# HOW TO USE THIS MANUAL

## MANUAL FORMAT

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

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

- Bearings
  Pitting/Damage → Replace.

To assist you to find your way about this manual, the Section Title and Major Heading is given at the head of every page.

An Index to contents is provided on the first page of each Section.

## MODEL INDICATION

Multiple models are shown in this manual. These indications are noted as follows.

| Model name | 40VMH | 40VMHD | 40VMHO | 40VMO | 40VWH | 40VE | 40VEO | 40VEHTO | 40VET |
|---|---|---|---|---|---|---|---|---|---|
| USA and CANADA name | C40MH | | 40MH | | | C40ER | 40ER | P40TH | C40TR |
| Indication | 40VMH | 40VMHD | 40VMHO | 40VMO | 40VWH | 40VE | 40VEO | 40VEHTO | 40VET |
| Model name | 40VETO | 50HMHO | 50HMHD | 50HMO | 50HMDO | 50HWHD | 50HEDO | 50HET | 50HETO |
| USA and CANADA name | 40TR | | | | | | 50ER | C50TR | 50TR |
| Indication | 40VETO | 50HMHO | 50HMHD | 50HMO | 50HMDO | 50HWHD | 50HEDO | 50HET | 50HETO |

## THE ILLUSTRATIONS

Some illustrations in this manual may differ from the model you have. This is because a procedure described may relate to several models, though only one may be illustrated. (The name of model described will be mentioned in the description).

## REFERENCES

These have been kept to a minimum; however, when you are referred to another section of the manual, you are told the page number to go to.

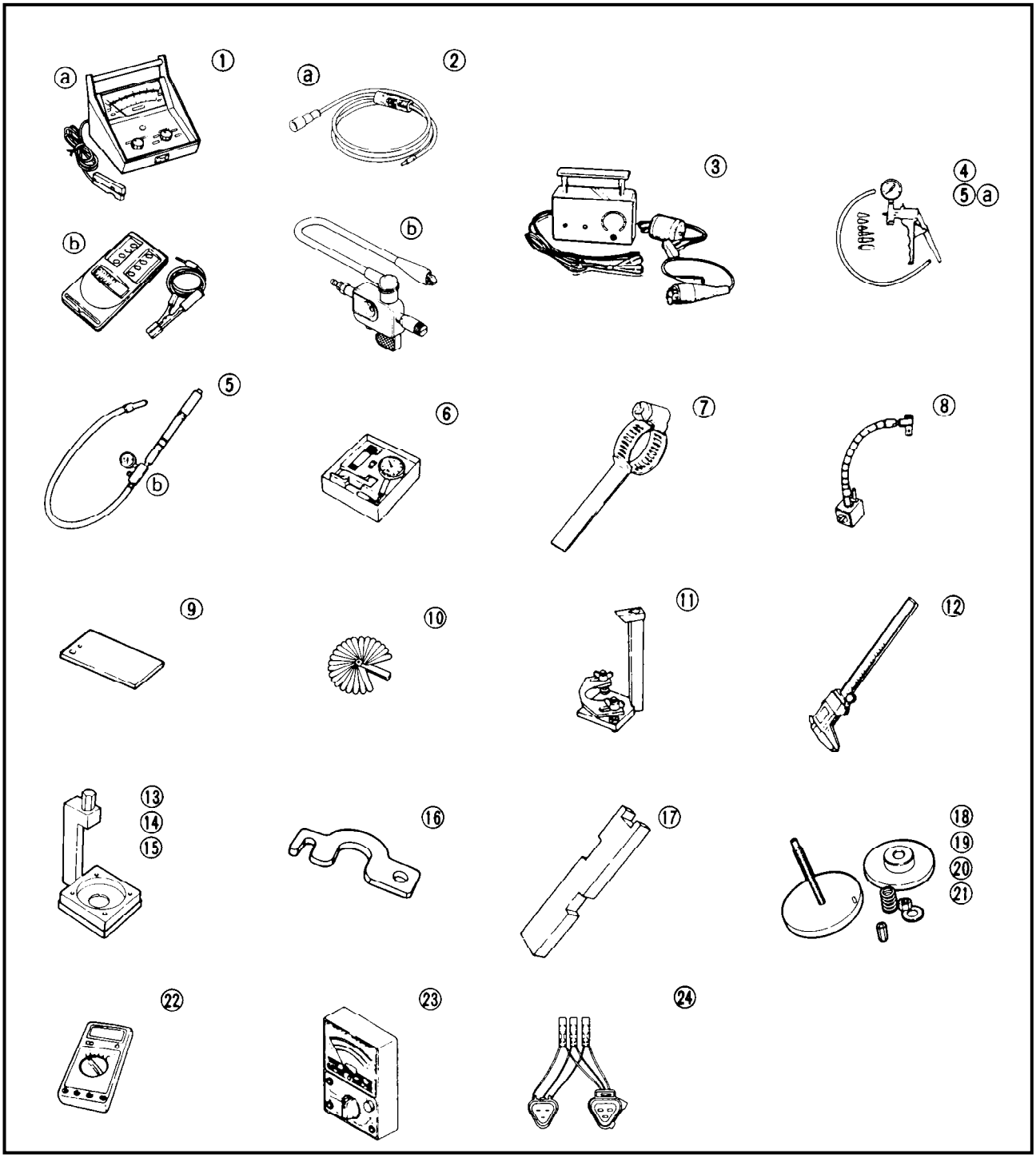
A80000-0*

## SPECIAL TOOLS

The use of correct special tools recommended by Yamaha will aid the work and enable accurate assembly and tune-up. Improvisations and use of improper tools can cause damage to the equipment.

