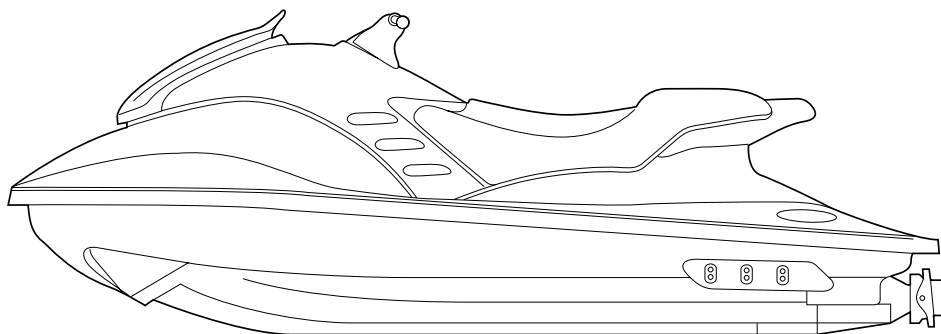




# ***WaveRunner GP1200R***



## **SERVICE MANUAL**



**LIT-18616-02-15**

**FOX-28197-ZA-11**

## NOTICE

This manual has been prepared by the Yamaha Motor Company Ltd. primarily for use by Yamaha dealers and their trained mechanics when performing maintenance procedures and repairs to Yamaha equipment. It has been written to suit the needs of persons who have a basic understanding of the mechanical and electrical concepts and procedures inherent in the work, for without such knowledge attempted repairs or service to the equipment could render it unsafe or unfit for use.

Because the Yamaha Motor Company, Ltd. has a policy of continuously improving its products, models may differ in detail from the descriptions and illustrations given in this publication. Use only the latest edition of this manual. Authorized Yamaha dealers are notified periodically of modifications and significant changes in specifications and procedures, and these are incorporated in successive editions of this manual.

A10001-0\*

**WaveRunner GP1200R  
SERVICE MANUAL**

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**1st Edition, February 2000**

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**Printed in USA**

**LIT-18616-02-15**

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## HOW TO USE THIS MANUAL

### MANUAL FORMAT

All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspection operations.

In this revised format, the condition of a faulty component will precede an arrow symbol and the course of action required will follow the symbol, e.g.,

- Bearings  
Pitting/scratches → Replace.

To assist you in finding your way through this manual, the section title and major heading is given at the top of every page.

### ILLUSTRATIONS

The illustrations within this service manual represent all of the designated models.

### CROSS REFERENCES

The cross references have been kept to a minimum. Cross references will direct you to the appropriate section or chapter.

---

## IMPORTANT INFORMATION

In this Service Manual particularly important information is distinguished in the following ways.

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

### WARNING

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

---

### CAUTION:

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

---

### NOTE:

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

---

### IMPORTANT:

This part has been subjected to change of specification during production.

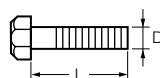
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## HOW TO USE THIS MANUAL

- ① To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.
- ② Numbers are given in the order of the jobs in the exploded diagram.
- ③ Symbols indicate parts to be lubricated or replaced (see "SYMBOLS").
- ④ A job instruction chart accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.
- ⑤ Dimension figures and the number of parts, are provided for fasteners that require a tightening torque.

Example:

Bolt or screw size 10 × 25 mm : M10 (D) × 25 mm (L)



- ⑥ Jobs requiring more information (such as special tools and technical data) are described sequentially.

### JET PUMP NOZZLE DEFLECTOR AND NOZZLE RING

#### NOZZLE DEFLECTOR AND NOZZLE RING EXPLODED DIAGRAM

#### REMOVAL AND INSTALLATION CHART

| Step                                            | Procedure/Part name | Q'ty | Service points                      |
|-------------------------------------------------|---------------------|------|-------------------------------------|
| <b>NOZZLE DEFLECTOR AND NOZZLE RING REMOVAL</b> |                     |      |                                     |
| 1                                               | Jet pump unit       | 2    | Follow the left "Step" for removal. |
| 2                                               | Bolt                | 2    | Refer to "JET PUMP UNIT".           |
| 3                                               | Spacer              | 1    |                                     |
| 4                                               | Nozzle deflector    | 2    |                                     |
| 5                                               | Bolt                | 2    |                                     |
| 6                                               | Spacer              | 2    |                                     |
| 7                                               | Nozzle ring         | 1    |                                     |
| 8                                               | Ball joint          | 1    |                                     |
| Reverse the removal steps for installation.     |                     |      |                                     |

6-3

### JET PUMP IMPELLER DUCT AND DRIVE SHAFT

**SERVICE POINTS**

**Drive shaft removal**

1. Remove:

- Impeller

**Drive shaft holder:**  
YB-06049/90890-06518

**NOTE:**  
The impeller has left-hand threads. Turn the impeller clockwise to loosen it.

2. Remove:

- Nut ②

**Drive shaft holder:**  
YB-06049/90890-06518

3. Remove:

- Drive shaft ①
- Rear bearing ②

**NOTE:**  
Remove the drive shaft and rear bearing with a press.

4. Remove:

- Front bearing

**Slide hammer set:**  
90890-06523  
YB-06096/90890-06531

**Impeller inspection**  
Refer to "JET PUMP UNIT" in chapter 3.

**Drive shaft inspection**

1. Inspect:

- Drive shaft

Damage/wear → Replace.

**Bearing inspection**

1. Inspect:

- Front and rear bearings (rotate each inner race by hand)

Damage/rough movement → Replace.

6-8

A50001-1-4

**SYMBOLS**

Symbols ① to ⑨ are designed as thumb-tabs to indicate the content of a chapter.

- ① General Information
- ② Specifications
- ③ Periodic Inspection and Adjustment
- ④ Fuel System
- ⑤ Power Unit
- ⑥ Jet Pump Unit
- ⑦ Electrical System
- ⑧ Hull and Hood
- ⑨ Trouble analysis

Symbols ⑩ to ⑮ indicate specific data:

- ⑩ Special tool
- ⑪ Specified liquid
- ⑫ Specified engine speed
- ⑬ Specified torque
- ⑭ Specified measurement
- ⑮ Specified electrical value  
[Resistance ( $\Omega$ ), Voltage (V), Electric current (A)]

Symbol ⑯ to ⑰ in an exploded diagram indicate the grade of lubricant and the location of lubrication point:

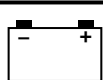
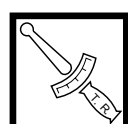
- ⑯ Apply YAMALUBE 2-W oil
- ⑰ Apply water resistant grease  
(Yamaha grease A, Yamaha marine grease)
- ⑱ Apply molybdenum disulfide grease

Symbols ⑲ to ⑳ in an exploded diagram indicate the grade of the sealing or locking agent, and the location of the application point:

- ⑲ Apply Gasket Maker®
- ⑳ Apply Yamabond #4  
(Yamaha bond number 4)
- ㉑ Apply LOCTITE® No. 271 (Red LOCTITE)
- ㉒ Apply LOCTITE® No. 242 (Blue LOCTITE)
- ㉓ Apply LOCTITE® No. 572
- ㉔ Apply silicone sealant

**NOTE:**

In this manual, the above symbols may not be used in every case.

|                                                                                                             |                                                                                                             |
|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| ①<br><b>GEN<br/>INFO</b>   | ②<br><b>SPEC</b>           |
| ③<br><b>INSP<br/>ADJ</b>   | ④<br><b>FUEL</b>           |
| ⑤<br><b>POWR</b>           | ⑥<br><b>JET<br/>PUMP</b>   |
| ⑦<br><b>ELEC</b>           | ⑧<br><b>HULL<br/>HOOD</b>  |
| ⑨<br><b>TRBL<br/>ANLS</b>  | ⑩                          |
| ⑪                        | ⑫                        |
| ⑬                        | ⑭                        |
| ⑮                        | ⑯                        |
| ⑰                        | ⑱                        |
| ⑲                        | ⑳                        |
| ㉑                        | ㉒                        |
| ㉓                        | ㉔                        |

# INDEX

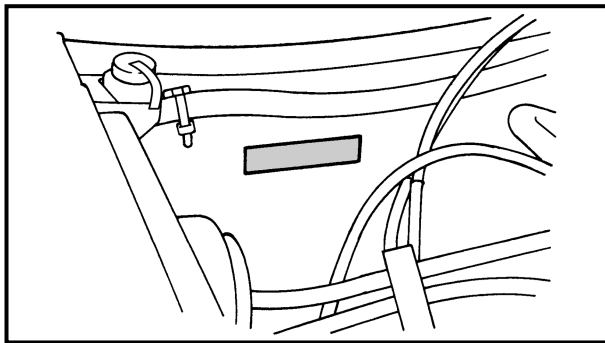
|                                       |                                                                                       |   |
|---------------------------------------|---------------------------------------------------------------------------------------|---|
| GENERAL INFORMATION                   |    | 1 |
|                                       | GEN<br>INFO                                                                           |   |
| SPECIFICATIONS                        |    | 2 |
|                                       | SPEC                                                                                  |   |
| PERIODIC INSPECTION AND<br>ADJUSTMENT |    | 3 |
|                                       | INSP<br>ADJ                                                                           |   |
| FUEL SYSTEM                           |   | 4 |
|                                       | FUEL                                                                                  |   |
| POWER UNIT                            |  | 5 |
|                                       | POWR                                                                                  |   |
| JET PUMP UNIT                         |  | 6 |
|                                       | JET<br>PUMP                                                                           |   |
| ELECTRICAL SYSTEM                     |  | 7 |
|                                       | ELEC                                                                                  |   |
| HULL AND HOOD                         |  | 8 |
|                                       | HULL<br>HOOD                                                                          |   |
| TROUBLE ANALYSIS                      |  | 9 |
|                                       | TRBL<br>ANLS                                                                          |   |

## CHAPTER 1

### GENERAL INFORMATION



|                                          |                |
|------------------------------------------|----------------|
| <b>IDENTIFICATION NUMBERS .....</b>      | <b>1-1</b>     |
| PRIMARY I.D. NUMBER.....                 | 1-1            |
| ENGINE SERIAL NUMBER .....               | 1-1            |
| JET PUMP UNIT SERIAL NUMBER .....        | 1-1            |
| HULL IDENTIFICATION NUMBER (H.I.N.)..... | 1-1            |
| <br><b>SAFETY WHILE WORKING .....</b>    | <br><b>1-2</b> |
| FIRE PREVENTION .....                    | 1-2            |
| VENTILATION.....                         | 1-2            |
| SELF-PROTECTION .....                    | 1-2            |
| OILS, GREASES AND SEALING FLUIDS.....    | 1-2            |
| GOOD WORKING PRACTICES .....             | 1-3            |
| DISASSEMBLY AND ASSEMBLY .....           | 1-4            |
| <br><b>SPECIAL TOOLS .....</b>           | <br><b>1-5</b> |
| MEASURING .....                          | 1-5            |
| REMOVAL AND INSTALLATION .....           | 1-6            |

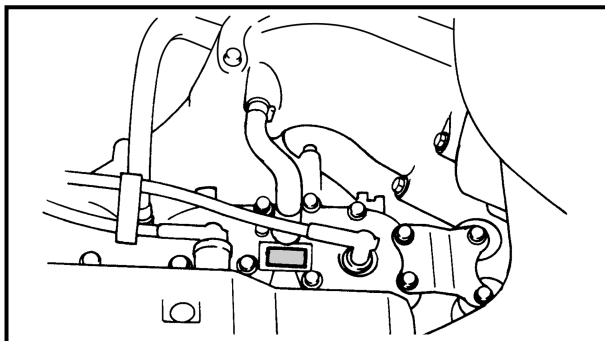


A60700-0\*

## IDENTIFICATION NUMBERS PRIMARY I.D. NUMBER

The primary I.D. number is stamped on a label attached to the inside of the engine compartment.

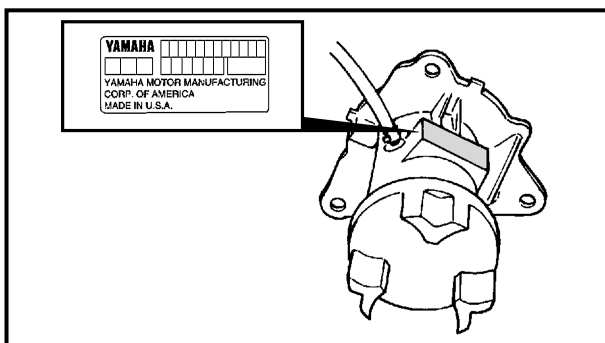
**Starting primary I.D. number:**  
**FOX: 800101 ~**



## ENGINE SERIAL NUMBER

The engine serial number is stamped on a label attached to the cylinder head.

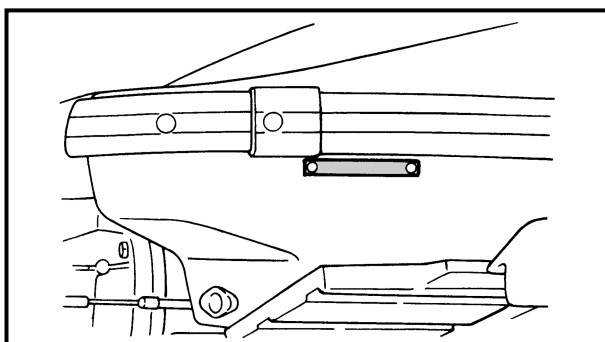
**Starting serial number:**  
**67X: 000101 ~**



## JET PUMP UNIT SERIAL NUMBER

The jet pump unit serial number is stamped on a label attached to the intermediate housing.

**Starting serial number:**  
**67X: 800101 ~**

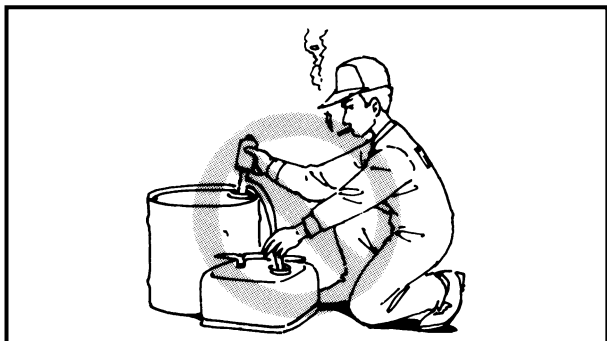


## HULL IDENTIFICATION NUMBER (H.I.N.)

The H.I.N. is stamped on a plate attached to the aft deck.

## **SAFETY WHILE WORKING**

The procedures given in this manual are those recommended by Yamaha to be followed by Yamaha dealers and their mechanics.

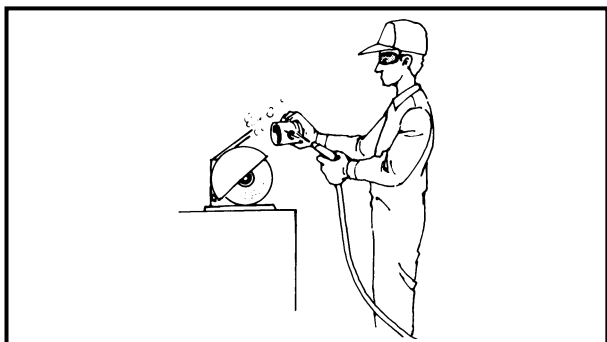


## **FIRE PREVENTION**

Gasoline (petrol) is highly flammable. Petroleum vapor is explosive if ignited. Do not smoke while handling gasoline (petrol) and keep it away from heat, sparks, and open flames.

## **VENTILATION**

Petroleum vapor is heavier than air and is deadly if inhaled in large quantities. Engine exhaust gases are harmful to breathe. When test-running an engine indoors, maintain good ventilation.



## **SELF-PROTECTION**

Protect your eyes with suitable safety spectacles or safety goggles when grinding or doing any operation which may cause particles to fly off.

Protect hands and feet by wearing safety gloves or protective shoes if appropriate to the work you are doing.



## **OILS, GREASES AND SEALING FLUIDS**

Use only genuine Yamaha oils, greases, and sealing fluids or those recommended by Yamaha.



Under normal conditions of use there should be no hazards from the use of the lubricants mentioned in this manual, but safety is all-important, and by adopting good safety practises any risk is minimized. A summary of the most important precautions is as follows:

1. While working, maintain good standards of personal and industrial hygiene.
2. Clothing which has become contaminated with lubricants should be changed as soon as practicable and laundered before further use.
3. Avoid skin contact with lubricants (e.g., do not place a soiled rag in your pocket).
4. Hands and any other part of the body which have been in contact with lubricants or lubricant-contaminated clothing should be thoroughly washed with hot water and soap as soon as practicable.
5. To protect the skin, the application of a suitable barrier cream to the hands before working is recommended.
6. A supply of clean lint-free cloths should be available for wiping purposes.



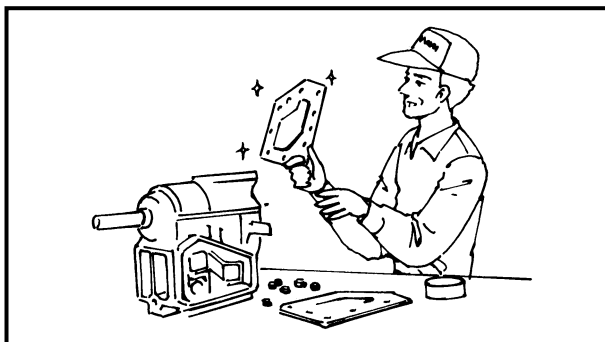
## GOOD WORKING PRACTICES

### 1. The right tools

Use the recommended special tools to protect parts from damage. Use the right tool in the right manner – do not improvise.

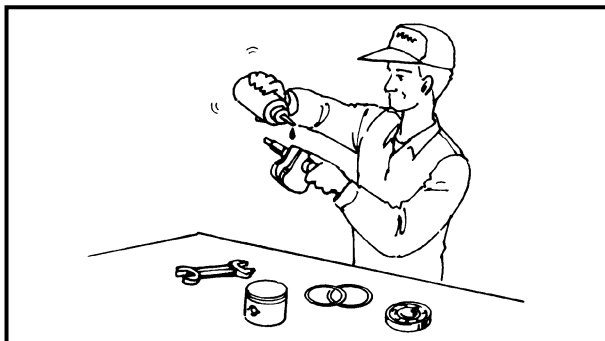
### 2. Tightening torque

Follow the tightening torque instructions. When tightening bolts, nuts and screws, tighten the larger sizes first and tighten inner-positioned fixings before outer-positioned ones.



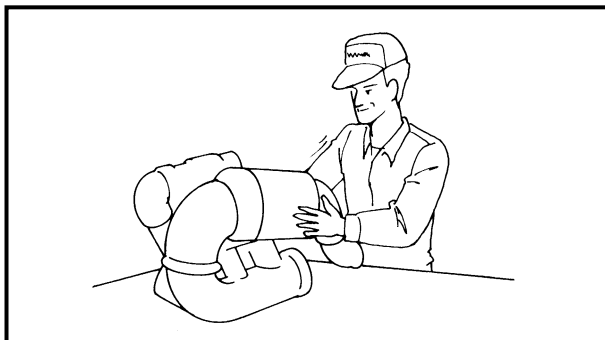
### 3. Non-reusable items

Always use new gaskets, packings, O-rings, oil seals, split-pins, circlips, etc., on reassembly.



## DISASSEMBLY AND ASSEMBLY

1. Clean parts with compressed air when disassembling.
2. Oil the contact surfaces of moving parts during assembly.



3. After assembly, check that moving parts operate normally.

4. Install bearings with the manufacturer's markings on the side exposed to view and liberally oil the bearings.

### **CAUTION:**

**Do not spin bearings with compressed air because this will damage their surfaces.**

5. When installing oil seals, apply a light coat of water-resistant grease to the outside diameter.

## SPECIAL TOOLS

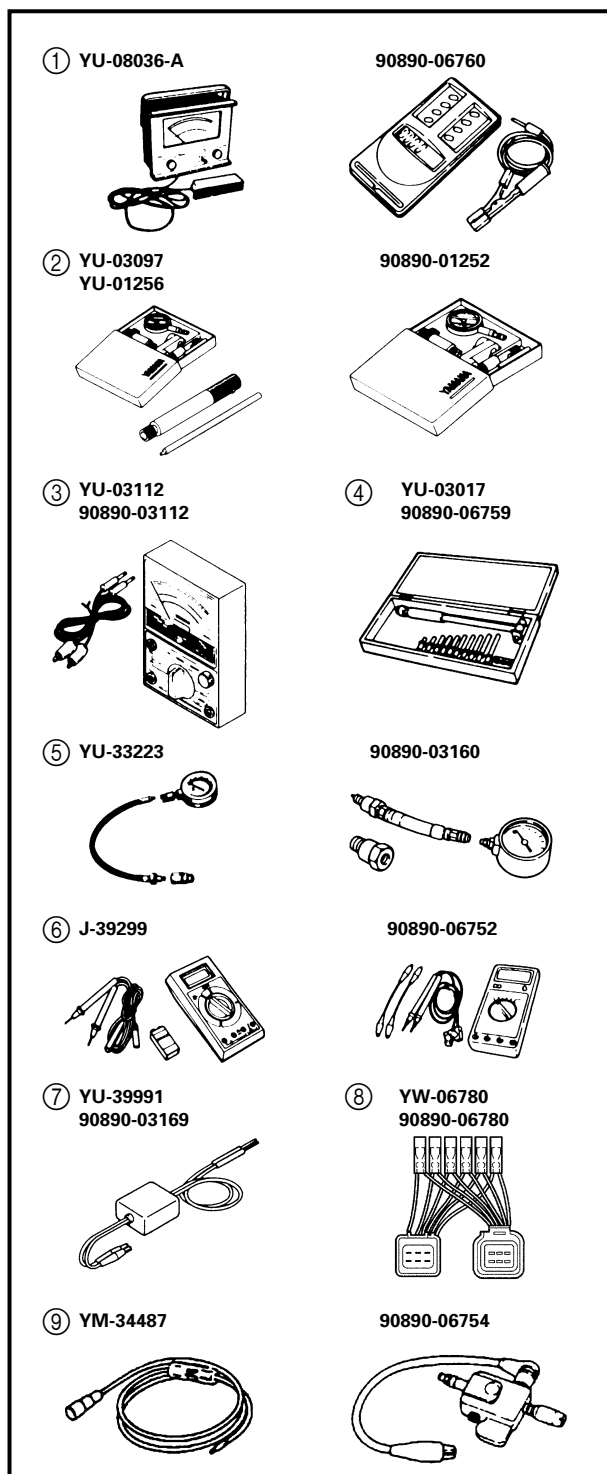
Using the correct special tools recommended by Yamaha, will aid the work and enable accurate assembly and tune-up. Improvisations and using improper tools can damage the equipment.

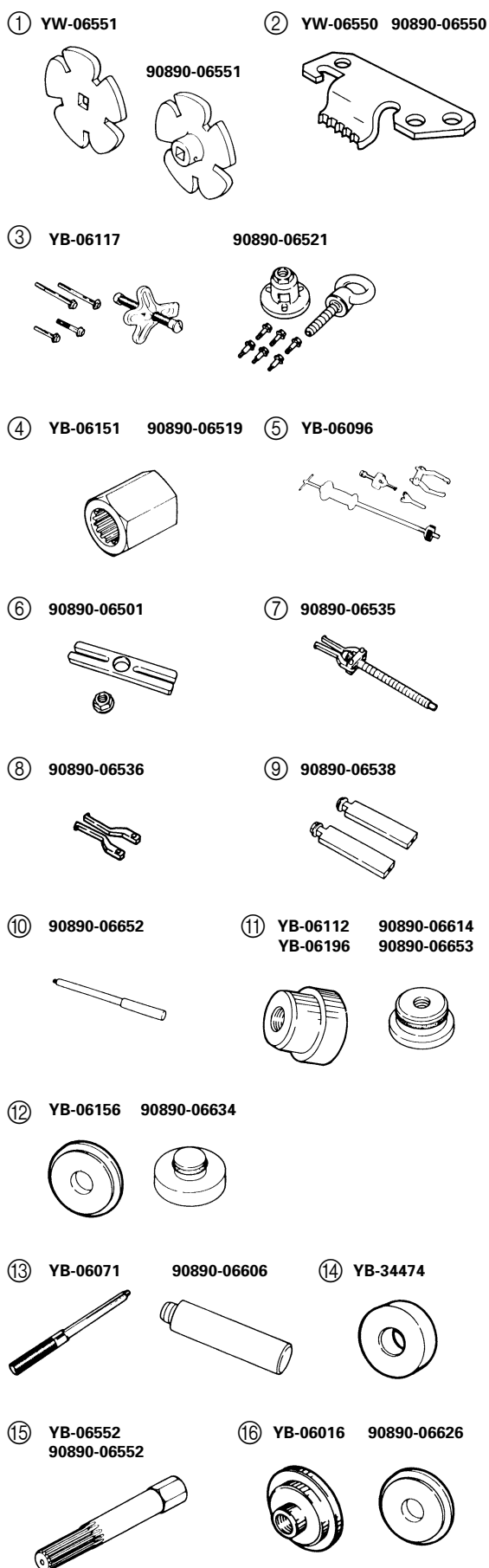
### NOTE:

- For U.S.A. and Canada, use part numbers starting with "J-", "YB-", "YM-", "YU-" or "YW-".
- For other countries, use part numbers starting with "90890-".

## MEASURING

- Engine tachometer  
P/N. YU-08036-A  
90890-06760
- Dial gauge and stand  
P/N. YU-03097, YU-01256  
90890-01252
- Pocket tester  
P/N. YU-03112  
90890-03112
- Cylinder gauge set  
P/N. YU-03017  
90890-06759
- Compression gauge  
P/N. YU-33223  
90890-03160
- Digital multimeter  
P/N. J-39299  
90890-06752
- Peak voltage adapter  
P/N. YU-39991  
90890-03169
- Peak voltage test harness  
P/N. YW-06780  
90890-06780
- Spark gap tester  
P/N. YM-34487  
90890-06754





## REMOVAL AND INSTALLATION

1. Coupler wrench  
P/N. YW-06551  
90890-06551
2. Flywheel holder  
P/N. YW-06550  
90890-06550
3. Flywheel puller  
P/N. YB-06117  
90890-06521
4. Drive shaft holder (impeller)  
P/N. YB-06151  
90890-06519
5. Slide hammer set (jet pump bearing)  
P/N. YB-06096
6. Stopper guide plate (jet pump bearing)  
P/N. 90890-06501
7. Bearing puller (jet pump bearing)  
P/N. 90890-06535
8. Bearing puller claw 1 (jet pump bearing)  
P/N. 90890-06536
9. Stopper guide stand (jet pump bearing)  
P/N. 90890-06538
10. Drive rod L3 (jet pump bearing)  
P/N. 90890-06652
11. Needle bearing attachment  
(jet pump bearing and oil seal)  
P/N. YB-06112, YB-06196  
90890-06614, 90890-06653
12. Ball bearing attachment  
(jet pump oil seal)  
P/N. YB-06156  
90890-06634
13. Driver rod  
(intermediate shaft and jet pump)  
P/N. YB-06071  
90890-06606
14. Bearing inner/outer race attachment  
(jet pump bearing)  
P/N. YB-34474
15. Shaft holder (intermediate shaft)  
P/N. YB-06552  
90890-06552
16. Bearing outer race attachment  
(intermediate shaft)  
P/N. YB-06016  
90890-06626

CHAPTER 2

SPECIFICATIONS

|                                 |      |
|---------------------------------|------|
| GENERAL SPECIFICATIONS .....    | 2-1  |
| MAINTENANCE SPECIFICATIONS..... | 2-3  |
| ENGINE .....                    | 2-3  |
| JET PUMP UNIT .....             | 2-4  |
| HULL AND HOOD .....             | 2-4  |
| ELECTRICAL .....                | 2-5  |
| TIGHTENING TORQUES .....        | 2-7  |
| SPECIFIED TORQUES .....         | 2-7  |
| GENERAL TORQUE .....            | 2-10 |
| CABLE AND HOSE ROUTING.....     | 2-11 |

**GENERAL SPECIFICATIONS**

| Item                                          | Unit                       | Model                     |
|-----------------------------------------------|----------------------------|---------------------------|
|                                               |                            | GP1200R                   |
| MODEL CODE                                    |                            |                           |
| Hull                                          |                            | F0X                       |
| Engine                                        |                            | 67X                       |
| DIMENSIONS                                    |                            |                           |
| Length                                        | mm (in)                    | 2,930 (115.4)             |
| Width                                         | mm (in)                    | 1,150 (45.3)              |
| Height                                        | mm (in)                    | 1,020 (40.2)              |
| Dry weight                                    | kg (lb)                    | 306 (675)                 |
| Vehicle capacity                              |                            | 2                         |
| PERFORMANCE                                   |                            |                           |
| Maximum output                                | kW (PS) @ r/min            | 114.0 (155) @ 7,000       |
| Maximum fuel consumption                      | ℓ /h (US gal/h, Imp gal/h) | 64.0 (16.9, 14.1)         |
| Cruising range                                | hr                         | 1.1                       |
| ENGINE                                        |                            |                           |
| Engine type                                   |                            | 2-stroke                  |
| Number of cylinders                           |                            | 3                         |
| Displacement                                  | cm <sup>3</sup> (cu. in)   | 1,176 (71.74)             |
| Bore × stroke                                 | mm (in)                    | 80.0 × 78.0 (3.15 × 3.07) |
| Compression ratio                             |                            | 5.9:1                     |
| Intake system                                 |                            | Reed valve                |
| Carburetor model<br>(manufacturer) × quantity |                            | BN44 (MIKUNI) × 3         |
| Enrichment control                            |                            | Choke valve               |
| Scavenging system                             |                            | Loop charge               |
| Lubrication system                            |                            | Variable oil injection    |
| Cooling system                                |                            | Water cooled              |
| Starting system                               |                            | Electric starter          |
| Ignition system                               |                            | Digital CDI               |
| Ignition timing                               | Degree                     | 18 BTDC ~ 24 BTDC         |
| Spark plug model<br>(manufacturer)            |                            | BR8ES-11 (NGK)            |
| Battery capacity                              | V-Ah (kC)                  | 12 - 19 (68.4)            |
| Lighting coil                                 | A @ r/min                  | 9 ~ 11 @ 6,000            |
| DRIVE UNIT                                    |                            |                           |
| Propulsion system                             |                            | Jet pump                  |
| Jet pump type                                 |                            | Axial flow, single stage  |
| Impeller rotation (from rear)                 |                            | Counterclockwise          |
| Transmission                                  |                            | Direct drive from engine  |
| Steering nozzle angle                         | Degree                     | 23 + 23                   |
| Trim nozzle angle                             | Degree                     | -5, 0, 5, 10, 15          |
| Trim system                                   |                            | Manual 5 positions        |
| Reverse system                                |                            | N.A.                      |



| Item                                          | Unit                   | Model                     |
|-----------------------------------------------|------------------------|---------------------------|
|                                               |                        | GP1200R                   |
| FUEL AND OIL                                  |                        |                           |
| Fuel                                          |                        | Regular unleaded gasoline |
| Minimum fuel rating                           | PON*                   | 86                        |
|                                               | RON*                   | 90                        |
| Oil                                           |                        | YAMALUBE 2-W*             |
| Fuel/oil mixing ratio<br>(wide open throttle) |                        | 30:1                      |
| Fuel tank capacity                            | ℓ (US gal,<br>Imp gal) | 60 (15.9, 13.2)           |
| Fuel tank reserve capacity                    | ℓ (US gal,<br>Imp gal) | 10 (2.6, 2.2)             |
| Oil tank capacity                             | ℓ (US gal,<br>Imp gal) | 5.5 (1.45, 1.21)          |

PON\*: Pump Octane Number = (Motor Octane Number + Research Octane Number)/2

RON\*: Research Octane Number

YAMALUBE 2-W\*: YAMALUBE 2-W is developed for this water vehicles and available from a Yamaha water vehicle dealer.

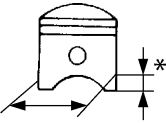
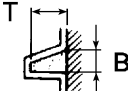
**CAUTION:**

**Use only YAMALUBE 2-W oil. Using another oil can seriously damage the catalytic converter and other engine components.**



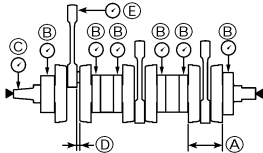
## MAINTENANCE SPECIFICATIONS

### ENGINE

| Item                                                                                               | Unit                      | Model                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                    |                           | GP1200R                                                                                                                                                                      |
| <b>CYLINDER HEAD</b>                                                                               |                           |                                                                                                                                                                              |
| Warpage limit                                                                                      | mm (in)                   | 0.1 (0.004)                                                                                                                                                                  |
| Compression pressure* <sup>1</sup>                                                                 | KPa (kg/cm <sup>2</sup> ) | 500 (5.0)                                                                                                                                                                    |
| <b>CYLINDERS</b>                                                                                   |                           |                                                                                                                                                                              |
| Bore size                                                                                          | mm (in)                   | 80.000 ~ 80.018 (3.1496 ~ 3.1503)                                                                                                                                            |
| Taper limit                                                                                        | mm (in)                   | 0.08 (0.003)                                                                                                                                                                 |
| Out-of-round limit                                                                                 | mm (in)                   | 0.05 (0.002)                                                                                                                                                                 |
| Wear limit                                                                                         | mm (in)                   | Original cylinder bore + 0.04 (0.0016)                                                                                                                                       |
| <b>PISTONS</b>                                                                                     |                           |                                                                                                                                                                              |
| Diameter                                                                                           | mm (in)                   | Red: 79.899 ~ 79.902 (3.1456 ~ 3.1457)<br>Orange: 79.903 ~ 79.906 (3.1458 ~ 3.1459)<br>Green: 79.907 ~ 79.910 (3.1459 ~ 3.1461)<br>Purple: 79.911 ~ 79.914 (3.1461 ~ 3.1462) |
|  Measuring point* | mm (in)                   | 22 (0.87)                                                                                                                                                                    |
| Piston-to-cylinder clearance                                                                       | mm (in)                   | 0.100 ~ 0.105 (0.0039 ~ 0.0041)                                                                                                                                              |
| Wear limit                                                                                         | mm (in)                   | Cylinder bore – 0.105 (0.0041)                                                                                                                                               |
| Piston pin bore inside diameter                                                                    | mm (in)                   | 22.004 ~ 22.025 (0.8663 ~ 0.8671)                                                                                                                                            |
| <b>PISTON RINGS</b>                                                                                |                           |                                                                                                                                                                              |
|  Top            |                           |                                                                                                                                                                              |
| Type                                                                                               |                           | Keystone                                                                                                                                                                     |
| Dimensions (B)                                                                                     | mm (in)                   | 1.47 ~ 1.49 (0.058 ~ 0.059)                                                                                                                                                  |
| Dimensions (T)                                                                                     | mm (in)                   | 2.8 ~ 2.9 (0.110 ~ 0.114)                                                                                                                                                    |
| End gap                                                                                            | mm (in)                   | 0.45 ~ 0.60 (0.018 ~ 0.024)                                                                                                                                                  |
| Ring groove clearance                                                                              | mm (in)                   | 0.03 ~ 0.05 (0.001 ~ 0.002)                                                                                                                                                  |
| 2nd                                                                                                |                           |                                                                                                                                                                              |
| Type                                                                                               |                           | Keystone                                                                                                                                                                     |
| Dimensions (B)                                                                                     | mm (in)                   | 1.47 ~ 1.49 (0.058 ~ 0.059)                                                                                                                                                  |
| Dimensions (T)                                                                                     | mm (in)                   | 2.8 ~ 2.9 (0.110 ~ 0.114)                                                                                                                                                    |
| End gap                                                                                            | mm (in)                   | 0.45 ~ 0.60 (0.018 ~ 0.024)                                                                                                                                                  |
| Ring groove clearance                                                                              | mm (in)                   | 0.03 ~ 0.05 (0.001 ~ 0.002)                                                                                                                                                  |
| <b>PISTON PINS</b>                                                                                 |                           |                                                                                                                                                                              |
| Diameter                                                                                           | mm (in)                   | 21.995 ~ 22.000 (0.8659 ~ 0.8661)                                                                                                                                            |
| Wear limit                                                                                         | mm (in)                   | 21.990 (0.8657)                                                                                                                                                              |

\*1: At 760 mmHg and 20 °C (68 °F).



| Item                                                                              | Unit    | Model                              |
|-----------------------------------------------------------------------------------|---------|------------------------------------|
|                                                                                   |         | GP1200R                            |
| CRANKSHAFT ASSEMBLY                                                               |         |                                    |
| Crank width ㉑                                                                     | mm (in) | 72.95 ~ 73.00 (2.872 ~ 2.874)      |
| Deflection limit ㉒                                                                | mm (in) | 0.05 (0.002)                       |
| Deflection limit ㉓                                                                | mm (in) | 0.15 (0.006)                       |
| Big end side clearance ㉔                                                          | mm (in) | 0.25 ~ 0.75 (0.010 ~ 0.030)        |
| Maximum small end axial play ㉕                                                    | mm (in) | 2.0 (0.08)                         |
|  |         |                                    |
| CARBURETORS                                                                       |         |                                    |
| Type                                                                              |         | Floatless                          |
| Identification mark                                                               |         | #1: 67X-01, #2: 67X-02, #3: 67X-03 |
| Main nozzle                                                                       | mm (in) | 3.2 (0.13)                         |
| Main jet                                                                          |         | 117.5                              |
| Pilot jet                                                                         |         | 95                                 |
| Throttle valve                                                                    |         | 150                                |
| Valve seat size                                                                   | mm (in) | 1.2 (0.05)                         |
| Trolling speed                                                                    | r/min   | 1,350 ± 50                         |
| REED VALVES                                                                       |         |                                    |
| Thickness                                                                         | mm (in) | 0.6 (0.024)                        |
| Reed valve stopper height                                                         | mm (in) | 10.4 ~ 11.0 (0.41 ~ 0.43)          |
| Reed valve warpage limit                                                          | mm (in) | 0.2 (0.01)                         |

## JET PUMP UNIT

| Item                      | Unit    | Model                       |
|---------------------------|---------|-----------------------------|
|                           |         | GP1200R                     |
| JET PUMP                  |         |                             |
| Impeller material         |         | Stainless steel             |
| Number of impeller blades |         | 3                           |
| Impeller pitch angle      | Degree  | 13.5                        |
| Impeller clearance        | mm (in) | 0.35 ~ 0.45 (0.014 ~ 0.018) |
| Impeller clearance limit  | mm (in) | 0.6 (0.02)                  |
| Drive shaft runout limit  | mm (in) | 0.3 (0.012)                 |
| Nozzle diameter           | mm (in) | 86.8 (3.42)                 |

## HULL AND HOOD

| Item                     | Unit    | Model                   |
|--------------------------|---------|-------------------------|
|                          |         | GP1200R                 |
| FREE PLAY                |         |                         |
| YPVS cable slack         | mm (in) | 0.5 ~ 1.5 (0.02 ~ 0.06) |
| Throttle lever free play | mm (in) | 4 ~ 7 (0.16 ~ 0.28)     |



## ELECTRICAL

| Item                            | Unit       | Model                                      |
|---------------------------------|------------|--------------------------------------------|
|                                 |            | GP1200R                                    |
| BATTERY                         |            |                                            |
| Type                            |            | Fluid                                      |
| Capacity                        | V-Ah (kC)  | 12 - 19 (68.4)                             |
| CDI UNIT                        |            |                                            |
| (B/O – B for cylinder #1)       |            |                                            |
| (B/W – B for cylinder #2)       |            |                                            |
| (B/Y – B for cylinder #3)       |            |                                            |
| Output peak voltage lower limit |            |                                            |
| @cranking 1                     | V          | 200                                        |
| @cranking 2                     | V          | 180                                        |
| @2,000 r/min                    | V          | 190                                        |
| @3,500 r/min                    | V          | 180                                        |
| STATOR                          |            |                                            |
| Pickup coil (W/R – B/O)         |            |                                            |
| Output peak voltage lower limit |            |                                            |
| @cranking 1                     | V          | 5                                          |
| @cranking 2                     | V          | 2.8                                        |
| @2,000 r/min                    | V          | 7.9                                        |
| @3,500 r/min                    | V          | 11                                         |
| Lighting coil (G – G)           |            |                                            |
| Output peak voltage lower limit |            |                                            |
| @cranking 1                     | V          | 9                                          |
| @cranking 2                     | V          | 9                                          |
| @2,000 r/min                    | V          | 14                                         |
| @3,500 r/min                    | V          | 14                                         |
| Pickup coil resistance          | Ω (color)  | 445 ~ 545 (W/R – B/O)                      |
| Lighting coil resistance        | Ω (color)  | 0.49 ~ 0.59 (G – G)                        |
| Minimum charging current        | A @ r/min  | 9 @ 6,000                                  |
| IGNITION COIL                   |            |                                            |
| Minimum spark gap               | mm (in)    | 10 (0.39)                                  |
| Primary coil resistance         | Ω (color)  | 0.26 ~ 0.36 (B/W – Body)                   |
| Secondary coil resistance       | kΩ (color) | 3.5 ~ 4.7 (B/W – Spark plug lead terminal) |
| Spark plug lead resistance      |            |                                            |
| #1                              | kΩ         | 6.1 ~ 14.3                                 |
| #2                              | kΩ         | 4.6 ~ 11.1                                 |
| #3                              | kΩ         | 3.3 ~ 8.2                                  |

Cranking 1: unloaded

Cranking 2: loaded



| Item                                                                                                                         | Unit                                                           | Model                                                                               |
|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                                                                                                              |                                                                | GP1200R                                                                             |
| RECTIFIER/REGULATOR<br>(R – B)<br>Output peak voltage lower<br>limit (unloaded)<br>@cranking<br>@2,000 r/min<br>@3,500 r/min | V<br>V<br>V                                                    | 7<br>12.6<br>12.6                                                                   |
| STARTER MOTOR<br>Brush length<br>Wear limit<br>Commutator undercut<br>Limit<br>Commutator diameter<br>Limit                  | mm (in)<br>mm (in)<br>mm (in)<br>mm (in)<br>mm (in)<br>mm (in) | 12.5 (0.49)<br>6.5 (0.26)<br>0.7 (0.03)<br>0.2 (0.01)<br>28.0 (1.10)<br>27.0 (1.06) |
| FUSE<br>Rating                                                                                                               | V-A                                                            | 12-10<br>12-20                                                                      |

**TIGHTENING TORQUES**  
**SPECIFIED TORQUES**

| Part to tightened                              |     | Part name | Thread size | Q'ty | Tightening torque |       |       | Remarks                                                                                   |
|------------------------------------------------|-----|-----------|-------------|------|-------------------|-------|-------|-------------------------------------------------------------------------------------------|
|                                                |     |           |             |      | Nm                | m•kgf | ft•lb |                                                                                           |
| ENGINE                                         |     |           |             |      |                   |       |       |                                                                                           |
| Muffler cover – muffler                        |     | Bolt      | M6          | 3    | 12                | 1.2   | 8.7   |  242   |
| Muffler stay – cylinder body                   |     | Bolt      | M10         | 2    | 39                | 3.9   | 28    |  271   |
| Muffler – muffler stay 2                       |     | Bolt      | M10         | 1    | 39                | 3.9   | 28    |  271   |
| Eye – cylinder head                            |     | Bolt      | M10         | 4    | 39                | 3.9   | 28    |  271   |
| Muffler – eye                                  |     | Nut       | M10         | 2    | 39                | 3.9   | 28    |  271   |
| Muffler stay 2 – crankcase                     |     | Bolt      | M10         | 2    | 39                | 3.9   | 28    |  271   |
| Exhaust temperature sensor – muffler           |     | —         | —           | 1    | 39                | 3.9   | 28    |  572   |
| Water temperature sensor – mixing joint        |     | —         | —           | 1    | 20                | 2.0   | 14    |  572   |
| Muffler stay – catalyst housing                | 1st | Bolt      | M10         | 2    | 15                | 1.5   | 11    |  271   |
|                                                | 2nd |           |             |      | 39                | 3.9   | 28    |                                                                                           |
| Muffler – catalyst housing                     | 1st | Bolt      | M8          | 6    | 15                | 1.5   | 11    |  271   |
|                                                | 2nd |           |             |      | 33                | 3.3   | 24    |                                                                                           |
| Muffler – mixing joint                         | 1st | Bolt      | M8          | 6    | 11                | 1.1   | 8.0   |  271   |
|                                                | 2nd |           |             |      | 22                | 2.2   | 16    |                                                                                           |
| Exhaust chamber joint – exhaust manifold       |     | Bolt      | M10         | 4    | 39                | 3.9   | 28    |  271   |
| Exhaust chamber/stay – bracket                 |     | Bolt      | M10         | 2    | 39                | 3.9   | 28    |  271   |
| Exhaust chamber stay/ cylinder head – cylinder | 1st | Bolt      | M8          | 2    | 15                | 1.5   | 11    |                                                                                           |
|                                                | 2nd |           |             |      | 35                | 3.5   | 25    |                                                                                           |
| Exhaust chamber – exhaust chamber joint        |     | Bolt      | M10         | 6    | 39                | 3.9   | 28    |  271   |
| Engine – engine mount                          |     | Bolt      | M8          | 4    | 17                | 1.7   | 12    |  572  |
| Exhaust manifold – cylinder                    | 1st | Bolt      | M10         | 10   | 22                | 2.2   | 16    |  271 |
|                                                | 2nd |           |             |      | 39                | 3.9   | 28    |                                                                                           |
|                                                | 1st | Nut       | M10         | 2    | 15                | 1.5   | 11    |  271 |
|                                                | 2nd |           |             |      | 39                | 3.9   | 28    |                                                                                           |
| Water pipe – exhaust manifold                  |     | Bolt      | M6          | 6    | 12                | 1.2   | 8.7   |  242 |
| Reed valve plat/reed valve – crankcase         |     | Bolt      | M6          | 18   | 12                | 1.2   | 8.7   |  242 |
| Reed valve – reed valve base                   |     | Screw     | M4          | 24   | 1                 | 0.1   | 0.7   |  242 |
| YPVS cable holder/valve cover – cylinder       |     | Bolt      | M6          | 2    | 10                | 1.0   | 7.2   |  572 |
| YPVS valve cover – cylinder                    |     | Bolt      | M6          | 10   | 10                | 1.0   | 7.2   |  572 |
| YPVS valve arm – shaft                         |     | Bolt      | M4          | 3    | 3                 | 0.3   | 2.2   |  242 |
| YPVS valve assembly – cylinder                 |     | Bolt      | M5          | 3    | 4                 | 0.4   | 2.9   |  242 |
| Spark plug – cylinder head                     |     | Bolt      | M14         | 3    | 25                | 2.5   | 18    |                                                                                           |
| Cylinder head cover/ cylinder head – cylinder  | 1st | Bolt      | M8          | 22   | 22                | 2.2   | 16    |                                                                                           |
|                                                | 2nd |           |             |      | 22                | 2.2   | 16    |                                                                                           |
|                                                | 3rd |           |             |      | 35                | 3.5   | 25    |                                                                                           |



| Part to tightened                                            |     | Part name | Thread size | Q'ty | Tightening torque |       |       | Remarks                                                                                   |
|--------------------------------------------------------------|-----|-----------|-------------|------|-------------------|-------|-------|-------------------------------------------------------------------------------------------|
|                                                              |     |           |             |      | Nm                | m•kgf | ft•lb |                                                                                           |
| Cylinder – crankcase                                         | 1st | Bolt      | M10         | 12   | 22                | 2.2   | 16    |  572   |
|                                                              | 2nd |           |             |      | 39                | 3.9   | 28    |                                                                                           |
| Generator cover – crankcase                                  | 1st | Bolt      | M10         | 7    | 15                | 1.5   | 11    |  271   |
|                                                              | 2nd |           |             |      | 50                | 5.0   | 36    |                                                                                           |
| Generator cover/ground lead – crankcase                      | 1st | Bolt      | M10         | 1    | 15                | 1.5   | 11    |                                                                                           |
|                                                              | 2nd |           |             |      | 50                | 5.0   | 36    |                                                                                           |
| Bracket – crankcase                                          |     | Bolt      | M10         | 4    | 39                | 3.9   | 28    |  271   |
| Pickup coil – generator cover                                |     | Bolt      | M5          | 2    | 5                 | 0.5   | 3.6   |  242   |
| Stator coil – generator cover                                |     | Bolt      | M6          | 3    | 15                | 1.5   | 11    |  242   |
| Drive coupling – crankshaft                                  |     | Coupling  | M27         | 1    | 36                | 3.6   | 25    |  572   |
| Flywheel magneto – crankshaft                                |     | Bolt      | M10         | 1    | 75                | 7.5   | 54    |  572   |
| Upper crankcase – lower crankcase                            | 1st | Bolt      | M8          | 17   | 15                | 1.5   | 11    |                                                                                           |
|                                                              | 2nd |           |             |      | 27                | 2.7   | 19    |                                                                                           |
|                                                              |     |           | M6          | 10   | 11                | 1.1   | 8.0   |                                                                                           |
| Engine bracket – lower crankcase                             | 1st | Bolt      | M8          | 6    | 15                | 1.5   | 11    |  271   |
|                                                              | 2nd |           |             |      | 27                | 2.7   | 19    |                                                                                           |
| JET PUMP UNIT                                                |     |           |             |      |                   |       |       |                                                                                           |
| Steering cable joint – nozzle deflector                      |     | Nut       | —           | 1    | 7                 | 0.7   | 5.1   |                                                                                           |
| Ride plate – hull                                            |     | Bolt      | M8          | 4    | 17                | 1.7   | 12    |  572 |
| Intake duct – hull                                           |     | Bolt      | M8          | 4    | 17                | 1.7   | 12    |  572 |
| Intake grate – hull                                          |     | Bolt      | M6          | 4    | 7                 | 0.7   | 5.1   |  572 |
| Nozzle ring – nozzle                                         |     | Bolt      | M8          | 2    | 15                | 1.5   | 11    |  271 |
| Nozzle deflector – nozzle ring                               |     | Bolt      | M8          | 2    | 15                | 1.5   | 11    |  271 |
| Strainer cover – impeller duct                               |     | Bolt      | M6          | 4    | 7                 | 0.7   | 5.1   |  572 |
| Drive shaft nut – drive shaft                                |     | Nut       | —           | 1    | 74                | 7.4   | 53    |                                                                                           |
| Impeller (left-hand threads) – drive shaft                   |     | Impeller  | —           | 1    | 18                | 1.8   | 13    |  572 |
| Transom plate – hull                                         |     | Nut       | —           | 4    | 26                | 2.6   | 19    |                                                                                           |
| Intermediate housing – bulkhead                              |     | Bolt      | M8          | 3    | 17                | 1.7   | 12    |  572 |
| Driven coupling – shaft                                      |     | Coupling  | —           | 1    | 36                | 3.6   | 25    |  572 |
| Speed sensor – jet pump cover                                |     | Screw     | —           | 4    | 4                 | 0.4   | 2.9   |  242 |
| HULL AND HOOD                                                |     |           |             |      |                   |       |       |                                                                                           |
| Handlebar cover – handlebar cover stay                       |     | Screw     | M6          | 4    | 1.1               | 0.11  | 0.8   |                                                                                           |
| Handlebar cover stay – steering column                       |     | Screw     | M6          | 4    | 2.9               | 0.29  | 2.1   |                                                                                           |
| Upper handlebar holder/lower handle holder – steering column |     | Bolt      | M8          | 4    | 16                | 1.6   | 11    |                                                                                           |
| QSTS converter – hull                                        |     | Nut       | —           | 2    | 5                 | 0.5   | 3.6   |                                                                                           |
| Throttle lever assembly – handlebar                          |     | Screw     | M5          | 2    | 3                 | 0.3   | 2.2   |                                                                                           |
| Handlebar switch assembly – handlebar                        |     | Screw     | M5          | 2    | 3                 | 0.3   | 2.2   |                                                                                           |
| QSTS grip assembly – handlebar                               |     | Screw     | M6          | 1    | 3                 | 0.3   | 2.2   |                                                                                           |



| Part to tightened                                     | Part name | Thread size | Q'ty | Tightening torque |       |       | Remarks |
|-------------------------------------------------------|-----------|-------------|------|-------------------|-------|-------|---------|
|                                                       |           |             |      | Nm                | m•kgf | ft•lb |         |
| Grip end – handlebar                                  | Bolt      | M5          | 2    | 1                 | 0.1   | 0.7   |         |
| Choke lever assembly – handlebar                      | Screw     | M5          | 2    | 3                 | 0.3   | 2.2   |         |
| QSTS cable housing – cover                            | Screw     | M4          | 1    | 1                 | 0.1   | 0.7   |         |
| Plate/steering column assembly – deck                 | Nut       | —           | 2    | 16                | 1.6   | 11    |         |
| Steering column – deck                                | Nut       | —           | 2    | 16                | 1.6   | 11    |         |
| Steering arm – steering column                        | Nut       | M8          | 1    | 16                | 1.6   | 11    |         |
| QSTS cable locknut (nozzle ring side) – hull          | Nut       | —           | 1    | 3                 | 0.3   | 2.2   |         |
| QSTS cable – hull                                     | Nut       | —           | 1    | 6                 | 0.6   | 4.3   |         |
| QSTS cable – QSTS converter                           | Nut       | —           | 1    | 4                 | 0.4   | 2.9   |         |
| Steering cable locknut (nozzle deflector side) – hull | Nut       | —           | 1    | 6                 | 0.6   | 4.3   |         |
| Steering cable – hull                                 | Nut       | —           | 1    | 6                 | 0.6   | 4.3   |         |
| Steering cable holder – bracket                       | Bolt      | M6          | 1    | 5                 | 0.5   | 3.6   |         |
| Speed sensor lead – hull                              | Nut       | —           | 1    | 6                 | 0.6   | 4.3   |         |
| Hinge assembly – front hood                           | Bolt      | M6          | 2    | 6                 | 0.6   | 4.3   |         |
| Wind shield – front hood                              | Screw     | M5          | 8    | 1                 | 0.1   | 0.7   |         |
| Hood lock – front hood                                | Bolt      | M6          | 2    | 5                 | 0.5   | 3.6   |         |
| Steering console cover assembly – deck                | Nut       | —           | 2    | 5                 | 0.5   | 3.6   |         |
|                                                       | Bolt      | M6          | 4    | 3                 | 0.3   | 2.2   |         |
|                                                       | Screw     | M5          | 2    | 2                 | 0.2   | 1.4   |         |
|                                                       | Nut       | M8          | 2    | 16                | 1.6   | 11    |         |
| Multifunction meter – holder                          | Nut       | —           | 2    | 2                 | 0.2   | 1.4   |         |
| Steering console cover – side cover                   | Screw     | M6          | 4    | 3                 | 0.3   | 2.2   |         |
| Steering console cover – glove compartment            | Screw     | M5          | 4    | 1                 | 0.1   | 0.7   |         |
| Steering cable bracket – deck                         | Bolt      | M6          | 3    | 5                 | 0.5   | 3.6   |         |
| Hood lock assembly – deck                             | Nut       | M6          | 2    | 5                 | 0.5   | 3.6   |         |
| Seat lock assembly – seat                             | Bolt      | M6          | 2    | 6                 | 0.6   | 4.3   |         |
| Bracket/deck – notch                                  | Nut       | —           | 1    | 26                | 2.6   | 19    |         |
| Bracket/deck – hand grip                              | Bolt      | M8          | 2    | 5                 | 0.5   | 3.6   |         |
| Hand grip – deck                                      | Bolt      | M8          | 2    | 5                 | 0.5   | 3.6   |         |
| Battery box/stay – holder                             | Bolt      | M6          | 2    | 5                 | 0.5   | 3.6   |         |
| Battery box – deck                                    | Nut       | —           | 2    | 13                | 1.3   | 9.4   |         |
| Battery box – electrical box                          | Nut       | —           | 4    | 15                | 1.5   | 11    |         |
| Exhaust outlet – hull                                 | Bolt      | M6          | 3    | 5                 | 0.5   | 3.6   |         |
| Sponson – hull                                        | Bolt      | M8          | 6    | 18                | 1.8   | 13    |         |
| Spout – hull                                          | Nut       | —           | 1    | 5                 | 0.5   | 3.6   |         |
| Rope hole bolt                                        | Nut       | —           | 2    | 5                 | 0.5   | 3.6   |         |
| Bow eye – hull                                        | Bolt      | M6          | 2    | 13                | 1.3   | 9.4   |         |
| Flap – hull                                           | Bolt      | M6          | 8    | 6                 | 0.6   | 4.3   |         |
| Drain plug/packing – hull                             | Nut       | —           | 4    | 2                 | 0.2   | 1.4   |         |



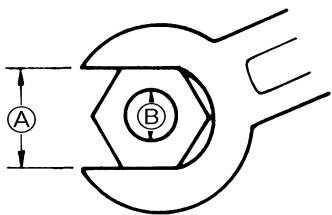
| Part to tightened         | Part name | Thread size | Q'ty | Tightening torque |       |       | Remarks                                                                             |
|---------------------------|-----------|-------------|------|-------------------|-------|-------|-------------------------------------------------------------------------------------|
|                           |           |             |      | Nm                | m•kgf | ft•lb |                                                                                     |
| Engine mount – hull       | Bolt      | M8          | 6    | 17                | 1.7   | 12    |  |
| Engine mount/plate – hull | Bolt      | M8          | 2    | 17                | 1.7   | 12    |  |
| Engine damper – hull      | Bolt      | M6          | 4    | 5                 | 0.5   | 3.6   |                                                                                     |

| Nut ① | Bolt ② | General torque specifications |       |       |
|-------|--------|-------------------------------|-------|-------|
|       |        | Nm                            | m•kgf | ft•lb |
| 8 mm  | M5     | 5.0                           | 0.5   | 3.6   |
| 10 mm | M6     | 8.0                           | 0.8   | 5.8   |
| 12 mm | M8     | 18                            | 1.8   | 13    |
| 14 mm | M10    | 36                            | 3.6   | 25    |
| 17 mm | M12    | 43                            | 4.3   | 31    |

### GENERAL TORQUE

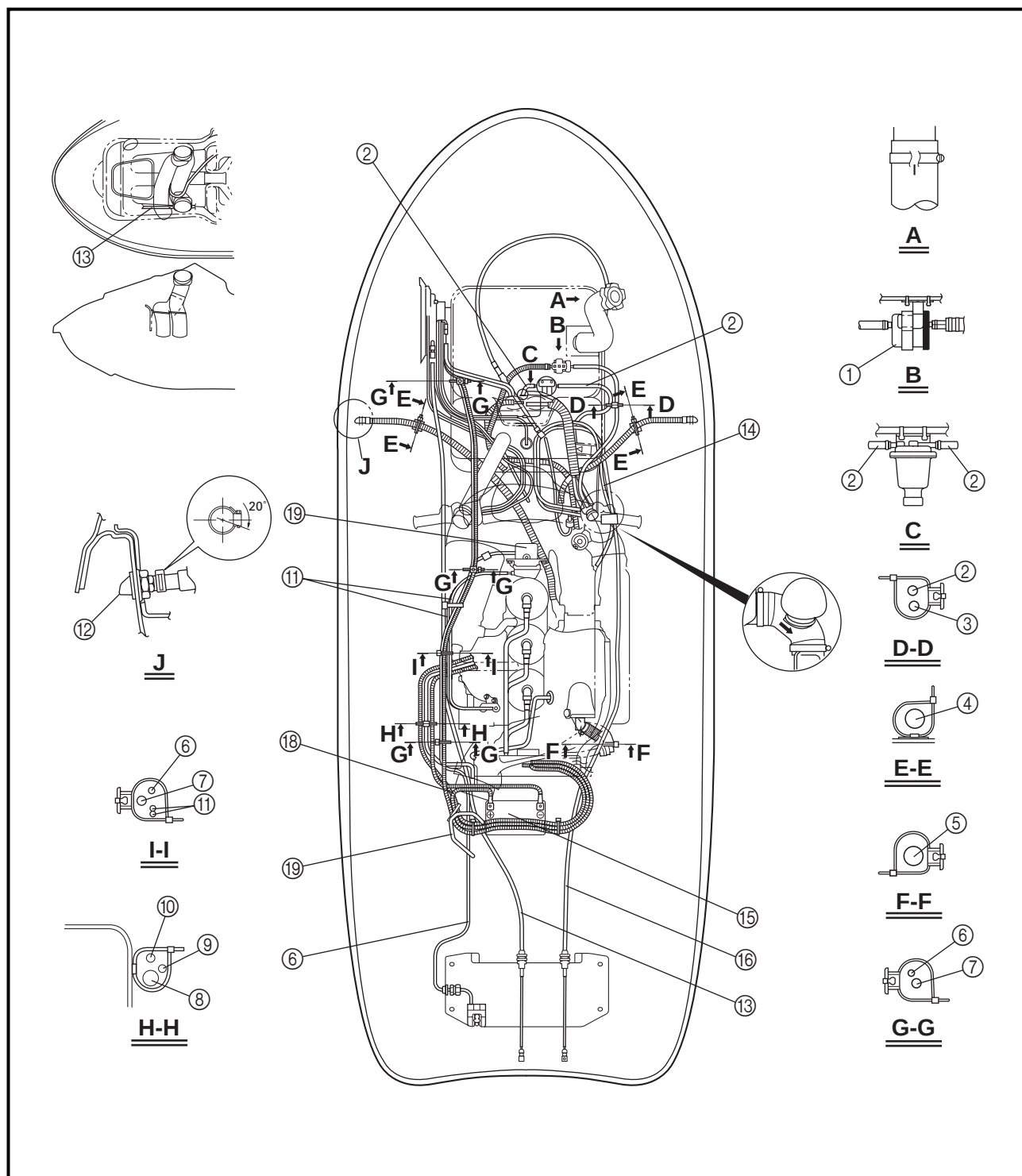
This chart specifies tightening torques for standard fasteners with a standard ISO thread pitch. Tightening torque specifications for special components or assemblies are provided in applicable sections of this manual. To avoid warpage, tighten multi-fastener assemblies in a crisscross fashion and progressive stages until the specified tightening torque is reached. Unless otherwise specified, tightening torque specifications require clean, dry threads.

Components should be at room temperature.





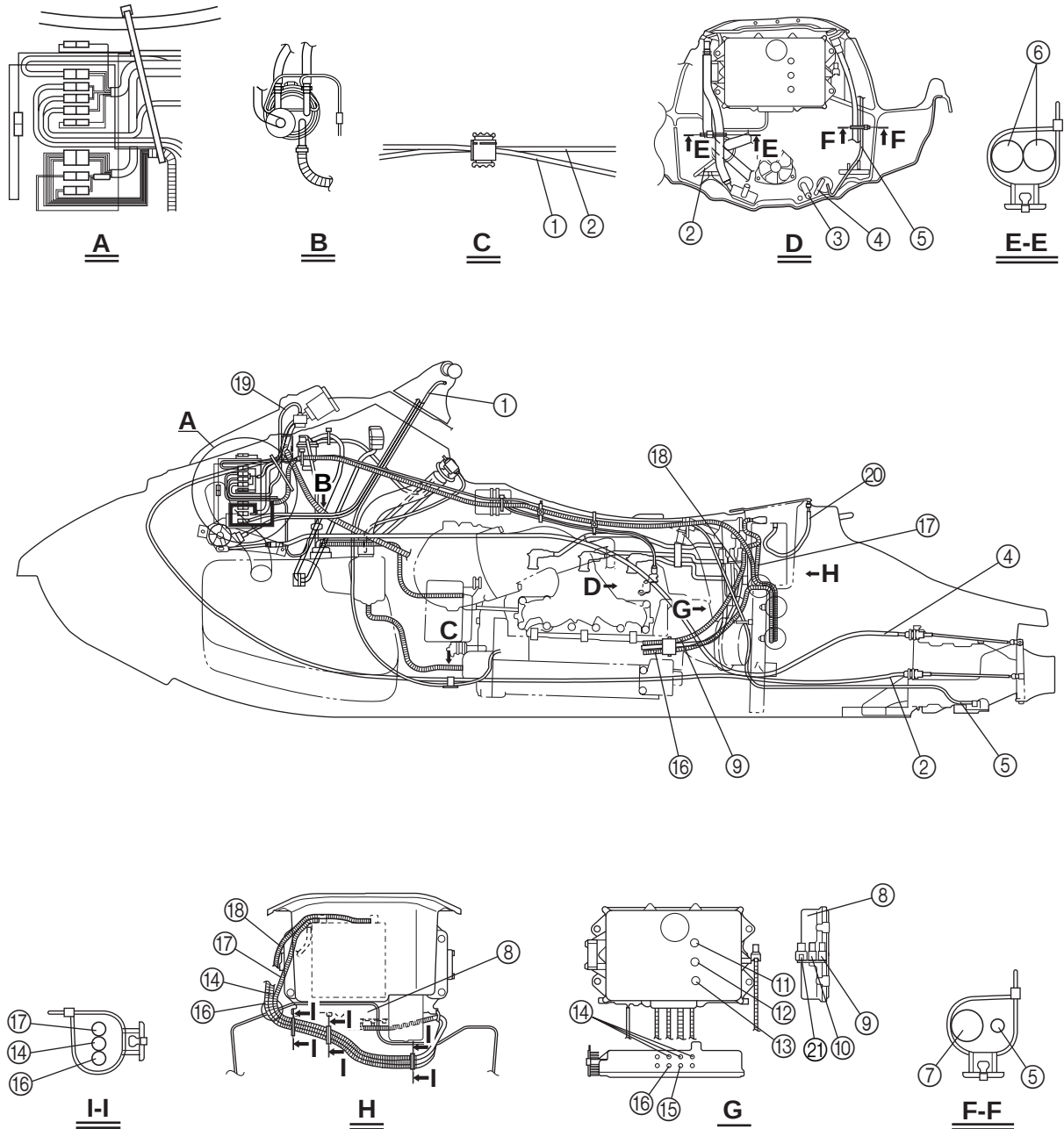
## CABLE AND HOSE ROUTING



- ① Fuel filter
- ② Fuel breather hose
- ③ Fuel hose
- ④ Pilot water hose
- ⑤ Bilge hose
- ⑥ Speed sensor lead
- ⑦ Electrical box lead
- ⑧ Starter motor lead

- ⑨ Generator lead
- ⑩ Battery negative lead
- ⑪ YPVS cable
- ⑫ Pilot water outlet
- ⑬ QSTS cable
- ⑭ Choke cable
- ⑮ Battery
- ⑯ Steering cable

- ⑰ Battery breather hose
- ⑱ Battery positive lead
- ⑲ YPVS servomotor



- |                      |                                |                                      |
|----------------------|--------------------------------|--------------------------------------|
| ① Choke cable        | ⑨ To stator assembly           | ⑯ To starter motor positive terminal |
| ② Steering cable     | ⑩ To water temperature sensor  | ⑰ Battery positive lead              |
| ③ Cooling water hose | ⑪ To cylinder #1               | ⑱ Battery negative lead              |
| ④ QSTS cable         | ⑫ To cylinder #2               | ⑲ Buzzer lead                        |
| ⑤ Speed sensor lead  | ⑬ To cylinder #3               | ⑳ Battery breather hose              |
| ⑥ Bilge hose         | ⑭ To meter                     | ㉑ Exhaust temperature sensor         |
| ⑦ Flushing hose      | ⑮ To battery positive terminal |                                      |
| ⑧ Electrical box     |                                |                                      |

CHAPTER 3

PERIODIC INSPECTION AND ADJUSTMENT

|                                                |      |
|------------------------------------------------|------|
| MAINTENANCE INTERVAL CHART .....               | 3-1  |
| PERIODIC SERVICE .....                         | 3-2  |
| CONTROL SYSTEM .....                           | 3-2  |
| Steering column inspection .....               | 3-2  |
| Steering cable inspection and adjustment ..... | 3-2  |
| Throttle cable inspection and adjustment ..... | 3-3  |
| Choke cable inspection and adjustment .....    | 3-4  |
| QSTS cable inspection and adjustment .....     | 3-5  |
| YPVS cable adjustment .....                    | 3-6  |
| FUEL SYSTEM.....                               | 3-7  |
| Fuel line inspection .....                     | 3-7  |
| Trolling speed check and adjustment .....      | 3-8  |
| OIL INJECTION SYSTEM.....                      | 3-9  |
| Oil line inspection .....                      | 3-9  |
| POWER UNIT.....                                | 3-9  |
| Spark plug inspection .....                    | 3-9  |
| ELECTRICAL .....                               | 3-10 |
| Battery inspection .....                       | 3-10 |
| JET PUMP UNIT.....                             | 3-13 |
| Impeller inspection .....                      | 3-13 |
| Water inlet strainer inspection.....           | 3-14 |
| Bilge strainer inspection .....                | 3-14 |
| GENERAL.....                                   | 3-14 |
| Drain plug inspection.....                     | 3-14 |
| Lubrication points .....                       | 3-15 |

## MAINTENANCE INTERVAL CHART

The following chart should be considered strictly as a guide to general maintenance intervals. Depending on operating conditions, the intervals of maintenance should be changed.

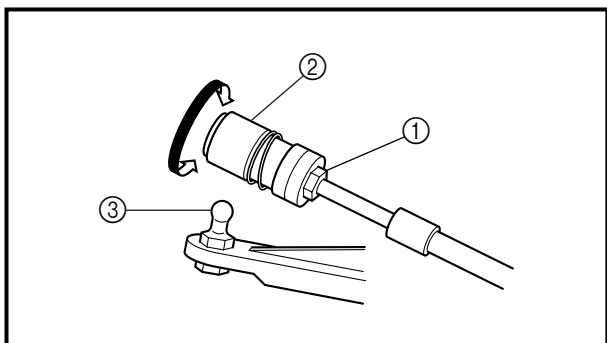
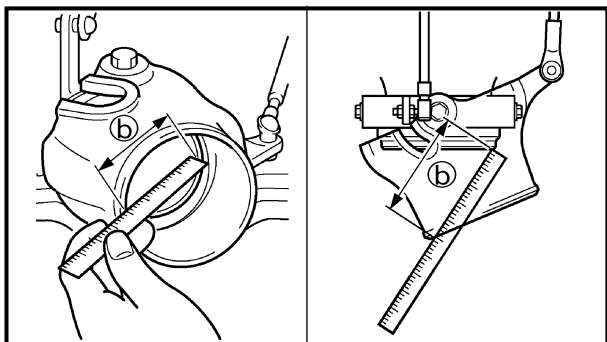
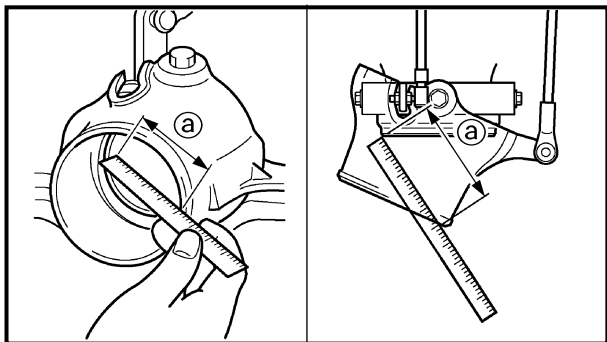
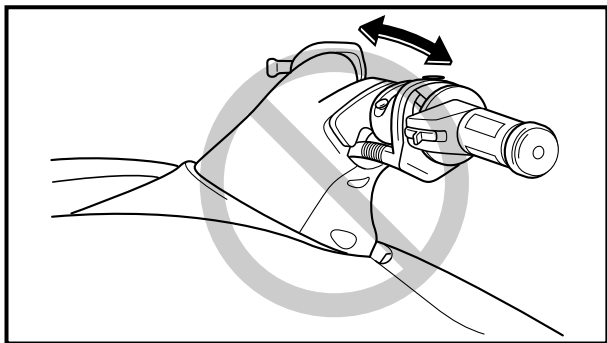
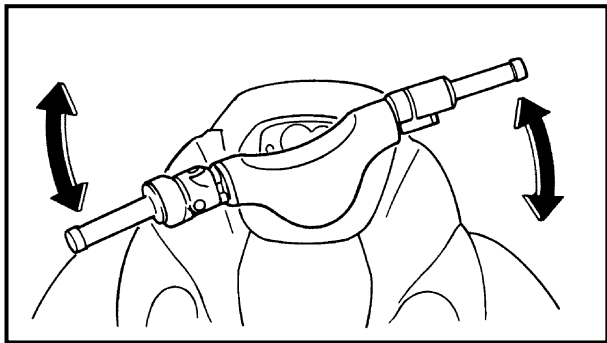
| Item                      | Remarks              | Initial                |                        | Every                   |                       | Refer to page |
|---------------------------|----------------------|------------------------|------------------------|-------------------------|-----------------------|---------------|
|                           |                      | 10 hours<br>(Break-in) | 50 hours<br>(3 months) | 100 hours<br>(6 months) | 200 hours<br>(1 year) |               |
| CONTROL SYSTEM            |                      |                        |                        |                         |                       |               |
| Steering cable            | Inspect/adjust       |                        |                        | ○                       |                       | 3-2           |
| Steering column           | Inspect              | ○                      |                        | ○                       |                       | 3-2           |
| Throttle cable            | Inspect/adjust       |                        |                        | ○                       |                       | 3-3           |
| Carburetor throttle shaft | Inspect/adjust       |                        |                        | ○                       |                       | —             |
| Choke cable               | Inspect/adjust       |                        |                        | ○                       |                       | 3-4           |
| QSTS cable                | Inspect/adjust       |                        |                        | ○                       |                       | 3-5           |
| YPVS cable                | Inspect/adjust       |                        |                        |                         | ○                     | 3-6           |
| FUEL SYSTEM               |                      |                        |                        |                         |                       |               |
| Fuel tank                 | Clean                |                        |                        |                         | ○                     | 4-9           |
| Fuel filter               | Clean/replace        | ○                      |                        |                         | ○                     | 3-7           |
| Fuel line                 | Inspect              |                        |                        | ○                       |                       | 3-7           |
| Trolling speed            | Check/adjust         |                        |                        | ○                       |                       | 3-8           |
| Carburetor setting        | Inspect/adjust       | ○                      |                        | ○                       |                       | 4-16          |
| OIL INJECTION SYSTEM      |                      |                        |                        |                         |                       |               |
| Oil injection system      | Check/clean          | ○                      |                        |                         | ○                     | 4-30          |
| Oil pump cable            | Inspect/adjust       |                        |                        | ○                       |                       | 4-29          |
| POWER UNIT                |                      |                        |                        |                         |                       |               |
| Spark plugs               | Inspect/clean/adjust | ○                      | ○                      | ○                       |                       | 3-9           |
| Cooling-water passage     | Inspect/clean        | ○ <sup>*1</sup>        |                        |                         |                       | —             |
| Rubber coupling           | Inspect              |                        |                        |                         | ○                     | —             |
| ELECTRICAL                |                      |                        |                        |                         |                       |               |
| Battery                   | Inspect              | ○ <sup>*2</sup>        |                        |                         |                       | 3-10          |
| JET PUMP UNIT             |                      |                        |                        |                         |                       |               |
| Impeller                  | Inspect              |                        | ○                      | ○                       |                       | 3-13          |
| Water inlet strainer      | Clean                |                        | ○                      | ○                       |                       | 3-14          |
| Bilge strainer            | Clean                |                        | ○                      | ○                       |                       | 3-14          |
| GENERAL                   |                      |                        |                        |                         |                       |               |
| Bolts and nuts            | Retighten            | ○                      |                        | ○                       |                       | —             |
| Drain plugs               | Inspect/replace      |                        |                        |                         | ○                     | 3-14          |
| Lubrication points        | Grease               |                        |                        | ○                       |                       | 3-15          |
| Intermediate housing      | Grease               | ○ <sup>*3</sup>        |                        | ○ <sup>*4</sup>         |                       | 3-17          |

\*1: After every ride

\*2: Inspect fluid level before every ride

\*3: Grease capacity 33.0 ~ 35.0 cm<sup>3</sup> (1.11 ~ 1.18 oz.)

\*4: Grease capacity 6.0 ~ 8.0 cm<sup>3</sup> (0.20 ~ 0.27 oz.)



## PERIODIC SERVICE CONTROL SYSTEM

### Steering column inspection

- Inspect:
  - Steering column  
Excessive play → Replace the steering column.  
Refer to “STEERING COLUMN” in chapter 8.

#### Inspection steps:

- Move the handlebar up and down and back and forth.
- Check the excessive play of the handlebar.

### Steering cable inspection and adjustment

- Inspect:
  - Distance ①, ②  
Out of specification → Adjust.

#### Inspection steps:

- Turn the handlebar from lock to lock.
- Measure distances ① and ②.
- If the difference is not within specification, adjust the cable joint.

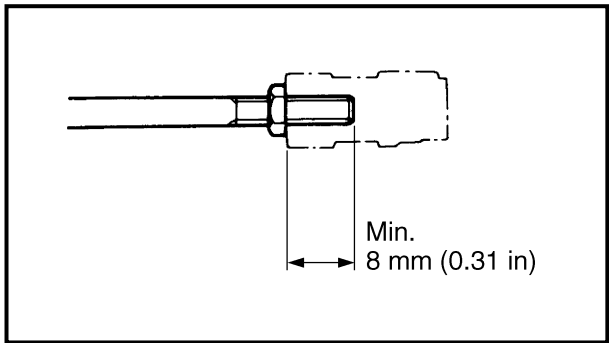
**Difference of distances ① and ②:**  
**Maximum 5 mm (0.2 in)**

- Adjust:
  - Steering cable joint  
(steering column side)

#### Adjustment steps:

- Loosen the locknut ①.
- Disconnect the steering cable joint ② from the ball joint ③.
- Turn the cable joint in or out for adjusting the distances ① and ②.

|          |                          |
|----------|--------------------------|
| Turn in  | Distance ① is increased. |
| Turn out | Distance ② is increased. |



**⚠ WARNING**

The cable joint must be screwed in more than 8 mm (0.31 in).

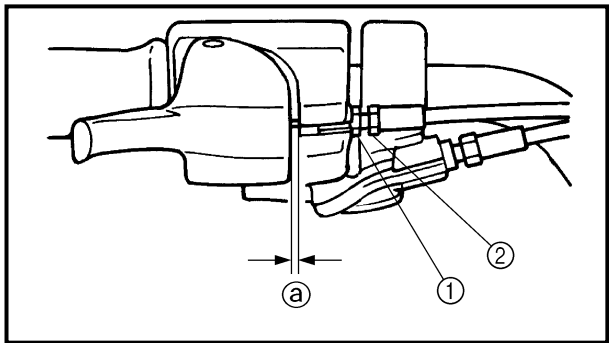
- Connect the cable joint and tighten the locknut.



**Locknut:**  
6 Nm (0.6 m • kgf, 4.3 ft • lb)

**NOTE:**

If the steering cable cannot be properly adjusted at the steering column side, make sure the steering cable at the jet pump side is set to the specified length. Refer to “REMOTE CONTROL CABLES AND SPEED SENSOR LEAD” in chapter 8.



**Throttle cable inspection and adjustment**

**NOTE:**

Before adjusting the throttle lever free play, adjust the trolling speed.

1. Measure:
- Throttle lever free play ①  
Out of specification → Adjust.



**Throttle lever free play:**  
4 ~ 7 mm (0.16 ~ 0.28 in)

2. Adjust:
- Throttle lever free play

**Adjustment steps:**

- Loosen the locknut ①.
- Turn the adjuster ② in or out until the specified free play is obtained.

|                        |                         |
|------------------------|-------------------------|
| Turn in                | Free play is increased. |
| Turn out               | Free play is decreased. |
| ● Tighten the locknut. |                         |

### ⚠ WARNING

After adjusting the free play, turn the handlebar to the right and left and make sure that the trolling speed does not increase.

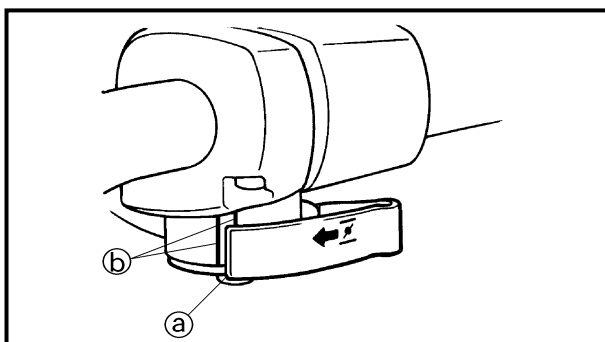
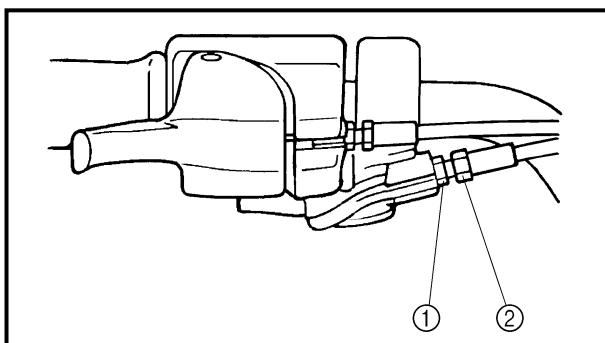
### Choke cable inspection and adjustment

#### 1. Check:

- Choke lever operation
- Incorrect operation → Adjust.

#### Checking steps:

- Check that the choke lever moves back slightly when it is fully opened.
- Check that the inner cable has some slack when the choke lever is completely closed.



#### 2. Adjust:

- Choke lever operation

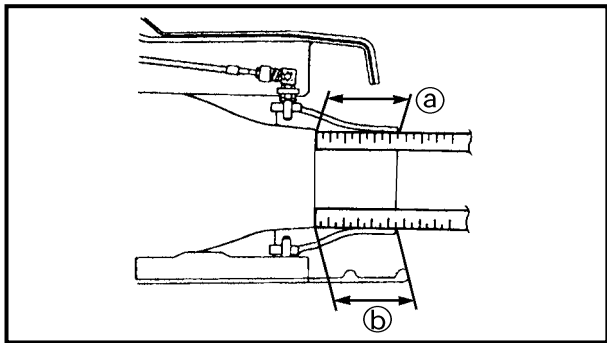
#### Adjustment steps:

- Loosen the locknut ①.
- Screw the adjuster ② fully into the bracket.
- Align the choke lever end ① within the line marks ②.
- Turn out the adjuster ② until the inner cable is taut.

#### NOTE:

If the inner cable is difficult to make taut using the adjuster ②, adjust the choke lever so that the cable is taut. The cable must be taut when the choke lever end ① is positioned within the line marks ②. Reset the adjuster if necessary.

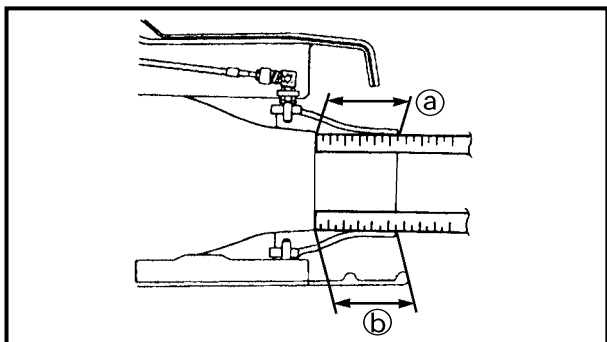
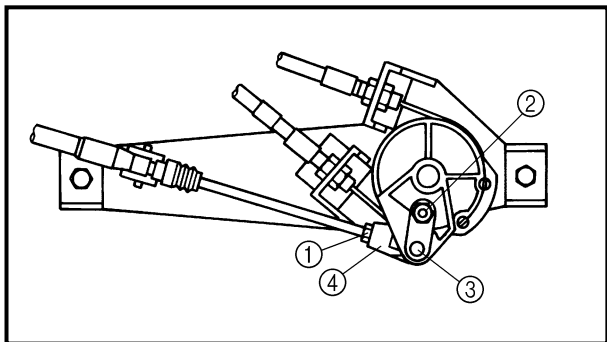
- Tighten the locknut ①.



### QSTS cable inspection and adjustment

1. Measure:
- Nozzle deflector set length ①, ②
- Difference → Adjust.

- Measurement steps:
- Set the control grip in the neutral position.
  - Measure the nozzle deflector set length ① and ②.
  - If ① and ② length are not even, adjust the cable joint.



2. Adjust:
- QSTS cable

- Adjustment steps:
- Set the control grip in the neutral position.
  - Loosen the locknut ①.
  - Remove the nut ② and pivot pin ③.
  - Set the jet nozzle in the center position.
  - Turn the cable joint ④ for adjusting.

|          |                        |
|----------|------------------------|
| Turn in  | Length ② is increased. |
| Turn out | Length ① is increased. |

- WARNING**

The cable joint must be screwed in more than 8 mm (0.31 in).
- Connect the cable joint ④ and pivot pin ③ and tighten the nut ②.

|                                                                          |                                                    |
|--------------------------------------------------------------------------|----------------------------------------------------|
|                                                                          | <b>Nut:</b><br>4 Nm (0.4 m • kgf, 2.9 ft • lb)     |
| <ul style="list-style-type: none"> <li>Tighten the locknut ①.</li> </ul> |                                                    |
|                                                                          | <b>Locknut:</b><br>4 Nm (0.4 m • kgf, 2.9 ft • lb) |

**NOTE:**

If correct adjustment by using the cable joint at the wheel end is not obtained, adjust the cable joint on the trim nozzle end. Refer to "REMOTE CONTROL CABLES AND SPEED SENSOR LEAD" in chapter 8.

**YPVS cable adjustment**
**1. Check:**

- YPVS valve position

Incorrect position → Adjust the YPVS cable.

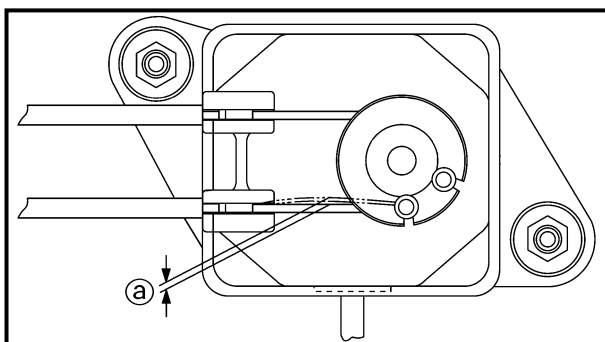
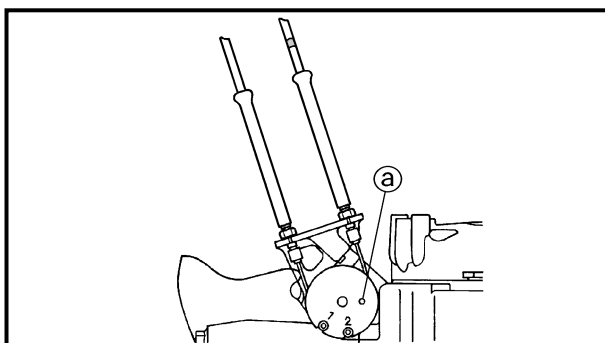
**Checking steps:**

- Start the engine and then stop it.

**NOTE:**

When the engine has been stopped for 3 seconds, the YPVS valve assembly will extend and retract one time.

- Check that the hole ① in the pulley is aligned with the hole in the cylinder when the YPVS valve is fully closed.

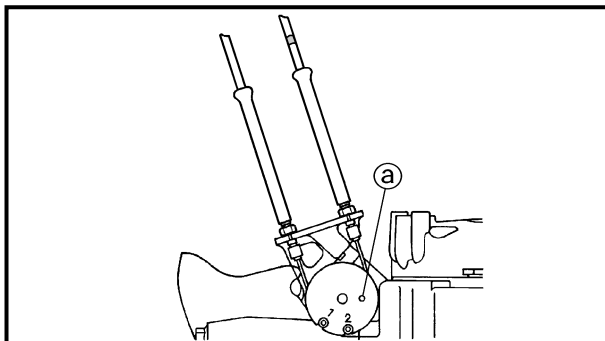
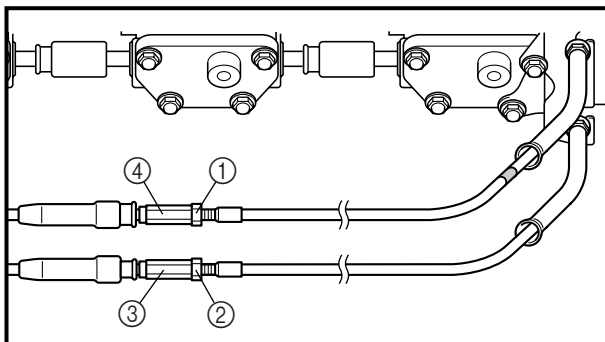

**2. Measure:**

- YPVS cable slack ①

Out of specification → Adjust.



**YPVS cable slack:**  
**0.5 ~ 1.5 mm (0.02 ~ 0.06 in)**



### 3. Adjust:

- YPVS cables 1 and 2

#### Adjustment steps:

- Loosen locknuts ① and ②.
- Turn in the adjuster ③ and ④ until there is slack in the cable.
- Align the hole (a) in the pulley with the hole in the cylinder.
- Insert a 4-mm-diameter pin through the holes in the pulley and cylinder.
- Turn the adjuster ③ and ④ in or out until the specified slack is obtained.

|          |                     |
|----------|---------------------|
| Turn in  | Slack is increased. |
| Turn out | Slack is decreased. |

- Finger tighten the locknut ① and ②.
- Remove the pin.
- Start and stop the engine.
- Recheck the hole alignment.
- If the hole alignment is correctly, tighten the locknut.
- If the hole alignment is incorrect, repeat the above steps.

## FUEL SYSTEM

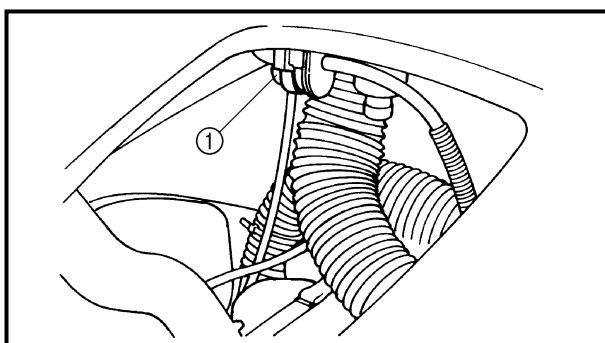
### ⚠ WARNING

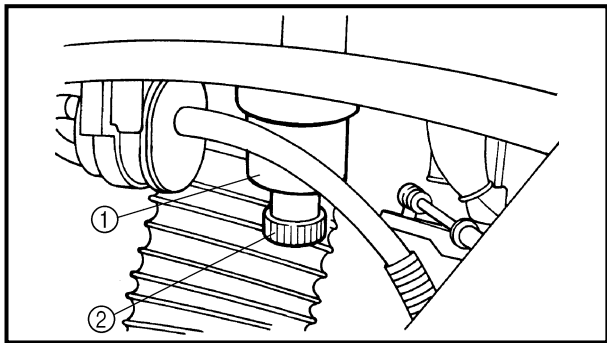
- Stop the engine, set the fuel cock to "OFF" before servicing the fuel system.
- When removing fuel system parts, wrap them in a cloth and take care that no fuel spills into the engine compartment.

### Fuel line inspection

#### 1. Inspect:

- Fuel filter ①  
Contaminants → Replace.  
Cracks/damage → Replace.  
Water contamination → Replace and check the fuel tank.
- Fuel hose
- Fuel tank
- Fuel hoses through part
- Fuel filler cap  
Cracks/damage → Replace.





2. Inspect:
- Water separator ①  
Water accumulation → Drain.

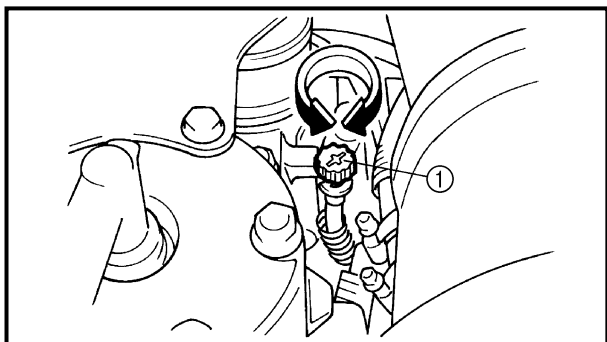
**NOTE:** \_\_\_\_\_  
If need the water draining, remove the drain plug ②.

\_\_\_\_\_

### Trolling speed check and adjustment

1. Check:
- Trolling speed  
Out of specification → Adjust.

|                                                                                                                                                                                                                                          |                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
|                                                                                                                                                         | <b>Trolling speed:</b><br>$1,350 \pm 50 \text{ r/min}$    |
| <b>Checking steps (with the vehicle in the water):</b> <ul style="list-style-type: none"> <li>● Start the engine and allow it to warm up for several minutes.</li> <li>● Attach the engine tachometer to the spark plug lead.</li> </ul> |                                                           |
|                                                                                                                                                       | <b>Engine tachometer:</b><br><b>YU-8036-A/90890-06760</b> |
| <ul style="list-style-type: none"> <li>● Measure the engine trolling speed.</li> </ul>                                                                                                                                                   |                                                           |



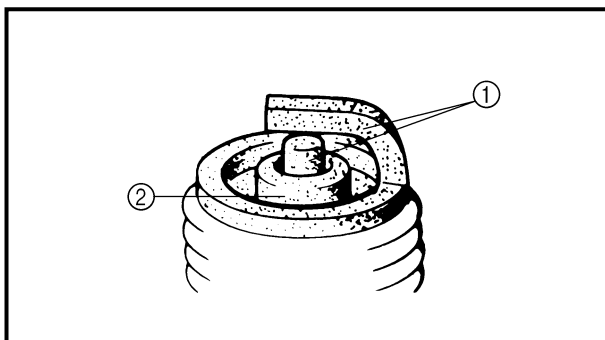
2. Adjust:
- Trolling speed

|                                                                                                                                                                                                            |                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| <b>Adjustment steps:</b> <ul style="list-style-type: none"> <li>● Start the engine and allow it to warm up for several minutes.</li> <li>● Attach the engine tachometer to the spark plug lead.</li> </ul> |                                                           |
|                                                                                                                         | <b>Engine tachometer:</b><br><b>YU-8036-A/90890-06760</b> |
| <ul style="list-style-type: none"> <li>● Turn the remote throttle stop screw ① in or out until the specified trolling speed is obtain.</li> </ul>                                                          |                                                           |

## OIL INJECTION SYSTEM

### Oil line inspection

Refer to "OIL TANK" in chapter 4.



## POWER UNIT

### Spark plug inspection

#### 1. Inspect:

- Electrodes ①  
Damage/wear → Replace.
- Insulator color ②  
Distinctly different color → Check the engine condition.



#### Color guide:

**Medium to light tan color:**

**Normal**

**Whitish color:**

**Lean fuel mixture**

**Air leak**

**Incorrect settings**

**Blackish color:**

**Overly rich mixture**

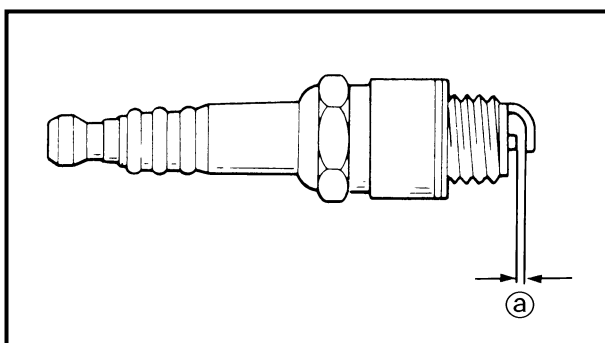
**Electrical malfunction**

**Excessive oil use**

**Defective spark plug**

#### 2. Clean:

- Spark plug  
(with a spark plug cleaner or wire brush)



#### 3. Measure:

- Spark plug gap ③  
Out of specification → Regap.



#### Spark plug gap:

**1.0 ~ 1.1 mm (0.039 ~ 0.043 in)**

## 4. Tighten:

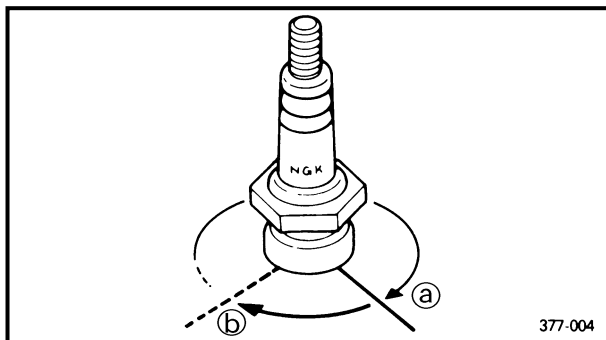
- Spark plug



**Spark plug:**  
25 Nm (2.5 m • kgf, 18 ft • lb)

## NOTE:

- Before installing the spark plug, clean the gasket surface and spark plug surface. Also, it is suggested to apply a thin film of anti-seize compound to the spark plug threads to prevent thread seizure.
- If a torque wrench is not available, a good estimate of the correct tightening torque for a new spark plug is to finger tighten ① the spark plug and then tighten it another 1/4 to 1/2 of a turn ②.



## ELECTRICAL

## Battery inspection

**⚠ WARNING**

Battery electrolyte is dangerous; it contains sulfuric acid which is poisonous and highly caustic.

Always follow these preventive measures:

- Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.
- Wear protective eye gear when handling or working near batteries.

Antidote (EXTERNAL):

- SKIN - Wash with water.
- EYES - Flush with water for 15 minutes and get immediate medical attention.

Antidote (INTERNAL):

- Drink large quantities of water or milk followed with milk of magnesia, beaten egg or vegetable oil. Get immediate medical attention.

Batteries generate explosive, hydrogen gas. Always follow these preventive measures:

- Charge batteries in a well-ventilated area.
- Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).
- DO NOT SMOKE when charging or handling batteries.

**KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.**

#### CAUTION:

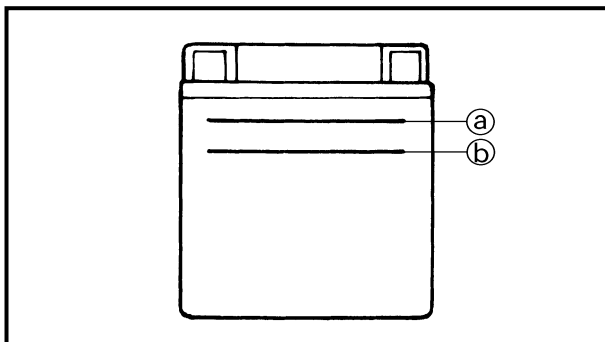
- Do not place the battery on its side.
- Before adding electrolyte or recharging, be sure to remove the battery from the battery box.
- Make sure that the battery breather hose is properly connected and is not pinched or damaged.

1. Remove:

- Battery

#### ⚠ WARNING

- When removing the battery, disconnect the negative lead first.
- Remove the battery to prevent acid loss during turning the machine on its side for the impeller service.



## 2. Inspect:

- Electrolyte level

Low → Add distilled water.

The electrolyte level should be between the upper ① and lower ② level marks.

**Filling steps:**

- Remove each filler cap.
- Add distilled water.
- When the electrolyte level reaches the upper level mark, allow the cell to stand for 20 minutes. If the electrolyte level drops, add more distilled water so the level reaches the upper level mark.

**CAUTION:**

Use only distilled water. Other types of water contain minerals which are harmful to batteries.

## 3. Inspect:

- Specific gravity

Out of specification → Charge.



**Specific gravity at 20 °C (68 °F):**

**1.28**

**Charging current:**

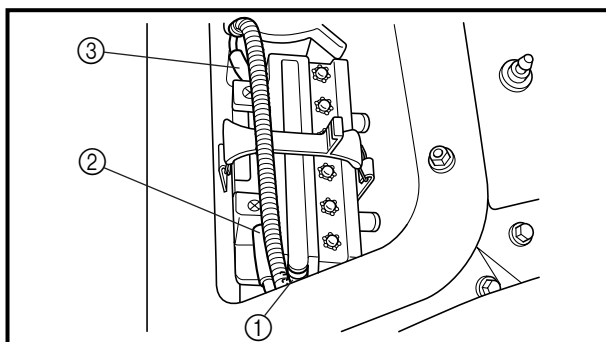
**1.9 amps × 10 hrs (68.4 kC.)**

## 4. Install:

- Filler caps

**CAUTION:**

Before installation, rinse off any fluid from the battery box and battery and make sure that the battery is dry before installing it.

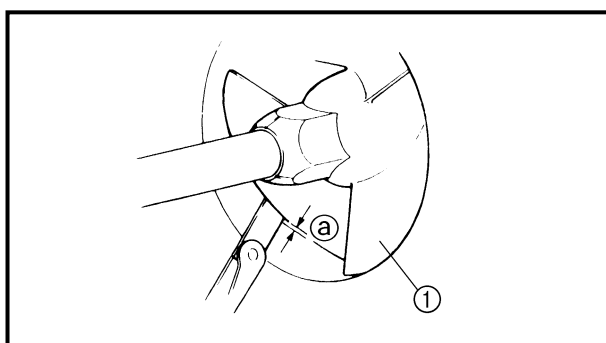


## 5. Install:

- Battery breather hose ①
- Battery
- Battery positive lead ②
- Battery negative lead ③
- Band

**CAUTION:**

- Connect the positive lead to the battery terminal first.
- Make sure the battery leads are connected properly. Reversing the leads can seriously damage the electrical system.
- Make sure that the battery breather hose is properly connected and is not obstructed.
- Coat the terminals with a water resistant grease to minimize terminal corrosion.

