the clutch push rod.



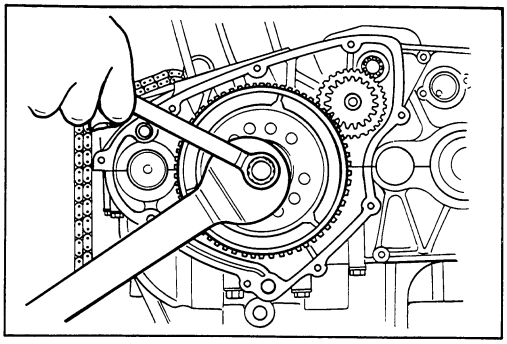
- Remove the generator cover and its gasket.



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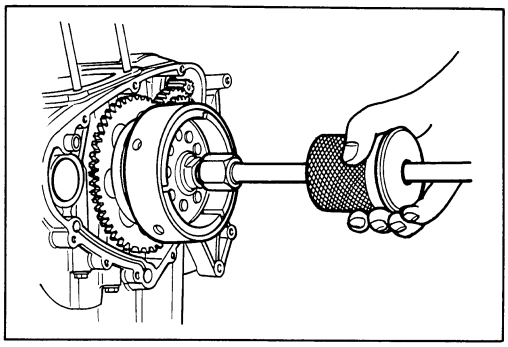
- Remove the generator rotor mounting bolt with the special tool.

**09930-44511 : Generator rotor holder**

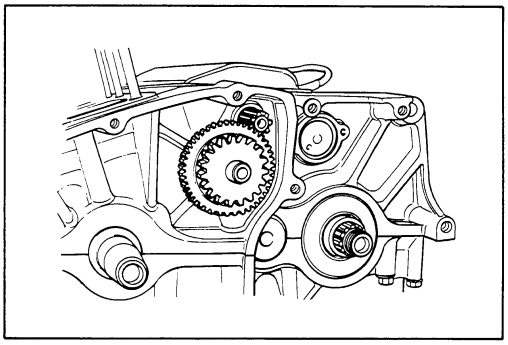


- Remove the generator rotor assembly from the crankshaft with the special tools.

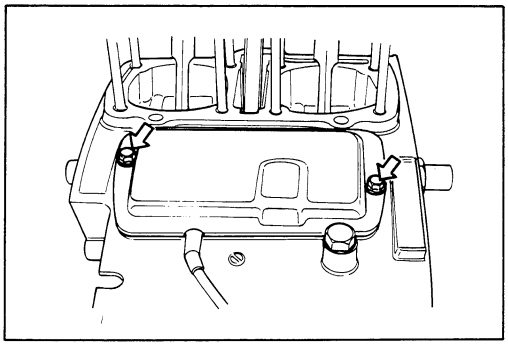
**09930-30102 : Sliding shaft**
**09930-33710 : Rotor remover attachment**



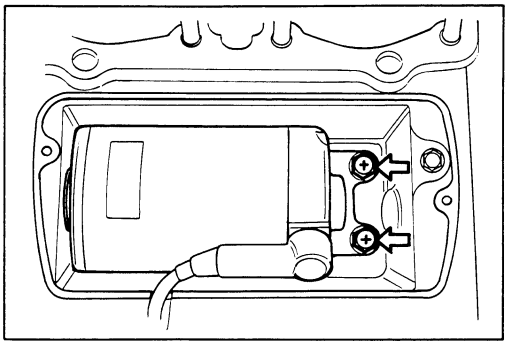
- Remove the starter idle gear and its shaft.



- Remove the starter motor cover.

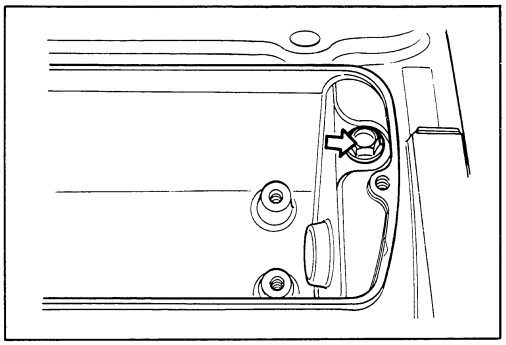


- Remove the starter motor.

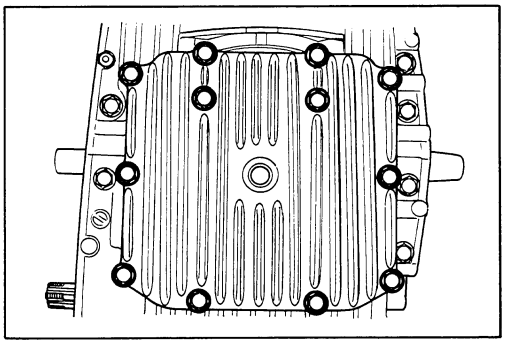


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- Remove the upper crankcase tightening bolt.

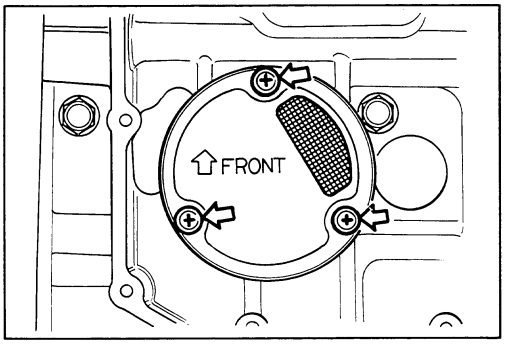


- Remove the oil pan.



- Remove the oil sump filter.

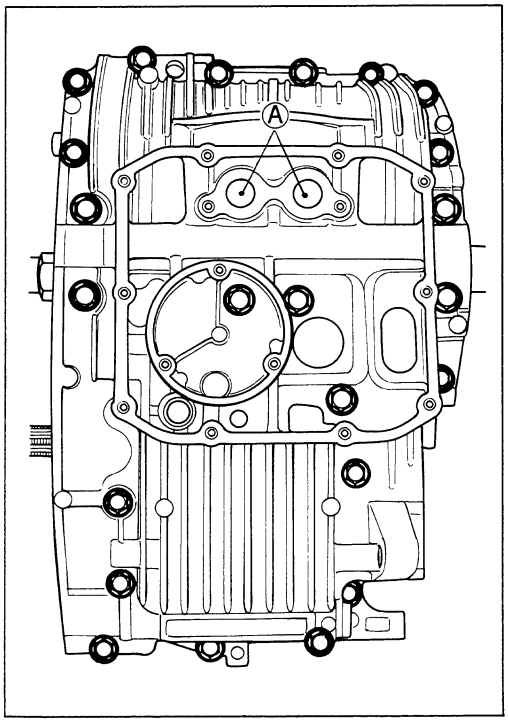
*NOTE:*
*When installing the oil sump filter, face the arrow mark to the front.*



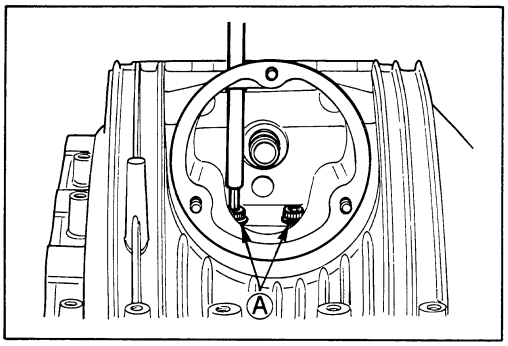

- Remove the oil filter cap and oil filter.
- Remove the crankcase/crankshaft tightening bolts.

*NOTE:*
* *When loosening the crankcase/crankshaft tightening bolts, loosen them from outside to inside.*
* *Two allen bolts are used for tightening crankshaft at the portion Ⓐ.*
* *Make sure that all bolts are removed before using the crankcase separating tool.*

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

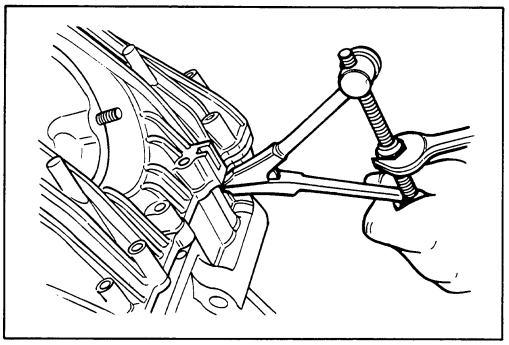



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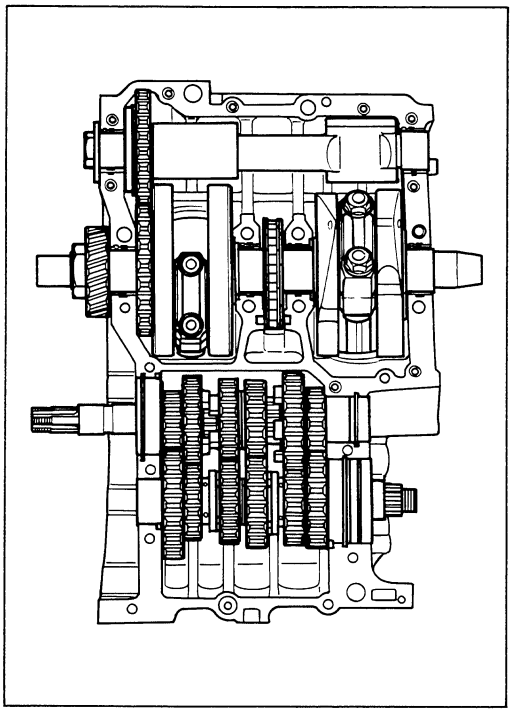

- Separate the upper and lower crankcase halves with the special tool.

**09912-34510 : Crankcase separating tool**



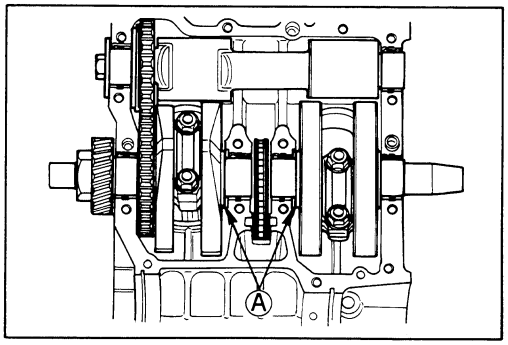
- Remove the countershaft assembly and driveshaft assembly.

*NOTE:*
*Do not lose the C-rings.*



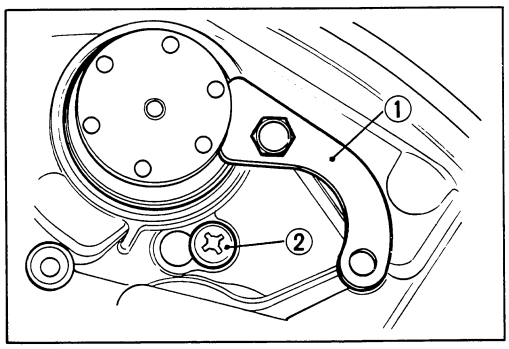
- Remove the crankshaft assembly and counter-balancer shaft assembly.

*NOTE:*
*Bear in mind that the crankshaft thrust bearings Ⓐ are located between shaft and case.*



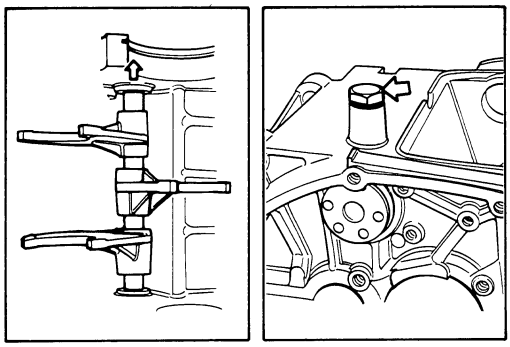

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- Remove the gearshift cam guide ① and gearshift fork shaft stopper screw ②.




- Holding the gearshift forks by hand, draw out the gearshift fork shaft from the upper crankcase.
- Remove the neutral positioning stopper, and then remove the gearshift cam.

*NOTE:*
*Do not lose the neutral positioning spring.*



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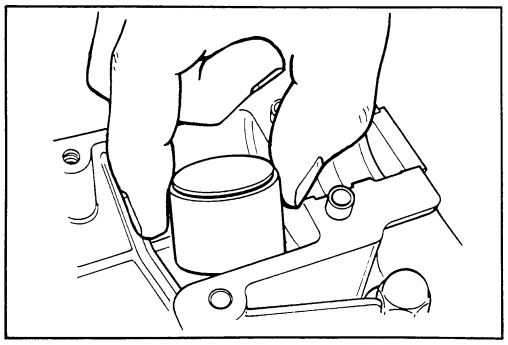
# ENGINE COMPONENTS INSPECTION AND SERVICE

## CYLINDER HEAD

### CYLINDER HEAD SERVICE

**CAUTION:**
**Be sure to identify each removed part as to its location, and lay the parts out in groups designated as "No. 1", "No. 2", "Exhaust", "Inlet", so that each will be restored to the original location during assembly.**

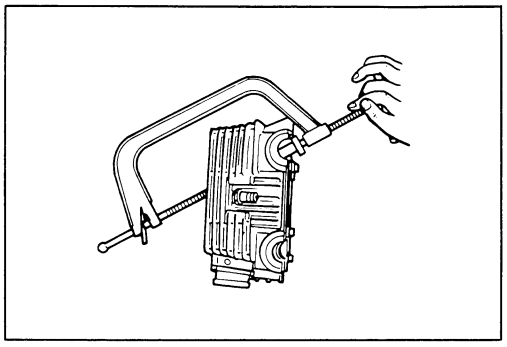
*NOTE:*
*If valve guides have to be removed for replacement after inspecting related parts, carry out the steps shown in valve guide servicing.*

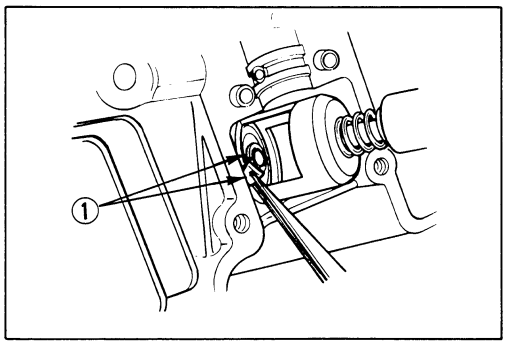


- Pull out the tappets and shims with fingers.

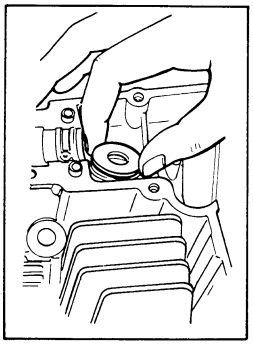
- Using special tools, compress the valve springs and take off the two cotter halves ① from valve stem.

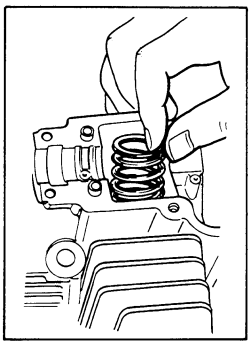
**09916-14510 : Valve lifter**
**09916-84510 : Tweezers**





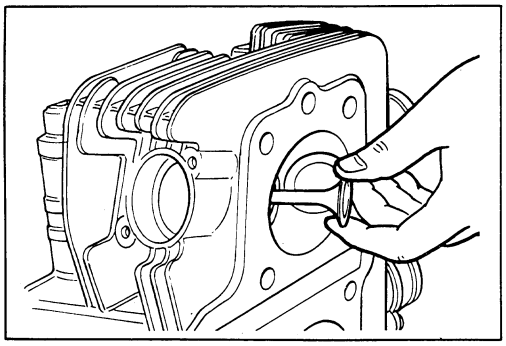

- Take out the spring retainer, inner and outer springs.





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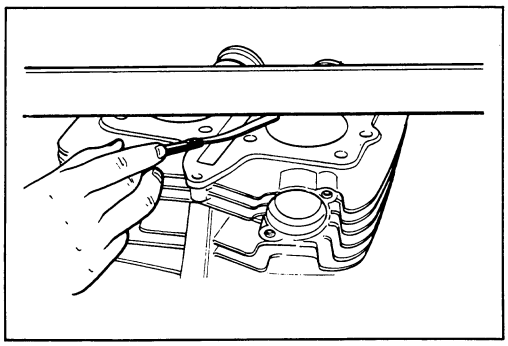
- Pull out the valves from the other side.



### CYLINDER HEAD DISTORTION

Remove the carbon deposits.
Check the gasket surface of the cylinder head for distortion with a straight edge and thickness gauge, taking a clearance reading at several places indicated. If the largest reading at any position of the straight edge exceeds the limit, replace the cylinder head.

**09900-20803 : Thickness gauge**



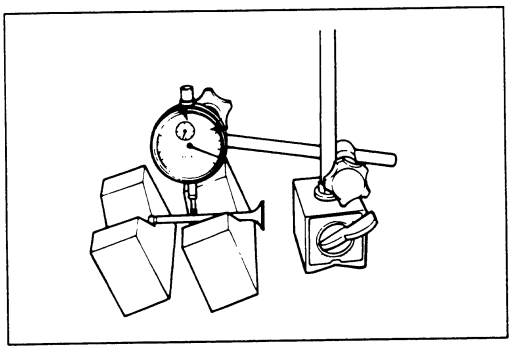
| Cylinder head distortion | Service Limit |
|---|---|
| | 0.1 mm (0.004 in) |

## VALVES

### VALVE STEM RUNOUT

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

**09900-20606 : Dial gauge (1/100 mm, 10 mm)**
**09900-20701 : Magnetic stand**
**09900-21304 : V-block (100 mm)** } **Not available in U.S.A.**

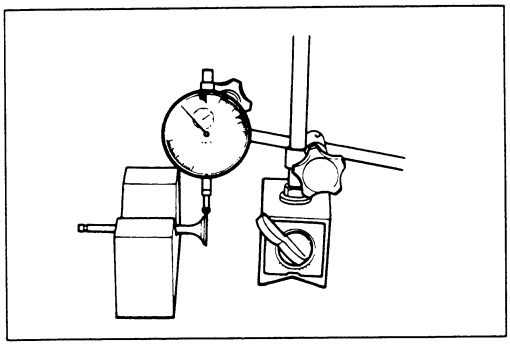


| Valve stem runout | Service Limit |
|---|---|
| IN & EX | 0.05 mm (0.002 in) |

### VALVE HEAD RADIAL RUNOUT

Place the dial gauge at right angles to the valve head face, and measure the valve head radial runout.
If it measures more than the limit, replace the valve.

**09900-20606 : Dial gauge (1/100 mm, 10 mm)**
**09900-20701 : Magnetic stand**
**09900-21304 : V-block (100 mm)** } **Not available in U.S.A.**

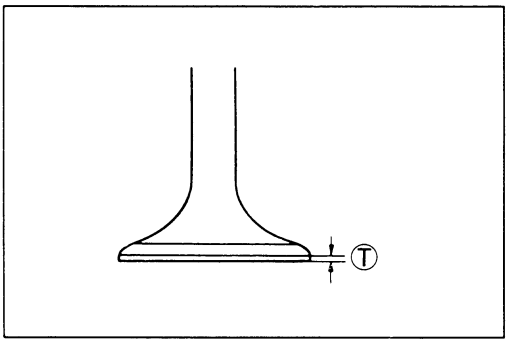


| Valve head radial runout | Service Limit |
|---|---|
| | 0.03 mm (0.001 in) |

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## VALVE FACE WEAR

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

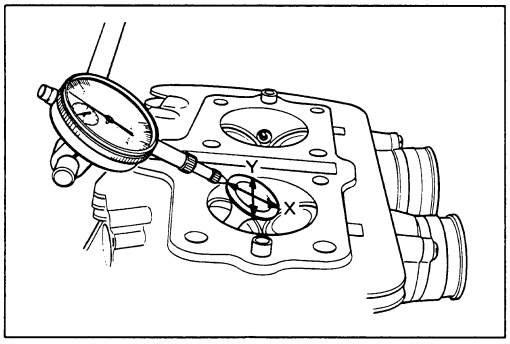



**09900-20102 : Vernier calipers**

| Valve head thickness | Service Limit |
|---|---|
| | 0.5 mm (0.02 in) |

## VALVE GUIDE-VALVE STEM CLEARANCE

Lift the valve about 10 mm (0.39 in) from the valve seat. Measure the clearance in two directions, "X" and "Y", perpendicular to each other, by positioning the dial gauge as shown. If the clearance measured exceeds the limit, determine whether the valve or the guide should be replaced to reduce the clearance to the standard range:

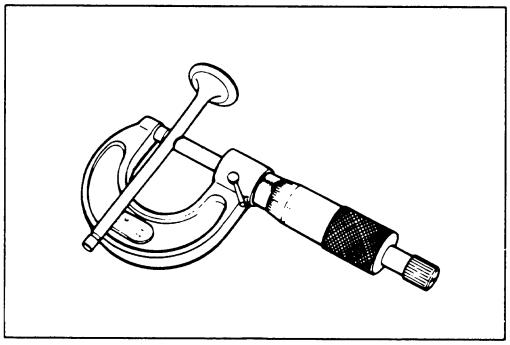



**09900-20606 : Dial gauge (1/100 mm, 10 mm)**
**09900-20701 : Magnetic stand (Not available in U.S.A.)**

| Valve guide to valve stem clearance | Service Limit |
|---|---|
| IN & EX | 0.35 mm (0.014 in) |

## VALVE STEM WEAR

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

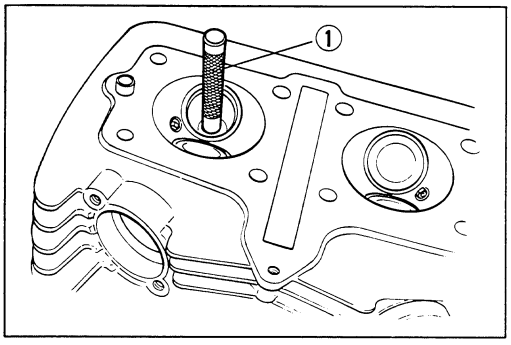


**09900-20205 : Micrometer (1/1000 mm, 0-25 mm)**

| Valve stem outer diameter | Standard |
|---|---|
| IN | 6.960 – 6.975 mm (0.2740 – 0.2746 in) |
| EX | 6.945 – 6.960 mm (0.2734 – 0.2740 in) |

## VALVE GUIDE SERVICE

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




**09916-44511 : Valve guide remover**

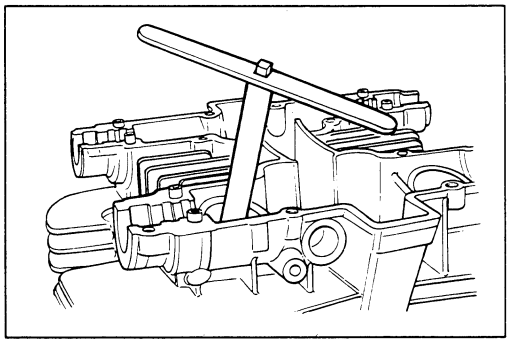
*NOTE:*

* *Discard the removed valve guide subassemblies.*
* *Only oversized valve guides are available as the replacement parts.*

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

**09916-34531 : Valve guide reamer (12.3 mm)**
**09916-34541 : Reamer handle**



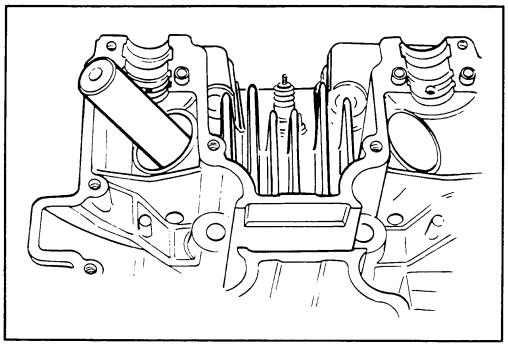
- Fit a ring to each valve guide.

*NOTE:*
*Be sure to use new rings and valve guides.*

**Valve guide oversize : 0.3 mm (11115-45740)**

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

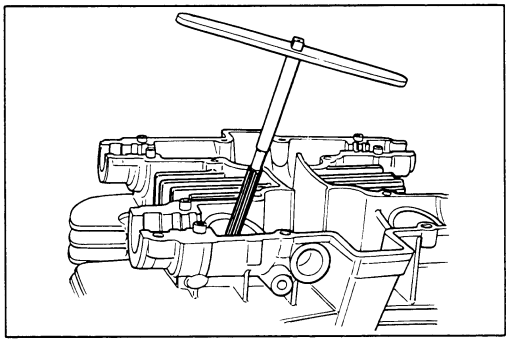
**09916-57321 : Valve guide installer handle**
**09916-54531 : Attachment**



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

- After fitting the valve guides, re-finish their guiding bores with the reamer.

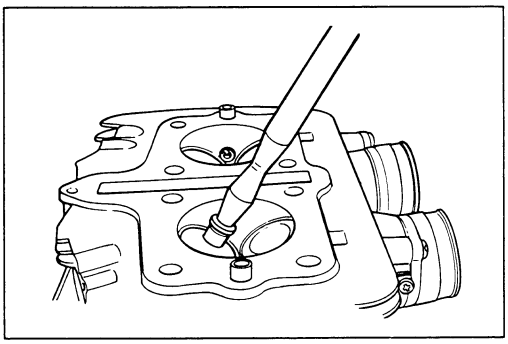
**09916-34520 : Valve guide reamer (7 mm)**
**09916-34541 : Reamer handle**



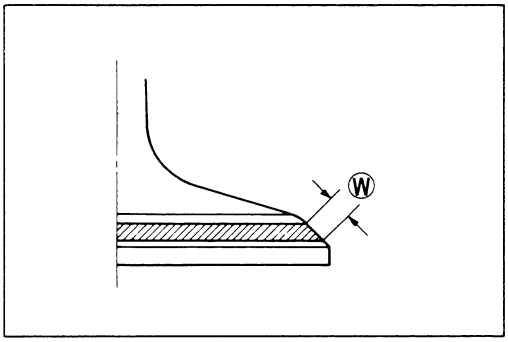
*NOTE:*
*Be sure to clean and oil the guides after reaming.*

## VALVE SEAT WIDTH

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



| Valve seat width | Standard |
|---|---|
| IN & EX | 1.0 – 1.2 mm (0.04 – 0.05 in) |

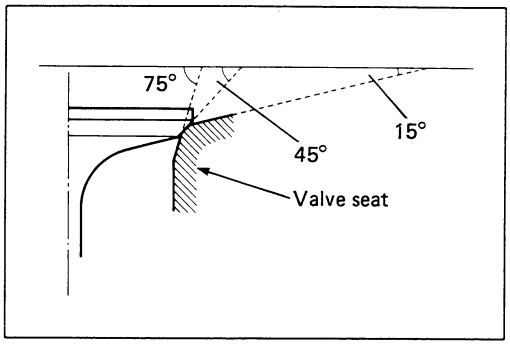



If either requirement is not met, correct the seat by servicing it as follows:

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## VALVE SEAT SERVICE

The valve seats for both intake and exhaust valves are machined to two different angles. The seat contact surface is cut 45° and the area above the contact surface (closest to the combustion chamber) is cut to 15°.




**(For U.S.A. model)**
**Valve seat cutter : (N-635), (N-229) and (N-211)**
**Solid pilot : (N-140-7.0)**

**(For the Other models)**
**09916-24900 : Valve seat cutter set**
**(N-635) : Valve seat cutter**
**(N-229) : Valve seat cutter**
**(N-211) : Valve seat cutter**
**(N-140-7.0) : Solid pilot**

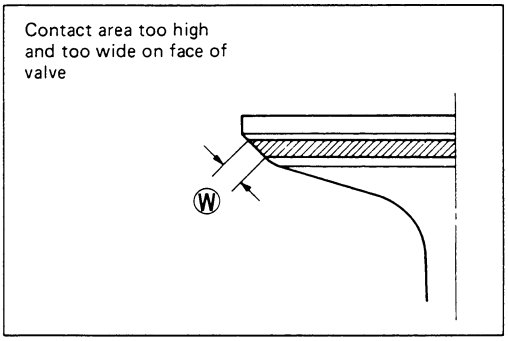
| | Intake side | Exhaust side |
|---|---|---|
| 45° | N-635 | N-229 |
| 15° | N-635 | N-229 |
| 75° | N-211 | N-211 |

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

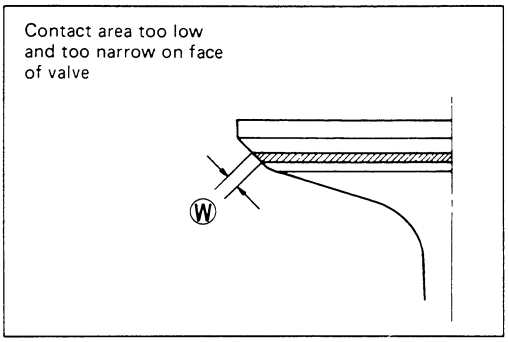
- Insert the solid pilot with a slight rotation. Seat the pilot snugly. Install the 45° cutter, attachment and T handle.
- Using the 45° cutter, descale and clean up the seat with one or two turns.
- Inspect the seat by the previously described seat width measurement procedure. If the seat is pitted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

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

If the contact area is too high on the valve, or if it is too wide, use the 15°/75° cutter to lower and narrow the contact area.

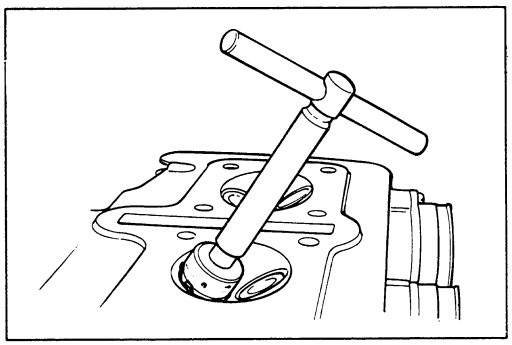



If the contact area is too low or too narrow, use the 45° cutter to raise and widen the contact area.



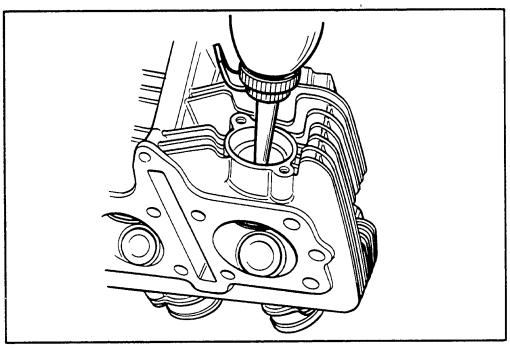

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- After the desired seat position and width is achieved, use the 45° cutter very lightly to clean up any burrs caused by the previous cutting operations.



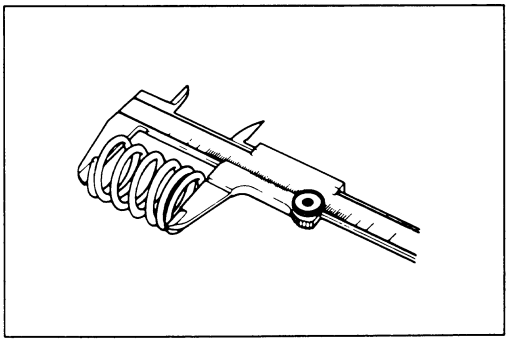
**CAUTION:**
**DO NOT use lapping compound after the final cut is made. The finished valve seat should have a velvety smooth finish and not a highly polished or shiny finish. This will provide a soft surface for the final seating of the valve which will occur during the first few seconds of engine operation.**

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



**WARNING:**
**Always use extreme caution when handling gasoline.**

*NOTE:*
*After servicing the valve seats, be sure to adjust the tappet clearance after the cylinder head has been reinstalled. (See page 2-6.)*



## VALVE SPRINGS

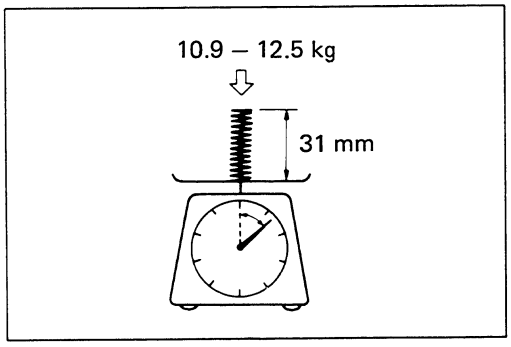
The force of the two coil springs keeps the valve seat tight. Weakened springs result in reduced engine power output, and often account for the chattering noise coming from the valve mechanism. Check the valve springs for proper strength by measuring their free lengths and also by the force required to compress them. If the spring length is less than the service limit, or if the force required to compress the spring dose not fall within the range specified, replace both the inner and outer springs as a set.

**09900-20102 : Vernier calipers (200 mm)**

**CAUTION:**
**Replace both the valve springs, inner and outer, at a time, if any one of these is found to be beyond the limit.**

| Valve spring free length | Service Limit |
|---|---|
| INNER | 35.6 mm (1.40 in) |
| OUTER | 40.6 mm (1.60 in) |

| Valve spring tension | Standard |
|---|---|
| INNER | 10.9 – 12.5 kg/31.0 mm<br>(24.0 – 27.6 lbs/1.22 in) |
| OUTER | 20.3 – 23.3 kg/35.0 mm<br>(44.8 – 51.4 lbs/1.38 in) |

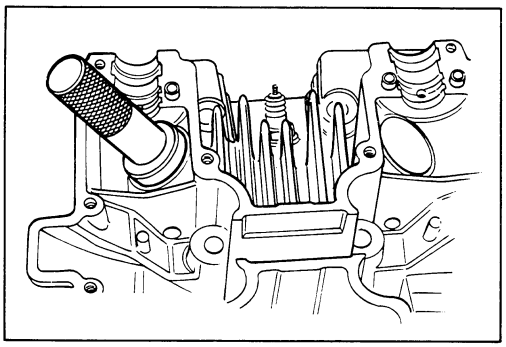



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## REASSEMBLY

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

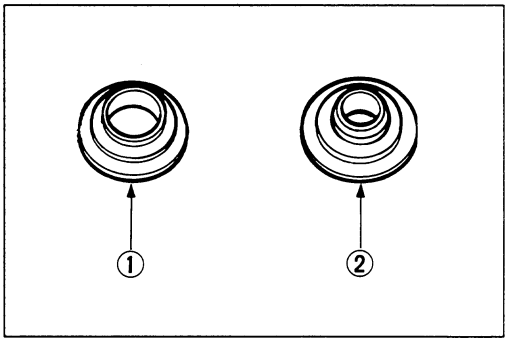
**09916-57321 : Valve guide installer handle**
**09911-94530 : Attachment.**



**CAUTION:**
**Do not reuse the oil seals.**

- Install the valve spring lower seat ①.

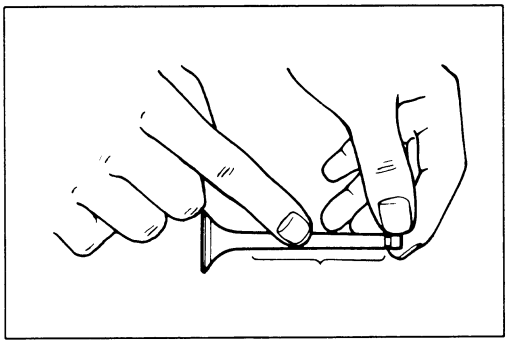
**CAUTION:**
**Be careful not to confuse the lower seat with the spring retainer ②.**



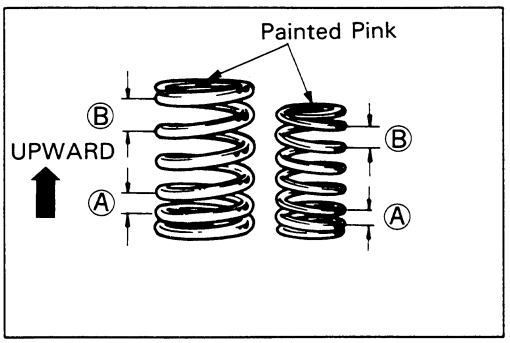

- Insert the valves, with their stems coated with high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE) all around and along the full stem length without any break.

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

**99000-25140 : SUZUKI MOLY PASTE**



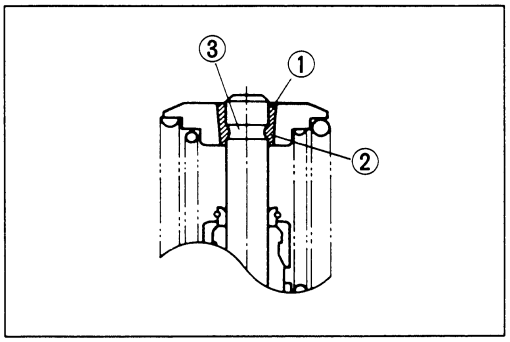
- Install the valve springs with the small-pitch portion Ⓐ facing cylinder head.
  Ⓑ : Large-pitch portion




- Put on the valve spring retainer and, using the valve lifter, press down the springs, fit the cotter halves to the stem end, and release the lifter to allow the cotter ① to wedge in between retainer and stem.

*NOTE:*
*Be sure that the rounded lip ② of the cotter fits snugly into the groove ③ in the stem end.*

**09916-14510 : Valve lifter**
**09916-84510 : Tweezers**

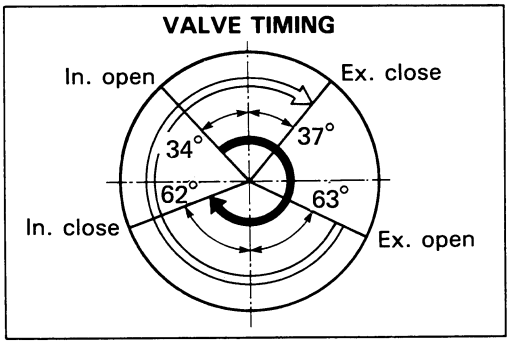



**CAUTION:**
**Be sure to restore each spring and valve to their original positions.**

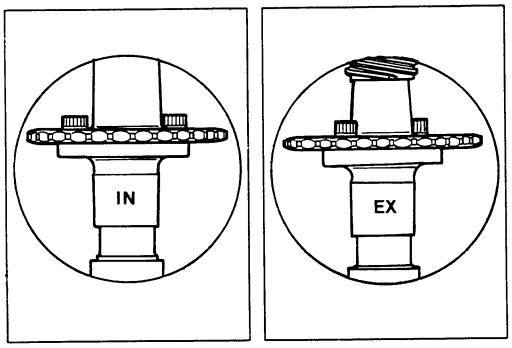
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## CAMSHAFTS

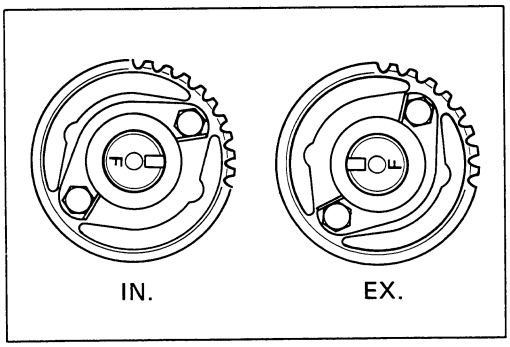
Both camshafts should be checked for runout and also for wear of cams and journals if the engine has been noted as giving abnormal noise or vibration or lack power output. Any of these conditions may be caused by camshafts worn down or distorted to the service limit.




The exhaust camshaft can be distinguished from that of the intake by the embossed letters "EX" (for exhaust) as against letters "IN" (for intake).



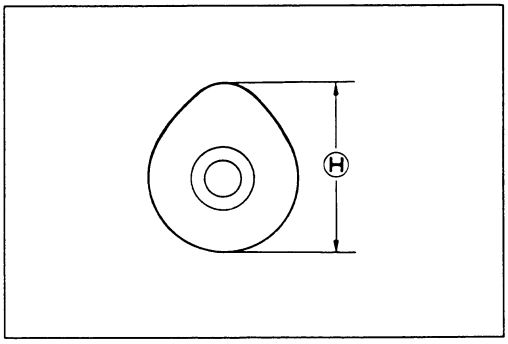

Similarly, the right end can be distinguished by the notch from the left end.
The punch letter "F" on the right end of both camshafts of this model means to distinguish these camshafts from those of other models.




### CAM WEAR

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

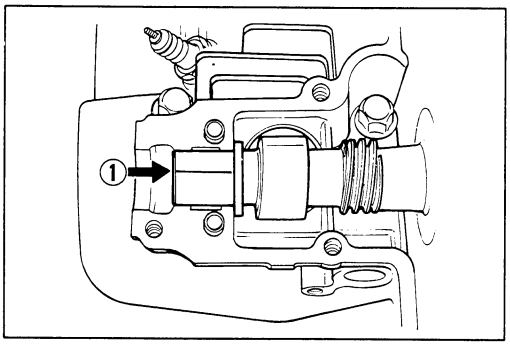
**09900-20202 : Micrometer (25 — 50 mm)**




| Cam height Ⓗ | Service Limit |
|---|---|
| IN | 36.49 mm (1.437 in) |
| EX | 36.00 mm (1.417 in) |

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## CAMSHAFT JOURNAL WEAR




Determine whether or not each journal is worn down to the limit by measuring the oil clearance with the camshaft installed in place.

- Use plastigauge ① to read the clearance at the widest portion, which is specified as follows:

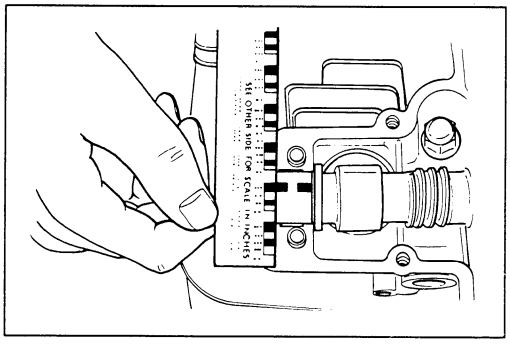
**09900-22301 : Plastigauge**
**(Not available in U.S.A.)**

| Camshaft journal oil clearance | Service Limit |
|---|---|
| IN & EX | 0.150 mm (0.0059 in) |

*NOTE:*
*Install each holder to their original positions.*

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

**Camshaft journal holder bolt : 8 — 12 N·m (0.8 — 1.2 kg-m, 6.0 — 8.5 lb-ft)**

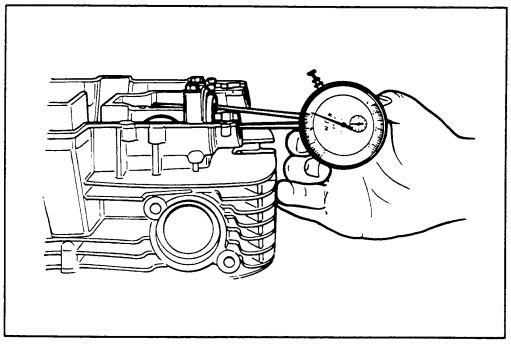


*NOTE:*
*Do not rotate the camshaft with plastigauge is in place.*

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

If the camshaft journal oil clearance measured exceeds the limit, measure the following two portions:

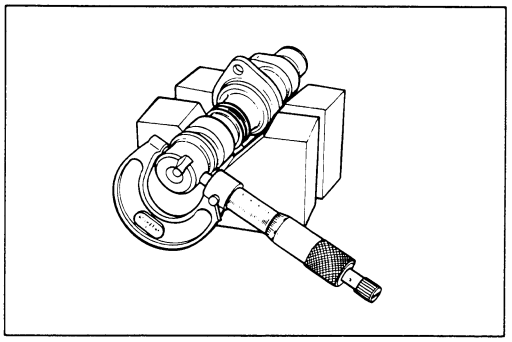
- Inner diameter of camshaft journal



**09900-20602 : Dial gauge (1/1000 mm, 1 mm)**
**09900-22403 : Small bore gauge (18-35 mm)**
**(Not available in U.S.A.)**

| Camshaft journal holder I.D. | Standard |
|---|---|
| IN & EX | 22.012 — 22.025 mm (0.8666 — 0.8671 in) |

- Outer diameter of camshaft journal



**09900-20205 : Micrometer (0-25 mm)**

| Camshaft journal O.D. | Standard |
|---|---|
| IN & EX | 21.959 — 21.980 mm (0.8645 — 0.8654 in) |

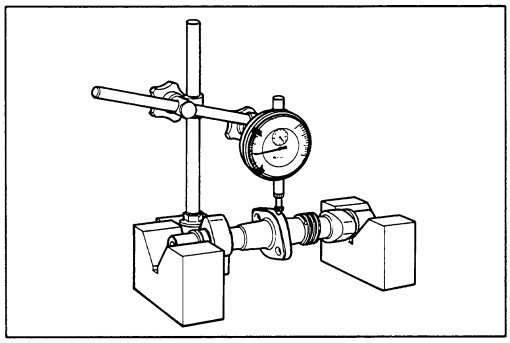
Replace the camshaft or cylinder head depending upon which one exceeds the specification.

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### CAMSHAFT RUNOUT

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

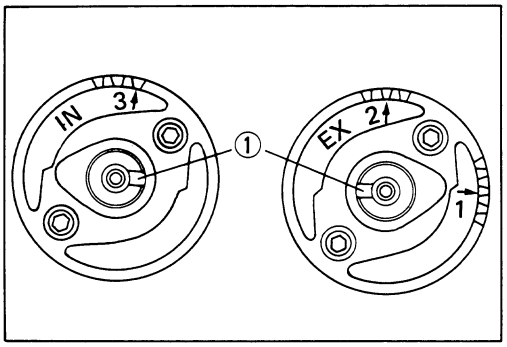
**09900-20606 : Dial gauge (1/100 mm, 10 mm)**
**09900-20701 : Magnetic stand**
**09900-21304 : V-block (100 mm)** } **Not available in U.S.A.**



| Camshaft runout | Service Limit |
|---|---|
| IN & EX | 0.1 mm (0.004 in) |

### CAM SPROCKET

The fixed position of each cam sprocket on each camshaft is determined by arrow mark "3", on INTAKE sprocket, or arrow marks "1" and "2", on EXHAUST sprocket, located in reference to the notch ① in the right end of each camshaft.

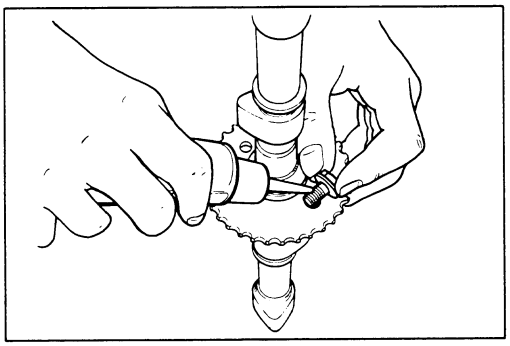



### REASSEMBLY

- Apply THREAD LOCK SUPER "1303" to the threads of cam sprocket bolts, and tighten them to the specified torque.
- Bend up the washer tongue positively to lock the bolts.

**99000-32030 : THREAD LOCK SUPER "1303"**

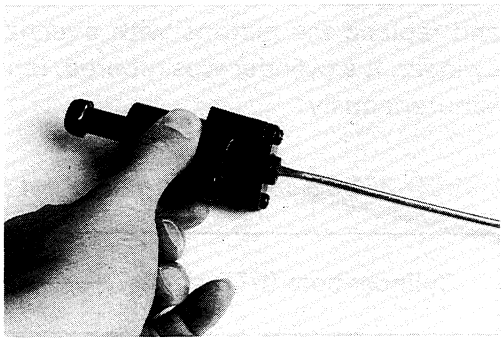
**Cam sprocket bolt : 17 – 19 N·m**
**(1.7 – 1.9 kg-m, 12.5 – 13.5 lb-ft)**



## CAM CHAIN TENSIONER

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

Insert the ⊖ screwdriver into the slotted end of cam chain tensioner and turn the ⊖ screwdriver clockwise to lessen the tension and release the ⊖ screwdriver from the cam chain tensioner, to make sure the push rod movement. If the push rod is stuck or spring mechanism failed, replace the cam chain tensioner assembly with a new one.

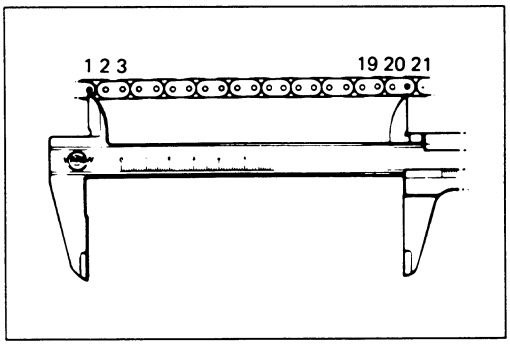


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### CAM CHAIN LENGTH

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

**09900-20102 : Vernier calipers (200 mm)**



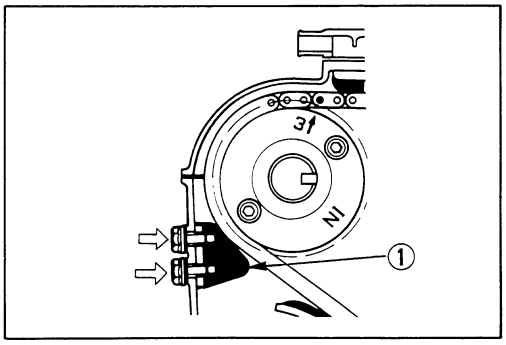

| Cam chain 20-pitch length | Service Limit |
|---|---|
| | 158.0 mm (6.22 in) |

### CAM CHAIN GUIDE

*NOTE:*
*When replacing the cam chain guide ①, apply SUZUKI THREAD LOCK SUPER "1303" to threads of bolt.*

**99000-32030 : THREAD LOCK SUPER "1303"**

**Cam chain guide mounting bolt : 4 — 7 N·m (0.4 — 0.7 kg-m, 3.0 — 5.0 lb-ft)**

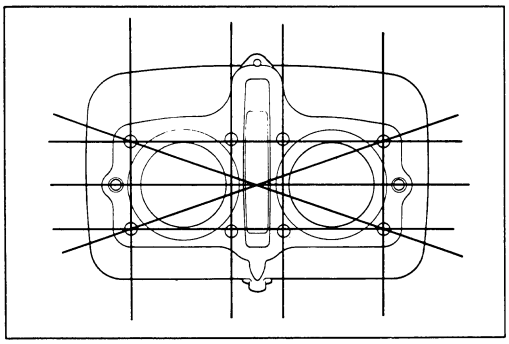



## CYLINDER

### CYLINDER DISTORTION

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

**09900-20803 : Thickness gauge**

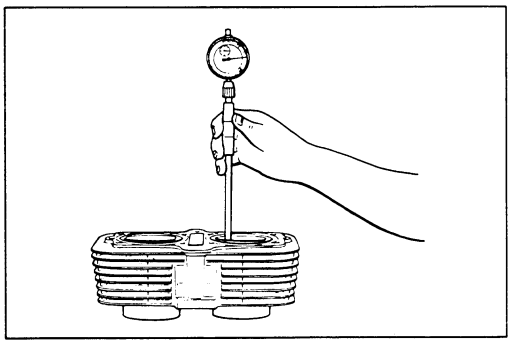


| Cylinder distorsion | Service Limit |
|---|---|
| | 0.10 mm (0.004 in) |

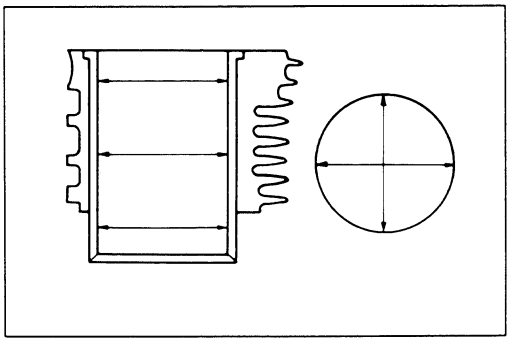
### CYLINDER BORE

Measure the cylinder bore diameter at six places. If any one of the measurements exceeds the limit, rebore the cylinder and replace the pistons with oversize ohes, or replace the cylinder. It a cylinder was rebored, rebore remaining cylinders simutaneously.

**09900-20508 : Cylinder gauge set (40 — 80 mm)**



| Cylinder bore (STD size) | Service Limit |
|---|---|
| | 74.080 mm (2.9165 in) |



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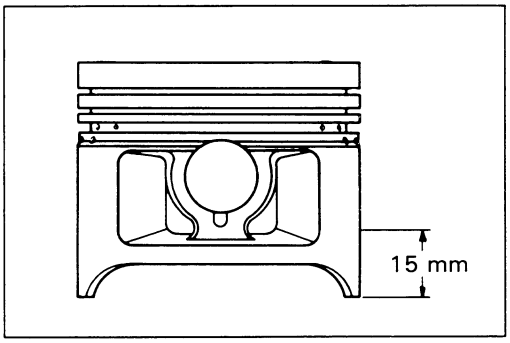
# PISTONS

## PISTON DIAMETER

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

**Piston oversize : 0.5, 1.0 mm**

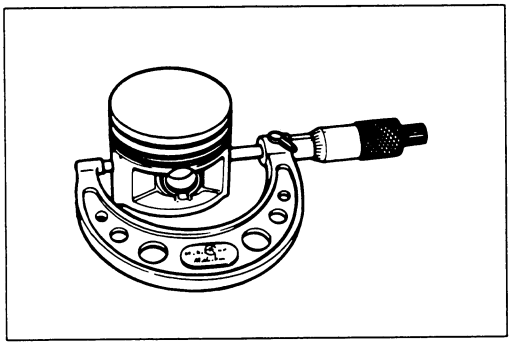
**09900-20203 : Micrometer (50 — 75 mm)**




| Piston diameter (STD size) | Service Limit |
|---|---|
| | 73.880 mm (2.9087 in) |

## PISTON-CYLINDER CLEARANCE

As a result of the above measurement, if the clearance between the piston and cylinder exceeds the following service limit, treat either to replace with an oversize piston or replacing both cylinder and piston.

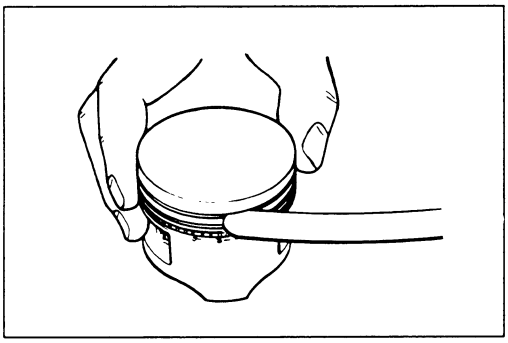


| Piston to cylinder clearance | Service Limit |
|---|---|
| | 0.120 mm (0.0047 in) |

## PISTON RING-GROOVE CLEARANCE

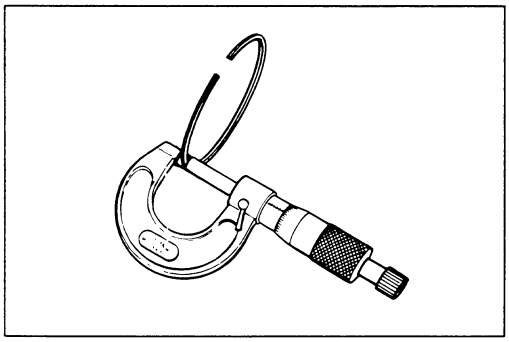
Using a thickness gauge, measure the side clearances of the 1st and 2nd rings. If any of the clearances exceeds the limit, replace both piston and piston rings.

**09900-20803 : Thickness gauge**



| Piston ring to groove clearance | Service Limit |
|---|---|
| 1st | 0.18 mm (0.007 in) |
| 2nd | 0.15 mm (0.006 in) |

| Piston ring groove width | Standard |
|---|---|
| 1st & 2nd | 1.21 — 1.23 mm (0.047 — 0.048 in) |
| Oil | 2.51 — 2.53 mm (0.099 — 0.100 in) |



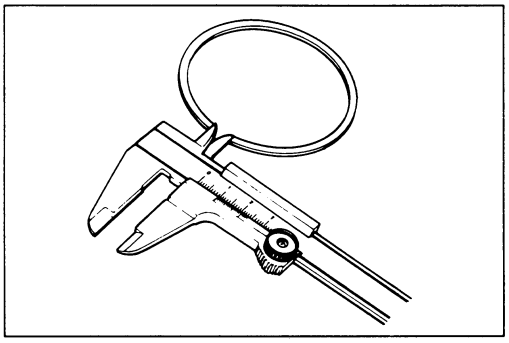
| Piston ring thickness | Standard |
|---|---|
| 1st & 2nd | 1.17 — 1.19 mm (0.046 — 0.047 in) |

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## PISTON RINGS

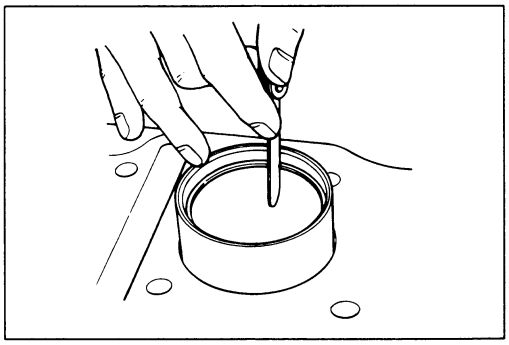
### PISTON RING END GAP

Before installing piston rings, measure the free end gap of each ring using a vernier calipers. Next, fit the ring in the cylinder, and measure each ring end gap using a thickness gauge.
If the free end gap is smaller than service limit, replace it with new one.



**09900-20102 : Vernier calipers (200 mm)**

| Piston ring free end gap | | Service Limit |
|---|---|---|
| 1st | N | 5.6 mm (0.22 in) |
| 2nd | N | 8.8 mm (0.35 in) |



If the end gap is larger than service limit, replace it with new one.

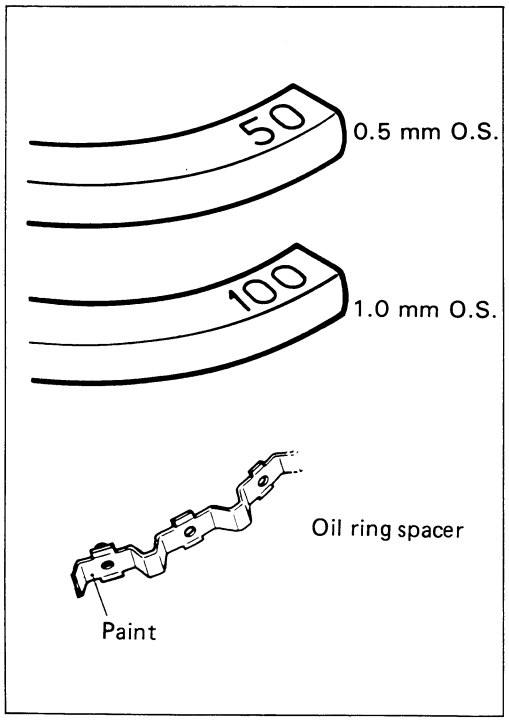
**09900-20803 : Thickness gauge**

| Piston ring end gap | Service Limit |
|---|---|
| 1st & 2nd | 0.7 mm (0.03 in) |

### OVERSIZE PISTON RING

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

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




### OVERSIZE OIL RING

The following two types of oversize oil ring are available. They bear the following identification marks.

| SIZE | COLOR |
|---|---|
| STD | Painted red |
| 0.5 mm O.S. | Painted blue |
| 1.0 mm O.S. | Painted yellow |

### OVERSIZE SIDE RAIL

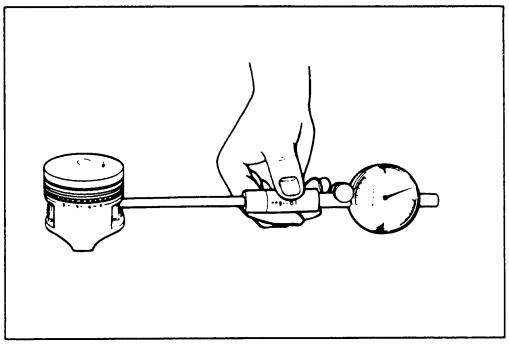
Just measure out side diameter to identify the size.

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## PISTON PINS

### PISTON PIN BORE

Using a small bore gauge, measure the piston pin bore inside diameter, and using a micrometer, measure the piston pin outside diameter. If the difference between these two measurement is more than the limits, replace both piston and piston pin.

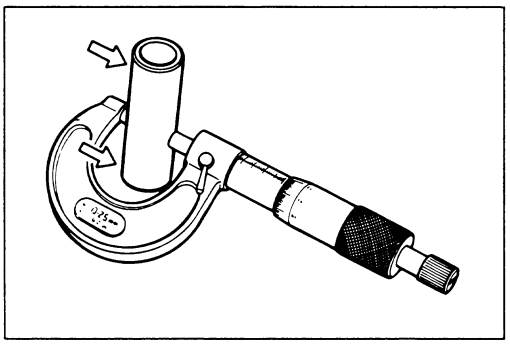


**09900-20602 : Dial gauge (1/1000 mm, 1 mm)**
**09900-22403 : Small bore gauge (18 — 35 mm)**
**(Not available in U.S.A.)**

| | Service Limit |
|---|---|
| Piston pin bore | 18.030 mm (0.7098 in) |

### PISTON PIN DIAMETER

Using a micrometer, measure the piston pin outside diameter at three positions.



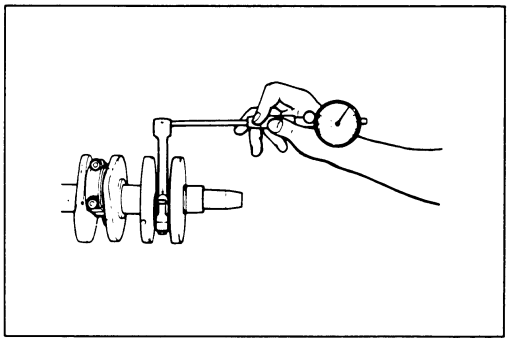
**09900-20205 : Micrometer (0 — 25 mm)**

| | Service Limit |
|---|---|
| Piston pin O.D. | 17.980 mm (0.7079 in) |

## CONRODS

### CONROD SMALL END I.D.

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



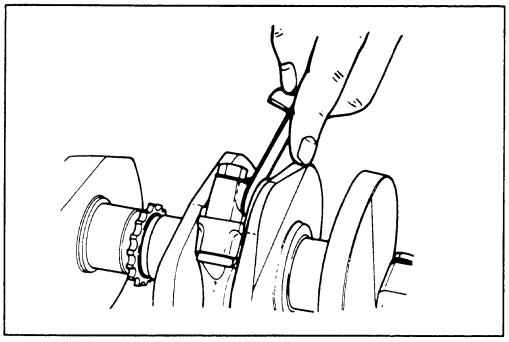
**09900-20602 : Dial gauge (1/1000 mm, 1 mm)**
**09900-22403 : Small bore gauge (18 — 35 mm)**
**(Not available in U.S.A.)**

| | Service Limit |
|---|---|
| Conrod small end I.D. | 18.040 mm (0.7102 in) |

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

### CONROD BIG END SIDE CLEARANCE

Check the conrod side clearance using a thickness gauge.



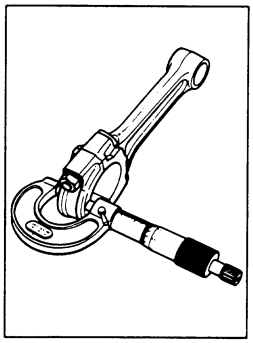
**09900-20803 : Thickness gauge**

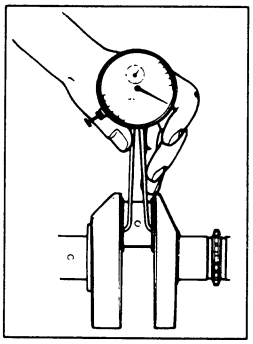
| | Service Limit |
|---|---|
| Conrod big end side clearance | 0.3 mm (0.01 in) |

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If the side clearance exceeds the limit, replace either conrod or crankshaft to measure both widths.

**09900-20205 : Micrometer (0 — 25 mm)**
**09900-20605 : Dial calipers (10 — 34 mm)**
**(Not available in U.S.A.)**

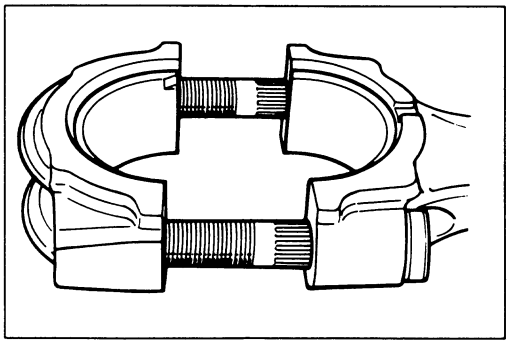




| | Standard |
|---|---|
| Conrod big end width | 22.95 — 23.00 mm (0.904 — 0.906 in) |
| Crank pin width | 23.10 — 23.15 mm (0.909 — 0.911 in) |

## CONROD-CRANK PIN BEARING SELECTION

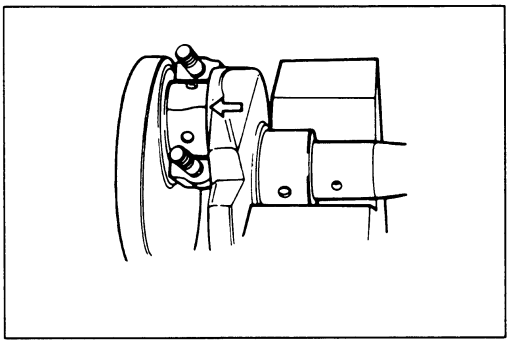
- Loosen the bearing cap nuts, and tap the bolt end lightly with plastic hammer to remove bearing cap.
- Remove the rods, and mark them to identify the cylinder position.
- Inspect the bearing surfaces for any sign of fusion, pitting, burn, or flaws. If any, replace them with a specified set of bearings.



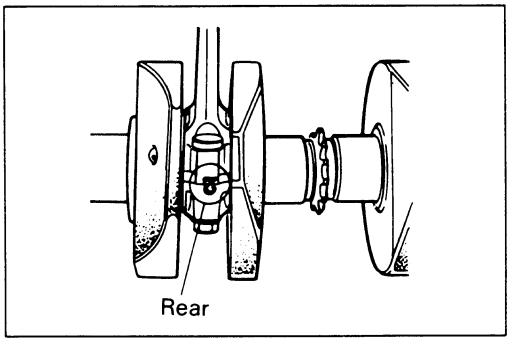
*NOTE:*
*Never try to remove the conrod cap bolts because it is impossible to refit the conrod cap bolts tight again.*

- Place plastigauge axially on the crank pin avoiding oil hole and at the TDC or BDC side as shown.

**09900-22301 : Plastigauge**
**(Not available in U.S.A.)**



- Tighten the bearing cap with two-step torque values.



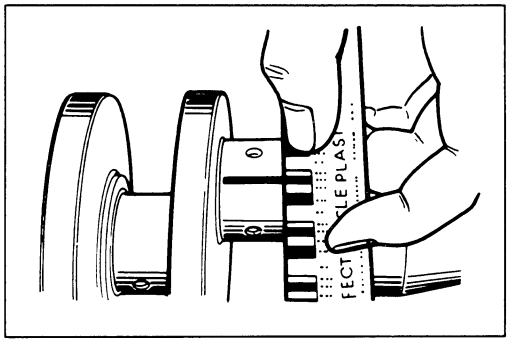

*NOTE:*
*When fitting bearing cap to crank pin, be sure to discriminate one end from the other, namely front and rear.*

**Conrod bearing cap nut**
**Initial : 22 — 28 N·m (2.2 — 2.8 kg-m, 16.0 — 20.0 lb-ft)**
**Final : 30 — 34 N·m (3.0 — 3.4 kg-m, 21.5 — 25.0 lb-ft)**

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

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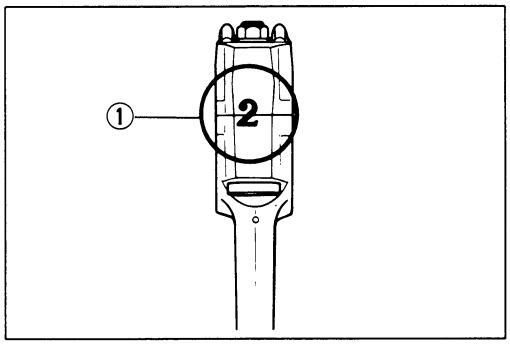
- Remove the caps, and measure the width of compressed plastigauge with its envelope scale. This measurement should be taken at the widest part.

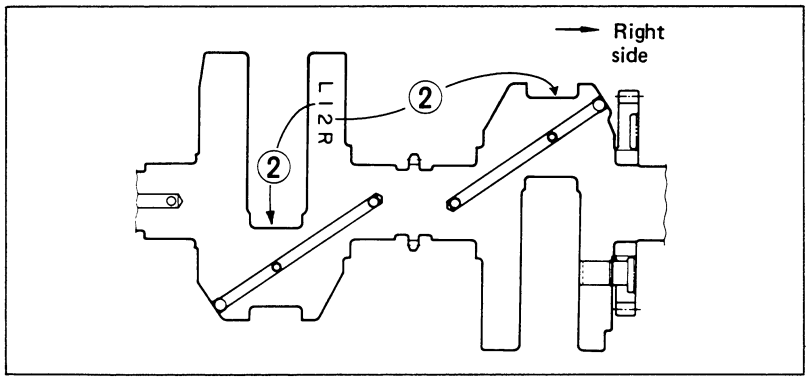


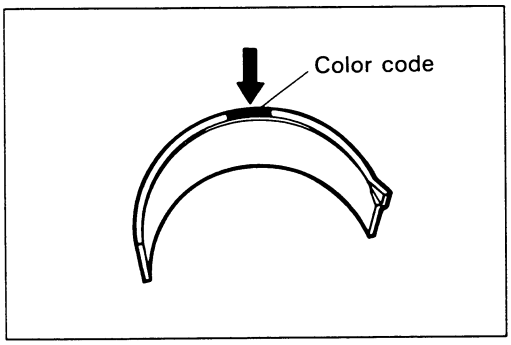
| Conrod big end oil clearance | Standard | Service Limit |
|---|---|---|
| | 0.024 – 0.048 mm (0.0009 – 0.0019 in) | 0.080 mm (0.0031 in) |

If oil clearance exceeds the service limit, select the specific bearing to refer below table.
The bearing distinguished by color painted is selected easily by the following two steps.

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




**Bearing selection table**

| | | Crank pin O.D. ② | | |
|---|---|---|---|---|
| | **Code** | 1 | 2 | 3 |
| **Conrod I.D. ①** | 1 | Green | Black | Brown |
| | 2 | Black | Brown | Yellow |

**CAUTION:**
**Bearing should be replaced as a set.**

(REFERENCE DATA)
**Conrod I.D. specification**

| Code | I.D. specification |
|---|---|
| 1 | 37.000 – 37.008 mm (1.4567 – 1.4570 in) |
| 2 | 37.008 – 37.016 mm (1.4570 – 1.4573 in) |

**Crank pin O.D. specification**

| Code | O.D. specification |
|---|---|
| 1 | 33.992 – 34.000 mm (1.3383 – 1.3386 in) |
| 2 | 33.984 – 33.992 mm (1.3380 – 1.3383 in) |
| 3 | 33.976 – 33.984 mm (1.3376 – 1.3380 in) |

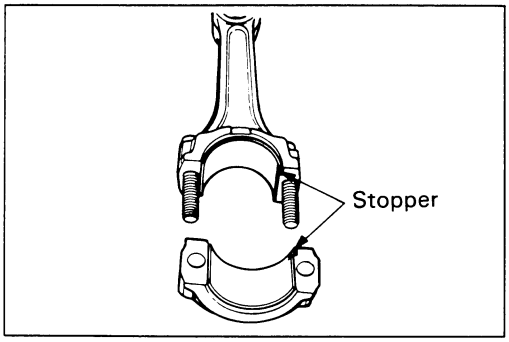
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**Bearing thickness specification**

| Color (Part No.) | Thickness |
|---|---|
| Green (12164-01D00-0A0) | 1.484 – 1.488 mm (0.0584 – 0.0586 in) |
| Black (12164-01D00-0B0) | 1.488 – 1.492 mm (0.0586 – 0.0587 in) |
| Brown (12164-01D00-0C0) | 1.492 – 1.496 mm (0.0587 – 0.0589 in) |
| Yellow (12164-01D00-0D0) | 1.496 – 1.500 mm (0.0589 – 0.0590 in) |

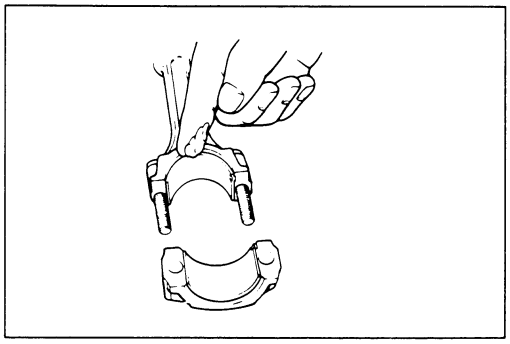
## BEARING ASSEMBLY

- When fitting the bearings to the bearing cap and conrod, be sure to fix the stopper part first, and press the other end.




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

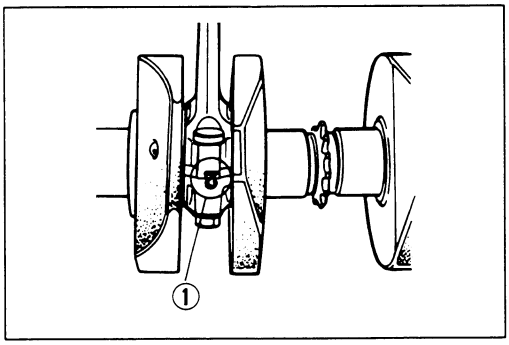
**99000-25140 : SUZUKI MOLY PASTE**



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

**Conrod bearing cap nut : 30 – 34 N·m**
**(3.0 – 3.4 kg-m,**
**21.5 – 25.0 lb-ft)**

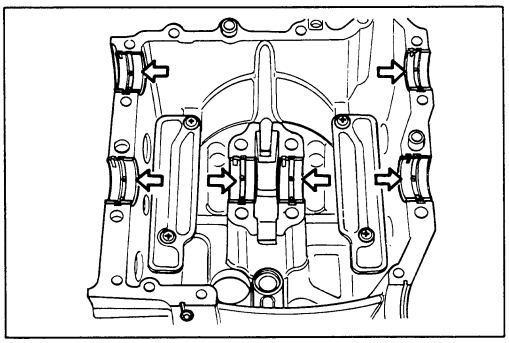
- Check the conrod movement for smooth turning.



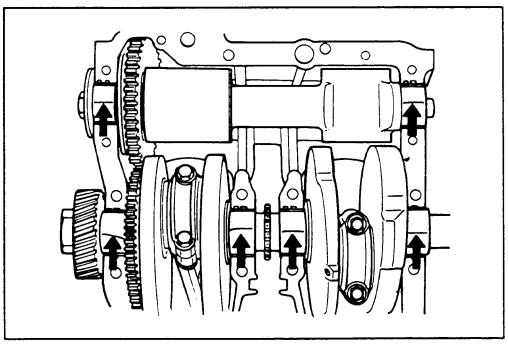

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# CRANKSHAFT AND COUNTER-BALANCER SHAFT

## CRANKCASE-CRANKSHAFT AND COUNTER-BALANCER BEARING SELECTION



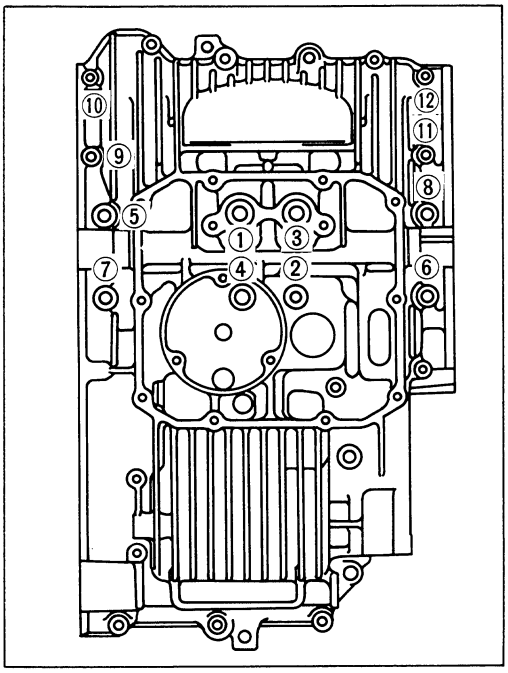
- Inspect each bearing of upper and lower crankcases for any damage.



- Place the plastigauge on each crankshaft and counter-balancer shaft journal in the usual manner.

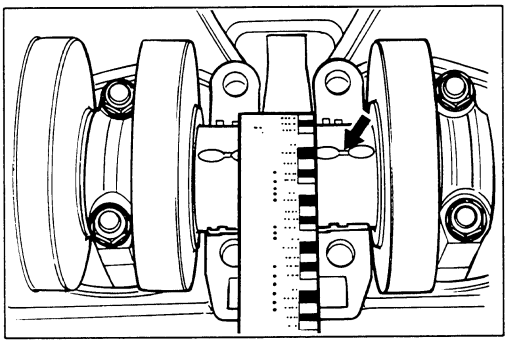
*NOTE:*
*Do not place the plastigauge on the oil hole, and do not rotate the shaft when plastigauge is in place.*

**09900-22301 : Plastigauge**
**(Not available in U.S.A.)**




- Mate the lower crankcase with the upper crankcase, and tighten the crankshaft/counter-balancer shaft tightening bolts with specified torque value as the indicated order.

| Item | Initial | Final |
|---|---|---|
| ① – ⑧ | 13 N·m (1.3 kg-m, 9.5 lb-ft) | 20 – 24 N·m (2.0 – 2.4 kg-m, 14.5 – 17.5 lb-ft) |
| ⑨ – ⑫ | 6 N·m (0.6 kg-m, 4.5 lb-ft) | 9 – 13 N·m (0.9 – 1.3 kg-m, 6.5 – 9.5 lb-ft) |
| The other 6 mm bolts | 6 N·m (0.6 kg-m, 4.5 lb-ft) | 10 N·m (1.0 kg-m, 7.0 lb-ft) |
| The other 8 mm bolts | 13 N·m (1.3 kg-m, 9.5 lb-ft) | 20 N·m (2.0 kg-m, 14.5 lb-ft) |



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

| Crankshaft and counter-balancer shaft oil clearance | Standard | Service Limit |
|---|---|---|
| | 0.020 – 0.044 mm (0.0008 – 0.0017 in) | 0.080 mm (0.0031 in) |

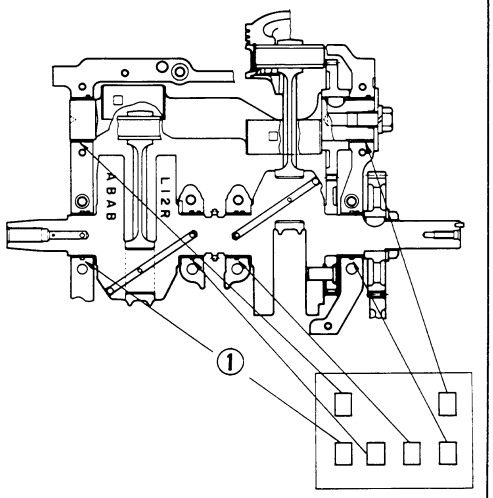
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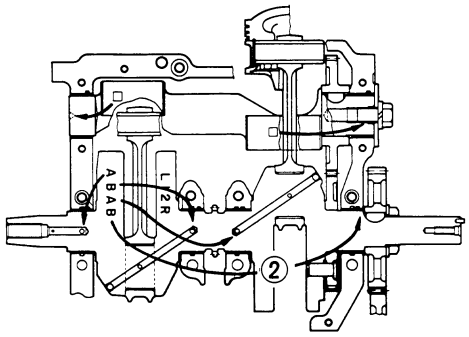
If the width at the widest part exceeds the limit, replace the set of bearings with new ones to refer the selection table.

- Check the corresponding crankcase journal I.D. code number ① "A" or "B" which are stamped on the rear surface of upper crankcase.
- Check the corresponding crankshaft and counter-balancer shaft journal O.D. code number ② "A", "B" or "C".

**Bearing selection table**

| | | Crankshaft and counter-balancer journal O.D. ② | | |
|---|---|---|---|---|
| | Code | A | B | C |
| Crankcase I.D. ① | A | Green | Black | Brown |
| | B | Black | Brown | Yellow |




**CAUTION:**
**Bearing should be replaced as a set.**

**(REFERENCE DATA)**
**Crankcase I.D. specification**

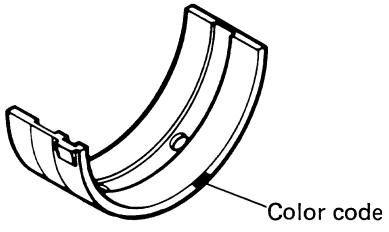
| Code | I.D. specification |
|---|---|
| A | 35.000 – 35.008 mm (1.3780 – 1.3783 in) |
| B | 35.008 – 35.016 mm (1.3783 – 1.3786 in) |

**Crankshaft and counter-balancer shaft journal O.D. specification**

| Code | O.D. specification |
|---|---|
| A | 31.992 – 32.000 mm (1.2595 – 1.2598 in) |
| B | 31.984 – 31.992 mm (1.2592 – 1.2595 in) |
| C | 31.976 – 31.984 mm (1.2589 – 1.2592 in) |

**Bearing thickness specification**

| Color (Part No.) | Specification |
|---|---|
| Green (12229-01D00-0A0) | 1.486 – 1.490 mm (0.0585 – 0.0587 in) |
| Black (12229-01D00-0B0) | 1.490 – 1.494 mm (0.0587 – 0.0588 in) |
| Brown (12229-01D00-0C0) | 1.494 – 1.498 mm (0.0588 – 0.0590 in) |
| Yellow (12229-01D00-0D0) | 1.498 – 1.502 mm (0.0590 – 0.0591 in) |

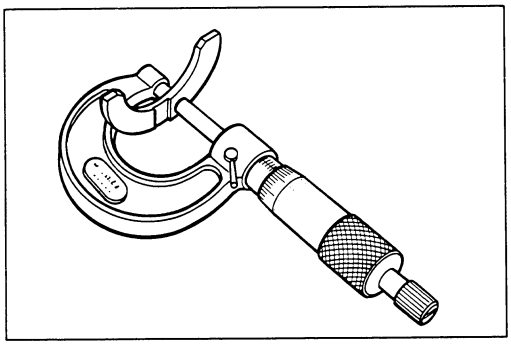



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### CRANKSHAFT THRUST BEARING

- Check the crankshaft thrust bearing thickness for wear. If most wearing portion exceeds the following limit, replace them with new ones as a set.

**09900-20205 : Micrometer (1/1000 mm, 0 – 25 mm)**

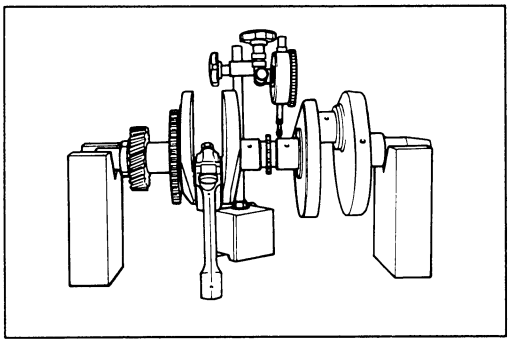


| | |
|---|---|
| Service Limit | 2.85 mm (0.112 in) |

### CRANKSHAFT RUNOUT

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

**09900-20606 : Dial gauge (1/100 mm, 10 mm)**
**09900-20701 : Magnetic stand**
**09900-21304 : V-block (100 mm)** } **Not available in U.S.A.**



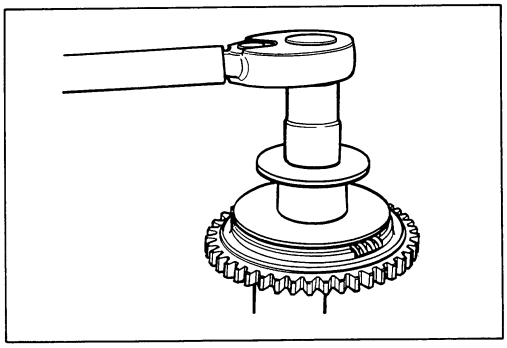
| | |
|---|---|
| Crankshaft runout | Service Limit |
| | 0.05 mm (0.002 in) |

## COUNTER-BALANCER SHAFT

### DISASSEMBLY

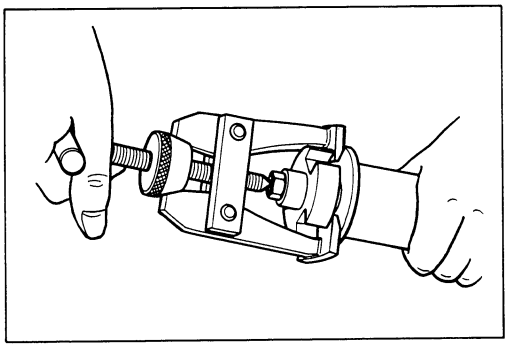
- Remove the counter-balancer shaft setting bolt.
- Remove the washers and spacer along with the driven gear.

*NOTE:*
*Do not lose the damper springs and pins.*



- Remove the inner race with the special tool.

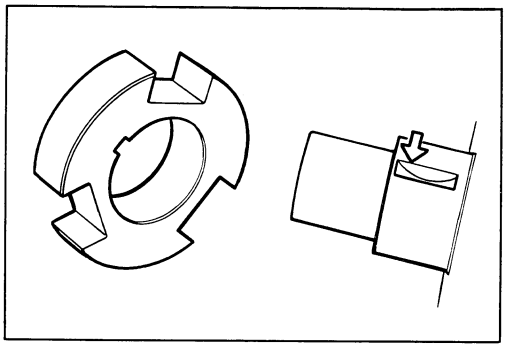
**09913-61110 : Bearing puller**



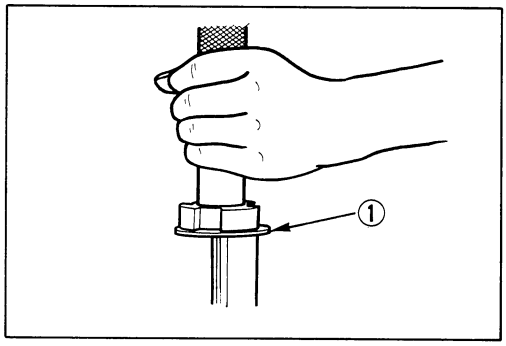
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## REASSEMBLY

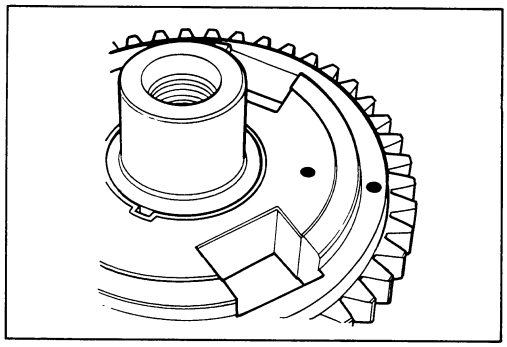
- Locate the washer ① onto the counter-balancer shaft and fit the key in the key slot, then install the inner race to use a hand press as shown.



*NOTE:*
*The Punch-marked side of inner race comes outside.*

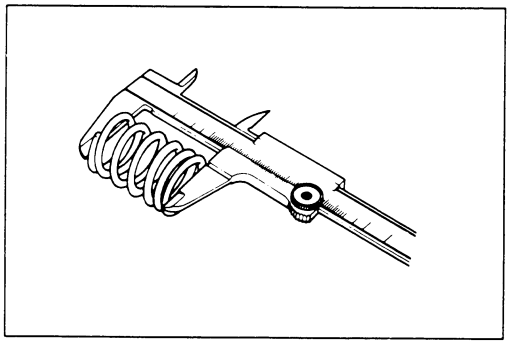



- Align the punched marks on the driven gear and inner race.

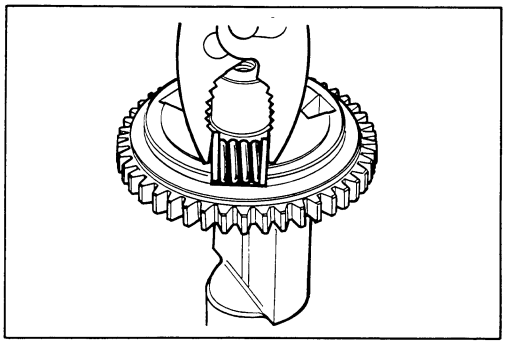


- Check the springs for strength by measuring their free length and if one of them is shorter than limit, replace all of them with new ones.

| | |
|---|---|
| Service Limit | 14.9 mm<br>(0.59 in) |



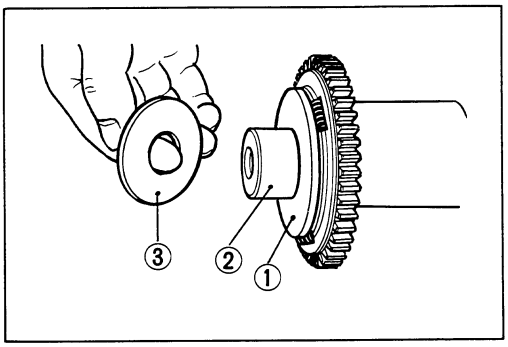
- Install the damper springs and pins with pliers.



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- Install the washer ①, spacer ② and washer ③.
- Tighten the counter-balancer shaft setting bolt to the specified torque.

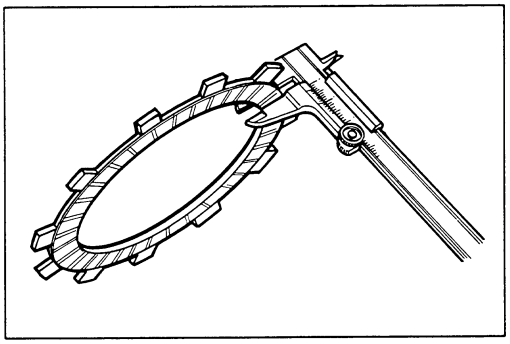
**Tightening torque : 35 – 45 N·m**
**(3.5 – 4.5 kg-m,**
**25.5 – 32.5 lb-ft)**



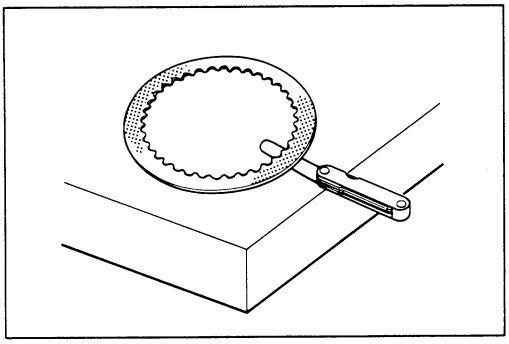

## CLUTCH

### CLUTCH DRIVE AND DRIVEN PLATES

Clutch plates in service remain in oily condition as they are lubricated with oil. Because of this condition, both drive and driven plates are subject to little wearing action and therefore last much longer. Their life depends largely on the quality of oil used in the clutch and also on the way the clutch is operated.
These plates are expendable: they are meant to be replaced when found worn down or distorted to the respective limit: use a vernier calipers to check thickness and a thickness gauge and surface plate to check distortion.



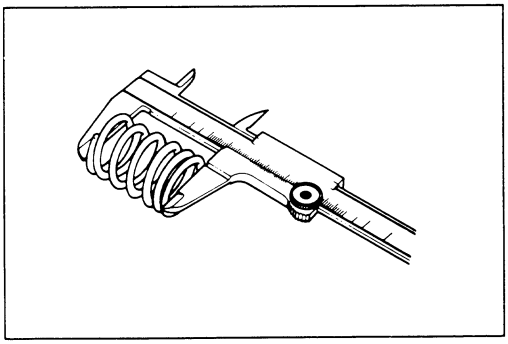
**09900-20102 : Vernier calipers (200 mm)**
**09900-20803 : Thickness gauge**



| | Standard | Service Limit |
|---|---|---|
| Drive plate thickness | 2.92 – 3.08 mm (0.115 – 0.121 in) | 2.62 mm (0.103 in) |
| Driven plate distortion | – | 0.10 mm (0.004 in) |

### CLUTCH SPRING FREE LENGTH

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

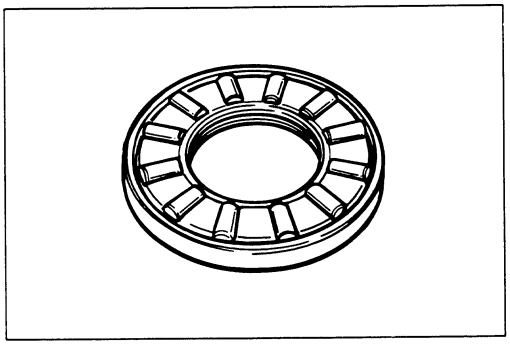


**09900-20102 : Vernier calipers (200 mm)**

| Clutch spring free length | Service Limit |
|---|---|
| | 60.8 mm (2.39 in) |

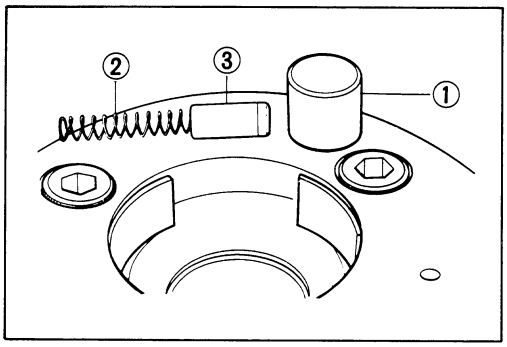
### CLUTCH RELEASE BEARING

Inspect the clutch release bearing for any abnormality to decide whether it can be reused or should be replaced.
Smooth engagement and disengagement of the clutch depends much on the condition of this bearing.



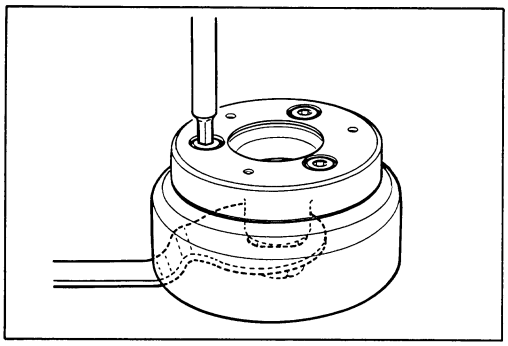
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## STARTER CLUTCH



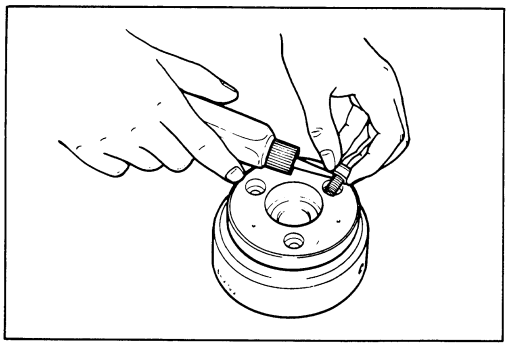

### DISASSEMBLY

- Remove the starter driven gear.
- Remove the roller ①, spring ② and push piece ③.



- Hold the generator rotor with the rotor holder and remove the starter clutch securing bolts.

**09930-44511 : Rotor holder**



### REASSEMBLY

- Apply a small quantity of THREAD LOCK SUPER "1303" to the starter clutch securing bolts and tighten them to the specified torque by holding the rotor holder.

**99000-32030 : THREAD LOCK SUPER "1303"**

**Tightening torque : 15 – 20 N·m**
**(1.5 – 2.0 kg-m,**
**11.0 – 14.5 lb-ft)**

## OIL PUMP

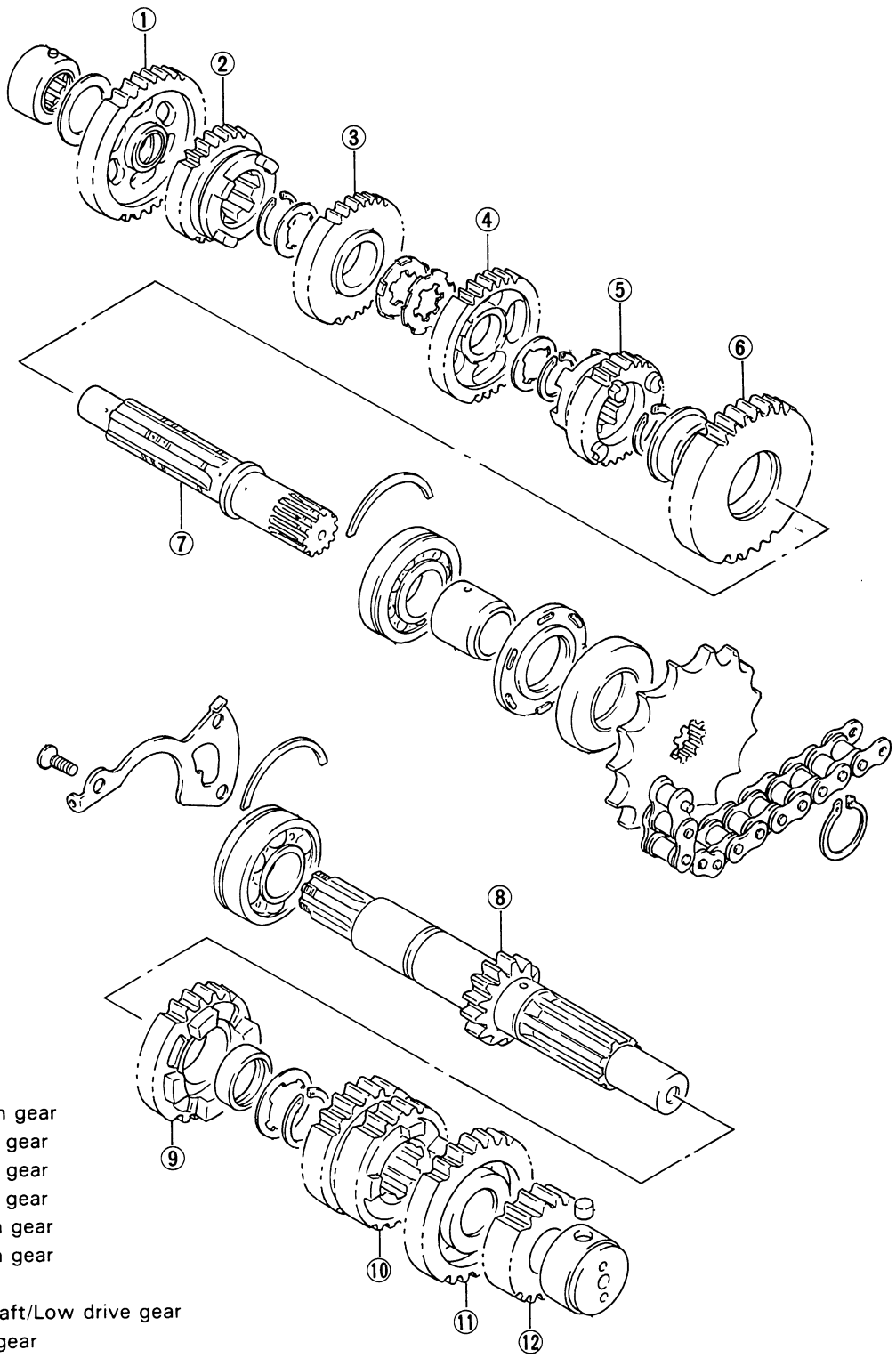
**CAUTION:**
**Do not attempt to disassemble the oil pump assembly.**
**The oil pump is available only as an assembly.**

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# TRANSMISSION GEARS

## DISASSEMBLY

Disassemble the transmission gears as shown in the illustration.




① Low driven gear
② 5th driven gear
③ 4th driven gear
④ 3rd driven gear
⑤ Top driven gear
⑥ 2nd driven gear
⑦ Driveshaft
⑧ Countershaft/Low drive gear
⑨ 5th drive gear
⑩ 3rd/4th drive gear
⑪ Top drive gear
⑫ 2nd drive gear

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## REASSEMBLY

Assemble the countershaft and driveshaft in the reverse order of disassembly. Pay attention to following points:

*NOTE:*

* *Before installing the gears, rotate the bearing by hand to inspect for abnormal noise and smooth rotation. If there is any abnormal, replace the bearing with new one.*
* *Before installing the gears, coat lightly moly paste or engine oil on the driveshaft and countershaft.*

**99000-25140 : SUZUKI MOLY PASTE**

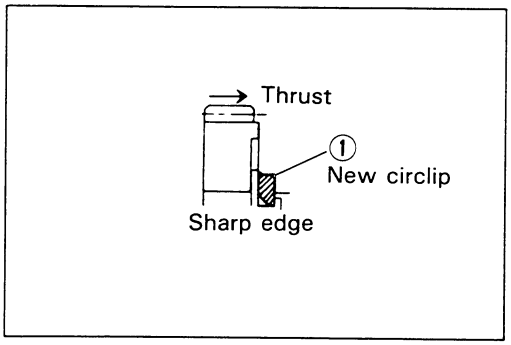
**CAUTION:**

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

*NOTE:*

*In reassembling the transmission gears, attention must be given to the locations and positions of washers and circlips. The cross sectional view given here will serve as a reference for correctly mounting the gears, washers and circlips. (Refer to page 3-44.)*

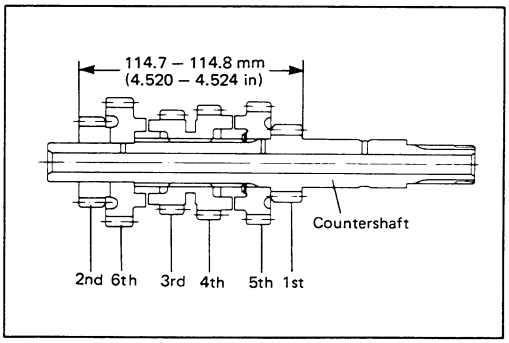
- When installing a new circlip ①, pay attention to the direction of the circlip. Fit it to the side where the thrust is as shown in the illustration.




- Press-fit the 2nd drive gear onto the countershaft.

*NOTE:*

* *Before reassembling the 2nd drive gear, apply its internal surface with THREAD LOCK SUPER "1303" and install it so that the length as shown in the illustration.*
* *After installing the 2nd drive gear, check that Top drive gear spins smoothly by moving it with your fingers.*
* *This procedure may be performed only twice before shaft replacement is required.*

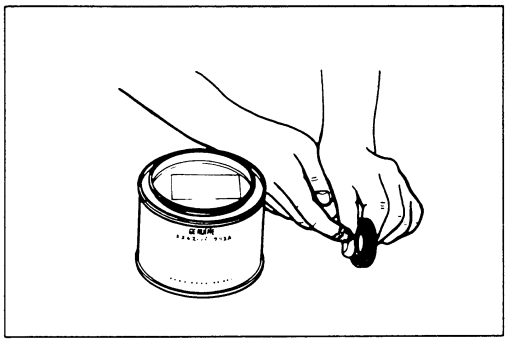



**99000-32030 : THREAD LOCK SUPER "1303"**

- Apply grease to each oil seal lip and install them onto the driveshaft and countershaft.

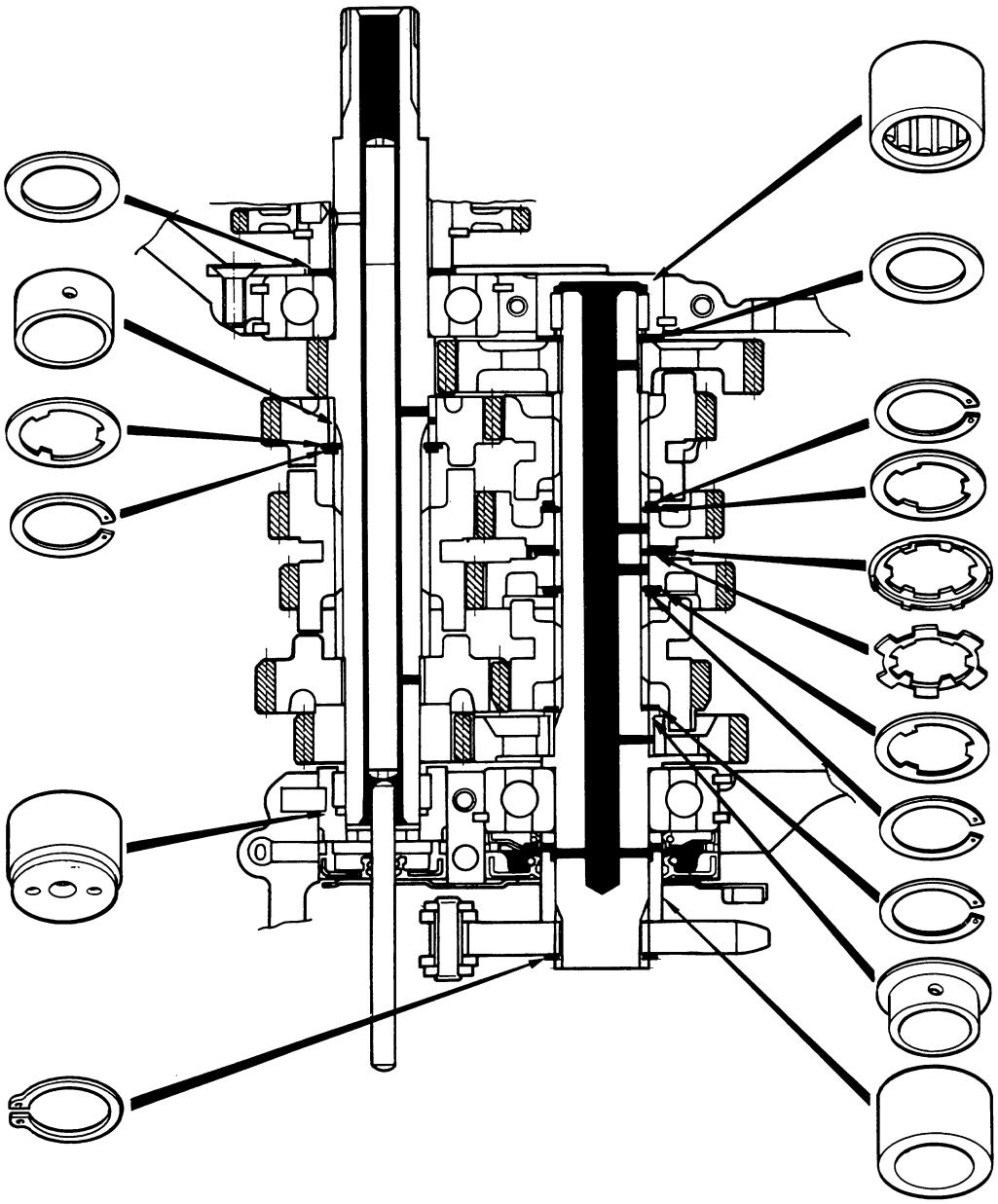
**(For U.S.A. model)**
**99000-25030 : SUZUKI SUPER GREASE "A"**

**(For the other models)**
**99000-25010 : SUZUKI SUPER GREASE "A"**



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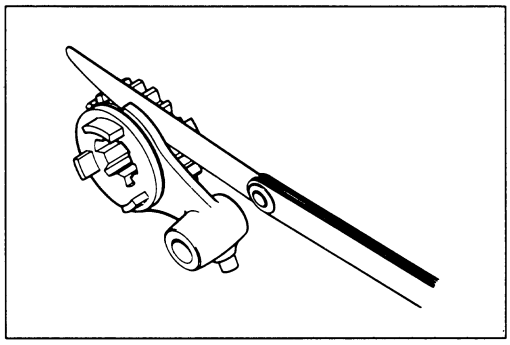
## LOCATION OF SMALL PARTS



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## GEARSHIFT FORK-GROOVE CLEARANCE

Using a thickness gauge, check the gearshift fork clearance in the groove of its gear.
The clearance for each of the three gearshift forks plays an important role in the smoothness and positiveness of shifting action.

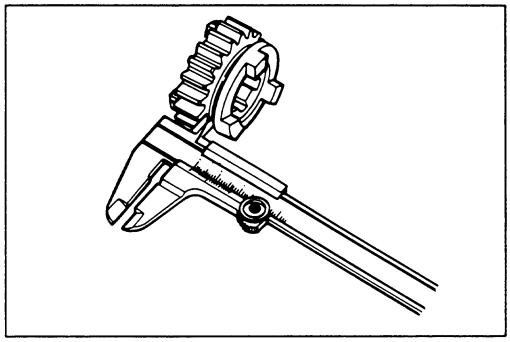


| | Standard | Service Limit |
|---|---|---|
| Gearshift fork to groove clearance | 0.10 — 0.30 mm (0.004 — 0.012 in) | 0.50 mm (0.020 in) |

If the clearance checked is noted to exceed the standard range mentioned on above, check the following points:

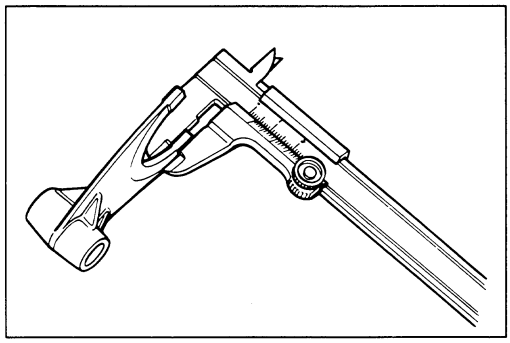
**09900-20803 : Thickness gauge**
**09900-20102 : Vernier calipers (200 mm)**

- Check to measure the shift fork groove width with a vernier calipers. If it exceeds the standard, replace its gear with a new one.



| | Standard | |
|---|---|---|
| Gearshift fork groove width | No. 1, 2 & 3 | 5.5 — 5.6 mm (0.217 — 0.220 in) |

- Check to measure the shift fork thickness with a vernier calipers. If it exceeds the standard, replace the fork with a new one.



| | Standard | |
|---|---|---|
| Gearshift fork thickness | No. 1, 2 & 3 | 5.3 — 5.4 mm (0.209 — 0.213 in) |

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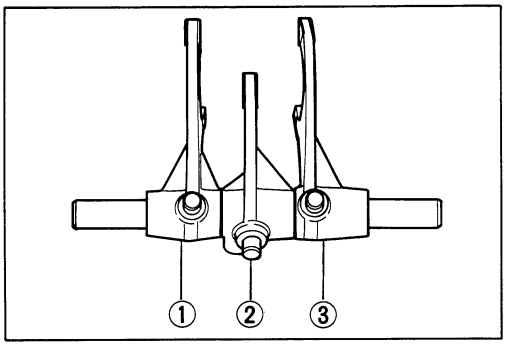
# ENGINE REASSEMBLY

The engine is reassembled by carrying out the steps of disassembly in the reversed order, but there are a number of steps which demand special descriptions or precautionary measures.

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

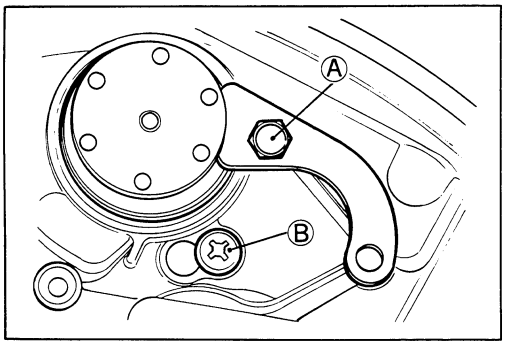
- Install the gearshift forks to the crankcase in the correct position and direction.

① For 5th driven gear
② For 3rd/4th drive gear
③ For Top driven gear

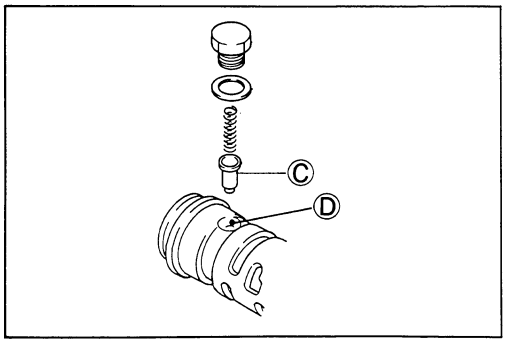



- Apply a small quantity of THREAD LOCK "1342" to the gearshift cam guide bolt Ⓐ and gearshift fork shaft stopper screw Ⓑ.

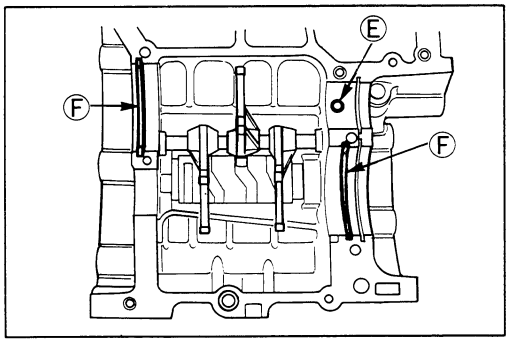
**99000-32050 : THREAD LOCK "1342"**




- Meet the neutral positioning stopper Ⓒ with the dent Ⓓ of gearshift cam.

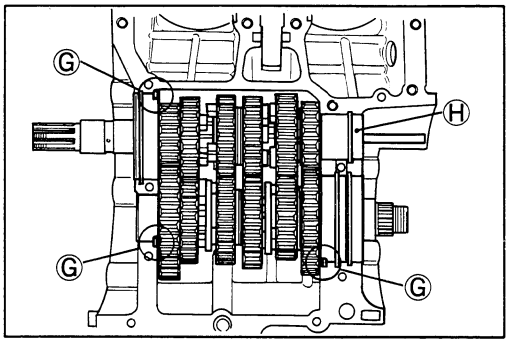



- Fit the bearing pin Ⓔ and C-rings Ⓕ on the upper crankcase.



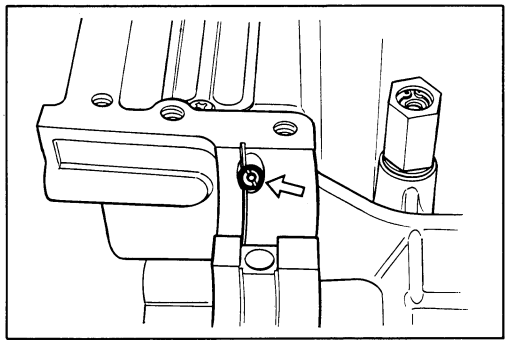

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- Install both of the countershaft assembly and driveshaft assembly on the upper crankcase.



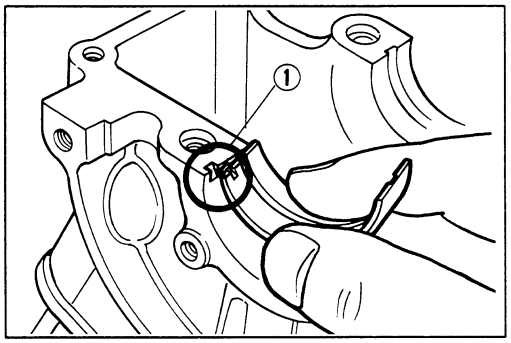

*NOTE:*
* *Be sure to install the bearing dowel pins Ⓖ in their respective positions.*
* *Install the countershaft end cap to the position Ⓗ.*
* *Make sure that the countershaft turns freely while holding the driveshaft. If not, shift the gear to the neutral position.*

- Check for clogging the oil orifices fitted on the lower crankcase.



**OIL ORIFICE LOCATION**
* Both sides of the counter-balancer shaft journal
* Countershaft left-side journal

- When fitting the crankshaft and counter-balancer shaft journal bearings to the upper and lower crankcases, be sure to fix the stopper part ① first and press the other end.
(Refer to page 3-36.)



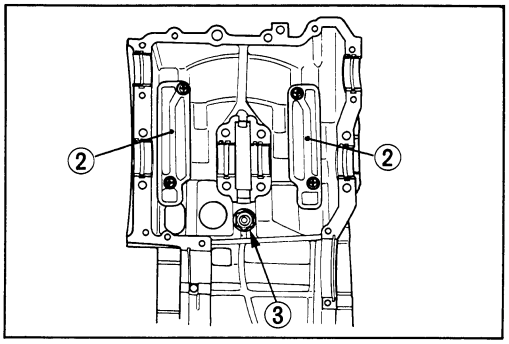

**CAUTION:**
**Do not touch the bearing suface with your hands. Grasp by the edge of the bearing shell.**

*NOTE:*
* *When replacing the oil separator plates ② , apply a small quantity of THREAD LOCK "1342" to the screws.*

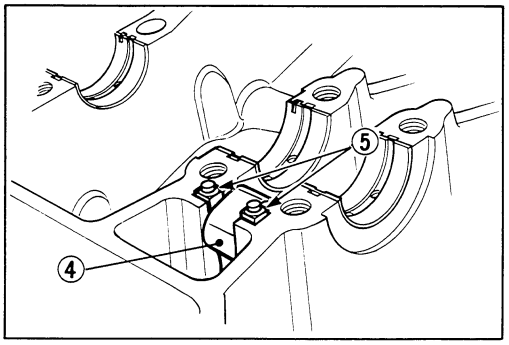
**99000-32050 : THREAD LOCK "1342"**

* *When replacing the oil pressure regulator ③, tighten it to the specified torque.*

**17 – 20 N·m (1.7 – 2.0 kg-m, 12.5 – 14.5 lb-ft)**



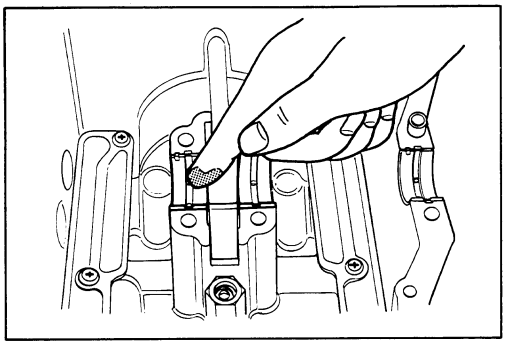

- Install the cam chain guide ④ and two dampers ⑤ properly.




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- Before installing the crankshaft and counter-balancer shaft, apply SUZUKI Moly Paste to each journal bearing.

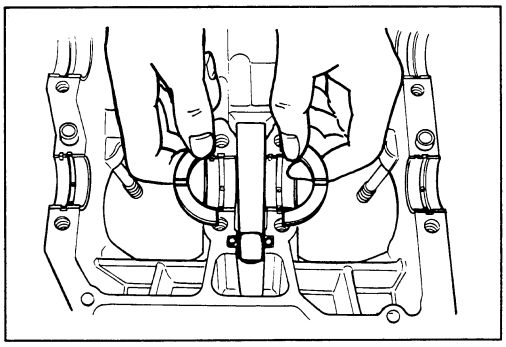
**99000-25140 : SUZUKI MOLY PASTE**



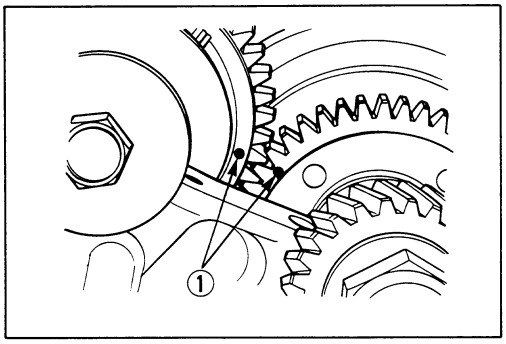
- Insert the right and left-thrust bearings with oil grooved facing the crank web.
- Clean the mating surfaces of the crankcases before matching the upper and lower ones.
- Install the dowel pins to the upper crankcase.
- Apply SUZUKI Bond No.1207B to the mating surface of the lower crankcase.

**(For U.S.A. model)**
**99104-31140 : SUZUKI BOND NO. 1207B**

**(For the Other models)**
**99000-31140 : SUZUKI BOND NO. 1207B**

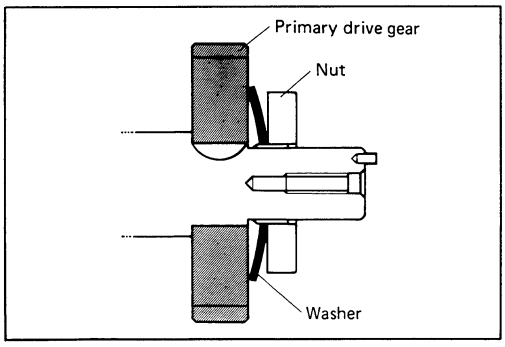


*NOTE:*
*When installing the crankshaft and counter-balancer shaft, be sure to align the punched marks ① on the counter-balancer drive and driven gears.*

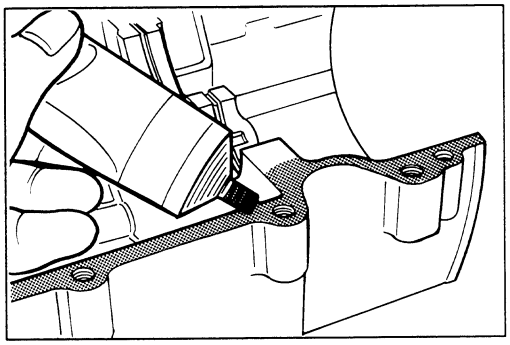



*NOTE:*
*When replacing the primary drive gear, be sure to face the concaved side of washer to the gear as shown.*

**Primary drive gear nut : 90 — 110 N·m**
**(9.0 — 11.0 kg-m, 65.0 — 80.0 lb-ft)**

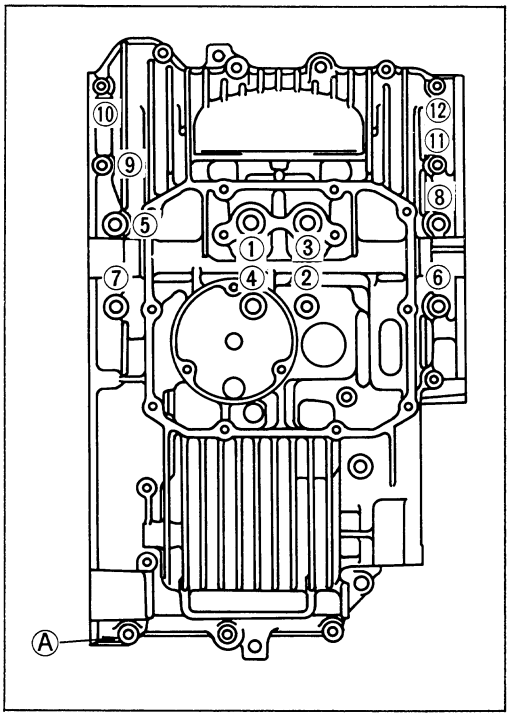



*NOTE:*
*Use of SUZUKI Bond No. 1207B is as follows:*
* *Make surfaces free from moisture, oil dust and other foreign materials.*
* *Spread on surfaces thinly to form an even layer, and assmble the cases within few minutes.*
* *Take extreme care not to apply any bond No. 1207B to the bearing surfaces.*
* *Apply to distorted surface as it forms a comparatively thick film.*



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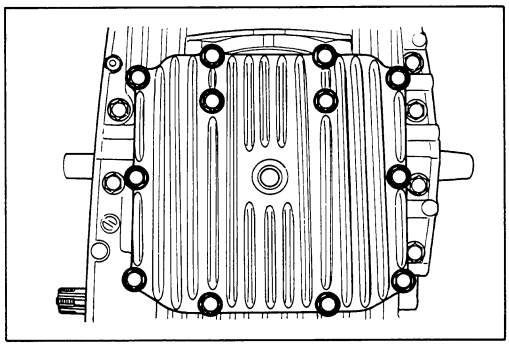
- Tighten the crankshaft/counter-balancer shaft tightening bolts in the ascending order of numbers assigned to these bolts, tightening each bolt a little at a time to equalize the pressure. Tighten the lower and upper crankcase securing bolts and nuts to the specified torque value.




| Item | Initial | Final |
|---|---|---|
| ① – ⑧ | 13 N·m (1.3 kg-m, 9.5 lb-ft) | 20 – 24 N·m (2.0 – 2.4 kg-m, 14.5 – 17.5 lb-ft) |
| ⑨ – ⑫ | 6 N·m (0.6 kg-m, 4.5 lb-ft) | 9 – 13 N·m (0.9 – 1.3 kg-m, 6.5 – 9.5 lb-ft) |
| The other 6 mm bolts | 6 N·m (0.6 kg-m, 4.5 lb-ft) | 10 N·m (1.0 kg-m, 7.0 lb-ft) |
| The other 8 mm bolts | 13 N·m (1.3 kg-m, 9.5 lb-ft) | 20 N·m (2.0 kg-m, 14.5 lb-ft) |

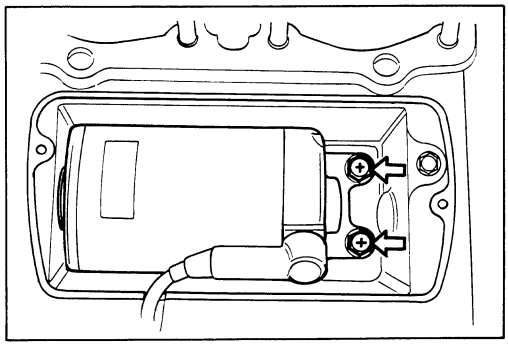
*NOTE:*
*Fit up the engine ground wire to the crankcase securing bolt Ⓐ correctly as shown in the illustration.*

- Install the oil sump filter. (See page 3-16.)
- Fit a new gasket and install the oil pan.



**Tightening torque**
**Oil pan bolt : 10 N·m (1.0 kg-m, 7.0 lb-ft)**

- Install the starter motor with two bolts.



*NOTE:*
** Apply SUZUKI SUPER GREASE "A" to the starter motor O-ring.*
** Apply a small quantity of THREAD LOCK "1342" to the bolts.*

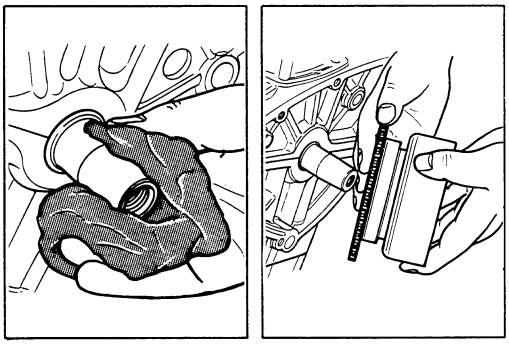
**99000-32050 : THREAD LOCK "1342"**

**(For U.S.A. model)**
**99000-25030 : SUZUKI SUPER GREASE "A"**

**(For the other models)**
**99000-25010 : SUZUKI SUPER GREASE "A"**

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

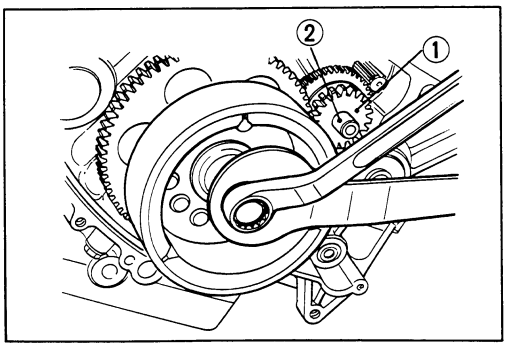


*NOTE:*
*Apply a small quantity of THREAD LOCK SUPER "1303" to the thread of generator rotor mounting bolt.*

**(For U.S.A. model)**
**99000-32030 : THREAD LOCK SUPER "1303"**

**(For the other models)**
**99000-32100 : THREAD LOCK SUPER "1305"**

- Tighten the generator rotor mounting bolt to the specified torque.




**Generator rotor : 110 – 130 N·m**
**mounting bolt (11.0 – 13.0 kg-m, 79.5 – 94.5 lb-ft)**

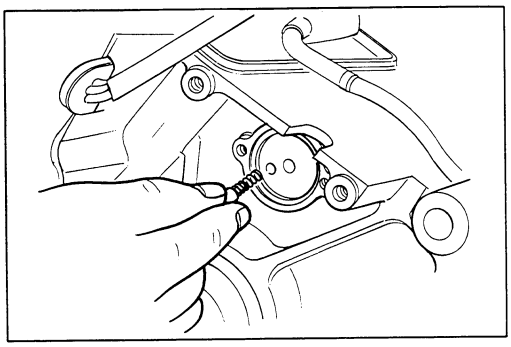
**09930-44511 : Generator rotor holder**

- Install the starter idle gear ① and its shaft ②.
- Coat SUZUKI Bond No.1207B lightly to the portion around mating surface between upper and lower crankcases.

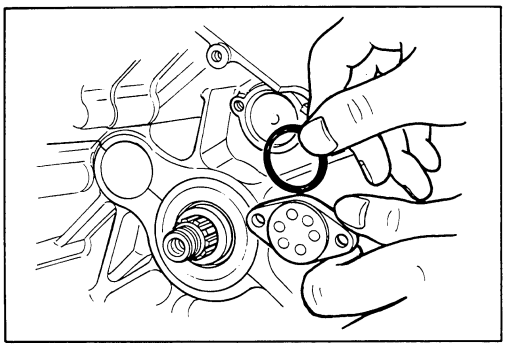
**(For U.S.A. model)**
**99104-31140 : SUZUKI BOND NO.1207B**

**(For the other models)**
**99000-31140 : SUZUKI BOND NO.1207B**

- Install the neutral position indicator switch with two screws.



*NOTE:*
*When installing the neutral position indicator switch, be sure to locate the spring, switch contact and O-ring.*

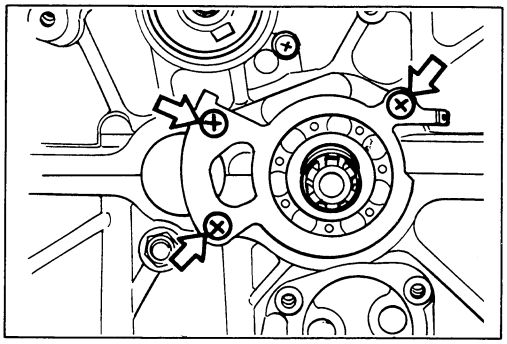


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- Install the bearing retainer with three screws.

*NOTE:*
*Apply a small quantity of THREAD LOCK "1342" to the three screws.*

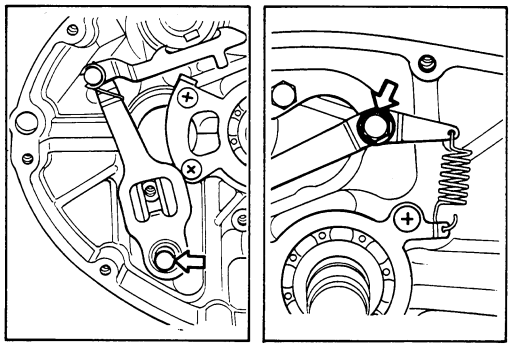
**99000-32050 : THREAD LOCK "1342"**



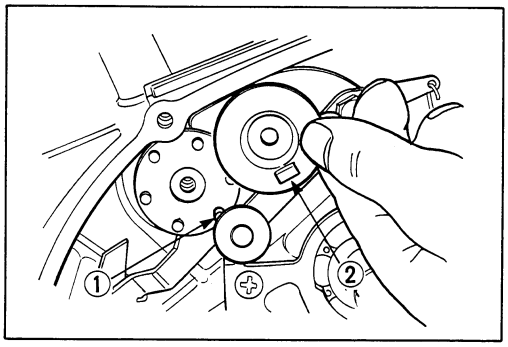
- Install the gearshift shaft assembly.
- Install the gearshift cam stopper with bolt and hook the spring to the bearing retainer.

*NOTE:*
*Apply a small quantity of THREAD LOCK "1342" to the bolt.*

**99000-32050 : THREAD LOCK "1342"**

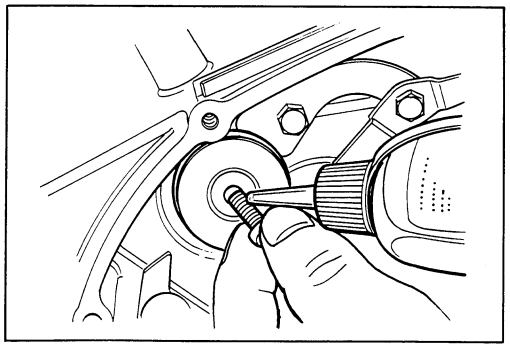


- Bring the gearshift cam to the "NEUTRAL" position.
- Insert the neutral cam pin ① into the gearshift cam to contact it with the gearshift cam stopper.
- Mate the recess ② of gearshift cam pin retainer with the neutral cam pin ①.



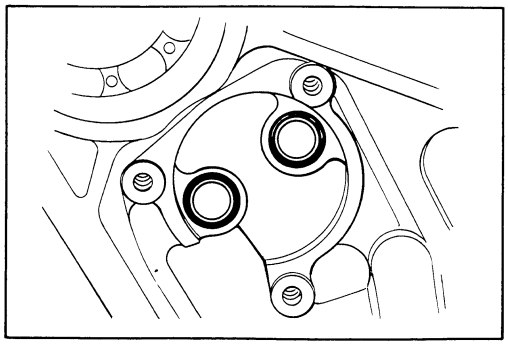

- Apply a small quantity of THREAD LOCK SUPER "1303" to the gearshift cam pin retainer screw.

**99000-32030 : THREAD LOCK SUPER "1303"**



- Fit the O-rings of oil pump to the correct position.

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

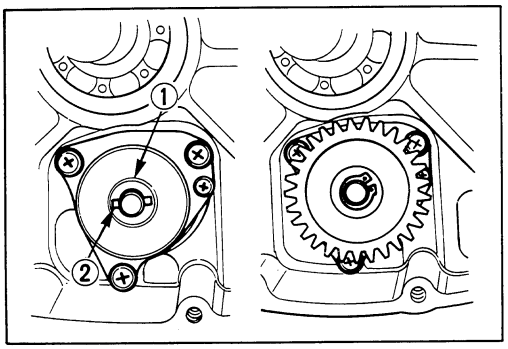


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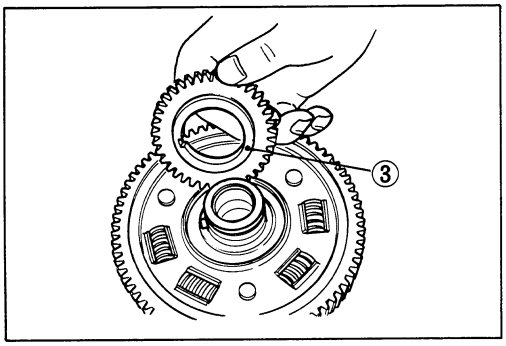
- Apply a small quantity of THREAD LOCK "1342" to the oil pump mounting screws.
- Install the washer ① and pin ②.
- Fix the oil pump driven gear with the circlip.

**99000-32050 : THREAD LOCK "1342"**

**09900-06107 : Snap ring pliers**

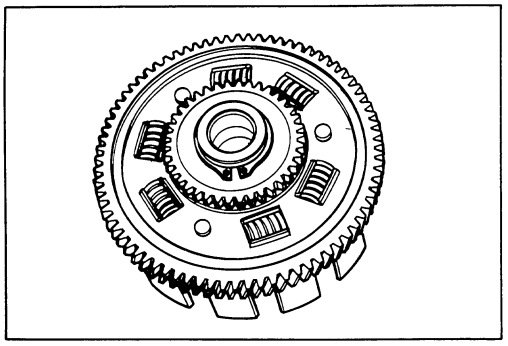



*NOTE:*
*When installing the oil pump drive gear onto the primary driven gear, be sure to face the toll boss ③ of driven gear to the clutch side.*

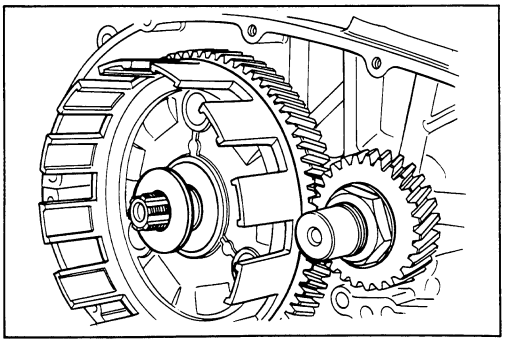



- Fix the oil pump driven gear with circlip.

**09900-06107 : Snap ring pliers**



- Install the thrust washer onto the countershaft and apply engine oil to the bush of primary driven gear.
- Install the primary driven gear assembly onto the countershaft, then install the thrust washer onto the countershaft.

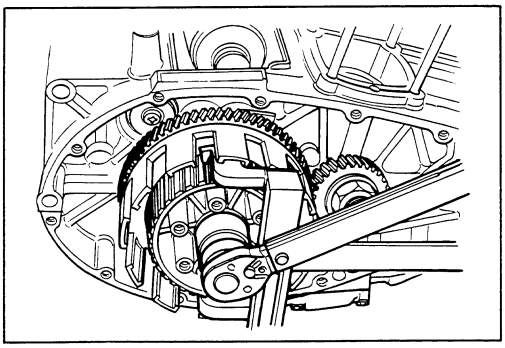


- Tighten the clutch sleeve hub nut to the specified torque.

