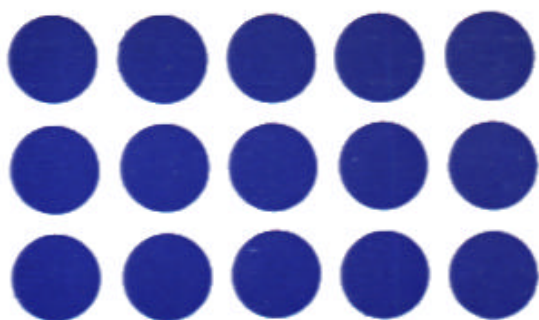
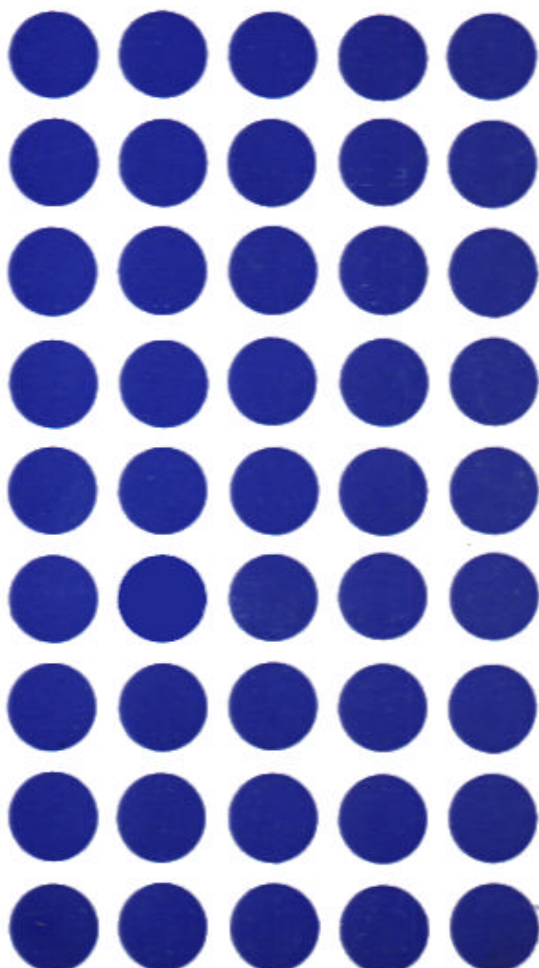


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HONDA BOAT ENGINE

MODEL GB-30



I. FEATURES

"Honda Outboard Equipment" GB 30 is designed with a view to highest performance at the most economical price. Combined with the Honda engine Model G II 30, the unit can be used in a wide range of applications including fishing and hunting and for family leisure. Simple removal and installation of the engine permits use as power for other machinery.

MAJOR FEATURES ARE SHOWN IN THE FOLLOWING:

1. Applications of engine

Installation and removal of the engine can be made simply by two engine mounting bolts. A minimum of effort allows using the engine as a power source for other purposes such as generator, pump, and other civil engineering machinery.

2. Maximum handling ease

Employment of the loop type steering handle and clutch permits simple control for forward, reverse, and stop, without stopping the engine.

3. Low speed cruising

Since this is a four-cycle engine, irregular rotation at a low speed range is eliminated; such "rough" running is common with two-cycle engines. Continuous low speed cruising is hence possible. The engine does not become overheated and hence can be used for unreasonable loads such as towing a nonpowered boat.

4. Low fuel consumption

The fuel consumption is approximately 20% lower than that of the 2-cycle outboard engine. For continuous operation, the Honda designated fuel (Mitsubishi) should be used.

5. Minimum vibration

Precise manufacture of each part and shock absorption between the loop handle and the engine are combined to prevent conveyance of vibration to the operator.

6. Easy starting

The carburetor of the engine is a fixed type and requires no adjustment; the engine can be easily started by means of the engine starter lock device and recoil starter. The engine starter lock device can be also used for securing the engine when powering other machinery.

7. High durability

Employment of ball bearings plus usage of select material and highly accurate production techniques eliminate trouble and adds particularly superior anticorrosion resistivity.

2. SPECIFICATIONS and PERFORMANCE

[NAME AND TYPE OF MOTOR]

Item	Specifications
Name	Honda outboard motor GB 30
Type	Forced air cooling
Total displacement (cc)	170 cc (10.4 cu. in.)

[MOTOR PERFORMANCE]

Item	Specifications
Normal output (HP/rpm)	3.0/3400
Maximum output (HP)	4.0
Type of fuel	Gasoline or fuel for agricultural use
Starting system	Recoil
Ignition system	Flywheel magneto
Exhaust system	Into atmosphere
Fuel tank capacity (liters)	4.5 (1.2 US gal., 1.0 Imperial gal.)

[PERFORMANCE OF MOTOR COMPLETELY MOUNTED]

Item	Specifications
Maximum speed (km/h)	One-passenger boat 19 (12 mph) (Two-passenger boat 14 (9 mph)
Fuel consumption (liters/h)	2.3 (0.6 US Gal/h, 0.5 Imp. Gal/h)
Maneuver-ability	Right turn
	Left turn
Steering angle 360 degrees	
Steering angle 360 degrees	
Lubricating system	Oil tank system
Oil amount	Outboard equipment (liters)
	Engine (liters)
0.16 (0.35 US pt, 0.27 Imperial pt)	
0.57 (1.2 US pt, 1.0 Imperial pt)	
Acceleration (kg)	50 (110 lbs)
Noise (phons)	100 to 102 (C scale)
Vibration (at loop handle) (G)	0.5 to 0.8

[DIMENSIONS AND WEIGHT]

Item	Specifications
Overall length (mm)	684 (27 in.) (excluding engine)
Overall width (mm)	470 (18.5 in.) (excluding engine)
Overall height (mm)	1180 (1330) (excluding engine) (47.25 in.) (52.53 in.)
Main unit maintenance weight (kg)	12.0 (12.5) (excluding engine) (26.5 lbs) (27.5 lbs)
Fully equipped weight (Kg)	34.5 (35.0) (with engine equipped (76 lbs) (77 lbs)

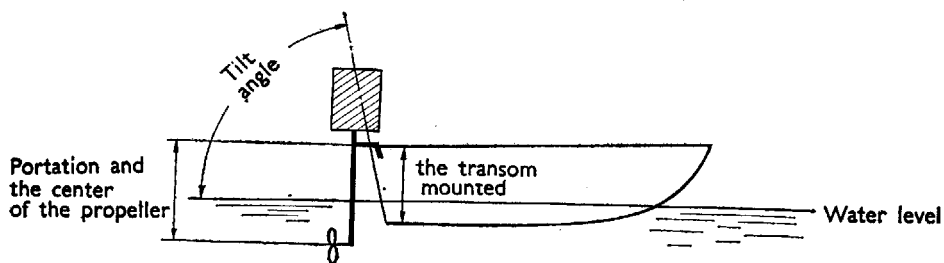
[POWER TRANSMISSION SYSTEM]

Item	Specifications						
Power transmission system from engine to propeller							
Reduction ratio from engine to propeller	12:9						
Clutch system	Contraction type belt clutch						
V-belt	<table border="1"> <tr> <td>Type</td> <td>A</td> </tr> <tr> <td>Number</td> <td>1</td> </tr> <tr> <td>Effective length mm (inch)</td> <td>686 (27")</td> </tr> </table>	Type	A	Number	1	Effective length mm (inch)	686 (27")
Type	A						
Number	1						
Effective length mm (inch)	686 (27")						
Chain	No. of links 156 (180 for long type)						
Sprocket	Drive 11						
Wheel	Driven 11						

[STEERING SYSTEM AND TILT ANGLE ADJUSTMENT]

Item		Specifications
Type		Loop handle
Steering angle		360-degree turning system
Tilt angle	Maximum	87 degrees
	Minimum	69 degrees
	Adjust angle (pitch)	6 degrees
Transom	Height (mm)	For 410 (16 in.) For 560 (22 in.)
	Thickness (mm)	60
Forward, Reverse		Loop handle, 360 degree rotation
Distance between the transom mounted portion and the center of the propeller		550 for 410 mm (16 in.) use
		700 for 560 mm (22 in.) use

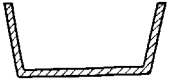
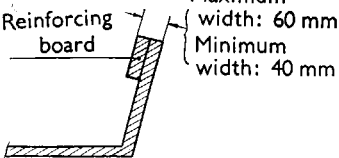

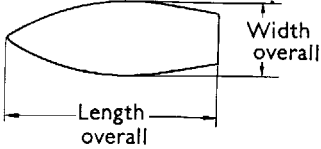
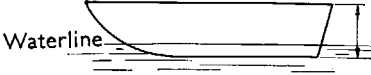
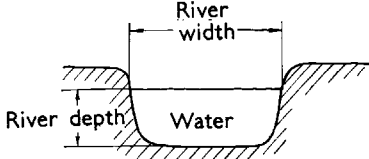
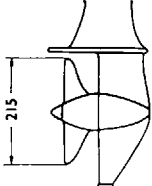
Note : Figures in parentheses indicate Model II, long type.

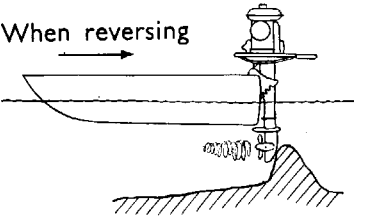
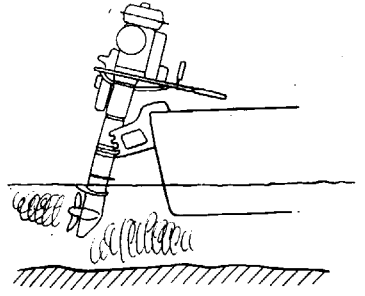


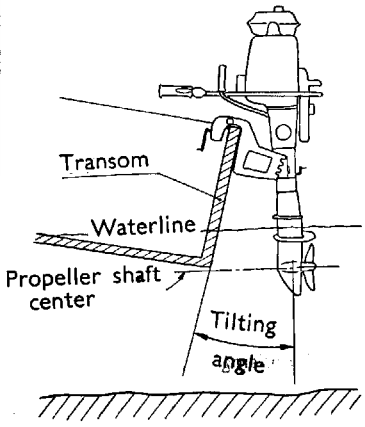
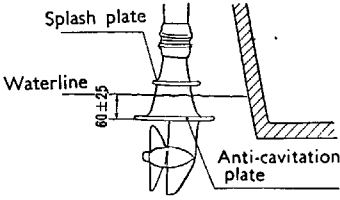
[PROPELLER SYSTEM]