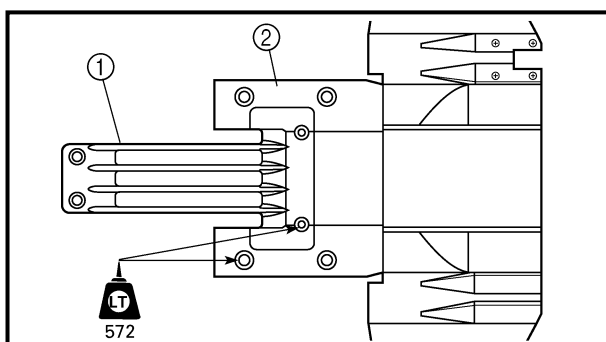

**JET PUMP UNIT**
**Impeller inspection**

## 1. Check:

- Impeller ①  
Damage/wear → Replace.  
Nicks/scratches → File or grind.

## 2. Measure:

- Impeller-to-housing clearance ②  
Out of specification → Replace.



**Max. impeller-to-housing clearance:**  
**0.6 mm (0.02 in)**

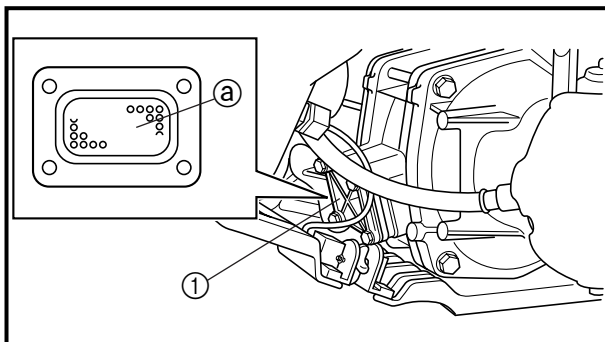
**Measurement steps:**

- Remove the battery leads.
- Remove the intake grate ① and intake duct ②.
- Measure the clearance at each impeller blade as shown (a total of three measurements).
- Install the intake grate and intake duct.



**Bolt:**  
**M6: 7 Nm (0.7 m • kgf, 5.1 ft • lb)**  
**M8: 17 Nm**  
**(1.7 m • kgf, 12 ft • lb)**

- Install the battery leads.



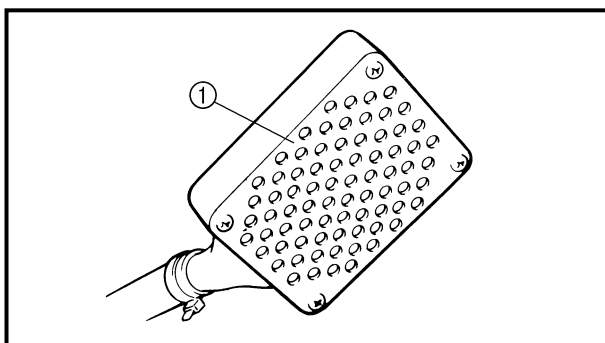
## Water inlet strainer inspection

### 1. Inspect:

- Water inlet strainer  
Contaminants → Clean.  
Cracks/damage → Replace.

### Inspection steps:

- Remove the water inlet cover ①.
- Inspect the water inlet strainer mesh ②.
- Install the water inlet cover.



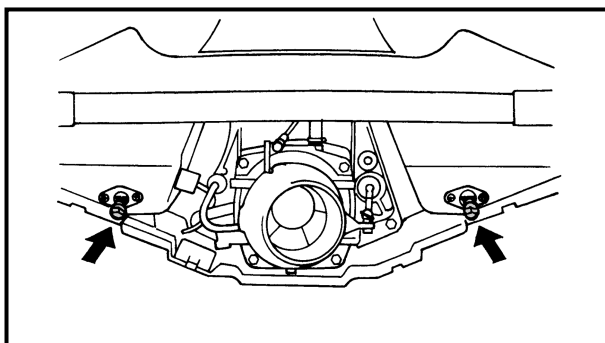
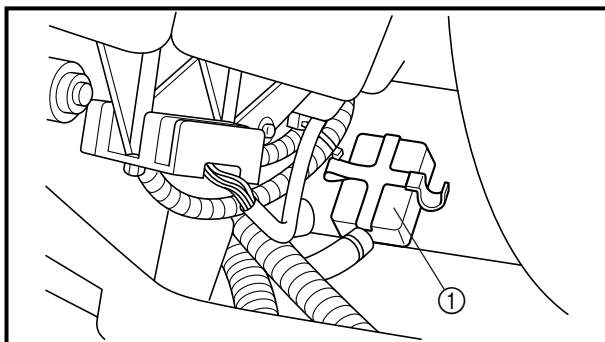
## Bilge strainer inspection

### 1. Inspect:

- Bilge strainer  
Contaminants → Clean.  
Cracks/damage → Replace.

### Inspection steps:

- Disconnect the bilge strainer ① from the bilge strainer holder.
- Inspect the bilge strainer.

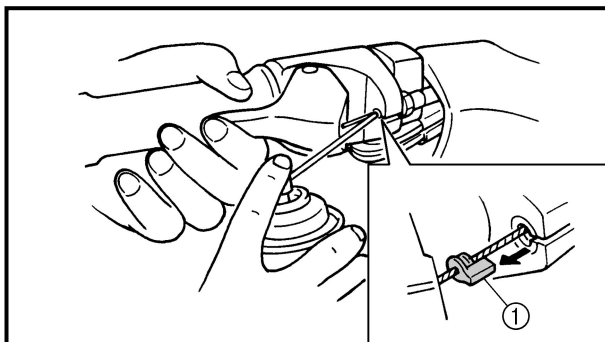


## GENERAL

### Drain plug inspection

#### 1. Inspect:

- Drain plug  
Cracks/damage → Replace.
- O-ring  
Cracks/wear → Replace.
- Screw threads  
Contaminants → Clean.



### Lubrication points

#### 1. Lubricate:

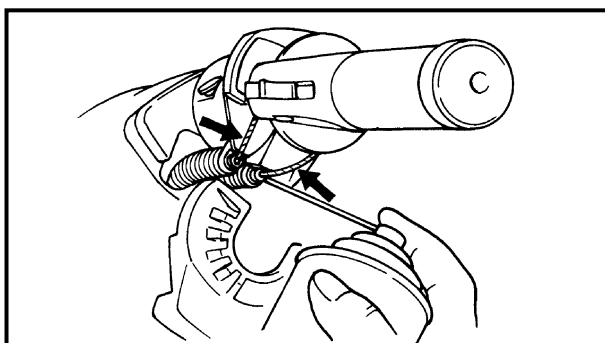
- Throttle cable (handlebar side)



**Recommended lubricant:**  
**Rust inhibitor**

#### NOTE:

Before lubricating the throttle cable, squeeze the throttle lever and remove the rubber seal ①.



#### 2. Lubricate:

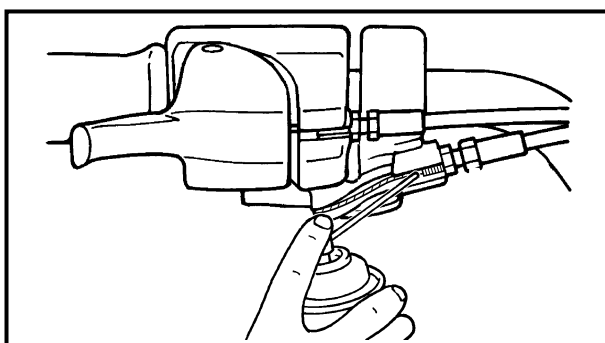
- QSTS control cables (handlebar side)



**Recommended lubricant:**  
**Yamaha marine grease,**  
**Yamaha grease A**  
**(Water resistant grease)**

#### NOTE:

Before lubricating the QSTS control cables, remove the QSTS cable housing cover. Spray the rust inhibitor into the outer cables, and apply grease to the inner cables.

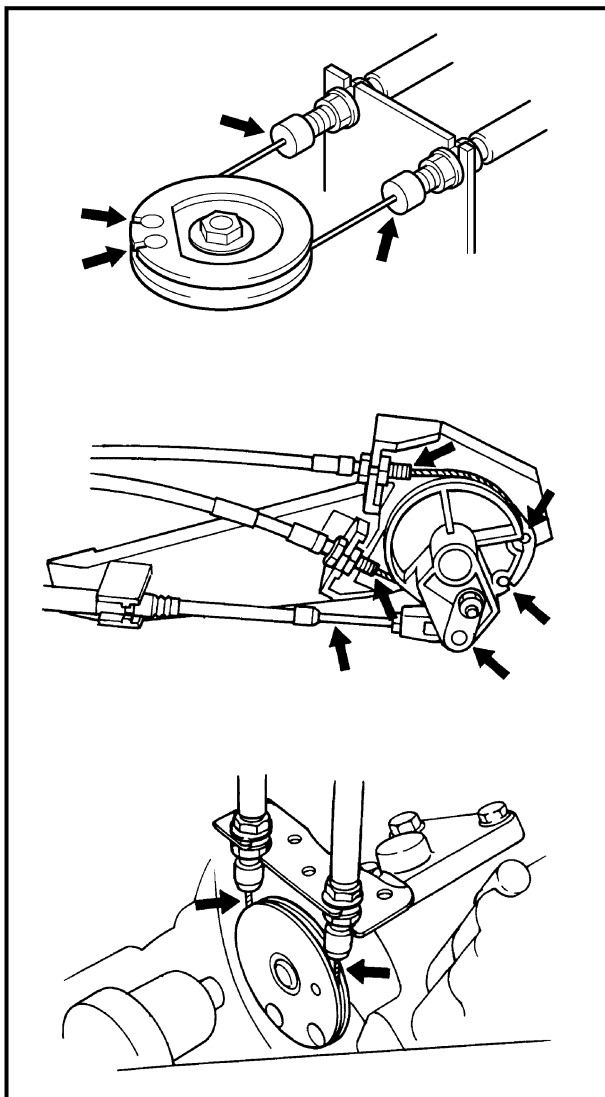


#### 3. Lubricate:

- Choke cable (handlebar side)



**Recommended lubricant:**  
**Rust inhibitor**

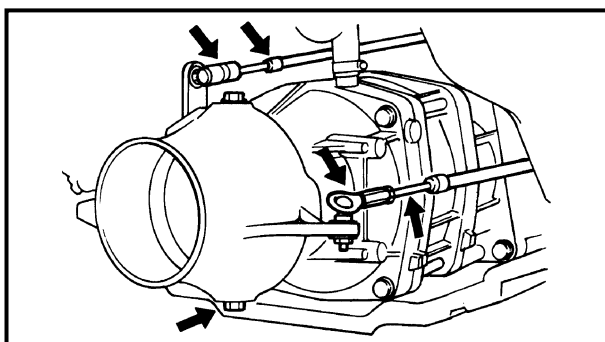


## 4. Lubricate:

- Throttle cable (carburetor side)
- Oil pump cable
- QSTS cables (pulley side)
- YPVS cables



**Recommended grease:**  
Yamaha marine grease,  
Yamaha grease A  
(Water resistant grease)

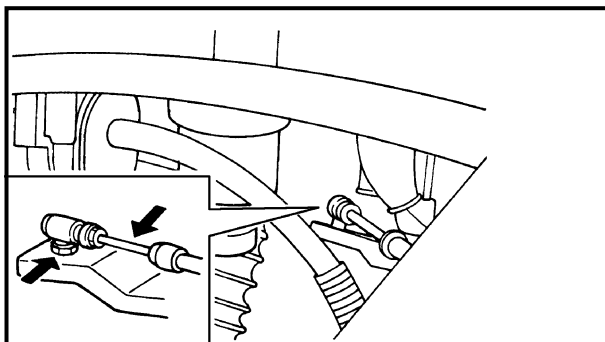


## 5. Lubricate:

- Nozzle pivot shaft
- Steering cable (nozzle side)
- QSTS cable (nozzle side)



**Recommended grease:**  
Yamaha marine grease,  
Yamaha grease A  
(Water resistant grease)



## 6. Lubricate:

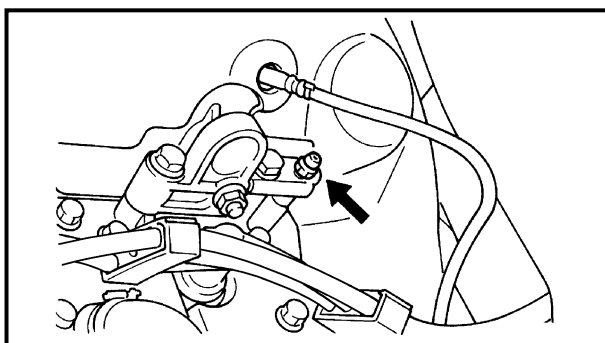
- Steering cable
- Steering cable joint

## NOTE:

Disconnect the joints and apply a small amount of grease.



**Recommended grease:**  
Yamaha marine grease,  
Yamaha grease A  
(Water resistant grease)



## 7. Fill:

- Intermediate housing



**Recommended grease:**  
Yamaha marine grease,  
Yamaha grease A  
(Water resistant grease)

## NOTE:

Fill the intermediate housing with the recommended grease through the grease nipples.

## CHAPTER 4

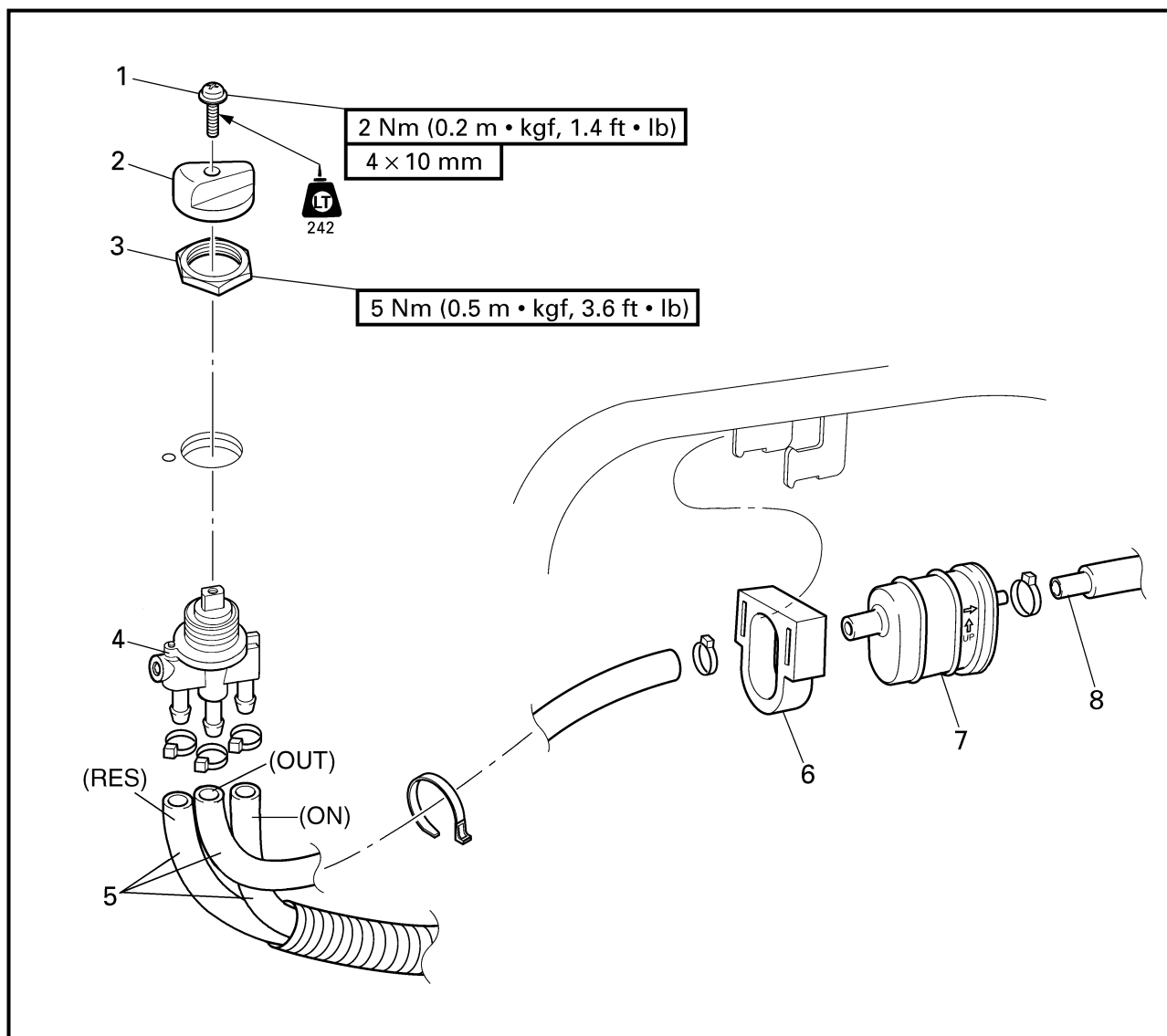
### FUEL SYSTEM

|                                                                |                 |
|----------------------------------------------------------------|-----------------|
| <b>FUEL COCK AND FUEL FILTER .....</b>                         | <b>4-1</b>      |
| EXPLODED DIAGRAM .....                                         | 4-1             |
| REMOVAL AND INSTALLATION CHART .....                           | 4-1             |
| SERVICE POINTS .....                                           | 4-2             |
| Fuel filter inspection .....                                   | 4-2             |
| Fuel cock inspection.....                                      | 4-2             |
| <br><b>OIL TANK .....</b>                                      | <br><b>4-3</b>  |
| EXPLODED DIAGRAM .....                                         | 4-3             |
| REMOVAL AND INSTALLATION CHART .....                           | 4-3             |
| SERVICE POINTS .....                                           | 4-5             |
| Oil line inspection .....                                      | 4-5             |
| Oil level switch inspection.....                               | 4-5             |
| Oil tank inspection .....                                      | 4-5             |
| <br><b>FUEL TANK .....</b>                                     | <br><b>4-6</b>  |
| EXPLODED DIAGRAM .....                                         | 4-6             |
| REMOVAL AND INSTALLATION CHART .....                           | 4-6             |
| SERVICE POINTS .....                                           | 4-9             |
| Check valve inspection .....                                   | 4-9             |
| Fuel level switch inspection .....                             | 4-9             |
| Fuel tank inspection .....                                     | 4-9             |
| Pipe joint inspection .....                                    | 4-9             |
| <br><b>INTAKE DUCT AND SILENCER .....</b>                      | <br><b>4-10</b> |
| EXPLODED DIAGRAM .....                                         | 4-10            |
| REMOVAL AND INSTALLATION CHART .....                           | 4-10            |
| <br><b>CARBURETOR UNIT.....</b>                                | <br><b>4-12</b> |
| EXPLODED DIAGRAM .....                                         | 4-12            |
| REMOVAL AND INSTALLATION CHART .....                           | 4-12            |
| SERVICE POINTS .....                                           | 4-16            |
| Throttle valve synchronization inspection and adjustment ..... | 4-16            |
| Choke cable and throttle cable installation.....               | 4-17            |
| Oil pump cable installation .....                              | 4-17            |
| Carburetor assembly .....                                      | 4-17            |

|                                          |          |
|------------------------------------------|----------|
| <b>CARBURETOR</b> .....                  | 4-18     |
| EXPLODED DIAGRAM .....                   | 4-18     |
| REMOVAL AND INSTALLATION CHART .....     | 4-18     |
| SERVICE POINTS .....                     | 4-21     |
| Diaphragm inspection .....               | 4-21     |
| Accelerator pump body inspection .....   | 4-21     |
| Arm inspection .....                     | 4-21     |
| Regulator body inspection .....          | 4-22     |
| Needle valve inspection .....            | 4-22     |
| Jet and carburetor body inspection ..... | 4-22     |
| Carburetor assembly .....                | 4-22     |
| <br><b>FUEL PUMP</b> .....               | <br>4-23 |
| EXPLODED DIAGRAM .....                   | 4-23     |
| REMOVAL AND INSTALLATION CHART .....     | 4-23     |
| SERVICE POINTS .....                     | 4-25     |
| Fuel pump inspection .....               | 4-25     |
| Fuel filter inspection .....             | 4-25     |
| <br><b>OIL PUMP</b> .....                | <br>4-26 |
| EXPLODED DIAGRAM .....                   | 4-26     |
| REMOVAL AND INSTALLATION CHART .....     | 4-26     |
| SERVICE POINTS .....                     | 4-28     |
| Oil pump inspection .....                | 4-28     |
| Oil hose inspection .....                | 4-28     |
| Check valve inspection .....             | 4-28     |
| Oil pump cable adjustment .....          | 4-29     |
| Oil injection pump air bleeding .....    | 4-30     |



## FUEL COCK AND FUEL FILTER EXPLODED DIAGRAM



## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name                          | Q'ty | Service points                              |
|------|----------------------------------------------|------|---------------------------------------------|
|      | <b>FUEL COCK AND FUEL FILTER<br/>REMOVAL</b> |      | Follow the left "Step" for removal.         |
| 1    | Screw                                        | 1    |                                             |
| 2    | Knob                                         | 1    |                                             |
| 3    | Nut                                          | 1    |                                             |
| 4    | Fuel cock assembly                           | 1    |                                             |
| 5    | Fuel hose                                    | 3    |                                             |
| 6    | Holder                                       | 1    |                                             |
| 7    | Fuel filter                                  | 1    |                                             |
| 8    | Fuel hose                                    | 1    |                                             |
|      |                                              |      | Reverse the removal steps for installation. |

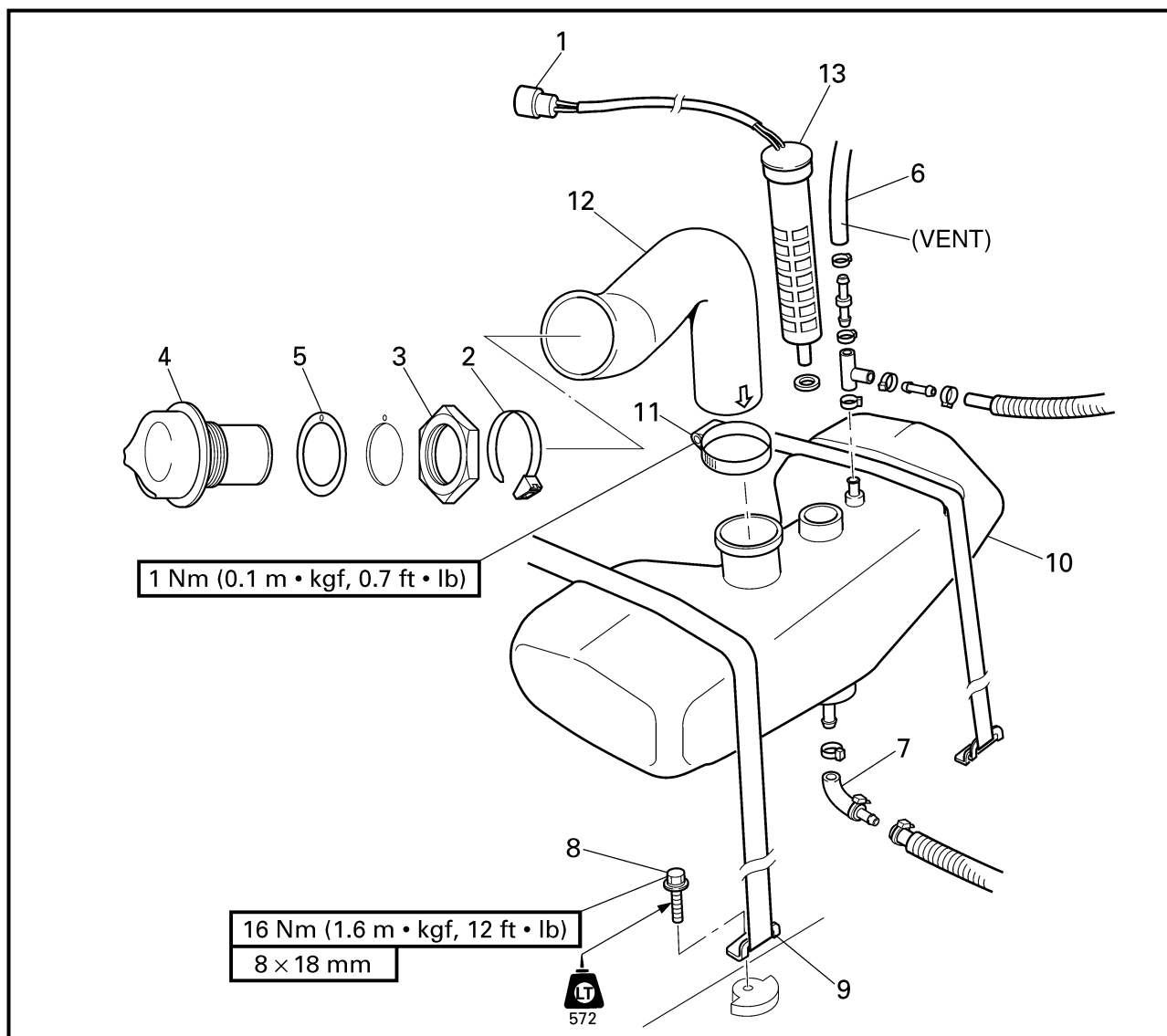
**SERVICE POINTS****Fuel filter inspection**

Refer to "FUEL SYSTEM" in chapter 3.

**Fuel cock inspection****1. Check:**

- Fuel cock
  - Contaminants → Clean.
  - Rough movement → Replace.

## OIL TANK EXPLODED DIAGRAM

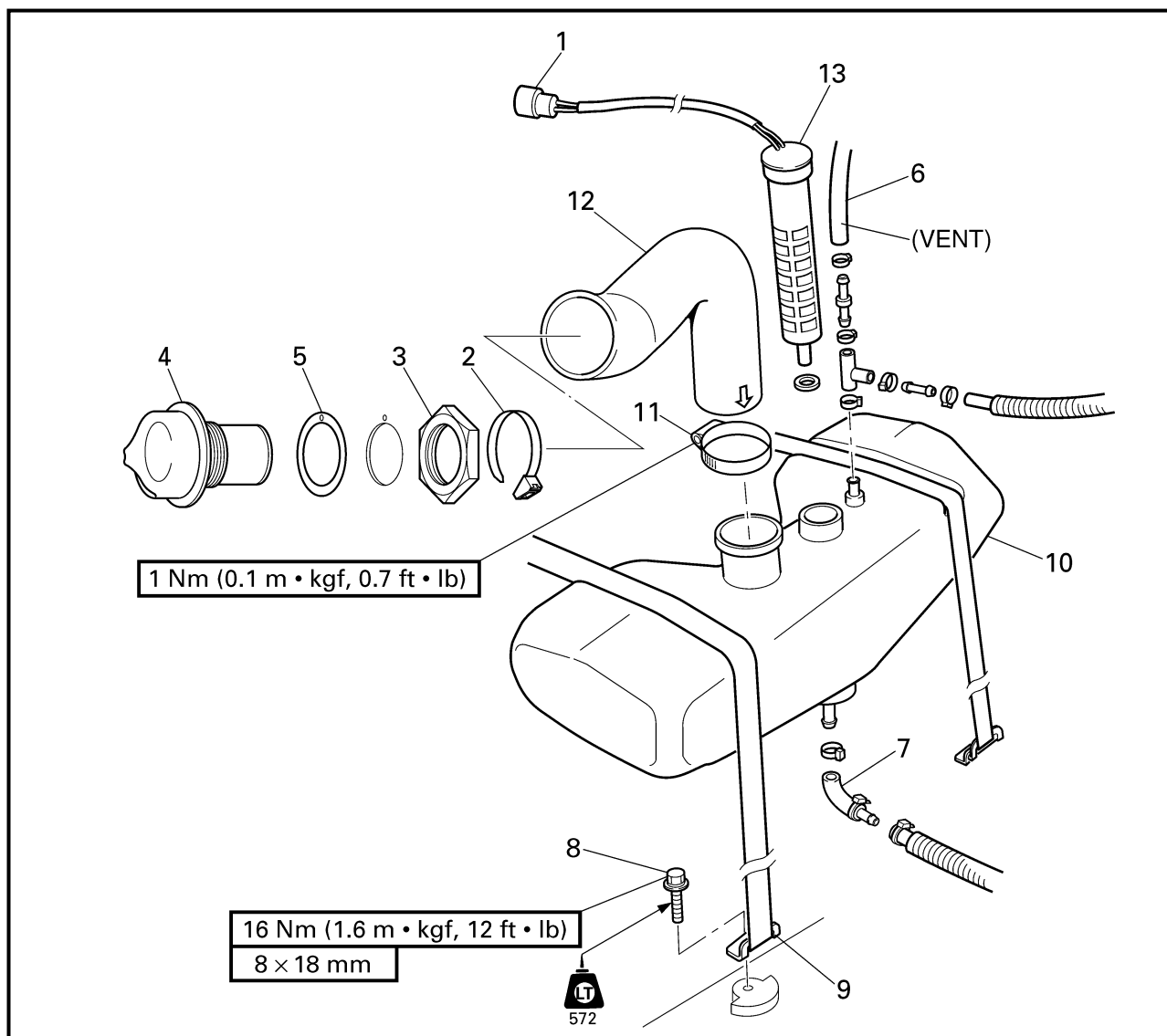


## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name             | Q'ty | Service points                                  |
|------|---------------------------------|------|-------------------------------------------------|
|      | <b>OIL TANK REMOVAL</b>         |      | Follow the left "Step" for removal.             |
|      | Engine unit                     |      | Refer to "ENGINE UNIT" in chapter 5.            |
|      | Steering console cover assembly |      | Refer to "STEERING CONSOLE COVER" in chapter 8. |
| 1    | Oil level sensor coupler        | 1    |                                                 |
| 2    | Band                            | 1    |                                                 |
| 3    | Nut                             | 1    |                                                 |
| 4    | Oil filler neck                 | 1    |                                                 |
| 5    | Rubber seal                     | 1    |                                                 |



## EXPLODED DIAGRAM



| Step | Procedure/Part name | Q'ty | Service points                              |
|------|---------------------|------|---------------------------------------------|
| 6    | Breather hose       | 1    | Reverse the removal steps for installation. |
| 7    | Oil hose            | 1    |                                             |
| 8    | Bolt                | 2    |                                             |
| 9    | Tank belt           | 2    |                                             |
| 10   | Oil tank assembly   | 1    |                                             |
| 11   | Hose clamp          | 1    |                                             |
| 12   | Oil filler hose     | 1    |                                             |
| 13   | Oil level sensor    | 1    |                                             |

**SERVICE POINTS****Oil line inspection**

## 1. Inspect:

- Oil filter  
Contaminants → Clean.  
Frays/tears → Replace.
- Rubber seal  
Cracks/wear → Replace.
- Oil hose
- Oil tank
- Oil filler cap  
Cracks/damage → Replace.
- Check valve  
Malfunction → Replace.

**Oil level switch inspection**

Refer to “INDICATION SYSTEM” in chapter 7.

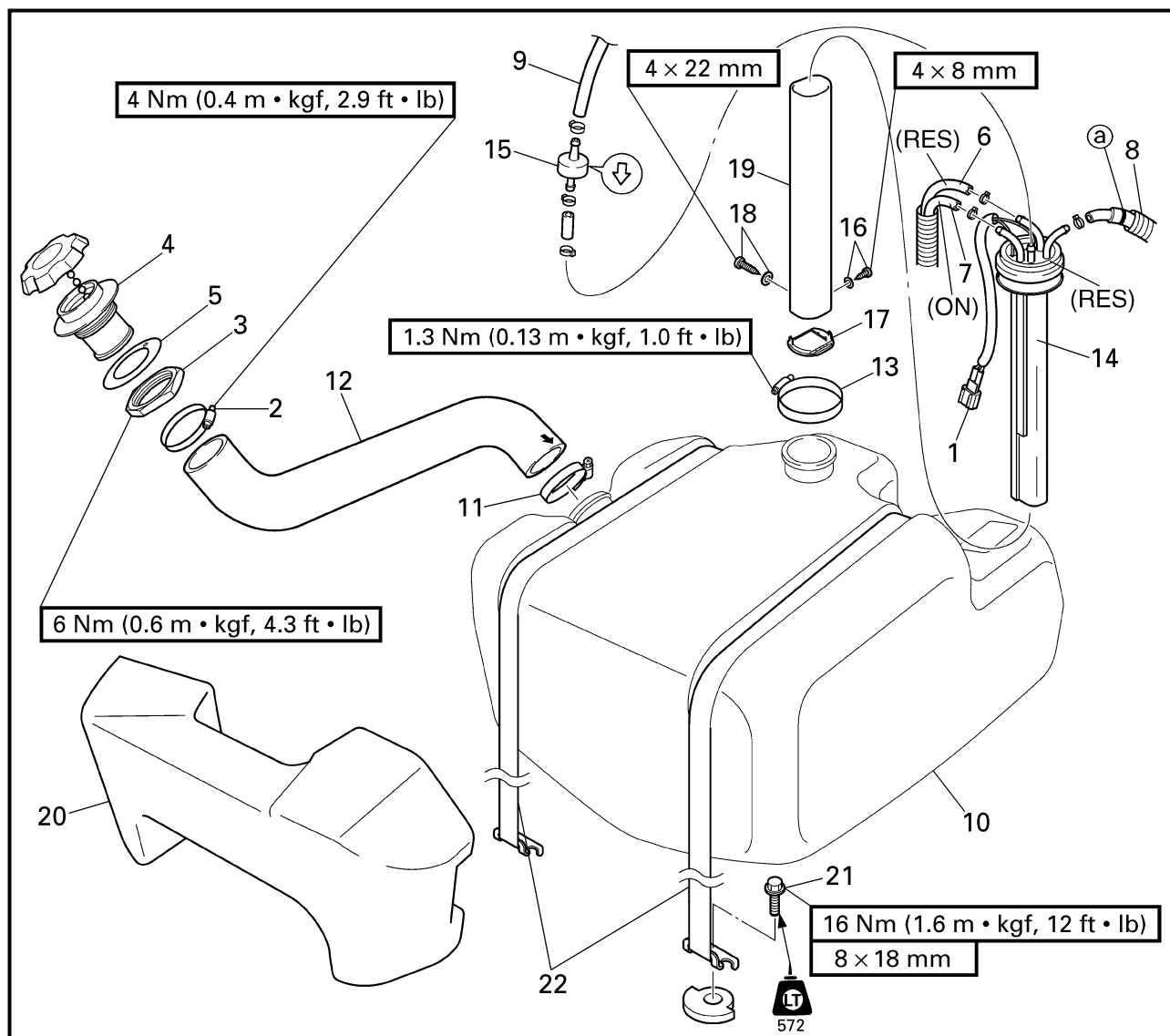
**Oil tank inspection**

## 1. Inspect:

- Oil tank  
Cracks/damage → Replace.

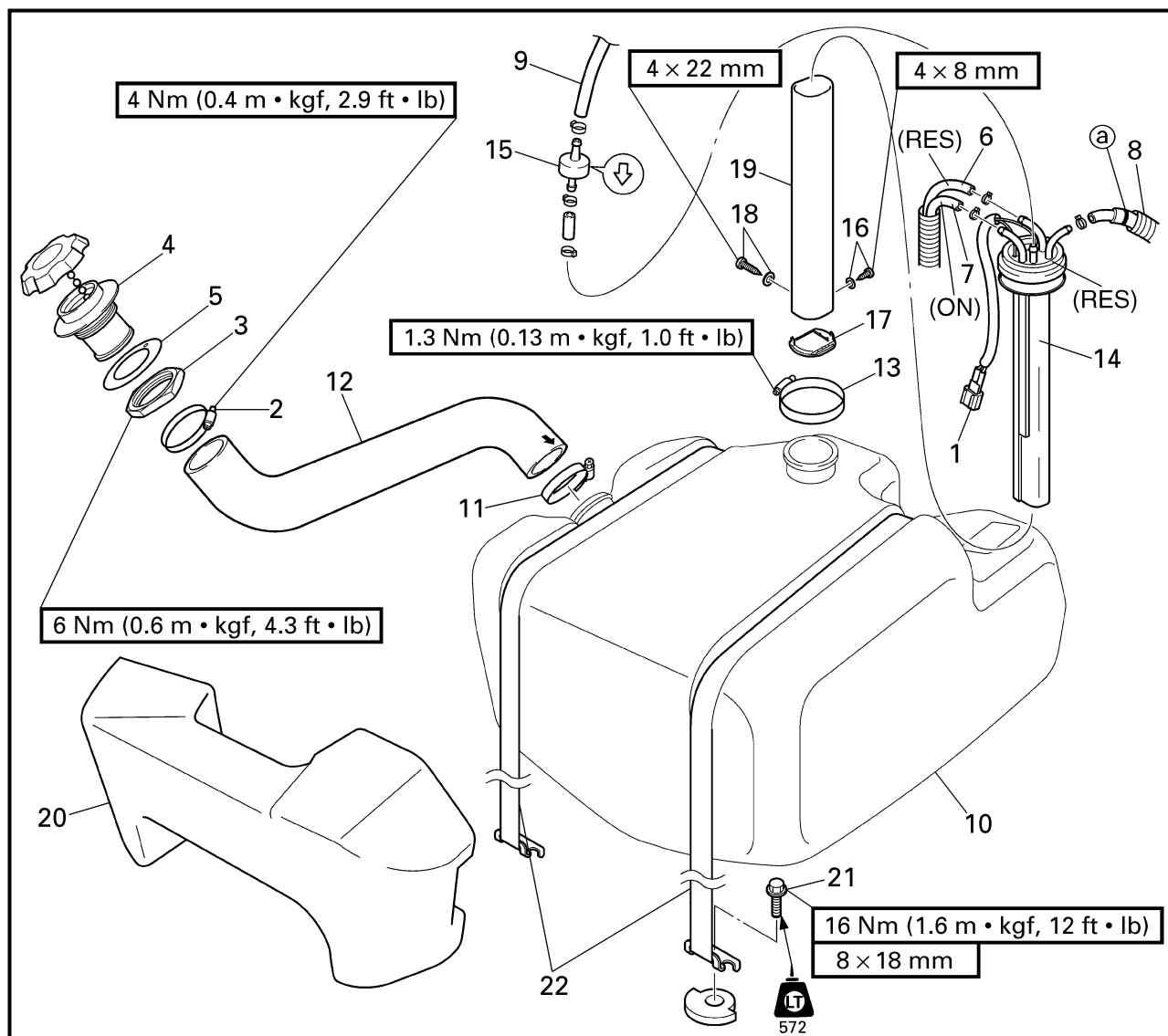
## FUEL TANK

### EXPLODED DIAGRAM



## REMOVAL AND INSTALLATION CHART

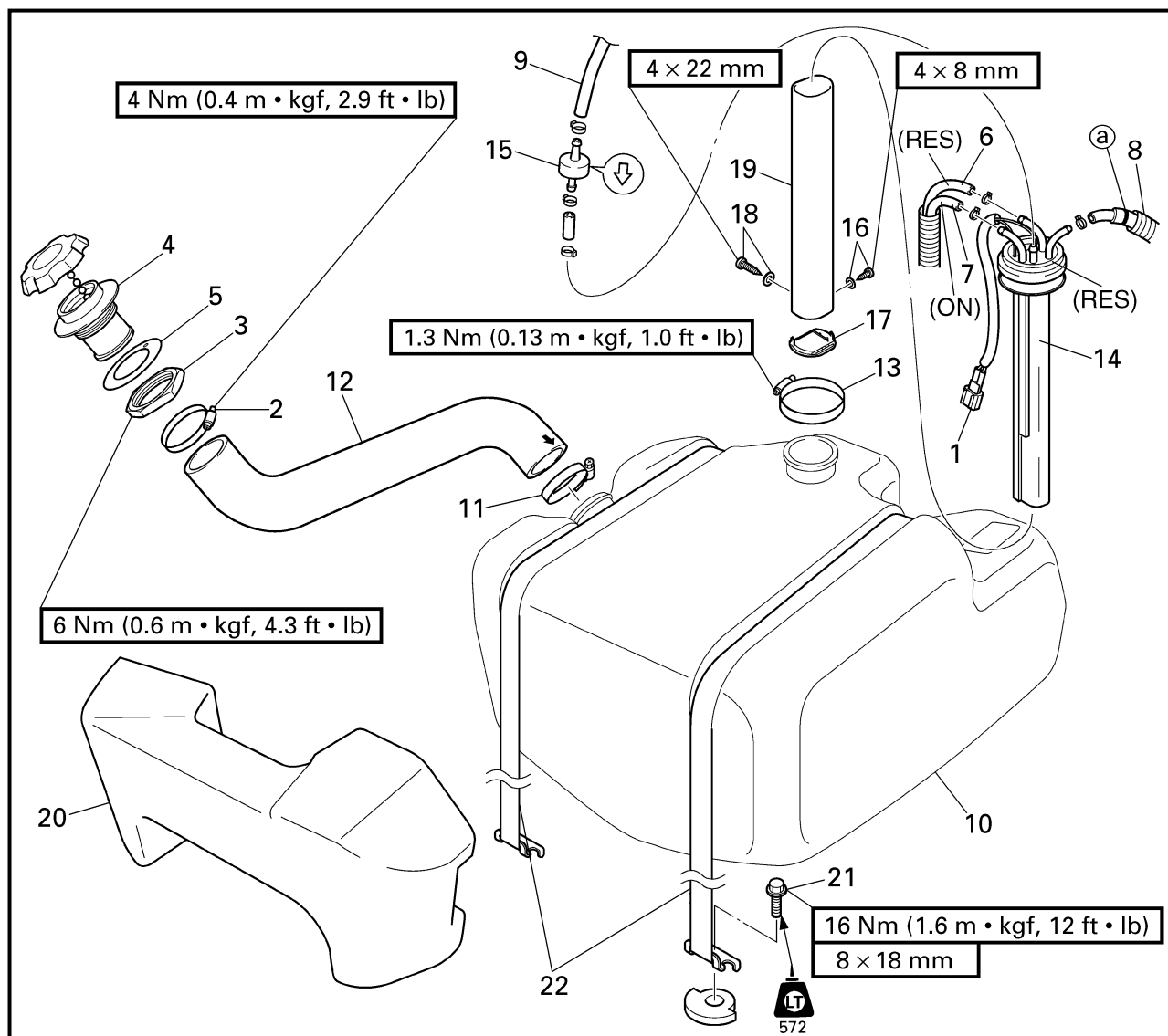
| Step | Procedure/Part name       | Q'ty | Service points                                              |
|------|---------------------------|------|-------------------------------------------------------------|
|      | <b>FUEL TANK REMOVAL</b>  |      |                                                             |
|      | Oil tank                  |      | Follow the left "Step" for removal.<br>Refer to "OIL TANK". |
| 1    | Fuel level sensor coupler | 1    |                                                             |
| 2    | Hose clamp                | 1    |                                                             |
| 3    | Nut                       | 1    |                                                             |
| 4    | Fuel filler neck          | 1    |                                                             |
| 5    | Rubber seal               | 1    |                                                             |
| 6    | Fuel reserve hose         | 1    |                                                             |


**EXPLODED DIAGRAM**


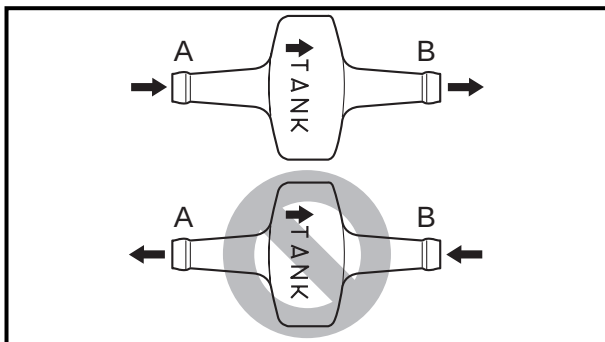
| Step | Procedure/Part name  | Q'ty | Service points |
|------|----------------------|------|----------------|
| 7    | Fuel hose            | 1    | Red mark (a)   |
| 8    | Fuel return hose     | 1    |                |
| 9    | Fuel breather hose   | 1    |                |
| 10   | Fuel tank assembly   | 1    |                |
| 11   | Hose clamp           | 1    |                |
| 12   | Fuel filler hose     | 1    |                |
| 13   | Hose clamp           | 1    |                |
| 14   | Fuel sensor assembly | 1    |                |



## EXPLODED DIAGRAM



| Step | Procedure/Part name | Q'ty | Service points                              |
|------|---------------------|------|---------------------------------------------|
| 15   | One way valve       | 1    | Reverse the removal steps for installation. |
| 16   | Screw/washer        | 1/1  |                                             |
| 17   | Filter              | 1    |                                             |
| 18   | Screw/washer        | 1/1  |                                             |
| 19   | Sleeve              | 1    |                                             |
| 20   | Floatation          | 1    |                                             |
| 21   | Bolt                | 2    |                                             |
| 22   | Tank bolt           | 2    |                                             |

**SERVICE POINTS****Check valve inspection**

## 1. Check:

- Check valve  
Faulty → Replace.

**Checking steps:**

- Connect a hose to the end of check valve "A" and blow into it.  
Air should come out from end "B".
- Connect the hose to the end of check valve "B" and blow into it.  
Air should not come out from end "A".

**Fuel level switch inspection**

Refer to "INDICATION SYSTEM" in chapter 7.

**Fuel tank inspection**

## 1. Inspect:

- Fuel tank  
Cracks/damage → Replace.

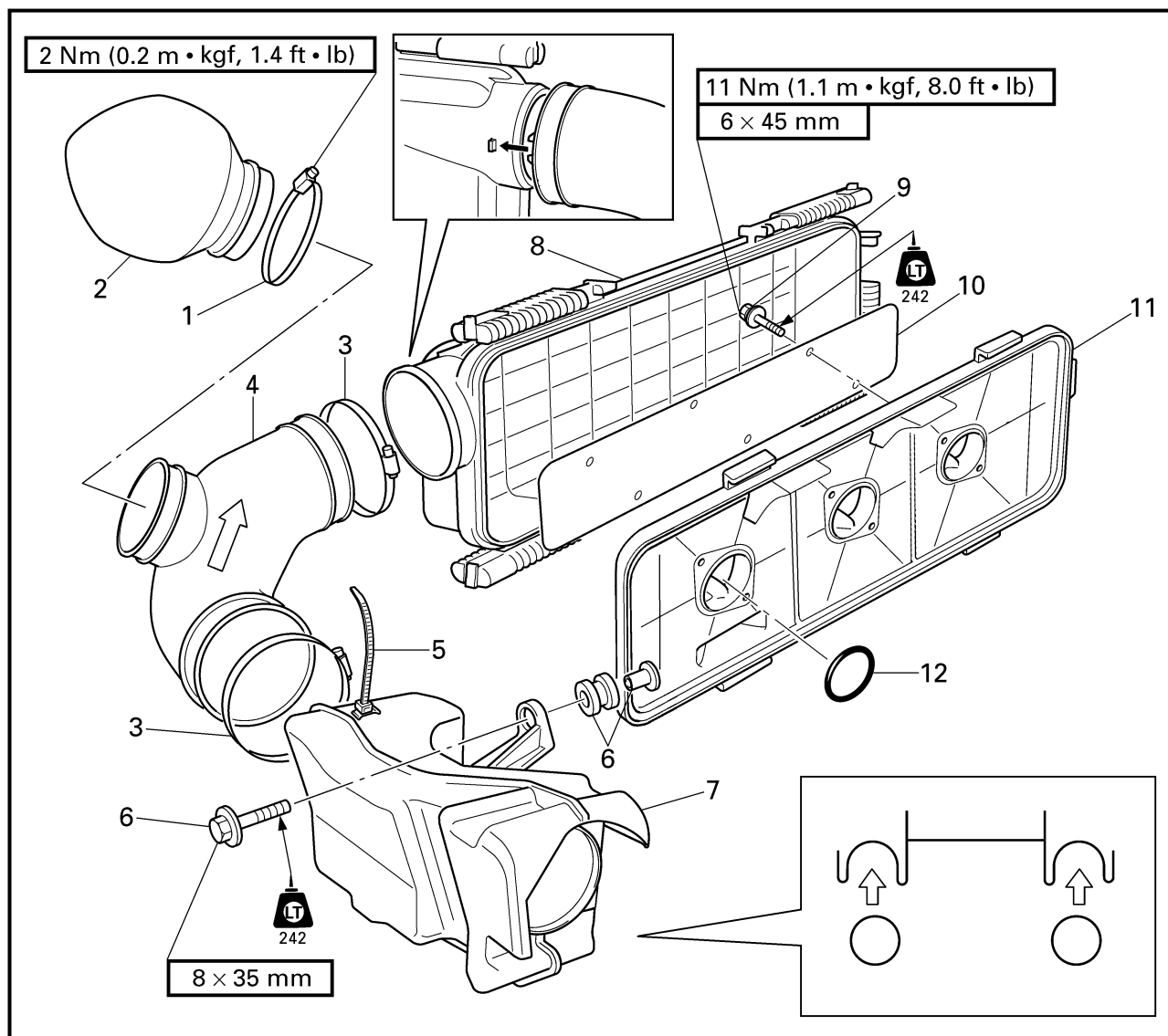
**Pipe joint inspection**

## 1. Inspect:

- Pipe  
Contaminants → Clean.  
Bends/damage → Replace.



## INTAKE DUCT AND SILENCER EXPLODED DIAGRAM

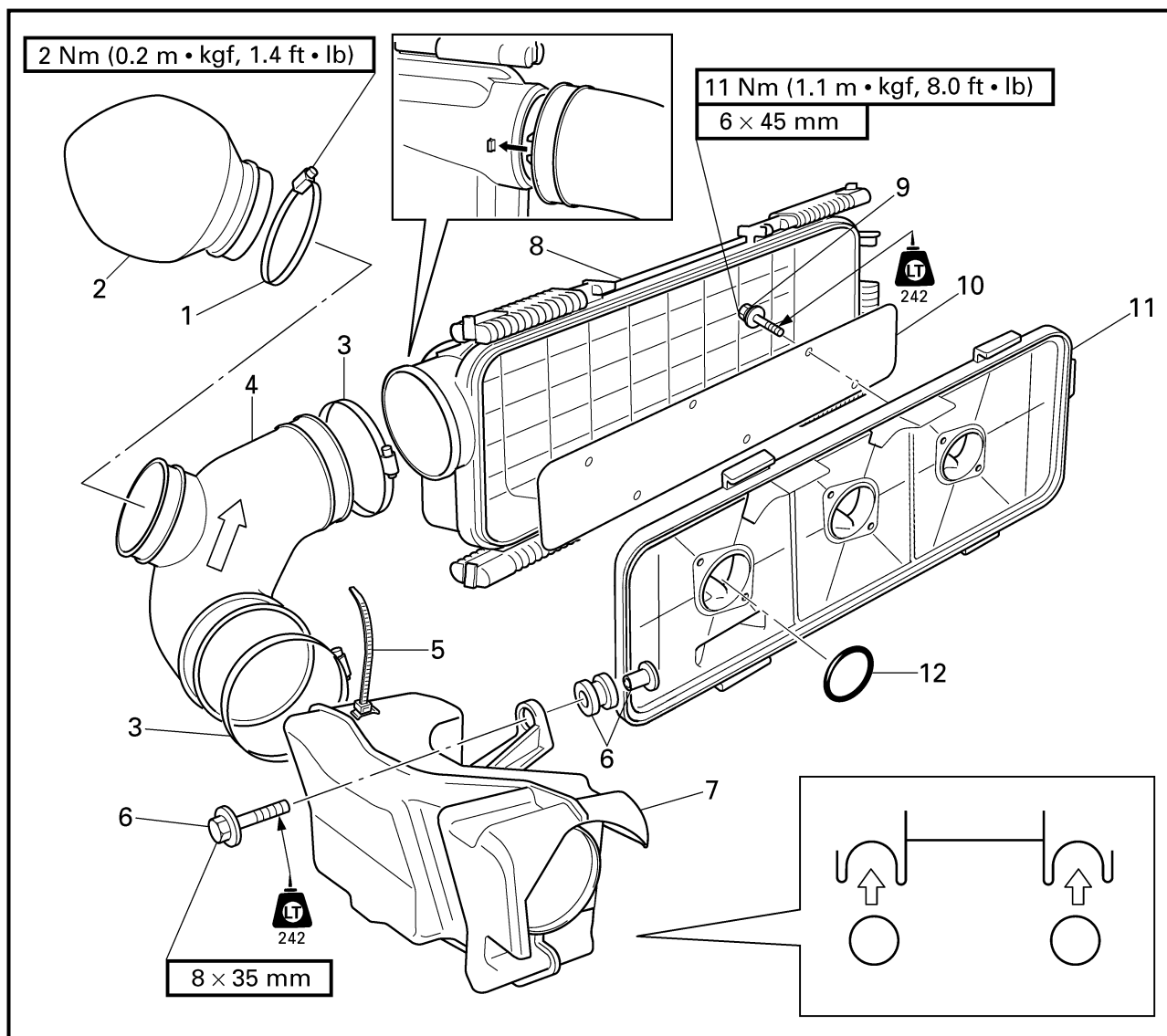


## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name                     | Q'ty | Service points                                                                                                                    |
|------|-----------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------|
|      | <b>INTAKE DUCT AND SILENCER REMOVAL</b> |      | Follow the left "Step" for removal.                                                                                               |
|      | Exhaust chamber assembly                |      | Refer to "EXHAUST CHAMBER ASSEMBLY" in chapter 5.                                                                                 |
| 1    | Hose clamp                              | 1    |                                                                                                                                   |
| 2    | Silencer                                | 1    |                                                                                                                                   |
| 3    | Hose clamp                              | 2    |                                                                                                                                   |
| 4    | Joint hose                              | 1    |                                                                                                                                   |
| 5    | Band                                    | 1    | <b>NOTE:</b> Tie the fuel suction hose, fuel return hose, throttle cable and pilot water hose (port side) together with the band. |



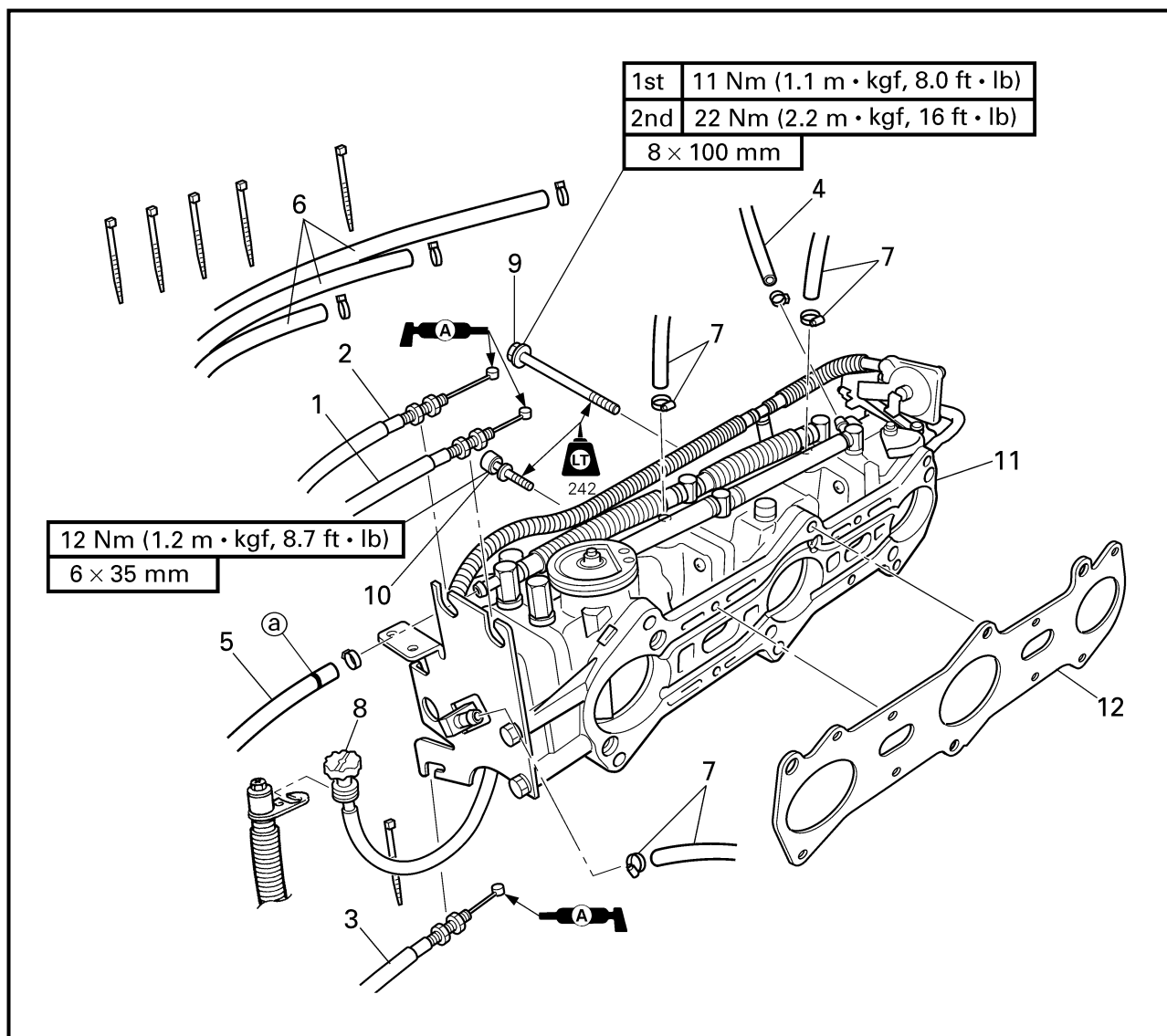
## EXPLODED DIAGRAM



| Step | Procedure/Part name | Q'ty  | Service points                              |
|------|---------------------|-------|---------------------------------------------|
| 6    | Bolt/collar/grommet | 1/1/1 | Reverse the removal steps for installation. |
| 7    | Intake duct         | 1     |                                             |
| 8    | Silencer case       | 1     |                                             |
| 9    | Bolt                | 6     |                                             |
| 10   | Spark arrester      | 1     |                                             |
| 11   | Silencer plate      | 1     |                                             |
| 12   | O-ring              | 3     |                                             |



## CARBURETOR UNIT EXPLODED DIAGRAM

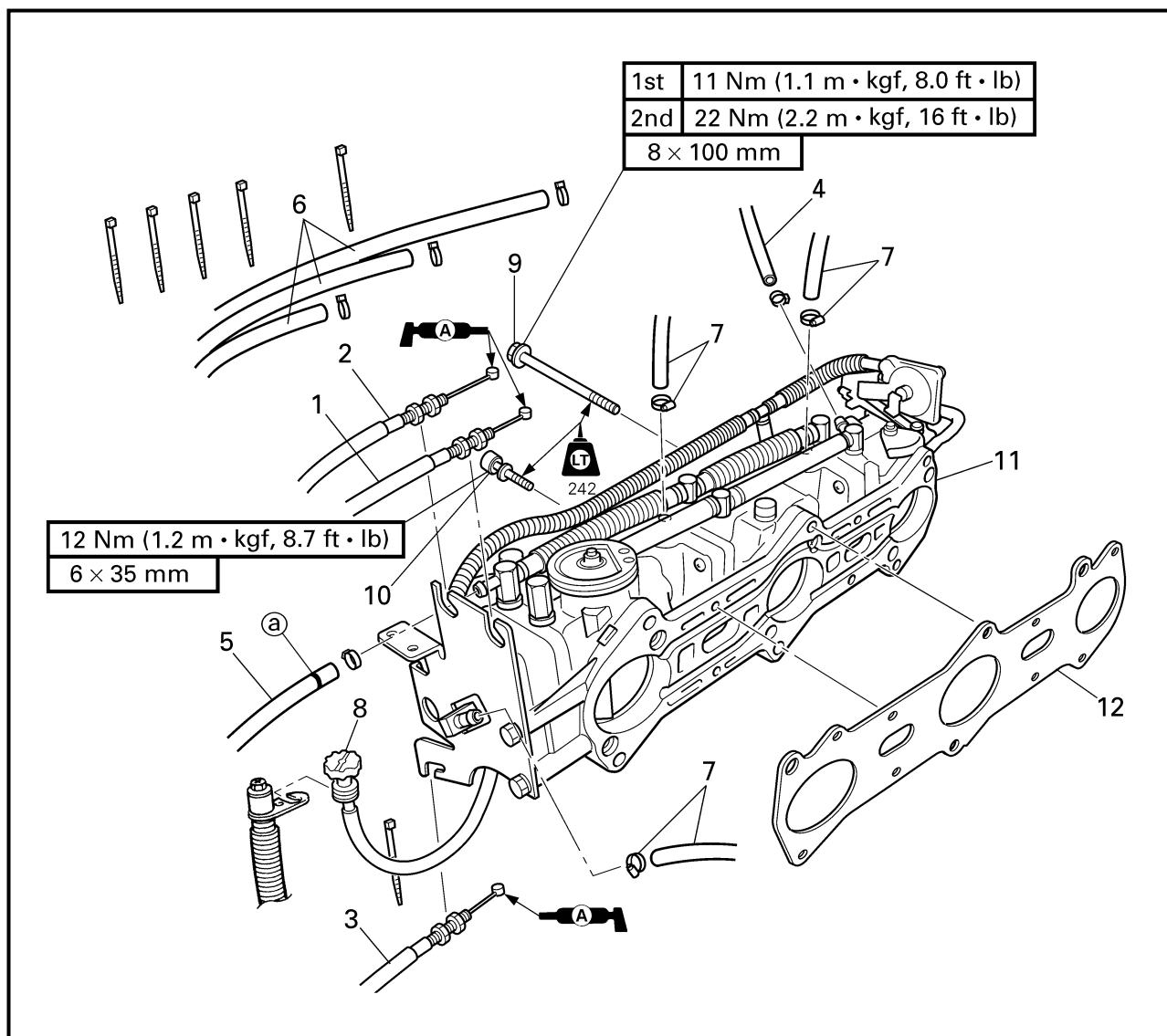


## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name            | Q'ty | Service points                                                                                                                                 |
|------|--------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | <b>CARBURETOR UNIT REMOVAL</b> |      |                                                                                                                                                |
|      | Silencer plate                 | 1    | Follow the left "Step" for removal.<br>Refer to "INTAKE DUCT AND SILENCER".<br><b>NOTE:</b> _____                                              |
|      | Oil pump cable                 | 1    | Before removing the oil pump cable,<br>mark the cable's installation position for<br>reference when installing the oil pump<br>cable.<br>_____ |
|      | Throttle cable                 | 1    |                                                                                                                                                |
| 2    | Choke cable                    | 1    |                                                                                                                                                |
| 3    | Fuel suction hose              | 1    |                                                                                                                                                |



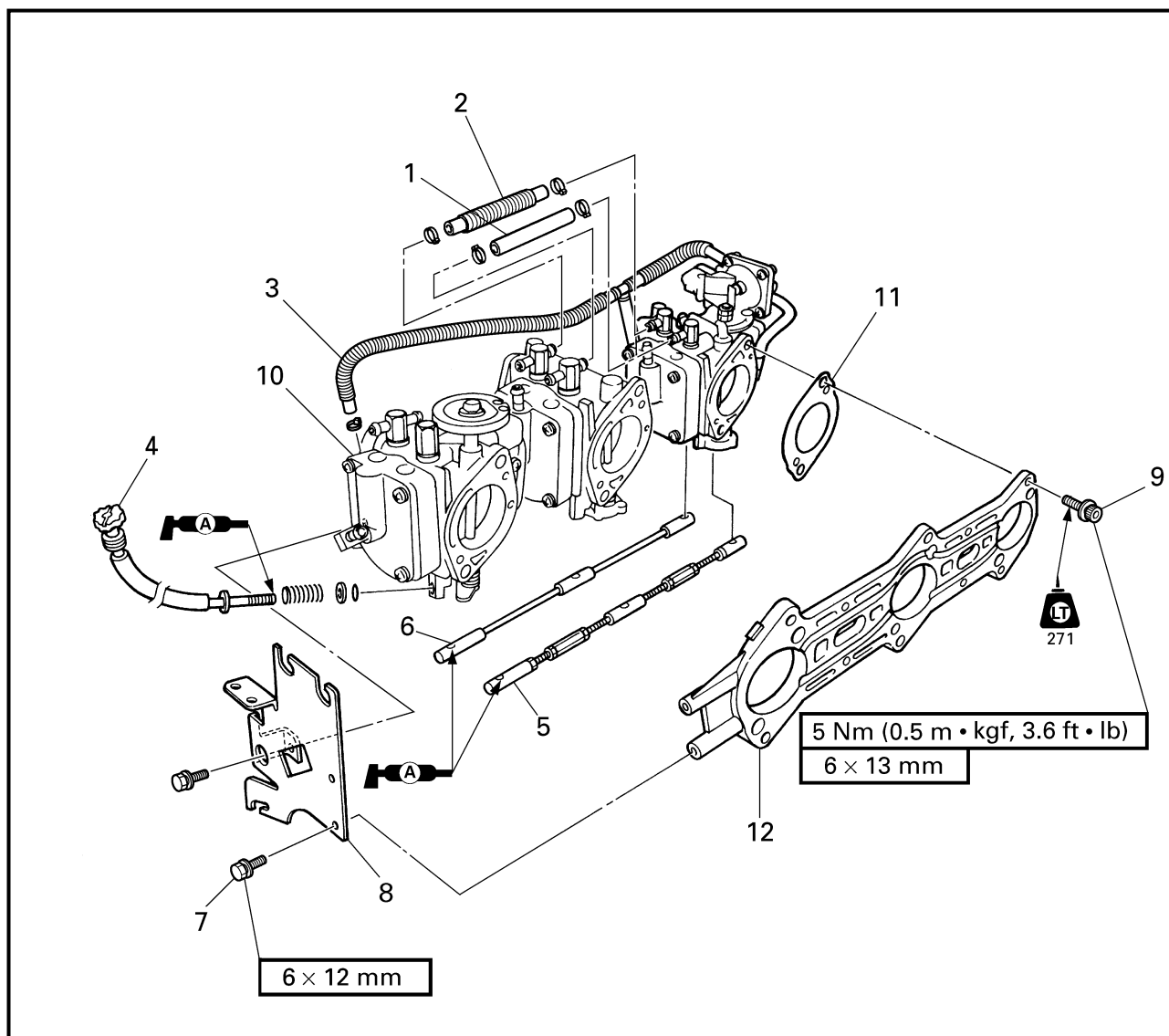
## EXPLODED DIAGRAM



| Step | Procedure/Part name         | Q'ty | Service points                                                     |
|------|-----------------------------|------|--------------------------------------------------------------------|
| 5    | Fuel return hose            | 1    | Red mark (a)                                                       |
| 6    | Oil delivery hose           | 3    |                                                                    |
| 7    | Clamp/fuel pump vacuum hose | 3/3  |                                                                    |
| 8    | Remote throttle stop screw  | 1    |                                                                    |
| 9    | Bolt                        | 6    |                                                                    |
| 10   | Bolt                        | 4    |                                                                    |
| 11   | Carburetor assembly         | 1    |                                                                    |
| 12   | Gasket                      | 1    | <b>Not reusable</b><br>Reverse the removal steps for installation. |



## EXPLODED DIAGRAM

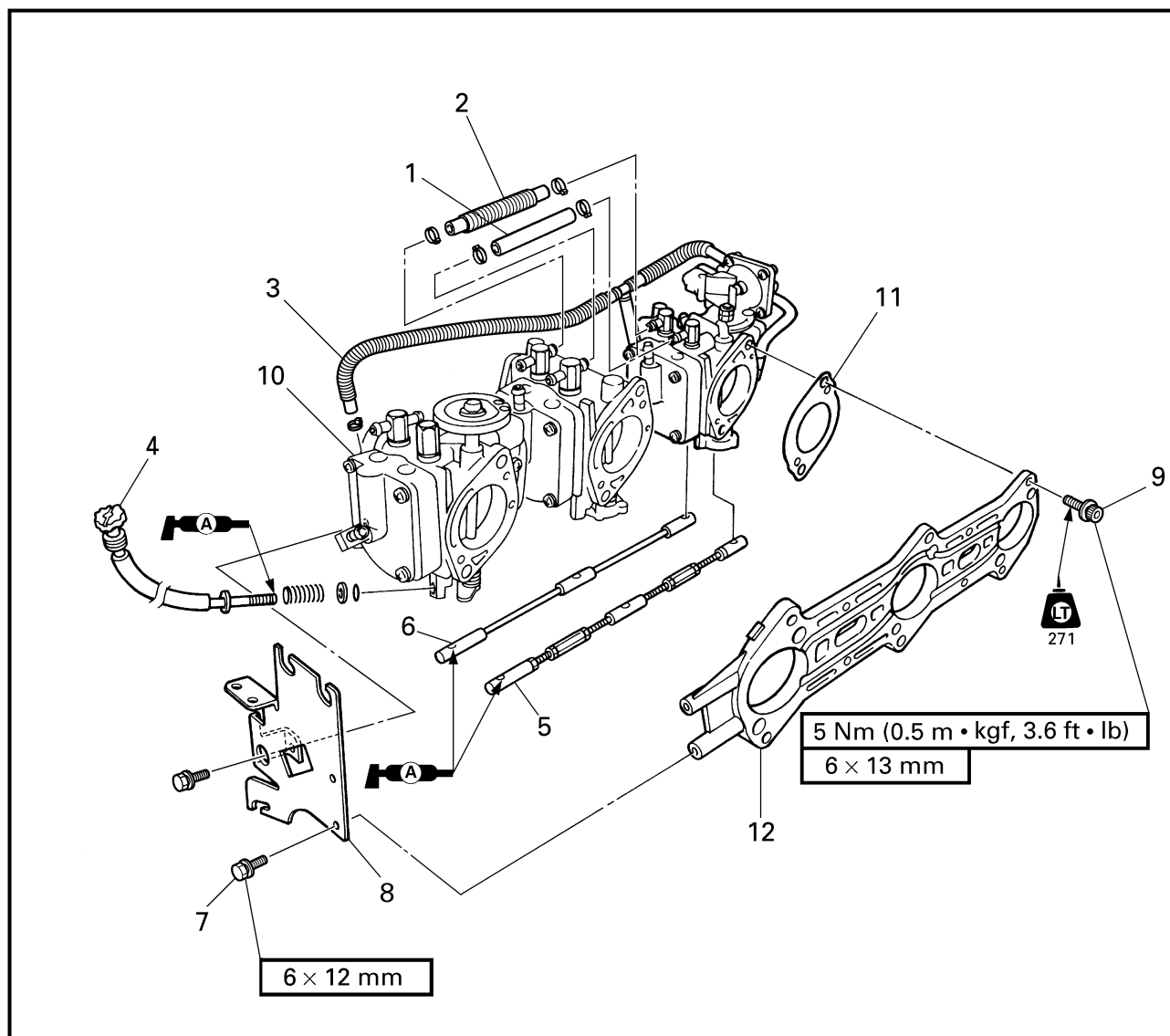


## REMOVAL AND INSTALLATION CHART

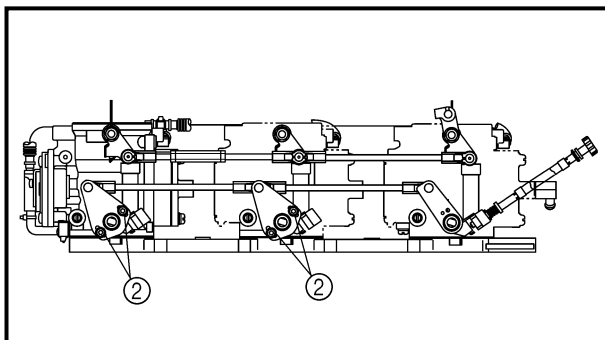
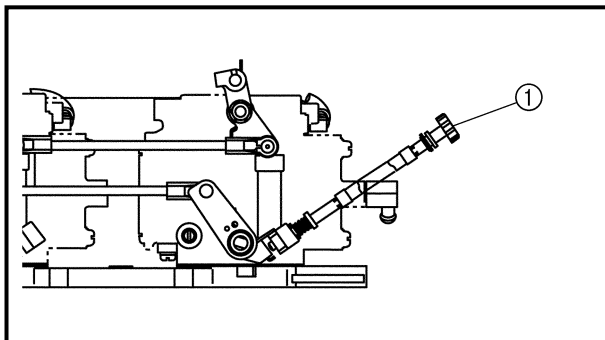
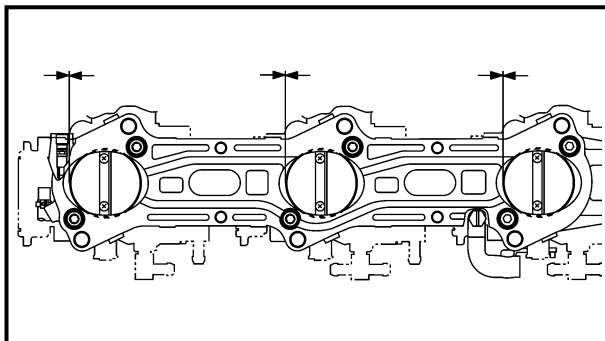
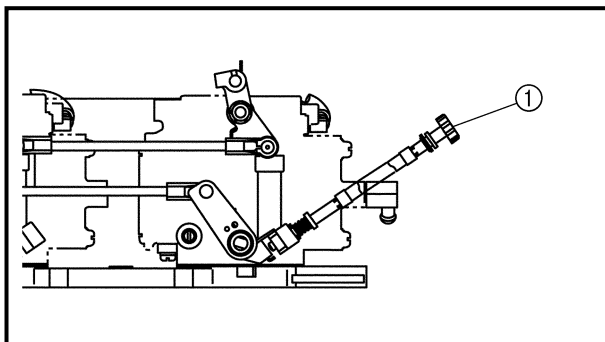
| Step | Procedure/Part name                 | Q'ty | Service points                      |
|------|-------------------------------------|------|-------------------------------------|
|      | <b>CARBURETOR UNIT SEPARATION</b>   |      | Follow the left "Step" for removal. |
| 1    | Hose                                | 2    | Fuel suction                        |
| 2    | Hose                                | 2    | Fuel return                         |
| 3    | Accelerator pump hose               | 1    |                                     |
| 4    | Remote throttle stop screw assembly | 1    |                                     |
| 5    | Throttle link                       | 1    |                                     |
| 6    | Choke link                          | 1    |                                     |



## EXPLODED DIAGRAM



| Step | Procedure/Part name | Q'ty | Service points                                                                 |
|------|---------------------|------|--------------------------------------------------------------------------------|
| 7    | Bolt                | 3    | <div>Not reusable</div> <div>Reverse the removal steps for installation.</div> |
| 8    | Cable holder        | 1    |                                                                                |
| 9    | Bolt                | 6    |                                                                                |
| 10   | Carburetor          | 3    |                                                                                |
| 11   | Gasket              | 3    |                                                                                |
| 12   | Plate               | 1    |                                                                                |



## SERVICE POINTS

### Throttle valve synchronization inspection and adjustment

#### 1. Check:

- Throttle valve synchronization
- Not synchronized → Adjust.

#### Checking steps:

- Loosen the remote throttle stop screw ① until untouched the screw end from the throttle lever.
- Check the each throttle valve is fully closed.

#### 2. Adjust:

- Throttle valve synchronization

#### Adjustment steps:

- Loosen the remote throttle stop screw ① until untouched the screw end from the throttle lever.
- Loosen the screws ②.

#### NOTE:

Make sure that the throttle valves are in the fully closed position.

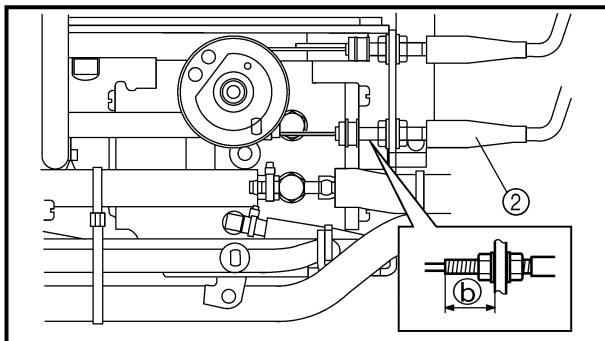
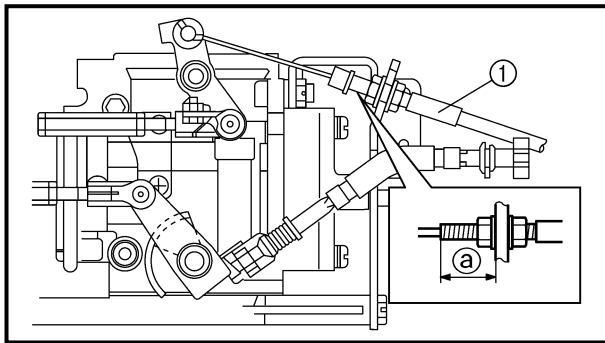
- Tighten the screws ②.



#### Screw:

2 Nm (0.2 m • kgf, 1.4 ft • lb)

- Turn in the remote throttle stop screw to the original position.



### Choke cable and throttle cable installation

#### 1. Install:

- Choke cable ①
- Throttle cable ②



#### Choke cable guide installation position ①:

16 ~ 18 mm (0.63 ~ 0.71 in)

#### Throttle cable guide installation position ②:

18 ~ 20 mm (0.71 ~ 0.79 in)

#### 2. Adjust:

- Throttle lever free play  
Refer to "CONTROL SYSTEM" in chapter 3.

### Oil pump cable installation

#### 1. Adjust:

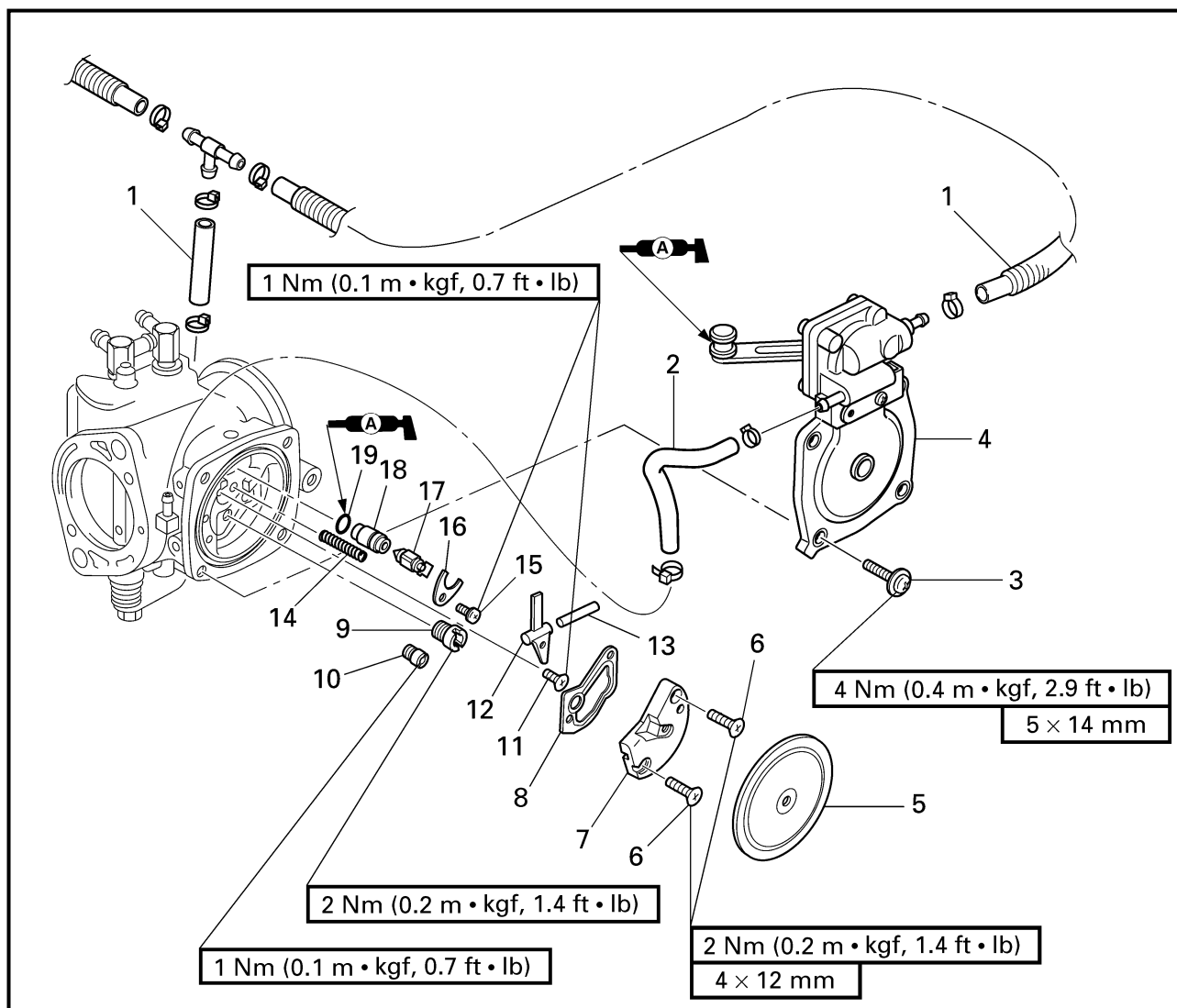
- Oil pump cable  
Refer to "OIL PUMP".

### Carburetor assembly

#### 1. Adjust:

- Trolling speed  
Refer to "FUEL SYSTEM" in chapter 3.

## CARBURETOR EXPLODED DIAGRAM

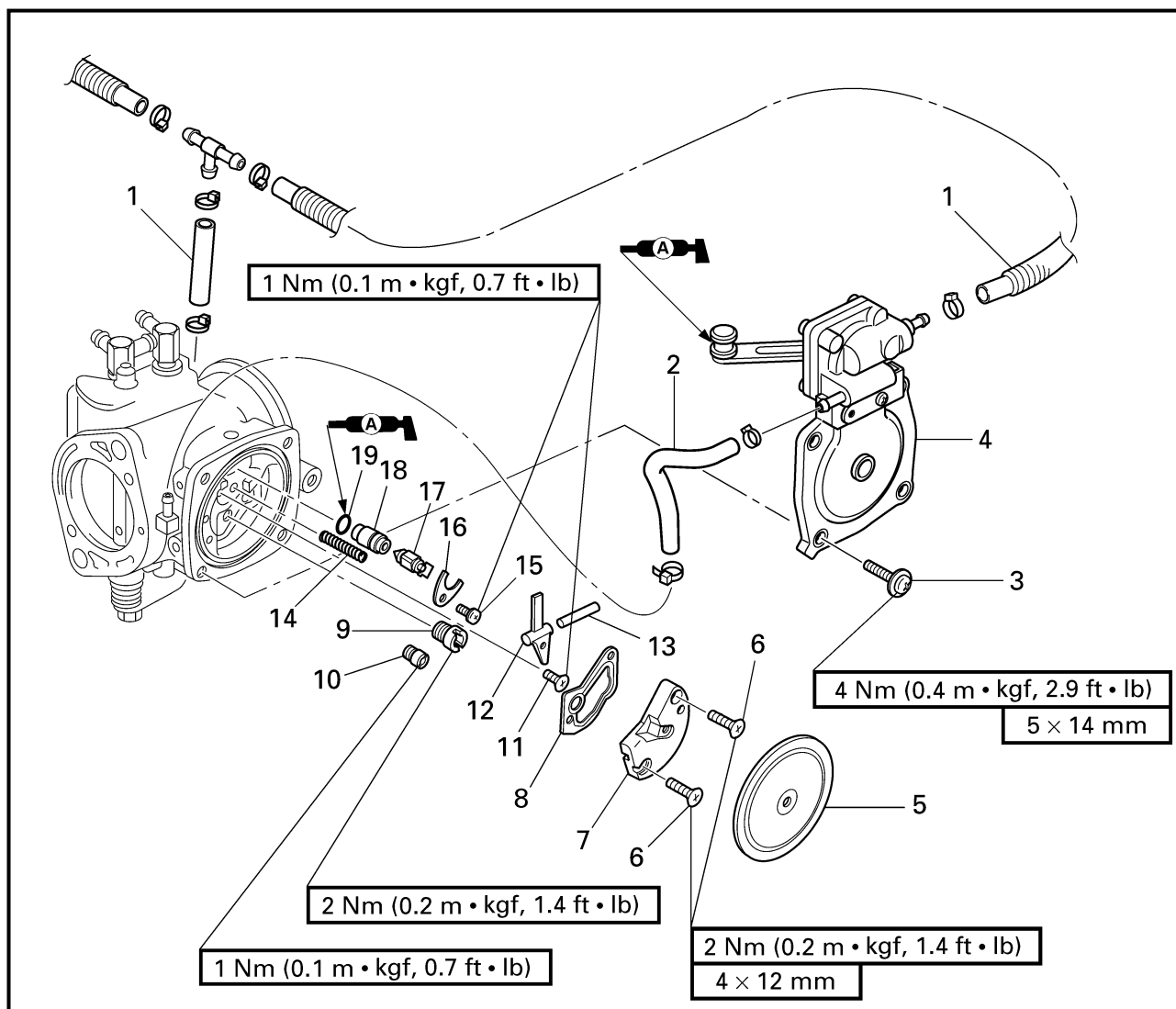


## REMOVAL AND INSTALLATION CHART

| Step                          | Procedure/Part name               | Q'ty | Service points                          |
|-------------------------------|-----------------------------------|------|-----------------------------------------|
| <b>CARBURETOR DISASSEMBLY</b> |                                   |      |                                         |
| 1                             | Accelerator pump delivery hose    | 2    | Follow the left "Step" for disassembly. |
| 2                             | Accelerator pump fuel hose        | 1    | For carburetor #3                       |
| 3                             | Screw                             | 4    |                                         |
| 4                             | Accelerator pump/carburetor cover | 1/1  | Carburetor #3/carburetor #1 and #2      |
| 5                             | Diaphragm                         | 1    |                                         |
| 6                             | Screw                             | 2    |                                         |
| 7                             | Regulator body                    | 1    |                                         |
| 8                             | Gasket                            | 1    |                                         |
| 9                             | Main jet                          | 1    |                                         |



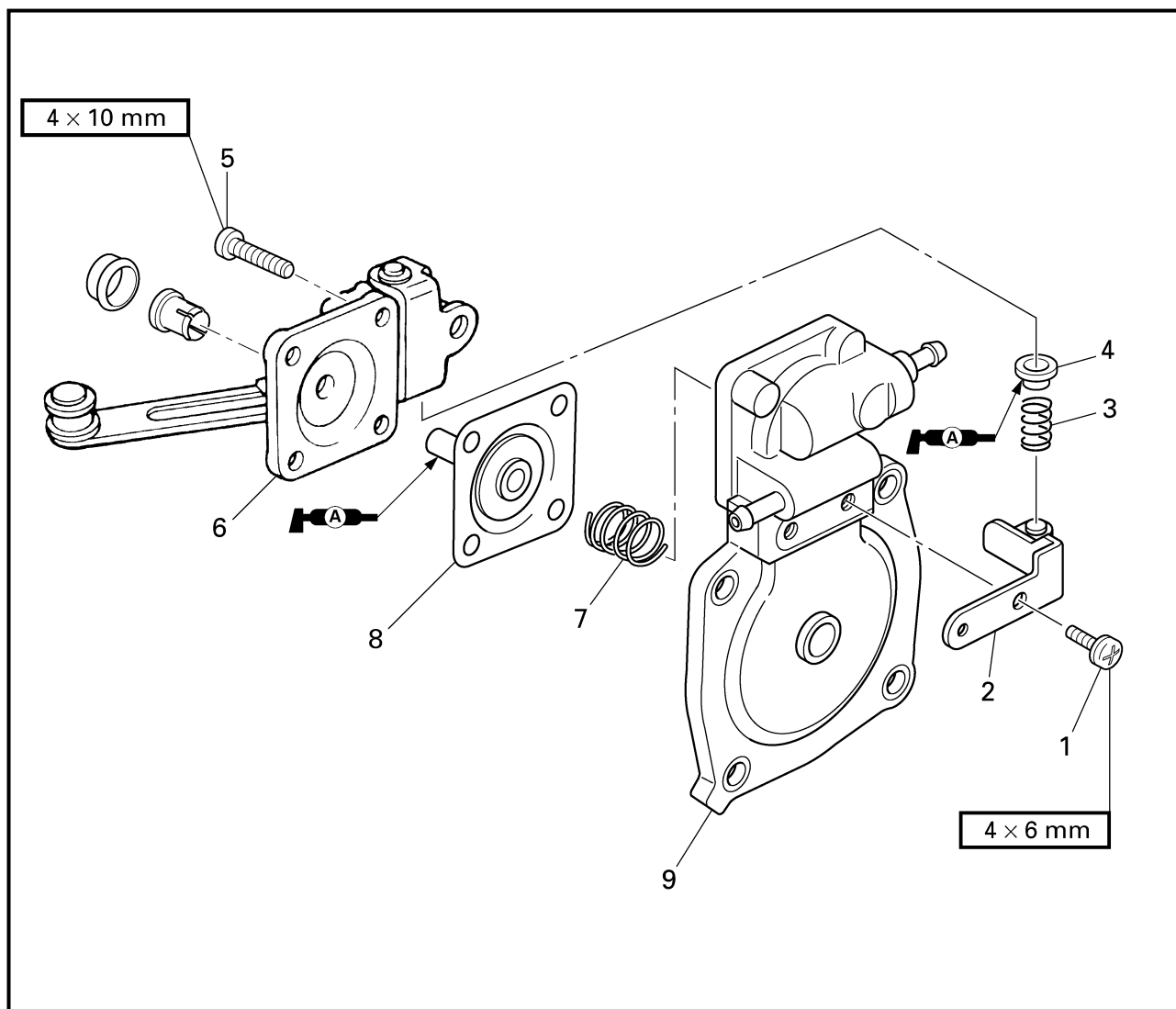
## EXPLODED DIAGRAM



| Step | Procedure/Part name      | Q'ty | Service points                              |
|------|--------------------------|------|---------------------------------------------|
| 10   | Pilot jet                | 1    | Reverse the disassembly steps for assembly. |
| 11   | Screw                    | 1    |                                             |
| 12   | Arm                      | 1    |                                             |
| 13   | Arm pin                  | 1    |                                             |
| 14   | Spring                   | 1    |                                             |
| 15   | Screw                    | 1    |                                             |
| 16   | Needle valve seat holder | 1    |                                             |
| 17   | Needle valve             | 1    |                                             |
| 18   | Needle valve seat        | 1    |                                             |
| 19   | O-ring                   | 1    |                                             |



## EXPLODED DIAGRAM



## REMOVAL AND INSTALLATION CHART

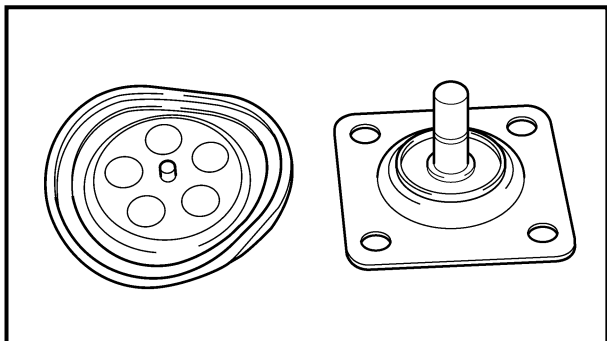
| Step | Procedure/Part name                     | Q'ty | Service points                              |
|------|-----------------------------------------|------|---------------------------------------------|
|      | <b>ACCELERATOR PUMP<br/>DISASSEMBLY</b> |      | Follow the left "Step" for disassembly.     |
| 1    | Screw                                   | 1    |                                             |
| 2    | Stay                                    | 1    |                                             |
| 3    | Spring                                  | 1    |                                             |
| 4    | Spring seat                             | 1    |                                             |
| 5    | Screw                                   | 4    |                                             |
| 6    | Accelerator pump cover assembly         | 1    |                                             |
| 7    | Spring                                  | 1    |                                             |
| 8    | Diaphragm                               | 1    |                                             |
| 9    | Accelerator pump body                   | 1    |                                             |
|      |                                         |      | Reverse the disassembly steps for assembly. |



## SERVICE POINTS

### CAUTION:

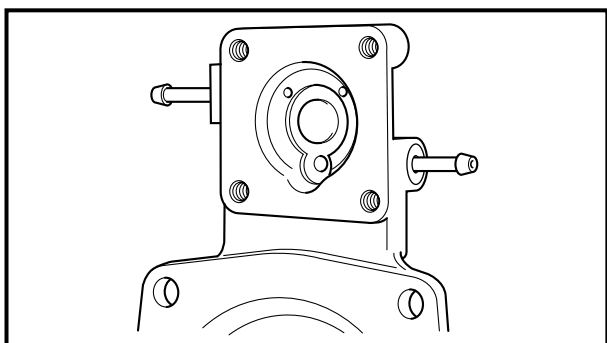
Do not use steel wire for cleaning the jets. This may enlarge the jet diameters and seriously affect performance.



### Diaphragm inspection

#### 1. Inspect:

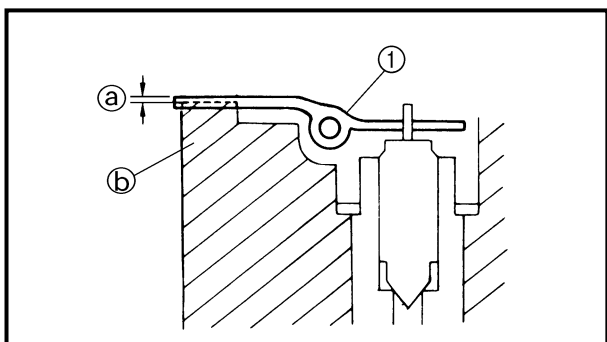
- Diaphragm  
Damage → Replace.



### Accelerator pump body inspection

#### 1. Inspect:

- One way valve  
Crack/damage → Replace the accelerator pump body.
- Fuel passage  
Clog → Clean or replace.



### Arm inspection

#### 1. Inspect:

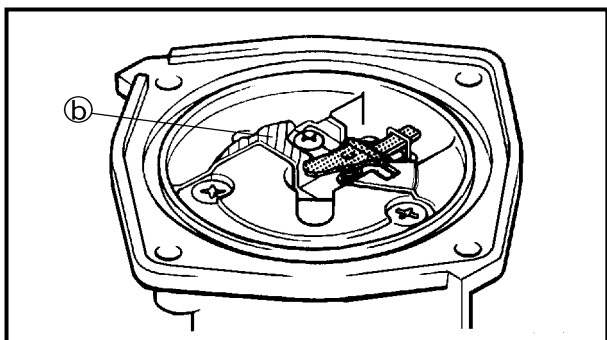
- Arm ①  
Bends/damage → Repair or replace.

#### 2. Measure:

- Arm height ②

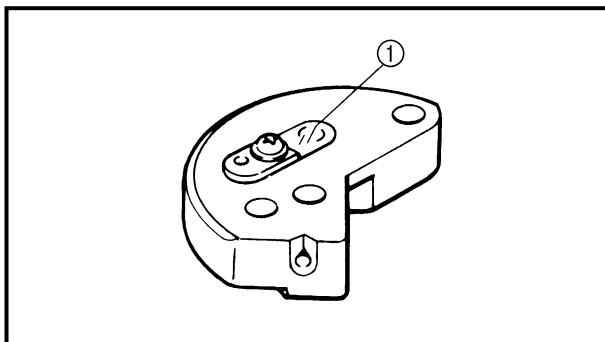


**Arm height:**  
0 ~ 0.2 mm (0 ~ 0.008 in)



### NOTE:

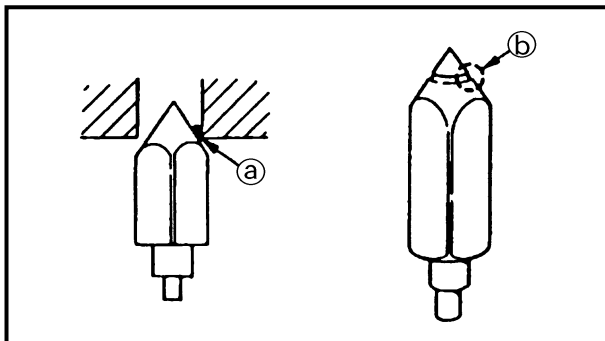
- Measure the distance between the surface of the carburetor body (b) and the top surface of the arm.
- The arm should be resting on the needle valve, but not compressing it.



### Regulator body inspection

#### 1. Inspect:

- Regulator body  
Contaminants → Clean.  
Damage → Replace.
- Valve (clear film) ①  
Damage → Replace.



### Needle valve inspection

#### 1. Inspect:

- Needle valve
- Needle valve seat  
Contaminants ① → Clean.  
Wear ② → Replace.

### NOTE:

Always replace the needle valve and needle valve seat as a set.

### Jet and carburetor body inspection

#### 1. Inspect:

- Main jet
- Pilot jet
- Carburetor body  
Clog/contaminants → Clean.  
Damage/wear → Replace.

### CAUTION:

Do not use a steel wire to clean the jets. This may enlarge the jet diameters and seriously affect performance.

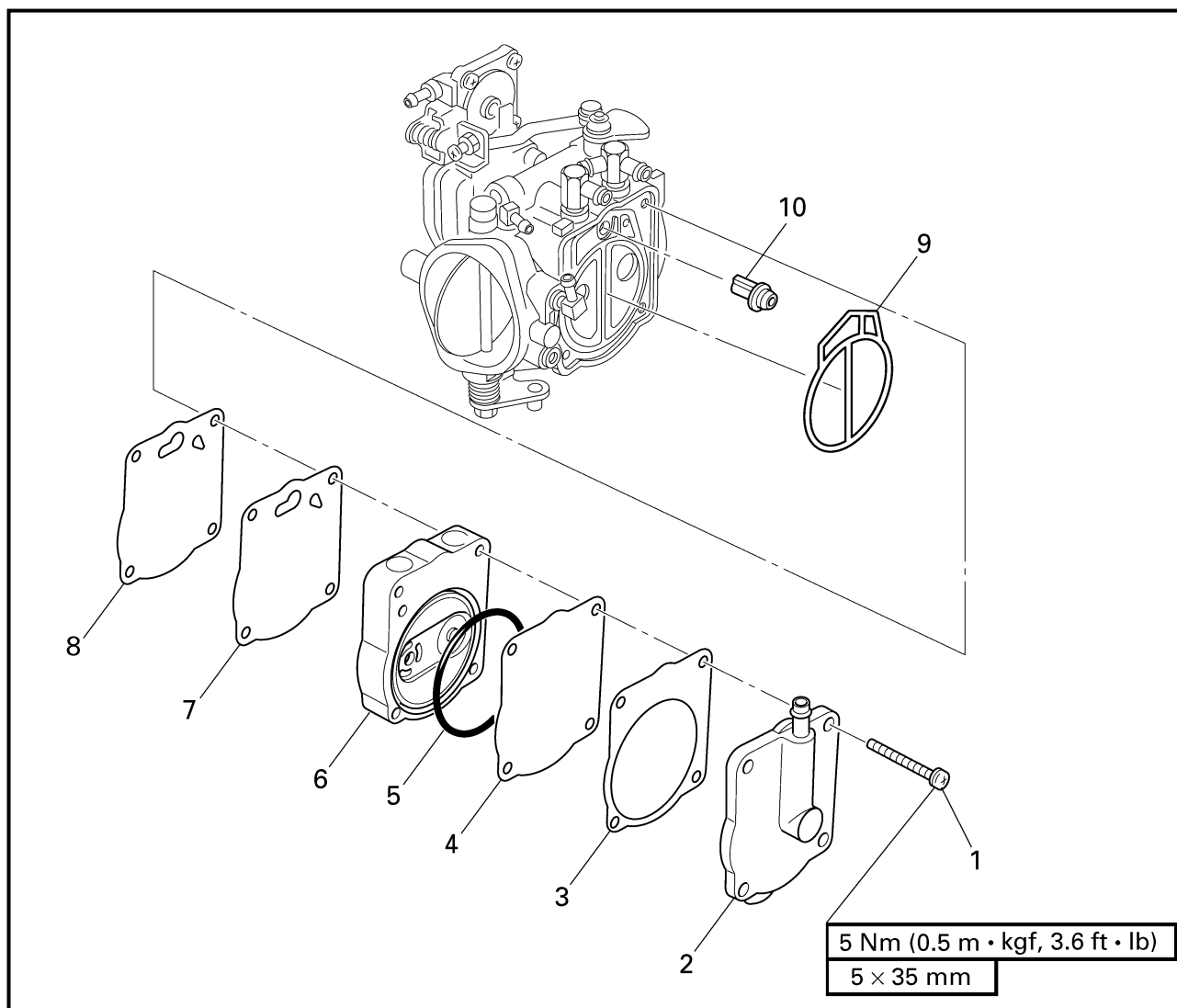
### Carburetor assembly

#### 1. Adjust:

- Trolling speed  
Refer to "FUEL SYSTEM" in chapter 3.