**Clutch sleeve hub nut : 40 – 60 N·m (4.0 – 6.0 kg-m, 29.0 – 43.5 lb-ft)**

**09920-53710 : Clutch sleeve hub holder**

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

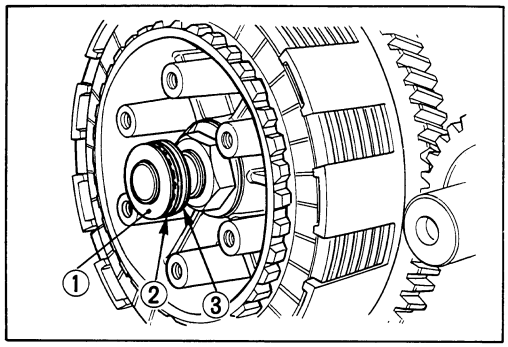


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- Insert the clutch push rods into the countershaft.
- Insert the drive and driven plate one by one into the sleeve hub.

*NOTE:*
*Be sure to insert the drive plate first.*

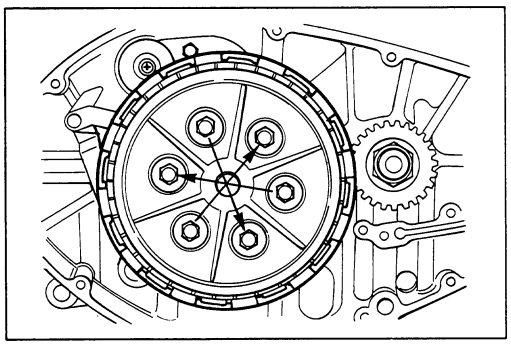
- Install the washer ①, bearing ② and push piece ③.




- Tighten the clutch spring set bolts in the order.

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

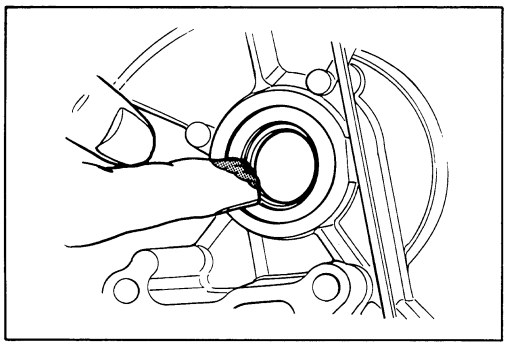
**Clutch spring set bolt : 4 — 6 N·m**
**(0.4 — 0.6 kg-m, 3.0 — 4.5 lb-ft)**



- Apply grease to the lip of crankshaft oil seal.

**(For U.S.A. model)**
**99000-25030 : SUZUKI SUPER GREASE "A"**

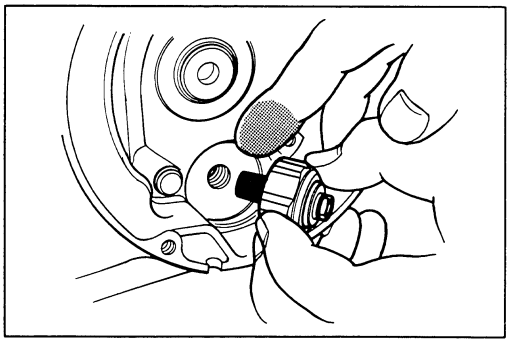
**(For the other models)**
**99000-25010 : SUZUKI SUPER GREASE "A"**



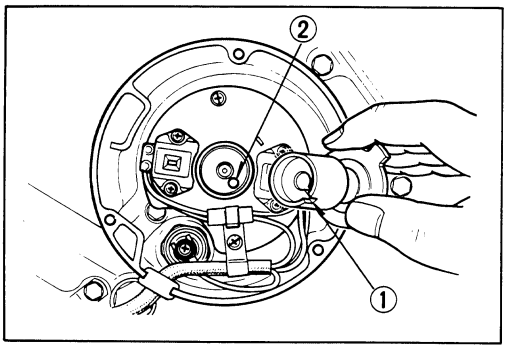
*NOTE:*
*When replacing the oil pressure switch, apply SUZUKI Bond No. 1207B to its thread lightly.*

**(For U.S.A. model)**
**99104-31140 : SUZUKI BOND NO.1207B**

**(For the other models)**
**99000-31140 : SUZUKI BOND NO.1207B**



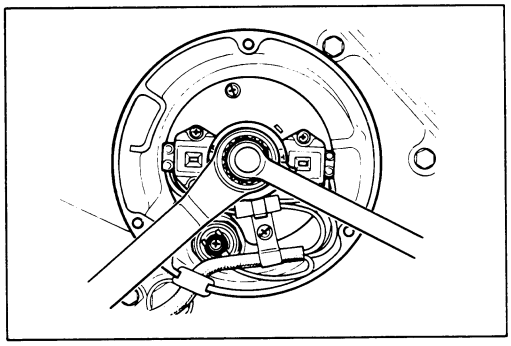
- Install the signal generator stator with two screws.
- Make sure to fit the slot ① on the back surface of the signal generator rotor over the locating pin ② at the end of crankshaft.




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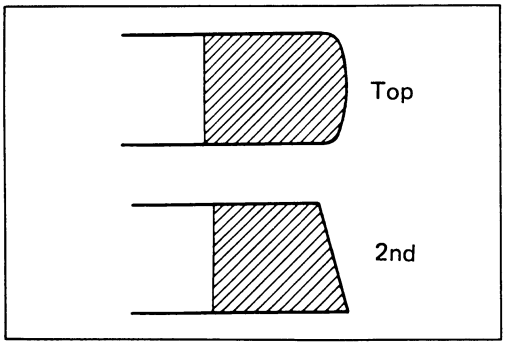
- Hold the crankshaft turning nut and tighten the rotor bolt with specified torque.

**Signal generator rotor bolt: 17 — 23 N·m (1.7 — 2.3 kg-m, 12.5 — 16.5 lb-ft)**

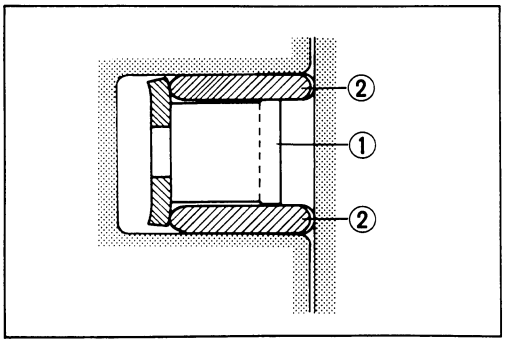


- Install the piston rings in the order of oil ring, 2nd ring and top ring.
- Top ring and 2nd (middle) ring differ in the shape of ring face, and the face of top ring is chrome-plated whereas that of ring is not.
- Top and 2nd (middle) rings have letter "N" marked on the side.

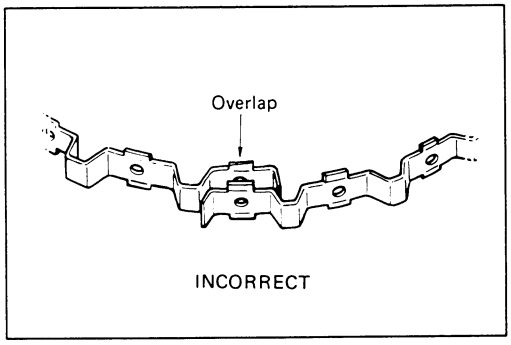
*NOTE:*
*Be sure to bring the marked side to top when fitting to the piston.*



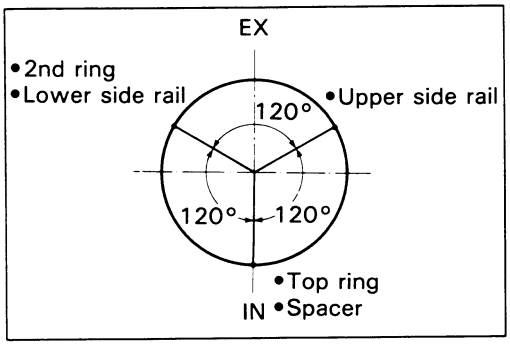

- The first member to go into the oil ring groove is spacer ①. After placing spacer, fit the two side rails ②.




**CAUTION:**
**When installing the spacer, be careful not to allow its two ends to overlap in the groove.**

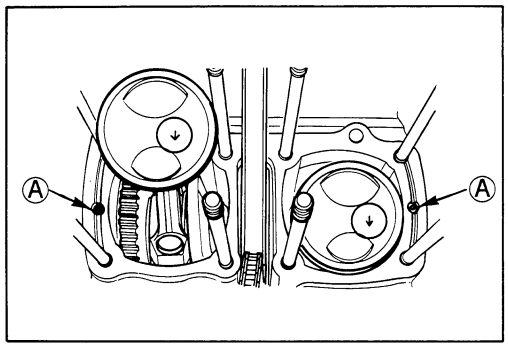



- Position the gaps of the three rings as shown. Before inserting each piston into the cylinder, check that the gaps are so located.



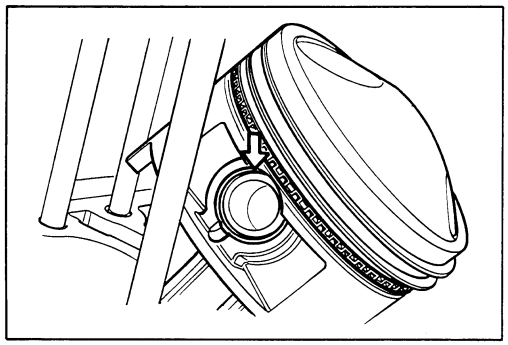

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- Check for clogging the oil jets Ⓐ fitted on the crankcase.
- The piston is correct position when its arrow (on the top) points forward.




- Have each piston pin oiled lightly before installing it.
- Place a cloth beneath the piston, and install the circlips.

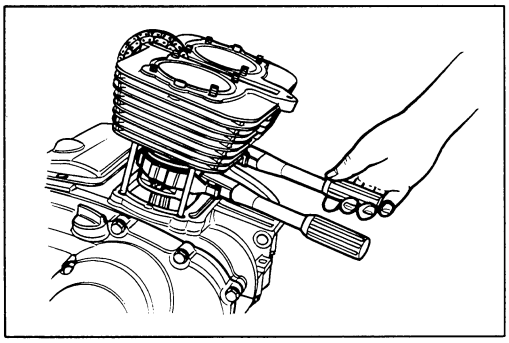
*NOTE:*
*Be sure to use new circlips.*



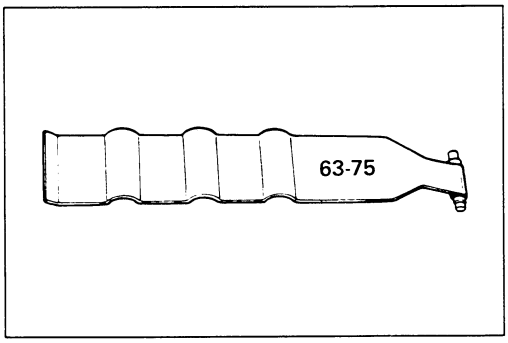
- Before assembling on the cylinder block, oil the big and small ends of each conrod and also the sliding surface of each piston.
- Place the dowel pins and new cylinder gasket on the crankcase.

- Install piston ring holders in the indicated manner. Some light resistance must be overcome to lower the cylinder block.

**09916-74521 : Holder body**
**09916-74540 : Band (bore 63 — 75 mm)**



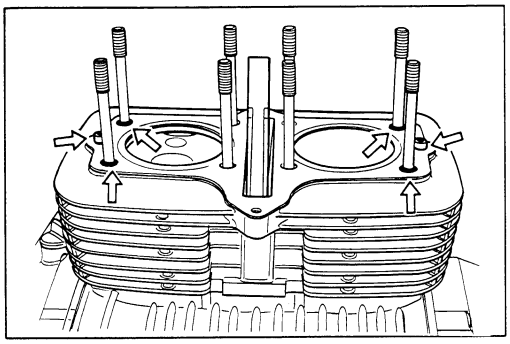
*NOTE:*
** Do not overtighten the special tool bands or the cylinders will resist to admit the pistons.*
** Each band has a number punchmarked on it. The number refers to a particular range of piston sizes.*




- Place the four O-rings and two dowel pins on the cylinder.

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

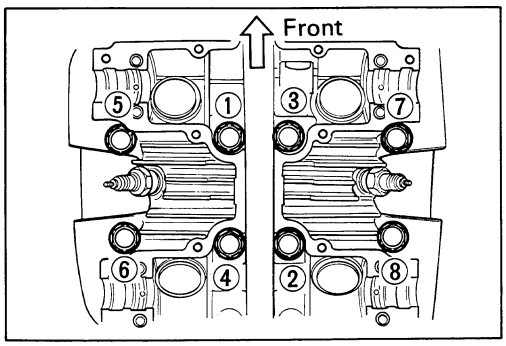
- Be sure to replace the cylinder head gasket with new one to prevent gas leakage.



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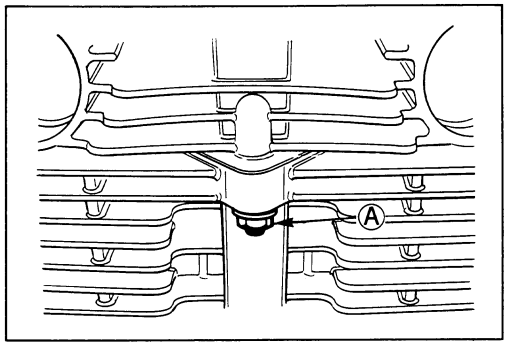
- Place the cylinder head on the cylinder.
- Tighten the eight 10-mm nuts to the specified torque with a torque wrench sequentially in the ascending order of numbers.

**Cylinder head nut : 35 — 40 N·m**
**(3.5 — 4.0 kg-m, 25.5 — 29.0 lb-ft)**



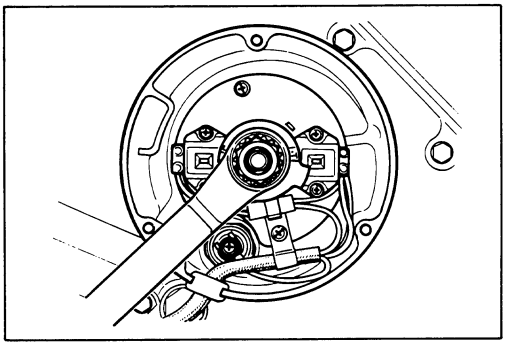

- After firmly tightening the eight 8-mm nuts, install one 6-mm nut Ⓐ and tighten it to the specified torque.

**Cylinder head nut : 8 — 12 N·m**
**(0.8 — 1.2 kg-m, 6.0 — 8.5 lb-ft)**




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

**CAUTION:**
**To turn over crankshaft, torque the nut with a 19 mm wrench. Never try to rotate the crankshaft by putting a 10 mm wrench.**

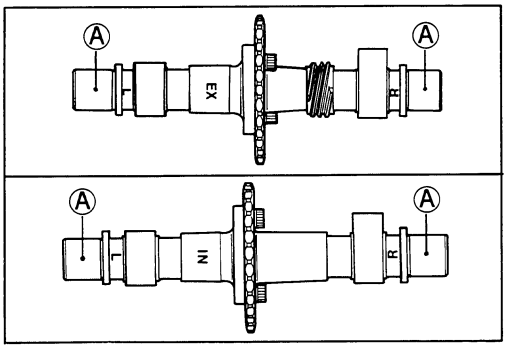


*NOTE:*

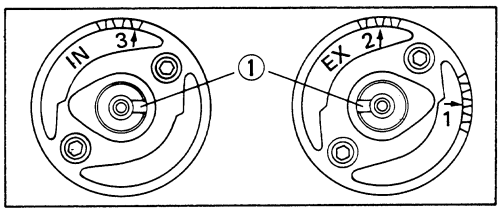
* *Just before placing the camshaft on the cylinder head, apply SUZUKI MOLY PASTE to its journals, fully coating each journal Ⓐ with the paste taking care not to leave any dry spot.*

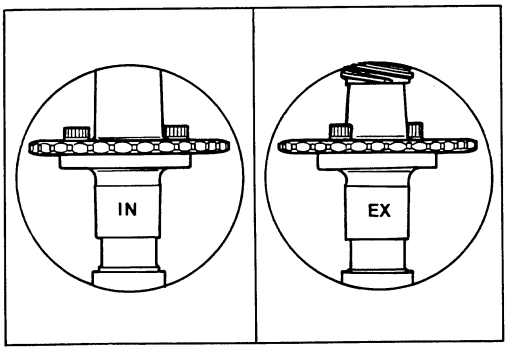
* *Apply engine oil to the camshaft journal holders.*

**99000-25140 : SUZUKI MOLY PASTE**



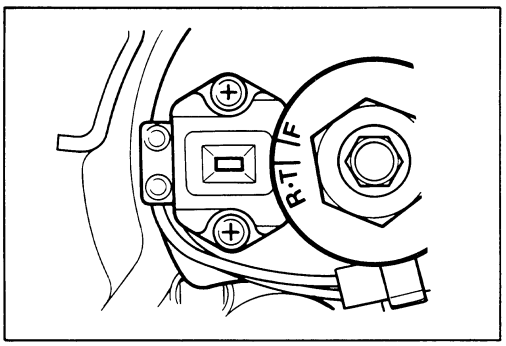

- The exhaust camshaft can be distinguished from that of the intake by the embossed letters "EX" (for exhaust) as against letters "IN" (for intake). Similarly, the right end can be distinguished by the notch ① at the right end.



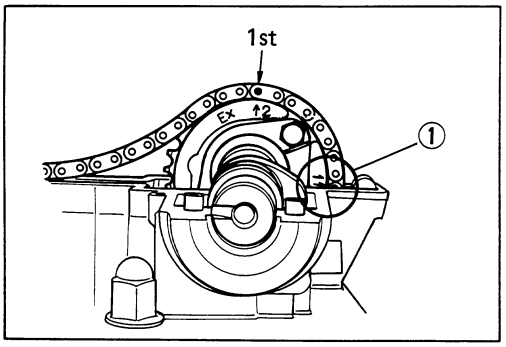




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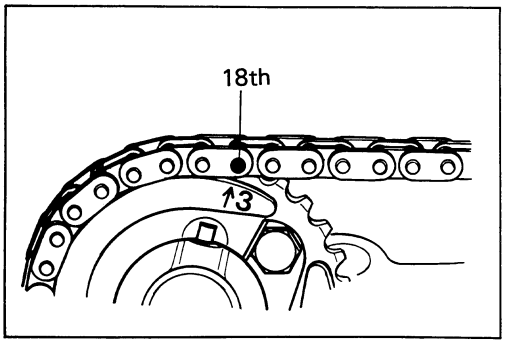
- With "R"."T" mark accurately lined up with the timing mark, hold the crankshaft steady and lightly pull up the chain to remove the slack between the crank sprocket and exhaust sprocket.



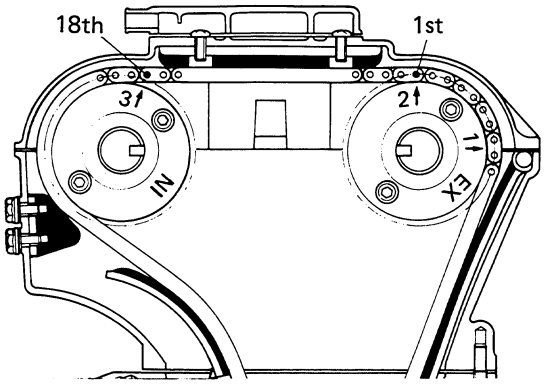

- Exhaust sprocket bears an arrow marked "1" indicated as ①. Turn over the exhaust camshaft so that the arrow points flush with the gasketed surface of the cylinder head. Engage the cam chain with this sprocket.




- The other arrow marked "2" is now pointing straight upward. Count the chain roller pins toward the intake camshaft, starting from the roller pin directly above this arrow marked "2" and ending with the 18th roller pin. Engage the cam chain with intake sprocket, locating the 18th pin at the above the arrow marked "3" on the intake sprocket.

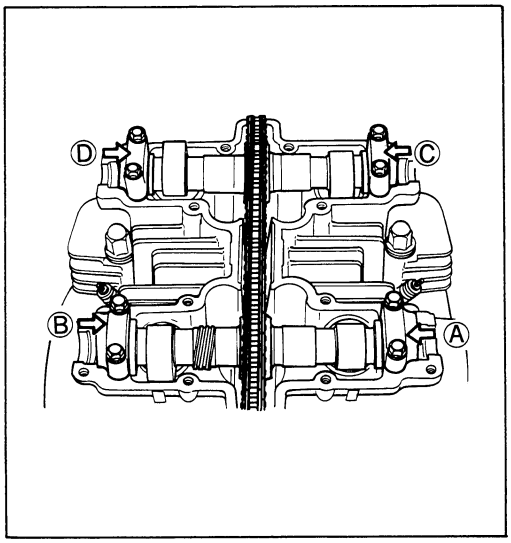



*NOTE:*
*The cam chain is now riding on all three sprockets. Be careful not to disturb the crankshaft until the four camshaft journal holders and cam chain tensioner are secured.*




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- Each camshaft journal holder is identified with a cast-on letter. Install the dowel pins to each camshaft journal holder.
- Secure the four camshaft journal holders evenly by tightening the camshaft journal holder bolts sequentially. Try to equalize the pressure by moving the wrench diagonally from one bolt to another and from one camshaft journal holder to another, to push shafts down evenly.



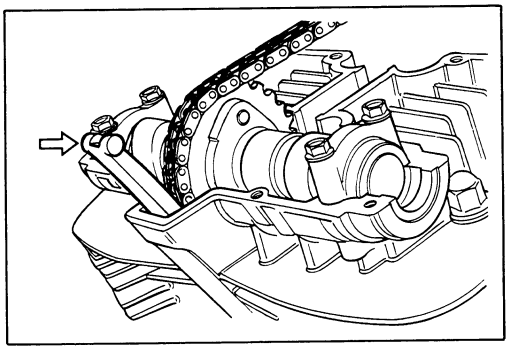

*NOTE:*
*Damage of head or camshaft journal holder thrust surfaces may result if the camshaft journal holders are not drawn down evenly.*

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

**Camshaft journal holder bolt : 8 — 12 N·m (0.8 — 1.2 kg-m, 6.0 — 8.5 lb-ft)**

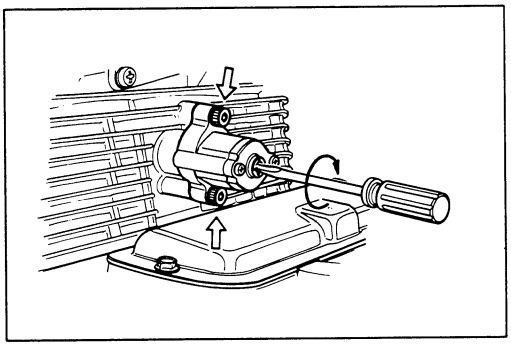
CAUTION:
**The camshaft journal holder bolts are made of a special material and much superior in strength compared with other type of high strength bolts.**
**Take special care not to use other types of bolts instead of these special bolts. To identify these bolts, each of them has a figure "11" on its head.**

- Insert the cam chain guide properly.



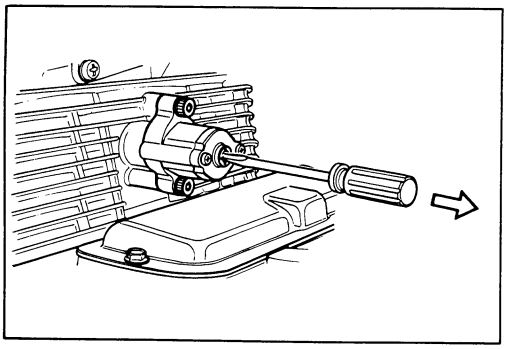
- Remove the cap and turn the slotted end of cam chain tensioner with the ⊖ screwdriver in the clockwise direction and lessen the tension from it.
- Install a new gasket and cam chain tensioner to the cylinder block with two bolts and tighten them to the specified torque.

**Cam chain tensioner mounting bolt : 6 — 8 N·m (0.6 — 0.8 kg-m, 4.5 — 6.0 lb-ft)**



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- Pull out the ⊖ screwdriver from the cam chain tensioner. As the slotted end of cam chain tensioner turns, the tension rod is advanced under spring force and pushes the cam chain tensioner against the cam chain.
- Fit the cap.



**CAUTION:**
**After installing the cam chain tensioner, check to be sure that the tensioner work properly by checking the slack of cam chain.**

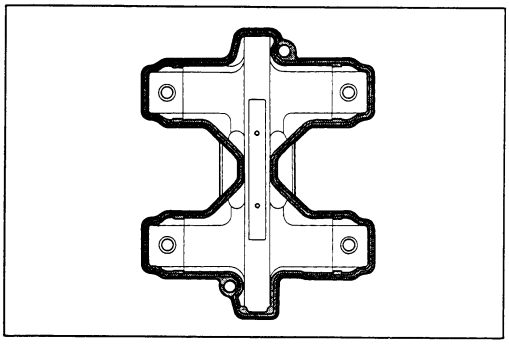
- Install the oil filter and its cap. (Refer to page 2-10.)
- Pour about 50 ml (1.69 US oz) of engine oil in each oil pocket in the head.

**CAUTION:**
**Be sure to check and adjust the tappet clearance.**
**(Refer to page 2-5.)**

- After adjusting the tappet clearance, install the signal generator cover.

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

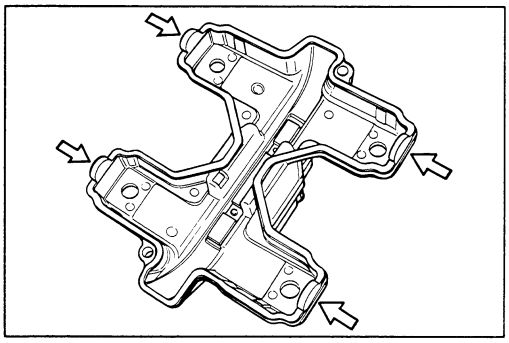
- Before installing the cylinder head cover gaskets on the cylinder head cover, apply SUZUKI BOND NO. 1207B to the groove of the head cover as shown in the figure.



**(For U.S.A. model)**
**99104-31140 : SUZUKI BOND NO.1207B**

**(For the other models)**
**99000-31140 : SUZUKI BOND NO.1207B**

- Apply SUZUKI BOND NO.1207B to the four cam end caps of the cylinder head cover gasket as shown in the figure.

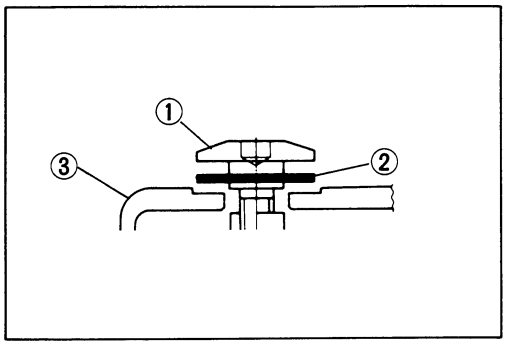


**(For U.S.A. model)**
**99104-31140 : SUZUKI BOND NO.1207B**

**(For the other models)**
**99000-31140 : SUZUKI BOND NO.1207B**

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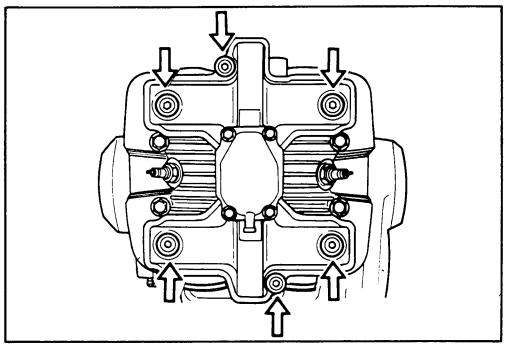
- Place the cylinder head cover on the cylinder head.
- Seat the four O-rings to each exact position.




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

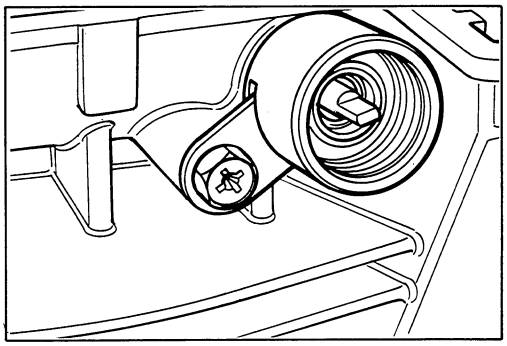
①: Cylinder head cover bolt
②: O-ring
③: Cylinder head cover

- Tighten the cylinder head cover bolts to the specified torque.

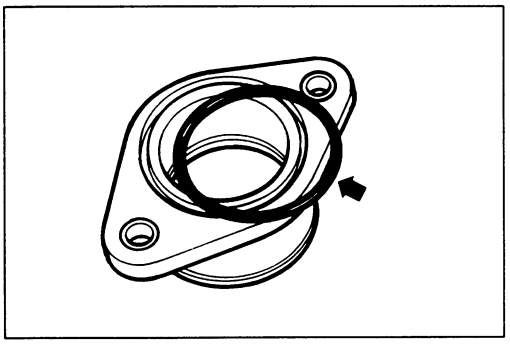


**Head cover bolt : 13 – 15 N·m**
**(1.3 – 1.5 kg-m, 9.5 – 11.0 lb-ft)**

- Apply engine oil to the tachometer driven gear and install it.



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



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# FUEL AND LUBRICATION SYSTEM

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# FUEL TANK AND FUEL COCK

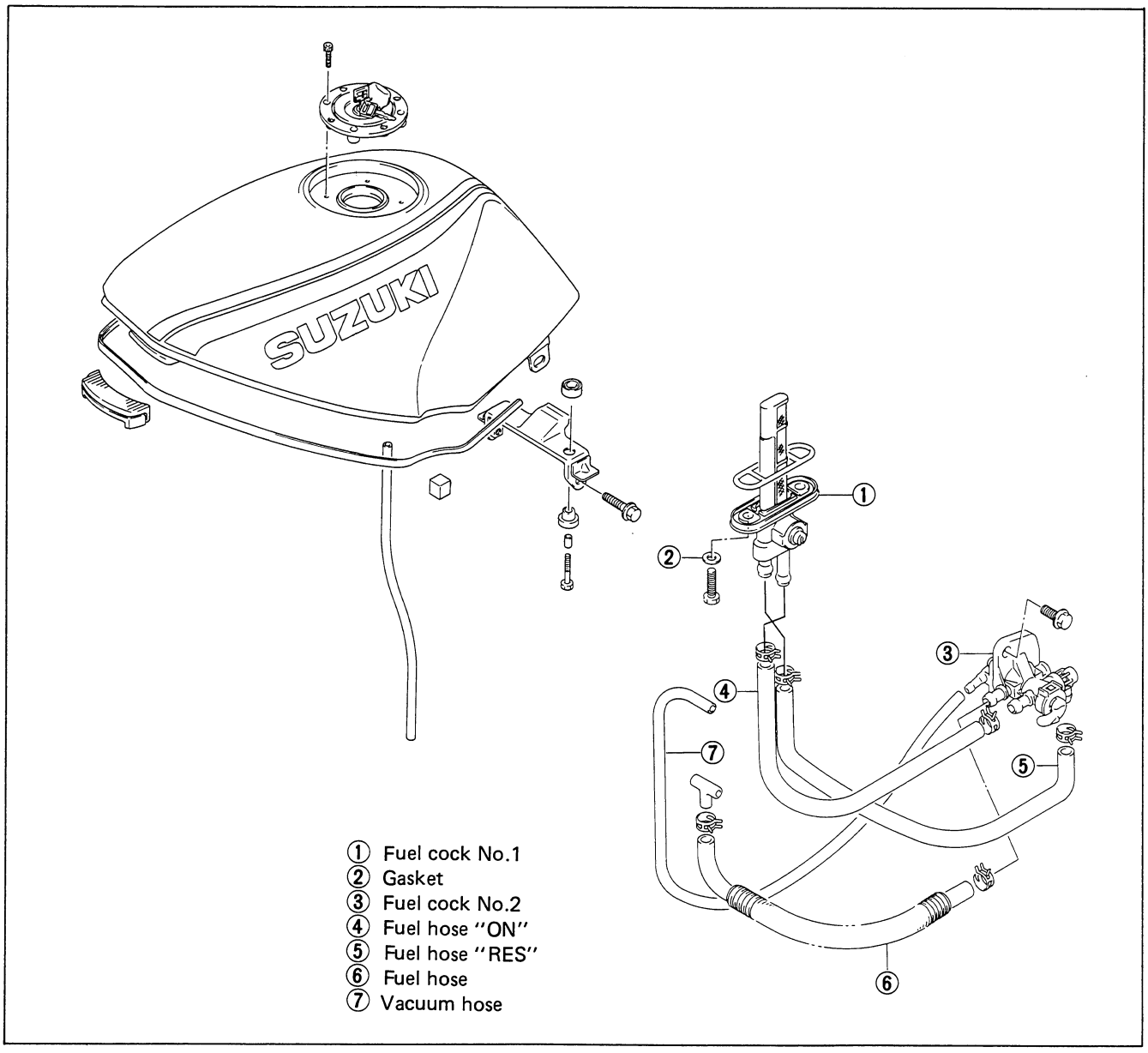
## FUEL TANK REMOVAL

Refer to page 3-4.

## FUEL COCK REMOVAL

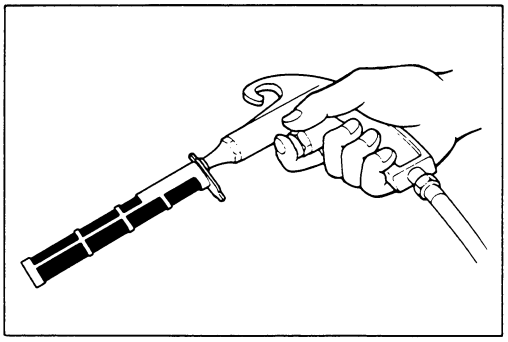
Refer to page 3-4.

**WARNING:**
**Gasoline is very explosive. Extreme care must be taken. Gasket must be replaced with a new one to prevent fuel leakage.**




## INSPECTION AND CLEANING

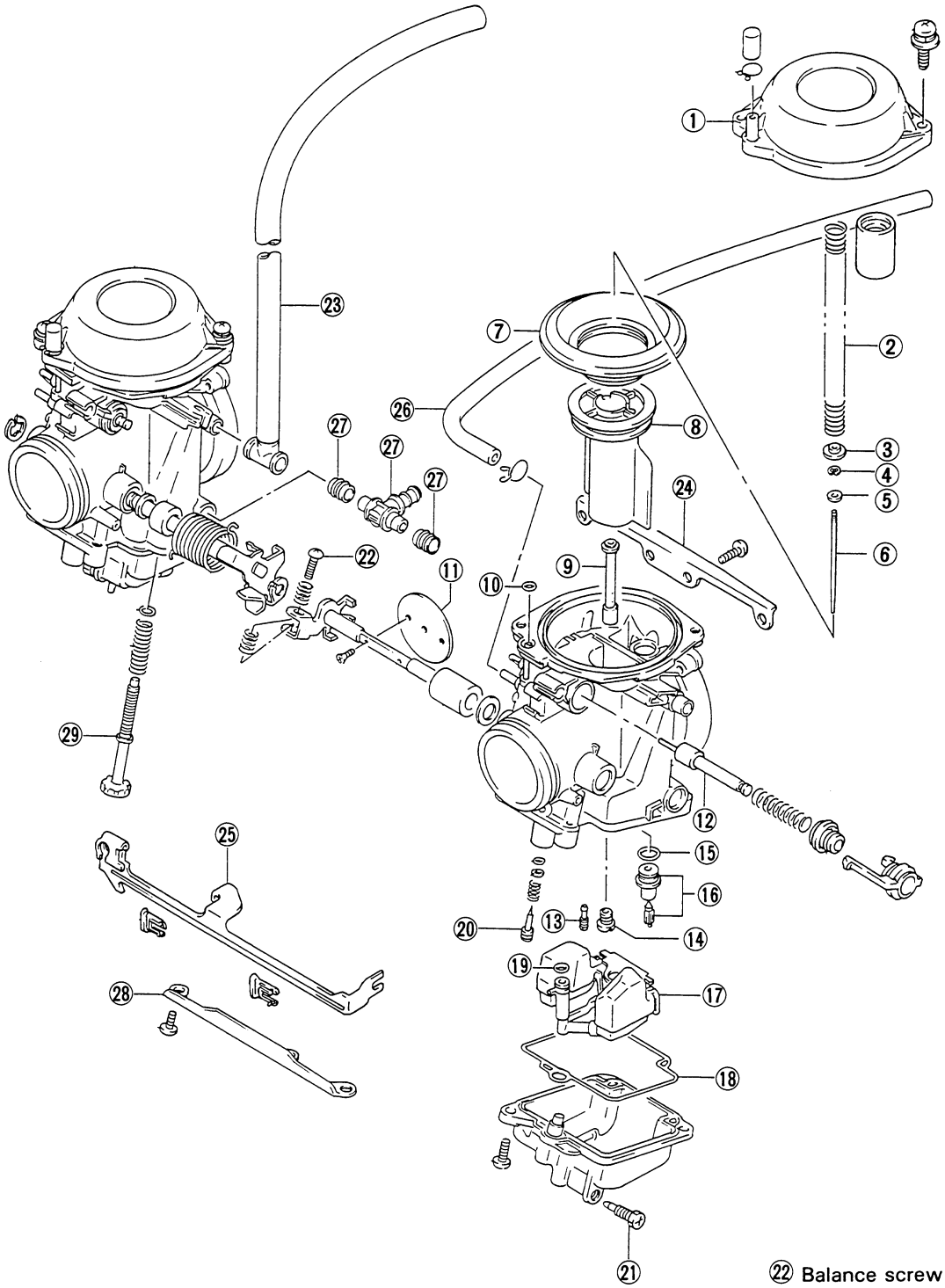
If the fuel strainer is dirty with sediment or rust, fuel will not flow smoothly and loss in engine power may result. Clean the fuel strainer with compressed air.



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# CARBURETOR

## CONSTRUCTION



① Top cap
② Spring
③ Spring seat
④ E-ring
⑤ Washer
⑥ Jet needle
⑦ Diaphragm
⑧ Piston valve
⑨ Needle jet
⑩ O-ring
⑪ Throttle valve
⑫ Starter plunger
⑬ Pilot jet
⑭ Main jet
⑮ O-ring
⑯ Needle valve
⑰ Float ass'y
⑱ Gasket
⑲ O-ring
⑳ Pilot screw
㉑ Drain screw
㉒ Balance screw
㉓ Air vent hose
㉔ Carburetor set upper plate
㉕ Starter shaft lever
㉖ Vacuum hose
㉗ Fuel hose connector set
㉘ Carburetor set lower plate
㉙ Throttle stop screw

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## SPECIFICATIONS

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-03 | E-33 |
| Carburetor type | | MIKUNI BST33S | ← |
| Bore size | | 33 mm | ← |
| I.D. No. | | 01D00 | 01D10 |
| Idle r/min. | | 1 200 ± 100 r/min. | ← |
| Float height | | 14.6 ± 1.0 mm | ← |
| Main jet | (M.J.) | # 122.5 | ← |
| Main air jet | (M.A.J.) | 0.5 mm | ← |
| Jet needle | (J.N.) | 5DH8 | ← |
| Needle jet | (N.J.) | O-3 | ← |
| Throttle valve | (Th.V.) | #120 | ← |
| Pilot jet | (P.J.) | # 37.5 | ← |
| By-pass | (B.P.) | 0.8, 0.8, 0.8, 0.8 mm | ← |
| Pilot outlet | (P.O.) | 0.8 mm | 0.9 mm |
| Valve seat | (V.S.) | 1.5 mm | ← |
| Starter jet | (G.S.) | #42.5 | ← |
| Pilot screw | (P.S.) | PRE-SET | ← |
| Pilot air jet | (P.A.J.) | 1.3 mm | 1.35 mm |
| Throttle cable play | | 0.5 – 1.0 mm (0.02 – 0.04 in) | ← |

| ITEM | | SPECIFICATION | | | | | |
|---|---|---|---|---|---|---|---|
| | | E-01, 16 17, 28 | E-02, 04, 15, 21, 25, 34, 53 | E-24 | E-22 | E-22 (GS500E-U) | E-39 |
| Carburetor type | | MIKUNI BST33SS | ← | ← | ← | ← | ← |
| Bore size | | 33 mm | ← | ← | ← | ← | ← |
| I.D. No. | | 01D20 | 01D30 | 01D50 | 01D70 | 01D60 | 01D80 |
| Idle r/min. | | 1 200 ± 100 r/min | ← | ← | ← | ← | ← |
| Float height | | 14.6 ± 1.0 mm | ← | ← | ← | ← | ← |
| Main jet | (M.J.) | #122.5 | #120 | ← | ← | #135 | #120 |
| Main air jet | (M.A.J.) | 0.5 mm | ← | ← | ← | ← | ← |
| Jet needle | (J.N.) | 5DH9-3rd | ← | ← | ← | 5DH9-4th | 5DH9-3rd |
| Needle jet | (N.J.) | O–2 | ← | ← | ← | ← | ← |
| Throttle valve | (Th.V.) | #120 | ← | ← | ← | ← | ← |
| Pilot jet | (P.J.) | #40 | ← | ← | ← | ← | ← |
| By-pass | (B.P.) | 0.8, 0.8 0.8, 0.8 mm | ← | ← | ← | ← | ← |

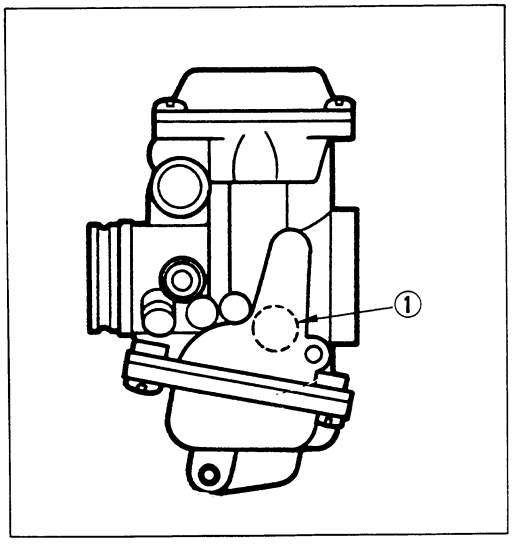
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| ITEM | | SPECIFICATION | | | | | |
|---|---|---|---|---|---|---|---|
| | | E-01, 16 17, 28 | E-02, 04, 15, 21, 25, 34, 53 | E-24 | E-22 | E-22 (GS500E-U) | E-39 |
| Pilot outlet | (P.O.) | 0.8 mm | ← | ← | ← | ← | ← |
| Valve seat | (V.S.) | 1.5 mm | ← | ← | ← | ← | ← |
| Starter jet | (G.S.) | #42.5 | ← | ← | ← | ← | ← |
| Pilot screw | (P.S.) | PRE-SET (2-1/4 turns back) | ← | ← | ← | ← | ← |
| Pilot air jet | (P.A.J.) | 1.3 mm | ← | ← | ← | ← | ← |
| Throttle cable play | | 0.5 – 1.0 mm (0.02 – 0.04 in) | ← | ← | ← | ← | ← |

E-01: General
E-02: England
E-03: U.S.A.
E-04: France
E-15: Finland
E-16: Norway
E-17: Sweden
E-21: Belgium
E-22: W. Germany
E-24: Australia
E-25: Netherland
E-28: Canada
E-33: California (U.S.A.)
E-34: Italy
E-39: Austria
E-53: Spain

## I.D. NO. LOCATION

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

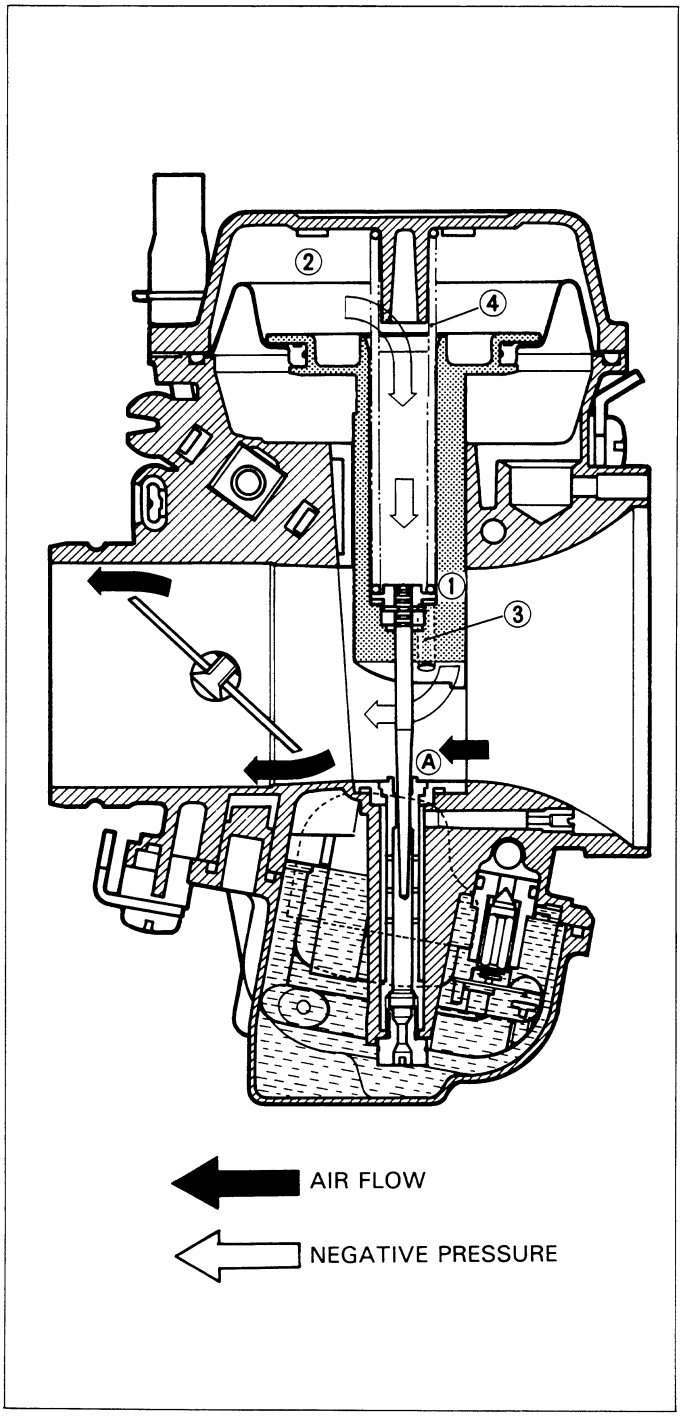


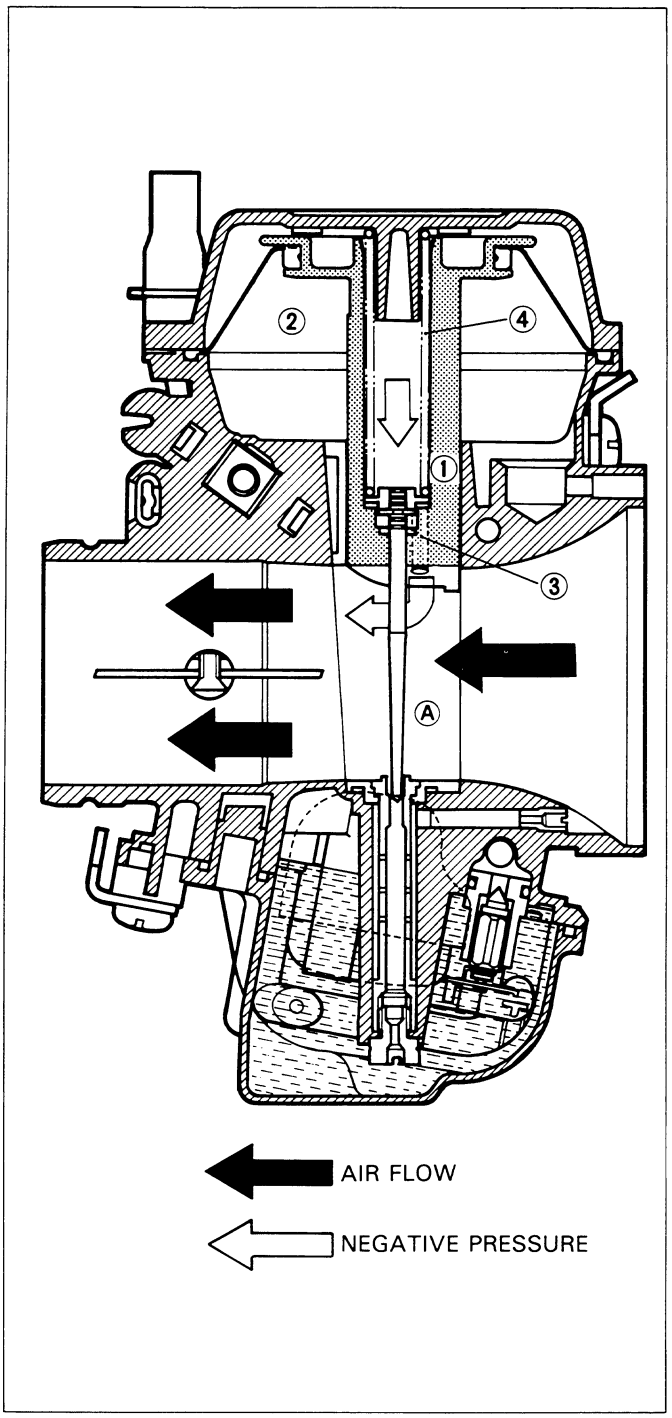

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## DIAPHRAGM AND PISTON OPERATION

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

Rising negative pressure overcomes the spring ④ force, causing the piston valve ① to rise to increase the said area and thus prevent the air velocity from increasing. Thus, air velocity in the venturi passage is kept relatively constant for improved fuel atomization and for securing optimum ratio of fuel/air mixture.

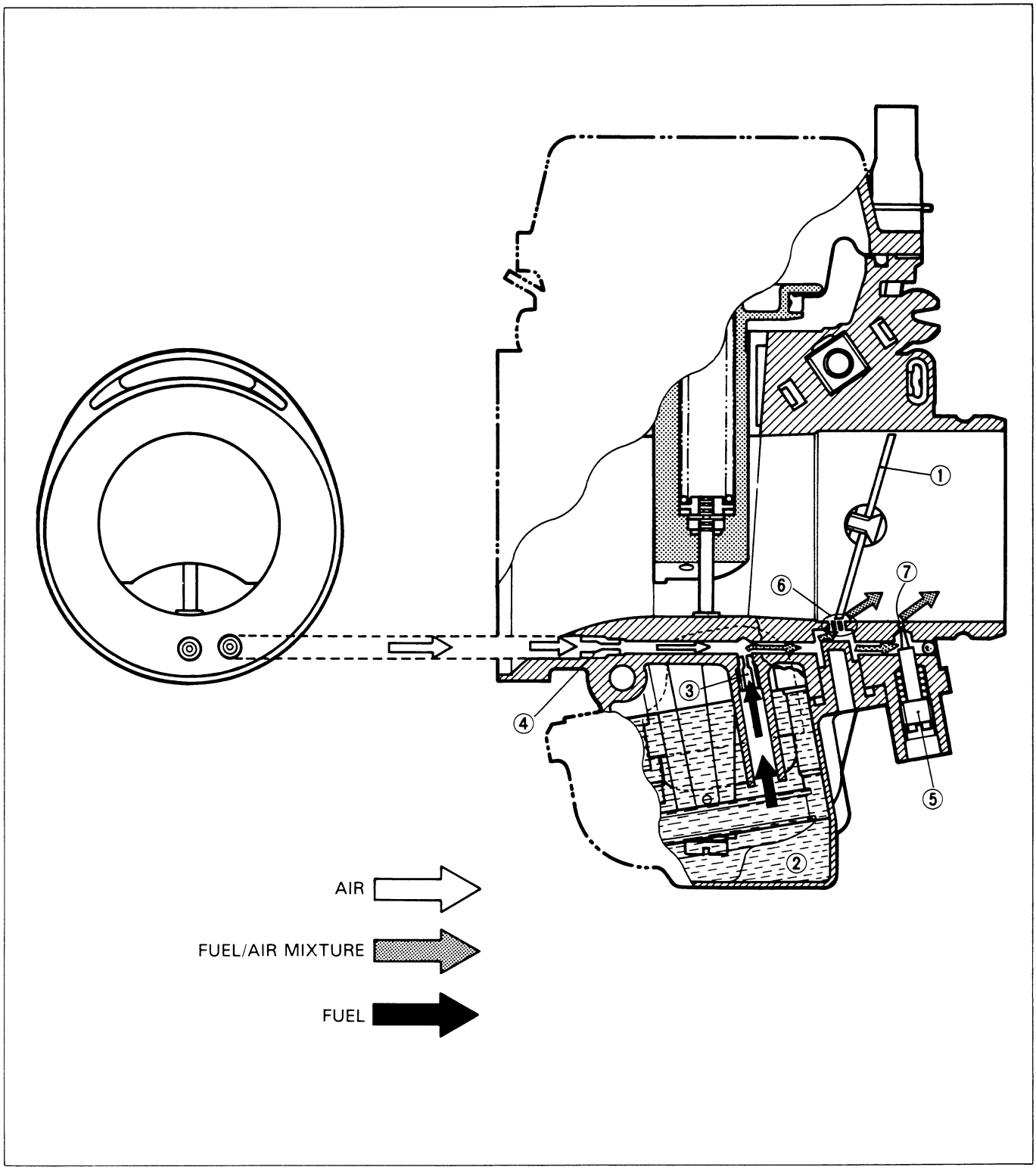



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## SLOW SYSTEM

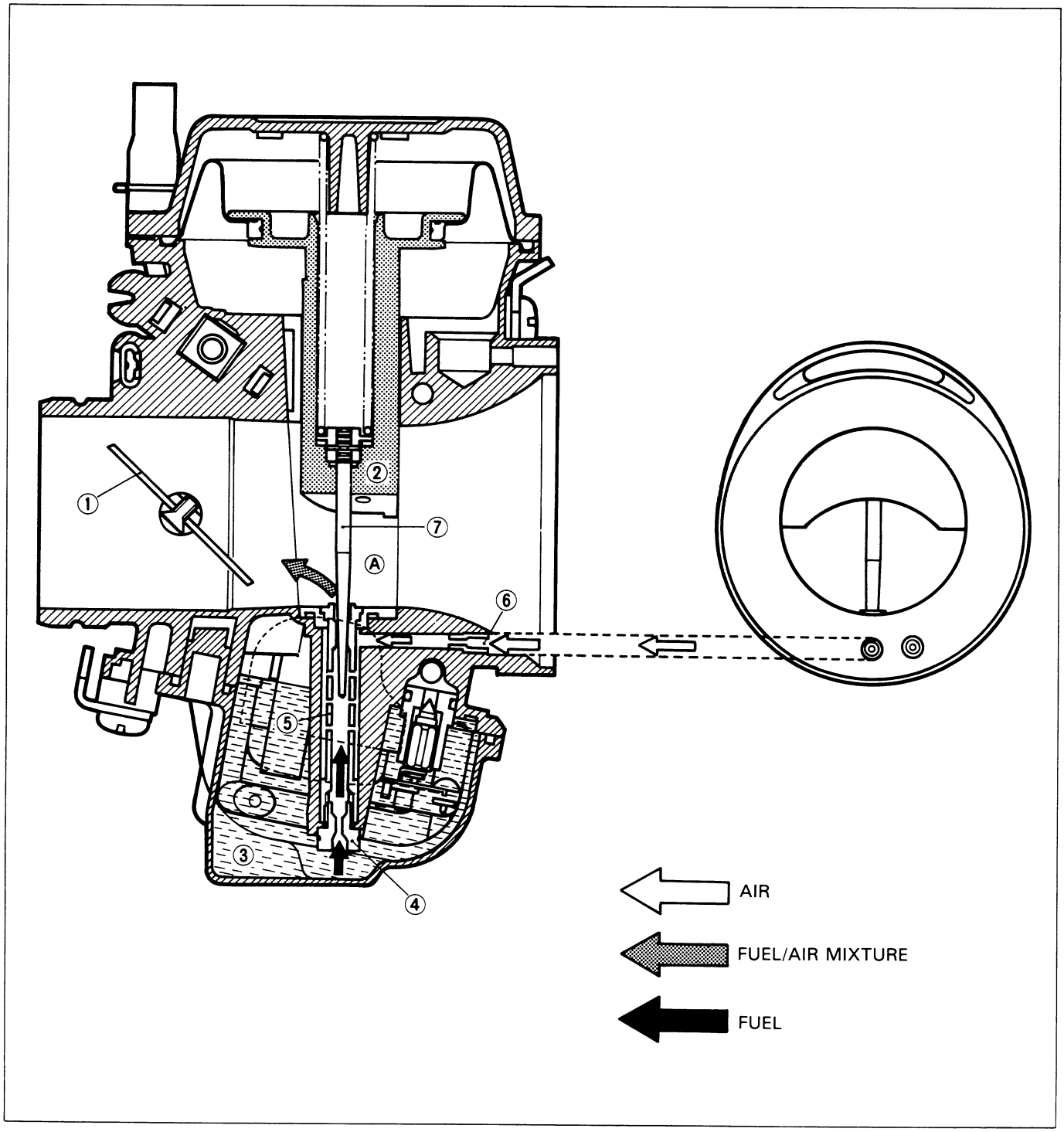
This system supplies fuel during engine operation with throttle valve ① closed or slight opened. The fuel from float chamber ② is metered by pilot jet ③ where it mixes with air coming in through pilot air jet ④. This mixture, rich with fuel, then goes up through pilot passage to pilot screw ⑤. A part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




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## MAIN SYSTEM

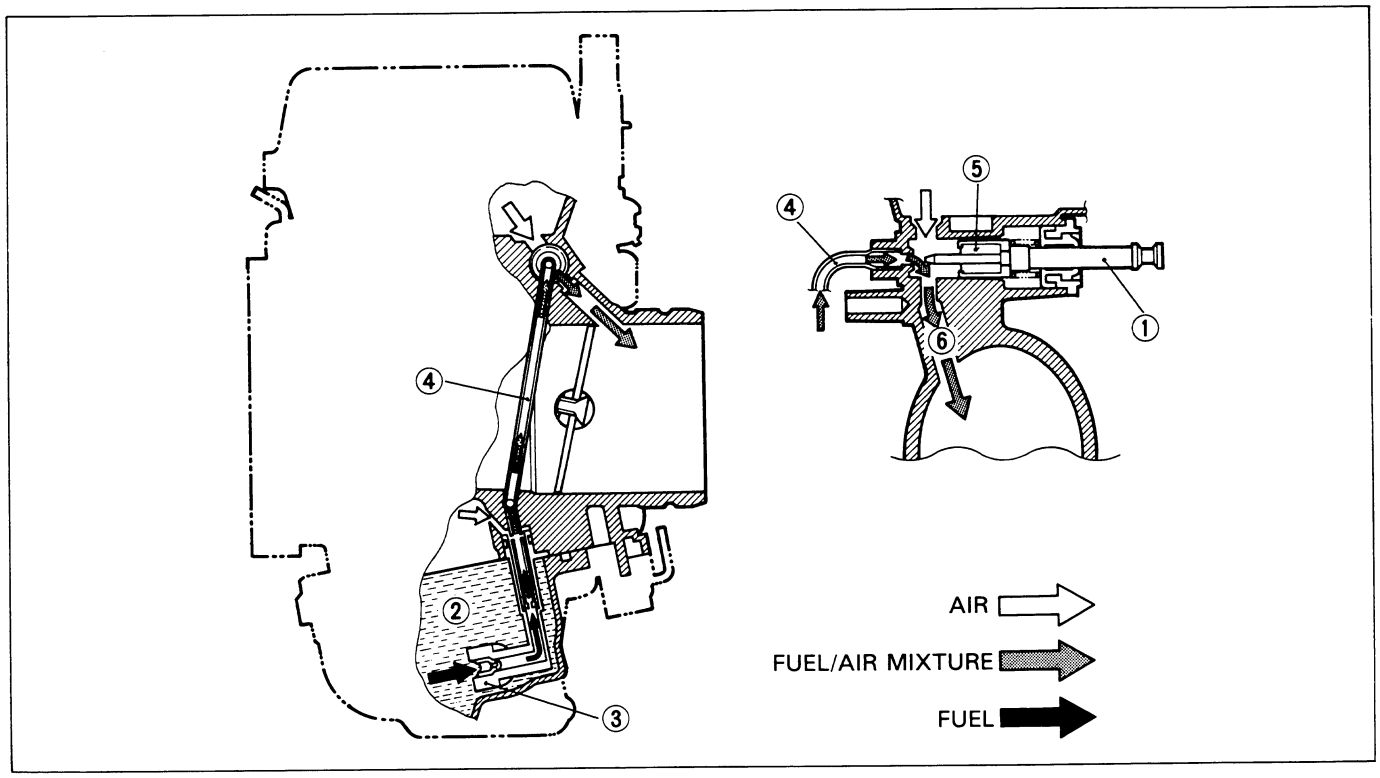
As throttle valve ① is opened, engine speed rises, and this increases negative pressure in the venturi Ⓐ. Consequently the piston valve ② moves upward.
Meanwhile, the fuel in float chamber ③ is metered by main jet ④, and the metered fuel enters needle jet ⑤, in which it mixes with the air admitted through main air jet ⑥ to form an emulsion.
The emulsified fuel then passes through the clearance between needle jet ⑤ and jet needle ⑦, and is discharged into the venturi Ⓐ, in which it meets main air stream being drawn by the engine.
Mixture proportioning is accomplished in needle jet ⑤; the clearance through which the emulsified fuel must flow in large or small, depending ultimately on throttle position.




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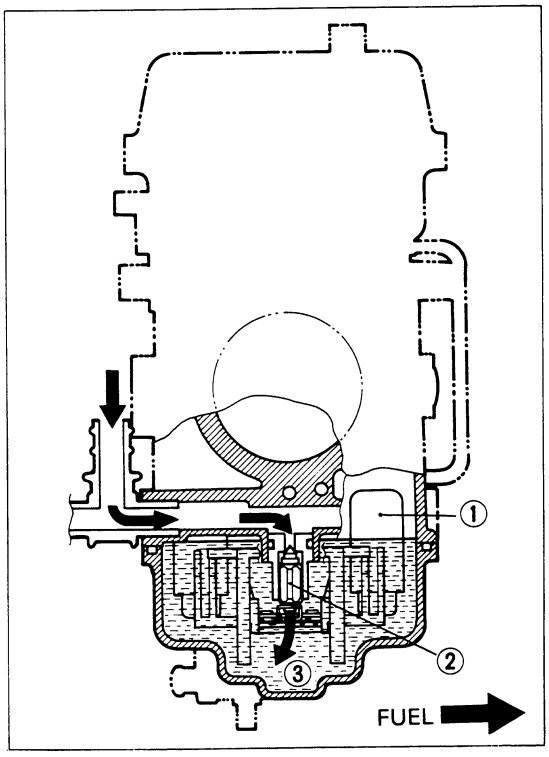
## STARTER SYSTEM

Pulling up the starter shaft ①, fuel is drawn into the starter circuit from the float chamber ②. Starter jet ③ meters this fuel, which then flows into starter pipe ④ and mixes with the air coming from the float chamber ②. The mixture, rich in fuel content, reaches starter plunger ⑤ and mixes again with the air coming through a passage extending from behind the diaphragm.
The two successive mixings of fuel with air are such that proper fuel/air mixture for starting is produced when the mixture is sprayed out through starter outlet ⑥ into the main bore.




## FLOAT SYSTEM

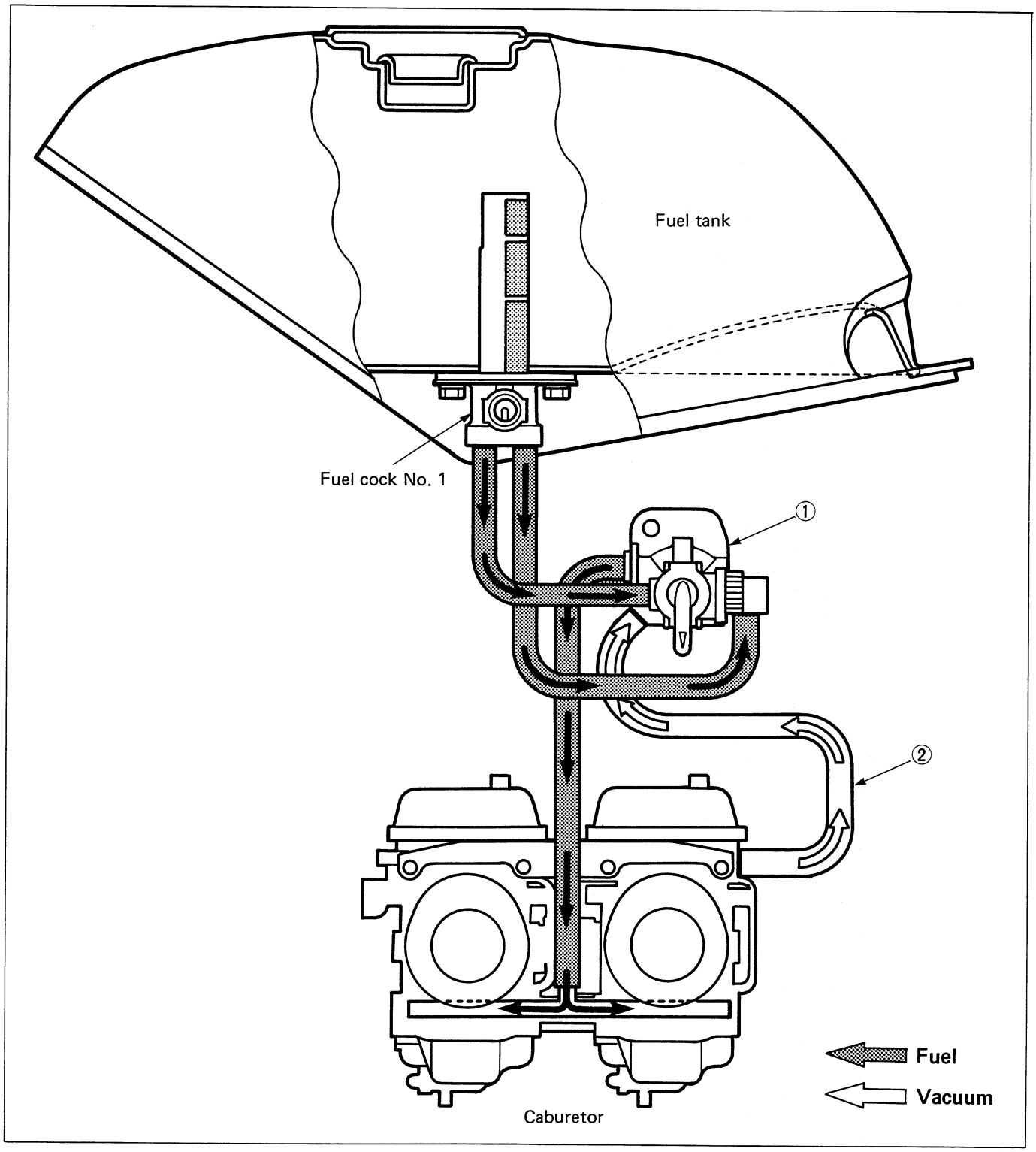
Floats ① and needle valve ② are associated with the same mechanism, so that, as the floats ① move up and down, the needle valve ② too moves likewise.
When fuel level is up in float chamber ③, floats ① are up and needle valve ② remains pushed up against valve seat. Under this condition, no fuel enters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




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## FUEL SYSTEM

When turning starter motor, negative pressure is generated in the combustion chamber. This negative pressure works on the diaphragm of fuel cock ① through passage way provided in the carburetor main bore and vacuum hose ②, and diaphragm builds up a negative pressure which is higher than the spring pressure. Fuel valve in the fuel cock ① is forced to open due to diaphragm operation, and thus allows fuel to flow into carburetor float chamber.




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## REMOVAL

Refer to page 3-5.

## DISASSEMBLY

Disassemble the carburetor as shown in the illustration on page 4-2.

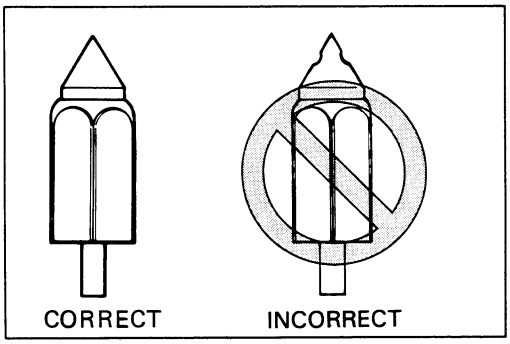
## INSPECTION AND ADJUSTMENT

Check following items for any damage or clogging.

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

## NEEDLE VALVE INSPECTION

If foreign matter is caught between the valve seat and the needle, the gasoline will continue flowing and cause it to overflow. If the seat and needle are worn beyond the permissible limits, similar trouble will occur. Conversely, if the needle sticks, the gasoline will not flow into the float chamber. Clean the float chamber and float parts with gasoline. If the needle is worn as shown in the illustration, replace it together with a valve seat. Clean the fuel passage of the mixing chamber with compressed air.

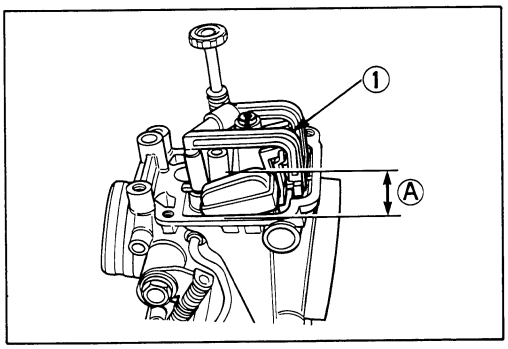



## FLOAT HEIGHT ADJUSTMENT

To check the float height, invert the carburetor body, with the float arm kept free, measure the height Ⓐ while float arm is just in contact with needle valve by using calipers.
Bend the tongue ① as necessary to bring the height Ⓐ to this value.

**Float height Ⓐ: 14.6 ± 1.0 mm (0.57 ± 0.04 in)**

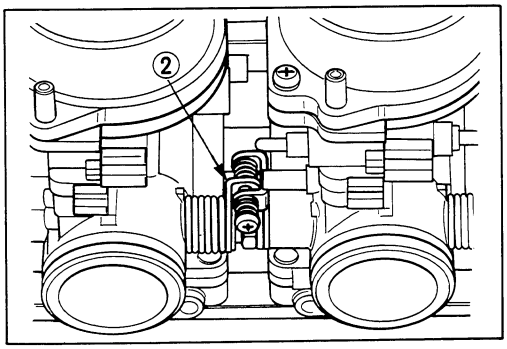
**09900-20102 : Vernier calipers**




## REASSEMBLY AND REMOUNTING

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

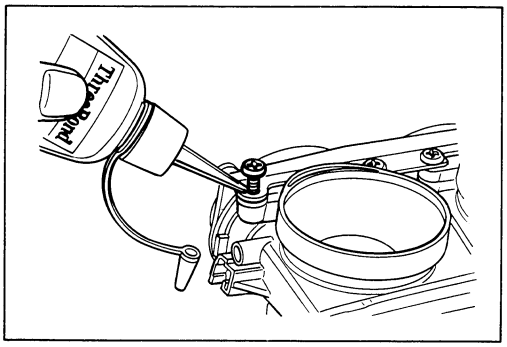
- When engaging two carburetors, position the throttle valve control lever ② correctly.



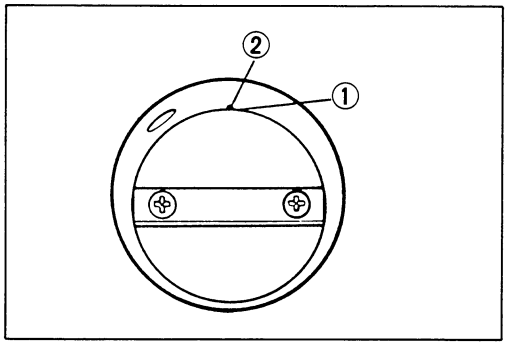

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- Apply THREAD LOCK CEMENT to the upper and lower plates' screws.

**99000-32040 : THREAD LOCK CEMENT**




- Set each throttle valve in such a way that its top end ① meets the foremost by-pass ②. This is accomplished by turning the throttle stop screw and throttle valve balance screw.
- After all work is completed, mount the carburetors on the engine and the following adjustments are necessary.
  * Engine idle r/min ..... Page 2-11
  * Throttle cable play ..... Page 2-11
  * Balancing carburetors ..... Page 4-12



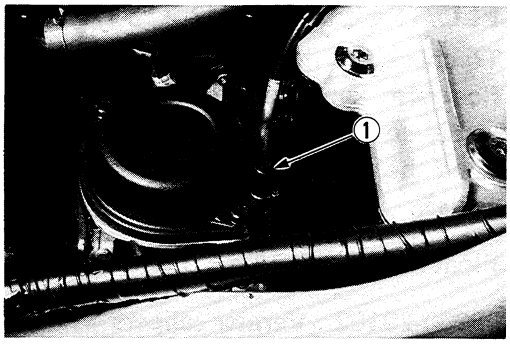

## BALANCE OF CARBURETORS

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

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

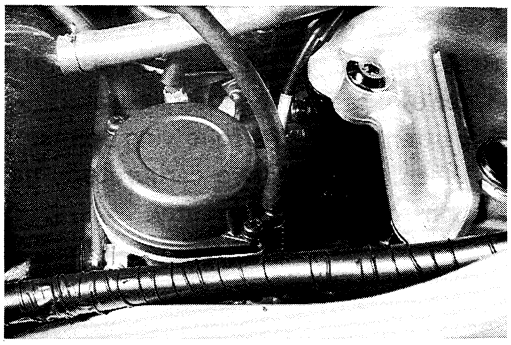
### CALIBRATING EACH GAUGE

- Start up the engine and run it in idling condition for warming up.
- Stop the warmed-up engine.
- Remove the vacuum inlet cap ① for right cylinder.



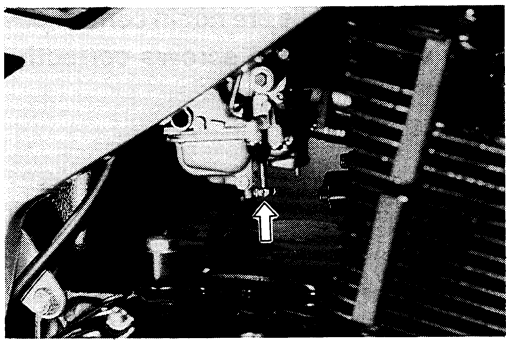

- Connect one of the four rubber hoses of balancer gauge to this inlet.

**09913-13121 : Carburetor balancer**

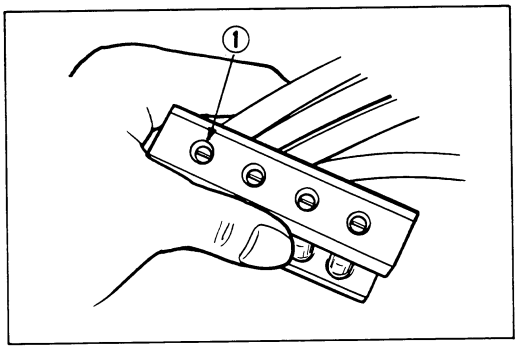


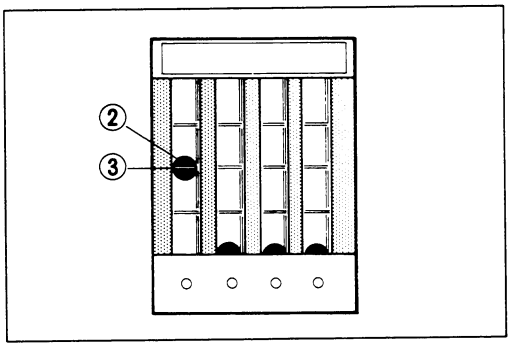
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- Start up the engine and keep it running at 1 750 r/min. by turning throttle stop screw.



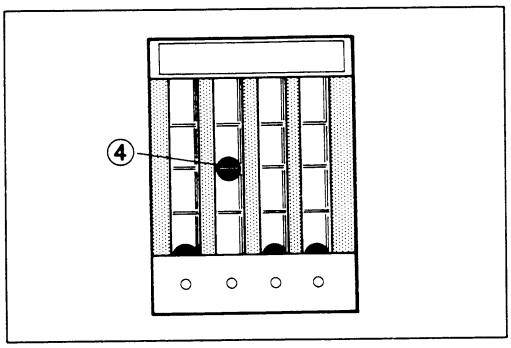
- Turn the air screw ① of the gauge so that the vacuum acting on the tube of that hose will bring the steel ball ② in the tube to the center line ③.



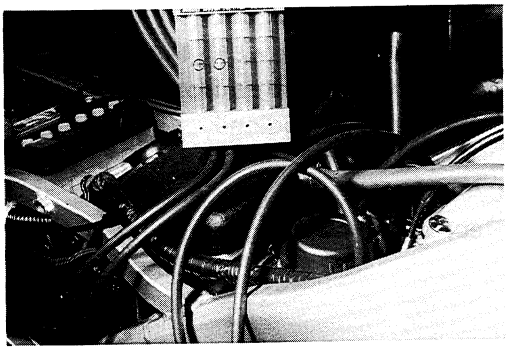

- After making sure that the steel ball stays steady at the center line, disconnect the hose from inlet and connect the next hose to the inlet.
- Turn air screw to bring the other steel ball ④ to the center line.

The balancer gauge is now ready for use in balancing the carburetors.




## BALANCING CARBURETORS

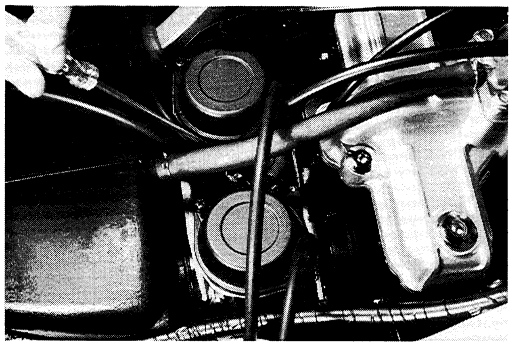
For balancing all the carburetor movement, remove all the vacuum inlet caps from each carburetor. Connect the balancer gauge hoses to these vacuum inlets and adjust the balance of carburetors as follows:



- Start up the engine, and keep it running at 1 750 r/min. to see engine tachometer reading.
  A correctly adjusted carburetor has the steel balls in the No. 1 and No. 2 tubes at the same level.

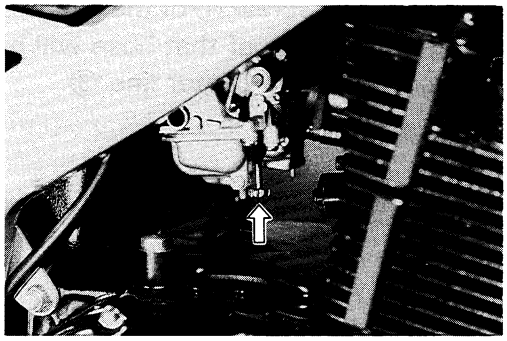
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- If the steel balls are not in correct positions, adjust the throttle valve balance screws correctly.

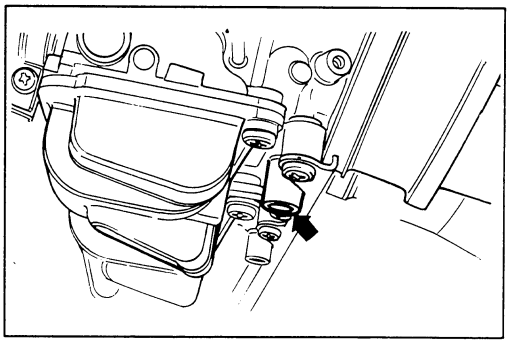


- After balancing the carburetors, set its speed between 1 100 and 1 300 r/min. by turning the throttle stop screw referring engine tachometer reading.

  Idle r/min: 1 200 ± 100 r/min



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



# LUBRICATION SYSTEM

## OIL PRESSURE

Refer to page 3-2.

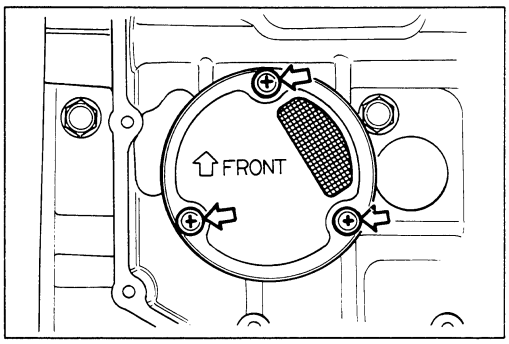
## OIL FILTER

Refer to page 2-10.

## OIL SUMP FILTER

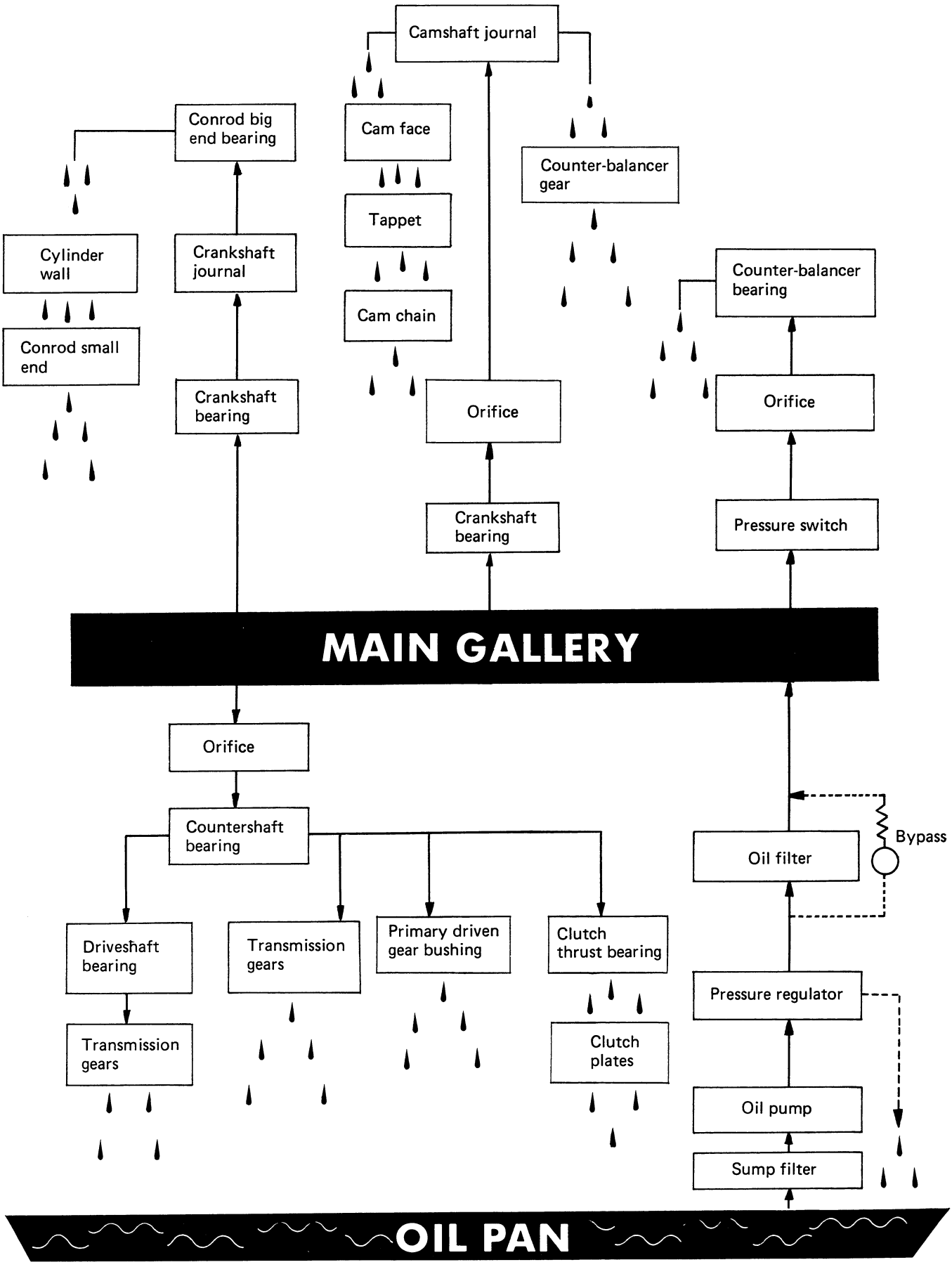
At the same time wash the oil pan. Check to be sure that the oil sump filter is free from any sign of rupture and wash the filter clean periodically.

**CAUTION:**
**Replace the oil pan gasket with new one to prevent oil leakage.**



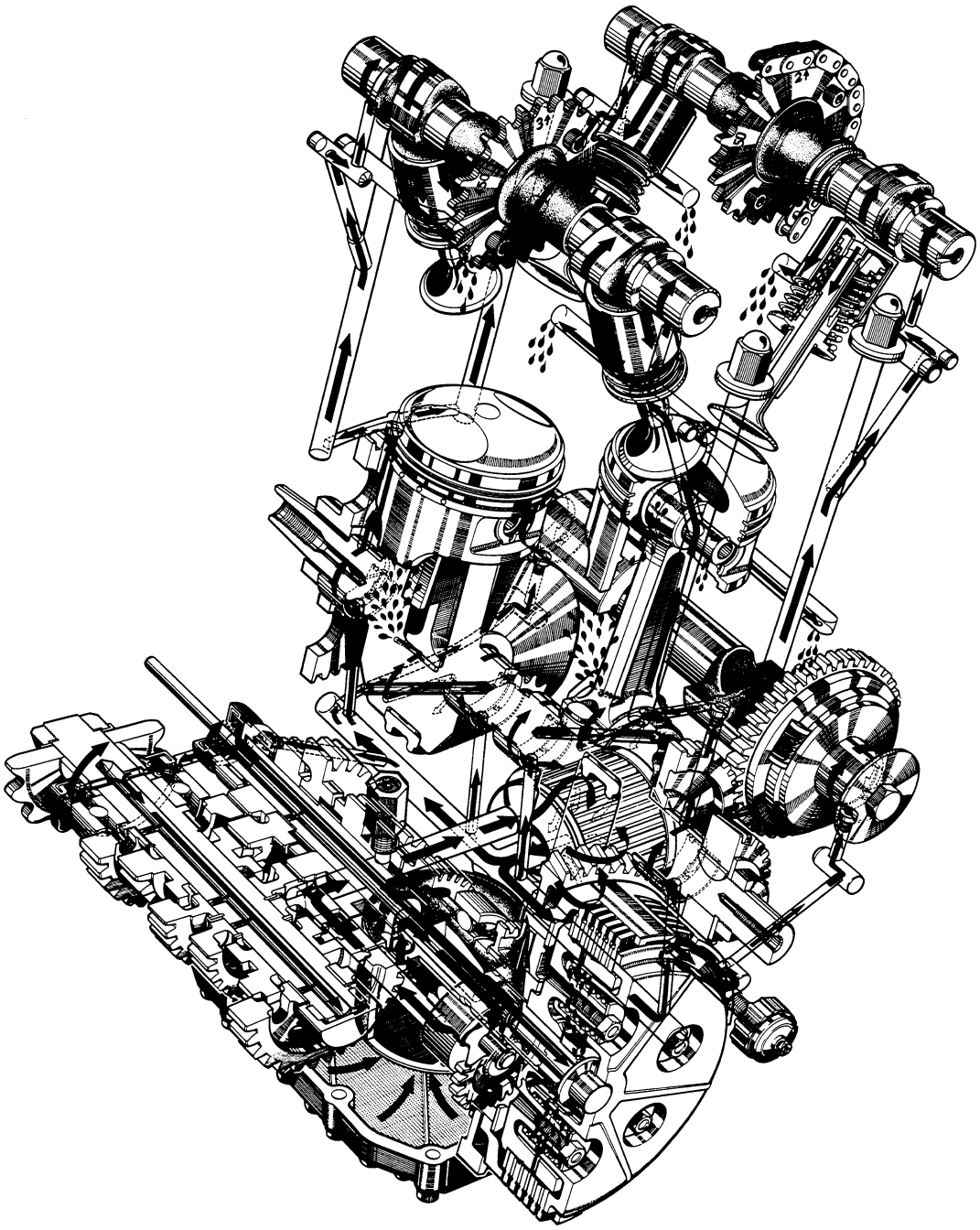

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## ENGINE LUBRICATION SYSTEM CHART




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## ENGINE LUBRICATION SYSTEM



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# ELECTRICAL SYSTEM

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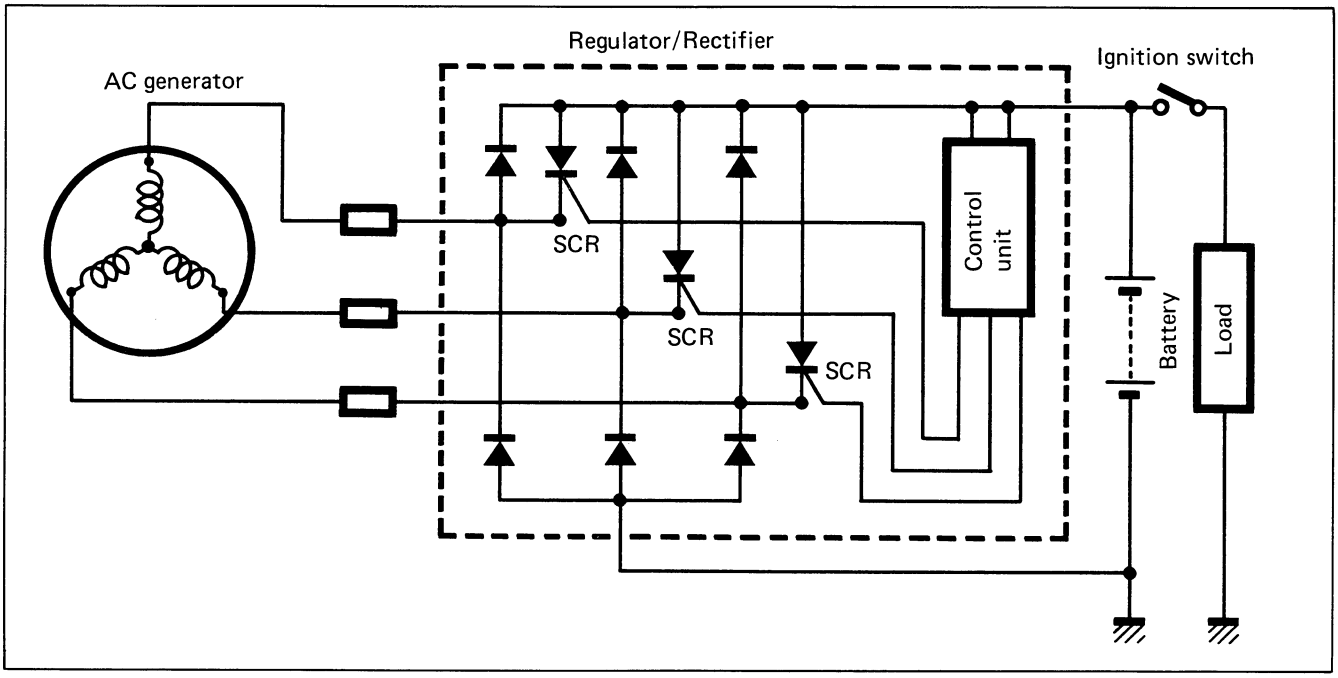

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# CHARGING SYSTEM

## DESCRIPTION

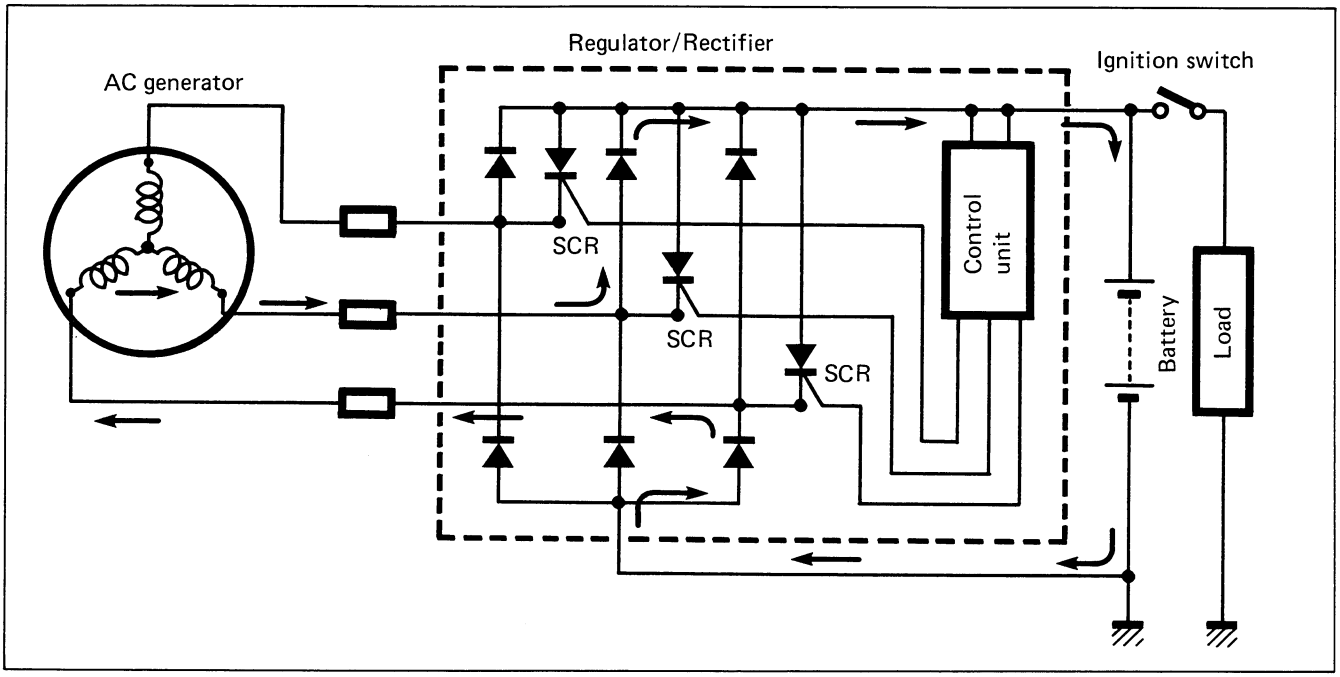
The circuit of the charging system is indicated in the figure, which is composed of an AC generator, regulator/rectifier unit and battery.

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



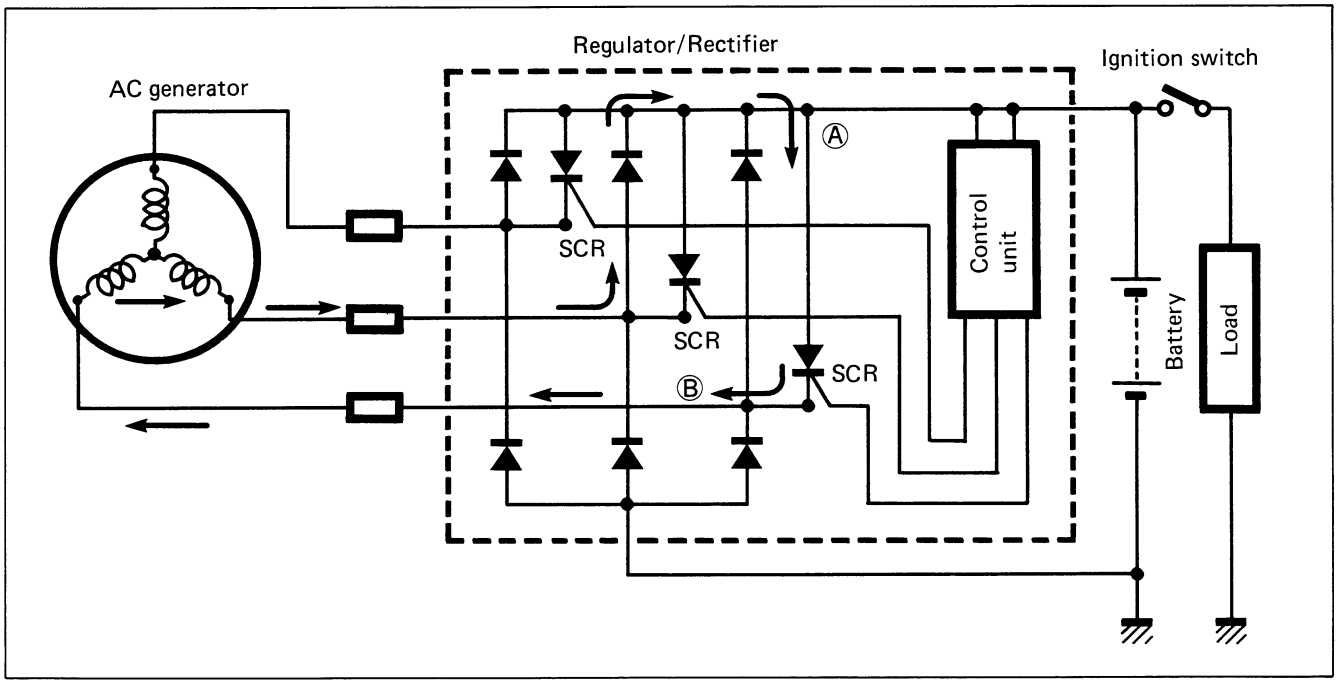

### FUNCTION OF REGULATOR

While the engine r/min is low and the generated voltage of the AC generator is lower than the adjusted voltage of regulator, the regulator does not function. However, the generated current charges the battery directly at this time.




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When the engine r/min becomes higher, the generated voltage of the AC generator also becomes higher and the voltage between the battery terminals becomes high accordingly. When it reaches the adjusted voltage of the control unit and it is turned "ON", a signal will be sent to the SCR (Thyristor) gate probe and the SCR will be turned "ON".
Then, the SCR becomes conductive in the direction from point Ⓐ to point Ⓑ. At this time, the current generated from the AC generator gets through the SCR without charging the battery and returns to AC generator again. At the end of this state, since the AC current generated from AC generator flows to point Ⓑ , the reverse current tends to flow to SCR. Then, the circuit of SCR turns to the OFF mode and begins to charge the battery again. Thus these repetitions maintain charging voltage and current to the battery constant and protect it from overcharging.

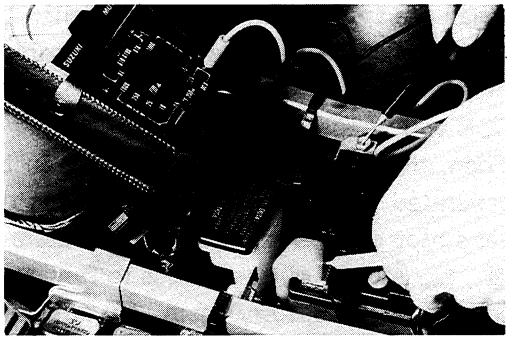



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## INSPECTION

### CHARGING OUTPUT CHECK

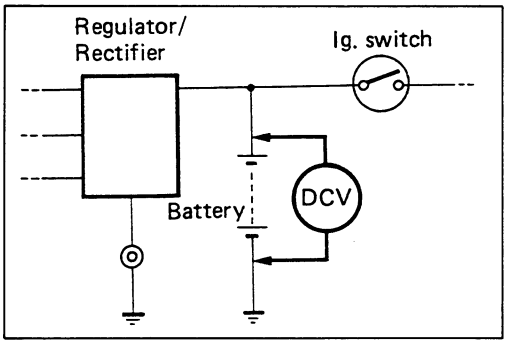
- Remove the seat.
- Start the engine and keep it running at 5 000 r/min with lighting switch turned ON and dimmer switch turned HI position.
- Using the pocket tester, measure the DC voltage between the battery terminals, ⊕ and ⊖.
  If the tester reads under 13.5V or over 15.5V, check the AC generator no-load performance and regulator/rectifier.



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

**STD charging output : 13.5 – 15.5V (DC) at 5 000 r/min**

**09900-25002 : Pocket tester**

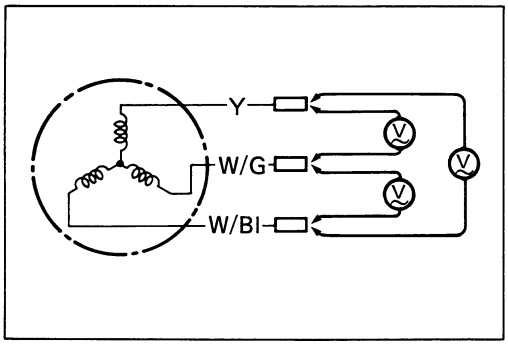



### AC GENERATOR NO-LOAD PERFORMANCE

- Remove the seat and left frame cover.
- Disconnect the AC generator lead wires.
- Start the engine and keep it running at 5 000 r/min.
- Using the pocket tester, measure the AC voltage between the three lead wires.
  If the tester reads under 75V, the AC generator is faulty.

**STD no-load performance : More than 75V (AC) at 5 000 r/min (When engine is cold.)**

**09900-25002 : Pocket tester**

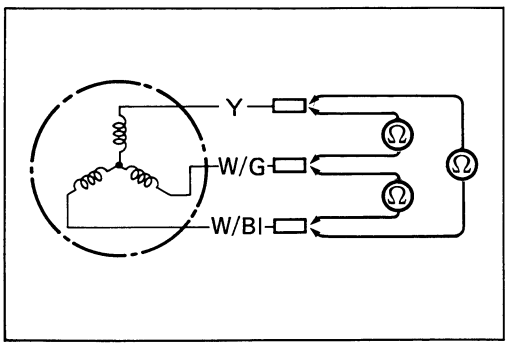



### AC GENERATOR CONTINUITY CHECK

- Using the pocket tester, check the continuity between the three lead wires.
  Check that there is no continuity between the lead wires and ground.

**09900-25002 : Pocket tester**

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



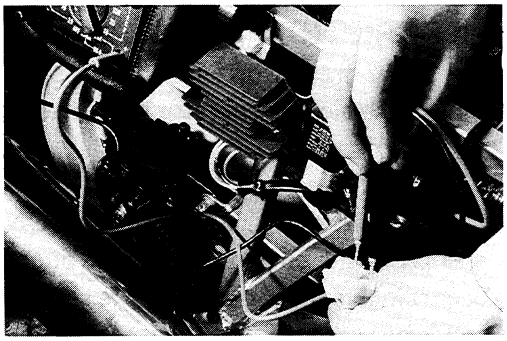

Y : Yellow
W/G : White with Green tracer
W/Bl : White with Blue tracer

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## REGULATOR/RECTIFIER

- Remove the seat and right frame cover.
- Using the pocket tester (x 1Ω range), measure the resistance between the lead wires in the following table.
  If the resistance checked is incorrect, replace the regulator/rectifier.

**09900-25002 : Pocket tester**

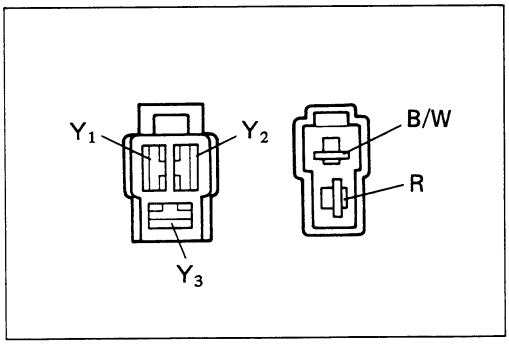


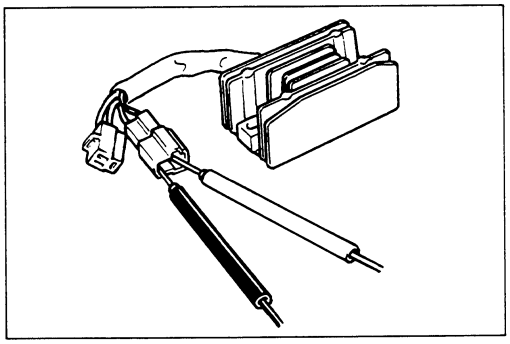
Unit: Approx. Ω

| ⊖ Probe of tester to: / ⊕ Probe of tester to: | $Y_1$ | $Y_2$ | $Y_3$ | R | B/W |
|---|---|---|---|---|---|
| $Y_1$ | | ∞ | ∞ | 6.0 | ∞ |
| $Y_2$ | ∞ | | ∞ | 6.0 | ∞ |
| $Y_3$ | ∞ | ∞ | | 6.0 | ∞ |
| R | ∞ | ∞ | ∞ | | ∞ |
| B/W | 6.0 | 6.0 | 6.0 | 40 | |

Y: Yellow, R: Red, B/W: Black with White tracer, ∞ : Infinity

*NOTE:*
*As transistors, capacitors, Zener diodes, etc. are used inside this regulator/rectifier, the resistance values will differ when an ohmmeter other than the SUZUKI pocket tester is used.*



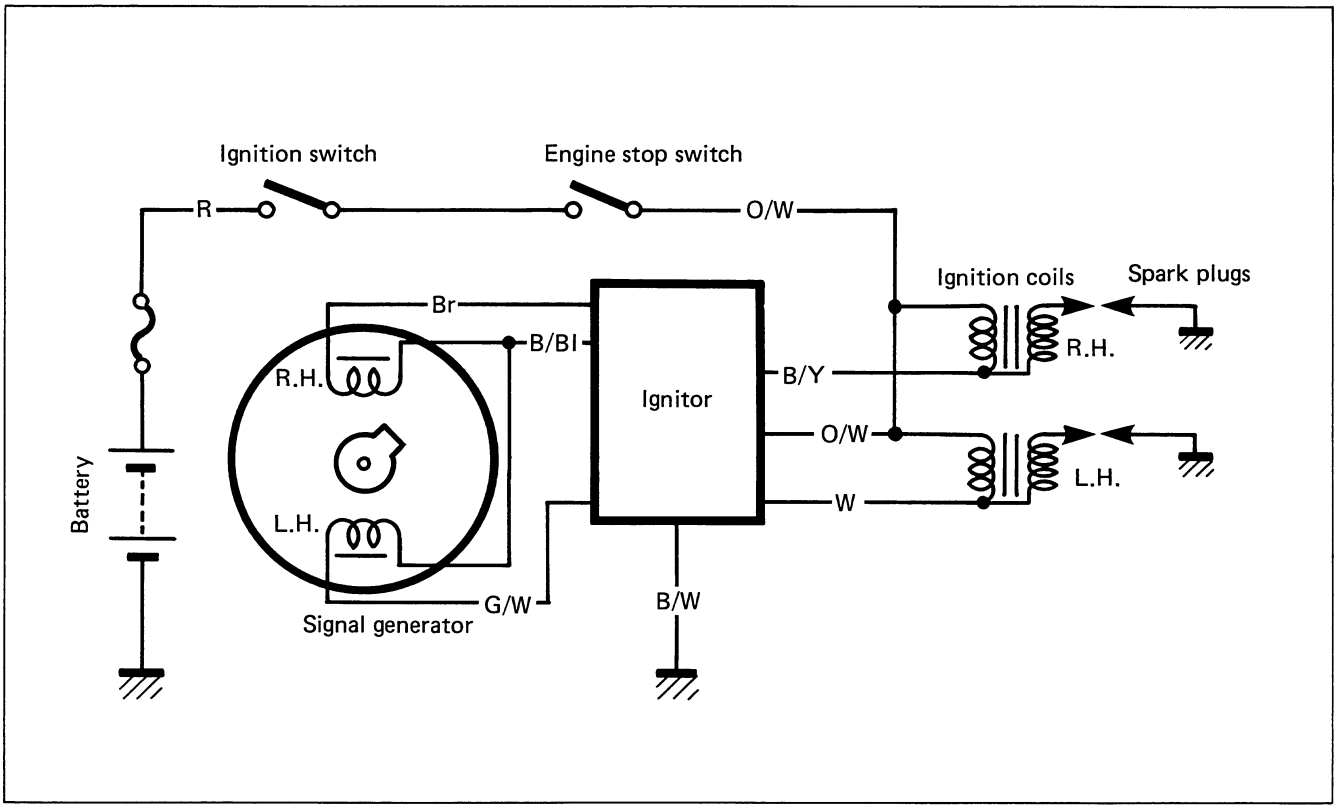
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# IGNITION SYSTEM

## DESCRIPTION

The fully transistorized ignition system consists of a signal generator, ignitor, ignition coils, and spark plugs. The signal generator comprises rotor tip and pick-up coil.

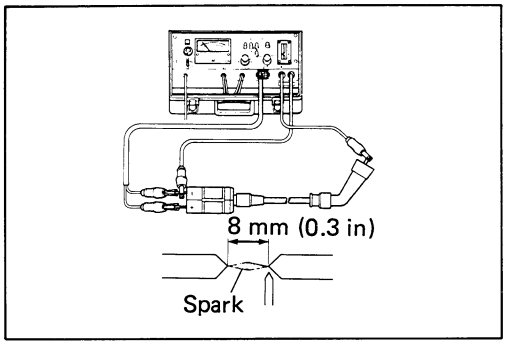
The signal generator is mounted at the right end of the crankshaft. The output of the signal generator goes to the ignitor unit, where it turns ON and OFF the transistor alternately. As the transistor is turned ON and OFF, the current passing through the primary windings of the ignition coil is also turned OFF and ON accordingly, thus it induces the secondary current on the ignition coil secondary windings and produce the spark between spark plug gaps.




*NOTE:*
*The ignition cut-off circuit is not incorporated in this ignitor unit.*

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## INSPECTION




### IGNITION COIL (Checking with Electro Tester)

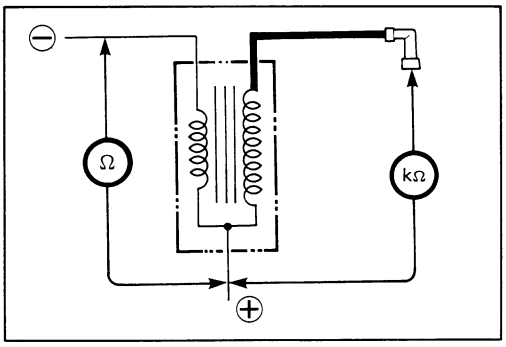
- Remove the ignition coils from the frame.
- Using the electro tester, test each ignition coil for sparking performance. The test connection is as indicated. Make sure that the three-needle sparking distance is at least 8 mm.
  If no sparking or orange color sparking occurs with this much gap, then it is defective and must be replaced.

**09900-28106 : Electro tester**

**STD Spark performance : 8 mm (0.3 in)**

### IGNITION COIL (Checking with Pocket Tester)

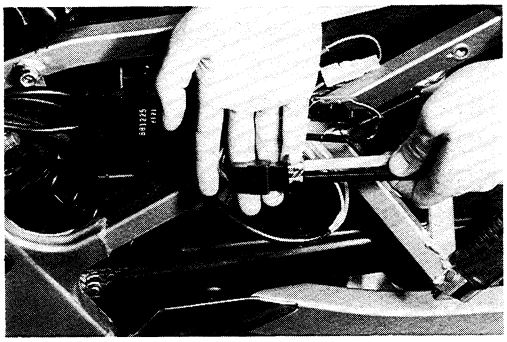
- A SUZUKI pocket tester or an ohmmeter may be used, instead of the electro tester. In either case, the ignition coil is to be checked for continuity in both primary and secondary windings.
  Exact ohmic readings are not necessary, but, if the windings are in sound condition, their continuity will be noted with these approximate ohmic values.




**09900-25002 : Pocket tester**

**Ignition coil resistance**
**Primary : ⊕ tap — ⊖ tap 3 — 6 Ω**
**Tester range: (x 1 Ω)**
**Secondary : ⊕ tap — Plug cap 18 — 30 kΩ**
**Tester range: (x 1 kΩ)**

### SIGNAL GENERATOR (Checking with Pocket Tester)



- Remove the seat and left frame cover.
- Measure the resistance between lead wires. If the resistance is infinity or less than the specification, the signal generator must be replaced.

**09900-25002 : Pocket tester**

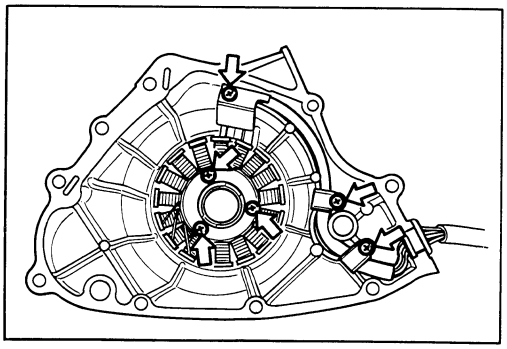
**Signal coil resistance : Br — B/Bl, G/W — B/Bl } 250 — 420 Ω**
**Tester range: (x 100 Ω)**

**Wire color**
Br : Brown
G/W : Green with White tracer
B/Bl : Black with Blue tracer

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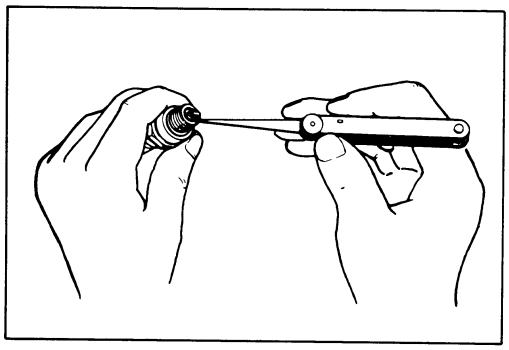
**CAUTION:**
**When replacing the generator coil, apply a small quantity of THREAD LOCK "1342" to the mounting screws and lead wire guide screws.**

**99000-32050 : THREAD LOCK "1342"**



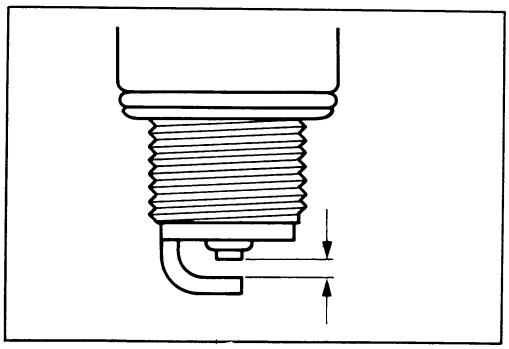
**SPARK PLUG**

- Clean the plug with a wire brush and pin. Use the pin to remove carbon, taking care not to damage the porcelain.



- Check the gap with a thickness gauge.

**Spark plug gap : 0.8 – 0.9 mm (0.031 – 0.035 in)**



**Recommended spark plug**

ND: X24EPR-U9 . . . . . Standard
ND: X22EPR-U9 . . . . . Hot type
ND: X27EPR-U9 . . . . . Cold type
NGK: DPR8EA-9 . . . . . Standard
NGK: DPR7EA-9 . . . . . Hot type
NGK: DPR9EA-9 . . . . . Cold type

*NOTE:*
*"R" type spark plug is installed for some specifications. "R" type spark plug has a resister located at the center electrode to prevent radio noise.*

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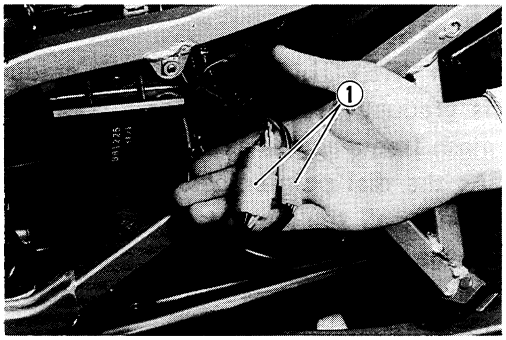
**IGNITOR UNIT (Checking with Digital Ignitor Checker)**

This section explains the checking procedure for the ignitor unit using Digital Ignitor Checker (special tool). With this checker, the ignitor unit can be checked either on the machine or off the machine. The following explains the checking procedure on the machine.

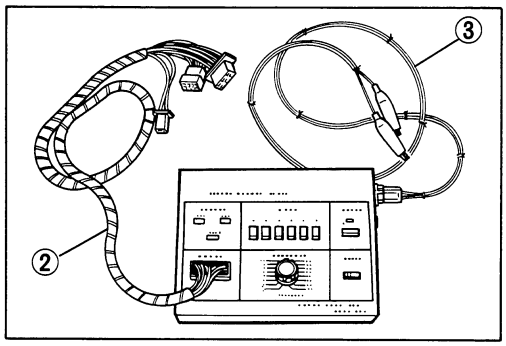
**09931-64411 : Digital ignitor checker**

WIRING PROCEDURE:

- Remove the seat.
- Remove the left frame cover.
- Disconnect two ignitor lead wire couples ① at the ignitor unit.




- Prepare the ignitor checker lead wire "MODE 5" ② which comes supplied with the ignitor checker and connect its end to the ignitor unit and another end to the checker.
- Connect the power source leads ③ to the battery.




**CAUTION:**

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

*NOTE:*

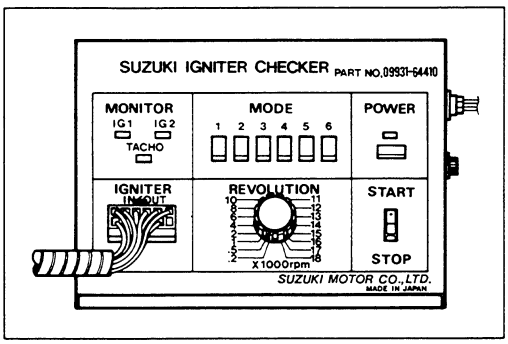
*Be sure that the battery used is in fully-charged condition.*

CHECK PROCEDURE:

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

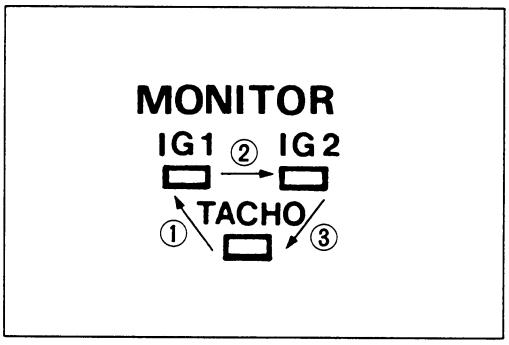
First Step:

Depress "MODE 5" button then "POWER" button. This time, "POWER" lamp should come on, if not, battery is undercharged. Also, "TACHO" MONITOR lamps should come on. If this lamp does not light, the ignitor unit should be replaced.

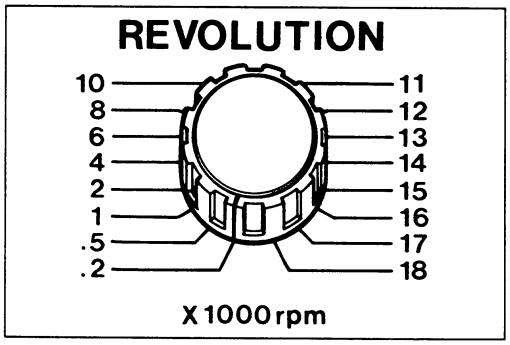


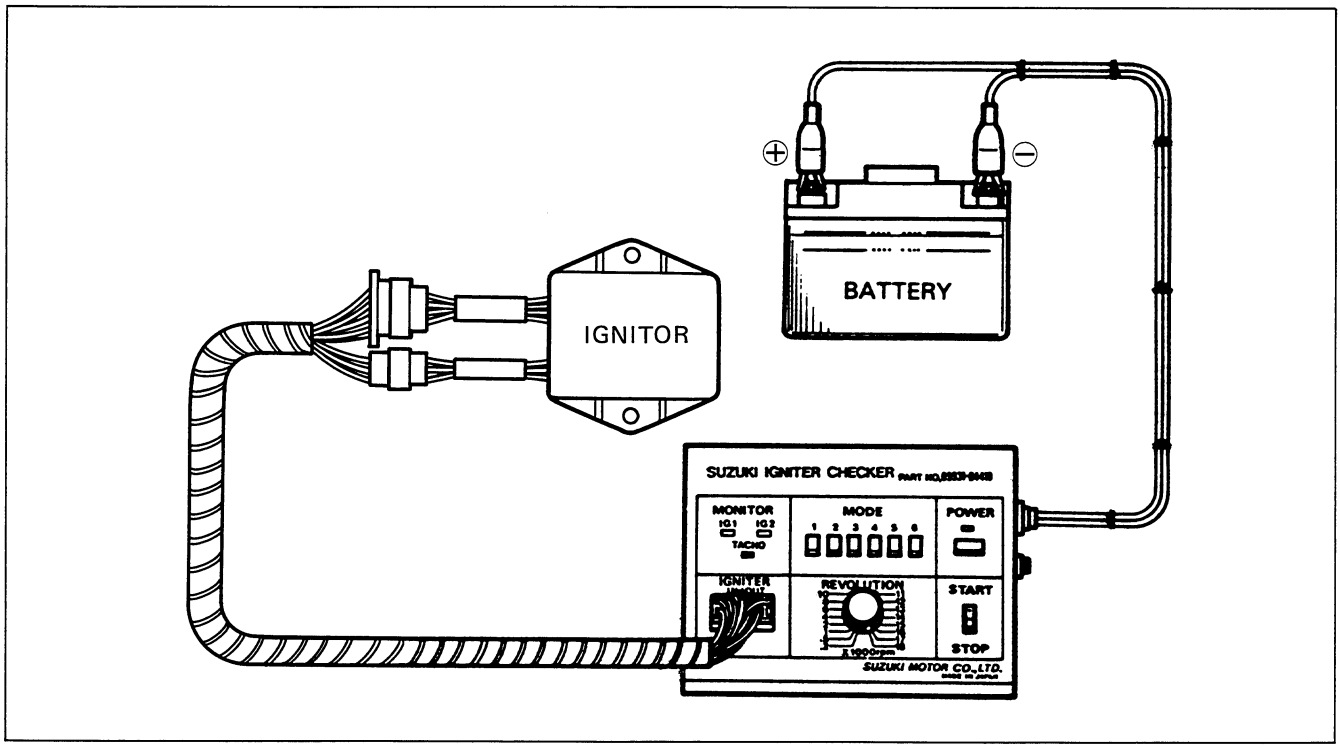

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Second Step:
Set "REVOLUTION" dial pointer to ".2" position in which the checker produces the ignition primary current pulses simulating 200 r/min of engine revolution when "START" switch is turned on. With "START" switch is turned to ON position,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




Third Step:
Turn "REVOLUTION" Dial up gradually (assuming the engine is gradually revved up) and check that the MONITOR lamp flash frequency as explained in the second step above increases. As the dial pointer passes beyond the graduation "1" (1 000 r/min), all the three lamps should show continuously lighted. If the lamps go off at the graduation below "10", the engine can not perform properly and therefore the ignitor unit must be replaced.



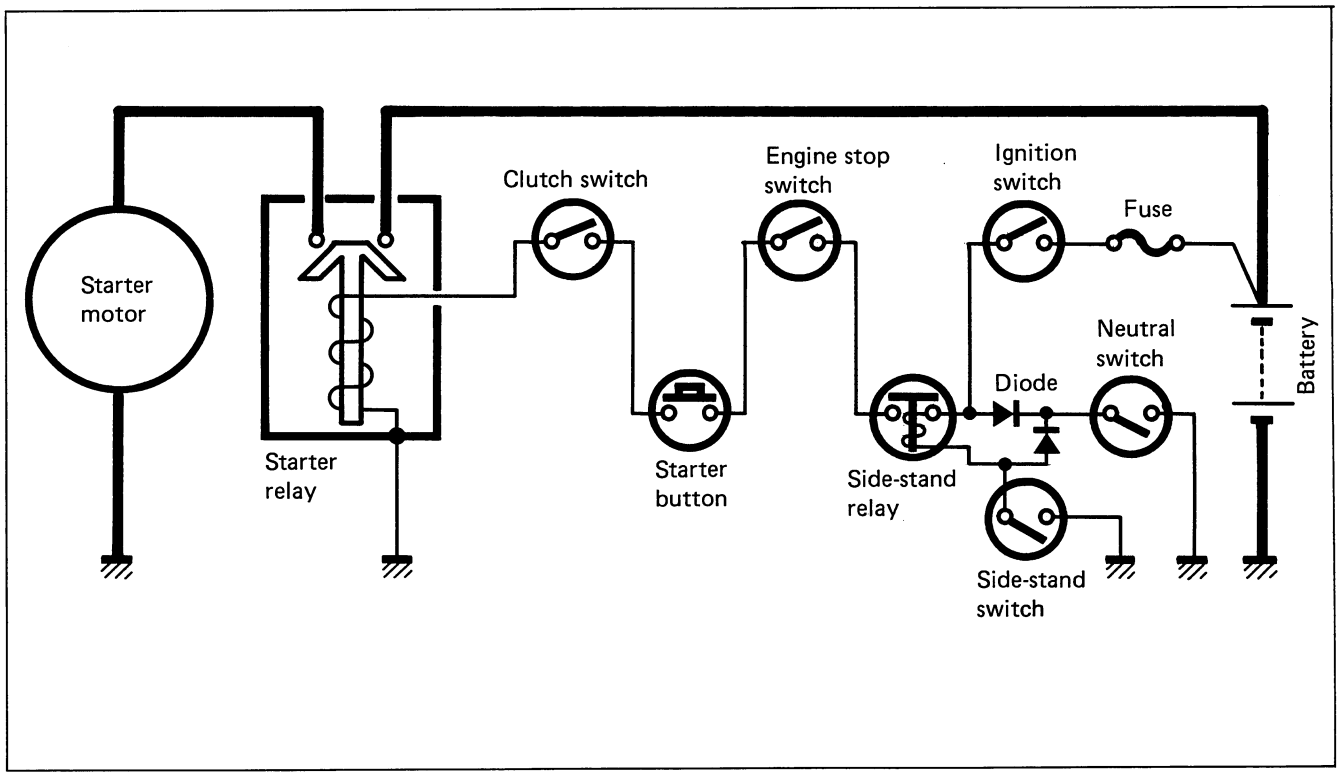




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# STARTER SYSTEM

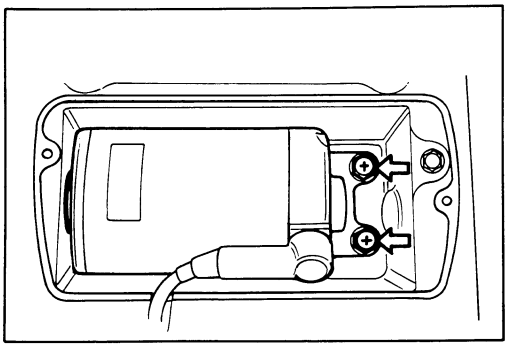
## DESCRIPTION

The starter system is shown in the diagram below: namely, the starter motor, starter relay, side stand relay, interlock switch, starter button, engine stop switch, side stand switch, IG switch and battery. Depressing the starter button (on the right handlebar switch box) energizes the relay, causing the contact points to close which connects the starter motor to the battery. The motor draws about 80 amperes to start the engine.



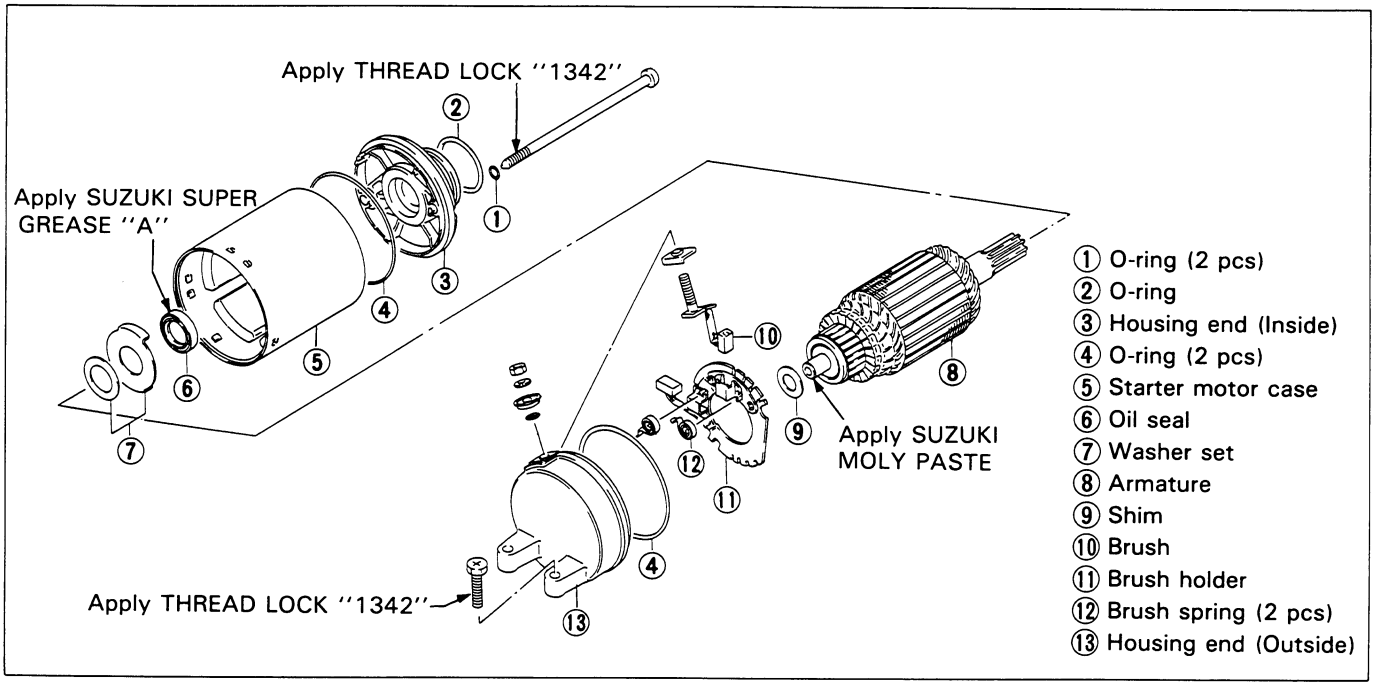

## REMOVAL AND DISASSEMBLY

- Remove the starter motor cover.
- Disconnect the starter motor lead wire and remove the starter motor. (Refer to page 3-15.)



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• Disassemble the starter motor as shown in the illustration.

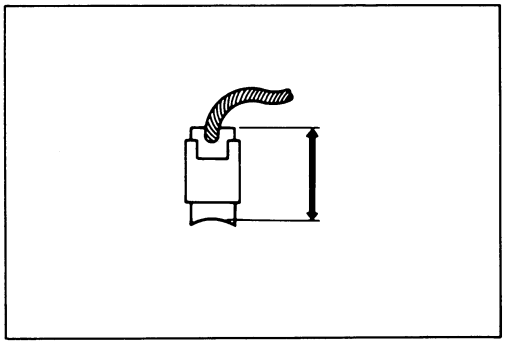



## INSPECTION

### CARBON BRUSH

When the brushes are worn, the motor will be unable to produce sufficient torque, and the engine will be difficult to turn over. To prevent this, periodically, measure the length of the brushes with a vernier calipers, replacing them when they are too short or chipping.

**09900-20102 : Vernier calipers (200 mm)**



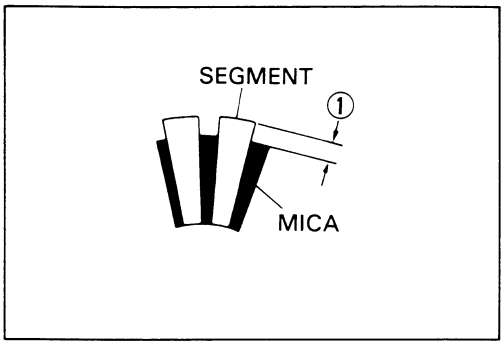
| Brush length | Service Limit |
|---|---|
| | 9 mm (0.35 in) |

### COMMUTATOR

If the commutator surface is dirty, starting performance decreases. Polish the commutator with # 400 or similar fine emery paper when it is dirty. After polishing it, wipe the commutator with a clean dry cloth.

Measure the commutator under cut ① with a vernier calipers.

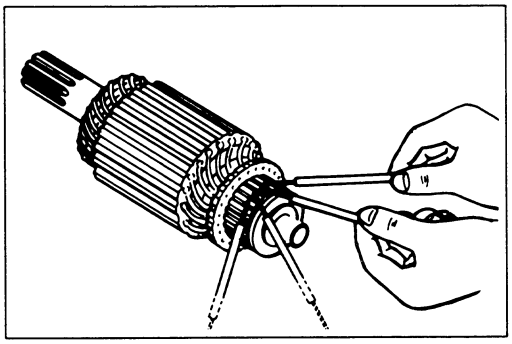
**09900-20102 : Vernier calipers (200 mm)**




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

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### ARMATURE COIL



Using a pocket tester, check the coil for open and ground by placing probe pins on each commutator segment and rotor core (to test for ground) and on any two segments at various places (to test for open), with the brushes lifted off the commutator surface.
If the coil is found to be open-circuited or grounded replace the armature. Continuous use of a defective armature will cause the starter motor to suddenly fail.

**09900-25002 : Pocket tester**

**Tester knob indication : × 1Ω range**

### OIL SEAL

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

## REASSEMBLY

Reassemble the starter motor in the reverse order of disassembly. Pay attention to the following points:

### O-RING

**CAUTION:**
**Replace the O-rings with new ones to prevent oil leakage and moisture.**

### HOUSING END (Inside)

- Apply grease to the lip of oil seal. (Refer to page 5-11.)

**(For U.S.A. model)**
**99000-25030 : SUZUKI SUPER GREASE "A"**
**(For the other models)**
**99000-25010 : SUZUKI SUPER GREASE "A"**

### HOUSING END (Outside)

- Apply a small quantity of SUZUKI MOLY PASTE to the armature end. (Refer to page 5-11.)

**99000-25140 : SUZUKI MOLY PASTE**

- Apply a small quantity of THREAD LOCK "1342" to the starter motor housing screws. (Refer to page 5-11.)

**99000-32050 : THREAD LOCK "1342"**

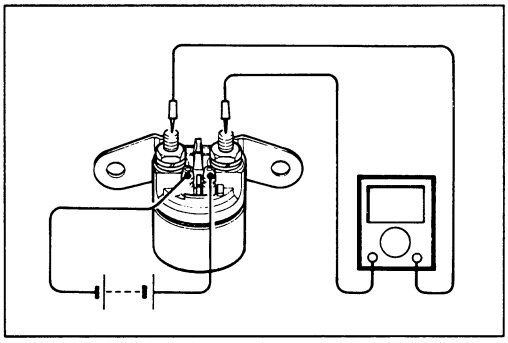
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## STARTER RELAY INSPECTION

- Disconnect the lead wire of starter motor at starter relay which is located battery holder of right side.
- Turn on the ignition switch, inspect the continuity between the terminals, positive and negative, when squeezing the clutch lever and pushing the starter button.
  If the starter relay is in sound condition, continuity is found.

**09900-25002 : Pocket tester**

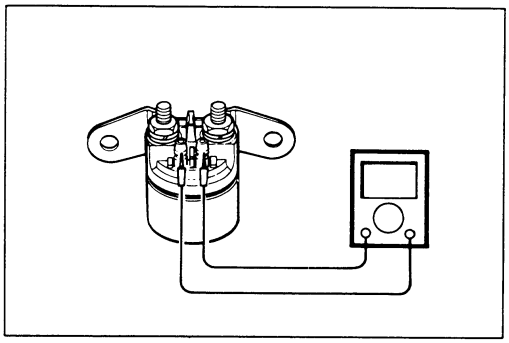
**Tester knob indication : × 1Ω range**



- Disconnect the lead wires from the starter relay.
- Check the coil for "open", "ground" and ohmic resistance.
  The coil is in good condition if the resistance is as follows.

