

PREFACE

This manual covers the construction, function and servicing procedures of the Honda BF2D outboard motor.

Careful observance of these instructions will result in better, safe service work.

ALL INFORMATION, ILLUSTRATIONS, DIRECTIONS AND SPECIFICATIONS INCLUDED IN THIS PUBLICATION ARE BASED ON THE LATEST PRODUCT INFORMATION AVAILABLE AT THE TIME OF APPROVAL FOR PRINTING. HONDA MOTOR CO., LTD. RESERVES THE RIGHT TO MAKE CHANGES WITHOUT INCURRING ANY OBLIGATION WHATEVER. NO PART OF THIS PUBLICATION MAY BE REPRODUCED WITHOUT WRITTEN PERMISSION.

HONDA MOTOR CO., LTD.
SERVICE PUBLICATION OFFICE

CONTENTS

| | |
|---|-----------|
| SPECIFICATIONS | 1 |
| SERVICE INFORMATION | 2 |
| MAINTENANCE | 3 |
| ENGINE COVER/FUEL TANK | 4 |
| RECOIL STARTER/FAN COVER | 5 |
| ENGINE REMOVAL/INSTALLATION | 6 |
| CARBURETOR | 7 |
| FLYWHEEL/IGNITION COIL | 8 |
| CLUTCH | 9 |
| CAMSHAFT/ROCKER ARM | 10 |
| OIL CASE/CRANKSHAFT/ CYLINDER BLOCK/PISTON/VALVE | 11 |
| STEERING HANDLE | 12 |
| CLUTCH HOUSING/ENGINE UNDER CASE/EXHAUST PIPE | 13 |
| STERN BRACKET/EXTENSION CASE | 14 |
| GEAR CASE/VERTICAL SHAFT | 15 |

1. SPECIFICATIONS

3. WIRING DIAGRAM

2. DIMENSIONAL DRAWINGS

1. SPECIFICATIONS

• DIMENSIONS AND WEIGHTS

| Type | S | L | SH | LH | SC | LC | SCH | LCH |
|-----------------------|---|-----------------------|----------------------|-----------------------|----------------------|-----------------------|----------------------|-----------------------|
| Description code | BZBK | | | | BZBF | | | |
| Overall length | 410 mm (16.1 in) | | | | | | | |
| Overall width | 280 mm (11.0 in) | | | | | | | |
| Overall height | 945 mm (37.2 in) | 1,100 mm (43.3 in) | 945 mm (37.2 in) | 1,100 mm (43.3 in) | 945 mm (37.2 in) | 1,100 mm (43.3 in) | 945 mm (37.2 in) | 1,100 mm (43.3 in) |
| Dry weight | 12.1 kg (26.7 lb) | 12.7 kg (28.0 lb) | 12.4 kg (27.3 lb) | 13.0 kg (28.7 lb) | 12.4 kg (27.3 lb) | 13.0 kg (28.7 lb) | 12.7 kg (28.0 lb) | 13.3 kg (29.3 lb) |
| Operating weight | 13.1 kg (29.9 lb) | 13.7 kg (30.2 lb) | 13.4 kg (29.5 lb) | 14.0 kg (30.9 lb) | 13.4 kg (29.5 lb) | 14.0 kg (30.9 lb) | 13.7 kg (30.2 lb) | 14.3 kg (31.5 lb) |
| Transom height | 418 mm (16.5 in) | 571 mm (22.5 in) | 418 mm (16.5 in) | 571 mm (22.5 in) | 418 mm (16.5 in) | 571 mm (22.5 in) | 418 mm (16.5 in) | 571 mm (22.5 in) |
| Transom angle | 4-stage adjustment (5°, -10°, -15°, -20°) | | | | | | | |
| Tilt angle adjustment | 1-stage adjustment | | | | | | | |
| Tilt-up angle | 75° | | | | | | | |
| Swivel angle | 360° | | | | | | | |

• ENGINE

| | |
|--------------------|--|
| Type | Vertical 4-stroke, overhead valve single cylinder |
| Displacement | 57 cm ³ (3.48 cu in) |
| Bore x stroke | 45.0 x 36.0 mm (1.77 x 1.42 in) |
| Maximum horsepower | 1.5 kW (2.0 PS) at 6,000 min ⁻¹ (rpm) |
| Maximum torque | 2.69 N·m (0.27 kgf·m, 1.95 lbf·ft) at 4,500 min ⁻¹ (rpm) |
| Compression ratio | 8.0 : 1 |
| Fuel consumption | 420 g/kW·h (309 g/PS·h, 0.68 lb/PS·h) |
| Cooling system | Forced air |
| Ignition system | Transistorized magneto ignition |
| Ignition timing | 27° B.T.D.C. |
| Spark plug | NGK: CR5HSB, DENSO: U16FSR-UB |
| Carburetor | Float type |
| Lubrication system | Forced splash |
| Oil capacity | 0.25 ℓ (0.26 US qt, 0.22 Imp qt) |
| Starting system | Recoil starter |
| Stopping system | Primary ground |
| Fuel used | Automotive unleaded gasoline 91 reach octane, 86 pump octane or higher |
| Fuel tank capacity | 1.0 ℓ (0.26 US gal, 0.22 Imp gal) |
| Clutch | Centrifugal (SC, LC, SCH and LCH type only) |

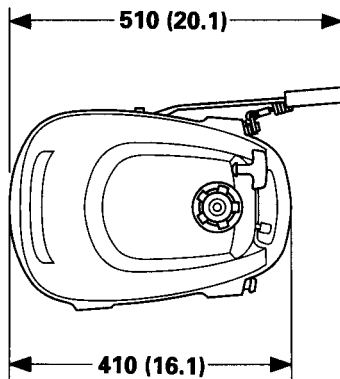
• LOWER UNIT

| | | |
|------------------------|----------------------------------|------------------------------|
| Type | S, L, SH, LH, SC, LC, SCH, LCH | |
| Reduction | Spiral bevel gear | |
| Gear ratio | 0.41 (12/29) | |
| Gear case oil | Hypoid gear oil (SAE #90) | |
| Gear case oil capacity | 0.05 ℓ (0.05 US qt, 0.04 Imp qt) | |
| Propeller | Type | Aerofoil |
| | No. of blades x Dia. x Pitch | 3 x 184 x 120 mm |
| | Rotating direction | Clockwise (Viewed from rear) |

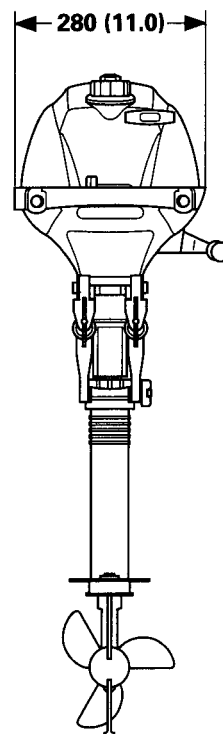
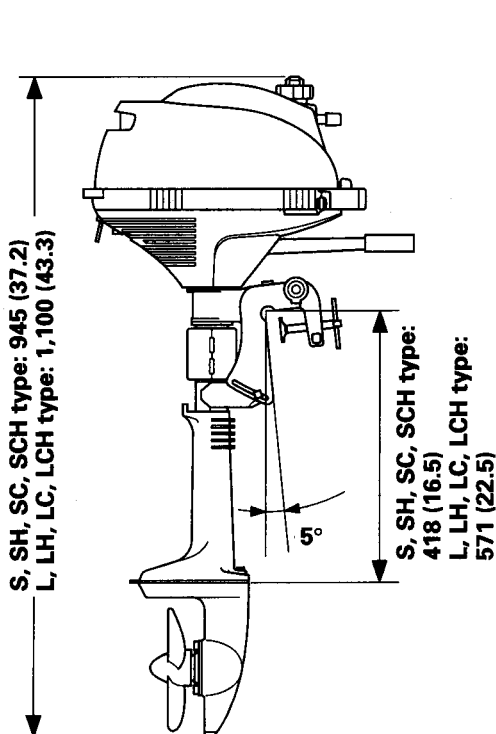
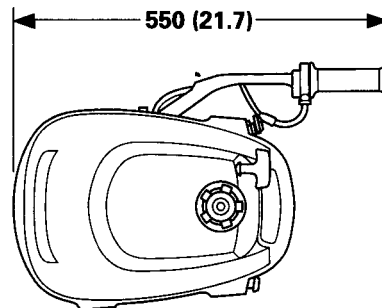
2. DIMENSIONAL DRAWINGS

Unit: mm (in)

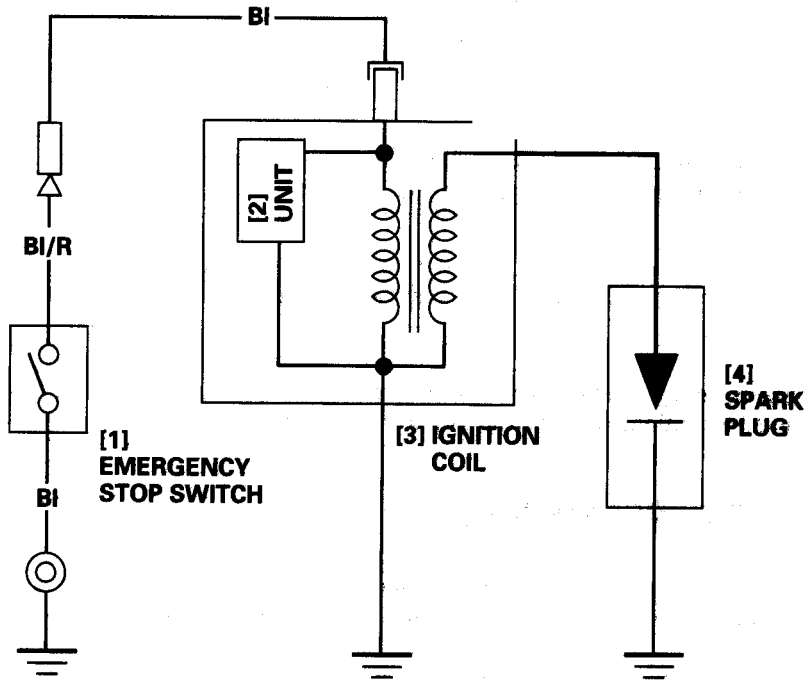
S, L, SC, LC type:



SH, LH, SCH, LCH type:



3. WIRING DIAGRAM



[5]
BI: Black
R: Red

- | | |
|---------------------------------------|----------------------------|
| 1. THE IMPORTANCE OF PROPER SERVICING | 6. TORQUE VALUES |
| 2. IMPORTANT SAFETY PRECAUTIONS | 7. SPECIAL TOOLS |
| 3. SERVICE RULES | 8. TROUBLESHOOTING |
| 4. SERIAL NUMBER LOCATION | 9. CABLE & HARNESS ROUTING |
| 5. MAINTENANCE STANDARDS | |

1. THE IMPORTANCE OF PROPER SERVICING

Proper servicing is essential to the safety of the operator and the reliability of the engine. Any error or oversight made by the technician while servicing can easily result in faulty operation, damage to the engine or injury to the operator.

⚠ WARNING

Improper servicing can cause an unsafe condition that can lead to serious injury or death. Follow the procedures and precautions in this shop manual carefully.

Some of the most important precautions are given below. However, we cannot warn you of every conceivable hazard that can arise in performing maintenance or repairs. Only you can decide whether or not you should perform a given task.

⚠ WARNING

Failure to follow maintenance instructions and precautions can cause you to be seriously hurt or killed. Follow the procedures and precautions in this shop manual carefully.

2. IMPORTANT SAFETY PRECAUTIONS

Be sure you have a clear understanding of all basic shop safety practices and that you are wearing appropriate clothing and safety equipment. When performing maintenance or repairs, be especially careful of the following:

- **Read the instructions before you begin, and be sure you have the tools and skills required to perform the tasks safely.**
Be sure that the engine is off before you begin any maintenance or repairs. This will reduce the possibility of several hazards:
- **Carbon monoxide poisoning from engine exhaust.**
Be sure there is adequate ventilation whenever you run the engine.
- **Burns from hot parts.**
Let the engine cool before you touch it.
- **Injury from moving parts.**
Do not run the engine unless the instruction tells you to do so. Even then, keep your hands, fingers, and clothing away.

To reduce the possibility of a fire or explosion, be sure when working around gasoline. Use only a nonflammable solvent, not gasoline, to clean parts. Keep all cigarettes, sparks, and flames away from all fuel-related parts.

3. SERVICE RULES

1. Use genuine Honda or Honda-recommended parts and lubricants or their equivalents. Parts that do not meet Honda's design specifications may damage the engine.
2. Use the special tools designed for the product.
3. Install new gaskets, O-rings, etc. when reassembling.
4. When torquing bolts or nuts, begin with larger-diameter or inner bolts first and tighten to the specified torque diagonally, unless a particular sequence is specified.
5. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
6. After reassembly, check all parts for proper installation and operation.
7. Many screws used in this machine are self-tapping. Be aware that cross-threading or overtightening these screws will strip the threads and ruin the hole.
8. Use only metric tools when servicing this engine. Metric bolts, nuts and screws are not interchangeable with non-metric fasteners. The use of incorrect tools and fasteners will damage the engine.
9. Be sure that the battery built in a tester is fully charged and check the meter before inspection using the tester.
10. Follow the instructions represented by these symbols when they are used.

 GREASE : Apply recommended grease.

 S. TOOL : Use special tool.

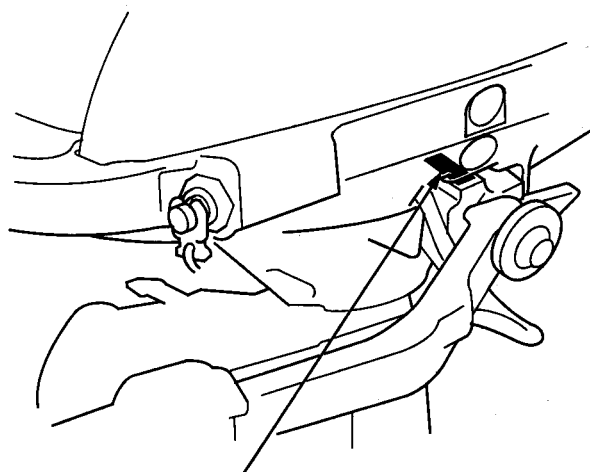
 OIL : Apply oil.

○ x ○ (○): Indicates the diameter, length, and quantity of metric flange bolt used.

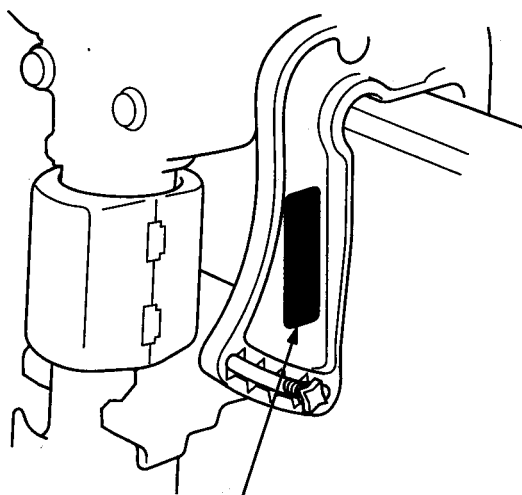
P. ○-○ : Indicates the reference page.

4. SERIAL NUMBER LOCATION

The engine serial number is stamped on the clutch housing and frame serial number is located on the stern bracket. Refer to this when ordering parts or making technical inquiries.



ENGINE SERIAL NUMBER



FRAME SERIAL NUMBER

5. MAINTENANCE STANDARDS

ENGINE

| Part | Item | | Standard | Service limit |
|---------------------|------------------------------|---------------------------------------|--|-----------------------|
| Engine | Idle speed | | 2,000 ± 100 min ⁻¹ (rpm) | — |
| | Full throttle range | | 5,000 – 6,000 min ⁻¹ (rpm) | — |
| | Cylinder compression | | 0.88 MPa (9.0 kgf/cm ² 128 psi)/ 1,000 min ⁻¹ (rpm) | — |
| Cylinder | Sleeve I.D. | | 45.000 – 45.015 mm (1.7717 – 1.7722 in) | 45.100 mm (1.7756 in) |
| Piston | Skirt O.D. | | 44.97 – 44.99 mm (1.770 – 1.771 in) | 44.90 mm (1.768 in) |
| | Piston-to-cylinder clearance | | 0.010 – 0.045 mm (0.0004 – 0.00187 in) | 0.120 mm (0.0047 in) |
| | Pin bore I.D. | | 10.002 – 10.008 mm (0.3938 – 0.3940 in) | 10.050 mm (0.3957 in) |
| Piston pin | O.D. | | 9.994 – 10.000 mm (0.3935 – 0.3937 in) | 9.950 mm (0.3917 in) |
| | Pin-to-piston clearance | | 0.002 – 0.014 mm (0.0001 – 0.0006 in) | 0.100 mm (0.0039 in) |
| Piston ring | Ring width | Top/second | 0.97 – 0.99 mm (0.038 – 0.039 in) | 0.920 mm (0.0362 in) |
| | Ring side clearance | Top/second | 0.015 – 0.050 mm (0.0006 – 0.0020 in) | 0.120 mm (0.0047 in) |
| | Ring end gap | Top | 0.100 – 0.250 mm (0.0039 – 0.0098 in) | 0.600 mm (0.0236 in) |
| | | Second | 0.250 – 0.400 mm (0.0098 – 0.0157 in) | 0.600 mm (0.0236 in) |
| Connecting rod | Small end I.D. | | 10.006 – 10.017 mm (0.3939 – 0.3944 in) | 10.050 mm (0.3957 in) |
| | Big end I.D. | | 15.000 – 15.011 mm (0.5906 – 0.5910 in) | 15.040 mm (0.5921 in) |
| | Big end oil clearance | | 0.016 – 0.038 mm (0.0006 – 0.0015 in) | 0.100 mm (0.0039 in) |
| | Big end side clearance | | 0.1 – 0.6 mm (0.004 – 0.024 in) | 0.8 mm (0.031 in) |
| Crankshaft | Crank pin O.D. | | 14.973 – 14.984 mm (0.5895 – 0.5899 in) | 14.940 mm (0.5882 in) |
| Valves | Valve clearance | IN | 0.08 ± 0.02 mm (0.0031 ± 0.0008 in) | — |
| | | EX | 0.11 ± 0.02 mm (0.0043 ± 0.0008 in) | — |
| | Stem O.D. | IN | 3.970 – 3.985 mm (0.1563 – 0.1569 in) | 3.900 mm (0.1535 in) |
| | | EX | 3.935 – 3.950 mm (0.1549 – 0.1555 in) | 3.880 mm (0.1528 in) |
| | Guide I.D. | IN/EX | 4.000 – 4.018 mm (0.1575 – 0.1582 in) | 4.060 mm (0.1598 in) |
| | Stem-to-guide clearance | IN | 0.015 – 0.048 mm (0.0006 – 0.0019 in) | 0.098 mm (0.0039 in) |
| EX | | 0.050 – 0.083 mm (0.0020 – 0.0033 in) | 0.120 mm (0.0047 in) | |
| Valve spring | Free length | IN/EX | 23.7 mm (0.93 in) | 22.8 mm (0.90 in) |
| Camshaft | Cam height | | 27.972 mm (1.1013 in) | 27.672 mm (1.0894 in) |
| | I.D. (Bearing) | | 5.020 – 5.050 mm (0.1976 – 0.1988 in) | 5.100 mm (0.2008 in) |
| Camshaft roller | O.D. | | 4.990 – 5.000 mm (0.1965 – 0.1969 in) | 4.950 mm (0.1949 in) |
| Valve lifter | I.D. (Bearing) | | 5.005 – 5.025 mm (0.1970 – 0.1978 in) | 5.050 mm (0.1988 in) |
| Valve lifter roller | O.D. | | 4.990 – 5.000 mm (0.1965 – 0.1969 in) | 4.950 mm (0.1949 in) |
| Crankcase cover | Camshaft | Bearing I.D. | 5.005 – 5.023 mm (0.1970 – 0.1978 in) | 5.050 mm (0.1988 in) |
| | Valve lifter roller | Bearing I.D. | 5.005 – 5.023 mm (0.1970 – 0.1978 in) | 5.050 mm (0.1988 in) |
| Cylinder block | Camshaft roller | Bearing I.D. | 5.005 – 5.023 mm (0.1970 – 0.1978 in) | 5.050 mm (0.1988 in) |
| | Valve lifter roller | Bearing I.D. | 5.005 – 5.023 mm (0.1970 – 0.1978 in) | 5.050 mm (0.1988 in) |
| | Rocker arm roller | Bearing I.D. | 4.000 – 4.018 mm (0.1575 – 0.1582 in) | 4.050 mm (0.1594 in) |
| Rocker arm | I.D. (Bearing) | | 4.005 – 4.025 mm (0.1577 – 0.1585 in) | 4.050 mm (0.1594 in) |
| Rocker arm roller | O.D. | | 3.990 – 4.000 mm (0.1571 – 0.1575 in) | 3.950 mm (0.1555 in) |
| Clutch | Lining thickness | | 2.0 mm (0.08 in) | 1.0 mm (0.04 in) |
| Clutch outer | I.D. | | 78.00 – 78.25 mm (3.071 – 3.081 in) | 78.5 mm (30.09 in) |

HONDA

BF2D

| Part | Item | Standard | Service limit |
|---------------|---------------------|---|----------------------|
| Spark plug | Gap | 0.6 – 0.7 mm (0.024 – 0.028 in) | — |
| Ignition coil | Resistance | Primary side | 0.98 – 1.20 Ω |
| | | Secondary side | 11 – 15 k Ω |
| | Air gap | 0.3 – 0.5 mm (0.012 – 0.020 in) | — |
| Carburetor | Main jet | #65 | — |
| | Float height | 12 mm (0.47 in) | — |
| | Pilot screw opening | Except SCG, LCG, SCHG, LCHG type: 2 turns out SCG, LCG, SCHG, LCHG type: 2-1/4 turns out | — |

• LOWER UNIT

| Part | Item | Standard | Service limit |
|------------------------|---------------------------------------|---|-----------------------|
| Propeller shaft | Holder O.D. | 10.973 – 10.984 mm (0.4320 – 0.4324 in) | 10.930 mm (0.4303 in) |
| Propeller shaft holder | Shaft bore I.D. | 11.000 – 11.018 mm (0.4331 – 0.4338 in) | 11.060 mm (0.4354 in) |
| | Holder-to-shaft clearance | 0.016 – 0.045 mm (0.0006 – 0.0018 in) | — |
| Vertical shaft | Gear case O.D. | 10.97 – 10.99 mm (0.432 – 0.433 in) | 10.93 mm (0.430 in) |
| | Vertical bushing O.D. | 10.97 – 10.99 mm (0.432 – 0.433 in) | 10.93 mm (0.430 in) |
| Gear case | Vertical shaft bore I.D. | 11.000 – 11.018 mm (0.4331 – 0.4338 in) | 11.060 mm (0.4354 in) |
| | Gear case-to-vertical shaft clearance | 0.010 – 0.048 mm (0.0004 – 0.0019 in) | — |
| Vertical shaft bushing | Vertical shaft bore I.D. | 11.15 – 11.20 mm (0.439 – 0.441 in) | 11.70 mm (0.461 in) |
| | Bushing-to-vertical shaft clearance | 0.16 – 0.23 mm (0.006 – 0.009 in) | — |

6. TORQUE VALUES

| Item | Thread dia. x pitch type | Tightening torque | | | Remark |
|--------------------------|--------------------------|-------------------|-------|--------|--------------------------------|
| | | N·m | kgf·m | lbf·ft | |
| Spark plug | M10 x 1.0 | 12 | 1.2 | 9 | |
| Crankcase side cover | M5 x 0.8 CT flange bolt | 7.5 | 0.75 | 5.4 | |
| Crankcase | M5 x 0.8 CT flange bolt | 7.5 | 0.75 | 5.4 | |
| Connecting rod cap | M5 x 0.8 flange bolt | 6.0 | 0.6 | 4.3 | |
| Cylinder head cover bolt | M5 x 0.8 CT flange bolt | 6.0 | 0.6 | 4.3 | |
| Oil drain bolt | M8 x 1.25 screw | 6.5 | 0.65 | 4.7 | |
| Flywheel | M10 x 1.25 flange nut | 27.5 | 2.75 | 20 | Apply oil to threads and seat. |
| Fuel tank | M6 x 1.0 cap nut | 8 | 0.8 | 5.8 | |
| Clutch stay | M8 x 1.25 flange bolt | 22.5 | 2.25 | 16 | |
| Clutch shoe bolt | M8 x 1.25 special bolt | 15.5 | 1.55 | 11 | |
| Ignition coil | M5 x 0.8 CT flange bolt | 6.0 | 0.6 | 4.3 | |
| Stud bolt | M5 x 0.8 CT flange bolt | 6.0 | 0.6 | 4.3 | |
| Carburetor joint plate | M5 x 0.8 screw | 4.5 | 0.45 | 3.3 | |
| Carburetor drain bolt | M4 x 0.7 screw | 1.5 | 0.15 | 1.1 | |
| Emergency stop switch | M16 x 1.0 hex. nut | 3.0 | 0.3 | 2.2 | |
| Exhaust pipe | M5 x 0.8 flange bolt | 6.0 | 0.6 | 4.3 | |
| Gear case | M6 x 1.0 hex. bolt | 10 | 1.0 | 7 | |
| Anode metal | M6 x 1.0 hex. bolt | 10 | 1.0 | 7 | |
| Propeller shaft holder | M6 x 1.0 hex. bolt | 10 | 1.0 | 7 | |
| Cavitation plate | M6 x 1.0 hex. bolt | 10 | 1.0 | 7 | |
| Oil check bolt | M8 x 1.25 special bolt | 3.5 | 0.35 | 2.5 | |
| Extension case | M6 x 1.0 flange bolt | 12 | 1.2 | 9 | |
| Extension separator | M6 x 1.0 hex. bolt | 10 | 1.0 | 7 | |
| Water pipe | M5 x 0.8 hex. bolt | 5.3 | 0.53 | 3.8 | |
| Swivel case cap | M8 x 1.25 hex. bolt | 24 | 2.4 | 17 | |
| Stern bracket | M8 x 1.25 hex. bolt/nut | 24 | 2.4 | 17 | |
| Under case | M6 x 1.0 flange bolt | 13 | 1.3 | 9 | |
| Grease nipple | M6 x 1.0 | 3.0 | 0.3 | 2.2 | |
| Steering handle | M8 x 1.25 flange bolt | 24 | 2.4 | 17 | |
| Throttle housing | M5 x 0.8 screw | 4.3 | 0.43 | 3.1 | |
| Throttle lever | M6 x 1.0 hex. nut | 10 | 1.0 | 7 | |
| Throttle arm | M6 x 1.0 hex. nut | 10 | 1.0 | 7 | |
| Cable holder | M6 x 1.0 flange bolt | 8 | 0.8 | 6 | |
| Throttle cable | M10 x 1.25 hex. nut | 4 | 0.4 | 2.9 | |

- Use standard torque values (P. 2-6) for the fasteners that are not listed in this table.
- CT flange bolt indicates a self-tapping bolt.

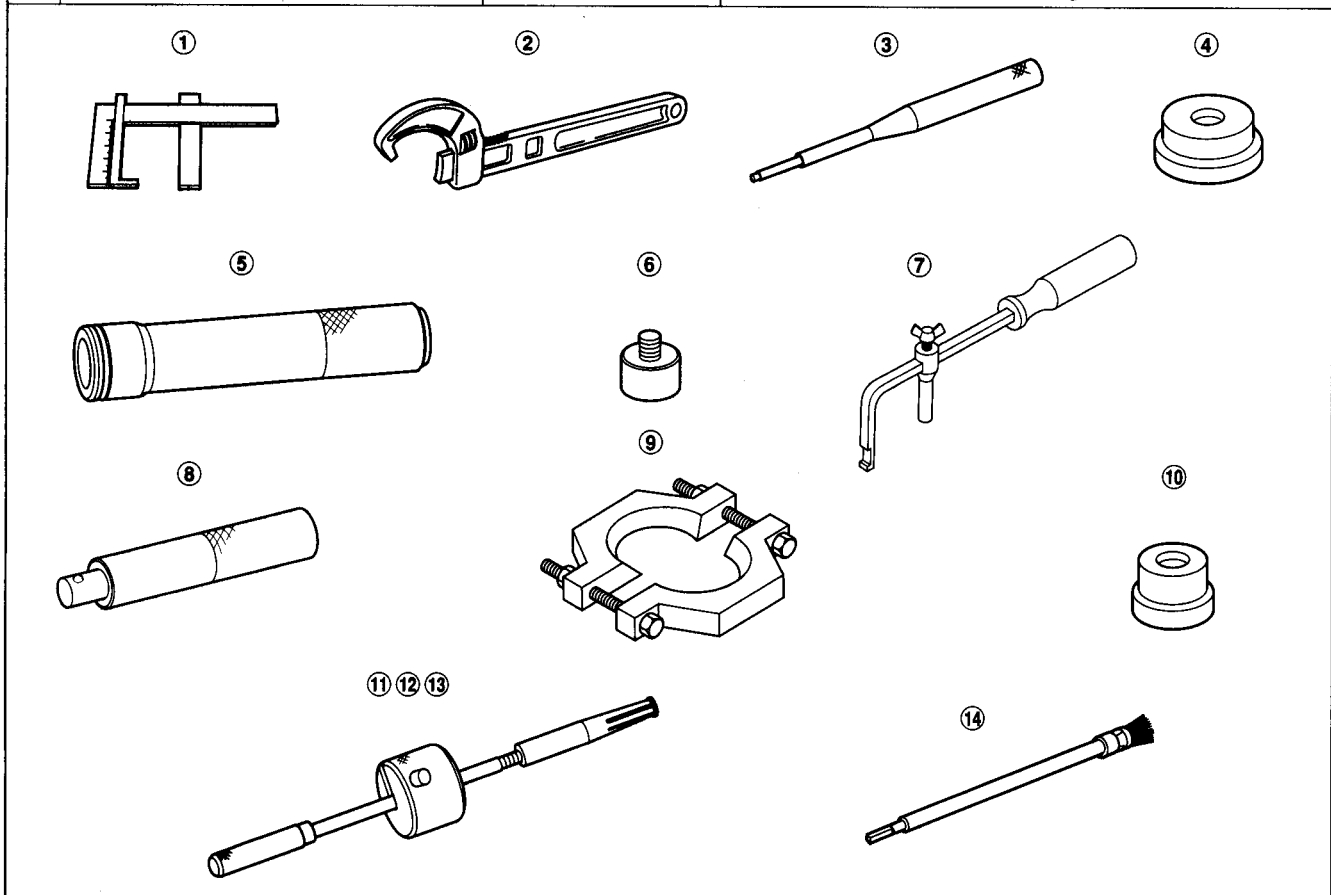
STANDARD TORQUE VALUES

| Item | Thread dia. | Tightening torque | | |
|-------------------------|-------------|-------------------|-------|--------|
| | | N-m | kgf-m | lbf-ft |
| Flange bolt, flange nut | 4 mm | 3.5 | 0.35 | 2.5 |
| | 5 mm | 5.5 | 0.55 | 4.0 |
| | 6 mm | 10 | 1.0 | 7 |
| | 8 mm | 27 | 2.7 | 20 |
| Screw | 3 mm | 1.0 | 0.10 | 0.7 |
| | 4 mm | 2.1 | 0.21 | 1.4 |
| | 5 mm | 4.3 | 0.43 | 3.1 |
| CT flange bolt | 5 mm | 5.5 | 0.55 | 4.0 |

- CT flange bolt indicates a self-tapping bolt.