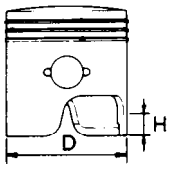
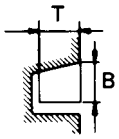
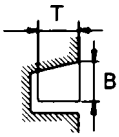
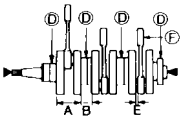
**NOTE:**

- For U.S.A. and Canada, use part number starting with "YB-", "YU-" or "YW-".
- For others, use part number starting with "90890-".



# MAINTENANCE SPECIFICATIONS

## ENGINE

| Item | Unit | Model | |
|---|---|---|---|
| | | 40 hp | 50 hp |
| CYLINDER HEAD: | | | |
| Warpage limit | mm (in) | 0.1 (0.004) | |
| CYLINDER: | | | |
| Bore size | mm (in) | 67.00 ~ 67.02 (2.638 ~ 2.639) | |
| Wear limit | mm (in) | 67.10 (2.642) | |
| Taper limi | mm (in) | 0.08 (0.003) | |
| Out of round limit | mm (in) | 0.05 (0.002) | |
| PISTON: | | | |
| Identification mark   | mm (in) | W | |
| Piston clearance | mm (in) | 0.060 ~ 0.065 (0.0024 ~ 0.0026) | |
| Limit | mm (in) | 0.115 (0.0045) | |
| Diameter D | mm (in) | 66.940 ~ 67.000 (2.6354 ~ 2.6378) | |
| Measuring point H | mm (in) | 10 (0.4) | |
| Pin boss inside diameter | mm (in) | 18.008 ~ 18.015 (0.7090 ~ 0.7093) | |
| Ring groove clearance (installed) | mm (in) | | |
| top | mm (in) | 0.04 ~ 0.08 (0.002 ~ 0.003) | |
| 2nd | mm (in) | 0.03 ~ 0.07 (0.001 ~ 0.003) | |
| Over size piston | mm (in) | | |
| Diameter 1st*1 | mm (in) | 67.25 (2.648) | |
| 2nd | mm (in) | 67.50 (2.657) | |
| PISTON PIN: | | | |
| Diameter | mm (in) | 17.995 ~ 18.000 (0.7085 ~ 0.7087) | |
| PISTON RING (1st): | | | |
| Type   | mm (in) | Keystone | |
| Dimensions (B × T) | mm (in) | 2.0 × 2.6 (0.08 × 0.10) | |
| End gap (installed) | mm (in) | 0.40 ~ 0.60 (0.016 ~ 0.024) | |
| Limit | mm (in) | 0.80 (0.031) | |
| PISTON RING (2nd): | | | |
| Type   | mm (in) | Keystone | |
| Dimensions (B × T) | mm (in) | 2.0 × 2.6 (0.08 × 0.10) | |
| End gap (installed) | mm (in) | 0.40 ~ 0.60 (0.016 ~ 0.024) | |
| Limit | mm (in) | 0.80 (0.031) | |
| CONNECTING ROD: | | | |
| Small end diameter | mm (in) | 22.005 ~ 22.008 (0.8663 ~ 0.8665) | |
| CRANK SHAFT ASSEMBLY: | | | |
| Crank width A   | mm (in) | 53.90 ~ 53.95 (2.122 ~ 2.124) | |
| Crank width B | mm (in) | 32.88 ~ 33.10 (1.294 ~ 1.303) | |
| Runout limit D | mm (in) | 0.03 (0.001) | |
| Big end side clearance E | mm (in) | 0.20 ~ 0.70 (0.008 ~ 0.028) | |
| Small end axial play limit F | mm (in) | 2.0 (0.08) | |

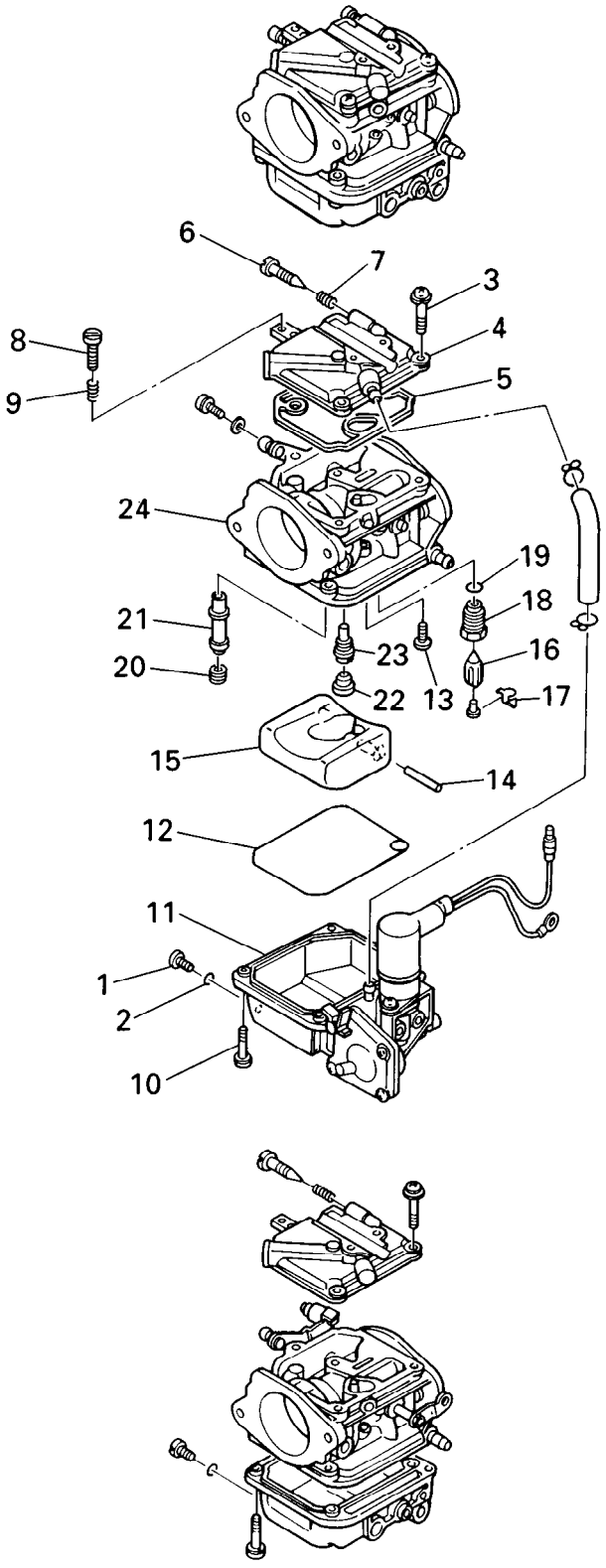
*1: Except for U.S.A.

