



# **XVS650**

## **2001**

**4VR-AE3**

# **SUPPLEMENTARY SERVICE MANUAL**







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## FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and data for the XVS650 2001. For complete service information procedures it is necessary to use this Supplementary Service Manual together with the following manual.

|  |
|--|
| <p><b>XVS650 '97 SERVICE MANUAL: 4VR-AE1</b><br/><b>XVS650 '97 SUPPLEMENTARY SERVICE MANUAL: 4VR-AE2</b></p> |
|--|

|   |
|---|
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## NOTICE

This manual was produced by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual, so it is assumed that anyone who uses this book to perform maintenance and repairs on Yamaha motorcycles has a basic understanding of the mechanical ideas and the procedures of motorcycle repair. Repairs attempted by anyone without this knowledge are likely to render the motorcycle unsafe and unfit for use.

Yamaha Motor Company, Ltd. is continually striving to improve all its models. Modifications and significant changes in specifications or procedures will be forwarded to all authorized Yamaha dealers and will appear in future editions of this manual where applicable.

**NOTE:** 

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Designs and specifications are subject to change without notice.

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## IMPORTANT INFORMATION

Particularly important information is distinguished in this manual by the following notations.



The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



Failure to follow WARNING instructions could result in severe injury or death to the motorcycle operator, a bystander or a person inspecting or repairing the motorcycle.

**CAUTION:**

A CAUTION indicates special precautions that must be taken to avoid damage to the motorcycle.

**NOTE:**

A NOTE provides key information to make procedures easier or clearer.



# HOW TO USE THIS MANUAL

## MANUAL ORGANIZATION

This manual consists of chapters for the main categories of subjects. (See “Illustrated symbols”)

- 1st title ①: This is the title of the chapter with its symbol in the upper right corner of each page.
- 2nd title ②: This title indicates the section of the chapter and only appears on the first page of each section. It is located in the upper left corner of the page.
- 3rd title ③: This title indicates a sub-section that is followed by step-by-step procedures accompanied by corresponding illustrations.

## EXPLODED DIAGRAMS

To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

1. An easy-to-see exploded diagram ④ is provided for removal and disassembly jobs.
2. Numbers ⑤ are given in the order of the jobs in the exploded diagram. A number that is enclosed by a circle indicates a disassembly step.
3. An explanation of jobs and notes is presented in an easy-to-read way by the use of symbol marks ⑥. The meanings of the symbol marks are given on the next page.
4. A job instruction chart ⑦ accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.
5. For jobs requiring more information, the step-by-step format supplements ⑧ are given in addition to the exploded diagram and the job instruction chart.

② CLUTCH      ① ENG      ⑥

**CLUTCH**  
CRANKCASE COVER (RIGHT)

⑤

④

⑦

| Order | Job name/Part name                     | Q'ty | Remarks  |
|-------|--|------|--|
|       | <b>Crankcase cover (right) removal</b> |      | Remove the parts in the order below.<br>Stand the motorcycle on a level surface.<br><b>WARNING</b><br>Securely support the motorcycle so there is no danger of it falling over.<br>Refer to "ENGINE OIL REPLACEMENT" in CHAPTER 3. |
|       | Engine oil                             |      | Refer to "ENGINE REMOVAL".   |
|       | Muffler assembly 1,2                   |      |  |
|       | Brake pedal link                       |      |  |
| 1     | Oil filter cover plate                 | 1    |  |
| 2     | Oil filter cover                       | 1    | L=70 mm × 1, 65 mm × 1, 25 mm × 3  |
| 3     | O-ring                                 | 1    |  |
| 4     | Oil filter                             | 1    |  |
| 5     | Crankcase cover (right)                | 1    | L=65 mm × 1, 55 mm × 1, 45 mm × 4, 30 mm × 4   |

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CLUTCH      ENG      ③

**CLUTCH REMOVAL**

1. Straighten:  
• Lock washer tab

2. Loosen:  
• Nut (clutch boss) ①

**NOTE:**  
Loosen the nut (clutch boss) ① while holding the clutch boss ② with the clutch holding tool ③.

**PRIMARY DRIVE GEAR REMOVAL**

1. Straighten:  
• Lock washer tab

2. Loosen:  
• Nut (primary drive gear) ①

**NOTE:**  
Place a copper plate ② between the teeth of the primary drive gear ③ and primary driven gear to lock them.

**CLUTCH INSPECTION**

1. Inspect:  
• Friction plates  
Wear/damage → Replace the friction plates as a set.







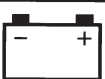
















2. Measure:  
• Friction plate thickness  
Out of specification → Replace the friction plates as a set.  
Measure at four places.

3. Inspect:  
• Clutch plate  
Damage → Replace the clutch plates as a set.

4. Measure:  
• Clutch plate warpage  
Out of specification → Replace the clutch plates as a set.  
Use a surface plate and a feeler gauge ①.

4-38



|  |   |   |
|--|---|---|
| ①<br>GEN<br>INFO  | ②<br>SPEC          |   |
| ③<br>INSP<br>ADJ  | ④<br>ENG           |   |
| ⑤<br>CARB         | ⑥<br>CHAS          |   |
| ⑦<br>ELEC         | ⑧<br>TRBL<br>SHTG  |   |
| ⑨                | ⑩                 |   |
| ⑪               | ⑫                |   |
| ⑬               | ⑭                |   |
| ⑮               | ⑯                |   |
| ⑰               | ⑱                | ⑲  |
| ⑳               | ㉑                | ㉒  |
| ㉓               | ㉔<br>New  |   |

EAS0009

## SYMBOLS

The following symbols are not relevant to every vehicle.

Symbols ① to ⑧ indicate the subject of each chapter.

- ① General information
- ② Specifications
- ③ Periodic checks and adjustments
- ④ Engine
- ⑤ Carburetor(-s)
- ⑥ Chassis
- ⑦ Electrical system
- ⑧ Troubleshooting

Symbols ⑨ to ⑯ indicate the following.

- ⑨ Serviceable with engine mounted
- ⑩ Filling fluid
- ⑪ Lubricant
- ⑫ Special tool
- ⑬ Tightening torque
- ⑭ Wear limit, clearance
- ⑮ Engine speed
- ⑯ Electrical data

Symbols ⑰ to ㉒ in the exploded diagrams indicate the types of lubricants and lubrication points.

- ⑰ Engine oil
- ⑱ Gear oil
- ⑲ Molybdenum disulfide oil
- ㉑ Wheel bearing grease
- ㉒ Lithium soap base grease
- ㉓ Molybdenum disulfide grease

Symbols ㉓ to ㉔ in the exploded diagrams indicate the following:

- ㉓ Apply locking agent (LOCTITE®)
- ㉔ Replace the part



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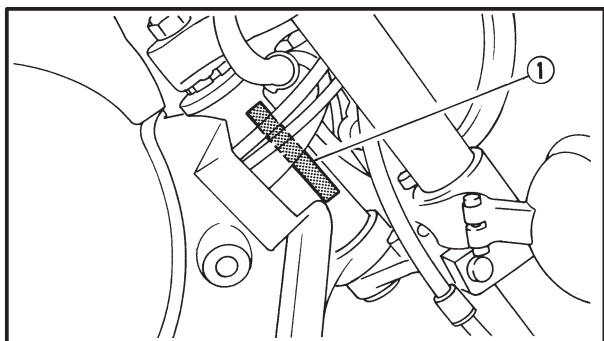
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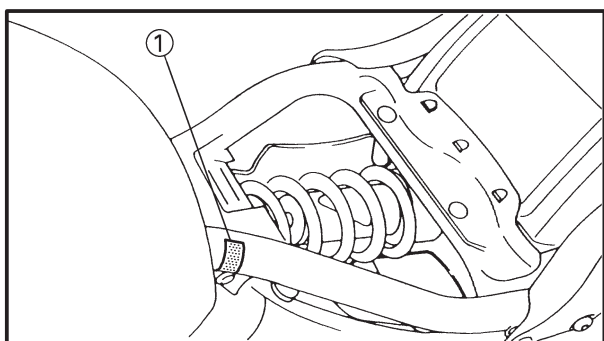
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### GENERAL INFORMATION MOTORCYCLE IDENTIFICATION

EB100010

#### VEHICLE IDENTIFICATION NUMBER

The vehicle identification number ① is stamped into the right side of the steering head.



#### MODEL LABEL

The model label ① is affixed to the frame. This information will be needed to order spare parts.





## SPECIFICATIONS

### GENERAL SPECIFICATIONS

| Item   | Standard           |
|--|--------------------|
| Model code:                                    | XVS650: 4VRD, 4XRD |
| Basic weight:<br>With oil and a full fuel tank | 233 kg             |
| Bulb wattage × quantity:                       |                    |
| Headlight                                      | 12 V 60 W/55 W × 1 |
| Tail/brake light                               | 12 V 5 W/21 W × 1  |
| Auxiliary light                                | 12 V 4W × 1        |
| Turn signal light                              | 12 V 21 W × 4      |
| Meter light                                    | 12 V 1.7 W × 1     |
| Neutral indicator light                        | 12 V 1.7 W × 1     |
| High beam indicator light                      | 12 V 1.7 W × 1     |
| Turn indicator light                           | 12 V 1.7 W × 1     |
| Engine indicator light                         | 12 V 1.7 W × 1     |





# MAINTENANCE SPECIFICATIONS

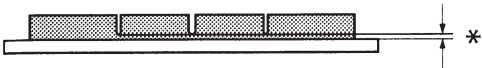
## ENGINE

| Item                            | Standard                                      | Limit |
|---------------------------------|---|-------|
| Connecting rod:                 |   |       |
| Oil clearance                   | 0.031 ~ 0.055 mm                              | ...   |
| Color code (corresponding size) | ① Blue ② Black ③ Brown ④ Green                | ...   |
| Carburetor:                     |   |       |
| I.D. mark                       | 5BN5 20 (4XRD)                                | ...   |
|                                 | 5BN8 30 (4VRD)                                | ...   |
| Main jet (M.J)                  | #90   | ...   |
| Main air jet (M.A.J)            | #50   | ...   |
| Jet needle (J.N)                | 4CT2-2  | ...   |
| Needle jet (N.J)                | O-4   | ...   |
| Pilot air jet (P.A.J.1)         | #100  | ...   |
| Pilot outlet (P.O)              | 0.85  | ...   |
| Pilot jet (P.J)                 | #20   | ...   |
| Bypass 1 (B.P.1)                | 0.8   | ...   |
| Bypass 2 (B.P.2)                | 0.8   | ...   |
| Bypass 3 (B.P.3)                | 0.8   | ...   |
| Pilot screw (P.S)               | 2-1/2   | ...   |
| Valve seat size (V.S)           | 1.0   | ...   |
| Starter jet (G.S.1)             | #17.5   | ...   |
| Starter jet (G.S.2)             | 0.9   | ...   |
| Throttle valve size (Th.V)      | #140  | ...   |
| Fuel level (F.L)                | 7.5 ~ 8.5 mm                                  | ...   |
| Engine idle speed               | 1,150 ~ 1,250 r/min                           | ...   |
| Intake vacuum                   | 29.0 kPa (0.29 kg/cm <sup>2</sup> , 220 mmHg) | ...   |
| CO%                             | 3 ~ 4%  | ...   |
| Engine oil temperature          | 80 ~ 90°C                                     | ...   |





### CHASSIS

| Item  | Standard                   | Limit  |
|---|----------------------------|--------|
| Front suspension:   |                            |        |
| Front fork travel   | 140 mm                     | ...    |
| Fork spring free length   | 303 mm                     | 292 mm |
| Installed length  | 258 mm                     | ...    |
| Spring rate (K1)  | 3.5 N/mm (0.35 kg/mm)      | ...    |
| Stroke (K1)   | 0 ~ 140 mm                 | ...    |
| Optional spring   | No                         | ...    |
| Oil capacity  | 0.462 L                    | ...    |
| Oil level   | 110 mm                     | ...    |
| Oil grade   | Fork oil 10W or equivalent | ...    |
| Front brake:  |                            |        |
| Type  | Single disk                | ...    |
| Disc outside diameter × thickness   | 298 × 5 mm                 | 4.5 mm |
| Pad thickness inner   | 6.0 mm                     | 0.8 mm |
| Pad thickness outer   | 6.0 mm                     | 0.8 mm |
|  |                            |        |
| Master cylinder inside diameter   | 14.0 mm                    | ...    |
| Caliper cylinder inside diameter  | 30.2 mm                    | ...    |
| Caliper cylinder inside diameter  | 33.3 mm                    | ...    |
| Brake fluid type  | DOT 4                      | ...    |





### ELECTRICAL

| Item                           | Standard                                | Limit |
|--------------------------------|---|-------|
| T.C.I.:                        |   |       |
| Pickup coil resistance/color   | 182 ~ 222 $\Omega$ at 20°C/Gray – Black | ...   |
| T.C.I. unit model/manufacturer | J4T097/MITSUBISHI                       | ...   |
| Ignition coil:                 |   |       |
| Model/manufacturer             | F6T541/MITSUBISHI                       | ...   |
| Minimum spark gap              | 6 mm                                    | ...   |
| Primary winding resistance     | 3.6 ~ 4.8 $\Omega$ at 20°C              | ...   |
| Secondary winding resistance   | 10.7 ~ 14.5 k $\Omega$ at 20°C          | ...   |
| Voltage regulator:             |   |       |
| Type                           | Semi-conductor, short-circuit type      | ...   |
| Model/manufacturer             | SH650C-11/SHINDENGEN                    | ...   |
| No load regulated voltage      | 14.1 ~ 14.9 V                           | ...   |
| Rectifier:                     |   |       |
| Model/manufacturer             | SH650C-11/SHINDENGEN                    | ...   |
| Capacity                       | 18 A                                    | ...   |
| Withstand voltage              | 200 V                                   | ...   |
| Electric starter system:       |   |       |
| Type                           | Constant mesh type                      | ...   |
| Starter motor:                 |   |       |
| Model/manufacturer             | SM-13/MITSUBA                           | ...   |
| I.D. number                    | SM-13                                   | ...   |
| Output                         | 0.7 kW                                  | ...   |
| Brush overall length           | 10 mm                                   | 4 mm  |
| Commutator diameter            | 28 mm                                   | 27 mm |
| Mica undercut                  | 0.7 mm                                  | ...   |
| Starter relay:                 |   |       |
| Model/manufacturer             | MS-5F-441/JIDECO                        | ...   |
| Amperage rating                | 180 A                                   | ...   |
| Flasher relay:                 |   |       |
| Type                           | Full transistor type                    | ...   |
| Model/manufacturer             | FE246BH/DENSO                           | ...   |
| Self cancelling device         | No                                      | ...   |
| Flasher frequency              | 75 ~ 95 cycle/min                       | ...   |
| Wattage                        | 21 W $\times$ 2 + 3.4 W                 | ...   |
| Fuel pump relay:               |   |       |
| Model/manufacturer             | G8R-30Y-Q/OMRON                         | ...   |



# MAINTENANCE SPECIFICATIONS

**SPEC**



| Item                            | Standard | Limit |
|---------------------------------|----------|-------|
| Circuit breaker:                |          |       |
| Type                            | Fuse     | ...   |
| Amperage for individual circuit |          |       |
| MAIN                            | 30 A × 1 | ...   |
| HEADLIGHT                       | 15 A × 1 | ...   |
| SIGNALS                         | 10 A × 1 | ...   |
| IGNITION                        | 10 A × 1 | ...   |
| CARBURETOR HEATER               | 15 A × 1 | ...   |
| Reserve                         | 30 A × 1 | ...   |
| Reserve                         | 15 A × 1 | ...   |
| Reserve                         | 10 A × 1 | ...   |



## LUBRICATION POINTS AND LUBRICANT TYPES

**SPEC**



EB203000

### LUBRICATION POINTS AND LUBRICANT TYPES ENGINE

| Lubrication point   | Symbol |
|---------------------|--------|
| Crankshaft journal  |        |
| Camshaft cam lobe   |        |
| Primary driven gear |        |





