HOW TO USE THIS MANUAL

MANUAL FORMAT

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

For instance, the condition of a faulty component will precede an arrow symbol and the course of action required will follow the symbol.

- Bearings

  Pitting/scratches → Replace.

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

MODEL INDICATION

Multiple models are mentioned in this manual and their model indications are noted as follows.

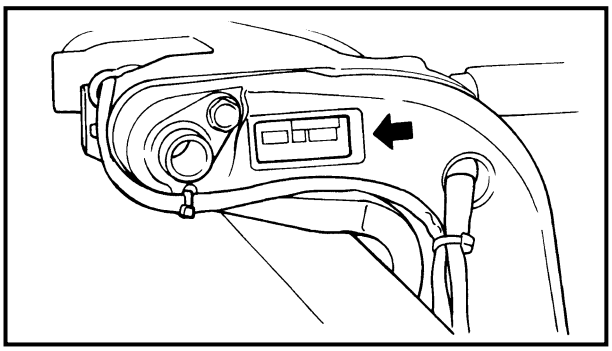
Model name	150AET	L150AET	150FETO		L150FETO		150GETO
USA and Canada name	C150TR	—	—	S150TR	—	L150TR	P150TR
Indication	150AET	L150AET	150FETO	S150FETO	L150FETO	LS150FETO	150GETO
Model name	D150HETO	175AET	175DETO		175FETO	200AET	L200AET
USA and Canada name	D150TR	—	—	S175TR	P175TR	—	—
Indication	D150HETO	175AET	175DETO	S175DETO	175FETO	200AET	L200AET
Model name	200FETO		L200FETO		200GETO	225DET	225DETO
USA and Canada name	200TR	S200TR	—	L200TR	P200TR	—	—
Indication	200FETO	S200FETO	L200FETO	LS200FETO	200GETO	225DET	225DETO

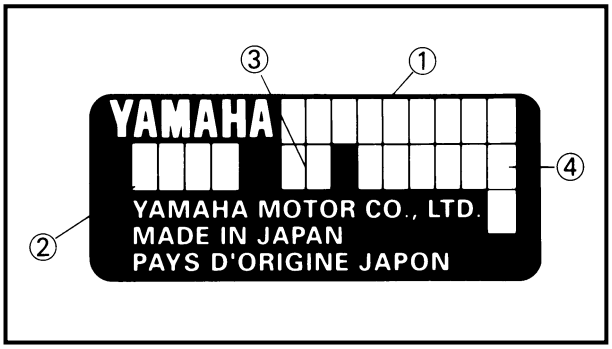
ILLUSTRATIONS

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

CROSS REFERENCES

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





IDENTIFICATION

SERIAL NUMBER

The outboard motor's serial number is stamped on a label which is attached to the port clamp bracket.

NOTE:

As an antitheft measure, a special label on which the outboard motor's serial number is stamped is bonded to the port clamp bracket. The label is specially treated so that peeling it off causes cracks across the serial number.

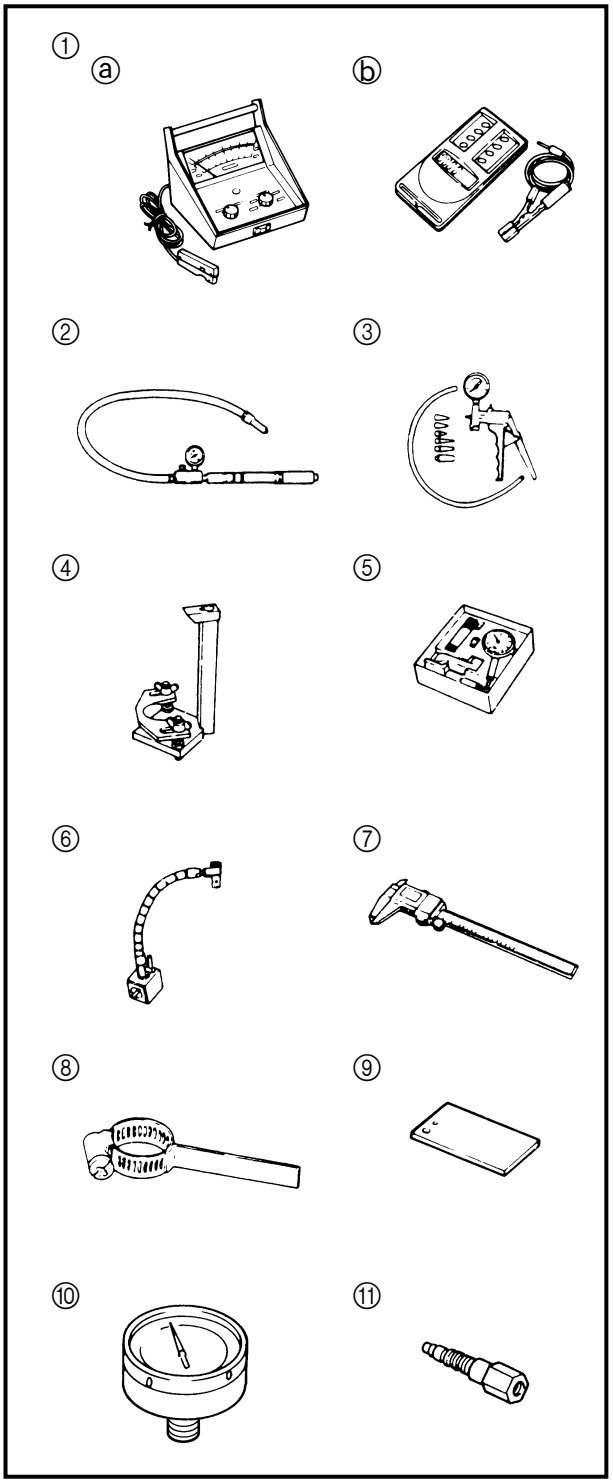
① Model name
② Approval model code
③ Transom height
④ Serial number