## MAINTENANCE INTERVAL CHART

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

| Item | Remarks | Initial | | Every | | Refer page |
|---|---|---|---|---|---|---|
| | | 10 hours (Break-in) | 50 hours (3 months) | 100 hours (6 months) | 200 hours (1 year) | |
| COWLING: | | | | | | |
| Cowling clamp | Inspection | | | | ○ | — |
| FUEL SYSTEM: | | | | | | |
| Fuel line | Inspection | ○ | | ○ | ○ | 3-2 |
| Fuel filter | Cleaning | ○ | ○ | ○ | | 4-3 |
| Carburetor | Cleaning | ○ | ○ | ○ | | 4-9 |
| POWER UNIT: | | | | | | |
| Water leakage | Inspection | ○ | ○ | ○ | | — |
| Motor exterior | Inspection | ○ | ○ | ○ | | — |
| Exhaust leakage | Inspection | ○ | ○ | ○ | | — |
| Cooling water passage | Cleaning | | ○ | ○ | | — |
| CONTROL SYSTEM: | | | | | | |
| Throttle link | Inspection/Adjustment | | | | ○ | 3-2 |
| Throttle cable | Inspection/Adjustment | | | | ○ | 3-3 |
| Shift cable | Inspection/Adjustment | | | | ○ | 3-4 |
| Start-in-gear projection | Inspection/Adjustment | ○ | | ○ | | 3-5 |
| Idle speed | Inspection/Adjustment | ○ | | ○ | | 3-5 |
| OIL INJECTION SYSTEM: | | | | | | |
| Oil tank water drain hose | Cleaning | ○ | ○ | ○ | | 3-6 |
| Oil pump link | Inspection/Adjustment | ○ | | ○ | | 3-6 |
| POWER TRIM AND TILT SYSTEM: | | | | | | |
| Power trim and tilt fluid | Inspection | ○ | ○ | ○ | ○ | 3-7 |
| LOWER UNIT: | | | | | | |
| Gear oil | Change | ○ | | ○ | | 3-8 |
| Lower unit leakage | Inspection | | | | ○ | 3-8 |
| Propeller | Inspection | ○ | ○ | ○ | | 6-2 |
| GENERAL: | | | | | | |
| Anode | Inspection | | ○ | ○ | | 3-9 |
| Battery | Inspection | ○ | ○ | ○ | | 3-9 |
| Spark plug | Cleaning/Adjustment/ Replacement | ○ | ○ | ○ | | 3-10 |
| Wiring and connector | Adjustment/Reconnect | ○ | ○ | ○ | | — |
| Bolts and nuts | Retightening | ○ | ○ | ○ | | — |
| Grease points | Greasing | | | ○ | | 3-11 |