**09900-25002 : Pocket tester**

**Tester knob indication : × 1Ω range**

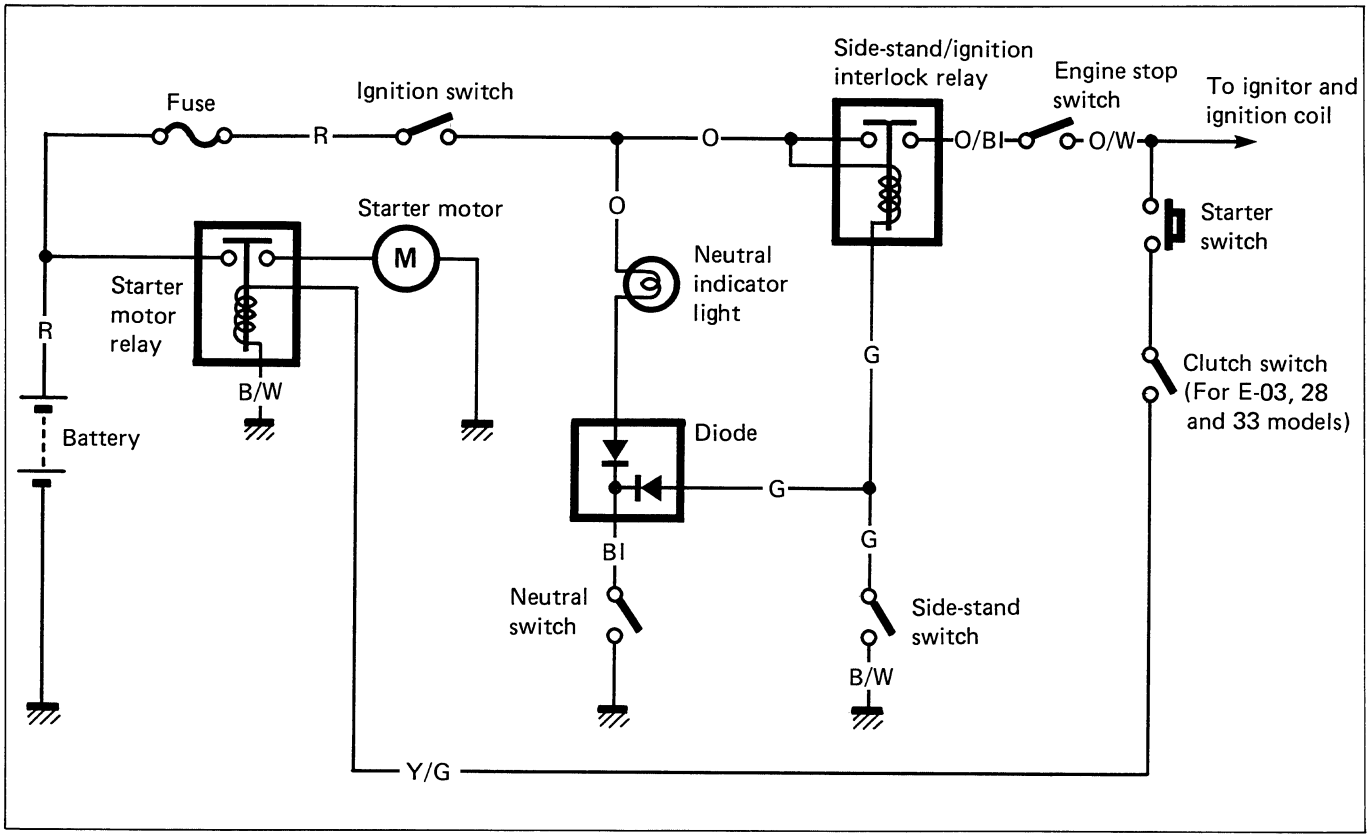


| Starter relay resistance | Standard |
|---|---|
| | 3 – 5Ω |

# SIDE-STAND/IGNITION INTERLOCK SYSTEM

## DESCRIPTION

This side-stand/ignition interlock system is to prevent starting the motorcycle with the side-stand left down. The system is operated by an electric circuit provided between the battery and ignition coil.

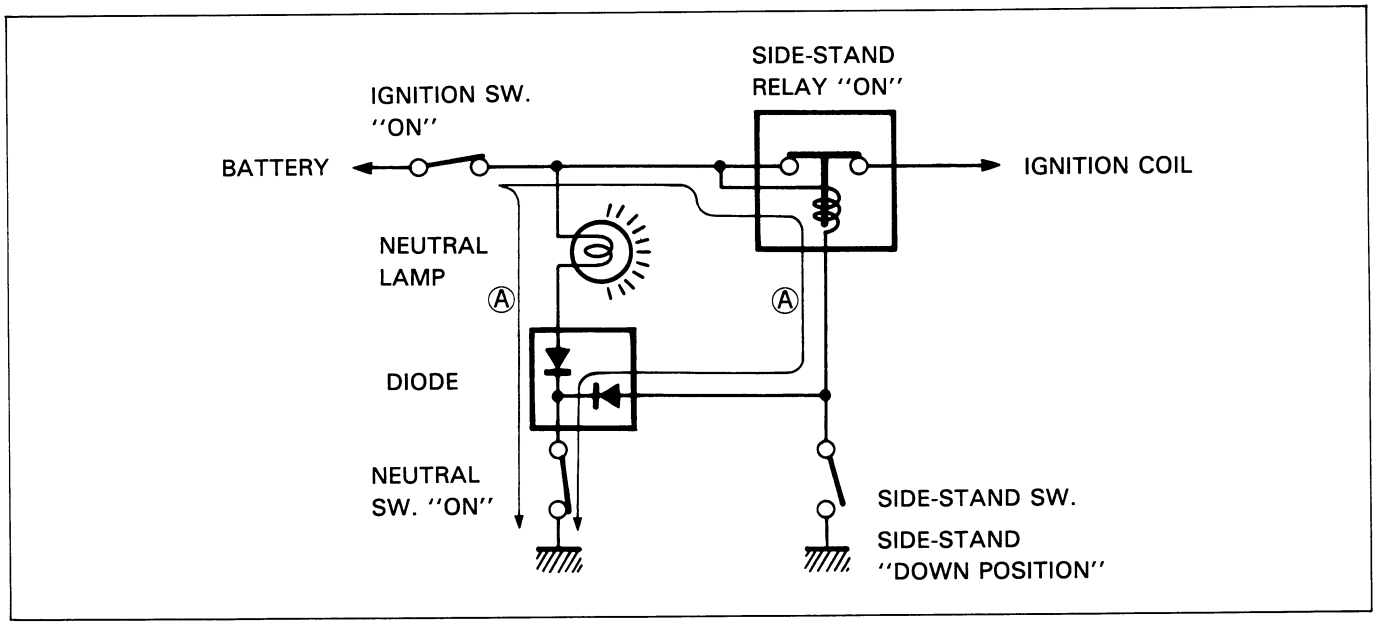



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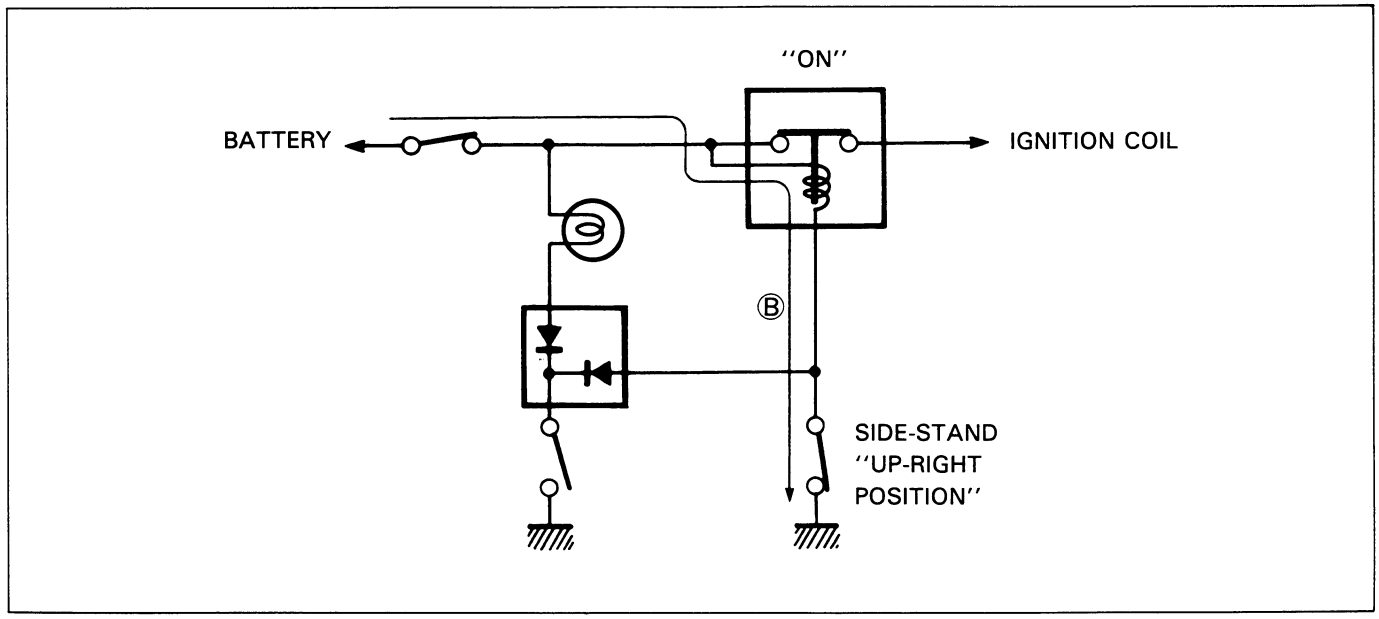
The circuit consists of relay, lamp, diode and switches and decides to live the ignition coil depending on the position of the TRANSMISSION and SIDE-STAND with the neutral and side-stand switches working mutually.

The ignition coil lives only in two situations as follows:

1. Transmission: ''NEUTRAL (ON)'' Side-stand: ''DOWN (OFF)''
   The current flow Ⓐ turns ''ON'' the relay and the ignition coil lives even the side-stand is kept down. This is for warming up the engine.




2. Side-stand: ''UP-RIGHT (ON)''
   The current flow Ⓑ turns ''ON'' the relay and the ignition coil lives. The engine can be easily started at any transmission position.

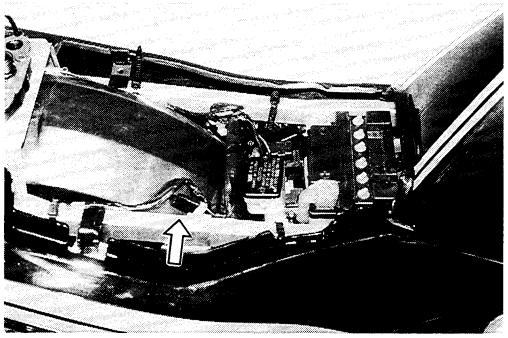



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## INSPECTION

If the interlock system does not operate properly, check each component. If any abnormality is found, replace the component with a new one.

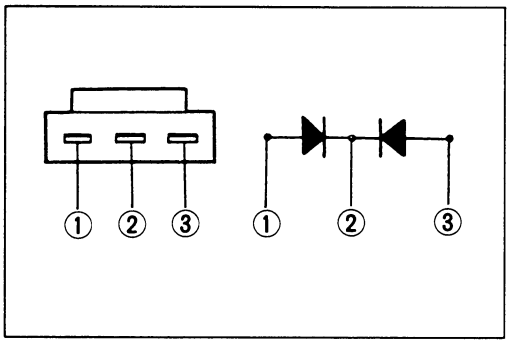
**09900-25002 : Pocket tester**



### Diode

The diode is located behind the rear brake reservoir tank.
The diode can pass current only in one direction.

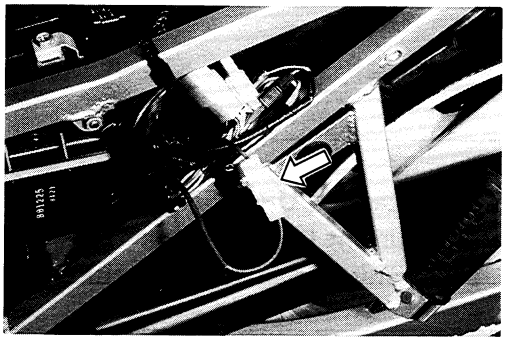
- Check the continuity between ① and ②. If one way continuity the diode is in good condition.
- Also check the continuity between ② and ③ as required.




### Neutral switch

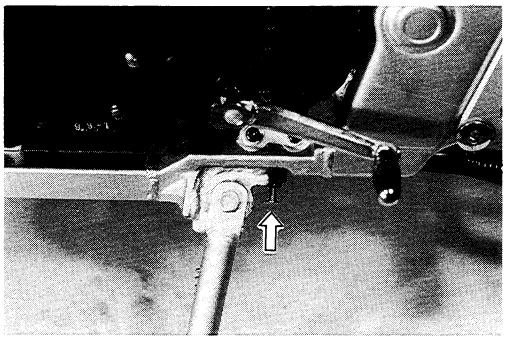
The neutral lead wire coupler is located behind the left frame cover.

- Disconnect the neutral switch lead and check the continuity between BI and ground with the transmission in "NEUTRAL".



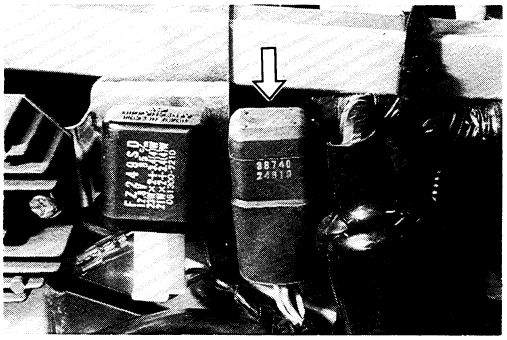
### Side-stand switch

| | G | B/W |
|---|---|---|
| ON (UP-right position) | ○——— | ———○ |
| OFF (Down position) | | |



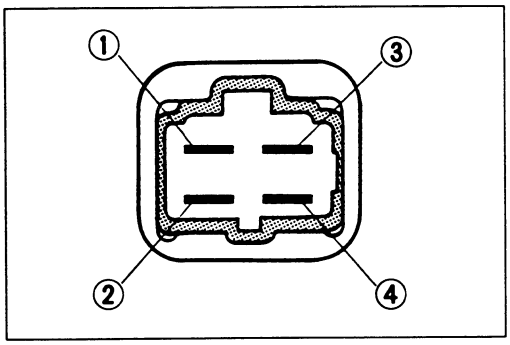
### Side-stand/ignition interlock relay

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



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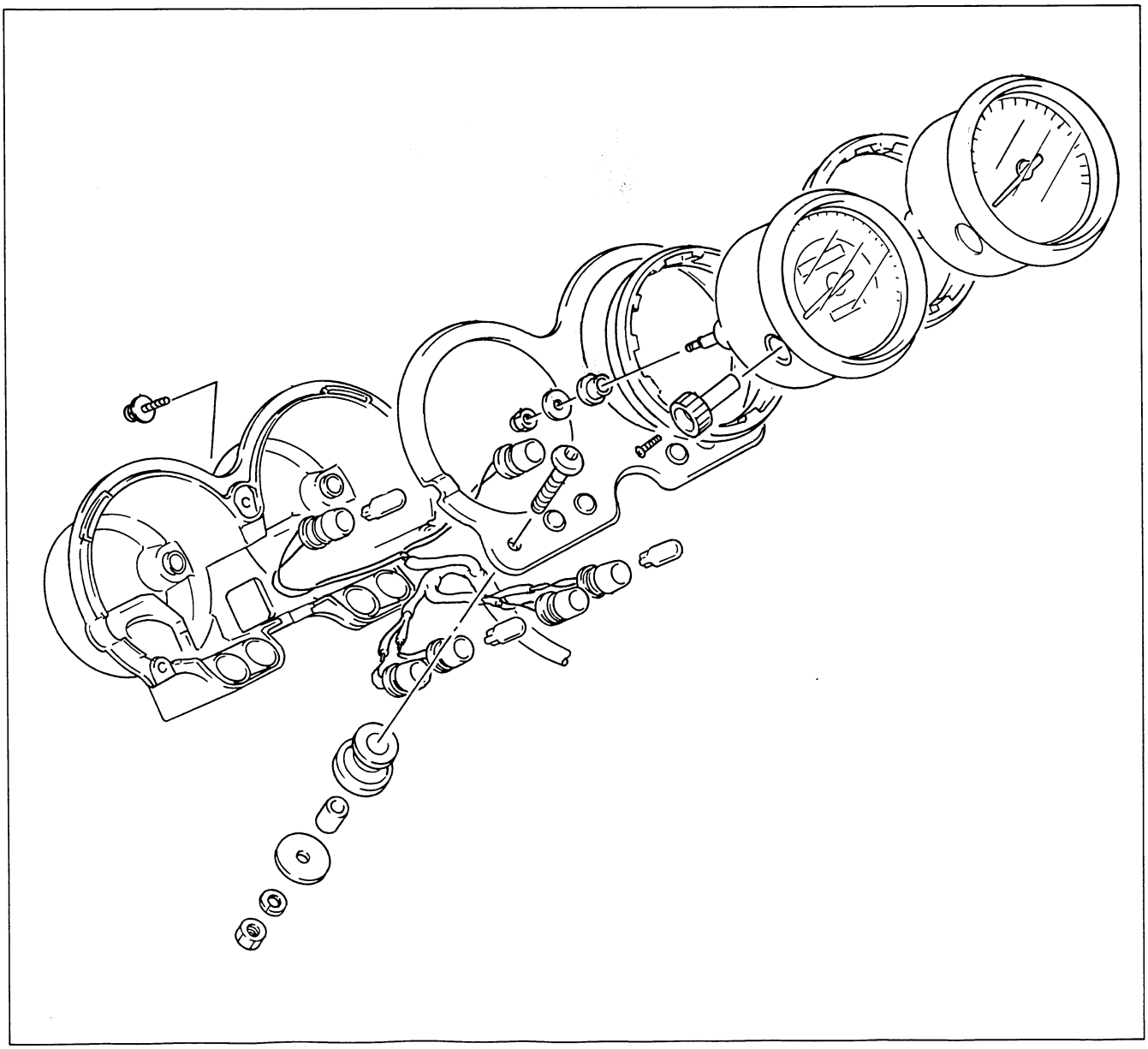
First, check the insulation between ① and ② terminals with pocket tester. Then apply 12 volts to ③ and ④ terminals, ⊕ to ③ and ⊖ to ④, and check the continuity between ① and ②.
If there is no continuity, replace it with a new one.




# COMBINATION METER

## REMOVAL AND DISASSEMBLY

- Disassemble the combination meter as follows.



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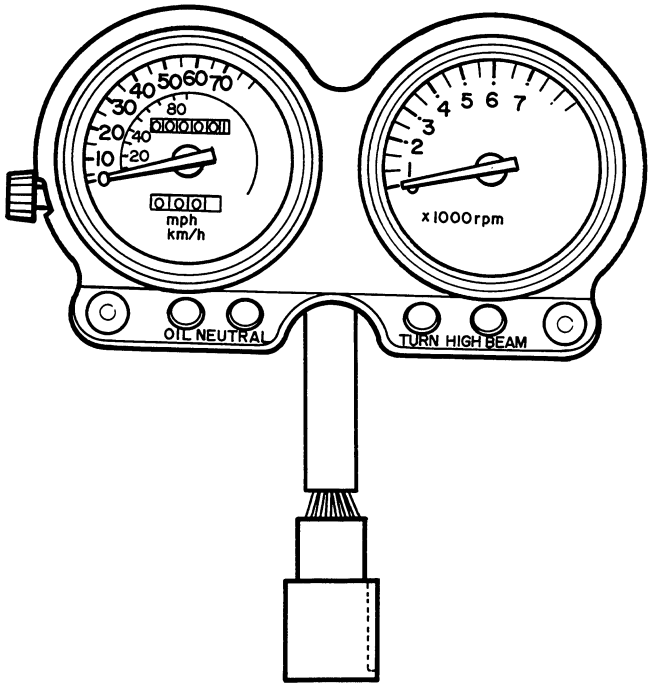
## INSPECTION

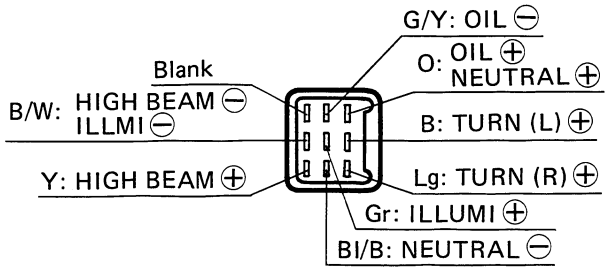
Using the pocket tester, check the continuity between lead wires in the diagram as shown below.
If the continuity measured is incorrect, replace the respective parts.

**09900-25002 : Pocket tester**

**Tester knob indication : × 1Ω range**

*NOTE:*
*When making this test, it is not necessary to remove the combination meter.*



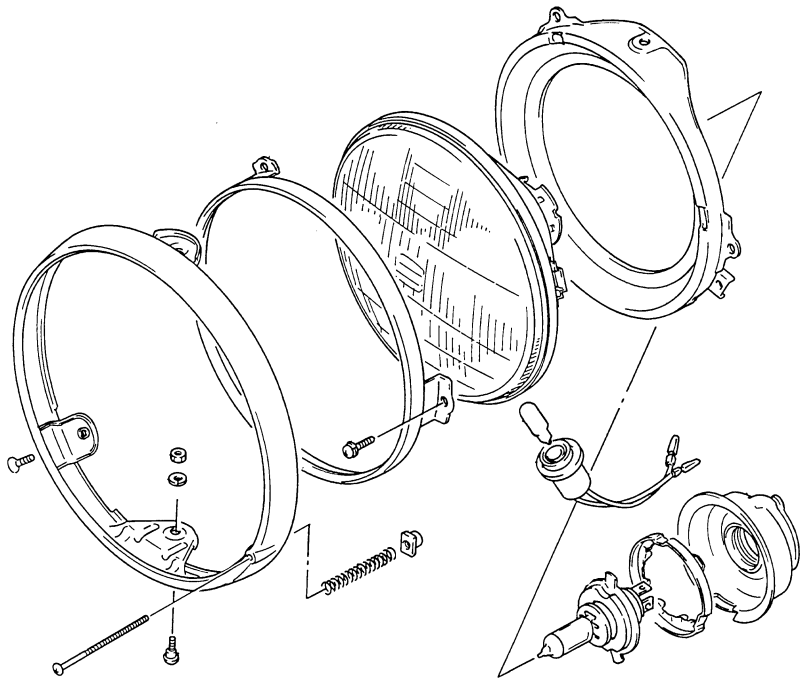

| ITEM | ⊕ Probe of tester to: | ⊖ Probe of tester to: |
|---|---|---|
| TURN SIGNAL | B | Lg |
| ILLUMI. | Gr | B/W |
| HIGH BEAM | Y | B/W |
| OIL | O | G/Y |
| NEUTRAL | O | Bl/B |

WIRE COLOR
B : Black
Lg : Light green
O : Orange
Gr : Gray
Y : Yellow
Bl/B: Blue with Black tracer
B/W: Black with White tracer
G/Y: Green with Yellow tracer

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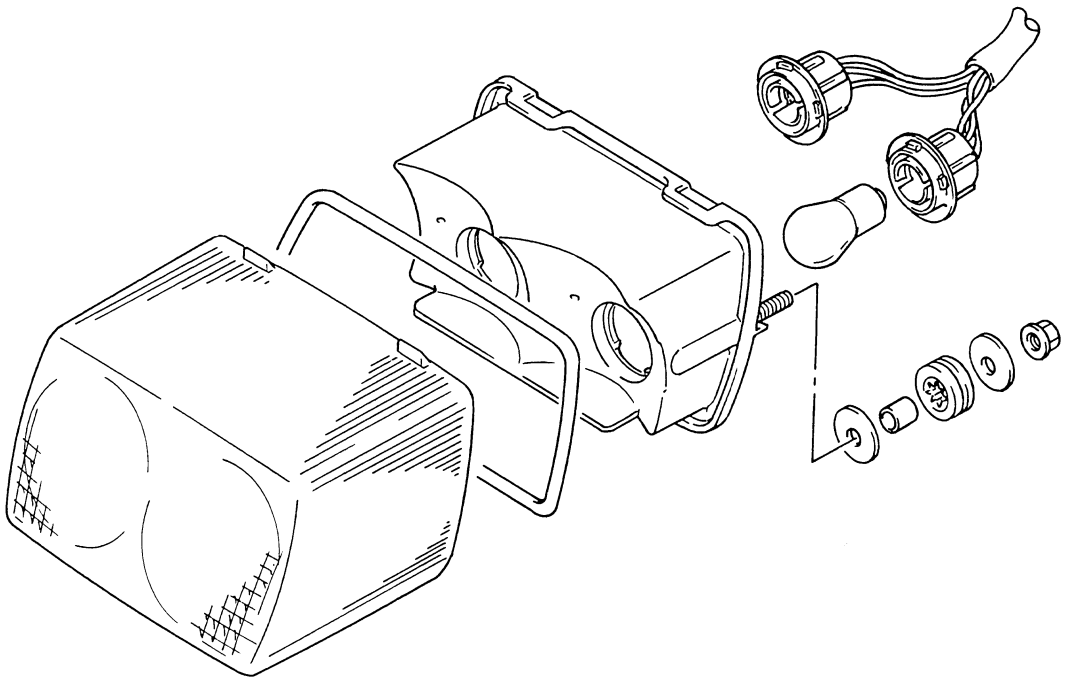
# LAMPS

## HEADLIGHT



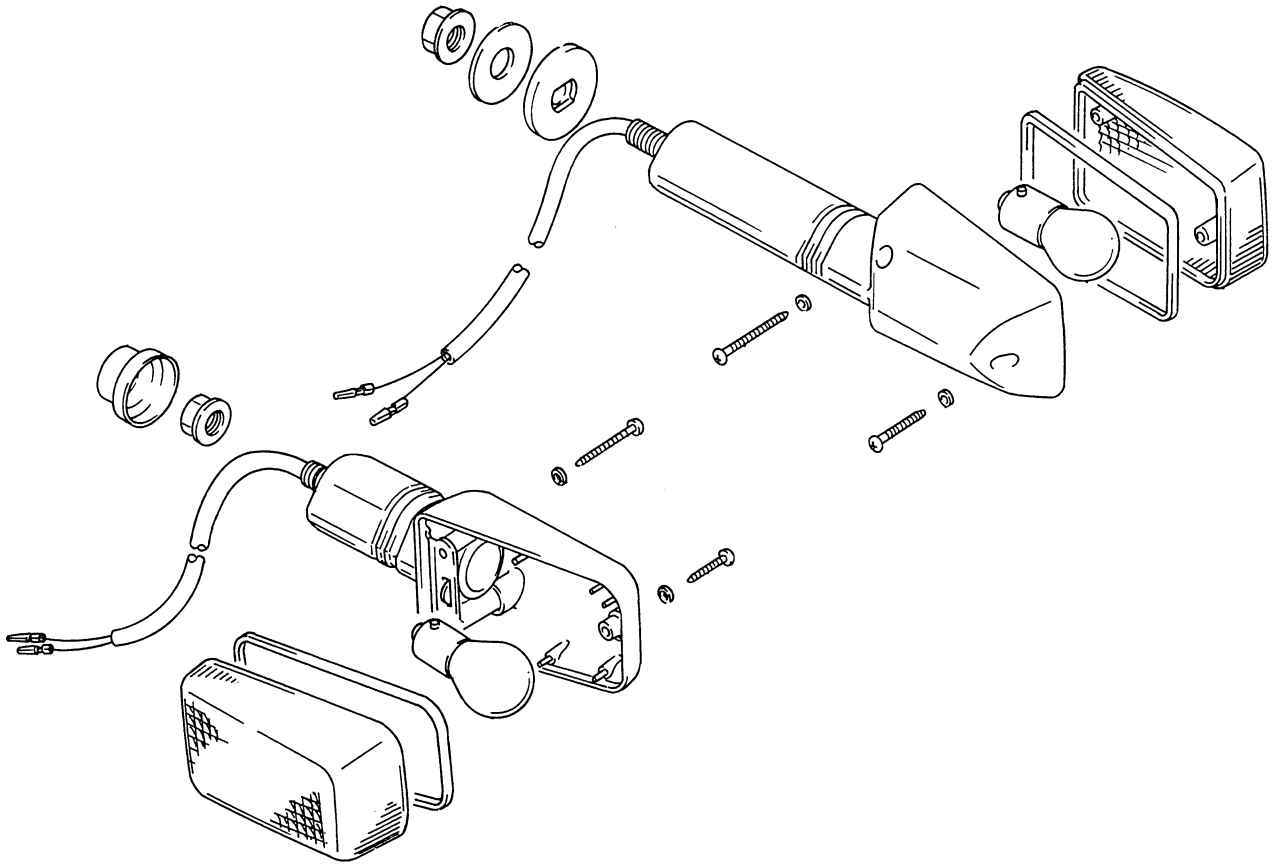
*NOTE:*
*Adjust the headilight, both vertical and horizontal, after reassembling.*

## TAIL/BRAKE LIGHT



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## TURN SIGNAL LIGHT



**CAUTION: Do not overtighten the lens fitting screws.**

# SWITCHES

Inspect each switch for continuity with the pocket tester referring to the wiring diagram. If any abnormality is found, replace the respective switch assemblies with new ones. (Refer to the chapter 7 of wiring diagram.)

**09900-25002 : Pocket tester**

**Tester knob indication : × 1Ω range**

## OIL PRESSURE SWITCH

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

| | G/Y | Ground |
|---|---|---|
| ON | ○——— | ———○ |
| OFF | | |

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

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# RELAY

## STARTER RELAY

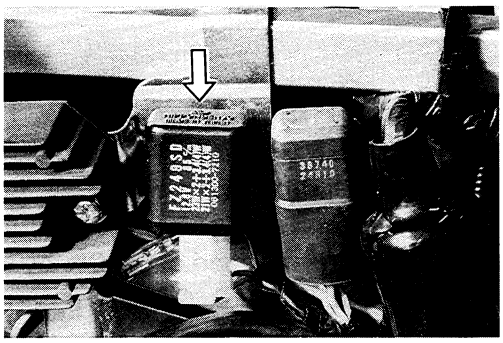
The starter relay is located on the battery holder of right side.
(Refer to page 5-13 for details.)

## SIDE-STAND RELAY

The side-stand relay is located behind the right frame cover.
(Refer to page 5-15 for details.)

## TURN SIGNAL RELAY

The turn signal relay is located behind the right frame cover.
If the turn signal light does not light, inspect the bulb or repair the circuit connection.
If the bulb and circuit connection checked are correct, the turn signal relay may be faulty, replace it with a new one.



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

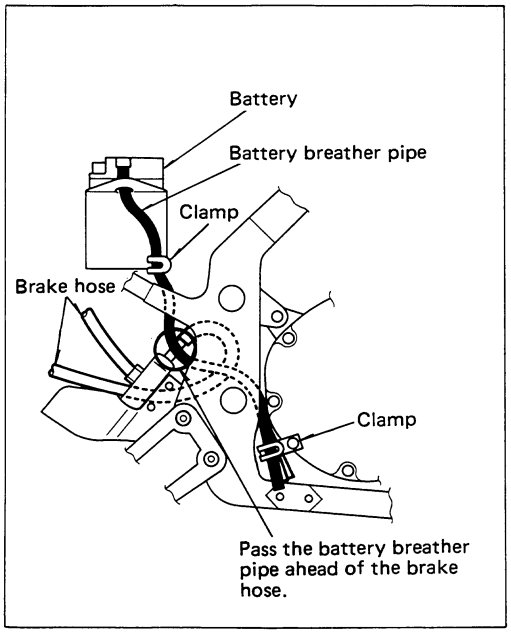
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# BATTERY

## SPECIFICATIONS

| | |
|---|---|
| Type designation | FB10L-B2 |
| Capacity | 12V, 39.6 kC (11 Ah)/10HR |
| Standard electrolyte S.G. | 1.28 at 20°C (68°F) |

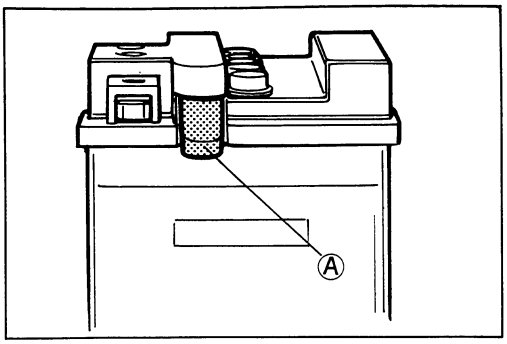
In fitting the battery to the motorcycle, connect the breather hose to the battery vent.




## INITIAL CHARGING

### FILLING ELECTROLYTE

Remove the short sealed tube Ⓐ before filling electrolyte. Fill the battery with electrolyte (dilute sulfuric acid solution with acid concentration of 35.0% by weight, having a specific gravity of 1.28 at 20°C (68°F)) up to indicated MAX. LEVEL. Electrolyte should be always cooled below 30°C (86°F) before filling into battery. Leave battery standing for half an hour after filling. Add additional electrolyte if necessary. Charge battery with current as described in the table shown below.



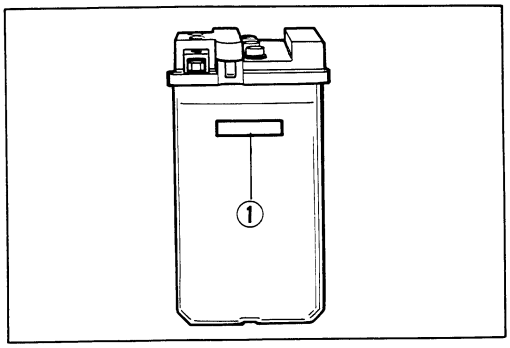

| | |
|---|---|
| Maximum charging current | 1.4A |

### CHARGING TIME

The charging time for a new battery is determined by the number of months that have elapsed since the date of manufacture.

### CONFIRMATION FOR DATE OF MANUFACTURE

Date of manufacture is indicated by a three-part number ①, as shown in the photograph, each indicating month, date and year.



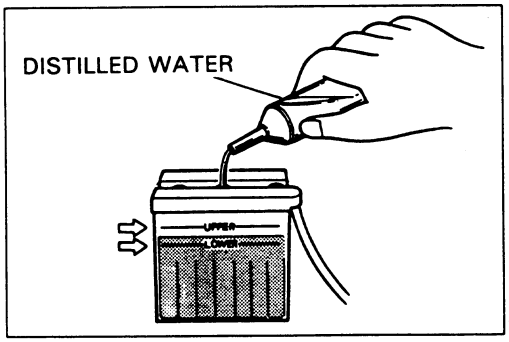

Near the end of charging period, adjust the specific gravity of electrolyte to value specified. After charging, adjust the electrolyte level to the MAX. LEVEL with DISTILLED WATER.

## SERVICING

Visually inspect the surface of the battery container. If any signs of cracking or electrolyte leakage from the sides of the battery have occurred, replace the battery with a new one. If the battery terminals are found to be coated with rust or an acidic white powdery substance, then this can be cleaned away with sandpaper.

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Check the electrolyte level and add distilled water, as necessary to raise the electrolyte to each cell's MAX. level.
Check the battery for proper charge by taking an electrolyte S.G. reading. If the reading is 1.22 or less, as corrected to 20°C (68°F), it means that the battery is still in a run-down condition and needs recharging.



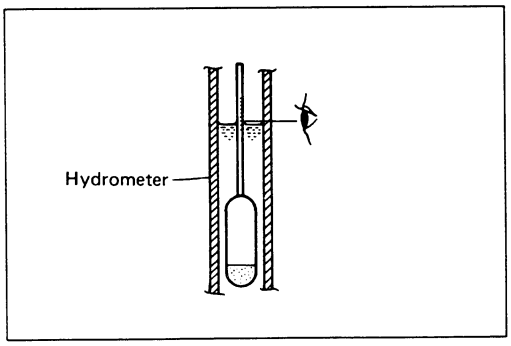

*NOTE:*
*First, remove the ⊖ lead wire.*

| Months after manufacturing | Within 6 | Within 9 | Within 12 | Over 12 |
|---|---|---|---|---|
| Necessary charging hours | 20 | 30 | 40 | 60 |

## RECHARGING OPERATION BASED ON S.G. READING

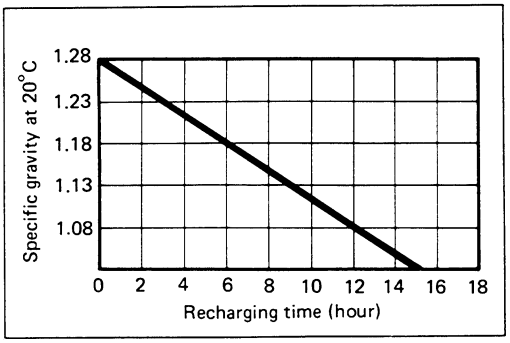
To read the S.G. on the hydrometer, bring the electrolyte in the hydrometer to eye level and read the graduation on the float scale bordering on the meniscus (curved-up portion of electrolyte surface), as shown in figure.

**09900-28403 : Hydrometer**



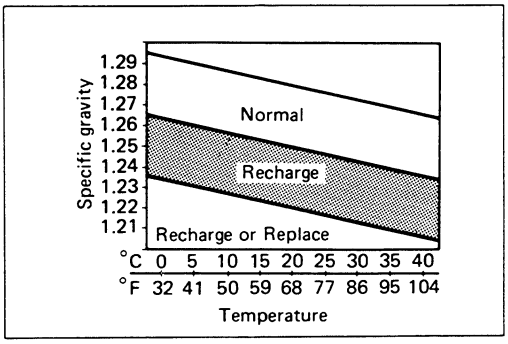

Check the reading (as corrected to 20°C) with chart to determine the recharging time in hour by constant-current charging at a charging rate of 1.4 amperes (which is tenth of the capacity of the present battery).

| Electrolyte specific gravity | 1.28 at 20°C (68°F) |
|---|---|



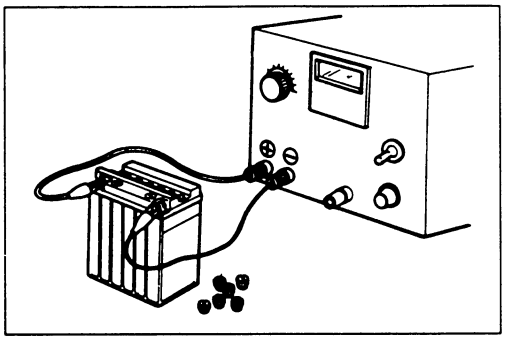

Be careful not to permit the electrolyte temperature to exceed 45°C (113°F), at any time, during the recharging operation. Interrupt the operation, as necessary, to let the electrolyte cool down. Recharge the battery to the specification.

**CAUTION:**
**Constant-voltage charging, otherwise called "quick" charging, is not recommendable for it could shorten the life of the battery.**




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## SERVICE LIFE



Lead oxide is applied to the pole plates of the battery which will come off gradually during the service. When the bottom of the battery case becomes full of the sediment, the battery cannot be used any more. If the battery is not charged for a long time, lead sulfate is generated on the surface of the pole plates and will deteriorate the performance (sulfation). Replace the battery with new one in such a case.
When a battery is left for a long term without using, it is apt to subject to sulfation. When the motorcycle is not used for more than 1 month (especially during the winter season), recharge the battery once a month at least.

**WARNING:**

* **Before charging a battery, remove the seal cap from each cell.**
* **Keep fire and sparks away from a battery being charged.**
* **When removing a battery from the motorcycle, be sure to remove the ⊖ terminal first.**

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# CHASSIS

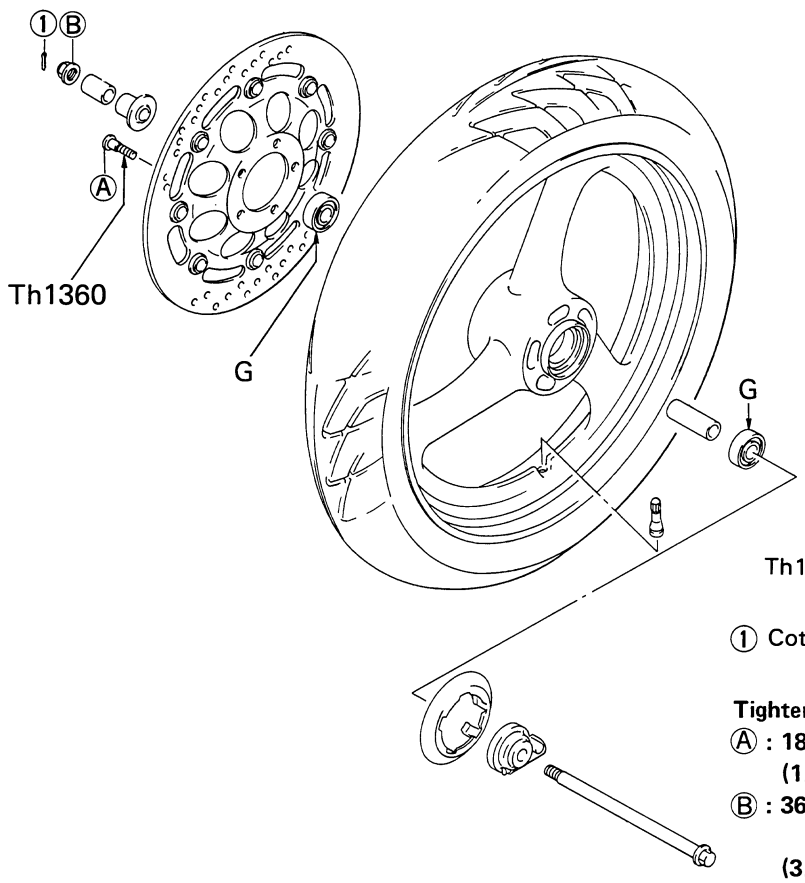
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# FRONT WHEEL




Th1360 : Apply THREAD LOCK "1360"
G : Apply SUPER GREASE "A"
① Cotter pin (For E-03, 28 and 33 models)

**Tightening torque**
**Ⓐ : 18 – 28 N·m**
**(1.8 – 2.8 kg-m, 13.0 – 20.0 lb-ft)**
**Ⓑ : 36 – 52 N·m ... Normal nut with cotter pin**
**(3.6 – 5.2 kg-m, 26.0 – 37.5 lb-ft)**

**40 – 58 N·m ... Self-lock nut**
**(4.0 – 5.8 kg-m, 29.0 – 42.0 lb-ft)**

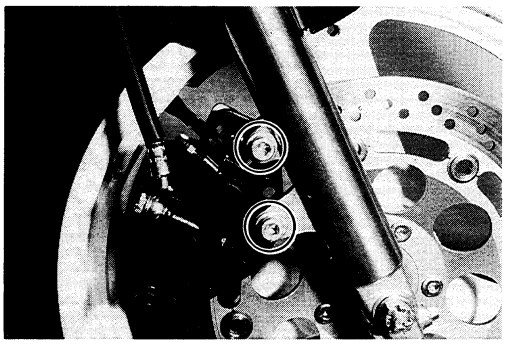
## REMOVAL

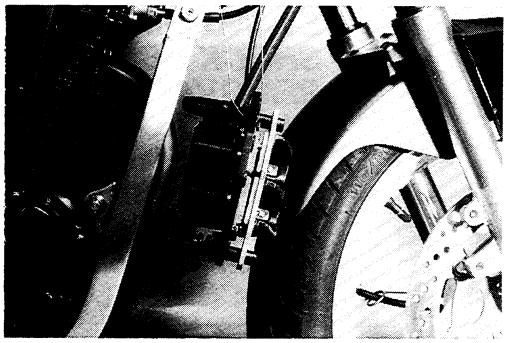
- Support the motorcycle by center stand and jack.
- Remove the brake caliper by removing the mounting bolts.

**09900-00410 : Hexagon wrench set**
**(Not available in U.S.A)**

*NOTE:*
*Do not operate the brake lever while dismounting the brake caliper.*

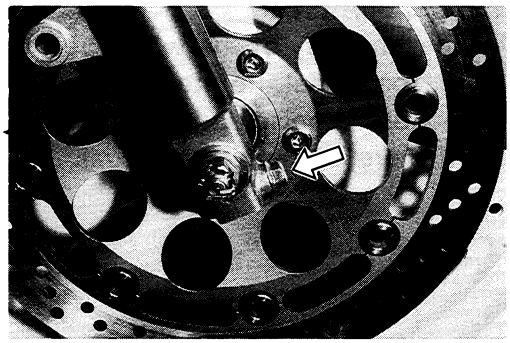
**CAUTION:**
**Hang the brake caliper from the motorcycle frame by using the string, etc., taking care not to bend the brake hose.**



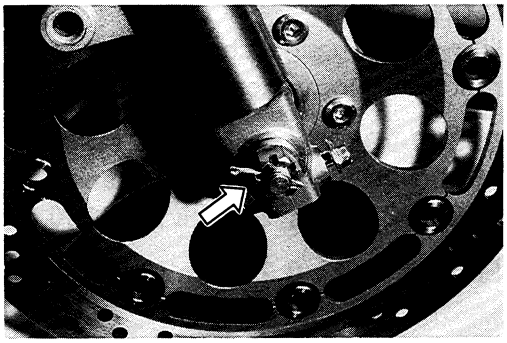


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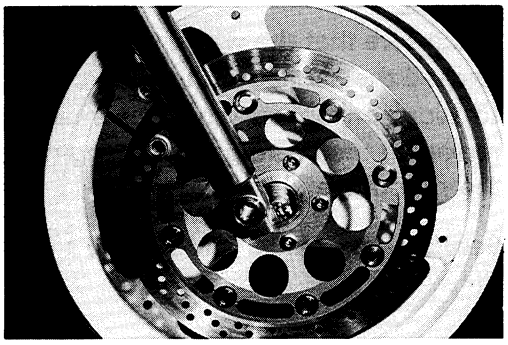
- Loosen the pinch bolt.



- Remove the cotter pin. (For E-03, 28 and 33 models)
- Remove the axle nut.
  E-03: U.S.A.
  E-28: Canada
  E-33: California (U.S.A.)

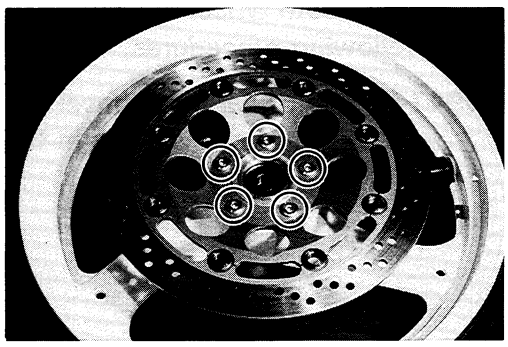


- Draw out the axle shaft and take off the front wheel.



- Remove the brake disc off the front wheel by removing the mounting bolts.

**09900-00410 : Hexagon wrench set**
**(Not available in U.S.A)**



## INSPECTION AND DISASSEMBLY

### SPEEDOMETER GEAR BOX DUST SEAL

Inspect the lip of dust seal for damage.



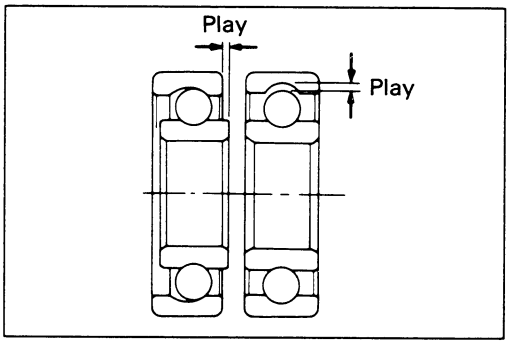
### TIRE

**Refer to page 6-36.**

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## WHEEL BEARINGS

Inspect the play of the wheel bearings by hand while they are in the wheel. Rotate the inner race by hand to inspect for abnormal noise and smooth rotation. Replace the bearing if there is anything unusual.

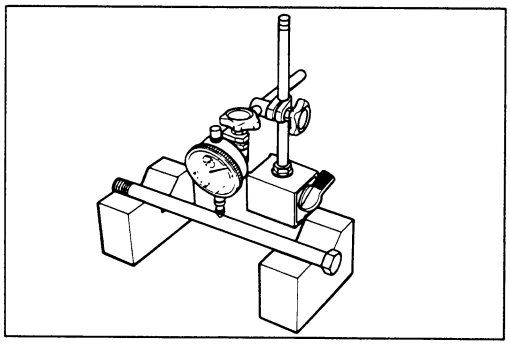



## AXLE SHAFT

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

**09900-20606 : Dial gauge (1/100)**
**09900-20701 : Magnetic stand** } **Not available**
**09900-21304 : V-block set (100 mm)** } **in U.S.A**

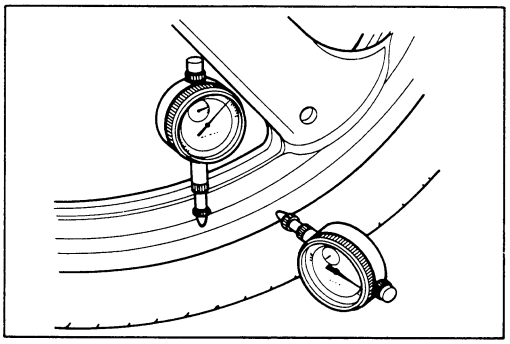
**Service limit : 0.25 mm (0.010 in)**



## WHEEL

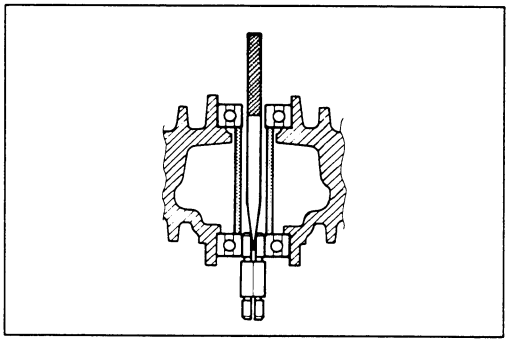
Make sure that the wheel runout checked as shown does not exceed the service limit. An excessive runout is usually due to worn or loosen wheel bearings and can be reduced by replacing the bearings. If bearing replacement fails to reduce the runout, replace the wheel.

**Service limit (Axial and Radial) : 2.0 (0.08 in)**



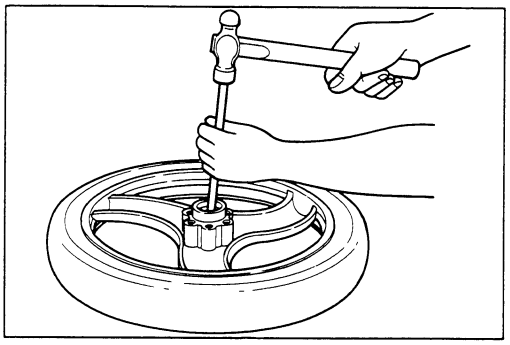
- Drive out both wheel bearings by using the special tool in the following procedures.

**09941-50110 : Bearing remover**
**(Not available in U.S.A)**



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

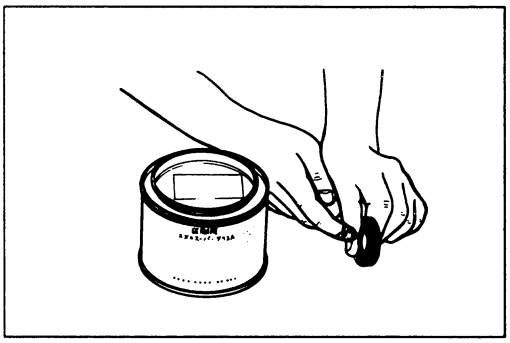
**CAUTION:**
**The removed bearings should be replaced with new ones.**



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## REASSEMBLY AND REMOUNTING

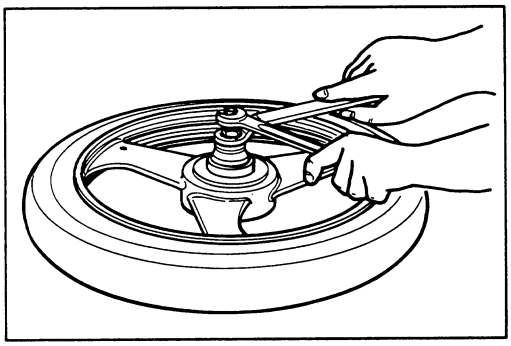
Reassemble and remount the front wheel in the reverse order of removal and disassembly. Pay attention to the following points:



### WHEEL BEARING

- Apply grease to the bearing before installing.

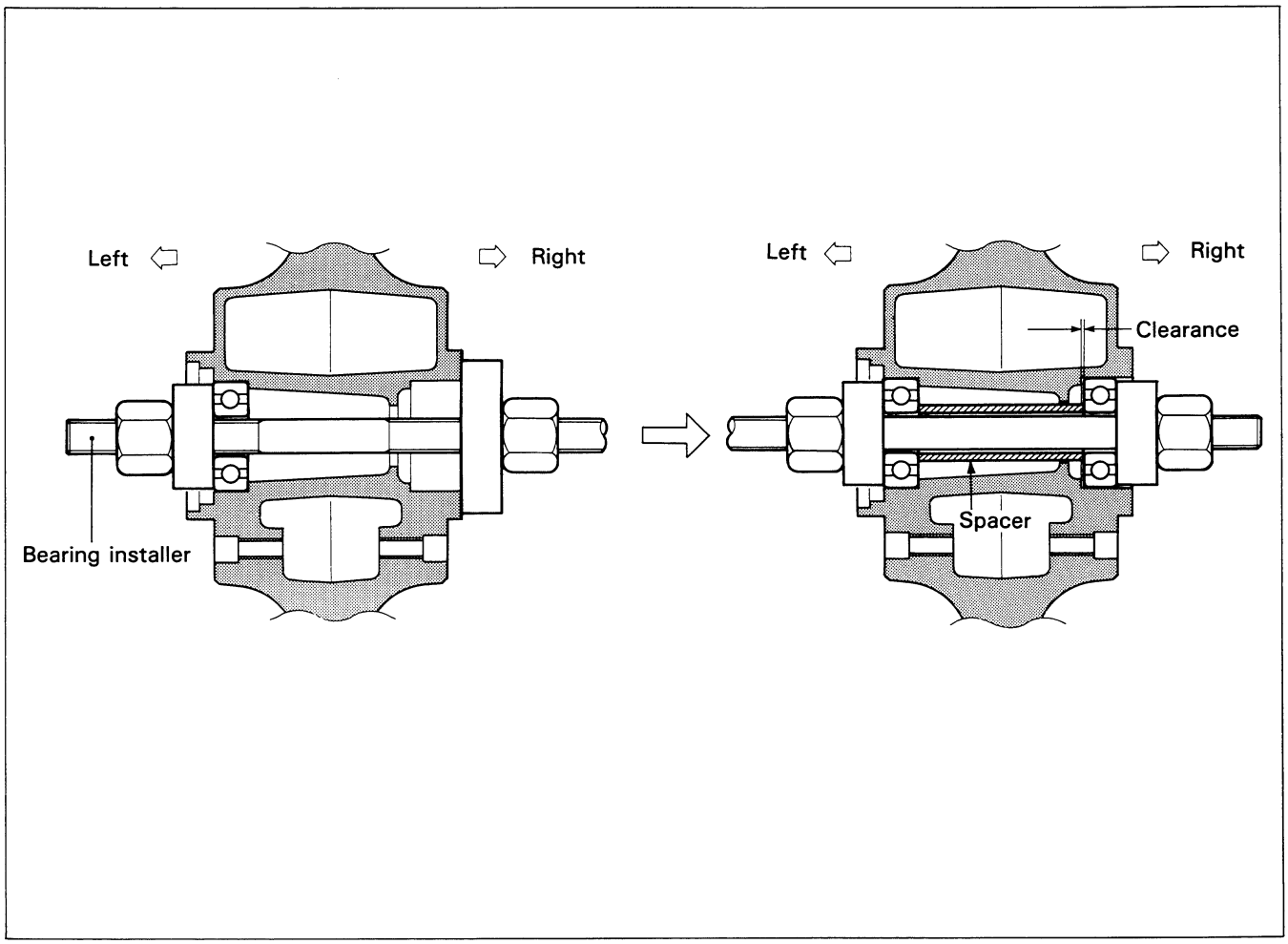
**(For U.S.A. model)**
**99000-25030 : SUZUKI SUPER GREASE "A"**
**(For the other models)**
**99000-25010 : SUZUKI SUPER GREASE "A"**



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

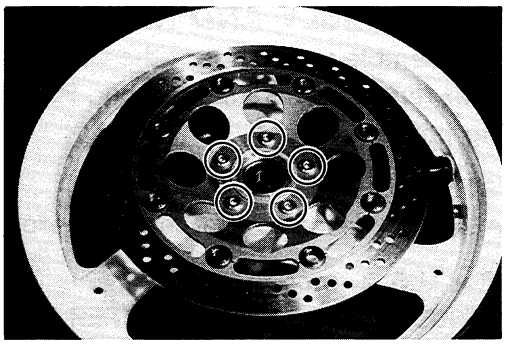
**09924-84510 : Bearing installer set**

*NOTE:*
*First install the left wheel bearing, then install the right wheel bearing. The sealed cover on the bearing is positioned out side.*




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## BRAKE DISC

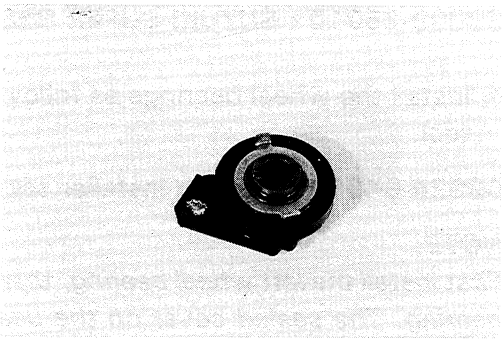


- Make sure that the brake disc is clean and free of any greasy matter. Apply THREAD LOCK "1360" to the disc mounting bolts and tighten them to the specified torque.

**Tightening torque : 18 – 28 N·m**
**(1.8 – 2.8 kg-m, 13.0 – 20.0 lb-ft)**

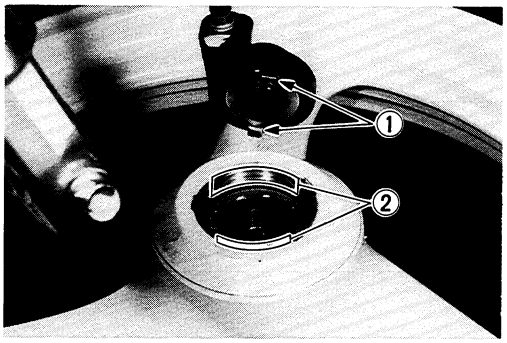
**99000-32130 : THREAD LOCK "1360"**

## SPEEDOMETER GEARBOX

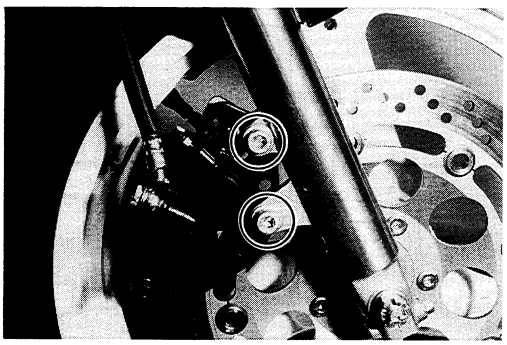


- Before installing the speedometer gearbox, apply grease to its dust seal lip and align the two drive lugs ① to the two recesses ② of the wheel hub and attach the speedometer gearbox to the wheel hub. When tightening the front axle, check to be sure that the speedometer gearbox is in the position so that the speedometer cable does not bend sharply.

**(For U.S.A. model)**
**99000-25030 : SUZUKI SUPER GREASE "A"**
**(For the other models)**
**99000-25010 : SUZUKI SUPER GREASE "A"**




## BRAKE CALIPER



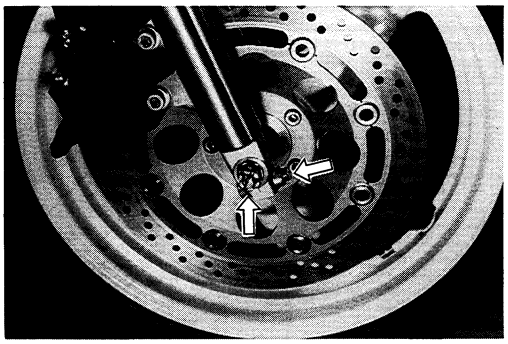
- Tighten the brake caliper mounting bolts to the specified torque.

**Tightening torque : 30 – 48 N·m**
**(3.0 – 4.8 kg-m, 21.5 – 35.0 lb-ft)**

*NOTE:*
*Push the pistons all the way into the caliper and remount the caliper.*

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## AXLE SHAFT



- Tighten the axle nut to the specified torque.

**Tightening torque : 36 – 52 N·m ... Normal nut with cotter pin**
**(3.6 – 5.2 kg-m, 26.0 – 37.5 lb-ft)**

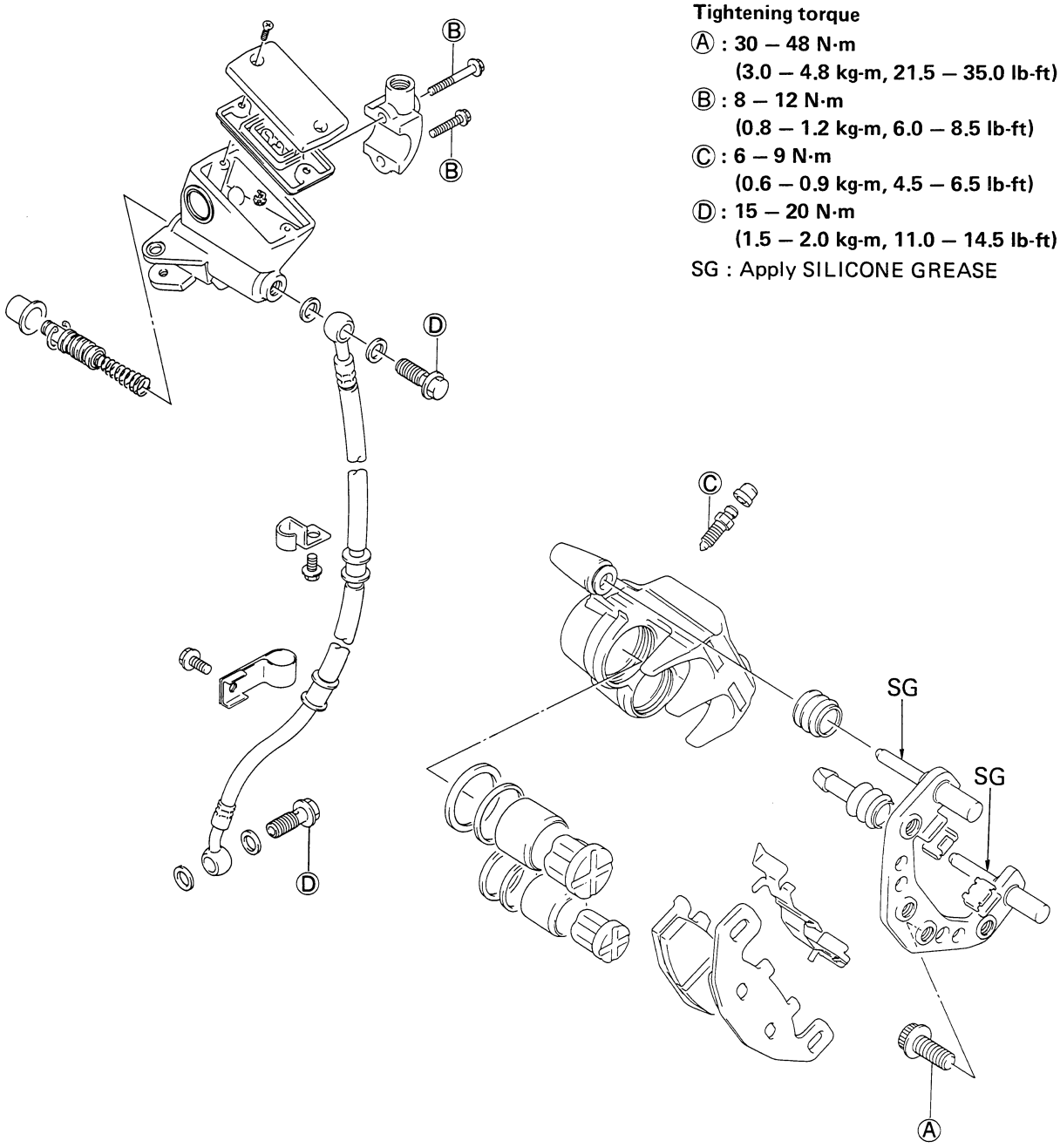
**40 – 58 N·m ... Self-lock nut**
**(4.0 – 5.8 kg-m, 29.0 – 42.0 lb-ft)**

- Tighten the pinch bolt to the specified torque.

**Tightening torque : 18 – 28 N·m**
**(1.8 – 2.8 kg-m, 13.0 – 20.0 lb-ft)**

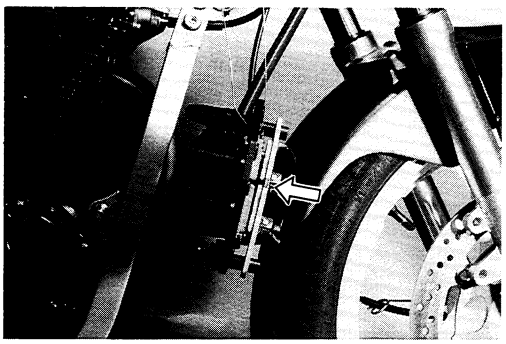
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# FRONT BRAKE




## BRAKE PAD REPLACEMENT

- Remove the brake caliper by removing the mounting bolts.
- Remove the pads.



**CAUTION:**

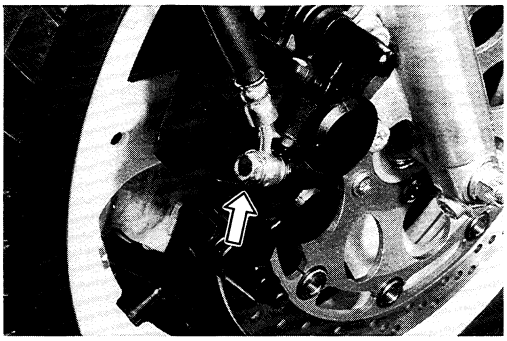
*** Do not operate the brake lever while dismounting the pads.**

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

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## CALIPER REMOVAL AND DISASSEMBLY

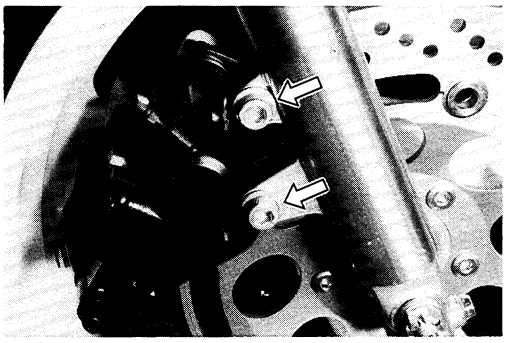
- Disconnect the brake hose by removing the union bolt and catch the brake fluid in a suitable receptacle.



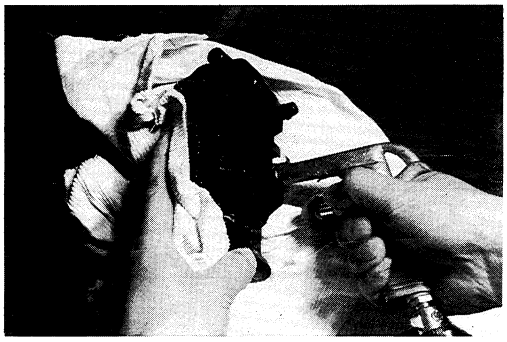
**CAUTION:**
**Never re-use the brake fluid left over from the servicing and stored for long periods.**

**WARNING:**
**Brake fluid, if it leaks, will interfere with safe running and discolor painted surfaces. Check the brake hose and hose joint for cracks and oil leakage.**

- Remove the caliper mounting bolts and take off the caliper.
- Remove the pads.

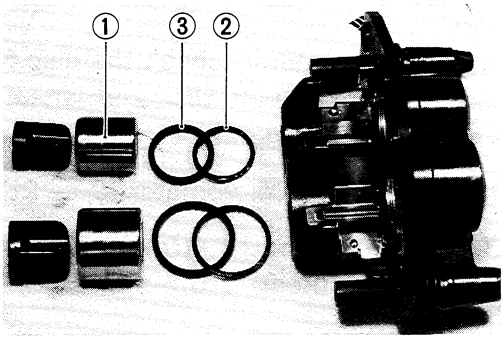


- Place a rag over the pistons to prevent them from popping out and push out the pistons by using the air gun.



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

- Remove the piston ①, dust seal ② and piston seal ③ out of the caliper.

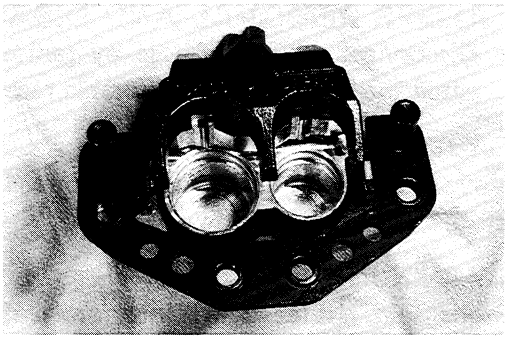



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## CALIPER AND DISC INSPECTION

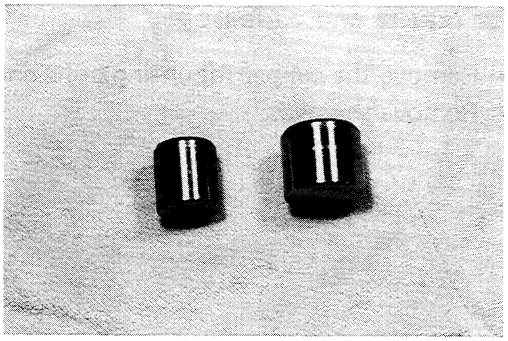
### CALIPER

Inspect the caliper bore wall for nicks, scratches or other damage.



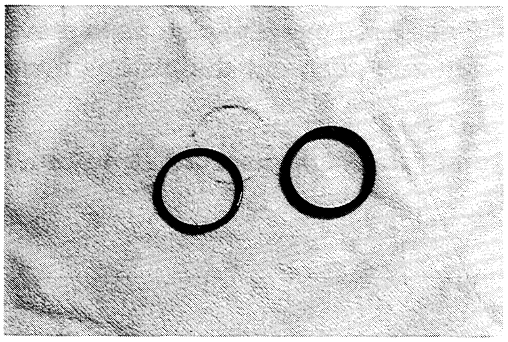
### PISTON

Inspect the piston surface for any scratches or other damage.



### RUBBER PARTS

Inspect each rubber part for damage and wear.

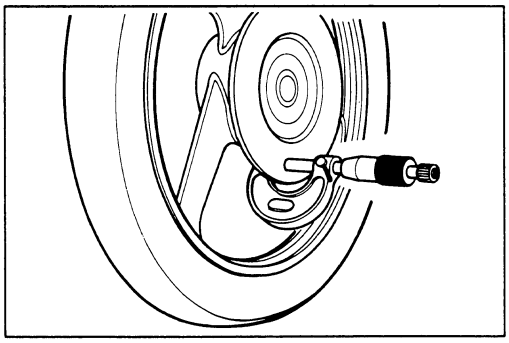


### DISC

Using a micrometer, check the disc for wear, its thickness can be checked with disc and wheel in place. The service limits for the thickness of the discs are shown below.

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

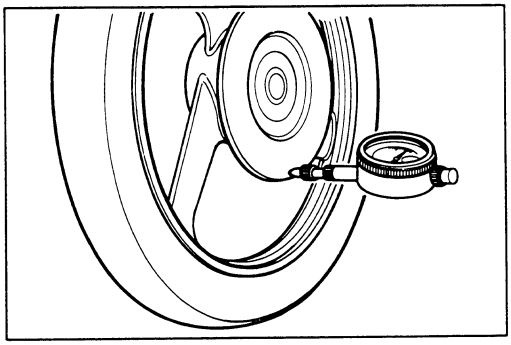
**Service limit (Front) : 4.0 mm (0.15 in)**
**(Rear) : 5.5 mm (0.22 in)**



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

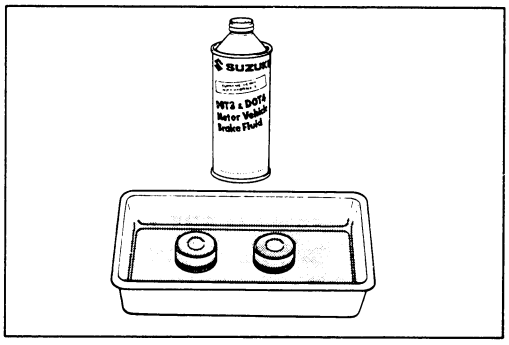
**09900-20606 : Dial gauge (1/100 mm)**
**09900-20701 : Magnetic stand (Not available in U.S.A.)**

**Service limit : 0.30 mm (0.012 in)**



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## CALIPER REASSEMBLY AND REMOUNTING




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

**CAUTION:**

* **Wash the caliper components with fresh brake fluid before reassembly.**
* **Never use cleaning solvent or gasoline to wash them.**
* **Apply brake fluid to the caliper bore and piston to be inserted into the bore.**

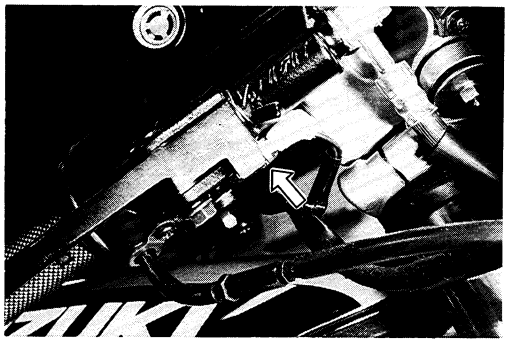
**CALIPER BOLTS**

Tighten the bolts to the specified torque.
(Refer to page 6-7.)

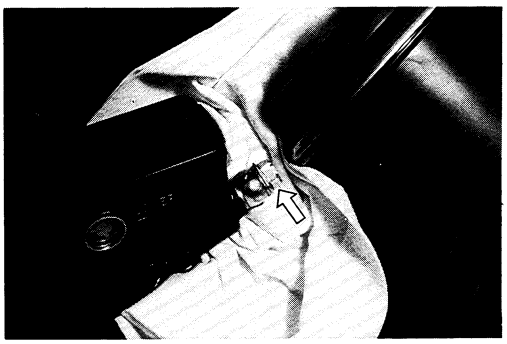
**CAUTION:**

**Bleed air after reassembling the caliper. (Refer to page 2-16.)**

## MASTER CYLINDER REMOVAL AND DISASSEMBLY



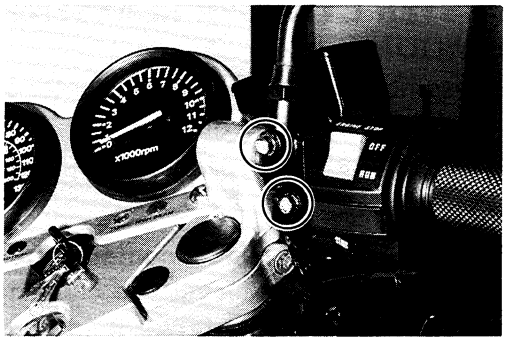
- Remove the front brake light switch.



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

**CAUTION:**

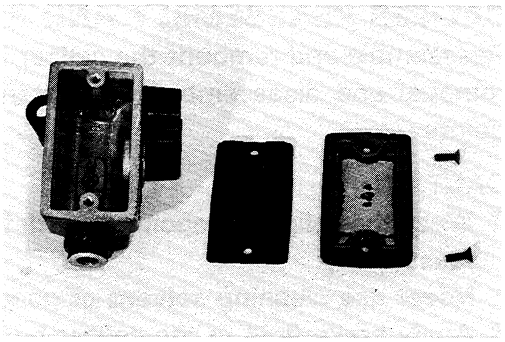
**Completely wipe off any brake fluid adhering to any parts of motorcycle. The fluid reacts chemically with paint, plastics, rubber materials, etc.**




- Remove the master cylinder assembly.

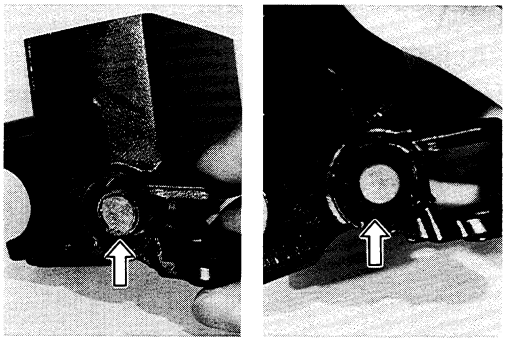
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- Remove the front brake lever, reservoir cap and diaphragm.
- Drain brake fluid.

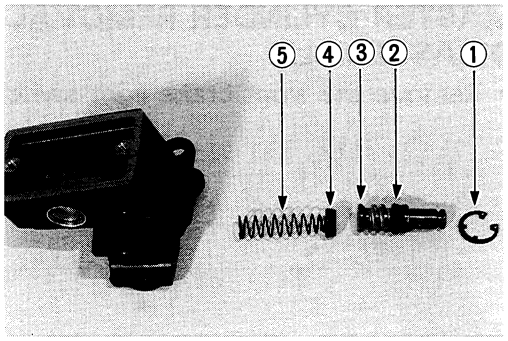


- Remove the dust seal, then remove the circlip by using the special tool.

**09900-06108 : Snap ring pliers**

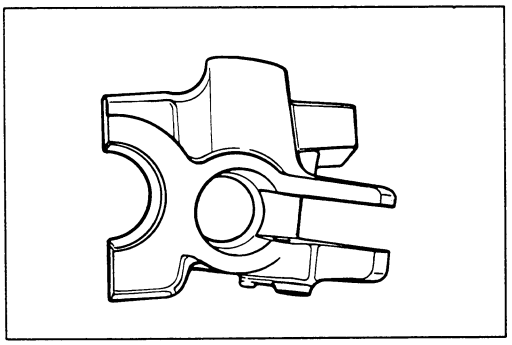


- Remove the piston/secondary cup, primary cup and spring.
  ① Circlip
  ② Secondary cup
  ③ Piston
  ④ Primary cup
  ⑤ Return spring




## MASTER CYLINDER INSPECTION

Inspect the master cylinder bore for any scratches or other damage.
Inspect the piston surface for any scratches or other damage.
Inspect the primary cup, secondary cup and dust seal for wear or damage.

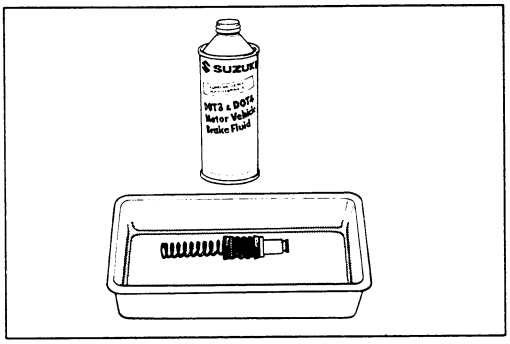


## MASTER CYLINDER REASSEMBLY AND REMOUNTING

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

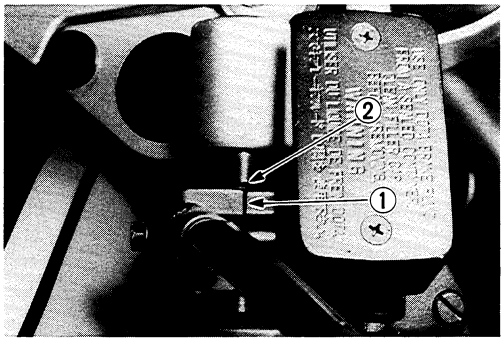
**CAUTION:**

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



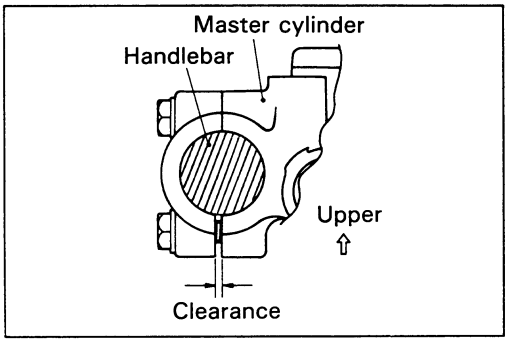

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- When remounting the master cylinder on the handebar, align the master cylinder holder mating surface ① with punched mark ② on the handlebar, and first tighten the upper clamp bolt as shown.



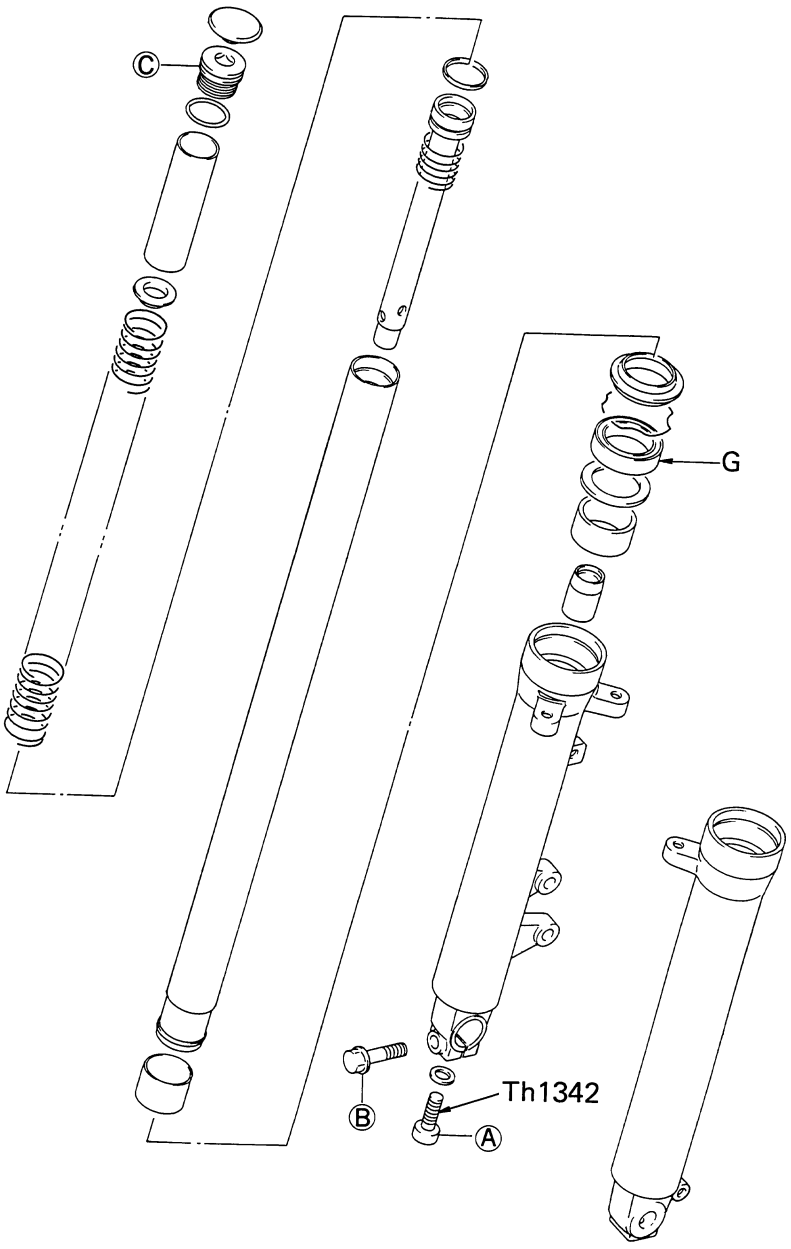

**Tightening torque : 8.0 – 12.0 N·m**
**(0.8 – 1.2 kg-m, 6.0 – 8.5 lb-ft)**

**CAUTION:**
**Bleed air after reassembling master cylinder. (Refer to page 2-16.)**
**Adjust the front brake light switch after installation.**




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# FRONT FORK



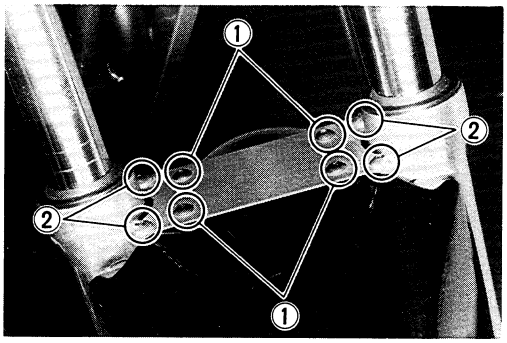

**Tightening torque**
Ⓐ : 15 – 25 N·m
(1.5 – 2.5 kg-m,
11.0 – 18.0 lb-ft)
Ⓑ : 18 – 28 N·m
(1.8 – 2.8 kg-m,
13.0 – 20.0 lb-ft)
Ⓒ : 15 – 30 N·m
(1.5 – 3.0 kg-m,
11.0 – 21.5 lb-ft)

G : Apply SUPER GREASE "A"
Th1342 : Apply THREAD LOCK "1342"

## REMOVAL

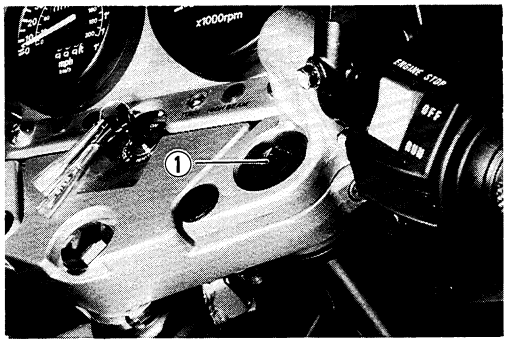
- Remove the front wheel. (Refer to page 6-1.)
- Remove the front fender by removing four screws ①.
- Remove the front fender brace by removing four screws ②.

**09900-00401 : L-type hexagon wrench**

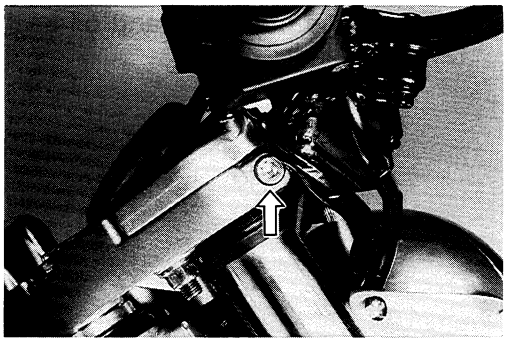



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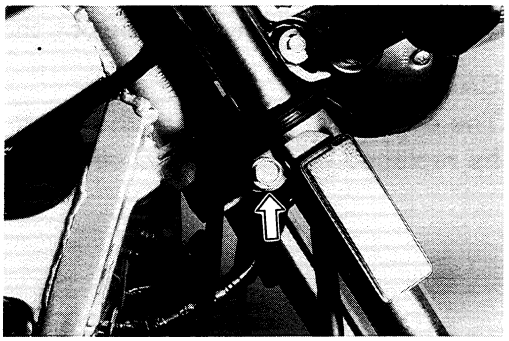
*NOTE:*
*Slightly loosen the front fork cap bolt ① to facilitate later disassembly before loosening the front fork clamp bolt.*




- Loosen the front fork upper clamp bolt.

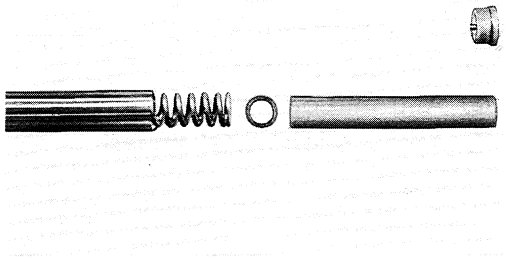


- Loosen the front fork lower clamp bolt and pull down the front fork.

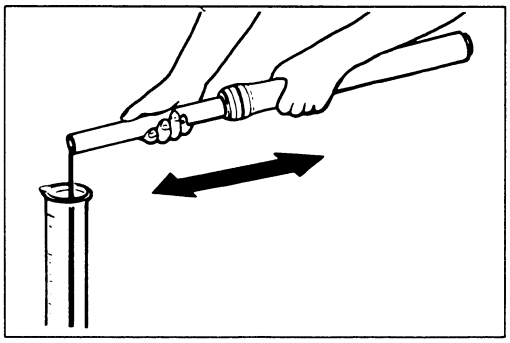


## DISASSEMBLY

- Remove the front fork cap bolt.
- Remove the spacer, spring seat and spring out of the inner tube.

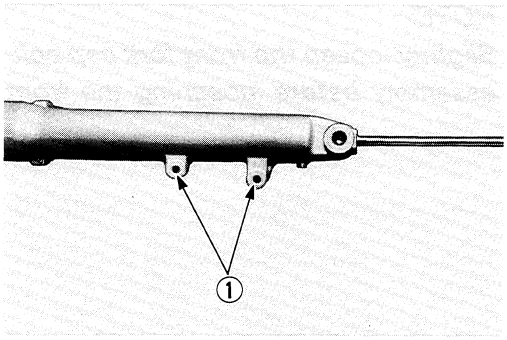


- Invert the fork and stroke it several times to let out fork oil.
- Hold the fork inverted for a few-minutes to drain oil.

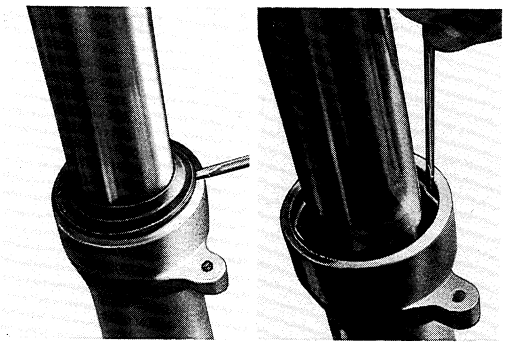


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- While holding the caliper mounting portion ① by vise and remove the damper rod bolt.

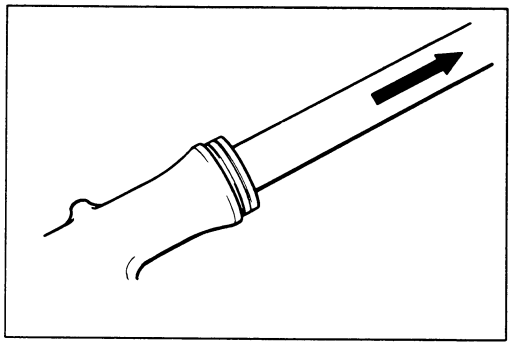



- Remove the dust seal and oil seal stopper ring.

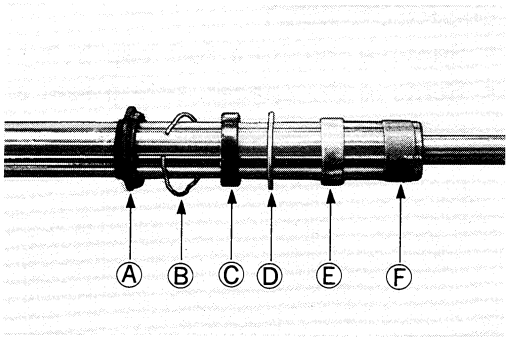


- Separate the inner tube out of the outer tube.

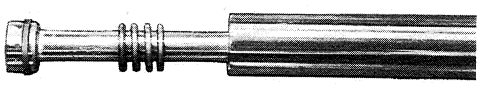
**CAUTION:**
**The outer tube and inner tube "anti-friction " metals must be replaced along with the oil seal and dust seal.**



Ⓐ Dust seal
Ⓑ Oil seal stopper ring
Ⓒ Oil seal
Ⓓ Oil seal retainer
Ⓔ Anti-friction metal (Outer)
Ⓕ Anti-friction metal (Inner)




- Remove the damper rod and rebound spring out of the inner tube.

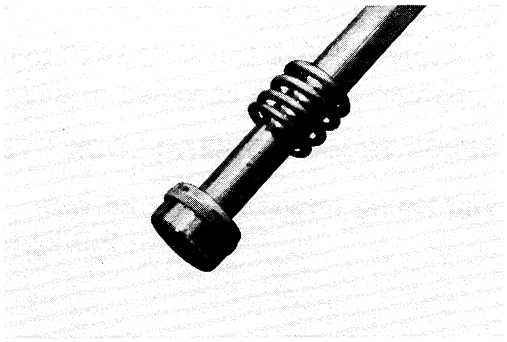


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## INSPECTION

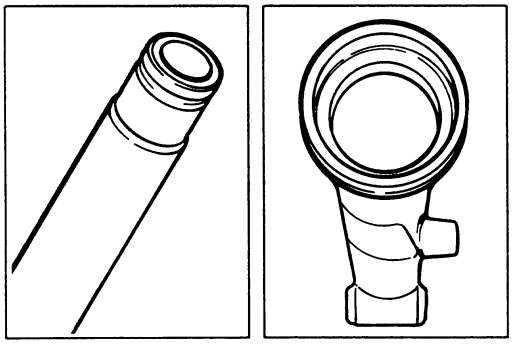
### DAMPER ROD RING

Inspect the damper rod ring for wear or damage.



### INNER AND OUTER TUBE

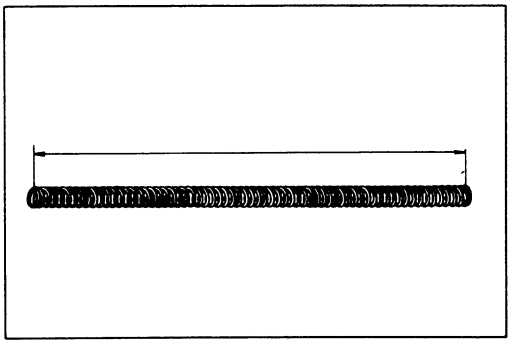
Inspect the inner tube sliding surface and outer tube sliding surface for any scuffing.



### FORK SPRING

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

**Service limit : 254 mm (10.0 in)**

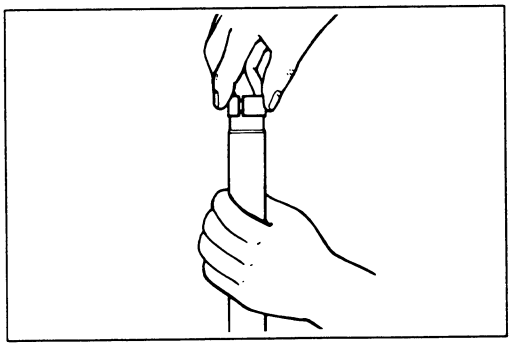


## REASSEMBLY AND REMOUNTING

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

### INNER TUBE METAL

- Hold the inner tube vertically and clean the metal groove and install the metal by hand as shown.



**CAUTION:**

**Use special care to prevent damage to the ''Teflon'' coated surface of the Anti-friction metal when mounting it.**

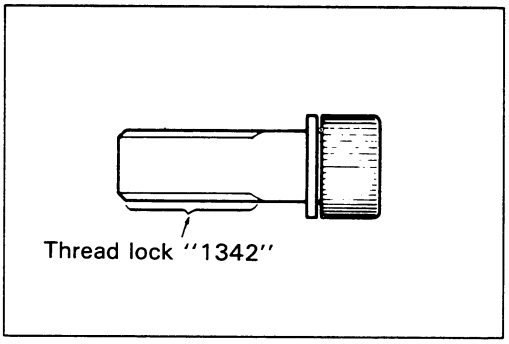
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**DAMPER ROD BOLT**

- Apply THREAD LOCK "1342" to the damper rod bolt and tighten it to the specified torque.

**99000-32050 : THREAD LOCK "1342"**

**Tightening torque : 15 — 25 N·m**
**(1.5 — 2.5 kg-m, 11.0 — 18.0 lb-ft)**

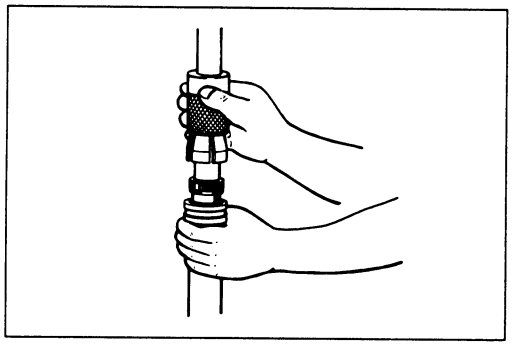



**OUTER TUBE METAL, OIL SEAL AND DUST SEAL**

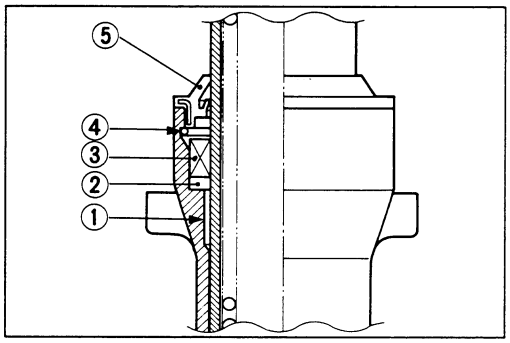
- Clean the metal groove of outer tube and metal outer surface.
- Install the outer tube metal, oil seal retainer and oil seal.

**09940-50112 : Front fork oil seal installer**

**CAUTION:**
**Use special care to prevent damage to the "Teflon" coated surface of the Anti-Friction metal when installing it.**



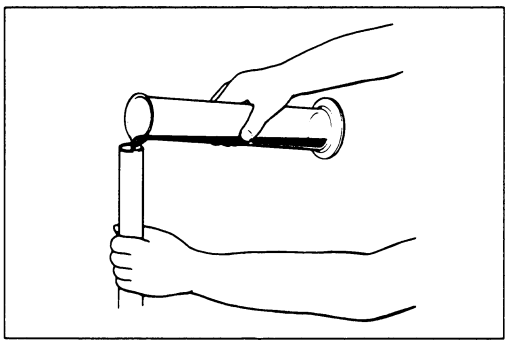
- After installing the oil seal, install the oil stopper ring and dust seal.
  ① Anti-friction metal
  ② Oil seal retainer
  ③ Oil seal
  ④ Oil seal stopper ring
  ⑤ Dust seal




**FORK OIL**

- Use fork oil whose viscosity rating meets specifications below.

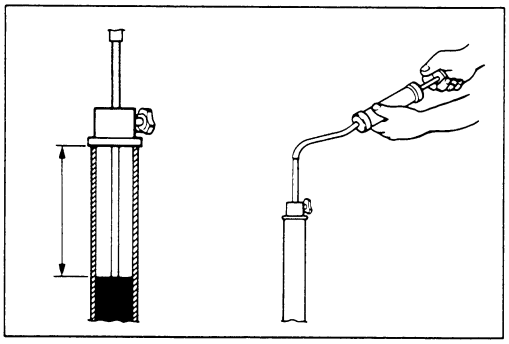
**Fork oil type : Fork oil #10**
**Capacity (each leg) : 382 ml (12.9/13.5 US/Imp oz)**



- Hold the front fork vertically and adjust the fork oil level with the special tool.

*NOTE:*
*When adjusting oil level, remove the fork springs and compress the inner tube fully.*

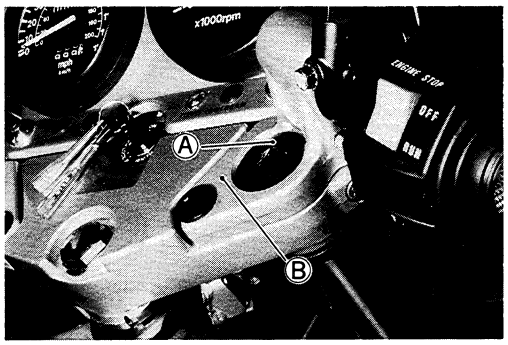
**09943-74111 : Fork oil level gauge**
**Oil level : 99 mm (3.9 in)**



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### INNER TUBE

- When installing the front fork assembly, align the upper surface Ⓐ of inner tube with the upper surface Ⓑ of the handlebar holder.




### CLAMP BOLTS AND NUTS

- Tighten the upper and lower clamp bolts and handlebar mounting bolts and nuts to the specified torque.

**09900-00410 : Hexagon wrench set**

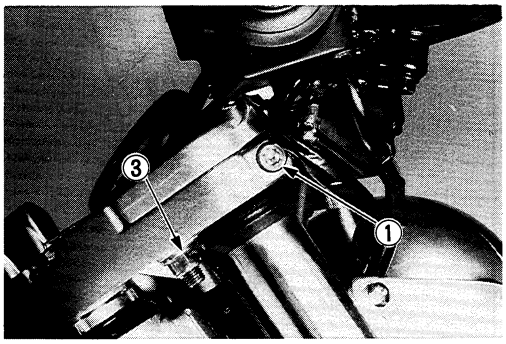
### TIGHTENING TORQUE

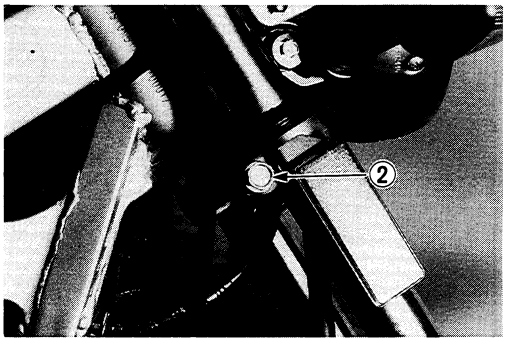
① **(Front fork upper clamp bolt) :**
**18 – 28 N·m (1.8 – 2.8 kg-m, 13.0 – 20.0 lb-ft)**

② **(Front fork lower clamp bolt) :**
**25 – 40 N·m (2.5 – 4.0 kg-m, 18.0 – 29.0 lb-ft)**

③ **(Handlebar holder mounting nut) :**
**27 – 42 N·m (2.7 – 4.2 kg-m, 19.5 – 30.5 lb-ft)**

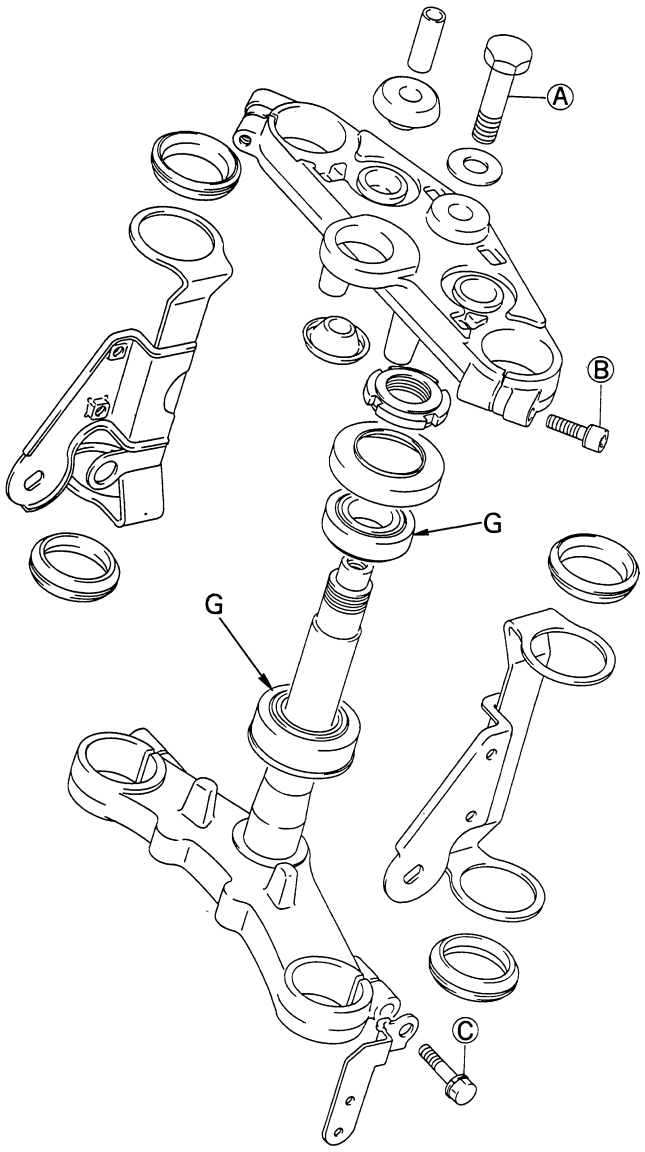
*NOTE:*
*Before tightening the front fender brace mounting screws, move the front fork up and down 4 or 5 times.*




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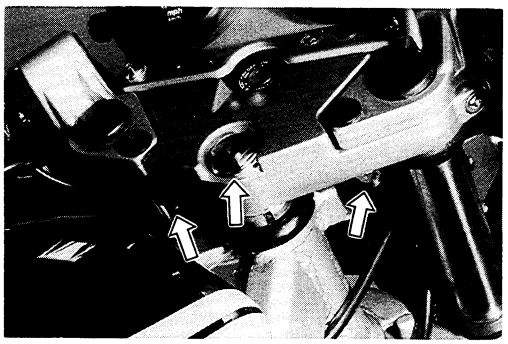
# STEERING




G : Apply SUPER GREASE "A"

**Tightening torque**
Ⓐ : 35 – 55 N·m
(3.5 – 5.5 kg-m, 25.5 – 40.0 lb-ft)
Ⓑ : 18 – 28 N·m
(1.8 – 2.8 kg-m, 13.0 – 20.0 lb-ft)
Ⓒ : 25 – 40 N·m
(2.5 – 4.0 kg-m, 18.0 – 29.0 lb-ft)

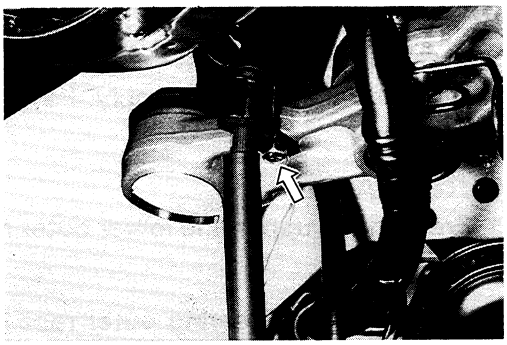
## REMOVAL



- Remove the front wheel. (Refer to page 6-1.)
- Remove the front forks. (Refer to page 6-13.)
- Disconnect the tachometer cable and speedometer cable.
- Remove the headlight and disconnect the lead wires in the headlight housing.
- Remove the tachometer and speedometer.
- Remove the left and right handlebars along with the handlebar holder by removing the handlebar holder mounting bolts and nuts.
- Remove the steering stem head bolt.
- Remove the steering stem head by disconnecting the ignition switch lead wire coupler.

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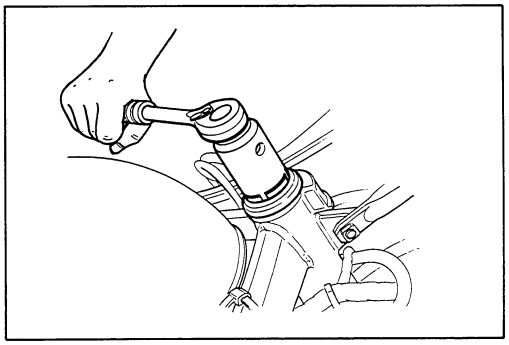
- Remove the brake hose clamp.



- Remove the steering stem nut by using the special tool, then remove the steering stem lower bracket.

**09940-14911 : Steering stem nut wrench**

*NOTE:*
*Hold the steering stem lower bracket by hand to prevent it from falling.*

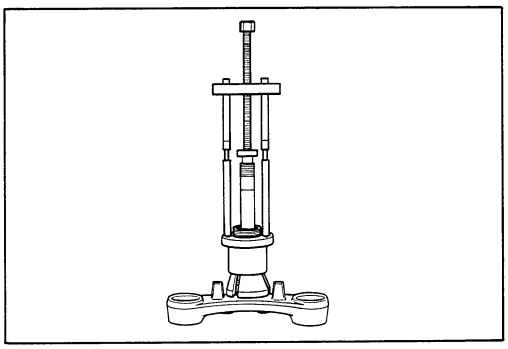


## DISASSEMBLY

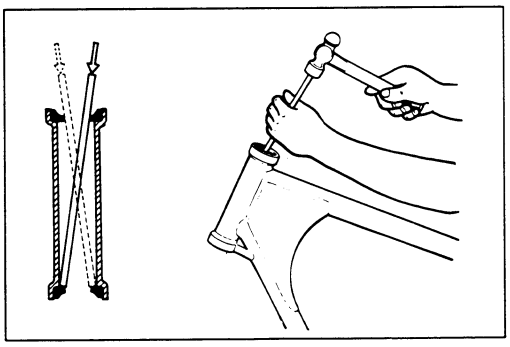
- Draw out the steering stem lower bearing by using the special tools.

**09941-84510 : Bearing remover**

**CAUTION:**
**The removed bearing should be replaced.**



- Drive out the steering stem bearing races, upper and lower, by using the appropriate drift.



## INSPECTION

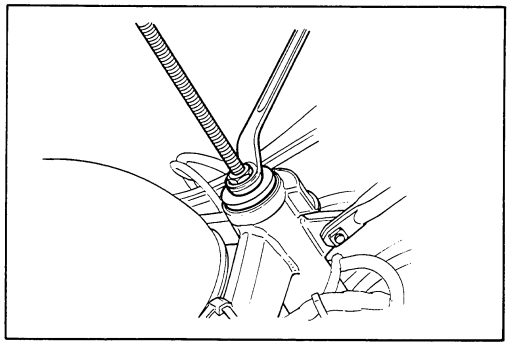
Inspect the removed parts for the following abnormalities.

* Handlebar distortion
* Race wear and brinelling
* Bearing wear or damage
* Abnormal noise of bearing
* Distortion of steering stem

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## REASSEMBLY AND REMOUNTING

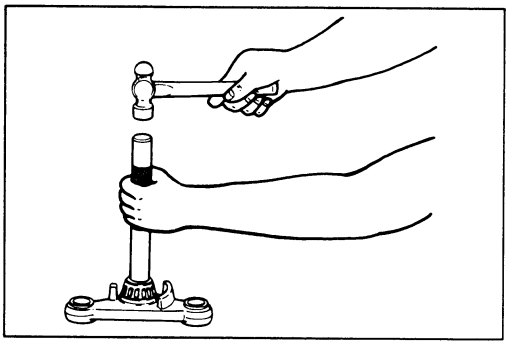
Reassemble and remount the steering stem in the reverse order of removal and disassembly. Pay attention to the following points:



### OUTER RACES

- Press in the upper and lower outer races by using the special tool.

**09941-34513 : Steering outer race installer**

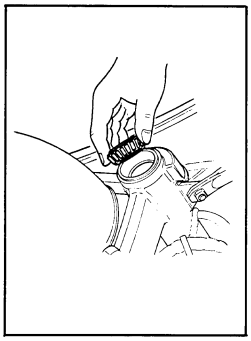


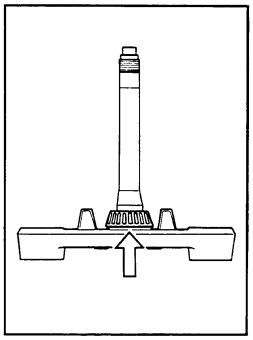
### BEARING

- Place a washer on the bearing and press in the lower bearing by using the special tool.

**09941-74910 : Steering bearing installer**

- Apply grease to the upper and lower bearings before remounting the steering stem.





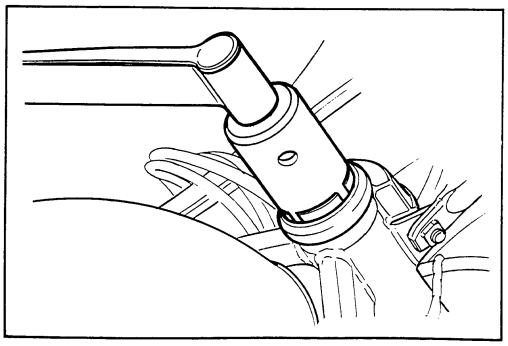
**(For U.S.A. model)**
**99000-25030 : SUZUKI SUPER GREASE "A"**
**(For the other models)**
**99000-25010 : SUZUKI SUPER GREASE "A"**

### STEM NUT

- Tighten the steering stem nut to the specified torque.

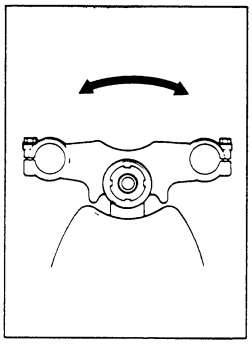
**09940-14911 : Steering stem nut wrench**

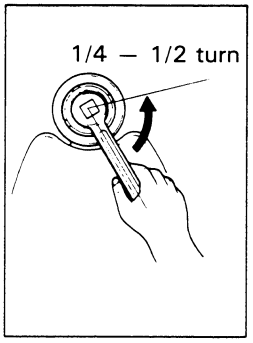
**Tightening torque : 40 — 50 N·m**
**(4.0 — 5.0 kg-m, 29.0 — 36.0 lb-ft)**



- Turn the steering stem lower bracket about five or six times to the left and right so that the taper roller bearing will be seated properly.
- Turn back the stem nut by 1/4 — 1/2 turn.

*NOTE:*
*This adjustment will vary from motorcycle to motorcycle.*



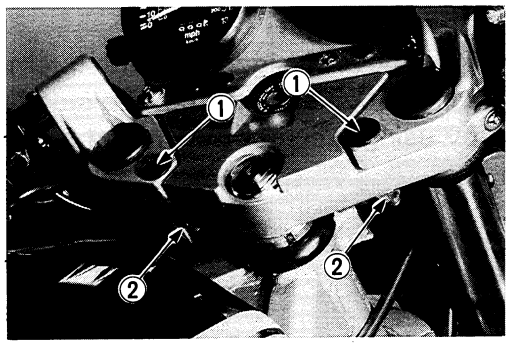



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### HANDLEBAR HOLDER

- Tighten the handlebar holder set bolt and nut to the specified torque.

**Tightening torque**
**Bolt ① and Nut ② : 27 — 42 N·m**
**(2.7 — 4.2 kg-m, 19.5 — 30.5 lb-ft)**

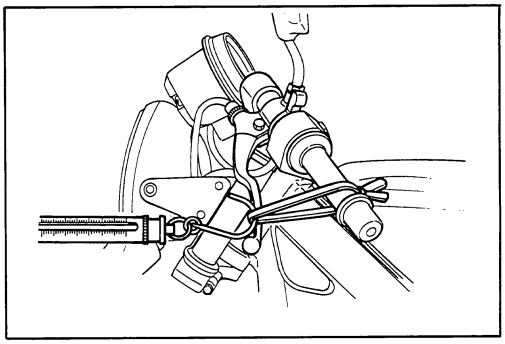


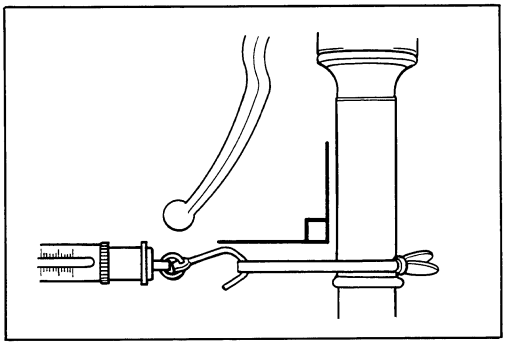

## STEERING TENSION ADJUSTMENT

Check the steering movement in the following procedure.

- By using jacks at two (right and left) positions on the frame down tubes (lower straight portions), lift the front wheel until it is off the floor by 20 to 30 mm.
- Check to make sure that the cables and wire harnesses are properly routed.
- With the front wheel in the straight ahead state, hitch the spring scale (special tool) on one handlebar grip end as shown in the figure and read the graduation when the handlebar starts moving. Do the same on the other grip end.

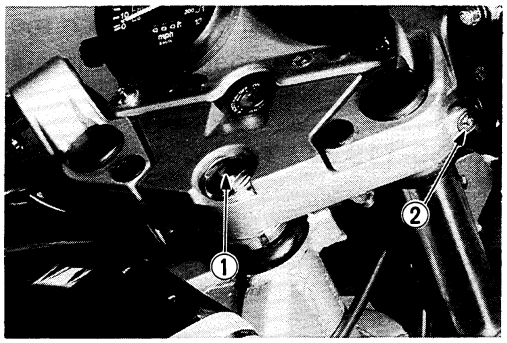
**Initial force : 200 — 500 grams**
**09940-92710 : Spring scale**





- If the initial force read on the scale when the handlebar starts turning is either too heavy or too light, adjust it till it satisfies the specification.
  1) First, loosen the front fork upper clamp bolts and steering stem head bolt, and then adjust the steering stem nut by loosening or tightening it.
  2) Tighten the head bolt and clamp bolts to the specified torque and re-check the initial force with the spring scale according to the previously described procedure.

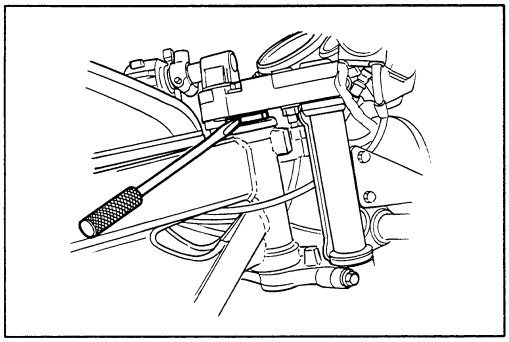
**Tightening torque**
**Stem head bolt ① : 35 — 55 N·m**
**(3.5 — 5.5 kg-m, 25.5 — 40.0 lb-ft)**
**Front fork**
**Upper clamp bolt ② : 18 — 28 N·m**
**(1.8 — 2.8 kg-m, 13.0 — 20.0 lb-ft)**




  3) If the initial force is found within the specified range, adjustment has been completed.

*NOTE:*
*Hold the front fork legs, move them back and forth and make sure that the steering is not loose.*

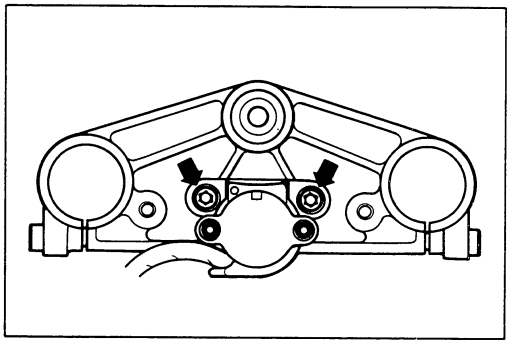
- Lower the jacks.

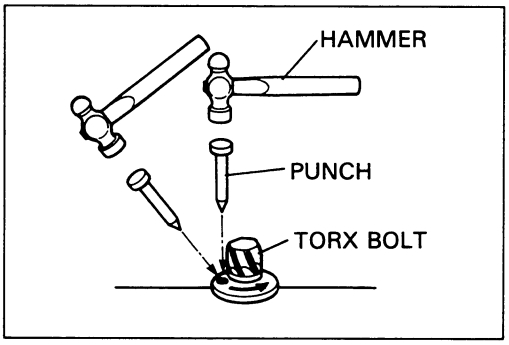


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## IGNITION SWITCH

- To remove the ignition switch, remove the bolt to detach the ignition switch from the steering stem upper bracket by using a center punch and hummer.



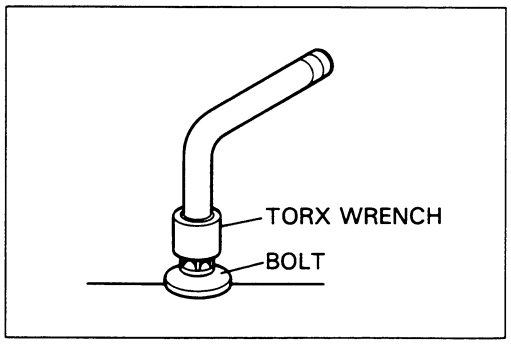



- To install the ignition switch, always use the new special bolt and follow the procedures below.

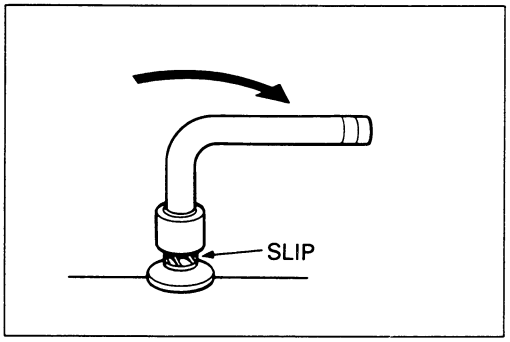
*NOTE:*
*The spare ignition switch comes equipped with the special bolts, however, the bolt is also individually available as spare parts.*

- Using the special bolts, attach the ignition switch on the steering stem upper bracket in place and run in the bolts with the special tool.

**09930-11910 : Torx wrench**

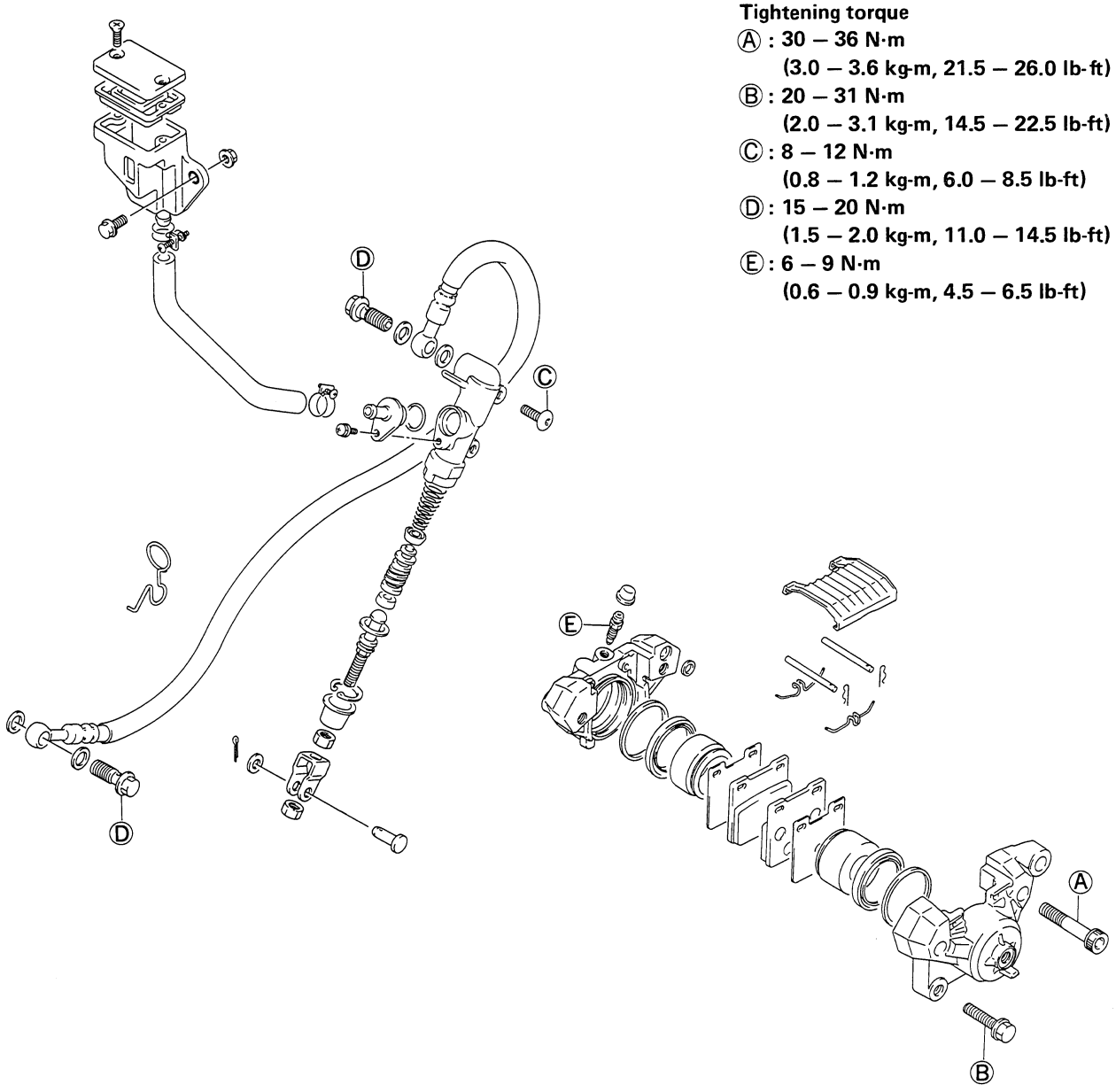



- Continue turning the tool until the tool slips from the bolt head or the bolt head breaks off, then the bolt has become tightened to the proper specification.




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# REAR BRAKE



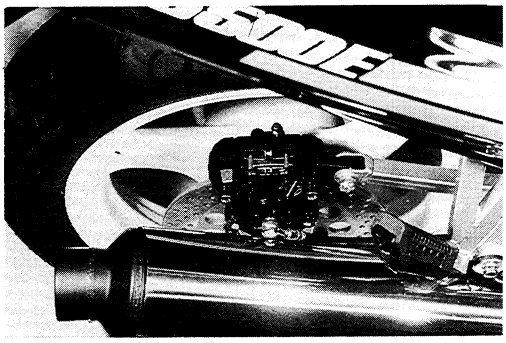

## BRAKE PAD REPLACEMENT

- Remove the dust seal cover.
- Remove the clips, pins and springs.
- Remove the pads.

CAUTION:

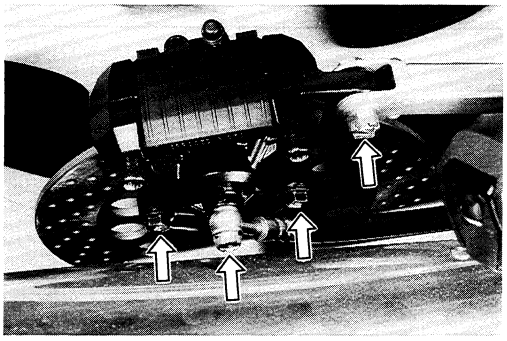
* Do not operate the brake pedal while dismounting the pads.

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



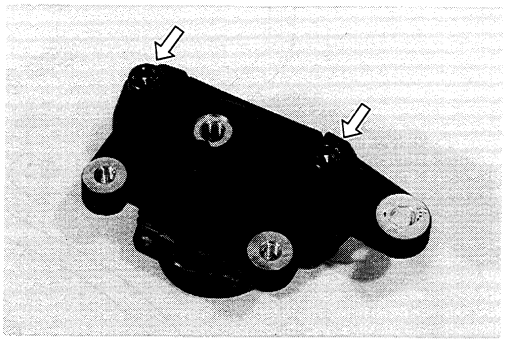
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## CALIPER REMOVAL AND DISASSEMBLY



- Remove the union bolt and catch the brake fluid in a suitable receptacle.
- Remove the caliper mounting bolts.
- Remove the torque link bolt and nut, and take off the caliper.

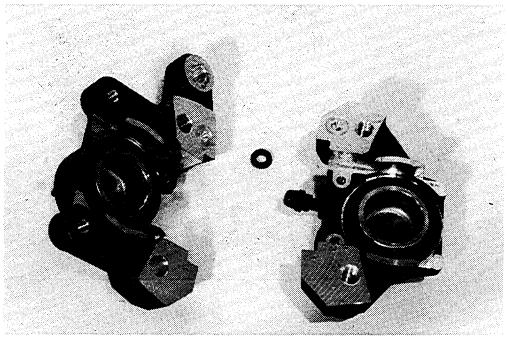
*NOTE:*
*Slightly loosen the caliper housing bolts to facilitate later disassembly before removing the caliper mounting bolts.*



- Remove the pads. (Refer to page 6-24.)
- Remove the caliper housing bolts and separate the caliper halves.

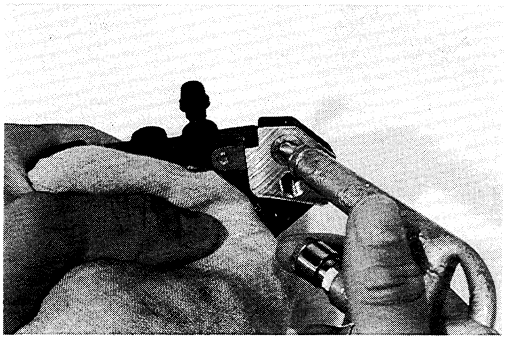
- Remove the O-ring.

*NOTE:*
*Once separate the caliper halves, replace the O-ring with a new one.*

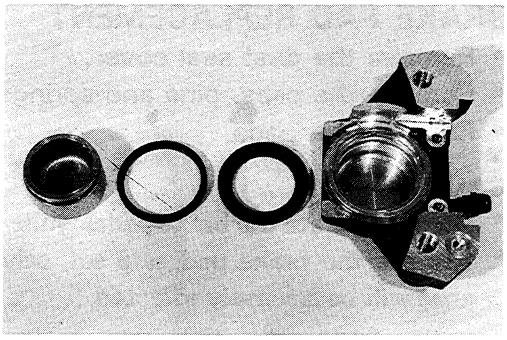


- Place a rag over the piston to prevent it from popping out and push out the piston by using air gun.

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



- Remove the dust seal, piston and piston seal out of the caliper.

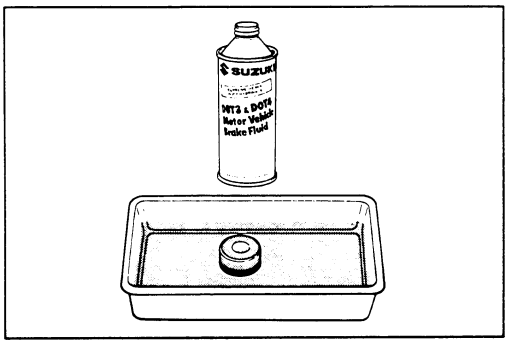


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## CALIPER AND DISC INSPECTION

**CALIPER** ..... Refer to page 6-9.
**PISTON** ..... Refer to page 6-9.
**RUBBER PARTS** ..... Refer to page 6-9.
**DISC** ..... Refer to page 6-9.

## CALIPER REASSEMBLY AND REMOUNTING




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

**CAUTION:**

* **Wash the caliper components with fresh brake fluid before reassembly.**
* **Never use cleaning solvent or gasoline to wash them.**
* **Apply brake fluid to the caliper bore and piston to be inserted into the bore.**
* **Bleed air after reassembling the caliper. (Refer to page 2-16.)**

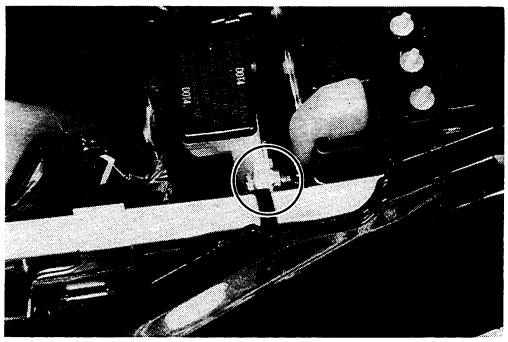
### CALIPER BOLTS

Tighten the bolts to the specified torque.
(Refer to page 6-24.)

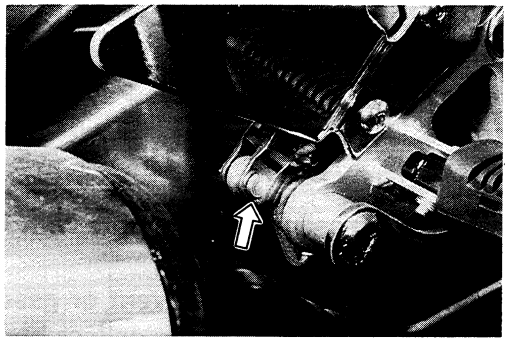
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## MASTER CYLINDER REMOVAL AND DISASSEMBLY

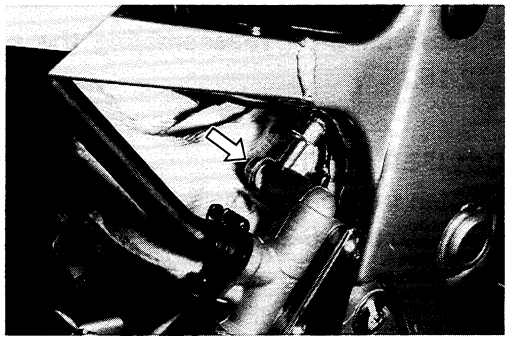
- Remove the seat.
- Remove the reservoir tank mounting bolt.



- Pull out cotter pin and remove the push rod pin.



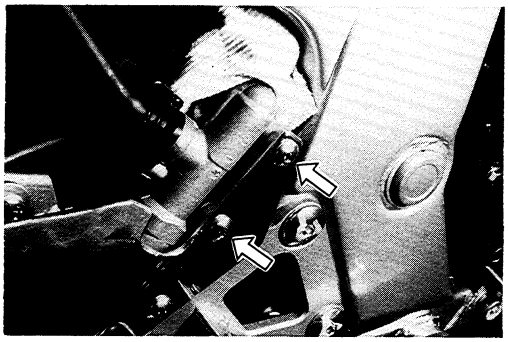
- Place a rag underneath the union bolt on the master cylinder to catch spilled drops of brake fluid. Unscrew the union bolt and disconnect the brake hose from the master cylinder joint.



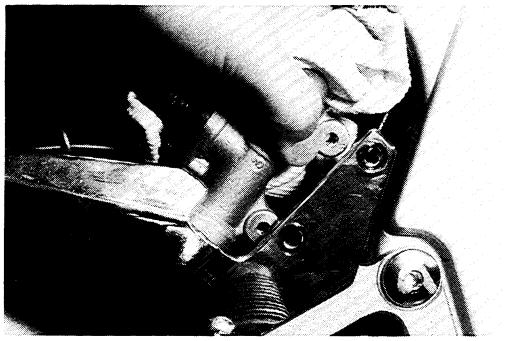
**CAUTION:**
**Immediately and completely wipe off any brake fluid contacting any part of the motorcycle. The fluid reacts chemically with paint, plastics and rubber materials, etc. and will damage them severely.**

- Remove the master cylinder/footrest mounting bolts.

**09900-00401 : L-type hexagon wrench**

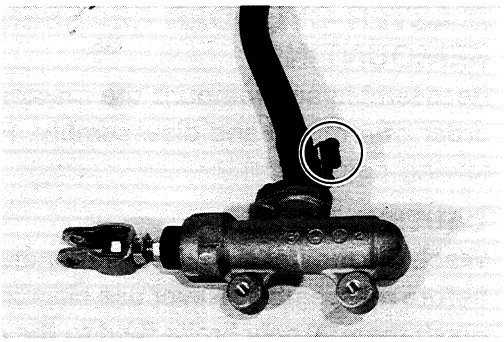


- Remove the master cylinder assembly.



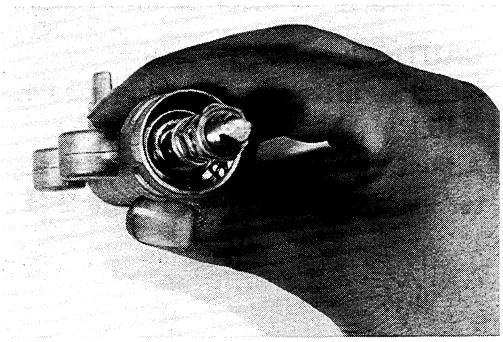
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- Remove the reservoir tank hose.
- Remove the reservoir tank cap and drain brake fluid from the reservoir tank.

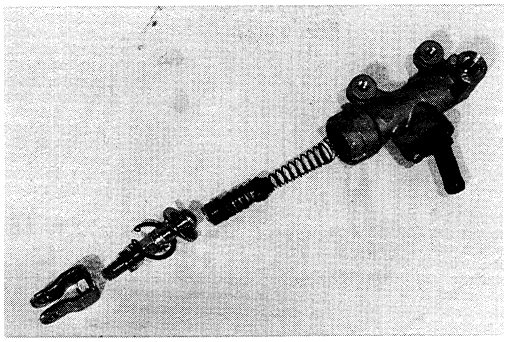


- Remove the dust seal, then remove the circlip by using the special tool.

**09900-06105 : Snap ring pliers**

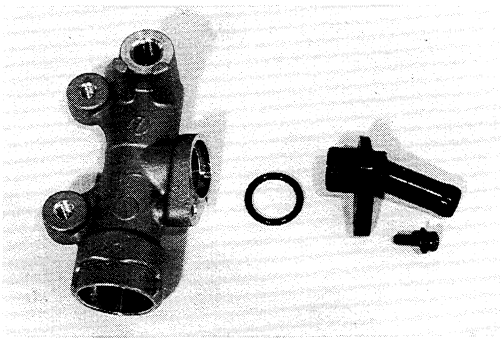


- Remove the push rod, piston, primary cup and spring.



- Remove the connector and O-ring.

**CAUTION:**
**The removed O-ring should be replaced with new one.**



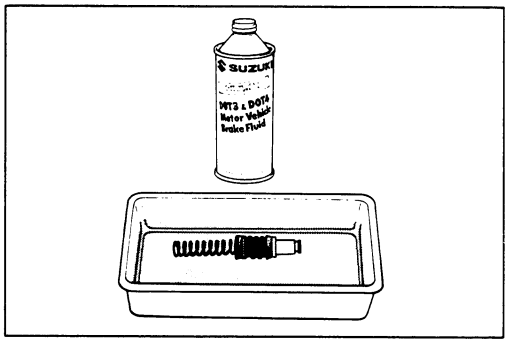
## MASTER CYLINDER INSPECTION

### CYLINDER, PISTON AND CUP SET

Inspect the cylinder bore wall for any scratches or other damage.
Inspect the piston surface for any scratches or other damage.
Inspect the cup set and each rubber part for damage.