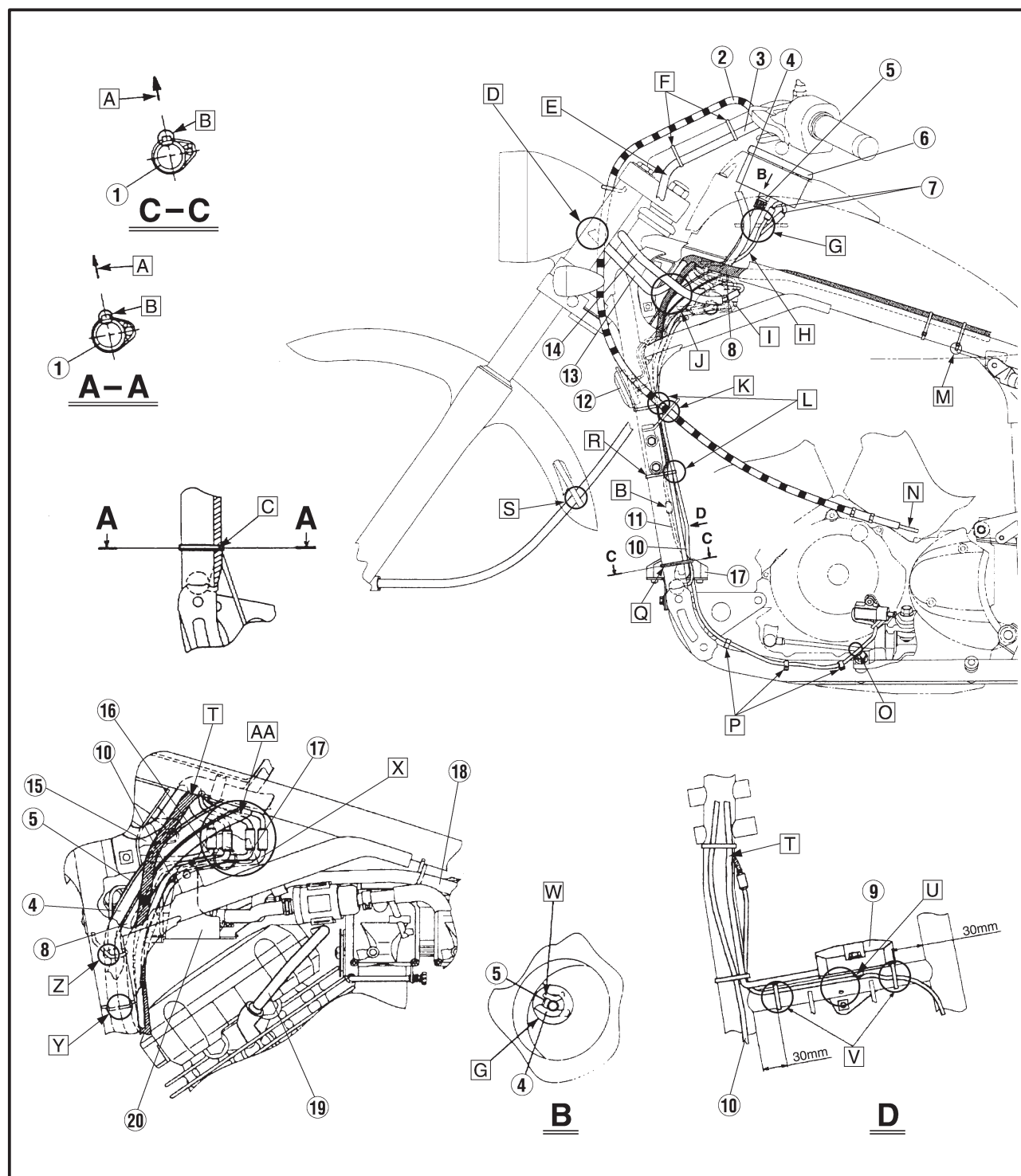
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## CABLE ROUTING

- ① Frame
- ② Clutch cable
- ③ Left handlebar switch lead
- ④ Fuel tank breather hose
- ⑤ Speedometer cable
- ⑥ Speedometer
- ⑦ Speedometer light leads
- ⑧ Vacuum chamber air vent hose
- ⑨ Rectifier/regulator

- ⑩ Sidestand switch lead
- ⑪ Rear brake switch lead
- ⑫ Horn
- ⑬ Headlight lead
- ⑭ Right handlebar switch lead
- ⑮ Main switch
- ⑯ Main switch lead
- ⑰ Fuel pump lead
- ⑱ Fuel hose

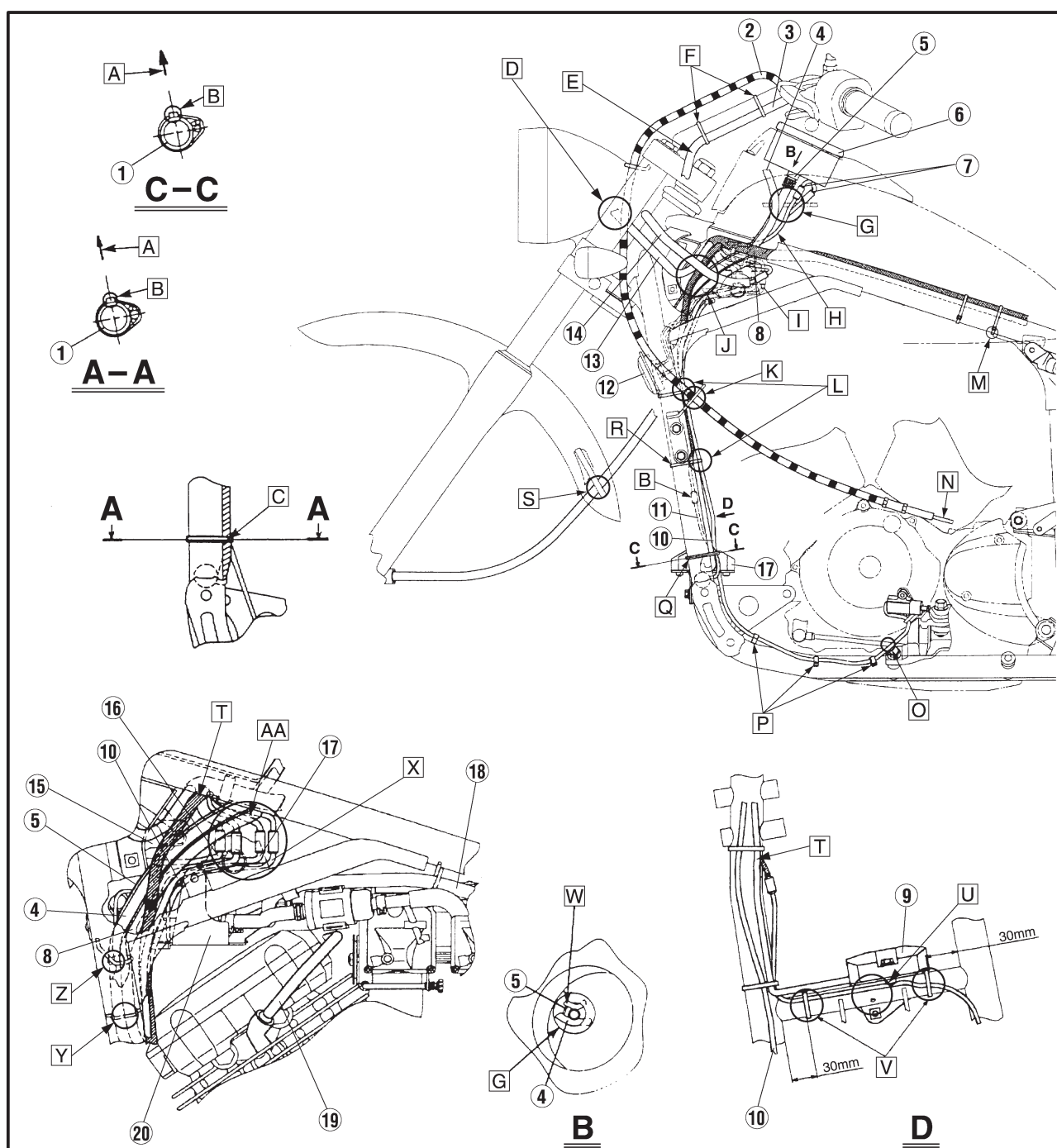
- ⑲ Spark plug lead
- ⑳ Fuel pump







- A** Inside the motorcycle.
- B** Place the end of the plastic locking tie as shown.
- C** Fasten the rear brake switch lead, sidestand switch lead and rectifier/regulator lead with metal clamp or plastic locking tie.
- D** Pass the front flasher light leads (left and right) and headlight lead through the headlight cover hole.
- E** Pass the left handlebar switch lead behind the upper bracket.
- F** Fasten the left handlebar switch lead with a plastic locking tie.
- G** Pass the speedometer cable, speedometer light leads and fuel tank breather hose through the fuel tank hole.
- H** To the speedometer light leads.
- I** Rectifier/regulator lead should not be out over the bracket.
- J** Pass the right handlebar switch lead and headlight lead over the other harness and leads.
- K** Pass the clutch cable through the cable guide.
- L** Fasten the sidestand switch lead and rectifier/regulator lead with a plastic locking tie.
- M** Install the plastic locking tie so that it is up against the frame projection.
- N** To the engine.
- O** The sidestand switch lead should not touch the shift rod.



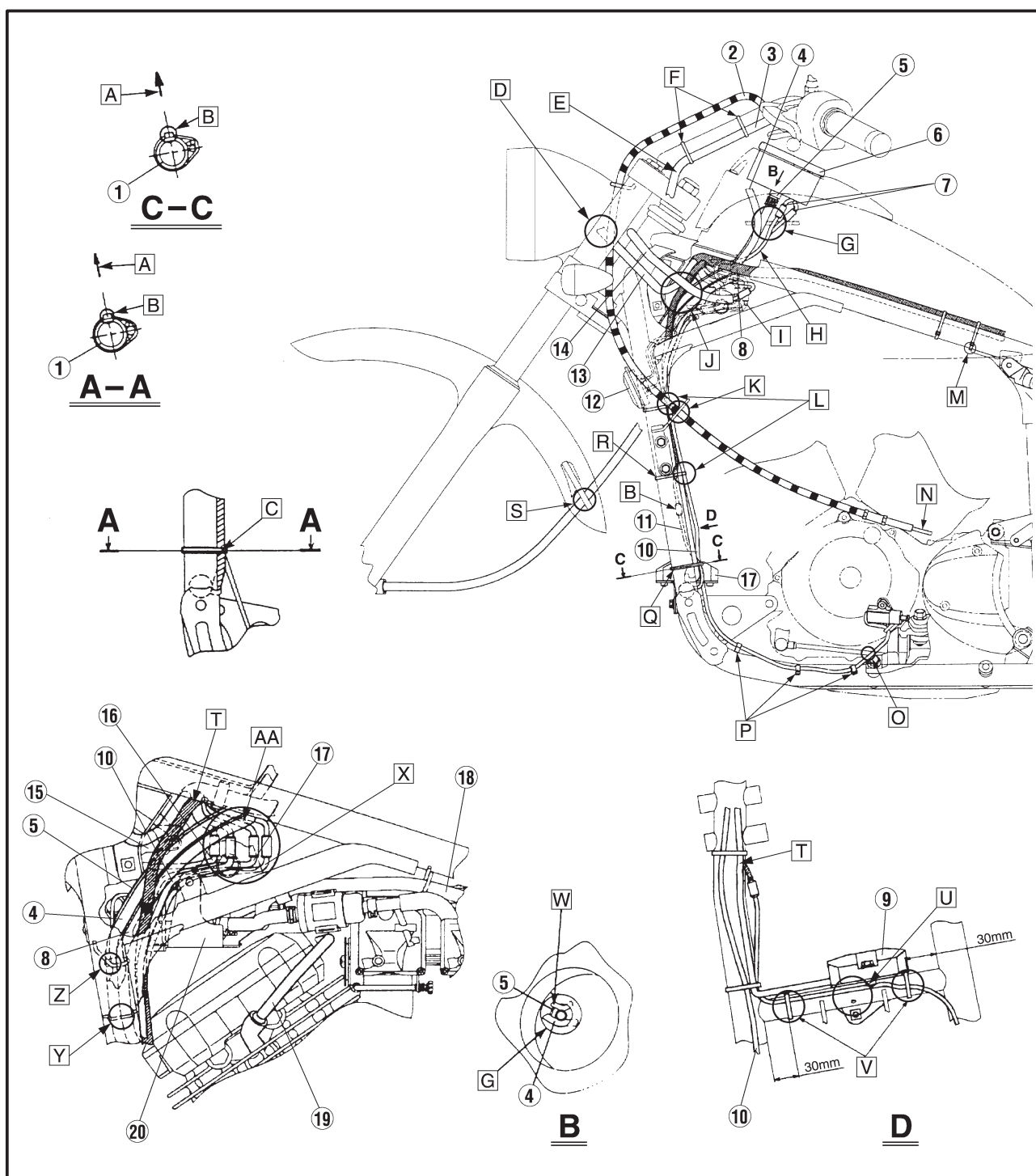


## CABLE ROUTING

**SPEC**



- P** Fasten the sidestand switch lead with a metal clamp.
- Q** Connect the rear brake switch coupler in front of the roll over valve stay.
- R** Install the plastic locking tie immediately below the cable guide bracket.
- S** Pass the speedometer cable through the speedometer cable holder.
- T** To the rectifier/regulator.
- U** Pass the rear brake switch lead between the frame and rectifier/regulator. Do not pinch the rear brake switch lead.
- V** Fasten the rear brake switch lead with a plastic locking tie.
- W** To the speedometer light leads.
- X** Place the rectifier/regulator coupler completely inside the motorcycle body.
- Y** Pass the fuel tank breather hose and vacuum chamber air vent hose through the holder.
- Z** Pass the speedometer cable through the holder.
- AA** Place the couplers behind the steering head.





# CABLE ROUTING

**SPEC**



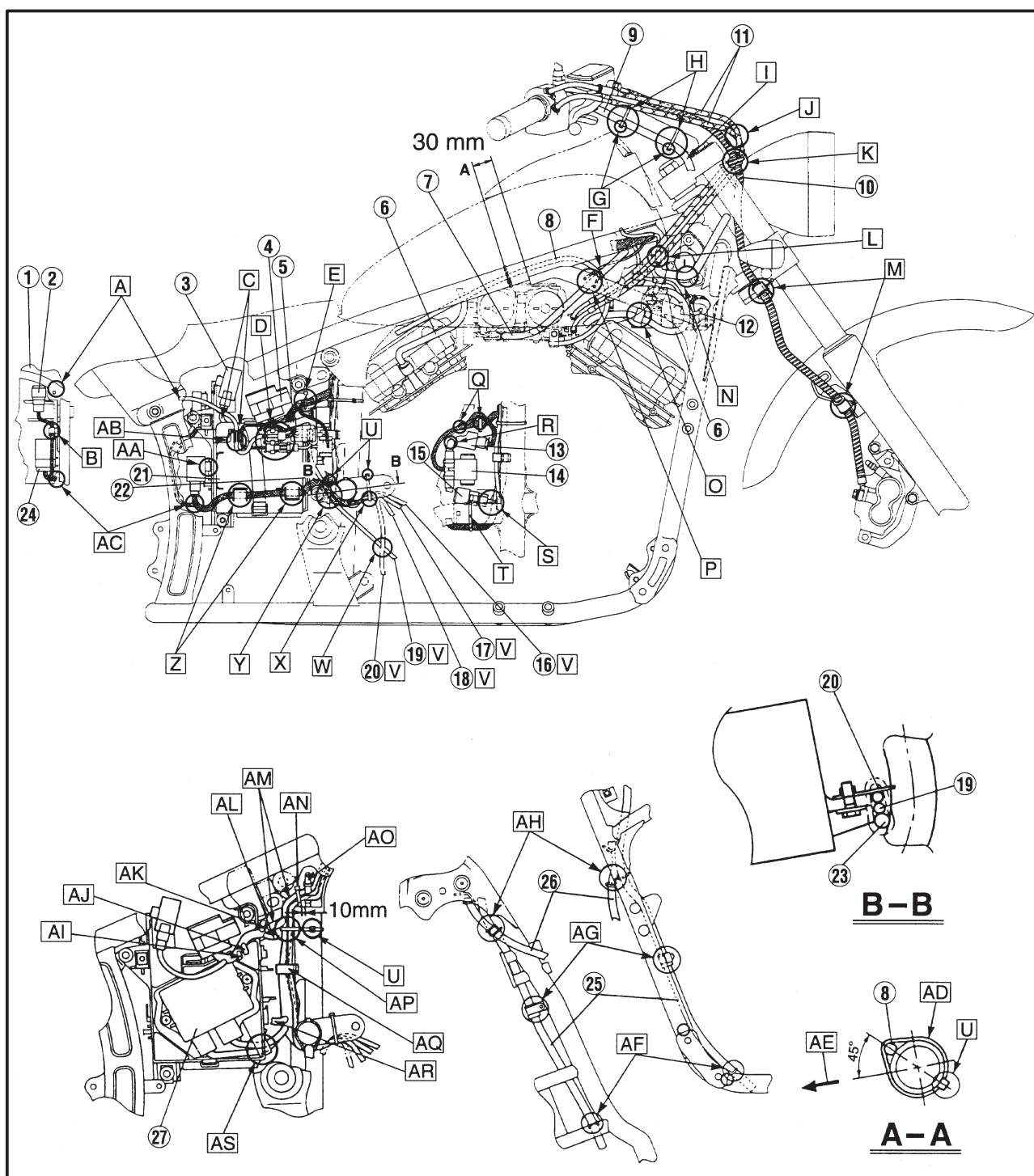
- ① Frame bracket
- ② Dimmer switch
- ③ Self-canceling turn signal relay
- ④ Fuse box
- ⑤ Battery positive (+) lead
- ⑥ Spark plug lead
- ⑦ Vacuum chamber air bent hose
- ⑧ Starter cable
- ⑨ Right handlebar switch lead
- ⑩ Brake hose
- ⑪ Throttle cables
- ⑫ Thermo switch lead

- ⑬ Flasher light relay
- ⑭ Starter relay
- ⑮ Carburetor heater relay
- ⑯ Neutral switch lead
- ⑰ Pickup coil lead
- ⑱ A.C. magneto lead
- ⑲ Battery negative (-) lead
- ⑳ Starter motor lead
- ㉑ Battery cover
- ㉒ Battery
- ㉓ Wire harness
- ㉔ Starting circuit cut-off relay

- ㉕ Fuel tank breather hose
- ㉖ Speedometer cable
- ㉗ Ignitor unit

**A** Pass the tail/brake light lead between the frame bracket and battery box. Position the mud guard the between the edge of the frame bracket and the tail/brake light lead.