# CARBURETOR
## EXPLODED DIAGRAM

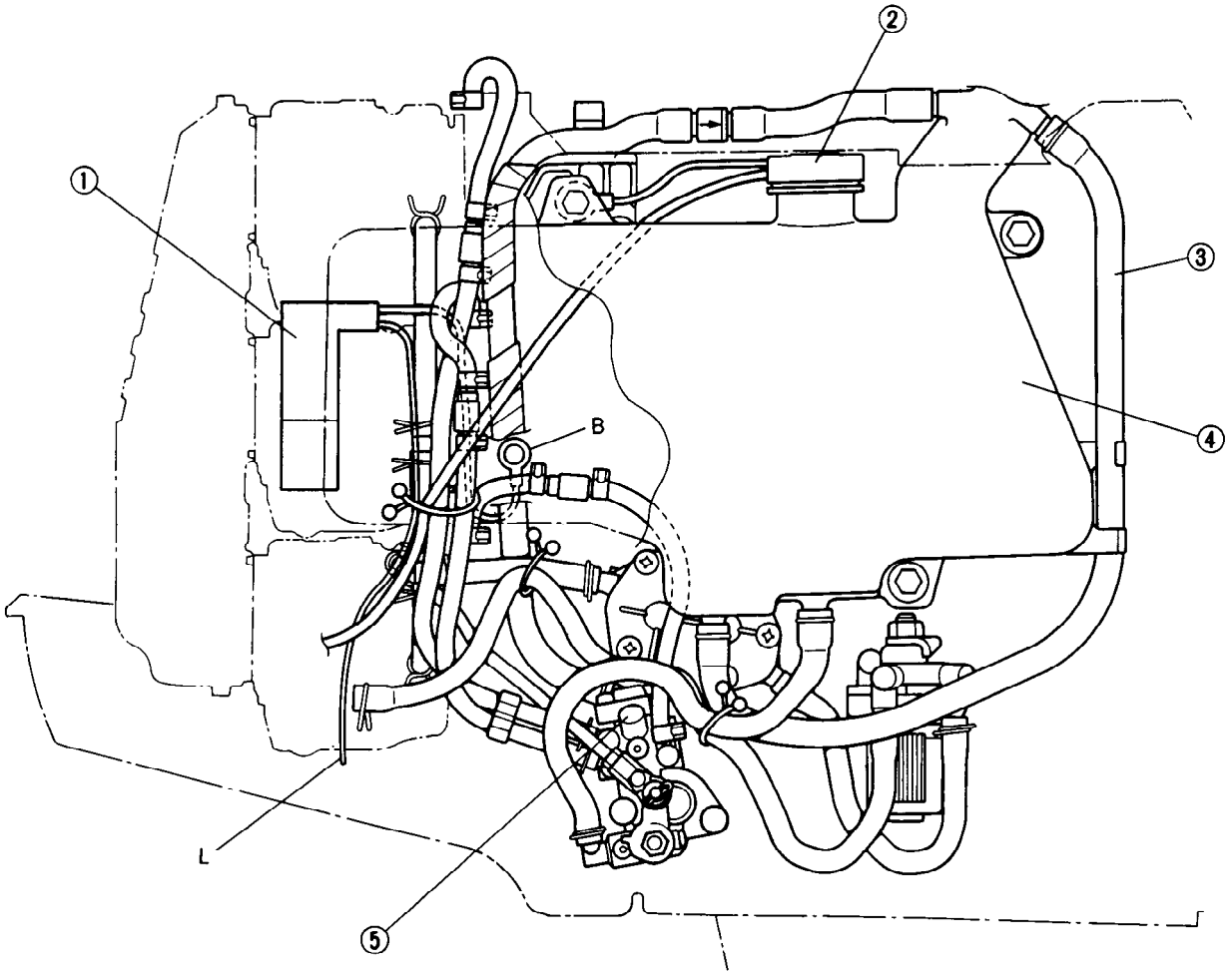


## REMOVAL AND INSTALLATION CHART

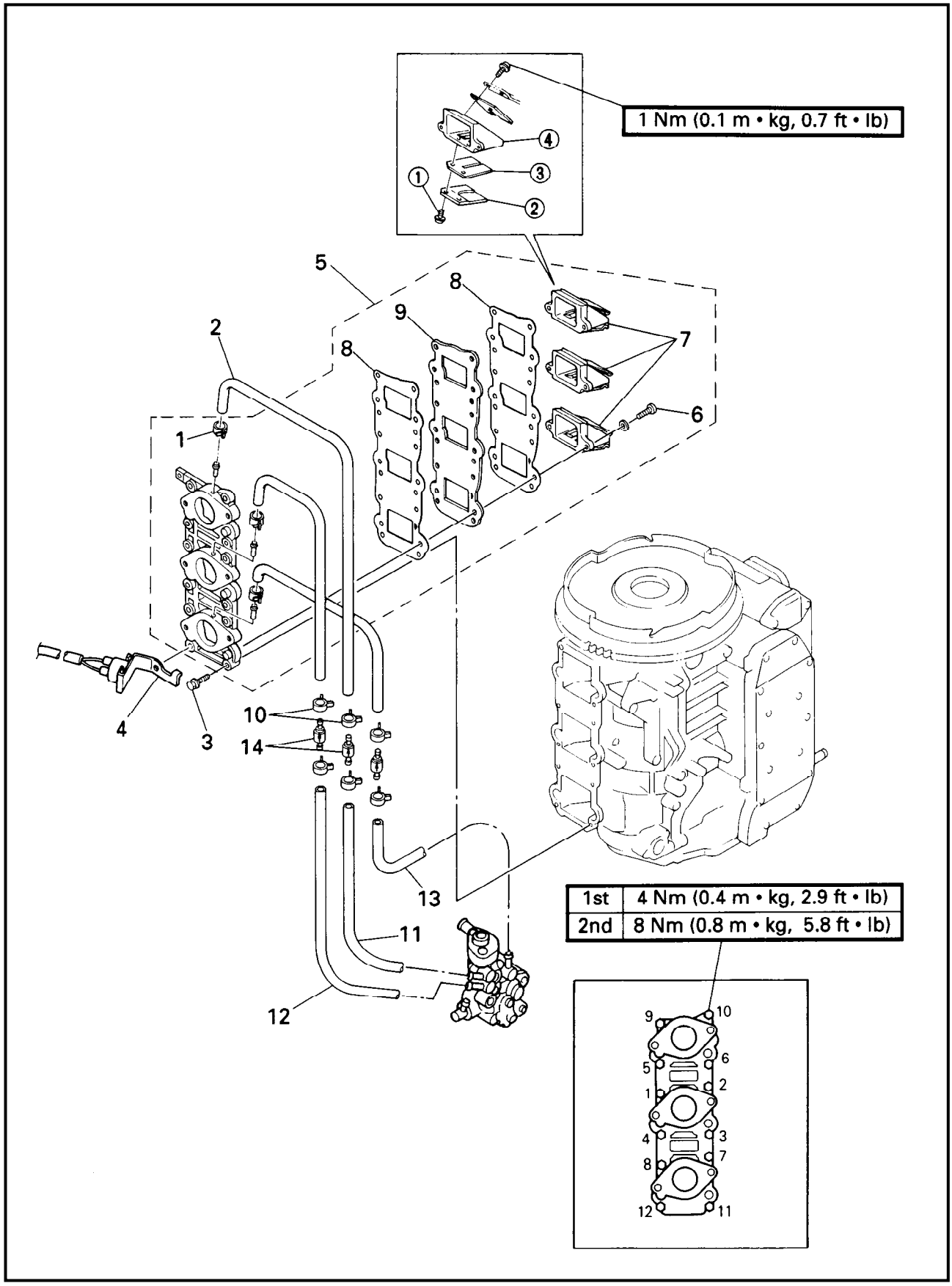
| Step | Procedure/Part name | Q'ty | Service points |
|---|---|---|---|
| | **CARBURETOR DISASSEMBLY** | | Follow the left "Step" for removal. |
| | Carburetor ass'y | | Refer to "CARBURETOR REMOVAL". |
| 1 | Drain screw | 1 | |
| 2 | O-ring | 1 | |
| 3 | Screw (with washer) | 3 | 4 × 14 mm |
| 4 | Carburetor cover | 1 | |
| 5 | Cover packing | 1 | |
| 6 | Pilot adjusting screw | 1 | **CAUTION:**<br>**Do not damage the tip of the pilot screw by over-tighten it.** |
| 7 | Spring | 1 | |
| 8 | Stopping screw | 1 | Middle carburetor only |
| 9 | Spring | 1 | |
| 10 | Screw (with washer) | 4 | 4 × 14 mm |
| 11 | Float chamber | 1 | |
| 12 | Float chamber packing | 1 | |
| 13 | Screw | 1 | 4 mm |
| 14 | Arm pin | 1 | |
| 15 | Float | 1 | **NOTE:**<br>The float is removed together with the needle valve and the clip. |
| 16 | Needle valve | 1 | |
| 17 | Needle valve clip | 1 | |
| 18 | Valve seat | 1 | |
| 19 | O-ring | 1 | |
| 20 | Main jet | 1 | |
| 21 | Main nozzle | 1 | |
| 22 | Cap | 1 | |
| 23 | Pilot jet | 1 | |
| 24 | Carburetor body | 1 | |
| | | | Reverse the removal steps for installation. |