STARTING SERIAL NUMBERS

The starting serial number blocks are as follows:

Model name			Approval model code	Starting serial number
World-wide	USA	Canada		
150AET	C150TR	—	6G4	L: 305521 -
				X: 704396 -
L150AET	—		6K0	X: 750347 -
150FETO	—		6G4	L: 352137 -
	S150TR			X: 504118 -
L150FETO	—		6K0	L: 350142 -
	L150TR	—		X: 501152 -
150GETO	P150TR		6J9	L: 502379 -
D150HETO	D150TR	—		L: 601301 -
175AET	—		6G5	L: 302440 -
				X: 701017 -
175DETO	—			L: 350273 -
	S175TR	—		X: 501252 -

Model name			Approval model code	Starting serial number
World-wide	USA	Canada		
175FETO	P175TR		62H	L: 500647 -
200AET	—		6G6	L: 308781 -
				X: 707018 -
L200AET	—		6K1	X: 752202 -
200FETO	200TR	—	6G6	L: 350991 -
	S200TR			X: 506004 -
L200FETO	—		6K1	L: 350141 -
	L200TR	—		X: 501625 -
200GETO	P200TR		61H	L: 502516 -
225DET	—		6K7	L: 400393 -
				X: 500160 -
225DETO	—			L: 450255 -
				X: 550266 -



SPECIAL TOOLS

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

NOTE:

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

MEASURING

① Tachometer
P/N. YU-08036-A ..... ⓐ
90890-06760 ..... ⓑ
② Pressure tester
P/N. YB-35956
90890-06762
③ Mity vac
P/N. YB-35956
90890-06756
④ Pinion height gauge
P/N. YB-34432-7, YB-34432-11,
YB-34432-97
90890-06702
⑤ Dial gauge set
P/N. YU-03097
90890-01252
⑥ Magnetic base
P/N. YU-34481
90890-06705
⑦ Digital caliper
P/N. 90890-06704
⑧ Backlash indicator
P/N. YB-06265
90890-06706
⑨ Magnetic base attaching plate
P/N. YB-07003
90890-07003
⑩ Hydraulic pressure gauge
P/N. 90890-06776
⑪ Up-relief valve attachment
P/N. 90890-06773
Down-relief valve attachment
P/N. 90890-06774

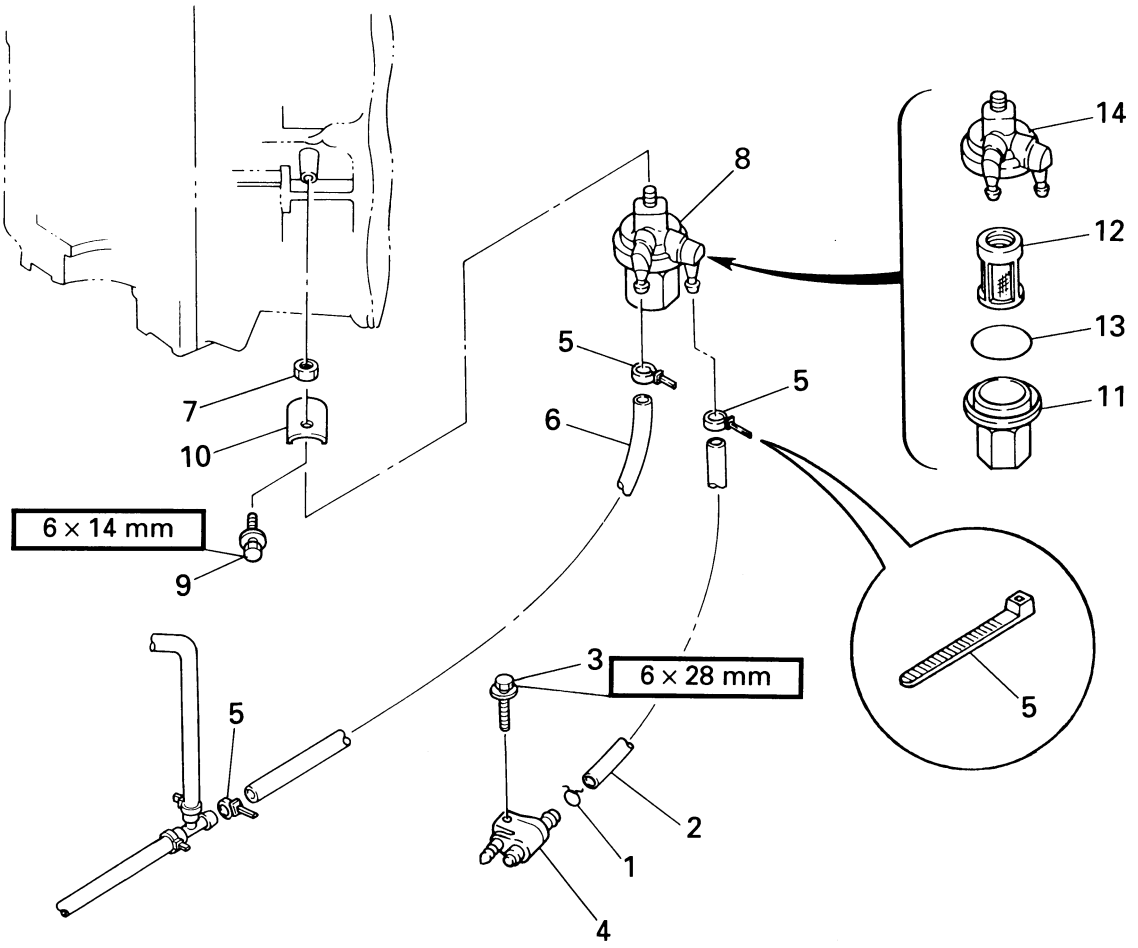
Item		Unit	Model							
	Worldwide		175FETO	200FETO		L200FETO		200GETO	225DET	225DETO
	USA		P175TR	200TR	S200TR	—	L200TR	P200TR	—	—
	Canada		P175TR	—	S200TR	—	—	P200TR	—	—
Exhaust system			Through prop boss							
Lubrication system			Oil injection						Pre-mix	Oil injection
Cooling system			Water							
Ignition system			Microcomputer (CDI)							
Starting system			Electric							
Advance type			Mechanical and microcomputer							
FUEL AND OIL										
Fuel type			Unleaded regular gasoline							
Fuel rating		*PON RON	86 91							
Engine oil type			2-stroke outboard engine oil							
Engine oil grade			TC-W3							
Engine oil capacity (engine oil tank)		L (US qt, Imp qt)	0.9 (0.95, 0.79)						—	0.9 (0.95, 0.79)
(sub-oil tank)		L (US qt, Imp qt)	10.5 (11.1, 9.2)						—	10.5 (11.1, 9.2)
Gear oil type			Hypoid gear oil SAE 90							
Gear oil total quantity		cm^3 (US oz, Imp oz)	980 (33.1, 34.5)			870 (29.4, 30.6)		980 (33.1, 34.5)		
BRACKET										
Trim angle (at 12° boat transom)		Degree	–4 - 16							
Tilt-up angle		Degree	70							
Steering angle		Degree	35 + 35							
DRIVE UNIT										
Gear shift positions			F-N-R							
Gear ratio			1.86 (26/14)							
Reduction gear type			Spiral bevel gear							
Clutch type			Dog clutch							
Propeller shaft type			Spline							
Propeller direction (rear view)			Clockwise			Counterclock-wise		Clockwise		