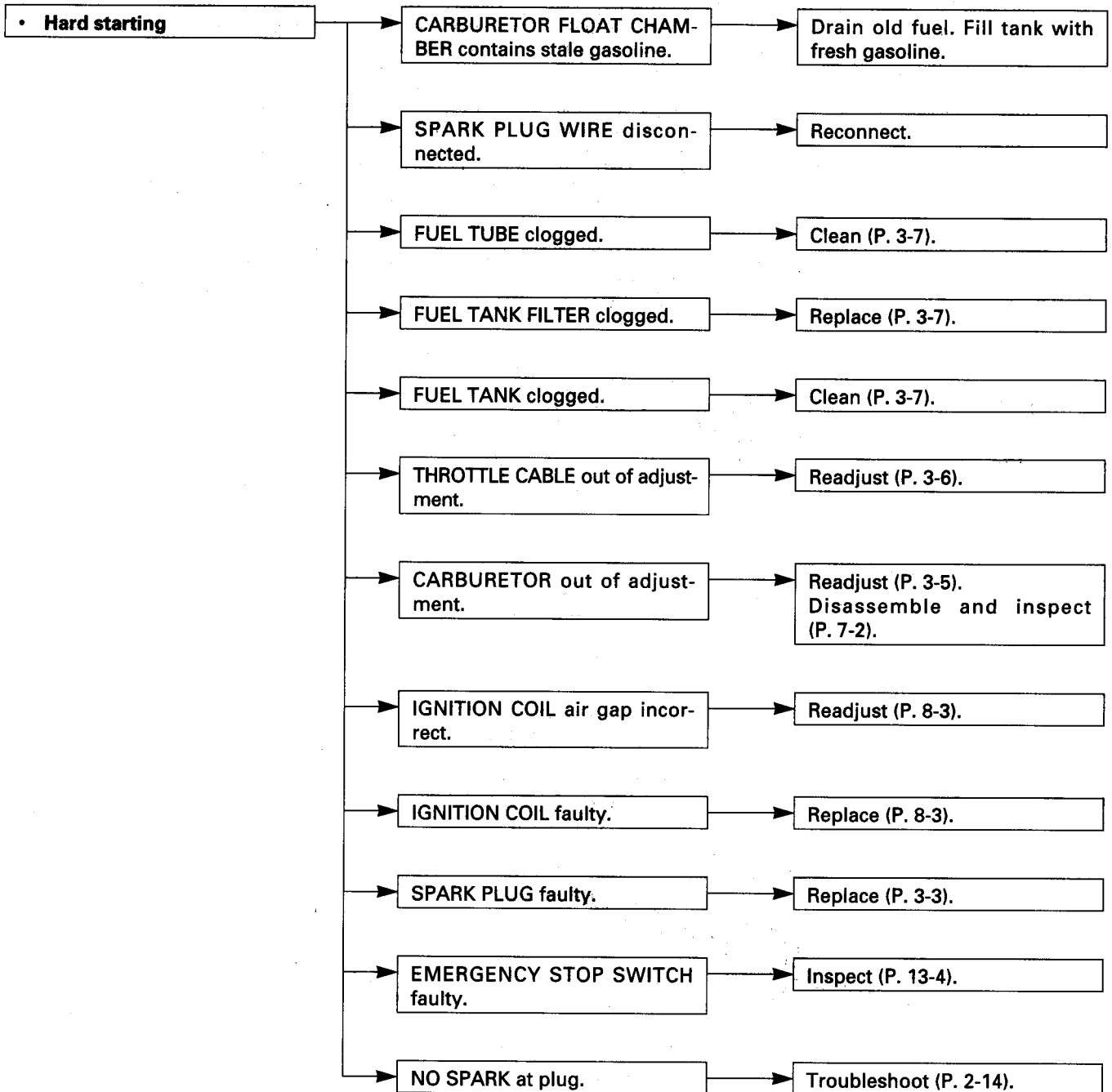
7. SPECIAL TOOLS

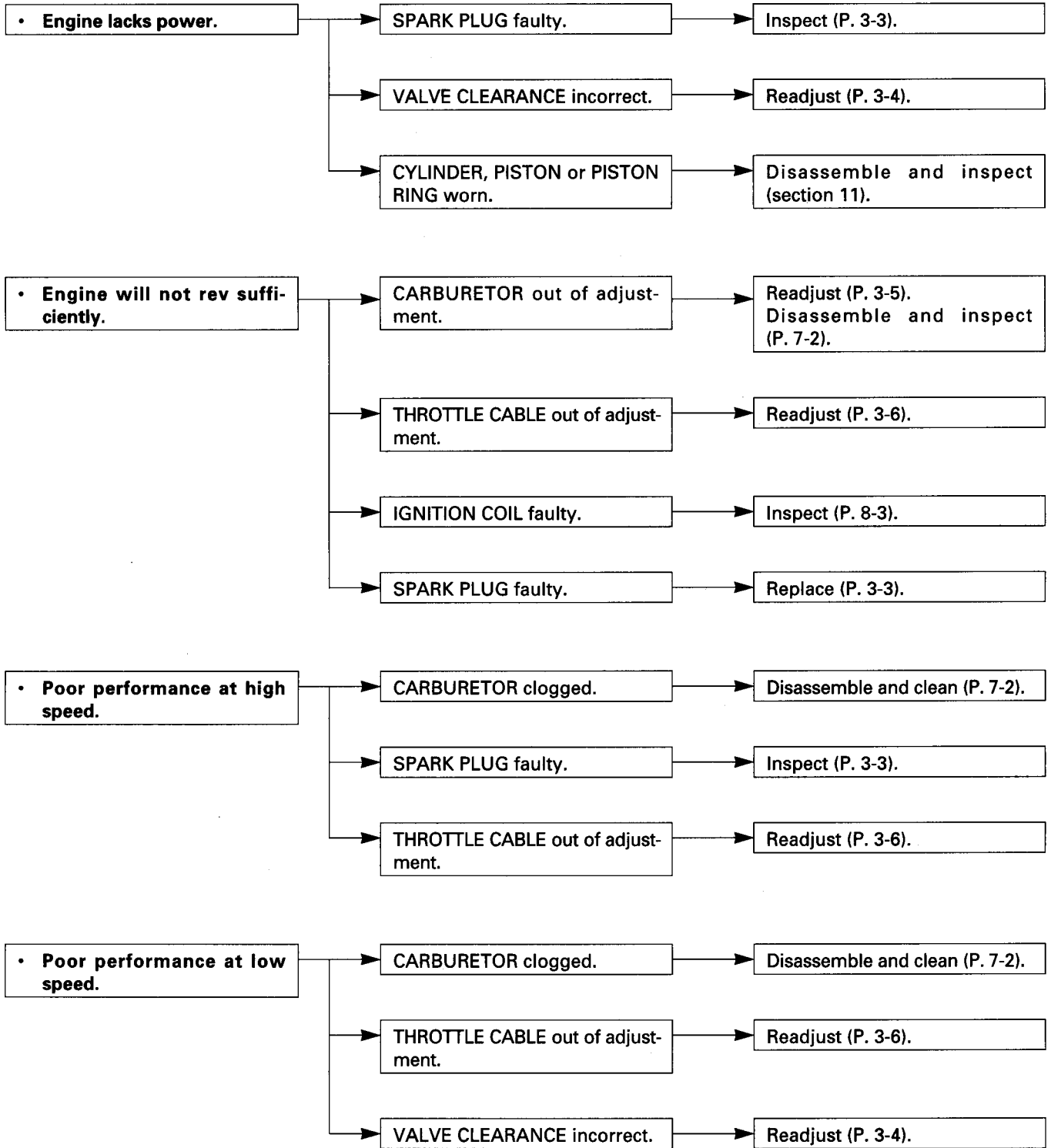
| No. | Tool name | Tool number | Application |
|-----|-----------------------------|-----------------|---|
| ① | Float level gauge | 07401 - 0010000 | Carburetor float level inspection |
| ② | Pin spanner | 07702 - 0020001 | Clutch stay bolt removal/installation |
| ③ | Pin driver, 2.5 mm | 07744 - 0010100 | 2.5 mm spring pin removal/installation |
| ④ | Outer driver, 24 x 26 mm | 07746 - 0010700 | Crankshaft oil seal installation |
| ⑤ | Inner driver handle | 07746 - 0020100 | Gear case bearing installation |
| ⑥ | Pilot, 17 mm | 07746 - 0040400 | Clutch outer bearing installation |
| ⑥ | Pilot, 10 mm | 07746 - 0040100 | Crankshaft oil seal installation |
| ⑦ | Oil seal remover | 07748 - 0010001 | Gear case bearing installation |
| ⑧ | Driver handle | 07749 - 0010000 | Water seal removal |
| ⑨ | Bearing separator | 07631 - 0010000 | Used together with the tools ⑥ and ④ or ⑩ |
| ⑩ | Oil seal driver attachment | 07947 - ZV00100 | Clutch outer bearing removal |
| ⑪ | Bearing remover shaft | 07936 - GE00100 | Water seal installation |
| ⑫ | Bearing remover head, 10 mm | 07936 - GE00200 | |
| ⑬ | Sliding weight | 07741 - 0010201 | } Gear case bearing removal |
| ⑭ | Cleaning brush | 07998 - VA20100 | |



8. TROUBLESHOOTING

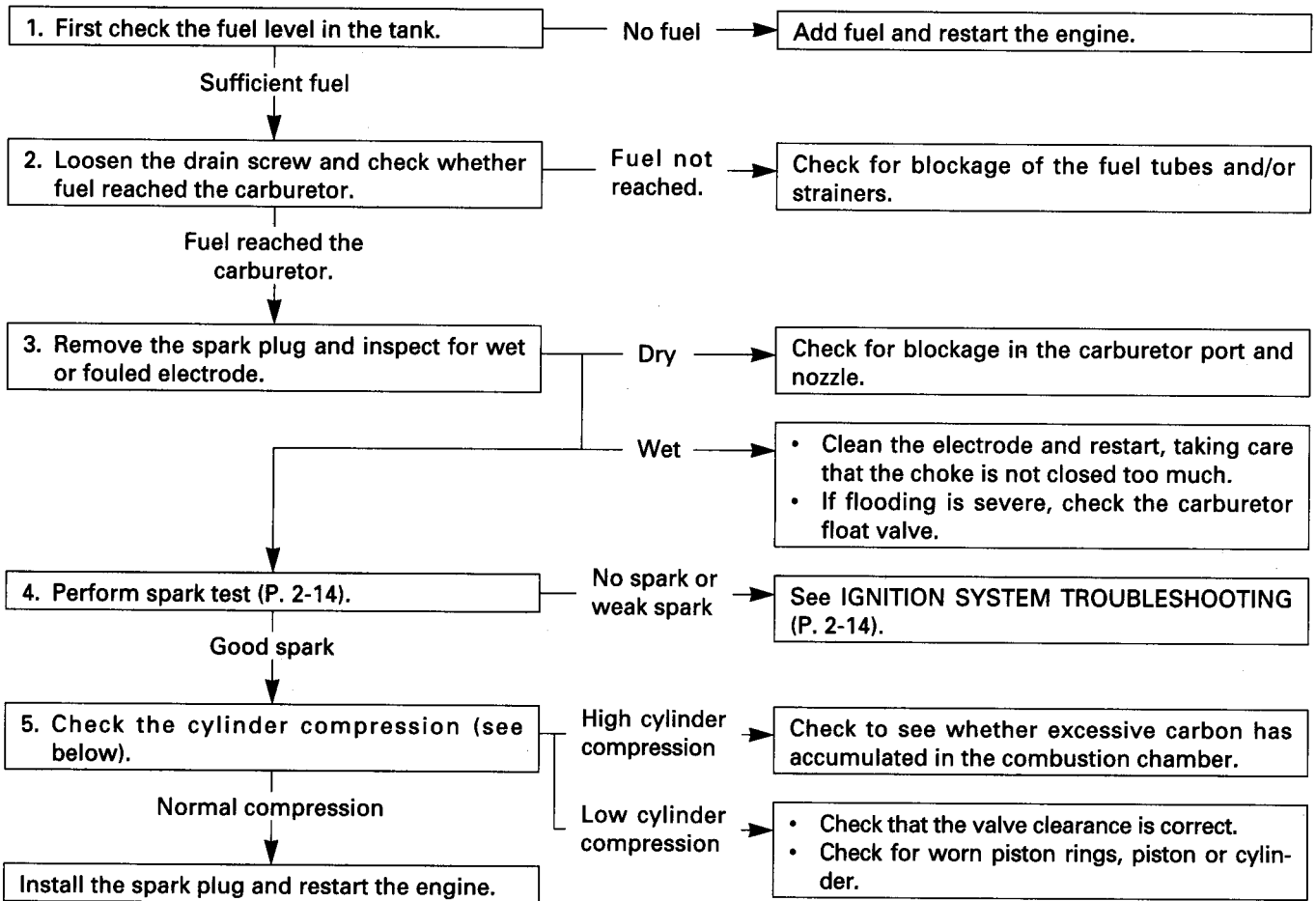
a. GENERAL SYMPTOMS AND POSSIBLE CAUSES





b. ENGINE

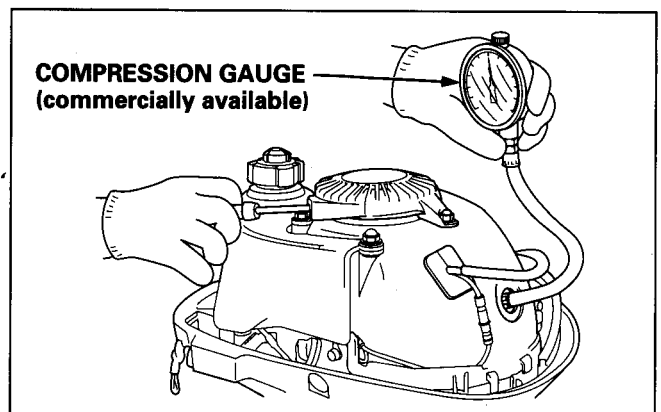
• Hard Starting



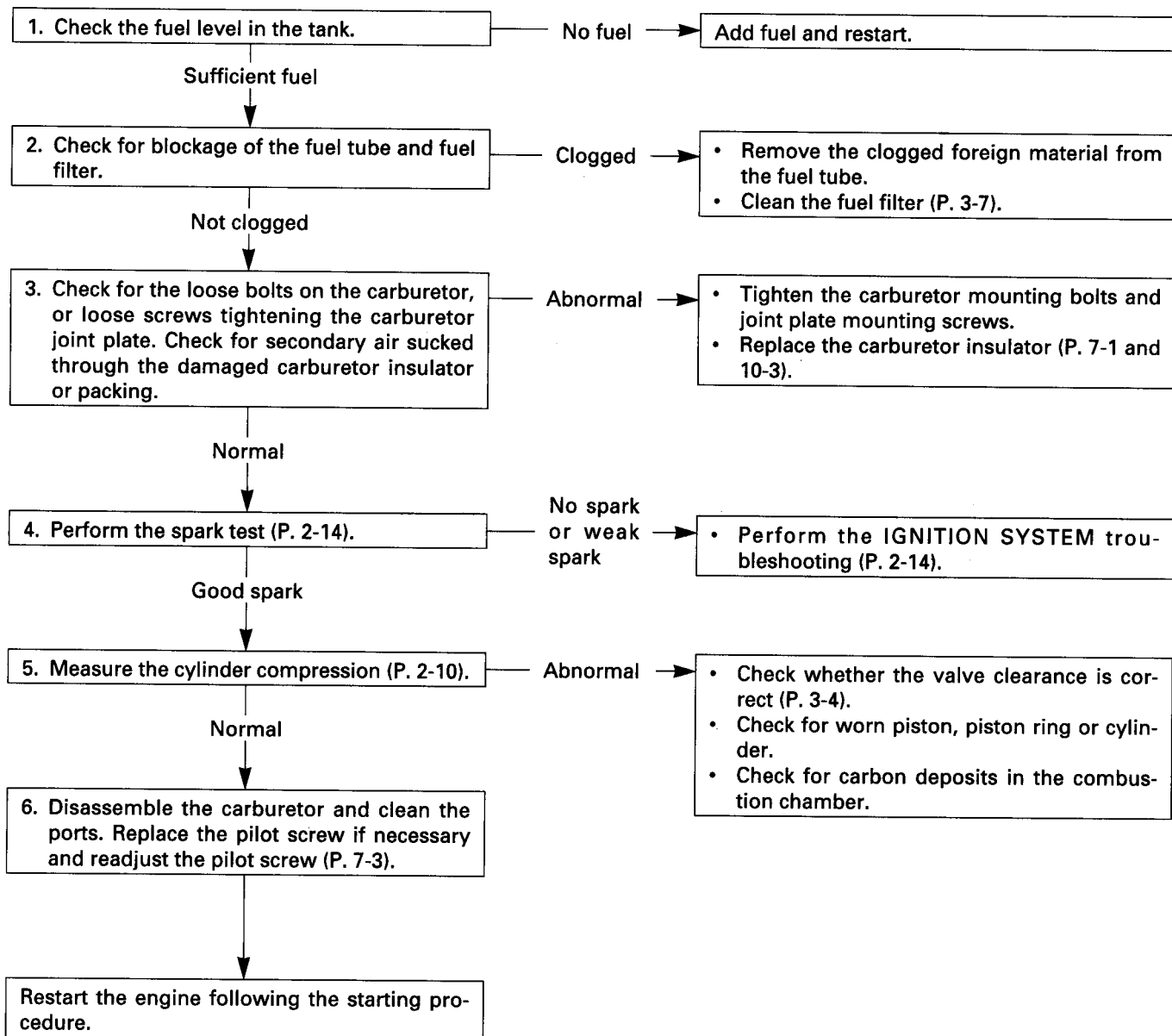
• CYLINDER COMPRESSION CHECK

- 1) Remove the engine cover (P. 4-1).
- 2) Remove the spark plug and install a compression gauge in the spark plug hole.
- 3) Pull the recoil starter several times with force and measure the cylinder compression.

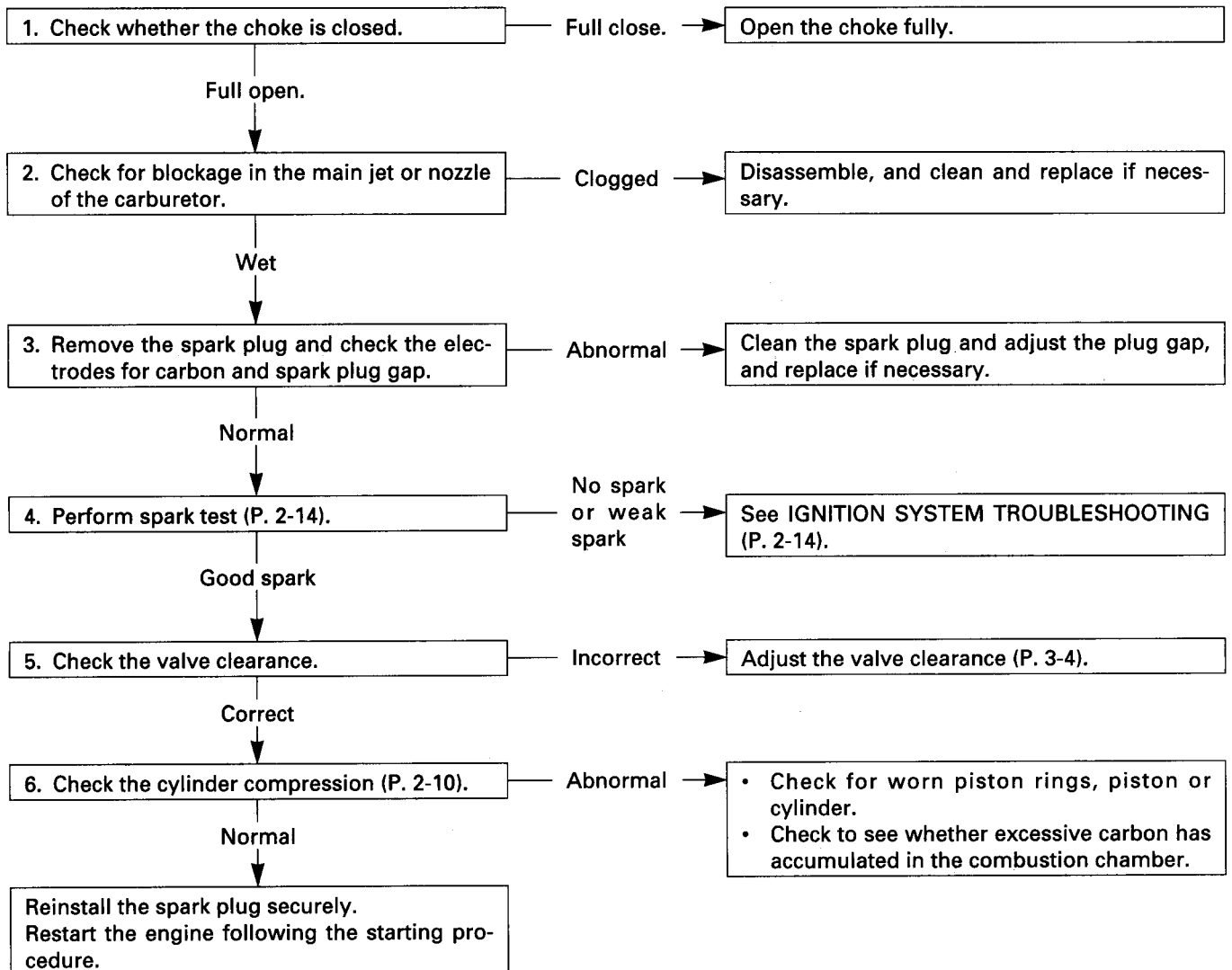
| | |
|----------------------|---|
| Cylinder compression | 0.88 MPa (9.0 kgf/cm ² , 128 psi) at 1,000 rpm |
|----------------------|---|



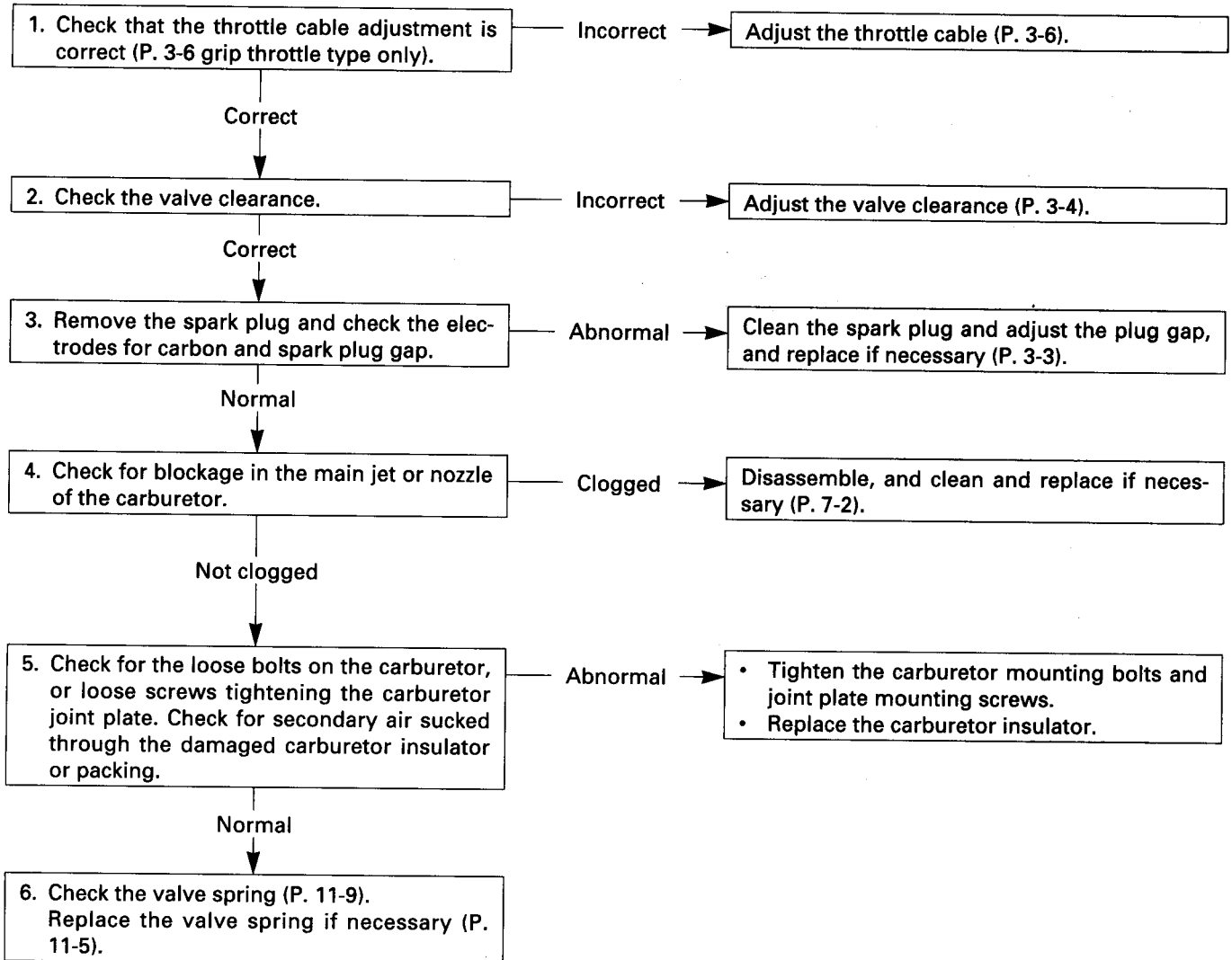
• Engine Starts But Then Stalls



• Engine Lacks Power



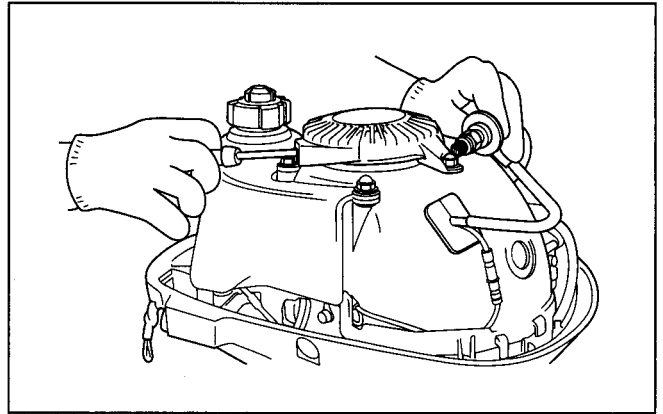
• Engine Speed Does Not Increase



• SPARK TEST

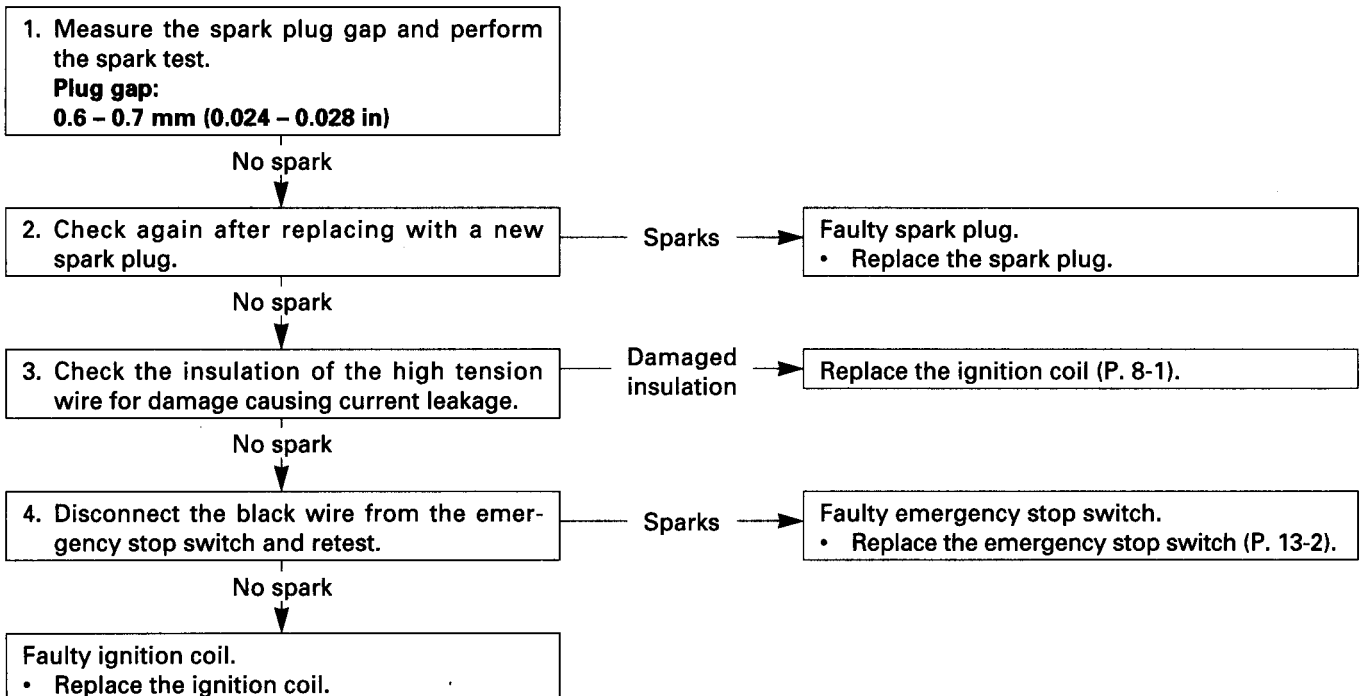
⚠ WARNING

- Do not pull the recoil starter rope while touching the high tension wire. High voltage generates, which is very dangerous. Be sure to ground the spark plug and hold the plug cap to perform the spark test.
- Gasoline is extremely flammable and explosive. If ignited, gasoline can burn you severely. Be sure there is no spilled fuel near the engine.
- Unburnt gas can ignite if it is left in the cylinder. Be sure to drain the carburetor thoroughly before spark test, and release the unburnt gas from the cylinder by pulling the recoil starter several times.

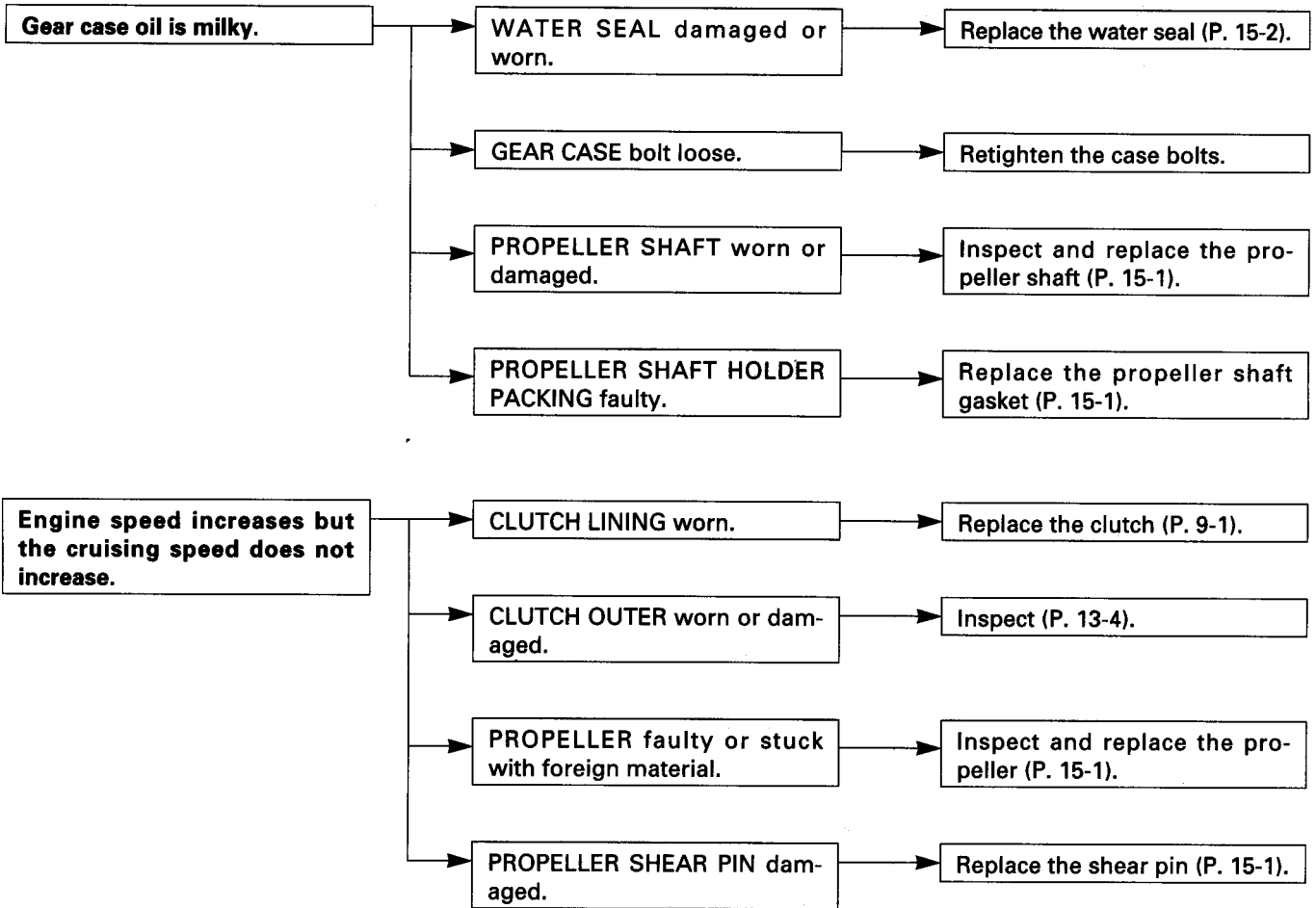


- 1) Remove the engine cover (P. 4-1) and remove the spark plug cap. Clean any dirt from around the spark plug base, then remove the spark plug.
- 2) Loosen the carburetor drain screw to drain the carburetor thoroughly. Pull the recoil starter several times to release the unburnt gas from the cylinder.
- 3) Install the spark plug in the plug cap.
- 4) Make sure that the emergency stop switch clip is engaged with the emergency stop switch.
- 5) Ground the side electrode against the recoil starter mounting cap nut as shown, pull the recoil starter and check to see if sparks jump across the electrodes.

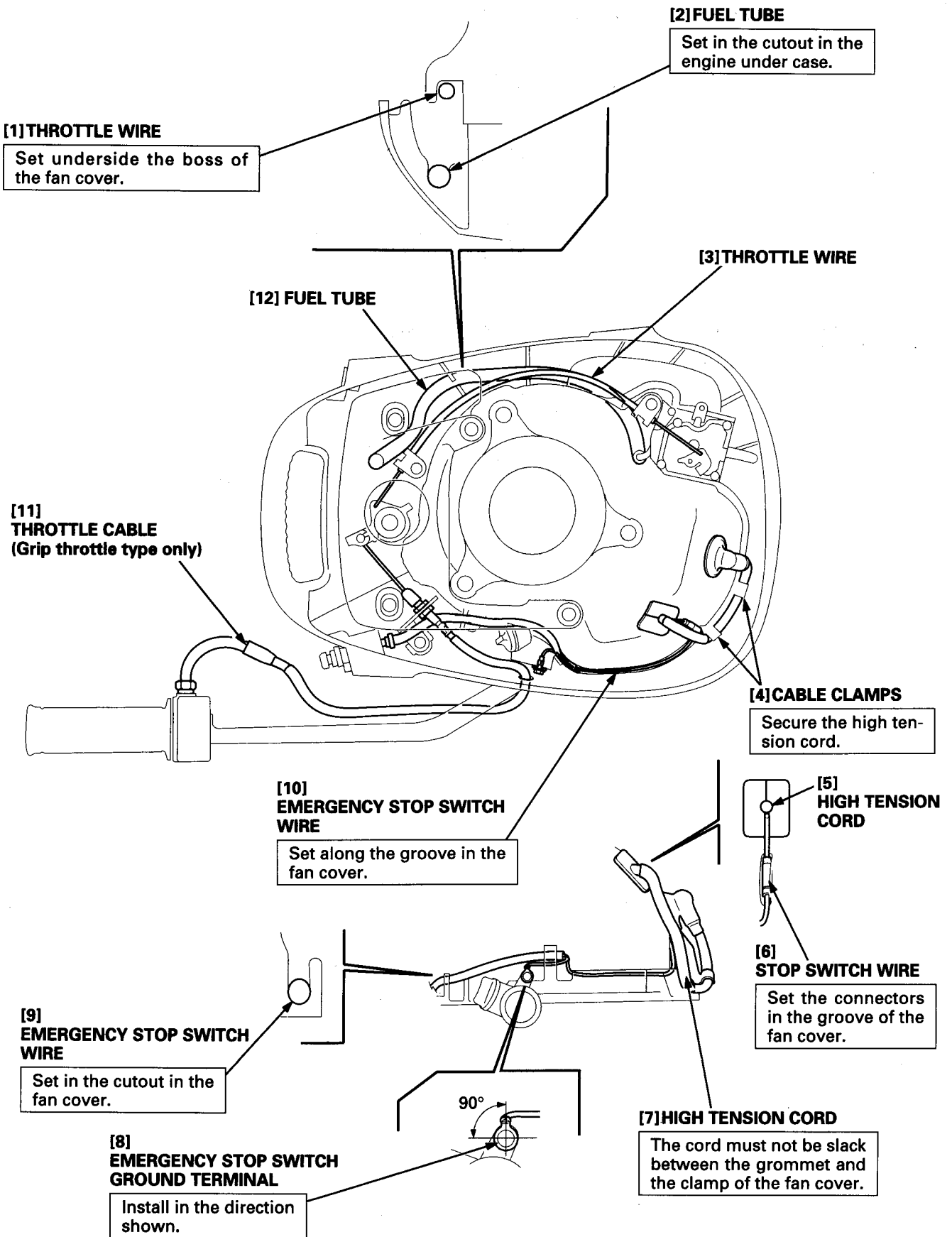
c. IGNITION SYSTEM



d. LOWER UNIT



9. CABLE & HARNESS ROUTING



3. MAINTENANCE

HONDA
BF2D

1. MAINTENANCE SCHEDULE
2. ENGINE OIL
3. GEAR CASE OIL
4. SPARK PLUG
5. VALVE CLEARANCE

6. CARBURETOR
7. THROTTLE CABLE (SH, SCH, LH, LCH type)
8. FUEL FILTER/FUEL TANK/FUEL LINE
9. LUBRICATION POINTS

1. MAINTENANCE SCHEDULE

| ITEM | REGULAR SERVICE PERIOD (2) Perform at every indicated month or operating hour intervals, whichever comes first. | Each use | First month or 10 Hrs. | Every 6 months or 50 Hrs. | Every year or 150 Hrs. | Ref. page |
|--|--|----------|------------------------|---------------------------|------------------------|-------------|
| | | | | | | |
| Engine oil | Check level | ○ | | | | 3-2 |
| | Change | | ○ | ○ | | |
| Gear case oil | Check level | | | ○ | | 3-3 |
| | Change | | ○ | | ○ | |
| Starter rope | Check | | | ○ | | 5-2 |
| Idle speed | Check-Adjust | | | ○ | | 3-6 |
| Valve clearance | Check-Adjust | | | | ○ | 3-4 |
| Clutch shoe and drum (SC, LC, SCH, LCH type) | Check | | | | ○ | 9-2 13-4 |
| Spark plug | Clean-Adjust (Replace if necessary) | | ○ | ○ | | 3-3 |
| Propeller and cotter pin | Check | ○ | | | | 15-1 |
| Anode metal | Check | ○ | | | | 14-2 |
| Lubrication | Grease | | ○ (1) | ○ (1) | | 3-8 |
| Fuel tank and filter | Clean (Replace if necessary) | | | ○ | | 3-7 |
| Fuel line | Check (Replace if necessary) | | Every 2 years | | | 3-7 |
| All bolts and nuts | Check tightness | | ○ | | ○ | — |
| Swivel case liner and bushing | Replace | | Every 3 years | | | 14-1, 3 |
| Water seal | Replace | | Every 3 years | | | 15-1 |

- NOTE:
- (1) Lubricate more frequently when used in salt water.
 - (2) For professional commercial use, log hours of operation to determine proper maintenance interval.