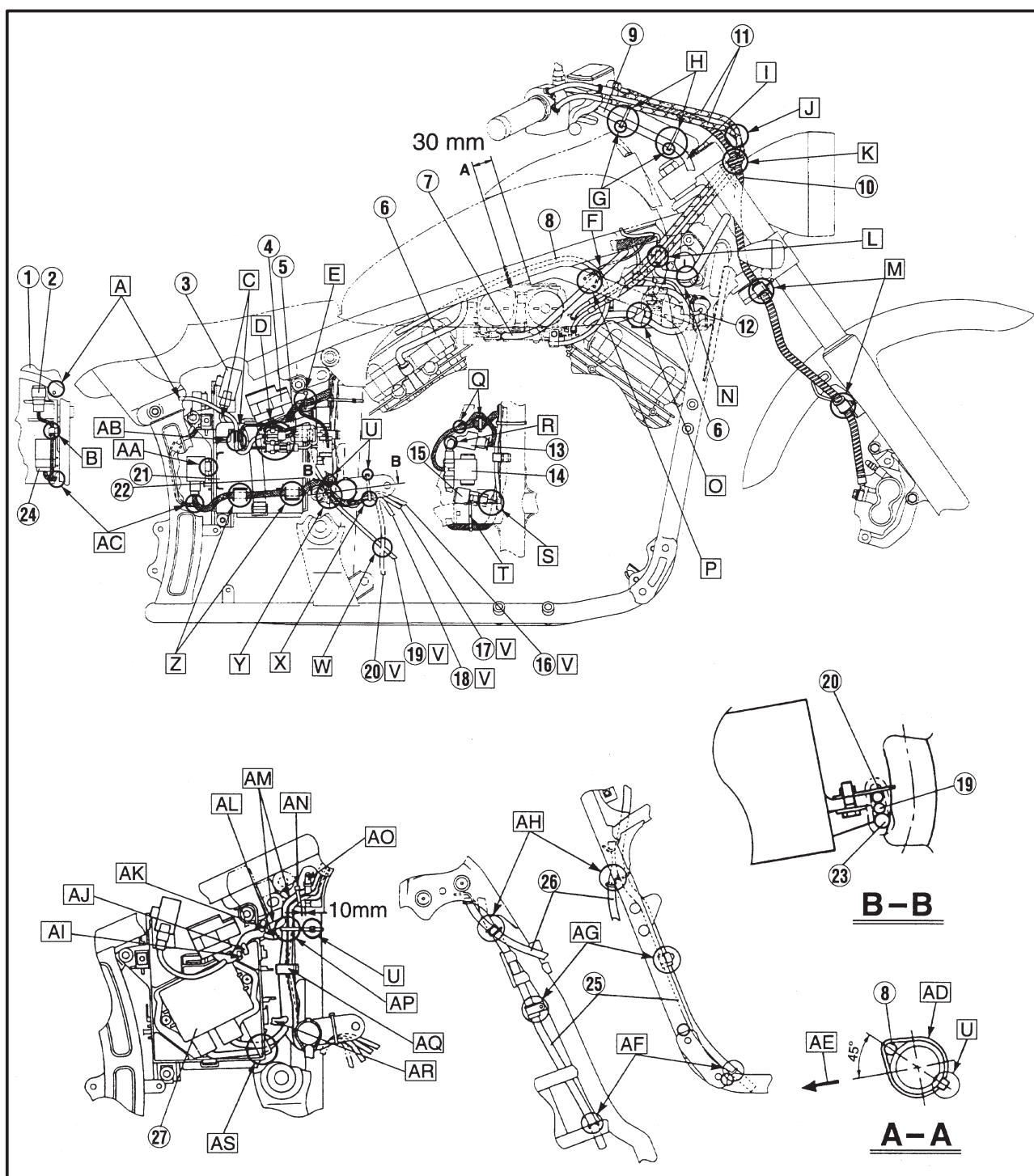
**B** Fasten the dimmer switch lead with a clamp.







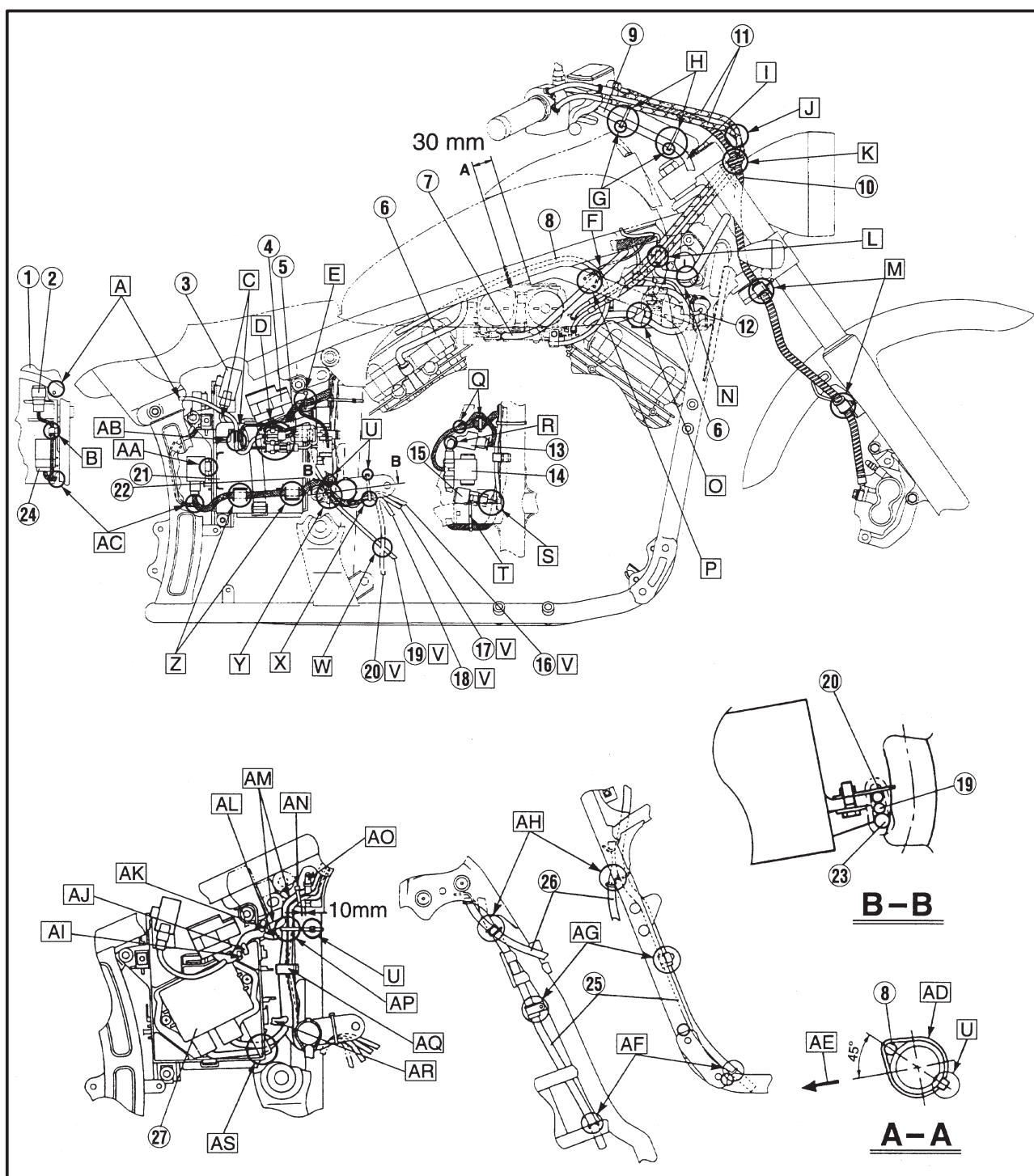
- [C] Fasten the self-canceling turn signal relay lead and battery positive (+) lead with a battery band.
- [D] Fasten the tail/brake light lead coupler and battery negative (-) lead coupler with a clamp.
- [E] Fasten the starter relay lead and fuse box lead with a plastic locking tie.
- [F] To the ignition coil.
- [G] The end of the plastic locking tie should face towards the under the handlebar.
- [H] Fasten the right handlebar switch lead with a plastic locking tie.
- [I] Pass the right handlebar switch lead behind the upper bracket.
- [J] Cross the throttle cable in front of the guide wire.
- [K] Fasten the brake hose grommet with a brake hose holder.
- [L] Place the left handlebar switch coupler on the side of the main switch.
- [M] Fasten the brake hose with a brake hose holder.
- [N] Pass the left handlebar switch lead under the main switch.







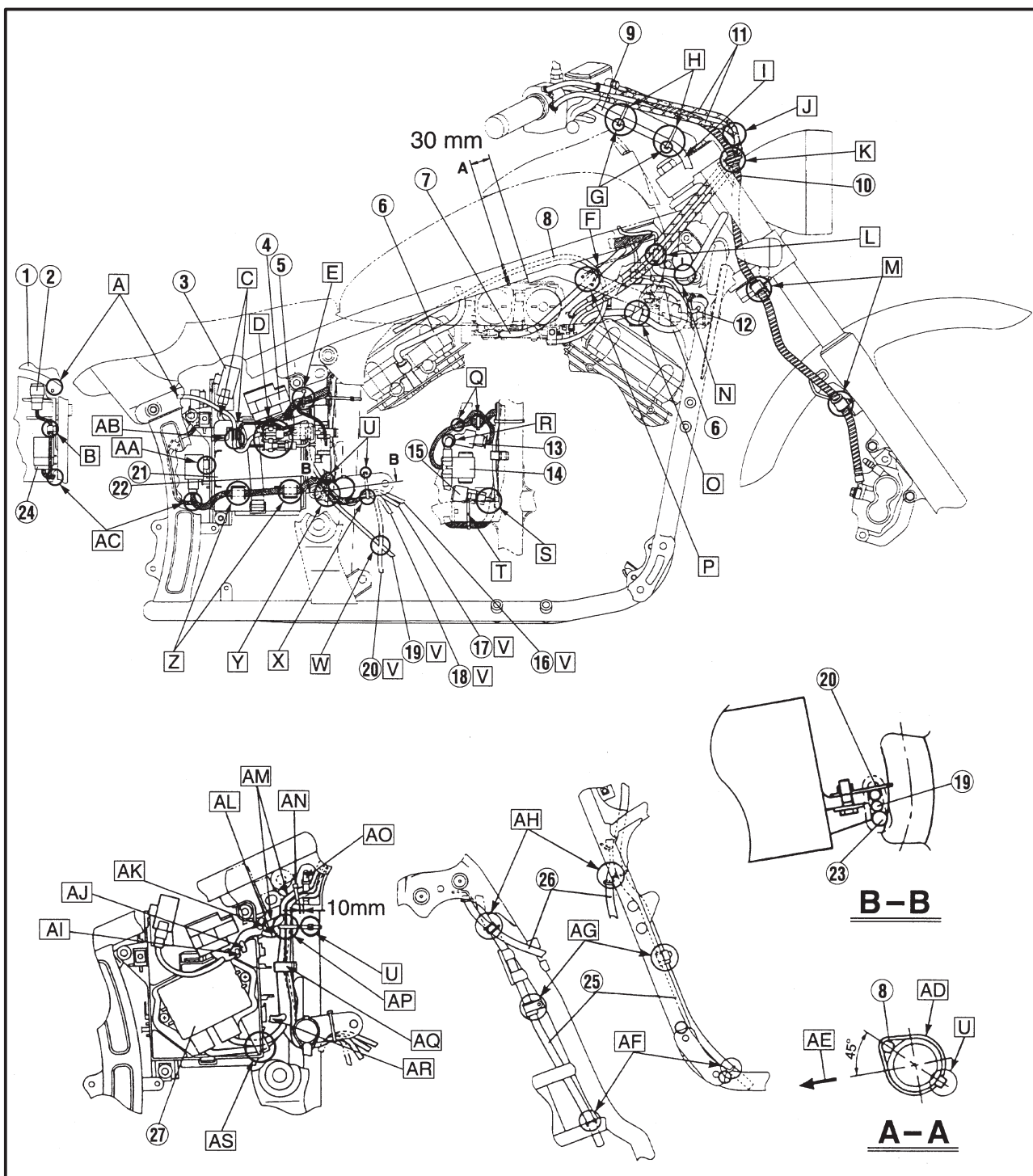
- Fasten the spark plug lead with a metal clamp.
- P Pass the ignition coil lead inside of the starter cable.
- Q Fasten the fuse box lead with a plastic locking tie.
- R Fasten the battery positive (+) lead with a battery box clamp.
- S The carburetor heater relay should not touch the wire harness.
- T Fasten the wire harness with a plastic locking tie.
- U Place the end of the plastic locking tie as shown.
- V From the engine.
- W Pass the starter motor lead over the battery negative (-) lead.
- X Fasten the pickup coil lead, A.C. magneto lead, neutral switch lead and starter motor lead with a plastic locking tie.
- Y Fasten the battery negative (-) lead, starter motor lead and wire harness with a plastic locking tie.
- Z Fasten the wire harness with a clamp.
- AA The starting safety relay must be fixed to the battery box after connecting the wire harness.
- AB Fasten the battery negative (-) lead and tail/brake light lead with a clamp.
- AC Pass the wire harness between the frame and battery box.







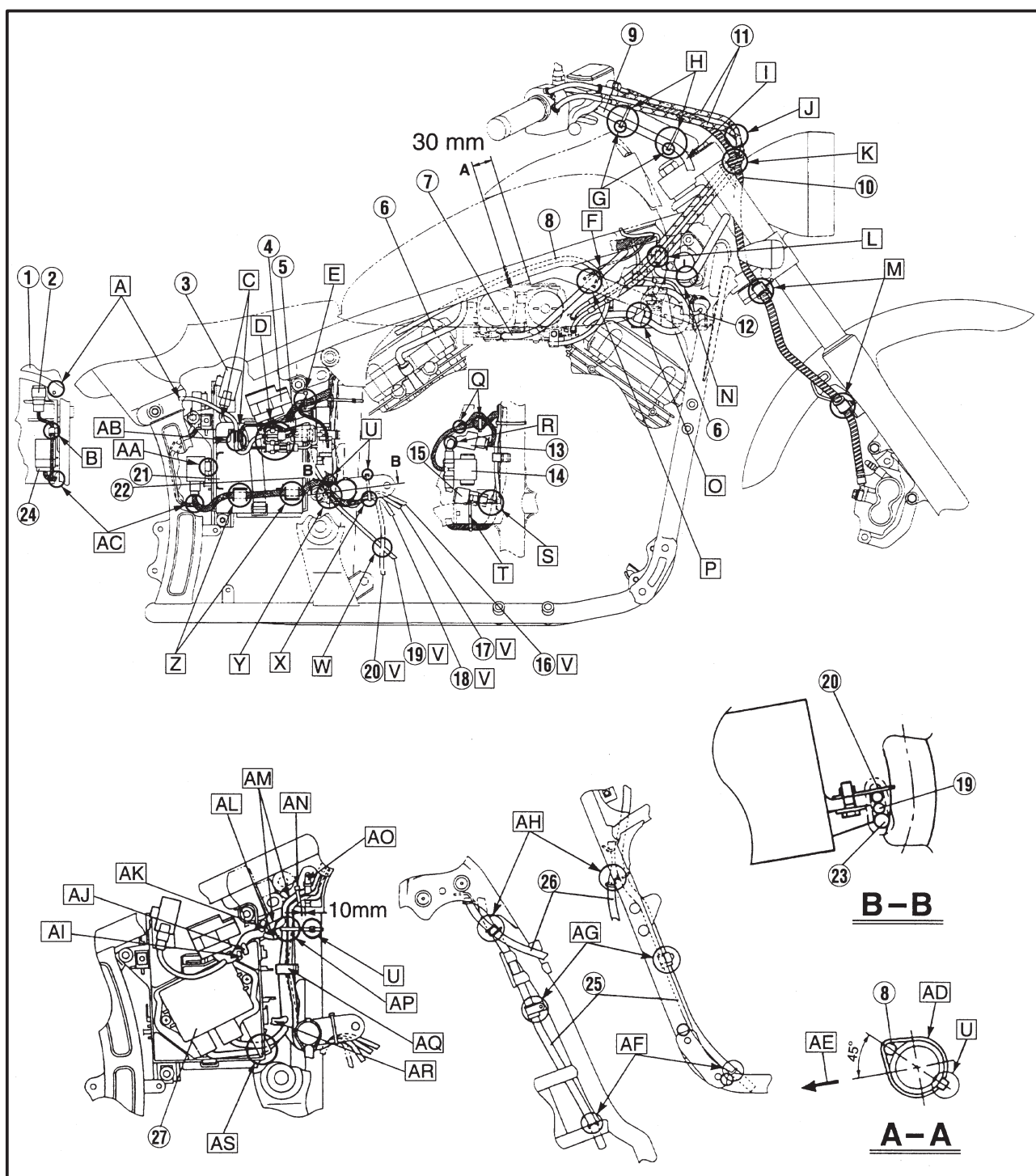
- AM** The wire harness and leads should not touch the rear shock absorber.
- AN** Fasten the wire harness and leads with a plastic locking tie.
- AO** Pass the plastic band through the frame hole. Fasten the wire harness with a plastic band at the point where the tape is located.
- AP** Fasten the wire harness and leads with a plastic locking tie.
- AQ** Fasten the wire harness and leads with a metal clamp.
- AR** To the carburetor heater relay.