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## MASTER CYLINDER REASSEMBLY AND REMOUNTING



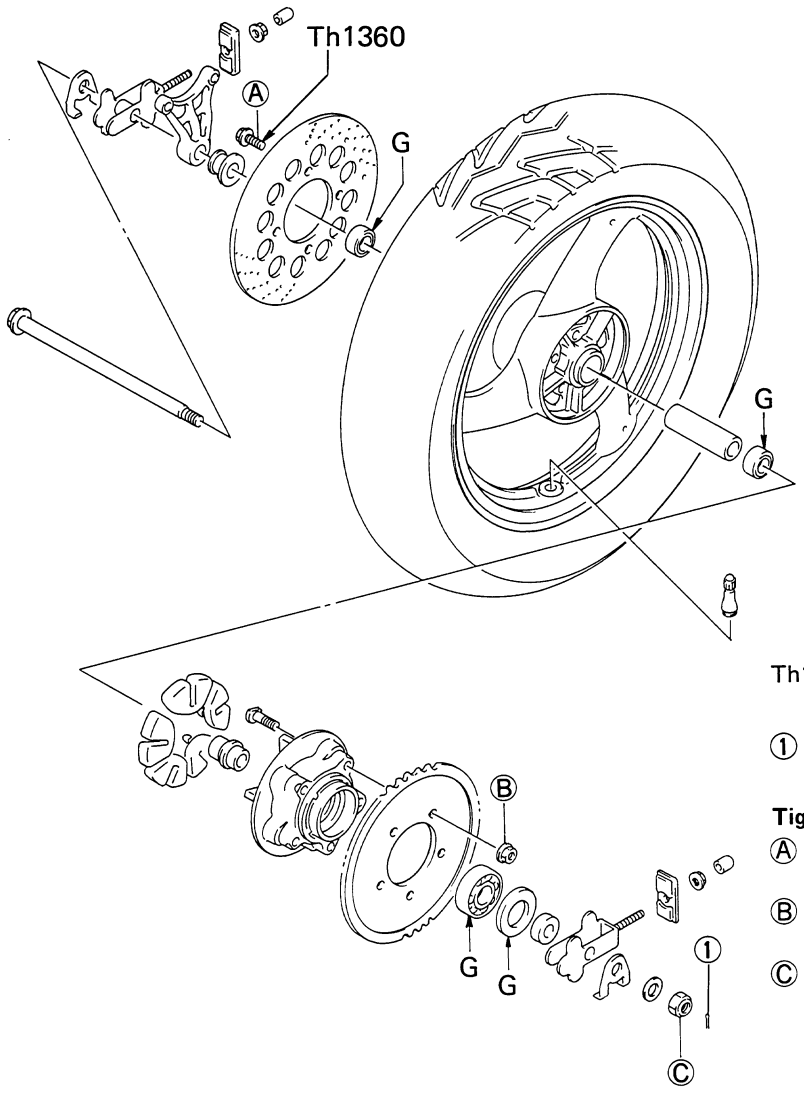

Reassemble and remount the master cylinder in the reverse order of removal and disassembly. Pay attention to the following points:

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

**CAUTION:**
**Bleed air after reassembling master cylinder. (Refer to page 2-16.)**
**Adjust the rear brake light switch and brake pedal height after installation.(Refer to page 2-15.)**

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# REAR WHEEL




Th1360 : Apply THREAD LOCK "1360"
G : Apply SUPER GREASE "A"

① Cotter pin (For E-03, 28 and 33 models)

**Tightening torque**

**Ⓐ : 18 – 28 N·m**
**(1.8 – 2.8 kg-m, 13.0 – 20.0 lb-ft)**

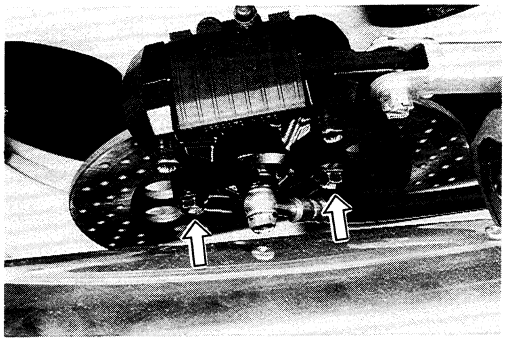
**Ⓑ : 40 – 60 N·m**
**(4.0 – 6.0 kg-m, 29.0 – 43.5 lb-ft)**

**Ⓒ : 50 – 80 N·m ... Normal nut with cotter pin**
**(5.0 – 8.0 kg-m, 36.0 – 58.0 lb-ft)**

**60 – 96 N·m ... Self-lock nut**
**(6.0 – 9.6 kg-m, 43.5 – 69.5 lb-ft)**

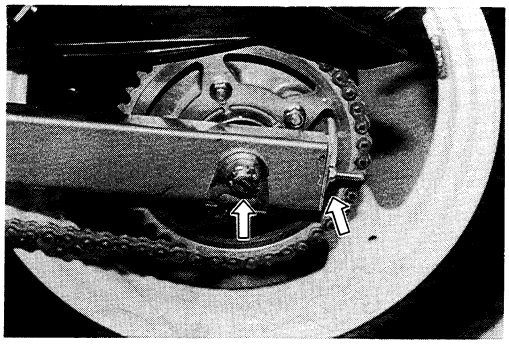
## REMOVAL

- Support the motorcycle by center stand.
- Remove the rear brake caliper mounting bolts and lift the caliper along with the torque link.

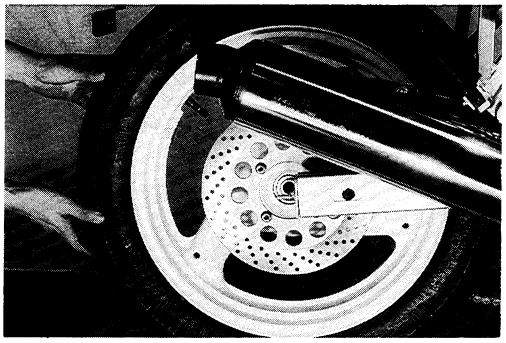


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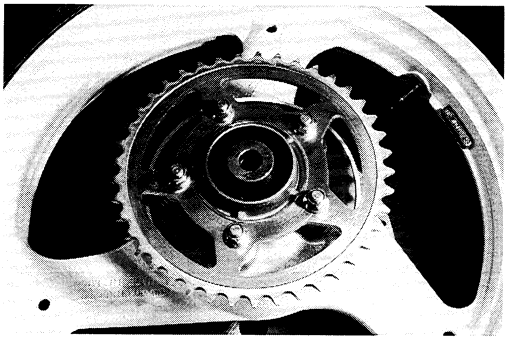
- Remove the cotter pin. (For E-03, 28 and 33 models)
- Remove the rear axle nut.
- Loosen the chain adjusting nuts, left and right.
- Draw out the axle shaft.



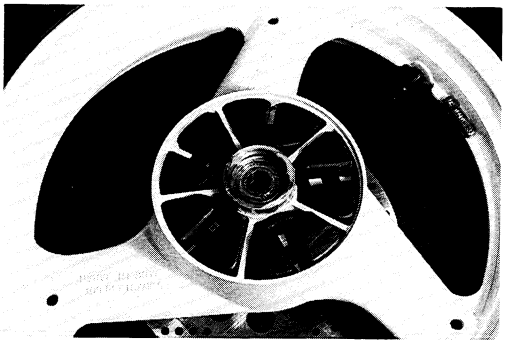
- Disengage the drive chain from the rear sprocket.
- Remove the rear wheel.



- Remove the rear sprocket along with its mounting drum off the wheel hub.

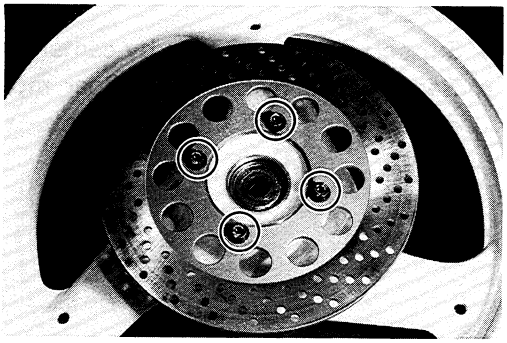


- Remove the five dampers out of the wheel hub.



- Remove the brake disc by removing the mounting bolts.

**09900-00410 : Hexagon wrench set**
**(Not available in U.S.A.)**



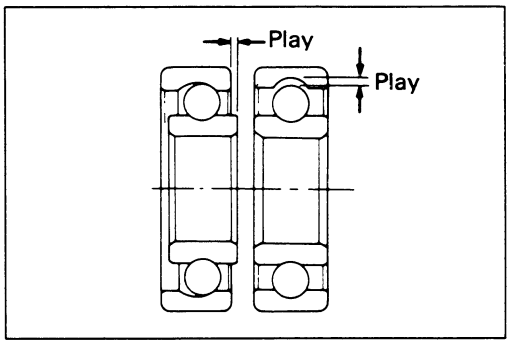
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## INSPECTION AND DISASSEMBLY

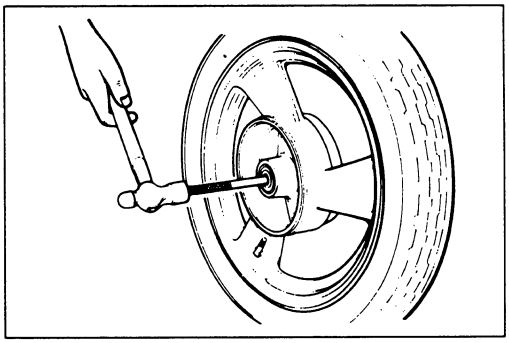
**TIRE** ..... Refer to page 6-36.

### WHEEL AND SPROCKET DRUM BEARINGS

Inspect the play of respective bearings by hand while they are in the wheel and sprocket drum. Rotate the inner race by hand to inspect for abnormal noise and smooth rotation. Replace the bearing if there is anything unusual.




- Drive out the wheel bearings and sprocket drum bearing by using a proper tool.



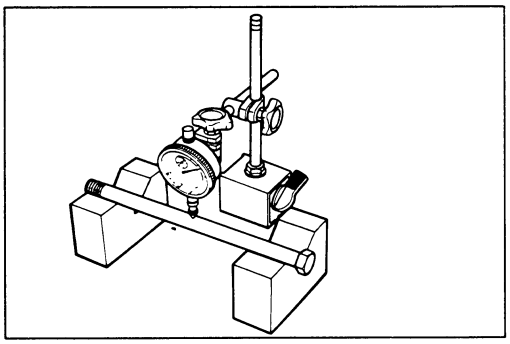
**CAUTION:**
**The removed bearings and oil seal should be replaced with new ones.**

### AXLE SHAFT

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

**09900-20606 : Dial gauge (1/100)**
**09900-20701 : Magnetic stand** } **Not available in U.S.A**
**09900-21304 : V-block set (100 mm)**

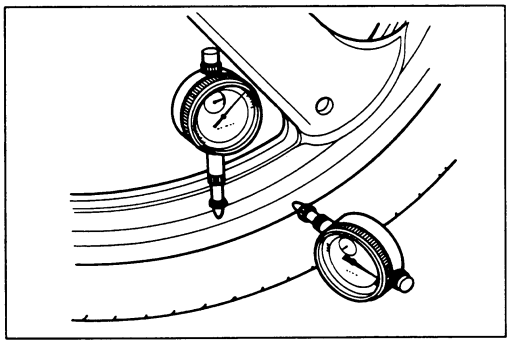
**Service limit : 0.25 mm (0.010 in)**



### WHEEL

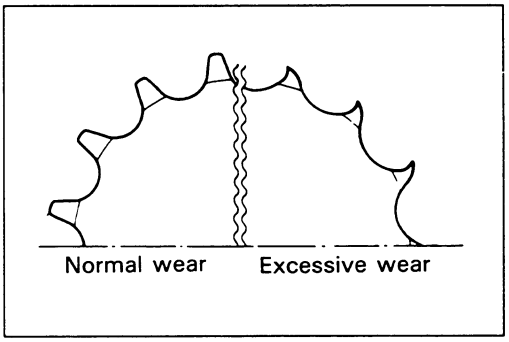
Make sure that the wheel runout checked as shown does not exceed the service limit. An excessive runout is usually due to worn or loose wheel bearings and can be reduced by replacing the bearings. If bearing replacement fails to reduce the runout, replace the wheel.

**Service limit (Axial and Radial): 2.0 mm (0.08 in)**



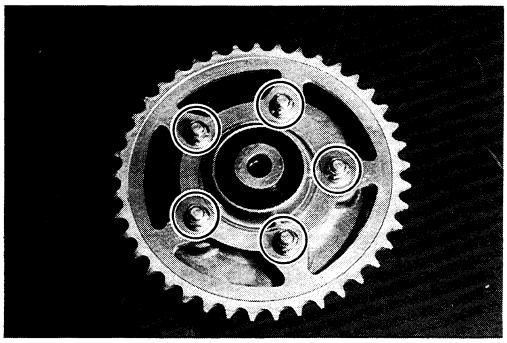
### SPROCKET

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



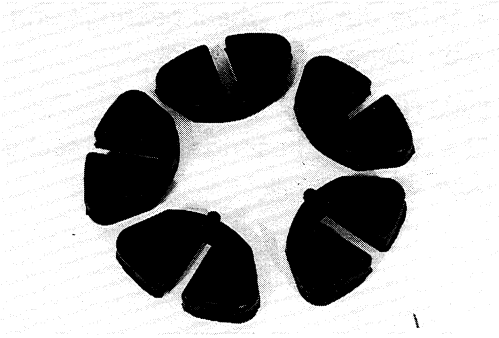

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- Remove the rear sprocket by removing the mounting nuts.



**DAMPER**

Inspect the dampers for wear and damage.



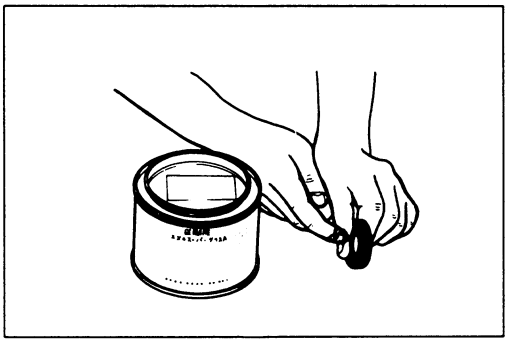
## REASSEMBLY AND REMOUNTING

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

**WHEEL BEARING**

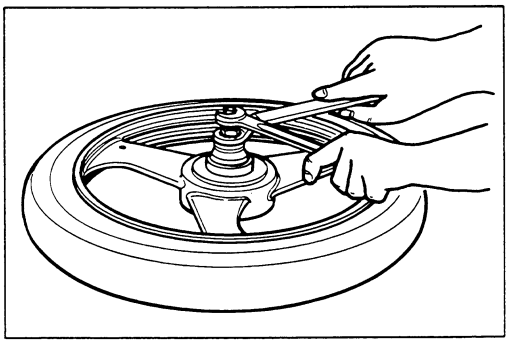
- Apply grease to the bearings before installing.

**(For U.S.A. model)**
**99000-25030 : SUZUKI SUPER GREASE "A"**
**(For the other models)**
**99000-25010 : SUZUKI SUPER GREASE "A"**



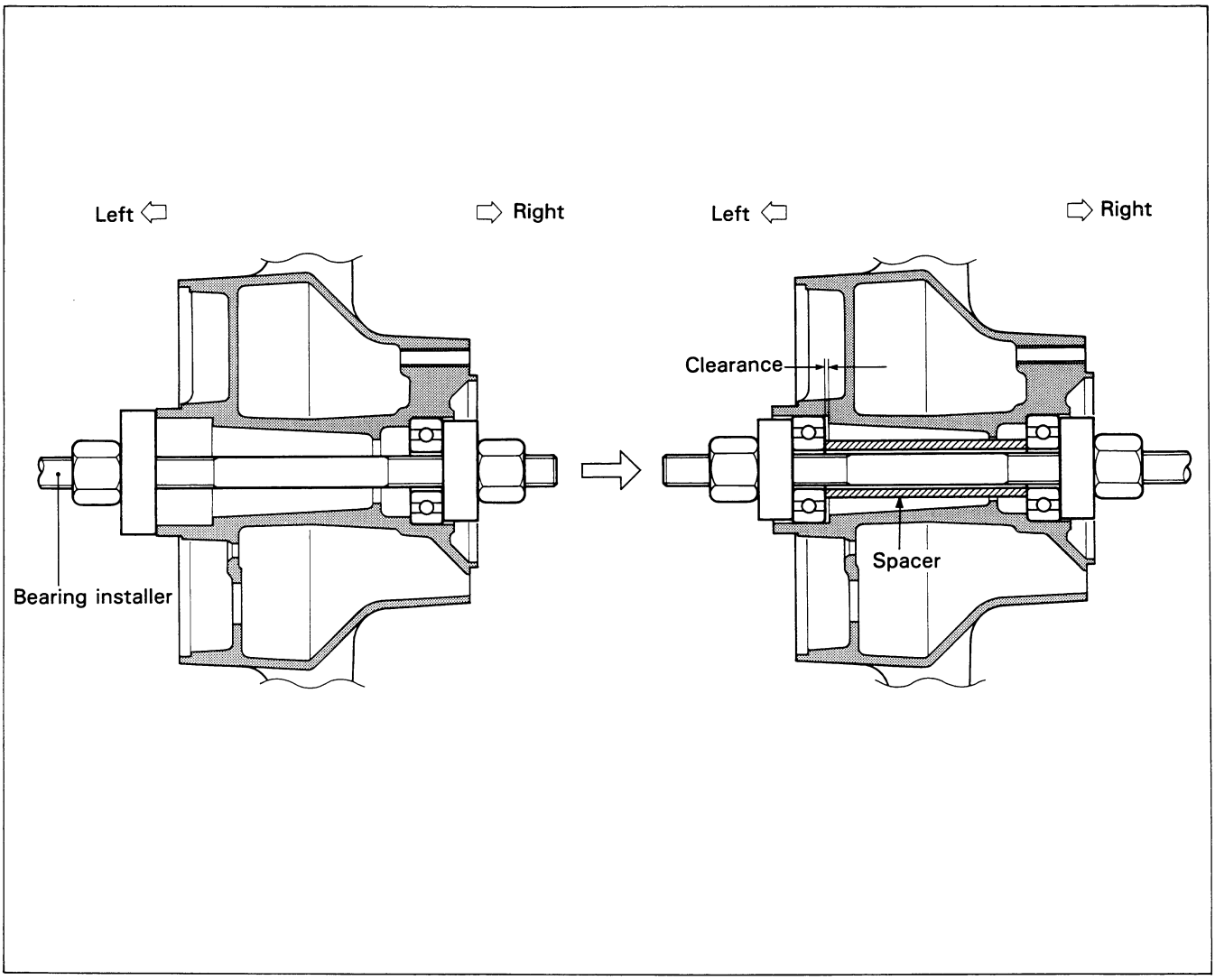
- Install the wheel bearings by using the special tools.

**09941-34513 : Bearing installer set**



*NOTE:*
*First install the right wheel bearing, then install the left wheel bearing. The sealed cover on the bearing is positioned outside.*
*Refer to next page.*

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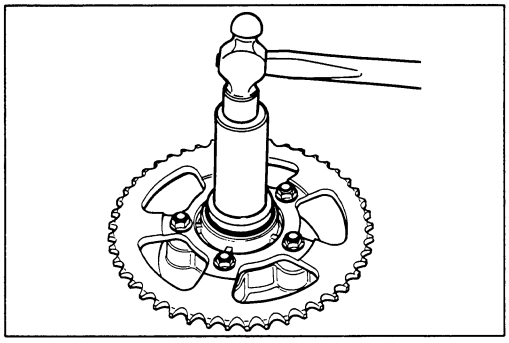

**SPROCKET DRUM BEARING AND SPROCKET**

- Install the bearing by using the special tool.

**09913-75520 : Bearing installer**

- Apply grease to the bearing and oil seal lip.

**(For U.S.A. model)**
**99000-25030 : SUZUKI SUPER GREASE "A"**
**(For the other models)**
**99000-25010 : SUZUKI SUPER GREASE "A"**



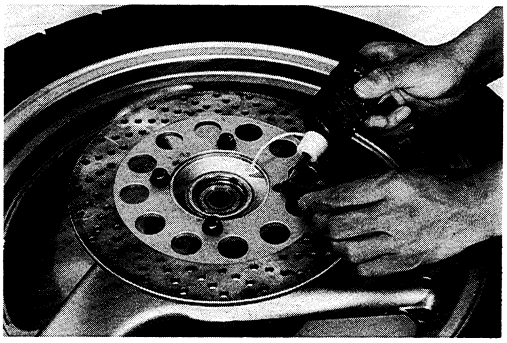
*NOTE:*
*When installing the rear sprocket on its mounting drum, the stamped mark on the sprocket is positioned outside.*

- Tighten the sprocket mounting nuts to the specified torque.

**Tightening torque : 40 — 60 N·m**
**(4.0 — 6.0 kg-m, 29.0 — 43.5 lb-ft)**

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## BRAKE DISC



- Make sure that the brake disc is clean and free of any greasy matter.
- Apply THREAD LOCK "1360" to the disc bolts and tighten them to the specified torque.

**99000-32130 : THREAD LOCK "1360"**
**Tightening torque : 18 – 28 N·m**
**(1.8 – 2.8 kg-m, 13.0 – 20.0 lb-ft)**

## TIGHTENING TORQUE

**Axle nut:**
**50 – 80 N·m (5.0 – 8.0 kg-m, 36.0 – 58.0 lb-ft) ... Normal nut with cotter pin**
**60 – 96 N·m (6.0 – 9.6 kg-m, 43.5 – 69.5 lb-ft) ... Self-lock nut**

**Brake caliper mounting bolt:**
**20 – 31 N·m (2.0 – 3.1 kg-m, 14.5 – 22.5 lb-ft)**

## ADJUSTMENT

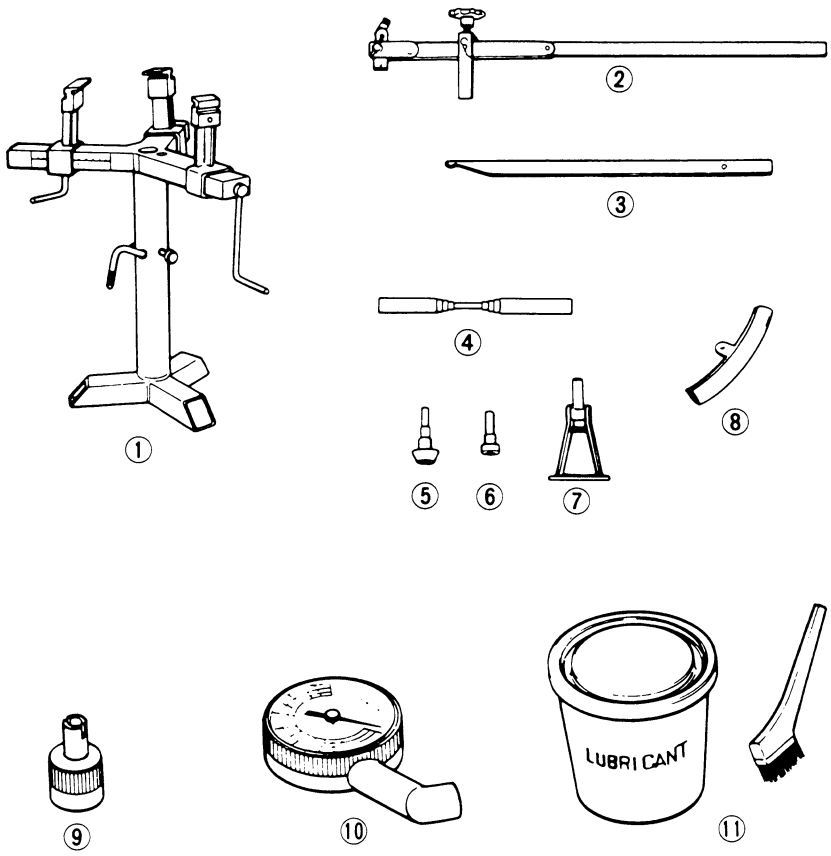
- Adjust the chain slack after rear wheel installation. (Page 2-13)

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# TIRE AND WHEEL

## TIRE REMOVAL

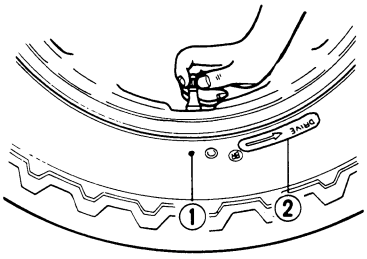
The most critical factor of a tubeless tire is the seal between the wheel rim and the tire bead. Because of this, we recommend using a tire changer which is also more efficient than tire levers.
For tire removal the following tools are required.




① Tire changer stand
② Operation arm
③ Tire lever
④ Center shaft
⑤ Bead pushing roller
⑥ Rim guide roller
⑦ Bead breaker
⑧ Rim protector
⑨ Core remover
⑩ Air pressure gauge
⑪ Tire lubricant

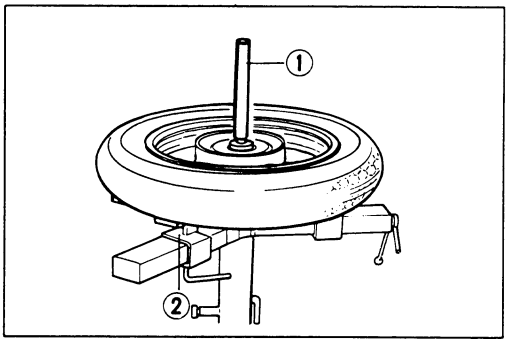
- Remove the valve core from the valve stem, and deflate the tire completely.

*NOTE:*
*Mark the tire with chalk to note the position ① of the tire on the rim and rotational direction ② of the tire.*

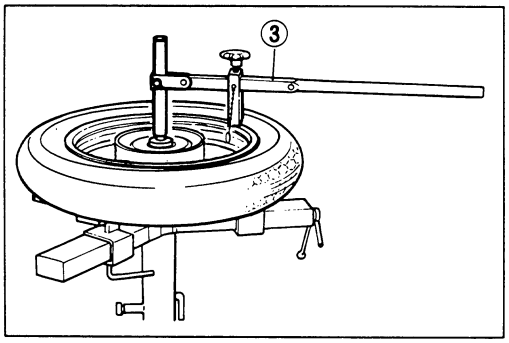


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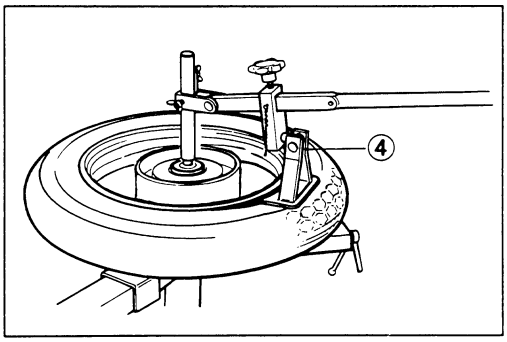
- Place the center shaft ① to the wheel, and fix the wheel with the rim holder ②.



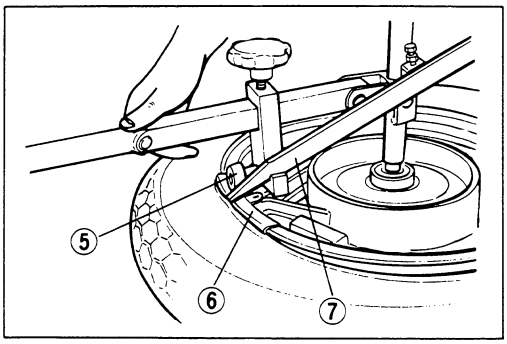

- Attach the operation arm ③ to the center shaft.



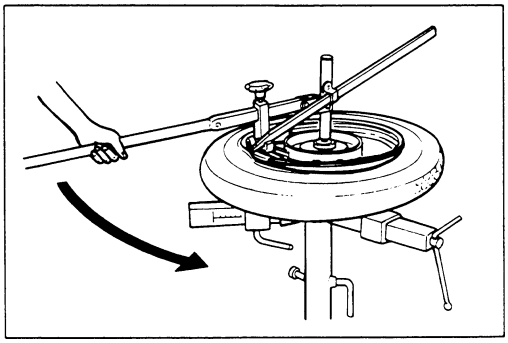

- Attach the bead breaker ④ to the operation arm, and dismount the bead from the rim. Turn the wheel over and dismount the other bead from the rim.




- Install the rim guide roller ⑤.
- Install the rim protector ⑥, and raise the tire bead with the tire lever ⑦.




- Set the tire lever against the operation arm, and rotate the lever around the rim. Repeat this procedure to remove the other bead from the rim.



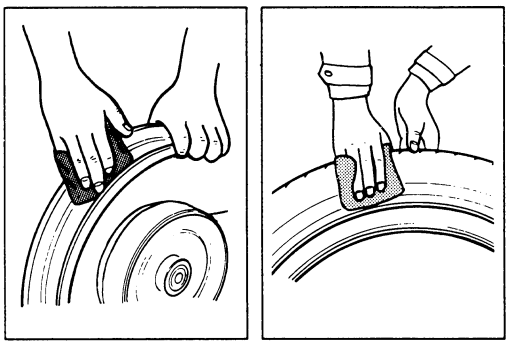
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## INSPECTION

### WHEEL

Wipe off any rubber substance or rust from the wheel, and inspect the wheel rim. If any one of the following items is observed, replace it with a new wheel.

* A distortion or crack.
* Any scratches or flaws in the bead seating area.
* Wheel runout (Axial & Radial) of more than 2.0 mm (0.08 in).



### TIRE

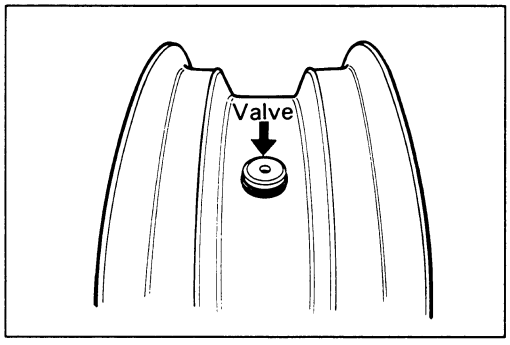
Thoroughly inspect the removed tire, and if any one of the following items is observed, do not repair the tire. Replace with a new one.

* A puncture or a split whose total length or diameter exceeds 6.0 mm (0.24 in).
* A scratch or split at the side wall.
* Tread depth less than 1.6 mm (0.06 in) in the front tire and less than 2.0 mm (0.08 in) in the rear tire.
* Ply separation.
* Tread separation.
* Tread wear is extraordinarily deformed or distributed around the tire.
* Scratches at the bead.
* Cord is cut.
* Damage from skidding (flat spots).
* Abnormality in the inner liner.

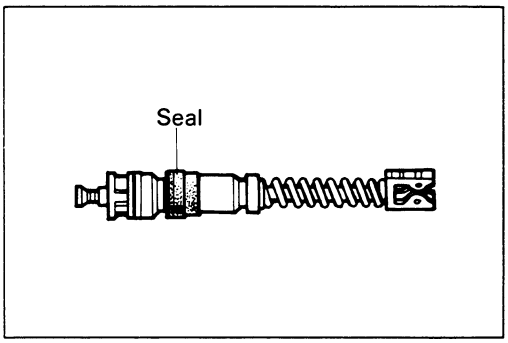
*NOTE:*
*When repairing a flat tire, follow the repair instructions and use only recommended repairing materials.*

### VALVE INSPECTION

Inspect the valve after the tire is removed from the rim, and replace with a new valve if the seal rubber has any splits or scratches.



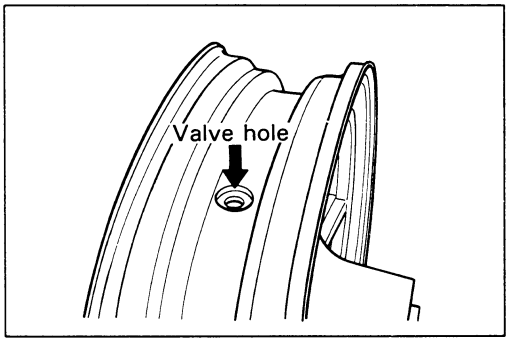

Inspect the removed valve core and replace with the new one if the seal rubber is abnormally deformed or worn.




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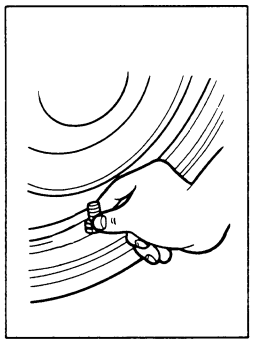
### VALVE INSTALLATION

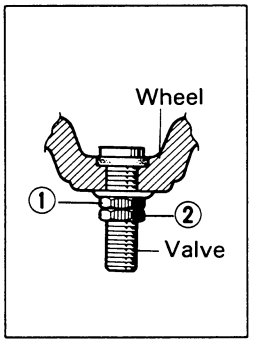
Any dust or rust around the valve hole must be cleaned off. Then install the valve in the rim.




**CAUTION:**

**When installing the valve, tighten the nut ① by hand as much as possible. Holding the nut ① under this condition, tighten the lock nut ②. Do not overtighten the nut ① as this may distort the rubber packing and cause an air leak.**



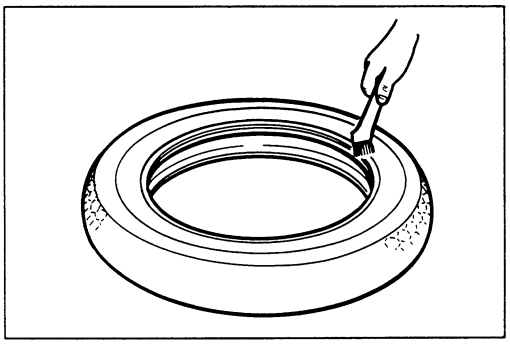



## TIRE MOUNTING

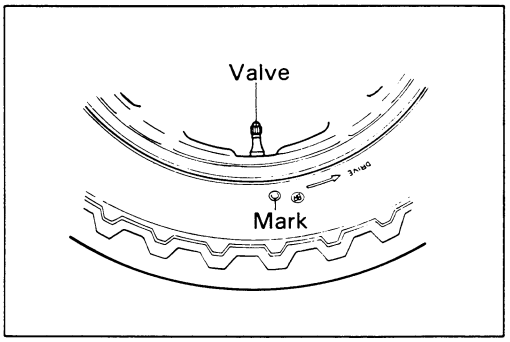
- Apply a special tire lubricant or neutral soapy liquid to the tire bead.

**CAUTION:**

**Never apply grease, oil or gasoline to the tire bead.**



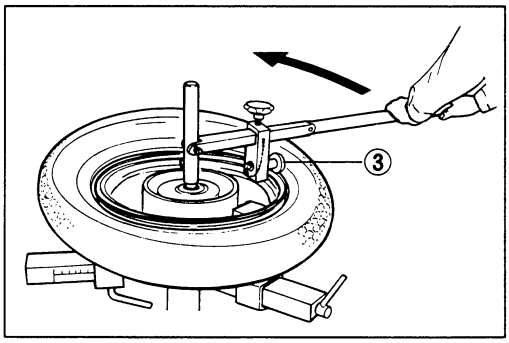
- When installing the tire, make certain that the directional arrow faces the direction of wheel rotation and align the balancing mark of the tire with the valve as shown.




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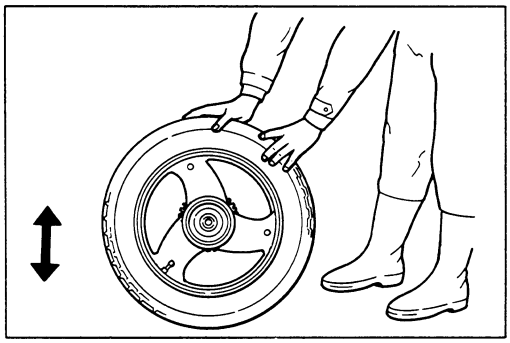
- Set the bead pushing roller ③.
- Rotate the operation arm around the rim to mount the bead completely. Do the bottom bead first, then the upper bead.
- Remove the wheel from the tire changer, and install the valve core in the valve stem.

*NOTE:*
*Before installing the valve core, inspect the core.*




- Bounce the tire several times while rotating. This makes the tire bead expand outwards, and thus makes inflation easier.

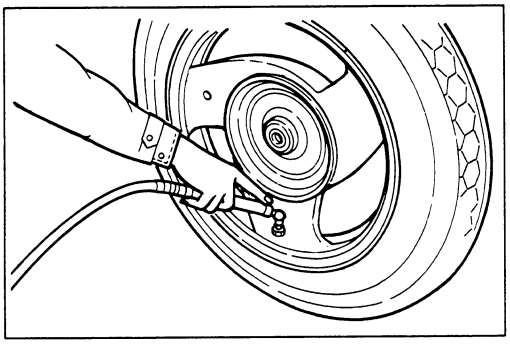
*NOTE:*
*Before inflating, confirm that the balance mark lines up with the valve stem.*



- Pump up the tire with air.

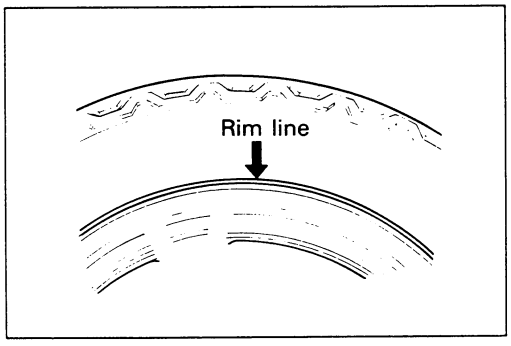
**WARNING:**
**Do not inflate the tire to more than 400 kPa (4.0 kg/cm², 56 psi). The tire could burst with sufficient force to cause severe injury. Never stand directly over the tire while inflating it.**

*NOTE:*
*Check the ''rim line'' cast on the tire side walls. It must be equidistant from the wheel rim all the way around. If the distance between the rim line and wheel rim varies, this indicates that the bead is not properly seated. If this is so, deflate the tire completely, and unseat the bead for both sides. Coat the bead with lubricant, and try again.*



- After tire is properly seated to the wheel rim, adjust the air-pressure to the recommended pressure. Correct the wheel balance if necessary.

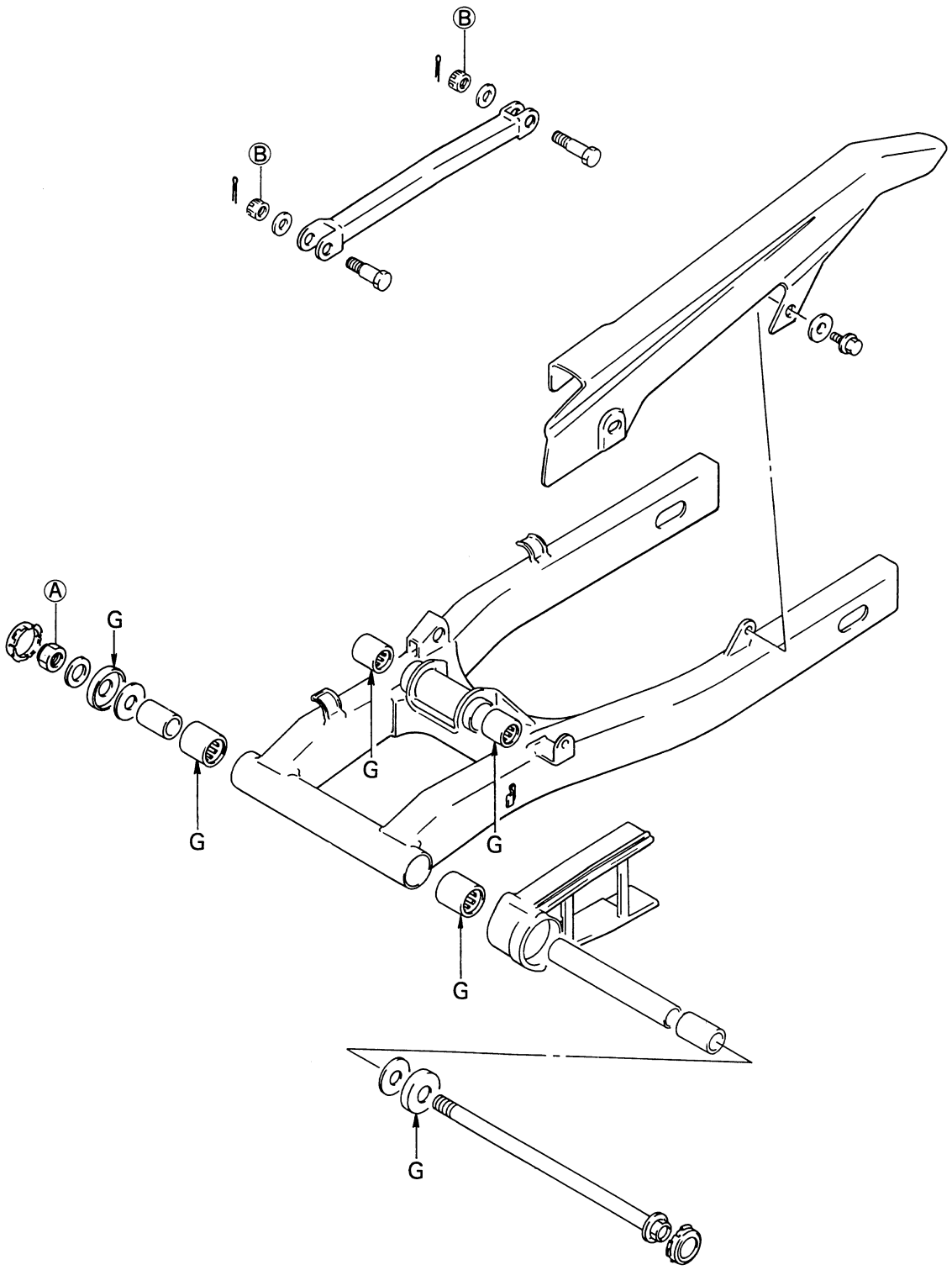
**WARNING:**
* **Do not run a repaired tire more than 50 km/h (30 mph) within 24 hours after tire repairing, since the patch may not be completely cured.**
* **Do not exceed 130 km/h (80 mph) with a repaired tire.**




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# REAR SUSPENSION

## SWINGARM

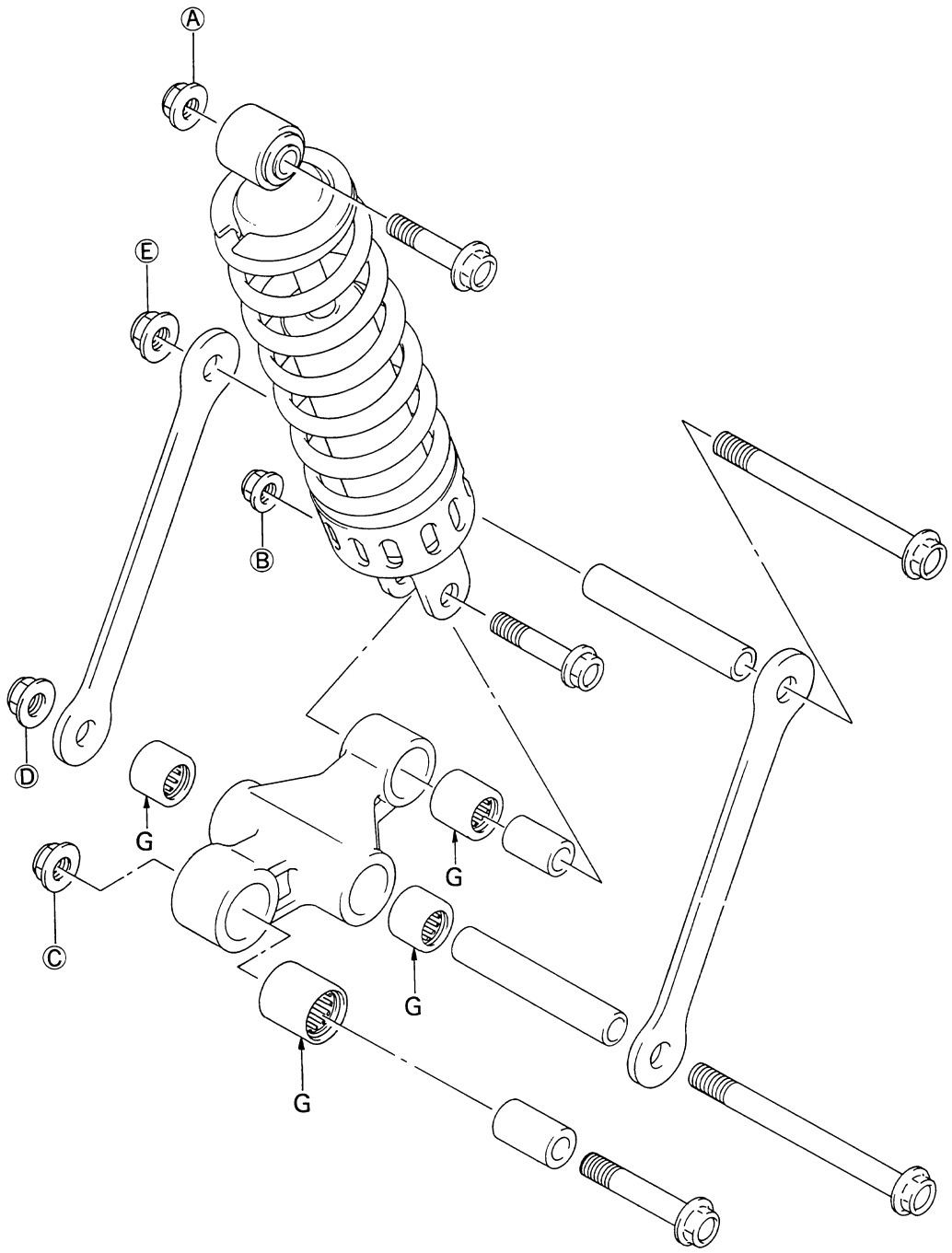



**Tightening torque**
Ⓐ : 55 – 88 N·m
(5.5 – 8.8 kg-m, 40.0 – 63.5 lb-ft)
Ⓑ : 22 – 35 N·m
(2.2 – 3.5 kg-m, 16.0 – 25.5 lb-ft)

G : Apply SUPER GREASE "A"

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## SHOCK ABSORBER AND CUSHION LEVER




**Tightening torque**

Ⓐ, Ⓑ : 40 – 60 N·m
(4.0 – 6.0 kg-m, 29.0 – 43.5 lb-ft)

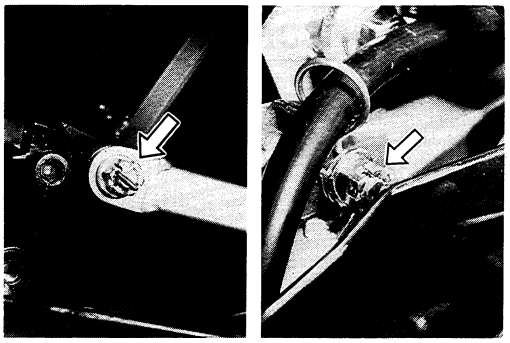
Ⓒ, Ⓓ, Ⓔ : 70 – 100 N·m
(7.0 – 10.0 kg-m, 50.5 – 72.5 lb-ft)

G : Apply SUPER GREASE "A"

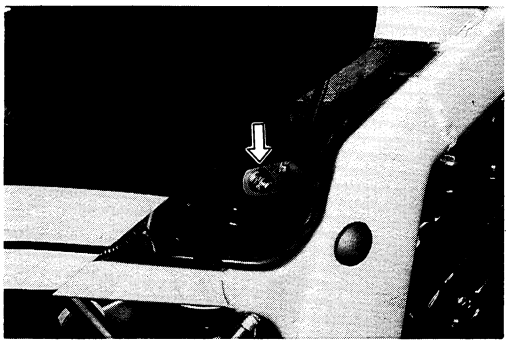
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## REMOVAL

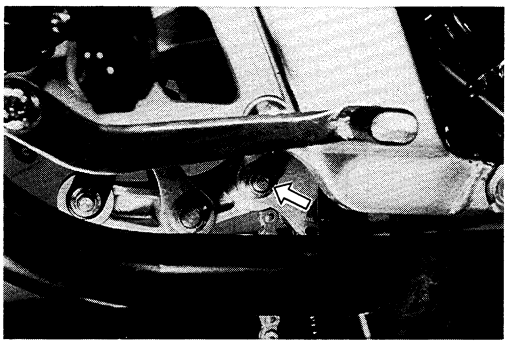
- Remove the brake caliper and rear wheel. (Refer to page 6-30.)
- Remove the cotter pins and torque link mounting bolts.



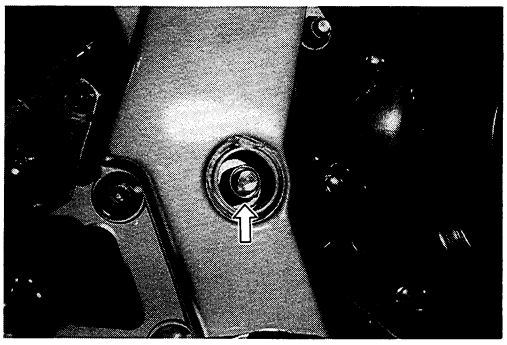
- Remove the shock absorber upper mounting bolt.



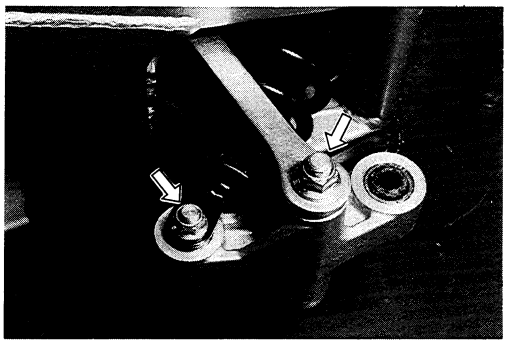
- Remove the cushion lever mounting bolt.



- Remove the swingarm pivot shaft.
- Remove the rear suspension assembly.

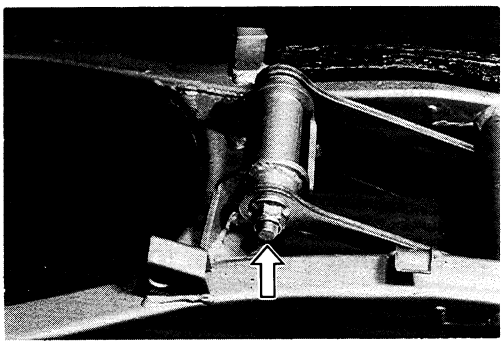


- Remove the cushion lever/rod bolt.
- Remove the shock absorber lower mounting bolt.



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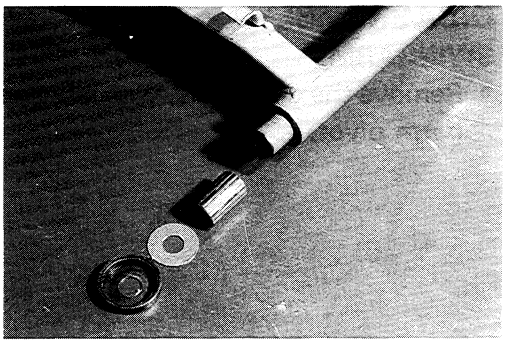
- Remove the cushion lever rod bolt.



## INSPECTION

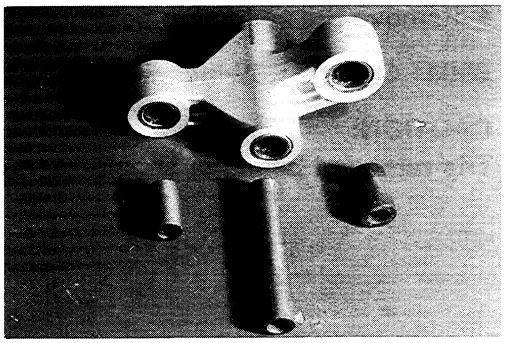
### SWINGARM

Insert the spacer in the bearing and check the play by moving the spacer up and down. If an excessive play is noted, replace the bearing with a new one.
Inspect the spacer for any flaws or other damage.
Inspect each rubber part for wear and damage.



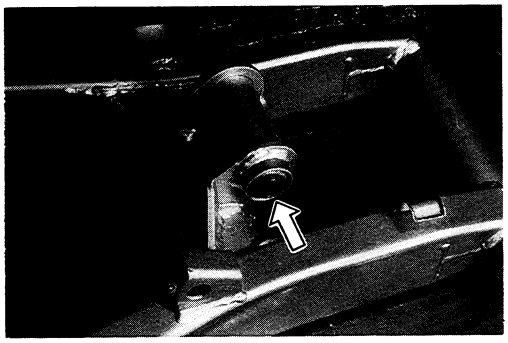
### CUSHION LEVER

Inspect the spacer for any flows or other damage.
Insert the spacer in the bearing and check the play by moving the spacer up and down.
If an excessive play is noted, replace the bearing with a new one.



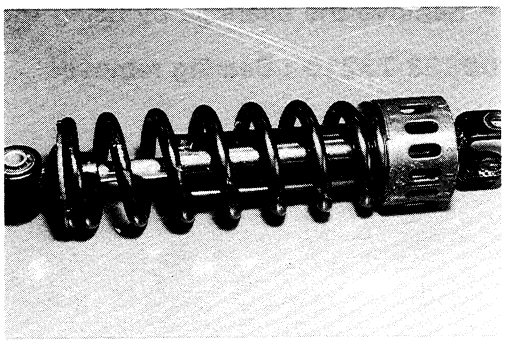
### CUSHION LEVER ROD

Inspect the spacer for any flaws or other damage.
Insert the spacer in the bearing and check the play by moving the spacer up and down. If an excessive play is noted, replace the bearing with a new one.



### SHOCK ABSORBER

Inspect the shock absorber body, bushing and bearing for damage and oil leakage. If any defects are found, replace the shock absorber with new one.

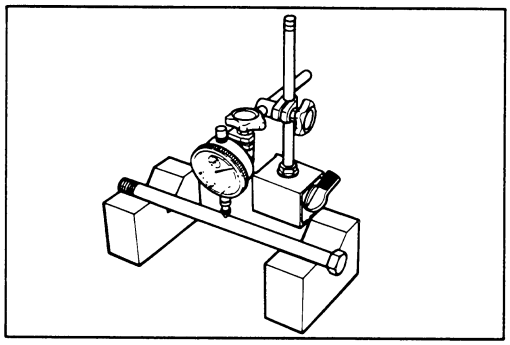


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### SWINGARM PIVOT SHAFT

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

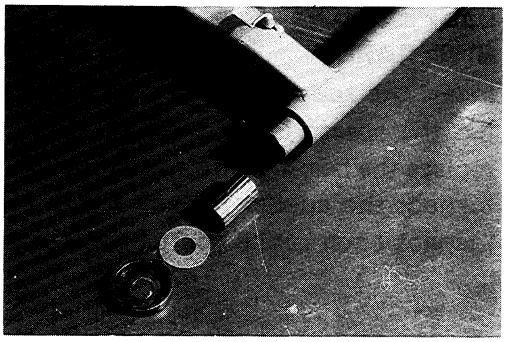
**09900-20606 : Dial gauge (1/100)**
**09900-20701 : Magnetic stand** } **Not available**
**09900-21304 : V-block set (100 mm)** } **in U.S.A.**
**Service limit : 0.3 mm (0.01 in)**



## DISASSEMBLY

### SWINGARM

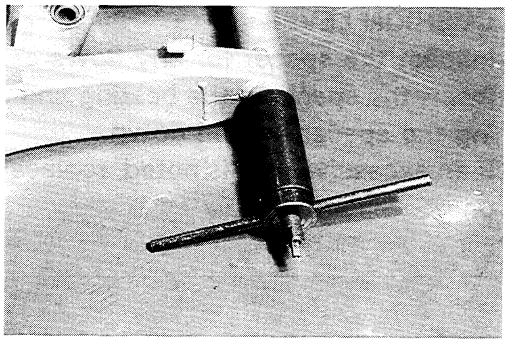
- Remove the dust seals, washers and spacers from the swingarm pivot.



- Remove the swingarm bearings by using the special tool.

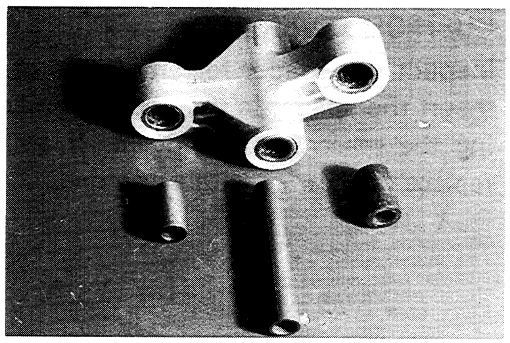
**09941-44510 : Swingarm bearing remover**

**CAUTION:**
**The removed bearings should be replaced with new ones.**



### CUSHION LEVER

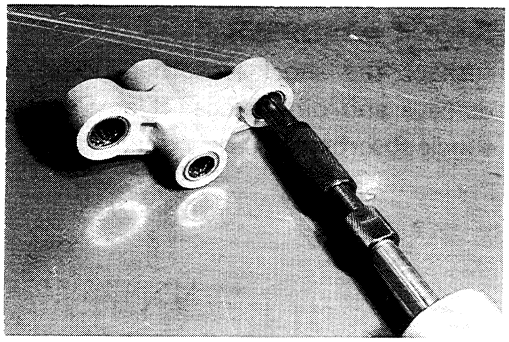
- Remove the spacers.



- Remove the bearings by using the special tool.

**09923-73210 : Bearing remover**

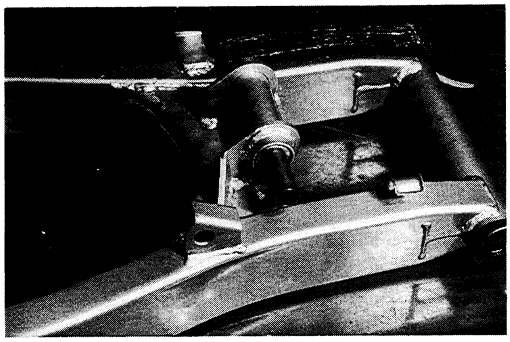
**CAUTION:**
**The removed bearings should be replaced with new ones.**



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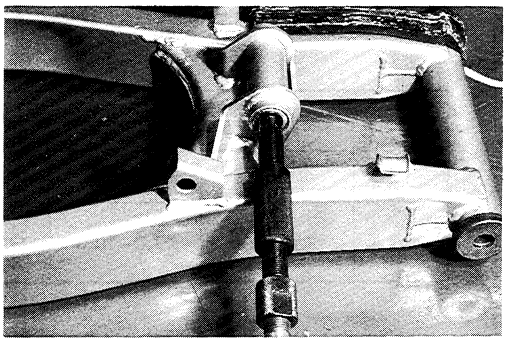
## CUSHION LEVER ROD

- Remove the spacer from the swingarm.



- Remove the bearing from the swingarm.

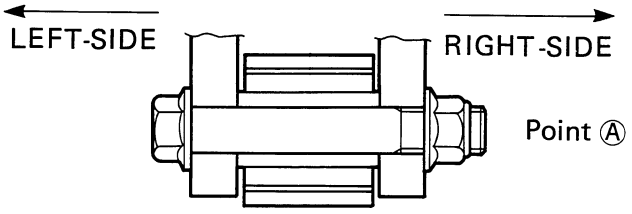
**09923-73210 : Bearing remover**

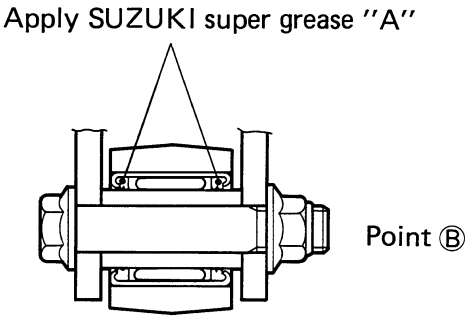


**CAUTION:**
**The removed bearings should be replaced with new ones.**

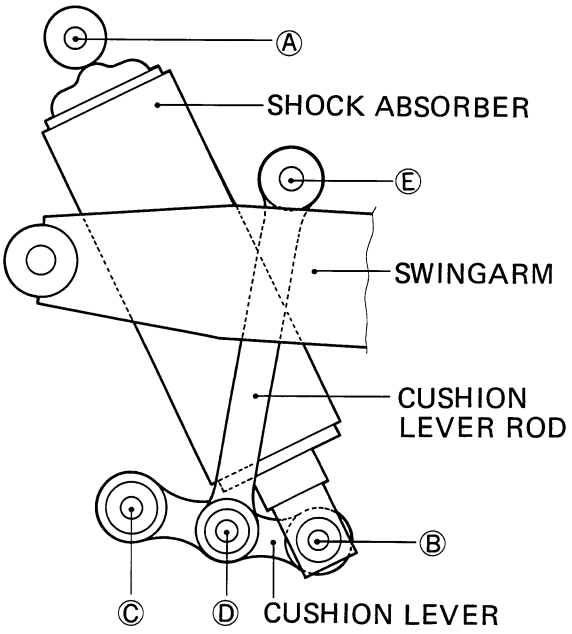
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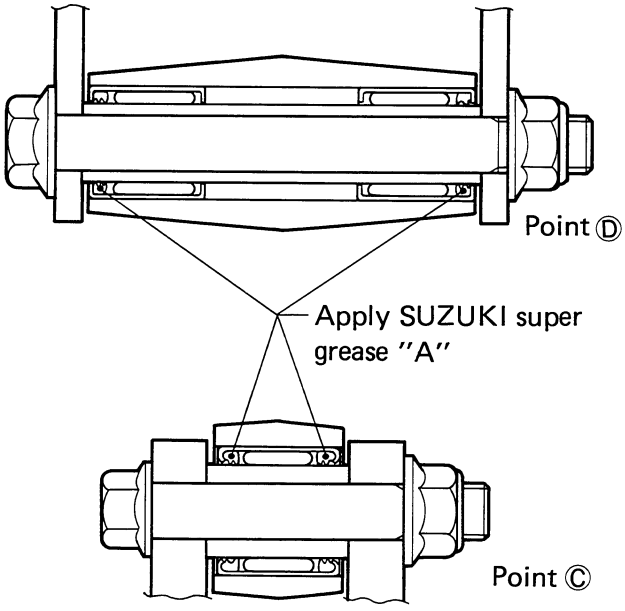
## REASSEMBLY INFORMATION

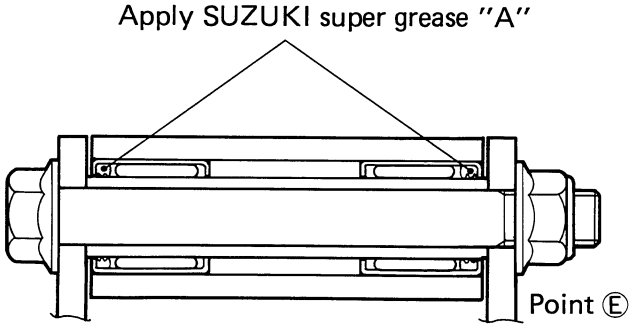



| Tightening torque | | | |
|---|---|---|---|
| ITEM | N·m | kg-m | lb-ft |
| Ⓐ Ⓑ | 40–60 | 4.0–6.0 | 29.0–43.5 |
| Ⓒ Ⓓ Ⓔ | 70–100 | 7.0–10.0 | 50.5–72.5 |



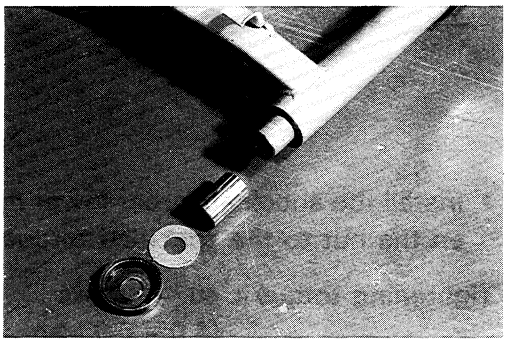




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## REASSEMBLY AND REMOUNTING

Reassemble and remount the swingarm, rear shock absorber, rear cushion lever rods and cushion lever. Pay attention to the following points:

### SWINGARM



- Force-fit the bearings into the swingarm pivot.

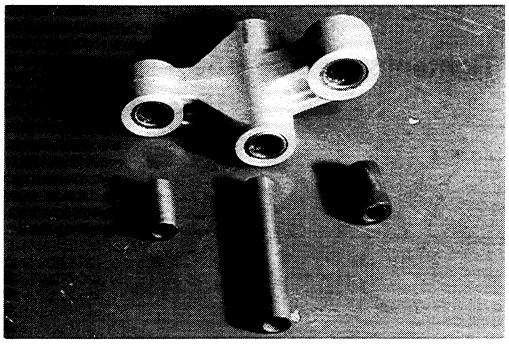
**09941-34513 : Steering outer race installer**

*NOTE:*
*When installing the bearings, punch-marked side of bearing comes outside.*

- Apply grease to the spacers and dust seals when installing them.

**(For U.S.A. model)**
**99000-25030 : SUZUKI SUPER GREASE "A"**
**(For the other models)**
**99000-25010 : SUZUKI SUPER GREASE "A"**

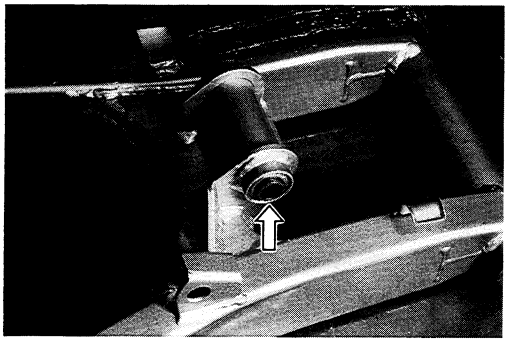
### CUSHION LEVER



- Install the cushion lever bearings by using an appropriate drift.
- Apply grease to the bearings.

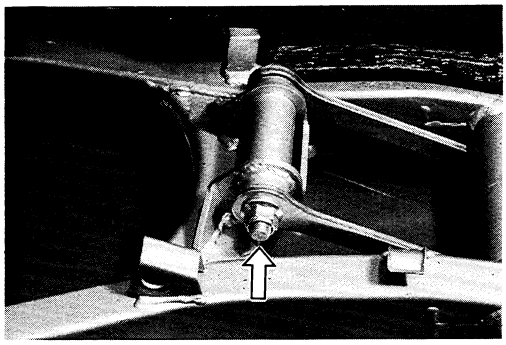
**(For U.S.A. model)**
**99000-25030 : SUZUKI SUPER GREASE "A"**
**(For the other models)**
**99000-25010 : SUZUKI SUPER GREASE "A"**

### CUSHION LEVER ROD



- Install the cushion lever rod bearings by using an appropriate drift.
- Apply grease to the bearings.

**(For U.S.A. model)**
**99000-25030 : SUZUKI SUPER GREASE "A"**
**(For the other models)**
**99000-25010 : SUZUKI SUPER GREASE "A"**



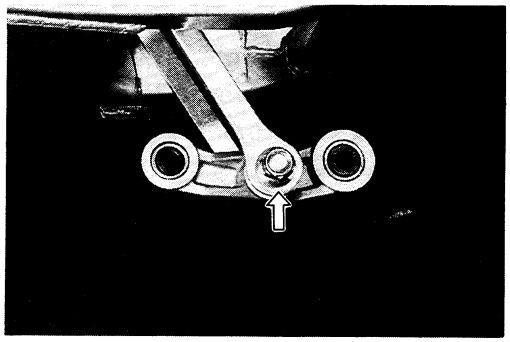
- Install the cushion lever rod bolt and tighten the nut to the specified torque.

**Tightening torque : 70 – 100 N·m**
**(7.0 – 10.0 kg-m, 50.5 – 72.5 lb-ft)**

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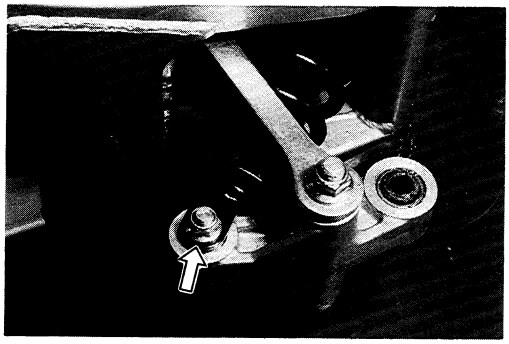
- Install the cushion lever/rod bolt and tighten the nut to the specified torque.

**Tightening torque : 70 – 100 N·m**
**(7.0 – 10.0 kg-m, 50.5 – 72.5 lb-ft)**



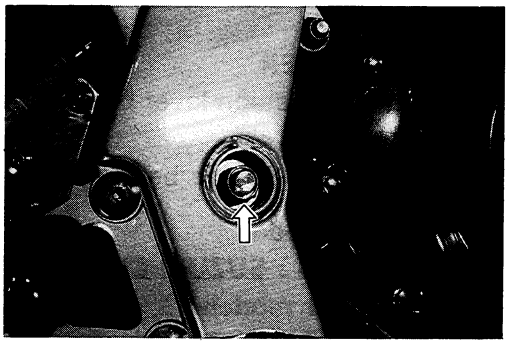
- Install the shock absorber lower mounting bolt and tighten the nut to the specified torque.

**Tightening torque : 40 – 60 N·m**
**(4.0 – 6.0 kg-m, 29.0 – 43.5 lb-ft)**



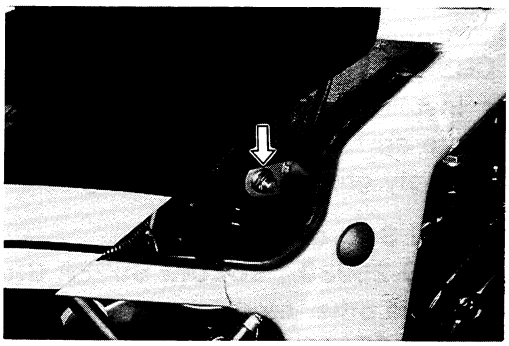
- Install the swingarm pivot shaft and tighten the nut to the specified torque.

**Tightening torque : 55 – 88 N·m**
**(5.5 – 8.8 kg-m, 40.0 – 63.5 lb-ft)**



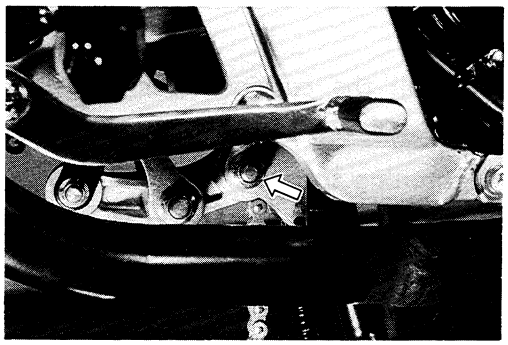
- Install the shock absorber upper mounting bolt and tighten the nut to the specified torque.

**Tightening torque : 40 – 60 N·m**
**(4.0 – 6.0 kg-m, 29.0 – 43.5 lb-ft)**



- Install the cushion lever mounting bolt and tighten the nut to the specified torque.

**Tightening torque : 70 – 100 N·m**
**(7.0 – 10.0 kg-m, 50.5 – 72.5 lb-ft)**



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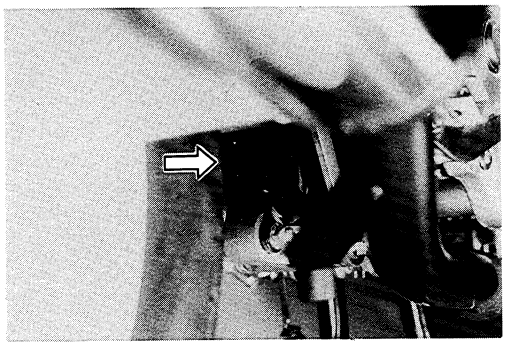
## FINAL INSPECTION AND ADJUSTMENT

After installing the rear suspension and rear wheel, the following adjustments are required before driving motorcycle.


* Drive chain . . . . . Page 2-13
* Rear brake . . . . . Page 2-15
* Tire pressure . . . . . Page 2-17
* Shock absorber . . . . . This page


## SHOCK ABSORBER SPRING PRE-LOAD

* Position "1" provides the softest spring pre-load.
* Position "7" provides the stiffest spring pre-load. (Factory setting : 4/7)



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# SERVICE INFORMATION

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# TROUBLESHOOTING

## ENGINE

| COMPLAINT | SYMPTOM AND POSSIBLE CAUSES | REMEDY |
|---|---|---|
| **Engine does not start, or is hard to start.** | **Compression too low** | |
| | 1. Out of adjustment tappet clearance | Adjust |
| | 2. Worn valve guide or poor seated valve | Repair or replace |
| | 3. Mistiming valve operation | Adjust |
| | 4. Excessively worn piston ring | Replace |
| | 5. Worn down cylinder bore | Replace or rebore |
| | 6. Too slow starter motor cranking | Consult "electrical complaints" |
| | 7. Poor seated spark plug | Retighten |
| | **Spark plug no sparking** | |
| | 1. Fouled spark plug | Clean |
| | 2. Wet spark plug | Clean and dry |
| | 3. Defective ignition coil | Replace |
| | 4. Opened or shorted high-tension cord | Replace |
| | 5. Defective signal generator or ignitor unit | Replace |
| | **No fuel flow to carburetor** | |
| | 1. Clogged fuel tank vent hole | Clean or replace |
| | 2. Clogged or defective fuel cock | Clean or replace |
| | 3. Defective carburetor needle valve | Replace |
| | 4. Clogged fuel hose or fuel filter | Clean or replace |
| **Engine stalls easily.** | 1. Fouled spark plug | Clean |
| | 2. Defective signal generator or ignitor unit | Replace |
| | 3. Clogged fuel hose | Clean |
| | 4. Clogged carburetor jet | Clean |
| | 5. Out of adjustment tappet clearance | Adjust |
| **Engine is noisy.** | **Excessive valve chatter** | |
| | 1. Too large tappet clearance | Adjust |
| | 2. Weakened or broken valve spring | Replace |
| | 3. Worn down rocker arm or rocker arm shaft | Replace |
| | **Noise appears to come from piston** | |
| | 1. Worn down piston or cylinder | Replace |
| | 2. Fouled combustion chamber with carbon | Clean |
| | 3. Worn piston pin or piston pin bore | Replace |
| | 4. Worn piston ring or piston ring groove | Replace |
| | **Noise appears to come from timing chain** | |
| | 1. Stretched chain | Replace |
| | 2. Worn sprocket | Replace |
| | 3. No working tension adjuster | Repair or replace |
| | **Noise appears to come from clutch** | |
| | 1. Worn countershaft splines or hub | Replace |
| | 2. Worn clutch plate teeth | Replace |
| | 3. Distorted clutch plate | Replace |
| | 4. Worn clutch release bearing | Replace |
| | 5. Weakened clutch damper | Replace primary driven gear |

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| COMPLAINT | SYMPTOM AND POSSIBLE CAUSES | REMEDY |
|---|---|---|
| **Engine is noisy.** | **Noise appears to come from crankshaft** | |
| | 1. Rattling bearing | Replace |
| | 2. Worn and burnt big end bearing | Replace |
| | 3. Worn and burnt journal bearing | Replace |
| | 4. Thrust clearance to large | Replace thrust bearing |
| | **Noise appears to come from transmission** | |
| | 1. Worn or rubbed gear | Replace |
| | 2. Badly worn splines | Replace |
| | 3. Worn or rubbed primary gear | Replace |
| | 4. Badly worn bearing | Replace |
| **Clutch slips.** | 1. Out of adjustment or loss of play | Adjust |
| | 2. Weakened clutch springs | Replace |
| | 3. Worn or distorted pressure plate | Replace |
| | 4. Distorted clutch plate | Replace |
| **Clutch drags.** | 1. Out of adjustment or too much play | Adjust |
| | 2. Weakened some clutch springs | Replace |
| | 3. Distorted pressure plate or clutch plate | Replace |
| **Transmission does not shift.** | 1. Broken gearshift cam | Replace |
| | 2. Distorted gearshift fork | Replace |
| | 3. Worn gearshift pawl | Replace |
| **Transmission does not shift back.** | 1. Broken return spring on shift shaft | Replace |
| | 2. Rubbed or sticky shift shaft | Repair |
| | 3. Distorted or worn gearshift fork | Replace |
| **Transmission jumps out of gear.** | 1. Worn shifting gear on driveshaft or countershaft | Replace |
| | 2. Distorted or worn gearshift fork | Replace |
| | 3. Weakened stopper spring on gearshift stopper | Replace |
| | 4. Worn gearshift pawl | Replace |
| **Engine idles poorly.** | 1. Out of adjustment tappet clearance | Adjust |
| | 2. Poor seated valve | Replace |
| | 3. Defective valve guide | Replace |
| | 4. Worn rocker arm or rocker arm shaft | Replace |
| | 5. Too wide spark plug gap | Adjust or replace |
| | 6. Defective ignition coil | Replace |
| | 7. Defective signal generator or ignitor unit | Replace |
| | 8. Out of adjustment carburetor fuel level | Adjust |
| | 9. Clogged carburetor jet | Clean |
| | 10. Unbalance carburetor | Adjust |
| **Engine runs poorly in high speed range.** | 1. Weakened valve spring | Replace |
| | 2. Worn cam | Replace |
| | 3. Incorrect valve timing | Adjust |
| | 4. Too narrow spark plug gap | Adjust |
| | 5. Ignition unadvanced sufficiently due to poorly working timing advance circuit | Replace |
| | 6. Defective ignition coil | Replace |
| | 7. Defective signal generator or ignitor unit | Replace |
| | 8. Too low fuel level | Adjust |
| | 9. Clogged air cleaner element | Clean |
| | 10. Clogged fuel hose | Clean |

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| COMPLAINT | SYMPTOM AND POSSIBLE CAUSES | REMEDY |
|---|---|---|
| **Exhaust smoke is dirty or heavy.** | 1. Too much engine oil | Drain out excess oil |
| | 2. Worn piston ring or cylinder | Replace |
| | 3. Worn valve guide | Replace |
| | 4. Scored or scuffed cylinder wall | Rebore or replace |
| | 5. Worn valve stem | Replace |
| | 6. Defective stem seal | Replace |
| | 7. Worn oil ring side rail | Replace |
| **Engine lacks power.** | 1. Too small tappet clearance | Adjust |
| | 2. Weakened valve spring | Replace |
| | 3. Incorrect valve timing | Adjust |
| | 4. Worn piston ring or cylinder | Replace |
| | 5. Poor seated valve | Repair |
| | 6. Fouled spark plug | Clean or replace |
| | 7. Incorrect spark plug gap | Adjust or replace |
| | 8. Clogged carburetor jet | Clean |
| | 9. Incorrect fuel level | Adjust |
| | 10. Clogged air cleaner element | Clean |
| | 11. Loosened carburetor balancing screw | Fix |
| | 12. Unreasonable sucked air | Retighten or replace |
| | 13. Too much engine oil | Drain out excess oil |
| **Engine overheats.** | 1. Heavy carbon deposit on piston crown | Clean |
| | 2. Unenough engine oil | Add oil |
| | 3. Defective oil pump | Replace |
| | 4. Clogged oil circuit | Clean |
| | 5. Too low fuel level | Adjust |
| | 6. Unreasonable sucked air | Retighten or replace |
| | 7. Using incorrect engine oil | Change |

## CARBURETOR

| COMPLAINT | SYMPTOM AND POSSIBLE CAUSES | REMEDY |
|---|---|---|
| **Starting troubles.** | 1. Clogged starter jet | Clean |
| | 2. Clogged starter pipe | Clean |
| | 3. Leaked air from joint between starter body and carburetor | Retighten, adjust or replace |
| | 4. Leaked air from carburetor joint or vacuum gauge joint | Check and adjust |
| | 5. Properly unoperated starter plunger | Check and adjust |
| **Idling or low speed troubles.** | 1. Clogged or loosened pilot jet and pilot air jet | Check and clean |
| | 2. Leaked air from carburetor joint, vacuum gauge joint or starter | Check and clean |
| | 3. Clogged pilot outlet or bypass | Check and clean |
| | 4. Unfully closed starter plunger | Check and adjust |
| **Medium or high speed troubles.** | 1. Clogged main jet or main air jet | Check and clean |
| | 2. Clogged needle jet | Check and clean |
| | 3. Properly unoperated throttle valve | Check |
| | 4. Clogged fuel filter | Check and clean |

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| COMPLAINT | SYMPTOM AND POSSIBLE CAUSES | REMEDY |
|---|---|---|
| **Overflow and/or fuel level fluctuates.** | 1. Worn or damaged needle valve<br>2. Broken needle valve spring<br>3. Properly unworked float<br>4. Adhered foreign matter on needle valve<br>5. Too high or low fuel level | Replace<br>Replace<br>Check and adjust<br>Clean<br>Adjust |

## ELECTRICAL

| COMPLAINT | SYMPTOM AND POSSIBLE CAUSES | REMEDY |
|---|---|---|
| **No-sparking or poor sparking.** | 1. Defective ignition coil<br>2. Defective spark plug<br>3. Defective signal generator or ignitor unit | Replace<br>Replace<br>Replace |
| **Spark plug fouls soon with carbon.** | 1. Too rich fuel/air mixture<br>2. High idling speed<br>3. Incorrect used gasoline<br>4. Dirty air cleaner element | Adjust carburetion<br>Adjust<br>Change<br>Clean |
| **Spark plug fouls soon.** | 1. Worn piston ring<br>2. Worn piston or cylinder<br>3. Excessive valve stem/guide clearance<br>4. Worn valve stem oil seal | Replace<br>Replace<br>Replace<br>Replace |
| **Spark plug electrode overheats or burns.** | 1. Overheated engine<br>2. Loosened spark plug<br>3. Too lean fuel/air mixture | Tune up<br>Retighten<br>Adjust carburetion |
| **Generator does not charge.** | 1. Opened or shorted lead wire<br>2. Loosened lead connection<br>3. Shorted, grounded or opened generator coil<br>4. Shorted or punctured regulator and rectifier | Repair or replace<br>Fix<br>Replace<br>Replace |
| **Generator charges below than specification.** | 1. Tended lead wire to get shorted or open-circuited or loosely connected at terminals<br>2. Grounded or open-circuited generator stator coil<br>3. Defective regulator and rectifier<br>4. Unenough battery electrolyte<br>5. Defective battery cell plates | Repair or fix<br>Replace<br>Replace<br>Add distilled water<br>Replace battery |
| **Generator overcharges.** | 1. Short-circuited battery interior<br>2. Damaged or defective regulator resistor element<br>3. Poorly grounded regulator | Replace battery<br>Replace<br>Clean and tighten |
| **Charging is unstable.** | 1. Frayed lead wire insulation due to vibration, resulting in intermittent shorting<br>2. Shorted generator interior<br>3. Defective regulator and rectifier | Repair or replace<br>Replace<br>Replace |
| **Starter button is ineffective.** | 1. Run down battery<br>2. Defective switch contact<br>3. Properly unseated brush on starter motor commutator<br>4. Defective starter relay<br>5. Defective side-stand relay<br>6. Defective side-stand switch or neutral switch | Repair or replace<br>Replace<br>Repair or replace<br>Replace<br>Replace<br>Replace |

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## BATTERY

| SYMPTON | PROBABLE CAUSE | REMEDY |
|---|---|---|
| **"SULFATION": acidic white powdery substance or spots on cell plates surface.** | 1. Unenough electrolyte | Add distilled water and recharge it. —If the battery seems not to damage, "sulfation" has not advanced too far. |
| | 2. Cracked battery case | Replace battery. |
| | 3. Left battery for a long time in a run-down condition | Replace battery. |
| | 4. Contaminated electrolyte (Foreign matter has entered in the battery and become mixed with the electrolyte.) | If "sulfation" seems not to advance too far, try to restore the battery to replace with new electrolyte, and recharge it fully. |
| **Battery runs down quickly.** | 1. Incorrect charging method | Check the generator, regulator/rectifier and circuit connections, and make necessary adjustments to obtain specified charging operation. |
| | 2. Lost active material in cell plate as a result of overcharging | Replace battery and correct charging method. |
| | 3. Battery existing short-circuit condition due to excessive accumulation of sediments caused by high electrolyte specific gravity | Replace battery. |
| | 4. Too low electrolyte specific gravity | Recharge battery fully under specified charging current. |
| | 5. Contaminated electrolyte | Replacing electrolyte, recharge the battery. |
| | 6. Too old battery | Replace battery. |
| **Battery polarity reverses.** | The battery has been connected the wrong way round in the system, so that it is being charged in the reverse direction. | Replace battery and be sure to connect the battery properly. |
| **Battery causes "sulfation".** | 1. Too low or too high charging rate. (Unused battery should be recharged at least once a month to avoid sulfation.) | Replace battery. |
| | 2. Unreasonable battery electrolyte level | Keep the electrolyte to "MAX" level. |
| | 3. Too high or too low specific gravity | Adjust the specific gravity by consulting battery maker's directions. |
| | 4. Left battery unused for too long in cold climate | Replace battery, if badly sulfated. |
| **Battery discharges too rapidly.** | 1. Dirty container top and sides | Clean |
| | 2. Impurities in the electrolyte | Change electrolyte. |
| | 3. Too high electrolyte specific gravity | Change electrolyte by consulting battery maker's directions. |

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## CHASSIS

| COMPLAINT | SYMPTOM AND POSSIBLE CAUSES | REMEDY |
|---|---|---|
| **Steering is heavy.** | 1. Overtightened steering stem nut<br>2. Broken steering stem bearing<br>3. Distorted steering stem<br>4. Unenough tire pressure | Adjust<br>Replace<br>Replace<br>Adjust |
| **Handle is wobbly.** | 1. Unbalance of right and left front forks<br>2. Distorted front fork<br>3. Distorted front axle<br>4. Crooked tire | Replace<br>Repair or replace<br>Replace<br>Replace |
| **Front wheel is wobbly.** | 1. Distorted wheel rim<br>2. Worn down front wheel bearing<br>3. Defective or incorrect tire<br>4. Loosened front axle<br>5. Incorrect front fork oil level | Replace<br>Replace<br>Replace<br>Retighten<br>Adjust |
| **Front suspension is too soft.** | 1. Weakened spring<br>2. Unenough fork oil level | Replace<br>Refill |
| **Front suspension is too stiff.** | 1. Too viscous fork oil<br>2. Too much fork oil | Replace<br>Drain excess oil |
| **Front suspension is noisy.** | 1. Unenough fork oil level<br>2. Loosened suspension mountings | Refill<br>Retighten |
| **Rear wheel is wobbly.** | 1. Distorted wheel rim<br>2. Worn down rear wheel or swingarm bearing<br>3. Defective or incorrect tire<br>4. Worn swingarm and rear cushion bearing<br>5. Loosened suspension mountings | Replace<br>Replace<br>Replace<br>Replace<br>Retighten |
| **Rear suspension is too soft.** | 1. Weakened shock absorber spring<br>2. Improper rear suspension adjuster setting<br>3. Leaked shock absorber oil | Replace<br>Adjust<br>Replace |
| **Rear suspension is too stiff.** | 1. Improper rear suspension adjuster setting<br>2. Bent shock absorber shaft<br>3. Bent swingarm<br>4. Worn swingarm and rear cushion bearing | Adjust<br>Replace<br>Replace<br>Replace |
| **Rear suspension is noisy.** | 1. Loosened suspension mountings<br>2. Worn swingarm and rear cushion bearing | Retighten<br>Replace |

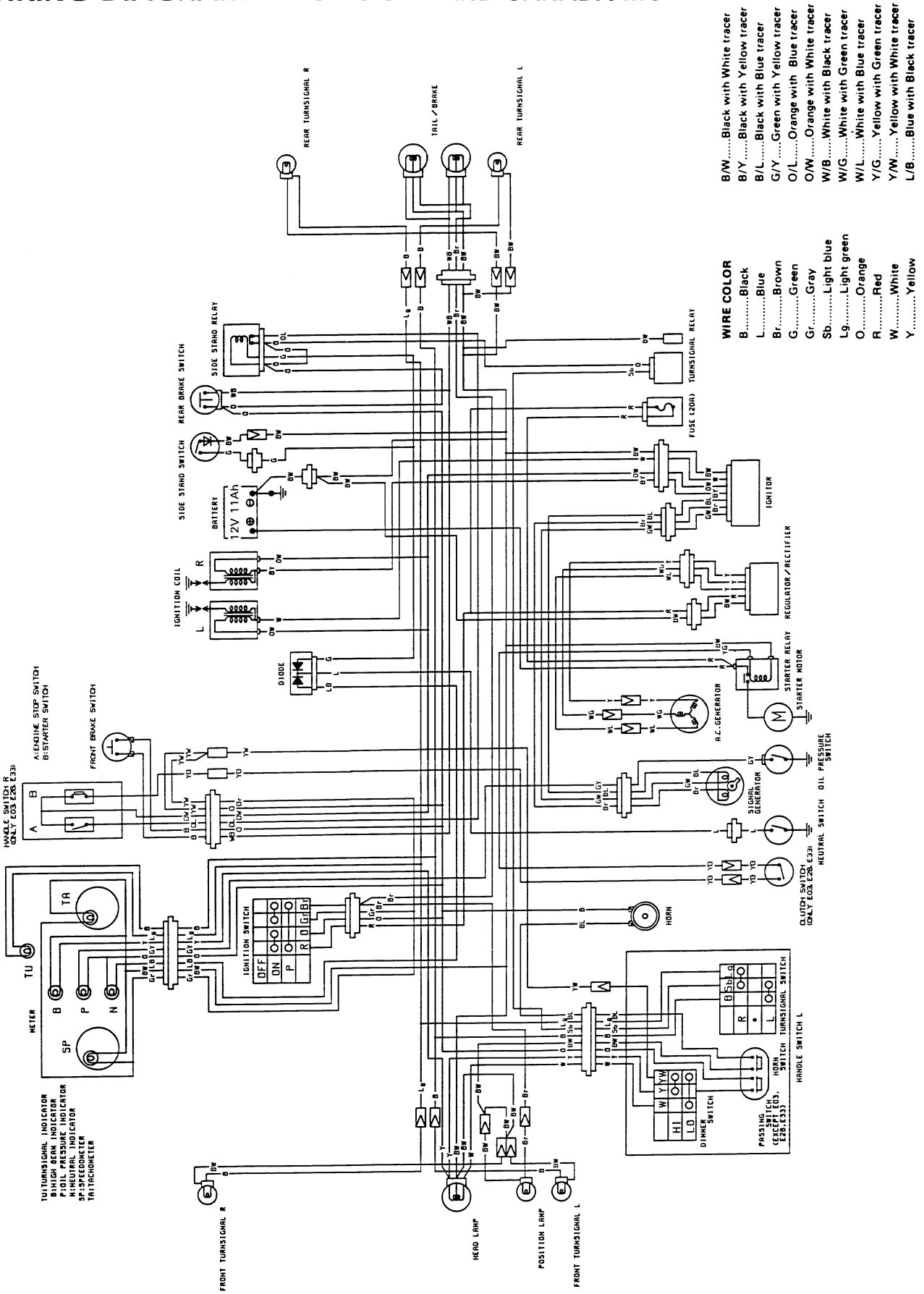
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## BRAKES

| COMPLAINT | SYMPTOM AND POSSIBLE CAUSES | REMEDY |
|---|---|---|
| **Brake power is insufficient.** | 1. Leaked brake fluid<br>2. Worn pad<br>3. Adhered oil to pad surface<br>4. Worn disc<br>5. Entered air in hydraulic system | Repair or replace<br>Replace<br>Clean disc and pad<br>Replace<br>Bleed air |
| **Brake squeaks.** | 1. Adhered carbon to surface<br>2. Tilted pad<br>3. Damaged wheel bearing<br>4. Loosened front and rear wheel axles<br>5. Worn pad<br>6. Contaminated brake fluid<br>7. Clogged master cylinder return port | Repair with sandpaper<br>Modify pad fitting<br>Replace<br>Tighten to specified torque<br>Replace<br>Replace brake fluid<br>Clean |
| **Brake lever stroke is excessive.** | 1. Entered air in hydraulic system<br>2. Insufficient brake fluid<br>3. Improper brake fluid quality | Bleed air<br>Replenish<br>Replace |
| **Brake fluid leaks.** | 1. Insufficient connection joint tightening<br>2. Cracked brake hose<br>3. Worn piston and/or cup | Retighten<br>Replace<br>Replace |

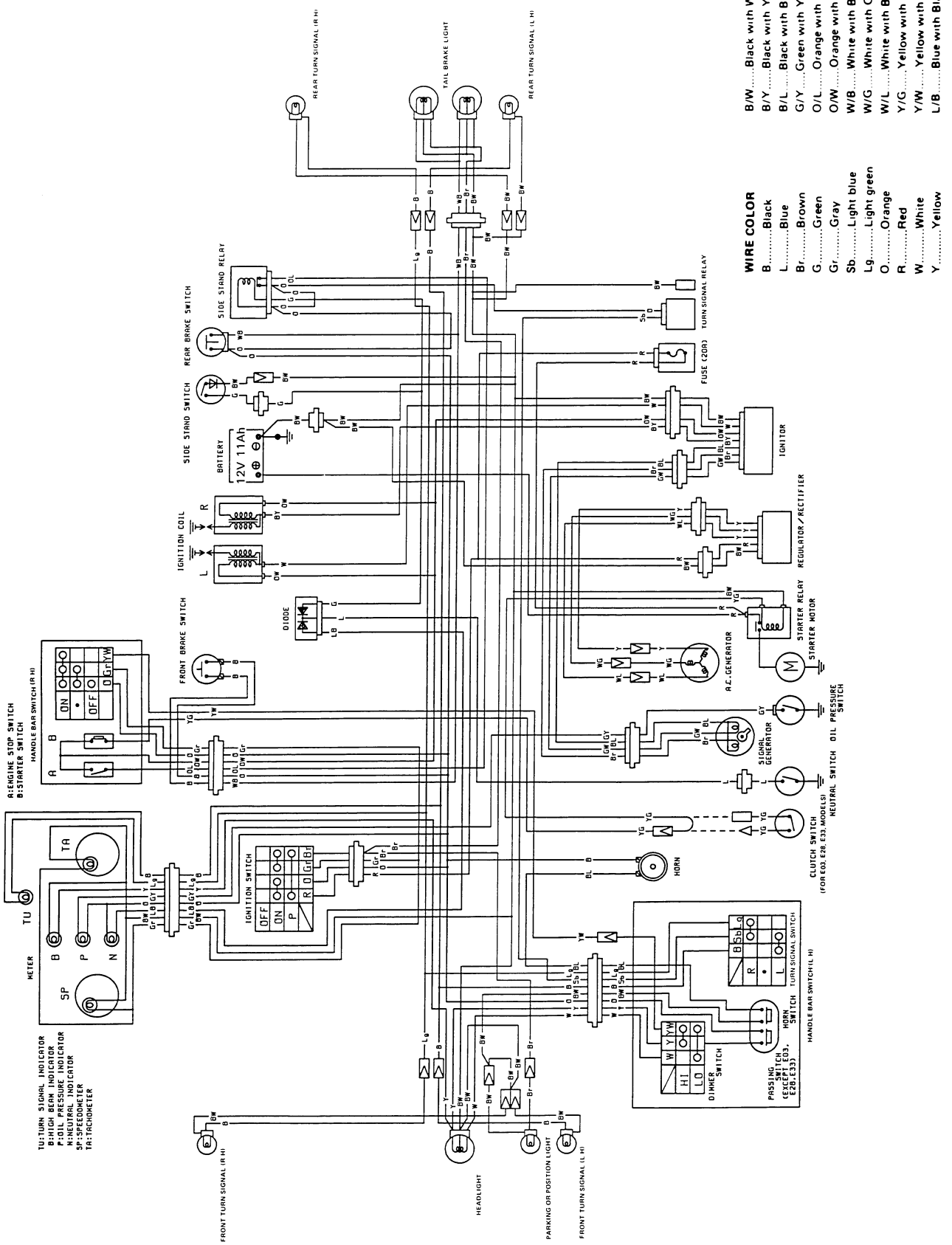
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# WIRING DIAGRAM FOR U.S.A. AND CANADA MODELS




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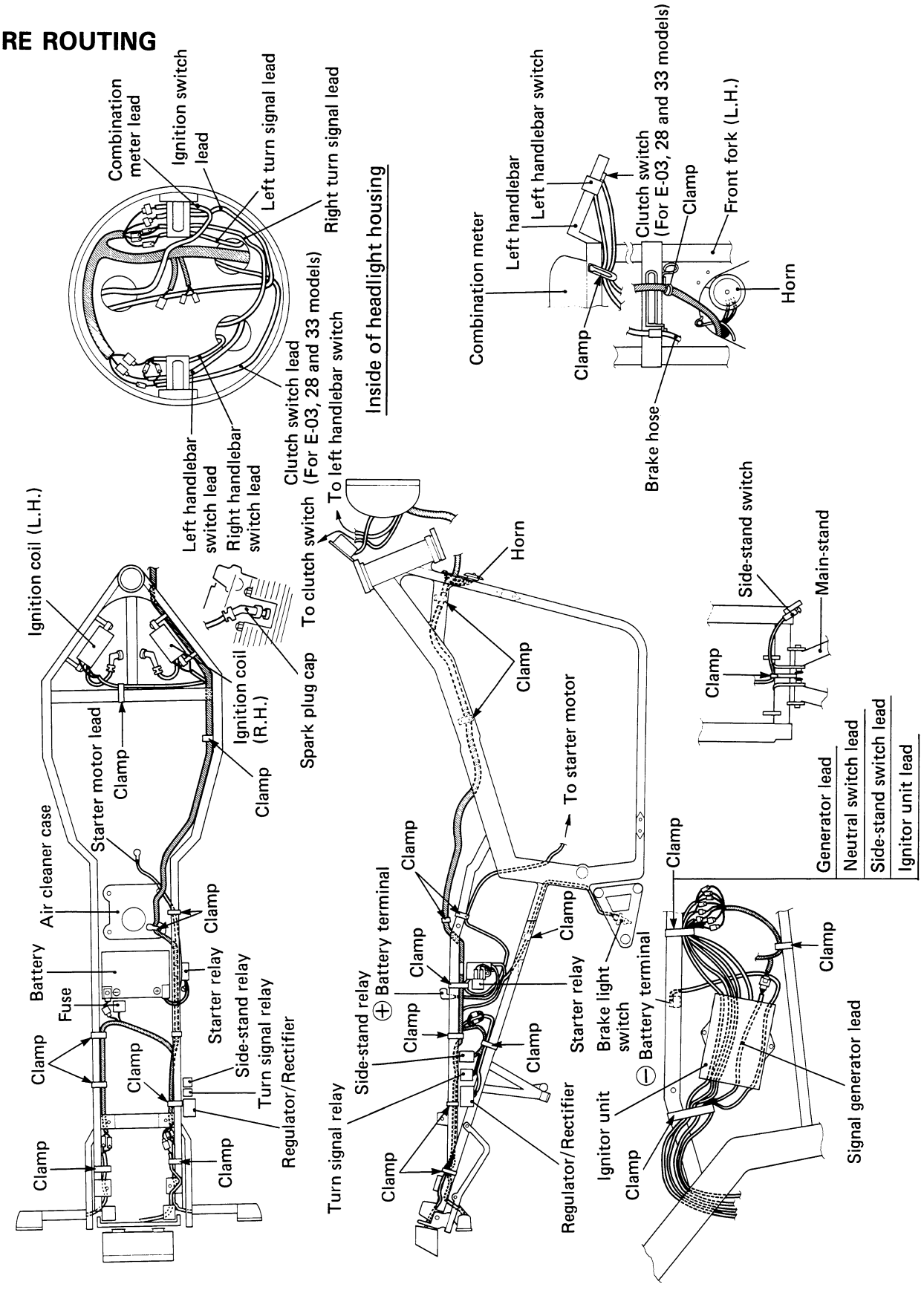
# FOR OTHER MODELS




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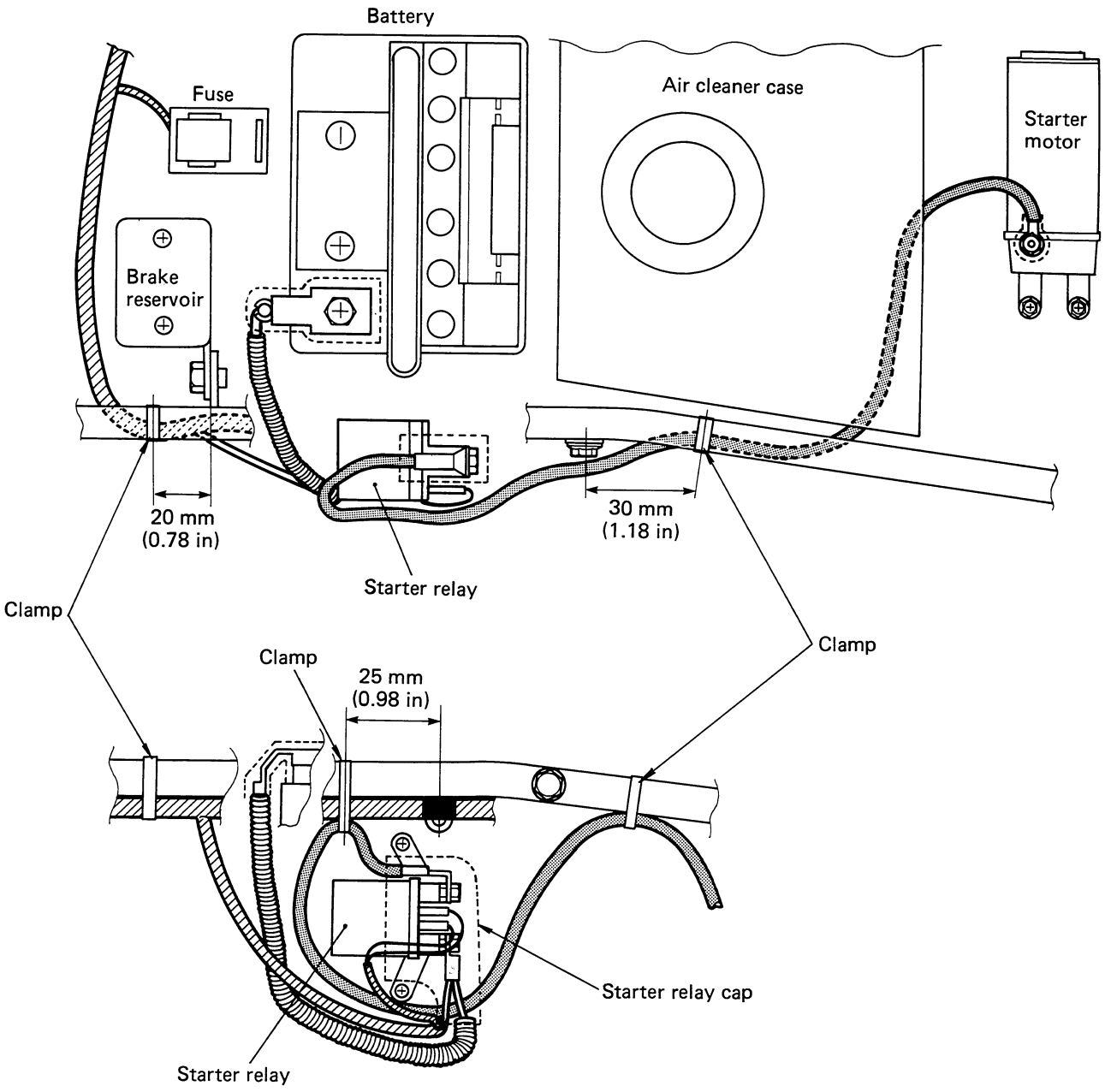
# WIRE HARNESS, CABLE AND HOSE ROUTING

## WIRE ROUTING



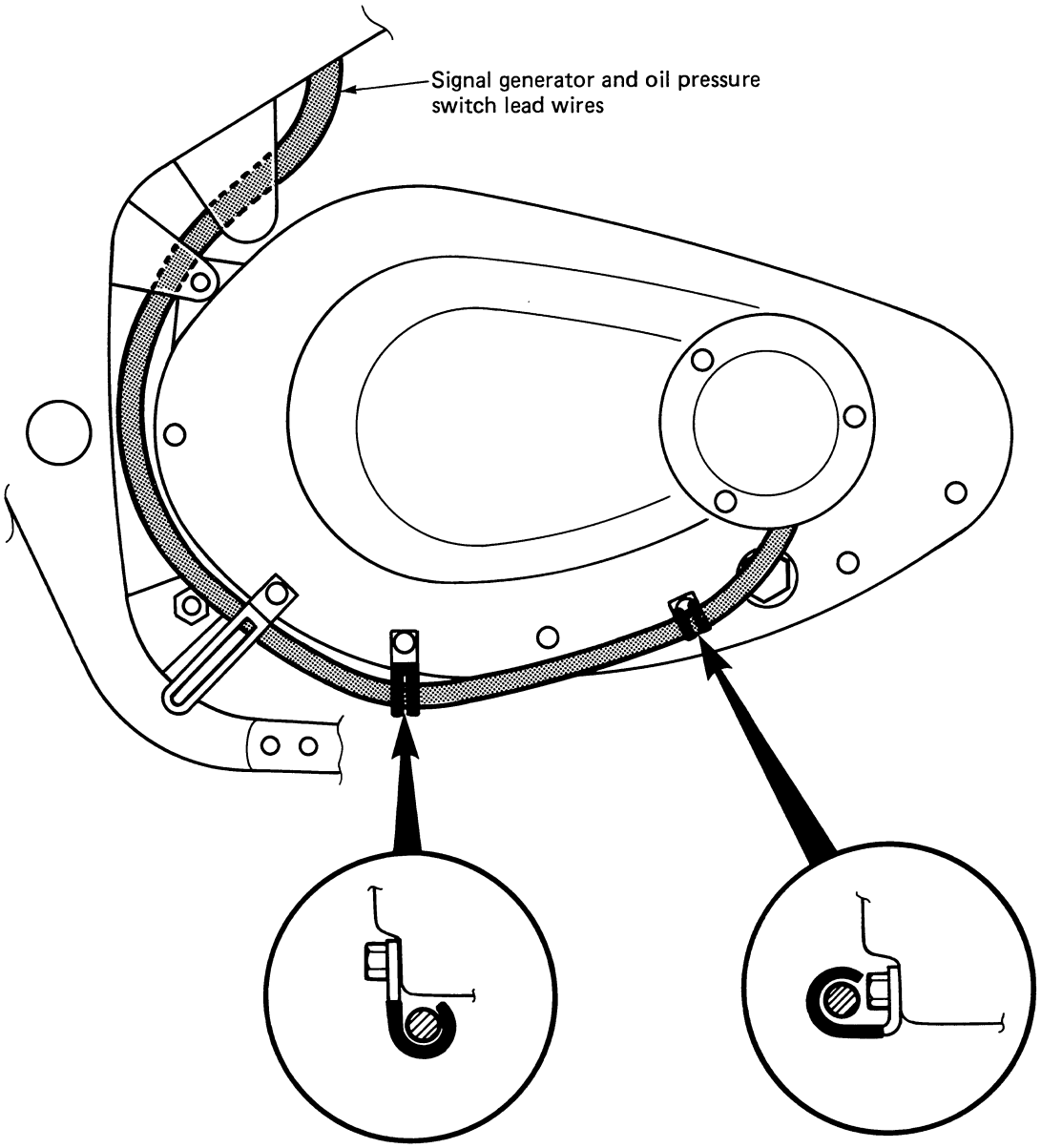

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## WIRE ROUTING



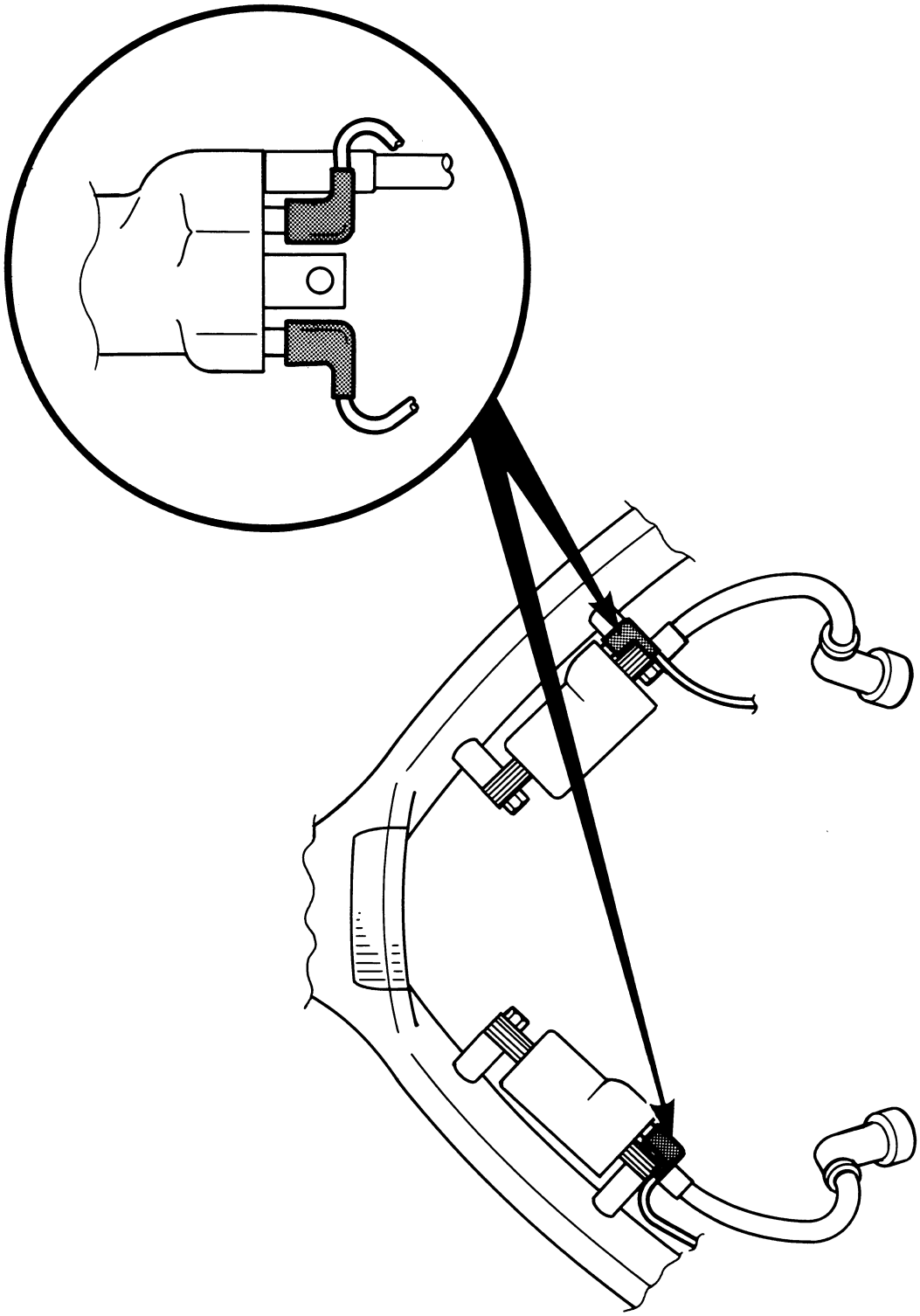

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## ENGINE LEAD WIRES



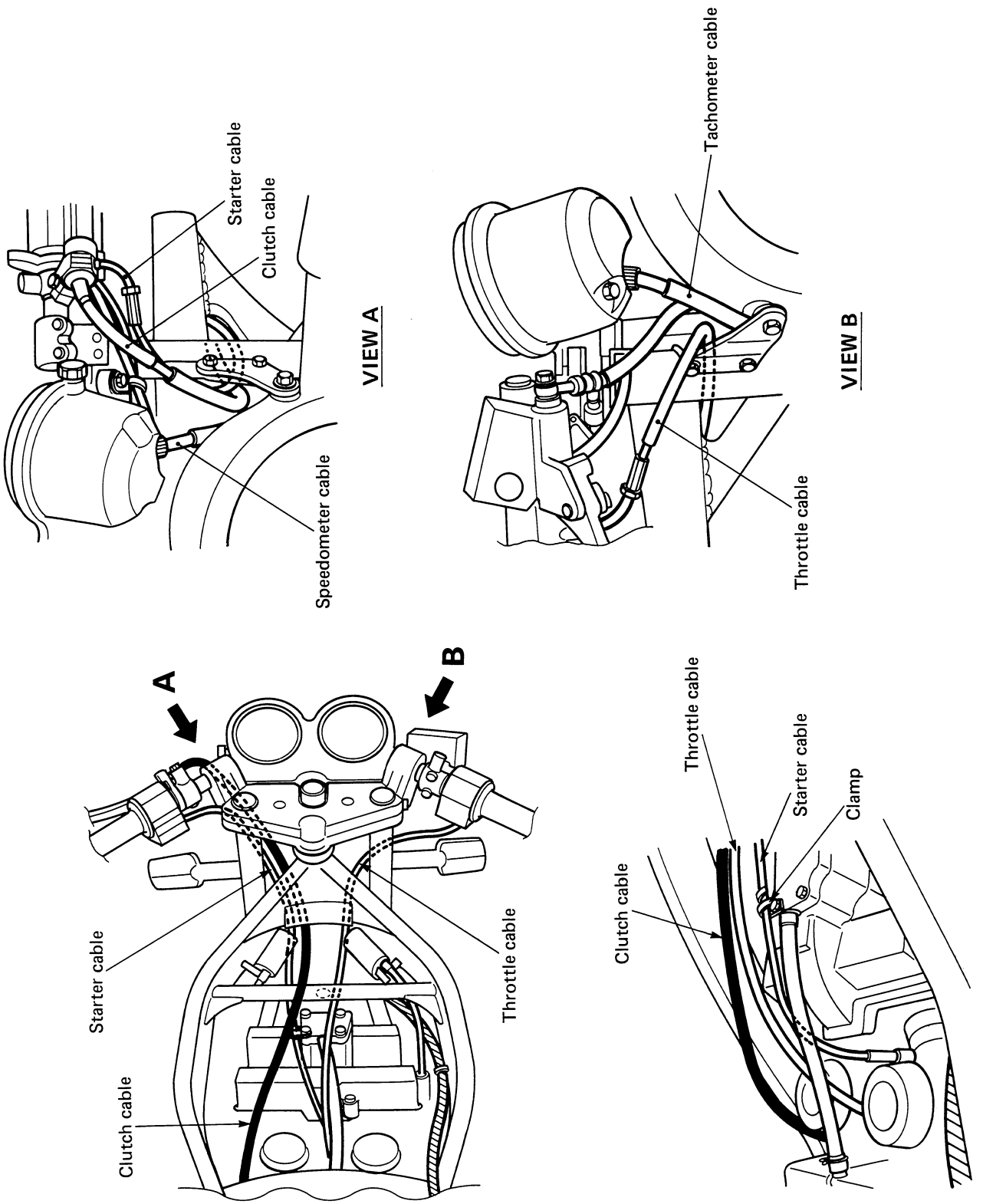

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## HIGH TENSION CORD ROUTING



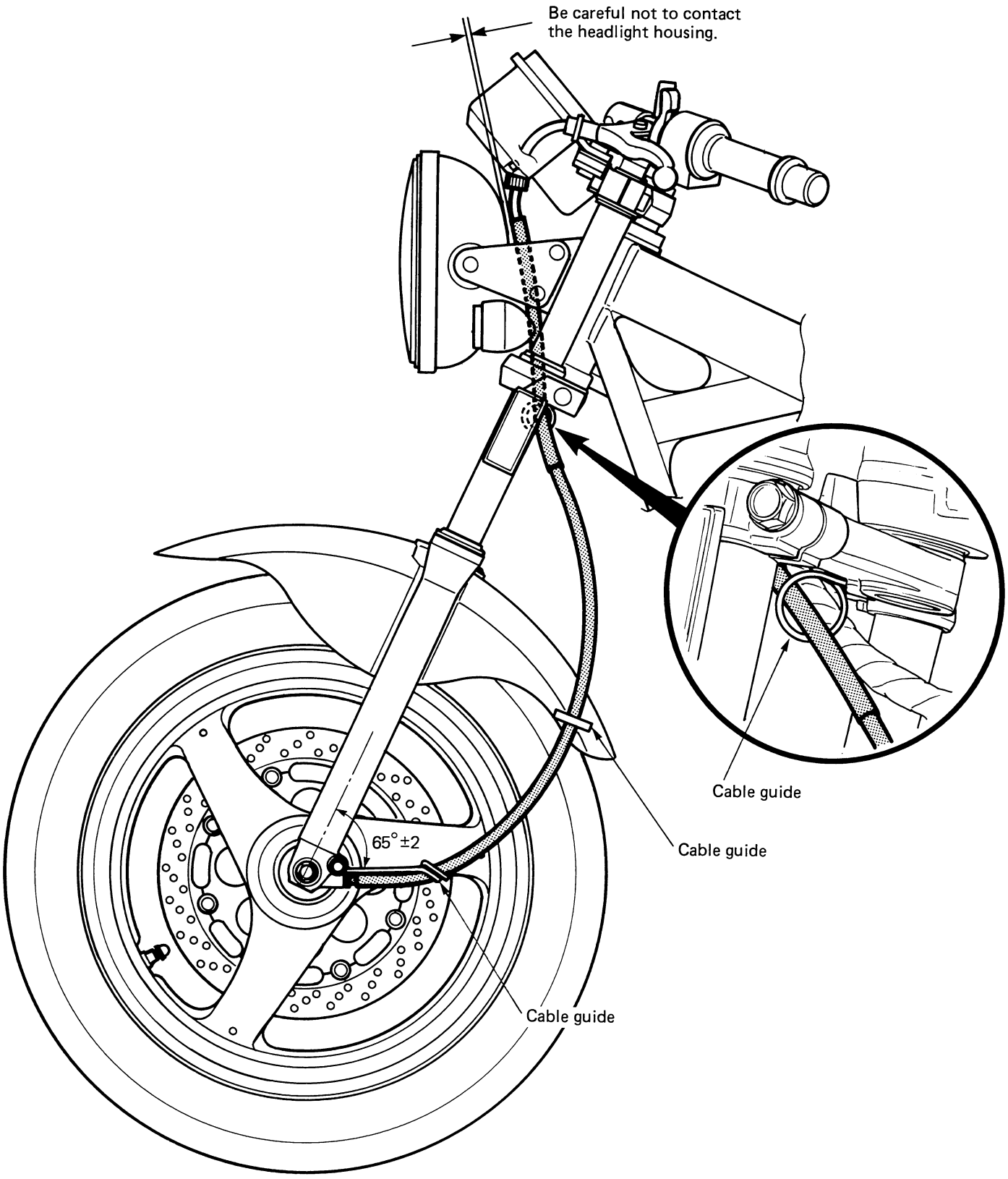
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## CABLE ROUTING



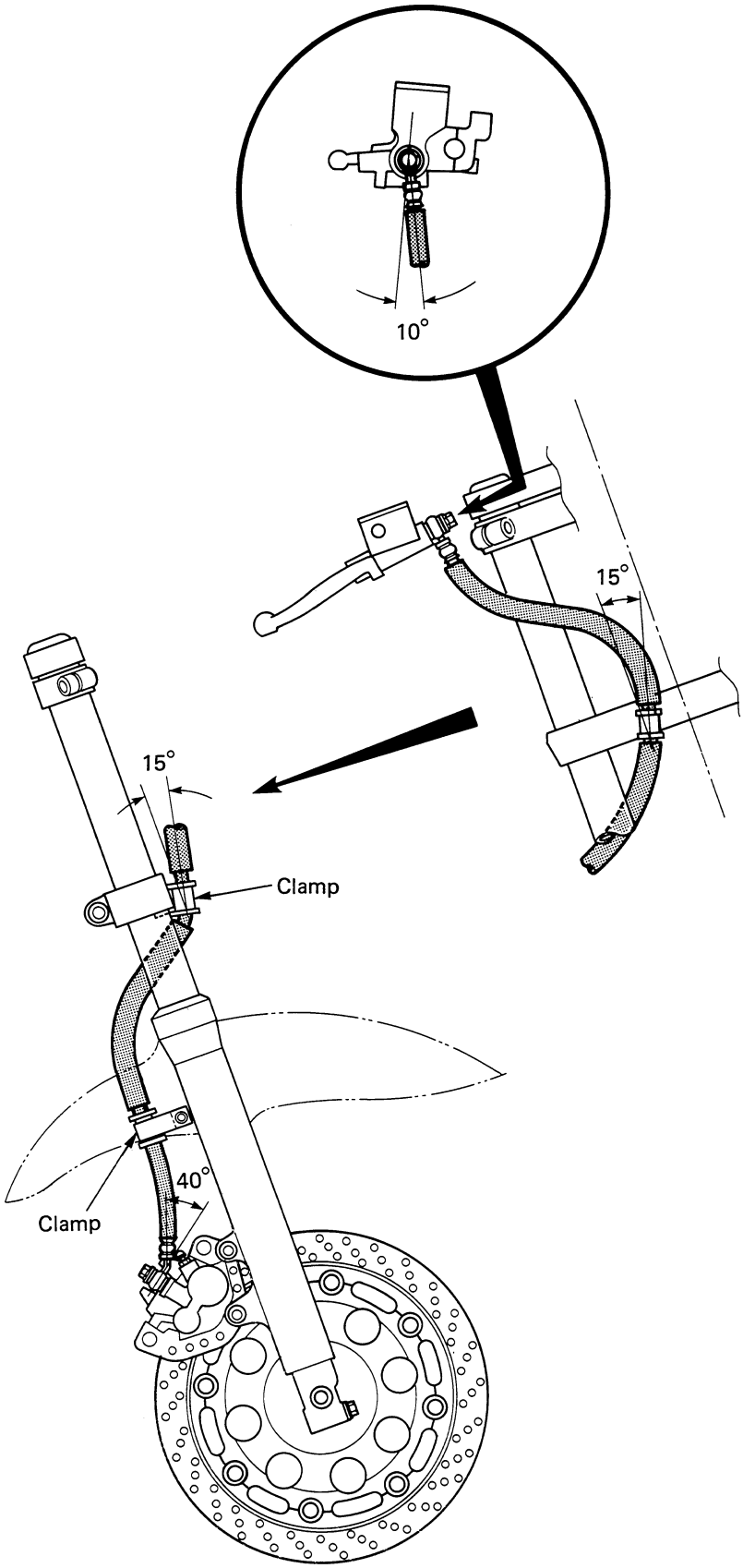

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## SPEEDOMETER CABLE ROUTING



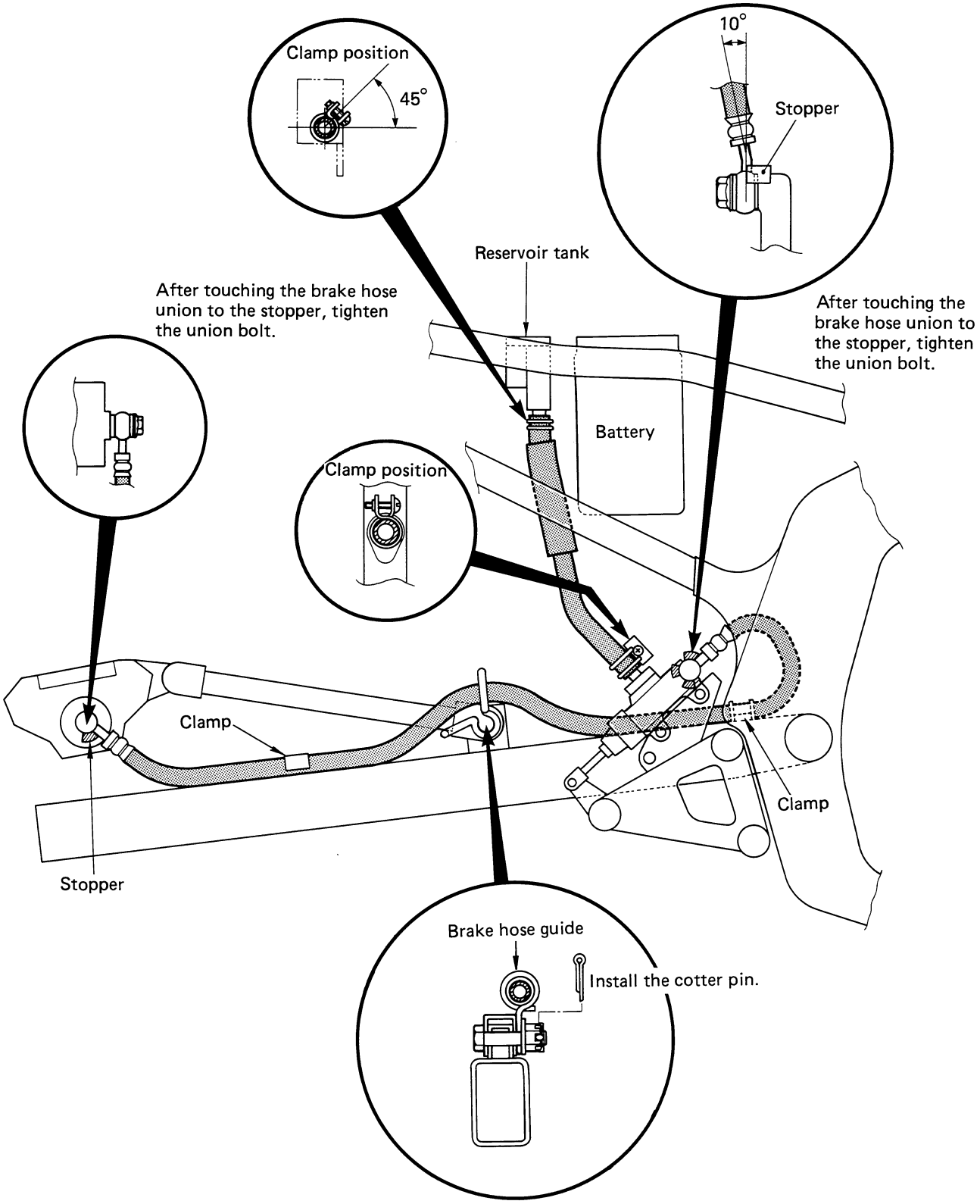

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## FRONT BRAKE HOSE ROUTING



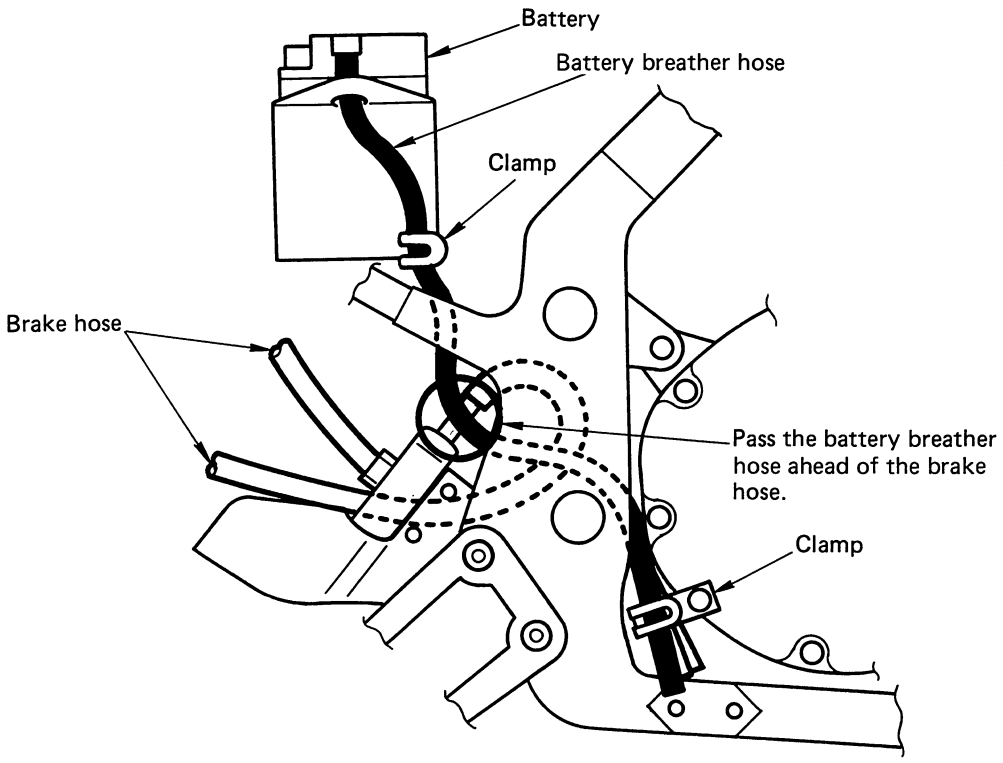

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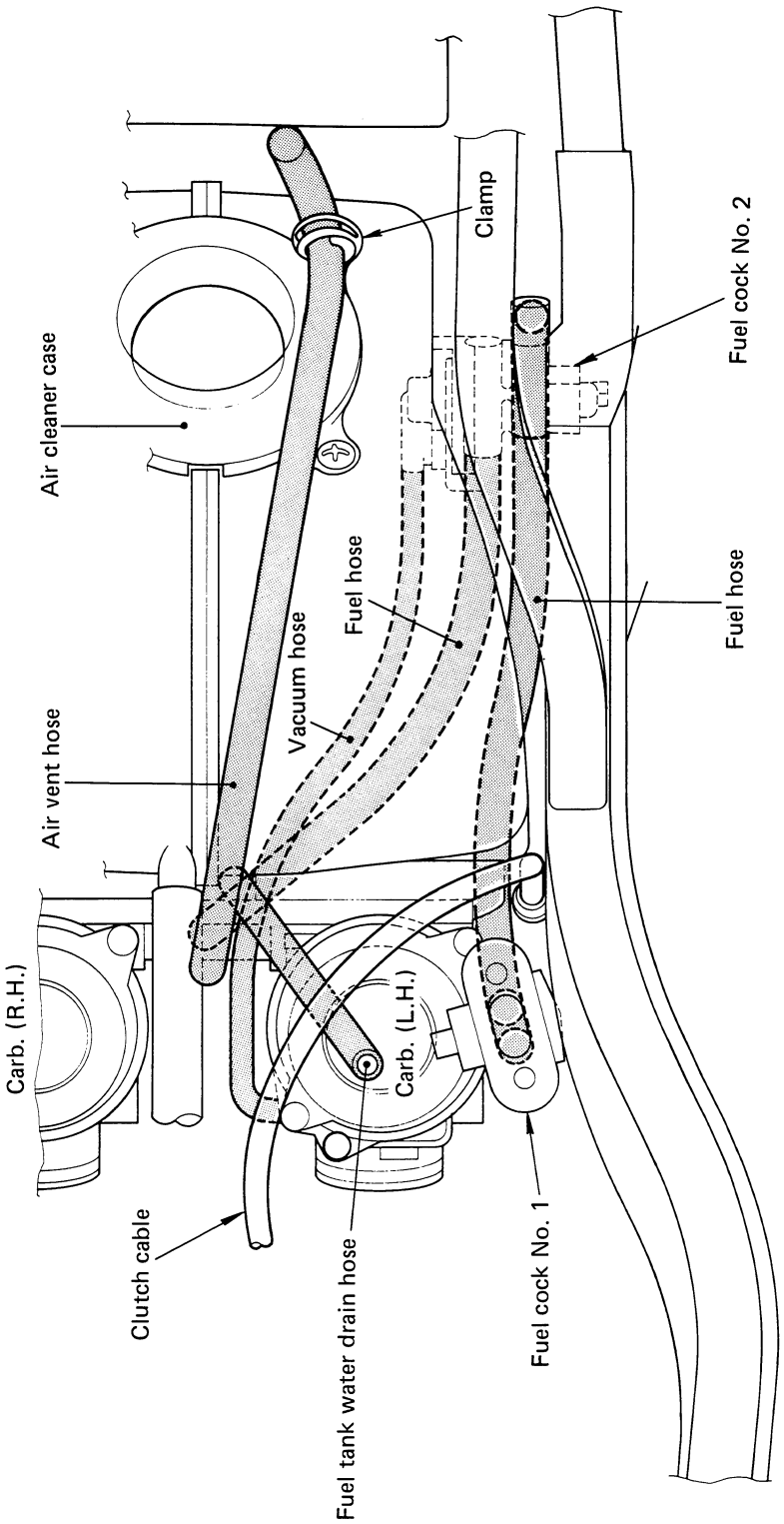

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# BATTERY BREATHER HOSE ROUTING



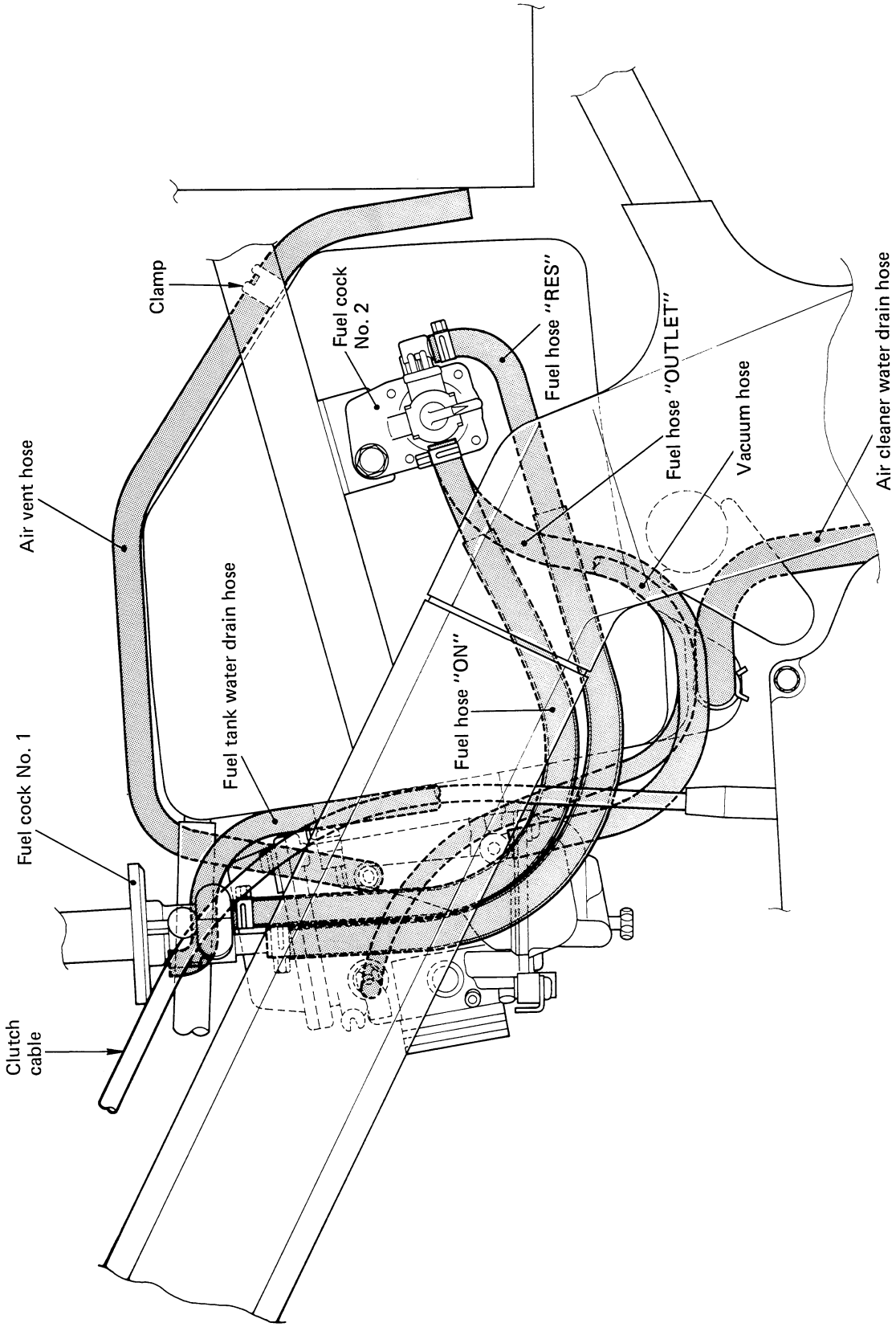

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# FUEL HOSE, VACUUM HOSE AND AIR VENT HOSE ROUTING



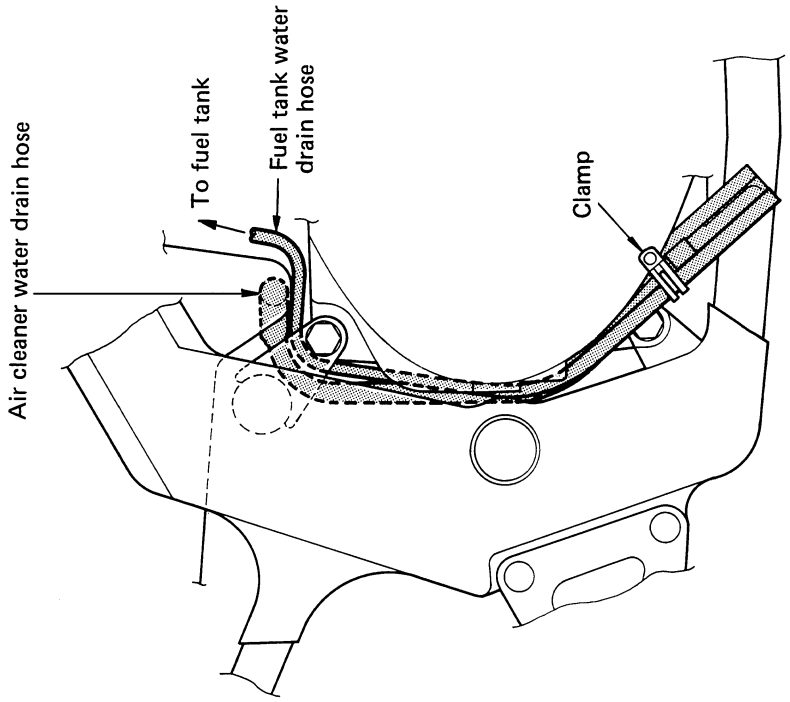

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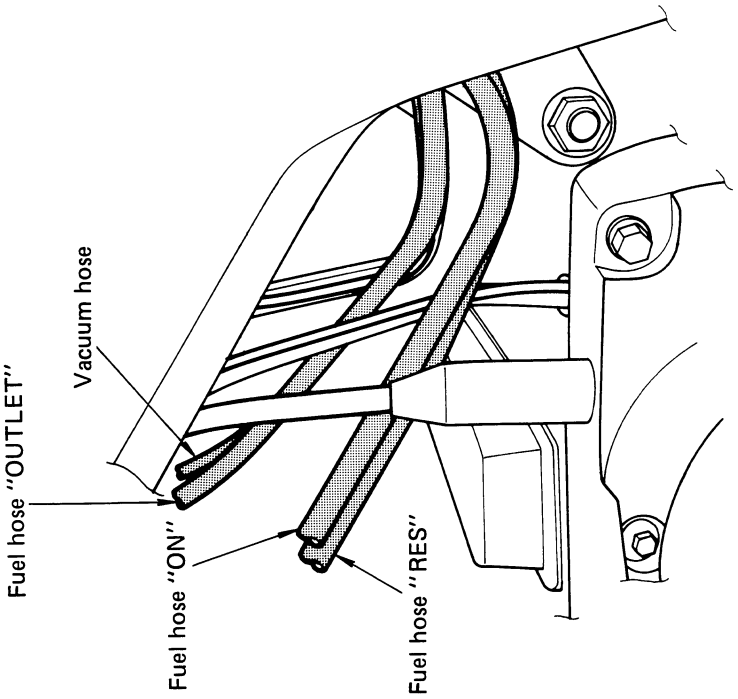
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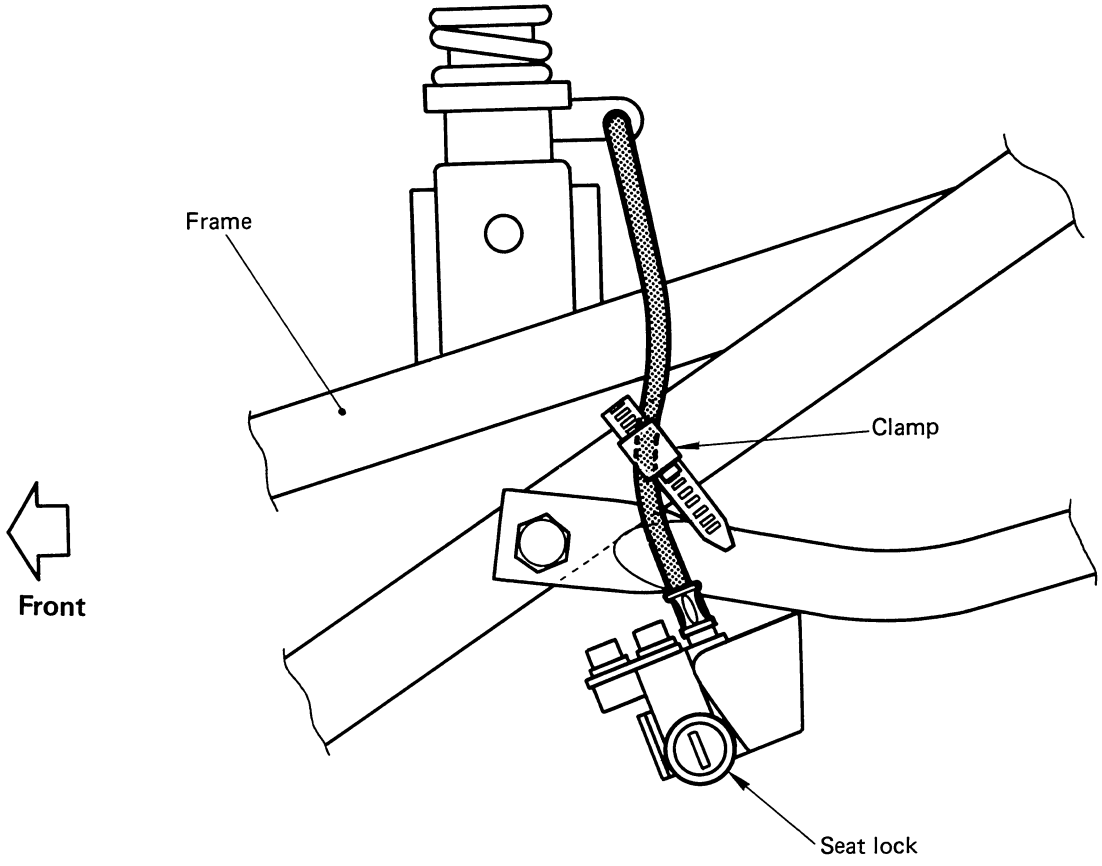
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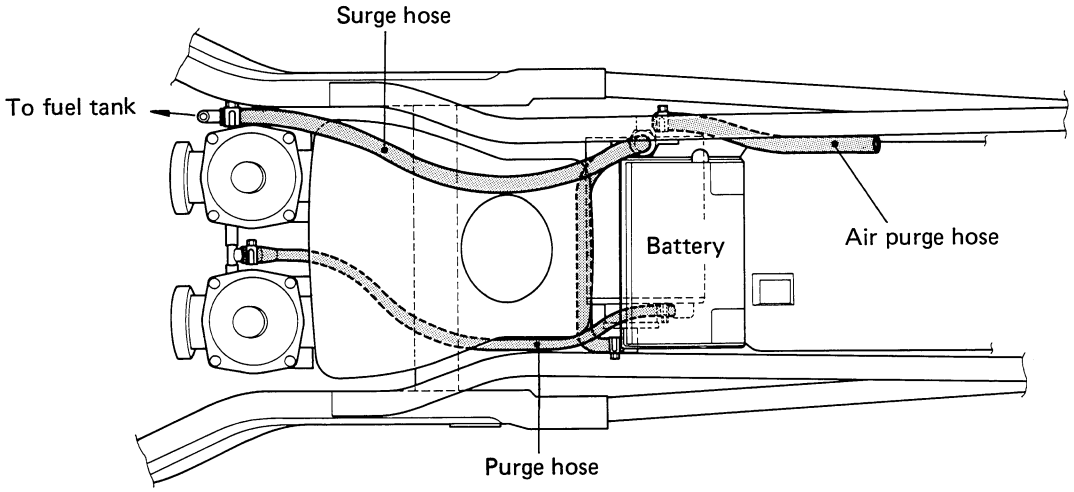

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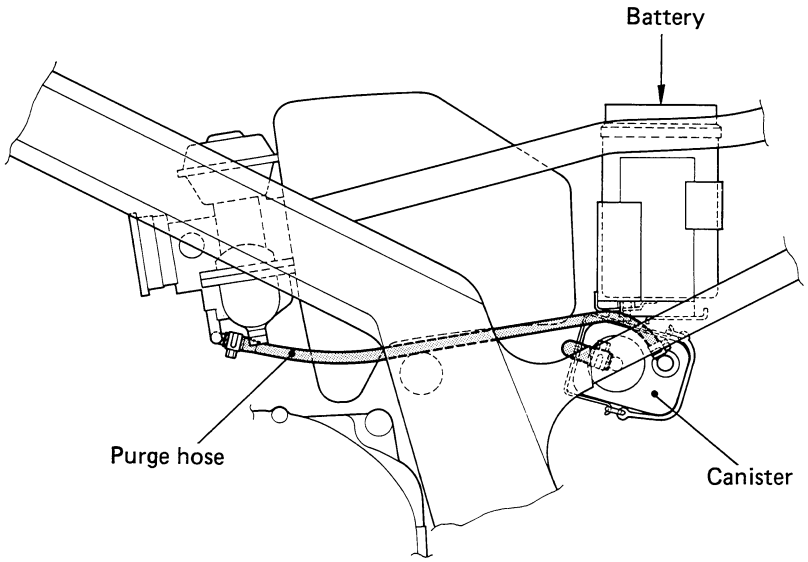
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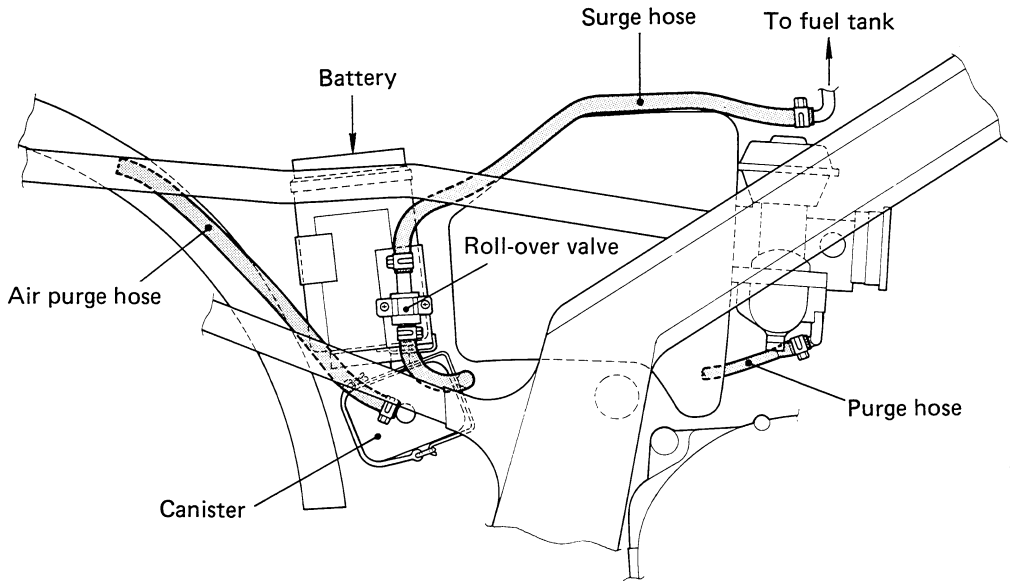



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## CANISTER HOSE ROUTING
## (For CALIFORNIA model)

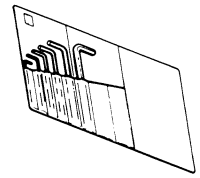
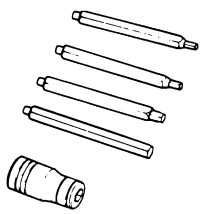
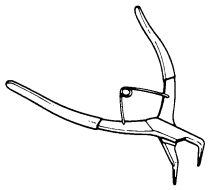
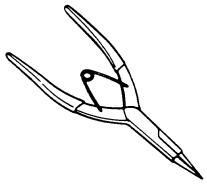
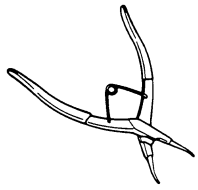
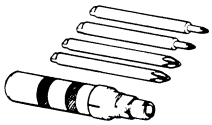
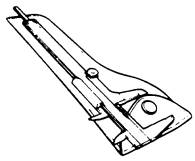
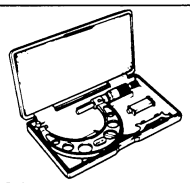
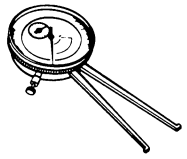
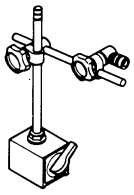
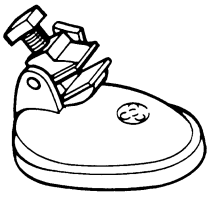
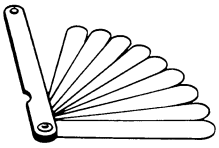
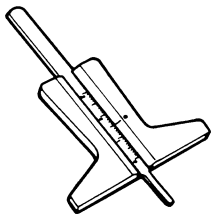
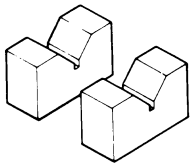
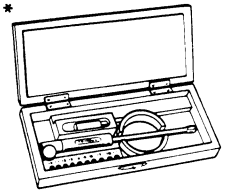
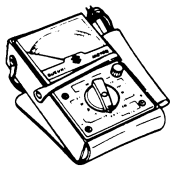
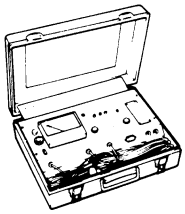
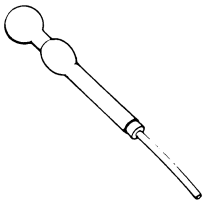
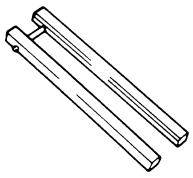
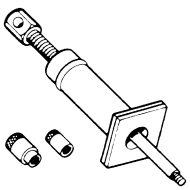
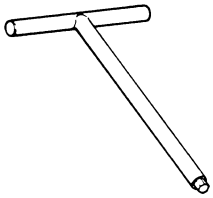
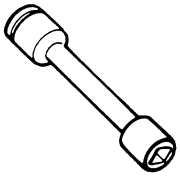
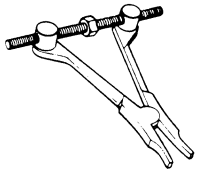
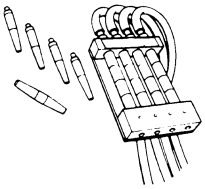


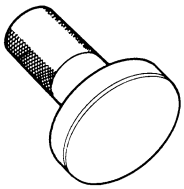
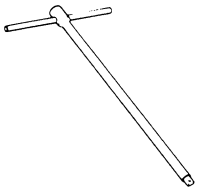
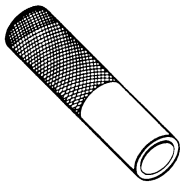
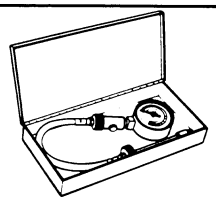
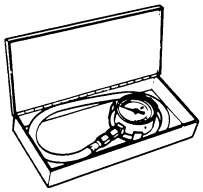
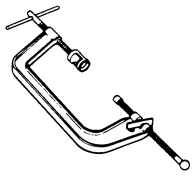
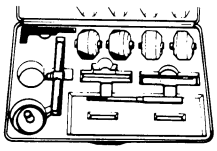
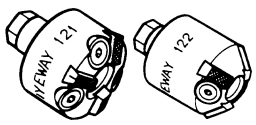
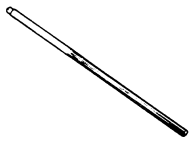
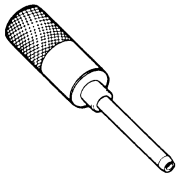
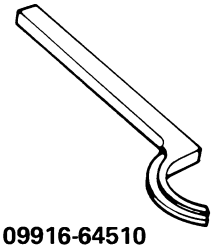
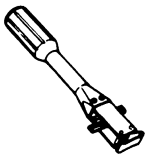
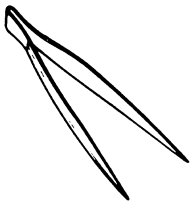
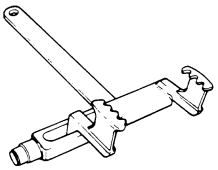
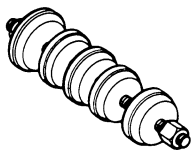
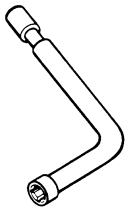
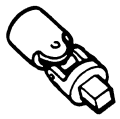
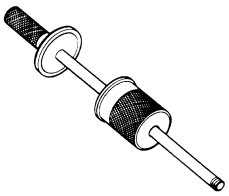
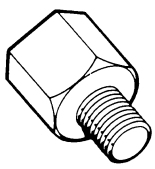
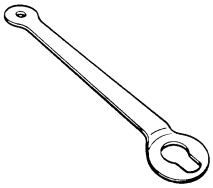
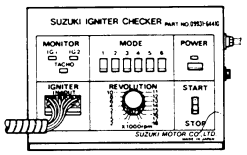
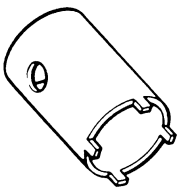
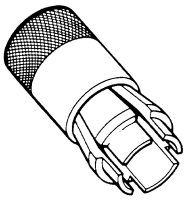




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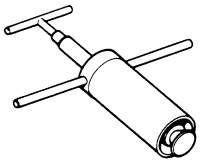
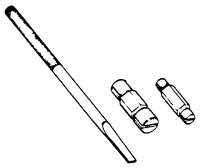
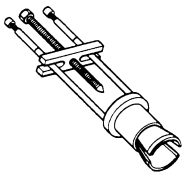
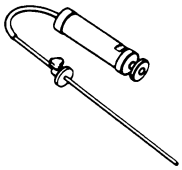
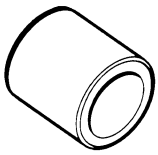
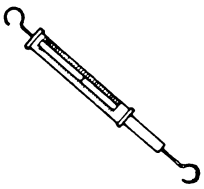
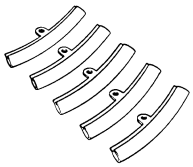
# SPECIAL TOOLS

| | | | | |
|---|---|---|---|---|
| <br>09900-00401<br>"L" type hexagon wrench set | * <br>09900-00410<br>Hexagon wrench set | <br>09900-06105<br>Snap ring pliers | <br>09900-06107<br>Snap ring pliers | <br>09900-06108<br>Snap ring pliers |
| <br>09900-09003<br>Impact driver set | <br>09900-20102<br>Vernier calipers (1/20 mm, 200 mm) | <br>09900-20202<br>Micrometer (1/100 mm, 25-50 mm) | <br>09900-20203<br>Micrometer (1/100 mm, 50-75 mm) | <br>09900-20205<br>Micrometer (1/1000 mm, 0-25 mm) |
| <br>09900-20508<br>Cylinder gauge set (1/100 mm , 40-80 mm) | <br>09900-20602<br>Dial gauge (1/1000 mm, 1mm) | * <br>09900-20605<br>Dial calipers (1/100 mm, 10-34 mm) | <br>09900-20606<br>Dial gauge (1/100 mm, 10 mm) | * <br>09900-20701<br>Magnetic stand |
| * <br>09900-20702<br>Micrometer stand | <br>09900-20803<br>Thickness gauge | * <br>09900-20805<br>Tire depth gauge | * <br>09900-21304<br>V-block set (100 mm) | * <br>09900-22301<br>Plastigauge |
| * <br>09900-22403<br>Small bore gauge (18-35 mm) | <br>09900-25002<br>Pocket tester | <br>09900-28106<br>Electro tester | <br>09900-28403<br>Hydrometer | <br>09910-20116<br>Conrod stopper |
| <br>09910-34510<br>Piston pin puller | <br>09911-73730<br>"T" type hexagon wrench (5 mm) | <br>09911-74510<br>Long socket (14 mm) | <br>09912-34510<br>Cylinder disassembler | <br>09913-13121<br>Carburetor balancer |

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| | | | | |
|---|---|---|---|---|
| <br>09913-75520<br>Bearing installer | <br>09914-24510<br>T-handle | <br>09914-25811<br>"T" type hexagon wrench (6 mm) | <br>09914-79610<br>Bearing and oil seal installer | <br>09915-64510<br>Compression gauge<br>09915-63210<br>(Adaptor) |
| <br>09915-74510<br>Oil pressure gauge<br>09915-77330(Meter) | <br>09916-14510<br>Valve lifter | <br>09916-24900<br>Valve seat cutter set | <br>See page 3-22.<br>Valve seat cutter head<br>45°, 15° and 75° | <br>09916-34520<br>Valve guide reamer<br>(7 mm) |
| <br>09916-34531<br>Valve guide reamer<br>(12.3 mm) | <br>09916-34541<br>Valve guide reamer handle | <br>09916-44511<br>Valve guide remover | <br>09916-54531<br>Attachment | <br>09916-57321<br>Valve guide installer handle |
| <br>09916-64510<br>Tappet depressor | <br>09916-74521<br>Piston ring compressor body | <br>09916-74540<br>Piston ring compressor band (63-75 mm) | <br>09916-84510<br>Tweezers | <br>09920-53710<br>Clutch sleeve hub holder |
| <br>09923-73210<br>Bearing puller<br>(17-20 mm) | <br>09924-84510<br>Bearing installer set | <br>09930-11910<br>Torx wrench | <br>09930-14530<br>Universal joint | <br>09930-30102<br>Sliding shaft |
| <br>09930-33710<br>Rotor remover attachment | <br>09930-44511<br>Generator rotor holder | <br>09931-64430<br>Ignitor checker (Digital type) | <br>09940-14911<br>Steering stem nut wrench | <br>09940-50112<br>Front fork oil seal installer |

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| | | | | |
|---|---|---|---|---|
|  09941-34513 Steering outer race installer |  09941-44510 Swingarm bearing remover |  09941-50110 Bearing remover |  09941-74910 Steering bearing installer |  09941-84510 Bearing remover |
|  09943-74111 Front fork oil level gauge |  09911-94530 Attachment |  09940-92710 Spring scale |  09941-94510 Rim protector | |

* : Tools asterisked on above are unavailable in U.S.A.