2. ENGINE OIL

Oil Level Check:

- 1) Hold the outboard motor vertical.
- 2) Check the oil level through the inspection window.
- 3) If the oil level is low, remove the oil filler cap and add the engine oil to the upper level.
Change the engine oil if it is stale or contaminated with the foreign material.

| | |
|-----------------|---|
| Recommended oil | SAE 10W-30 API Service Classification SF or SG |
|-----------------|---|

Engine oil is a major factor affecting performance and service life. Use 4-stroke automotive detergent oil.

Use Honda 4-stroke, or an equivalent high detergent, premium quality motor oil certified to meet or exceed U.S. automobile manufacturer's requirements for service classification SG or SF. Motor oils certified SG or SF will show this designation on the container.

Oil Change:

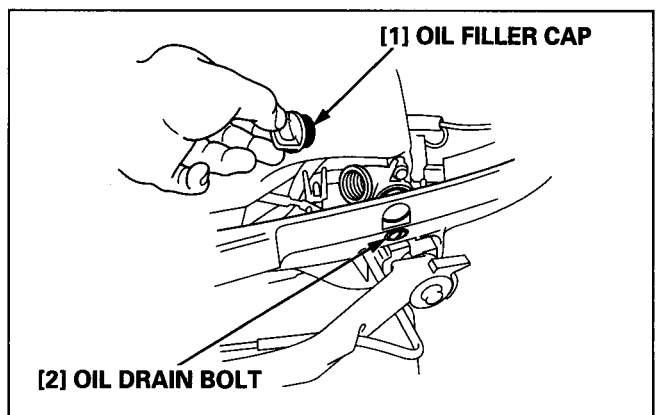
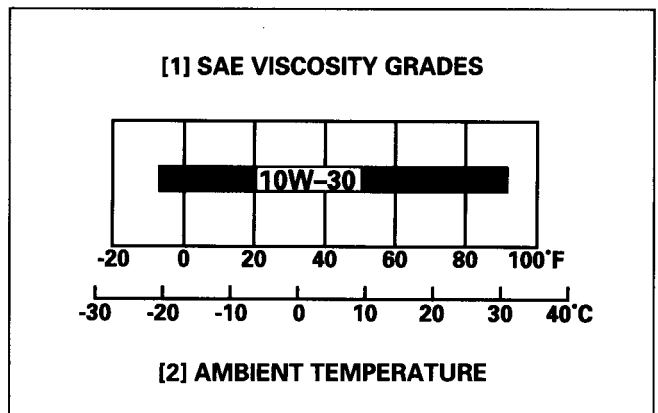
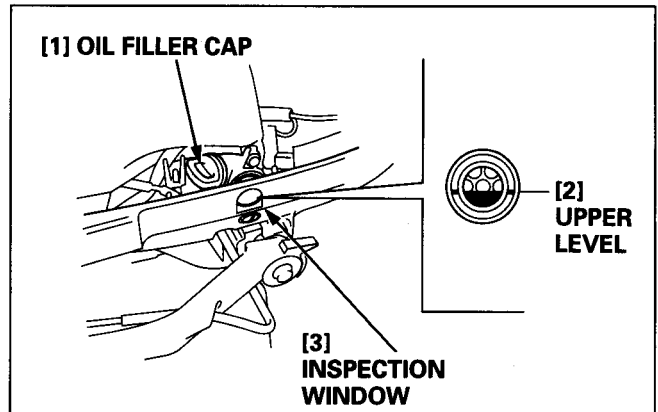
Drain the used oil while the engine is warm. Warm oil drains quickly and completely.

- 1) Be sure that the fuel valve and fuel tank cap are tightened securely.
- 2) Remove the oil filler cap and oil drain bolt. Tilt the motor toward the steering handle side and drain the engine oil into a suitable container.

Please dispose of the used motor oil in a manner that is compatible with the environment. We suggest you take used oil in a sealed container to your local recycling center or service station for reclamation. Do not throw it in the trash, pour it on the ground, or down a drain.

CAUTION

- **Used engine oil contains substances that have been identified as carcinogenic.**
- **If repeatedly left in contact with the skin for prolonged periods, it may cause skin cancer.**
- **Wash your hands thoroughly with soap and water as soon as possible after contact with used engine oil.**



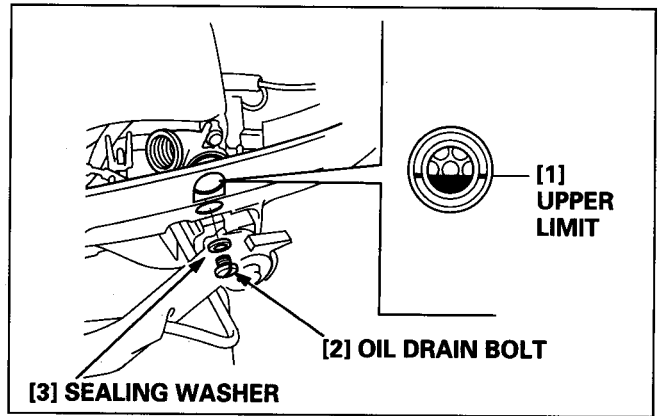
- Return the motor vertical. Install a new sealing washer and oil drain bolt, and tighten the bolt to the specified torque.

TORQUE: 6.5 N·m (0.65 kgf·m, 4.7 lbf·ft)

- Refill with the recommended fresh engine oil to the upper level.

| | |
|--------------|----------------------------------|
| Oil capacity | 0.25 ℓ (0.26 US qt, 0.22 Imp qt) |
|--------------|----------------------------------|

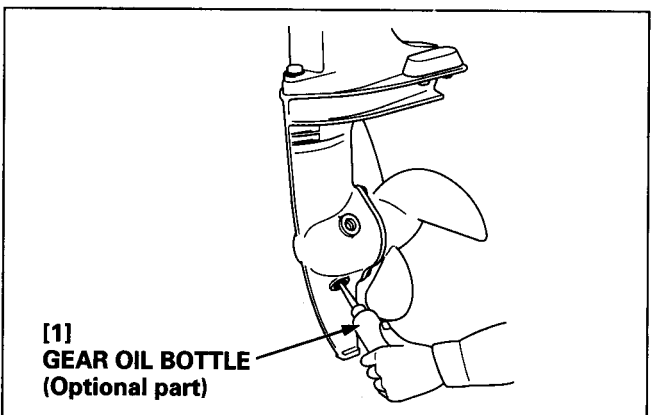
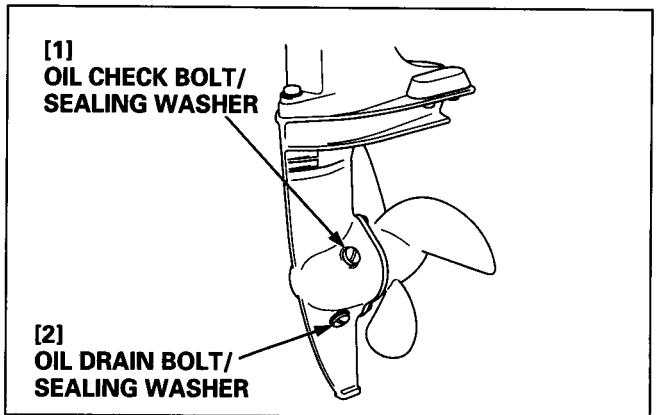
- Check the oil level again and add to the upper level of the inspection window, if necessary.



3. GEAR CASE OIL

Oil Change:

- Place the outboard motor vertical.
- Remove the oil level check bolt, oil drain bolt and washer, and drain the gear case oil into a suitable container. Check for water in the drained gear case oil. If there is water in the gear case oil, check the gasket and water seal for damage and check torque at each tightening point of the gear case.
- Using the gear oil bottle (optional part) or commercially available oil gun, pour fresh gear oil through the oil drain bolt hole.



| | |
|-----------------|---|
| Recommended oil | SAE 90 outboard motor gear oil API standard GL-4 or GL-5 |
| Oil capacity | 0.05 ℓ (0.05 US qt, 0.04 Imp qt) |

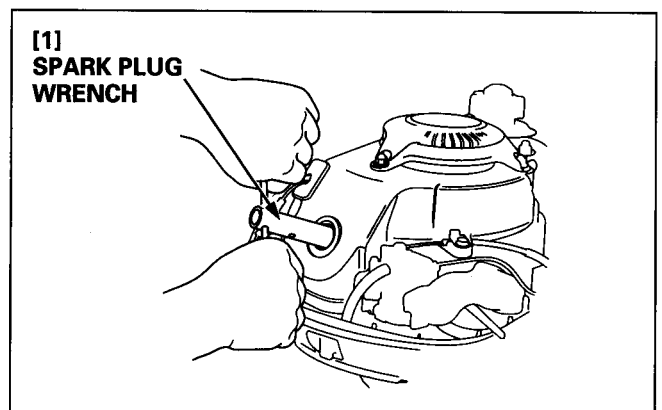
- When the oil flows out of the oil level check hole, install a new sealing washer and oil check bolt quickly.
- Then install the oil drain bolt with a new sealing washer.
- Tighten the oil drain bolt and oil check bolt securely.

TORQUE: 3.5 N·m (0.35 kgf·m, 3.8 lbf·ft)

4. SPARK PLUG

Cleaning/Adjustment:

- Remove the engine cover (P. 4-1) and remove the spark plug cap.
- Remove the spark plug using a spark plug wrench.



- 3) Visually inspect the spark plug. Discard the plug if the insulator is cracked or chipped.
- 4) Remove carbon or other deposits with a stiff wire brush.
- 5) Measure the plug gap with a wire-type feeler gauge. If necessary, adjust the gap by bending the side electrode.

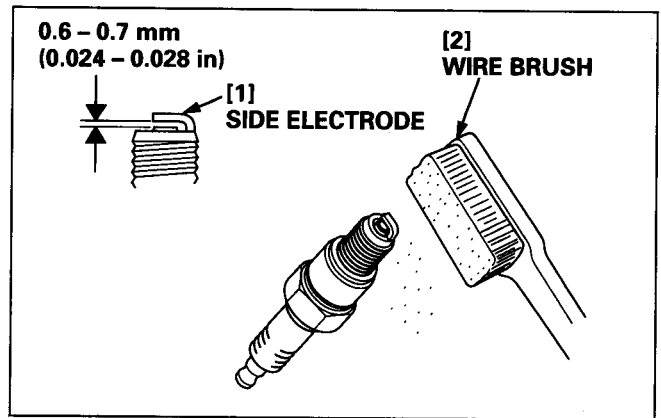
| | | |
|------------------------|---------------------------------|-----------|
| Spark plug gap | 0.6 – 0.7 mm (0.024 – 0.028 in) | |
| Recommended spark plug | NGK | CR5HSB |
| | DENSO | U16FSR-UB |

- 6) Make sure the sealing washer is in good condition; replace if necessary.
- 7) Install the plug fingertight to seat the washer, then tighten with a plug wrench to compress the sealing washer.
 - If reinstalling the used spark plug, tighten 1/8 – 1/4 turn after the spark plug seats.
 - If installing a new spark plug, tighten 1/2 turn after the spark plug seats.

CAUTION

A loose spark plug can become very hot and may damage the engine. Overtightening the spark plug can damage the threads in the cylinder head.

- 8) Reinstall the spark plug cap, and install the engine cover.



5. VALVE CLEARANCE

Valve clearance inspection and adjustment must be performed with the engine cold.

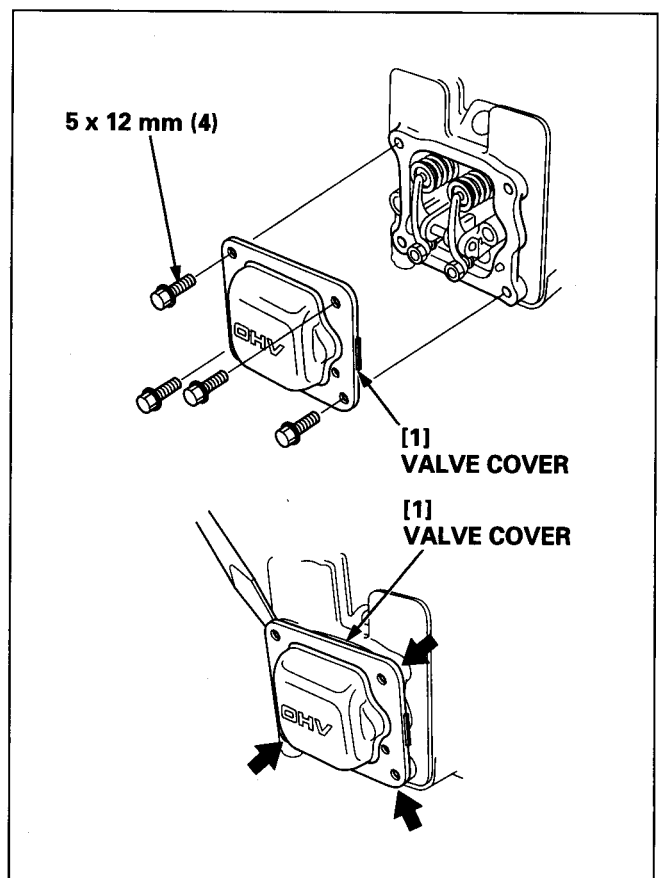
Inspection/Adjustment:

- 1) Remove the engine (P. 6-1).
- 2) Remove the four 5 x 12 mm flange bolts.
- 3) Loosen the valve cover by slightly prying up each corner, then remove the valve cover.

Catch up the spilled engine oil with a shop towel when removing the valve cover.

CAUTION

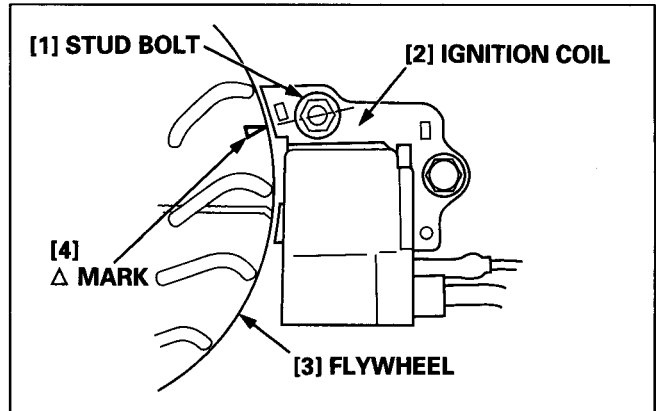
- Do not remove the valve cover with excessive force. It can deform the valve cover.
- Replace the valve cover if it is deformed.



- 4) Turn the flywheel clockwise and set the piston at top dead center of the compression stroke. (Align the Δ mark on the flywheel with the center of the ignition coil mounting stud bolt as shown.)

- If the exhaust side opens when the mark aligns with the end of the ignition coil installation part, turn the flywheel one turn again and bring the mark to the alignment position.

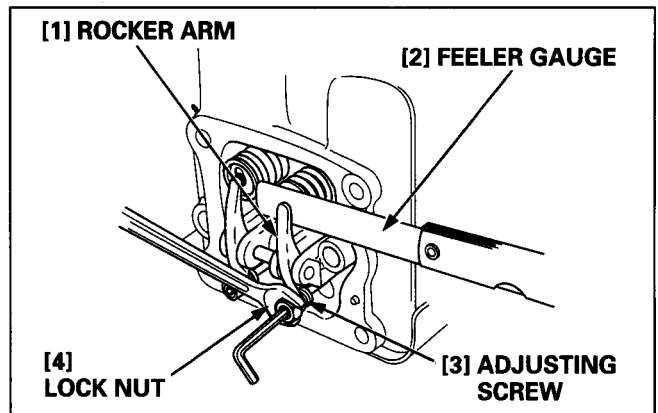
- 5) Insert a feeler gauge between the rocker arm and valve, and measure the valve clearance.



| | | |
|-----------------|----|----------------|
| Valve clearance | IN | 0.06 – 0.10 mm |
| | EX | 0.09 – 0.13 mm |

- 6) If adjustment is necessary, proceed as follows.
- Loosen the adjusting screw lock nut and adjust the valve clearance by turning the adjusting screw in or out.
 - To increase valve clearance, screw out.
 - To decrease valve clearance, screw in.
 - Holding the adjusting screw with the valve adjusting wrench, tighten the lock nut to the specified torque.

TORQUE: 5.5 N-m (0.55 kgf-m, 4.0 lbf-ft)



- After tightening the lock nut, check the valve clearance again.

- 7) Install the valve cover (P. 10-2).
- 8) Reinstall the removed parts in the reverse order of removal.

6. CARBURETOR

CAUTION

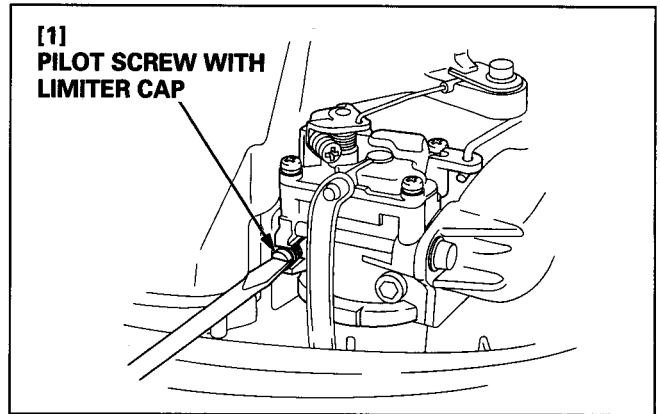
- Running the outboard motor for long time without sufficient water will damage the lower unit parts.
- Keep clear of moving parts.

Adjustment:

- Run the outboard motor in an outboard test tank with the water at least 100 mm (4 in) above the antiventilation plate. Allow the engine to warm up to normal operating temperature.
- Stop the engine and remove the engine cover. Attach an engine tachometer and restart the engine.

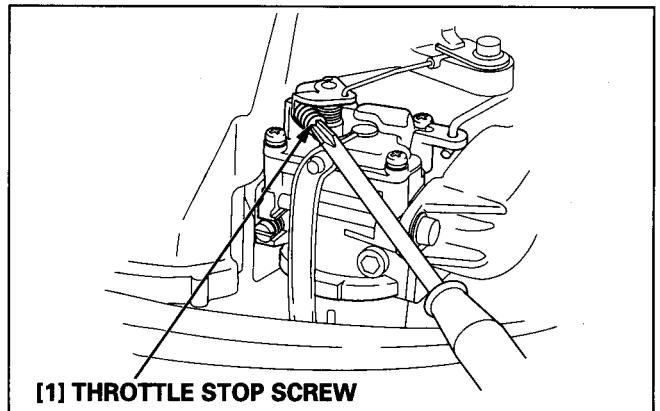
- 3) With the engine idling, turn the pilot screw in or out to the setting that produces the highest idle speed. The correct setting will usually be obtained at approximately the following number of turns out from the fully closed (lightly seated) position.

| | |
|------------------------------|---|
| Standard pilot screw opening | SCG, LCG, SCHG, LCHG type: 2-1/4 turns out Except SCG, LCG, SCHG, LCHG type: 2 turns out |
|------------------------------|---|



- 4) After the pilot screw is correctly adjusted, turn the throttle stop screw to obtain the standard idle speed.

| | |
|---------------------------------|-------------------------------------|
| Specified idle speed in neutral | 2,000 ± 100 min ⁻¹ (rpm) |
|---------------------------------|-------------------------------------|



7. THROTTLE CABLE (SH, SCH, LH, LCH type)

Adjustment:

- 1) Check the throttle grip play.

The play must be approximately one graduation from the throttle mark.

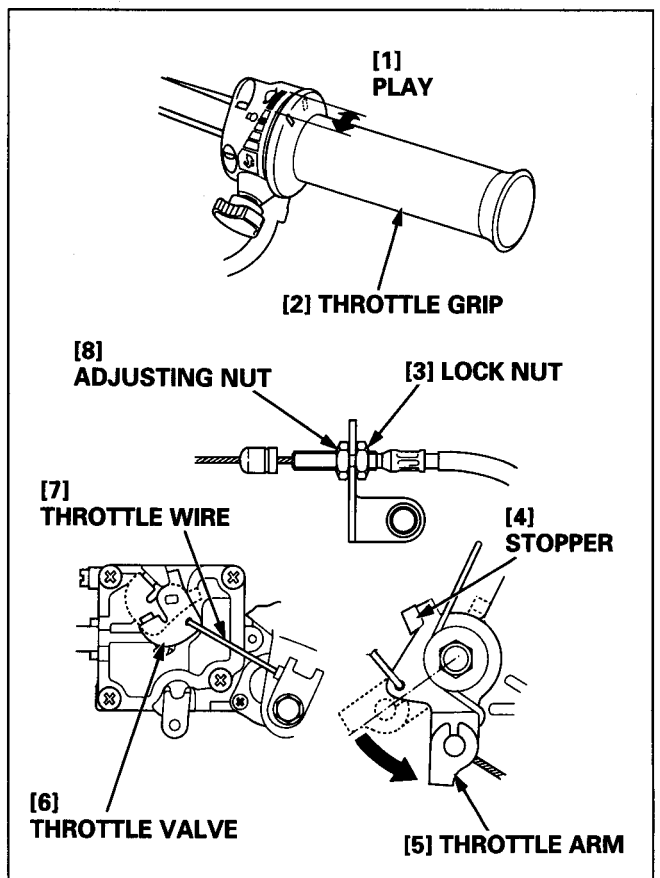
- 2) If adjustment is necessary, adjust by loosening the lock nut and turning the adjusting nut right or left.

- 3) Move the throttle grip to the full open position and check whether the throttle arm contacts the stopper.

If the throttle arm does not contact the stopper, repeat the above steps 1) and 2).

- 4) Check whether the throttle grip moves smoothly and it is linked with the carburetor throttle lever operation. Check to see whether the carburetor throttle lever operates smoothly from the fully close to the full open positions.

If the carburetor throttle valve does not open or close fully, check the throttle wire installation and adjust as needed.



8. FUEL FILTER/FUEL TANK/FUEL LINE

⚠ WARNING

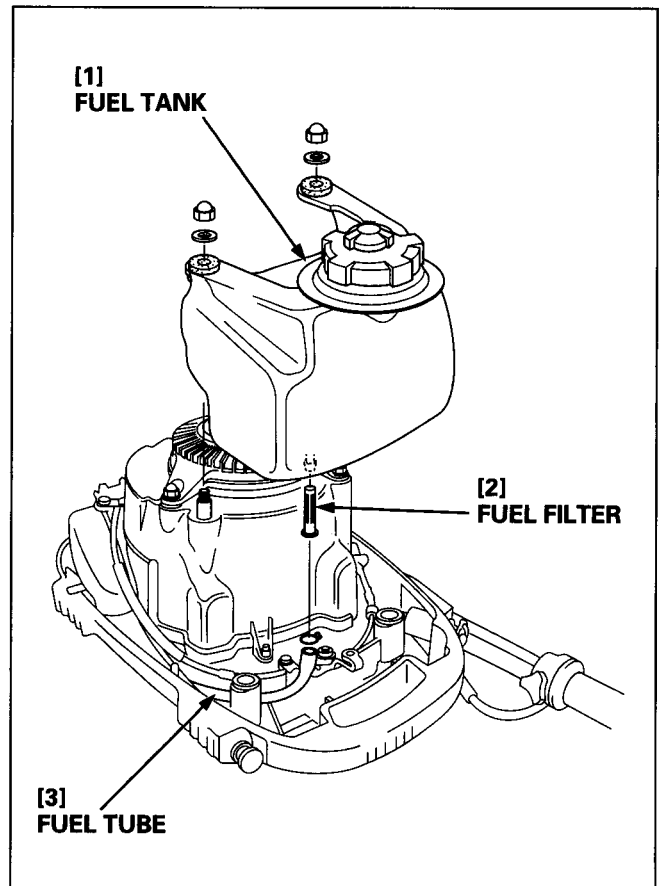
Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel. Keep heat, sparks, and flame away. Wipe up spills immediately.

Check/Cleaning

- 1) Drain the fuel into a suitable container.
- 2) Remove the engine cover (P. 4-1).
- 3) Remove the fuel tank and disconnect the fuel tank tube.
- 4) Remove the fuel filter.
- 5) Remove the clogged foreign material from the fuel filter, and check the fuel filter for damage. Replace the filter if necessary.
- 6) Clean the fuel tank with cleaning solvent and allow the fuel tank to dry thoroughly.
- 7) Check the fuel tube for deterioration, cracks, and other damage. Replace if necessary.
- 8) After cleaning, set the fuel filter in the fuel tank and connect the fuel tank tube.

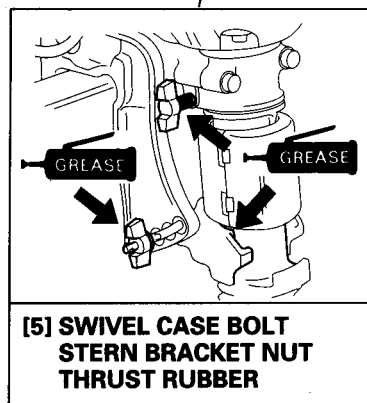
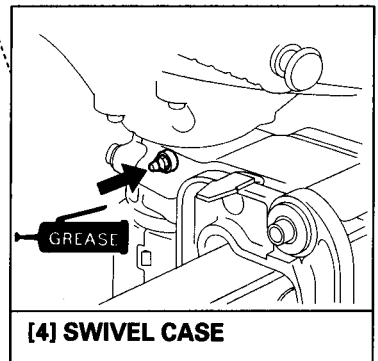
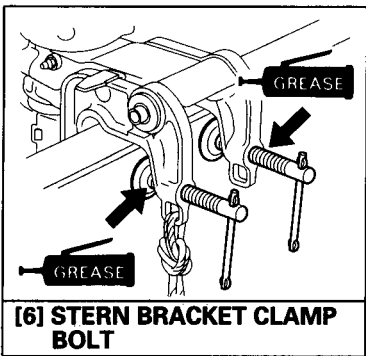
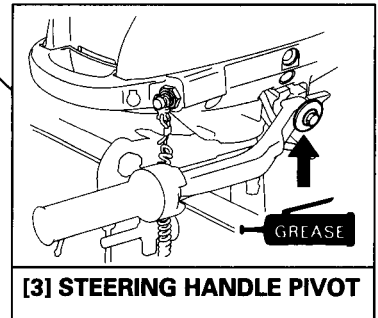
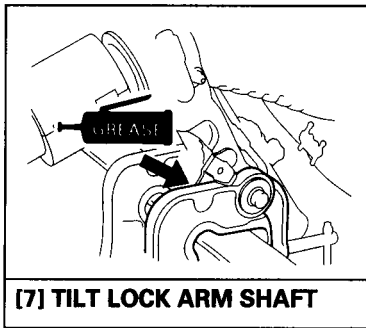
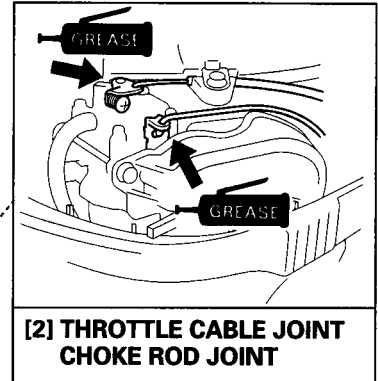
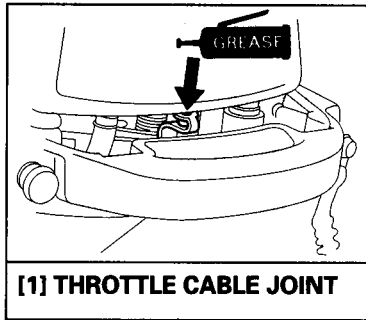
Insert the fuel tank tube as deep as to the base of the tank joint securely (P. 4-2).

- 9) Install the fuel tank and check to see whether the fuel is not leaking from the fuel tank tube.
- 10) Install the engine cover.



9. LUBRICATION POINTS

Apply marine anti-corrosion grease to the parts shown below.



4. ENGINE COVER/FUEL TANK

HONDA
BF2D

1. ENGINE COVER

2. FUEL TANK

1. ENGINE COVER

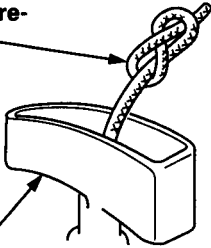
a. REMOVAL/INSTALLATION

[1] STARTER GRIP

REASSEMBLY:

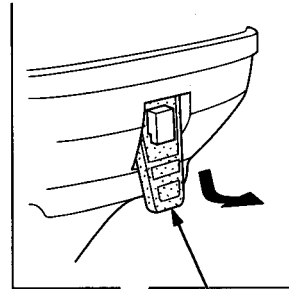
Pass the rope end through the starter grip and make a figure-eight knot at the rope end as shown.

[1]-1
Make a figure-eight knot.

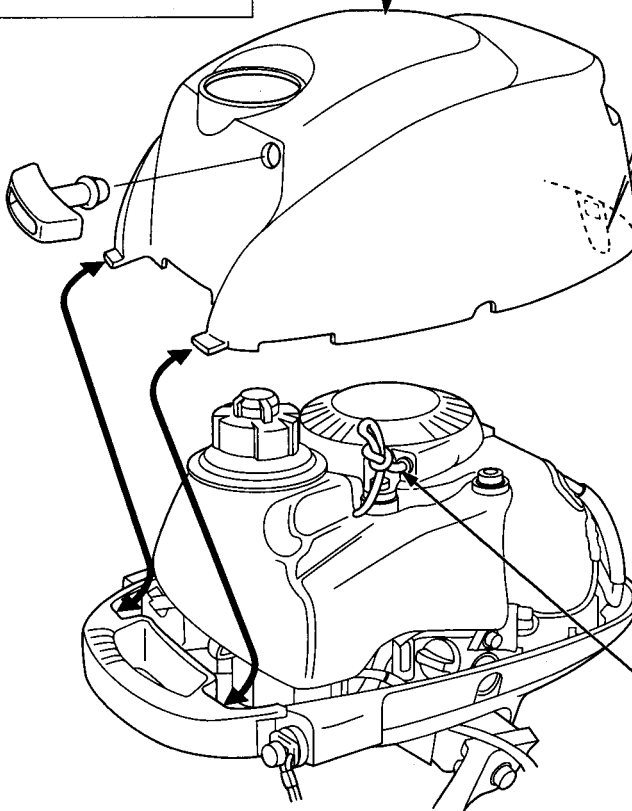


[1]-2
STARTER GRIP

[2]
ENGINE COVER



[3]
ENGINE COVER LOCK BAND



[4]
STARTER ROPE

REMOVAL:

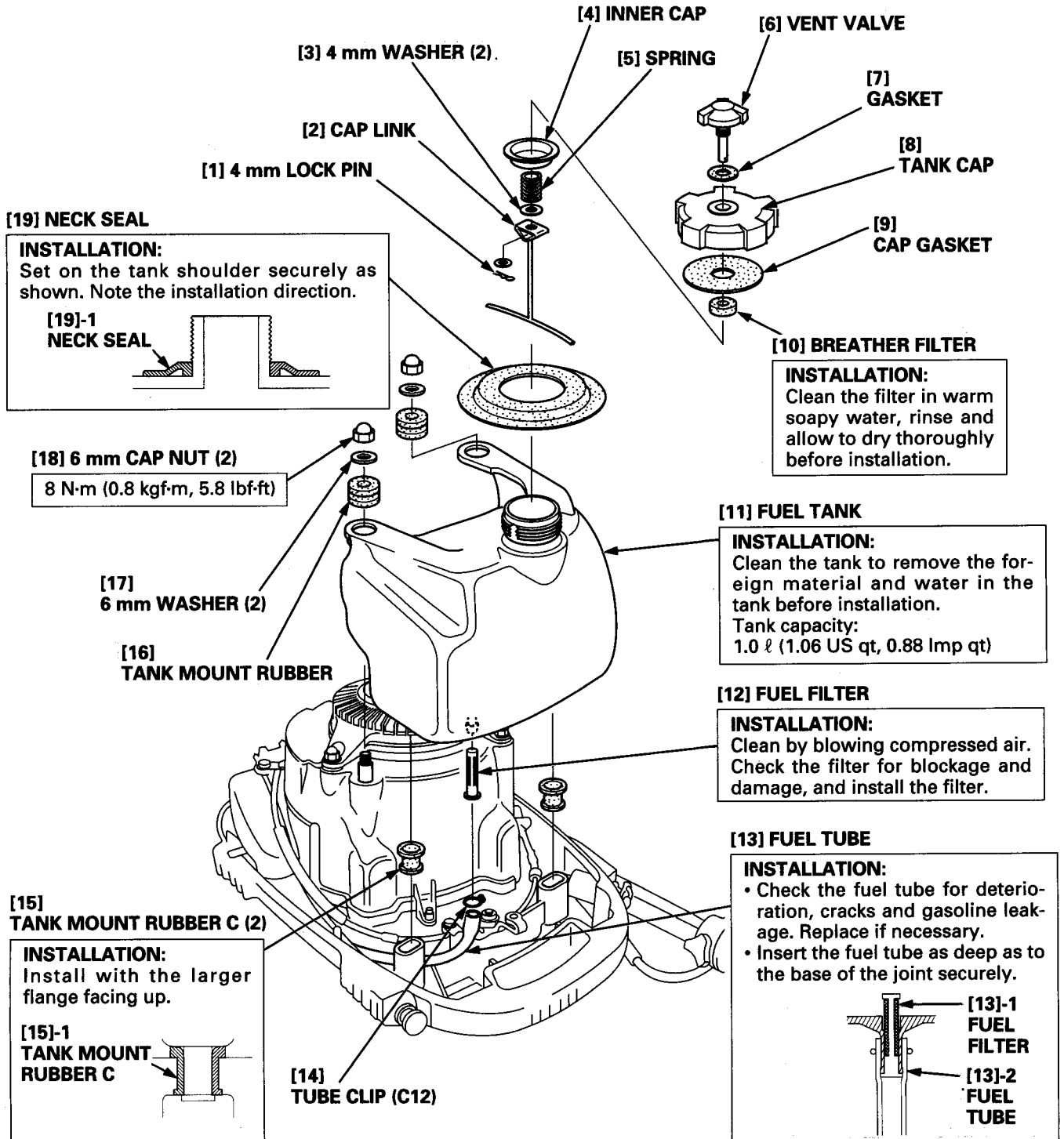
To prevent the starter rope from rewinding, make a knot in the rope at the recoil starter.