## OIL LINE LAYOUT

① Electrothermal valve (EM, E model)
② Oil level sensor
③ Oil drain hose
④ Oil tank
⑤ Oil pump

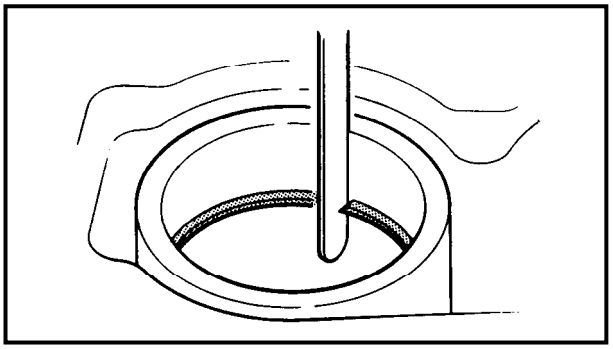


# REED VALVE AND CHECK VALVE
## EXPLODED DIAGRAM



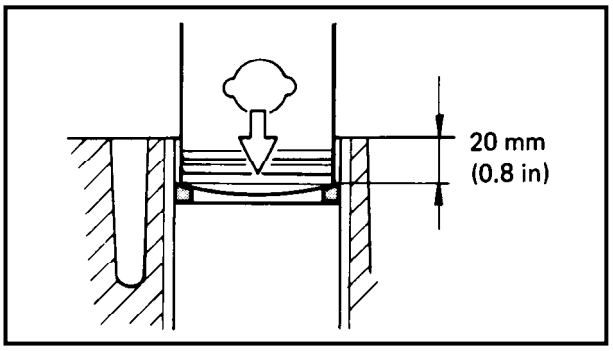
**Piston ring inspection**

1. Inspect:
   - Piston ring
     Breakage/Damage → Replace.

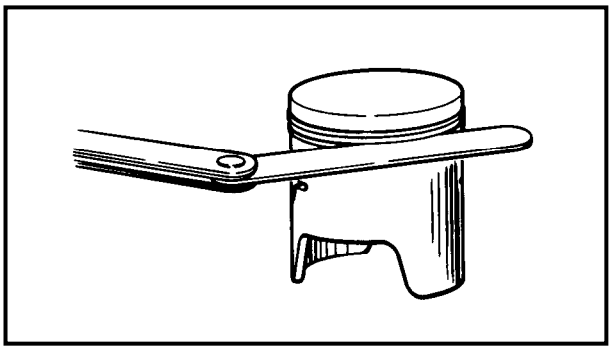


2. Measure:
   - End gap
     Use a feeler gauge.
     Out of specification → Replace.

**End gap:**
**Top: 0.40 ~ 0.60 mm**
**(0.016 ~ 0.024 in)**
**2nd: 0.40 ~ 0.60 mm**
**(0.016 ~ 0.024 in)**
**End gap limit:**
**Top: 0.80 mm (0.031 in)**
**2nd: 0.80 mm (0.031 in)**
**Measuring point**
**20 mm (0.8 in)**