- AS** Pass the ignitor unit leads through the battery box hole.





# CABLE ROUTING

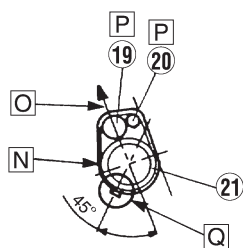
**SPEC**



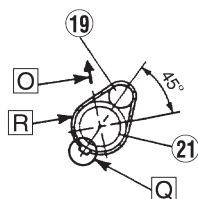
- ① Front flasher light (right)
- ② Throttle cables
- ③ Brake hose
- ④ Right handlebar switch lead
- ⑤ Clutch cable
- ⑥ Left handlebar switch lead
- ⑦ Front flasher light (left)
- ⑧ Ignition coil
- ⑨ Spark plug lead
- ⑩ Silencer
- ⑪ Starter cable
- ⑫ Speedometer cable

- ⑬ Neutral switch lead
- ⑭ Pickup coil lead
- ⑮ A.C. magneto lead
- ⑯ Thermo switch lead
- ⑰ Fuel tank breather hose
- ⑱ Rectifier/regulator coupler
- ⑲ Wire harness
- ⑳ Throttle position sensor (TPS) lead
- ㉑ Frame
- ㉒ Air filter case

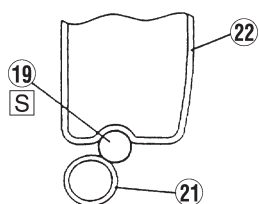
- A** Pass the throttle cables through the cable guide.
- B** Pass the left handlebar switch lead over the right handlebar switch lead.
- C** Pass the clutch cable through the cable guide.
- D** Fasten the handlebar switch leads with a plastic band.
- E** To the ignition coil.
- F** Pass the starter cable between the ignition coil and spark plug lead.



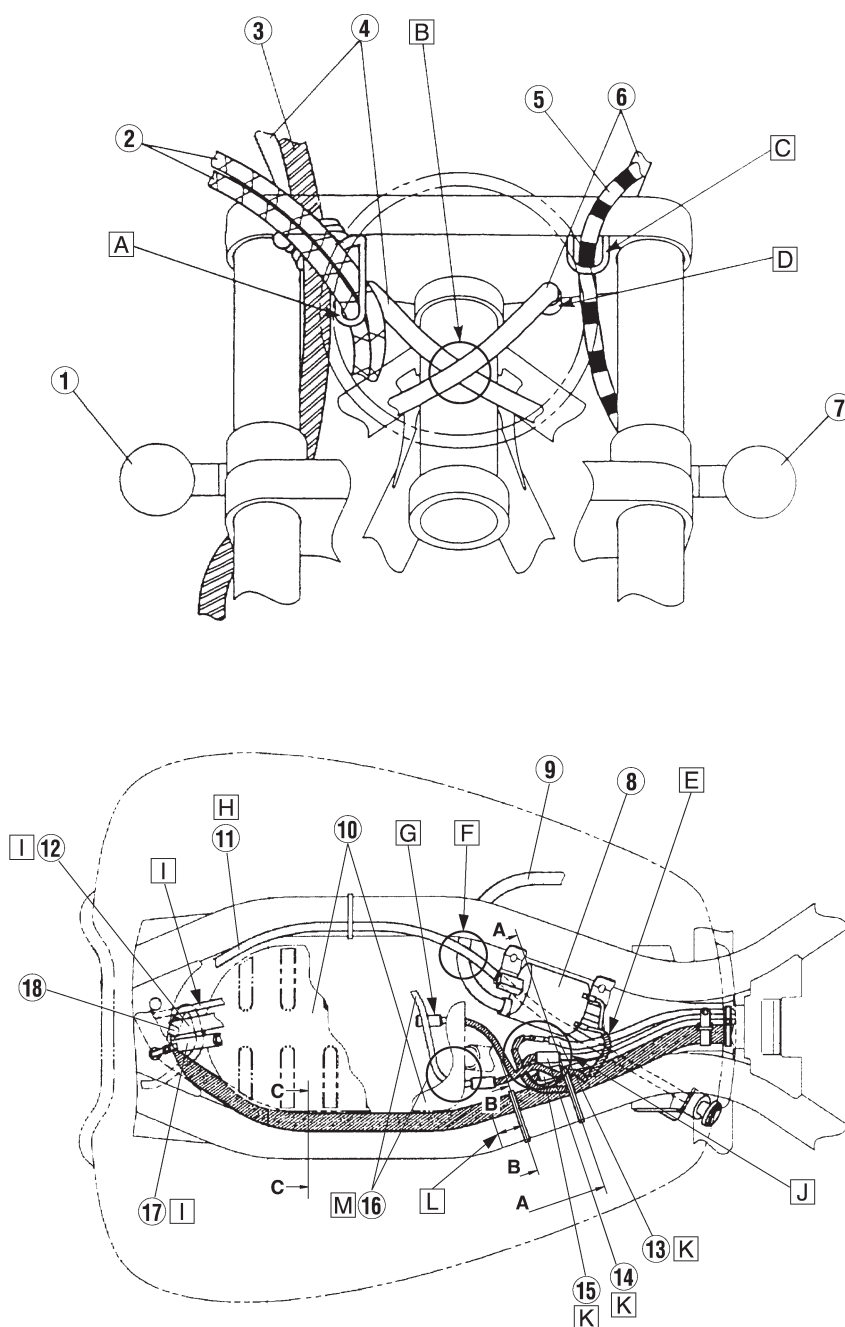
**A-A**



**B-B**



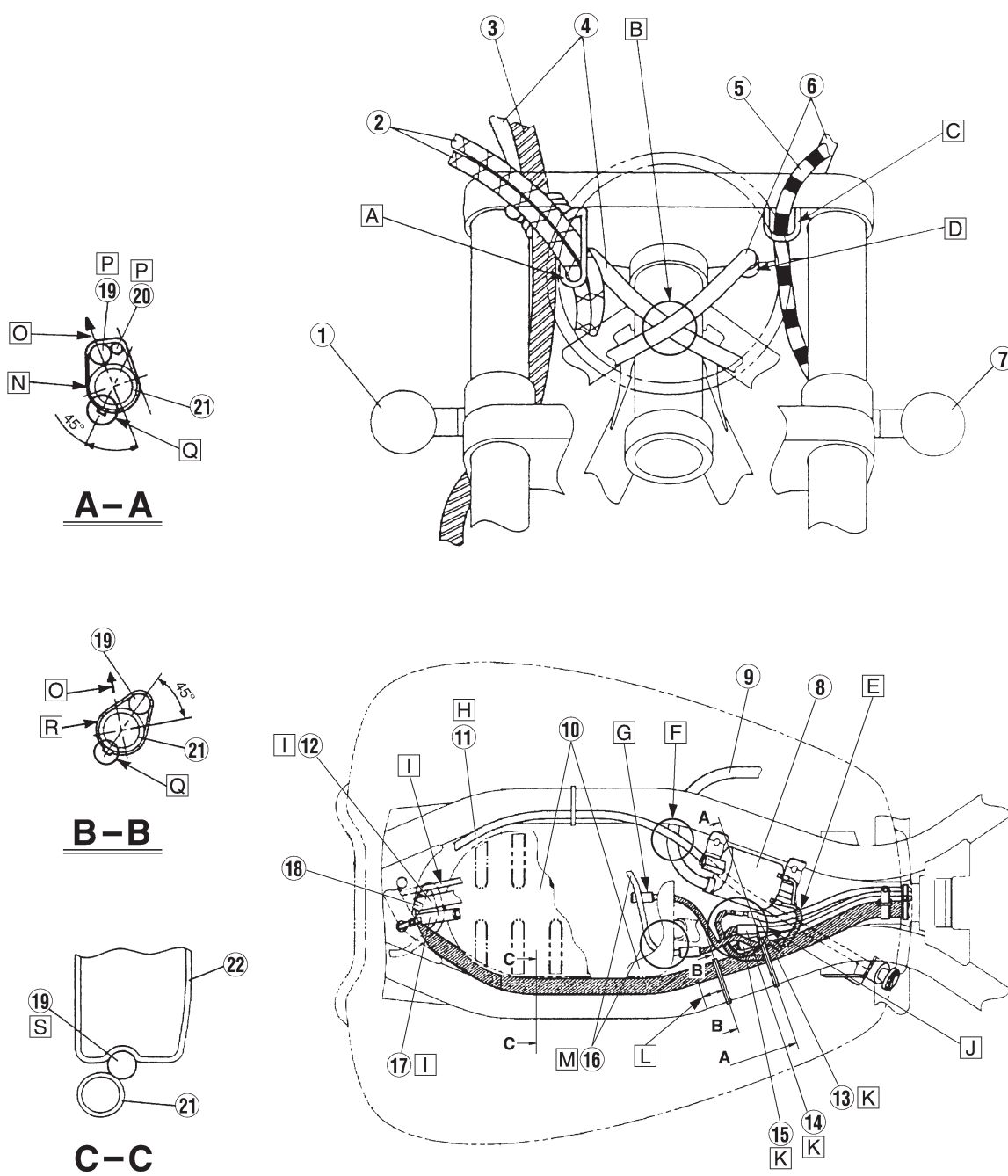
**C-C**







- G** To the throttle position sensor (TPS).
- H** To the carburetor.
- I** To the fuel tank.
- J** Pass the neutral switch lead, pickup coil lead and A.C. magneto lead under the ignition coil lead, thermo switch lead and throttle position sensor (TPS) lead.
- K** From the engine.
- L** 20 mm
- M** Pass the thermo switch lead inside of the silencer breather hose.
- N** Fasten the wire harness and throttle position sensor (TPS) lead with a plastic locking tie.
- O** Inside the motorcycle.
- P** Route the wire harness and throttle position sensor (TPS) lead so they run along the bottom of the frame tube.
- Q** Place the end of the plastic locking tie as shown.
- R** Fasten the wire harness with a plastic locking tie.
- S** Pass the wire harness between the air filter case groove and frame.







EB300000

## PERIODIC INSPECTIONS AND ADJUSTMENTS

### INTRODUCTION

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and longer service life. The need for costly overhaul work will be greatly reduced. This information applies to vehicles already in service as well as to new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

### NOTE:

- The annual checks must be performed every year, except if a kilometer-based maintenance is performed instead.
- From 50,000 km, repeat the maintenance intervals starting from 10,000 km.
- Items marked with an asterisk should be performed by a Yamaha dealer as they require special tools, data and technical skills.

EB301000

### PERIODIC MAINTENANCE/LUBRICATION INTERVALS

| No. | ITEM                           | CHECKS OR MAINTENANCE JOB  | ODOMETER READING (× 1,000 km) |    |    |    |    | ANNUAL CHECK |
|-----|--------------------------------|--|-------------------------------|----|----|----|----|--------------|
|     |                                |  | 1                             | 10 | 20 | 30 | 40 |              |
| 1   | * Fuel line                    | ● Check fuel hoses for cracks or damage.   |                               | ✓  | ✓  | ✓  | ✓  | ✓            |
| 2   | Spark plugs                    | ● Check condition.<br>● Clean and regap.   |                               | ✓  |    | ✓  |    |              |
|     |                                | ● Replace.   |                               |    | ✓  |    | ✓  |              |
| 3   | * Valves                       | ● Check valve clearance.<br>● Adjust.  |                               | ✓  | ✓  | ✓  | ✓  |              |
| 4   | Air filter element             | ● Clean.   |                               | ✓  |    | ✓  |    |              |
|     |                                | ● Replace.   |                               |    | ✓  |    | ✓  |              |
| 5   | Clutch                         | ● Check operation.<br>● Adjust.  | ✓                             | ✓  | ✓  | ✓  | ✓  |              |
| 6   | * Front brake                  | ● Check operation, fluid level and vehicle for fluid leakage.  | ✓                             | ✓  | ✓  | ✓  | ✓  | ✓            |
|     |                                | ● Replace brake pads.  | Whenever worn to the limit    |    |    |    |    |              |
| 7   | * Rear brake                   | ● Check operation and adjust brake pedal freeplay.   | ✓                             | ✓  | ✓  | ✓  | ✓  | ✓            |
|     |                                | ● Replace brake shoes.   | Whenever worn to the limit    |    |    |    |    |              |
| 8   | * Brake hose                   | ● Check for cracks or damage.  |                               | ✓  | ✓  | ✓  | ✓  | ✓            |
|     |                                | ● Replace.   | Every 4 years                 |    |    |    |    |              |
| 9   | * Wheels                       | ● Check runout, spoke tightness and for damage.<br>● Tighten spokes if necessary.                                  |                               | ✓  | ✓  | ✓  | ✓  |              |
| 10  | * Tires                        | ● Check tread depth and for damage.<br>● Replace if necessary.<br>● Check air pressure.<br>● Correct if necessary. |                               | ✓  | ✓  | ✓  | ✓  |              |
| 11  | * Wheel bearings               | ● Check bearing for looseness or damage.   |                               | ✓  | ✓  | ✓  | ✓  |              |
| 12  | * Swingarm                     | ● Check operation and for excessive play.  |                               | ✓  | ✓  | ✓  | ✓  |              |
|     |                                | ● Lubricate with molybdenum disulfide grease.  | Every 50,000 km               |    |    |    |    |              |
| 13  | * Steering bearings            | ● Check bearing play and steering for roughness.   | ✓                             | ✓  | ✓  | ✓  | ✓  |              |
|     |                                | ● Lubricate with lithium-soap-based grease.  | Every 20,000 km               |    |    |    |    |              |
| 14  | * Chassis fasteners            | ● Make sure that all nuts, bolts and screws are properly tightened.  |                               | ✓  | ✓  | ✓  | ✓  | ✓            |
| 15  | Sidestand                      | ● Check operation.<br>● Lubricate.   |                               | ✓  | ✓  | ✓  | ✓  | ✓            |
| 16  | * Sidestand switch             | ● Check operation.   | ✓                             | ✓  | ✓  | ✓  | ✓  | ✓            |
| 17  | * Front fork                   | ● Check operation and for oil leakage.   |                               | ✓  | ✓  | ✓  | ✓  |              |
| 18  | * Rear shock absorber assembly | ● Check operation and shock absorber for oil leakage.  |                               | ✓  | ✓  | ✓  | ✓  |              |
| 19  | * Carburetors                  | ● Check starter (choke) operation.<br>● Adjust engine idling speed and synchronization.                            | ✓                             | ✓  | ✓  | ✓  | ✓  | ✓            |
| 20  | Engine oil                     | ● Change.  | ✓                             | ✓  | ✓  | ✓  | ✓  | ✓            |



## PERIODIC MAINTENANCE/LUBRICATION INTERVALS



| NO. | ITEM                           | CHECKS OR MAINTENANCE JOB                      | ODOMETER READING (x 1,000 km) |    |    |    |    | ANNUAL CHECK |
|-----|--------------------------------|--|-------------------------------|----|----|----|----|--------------|
|     |                                |  | 1                             | 10 | 20 | 30 | 40 |              |
| 21  | Engine oil filter element      | • Replace.                                     | √                             |    | √  |    | √  |              |
| 22  | Final gear oil                 | • Check oil level and vehicle for oil leakage. | √                             | √  |    | √  |    |              |
|     |                                | • Change.                                      | √                             |    | √  |    | √  |              |
| 23  | * Lights, signals and switches | • Check operation.<br>• Adjust headlight beam. | √                             | √  | √  | √  | √  | √            |

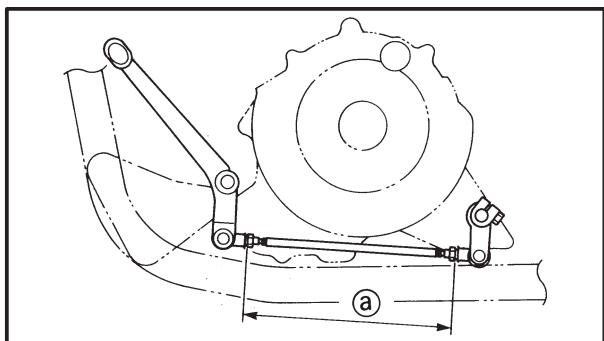
### NOTE:

- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.
- Hydraulic brake service
  - Regularly check and, if necessary, correct the brake fluid level.
  - Every two years replace the internal components of the brake master cylinder and caliper, and change the brake fluid.
  - Replace the brake hoses every four years and if cracked or damaged.