## FUEL PUMP

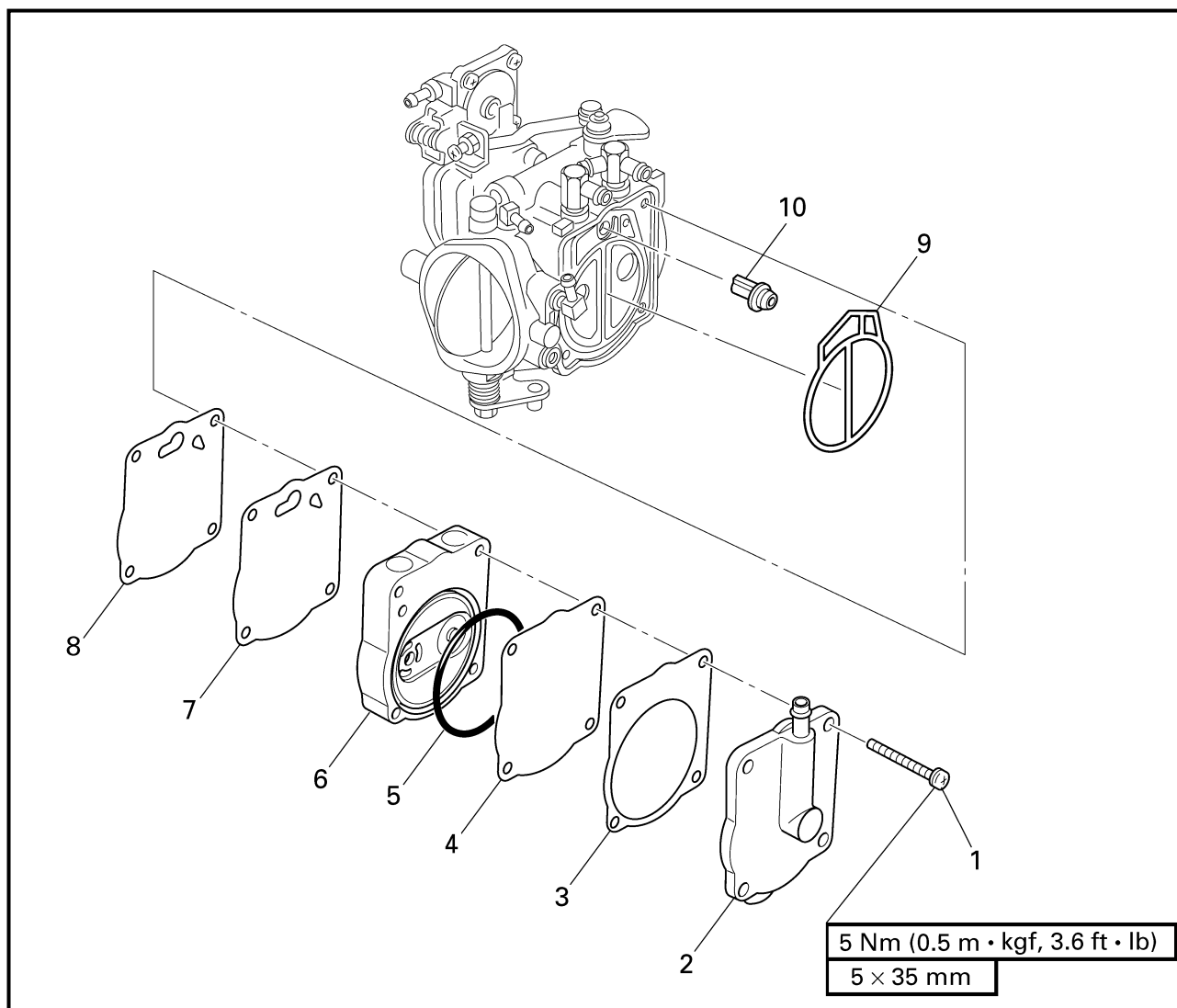
### EXPLODED DIAGRAM



### REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name          | Q'ty | Service points                                                    |
|------|------------------------------|------|-------------------------------------------------------------------|
|      | <b>FUEL PUMP DISASSEMBLY</b> |      |                                                                   |
|      | Carburetors                  |      | Follow the left "Step" for disassembly.<br>Refer to "CARBURETOR". |
| 1    | Screw                        | 4    |                                                                   |
| 2    | Fuel pump cover              | 1    |                                                                   |
| 3    | Gasket                       | 1    | <b>Not reusable</b>                                               |
| 4    | Diaphragm                    | 1    |                                                                   |
| 5    | O-ring                       | 1    |                                                                   |
| 6    | Diaphragm body               | 1    |                                                                   |

## EXPLODED DIAGRAM



| Step | Procedure/Part name | Q'ty | Service points                              |
|------|---------------------|------|---------------------------------------------|
| 7    | Rubber diaphragm    | 1    | Reverse the disassembly steps for assembly. |
| 8    | Diaphragm           | 1    |                                             |
| 9    | Packing             | 1    |                                             |
| 10   | Fuel filter         | 1    |                                             |

**SERVICE POINTS****Fuel pump inspection**

1. Inspect:

- Diaphragm
  - Rubber diaphragm
  - Diaphragm body
- Damage → Replace.

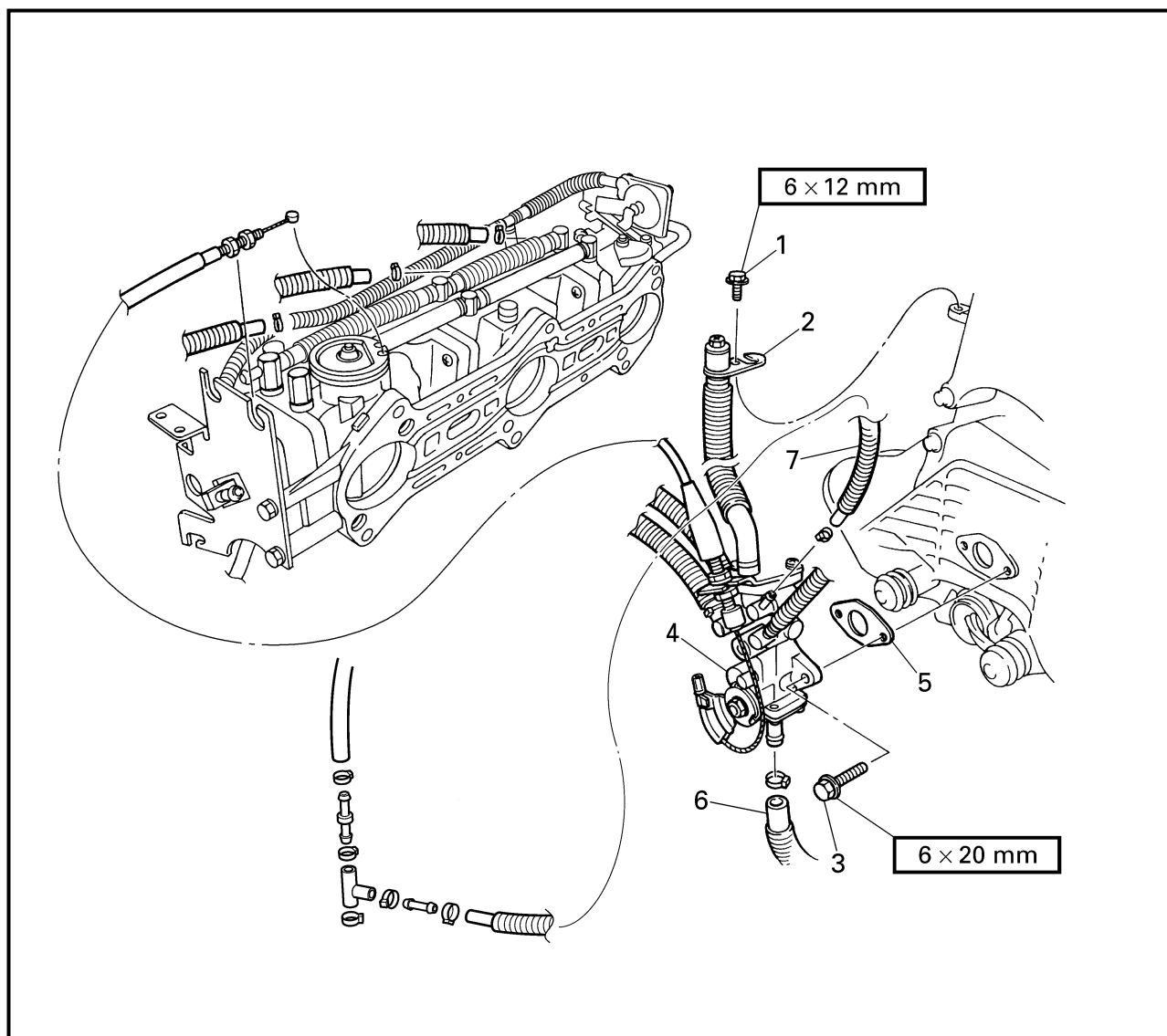
**Fuel filter inspection**

1. Inspect:

- Fuel filter
- Clog/contaminants → Clean.  
Damage → Replace.



## OIL PUMP EXPLODED DIAGRAM

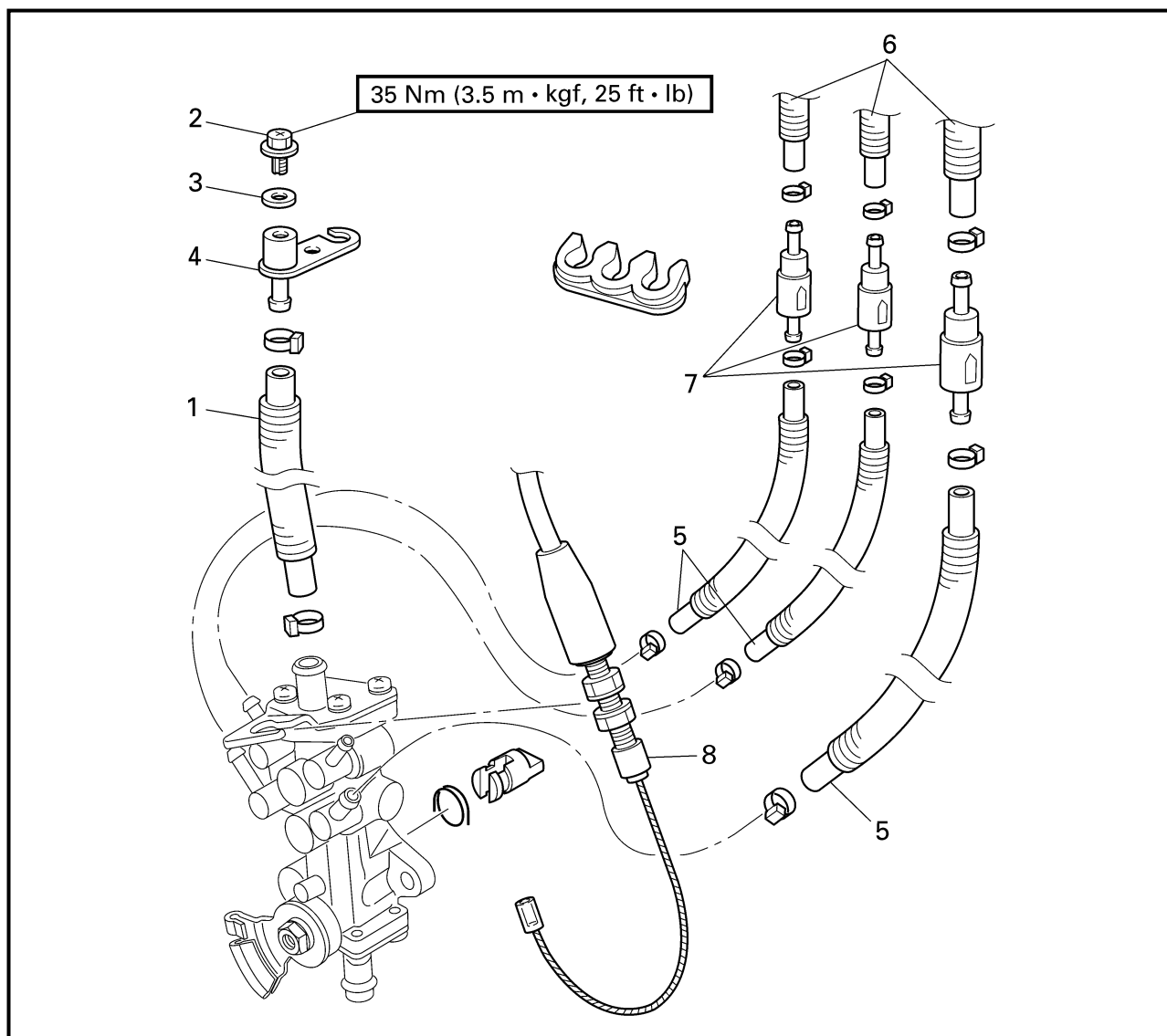


## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name     | Q'ty | Service points                                                              |
|------|-------------------------|------|-----------------------------------------------------------------------------|
|      | <b>OIL PUMP REMOVAL</b> |      |                                                                             |
|      | Engine unit             |      | Follow the left "Step" for removal.<br>Refer to "ENGINE UNIT" in chapter 5. |
| 1    | Bolt                    | 1    |                                                                             |
| 2    | Bleed hose stay         | 1    |                                                                             |
| 3    | Bolt                    | 2    |                                                                             |
| 4    | Oil pump assembly       | 1    |                                                                             |
| 5    | Gasket                  | 1    | <b>Not reusable</b>                                                         |
| 6    | Oil suction hose        | 1    |                                                                             |
| 7    | Oil return hose         | 1    |                                                                             |
|      |                         |      | Reverse the removal steps for installation.                                 |



## EXPLODED DIAGRAM



## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name                     | Q'ty | Service points                              |
|------|-----------------------------------------|------|---------------------------------------------|
|      | <b>OIL PUMP HOSES AND CABLE REMOVAL</b> |      | Follow the left "Step" for removal.         |
| 1    | Bleed hose                              | 1    |                                             |
| 2    | Air bleed screw                         | 1    |                                             |
| 3    | Gasket                                  | 1    |                                             |
| 4    | Bleed hose stay                         | 1    |                                             |
| 5    | Oil delivery hose 1                     | 3    |                                             |
| 6    | Oil delivery hose 2                     | 3    |                                             |
| 7    | Check valve                             | 3    |                                             |
| 8    | Oil pump cable                          | 1    |                                             |
|      |                                         |      | Reverse the removal steps for installation. |

**SERVICE POINTS****Oil pump inspection**

## 1. Inspect:

- Oil pump  
Contaminants → Clean.  
Damage/wear → Replace.
- Oil pump joint piece  
Damage/wear → Replace.

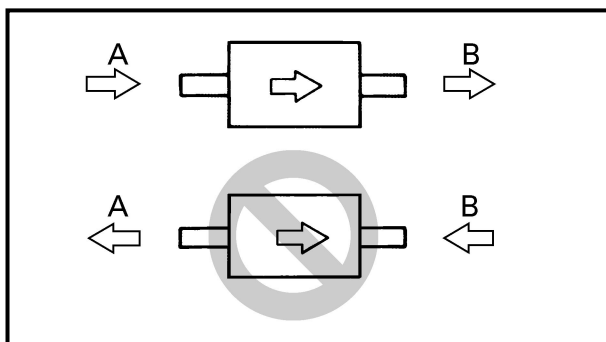
**Oil hose inspection**

## 1. Inspect:

- Oil hose  
Cracks/damage → Replace.

**CAUTION:**

- If the oil delivery hoses are not full of oil, fill them up.
- After installing the oil injection system, bleed the system of any air.

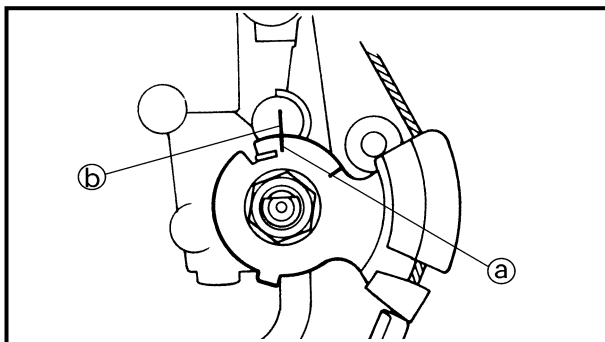
**Check valve inspection**

## 1. Check:

- Check valve  
Faulty → Replace.

**Checking steps:**

- Connect a hose to the end of check valve "A" and blow into it.  
Air should come out from end "B".
- Connect the hose to the end of check valve "B" and blow into it.  
Air should not come out from end "A".



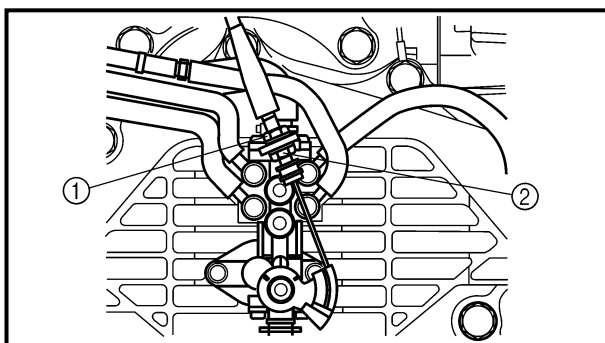
### Oil pump cable adjustment

#### 1. Check:

- Oil pump lever position  
Incorrect → Adjust.

#### Checking steps:

- Fully close the carburetor throttle valves.
- Check that the mark (a) on the oil pump lever is aligned with the mark (b) on the oil pump body.

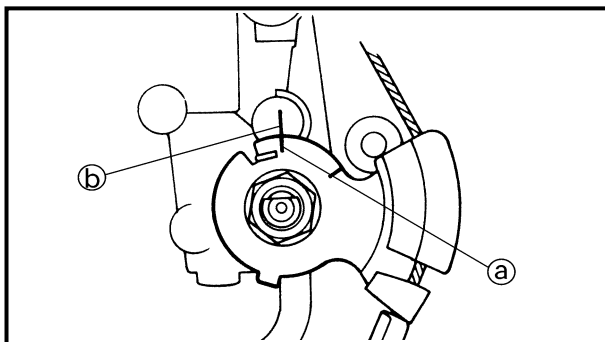


#### 2. Adjust:

- Oil pump cable

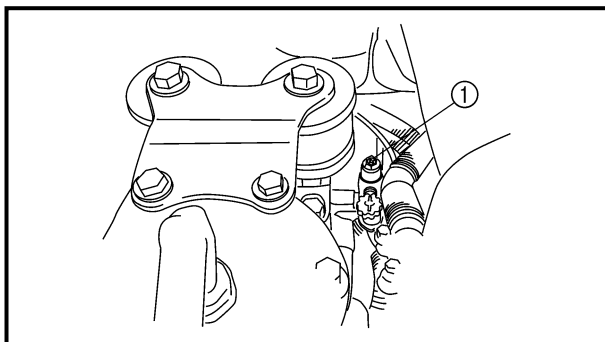
#### Adjustment steps:

- Loosen the locknut (1) and the adjusting nut (2).
- Fully close the carburetor throttle valves.
- Adjust the oil pump cable so that the mark (a) on the oil pump lever is aligned with the mark (b) on the oil pump body.
- Tighten the adjusting nut and locknut.



#### NOTE:

If the installation position has been marked for reference on the inner cable at the carburetor end while marks (a) and (b) are aligned, adjusting the cable at the carburetor end is easier.



### Oil injection pump air bleeding

#### 1. Bleed:

- Air

#### Air bleeding steps:

- Place rags around the air bleed screw ① to catch any oil that might spill.
- Fill the oil tank with the recommended oil.

#### NOTE:

If the oil pump is replaced or the oil suction hose is reinstalled, bleed air from the oil suction hose by removing it from the oil pump.

After bleeding the air, reconnect the hose with a locking tie.



**Recommended engine oil:**  
**YAMALUBE 2-W oil only**

- Loosen the air bleed screw ① two full turns and make sure that both the oil and air bubbles flow out.
- When there are no air bubbles left, tighten the air bleed screw.
- Wipe up any spilt oil.



**Air bleed screw:**  
**3 Nm (0.3 m • kgf, 2.2 ft • lb)**

#### CAUTION:

- Do not run the engine if oil does not flow out of the air bleed screw. Inspect the oil pump hoses for proper routing and make sure there are no restrictions in the line.
- Use only YAMALUBE 2-W oil. Using another oil can seriously damage the catalytic converter and other engine components.

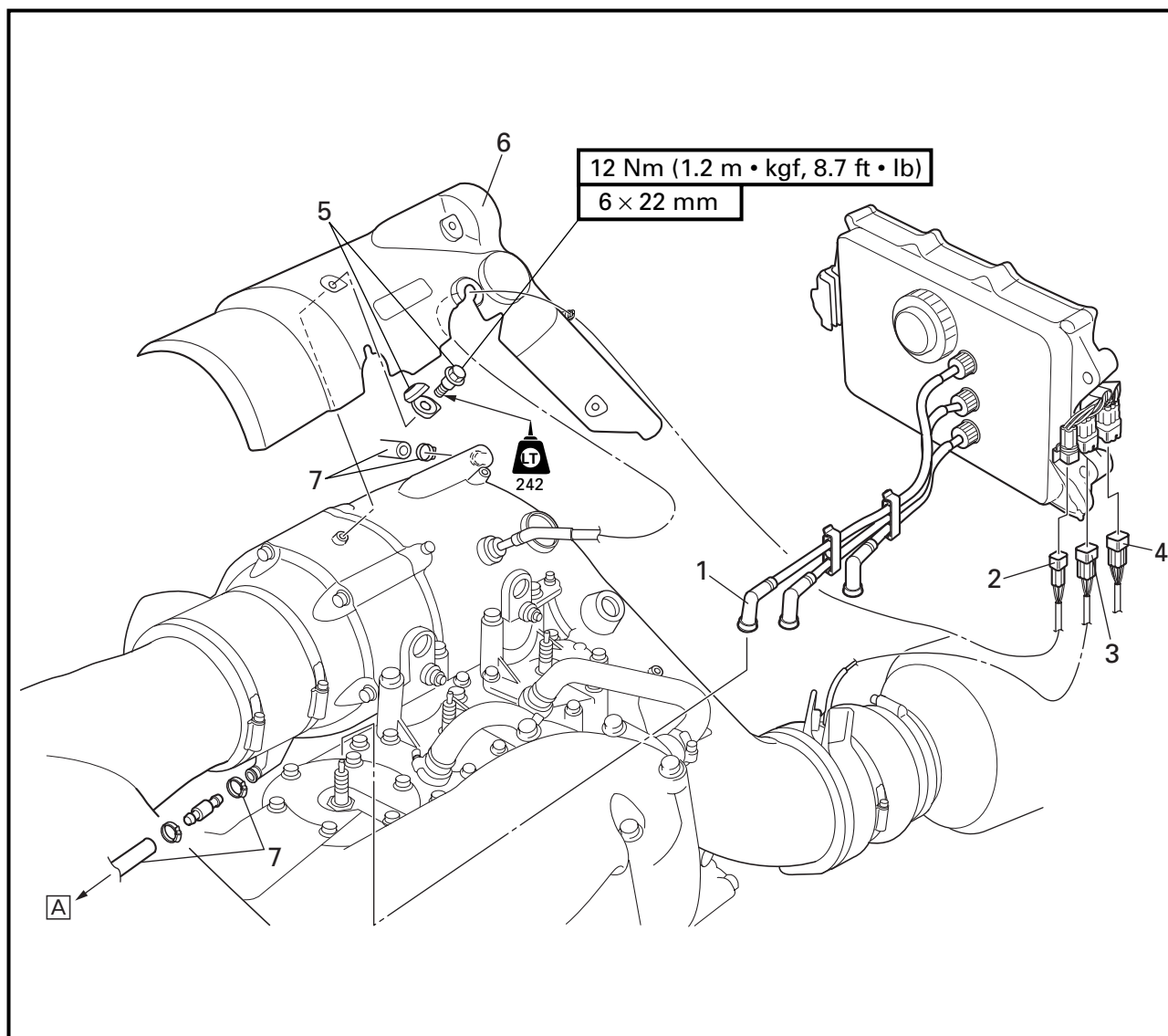
## CHAPTER 5

### POWER UNIT

|                                           |                 |
|-------------------------------------------|-----------------|
| <b>MUFFLER ASSEMBLY .....</b>             | <b>5-1</b>      |
| EXPLODED DIAGRAM .....                    | 5-1             |
| REMOVAL AND INSTALLATION CHART .....      | 5-1             |
| SERVICE POINT .....                       | 5-7             |
| Catalyst inspection .....                 | 5-7             |
| <br><b>EXHAUST CHAMBER ASSEMBLY .....</b> | <br><b>5-8</b>  |
| EXPLODED DIAGRAM .....                    | 5-8             |
| REMOVAL AND INSTALLATION CHART .....      | 5-8             |
| <br><b>ENGINE UNIT .....</b>              | <br><b>5-11</b> |
| EXPLODED DIAGRAM .....                    | 5-11            |
| REMOVAL AND INSTALLATION CHART .....      | 5-11            |
| SERVICE POINTS .....                      | 5-13            |
| Shim removal .....                        | 5-13            |
| Engine mount inspection .....             | 5-13            |
| Coupling clearance inspection .....       | 5-13            |
| <br><b>EXHAUST MANIFOLD .....</b>         | <br><b>5-14</b> |
| EXPLODED DIAGRAM .....                    | 5-14            |
| REMOVAL AND INSTALLATION CHART .....      | 5-14            |
| <br><b>REED VALVES .....</b>              | <br><b>5-16</b> |
| EXPLODED DIAGRAM .....                    | 5-16            |
| REMOVAL AND INSTALLATION CHART .....      | 5-16            |
| SERVICE POINTS .....                      | 5-17            |
| Reed valve inspection .....               | 5-17            |
| <br><b>YPVS .....</b>                     | <br><b>5-18</b> |
| EXPLODED DIAGRAM .....                    | 5-18            |
| REMOVAL AND INSTALLATION CHART .....      | 5-18            |
| SERVICE POINTS .....                      | 5-21            |
| YPVS valve inspection .....               | 5-21            |
| YPVS valve installation .....             | 5-21            |
| <br><b>CYLINDER HEAD .....</b>            | <br><b>5-22</b> |
| EXPLODED DIAGRAM .....                    | 5-22            |
| REMOVAL AND INSTALLATION CHART .....      | 5-22            |
| SERVICE POINTS .....                      | 5-24            |
| Cylinder head inspection .....            | 5-24            |

|                                                 |      |
|-------------------------------------------------|------|
| <b>CYLINDERS</b> .....                          | 5-25 |
| EXPLODED DIAGRAM.....                           | 5-25 |
| REMOVAL AND INSTALLATION CHART .....            | 5-25 |
| SERVICE POINTS .....                            | 5-26 |
| Cylinder inspection .....                       | 5-26 |
| <br><b>PISTONS</b> .....                        | 5-27 |
| EXPLODED DIAGRAM.....                           | 5-27 |
| REMOVAL AND INSTALLATION CHART .....            | 5-27 |
| SERVICE POINTS .....                            | 5-29 |
| Piston pin clip removal and installation.....   | 5-29 |
| Piston inspection.....                          | 5-29 |
| Cylinder and piston combination .....           | 5-30 |
| Piston ring inspection .....                    | 5-30 |
| Piston pin and bearing inspection .....         | 5-31 |
| <br><b>GENERATOR AND STARTER MOTOR</b> .....    | 5-33 |
| EXPLODED DIAGRAM.....                           | 5-33 |
| REMOVAL AND INSTALLATION CHART .....            | 5-33 |
| SERVICE POINTS .....                            | 5-40 |
| Drive coupling removal and installation .....   | 5-40 |
| Flywheel magneto removal and installation ..... | 5-40 |
| Drive coupling inspection.....                  | 5-41 |
| Flywheel magneto inspection .....               | 5-41 |
| Starter clutch assembly inspection .....        | 5-41 |
| <br><b>CRANKCASE</b> .....                      | 5-42 |
| EXPLODED DIAGRAM.....                           | 5-42 |
| REMOVAL AND INSTALLATION CHART .....            | 5-42 |
| SERVICE POINTS .....                            | 5-44 |
| Crankcase inspection .....                      | 5-44 |
| Crankcase installation.....                     | 5-44 |
| <br><b>CRANKSHAFT</b> .....                     | 5-45 |
| EXPLODED DIAGRAM.....                           | 5-45 |
| REMOVAL AND INSTALLATION CHART .....            | 5-45 |
| SERVICE POINTS .....                            | 5-46 |
| Crankshaft inspection .....                     | 5-46 |

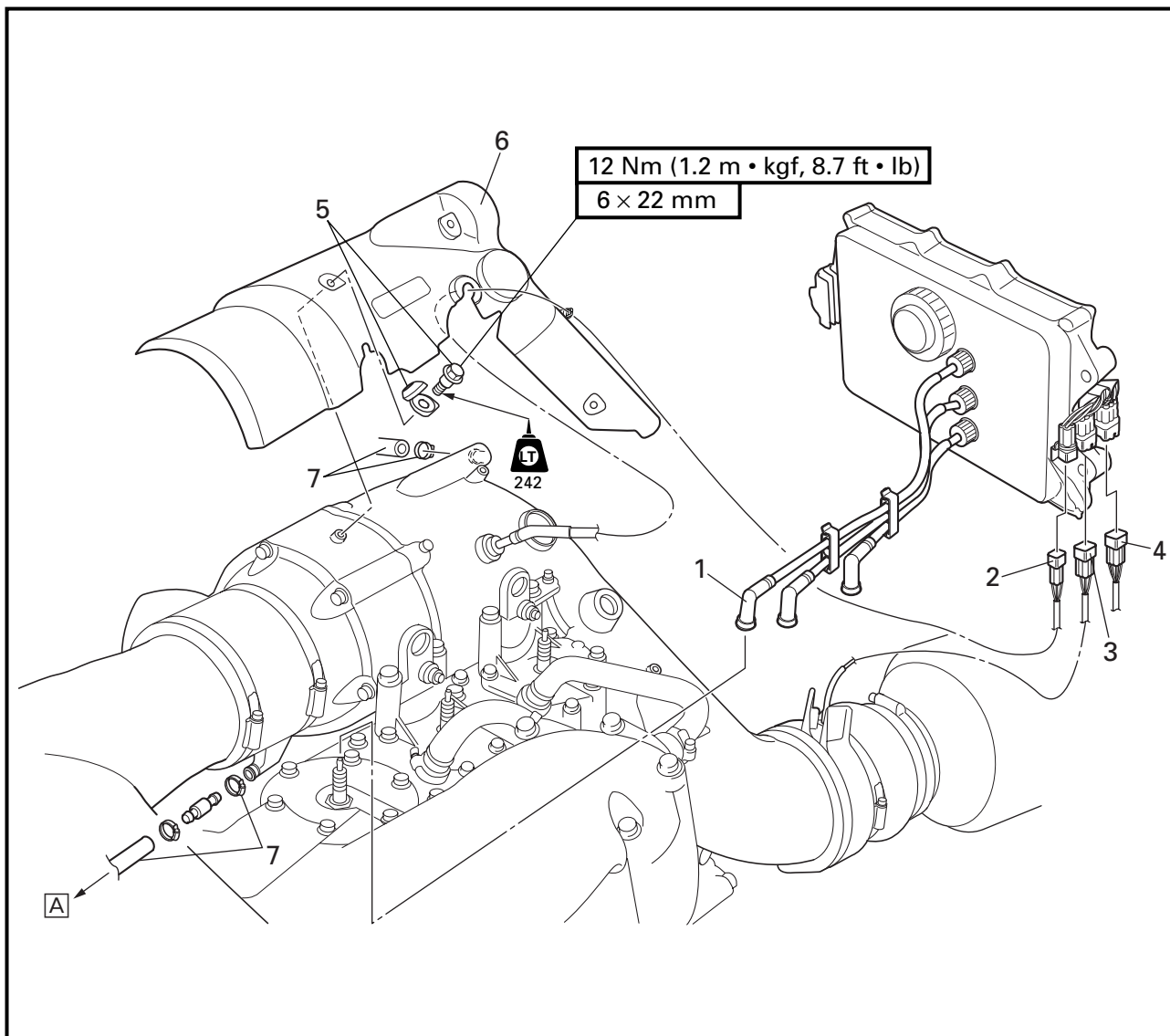
**MUFFLER ASSEMBLY  
EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

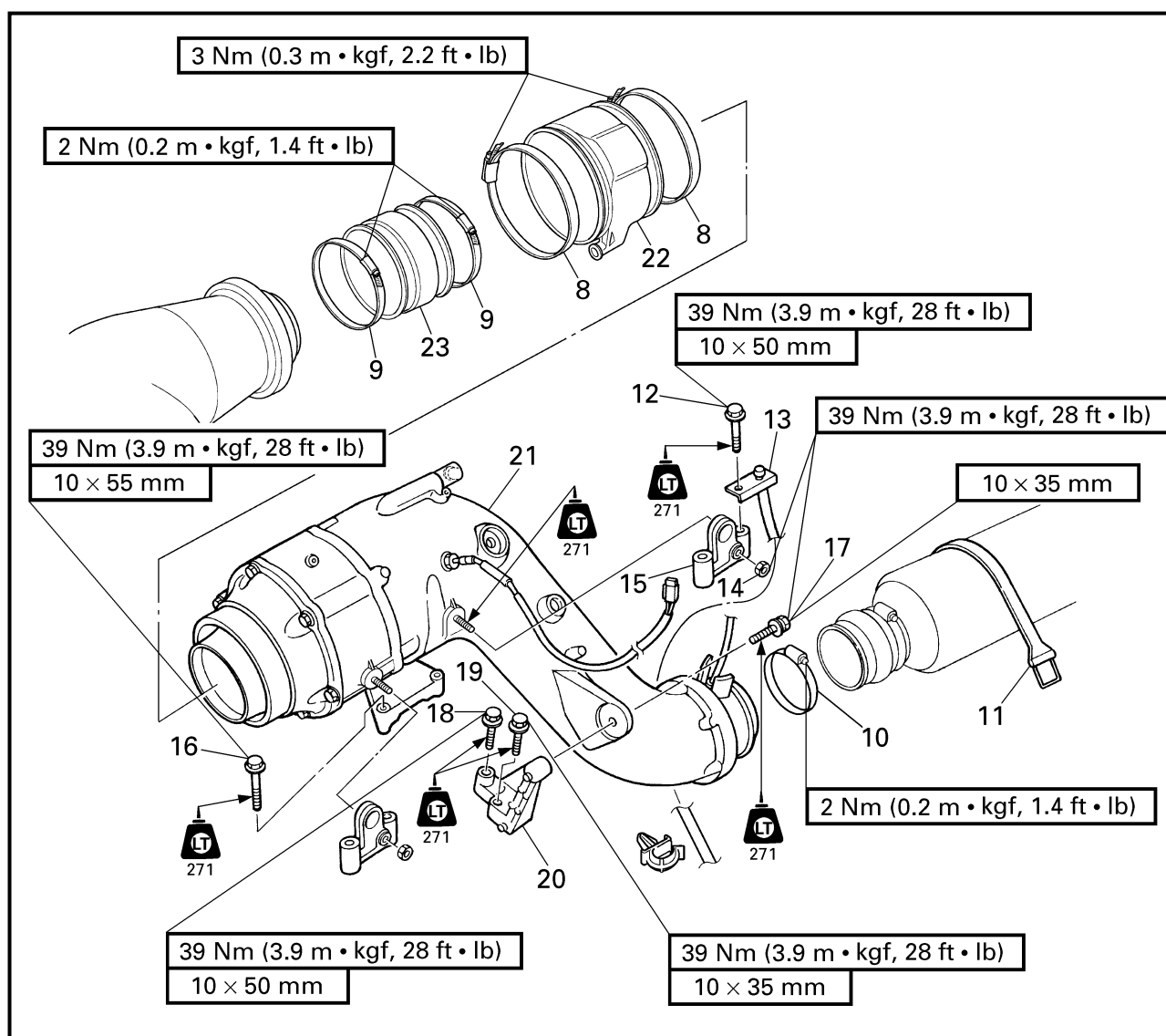
| Step | Procedure/Part name                      | Q'ty | Service points                           |
|------|------------------------------------------|------|------------------------------------------|
|      | <b>WATER HOSES AND LEADS<br/>REMOVAL</b> |      | Follow the left "Step" for removal.      |
|      | YPVS servomotor                          |      | Refer to "YPVS SERVOMOTOR" in chapter 7. |
|      | Battery box                              |      | Refer to "BATTERY BOX" in chapter 8.     |
| 1    | Spark plug cap                           | 3    |                                          |
| 2    | Exhaust temperature sensor coupler       | 1    |                                          |
| 3    | Water temperature sensor coupler         | 1    |                                          |

**EXPLODED DIAGRAM**



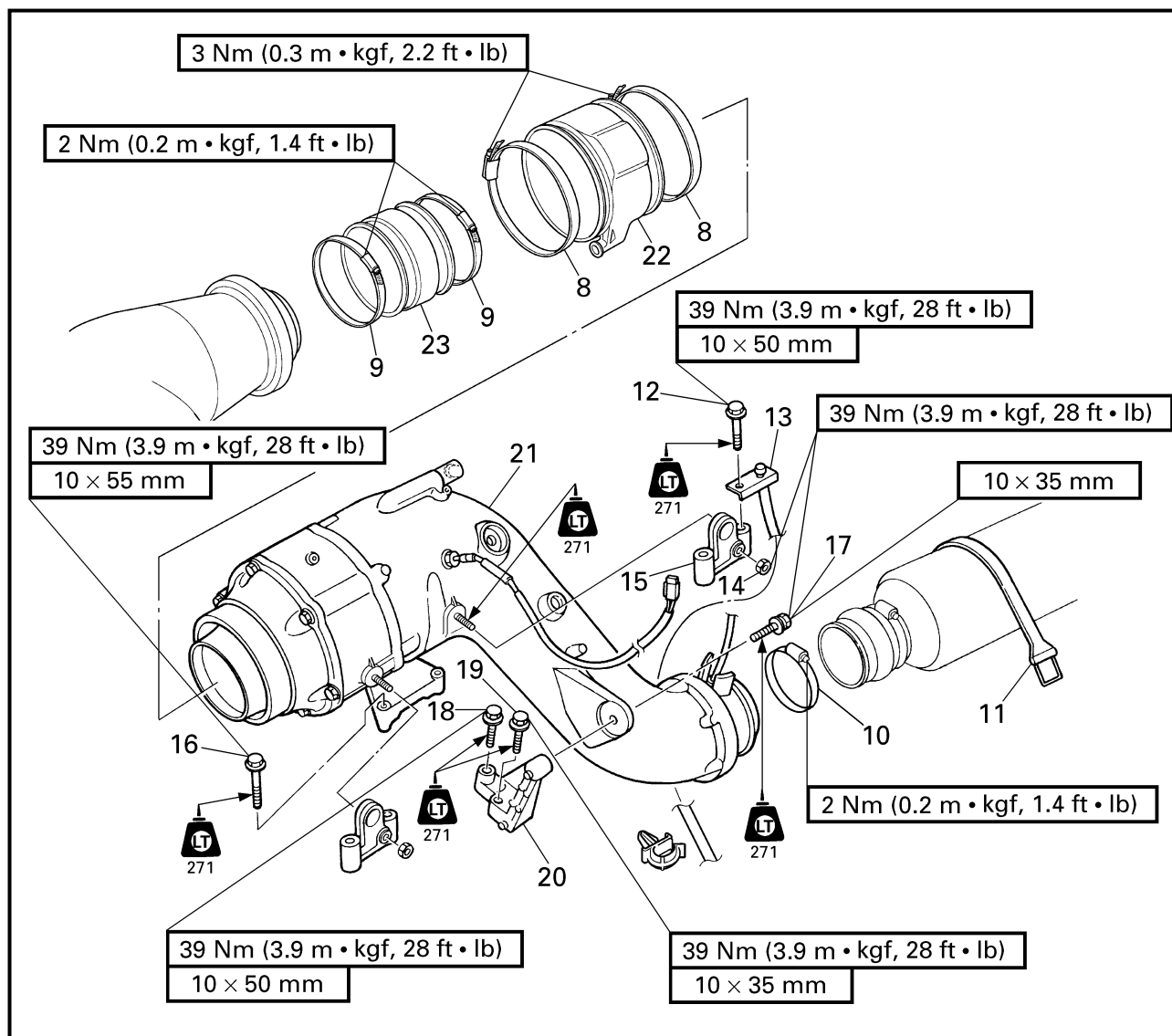
| Step | Procedure/Part name | Q'ty | Service points                                                                    |
|------|---------------------|------|-----------------------------------------------------------------------------------|
| 4    | AC magneto coupler  | 1    | <div> <div></div> <div>A For cooling water pilot outlet on port side</div> </div> |
| 5    | Cap/bolt            | 3/3  |                                                                                   |
| 6    | Cover               | 1    |                                                                                   |
| 7    | Water hose/clamp    | 2/2  |                                                                                   |

## EXPLODED DIAGRAM



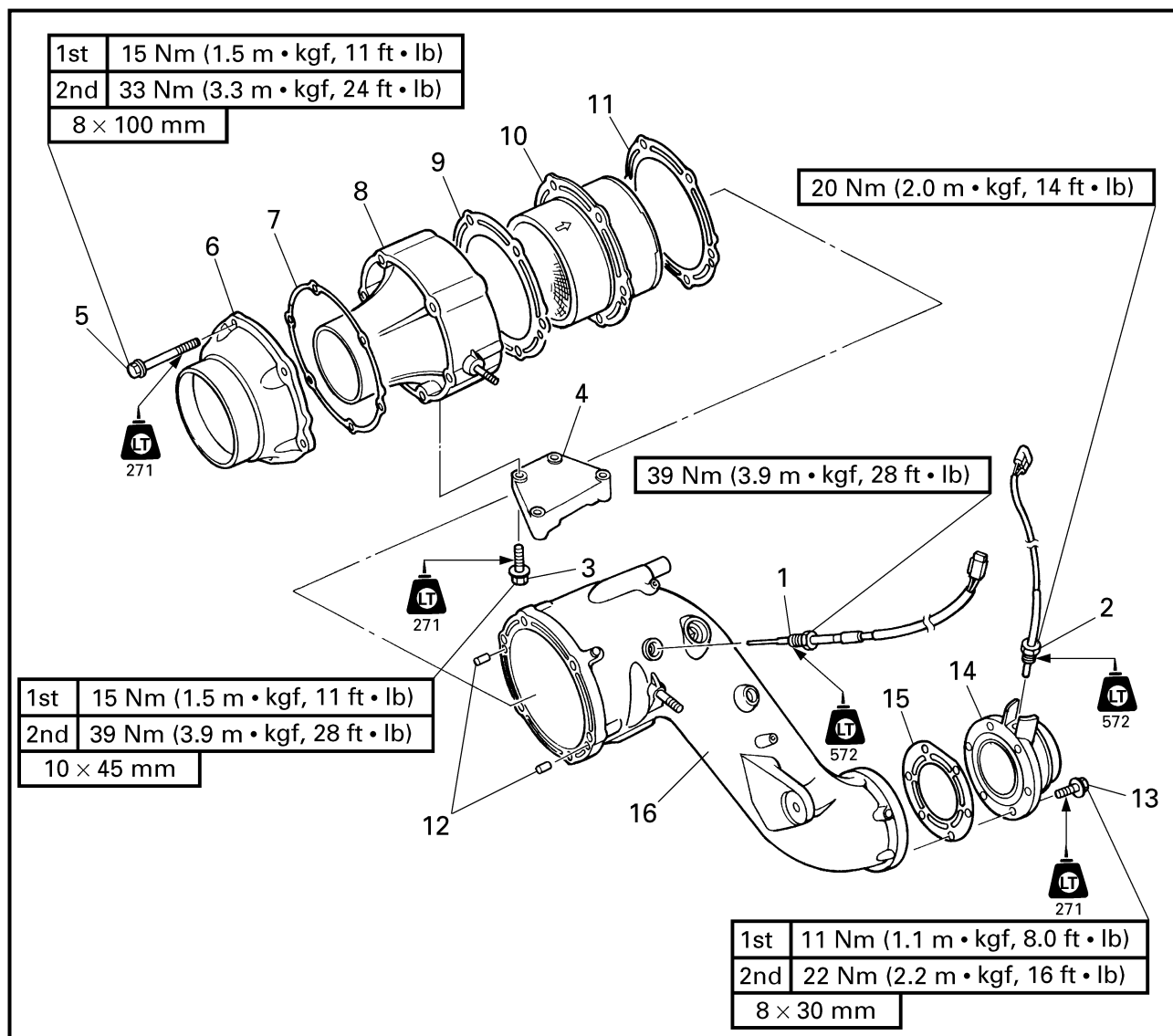
| Step | Procedure/Part name              | Q'ty | Service points                                                                                                             |
|------|----------------------------------|------|----------------------------------------------------------------------------------------------------------------------------|
| 8    | Hose clamp                       | 2    | Slide the outer exhaust joint.                                                                                             |
| 9    | Hose clamp                       | 2    |                                                                                                                            |
| 10   | Hose clamp                       | 1    |                                                                                                                            |
| 11   | Water lock band                  | 1    | Slide the water lock.                                                                                                      |
| 12   | Bolt                             | 4    |                                                                                                                            |
| 13   | Intermediate housing grease hose | 1    |                                                                                                                            |
| 14   | Nut                              | 2    |                                                                                                                            |
| 15   | Eye                              | 2    |                                                                                                                            |
|      |                                  |      | <b>NOTE:</b> Remove the spark plug before removing the eye, and reinstall it to make removing the muffler assembly easier. |

**EXPLODED DIAGRAM**



| Step | Procedure/Part name | Q'ty | Service points                                                                                    |
|------|---------------------|------|---------------------------------------------------------------------------------------------------|
| 16   | Bolt                | 2    | <b>NOTE:</b> _____<br>Remove the cylinder head if it is difficult to remove the muffler assembly. |
| 17   | Bolt                | 1    |                                                                                                   |
| 18   | Bolt                | 1    |                                                                                                   |
| 19   | Bolt                | 1    |                                                                                                   |
| 20   | Muffler stay 2      | 1    |                                                                                                   |
| 21   | Muffler assembly    | 1    |                                                                                                   |
| 22   | Outer exhaust joint | 1    |                                                                                                   |
| 23   | Inner exhaust joint | 1    | Reverse the removal steps for installation.                                                       |

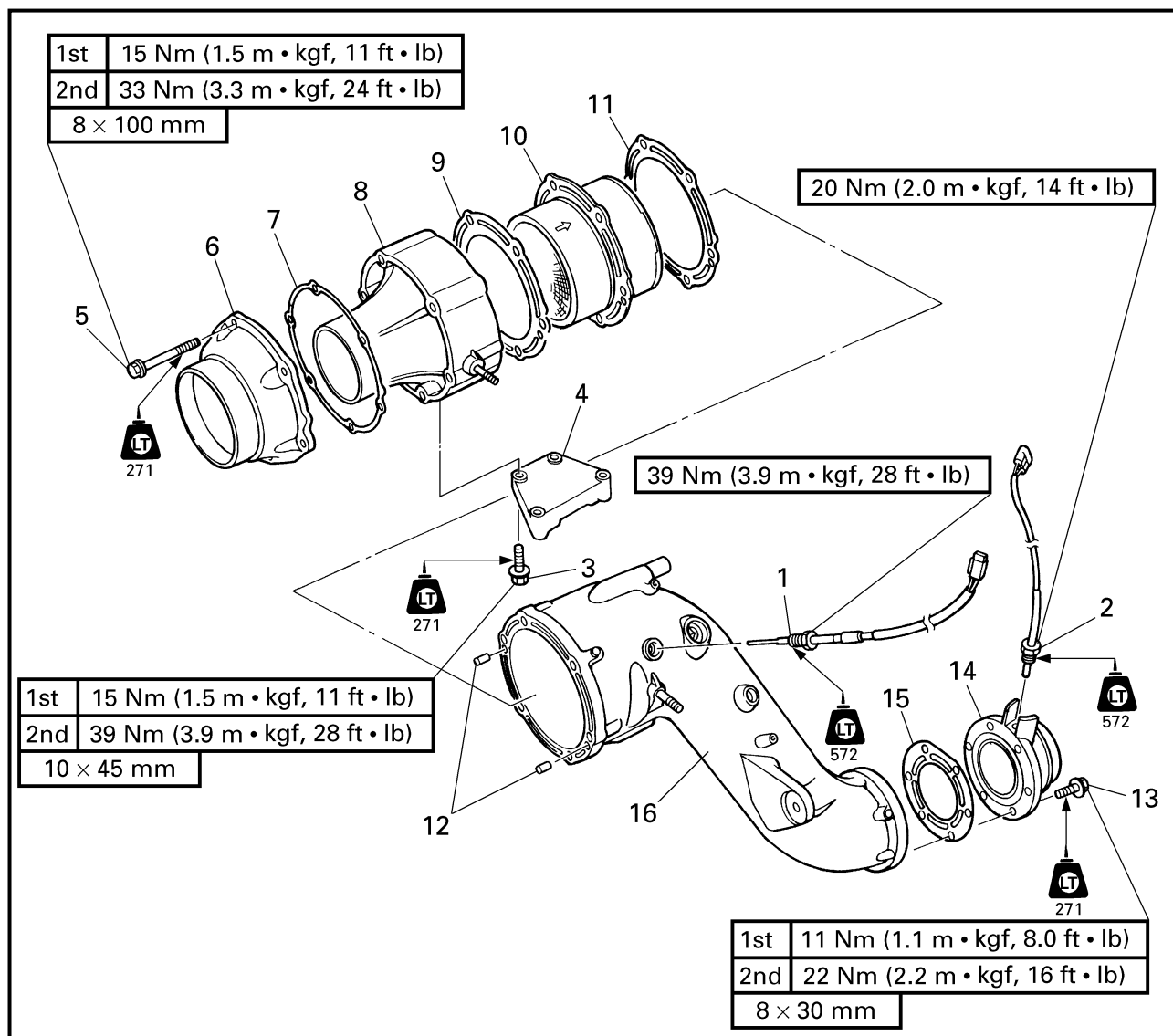
## EXPLODED DIAGRAM



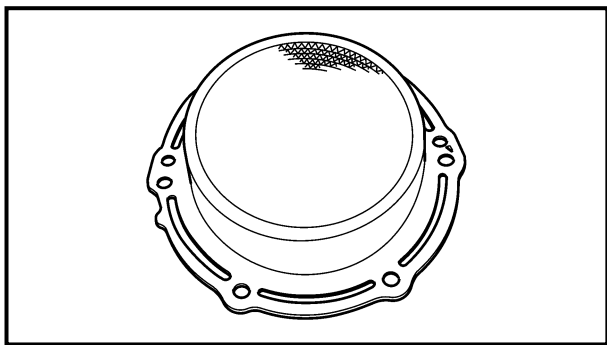
## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name        | Q'ty | Service points                          |
|------|----------------------------|------|-----------------------------------------|
|      | <b>MUFFLER DISASSEMBLY</b> |      | Follow the left "Step" for disassembly. |
| 1    | Exhaust temperature sensor | 1    |                                         |
| 2    | Water temperature sensor   | 1    |                                         |
| 3    | Bolt                       | 2    |                                         |
| 4    | Muffler stay               | 1    |                                         |
| 5    | Bolt                       | 6    |                                         |
| 6    | Cover                      | 1    |                                         |
| 7    | Gasket                     | 1    | <b>Not reusable</b>                     |
| 8    | Catalyst housing           | 1    |                                         |

**EXPLODED DIAGRAM**



| Step | Procedure/Part name | Q'ty | Service points                              |
|------|---------------------|------|---------------------------------------------|
| 9    | Gasket              | 1    | <b>Not reusable</b>                         |
| 10   | Catalyst            | 1    |                                             |
| 11   | Gasket              | 1    | <b>Not reusable</b>                         |
| 12   | Pin                 | 2    |                                             |
| 13   | Bolt                | 6    |                                             |
| 14   | Mixing joint        | 1    |                                             |
| 15   | Gasket              | 1    | <b>Not reusable</b>                         |
| 16   | Muffler             | 1    |                                             |
|      |                     |      | Reverse the disassembly steps for assembly. |

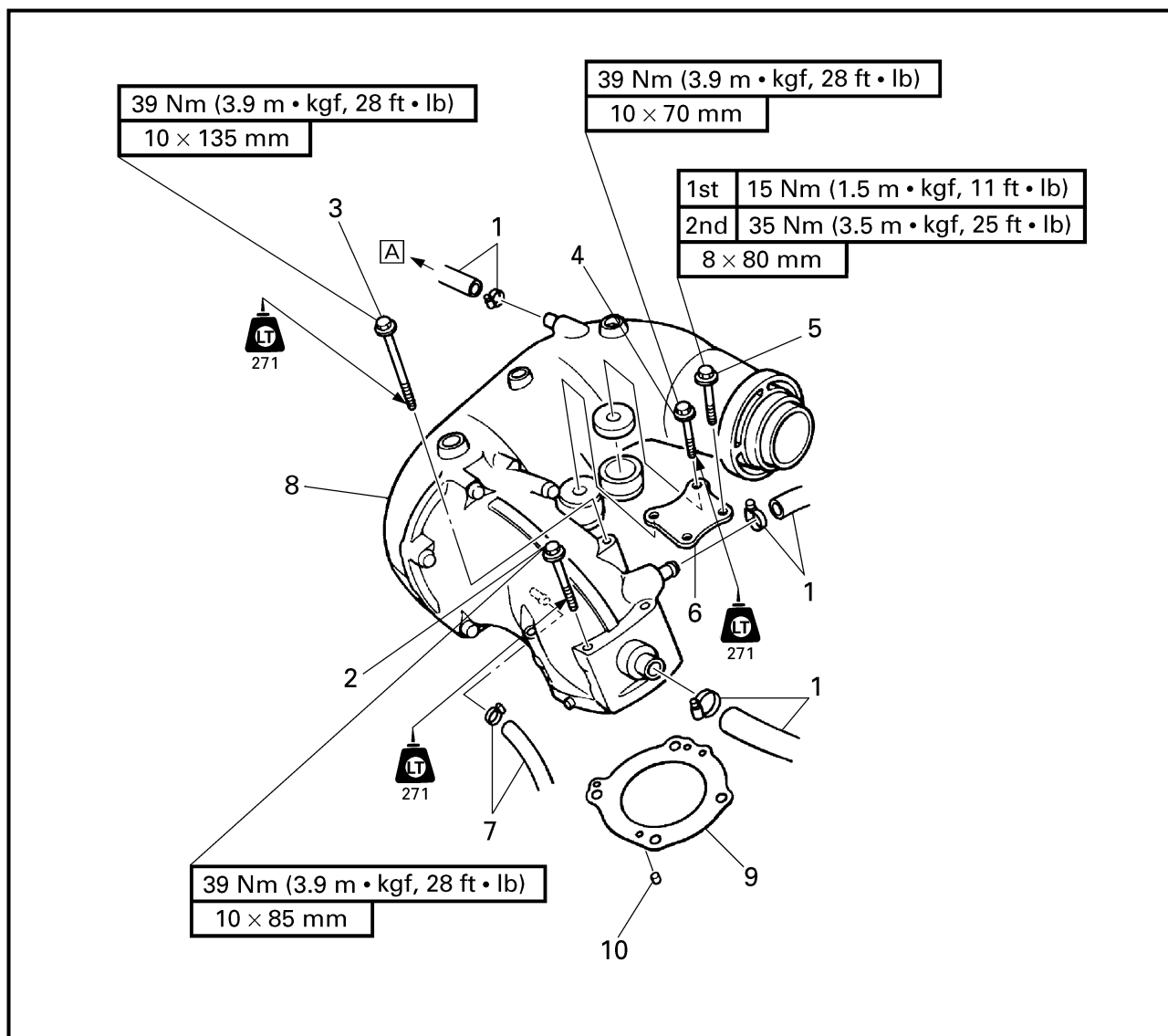
**SERVICE POINT****Catalyst inspection**

## 1. Inspect:

- Catalyst

Cracks/damage → Replace.

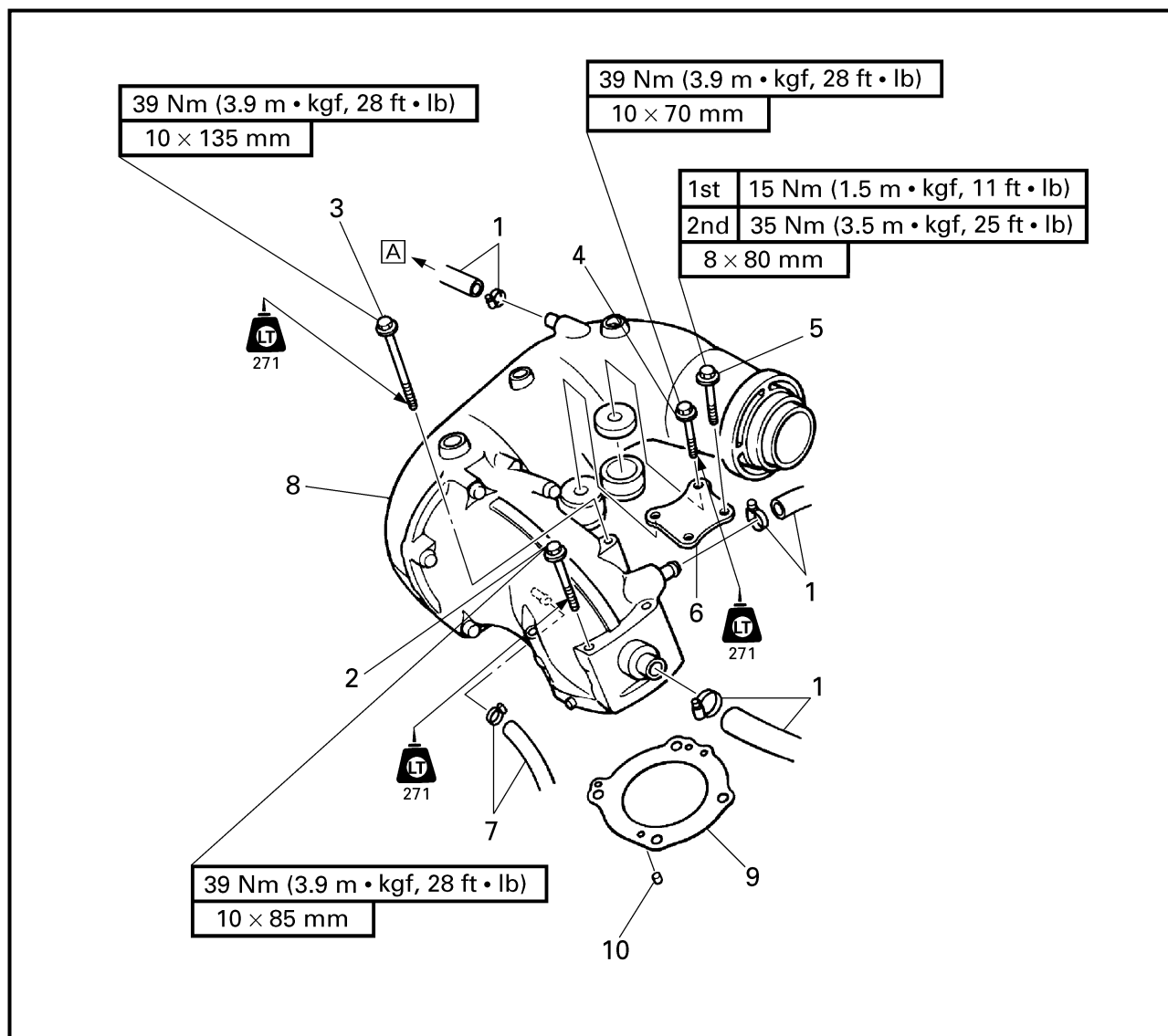
**EXHAUST CHAMBER ASSEMBLY  
EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

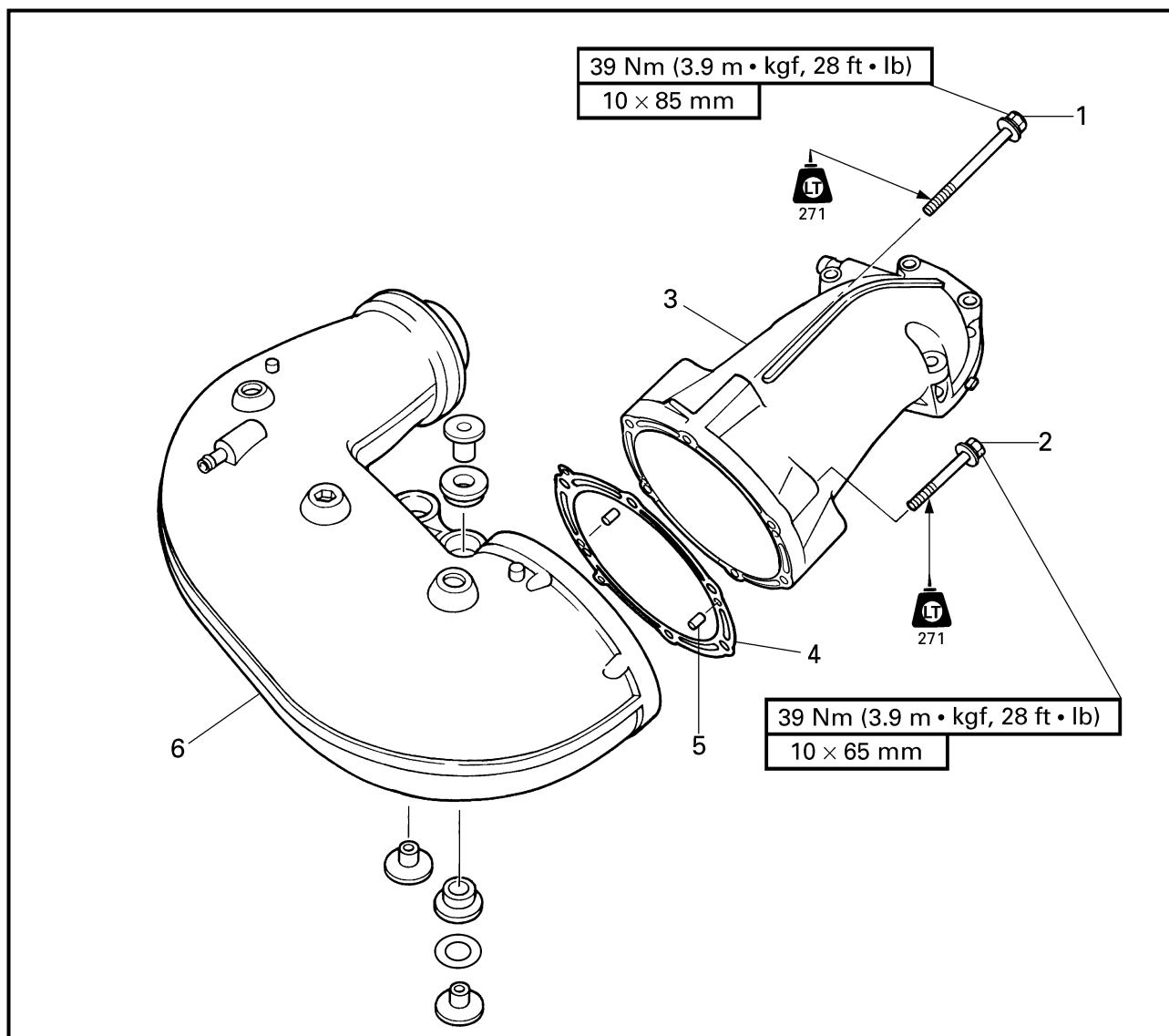
| Step | Procedure/Part name                     | Q'ty | Service points                                                                     |
|------|-----------------------------------------|------|------------------------------------------------------------------------------------|
|      | <b>EXHAUST CHAMBER ASSEMBLY REMOVAL</b> |      | Follow the left "Step" for removal.                                                |
| 1    | Muffler assembly<br>Clamp/hose          | 3/3  | Refer to "MUFFLER ASSEMBLY".<br>A For cooling water pilot outlet on starboard side |
| 2    | Bolt                                    | 3    |                                                                                    |
| 3    | Bolt                                    | 1    |                                                                                    |
| 4    | Bolt                                    | 2    |                                                                                    |
| 5    | Bolt                                    | 2    |                                                                                    |
| 6    | Exhaust chamber stay                    | 1    |                                                                                    |
| 7    | Clamp/hose                              | 1/1  |                                                                                    |

EXPLODED DIAGRAM



| Step | Procedure/Part name      | Q'ty | Service points                                                                                                                                                                      |
|------|--------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8    | Exhaust chamber assembly | 1    | <b>NOTE:</b> Before installing the exhaust chamber assembly, install the clamp/hose (step No.7) and place the bolts (step No.2) in the bolts holes of the exhaust chamber assembly. |
| 9    | Gasket                   | 1    | <b>Not reusable</b>                                                                                                                                                                 |
| 10   | Pin                      | 2    | Reverse the removal steps for installation.                                                                                                                                         |

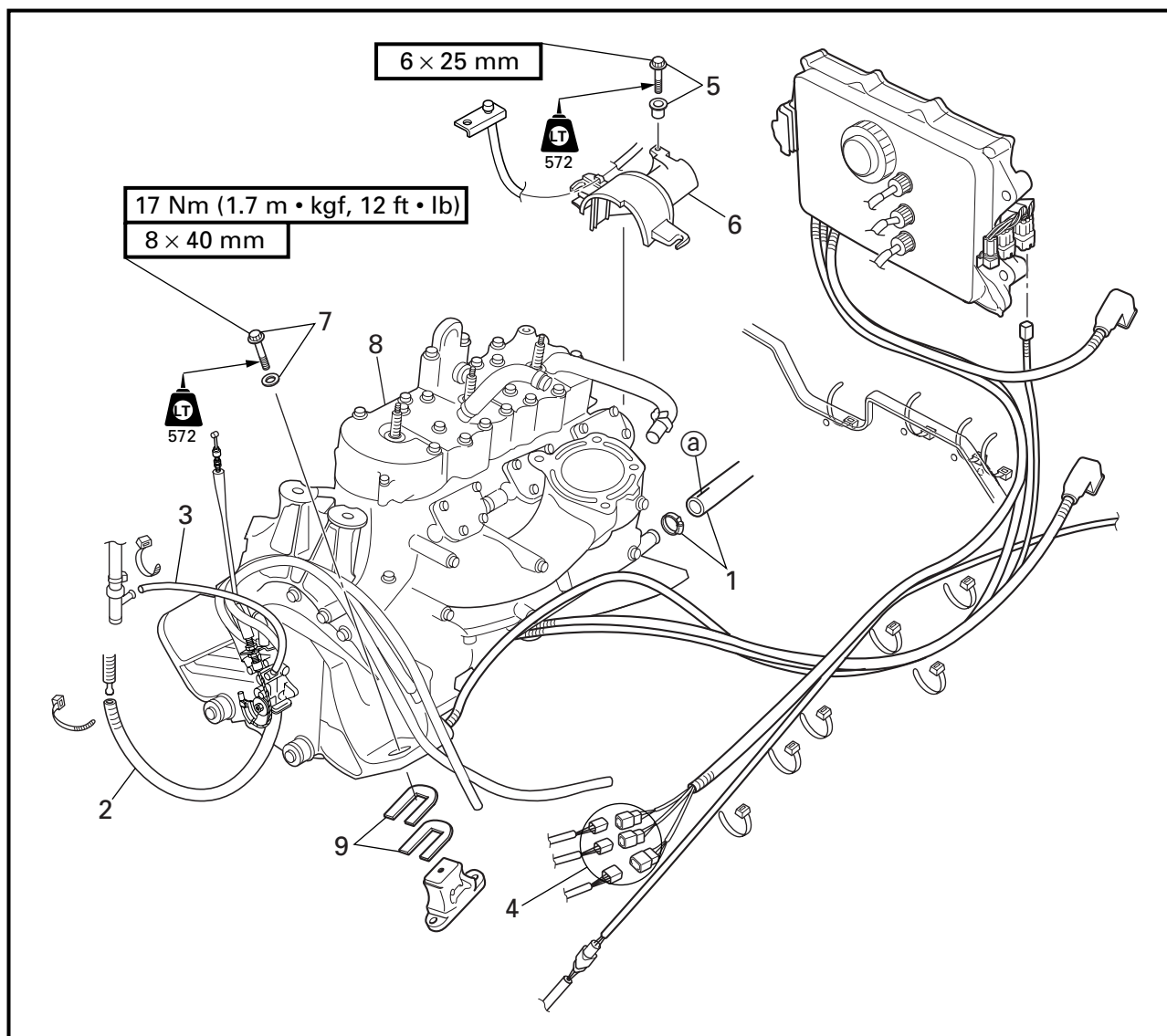
## EXPLODED DIAGRAM



## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name                | Q'ty | Service points                              |
|------|------------------------------------|------|---------------------------------------------|
|      | <b>EXHAUST CHAMBER DISASSEMBLY</b> |      | Follow the left "Step" for disassembly.     |
| 1    | Bolt                               | 5    |                                             |
| 2    | Bolt                               | 1    |                                             |
| 3    | Exhaust chamber joint              | 1    |                                             |
| 4    | Gasket                             | 1    | <b>Not reusable</b>                         |
| 5    | Pin                                | 2    |                                             |
| 6    | Exhaust chamber                    | 1    | Reverse the disassembly steps for assembly. |

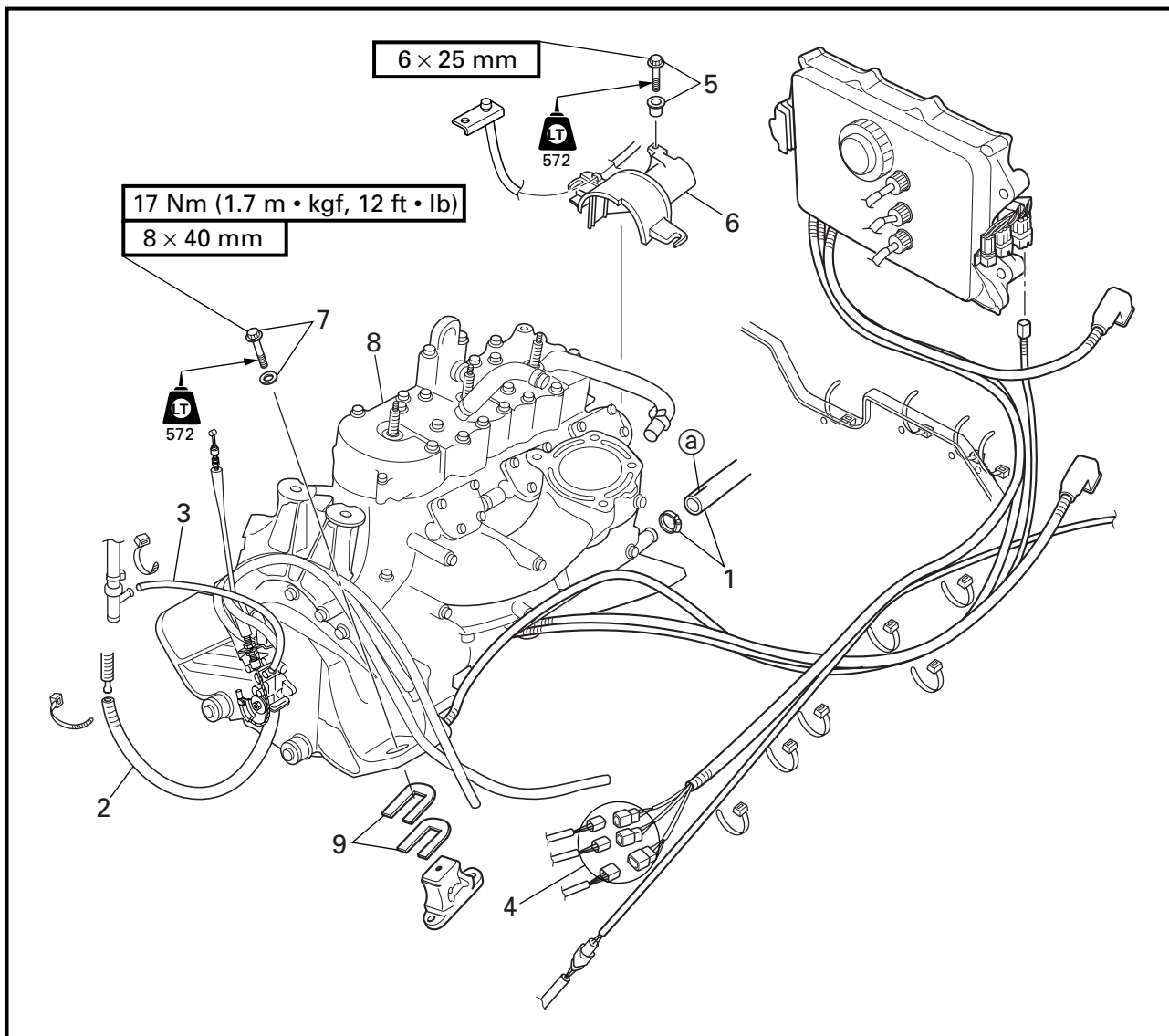
## ENGINE UNIT EXPLODED DIAGRAM



## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name          | Q'ty | Service points                                                                  |
|------|------------------------------|------|---------------------------------------------------------------------------------|
|      | <b>ENGINE UNIT REMOVAL</b>   |      |                                                                                 |
|      | Carburetor unit              |      | Follow the left "Step" for removal.<br>Refer to "CARBURETOR UNIT" in chapter 4. |
| 1    | Clamp/water hose             | 1/1  | Should be white mark Ⓐ up side                                                  |
| 2    | Oil suction hose             | 1    |                                                                                 |
| 3    | Oil return hose              | 1    |                                                                                 |
| 4    | Multi-function meter coupler | 3    |                                                                                 |
| 5    | Bolt/collar                  | 1/1  |                                                                                 |

## EXPLODED DIAGRAM



| Step | Procedure/Part name | Q'ty | Service points                                                                      |
|------|---------------------|------|-------------------------------------------------------------------------------------|
| 6    | Coupling cover      | 1    | Install the shims original position.<br>Reverse the removal steps for installation. |
| 7    | Bolt/washer         | 4/4  |                                                                                     |
| 8    | Engine assembly     | 1    |                                                                                     |
| 9    | Shim                | *    |                                                                                     |

\*: As required

## SERVICE POINTS

### Shim removal

1. Remove:

- Shims

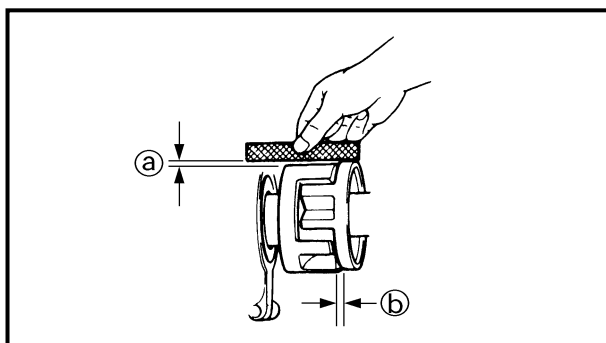
### NOTE:

To ease reassembly and coupling alignment, remove the shims and organize them in their respective groups (e.g., front right, rear left) prior to removing the mounting bolts.

### Engine mount inspection

1. Inspect:

- Engine mounts  
Cracks/damage → Replace.



### Coupling clearance inspection

1. Measure:

- Clearance (a)
- Clearance (b)  
(with the rubber damper)  
Out of specification → Adjust.

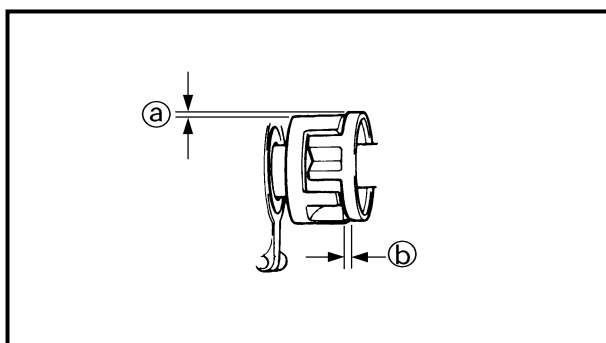
### NOTE:

Measure the clearances with a straightedge and thickness gauge.



**Clearance (a):**  
0 ~ 0.5 mm (0 ~ 0.020 in)

**Clearance (b):**  
2 ~ 4 mm (0.079 ~ 0.157 in)



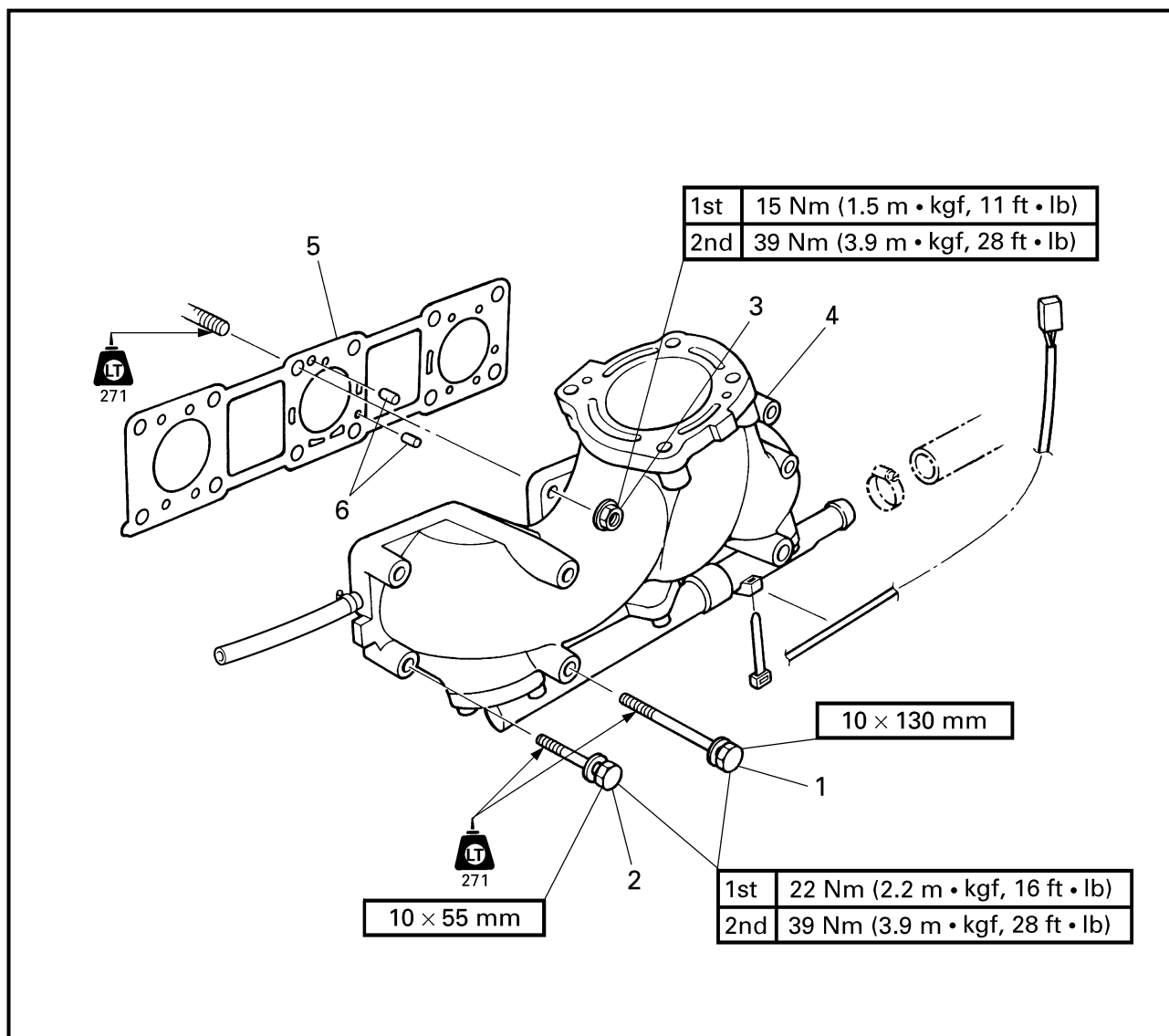
2. Adjust:

- Clearance (a) and (b)

### Adjustment steps:

- Adjust the clearance (a) by adding or removing shims.
- Adjust the clearance (b) by moving the engine unit position.

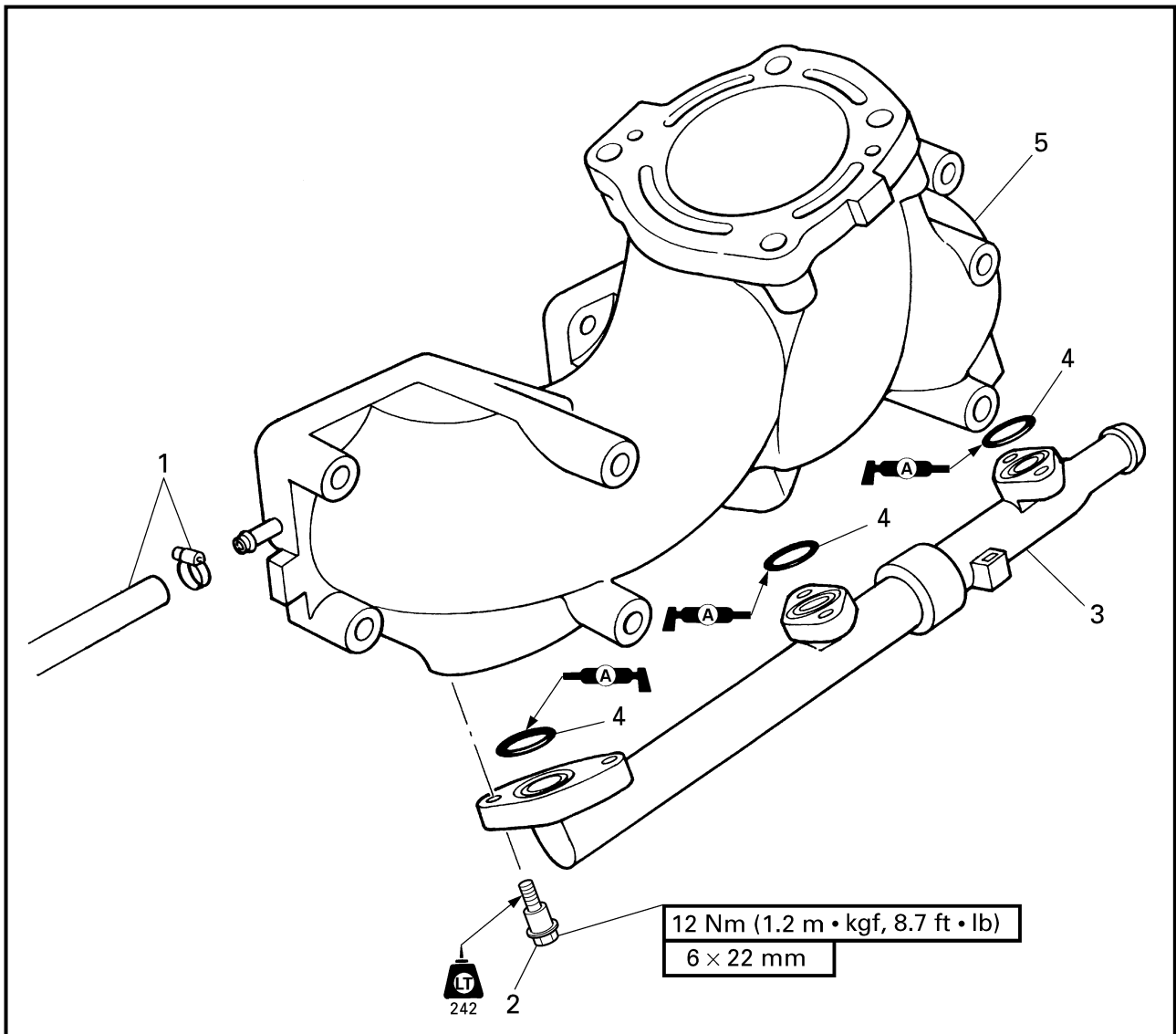
## EXHAUST MANIFOLD EXPLODED DIAGRAM



## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name                       | Q'ty | Service points                              |
|------|-------------------------------------------|------|---------------------------------------------|
|      | <b>EXHAUST MANIFOLD AND LEADS REMOVAL</b> |      | Follow the left "Step" for removal.         |
|      | Engine unit                               |      | Refer to "ENGINE UNIT".                     |
| 1    | Bolt                                      | 4    |                                             |
| 2    | Bolt                                      | 6    |                                             |
| 3    | Nut                                       | 2    |                                             |
| 4    | Exhaust manifold                          | 1    |                                             |
| 5    | Gasket                                    | 1    | <b>Not reusable</b>                         |
| 6    | Pin                                       | 2    |                                             |
|      |                                           |      | Reverse the removal steps for installation. |

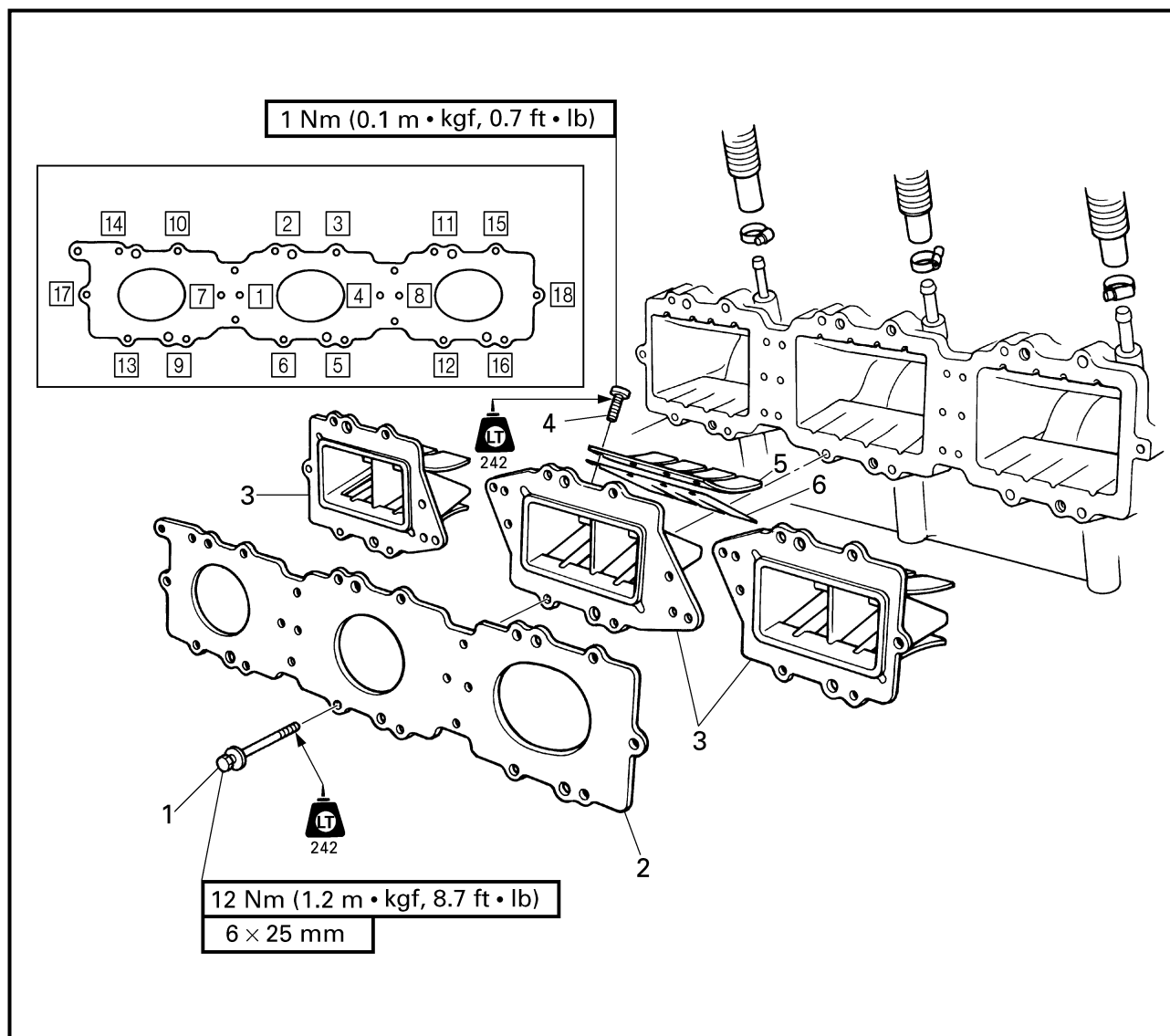
## EXPLODED DIAGRAM



## REMOVAL AND INSTALLATION CHART

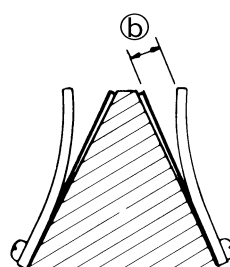
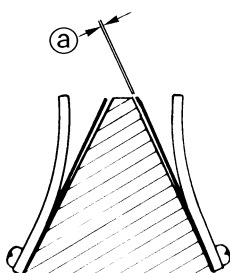
| Step | Procedure/Part name                 | Q'ty | Service points                              |
|------|-------------------------------------|------|---------------------------------------------|
|      | <b>EXHAUST MANIFOLD DISASSEMBLY</b> |      | Follow the left "Step" for disassembly.     |
| 1    | Clamp/hose                          | 1/1  |                                             |
| 2    | Bolt                                | 6    |                                             |
| 3    | Water pipe                          | 1    |                                             |
| 4    | O-ring                              | 3    |                                             |
| 5    | Exhaust manifold                    | 1    |                                             |
|      |                                     |      | Reverse the disassembly steps for assembly. |

## REED VALVES EXPLODED DIAGRAM



## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name       | Q'ty | Service points                                                               |
|------|---------------------------|------|------------------------------------------------------------------------------|
|      | <b>REED VALVE REMOVAL</b> |      |                                                                              |
|      | Carburetor unit           |      | Follow the left "Step" for removal. Refer to "CARBURETOR UNIT" in chapter 4. |
| 1    | Bolt                      | 18   | <b>NOTE:</b> _____                                                           |
| 2    | Reed valve plate          | 1    | Tighten the bolts in the proper sequence as shown.                           |
| 3    | Reed valve assembly       | 3    | _____                                                                        |
| 4    | Screw                     | 24   |                                                                              |
| 5    | Valve stopper             | 6    |                                                                              |
| 6    | Reed valve                | 6    |                                                                              |
|      |                           |      | Reverse the removal steps for installation.                                  |

**SERVICE POINTS****Reed valve inspection**

1. Inspect:
  - Reed valves  
Cracks/damage → Replace.
2. Measure:
  - Valve bending (a)  
Out of specification → Replace.



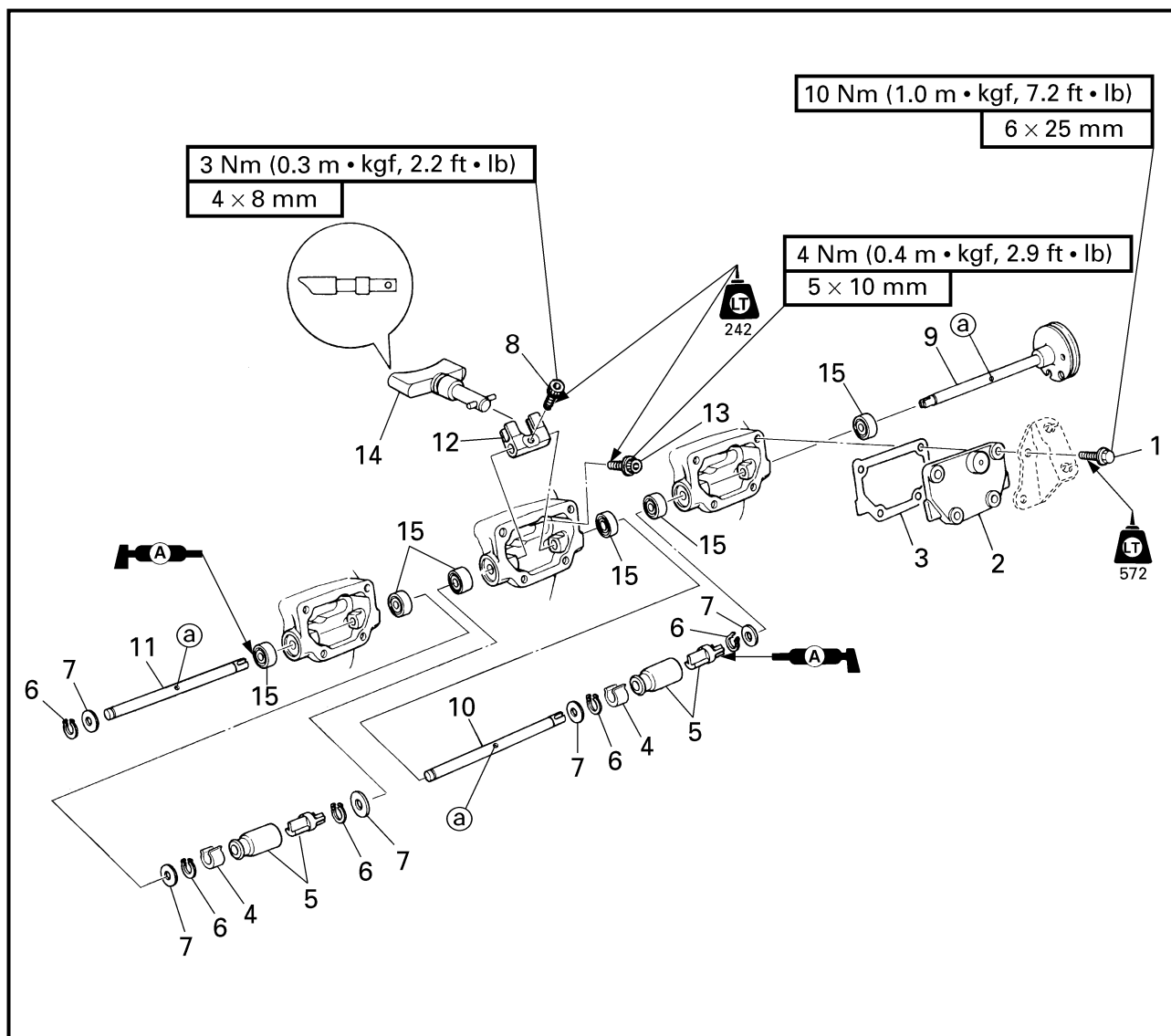
**Max. valve bending:**  
**0.2 mm (0.01 in)**

3. Measure:
  - Valve stopper height (b)  
Out of specification → Adjust or replace.



**Valve stopper height:**  
**10.4 ~ 11.0 mm (0.41 ~ 0.43 in)**

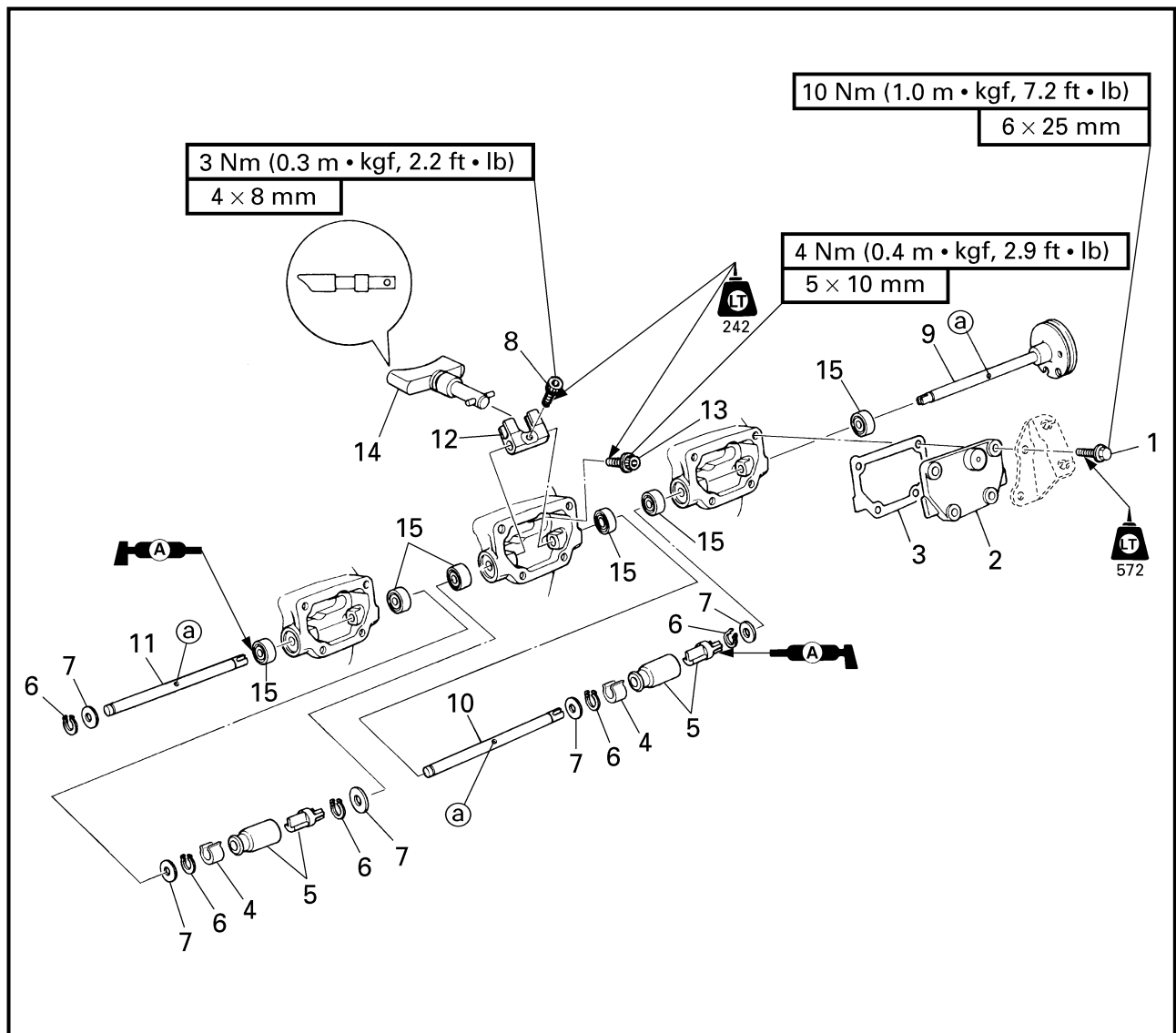
## YPVS EXPLODED DIAGRAM



## REMOVAL AND INSTALLATION CHART

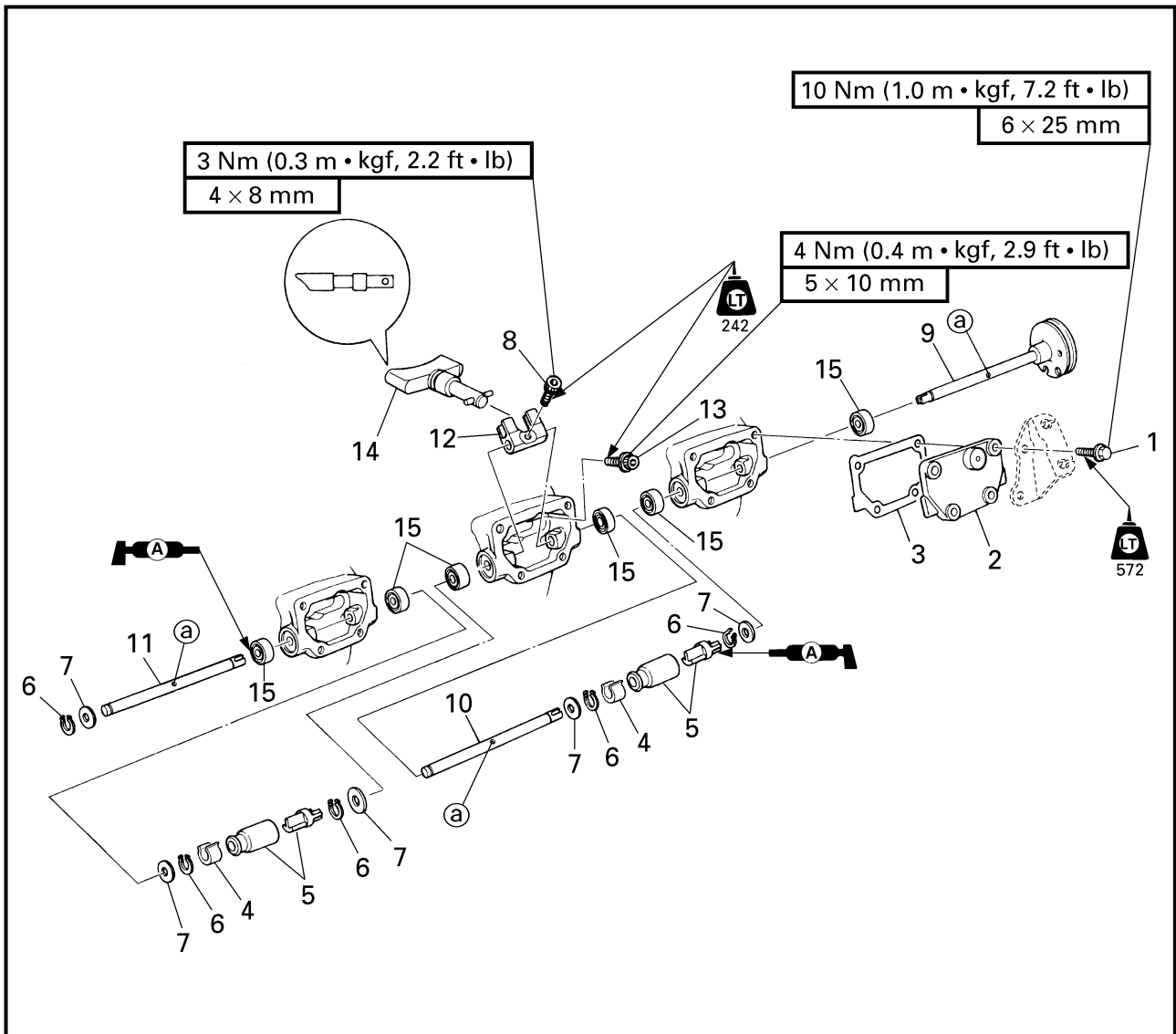
| Step | Procedure/Part name      | Q'ty | Service points                                                              |
|------|--------------------------|------|-----------------------------------------------------------------------------|
|      | <b>YPVS REMOVAL</b>      |      |                                                                             |
|      | Exhaust chamber assembly |      | Follow the left "Step" for removal.<br>Refer to "EXHAUST CHAMBER ASSEMBLY". |
| 1    | Bolt                     | 12   |                                                                             |
| 2    | YPVS valve cover         | 3    |                                                                             |
| 3    | Gasket                   | 3    | <b>Not reusable</b>                                                         |
| 4    | Spacer                   | 2    |                                                                             |
| 5    | Link joint/cover         | 2/2  |                                                                             |
| 6    | Circlip                  | 5    | <b>Not reusable</b>                                                         |

## EXPLODED DIAGRAM

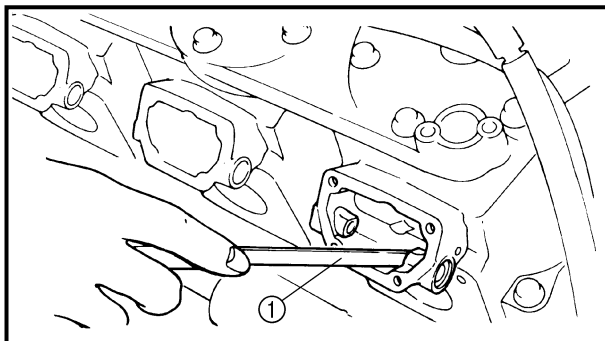
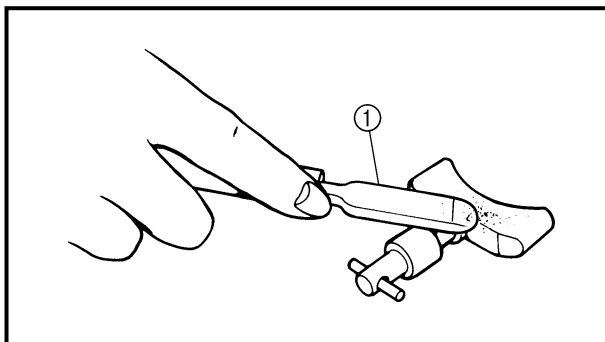


| Step | Procedure/Part name | Q'ty | Service points                                                                               |
|------|---------------------|------|----------------------------------------------------------------------------------------------|
| 7    | Washer              | 5    | <b>NOTE:</b> _____<br>During installation, align the hole ① in the YPVS shaft with the bolt. |
| 8    | Bolt                | 3    |                                                                                              |
| 9    | Shaft 3             | 1    |                                                                                              |
| 10   | Shaft 2             | 1    |                                                                                              |
| 11   | Shaft 1             | 1    |                                                                                              |
| 12   | YPVS valve arm      | 3    |                                                                                              |

## EXPLODED DIAGRAM



| Step | Procedure/Part name | Q'ty | Service points                                                                                                                             |
|------|---------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------|
| 13   | Bolt                | 3    | <b>NOTE:</b> _____<br>If the YPVS shaft is removed, the oil seal must be replaced.<br>_____<br>Reverse the removal steps for installation. |
| 14   | YPVS valve assembly | 3    |                                                                                                                                            |
| 15   | Oil seal            | 6    |                                                                                                                                            |



## SERVICE POINTS

### YPVS valve inspection

#### 1. Eliminate:

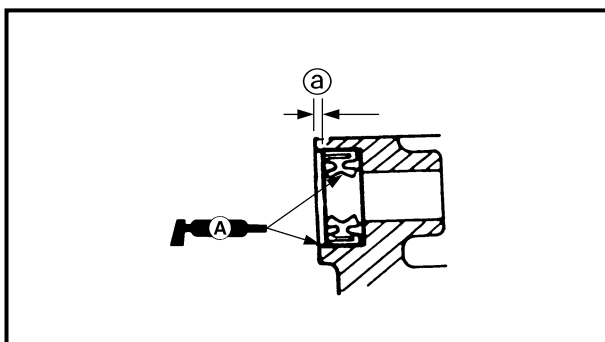
- Carbon deposits  
(with a rounded scraper ①)

#### CAUTION:

**Do not use a sharp instrument to avoid damaging or scratching the surfaces.**

#### 2. Inspect:

- YPVS valve assembly  
Crack/damage/wear → Replace.