* PON: Pump Octane Number
RON: Research Octane Number

MAINTENANCE INTERVAL CHART

Use the following chart as a guide to general maintenance intervals.
Dependant on operating conditions, adjust the maintenance intervals accordingly.

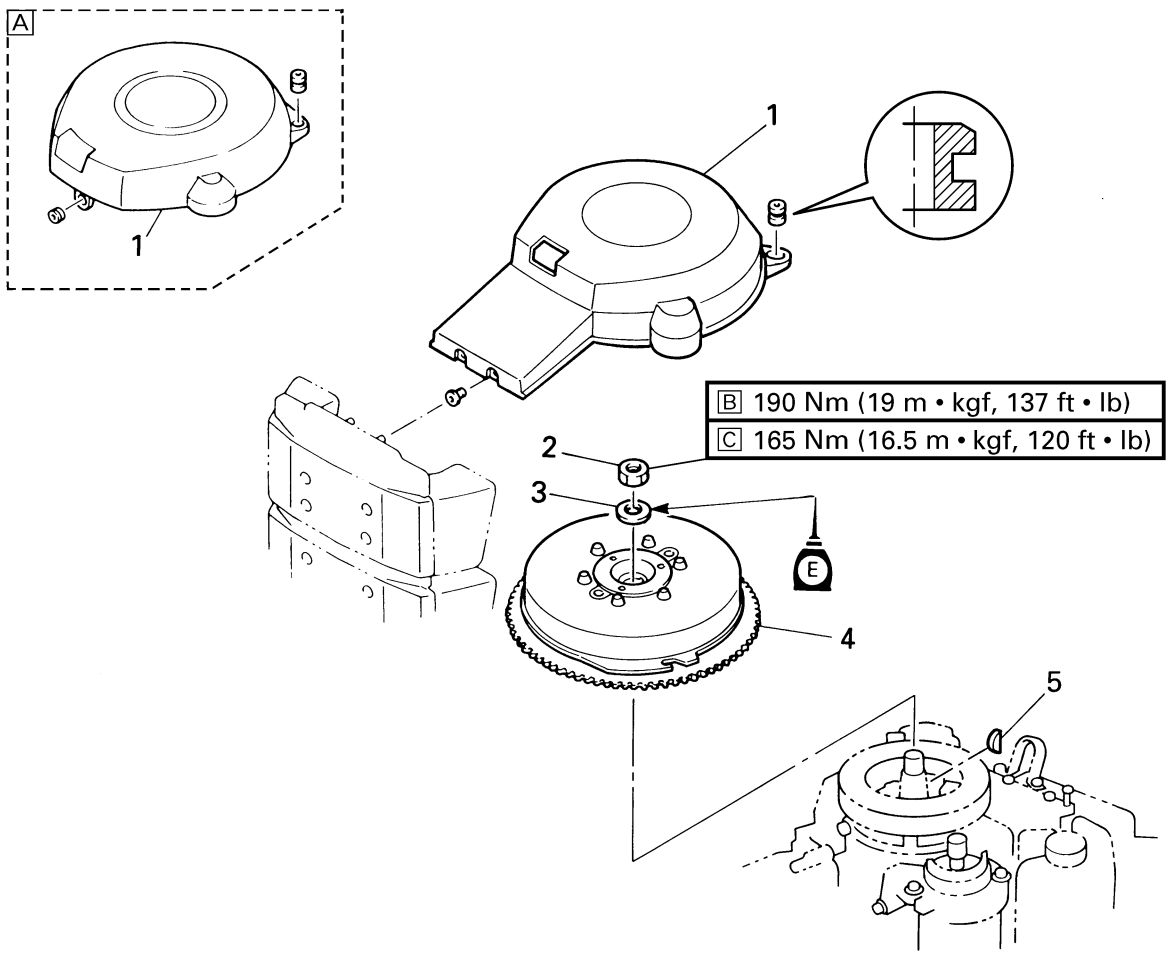
Item	Remarks	Initial		Every		Refer to page
		10 hours (Break-in)	50 hours (3 months)	100 hours (6 months)	200 hours (1 year)	
TOP COWLING						
Top cowling fit	Inspect				○	3-2
FUEL SYSTEM						
Fuel line	Inspect	○		○	○	3-2
Fuel filter	Clean/inspect	○	○	○		3-3
Carburetor	Clean	○	○	○		4-17
POWER UNIT						
Water leakage	Inspect	○	○	○		—
Motor exterior	Inspect	○	○	○		—
Exhaust leakage	Inspect	○	○	○		—
Cooling water passage	Clean/flush		○	○		—
CONTROL SYSTEM						
Carburetor synchronization	Inspect/adjust				○	3-6
Engine idling speed	Inspect/adjust	○		○		3-7
Remote control shift cable	Inspect/adjust				○	3-11
Remote control throttle cable	Inspect/adjust				○	3-11
OIL INJECTION SYSTEM						
Oil tank water drain	Clean	○	○	○		—
Oil pump lever	Inspect/adjust	○				3-12
POWER TRIM AND TILT UNIT						
Power trim and tilt fluid	Inspect	○	○	○	○	3-16
LOWER UNIT						
Gear oil	Change	○		○		3-17
Lower unit leakage	Inspect				○	3-19
Propeller	Inspect	○	○	○		6-3, 6-27, 6-51
GENERAL						
Anodes	Inspect/replace		○	○		3-19
Battery	Inspect/charge	(every month)				3-20
Spark plugs	Clean/adjust/replace	○	○	○		3-21
Wiring and connectors	Adjust/reconnect	○	○	○		—
Bolts and nuts	Tighten	○	○	○		—
Lubrication points	Grease			○		3-23