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# TIGHTENING TORQUE

## ENGINE

| ITEM | N·m | kg-m | lb-ft |
|---|---|---|---|
| Cylinder head cover bolt | 13 – 15 | 1.3 – 1.5 | 9.5 – 11.0 |
| Cylinder head nut | 35 – 40 | 3.5 – 4.0 | 25.5 – 29.0 |
| Cylinder head bolt | 8 – 12 | 0.8 – 1.2 | 6.0 – 8.5 |
| Cylinder stud bolt | 13 – 16 | 1.3 – 1.6 | 9.5 – 11.5 |
| Camshaft journal holder bolt | 8 – 12 | 0.8 – 1.2 | 6.0 – 8.5 |
| Cam sprocket bolt | 17 – 19 | 1.7 – 1.9 | 12.5 – 13.5 |
| Cam chain tensioner mounting bolt | 6 – 8 | 0.6 – 0.8 | 4.5 – 6.0 |
| Conrod bearing cap nut | 30 – 34 | 3.0 – 3.4 | 21.5 – 25.0 |
| Generator rotor mounting bolt | 110 – 130 | 11.0 – 13.0 | 79.5 – 94.5 |
| Starter clutch securing bolt | 15 – 20 | 1.5 – 2.0 | 11.0 – 14.5 |
| Signal generator bolt | 17 – 23 | 1.7 – 2.3 | 12.5 – 16.5 |
| Crankcase bolt (6 mm) | 9 – 13 | 0.9 – 1.3 | 6.5 – 9.5 |
| (8 mm) | 20 – 24 | 2.0 – 2.4 | 14.5 – 17.4 |
| Counter-balancer shaft setting bolt | 35 – 45 | 3.5 – 4.5 | 25.5 – 32.5 |
| Oil pump mounting screw | 8 – 12 | 0.8 – 1.2 | 6.0 – 8.5 |
| Oil pressure regulator | 17 – 20 | 1.7 – 2.0 | 12.5 – 14.5 |
| Oil drain plug | 20 – 25 | 2.0 – 2.5 | 14.5 – 18.0 |
| Oil pan bolt | 12 – 16 | 1.2 – 1.6 | 8.5 – 11.5 |
| Clutch sleeve hub nut | 40 – 60 | 4.0 – 6.0 | 29.0 – 43.5 |
| Clutch spring set bolt | 4 – 6 | 0.4 – 0.6 | 3.0 – 4.5 |
| Exhaust pipe bolt | 9 – 12 | 0.9 – 1.2 | 6.5 – 8.5 |
| Muffler mounting bolt | 18 – 28 | 1.8 – 2.8 | 13.0 – 20.0 |
| Engine mounting bolt | 60 – 72 | 6.0 – 7.2 | 43.5 – 52.0 |

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## CHASSIS

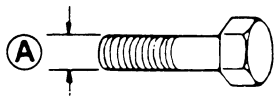
| Item | | N·m | kg-m | lb-ft |
|---|---|---|---|---|
| Steering stem head bolt | | 35 – 55 | 3.5 – 5.5 | 25.5 – 40.0 |
| Front fork upper clamp bolt | | 18 – 28 | 1.8 – 2.8 | 13.0 – 20.0 |
| Front fork lower clamp bolt | | 25 – 40 | 2.5 – 4.0 | 18.0 – 29.0 |
| Front axle nut | Normal nut with cotter pin | 36 – 52 | 3.6 – 5.2 | 26.0 – 37.5 |
| | Self-lock nut | 40 – 58 | 4.0 – 5.8 | 29.0 – 42.0 |
| Front axle pinch bolt | | 18 – 28 | 1.8 – 2.8 | 13.0 – 20.0 |
| Handlebar set bolt | | 8 – 12 | 0.8 – 1.2 | 6.0 – 8.5 |
| Handlebar holder mounting nut | | 27 – 42 | 2.7 – 4.2 | 19.5 – 30.5 |
| Front brake master cylinder mounting bolt | | 8 – 12 | 0.8 – 1.2 | 6.0 – 8.5 |
| Front brake caliper mounting bolt | | 30 – 48 | 3.0 – 4.8 | 21.5 – 35.0 |
| Front brake caliper housing bolt | | 30 – 36 | 3.0 – 3.6 | 21.5 – 26.0 |
| Brake hose union bolt | | 15 – 20 | 1.5 – 2.0 | 11.0 – 14.5 |
| Air bleeder valve | | 6 – 9 | 0.6 – 0.9 | 4.5 – 6.5 |
| Front and rear disc bolt | | 18 – 28 | 1.8 – 2.8 | 13.0 – 20.0 |
| Swingarm pivot nut | | 55 – 88 | 5.5 – 8.8 | 40.0 – 63.5 |
| Rear shock absorber upper/lower mounting nut | | 40 – 60 | 4.0 – 6.0 | 29.0 – 43.5 |
| Rear cushion lever mounting nut | | 70 – 100 | 7.0 – 10.0 | 50.5 – 72.5 |
| Rear cushion lever rod mounting nut (Upper & Lower) | | 70 – 100 | 7.0 – 10.0 | 50.5 – 72.5 |
| Rear brake caliper mounting bolt | | 20 – 31 | 2.0 – 3.1 | 14.5 – 22.5 |
| Rear brake caliper housing bolt | | 30 – 36 | 3.0 – 3.6 | 21.5 – 26.0 |
| Torque link nut (Front & Rear) | | 22 – 35 | 2.2 – 3.5 | 16.0 – 25.5 |
| Rear brake master cylinder mounting bolt | | 8 – 12 | 0.8 – 1.2 | 6.0 – 8.5 |
| Rear axle nut | Normal nut with cotter pin | 50 – 80 | 5.0 – 8.0 | 36.0 – 58.0 |
| | Self-lock nut | 60 – 96 | 6.0 – 9.6 | 43.5 – 69.5 |
| Rear sprocket nut | | 40 – 60 | 4.0 – 6.0 | 29.0 – 43.5 |

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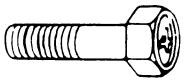
## TIGHTENING TORQUE CHART

For other bolts and nuts not listed previously, refer to each tightening torque value in the following chart:

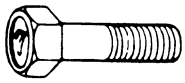
| Bolt Diameter (mm) | Conventional or "4" marked bolt | | | "7" marked bolt | | |
|---|---|---|---|---|---|---|
| | N·m | kg-m | lb-ft | N·m | kg-m | lb-ft |
| 4 | 1—2 | 0.1—0.2 | 0.7—1.5 | 1.5—3 | 0.15—0.3 | 1.0—2.0 |
| 5 | 2—4 | 0.2—0.4 | 1.5—3.0 | 3—6 | 0.3—0.6 | 2.0—4.5 |
| 6 | 4—7 | 0.4—0.7 | 3.0—5.0 | 8—12 | 0.8—1.2 | 6.0—8.5 |
| 8 | 10—16 | 1.0—1.6 | 7.0—11.5 | 18—28 | 1.8—2.8 | 13.0—20.0 |
| 10 | 22—35 | 2.2—3.5 | 16.0—25.5 | 40—60 | 4.0—6.0 | 29.0—43.5 |
| 12 | 35—55 | 3.5—5.5 | 25.5—40.0 | 70—100 | 7.0—10.0 | 50.5—72.5 |
| 14 | 50—80 | 5.0—8.0 | 36.5—58.0 | 110—160 | 11.0—16.0 | 79.5—115.5 |
| 16 | 80—130 | 8.0—13.0 | 58.0—94.0 | 170—250 | 17.0—25.0 | 123.0—181.0 |
| 18 | 130—190 | 13.0—19.0 | 94.0—137.5 | 200—280 | 20.0—28.0 | 144.5—202.5 |




Conventional Bolt



"4" Marked Bolt



"7" Marked Bolt

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# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Valve diam. | IN. | 39 (1.5) | ——— |
| | EX. | 32 (1.3) | ——— |
| Valve lift | IN. | 8.5 (0.33) | ——— |
| | EX. | 8.0 (0.31) | ——— |
| Tappet clearance (when cold) | IN. & EX. | 0.03—0.08 (0.001—0.003) | ——— |
| Valve guide to valve stem clearance | IN. | 0.025—0.055 (0.0010—0.0022) | 0.35 (0.014) |
| | EX. | 0.040—0.070 (0.0016—0.0028) | 0.35 (0.014) |
| Valve guide I.D. | IN. & EX. | 7.000—7.015 (0.2756—0.2762) | ——— |
| Valve stem O.D. | IN. | 6.960—6.975 (0.2740—0.2746) | ——— |
| | EX. | 6.945—6.960 (0.2734—0.2740) | ——— |
| Valve stem runout | IN. & EX. | ——— | 0.05 (0.002) |
| Valve head thickness | IN. & EX. | ——— | 0.5 (0.02) |
| Valve seat width | IN. & EX. | 1.0—1.2 (0.04—0.05) | ——— |
| Valve head radial runout | IN. & EX. | ——— | 0.03 (0.001) |
| Valve spring free length (IN. & EX.) | INNER | ——— | 35.6 (1.40) |
| | OUTER | ——— | 40.6 (1.60) |
| Valve spring tension (IN. & EX.) | INNER | 10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in) | ——— |
| | OUTER | 20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in) | ——— |

## CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Cam height | IN. | 36.789—36.819 (1.4484—1.4496) | 36.49 (1.437) |
| | EX. | 36.291—36.321 (1.4288—1.4300) | 36.00 (1.417) |
| Camshaft journal oil clearance | IN. & EX. | 0.032—0.066 (0.0013—0.0026) | 0.150 (0.0060) |
| Camshaft journal holder I.D. | IN. & EX. | 22.012—22.025 (0.8666—0.8671) | ——— |
| Camshaft journal O.D. | IN. & EX. | 21.959—21.980 (0.8645—0.8654) | ——— |

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| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Camshaft runout | IN. & EX. | — | 0.10 (0.004) |
| Cam chain 20-pitch length | — | | 157.8 (6.21) |
| Cam chain pin (at arrow "3") | 18th pin | | — |
| Cylinder head distortion | — | | 0.10 (0.004) |

## CYLINDER + PISTON + PISTON RING

Unit: mm (in)

| ITEM | STANDARD | | | LIMIT |
|---|---|---|---|---|
| Compression pressure | 1 000—1 400 kPa (10—14 kg/cm², 142—199 psi) | | | 800 kPa (8 kg/cm², 114 psi) |
| Compression pressure difference | — | | | 200 kPa (2 kg/cm², 28 psi) |
| Piston to cylinder clearance | 0.050—0.060 (0.0020—0.0024) | | | 0.120 (0.0047) |
| Cylinder bore | 74.000—74.015 (2.9134—2.9140) | | | 74.080 (2.9165) |
| Piston diam. | 73.945—73.960 (2.9112—2.9118) Measure at 15 mm (0.6 in) from the skirt end. | | | 73.880 (2.9087) |
| Cylinder distortion | — | | | 0.10 (0.004) |
| Piston ring free end gap | 1st | N | Approx. 7.0 (0.28) | 5.6 (0.22) |
| | 2nd | N | Approx. 11.0 (0.43) | 8.8 (0.35) |
| Piston ring end gap | 1st | | 0.10—0.25 (0.004—0.010) | 0.70 (0.028) |
| | 2nd | | 0.10—0.25 (0.004—0.010) | 0.70 (0.028) |
| Piston ring to groove clearance | 1st | | — | 0.180 (0.0071) |
| | 2nd | | — | 0.150 (0.0059) |
| Piston ring groove width | 1st | | 1.21—1.23 (0.047—0.048) | |
| | 2nd | | 1.21—1.23 (0.047—0.048) | |
| | Oil | | 2.51—2.53 (0.099—0.100) | |
| Piston ring thickness | 1st | | 1.17—1.19 (0.046—0.047) | |
| | 2nd | | 1.17—1.19 (0.046—0.047) | |
| Piston pin bore | 18.002—18.008 (0.7087—0.7090) | | | 18.030 (0.7098) |
| Piston pin O.D. | 17.995—18.000 (0.7085—0.7087) | | | 17.980 (0.7079) |

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## CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Conrod small end I.D. | 18.006—18.014 (0.7089—0.7092) | 18.040 (0.7102) |
| Conrod big end side clearance | 0.1—0.2 (0.004—0.008) | 0.3 (0.012) |
| Conrod big end width | 22.95—23.00 (0.904—0.906) | ——— |
| Crank pin width | 23.10—23.15 (0.909—0.911) | ——— |
| Conrod big end oil clearance | 0.024—0.048 (0.0009—0.0019) | 0.080 (0.0031) |
| Crank pin O.D. | 33.976—34.000 (1.3376—1.3386) | ——— |
| Crankshaft journal oil clearance | 0.020—0.044 (0.0008—0.0017) | 0.080 (0.0031) |
| Crankshaft journal O.D. | 31.976—32.000 (1.2589—1.2598) | ——— |
| Crankshaft thrust bearing thickness | 2.950—2.975 (0.1161—0.1171) | 2.850 (0.1122) |
| Crankshaft runout | ——— | 0.05 (0.002) |
| Balancer journal oil clearance | 0.020—0.044 (0.0008—0.0017) | 0.080 (0.0031) |
| Balancer journal O.D. | 31.984—32.000 (1.2592—1.2598) | ——— |
| Balancer spring free length | ——— | 14.9 (0.59) |

## OIL PUMP

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Oil pump reduction ratio | 1.879 (76/28 x 27/39) | ——— |
| Oil pressure (at 60°C, 140°F) | Above 200 kPa (2.0 kg/cm$^2$, 28 psi) Below 500 kPa (5.0 kg/cm$^2$, 71 psi) at 3 000 r/min. | ——— |

## CLUTCH

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Clutch cable play | 4 (0.2) | ——— |
| Clutch release screw | 1/4—1/2 turn back | ——— |
| Drive plate thickness | 2.92—3.08 (0.115—0.121) | 2.62 (0.103) |
| Drive plate claw width | 15.8—16.0 (0.62—0.63) | 15.0 (0.59) |
| Driven plate distortion | ——— | 0.10 (0.004) |
| Clutch spring free length | ——— | 60.8 (2.39) |

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## TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

| ITEM | | STANDARD | LIMIT |
|---|---|---|---|
| Primary reduction ratio | | 2.714 (76/28) | ——— |
| Final reduction ratio | | 2.437 (39/16) | ——— |
| Gear ratios | Low | 2.461 (32/13) | ——— |
| | 2nd | 1.777 (32/18) | ——— |
| | 3rd | 1.380 (29/21) | ——— |
| | 4th | 1.125 (27/24) | ——— |
| | 5th | 0.961 (25/26) | ——— |
| | Top | 0.851 (23/27) | ——— |
| Shift fork to groove clearance | | 0.1—0.3 (0.004—0.012) | 0.5 (0.020) |
| Shift fork groove width | No.1, No.2 & No.3 | 5.5—5.6 (0.217—0.220) | ——— |
| Shift fork thickness | No.1, No.2 & No.3 | 5.3—5.4 (0.209—0.213) | ——— |
| Countershaft length (Low to 2nd) | | $114.7 \pm {}^{0.1}_{0}$ ($4.516 \pm {}^{0.004}_{0}$) | ——— |
| Drive chain | Type | D.I.D.: DID520V6 | ——— |
| | Links | 110 | ——— |
| | 20-pitch length | ——— | 319.4 (12.57) |
| Drive chain slack | | 20—30 (0.8—1.2) | ——— |

## CARBURETOR

| ITEM | SPECIFICATION | |
|---|---|---|
| | E-03 | E-33 |
| Carburetor type | MIKUNI BST33SS | ← |
| Bore size | 33 mm | ← |
| I.D. No. | 01D00 | 01D10 |
| Idle r/min. | 1 200 ± 100 r/min. | ← |
| Float height | 14.6 ± 1.0 mm | ← |
| Main jet (M.J.) | #122.5 | ← |
| Main air jet (M.A.J) | 0.5 mm | ← |
| Jet needle (J.N.) | 5DH8 | ← |
| Needle jet (N.J.) | O-3 | ← |
| Throttle valve (Th.V.) | #120 | ← |
| Pilot jet (P.J.) | #37.5 | ← |
| By-pass (B.P.) | 0.8, 0.8, 0.8, 0.8 mm | ← |
| Pilot outlet (P.O.) | 0.8 mm | 0.9 mm |
| Valve seat (V.S.) | 1.5 mm | ← |
| Starter jet (G.S.) | #42.5 | ← |
| Pilot screw (P.S.) | PRE-SET | ← |
| Pilot air jet (P.A.J.) | 1.3 mm | 1.35 mm |
| Throttle cable play | 0.5—1.0 mm (0.02—0.04 in) | ← |

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## CARBURETOR

| ITEM | SPECIFICATION | | | | | |
|---|---|---|---|---|---|---|
| | E-01,16 17,28 | E-02,04, 15,21,25, 34,53 | E-24 | E-22 | E-22 (GS500E-U) | E-39 |
| Carburetor type | MIKUNI BST33SS | ← | ← | ← | ← | ← |
| Bore size | 33 mm | ← | ← | ← | ← | ← |
| I.D. No. | 01D20 | 01D30 | 01D50 | 01D70 | 01D60 | 01D80 |
| Idle r/min. | 1200± 100 r/min | ← | ← | ← | ← | ← |
| Float height | 14.6± 1.0 mm | ← | ← | ← | ← | ← |
| Main jet (M.J.) | #122.5 | #120 | ← | ← | #135 | #120 |
| Main air jet (M.A.J.) | 0.5 mm | ← | ← | ← | ← | ← |
| Jet needle (J.N.) | 5DH9-3rd | ← | ← | ← | 5DH9-4th | 5DH9-3rd |
| Needle jet (N.J.) | O-2 | ← | ← | ← | ← | ← |
| Throttle valve (Th.V.) | #120 | ← | ← | ← | ← | ← |
| Pilot jet (P.J.) | #40 | ← | ← | ← | ← | ← |
| By-pass (B.P.) | 0.8, 0.8 0.8, 0.8 mm | ← | ← | ← | ← | ← |
| Pilot outlet (P.O.) | 0.8 mm | ← | ← | ← | ← | ← |
| Valve seat (V.S.) | 1.5 mm | ← | ← | ← | ← | ← |
| Starter jet (G.S.) | #42.5 | ← | ← | ← | ← | ← |
| Pilot screw (P.S.) | PRE-SET (2¼ turns back) | ← | ← | ← | ← | ← |
| Pilot air jet (P.A.J.) | 1.3 mm | ← | ← | ← | ← | ← |
| Throttle cable play | 0.5— 1.0 mm (0.02— 0.04 in) | ← | ← | ← | ← | ← |

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## ELECTRICAL

Unit: mm (in)

| ITEM | | SPECIFICATION | | NOTE |
|---|---|---|---|---|
| Ignition timing | | 12° B.T.D.C. at 1 650 r/min.<br>40° B.T.D.C. at 4 000 r/min. | | |
| Firing order | | L • R | | |
| Spark plug | | Type | N.D.: X24EPR-U9<br>NGK: DPR8EA-9 | |
| | | Gap | 0.8—0.9<br>(0.031—0.035) | |
| Spark performance | | Over 8 (0.3) at 1 atm. | | |
| Signal coil resistance | | 250—420 Ω | | |
| Ignition coil resistance | | Primary | 3—6 Ω | Terminal-Terminal |
| | | Secondary | 18—30 kΩ | Plug cap—Terminal |
| Generator no-load voltage | | More than 75V (AC) at 5 000 r/min. | | |
| Regulated voltage | | 13.5—15.5V at 5 000 r/min. | | |
| Starter motor brush length | | N.D. | Limit: 9 (0.4) | |
| commutator under-cut | | Limit: 0.2 (0.008) | | |
| Starter relay resistance | | 3—5 Ω | | |
| Battery | Type designation | FB10L-B2 | | |
| | Capacity | 12V 39.6kC (11Ah)/10HR | | |
| | Standard electrolyte S.G. | 1.28 at 20°C (68°F) | | |
| Fuse size | | 20A | | |

## WATTAGE

Unit: W

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-03, 28, 33 | The others |
| Headlight | HI | 60 | ← |
| | LO | 55 | ← |
| Position light | | | 4 |
| Tail/Brake light | | 5/21 | ← |
| Turn signal light | | 21 | ← |
| Tachometer light | | 3.4 | ← |
| Speedometer light | | 3.4 | ← |
| Turn signal indicator light | | 3.4 | ← |
| High beam indicator light | | 1.7 | ← |
| Neutral indicator light | | 3.4 | ← |
| Oil pressure indicator light | | 3.4 | ← |

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## BRAKE + WHEEL

Unit: mm (in)

| ITEM | | STANDARD | LIMIT |
|---|---|---|---|
| Rear brake pedal height | | 47 (1.9) | ——— |
| Brake disc thickness | Front | 4.5 ± 0.2 (0.177 ± 0.008) | 4.0 (0.16) |
| | Rear | 6.0 ± 0.2 (0.236 ± 0.008) | 5.5 (0.22) |
| Brake disc runout | | ——— | 0.30 (0.012) |
| Master cylinder bore | Front | 12.700 – 12.743 (0.5000 – 0.5017) | ——— |
| | Rear | 12.700 – 12.743 (0.5000 – 0.5017) | ——— |
| Master cylinder piston diam. | Front | 12.657 – 12.684 (0.4983 – 0.4994) | ——— |
| | Rear | 12.657 – 12.684 (0.4983 – 0.4994) | ——— |
| Brake caliper cylinder bore | Front | 27.000 – 27.076 (1.0630 – 1.0660) | ——— |
| | | 33.960 – 34.036 (1.3370 – 1.3400) | ——— |
| | Rear | 38.180 – 38.256 (1.5031 – 1.5061) | ——— |
| Brake caliper piston diam. | Front | 26.920 – 26.970 (1.0598 – 1.0618) | ——— |
| | | 33.884 – 33.934 (1.3340 – 1.3360) | ——— |
| | Rear | 38.098 – 38.148 (1.4999 – 1.5019) | ——— |
| Wheel rim runout | Axial | ——— | 2.0 (0.08) |
| | Radial | ——— | 2.0 (0.08) |
| Wheel axle runout | Front | ——— | 0.25 (0.010) |
| | Rear | ——— | 0.25 (0.010) |
| Tire size | Front | 110/70-17 54H | ——— |
| | Rear | 130/70-17 62H | ——— |
| Tire tread depth | Front | ——— | 1.6 (0.06) |
| | Rear | ——— | 2.0 (0.08) |

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## SUSPENSION

Unit: mm (in)

| ITEM | STANDARD | LIMIT | NOTE |
|---|---|---|---|
| Front fork stroke | 120 (4.7) | ——— | |
| Front fork spring free length | ——— | 254 (10.0) | |
| Front fork oil level | 99 (3.9) | ——— | |
| Rear shock absor ber spring adjuster | 4th/7 | ——— | |
| Rear wheel travel | 115 (4.5) | ——— | |
| Swingarm pivot shaft runout | ——— | 0.3 (0.01) | |

## TIRE PRESSURE

| COLD INFLATION TIRE PRESSURE | SOLO RIDING | | | DUAL RIDING | | |
|---|---|---|---|---|---|---|
| | kPa | kg/cm$^2$ | psi | kPa | kg/cm$^2$ | psi |
| FRONT | 225 | 2.25 | 33 | 225 | 2.25 | 33 |
| REAR | 250 | 2.50 | 36 | 280 | 2.80 | 41 |

## FUEL + OIL

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Fuel type | • Use only unleaded or low-lead type gasoline of at least 85-95 pump octane ($\frac{R+M}{2}$) or 89 octane or higher rated by the research method.<br>• Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible. | | E-03, 33 |
| | Use only unleaded or low-lead type gasoline of at least 85-95 pump octane ($\frac{R+M}{2}$ method) or 89 octane or higher rated by the Research Method. | | E-28 |
| | Gasoline used should be graded 85-95 octane or higher. An unleaded or low-lead type gasoline is recommended. | | The others |
| Fuel tank including reserve | 17.0 L (4.5/3.7 US/Imp gal) | | |
| reserve | 3.5 L (3.7/3.1 US/Imp qt) | | |
| Engine oil type | SAE 10W/40, API SE or SF | | |
| Engine oil capacity | Change | 2 600 ml (2.7/2.3 US/Imp qt) | |
| | Filter change | 2 900 ml (3.1/2.6 US/Imp qt) | |
| | Overhaul | 3 200 ml (3.4/2.8 US/Imp qt) | |
| Front fork oil type | Fork oil #10 | | |
| Front fork oil capacity (each leg) | 382 ml (12.9/13.5 US/Imp oz) | | |
| Brake fluid type | DOT 4 | | |

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# EMISSION CONTROL INFORMATION

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# EMISSION CONTROL CARBURETOR COMPONENTS

GS500E motorcycles are equipped with precision, manufactured carburetors for emission level control. These carburetors require special mixture control components and other precision adjustments to function properly.

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

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

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

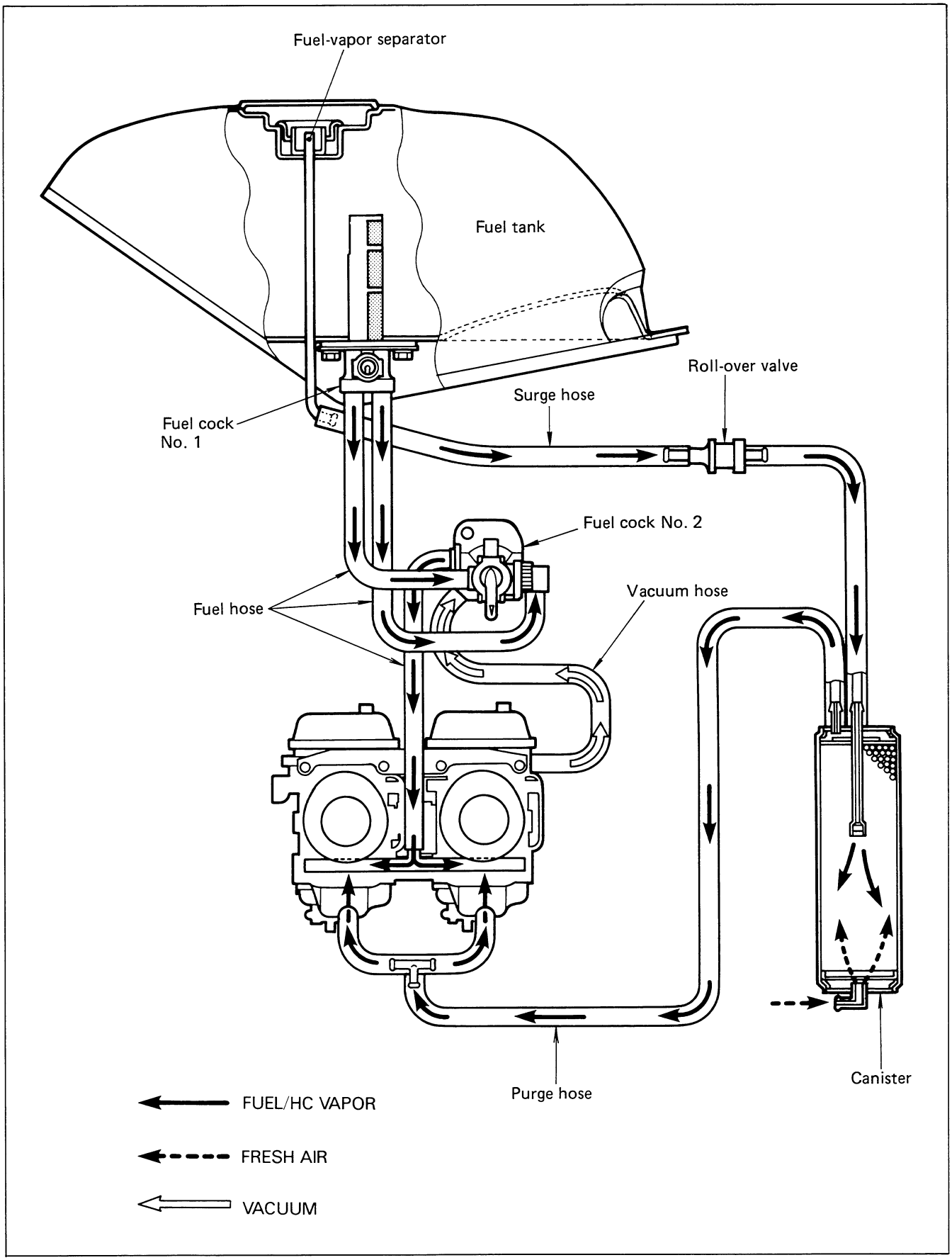
The carburetor specification for the emission-controlled GS500E are as follows.

| Carburetor I.D. No. | Main Jet | Needle Jet | Jet Needle | Pilot Jet | Pilot Screw |
|---|---|---|---|---|---|
| 01D10 (California model) | # 122.5 | 0-3 | 5DH8 | # 37.5 | PRE-SET DO NOT ADJUST |
| 01D00 (Other state models) | | | | | |

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

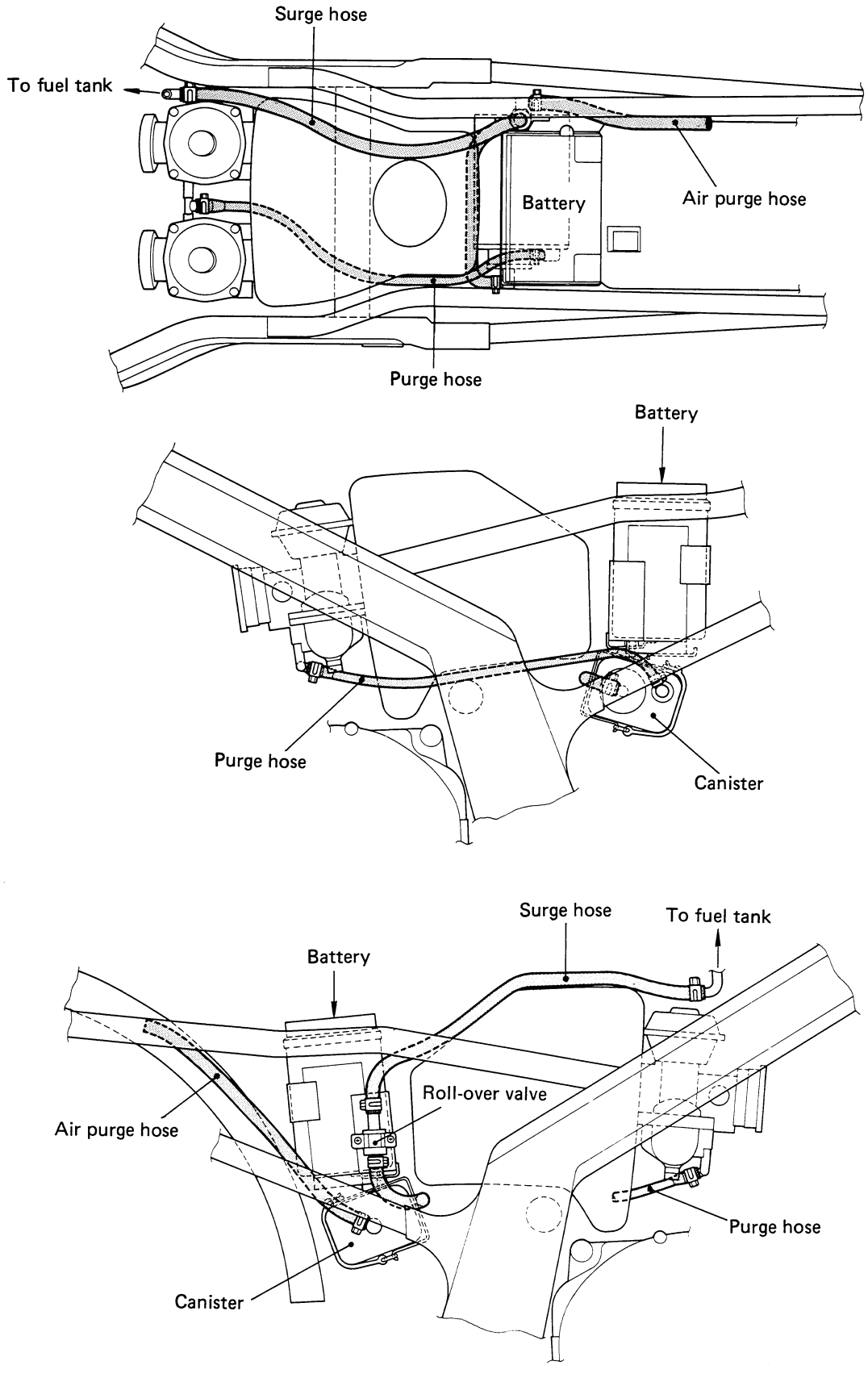
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# EVAPORATIVE EMISSION CONTROL SYSTEM
## (Only for California model)




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# CANISTER HOSE ROUTING
## (Only for California model)




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# GS500EL ('90-MODEL)

## FOREWORD

*This section describes service data and service specifications which differ from those of the GS500EK ('89-model).*

*NOTE:*
- *Any differences between ''K'' ('89-model) and ''L'' ('90-model) in specifications and service data are clearly indicated with the asterisk marks (*).*
- *Please refer to the sections 1 through 8 for details which are not given in this section.*

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# SPECIFICATIONS

## DIMENSIONS AND DRY MASS

| | |
|---|---|
| Overall length | *2 095 mm (82.5 in) . . . . . E-17 |
| | *2 105 mm (82.9 in) . . . . . E-25 |
| | *2 180 mm (85.8 in) . . . . . E-15, 16 and 22 |
| | 2 075 mm (81.7 in) . . . . . The others |
| Overall width | * 755 mm (29.7 in) |
| Overall height | 1 045 mm (41.1 in) |
| Wheelbase | 1 410 mm (55.5 in) |
| Ground clearance | 155 mm ( 6.1 in) |
| Seat height | 790 mm (31.1 in) |
| Dry mass | 169 kg (373 lbs) |

## ENGINE

| | |
|---|---|
| Type | Four-stroke, air-cooled, DOHC, TDCC |
| Valve clearance (IN & EX) | 0.03 — 0.08 mm (0.0018 — 0.0031 in) |
| Number of cylinders | 2 |
| Bore | 74.0 mm (2.913 in) |
| Stroke | 56.6 mm (2.228 in) |
| Piston displacement | 487 $cm^3$ (29.7 cu. in) |
| Compression ratio | 9.0 : 1 |
| Caburetor | MIKUNI BST33SS, twin |
| Air cleaner | Polyester fiber element |
| Starter system | Electric starter motor |
| Lubrication system | Wet sump |

## TRANSMISSION

| | |
|---|---|
| Clutch | Wet multi-plate type |
| Transmission | 6-speed constant mesh |
| Gearshift pattern | 1-down, 5-up |
| Primary reduction ratio | 2.714 (76/28) |
| Gear ratios, Low | 2.461 (32/13) |
| 2nd | 1.777 (32/18) |
| 3rd | 1.380 (29/21) |
| 4th | 1.125 (27/24) |
| 5th | 0.961 (25/26) |
| Top | 0.851 (23/27) |
| Final reduction ratio | 2.437 (39/16) |
| Drive chain | DAIDO DID. 520$V_6$, 110 links |

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## CHASSIS

| | |
|---|---|
| Front suspension | Telescopic, coil spring, oil damped |
| Rear suspension | Full-floating suspension system, oil damped, spring preload 7-way adjustable |
| Front suspension stroke | 120 mm (4.7 in) |
| Rear wheel travel | 115 mm (4.5 in) |
| Caster | 64° 30' |
| Trail | 95 mm (3.7 in) |
| Steering angle | 35° |
| Turning radius | 2.7 m (8.9 ft) |
| Front brake | Disc brake |
| Rear brake | Disc brake |
| Front tire size | 110/70-17 54H, tubeless |
| Rear tire size | 130/70-17 62H, tubeless |

## ELECTRICAL

| | |
|---|---|
| Ignition type | Fully Transistorized |
| Ignition timing | 12° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min<br>5° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min . . . . . E-33 |
| Spark plug | NGK DPR8EA-9 or NIPPON DENSO X24EPR-U9 |
| Battery | 12V 39.6 kC (11 Ah)/10HR |
| Generator | Three-phase A.C. generator |
| Fuse | 20A |
| Headlight | 12V 60/55W |
| Position light | 12V 4W . . . . . Except for E-03, 28 and 33 |
| Turn signal light | 12V 21W |
| Tail/brake light | 12V 5/21W (x 2 pcs.) |
| Speedometer light | 12V 3.4W |
| Tachometer light | 12V 3.4W |
| Neutral indicator light | 12V 3.4W |
| High beam indicator light | 12V 1.7W |
| Turn signal indicator light | 12V 3.4W |
| Oil pressure indicator light | 12V 3.4W |

## CAPACITIES

| | |
|---|---|
| Fuel tank, including reserve | 17.0 L (4.5/3.7 US/Imp gal)<br>15.0 L (4.0/3.3 US/Imp gal) . . . . . E-33 |
| reserve | 3.5 L (0.9/0.8 US/Imp gal) |
| Engine oil, oil change | 2 600 ml (2.7/2.3 US/Imp qt) |
| with filter change | 2 900 ml (3.1/2.6 US/Imp qt) |
| overhaul | 3 200 ml (3.4/2.8 US/Imp qt) |
| Front fork oil (each leg) | 382 ml (12.9/13.5 US/Imp oz) |

- These specifications are subject to change without notice.
- Asterisk mark (*) indicates the new L model specifications.

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# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Valve diam. | IN. | 39 (1.5) | ——— |
| | EX. | 32 (1.3) | ——— |
| Valve lift | IN. | 8.5 (0.33) | ——— |
| | EX. | 8.0 (0.31) | ——— |
| Tappet clearance (when cold) | IN. & EX. | 0.03—0.08 (0.001—0.003) | ——— |
| Valve guide to valve stem clearance | IN. | 0.025—0.055 (0.0010—0.0022) | 0.35 (0.014) |
| | EX. | 0.040—0.070 (0.0016—0.0028) | 0.35 (0.014) |
| Valve guide I.D. | IN. & EX. | 7.000—7.015 (0.2756—0.2762) | ——— |
| Valve stem O.D. | IN. | 6.960—6.975 (0.2740—0.2746) | ——— |
| | EX. | 6.945—6.960 (0.2734—0.2740) | ——— |
| Valve stem runout | IN. & EX. | ——— | 0.05 (0.002) |
| Valve head thickness | IN. & EX. | ——— | 0.5 (0.02) |
| Valve seat width | IN. & EX. | 1.0—1.2 (0.04—0.05) | ——— |
| Valve head radial runout | IN. & EX. | ——— | 0.03 (0.001) |
| Valve spring free length (IN. & EX.) | INNER | ——— | 35.6 (1.40) |
| | OUTER | ——— | 40.6 (1.60) |
| Valve spring tension (IN. & EX.) | INNER | 10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in) | ——— |
| | OUTER | 20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in) | ——— |

## CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Cam height | IN. | 36.789—36.819 (1.4484—1.4496) | 36.49 (1.437) |
| | EX. | 36.291—36.321 (1.4288—1.4300) | 36.00 (1.417) |
| Camshaft journal oil clearance | IN. & EX. | 0.032—0.066 (0.0013—0.0026) | 0.150 (0.0060) |
| Camshaft journal holder I.D. | IN. & EX. | 22.012—22.025 (0.8666—0.8671) | ——— |
| Camshaft journal O.D. | IN. & EX. | 21.959—21.980 (0.8645—0.8654) | ——— |

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| ITEM | STANDARD | LIMIT |
|---|---|---|
| Camshaft runout | IN. & EX. — | 0.10 (0.004) |
| Cam chain 20-pitch length | — | 157.8 (6.21) |
| Cam chain pin (at arrow "3") | 18th pin | — |
| Cylinder head distortion | — | 0.10 (0.004) |

## CYLINDER + PISTON + PISTON RING

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Compression pressure | 1 000 – 1 400 kPa (10 – 14 kg/cm², 142 – 199 psi) | 800 kPa (8 kg/cm², 114 psi) |
| Compression pressure difference | — | 200 kPa (2 kg/cm², 28 psi) |
| Piston to cylinder clearance | 0.050 – 0.060 (0.0020 – 0.0024) | 0.120 (0.0047) |
| Cylinder bore | 74.000 – 74.015 (2.9134 – 2.9140) | 74.080 (2.9165) |
| Piston diam. | 73.945 – 73.960 (2.9112 – 2.9118) Measure at 15 mm (0.6 in) from the skirt end. | 73.880 (2.9087) |
| Cylinder distortion | — | 0.10 (0.004) |
| Piston ring free end gap | 1st N Approx. 7.0 (0.28) | 5.6 (0.22) |
| | 2nd N Approx. 11.0 (0.43) | 8.8 (0.35) |
| Piston ring end gap | 1st 0.10 – 0.25 (0.004 – 0.010) | 0.70 (0.028) |
| | 2nd 0.10 – 0.25 (0.004 – 0.010) | 0.70 (0.028) |
| Piston ring to groove clearance | 1st — | 0.180 (0.0071) |
| | 2nd — | 0.150 (0.0059) |
| Piston ring groove width | 1st 1.21 – 1.23 (0.047 – 0.048) | |
| | 2nd 1.21 – 1.23 (0.047 – 0.048) | |
| | Oil 2.51 – 2.53 (0.099 – 0.100) | |
| Piston ring thickness | 1st 1.17 – 1.19 (0.046 – 0.047) | |
| | 2nd 1.17 – 1.19 (0.046 – 0.047) | |
| Piston pin bore | 18.002 – 18.008 (0.7087 – 0.7090) | 18.030 (0.7098) |
| Piston pin O.D. | 17.995 – 18.000 (0.7085 – 0.7087) | 17.980 (0.7079) |

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## CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Conrod small end I.D. | 18.006—18.014 (0.7089—0.7092) | 18.040 (0.7102) |
| Conrod big end side clearance | 0.1—0.2 (0.004—0.008) | 0.3 (0.012) |
| Conrod big end width | 22.95—23.00 (0.904—0.906) | ——— |
| Crank pin width | 23.10—23.15 (0.909—0.911) | ——— |
| Conrod big end oil clearance | 0.024—0.048 (0.0009—0.0019) | 0.080 (0.0031) |
| Crank pin O.D. | 33.976—34.000 (1.3376—1.3386) | ——— |
| Crankshaft journal oil clearance | 0.020—0.044 (0.0008—0.0017) | 0.080 (0.0031) |
| Crankshaft journal O.D. | 31.976—32.000 (1.2589—1.2598) | ——— |
| Crankshaft thrust bearing thickness | 2.950—2.975 (0.1161—0.1171) | 2.850 (0.1122) |
| Crankshaft runout | ——— | 0.05 (0.002) |
| Balancer journal oil clearance | 0.020—0.044 (0.0008—0.0017) | 0.080 (0.0031) |
| Balancer journal O.D. | 31.984—32.000 (1.2592—1.2598) | ——— |
| Balancer spring free length | ——— | 14.9 (0.59) |

## OIL PUMP

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Oil pump reduction ratio | 1.879 (76/28 x 27/39) | ——— |
| Oil pressure (at 60°C, 140°F) | Above 200 kPa (2.0 kg/cm$^2$, 28 psi) Below 500 kPa (5.0 kg/cm$^2$, 71 psi) at 3 000 r/min. | ——— |

## CLUTCH

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Clutch cable play | 4 (0.2) | ——— |
| Clutch release screw | 1/4—1/2 turn back | ——— |
| Drive plate thickness | 2.92—3.08 (0.115—0.121) | 2.62 (0.103) |
| Drive plate claw width | 15.8—16.0 (0.62—0.63) | 15.0 (0.59) |
| Driven plate distortion | ——— | 0.10 (0.004) |
| Clutch spring free length | ——— | 60.8 (2.39) |

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## TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

| ITEM | | STANDARD | LIMIT |
|---|---|---|---|
| Primary reduction ratio | | 2.714 (76/28) | ——— |
| Final reduction ratio | | 2.437 (39/16) | ——— |
| Gear ratios | Low | 2.461 (32/13) | ——— |
| | 2nd | 1.777 (32/18) | ——— |
| | 3rd | 1.380 (29/21) | ——— |
| | 4th | 1.125 (27/24) | ——— |
| | 5th | 0.961 (25/26) | ——— |
| | Top | 0.851 (23/27) | ——— |
| Shift fork to groove clearance | | 0.1—0.3 (0.004—0.012) | 0.5 (0.020) |
| Shift fork groove width | No.1, No.2 & No.3 | 5.5—5.6 (0.217—0.220) | ——— |
| Shift fork thickness | No.1, No.2 & No.3 | 5.3—5.4 (0.209—0.213) | ——— |
| Countershaft length (Low to 2nd) | | $114.7 \pm {}^{0.1}_{0}$ ($4.516 \pm {}^{0.004}_{0}$) | ——— |
| Drive chain | Type | D.I.D.: DID520V6 | ——— |
| | Links | 110 | ——— |
| | 20-pitch length | ——— | 319.4 (12.57) |
| Drive chain slack | | 20—30 (0.8—1.2) | ——— |

## CARBURETOR

| ITEM | SPECIFICATION | |
|---|---|---|
| | E-03 | E-33 |
| Carburetor type | MIKUNI BST33SS | ← |
| Bore size | 33 mm | ← |
| I.D. No. | 01D00 | 01D10 |
| Idle r/min. | 1 200 ± 100 r/min. | ← |
| Float height | 14.6 ± 1.0 mm | ← |
| Main jet (M.J.) | #122.5 | ← |
| Main air jet (M.A.J) | 0.5 mm | ← |
| Jet needle (J.N.) | 5DH8 | ← |
| Needle jet (N.J.) | O-3 | ← |
| Throttle valve (Th.V.) | #120 | ← |
| Pilot jet (P.J.) | #37.5 | ← |
| By-pass (B.P.) | 0.8, 0.8, 0.8, 0.8 mm | ← |
| Pilot outlet (P.O.) | 0.8 mm | 0.9 mm |
| Valve seat (V.S.) | 1.5 mm | ← |
| Starter jet (G.S.) | #42.5 | ← |
| Pilot screw (P.S.) | PRE-SET | ← |
| Pilot air jet (P.A.J.) | 1.3 mm | 1.35 mm |
| Throttle cable play | 0.5—1.0 mm (0.02—0.04 in) | ← |

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## CARBURETOR

| ITEM | SPECIFICATION | | | | | |
|---|---|---|---|---|---|---|
| | E-01,16 17,28 | E-02,04, 15,21,25, 34,53 | E-24 | E-22 | E-22 (GS500E-U) | E-39 |
| Carburetor type | MIKUNI BST33SS | ← | ← | ← | ← | ← |
| Bore size | 33 mm | ← | ← | ← | ← | ← |
| I.D. No. | 01D20 | 01D30 | 01D50 | 01D70 | 01D60 | 01D80 |
| Idle r/min. | 1200± 100 r/min | ← | ← | ← | ← | ← |
| Float height | 14.6± 1.0 mm | ← | ← | ← | ← | ← |
| Main jet (M.J.) | #122.5 | #120 | ← | ← | #135 | #120 |
| Main air jet (M.A.J.) | 0.5 mm | ← | ← | ← | ← | ← |
| Jet needle (J.N.) | 5DH9-3rd | ← | ← | ← | 5DH9-4th | 5DH9-3rd |
| Needle jet (N.J.) | O-2 | ← | ← | ← | ← | ← |
| Throttle valve (Th.V.) | #120 | ← | ← | ← | ← | ← |
| Pilot jet (P.J.) | #40 | ← | ← | ← | ← | ← |
| By-pass (B.P.) | 0.8, 0.8 0.8, 0.8 mm | ← | ← | ← | ← | ← |
| Pilot outlet (P.O.) | 0.8 mm | ← | ← | ← | ← | ← |
| Valve seat (V.S.) | 1.5 mm | ← | ← | ← | ← | ← |
| Starter jet (G.S.) | #42.5 | ← | ← | ← | ← | ← |
| Pilot screw (P.S.) | PRE-SET (2¼ turns back) | ← | ← | ← | ← | ← |
| Pilot air jet (P.A.J.) | 1.3 mm | ← | ← | ← | ← | ← |
| Throttle cable play | 0.5— 1.0 mm (0.02— 0.04 in) | ← | ← | ← | ← | ← |

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## ELECTRICAL

Unit: mm (in)

| ITEM | | SPECIFICATION | | NOTE |
|---|---|---|---|---|
| Ignition timing | | 12° B.T.D.C. at 1 650 r/min.<br>40° B.T.D.C. at 4 000 r/min. | | |
| Firing order | | L • R | | |
| Spark plug | | Type | N.D.: X24EPR-U9<br>NGK: DPR8EA-9 | |
| | | Gap | 0.8—0.9<br>(0.031—0.035) | |
| Spark performance | | Over 8 (0.3) at 1 atm. | | |
| Signal coil resistance | | 250—420 Ω | | |
| Ignition coil resistance | | Primary | 3—6 Ω | Terminal-Terminal |
| | | Secondary | 18—30 kΩ | Plug cap—Terminal |
| Generator no-load voltage | | More than 75V (AC) at 5 000 r/min. | | |
| Regulated voltage | | 13.5—15.5V at 5 000 r/min. | | |
| Starter motor brush length | | N.D. | Limit: 9 (0.4) | |
| commutator under-cut | | Limit: 0.2 (0.008) | | |
| Starter relay resistance | | 3—5 Ω | | |
| Battery | Type designation | FB10L-B2 | | |
| | Capacity | 12V 39.6kC (11Ah)/10HR | | |
| | Standard electrolyte S.G. | 1.28 at 20°C (68°F) | | |
| Fuse size | | 20A | | |

## WATTAGE

Unit: W

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-03, 28, 33 | The others |
| Headlight | HI | 60 | ← |
| | LO | 55 | ← |
| Position light | | | 4 |
| Tail/Brake light | | 5/21 | ← |
| Turn signal light | | 21 | ← |
| Tachometer light | | 3.4 | ← |
| Speedometer light | | 3.4 | ← |
| Turn signal indicator light | | 3.4 | ← |
| High beam indicator light | | 1.7 | ← |
| Neutral indicator light | | 3.4 | ← |
| Oil pressure indicator light | | 3.4 | ← |

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## BRAKE + WHEEL

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Rear brake pedal height | 47 (1.9) | | ——— |
| Brake disc thickness | Front | 4.5 ± 0.2 (0.177 ± 0.008) | 4.0 (0.16) |
| | Rear | 6.0 ± 0.2 (0.236 ± 0.008) | 5.5 (0.22) |
| Brake disc runout | ——— | | 0.30 (0.012) |
| Master cylinder bore | Front | 12.700—12.743 (0.5000—0.5017) | ——— |
| | Rear | 12.700—12.743 (0.5000—0.5017) | ——— |
| Master cylinder piston diam. | Front | 12.657—12.684 (0.4983—0.4994) | ——— |
| | Rear | 12.657—12.684 (0.4983—0.4994) | ——— |
| Brake caliper cylinder bore | Front | 27.000—27.076 (1.0630—1.0660) | ——— |
| | | 33.960—34.036 (1.3370—1.3400) | ——— |
| | Rear | 38.180—38.256 (1.5031—1.5061) | ——— |
| Brake caliper piston diam. | Front | 26.920—26.970 (1.0598—1.0618) | ——— |
| | | 33.884—33.934 (1.3340—1.3360) | ——— |
| | Rear | 38.098—38.148 (1.4999—1.5019) | ——— |
| Wheel rim runout | Axial | ——— | 2.0 (0.08) |
| | Radial | ——— | 2.0 (0.08) |
| Wheel axle runout | Front | ——— | 0.25 (0.010) |
| | Rear | ——— | 0.25 (0.010) |
| Tire size | Front | 110/70-17 54H | ——— |
| | Rear | 130/70-17 62H | ——— |
| Tire tread depth | Front | ——— | 1.6 (0.06) |
| | Rear | ——— | 2.0 (0.08) |

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## SUSPENSION

Unit: mm (in)

| ITEM | STANDARD | LIMIT | NOTE |
|---|---|---|---|
| Front fork stroke | 120 (4.7) | ——— | |
| Front fork spring free length | ——— | 254 (10.0) | |
| Front fork oil level | 99 (3.9) | ——— | |
| Rear shock absor ber spring adjuster | 4th/7 | ——— | |
| Rear wheel travel | 115 (4.5) | ——— | |
| Swingarm pivot shaft runout | ——— | 0.3 (0.01) | |

## TIRE PRESSURE

| COLD INFLATION TIRE PRESSURE | SOLO RIDING | | | DUAL RIDING | | |
|---|---|---|---|---|---|---|
| | kPa | kg/cm$^2$ | psi | kPa | kg/cm$^2$ | psi |
| FRONT | 225 | 2.25 | 33 | 225 | 2.25 | 33 |
| REAR | 250 | 2.50 | 36 | 280 | 2.80 | 41 |

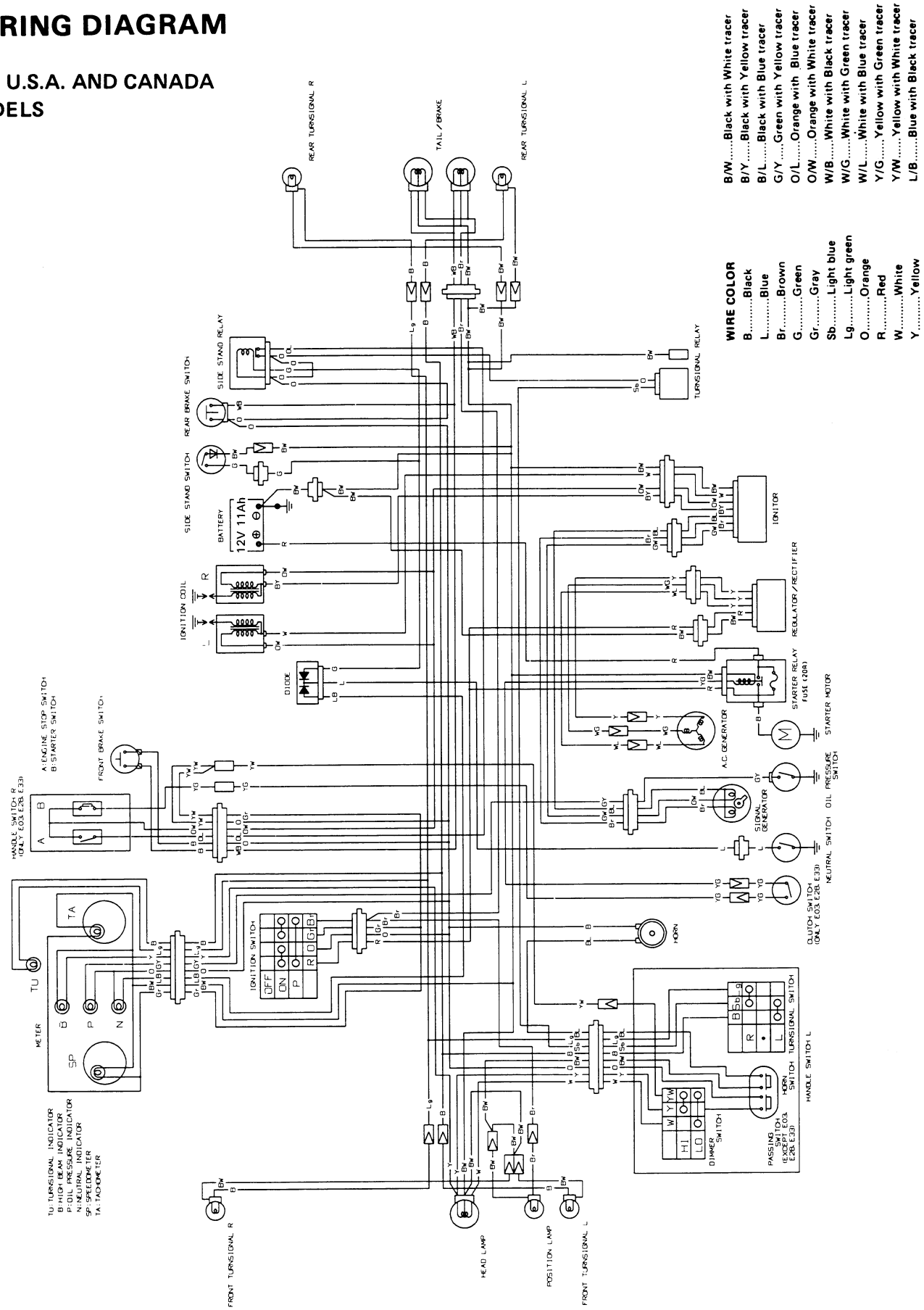
## FUEL + OIL

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Fuel type | • Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octane or higher rated by the research method.<br>• Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible. | | E-03, 33 |
| | Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method. | | E-28 |
| | Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended. | | For the others |
| Fuel tank including reserve | 17.0 L (4.5/3.7 US/Imp gal) | | |
| reserve | 3.5 L (3.7/3.1 US/Imp qt) | | |
| Engine oil type | SAE 10W/40, API SE or SF | | |
| Engine oil capacity | Change | 2 600 ml (2.7/2.3 US/Imp qt) | |
| | Filter change | 2 900 ml (3.1/2.6 US/Imp qt) | |
| | Overhaul | 3 200 ml (3.4/2.8 US/Imp qt) | |
| Front fork oil type | Fork oil #10 | | |
| Front fork oil capacity (each leg) | 382 ml (12.9/13.5 US/Imp oz) | | |
| Brake fluid type | DOT 4 | | |

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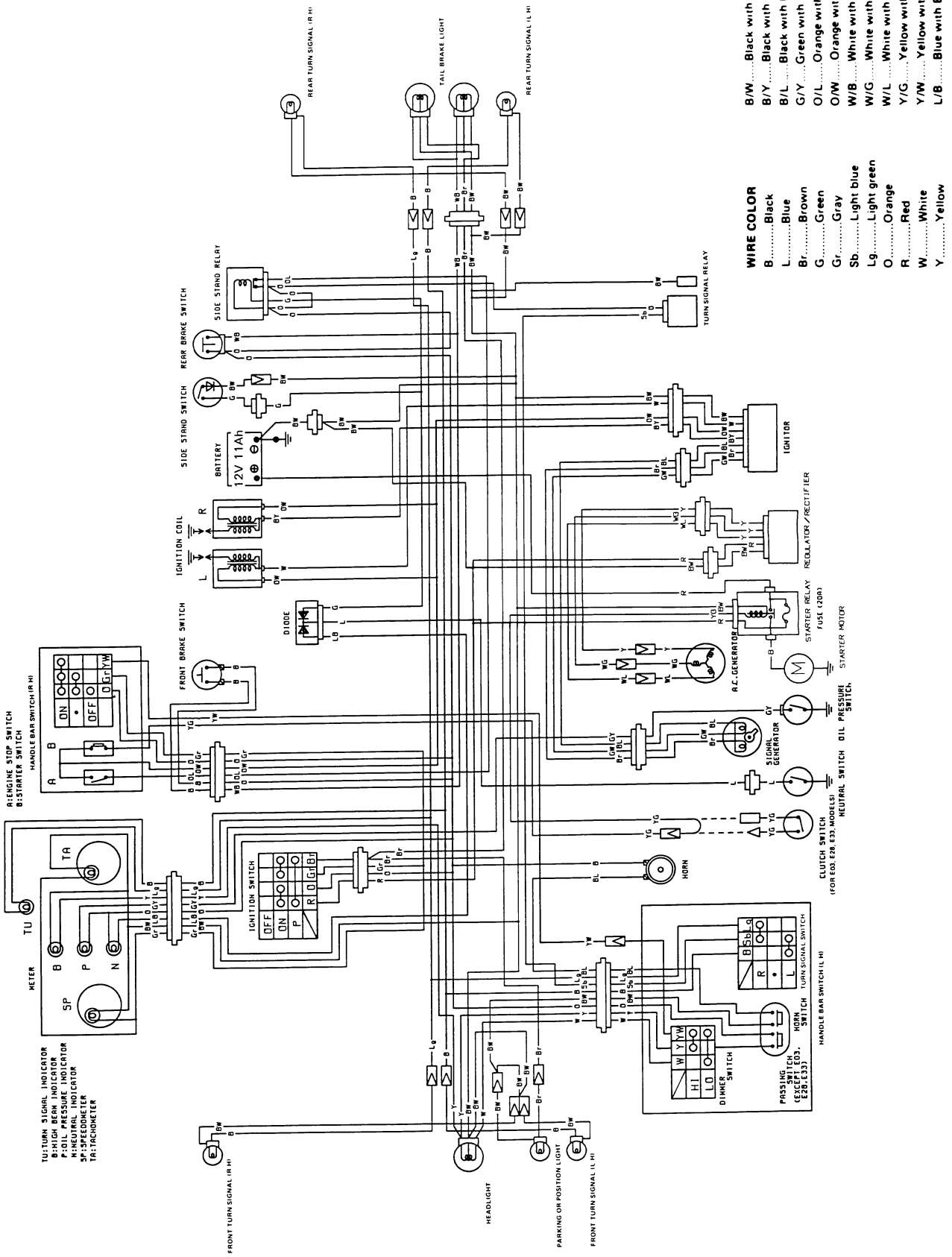
# WIRING DIAGRAM

## FOR U.S.A. AND CANADA MODELS



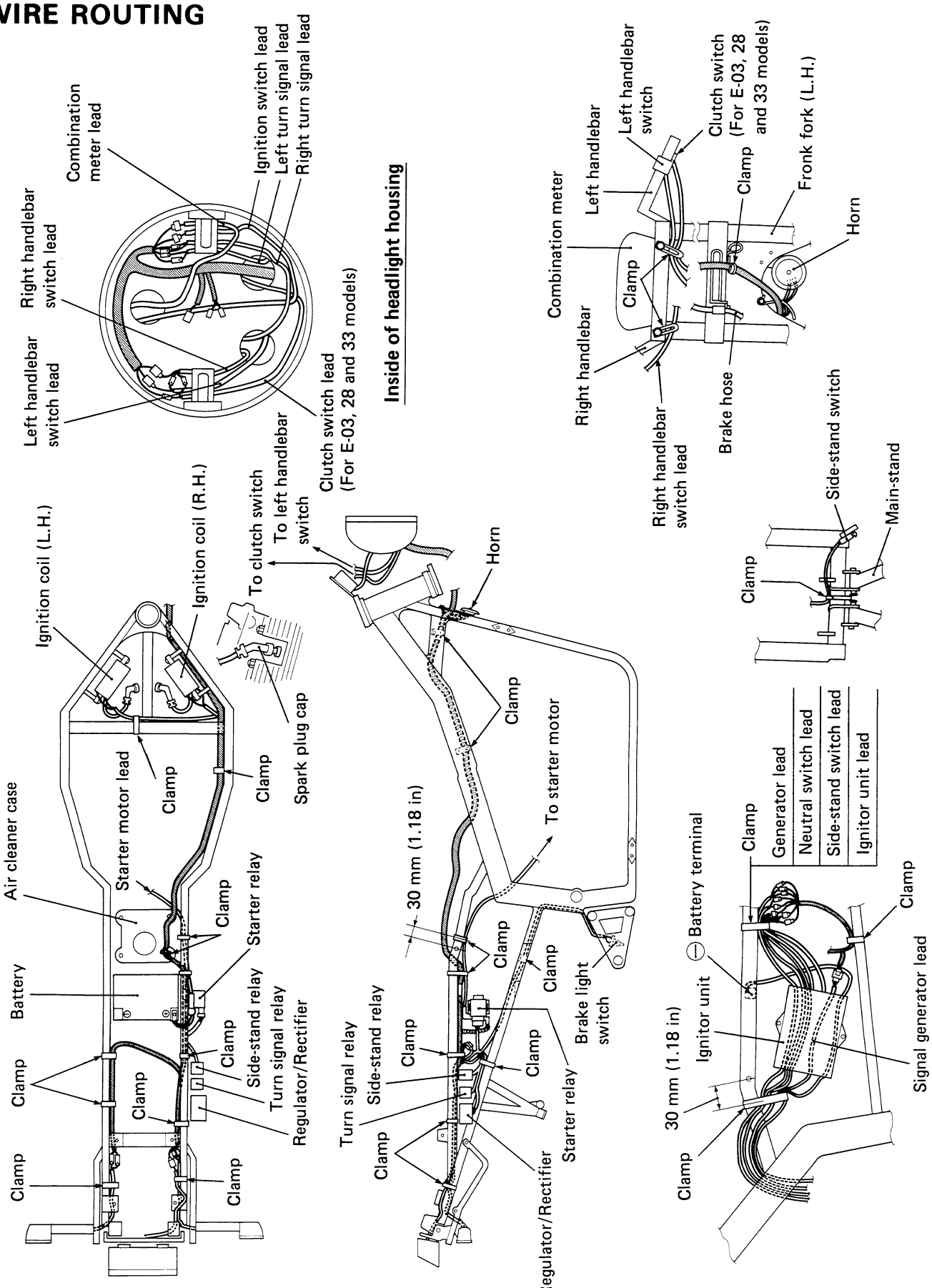

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## FOR OTHER MODELS

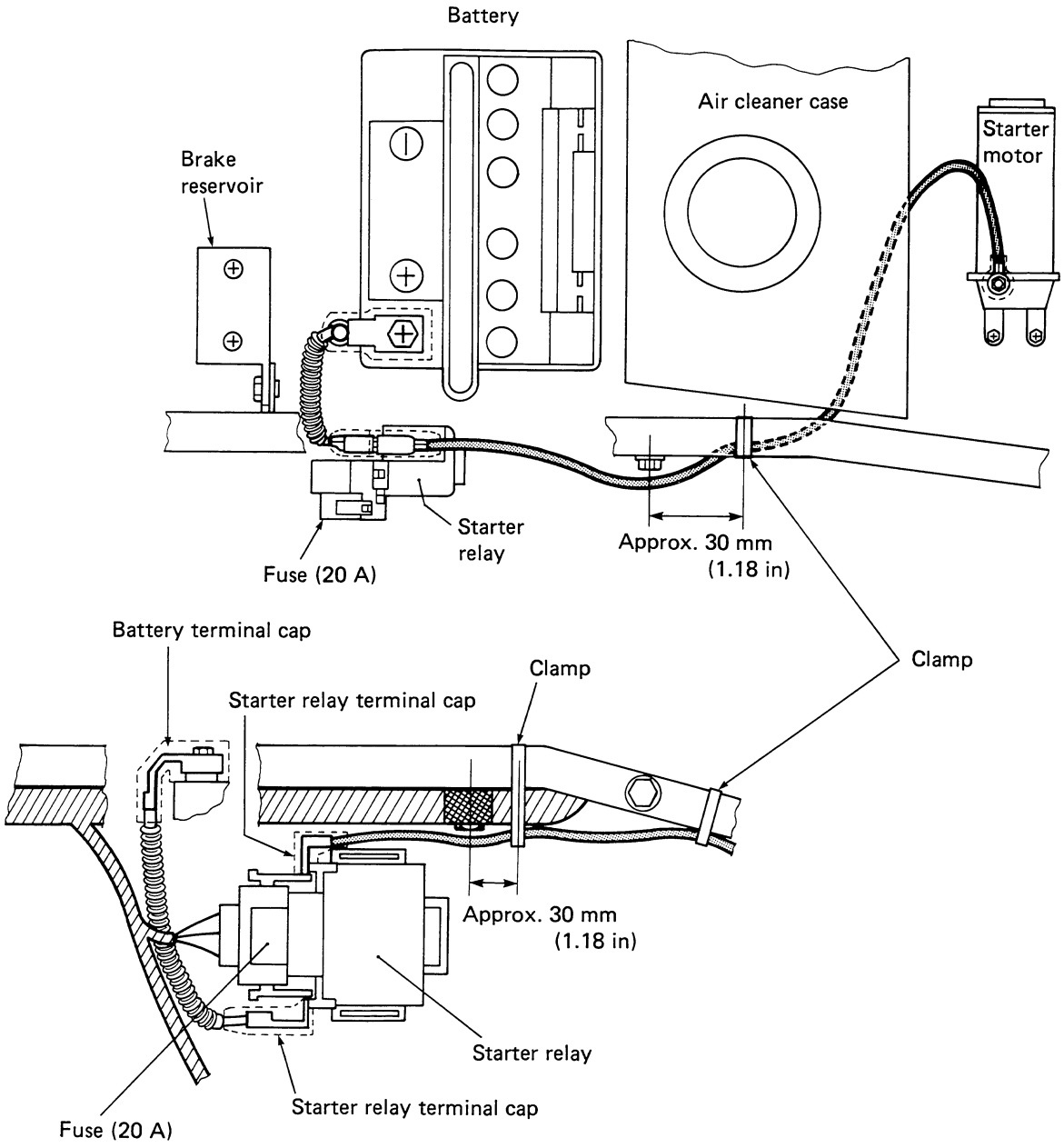



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# WIRE ROUTING

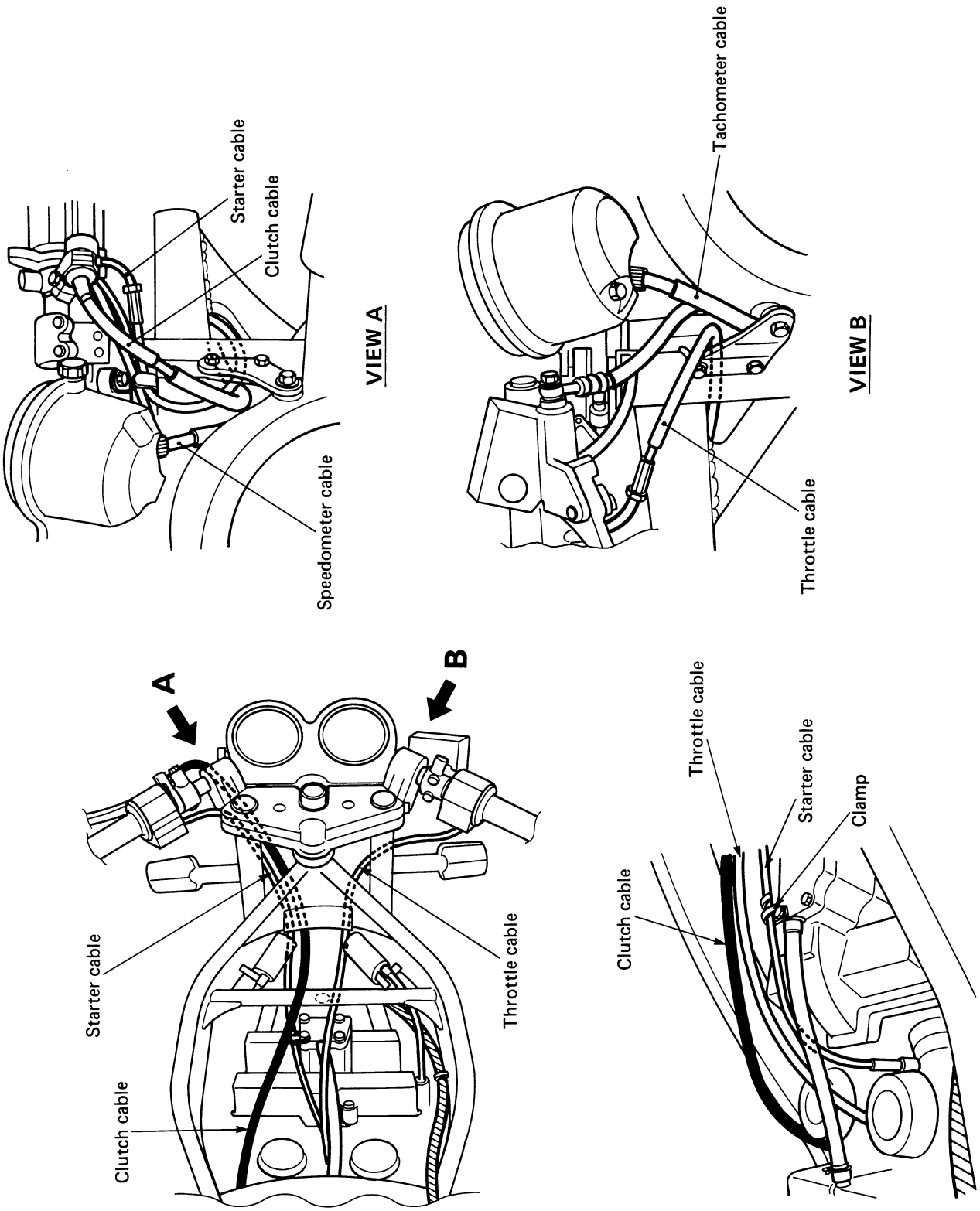



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## CABLE ROUTING




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# GS500EM ('91-MODEL)

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SERVICE DATA . . . . . 10- 2
WIRE HARNESS, CABLE AND HOSE ROUTING . . . . . 10-10




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# SPECIFICATIONS

| | |
|---|---|
| **DIMENSIONS AND DRY MASS** | |
| Overall length | 2 075 mm (81.7 in)<br>2 095 mm (82.5 in) . . . . . E17<br>2 105 mm (82.9 in) . . . . . E25<br>2 180 mm (85.8 in) . . . . . E15, 16, 22 |
| Overall width | 755 mm (29.7 in) |
| Overall height | 1 045 mm (41.1 in) |
| Wheelbase | 1 410 mm (55.5 in) |
| Ground clearance | 155 mm ( 6.1 in) |
| Seat height | 790 mm (31.1 in) |
| Dry mass | 169 kg (373 lbs) |
| **ENGINE** | |
| Type | Four-stroke, air-cooled, DOHC, TDCC |
| Valve clearance (IN & EX) | 0.03 – 0.08 mm (0.0012 – 0.0031 in) |
| Number of cylinders | 2 |
| Bore | 74.0 mm (2.913 in) |
| Stroke | 56.6 mm (2.228 in) |
| Piston displacement | 487 $cm^3$ (29.7 cu. in) |
| Compression ratio | 9.0 : 1 |
| Carburetor | MIKUNI BST33SS, twin |
| Air cleaner | Polyester fiber element |
| Starter system | Electric |
| Lubrication system | Wet sump |
| **TRANSMISSION** | |
| Clutch | Wet multi-plate type |
| Transmission | 6-speed constant mesh |
| Gearshift pattern | 1-down, 5-up |
| Primary reduction ratio | 2.714 (76/28) |
| Gear ratios, low | 2.461 (32/13) |
| 2nd | 1.777 (32/18) |
| 3rd | 1.380 (29/21) |
| 4th | 1.125 (27/24) |
| 5th | 0.961 (25/26) |
| Top | 0.851 (23/27) |
| Final reduction ratio | 2.437 (39/16) |
| Drive chain | DAIDO DID. 520V6, 110 links |
| **CHASSIS** | |
| Front suspension | Telescopic, coil spring, oil damped |
| Rear suspension | Full-floating suspension system, oil damped, spring preload 7-way adjustable |
| Front suspension stroke | 120 mm (4.7 in) |
| Rear wheel travel | 115 mm (4.5 in) |
| Caster | 64° 30′ |
| Trail | 95 mm (3.7 in) |
| Steering angle | 35° |
| Turning radius | 2.7 m (8.9 ft) |
| Front brake | Disc brake |
| Rear brake | Disc brake |
| Front tire size | 110/70-17 54H, tubeless |
| Rear tire size | 130/70-17 62H, tubeless |
| **ELECTRICAL** | |
| Ignition type | Fully transistorized |
| Ignition timing | 12° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min<br>5° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min . . . E33 |
| Spark plug | NGK DPR8EA-9 or NIPPON DENSO X24EPR-U9 |
| Battery | 12V 39.6 kC (11Ah)/10HR |
| Generator | Three-phase A.C. generator |
| Fuse | 20A |
| Headlight | 12V 60/55W |
| Position light | 12V 4W . . . . Except E03, 28, 33 |
| Turn signal light | 12V 21W |
| Tail/brake light | 12V 5/21W (x 2pcs.) |
| Speedometer light | 12V 3.4W |
| Tachometer light | 12V 3.4W |
| Neutral indicator light | 12V 3.4W |
| High beam indicator light | 12V 1.7W |
| Turn signal indicator light | 12V 3.4W |
| Oil pressure indicator light | 12V 3.4W |
| **CAPACITIES** | |
| Fuel tank, including reserve | 17.0 L (4.5/3.7 US/Imp gal)<br>15.0 L (4.0/3.3 US/Imp gal) . . . . . E33 |
| reserve | 3.5 L (0.9/0.8 US/Imp gal) |
| Engine oil, without filter change | 2 600 ml (2.8/2.3 US/Imp qt) |
| with filter change | 2 900 ml (3.0/2.6 US/Imp qt) |
| overhaul | 3 200 ml (3.4/2.8 US/Imp qt) |
| Front fork oil (each leg) | 382 ml (12.9/13.5 US/Imp oz) |

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# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Valve diam. | IN. | 39 (1.5) | ——— |
| | EX. | 32 (1.3) | ——— |
| Valve lift | IN. | 8.5 (0.33) | ——— |
| | EX. | 8.0 (0.31) | ——— |
| Tappet clearance (when cold) | IN. & EX. | 0.03—0.08 (0.001—0.003) | ——— |
| Valve guide to valve stem clearance | IN. | 0.025—0.055 (0.0010—0.0022) | 0.35 (0.014) |
| | EX. | 0.040—0.070 (0.0016—0.0028) | 0.35 (0.014) |
| Valve guide I.D. | IN. & EX. | 7.000—7.015 (0.2756—0.2762) | ——— |
| Valve stem O.D. | IN. | 6.960—6.975 (0.2740—0.2746) | ——— |
| | EX. | 6.945—6.960 (0.2734—0.2740) | ——— |
| Valve stem runout | IN. & EX. | ——— | 0.05 (0.002) |
| Valve head thickness | IN. & EX. | ——— | 0.5 (0.02) |
| Valve seat width | IN. & EX. | 1.0—1.2 (0.04—0.05) | ——— |
| Valve head radial runout | IN. & EX. | ——— | 0.03 (0.001) |
| Valve spring free length (IN. & EX.) | INNER | ——— | 35.6 (1.40) |
| | OUTER | ——— | 40.6 (1.60) |
| Valve spring tension (IN. & EX.) | INNER | 10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in) | ——— |
| | OUTER | 20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in) | ——— |

## CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Cam height | IN. | 36.789—36.819 (1.4484—1.4496) | 36.49 (1.437) |
| | EX. | 36.291—36.321 (1.4288—1.4300) | 36.00 (1.417) |
| Camshaft journal oil clearance | IN. & EX. | 0.032—0.066 (0.0013—0.0026) | 0.150 (0.0060) |
| Camshaft journal holder I.D. | IN. & EX. | 22.012—22.025 (0.8666—0.8671) | ——— |
| Camshaft journal O.D. | IN. & EX. | 21.959—21.980 (0.8645—0.8654) | ——— |

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| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Camshaft runout | IN. & EX. | ——— | 0.10 (0.004) |
| Cam chain 20-pitch length | ——— | | 157.8 (6.21) |
| Cam chain pin (at arrow "3") | 18th pin | | ——— |
| Cylinder head distortion | ——— | | 0.10 (0.004) |

## CYLINDER + PISTON + PISTON RING

Unit: mm (in)

| ITEM | STANDARD | | | LIMIT |
|---|---|---|---|---|
| Compression pressure | 1 000 – 1 400 kPa (10 – 14 kg/cm², 142 – 199 psi) | | | 800 kPa (8 kg/cm², 114 psi) |
| Compression pressure difference | ——— | | | 200 kPa (2 kg/cm², 28 psi) |
| Piston to cylinder clearance | 0.050 – 0.060 (0.0020 – 0.0024) | | | 0.120 (0.0047) |
| Cylinder bore | 74.000 – 74.015 (2.9134 – 2.9140) | | | 74.080 (2.9165) |
| Piston diam. | 73.945 – 73.960 (2.9112 – 2.9118) Measure at 15 mm (0.6 in) from the skirt end. | | | 73.880 (2.9087) |
| Cylinder distortion | ——— | | | 0.10 (0.004) |
| Piston ring free end gap | 1st | N | Approx. 7.0 (0.28) | 5.6 (0.22) |
| | 2nd | N | Approx. 11.0 (0.43) | 8.8 (0.35) |
| Piston ring end gap | 1st | | 0.10 – 0.25 (0.004 – 0.010) | 0.70 (0.028) |
| | 2nd | | 0.10 – 0.25 (0.004 – 0.010) | 0.70 (0.028) |
| Piston ring to groove clearance | 1st | | ——— | 0.180 (0.0071) |
| | 2nd | | ——— | 0.150 (0.0059) |
| Piston ring groove width | 1st | | 1.21 – 1.23 (0.047 – 0.048) | |
| | 2nd | | 1.21 – 1.23 (0.047 – 0.048) | |
| | Oil | | 2.51 – 2.53 (0.099 – 0.100) | |
| Piston ring thickness | 1st | | 1.17 – 1.19 (0.046 – 0.047) | |
| | 2nd | | 1.17 – 1.19 (0.046 – 0.047) | |
| Piston pin bore | 18.002 – 18.008 (0.7087 – 0.7090) | | | 18.030 (0.7098) |
| Piston pin O.D. | 17.995 – 18.000 (0.7085 – 0.7087) | | | 17.980 (0.7079) |

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## CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Conrod small end I.D. | 18.006—18.014 (0.7089—0.7092) | 18.040 (0.7102) |
| Conrod big end side clearance | 0.1—0.2 (0.004—0.008) | 0.3 (0.012) |
| Conrod big end width | 22.95—23.00 (0.904—0.906) | ——— |
| Crank pin width | 23.10—23.15 (0.909—0.911) | ——— |
| Conrod big end oil clearance | 0.024—0.048 (0.0009—0.0019) | 0.080 (0.0031) |
| Crank pin O.D. | 33.976—34.000 (1.3376—1.3386) | ——— |
| Crankshaft journal oil clearance | 0.020—0.044 (0.0008—0.0017) | 0.080 (0.0031) |
| Crankshaft journal O.D. | 31.976—32.000 (1.2589—1.2598) | ——— |
| Crankshaft thrust bearing thickness | 2.950—2.975 (0.1161—0.1171) | 2.850 (0.1122) |
| Crankshaft runout | ——— | 0.05 (0.002) |
| Balancer journal oil clearance | 0.020—0.044 (0.0008—0.0017) | 0.080 (0.0031) |
| Balancer journal O.D. | 31.984—32.000 (1.2592—1.2598) | ——— |
| Balancer spring free length | ——— | 14.9 (0.59) |

## OIL PUMP

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Oil pump reduction ratio | 1.879 (76/28 x 27/39) | ——— |
| Oil pressure (at 60°C, 140°F) | Above 200 kPa (2.0 kg/cm$^2$, 28 psi) Below 500 kPa (5.0 kg/cm$^2$, 71 psi) at 3 000 r/min. | ——— |

## CLUTCH

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Clutch cable play | 4 (0.2) | ——— |
| Clutch release screw | 1/4—1/2 turn back | ——— |
| Drive plate thickness | 2.92—3.08 (0.115—0.121) | 2.62 (0.103) |
| Drive plate claw width | 15.8—16.0 (0.62—0.63) | 15.0 (0.59) |
| Driven plate distortion | ——— | 0.10 (0.004) |
| Clutch spring free length | ——— | 60.8 (2.39) |

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## TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

| ITEM | | STANDARD | LIMIT |
|---|---|---|---|
| Primary reduction ratio | | 2.714 (76/28) | ——— |
| Final reduction ratio | | 2.437 (39/16) | ——— |
| Gear ratios | Low | 2.461 (32/13) | ——— |
| | 2nd | 1.777 (32/18) | ——— |
| | 3rd | 1.380 (29/21) | ——— |
| | 4th | 1.125 (27/24) | ——— |
| | 5th | 0.961 (25/26) | ——— |
| | Top | 0.851 (23/27) | ——— |
| Shift fork to groove clearance | | 0.1—0.3 (0.004—0.012) | 0.5 (0.020) |
| Shift fork groove width | No.1, No.2 & No.3 | 5.5—5.6 (0.217—0.220) | ——— |
| Shift fork thickness | No.1, No.2 & No.3 | 5.3—5.4 (0.209—0.213) | ——— |
| Countershaft length (Low to 2nd) | | $114.7 \pm {}^{0.1}_{0}$ ($4.516 \pm {}^{0.004}_{0}$) | ——— |
| Drive chain | Type | D.I.D.: DID520V6 | ——— |
| | Links | 110 | ——— |
| | 20-pitch length | ——— | 319.4 (12.57) |
| Drive chain slack | | 20—30 (0.8—1.2) | ——— |

## CARBURETOR

| ITEM | SPECIFICATION | |
|---|---|---|
| | E-03 | E-33 |
| Carburetor type | MIKUNI BST33SS | ← |
| Bore size | 33 mm | ← |
| I.D. No. | 01D00 | 01D10 |
| Idle r/min. | 1 200 ± 100 r/min. | ← |
| Float height | 14.6 ± 1.0 mm | ← |
| Main jet (M.J.) | #122.5 | ← |
| Main air jet (M.A.J) | 0.5 mm | ← |
| Jet needle (J.N.) | 5DH8 | ← |
| Needle jet (N.J.) | O-3 | ← |
| Throttle valve (Th.V.) | #120 | ← |
| Pilot jet (P.J.) | #37.5 | ← |
| By-pass (B.P.) | 0.8, 0.8, 0.8, 0.8 mm | ← |
| Pilot outlet (P.O.) | 0.8 mm | 0.9 mm |
| Valve seat (V.S.) | 1.5 mm | ← |
| Starter jet (G.S.) | #42.5 | ← |
| Pilot screw (P.S.) | PRE-SET | ← |
| Pilot air jet (P.A.J.) | 1.3 mm | 1.35 mm |
| Throttle cable play | 0.5—1.0 mm (0.02—0.04 in) | ← |

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## CARBURETOR

| ITEM | SPECIFICATION | | | | | | |
|---|---|---|---|---|---|---|---|
| | E-01,28 | E-02,04, 16,21, 25,34, 53 | E-24 | E-15,22 | E-22 (GS500 E-U) | E-39 | E-17 |
| Carburetor type | MIKUNI BST33SS | ← | ← | ← | ← | ← | ← |
| Bore size | 33 | ← | ← | ← | ← | ← | ← |
| I.D. No. | 01D20 | 01D30 | 01D50 | 01D70 | 01D60 | 01D80 | 01D90 |
| Idle r/min. | 1200± 100 r/min | ← | ← | ← | ← | ← | ← |
| Fuel level | 14.6± 1.0 mm | ← | ← | ← | ← | ← | ← |
| Main jet (M.J.) | #122.5 | #120 | ← | ← | #135 | #120 | #135 |
| Main air jet (M.A.J.) | 0.5 mm | ← | ← | ← | ← | ← | ← |
| Jet needle (J.N.) | 5DH9-3rd | ← | ← | ← | 5DH9-4th | 5DH9-3rd | 5DH9-4th |
| Needle jet (N.J.) | O-2 | ← | ← | ← | ← | ← | ← |
| Throttle valve (Th.V.) | #120 | ← | ← | ← | ← | ← | ← |
| Pilot jet (P.J.) | #40 | ← | ← | ← | ← | ← | ← |
| By-pass (B.P.) | 0.8, 0.8 0.8, 0.8 mm | ← | ← | ← | ← | ← | ← |
| Pilot outlet (P.O.) | 0.8 mm | ← | ← | ← | ← | ← | ← |
| Valve seat (V.S.) | 1.5 mm | ← | ← | ← | ← | ← | ← |
| Starter jet (G.S.) | #42.5 | ← | ← | ← | ← | ← | ← |
| Pilot screw (P.S.) | PRE-SET (2¼ turns back) | ← | ← | ← | ← | ← | PRE-SET (2½ turns back) |
| Pilot air jet (P.A.J.) | 1.3 mm | ← | ← | ← | ← | ← | ← |
| Throttle cable play | 0.5— 1.0 mm (0.02— 0.04 in) | ← | ← | ← | ← | ← | ← |

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## ELECTRICAL

Unit: mm (in)

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Ignition timing | 5° B.T.D.C. at 1200 r/min.<br>40° B.T.D.C. at 4 000 r/min. | | E-33 |
| | 12° B.T.D.C at 1200 r/min.<br>40° B.T.D.C at 4000 r/min. | | For the others |
| Firing order | L • R | | |
| Spark plug | Type | N.D.: X24EPR-U9<br>NGK: DPR8EA-9 | |
| | Gap | 0.8—0.9<br>(0.031—0.035) | |
| Spark performance | Over 8 (0.3) at 1 atm. | | |
| Signal coil resistance | 250—420 Ω | | |
| Ignition coil resistance | Primary | 3—6 Ω | Terminal-Terminal |
| | Secondary | 18—30 kΩ | Plug cap—Terminal |
| Generator no-load voltage | More than 75V (AC) at 5000 r/min. | | |
| Regulated voltage | 13.5—15.5V at 5000 r/min. | | |
| Starter motor brush length | N.D. | Limit: 9 (0.4) | |
| commutator under-cut | Limit: 0.2 (0.008) | | |
| Starter relay resistance | 3—5 Ω | | |
| Battery — Type designation | FB10L-B2 | | |
| Capacity | 12V 39.6kC (11Ah)/10HR | | |
| Standard electrolyte S.G. | 1.28 at 20°C (68°F) | | |
| Fuse size | 20A | | |

## WATTAGE

Unit: W

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-03, 28, 33 | The others |
| Headlight | HI | 60 | ← |
| | LO | 55 | ← |
| Position light | | | 4 |
| Tail/Brake light | | 5/21 | ← |
| Turn signal light | | 21 | ← |
| Tachometer light | | 3.4 | ← |
| Speedometer light | | 3.4 | ← |
| Turn signal indicator light | | 3.4 | ← |
| High beam indicator light | | 1.7 | ← |
| Neutral indicator light | | 3.4 | ← |
| Oil pressure indicator light | | 3.4 | ← |

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## BRAKE + WHEEL

Unit: mm (in)

| ITEM | | STANDARD | LIMIT |
|---|---|---|---|
| Rear brake pedal height | | 47 (1.9) | ——— |
| Brake disc thickness | Front | 4.5 ± 0.2 (0.177 ± 0.008) | 4.0 (0.16) |
| | Rear | 6.0 ± 0.2 (0.236 ± 0.008) | 5.5 (0.22) |
| Brake disc runout | | ——— | 0.30 (0.012) |
| Master cylinder bore | Front | 12.700 – 12.743 (0.5000 – 0.5017) | ——— |
| | Rear | 12.700 – 12.743 (0.5000 – 0.5017) | ——— |
| Master cylinder piston diam. | Front | 12.657 – 12.684 (0.4983 – 0.4994) | ——— |
| | Rear | 12.657 – 12.684 (0.4983 – 0.4994) | ——— |
| Brake caliper cylinder bore | Front | 27.000 – 27.076 (1.0630 – 1.0660) | ——— |
| | | 33.960 – 34.036 (1.3370 – 1.3400) | ——— |
| | Rear | 38.180 – 38.256 (1.5031 – 1.5061) | ——— |
| Brake caliper piston diam. | Front | 26.920 – 26.970 (1.0598 – 1.0618) | ——— |
| | | 33.884 – 33.934 (1.3340 – 1.3360) | ——— |
| | Rear | 38.098 – 38.148 (1.4999 – 1.5019) | ——— |
| Wheel rim runout | Axial | ——— | 2.0 (0.08) |
| | Radial | ——— | 2.0 (0.08) |
| Wheel axle runout | Front | ——— | 0.25 (0.010) |
| | Rear | ——— | 0.25 (0.010) |
| Tire size | Front | 110/70-17 54H | ——— |
| | Rear | 130/70-17 62H | ——— |
| Tire tread depth | Front | ——— | 1.6 (0.06) |
| | Rear | ——— | 2.0 (0.08) |

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## SUSPENSION

Unit: mm (in)

| ITEM | STANDARD | LIMIT | NOTE |
|---|---|---|---|
| Front fork stroke | 120 (4.7) | ——— | |
| Front fork spring free length | ——— | 254 (10.0) | |
| Front fork oil level | 99 (3.9) | ——— | |
| Rear shock absor ber spring adjuster | 4th/7 | ——— | |
| Rear wheel travel | 115 (4.5) | ——— | |
| Swingarm pivot shaft runout | ——— | 0.3 (0.01) | |

## TIRE PRESSURE

| COLD INFLATION TIRE PRESSURE | SOLO RIDING | | | DUAL RIDING | | |
|---|---|---|---|---|---|---|
| | kPa | kg/cm$^2$ | psi | kPa | kg/cm$^2$ | psi |
| FRONT | 225 | 2.25 | 33 | 225 | 2.25 | 33 |
| REAR | 250 | 2.50 | 36 | 280 | 2.80 | 41 |

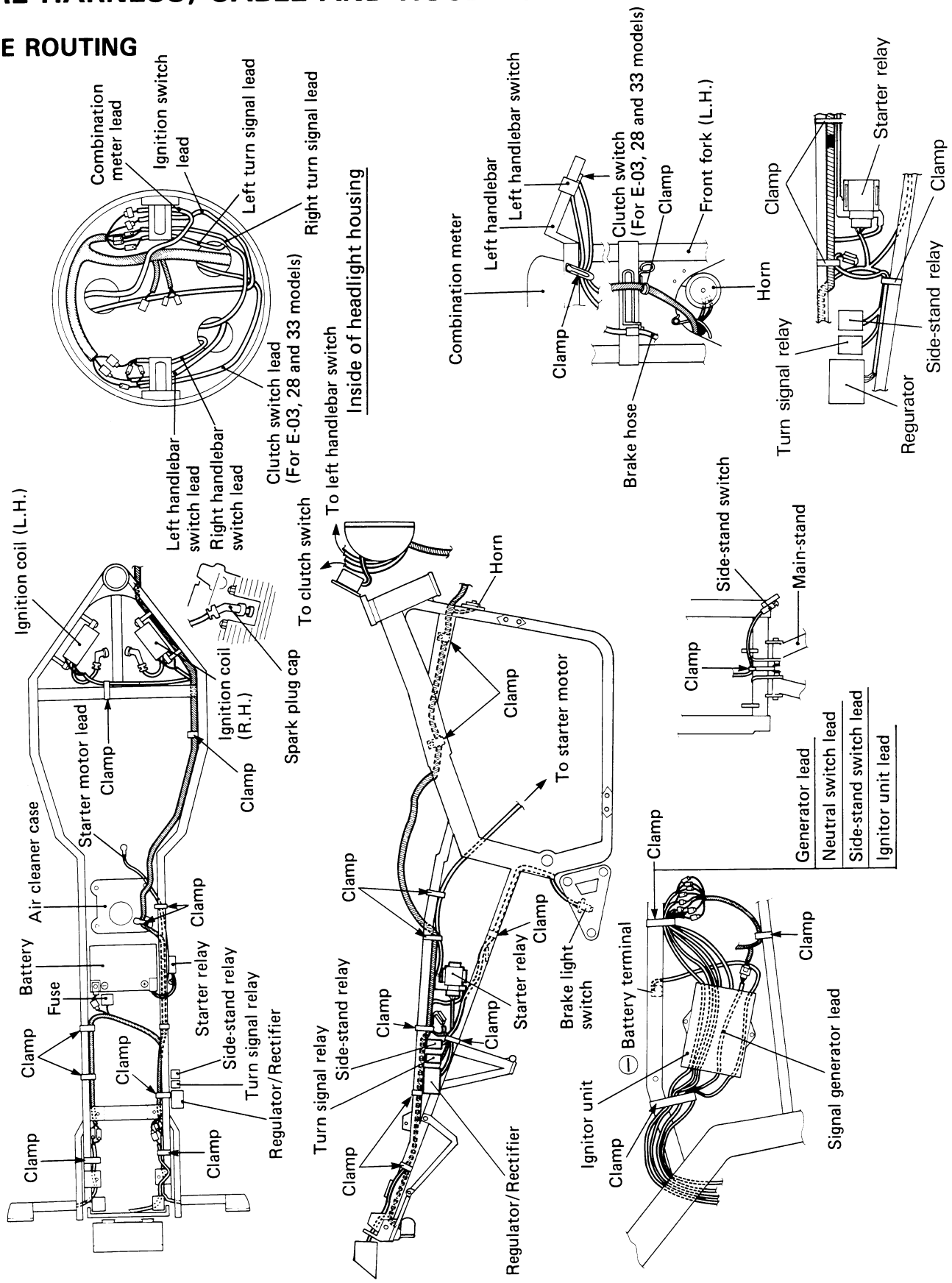
## FUEL + OIL

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Fuel type | ● Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ ) or 91 octane or higher rated by the research method.<br>● Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and coorosion inhibitor is permissible. | | E-03,33 |
| | Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method. | | E-28 |
| | Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended. | | For the others |
| Fuel tank including reserve | 15.0 L (4.0/3.3 US/Immp gal) | | E-33 |
| | 17.0 L (4.5/3.7 US/Imp gal) | | For the others |
| reserve | 3.5 L (0.9/0.8 US/Imp gal) | | |
| Engine oil type | SAE 10W/40, API SE or SF | | |
| Engine oil capcity | Change | 2 600 ml (2.7/2.3 US/Imp qt) | |
| | Filter change | 2 900 ml (3.1/2.6 US/Imp qt) | |
| | Overhaul | 3 200 ml (3.4/2.8 US/Imp qt) | |
| Front fork oil type | Fork oil # 10 | | |
| Front fork oil capacity (each leg) | 382 ml (12.9/13.5 US/Imp oz) | | |
| Brake fluid type | DOT 4 | | |

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# WIRE HARNESS, CABLE AND HOSE ROUTING

## WIRE ROUTING




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# GS500EN ('92-MODEL)

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# SPECIFICATIONS

## DIMENSIONS AND DRY MASS

| | |
|---|---|
| Overall length | 2 075 mm (81.7 in)<br>2 095 mm (82.5 in) . . . . . E17<br>2 105 mm (82.9 in) . . . . . E25<br>2 180 mm (85.8 in) . . . . . E15, 16, 22 |
| Overall width | 755 mm (29.7 in) |
| Overall height | 1 045 mm (41.1 in) |
| Wheelbase | 1 410 mm (55.5 in) |
| Ground clearance | 155 mm ( 6.1 in) |
| Seat height | 790 mm (31.1 in) |
| Dry mass | 169 kg (373 lbs) |

## ENGINE

| | |
|---|---|
| Type | Four-stroke, air-cooled, DOHC, TDCC |
| Valve clearance (IN & EX) | 0.03 – 0.08 mm (0.0012 – 0.0031 in) |
| Number of cylinders | 2 |
| Bore | 74.0 mm (2.913 in) |
| Stroke | 56.6 mm (2.228 in) |
| Piston displacement | 487 $cm^3$ (29.7 cu. in) |
| Compression ratio | 9.0 : 1 |
| Carburetor | MIKUNI BST33SS, twin |
| Air cleaner | Polyester fiber element |
| Starter system | Electric |
| Lubrication system | Wet sump |

## TRANSMISSION

| | |
|---|---|
| Clutch | Wet multi-plate type |
| Transmission | 6-speed constant mesh |
| Gearshift pattern | 1-down, 5-up |
| Primary reduction ratio | 2.714 (76/28) |
| Gear ratios, Low | 2.461 (32/13) |
| 2nd | 1.777 (32/18) |
| 3rd | 1.380 (29/21) |
| 4th | 1.125 (27/24) |
| 5th | 0.961 (25/26) |
| Top | 0.851 (23/27) |
| Final reduction ratio | 2.437 (39/16) |
| Drive chain | DAIDO DID. 520V6, 110 links |

## CHASSIS

| | |
|---|---|
| Front suspension | Telescopic, coil spring, oil damped . . . . . E03, 38, 33<br>Telescopic, coil spring, oil damped, spring pre-load 7-way adjustable . . . . . Others |
| Rear suspension | New-link suspension system, oil damped, spring pre-load 7-way adjustable |
| Front suspension stroke | 120 mm (4.7 in) |
| Rear wheel travel | 115 mm (4.5 in) |
| Caster | 64° 30' |
| Trail | 95 mm (3.7 in) |
| Steering angle | 35° |
| Turning radius | 2.7 m (8.9 ft) |
| Front brake | Disc brake |
| Rear brake | Disc brake |
| Front tire size | 110/70-17 54H, tubeless |
| Rear tire size | 130/70-17 62H, tubeless |

## ELECTRICAL

| | |
|---|---|
| Ignition type | Fully transistorized |
| Ignition timing | 12° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min<br>5° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min . . E33 only |
| Spark plug | NGK DPR8EA-9 or NIPPON DENSO X24EPR-U9 |
| Battery | 12V 39.6 kC (11Ah)/10HR |
| Generator | Three-phase A.C. generator |
| Fuse | 20A |
| Headlight | 12V 60/55W |
| Position light | 12V 4W . . . . Except E03, 28, 33 |
| Turn signal light | 12V 21W |
| Tail/brake light | 12V 5/21W (x 2pcs.) |
| Speedometer light | 12V 3.4W |
| Tachometer light | 12V 3.4W |
| Neutral indicator light | 12V 3.4W |
| High beam indicator light | 12V 1.7W |
| Turn signal indicator light | 12V 3.4W |
| Oil pressure indicator light | 12V 3.4W |

## CAPACITIES

| | |
|---|---|
| Fuel tank, including reserve | 17.0 L (4.5/3.7 US/Imp gal)<br>15.0 L (4.0/3.3 US/Imp gal) . . . . . E33 only |
| reserve | 3.5 L (0.9/0.8 US/Imp gal) |
| Engine oil, without filter change | 2 600 ml (2.8/2.3 US/Imp qt) |
| with filter change | 2 900 ml (3.0/2.6 US/Imp qt) |
| overhaul | 3 200 ml (3.4/2.8 US/Imp qt) |
| Front fork oil (each leg) | 382 ml (12.9/13.5 US/Imp oz) . . . . . E03, 28, 33<br>377 ml (12.7/13.3 US/Imp oz) . . . . . Others |

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# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Valve diam. | IN. | 39 (1.5) | ——— |
| | EX. | 32 (1.3) | ——— |
| Valve lift | IN. | 8.5 (0.33) | ——— |
| | EX. | 8.0 (0.31) | ——— |
| Tappet clearance (when cold) | IN. & EX. | 0.03—0.08 (0.001—0.003) | ——— |
| Valve guide to valve stem clearance | IN. | 0.025—0.055 (0.0010—0.0022) | 0.35 (0.014) |
| | EX. | 0.040—0.070 (0.0016—0.0028) | 0.35 (0.014) |
| Valve guide I.D. | IN. & EX. | 7.000—7.015 (0.2756—0.2762) | ——— |
| Valve stem O.D. | IN. | 6.960—6.975 (0.2740—0.2746) | ——— |
| | EX. | 6.945—6.960 (0.2734—0.2740) | ——— |
| Valve stem runout | IN. & EX. | ——— | 0.05 (0.002) |
| Valve head thickness | IN. & EX. | ——— | 0.5 (0.02) |
| Valve seat width | IN. & EX. | 1.0—1.2 (0.04—0.05) | ——— |
| Valve head radial runout | IN. & EX. | ——— | 0.03 (0.001) |
| Valve spring free length (IN. & EX.) | INNER | ——— | 35.6 (1.40) |
| | OUTER | ——— | 40.6 (1.60) |
| Valve spring tension (IN. & EX.) | INNER | 10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in) | ——— |
| | OUTER | 20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in) | ——— |

## CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Cam height | IN. | 36.789—36.819 (1.4484—1.4496) | 36.49 (1.437) |
| | EX. | 36.291—36.321 (1.4288—1.4300) | 36.00 (1.417) |
| Camshaft journal oil clearance | IN. & EX. | 0.032—0.066 (0.0013—0.0026) | 0.150 (0.0060) |
| Camshaft journal holder I.D. | IN. & EX. | 22.012—22.025 (0.8666—0.8671) | ——— |
| Camshaft journal O.D. | IN. & EX. | 21.959—21.980 (0.8645—0.8654) | ——— |

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| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Camshaft runout | IN. & EX. | — | 0.10 (0.004) |
| Cam chain 20-pitch length | — | | 157.8 (6.21) |
| Cam chain pin (at arrow "3") | 18th pin | | — |
| Cylinder head distortion | — | | 0.10 (0.004) |

## CYLINDER + PISTON + PISTON RING

Unit: mm (in)

| ITEM | STANDARD | | | LIMIT |
|---|---|---|---|---|
| Compression pressure | 1 000—1 400 kPa (10—14 kg/cm², 142—199 psi) | | | 800 kPa (8 kg/cm², 114 psi) |
| Compression pressure difference | — | | | 200 kPa (2 kg/cm², 28 psi) |
| Piston to cylinder clearance | 0.050—0.060 (0.0020—0.0024) | | | 0.120 (0.0047) |
| Cylinder bore | 74.000—74.015 (2.9134—2.9140) | | | 74.080 (2.9165) |
| Piston diam. | 73.945—73.960 (2.9112—2.9118) Measure at 15 mm (0.6 in) from the skirt end. | | | 73.880 (2.9087) |
| Cylinder distortion | — | | | 0.10 (0.004) |
| Piston ring free end gap | 1st | N | Approx. 7.0 (0.28) | 5.6 (0.22) |
| | 2nd | N | Approx. 11.0 (0.43) | 8.8 (0.35) |
| Piston ring end gap | 1st | | 0.10—0.25 (0.004—0.010) | 0.70 (0.028) |
| | 2nd | | 0.10—0.25 (0.004—0.010) | 0.70 (0.028) |
| Piston ring to groove clearance | 1st | | — | 0.180 (0.0071) |
| | 2nd | | — | 0.150 (0.0059) |
| Piston ring groove width | 1st | | 1.21—1.23 (0.047—0.048) | |
| | 2nd | | 1.21—1.23 (0.047—0.048) | |
| | Oil | | 2.51—2.53 (0.099—0.100) | |
| Piston ring thickness | 1st | | 1.17—1.19 (0.046—0.047) | |
| | 2nd | | 1.17—1.19 (0.046—0.047) | |
| Piston pin bore | 18.002—18.008 (0.7087—0.7090) | | | 18.030 (0.7098) |
| Piston pin O.D. | 17.995—18.000 (0.7085—0.7087) | | | 17.980 (0.7079) |

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## CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Conrod small end I.D. | 18.006—18.014<br>(0.7089—0.7092) | 18.040<br>(0.7102) |
| Conrod big end side clearance | 0.1—0.2<br>(0.004—0.008) | 0.3<br>(0.012) |
| Conrod big end width | 22.95—23.00<br>(0.904—0.906) | ——— |
| Crank pin width | 23.10—23.15<br>(0.909—0.911) | ——— |
| Conrod big end oil clearance | 0.024—0.048<br>(0.0009—0.0019) | 0.080<br>(0.0031) |
| Crank pin O.D. | 33.976—34.000<br>(1.3376—1.3386) | ——— |
| Crankshaft journal oil clearance | 0.020—0.044<br>(0.0008—0.0017) | 0.080<br>(0.0031) |
| Crankshaft journal O.D. | 31.976—32.000<br>(1.2589—1.2598) | ——— |
| Crankshaft thrust bearing thickness | 2.950—2.975<br>(0.1161—0.1171) | 2.850<br>(0.1122) |
| Crankshaft runout | ——— | 0.05<br>(0.002) |
| Balancer journal oil clearance | 0.020—0.044<br>(0.0008—0.0017) | 0.080<br>(0.0031) |
| Balancer journal O.D. | 31.984—32.000<br>(1.2592—1.2598) | ——— |
| Balancer spring free length | ——— | 14.9<br>(0.59) |

## OIL PUMP

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Oil pump reduction ratio | 1.879 (76/28 x 27/39) | ——— |
| Oil pressure (at 60°C,140°F) | Above 200 kPa (2.0 kg/cm², 28 psi)<br>Below 500 kPa (5.0 kg/cm², 71 psi)<br>at 3 000 r/min. | ——— |

## CLUTCH

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Clutch cable play | 4<br>(0.2) | ——— |
| Clutch release screw | 1/4—1/2 turn back | ——— |
| Drive plate thickness | 2.92—3.08<br>(0.115—0.121) | 2.62<br>(0.103) |
| Drive plate claw width | 15.8—16.0<br>(0.62—0.63) | 15.0<br>(0.59) |
| Driven plate distortion | ——— | 0.10<br>(0.004) |
| Clutch spring free length | ——— | 60.8<br>(2.39) |

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## TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

| ITEM | | STANDARD | | LIMIT |
|---|---|---|---|---|
| Primary reduction ratio | | 2.714 (76/28) | | ——— |
| Final reduction ratio | | 2.437 (39/16) | | ——— |
| Gear ratios | Low | 2.461 (32/13) | | ——— |
| | 2nd | 1.777 (32/18) | | ——— |
| | 3rd | 1.380 (29/21) | | ——— |
| | 4th | 1.125 (27/24) | | ——— |
| | 5th | 0.961 (25/26) | | ——— |
| | Top | 0.851 (23/27) | | ——— |
| Shift fork to groove clearance | | 0.1—0.3 (0.004—0.012) | | 0.5 (0.020) |
| Shift fork groove width | | No.1, No.2 & No.3 | 5.5—5.6 (0.217—0.220) | ——— |
| Shift fork thickness | | No.1, No.2 & No.3 | 5.3—5.4 (0.209—0.213) | ——— |
| Countershaft length (Low to 2nd) | | $114.7\ ^{+0.1}_{-0}$ $\left(4.516\ ^{+0.004}_{-0}\right)$ | | ——— |
| Drive chain | | Type | D.I.D.: DID520V6 | ——— |
| | | Links | 110 | ——— |
| | | 20-pitch length | ——— | 319.4 (12.57) |
| Drive chain slack | | 20—30 (0.8—1.2) | | ——— |

## CARBURETOR

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-03 | E-33 |
| Carburetor type | | MIKUNI BST33SS | ← |
| Bore size | | 33 mm | ← |
| I.D. No | | 01D00 | 01D10 |
| Idle r/min. | | 1 200 ± 100 r/min. | ← |
| Float height | | 14.6 ± 1.0 mm | ← |
| Main jet | (M.J.) | #122.5 | ← |
| Main air jet | (M.A.J.) | 0.5 mm | ← |
| Jet needle | (J.N.) | 5DH8 | ← |
| Needle jet | (N.J.) | O-3 | ← |
| Throttle valve | (Th.V.) | #120 | ← |
| Pilot jet | (P.J.) | #37.5 | ← |
| By-pass | (B.P.) | 0.8, 0.8, 0.8, 0.8 mm | ← |
| Pilot outlet | (P.O.) | 0.8 mm | 0.9 mm |
| Valve seat | (V.S.) | 1.5 mm | ← |
| Starter jet | (G.S.) | #42.5 | ← |
| Pilot screw | (P.S.) | PRE-SET | ← |
| Pilot air jet | (P.A.J.) | 1.3 mm | 1.35 mm |
| Throttle cable play | | 0.5—1.0 mm (0.02—0.04 in) | ← |

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## CARBURETOR

| ITEM | SPECIFICATION | | | | | | |
|---|---|---|---|---|---|---|---|
| | E-01,28 | E-02,04, 16,21, 25,34, 53 | E-24 | E-15,22 | E-22 (GS500 E-U) | E-39 | E-17 |
| Carburetor type | MIKUNI BST33SS | ← | ← | ← | ← | ← | ← |
| Bore size | 33 | ← | ← | ← | ← | ← | ← |
| I.D. No. | 01D20 | 01D30 | 01D50 | 01D70 | 01D60 | 01D80 | 01D90 |
| Idle r/min. | 1200± 100 r/min | ← | ← | ← | ← | ← | ← |
| Fuel level | 14.6± 1.0 mm | ← | ← | ← | ← | ← | ← |
| Main jet (M.J.) | #122.5 | #120 | ← | ← | #135 | #120 | #135 |
| Main air jet (M.A.J.) | 0.5 mm | ← | ← | ← | ← | ← | ← |
| Jet needle (J.N.) | 5DH9-3rd | ← | ← | ← | 5DH9-4th | 5DH9-3rd | 5DH9-4th |
| Needle jet (N.J.) | O-2 | ← | ← | ← | ← | ← | ← |
| Throttle valve (Th.V.) | #120 | ← | ← | ← | ← | ← | ← |
| Pilot jet (P.J.) | #40 | ← | ← | ← | ← | ← | ← |
| By-pass (B.P.) | 0.8, 0.8 0.8, 0.8 mm | ← | ← | ← | ← | ← | ← |
| Pilot outlet (P.O.) | 0.8 mm | ← | ← | ← | ← | ← | ← |
| Valve seat (V.S.) | 1.5 mm | ← | ← | ← | ← | ← | ← |
| Starter jet (G.S.) | #42.5 | ← | ← | ← | ← | ← | ← |
| Pilot screw (P.S.) | PRE-SET (2¼ turns back) | ← | ← | ← | ← | ← | PRE-SET (2½ turns back) |
| Pilot air jet (P.A.J.) | 1.3 mm | ← | ← | ← | ← | ← | ← |
| Throttle cable play | 0.5— 1.0 mm (0.02— 0.04 in) | ← | ← | ← | ← | ← | ← |

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## ELECTRICAL

Unit: mm (in)

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Ignition timing | 5° B.T.D.C. at 1 200 r/min.<br>40° B.T.D.C. at 4 000 r/min. | | E-33 |
| | 12° B.T.D.C. at 1 200 r/min.<br>40° B.T.D.C. at 4 000 r/min. | | For the others |
| Firing order | L • R | | |
| Spark plug | Type | N.D.: X24EPR-U9<br>NGK.: DPR8EA-9 | |
| | Gap | 0.8—0.9<br>(0.031—0.035) | |
| Spark performance | Over 8 (0.3) at 1 atm. | | |
| Signal coil resistance | 250—420 Ω | | |
| Ignition coil resistance | Primary | 3—6 Ω | Terminal—Terminal |
| | Secondary | 18—30 kΩ | Plug cap—Terminal |
| Generator no-load voltage | More than 75 V (AC) at 5 000 r/min. | | |
| Regulated voltage | 13.5—15.5 V at 5 000 r/min. | | |
| Starter motor brush length | N.D. | Limit: 9 (0.4) | |
| commutator under-cut | Limit: 0.2 (0.008) | | |
| Starter relay resistance | 3—5 Ω | | |
| Battery Type designation | FB10L-B2 | | |
| Capacity | 12V 39.6kC (11Ah)/10HR | | |
| Standard electrolyte S.G. | 1.28 at 20°C (68°F) | | |
| Fuse size | 20 A | | |

## WATTAGE

Unit:W

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-03,28,33 | The others |
| Headlight | HI | 60 | ← |
| | LO | 55 | ← |
| Position light | | | 4 |
| Tail/Brake light | | 5/21 | ← |
| Turn signal light | | 21 | ← |
| Tachometer light | | 3.4 | ← |
| Speedometer light | | 3.4 | ← |
| Turn signal indicator light | | 3.4 | ← |
| High beam indicator light | | 1.7 | ← |
| Neutral indicator light | | 3.4 | ← |
| Oil pressure indicator light | | 3.4 | ← |

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## BRAKE + WHEEL

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Rear brake pedal height | 47 (1.9) | | — |
| Brake disc thickness | Front | 4.5 ± 0.2 (0.177 ± 0.008) | 4.0 (0.16) |
| | Rear | 6.0 ± 0.2 (0.236 ± 0.008) | 5.5 (0.22) |
| Brake disc runout | — | | 0.30 (0.012) |
| Master cylinder bore | Front | 12.700—12.743 (0.5000—0.5017) | — |
| | Rear | 12.700—12.743 (0.5000—0.5017) | — |
| Master cylinder piston diam. | Front | 12.657—12.684 (0.4983—0.4994) | — |
| | Rear | 12.657—12.684 (0.4983—0.4994) | — |
| Brake caliper cylinder bore | Front | 27.000—27.076 (1.0630—1.0660) | — |
| | | 33.960—34.036 (1.3370—1.3400) | — |
| | Rear | 38.180—38.256 (1.5031—1.5061) | — |
| Brake caliper piston diam. | Front | 26.920—26.970 (1.0598—1.0618) | — |
| | | 33.884—33.934 (1.3340—1.3360) | — |
| | Rear | 38.098—38.148 (1.4999—1.5019) | — |
| Wheel rim runout | Axial | — | 2.0 (0.08) |
| | Radial | — | 2.0 (0.08) |
| Wheel axle runout | Front | — | 0.25 (0.010) |
| | Rear | — | 0.25 (0.010) |
| Tire size | Front | 110/70-17 54H | — |
| | Rear | 130/70-17 62H | — |
| Tire tread depth | Front | — | 1.6 (0.06) |
| | Rear | — | 2.0 (0.08) |

## SUSPENSION

Unit: mm (in)

| ITEM | STANDARD | LIMIT | NOTE |
|---|---|---|---|
| Front fork stroke | 120 (4.7) | — | |
| Front fork spring free length | — | 254 (10.0) | E-03,28,33 |
| | — | 303 (11.9) | For the others |