### YPVS valve installation

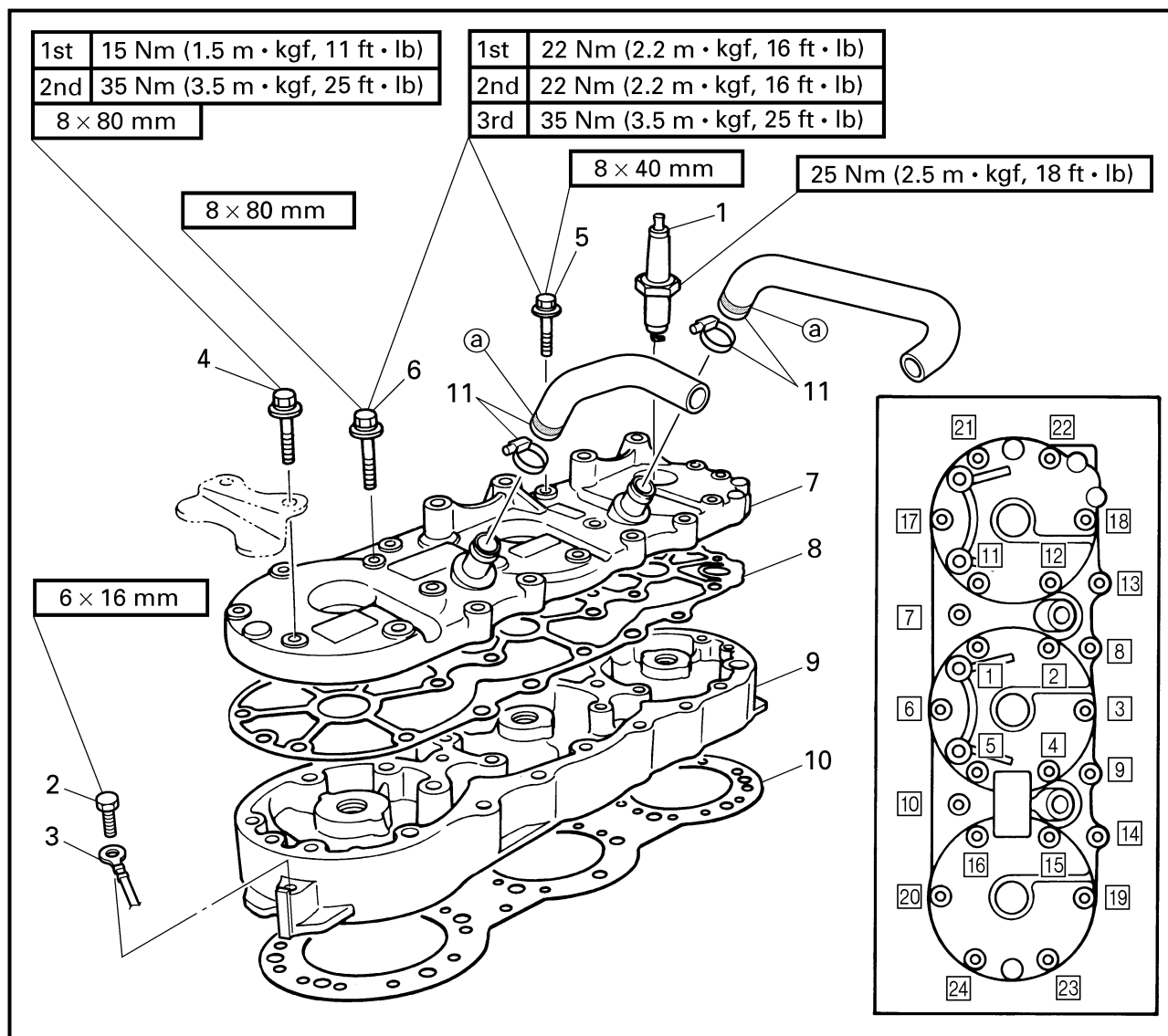
#### 1. Install:

- Oil seal



**Distance ②:**  
**1.0 ~ 1.5 mm (0.04 ~ 0.06 in)**

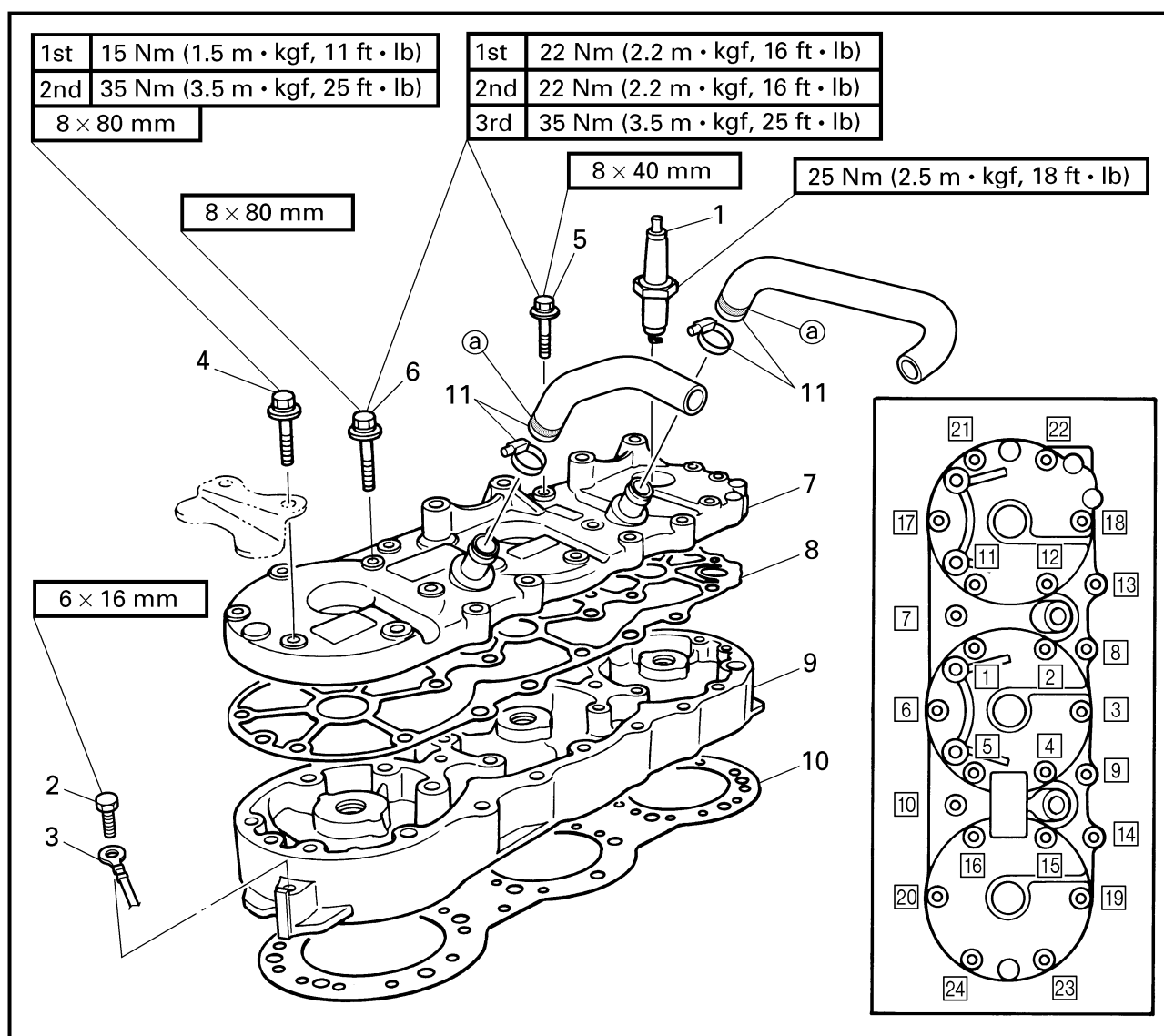
## CYLINDER HEAD EXPLODED DIAGRAM



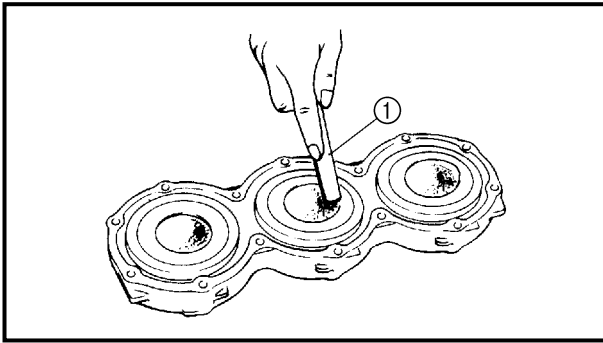
## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name          | Q'ty | Service points                                                                                    |
|------|------------------------------|------|---------------------------------------------------------------------------------------------------|
|      | <b>CYLINDER HEAD REMOVAL</b> |      |                                                                                                   |
|      | Exhaust chamber assembly     |      | Follow the left "Step" for removal.<br>Refer to "EXHAUST CHAMBER ASSEMBLY".                       |
| 1    | Spark plug                   | 3    |                                                                                                   |
| 2    | Bolt                         | 1    | <b>NOTE:</b> _____                                                                                |
| 3    | Ground lead                  | 1    | Tighten the bolts in the proper sequence as shown and in three stages. (No. 23, 24 in two stages) |
| 4    | Bolt                         | 2    |                                                                                                   |
| 5    | Bolt                         | 6    |                                                                                                   |
| 6    | Bolt                         | 16   |                                                                                                   |

**EXPLODED DIAGRAM**



| Step | Procedure/Part name | Q'ty | Service points                                              |
|------|---------------------|------|-------------------------------------------------------------|
| 7    | Cylinder head cover | 1    |                                                             |
| 8    | Gasket              | 1    | <b>Not reusable</b>                                         |
| 9    | Cylinder head       | 1    |                                                             |
| 10   | Gasket              | 1    | <b>Not reusable</b>                                         |
| 11   | Clamp/hose          | 2/2  | @ white mark<br>Reverse the removal steps for installation. |

**SERVICE POINTS****Cylinder head inspection**

## 1. Eliminate:

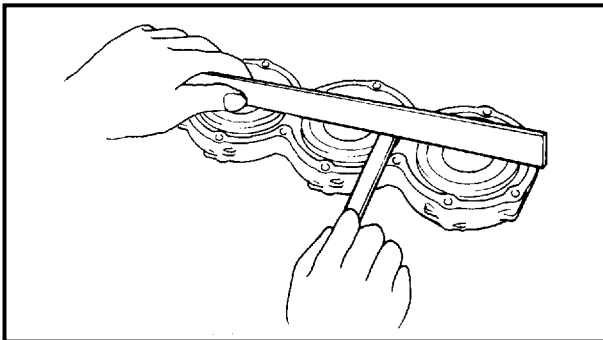
- Carbon deposits  
(with a rounded scraper ①)

**CAUTION:**

**Do not use a sharp instrument to avoid damaging or scratching the cylinder head or spark plug bore threads.**

## 2. Inspect:

- Cylinder head water jacket  
Corrosion/mineral deposits → Clean or replace.

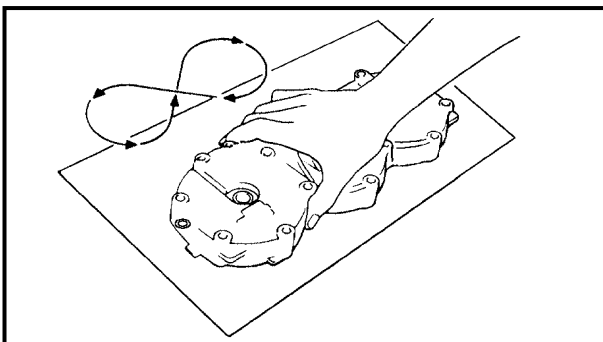


## 3. Measure:

- Cylinder head warpage  
(with a straightedge and thickness gauge)  
Out of specification/score marks → Resurface.

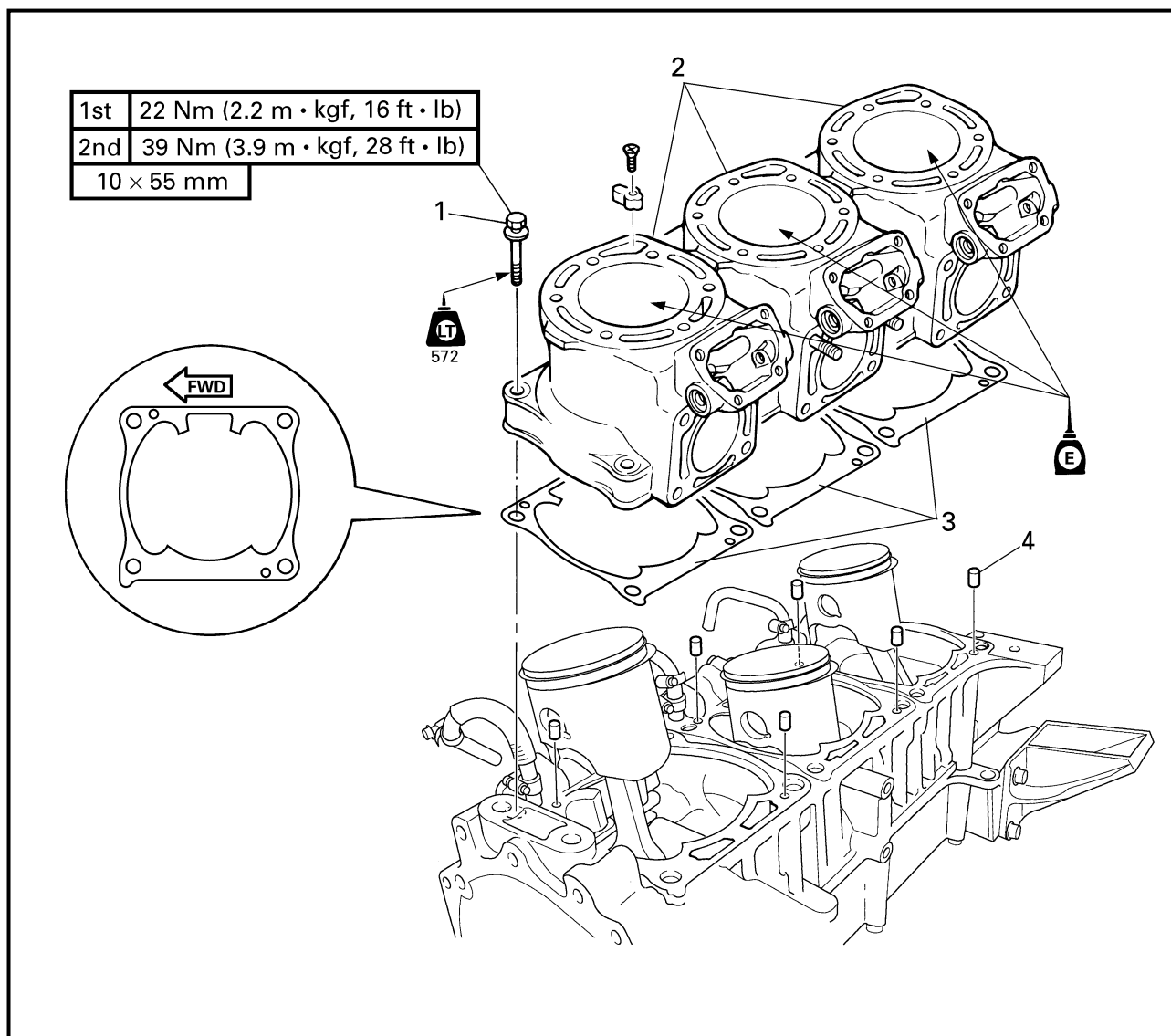


**Warpage limit:**  
**0.1 mm (0.004 in)**

**NOTE:**

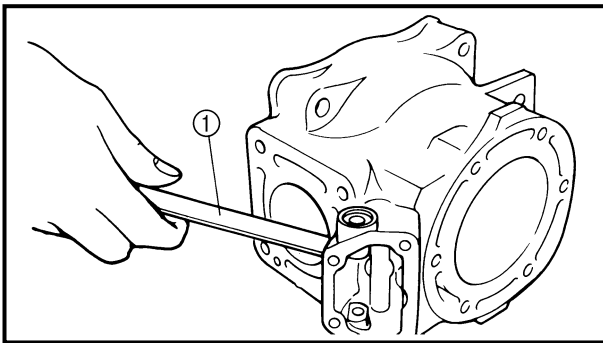
Place a 400 ~ 600 grit wet sandpaper on a surface plate and resurface the cylinder head using a figure-eight sanding pattern.

## CYLINDERS EXPLODED DIAGRAM



## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name     | Q'ty | Service points                                                                                                                                                             |
|------|-------------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | <b>CYLINDER REMOVAL</b> | 12   | Follow the left "Step" for removal.<br>Refer to "YPVS".<br>Refer to "CYLINDER HEAD".<br><b>NOTE:</b> _____<br>Tighten the bolts in a crisscross pattern and in two stages. |
|      | YPVS                    |      |                                                                                                                                                                            |
|      | Cylinder head           |      |                                                                                                                                                                            |
|      | Bolt                    |      |                                                                                                                                                                            |
| 2    | Cylinder                | 3    | <b>NOTE:</b> _____<br>Install the original position.                                                                                                                       |
| 3    | Cylinder gasket         | 3    | <b>Not reusable</b>                                                                                                                                                        |
| 4    | Pin                     | 6    |                                                                                                                                                                            |
|      |                         |      | Reverse the removal steps for installation.                                                                                                                                |



## SERVICE POINTS

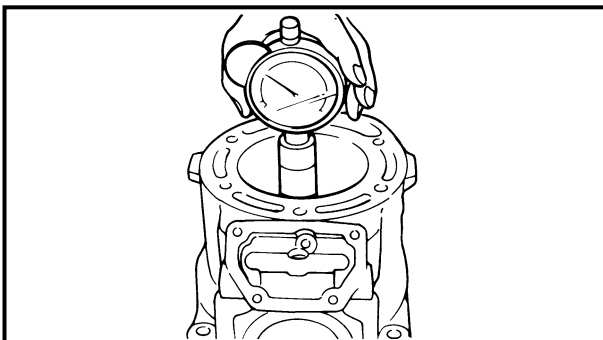
### Cylinder inspection

#### 1. Eliminate:

- Carbon deposits  
(with a rounded scraper ①)

#### 2. Inspect:

- Cylinder water jacket  
Corrosion/mineral deposits → Clean or replace.
- Cylinder inner surface  
Score marks → Replace.

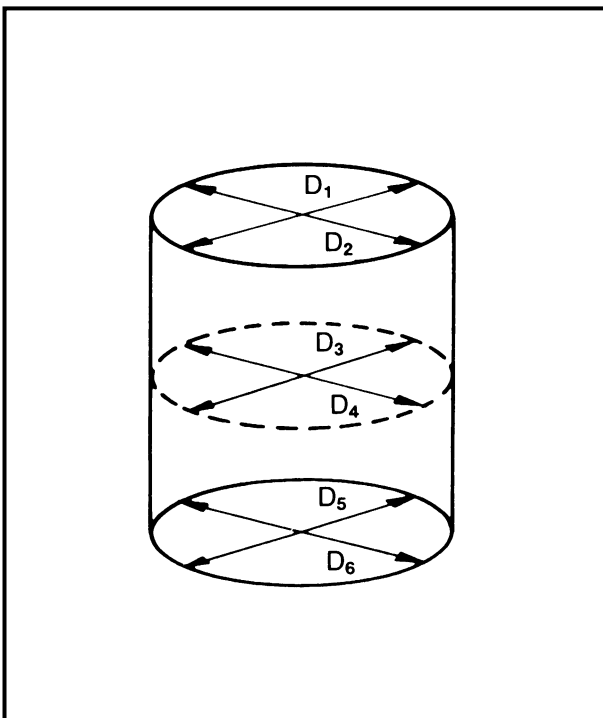


#### 3. Measure:

- Cylinder bore "D"  
(with a cylinder gauge)  
Out of specification → Replace cylinder and piston as a set.

### NOTE:

Measure the cylinder bore in parallel and at a right angle to the crankshaft. Then, average the measurements.



|                                                                                                                                                                                                 | Standard                                   | Limit                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------------------|
| Cylinder bore "D"                                                                                                                                                                                                                                                                  | 80.000 ~ 80.018 mm<br>(3.1496 ~ 3.1503 in) | Original cylinder bore + 0.04 mm<br>(0.0016 in) |
| Taper "T"                                                                                                                                                                                                                                                                          | —                                          | 0.08 mm<br>(0.003 in)                           |
| Out of round "R"                                                                                                                                                                                                                                                                   | —                                          | 0.05 mm<br>(0.002 in)                           |
| D = Maximum (D <sub>1</sub> ~ D <sub>6</sub> )<br>T = (Maximum D <sub>1</sub> or D <sub>2</sub> ) – (Maximum D <sub>5</sub> or D <sub>6</sub> )<br>R = (Maximum D <sub>1</sub> , D <sub>3</sub> or D <sub>5</sub> ) – (Minimum D <sub>2</sub> , D <sub>4</sub> or D <sub>6</sub> ) |                                            |                                                 |

This diagram illustrates the exploded view of a mechanical assembly. The components are numbered as follows:

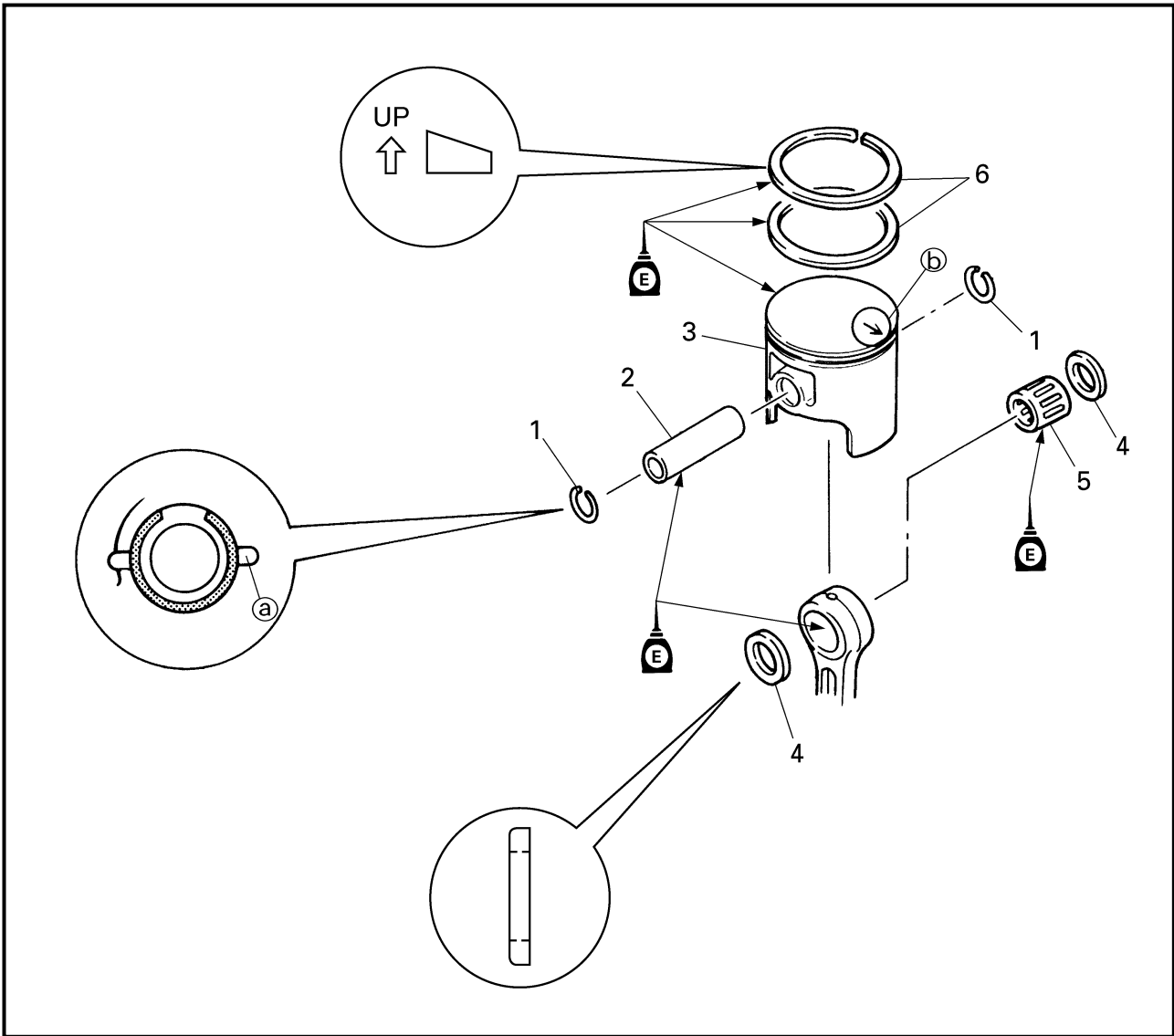
- 1**: A small ring or washer.
- 2**: A cylindrical component, possibly a piston or a sleeve.
- 3**: A main cylindrical body or housing.
- 4**: A small circular component, likely a seal or a gasket.
- 5**: A small cylindrical component, possibly a pin or a screw.
- 6**: A large circular component, likely a cover or a flange.

Callouts and details include:

- UP**: An arrow pointing upwards, indicating the orientation of the assembly.
- a**: A detail view of the top of component 3, showing a ring and a small protrusion.
- b**: A detail view of the side of component 3, showing a small protrusion.
- E**: A symbol indicating a specific material or finish, shown on components 1, 2, 4, 5, and 6.

| Step | Procedure/Part name                                   | Q'ty | Service points                                                                                                                                                                 |
|------|-------------------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | <b>PISTON REMOVAL</b><br>Cylinders<br>Piston pin clip | 2    | Follow the left "Step" for removal.<br>Refer to "CYLINDERS".<br><br><b>CAUTION:</b> _____<br><b>Do not align the open end of the clip with the piston pin slot ①.</b><br>_____ |
| 2    | Piston pin                                            | 1    |                                                                                                                                                                                |
| 3    | Piston                                                | 1    | <b>NOTE:</b> _____                                                                                                                                                             |
| 4    | Washer                                                | 2    | Make sure that the arrow ② faces towards the exhaust side.<br>_____                                                                                                            |

EXPLODED DIAGRAM



| Step | Procedure/Part name | Q'ty | Service points                                                                                                                             |
|------|---------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------|
| 5    | Bearing             | 1    | <div>CAUTION:</div> <div>Align each end gap with its respective locating pin.</div> <div>Reverse the removal steps for installation.</div> |
| 6    | Piston ring         | 2    |                                                                                                                                            |

## SERVICE POINTS

### Piston pin clip removal and installation

1. Remove and install:

- Piston pin clip

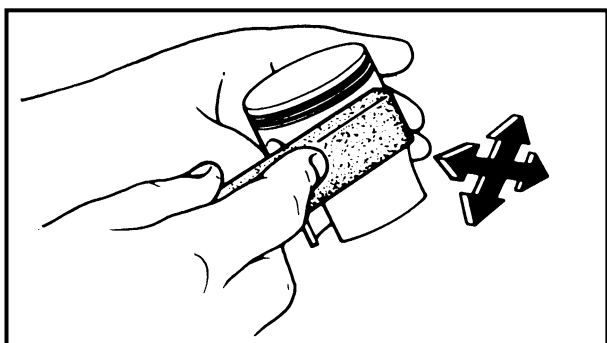
#### NOTE:

Before removing or installing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase.

### Piston inspection

1. Eliminate:

- Carbon deposits  
(from the piston crown and piston ring grooves)

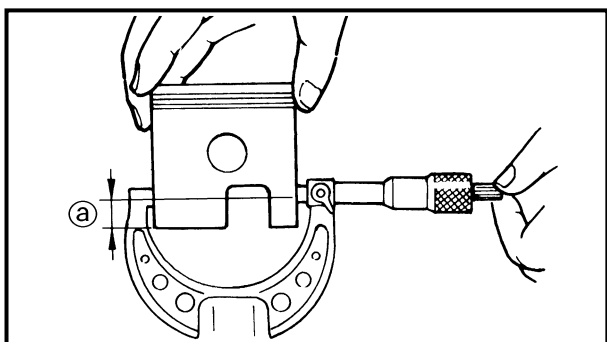


2. Inspect:

- Piston wall  
Score marks → Repair with 600 ~ 800 grit wet sandpaper or replace.

#### NOTE:

Lightly sand the piston wall in a crisscross pattern.



3. Measure:

- Piston skirt diameter  
(with a micrometer)  
Out of specification → Replace.

|  | Piston diameter                            | Distance ①         |
|-------------------------------------------------------------------------------------|--------------------------------------------|--------------------|
|                                                                                     | 79.899 ~ 79.914 mm<br>(3.1456 ~ 3.1462 in) | 22 mm<br>(0.87 in) |

#### 4. Calculate:

- Piston-to-cylinder clearance

Out of specification → Replace the piston, piston rings and cylinder as a set.

$$\text{PISTON CLEARANCE} = \text{CYLINDER BORE} - \text{PISTON DIAMETER}$$



**Piston-to-cylinder clearance:**  
0.100 ~ 0.105 mm  
(0.0039 ~ 0.0041 in)

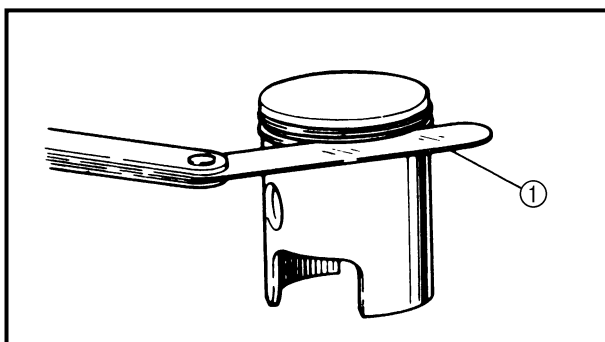
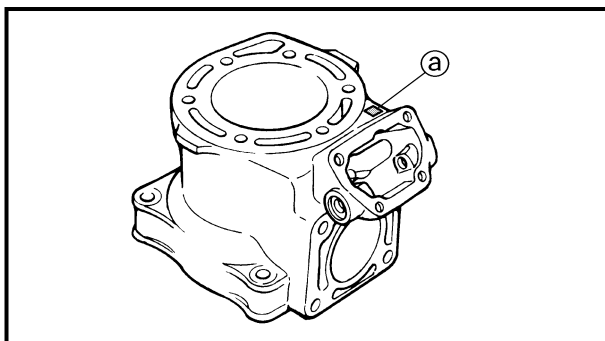
#### Cylinder and piston combination

Select the appropriate piston to match the cylinder size by the table as follows.

| Cylinder size indication ① | Piston color mark |
|----------------------------|-------------------|
| 0 ~ 5                      | Red               |
| 6 ~ 10                     | Orange            |
| 11 ~ 15                    | Green             |
| 16 ~ 18                    | Purple            |

#### NOTE:

New cylinder bore size = 80.000 + ①/1,000  
Example: ① = 12 → 80.012 mm.



#### Piston ring inspection

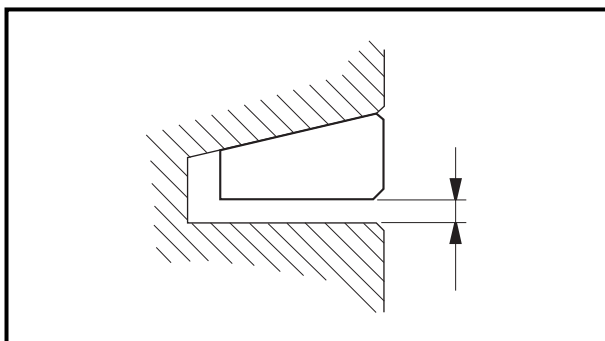
##### 1. Measure:

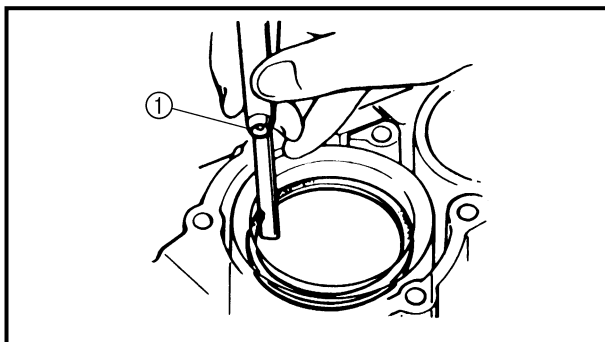
- Side clearance  
(with a thickness gauge ①)

Out of specification → Replace the piston and piston rings as a set.



**Side clearance:**  
0.03 ~ 0.05 mm (0.001 ~ 0.002 in)





2. Measure:

- End gap

(with a thickness gauge ①)

Out of specification → Replace the piston rings as a set.

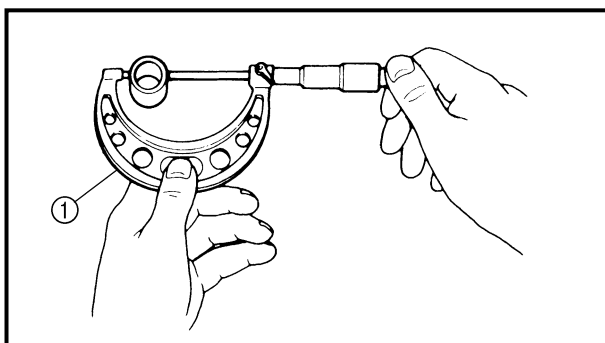


**End gap:**

**0.45 ~ 0.60 mm (0.018 ~ 0.024 in)**

**NOTE:**

Push the piston ring into the cylinder with the piston crown.



**Piston pin and bearing inspection**

1. Inspect:

- Piston pins
- Bearings

Signs of heat discoloration → Replace.

2. Measure:

- Piston pin outside diameter  
(with a micrometer ①)

Out of specification → Replace.



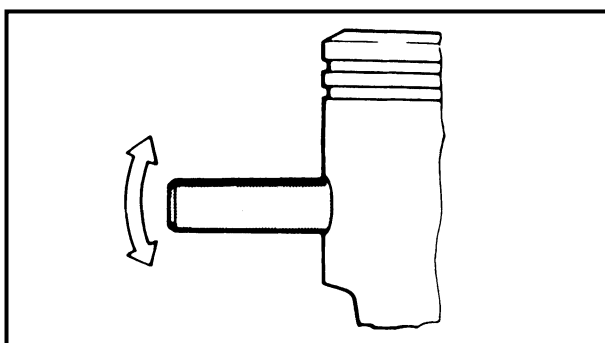
**Piston pin outside diameter:**

**Standard**

**21.995 ~ 22.000 mm  
(0.8659 ~ 0.8661 in)**

**Limit**

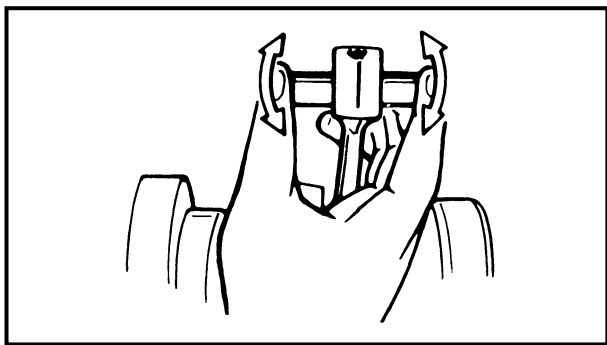
**21.990 mm (0.8657 in)**



3. Check:

- Piston-pin-to-piston free play  
(with the piston pin in the piston as shown)

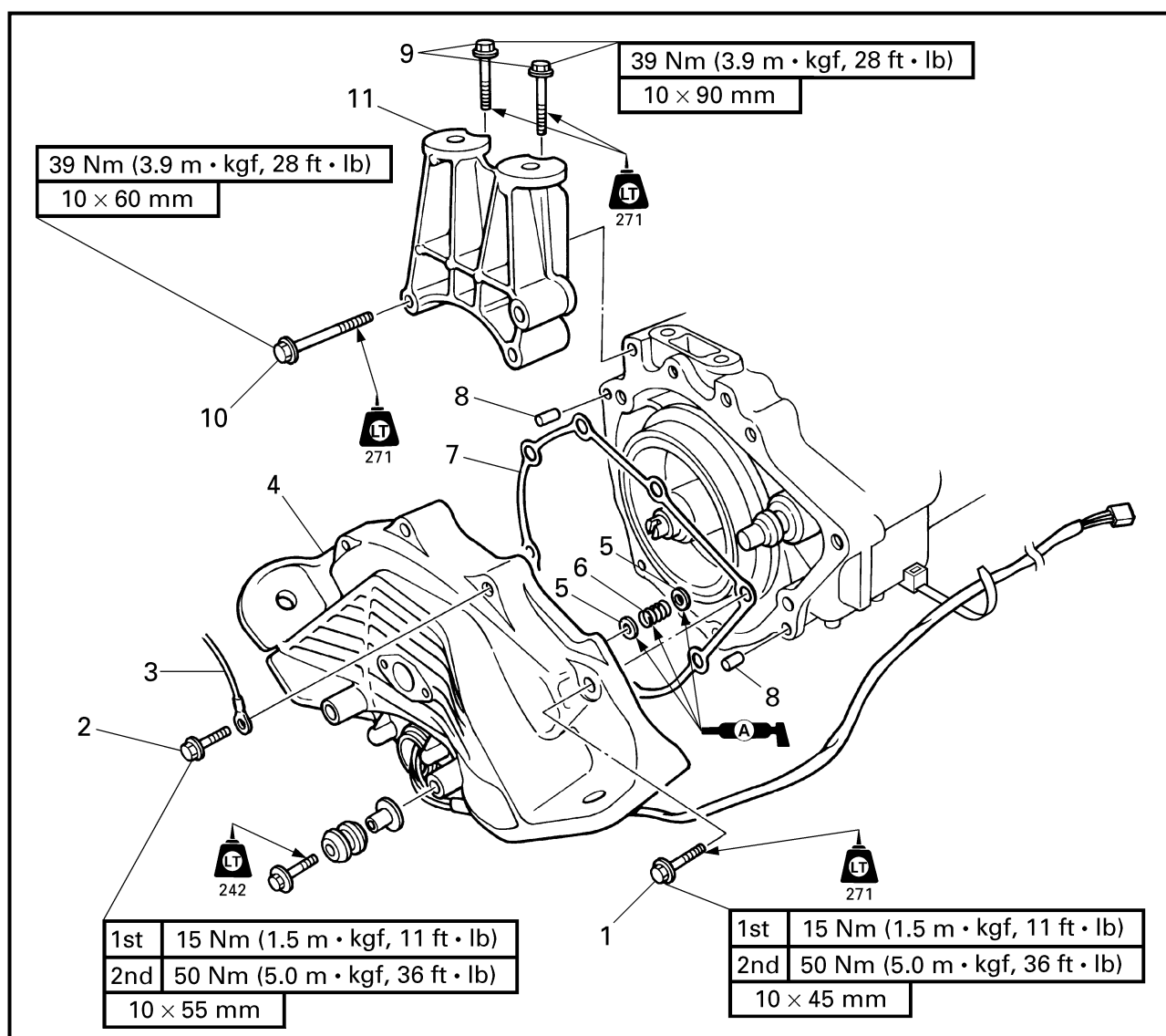
Free play → Replace the piston pin, piston or both.



4. Check:

- Piston-pin-to-connecting-rod free play (with the piston pin in the small end of the connecting rod as shown)  
Free play/small end wear → Replace the piston pin, connecting rod or both.

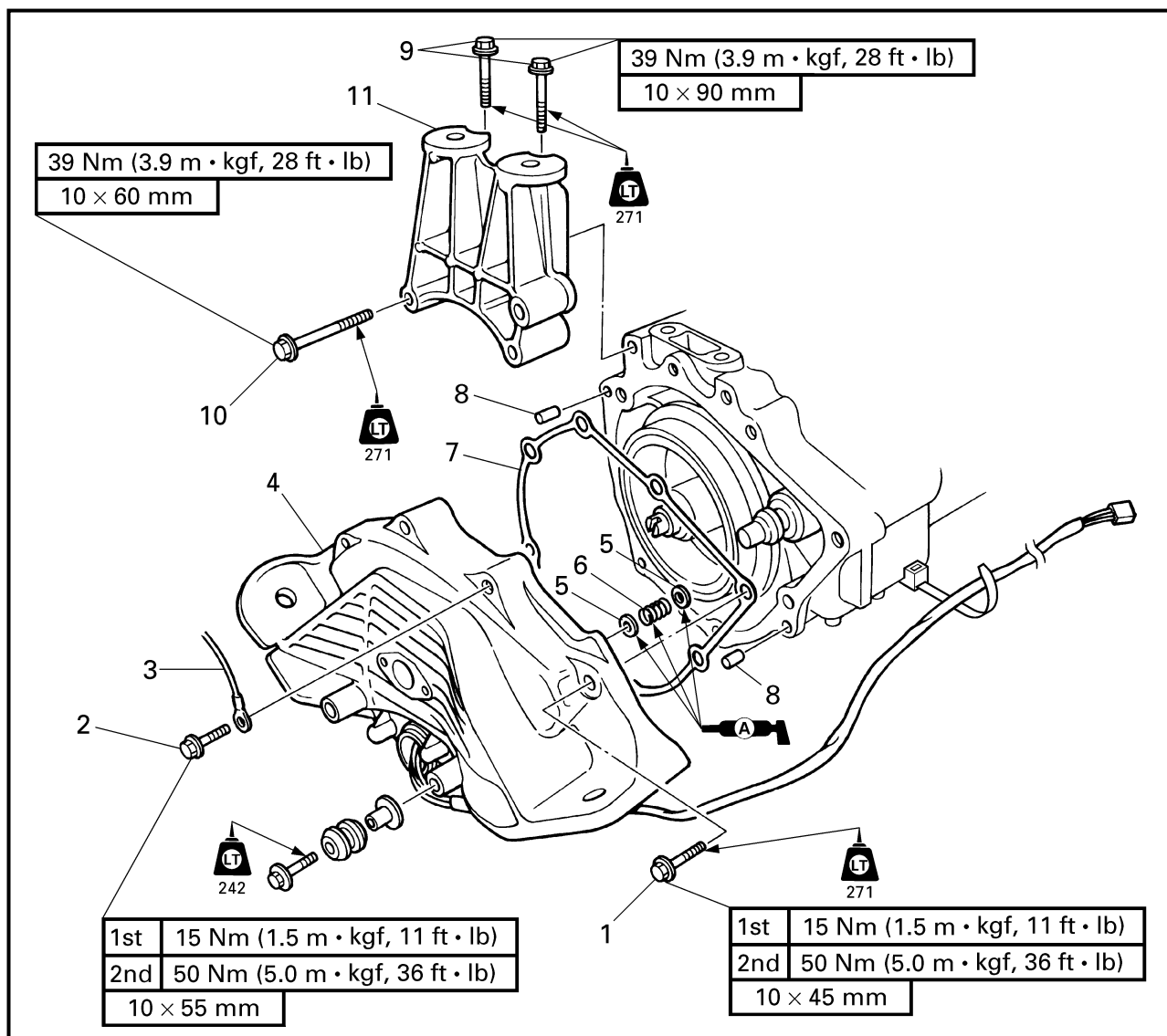
# **GENERATOR AND STARTER MOTOR EXPLODED DIAGRAM**



## **REMOVAL AND INSTALLATION CHART**

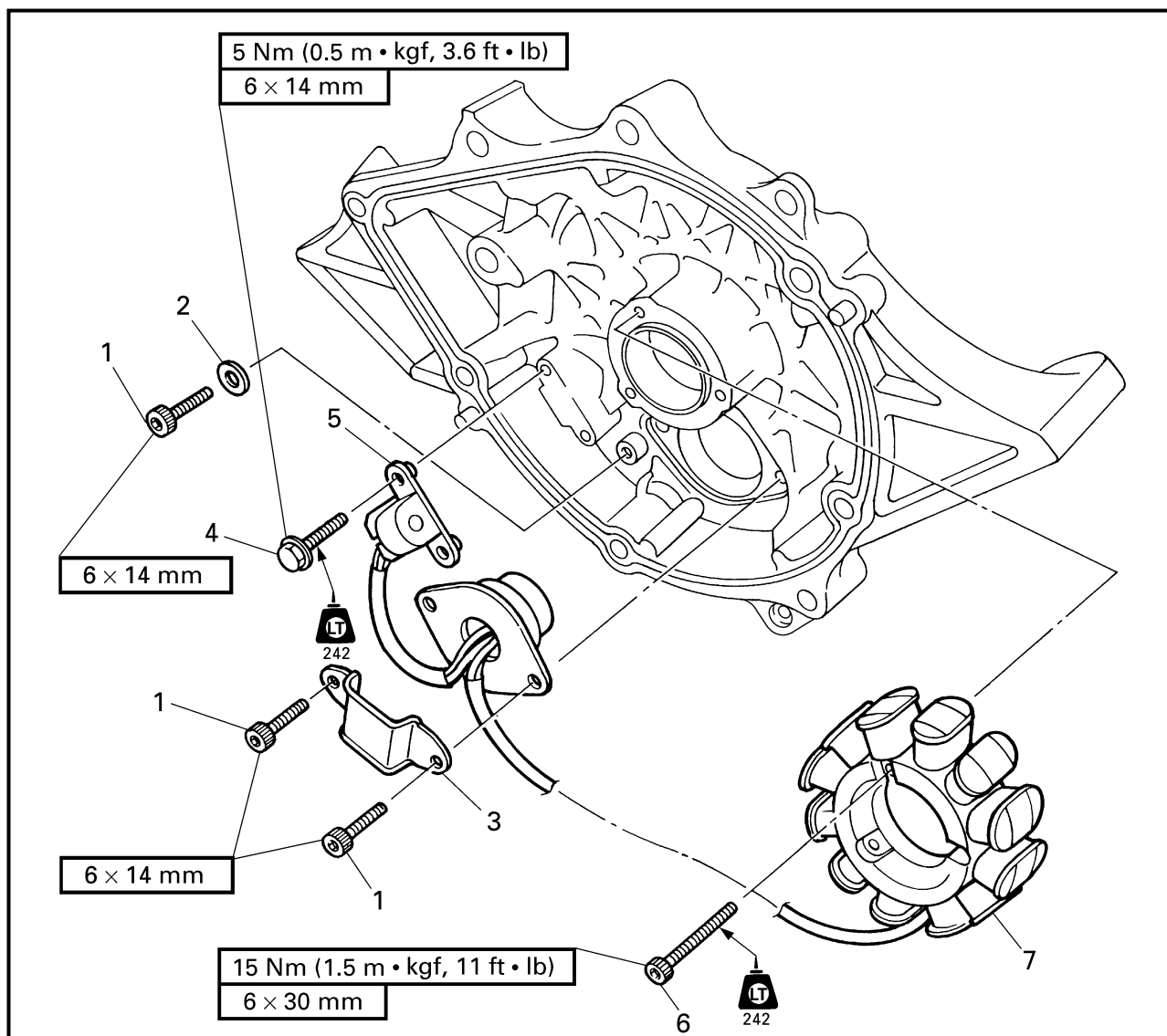
| Step | Procedure/Part name            | Q'ty | Service points                                                           |
|------|--------------------------------|------|--------------------------------------------------------------------------|
|      | <b>GENERATOR COVER REMOVAL</b> |      | Follow the left "Step" for removal.<br>Refer to "OIL PUMP" in chapter 4. |
|      | Oil pump                       |      |                                                                          |
| 1    | Bolt                           | 1    |                                                                          |
| 2    | Bolt                           | 7    |                                                                          |
| 3    | Ground lead                    | 1    |                                                                          |
| 4    | Generator cover                | 1    |                                                                          |
| 5    | Washer                         | 2    |                                                                          |

**EXPLODED DIAGRAM**



| Step | Procedure/Part name | Q'ty | Service points                              |
|------|---------------------|------|---------------------------------------------|
| 6    | Spring              | 1    | Reverse the removal steps for installation. |
| 7    | Packing             | 1    |                                             |
| 8    | Pin                 | 2    |                                             |
| 9    | Bolt                | 2    |                                             |
| 10   | Bolt                | 2    |                                             |
| 11   | Bracket             | 1    |                                             |

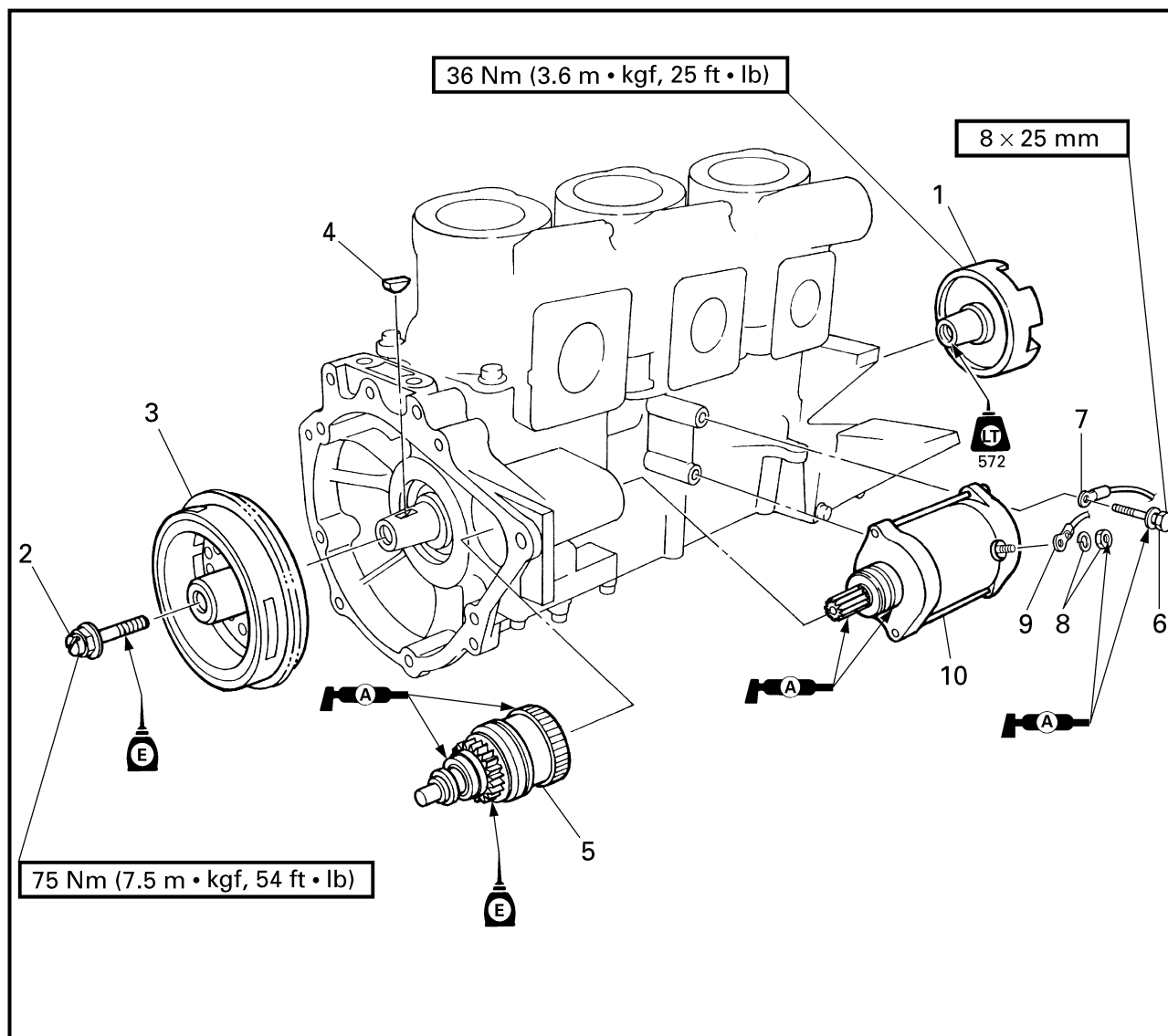
## EXPLODED DIAGRAM



## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name                        | Q'ty | Service points                                                                                                                                                |
|------|--------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | <b>STATOR COIL AND PICKUP COIL REMOVAL</b> |      | Follow the left "Step" for removal.                                                                                                                           |
| 1    | Bolt                                       | 3    | <b>NOTE:</b> _____<br>This washer holds the pickup coil lead. Make sure to not pinch the lead between the projection and the washer when installing the bolt. |
| 2    | Washer                                     | 1    |                                                                                                                                                               |
| 3    | Cable holder                               | 1    |                                                                                                                                                               |
| 4    | Bolt                                       | 2    |                                                                                                                                                               |
| 5    | Pickup coil                                | 1    |                                                                                                                                                               |
| 6    | Bolt                                       | 3    |                                                                                                                                                               |
| 7    | Stator coil                                | 1    | Reverse the removal steps for installation.                                                                                                                   |

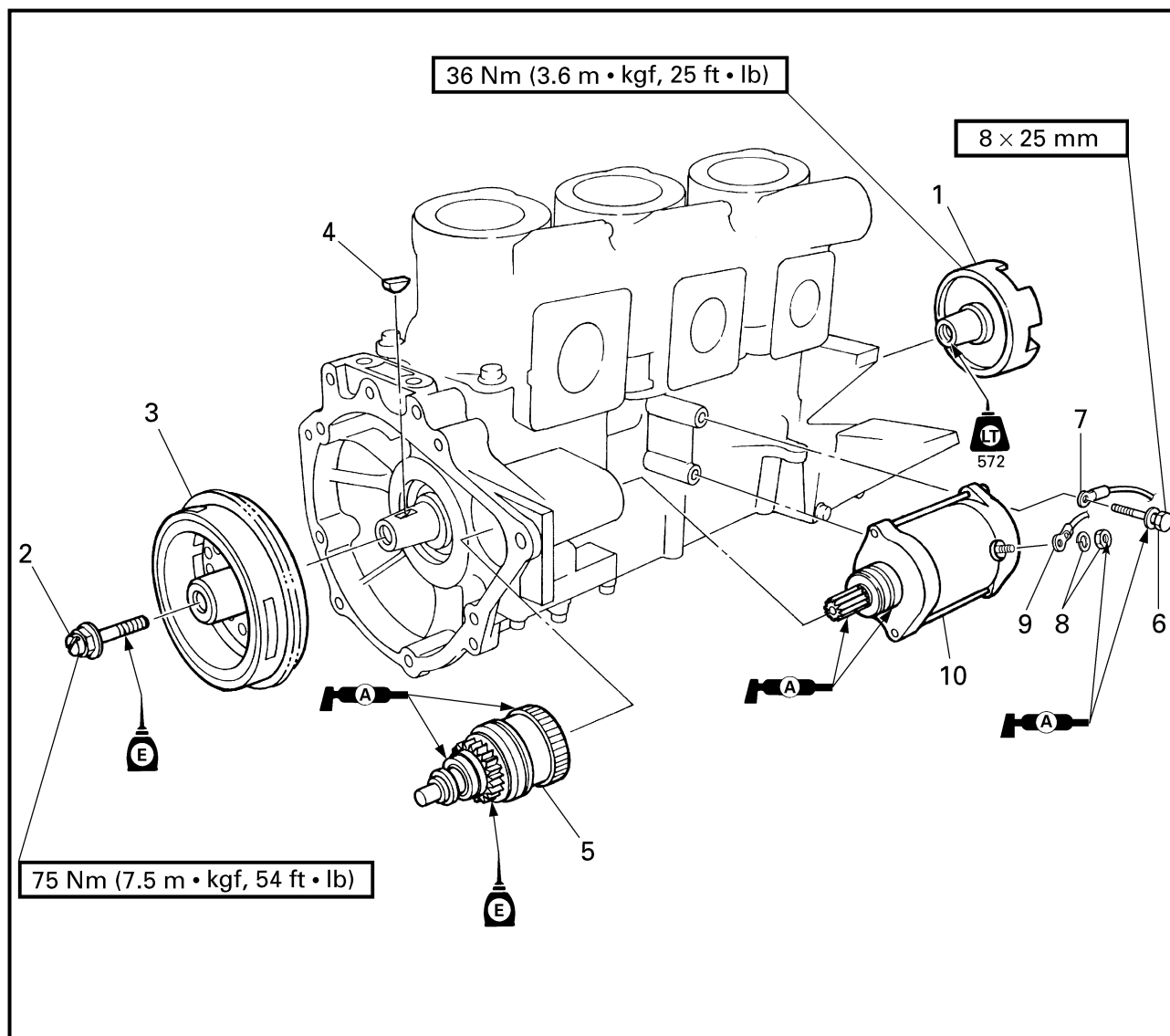
**EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

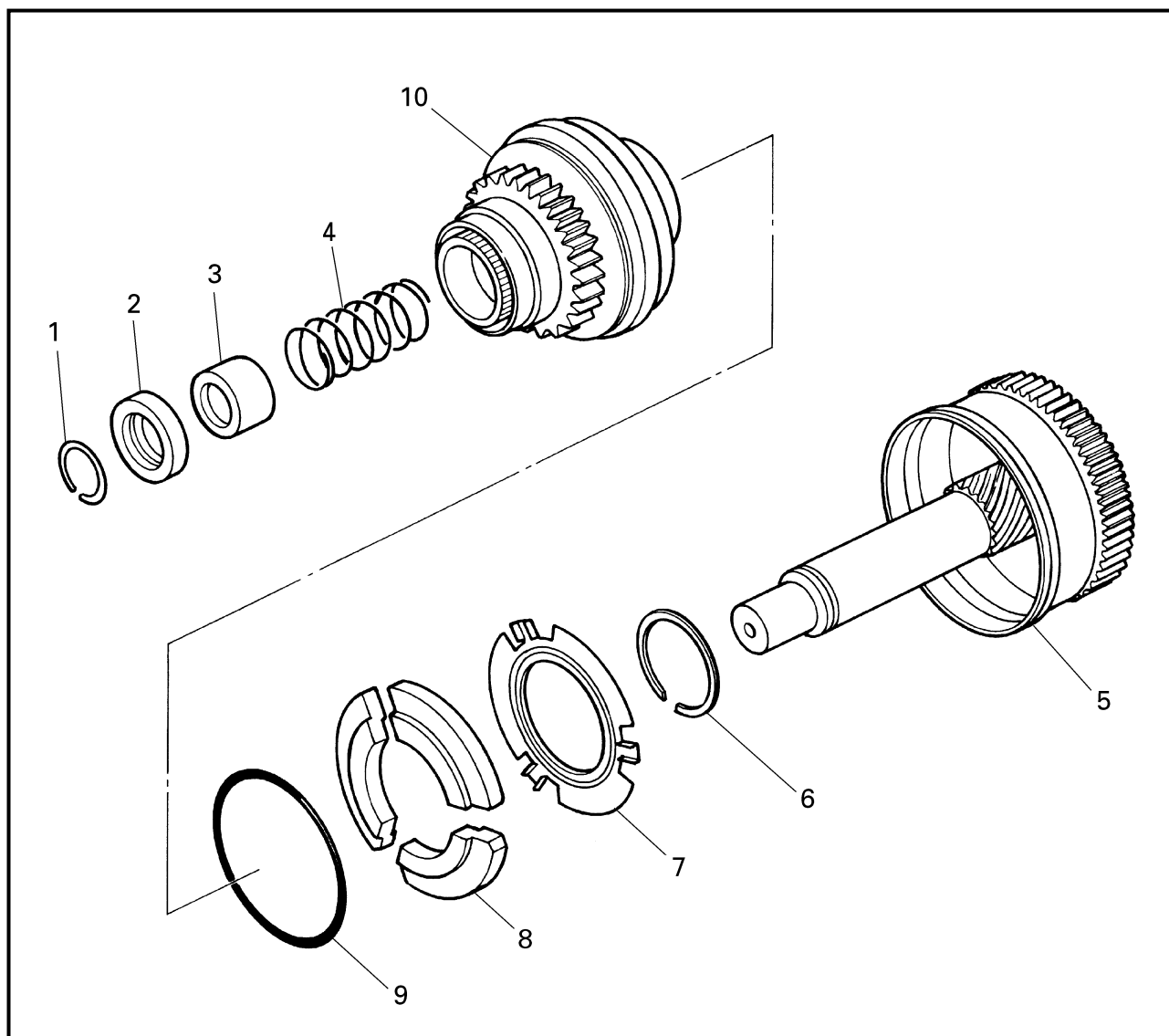
| Step | Procedure/Part name                              | Q'ty | Service points                      |
|------|--------------------------------------------------|------|-------------------------------------|
|      | <b>GENERATOR ROTOR AND STARTER MOTOR REMOVAL</b> |      | Follow the left "Step" for removal. |
| 1    | Drive coupling                                   | 1    |                                     |
| 2    | Flywheel magneto bolt                            | 1    |                                     |
| 3    | Flywheel magneto                                 | 1    |                                     |
| 4    | Woodruff key                                     | 1    |                                     |
| 5    | Starter clutch assembly                          | 1    |                                     |
| 6    | Bolt                                             | 2    |                                     |
| 7    | Battery negative lead                            | 1    |                                     |

**EXPLODED DIAGRAM**



| Step | Procedure/Part name | Q'ty | Service points                              |
|------|---------------------|------|---------------------------------------------|
| 8    | Nut/washer          | 1/1  | Reverse the removal steps for installation. |
| 9    | Starter motor lead  | 1    |                                             |
| 10   | Starter motor       | 1    |                                             |

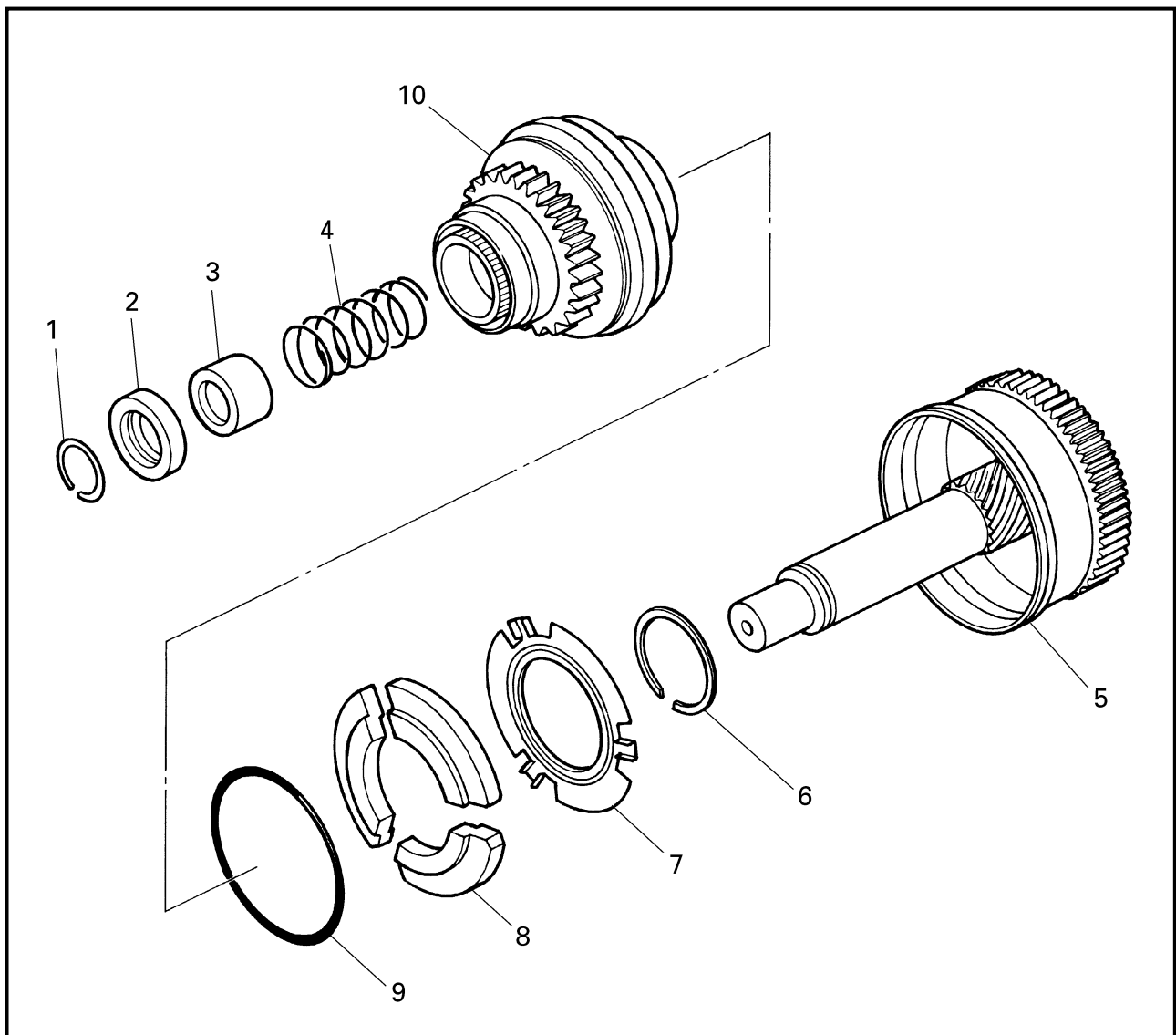
## EXPLODED DIAGRAM



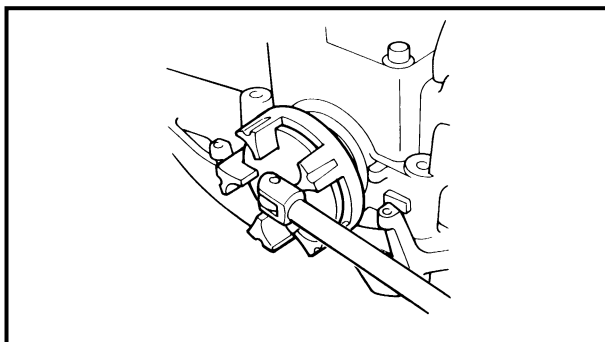
## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name                   | Q'ty | Service points                          |
|------|---------------------------------------|------|-----------------------------------------|
|      | <b>STARTER CLUTCH<br/>DISASSEMBLY</b> |      | Follow the left "Step" for disassembly. |
| 1    | Clip                                  | 1    | <b>Not reusable</b>                     |
| 2    | Clip stopper                          | 1    |                                         |
| 3    | Spring seat                           | 1    |                                         |
| 4    | Spring                                | 1    |                                         |
| 5    | Idle gear                             | 1    |                                         |
| 6    | Circlip                               | 1    |                                         |
| 7    | Plate                                 | 1    |                                         |

**EXPLODED DIAGRAM**



| Step | Procedure/Part name | Q'ty | Service points                              |
|------|---------------------|------|---------------------------------------------|
| 8    | Weight              | 3    | Reverse the disassembly steps for assembly. |
| 9    | Spring ring         | 1    |                                             |
| 10   | Pinion gear         | 1    |                                             |



## SERVICE POINTS

### Drive coupling removal and installation

#### 1. Remove:

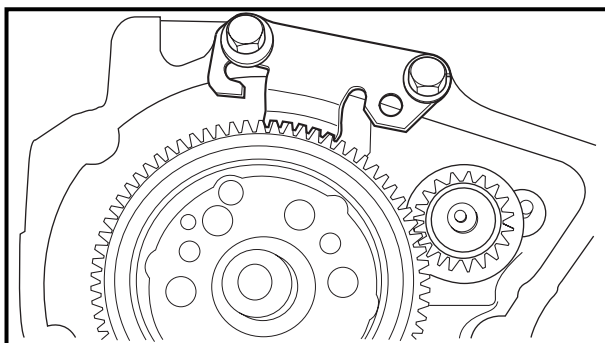
- Drive coupling



**Coupler wrench:**  
YW-06551/90890-06551  
**Flywheel holder:**  
YW-06550/90890-06550

#### NOTE:

Install the drive coupling with the same special tools that were used for removal.



### Flywheel magneto removal and installation

#### 1. Remove:

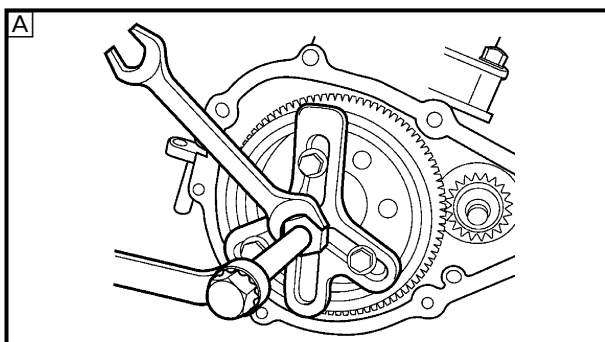
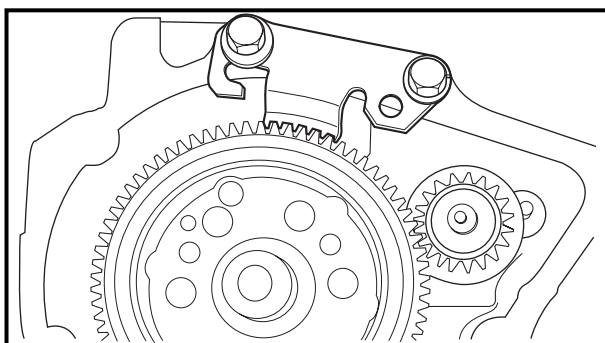
- Flywheel magneto bolt



**Flywheel holder:**  
YW-06550/90890-06550

#### NOTE:

Install the bolt with the same special tool that was used for removal.



#### 2. Remove:

- Generator rotor



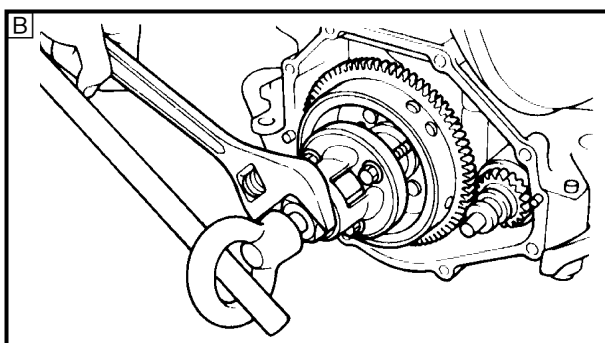
**Flywheel puller:**  
YB-06117/90890-06521  
**Set bolt:**  
M8 × 60 mm

[A] For USA and Canada

[B] For worldwide

## CAUTION:

To prevent damage to the engine or tools, screw in the flywheel puller set bolts evenly and completely so that the puller plate is parallel to the generator rotor.

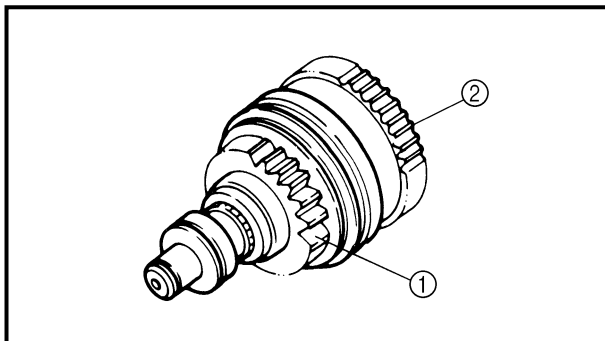


**Drive coupling inspection**

1. Inspect:
  - Drive coupling  
Damage/wear → Replace.

**Flywheel magneto inspection**

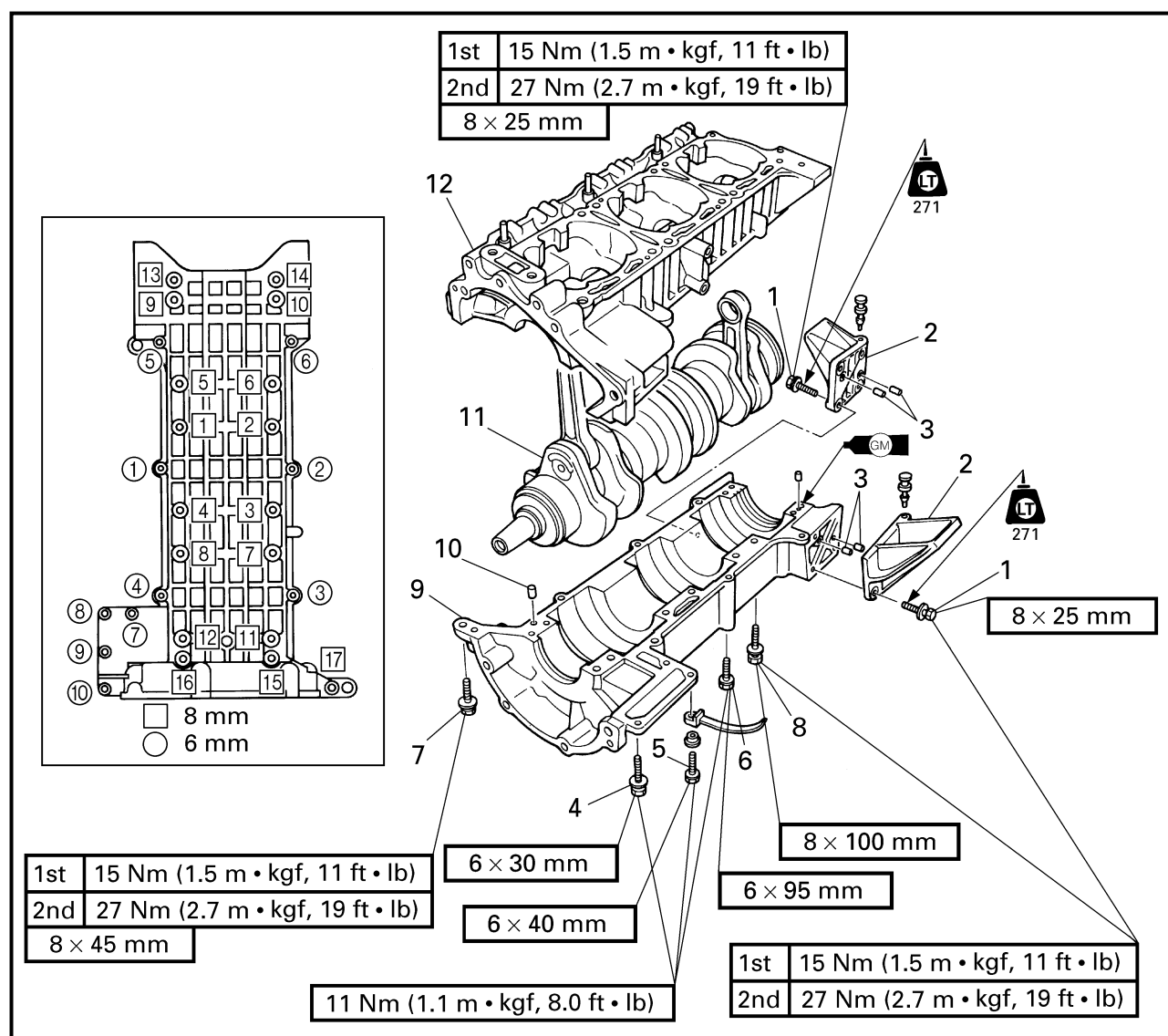
1. Inspect:
  - Ring gear  
Damage/wear → Replace.



**Starter clutch assembly inspection**

1. Inspect:
  - Pinion gear ①
  - Idle gear ②  
Damage/wear → Replace.
2. Check:
  - Gear movement  
Rough movement → Replace the defective part(s).

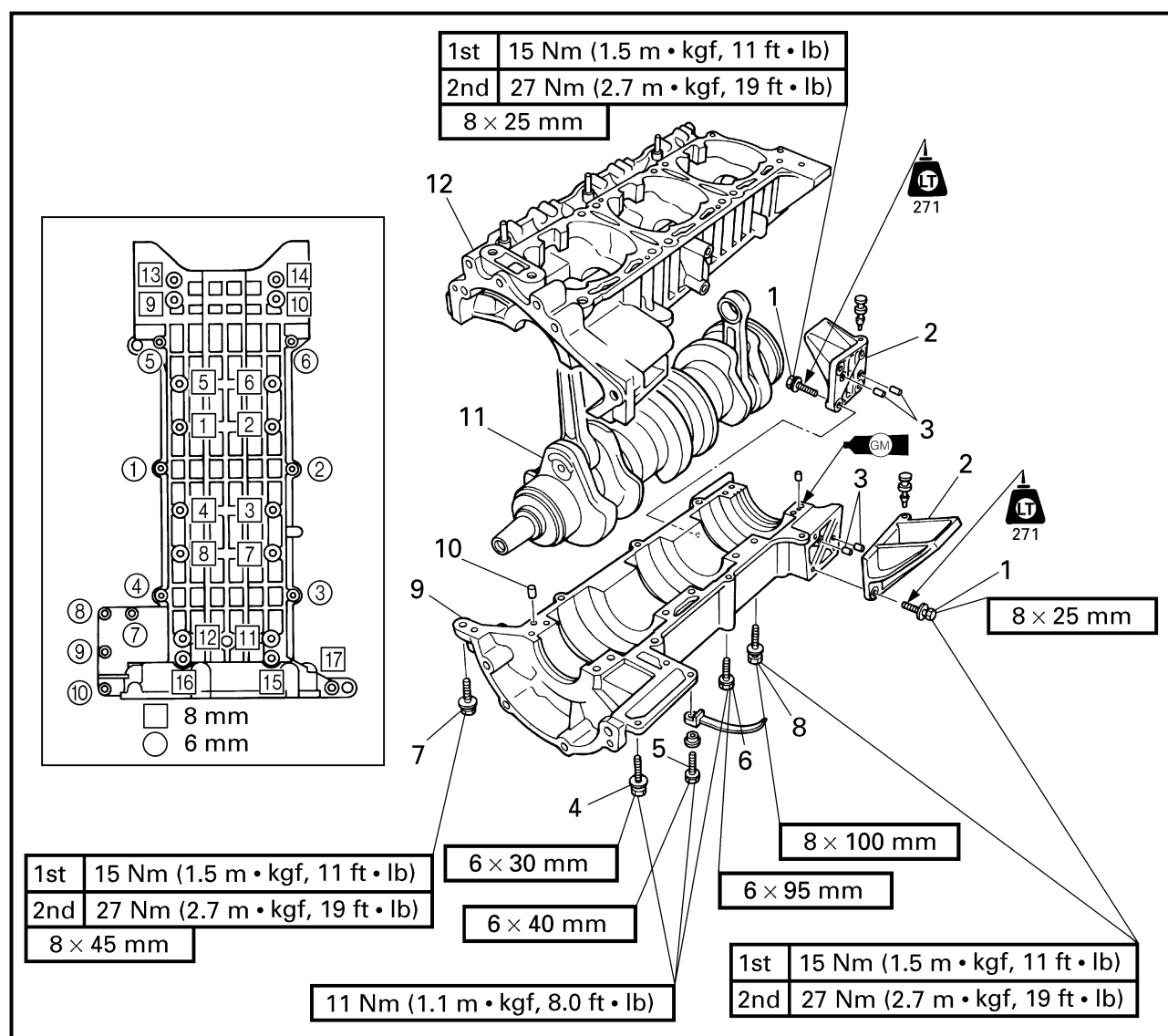
## CRANKCASE EXPLODED DIAGRAM



## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name               | Q'ty | Service points                                              |
|------|-----------------------------------|------|-------------------------------------------------------------|
|      | <b>CRANKCASE DISASSEMBLY</b>      |      |                                                             |
|      | Pistons                           |      | Follow the left "Step" for disassembly. Refer to "PISTONS". |
|      | Generator cover and starter motor |      | Refer to "GENERATOR AND STARTER MOTOR".                     |
| 1    | Bolt                              | 6    |                                                             |
| 2    | Mount bracket                     | 2    |                                                             |
| 3    | Pin                               | 4    |                                                             |
| 4    | Bolt                              | 3    |                                                             |
| 5    | Bolt                              | 1    |                                                             |
| 6    | Bolt                              | 6    |                                                             |

## EXPLODED DIAGRAM

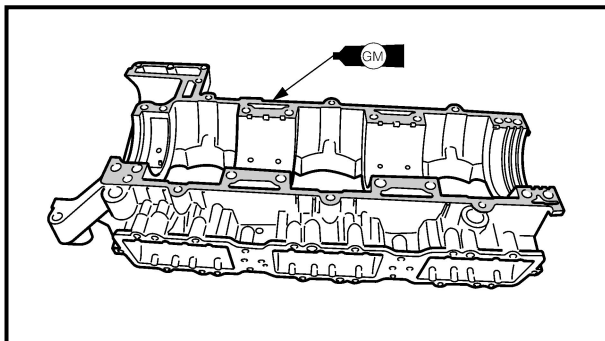


| Step | Procedure/Part name | Q'ty | Service points                                              |
|------|---------------------|------|-------------------------------------------------------------|
| 7    | Bolt                | 1    | <b>NOTE:</b> <u>Tighten the bolts in sequence as shown.</u> |
| 8    | Bolt                | 16   |                                                             |
| 9    | Lower crankcase     | 1    |                                                             |
| 10   | Pin                 | 2    |                                                             |
| 11   | Crankshaft assembly | 1    |                                                             |
| 12   | Upper crankcase     | 1    | Reverse the disassembly steps for assembly.                 |

## SERVICE POINTS

### Crankcase inspection

1. Inspect:
  - Mating surfaces  
Scratches → Replace the crankcase.
  - Crankcase  
Cracks/damage → Replace.



### Crankcase installation

1. Apply:
  - Gasket Maker®  
(onto the crankcase mating surfaces)

#### NOTE:

Before applying Gasket Maker®, clean the crankcase mating surfaces.

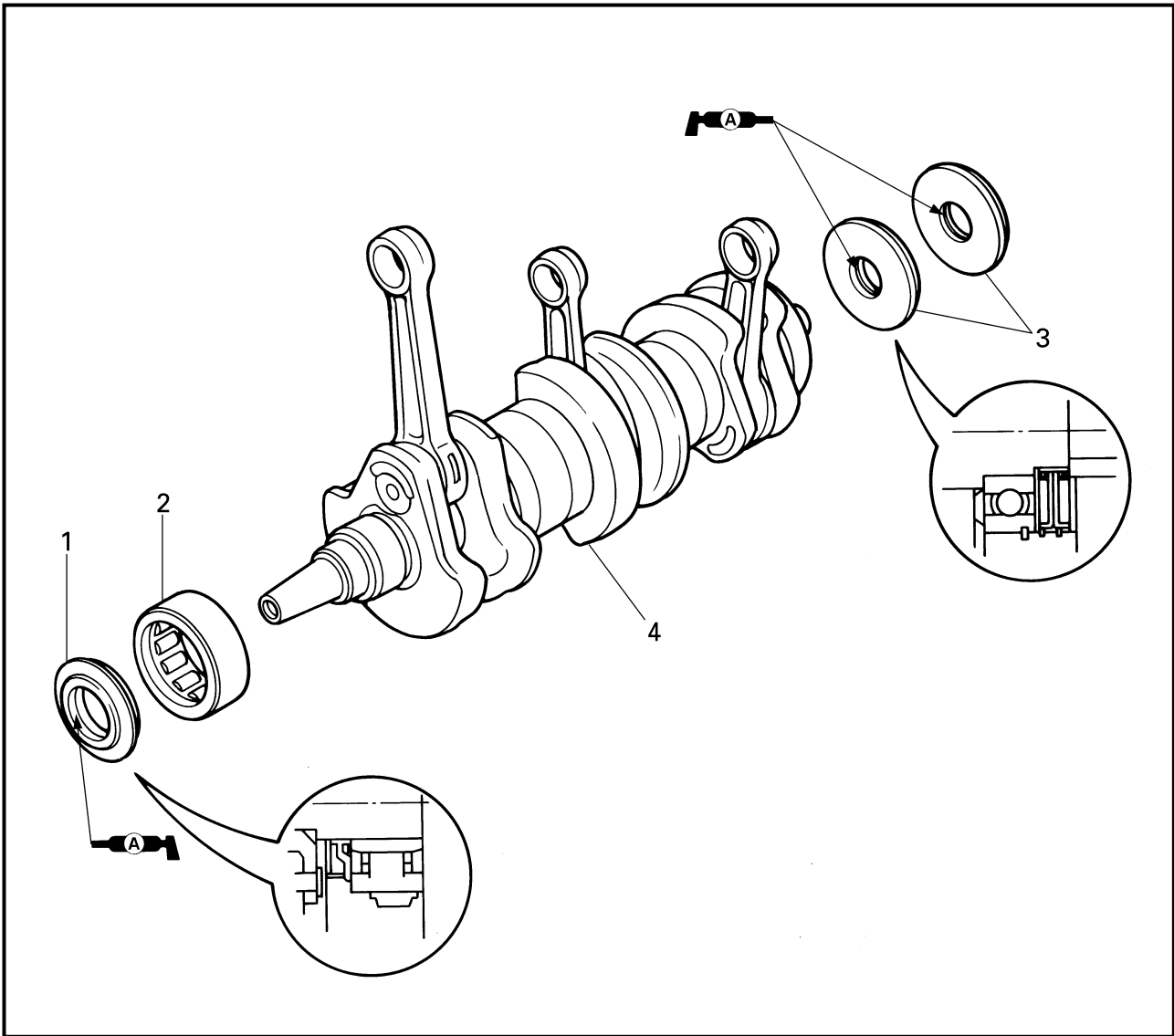
2. Check:
  - Crankshaft  
Rough movement → Recheck.

#### NOTE:

Make sure that the crankshaft rotates smoothly after installing it.

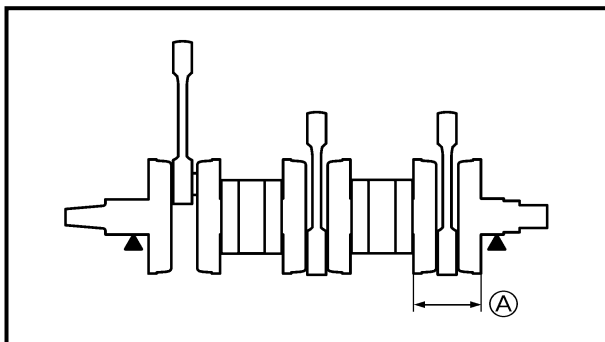
CRANKSHAFT

EXPLODED DIAGRAM



REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name       | Q'ty | Service points                                                                                                                                                 |
|------|---------------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | <b>CRANKSHAFT REMOVAL</b> |      |                                                                                                                                                                |
|      | Crankcase                 |      | Follow the left "Step" for removal.<br>Refer to "CRANKCASE".                                                                                                   |
| 1    | Oil seal                  | 1    |                                                                                                                                                                |
| 2    | Bearing                   | 1    |                                                                                                                                                                |
| 3    | Oil seal                  | 2    |                                                                                                                                                                |
| 4    | Crankshaft assembly       | 1    | <div>CAUTION:</div> <div>Install the bearing locating pins into the gloves in the crankcase body.</div> <div>Reverse the removal steps for installation.</div> |



## SERVICE POINTS

### Crankshaft inspection

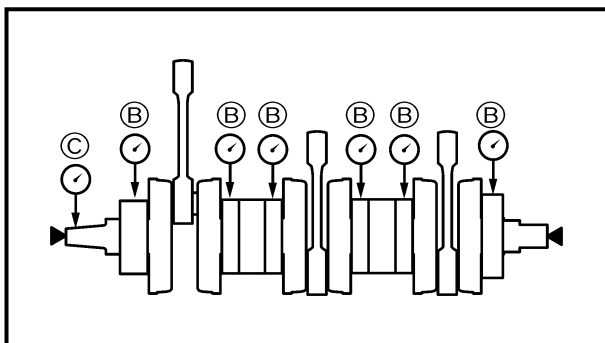
#### 1. Measure:

- Crank width (A)

Out of specification → Replace.



**Crank width:**  
72.95 ~ 73.00 mm  
(2.872 ~ 2.874 in)



#### 2. Measure:

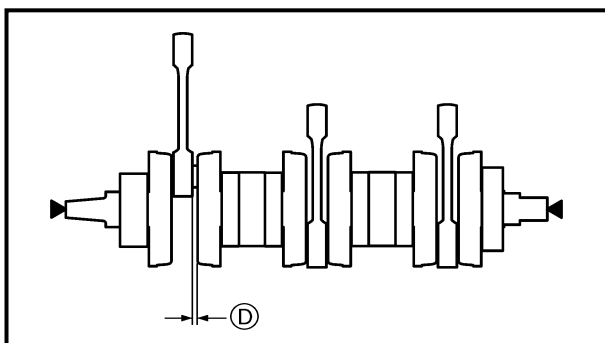
- Deflection (B)

(with a dial gauge)

Out of specification → Replace.



**Max. deflection:**  
(B) 0.05 mm (0.002 in)  
(C) 0.15 mm (0.006 in)



#### 3. Measure:

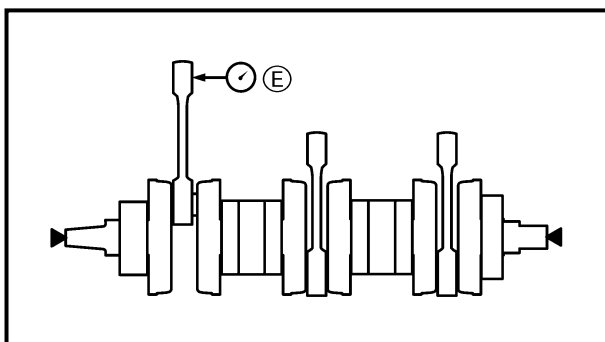
- Big end side clearance (D)

(with a thickness gauge)

Out of specification → Replace.



**Big end side clearance:**  
0.25 ~ 0.75 mm (0.010 ~ 0.030 in)



#### 4. Measure:

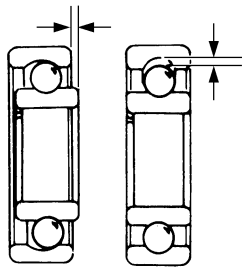
- Small end free play (E)

(with a dial gauge)

Out of specification → Replace.



**Small end free play:**  
2.0 mm (0.08 in)



5. Inspect:

- Bearings

Damage/pitting → Replace.

**NOTE:** \_\_\_\_\_

- Before inspection, thoroughly clean the bearings.
- Immediately after inspection, lubricate the bearings to prevent rust.

6. Inspect:

- Oil seals

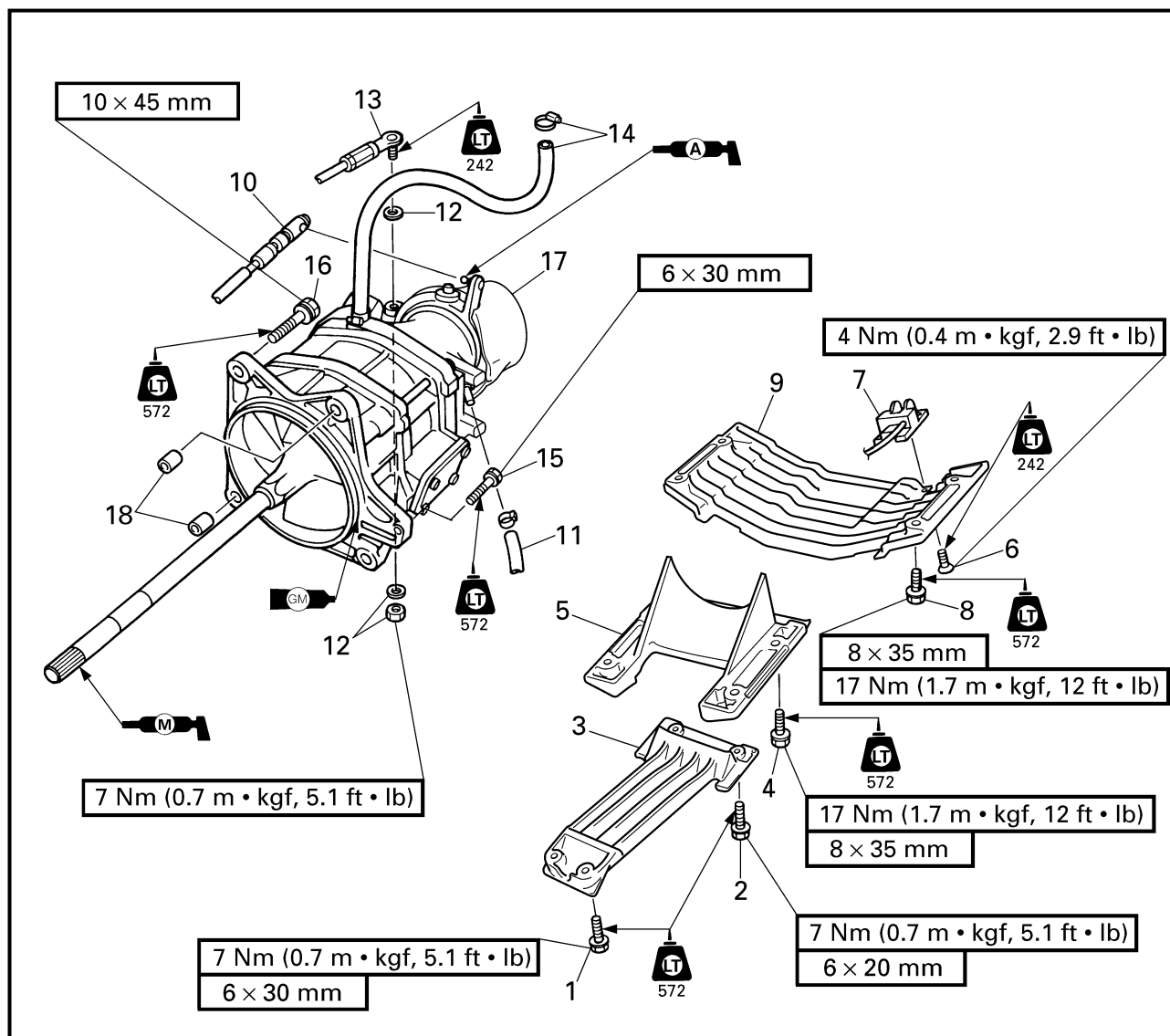
Damage/wear → Replace.