Order	Job/Part	Q'ty	Remarks
8	Fuel filter	1	
9	Bolt	1	
10	Fuel filter bracket	1	
11	Fuel filter cap	1	
12	Fuel filter element	1	
13	O-ring	1	
14	Fuel filter cup	1	
			For installation, reverse the removal procedure.

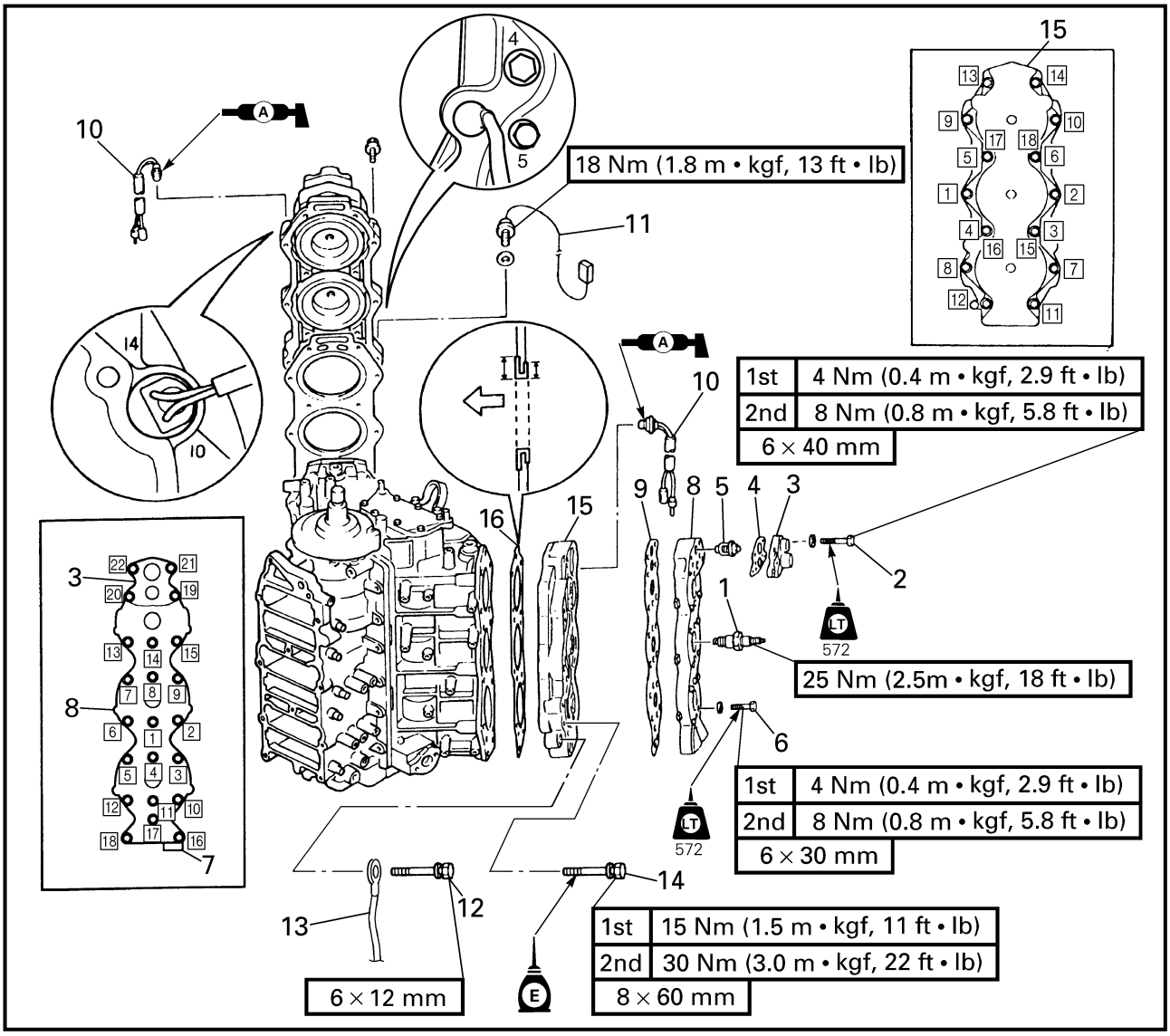
FLYWHEEL MAGNET ASSEMBLY

REMOVING/INSTALLING THE FLYWHEEL MAGNET ASSEMBLY

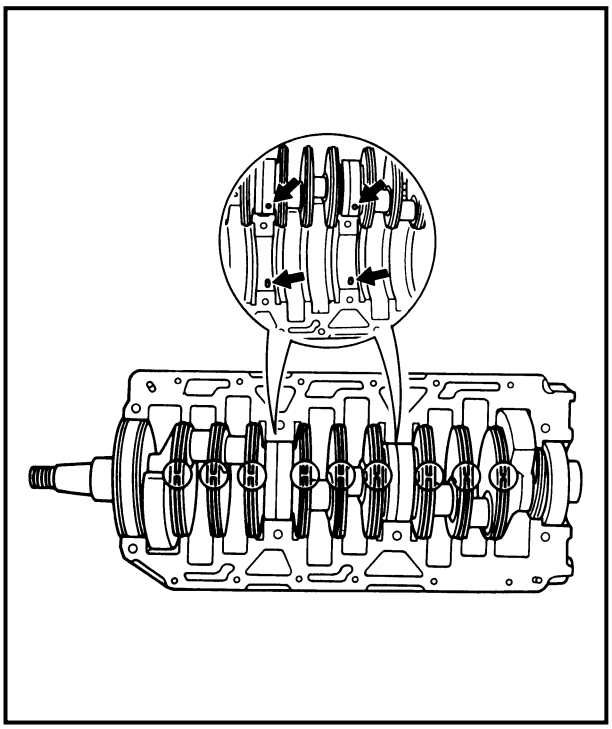


Order	Job/Part	Q'ty	Remarks
1	Flywheel magnet assembly cover	1	
2	Flywheel magnet assembly nut	1	
3	Washer	1	
4	Flywheel magnet assembly	1	
5	Woodruff key	1	
			For installation, reverse the removal procedure.

A S150F, LS150F, S175D, S200F, LS200F/S150TR, L150TR, S175TR, S200TR, L200TR
B Oil injection and 225DET models
C Pre-mix except for 225DET models



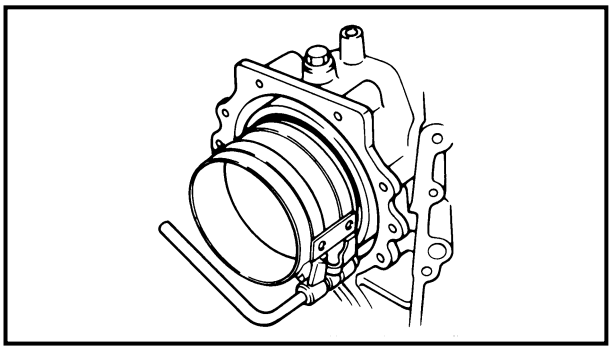
Order	Job/Part	Q'ty	Remarks
9	Gasket	2	**Not reusable**
10	Thermo switch	2	
11	Engine cooling water temperature sensor	1	
12	Bolt	2	
13	Ground lead	2	
14	Bolt	28	
15	Cylinder head	2	
16	Gasket	2	**Not reusable**
			For installation, reverse the removal procedure.

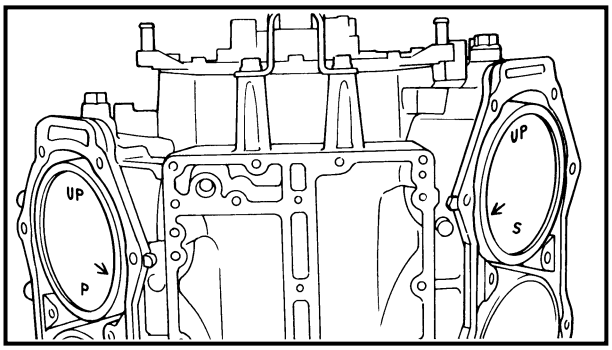