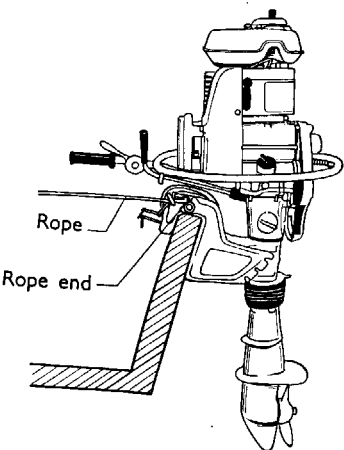
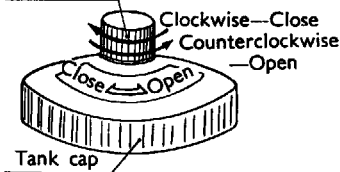
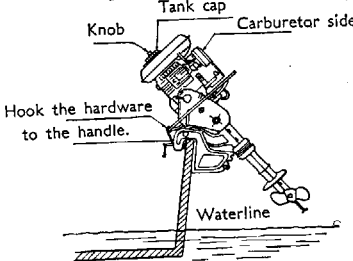
Item	Specifications
No. of propeller blades × diameter (mm) × pitch (mm)	Light load (high speed) 2×200 (7.9 in.)×140 (5.5 in.)
	Heavy load (low speed) 3×200 (7.9 in.) ×100 (4 in.)
Propeller rotation (as observed from the stern)	Counterclockwise

[PERFORMANCE LIMIT]

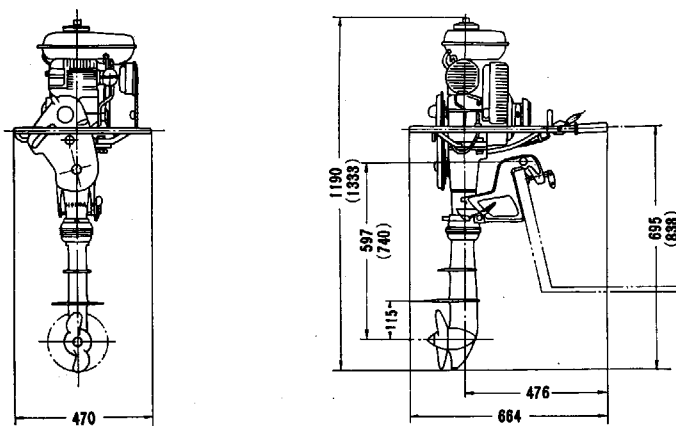
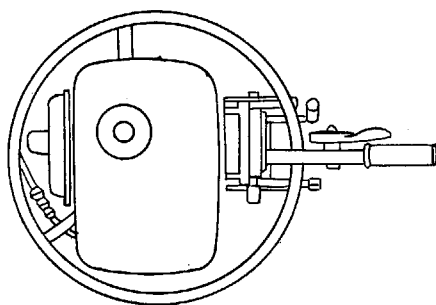
Item	Description	Diagram
Hull used	Rowboat (flat bottom type)	
	Double board provided at portion where outboard motor is mounted	
	Outboard motor should not be applied to a boat with a round bottom due to its instability	
	Length overall 10 m (394 in) Beam 2 m (79 in)	
	Height of transom 0.35 m (14 in) (standard type) 0.5 m (20 in) (long type)	
River conditions	River width: More than 2.5 m (8 ft.) River depth: More than 0.6 m (2 ft.)	
	Maximum diameter (mm)	

Item	Description	Diagram
Forward	<p>Avoid abrupt and sharp turning while running at high speed as this causes water penetration or capsizing of the boat.</p>	
Reverse	<p>A boat is not designed for reverse. Therefore reversing at high speed causes water penetration; always use low speed for reverse. While in reverse, ample care should be taken so that rocks and piles under water do not interfere with the propeller.</p>	
Shoal cruising	<p>For cruising over shoals or in areas with vegetation tilt the propeller further from the stern so that vegetation can slip off at the front edge of the lower portion of the bottom case. Under such a condition, an increase of engine speed does not produce a corresponding increase of boat speed. Use low speed for cruising.</p>	
Switching over from forward to reverse.	<p>Switching over should be made to reverse when the forward speed becomes sufficiently low.</p>	
Abrupt throttle-down	<p>An abrupt change of throttle to a low speed from the full open position causes the stern to go down rapidly, thus often resulting in water penetration at the transom. The throttle control must be made easily and slowly.</p>	

Item	Description	Diagram
Clutch control	When engaging the clutch, the throttle must have been set to low speed for safety and proper handling of GB 30.	
Adjustment of installation angle of the outboard equipment on the transom.	The adjustable hanger angle should be adjusted so that the propeller shaft is kept parallel with the waterline for maximum propelling efficiency. The following should be taken into consideration: When the load is comparatively light, the stem is floated up as the speed is increased and the tilt angle of the transom varies. It is then important to adjust the angle considering this factor.	 <p>The diagram shows a side view of an outboard motor mounted on a transom. A horizontal dashed line represents the waterline. The transom is shown as a vertical structure. The propeller shaft is shown extending from the motor down into the water. The angle between the transom and the waterline is labeled as the 'Tilting angle'. The center of the propeller shaft is labeled as the 'Propeller shaft center'.</p>
Installation height of outboard equipment	The outboard equipment should be installed on the transom in a manner which permits the water level to be 60 — 25 mm (2.35 — 1.0 in) above the anti-cavitation plate. Otherwise, cavitation occurs due to air suction. The propelling efficiency is reduced and the propeller may possibly be damaged.	 <p>The diagram shows a close-up of the outboard motor's lower unit. A horizontal dashed line represents the waterline. The splash plate is shown above the waterline. The propeller is shown below the waterline. The anti-cavitation plate is shown below the propeller. The distance between the waterline and the anti-cavitation plate is labeled as '60-25'.</p>

Item	Description	Diagram
Prevention of accidental dropping of outboard equipment	There need not be great concern over dropping of the outboard motor during cruising since it is securely fixed to the hull with mounting bolts. To guard against the small possibility of dropping, it is recommended that the outboard equipment be tied with a rope to the hull during cruising. For ease of tying, a rope end plate is provided at the side of the adjustable hanger.	 <p>The diagram shows an outboard motor mounted on a hull. A rope is tied to a metal plate (labeled 'Rope end') which is attached to the side of the motor's adjustable hanger. The rope extends towards the hull. Labels include 'Rope' and 'Rope end'.</p>
Engine	Engine Model G II 30 is used. This engine is treated with a special surface treatment for sea water resistivity.	
Fuel tank cap	For preventing fuel from running out of the tank when the boat is inclined, a seal bolt cap is installed on the tank cap. During operation, the seal bolt cap must be open. When the engine is tilted for a long period of time, the seal bolt cap should be closed.	<p>Seal bolt cap located at top of the cap.</p>  <p>The diagram shows a cylindrical fuel tank cap with a seal bolt cap on top. Arrows indicate the directions for opening and closing. Labels include 'Clockwise—Close', 'Counterclockwise—Open', and 'Tank cap'.</p>
Raising outboard motor	The outboard motor when not in use for a long period of time should be raised, always with the carburetor up, to prevent oil passage from the tappet chamber into the carburetor.	 <p>The diagram shows an outboard motor being raised. A knob is used to rotate the carburetor side upwards. A hook is used to hold the hardware to the handle. The waterline is indicated. Labels include 'Knob', 'Tank cap', 'Carburetor side', 'Hook the hardware to the handle.', and 'Waterline'.</p>

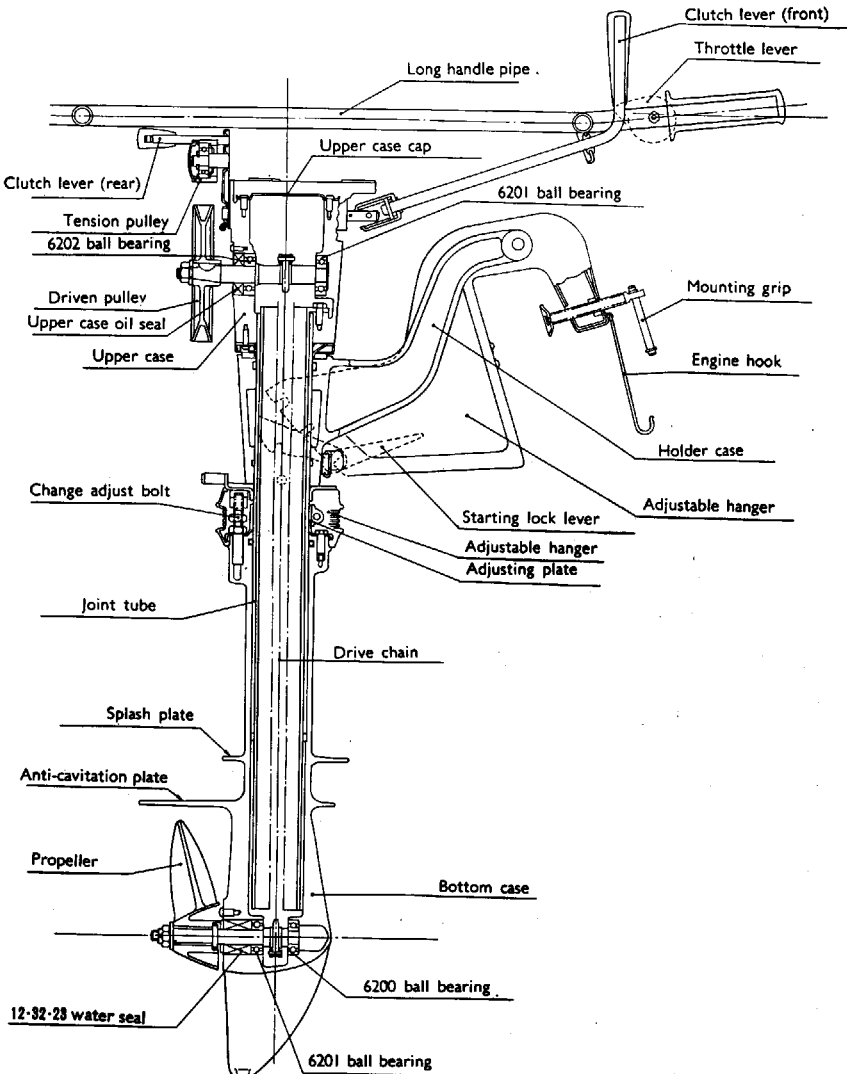
3. EXTERNAL VIEWS



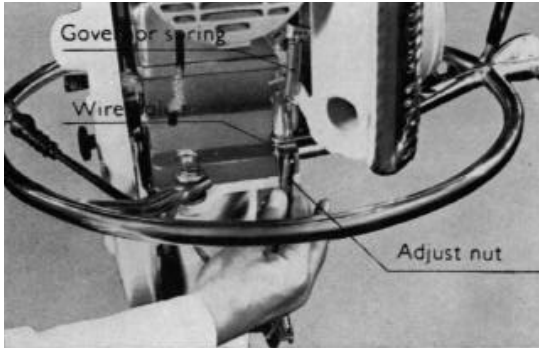
Figures in parentheses are applicable to Model 11

4. MAJOR CONSTRUCTION and NAME OF EACH PART

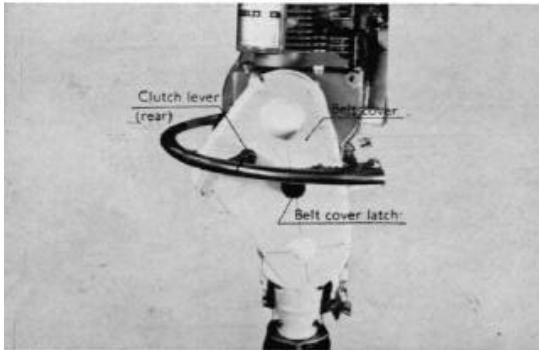
Major parts of the Honda Outboard Motor consists of the loop handle, upper case, holder case, bottom case, and joint tube, each made of a special light alloy metal with high corrosive resistivity. Rubber shock absorbers are applied to the portion where the handle and the motor body are connected for minimizing handle vibration during cruising. A belt chain is used for power conveyance from the engine to the propeller. For engaging and disengaging the power, a tension clutch is installed in the belt unit; smooth control is obtained.