2. FUEL TANK

a. DISASSEMBLY/REASSEMBLY

⚠ WARNING

- Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel. Keep heat, sparks, and flame away. Wipe up spills immediately.
- Drain the fuel tank thoroughly before removing the fuel tank.



5. RECOIL STARTER/FAN COVER

HONDA
BF20

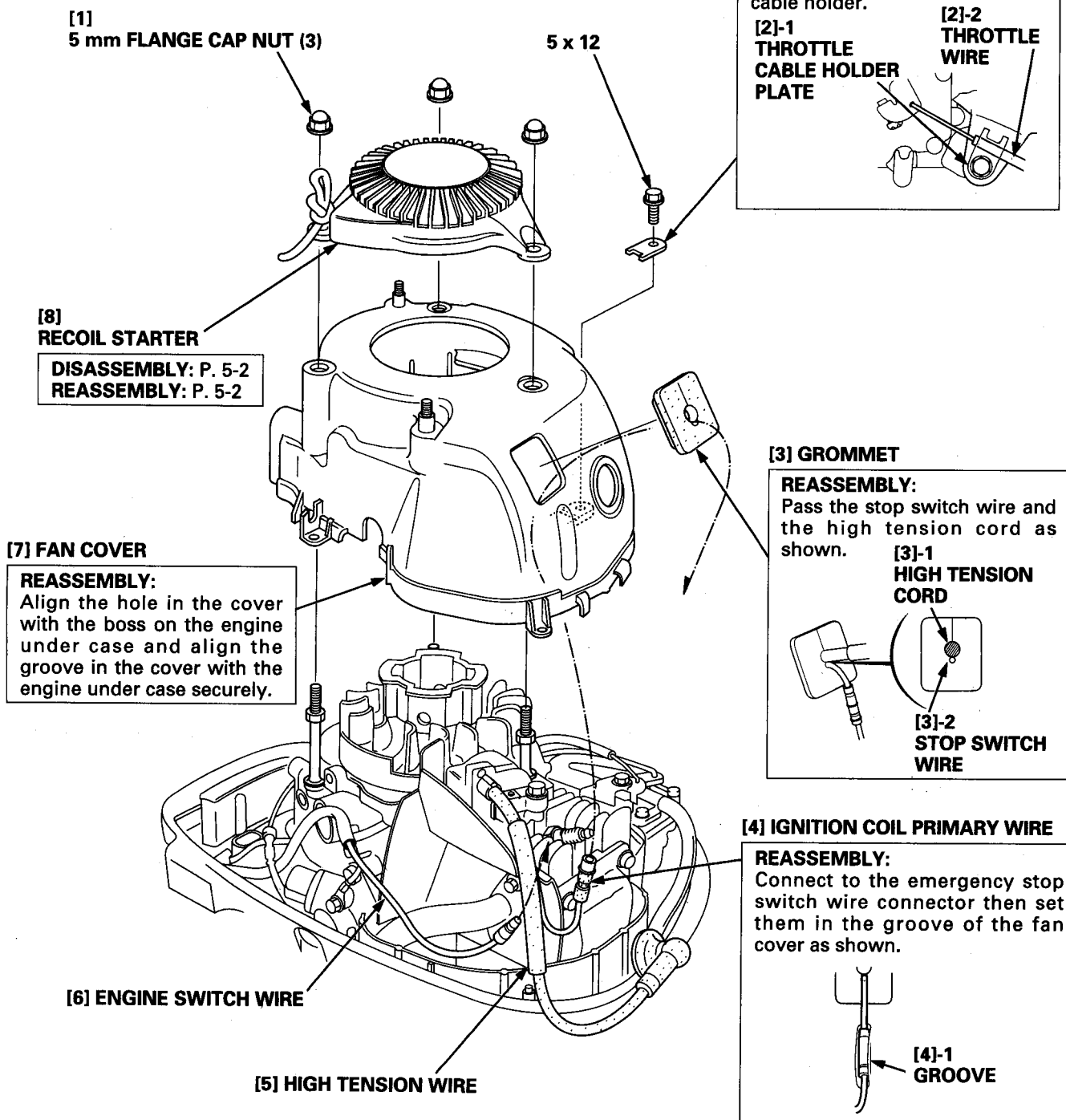
1. FAN COVER

2. RECOIL STARTER

1. FAN COVER

a. REMOVAL/INSTALLATION

- 1) Remove the engine cover (P. 4-1).
- 2) Remove the fuel tank (P. 4-2).
- 3) Remove the spark plug cap.
- 4) Disconnect the engine switch wire.



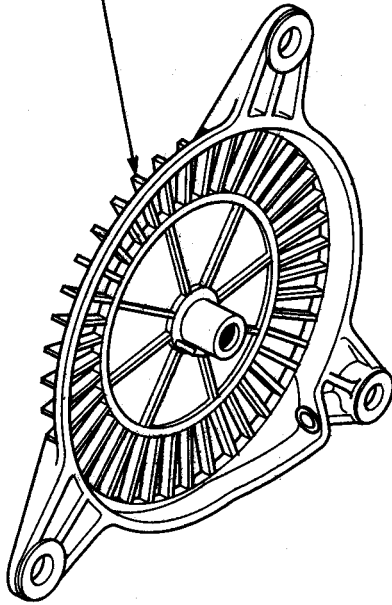
2. RECOIL STARTER

a. DISASSEMBLY

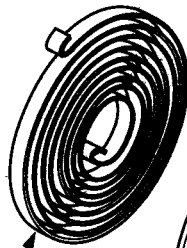
CAUTION

- Wear heavy gloves during operation.
- Take care not to allow the recoil starter spring to pop out.

[1] RECOIL STARTER CASE



[2] STARTER REEL



[3] RECOIL STARTER ROPE

Check for fraying and wear, and replace if necessary.



[4] RATCHET (2)

[5] FRICTION SPRING RING

[7] RATCHET GUIDE

[6] SET SCREW

[8] RECOIL STARTER SPRING

DISASSEMBLY:
Wear gloves during operation.
Take care not to allow the recoil starter spring to pop out.

b. REASSEMBLY

CAUTION

- Wear heavy gloves during operation.
- Take care not to allow the recoil starter spring to pop out.

- 1) Set the hook at the outer end of the recoil starter spring in the groove in the starter reel, and wind the starter spring around the starter reel.

[1] RECOIL STARTER SPRING

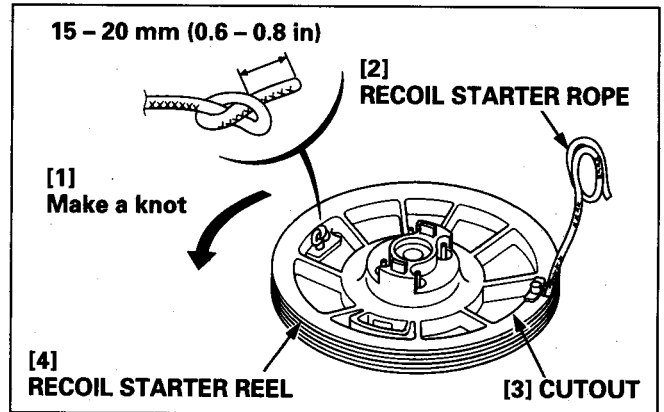
[2] HOOK

[4] RECOIL STARTER REEL

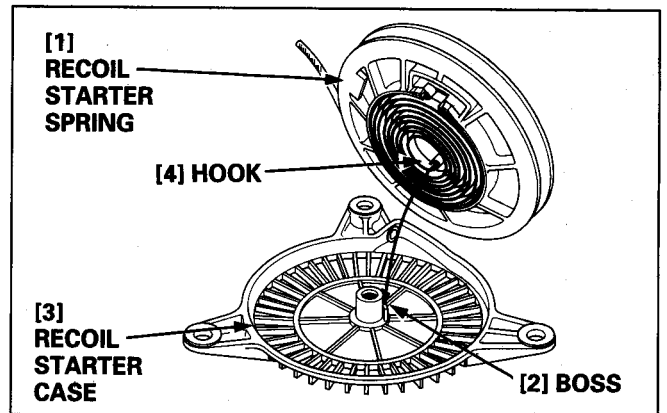
[3] GROOVE

- 2) Pass the starter rope through the rope hole in the reel and make a knot at the rope end as shown.

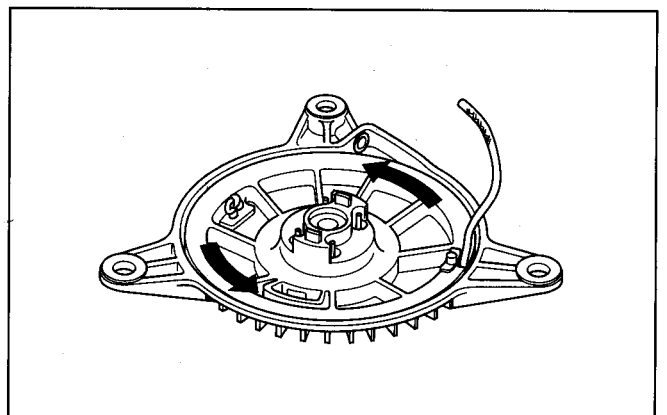
Wind the rope around the recoil starter reel in the direction of the arrow. Leave approximately 20 cm (8 in) of the starter rope unwound. It must be out of the cutout in the starter reel.



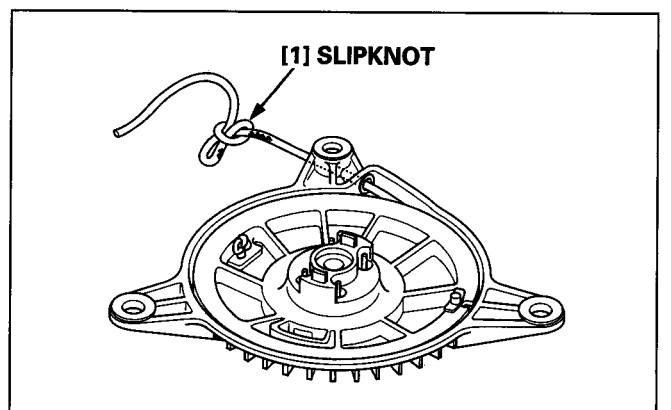
- 3) Install the reel in the case so that the hook at the inner end of the recoil starter spring sets on the boss of the case.



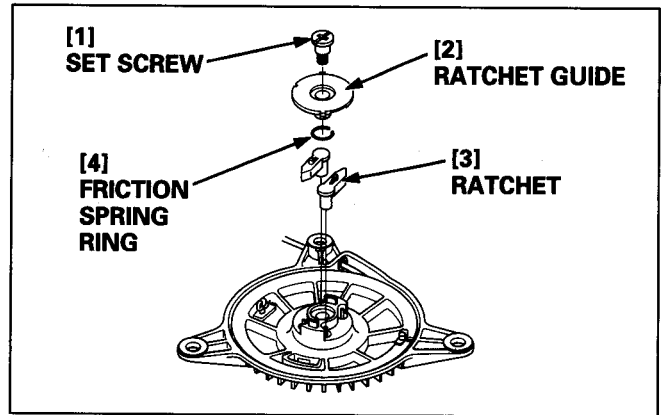
- 4) With the starter rope end out of the cutout in the reel, turn the starter reel approximately 3 turns in the direction of the arrows to preload the spring.



- 5) Pull out the rope end from the hole in the case, and make a slipknot in the rope to prevent the rope from rewinding.



- 6) Install the ratchet in the position shown.
- 7) Set the friction spring ring and set screw in the ratchet guide. Holding the ratchet guide, tighten the set screw securely.
- 8) Pull the starter rope several times and check whether the ratchet moves smoothly.



6. ENGINE REMOVAL/INSTALLATION

HONDA
BF2D

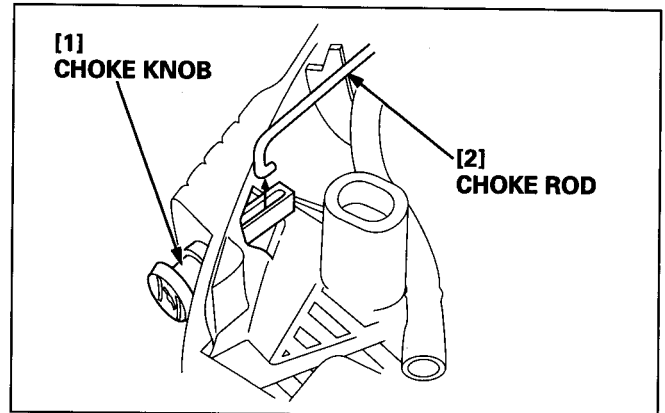
1. ENGINE REMOVAL

2. ENGINE INSTALLATION

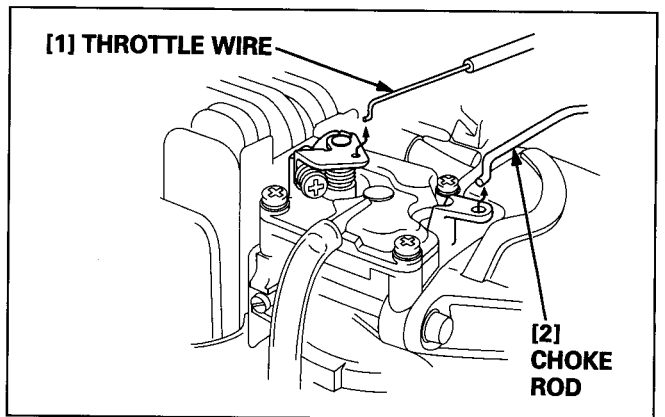
1. ENGINE REMOVAL

- 1) Remove the engine cover (P. 4-1), and remove the following parts.
 - Fuel tank (P. 4-2)
 - Recoil starter (P. 5-1)
 - Fan cover (P. 5-1)

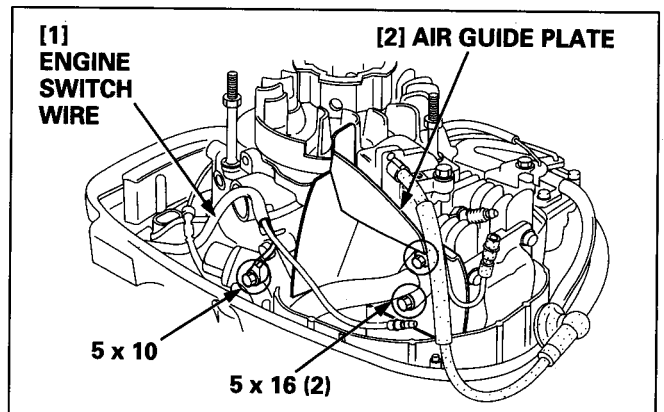
- 2) Push in the choke knob and disconnect the choke rod.



- 3) Disconnect the choke rod and throttle wire from the carburetor.



- 4) Remove the 5 x 16 mm flange bolts. Disconnect the exhaust pipe from the engine and remove the air guide plate.
- 5) Remove the 5 x 10 mm flange bolt and disconnect the engine switch ground terminal.
- 6) Remove the 6 x 60 flange bolts and washers and remove the engine.

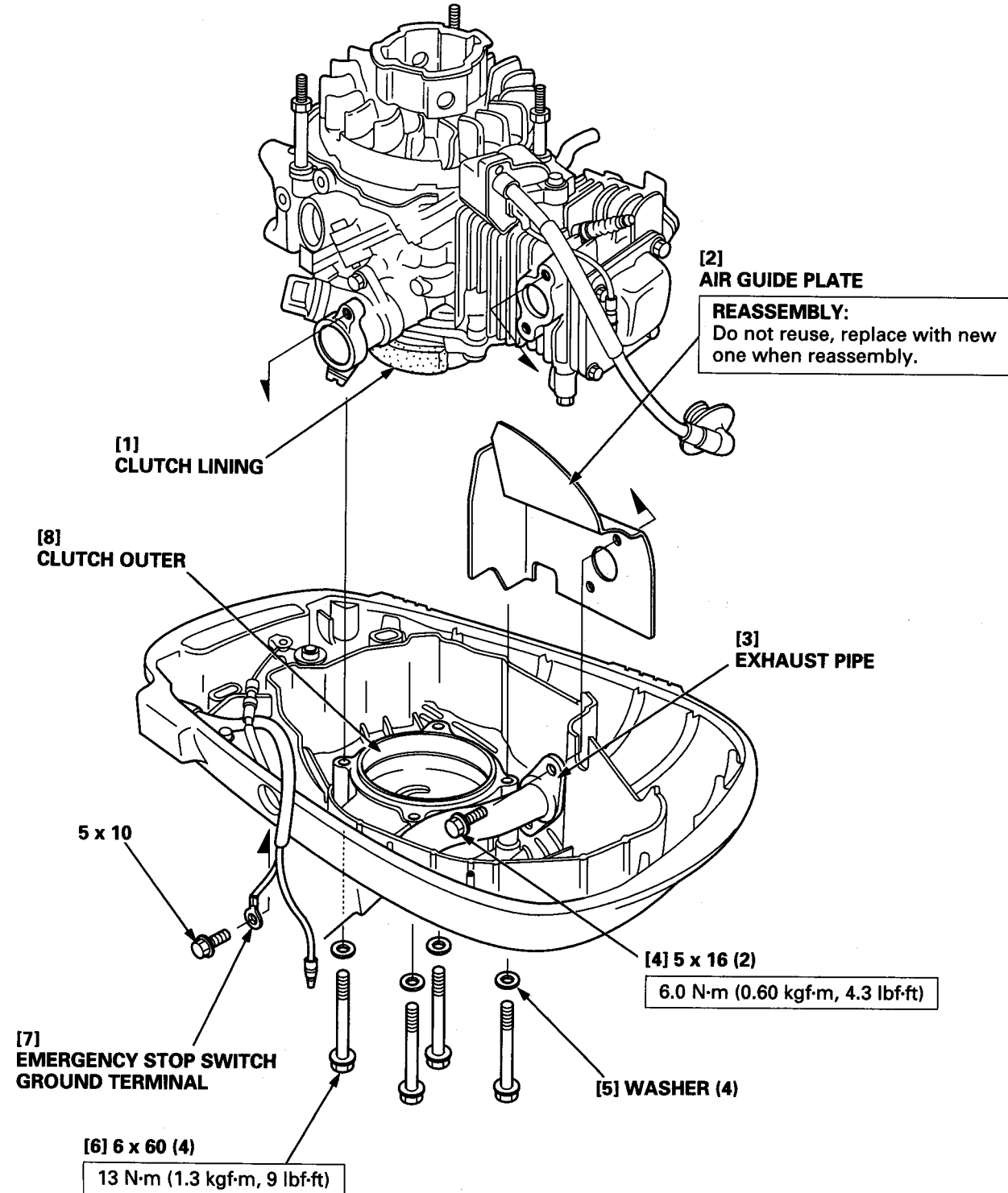


2. ENGINE INSTALLATION

Install the engine in the reverse order of removal.

CAUTION

Take care not to contaminate the clutch lining and the inner wall of the clutch outer with oil and grease.



1. CARBURETOR

1. CARBURETOR

a. REMOVAL/INSTALLATION

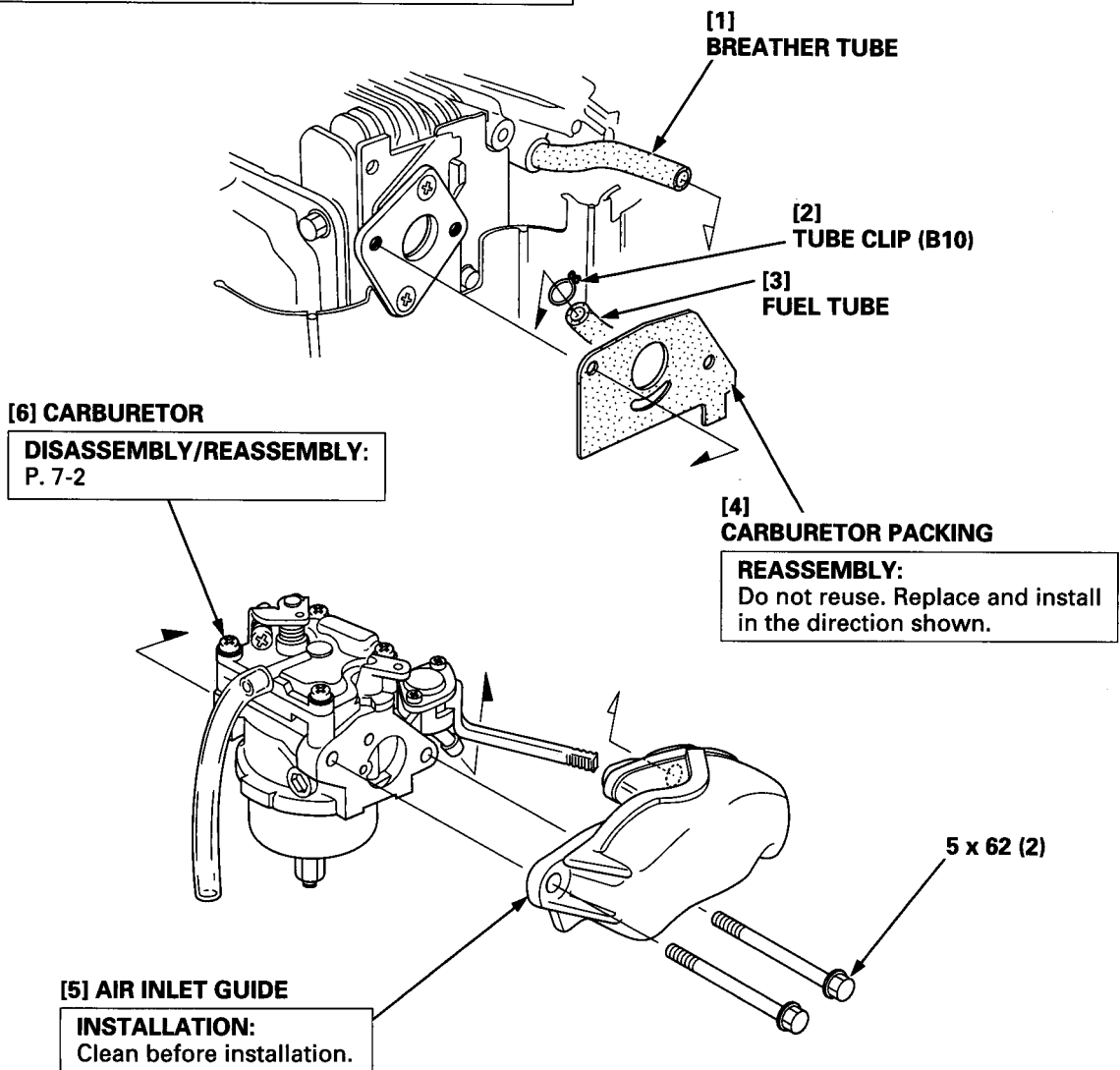
⚠ WARNING

Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel. Keep heat, sparks, and flame away. Wipe up spills immediately.

- 1) Remove the engine cover (P. 4-1) and fan cover (P. 5-1).
- 2) Completely drain the carburetor by loosening the drain screw.

CAUTION

Cover the intake port with a clean tape or film to prevent dirt from entering the engine. If these parts are left out, dirt will enter the intake system, damaging the engine.



b. DISASSEMBLY/REASSEMBLY

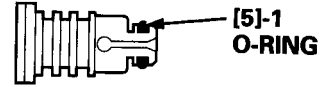
⚠ WARNING

- Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel. Keep heat, sparks, and flame away. Wipe up spills immediately.
- Drain the carburetor thoroughly before removing the carburetor.

[5] PILOT JET

REASSEMBLY:

- Clean the passage by blowing compressed air before installation.
- To facilitate installation, apply light coat of oil to the O-ring.



[4] 4 x 12 mm SCREW (4)

[3] CARBURETOR BODY COVER

[2] AIR VENT TUBE

[1] THROTTLE STOP SCREW
ADJUSTMENT: P. 3-5

[24] CARBURETOR BODY

REASSEMBLY:

- Clean by blowing compressed air before installation.

[23] PILOT SCREW

ADJUSTMENT: P. 3-5

[6] O-RING

[7]

3 x 6 mm SCREW (2)

[8] LEVER SETTING PLATE

[9] LEVER SPRING

[10] FUEL VALVE LEVER

[11] FUEL VALVE PACKING

REASSEMBLY:

- Check the packing for wear and damage before installation.

[12] MAIN NOZZLE

REASSEMBLY:

- Clean the passage by blowing compressed air before installation.

[12]-1
MAIN NOZZLE

[22] FLOAT VALVE

REASSEMBLY:

- Check the valve tip for wear and the valve spring for operation.



[22]-1
VALVE SEAT



[22]-4 [22]-2
NORMAL WORN

[22]-3 FLOAT VALVE

[21] FLOAT PIN

[13] MAIN JET

REASSEMBLY:

- Clean the passage by blowing compressed air before installation. Main jet: #65

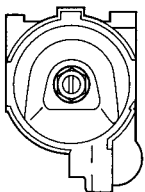
[13]-1
MAIN JET

[20] FLOAT CHAMBER GASKET

[19] FLOAT CHAMBER

REASSEMBLY:

- Install in the direction shown.



[18] SEALING WASHER

[15] O-RING

[14] FLOAT

REASSEMBLY:

- After installation, check the float operation by pushing the float tip lightly with a finger.
- INSPECTION: P. 7-3

[17] SETTING BOLT

[16] DRAIN SCREW

- REASSEMBLY: After installation, check for gasoline leakage.

1.5 N·m (0.15 kgf·m, 1.1 lbf·ft)

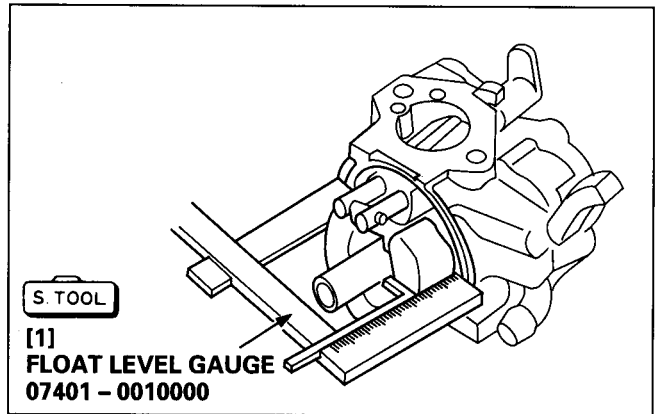
c. INSPECTION

• FLOAT LEVEL HEIGHT

With the carburetor in an upright, measure the distance between the float top and carburetor body when the float just contacts the float valve.

| | |
|-----------------------|-------------------|
| Standard float height | 12.0 mm (0.47 in) |
|-----------------------|-------------------|

If the height is out of specification, replace the float.
Check the float operation.



1. FLYWHEEL/IGNITION COIL

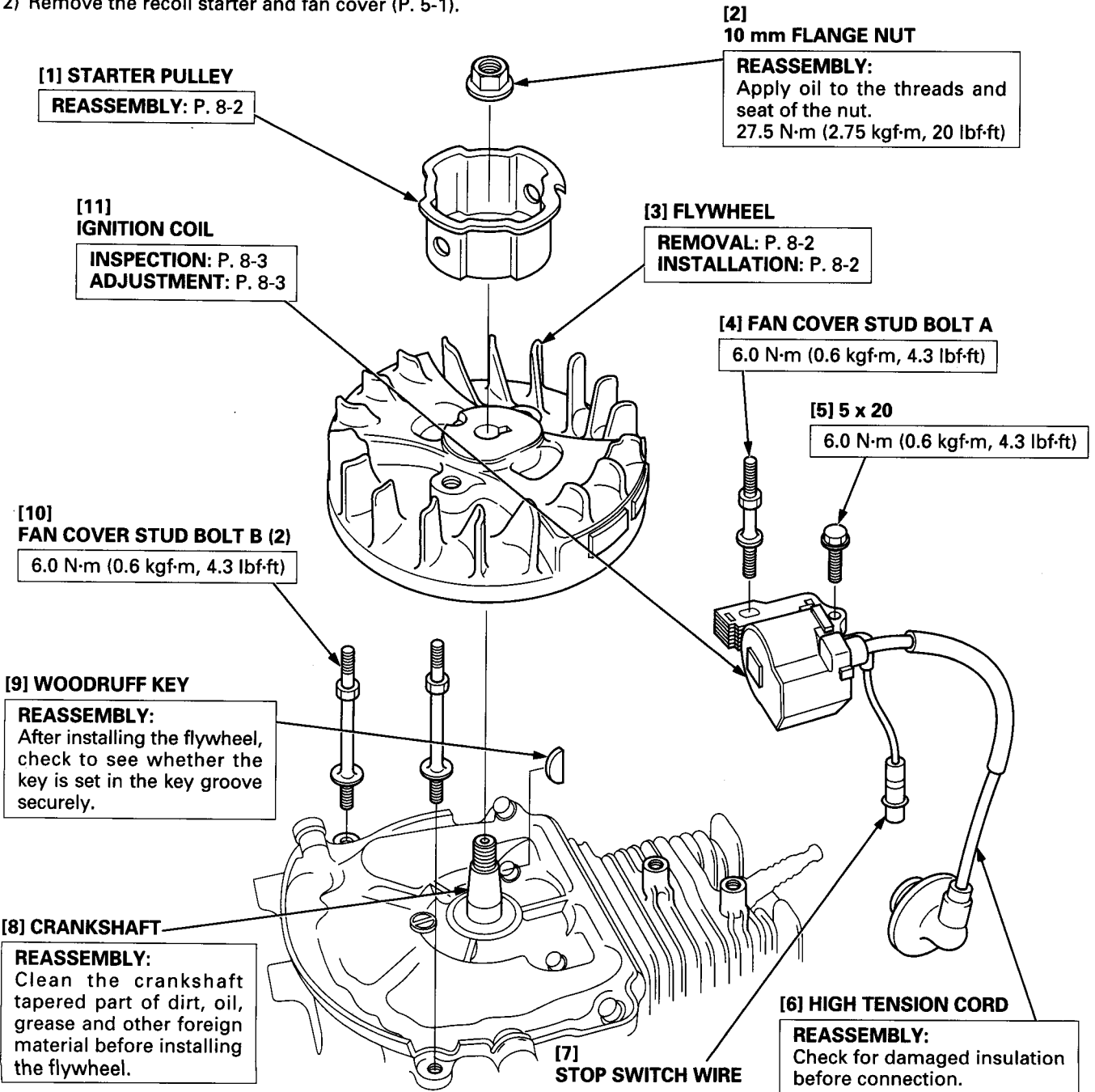
1. FLYWHEEL/IGNITION COIL

a. DISASSEMBLY/REASSEMBLY

CAUTION

Take care not to damage the fan blades during removal and installation of the flywheel.

- 1) Remove the fuel tank (P. 4-2).
- 2) Remove the recoil starter and fan cover (P. 5-1).



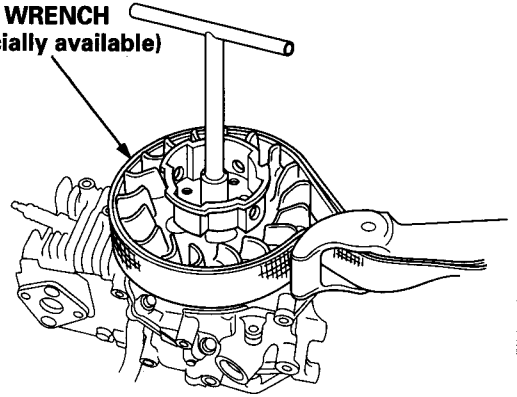
• FLYWHEEL REMOVAL

- 1) Remove the ignition coil.
- 2) Holding the flywheel with a commercially available strap wrench, remove the 10 mm flange nut.

CAUTION

Do not loosen the nut by setting a screw driver or equivalent tool on the fan blade or projection.

[1] STRAP WRENCH
(Commercially available)

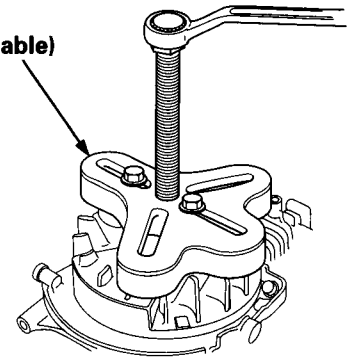


- 3) Remove the starter pulley.
- 4) Set a commercially available flywheel puller on the flywheel.
- 5) Screw in the flywheel puller and remove the flywheel.

CAUTION

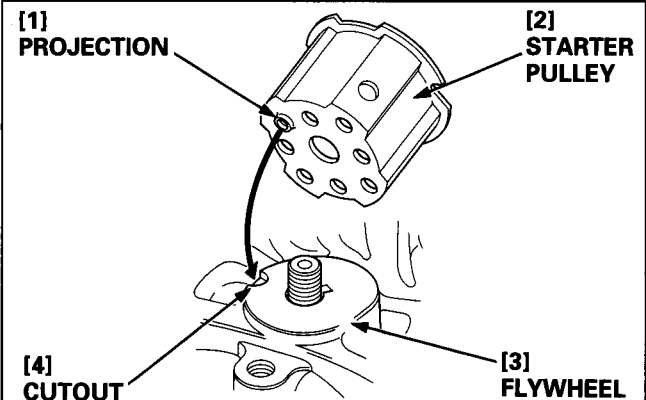
Do not try to remove the flywheel by striking it with a hammer.

[1] FLYWHEEL PULLER
(Commercially available)



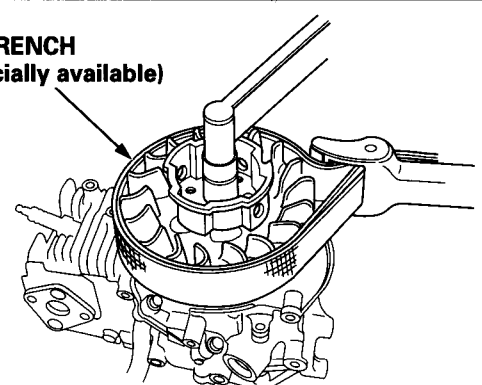
• FLYWHEEL INSTALLATION

- 1) Clean the crankshaft tapered part of dirt, oil, grease and other foreign material before installing the flywheel.
 - Be sure that there is no washer and other foreign material on the magnetic part.
- 2) Set the woodruff key in the key groove securely.
- 3) Install the flywheel over the crankshaft.
- 4) Align the projection on the starter pulley with the cutout in the flywheel, and install the pulley.



- 5) Apply light coat of the oil to the threads and seating surface of the 10 mm flange nut, and loosely tighten the nut. Holding the flywheel with a commercially available strap wrench, tighten the 10 mm flange nut to the specified torque.

[1] STRAP WRENCH
(Commercially available)



TORQUE: 27.5 N·m (2.75 kgf·m, 20 lbf·ft)

- 6) Install the ignition coil and adjust the air gap. (P. 8-3).

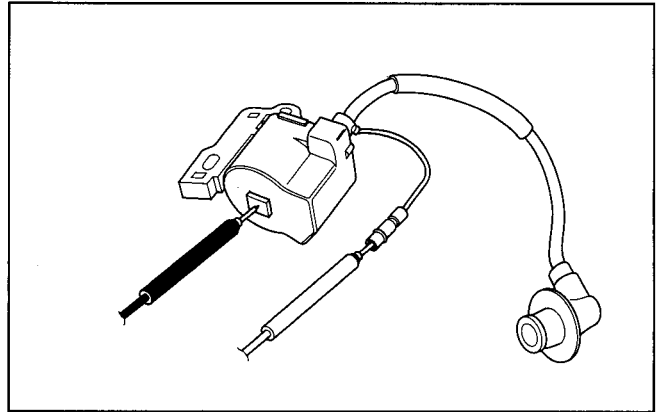
b. INSPECTION

• IGNITION COIL

Primary resistance

Attach one lead of the tester to the lead wire terminal and another tester lead to the iron core, and measure the primary resistance of the ignition coil.