INSTALLING THE CRANKSHAFT ASSEMBLY

Install:
- Cylinder body
- Crankshaft assembly

NOTE:
- Align the crankshaft labyrinth ring end gaps with their respective locating pins.
- Install the bearing locating pins into the cylinder body.





INSTALLING THE PISTON AND CONNECTING ROD ASSEMBLIES

Install:
- Piston and connecting rod assembly

	**Piston ring compressor YU-33294 / 90890-06530**

NOTE:
- Before installing the piston and connecting rod assemblies, lubricate the cylinder walls with 2-stroke outboard engine oil.
- Reinstall the piston and connecting rod assemblies in their original cylinders.
- Install the piston and connecting rod assemblies with the "S" mark in the starboard side cylinders, and those with the "P" mark in the port side cylinders.
- The "UP" mark on the piston crown must face towards the flywheel.

INSPECTING THE DOG CLUTCH

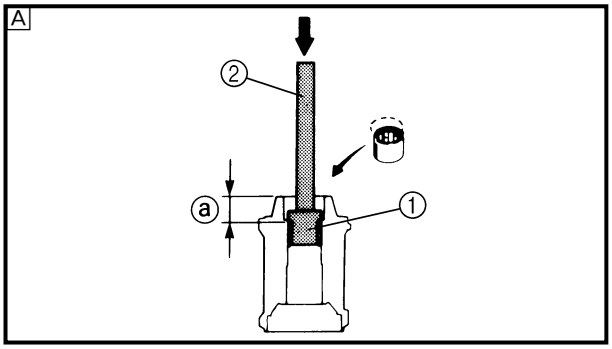
Inspect:
- Dog clutch
  Damage/wear → Replace.

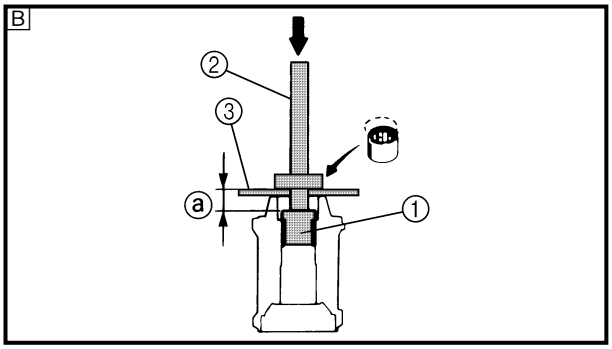
INSPECTING THE PROPELLER SHAFT

Inspect:
- Propeller shaft
  Damage/wear → Replace.