## SHIFT PEDAL ADJUSTMENT

**INSP  
ADJ**



EB304080

### SHIFT PEDAL ADJUSTMENT

#### 1. Check:

- Shift pedal position  
Check the shift pedal rod length ①.  
If the position is incorrect → Adjust.



**Shift pedal rod length:  
156.6 mm**

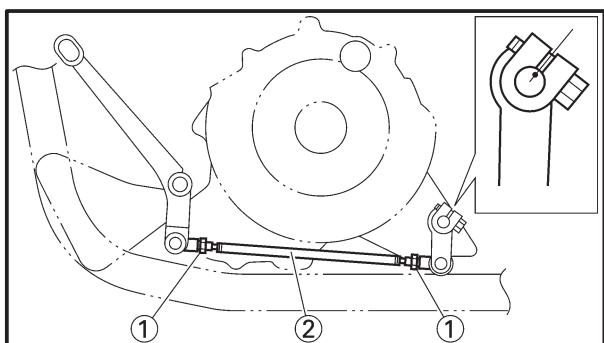
#### 2. Adjust:

- Shift pedal position

\*\*\*\*\*

#### Adjustment steps:

- Loosen both locknuts ①.
- To obtain the correct pedal position turn the shift pedal rod ② in or out.



|                     |                                |
|---------------------|--------------------------------|
| <b>Turning in:</b>  | <b>shift pedal is lowered.</b> |
| <b>Turning out:</b> | <b>shift pedal is raised.</b>  |

- Tighten both locknuts.

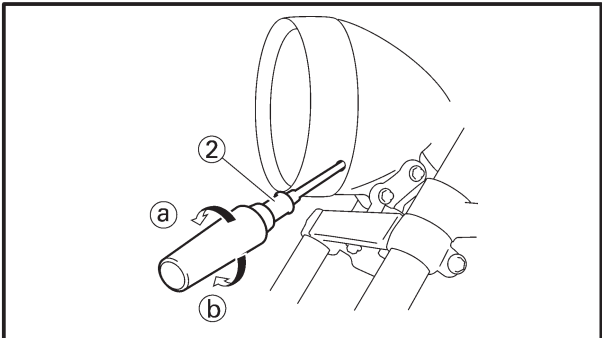
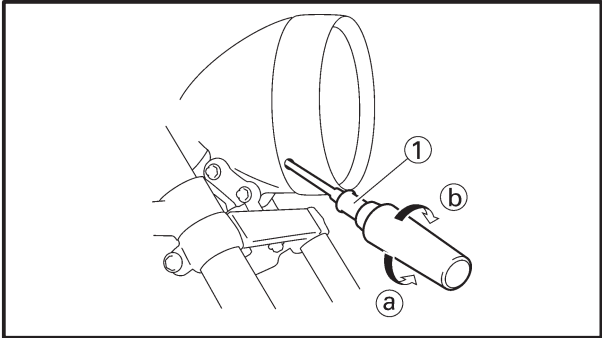
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#### NOTE:

- Align the mark on the shift shaft with the center of the slit.
- Turn in the both side of the shift pedal rod more than 4 times.



# HEADLIGHT BEAM ADJUSTMENT



EB305020

## HEADLIGHT BEAM ADJUSTMENT

1. Adjust:
- headlight beam (vertically)
- a. Turn the adjusting screw ① in direction ① or ②.

|  |
|--|
| Direction ① → Headlight beam is raised.  |
| Direction ② → Headlight beam is Lowered. |

\*\*\*\*\*

2. Adjust:
- headlight beam (horizontally)
- a. Turn the adjusting screw ③ in direction ③ or ④.

|  |
|--|
| Direction ③ → Headlight beam moves to the right. |
| Direction ④ → Headlight beam moves to the left.  |

\*\*\*\*\*





EB601000

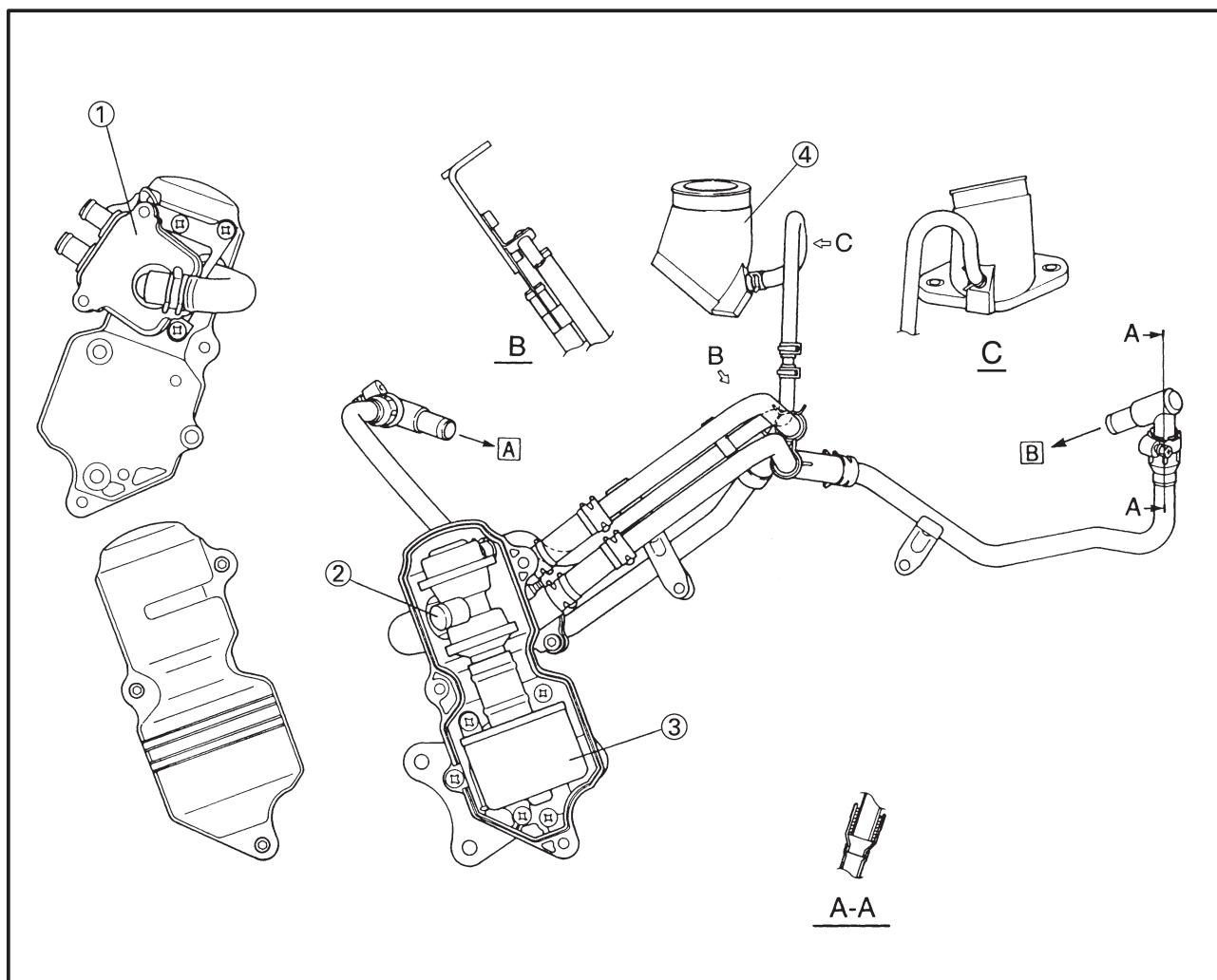
## CARBURATION

### AIR INDUCTION SYSTEM

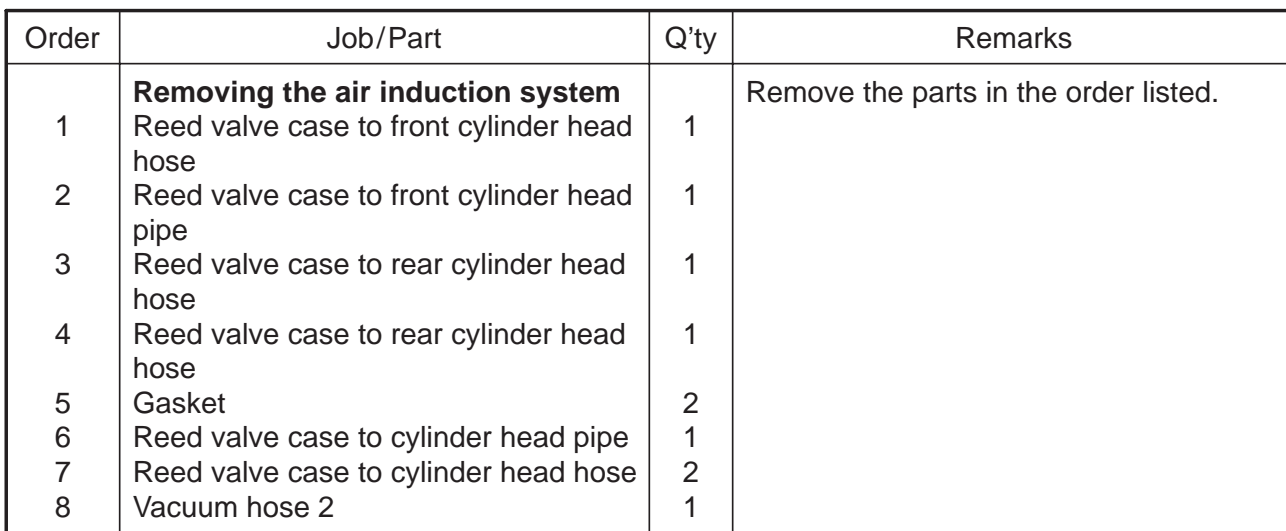
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#### AIR INDUCTION SYSTEM DIAGRAMS

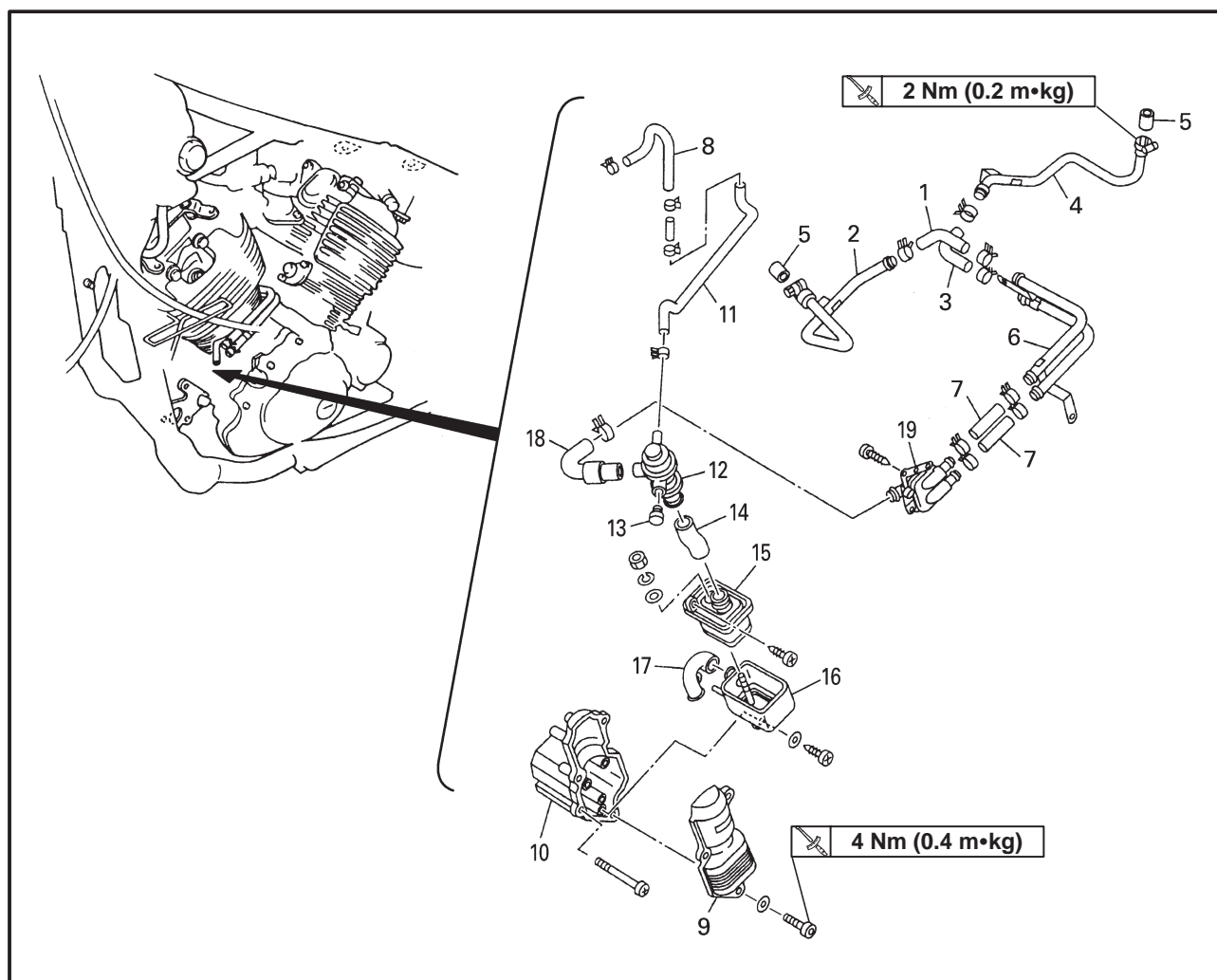
- |                    |                                     |
|--------------------|-------------------------------------|
| ① Reed valve       | <u>A</u> To the front cylinder head |
| ② Air cut valve    | <u>B</u> To the rear cylinder head  |
| ③ Air cleaner      |                                     |
| ④ Carburetor joint |                                     |











| Order | Job/Part                          | Q'ty | Remarks  |
|-------|-----------------------------------|------|--|
| 9     | Cover                             | 1    | For installation, reverse the removal procedure. |
| 10    | Cover                             | 1    |  |
| 11    | Vacuum hose 1                     | 1    |  |
| 12    | Air cut valve                     | 1    |  |
| 13    | Plug                              | 1    |  |
| 14    | Air cut valve to air cleaner hose | 1    |  |
| 15    | Air cleaner                       | 1    |  |
| 16    | Air Cleaner case                  | 1    |  |
| 17    | Bend hose                         | 1    |  |
| 18    | Air cut valve to reed valve hose  | 1    |  |
| 19    | Reed valve                        | 1    |  |



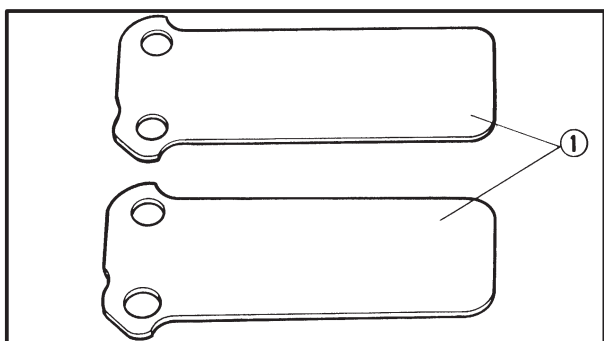


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### CHECKING THE AIR INDUCTION SYSTEM

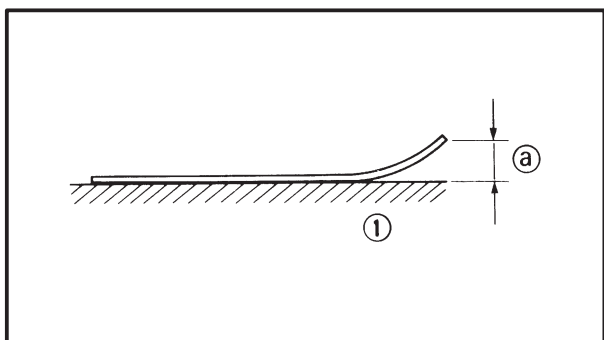
#### 1. Check:

- hoses  
Loose connection → Connect properly.  
Cracks/damage → Replace.
- pipes  
Cracks/damage → Replace.



#### 2. Check:

- reed valve ①
- reed valve stopper
- reed valve seat  
Cracks/damage → Replace the reed valve.