## CHAPTER 6

### JET PUMP UNIT

|                                                                   |             |
|-------------------------------------------------------------------|-------------|
| <b>JET PUMP UNIT .....</b>                                        | <b>6-1</b>  |
| EXPLODED DIAGRAM .....                                            | 6-1         |
| REMOVAL AND INSTALLATION CHART .....                              | 6-1         |
| <br><b>NOZZLE DEFLECTOR AND NOZZLE RING .....</b>                 | <b>6-4</b>  |
| EXPLODED DIAGRAM .....                                            | 6-4         |
| REMOVAL AND INSTALLATION CHART .....                              | 6-4         |
| <br><b>IMPELLER DUCT, IMPELLER HOUSING, AND INTAKE DUCT .....</b> | <b>6-5</b>  |
| EXPLODED DIAGRAM .....                                            | 6-5         |
| REMOVAL AND INSTALLATION CHART .....                              | 6-5         |
| <br><b>IMPELLER DUCT AND DRIVE SHAFT .....</b>                    | <b>6-7</b>  |
| EXPLODED DIAGRAM .....                                            | 6-7         |
| REMOVAL AND INSTALLATION CHART .....                              | 6-7         |
| SERVICE POINTS .....                                              | 6-9         |
| Drive shaft removal .....                                         | 6-9         |
| Impeller inspection .....                                         | 6-10        |
| Drive shaft inspection .....                                      | 6-10        |
| Drive shaft installation .....                                    | 6-10        |
| <br><b>TRANSOM PLATE AND HOSES .....</b>                          | <b>6-13</b> |
| EXPLODED DIAGRAM .....                                            | 6-13        |
| REMOVAL AND INSTALLATION CHART .....                              | 6-13        |
| SERVICE POINTS .....                                              | 6-15        |
| Bilge strainer inspection .....                                   | 6-15        |
| Bilge hose inspection .....                                       | 6-15        |
| <br><b>BEARING HOUSING .....</b>                                  | <b>6-16</b> |
| EXPLODED DIAGRAM .....                                            | 6-16        |
| REMOVAL AND INSTALLATION CHART .....                              | 6-16        |
| SERVICE POINTS .....                                              | 6-19        |
| Driven coupling removal and installation .....                    | 6-19        |
| Intermediate drive shaft removal .....                            | 6-19        |
| Bearing removal .....                                             | 6-19        |
| Bearing, driven coupling shaft, and grease hose inspection .....  | 6-20        |
| Driven coupling inspection .....                                  | 6-20        |
| Bearing installation .....                                        | 6-20        |
| Oil seal installation .....                                       | 6-20        |
| Intermediate housing installation .....                           | 6-21        |

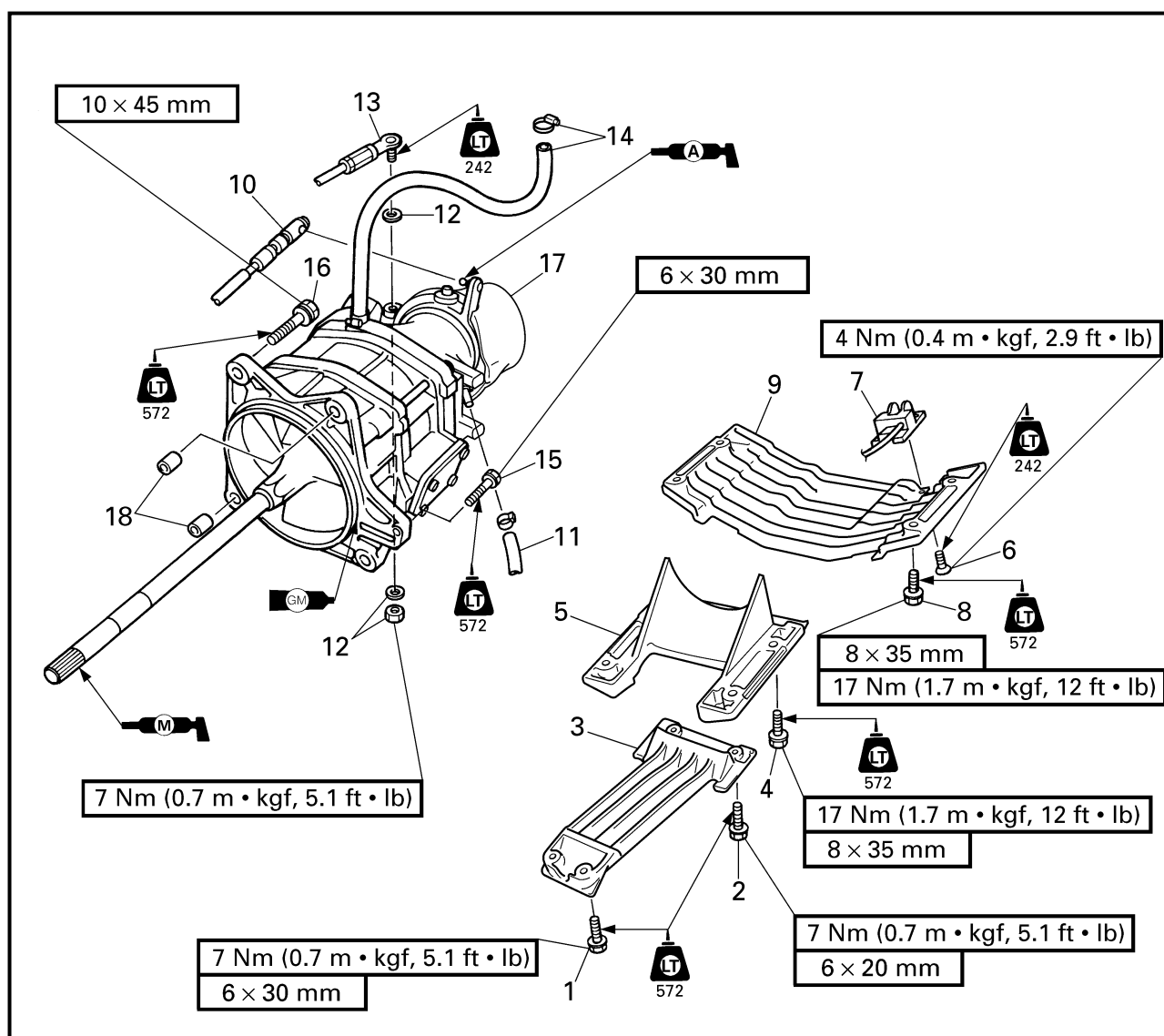
**JET PUMP UNIT  
EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

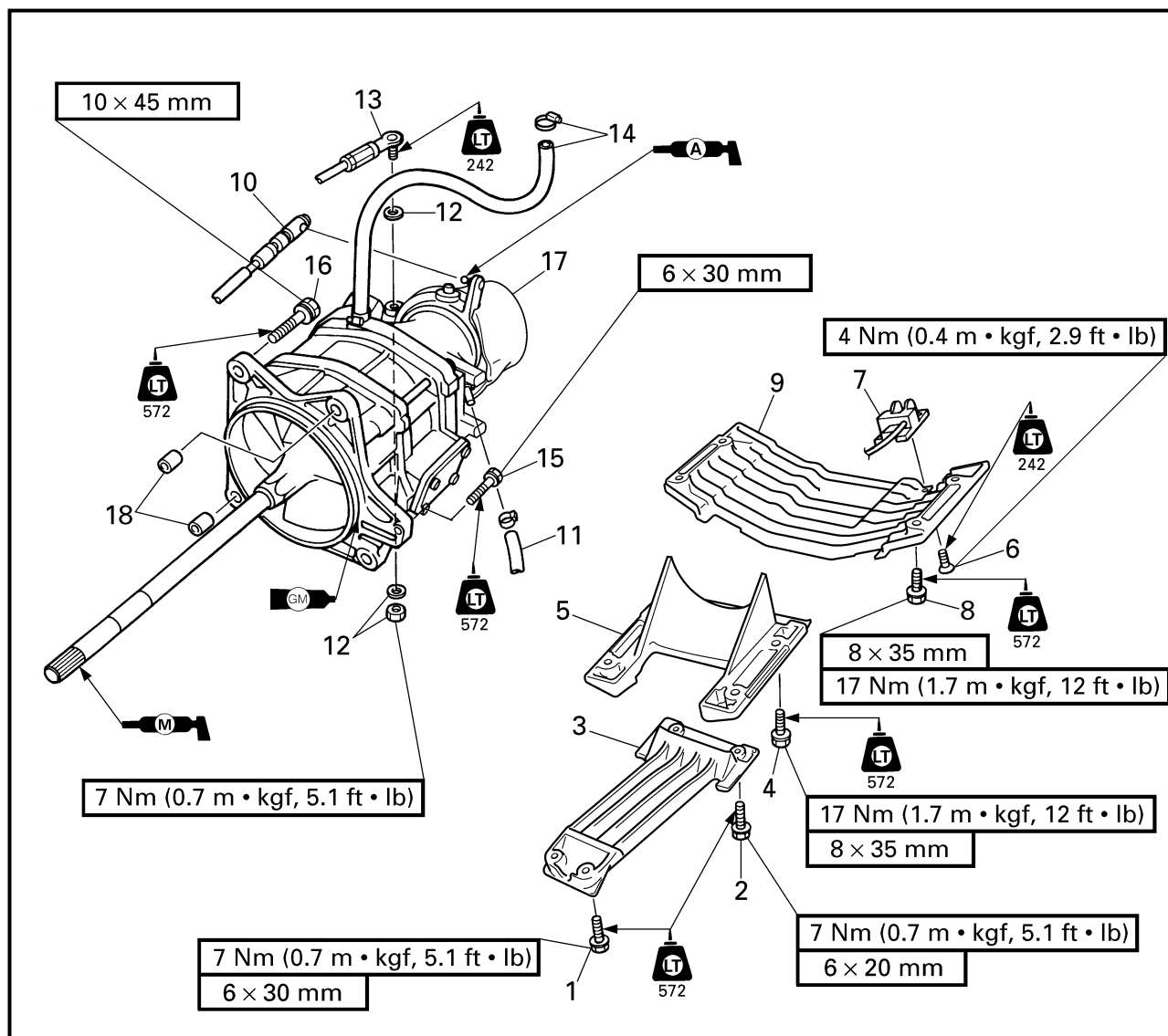
| Step | Procedure/Part name          | Q'ty | Service points                                                                                  |
|------|------------------------------|------|-------------------------------------------------------------------------------------------------|
|      | <b>JET PUMP UNIT REMOVAL</b> |      | Follow the left "Step" for removal.                                                             |
| 1    | Bolt                         | 2    |                                                                                                 |
| 2    | Bolt                         | 2    |                                                                                                 |
| 3    | Intake grate                 | 1    |                                                                                                 |
| 4    | Bolt                         | 4    |                                                                                                 |
| 5    | Intake duct                  | 1    |                                                                                                 |
| 6    | Screw                        | 4    |                                                                                                 |
| 7    | Speed sensor                 | 1    | <b>NOTE:</b> _____<br>Route the speed sensor lead between the jet pump unit and the bilge hose. |

## EXPLODED DIAGRAM



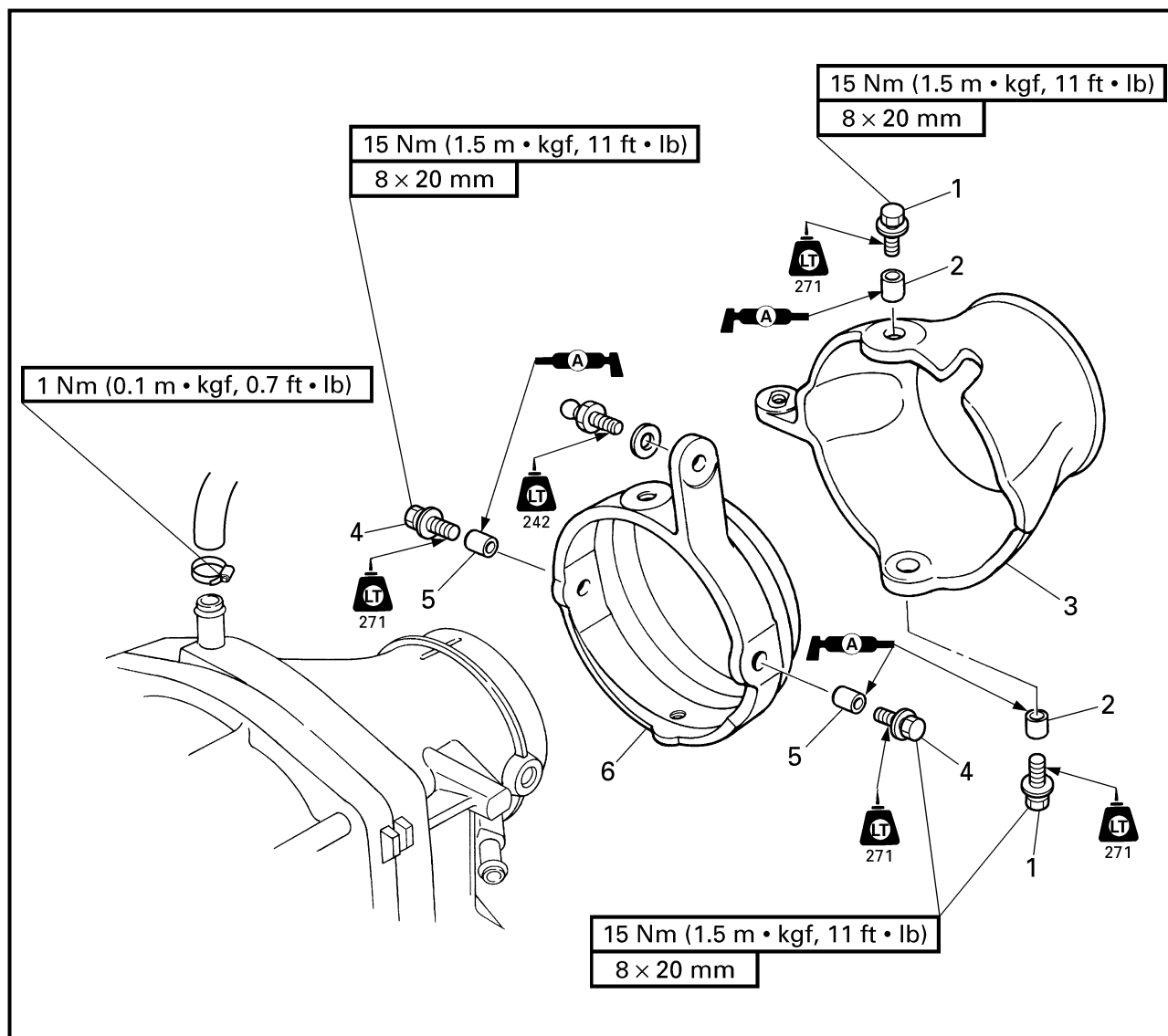
| Step | Procedure/Part name  | Q'ty | Service points |
|------|----------------------|------|----------------|
| 8    | Bolt                 | 4    |                |
| 9    | Ride plate           | 1    |                |
| 10   | QSTS cable joint     | 1    |                |
| 11   | Bilge hose           | 1    |                |
| 12   | Nut/washer           | 1/2  |                |
| 13   | Steering cable joint | 1    |                |
| 14   | Clamp/spout hose     | 1/1  |                |
| 15   | Bolt                 | 1    |                |
| 16   | Bolt                 | 4    |                |

**EXPLODED DIAGRAM**



| Step | Procedure/Part name    | Q'ty | Service points                                                                                                                                                                                                                                       |
|------|------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17   | Jet pump unit assembly | 1    | <b>NOTE:</b> _____<br>• Pull the jet pump unit straight back.<br>• When installing the jet pump unit, align the drive shaft spline (male) with the intermediate drive shaft spline (female).<br>_____<br>Reverse the removal steps for installation. |
| 18   | Dowel pin              | 2    |                                                                                                                                                                                                                                                      |

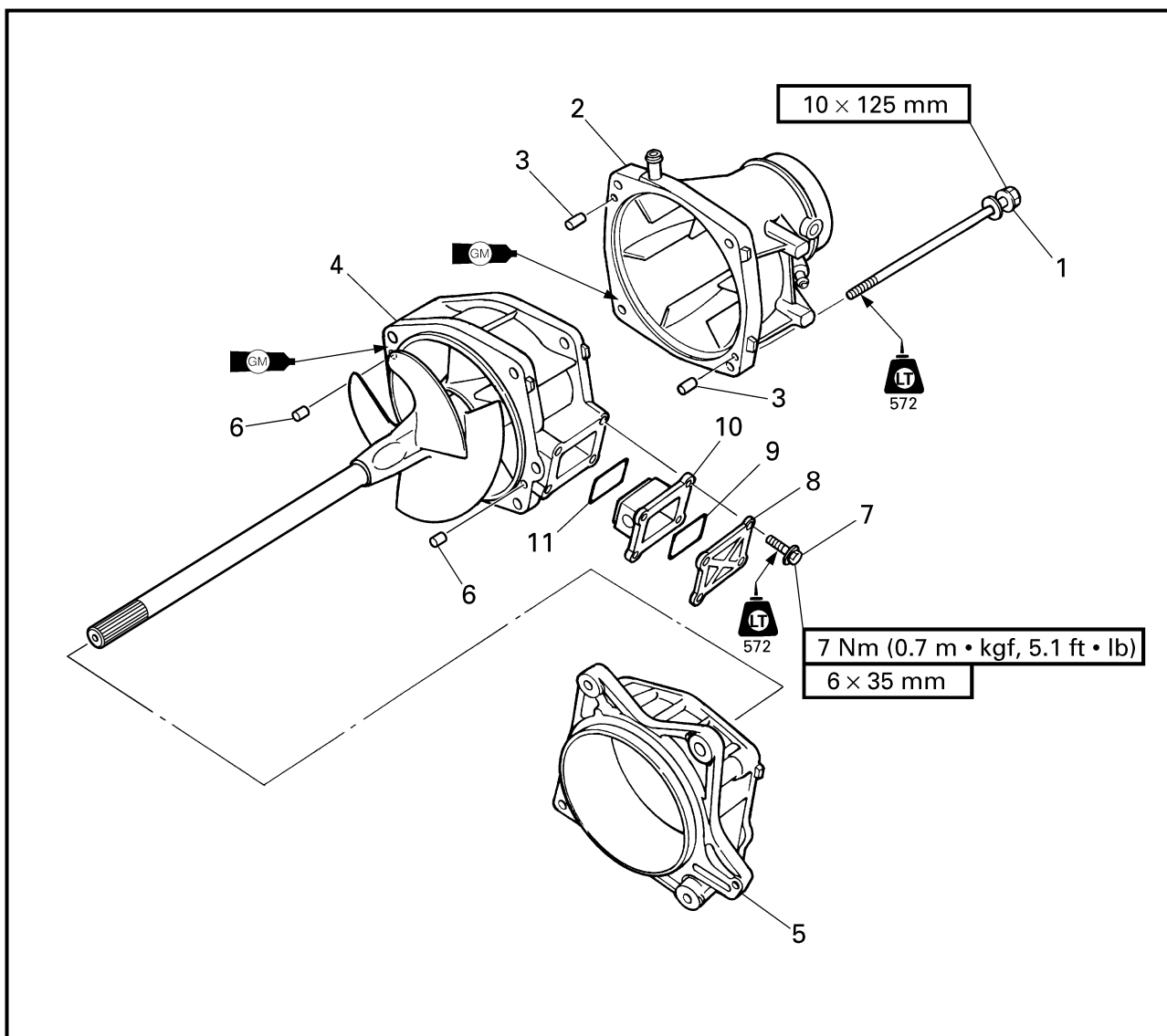
**NOZZLE DEFLECTOR AND NOZZLE RING  
EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

| Step | Procedure/Part name                             | Q'ty | Service points                              |
|------|-------------------------------------------------|------|---------------------------------------------|
|      | <b>NOZZLE DEFLECTOR AND NOZZLE RING REMOVAL</b> |      | Follow the left "Step" for removal.         |
|      | Jet pump unit                                   |      | Refer to "JET PUMP UNIT".                   |
| 1    | Bolt                                            | 2    |                                             |
| 2    | Collar                                          | 2    |                                             |
| 3    | Nozzle deflector                                | 1    |                                             |
| 4    | Bolt                                            | 2    |                                             |
| 5    | Collar                                          | 2    |                                             |
| 6    | Nozzle ring                                     | 1    |                                             |
|      |                                                 |      | Reverse the removal steps for installation. |

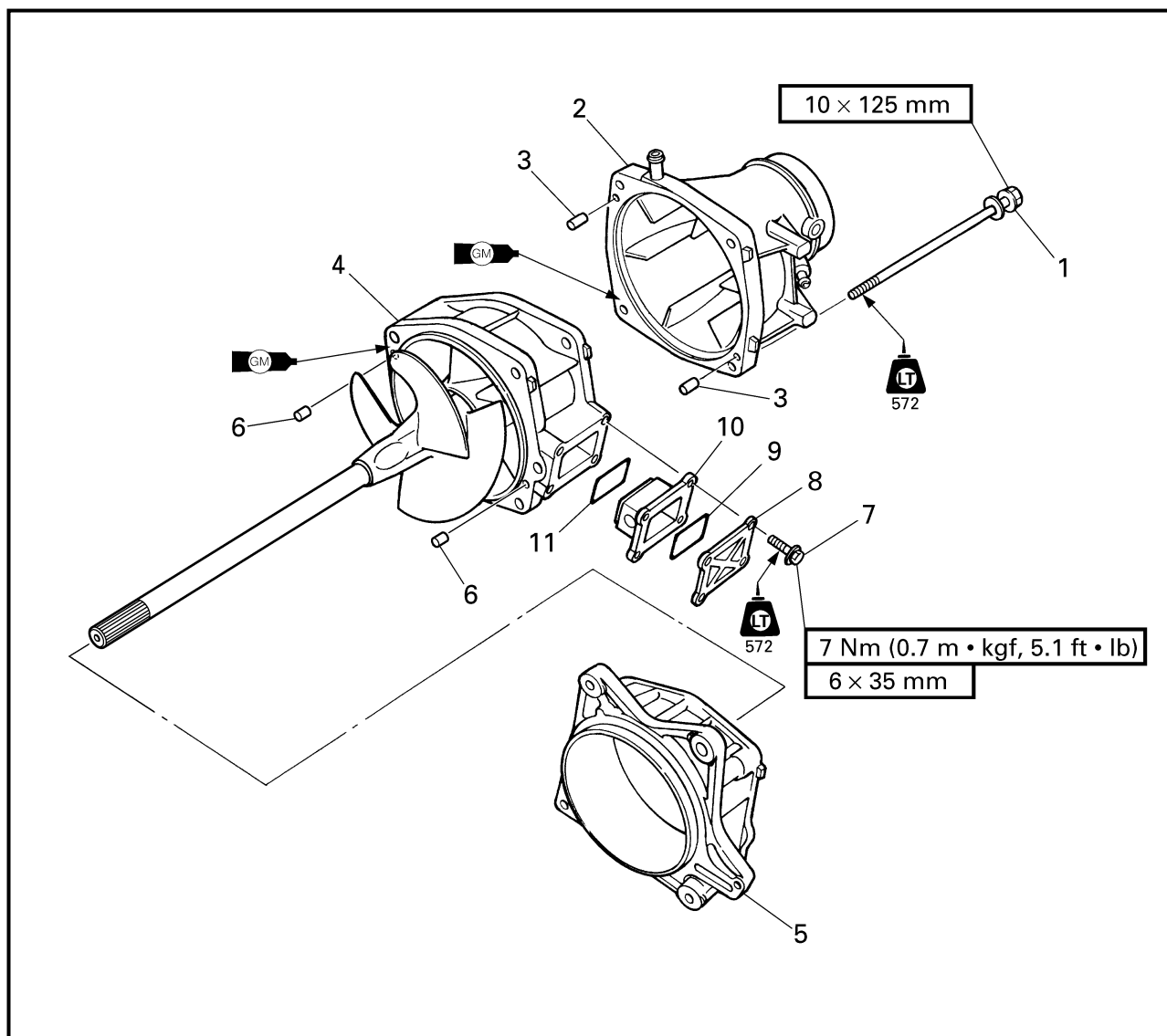
**IMPELLER DUCT, IMPELLER HOUSING, AND INTAKE DUCT  
EXPLODED DIAGRAM**



**REMOVAL AND INSTALLATION CHART**

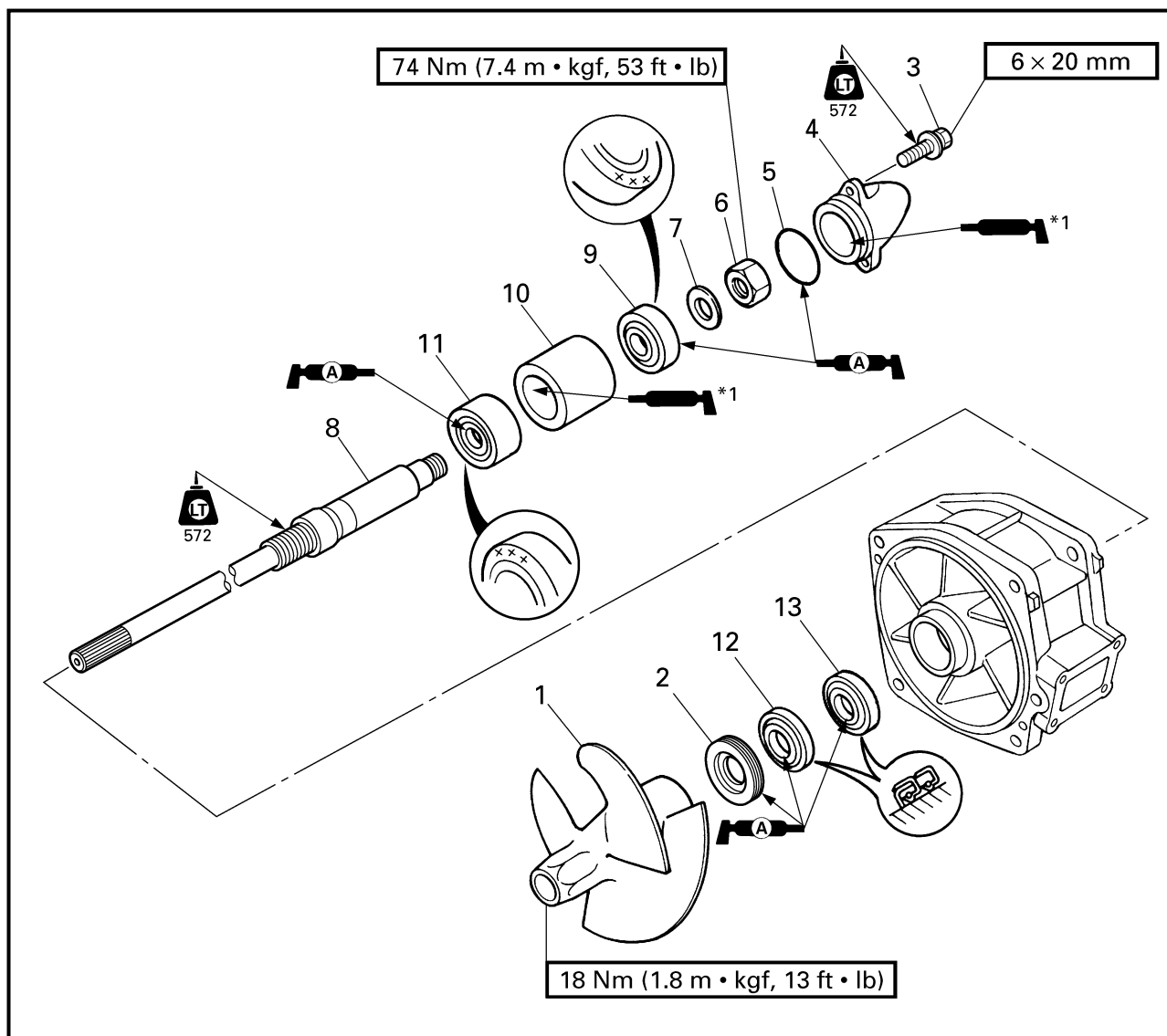
| Step | Procedure/Part name                               | Q'ty | Service points                                                                       |
|------|---------------------------------------------------|------|--------------------------------------------------------------------------------------|
|      | <b>IMPELLER DUCT AND IMPELLER HOUSING REMOVAL</b> |      | Follow the left "Step" for removal.                                                  |
|      | Nozzle ring                                       |      | Refer to "NOZZLE DEFLECTOR AND NOZZLE RING".                                         |
| 1    | Bolt                                              | 4    | <b>NOTE:</b> _____<br>Clean the matching surfaces before applying the Gasket Maker®. |
| 2    | Nozzle                                            | 1    |                                                                                      |
| 3    | Pin                                               | 2    |                                                                                      |
| 4    | Impeller duct assembly                            | 1    |                                                                                      |
| 5    | Impeller housing                                  | 1    |                                                                                      |
| 6    | Pin                                               | 2    |                                                                                      |

**EXPLODED DIAGRAM**



| Step | Procedure/Part name  | Q'ty | Service points                              |
|------|----------------------|------|---------------------------------------------|
| 7    | Bolt                 | 4    | Reverse the removal steps for installation. |
| 8    | Water inlet cover    | 1    |                                             |
| 9    | Packing              | 1    |                                             |
| 10   | Water inlet strainer | 1    |                                             |
| 11   | Packing              | 1    |                                             |

## IMPELLER DUCT AND DRIVE SHAFT EXPLODED DIAGRAM

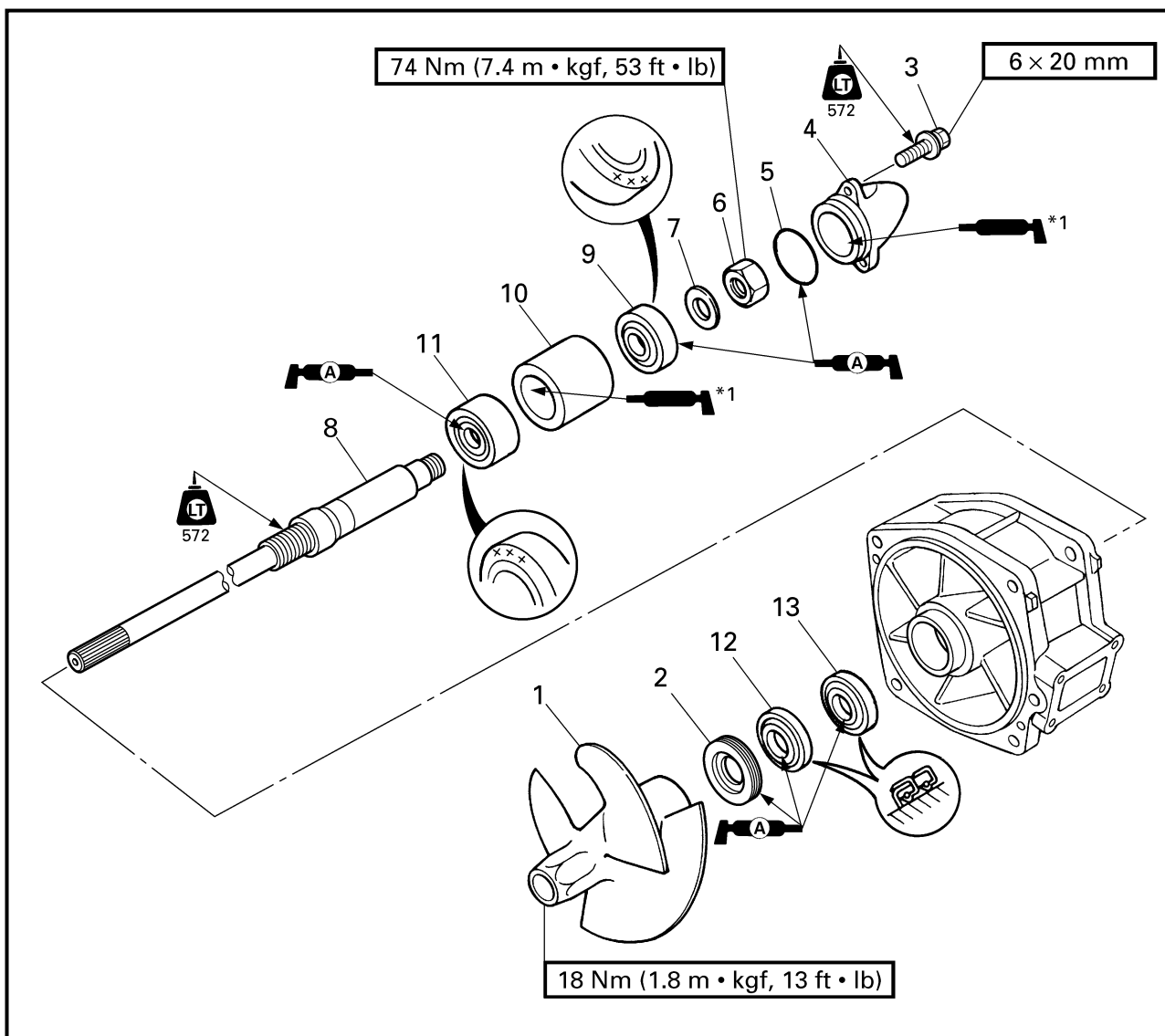


## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name                              | Q'ty | Service points                          |
|------|--------------------------------------------------|------|-----------------------------------------|
|      | <b>IMPELLER DUCT AND DRIVE SHAFT DISASSEMBLY</b> |      | Follow the left "Step" for disassembly. |
| 1    | Impeller                                         | 1    | Left-hand threads                       |
| 2    | Spacer                                           | 1    |                                         |
| 3    | Bolt                                             | 3    |                                         |
| 4    | Cap                                              | 1    |                                         |
| 5    | O-ring                                           | 1    |                                         |
| 6    | Nut                                              | 1    |                                         |
| 7    | Washer                                           | 1    |                                         |

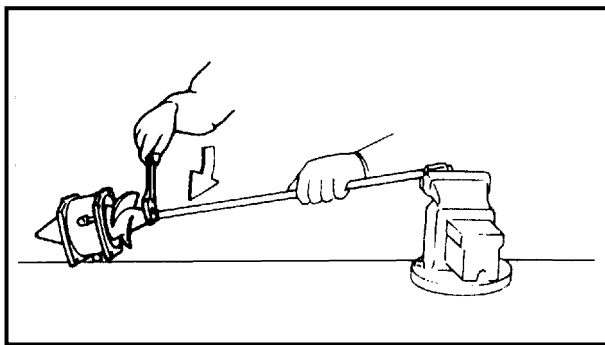
\*1: EPNOC grease AP #0

## EXPLODED DIAGRAM



| Step | Procedure/Part name | Q'ty | Service points                                                                                                                                      |
|------|---------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 8    | Drive shaft         | 1    | <b>Not reusable</b><br><br><b>Not reusable</b><br><br><b>Not reusable</b><br><br><b>Not reusable</b><br>Reverse the disassembly steps for assembly. |
| 9    | Rear bearing        | 1    |                                                                                                                                                     |
| 10   | Spacer              | 1    |                                                                                                                                                     |
| 11   | Front bearing       | 1    |                                                                                                                                                     |
| 12   | Oil seal            | 1    |                                                                                                                                                     |
| 13   | Oil seal            | 1    |                                                                                                                                                     |

\*1: EPNOC grease AP #0



**SERVICE POINTS**

**Drive shaft removal**

1. Remove:
  - Impeller



**Drive shaft holder:**  
**YB-06151/90890-06519**

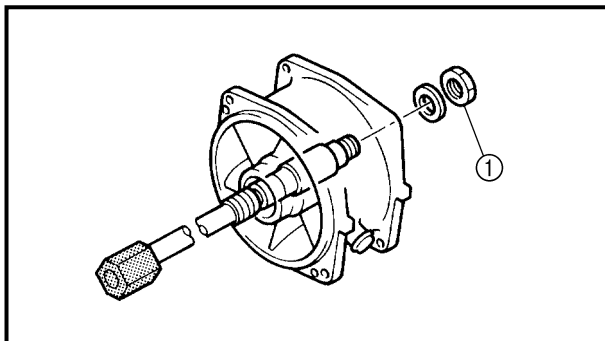
**NOTE:**

The impeller has left-hand threads. Turn the impeller clockwise to loosen it.

2. Remove:
  - Nut ①



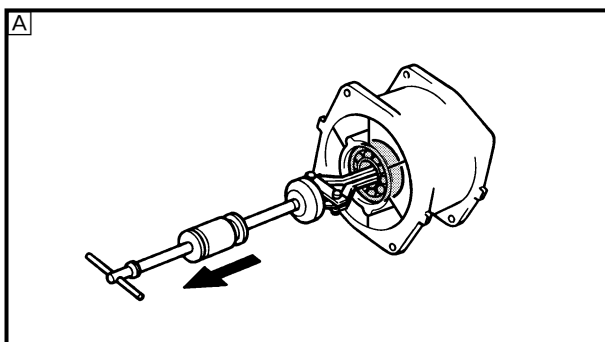
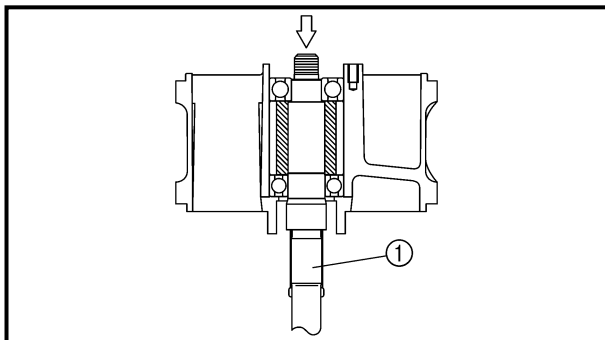
**Drive shaft holder:**  
**YB-06151/90890-06519**



3. Remove:
  - Drive shaft ①

**NOTE:**

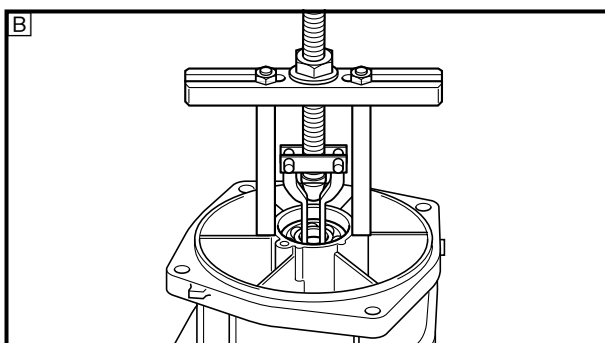
Remove the drive shaft with a press.



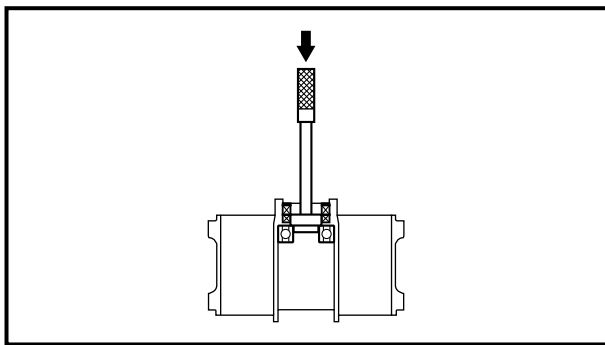
4. Remove:
  - Rear bearing



**Slide hammer set:**  
**YB-06096**  
**Stopper guide plate:**  
**90890-06501**  
**Bearing puller:**  
**90890-06535**  
**Bearing puller claw 1:**  
**90890-06536**  
**Stopper guide stand:**  
**90890-06538**



- [A] For USA and Canada  
[B] For worldwide



5. Remove:

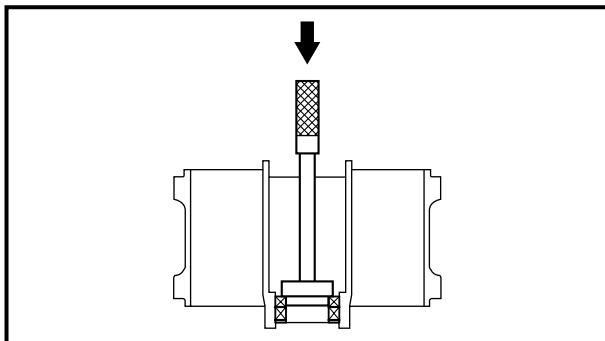
- Front bearing



**Driver rod L3:**  
YB-06071/90890-06652  
**Needle bearing attachment:**  
YB-06112/90890-06614

**NOTE:**

Remove the front bearing with a press.



6. Remove:

- Oil seal



**Driver rod L3:**  
YB-06071/90890-06652  
**Needle bearing attachment:**  
YB-06196/90890-06653

**NOTE:**

Remove the oil seal with press.

### Impeller inspection

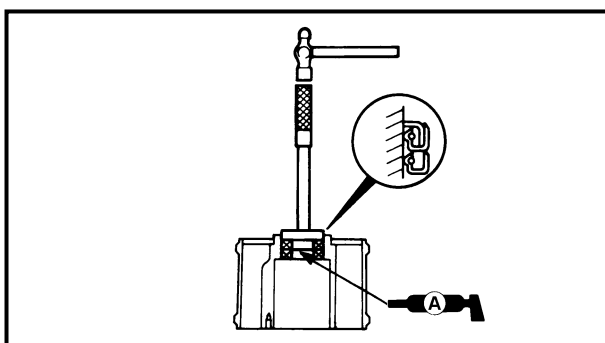
Refer to "JET PUMP UNIT" in chapter 3.

### Drive shaft inspection

1. Inspect:

- Drive shaft

Damage/wear → Replace.



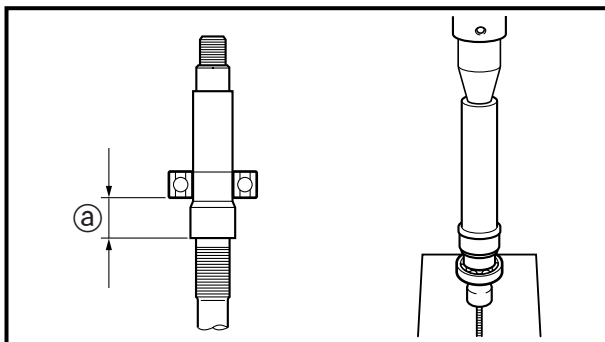
### Drive shaft installation

1. Install:

- Oil seal



**Driver rod:**  
YB-06071/90890-06606  
**Ball bearing attachment:**  
YB-06156/90890-06634



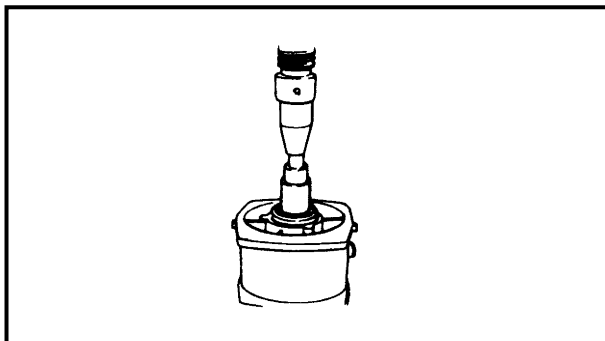
2. Install:
- Front bearing
  - Drive shaft

**NOTE:**

Install the front bearing and drive shaft with a press.



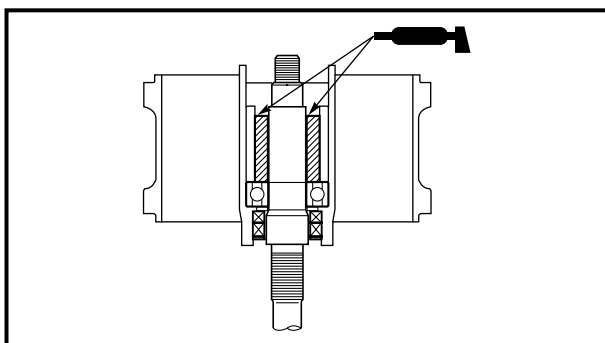
**Distance ①:**  
 **$23 \pm 0.1 \text{ mm}$  ( $0.91 \pm 0.004 \text{ in}$ )**



3. Install:
- Drive shaft (with front bearing)
  - Spacer
  - Impeller duct

**NOTE:**

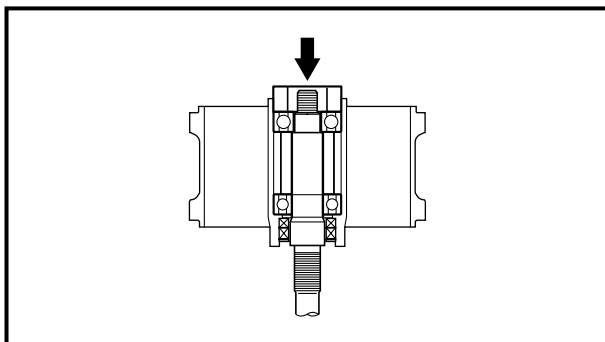
Press the spacer and the front bearing with a 36-mm deep socket.



4. Add:
- EPNOC grease AP #0  
(between the drive shaft and spacer)



**Quantity:**  
**Approximately 1/3 of capacity**



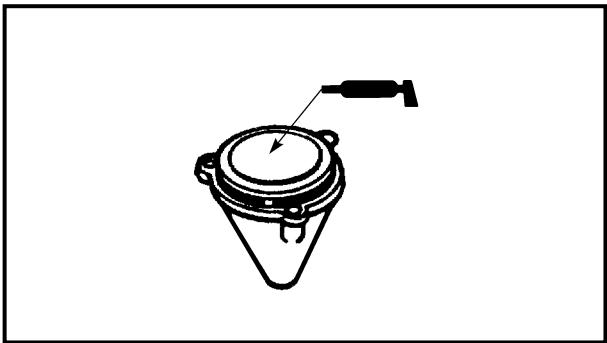
5. Install:
- Rear bearing



**Bearing inner/outer race  
attachment:**  
**YB-34474**

**NOTE:**

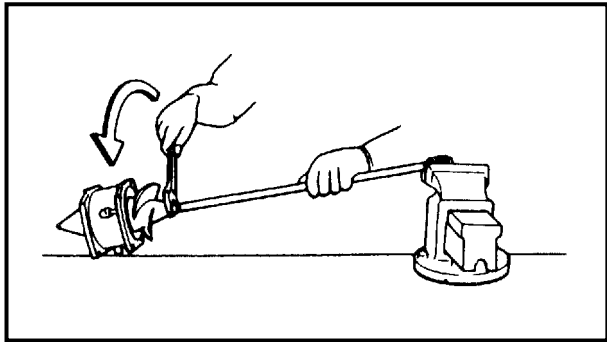
- Press the bearing inner/outer race at the same time holding the drive shaft and impeller duct.
- If a bearing inner/outer race attachment is not available, use a washer or pipe with an outer diameter of 46 mm (1.81 in) and an inner diameter of 20 mm (0.79 in).



6. Add:
- EPNOC grease AP #0 (into the cap)



**Quantity:**  
Approximately 1/3 of capacity

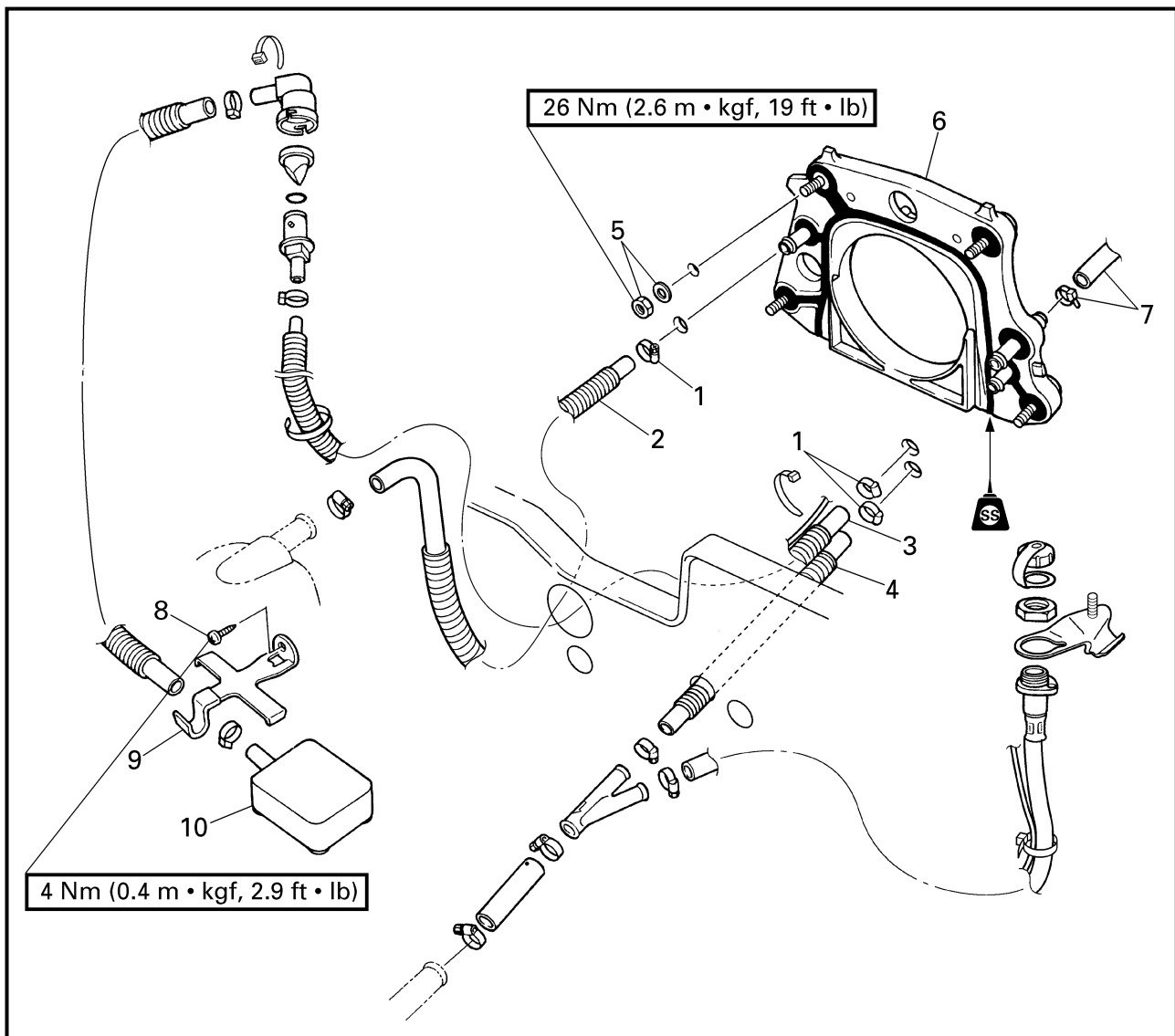


7. Install:
- Nut
  - Impeller



**Drive shaft holder:**  
YB-06151/90890-06519

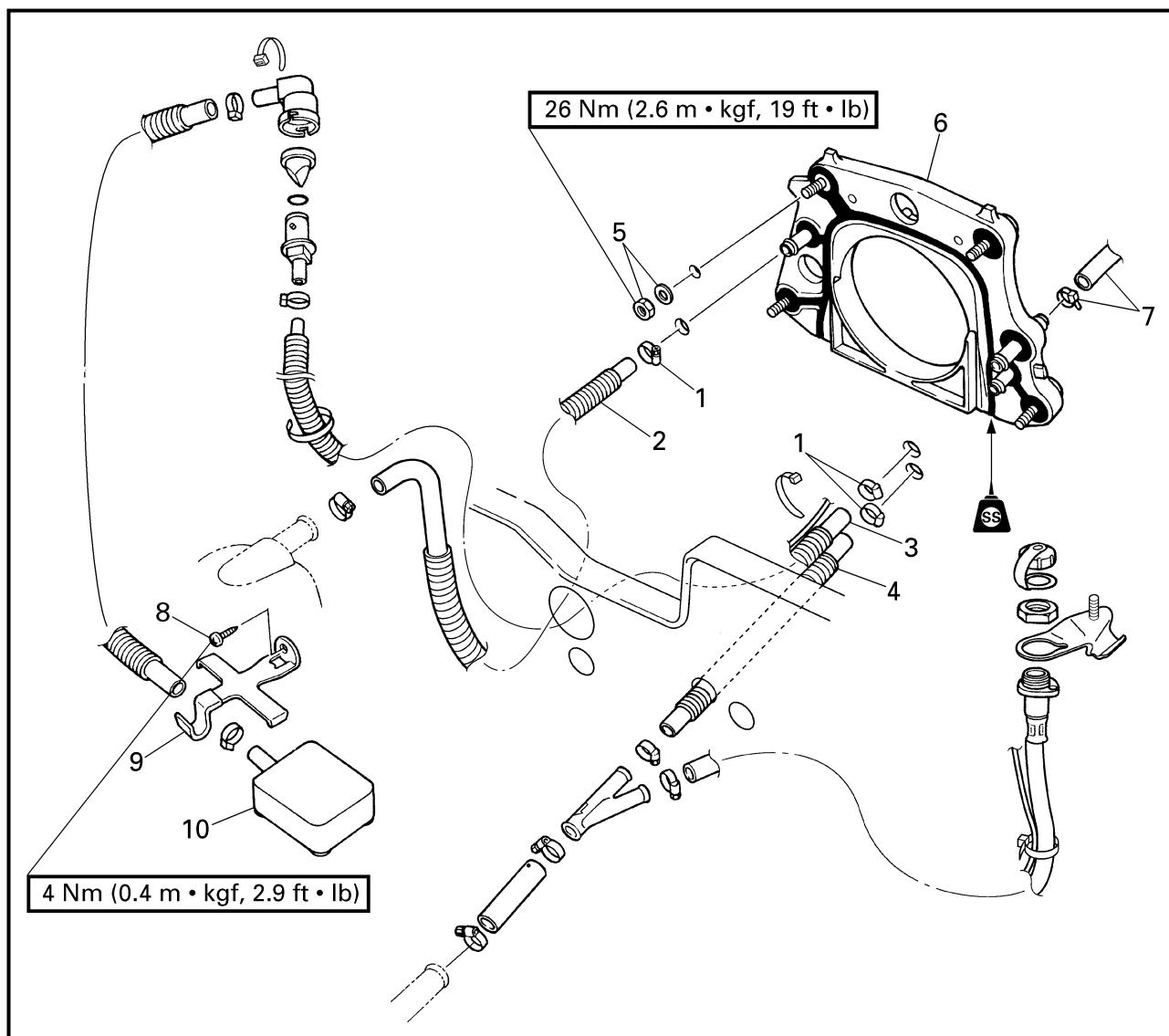
**TRANSOM PLATE AND HOSES  
EXPLODED DIAGRAM**



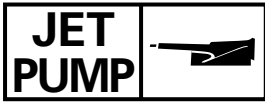
**REMOVAL AND INSTALLATION CHART**

| Step | Procedure/Part name                    | Q'ty | Service points                                                                    |
|------|----------------------------------------|------|-----------------------------------------------------------------------------------|
|      | <b>TRANSOM PLATE AND HOSES REMOVAL</b> |      | Follow the left "Step" for removal.                                               |
|      | Exhaust system                         |      | Refer to "EXHAUST SYSTEM" in chapter 8.                                           |
|      | Jet pump unit                          |      | Refer to "JET PUMP UNIT".                                                         |
| 1    | Hose clamp                             | 3    |                                                                                   |
| 2    | Hose                                   | 1    | Cooling water outlet                                                              |
| 3    | Bilge hose 1                           | 1    | <b>NOTE:</b> _____<br>Route the bilge hose 1 under the drive shaft tube.<br>_____ |

## EXPLODED DIAGRAM



| Step | Procedure/Part name   | Q'ty | Service points                              |
|------|-----------------------|------|---------------------------------------------|
| 4    | Hose                  | 1    | Cooling water inlet                         |
| 5    | Nut/washer            | 4/4  |                                             |
| 6    | Transom plate         | 1    |                                             |
| 7    | Clamp/bilge hose 2    | 1/1  |                                             |
| 8    | Screw                 | 1    |                                             |
| 9    | Bilge strainer holder | 1    |                                             |
| 10   | Bilge strainer        | 1    |                                             |
|      |                       |      | Reverse the removal steps for installation. |



### SERVICE POINTS

#### Bilge strainer inspection

Refer to "JET PUMP UNIT" in chapter 3.

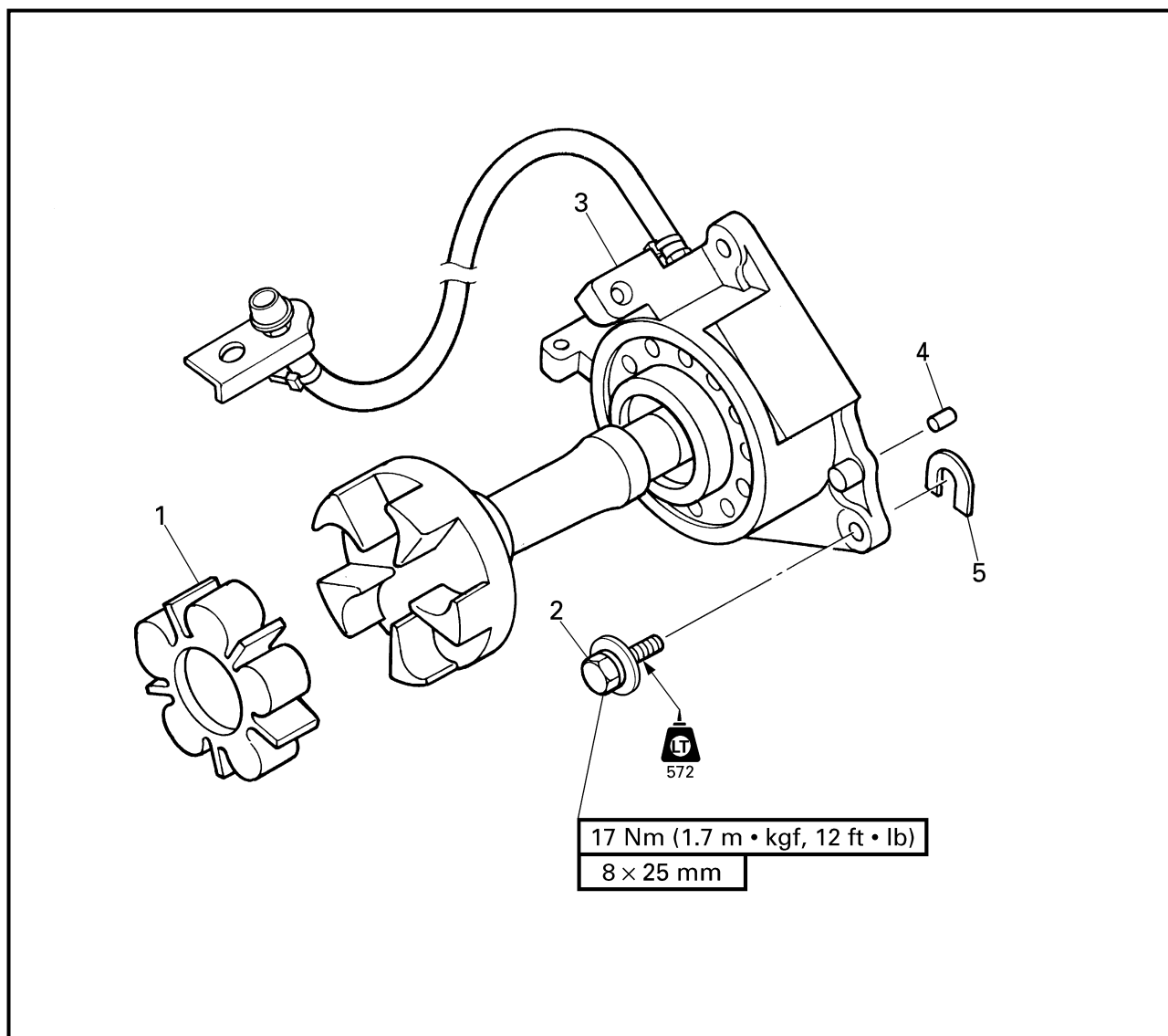
#### Bilge hose inspection

1. Inspect:

- Bilge hose

Cracks/damage/wear → Replace.

**BEARING HOUSING  
EXPLODED DIAGRAM**

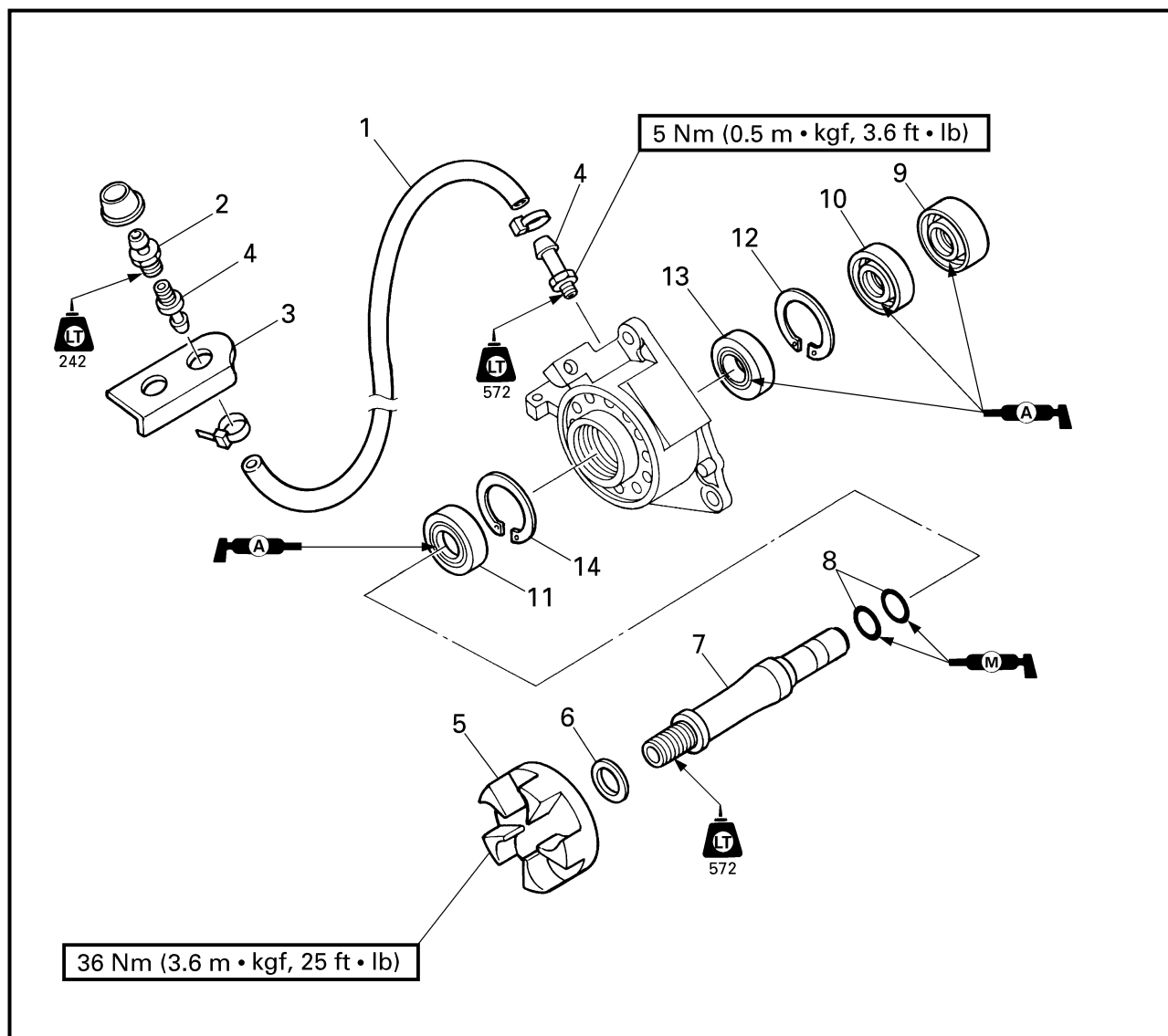


**REMOVAL AND INSTALLATION CHART**

| Step | Procedure/Part name            | Q'ty | Service points                                                                                                               |
|------|--------------------------------|------|------------------------------------------------------------------------------------------------------------------------------|
|      | <b>BEARING HOUSING REMOVAL</b> |      |                                                                                                                              |
|      | Engine unit                    |      | Follow the left "Step" for removal.<br>Refer to "ENGINE UNIT" in chapter 5.                                                  |
| 1    | Rubber coupling                | 1    |                                                                                                                              |
| 2    | Bolt                           | 3    |                                                                                                                              |
| 3    | Intermediate housing assembly  | 1    |                                                                                                                              |
| 4    | Pin                            | 2    |                                                                                                                              |
| 5    | Shim                           | *    | <b>NOTE:</b> _____<br>Install the shims in their original locations.<br>_____<br>Reverse the removal steps for installation. |

\*: As required

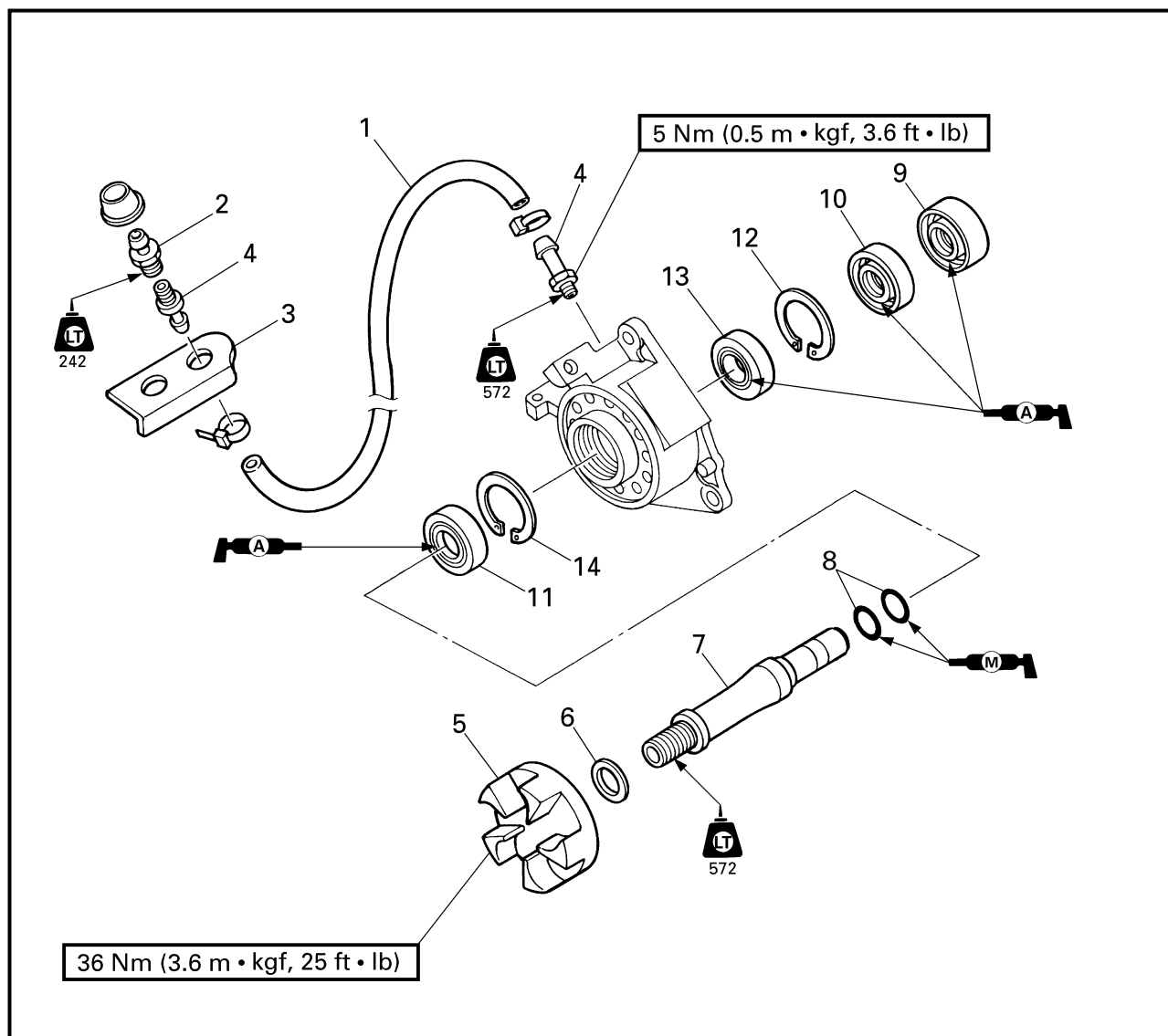
**EXPLODED DIAGRAM**



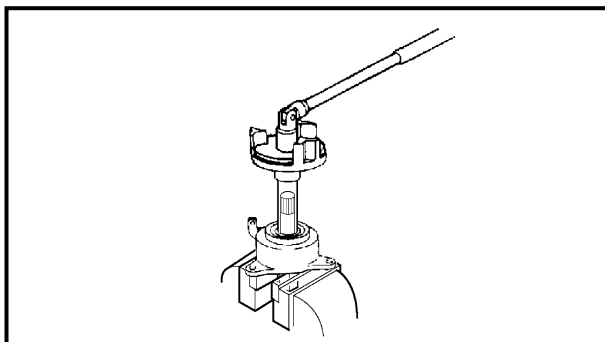
**REMOVAL AND INSTALLATION CHART**

| Step | Procedure/Part name                    | Q'ty | Service points                          |
|------|----------------------------------------|------|-----------------------------------------|
|      | <b>BEARING HOUSING<br/>DISASSEMBLY</b> |      | Follow the left "Step" for disassembly. |
| 1    | Grease hose                            | 1    |                                         |
| 2    | Grease nipple                          | 1    |                                         |
| 3    | Grease nipple stay                     | 1    |                                         |
| 4    | Nipple                                 | 2    |                                         |
| 5    | Driven coupling                        | 1    |                                         |
| 6    | Washer                                 | 1    |                                         |
| 7    | Intermediate drive shaft               | 1    |                                         |

**EXPLODED DIAGRAM**



| Step | Procedure/Part name | Q'ty | Service points                              |
|------|---------------------|------|---------------------------------------------|
| 8    | O-ring              | 2    |                                             |
| 9    | Oil seal            | 1    | <b>Not reusable</b>                         |
| 10   | Oil seal            | 1    | <b>Not reusable</b>                         |
| 11   | Oil seal            | 1    | <b>Not reusable</b>                         |
| 12   | Circlip             | 1    |                                             |
| 13   | Bearing             | 1    | <b>Not reusable</b>                         |
| 14   | Circlip             | 1    |                                             |
|      |                     |      | Reverse the disassembly steps for assembly. |



## SERVICE POINTS

### Driven coupling removal and installation

1. Remove and install:

- Driven coupling



**Coupler wrench:**  
**YW-06551/90890-06551**  
**Shaft holder:**  
**YB-06552/90890-06552**

### NOTE:

Install the driven coupling with the same special tools that were used for removal.

### Intermediate drive shaft removal

1. Remove:

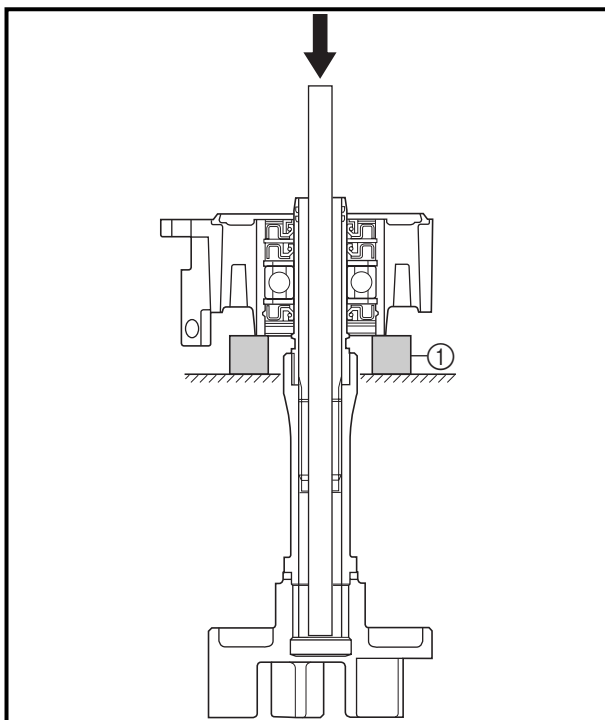
- Intermediate drive shaft

#### Removal steps:

- Temporarily install the driven coupling to the intermediate drive shaft.
- Insert the long rod to the driven coupling shaft.
- Press out the intermediate drive shaft by pushing the rod.

### NOTE:

Support the intermediate housing with steel blocks ① and press the driven coupling shaft.



### Bearing removal

1. Remove:

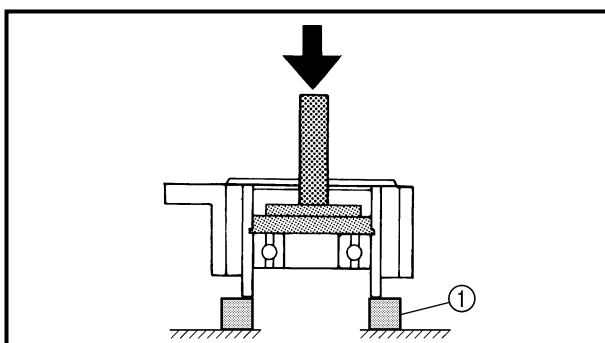
- Bearing

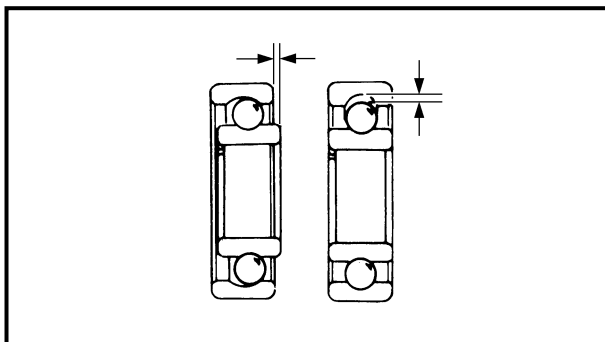


**Driver rod:**  
**YB-06071/90890-06606**  
**Bearing outer race attachment:**  
**YB-06016/90890-06626**

### NOTE:

- Install the bearing with the same special tools that were used for removal.
- Support the intermediate housing with steel blocks ① and press the bearing.





### Bearing, driven coupling shaft, and grease hose inspection

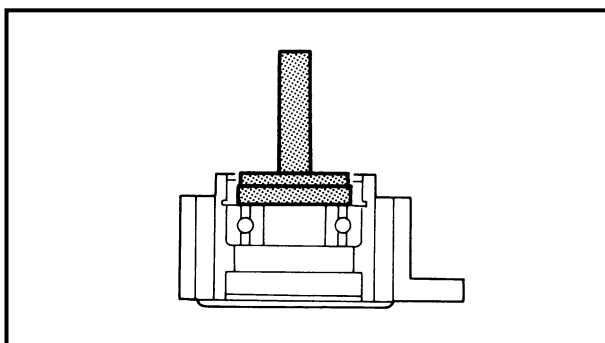
#### 1. Inspect:

- Bearing  
Rotate the inner race by hand.  
Damage/rough movement → Replace.
- Intermediate drive shaft  
Damage/pitting → Replace.
- Grease hose  
Cracks/wear → Replace.

### Driven coupling inspection

#### 1. Inspect:

- Driven coupling
- Driven coupling damper  
Damage/wear → Replace.



### Bearing installation

#### 1. Install:

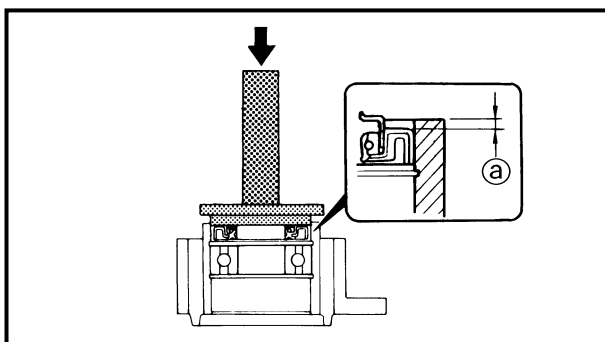
- Circlip (rear)

#### 2. Install:

- Bearing



**Driver rod:**  
YB-06071/90890-06606  
**Bearing outer race attachment:**  
YB-06016/90890-06626



### Oil seal installation

#### 1. Install:

- Oil seal



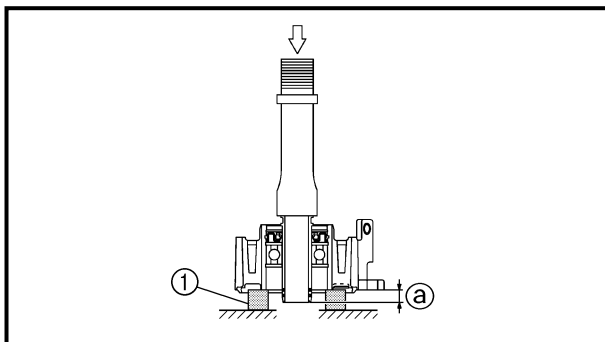
**Driver rod:**  
YB-06071/90890-06606  
**Bearing outer race attachment:**  
YB-06016/90890-06626

### NOTE:

Before installing the oil seal, lubricate the clip glove with water resistant grease.



**Distance ①:**  
6.8 ~ 7.2 mm (0.27 ~ 0.28 in)



**2. Install:**

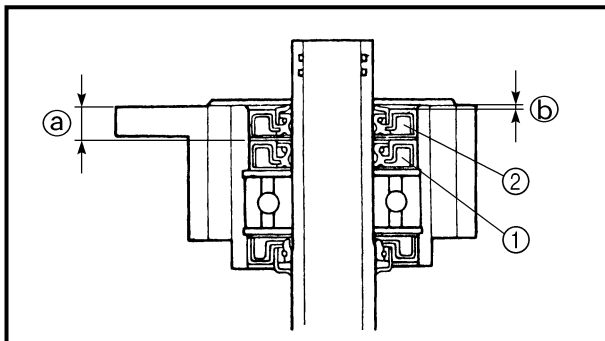
- Intermediate drive shaft



**Distance ①:**  
9.5 ~ 10.5 mm (0.37 ~ 0.41 in)

**NOTE:**

Support the intermediate housing with steel blocks ① and press the driven coupling shaft.

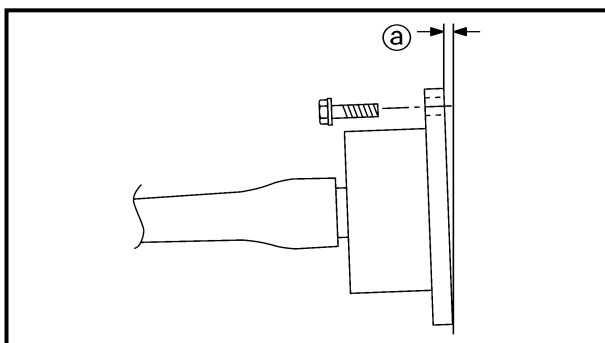


**3. Install:**

- Oil seal ① [8 mm (0.31 in)]
- Oil seal ② [10 mm (0.39 in)]



**Distance ①:**  
10.3 ~ 10.7 mm (0.41 ~ 0.42 in)  
**Distance ②:**  
1.6 ~ 2.0 mm (0.06 ~ 0.08 in)



**Intermediate housing installation**

**1. Install:**

- Intermediate housing
- Shim

**Installation steps:**

- Install the intermediate housing.
- Measure the clearance ① at each bolt hole.
- Install the suitable shim from the table below.

| Clearance ①                        | Shim thickness |
|------------------------------------|----------------|
| 0 ~ 0.2 mm<br>(0 ~ 0.008 in)       | No need        |
| 0.3 ~ 0.7 mm<br>(0.012 ~ 0.028 in) | 0.5 mm         |
| 0.8 ~ 1.2 mm<br>(0.031 ~ 0.047 in) | 1.0 mm         |
| 1.3 ~ 2.0 mm<br>(0.051 ~ 0.079 in) | 1.5 mm         |

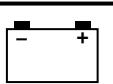
**NOTE:**

Install the shim(s) to the original position if the intermediate housing is not replaced.

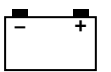
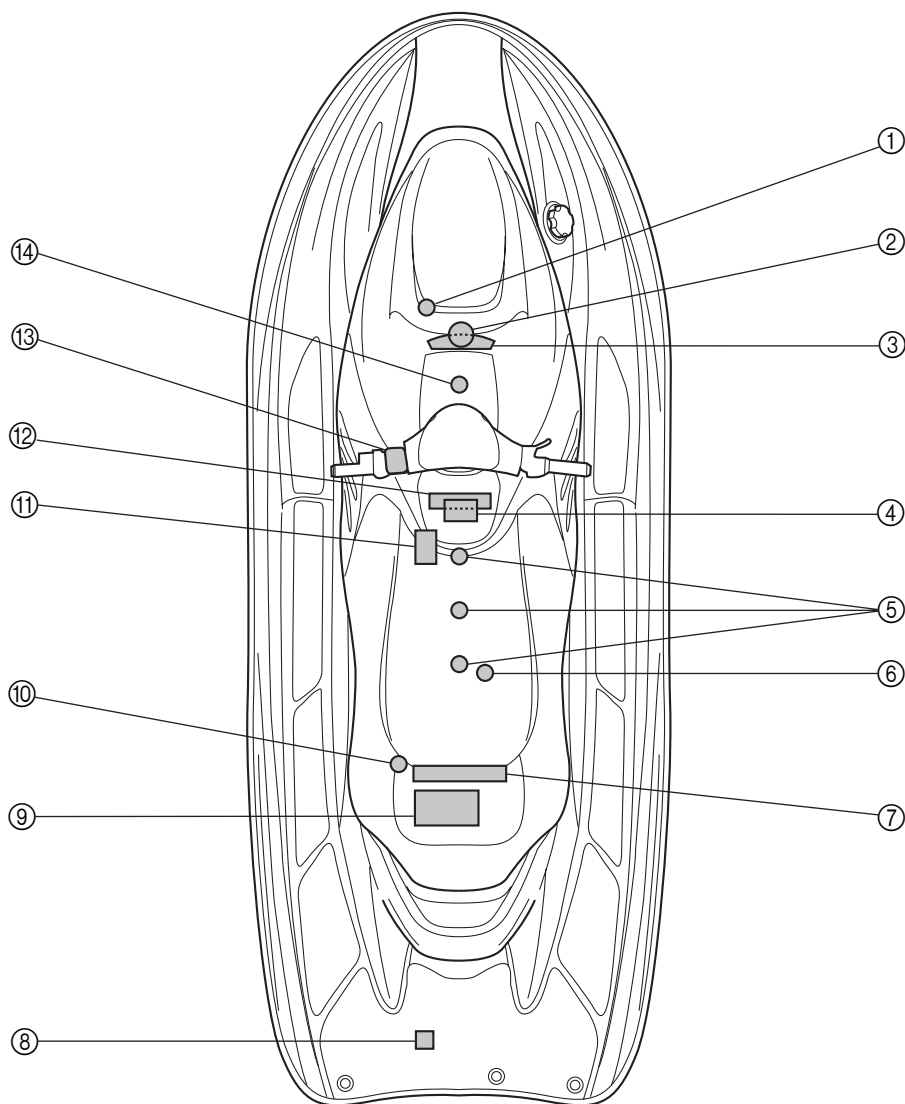
## CHAPTER 7

### ELECTRICAL SYSTEM

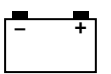
|                                           |             |
|-------------------------------------------|-------------|
| <b>ELECTRICAL COMPONENTS.....</b>         | <b>7-1</b>  |
| <b>ELECTRICAL BOX.....</b>                | <b>7-2</b>  |
| EXPLODED DIAGRAM.....                     | 7-2         |
| REMOVAL AND INSTALLATION CHART .....      | 7-2         |
| <b>ELECTRICAL ANALYSIS .....</b>          | <b>7-7</b>  |
| INSPECTION.....                           | 7-7         |
| Digital circuit tester .....              | 7-7         |
| Low resistance measurement.....           | 7-8         |
| Peak voltage measurement.....             | 7-8         |
| Peak voltage adaptor .....                | 7-8         |
| Test harness .....                        | 7-9         |
| <b>IGNITION SYSTEM.....</b>               | <b>7-10</b> |
| WIRING DIAGRAM.....                       | 7-10        |
| IGNITION SPARK GAP.....                   | 7-11        |
| IGNITION SYSTEM PEAK VOLTAGE.....         | 7-12        |
| BATTERY .....                             | 7-14        |
| FUSE .....                                | 7-14        |
| SPARK PLUGS .....                         | 7-14        |
| SPARK PLUG LEAD ASSEMBLY.....             | 7-14        |
| IGNITION COIL.....                        | 7-15        |
| ENGINE STOP SWITCH.....                   | 7-15        |
| WATER TEMPERATURE SENSOR.....             | 7-16        |
| EXHAUST TEMPERATURE SENSOR .....          | 7-16        |
| <b>STARTING SYSTEM.....</b>               | <b>7-17</b> |
| WIRING DIAGRAM.....                       | 7-17        |
| BATTERY .....                             | 7-18        |
| WIRING CONNECTIONS .....                  | 7-18        |
| FUSE .....                                | 7-18        |
| STARTER SWITCH.....                       | 7-19        |
| STARTER RELAY.....                        | 7-19        |
| <b>STARTER MOTOR .....</b>                | <b>7-20</b> |
| EXPLODED DIAGRAM.....                     | 7-20        |
| REMOVAL AND INSTALLATION CHART .....      | 7-20        |
| SERVICE POINTS .....                      | 7-23        |
| Armature inspection .....                 | 7-23        |
| Brush holder inspection .....             | 7-24        |
| Starter motor front cover inspection..... | 7-24        |



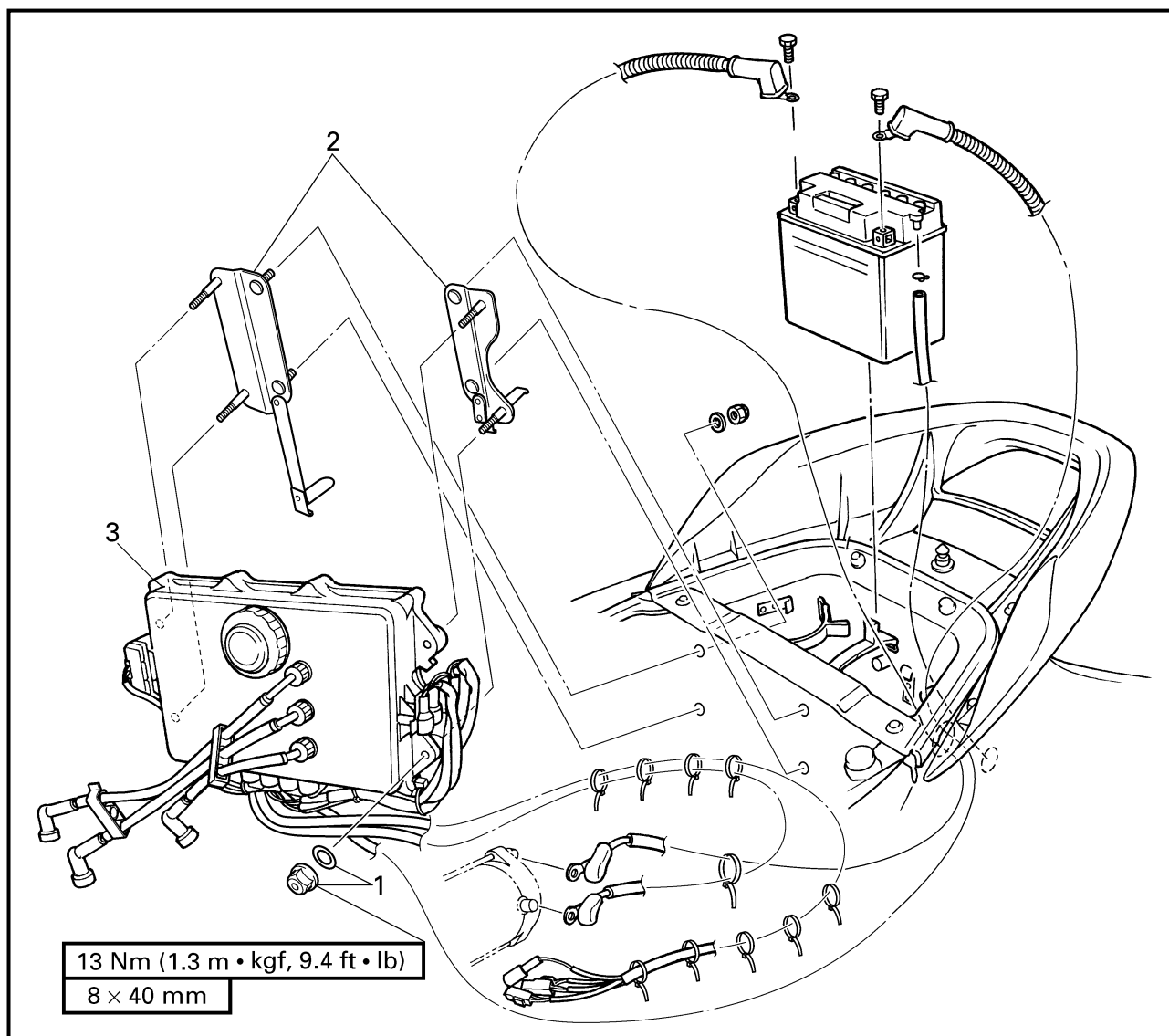
|                                           |      |
|-------------------------------------------|------|
| <b>CHARGING SYSTEM</b> .....              | 7-25 |
| WIRING DIAGRAM.....                       | 7-25 |
| FUSE .....                                | 7-26 |
| BATTERY .....                             | 7-26 |
| LIGHTING COIL .....                       | 7-26 |
| RECTIFIER/REGULATOR.....                  | 7-26 |
| <br><b>YPVS</b> .....                     | 7-27 |
| WIRING DIAGRAM.....                       | 7-27 |
| FUSE .....                                | 7-28 |
| BATTERY .....                             | 7-28 |
| PICKUP COIL .....                         | 7-28 |
| CDI UNIT .....                            | 7-28 |
| LIGHTING COIL .....                       | 7-28 |
| RECTIFIER/REGULATOR.....                  | 7-28 |
| <br><b>YPVS SERVOMOTOR</b> .....          | 7-29 |
| EXPLODED DIAGRAM .....                    | 7-29 |
| REMOVAL AND INSTALLATION CHART .....      | 7-29 |
| SERVICE POINTS .....                      | 7-30 |
| YPVS cable removal and installation ..... | 7-30 |
| YPVS cable inspection .....               | 7-30 |
| YPVS servomotor inspection .....          | 7-30 |
| YPVS cable adjustment .....               | 7-31 |
| <br><b>INDICATION SYSTEM</b> .....        | 7-32 |
| WIRING DIAGRAM.....                       | 7-32 |
| FUSE .....                                | 7-33 |
| BATTERY .....                             | 7-33 |
| LIGHTING COIL .....                       | 7-33 |
| RECTIFIER/REGULATOR.....                  | 7-33 |
| CDI UNIT.....                             | 7-33 |
| WATER TEMPERATURE SENSOR.....             | 7-33 |
| EXHAUST TEMPERATURE SENSOR .....          | 7-33 |
| BUZZER .....                              | 7-33 |
| OIL LEVEL SENSOR .....                    | 7-33 |
| FUEL LEVEL SENSOR.....                    | 7-34 |
| MULTI-FUNCTION METER.....                 | 7-34 |
| Multi-function meter .....                | 7-34 |
| MULTI-FUNCTION METER REMOVAL .....        | 7-34 |
| Display function .....                    | 7-35 |
| Fuel level gauge .....                    | 7-36 |
| Oil level gauge.....                      | 7-37 |
| Overheat warning indicator .....          | 7-38 |
| Speed meter .....                         | 7-40 |
| Speed sensor.....                         | 7-40 |


**ELECTRICAL COMPONENTS**


- |                              |                                                                     |
|------------------------------|---------------------------------------------------------------------|
| ① Buzzer                     | ⑨ Battery                                                           |
| ② Fuel level sensor          | ⑩ Water temperature sensor                                          |
| ③ Multi-function meter       | ⑪ Starter motor                                                     |
| ④ YPVS servomotor            | ⑫ Stator coil and pickup coil                                       |
| ⑤ Spark plugs                | ⑬ Engine stop switch, engine stop lanyard switch and starter switch |
| ⑥ Exhaust temperature sensor | ⑭ Oil level sensor                                                  |
| ⑦ Electrical box             |                                                                     |
| ⑧ Speed sensor               |                                                                     |

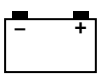


## ELECTRICAL BOX EXPLODED DIAGRAM

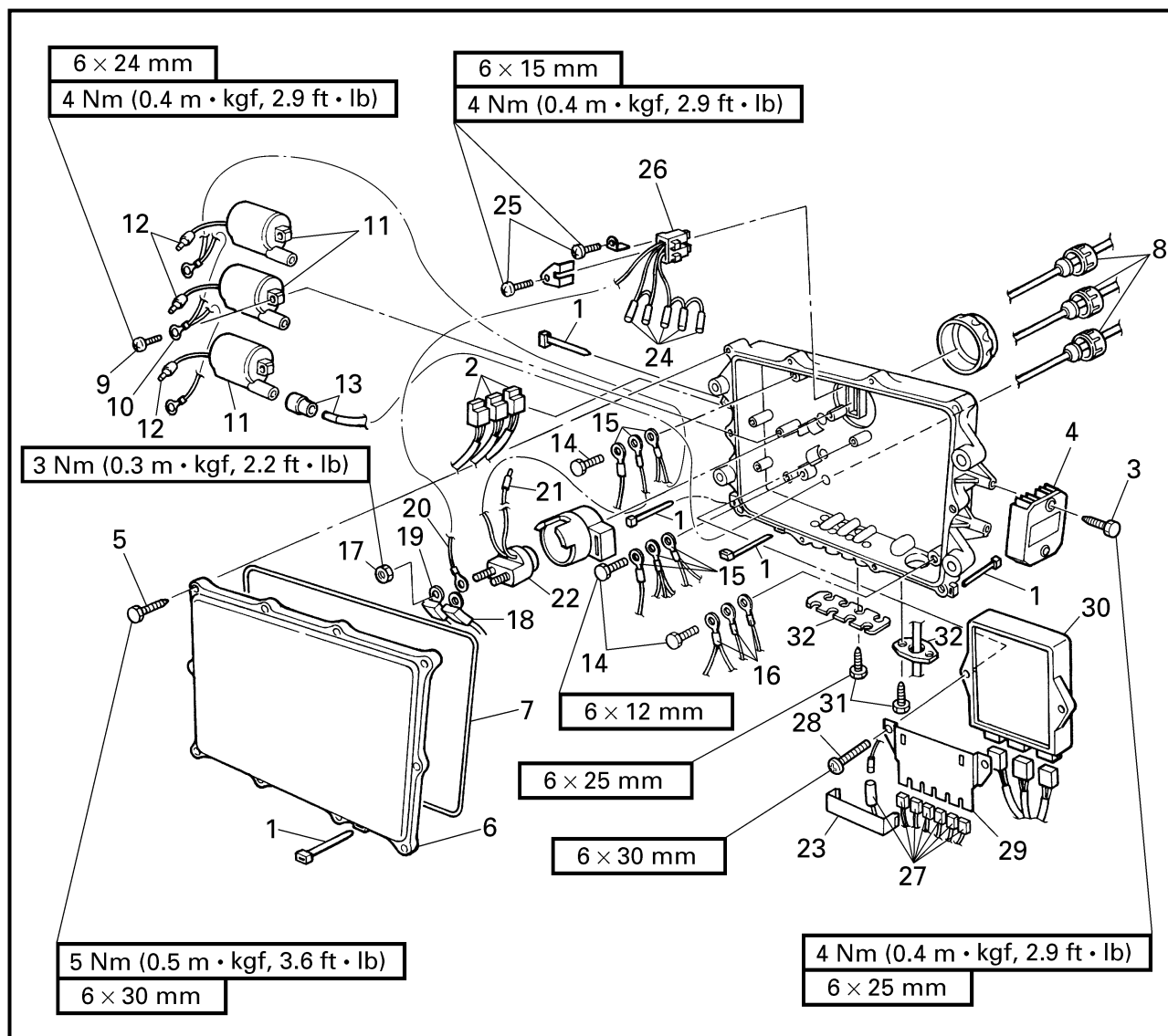


## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name           | Q'ty | Service points                                       |
|------|-------------------------------|------|------------------------------------------------------|
|      | <b>ELECTRICAL BOX REMOVAL</b> |      |                                                      |
|      | Engine unit                   |      | Follow the left "Step" for removal.                  |
|      | Battery negative lead         |      | Refer to "ENGINE UNIT" in chapter 5.                 |
|      | Starter motor lead            |      | Refer to "GENERATOR AND STARTER MOTOR" in chapter 5. |
| 1    | Nut/washer                    | 4/4  |                                                      |
| 2    | Bracket                       | 2    |                                                      |
| 3    | Electrical box                | 1    |                                                      |
|      |                               |      | Reverse the removal steps for installation.          |

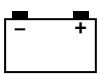


## EXPLODED DIAGRAM

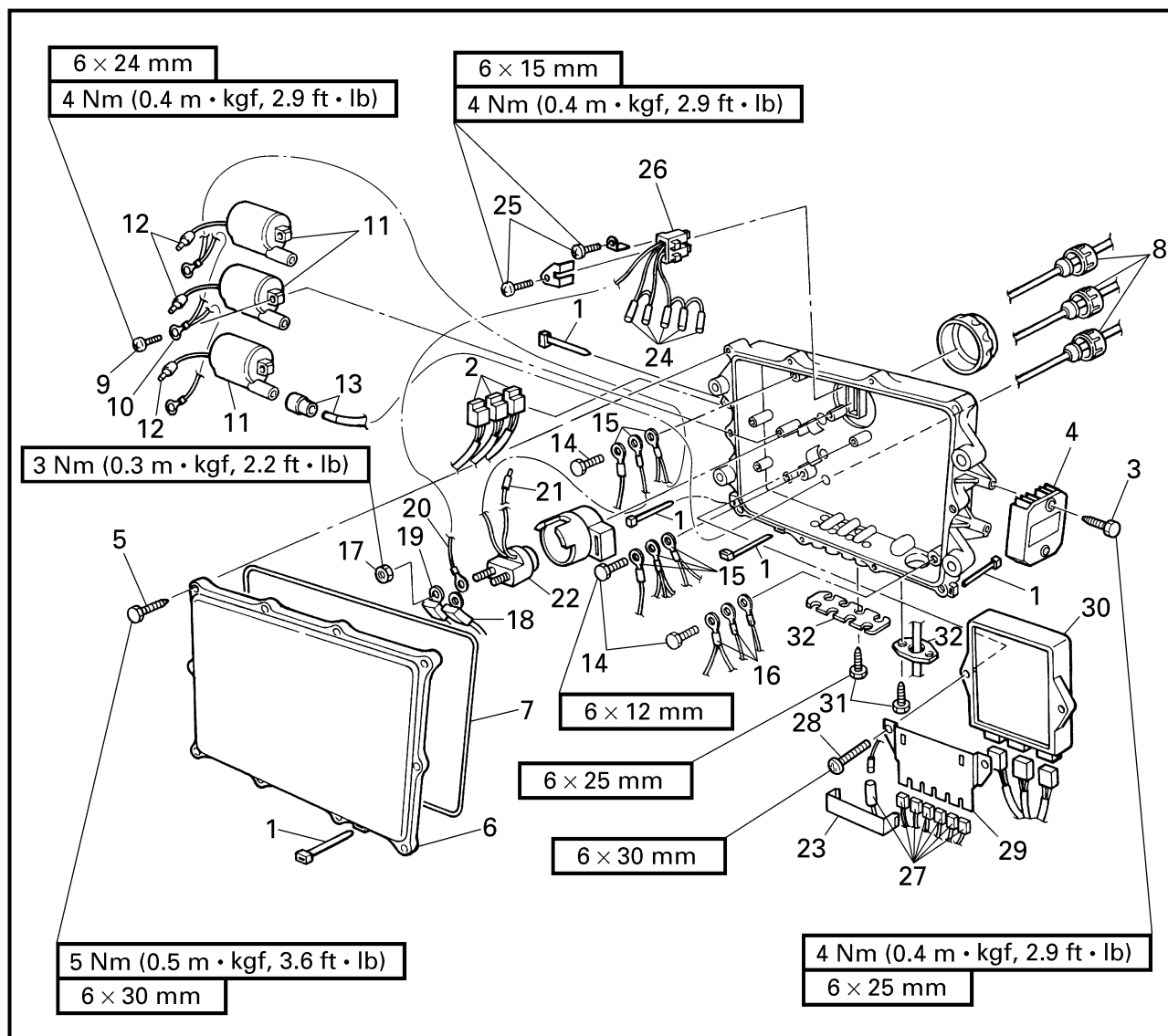


## REMOVAL AND INSTALLATION CHART

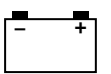
| Step | Procedure/Part name               | Q'ty | Service points                                          |
|------|-----------------------------------|------|---------------------------------------------------------|
|      | <b>ELECTRICAL BOX DISASSEMBLY</b> |      |                                                         |
| 1    | Clamp                             | 5    | Follow the left "Step" for disassembly.                 |
| 2    | Coupler                           | 3    |                                                         |
| 3    | Screw                             | 2    | For water, exhaust temperature sensor and lighting coil |
| 4    | Rectifier/regulator               | 1    |                                                         |
| 5    | Screw                             | 10   |                                                         |
| 6    | Cover                             | 1    |                                                         |
| 7    | Packing                           | 1    |                                                         |
| 8    | Spark plug lead holder            | 3    |                                                         |
| 9    | Screw                             | 6    |                                                         |
| 10   | Ground lead                       | 3    |                                                         |



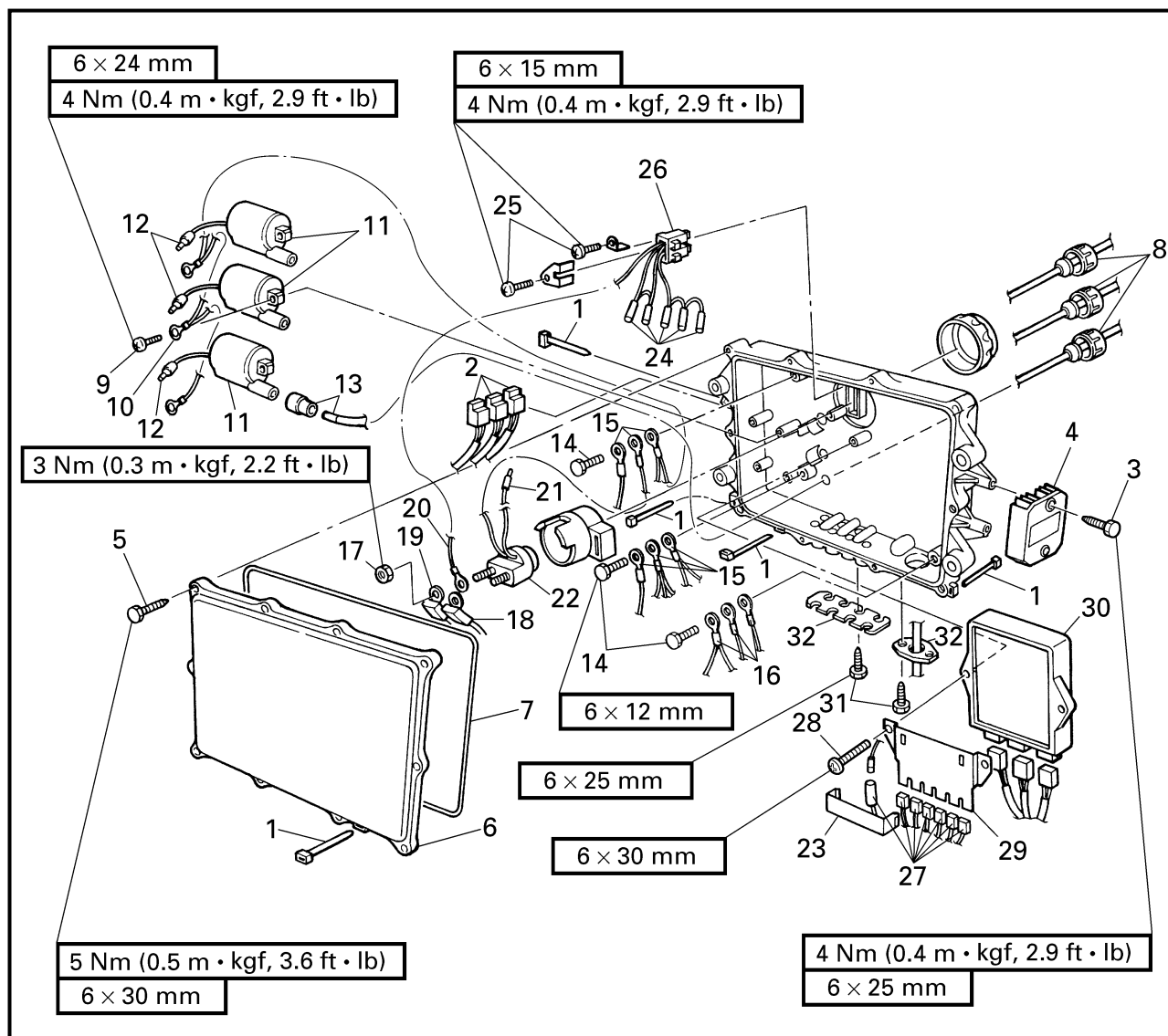
## EXPLODED DIAGRAM



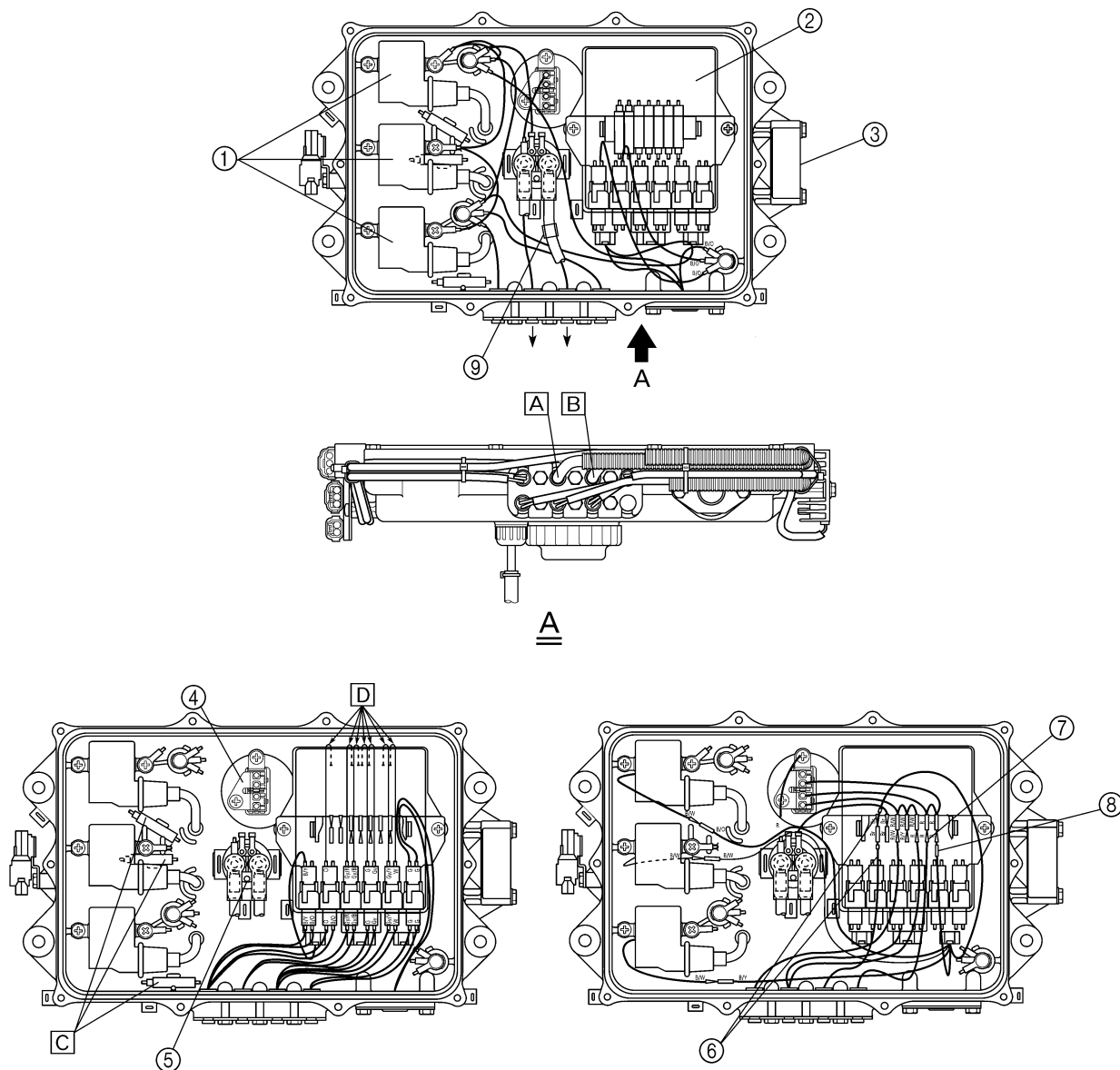
| Step | Procedure/Part name   | Q'ty | Service points |
|------|-----------------------|------|----------------|
| 11   | Ignition coil         | 3    | Black/orange   |
| 12   | Ignition coil lead    | 3    |                |
| 13   | Spark plug lead/cap   | 3/3  |                |
| 14   | Bolt                  | 3    |                |
| 15   | Ground lead           | 6    |                |
| 16   | Lead                  | 3    |                |
| 17   | Nut                   | 2    |                |
| 18   | Starter motor lead    | 1    |                |
| 19   | Battery positive lead | 1    |                |
| 20   | Fuse lead             | 1    |                |
| 21   | Starter relay lead    | 1    |                |
| 22   | Starter relay         | 1    |                |



## EXPLODED DIAGRAM



| Step | Procedure/Part name | Q'ty | Service points                              |
|------|---------------------|------|---------------------------------------------|
| 23   | Lead holder         | 1    | Reverse the disassembly steps for assembly. |
| 24   | Fuse lead           | 5    |                                             |
| 25   | Screw               | 2    |                                             |
| 26   | Fuse holder         | 1    |                                             |
| 27   | Lead/coupler        | 1/6  |                                             |
| 28   | Screw               | 2    |                                             |
| 29   | Coupler bracket     | 1    |                                             |
| 30   | CDI unit            | 1    |                                             |
| 31   | Screw               | 8    |                                             |
| 32   | Lead holder plate   | 2    |                                             |



- ① Ignition coil
- ② CDI unit
- ③ Rectifier/regulator
- ④ Fuse holder
- ⑤ Starter relay
- ⑥ Tape
- ⑦ Clear tube
- ⑧ Red tube
- ⑨ White tape

- A** To battery positive terminal
- B** To starter motor
- C** Affix the ignition coil connector to the electrical box holder.
- D** Pass the 8 pin coupler leads behind the CDI unit and insert them into the bracket.