ASSEMBLING THE PROPELLER SHAFT HOUSING

1. Install:
   - Needle bearing



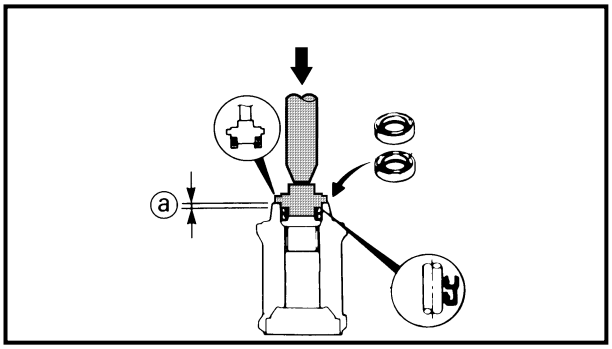


Needle bearing installation position ⓐ
24.75 - 25.25 mm (0.974 - 0.994 in)

Bearing/oil seal attachment .... ①
YB-06196 / 90890-06610
Driver rod ..... ②
YB-06071 / 90890-06604
Bearing/oil seal depth plate .... ③
90890-06603

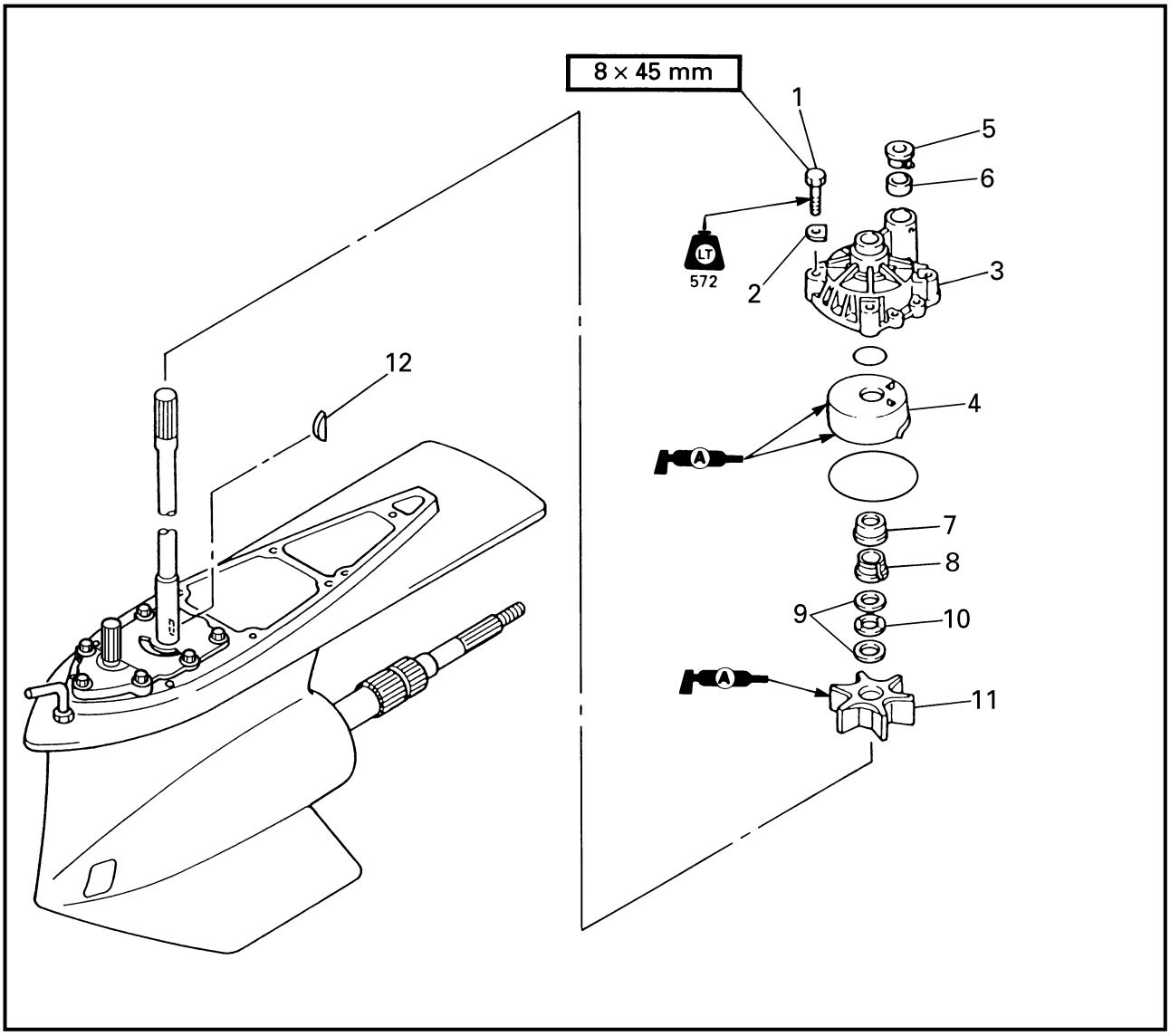
A For USA and Canada
B Except for USA and Canada

2. Install:
   - Oil seal



Oil seal installation position ⓐ
4.75 - 5.25 mm (0.187 - 0.207 in)