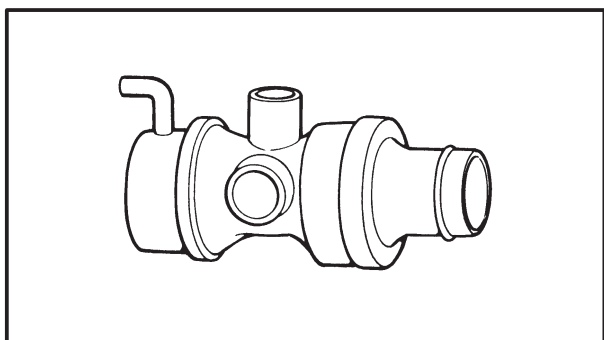
#### 3. Measure:

- reed valve bending ②  
Out of specification → Replace the reed valve.



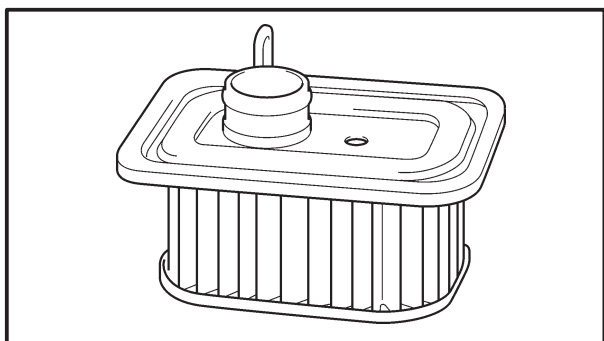
**Maximum reed valve bending  
0.4 mm**

① Surface plate



#### 4. Check:

- air cutoff valve  
Cracks/damage → Replace.



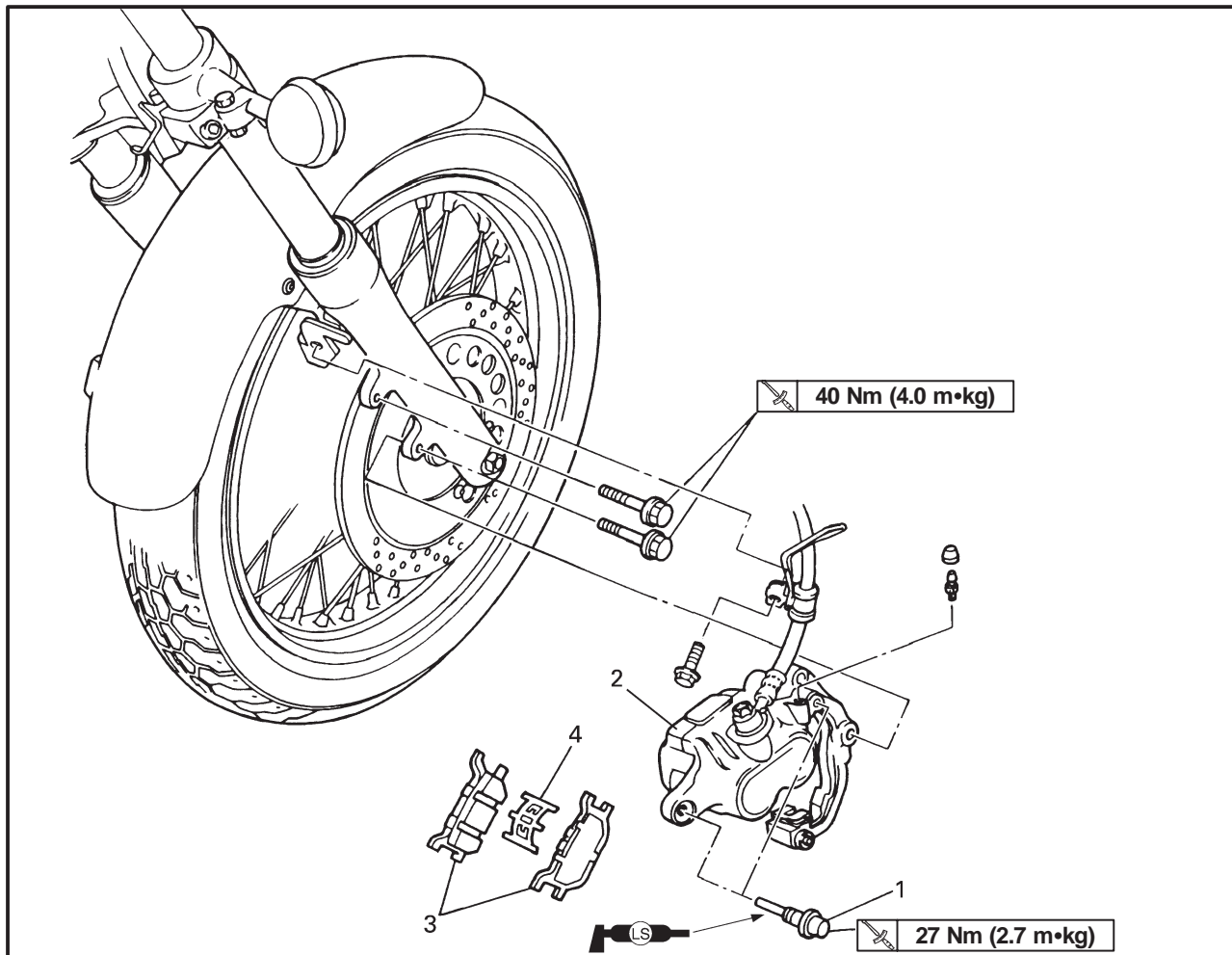
#### 5. Check:

- air cleaner  
Cracks/damage → Replace.  
Clogged → Clean.





## CHASSIS

**FRONT BRAKE**  
**FRONT BRAKE PADS**


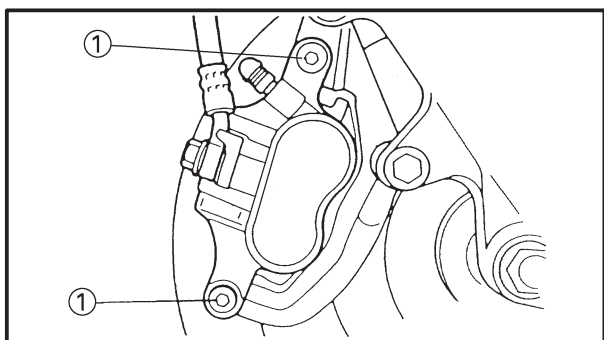
| Order | Job/Part                       | Q'ty | Remarks  |
|-------|--------------------------------|------|--|
|       | <b>Front brake pad removal</b> |      |  |
| 1     | Retaining bolt                 | 2    | Remove the parts in the order below.             |
| 2     | Brake caliper                  | 1    |  |
| 3     | Brake pads                     | 2    | Refer to "BRAKE PAD REPLACEMENT".                |
| 4     | Pad spring                     | 1    |  |
|       |                                |      | For installation, reverse the removal procedure. |



**CAUTION:**

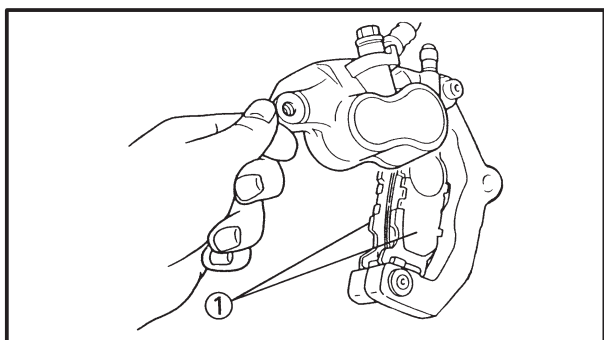
Disc brake components rarely require disassembly. **DO NOT:**

- disassemble components unless absolutely necessary;
- use solvents on internal brake components;
- use spent brake fluid for cleaning; (use only clean brake fluid)
- allow brake fluid to come in contact with the eyes, as this may cause eye injury;
- splash brake fluid onto painted surfaces or plastic parts, as this may cause damage;
- disconnect any hydraulic connection, as this would require the entire brake system to be disassembled, drained, cleaned, properly filled and bled after reassembly.

**BRAKE PAD REPLACEMENT****NOTE:**

It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.

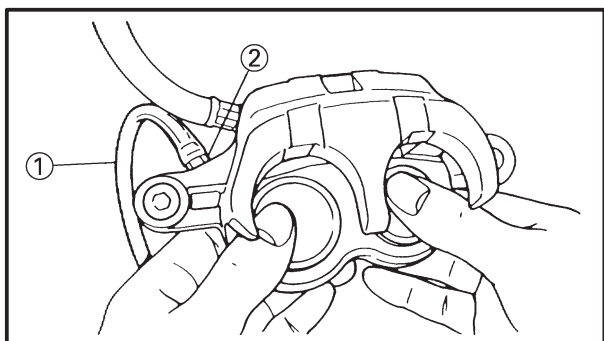
1. Remove:
  - Retaining bolt ①



2. Remove:
  - Brake pads ①

**NOTE:**

- Install new brake pad springs when the brake pads have to be replaced.
- Replace the brake pads as a set if either is found to be worn to the wear limit.



3. Install:
  - Brake pads
  - Brake pads spring

\*\*\*\*\*

**Installation steps:**

- Connect a suitable hose ① tightly to the brake caliper bleed screw ②. Put the other end of this hose into an open container.



- Loosen the brake caliper bleed screw and using a finger push the caliper pistons into the brake caliper.
- Tighten the brake caliper bleed screw ②.



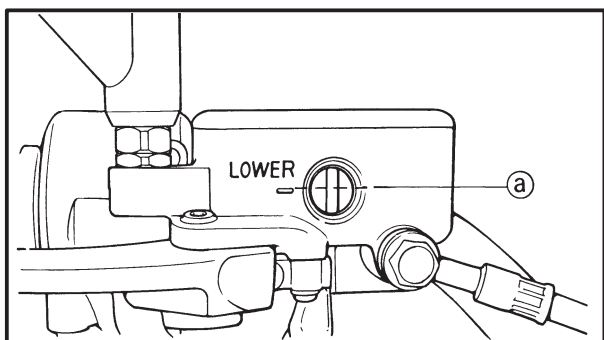
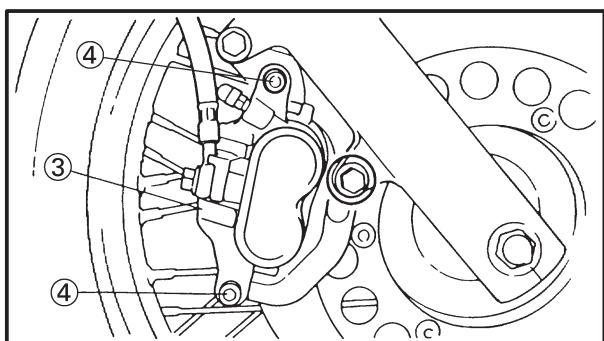
**Brake caliper bleed screw:**  
**6 Nm (0.6 m•kg)**

- Install new brake pads and a new brake pad spring.
- Install the brake caliper ③ and retaining bolt ④.



**Bolt (brake caliper):**  
**40 Nm (4.0 m•kg)**  
**Retaining bolt:**  
**27 Nm (2.7 m•kg)**

\*\*\*\*\*

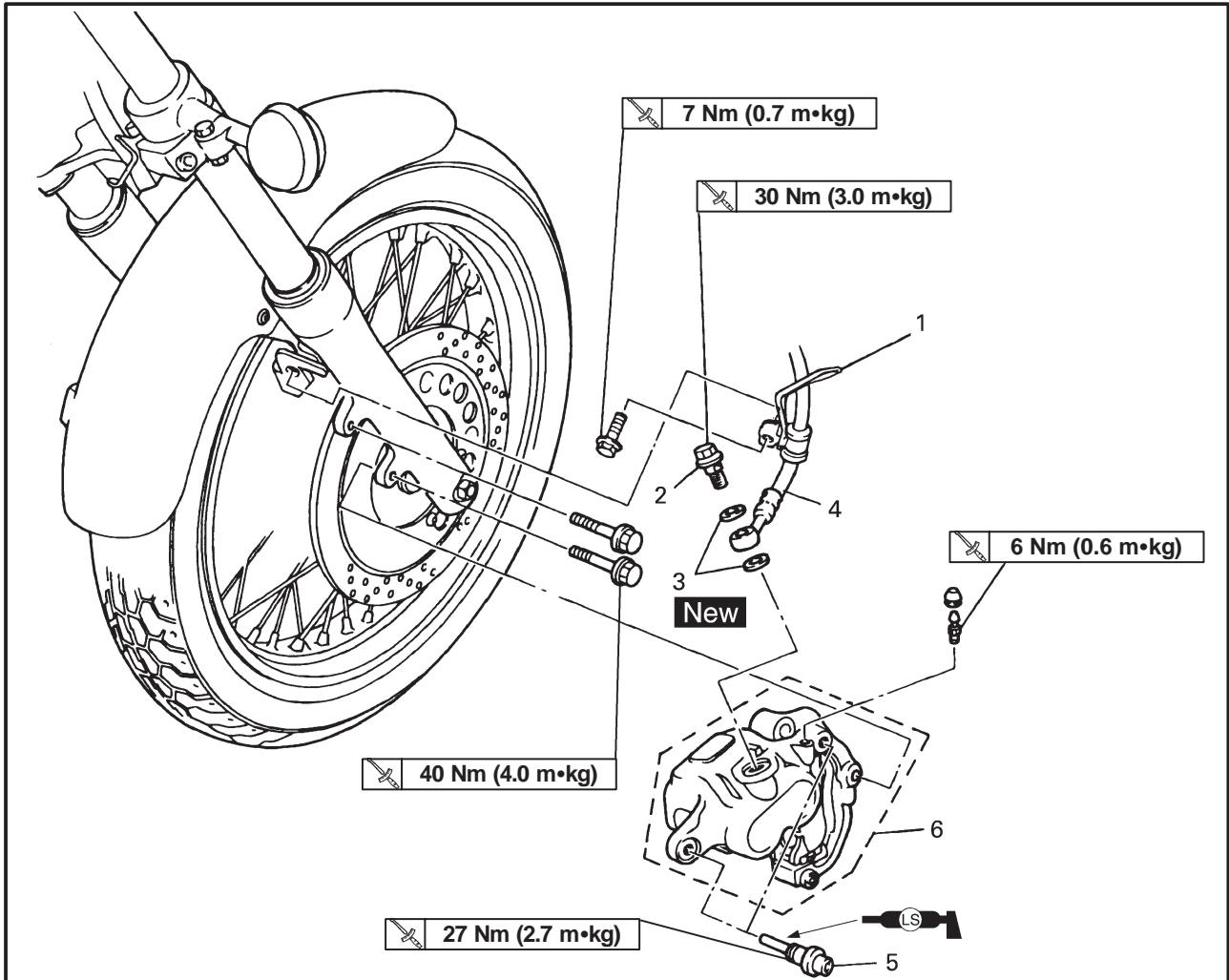


4. Check
    - Brake fluid level  
Refer to “BRAKE FLUID LEVEL INSPECTION” in CHAPTER 3.
- ① “LOWER” level line

5. Check:
  - Brake lever operation  
Soft or spongy feeling → Bleed the brake system.  
Refer to “AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)” in CHAPTER 3.



# FRONT BRAKE CALIPER

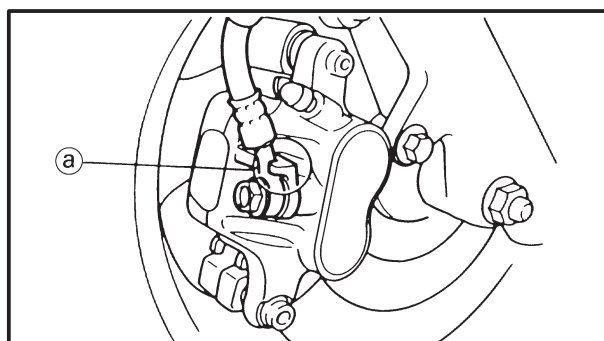
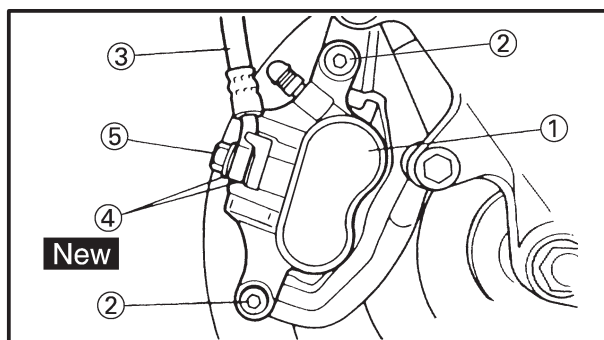


| Order | Job/Part                           | Q'ty | Remarks  |
|-------|------------------------------------|------|--|
|       | <b>Front brake caliper removal</b> |      |  |
| 1     | Brake fluid                        | 1    | Remove the parts in the order below.<br>Drain    |
| 2     | Brake hose holder                  | 1    |  |
| 3     | Union bolts                        | 1    |  |
| 4     | Copper washers                     | 2    |  |
| 5     | Brake hose                         | 1    | Refer to "CALIPER INSTALLATION".                 |
| 6     | Retaining bolt                     | 2    |  |
|       | Brake caliper assembly             | 1    | For installation, reverse the removal procedure. |



## FRONT BRAKE

CHAS



### CALIPER INSTALLATION

#### 1. Install:

- Brake caliper ①
- Retaining bolt ②
- Brake hose ③
- Copper washers ④
- Union bolt ⑤

27 Nm (2.7 m•kg)

New

30 Nm (3.0 m•kg)

### CAUTION:

When installing the brake hose on the brake caliper, make sure that the brake pipe touches the projection ① on the brake caliper.