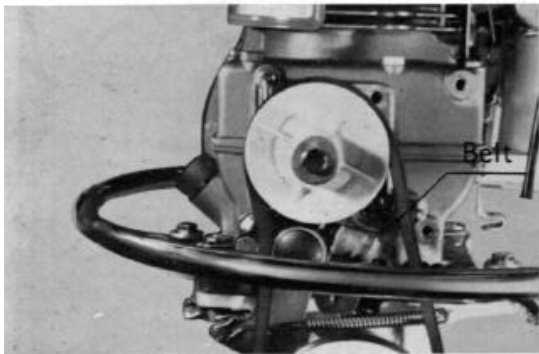
5. DISASSEMBLING and REASSEMBLING



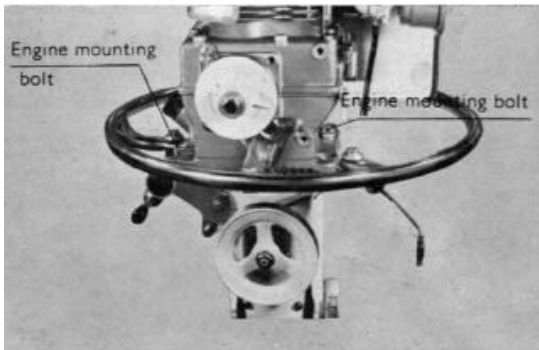
(Fig. 1-1)



(Fig. 1-2)



(Fig. 1-3)



(Fig. 1-4)

I. INSTALLATION AND REMOVAL

A. Removal

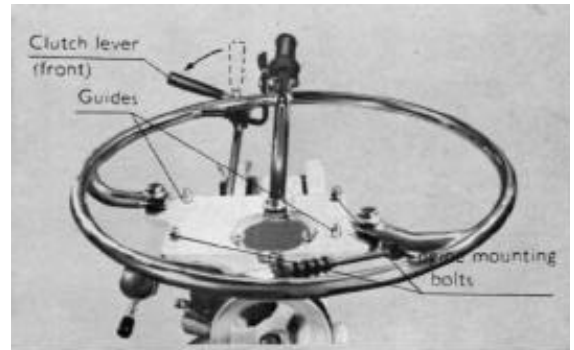
1. Pull down by hand the adjusting nut unit at the top end of the throttle wire, removing it from the throttle wire holder and separating it from the governor spring. (Refer to Fig. 1-1)
2. Operate the clutch lever (rear) to the right side and loosen the belt cover latch for removal of the belt cover. (Refer to Fig. 1-2)
3. Remove the belt (Refer to Fig. 1-3)
4. Loosen the two engine mounting bolts and lift up the engine for removal. (Refer to Fig. 1-4)

B. Installation

1. The engine should be mounted with four holes located on the oil pan of the engine set to two guides and to two engine mounting bolts. (Refer to Fig. 1-5)

(Note) The clutch lever (front) should be operated in the direction as the arrow mark points.

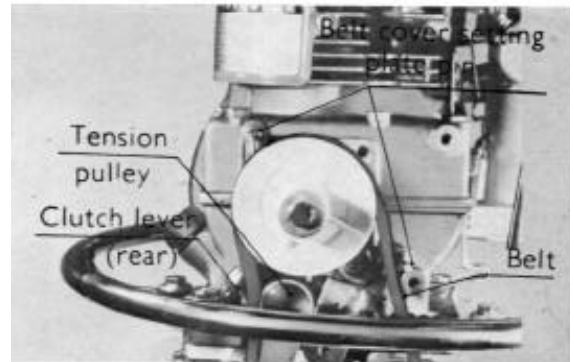
2. The subsequent engine installation is the reverse of dismounting.



(Fig. 1-5)

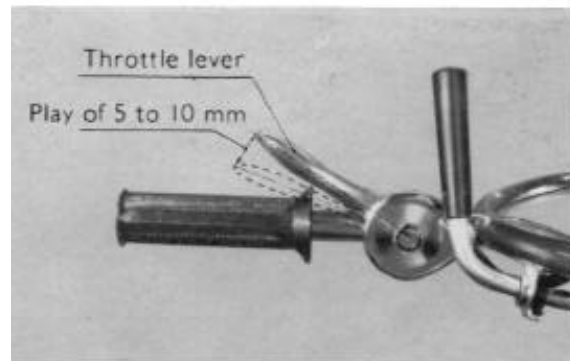
(Important)

1. Upon placing the belt, its relationship with the tension pulley and the belt cover setting plate is as shown in the diagram. (Refer to Fig. 1-6)



(Fig. 1-6)

2. After the engine has been mounted, play of the throttle lever should be adjusted.
 - a. Loosen the lock nut and adjust the adjusting nut to obtain a play of 5 to 10 mm (.2 to .4 in) at the top end of the throttle lever. (Refer to Fig. 1-7)

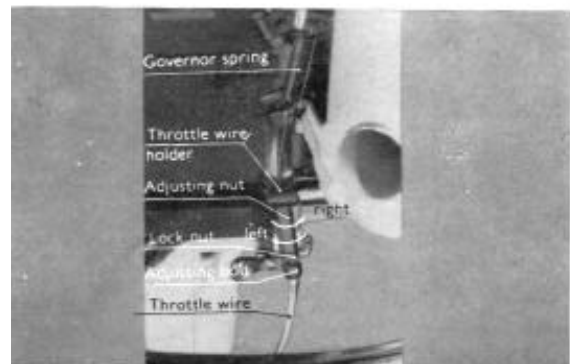


(Fig. 1-7)

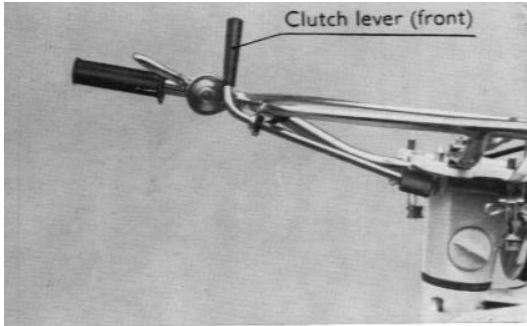
- b. The adjusting nut

When turned counterclockwise this permits a larger play of the throttle lever; when turned clockwise, it permits a smaller play of the throttle lever. (Refer to Fig. 1-8)

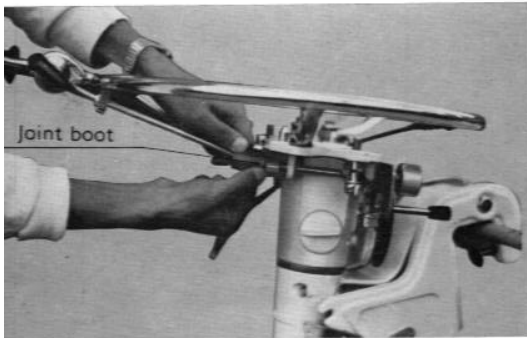
(Note) After the adjustment has been completed, the lock nut should be securely tightened to the adjusting nut.



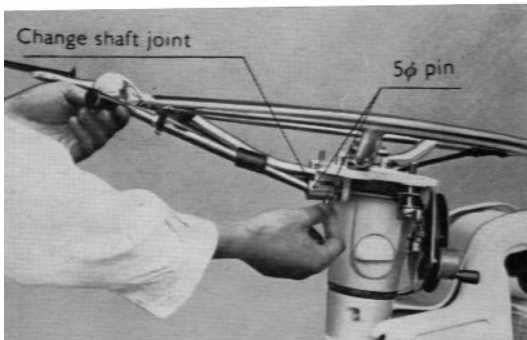
(Fig. 1-8)



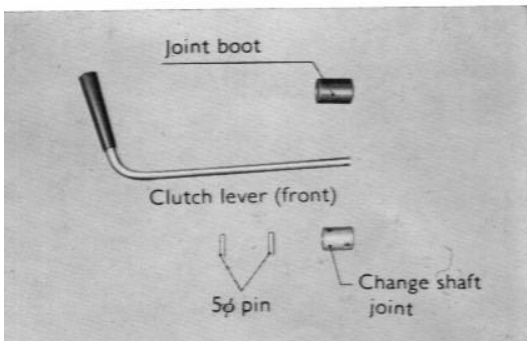
(Fig. 2-1)



(Fig. 2-2)



(Fig. 2-3)



(Fig. 2-4)

2. CLUTCH AND HANDLE

A. Construction of clutch lever (front)

1. The clutch lever (front) is used to engage and disengage power during forward cruising. It is installed in front of the handle grip. The lever is operated to the left or right for steering. (Refer to Fig. 2-1)

B. Removal

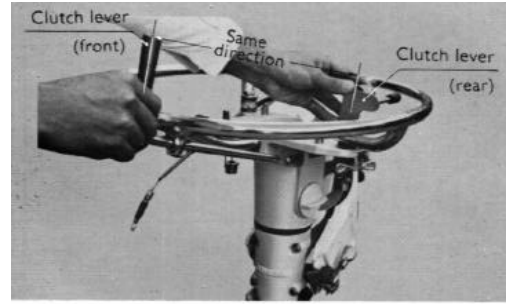
1. Remove the joint boot (rubber cap) (Refer to Fig. 2-2)
2. By hand, pull out 5φ pins (two) from the change shaft joint. (Refer to Fig. 2-3)
3. Separate the joint from the handle. (Refer to Fig. 2-4)

