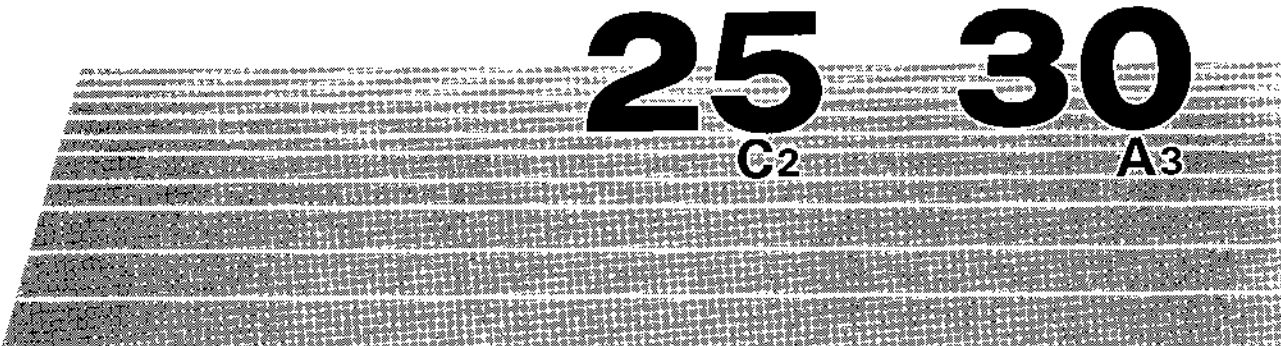




TOHATSU *OUTBOARDS*

25 **30**
C2 A3



OWNER'S HAND BOOK

003-11020-B

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TOHATSU ENGINE

OWNER REGISTRATION AND IDENTIFICATION

Upon purchasing this product, be sure your dealer fills out the WARRANTY CARD correctly and mails it to the distributor, completely filled in. This card identifies you as the legal owner of the product and serves as your warranty registration of the same.

If this procedure is not followed, your outboard will not be covered by warranty.

PREDELIVERY CHECK

Be sure that the product has been checked by an authorized TOHATSU dealer before the delivery.

Warranty

This TOHATSU product is fully guaranteed against defective materials and workmanship for the period from the date of purchase, provided that the purchase has been registered in accordance with the above.

The warranty will not apply to normal worn parts, adjustments, tune-ups or to any damage caused by;

- 1) Uses or operations NOT conforming to the instructions described in this owners manual;
- 2) Participating in or preparing for racing or other competitive activity;
- 3) Water entering the engine or the engine room;
- 4) Any other thoughtless use or operation.

The warranty will become void if the product has been altered, modified or repaired by any other than a company or a service firm authorized by TOHATSU.

The warranty will cover only your TOHATSU product and will not cover the boat mounted with the product, trailer, equipment or accessories associated to the product. —

Serial Number

Please record the serial number of the engine (indicated on the lower engine cover and cylinder block) in the space below. This number will come in handy in the event of theft or to help in quickly identifying the product type.

Serial Number: _____

*The dealer mentioned in this manual means TOHATSU authorized dealer.

To You the Customer:

Thank you for selecting a Tohatsu product. You are now the proud owner of an excellent outboard engine, which will serve you for many years to come.

We would like to point out that carefree usage can only be assured on the condition that this manual is read through in its entirety and maintenance routines, as described later in this manual, are followed carefully. Should difficulty arise with the engine, please check the trouble according to the troubleshooting list at the end of this manual, and if it cannot be remedied, contact an authorized Tohatsu service shop or your dealer. ...

We hope you will get much enjoyment from this product and wish you good luck with your boating adventures.

Tohatsu Corporation

NOTICE

HEED ALL WARNINGS AND CAUTIONS AS SET FORTH HEREIN. THEY HAVE BEEN INCLUDED FOR YOUR SAFETY AND MUST BE READ CAREFULLY. NEGLIGENCE IN OBSERVING SUCH WARNINGS AND CAUTIONS COULD RESULT IN SEVERE INJURY OR DEATH.