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| ITEM | STANDARD | LIMIT | NOTE |
|---|---|---|---|
| Front fork oil level | 99 (3.9) | ——— | E-03,28,33 |
| | 105 (4.1) | ——— | For the others |
| Rear shock absorber spring adjuster | 4th/7 | ——— | |
| Rear wheel travel | 115 (4.5) | ——— | |
| Swingarm pivot shaft runout | ——— | 0.3 (0.01) | |

## TIRE PRESSURE

| COLD INFLATION TIRE PRESSURE | SOLO RIDING | | | DUAL RIDING | | |
|---|---|---|---|---|---|---|
| | kPa | kg/cm² | psi | kPa | kg/cm² | psi |
| FRONT | 225 | 2.25 | 33 | 225 | 2.25 | 33 |
| REAR | 250 | 2.50 | 36 | 280 | 2.80 | 41 |

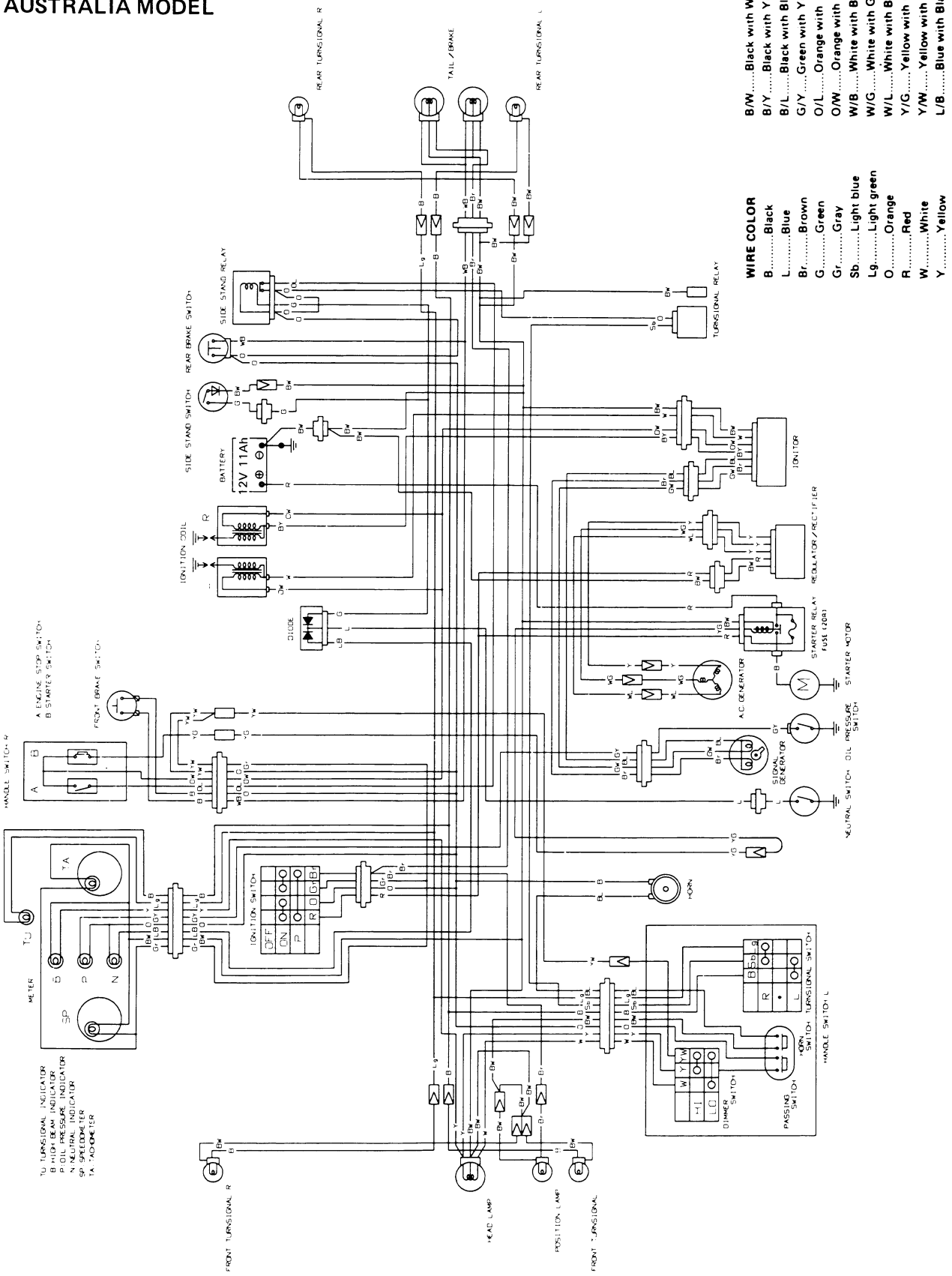
## FUEL + OIL

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Fuel type | • Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ ) or 91 octane or higher rated by the research method.<br>• Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible. | | E-03,33 |
| | Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method. | | E-28 |
| | Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended. | | For the others |
| Fuel tank including reserve | 15.0 L (4.0/3.3 US/Imp gal) | | E-33 |
| | 17.0 L (4.5/3.7 US/Imp gal) | | For the others |
| reserve | 3.5 L (0.9/0.8 US/Imp gal) | | |
| Engine oil type | SAE 10W/40, API SE or SF | | |
| Engine oil capacity | Change | 2 600 ml (2.7/2.3 US/Imp qt) | |
| | Filter change | 2 900 ml (3.1/2.6 US/Imp qt) | |
| | Overhaul | 3 200 ml (3.4/2.8 US/Imp qt) | |
| Front fork oil type | Fork oil #10 | | |
| Front fork oil capacity (each leg) | 382 ml (12.9/13.5 US/Imp oz) | | E-03,28,33 |
| | 377 ml (12.7/13.3 US/Imp oz) | | For the others |
| Brake fluid type | DOT 4 | | |

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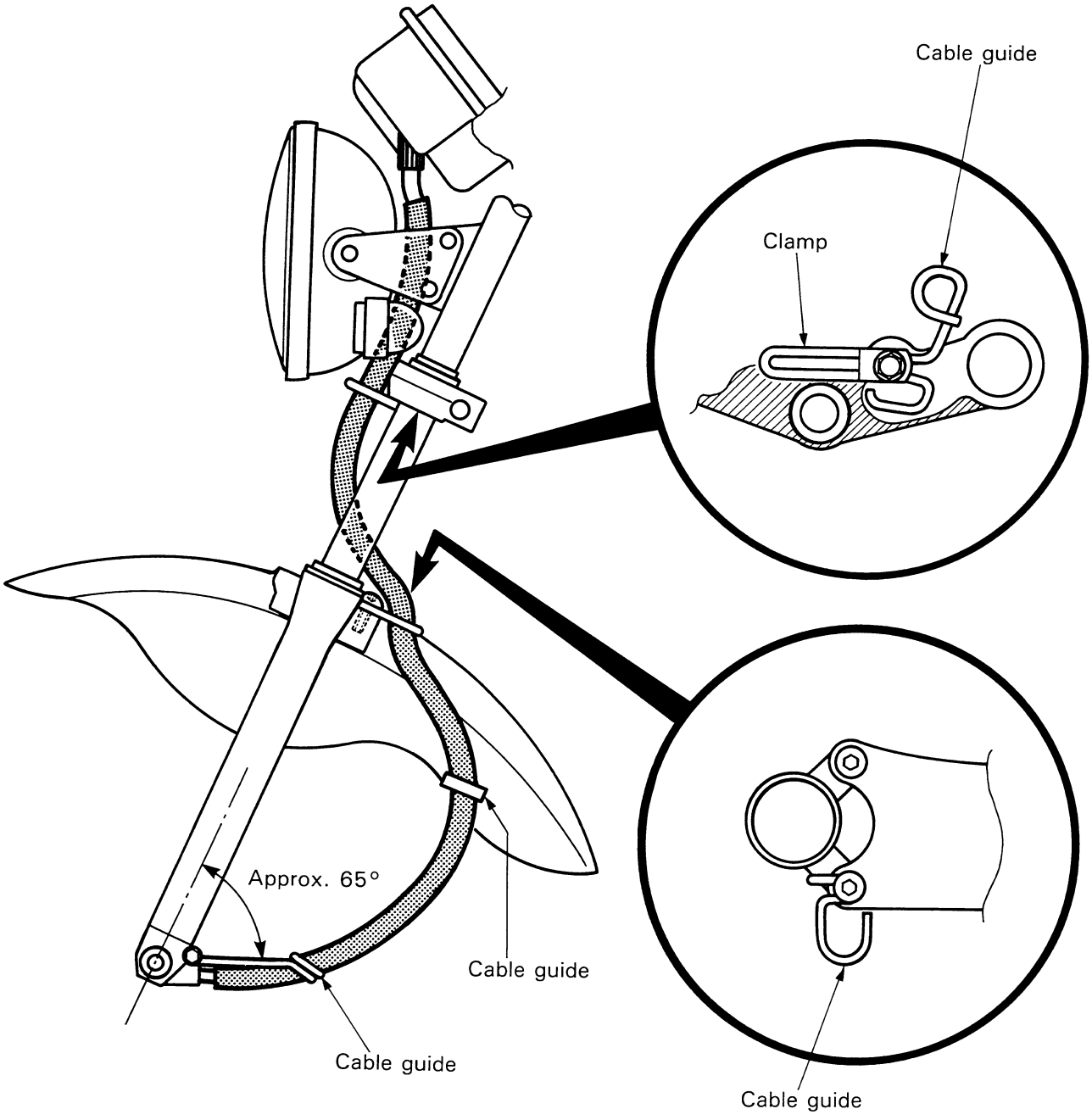
# WIRING DIAGRAM

## FOR AUSTRALIA MODEL




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## SPEEDOMETER CABLE ROUTING




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# GS500EP ('93-MODEL)

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SPECIFICATIONS . . . . . 12-1
SERVICE DATA . . . . . 12-2



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# SPECIFICATIONS

## DIMENSIONS AND DRY MASS

| | |
|---|---|
| Overall length | 2 075 mm (81.7 in)<br>2 095 mm (82.5 in) . . . . . E17<br>2 105 mm (82.9 in) . . . . . E25<br>2 180 mm (85.8 in) . . . . . E15, 16, 22 |
| Overall width | 755 mm (29.7 in) |
| Overall height | 1 045 mm (41.1 in) |
| Wheelbase | 1 410 mm (55.5 in) |
| Ground clearance | 155 mm ( 6.1 in) |
| Seat height | 790 mm (31.1 in) |
| Dry mass | 169 kg (373 lbs) |

## ENGINE

| | |
|---|---|
| Type | Four-stroke, air-cooled, DOHC, TDCC |
| Valve clearance (IN & EX) | 0.03 – 0.08 mm (0.0012 – 0.0031 in) |
| Number of cylinders | 2 |
| Bore | 74.0 mm (2.913 in) |
| Stroke | 56.6 mm (2.228 in) |
| Piston displacement | 487 $cm^3$ (29.7 cu. in) |
| Compression ratio | 9.0 : 1 |
| Carburetor | MIKUNI BST33SS, twin |
| Air cleaner | Polyester fiber element |
| Starter system | Electric |
| Lubrication system | Wet sump |

## TRANSMISSION

| | |
|---|---|
| Clutch | Wet multi-plate type |
| Transmission | 6-speed constant mesh |
| Gearshift pattern | 1-down, 5-up |
| Primary reduction ratio | 2.714 (76/28) |
| Gear ratios, low | 2.461 (32/13) |
| 2nd | 1.777 (32/18) |
| 3rd | 1.380 (29/21) |
| 4th | 1.125 (27/24) |
| 5th | 0.961 (25/26) |
| Top | 0.851 (23/27) |
| Final reduction ratio | 2.437 (39/16) |
| Drive chain | DAIDO DID. 520V6, 110 links |

## CHASSIS

| | |
|---|---|
| Front suspension | Telescopic, coil spring, oil damped . . . . . E03, 38, 33<br>Telescopic, coil spring, oil damped, spring pre-load 7-way adjustable . . . . . Others |
| Rear suspension | New-link suspension system, oil damped, spring pre-load 7-way adjustable |
| Front suspension stroke | 120 mm (4.7 in) |
| Rear wheel travel | 115 mm (4.5 in) |
| Caster | 64° 30' |
| Trail | 95 mm (3.7 in) |
| Steering angle | 35° |
| Turning radius | 2.7 m (8.9 ft) |
| Front brake | Disc brake |
| Rear brake | Disc brake |
| Front tire size | 110/70-17 54H, tubeless |
| Rear tire size | 130/70-17 62H, tubeless |

## ELECTRICAL

| | |
|---|---|
| Ignition type | Fully transistorized |
| Ignition timing | 12° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min<br>5° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min . . E33 only |
| Spark plug | NGK DPR8EA-9 or NIPPON DENSO X24EPR-U9 |
| Battery | 12V 39.6 kC (11Ah)/10HR |
| Generator | Three-phase A.C. generator |
| Fuse | 20A |
| Headlight | 12V 60/55W |
| Position light | 12V 4W . . . . . Except E03, 24, 28, 33 |
| Turn signal light | 12V 21W |
| Tail/brake light | 12V 5/21W (x 2pcs.) |
| Speedometer light | 12V 3.4W |
| Tachometer light | 12V 3.4W |
| Neutral indicator light | 12V 3.4W |
| High beam indicator light | 12V 1.7W |
| Turn signal indicator light | 12V 3.4W |
| Oil pressure indicator light | 12V 3.4W |

## CAPACITIES

| | |
|---|---|
| Fuel tank, including reserve | 17.0 L (4.5/3.7 US/Imp gal)<br>15.0 L (4.0/3.3 US/Imp gal) . . . . . E33 only |
| reserve | 3.5 L (0.9/0.8 US/Imp gal) |
| Engine oil, without filter change | 2 600 ml (2.8/2.3 US/Imp qt) |
| with filter change | 2 900 ml (3.0/2.6 US/Imp qt) |
| overhaul | 3 200 ml (3.4/2.8 US/Imp qt) |
| Front fork oil (each leg) | 382 ml (12.9/13.5 US/Imp oz) . . . . . E03, 28, 33<br>377 ml (12.7/13.3 US/Imp oz) . . . . . Others |

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# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Valve diam. | IN. | 39 (1.5) | — |
| | EX. | 32 (1.3) | — |
| Valve lift | IN. | 8.5 (0.33) | — |
| | EX. | 8.0 (0.31) | — |
| Tappet clearance (when cold) | IN. & EX. | 0.03—0.08 (0.001—0.003) | — |
| Valve guide to valve stem clearance | IN. | 0.025—0.055 (0.0010—0.0022) | 0.35 (0.014) |
| | EX. | 0.040—0.070 (0.0016—0.0028) | 0.35 (0.014) |
| Valve guide I.D. | IN. & EX. | 7.000—7.015 (0.2756—0.2762) | — |
| Valve stem O.D. | IN. | 6.960—6.975 (0.2740—0.2746) | — |
| | EX. | 6.945—6.960 (0.2734—0.2740) | — |
| Valve stem runout | IN. & EX. | — | 0.05 (0.002) |
| Valve head thickness | IN. & EX. | — | 0.5 (0.02) |
| Valve seat width | IN. & EX. | 1.0—1.2 (0.04—0.05) | — |
| Valve head radial runout | IN. & EX. | — | 0.03 (0.001) |
| Valve spring free length (IN. & EX.) | INNER | — | 35.6 (1.40) |
| | OUTER | — | 40.6 (1.60) |
| Valve spring tension (IN. & EX.) | INNER | 10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in) | — |
| | OUTER | 20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in) | — |

## CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Cam height | IN. | 36.789—36.819 (1.4484—1.4496) | 36.49 (1.437) |
| | EX. | 36.291—36.321 (1.4288—1.4300) | 36.00 (1.417) |
| Camshaft journal oil clearance | IN. & EX. | 0.032—0.066 (0.0013—0.0026) | 0.150 (0.0060) |
| Camshaft journal holder I.D. | IN. & EX. | 22.012—22.025 (0.8666—0.8671) | — |
| Camshaft journal O.D. | IN. & EX. | 21.959—21.980 (0.8645—0.8654) | — |

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| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Camshaft runout | IN. & EX. | ——— | 0.10 (0.004) |
| Cam chain 20-pitch length | ——— | | 157.8 (6.21) |
| Cam chain pin (at arrow "3") | 18th pin | | ——— |
| Cylinder head distortion | ——— | | 0.10 (0.004) |

## CYLINDER + PISTON + PISTON RING

Unit: mm (in)

| ITEM | STANDARD | | | LIMIT |
|---|---|---|---|---|
| Compression pressure | 1 000—1 400 kPa (10—14 kg/cm², 142—199 psi) | | | 800 kPa (8 kg/cm², 114 psi) |
| Compression pressure difference | ——— | | | 200 kPa (2 kg/cm², 28 psi) |
| Piston to cylinder clearance | 0.050—0.060 (0.0020—0.0024) | | | 0.120 (0.0047) |
| Cylinder bore | 74.000—74.015 (2.9134—2.9140) | | | 74.080 (2.9165) |
| Piston diam. | 73.945—73.960 (2.9112—2.9118) Measure at 15 mm (0.6 in) from the skirt end. | | | 73.880 (2.9087) |
| Cylinder distortion | ——— | | | 0.10 (0.004) |
| Piston ring free end gap | 1st | N | Approx. 7.0 (0.28) | 5.6 (0.22) |
| | 2nd | N | Approx. 11.0 (0.43) | 8.8 (0.35) |
| Piston ring end gap | 1st | | 0.10—0.25 (0.004—0.010) | 0.70 (0.028) |
| | 2nd | | 0.10—0.25 (0.004—0.010) | 0.70 (0.028) |
| Piston ring to groove clearance | 1st | | ——— | 0.180 (0.0071) |
| | 2nd | | ——— | 0.150 (0.0059) |
| Piston ring groove width | 1st | | 1.21—1.23 (0.047—0.048) | |
| | 2nd | | 1.21—1.23 (0.047—0.048) | |
| | Oil | | 2.51—2.53 (0.099—0.100) | |
| Piston ring thickness | 1st | | 1.17—1.19 (0.046—0.047) | |
| | 2nd | | 1.17—1.19 (0.046—0.047) | |
| Piston pin bore | 18.002—18.008 (0.7087—0.7090) | | | 18.030 (0.7098) |
| Piston pin O.D. | 17.995—18.000 (0.7085—0.7087) | | | 17.980 (0.7079) |

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## CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Conrod small end I.D. | 18.006—18.014<br>(0.7089—0.7092) | 18.040<br>(0.7102) |
| Conrod big end side clearance | 0.1—0.2<br>(0.004—0.008) | 0.3<br>(0.012) |
| Conrod big end width | 22.95—23.00<br>(0.904—0.906) | ——— |
| Crank pin width | 23.10—23.15<br>(0.909—0.911) | ——— |
| Conrod big end oil clearance | 0.024—0.048<br>(0.0009—0.0019) | 0.080<br>(0.0031) |
| Crank pin O.D. | 33.976—34.000<br>(1.3376—1.3386) | ——— |
| Crankshaft journal oil clearance | 0.020—0.044<br>(0.0008—0.0017) | 0.080<br>(0.0031) |
| Crankshaft journal O.D. | 31.976—32.000<br>(1.2589—1.2598) | ——— |
| Crankshaft thrust bearing thickness | 2.950—2.975<br>(0.1161—0.1171) | 2.850<br>(0.1122) |
| Crankshaft runout | ——— | 0.05<br>(0.002) |
| Balancer journal oil clearance | 0.020—0.044<br>(0.0008—0.0017) | 0.080<br>(0.0031) |
| Balancer journal O.D. | 31.984—32.000<br>(1.2592—1.2598) | ——— |
| Balancer spring free length | ——— | 14.9<br>(0.59) |

## OIL PUMP

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Oil pump reduction ratio | 1.879 (76/28 x 27/39) | ——— |
| Oil pressure (at 60°C,140°F) | Above 200 kPa (2.0 kg/cm², 28 psi)<br>Below 500 kPa (5.0 kg/cm², 71 psi)<br>at 3 000 r/min. | ——— |

## CLUTCH

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Clutch cable play | 4<br>(0.2) | ——— |
| Clutch release screw | 1/4—1/2 turn back | ——— |
| Drive plate thickness | 2.92—3.08<br>(0.115—0.121) | 2.62<br>(0.103) |
| Drive plate claw width | 15.8—16.0<br>(0.62—0.63) | 15.0<br>(0.59) |
| Driven plate distortion | ——— | 0.10<br>(0.004) |
| Clutch spring free length | ——— | 60.8<br>(2.39) |

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## TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

| ITEM | | STANDARD | | LIMIT |
|---|---|---|---|---|
| Primary reduction ratio | | 2.714 (76/28) | | ——— |
| Final reduction ratio | | 2.437 (39/16) | | ——— |
| Gear ratios | Low | 2.461 (32/13) | | ——— |
| | 2nd | 1.777 (32/18) | | ——— |
| | 3rd | 1.380 (29/21) | | ——— |
| | 4th | 1.125 (27/24) | | ——— |
| | 5th | 0.961 (25/26) | | ——— |
| | Top | 0.851 (23/27) | | ——— |
| Shift fork to groove clearance | | 0.1—0.3 (0.004—0.012) | | 0.5 (0.020) |
| Shift fork groove width | | No.1, No.2 & No.3 | 5.5—5.6 (0.217—0.220) | ——— |
| Shift fork thickness | | No.1, No.2 & No.3 | 5.3—5.4 (0.209—0.213) | ——— |
| Countershaft length (Low to 2nd) | | $114.7\ ^{+0.1}_{-0}$ $\left(4.516\ ^{+0.004}_{-0}\right)$ | | ——— |
| Drive chain | | Type | D.I.D.: DID520V6 | ——— |
| | | Links | 110 | ——— |
| | | 20-pitch length | ——— | 319.4 (12.57) |
| Drive chain slack | | 20—30 (0.8—1.2) | | ——— |

## CARBURETOR

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-03 | E-33 |
| Carburetor type | | MIKUNI BST33SS | ← |
| Bore size | | 33 mm | ← |
| I.D. No | | 01D00 | 01D10 |
| Idle r/min. | | 1 200 ± 100 r/min. | ← |
| Float height | | 14.6 ± 1.0 mm | ← |
| Main jet | (M.J.) | #122.5 | ← |
| Main air jet | (M.A.J.) | 0.5 mm | ← |
| Jet needle | (J.N.) | 5DH8 | ← |
| Needle jet | (N.J.) | O-3 | ← |
| Throttle valve | (Th.V.) | #120 | ← |
| Pilot jet | (P.J.) | #37.5 | ← |
| By-pass | (B.P.) | 0.8, 0.8, 0.8, 0.8 mm | ← |
| Pilot outlet | (P.O.) | 0.8 mm | 0.9 mm |
| Valve seat | (V.S.) | 1.5 mm | ← |
| Starter jet | (G.S.) | #42.5 | ← |
| Pilot screw | (P.S.) | PRE-SET | ← |
| Pilot air jet | (P.A.J.) | 1.3 mm | 1.35 mm |
| Throttle cable play | | 0.5—1.0 mm (0.02—0.04 in) | ← |

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## CARBURETOR

| ITEM | | SPECIFICATION | | | | | |
|---|---|---|---|---|---|---|---|
| | | E-01,28 | E-02,04, 21,25, 34,53 | E-24 | E-22 | E-22 (GS500 E-U) | E-17 |
| Carburetor type | | MIKUNI BST33SS | ← | ← | ← | ← | ← |
| Bore size | | 33 | ← | ← | ← | ← | ← |
| I.D. No. | | 01D20 | 01D30 | 01D50 | 01D70 | 01D60 | 01D9 |
| Idle r/min. | | 1200 ± 100 r/min. | ← | ← | ← | ← | ← |
| Float height | | 14.6 ± 1.0 mm | ← | ← | ← | ← | ← |
| Main jet | (M.J.) | #122.5 | #120 | ← | ← | #135 | ← |
| Main air jet | (M.A.J.) | 0.5 mm | ← | ← | ← | ← | ← |
| Jet needle | (J.N.) | 5DH9-3rd | ← | ← | ← | 5DH9-4th | ← |
| Needle jet | (N.J.) | O-2 | ← | ← | ← | ← | ← |
| Throttle valve | (Th.V.) | #120 | ← | ← | ← | ← | ← |
| Pilot jet | (P.J.) | #40 | ← | ← | ← | ← | ← |
| By-pass | (B.P.) | 0.8, 0.8 0.8, 0.8 mm | ← | ← | ← | ← | ← |
| Pilot outlet | (P.O.) | 0.8 mm | ← | ← | ← | ← | ← |
| Valve seat | (V.S.) | 1.5 mm | ← | ← | ← | ← | ← |
| Starter jet | (G.S.) | #42.5 | ← | ← | ← | ← | ← |
| Pilot screw | (P.S.) | PRE-SET (2¼ turns back) | ← | ← | ← | ← | PRE-SET (2½ turns back) |
| Pilot air jet | (P.A.J.) | 1.3 mm | ← | ← | ← | ← | ← |
| Throttle cable play | | 0.5—1.0 mm (0.02—0.04 in) | ← | ← | ← | ← | ← |

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| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-18 | E-39 (GS500E-U) |
| Carburetor type | | MIKUNI BST33SS | ← |
| Bore size | | 33 | ← |
| I.D. No. | | 02D1 | 02D2 |
| Idle r/min. | | $1300^{+100}_{-50}$ r/min. | 1200 ± 50 r/min. |
| Float height | | 14.6 ± 1.0 mm | ← |
| Main jet | (M.J.) | Right: #115, Left: #120 | Right: #115, Left: #125 |
| Main air jet | (M.A.J.) | 0.5 mm | ← |
| Jet needle | (J.N.) | 5DH9-3rd | ← |
| Needle jet | (N.J.) | O-2 | ← |
| Throttle valve | (Th.V.) | #125 | ← |
| Pilot jet | (P.J.) | #40 | ← |
| By-pass | (B.P.) | 0.8, 0.8, 0.8, 0.8 mm | ← |
| Pilot outlet | (P.O.) | 0.8 mm | ← |
| Valve seat | (V.S.) | 1.5 mm | ← |
| Starter jet | (G.S.) | #42.5 | ← |
| Pilot screw | (P.S.) | PRE-SET (1⅝ turns back) | PRE-SET (1¾ turns back) |
| Pilot air jet | (P.A.J.) | 1.4 mm | ← |
| Throttle cable play | | 0.5—1.0 mm (0.02—0.04 in) | ← |

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## ELECTRICAL

Unit: mm (in)

| ITEM | | SPECIFICATION | | NOTE |
|---|---|---|---|---|
| Ignition timing | | 5° B.T.D.C. at 1 200 r/min.<br>40° B.T.D.C. at 4 000 r/min. | | E-33 |
| | | 12° B.T.D.C. at 1 200 r/min.<br>40° B.T.D.C. at 4 000 r/min. | | For the others |
| Firing order | | L • R | | |
| Spark plug | | Type | N.D.: X24EPR-U9<br>NGK.: DPR8EA-9 | |
| | | Gap | 0.8—0.9<br>(0.031—0.035) | |
| Spark performance | | Over 8 (0.3) at 1 atm. | | |
| Signal coil resistance | | 250—420 Ω | | |
| Ignition coil resistance | | Primary | 3—6 Ω | Terminal—Terminal |
| | | Secondary | 18—30 kΩ | Plug cap—Terminal |
| Generator no-load voltage | | More than 75 V (AC) at 5 000 r/min. | | |
| Regulated voltage | | 13.5—15.5 V at 5 000 r/min. | | |
| Starter motor brush length | | N.D. | Limit: 9 (0.4) | |
| commutator under-cut | | Limit: 0.2 (0.008) | | |
| Starter relay resistance | | 3—5 Ω | | |
| Battery | Type designation | FB10L-B2 | | |
| | Capacity | 12V 39.6kC (11Ah)/10HR | | |
| | Standard electrolyte S.G. | 1.28 at 20°C (68°F) | | |
| Fuse size | | 20 A | | |

## WATTAGE

Unit:W

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-03,24,28,33 | The others |
| Headlight | HI | 60 | ← |
| | LO | 55 | ← |
| Position light | | | 4 |
| Tail/Brake light | | 5/21 | ← |
| Turn signal light | | 21 | ← |
| Tachometer light | | 3.4 | ← |
| Speedometer light | | 3.4 | ← |
| Turn signal indicator light | | 3.4 | ← |
| High beam indicator light | | 1.7 | ← |
| Neutral indicator light | | 3.4 | ← |
| Oil pressure indicator light | | 3.4 | ← |

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## BRAKE + WHEEL

Unit: mm (in)

| ITEM | | STANDARD | LIMIT |
|---|---|---|---|
| Rear brake pedal height | | 47<br>(1.9) | — |
| Brake disc thickness | Front | 4.5 ± 0.2<br>(0.177 ± 0.008) | 4.0<br>(0.16) |
| | Rear | 6.0 ± 0.2<br>(0.236 ± 0.008) | 5.5<br>(0.22) |
| Brake disc runout | | — | 0.30<br>(0.012) |
| Master cylinder bore | Front | 12.700—12.743<br>(0.5000—0.5017) | — |
| | Rear | 12.700—12.743<br>(0.5000—0.5017) | — |
| Master cylinder piston diam. | Front | 12.657—12.684<br>(0.4983—0.4994) | — |
| | Rear | 12.657—12.684<br>(0.4983—0.4994) | — |
| Brake caliper cylinder bore | Front | 27.000—27.076<br>(1.0630—1.0660) | — |
| | | 33.960—34.036<br>(1.3370—1.3400) | — |
| | Rear | 38.180—38.256<br>(1.5031—1.5061) | — |
| Brake caliper piston diam. | Front | 26.920—26.970<br>(1.0598—1.0618) | — |
| | | 33.884—33.934<br>(1.3340—1.3360) | — |
| | Rear | 38.098—38.148<br>(1.4999—1.5019) | — |
| Wheel rim runout | Axial | — | 2.0<br>(0.08) |
| | Radial | — | 2.0<br>(0.08) |
| Wheel axle runout | Front | — | 0.25<br>(0.010) |
| | Rear | — | 0.25<br>(0.010) |
| Tire size | Front | 110/70-17 54H | — |
| | Rear | 130/70-17 62H | — |
| Tire tread depth | Front | — | 1.6<br>(0.06) |
| | Rear | — | 2.0<br>(0.08) |

## SUSPENSION

Unit: mm (in)

| ITEM | STANDARD | LIMIT | NOTE |
|---|---|---|---|
| Front fork stroke | 120<br>(4.7) | — | |
| Front fork spring free length | — | 254<br>(10.0) | E-03,28,33 |
| | — | 303<br>(11.9) | For the others |

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| ITEM | STANDARD | LIMIT | NOTE |
|---|---|---|---|
| Front fork oil level | 99 (3.9) | ——— | E-03,28,33 |
| | 105 (4.1) | ——— | For the others |
| Rear shock absorber spring adjuster | 4th/7 | ——— | |
| Rear wheel travel | 115 (4.5) | ——— | |
| Swingarm pivot shaft runout | ——— | 0.3 (0.01) | |

## TIRE PRESSURE

| COLD INFLATION TIRE PRESSURE | SOLO RIDING | | | DUAL RIDING | | |
|---|---|---|---|---|---|---|
| | kPa | kg/cm² | psi | kPa | kg/cm² | psi |
| FRONT | 225 | 2.25 | 33 | 225 | 2.25 | 33 |
| REAR | 250 | 2.50 | 36 | 280 | 2.80 | 41 |

## FUEL + OIL

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Fuel type | • Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ ) or 91 octane or higher rated by the research method.<br>• Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible. | | E-03,33 |
| | Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method. | | E-28 |
| | Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended. | | For the others |
| Fuel tank including reserve | 15.0 L (4.0/3.3 US/Imp gal) | | E-33 |
| | 17.0 L (4.5/3.7 US/Imp gal) | | For the others |
| reserve | 3.5 L (0.9/0.8 US/Imp gal) | | |
| Engine oil type | SAE 10W/40, API SE or SF | | |
| Engine oil capacity | Change | 2 600 ml (2.7/2.3 US/Imp qt) | |
| | Filter change | 2 900 ml (3.1/2.6 US/Imp qt) | |
| | Overhaul | 3 200 ml (3.4/2.8 US/Imp qt) | |
| Front fork oil type | Fork oil #10 | | |
| Front fork oil capacity (each leg) | 382 ml (12.9/13.5 US/Imp oz) | | E-03,28,33 |
| | 377 ml (12.7/13.3 US/Imp oz) | | For the others |
| Brake fluid type | DOT 4 | | |

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# GS500ER ('94-MODEL)

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# SPECIFICATIONS

## DIMENSIONS AND DRY MASS

| | |
|---|---|
| Overall length | 2 095 mm (82.5 in) . . . . . E17<br>2 105 mm (82.9 in) . . . . . E25<br>2 180 mm (85.8 in) . . . . . E22<br>2 075 mm (81.7 in) . . . . . Others |
| Overall width | 745 mm (29.3 in) |
| Overall height | 1 045 mm (41.1 in) |
| Wheelbase | 1 410 mm (55.5 in) |
| Ground clearance | 155 mm ( 6.1 in) |
| Seat height | 790 mm (31.1 in) |
| Dry mass | 170 kg (374 lbs) . . . . . E33<br>169 kg (372 lbs). . . . . Others |

## ENGINE

| | |
|---|---|
| Type | Four-stroke, air-cooled, DOHC |
| Valve clearance (IN & EX) | 0.03—0.08 mm (0.0012—0.0031 in) |
| Number of cylinders | 2 |
| Bore | 74.0 mm (2.913 in) |
| Stroke | 56.6 mm (2.228 in) |
| Piston displacement | 487 $cm^3$ (29.7 cu. in) |
| Compression ratio | 9.0 : 1 |
| Carburetor | BST33, twin |
| Air cleaner | Polyester fiber element |
| Starter system | Electric |
| Lubrication system | Wet sump |

## TRANSMISSION

| | |
|---|---|
| Clutch | Wet multi-plate type |
| Transmission | 6-speed constant mesh |
| Gearshift pattern | 1-down, 5-up |
| Primary reduction ratio | 2.714 (76/28) |
| Gear ratios, Low | 2.461 (32/13) |
| 2nd | 1.777 (32/18) |
| 3rd | 1.380 (29/21) |
| 4th | 1.125 (27/24) |
| 5th | 0.961 (25/26) |
| Top | 0.851 (23/27) |
| Final reduction ratio | 2.437 (39/16) |
| Drive chain | DID. 520$V_6$, 110 links |

## CHASSIS

| | |
|---|---|
| Front suspension | Telescopic, coil spring, oil damped . . . . E03, 33<br>Telescopic coil spring, oil damped, spring preload adjustable . . . . Others |
| Rear suspension | Link type, oil damped, spring preload 7-way adjustable |
| Front suspension stroke | 120 mm (4.7 in) |
| Rear wheel travel | 115 mm (4.5 in) |
| Caster | 64° 30' |
| Trail | 95 mm (3.7 in) |
| Steering angle | 35° |
| Turning radius | 2.7 m (8.9 ft) |
| Front brake | Disc brake |
| Rear brake | Disc brake |
| Front tire size | 110/70-17 54H |
| Rear tire size | 130/70-17 62H |

## ELECTRICAL

| | |
|---|---|
| Ignition type | Transistorized |
| Ignition timing | 5° B.T.D.C. at 1000 r/min and 40° B.T.D.C. at 4000 r/min . . . . E33<br>12° B.T.D.C. at 1200 r/min and 40° B.T.D.C at 4000 r/min . . . . Others |
| Spark plug | NGK DPR8EA-9 or NIPPON DENSO X24EPR-U9 |
| Battery | 12V 39.6 kC (11 Ah)/10HR |
| Generator | Three-phase A.C. generator |
| Fuse | 20A |
| Headlight | 12V 60/55W |
| Position light | 12V 4W . . . .Except E03, 24, 28, 33 |
| Turn signal light | 12V 21W |
| Tail/brake light | 12V 5/21W (x 2 pcs.) |
| Speedometer light | 12V 3.4W |
| Neutral indicator light | 12V 3.4W |
| High beam indicator light | 12V 1.7W |
| Turn signal indicator light | 12V 3.4W |
| Oil pressure indicator light | 12V 3.4W |

## CAPACITIES

| | |
|---|---|
| Fuel tank including reserve | 15.0 L (4.0/3.3 US/Imp gal) . . . . . E33<br>17.0 L (4.5/3.7 US/Imp gal) . . . . . Others |
| reserve | 3.5 L (0.9/0.8 US/Imp gal) |
| Engine oil, without filter change | 2 600 ml (2.7/2.3 US/Imp.qt) |
| with filter change | 2 900 ml (3.1/2.6 US/Imp. qt) |
| overhaul | 3 200 ml (3.4/2.8 US/Imp.qt) |
| Front fork oil (each leg) | 382 ml (12.9/13.5 US/Imp oz) . . . . . E03,28,33<br>377 ml (12.7/13.3 US/Imp oz) . . . . . Others |

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# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Valve diam. | IN. | 39 (1.5) | ——— |
| | EX. | 32 (1.3) | ——— |
| Valve lift | IN. | 8.5 (0.33) | ——— |
| | EX. | 8.0 (0.31) | ——— |
| Tappet clearance (when cold) | IN. & EX. | 0.03—0.08 (0.001—0.003) | ——— |
| Valve guide to valve stem clearance | IN. | 0.025—0.055 (0.0010—0.0022) | 0.35 (0.014) |
| | EX. | 0.040—0.070 (0.0016—0.0028) | 0.35 (0.014) |
| Valve guide I.D. | IN. & EX. | 7.000—7.015 (0.2756—0.2762) | ——— |
| Valve stem O.D. | IN. | 6.960—6.975 (0.2740—0.2746) | ——— |
| | EX. | 6.945—6.960 (0.2734—0.2740) | ——— |
| Valve stem runout | IN. & EX. | ——— | 0.05 (0.002) |
| Valve head thickness | IN. & EX. | ——— | 0.5 (0.02) |
| Valve seat width | IN. & EX. | 1.0—1.2 (0.04—0.05) | ——— |
| Valve head radial runout | IN. & EX. | ——— | 0.03 (0.001) |
| Valve spring free length (IN. & EX.) | INNER | ——— | 35.6 (1.40) |
| | OUTER | ——— | 40.6 (1.60) |
| Valve spring tension (IN. & EX.) | INNER | 10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in) | ——— |
| | OUTER | 20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in) | ——— |

## CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

| ITEM | | STANDARD | | LIMIT |
|---|---|---|---|---|
| Cam height | E-03,18, 24,28,33 | IN. | 36.789—36.819 (1.4484—1.4496) | 36.49 (1.437) |
| | | EX. | 36.291—36.321 (1.4288—1.4300) | 36.00 (1.417) |
| | For the others | IN. | 36.090—36.130 (1.4208—1.4224) | 35.80 (1.409) |
| | | EX. | 36.090—36.130 (1.4208—1.4224) | 35.80 (1.409) |
| Camshaft journal oil clearance | | IN. & EX. | 0.032—0.066 (0.0013—0.0026) | 0.150 (0.0060) |

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| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Camshaft journal holder I.D. | IN. & EX. | 22.012—22.025<br>(0.8666—0.8671) | ——— |
| Camshaft journal O.D. | IN. & EX. | 21.959—21.980<br>(0.8645—0.8654) | ——— |
| Camshaft runout | IN. & EX. | ——— | 0.10<br>(0.004) |
| Cam chain 20-pitch length | ——— | | 157.8<br>(6.21) |
| Cam chain pin (at arrow "3") | 18th pin | | ——— |
| Cylinder head distortion | ——— | | 0.10<br>(0.004) |

## CYLINDER + PISTON + PISTON RING

Unit: mm (in)

| ITEM | STANDARD | | | LIMIT |
|---|---|---|---|---|
| Compression pressure | 1 000—1 400 kPa<br>(10—14 kg/cm², 142—199 psi) | | | 800 kPa<br>(8 kg/cm², 114 psi) |
| Compression pressure difference | ——— | | | 200 kPa<br>(2 kg/cm², 28 psi) |
| Piston to cylinder clearance | 0.050—0.060<br>(0.0020—0.0024) | | | 0.120<br>(0.0047) |
| Cylinder bore | 74.000—74.015<br>(2.9134—2.9140) | | | 74.080<br>(2.9165) |
| Piston diam. | 73.945—73.960<br>(2.9112—2.9118)<br>Measure at 15 mm (0.6 in) from the skirt end. | | | 73.880<br>(2.9087) |
| Cylinder distortion | ——— | | | 0.10<br>(0.004) |
| Piston ring free end gap | 1st | N | Approx. 7.0<br>(0.28) | 5.6<br>(0.22) |
| | 2nd | N | Approx. 11.0<br>(0.43) | 8.8<br>(0.35) |
| Piston ring end gap | 1st | | 0.10—0.25<br>(0.004—0.010) | 0.70<br>(0.028) |
| | 2nd | | 0.10—0.25<br>(0.004—0.010) | 0.70<br>(0.028) |
| Piston ring to groove clearance | 1st | | ——— | 0.180<br>(0.0071) |
| | 2nd | | ——— | 0.150<br>(0.0059) |
| Piston ring groove width | 1st | | 1.21—1.23<br>(0.047—0.048) | |
| | 2nd | | 1.21—1.23<br>(0.047—0.048) | |
| | Oil | | 2.51—2.53<br>(0.099—0.100) | |
| Piston ring thickness | 1st | | 1.17—1.19<br>(0.046—0.047) | |
| | 2nd | | 1.17—1.19<br>(0.046—0.047) | |

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| ITEM | STANDARD | LIMIT |
|---|---|---|
| Piston pin bore | 18.002—18.008<br>(0.7087—0.7090) | 18.030<br>(0.7098) |
| Piston pin O.D. | 17.995—18.000<br>(0.7085—0.7087) | 17.980<br>(0.7079) |

## CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Conrod small end I.D. | 18.006—18.014<br>(0.7089—0.7092) | 18.040<br>(0.7102) |
| Conrod big end side clearance | 0.1—0.2<br>(0.004—0.008) | 0.3<br>(0.012) |
| Conrod big end width | 22.95—23.00<br>(0.904—0.906) | ——— |
| Crank pin width | 23.10—23.15<br>(0.909—0.911) | ——— |
| Conrod big end oil clearance | 0.024—0.048<br>(0.0009—0.0019) | 0.080<br>(0.0031) |
| Crank pin O.D. | 33.976—34.000<br>(1.3376—1.3386) | ——— |
| Crankshaft journal oil clearance | 0.020—0.044<br>(0.0008—0.0017) | 0.080<br>(0.0031) |
| Crankshaft journal O.D. | 31.976—32.000<br>(1.2589—1.2598) | ——— |
| Crankshaft thrust bearing thickness | 2.950—2.975<br>(0.1161—0.1171) | 2.850<br>(0.1122) |
| Crankshaft runout | ——— | 0.05<br>(0.002) |
| Balancer journal oil clearance | 0.020—0.044<br>(0.0008—0.0017) | 0.080<br>(0.0031) |
| Balancer journal O.D. | 31.984—32.000<br>(1.2592—1.2598) | ——— |
| Balancer spring free length | ——— | 14.9<br>(0.59) |

## OIL PUMP

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Oil pump reduction ratio | 1.879 (76/28 x 27/39) | ——— |
| Oil pressure (at 60°C,140°F) | Above 200 kPa (2.0 kg/cm², 28 psi)<br>Below 500 kPa (5.0 kg/cm², 71 psi)<br>at 3 000 r/min. | ——— |

## CLUTCH

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Clutch cable play | 10—15<br>(0.4—0.6) | ——— |
| Clutch release screw | 1/4—1/2 turn back | ——— |
| Drive plate thickness | 2.92—3.08<br>(0.115—0.121) | 2.62<br>(0.103) |
| Drive plate claw width | 15.8—16.0<br>(0.62—0.63) | 15.0<br>(0.59) |
| Driven plate distortion | ——— | 0.10<br>(0.004) |
| Clutch spring free length | ——— | 60.8<br>(2.39) |

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## TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

| ITEM | | STANDARD | LIMIT |
|---|---|---|---|
| Primary reduction ratio | | 2.714 (76/28) | ——— |
| Final reduction ratio | | 2.437 (39/16) | ——— |
| Gear ratios | Low | 2.461 (32/13) | ——— |
| | 2nd | 1.777 (32/18) | ——— |
| | 3rd | 1.380 (29/21) | ——— |
| | 4th | 1.125 (27/24) | ——— |
| | 5th | 0.961 (25/26) | ——— |
| | Top | 0.851 (23/27) | ——— |
| Shift fork to groove clearance | | 0.1—0.3 (0.004—0.012) | 0.5 (0.020) |
| Shift fork groove width | No.1, No.2 & No.3 | 5.5—5.6 (0.217—0.220) | ——— |
| Shift fork thickness | No.1, No.2 & No.3 | 5.3—5.4 (0.209—0.213) | ——— |
| Countershaft length (Low to 2nd) | | $114.7\ ^{+0.1}_{-0}$ $\left(4.516\ ^{+0.004}_{-0}\right)$ | ——— |
| Drive chain | Type | D.I.D.: DID520V6 | ——— |
| | Links | 110 | ——— |
| | 20-pitch length | ——— | 319.4 (12.57) |
| Drive chain slack | | 20—30 (0.8—1.2) | ——— |

## CARBURETOR

| ITEM | SPECIFICATION | |
|---|---|---|
| | E-03 | E-33 |
| Carburetor type | MIKUNI BST33SS | ← |
| Bore size | 33 mm | ← |
| I.D. No | 01D00 | 01D10 |
| Idle r/min. | 1 200 ± 100 r/min. | ← |
| Float height | 14.6 ± 1.0 mm | ← |
| Main jet (M.J.) | #122.5 | ← |
| Main air jet (M.A.J.) | 0.5 mm | ← |
| Jet needle (J.N.) | 5DH8 | ← |
| Needle jet (N.J.) | O-3 | ← |
| Throttle valve (Th.V.) | #120 | ← |
| Pilot jet (P.J.) | #37.5 | ← |
| By-pass (B.P.) | 0.8, 0.8, 0.8, 0.8 mm | ← |
| Pilot outlet (P.O.) | 0.8 mm | 0.9 mm |
| Valve seat (V.S.) | 1.5 mm | ← |
| Starter jet (G.S.) | #42.5 | ← |
| Pilot screw (P.S.) | PRE-SET | ← |
| Pilot air jet (P.A.J.) | 1.3 mm | 1.35 mm |
| Throttle cable play | 3—6 mm (0.1—0.2 in) | ← |

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## CARBURETOR

| ITEM | SPECIFICATION | | | | | |
|---|---|---|---|---|---|---|
| | E-28 | E-02,04, 21,25, 34,37,53 | E-24 | E-22 | E-22,34 (GS500 E-U) | E-17 |
| Carburetor type | MIKUNI BST33SS | ← | ← | ← | ← | ← |
| Bore size | 33 | ← | ← | ← | ← | ← |
| I.D. No. | 01D20 | 02D5 | 01D50 | 02D6 | 02D3 | 01D9 |
| Idle r/min. | 1200 ± 100 r/min. | ← | ← | ← | ← | ← |
| Float height | 14.6 ± 1.0 mm | ← | ← | ← | ← | ← |
| Main jet (M.J.) | #122.5 | L: #125 R: #122.5 | #120 | L: #125 R: #122.5 | #130 | #135 |
| Main air jet (M.A.J.) | 0.5 mm | ← | ← | ← | ← | ← |
| Jet needle (J.N.) | 5DH9-3rd | ← | ← | ← | ← | 5DH9-4th |
| Needle jet (N.J.) | O-2 | ← | ← | ← | ← | ← |
| Throttle valve (Th.V.) | #120 | ← | ← | ← | ← | ← |
| Pilot jet (P.J.) | #40 | ← | ← | ← | ← | ← |
| By-pass (B.P.) | 0.8, 0.8 0.8, 0.8 mm | ← | ← | ← | ← | ← |
| Pilot outlet (P.O.) | 0.8 mm | 0.9 mm | 0.8 mm | 0.9 mm | ← | 0.8 mm |
| Valve seat (V.S.) | 1.5 mm | ← | ← | ← | ← | ← |
| Starter jet (G.S.) | #42.5 | ← | ← | ← | ← | ← |
| Pilot screw (P.S.) | PRE-SET (2¼ turns back) | PRE-SET (1⅞ turns back) | PRE-SET (2¼ turns back) | PRE-SET (1⅝ turns back) | PRE-SET (1⅞ turns back) | PRE-SET (2½ turns back) |
| Pilot air jet (P.A.J.) | 1.3 mm | 1.2 mm | 1.3 mm | 1.2 mm | 1.25 mm | 1.3 mm |
| Throttle cable play | 3—6 mm (0.1—0.2 in) | ← | ← | ← | ← | ← |

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| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-18 | E-39 (GS500E-U) |
| Carburetor type | | MIKUNI BST33SS | ← |
| Bore size | | 33 | ← |
| I.D. No. | | 02D1 | 02D2 |
| Idle r/min. | | $1300^{+100}_{-50}$ r/min. | 1200 ± 50 r/min. |
| Float height | | 14.6 ± 1.0 mm | ← |
| Main jet | (M.J.) | Right: #115, Left: #120 | Right: #115, Left: #125 |
| Main air jet | (M.A.J.) | 0.5 mm | ← |
| Jet needle | (J.N.) | 5DH9-3rd | ← |
| Needle jet | (N.J.) | O-2 | ← |
| Throttle valve | (Th.V.) | #125 | ← |
| Pilot jet | (P.J.) | #40 | ← |
| By-pass | (B.P.) | 0.8, 0.8, 0.8, 0.8 mm | ← |
| Pilot outlet | (P.O.) | 0.8 mm | ← |
| Valve seat | (V.S.) | 1.5 mm | ← |
| Starter jet | (G.S.) | #42.5 | ← |
| Pilot screw | (P.S.) | PRE-SET (1⅝ turns back) | PRE-SET (1¾ turns back) |
| Pilot air jet | (P.A.J.) | 1.4 mm | ← |
| Throttle cable play | | 3—6 mm (0.1—0.2 in) | ← |

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## ELECTRICAL

Unit: mm (in)

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Ignition timing | 5° B.T.D.C. at 1 200 r/min.<br>40° B.T.D.C. at 4 000 r/min. | | E-33 |
| | 12° B.T.D.C. at 1 200 r/min.<br>40° B.T.D.C. at 4 000 r/min. | | For the others |
| Firing order | L • R | | |
| Spark plug | Type | N.D.: X24EPR-U9<br>NGK.: DPR8EA-9 | |
| | Gap | 0.8—0.9<br>(0.031—0.035) | |
| Spark performance | Over 8 (0.3) at 1 atm. | | |
| Signal coil resistance | 250—420 Ω | | |
| Ignition coil resistance | Primary | 3—6 Ω | Terminal—Terminal |
| | Secondary | 18—30 kΩ | Plug cap—Terminal |
| Generator no-load voltage | More than 75 V (AC) at 5 000 r/min. | | |
| Regulated voltage | 13.5—15.5 V at 5 000 r/min. | | |
| Starter motor brush length | N.D. | Limit: 9 (0.4) | |
| commutator under-cut | Limit: 0.2 (0.008) | | |
| Starter relay resistance | 3—5 Ω | | |
| Battery — Type designation | FB10L-B2 | | |
| Capacity | 12V 39.6kC (11Ah)/10HR | | |
| Standard electrolyte S.G. | 1.28 at 20°C (68°F) | | |
| Fuse size | 20 A | | |

## WATTAGE

Unit:W

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-03,24,28,33 | The others |
| Headlight | HI | 60 | ← |
| | LO | 55 | ← |
| Position light | | | 4 |
| Tail/Brake light | | 5/21 | ← |
| Turn signal light | | 21 | ← |
| Tachometer light | | 3.4 | ← |
| Speedometer light | | 3.4 | ← |
| Turn signal indicator light | | 3.4 | ← |
| High beam indicator light | | 1.7 | ← |
| Neutral indicator light | | 3.4 | ← |
| Oil pressure indicator light | | 3.4 | ← |

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## BRAKE + WHEEL

Unit: mm (in)

| ITEM | | STANDARD | LIMIT |
|---|---|---|---|
| Rear brake pedal height | | 47<br>(1.9) | ——— |
| Brake disc thickness | Front | 4.5 ± 0.2<br>(0.177 ± 0.008) | 4.0<br>(0.16) |
| | Rear | 6.0 ± 0.2<br>(0.236 ± 0.008) | 5.5<br>(0.22) |
| Brake disc runout | | ——— | 0.30<br>(0.012) |
| Master cylinder bore | Front | 12.700—12.743<br>(0.5000—0.5017) | ——— |
| | Rear | 12.700—12.743<br>(0.5000—0.5017) | ——— |
| Master cylinder piston diam. | Front | 12.657—12.684<br>(0.4983—0.4994) | ——— |
| | Rear | 12.657—12.684<br>(0.4983—0.4994) | ——— |
| Brake caliper cylinder bore | Front | 27.000—27.076<br>(1.0630—1.0660) | ——— |
| | | 33.960—34.036<br>(1.3370—1.3400) | ——— |
| | Rear | 38.180—38.256<br>(1.5031—1.5061) | ——— |
| Brake caliper piston diam. | Front | 26.920—26.970<br>(1.0598—1.0618) | ——— |
| | | 33.884—33.934<br>(1.3340—1.3360) | ——— |
| | Rear | 38.098—38.148<br>(1.4999—1.5019) | ——— |
| Wheel rim runout | Axial | ——— | 2.0<br>(0.08) |
| | Radial | ——— | 2.0<br>(0.08) |
| Wheel axle runout | Front | ——— | 0.25<br>(0.010) |
| | Rear | ——— | 0.25<br>(0.010) |
| Tire size | Front | 110/70-17 54H | ——— |
| | Rear | 130/70-17 62H | ——— |
| Tire tread depth | Front | ——— | 1.6<br>(0.06) |
| | Rear | ——— | 2.0<br>(0.08) |

## SUSPENSION

Unit: mm (in)

| ITEM | STANDARD | LIMIT | NOTE |
|---|---|---|---|
| Front fork stroke | 120<br>(4.7) | ——— | |
| Front fork spring free length | ——— | 254<br>(10.0) | E-03,28,33 |
| | ——— | 303<br>(11.9) | For the others |

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| ITEM | STANDARD | LIMIT | NOTE |
|---|---|---|---|
| Front fork oil level | 99 (3.9) | ——— | E-03,28,33 |
| | 105 (4.1) | ——— | For the others |
| Rear shock absorber spring adjuster | 4th/7 | ——— | |
| Rear wheel travel | 115 (4.5) | ——— | |
| Swingarm pivot shaft runout | ——— | 0.3 (0.01) | |

## TIRE PRESSURE

| COLD INFLATION TIRE PRESSURE | SOLO RIDING | | | DUAL RIDING | | |
|---|---|---|---|---|---|---|
| | kPa | kg/cm² | psi | kPa | kg/cm² | psi |
| FRONT | 225 | 2.25 | 33 | 225 | 2.25 | 33 |
| REAR | 250 | 2.50 | 36 | 280 | 2.80 | 41 |

## FUEL + OIL

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Fuel type | • Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ ) or 91 octane or higher rated by the research method.<br>• Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible. | | E-03,33 |
| | Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method. | | E-28 |
| | Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended. | | For the others |
| Fuel tank including reserve | 15.0 L (4.0/3.3 US/Imp gal) | | E-33 |
| | 17.0 L (4.5/3.7 US/Imp gal) | | For the others |
| reserve | 3.5 L (0.9/0.8 US/Imp gal) | | |
| Engine oil type | SAE 10W/40, API SE or SF | | |
| Engine oil capacity | Change | 2 600 ml (2.7/2.3 US/Imp qt) | |
| | Filter change | 2 900 ml (3.1/2.6 US/Imp qt) | |
| | Overhaul | 3 200 ml (3.4/2.8 US/Imp qt) | |
| Front fork oil type | Fork oil #10 | | |
| Front fork oil capacity (each leg) | 382 ml (12.9/13.5 US/Imp oz) | | E-03,28,33 |
| | 377 ml (12.7/13.3 US/Imp oz) | | For the others |
| Brake fluid type | DOT 4 | | |

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# GS500ES ('95-MODEL)

## FOREWORD

*This section describes service data and service specifications which differ from those of the GS500ER ('94-model).*

*NOTE:*
- *Any differences between GS500ER ('94-model) and GS500ES ('95-model) in specifications and service data are clearly indicated with the asterisk marks (*).*
- *Please refer to the sections 1 through 13 for details which are not given in this section.*

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# SPECIFICATIONS

## DIMENSIONS AND DRY MASS

| | |
|---|---|
| Overall length | 2 105 mm (82.9 in) . . . . . E25 |
| | 2 180 mm (85.8 in) . . . . . E22 |
| | 2 075 mm (81.7 in) . . . . . Others |
| Overall width | 745 mm (29.3 in) |
| Overall height | 1 045 mm (41.1 in) |
| Wheelbase | 1 410 mm (55.5 in) |
| Ground clearance | 155 mm ( 6.1 in) |
| Seat height | 790 mm (31.1 in) |
| Dry mass | 170 kg (374 lbs). . . . . E33 |
| | 169 kg (372 lbs). . . . . Others |

## ENGINE

| | |
|---|---|
| Type | Four-stroke, air-cooled, DOHC |
| Valve clearance (IN & EX) | 0.03—0.08 mm (0.0012—0.0031 in) |
| Number of cylinders | 2 |
| Bore | 74.0 mm (2.913 in) |
| Stroke | 56.6 mm (2.228 in) |
| Piston displacement | 487 $cm^3$ (29.7 cu. in) |
| Compression ratio | 9.0 : 1 |
| Carburetor | BST33, twin |
| Air cleaner | Polyester fiber element |
| Starter system | Electric |
| Lubrication system | Wet sump |

## TRANSMISSION

| | |
|---|---|
| Clutch | Wet multi-plate type |
| Transmission | 6-speed constant mesh |
| Gearshift pattern | 1-down, 5-up |
| Primary reduction ratio | 2.714 (76/28) |
| Gear ratios, Low | 2.461 (32/13) |
| 2nd | 1.777 (32/18) |
| 3rd | 1.380 (29/21) |
| 4th | 1.125 (27/24) |
| 5th | 0.961 (25/26) |
| Top | 0.851 (23/27) |
| Final reduction ratio | 2.437 (39/16) |
| Drive chain | DID. 520$VS_2$, 110 links |

## CHASSIS

| | |
|---|---|
| Front suspension | Telescopic, coil spring, oil damped . . . . E03,28,33 |
| | Telescopic coil spring, oil damped, spring preload fully adjustable . . . Others |
| Rear suspension | Link type, oil damped, spring preload 7-way adjustable |
| Front suspension stroke | 120 mm (4.7 in) |
| Rear wheel travel | 115 mm (4.5 in) |
| Caster | 64° 30′ |
| Trail | 95 mm (3.7 in) |
| Steering angle | 35° |
| Turning radius | 2.7 m (8.9 ft) |
| Front brake | Disc brake |
| Rear brake | Disc brake |
| Front tire size | 110/70-17 54H |
| Rear tire size | 130/70-17 62H |

## ELECTRICAL

| | |
|---|---|
| Ignition type | Electronic ignition (transistorized) |
| Ignition timing | 5° B.T.D.C. at 1000 r/min and 40° B.T.D.C. at 4000 r/min . . . E33 |
| | 12° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min . . . Others |
| Spark plug | NGK DPR8EA-9 or NIPPON DENSO X24EPR-U9 |
| Battery | 12V 39.6 kC (11 Ah)/10HR |
| Generator | Three-phase A.C. generator |
| Fuse | 20A |
| Headlight | 12V 60/55W |
| Position light | 12V 4W . . . . Except E03,28,33 |
| Turn signal light | 12V 21W |
| Tail/brake light | 12V 5/21W (x 2 pcs.) |
| Speedometer light | 12V 3.4W |
| Tachometer light | 12V 3.4W |
| Neutral indicator light | 12V 3.4W |
| High beam indicator light | 12V 1.7W |
| Turn signal indicator light | 12V 3.4W |
| Oil pressure indicator light | 12V 3.4W |

## CAPACITIES

| | |
|---|---|
| Fuel tank including reserve | 15.0 L (4.0/3.3 US/Imp gal) . . . . . E33 |
| | 17.0 L (4.5/3.7 US/Imp gal) . . . . . Others |
| reserve | 3.5 L (0.9/0.8 US/Imp gal) |
| Engine oil, without filter change | 2 600 ml (2.7/2.3 US/Imp.qt) |
| with filter change | 2 900 ml (3.1/2.6 US/Imp. qt) |
| overhaul | 3 200 ml (3.4/2.8 US/Imp.qt) |
| Front fork oil (each leg) | 382 ml (12.9/13.5 US/Imp oz) . . . . . E03,28,33 |
| | 377 ml (12.7/13.3 US/Imp oz) . . . . . Others |

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# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Valve diam. | IN. | 39 (1.5) | — |
| | EX. | 32 (1.3) | — |
| Valve lift | IN. | 8.5 (0.33) | — |
| | EX. | 8.0 (0.31) | — |
| Tappet clearance (when cold) | IN. & EX. | 0.03—0.08 (0.001—0.003) | — |
| Valve guide to valve stem clearance | IN. | 0.025—0.055 (0.0010—0.0022) | — |
| | EX. | 0.040—0.070 (0.0016—0.0028) | — |
| Valve stem deflection | IN. & EX. | — | 0.35 (0.014) |
| Valve guide I.D. | IN. & EX. | 7.000—7.015 (0.2756—0.2762) | — |
| Valve stem O.D. | IN. | 6.960—6.975 (0.2740—0.2746) | — |
| | EX. | 6.945—6.960 (0.2734—0.2740) | — |
| Valve stem runout | IN. & EX. | — | 0.05 (0.002) |
| Valve head thickness | IN. & EX. | — | 0.5 (0.02) |
| Valve seat width | IN. & EX. | 1.0—1.2 (0.04—0.05) | — |
| Valve head radial runout | IN. & EX. | — | 0.03 (0.001) |
| Valve spring free length (IN. & EX.) | INNER | — | 35.6 (1.40) |
| | OUTER | — | 40.6 (1.60) |
| Valve spring tension (IN. & EX.) | INNER | 10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in) | — |
| | OUTER | 20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in) | — |

## CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

| ITEM | | STANDARD | | LIMIT |
|---|---|---|---|---|
| Cam height | E-03,18, 24,28,33 | IN. | 36.789—36.819 (1.4484—1.4496) | 36.49 (1.437) |
| | | EX. | 36.291—36.321 (1.4288—1.4300) | 36.00 (1.417) |
| | For the others | IN. | 36.090—36.130 (1.4208—1.4224) | 35.80 (1.409) |
| | | EX. | 36.090—36.130 (1.4208—1.4224) | 35.80 (1.409) |

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| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Camshaft journal oil clearance | IN. & EX. | 0.032—0.066<br>(0.0013—0.0026) | 0.150<br>(0.0060) |
| Camshaft journal holder I.D. | IN. & EX. | 22.012—22.025<br>(0.8666—0.8671) | ——— |
| Camshaft journal O.D. | IN. & EX. | 21.959—21.980<br>(0.8645—0.8654) | ——— |
| Camshaft runout | IN. & EX. | ——— | 0.10<br>(0.004) |
| Cam chain 20-pitch length | ——— | | 157.8<br>(6.21) |
| Cam chain pin (at arrow "3") | 18th pin | | ——— |
| Cylinder head distortion | ——— | | 0.10<br>(0.004) |

## CYLINDER + PISTON + PISTON RING

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Compression pressure | 1 000—1 400 kPa<br>(10—14 kg/cm², 142—199 psi) | | 800 kPa<br>(8 kg/cm², 114 psi) |
| Compression pressure difference | ——— | | 200 kPa<br>(2 kg/cm², 28 psi) |
| Piston to cylinder clearance | 0.050—0.060<br>(0.0020—0.0024) | | 0.120<br>(0.0047) |
| Cylinder bore | 74.000—74.015<br>(2.9134—2.9140) | | 74.080<br>(2.9165) |
| Piston diam. | 73.945—73.960<br>(2.9112—2.9118)<br>Measure at 15 mm (0.6 in) from the skirt end. | | 73.880<br>(2.9087) |
| Cylinder distortion | ——— | | 0.10<br>(0.004) |
| Piston ring free end gap | 1st N | Approx. 7.0<br>(0.28) | 5.6<br>(0.22) |
| | 2nd N | Approx. 11.0<br>(0.43) | 8.8<br>(0.35) |
| Piston ring end gap | 1st | 0.10—0.25<br>(0.004—0.010) | 0.70<br>(0.028) |
| | 2nd | 0.10—0.25<br>(0.004—0.010) | 0.70<br>(0.028) |
| Piston ring to groove clearance | 1st | ——— | 0.180<br>(0.0071) |
| | 2nd | ——— | 0.150<br>(0.0059) |
| Piston ring groove width | 1st | 1.21—1.23<br>(0.047—0.048) | |
| | 2nd | 1.21—1.23<br>(0.047—0.048) | |
| | Oil | 2.51—2.53<br>(0.099—0.100) | |
| Piston ring thickness | 1st | 1.17—1.19<br>(0.046—0.047) | |
| | 2nd | 1.17—1.19<br>(0.046—0.047) | |

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| ITEM | STANDARD | LIMIT |
|---|---|---|
| Piston pin bore | 18.002—18.008<br>(0.7087—0.7090) | 18.030<br>(0.7098) |
| Piston pin O.D. | 17.995—18.000<br>(0.7085—0.7087) | 17.980<br>(0.7079) |

## CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Conrod small end I.D. | 18.006—18.014<br>(0.7089—0.7092) | 18.040<br>(0.7102) |
| Conrod big end side clearance | 0.1—0.2<br>(0.004—0.008) | 0.3<br>(0.012) |
| Conrod big end width | 22.95—23.00<br>(0.904—0.906) | ——— |
| Crank pin width | 23.10—23.15<br>(0.909—0.911) | ——— |
| Conrod big end oil clearance | 0.024—0.048<br>(0.0009—0.0019) | 0.080<br>(0.0031) |
| Crank pin O.D. | 33.976—34.000<br>(1.3376—1.3386) | ——— |
| Crankshaft journal oil clearance | 0.020—0.044<br>(0.0008—0.0017) | 0.080<br>(0.0031) |
| Crankshaft journal O.D. | 31.976—32.000<br>(1.2589—1.2598) | ——— |
| Crankshaft thrust bearing thickness | 2.950—2.975<br>(0.1161—0.1171) | 2.850<br>(0.1122) |
| Crankshaft runout | ——— | 0.05<br>(0.002) |
| Balancer journal oil clearance | 0.020—0.044<br>(0.0008—0.0017) | 0.080<br>(0.0031) |
| Balancer journal O.D. | 31.984—32.000<br>(1.2592—1.2598) | ——— |
| Balancer spring free length | ——— | 14.9<br>(0.59) |

## OIL PUMP

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Oil pump reduction ratio | 1.879 (76/28 x 27/39) | ——— |
| Oil pressure (at 60°C,140°F) | Above 200 kPa (2.0 kg/cm², 28 psi)<br>Below 500 kPa (5.0 kg/cm², 71 psi)<br>at 3 000 r/min. | ——— |

## CLUTCH

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Clutch lever play | 10—15<br>(0.4—0.6) | ——— |
| Clutch release screw | 1/4—1/2 turn back | ——— |
| Drive plate thickness | 2.92—3.08<br>(0.115—0.121) | 2.62<br>(0.103) |
| Drive plate claw width | 15.8—16.0<br>(0.62—0.63) | 15.0<br>(0.59) |
| Driven plate distortion | ——— | 0.10<br>(0.004) |
| Clutch spring free length | ——— | 60.8<br>(2.39) |

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## TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

| ITEM | | STANDARD | LIMIT |
|---|---|---|---|
| Primary reduction ratio | | 2.714 (76/28) | ——— |
| Final reduction ratio | | 2.437 (39/16) | ——— |
| Gear ratios | Low | 2.461 (32/13) | ——— |
| | 2nd | 1.777 (32/18) | ——— |
| | 3rd | 1.380 (29/21) | ——— |
| | 4th | 1.125 (27/24) | ——— |
| | 5th | 0.961 (25/26) | ——— |
| | Top | 0.851 (23/27) | ——— |
| Shift fork to groove clearance | | 0.1—0.3 (0.004—0.012) | 0.5 (0.020) |
| Shift fork groove width | No.1, No.2 & No.3 | 5.5—5.6 (0.217—0.220) | ——— |
| Shift fork thickness | No.1, No.2 & No.3 | 5.3—5.4 (0.209—0.213) | ——— |
| Countershaft length (Low to 2nd) | | $114.7\ ^{+0.1}_{-0}$ $\left(4.516\ ^{+0.004}_{-0}\right)$ | ——— |
| Drive chain | Type | *D.I.D.: DID520VS$_2$ | ——— |
| | Links | 110 | ——— |
| | 20-pitch length | ——— | 319.4 (12.57) |
| Drive chain slack | | 20—30 (0.8—1.2) | ——— |

## CARBURETOR

| ITEM | SPECIFICATION | |
|---|---|---|
| | E-03 | E-33 |
| Carburetor type | MIKUNI BST33SS | ← |
| Bore size | 33 mm | ← |
| I.D. No | 01D00 | 01D10 |
| Idle r/min. | 1 200 ± 100 r/min. | ← |
| Float height | 14.6 ± 1.0 mm | ← |
| Main jet (M.J.) | #122.5 | ← |
| Main air jet (M.A.J.) | 0.5 mm | ← |
| Jet needle (J.N.) | 5DH8 | ← |
| Needle jet (N.J.) | O-3 | ← |
| Throttle valve (Th.V.) | #120 | ← |
| Pilot jet (P.J.) | #37.5 | ← |
| By-pass (B.P.) | 0.8, 0.8, 0.8, 0.8 mm | ← |
| Pilot outlet (P.O.) | 0.8 mm | 0.9 mm |
| Valve seat (V.S.) | 1.5 mm | ← |
| Starter jet (G.S.) | #42.5 | ← |
| Pilot screw (P.S.) | PRE-SET | ← |
| Pilot air jet (P.A.J.) | 1.3 mm | 1.35 mm |
| Throttle cable play | 3—6 mm (0.1—0.2 in) | ← |

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## CARBURETOR

| ITEM | SPECIFICATION | | | |
|---|---|---|---|---|
| | E-28 | E-02,04, 25,34,37 | E-22 | E-22,34 (GS500E-U) |
| Carburetor type | MIKUNI BST33SS | ← | ← | ← |
| Bore size | 33 | ← | ← | ← |
| I.D. No. | 01D20 | 02D5 | 02D6 | 02D3 |
| Idle r/min. | 1200 ± 100 r/min. | ← | ← | ← |
| Float height | 14.6 ± 1.0 mm | ← | ← | ← |
| Main jet (M.J.) | #122.5 | L: #125 R: #122.5 | ← | #130 |
| Main air jet (M.A.J.) | 0.5 mm | ← | ← | ← |
| Jet needle (J.N.) | 5DH9-3rd | ← | ← | ← |
| Needle jet (N.J.) | O-2 | ← | ← | ← |
| Throttle valve (Th.V.) | #120 | ← | ← | ← |
| Pilot jet (P.J.) | #40 | ← | ← | ← |
| By-pass (B.P.) | 0.8, 0.8 0.8, 0.8 mm | ← | ← | ← |
| Pilot outlet (P.O.) | 0.8 mm | 0.9 mm | ← | ← |
| Valve seat (V.S.) | 1.5 mm | ← | ← | ← |
| Starter jet (G.S.) | #42.5 | ← | ← | ← |
| Pilot screw (P.S.) | PRE-SET (2¼ turns back) | PRE-SET (1⅞ turns back) | PRE-SET (1⅝ turns back) | PRE-SET (1⅞ turns back) |
| Pilot air jet (P.A.J.) | 1.3 mm | 1.2 mm | ← | 1.25 mm |
| Throttle cable play | 3—6 mm (0.1—0.2 in) | ← | ← | ← |

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| ITEM | SPECIFICATION | |
|---|---|---|
| | E-18 | E-39 (GS500E-U) |
| Carburetor type | MIKUNI BST33SS | ← |
| Bore size | 33 | ← |
| I.D. No. | 02D1 | 02D2 |
| Idle r/min. | $1300^{+100}_{-50}$ r/min. | 1200 ± 50 r/min. |
| Float height | 14.6 ± 1.0 mm | ← |
| Main jet (M.J.) | Right: #115, Left: #120 | Right: #115, Left: #125 |
| Main air jet (M.A.J.) | 0.5 mm | ← |
| Jet needle (J.N.) | 5DH9-3rd | ← |
| Needle jet (N.J.) | O-2 | ← |
| Throttle valve (Th.V.) | #125 | ← |
| Pilot jet (P.J.) | #40 | ← |
| By-pass (B.P.) | 0.8, 0.8, 0.8, 0.8 mm | ← |
| Pilot outlet (P.O.) | 0.8 mm | ← |
| Valve seat (V.S.) | 1.5 mm | ← |
| Starter jet (G.S.) | #42.5 | ← |
| Pilot screw (P.S.) | PRE-SET (1⅝ turns back) | PRE-SET (1¾ turns back) |
| Pilot air jet (P.A.J.) | 1.4 mm | ← |
| Throttle cable play | 3—6 mm (0.1—0.2 in) | ← |

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## ELECTRICAL

Unit: mm (in)

| ITEM | | SPECIFICATION | | NOTE |
|---|---|---|---|---|
| Ignition timing | | 5° B.T.D.C. at 1 200 r/min.<br>40° B.T.D.C. at 4 000 r/min. | | E-33 |
| | | 12° B.T.D.C. at 1 200 r/min.<br>40° B.T.D.C. at 4 000 r/min. | | For the others |
| Firing order | | L • R | | |
| Spark plug | | Type | N.D.: X24EPR-U9<br>NGK.: DPR8EA-9 | |
| | | Gap | 0.8—0.9<br>(0.031—0.035) | |
| Spark performance | | Over 8 (0.3) at 1 atm. | | |
| Signal coil resistance | | 250—420 Ω | | |
| Ignition coil resistance | | Primary | 3—6 Ω | Terminal—Terminal |
| | | Secondary | 18—30 kΩ | Plug cap—Terminal |
| Generator no-load voltage | | More than 75 V (AC) at 5 000 r/min. | | |
| Regulated voltage | | 13.5—15.5 V at 5 000 r/min. | | |
| Starter motor brush length | | N.D. | Limit: 9 (0.4) | |
| commutator under-cut | | Limit: 0.2 (0.008) | | |
| Starter relay resistance | | 3—5 Ω | | |
| Battery | Type designation | FB10L-B2 | | |
| | Capacity | 12V 39.6kC (11Ah)/10HR | | |
| | Standard electrolyte S.G. | 1.28 at 20°C (68°F) | | |
| Fuse size | | 20 A | | |

## WATTAGE

Unit:W

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-03,24,28,33 | The others |
| Headlight | HI | 60 | ← |
| | LO | 55 | ← |
| Position light | | | 4 |
| Tail/Brake light | | 5/21 | ← |
| Turn signal light | | 21 | ← |
| Tachometer light | | 3.4 | ← |
| Speedometer light | | 3.4 | ← |
| Turn signal indicator light | | 3.4 | ← |
| High beam indicator light | | 1.7 | ← |
| Neutral indicator light | | 3.4 | ← |
| Oil pressure indicator light | | 3.4 | ← |

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## BRAKE + WHEEL

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Rear brake pedal height | *55 (2.2) | | ——— |
| Brake disc thickness | Front | 4.5 ± 0.2 (0.177 ± 0.008) | 4.0 (0.16) |
| | Rear | 6.0 ± 0.2 (0.236 ± 0.008) | 5.5 (0.22) |
| Brake disc runout | ——— | | 0.30 (0.012) |
| Master cylinder bore | Front | 12.700—12.743 (0.5000—0.5017) | ——— |
| | Rear | 12.700—12.743 (0.5000—0.5017) | ——— |
| Master cylinder piston diam. | Front | 12.657—12.684 (0.4983—0.4994) | ——— |
| | Rear | 12.657—12.684 (0.4983—0.4994) | ——— |
| Brake caliper cylinder bore | Front | 27.000—27.076 (1.0630—1.0660) | ——— |
| | | 33.960—34.036 (1.3370—1.3400) | ——— |
| | Rear | 38.180—38.256 (1.5031—1.5061) | ——— |
| Brake caliper piston diam. | Front | 26.920—26.970 (1.0598—1.0618) | ——— |
| | | 33.884—33.934 (1.3340—1.3360) | ——— |
| | Rear | 38.098—38.148 (1.4999—1.5019) | ——— |
| Wheel rim runout | Axial | ——— | 2.0 (0.08) |
| | Radial | ——— | 2.0 (0.08) |
| Wheel axle runout | Front | ——— | 0.25 (0.010) |
| | Rear | ——— | 0.25 (0.010) |
| Tire size | Front | 110/70-17 54H | ——— |
| | Rear | 130/70-17 62H | ——— |
| Tire tread depth | Front | ——— | 1.6 (0.06) |
| | Rear | ——— | 2.0 (0.08) |

## SUSPENSION

Unit: mm (in)

| ITEM | STANDARD | LIMIT | NOTE |
|---|---|---|---|
| Front fork stroke | 120 (4.7) | ——— | |
| Front fork spring free length | ——— | 254 (10.0) | E-03,28,33 |
| | ——— | 303 (11.9) | For the others |

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| ITEM | STANDARD | LIMIT | NOTE |
|---|---|---|---|
| Front fork oil level | 99 (3.9) | ——— | E-03,28,33 |
| | 105 (4.1) | ——— | For the others |
| Rear shock absorber spring adjuster | 4th position among 7 | ——— | |
| Rear wheel travel | 115 (4.5) | ——— | |
| Swingarm pivot shaft runout | ——— | 0.3 (0.01) | |

## TIRE PRESSURE

| COLD INFLATION TIRE PRESSURE | SOLO RIDING | | | DUAL RIDING | | |
|---|---|---|---|---|---|---|
| | kPa | kg/cm² | psi | kPa | kg/cm² | psi |
| FRONT | 225 | 2.25 | 33 | 225 | 2.25 | 33 |
| REAR | 250 | 2.50 | 36 | 280 | 2.80 | 41 |

## FUEL + OIL

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Fuel type | • Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ ) or 91 octane or higher rated by the research method.<br>• Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible. | | E-03,33 |
| | Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method. | | E-28 |
| | Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended. | | For the others |
| Fuel tank including reserve | 15.0 L (4.0/3.3 US/Imp gal) | | E-33 |
| | 17.0 L (4.5/3.7 US/Imp gal) | | For the others |
| reserve | 3.5 L (0.9/0.8 US/Imp gal) | | |
| Engine oil type | SAE 10W/40, API SE or SF | | |
| Engine oil capacity | Change | 2 600 ml (2.7/2.3 US/Imp qt) | |
| | Filter change | 2 900 ml (3.1/2.6 US/Imp qt) | |
| | Overhaul | 3 200 ml (3.4/2.8 US/Imp qt) | |
| Front fork oil type | Fork oil #10 | | |
| Front fork oil capacity (each leg) | 382 ml (12.9/13.5 US/Imp oz) | | E-03,28,33 |
| | 377 ml (12.7/13.3 US/Imp oz) | | For the others |
| Brake fluid type | DOT 4 | | |

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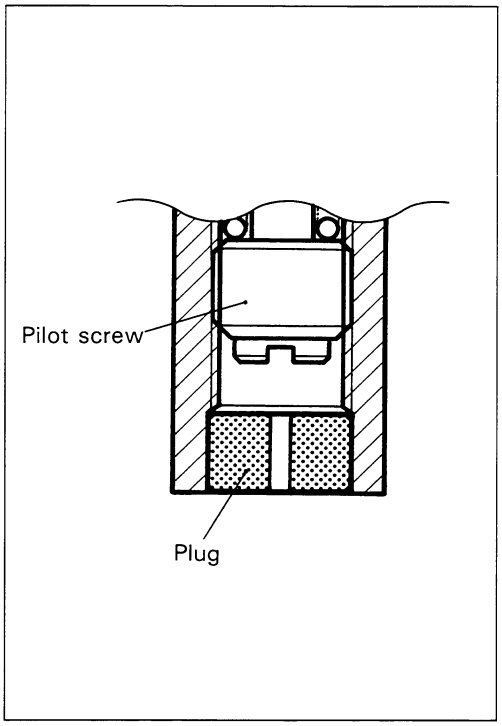
# CARBURETOR

## PILOT SCREW REMOVAL AND INSTALLATION

- Remove the plug by carefully punching a hole in it using an awl or suitable tool.
- Before removing the pilot screw, determine the setting by slowly turning it clockwise and count the number of turns required to lightly seat the screw. Turn the screw counterclockwise to remove it.

*NOTE:*
*This counted number is important when reassembling pilot screw to original position.*

- When installing the pilot screw, turn it in fully but not tightly. From that position turn it out the same number as counted during removal.
- Install the new plug in the pilot screw hole.




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# FOREWORD

*This section describes service data, service specifications and servicing procedures which differ from those of the GS500ES ('95-model).*

*NOTE:*
- *Any differences between GS500ES ('95-model) and GS500ET ('96-model) in specifications and service data are cleary indicated with the asterisk marks (*).*
- *Please refer to the sections 1 through 14 for details which are not given in this manual.*

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**SERVICE DATA** ..... **15- 2**
**FRONT BRAKE** ..... **15- 9**



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# SPECIFICATIONS

## DIMENSIONS AND DRY MASS

| | |
|---|---|
| Overall length | 2 075 mm (81.7 in) |
| Overall width | 745 mm (29.3 in) |
| Overall height | 1 045 mm (41.1 in) |
| Wheelbase | 1 410 mm (55.5 in) |
| Ground clearance | 155 mm ( 6.1 in) |
| Seat height | 790 mm (31.1 in) |
| Dry mass | 170 kg (374 lbs)... Calif. model |
| | 169 kg (372 lbs) |

## ENGINE

| | |
|---|---|
| Type | Four-stroke, air-cooled, DOHC |
| Valve clearance (IN & EX) | 0.03—0.08 mm (0.0012—0.0031 in) |
| Number of cylinders | 2 |
| Bore | 74.0 mm (2.913 in) |
| Stroke | 56.6 mm (2.228 in) |
| Piston displacement | 487 $cm^3$ (29.7 cu. in) |
| Compression ratio | 9.0 : 1 |
| Carburetor | BST33, twin |
| Air cleaner | Polyester fiber element |
| Starter system | Electric |
| Lubrication system | Wet sump |

## TRANSMISSION

| | |
|---|---|
| Clutch | Wet multi-plate type |
| Transmission | 6-speed constant mesh |
| Gearshift pattern | 1-down, 5-up |
| Primary reduction ratio | 2.714 (76/28) |
| Gear ratios, Low | 2.461 (32/13) |
| 2nd | 1.777 (32/18) |
| 3rd | 1.380 (29/21) |
| 4th | 1.125 (27/24) |
| 5th | 0.961 (25/26) |
| Top | 0.851 (23/27) |
| Final reduction ratio | 2.437 (39/16) |
| Drive chain | DID. 520$VS_2$, 110 links |

## CHASSIS

| | |
|---|---|
| Front suspension | Telescopic, coil spring, oil damped |
| Rear suspension | Link type, oil damped, spring preload 7-way adjustable |
| Front suspension stroke | 120 mm (4.7 in) |
| Rear wheel travel | 115 mm (4.5 in) |
| Caster | 64° 30′ |
| Trail | 95 mm (3.7 in) |
| Steering angle | 35° |
| Turning radius | 2.7 m (8.9 ft) |
| Front brake | Disc brake |
| Rear brake | Disc brake |
| Front tire size | 110/70-17 54H |
| Rear tire size | 130/70-17 62H |

## ELECTRICAL

| | |
|---|---|
| Ignition type | Electronic ignition (transistorized) |
| Ignition timing | 5° B.T.D.C. at 1000 r/min and 40° B.T.D.C. at 4000 r/min ... Calif. model |
| | 12° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min |
| Spark plug | NGK DPR8EA-9 or NIPPON DENSO X24EPR-U9 |
| Battery | 12V 39.6 kC (11 Ah)/10HR |
| Generator | Three-phase A.C. generator |
| Fuse | 20A |
| Headlight | 12V 60/55W |
| Turn signal light | 12V 21W |
| Tail/brake light | 12V 5/21W (x 2 pcs.) |
| Speedometer light | 12V 3.4W |
| Tachometer light | 12V 3.4W |
| Neutral indicator light | 12V 3.4W |
| High beam indicator light | 12V 1.7W |
| Turn signal indicator light | 12V 3.4W |
| Oil pressure indicator light | 12V 3.4W |

## CAPACITIES

| | |
|---|---|
| Fuel tank including reserve | 15.0 L (4.0/3.3 US/Imp gal)... Calif. model |
| | 17.0 L (4.5/3.7 US/Imp gal) |
| reserve | 3.5 L (0.9/0.8 US/Imp gal) |
| Engine oil, without filter change | 2 600 ml (2.7/2.3 US/Imp.qt) |
| with filter change | 2 900 ml (3.1/2.6 US/Imp. qt) |
| overhaul | 3 200 ml (3.4/2.8 US/Imp.qt) |
| Front fork oil (each leg) | 382 ml (12.9/13.5 US/Imp oz) |

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# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Valve diam. | IN. | 39 (1.5) | ——— |
| | EX. | 32 (1.3) | ——— |
| Valve lift | IN. | 8.5 (0.33) | ——— |
| | EX. | 8.0 (0.31) | ——— |
| Tappet clearance (when cold) | IN. & EX. | 0.03—0.08 (0.001—0.003) | ——— |
| Valve guide to valve stem clearance | IN. | 0.025—0.055 (0.0010—0.0022) | ——— |
| | EX. | 0.040—0.070 (0.0016—0.0028) | ——— |
| Valve stem deflection | IN. & EX. | ——— | 0.35 (0.014) |
| Valve guide I.D. | IN. & EX. | 7.000—7.015 (0.2756—0.2762) | ——— |
| Valve stem O.D. | IN. | 6.960—6.975 (0.2740—0.2746) | ——— |
| | EX. | 6.945—6.960 (0.2734—0.2740) | ——— |
| Valve stem runout | IN. & EX. | ——— | 0.05 (0.002) |
| Valve head thickness | IN. & EX. | ——— | 0.5 (0.02) |
| Valve seat width | IN. & EX. | 1.0—1.2 (0.04—0.05) | ——— |
| Valve head radial runout | IN. & EX. | ——— | 0.03 (0.001) |
| Valve spring free length (IN. & EX.) | INNER | ——— | 35.6 (1.40) |
| | OUTER | ——— | 40.6 (1.60) |
| Valve spring tension (IN. & EX.) | INNER | 10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in) | ——— |
| | OUTER | 20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in) | ——— |

## CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Cam height | IN. | 36.789—36.819 (1.4484—1.4496) | 36.49 (1.437) |
| | EX. | 36.291—36.321 (1.4288—1.4300) | 36.00 (1.417) |

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| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Camshaft journal oil clearance | IN. & EX. | 0.032—0.066<br>(0.0013—0.0026) | 0.150<br>(0.0060) |
| Camshaft journal holder I.D. | IN. & EX. | 22.012—22.025<br>(0.8666—0.8671) | ——— |
| Camshaft journal O.D. | IN. & EX. | 21.959—21.980<br>(0.8645—0.8654) | ——— |
| Camshaft runout | IN. & EX. | ——— | 0.10<br>(0.004) |
| Cam chain pin (at arrow "3") | 18th pin | | ——— |
| Cylinder head distortion | ——— | | 0.10<br>(0.004) |

## CYLINDER + PISTON + PISTON RING

Unit: mm (in)

| ITEM | STANDARD | | | LIMIT |
|---|---|---|---|---|
| Compression pressure | 1 000—1 400 kPa<br>(10—14 kg/cm², 142—199 psi) | | | 800 kPa<br>(8 kg/cm², 114 psi) |
| Compression pressure difference | ——— | | | 200 kPa<br>(2 kg/cm², 28 psi) |
| Piston to cylinder clearance | 0.050—0.060<br>(0.0020—0.0024) | | | 0.120<br>(0.0047) |
| Cylinder bore | 74.000—74.015<br>(2.9134—2.9140) | | | 74.080<br>(2.9165) |
| Piston diam. | 73.945—73.960<br>(2.9112—2.9118)<br>Measure at 15 mm (0.6 in) from the skirt end. | | | 73.880<br>(2.9087) |
| Cylinder distortion | ——— | | | 0.10<br>(0.004) |
| Piston ring free end gap | 1st | N | Approx. 7.0<br>(0.28) | 5.6<br>(0.22) |
| | 2nd | N | Approx. 11.0<br>(0.43) | 8.8<br>(0.35) |
| Piston ring end gap | 1st | | 0.10—0.25<br>(0.004—0.010) | 0.70<br>(0.028) |
| | 2nd | | 0.10—0.25<br>(0.004—0.010) | 0.70<br>(0.028) |
| Piston ring to groove clearance | 1st | | ——— | 0.180<br>(0.0071) |
| | 2nd | | ——— | 0.150<br>(0.0059) |
| Piston ring groove width | 1st | | 1.21—1.23<br>(0.047—0.048) | |
| | 2nd | | 1.21—1.23<br>(0.047—0.048) | |
| | Oil | | 2.51—2.53<br>(0.099—0.100) | |
| Piston ring thickness | 1st | | 1.17—1.19<br>(0.046—0.047) | |
| | 2nd | | 1.17—1.19<br>(0.046—0.047) | |

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| ITEM | STANDARD | LIMIT |
|---|---|---|
| Piston pin bore | 18.002—18.008<br>(0.7087—0.7090) | 18.030<br>(0.7098) |
| Piston pin O.D. | 17.995—18.000<br>(0.7085—0.7087) | 17.980<br>(0.7079) |

## CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Conrod small end I.D. | 18.006—18.014<br>(0.7089—0.7092) | 18.040<br>(0.7102) |
| Conrod big end side clearance | 0.1—0.2<br>(0.004—0.008) | 0.3<br>(0.012) |
| Conrod big end width | 22.95—23.00<br>(0.904—0.906) | ——— |
| Crank pin width | 23.10—23.15<br>(0.909—0.911) | ——— |
| Conrod big end oil clearance | 0.024—0.048<br>(0.0009—0.0019) | 0.080<br>(0.0031) |
| Crank pin O.D. | 33.976—34.000<br>(1.3376—1.3386) | ——— |
| Crankshaft journal oil clearance | 0.020—0.044<br>(0.0008—0.0017) | 0.080<br>(0.0031) |
| Crankshaft journal O.D. | 31.976—32.000<br>(1.2589—1.2598) | ——— |
| Crankshaft thrust bearing thickness | 2.950—2.975<br>(0.1161—0.1171) | 2.850<br>(0.1122) |
| Crankshaft runout | ——— | 0.05<br>(0.002) |
| Balancer journal oil clearance | 0.020—0.044<br>(0.0008—0.0017) | 0.080<br>(0.0031) |
| Balancer journal O.D. | 31.984—32.000<br>(1.2592—1.2598) | ——— |
| Balancer spring free length | ——— | 14.9<br>(0.59) |

## OIL PUMP

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Oil pump reduction ratio | 1.879 (76/28 x 27/39) | ——— |
| Oil pressure (at 60°C,140°F) | Above 200 kPa (2.0 kg/cm², 28 psi)<br>Below 500 kPa (5.0 kg/cm², 71 psi)<br>at 3 000 r/min. | ——— |

## CLUTCH

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Clutch lever play | 10—15<br>(0.4—0.6) | ——— |
| Clutch release screw | 1/4—1/2 turn back | ——— |
| Drive plate thickness | 2.92—3.08<br>(0.115—0.121) | 2.62<br>(0.103) |
| Drive plate claw width | 15.8—16.0<br>(0.62—0.63) | 15.0<br>(0.59) |
| Driven plate distortion | ——— | 0.10<br>(0.004) |
| Clutch spring free length | ——— | 60.8<br>(2.39) |

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## TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

| ITEM | | STANDARD | | LIMIT |
|---|---|---|---|---|
| Primary reduction ratio | | 2.714 (76/28) | | ——— |
| Final reduction ratio | | 2.437 (39/16) | | ——— |
| Gear ratios | Low | 2.461 (32/13) | | ——— |
| | 2nd | 1.777 (32/18) | | ——— |
| | 3rd | 1.380 (29/21) | | ——— |
| | 4th | 1.125 (27/24) | | ——— |
| | 5th | 0.961 (25/26) | | ——— |
| | Top | 0.851 (23/27) | | ——— |
| Shift fork to groove clearance | | 0.1—0.3 (0.004—0.012) | | 0.5 (0.020) |
| Shift fork groove width | | No.1, No.2 & No.3 | 5.5—5.6 (0.217—0.220) | ——— |
| Shift fork thickness | | No.1, No.2 & No.3 | 5.3—5.4 (0.209—0.213) | ——— |
| Countershaft length (Low to 2nd) | | $114.7\ ^{+0.1}_{-0}$ $\left(4.516\ ^{+0.004}_{-0}\right)$ | | ——— |
| Drive chain | | Type | D.I.D.: DID520VS$_2$ | ——— |
| | | Links | 110 | ——— |
| | | 20-pitch length | ——— | 319.4 (12.57) |
| Drive chain slack | | 20—30 (0.8—1.2) | | ——— |

## CARBURETOR

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-03 | E-33 |
| Carburetor type | | MIKUNI BST33SS | ← |
| Bore size | | 33 mm | ← |
| I.D. No | | 01D00 | 01D10 |
| Idle r/min. | | 1 200 ± 100 r/min. | ← |
| Float height | | 14.6 ± 1.0 mm | ← |
| Main jet | (M.J.) | #122.5 | ← |
| Main air jet | (M.A.J.) | 0.5 mm | ← |
| Jet needle | (J.N.) | 5DH8 | ← |
| Needle jet | (N.J.) | O-3 | ← |
| Throttle valve | (Th.V.) | #120 | ← |
| Pilot jet | (P.J.) | #37.5 | ← |
| By-pass | (B.P.) | 0.8, 0.8, 0.8, 0.8 mm | ← |
| Pilot outlet | (P.O.) | 0.8 mm | 0.9 mm |
| Valve seat | (V.S.) | 1.5 mm | ← |
| Starter jet | (G.S.) | #42.5 | ← |
| Pilot screw | (P.S.) | PRE-SET | ← |
| Pilot air jet | (P.A.J.) | 1.3 mm | 1.35 mm |
| Throttle cable play | | 3—6 mm (0.1—0.2 in) | ← |

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## ELECTRICAL

Unit: mm (in)

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Ignition timing | 5° B.T.D.C. at 1 000 r/min.<br>40° B.T.D.C. at 4 000 r/min. | | E-33 |
| | 12° B.T.D.C. at 1 200 r/min.<br>40° B.T.D.C. at 4 000 r/min. | | For the others |
| Firing order | L • R | | |
| Spark plug | Type | N.D.: X24EPR-U9<br>NGK.: DPR8EA-9 | |
| | Gap | 0.8—0.9<br>(0.031—0.035) | |
| Spark performance | Over 8 (0.3) at 1 atm. | | |
| Signal coil resistance | 250—420 Ω | | |
| Ignition coil resistance | Primary | 3—6 Ω | Terminal—Terminal |
| | Secondary | 18—30 kΩ | Plug cap—Terminal |
| Generator no-load voltage | More than 75 V (AC) at 5 000 r/min. | | |
| Regulated voltage | 13.5—15.5 V at 5 000 r/min. | | |
| Starter motor brush length | N.D. | Limit: 9 (0.4) | |
| commutator under-cut | Limit: 0.2 (0.008) | | |
| Starter relay resistance | 3—5 Ω | | |
| Battery Type designation | FB10L-B2 | | |
| Capacity | 12V 39.6kC (11Ah)/10HR | | |
| Standard electrolyte S.G. | 1.28 at 20°C (68°F) | | |
| Fuse size | 20 A | | |

## WATTAGE

Unit:W

| ITEM | | SPECIFICATION |
|---|---|---|
| Headlight | HI | 60 |
| | LO | 55 |
| Tail/Brake light | | 5/21 |
| Turn signal light | | 21 |
| Tachometer light | | 3.4 |
| Speedometer light | | 3.4 |
| Turn signal indicator light | | 3.4 |
| High beam indicator light | | 1.7 |
| Neutral indicator light | | 3.4 |
| Oil pressure indicator light | | 3.4 |

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## BRAKE + WHEEL

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Rear brake pedal height | 55 (2.2) | | ——— |
| Brake disc thickness | Front | 4.5 ± 0.2 (0.177 ± 0.008) | 4.0 (0.16) |
| | Rear | 6.0 ± 0.2 (0.236 ± 0.008) | 5.5 (0.22) |
| Brake disc runout | ——— | | 0.30 (0.012) |
| Master cylinder bore | Front | 12.700—12.743 (0.5000—0.5017) | ——— |
| | Rear | 12.700—12.743 (0.5000—0.5017) | ——— |
| Master cylinder piston diam. | Front | 12.657—12.684 (0.4983—0.4994) | ——— |
| | Rear | 12.657—12.684 (0.4983—0.4994) | ——— |
| Brake caliper cylinder bore | Front | *30.230—30.306 (1.1902—1.1931) | ——— |
| | Rear | 38.180—38.256 (1.5031—1.5061) | ——— |
| Brake caliper piston diam. | Front | *30.150—30.200 (1.1870—1.1890) | ——— |
| | Rear | 38.098—38.148 (1.4999—1.5019) | ——— |
| Wheel rim runout | Axial | ——— | 2.0 (0.08) |
| | Radial | ——— | 2.0 (0.08) |
| Wheel axle runout | Front | ——— | 0.25 (0.010) |
| | Rear | ——— | 0.25 (0.010) |
| Tire size | Front | 110/70-17 54H | ——— |
| | Rear | 130/70-17 62H | ——— |
| Tire tread depth | Front | ——— | 1.6 (0.06) |
| | Rear | ——— | 2.0 (0.08) |

## SUSPENSION

Unit: mm (in)

| ITEM | STANDARD | LIMIT | NOTE |
|---|---|---|---|
| Front fork stroke | 120 (4.7) | ——— | |
| Front fork spring free length | ——— | 254 (10.0) | |

Asterisk mark (*) indicates the new ''T''-model specifications.

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| ITEM | STANDARD | LIMIT | NOTE |
|---|---|---|---|
| Front fork oil level | 99 (3.9) | ——— | E-03,28,33 |
| | 105 (4.1) | ——— | For the others |
| Rear shock absorber spring adjuster | 4th position among 7 | ——— | |
| Rear wheel travel | 115 (4.5) | ——— | |
| Swingarm pivot shaft runout | ——— | 0.3 (0.01) | |

## TIRE PRESSURE

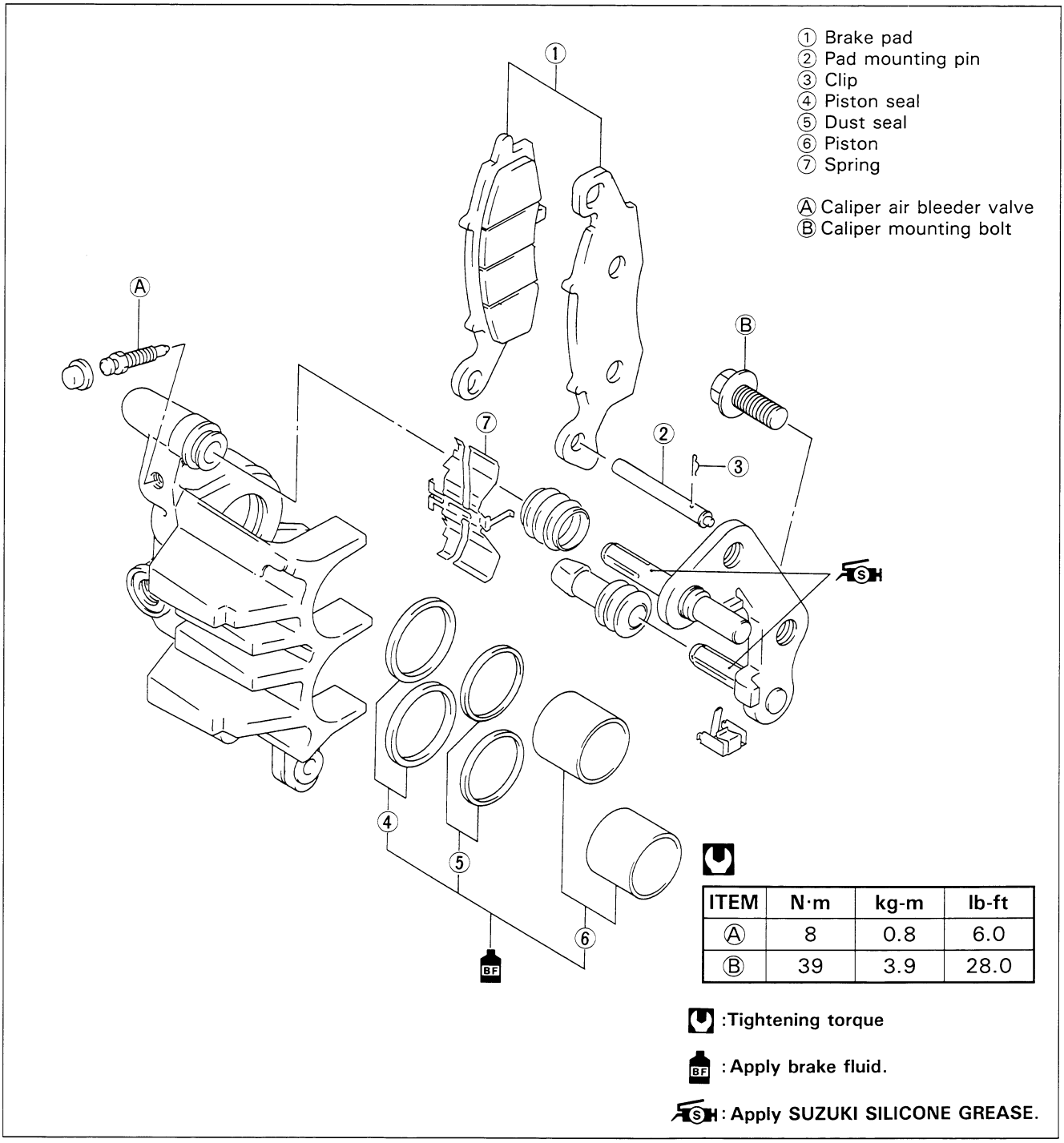
| COLD INFLATION TIRE PRESSURE | SOLO RIDING | | | DUAL RIDING | | |
|---|---|---|---|---|---|---|
| | kPa | kg/cm² | psi | kPa | kg/cm² | psi |
| FRONT | 225 | 2.25 | 33 | 225 | 2.25 | 33 |
| REAR | 250 | 2.50 | 36 | 280 | 2.80 | 41 |

## FUEL + OIL

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Fuel type | • Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ ) or 91 octane or higher rated by the research method.<br>• Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible. | | |
| Fuel tank including reserve | 15.0 L (4.0/3.3 US/Imp gal) | | E-33 |
| | 17.0 L (4.5/3.7 US/Imp gal) | | E-03 |
| reserve | 3.5 L (0.9/0.8 US/Imp gal) | | |
| Engine oil type | SAE 10W/40, API SE, SF or SG | | |
| Engine oil capacity | Change | 2 600 ml (2.7/2.3 US/Imp qt) | |
| | Filter change | 2 900 ml (3.1/2.6 US/Imp qt) | |
| | Overhaul | 3 200 ml (3.4/2.8 US/Imp qt) | |
| Front fork oil type | Fork oil #10 | | |
| Front fork oil capacity (each leg) | 382 ml (12.9/13.5 US/Imp oz) | | |
| Brake fluid type | DOT 4 | | |

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# FRONT BRAKE




| ITEM | N·m | kg-m | lb-ft |
|---|---|---|---|
| Ⓐ | 8 | 0.8 | 6.0 |
| Ⓑ | 39 | 3.9 | 28.0 |

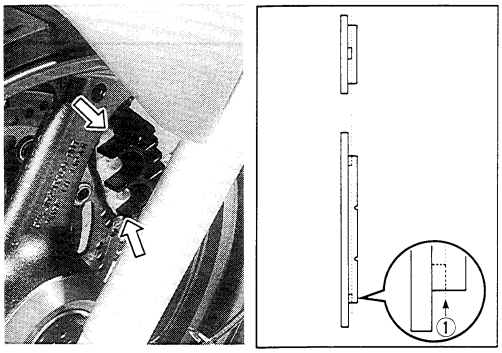
: Tightening torque

BF : Apply brake fluid.

SH : Apply SUZUKI SILICONE GREASE.

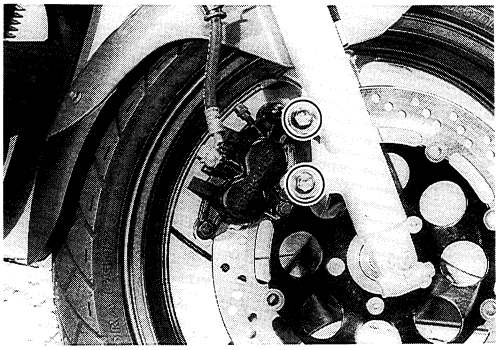
## BRAKE PAD INSPECTION

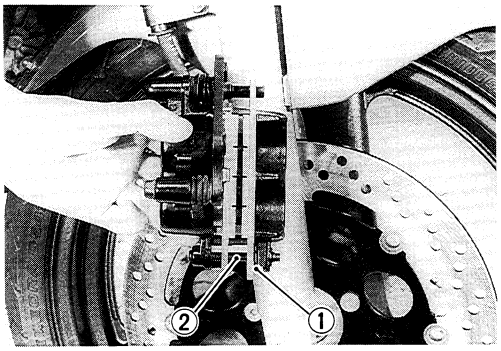
The extent of brake pad wear can be checked by observing the limit line ① on the pad. When the wear exceeds the limit line, replace the pads with new ones.




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## BRAKE PAD REPLACEMENT






- Disconnect the brake caliper by removing the caliper mounting bolt.
- Remove the brake pads by removing the clip ①, pad mounting pin ②.

**⚠ CAUTION**

- **Do not operate the brake lever while dismounting the pads.**
- **Replace the brake pad as a set, otherwise braking performance will be adversely affected.**

- Remount the new pads.

*NOTE:*
*After replacing the brake pads, pump with the brake lever few times to operate the brake correctly and then check the brake fluid level.*

## CALIPER REMOVAL AND DISASSEMBLY

- Remove and disassemble the brake caliper in the same manner of the '95-model.

## CALIPER INTERCHANGEABILITY

- When replacing the brake caliper assembly with a early or late type, should replace the brake disc with a same type one.

| PART NAME | LATE | EARLY |
|---|---|---|
| | PART NO. | PART NO. |
| Brake caliper assembly | 59100-01D01 | 59100-33D00 |
| Brake disc | 59210-01D30 | 59210-01D40 |

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# GS500EV ('97-MODEL)

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WIRING DIAGRAM ..... 16-11


*NOTE:*
*Asterisk mark (*) indicates the New V-model specifications.*



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# SPECIFICATIONS

## DIMENSIONS AND DRY MASS

| | |
|---|---|
| Overall length | 2 105 mm (82.9 in) . . . . . E25<br>2 180 mm (85.8 in) . . . . . E22, E18, E39<br>2 075 mm (81.7 in) . . . . . Others |
| Overall width | 745 mm (29.3 in) |
| Overall height | 1 045 mm (41.1 in) |
| Wheelbase | 1 410 mm (55.5 in) |
| Ground clearance | 155 mm ( 6.1 in) |
| Seat height | 790 mm (31.1 in) |
| Dry mass | 170 kg (374 lbs) . . . . . E33<br>169 kg (372 lbs) . . . . . Others |

## ENGINE

| | |
|---|---|
| Type | Four-stroke, air-cooled, DOHC |
| Valve clearance (IN & EX) | 0.03—0.08 mm (0.0012—0.0031 in) |
| Number of cylinders | 2 |
| Bore | 74.0 mm (2.913 in) |
| Stroke | 56.6 mm (2.228 in) |
| Piston displacement | 487 $cm^3$ (29.7 cu. in) |
| Compression ratio | 9.0 : 1 |
| Carburetor | BST33, twin |
| Air cleaner | Non-woven fabric element |
| Starter system | Electric |
| Lubrication system | Wet sump |

## TRANSMISSION

| | |
|---|---|
| Clutch | Wet multi-plate type |
| Transmission | 6-speed constant mesh |
| Gearshift pattern | 1-down, 5-up |
| Primary reduction ratio | 2.714 (76/28) |
| Gear ratios, Low | 2.461 (32/13) |
| 2nd | 1.777 (32/18) |
| 3rd | 1.380 (29/21) |
| 4th | 1.125 (27/24) |
| 5th | 0.961 (25/26) |
| Top | 0.851 (23/27) |
| Final reduction ratio | 2.437 (39/16) |
| Drive chain | DID. 520$VS_2$, 110 links |

## CHASSIS

| | |
|---|---|
| Front suspension | Telescopic, coil spring, oil damped . . . . E03,28,33<br>Telescopic coil spring, oil damped, spring preload adjustable . . . Others |
| Rear suspension | Link type, oil damped, spring preload 7-way adjustable |
| Front suspension stroke | 120 mm (4.7 in) |
| Rear wheel travel | 115 mm (4.5 in) |
| Caster | 25° 30′ |
| Trail | 95 mm (3.7 in) |
| Steering angle | 35° |
| Turning radius | 2.7 m (8.9 ft) |
| Front brake | Disk brake |
| Rear brake | Disk brake |
| Front tire size | 110/70-17 54H, tubeless |
| Rear tire size | 130/70-17 62H, tubeless |

## ELECTRICAL

| | |
|---|---|
| Ignition type | Electronic ignition (transistorized) |
| Ignition timing | 5° B.T.D.C. at 1000 r/min and 40° B.T.D.C. at 4000 r/min . . . E33<br>12° B.T.D.C. at 1200 r/min and 40° B.T.D.C. at 4000 r/min . . . Others |
| Spark plug | NGK DPR8EA-9 or NIPPON DENSO X24EPR-U9 |
| Battery | 12V 39.6 kC (11 Ah)/10HR |
| Generator | Three-phase A.C. generator |
| Fuse | 20A |
| Headlight | 12V 60/55W |
| Position light | 12V 4W . . . Except E03, 24, 28, 33 |
| Turn signal light | 12V 21W |
| Tail/brake light | 12V 5/21W (x 2 pcs.) |
| Speedometer light | 12V 3.4W |
| Tachometer light | 12V 3.4W |
| Neutral indicator light | 12V 3.4W |
| High beam indicator light | 12V 1.7W |
| Turn signal indicator light | 12V 3.4W |
| Oil pressure indicator light | 12V 3.4W |

## CAPACITIES

| | |
|---|---|
| Fuel tank including reserve | 15.0 L (4.0/3.3 US/Imp gal) . . . . . E33<br>17.0 L (4.5/3.7 US/Imp gal) . . . . . Others |
| reserve | 3.5 L (0.9/0.8 US/Imp gal) |
| Engine oil, without filter change | 2 600 ml (2.7/2.3 US/Imp.qt) |
| with filter change | 2 900 ml (3.1/2.6 US/Imp. qt) |
| overhaul | 3 200 ml (3.4/2.8 US/Imp.qt) |
| Front fork oil (each leg) | 382 ml (12.9/13.5 US/Imp oz) . . . . . E03,28,33<br>377 ml (12.7/13.3 US/Imp oz) . . . . . Others |

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# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Valve diam. | IN. | 39 (1.5) | ——— |
| | EX. | 32 (1.3) | ——— |
| Valve lift | IN. | 8.5 (0.33) | ——— |
| | EX. | 8.0 (0.31) | ——— |
| Tappet clearance (when cold) | IN. & EX. | 0.03—0.08 (0.001—0.003) | ——— |
| Valve guide to valve stem clearance | IN. | 0.025—0.055 (0.0010—0.0022) | ——— |
| | EX. | 0.040—0.070 (0.0016—0.0028) | ——— |
| Valve stem deflection | IN. & EX. | ——— | 0.35 (0.014) |
| Valve guide I.D. | IN. & EX. | 7.000—7.015 (0.2756—0.2762) | ——— |
| Valve stem O.D. | IN. | 6.960—6.975 (0.2740—0.2746) | ——— |
| | EX. | 6.945—6.960 (0.2734—0.2740) | ——— |
| Valve stem runout | IN. & EX. | ——— | 0.05 (0.002) |
| Valve head thickness | IN. & EX. | ——— | 0.5 (0.02) |
| Valve seat width | IN. & EX. | 1.0—1.2 (0.04—0.05) | ——— |
| Valve head radial runout | IN. & EX. | ——— | 0.03 (0.001) |
| Valve spring free length (IN. & EX.) | INNER | ——— | 35.6 (1.40) |
| | OUTER | ——— | 40.6 (1.60) |
| Valve spring tension (IN. & EX.) | INNER | 10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in) | ——— |
| | OUTER | 20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in) | ——— |

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## CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

| ITEM | | STANDARD | | LIMIT |
|---|---|---|---|---|
| Cam height | E-03,18, 24,28,33 | IN. | 36.789—36.819 (1.4484—1.4496) | 36.49 (1.437) |
| | | EX. | 36.291—36.321 (1.4288—1.4300) | 36.00 (1.417) |
| | For the others | IN. | 36.090—36.130 (1.4208—1.4224) | 35.80 (1.409) |
| | | EX. | 36.090—36.130 (1.4208—1.4224) | 35.80 (1.409) |
| Camshaft journal oil clearance | | IN. & EX. | 0.032—0.066 (0.0013—0.0026) | 0.150 (0.0060) |
| Camshaft journal holder I.D. | | IN. & EX. | 22.012—22.025 (0.8666—0.8671) | ——— |
| Camshaft journal O.D. | | IN. & EX. | 21.959—21.980 (0.8645—0.8654) | ——— |
| Camshaft runout | | IN. & EX. | ——— | 0.10 (0.004) |
| Cam chain pin (at arrow "3") | | 18th pin | | ——— |
| Cylinder head distortion | | ——— | | 0.10 (0.004) |

## CYLINDER + PISTON + PISTON RING

Unit: mm (in)

| ITEM | | | STANDARD | LIMIT |
|---|---|---|---|---|
| Compression pressure | | | 1 000—1 400 kPa (10—14 kg/cm², 142—199 psi) | 800 kPa (8 kg/cm², 114 psi) |
| Compression pressure difference | | | ——— | 200 kPa (2 kg/cm², 28 psi) |
| Piston to cylinder clearance | | | 0.050—0.060 (0.0020—0.0024) | 0.120 (0.0047) |
| Cylinder bore | | | 74.000—74.015 (2.9134—2.9140) | 74.080 (2.9165) |
| Piston diam. | | | 73.945—73.960 (2.9112—2.9118) Measure at 15 mm (0.6 in) from the skirt end. | 73.880 (2.9087) |
| Cylinder distortion | | | ——— | 0.10 (0.004) |
| Piston ring free end gap | 1st | N | Approx. 7.0 (0.28) | 5.6 (0.22) |
| | 2nd | N | Approx. 11.0 (0.43) | 8.8 (0.35) |
| Piston ring end gap | 1st | | 0.10—0.25 (0.004—0.010) | 0.70 (0.028) |
| | 2nd | | 0.10—0.25 (0.004—0.010) | 0.70 (0.028) |
| Piston ring to groove clearance | 1st | | ——— | 0.180 (0.0071) |
| | 2nd | | ——— | 0.150 (0.0059) |

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| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Piston ring groove width | 1st | 1.21—1.23 (0.047—0.048) | |
| | 2nd | 1.21—1.23 (0.047—0.048) | |
| | Oil | 2.51—2.53 (0.099—0.100) | |
| Piston ring thickness | 1st | 1.17—1.19 (0.046—0.047) | |
| | 2nd | 1.17—1.19 (0.046—0.047) | |
| Piston pin bore | 18.002—18.008 (0.7087—0.7090) | | 18.030 (0.7098) |
| Piston pin O.D. | 17.995—18.000 (0.7085—0.7087) | | 17.980 (0.7079) |

## CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Conrod small end I.D. | 18.006—18.014 (0.7089—0.7092) | 18.040 (0.7102) |
| Conrod big end side clearance | 0.1—0.2 (0.004—0.008) | 0.3 (0.012) |
| Conrod big end width | 22.95—23.00 (0.904—0.906) | ——— |
| Crank pin width | 23.10—23.15 (0.909—0.911) | ——— |
| Conrod big end oil clearance | 0.024—0.048 (0.0009—0.0019) | 0.080 (0.0031) |
| Crank pin O.D. | 33.976—34.000 (1.3376—1.3386) | ——— |
| Crankshaft journal oil clearance | 0.020—0.044 (0.0008—0.0017) | 0.080 (0.0031) |
| Crankshaft journal O.D. | 31.976—32.000 (1.2589—1.2598) | ——— |
| Crankshaft thrust bearing thickness | 2.950—2.975 (0.1161—0.1171) | 2.850 (0.1122) |
| Crankshaft runout | ——— | 0.05 (0.002) |
| Balancer journal oil clearance | 0.020—0.044 (0.0008—0.0017) | 0.080 (0.0031) |
| Balancer journal O.D. | 31.984—32.000 (1.2592—1.2598) | ——— |
| Balancer spring free length | ——— | 14.9 (0.59) |

## OIL PUMP

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Oil pump reduction ratio | 1.879 (76/28 x 27/39) | ——— |
| Oil pressure (at 60°C,140°F) | Above 200 kPa (2.0 kg/cm², 28 psi) Below 500 kPa (5.0 kg/cm², 71 psi) at 3 000 r/min. | ——— |

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## CLUTCH

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Clutch lever play | 10—15 (0.4—0.6) | ——— |
| Clutch release screw | 1/4—1/2 turn back | ——— |
| Drive plate thickness | 2.92—3.08 (0.115—0.121) | 2.62 (0.103) |
| Drive plate claw width | 15.8—16.0 (0.62—0.63) | 15.0 (0.59) |
| Driven plate distortion | ——— | 0.10 (0.004) |
| Clutch spring free length | ——— | 60.8 (2.39) |

## TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

| ITEM | | STANDARD | | LIMIT |
|---|---|---|---|---|
| Primary reduction ratio | | 2.714 (76/28) | | ——— |
| Final reduction ratio | | 2.437 (39/16) | | ——— |
| Gear ratios | Low | 2.461 (32/13) | | ——— |
| | 2nd | 1.777 (32/18) | | ——— |
| | 3rd | 1.380 (29/21) | | ——— |
| | 4th | 1.125 (27/24) | | ——— |
| | 5th | 0.961 (25/26) | | ——— |
| | Top | 0.851 (23/27) | | ——— |
| Shift fork to groove clearance | | 0.1—0.3 (0.004—0.012) | | 0.5 (0.020) |
| Shift fork groove width | | No.1, No.2 & No.3 | 5.5—5.6 (0.217—0.220) | ——— |
| Shift fork thickness | | No.1, No.2 & No.3 | 5.3—5.4 (0.209—0.213) | ——— |
| Countershaft length (Low to 2nd) | | $114.7\ ^{+0.1}_{-0}$ $\left(4.516\ ^{+0.004}_{-0}\right)$ | | ——— |
| Drive chain | | Type | D.I.D.: DID520VS$_2$ | ——— |
| | | Links | 110 | ——— |
| | | 20-pitch length | ——— | 319.4 (12.57) |
| Drive chain slack | | 20—30 (0.8—1.2) | | ——— |

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## CARBURETOR

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-03 | E-33 |
| Carburetor type | | MIKUNI BST33SS | ← |
| Bore size | | 33 mm | ← |
| I.D. No | | 01D00 | *01DA |
| Idle r/min. | | 1 200 ± 100 r/min. | ← |
| Float height | | 14.6 ± 1.0 mm | ← |
| Main jet | (M.J.) | # 122.5 | ← |
| Jet needle | (J.N.) | 5DH8 | ← |
| Needle jet | (N.J.) | O-3M | ← |
| Throttle valve | (Th.V.) | #120 | *#125 |
| Pilot jet | (P.J.) | # 37.5 | ← |
| Pilot screw | (P.S.) | PRE-SET | ← |
| Throttle cable play | | 3—6 mm (0.1—0.2 in) | ← |

## CARBURETOR

| ITEM | | SPECIFICATION | | | |
|---|---|---|---|---|---|
| | | E-28 | E-02,04, 25,34 | E-22 | E-04,22 (GS500E-U) |
| Carburetor type | | MIKUNI BST33SS | ← | ← | ← |
| Bore size | | 33 mm | ← | ← | ← |
| I.D. No. | | *01D00 | 02D8 | 02DA | 02DB |
| Idle r/min. | | 1200± 100 r/min. | ← | ← | ← |
| Float height | | 14.6± 1.0 mm | ← | ← | ← |
| Main jet | (M.J.) | *# 122.5 | #115 | ← | #117.5 |
| Jet needle | (J.N.) | *5DH8 | 5DH9-3rd | ← | 5DH9-2nd |
| Needle jet | (N.J.) | *O-3M | O-2 | ← | ← |
| Throttle valve | (Th.V.) | #120 | ← | ← | ← |
| Pilot jet | (P.J.) | *# 37.5 | #40 | ← | ← |
| Pilot screw | (P.S.) | PRE-SET (2¼ turns back) | PRE-SET (2 turns back) | ← | ← |
| Throttle cable play | | 3—6 mm (0.1—0.2 in) | ← | ← | ← |

## CARBURETOR

| ITEM | SPECIFICATION | | | |
|---|---|---|---|---|
| | E-24 | P-37 | E-18 | E-39 (GS500E-U) |
| Carburetor type | MIKUNI BST33SS | ← | ← | ← |
| Bore size | 33 | ← | ← | ← |
| I.D. No. | 01D6 | 02D5 | 02D1 | 02D2 |

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| ITEM | SPECIFICATION | | | |
|---|---|---|---|---|
| | E-24 | E-37, P-37 | E-18 | E-39 (GS500E-U) |
| Idle r/min. | 1200 ± 100 r/min. | ← | 1300 $^{+100}_{-50}$ r/min. | 1200 ± 50 r/min. |
| Float height | 14.6 ± 1.0 mm | ← | ← | ← |
| Main jet (M.J.) | L: #125<br>R: #122.5 | ← | L: #120<br>R: #115 | L: #125<br>R: #115 |
| Jet needle (J.N.) | 5DH9-3rd | ← | ← | ← |
| Needle jet (N.J.) | O-2 | ← | ← | ← |
| Throttle valve (Th.V.) | #120 | ← | #125 | ← |
| Pilot jet (P.J.) | #40 | ← | ← | ← |
| Pilot screw (P.S.) | PRE-SET (1 5/8 turns back) | PRE-SET (1 7/8 turns back) | PRE-SET (1 5/8 turns back) | PRE-SET (1 3/4 turns back) |
| Throttle cable play | 3—6 mm (0.1—0.2 in) | ← | ← | ← |

## ELECTRICAL

Unit: mm (in)

| ITEM | | SPECIFICATION | | NOTE |
|---|---|---|---|---|
| Ignition timing | | 5° B.T.D.C. at 1 000 r/min.<br>40° B.T.D.C. at 4 000 r/min. | | E-33 |
| | | 12° B.T.D.C. at 1 200 r/min.<br>40° B.T.D.C. at 4 000 r/min. | | For the others |
| Firing order | | L • R | | |
| Spark plug | Type | N.D.: X24EPR-U9<br>NGK.: DPR8EA-9 | | |
| | Gap | 0.8—0.9 (0.031—0.035) | | |
| Spark performance | | Over 8 (0.3) at 1 atm. | | |
| Signal coil resistance | | 250—420 Ω | | |
| Ignition coil resistance | Primary | 3—6 Ω | | Terminal—Terminal |
| | Secondary | 18—30 kΩ | | Plug cap—Terminal |
| Generator Max. output | | Approx. 200W at 5 000 r/min. | | |
| Generator no-load voltage | | More than 75 V (AC) at 5 000 r/min. | | |
| Regulated voltage | | 13.5—15.5 V at 5 000 r/min. | | |
| Starter motor brush length | N.D. | Limit: 9 (0.4) | | |
| commutator under-cut | | Limit: 0.2 (0.008) | | |
| Starter relay resistance | | 3—5 Ω | | |
| Battery | Type designation | FB10L-B2 | | |
| | Capacity | 12V 39.6kC (11Ah)/10HR | | |
| | Standard electrolyte S.G. | 1.28 at 20°C (68°F) | | |
| Fuse size | | 20 A | | |

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## WATTAGE

Unit:W

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-03,24,28,33 | The others |
| Headlight | HI | 60 | ← |
| | LO | 55 | ← |
| Position light | | | 4 |
| Tail/Brake light | | 5/21 | ← |
| Turn signal light | | 21 | ← |
| Tachometer light | | 3.4 | ← |
| Speedometer light | | 3.4 | ← |
| Turn signal indicator light | | 3.4 | ← |
| High beam indicator light | | 1.7 | ← |
| Neutral indicator light | | 3.4 | ← |
| Oil pressure indicator light | | 3.4 | ← |

## BRAKE + WHEEL

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Rear brake pedal height | 55 (2.2) | | ——— |
| Brake disc thickness | Front | 4.5 ± 0.2 (0.177 ± 0.008) | 4.0 (0.16) |
| | Rear | 6.0 ± 0.2 (0.236 ± 0.008) | 5.5 (0.22) |
| Brake disc runout | ——— | | 0.30 (0.012) |
| Master cylinder bore | Front | 12.700—12.743 (0.5000—0.5017) | ——— |
| | Rear | 12.700—12.743 (0.5000—0.5017) | ——— |
| Master cylinder piston diam. | Front | 12.657—12.684 (0.4983—0.4994) | ——— |
| | Rear | 12.657—12.684 (0.4983—0.4994) | ——— |
| Brake caliper cylinder bore | Front | 30.230—30.306 (1.1902—1.1931) | ——— |
| | Rear | 38.180—38.256 (1.5031—1.5061) | ——— |
| Brake caliper piston diam. | Front | 30.150—30.200 (1.1870—1.1890) | ——— |
| | Rear | 38.098—38.148 (1.4999—1.5019) | ——— |

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| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Wheel rim runout | Axial | — | 2.0 (0.08) |
| | Radial | — | 2.0 (0.08) |
| Wheel axle runout | Front | — | 0.25 (0.010) |
| | Rear | — | 0.25 (0.010) |
| Wheel rim size | Front | J17 × MT3.00 | — |
| | Rear | J17 × MT3.50 | — |
| Tire size | Front | 110/70-17 54H | — |
| | Rear | 130/70-17 62H | — |
| Tire tread depth | Front | — | 1.6 (0.06) |
| | Rear | — | 2.0 (0.08) |

## SUSPENSION

Unit: mm (in)

| ITEM | STANDARD | LIMIT | NOTE |
|---|---|---|---|
| Front fork stroke | 120 (4.7) | — | |
| Front fork spring free length | — | 254 (10.0) | E-03,28,33 |
| | — | 303 (11.9) | For the others |
| Front fork oil level | 99 (3.9) | — | E-03,28,33 |
| | 105 (4.1) | — | For the others |
| Rear shock absorber spring adjuster | 4th position among 7 | — | |
| Rear wheel travel | 115 (4.5) | — | |
| Swingarm pivot shaft runout | — | 0.3 (0.01) | |

## TIRE PRESSURE

| COLD INFLATION TIRE PRESSURE | SOLO RIDING | | | DUAL RIDING | | |
|---|---|---|---|---|---|---|
| | kPa | kg/cm² | psi | kPa | kg/cm² | psi |
| FRONT | 225 | 2.25 | 33 | 225 | 2.25 | 33 |
| REAR | 250 | 2.50 | 36 | 280 | 2.80 | 41 |

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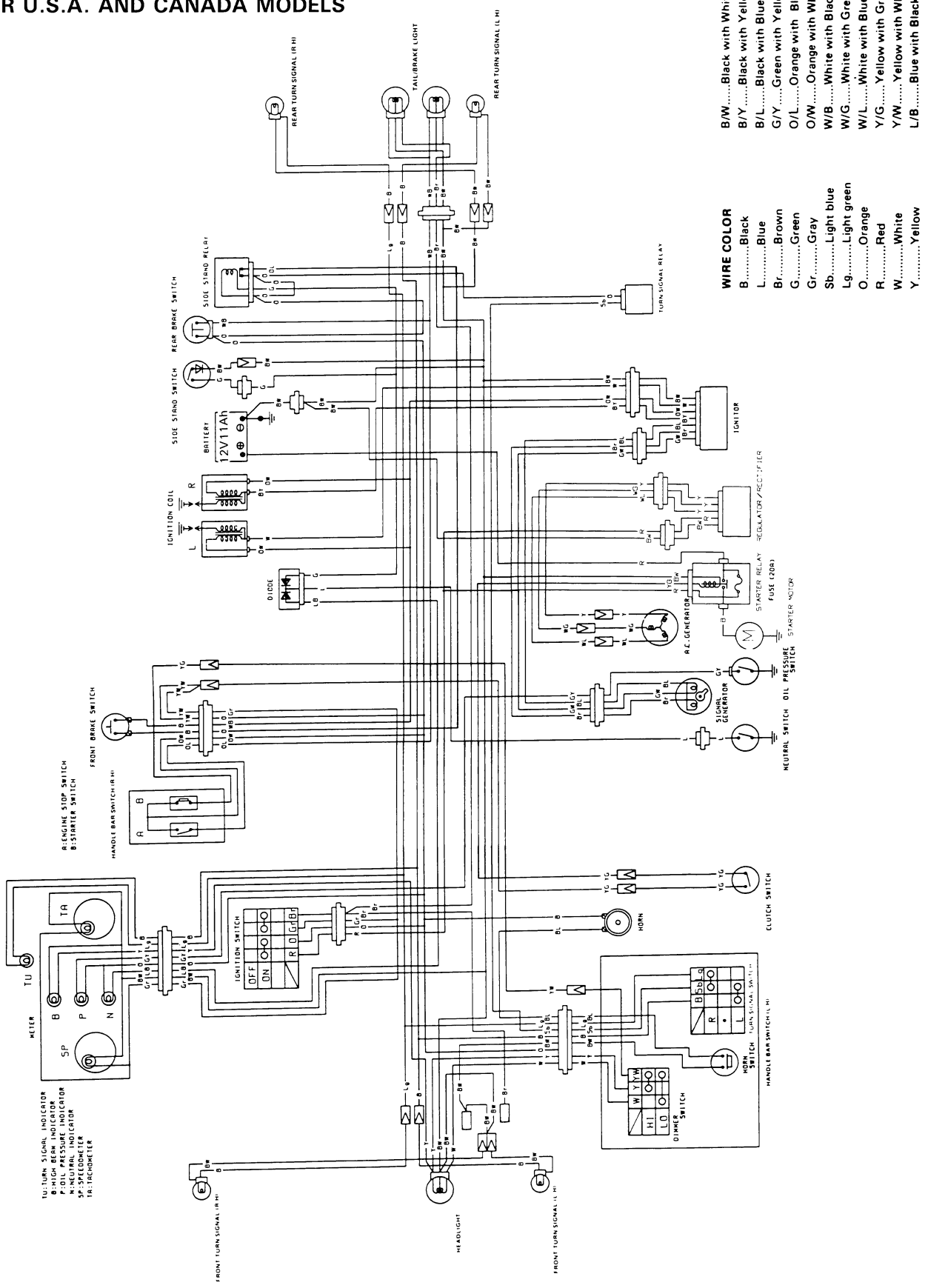
## FUEL + OIL

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Fuel type | • Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ ) or 91 octane or higher rated by the research method.<br>• Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible. | | E-03,33 |
| | Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method. | | E-28 |
| | Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended. | | For the others |
| Fuel tank including reserve | 15.0 L<br>(4.0/3.3 US/Imp gal) | | E-33 |
| | 17.0 L<br>(4.5/3.7 US/Imp gal) | | For the others |
| reserve | 3.5 L<br>(0.9/0.8 US/Imp gal) | | |
| Engine oil type | SAE 10W/40, API SF or SG | | |
| Engine oil capacity | Change | 2 600 ml<br>(2.7/2.3 US/Imp qt) | |
| | Filter change | 2 900 ml<br>(3.1/2.6 US/Imp qt) | |
| | Overhaul | 3 200 ml<br>(3.4/2.8 US/Imp qt) | |
| Front fork oil type | Fork oil #10 | | |
| Front fork oil capacity (each leg) | 382 ml<br>(12.9/13.5 US/Imp oz) | | E-03,28,33 |
| | 377 ml<br>(12.7/13.3 US/Imp oz) | | For the others |
| Brake fluid type | DOT 4 | | |

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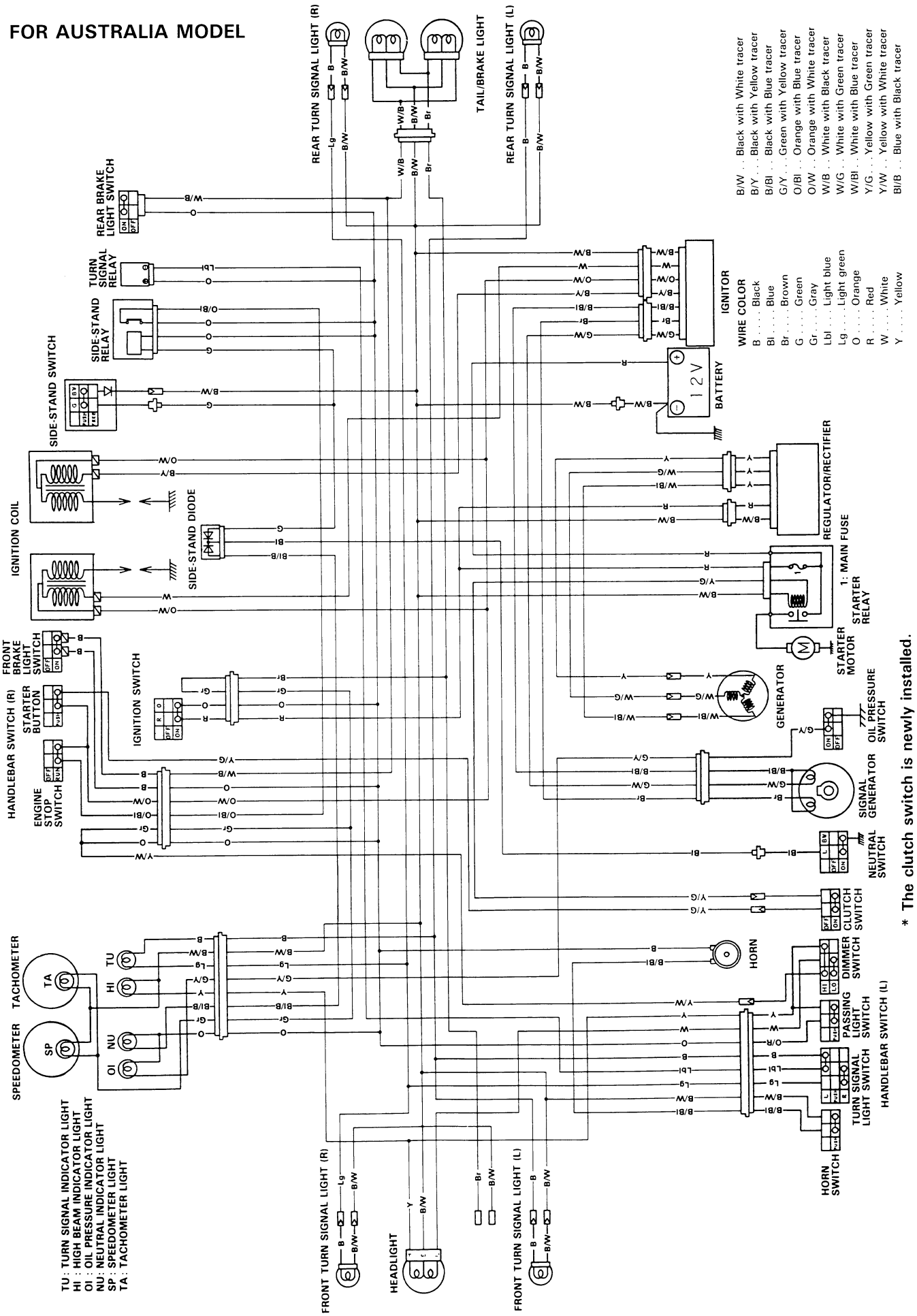
# WIRING DIAGRAM

## FOR U.S.A. AND CANADA MODELS




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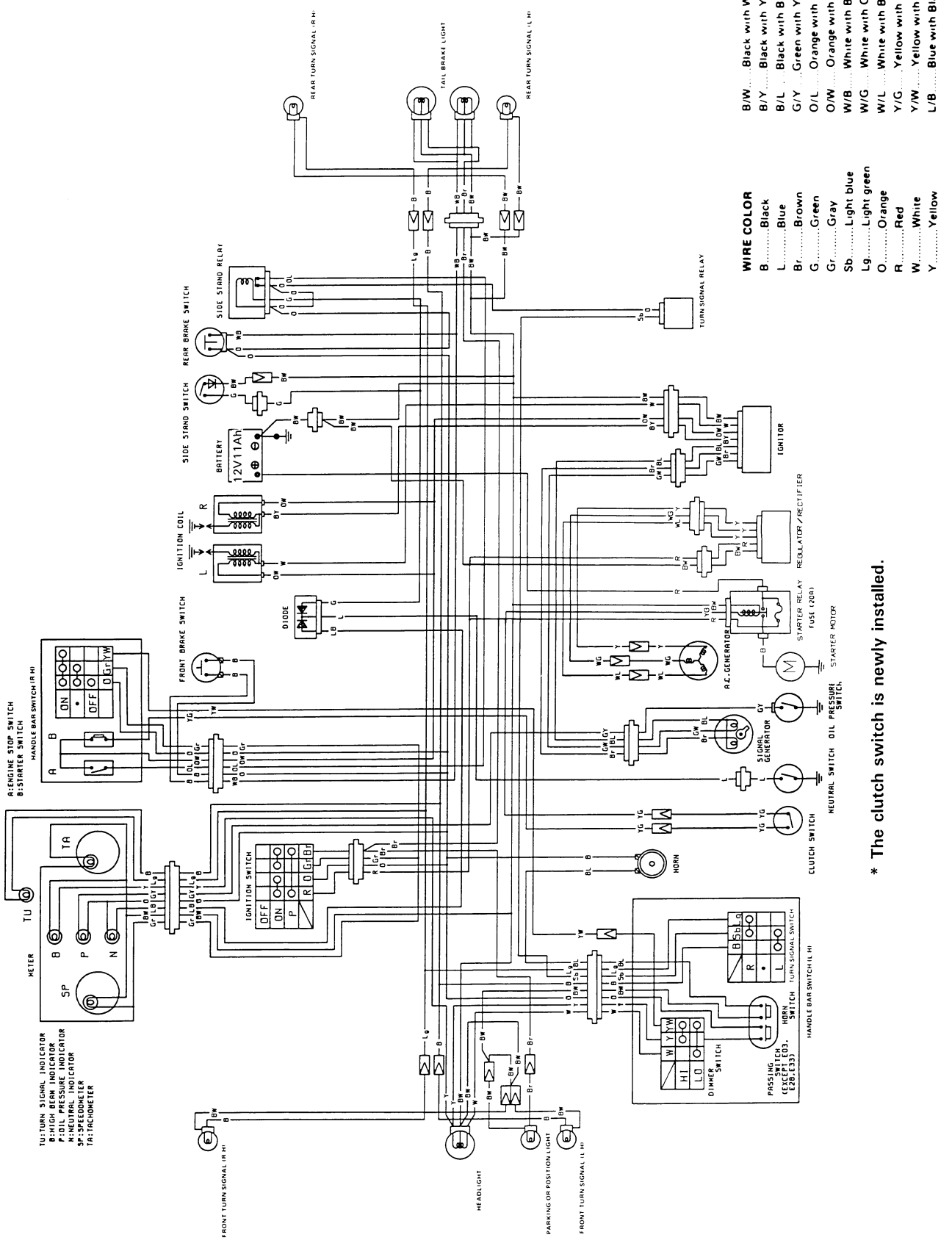
## FOR AUSTRALIA MODEL




* The clutch switch is newly installed.