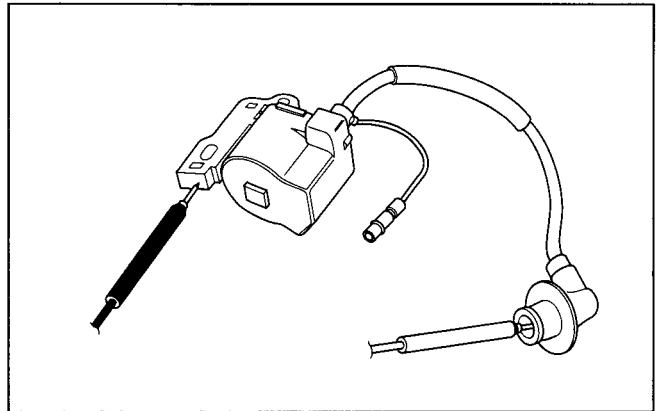
| | |
|------------|---------------------|
| Resistance | 0.98 – 1.2 Ω |
|------------|---------------------|



Secondary resistance

Attach one lead of the tester to the terminal inside the spark plug cap and another lead to the iron core, and measure the secondary resistance of the ignition coil.

| | |
|------------|--------------------|
| Resistance | 11 – 15 k Ω |
|------------|--------------------|



c. ADJUSTMENT

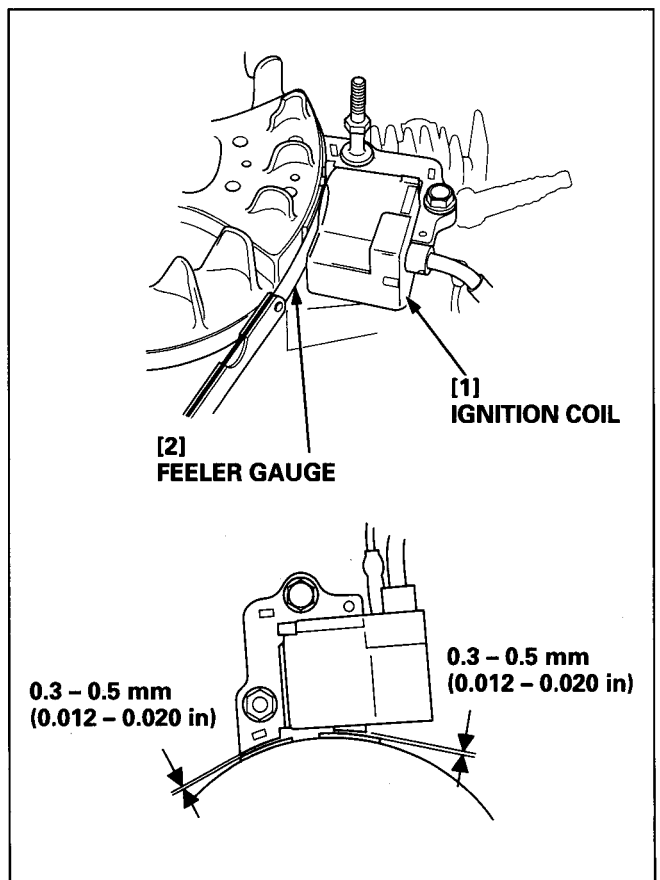
• IGNITION COIL AIR GAP

- 1) Loosen the two ignition coil bolts.
- 2) Insert a feeler gauge of the proper thickness between the ignition coil and the projection points on the flywheel.

To bring the air gap at both ends of the ignition coil equal, set the feeler gauge along the circumference of the unit and adjust the clearance at the both ends simultaneously.

- 3) Pushing the ignition coil against the flywheel, tighten the two bolts and adjust the air gap.

| | |
|---------|---------------------------------|
| Air gap | 0.3 – 0.5 mm (0.012 – 0.020 in) |
|---------|---------------------------------|



1. CLUTCH

1. CLUTCH

a. DISASSEMBLY/REASSEMBLY

1) Remove the engine (P. 6-1).

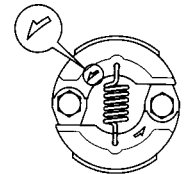
[1] CLUTCH STAY

REMOVAL: P. 9-2
INSTALLATION:
Clean the crankshaft and clutch stay installation surfaces and install the clutch stay.

[2] CLUTCH ASSEMBLY

INSTALLATION:

- Install with the side marked with the arrow marks toward you.
- Install the 8 mm clutch washers behind the clutch securely.



INSPECTION: P. 9-2

[7] 8 mm CLUTCH STAY BOLT

DISASSEMBLY/REASSEMBLY: P. 9-2
22.5 N·m (2.25 kgf·m, 16 lbf·ft)

[5] S, L, SH, LH TYPE

[6] 8 mm CLUTCH WASHER (2)

[3] 8 mm CLUTCH BOLT (2)

DISASSEMBLY/REASSEMBLY:
Remove and install the bolts while holding the clutch stay with a pin spanner or holding the flywheel with a commercially available strap wrench.

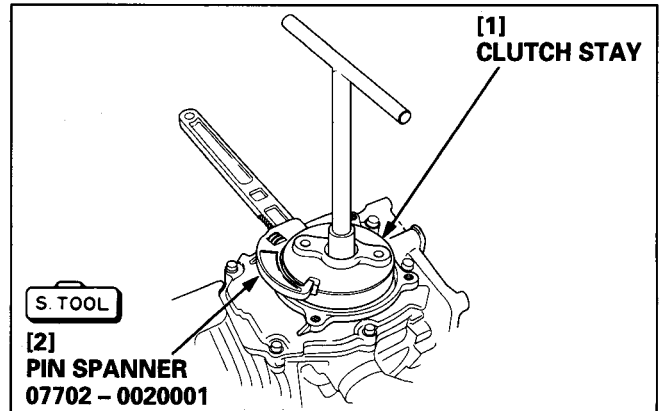
15.5 N·m (1.55 kgf·m, 11 lbf·ft)

[4] EXTENSION SHAFT

8 x 14 (2)

• CLUTCH STAY REMOVAL

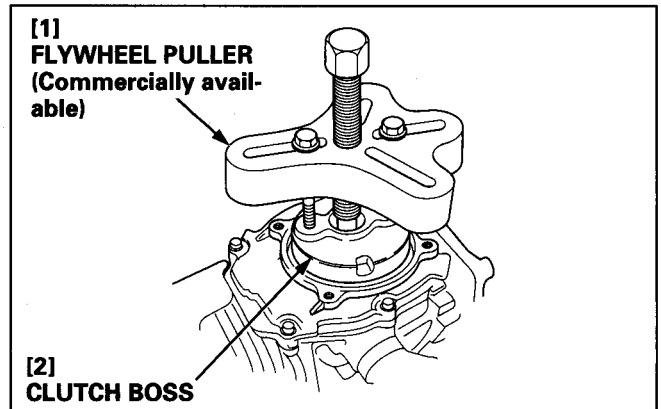
- 1) Holding the clutch boss with the pin spanner or holding the flywheel with a commercially available strap wrench, remove the 8 mm clutch stay bolt.
- 2) Remove the clutch boss using a commercially available flywheel puller.



• CLUTCH STAY INSTALLATION

- 1) Clean the crankshaft and clutch stay tapered part of dirt, oil, grease and other foreign material before installing the clutch stay.
- 2) Install the clutch stay onto the crankshaft and install the 8 mm clutch stay bolt.
- 3) Holding the clutch stay with the pin spanner or holding the flywheel with a commercially available strap wrench, tighten the 8 mm clutch stay bolt to the specified torque.

TORQUE: 22.5 N·m (2.25 kgf·m, 16 lbf·ft)

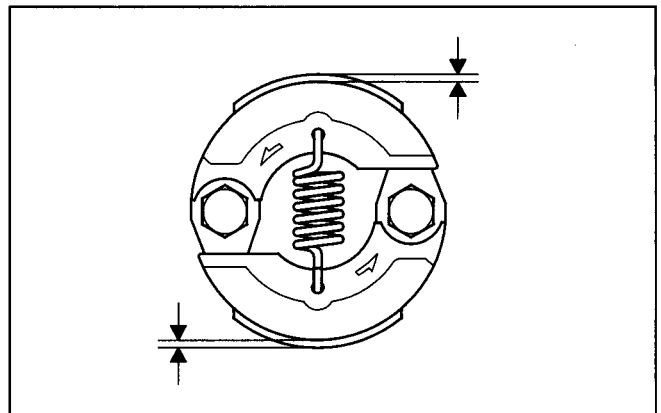


b. INSPECTION

• CLUTCH LINING THICKNESS (SC, LC, SCH, LCH Type only)

Measure the thickness at the center of the lining (with clutch type only).

| Standard | Service limit |
|------------------|------------------|
| 2.0 mm (0.08 in) | 1.0 mm (0.04 in) |



1. ROCKER ARM/PUSH ROD

3. INSPECTION

2. CRANKCASE SIDE COVER/CAMSHAFT/ VALVE LIFTER

1. ROCKER ARM/PUSH ROD

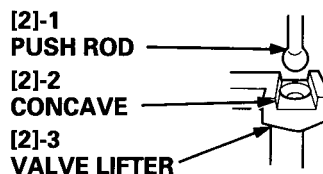
a. DISASSEMBLY/REASSEMBLY

[1] CYLINDER BLOCK
INSPECTION: P. 10-7

[2] PUSH ROD (2)

REASSEMBLY:

Check for wear and bend at both ends of the push rod. Install by aligning with the adjustment screw and the concave in the valve lifter securely.



[21-1] PUSH ROD
[21-2] CONCAVE
[21-3] VALVE LIFTER

[3] ROCKER ARM SHAFT
INSPECTION: P. 10-7

[4] 5 x 12 (4)

REASSEMBLY:

Tighten the bolts diagonally in 2 or 3 steps.

6.0 N·m (0.6 kgf·m, 4.3 lbf·ft)

[9] VALVE ADJUSTING SCREW (2)

[7] ROCKER ARM (2)
INSPECTION: P. 10-6

[6] LOCK NUT (2)
ADJUSTMENT: P. 3-4

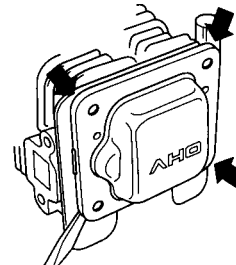
[5] VALVE COVER

[8] SPARK PLUG
INSPECTION: P. 3-3
STANDARD SPARK PLUG:
CR5HSB (NGK)
U16FSR-UB (DENSO)
12 N·m (1.2 kgf·m, 9 lbf·ft)

DISASSEMBLY:

- When removing the valve cover, pry off slowly at each corner of the valve cover.
- Do not remove the valve cover with force. It can deform the valve cover. Replace the valve cover if it is deformed.

INSTALLATION: P. 10-2

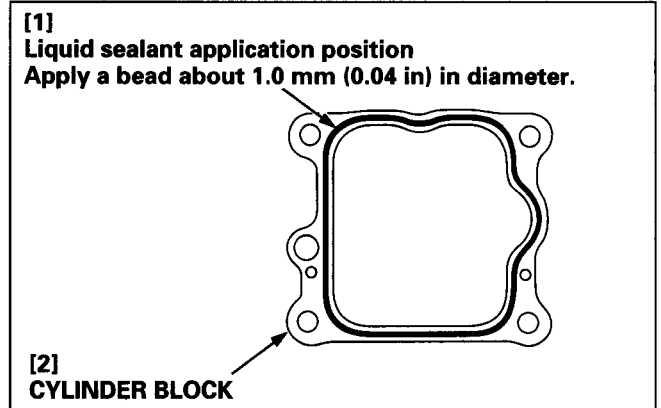


• **CYLINDER HEAD COVER INSTALLATION**

- 1) Clean the mating surfaces of the valve cover and the cylinder block with a degreasing cleaning agent or a clean shop towel.
- 2) Apply the liquid sealant (Three Bond 1207B or equivalent) to the position shown on the cylinder block.

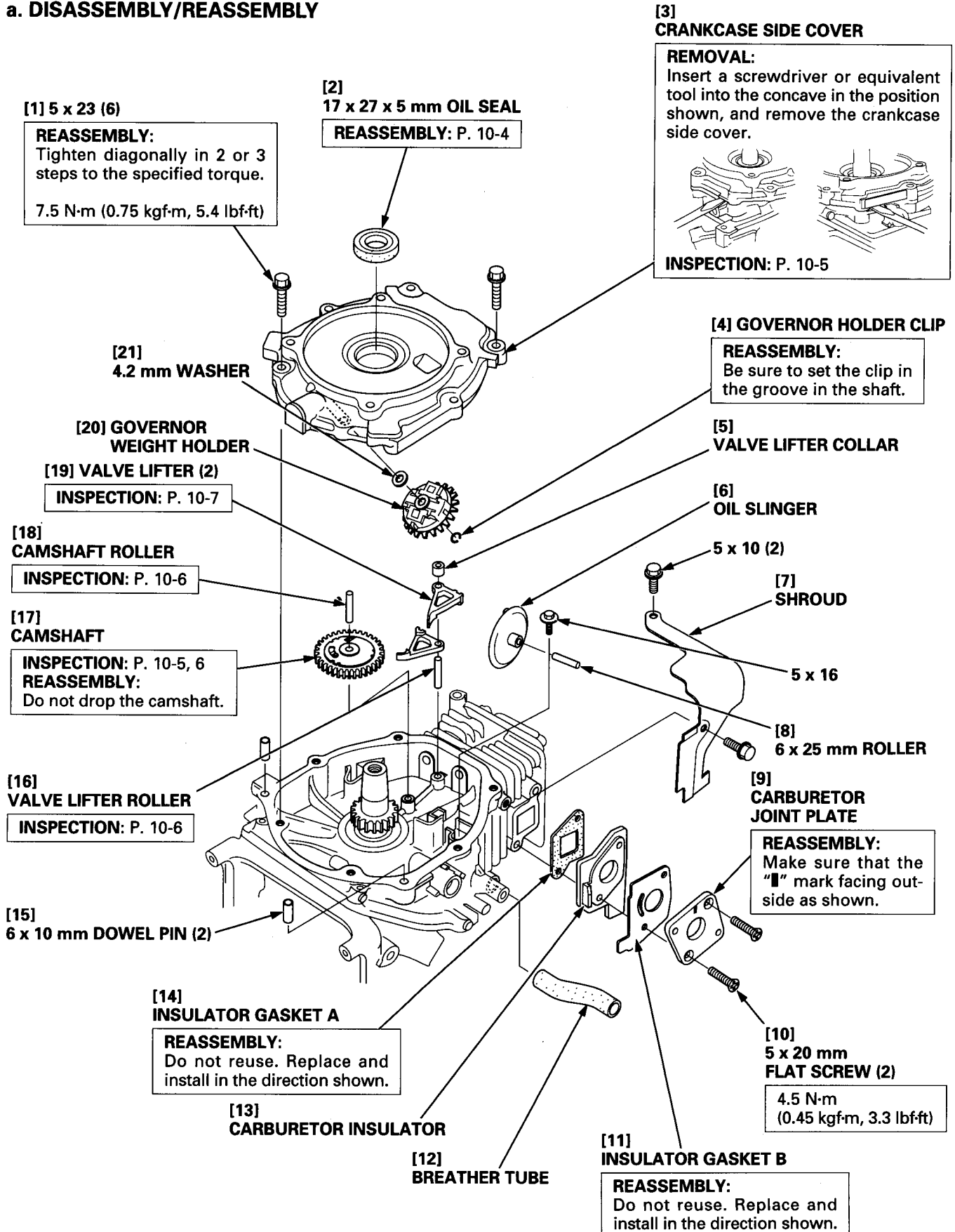
Assemble the valve cover within 3 minutes after application of the liquid packing.

- 3) Wait for 20 minutes after assembly. Do not add oil or start the engine during this period.



2. CRANKCASE SIDE COVER/CAMSHAFT/VALVE LIFTER

a. DISASSEMBLY/REASSEMBLY



• CRANKCASE SIDE COVER INSTALLATION

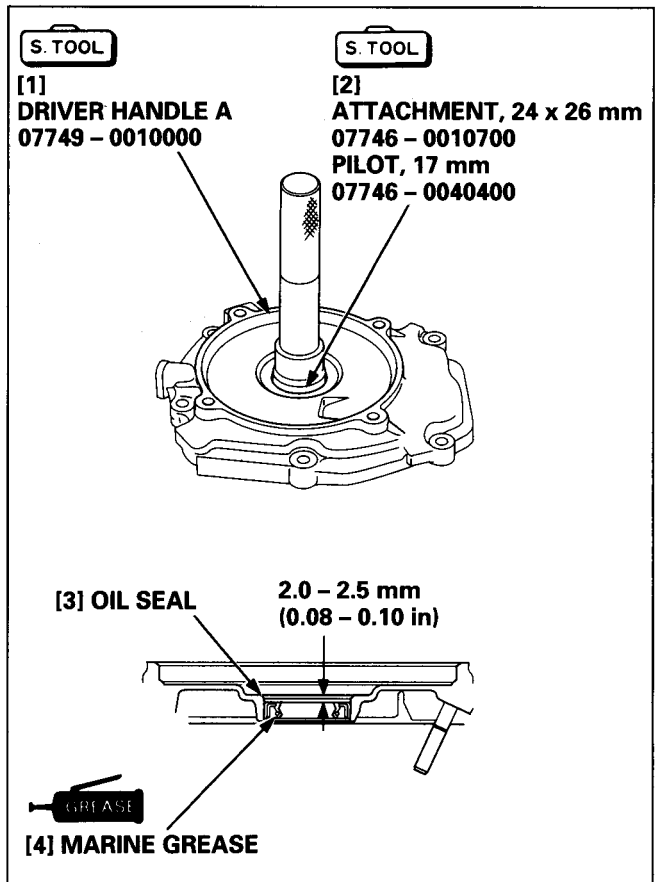
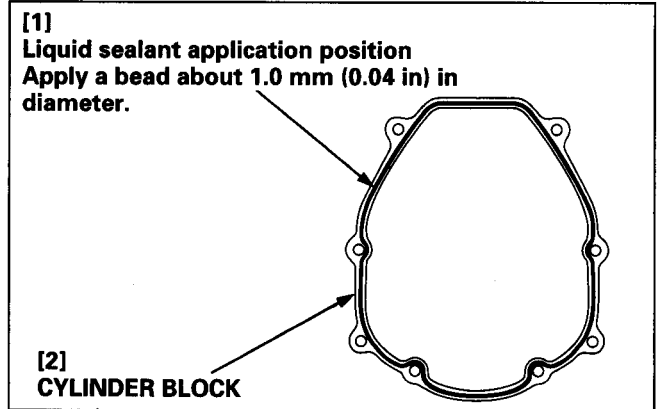
- 1) Clean the mating surfaces of the side cover and the cylinder block with a degreasing cleaning agent or a clean shop towel.
- 2) Apply the liquid sealant (Three Bond 1216E or equivalent) to the mating surface of the cylinder block as shown.
- 3) Install the side cover on the cylinder block.
Be sure to assemble within 3 minutes after application of the liquid sealant.
- 4) Loosely install the bolts, then tighten them diagonally in 2 or 3 steps to the specified torque.

TORQUE: 7.5 N·m (0.75 kgf·m, 5.4 lbf·ft)

- 5) Wait for 30 minutes after assembly. Do not add oil or start the engine during this period.

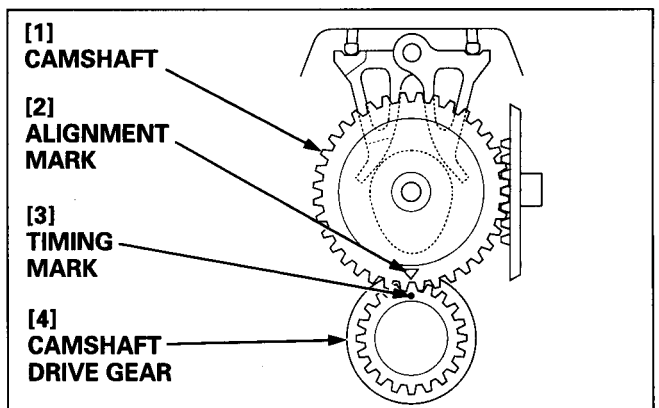
• OIL SEAL INSTALLATION:

- 1) Drive in the oil seal to the specified depth using the special tools as shown.
- 2) Apply marine grease to the oil seal lip.



• CAMSHAFT INSTALLATION (Valve timing adjustment)

Install the camshaft by aligning the alignment mark on the camshaft with the timing mark on the crankshaft.

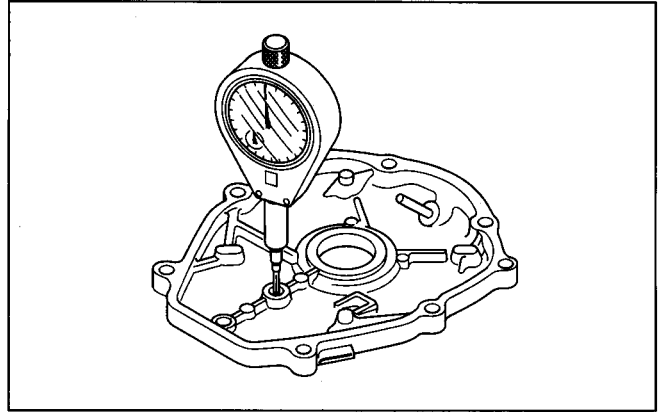


3. INSPECTION

• CRANKCASE SIDE COVER

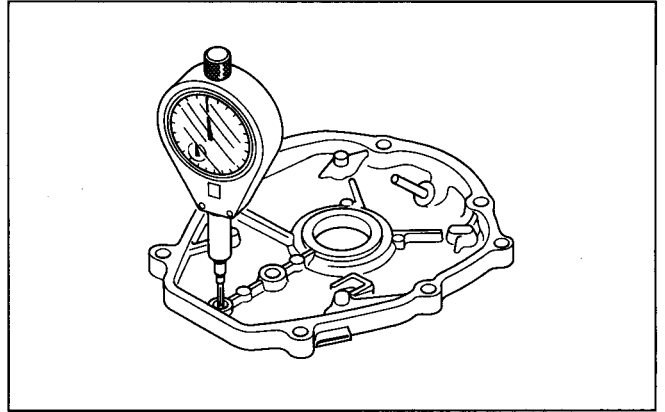
Measure the I.D. of the camshaft roller bearing.

| Standard | Service limit |
|--|-------------------------|
| 5.005 – 5.023 mm (0.1970 – 0.1978 in) | 5.050 mm (0.1988 in) |



Measure the I.D. of the valve lifter roller bearing.

| Standard | Service limit |
|--|-------------------------|
| 5.005 – 5.023 mm (0.1970 – 0.1978 in) | 5.050 mm (0.1988 in) |



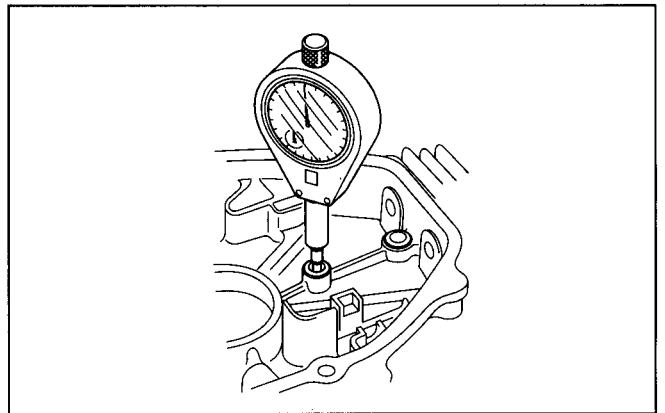
• CYLINDER BLOCK

Measure the I.D. of the camshaft roller bearing.

| Standard | Service limit |
|--|-------------------------|
| 5.005 – 5.023 mm (0.1970 – 0.1978 in) | 5.050 mm (0.1988 in) |

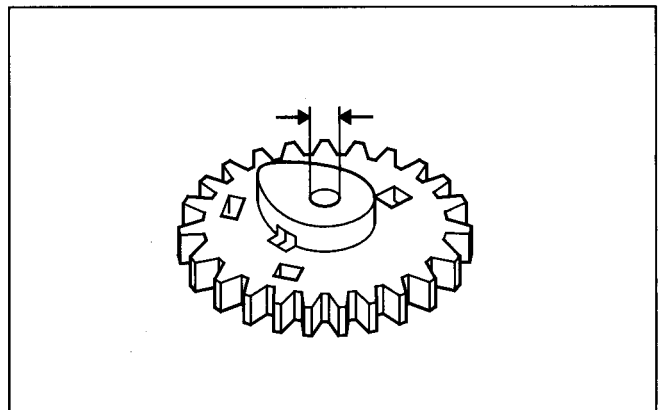
Measure the I.D. of the valve lifter roller bearing.

| Standard | Service limit |
|--|-------------------------|
| 5.005 – 5.023 mm (0.1970 – 0.1978 in) | 5.050 mm (0.1988 in) |



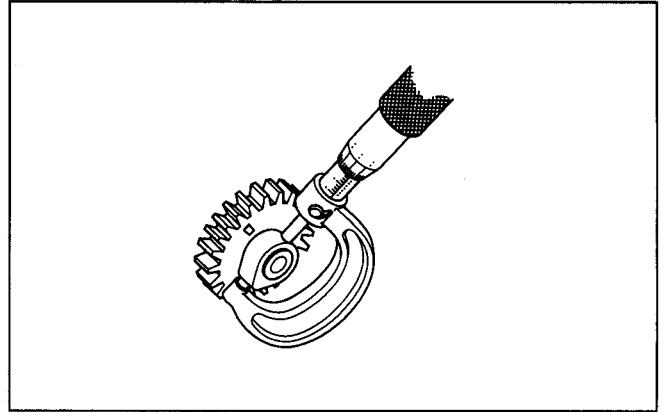
• CAMSHAFT I.D.

| Standard | Service limit |
|--|-------------------------|
| 5.020 – 5.050 mm (0.1976 – 0.1988 in) | 5.100 mm (0.2008 in) |



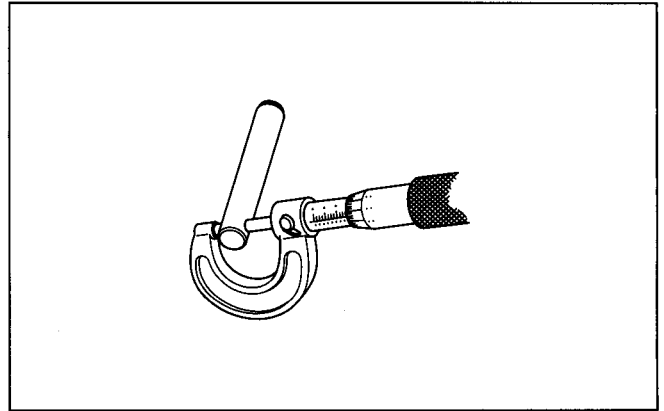
• CAM HEIGHT

| Standard | Service limit |
|--------------------------|--------------------------|
| 27.972 mm (1.1013 in) | 27.672 mm (1.0894 in) |



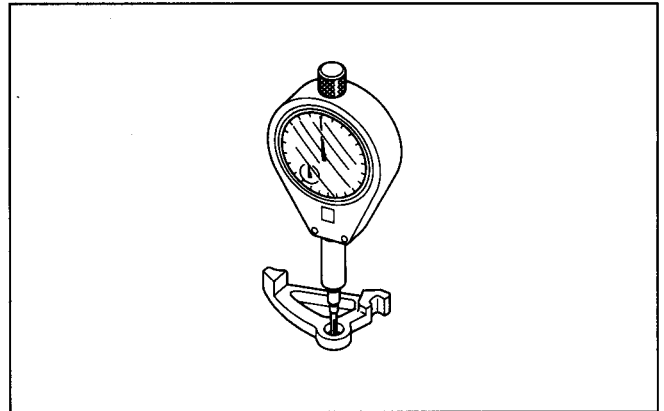
• CAMSHAFT ROLLER/VALVE LIFTER ROLLER O.D.

| Standard | Service limit |
|--|-------------------------|
| 4.990 – 5.000 mm (0.1965 – 0.1969 in) | 4.950 mm (0.1949 in) |



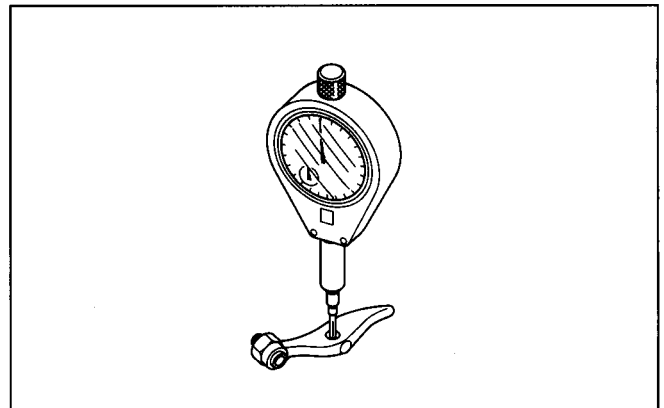
• VALVE LIFTER I.D.

| Standard | Service limit |
|--|-------------------------|
| 5.005 – 5.025 mm (0.1970 – 0.1978 in) | 5.050 mm (0.1988 in) |



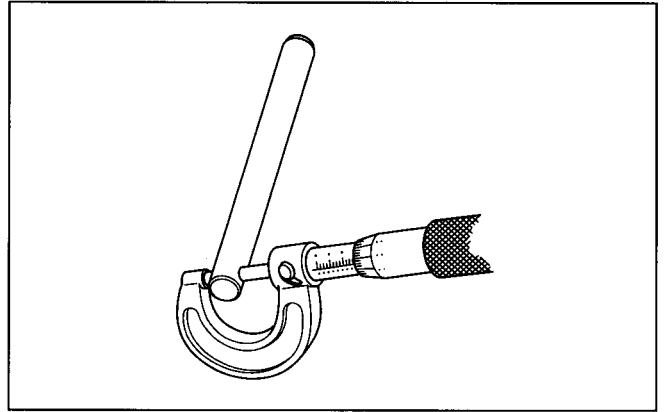
• ROCKER ARM I.D.

| Standard | Service limit |
|--|-------------------------|
| 4.005 – 4.025 mm (0.1577 – 0.1585 in) | 4.050 mm (0.1594 in) |



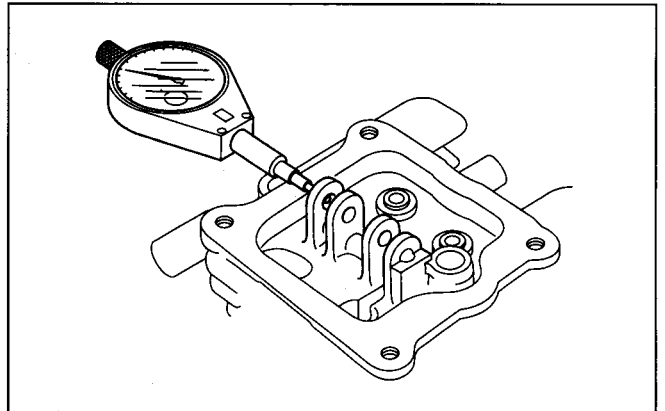
• ROCKER ARM SHAFT O.D.

| Standard | Service limit |
|--|-------------------------|
| 3.990 – 4.000 mm (0.1571 – 0.1575 in) | 3.950 mm (0.1555 in) |



• ROCKER ARM SHAFT BEARING I.D.

| Standard | Service limit |
|--|-------------------------|
| 4.000 – 4.018 mm (0.1575 – 0.1582 in) | 4.050 mm (0.1594 in) |



11. OIL CASE/CRANKSHAFT/CYLINDER BLOCK/PISTON/VALVE

HONDA BF20

1. OIL CASE/CRANKSHAFT

2. PISTON

3. VALVE/CYLINDER BLOCK

4. INSPECTION

1. OIL CASE/CRANKSHAFT

a. DISASSEMBLY/REASSEMBLY

[1]
5 x 23 (8)

REASSEMBLY:
Tighten diagonally in 2 or 3 steps to the specified torque.

7.5 N·m (0.75 kgf·m, 5.4 lbf·ft)

[2]
MARINE GREASE

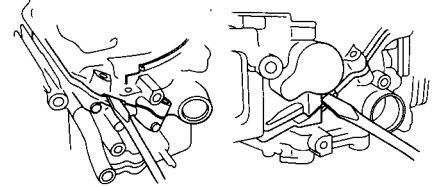
[3]
17 x 27 x 5 mm OIL SEAL

INSTALLATION: P. 11-2

[4]
OIL CASE

REMOVAL:

Insert a screwdriver into the concave in the position shown, and remove the oil case.



REASSEMBLY: P. 11-2

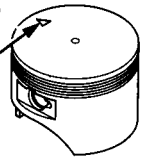
[5]
PISTON/CONNECTING ROD ASSEMBLY

DISASSEMBLY/REASSEMBLY:
P. 11-4

INSTALLATION:

- Install with the Δ mark on the head toward the IN side.
- Take care not to break the piston ring during installation.

[5]-1
 Δ MARK



[22]
CRANKSHAFT

INSPECTION: P. 11-8

[21]
CONNECTING ROD CAP

REASSEMBLY: P. 11-3

[20]
CONNECTING ROD BOLT (2)

6.0 N·m
(0.6 kgf·m, 4.3 lbf·ft)

[19]
6 x 15 mm DOWEL PIN (2)

[18]
CYLINDER BLOCK

INSPECTION: P. 11-6

[17]
BREATHER PIPE

[16]
4 x 10

ASSEMBLY:
Apply LOCKTITE® 638 to the thread.

[6] BREATHER FILTER

[7] 3 x 5 mm SCREW

[8] STOPPER PLATE

INSTALLATION: P. 11-3

[9] OIL OUTLET VALVE

INSTALLATION: P. 11-3

5 x 16

[10] OIL FILLER EXTENSION

[11] SEALING WASHER

[12]
OIL DRAIN BOLT

6.5 N·m
(0.65 kgf·m, 4.7 lbf·ft)

[13] GASKET

[14] OIL FILLER CAP

[15]
22.1 x 2.2 mm O-RING

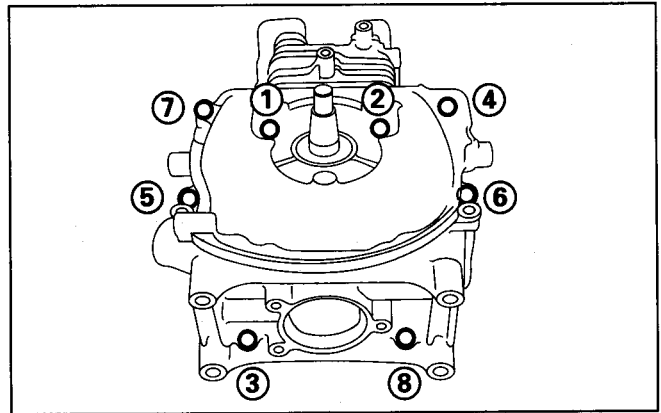
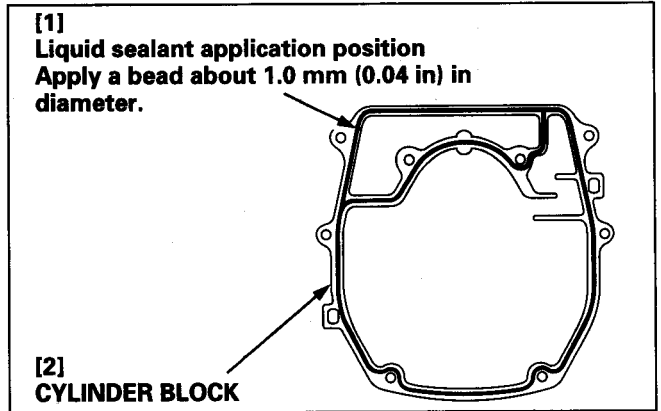
ASSEMBLY:
Do not reuse.