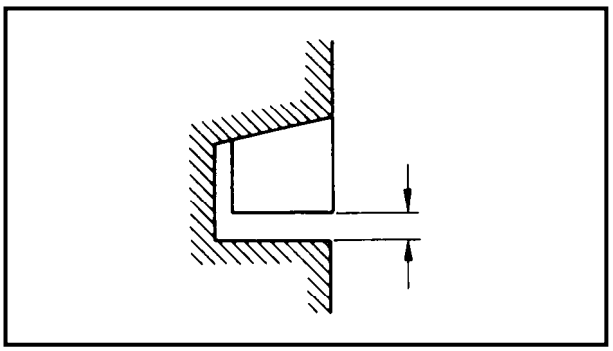



**NOTE:**
Install the piston ring into the cylinder. Push the ring with the piston crown.



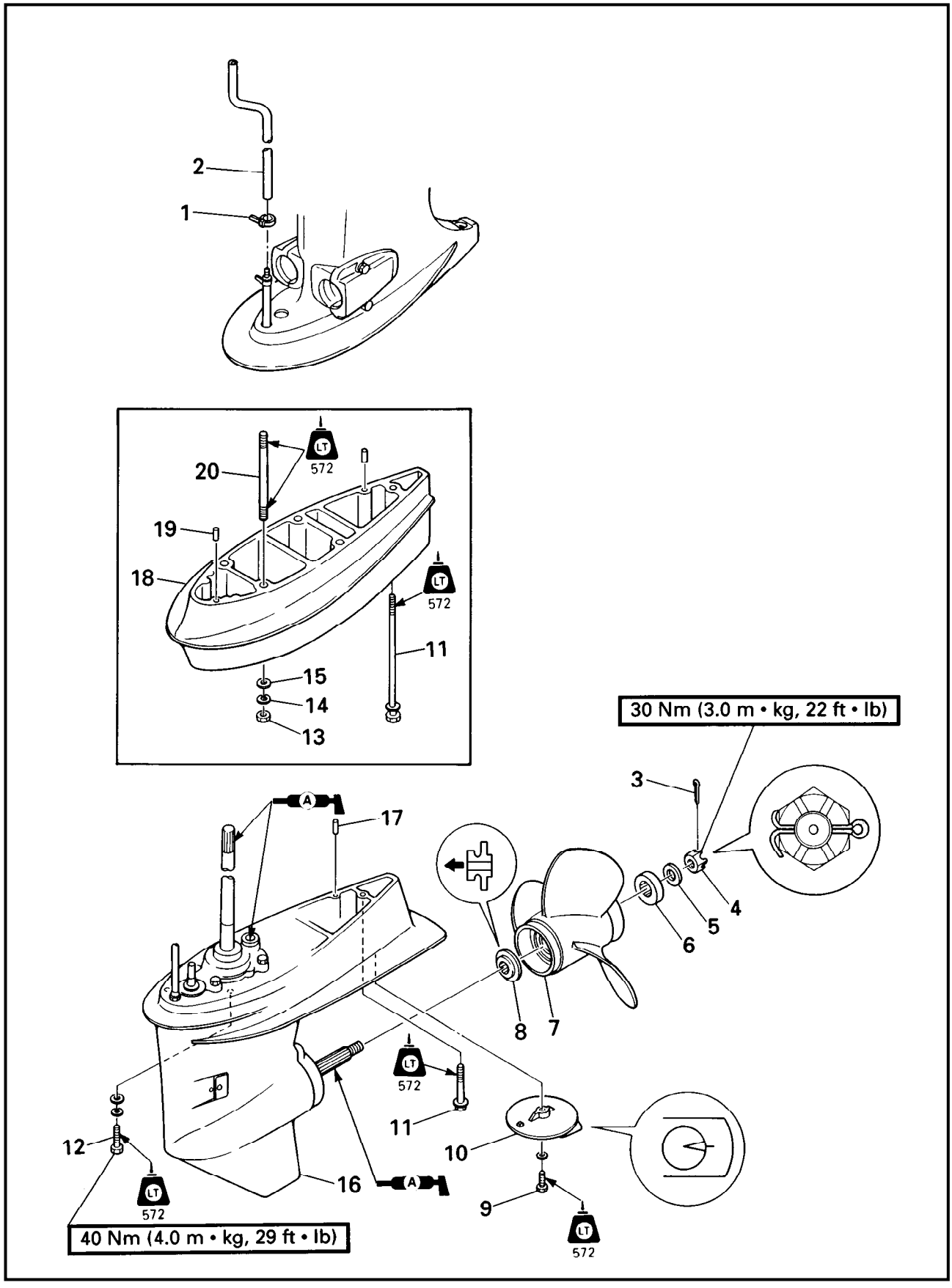
3. Measure:
   - Side clearance
     Use a thickness gauge.
     Out of specification → Replace piston and/or ring.

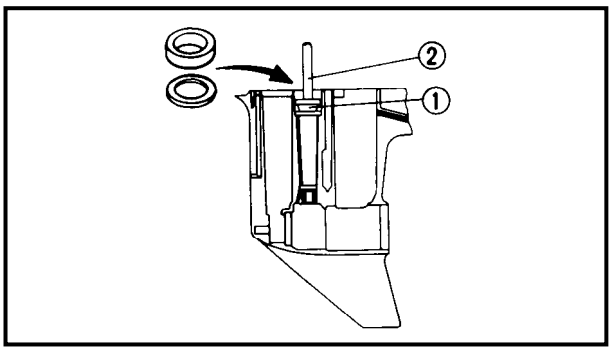
**Side clearance:**
**Top: 0.04 ~ 0.08 mm**
**(0.002 ~ 0.003 in)**
**2nd: 0.03 ~ 0.07 mm**
**(0.001 ~ 0.003 in)**