EMERGENCY STOP SWITCH

The stop switch will cut off the engine when the stop switch line is pulled out. This line connects to the wrist of the operator, effectively preventing injuries from the propeller in case he fallen overboard.

We highly recommend use of the stop switch line, since it can save the life of the operator if bad things come to worse. However, we would also like to point out the drawbacks of the switch to the operator. Accidental activation of the switch (such as the line being pulled in heavy seas), could cause passengers to lose their balance, fall overboard, and could result in loss of power in heavy seas, strong currents or high winds. Loss of control while mooring is another potential hazard.

To prevent such hazardous situations, the line is curled and will extend to a full 1,300 mm.

WARNING

As the operator/driver of the boat, you are responsible for the safety of those aboard, other crafts around you and that local boating regulations are followed. As such you should possess thorough knowledge of correct operation of the boat, its accessories and the engine. Thus, to learn about correct operation and maintenance of the engine, please read through this manual carefully.

WARNING

It is very difficult for a person standing or floating in the water to take evasive action should he see a power boat heading in his direction, even at a slow speed. Therefore, it is strongly recommended that when your boat is in the immediate vicinity of people in the water, the engine be shifted to neutral and shut off.

SERIOUS INJURY IS LIKELY IF CONTACT IS MADE WITH A PERSON IN THE WATER BY A MOVING BOAT, GEAR HOUSING, PROPELLER, OR ANY SOLID DEVICE RIGIDLY ATTACHED TO A BOAT OR GEAR HOUSING.

It is the operator's responsibility to perform all safety checks and to ensure that all lubrication and maintenance instructions are complied with for safe operation. It is also the operator's responsibility to return the unit to the local dealer for periodic inspection.

Correct periodic maintenance and good care of this outboard engine will lessen the chance for problems and keep overall operating expenses at a minimum.

SERVICING, REPLACEMENT PARTS & LUBRICANTS

Only let an authorized TOHATSU service shop perform servicing or maintenance on this product. Be sure to use genuine parts, and genuine lubricants or recommended lubricants.

MAINTENANCE

As the owner of this outboard engine, you should have acquainted yourself with the correct maintenance of the same. Please comply with all instructions on lubrication and maintenance, and return it to the dealer or service shop for periodic inspection at the prescribed intervals.

Troublefree operation cannot be expected unless the engine receive correct periodic maintenance and is taken good care of. Moreover, if such maintenance is performed periodically, it is not likely that a costly overhaul would ever be required.

USE OF SERVICE SHOP

When subjecting your TOHATSU product to a check or a repair, please be sure to use a TOHATSU dealer authorized by the TOHATSU or a TOHATSU agent.

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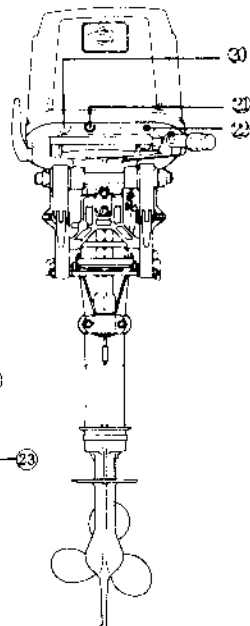
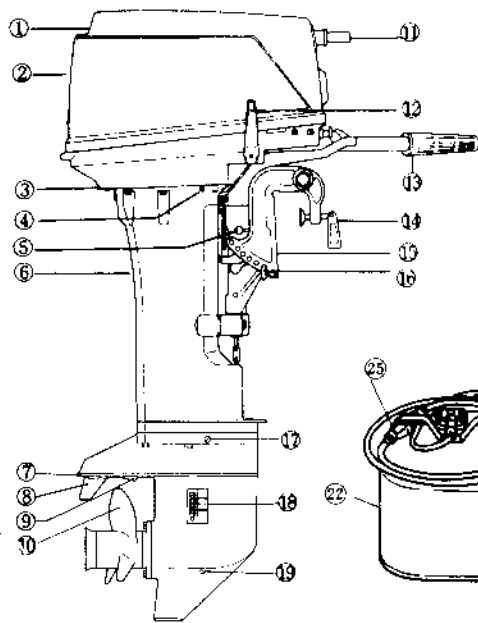
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SPECIFICATIONS