### ⚠ WARNING

Proper brake hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING".

#### 2. Fill:

- Brake reservoir



Recommended brake fluid:  
DOT 4

### CAUTION:

Brake fluid may damage painted surfaces or plastic parts. Always clean up spilled brake fluid immediately.

### ⚠ WARNING

- Use only the designated quality brake fluid: other brake fluids may deteriorate the rubber seals, causing leakage and poor brake performance.
- Refill with the same type of brake fluid: mixing brake fluids may result in a harmful chemical reaction and lead to poor brake performance.
- Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the brake fluid and may result in vapor lock.

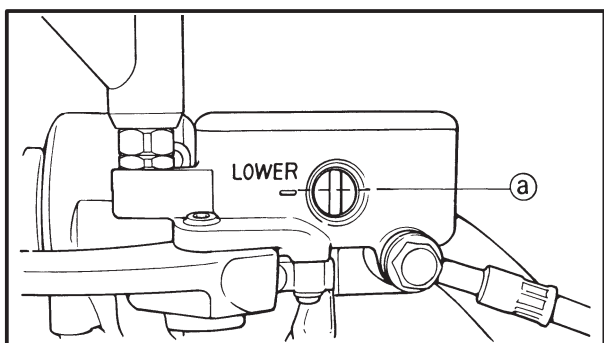




### 3. Air bleed

- Brake system

Refer to “AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)” in CHAPTER 3.



### 4. Check:

- Brake fluid level

Brake fluid level is under the “LOWER” level line → Fill up.

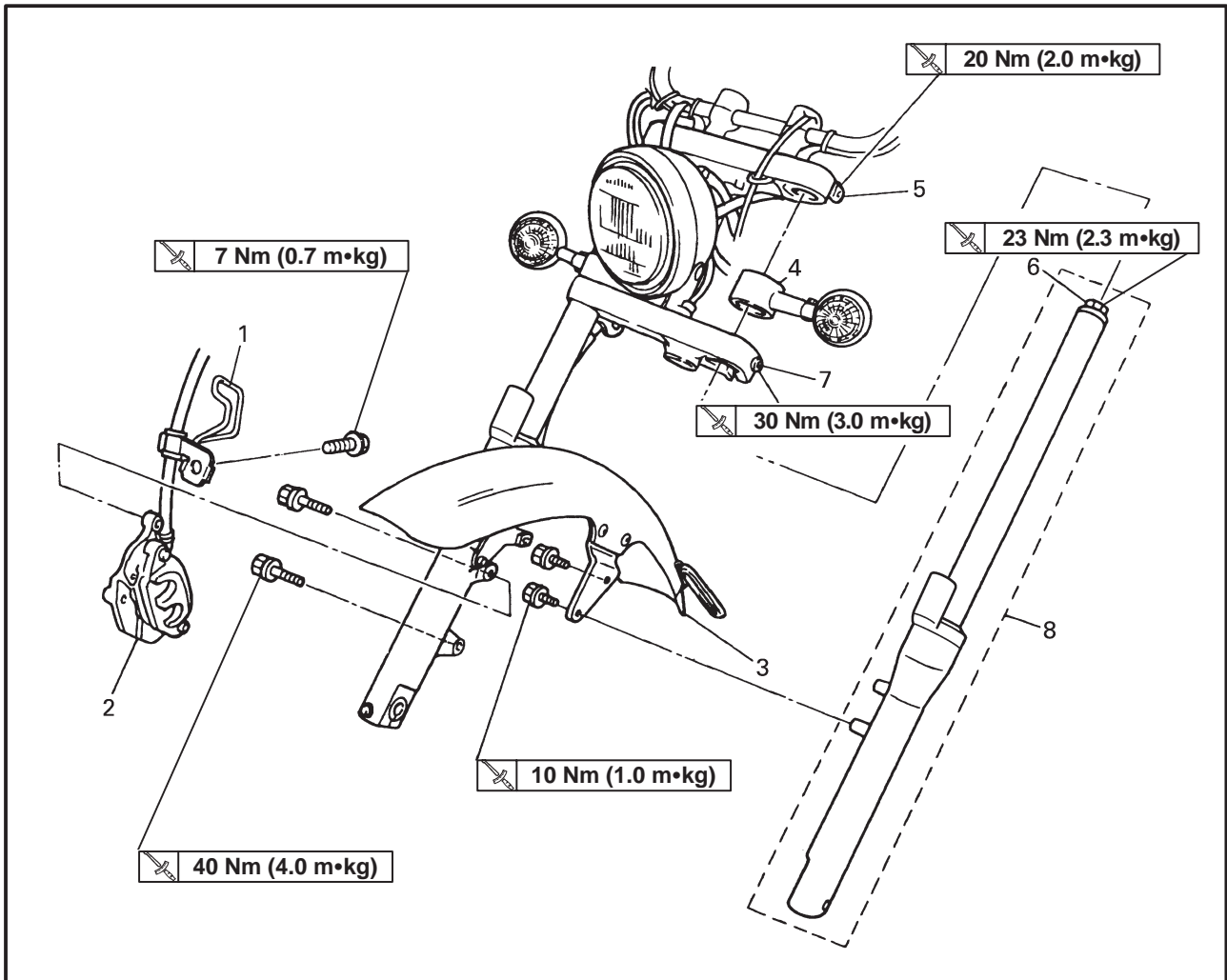
Refer to “BRAKE FLUID LEVEL INSPECTION” in CHAPTER 3.

- Ⓐ “LOWER” level line



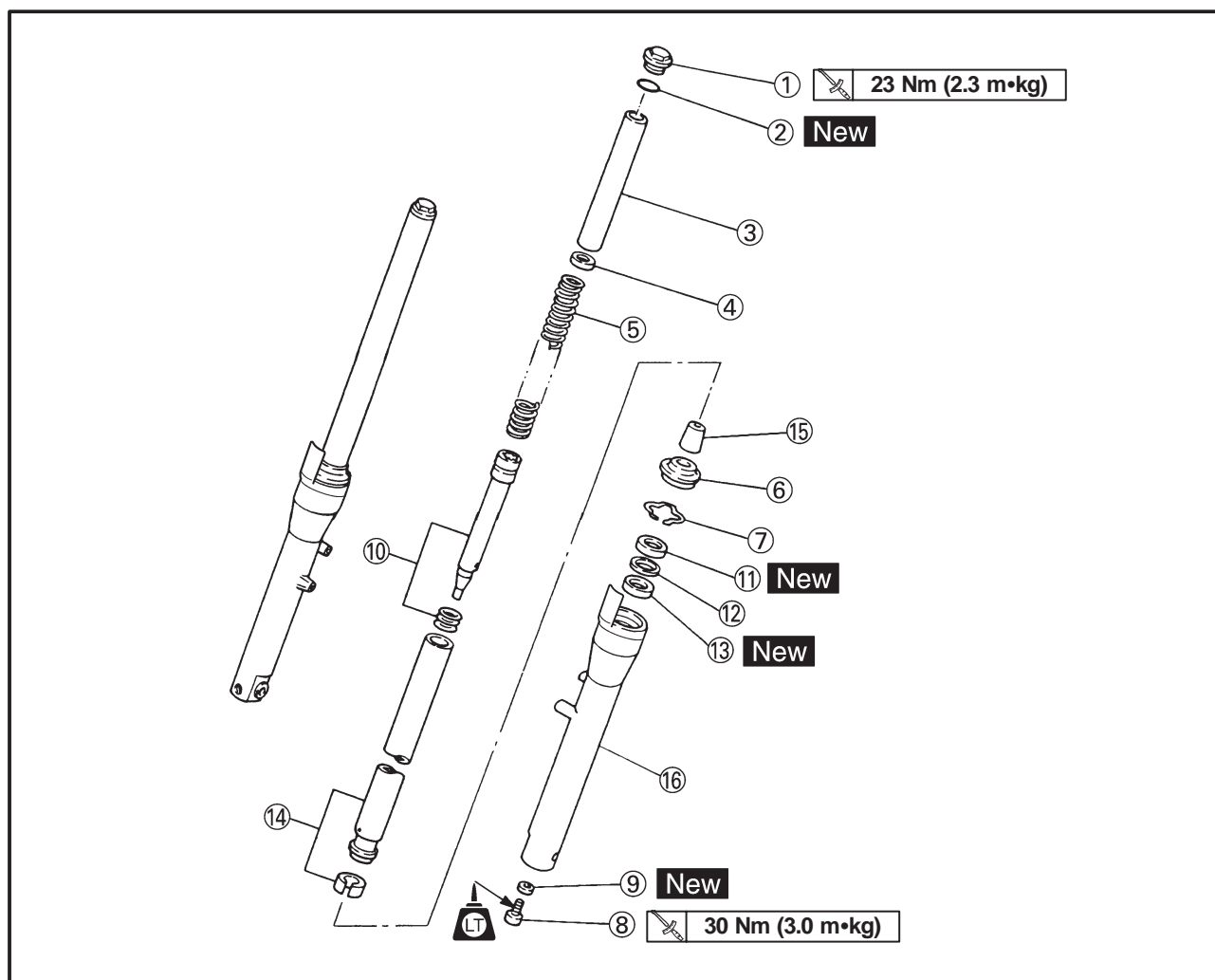


## FRONT FORK



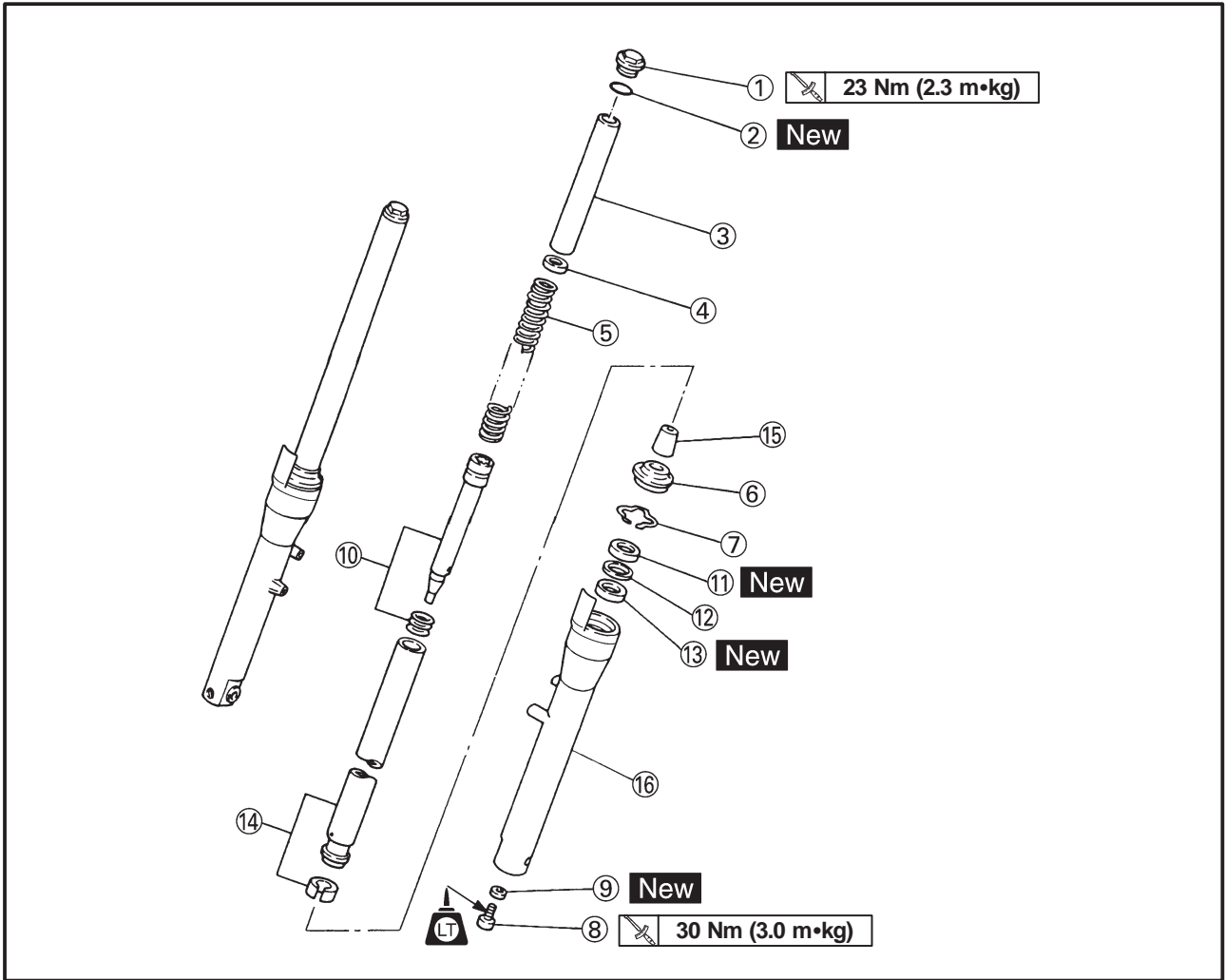
| Order | Job/Part                        | Q'ty | Remarks   |
|-------|---------------------------------|------|---|
|       | <b>Front fork removal</b>       |      |   |
|       | Front wheel                     |      | Remove the parts in the order below.<br>Refer to "FRONT WHEEL". |
| 1     | Brake hose holder               | 1    |   |
| 2     | Brake caliper assembly          | 1    |   |
| 3     | Front fender                    | 1    |   |
| 4     | Front flasher light holder nuts | 2    |   |
| 5     | Upper bracket bolts             | 2    |   |
| 6     | Cap bolts                       | 2    | Loosen  |
| 7     | Lower bracket bolts             | 2    | Refer to "FRONT FORK<br>INSTALLATION".                          |
| 8     | Front forks                     | 2    | For installation, reverse the removal<br>procedure.             |





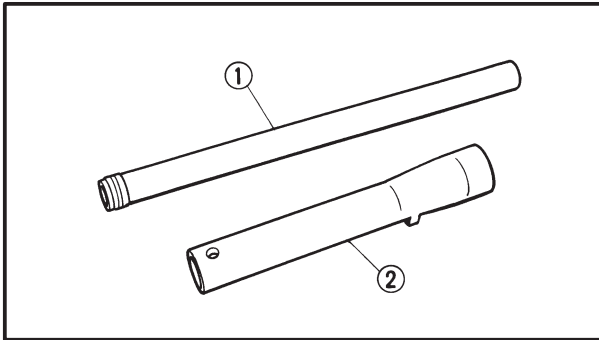
| Order | Job/Part                      | Q'ty | Remarks                                     |
|-------|-------------------------------|------|---|
|       | <b>Front fork disassembly</b> |      |   |
| ①     | Cap bolt                      | 1    | Disassemble the parts in the order below.   |
| ②     | O-ring                        | 1    |   |
| ③     | Spacer collar                 | 1    |   |
| ④     | Spring seat                   | 1    |   |
| ⑤     | Fork spring                   | 1    |   |
| ⑥     | Dust seal                     | 1    | Refer to "FRONT FORK ASSEMBLY".             |
| ⑦     | Retaining clip                | 1    |   |
| ⑧     | Damper rod bolt               | 1    |   |
| ⑨     | Gasket                        | 1    | Refer to "FRONT FORK DISASSEMBLY/ASSEMBLY". |
| ⑩     | Damper rod/rebound spring     | 1/1  |   |
| ⑪     | Oil seal                      | 1    |   |





| Order | Job/Part                | Q'ty | Remarks  |
|-------|-------------------------|------|--|
| ⑫     | Seal spacer             | 1    | Refer to "FRONT FORK ASSEMBLY".                  |
| ⑬     | Slide metal             | 1    |  |
| ⑭     | Inner tube/piston metal | 1/1  |  |
| ⑮     | Oil lock piece          | 1    |  |
| ⑯     | Outer tube              | 1    |  |
|       |                         |      | For assembly, reverse the disassembly procedure. |





EB703030

### FRONT FORK INSPECTION

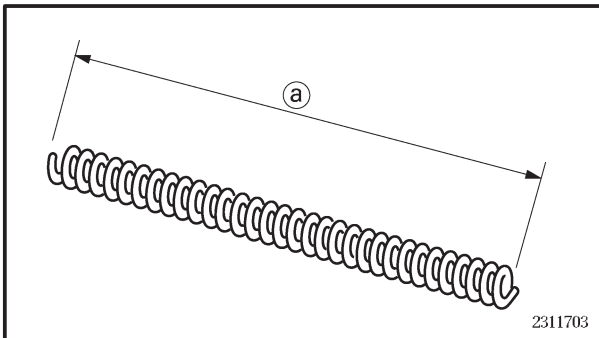
#### 1. Check:

- Inner tube ①
- Outer tube ②

Scratches/bends/damage → Replace.