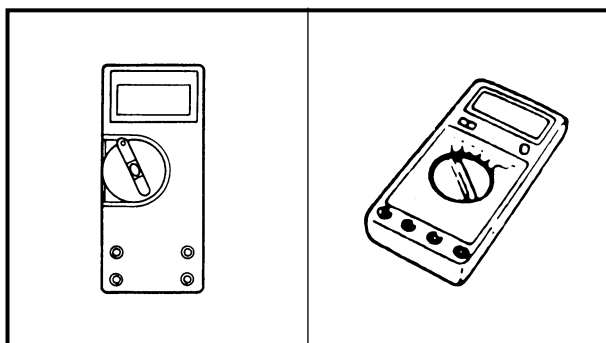
- Br : Brown
- G : Green
- Gy : Gray

- O : Orange
- R : Red
- W : White
- B/O : Black/orange
- B/W : Black/white
- B/Y : Black/yellow
- Gy/B : Gray/black
- Gy/R : Gray/red
- Gy/Y : Gray/yellow
- R/W : Red/white
- R/Y : Red/yellow

## ELECTRICAL ANALYSIS INSPECTION

### CAUTION:

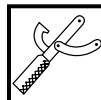
- All measuring instruments should be handled with special care. Damaged or mis-handled instruments will not measure properly.
- On an instrument powered by dry batteries, check the battery's voltage periodically and replace the batteries if necessary.



### Digital circuit tester

#### NOTE:

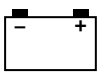
Throughout this chapter the digital circuit tester's part number has been omitted. Refer to the following part number.



**Digital circuit tester:**  
**J-39299/90890-06752**

#### NOTE:

"○—○" indicates a continuity of electricity; i.e., a closed circuit at the respective switch position.



### Low resistance measurement

**NOTE:**

- When measuring a resistance of 10  $\Omega$  or less with the digital tester, the correct measurement cannot be obtained because of the tester's internal resistance.
- To obtain the correct value, subtract the internal resistance from the displayed measurement.
- The internal resistance of the tester can be obtained by connecting both of its terminals.



**Correct value =  
Displayed measurement –  
Internal resistance**

### Peak voltage measurement

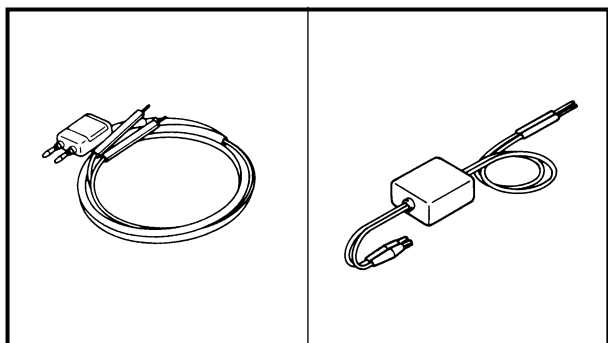
**NOTE:**

- When checking the condition of the ignition system it is vital to know the peak voltage.
- Cranking speed is dependant on many factors (e.g., fouled or weak spark plugs, a weak battery). If one of these is defected, the peak voltage will be lower than specification.
- If the peak voltage measurement is not within specification the engine will not operate properly.
- A low peak voltage will also cause components to prematurely wear.

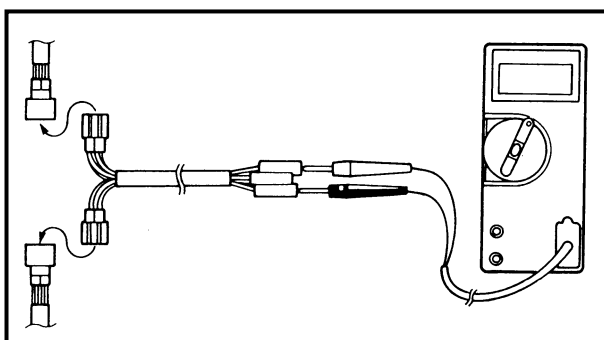
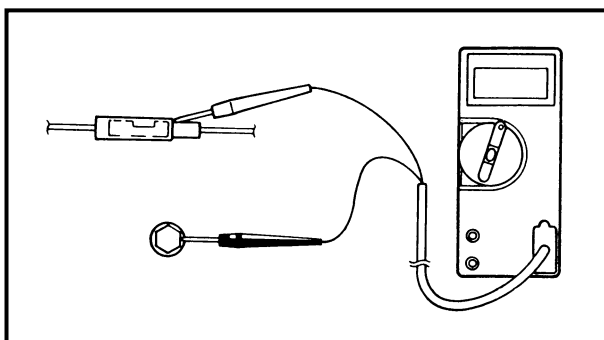
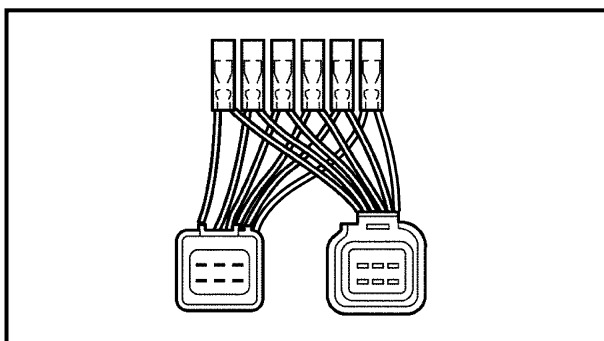
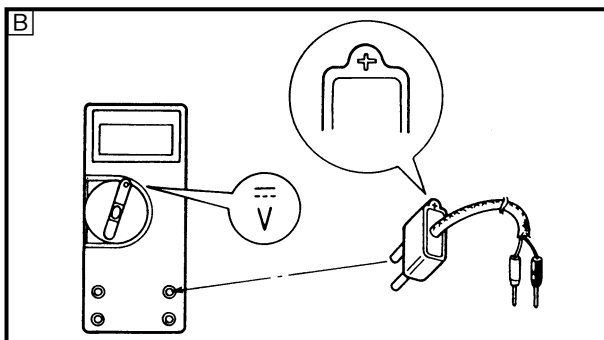
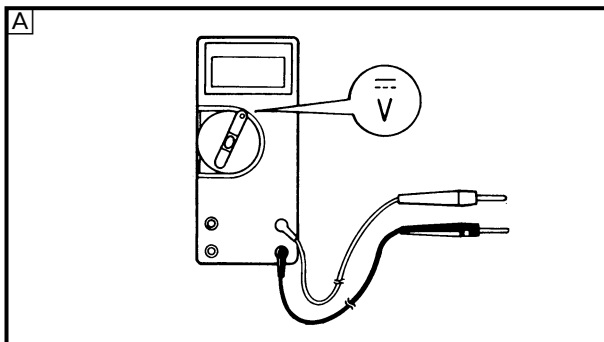
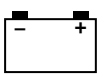
### Peak voltage adaptor

**NOTE:**

- Throughout this chapter the peak voltage adaptor's part number has been omitted. Refer to the following part number.
- The peak voltage adaptor should be used with the digital circuit tester.



**Peak voltage adaptor:  
YU-39991/90890-03169**



- When measuring the peak voltage, connect the peak voltage adaptor to the digital tester and switch the selector to the DC voltage mode.

**NOTE:**

- Make sure that the adaptor leads are properly installed in the digital circuit tester.
- Make sure that the positive pin (the "+" mark facing up as shown) on the adaptor is installed into the positive terminal of the tester.
- The test harness is needed for the following tests.

**A** Voltage measurement

**B** Peak voltage measurement

**Test harness**

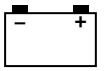
| YW-   | 90890- | Pin | Usage                         |
|-------|--------|-----|-------------------------------|
| 06780 | 06780  | 6   | Pickup coil and lighting coil |

**Checking steps:**

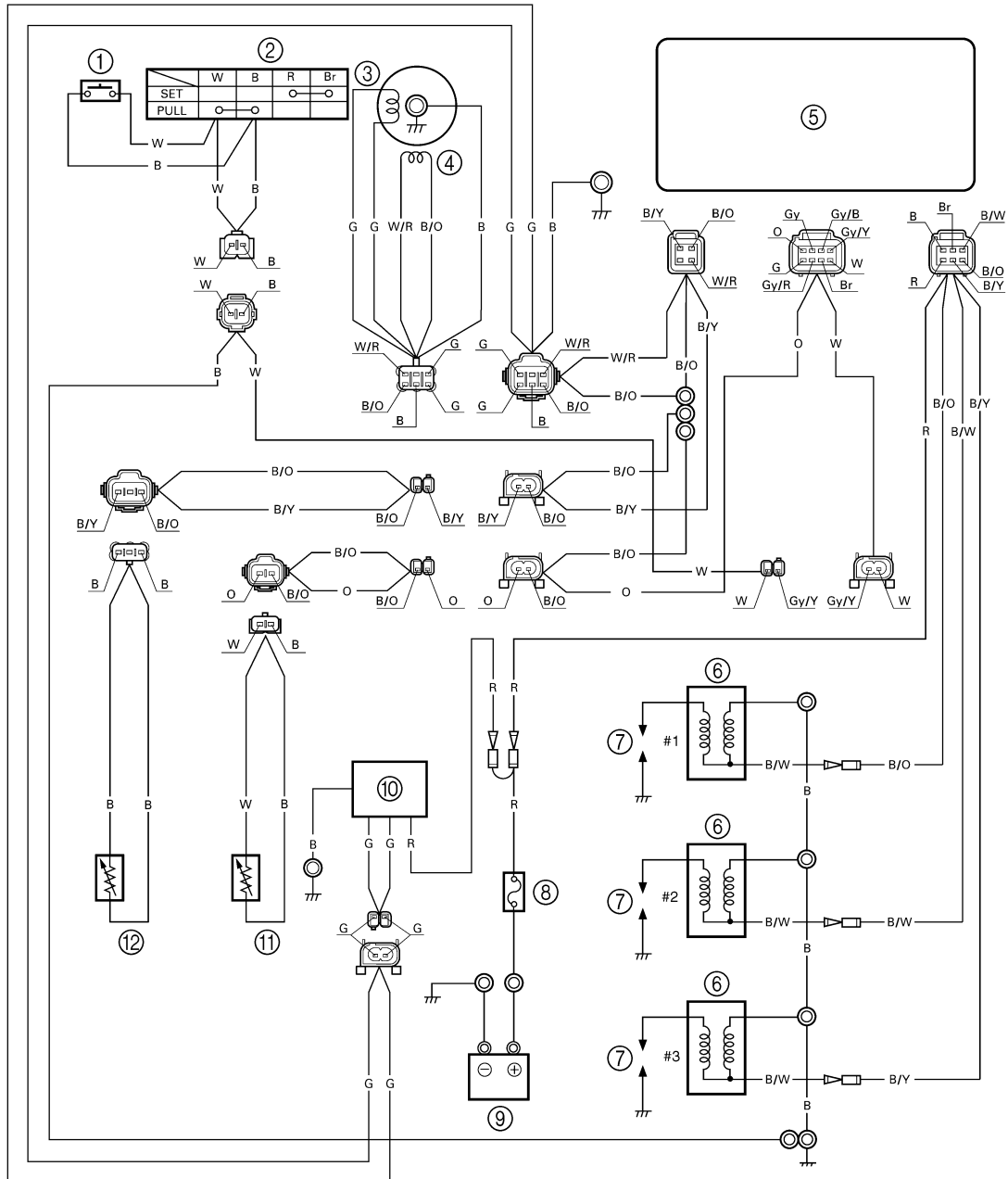
- Disconnect the coupler connections.
- Connect the test harness between the couplers.
- Connect the tester terminals to the terminals which are being checked.
- Run the engine and observe the measurement.

**NOTE:**

- Make sure the output lead (red lead) of the rectifier/regulator is disconnected when measuring the peak voltage of the lighting coil and rectifier/regulator.
- If the lighting coil and pickup coil(s) are measured unloaded, disconnect the test harness on the output side coupler.



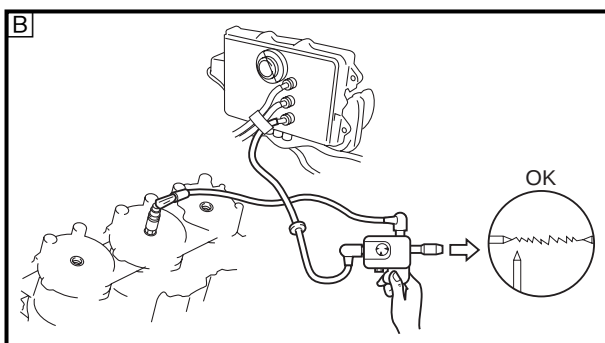
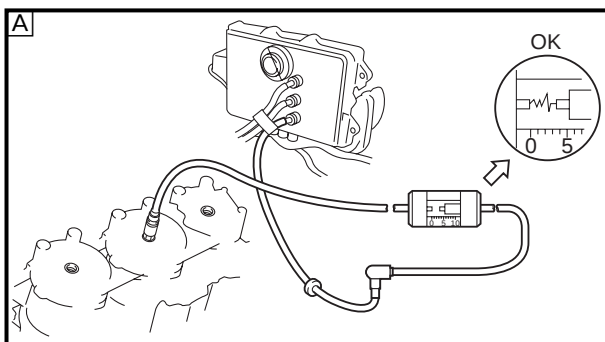
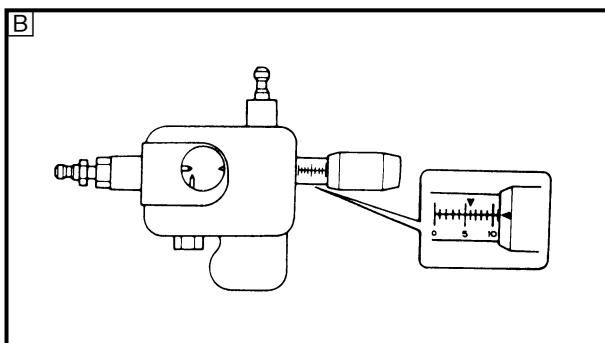
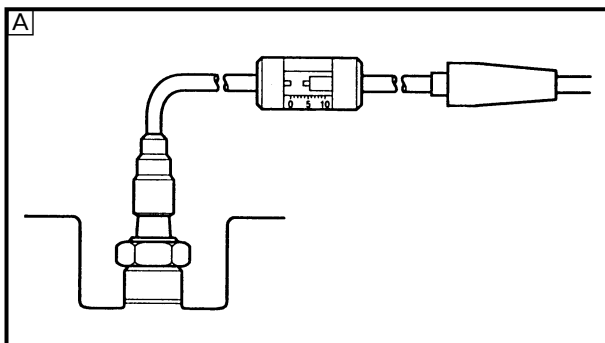
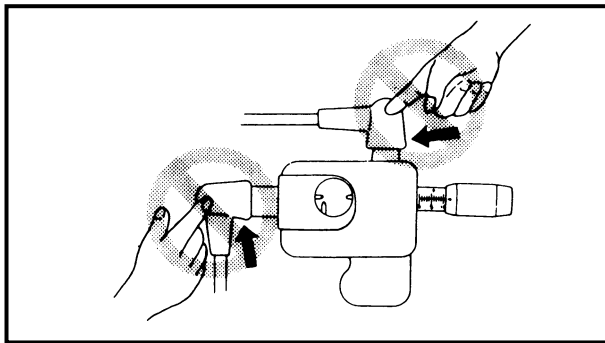
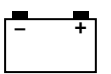
## IGNITION SYSTEM WIRING DIAGRAM



- ① Engine stop switch
- ② Engine stop lanyard switch
- ③ Lighting coil
- ④ Pickup coil
- ⑤ CDI unit
- ⑥ Ignition coil
- ⑦ Spark plug
- ⑧ Fuse (20A)
- ⑨ Battery

- ⑩ Rectifier/regulator
- ⑪ Exhaust temperature sensor
- ⑫ Water temperature sensor

- B : Black
- O : Orange
- R : Red
- W : White
- B/O : Black/orange
- B/W : Black/white
- B/Y : Black/yellow
- W/R : White/red



## IGNITION SPARK GAP

### ⚠ WARNING

- When checking the spark gap, do not touch any of the connections of the spark gap tester lead wires.
- When performing the spark gap test, take special care not to let sparks leak out of the removed spark plug cap.
- When performing the spark gap check, keep flammable gas or liquids away, since this test can produce sparks.

#### 1. Check:

- Ignition spark gap  
Below specification → Check the CDI unit output peak voltage.  
Check the ignition coil for resistance.



**Spark gap:**  
10 mm (0.39 in)

#### Checking steps:

- Connect the spark plug cap to the spark gap tester.
- Set the spark gap length on the adjusting knob.



**Spark gap tester:**  
YM-34487/90890-06754

- Crank the engine and observe the ignition system spark through the discharge window.

**A** For USA and Canada

**B** For worldwide

IGNITION SYSTEM PEAK VOLTAGE

⚠ WARNING

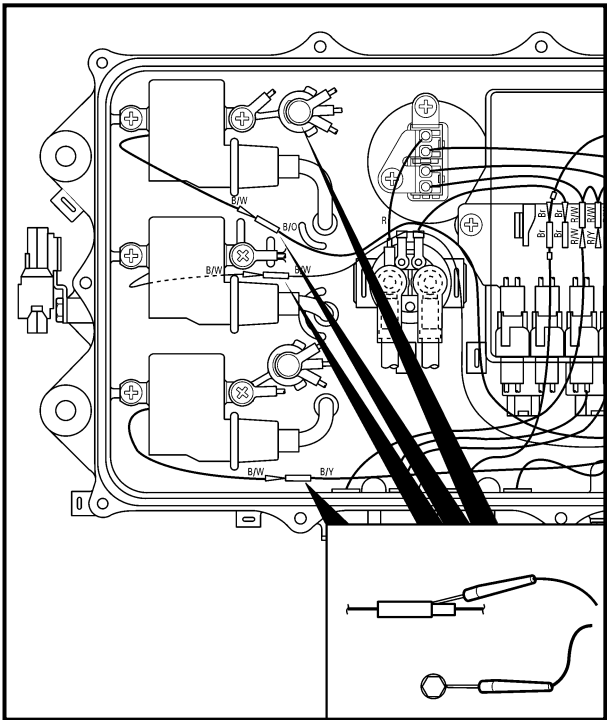
When checking the electrical components, do not touch any of the connections of the digital tester lead wires.

NOTE:

- If there is no spark, or the spark is weak, continue with the ignition system test.
  - If a good spark is obtained, the problem is not with the ignition system, but possibly with the spark plug(-s) or another component.

1. Measure:

- CDI unit output peak voltage  
Below specification → Measure the rectifier/regulator output peak voltage.  
Replace the CDI unit.

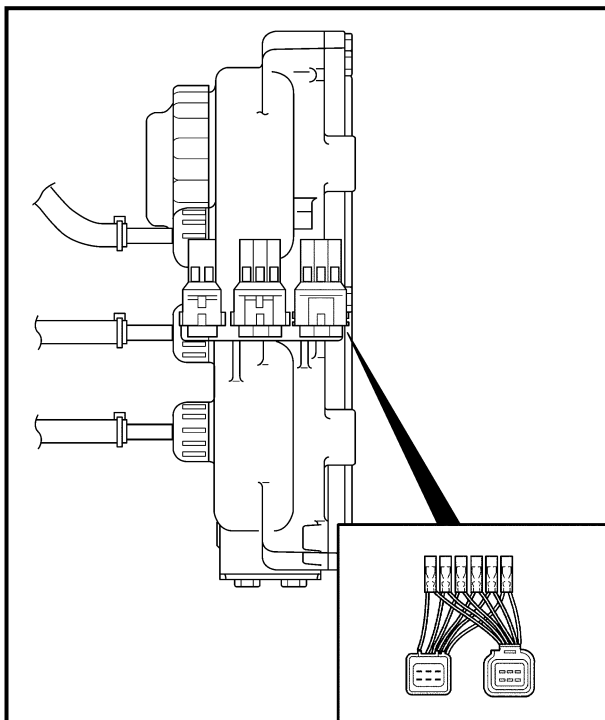
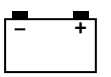


**CDI unit output peak voltage:**  
**Black/orange (B/O) – Black (B)**  
**Black/white (B/W) – Black (B)**  
**Black/yellow (B/Y) – Black (B)**

| r/min | Unloaded | Loaded |       |
|-------|----------|--------|-------|
|       | Cranking | 2,000  | 3,500 |
| V     | 200      | 180    | 180   |

NOTE:

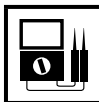
B/O – B for cylinder #1.  
B/W – B for cylinder #2.  
B/Y – B for cylinder #3.



## 2. Measure:

- Pickup coil output peak voltage

Below specification → Replace the pickup coil.



**Pickup coil output peak voltage:**  
White/red (W/R) –  
Black/orange (B/O)

| r/min | Unloaded | Loaded |       |       |
|-------|----------|--------|-------|-------|
|       | Cranking |        | 2,000 | 3,500 |
| V     | 5        | 2.8    | 7.9   | 11    |

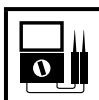
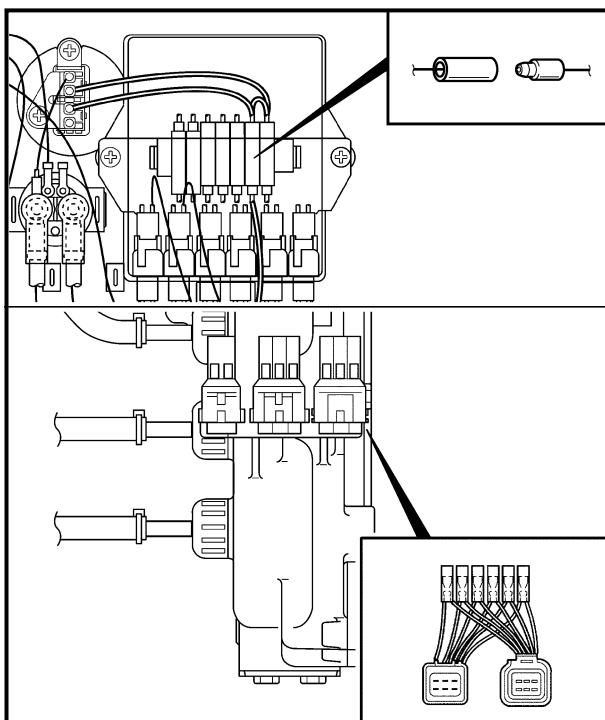
## NOTE:

The starter motor will not operate when the test harness on the output side coupler is disconnected to measure the unloaded peak voltage for the pickup coil(s). Therefore, connect the black lead of the test harness to the ground with a lead.

## 3. Measure:

- Lighting coil output peak voltage

Below specification → Replace the lighting coil.

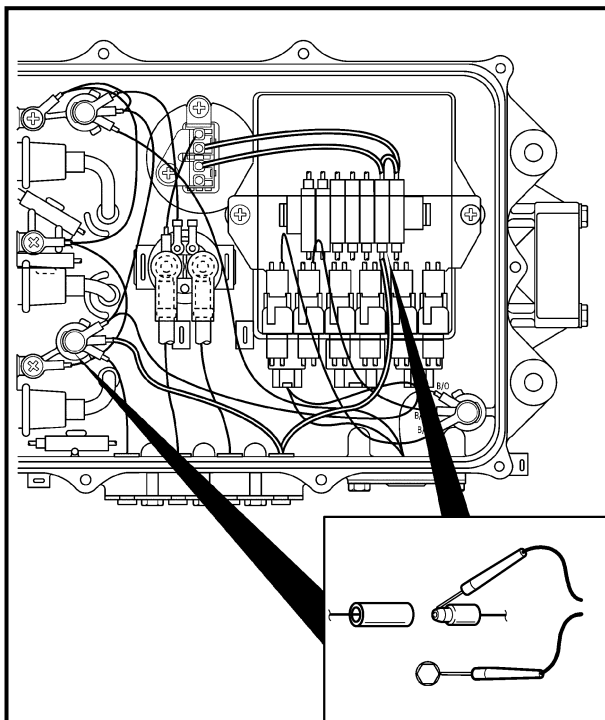
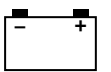


**Lighting coil output peak voltage:**  
Green (G) – Green (G)

|       | Unloaded | Loaded |       |       |
|-------|----------|--------|-------|-------|
| r/min | Cranking |        | 2,000 | 3,500 |
| V     | 9        | 9      | 14    | 14    |

## NOTE:

- Make sure the output lead (red lead) of the rectifier/regulator is disconnected when measuring the output peak voltage.
- The starter motor will not operate when the test harness on the output side coupler is disconnected to measure the unloaded peak voltage for the lighting coil. Therefore, connect the black lead of the test harness to the ground with a lead.



## 4. Measure:

- Rectifier/regulator output peak voltage

Below specification → Replace the rectifier/regulator.

**Rectifier/regulator output peak voltage:**

Red (R) – Black (B)

| r/min | Unloaded |       |       |
|-------|----------|-------|-------|
|       | Cranking | 2,000 | 3,500 |
| V     | 7        | 12.6  | 12.6  |

**NOTE:**

Make sure the output lead (red lead) of the rectifier/regulator is disconnected when measuring the output peak voltage.

**BATTERY**

Refer to “ELECTRICAL” in chapter 3.

**FUSE**

Refer to “STARTING SYSTEM”.

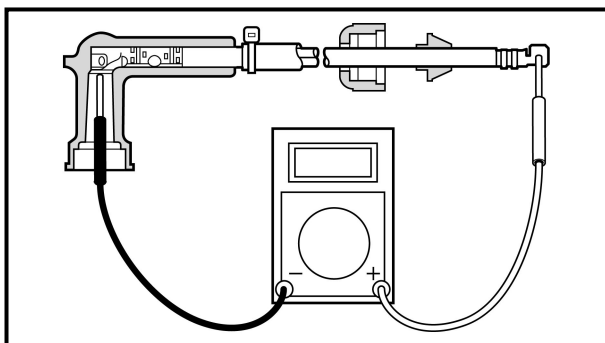
**SPARK PLUGS**

Refer to “ELECTRICAL” in chapter 3.

**SPARK PLUG LEAD ASSEMBLY**

## 1. Inspect:

- Spark plug lead assembly
- Cracks/damage → Replace.



## 2. Measure:

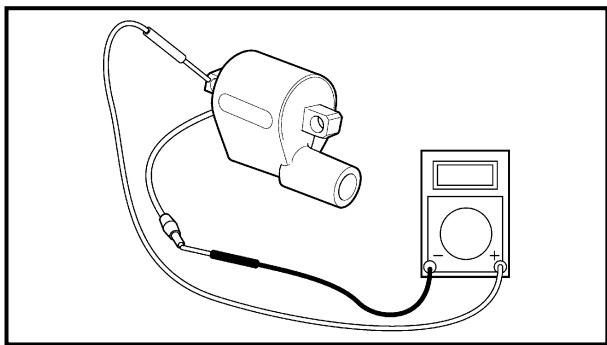
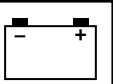
- Spark plug lead resistance
- Out of specification → Replace.

**Spark plug lead resistance:**

#1: 6.1 ~ 14.3 kΩ

#2: 4.6 ~ 11.1 kΩ

#3: 3.3 ~ 8.2 kΩ

**IGNITION COIL**

## 1. Measure:

- Primary coil resistance

Out of specification → Replace.

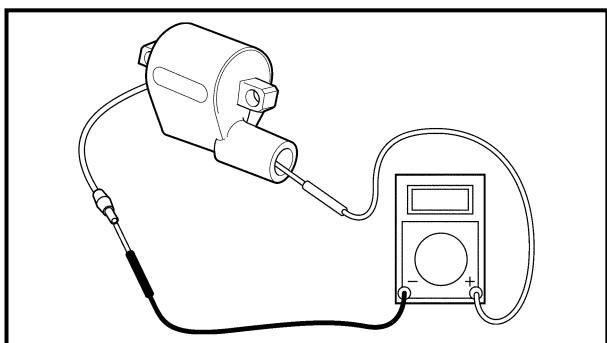


**Primary coil resistance:**  
**Black/white (B/W) – Body**  
**0.26 ~ 0.36  $\Omega$  at 20 °C (68 °F)**

**NOTE:**

When measuring a resistance of 10  $\Omega$  or less with the digital tester, the correct measurement cannot be obtained because of the tester's internal resistance.

Refer to "Low resistance measurement".



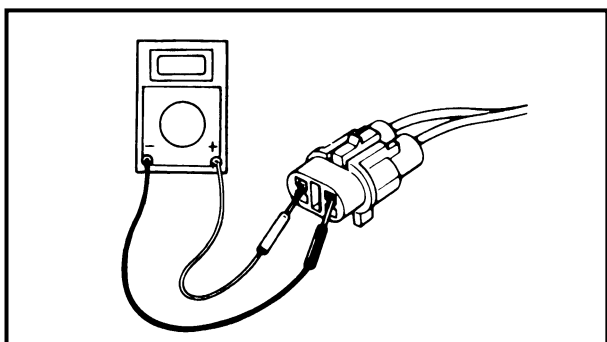
## 2. Measure:

- Secondary coil resistance

Out of specification → Replace.



**Secondary coil resistance:**  
**Black/white (B/W) – Spark plug**  
**lead terminal**  
**3.5 ~ 4.7 k $\Omega$  at 20 °C (68 °F)**

**ENGINE STOP SWITCH**

## 1. Check:

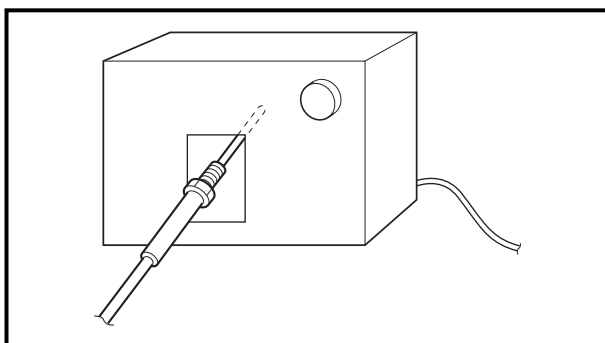
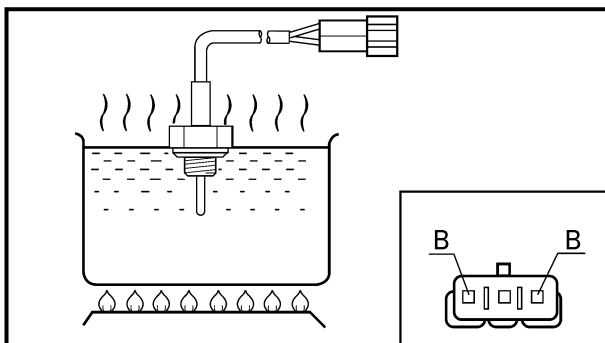
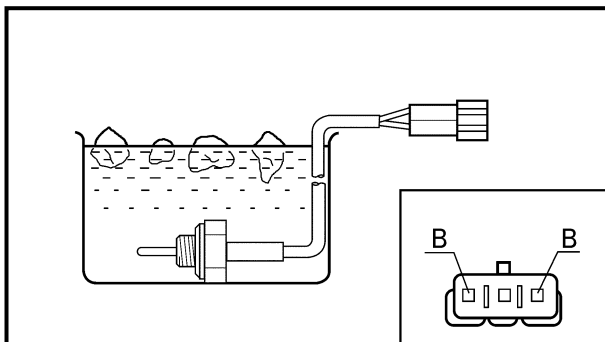
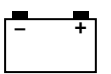
- Engine stop switch continuity

Out of specification → Replace.



**Engine stop switch continuity**  
**(black coupler)**

| Lock plate | Position | Lead color |       |
|------------|----------|------------|-------|
|            |          | White      | Black |
| Installed  | Free     |            |       |
|            | Push     | ○ — ○      | ○ — ○ |
| Removed    | Free     | ○ — ○      | ○ — ○ |
|            | Push     | ○ — ○      | ○ — ○ |



## WATER TEMPERATURE SENSOR

### 1. Measure:

- Water temperature sensor resistance (at the specified temperature)  
Out of specification → Replace.



### Water temperature sensor resistance:

0 °C (32 °F): 24.0 ~ 37.1 kΩ

100 °C (212 °F): 0.87 ~ 1.18 kΩ

200 °C (392 °F): 0.104 ~ 0.153 kΩ

### Measurement steps:

- Ice the water temperature sensor and measure the resistance.
- Suspend the water temperature sensor in a container filled with oil.
- Slowly heat the oil.
- Measure the resistance when the specified temperature is reached.

## EXHAUST TEMPERATURE SENSOR

### 1. Measure:

- Exhaust temperature sensor resistance (at the specified temperature)  
Out of specification → Replace.



### Exhaust temperature sensor resistance:

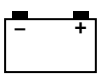
300 °C (572 °F): 73 ~ 241 kΩ

600 °C (1,112 °F): 0.86 ~ 1.58 kΩ

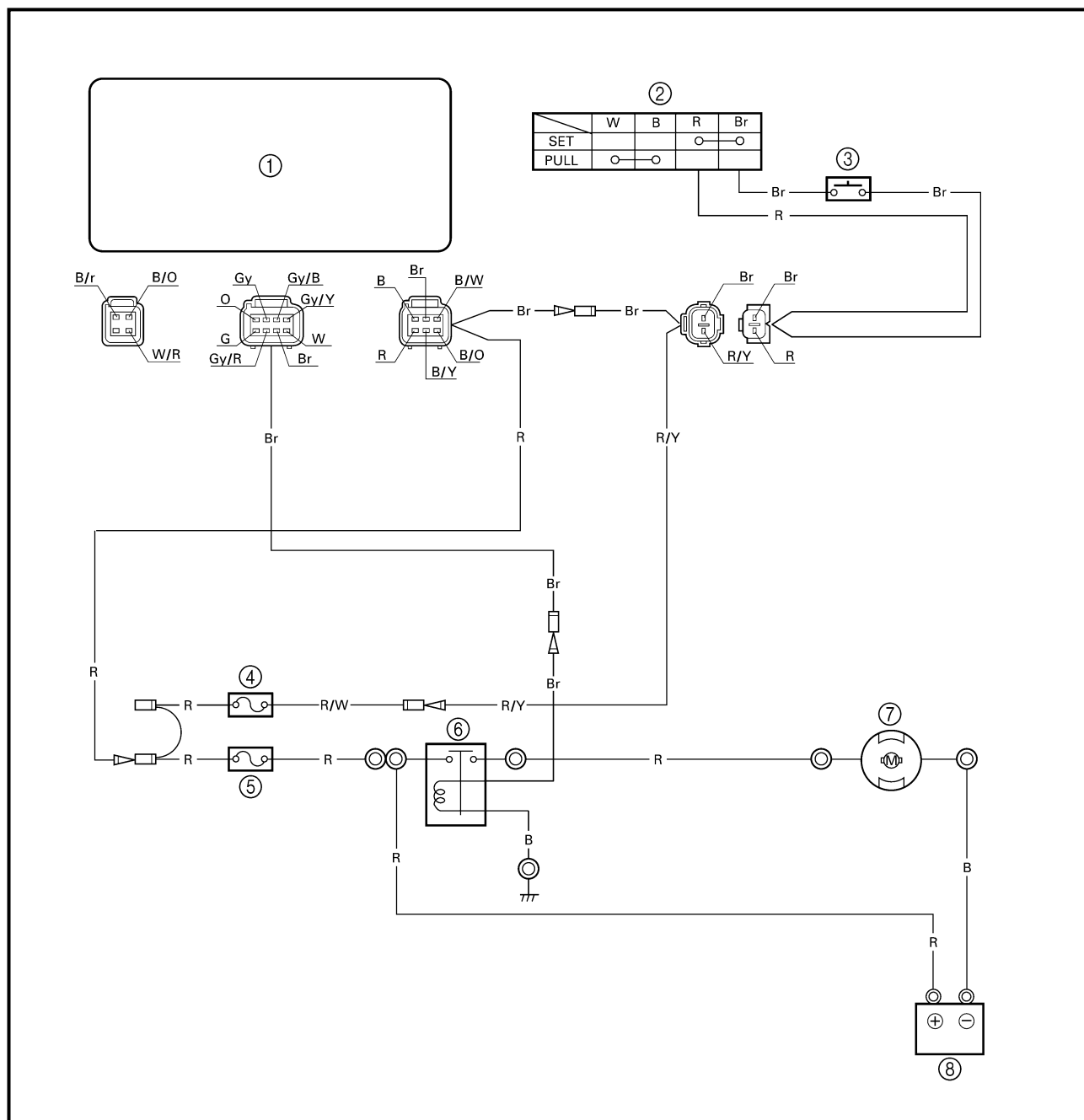
900 °C (1,652 °F): 64 ~ 90 Ω

### Measurement steps:

- Heat the exhaust temperature sensor using an electric furnace or equivalent.
- Measure the resistance when the specified temperature.

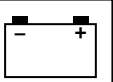


## STARTING SYSTEM WIRING DIAGRAM



- ① CDI unit
- ② Engine stop lanyard switch
- ③ Starter switch
- ④ Fuse (10A)
- ⑤ Fuse (20A)
- ⑥ Starter relay
- ⑦ Starter motor
- ⑧ Battery

B : Black  
 Br : Brown  
 R : Red  
 R/Y : Red/yellow



## BATTERY

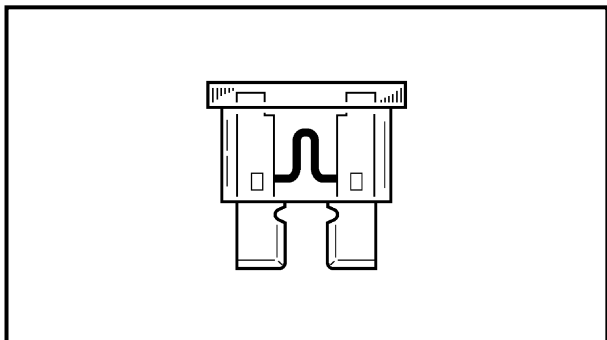
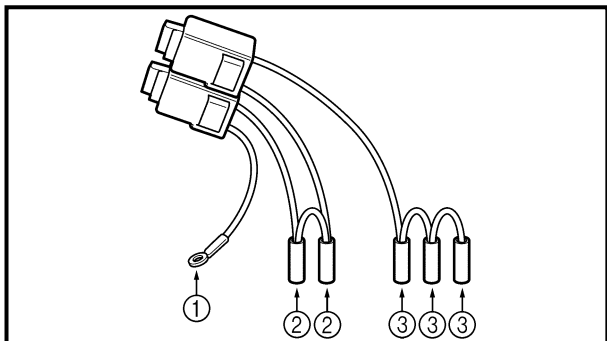
Refer to "ELECTRICAL" in chapter 3.

## WIRING CONNECTIONS

### 1. Check:

- Wiring connections

Poor connections → Properly connect.

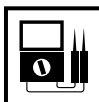


## FUSE

### 1. Check:

- Fuse holder continuity

No continuity → Check the fuse or replace the fuse holder.



### Fuse holder continuity:

Between ① and ②

Between ② and ③

### 2. Check:

- Fuse broken

Broken → Replace.



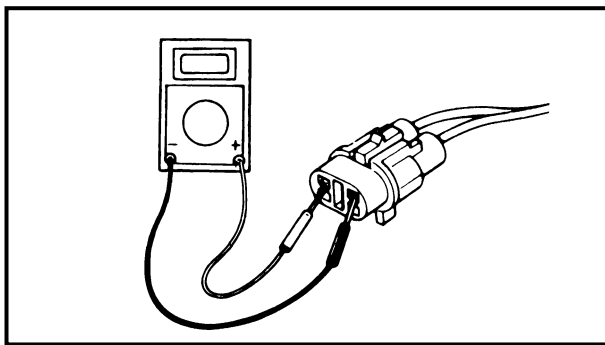
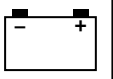
### Fuse rating:

10A, 20A

## NOTE:

20A fuse is for CDI unit and rectifier/regulator.

10A fuse is for multi-function meter, YPVS motor and start switch.



### STARTER SWITCH

#### 1. Check:

- Continuity

Out of specification → Replace.



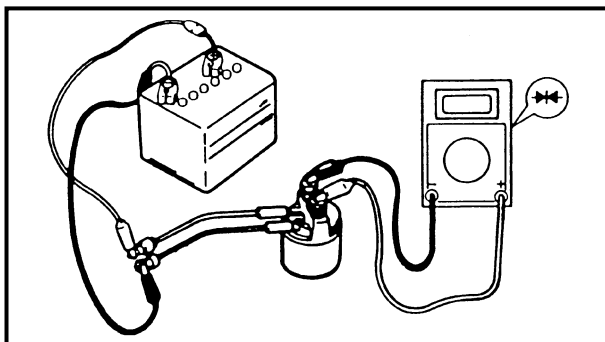
#### Starter continuity (natural color coupler)

| Lock plate | Position | Leads |       |
|------------|----------|-------|-------|
|            |          | Red   | Brown |
| Installed  | Free     |       |       |
|            | Push     | ○—○   | ○—○   |
| Removed    | Free     |       |       |
|            | Push     |       |       |

### STARTER RELAY

#### 1. Inspect:

- Brown lead terminal
  - Black lead terminal
- Loose → Tighten.



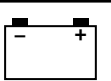
#### 2. Check:

- Starter relay

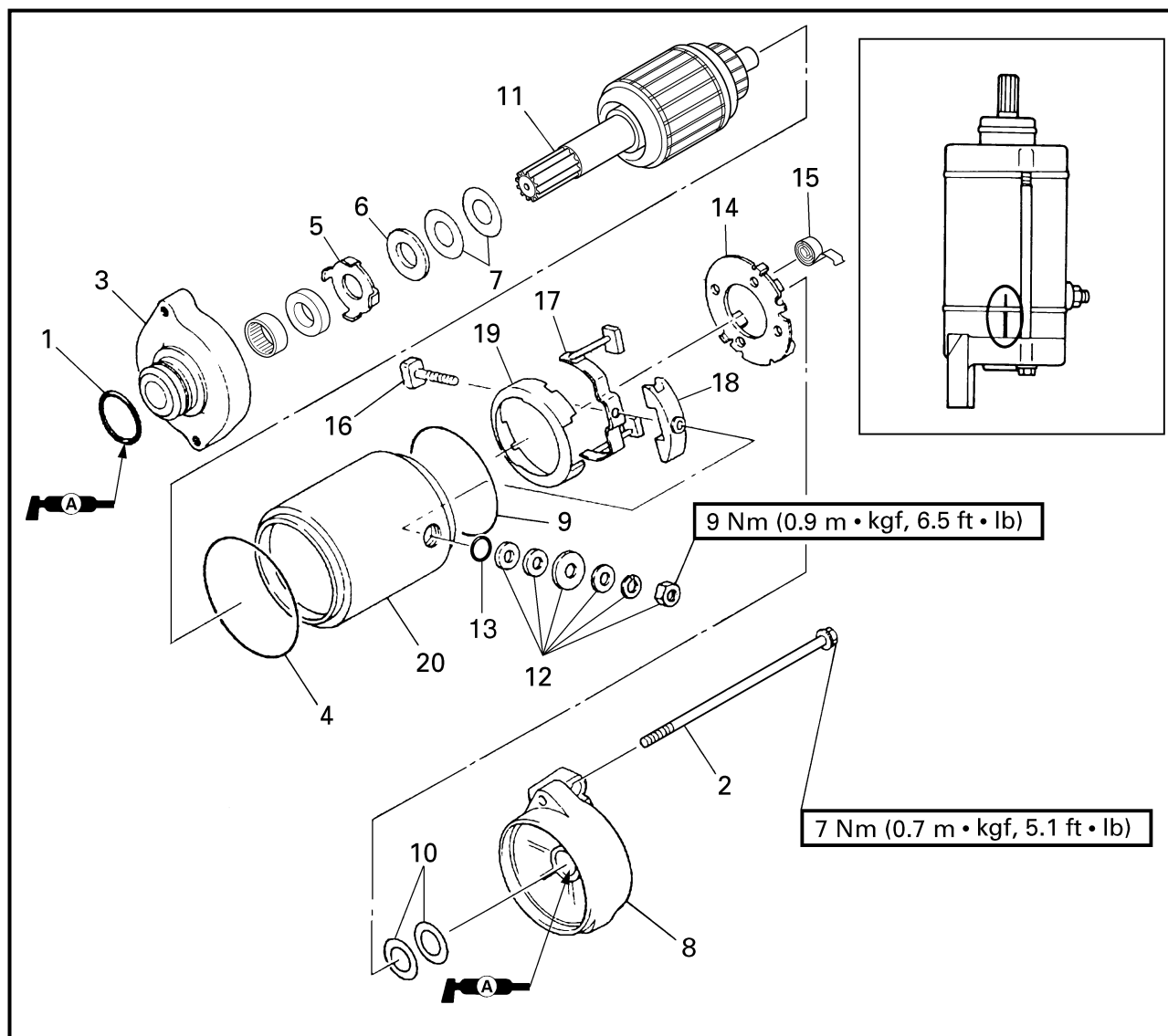
Faulty → Replace.

#### Checking steps:

- Connect the tester leads between the starter relay terminals as shown.
- Connect the brown lead terminal to the positive battery terminal.
- Connect the black lead terminal to the negative battery terminal.
- Check that there is continuity between the starter relay terminals.
- Check that there is no continuity after the brown or black lead is removed.



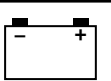
## STARTER MOTOR EXPLODED DIAGRAM



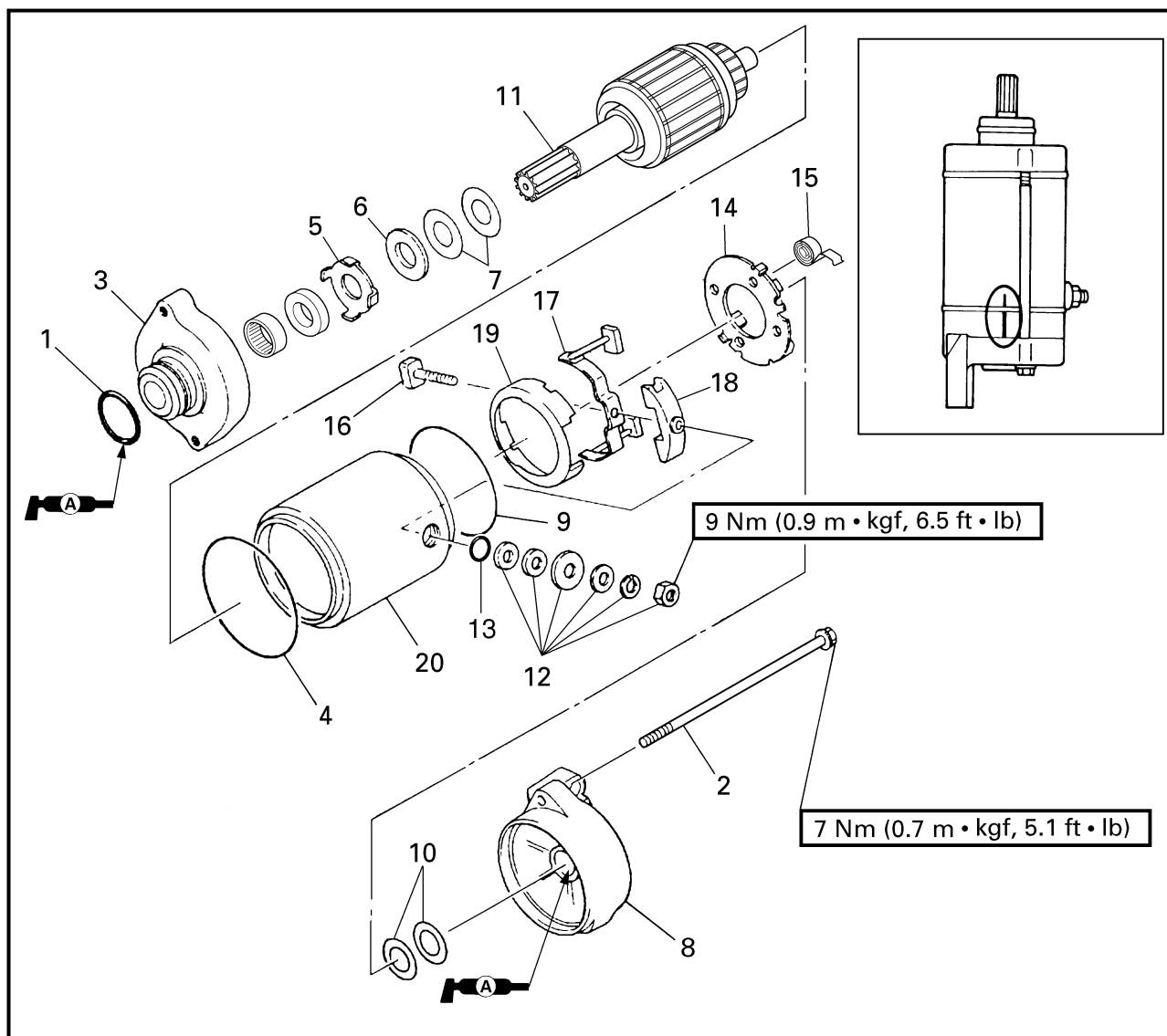
## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name                  | Q'ty | Service points                                       |
|------|--------------------------------------|------|------------------------------------------------------|
|      | <b>STARTER MOTOR<br/>DISASSEMBLY</b> |      | Follow the left "Step" for disassembly.              |
|      | Starter motor                        |      | Refer to "GENERATOR AND STARTER MOTOR" in chapter 5. |
| 1    | O-ring                               | 1    | <b>Not reusable</b>                                  |
| 2    | Bolt                                 | 2    |                                                      |
| 3    | Starter motor front cover            | 1    |                                                      |
| 4    | O-ring                               | 1    | <b>Not reusable</b>                                  |
| 5    | Oil seal retainer                    | 1    |                                                      |
| 6    | Washer                               | 1    |                                                      |
| 7    | Shim                                 | *    | t = 0.2 mm, 0.5 mm                                   |

\*: As required

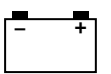


## EXPLODED DIAGRAM

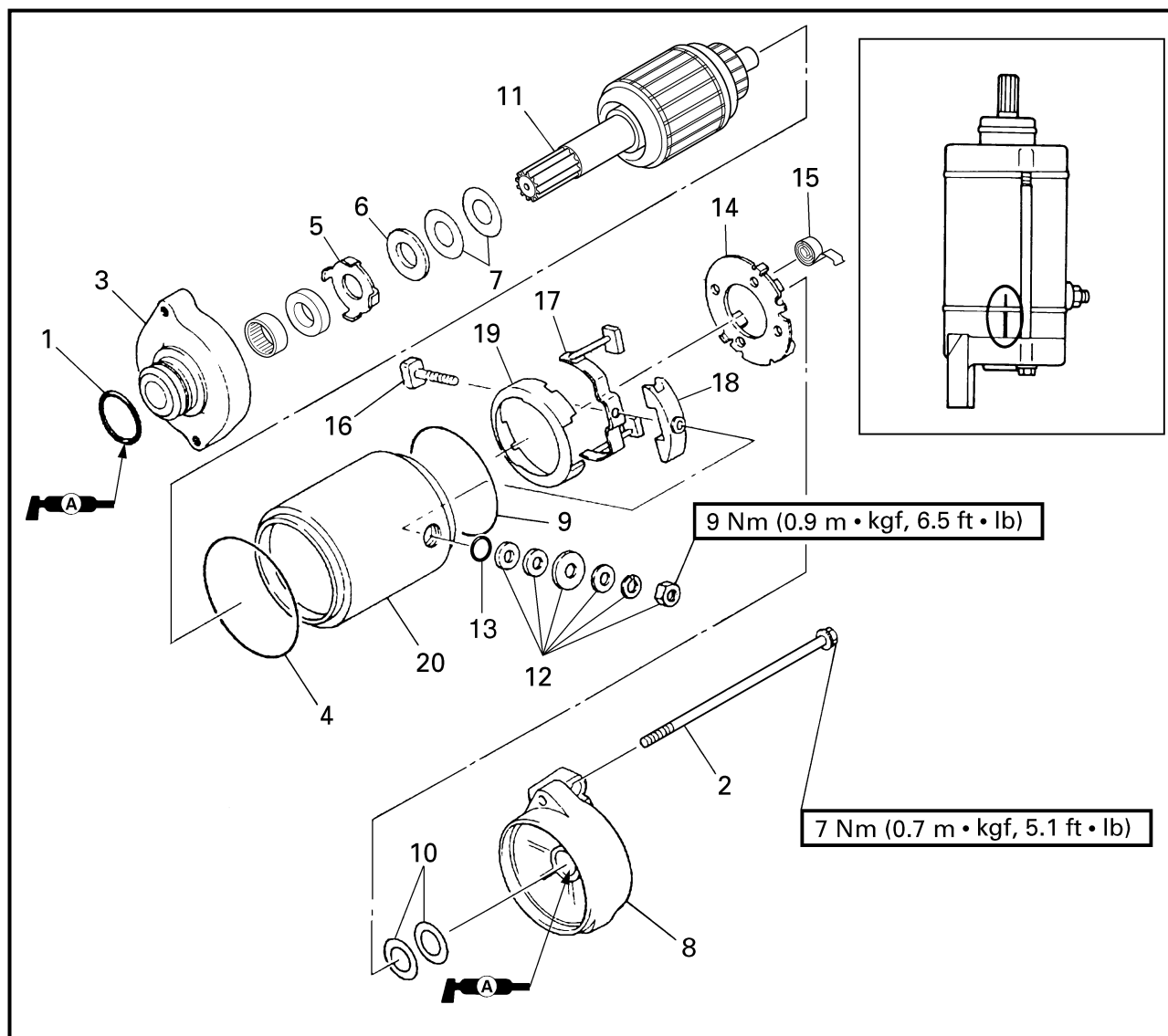


| Step | Procedure/Part name      | Q'ty  | Service points                            |
|------|--------------------------|-------|-------------------------------------------|
| 8    | Starter motor rear cover | 1     | <b>Not reusable</b><br>t = 0.2 mm, 0.8 mm |
| 9    | O-ring                   | 1     |                                           |
| 10   | Shim                     | *     |                                           |
| 11   | Armature assembly        | 1     | <b>Not reusable</b>                       |
| 12   | Nut/spring washer/washer | 1/1/4 |                                           |
| 13   | O-ring                   | 1     |                                           |
| 14   | Brush holder             | 1     |                                           |
| 15   | Brush spring             | 4     |                                           |
| 16   | Bolt                     | 1     |                                           |
| 17   | Brush assembly           | 1     |                                           |

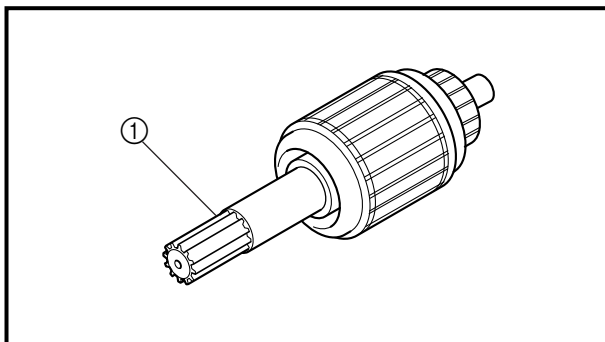
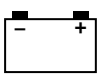
\*: As required



## EXPLODED DIAGRAM

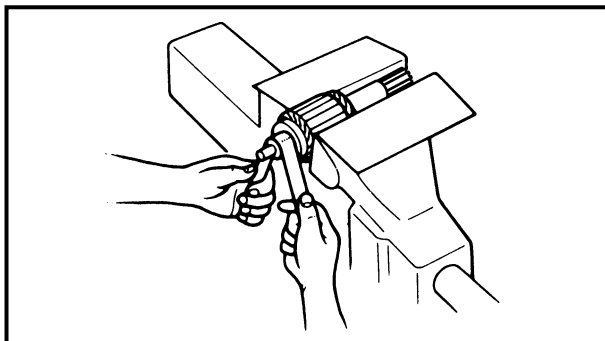


| Step | Procedure/Part name | Q'ty | Service points                              |
|------|---------------------|------|---------------------------------------------|
| 18   | Spacer              | 1    | Reverse the disassembly steps for assembly. |
| 19   | Holder              | 1    |                                             |
| 20   | Starter motor yoke  | 1    |                                             |

**SERVICE POINTS****Armature inspection**

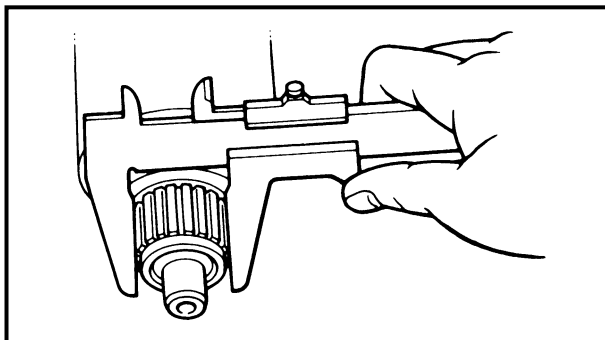
## 1. Inspect:

- Armature shaft ①  
Damage/wear → Replace.



## 2. Inspect:

- Commutator  
Dirt → Clean with 600 grit sandpaper.

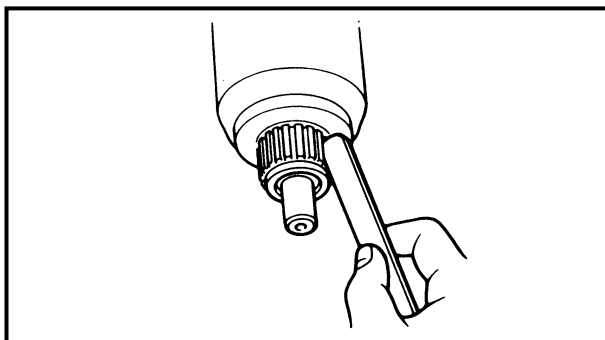


## 3. Measure:

- Commutator diameter  
Out of specification → Replace.



**Min. commutator diameter:**  
**27.0 mm (1.06 in)**

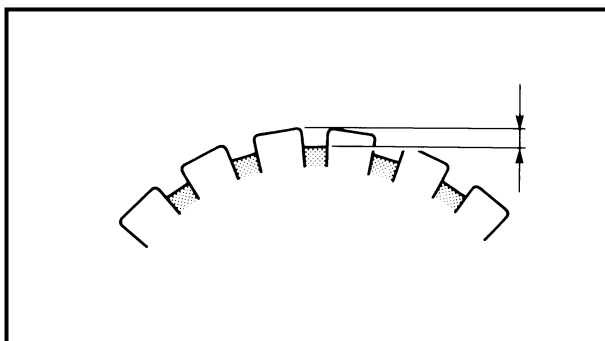


## 4. Check:

- Commutator undercut  
Contaminants → Clean.

**NOTE:**

Remove all mica and metal particles with compressed air.

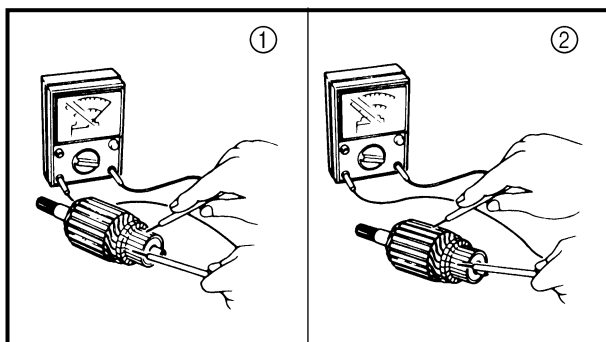
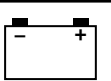


## 5. Measure:

- Commutator undercut  
Out of specification → Replace.



**Min. commutator undercut:**  
**0.2 mm (0.01 in)**

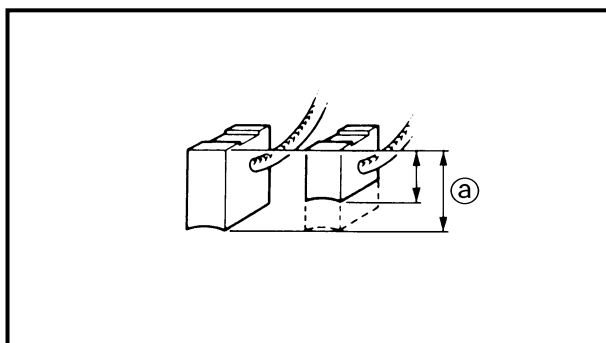


## 6. Inspect:

- Armature coil continuity  
Out of specification → Replace.

**Armature coil continuity:**

| Commutator segments ①    | Continuity    |
|--------------------------|---------------|
| Segment - Laminations ②  | No continuity |
| Segment - Armature shaft | No continuity |

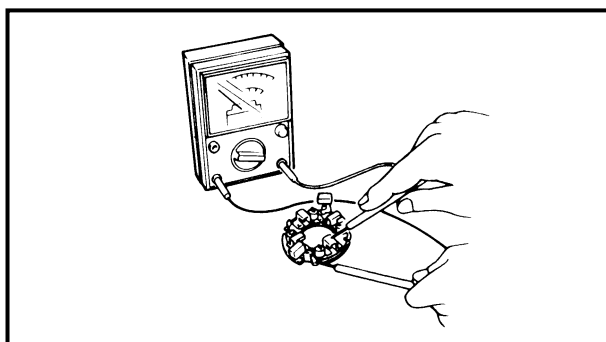
**Brush holder inspection**

## 1. Measure:

- Brush length ①  
Out of specification → Replace.



**Min. brush length:**  
6.5 mm (0.26 in)

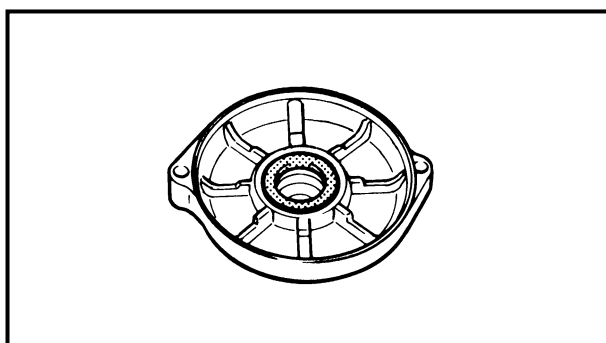


## 2. Check:

- Brush holder continuity  
Out of specification → Replace.

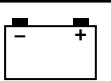
**Brush holder continuity:**

|                     |               |
|---------------------|---------------|
| Brush holder - Base | No continuity |
|---------------------|---------------|

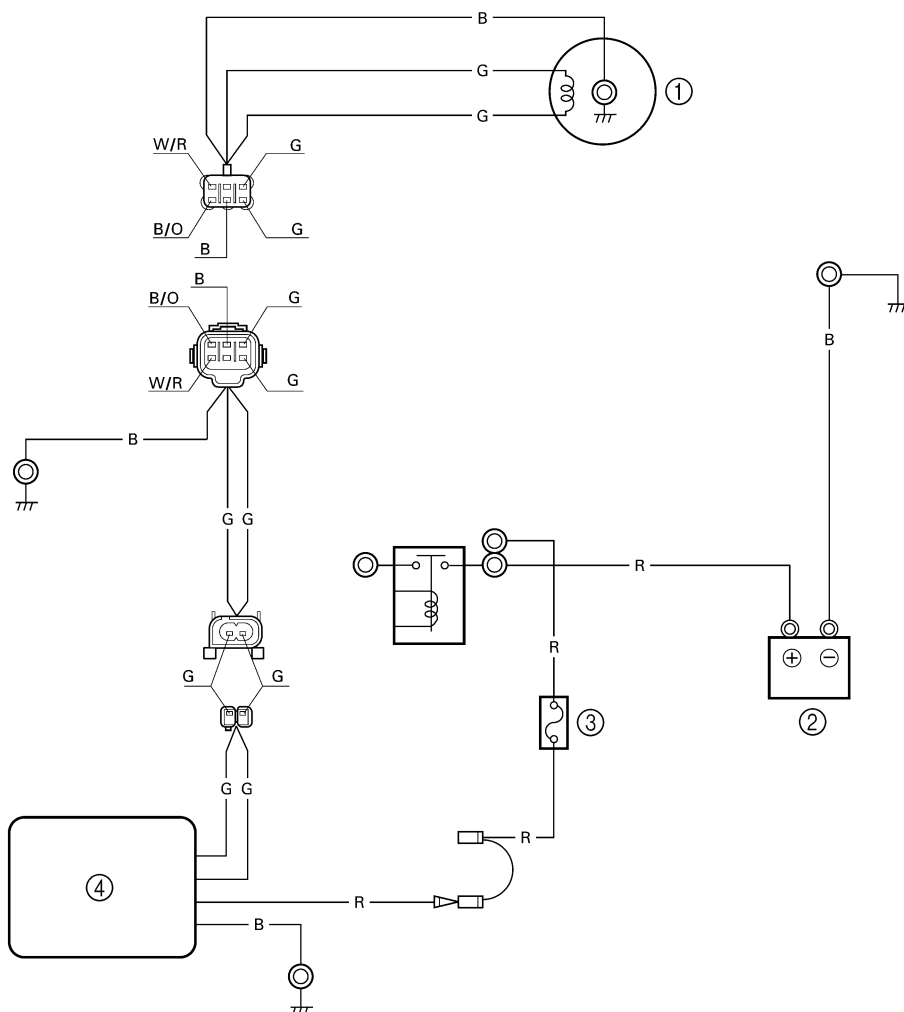
**Starter motor front cover inspection**

## 1. Inspect:

- Starter motor front cover bushing  
Damage/wear → Replace the starter motor front cover.



## CHARGING SYSTEM WIRING DIAGRAM



- ① Lighting coil
- ② Battery
- ③ Fuse (20A)
- ④ Rectifier/regulator

B : Black  
G : Green  
R : Red  
G/W : Green/white

**FUSE**

Refer to "STARTING SYSTEM".

**BATTERY**

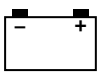
Refer to "ELECTRICAL" in chapter 3.

**LIGHTING COIL**

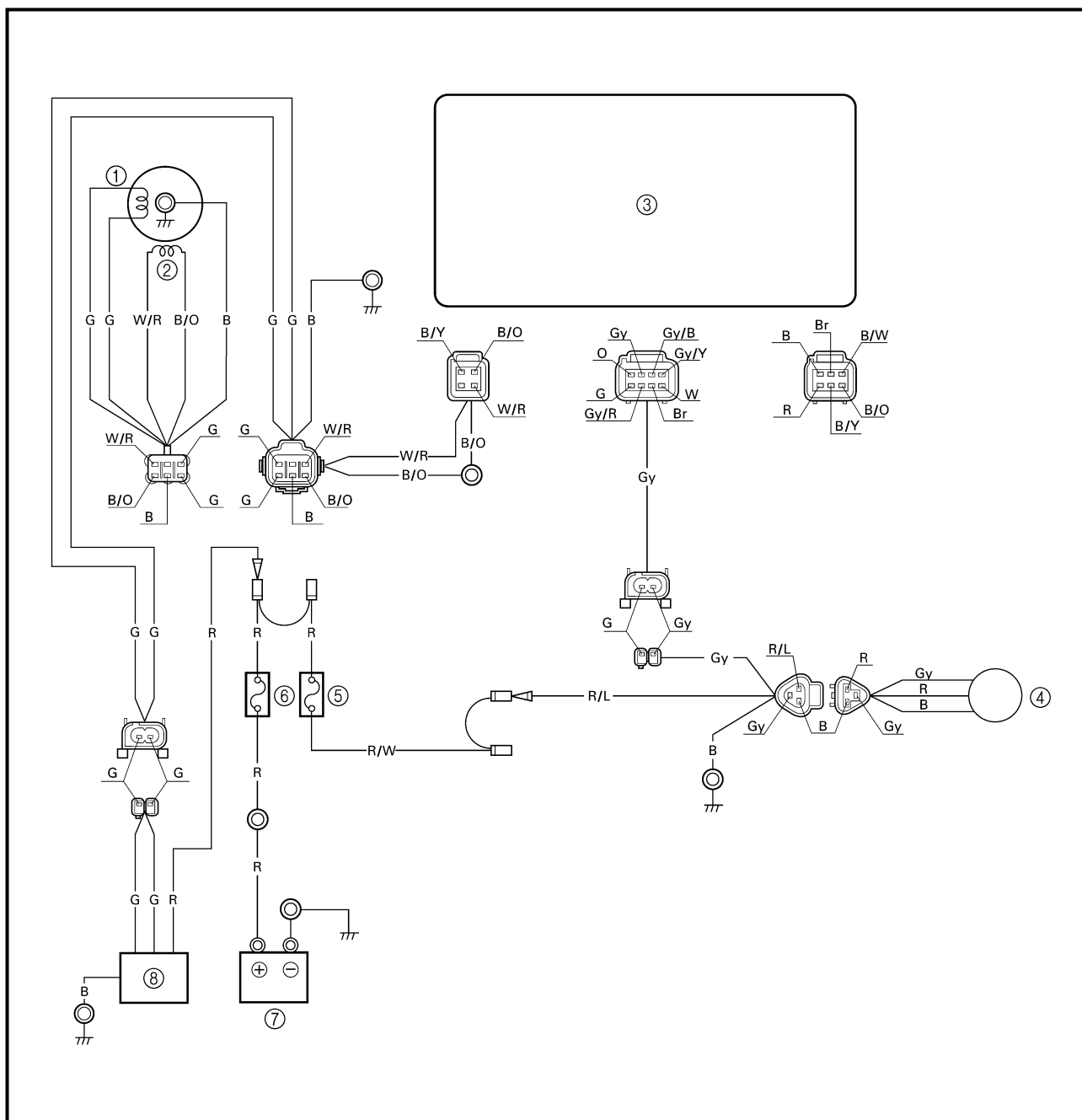
Refer to "IGNITION SYSTEM".

**RECTIFIER/REGULATOR**

Refer to "IGNITION SYSTEM".

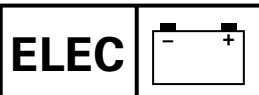


## YPVS WIRING DIAGRAM



- ① Lighting coil
- ② Pickup coil
- ③ CDI unit
- ④ YPVS servomotor
- ⑤ Fuse (10A)
- ⑥ Fuse (20A)
- ⑦ Battery
- ⑧ Rectifier/regulator

- B : Black
- Gy : Gray
- R : Red
- B/O : Black/orange
- R/L : Red/blue
- R/W : Red/white
- W/R : White/red

**FUSE**

Refer to "STARTING SYSTEM".

**BATTERY**

Refer to "ELECTRICAL" in chapter 3.

**PICKUP COIL**

Refer to "IGNITION SYSTEM".

**CDI UNIT**

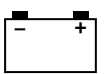
Refer to "IGNITION SYSTEM".

**LIGHTING COIL**

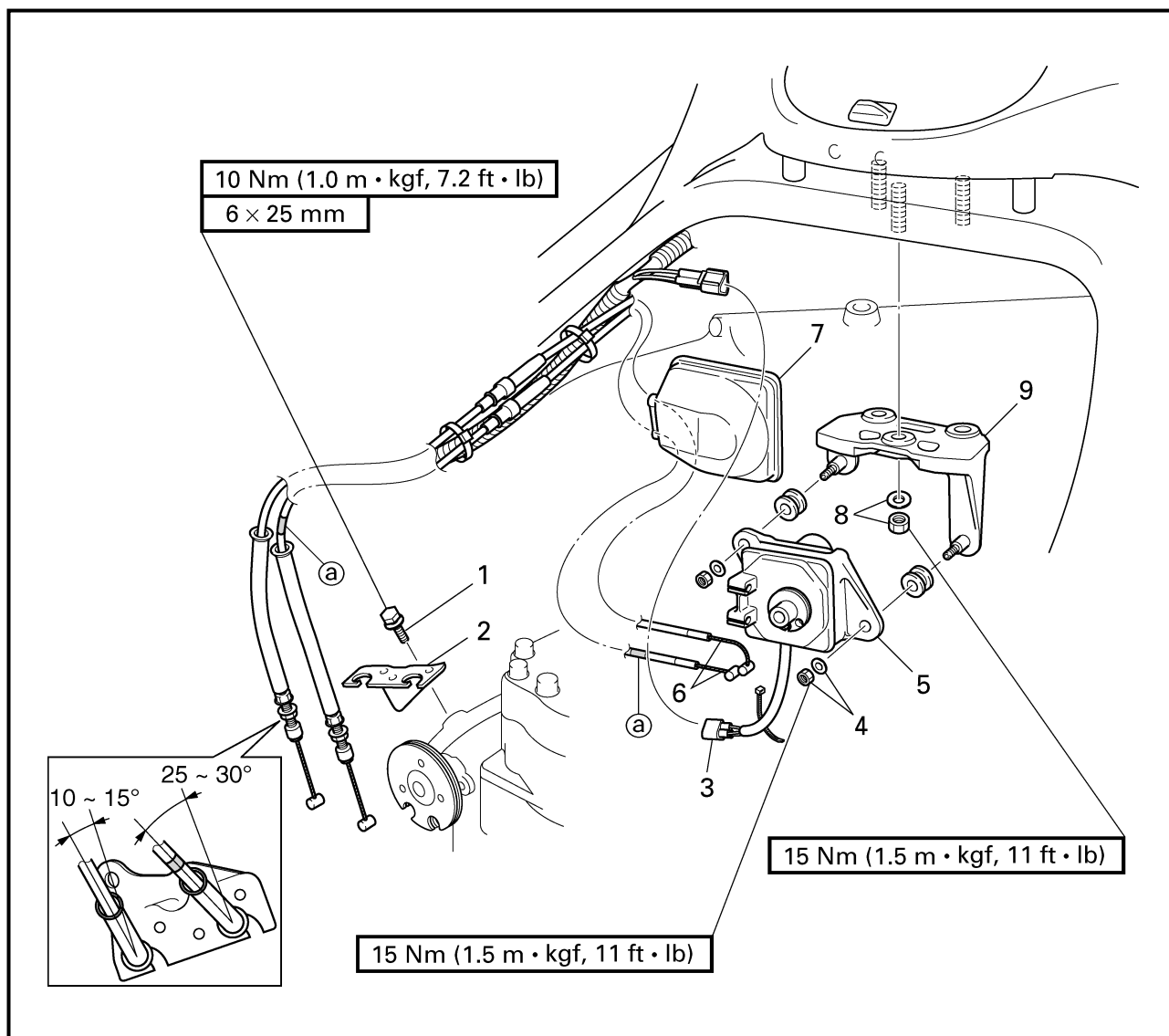
Refer to "IGNITION SYSTEM".

**RECTIFIER/REGULATOR**

Refer to "IGNITION SYSTEM".

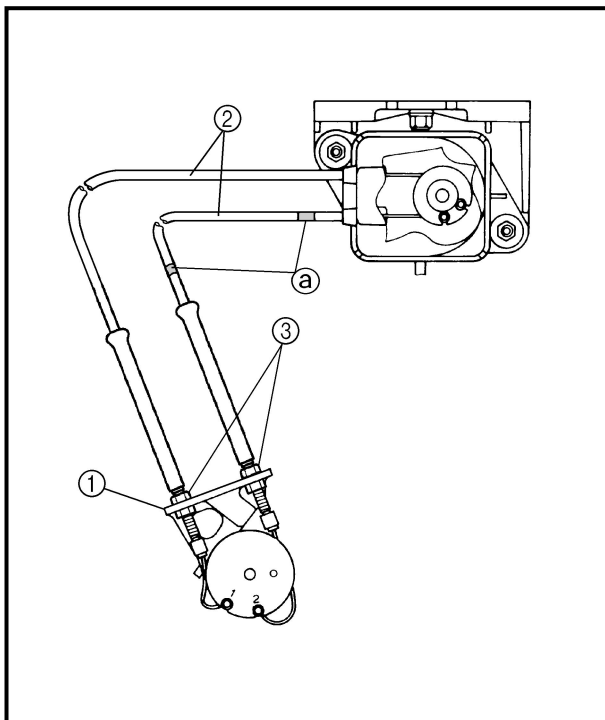
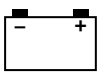


## YPVS SERVOMOTOR EXPLODED DIAGRAM



## REMOVAL AND INSTALLATION CHART

| Step                           | Procedure/Part name     | Q'ty | Service points                                             |
|--------------------------------|-------------------------|------|------------------------------------------------------------|
| <b>YPVS SERVOMOTOR REMOVAL</b> |                         |      | Follow the left "Step" for removal.                        |
| 1                              | Bolt                    | 2    | Slide the cover.<br>White paint mark ㊟ is for No. 2 cable. |
| 2                              | Cable holder            | 1    |                                                            |
| 3                              | YPVS servomotor coupler | 1    |                                                            |
| 4                              | Nut/washer              | 2/2  |                                                            |
| 5                              | YPVS servomotor         | 1    |                                                            |
| 6                              | YPVS cable              | 2    |                                                            |
| 7                              | Cover                   | 1    | Reverse the removal steps for installation.                |
| 8                              | Nut/washer              | 3/3  |                                                            |
| 9                              | YPVS servomotor bracket | 1    |                                                            |



## SERVICE POINTS

### YPVS cable removal and installation

#### 1. Remove:

- YPVS cables 1 and 2

#### Removal steps:

- Remove the YPVS cable holder ①.
- Remove the YPVS cables ② from the both drums.

#### NOTE:

- There is a white paint mark (a) on YPVS cable 2.
- When installing the YPVS cable, make sure that the YPVS cable locknuts ③ are fully turned in.

### YPVS cable inspection

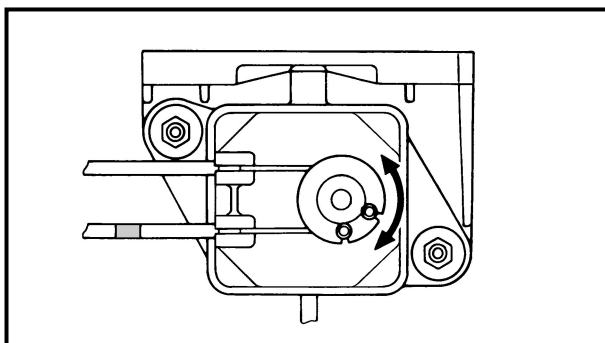
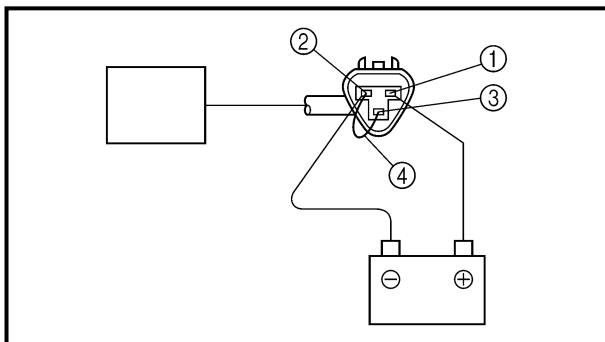
#### 1. Inspect:

- YPVS cables 1 and 2  
Frays/kinks/rough movement →  
Replace.

### YPVS servomotor inspection

#### 1. Check:

- YPVS servomotor  
YPVS servomotor does not move →  
Replace.



#### Checking steps:

- Connect the battery (12 V) to the YPVS servomotor coupler as shown.

**Battery positive terminal →**

**Red (R) terminal ①**

**Battery negative terminal →**

**Black (B) terminal ②**

- Install a jumper lead ④ between the black ② and gray ③ terminals as shown. Only install the jumper lead for 1 or 2 seconds.

**Black (B) terminal ② ↔**

**Gray (Gy) terminal ③**



- Make sure the servomotor operates properly.

**NOTE:** \_\_\_\_\_

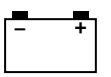
Make sure the pulley operates three seconds after the jumper lead is removed.

**CAUTION:** \_\_\_\_\_

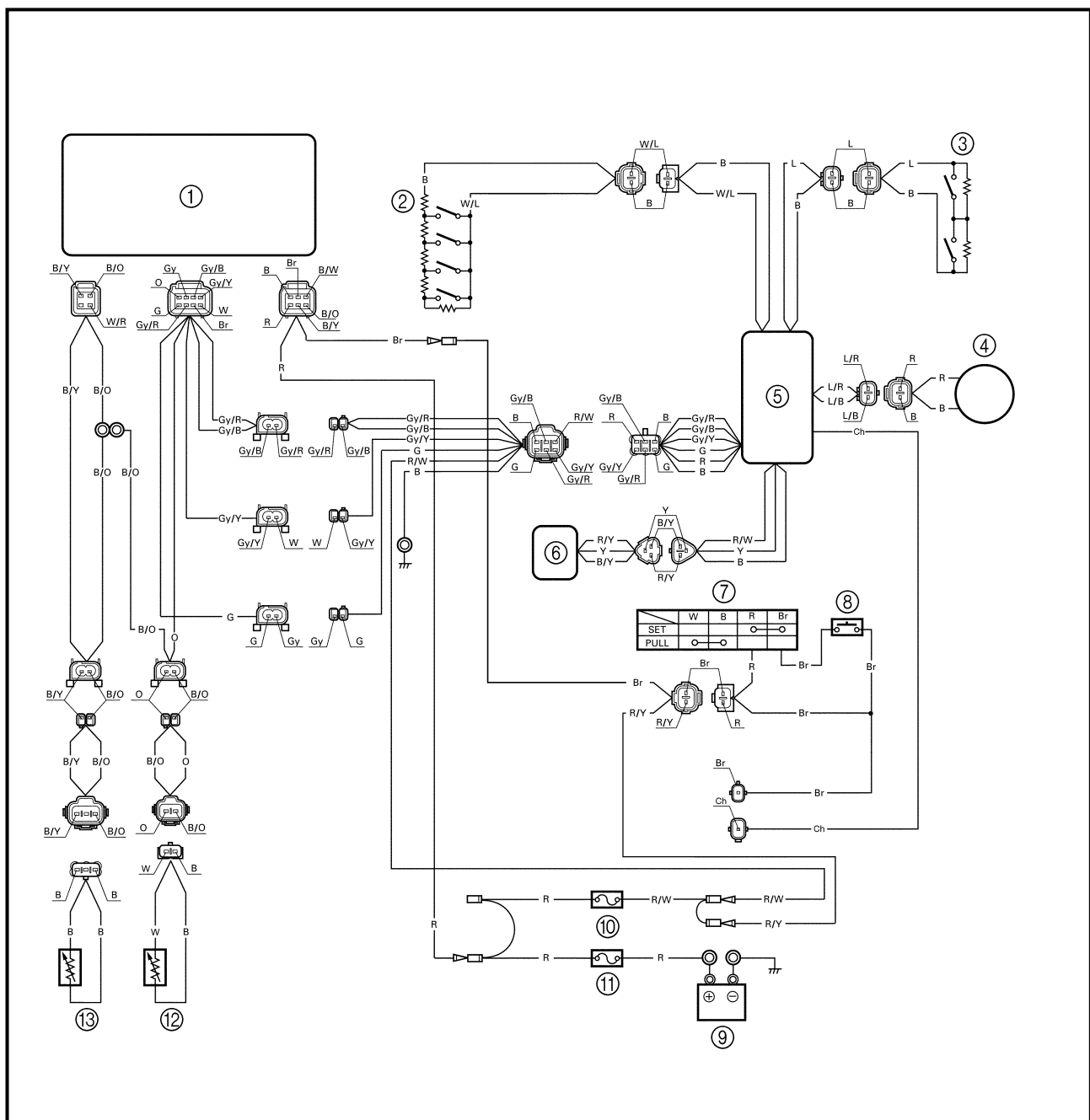
**Do not disassemble the YPVS servomotor unit. It is a sealed unit and if it is faulty it must be replaced.**

**YPVS cable adjustment**

Refer to "CONTROL SYSTEM" in chapter 3.



## INDICATION SYSTEM WIRING DIAGRAM



- ① CDI unit
- ② Fuel level sensor
- ③ Oil level sensor
- ④ Buzzer
- ⑤ Multi-function meter
- ⑥ Speed sensor
- ⑦ Engine stop lanyard switch
- ⑧ Starter switch
- ⑨ Battery
- ⑩ Fuse (10A)

- ⑪ Fuse (20A)
- ⑫ Exhaust temperature sensor
- ⑬ Water temperature sensor

B : Black  
 Br : Brown  
 Ch : Chocolate  
 G : Green  
 Gy : Gray  
 L : Blue  
 O : Orange  
 R : Red  
 W : White  
 Y : Yellow  
 B/O : Black/orange

B/Y : Black/yellow  
 Gy/B : Gray/black  
 Gy/R : Gray/red  
 Gy/Y : Gray/yellow  
 L/B : Blue/black  
 L/R : Blue/red  
 R/W : Red/white  
 R/Y : Red/yellow  
 W/L : White/blue

**FUSE**

Refer to "STARTING SYSTEM".

**BATTERY**

Refer to "ELECTRICAL" in chapter 3.

**LIGHTING COIL**

Refer to "IGNITION SYSTEM".

**RECTIFIER/REGULATOR**

Refer to "IGNITION SYSTEM".

**CDI UNIT**

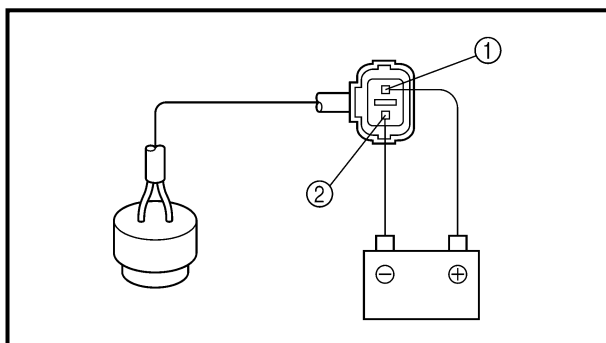
Refer to "IGNITION SYSTEM".

**WATER TEMPERATURE SENSOR**

Refer to "IGNITION SYSTEM".

**EXHAUST TEMPERATURE SENSOR**

Refer to "IGNITION SYSTEM".

**BUZZER**

1. Check:

- Buzzer

Buzzer does not sound → Replace.

**Checking steps:**

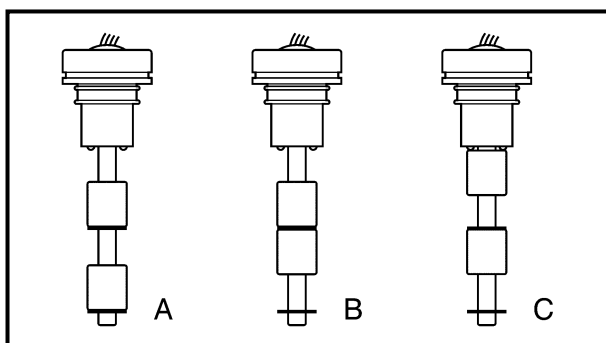
- Connect the battery (12 V) to the buzzer coupler as shown.

**Battery positive terminal →**

**Red (R) terminal ①**

**Battery negative terminal →**

**Black (B) terminal ②**

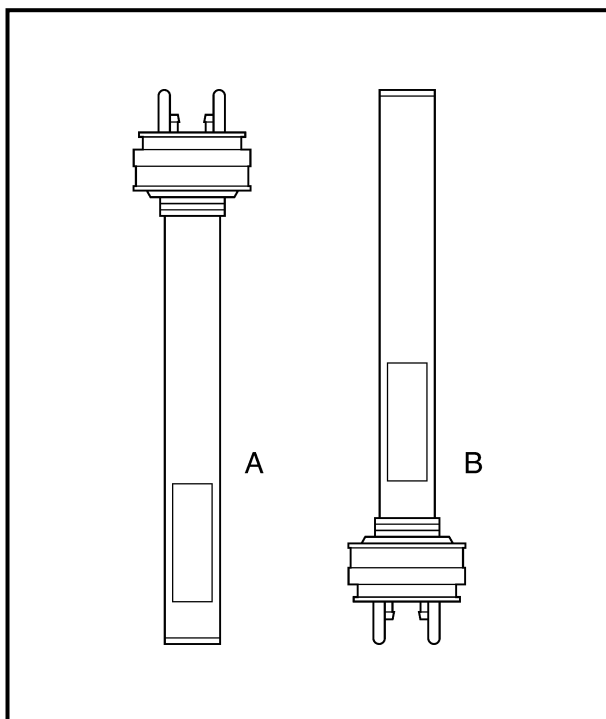
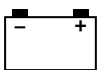
**OIL LEVEL SENSOR**

1. Measure:

- Oil level sensor resistance

Out of specification → Replace.

| Blue (L) – Black (B)                                                                |                |                |
|-------------------------------------------------------------------------------------|----------------|----------------|
|  | Float position | Resistance (Ω) |
|                                                                                     | A              | 292 ~ 308      |
|                                                                                     | B              | 97 ~ 103       |
|                                                                                     | C              | 0 ~ 3          |



### FUEL LEVEL SENSOR

#### 1. Measure:

- Fuel level sensor resistance  
Out of specification → Replace.

| White/blue (W/L) – Black (B)                                                      |                |                         |
|-----------------------------------------------------------------------------------|----------------|-------------------------|
|  | Float position | Resistance ( $\Omega$ ) |
|                                                                                   | A              | 757 ~ 803               |
|                                                                                   | B              | 0 ~ 8                   |

### MULTI-FUNCTION METER

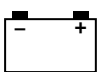
#### Multi-function meter

#### 1. Check:

- Multi-function meter  
Cracked meter housing → Replace the multi-function meter.  
Meter is fogged/shows signs of water intrusion → Replace the multi-function meter.

### MULTI-FUNCTION METER REMOVAL

Refer to “STEERING CONSOLE COVER” in chapter 8.

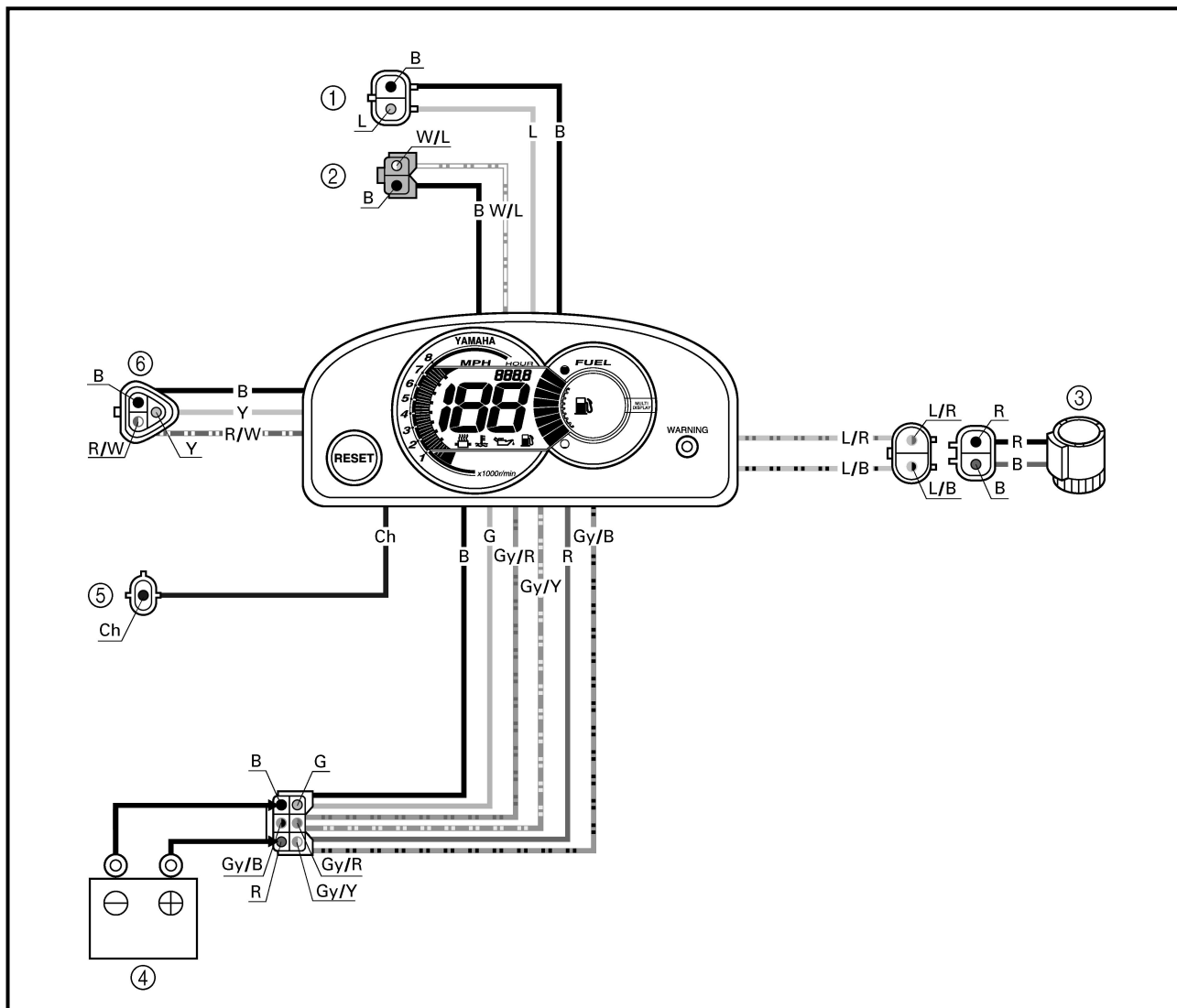


### Display function

#### 1. Check:

- Display function

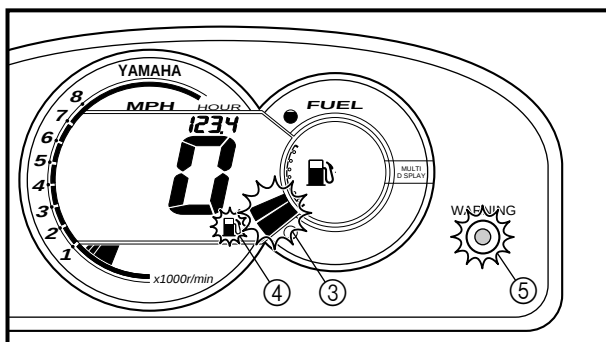
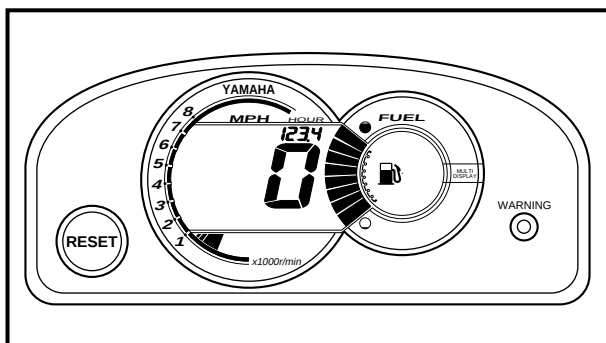
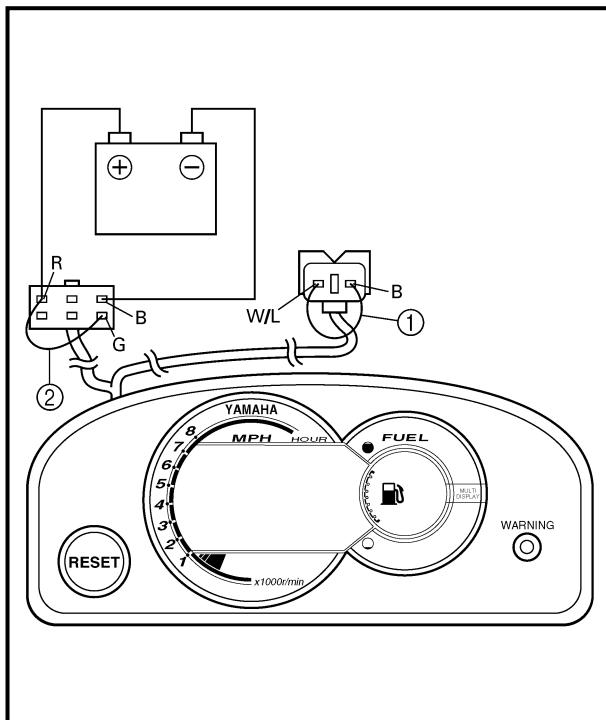
Not operate → Replace the multi-function meter.



- ① Oil level sensor
- ② Fuel level sensor
- ③ Buzzer
- ④ Battery
- ⑤ Start switch
- ⑥ Speed sensor

B : Black  
 Ch : Chocolate  
 G : Green  
 L : Blue  
 R : Red  
 Y : Yellow

Gy/B : Gray/black  
 Gy/R : Gray/red  
 Gy/Y : Gray/yellow  
 L/B : Blue/black  
 L/R : Blue/red  
 R/W : Red/white  
 W/L : White/blue



### Fuel level gauge

#### 1. Check:

- Fuel level gauge  
Not operating → Replace the multi-function meter.