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## FOR OTHER MODELS




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# GS500EW/X/Y ('98/'99/'00-MODELS)

## CONTENTS


**SPECIFICATIONS ..... 17- 1**
**SERVICE DATA..... 17- 2**


*NOTE:*
*Asterisk mark (*) indicates the new specifications.*



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# SPECIFICATIONS

## DIMENSIONS AND DRY MASS

| | |
|---|---|
| Overall length | 2 105 mm (82.9 in) ..... E-25 |
| | 2 180 mm (85.8 in) ..... E-18, 22, 39 |
| | 2 075 mm (81.7 in) ..... Others |
| Overall width | 745 mm (29.3 in) |
| Overall height | 1 045 mm (41.1 in) |
| Wheelbase | 1 410 mm (55.5 in) |
| Ground clearance | 155 mm ( 6.1 in) |
| Seat height | 790 mm (31.1 in) |
| Dry mass | 170 kg (374 lbs) ..... E-33 |
| | 169 kg (372 lbs) ..... Others |

## ENGINE

| | |
|---|---|
| Type | Four stroke, air-cooled, DOHC |
| Valve clearance (IN & EX) | 0.03–0.08 mm (0.0012–0.0031 in) |
| Number of cylinders | 2 |
| Bore | 74.0 mm (2.913 in) |
| Stroke | 56.6 mm (2.228 in) |
| Displacement | 487 $cm^3$ (29.7 cu. in) |
| Compression ratio | 9.0 : 1 |
| Carburetor | BSR34, twin ..... E-04 |
| | BST33, twin ..... Others |
| Air cleaner | Non-woven fabric element |
| Starter system | Electric |
| Lubrication system | Wet sump |

## TRANSMISSION

| | |
|---|---|
| Clutch | Wet multi-plate type |
| Transmission | 6-speed constant mesh |
| Gearshift pattern | 1-down, 5-up |
| Primary reduction ratio | 2.714 (76/28) |
| Gear ratios, Low | 2.461 (32/13) |
| 2nd | 1.777 (32/18) |
| 3rd | 1.380 (29/21) |
| 4th | 1.125 (27/24) |
| 5th | 0.961 (25/26) |
| Top | 0.851 (23/27) |
| Final reduction ratio | 2.437 (39/16) |
| Drive chain | *D.I.D. 520VM, 110 links |

## CHASSIS

| | |
|---|---|
| Front suspension | Telescopic, coil spring, oil damped ..... E-03, 28, 33 |
| | Telescopic, coil spring, oil damped, spring preload adjustable .... Others |
| Rear suspension | Link type, oil damped, spring preload 7-way adjustable |
| Front suspension stroke | 120 mm (4.7 in) |
| Rear wheel travel | 115 mm (4.5 in) |
| Caster | 25° 30' |
| Trail | 95 mm (3.7 in) |
| Steering angle | 35° |
| Turning radius | 2.7 m (8.9 ft) |
| Front brake | Disk brake |
| Rear brake | Disk brake |
| Front tire size | 110/70-17 54H, tubeless |
| Rear tire size | 130/70-17 62H, tubeless |

## ELECTRICAL

| | |
|---|---|
| Ignition type | Electronic ignition (transistorized) |
| Ignition timing | 5° B.T.D.C. at 1 000 r/min and 40° B.T.D.C. at 4 000 r/min ..... E-33 |
| | 12° B.T.D.C. at 1 200 r/min and 40° B.T.D.C. at 4 000 r/min ..... Others |
| Spark plug | NGK DPR8EA-9 or DENSO X24EPR-U9 |
| Battery | 12V 39.6 kC (11 Ah)/10HR |
| Generator | Three-phase A.C. generator |
| Fuse | 20A |
| Headlight | 12V 60/55W |
| Position light | 12V 4W ..... Except E-03, 24, 28, 33 |
| Turn signal light | 12V 21W |
| Brake light/Taillight | 12V 21/5W (×2 pcs.) |
| Speedometer light | 12V 3.4W |
| Tachometer light | 12V 3.4W |
| Neutral indicator light | 12V 3.4W |
| High beam indicator light | 12V 1.7W |
| Turn signal indicator light | 12V 3.4W |
| Oil pressure indicator light | 12V 3.4W |

## CAPACITIES

| | |
|---|---|
| Fuel tank, including reserve | 15.0 L (4.0/3.3 US/Imp gal) ..... E-33 |
| | 17.0 L (4.5/3.7 US/Imp gal) ..... Others |
| reserve | 3.5 L (0.9/0.8 US/Imp gal) |
| Engine oil, without filter change | 2 600 ml (2.7/2.3 US/Imp qt) |
| with filter change | 2 900 ml (3.1/2.6 US/Imp qt) |
| overhaul | 3 200 ml (3.4/2.8 US/Imp qt) |
| Front fork oil (each leg) | 382 ml (12.9/13.5 US/Imp oz) ..... E-03, 28, 33 |
| | 377 ml (12.7/13.3 US/Imp oz) ..... Others |

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# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Valve diam. | IN. | 39 (1.5) | — |
| | EX. | 32 (1.3) | — |
| Valve lift | IN. | 8.5 (0.33) | — |
| | EX. | 8.0 (0.31) | — |
| Tappet clearance (when cold) | IN. & EX. | 0.03—0.08 (0.001—0.003) | — |
| Valve guide to valve stem clearance | IN. | 0.025—0.055 (0.0010—0.0022) | — |
| | EX. | 0.040—0.070 (0.0016—0.0028) | — |
| Valve stem deflection | IN. & EX. | — | 0.35 (0.014) |
| Valve guide I.D. | IN. & EX. | 7.000—7.015 (0.2756—0.2762) | — |
| Valve stem O.D. | IN. | 6.960—6.975 (0.2740—0.2746) | — |
| | EX. | 6.945—6.960 (0.2734—0.2740) | — |
| Valve stem runout | IN. & EX. | — | 0.05 (0.002) |
| Valve head thickness | IN. & EX. | — | 0.5 (0.02) |
| Valve seat width | IN. & EX. | 1.0—1.2 (0.04—0.05) | — |
| Valve head radial runout | IN. & EX. | — | 0.03 (0.001) |
| Valve spring free length (IN. & EX.) | INNER | — | 35.6 (1.40) |
| | OUTER | — | 40.6 (1.60) |
| Valve spring tension (IN. & EX.) | INNER | 10.9—12.5 kg (24.0—27.6 lbs) at length 31.0 mm (1.22 in) | — |
| | OUTER | 20.3—23.3 kg (44.8—51.4 lbs) at length 35.0 mm (1.38 in) | — |

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## CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

| ITEM | | STANDARD | | LIMIT |
|---|---|---|---|---|
| Cam height | E-03,18, 24,28,33 | IN. | 36.789—36.819 (1.4484—1.4496) | 36.49 (1.437) |
| | | EX. | 36.291—36.321 (1.4288—1.4300) | 36.00 (1.417) |
| | For the others | IN. | 36.090—36.130 (1.4208—1.4224) | 35.80 (1.409) |
| | | EX. | 36.090—36.130 (1.4208—1.4224) | 35.80 (1.409) |
| Camshaft journal oil clearance | | IN. & EX. | 0.032—0.066 (0.0013—0.0026) | 0.150 (0.0060) |
| Camshaft journal holder I.D. | | IN. & EX. | 22.012—22.025 (0.8666—0.8671) | — |
| Camshaft journal O.D. | | IN. & EX. | 21.959—21.980 (0.8645—0.8654) | — |
| Camshaft runout | | IN. & EX. | — | 0.10 (0.004) |
| Cam chain pin (at arrow "3") | | 18th pin | | — |
| Cylinder head distortion | | — | | 0.10 (0.004) |

## CYLINDER + PISTON + PISTON RING

Unit: mm (in)

| ITEM | | | STANDARD | LIMIT |
|---|---|---|---|---|
| Compression pressure | | | 1 000—1 400 kPa (10—14 kg/cm², 142—199 psi) | 800 kPa (8 kg/cm², 114 psi) |
| Compression pressure difference | | | — | 200 kPa (2 kg/cm², 28 psi) |
| Piston to cylinder clearance | | | 0.050—0.060 (0.0020—0.0024) | 0.120 (0.0047) |
| Cylinder bore | | | 74.000—74.015 (2.9134—2.9140) | 74.080 (2.9165) |
| Piston diam. | | | 73.945—73.960 (2.9112—2.9118) Measure at 15 mm (0.6 in) from the skirt end. | 73.880 (2.9087) |
| Cylinder distortion | | | — | 0.10 (0.004) |
| Piston ring free end gap | 1st | N | Approx. 7.0 (0.28) | 5.6 (0.22) |
| | 2nd | N | Approx. 11.0 (0.43) | 8.8 (0.35) |
| Piston ring end gap | 1st | | 0.10—0.25 (0.004—0.010) | 0.70 (0.028) |
| | 2nd | | 0.10—0.25 (0.004—0.010) | 0.70 (0.028) |
| Piston ring to groove clearance | 1st | | — | 0.180 (0.0071) |
| | 2nd | | — | 0.150 (0.0059) |

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| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Piston ring groove width | 1st | 1.21—1.23 (0.047—0.048) | |
| | 2nd | 1.21—1.23 (0.047—0.048) | |
| | Oil | 2.51—2.53 (0.099—0.100) | |
| Piston ring thickness | 1st | 1.17—1.19 (0.046—0.047) | |
| | 2nd | 1.17—1.19 (0.046—0.047) | |
| Piston pin bore | 18.002—18.008 (0.7087—0.7090) | | 18.030 (0.7098) |
| Piston pin O.D. | 17.995—18.000 (0.7085—0.7087) | | 17.980 (0.7079) |

## CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Conrod small end I.D. | 18.006—18.014 (0.7089—0.7092) | 18.040 (0.7102) |
| Conrod big end side clearance | 0.1—0.2 (0.004—0.008) | 0.3 (0.012) |
| Conrod big end width | 22.95—23.00 (0.904—0.906) | — |
| Crank pin width | 23.10—23.15 (0.909—0.911) | — |
| Conrod big end oil clearance | 0.024—0.048 (0.0009—0.0019) | 0.080 (0.0031) |
| Crank pin O.D. | 33.976—34.000 (1.3376—1.3386) | — |
| Crankshaft journal oil clearance | 0.020—0.044 (0.0008—0.0017) | 0.080 (0.0031) |
| Crankshaft journal O.D. | 31.976—32.000 (1.2589—1.2598) | — |
| Crankshaft thrust bearing thickness | 2.950—2.975 (0.1161—0.1171) | 2.850 (0.1122) |
| Crankshaft runout | — | 0.05 (0.002) |
| Balancer journal oil clearance | 0.020—0.044 (0.0008—0.0017) | 0.080 (0.0031) |
| Balancer journal O.D. | 31.984—32.000 (1.2592—1.2598) | — |
| Balancer spring free length | — | 14.9 (0.59) |

## OIL PUMP

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Oil pump reduction ratio | 1.879 (76/28 x 27/39) | — |
| Oil pressure (at 60°C,140°F) | Above 200 kPa (2.0 kg/cm², 28 psi) Below 500 kPa (5.0 kg/cm², 71 psi) at 3 000 r/min. | — |

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## CLUTCH

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Clutch lever play | 10—15 (0.4—0.6) | ——— |
| Clutch release screw | 1/4—1/2 turn back | ——— |
| Drive plate thickness | 2.92—3.08 (0.115—0.121) | 2.62 (0.103) |
| Drive plate claw width | 15.8—16.0 (0.62—0.63) | 15.0 (0.59) |
| Driven plate distortion | ——— | 0.10 (0.004) |
| Clutch spring free length | ——— | 60.8 (2.39) |

## TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

| ITEM | | STANDARD | | LIMIT |
|---|---|---|---|---|
| Primary reduction ratio | | 2.714 (76/28) | | ——— |
| Final reduction ratio | | 2.437 (39/16) | | ——— |
| Gear ratios | Low | 2.461 (32/13) | | ——— |
| | 2nd | 1.777 (32/18) | | ——— |
| | 3rd | 1.380 (29/21) | | ——— |
| | 4th | 1.125 (27/24) | | ——— |
| | 5th | 0.961 (25/26) | | ——— |
| | Top | 0.851 (23/27) | | ——— |
| Shift fork to groove clearance | | 0.1—0.3 (0.004—0.012) | | 0.5 (0.020) |
| Shift fork groove width | | No.1, No.2 & No.3 | 5.5—5.6 (0.217—0.220) | ——— |
| Shift fork thickness | | No.1, No.2 & No.3 | 5.3—5.4 (0.209—0.213) | ——— |
| Countershaft length (Low to 2nd) | | $114.7\ ^{+0.1}_{-0}$ $\left(4.516\ ^{+0.004}_{-0}\right)$ | | ——— |
| Drive chain | | Type | *D.I.D.: DID520VM | ——— |
| | | Links | 110 | ——— |
| | | 20-pitch length | ——— | 319.4 (12.57) |
| Drive chain slack | | 20—30 (0.8—1.2) | | ——— |

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## CARBURETOR

| ITEM | SPECIFICATION | | | |
|---|---|---|---|---|
| | E-02,25,34,54 | E-04 | E-18 | E-22 |
| Carburetor type | MIKUNI BST33SS | MIKUNI BSR34SS | MIKUNI BST33SS | ← |
| Bore size | 33 mm | 34 mm | 33 mm | ← |
| I.D. No | 02D8 | 01DB | 02D1 | 02DA |
| Idle r/min. | 1 200 ± 100 r/min. | ← | 1 300 $^{+100}_{-50}$ r/min. | 1 200 ± 100 r/min. |
| Float height | 14.6 ± 1.0 mm | 13.0 ± 1.0 mm | 14.6 ± 1.0 mm | ← |
| Main jet (M.J.) | #115 | #130 | L: 120<br>R: 115 | #115 |
| Jet needle (J.N.) | 5DH9-3rd | 5DH25-55-3rd | 5DH9-3rd | ← |
| Needle jet (N.J.) | O-2 | P-5 | O-2 | ← |
| Throttle valve (Th.V.) | #120 | #105 | #125 | #120 |
| Pilot jet (P.J.) | #40 | #17.5 | #40 | ← |
| Pilot screw (P.S.) | PRE-SET (2 turns back) | PRE-SET (2⅝ turns back) | PRE-SET (1⅝ turns back) | PRE-SET (2 turns back) |
| Throttle cable play | 3—6 mm (0.1—0.2 in) | ← | ← | ← |

## CARBURETOR

| ITEM | SPECIFICATION | | |
|---|---|---|---|
| | E-24 | E-28 | P-37 |
| Carburetor type | MIKUNI BST33SS | ← | ← |
| Bore size | 33 mm | ← | ← |
| I.D. No. | 02D6 | 01D00 | 02D7 |
| Idle r/min. | 1200 ± 100 r/min. | ← | ← |
| Float height | 14.6 ± 1.0 mm | ← | ← |
| Main jet (M.J.) | L: #125<br>R: #122.5 | #122.5 | L: #125<br>R: #122.5 |
| Jet needle (J.N.) | 5DH9-3rd | 5DH8 | 5DH9-3rd |
| Needle jet (N.J.) | O-2 | O-3M | O-2 |
| Throttle valve (Th.V.) | #120 | ← | ← |
| Pilot jet (P.J.) | #40 | #37.5 | #40 |
| Pilot screw (P.S.) | PRE-SET (1⅝ turns back) | PRE-SET (2¼ turns back) | PRE-SET (1⅞ turns back) |
| Throttle cable play | 3—6 mm (0.1—0.2 in) | ← | ← |

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## CARBURETOR

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-03 | E-33 |
| Carburetor type | | MIKUNI BST33SS | ← |
| Bore size | | 33 mm | ← |
| I.D. No. | | 01D00 | 01DA |
| Idle r/min. | | 1200 ± 100 r/min. | ← |
| Float height | | 14.6 ± 1.0 mm | ← |
| Main jet | (M.J.) | # 122.5 | ← |
| Jet needle | (J.N.) | 5DH8 | ← |
| Needle jet | (N.J.) | O-3M | ← |
| Throttle valve | (Th.V.) | # 120 | # 125 |
| Pilot jet | (P.J.) | # 37.5 | ← |
| Pilot screw | (P.S.) | PRE-SET | ← |
| Throttle cable play | | 3—6 mm (0.1—0.2 in) | ← |

## CARBURETOR

| ITEM | | SPECIFICATION | | |
|---|---|---|---|---|
| | | E-04 (GS500E-U) | E-22 (GS500E-U) | E-39 (GS500E-U) |
| Carburetor type | | MIKUNI BSR34SS | MIKUNI BST33SS | ← |
| Bore size | | 34 mm | 33 mm | ← |
| I.D. No. | | 01DC | 02DB | 02D2 |
| Idle r/min. | | 1200 ± 100 r/min. | ← | 1200 ± 50 r/min. |
| Float height | | 13.0 ± 1.0 mm | 14.6 ± 1.0 mm | ← |
| Main jet | (M.J.) | # 135 | # 117.5 | L: # 125<br>R: # 115 |
| Jet needle | (J.N.) | 5DH25-55-3rd | 5DH9-2nd | 5DH9-3rd |
| Needle jet | (N.J.) | P-5 | O-2 | ← |
| Throttle valve | (Th.V.) | # 105 | # 120 | # 125 |
| Pilot jet | (P.J.) | # 17.5 | # 40 | # 40 |
| Pilot screw | (P.S.) | PRE-SET (2⅝ turns back) | PRE-SET (2 turns back) | PRE-SET (1¾ turns back) |
| Throttle cable play | | 3—6 mm (0.1—0.2 in) | ← | ← |

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## ELECTRICAL

Unit: mm (in)

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Ignition timing | 5° B.T.D.C. at 1 000 r/min.<br>40° B.T.D.C. at 4 000 r/min. | | E-33 |
| | 12° B.T.D.C. at 1 200 r/min.<br>40° B.T.D.C. at 4 000 r/min. | | For the others |
| Firing order | L • R | | |
| Spark plug | Type | DENSO: X24EPR-U9<br>NGK: DPR8EA-9 | |
| | Gap | 0.8—0.9<br>(0.031—0.035) | |
| Spark performance | Over 8 (0.3) at 1 atm. | | |
| Signal generator resistance | 269.5—404.4 Ω | | Only for E-04 |
| | 250—420 Ω | | For the others |
| Ignition coil resistance | Primary | 3—6 Ω | Terminal—Terminal |
| | Secondary | 18—30 kΩ | Plug cap—Terminal |
| Signal generator peak voltage | More than 3.0 V | | Only for E-04 |
| Ignition coil primary peak voltage | More than 220 V | | Only for E-04 |
| Generator Max. output | Approx. 200W at 5 000 r/min. | | |
| Generator no-load voltage | More than 75 V (AC) at 5 000 r/min. | | |
| Regulated voltage | 13.5—15.5 V at 5 000 r/min. | | |
| Starter motor brush length | N.D. | Limit: 9 (0.4) | |
| commutator under-cut | Limit: 0.2 (0.008) | | |
| Starter relay resistance | 3—5 Ω | | |
| Battery Type designation | FB10L-B2 | | |
| Capacity | 12V 39.6kC (11Ah)/10HR | | |
| Standard electrolyte S.G. | 1.28 at 20°C (68°F) | | |
| Fuse size | 20 A | | |

## WATTAGE

Unit:W

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-03,24,28,33 | The others |
| Headlight | HI | 60 | ← |
| | LO | 55 | ← |
| Position light | | | 4 |
| Brake light/Taillight | | 21/5 | ← |
| Turn signal light | | 21 | ← |
| Tachometer light | | 3.4 | ← |
| Speedometer light | | 3.4 | ← |
| Turn signal indicator light | | 3.4 | ← |
| High beam indicator light | | 1.7 | ← |
| Neutral indicator light | | 3.4 | ← |
| Oil pressure indicator light | | 3.4 | ← |

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## BRAKE + WHEEL

Unit: mm (in)

| ITEM | | STANDARD | LIMIT |
|---|---|---|---|
| Rear brake pedal height | | 55 (2.2) | — |
| Brake disc thickness | Front | 4.5 ± 0.2 (0.177 ± 0.008) | 4.0 (0.16) |
| | Rear | 6.0 ± 0.2 (0.236 ± 0.008) | 5.5 (0.22) |
| Brake disc runout | | — | 0.30 (0.012) |
| Master cylinder bore | Front | 12.700—12.743 (0.5000—0.5017) | — |
| | Rear | 12.700—12.743 (0.5000—0.5017) | — |
| Master cylinder piston diam. | Front | 12.657—12.684 (0.4983—0.4994) | — |
| | Rear | 12.657—12.684 (0.4983—0.4994) | — |
| Brake caliper cylinder bore | Front | 30.230—30.306 (1.1902—1.1931) | — |
| | Rear | 38.180—38.256 (1.5031—1.5061) | — |
| Brake caliper piston diam. | Front | 30.150—30.200 (1.1870—1.1890) | — |
| | Rear | 38.098—38.148 (1.4999—1.5019) | — |
| Wheel rim runout | Axial | — | 2.0 (0.08) |
| | Radial | — | 2.0 (0.08) |
| Wheel axle runout | Front | — | 0.25 (0.010) |
| | Rear | — | 0.25 (0.010) |
| Wheel rim size | Front | J17 × MT3.00 | — |
| | Rear | J17 × MT3.50 | — |
| Tire size | Front | 110/70-17 54H | — |
| | Rear | 130/70-17 62H | — |
| Tire tread depth | Front | — | 1.6 (0.06) |
| | Rear | — | 2.0 (0.08) |

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## SUSPENSION

Unit: mm (in)

| ITEM | STANDARD | LIMIT | NOTE |
|---|---|---|---|
| Front fork stroke | 120 (4.7) | — | |
| Front fork spring free length | — | 254 (10.0) | E-03,28,33 |
| | — | 303 (11.9) | For the others |
| Front fork oil level | 99 (3.9) | — | E-03,28,33 |
| | 105 (4.1) | — | For the others |
| Rear shock absorber spring adjuster | 4th position among 7 | — | |
| Rear wheel travel | 115 (4.5) | — | |
| Swingarm pivot shaft runout | — | 0.3 (0.01) | |

## TIRE PRESSURE

| COLD INFLATION TIRE PRESSURE | SOLO RIDING | | | DUAL RIDING | | |
|---|---|---|---|---|---|---|
| | kPa | kg/cm² | psi | kPa | kg/cm² | psi |
| FRONT | 225 | 2.25 | 33 | 225 | 2.25 | 33 |
| REAR | 250 | 2.50 | 36 | 280 | 2.80 | 41 |

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## FUEL + OIL

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Fuel type | • Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ ) or 91 octane or higher rated by the research method.<br>• Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible. | | E-03,33 |
| | Use only unleaded gasoline of at least 87 pump octane ( $\frac{R+M}{2}$ method) or 91 octane or higher rated by the Research Method. | | E-28 |
| | Gasoline used should be graded 85-95 octane or higher. An unleaded gasoline is recommended. | | For the others |
| Fuel tank including reserve | 15.0 L (4.0/3.3 US/Imp gal) | | E-33 |
| | 17.0 L (4.5/3.7 US/Imp gal) | | For the others |
| reserve | 3.5 L (0.9/0.8 US/Imp gal) | | |
| Engine oil type | SAE 10W/40, API SF or SG | | |
| Engine oil capacity | Change | 2 600 ml (2.7/2.3 US/Imp qt) | |
| | Filter change | 2 900 ml (3.1/2.6 US/Imp qt) | |
| | Overhaul | 3 200 ml (3.4/2.8 US/Imp qt) | |
| Front fork oil type | Fork oil #10 | | |
| Front fork oil capacity (each leg) | 382 ml (12.9/13.5 US/Imp oz) | | E-03,28,33 |
| | 377 ml (12.7/13.3 US/Imp oz) | | For the others |
| Brake fluid type | DOT 4 | | |

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# GS500K1/K2 ('01/'02-MODELS)

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*NOTE:*
*Asterisk mark (*) indicates the new specifications.*



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# SPECIFICATIONS

**DIMENSIONS AND DRY MASS**

| | |
|---|---|
| Overall length | 2 080 mm (81.9 in) |
| Overall width | 800 mm (31.5 in) |
| Overall height | 1 060 mm (41.7 in) |
| Wheelbase | 1 405 mm (55.3 in) |
| Ground clearance | 150 mm ( 5.9 in) |
| Seat height | 790 mm (31.1 in) |
| Dry mass | 174 kg (383 lbs) |
| | 173 kg (381 lbs) |

**ENGINE**

| | |
|---|---|
| Type | Four-stroke, air-cooled, DOHC |
| Valve clearance (IN &EX) | 0.03 – 0.08 mm (0.0012 – 0.0031 in) |
| Number of cylinders | 2 |
| Bore | 74.0 mm (2.913 in) |
| Stroke | 56.6 mm (2.228 in) |
| Displacement | 487 $cm^3$ (29.7 cu. in) |
| Compression ratio | 9.0 : 1 |
| Carburetor | BSR34, twin |
| Air cleaner | Non-woven fabric element |
| Starter system | Electric |
| Lubrication system | Wet sump |
| Idle speed | 1 200 ± 100 r/min |

**TRANSMISSION**

| | |
|---|---|
| Clutch | Wet multi-plate type |
| Transmission | 6-speed constant mesh |
| Gearshift pattern | 1-down, 5-up |
| Primary reduction ratio | 2.714 (76/28) |
| Gear ratios, Low | 2.461 (32/13) |
| 2nd | 1.777 (32/18) |
| 3rd | 1.380 (29/21) |
| 4th | 1.125 (27/24) |
| 5th | 0.961 (25/26) |
| Top | 0.851 (23/27) |
| Final reduction ratio | 2.437 (39/16) |
| Drive chain | D.I.D. 520VM, 110 links |

**CHASSIS**

| | |
|---|---|
| Front suspension | Telescopic, coil spring, oil damped |
| Rear suspension | Link type, oil damped, spring pre-load 7-way adjustable |
| Front suspension stroke | 120 mm (4.7 in) |
| Rear wheel travel | 115 mm (4.5 in) |
| Caster | 25° 05' |
| Trail | 97 mm (3.82 in) |
| Steering angle | 35° |
| Turning radius | 2.7 m (8.9 ft) |
| Front brake | Disk brake |
| Rear brake | Disk brake |
| Front tire size | 110/70-17 54H, tubeless, BRIDGESTONE G547G |
| Rear tire size | 130/70-17 62H, tubeless, BRIDGESTONE G550 |

**ELECTRICAL**

| | |
|---|---|
| Ignition type | Electronic ignition (transistorized) |
| Ignition timing | 5° B.T.D.C. at 1 200 r/min ..... E-03, 28, 33 |
| | 12° B.T.D.C. at 1 200 r/min ..... Others |
| Spark plug | NGK DPR8EA-9 or DENSO X24EPR-U9 |
| Battery | 12V 39.6 kC (11 Ah)/10HR |
| Generator | Three-phase A.C. generator |
| Fuse | 20A |
| Headlight | 12V 60/55W |
| Position light | 12V 4W ..... Except E-03, 24, 28, 33 |
| Turn signal light | 12V 21W |
| Brake light/Taillight | 12V 32/3 cp (× 2 pcs.) ..... E-03, 28, 33 |
| | 12V 21/5W (× 2 pcs.) ..... Others |
| Speedometer light | 12V 3.4W |
| Tachometer light | 12V 3.4W |
| Neutral indicator light | 12V 3.4W |
| High beam indicator light | 12V 1.7W |
| Turn signal indicator light | 12V 3.4W |
| Oil pressure indicator light | 12V 3.4W |

**CAPACITIES**

| | |
|---|---|
| Fuel tank, including reserve | 19 L (5.0/4.2 US/Imp gal) ..... E-33 |
| | 20 L (5.3/4.4 US/Imp gal) ..... Others |
| reserve | 4.3 L (1.1/0.9 US/Imp gal) |
| Engine oil, without filter change | 2 600 ml (2.7/2.3 US/Imp qt) |
| with filter change | 2 900 ml (3.1/2.6 US/Imp qt) |
| overhaul | 3 200 ml (3.4/2.8 US/Imp qt) |
| Front fork oil (each leg) | 382 ml (12.9/13.5 US/Imp oz) ..... E-03, 28, 33 |
| | 389 ml (13.1/13.7 US/Imp oz) ..... Others |

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# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Valve diam. | IN. | 39<br>(1.5) | ——— |
| | EX. | 32<br>(1.3) | ——— |
| Valve lift | IN. | 8.5<br>(0.33) | ——— |
| | EX. | 8.0<br>(0.31) | ——— |
| Tappet clearance (when cold) | IN. & EX. | 0.03 – 0.08<br>(0.001 – 0.003) | ——— |
| Valve guide to valve stem clearance | IN. | 0.025 – 0.055<br>(0.0010 – 0.0022) | ——— |
| | EX. | 0.040 – 0.070<br>(0.0016 – 0.0028) | ——— |
| Valve stem deflection | IN. & EX. | ——— | 0.35<br>(0.014) |
| Valve guide I.D. | IN. & EX. | 7.000 – 7.015<br>(0.2756 – 0.2762) | ——— |
| Valve stem O.D. | IN. | 6.960 – 6.975<br>(0.2740 – 0.2746) | ——— |
| | EX. | 6.945 – 6.960<br>(0.2734 – 0.2740) | ——— |
| Valve stem runout | IN. & EX. | ——— | 0.05<br>(0.002) |
| Valve head thickness | IN. & EX. | ——— | 0.5<br>(0.02) |
| Valve seat width | IN. & EX. | 1.0 – 1.2<br>(0.04 – 0.05) | ——— |
| Valve head radial runout | IN. & EX. | ——— | 0.03<br>(0.001) |
| Valve spring free length (IN. & EX.) | INNER | ——— | 35.6<br>(1.40) |
| | OUTER | ——— | 40.6<br>(1.60) |
| Valve spring tension (IN. & EX.) | INNER | 10.9 – 12.5 kg (24.0 – 27.6 lbs)<br>at length 31.0 mm (1.22 in) | ——— |
| | OUTER | 20.3 – 23.3 kg (44.8 – 51.4 lbs)<br>at length 35.0 mm (1.38 in) | ——— |

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## CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

| ITEM | | STANDARD | | LIMIT |
|---|---|---|---|---|
| Cam height | E-03, 18, 24, 28, 33 | IN. | 36.789 – 36.819 (1.4484 – 1.4496) | 36.49 (1.437) |
| | | EX. | 36.291 – 36.321 (1.4288 – 1.4300) | 36.00 (1.417) |
| | For the others | IN. | 36.090 – 36.130 (1.4208 – 1.4224) | 35.80 (1.409) |
| | | EX. | 36.090 – 36.130 (1.4208 – 1.4224) | 35.80 (1.409) |
| Camshaft journal oil clearance | | IN. & EX. | 0.032 – 0.066 (0.0013 – 0.0026) | 0.150 (0.0060) |
| Camshaft journal holder I.D. | | IN. & EX. | 22.012 – 22.025 (0.8666 – 0.8671) | ——— |
| Camshaft journal O.D. | | IN. & EX. | 21.959 – 21.980 (0.8645 – 0.8654) | ——— |
| Camshaft runout | | IN. & EX. | ——— | 0.10 (0.004) |
| Cam chain pin (at arrow "3") | | 18th pin | | ——— |
| Cylinder head distortion | | ——— | | 0.10 (0.004) |

## CYLINDER + PISTON + PISTON RING

Unit: mm (in)

| ITEM | | | STANDARD | LIMIT |
|---|---|---|---|---|
| Compression pressure | | | 1 000 – 1 400 kPa (10 – 14 kg/cm$^2$) (142 – 199 psi) | 800 kPa (8 kg/cm$^2$) (114 psi) |
| Compression pressure difference | | | ——— | 200 kPa (2 kg/cm$^2$) (28 psi) |
| Piston to cylinder clearance | | | 0.050 – 0.060 (0.0020 – 0.0024) | 0.120 (0.0047) |
| Cylinder bore | | | 74.000 – 74.015 (2.9134 – 2.9140) | 74.080 (2.9165) |
| Piston diam. | | | 73.945 – 73.960 (2.9112 – 2.9118) Measure at 15 mm (0.6 in) from the skirt end. | 73.880 (2.9087) |
| Cylinder distortion | | | ——— | 0.10 (0.004) |
| Piston ring free end gap | 1st | N | Approx. 7.0 (0.28) | 5.6 (0.22) |
| | 2nd | N | Approx. 11.0 (0.43) | 8.8 (0.35) |
| Piston ring end gap | 1st | | 0.10 – 0.25 (0.004 – 0.010) | 0.70 (0.028) |
| | 2nd | | 0.10 – 0.25 (0.004 – 0.010) | 0.70 (0.028) |
| Piston ring to groove clearance | 1st | | ——— | 0.180 (0.0071) |
| | 2nd | | ——— | 0.150 (0.0059) |

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| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Piston ring groove width | 1st | 1.21 – 1.23<br>(0.047 – 0.048) | ——— |
| | 2nd | 1.21 – 1.23<br>(0.047 – 0.048) | ——— |
| | Oil | 2.51 – 2.53<br>(0.099 – 0.100) | ——— |
| Piston ring thickness | 1st | 1.17 – 1.19<br>(0.046 – 0.047) | ——— |
| | 2nd | 1.17 – 1.19<br>(0.046 – 0.047) | ——— |
| Piston pin bore | 18.002 – 18.008<br>(0.7087 – 0.7090) | | 18.030<br>(0.7098) |
| Piston pin O.D. | 17.995 – 18.000<br>(0.7085 – 0.7087) | | 17.980<br>(0.7079) |

## CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Conrod small end I.D. | 18.006 – 18.014<br>(0.7089 – 0.7092) | 18.040<br>(0.7102) |
| Conrod big end side clearance | 0.1 – 0.2<br>(0.004 – 0.008) | 0.3<br>(0.012) |
| Conrod big end width | 22.95 – 23.00<br>(0.904 – 0.906) | ——— |
| Crank pin width | 23.10 – 23.15<br>(0.909 – 0.911) | ——— |
| Conrod big end oil clearance | 0.024 – 0.048<br>(0.0009 – 0.0019) | 0.080<br>(0.0031) |
| Crank pin O.D. | 33.976 – 34.000<br>(1.3376 – 1.3386) | ——— |
| Crankshaft journal oil clearance | 0.020 – 0.044<br>(0.0008 – 0.0017) | 0.080<br>(0.0031) |
| Crankshaft journal O.D. | 31.976 – 32.000<br>(1.2589 – 1.2598) | ——— |
| Crankshaft thrust bearing thickness | 2.950 – 2.975<br>(0.1161 – 0.1171) | 2.850<br>(0.1122) |
| Crankshaft runout | ——— | 0.05<br>(0.002) |
| Balancer journal oil clearance | 0.020 – 0.044<br>(0.0008 – 0.0017) | 0.080<br>(0.0031) |
| Balancer journal O.D. | 31.984 – 32.000<br>(1.2592 – 1.2598) | ——— |
| Balancer spring free length | ——— | 14.9<br>(0.59) |

## OIL PUMP

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Oil pump reduction ratio | 1.879 (76/28 × 27/39) | ——— |
| Oil pressure (at 60°C, 140°F) | Above 200 kPa (2.0 kg/cm$^2$, 28 psi)<br>Below 500 kPa (5.0 kg/cm$^2$, 71 psi)<br>at 3 000 r/min. | ——— |

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## CLUTCH

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Clutch lever play | 10 – 15<br>(0.4 – 0.6) | ——— |
| Clutch release screw | 1/4 – 1/2 turn back | ——— |
| Drive plate thickness | 2.92 – 3.08<br>(0.115 – 0.121) | 2.62<br>(0.103) |
| Drive plate claw width | 15.8 – 16.0<br>(0.62 – 0.63) | 15.0<br>(0.59) |
| Driven plate distortion | ——— | 0.10<br>(0.004) |
| Clutch spring free length | ——— | 60.8<br>(2.39) |

## TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

| ITEM | | STANDARD | | LIMIT |
|---|---|---|---|---|
| Primary reduction ratio | | 2.714 (76/28) | | ——— |
| Final reduction ratio | | 2.437 (39/16) | | ——— |
| Gear ratios | Low | 2.461 (32/13) | | ——— |
| | 2nd | 1.777 (32/18) | | ——— |
| | 3rd | 1.380 (29/21) | | ——— |
| | 4th | 1.125 (27/24) | | ——— |
| | 5th | 0.961 (25/26) | | ——— |
| | Top | 0.851 (23/27) | | ——— |
| Shift fork to groove clearance | | 0.1 – 0.3<br>(0.004 – 0.012) | | 0.5<br>(0.020) |
| Shift fork groove width | | No.1, No.2 & No.3 | 5.5 – 5.6<br>(0.217 – 0.220) | ——— |
| Shift fork thickness | | No.1, No.2 & No.3 | 5.3 – 5.4<br>(0.209 – 0.213) | ——— |
| Countershaft length (Low to 2nd) | | $114.7\ ^{+0.1}_{-0}$<br>$\left(4.516^{+0.004}_{-0}\right)$ | | ——— |
| Drive chain | | Type | D.I.D.: DID520VM | ——— |
| | | Links | 110 | ——— |
| | | 20-pitch length | ——— | 319.4<br>(12.57) |
| Drive chain slack | | 20 – 30<br>(0.8 – 1.2) | | ——— |

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## CARBURETOR

| ITEM | | SPECIFICATION | | | |
|---|---|---|---|---|---|
| | | E-02, 19, 24, 54 (GS500) | E-19 (GS500-H) | E-19 (GS500-U) | E-19 (GS500-HU) |
| Carburetor type | | MIKUNI BSR34SS | ← | ← | ← |
| Bore size | | 34 mm | ← | ← | ← |
| I.D. No. | | 01DE | 01DF | 01DG | 01DK |
| Idle r/min. | | 1 200 ±100 r/min. | ← | ← | ← |
| Float height | | 13.0 ± 1.0 mm | ← | ← | ← |
| Main jet | (M.J.) | #115 | #130 | #115 | #135 |
| Jet needle | (J.N.) | 5DH41-2nd | 5DH41-3rd | 5DH41-2nd | 5DH41-3rd |
| Needle jet | (N.J.) | P-5M | ← | ← | ← |
| Throttle valve | (Th.V.) | #105 | ← | ← | ← |
| Pilot jet | (P.J.) | #17.5 | ← | ← | ← |
| Pilot screw | (P.S.) | PRE-SET (2¾ turns back) | PRE-SET (2⅝ turns back) | PRE-SET (2 turns back) | PRE-SET (2⅝ turns back) |
| Throttle cable play | | 3 – 6 mm (0.1 – 0.2 in) | ← | ← | ← |

## CARBURETOR

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-03, 28 | E-33 |
| Carburetor type | | MIKUNI BST34SS | ← |
| Bore size | | 34 mm | ← |
| I.D. No. | | 01DH | 01DJ |
| Idle r/min. | | 1 200 ± 100 r/min. | ← |
| Float height | | 13.0 ± 1.0 mm | ← |
| Main jet | (M.J.) | #127.5 | ← |
| Jet needle | (J.N.) | 5DH42 | ← |
| Needle jet | (N.J.) | P-5M | ← |
| Throttle valve | (Th.V.) | #105 | ← |
| Pilot jet | (P.J.) | #17.5 | ← |
| Pilot screw | (P.S.) | PRE-SET (2½ turns back) | ← |
| Throttle cable play | | 3 – 6 mm (0.1 – 0.2 in) | ← |

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## ELECTRICAL

Unit: mm (in)

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Ignition timing | 5° B.T.D.C. at 1 000 r/min. | | E-33 |
| | 12° B.T.D.C. at 1 200 r/min. | | For the others |
| Firing order | L · R | | |
| Spark plug | Type | DENSO: X24EPR-U9<br>NGK: DPR8EA-9 | |
| | Gap | 0.8 – 0.9<br>(0.031 – 0.035) | |
| Spark performance | Over 8 (0.3) at 1 atm. | | |
| Signal generator resistance | 269.5 – 404.4 Ω | | For H, HU models |
| | 250 – 420 Ω | | For the others |
| Ignition coil resistance | Primary | 3 – 6 Ω | Terminal – Terminal |
| | Secondary | 18 – 30 kΩ | Plug cap – Terminal |
| Signal generator peak voltage | More than 3.0 V | | For H, HU models |
| Ignition coil primary peak voltage | More than 220 V | | For H, HU models |
| Generator Max. output | Approx. 200 W at 5 000 r/min. | | |
| Generator no-load voltage | More than 75 V (AC) at 5 000 r/min. | | |
| Regulated voltage | 13.5 – 15.5 V at 5 000 r/min. | | |
| Starter motor brush length | N.D. | Limit: 9 (0.4) | |
| commutator under-cut | Limit: 0.2 (0.008) | | |
| Starter relay resistance | 3 – 5 Ω | | |
| Battery Type designation | FB10L-B2 | | |
| Capacity | 12V 39.6kC (11Ah)/10HR | | |
| Standard electrolyte S.G. | 1.28 at 20°C (68°F) | | |
| Fuse size | 20 A | | |

## WATTAGE

Unit: W

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | E-03, 24, 28, 33 | The others |
| Headlight | HI | 60 | ← |
| | LO | 55 | ← |
| Position light | | | 4 |
| Brake light/Taillight | | 21/5 (32/3 cp) | ← |
| Turn signal light | | 21 | ← |
| Tachometer light | | 3.4 | ← |
| Speedometer light | | 3.4 | ← |
| Turn signal indicator light | | 3.4 | ← |
| High beam indicator light | | 1.7 | ← |
| Neutral indicator light | | 3.4 | ← |
| Oil pressure indicator light | | 3.4 | ← |

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## BRAKE + WHEEL

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Rear brake pedal height | 55 (2.2) | | ——— |
| Brake disc thickness | Front | 4.5 ± 0.2 (0.177 ± 0.008) | 4.0 (0.16) |
| | Rear | 6.0 ± 0.2 (0.236 ± 0.008) | 5.5 (0.22) |
| Brake disc runout | ——— | | 0.30 (0.012) |
| Master cylinder bore | Front | 12.700 – 12.743 (0.5000 – 0.5017) | ——— |
| | Rear | 12.700 – 12.743 (0.5000 – 0.5017) | ——— |
| Master cylinder piston diam. | Front | 12.657 – 12.684 (0.4983 – 0.4994) | ——— |
| | Rear | 12.657 – 12.684 (0.4983 – 0.4994) | ——— |
| Brake caliper cylinder bore | Front | 30.230 – 30.306 (1.1902 – 1.1931) | ——— |
| | Rear | 38.180 – 38.256 (1.5031 – 1.5061) | ——— |
| Brake caliper piston diam. | Front | 30.150 – 30.200 (1.1870 – 1.1890) | ——— |
| | Rear | 38.098 – 38.148 (1.4999 – 1.5019) | ——— |
| Wheel rim runout | Axial | ——— | 2.0 (0.08) |
| | Radial | ——— | 2.0 (0.08) |
| Wheel axle runout | Front | ——— | 0.25 (0.010) |
| | Rear | ——— | 0.25 (0.010) |
| Wheel rim size | Front | J17 × MT3.00 | ——— |
| | Rear | J17 × MT3.50 | ——— |
| Tire size | Front | 110/70-17 54H | ——— |
| | Rear | 130/70-17 62H | |
| Tire tread depth | Front | ——— | 1.6 (0.06) |
| | Rear | ——— | 2.0 (0.08) |

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## SUSPENSION

Unit: mm (in)

| ITEM | STANDARD | LIMIT | NOTE |
|---|---|---|---|
| Front fork stroke | 120 (4.7) | ——— | |
| Front fork spring free length | ——— | 270 (10.6) | E-03, 28, 33 |
| | ——— | 336 (13.2) | For the others |
| Front fork oil level | 99 (3.9) | ——— | E-03, 28, 33 |
| | 91 (3.6) | ——— | For the others |
| Rear shock absorber spring adjuster | 4th position among 7 | ——— | |
| Rear wheel travel | 115 (4.5) | ——— | |
| Swingarm pivot shaft runout | ——— | 0.3 (0.01) | |

## TIRE PRESSURE

| COLD INFLATION TIRE PRESSURE | SOLO RIDING | | | DUAL RIDING | | |
|---|---|---|---|---|---|---|
| | kPa | $kg/cm^2$ | psi | kPa | $kg/cm^2$ | psi |
| FRONT | 225 | 2.25 | 33 | 225 | 2.25 | 33 |
| REAR | 250 | 2.50 | 36 | 280 | 2.80 | 41 |

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## FUEL + OIL

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Fuel type | Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octaneor higher rated by the research method.<br>Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible. | | E-03, 28, 33 |
| | Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended. | | For the others |
| Fuel tank including reserve | 19 L<br>(5.0/4.2 US/Imp gal) | | E-33 |
| | 20 L<br>(5.3/4.4 US/Imp gal) | | For the others |
| reserve | 4.3 L<br>(1.1/0.9 US/Imp gal) | | |
| Engine oil type | SAE 10W/40, API SF or SG | | |
| Engine oil capacity | Change | 2 600 ml<br>(2.7/2.3 US/Imp qt) | |
| | Filter change | 2 900 ml<br>(3.1/2.6 US/Imp qt) | |
| | Overhaul | 3 200 ml<br>(3.4/2.8 US/Imp qt) | |
| Front fork oil type | Fork oil #10 | | |
| Front fork oil capacity<br>(each leg) | 382 ml<br>(12.9/13.5 US/Imp oz) | | E-03, 28, 33 |
| | 389 ml<br>(13.1/13.7 US/Imp oz) | | For the others |
| Brake fluid type | DOT 4 | | |

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# GS500K3 ('03-MODEL)

*The descriptions of GS500K3 ('03-model) are applicable to 01E, 01F and 01G, and not to 03E.*

*This chapter describes service data, service specifications and servicing procedures which differ from those of the GS500K2 ('02-MODEL).*

*NOTE:*
** Please refer to the chapter 1 through 18 for details which are not given in this chapter.*
** Any difference between the GS500K2 ('02-model) and GS500K3 ('03-model) in specifications and service data are clearly indicated with an asterisk (*).*

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# SPECIFICATIONS

## DIMENSIONS AND DRY MASS

| | |
|---|---|
| Overall length | 2 080 mm (81.9 in) |
| Overall width | 800 mm (31.5 in) |
| Overall height | 1 060 mm (41.7 in) |
| Wheelbase | 1 405 mm (55.3 in) |
| Ground clearance | 150 mm ( 5.9 in) |
| Seat height | 790 mm (31.1 in) |
| Dry mass | 173 kg (381 lbs) |

## ENGINE

| | |
|---|---|
| Type | Four-stroke, air-cooled, DOHC |
| Number of cylinders | 2 |
| Bore | 74.0 mm (2.913 in) |
| Stroke | 56.6 mm (2.228 in) |
| Displacement | 487 $cm^3$ (29.7 cu. in) |
| Compression ratio | 9.0 : 1 |
| Carburetor | BSR34, twin |
| Air cleaner | Non-woven fabric element |
| Starter system | Electric |
| Lubrication system | Wet sump |
| Idle speed | 1 200 ± 100 r/min |

## DRIVE TRAIN

| | |
|---|---|
| Clutch | Wet multi-plate type |
| Transmission | 6-speed constant mesh |
| Gearshift pattern | 1-down, 5-up |
| Primary reduction ratio | 2.714 (76/28) |
| Gear ratios, Low | 2.461 (32/13) |
| 2nd | 1.777 (32/18) |
| 3rd | 1.380 (29/21) |
| 4th | 1.125 (27/24) |
| 5th | 0.961 (25/26) |
| Top | 0.851 (23/27) |
| Final reduction ratio | 2.437 (39/16) |
| Drive chain | D.I.D. 520VM, 110 links |

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## CHASSIS

| | |
|---|---|
| Front suspension | Telescopic, coil spring, oil damped |
| Rear suspension | Link type, coil spring, oil damped |
| Front suspension stroke | 120 mm (4.7 in) |
| Rear wheel travel | 115 mm (4.5 in) |
| Caster | 25° 05' |
| Trail | 97 mm (3.82 in) |
| Steering angle | 35° |
| Turning radius | 2.7 m (8.9 ft) |
| Front brake | Disc brake |
| Rear brake | Disc brake |
| Front tire size | 110/70-17M/C 54H, tubeless |
| Rear tire size | 130/70-17M/C 62H, tubeless |

## ELECTRICAL

| | |
|---|---|
| Ignition type | Electronic ignition (transistorized) |
| Ignition timing | 5° B.T.D.C. at 1 200 r/min.....P- 28 |
| | 12° B.T.D.C. at 1 200 r/min.....Others |
| Spark plug | NGK DPR8EA-9 or DENSO X24EPR-U9 |
| Battery | 12 V 39.6 kC (11 Ah)/10 HR |
| Generator | Three-phase A.C. generator |
| Fuse | 20 A |
| Headlight | 12 V 60/55 W |
| Position light | 12 V 4 W .....Except P- 24, 28 |
| Turn signal light | 12 V 21 W .....P-24, 28 |
| | * 12 V 18 W .....Others |
| Brake light/Taillight | 12 V 32/3 cp (× 2 pcs.)..... P-28 |
| | 12 V 21/5 W ( × 2 pcs.) ..... Others |
| Speedometer light | * 12 V 1.7 W |
| Tachometer light | * 12 V 1.7 W |
| Neutral indicator light | * 12 V 1.7 W |
| High beam indicator light | * 12 V 1.7 W |
| Turn signal indicator light | * 12 V 1.7 W |
| Oil pressure indicator light | * 12 V 1.7 W |

## CAPACITIES

| | |
|---|---|
| Fuel tank, including reserve | 20 L (5.3/4.4 US/Imp gal) |
| reserve | 4.3 L (1.1/0.9 US/Imp gal) |
| Engine oil, without filter change | 2 600 ml (2.7/2.3 US/Imp qt) |
| with filter change | 2 900 ml (3.1/2.6 US/Imp qt) |
| overhaul | 3 200 ml (3.4/2.8 US/Imp qt) |
| Front fork oil (each leg) | 382 ml (12.9/13.5 US/Imp oz).....P- 28 |
| | 389 ml (13.1/13.7 US/Imp oz).....Others |

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# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Valve diam. | IN. | 39<br>(1.5) | — |
| | EX. | 32<br>(1.3) | — |
| Valve lift | IN. | 8.5<br>(0.33) | — |
| | EX. | 8.0<br>(0.31) | — |
| Tappet clearance (when cold) | IN. & EX. | 0.03 – 0.08<br>(0.001 – 0.003) | — |
| Valve guide to valve stem clearance | IN. | 0.025 – 0.055<br>(0.0010 – 0.0022) | — |
| | EX. | 0.040 – 0.070<br>(0.0016 – 0.0028) | — |
| Valve stem deflection | IN. & EX. | — | 0.35<br>(0.014) |
| Valve guide I.D. | IN. & EX. | 7.000 – 7.015<br>(0.2756 – 0.2762) | — |
| Valve stem O.D. | IN. | 6.960 – 6.975<br>(0.2740 – 0.2746) | — |
| | EX. | 6.945 – 6.960<br>(0.2734 – 0.2740) | — |
| Valve stem runout | IN. & EX. | — | 0.05<br>(0.002) |
| Valve head thickness | IN. & EX. | — | 0.5<br>(0.02) |
| Valve seat width | IN. & EX. | 1.0 – 1.2<br>(0.04 – 0.05) | — |
| Valve head radial runout | IN. & EX. | — | 0.03<br>(0.001) |
| Valve spring free length (IN. & EX.) | INNER | — | 35.6<br>(1.40) |
| | OUTER | — | 40.6<br>(1.60) |
| Valve spring tension (IN. & EX.) | INNER | 10.9 – 12.5 kg (24.0 – 27.6 lbs)<br>at length 31.0 mm (1.22 in) | — |
| | OUTER | 20.3 – 23.3 kg (44.8 – 51.4 lbs)<br>at length 35.0 mm (1.38 in) | — |

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## CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

| ITEM | | STANDARD | | LIMIT |
|---|---|---|---|---|
| Cam height | E-03, 18, 24, 28, 33 | IN. | 36.789 – 36.819 (1.4484 – 1.4496) | 36.49 (1.437) |
| | | EX. | 36.291 – 36.321 (1.4288 – 1.4300) | 36.00 (1.417) |
| | For the others | IN. | 36.090 – 36.130 (1.4208 – 1.4224) | 35.80 (1.409) |
| | | EX. | 36.090 – 36.130 (1.4208 – 1.4224) | 35.80 (1.409) |
| Camshaft journal oil clearance | | IN. & EX. | 0.032 – 0.066 (0.0013 – 0.0026) | 0.150 (0.0060) |
| Camshaft journal holder I.D. | | IN. & EX. | 22.012 – 22.025 (0.8666 – 0.8671) | — |
| Camshaft journal O.D. | | IN. & EX. | 21.959 – 21.980 (0.8645 – 0.8654) | — |
| Camshaft runout | | IN. & EX. | — | 0.10 (0.004) |
| Cam chain pin (at arrow "3") | | 18th pin | | — |
| Cylinder head distortion | | — | | 0.10 (0.004) |

## CYLINDER + PISTON + PISTON RING

Unit: mm(in)

| ITEM | STANDARD | | | LIMIT |
|---|---|---|---|---|
| Compression pressure | 1 000 – 1 400 kPa (10 – 14 kg/cm², 142 – 199 psi) | | | 800 kPa (8 kg/cm², 114 psi) |
| Compression pressure difference | — | | | 200 kPa (2 kg/cm², 28 psi) |
| Piston to cylinder clearance | 0.050 – 0.060 (0.0020 – 0.0024) | | | 0.120 (0.0047) |
| Cylinder bore | 74.000 – 74.015 (2.9134 – 2.9140) | | | 74.080 (2.9165) |
| Piston diam. | 73.945 – 73.960 (2.9112 – 2.9118) Measure at 15 mm (0.6 in) from the skirt end. | | | 73.880 (2.9087) |
| Cylinder distortion | — | | | 0.10 (0.004) |
| Piston ring free end gap | 1st | N | Approx. 7.0 (0.28) | 5.6 (0.22) |
| | 2nd | N | Approx. 11.0 (0.43) | 8.8 (0.35) |
| Piston ring end gap | 1st | | 0.10 – 0.25 (0.004 – 0.010) | 0.70 (0.028) |
| | 2nd | | 0.10 – 0.25 (0.004 – 0.010) | 0.70 (0.028) |
| Piston ring to groove clearance | 1st | | — | 0.180 (0.0071) |
| | 2nd | | — | 0.150 (0.0059) |

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| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Piston ring groove width | 1st | 1.21 – 1.23<br>(0.047 – 0.048) | — |
| | 2nd | 1.21 – 1.23<br>(0.047 – 0.048) | — |
| | Oil | 2.51 – 2.53<br>(0.099 – 0.100) | — |
| Piston ring thickness | 1st | 1.17 – 1.19<br>(0.046 – 0.047) | — |
| | 2nd | 1.17 – 1.19<br>(0.046 – 0.047) | — |
| Piston pin bore | 18.002 – 18.008<br>(0.7087 – 0.7090) | | 18.030<br>(0.7098) |
| Piston pin O.D. | 17.995 – 18.000<br>(0.7085 – 0.7087) | | 17.980<br>(0.7079) |

## CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Conrod small end I.D. | 18.006 – 18.014<br>(0.7089 – 0.7092) | 18.040<br>(0.7102) |
| Conrod big end side clearance | 0.1 – 0.2<br>(0.004 – 0.008) | 0.3<br>(0.012) |
| Conrod big end width | 22.95 – 23.00<br>(0.904 – 0.906) | — |
| Crank pin width | 23.10 – 23.15<br>(0.909 – 0.911) | — |
| Conrod big end oil clearance | 0.024 – 0.048<br>(0.0009 – 0.0019) | 0.080<br>(0.0031) |
| Crank pin O.D. | 33.976 – 34.000<br>(1.3376 – 1.3386) | — |
| Crankshaft journal oil clearance | 0.020 – 0.044<br>(0.0008 – 0.0017) | 0.080<br>(0.0031) |
| Crankshaft journal O.D. | 31.976 – 32.000<br>(1.2589 – 1.2598) | — |
| Crankshaft thrust bearing thickness | 2.950 – 2.975<br>(0.1161 – 0.1171) | 2.850<br>(0.1122) |
| Crankshaft runout | — | 0.05<br>(0.002) |
| Balancer journal oil clearance | 0.020 – 0.044<br>(0.0008 – 0.0017) | 0.080<br>(0.0031) |
| Balancer journal O.D. | 31.984 – 32.000<br>(1.2592 – 1.2598) | — |
| Balancer spring free length | — | 14.9<br>(0.59) |

## OIL PUMP

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Oil pump reduction ratio | 1.879 (76/28 × 27/39) | — |
| Oil pressure (at 60 °C, 140 °F) | Above 200 kPa (2.0 kg/cm$^2$, 28 psi)<br>Below 500 kPa (5.0 kg/cm$^2$, 71 psi)<br>at 3 000 r/min. | — |

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## CLUTCH

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Clutch lever play | 10 – 15<br>(0.4 – 0.6) | — |
| Clutch release screw | 1/4 – 1/2 turn back | — |
| Drive plate thickness | 2.92 – 3.08<br>(0.115 – 0.121) | 2.62<br>(0.103) |
| Drive plate claw width | 15.8 – 16.0<br>(0.62 – 0.63) | 15.0<br>(0.59) |
| Driven plate distortion | — | 0.10<br>(0.004) |
| Clutch spring free length | — | 60.8<br>(2.39) |

## TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

| ITEM | | STANDARD | | LIMIT |
|---|---|---|---|---|
| Primary reduction ratio | | 2.714 (76/28) | | — |
| Final reduction ratio | | 2.437 (39/16) | | — |
| Gear ratios | Low | 2.461 (32/13) | | — |
| | 2nd | 1.777 (32/18) | | — |
| | 3rd | 1.380 (29/21) | | — |
| | 4th | 1.125 (27/24) | | — |
| | 5th | 0.961 (25/26) | | — |
| | Top | 0.851 (23/27) | | — |
| Shift fork to groove clearance | | 0.1 – 0.3<br>(0.004 – 0.012) | | 0.5<br>(0.020) |
| Shift fork groove width | | No.1, No.2 & No.3 | 5.5 – 5.6<br>(0.217 – 0.220) | — |
| Shift fork thickness | | No.1, No.2 & No.3 | 5.3 – 5.4<br>(0.209 – 0.213) | — |
| Countershaft length<br>(Low to 2nd) | | $114.7\ ^{+0.1}_{-0}$<br>$(4.516\ ^{+0.004}_{-0})$ | | — |
| Drive chain | | Type | D.I.D.: DID520VM | — |
| | | Links | 110 | — |
| | | 20-pitch length | — | 319.4<br>(12.57) |
| Drive chain slack | | 20 – 30<br>(0.8 – 1.2) | | — |

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## CARBURETOR

| ITEM | | SPECIFICATION | | |
|---|---|---|---|---|
| | | P-02, 09, 19, 24, 54 (GS500) | P-19 (GS500-H) | P-19 (GS500-U) |
| Carburetor type | | MIKUNI BSR34SS | ← | ← |
| Bore size | | 34 mm | ← | ← |
| I.D. No. | | 01DE | 01DF | 01DG |
| Idle r/min. | | 1 200 ±100 r/min. | ← | ← |
| Float height | | 13.0 ± 1.0 mm | ← | ← |
| Main jet | (M.J.) | #115 | #130 | #115 |
| Jet needle | (J.N.) | 5DH41-2nd | 5DH41-3rd | 5DH41-2nd |
| Needle jet | (N.J.) | P-5M | ← | ← |
| Throttle valve | (Th.V.) | #105 | ← | ← |
| Pilot jet | (P.J.) | #17.5 | ← | ← |
| Pilot screw | (P.S.) | 2¾ turns back | * 2¾ turns back | 2 turns back |
| Throttle cable play | | 3 – 6 mm (0.1 – 0.2 in) | ← | ← |

## CARBURETOR

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | P-19 (GS500-HU) | P-28 |
| Carburetor type | | ← | ← |
| Bore size | | ← | 34 mm |
| I.D. No. | | 01DK | 01DH |
| Idle r/min. | | ← | 1 200 ± 100 r/min. |
| Float height | | ← | 13.0 ± 1.0 mm |
| Main jet | (M.J.) | #135 | #127.5 |
| Jet needle | (J.N.) | 5DH41-3rd | 5DH42 |
| Needle jet | (N.J.) | ← | P-5M |
| Throttle valve | (Th.V.) | ← | #105 |
| Pilot jet | (P.J.) | ← | #17.5 |
| Pilot screw | (P.S.) | 2⅝ turns back | PRE-SET (2½ turns back) |
| Throttle cable play | | ← | ← |

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## ELECTRICAL

Unit: mm (in)

| ITEM | | SPECIFICATION | | NOTE |
|---|---|---|---|---|
| Ignition timing | | 5° B.T.D.C. at 1 000 r/min. | | P-28 |
| | | 12° B.T.D.C. at 1 200 r/min. | | Others |
| Firing order | | L·R | | |
| Spark plug | | Type | DENSO: X24EPR-U9<br>NGK: DPR8EA-9 | |
| | | Gap | 0.8 – 0.9<br>(0.031 – 0.035) | |
| Spark performance | | Over 8 (0.3) at 1 atm. | | |
| Signal generator resistance | | 250 – 420 Ω | | |
| Ignition coil resistance | | Primary | 3 – 6 Ω | Terminal – Terminal |
| | | Secondary | 18 – 30 kΩ | Plug cap – Terminal |
| Signal generator peak voltage | | * 1.8 V and more | | |
| Ignition coil primary peak voltage | | * 100 V and more | | |
| Generator Max. output | | Approx. 200 W at 5 000 r/min. | | |
| Generator no-load voltage | | More than 75 V (AC) at 5 000 r/min. | | |
| Regulated voltage | | 13.5 – 15.5 V at 5 000 r/min. | | |
| Starter motor brush length | | N.D. | Limit: 9 (0.4) | |
| commutator under-cut | | Limit: 0.2 (0.008) | | |
| Starter relay resistance | | 3 – 5 Ω | | |
| Battery | Type designation | FB10L-B2 | | |
| | Capacity | 12 V 39.6 kC (11 Ah)/10 HR | | |
| | Standard electrolyte S.G. | 1.28 at 20 °C (68 °F) | | |
| Fuse size | | 20 A | | |

## WATTAGE

Unit: W

| ITEM | | SPECIFICATION | | |
|---|---|---|---|---|
| | | P-28 | P-24 | Others |
| Headlight | HI | 60 | ← | ← |
| | LO | 55 | ← | ← |
| Position light | | | | 4 |
| Brake light/Taillight | | 32/3 cp | 21/5 | ← |
| Turn signal light | | 21 | 21 | * 18 |
| Tachometer light | | * 1.7 | ← | ← |
| Speedometer light | | * 1.7 | ← | ← |
| Turn signal indicator light | | * 1.7 | ← | ← |
| High beam indicator light | | * 1.7 | ← | ← |
| Neutral indicator light | | * 1.7 | ← | ← |
| Oil pressure indicator light | | * 1.7 | ← | ← |

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## BRAKE + WHEEL

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Rear brake pedal height | 55 (2.2) | | — |
| Brake disc thickness | Front | 4.5 ± 0.2 (0.177 ± 0.008) | 4.0 (0.16) |
| | Rear | 6.0 ± 0.2 (0.236 ± 0.008) | 5.5 (0.22) |
| Brake disc runout | — | | 0.30 (0.012) |
| Master cylinder bore | Front | * 12.700 – 12.725 (0.5000 – 0.5010) | — |
| | Rear | 12.700 – 12.743 (0.5000 – 0.5017) | — |
| Master cylinder piston diam. | Front | * 12.630 – 12.670 (0.4972 – 0.4988) | — |
| | Rear | 12.657 – 12.684 (0.4983 – 0.4994) | — |
| Brake caliper cylinder bore | Front | 30.230 – 30.306 (1.1902 – 1.1931) | — |
| | Rear | 38.180 – 38.256 (1.5031 – 1.5061) | — |
| Brake caliper piston diam. | Front | 30.150 – 30.200 (1.1870 – 1.1890) | — |
| | Rear | 38.098 – 38.148 (1.4999 – 1.5019) | — |
| Wheel rim runout | Axial | — | 2.0 (0.08) |
| | Radial | — | 2.0 (0.08) |
| Wheel axle runout | Front | — | 0.25 (0.010) |
| | Rear | — | 0.25 (0.010) |
| Wheel rim size | Front | 17 × MT3.00, 17M/C × MT3.00 | — |
| | Rear | 17 × MT3.50, 17M/C × MT3.50 | — |
| Tire size | Front | 110/70-17 54H, 110/70-17M/C 54H (G550) | — |
| | Rear | 130/70-17 62H, 130/70-17M/C 62H (G547 G) | — |
| Tire tread depth | Front | — | 1.6 (0.06) |
| | Rear | — | 2.0 (0.08) |

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## SUSPENSION

Unit: mm (in)

| ITEM | STANDARD | LIMIT | NOTE |
|---|---|---|---|
| Front fork stroke | 120 (4.7) | — | |
| Front fork spring free length | — | 270 (10.6) | P-28 |
| | — | 336 (13.2) | Others |
| Front fork oil level | 99 (3.9) | — | E-28 |
| | 91 (3.6) | — | Others |
| Rear shock absorber spring adjuster | 4th position among 7 | — | |
| Rear wheel travel | 115 (4.5) | — | |
| Swingarm pivot shaft runout | — | 0.3 (0.01) | |

## TIRE PRESSURE

| COLD INFLATION TIRE PRESSURE | SOLO RIDING | | | DUAL RIDING | | |
|---|---|---|---|---|---|---|
| | kPa | $kg/cm^2$ | psi | kPa | $kg/cm^2$ | psi |
| FRONT | 225 | 2.25 | 33 | 225 | 2.25 | 33 |
| REAR | 250 | 2.50 | 36 | 280 | 2.80 | 41 |

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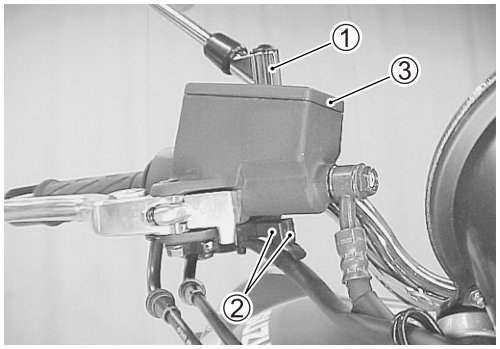
## FUEL + OIL

| ITEM | SPECIFICATION | | NOTE |
|---|---|---|---|
| Fuel type | Use only unleaded gasoline of at least 87 pump octane ($\frac{R+M}{2}$) or 91 octaneor higher rated by the research method.<br>Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible. | | P-28 |
| | Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended. | | Others |
| Fuel tank including reserve | 20 L<br>(5.3/4.4 US/Imp gal) | | |
| reserve | 4.3 L<br>(1.1/0.9 US/Imp gal) | | |
| Engine oil type | SAE 10W-40, API SF or SG | | |
| Engine oil capacity | Change | 2 600 ml<br>(2.7/2.3 US/Imp qt) | |
| | Filter change | 2 900 ml<br>(3.1/2.6 US/Imp qt) | |
| | Overhaul | 3 200 ml<br>(3.4/2.8 US/Imp qt) | |
| Front fork oil type | Fork oil #10 | | |
| Front fork oil capacity (each leg) | 382 ml<br>(12.9/13.5 US/Imp oz) | | P-28 |
| | 389 ml<br>(13.1/13.7 US/Imp oz) | | Others |
| Brake fluid type | DOT 4 | | |

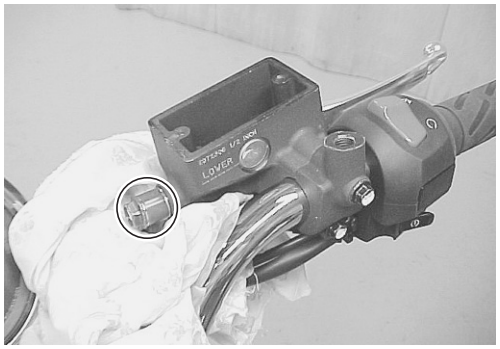
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# FRONT BRAKE MASTER CYLINDER

## REMOVAL AND DISASSEMBLY



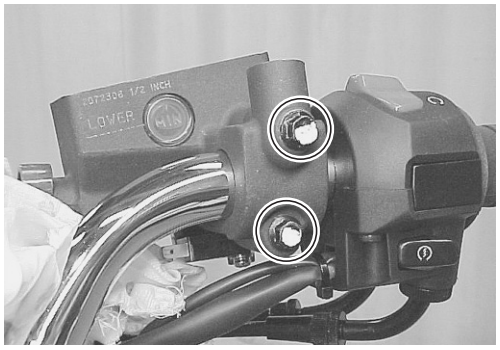

- Remove the rear view mirror ①.
- Disconnect the front brake light switch couplers ②.
- Remove the reservoir tank cap ③ and diaphragm.
- Suck up brake fluid as much as possible.



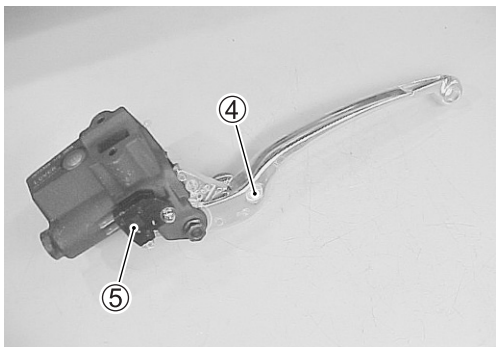
- Place a rag underneath the union bolt on the master cylinder to catch any spilt brake fluid. Remove the brake hose union bolt and disconnect the brake hose.

**CAUTION**

**Immediately and completely wipe off any brake fluid contacting any part of the motorcycle. The fluid reacts chemically with paint, plastics and rubber materials, etc. and will damage them severely.**



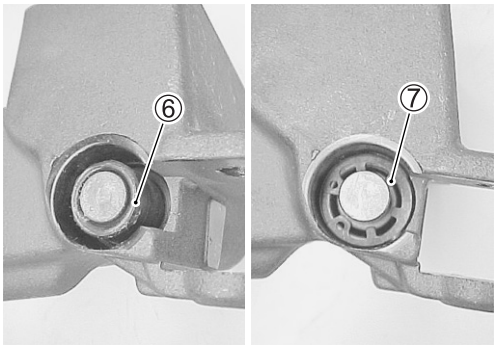
- Remove the master cylinder.



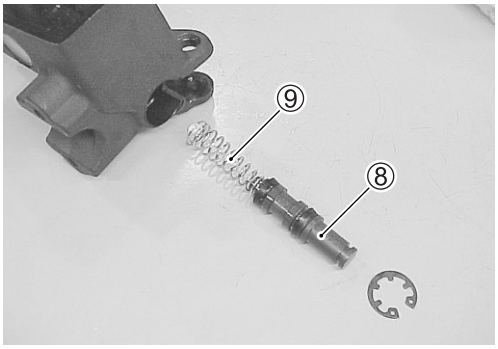

- Remove the brake lever ④ and brake switch ⑤.

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- Pull out the dust boot ⑥ and remove the snap ring ⑦.

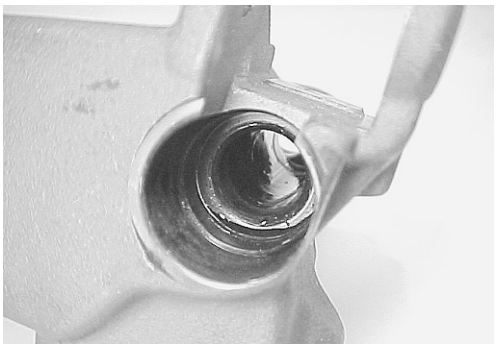



- Remove the piston and return spring.
  ⑧ Piston/cup set
  ⑨ Return spring

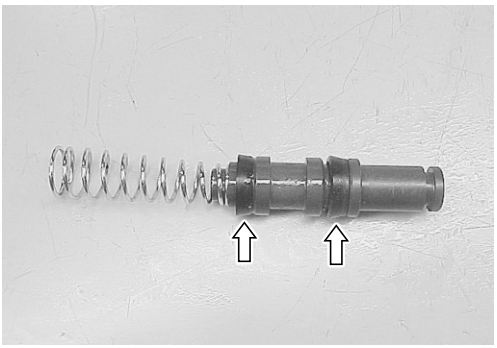



## INSPECTION

Inspect the master cylinder bore for any scratches or other damage.

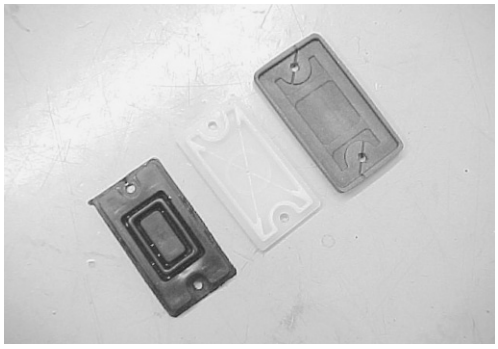


Inspect the piston surface for any scratches or other damage.
Inspect the primary cup and secondary cup for wear or damage.



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Inspect the reservoir tank cap and diaphragm for damage.

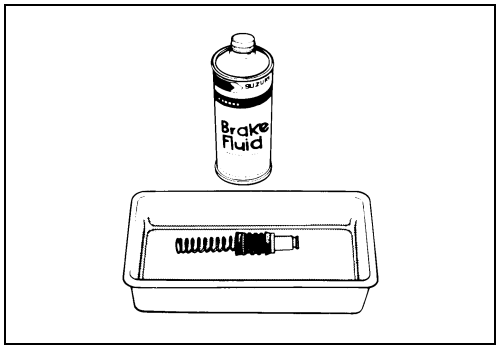


## REASSEMBLY AND REMOUNTING

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

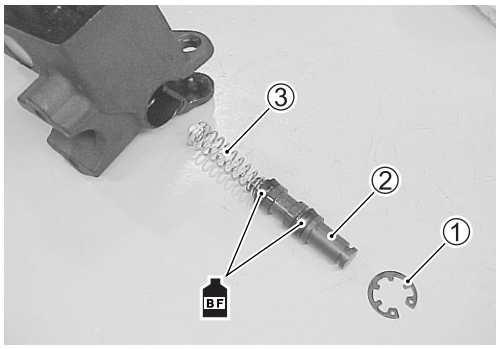
**CAUTION**

*** Wash the master cylinder components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.**
*** Do not wipe the components with a rag.**
*** Apply brake fluid to the cylinder bore and all the component to be inserted into the bore.**



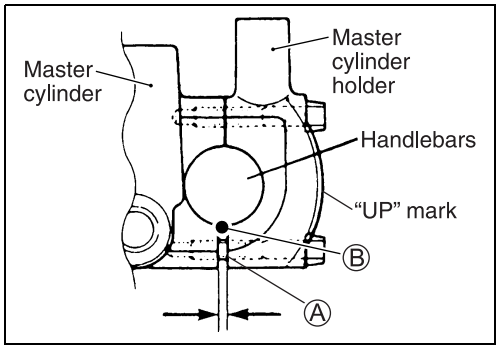

**Specification and Classification: DOT 4**

- Apply brake fluid to the piston and cups.
- Install the following parts to the master cylinder.
  ① Snap ring
  ② Piston/cup set
  ③ Return spring




- When remounting the brake master cylinder onto the handlebars, align the master cylinder holder's mating surface Ⓐ with punch mark Ⓑ on the handlebars and tighten the upper clamp bolt first as shown.

**Front brake master cylinder mounting bolt:**
**10 N·m (1.0 kgf-m, 7.0 lb-ft)**



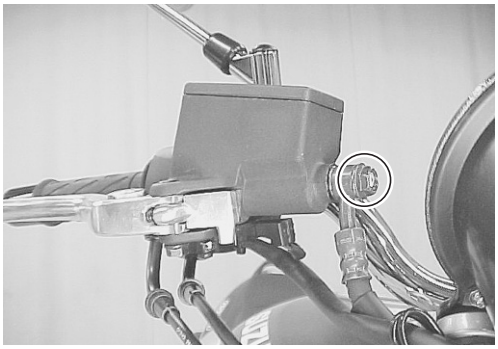

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- Tighten the union bolt.
  (Brake hose routing: ☞7-16)

**Brake hose union bolt: 23 N·m (2.3 kgf-m, 16.5 lb-ft)**

**CAUTION**

*** The seal washers should be replaced with the new ones to prevent fluid leakage.**
*** Bleed air from the system after reassembling the master cylinder. (☞2-16)**



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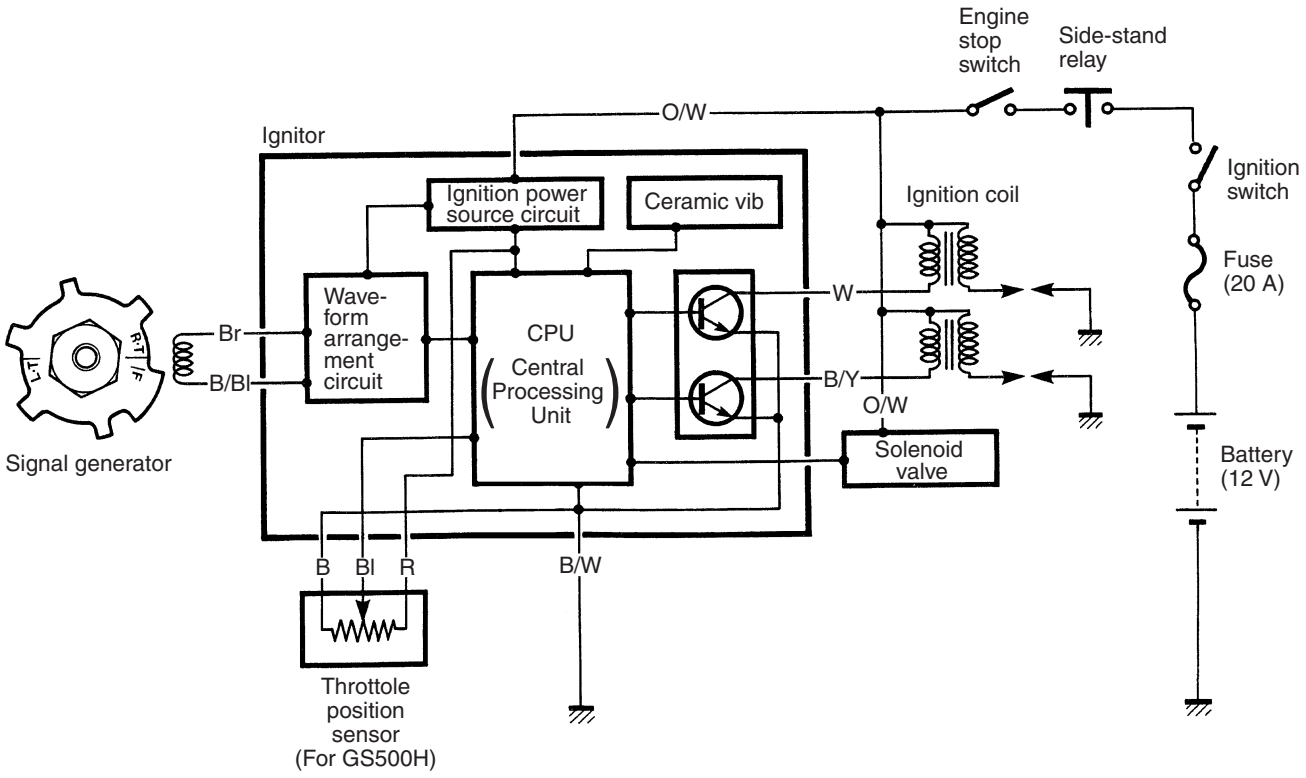
# IGNITION SYSTEM

## DESCRIPTION

The fully transistorized ignition system consists of a signal generator, ignitor unit, ignition coils and spark plugs.

The signal generator mounted at the right end of the crankshaft comprises the rotor tip and pickup coil.

The induced signal in the signal generator is sent to wave-form arrangement circuit, and CPU receives this signal and calculates the best ignition timing from the signal of ceramic vibrator. The CPU outputs signal to the transistor of the I. G. coil output circuit which is connected to the primary windings of the ignition coil which is turned OFF and ON accordingly, thus it induces the secondary current on the ignition coil secondary windings and produce the spark between spark plug gaps.

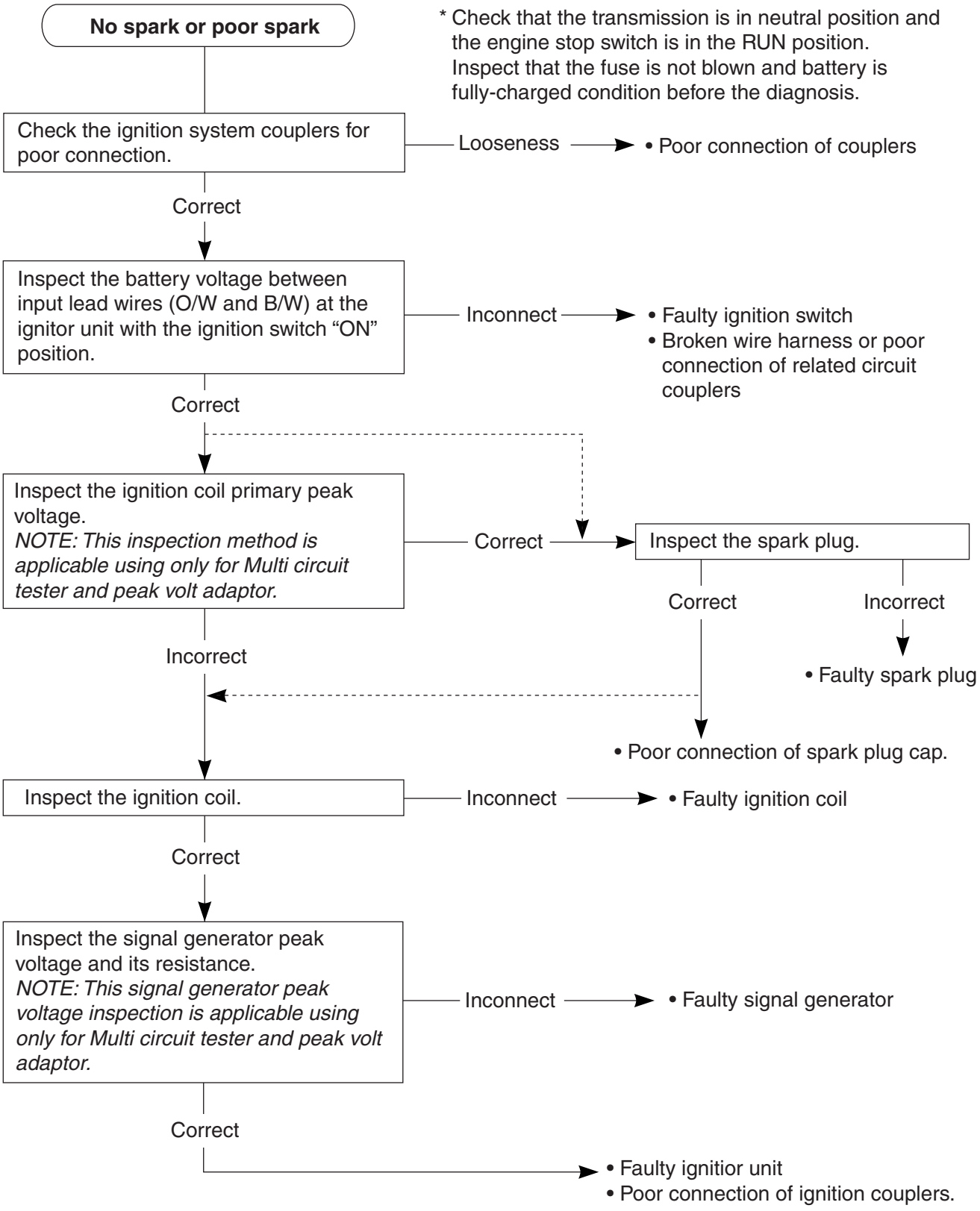



**WIRE COLOR**

B : Black
Bl : Blue
Br : Brown
R : Red
W : White
B/Bl : Black with Blue tracer
B/Y : Black with Yellow tracer
B/W : Black with White tracer
G/Bl : Green with Blue tracer
O/W : Orange with White tracer
R/B : Red with Black tracer

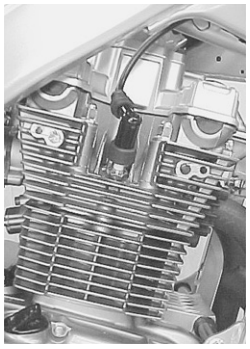
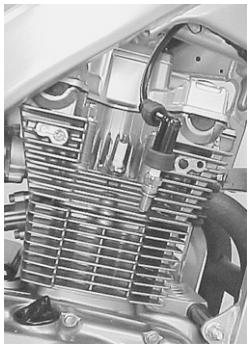
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## TROUBLESHOOTING



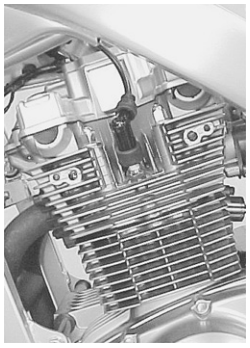
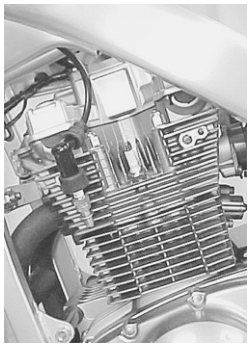

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## IGNITION COIL PRIMARY PEAK VOLTAGE

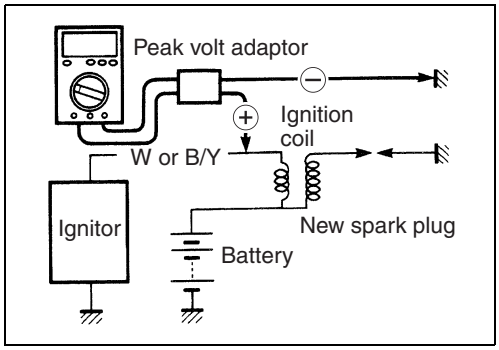



- Remove the fuel tank.
- Disconnect the two spark plug caps.
- Connect new two spark plugs to each spark plug cap and ground them.

*NOTE:*
*Be sure that all couplers and spark plugs are connected properly and the battery is in fully-charged condition.*

Inspect the No.1 ignition coil primary peak voltage in the following procedure.




- Connect the tester with peak voltage adaptor as follow.

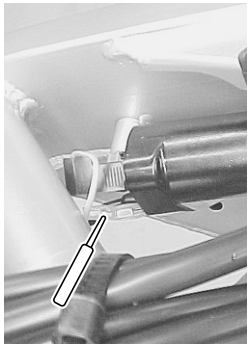
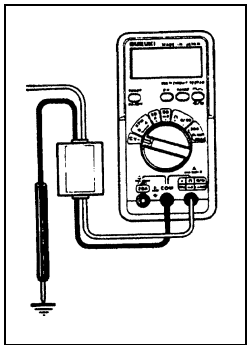
No.1 ignition coil: White terminal – Ground
(⊕ Probe) (⊖ Probe)

*NOTE:*
Do not disconnect the ignition coil primary wire.

**TOOL 09900-25008: Multi circuit tester set**

**CAUTION**

**When using the multi circuit tester and peak volt adaptor, follow the instruction manual.**

- Shift the transmission into the neutral.
- Turn the ignition switch to the "ON" position.
- Squeeze the clutch lever.
- Crank the engine a few seconds with starter motor by depressing starter button and then check the ignition coil primary peak voltage.
- Repeat the above inspection a few times and measure the highest ignition coil primary peak voltage.

**Tester knob indication: Voltage (⎓)**

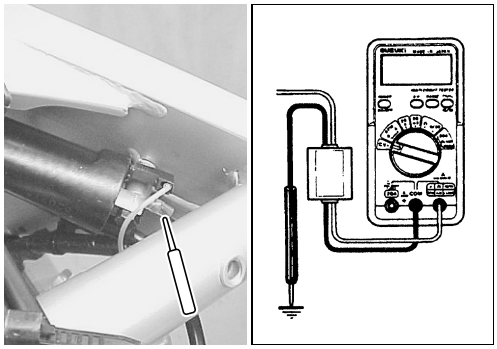
**DATA Ignition coil primary peak voltage: More than 100 V**

**⚠ WARNING**

**Do not touch the tester probes and spark plugs to prevent an electric shock while testing.**

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Inspect the No.2 ignition coil primary peak voltage in the same manner of No. 1 ignition coil inspection.
No. 2 ignition coil: B/Y terminal – Ground
(⊕ Probe) (⊖ Probe)
B/Y: Black with Yellow tracer



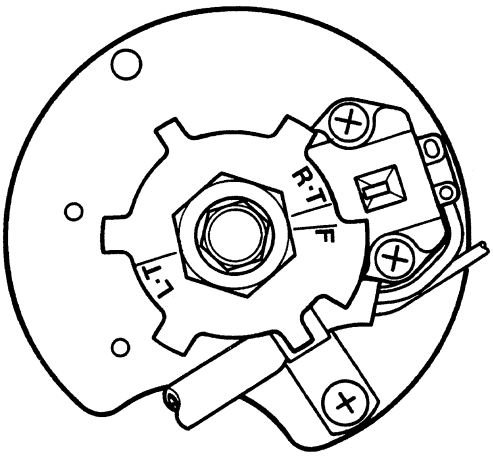
*NOTE:*
*Do not disconnect the ignition coil primary wire.*

**Tester knob indication: Voltage (⎓)**

**DATA Ignition coil primary peak voltage: More than 100 V**

If they are lower than the specified values, inspect the ignition coil, signal generator and ignitor.

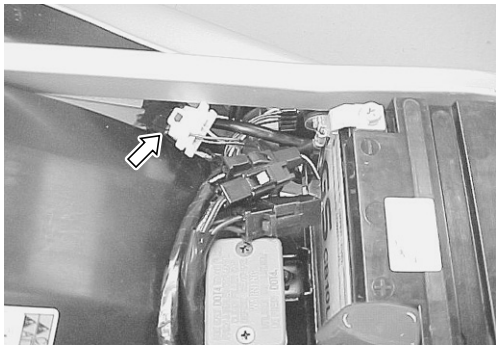
## SIGNAL GENERATOR




*NOTE:*
*At above condition, the right cylinder is at the Top Dead Center (TDC). When checking the tappet clearance and assembling the camshafts, the signal generator rotor must be at this position.*

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## SIGNAL GENERATOR PEAK VOLTAGE



- Remove the seat.
- Disconnect the signal generator lead wire coupler.

*NOTE:*
*Be sure that all couplers are connected properly and the battery is in fully-charged condition.*

Inspect the signal generator peak voltage between Brown and B/Bl lead wires on the signal generator lead wire coupler.

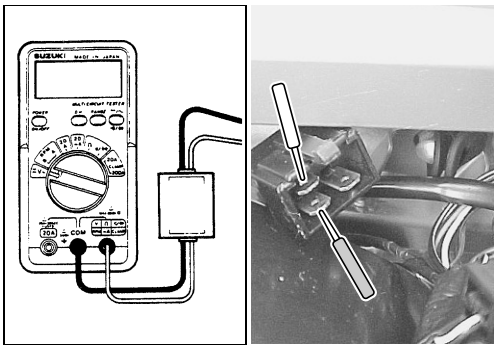
- Connect the tester with peak volt adaptor as follow.

Brown (⊕ Probe) – B/Bl (⊖ Probe)
B/Bl: Black with Blue tracer

**TOOL 09900-25008: Multi circuit tester set**

**CAUTION**

**When using multi circuit tester and peak volt adaptor, follow the instruction manual.**

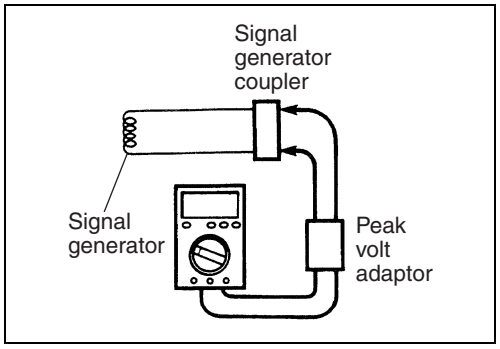


- Shift the transmission into the neutral.
- Turn the ignition switch to the "ON" position.
- Squeeze the clutch lever.
- Crank the engine a few seconds with starter motor by depressing starter button and then check the signal generator peak voltage.
- Repeat the above test procedure a few times and measure the highest signal generator peak voltage.

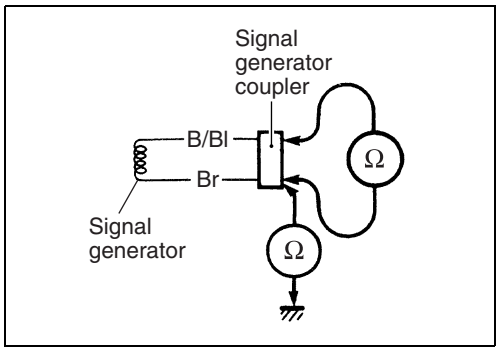
**Tester knob indication: Voltage (⎓)**

**DATA Signal generator peak voltage:**
**More than 1.8 V (Br – B/Bl)**

If the peak voltage on the signal generator lead wire coupler is abnormal, the signal generator must be replaced and recheck.




## SIGNAL GENERATOR RESISTANCE



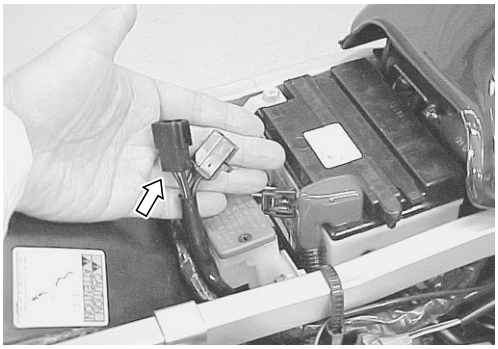

- Remove the frame cover and disconnect the signal generator lead wire coupler.
- Measure the resistance between lead wires and ground. If the resistance is not specified value, the signal coil must be replaced.

**DATA Signal coil resistance: 250 – 420 Ω (Br – B/Bl)**
**∞ Ω (Br – Ground)**

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# REGULATOR/RECTIFIER

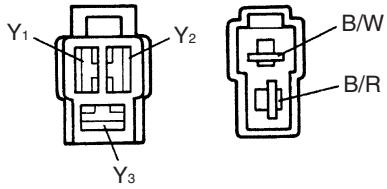
- Remove the seat.
- Diconnect the regulator/rectifier couplers.



Measure the voltage between the terminals using the multi circuit tester as indicated in the table below. If the voltage is not within the specified value, replace the regulator/rectifier with a new one.

**09900-25008: Multi circuit tester set**

**Tester knob indication: Diode test (⊣◀)**




Unit: V

| Probe of tester to: ⊖ \ ⊕ Probe of tester to: | $Y_1$ | $Y_2$ | $Y_3$ | B/R | B/W |
|---|---|---|---|---|---|
| $Y_1$ | | ✻ | ✻ | ✻ | 0.4 – 0.7 |
| $Y_2$ | ✻ | | ✻ | ✻ | 0.4 – 0.7 |
| $Y_3$ | ✻ | ✻ | | ✻ | 0.4 – 0.7 |
| B/R | 0.4 – 0.7 | 0.4 – 0.7 | 0.4 – 0.7 | | 0.5 – 1.2 |
| B/W | ✻ | ✻ | ✻ | ✻ | |

✻ More than 1.4 V (tester's battery voltage)

*NOTE:*
*If the tester reads under 1.4 V when the tester probes are not connected, replace the battery of multi circuit tester.*

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# COMBINATION METER

The combination is equiped with the electrical tachometer.
And so the tachometer cable and tachometer driven gear are eliminated.

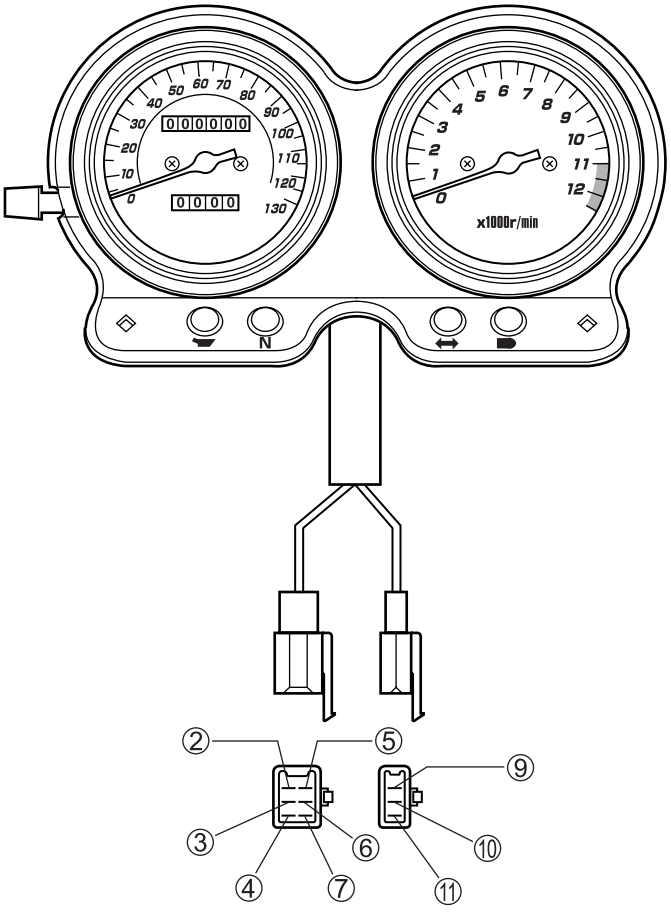
## INSPECTION

- Remove the headlight.
- Disconnect the combination meter couplers.

Using the multi circuit tester, check the continuity between lead wires in the diagram as shown below.
If the continuity measured is incorrect, replace the respective parts.

**09900-25008: Multi circuit tester**

**Tester knob indication: Resistance (Ω)**




| ITEM | ⊕ Probe of tester to: | ⊖ Probe of tester to: |
|---|---|---|
| TURN SIGNAL | ③ | ⑥ |
| ILLUMI. | ⑩ | ⑪ |
| HIGH BEAM | ① | ⑦ |
| OIL | ⑤ | ④ |
| NEUTRAL | ⑤ | ② |

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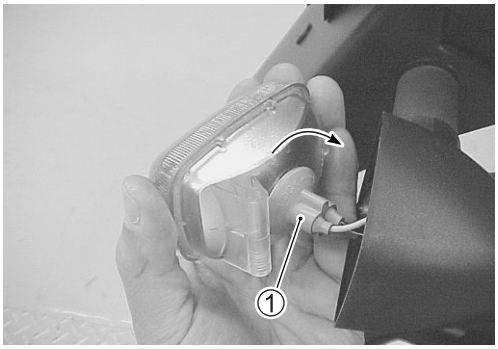
# TURN SIGNAL LIGHT

## BUIB REPLACEMENT

- Loosen the screw.



- Release the bulb socket ① by turning it clockwise.

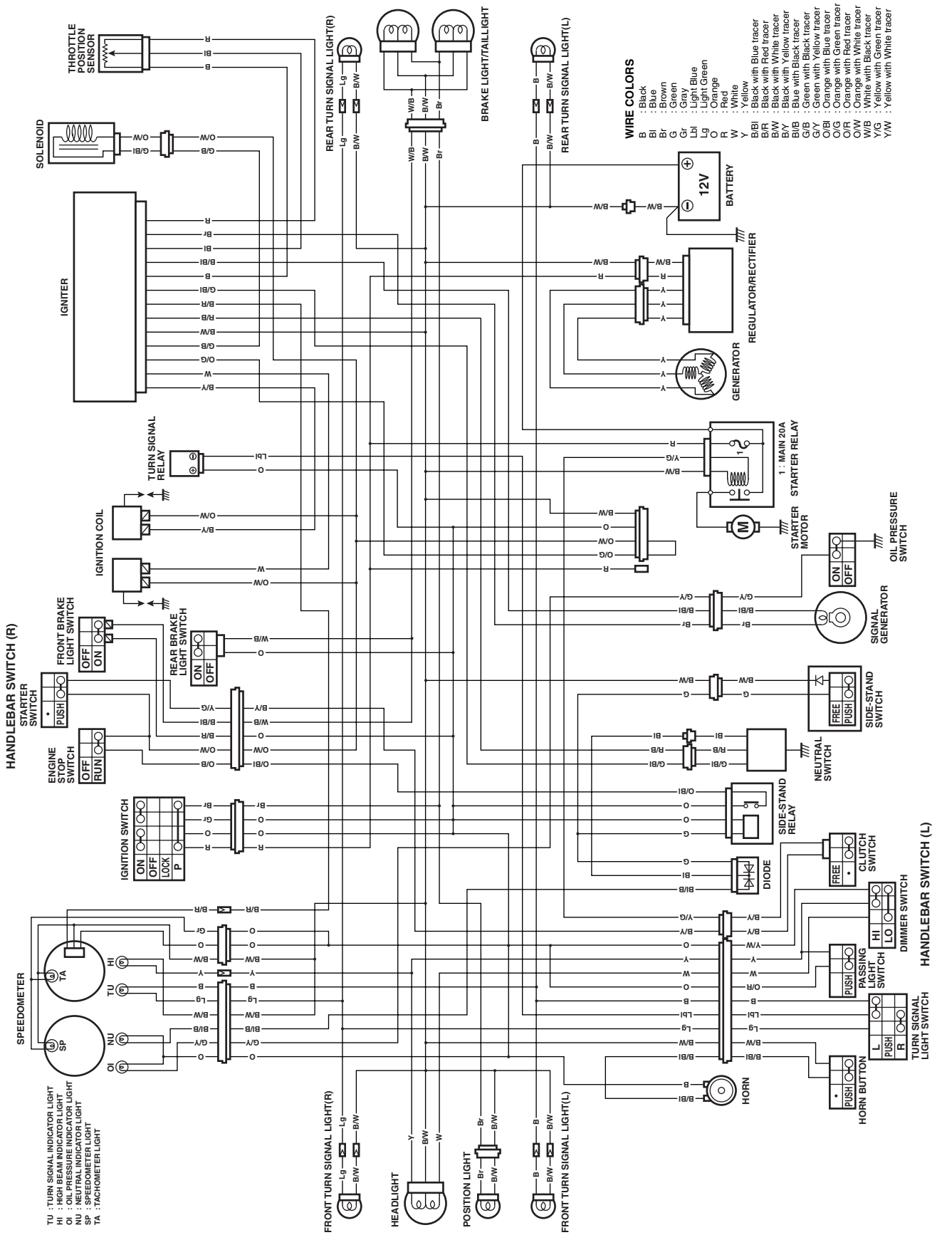



- Replace the bulb and lock the bulb socket.
- Hook the claw Ⓐ on the turn signal light body.
- Tighten the screw.



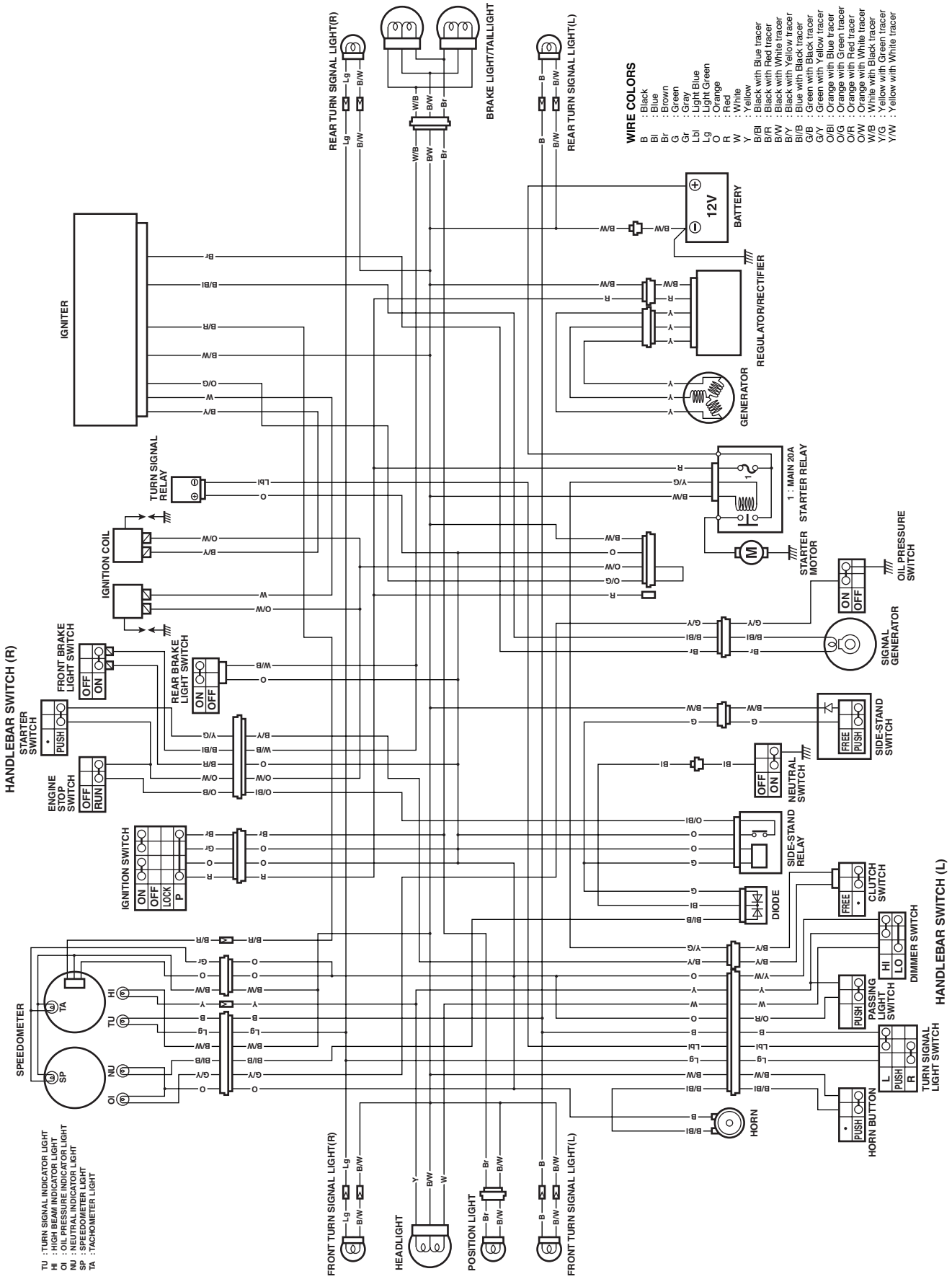

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# WIRING DIAGRAM
## FOR GS500HK3/GS500HUK3 P-19



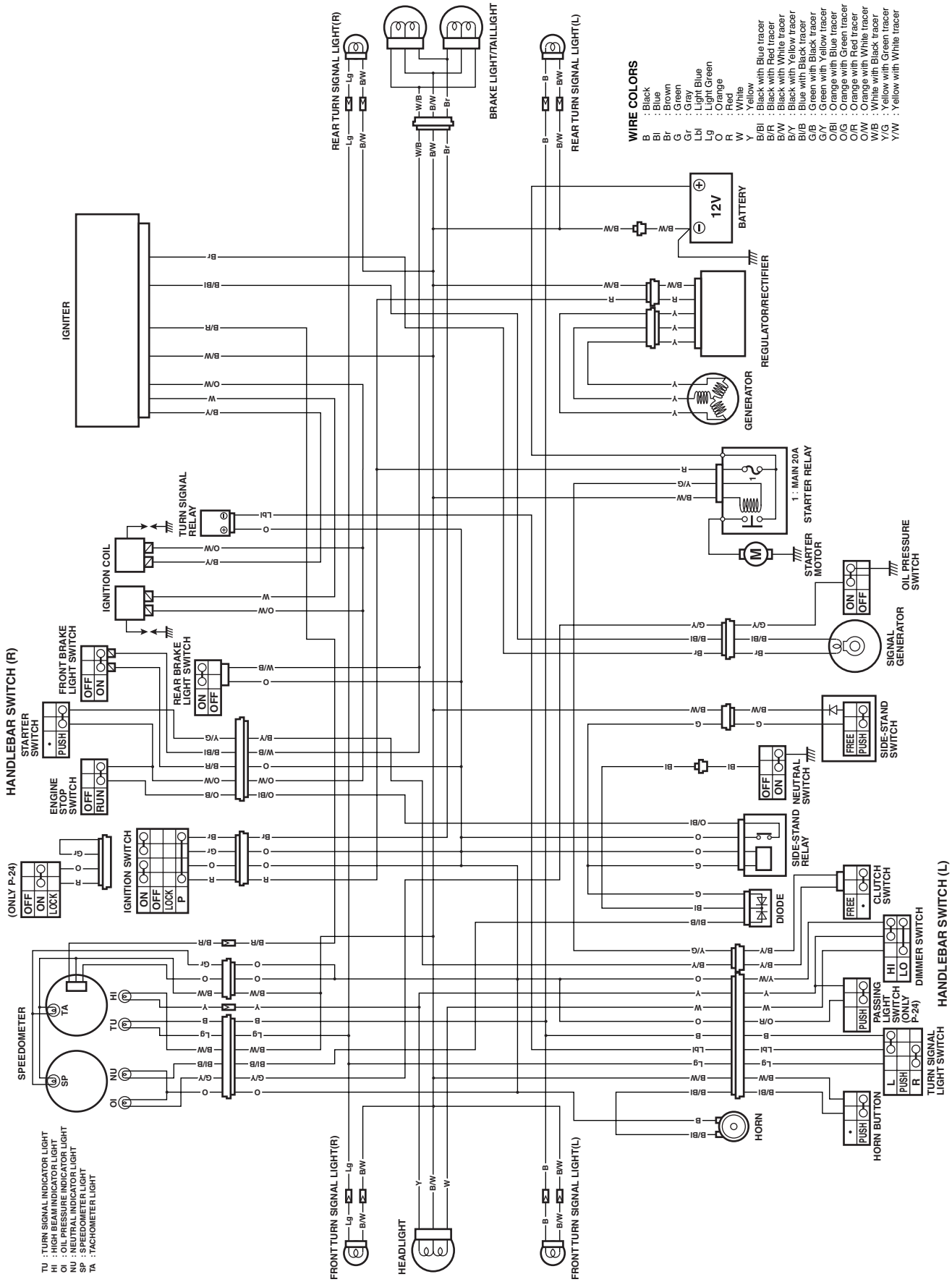

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# FOR GS500K3/GS500UK3 P-02, 19, 54



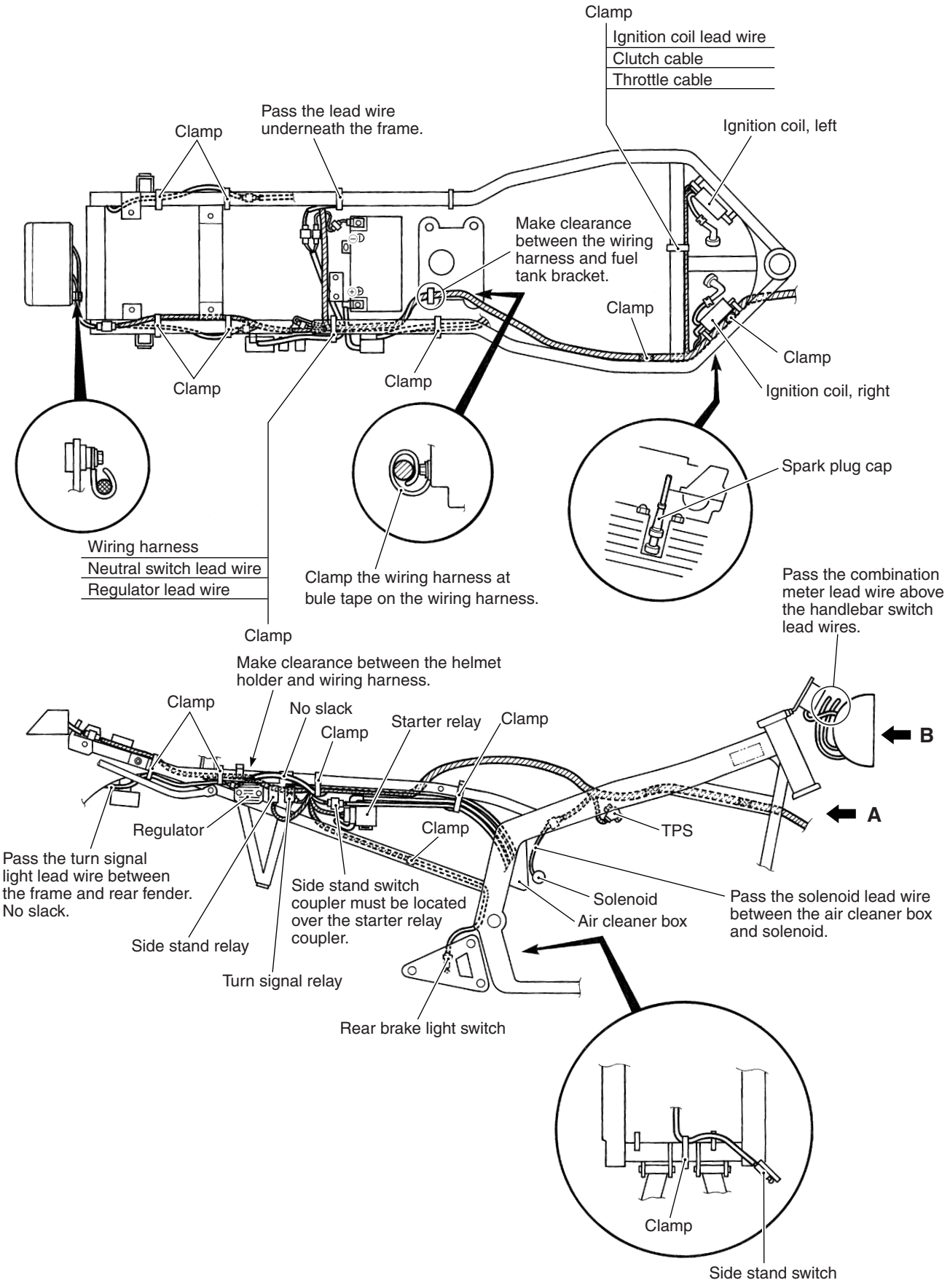

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# FOR GS500 P-24, 28

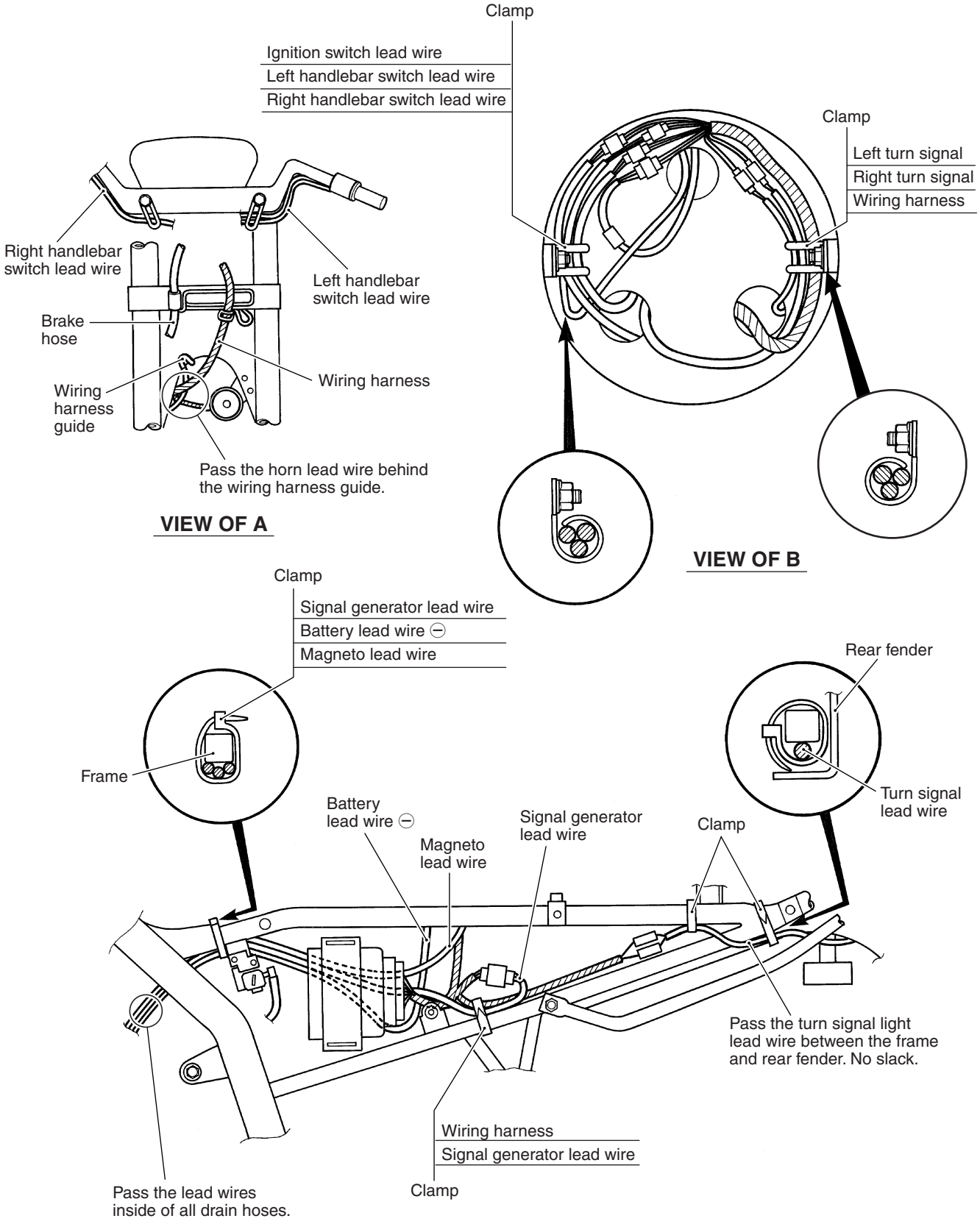



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# WIRE ROUTING




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# GS500K4/FK4 ('04-MODEL)

## FOREWORD

*This chapter describes service data, service specifications and servicing procedures which differ from those of the GS500K3 ('03-MODEL).*

*NOTE:*
** Any difference between the GS500K3 ('03-model) and GS500/FK4 ('04-model) in specifications and service data are clearly indicated with an asterisk (*).*
** Please refer to the chapter 1 through 19 for details which are not given in this chapter.*

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## COUNTRY AND AREA CODES

The following codes stand for the applicable country (-ies) and area (-s).

| CODE | COUNTRY or AREA |
|---|---|
| P-02 | UK |
| P-03 | USA (Except for California) |
| P-09 | Colombia |
| P-19 | EU |
| P-24 | Australia |
| P-28 | Canada |
| P-33 | California (USA) |
| P-54 | Spain |

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# SPECIFICATIONS

## DIMENSIONS AND DRY MASS

| | | | |
|---|---|---|---|
| Overall length | 2 080 mm (81.9 in) | | |
| Overall width | 800 mm (31.5 in) | | |
| Overall height | 1 060 mm (41.7 in) | | GS500/U |
| | * 1 150 mm (45.3 in) | | GS500F/FU |
| Wheelbase | 1 405 mm (55.3 in) | | |
| Ground clearance | 150 mm (5.9 in) | | GS500/U |
| | * 120 mm (4.7 in) | | GS500F/FU |
| Seat height | 790 mm (31.1 in) | | |
| Dry mass | 174 kg (383 lbs) | | GS500/U |
| | * 180 kg (396 lbs) | | GS500F/FU |

## ENGINE

| | |
|---|---|
| Type | Four-stroke, air-cooled, DOHC |
| Number of cylinders | 2 |
| Bore | 74.0 mm (2.913 in) |
| Stroke | 56.6 mm (2.228 in) |
| Displacement | 487 $cm^3$ (29.7 cu. in) |
| Compression ratio | 9.0 : 1 |
| Carburetor | BSR34, twin |
| Air cleaner | Non-woven fabric element |
| Starter system | Electric |
| Lubrication system | Wet sump |
| Idle speed | 1 200 ± 100 r/min |

## DRIVE TRAIN

| | | |
|---|---|---|
| Clutch | | Wet multi-plate type |
| Transmission | | 6-speed constant mesh |
| Gearshift pattern | | 1-down, 5-up |
| Primary reduction ratio | | 2.714 (76/28) |
| Gear ratios, | Low | 2.461 (32/13) |
| | 2nd | 1.777 (32/18) |
| | 3rd | 1.380 (29/21) |
| | 4th | 1.125 (27/24) |
| | 5th | 0.961 (25/26) |
| | Top | 0.851 (23/27) |
| Final reduction ratio | | 2.437 (39/16) |
| Drive chain | | D.I.D. 520VM, 110 links |

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## CHASSIS

| | | |
|---|---|---|
| Front suspension | | Telescopic, coil spring, oil damped |
| Rear suspension | | Link type, coil spring, oil damped |
| Front suspension stroke | | 120 mm (4.7 in) |
| Rear wheel travel | | 115 mm (4.5 in) |
| Caster | | 25° 05' |
| Trail | | 97 mm (3.82 in) |
| Steering angle | | 35° |
| Turning radius | | 2.7 m (8.9 ft) |
| Front brake | | Disc brake |
| Rear brake | | Disc brake |
| Front tire size | | 110/70-17M/C 54H, tubeless |
| Rear tire size | | 130/70-17M/C 62H, tubeless |

## ELECTRICAL

| | | |
|---|---|---|
| Ignition type | | Electronic ignition (transistorized) |
| Ignition timing | * | 5° B.T.D.C. at 1 200 r/min ..... P-03, 28, 33 |
| | | 12° B.T.D.C. at 1 200 r/min ..... Others |
| Spark plug | | NGK DPR8EA-9 or DENSO X24EPR-U9 |
| Battery | | 12 V 39.6 kC (11 Ah)/10 HR |
| Generator | | Three-phase A.C. generator |
| Fuse | | 20 A |
| Headlight | | 12 V 60/55 W |
| Position light | | 12 V 4 W.....GS500/U |
| | * | 12 V 5 W.....GS500F/FU |
| Turn signal light | | 12 V 21 W |
| Brake light/Taillight | | 12 V 32/3 cp (× 2 pcs.)..... P-03, 28, 33 |
| | | 12 V 21/5 W (× 2 pcs.) ..... Others |
| Speedometer light | * | 12 V 1.7 W |
| Tachometer light | * | 12 V 1.7 W |
| Neutral indicator light | * | 12 V 1.7 W |
| High beam indicator light | | 12 V 1.7 W |
| Turn signal indicator light | * | 12 V 1.7 W |
| Oil pressure indicator light | * | 12 V 1.7 W |

## CAPACITIES

| | | |
|---|---|---|
| Fuel tank, including reserve | | 19 L (5.0/4.2 US/Imp gal) ..... E-33 |
| | | 20 L (5.3/4.4 US/Imp gal) ..... Others |
| reserve | | 4.3 L (1.1/0.9 US/Imp gal) |
| Engine oil, oil change | | 2 600 ml (2.7/2.3 US/Imp qt) |
| with filter change | | 2 900 ml (3.1/2.6 US/Imp qt) |
| overhaul | | 3 200 ml (3.4/2.8 US/Imp qt) |
| Front fork oil (each leg) | * | 380 ml (12.7/13.4 US/Imp oz) |

These specifications are subject to change without notice.

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# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Valve diam. | IN. | 39<br>(1.5) | — |
| | EX. | 32<br>(1.3) | — |
| Valve lift | IN. | 8.5<br>(0.33) | — |
| | EX. | 8.0<br>(0.31) | — |
| Tappet clearance (when cold) | IN. & EX. | 0.03 – 0.08<br>(0.001 – 0.003) | — |
| Valve guide to valve stem clearance | IN. | 0.025 – 0.055<br>(0.0010 – 0.0022) | — |
| | EX. | 0.040 – 0.070<br>(0.0016 – 0.0028) | — |
| Valve stem deflection | IN. & EX. | — | 0.35<br>(0.014) |
| Valve guide I.D. | IN. & EX. | 7.000 – 7.015<br>(0.2756 – 0.2762) | — |
| Valve stem O.D. | IN. | 6.960 – 6.975<br>(0.2740 – 0.2746) | — |
| | EX. | 6.945 – 6.960<br>(0.2734 – 0.2740) | — |
| Valve stem runout | IN. & EX. | — | 0.05<br>(0.002) |
| Valve head thickness | IN. & EX. | — | 0.5<br>(0.02) |
| Valve seat width | IN. & EX. | 1.0 – 1.2<br>(0.04 – 0.05) | — |
| Valve head radial runout | IN. & EX. | — | 0.03<br>(0.001) |
| Valve spring free length (IN. & EX.) | INNER | — | 35.6<br>(1.40) |
| | OUTER | — | 40.6<br>(1.60) |
| Valve spring tension (IN. & EX.) | INNER | 10.9 – 12.5 kgf (24.0 – 27.6 lbs)<br>at length 31.0 mm (1.22 in) | — |
| | OUTER | 20.3 – 23.3 kgf (44.8 – 51.4 lbs)<br>at length 35.0 mm (1.38 in) | — |

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## CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Cam height | IN. | 36.090 – 36.130<br>(1.4208 – 1.4224) | 35.80<br>(1.409) |
| | EX. | 36.090 – 36.130<br>(1.4208 – 1.4224) | 35.80<br>(1.409) |
| Camshaft journal oil clearance | IN. & EX. | 0.032 – 0.066<br>(0.0013 – 0.0026) | 0.150<br>(0.0060) |
| Camshaft journal holder I.D. | IN. & EX. | 22.012 – 22.025<br>(0.8666 – 0.8671) | — |
| Camshaft journal O.D. | IN. & EX. | 21.959 – 21.980<br>(0.8645 – 0.8654) | — |
| Camshaft runout | IN. & EX. | — | 0.10<br>(0.004) |
| Cam chain pin (at arrow "3") | 18th pin | | — |
| Cylinder head distortion | — | | 0.10<br>(0.004) |

## CYLINDER + PISTON + PISTON RING

Unit: mm (in)

| ITEM | STANDARD | | | LIMIT |
|---|---|---|---|---|
| Compression pressure | 1 000 – 1 400 kPa<br>(10 – 14 kgf/cm$^2$, 142 – 199 psi) | | | 800 kPa<br>(8 kgf/cm$^2$, 114 psi) |
| Compression pressure difference | — | | | 200 kPa<br>(2 kgf/cm$^2$, 28 psi) |
| Piston to cylinder clearance | 0.050 – 0.060<br>(0.0020 – 0.0024) | | | 0.120<br>(0.0047) |
| Cylinder bore | 74.000 – 74.015<br>(2.9134 – 2.9140) | | | 74.080<br>(2.9165) |
| Piston diam. | 73.945 – 73.960<br>(2.9112 – 2.9118)<br>Measure at 15 mm (0.6 in) from the skirt end. | | | 73.880<br>(2.9087) |
| Cylinder distortion | — | | | 0.10<br>(0.004) |
| Piston ring free end gap | 1st | N | Approx. 7.0 (0.28) | 5.6<br>(0.22) |
| | 2nd | N | Approx. 11.0 (0.43) | 8.8<br>(0.35) |
| Piston ring end gap | 1st | | 0.10 – 0.25<br>(0.004 – 0.010) | 0.70<br>(0.028) |
| | 2nd | | 0.10 – 0.25<br>(0.004 – 0.010) | 0.70<br>(0.028) |
| Piston ring to groove clearance | 1st | | — | 0.180<br>(0.0071) |
| | 2nd | | — | 0.150<br>(0.0059) |

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| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Piston ring groove width | 1st | 1.21 – 1.23<br>(0.047 – 0.048) | — |
| | 2nd | 1.21 – 1.23<br>(0.047 – 0.048) | — |
| | Oil | 2.51 – 2.53<br>(0.099 – 0.100) | — |
| Piston ring thickness | 1st | 1.17 – 1.19<br>(0.046 – 0.047) | — |
| | 2nd | 1.17 – 1.19<br>(0.046 – 0.047) | — |
| Piston pin bore | 18.002 – 18.008<br>(0.7087 – 0.7090) | | 18.030<br>(0.7098) |
| Piston pin O.D. | 17.995 – 18.000<br>(0.7085 – 0.7087) | | 17.980<br>(0.7079) |

## CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Conrod small end I.D. | 18.006 – 18.014<br>(0.7089 – 0.7092) | 18.040<br>(0.7102) |
| Conrod big end side clearance | 0.1 – 0.2<br>(0.004 – 0.008) | 0.3<br>(0.012) |
| Conrod big end width | 22.95 – 23.00<br>(0.904 – 0.906) | — |
| Crank pin width | 23.10 – 23.15<br>(0.909 – 0.911) | — |
| Conrod big end oil clearance | 0.024 – 0.048<br>(0.0009 – 0.0019) | 0.080<br>(0.0031) |
| Crank pin O.D. | 33.976 – 34.000<br>(1.3376 – 1.3386) | — |
| Crankshaft journal oil clearance | 0.020 – 0.044<br>(0.0008 – 0.0017) | 0.080<br>(0.0031) |
| Crankshaft journal O.D. | 31.976 – 32.000<br>(1.2589 – 1.2598) | — |
| Crankshaft thrust bearing thickness | 2.950 – 2.975<br>(0.1161 – 0.1171) | 2.850<br>(0.1122) |
| Crankshaft runout | — | 0.05<br>(0.002) |
| Balancer journal oil clearance | 0.020 – 0.044<br>(0.0008 – 0.0017) | 0.080<br>(0.0031) |
| Balancer journal O.D. | 31.984 – 32.000<br>(1.2592 – 1.2598) | — |
| Balancer spring free length | — | 14.9<br>(0.59) |

## OIL PUMP

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Oil pump reduction ratio | 1.879 (76/28 × 27/39) | — |
| Oil pressure (at 60 °C, 140 °F) | Above 200 kPa (2.0 kgf/cm$^2$, 28 psi)<br>Below 500 kPa (5.0 kgf/cm$^2$, 71 psi)<br>at 3 000 r/min | — |

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## CLUTCH

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Clutch lever play | 10 – 15<br>(0.4 – 0.6) | — |
| Clutch release screw | 1/4 – 1/2 turn back | — |
| Drive plate thickness | 2.92 – 3.08<br>(0.115 – 0.121) | 2.62<br>(0.103) |
| Drive plate claw width | 15.8 – 16.0<br>(0.62 – 0.63) | 15.0<br>(0.59) |
| Driven plate distortion | — | 0.10<br>(0.004) |
| Clutch spring free length | — | 60.8<br>(2.39) |

## TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

| ITEM | | STANDARD | | LIMIT |
|---|---|---|---|---|
| Primary reduction ratio | | 2.714 (76/28) | | — |
| Final reduction ratio | | 2.437 (39/16) | | — |
| Gear ratios | Low | 2.461 (32/13) | | — |
| | 2nd | 1.777 (32/18) | | — |
| | 3rd | 1.380 (29/21) | | — |
| | 4th | 1.125 (27/24) | | — |
| | 5th | 0.961 (25/26) | | — |
| | Top | 0.851 (23/27) | | — |
| Shift fork to groove clearance | | 0.1 – 0.3<br>(0.004 – 0.012) | | 0.5<br>(0.020) |
| Shift fork groove width | | No.1, No.2 & No.3 | 5.5 – 5.6<br>(0.217 – 0.220) | — |
| Shift fork thickness | | No.1, No.2 & No.3 | 5.3 – 5.4<br>(0.209 – 0.213) | — |
| Countershaft length<br>(Low to 2nd) | | $114.7\ ^{+0.1}_{-0}$<br>$\left(4.516\ ^{+0.004}_{-0}\right)$ | | — |
| Drive chain | | Type | D.I.D.: DID520VM | — |
| | | Links | 110 | — |
| | | 20-pitch length | — | 319.4<br>(12.57) |
| Drive chain slack | | 20 – 30<br>(0.8 – 1.2) | | — |

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## CARBURETOR

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | GS500 P-02, 19, 24, 54<br>GS500F P-02, 19, 24, 54 | GS500U P-19<br>GS500FU P-19 |
| Carburetor type | | MIKUNI<br>BSR34 | ← |
| Bore size | | 34 mm | ← |
| I.D. No. | | * 01DN | * 01DP |
| Idle r/min | | 1 200 ±100 r/min | ← |
| Float height | | 13.0 ± 1.0 mm | ← |
| Main jet | (M.J.) | * #130 | * #135 |
| Jet needle | (J.N.) | 5DH57-3rd | ← |
| Needle jet | (N.J.) | P-5M | ← |
| Throttle valve | (Th.V.) | #105 | ← |
| Pilot jet | (P.J.) | #17.5 | ← |
| Pilot screw | (P.S.) | * 3 turns back | * ← |
| Throttle cable play | | 2.0 – 4.0 mm<br>(0.08 – 0.16 in) | ← |

## CARBURETOR

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | GS500 P-09, 28<br>GS500F P-03, 28 | GS500F P-33 |
| Carburetor type | | MIKUNI<br>BSR34 | ← |
| Bore size | | 34 mm | ← |
| I.D. No. | | * 01DS | * 01DU |
| Idle r/min | | 1 200 ± 100 r/min | ← |
| Float height | | 13.0 ± 1.0 mm | ← |
| Main jet | (M.J.) | * # 130 | * ← |
| Jet needle | (J.N.) | * 5DH91 | * 5DH60 |
| Needle jet | (N.J.) | P-5M | ← |
| Throttle valve | (Th.V.) | #105 | ← |
| Pilot jet | (P.J.) | #17.5 | ← |
| Pilot screw | (P.S.) | * PRE-SET (3 turns back) | * ← |
| Throttle cable play | | 2.0 – 4.0 mm<br>(0.08 – 0.16 in) | ← |

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## ELECTRICAL

Unit: mm (in)

| ITEM | | SPECIFICATION | | NOTE |
|---|---|---|---|---|
| Ignition timing | | * 5° B.T.D.C. at 1 200 r/min | | P-03, 28, 33 |
| | | 12° B.T.D.C. at 1 200 r/min | | Others |
| Firing order | | L·R | | |
| Spark plug | | Type | DENSO: X24EPR-U9<br>NGK: DPR8EA-9 | |
| | | Gap | 0.8 – 0.9<br>(0.031 – 0.035) | |
| Spark performance | | Over 8 (0.3) at 1 atm. | | |
| Signal generator resistance | | 250 – 420 Ω | | |
| Ignition coil resistance | | Primary | 3 – 6 Ω | Terminal – Terminal |
| | | Secondary | 18 – 30 kΩ | Plug cap – Terminal |
| Signal generator peak voltage | | 1.8 V and more | | ⊕ Probe: Br<br>⊖ Probe: B/Bl |
| Ignition coil primary peak voltage | | 100 V and more | | ⊕ Probe: W or B/Y<br>⊖ Probe: Ground |
| Generator Max. output | | Approx. 200 W at 5 000 r/min | | |
| Generator no-load voltage | | More than 75 V (AC) at 5 000 r/min | | |
| Regulated voltage | | 13.5 – 15.5 V at 5 000 r/min | | |
| Starter relay resistance | | 3 – 5 Ω | | |
| Battery | Type designation | * CB10L-B2 | | |
| | Capacity | 12 V 39.6 kC (11 Ah)/10 HR | | |
| | Standard electrolyte S.G. | 1.28 at 20 °C (68 °F) | | |
| Fuse size | | 20 A | | |

## WATTAGE

Unit: W

| ITEM | | SPECIFICATION | | |
|---|---|---|---|---|
| | | GS500/U<br>P-02, 09, 19, 24, 54 | GS500F/FU<br>P-02, 19, 24, 54 | P-03, 28, 33 |
| Headlight | HI | 60 | ← | ← |
| | LO | 55 | ← | ← |
| Position light | | 4 | * 5 | * ← |
| Brake light/Taillight | | 21/5 | ← | 32/3 cp |
| Turn signal light | | 21 | ← | ← |
| Tachometer light | | 1.7 | ← | * ← |
| Speedometer light | | 1.7 | ← | * ← |
| Turn signal indicator light | | 1.7 | ← | * ← |
| High beam indicator light | | 1.7 | ← | ← |
| Neutral indicator light | | 1.7 | ← | * ← |
| Oil pressure indicator light | | 1.7 | ← | * ← |

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## BRAKE + WHEEL

Unit: mm (in)

| ITEM | | STANDARD | LIMIT |
|---|---|---|---|
| Rear brake pedal height | | 55<br>(2.2) | — |
| Brake disc thickness | Front | 4.5 ± 0.2<br>(0.177 ± 0.008) | 4.0<br>(0.16) |
| | Rear | 6.0 ± 0.2<br>(0.236 ± 0.008) | 5.5<br>(0.22) |
| Brake disc runout | | — | 0.30<br>(0.012) |
| Master cylinder bore | Front | * 12.700 – 12.725<br>(0.5000 – 0.5010) | — |
| | Rear | 12.700 – 12.743<br>(0.5000 – 0.5017) | — |
| Master cylinder piston diam. | Front | * 12.630 – 12.670<br>(0.4972 – 0.4988) | — |
| | Rear | 12.657 – 12.684<br>(0.4983 – 0.4994) | — |
| Brake caliper cylinder bore | Front | 30.230 – 30.306<br>(1.1902 – 1.1931) | — |
| | Rear | 38.180 – 38.256<br>(1.5031 – 1.5061) | — |
| Brake caliper piston diam. | Front | 30.150 – 30.200<br>(1.1870 – 1.1890) | — |
| | Rear | 38.098 – 38.148<br>(1.4999 – 1.5019) | — |
| Wheel rim runout | Axial | — | 2.0<br>(0.08) |
| | Radial | — | 2.0<br>(0.08) |
| Wheel axle runout | Front | — | 0.25<br>(0.010) |
| | Rear | — | 0.25<br>(0.010) |
| Wheel rim size | Front | 17 × MT3.00, 17M/C × MT3.00 | — |
| | Rear | 17 × MT3.50, 17M/C × MT3.50 | — |
| Tire size | Front | 110/70-17M/C 54H | — |
| | Rear | 130/70-17M/C 62H | — |
| Tire tread depth | Front | — | 1.6<br>(0.06) |
| | Rear | — | 2.0<br>(0.08) |

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## SUSPENSION

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Front fork stroke | 120<br>(4.7) | — |
| Front fork spring free length | * 343<br>(13.5) | * 336<br>(13.2) |
| Front fork oil level | * 110<br>(4.3) | — |
| Front fork oil type | SUZUKI FORK OIL #10 or equivalent fork oil | — |
| Front fork oil capacity<br>(each leg) | * 380 ml<br>(12.8/13.4 US/Imp oz) | — |
| Front fork inner tube O.D. | * 36.9<br>(1.45) | — |
| Rear shock absorber spring adjuster | 4th position among 7 | — |
| Rear wheel travel | 115<br>(4.5) | — |
| Swingarm pivot shaft runout | — | 0.3<br>(0.01) |

## TIRE PRESSURE

| COLD INFLATION TIRE PRESSURE | SOLO RIDING | | | DUAL RIDING | | |
|---|---|---|---|---|---|---|
| | kPa | kgf/cm² | psi | kPa | kgf/cm² | psi |
| FRONT | 225 | 2.25 | 33 | 225 | 2.25 | 33 |
| REAR | 250 | 2.50 | 36 | 280 | 2.80 | 41 |

## FUEL + OIL

| ITEM | | SPECIFICATION | | NOTE |
|---|---|---|---|---|
| Fuel type | | Use only unleaded gasoline of at least 87 pump octane (R/2 + M/2) or 91 octane or higher rated by the research method.<br>Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible. | | P-03, 28, 33 |
| | | Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended. | | Others |
| Fuel tank including | reserve | 19 L<br>(5.0/4.2 US/Imp gal) | | P-33 |
| | | 20 L<br>(5.3/4.4 US/Imp gal) | | Others |
| | reserve | 4.3 L<br>(1.1/0.9 US/Imp gal) | | |
| Engine oil type | | SAE 10W-40, API SF or SG | | |
| Engine oil capacity | | Change | 2 600 ml<br>(2.7/2.3 US/Imp qt) | |
| | | Filter change | 2 900 ml<br>(3.1/2.6 US/Imp qt) | |
| | | Overhaul | 3 200 ml<br>(3.4/2.8 US/Imp qt) | |
| Brake fluid type | | DOT 4 | | |

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# TIGHTENING TORQUE
## ENGINE

| ITEM | N·m | kgf-m | lb-ft |
|---|---|---|---|
| Cylinder head cover bolt | 14 | 1.4 | 10.0 |
| Cylinder head nut | 38 | 3.8 | 27.5 |
| Cylinder head bolt | 10 | 1.0 | 7.0 |
| Cylinder stud bolt | 15 | 1.5 | 11.0 |
| Camshaft journal holder bolt | 10 | 1.0 | 7.0 |
| Cam sprocket bolt | 18 | 1.8 | 13.0 |
| Cam chain tensioner mounting bolt | 10 | 1.0 | 7.0 |
| Conrod bearing cap nut | 32 | 3.2 | 23.0 |
| Generator mounting rotor bolt | 120 | 12.0 | 87.0 |
| Starter clutch bolt | 18 | 1.8 | 13.0 |
| Signal generator bolt | 20 | 2.0 | 14.5 |
| Crankcase bolt (6 mm) | 11 | 1.1 | 8.0 |
| (8 mm) | 22 | 2.2 | 16.0 |
| Counter-balancer shaft setting bolt | 40 | 4.0 | 29.0 |
| Oil pump mounting screw | 10 | 1.0 | 7.0 |
| Oil pressure regulator | 19 | 1.9 | 13.5 |
| Oil drain plug | 23 | 2.3 | 16.5 |
| Oil pan bolt | 14 | 1.4 | 10.0 |
| Clutch sleeve hub nut | 50 | 5.0 | 36.0 |
| Clutch spring set bolt | 5 | 0.5 | 3.5 |
| Oil cooler hose bolt (crankcase side) (For GS500F) | * 26 | * 2.6 | * 19.0 |
| Exhaust pipe bolt | 10 | 1.0 | 7.0 |
| Muffler mounting bolt | 23 | 2.3 | 16.5 |
| Engine mounting bolt | 66 | 6.6 | 47.5 |

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## CHASSIS

| ITEM | | N·m | kgf-m | lb-ft |
|---|---|---|---|---|
| Steering stem head nut | | 45 | 4.5 | 32.5 |
| Front fork upper clamp bolt | | 23 | 2.3 | 16.5 |
| Front fork lower clamp bolt | | 30 | 3.0 | 21.5 |
| Front fork cap bolt | | * 25 | * 2.5 | * 18.0 |
| Front fork damper rod bolt | | * 28 | * 2.8 | * 20.0 |
| Front axle nut | Normal nut with cotter pin | 44 | 4.4 | 32.0 |
| | Self-lock nut | 49 | 4.9 | 35.5 |
| Front axle pinch bolt | | 23 | 2.3 | 16.5 |
| Handlebar set bolt | | 23 | 2.3 | 16.5 |
| Handlebar holder set nut | | 60 | 6.0 | 43.5 |
| Front brake master cylinder mounting bolt | | 10 | 1.0 | 7.0 |
| Front brake caliper mounting bolt | | 43 | 4.3 | 31.0 |
| Front footrest bolt | | 23 | 2.3 | 16.5 |
| Brake hose union bolt | | 23 | 2.3 | 16.5 |
| Air bleeder valve | | 8 | 0.8 | 6.0 |
| Front and rear disc bolt | | 23 | 2.3 | 16.5 |
| Swingarm pivot nut | | 72 | 7.2 | 52.0 |
| Rear shock absorber upper and lower mounting nut | | 60 | 6.0 | 43.5 |
| Rear cusion lever rod mounting nut | | 85 | 8.5 | 61.5 |
| Rear cusion lever mounting nut (Front & Center) | | 85 | 8.5 | 61.5 |
| Rear brake caliper mounting bolt | | 26 | 2.6 | 19.0 |
| Rear brake caliper housing bolt | | 33 | 3.3 | 24.0 |
| Rear brake master cylinder rod lock nut | | 18 | 1.8 | 13.0 |
| Rear brake pedal bolt | | 10 | 1.0 | 7.0 |
| Torque link nut (Front & Rear) | | 35 | 3.5 | 25.5 |
| Rear brake master cylinder mounting bolt | | 10 | 1.0 | 7.0 |
| Rear axle nut | Normal nut with cotter pin | 65 | 6.5 | 47.0 |
| | Self-lock nut | 78 | 7.8 | 56.5 |

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# PERIODIC MAINTENANCE CHART

Interval: This interval should be judged by odometer reading or months, whichever comes first.