• OIL CASE ASSEMBLY

- 1) Clean the mating surfaces of the oil case and the cylinder block with a degreasing cleaning agent or a clean shop towel.
- 2) Install the two 6 x 15 mm dowel pins on the cylinder block.
- 3) Apply the liquid sealant (Three Bond 1216E or equivalent) to the mating surface of the cylinder block as shown.
- 4) Install the oil case on the cylinder block.
 - Assemble the oil case with the cylinder block within 3 minutes after application of the liquid sealant.
 - If it is hard to install the oil case properly, install by turning the crankshaft a little.
 - Take care not to damage the oil seal lip.
- 5) Loosely install the bolts, then tighten them to the specified torque in the numbered sequence shown.

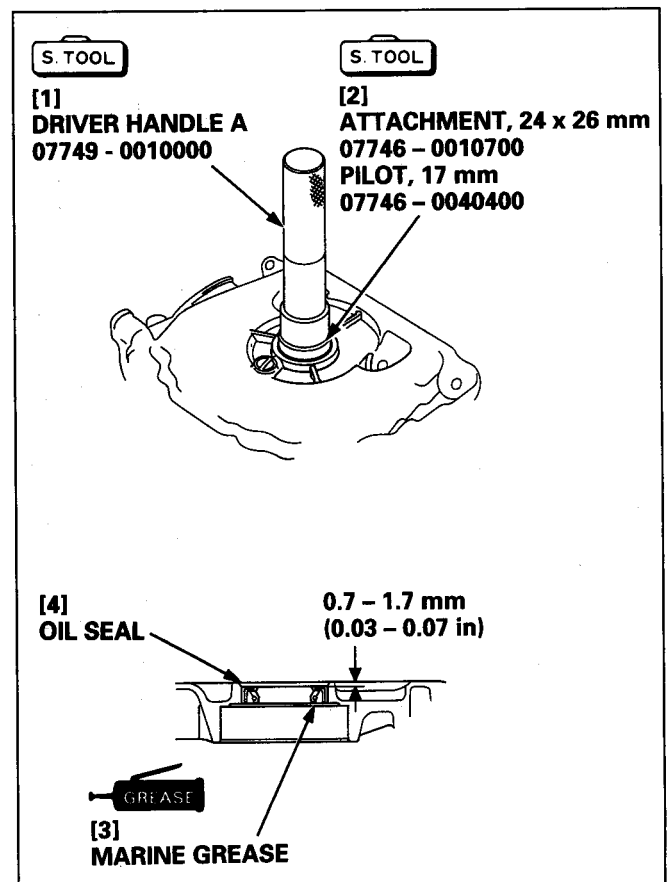
TORQUE: 7.5 N·m (0.75 kgf·m, 5.4 lbf·ft)

Wait for 30 minutes after assembly. Do not add oil or start the engine during this period.



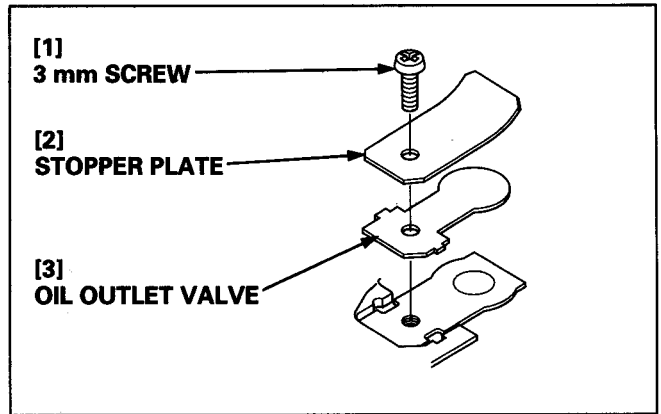
• OIL SEAL INSTALLATION

- 1) Drive in the oil seal to the depth shown using the special tools.
- 2) Apply marine grease to the oil seal lip.



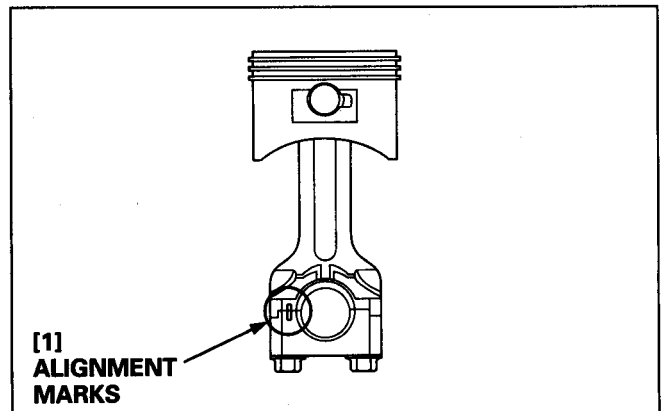
• BREATHER VALVE INSTALLATION

- 1) Clean the oil outlet valve, stopper plate and the valve installation section of the cylinder barrel.
- 2) Install the valve aligning the positioning projection and chamfer of the valve with the groove and chamfer of the cylinder barrel.
- 3) Install the stopper plate on the valve aligning the chamfered corner of the stopper plate with the chamfer of the cylinder barrel.
- 4) Tighten the 3 mm screw securely.



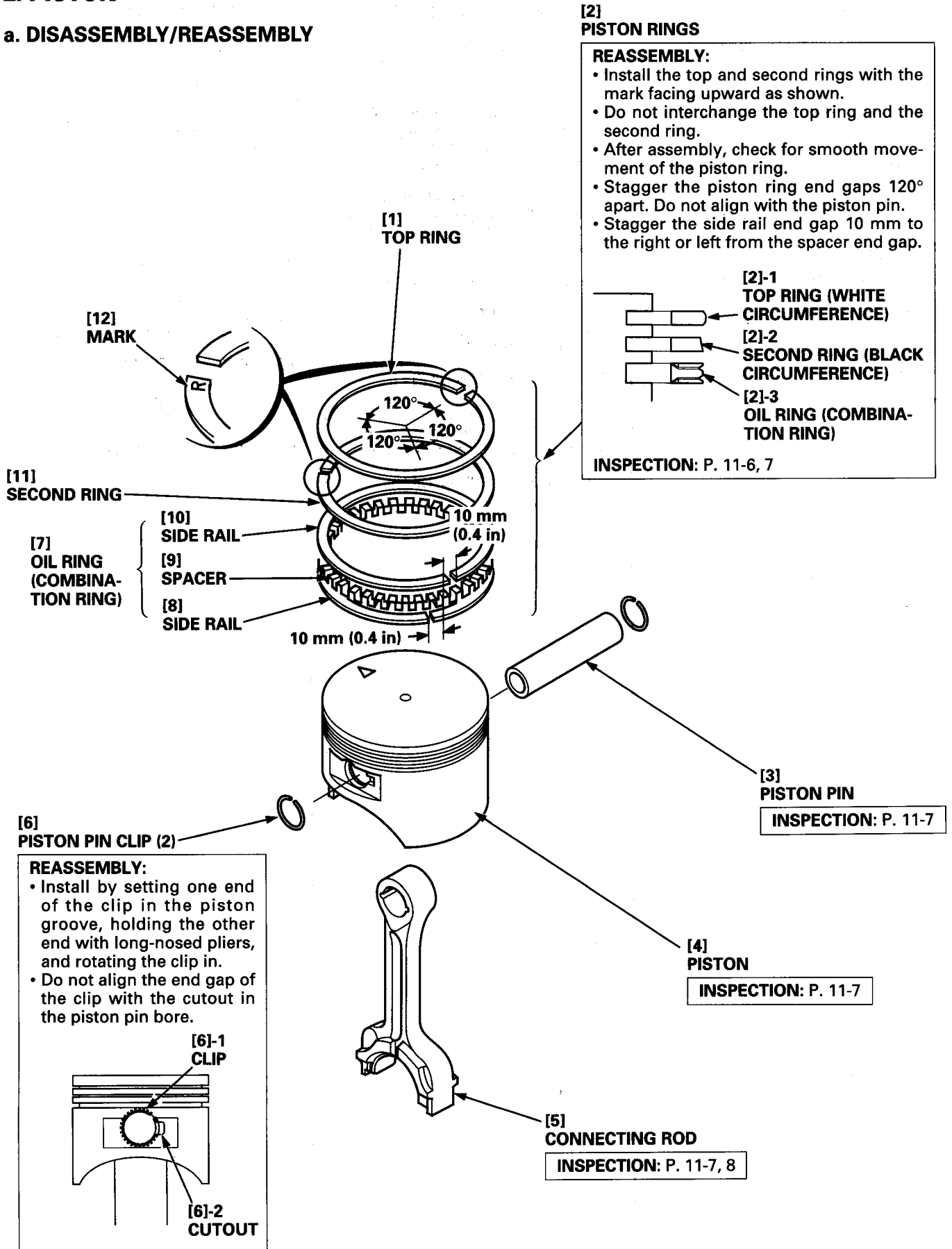
• CONNECTING ROD CAP

Install by aligning the alignment marks on the connecting rod big end and on the cap.



2. PISTON

a. DISASSEMBLY/REASSEMBLY



[2] PISTON RINGS

REASSEMBLY:

- Install the top and second rings with the mark facing upward as shown.
- Do not interchange the top ring and the second ring.
- After assembly, check for smooth movement of the piston ring.
- Stagger the piston ring end gaps 120° apart. Do not align with the piston pin.
- Stagger the side rail end gap 10 mm to the right or left from the spacer end gap.

[2]-1 TOP RING (WHITE CIRCUMFERENCE)

[2]-2 SECOND RING (BLACK CIRCUMFERENCE)

[2]-3 OIL RING (COMBINATION RING)

INSPECTION: P. 11-6, 7

[6] PISTON PIN CLIP (2)

REASSEMBLY:

- Install by setting one end of the clip in the piston groove, holding the other end with long-nosed pliers, and rotating the clip in.
- Do not align the end gap of the clip with the cutout in the piston pin bore.

[6]-1 CLIP

[6]-2 CUTOUT

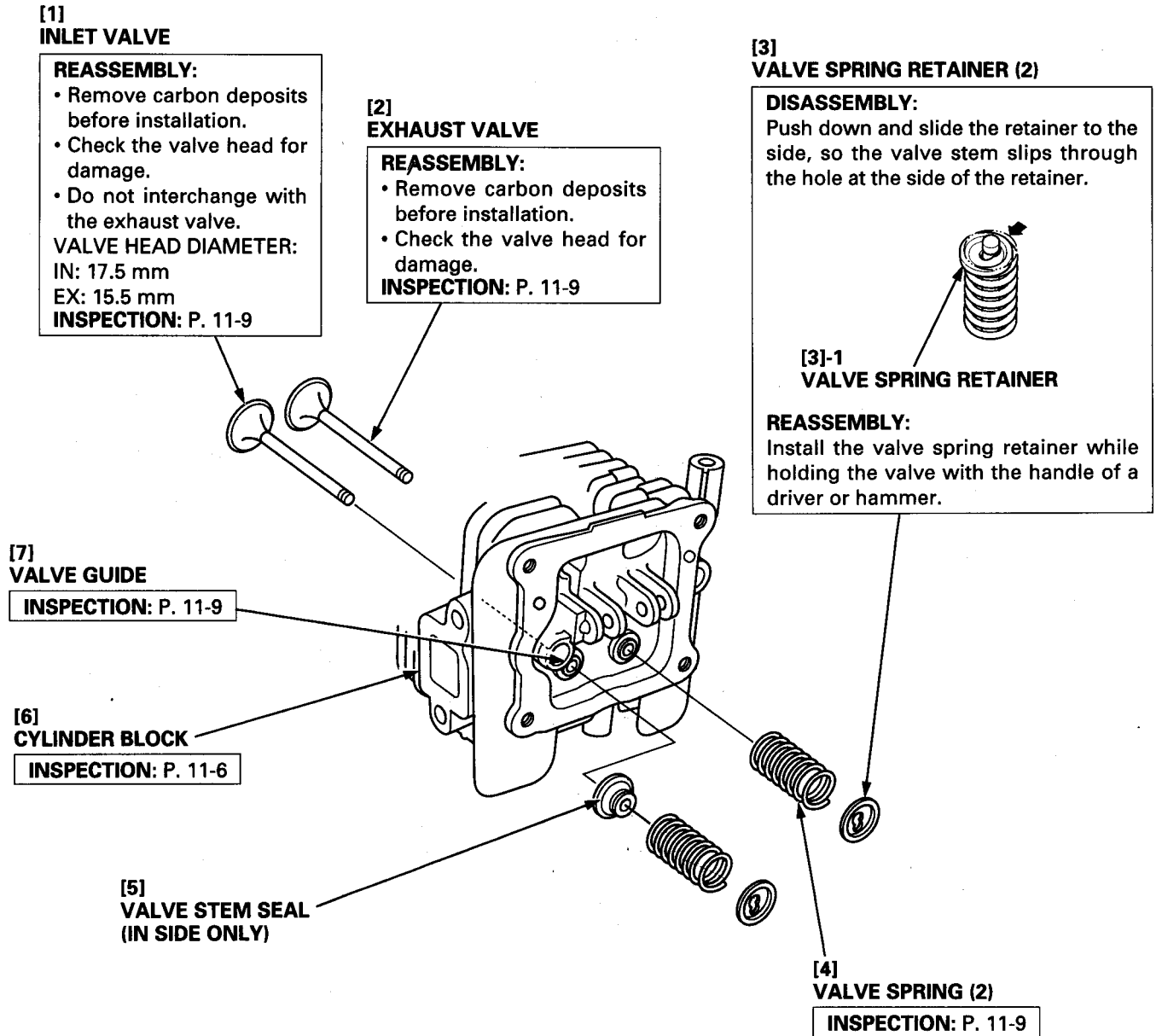
[3] PISTON PIN
INSPECTION: P. 11-7

[4] PISTON
INSPECTION: P. 11-7

[5] CONNECTING ROD
INSPECTION: P. 11-7, 8

3. VALVE/CYLINDER BLOCK

a. DISASSEMBLY/REASSEMBLY

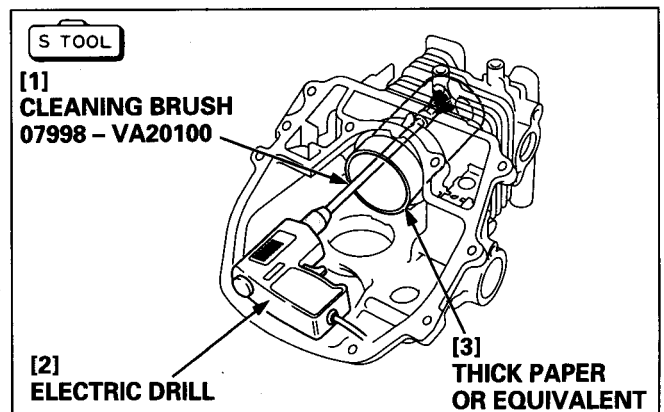


b. COMBUSTION CHAMBER CLEANING

CAUTION

- Be sure to insert a thick paper into the cylinder to protect the inner wall of the cylinder during cleaning.
- Do not press the cleaning brush with force against the combustion chamber.

- Prepare a protective lining of thick paper or equivalent material, with a diameter large enough to fit against the inner wall of the cylinder, and insert it into the cylinder.
- Attach a cleaning brush to an electric drill and clean the combustion chamber.

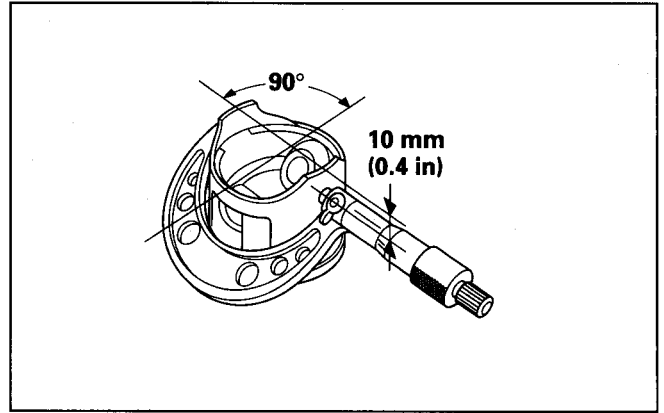


4. INSPECTION

• PISTON SKIRT O.D.

Measure and record the piston O.D. at a point 10 mm (0.4 in) from the bottom of the skirt and 90° to the piston pin bore.

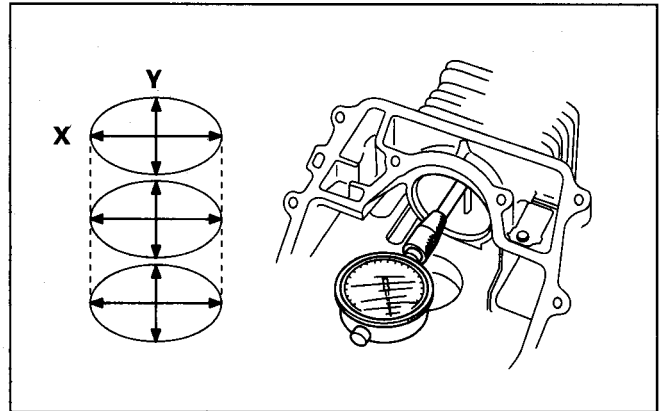
| Standard | Service limit |
|--|------------------------|
| 44.97 – 44.99 mm (1.770 – 1.771 in) | 44.90 mm (1.768 in) |



• CYLINDER SLEEVE I.D.

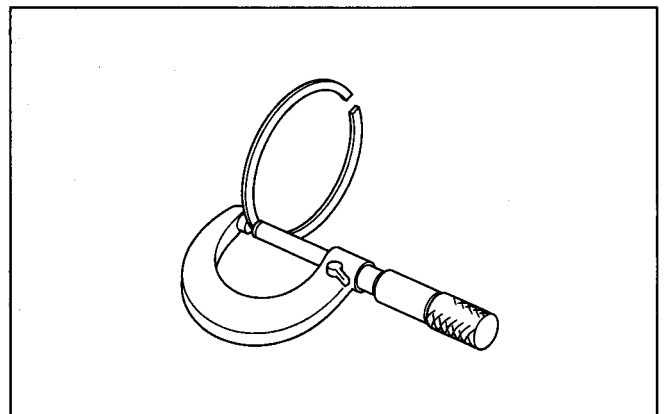
Measure and record the cylinder I.D. at three levels in both the "X" axis (parallel to piston pin) and the "Y" axis (perpendicular to piston pin). Take the maximum reading of each measurement to determine the cylinder I.D.

| Standard | Service limit |
|--|--------------------------|
| 45.000 – 45.015 mm (1.7717 – 1.7722 in) | 45.100 mm (1.7756 in) |



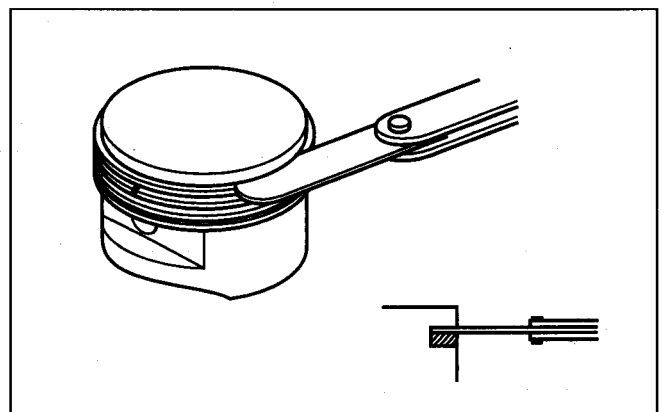
• PISTON-TO-CYLINDER CLEARANCE

| Standard | Service limit |
|--|-------------------------|
| 0.010 – 0.045 mm (0.0004 – 0.0018 in) | 0.120 mm (0.0047 in) |



• PISTON RING WIDTH

| | Standard | Service limit |
|------------|--------------------------------------|-------------------------|
| Top/Second | 0.97 – 0.99 mm (0.031 – 0.039 in) | 0.920 mm (0.0362 in) |



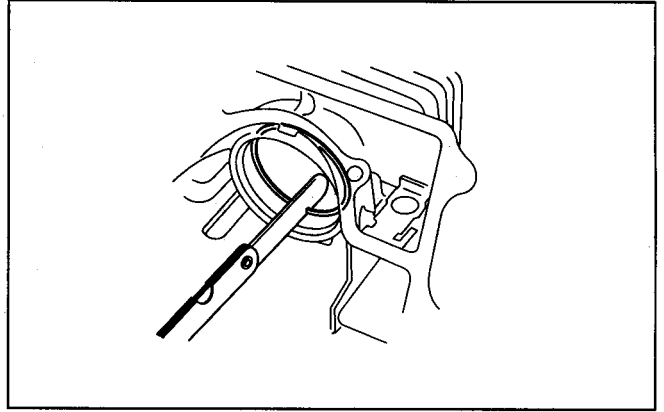
• RING SIDE CLEARANCE

| | Standard | Service limit |
|------------|--|-------------------------|
| Top/Second | 0.015 – 0.050 mm (0.0006 – 0.0020 in) | 0.120 mm (0.0047 in) |

• PISTON RING END GAP

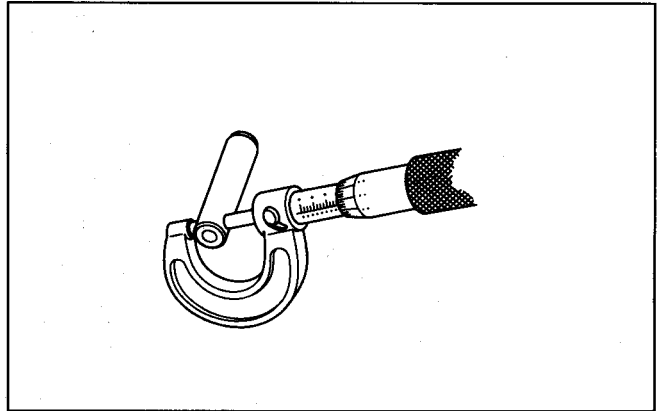
Use the top of the piston to position the ring horizontally in the cylinder, and measure the piston ring end gap.

| | Standard | Service limit |
|--------|--|-------------------------|
| Top | 0.100 – 0.250 mm (0.0039 – 0.0098 in) | 0.600 mm (0.0236 in) |
| Second | 0.250 – 0.400 mm (0.0098 – 0.0157 in) | 0.600 mm (0.0236 in) |



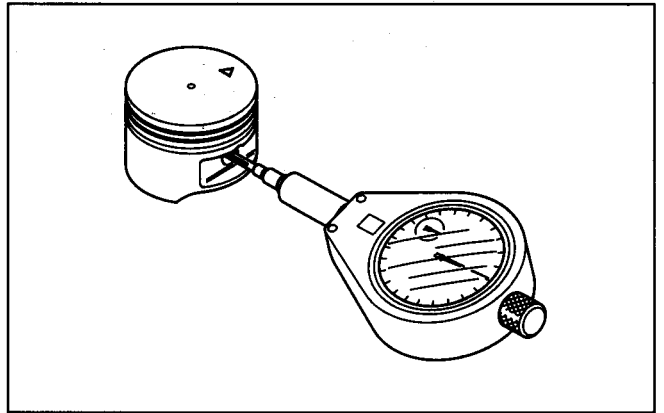
• PISTON PIN O.D.

| Standard | Service limit |
|---|-------------------------|
| 9.994 – 10.000 mm (0.3935 – 0.3937 in) | 9.950 mm (0.3917 in) |



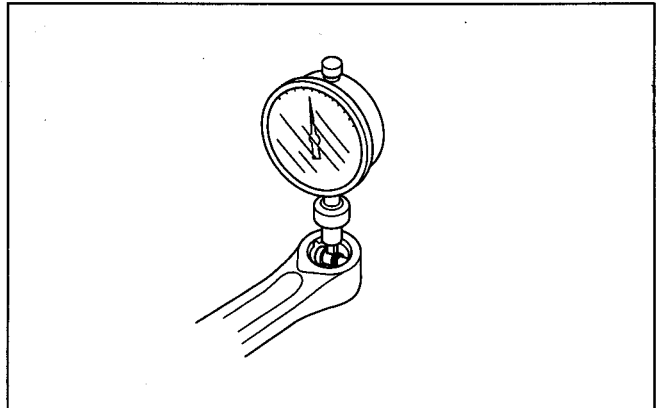
• PISTON PIN BORE I.D.

| Standard | Service limit |
|--|--------------------------|
| 10.002 – 10.008 mm (0.3938 – 0.3940 in) | 10.050 mm (0.3957 in) |



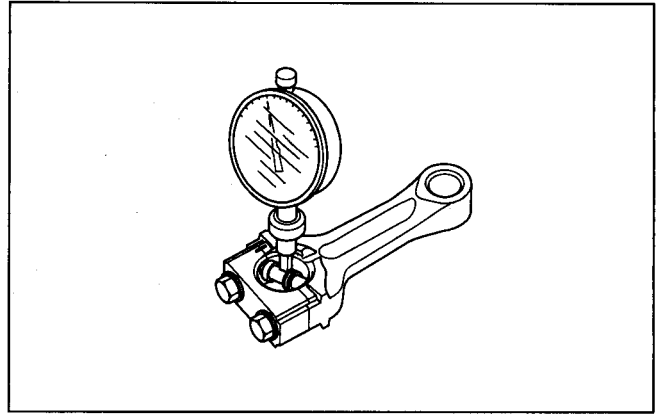
• CONNECTING ROD SMALL END I.D.

| Standard | Service limit |
|--|--------------------------|
| 10.006 – 10.017 mm (0.3939 – 0.3944 in) | 10.050 mm (0.3957 in) |



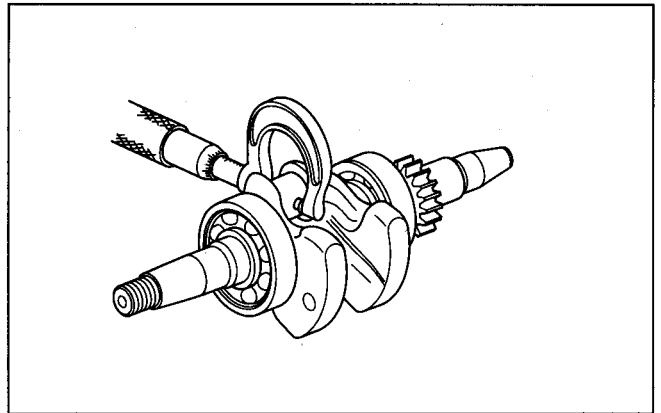
• CONNECTING ROD BIG END I.D.

| Standard | Service limit |
|--|--------------------------|
| 15.000 – 15.011 mm (0.5906 – 0.5910 in) | 15.040 mm (0.5921 in) |



• CRANK PIN O.D.

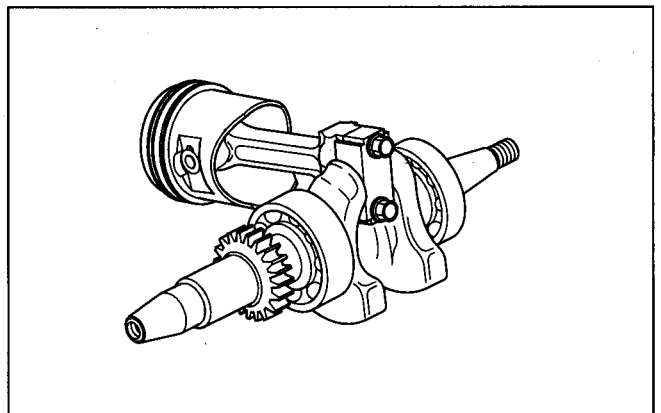
| Standard | Service limit |
|--|--------------------------|
| 14.973 – 14.984 mm (0.5895 – 0.5899 in) | 14.940 mm (0.5882 in) |



• CONNECTING ROD BIG END OIL CLEARANCE

- 1) Clean the crank pin and the connecting rod big end.
- 2) Set the plastigauge in the axial direction on the crank pin.
- 3) Install the connecting rod and connecting rod cap. Hold the crankshaft not to turn and tighten the connecting rod bolt to the specified torque.

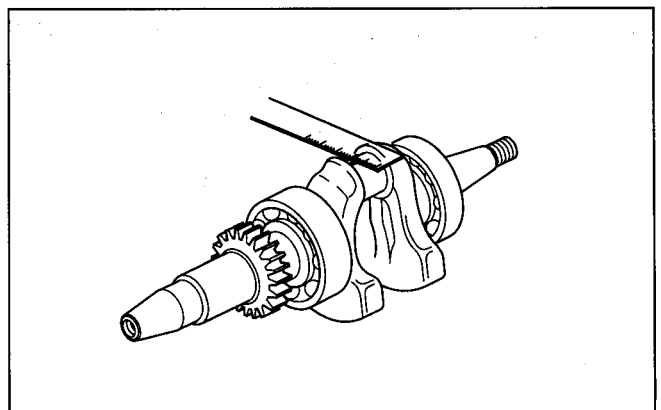
TORQUE: 5.9 N·m (0.6 kgf·m)



- 4) Remove the connecting rod cap and measure the plastigauge with the plastigauge scale.

| Standard | Service limit |
|--|-------------------------|
| 0.016 – 0.038 mm (0.0006 – 0.0015 in) | 0.100 mm (0.0039 in) |

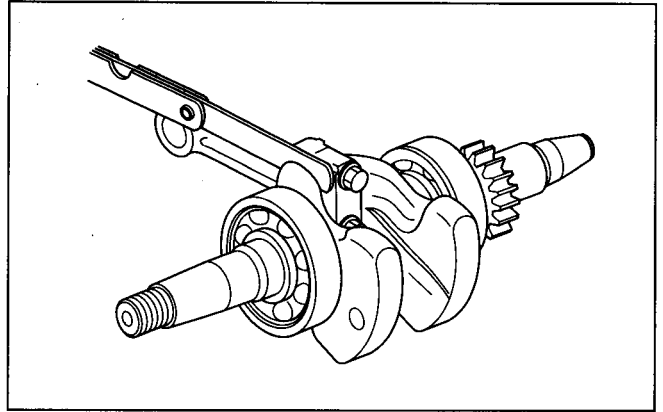
- 5) If the measurement exceeds the service limit, replace the connecting rod and recheck the clearance. If the clearance, measured by using a new connecting rod, exceeds the service limit, replace the crankshaft.



• CONNECTING ROD BIG END SIDE CLEARANCE

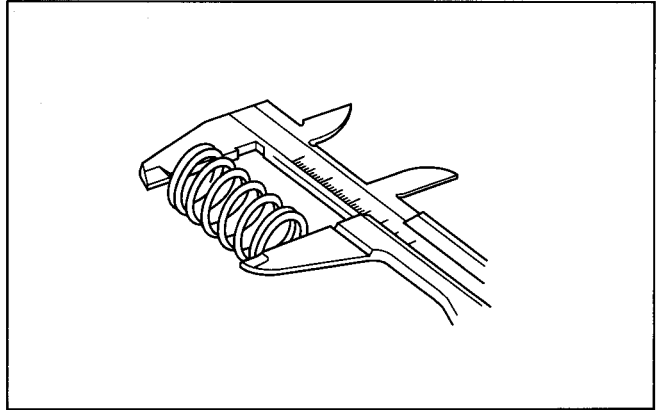
Measure the clearance using a feeler gauge.

| Standard | Service limit |
|------------------------------------|----------------------|
| 0.1 – 0.6 mm (0.004 – 0.024 in) | 0.8 mm (0.031 in) |



• VALVE SPRING FREE LENGTH

| Standard | Service limit |
|----------------------|----------------------|
| 23.7 mm (0.93 in) | 22.8 mm (0.90 in) |



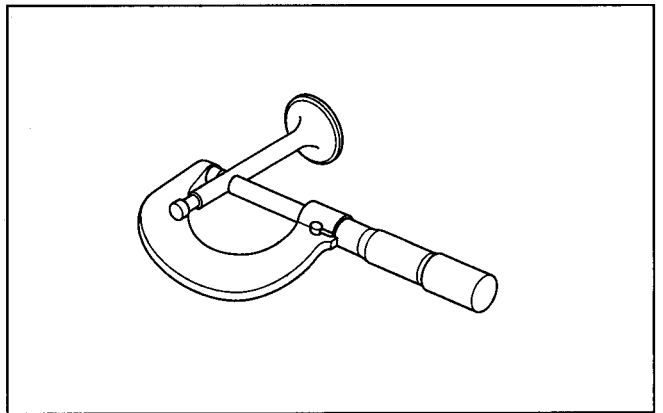
• VALVE STEM O.D.

Inspect each valve face for pitting or wear irregularities.
Inspect each valve stem for bending or abnormal stem wear.

Insert the valve into the valve guide and check for operation.

Measure the valve stem O.D. at the sliding surface of the valve guide.

| | Standard | Service limit |
|----|---|-------------------------|
| IN | 3.970 – 3.985 mm (0.15623 – 0.1569 in) | 3.900 mm (0.1535 in) |
| EX | 3.935 – 3.950 mm (0.1549 – 0.1555 in) | 3.880 mm (0.1528 in) |



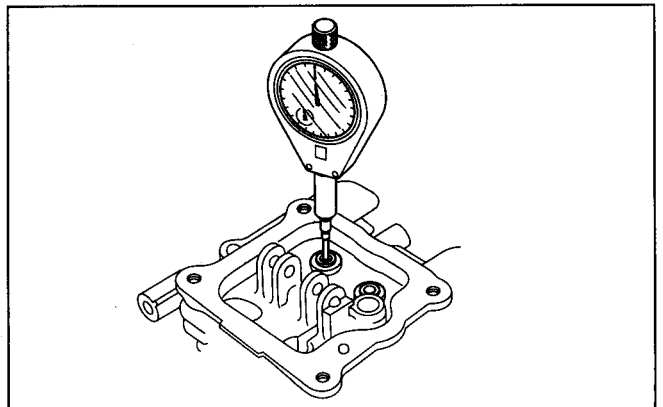
• VALVE GUIDE I.D.

| | Standard | Service limit |
|-------|--|-------------------------|
| IN/EX | 4.000 – 4.018 mm (0.1575 – 0.1582 in) | 4.060 mm (0.1598 in) |

If the measurement exceeds the service limit, replace the cylinder barrel.