#### **⚠ WARNING**

**Do not attempt to straighten a bent inner tube as this may dangerously weaken the tube.**

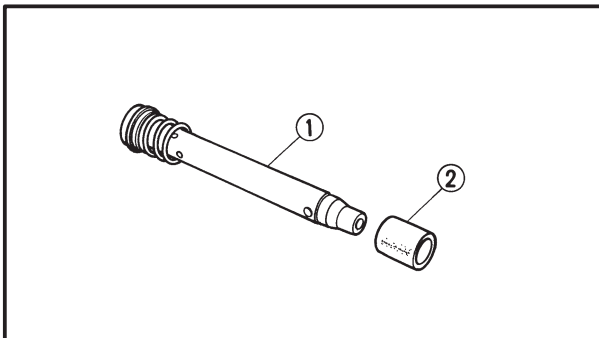


#### 2. Measure:

- Fork spring length (a)
- Over the specified limit → Replace.



**Fork spring free length (limit):  
292 mm**



#### 3. Check:

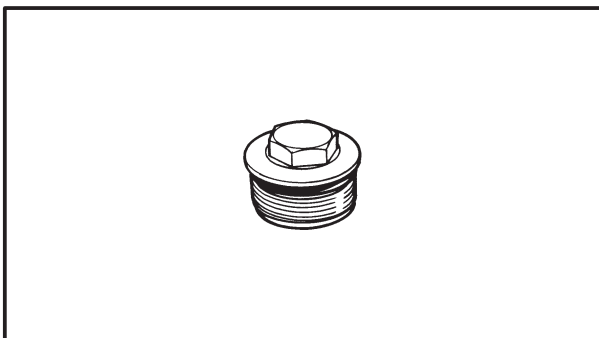
- Damper rod ①

Wear/damage → Replace.

Contamination → Blow out all of the oil passages with compressed air.

- Oil lock piece ②

Damage → Replace.



#### 4. Check:

- O-ring (cap bolt)

Wear/damage → Replace.

### FRONT FORK ASSEMBLY

#### NOTE:

- When reassembling the front fork, replace the following parts.

\*Piston metal

\*Slide metal

\*Oil seal

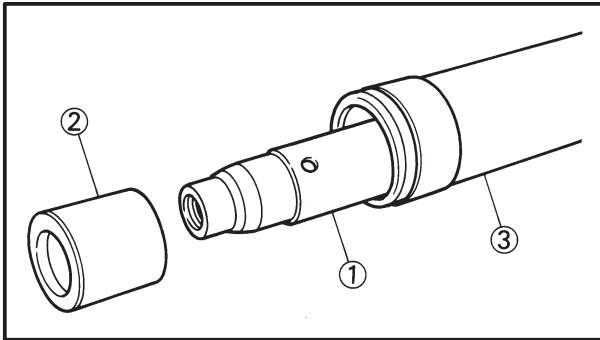
\*Dust seal

- Before reassembly make sure that all the components are clean.



## FRONT FORK

CHAS

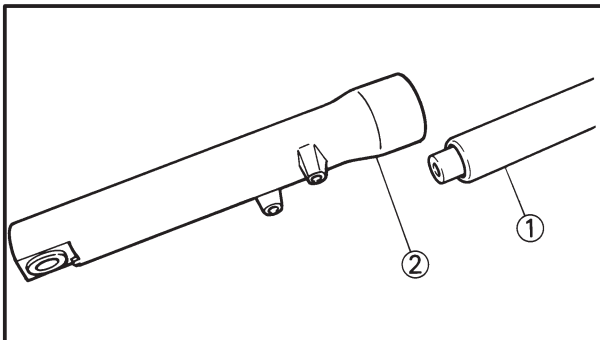


### 1. Install:

- Damper rod ①
- Rebound spring
- Oil lock piece ②
- Inner tube ③

### CAUTION:

Allow the damper rod to slide slowly down the inner tube until it protrudes from the bottom, being careful not to damage the inner tube.



### 2. Lubricate:

- Inner tube (outer surface)



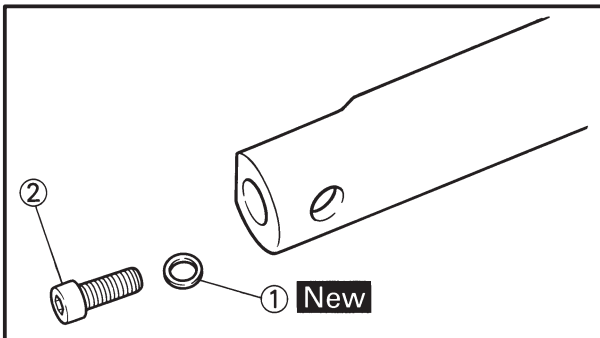
**Recommended oil:**  
Fork oil 10W or equivalent

### 3. Install:

- Inner tube ①  
(to outer tube ②)

### 4. Install:

- Gasket ① **New**
- Damper rod bolt ②



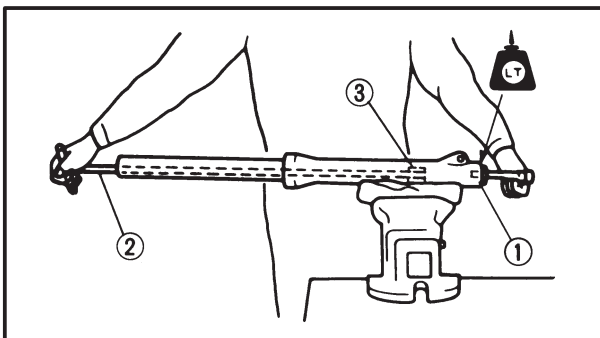
### 5. Tighten:

- Damper rod bolt ①

**30 Nm (3.0 m•kg)**

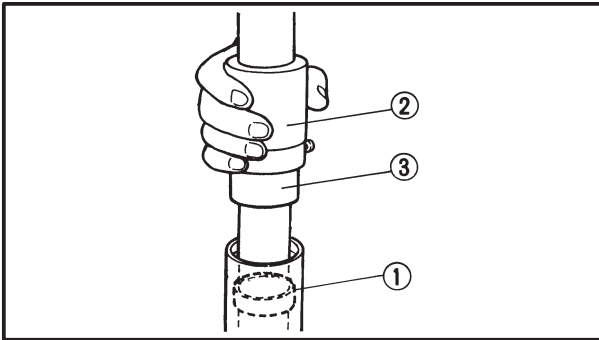
### NOTE:

Apply LOCTITE® to the threads of the damper rod holder. Tighten the damper rod bolt while holding the damper rod with a T-handle ② and a damper rod holder ③.



**T-handle: 90890-01326**  
**Damper rod holder: 90890-01388**

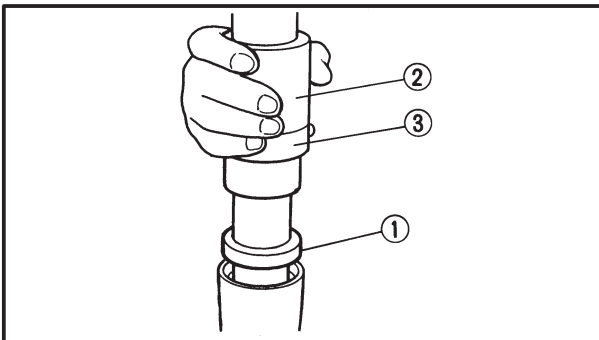




6. Install:

- Slide metal ① **New**
- Seal spacer

Use the fork seal driver weight ② and the adapter ③.



7. Install:

- Oil seal ① **New**

Use the fork seal driver weight ② and the adapter ③.



**Fork seal driver weight:**

**90890-01367**

**Adapter:**

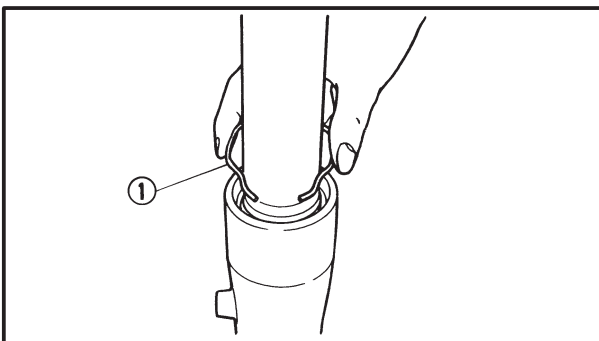
**90890-01381**

**NOTE:**

Before installing the oil seal, apply lithium soap base grease onto the oil seal lips.

**CAUTION:**

**Make sure that the numbered side of the oil seal faces up.**

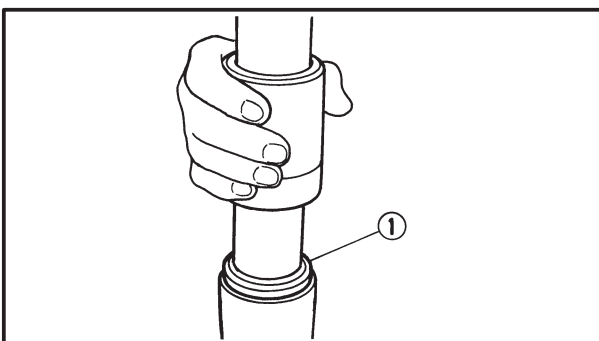


8. Install:

- Retaining clip ①

**NOTE:**

Adjust the retaining clip so that it fits into the outer tube groove.



9. Install:

- Dust seal ①

Use the fork seal driver weight.



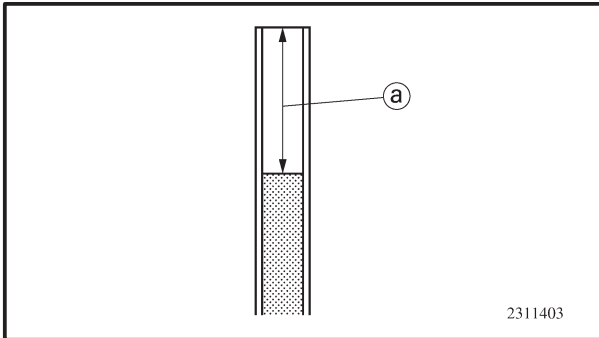
**Fork seal driver weight:**

**90890-01367**



## FRONT FORK

CHAS



### 10. Fill:

- Fork oil



#### Each fork:

**0.462 L (462 cm<sup>3</sup>)**

**Fork oil 10W or equivalent.**

**After filling up, slowly pump the fork up and down to distribute the fork oil.**

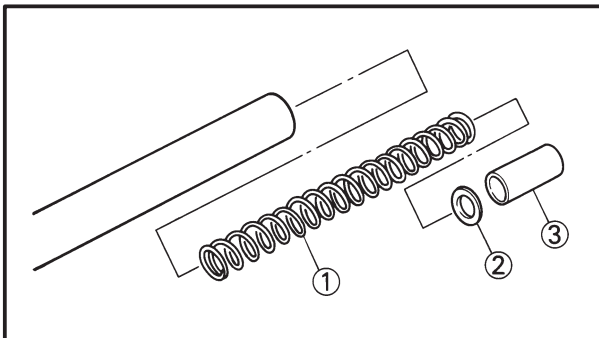
#### Oil level (a):

**110 mm**

**(from the top of the inner tube fully compressed and without the fork spring)**

### NOTE:

Hold the fork in an upright position.



### 11. Install:

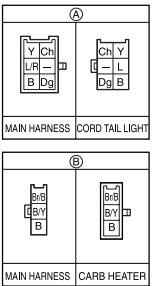
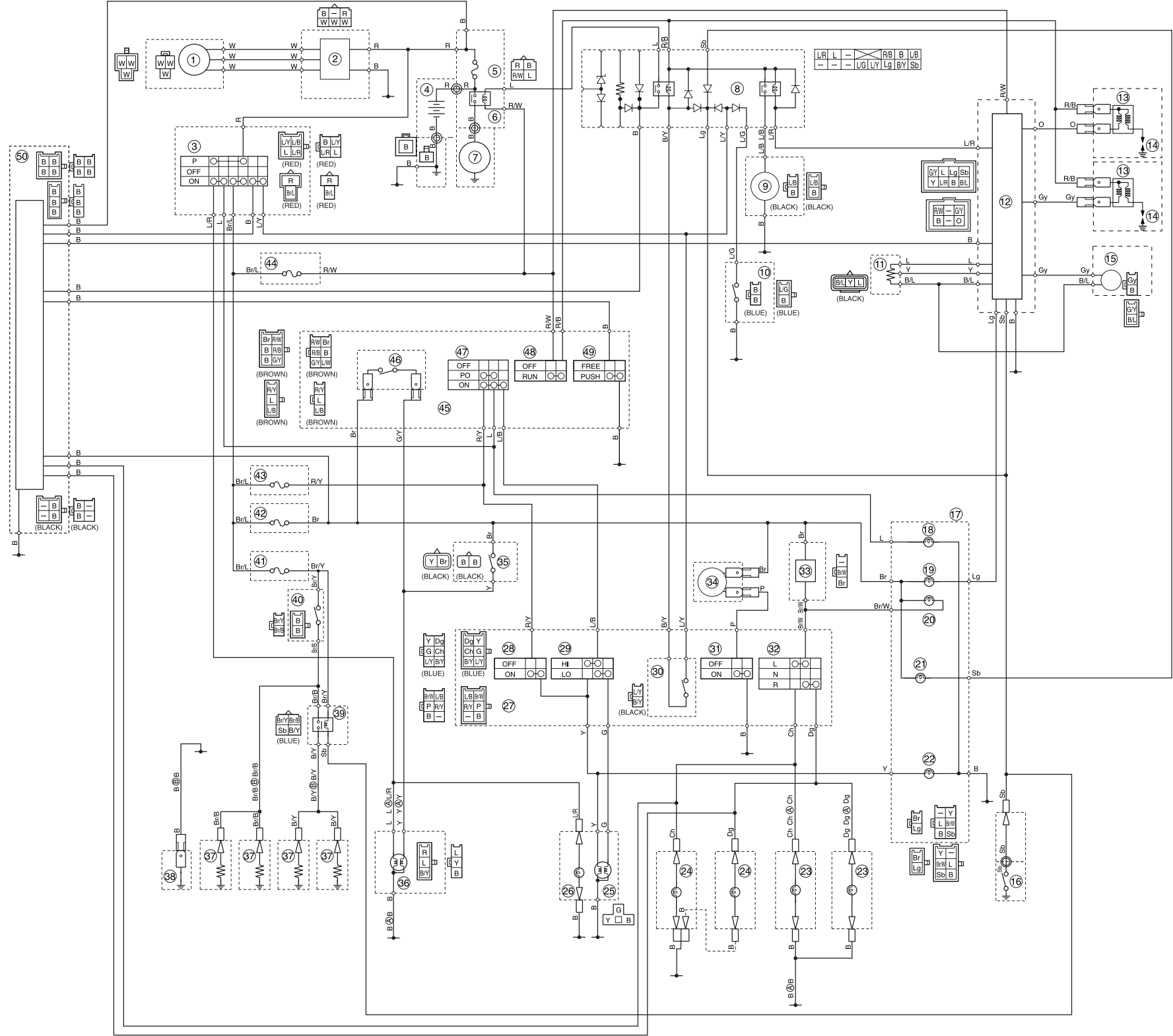
- Fork spring ①
- Spring seat ②
- Spacer collar ③
- O-ring
- Cap bolt

### NOTE:

- Before installing the cap bolt, apply grease to the O-ring.
- Temporarily tighten the cap bolt.



XVS650 2001 WIRING DIAGRAM



- ① A.C. magneto
- ② Rectifier/regulator
- ③ Main switch
- ④ Battery
- ⑤ Main fuse
- ⑥ Starter relay
- ⑦ Starter motor
- ⑧ Relay unit
- ⑨ Fuel pump
- ⑩ Sidestand switch
- ⑪ Throttle position sensor (TPS)
- ⑫ Ignitor unit
- ⑬ Ignition coil
- ⑭ Spark plug
- ⑮ Pickup coil
- ⑯ Neutral switch
- ⑰ Meter assembly
- ⑱ Meter light
- ⑲ Engine indicator light
- ⑳ Turn indicator light
- ㉑ Neutral indicator light
- ㉒ High beam indicator light
- ㉓ Rear turn signal
- ㉔ Front turn signal
- ㉕ Headlight
- ㉖ Auxiliary light
- ㉗ Left handlebar switch
- ㉘ Pass switch
- ㉙ Dimmer switch
- ㉚ Clutch switch
- ㉛ Horn switch
- ㉜ Turn switch
- ㉝ Flasher relay
- ㉞ Horn
- ㉟ Rear brake switch
- ㊱ Tail/brake light
- ㊲ Carburetor heater
- ㊳ Carburetor heater earth
- ㊴ Carburetor heater relay
- ㊵ Thermo switch
- ㊶ Carburetor heater fuse
- ㊷ Signal system fuse
- ㊸ Headlight fuse
- ㊹ Ignition fuse
- ㊺ Right handlebar switch
- ㊻ Front brake switch
- ㊼ Lights switch
- ㊽ Engine stop switch
- ㊾ Start switch
- ㊿ Alarm system (Option)

COLOR CODE

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