C. Installation

1. The clutch lever (front) should be installed in reverse to the description given in Paragraph 2.B.

(Important)

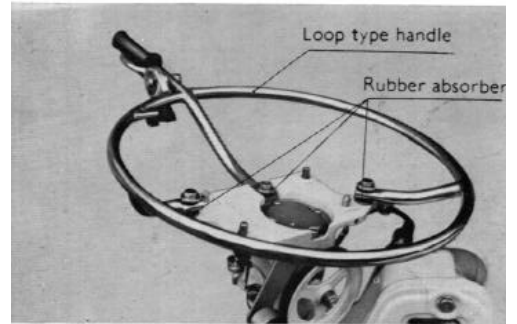
1. It should be installed in a manner which permits the grip of the clutch lever (front) to be in the same direction as the grip of the clutch lever (rear). (Refer to Fig. 2-5)



(Fig. 2-5)

D. Construction of loop handle

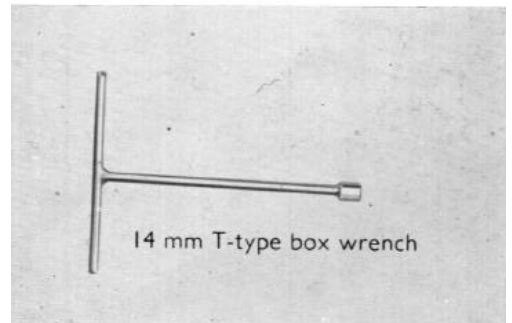
1. The handle is a loop type permitting steering control from any position (360 degrees). Forward and reverse are easily controlled. Furthermore, cushion rubber is provided between the handle and the equipment so that vibration conveyed to the handle is minimized. (Refer to Fig. 2-6)



(Fig. 2-6)

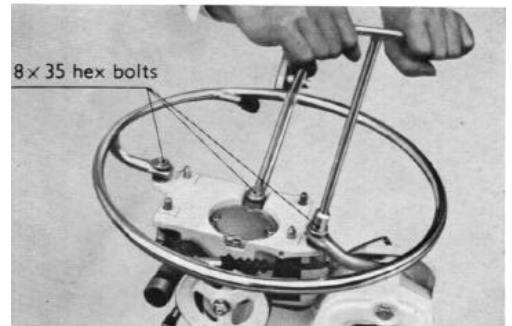
E. Disassembling

1. Tool necessary for disassembling and reassembling the handle. (Refer to Fig. 2-7)

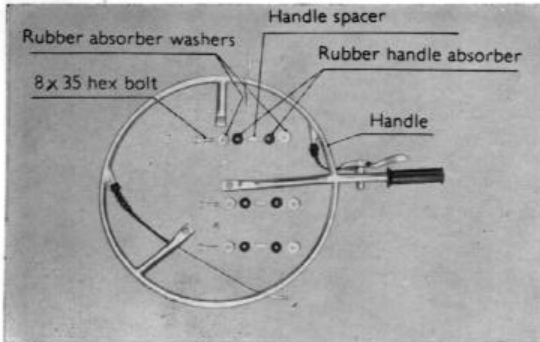


(Fig. 2-7)

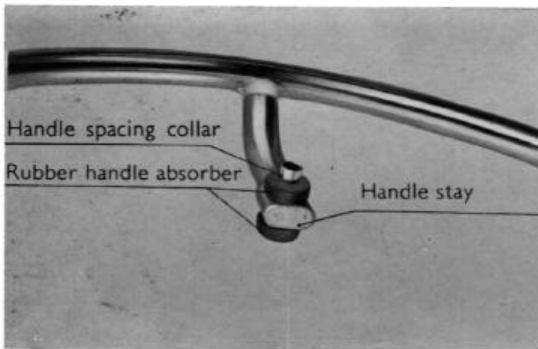
2. Remove the clutch lever (front) in the manner described in Paragraph 2.B.
3. Remove three 8×35 hex bolts for removal of handle.



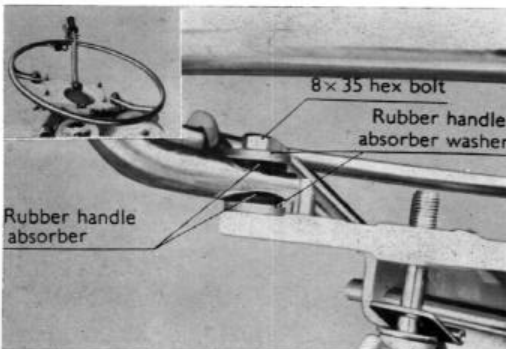
(Fig. 2-8)



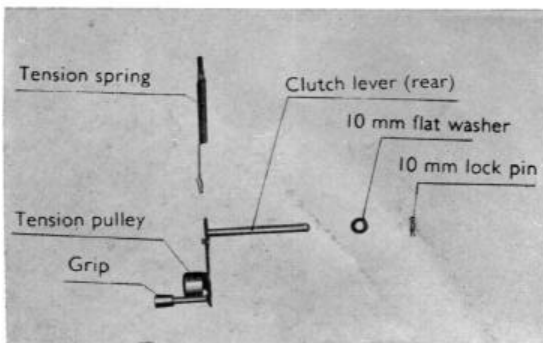
(Fig. 2-9)



(Fig. 2-10)



(Fig. 2-11)



(Fig. 2-12)

4. Separate from the handle six rubber absorber washers, six rubber handle absorbers, and three handle spacers. (Refer to Fig. 2-9)

F. Reassembling

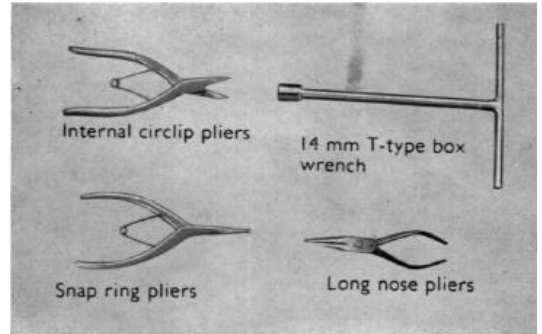
1. Insert the rubber handle absorbers into three holes of the handle stay from both sides and insert the handle spacers. (Refer to Fig. 2-10)
2. Insert the rubber handle absorber washers into upper and lower sides of the rubber handle absorbers and tighten with three 8 x 35 hex bolts. (Refer to Fig. 2-11)
3. Install the clutch lever (front) in the manner given in Paragraph 2.C.

G. Construction of clutch lever (rear) (complete unit clutch arm)

The clutch lever (rear) is used to engage and disengage power when reversing and extends outside the belt cover. It is controlled by operating the grip either to the left or right. It is coupled to the upper case by a 100 mm flat washer and 10 mm lock pin with the tension pulley and tension spring assembled. (Refer to Fig. 2-12)

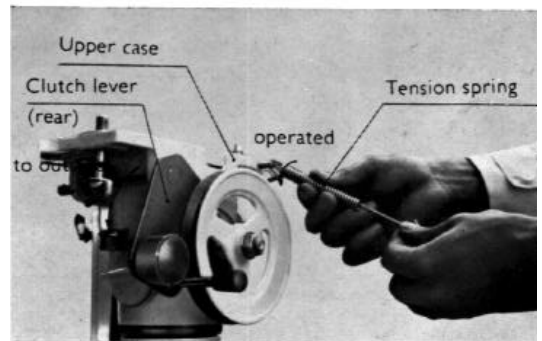
H. Disassembling

1. Tools necessary for disassembling and reassembling the clutch lever (rear). (Refer to Fig. 2-13)



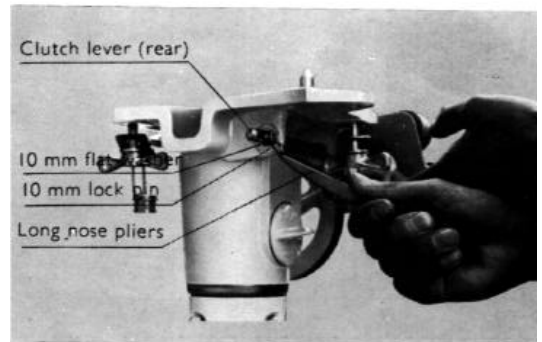
(Fig. 2-13)

2. Remove the handle in the manner described in Paragraph 2.E.
3. Operate the clutch lever (rear) to the outside; remove the tension spring from the hook and the clutch lever (rear) can be removed from the upper case. (Refer to Fig. 2-14)



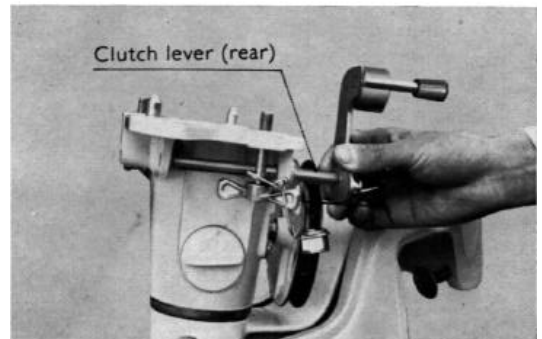
(Fig. 2-14)

4. Remove the 10 mm lock pin and the 10 mm flat washer. (Refer to Fig. 2-15)



(Fig. 2-15)

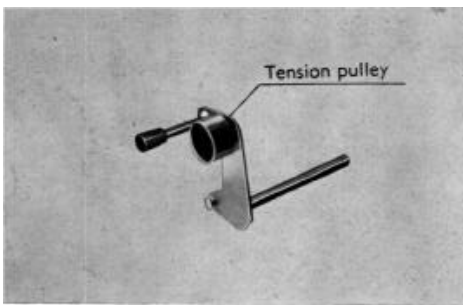
5. Remove the clutch lever (rear) (Refer to Fig. 2-16)



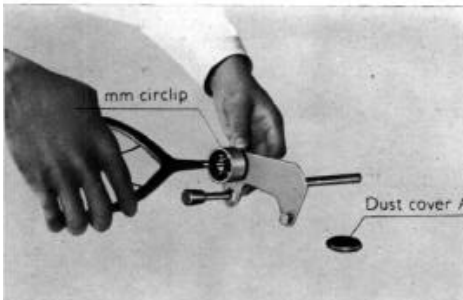
(Fig. 2-16)

I. Reassembling

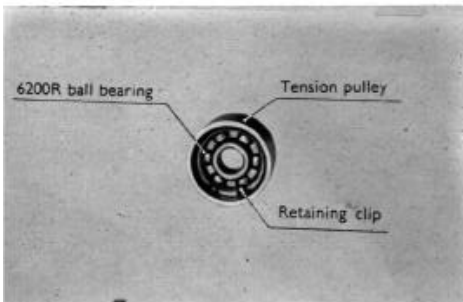
Reassembling is the reverse of disassembling



(Fig. 2-17)