# LOWER UNIT REMOVAL

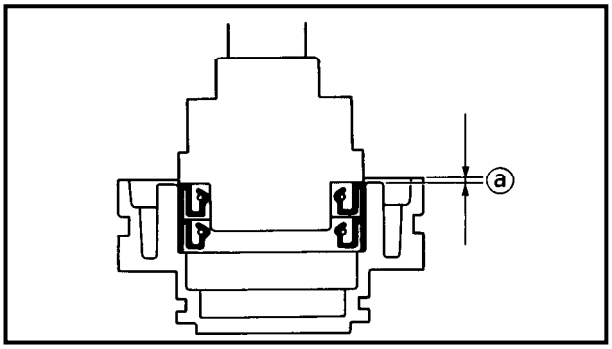
## EXPLODED DIAGRAM






3. Install:
   - Pinion gear shim
   - Drive shaft bearing outer race

**Bearing installer:**
**YB-06110/90890-06627** ..... ①
**Driver rod:**
**YB-06071/90890-06606** ..... ②

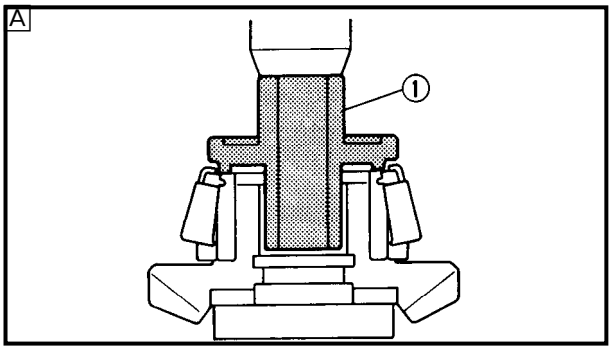



**Drive shaft oil seal housing assembly**

1. Install:
   - Oil seal ①

**Depth ⓐ:**
**0.0 ~ 0.5 mm (0.00 ~ 0.02 in)**

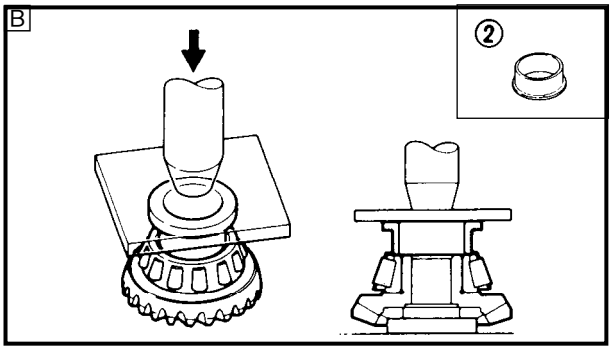
**Bearing installer:**
**YB-06167/90890-06628**
**Driver rod:**
**YB-06071/90890-06605**



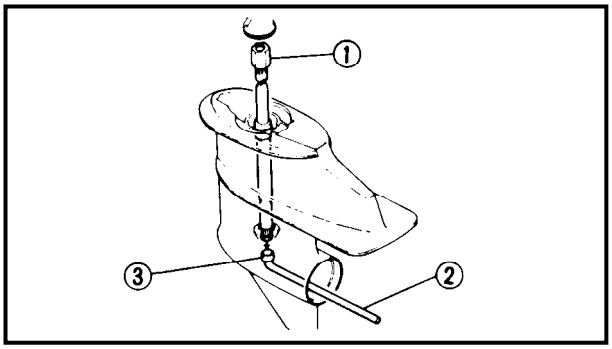

**Forward gear assembly**

1. Install:
   - Forward gear
   - Taper roller bearing

**Bearing installer:**
**YB-06270-A** ..... ①
**90890-06640** ..... ②




A For USA and CANADA
B Except for USA and CANADA




**Pinion nut installation**

1. Install:
   - Pinion nut

**Drive shaft holder:**
**YB-06079/90890-06517** ..... ①
**Pinion nut wrench:**
**90890-06505** ..... ②
**Socket adapter:**
**90890-06506** ..... ③

# TILLER HANDLE REMOVAL

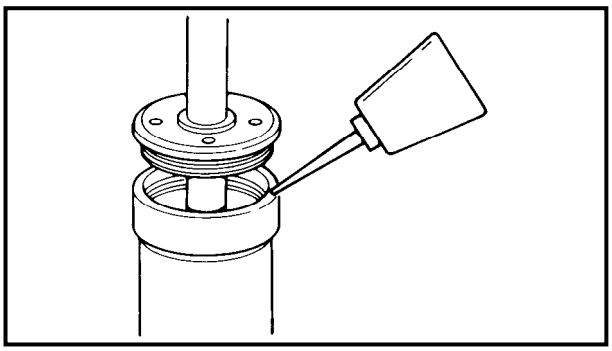


## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name | Q'ty | Service points |
|---|---|---|---|
| | **TILLER HANDLE REMOVAL** | | Follow the left "Step" for removal. |
| 1 | Bolt | 2 | Steering friction model |
| 2 | Clamp | 1 | E model |
| 3 | Screw | 1 | Steering friction model |
| 4 | Bolt | 1 | |
| 5 | Collar | 1 | |
| 6 | Clamp | 1 | |
| 7 | Bolt | 1 | M model |
| 8 | Engine stop switch lead (black) | 1 | |
| 9 | Engine stop switch coupler (blue) | 1 | |
| 10 | Main switch lead coupler | 1 | E model |
| 11 | Oil level sensor lead coupler | 1 | EHTO/TH model |
| 12 | Trim sensor lead coupler | 1 | |
| 13 | Extension wire lead coupler | 1 | |
| 14 | Clip | 1 | |
| 15 | Shift cable | 1 | |
| 16 | Clip | 1 | |
| 17 | Throttle cable | 1 | |
| 18 | Bolt | 2 | |
| 19 | Fitting plate ass'y | 1 | **NOTE:** When installing the fitting plate, lift the tiller handle straight up. |
| 20 | Clamp | 1 | M model |
| 21 | Engine stop switch lead | 1 | |
| 22 | Main switch lead | 1 | **NOTE:** Align the taped end of the battery cable and the extension wire lead with the end of the grommet. |
| 23 | Extension wire lead | 1 | |
| 24 | Nut | 2 | |
| 25 | Tiller handle ass'y | 1 | |
| | **STEERING FRICTION DISASSEMBLY** | | |
| ① | Bolt (with washer) | 2 | |
| ② | Plane washer | 2 | |
| ③ | Friction plate ass'y | 1 | |
| ④ | Collar | 2 | |
| ⑤ | Nut | 2 | |
| | | | Reverse the removal steps for installation. |