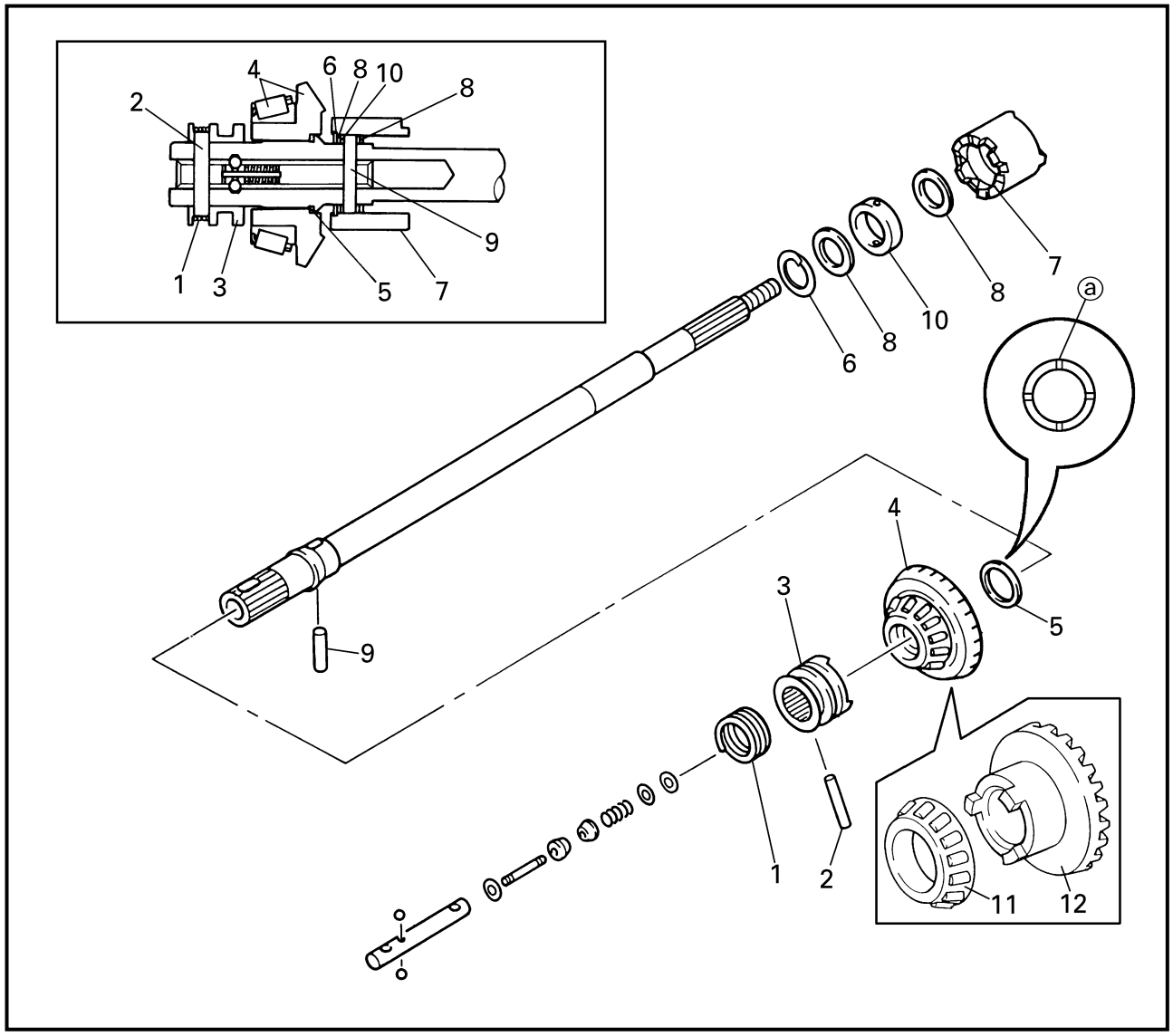
Bearing/oil seal attachment
YB-06195 / 90890-06633



Order	Job/Part	Q'ty	Remarks
8	Spacer	1	
9	Washer	2	
10	Wave washer	1	
11	Impeller	1	
12	Woodruff key	1	
			For installation, reverse the removal procedure.

INNER PROPELLER SHAFT ASSEMBLY (DUAL PROPELLER MODELS)

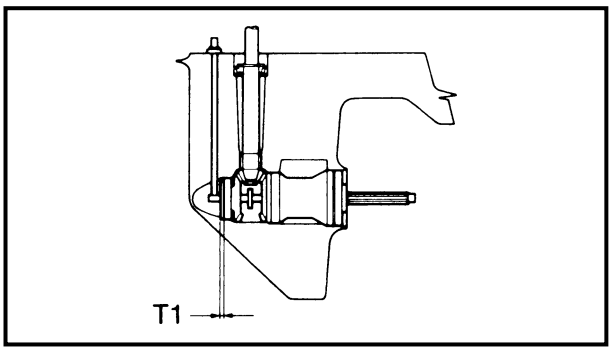
DISASSEMBLING/ASSEMBLING THE INNER PROPELLER SHAFT ASSEMBLY

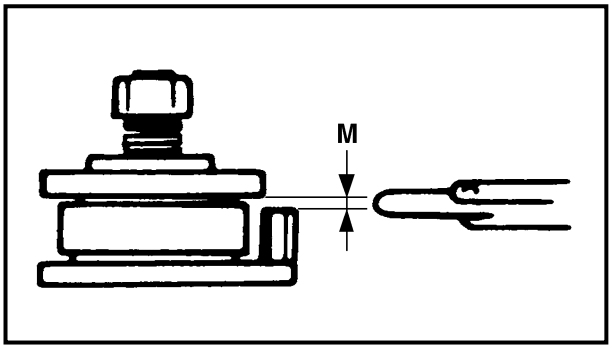


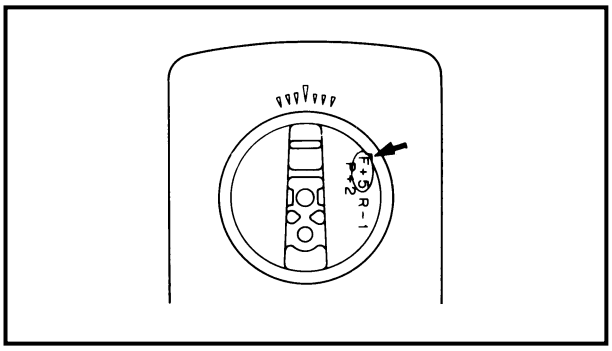
Order	Job/Part	Q'ty	Remarks
1	Spring	1	
2	Pin	1	
3	Front dog clutch	1	
4	Front gear assembly	1	
5	Washer	1	(with oil groove ⓐ)
6	Spring	1	

Continued on next page.