• VALVE STEM-TO-GUIDE CLEARANCE

| | Standard | Service limit |
|----|--|-------------------------|
| IN | 0.015 – 0.048 mm (0.0006 – 0.0019 in) | 0.098 mm (0.0039 in) |
| EX | 0.050 – 0.083 mm (0.0020 – 0.0033 in) | 0.120 mm (0.0039 in) |

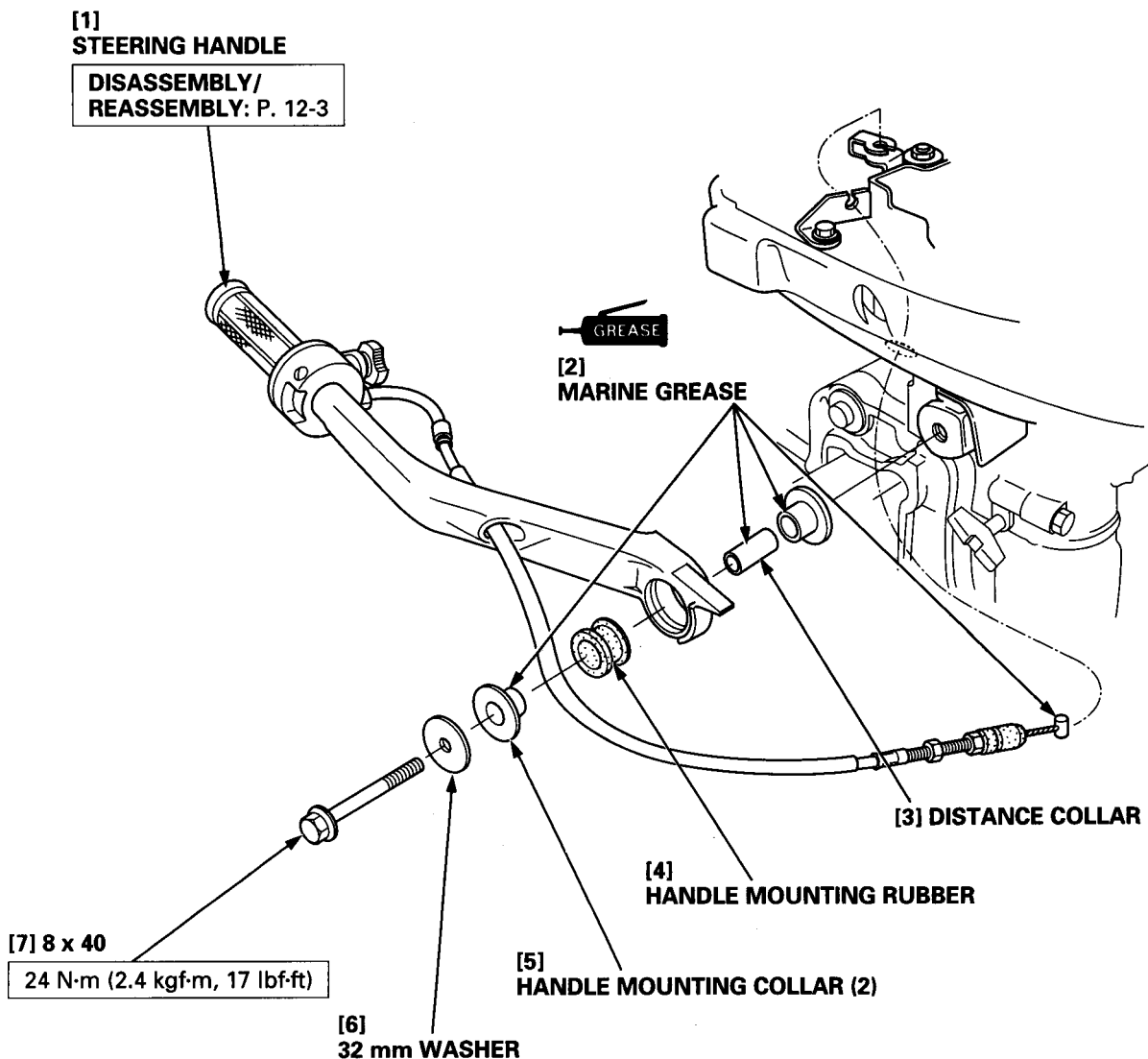
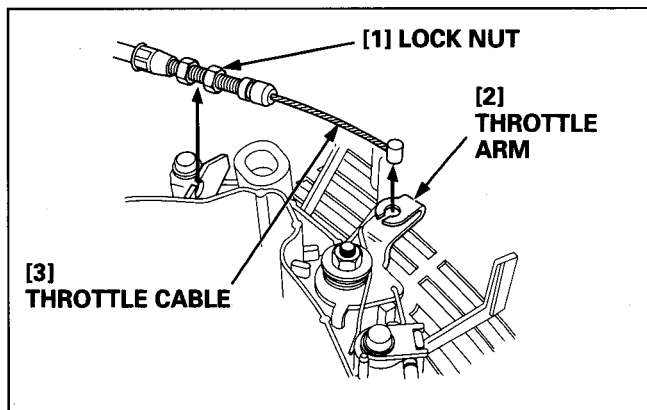


1. STEERING HANDLE

1. STEERING HANDLE

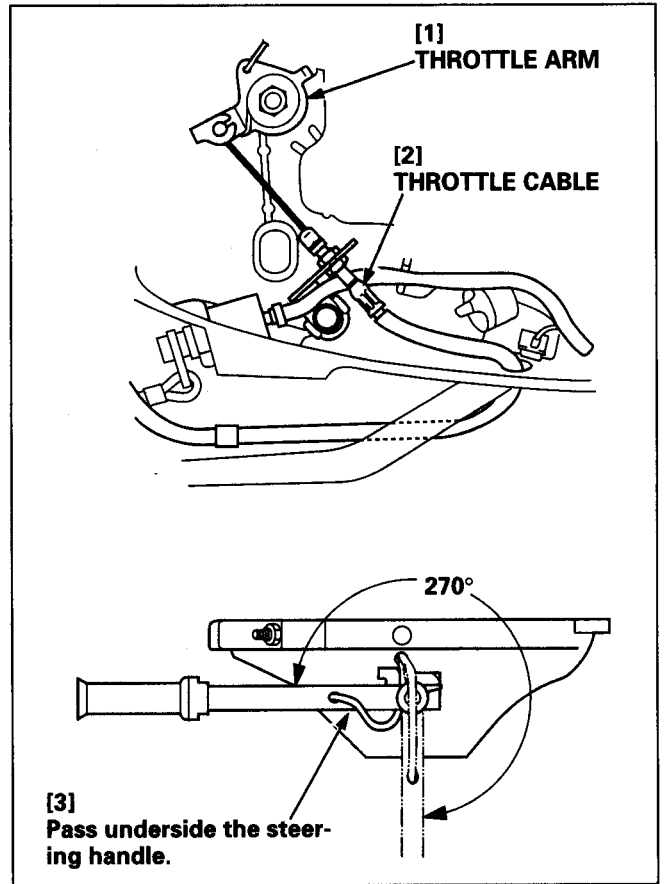
a. REMOVAL/INSTALLATION

- 1) Remove the engine cover (P. 4-1).
- 2) SH, LH, SCH, LCH type only:
 - Remove the fuel tank (P. 4-2).
 - Loosen the lock nut and disconnect the throttle cable from the throttle arm.
 - After installation, adjust the throttle cable (P. 3-6).



• THROTTLE CABLE INSTALLATION (SH, LH, SCH, LCH Type only)

- 1) Pass the throttle cable in the position shown. Connect the throttle cable to the throttle lever and set it at the cable holder.
- 2) Adjust the throttle cable (P. 3-6).
- 3) Turn the steering handle 270° and check the throttle cable for interference with the surrounding parts. Be sure that the cable is not pulled taut or excessively slack.



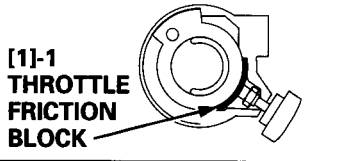
b. DISASSEMBLY/REASSEMBLY

• SH, LH, SCH, LCH TYPE

[1] THROTTLE FRICTION BLOCK

REASSEMBLY:

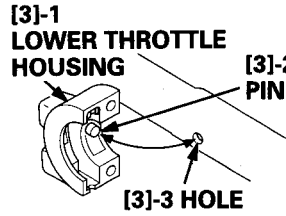
Set in the groove in the throttle housing securely. Be sure that the block is not off in the groove in the housing.



[3] LOWER THROTTLE HOUSING

REASSEMBLY:

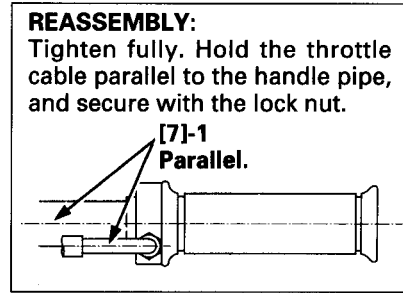
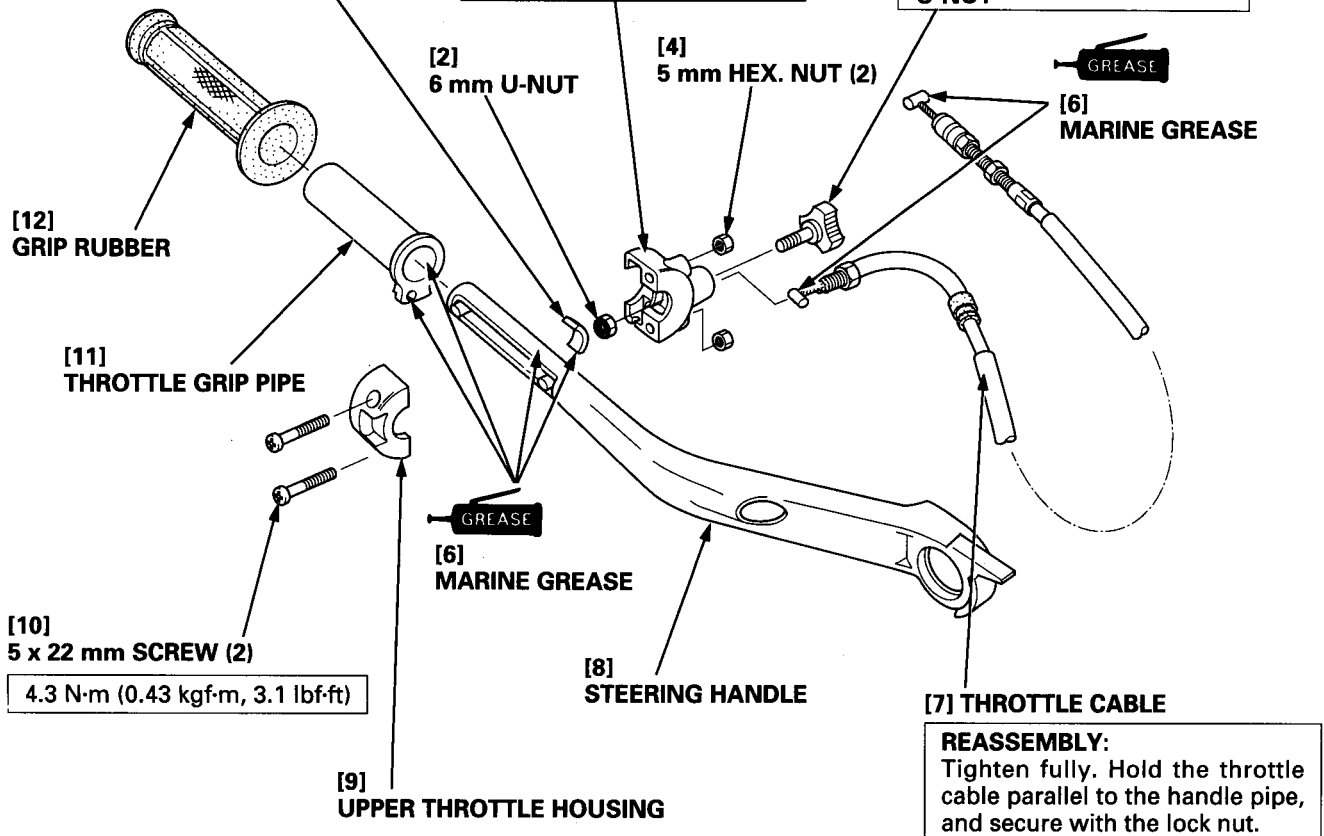
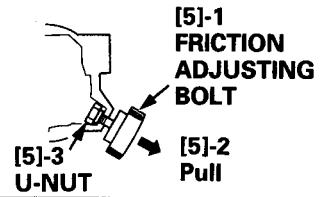
Install the lower throttle housing by aligning the pin of the housing with the hole in the handle pipe.



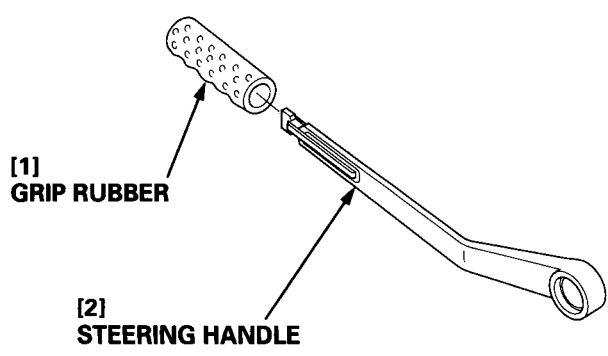
[5] FRICTION ADJUSTING BOLT

REASSEMBLY:

Install the U-nut in the direction shown and screw it in 2 - 3 turns. Then pull the adjusting bolt fully.



• S, L, SC, LC TYPE



13. CLUTCH HOUSING/ENGINE UNDER CASE/EXHAUST PIPE

HONDA
BF20

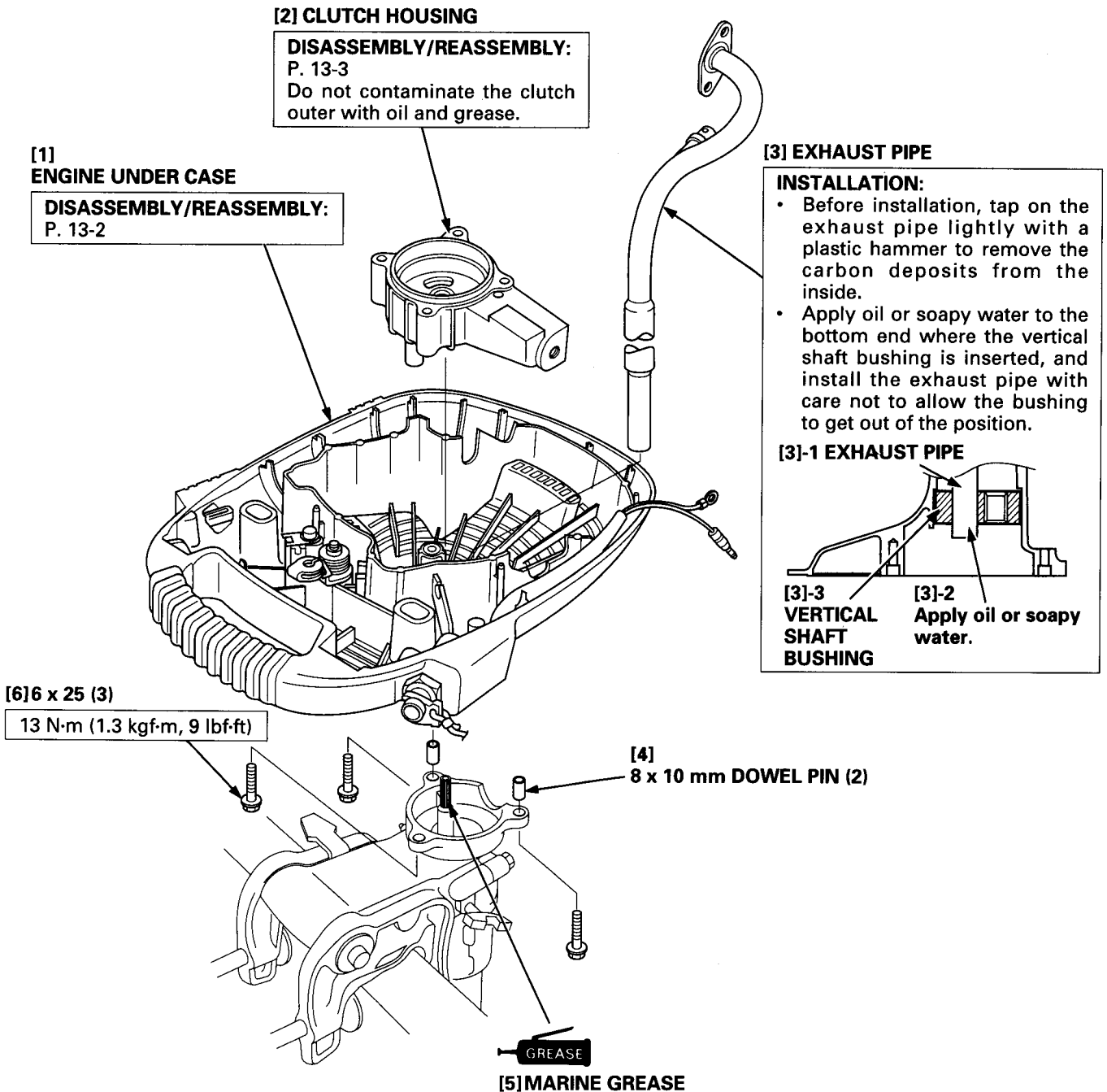
1. ENGINE UNDER CASE/EXHAUST PIPE

2. CLUTCH HOUSING

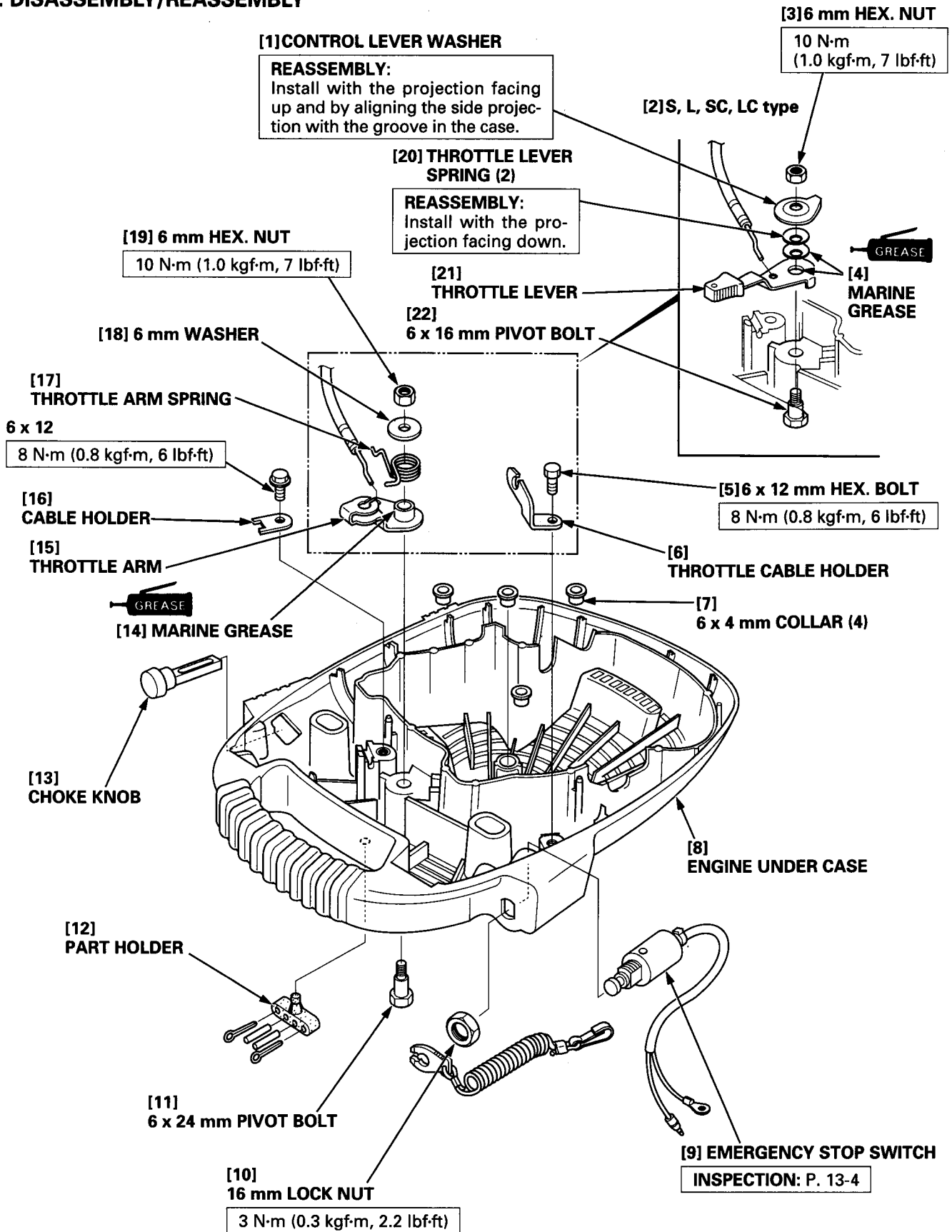
1. ENGINE UNDER CASE/EXHAUST PIPE

a. REMOVAL/INSTALLATION

- 1) Remove the engine (P. 6-1).
- 2) Remove the steering handle (P. 12-1).



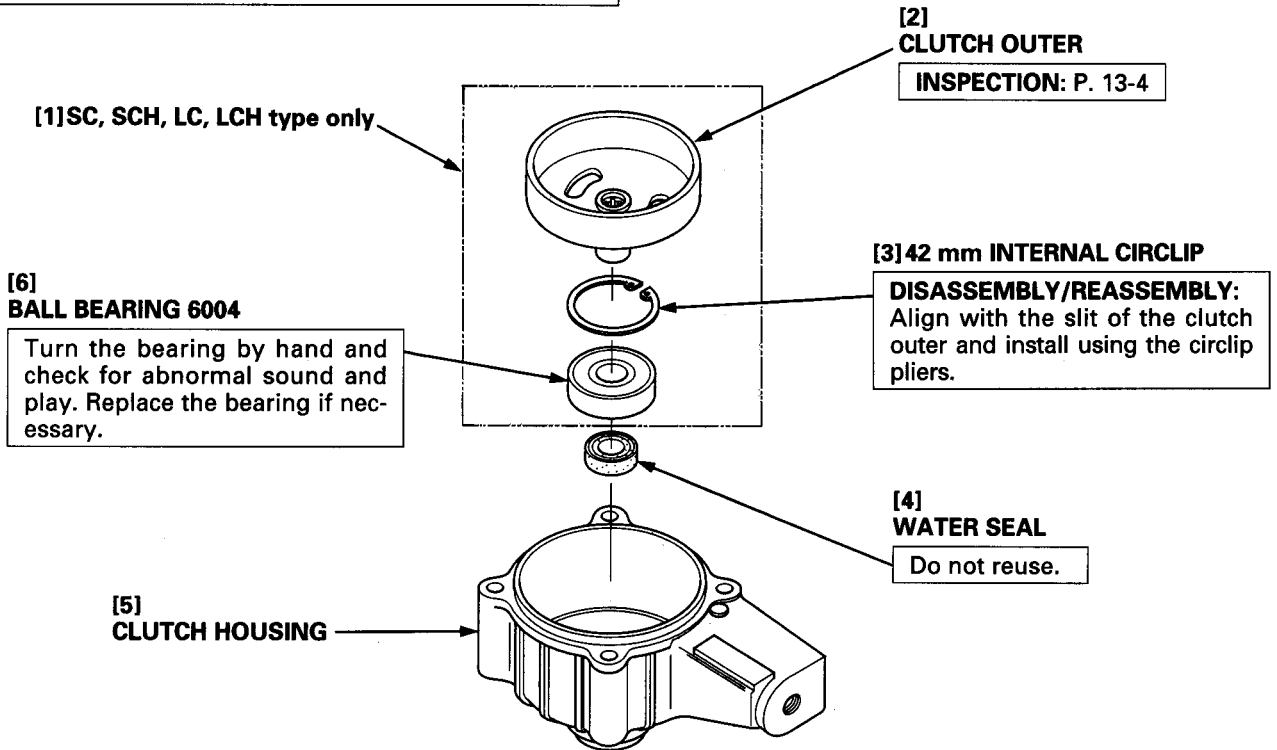
b. DISASSEMBLY/REASSEMBLY



2. CLUTCH HOUSING

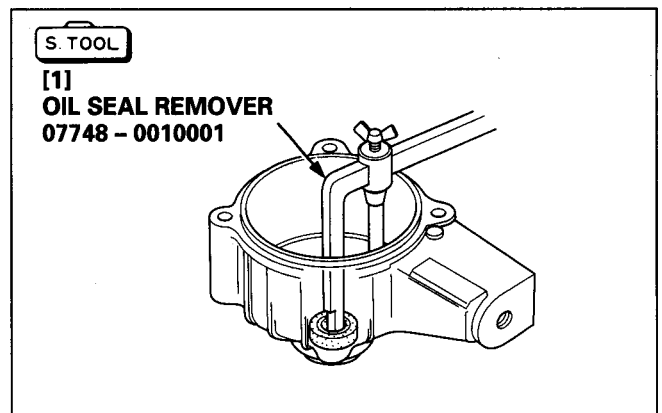
CAUTION

Do not contaminate the clutch outer with oil and grease.



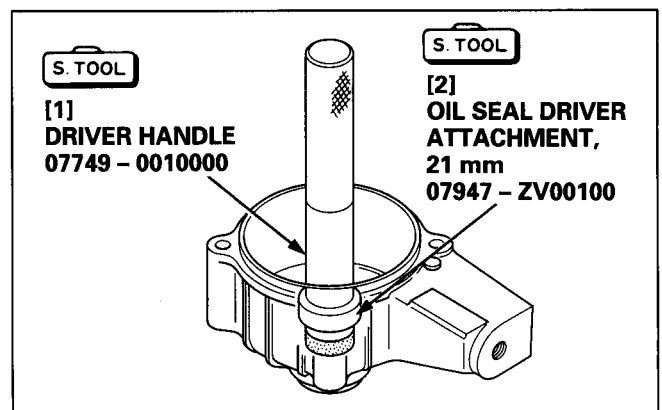
• WATER SEAL REPLACEMENT

1) Remove the water seal using the special tool.



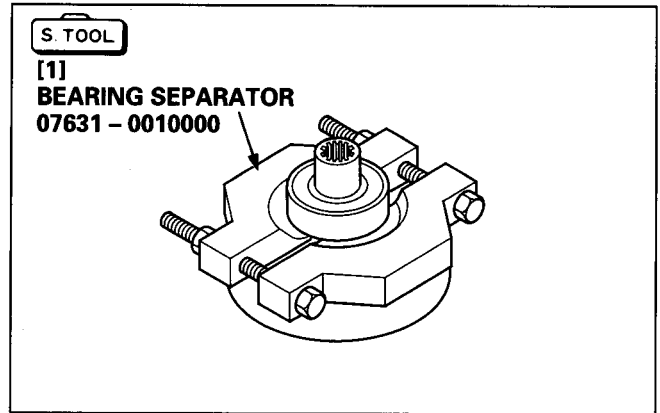
2) Install a new oil seal using the special tools.

3) Apply marine grease to the water seal lip.

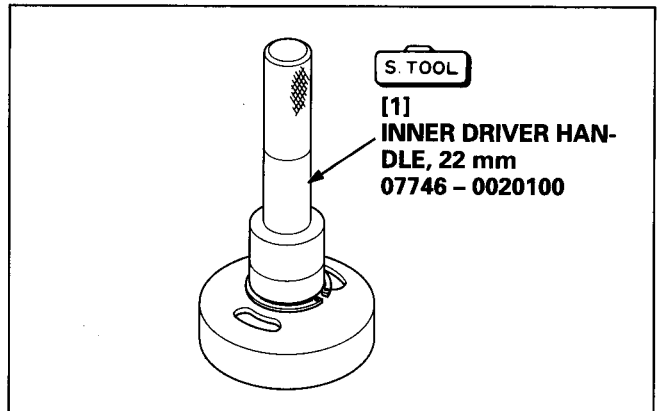


• BALL BEARING 6004 REPLACEMENT (SC, SCH, LC, LCH type only)

- 1) Remove the 42 mm circlip out of the hole in the clutch outer, and remove the clutch outer.
- 2) Remove the bearing using the special tool.



- 3) Install the 42 mm circlip on the clutch outer. Install with the press sagging facing the bearing.
- 4) Install a new bearing using the special tool.

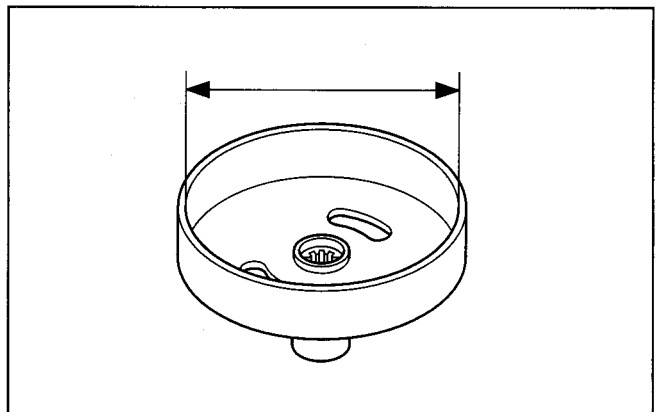


c. INSPECTION

• CLUTCH OUTER (SC, SCH, LC, LCH type only)

Measure the clutch outer I.D.

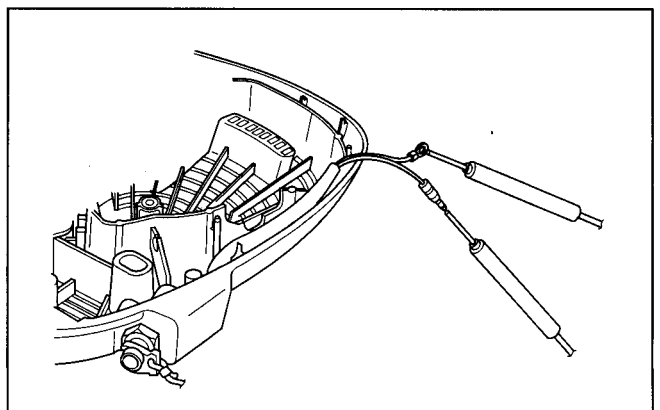
| Standard | Service limit |
|--|-------------------|
| 78.00 – 78.25 mm (3.071 – 3.081 in) | 78.5 mm (3.09 in) |



• EMERGENCY STOP SWITCH

Check for continuity between the terminals.

- There must be no continuity with the clip installed.
- There must be continuity when the switch is pushed with the clip installed.
- There must be continuity with the clip removed.



14. STERN BRACKET/EXTENSION CASE

HONDA
BF2D

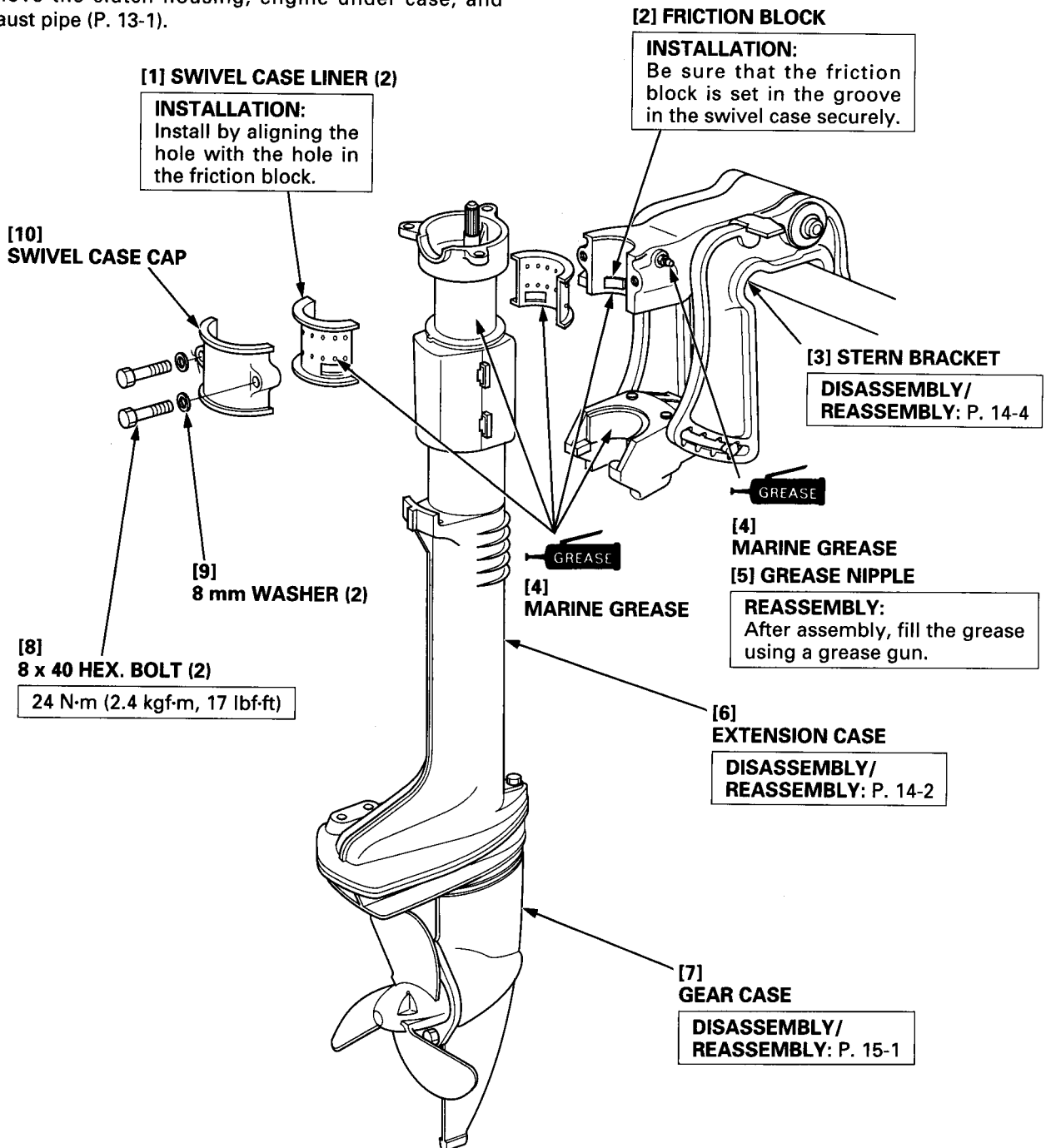
1. EXTENSION CASE

2. STERN BRACKET

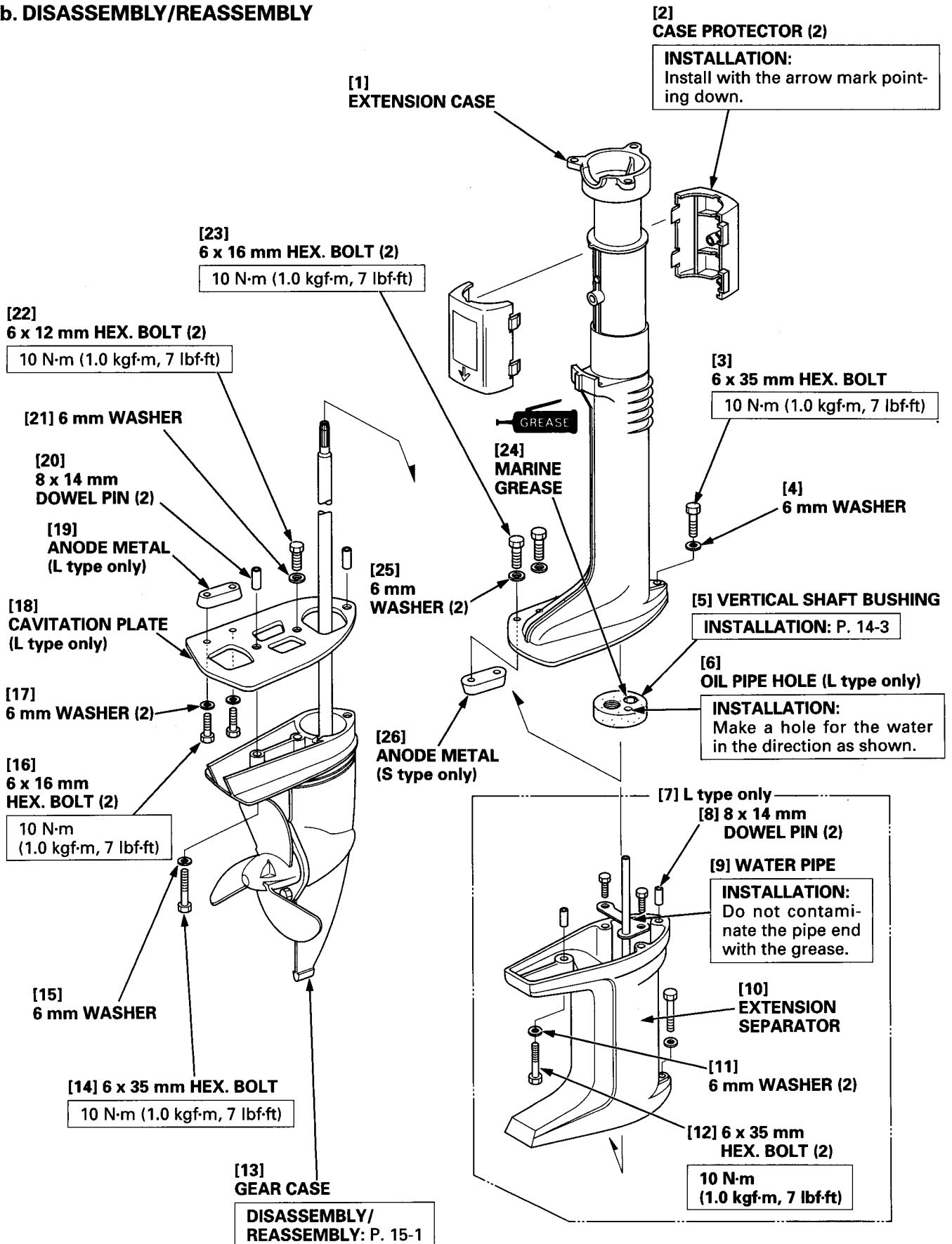
1. EXTENSION CASE

a. REMOVAL/INSTALLATION

- 1) Remove the engine (P. 6-1).
- 2) Remove the clutch housing, engine under case, and exhaust pipe (P. 13-1).