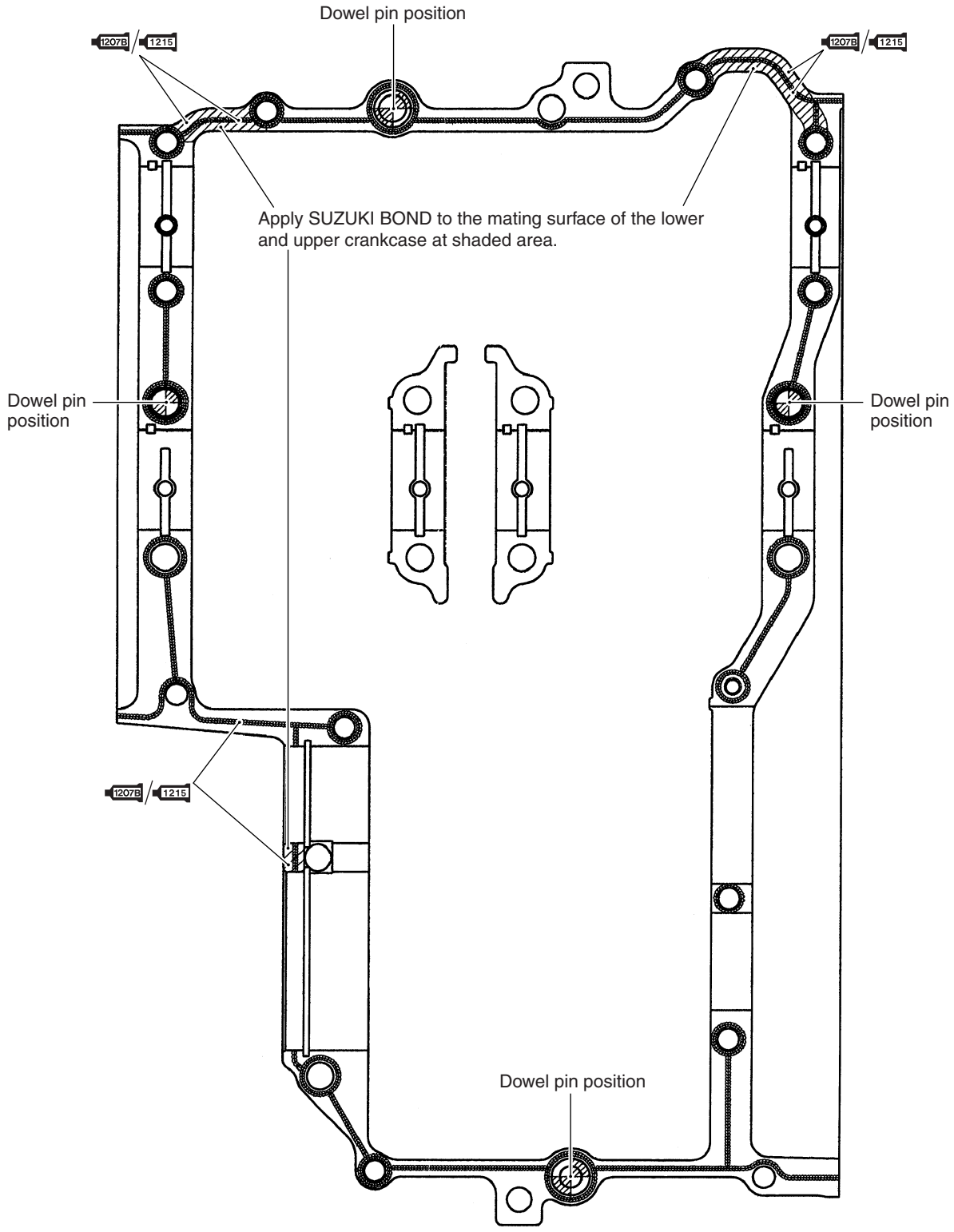
| Item \ Interval | km | 1 000 | 6 000 | 12 000 | 18 000 | 24 000 |
|---|---|---|---|---|---|---|
| | miles | 600 | 4 000 | 7 500 | 11 000 | 14 500 |
| | months | 2 | 12 | 24 | 36 | 48 |
| Battery (Specific gravity of electrolyte) | | — | I | I | I | I |
| Air cleaner element | | Clean every 3 000 km (2 000 miles) and replace every 12 000 km (7 500 miles). | | | | |
| Cylinder head nuts and exhaust pipe bolts | | T | T | T | T | T |
| Tappet clearance | | I | I | I | I | I |
| Spark plugs | | — | I | R | I | R |
| Fuel line | | I | I | I | I | I |
| | | Replace every 4 years. | | | | |
| Engine oil and filter | | R | R | R | R | R |
| Idle speed | | I | I | I | I | I |
| Throttle cable play | | I | I | I | I | I |
| Throttle valve synchronization | | I (C.A. only) | — | I | — | I |
| Evaporative emission system (California model only) | | — | — | I | — | I |
| | | Replace vapor hose every 4 years. | | | | |
| PAIR (air supply) system | | — | — | I | — | I |
| Clutch cable play | | I | I | I | I | I |
| Drive chain | | I | I | I | I | I |
| | | Clean and lublicate every 1 000 km (600 miles). | | | | |
| Brakes | | I | I | I | I | I |
| Brake hose | | I | I | I | I | I |
| | | Replace every 4 years. | | | | |
| Brake fluid | | — | I | I | I | I |
| | | Replace every 2 years. | | | | |
| Tires | | I | I | I | I | I |
| Steering | | I | I | I | I | I |
| Front forks | | I | — | I | — | I |
| Rear suspension | | I | — | I | — | I |
| Chassis bolts and nuts | | T | T | T | T | T |

*NOTE:*
*I=Inspect and clean, adjust, replace or lubricate as necessary*
*R=Replace*
*T=Tighten*

*NOTE:*
*(California model only) and (C.A. only) means that the item or the maintenance interval to be applied for the California model.*

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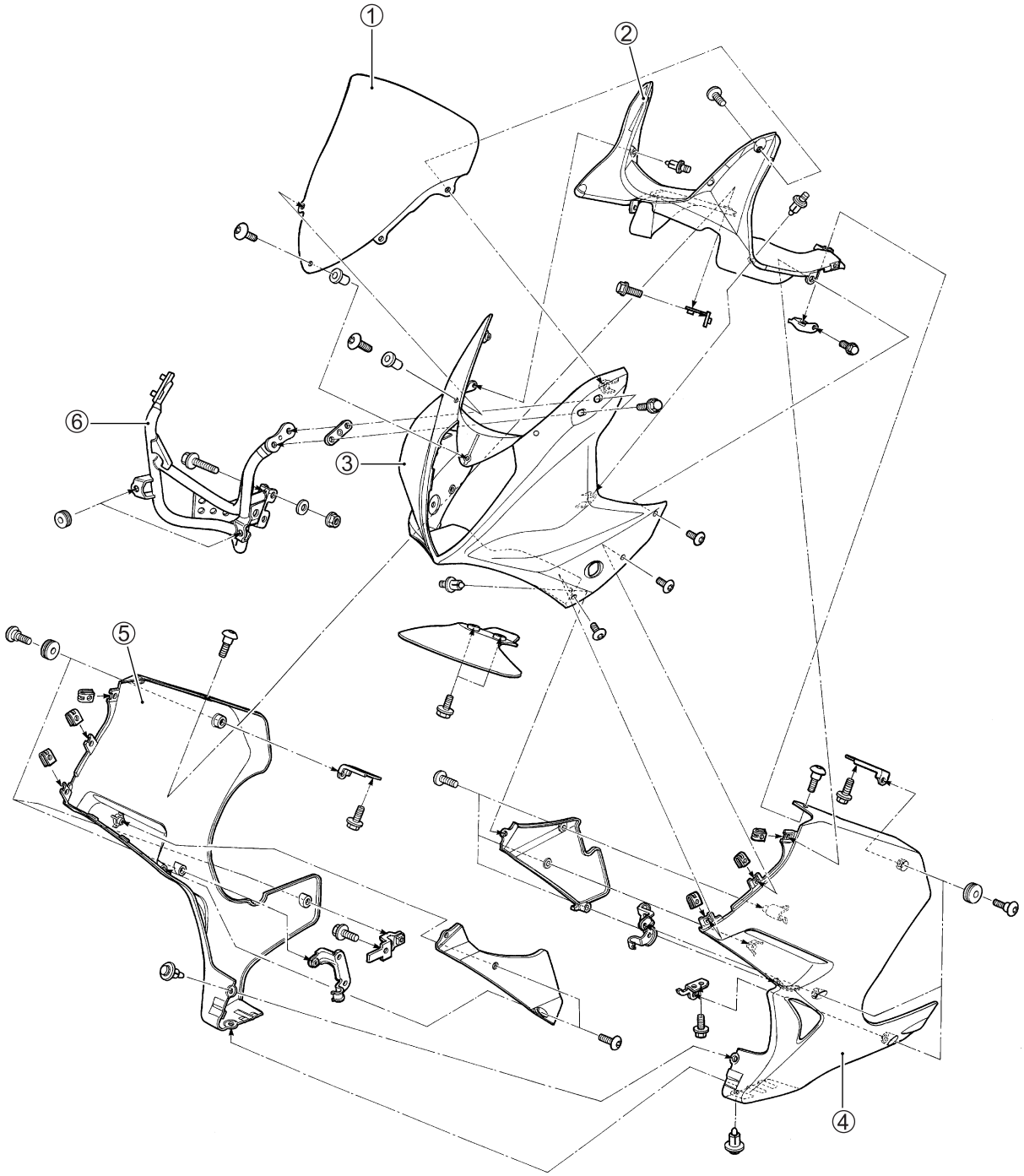
# LOWER CRANKCASE




1207B **99104-31140: SUZUKI BOND "1207B" (USA)**
1215 **99000-31110: SUZUKI BOND "1215" (Others)**

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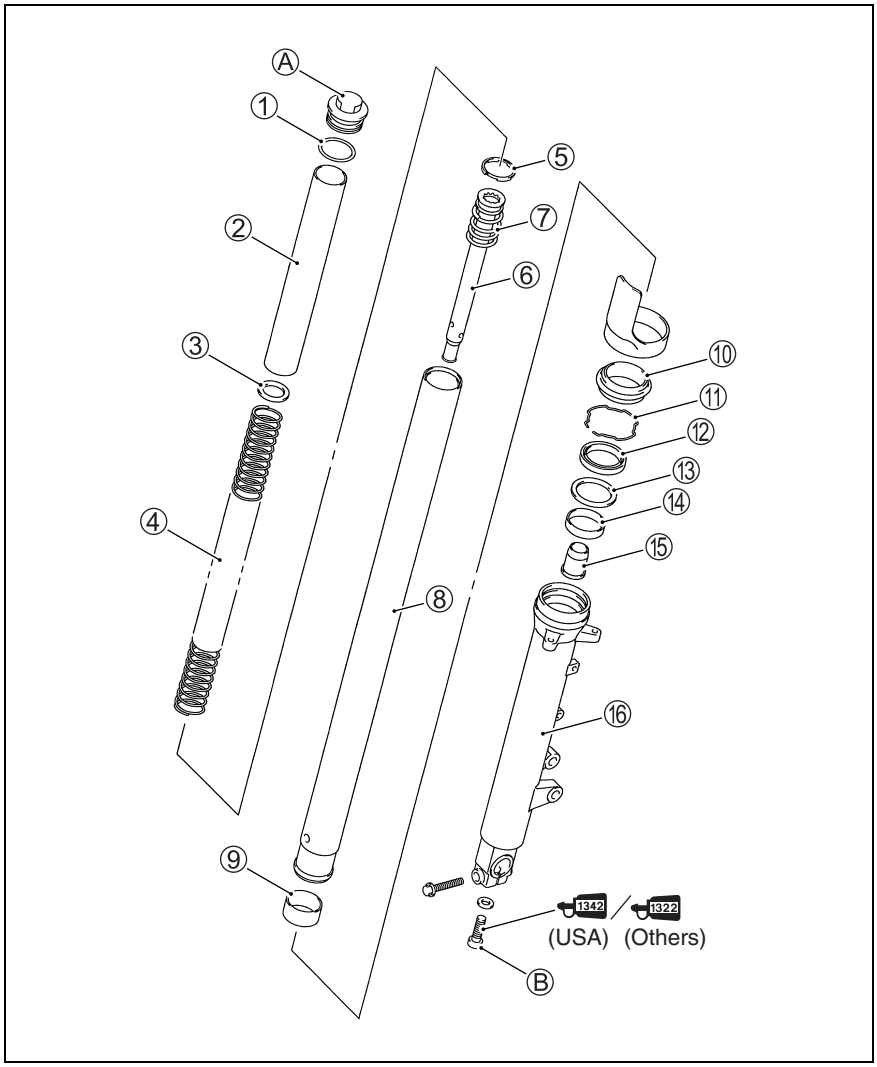
# COWLING (For GS500F)




| | |
|---|---|
| ① | Screen |
| ② | Front cowling cover (Center) |
| ③ | Front cowling |
| ④ | Front cowling cover (LH) |
| ⑤ | Front cowling cover (RH) |
| ⑥ | Cowling brace |

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# FRONT FORK




| | |
|---|---|
| ① | O-ring |
| ② | Spacer |
| ③ | Spring retainer |
| ④ | Front fork spring |
| ⑤ | Damper rod ring |
| ⑥ | Damper rod |
| ⑦ | Rebound spring |
| ⑧ | Inner tube |
| ⑨ | Anti-friction metal (Inner) |
| ⑩ | Dust seal |
| ⑪ | Oil seal stopper ring |
| ⑫ | Oil seal |
| ⑬ | Oil seal retainer |
| ⑭ | Anti-friction metal (Outer) |
| ⑮ | Oil lock piece |
| ⑯ | Outer tube |
| Ⓐ | Front fork cap bolt |
| Ⓑ | Damper rod bolt |

| ITEM | N·m | kgf-m | lb-ft |
|---|---|---|---|
| Ⓐ | 25 | 2.5 | 18.0 |
| Ⓑ | 28 | 2.8 | 20.0 |

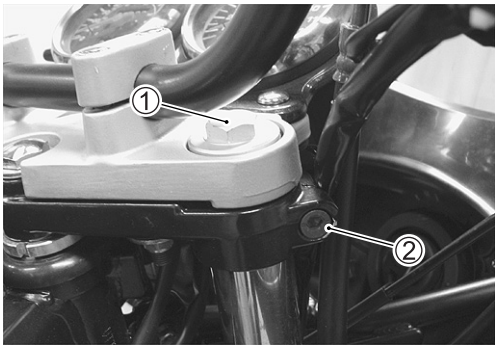
## REMOVAL

- Remove the front wheel.
- Remove the front fender and fender brace.

**⚠ WARNING**

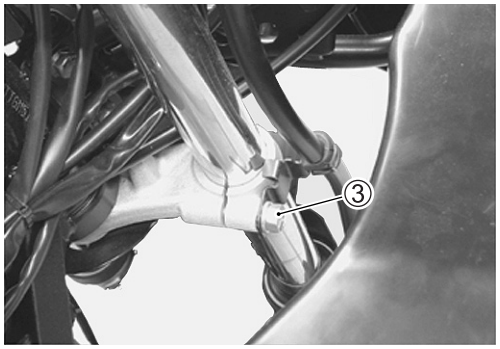
**Make sure that the motorcycle is supported securely.**

- Slightly loosen the front fork cap bolt ① to facilitate later disassembly before loosening the front fork clamp bolts.
- Loosen the front fork upper clamp bolt ②.




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- Loosen the front fork lower clamp bolt ③ and remove the front fork.



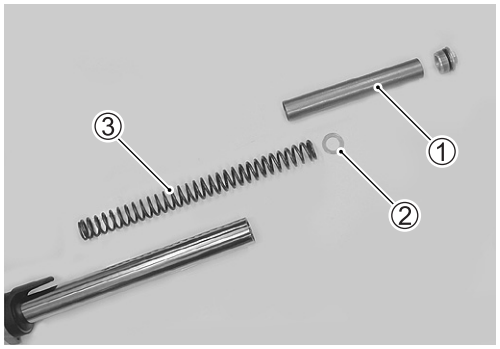

*NOTE:*
*Hold the front fork by the hand to prevent sliding out of the steering stem.*

**CAUTION**

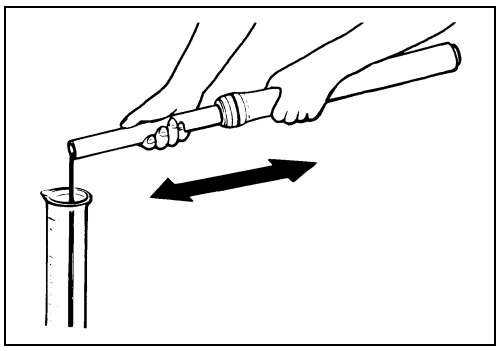
**Do not operate the brake lever while the caliper is removed.**

## DISASSEMBLY

- Remove the front fork cap bolt.
- Remove the spacer ①, spring retainer ② and spring ③.

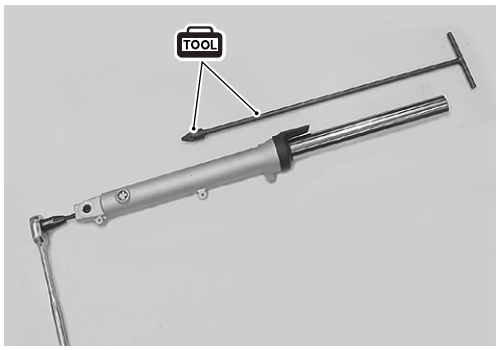



- Invert the front fork and stroke it several times to drain out the fork oil.
- Hold the fork inverted for a few minutes.

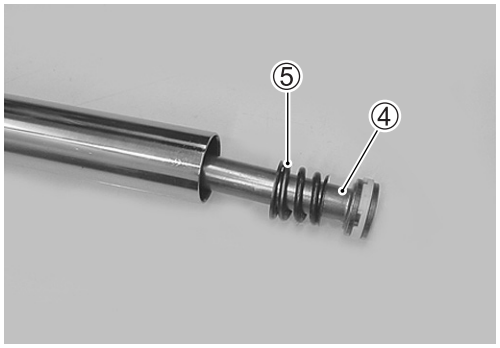


- Remove the damper rod bolt using the special tools and 7 mm hexagon wrench.

**TOOL 09940-34520: "T" handle**
**09940-34531: Attachment "A"**

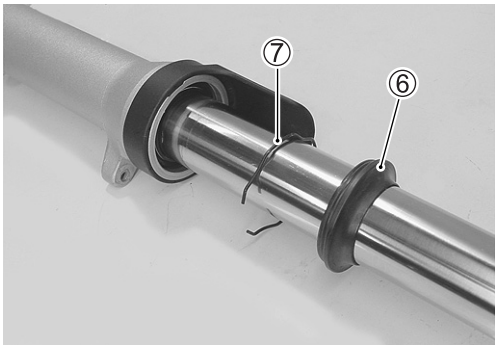



- Remove the damper rod ④ and rebound spring ⑤.

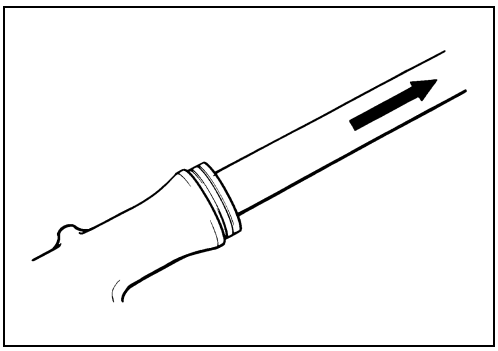



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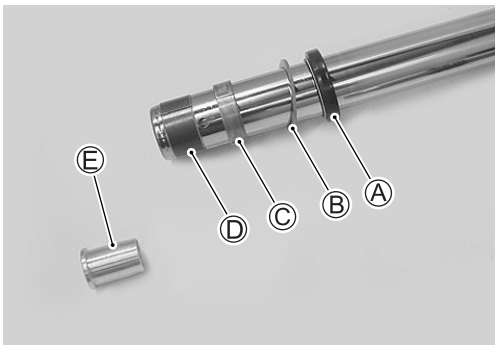
- Remove the dust seal ⑥ and oil seal stopper ring ⑦.




- Separate the inner tube out of the outer tube.



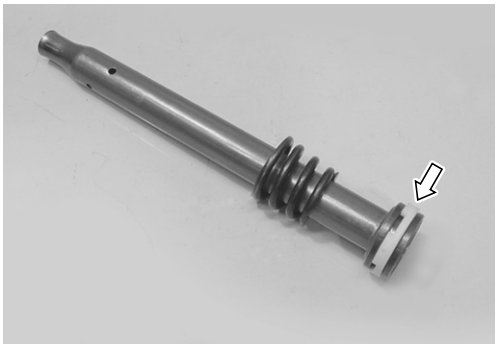
- Remove the following parts.
  - Ⓐ Oil seal
  - Ⓑ Oil seal retainer
  - Ⓒ Anti-friction metal (Outer)
  - Ⓓ Anti-friction metal (Inner)
  - Ⓔ Oil lock piece




## INSPECTION

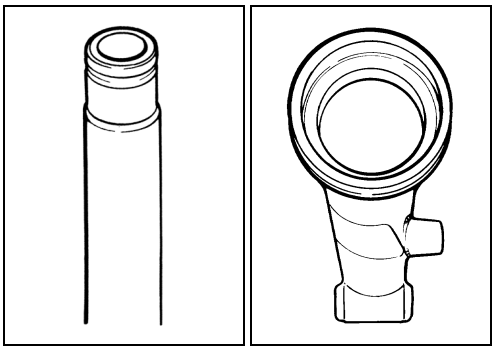
### DAMPER ROD RING

Inspect the damper rod ring for wear or damage. If damper rod ring is worn or damaged, replace it with a new one.



### INNER AND OUTER TUBES

Inspect the inner and outer tube sliding surfaces for scratches or damage. Replace the tube(s) if necessary.

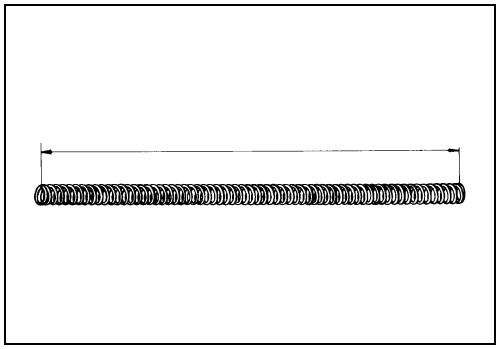


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### FORK SPRING

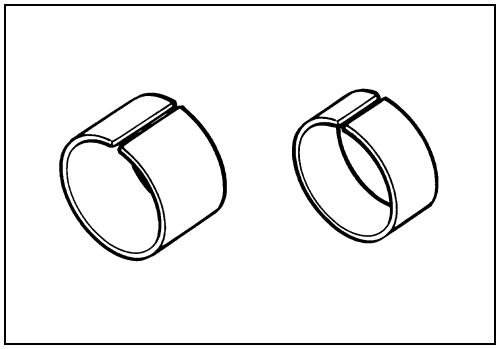
Measure the fork spring free length. If the fork spring free length is shorter than the service limit, replace the fork spring with a new one.

DATA **Front fork spring free length**
**Service limit: 336 mm (13.2 in)**



### INNER AND OUTER ANTI-FRICTION METALS

- Inspect the teflon coated surface of the anti-friction metals for wear and damage. Replace the metal(s) if necessary.



## REASSEMBLY

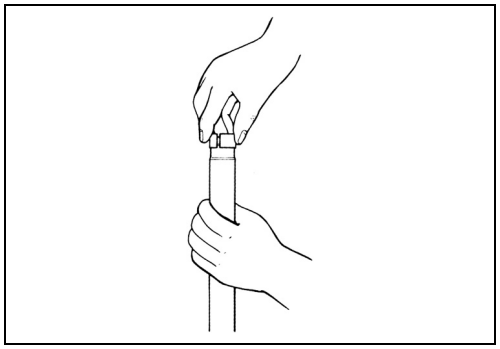
Reassembly is in the reverse order of disassembly. Pay attention to the following points.

### ANTI-FRICTION METALS

- Clean the inner tube metal groove.
- Hold the inner tube vertically and install the anti-friction metals by hand.

**CAUTION**

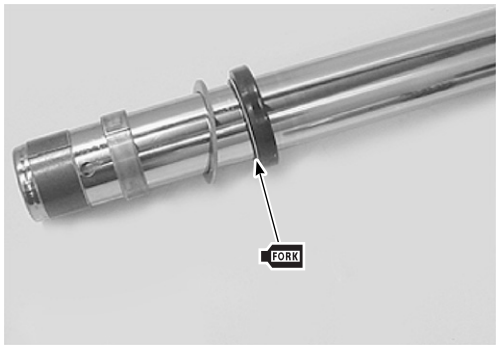
**Use special care to prevent damaging the teflon coated surface of the anti-friction metals when installing them.**



### OIL SEAL

- Apply fork oil lightly to the lip of a new oil seal and install it.

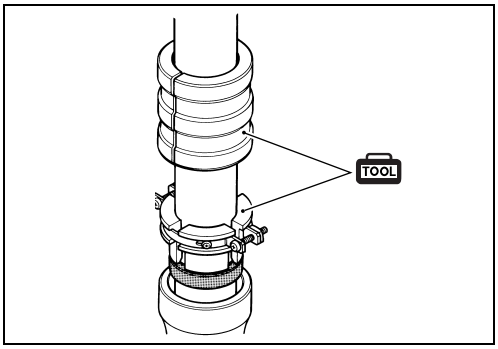
FORK **99000-99044-10G:**
**SUZUKI FORK OIL #10 or equivalent fork oil**




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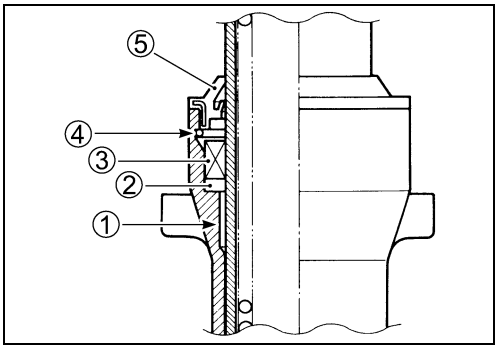
- Insert the inner tube into the outer tube and fit a new oil seal using the special tools.

**TOOL 09940-52861: Front fork oil seal installer set**




- Install the oil seal stopper ring and a new dust seal.

① Anti-friction metal (Outer)
② Oil seal retainer
③ Oil seal
④ Oil seal stopper ring
⑤ Dust seal




**CAUTION**

**Make sure that the oil seal stopper ring ④ is fit securely.**

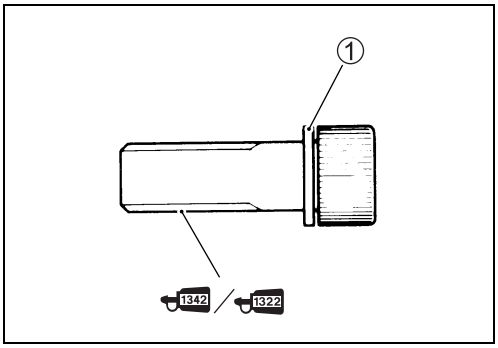
**DAMPER ROD**

- Install a new gasket ①.
- Apply THREAD LOCK to the damper rod bolt and tighten it to the specified torque.

**1342 99000-32050: THREAD LOCK "1342" (USA)**
**1322 99000-32110: THREAD LOCK "1322" (Others)**

**Damper rod bolt: 28 N·m (2.8 kgf-m, 20.0 lb-ft)**

**TOOL 09940-34520: "T" handle**
**09940-34531: Attachment "A"**

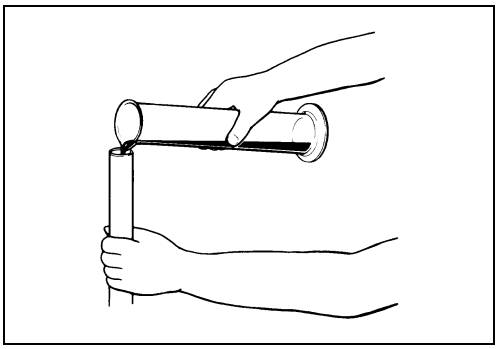



**FORK OIL**

- Pour specified fork oil into the inner tube.

**DATA Front fork oil capacity (each leg):**
**380 ml (12.8/13.4 US/Imp oz)**

**FORK 99000-99044-10G:**
**SUZUKI FORK OIL #10 or equivalent fork oil**

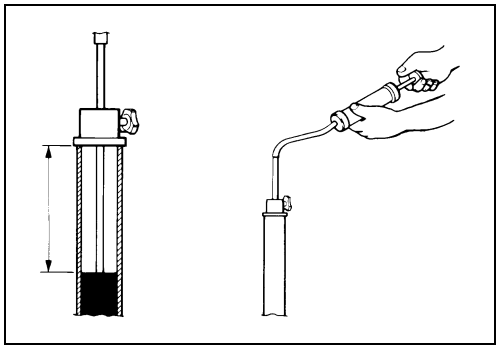


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- Hold the front fork vertically and adjust the fork oil level with the special tool.

**DATA Front fork oil level: 110 mm (4.3 in)**

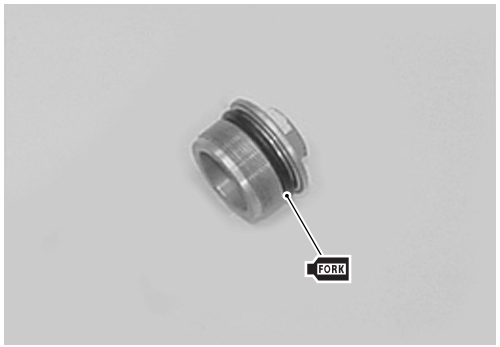
**TOOL 09943-74111: Front fork oil level gauge**



- Apply fork oil lightly to a new O-ring and install it to the front fork cap bolt.

**FORK 99000-99044-10G:**
**SUZUKI FORK OIL #10 or equivalent fork oil**

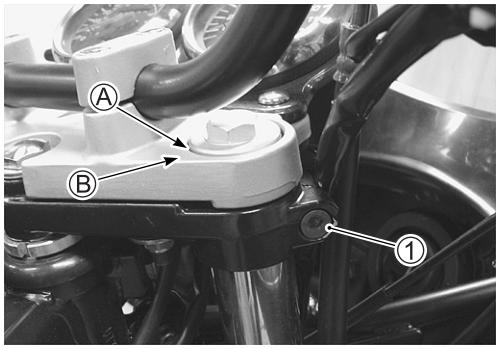
- Temporarily tighten the cap bolt.




## INSTALLATION

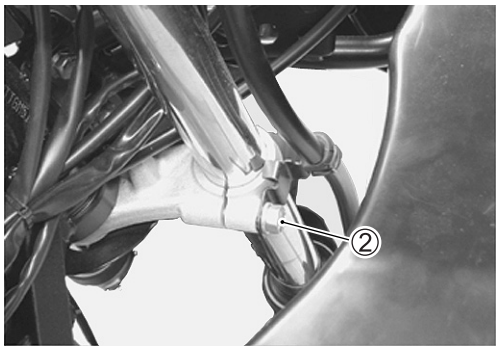
Installation is in the reverse order of removal. Pay attention to the following points.

- When installing the front fork assembly, align the upper surface Ⓐ of the inner tube with the surface Ⓑ of the steering upper bracket.
- Tighten the front fork upper clamp bolt ① to the specified torque.




**Front fork upper clamp bolt: 23 N·m (2.3 kgf-m, 16.5 lb-ft)**

- Tighten the front fork lower clamp bolt ② to the specified torque.




**Front fork lower clamp bolt: 30 N·m (3.0 kgf-m, 21.5 lb-ft)**

- Tighten the front fork cap bolt to the specified torque.

**Front fork cap bolt: 25 N·m (2.5 kgf-m, 18.0 lb-ft)**

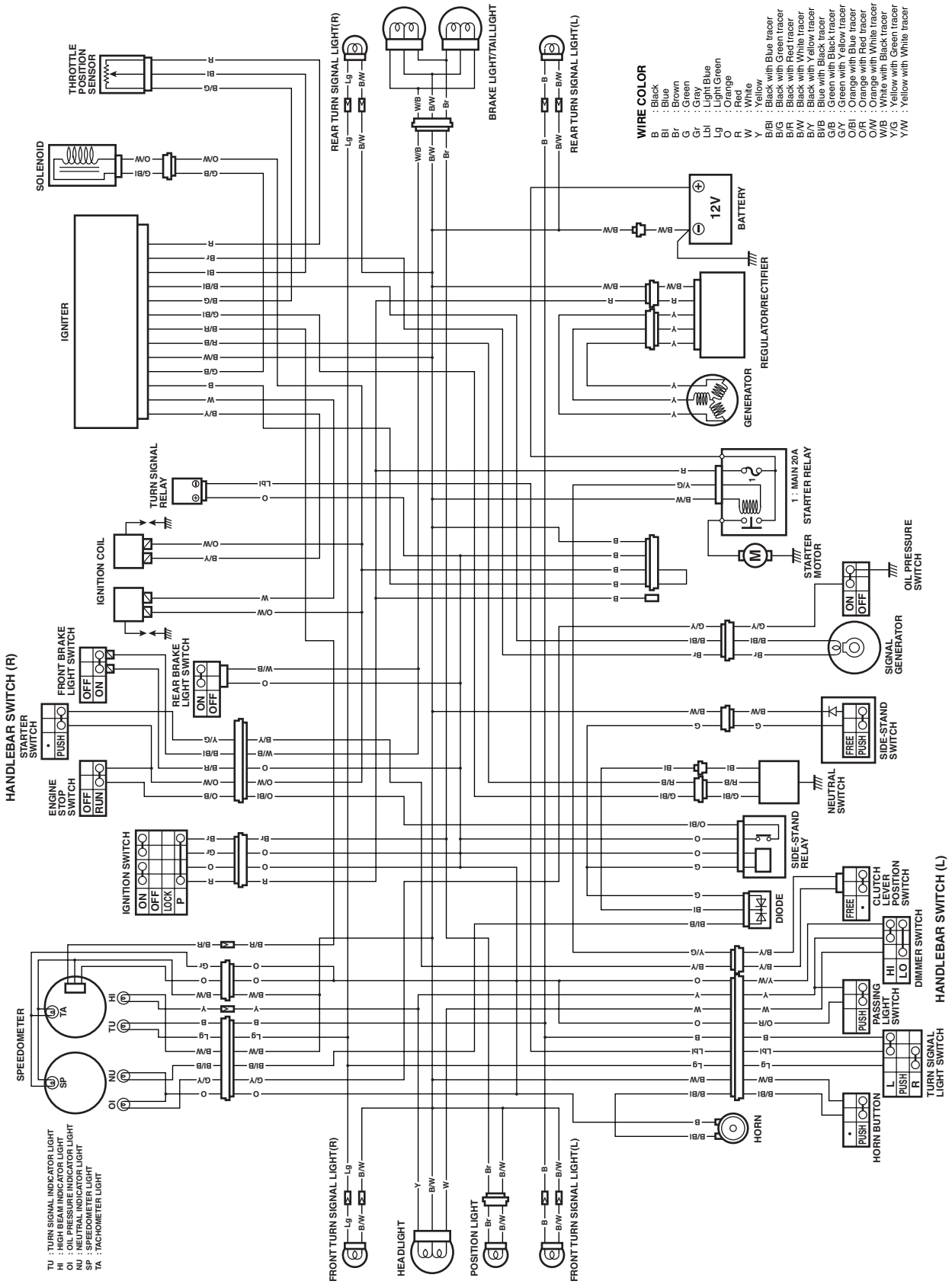
- Recheck that the surface Ⓐ is flush with the surface Ⓑ.
- Install the front fender and front wheel.

*NOTE:*
*Before tightening the front fender brace mounting screws, move the front forks up and down several times.*

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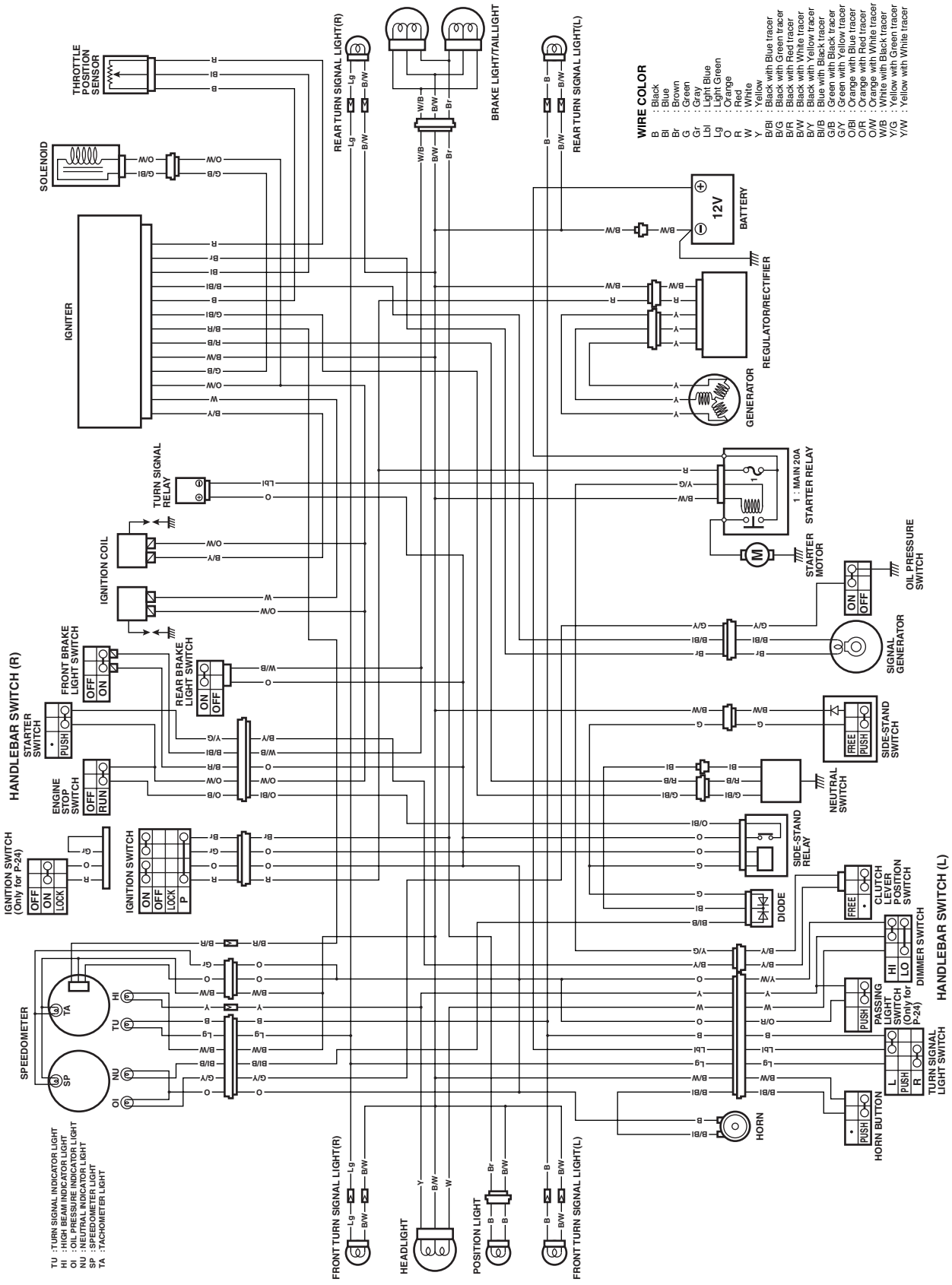
# WIRING DIAGRAM

## GS500K4/UK4 (P-02, 09, 19, 54)
## GS500FK4/FUK4 (P-02, 19, 54)



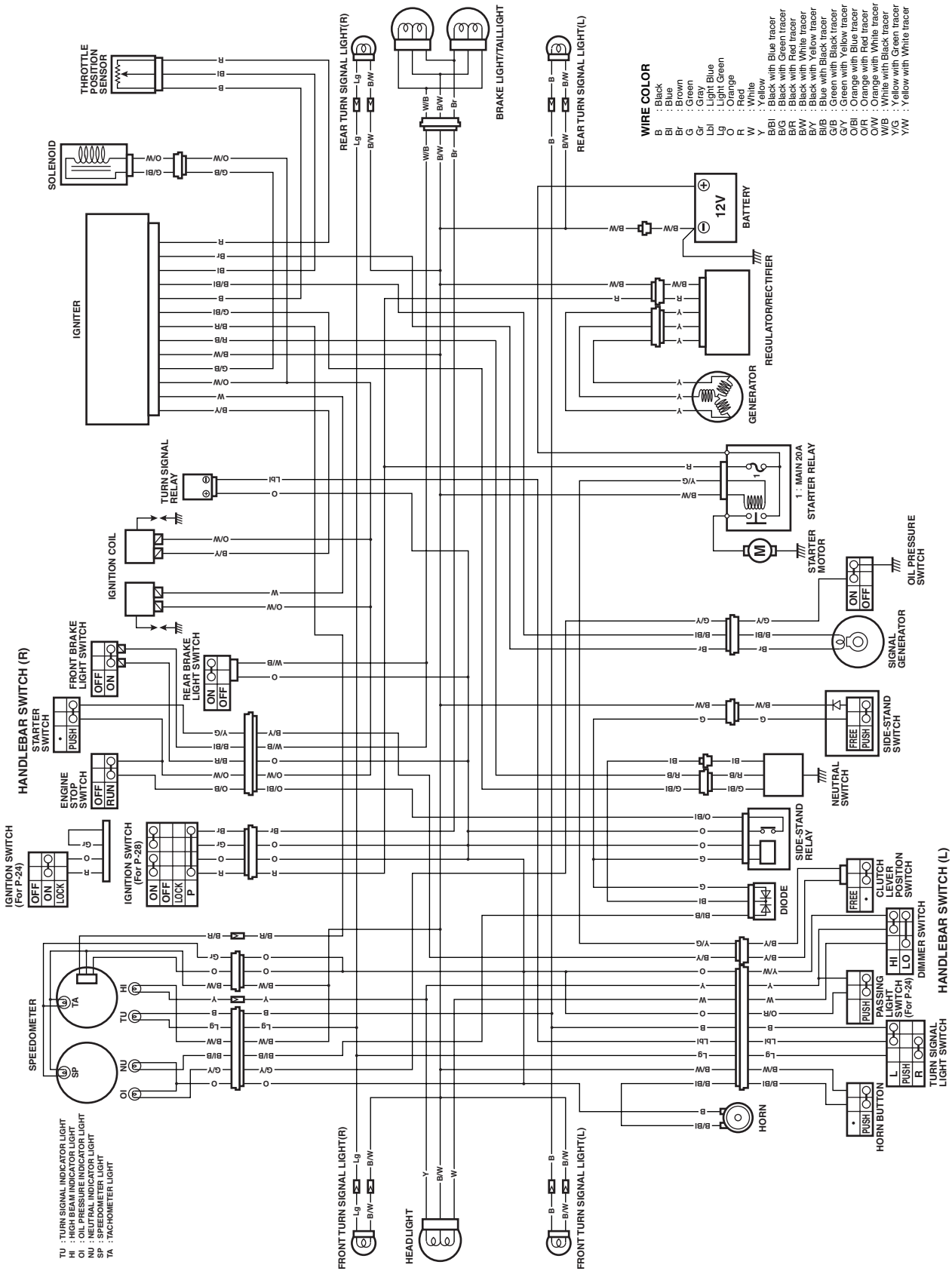

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# GS500K4 (P-24, 28)



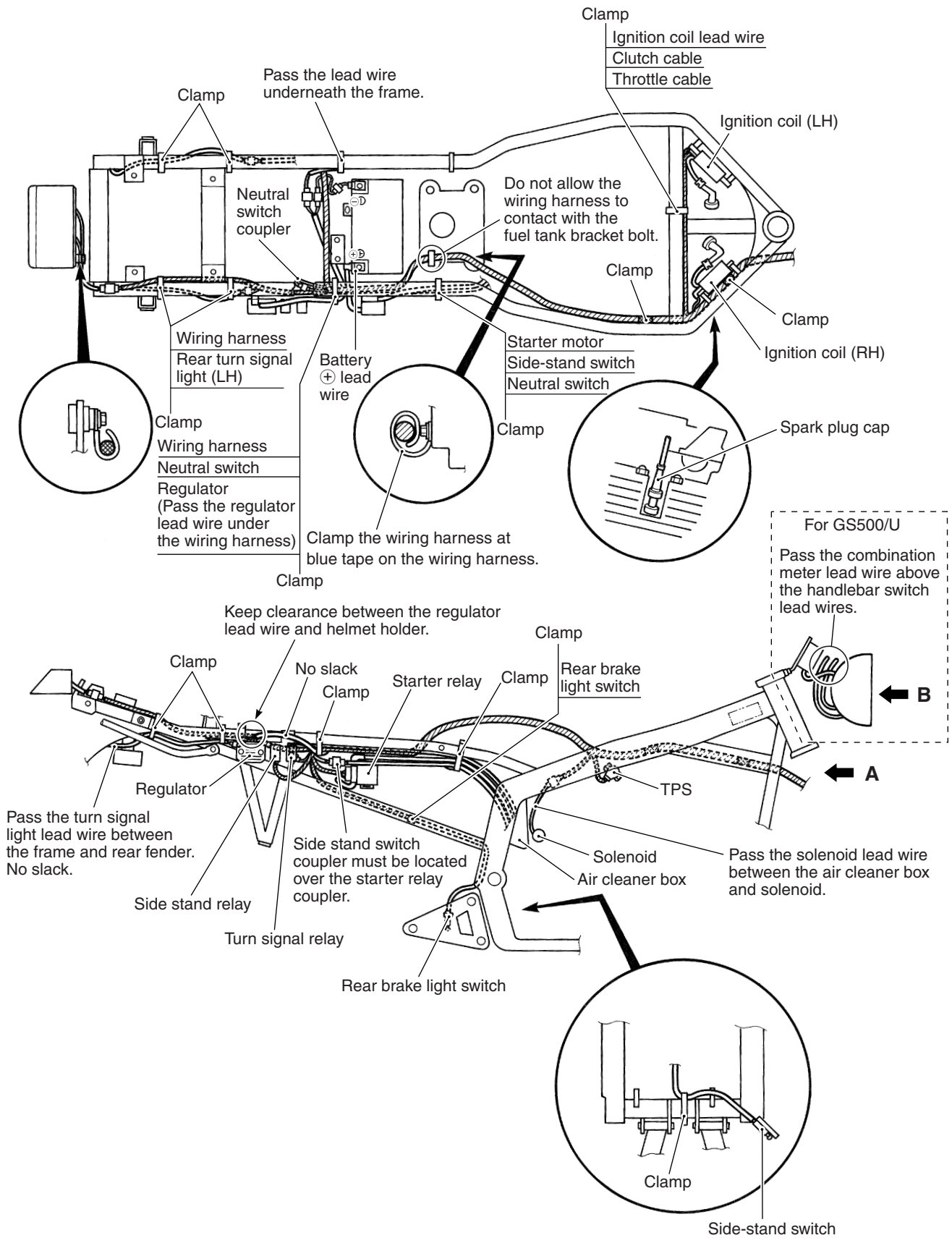

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# GS500FK4 (P-03, 24, 28, 33)

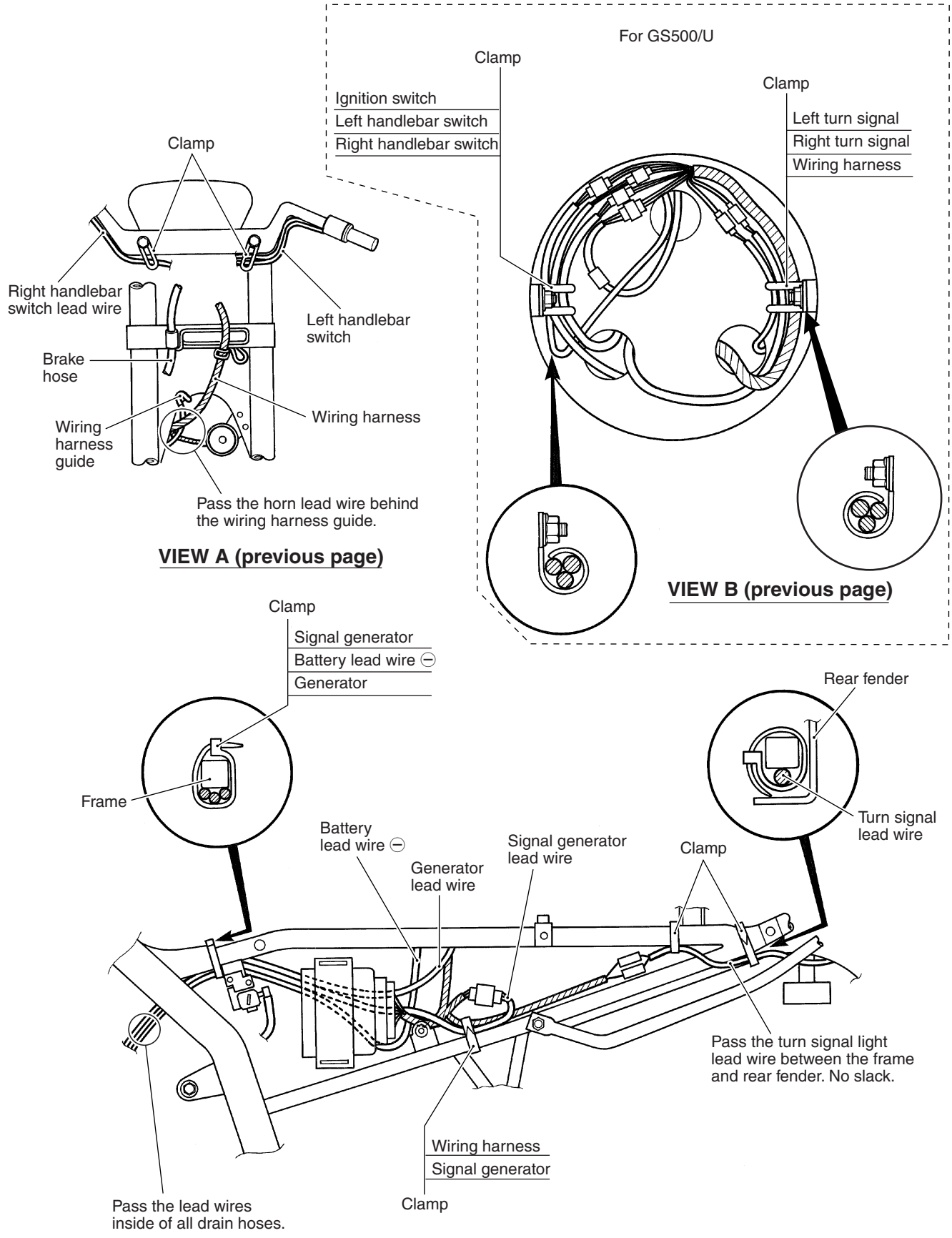



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# WIRING HARNESS AND HOSE ROUTING
## WIRING HARNESS ROUTING

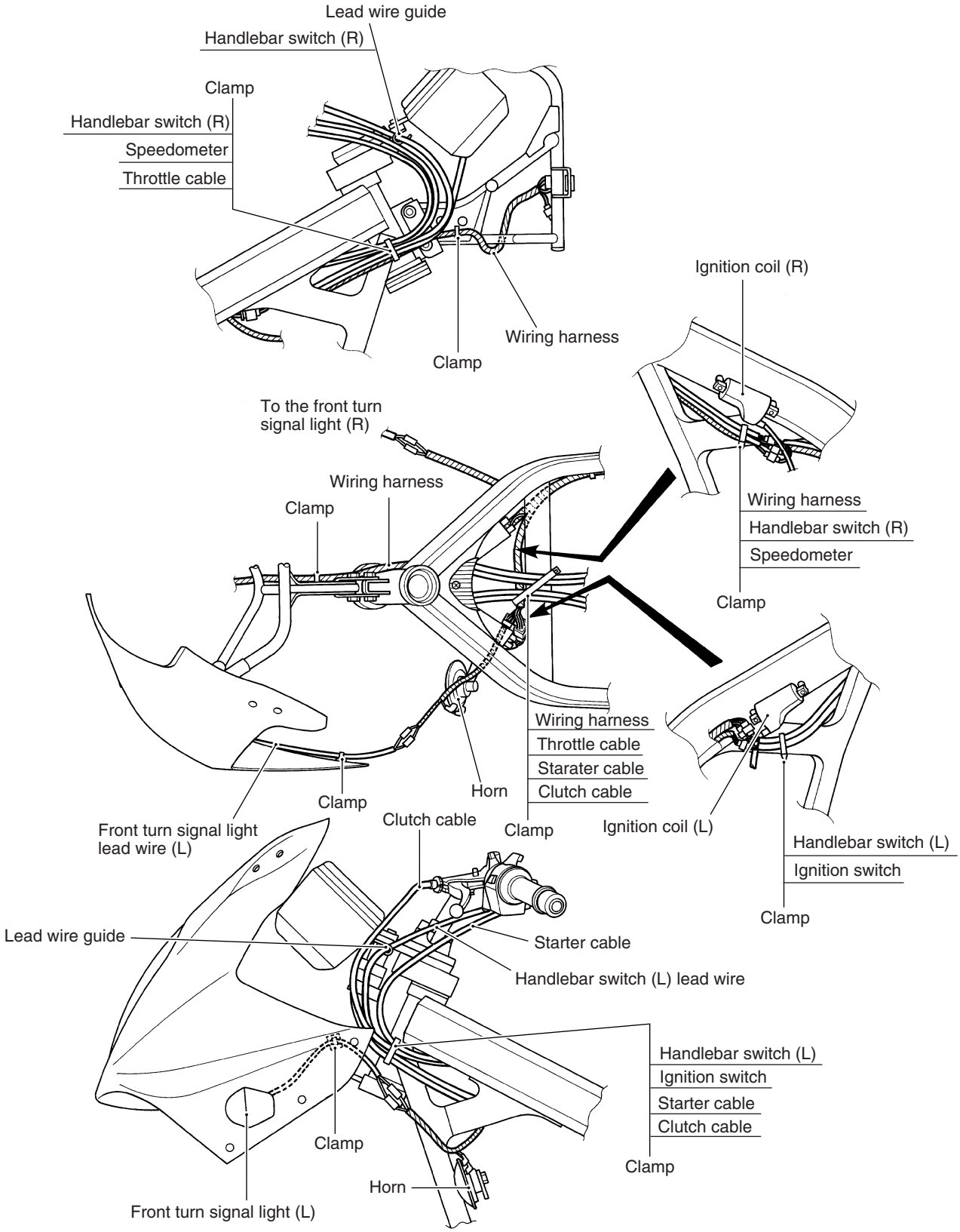



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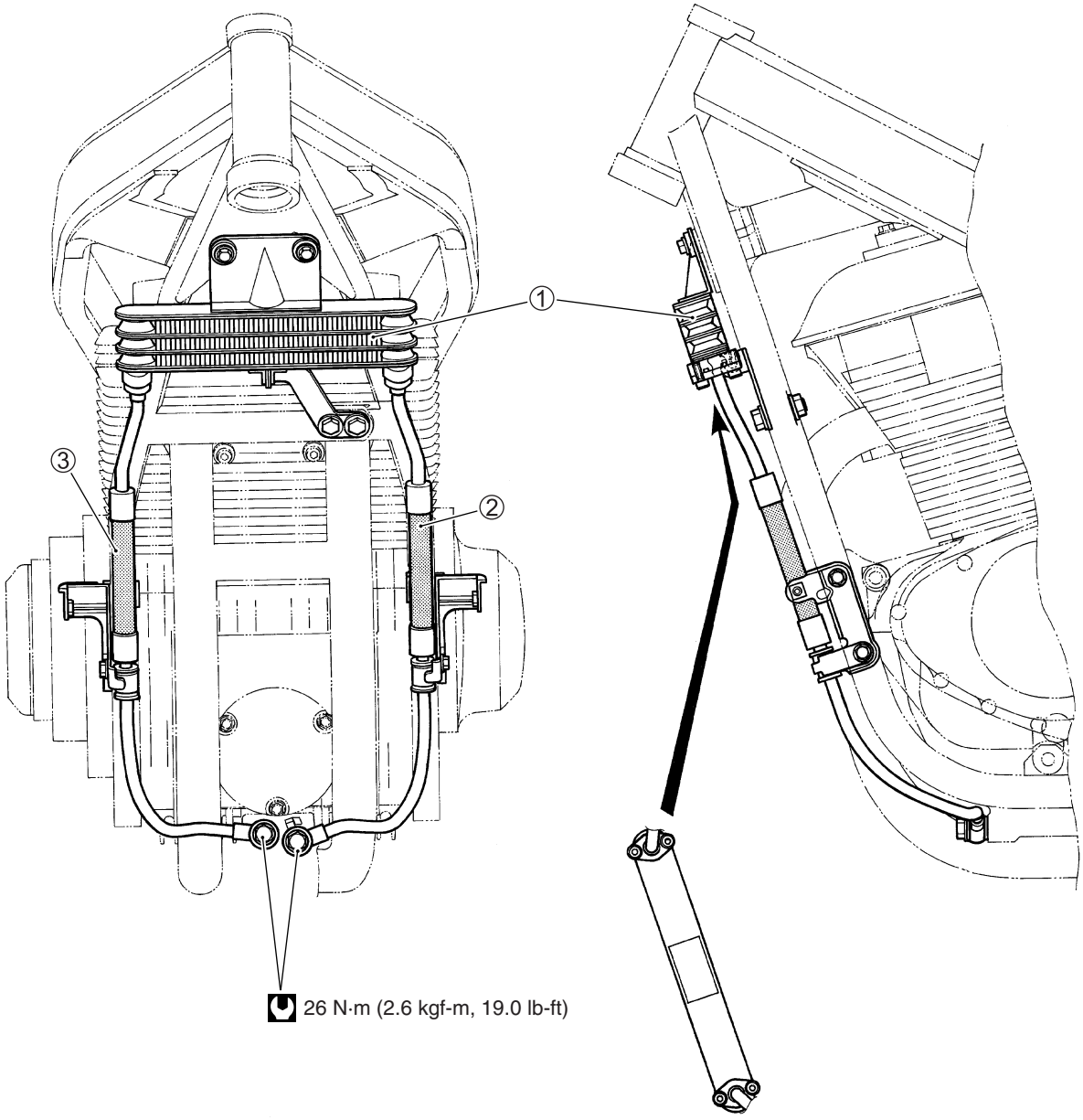

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# WIRING HARNESS ROUTING (For GS500F)




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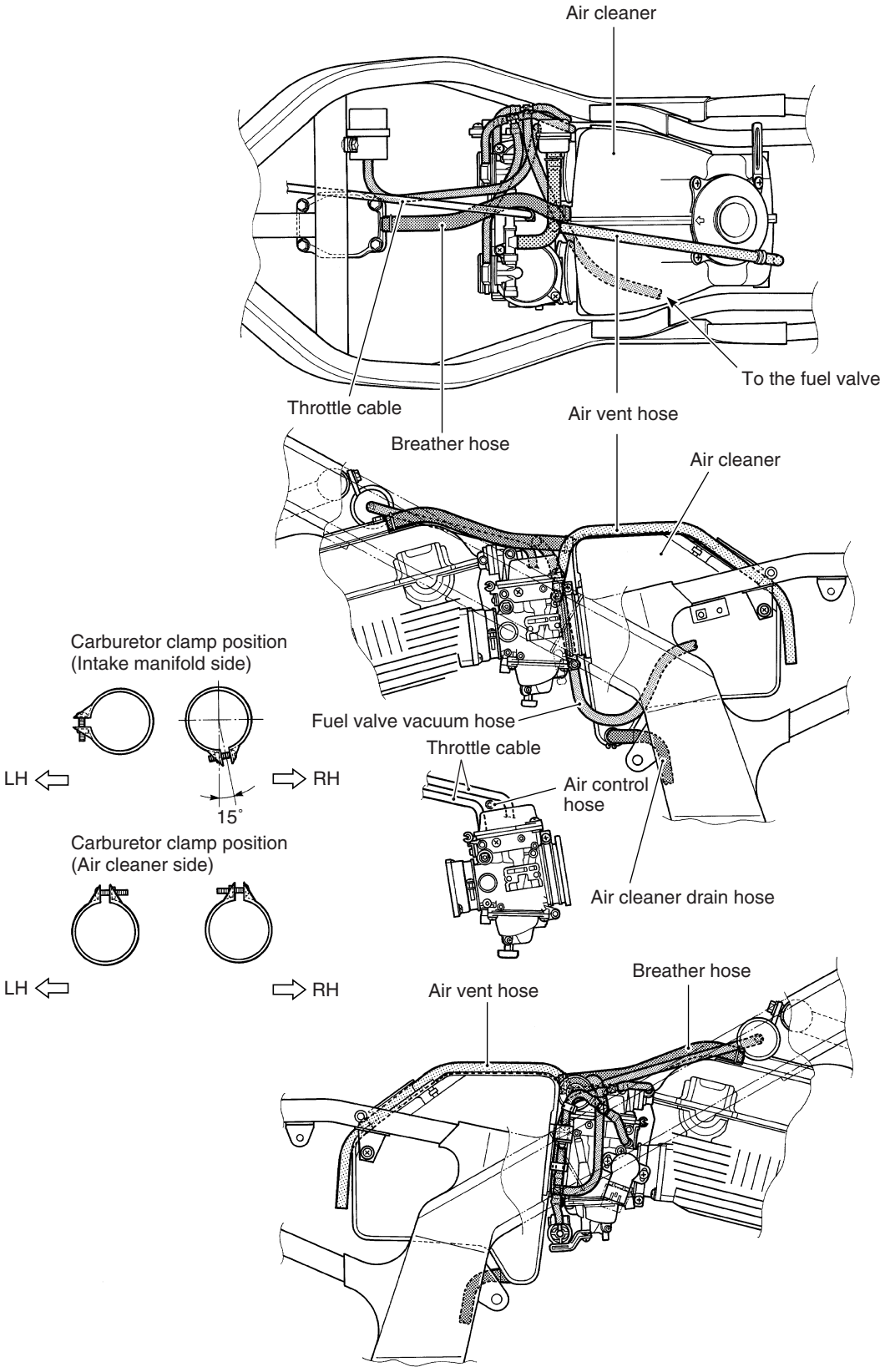
# OIL COOLER HOSE ROUTING (For GS500F)




| | |
|---|---|
| ① | Oil cooler |
| ② | Oil cooler hose (LH) |
| ③ | Oil cooler hose (RH) |

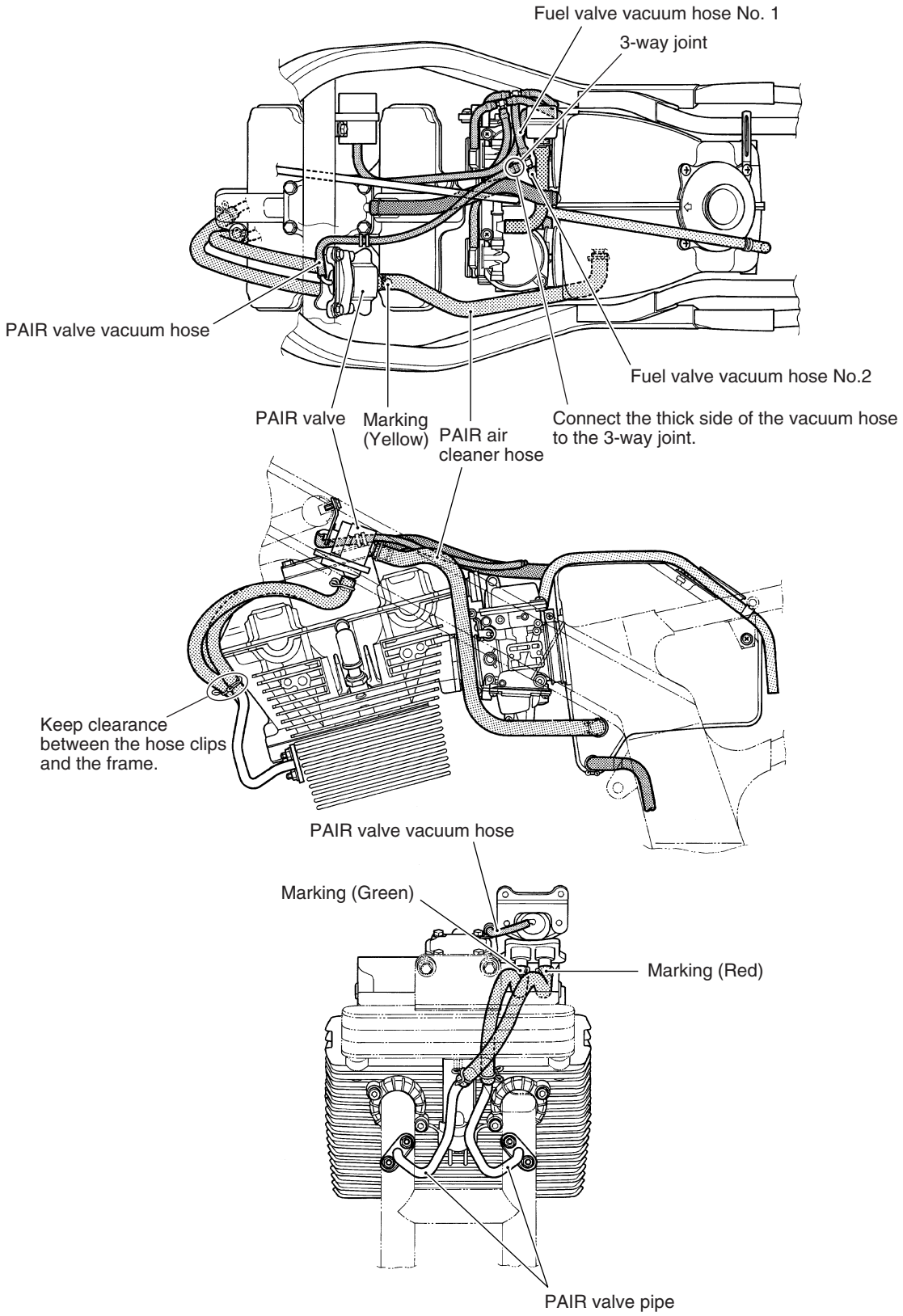
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# CARBURETOR AND AIR CLEANER HOSE ROUTING



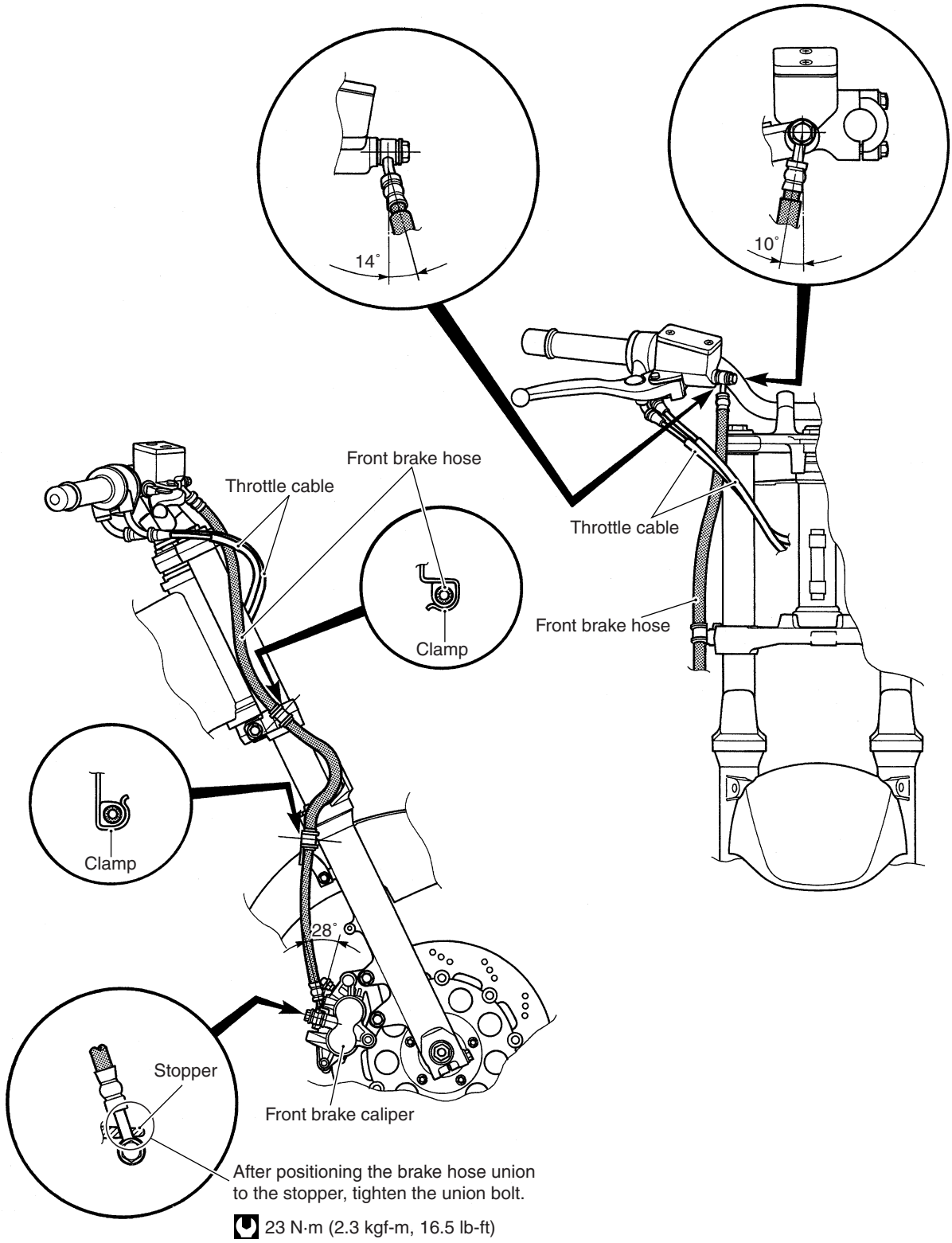

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# PAIR (AIR SUPPLY) SYSTEM HOSE ROUTING



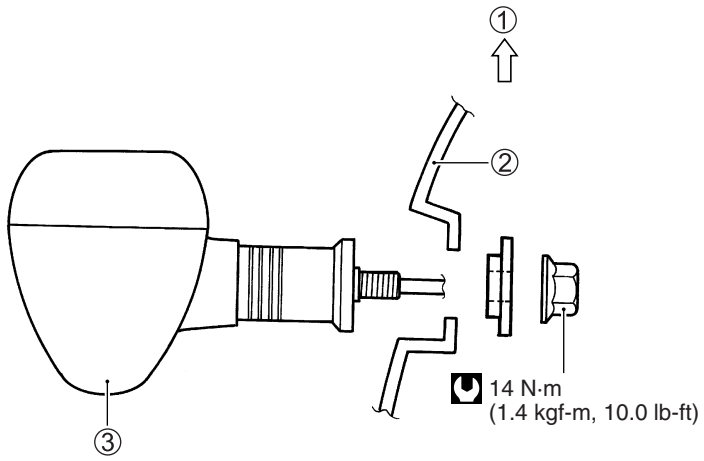

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# FRONT BRAKE HOSE ROUTING (For GS500F)




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# FRONT TURN SIGNAL LIGHT INSTALLATION (For GS500F)




| | |
|---|---|
| ① | Forward |
| ② | Cowling |
| ③ | Front turn signal light |

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# GS500K5/UK5/FK5/FUK5 ('05-MODEL)

*This chapter describes specifications, service data and servicing procedures which differ from those of the GS500K4/FK4 ('04-MODEL).*

*NOTE:*
** Any differences between the GS500K4/FK4 ('04-MODEL) and GS500K5/UK5/FK5/FUK5 ('05-MODEL) in specifications and service data are indicated with an asterisk mark (*).*
** Please refer to the chapter 1 through 20 for details which are not given in this chapter.*

## CONTENTS

**SPECIFICATIONS ..... 21- 2**
**SERVICE DATA ..... 21- 4**



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# SPECIFICATIONS

**DIMENSIONS AND DRY MASS**

| | | |
|---|---|---|
| Overall length | 2 080 mm (81.9 in) | |
| Overall width | 800 mm (31.5 in) | |
| Overall height | 1 060 mm (41.7 in) | GS500/U |
| | 1 150 mm (45.3 in) | GS500F/FU |
| Wheelbase | 1 405 mm (55.3 in) | |
| Ground clearance | 150 mm (5.9 in) | GS500/U |
| | 120 mm (4.7 in) | GS500F/FU |
| Seat height | 790 mm (31.1 in) | |
| Dry mass | 174 kg (383 lbs) | GS500/U |
| | 180 kg (396 lbs) | GS500F/FU |

**ENGINE**

| | |
|---|---|
| Type | Four-stroke, air-cooled, DOHC |
| Number of cylinders | 2 |
| Bore | 74.0 mm (2.913 in) |
| Stroke | 56.6 mm (2.228 in) |
| Displacement | 487 $cm^3$ (29.7 cu. in) |
| Compression ratio | 9.0 : 1 |
| Carburetor | BSR34, twin |
| Air cleaner | Non-woven fabric element |
| Starter system | Electric |
| Lubrication system | Wet sump |
| Idle speed | 1 200 ± 100 r/min |

**DRIVE TRAIN**

| | |
|---|---|
| Clutch | Wet multi-plate type |
| Transmission | 6-speed constant mesh |
| Gearshift pattern | 1-down, 5-up |
| Primary reduction ratio | 2.714 (76/28) |
| Gear ratios, Low | 2.461 (32/13) |
| 2nd | 1.777 (32/18) |
| 3rd | 1.380 (29/21) |
| 4th | 1.125 (27/24) |
| 5th | 0.961 (25/26) |
| Top | 0.851 (23/27) |
| Final reduction ratio | 2.437 (39/16) |
| Drive chain | D.I.D. 520VM, 110 links |

**CHASSIS**

| | |
|---|---|
| Front suspension | Telescopic, coil spring, oil damped |
| Rear suspension | Link type, coil spring, oil damped |
| Front suspension stroke | 120 mm (4.7 in) |
| Rear wheel travel | 115 mm (4.5 in) |
| Caster | 25° 05' |
| Trail | 97 mm (3.82 in) |
| Steering angle | 35° |
| Turning radius | 2.7 m (8.9 ft) |
| Front brake | Disc brake |
| Rear brake | Disc brake |
| Front tire size | 110/70 17M/C 54H, tubeless |
| Rear tire size | 130/70 17M/C 62H, tubeless |

**ELECTRICAL**

| | | |
|---|---|---|
| Ignition type | Electronic ignition (transistorized) | |
| Ignition timing | 5° B.T.D.C. at 1 200 r/min | P-03, 28, 33 |
| | 12° B.T.D.C. at 1 200 r/min | Others |
| Spark plug | NGK DPR8EA-9 or DENSO X24EPR-U9 | |
| Battery | 12 V 39.6 kC (11 Ah)/10 HR | |
| Generator | Three-phase A.C. generator | |
| Fuse | 20 A | |
| Headlight | 12 V 60/55 W | |
| Position light | 12 V 4 W GS500/U | Except P-03, 24, 28, 33 |
| | 12 V 5 W GS500F/FU | |
| Turn signal light | 12 V 21W | |
| Brake light/Taillight | 12 V 32/3 cp (× 2 pcs.) | P-03, 28, 33 |
| | 12 V 21/5 W (× 2 pcs.) | Others |
| Speedometer light | 12 V 1.7 W | |
| Tachometer light | 12 V 1.7 W | |
| Neutral indicator light | 12 V 1.7 W | |
| High beam indicator light | 12 V 1.7 W | |
| Turn signal indicator light | 12 V 1.7 W | |
| Oil pressure indicator light | 12 V 1.7 W | |

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**CAPACITIES**

| | | |
|---|---|---|
| Fuel tank, including reserve | 19.0 L (5.0/4.2 US/Imp gal) | P-33 |
| | 20.0 L (5.3/4.4 US/Imp gal) | Others |
| reserve | 4.3 L (1.1/0.9 US/Imp gal) | |
| Engine oil, oil change | 2 600 ml (2.7/2.3 US/Imp qt) | |
| with filter change | 2 900 ml (3.1/2.6 US/Imp qt) | |
| overhaul | 3 200 ml (3.4/2.8 US/Imp qt) | |

These specifications are subject to change without notice.

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# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Valve diam. | IN. | 39<br>(1.5) | — |
| | EX. | 32<br>(1.3) | — |
| Valve lift | IN. | 8.5<br>(0.33) | — |
| | EX. | 8.0<br>(0.31) | — |
| Tappet clearance (when cold) | IN. & EX. | 0.03 – 0.08<br>(0.001 – 0.003) | — |
| Valve guide to valve stem clearance | IN. | 0.025 – 0.055<br>(0.0010 – 0.0022) | — |
| | EX. | 0.040 – 0.070<br>(0.0016 – 0.0028) | — |
| Valve stem deflection | IN. & EX. | — | 0.35<br>(0.014) |
| Valve guide I.D. | IN. & EX. | 7.000 – 7.015<br>(0.2756 – 0.2762) | — |
| Valve stem O.D. | IN. | 6.960 – 6.975<br>(0.2740 – 0.2746) | — |
| | EX. | 6.945 – 6.960<br>(0.2734 – 0.2740) | — |
| Valve stem runout | IN. & EX. | — | 0.05<br>(0.002) |
| Valve head thickness | IN. & EX. | — | 0.5<br>(0.02) |
| Valve seat width | IN. & EX. | 1.0 – 1.2<br>(0.04 – 0.05) | — |
| Valve head radial runout | IN. & EX. | — | 0.03<br>(0.001) |
| Valve spring free length (IN. & EX.) | INNER | — | 35.6<br>(1.40) |
| | OUTER | — | 40.6<br>(1.60) |
| Valve spring tension (IN. & EX.) | INNER | 107 – 123 N<br>(10.9 – 12.5 kgf, 24.0 – 27.6 lbs)<br>at length 31.0 mm (1.22 in) | — |
| | OUTER | 199 – 228 N<br>(20.3 – 23.3 kgf, 44.8 – 51.4 lbs)<br>at length 35.0 mm (1.38 in) | — |

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## CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Cam height | IN. | 36.090 – 36.130<br>(1.4208 – 1.4224) | 35.80<br>(1.409) |
| | EX. | 36.090 – 36.130<br>(1.4208 – 1.4224) | 35.80<br>(1.409) |
| Camshaft journal oil clearance | IN. & EX. | 0.032 – 0.066<br>(0.0013 – 0.0026) | 0.150<br>(0.0060) |
| Camshaft journal holder I.D. | IN. & EX. | 22.012 – 22.025<br>(0.8666 – 0.8671) | — |
| Camshaft journal O.D. | IN. & EX. | 21.959 – 21.980<br>(0.8645 – 0.8654) | — |
| Camshaft runout | IN. & EX. | — | 0.10<br>(0.004) |
| Cam chain pin (at arrow "3") | 18th pin | | — |
| Cylinder head distortion | — | | 0.10<br>(0.004) |

## CYLINDER + PISTON + PISTON RING

Unit: mm (in)

| ITEM | STANDARD | | | LIMIT |
|---|---|---|---|---|
| Compression pressure | 1 000 – 1 400 kPa<br>(10 – 14 kgf/cm$^2$, 142 – 199 psi) | | | 800 kPa<br>(8 kgf/cm$^2$, 144 psi) |
| Compression pressure difference | — | | | 200 kPa<br>(2 kgf/cm$^2$, 28 psi) |
| Piston to cylinder clearance | 0.050 – 0.060<br>(0.0020 – 0.0024) | | | 0.120<br>(0.0047) |
| Cylinder bore | 74.000 – 74.015<br>(2.9134 – 2.9140) | | | 74.080<br>(2.9165) |
| Piston diam. | 73.945 – 73.960<br>(2.9112 – 2.9118)<br>Measure at 15 mm (0.6 in) from the skirt end. | | | 73.880<br>(2.9087) |
| Cylinder distortion | — | | | 0.10<br>(0.004) |
| Piston ring free end gap | 1st | N | Approx. 7.0 (0.28) | 5.6<br>(0.22) |
| | 2nd | N | Approx. 11.0 (0.43) | 8.8<br>(0.35) |
| Piston ring end gap | 1st | | 0.10 – 0.25<br>(0.004 – 0.010) | 0.70<br>(0.028) |
| | 2nd | | 0.10 – 0.25<br>(0.004 – 0.010) | 0.70<br>(0.028) |
| Piston ring to groove clearance | 1st | | — | 0.180<br>(0.0071) |
| | 2nd | | — | 0.150<br>(0.0059) |

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| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Piston ring groove width | 1st | 1.21 – 1.23<br>(0.047 – 0.048) | — |
| | 2nd | 1.21 – 1.23<br>(0.047 – 0.048) | — |
| | Oil | 2.51 – 2.53<br>(0.099 – 0.100) | — |
| Piston ring thickness | 1st | 1.17 – 1.19<br>(0.046 – 0.047) | — |
| | 2nd | 1.17 – 1.19<br>(0.046 – 0.047) | — |
| Piston pin bore | 18.002 – 18.008<br>(0.7087 – 0.7090) | | 18.030<br>(0.7098) |
| Piston pin O.D. | 17.995 – 18.000<br>(0.7085 – 0.7087) | | 17.980<br>(0.7079) |

## CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Conrod small end I.D. | 18.006 – 18.014<br>(0.7089 – 0.7092) | 18.040<br>(0.7102) |
| Conrod big end side clearance | 0.1 – 0.2<br>(0.004 – 0.008) | 0.3<br>(0.012) |
| Conrod big end width | 22.95 – 23.00<br>(0.904 – 0.906) | — |
| Crank pin width | 23.10 – 23.15<br>(0.909 – 0.911) | — |
| Conrod big end oil clearance | 0.024 – 0.048<br>(0.0009 – 0.0019) | 0.080<br>(0.0031) |
| Crank pin O.D. | 33.976 – 34.000<br>(1.3376 – 1.3386) | — |
| Crankshaft journal oil clearance | 0.020 – 0.044<br>(0.0008 – 0.0017) | 0.080<br>(0.0031) |
| Crankshaft journal O.D. | 31.976 – 32.000<br>(1.2589 – 1.2598) | — |
| Crankshaft thrust bearing thickness | 2.950 – 2.975<br>(0.1161 – 0.1171) | 2.850<br>(0.1122) |
| Crankshaft runout | — | 0.05<br>(0.002) |
| Balancer journal oil clearance | 0.020 – 0.044<br>(0.0008 – 0.0017) | 0.080<br>(0.0031) |
| Balancer journal O.D. | 31.984 – 32.000<br>(1.2592 – 1.2598) | — |
| Balancer spring free length | — | 14.9<br>(0.59) |

## OIL PUMP

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Oil pump reduction ratio | 1.879 (76/28 × 27/39) | — |
| Oil pressure (at 60 °C, 140 °F) | Above 200 kPa (2.0 kgf/cm$^2$, 28 psi)<br>Below 500 kPa (5.0 kgf/cm$^2$, 71 psi)<br>at 3 000 r/min | — |

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## CLUTCH

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Clutch lever play | 10 – 15<br>(0.4 – 0.6) | — |
| Clutch release screw | 1/4 – 1/2 turn back | — |
| Drive plate thickness | 2.92 – 3.08<br>(0.115 – 0.121) | 2.62<br>(0.103) |
| Drive plate claw width | 15.8 – 16.0<br>(0.62 – 0.63) | 15.0<br>(0.59) |
| Driven plate distortion | — | 0.10<br>(0.004) |
| Clutch spring free length | — | 60.8<br>(2.39) |

## TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

| ITEM | | STANDARD | | LIMIT |
|---|---|---|---|---|
| Primary reduction ratio | | 2.714 (76/28) | | — |
| Final reduction ratio | | 2.437 (39/16) | | — |
| Gear ratios | Low | 2.461 (32/13) | | — |
| | 2nd | 1.777 (32/18) | | — |
| | 3rd | 1.380 (29/21) | | — |
| | 4th | 1.125 (27/24) | | — |
| | 5th | 0.961 (25/26) | | — |
| | Top | 0.851 (23/27) | | — |
| Shift fork to groove clearance | | 0.1 – 0.3<br>(0.004 – 0.012) | | 0.5<br>(0.020) |
| Shift fork groove width | | No.1, No.2 & No.3 | 5.5 – 5.6<br>(0.217 – 0.220) | — |
| Shift fork thickness | | No.1, No.2 & No.3 | 5.3 – 5.4<br>(0.209 – 0.213) | — |
| Countershaft length<br>(Low to 2nd) | | $114.7\ ^{+0.1}_{-0}$<br>$(4.516\ ^{+0.004}_{-0})$ | | — |
| Drive chain | | Type | D.I.D.: DID520VM | — |
| | | Links | 110 | — |
| | | 20-pitch length | — | 319.4<br>(12.57) |
| Drive chain slack | | 20 – 30<br>(0.8 – 1.2) | | — |

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## CARBURETOR

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | GS500 P-02, 19, 24, 54<br>GS500F P-02, 19, 24, 54 | GS500U P-19<br>GS500FU P-19 |
| Carburetor type | | MIKUNI<br>BSR34 | ← |
| Bore size | | 34 mm | ← |
| I.D. No. | | 01DN | 01DP |
| Idle r/min | | 1 200 ± 100 r/min | ← |
| Float height | | 13.0 ± 1.0 mm | ← |
| Main jet | (M.J.) | #130 | #135 |
| Jet needle | (J.N.) | 5DH57-3rd | ← |
| Needle jet | (N.J.) | P-5M | ← |
| Throttle valve | (Th.V.) | #105 | ← |
| Pilot jet | (P.J.) | #17.5 | ← |
| Pilot screw | (P.S.) | 3 turns back | ← |
| Throttle cable play | | 2.0 – 4.0 mm<br>(0.08 – 0.16 in) | ← |

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | GS500 P-09, 28<br>GS500F P-03, 28 | GS500F P-33 |
| Carburetor type | | MIKUNI<br>BSR34 | ← |
| Bore size | | 34 mm | ← |
| I.D. No. | | 01DS | 01DU |
| Idle r/min | | 1 200 ± 100 r/min | ← |
| Float height | | 13.0 ± 1.0 mm | ← |
| Main jet | (M.J.) | # 130 | ← |
| Jet needle | (J.N.) | 5DH59 | 5DH60 |
| Needle jet | (N.J.) | P-5M | ← |
| Throttle valve | (Th.V.) | #105 | ← |
| Pilot jet | (P.J.) | #17.5 | ← |
| Pilot screw | (P.S.) | PRE-SET (3 turns back) | ← |
| Throttle cable play | | 2.0 – 4.0 mm<br>(0.08 – 0.16 in) | ← |

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## ELECTRICAL

Unit: mm (in)

| ITEM | | SPECIFICATION | | NOTE |
|---|---|---|---|---|
| Ignition timing | | 5° B.T.D.C. at 1 200 r/min | | P-03, 28, 33 |
| | | 12° B.T.D.C. at 1 200 r/min | | Others |
| Firing order | | L·R | | |
| Spark plug | | Type | DENSO: X24EPR-U9<br>NGK: DPR8EA-9 | |
| | | Gap | 0.8 – 0.9<br>(0.031 – 0.035) | |
| Spark performance | | Over 8 (0.3) at 1 atm. | | |
| Signal generator resistance | | 250 – 420 Ω | | |
| Ignition coil resistance | | Primary | 3 – 6 Ω | Terminal – Terminal |
| | | Secondary | 18 – 30 kΩ | Plug cap – Terminal |
| Signal generator peak voltage | | 1.8 V and more | | ⊕ Probe: Br<br>⊖ Probe: B/Bl |
| Ignition coil primary peak voltage | | 100 V and more | | ⊕ Probe: W or B/Y<br>⊖ Probe: Ground |
| Generator Max. output | | Approx. 200 W at 5 000 r/min | | |
| Generator no-load voltage | | More than 75 V (AC) at 5 000 r/min | | |
| Regulated voltage | | 13.5 – 15.5 V at 5 000 r/min | | |
| Starter relay resistance | | 3 – 5 Ω | | |
| Battery | Type designation | CB10L-B2 | | |
| | Capacity | 12 V 39.6 kC (11 Ah)/10 HR | | |
| | Standard electrolyte S.G. | 1.28 at 20 °C (68 °F) | | |
| Fuse size | | 20 A | | |

## WATTAGE

Unit: W

| ITEM | | SPECIFICATION | | |
|---|---|---|---|---|
| | | GS500/U<br>P-02, 09, 19, 24, 54 | GS500F/FU<br>P-02, 19, 24, 54 | P-03, 28, 33 |
| Headlight | HI | 60 | ← | ← |
| | LO | 55 | ← | ← |
| Position light | | 4 | 5 | ← |
| Brake light/Taillight | | 21/5 | ← | 32/3 cp |
| Turn signal light | | 21 | ← | ← |
| Tachometer light | | 1.7 | ← | ← |
| Speedometer light | | 1.7 | ← | ← |
| Turn signal indicator light | | 1.7 | ← | ← |
| High beam indicator light | | 1.7 | ← | ← |
| Neutral indicator light | | 1.7 | ← | ← |
| Oil pressure indicator light | | 1.7 | ← | ← |

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## BRAKE + WHEEL

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Rear brake pedal height | 55 (2.2) | | — |
| Brake disc thickness | Front | 4.5 ± 0.2 (0.177 ± 0.008) | 4.0 (0.16) |
| | Rear | 6.0 ± 0.2 (0.236 ± 0.008) | 5.5 (0.22) |
| Brake disc runout | — | | 0.30 (0.012) |
| Master cylinder bore | Front | 12.700 – 12.725 (0.5000 – 0.5010) | — |
| | Rear | 12.700 – 12.743 (0.5000 – 0.5017) | — |
| Master cylinder piston diam. | Front | 12.630 – 12.670 (0.4972 – 0.4988) | — |
| | Rear | 12.657 – 12.684 (0.4983 – 0.4994) | — |
| Brake caliper cylinder bore | Front | 30.230 – 30.306 (1.1902 – 1.1931) | — |
| | Rear | 38.180 – 38.256 (1.5031 – 1.5061) | — |
| Brake caliper piston diam. | Front | 30.150 – 30.200 (1.1870 – 1.1890) | — |
| | Rear | 38.098 – 38.148 (1.4999 – 1.5019) | — |
| Wheel rim runout | Axial | — | 2.0 (0.08) |
| | Radial | — | 2.0 (0.08) |
| Wheel axle runout | Front | — | 0.25 (0.010) |
| | Rear | — | 0.25 (0.010) |
| Wheel rim size | Front | 17 × MT3.00, 17M/C × MT3.00 | — |
| | Rear | 17 × MT3.50, 17M/C × MT3.50 | — |
| Tire size | Front | 110/70-17M/C 54H | — |
| | Rear | 130/70-17M/C 62H | — |
| Tire tread depth | Front | — | 1.6 (0.06) |
| | Rear | — | 2.0 (0.08) |

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## SUSPENSION

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Front fork stroke | 120<br>(4.7) | — |
| Front fork spring free length | 343<br>(13.5) | 336<br>(13.2) |
| Front fork oil level | 110<br>(4.3) | — |
| Front fork oil type | Fork oil #10 | — |
| Front fork oil capacity<br>(each leg) | 380 ml<br>(12.8/13.4 US/Imp oz) | — |
| Front fork inner tube O.D. | 36.9<br>(1.45) | — |
| Rear shock absorber spring adjuster | 4th position among 7 | — |
| Rear wheel travel | 115<br>(4.5) | — |
| Swingarm pivot shaft runout | — | 0.3<br>(0.01) |

## TIRE PRESSURE

| COLD INFLATION TIRE PRESSURE | SOLO RIDING | | | DUAL RIDING | | |
|---|---|---|---|---|---|---|
| | kPa | kgf/cm² | psi | kPa | kgf/cm² | psi |
| FRONT | 225 | 2.25 | 33 | 225 | 2.25 | 33 |
| REAR | 250 | 2.50 | 36 | 280 | 2.80 | 41 |

## FUEL + OIL

| ITEM | | SPECIFICATION | | NOTE |
|---|---|---|---|---|
| Fuel type | | Use only unleaded gasoline of at least 87 pump octane (R/2 + M/2) or 91 octaneor higher rated by the research method.<br>Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible. | | P-03, 28, 33 |
| | | Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended. | | Others |
| Fuel tank capacity | including reserve | 19 L<br>(5.0/4.2 US/Imp gal) | | P-33 |
| | | 20 L<br>(5.3/4.4 US/Imp gal) | | Others |
| | reserve | 4.3 L<br>(1.1/0.9 US/Imp gal) | | |
| Engine oil type | | * SAE 10W-40, API SF/SG or SH/SJ with JASO MA | | |
| Engine oil capacity | | Change | 2 600 ml<br>(2.7/2.3 US/Imp qt) | |
| | | Filter change | 2 900 ml<br>(3.1/2.6 US/Imp qt) | |
| | | Overhaul | 3 200 ml<br>(3.4/2.8 US/Imp qt) | |
| Brake fluid type | | DOT 4 | | |

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# GS500K6/UK6/FK6/FUK6 ('06-MODEL)

*This chapter describes specifications, service data and servicing procedures which differ from those of the GS500K5/UK5/FK5/FUK5 ('05-MODEL).*

*NOTE:*

** Any differences between the GS500K5/UK5/FK5/FUK5 ('05-MODEL) and GS500K6/UK6/FK6/FUK6 ('06-MODEL) in specifications and service data are indicated with an asterisk mark (*).*

** Please refer to the chapter 1 through 21 for details which are not given in this chapter.*

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# SPECIFICATIONS

**DIMENSIONS AND DRY MASS**

| | |
|---|---|
| Overall length | 2 080 mm (81.9 in) |
| Overall width | 800 mm (31.5 in) |
| Overall height | 1 060 mm (41.7 in) ..... GS500/U |
| | 1 150 mm (45.3 in) ..... GS500F/FU |
| Wheelbase | 1 405 mm (55.3 in) |
| Ground clearance | 150 mm (5.9 in) .....GS500/U |
| | 120 mm (4.7 in) .....GS500F/FU |
| Seat height | 790 mm (31.1 in) |
| Dry mass | 174 kg (383 lbs).....GS500/U |
| | 180 kg (396 lbs).....GS500F/FU |

**ENGINE**

| | |
|---|---|
| Type | Four-stroke, air-cooled, DOHC |
| Number of cylinders | 2 |
| Bore | 74.0 mm (2.913 in) |
| Stroke | 56.6 mm (2.228 in) |
| Displacement | 487 $cm^3$ (29.7 cu. in) |
| Compression ratio | 9.0 : 1 |
| Carburetor | BSR34, twin |
| Air cleaner | Non-woven fabric element |
| Starter system | Electric |
| Lubrication system | Wet sump |
| Idle speed | 1 200 ± 100 r/min |

**DRIVE TRAIN**

| | |
|---|---|
| Clutch | Wet multi-plate type |
| Transmission | 6-speed constant mesh |
| Gearshift pattern | 1-down, 5-up |
| Primary reduction ratio | 2.714 (76/28) |
| Gear ratios, Low | 2.461 (32/13) |
| 2nd | 1.777 (32/18) |
| 3rd | 1.380 (29/21) |
| 4th | 1.125 (27/24) |
| 5th | 0.961 (25/26) |
| Top | 0.851 (23/27) |
| Final reduction ratio | 2.437 (39/16) |
| Drive chain | D.I.D. 520VM, 110 links |

**CHASSIS**

| | |
|---|---|
| Front suspension | Telescopic, coil spring, oil damped |
| Rear suspension | Link type, coil spring, oil damped |
| Front suspension stroke | 120 mm (4.7 in) |
| Rear wheel travel | 115 mm (4.5 in) |
| Caster | 25° 05' |
| Trail | 97 mm (3.82 in) |
| Steering angle | 35° |
| Turning radius | 2.7 m (8.9 ft) |
| Front brake | Disc brake |
| Rear brake | Disc brake |
| Front tire size | 110/70-17M/C 54H, tubeless |
| Rear tire size | 130/70-17M/C 62H, tubeless |

**ELECTRICAL**

| | |
|---|---|
| Ignition type | Electronic ignition (transistorized) |
| Ignition timing | 5° B.T.D.C. at 1 200 r/min ..... P-03, 28, 33 |
| | 12° B.T.D.C. at 1 200 r/min ..... Others |
| Spark plug | NGK DPR8EA-9 or DENSO X24EPR-U9 |
| Battery | 12 V 39.6 kC (11 Ah)/10 HR |
| Generator | Three-phase A.C. generator |
| Fuse | 20 A |
| Headlight | 12 V 60/55 W |
| Position light | 12 V 4 W..... GS500/U ..... Except P-03, 24, 28, 33 |
| | 12 V 5 W..... GS500F/FU |
| Turn signal light | 12 V 21 W |
| Brake light/Taillight | 12 V 32/3 cp (× 2 pcs.) ..... P-03, 28, 33 |
| | 12 V 21/5 W (× 2 pcs.)..... Others |
| Speedometer light | 12 V 1.7 W |
| Tachometer light | 12 V 1.7 W |
| Neutral indicator light | 12 V 1.7 W |
| High beam indicator light | 12 V 1.7 W |
| Turn signal indicator light | 12 V 1.7 W |
| Oil pressure indicator light | 12 V 1.7 W |

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**CAPACITIES**

| | | | |
|---|---|---|---|
| Fuel tank, | including reserve | 19.0 L (5.0/4.2 US/Imp gal) | P-33 |
| | | 20.0 L (5.3/4.4 US/Imp gal) | Others |
| | reserve | 4.3 L (1.1/0.9 US/Imp gal) | |
| Engine oil, | oil change | 2 600 ml (2.7/2.3 US/Imp qt) | |
| | with filter change | 2 900 ml (3.1/2.6 US/Imp qt) | |
| | overhaul | 3 200 ml (3.4/2.8 US/Imp qt) | |

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# SERVICE DATA

## VALVE + GUIDE

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Valve diam. | IN. | 39<br>(1.5) | — |
| | EX. | 32<br>(1.3) | — |
| Valve lift | IN. | 8.5<br>(0.33) | — |
| | EX. | 8.0<br>(0.31) | — |
| Tappet clearance (when cold) | IN. & EX. | 0.03 – 0.08<br>(0.001 – 0.003) | — |
| Valve guide to valve stem clearance | IN. | 0.025 – 0.055<br>(0.0010 – 0.0022) | — |
| | EX. | 0.040 – 0.070<br>(0.0016 – 0.0028) | — |
| Valve stem deflection | IN. & EX. | — | 0.35<br>(0.014) |
| Valve guide I.D. | IN. & EX. | 7.000 – 7.015<br>(0.2756 – 0.2762) | — |
| Valve stem O.D. | IN. | 6.960 – 6.975<br>(0.2740 – 0.2746) | — |
| | EX. | 6.945 – 6.960<br>(0.2734 – 0.2740) | — |
| Valve stem runout | IN. & EX. | — | 0.05<br>(0.002) |
| Valve head thickness | IN. & EX. | — | 0.5<br>(0.02) |
| Valve seat width | IN. & EX. | 1.0 – 1.2<br>(0.04 – 0.05) | — |
| Valve head radial runout | IN. & EX. | — | 0.03<br>(0.001) |
| Valve spring free length (IN. & EX.) | INNER | — | 35.6<br>(1.40) |
| | OUTER | — | 40.6<br>(1.60) |
| Valve spring tension (IN. & EX.) | INNER | 107 – 123 N<br>(10.9 – 12.5 kgf, 24.0 – 27.6 lbs)<br>at length 31.0 mm (1.22 in) | — |
| | OUTER | 199 – 228 N<br>(20.3 – 23.3 kgf, 44.8 – 51.4 lbs)<br>at length 35.0 mm (1.38 in) | — |

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## CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Cam height | IN. | 36.090 – 36.130<br>(1.4208 – 1.4224) | 35.80<br>(1.409) |
| | EX. | 36.090 – 36.130<br>(1.4208 – 1.4224) | 35.80<br>(1.409) |
| Camshaft journal oil clearance | IN. & EX. | 0.032 – 0.066<br>(0.0013 – 0.0026) | 0.150<br>(0.0060) |
| Camshaft journal holder I.D. | IN. & EX. | 22.012 – 22.025<br>(0.8666 – 0.8671) | — |
| Camshaft journal O.D. | IN. & EX. | 21.959 – 21.980<br>(0.8645 – 0.8654) | — |
| Camshaft runout | IN. & EX. | — | 0.10<br>(0.004) |
| Cam chain pin (at arrow "3") | 18th pin | | — |
| Cylinder head distortion | — | | 0.10<br>(0.004) |

## CYLINDER + PISTON + PISTON RING

Unit: mm (in)

| ITEM | STANDARD | | | LIMIT |
|---|---|---|---|---|
| Compression pressure | 1 000 – 1 400 kPa<br>(10 – 14 kgf/cm$^2$, 142 – 199 psi) | | | 800 kPa<br>(8 kgf/cm$^2$, 144 psi) |
| Compression pressure difference | — | | | 200 kPa<br>(2 kgf/cm$^2$, 28 psi) |
| Piston to cylinder clearance | 0.050 – 0.060<br>(0.0020 – 0.0024) | | | 0.120<br>(0.0047) |
| Cylinder bore | 74.000 – 74.015<br>(2.9134 – 2.9140) | | | 74.080<br>(2.9165) |
| Piston diam. | 73.945 – 73.960<br>(2.9112 – 2.9118)<br>Measure at 15 mm (0.6 in) from the skirt end. | | | 73.880<br>(2.9087) |
| Cylinder distortion | — | | | 0.10<br>(0.004) |
| Piston ring free end gap | 1st | N | Approx. 7.0 (0.28) | 5.6<br>(0.22) |
| | 2nd | N | Approx. 11.0 (0.43) | 8.8<br>(0.35) |
| Piston ring end gap | 1st | | 0.10 – 0.25<br>(0.004 – 0.010) | 0.70<br>(0.028) |
| | 2nd | | 0.10 – 0.25<br>(0.004 – 0.010) | 0.70<br>(0.028) |
| Piston ring to groove clearance | 1st | | — | 0.180<br>(0.0071) |
| | 2nd | | — | 0.150<br>(0.0059) |

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| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Piston ring groove width | 1st | 1.21 – 1.23<br>(0.047 – 0.048) | — |
| | 2nd | 1.21 – 1.23<br>(0.047 – 0.048) | — |
| | Oil | 2.51 – 2.53<br>(0.099 – 0.100) | — |
| Piston ring thickness | 1st | 1.17 – 1.19<br>(0.046 – 0.047) | — |
| | 2nd | 1.17 – 1.19<br>(0.046 – 0.047) | — |
| Piston pin bore | 18.002 – 18.008<br>(0.7087 – 0.7090) | | 18.030<br>(0.7098) |
| Piston pin O.D. | 17.995 – 18.000<br>(0.7085 – 0.7087) | | 17.980<br>(0.7079) |

## CONROD + CRANKSHAFT + BALANCER

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Conrod small end I.D. | 18.006 – 18.014<br>(0.7089 – 0.7092) | 18.040<br>(0.7102) |
| Conrod big end side clearance | 0.1 – 0.2<br>(0.004 – 0.008) | 0.3<br>(0.012) |
| Conrod big end width | 22.95 – 23.00<br>(0.904 – 0.906) | — |
| Crank pin width | 23.10 – 23.15<br>(0.909 – 0.911) | — |
| Conrod big end oil clearance | 0.024 – 0.048<br>(0.0009 – 0.0019) | 0.080<br>(0.0031) |
| Crank pin O.D. | 33.976 – 34.000<br>(1.3376 – 1.3386) | — |
| Crankshaft journal oil clearance | 0.020 – 0.044<br>(0.0008 – 0.0017) | 0.080<br>(0.0031) |
| Crankshaft journal O.D. | 31.976 – 32.000<br>(1.2589 – 1.2598) | — |
| Crankshaft thrust bearing thickness | 2.950 – 2.975<br>(0.1161 – 0.1171) | 2.850<br>(0.1122) |
| Crankshaft runout | — | 0.05<br>(0.002) |
| Balancer journal oil clearance | 0.020 – 0.044<br>(0.0008 – 0.0017) | 0.080<br>(0.0031) |
| Balancer journal O.D. | 31.984 – 32.000<br>(1.2592 – 1.2598) | — |
| Balancer spring free length | — | 14.9<br>(0.59) |

## OIL PUMP

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Oil pump reduction ratio | 1.879 (76/28 × 27/39) | — |
| Oil pressure (at 60 °C, 140 °F) | Above 200 kPa (2.0 kgf/cm$^2$, 28 psi)<br>Below 500 kPa (5.0 kgf/cm$^2$, 71 psi)<br>at 3 000 r/min | — |

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## CLUTCH

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Clutch lever play | 10 – 15<br>(0.4 – 0.6) | — |
| Clutch release screw | 1/4 – 1/2 turn back | — |
| Drive plate thickness | 2.92 – 3.08<br>(0.115 – 0.121) | 2.62<br>(0.103) |
| Drive plate claw width | 15.8 – 16.0<br>(0.62 – 0.63) | 15.0<br>(0.59) |
| Driven plate distortion | — | 0.10<br>(0.004) |
| Clutch spring free length | — | 60.8<br>(2.39) |

## TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

| ITEM | | STANDARD | | LIMIT |
|---|---|---|---|---|
| Primary reduction ratio | | 2.714 (76/28) | | — |
| Final reduction ratio | | 2.437 (39/16) | | — |
| Gear ratios | Low | 2.461 (32/13) | | — |
| | 2nd | 1.777 (32/18) | | — |
| | 3rd | 1.380 (29/21) | | — |
| | 4th | 1.125 (27/24) | | — |
| | 5th | 0.961 (25/26) | | — |
| | Top | 0.851 (23/27) | | — |
| Shift fork to groove clearance | | 0.1 – 0.3<br>(0.004 – 0.012) | | 0.5<br>(0.020) |
| Shift fork groove width | | No.1, No.2 & No.3 | 5.5 – 5.6<br>(0.217 – 0.220) | — |
| Shift fork thickness | | No.1, No.2 & No.3 | 5.3 – 5.4<br>(0.209 – 0.213) | — |
| Countershaft length<br>(Low to 2nd) | | $114.7\ ^{+0.1}_{-0}$<br>$(4.516\ ^{+0.004}_{-0})$ | | — |
| Drive chain | | Type | D.I.D.: DID520VM | — |
| | | Links | 110 | — |
| | | 20-pitch length | — | 319.4<br>(12.57) |
| Drive chain slack | | 20 – 30<br>(0.8 – 1.2) | | — |

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## CARBURETOR

| ITEM | | SPECIFICATION | |
|---|---|---|---|
| | | GS500 P-02, 19, 24, 54<br>GS500F P-02, 19, 24, 54 | GS500U P-19<br>GS500FU P-19 |
| Carburetor type | | MIKUNI<br>BSR34 | ← |
| Bore size | | 34 mm | ← |
| I.D. No. | | 01DN | 01DP |
| Idle r/min | | 1 200 ± 100 r/min | ← |
| Float height | | 13.0 ± 1.0 mm | ← |
| Main jet | (M.J.) | #130 | #135 |
| Jet needle | (J.N.) | 5DH57-3rd | ← |
| Needle jet | (N.J.) | P-5M | ← |
| Throttle valve | (Th.V.) | #105 | ← |
| Pilot jet | (P.J.) | #17.5 | ← |
| Pilot screw | (P.S.) | 3 turns back | ← |
| Throttle cable play | | 2.0 – 4.0 mm<br>(0.08 – 0.16 in) | ← |

| ITEM | | SPECIFICATION | | |
|---|---|---|---|---|
| | | GS500 P-09 | GS500 P-28<br>GS500F P-03, 28 | GS500F P-33 |
| Carburetor type | | MIKUNI<br>BSR34 | ← | ← |
| Bore size | | 34 mm | ← | ← |
| I.D. No. | | 01DS | * 01DQ | 01DU |
| Idle r/min | | 1 200 ± 100 r/min | ← | ← |
| Float height | | 13.0 ± 1.0 mm | ← | ← |
| Main jet | (M.J.) | # 130 | ← | ← |
| Jet needle | (J.N.) | 5DH59 | * 5DH60 | ← |
| Needle jet | (N.J.) | P-5M | ← | ← |
| Throttle valve | (Th.V.) | #105 | ← | ← |
| Pilot jet | (P.J.) | #17.5 | ← | ← |
| Pilot screw | (P.S.) | PRE-SET<br>(3 turns back) | PRE-SET | ← |
| Throttle cable play | | 2.0 – 4.0 mm<br>(0.08 – 0.16 in) | ← | ← |

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## ELECTRICAL

Unit: mm (in)

| ITEM | | SPECIFICATION | | NOTE |
|---|---|---|---|---|
| Ignition timing | | 5° B.T.D.C. at 1 200 r/min | | P-03, 28, 33 |
| | | 12° B.T.D.C. at 1 200 r/min | | Others |
| Firing order | | L·R | | |
| Spark plug | | Type | DENSO: X24EPR-U9<br>NGK: DPR8EA-9 | |
| | | Gap | 0.8 – 0.9<br>(0.031 – 0.035) | |
| Spark performance | | Over 8 (0.3) at 1 atm. | | |
| Signal generator resistance | | 250 – 420 Ω | | |
| Ignition coil resistance | | Primary | 3 – 6 Ω | Terminal – Terminal |
| | | Secondary | 18 – 30 kΩ | Plug cap – Terminal |
| Signal generator peak voltage | | 1.8 V and more | | ⊕ Probe: Br<br>⊖ Probe: B/Bl |
| Ignition coil primary peak voltage | | 100 V and more | | ⊕ Probe: W or B/Y<br>⊖ Probe: Ground |
| Generator Max. output | | Approx. 200 W at 5 000 r/min | | |
| Generator no-load voltage | | More than 75 V (AC) at 5 000 r/min | | |
| Regulated voltage | | 13.5 – 15.5 V at 5 000 r/min | | |
| Starter relay resistance | | 3 – 5 Ω | | |
| Battery | Type designation | CB10L-B2 | | |
| | Capacity | 12 V 39.6 kC (11 Ah)/10 HR | | |
| | Standard electrolyte S.G. | 1.28 at 20 °C (68 °F) | | |
| Fuse size | | 20 A | | |

## WATTAGE

Unit: W

| ITEM | | SPECIFICATION | | |
|---|---|---|---|---|
| | | GS500/U<br>P-02, 09, 19, 24, 54 | GS500F/FU<br>P-02, 19, 24, 54 | P-03, 28, 33 |
| Headlight | HI | 60 | ← | ← |
| | LO | 55 | ← | ← |
| Position light | | 4 | 5 | ← |
| Brake light/Taillight | | 21/5 | ← | 32/3 cp |
| Turn signal light | | 21 | ← | ← |
| Tachometer light | | 1.7 | ← | ← |
| Speedometer light | | 1.7 | ← | ← |
| Turn signal indicator light | | 1.7 | ← | ← |
| High beam indicator light | | 1.7 | ← | ← |
| Neutral indicator light | | 1.7 | ← | ← |
| Oil pressure indicator light | | 1.7 | ← | ← |

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## BRAKE + WHEEL

Unit: mm (in)

| ITEM | STANDARD | | LIMIT |
|---|---|---|---|
| Rear brake pedal height | 55 (2.2) | | — |
| Brake disc thickness | Front | 4.5 ± 0.2 (0.177 ± 0.008) | 4.0 (0.16) |
| | Rear | 6.0 ± 0.2 (0.236 ± 0.008) | 5.5 (0.22) |
| Brake disc runout | — | | 0.30 (0.012) |
| Master cylinder bore | Front | 12.700 – 12.725 (0.5000 – 0.5010) | — |
| | Rear | 12.700 – 12.743 (0.5000 – 0.5017) | — |
| Master cylinder piston diam. | Front | 12.630 – 12.670 (0.4972 – 0.4988) | — |
| | Rear | 12.657 – 12.684 (0.4983 – 0.4994) | — |
| Brake caliper cylinder bore | Front | 30.230 – 30.306 (1.1902 – 1.1931) | — |
| | Rear | 38.180 – 38.256 (1.5031 – 1.5061) | — |
| Brake caliper piston diam. | Front | 30.150 – 30.200 (1.1870 – 1.1890) | — |
| | Rear | 38.098 – 38.148 (1.4999 – 1.5019) | — |
| Wheel rim runout | Axial | — | 2.0 (0.08) |
| | Radial | — | 2.0 (0.08) |
| Wheel axle runout | Front | — | 0.25 (0.010) |
| | Rear | — | 0.25 (0.010) |
| Wheel rim size | Front | 17 × MT3.00, 17M/C × MT3.00 | — |
| | Rear | 17 × MT3.50, 17M/C × MT3.50 | — |
| Tire size | Front | 110/70-17M/C 54H | — |
| | Rear | 130/70-17M/C 62H | — |
| Tire tread depth | Front | — | 1.6 (0.06) |
| | Rear | — | 2.0 (0.08) |

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## SUSPENSION

Unit: mm (in)

| ITEM | STANDARD | LIMIT |
|---|---|---|
| Front fork stroke | 120<br>(4.7) | — |
| Front fork spring free length | 343<br>(13.5) | 336<br>(13.2) |
| Front fork oil level | 110<br>(4.3) | — |
| Front fork oil type | Fork oil #10 | — |
| Front fork oil capacity<br>(each leg) | 380 ml<br>(12.8/13.4 US/Imp oz) | — |
| Front fork inner tube O.D. | 36.9<br>(1.45) | — |
| Rear shock absorber spring adjuster | 4th position among 7 | — |
| Rear wheel travel | 115<br>(4.5) | — |
| Swingarm pivot shaft runout | — | 0.3<br>(0.01) |

## TIRE PRESSURE

| COLD INFLATION TIRE PRESSURE | SOLO RIDING | | | DUAL RIDING | | |
|---|---|---|---|---|---|---|
| | kPa | kgf/cm² | psi | kPa | kgf/cm² | psi |
| FRONT | 225 | 2.25 | 33 | 225 | 2.25 | 33 |
| REAR | 250 | 2.50 | 36 | 280 | 2.80 | 41 |

## FUEL + OIL

| ITEM | | SPECIFICATION | | NOTE |
|---|---|---|---|---|
| Fuel type | | Use only unleaded gasoline of at least 87 pump octane (R/2 + M/2) or 91 octaneor higher rated by the research method.<br>Gasoline containing MTBE (Methyl Tertiary Butyl Ether), less than 10% ethanol, or less than 5% methanol with appropriate cosolvents and corrosion inhibitor is permissible. | | P-03, 28, 33 |
| | | Gasoline used should be graded 91 octane or higher. An unleaded gasoline is recommended. | | Others |
| Fuel tank capacity | including reserve | 19 L<br>(5.0/4.2 US/Imp gal) | | P-33 |
| | | 20 L<br>(5.3/4.4 US/Imp gal) | | Others |
| | reserve | 4.3 L<br>(1.1/0.9 US/Imp gal) | | |
| Engine oil type | | SAE 10W-40, API SF/SG or SH/SJ with JASO MA | | |
| Engine oil capacity | | Change | 2 600 ml<br>(2.7/2.3 US/Imp qt) | |
| | | Filter change | 2 900 ml<br>(3.1/2.6 US/Imp qt) | |
| | | Overhaul | 3 200 ml<br>(3.4/2.8 US/Imp qt) | |
| Brake fluid type | | DOT 4 | | |

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# STARTER BUTTON

| Color / Position | O/W | Y/G | O/R | Y/W |
|---|---|---|---|---|
| • | | | ○——— | ———○ |
| PUSH | ○——— | ———○ | | |

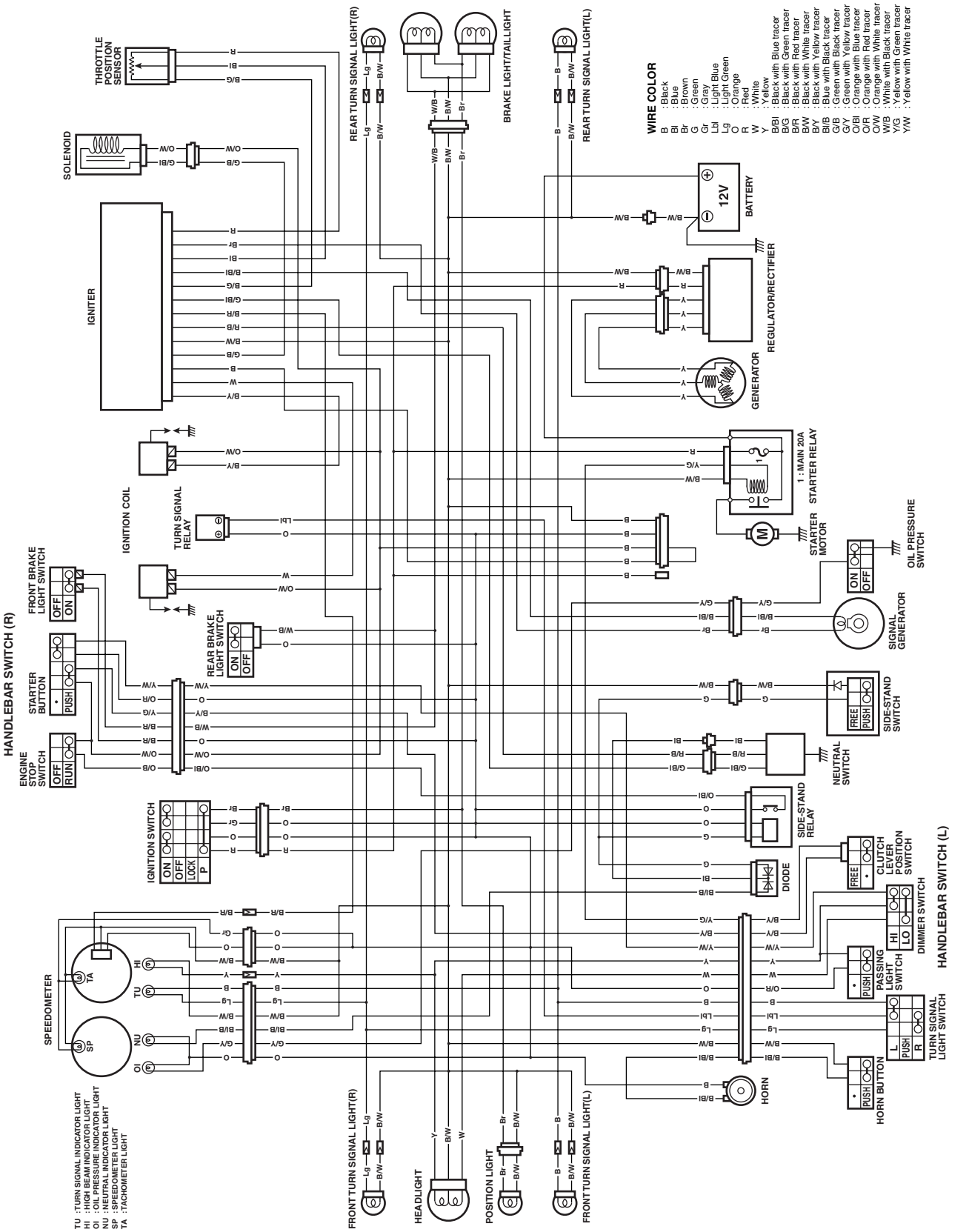
## WIRE COLOR

**O/R : Orange with Red tracer**
**O/W : Orange with White tracer**
**Y/G : Yellow with Green tracer**
**Y/W : Yellow with White tracer**

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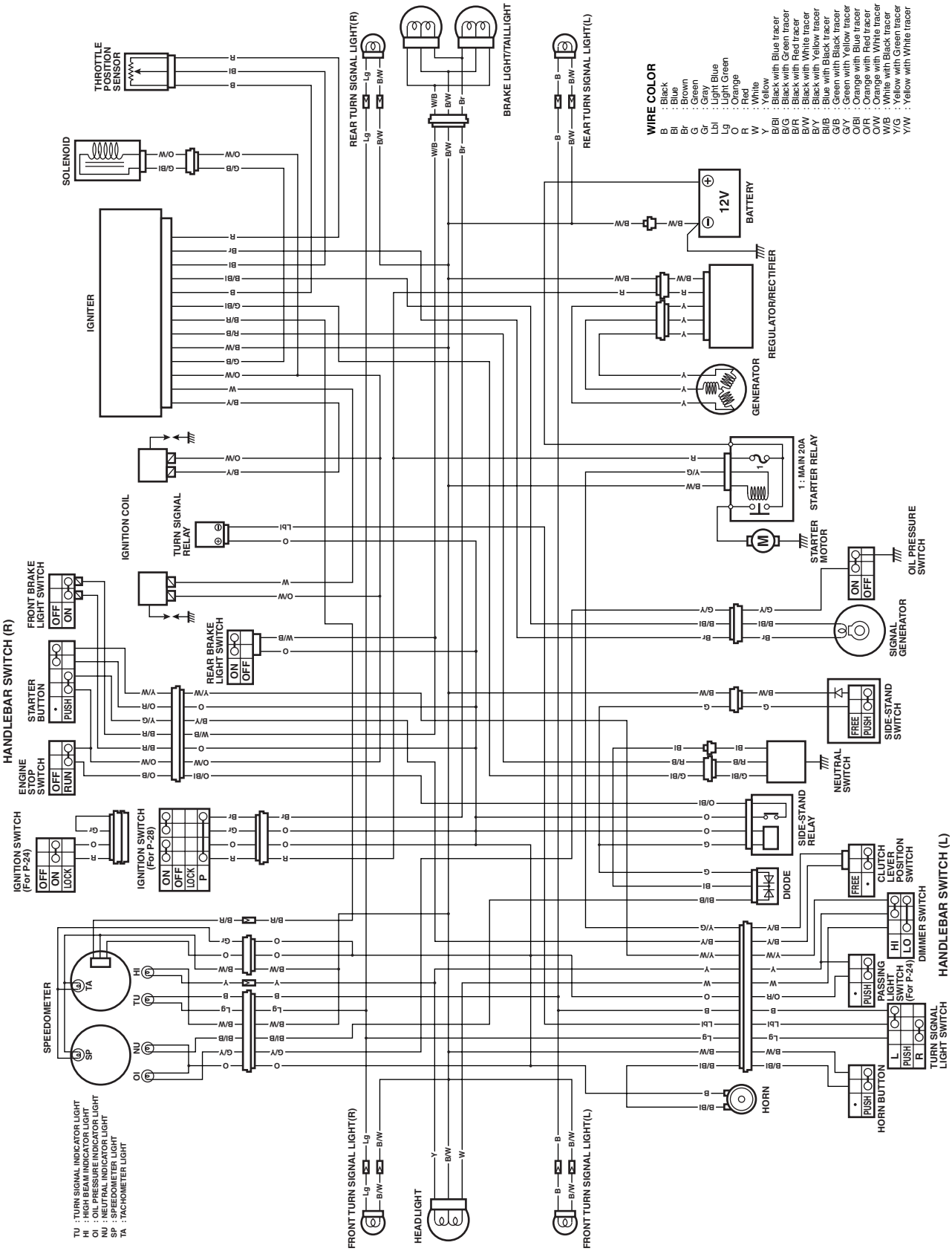
# WIRING DIAGRAM

## GS500K6/FK6
## (For P-02, 09, 19, 54)



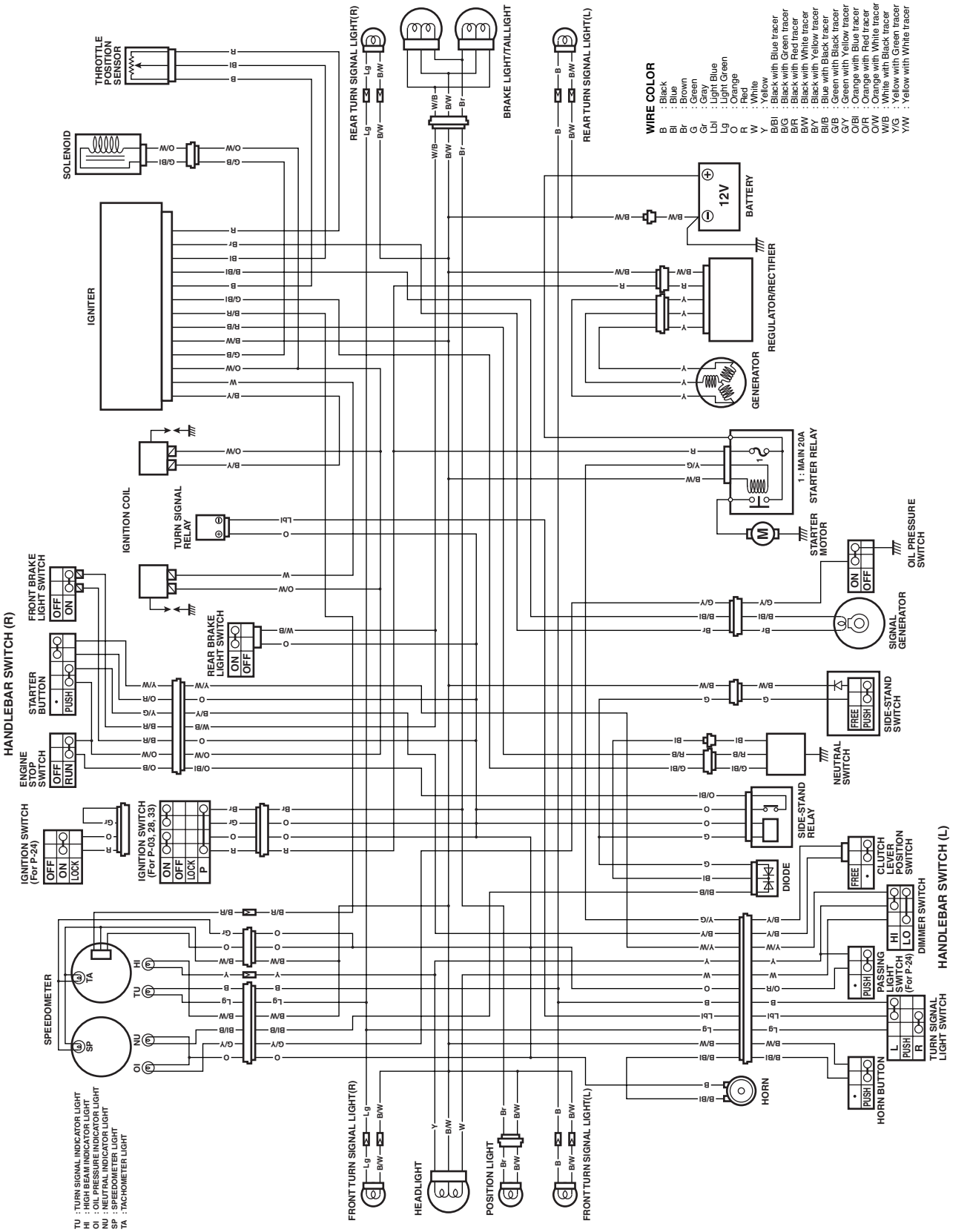

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# GS500K6
# (For P-24, 28)




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# GS500FK6
# (For P-03, 24, 28, 33)




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