SHIMMING (REGULAR ROTATION MODELS) (FOR USA AND CANADA)







SELECTING THE FORWARD GEAR SHIMS

NOTE:

Find the shim thickness (T1) by selecting shims until the specified value (M0) is obtained with the special tool.

1. Measure:
   • Specified measurement (M)
   Out of specified value (M0) → Adjust.

Specified value (M0) =
1.60 + F/100 mm

Measuring steps

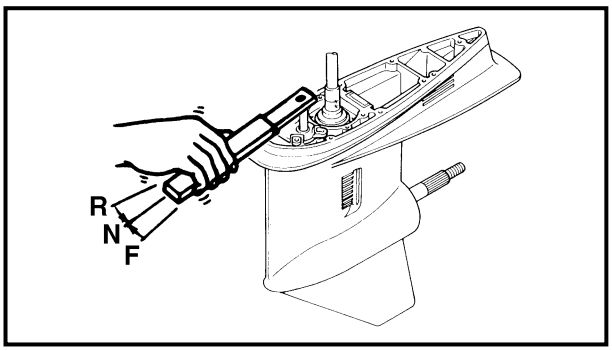
(1) Calculate the specified value (M0).

NOTE:

- "F" is the deviation of the lower case dimension from standard. It is stamped on the trim tab mounting surface of the lower case in 0.01-mm units. If the "F" mark is missing or unreadable, assume an "F" value of "0", and check the backlash when the unit is assembled.
- If the "F" mark is negative (–), then subtract the "F" value from the measurement.

Example:
If "F" is "+5", then
M0 = 1.60 + (+5)/100 mm
= 1.60 + 0.05 mm
= 1.65 mm
If "F" is "–3", then
M0 = 1.60 + (–3)/100 mm
= 1.60 – 0.03 mm
= 1.57 mm

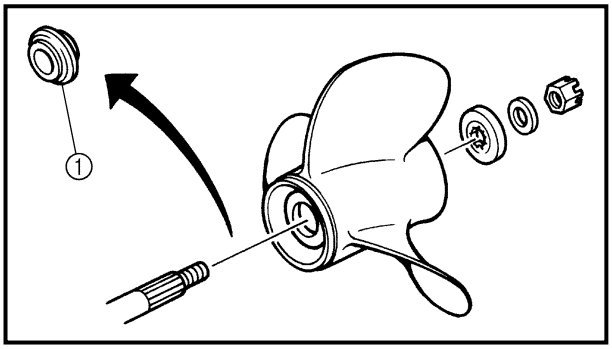
BACKLASH (REGULAR ROTATION MODELS)



Measuring steps

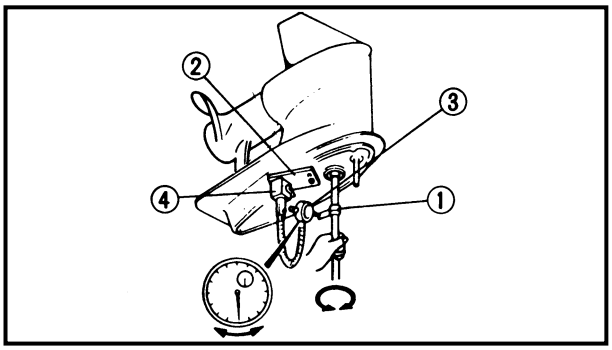
(1) Set the shift rod into the neutral position.

Shift rod wrench
YB-06052 / 90890-06052



(2) Load the reverse gear by installing the propeller without the spacer ① and then tighten the propeller nut.

Propeller nut
10 Nm (1.0 m • kgf, 7.2 ft • lb)



(3) Install the backlash indicator onto the drive shaft (on the 22.4 mm (0.88 in) diameter portion of the drive shaft).

Backlash indicator ..... ①
YB-06265 / 90890-06706

(4) Install the dial gauge onto the lower unit and have the dial gauge plunger contact the mark on the backlash indicator.

Magnetic-base plate..... ②
YB-07003 / 90890-07003
Dial gauge set ..... ③
YU-03097 / 90890-01252
Magnetic base..... ④
YU-34481 / 90890-06705

(5) Set the lower unit upside down.
(6) Slowly turn the drive shaft clockwise and counterclockwise. When the drive shaft stops in each direction, measure the backlash.

BACKLASH (DUAL PROPELLER MODELS)

NOTE:
- Do not install the water pump components when measuring the backlash.
- Measure both the forward and reverse gear backlashes.
- If both the forward and reverse gear backlashes are larger than specification, the pinion may be too high.
- If both the forward and reverse gear backlashes are smaller than specification, the pinion may be too low.

MEASURING THE FRONT GEAR BACKLASH

1. Measure:
   - Front gear backlash
     Out of specification → Adjust.

	**Front gear backlash** **0.19 - 0.59 mm (0.007 - 0.023 in)**

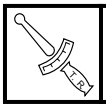
Measuring steps

(1) Set the shift rod into the neutral position.

	**Shift rod wrench** **YB-06052 / 90890-06052**

(2) Install the propeller shaft housing puller so it pushes against the inner propeller shaft.

	**Propeller shaft housing puller. ①** **YB-06502 / 90890-06502** **Universal puller..... ②** **YB-06540 / 90890-06540**

	**Universal puller** **10 Nm (1.0 m • kgf, 7.2 ft • lb)**