(Fig. 2-18)



(Fig. 2-19)

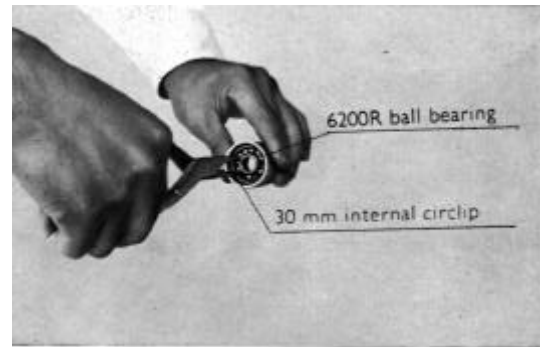
J. Construction of tension pulley

The tension pulley is used to stretch the belt and to convey power when the clutch is engaged. Since the pulley itself rotates, a ball bearing is used for minimizing friction. (Refer to Fig. 2-17)

K. Disassembling

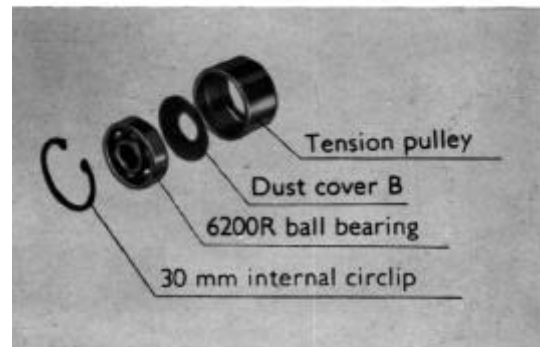
1. Remove dust cover A and the 10 mm circlip of the pulley shaft. (Refer to Fig. 2-18)
2. Remove the tension pulley (together with 6200R ball bearing) from the pulley shaft. (Refer to Fig. 2-19)

3. Remove 30 mm internal circlip and 6200R ball bearing. (Refer to Fig. 2-20)



(Fig. 2-20)

4. Remove dust cover B. (Refer to Fig. 2-21)



(Fig. 2-21)

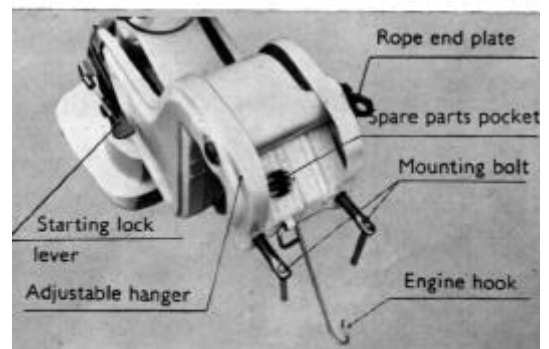
L. Reassembling

Reassembling is the reverse of disassembling

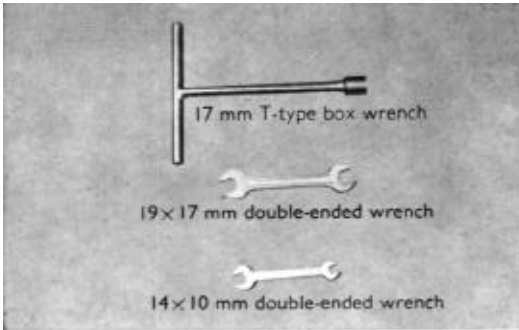
3. ADJUSTABLE HANGER, HOLDER CASE

A. Construction of adjustable hanger

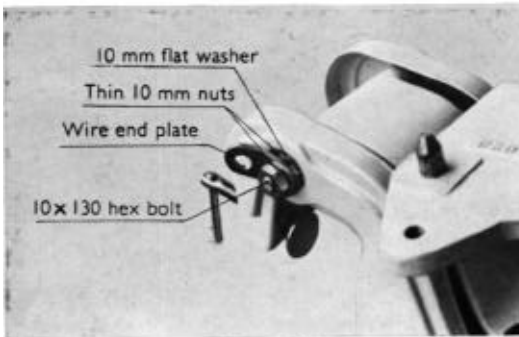
This is a portion in which the outboard motor is mounted to the hull and is fixed to the hull with two mounting bolts. At the side of the hanger are a groove for angle adjustment of the outboard motor, starting lock lever for facilitating engine start, hook for keeping the outboard motor raised, and a spare parts pocket containing shear pin and split pin. In addition, a rope end plate is provided for coupling the outboard motor and the hull, thus preventing the equipment from dropping into the water during cruising. (Refer to Fig. 3-1)



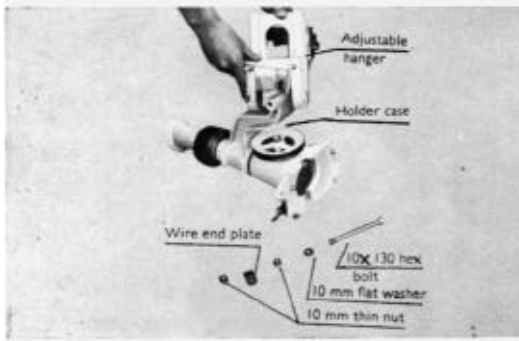
(Fig. 3-1)



(Fig. 3-2)



(Fig. 3-3)



(Fig. 3-4)

B. Disassembling

1. Necessary tools for disassembling and reassembling the adjustable hanger. (Refer to Fig. 3-2)

2. Remove the two thin 10 mm nuts, one 10 mm flat washer, and one wire end plate; also remove the 10x130 hex bolt. (Refer to Fig. 3-3)

3. Separate the adjustable hanger from the holder case. (Refer to Fig. 3-4)

C. Reassembling

Reassembling is the reverse of disassembling

D. Construction of starting lock lever

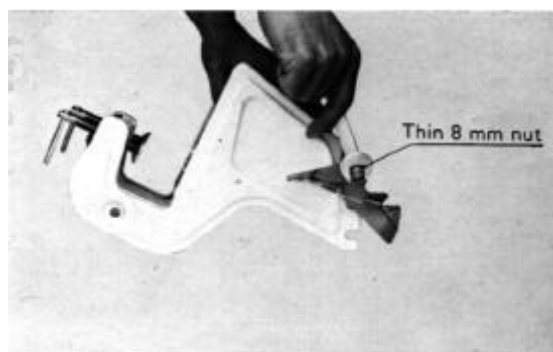
The lock lever is used to secure the engine during starting. It is also used when the engine is a power supply for other machinery (belt removed). (Refer to Fig. 3-5)



(Fig. 3-5)

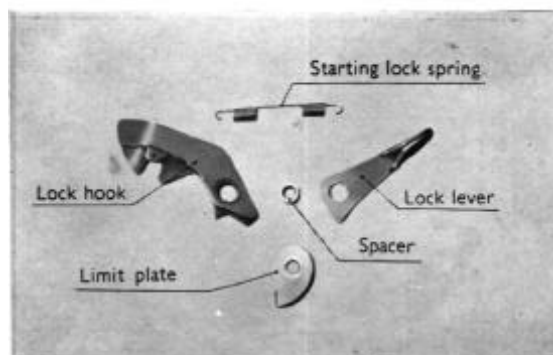
E. Disassembling

1. Remove the thin 8 mm lock lever nut. (Refer to Fig. 3-6)



(Fig. 3-6)

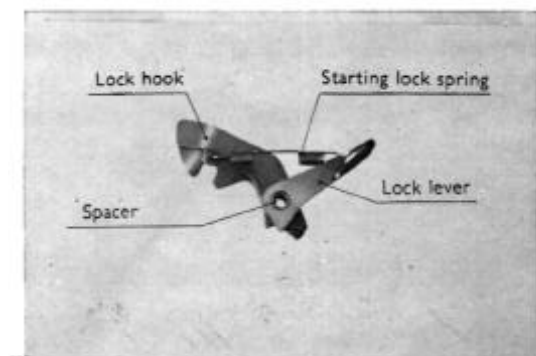
2. From the setting shaft, remove the lock lever, lock hook, limit plate, spacer and starting lock spring. (Refer to Fig. 3-7)



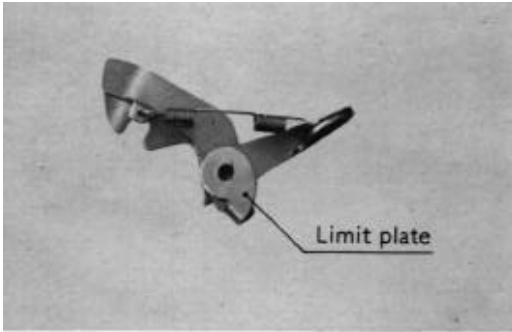
(Fig. 3-7)

F. Reassembling

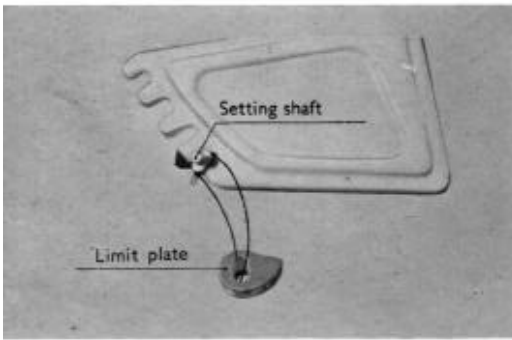
1. Apply the starting lock spring to the lock lever and the lock hook; insert the spacer (Refer to Fig. 3-8)



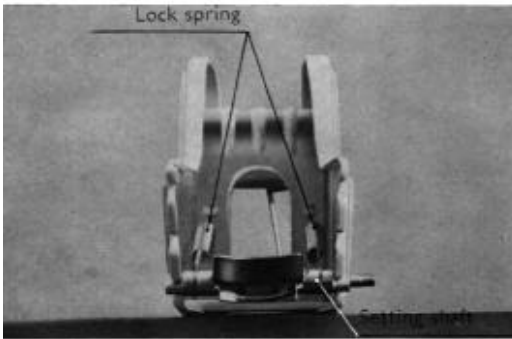
(Fig. 3-8)



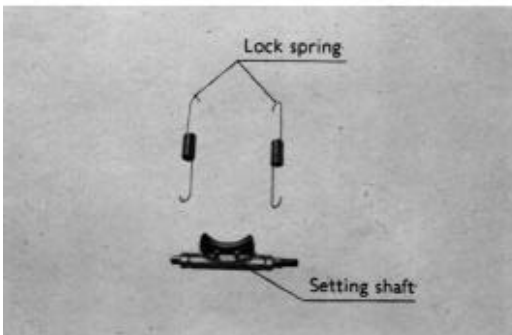
(Fig. 3-9)



(Fig. 3-10)



(Fig. 3-11)



(Fig. 3-13)

2. Fit the limit plate as shown in the figure (Refer to Fig. 30-10)

3. When installing on the setting shaft, the long hole of the limit plate versus the setting shaft should be as shown in Fig. 3-10.