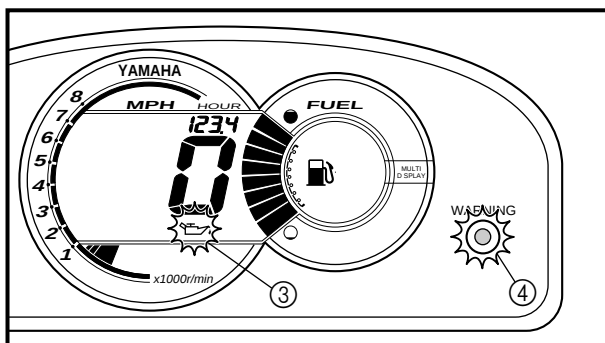
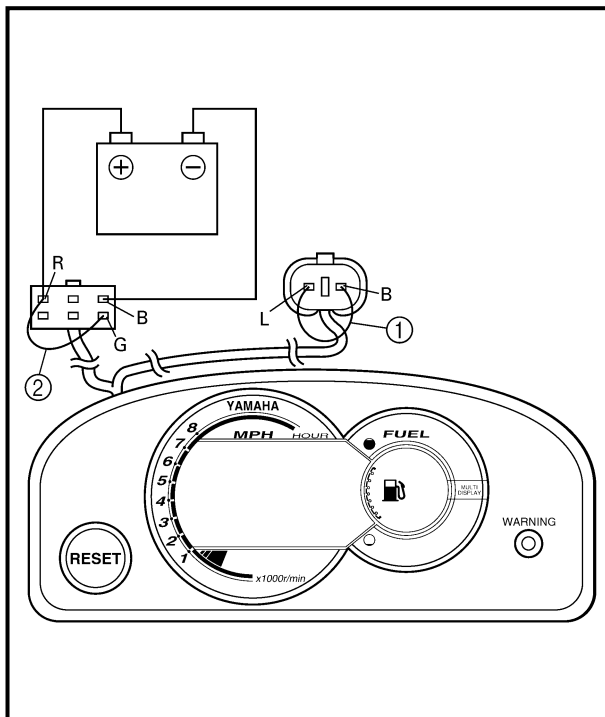
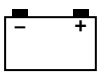
#### Checking steps:

- Supply DC 12 voltage to the natural color six-pin connector (+: red, -: black) with a battery.
- Disconnect the green two-pin connector (white/blue and black leads).
- Connect the white/blue and black terminals with a jumper lead ①.
- Connect the green and red terminals with a jumper lead ②.

#### NOTE:

If the jumper lead is installed for more than 30 seconds, the display will automatically turn off.

- Check the fuel level segments is full indicated.
- Remove the jumper lead ① from the green two-pin connector.
- Disconnect the jumper lead ② and then connect it to green and red terminal again.
- Make sure the fuel level segment ③, fuel symbol ④ and "WARNING" lamp ⑤ blinks, and the buzzer sounds intermittently.



### Oil level gauge

#### 1. Check:

- Oil level gauge  
Not operating → Replace the multi-function meter.

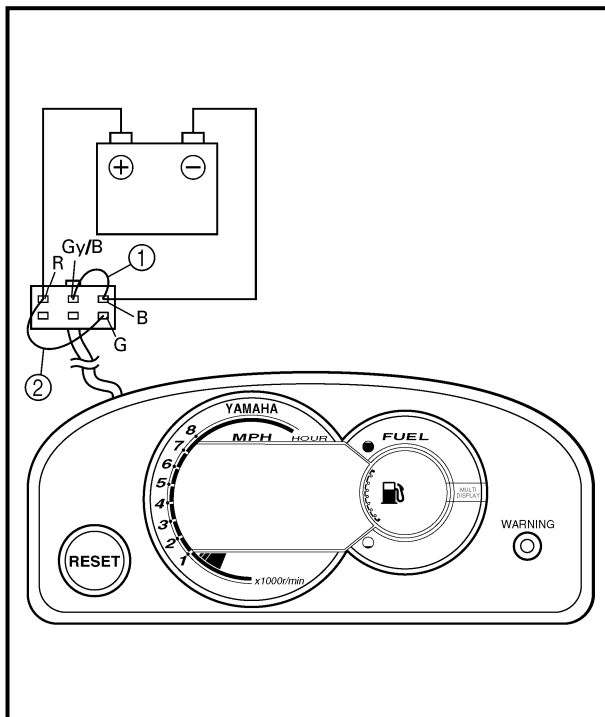
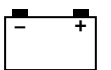
#### Checking steps:

- Supply DC 12 voltage to the natural color six-pin connector (+: red, -: black) with a battery.
- Disconnect the white two-pin connector (blue and black leads).
- Connect the blue and black terminals with a jumper lead ①.
- Connect the green and red terminals with a jumper lead ②.

#### NOTE:

If the jumper lead is installed for more than 30 seconds, the display will automatically turn off.

- Remove the jumper lead ① from the white two-pin connector.
- Disconnect the jumper lead ② and then connect it to green and red terminal again.
- Make sure the oil symbol ③ and "WARNING" lamp ④ blinks, and the buzzer sounds intermittently.



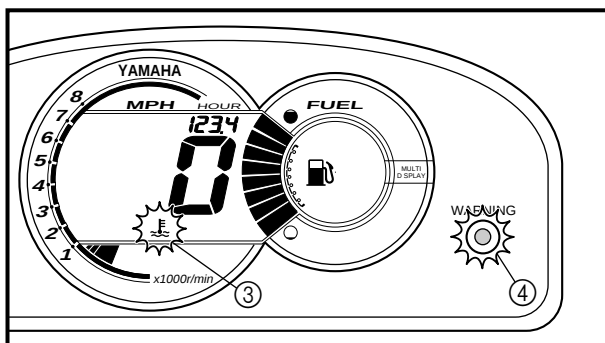
### Overheat warning indicator

#### 1. Check:

- Overheat 1 warning indicator  
Not operating → Replace the multi-function meter.

#### Checking steps:

- Supply DC 12 voltage to the natural color six-pin connector (+: red, -: black) with a battery.
- Connect the gray/black and black terminals with a jumper lead ①.
- Connect the green and red terminals with a jumper lead ②.
- Make sure the water temperature symbol ③ and "WARNING" lamp ④ blinks, and the buzzer sounds intermittently.

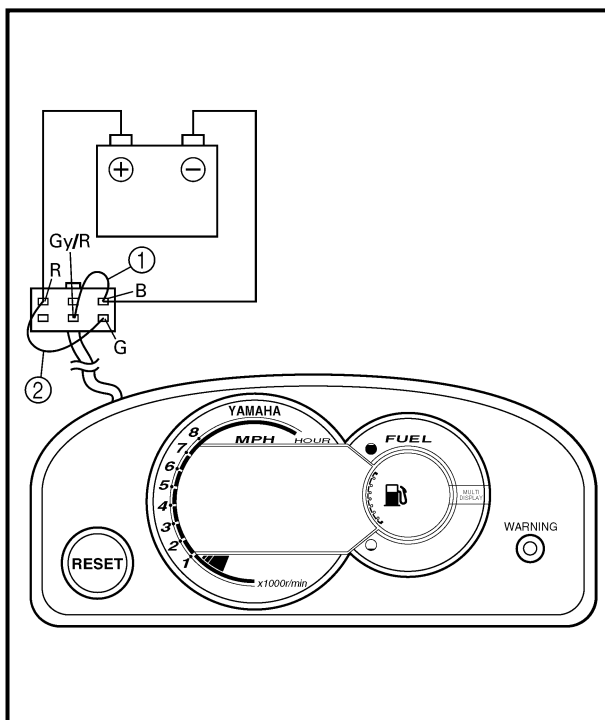


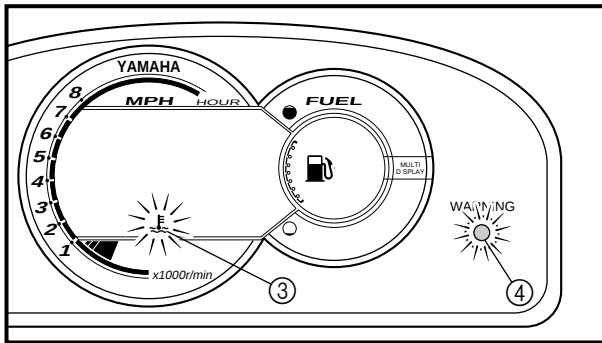
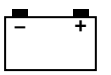
#### 2. Check:

- Overheat 2 warning indicator  
Not operating → Replace the multi-function meter.

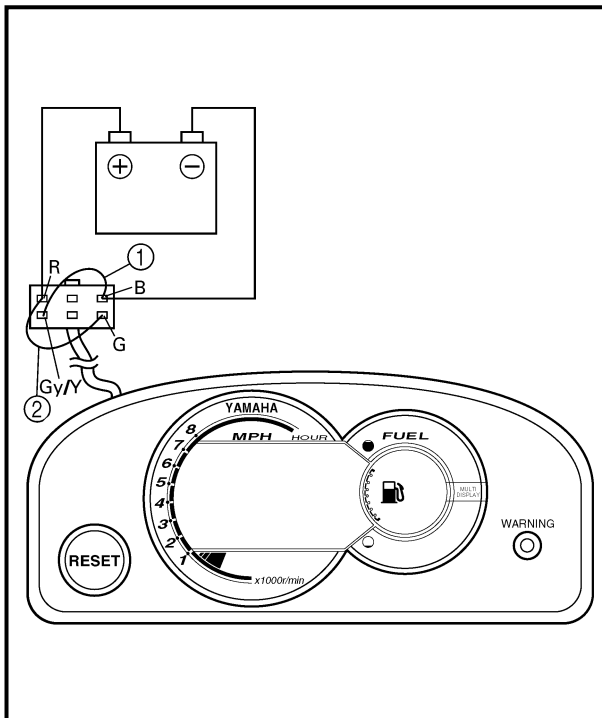
#### Checking steps:

- Supply DC 12 voltage to the natural color six-pin connector (+: red, -: black) with a battery.
- Connect the gray/red and black terminals with a jumper lead ①.
- Connect the green and red terminals with a jumper lead ②.





- Make sure the water temperature symbol ③ display and “WARNING” lamp ④ on, and the buzzer sounds continuity.



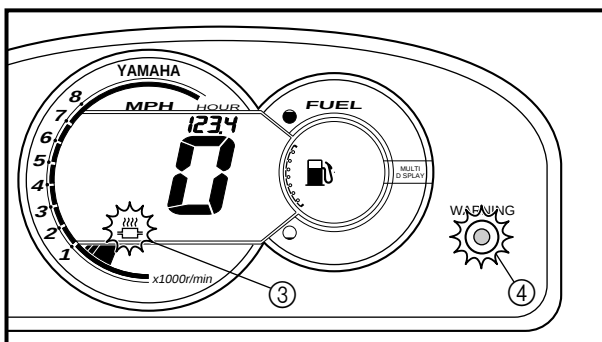
### 3. Check:

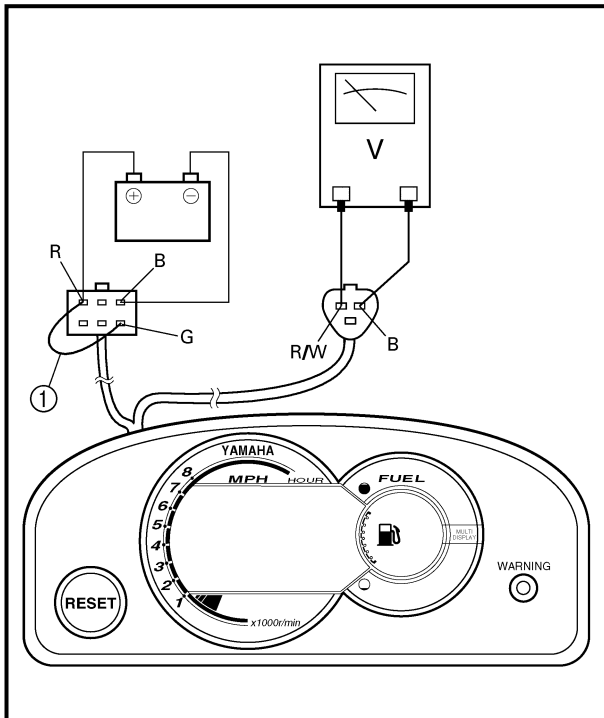
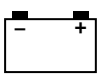
- Exhaust temperature warning indicator

Not operating → Replace the multi-function meter.

### Checking steps:

- Supply DC 12 voltage to the natural color six-pin connector (+: red, -: black) with a battery.
- Connect the gray/yellow and black terminals with a jumper lead ①.
- Connect the green and red terminals with a jumper lead ②.
- Make sure the exhaust temperature symbol ③ and “WARNING” lamp ④ blinks, and the buzzer sounds intermittently.



**Speed meter**

## 1. Check:

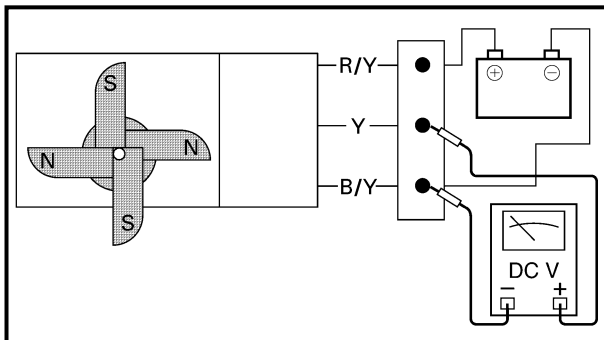
- Speed meter output voltage  
Within specification → Check the speed sensor output voltage and pulses.  
Out of specification → Replace.



**Speed meter output voltage:**  
**10.5 V**

**Checking steps:**

- Supply DC 12 voltage to the natural color six-pin connector (+: red, -: black) with a battery.
- Connect the green and red terminals with a jumper lead ①.
- Measure the voltage on the speed sensor connector (white color three-pin connector) between the red/white and black leads.

**Speed sensor**

## 1. Check:

- Speed sensor output voltage and pulses  
Out of specification → Replace.



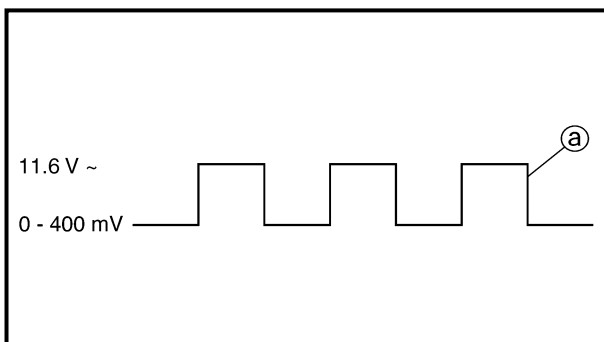
**Speed sensor output voltage**  
**(dependant on the paddle wheel**  
**position):**

**Less than 400 mV/**

**More than 11.6 V**

**Output pulse:**

**2 pulses/one-full turn**

**Checking steps:**

- Apply DC 12 voltage to the white color three-pin connector (between the red/yellow and black/yellow leads).
- Rotate the paddle wheel by hand and measure the voltage between the black and yellow leads.

**NOTE:**

As the paddle wheel is rotated, a square-wave voltage signal ② is produced.

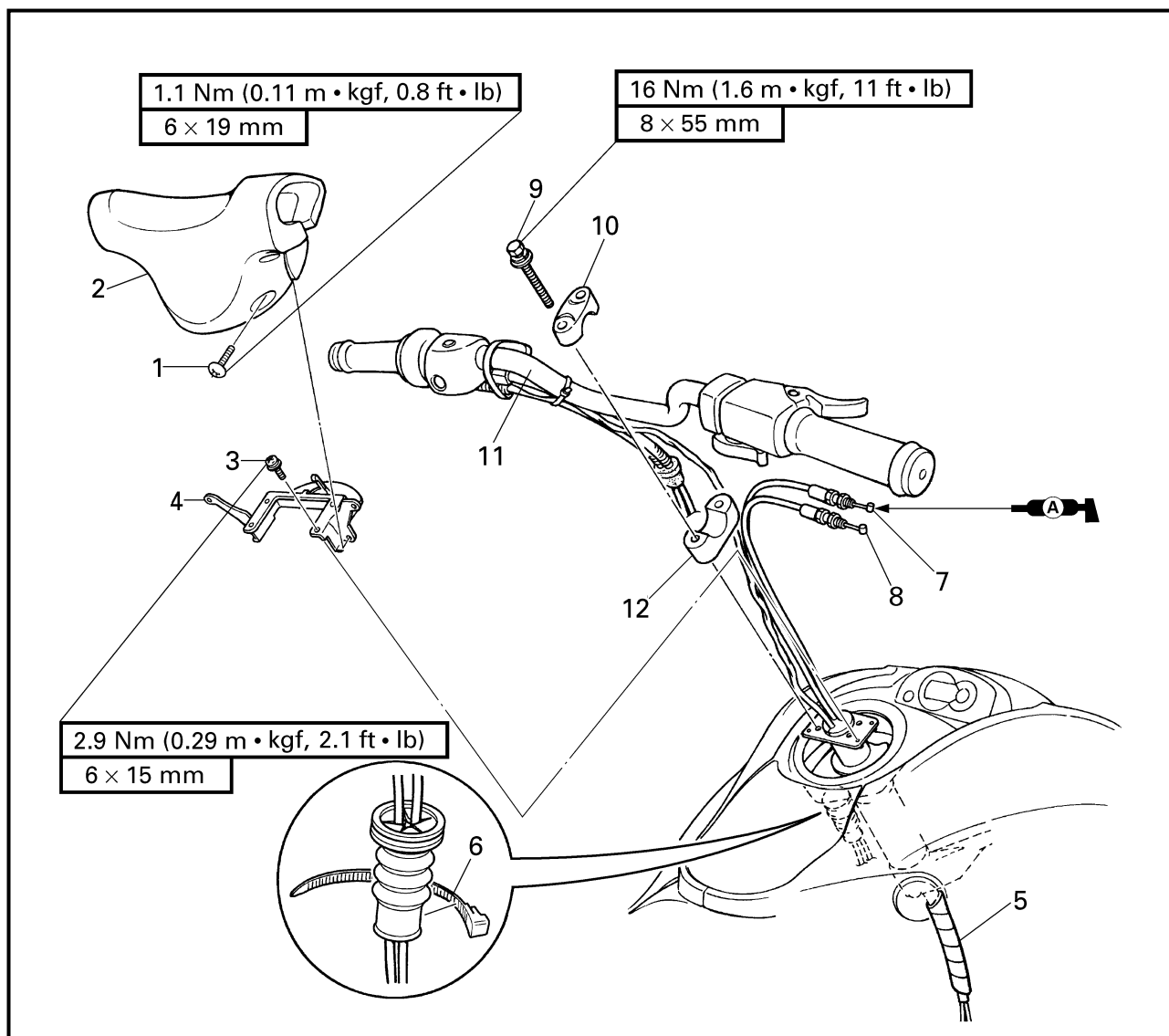
- Two pulses occur every time the paddle wheel makes one-full turn.

## CHAPTER 8

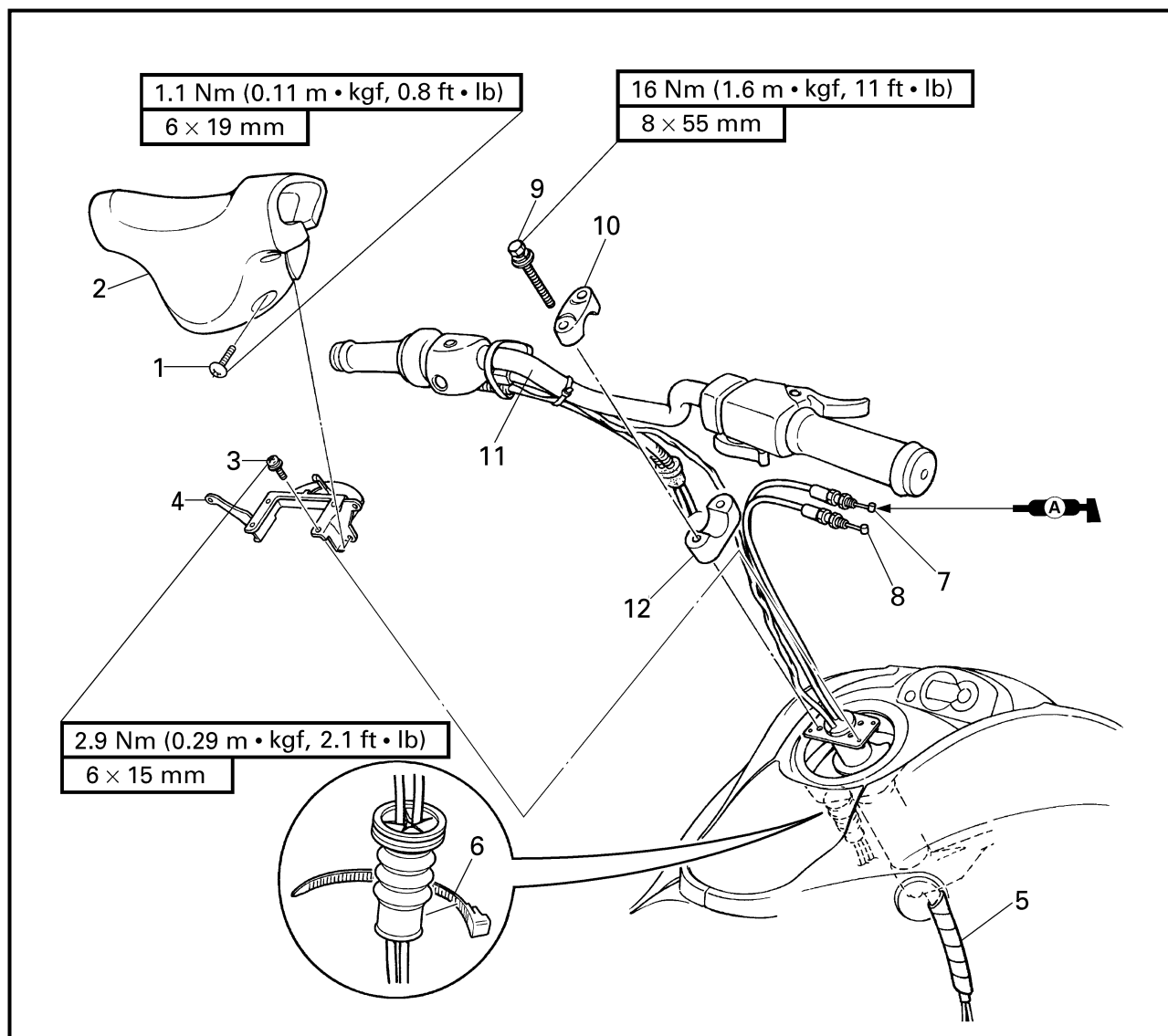
### HULL AND HOOD

|                                                              |      |
|--------------------------------------------------------------|------|
| <b>HANDLEBAR</b> .....                                       | 8-1  |
| EXPLODED DIAGRAM.....                                        | 8-1  |
| REMOVAL AND INSTALLATION CHART .....                         | 8-1  |
| SERVICE POINTS .....                                         | 8-7  |
| Handlebar inspection.....                                    | 8-7  |
| Handlebar switch inspection.....                             | 8-7  |
| Handlebar assembly installation .....                        | 8-7  |
| <br><b>QSTS GRIP</b> .....                                   | 8-10 |
| EXPLODED DIAGRAM.....                                        | 8-10 |
| REMOVAL AND INSTALLATION CHART .....                         | 8-10 |
| SERVICE POINTS .....                                         | 8-12 |
| QSTS cable inspection.....                                   | 8-12 |
| QSTS grip inspection.....                                    | 8-12 |
| <br><b>STEERING COLUMN</b> .....                             | 8-13 |
| EXPLODED DIAGRAM.....                                        | 8-13 |
| REMOVAL AND INSTALLATION CHART .....                         | 8-13 |
| SERVICE POINTS .....                                         | 8-16 |
| Steering column bushing inspection .....                     | 8-16 |
| <br><b>REMOTE CONTROL CABLES AND SPEED SENSOR LEAD</b> ..... | 8-17 |
| EXPLODED DIAGRAM.....                                        | 8-17 |
| REMOVAL AND INSTALLATION CHART .....                         | 8-17 |
| SERVICE POINTS .....                                         | 8-19 |
| Remote control cables inspection .....                       | 8-19 |
| Steering cable (jet pump side) installation .....            | 8-19 |
| Steering cable stopper installation.....                     | 8-19 |
| QSTS cable (jet pump side) installation.....                 | 8-20 |
| QSTS cable stopper installation .....                        | 8-20 |
| <br><b>FRONT HOOD</b> .....                                  | 8-21 |
| EXPLODED DIAGRAM.....                                        | 8-21 |
| REMOVAL AND INSTALLATION CHART .....                         | 8-21 |
| <br><b>STEERING CONSOLE COVER</b> .....                      | 8-23 |
| EXPLODED DIAGRAM.....                                        | 8-23 |
| REMOVAL AND INSTALLATION CHART .....                         | 8-23 |

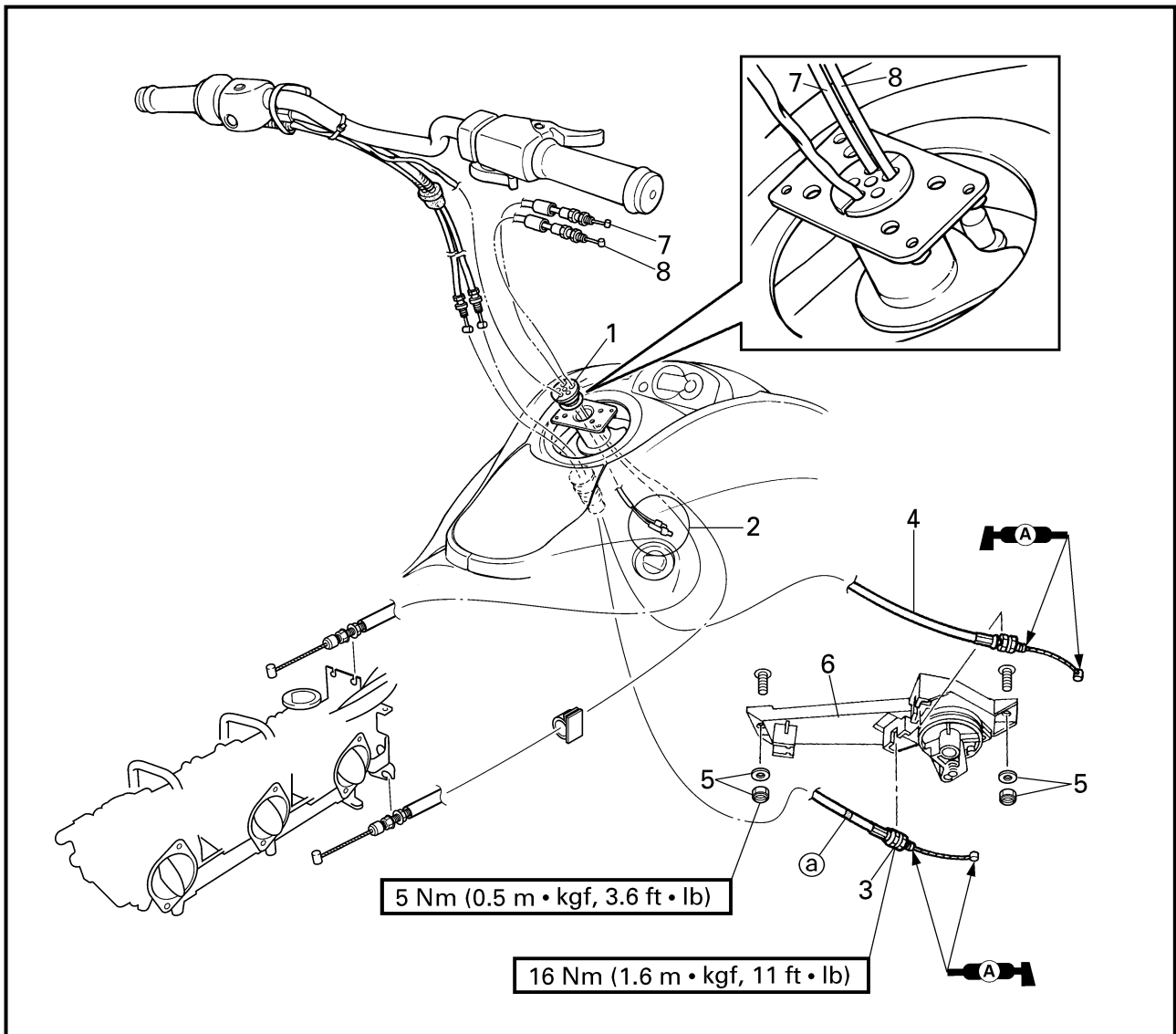
|                                            |             |
|--------------------------------------------|-------------|
| <b>BUZZER AND HOOD LOCK .....</b>          | <b>8-27</b> |
| EXPLODED DIAGRAM .....                     | 8-27        |
| REMOVAL AND INSTALLATION CHART .....       | 8-27        |
| <br><b>HOSES.....</b>                      | <b>8-30</b> |
| EXPLODED DIAGRAM .....                     | 8-30        |
| REMOVAL AND INSTALLATION CHART .....       | 8-30        |
| SERVICE POINTS .....                       | 8-32        |
| Check valve inspection .....               | 8-32        |
| Ventilation hose installation.....         | 8-32        |
| <br><b>SEATS AND HAND GRIP .....</b>       | <b>8-33</b> |
| EXPLODED DIAGRAM .....                     | 8-33        |
| REMOVAL AND INSTALLATION CHART .....       | 8-33        |
| SERVICE POINTS .....                       | 8-35        |
| Seat lock inspection .....                 | 8-35        |
| <br><b>BATTERY BOX.....</b>                | <b>8-36</b> |
| EXPLODED DIAGRAM .....                     | 8-36        |
| REMOVAL AND INSTALLATION CHART .....       | 8-36        |
| <br><b>EXHAUST SYSTEM.....</b>             | <b>8-38</b> |
| EXPLODED DIAGRAM .....                     | 8-38        |
| REMOVAL AND INSTALLATION CHART .....       | 8-38        |
| SERVICE POINTS .....                       | 8-40        |
| Exhaust system inspection.....             | 8-40        |
| Exhaust component parts sub-assembly ..... | 8-40        |
| <br><b>DECK AND HULL .....</b>             | <b>8-41</b> |
| EXPLODED DIAGRAM .....                     | 8-41        |
| REMOVAL AND INSTALLATION CHART .....       | 8-41        |
| <br><b>ENGINE MOUNT .....</b>              | <b>8-43</b> |
| EXPLODED DIAGRAM .....                     | 8-43        |
| REMOVAL AND INSTALLATION CHART .....       | 8-43        |
| HULL REPAIR .....                          | 8-44        |
| Shallow scratches .....                    | 8-44        |
| Deep scratches .....                       | 8-44        |
| Cracks and punctures .....                 | 8-45        |
| Insert nut.....                            | 8-46        |
| Graphic removal.....                       | 8-48        |
| Graphic installation.....                  | 8-48        |

**HANDLEBAR  
EXPLODED DIAGRAM**

**REMOVAL AND INSTALLATION CHART**

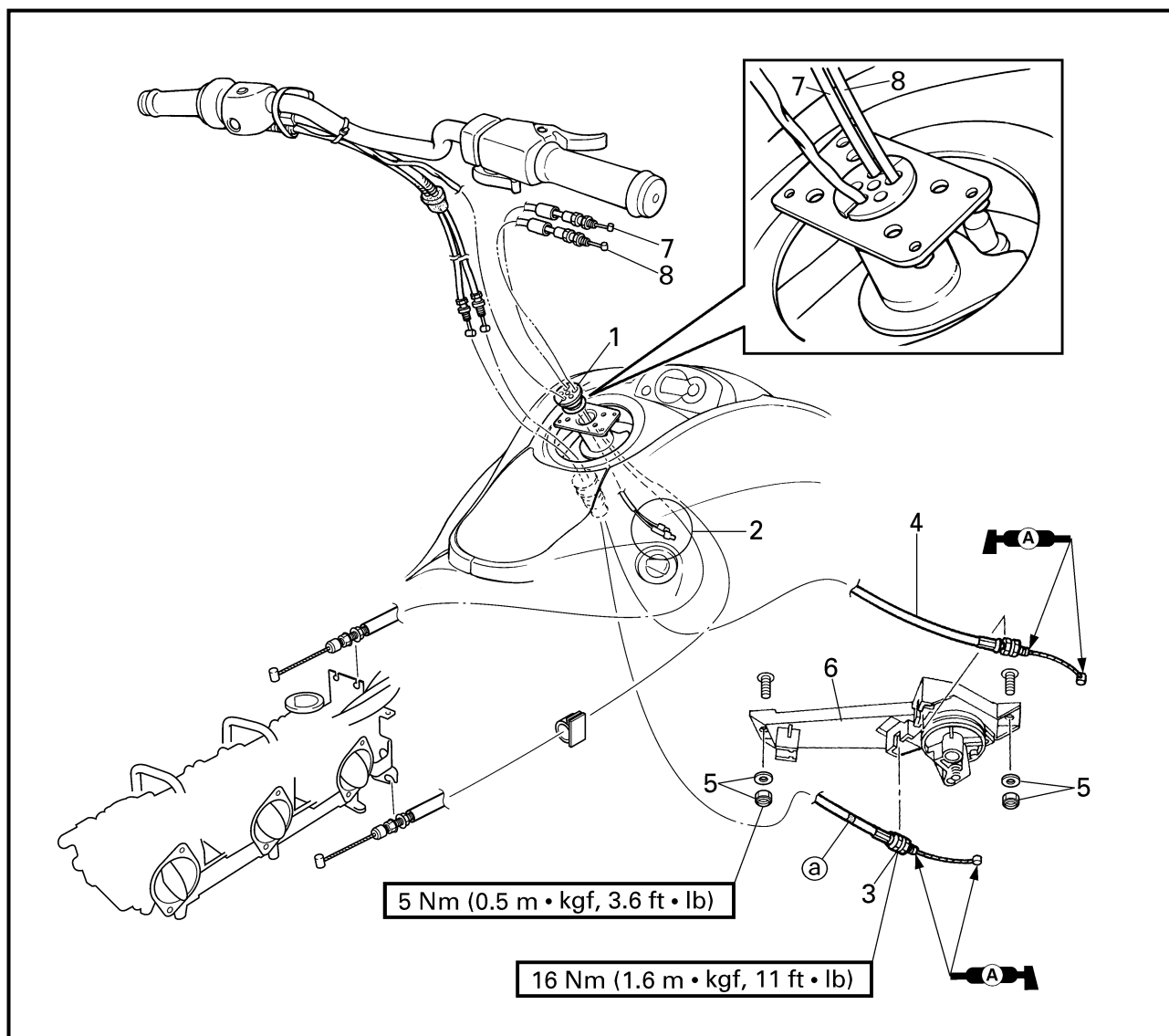
| Step | Procedure/Part name            | Q'ty | Service points                      |
|------|--------------------------------|------|-------------------------------------|
|      | <b>HANDLEBAR COVER REMOVAL</b> |      | Follow the left "Step" for removal. |
| 1    | Screw                          | 4    |                                     |
| 2    | Handlebar cover                | 1    |                                     |
| 3    | Screw                          | 4    |                                     |
| 4    | Handlebar cover stay           | 1    |                                     |
| 5    | Spiral tube                    | 1    |                                     |
| 6    | Band                           | 1    |                                     |

**EXPLODED DIAGRAM**


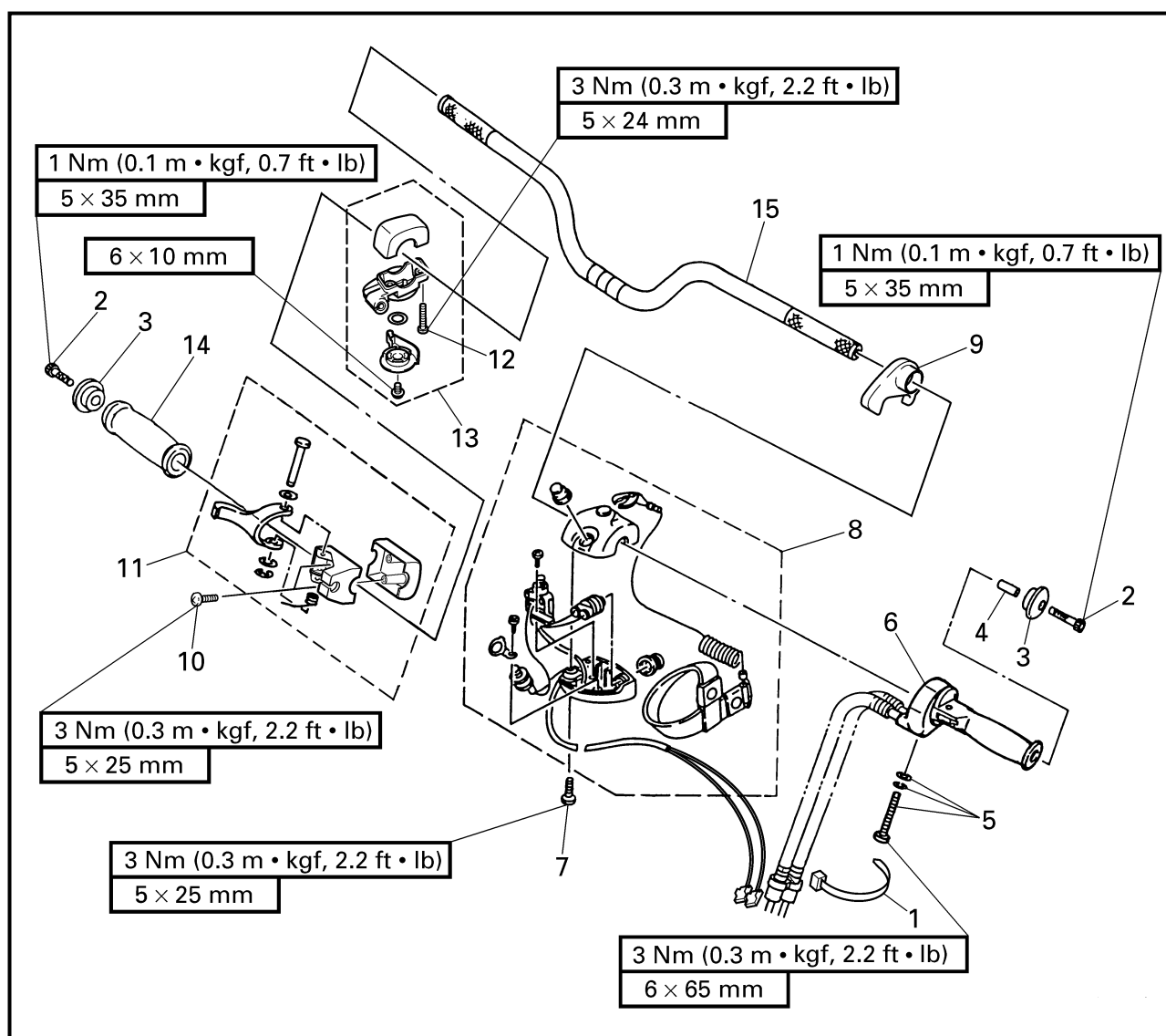
| Step | Procedure/Part name    | Q'ty | Service points                              |
|------|------------------------|------|---------------------------------------------|
| 7    | Throttle cable         | 1    | Reverse the removal steps for installation. |
| 8    | Choke cable            | 1    |                                             |
| 9    | Bolt                   | 4    |                                             |
| 10   | Upper handlebar holder | 2    |                                             |
| 11   | Handlebar assembly     | 1    |                                             |
| 12   | Lower handlebar holder | 2    |                                             |

**EXPLODED DIAGRAM**

**REMOVAL AND INSTALLATION CHART**

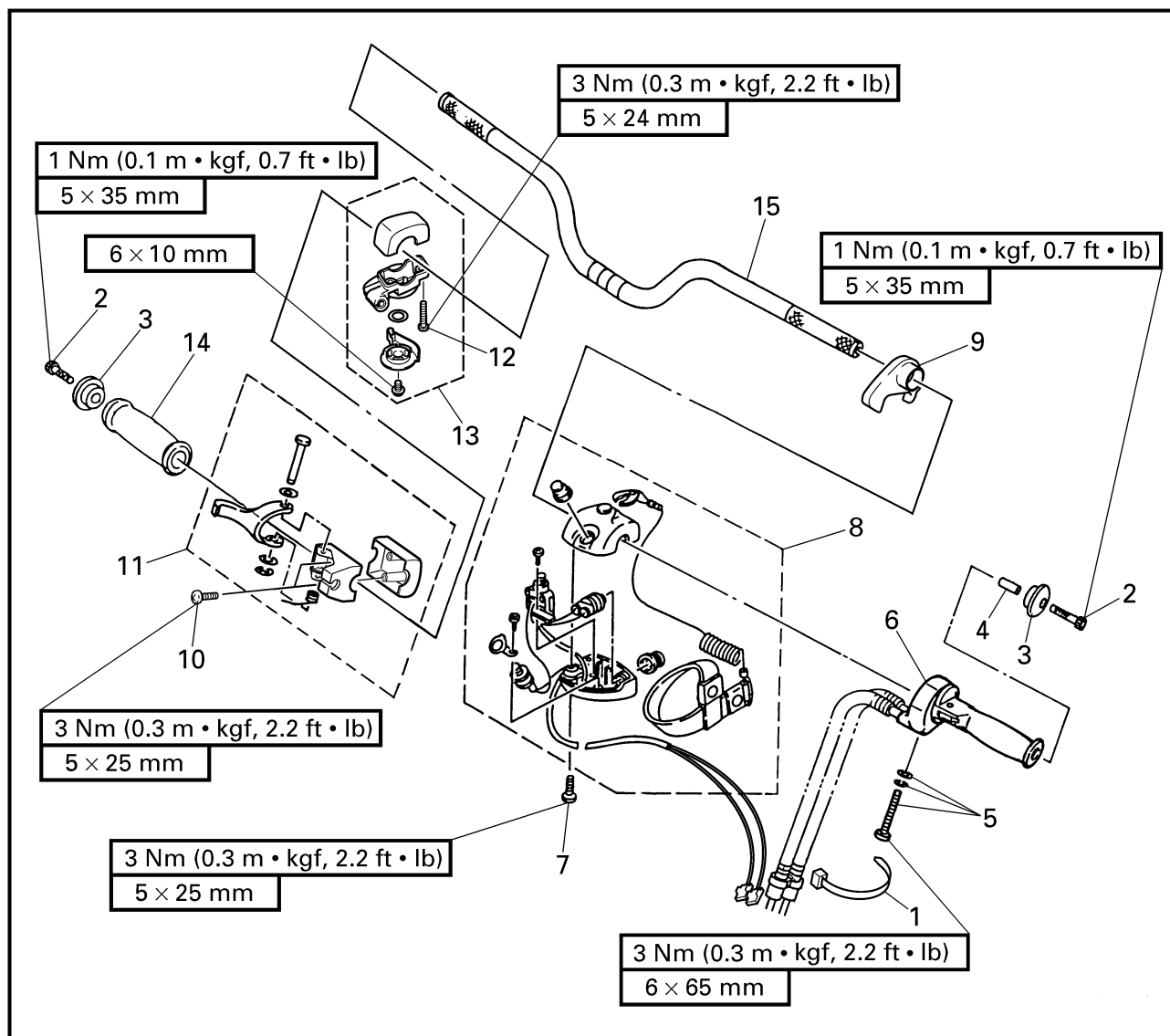
| Step | Procedure/Part name        | Q'ty | Service points                                                                                                                                                                             |
|------|----------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | <b>HANDLEBAR REMOVAL</b>   | 1    | Follow the left "Step" for removal.<br>Refer to "REMOTE CONTROL CABLES AND SPEED SENSOR LEAD".<br><b>NOTE:</b> _____<br>Apply soapy water to the grommet for easier installation.<br>_____ |
|      | QSTS cable (to jet nozzle) |      |                                                                                                                                                                                            |
|      | Grommet                    |      |                                                                                                                                                                                            |
| 2    | Handlebar switch coupler   | 3    | with white tape (a)                                                                                                                                                                        |
| 3    | QSTS cable 2               | 1    |                                                                                                                                                                                            |

**EXPLODED DIAGRAM**


| Step | Procedure/Part name | Q'ty | Service points                                                                                                                         |
|------|---------------------|------|----------------------------------------------------------------------------------------------------------------------------------------|
| 4    | QSTS cable 1        | 1    | <b>NOTE:</b> _____<br>Route the QSTS cables behind of the oil filler hose.<br>_____<br><br>Reverse the removal steps for installation. |
| 5    | Nut/washer          | 2/2  |                                                                                                                                        |
| 6    | QSTS converter      | 1    |                                                                                                                                        |
| 7    | Throttle cable      | 1    |                                                                                                                                        |
| 8    | Choke cable         | 1    |                                                                                                                                        |

**EXPLODED DIAGRAM**

**REMOVAL AND INSTALLATION CHART**

| Step | Procedure/Part name          | Q'ty  | Service points                          |
|------|------------------------------|-------|-----------------------------------------|
|      | <b>HANDLEBAR DISASSEMBLY</b> |       | Follow the left "Step" for disassembly. |
| 1    | Band                         | 1     |                                         |
| 2    | Bolt                         | 2     |                                         |
| 3    | Grip end                     | 2     |                                         |
| 4    | Spacer                       | 1     |                                         |
| 5    | Screw/washer/spring washer   | 1/1/1 |                                         |
| 6    | QSTS grip assembly           | 1     |                                         |
| 7    | Screw                        | 2     |                                         |
| 8    | Handlebar switch assembly    | 1     |                                         |
| 9    | Cable holder                 | 1     |                                         |

**EXPLODED DIAGRAM**


| Step | Procedure/Part name     | Q'ty | Service points                                                                                              |
|------|-------------------------|------|-------------------------------------------------------------------------------------------------------------|
| 10   | Screw                   | 2    | <b>NOTE:</b> _____<br>Apply adhesive to the handlebar and the inner surface of the handlebar grip.<br>_____ |
| 11   | Throttle lever assembly | 1    |                                                                                                             |
| 12   | Screw                   | 2    |                                                                                                             |
| 13   | Choke lever assembly    | 1    |                                                                                                             |
| 14   | Handlebar grip          | 1    |                                                                                                             |
| 15   | Handlebar               | 1    | Reverse the disassembly steps for assembly.                                                                 |



## SERVICE POINTS

### Handlebar inspection

1. Inspect:

- Handlebar  
Bends/cracks/damage → Replace.

### Handlebar switch inspection

Refer to "STARTING SYSTEM" in chapter 7.

### Handlebar assembly installation

1. Adjust:

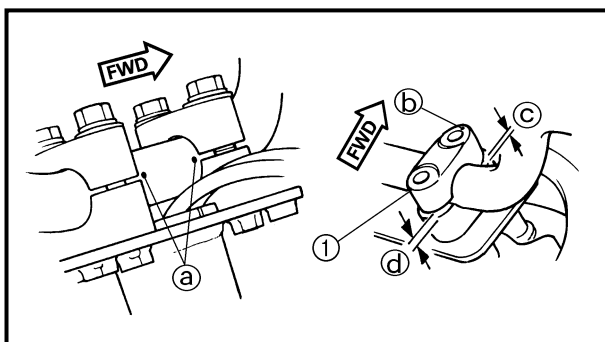
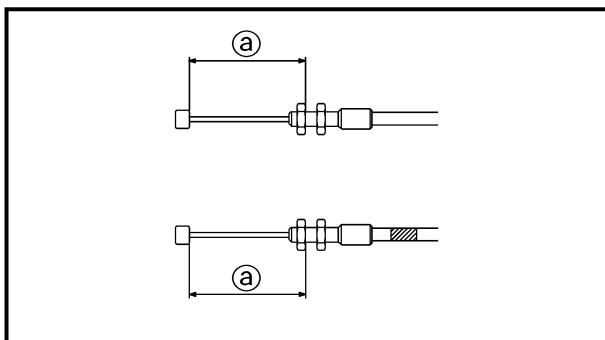
- QSTS cable length ①



**QSTS cable length:**  
 **$77 \pm 0.5 \text{ mm}$  ( $3.03 \pm 0.02 \text{ in}$ )**

**NOTE:**

- Before adjusting the QSTS cables, set the control grip to the neutral position.
- Adjust the QSTS cable lengths ① to the specified length and be sure to take up any slack.



2. Install:

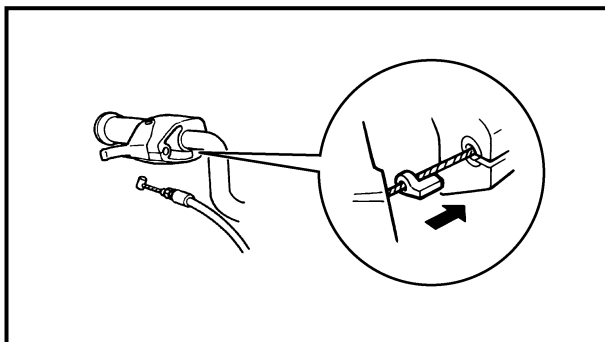
- Upper handlebar holder ①

**NOTE:**

- Align the punch marks ① on the handlebar with the top surface of the handlebar holder.
- The upper handlebar holder should be installed with the punch mark ② facing forward.

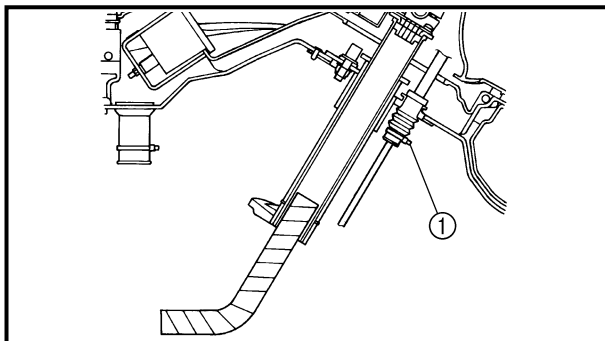
**CAUTION:**

**Clearance ③ should be narrower than clearance ④.**



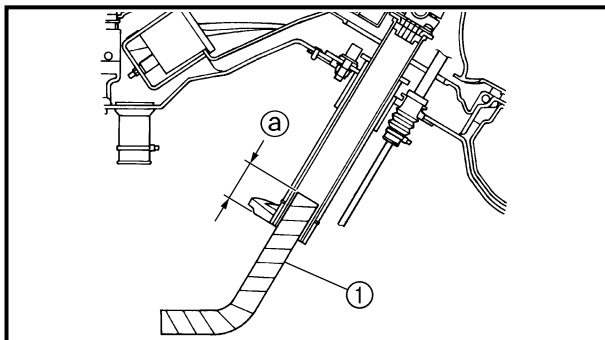
3. Install:
- Throttle cable

**NOTE:** \_\_\_\_\_  
Fit the seal into the glove in the bracket.



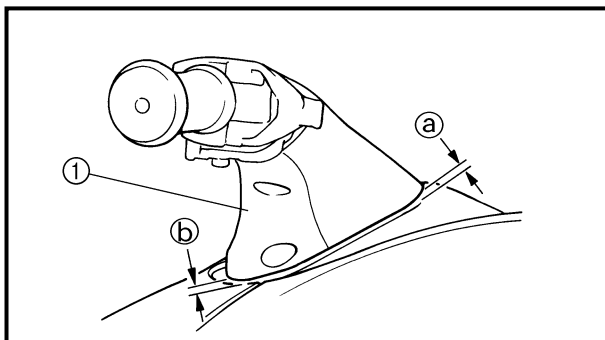
4. Install:
- Band ①

**NOTE:** \_\_\_\_\_  
After inserting the QSTS cables into the grommet, tie the end of grommet with the band.



5. Install:
- Spiral tube ①

**NOTE:** \_\_\_\_\_  
Be sure to install the spiral tube, containing the throttle cable, choke cable and handlebar switch lead, at least 50 mm (1.97 in) ① into the steering column.



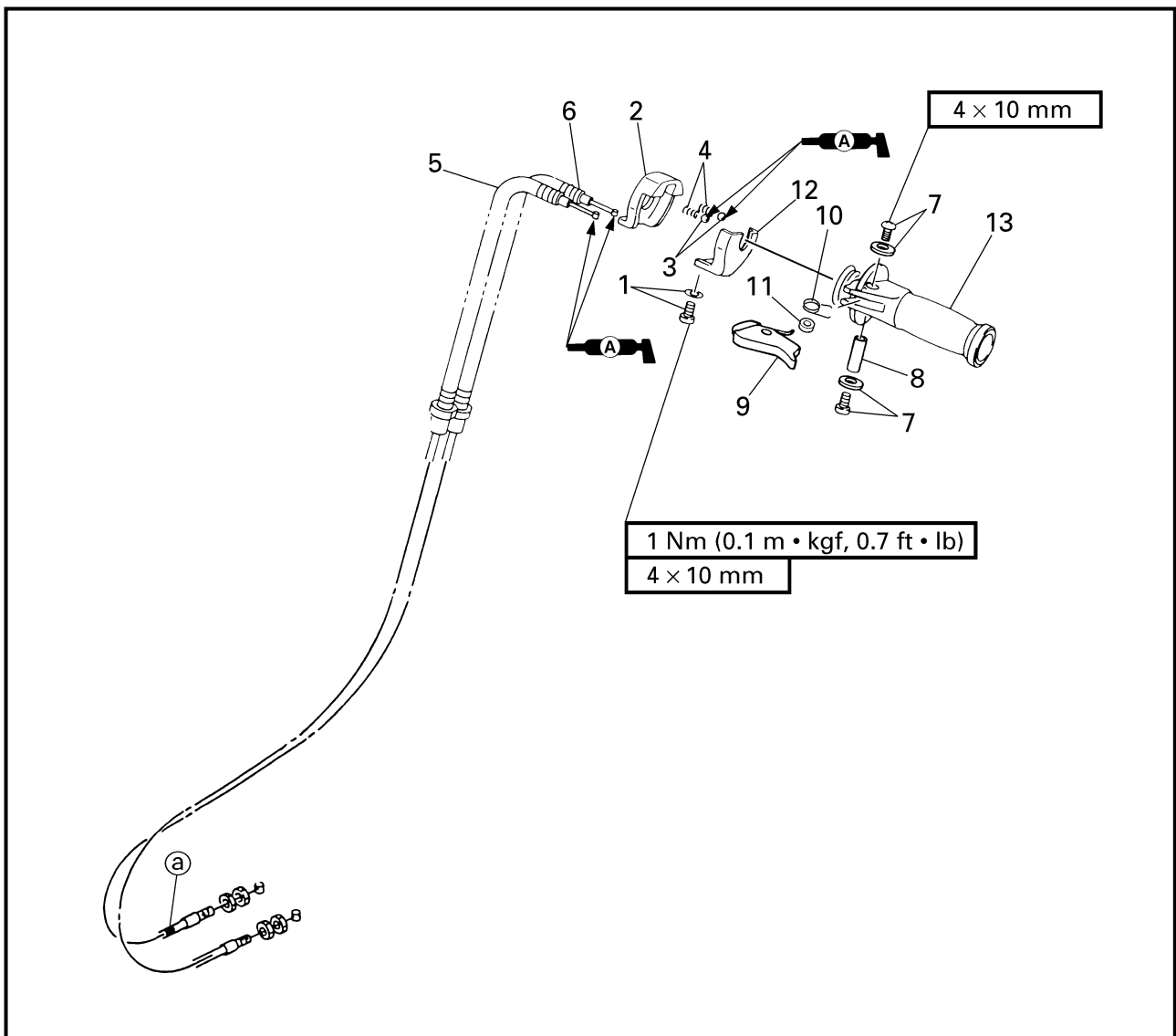
6. Install:
- Handlebar cover ①

**NOTE:** \_\_\_\_\_  
When the handlebar cover is in contact with the steering console cover, adjust the handlebar mount angle so that the clearance ① and ② are equal.



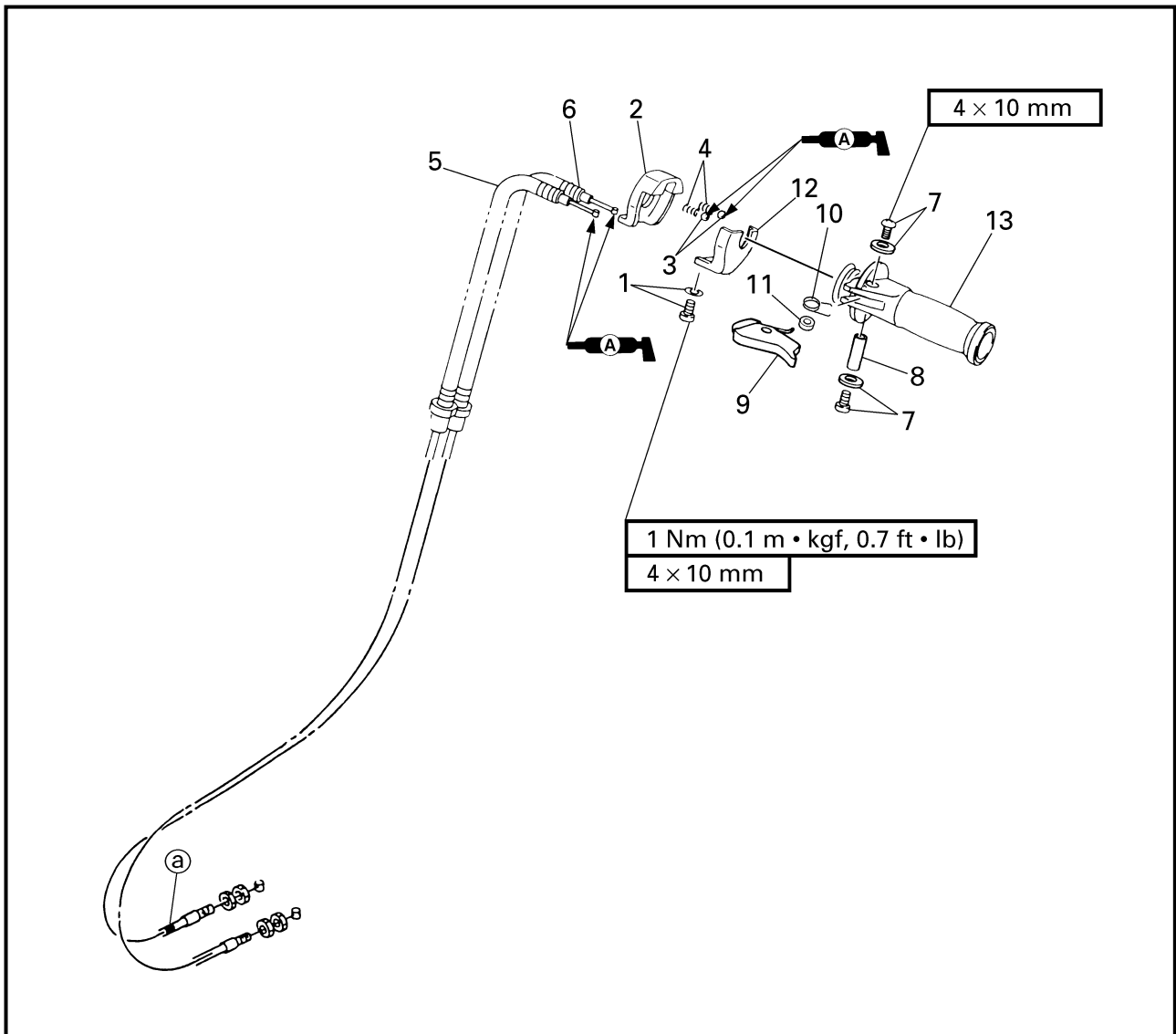
7. Adjust:
  - Choke lever operation  
Refer to "CONTROL SYSTEM" in chapter 3.
8. Adjust:
  - Throttle cable free play  
Refer to "CONTROL SYSTEM" in chapter 3.
9. Adjust:
  - QSTS cable free play  
Refer to "CONTROL SYSTEM" in chapter 3.

## QSTS GRIP EXPLODED DIAGRAM



## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name          | Q'ty | Service points                                                   |
|------|------------------------------|------|------------------------------------------------------------------|
|      | <b>QSTS GRIP DISASSEMBLY</b> |      |                                                                  |
|      | QSTS grip assembly           |      | Follow the left "Step" for disassembly.<br>Refer to "HANDLEBAR". |
| 1    | Screw/washer                 | 1/1  |                                                                  |
| 2    | Cover                        | 1    |                                                                  |
| 3    | Ball                         | 2    |                                                                  |
| 4    | Spring                       | 2    |                                                                  |
| 5    | QSTS cable 1                 | 1    |                                                                  |
| 6    | QSTS cable 2                 | 1    | with white tape ①                                                |

**EXPLODED DIAGRAM**


| Step | Procedure/Part name      | Q'ty | Service points                              |
|------|--------------------------|------|---------------------------------------------|
| 7    | Screw/washer             | 2/2  | Reverse the disassembly steps for assembly. |
| 8    | Collar                   | 1    |                                             |
| 9    | QSTS shift lock lever    | 1    |                                             |
| 10   | Spring                   | 1    |                                             |
| 11   | Spacer                   | 1    |                                             |
| 12   | QSTS cable housing cover | 1    |                                             |
| 13   | QSTS shift grip          | 1    |                                             |



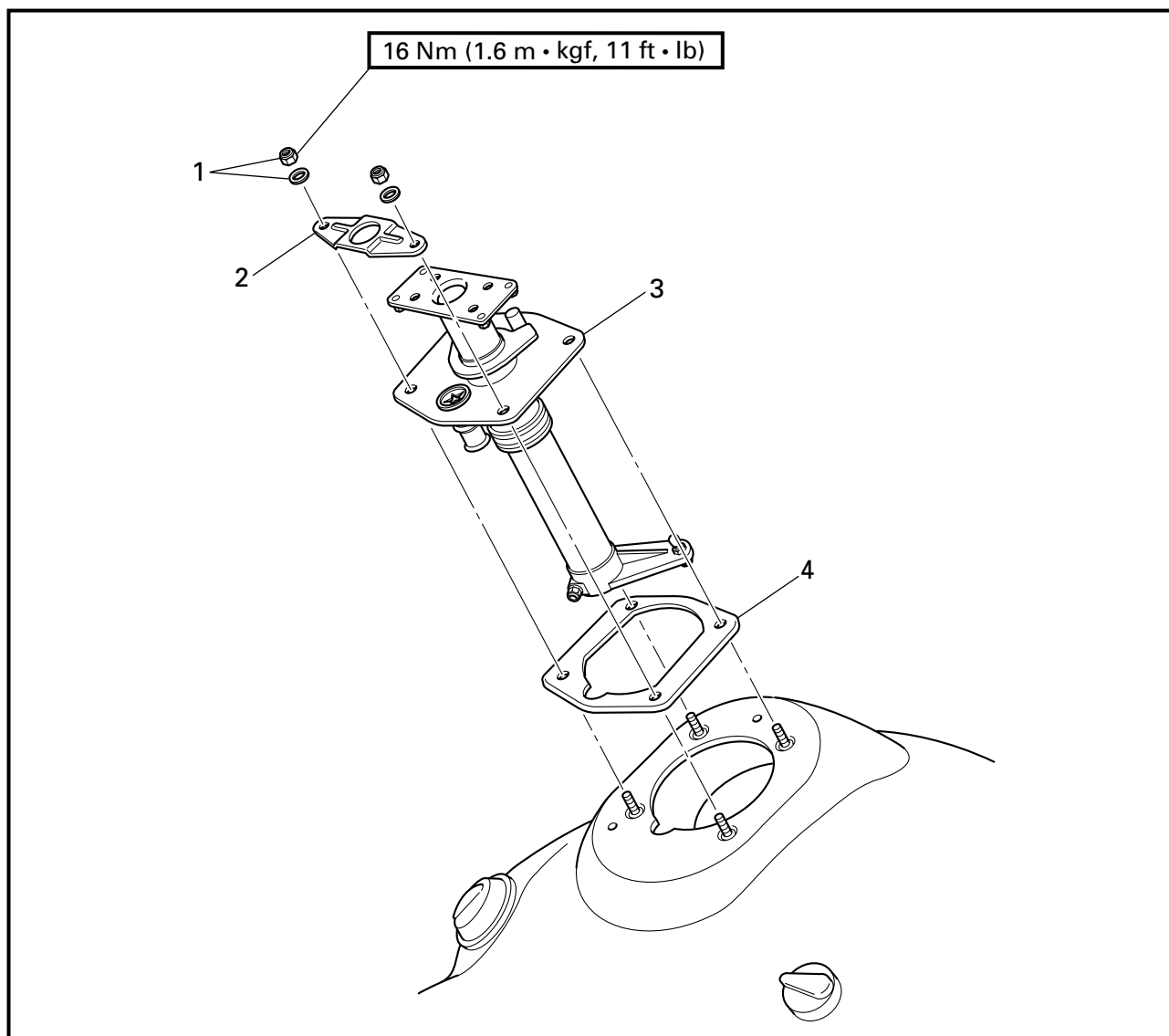
### SERVICE POINTS

#### QSTS cable inspection

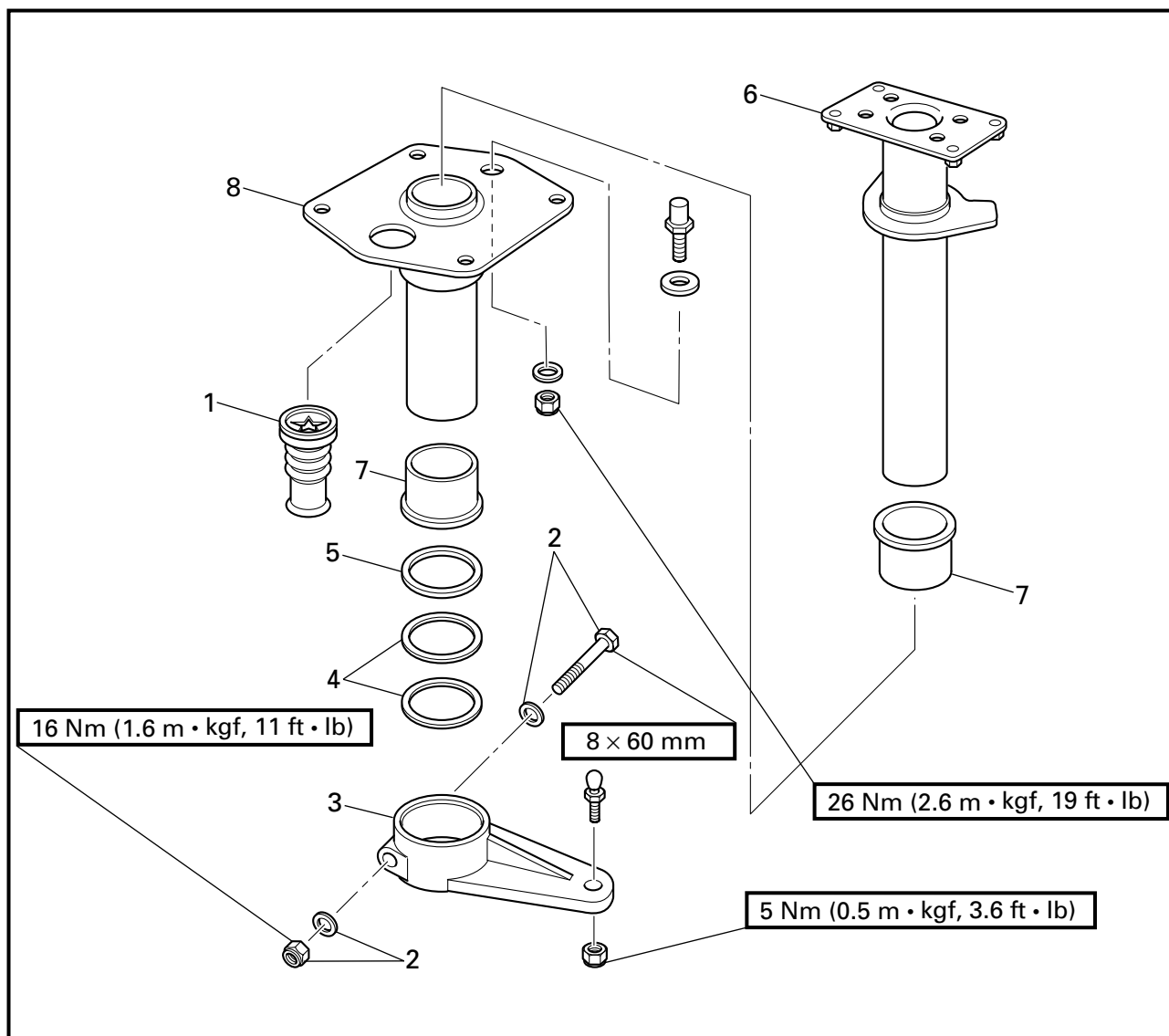
1. Inspect:
  - QSTS cables  
Frays/kinks/rough movement →  
Replace.

#### QSTS grip inspection

1. Inspect:
  - QSTS grip  
Damage/wear → Replace.

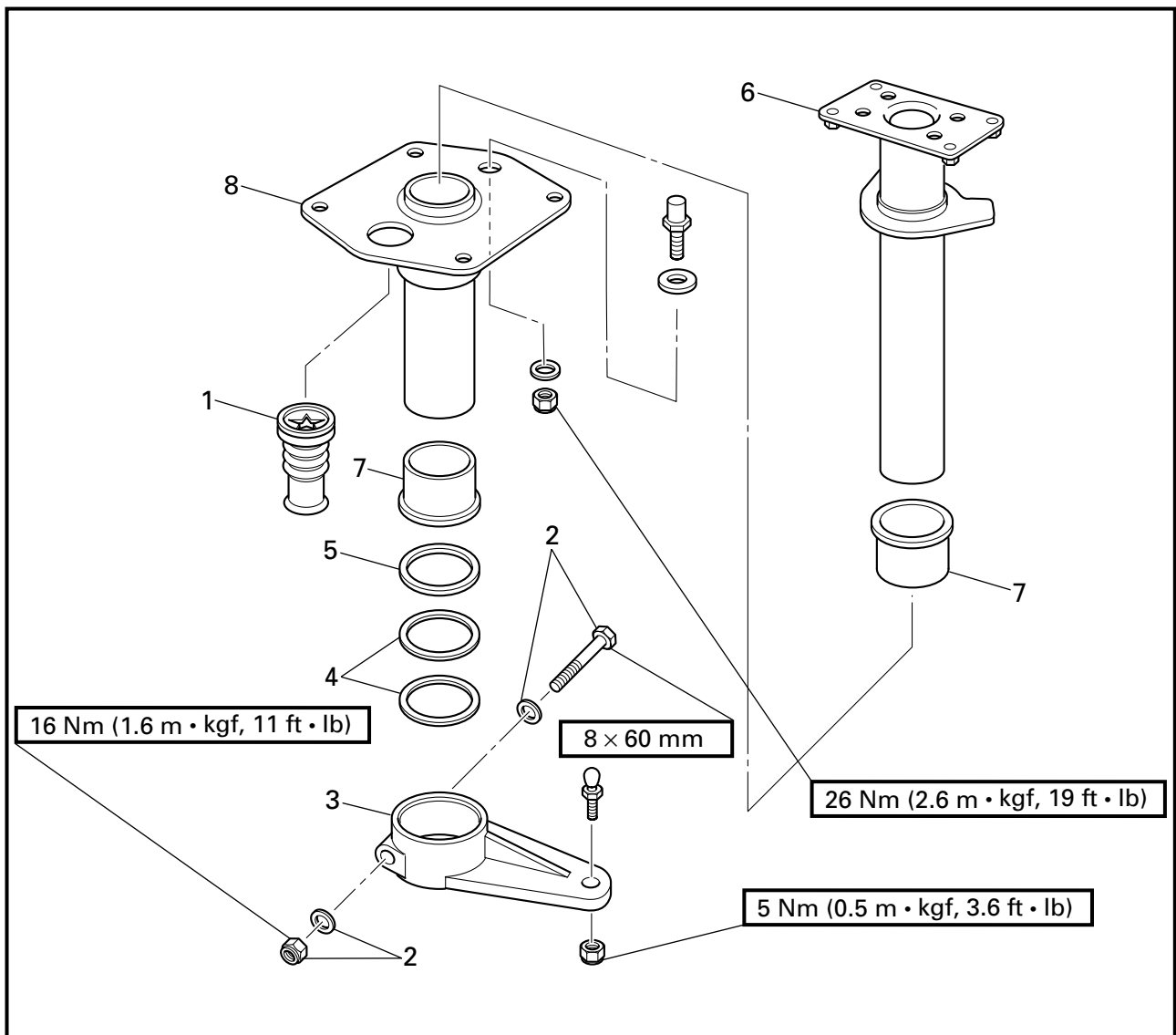
**STEERING COLUMN  
EXPLODED DIAGRAM**

**REMOVAL AND INSTALLATION CHART**

| Step | Procedure/Part name             | Q'ty | Service points                                                            |
|------|---------------------------------|------|---------------------------------------------------------------------------|
|      | <b>STEERING COLUMN REMOVAL</b>  |      |                                                                           |
|      | Steering console cover assembly |      | Follow the left "Step" for removal.<br>Refer to "STEERING CONSOLE COVER". |
| 1    | Nut/washer                      | 4/4  |                                                                           |
| 2    | Plate                           | 1    |                                                                           |
| 3    | Steering column assembly        | 1    |                                                                           |
| 4    | Rubber seal                     | 1    |                                                                           |
|      |                                 |      | Reverse the removal steps for installation.                               |

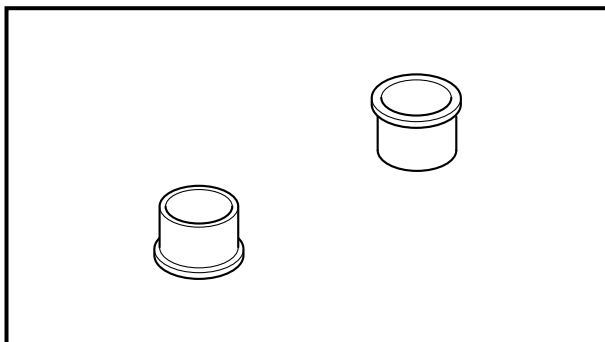
**EXPLODED DIAGRAM**

**REMOVAL AND INSTALLATION CHART**

| Step | Procedure/Part name                    | Q'ty  | Service points                          |
|------|----------------------------------------|-------|-----------------------------------------|
|      | <b>STEERING COLUMN<br/>DISASSEMBLY</b> |       | Follow the left "Step" for disassembly. |
| 1    | Grommet                                | 1     |                                         |
| 2    | Bolt/washer/nut                        | 1/2/1 |                                         |
| 3    | Steering arm                           | 1     |                                         |
| 4    | Shim                                   | *     |                                         |

\*: Be sure to install the same number of shim(s) as installed originally at factory.

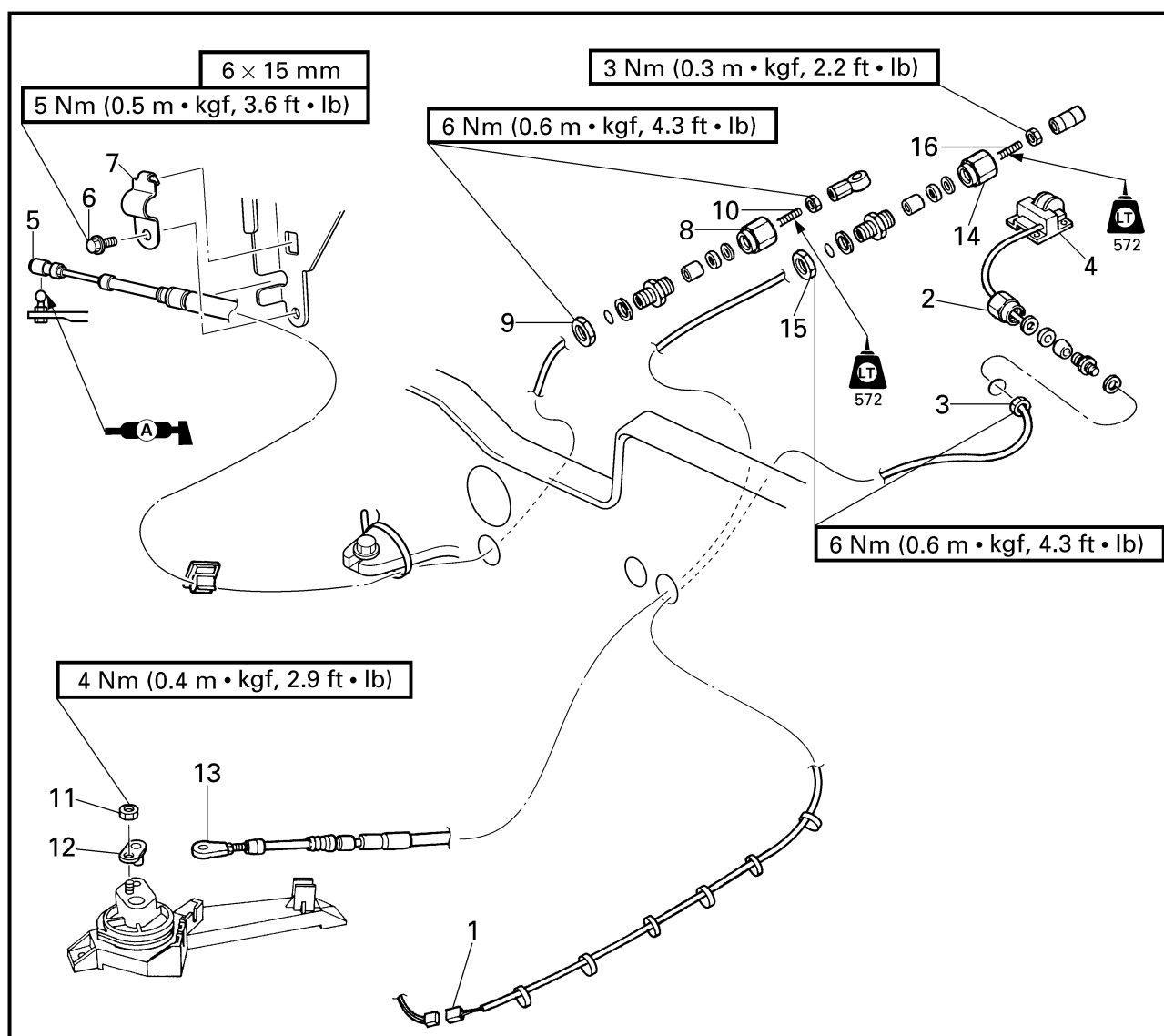
**EXPLODED DIAGRAM**


| Step | Procedure/Part name     | Q'ty | Service points                              |
|------|-------------------------|------|---------------------------------------------|
| 5    | Washer                  | 1    | Reverse the disassembly steps for assembly. |
| 6    | Steering column         | 1    |                                             |
| 7    | Bushing                 | 2    |                                             |
| 8    | Steering column housing | 1    |                                             |

**SERVICE POINTS****Steering column bushing inspection**

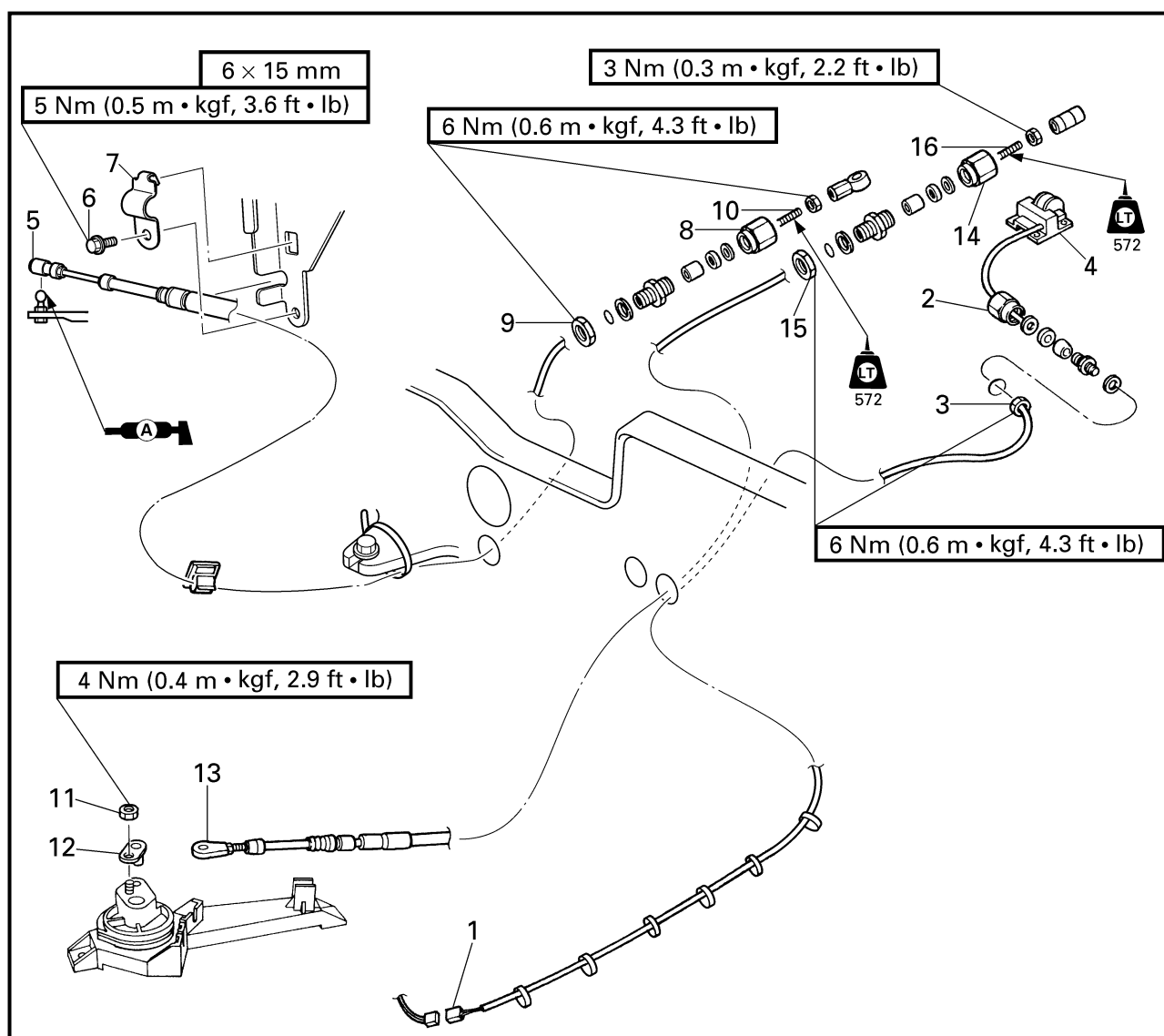
1. Inspect:
  - Bushings  
Damage/wear → Replace.
2. Inspect:
  - Steering column inspection  
Refer to “CONTROL SYSTEM” in chapter 3.

## REMOTE CONTROL CABLES AND SPEED SENSOR LEAD EXPLODED DIAGRAM



## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name                                        | Q'ty | Service points                      |
|------|------------------------------------------------------------|------|-------------------------------------|
|      | <b>REMOTE CONTROL CABLES AND SPEED SENSOR LEAD REMOVAL</b> |      | Follow the left "Step" for removal. |
| 1    | Speed sensor coupler                                       | 1    |                                     |
| 2    | Cap                                                        | 1    |                                     |
| 3    | Nut                                                        | 1    |                                     |
| 4    | Speed sensor                                               | 1    |                                     |
| 5    | Steering cable end                                         | 1    |                                     |
| 6    | Bolt                                                       | 1    |                                     |
| 7    | Steering cable holder                                      | 1    |                                     |





## SERVICE POINTS

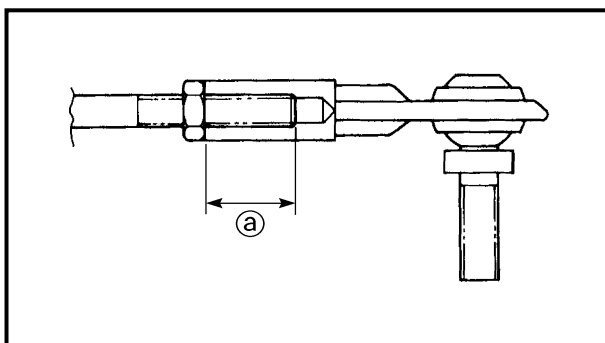
### **⚠ WARNING**

When routing the cables, do not grasp the cable by the outer crimped sheath or steel end. This could deform or loosen the cable end due to extreme angles and or pressure. Always hold the cables by the bracket or outer cover below the crimp. If a cable becomes damaged replace it. Never attempt to repair a damaged cable

### Remote control cables inspection

1. Inspect:

- Steering cable
  - QSTS cable
- Frays/kinks/rough movement → Replace.



### Steering cable (jet pump side) installation

1. Install:

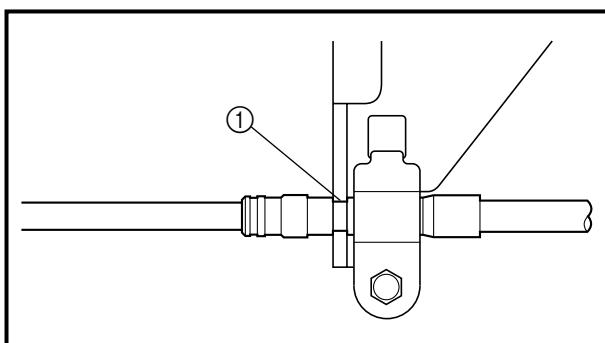
- Steering cable ①



**Steering cable set length  
(jet pump side):**  
13.5 ~ 15.5 mm (0.53 ~ 0.61 in)

### **⚠ WARNING**

The steering cable must be screwed in at least 8 mm (0.31 in).



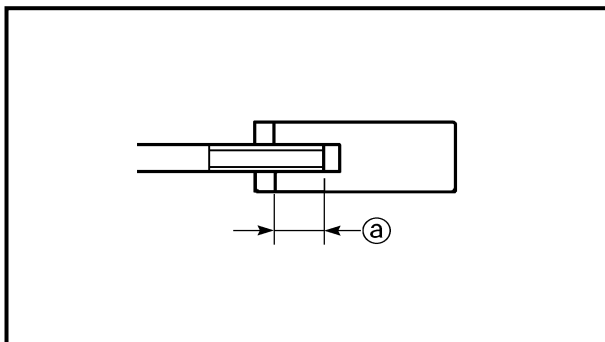
### Steering cable stopper installation

1. Install:

- Steering cable stopper

### **⚠ WARNING**

Be sure to fit the steering cable into the glove ① in the steering cable bracket.



## QSTS cable (jet pump side) installation

1. Install:

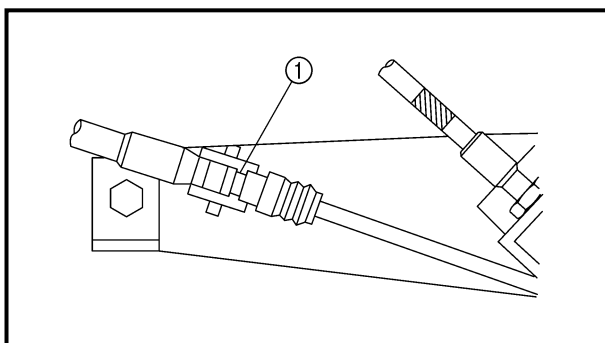
- QSTS cable (jet pump side) ②



**QSTS cable set length  
(jet pump side):**  
12.0 ~ 14.0 mm (0.47 ~ 0.55 in)

## ⚠ WARNING

The QSTS cable must be screwed in more than 8 mm (0.31 in).



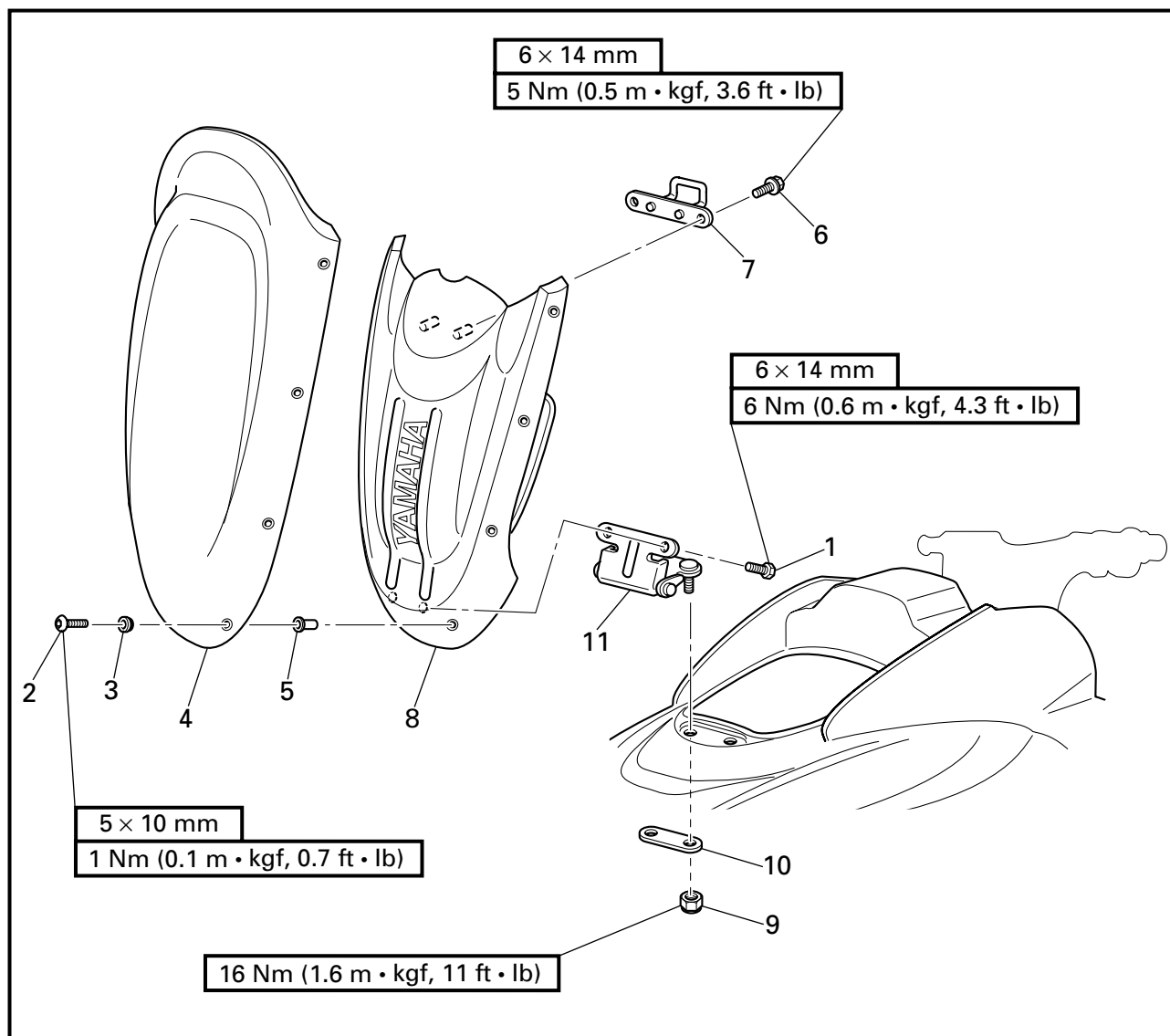
## QSTS cable stopper installation

1. Install:

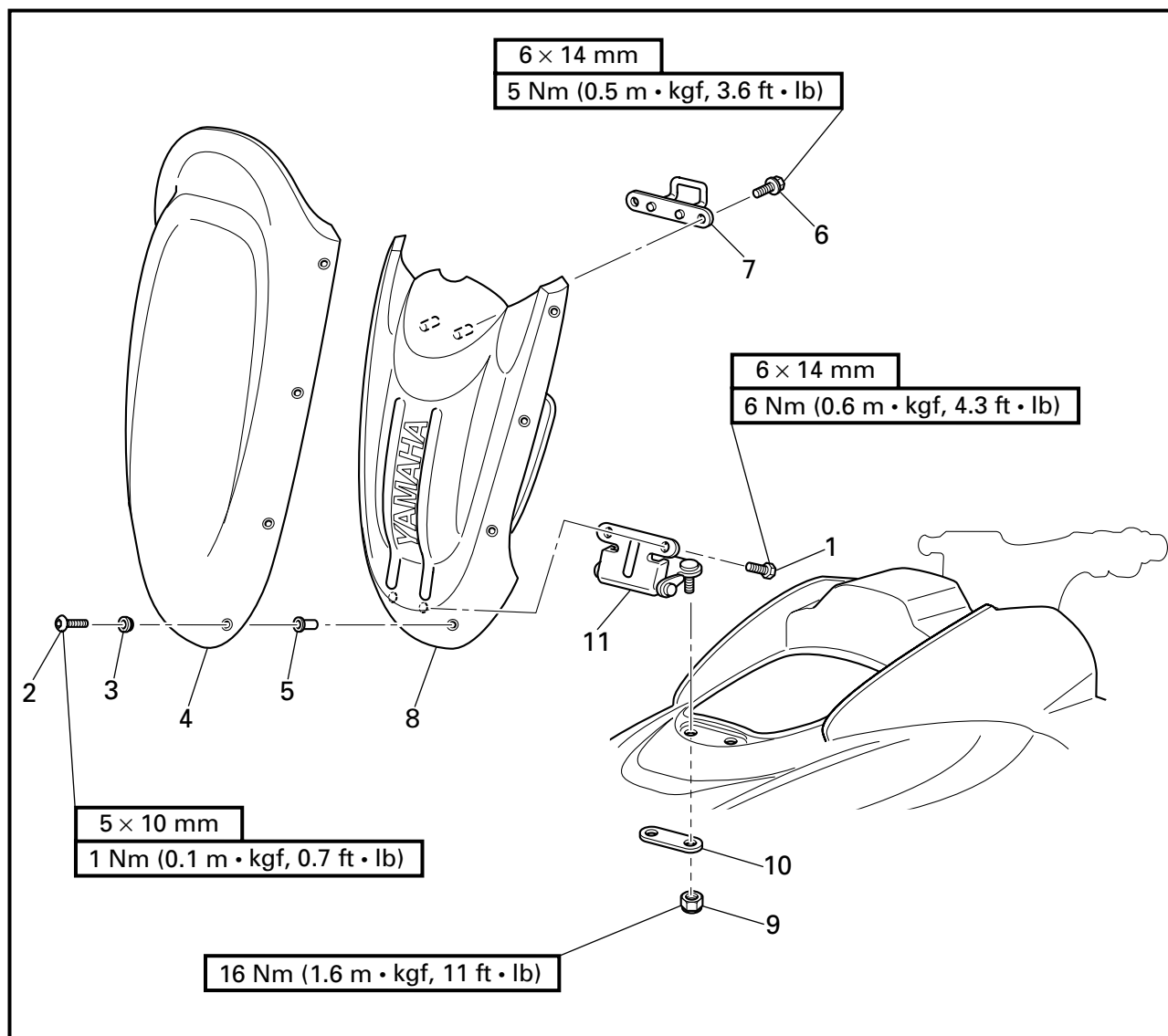
- QSTS cable stopper

## ⚠ WARNING

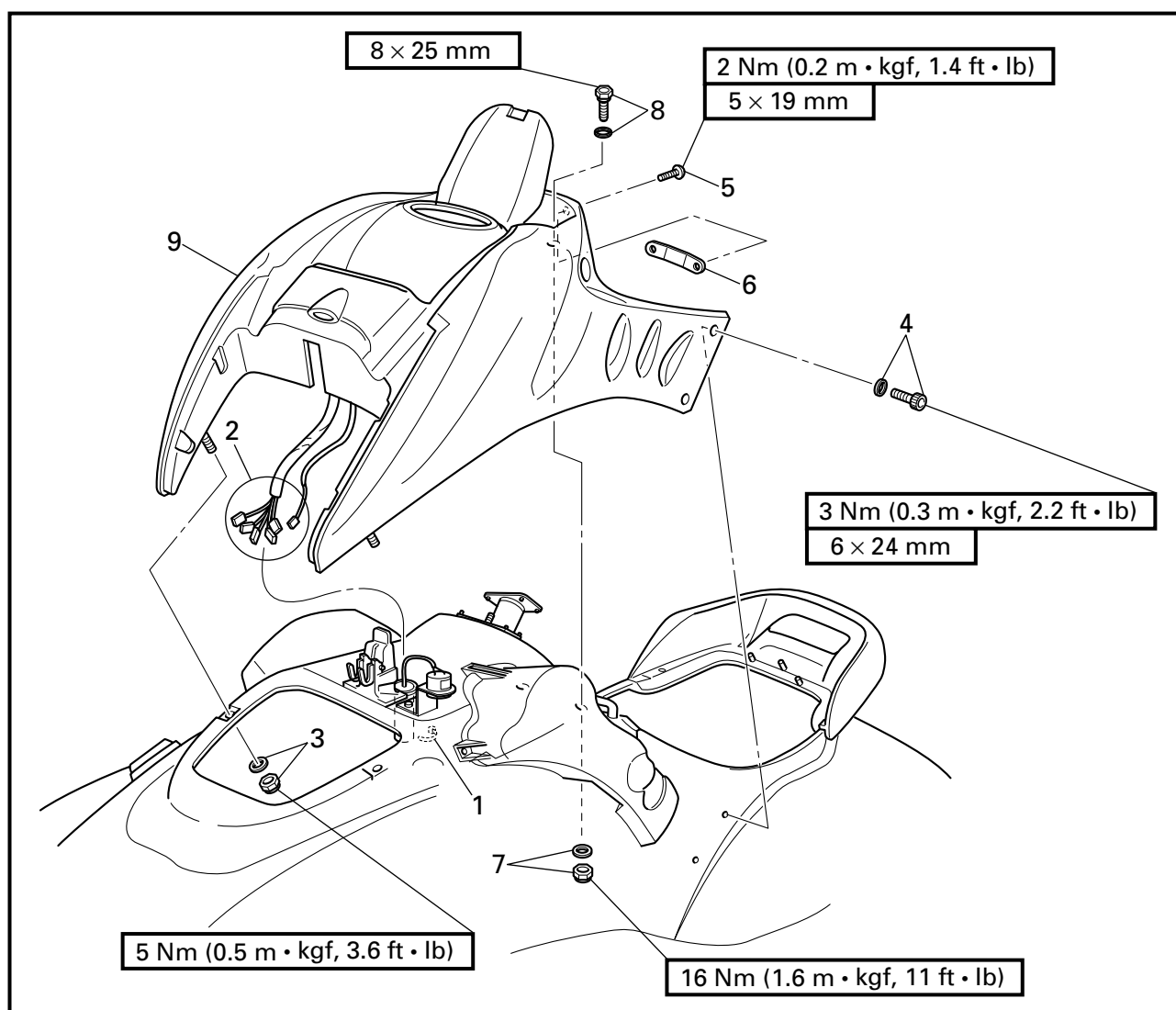
Be sure to fit the projection ① on the QSTS cable stopper into the groove in the outer cable.