## REMOVAL AND INSTALLATION CHART

| Step | Procedure/Part name | Q'ty | Service points |
|---|---|---|---|
| | **CLAMP BRACKET REMOVAL (Manual tilt)** | | Follow the left "Step" for removal. |
| | Upper case ass'y | | Refer to "UPPER CASE REMOVAL". |
| 1 | Spring | 1 | |
| 2 | Circlip | 1 | |
| 3 | Plane washer | 2 | |
| 4 | Tilt stop lever | 1 | |
| 5 | Pin | 1 | |
| 6 | Tilt pin | 1 | |
| 7 | Grease nipple | 1 | |
| 8 | Lead wire | 1 | |
| 9 | Nut | 1 | |
| 10 | Plane washer | 1 | |
| 11 | Bolt | 1 | |
| 12 | Collar | 1 | |
| 13 | Cap | 2 | |
| 14 | Self lock nut | 1 | |
| 15 | Clamp bracket plate | 1 | |
| 16 | Clamp bracket 2 ass'y | 1 | |
| 17 | Plane washer | 1 | |
| 18 | Shallow water drive lever | 1 | *: Shallow water drive model |
| 19 | Spring | 1 | |
| 20 | Tilt lever | 1 | |
| 21 | Swivel bracket ass'y | 1 | |
| 22 | Plane washer | 1 | |
| 23 | Clamp bracket 1 ass'y | 1 | |
| 24 | Clamp bracket bolt | 1 | |
| 25 | Self lock nut | 1 | |
| 26 | Bushing | 2 | |
| | **CLAMP BRACKET DISASSEMBLY** | | |
| ① | Circlip | 1 | |
| ② | Plane washer | 1 | |
| ③ | Clamp bracket plate | 1 | |
| ④ | Wave washer | 1 | |
| ⑤ | Pin | 1 | |
| ⑥ | Circlip | 1 | |
| ⑦ | Plane washer | 1 | |
| ⑧ | Wave washer | 1 | |
| ⑨ | Clamp bracket plate | 1 | |
| ⑩ | Pin | 1 | |
| | | | Reverse the removal steps for installation. |

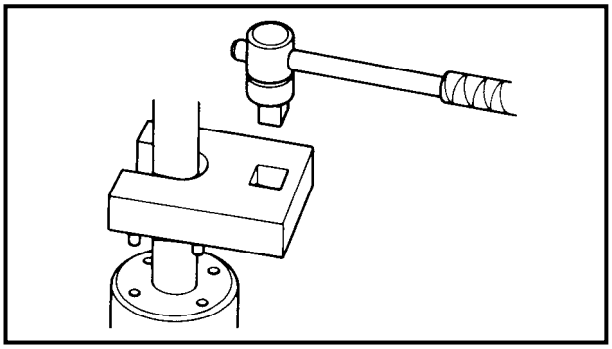


**Inner cylinder assembly**

1. Fill:
   - ATF (Dexiron type Ⅱ) to inner cylinder.

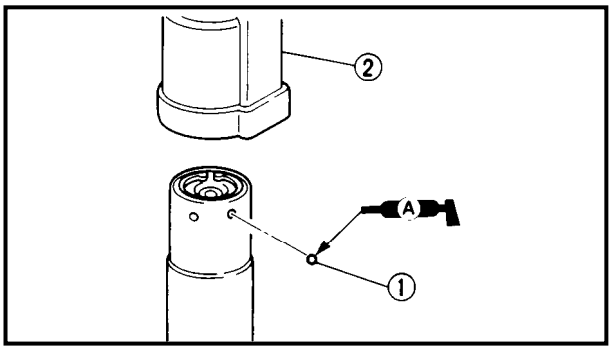
**NOTE:**

Depress the tilt rod fully and fill the inner cylinder with ATF before installing the end screw.



2. Tighten:
   - Inner cylinder end screw

| | |
|---|---|
|  | **Tilt cylinder wrench: YB-06175-2B/90890-06544** |

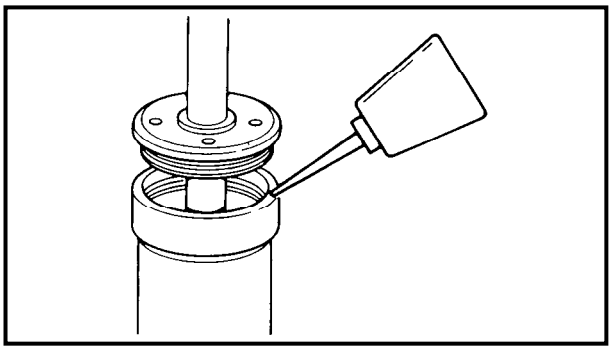



**Tilt cylinder assembly**

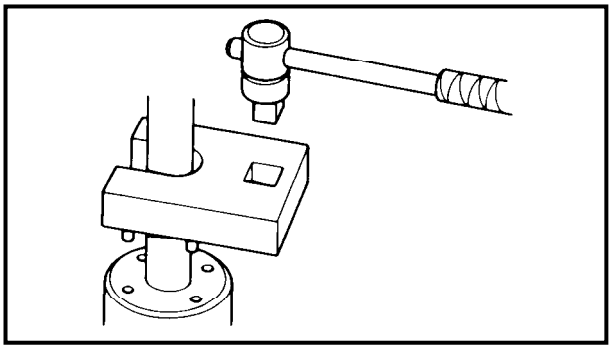
1. Install:
   - Ball ①
   - Tilt cylinder ②

**NOTE:**

- Apply the grease to the balls to prevent them from falling down.
- To find any ball that may fall, turn the inner cylinder unit upside down to install the tilt cylinder.



2. Fill:
   - ATF (Dexiron type Ⅱ) to tilt cylinder.



3. Tighten:
   - Tilt cylinder end screw

| | |
|---|---|
|  | **Tilt cylinder wrench: YB-06175-2B/90890-06544** |

# ELECTRICAL UNIT COMPONENTS

## E, EO MODEL

① Starter motor
② Rectifier regulator
③ Ignition coil
④ Fuse
⑤ Starter relay

ⓐ Bracket
ⓑ Ground terminal

B : Black
Br : Brown
B/O : Black/Orange
B/W : Black/White
B/Y : Black/Yellow
L : Blue
O : Orange
O/G : Orange/Green
P : Pink
Y/R : Yellow/Red
W : White