G. Construction of setting shaft

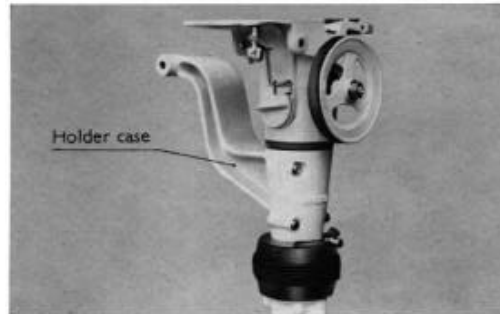
The setting shaft is to be inserted into any desired one of the four grooves of the adjustable hanger for adjustment of the out-board motor tilt angle. The contacting portion of the holder case center is provided with a rubber absorber for minimizing shock. The adjustable hanger is installed with two lock springs. (Refer to Fig. 3-11)

H. Disassembling and reassembling

Remove two lock springs, separating them from the adjustable hanger. (Refer to Fig. 3-12)

I. Construction of holder case

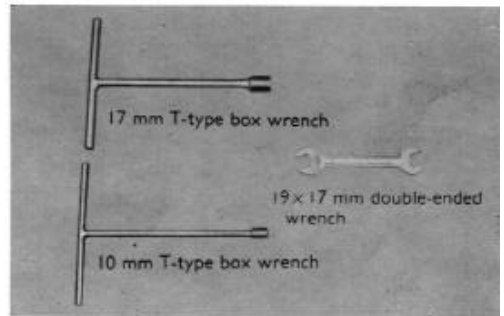
The holder case is the supporting unit of the outboard motor and is installed on the joint tube at its center; the contacting portion is fitted with an oil ring (oiled felt) for smooth operation. (Refer to Fig. 3-13)



(Fig. 3-13)

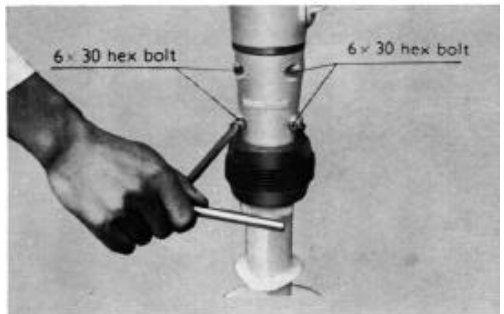
J. Disassembling

1. Tools necessary for disassembling and reassembling the holder case. (Refer to Fig 3-14)



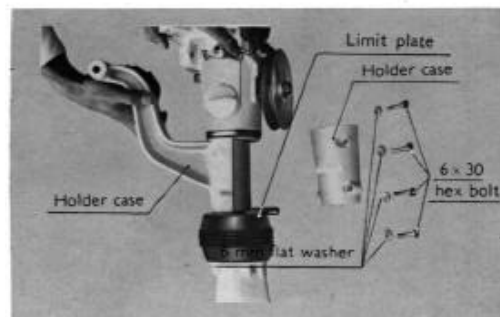
(Fig. 3-14)

2. Remove the adjustable hanger in the manner described in Paragraph 3.B.
3. Remove six 6×30 mm hex bolts used for securing the holder case and also remove four 6 mm flat washers. (Refer to Fig. 3-15)

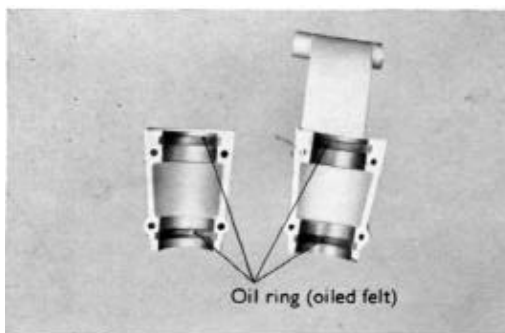


(Fig. 3-15)

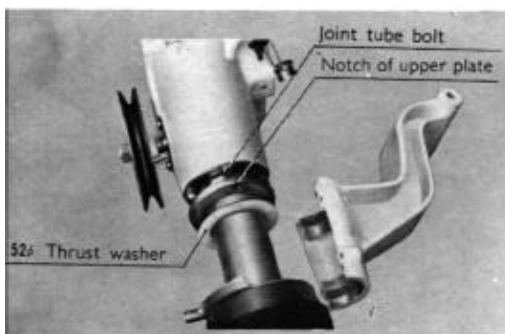
4. Separate the holder case cover and the holder case from the joint tube, preferably from the position opposite the side of the limit plate. (Refer to Fig. 3-6)



(Fig. 3-16)



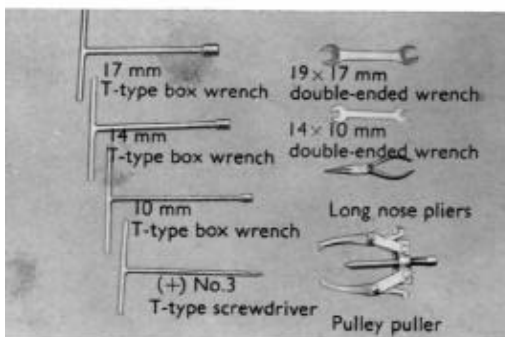
(Fig. 3-17)



(Fig. 3-18)



(Fig. 4-1)



(Fig. 4-2)

- Remove the holder case cover and the oil ring (oiled felt) from the internal groove of the holder case.

K. Reassembling

Reassembling is the reverse of disassembling (Important)

Set the notch of the upper plate to the head portion of the joint tube bolt and allow the 52φ thrust washer to come to the upper portion before installing the holder case and the cover. (Refer to Fig. 3-18).

4. UPPER CASE

A. Construction of upper case

The upper case is located at the upper portion of the outboard equipment and serves as a mounting base for the engine. Also provided with the case are controls such as loop handle, clutch, drive shaft, plus an oil inlet. The case is connected to the joint tube by four bolts. (Refer to Fig. 4-1)

B. Disassembling

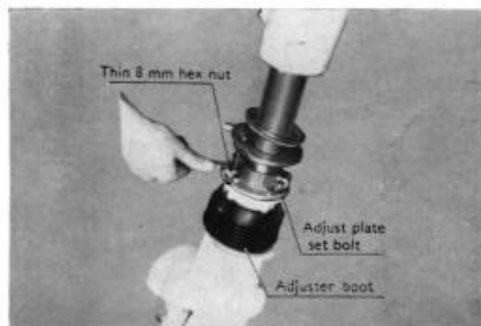
- Tools necessary for disassembling and reassembling upper case. (Refer to Fig. 4-2)

2. Remove the handle in the manner described in Paragraph 2. E.
3. Remove the clutch lever (rear) in the manner described in Paragraph 2. H.
4. Remove the adjustable hanger in the manner described in Paragraph 3.B.
5. Remove the holder case in the manner described in Paragraph 3.J.
6. Remove 10 mm hex nut and 10 mm flat washer, pulling out the driven pulley. (Refer to Fig. 4-3)



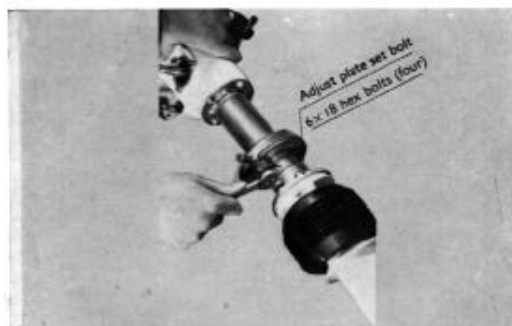
(Fig. 4-3)

7. Remove the adjuster boot and loosen the adjust plate set bolt; also turn counter-clockwise the lock of the change adjust bolt for loosening. (Refer to Fig. 4-4)



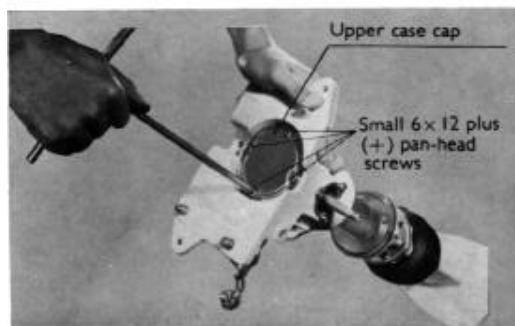
(Fig. 4-4)

8. Slightly loosen four adjust plate (6 × 18) hex bolts and turn the chain adjust bolt clockwise for reducing tension on the chain. (Refer to Fig. 4-5)

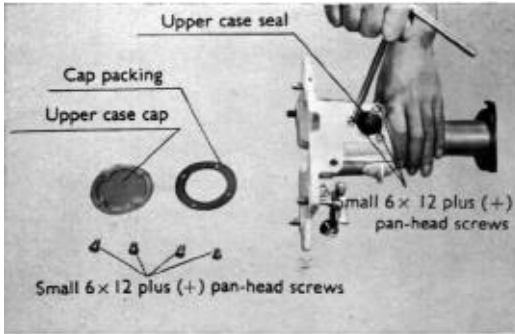


(Fig. 4-5)

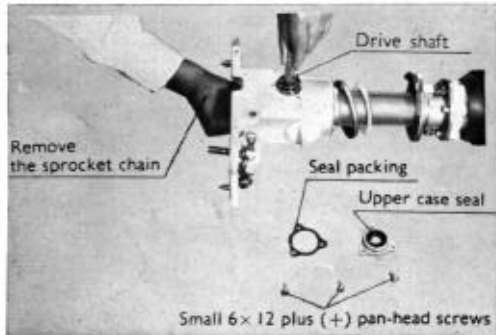
9. Remove four small 6 × 12 plus (+) panhead screws used for securing the upper case cap and remove the upper case cap and the cap packing. (Refer to Fig. 4-6)



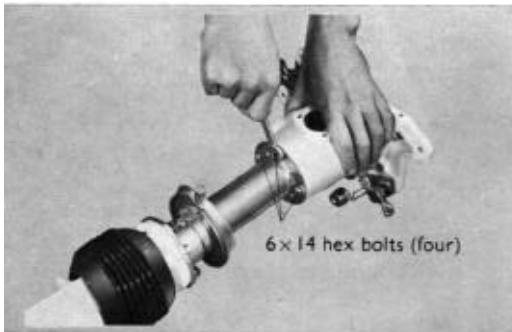
(Fig. 4-6)



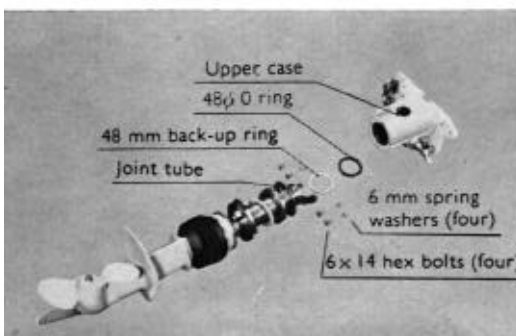
(Fig. 4-7)