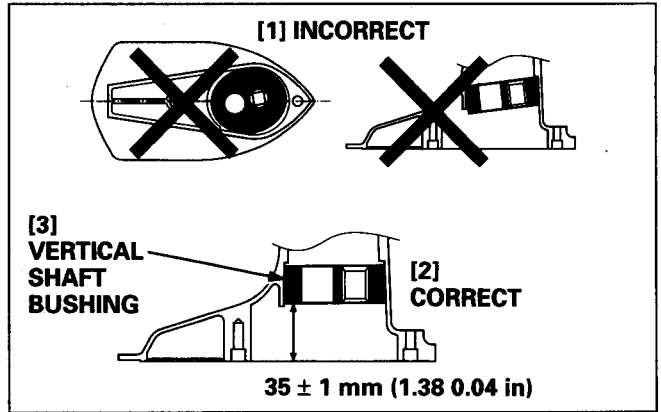


b. DISASSEMBLY/REASSEMBLY



• VERTICAL SHAFT BUSHING INSTALLATION

- 1) Clean and degrease the extension case installation part and the outer surface of the bushing.
- 2) Apply water to the outer surface of the bushing, and push the bushing into the extension case from the bottom until it stops.
- 3) Be sure that the bushing is not inclined and is not offset but is set properly.
- 4) Apply marine grease to the vertical shaft bushing.



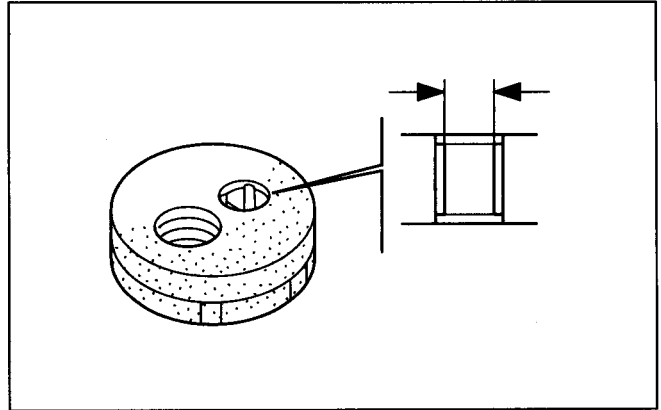
c. INSPECTION

• VERTICAL SHAFT BUSHING I.D.

| Standard | Service limit |
|--|------------------------|
| 11.15 – 11.20 mm (0.439 – 0.441 in) | 11.70 mm (0.461 in) |

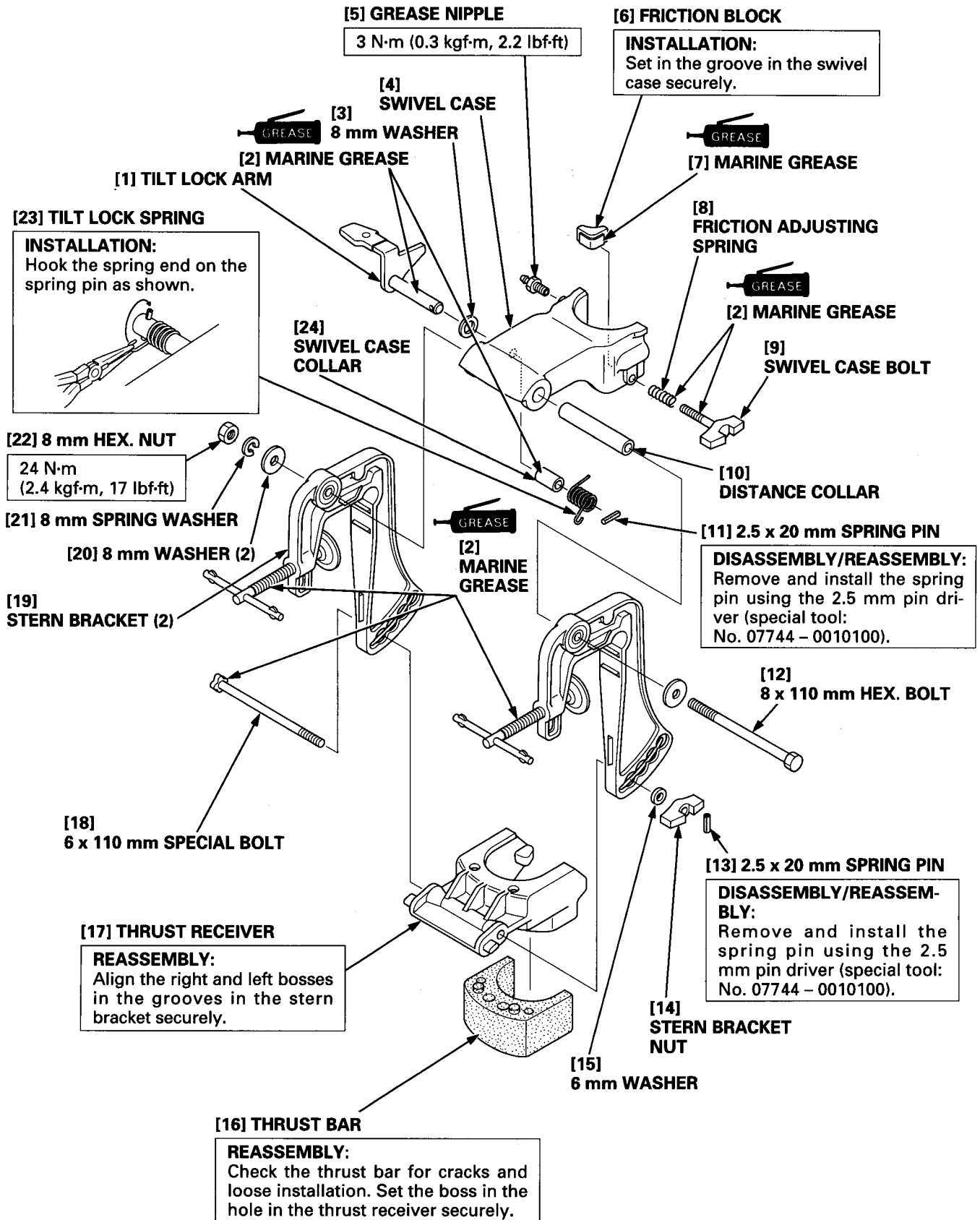
• VERTICAL SHAFT-TO-BUSHING CLEARANCE

| Standard | Service limit |
|--------------------------------------|---------------|
| 0.16 – 0.23 mm (0.006 – 0.009 in) | — — |



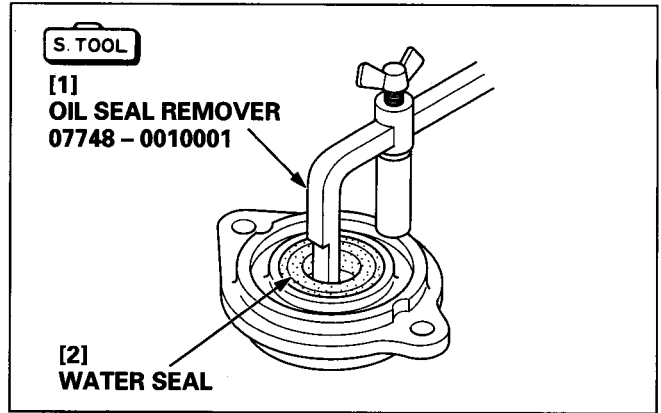
2. STERN BRACKET

a. DISASSEMBLY/REASSEMBLY



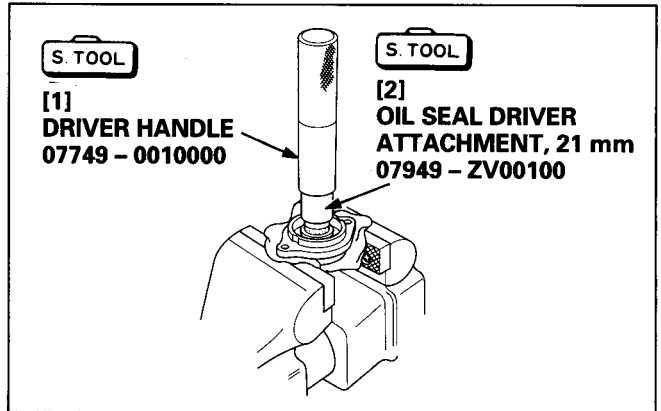
• WATER SEAL REPLACEMENT

1) Remove the water seal using the special tool.



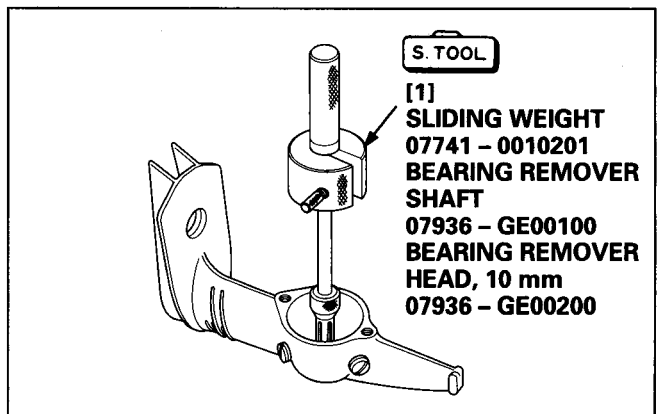
2) Install a new water seal using the special tools.

3) Fill the water seal lip with marine grease.

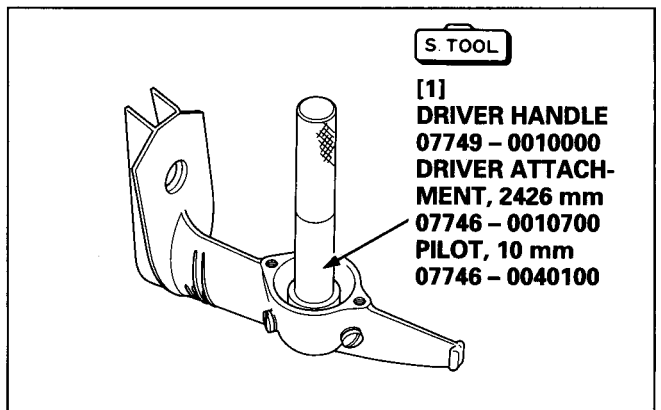


• BALL BEARING REPLACEMENT

1) Remove the bearing using the special tools.



2) Install a new bearing using the special tools.



b. INSPECTION

• PROPELLER SHAFT O.D.

Measure the O.D. at the holder.

| Standard | Service limit |
|--|--------------------------|
| 10.973 – 10.984 mm (0.4320 – 0.4324 in) | 10.930 mm (0.4303 in) |

• PROPELLER SHAFT HOLDER I.D.

Measure the propeller shaft holder I.D.

| Standard | Service limit |
|--|--------------------------|
| 11.000 – 11.018 mm (0.4331 – 0.4338 in) | 11.060 mm (0.4354 in) |

• PROPELLER SHAFT-TO-HOLDER CLEARANCE

Calculate the clearance between the propeller shaft and holder.

| Standard | Service limit |
|--|---------------|
| 0.016 – 0.045 mm (0.0006 – 0.0018 in) | — — |

• VERTICAL SHAFT O.D.

Measure the O.D. at the gear case and the vertical shaft bushing.

| | Standard | Service limit |
|-----------|--|-------------------------|
| Gear case | 10.970 – 10.990 mm (0.4319 – 0.4327 in) | 10.930 mm 0.4303 in) |
| Bushing | 10.970 – 10.990 mm (0.4319 – 0.4327 in) | 10.930 mm 0.4303 in) |

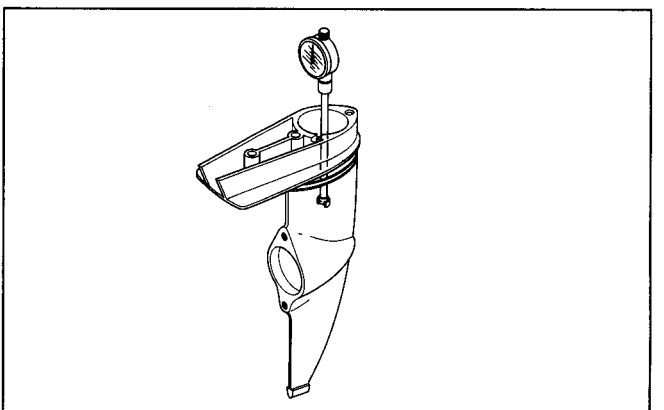
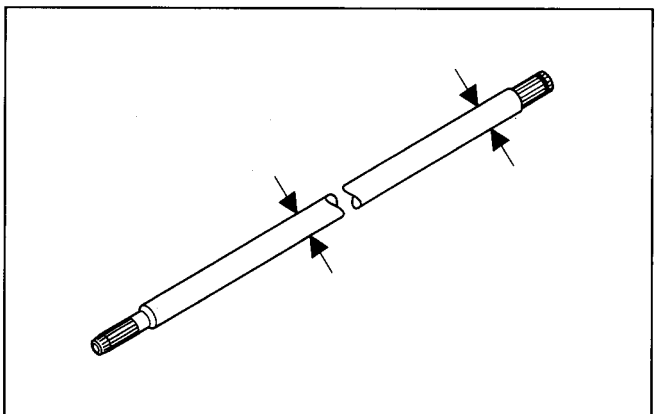
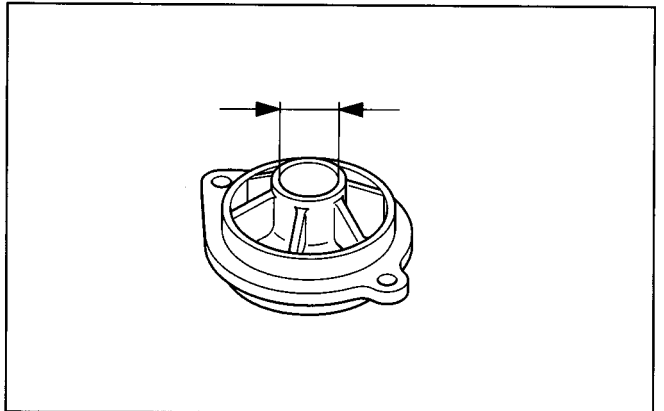
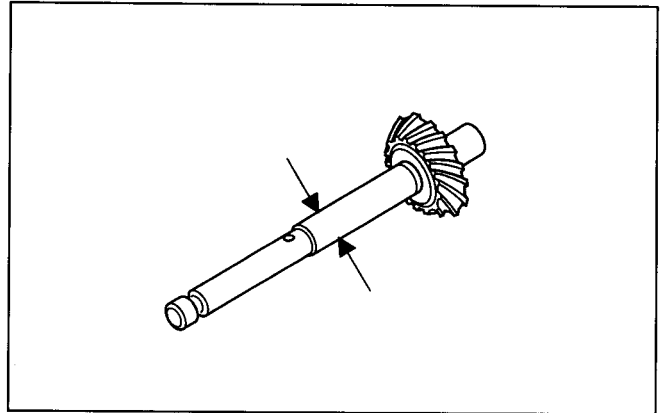
• GEAR CASE I.D.

| Standard | Service limit |
|--|--------------------------|
| 11.000 – 11.018 mm (0.4331 – 0.4338 in) | 11.060 mm (0.4354 in) |

• VERTICAL SHAFT-TO-GEAR CASE CLEARANCE

Calculate the clearance between the vertical shaft and gear case.

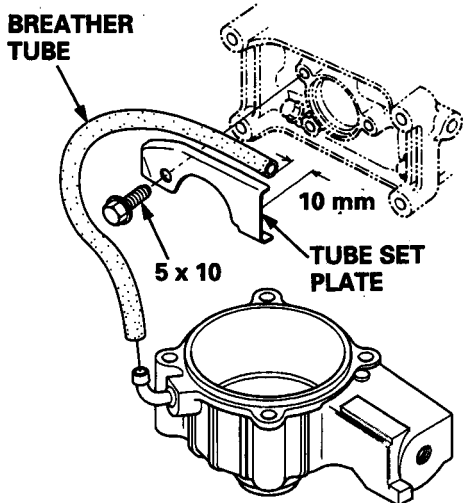
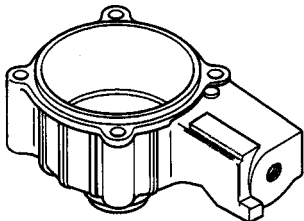
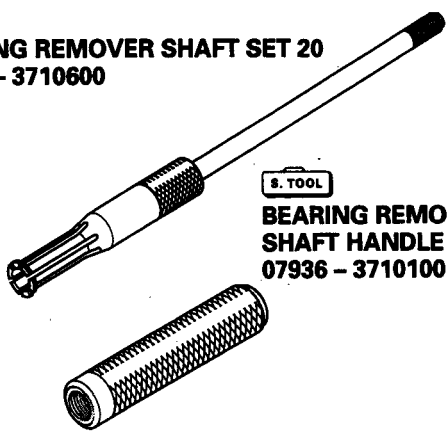
| Standard | Service limit |
|--|---------------|
| 0.010 – 0.048 mm (0.0004 – 0.0019 in) | — — |



SOME PARTS OF CHANGES

| Applicable Information | Engine Serial No. | Publication No. | Applicable Pages |
|------------------------|-------------------------------|-----------------|---------------------------|
| BF2D | BEBF - 1026044 and subsequent | 66ZW600 | 1-1, 2-7, 3-4, 10-1, 13-3 |

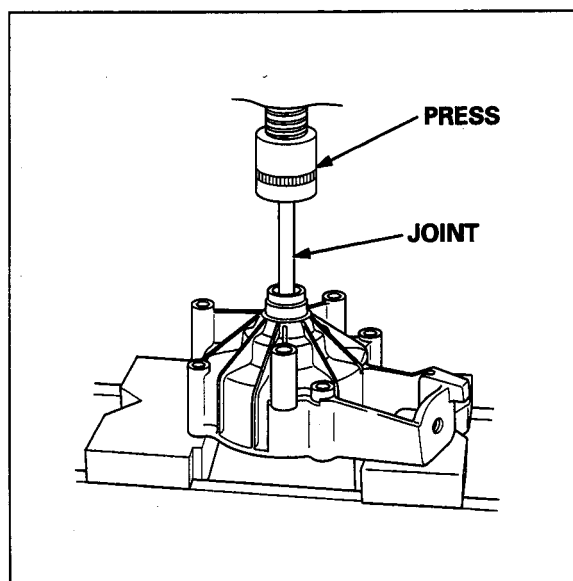
CHANGE LOCATIONS

| Item | After Modification | Before Modification |
|----------------|--|--|
| Spark Plugs | U14FSR-UB (DENSO) CR4HSB (NGK) | U16FSR-UB (DENSO) CR5HSB (NGK) |
| Clutch Housing |  <p>BREATHER TUBE</p> <p>10 mm</p> <p>5 x 10</p> <p>TUBE SET PLATE</p> <p>Install the breather tube with its tube set plate end 10 mm(0.4 in) apart from the tube set plate edge as shown.</p> |  |
| Special Tools | <p>S. TOOL</p> <p>BEARING REMOVER SHAFT SET 20 07936 - 3710600</p>  <p>S. TOOL</p> <p>BEARING REMOVER SHAFT HANDLE 07936 - 3710100</p> | |

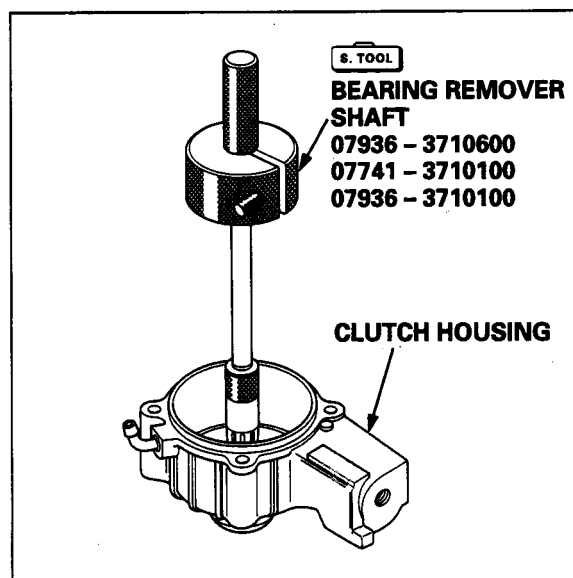
• CLUTCH OUTER

a. DISASSEMBLY/REASSEMBLY

1) Remove the 42.0 mm (1.65 in) internal circlip, and remove the clutch outer using a press and joint which has 10.0 mm (0.39 in) diameter.

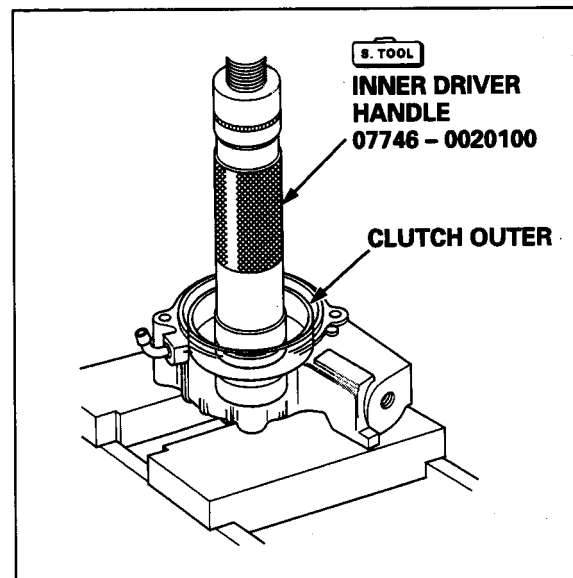


2) Remove the bearing using the 20.0 mm (0.79 in) bearing remover shaft if it is stuck in the clutch housing, though the bearing is normally remain in the clutch outer when disassembled.



3) Reassembly will be in the reverse order of disassembly. Install 42.0 mm (1.65 in) internal circlip and bearing to the clutch outer, then install the clutch outer to the clutch housing.

4) Make sure to install the 42.0 mm (1.65 in) internal circlip into the groove on the clutch housing.



HONDA
OUTBOARD
MOTOR

Shop Manual News

Power Equipment

| | |
|----------------------------|--------------------------------|
| News No. P/P-087 | Issue Date Nov. 2000 |
|----------------------------|--------------------------------|

SOME PARTS OF CHANGES

The method of installing the water seal which had been described to the undermentioned shop manual was changed.

| Applicable Information | Publication No. | Applicable Pages | Size of Water Seal |
|------------------------|-----------------|------------------|--------------------|
| BF2D | 66ZW600 | 15-1, 15-2 | 11 x 21 x 8 mm |
| BF20A/25A | 66ZV700 | 12-2, 12-5 | 22 x 35 x 7 mm |
| | | 12-8, 12-9 | 17 x 30 x 7 mm |
| | | 12-8 | 6 mm |
| | | 11-5, 11-8 | 22 x 35 x 7 mm |
| BF35A/45A | 66ZV300 | 11-10, 11-11 | 17 x 30 x 7 mm |
| | | 11-4, 11-5 | 10 x 21 x 6 mm |
| BF75A/90A | 66ZW000Z | 11-8, 11-11 | 30 x 45 x 7 mm |
| | | 12-5, 12-6 | 10 x 21 x 6 mm |
| BF115A/130A | 66ZW500 | 12-10, 12-15 | 30 x 45 x 7 mm |

CHANGE LOCATIONS

The liquid applied to the circumference of water seals has been changed.

| After Modification | Before Modification |
|---|--|
| INSTALLATION: <ul style="list-style-type: none"> ● Do not reuse. ● Apply grease to the mating surface and lips of the seals. ● Apply soapy water to the circumference of the seals. | INSTALLATION: <ul style="list-style-type: none"> ● Do not reuse. ● Apply grease to the mating surface, circumference and lips of the seals. |

OUTBOARD MOTOR

Power Equipment

| News No. | Issue Date |
|----------|------------|
| P/P-140 | Jul. 2002 |

SOME PARTS OF CHANGES

| Applicable Information | Publication No. | Applicable Page |
|------------------------|-----------------|-----------------|
| BF2D | 66ZW600 | 7-2 |

CHANGE LOCATIONS

• CARBURETOR

The carburetor drain screw and float chamber installation angle have been changed as follows.

| Engine serial number | BF2D: BEBF-1052806 and subsequent BF2B: BEBF-1053276 and subsequent | BF2D: Up to BEBF-1052805 BF2B: Up to BEBF-1053275 |
|--|--|--|
| Item CARBURETOR Position change of drain screw and the setting bolt | | |
| CARBURETOR Installation angle change of float chamber | | |

Important Set-up Information

HONDA

OUTBOARD MOTOR

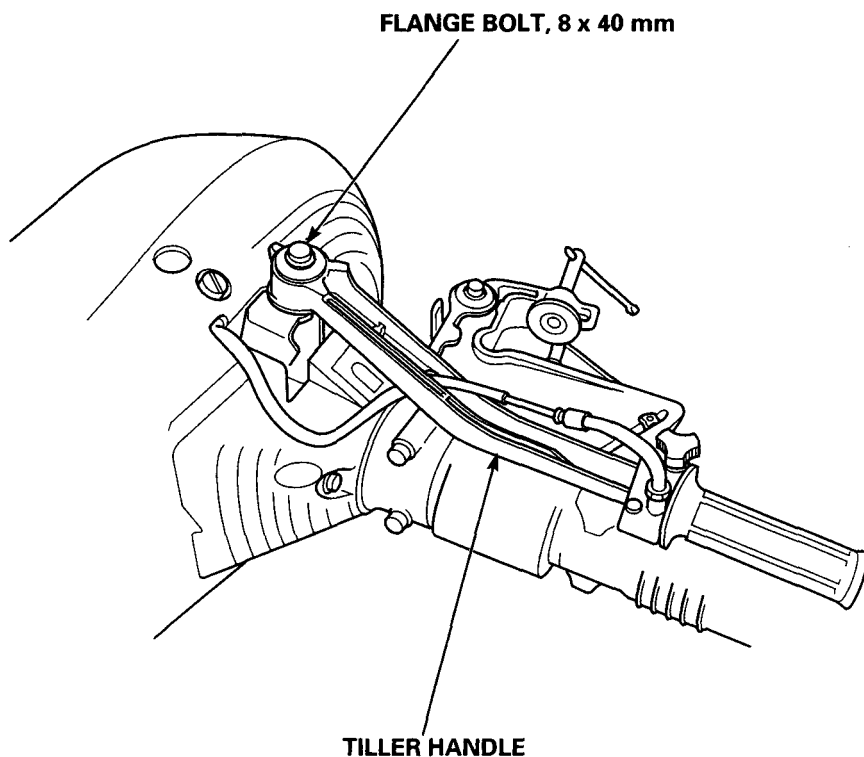
BF2D

TILLER HANDLE INSTALLATION

All information in this publication is based on the latest product information available at the time of approval for printing. The illustration may vary according to the type, however the handle parts installation sequence is the same.

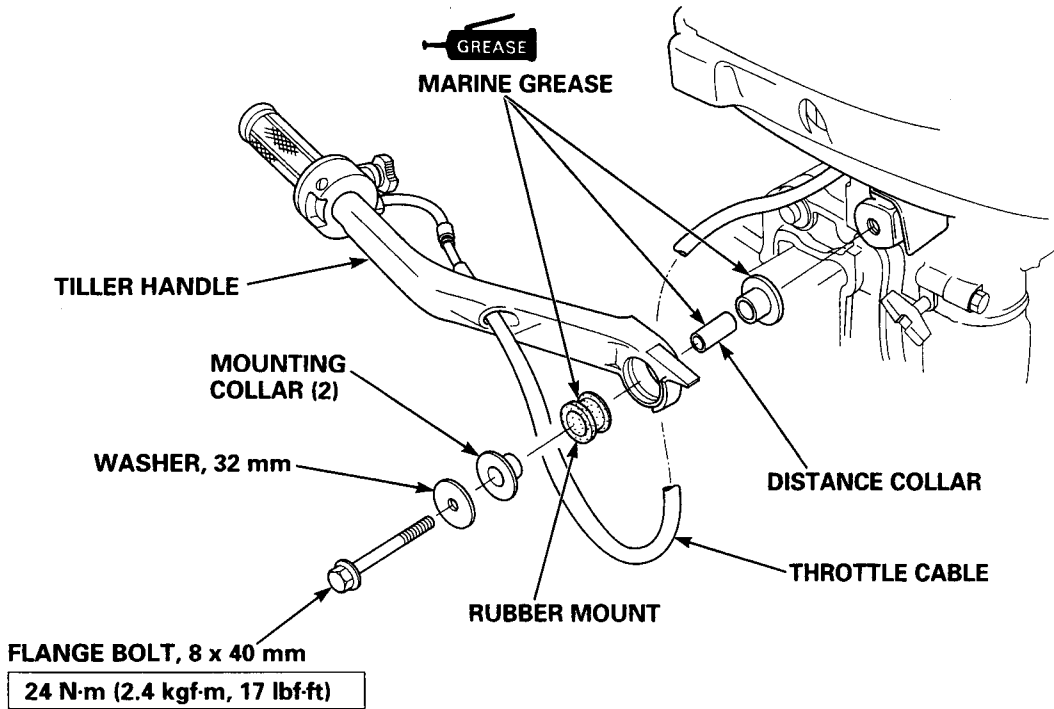
The tiller handle is temporarily installed in reverse direction of the proper installation direction in the packing case.

1. Remove the 8 x 40 mm flange bolt, and the tiller handle.

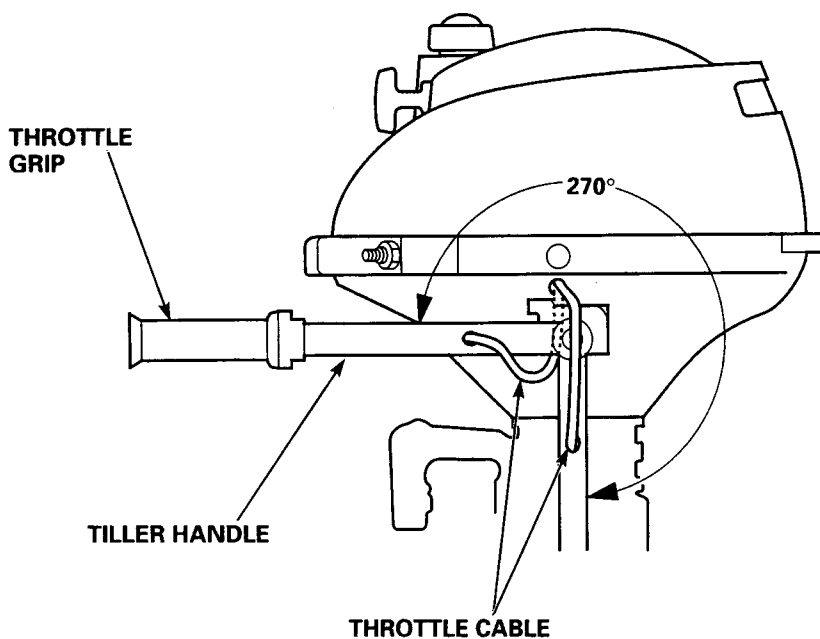


2. Follow the illustration below for proper assembly. Be sure the mounting collars, distance collar, and washer are installed in the order shown.

When installing the tiller handle be sure the throttle cable is routed below the handle, and is not twisted.



3. After installing the tiller handle be sure the handle will turn 270° smoothly. The throttle cable must not be twisted. Check the normal operation of the throttle grip in both positions.



| | | |
|------------|---|----------------|
| 1. | Specifications | 2 - 4 |
| 2. | Service information | 5 - 20 |
| 3. | Maintenance | 21 - 28 |
| 4. | Engine cover/Fuel tank | 29 - 30 |
| 5. | Recoil starter/Fan cover | 31 - 34 |
| 6. | Engine removal/Install | 35 - 36 |
| 7. | Carburetor | 37 - 39 |
| 8. | Flywheel/Ignition coil | 40 - 42 |
| 9. | Clutch | 43 - 44 |
| 10. | Camshaft/Rocker arm | 45 - 51 |
| 11. | Oil case/Crankshaft/ Block/Piston/Valve | 52 - 60 |
| 12. | Steering handle | 61 - 63 |
| 13. | Clutch housing/Engine undercase/Exhaust pipe | 64 - 67 |
| 14. | Stern bracket/Extension case | 68 - 71 |
| 15. | Gear case/Vertical shaft | 72 - 74 |
| 16. | Shop Manual News | 75 - 78 |
| 17. | Tiller Handle Installation | 79 - 80 |