**FRONT HOOD  
EXPLODED DIAGRAM**

**REMOVAL AND INSTALLATION CHART**

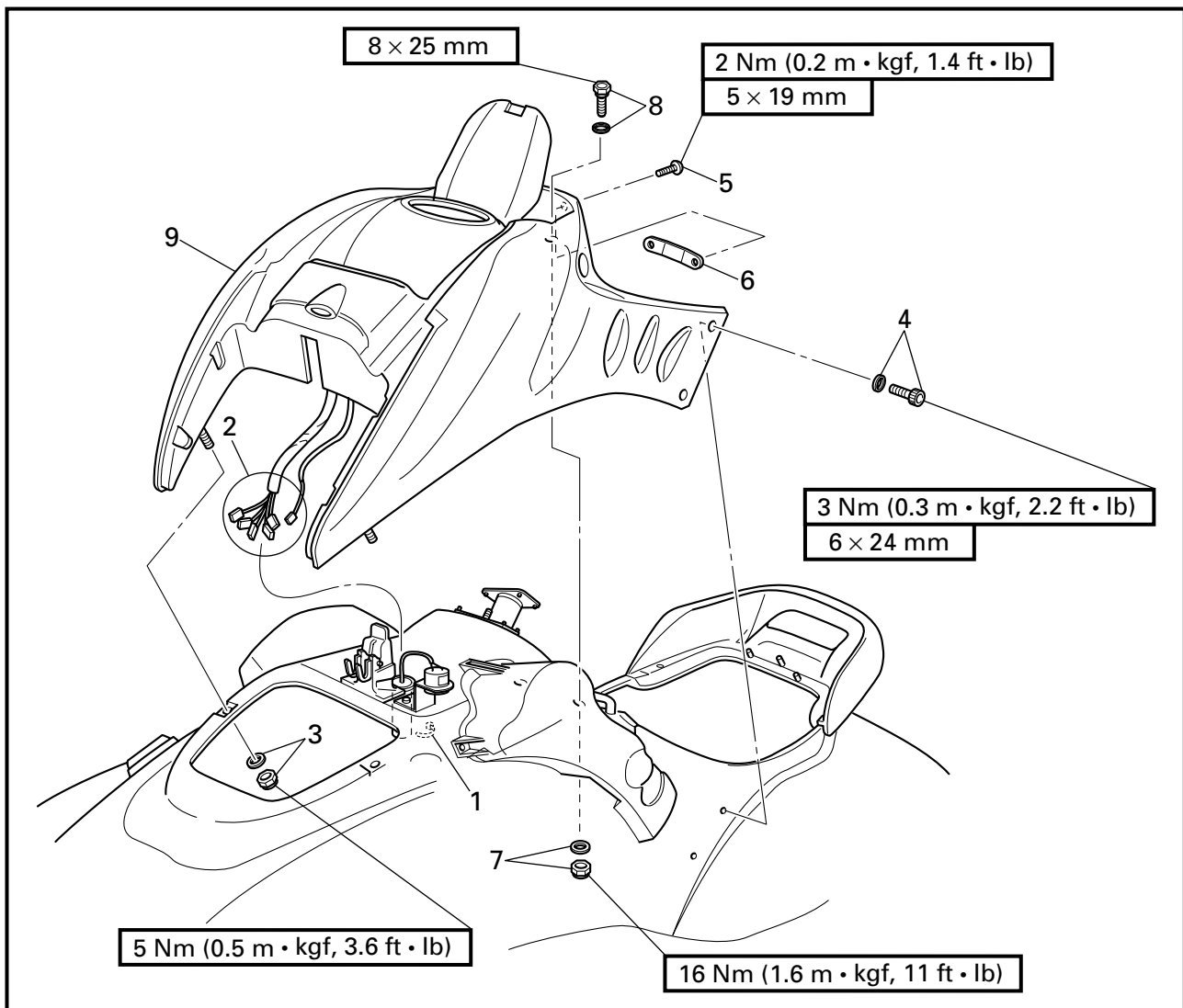
| Step | Procedure/Part name       | Q'ty | Service points                      |
|------|---------------------------|------|-------------------------------------|
|      | <b>FRONT HOOD REMOVAL</b> |      | Follow the left "Step" for removal. |
| 1    | Bolt                      | 2    |                                     |
| 2    | Screw                     | 8    |                                     |
| 3    | Seal washer               | 8    |                                     |
| 4    | Wind shield               | 1    |                                     |
| 5    | Pop nut                   | 8    |                                     |
| 6    | Bolt                      | 2    |                                     |

**EXPLODED DIAGRAM**


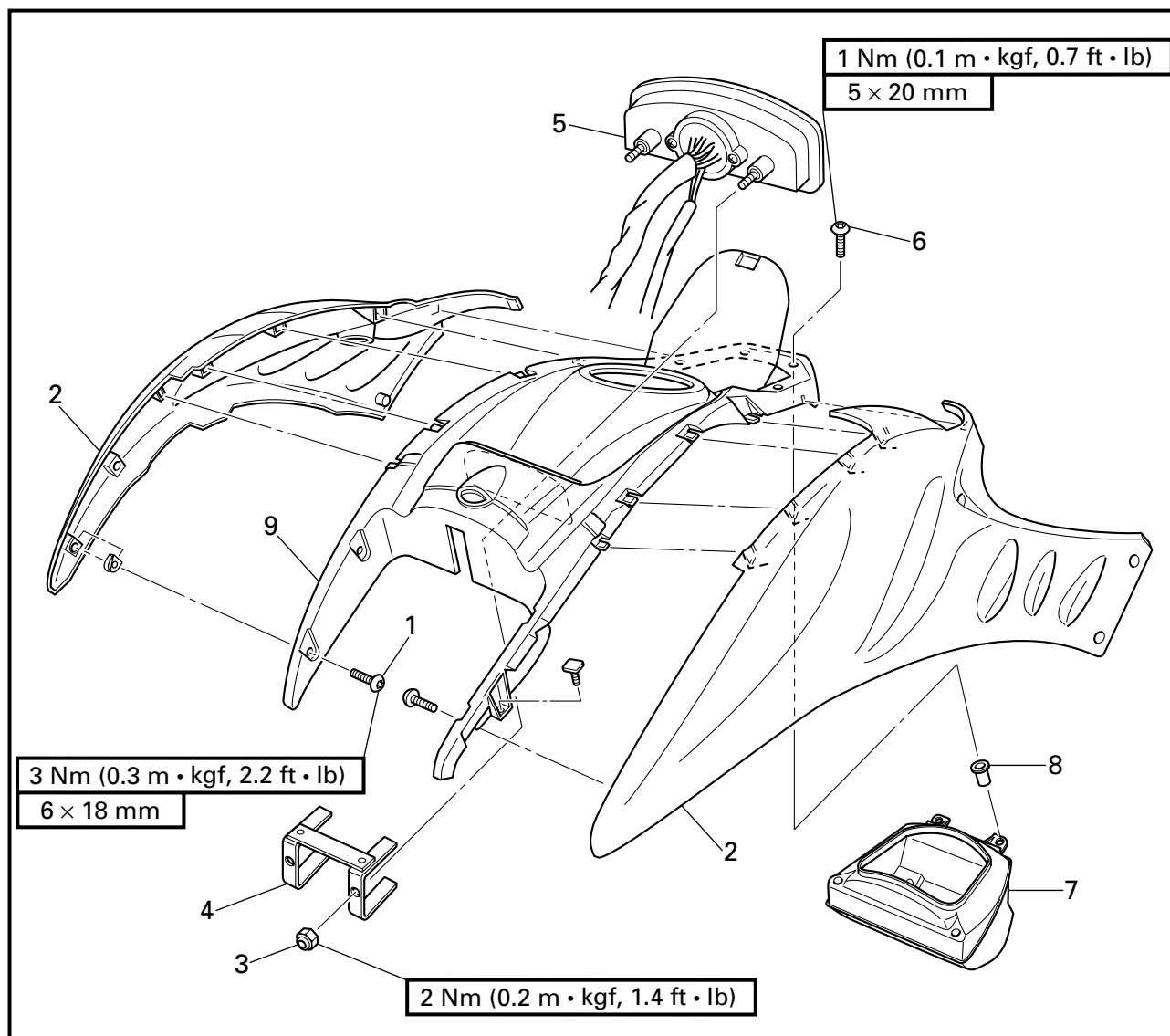
| Step | Procedure/Part name | Q'ty | Service points                              |
|------|---------------------|------|---------------------------------------------|
| 7    | Hood lock           | 1    | Reverse the removal steps for installation. |
| 8    | Front hood          | 1    |                                             |
| 9    | Nut                 | 2    |                                             |
| 10   | Plate               | 1    |                                             |
| 11   | Hinge assembly      | 1    |                                             |

**STEERING CONSOLE COVER  
EXPLODED DIAGRAM**

**REMOVAL AND INSTALLATION CHART**

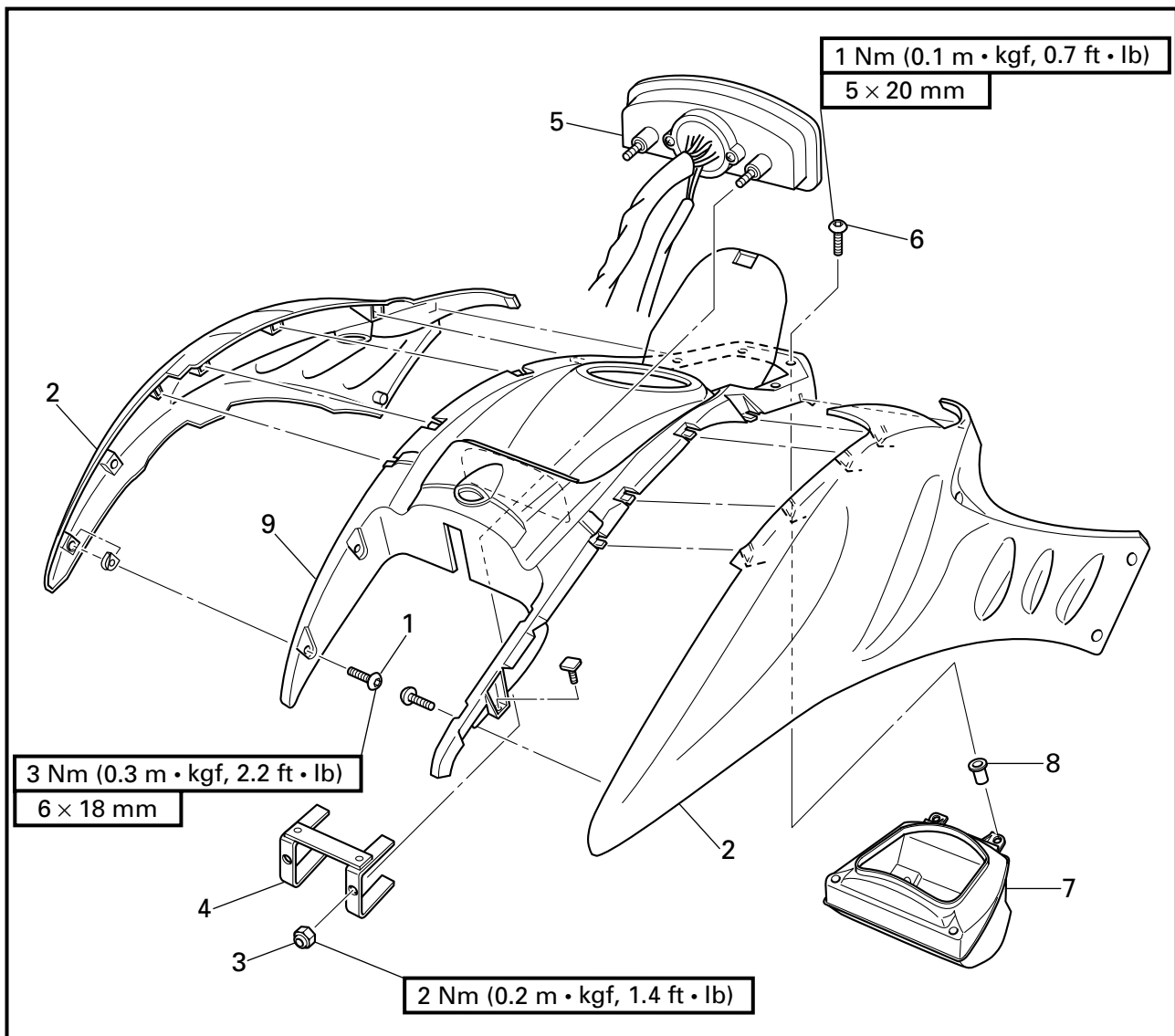
| Step | Procedure/Part name                       | Q'ty | Service points                                        |
|------|-------------------------------------------|------|-------------------------------------------------------|
|      | <b>STEERING CONSOLE COVER<br/>REMOVAL</b> |      | Follow the left "Step" for removal.                   |
|      | Handlebar assembly                        |      | Refer to "HANDLEBAR".                                 |
|      | Knob (fuel cock)                          |      | Refer to "FUEL COCK AND FUEL FILTER"<br>in chapter 4. |
| 1    | Band                                      | 1    |                                                       |
| 2    | Multifunction meter coupler               | 6    |                                                       |
| 3    | Nut/washer                                | 2/2  |                                                       |
| 4    | Bolt/washer                               | 4/4  |                                                       |
| 5    | Screw                                     | 2    |                                                       |

**EXPLODED DIAGRAM**


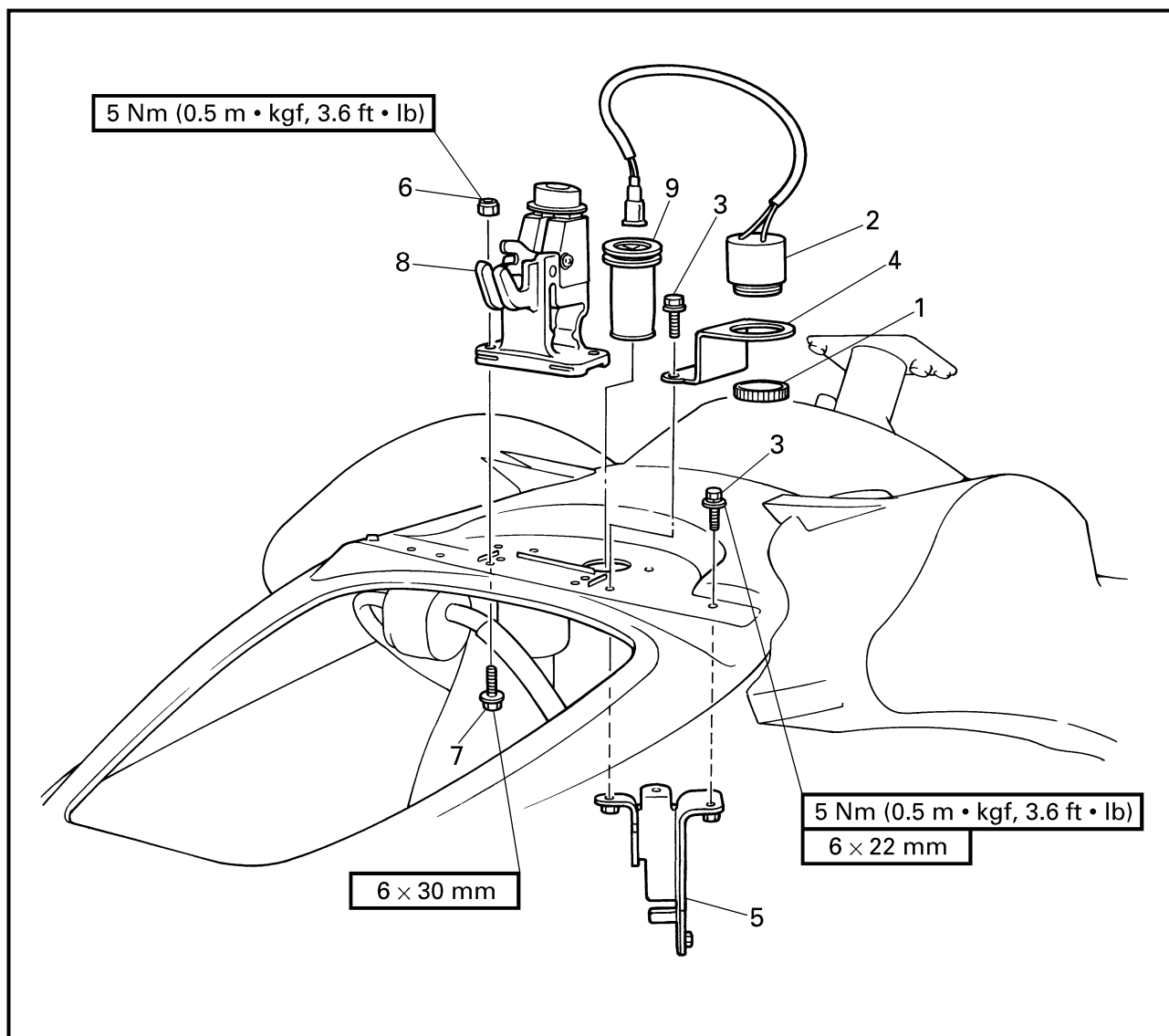
| Step | Procedure/Part name             | Q'ty | Service points                                                                                                                                                |
|------|---------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6    | Plate                           | 1    | <b>NOTE:</b> _____<br>Remove the oil filler cap to remove the steering console cover assembly easier.<br>_____<br>Reverse the removal steps for installation. |
| 7    | Nut/washer                      | 2/2  |                                                                                                                                                               |
| 8    | Bolt/square-ring                | 2/2  |                                                                                                                                                               |
| 9    | Steering console cover assembly | 1    |                                                                                                                                                               |

**EXPLODED DIAGRAM**

**REMOVAL AND INSTALLATION CHART**

| Step | Procedure/Part name                           | Q'ty | Service points                          |
|------|-----------------------------------------------|------|-----------------------------------------|
|      | <b>STEERING CONSOLE COVER<br/>DISASSEMBLY</b> |      | Follow the left "Step" for disassembly. |
| 1    | Screw                                         | 4    |                                         |
| 2    | Side cover                                    | 2    |                                         |
| 3    | Nut                                           | 2    |                                         |
| 4    | Holder                                        | 1    |                                         |
| 5    | Multifunction meter                           | 1    |                                         |

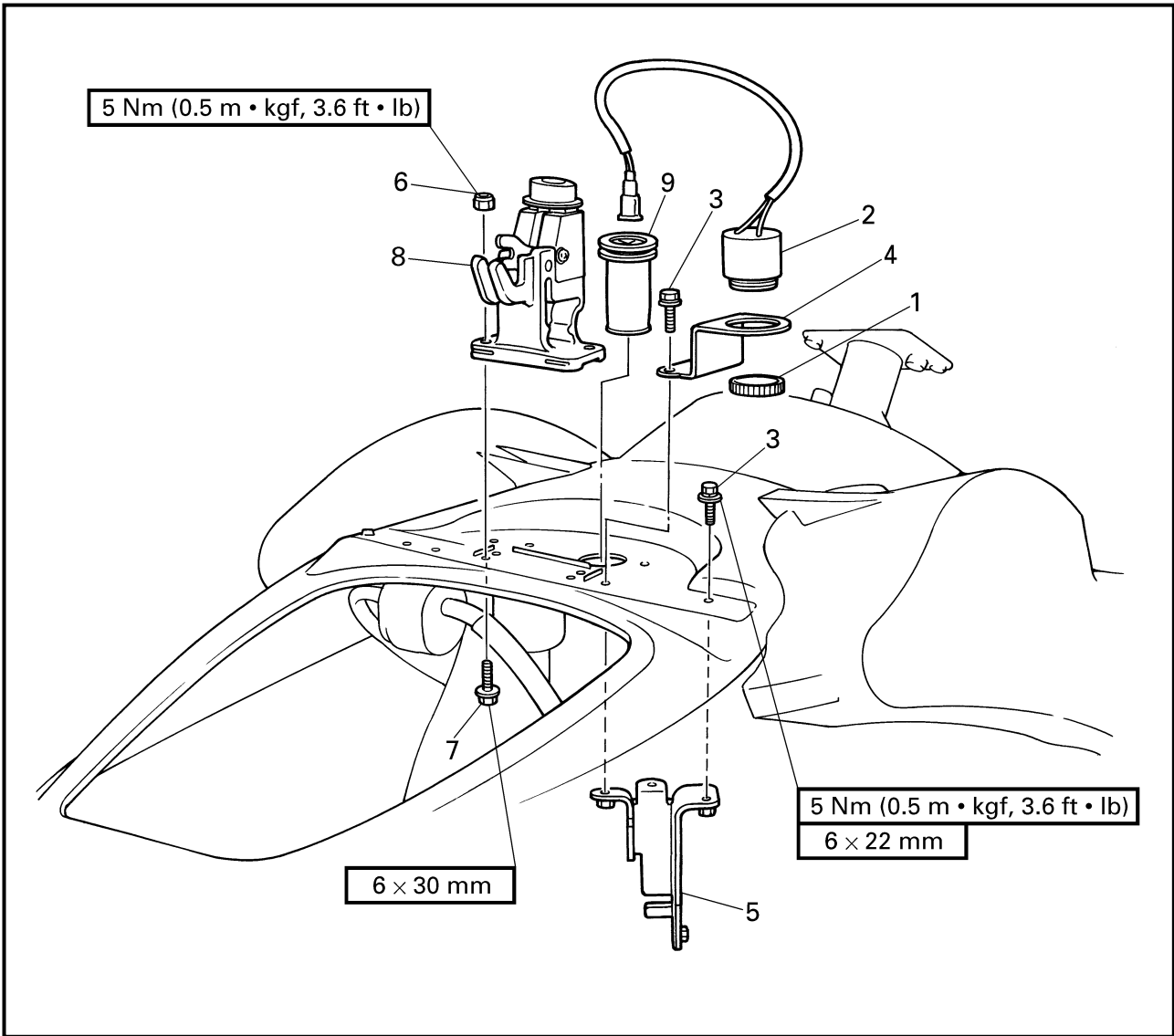
**EXPLODED DIAGRAM**


| Step | Procedure/Part name    | Q'ty | Service points                              |
|------|------------------------|------|---------------------------------------------|
| 6    | Screw                  | 4    | Reverse the disassembly steps for assembly. |
| 7    | Glove compartment      | 1    |                                             |
| 8    | Pop nut                | 4    |                                             |
| 9    | Steering console cover | 1    |                                             |

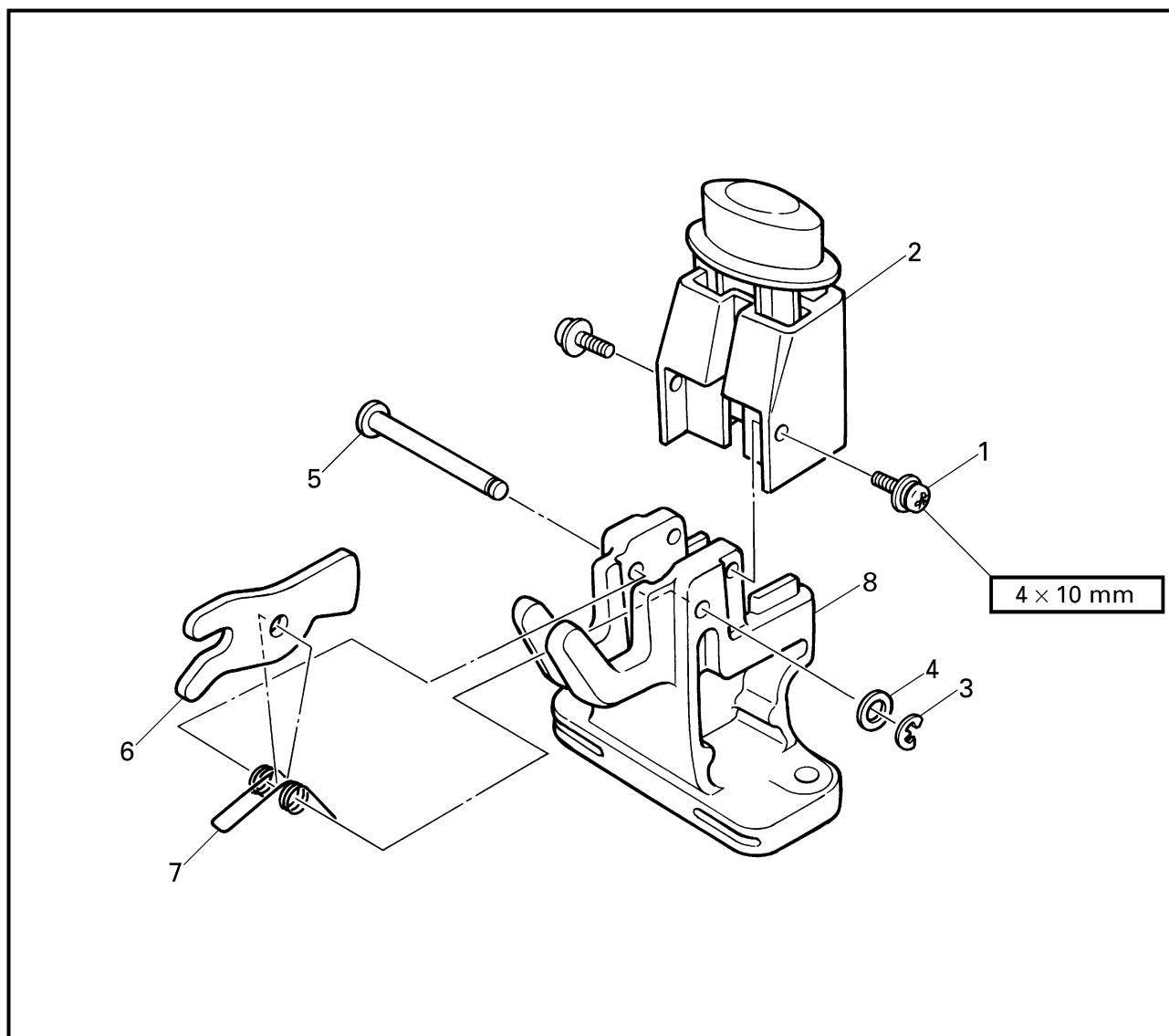
**BUZZER AND HOOD LOCK  
EXPLODED DIAGRAM**

**REMOVAL AND INSTALLATION CHART**

| Step | Procedure/Part name                     | Q'ty | Service points                                             |
|------|-----------------------------------------|------|------------------------------------------------------------|
|      | <b>BUZZER AND HOOD LOCK<br/>REMOVAL</b> |      | Follow the left "Step" for removal.                        |
|      | Steering console cover assembly         |      | Refer to "STEERING CONSOLE COVER".                         |
|      | Steering cable                          |      | Refer to "REMOTE CONTROL CABLES<br>AND SPEED SENSOR LEAD". |
| 1    | Ring nut                                | 1    |                                                            |
| 2    | Buzzer                                  | 1    |                                                            |
| 3    | Bolt                                    | 3    |                                                            |
| 4    | Bracket                                 | 1    |                                                            |
| 5    | Bracket                                 | 1    |                                                            |

EXPLODED DIAGRAM

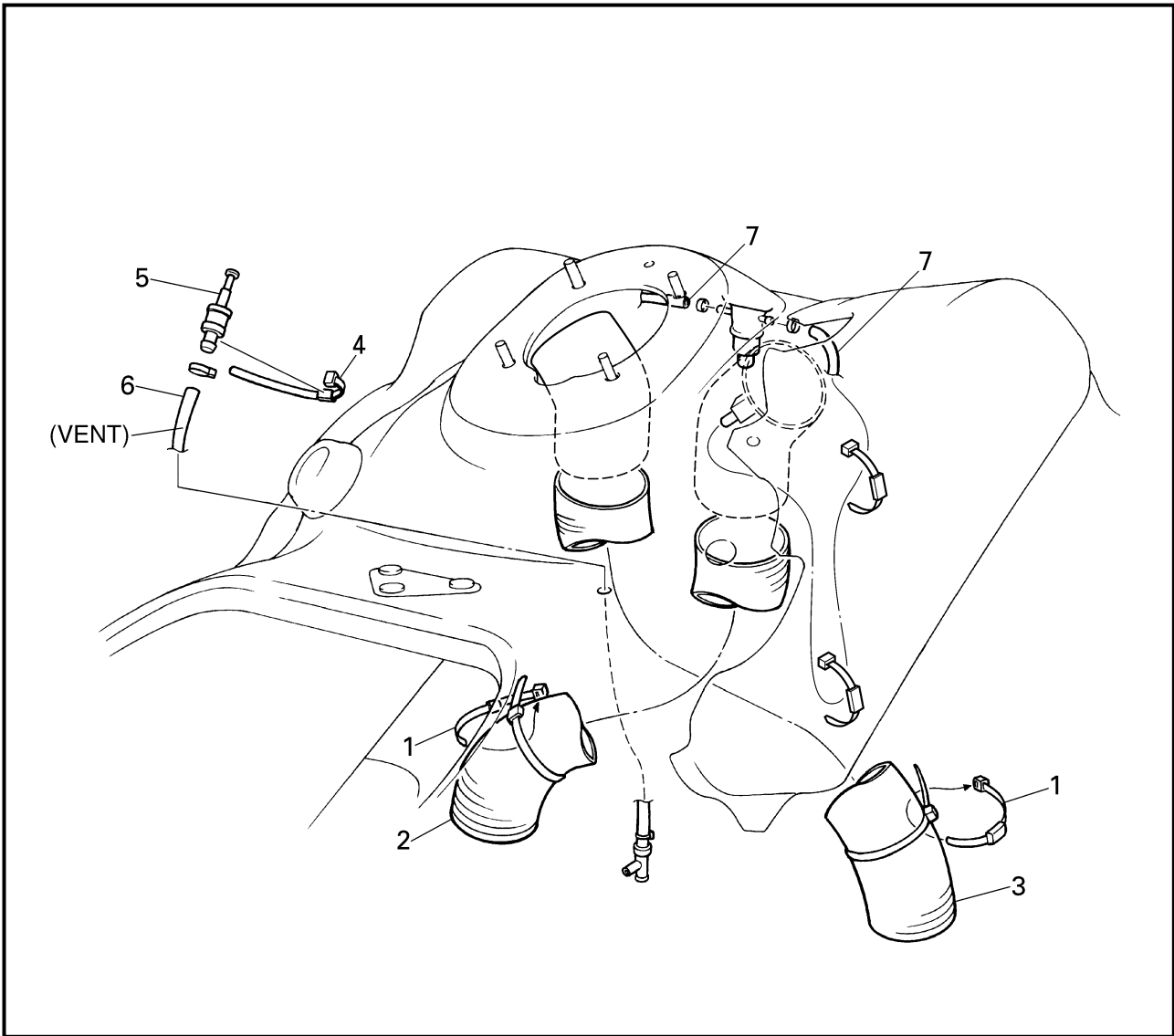


| Step | Procedure/Part name | Q'ty | Service points                              |
|------|---------------------|------|---------------------------------------------|
| 6    | Nut                 | 2    | Reverse the removal steps for installation. |
| 7    | Bolt                | 2    |                                             |
| 8    | Hood lock assembly  | 1    |                                             |
| 9    | Grommet             | 1    |                                             |

**EXPLODED DIAGRAM**

**REMOVAL AND INSTALLATION CHART**

| Step | Procedure/Part name          | Q'ty | Service points                              |
|------|------------------------------|------|---------------------------------------------|
|      | <b>HOOD LOCK DISASSEMBLY</b> |      |                                             |
| 1    | Screw                        | 2    | Follow the left "Step" for disassembly.     |
| 2    | Hood lock button assembly    | 1    |                                             |
| 3    | Circlip                      | 1    |                                             |
| 4    | Washer                       | 1    |                                             |
| 5    | Pin                          | 1    |                                             |
| 6    | Hook lever                   | 1    |                                             |
| 7    | Spring                       | 1    |                                             |
| 8    | Hood lock body               | 1    |                                             |
|      |                              |      | Reverse the disassembly steps for assembly. |

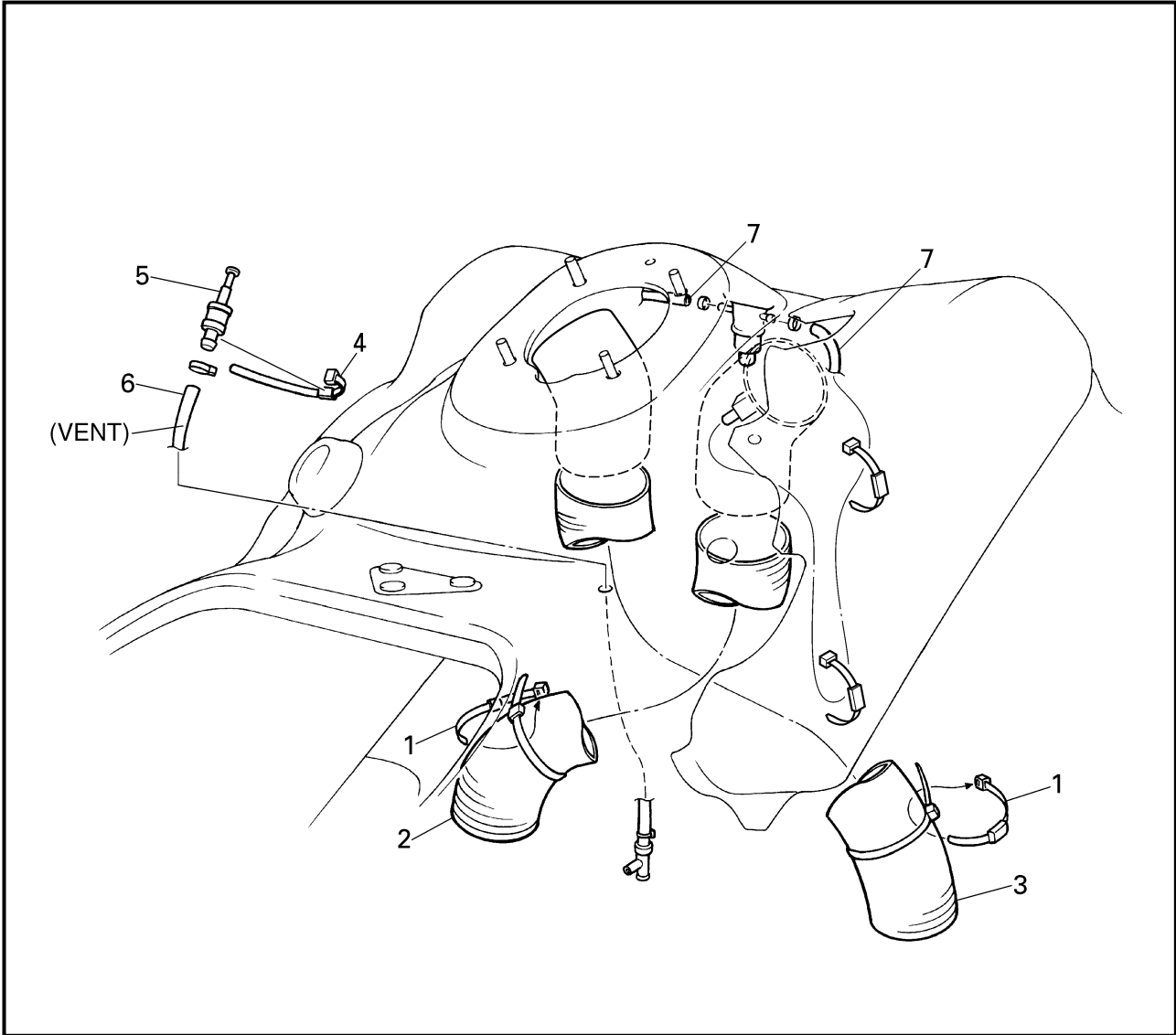
HOSES  
EXPLODED DIAGRAM



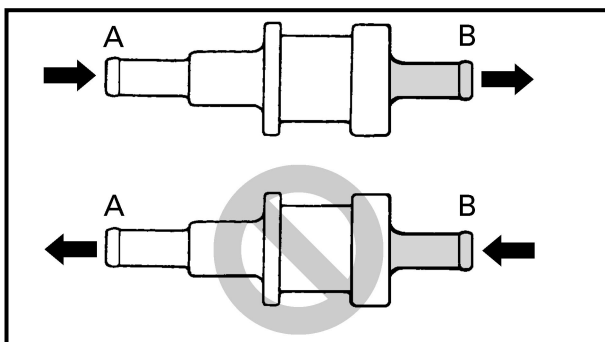
REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name             | Q'ty | Service points                                                                                                                                                                                                                                         |
|------|---------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | <b>HOSES REMOVAL</b>            |      |                                                                                                                                                                                                                                                        |
|      | Engine unit                     |      | Follow the left "Step" for removal.                                                                                                                                                                                                                    |
|      | Steering console cover assembly |      | Refer to "ENGINE UNIT" in chapter 5.                                                                                                                                                                                                                   |
|      | Band                            | 2    | Refer to "STEERING CONSOLE COVER".                                                                                                                                                                                                                     |
| 1    |                                 |      |                                                                                                                                                                                                                                                        |
| 2    | Ventilation hose (stern side)   | 1    | <b>NOTE:</b> _____                                                                                                                                                                                                                                     |
| 3    | Ventilation hose (bow side)     | 1    | <ul style="list-style-type: none"> <li>● Route the ventilation hose (bow side) in front of the fuel level sensor lead.</li> <li>● Route the ventilation hose (stern side) between the oil level sensor lead and the oil tank breather hose.</li> </ul> |

EXPLODED DIAGRAM



| Step | Procedure/Part name     | Q'ty | Service points                              |
|------|-------------------------|------|---------------------------------------------|
| 4    | Band                    | 1    | Reverse the removal steps for installation. |
| 5    | Check valve             | 1    |                                             |
| 6    | Oil tank breather hose  | 1    |                                             |
| 7    | Fuel tank breather hose | 2    |                                             |



## SERVICE POINTS

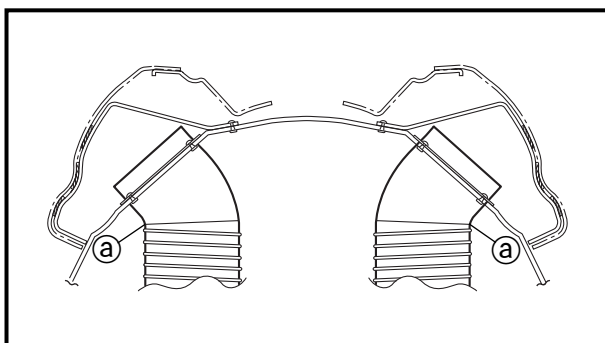
### Check valve inspection

1. Check:

- Check valve  
Faulty → Replace.

### Checking steps:

- Connect a hose to the end of check valve "A" and blow into it.  
Air should come out from end "B".
- Connect the hose to the end of check valve "B" and blow into it.  
Air should not come out from end "A".



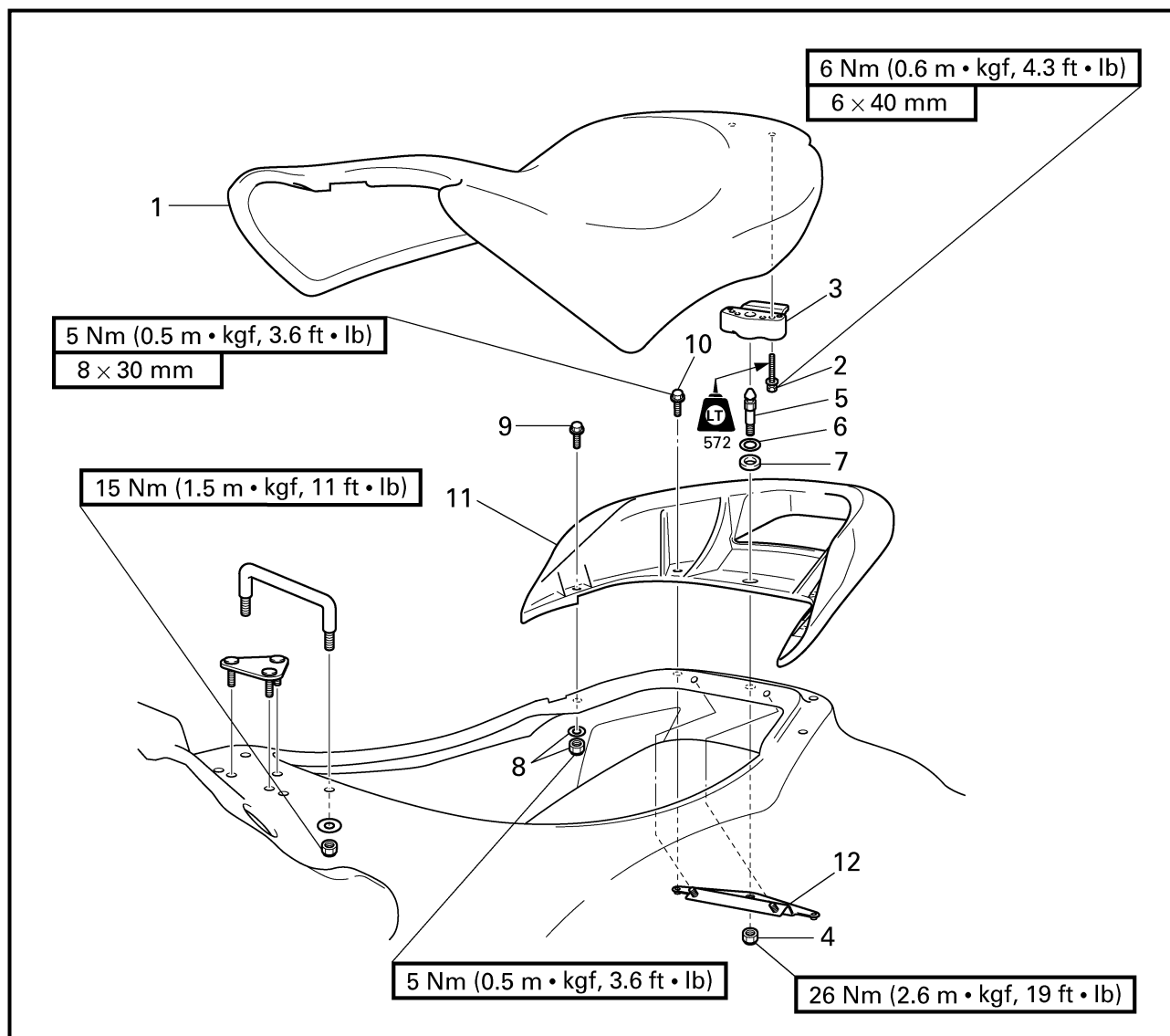
### Ventilation hose installation

1. Install:

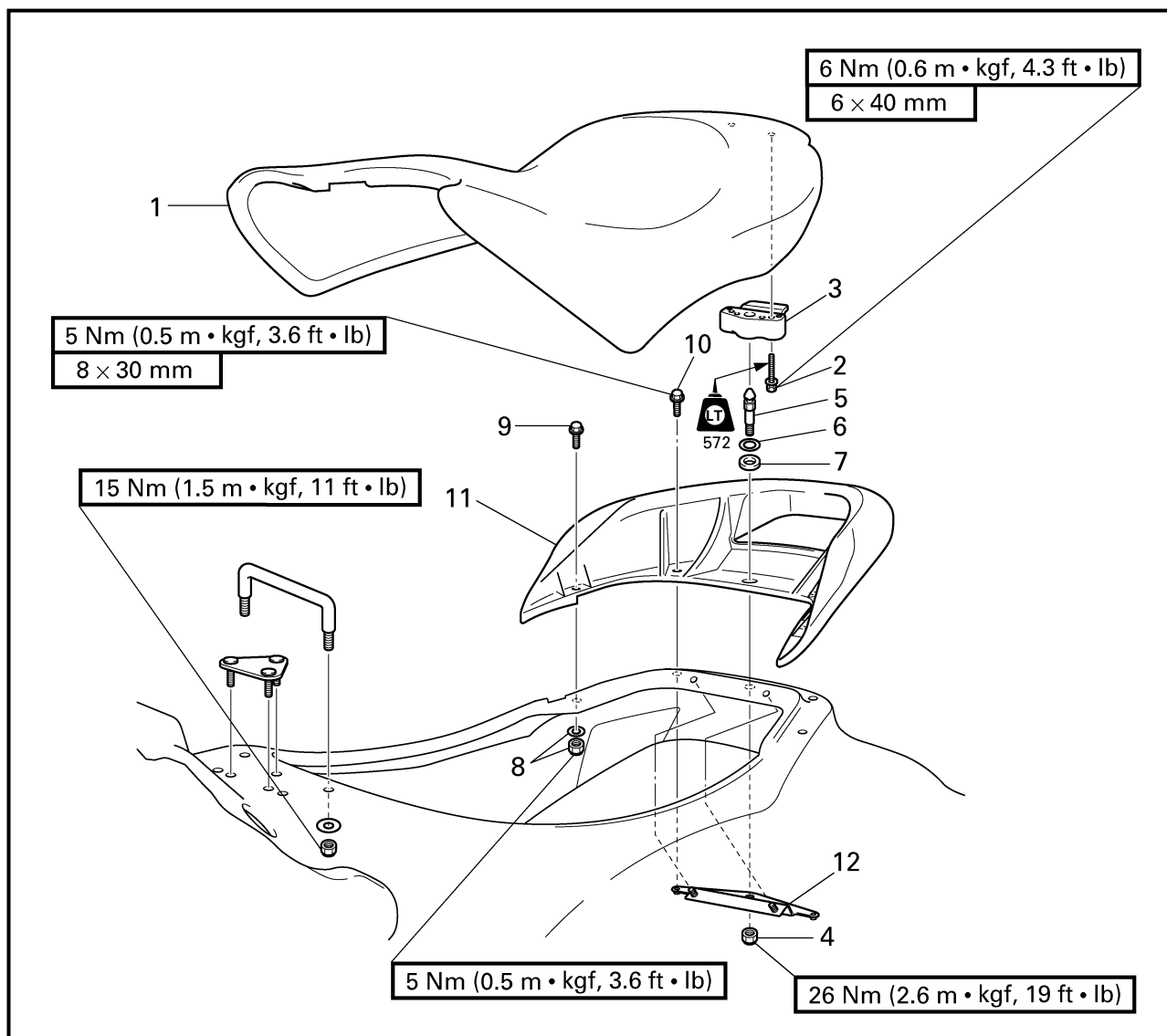
- Ventilation hose

### NOTE:

Insert the ventilation hose into the ventilation fitting until it reaches the bend ① in the fitting.

**SEATS AND HAND GRIP  
EXPLODED DIAGRAM**

**REMOVAL AND INSTALLATION CHART**

| Step | Procedure/Part name                    | Q'ty | Service points                      |
|------|----------------------------------------|------|-------------------------------------|
|      | <b>SEATS AND HAND GRIP<br/>REMOVAL</b> |      | Follow the left "Step" for removal. |
| 1    | Seat assembly                          | 1    |                                     |
| 2    | Bolt                                   | 2    |                                     |
| 3    | Seat lock assembly                     | 1    |                                     |
| 4    | Nut                                    | 1    |                                     |
| 5    | Notch                                  | 1    |                                     |
| 6    | Washer                                 | 1    |                                     |

**EXPLODED DIAGRAM**


| Step | Procedure/Part name | Q'ty | Service points                              |
|------|---------------------|------|---------------------------------------------|
| 7    | Rubber ring         | 1    | Reverse the removal steps for installation. |
| 8    | Nut/washer          | 2/2  |                                             |
| 9    | Bolt                | 2    |                                             |
| 10   | Bolt                | 2    |                                             |
| 11   | Hand grip           | 1    |                                             |
| 12   | Bracket             | 1    |                                             |



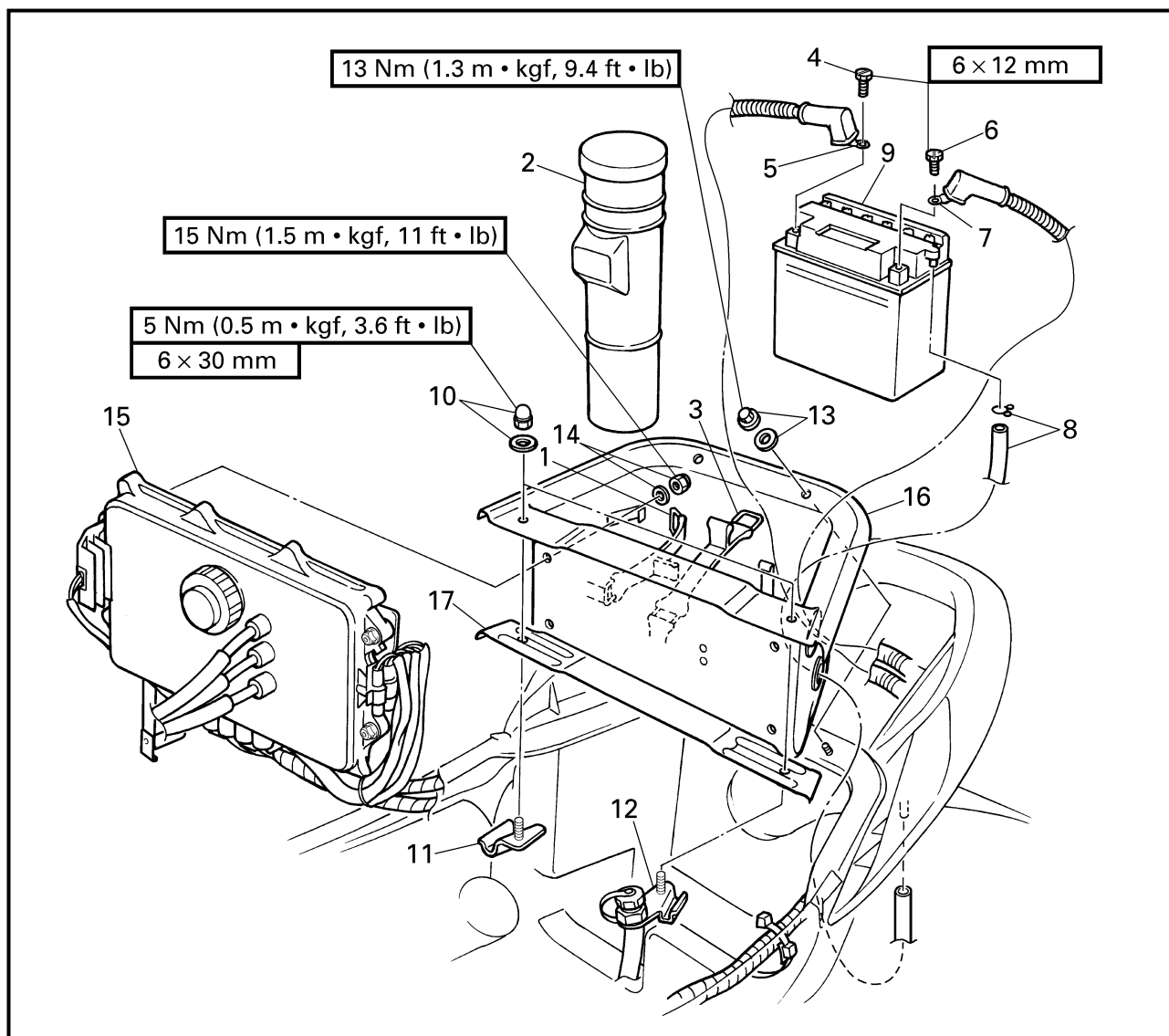
### SERVICE POINTS

#### Seat lock inspection

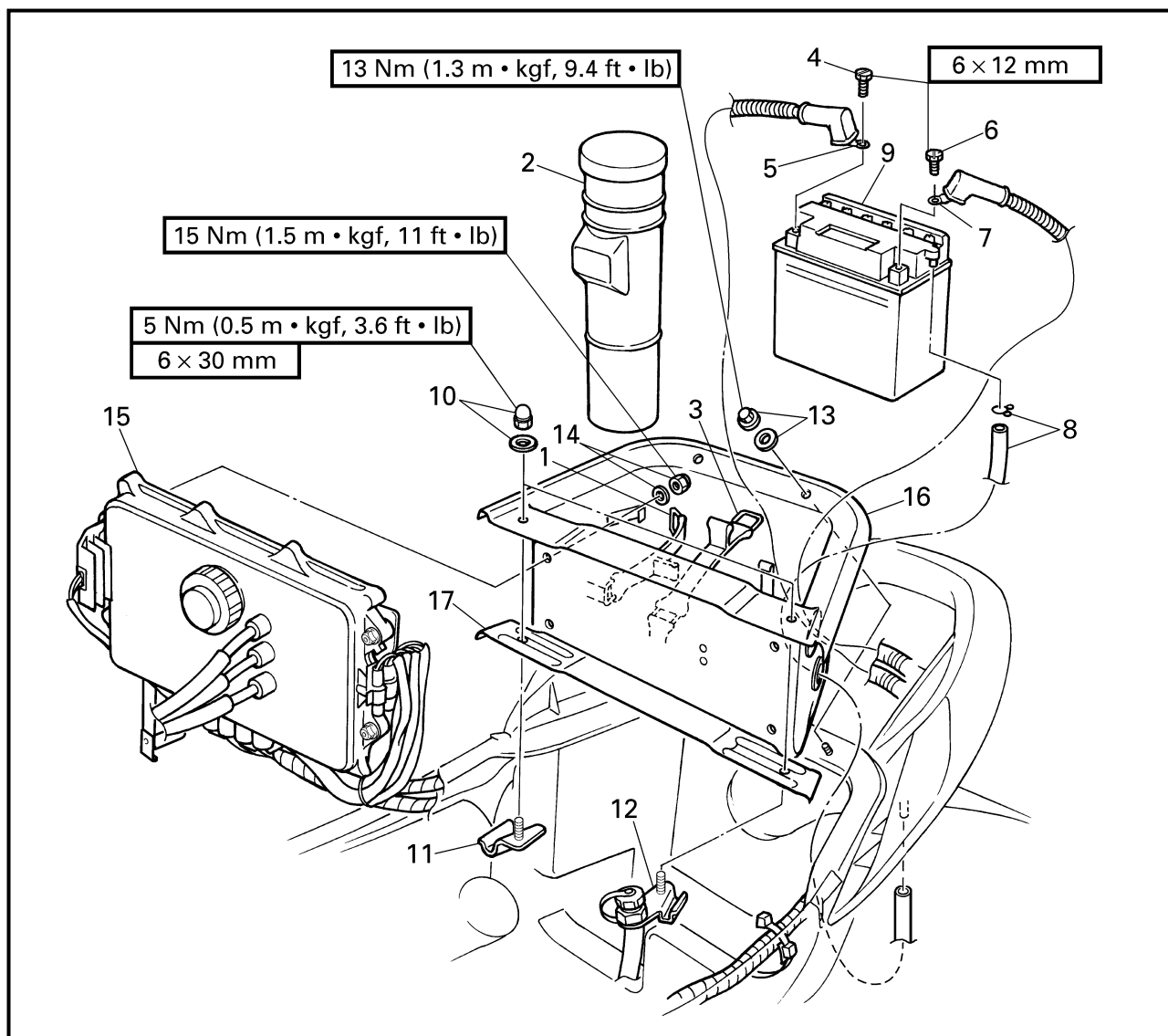
1. Inspect:

- Seat lock

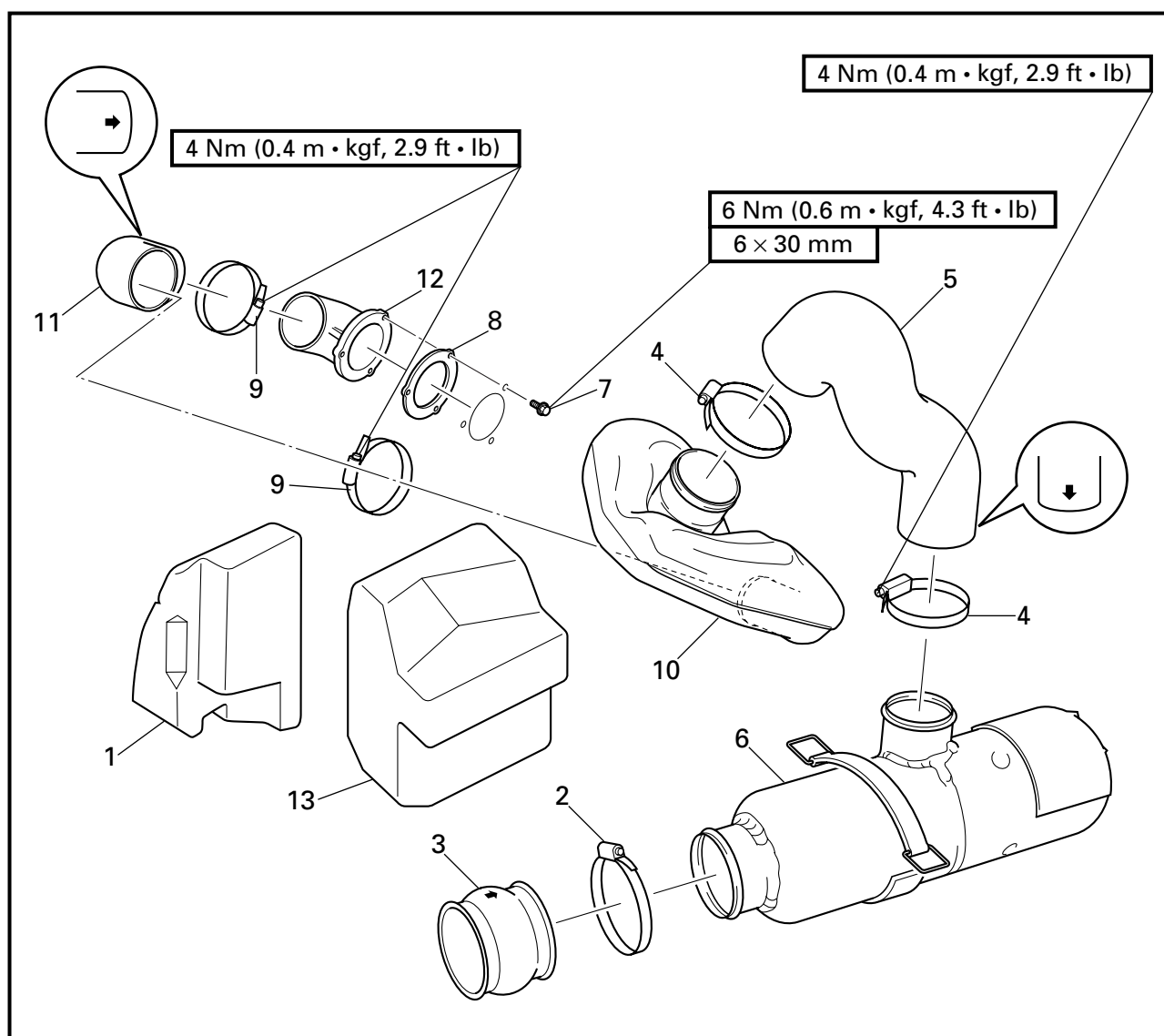
Damage/wear → Replace.

**BATTERY BOX  
EXPLODED DIAGRAM**

**REMOVAL AND INSTALLATION CHART**

| Step | Procedure/Part name         | Q'ty | Service points                      |
|------|-----------------------------|------|-------------------------------------|
|      | <b>BATTERY BOX REMOVAL</b>  |      | Follow the left "Step" for removal. |
| 1    | Band                        | 1    |                                     |
| 2    | Fire extinguisher container | 1    |                                     |
| 3    | Band                        | 1    |                                     |
| 4    | Bolt                        | 1    |                                     |
| 5    | Battery negative lead       | 1    |                                     |
| 6    | Bolt                        | 1    |                                     |
| 7    | Battery positive lead       | 1    |                                     |
| 8    | Clip/breather hose          | 1/1  |                                     |
| 9    | Battery                     | 1    |                                     |
| 10   | Cap nut/washer              | 2/2  |                                     |
| 11   | Holder                      | 1    |                                     |

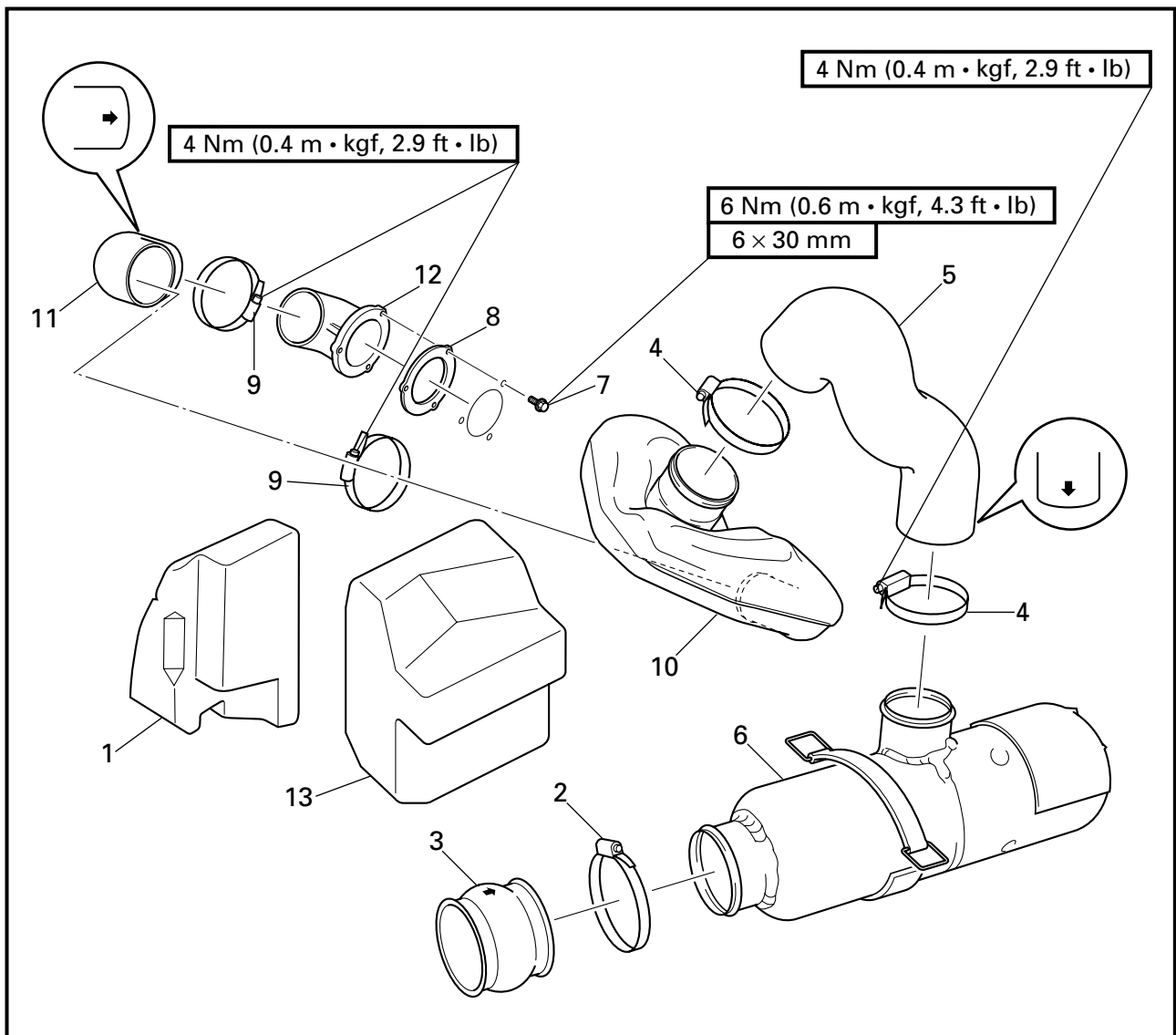
**EXPLODED DIAGRAM**


| Step | Procedure/Part name | Q'ty | Service points                                                                                                                                                                                           |
|------|---------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12   | Holder              | 1    | <b>NOTE:</b> _____<br>Before installing the battery box, route the battery leads and battery breather hose through the holes of the battery box.<br>_____<br>Reverse the removal steps for installation. |
| 13   | Cap nut/washer      | 2/2  |                                                                                                                                                                                                          |
| 14   | Nut/washer          | 4/4  |                                                                                                                                                                                                          |
| 15   | Electrical box      | 1    |                                                                                                                                                                                                          |
| 16   | Battery box         | 1    |                                                                                                                                                                                                          |
| 17   | Stay                | 1    |                                                                                                                                                                                                          |

**EXHAUST SYSTEM  
EXPLODED DIAGRAM**

**REMOVAL AND INSTALLATION CHART**

| Step | Procedure/Part name           | Q'ty | Service points                                                                           |
|------|-------------------------------|------|------------------------------------------------------------------------------------------|
|      | <b>EXHAUST SYSTEM REMOVAL</b> |      |                                                                                          |
|      | Exhaust chamber assembly      |      | Follow the left "Step" for removal.<br>Refer to "EXHAUST CHAMBER ASSEMBLY" in chapter 5. |
| 1    | Floatation                    | 1    |                                                                                          |
| 2    | Hose clamp                    | 1    |                                                                                          |
| 3    | Exhaust joint                 | 1    |                                                                                          |
| 4    | Hose clamp                    | 2    |                                                                                          |
| 5    | Rubber hose                   | 1    |                                                                                          |
| 6    | Water lock                    | 1    |                                                                                          |
| 7    | Bolt                          | 3    |                                                                                          |
| 8    | Packing                       | 1    |                                                                                          |

## EXPLODED DIAGRAM

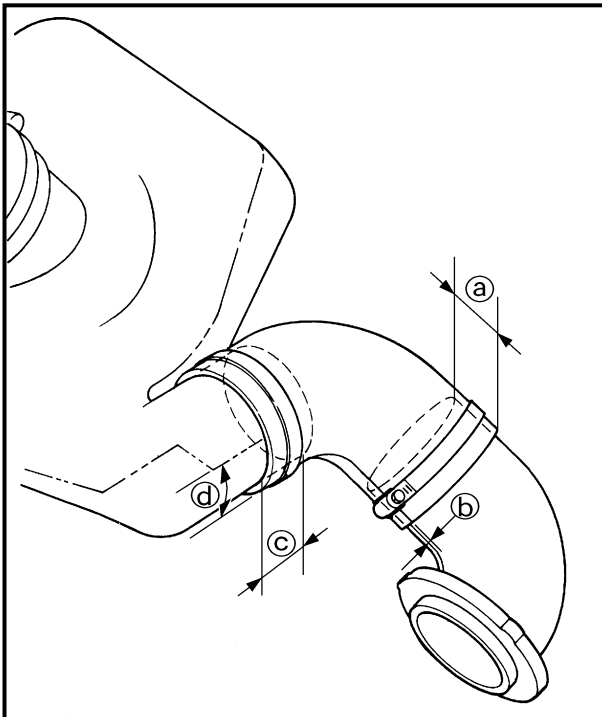


| Step | Procedure/Part name | Q'ty | Service points                                                                                               |
|------|---------------------|------|--------------------------------------------------------------------------------------------------------------|
| 9    | Hose clamp          | 2    | <b>NOTE:</b> _____<br>Remove parts 9 to 12 as a set.<br>_____<br>Reverse the removal steps for installation. |
| 10   | Water tank          | 1    |                                                                                                              |
| 11   | Rubber hose         | 1    |                                                                                                              |
| 12   | Exhaust outlet      | 1    |                                                                                                              |
| 13   | Floatation          | 1    |                                                                                                              |

## **SERVICE POINTS**

### **Exhaust system inspection**

1. Inspect:
  - Water lock band  
Cracks/damage → Replace.
2. Inspect:
  - Rubber hoses  
Burns/cracks/damage → Replace.
3. Inspect:
  - Water lock  
Cracks/leaks → Replace.
4. Inspect:
  - Water tank  
Cracks/damage/leaks → Replace.

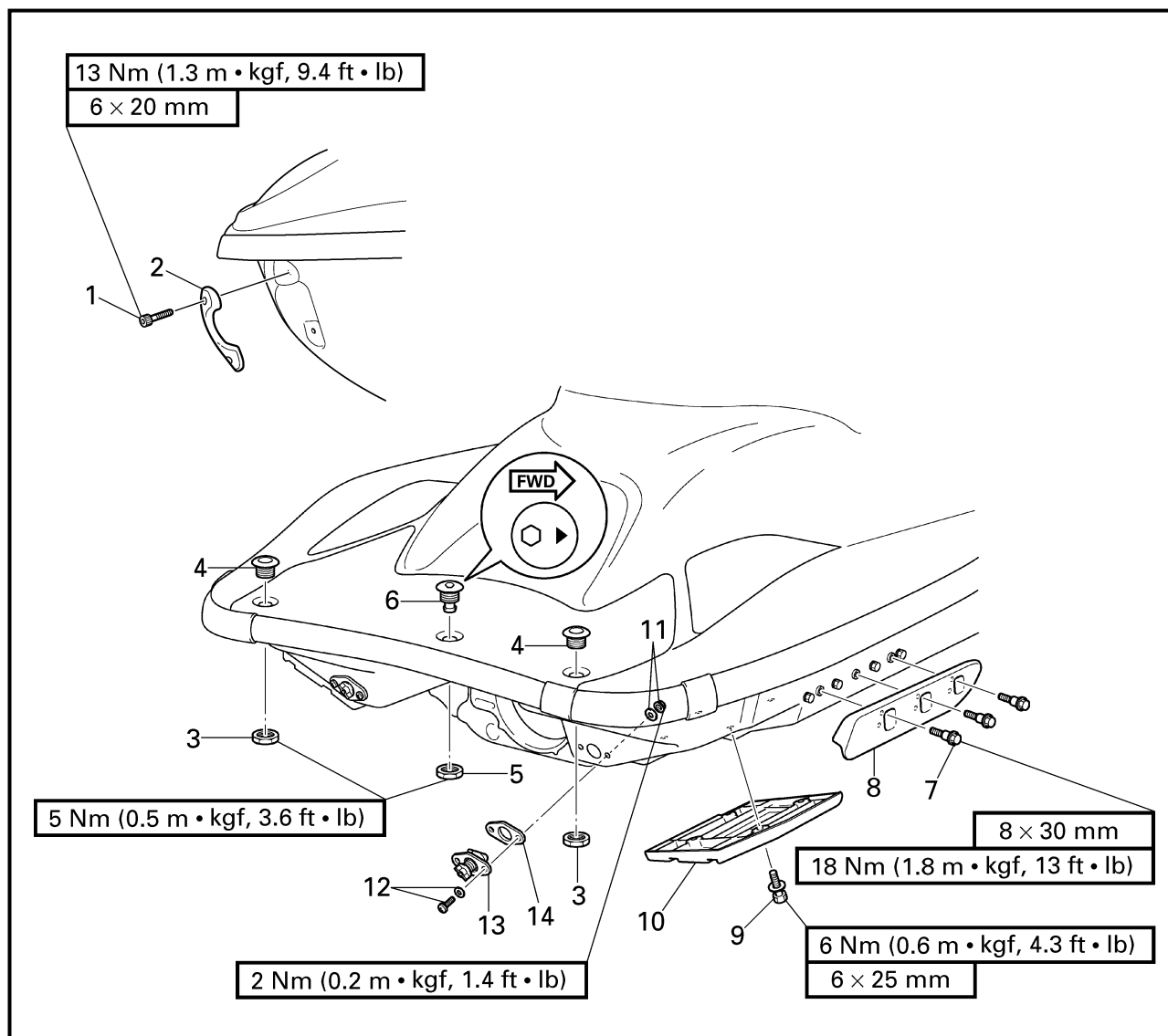


### **Exhaust component parts sub-assembly**

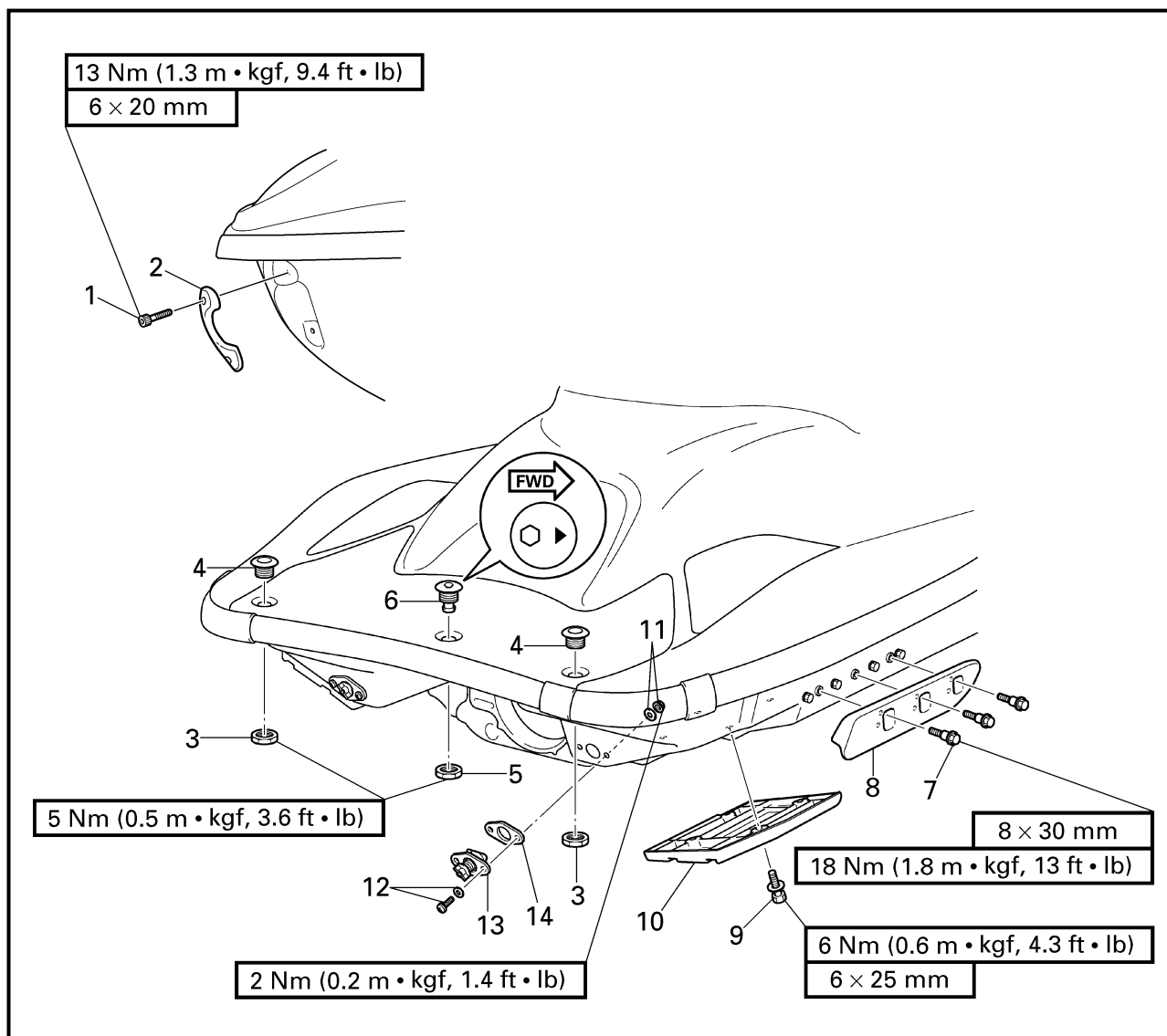
1. Install:
  - Exhaust outlet
  - Rubber hose
  - Water tank

#### **NOTE:**

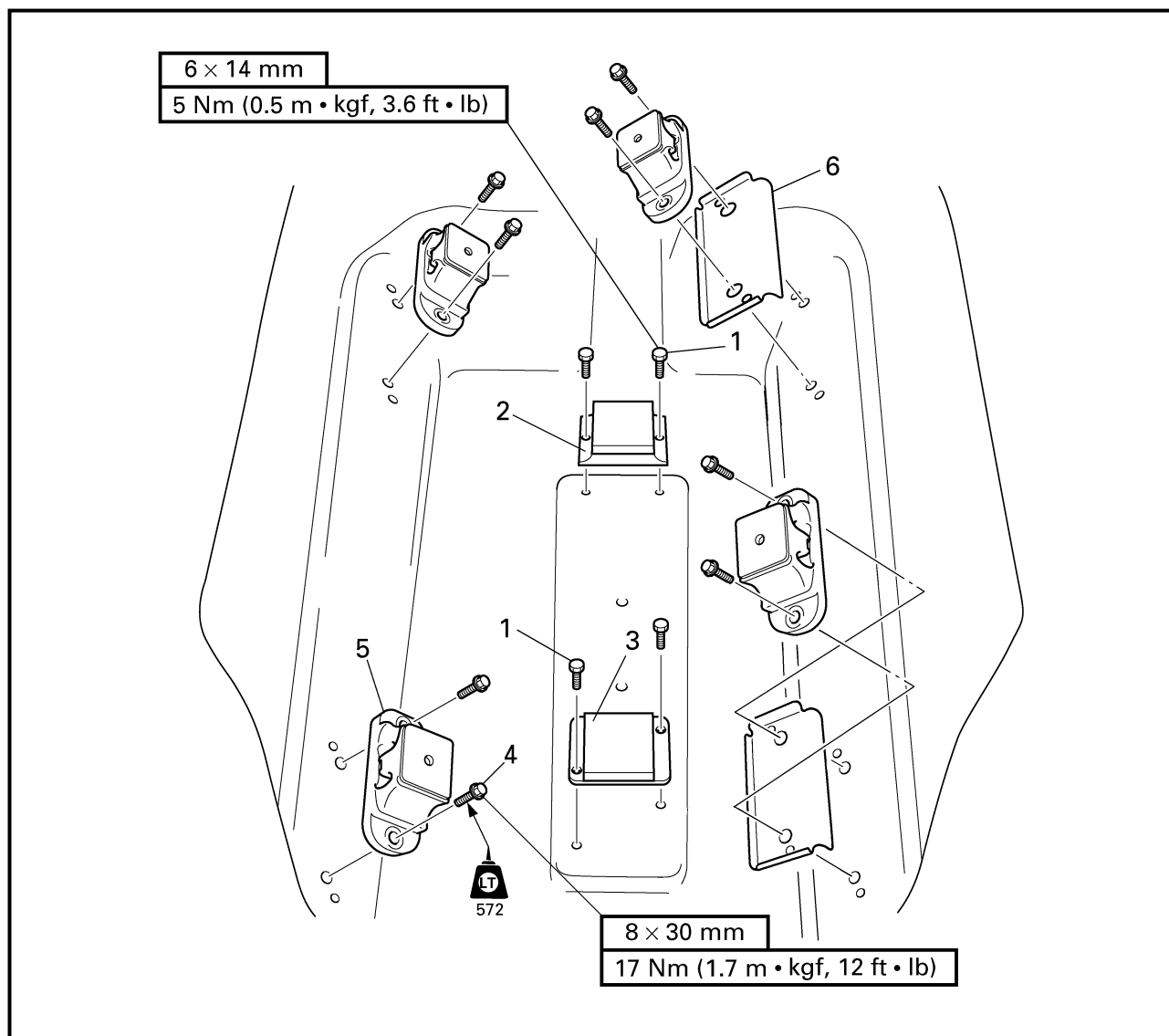
- Insert the exhaust outlet 45 mm (1.8 in) (a) into the rubber hose.
- Make sure that there is a surface distance of 10 mm (0.4 in) (b) between the parting lines of the exhaust outlet and the rubber hose.
- Insert the water tank 45 mm (1.8 in) (c) into the rubber hose.
- Make sure that there is a surface distance of 45 mm (1.8 in) (d) between the parting lines of the water tank and rubber hose.

**DECK AND HULL  
EXPLODED DIAGRAM**

**REMOVAL AND INSTALLATION CHART**

| Step | Procedure/Part name              | Q'ty | Service points                          |
|------|----------------------------------|------|-----------------------------------------|
|      | <b>DECK AND HULL DISASSEMBLY</b> |      | Follow the left "Step" for disassembly. |
| 1    | Bolt                             | 2    |                                         |
| 2    | Bow eye                          | 1    |                                         |
| 3    | Nut                              | 2    |                                         |
| 4    | Rope hole fitting                | 2    |                                         |
| 5    | Nut                              | 1    |                                         |
| 6    | Spout                            | 1    |                                         |
| 7    | Bolt                             | 6    |                                         |

**EXPLODED DIAGRAM**


| Step | Procedure/Part name | Q'ty | Service points                                                                                                                                                 |
|------|---------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8    | Sponson             | 2    | <b>NOTE:</b> _____<br>Make sure install the starboard and port side sponsons to the same position.<br>_____<br><br>Reverse the disassembly steps for assembly. |
| 9    | Bolt                | 8    |                                                                                                                                                                |
| 10   | Flap                | 2    |                                                                                                                                                                |
| 11   | Nut/washer          | 4/4  |                                                                                                                                                                |
| 12   | Screw/washer        | 4/4  |                                                                                                                                                                |
| 13   | Drain plug          | 2    |                                                                                                                                                                |
| 14   | Packing             | 2    |                                                                                                                                                                |

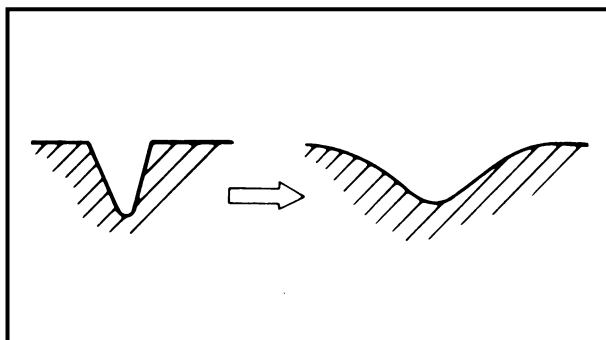
**ENGINE MOUNT  
EXPLODED DIAGRAM**

**REMOVAL AND INSTALLATION CHART**

| Step | Procedure/Part name         | Q'ty | Service points                                                              |
|------|-----------------------------|------|-----------------------------------------------------------------------------|
|      | <b>ENGINE MOUNT REMOVAL</b> |      |                                                                             |
|      | Engine assembly             |      | Follow the left "Step" for removal.<br>Refer to "ENGINE UNIT" in chapter 5. |
| 1    | Bolt                        | 4    |                                                                             |
| 2    | Damper 1                    | 1    |                                                                             |
| 3    | Damper 2                    | 1    |                                                                             |
| 4    | Bolt                        | 8    |                                                                             |
| 5    | Engine mount                | 4    |                                                                             |
| 6    | Liner                       | 2    | Starboard side<br>Reverse the removal steps for installation.               |

## HULL REPAIR

### Shallow scratches

1. Sand the scratches with 400 grit sandpaper (either wet or dry) until the scratches are smooth. Then, sand the scratches once again with 600 grit sandpaper (either wet or dry).

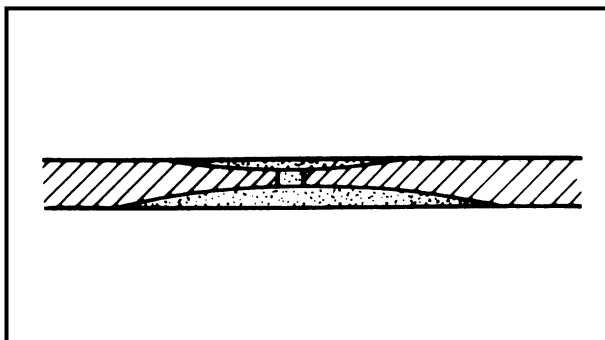
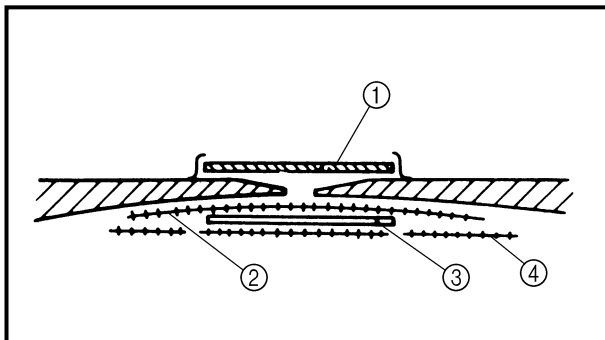
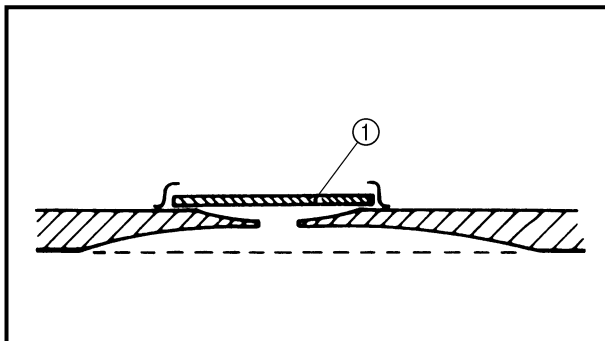
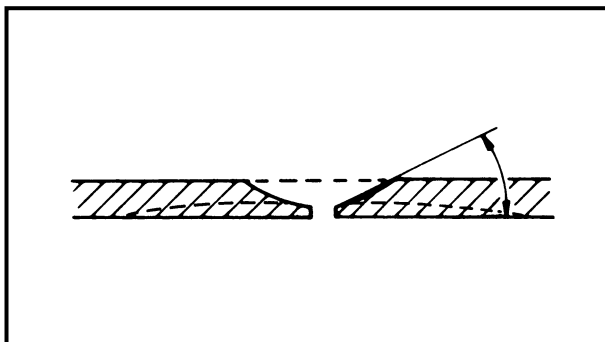


### Deep scratches

1. Remove any sharp or rough edges from the hull surface.
2. Sand the scratches and a 1-inch circumference around them with 80 grit sandpaper (either wet or dry).
3. Clean the entire area with acetone and let it completely dry.
4. Mix gel-coat and gel-coat thickener to form a putty, and then add the catalyst to the putty.
5. Apply the putty, spread it with a squeegee, and then cover the putty with wax paper.
6. When the putty has set, sand it. Smooth the area with 80 ~ 400 grit sandpaper (either wet or dry) and a sanding block.
7. Clean the area with a dry cloth and then polish it.

### WARNING

Resins, catalysts, and solvents are flammable and toxic; only use them in a well-ventilated area and keep them away from open flames and sparks. Always follow the manufacturer's instructions and warnings.



### Cracks and punctures

#### NOTE:

Before attempting to repair any cracks or punctures, refer to "WATER VEHICLE FRP REPAIR MANUAL".

1. Remove any damaged fiberglass.
2. Cut the damaged area and separate it approximately 0.25 inch.
3. On the outside of the hull, grind the separated edge of the area to less than 5° as shown.
4. Working from inside the hull, grind the damaged area approximately 4 inches beyond the damage.
5. Clean the area with acetone, apply BP-1 or an equivalent primer onto both sides of the damaged area, and then allow it to cure for approximately 30 minutes.
6. Cover a piece of cardboard with wax paper ① and then cover the damaged area with it.
7. Combine the polyester resin and the catalyst, and then apply the mixture onto the hull.
8. Install a glass mat ② (2 inches smaller than the ground area).
9. Apply the resin.
10. Install a 20 oz. fiberglass cloth ③ (1 inch smaller than the glass mat).
11. Apply the resin.
12. Install another glass mat ④ (1 inch smaller than the ground area).
13. When the resin has hardened remove the piece of cardboard.
14. Finish the outer surface.  
Refer to steps (3) ~ (7) in the "Deep scratches" section.

Insert nut

NOTE: \_\_\_\_\_

Use the insert nut when:

- A pop nut which was attached to the hull slipped off or,
- When a bolt which was fastened to an insert nut or pop nut broke.

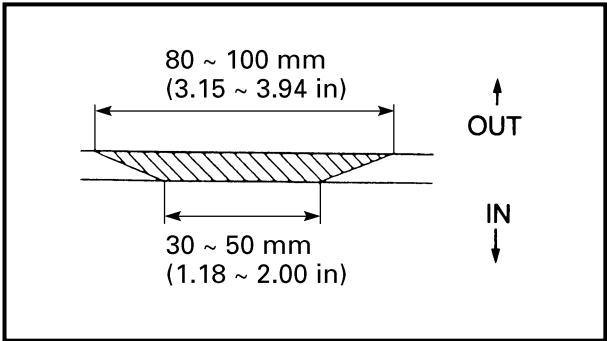
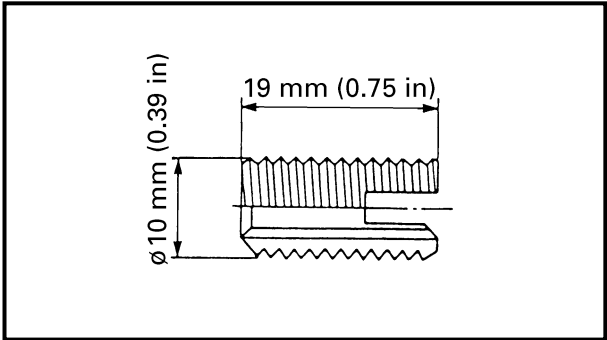
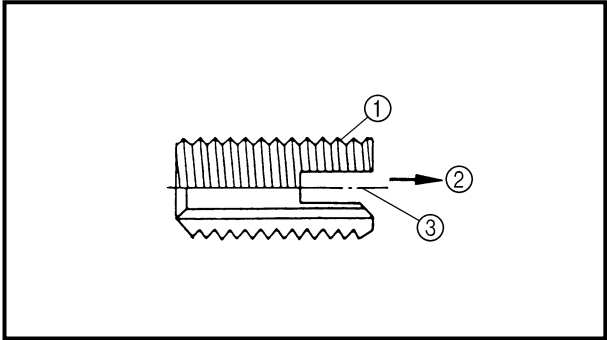
| Part No.     | Part name | Remarks             |
|--------------|-----------|---------------------|
| EW2-62733-09 | Nut       | Stainless steel, M6 |

- Nut ①
- Thread direction ②
- Slot to be threaded ③

NOTE: \_\_\_\_\_

Drilling size

| Material   | Pilot hole diameter    |
|------------|------------------------|
| FRP or SMC | 9.1 ~ 9.2 mm (0.36 in) |
| Brass      | 9.4 mm (0.37 in)       |



Example 1:

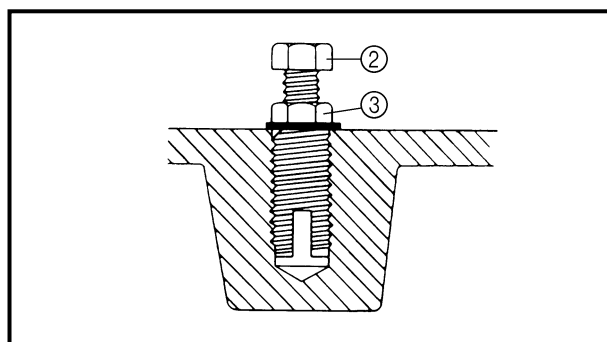
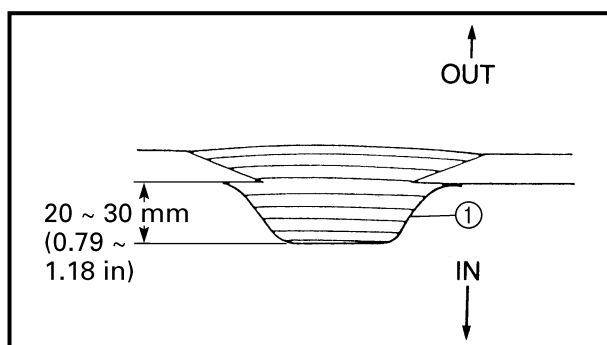
NOTE: \_\_\_\_\_

Before attempting to install the insert nut, refer to “WATER VEHICLE FRP REPAIR MANUAL”.

The insert nut is used to repair the pop nut designed for the ride plate.

(By repairing the FRP portion, the insert nut can be used for all models.)

1. Remove:
  - Pop nut
2. Clean the surface to be scarfed and the inside of the hull with acetone.
3. Scarf the shaded portion of the hull.



4. First, apply tape ① to the inner surface of the hull and then laminate fiberglass mats over the tape with resin.

### NOTE:

When it is possible to work inside the hull, laminate the mats from the inside.

5. Sand the outer surface of the hull until it is smooth.
6. Install the ride plate.
7. Drill a 20 mm (0.79 in) deep hole in the center of the laminated fiberglass layers with a 9.2 mm (0.36 in) diameter drill bit.
8. Pass the bolt ② through the insert nut and lock the bolt with the nut ③ as shown.
9. Screw in the insert nut so that the top is flush with the FRP surface.
10. Loosen the locknut and remove the bolt.

### CAUTION:

- Only use a steel bolt with a tensile strength of 8T or more.
- If the bolt is inferior in strength or is made of stainless steel it may break.

- Bolt ②
- Locknut ③

### Example 2:

The brass insert nut, which is designed for the Super Jet ride plate or the intake screen, is used as follows.

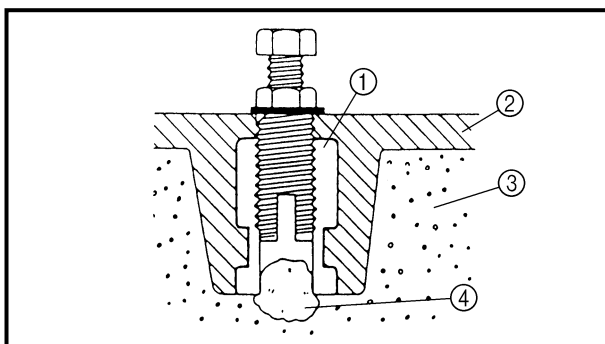
### NOTE:

If the bolt is broken, drill it out.

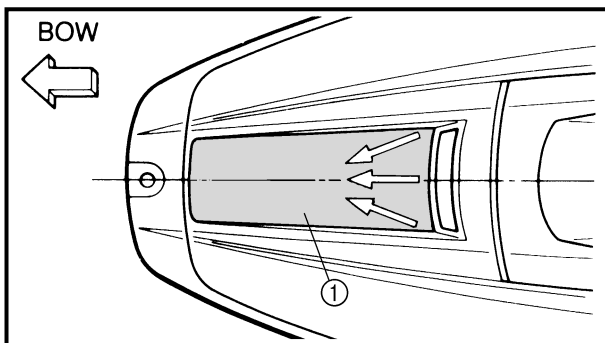
1. Drill a hole in the hull.

### NOTE:

- First, use a small-diameter drill bit followed by drill bits of gradually increasing diameter.
- Use a 9.4 mm (0.37 in) drill bit for the final drilling.

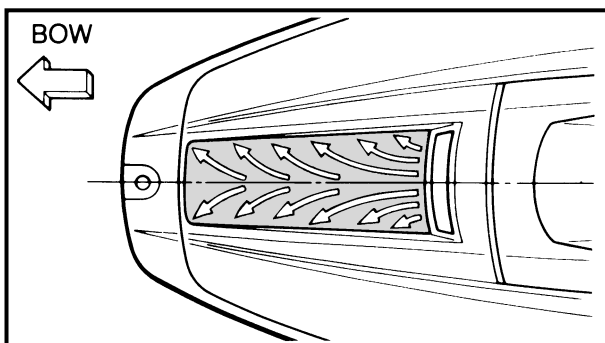


2. To prevent water from entering the urethane foam, apply silicone sealant to the inside of the hole as shown.
3. Install the insert nut as explained in "Example 1".
  - Brass insert nut ①
  - Hull ②
  - Urethane foam ③
  - Silicone sealant ④



### Graphic removal

1. Hold a hair dryer approximately 1.5 inches above the graphic ①.
2. Apply heat to one corner of the graphic.
3. Slowly peel off the heated portion of the graphic and continue working until you reach the opposite corner and the entire graphic is removed.
4. After the graphic is removed, clean the entire bow area with isopropyl alcohol to remove any residual adhesive.



### Graphic installation

1. Mix 1 tablespoon of liquid detergent and water in a 1-quart spray bottle.
2. Remove the backing from the new graphic.
3. Spray the soap and water mixture onto both sides of the graphic, and also onto the hull area where the graphic will be installed.

### NOTE:

Spraying the front of the graphic with the soap and water mixture will protect it from being scratched during installation.

4. Align the graphic onto the fitting area of the hull and position it with a squeegee.

### NOTE:

Be sure to remove any air bubbles from the graphic with the squeegee. Work from the top of the graphic down and slide the squeegee outwards from the graphic's center line.

5. Allow the graphic to dry before waxing or using the water vehicle.

---

## CHAPTER 9

### TROUBLE ANALYSIS

|                              |     |
|------------------------------|-----|
| TROUBLE ANALYSIS .....       | 9-1 |
| TROUBLE ANALYSIS CHART ..... | 9-1 |

## TROUBLE ANALYSIS

**NOTE:**

The following items should be checked before the "Trouble analysis" chart is consulted.

1. The battery is charged and its specified gravity is within specification.
2. There are no incorrect wiring connections.
3. Wiring connections are properly secured and not rusty.
4. The lock plate is attached to the engine stop lanyard switch.
5. Fuel is reaching the carburetors.

## TROUBLE ANALYSIS CHART

| Problems              |                       |                       |                       |                       |                       |                       |                       |                              |                       |                               | Items to be checked        |                   |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------------|-----------------------|-------------------------------|----------------------------|-------------------|
| ENGINE WILL NOT START | ROUGH IDLING          | ENGINE STALLS         | ENGINE WILL NOT STOP  | POOR PERFORMANCE      | OVERHEATING           | LOOSE STEERING        | BILGE INCREASE        | IRREGULAR WARNING INDICATION | POOR BATTERY CHARGING | YPVS SERVOMOTOR DOES NOT MOVE | Items                      | Reference chapter |
|                       |                       |                       |                       |                       |                       |                       |                       |                              |                       |                               | <b>FUEL SYSTEM</b>         |                   |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Fuel tank                  | 4                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Air vent hose              | 4                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Fuel hose                  | 4                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Fuel filter                | 4                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Fuel pump                  | 4                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Carburetors                | 4                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Carburetor synchronization | 4                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Trolling speed             | 3                 |
|                       |                       |                       |                       |                       |                       |                       |                       |                              |                       |                               | <b>POWER UNIT</b>          |                   |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Spark plug(s)              | 3                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Compression                | 5                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Reed valves                | 5                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Cylinder head gasket       | 5                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Piston rings               | 5                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Cylinder block             | 5                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Seals                      | 5                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Crankcase                  | 5                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Pistons                    | 5                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Bearings                   | 5                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Bearing housing            | 5                 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>        | <input type="radio"/> | <input type="radio"/>         | Couplings                  | 5                 |

| Problems              |                       |                       |                       |                       |                       |                       |                       |                              |                       |                               | Items to be checked                 |                   |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------------|-----------------------|-------------------------------|-------------------------------------|-------------------|
| ENGINE WILL NOT START | ROUGH IDLING          | ENGINE STALLS         | ENGINE WILL NOT STOP  | POOR PERFORMANCE      | OVERHEATING           | LOOSE STEERING        | BILGE INCREASE        | IRREGULAR WARNING INDICATION | POOR BATTERY CHARGING | YPVS SERVOMOTOR DOES NOT MOVE | Items                               | Reference chapter |
|                       |                       |                       |                       | <input type="radio"/> |                       |                       |                       |                              |                       |                               | Rubber coupling                     | 5                 |
|                       |                       |                       |                       |                       | <input type="radio"/> |                       | <input type="radio"/> |                              |                       |                               | Pilot water hose                    | 5                 |
|                       |                       |                       |                       |                       | <input type="radio"/> |                       | <input type="radio"/> |                              |                       |                               | Water hose                          | 5                 |
|                       |                       |                       |                       |                       | <input type="radio"/> |                       | <input type="radio"/> |                              |                       |                               | Water passage                       | 5                 |
|                       |                       |                       |                       |                       |                       |                       |                       |                              |                       |                               | <b>JET PUMP UNIT</b>                |                   |
|                       |                       |                       |                       | <input type="radio"/> | <input type="radio"/> |                       | <input type="radio"/> |                              |                       |                               | Duct                                | 6                 |
|                       |                       |                       |                       | <input type="radio"/> |                       |                       |                       |                              |                       |                               | Impeller                            | 6                 |
|                       |                       |                       |                       | <input type="radio"/> | <input type="radio"/> |                       |                       |                              |                       |                               | Intake screen                       | 6                 |
|                       | <input type="radio"/> |                       |                       | <input type="radio"/> |                       |                       |                       |                              |                       |                               | Bearings                            | 6                 |
|                       |                       |                       |                       | <input type="radio"/> | <input type="radio"/> |                       |                       |                              |                       |                               | Intake duct                         | 6                 |
|                       |                       |                       |                       |                       | <input type="radio"/> |                       |                       |                              |                       |                               | Water inlet hose                    | 6                 |
|                       |                       |                       |                       |                       |                       |                       | <input type="radio"/> |                              |                       |                               | Bilge hose                          | 6                 |
|                       |                       |                       |                       |                       |                       |                       | <input type="radio"/> |                              |                       |                               | Bilge strainer                      | 6                 |
|                       |                       |                       |                       |                       |                       |                       | <input type="radio"/> |                              |                       |                               | Bilge hose joint                    | 6                 |
|                       |                       |                       |                       |                       |                       |                       | <input type="radio"/> |                              |                       |                               | Valve body                          | 6                 |
|                       |                       |                       |                       |                       |                       |                       |                       |                              |                       |                               | <b>ELECTRICAL</b>                   |                   |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |                       |                       |                       | <input type="radio"/>        |                       | <input type="radio"/>         | CDI unit                            | 7                 |
|                       |                       | <input type="radio"/> |                       |                       |                       |                       |                       |                              | <input type="radio"/> |                               | Lighting coil                       | 7                 |
| <input type="radio"/> |                       | <input type="radio"/> |                       | <input type="radio"/> |                       |                       |                       |                              |                       |                               | Pickup coil (Pulser coil)           | 7                 |
| <input type="radio"/> |                       | <input type="radio"/> |                       | <input type="radio"/> |                       |                       |                       |                              |                       |                               | Ignition coil                       | 7                 |
|                       |                       |                       |                       | <input type="radio"/> |                       |                       |                       |                              | <input type="radio"/> |                               | Rectifier/regulator                 | 7                 |
| <input type="radio"/> |                       | <input type="radio"/> |                       |                       |                       |                       |                       | <input type="radio"/>        |                       |                               | Electrical sender(s)                | 7                 |
| <input type="radio"/> |                       |                       |                       |                       |                       |                       |                       |                              |                       |                               | Starter relay, starter motor        | 7                 |
|                       |                       |                       |                       | <input type="radio"/> |                       |                       |                       |                              |                       | <input type="radio"/>         | YPVS unit                           | 7                 |
| <input type="radio"/> |                       |                       |                       |                       |                       |                       |                       |                              | <input type="radio"/> |                               | Battery                             | 3                 |
| <input type="radio"/> |                       |                       |                       |                       |                       |                       |                       |                              | <input type="radio"/> |                               | Fuse(s)                             | 7                 |
| <input type="radio"/> |                       |                       |                       | <input type="radio"/> |                       |                       |                       |                              | <input type="radio"/> | <input type="radio"/>         | Wire harness, electrical coupler(s) | 7                 |
|                       |                       |                       |                       |                       |                       |                       |                       |                              |                       |                               | <b>HULL AND HOOD</b>                |                   |
|                       |                       |                       |                       |                       |                       | <input type="radio"/> |                       |                              |                       |                               | Steering column                     | 8                 |
|                       |                       |                       |                       | <input type="radio"/> |                       |                       | <input type="radio"/> |                              |                       |                               | Water lock                          | 8                 |
|                       |                       | <input type="radio"/> |                       | <input type="radio"/> |                       |                       | <input type="radio"/> |                              |                       |                               | Exhaust hose                        | 8                 |
|                       |                       |                       |                       | <input type="radio"/> |                       |                       | <input type="radio"/> |                              |                       |                               | Muffler                             | 8                 |
|                       |                       |                       |                       |                       |                       |                       | <input type="radio"/> |                              |                       |                               | Drain plugs                         | 8                 |



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(GP1200AY)

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# WIRING DIAGRAM GP1200R

| COLOR CODE |                |
|------------|----------------|
| ● B        | : Black        |
| ● Br       | : Brown        |
| ● Ch       | : Chocolate    |
| ● G        | : Green        |
| ● Gy       | : Gray         |
| ● L        | : Blue         |
| ● O        | : Orange       |
| ● R        | : Red          |
| ● W        | : White        |
| ● Y        | : Yellow       |
| ● B/O      | : Black/orange |
| ● B/W      | : Black/white  |
| ● B/Y      | : Black/yellow |
| ● Gy/B     | : Gray/black   |
| ● Gy/R     | : Gray/red     |
| ● Gy/Y     | : Gray/yellow  |
| ● L/B      | : Blue/black   |
| ● L/R      | : Blue/red     |
| ● R/L      | : Red/blue     |
| ● R/W      | : Red/white    |
| ● R/Y      | : Red/yellow   |
| ● W/L      | : White/blue   |
| ● W/R      | : White/red    |