(Fig. 4-8)



(Fig. 4-9)



(Fig. 4-10)

10. Remove three small 6×12 plus (+) panhead screws used for securing the upper case seal and remove the upper case seal and the seal packing. (Refer to Fig. 4-7)

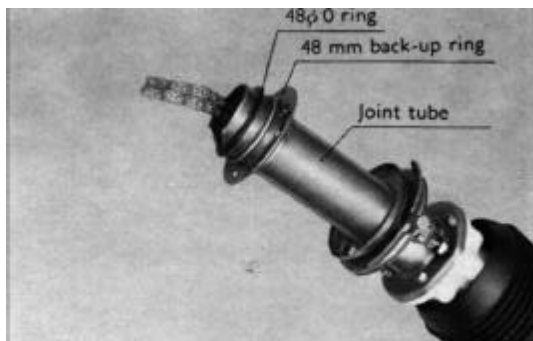
11. Use the right hand to remove the sprocket drive chain through the hole in the upper section of the upper case, removing the drive shaft with the left hand. (Refer to Fig. 4-8)

12. Remove four 6×14 hex bolts used for securing the joint tube and also remove four 9 mm washers. (Refer to Fig. 4-9)

13. From the joint tube remove the upper case, 48φ "O" ring, and 48 mm back-up ring. (Refer to Fig. 4-10)

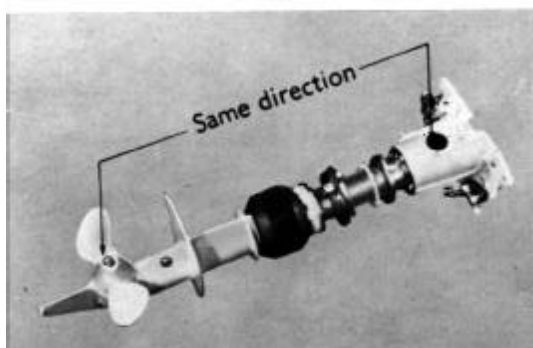
C. Reassembling

1. Insert into the joint tube the 48 mm back-up ring and 48ϕ "O" ring in this sequence. (Refer to Fig. 4-11)



(Fig. 4-11)

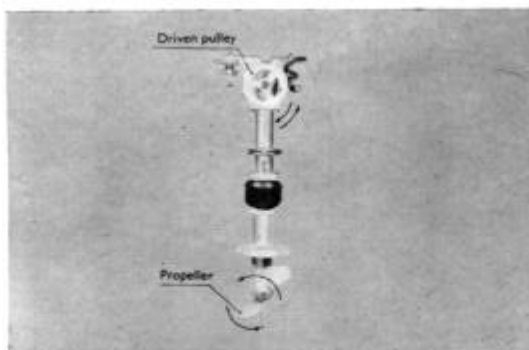
2. Position the upper case hole, through which the drive shaft runs, so that it is in the same direction as that of the propeller. Insert the assembly into the joint tube and secure it by four 6×14 hex bolts with 6mm spring washers. (Refer to Fig. 4-12)



(Fig. 4-12)

3. Reassembling of the drive shaft is the reverse of the disassembling described in Paragraph 4.B.11. (Do not forget the seal packing)

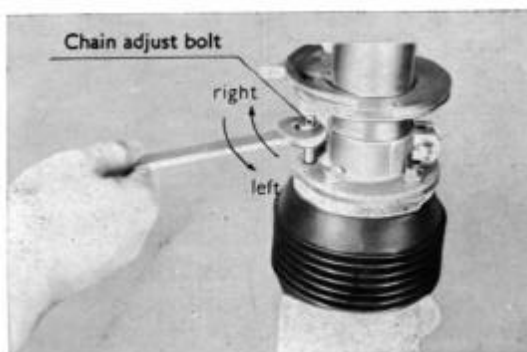
4. Reassemble the driven pulley and the upper case cap in a reverse manner to the disassembling described in Paragraph 4.B.6.9.



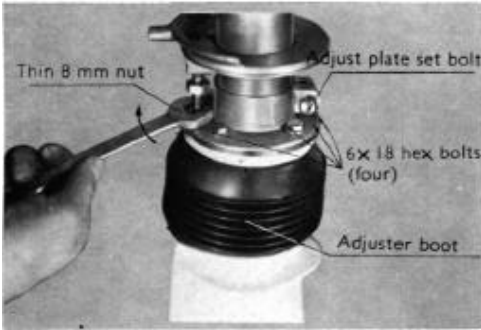
(Fig. 4-13)

5. Adjustment of drive chain

a. When turning the chain adjust bolt counterclockwise while rotating the driven pulley or the propeller, the rotation condition somewhat changes; this position is where the most desirable tension is obtained. The best tension permits a sag of 2 to 4 mm when the chain is depressed by finger from the position of the oil inlet. When the chain adjust is turned clockwise, the tension of the chain is reduced. (Refer to Fig. 4-14)

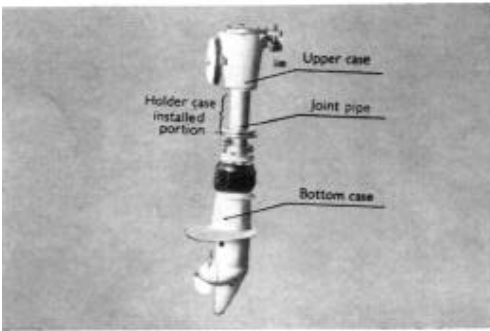


(Fig. 4-14)



(Fig. 4-15)

- b. Securely tighten four 6×18 hex bolts to secure the adjust plate.
 - c. Lock the chain adjust bolt by the thin 8 mm nut.
 - d. Tighten the adjust plate set bolt.
 - e. Put the adjustor boot in place (Refer to Fig. 4-15)
6. The subsequent reassembling is the reverse of disassembling.

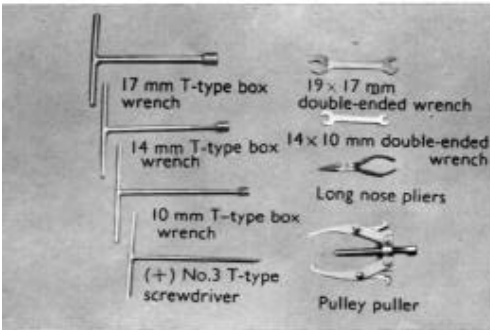


(Fig. 5-1)

5. JOINT TUBE, PROPELLER, BOTTOM CASE

A. Construction of joint tube

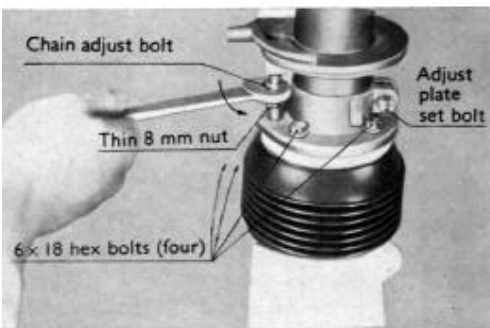
The joint tube is a part on which the upper case and the bottom case are connected; the holder case is installed on the center portion of the tube. (Refer to Fig. 5-1)



(Fig. 5-2)

B. Disassembling

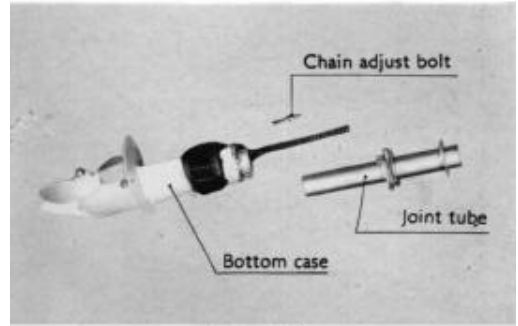
1. Tools necessary for disassembling the joint tube. (Refer to Fig. 5-2)



(Fig. 5-3)

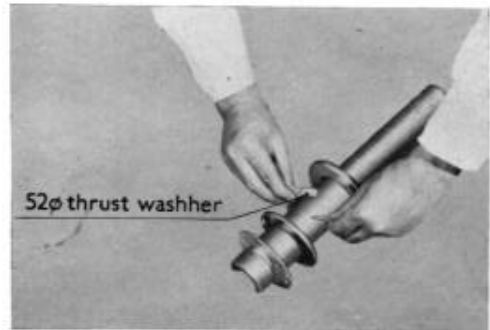
1. Remove the upper case in the manner described in Paragraph 4.B.

3. Loosen the thin 8 mm nut, adjust plate set bolt, and adjust plate 6×18 hex bolts (four); turn the chain adjust bolt counterclockwise for removal of the joint tube. (Refer to Figs. 5-3 and 5-4)



(Fig. 5-4)

4. Remove the 52φ thrust washer (nylon) from the joint tube. (Refer to Fig. 5-5)



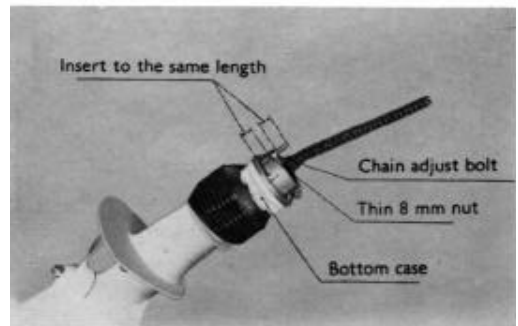
(Fig. 5-5)

C. Reassembling

Reassembling is the reverse of disassembling.

(Important)

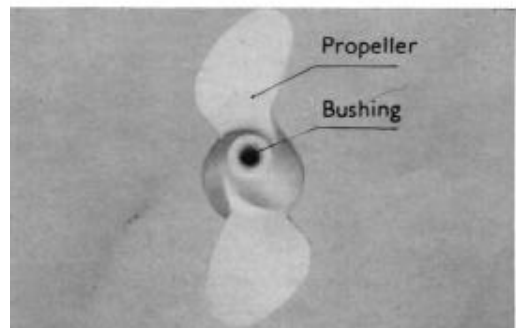
Prior to screw-in of the joint tube into the bottom case, screw in the longer chain adjust bolt into the bottom case to the extent where it becomes the same in length as the shorter one, before inserting into the threaded hole of the joint tube. (Refer to Fig. 5-6)



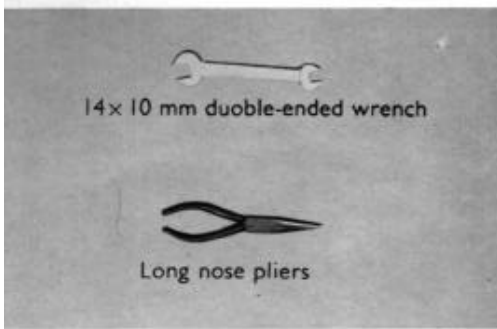
(Fig. 5-6)

D. Construction of propeller

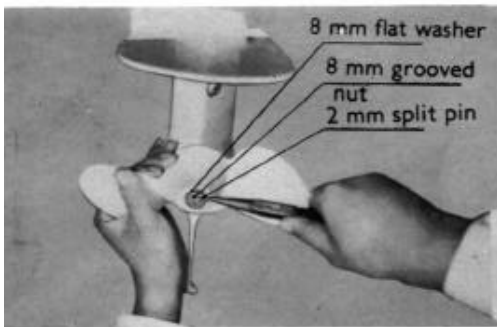
The propeller has a diameter of 200 mm and the shape is designed with full consideration for propelling efficiency. A shear pin is provided in order to prevent propeller damage when hitting various substances during cruising. A bushing of acetal resin is press fitted into the bearing to provide protection against corrosion by sea water. (Refer to Fig. 5-7)



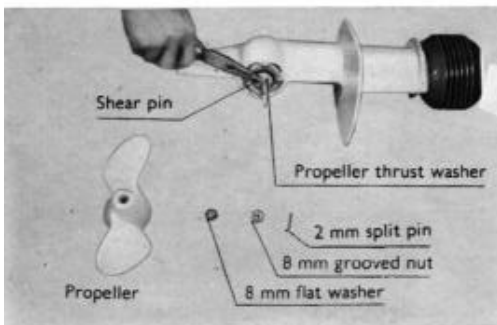
(Fig. 5-7)



(Fig. 5-8)



(Fig. 5-9)



(Fig. 5-10)

E. Disassembling

1. Tools necessary for disassembling and reassembling the propeller. (Refer to Fig.5-8)

2. Remove the 2 mm split pin and remove the 8 mm grooved nut and 8 mm flat washer. (Refer to Fig. 5-9)

3. Remove the propeller and remove the shear pin and propeller thrust washer. (Refer to Fig. 5-10)

F. Reassembling

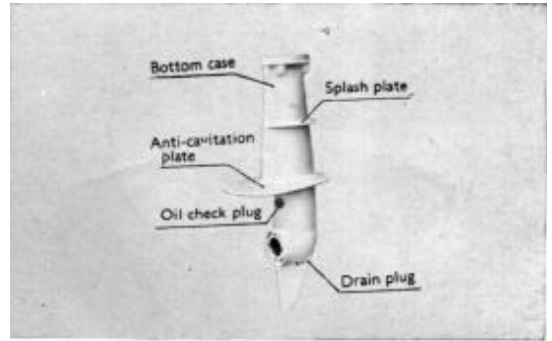
Reassembling is the reverse of the disassembling.

(Important)

Do not overtighten the 8 mm grooved nut.

G. Construction of bottom case

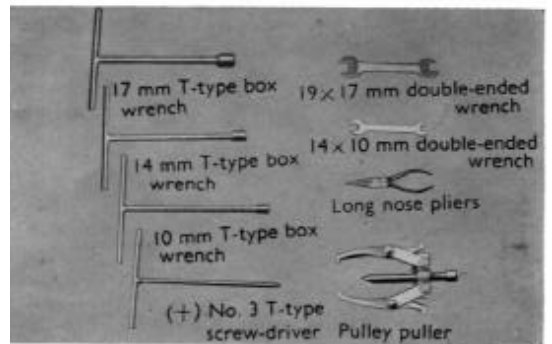
The bottom case is the lowest portion of the outboard equipment and is streamlined for propelling efficiency. The top section provides the propeller with an anti-cavitation plate for preventing possible cavitation during cruising. The splash plate located on the cavitation plate is for preventing water splash caused during high speed cruising. The interior serves as a lubricant oil pool and is used to lubricate the chain and bearing (etc.). (Refer to Fig. 5-11)



(Fig. 5-11)

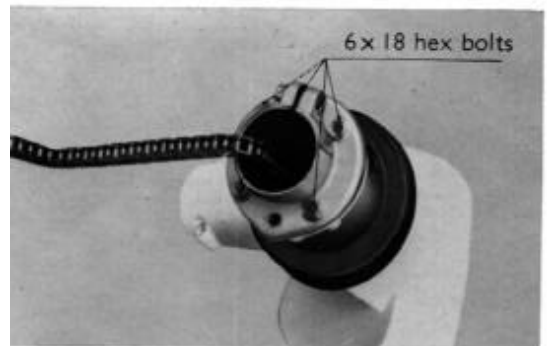
H. Disassembling

1. Tools necessary for disassembling and reassembling the bottom case. (Refer to Fig. 5-12)



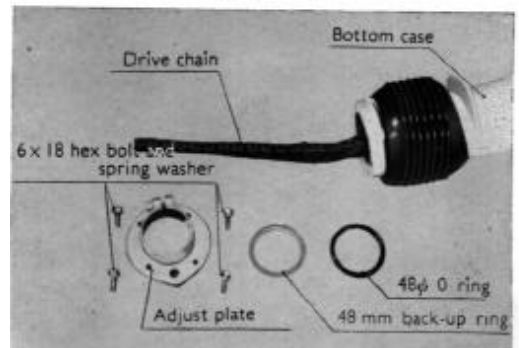
(Fig. 5-12)

2. Remove the joint tube in the manner described in Paragraph 5.B.
3. Remove the propeller in the manner described in Paragraph 5.E.
4. Remove four 6x18 hex bolts used to secure the adjust plate and remove the 6 mm spring washers. (Refer to Fig. 5-13)

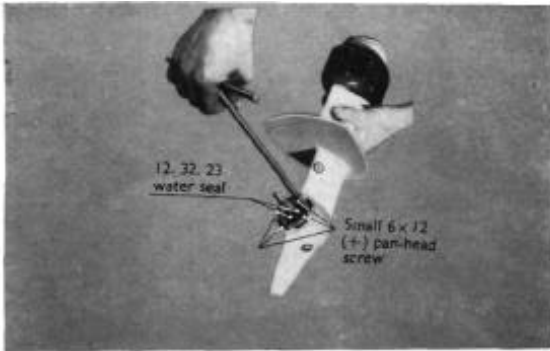


(Fig. 5-13)

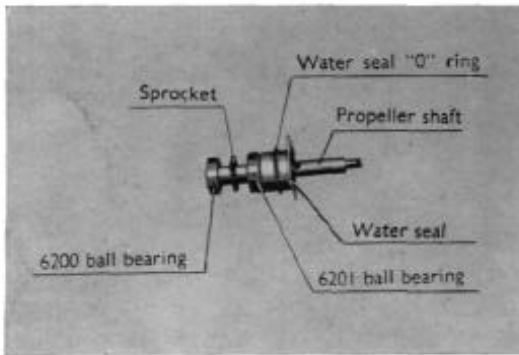
5. Separate from the bottom case the adjust plate, 48 mm back-up ring, and 48φ O ring. (Refer to Fig. 5-14)



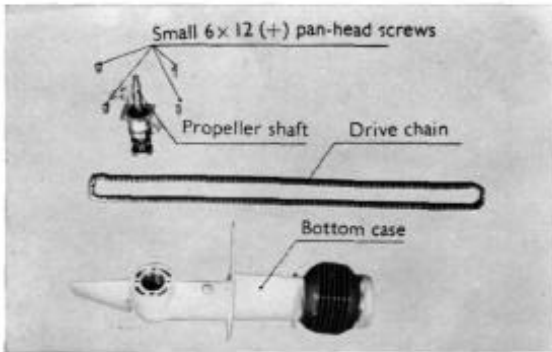
(Fig. 5-14)



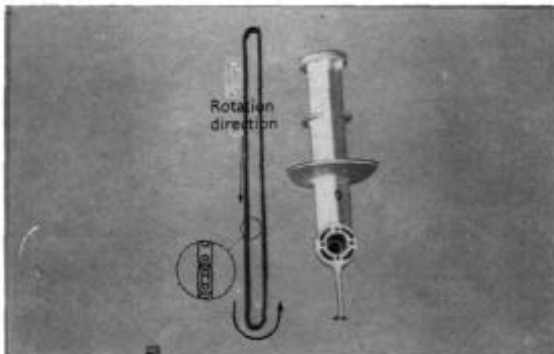
(Fig. 5-15)



(Fig. 5-16)



(Fig. 5-17)



(Fig. 5-18)

6. Remove four small 6×12 (+) pan-head screws used for securing 12, 32, 23 water seal. (Refer to Fig. 5-15)

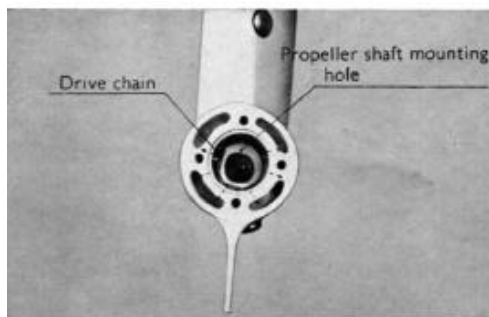
7. While inserting the drive chain into the bottom case (inner), remove the chain from the sprocket and remove the propeller shaft together with the water seal, bearing, and water seal "O" ring. (Refer to Fig. 5-16)

8. Remove the drive chain from the bottom case. (Refer to Fig. 5-17)

I. Reassembling

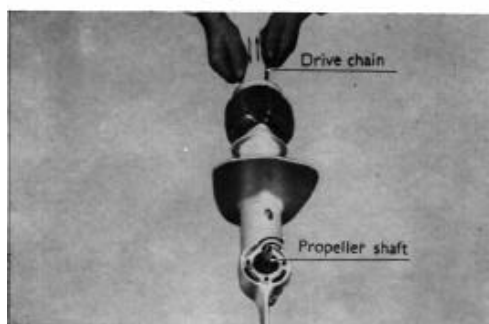
1. Insert the drive chain into the bottom case. In the case of the drive chain equipped with the change joint, insert the chain with the joint placed in the direction as shown in Fig. 5-18)

2. Fit the bearing water seal and water seal "O" ring to the propeller shaft: depress the drive chain onto the lower groove of the bottom case for inserting the propeller shaft. (Refer to Fig. 5-19)



(Fig. 5-19)

3. After completely inserting the propeller shaft, pull the drive chain for engagement with the sprocket. For insuring that the chain is fully engaged with the sprocket, move the chain up and down to determine if the propeller shaft rotates smoothly. (Refer to Fig. 5-20)



(Fig. 5-20)

4. The subsequent reassembling is the reverse of disassembling.

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