Models	M25C2			M30A3		
		EF	EP		EF	EP
Types						
Overall length, mm	884		600	884		600
Overall width, mm	412		355	412		355
Overall height, mm	S: 1,116 L: 1,243 LL: 1,319 UL: 1,370					
Transom height, mm	S: 435 L: 562 LL: 638 UL: 689					
Weight (S), kg	46	48.5	47.7	46	48.5	47.7
Max. output, PS/(KW)	25 (18.7)			30 (22.4)		
Full-throttle speed range, rpm	4,800 – 5,500					
Fuel consumption, l/h	13					
No. of cylinders	2					
Piston displacement, cc	430					
Bore x stroke, mm	68 x 59					
Exhaust system	Through hub exhaust					
Lubrication	Mixed gasoline					
Cooling system	Forced water cooling					
Starting system	Hand	Electric		Hand	Electric	
Ignition	C.D. ignition					
Ignition plug	NGK B7HS-10 10 or Champion L82C (gap 1.0 mm), NGK BPR7HS-10					
Alternator	12 V, 80 W					
Fuel mixing ratio	Regular gasoline 50: genuine engine oil 1					
Fuel tank capacity, l	24					
Gear reduction ratio	12 : 23					
Gear oil	Genuine or recommended gear oil API GL5 (SAE #80 to #90)					
Gear oil volume, cc	About 270					

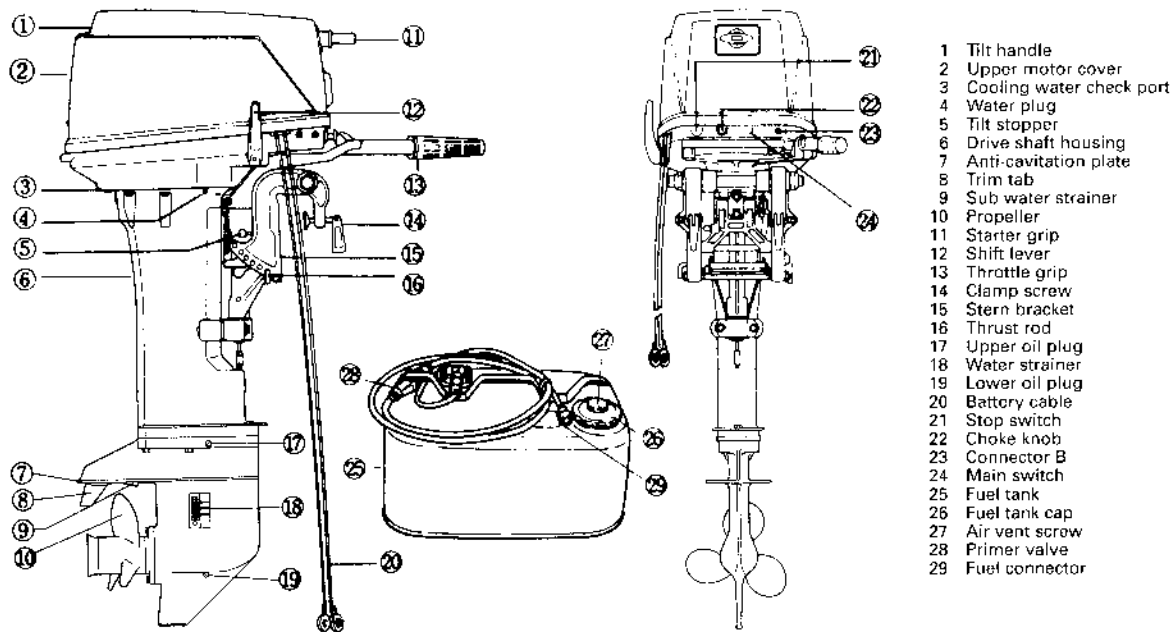
NOMENCLATURE

M25C/M30A3



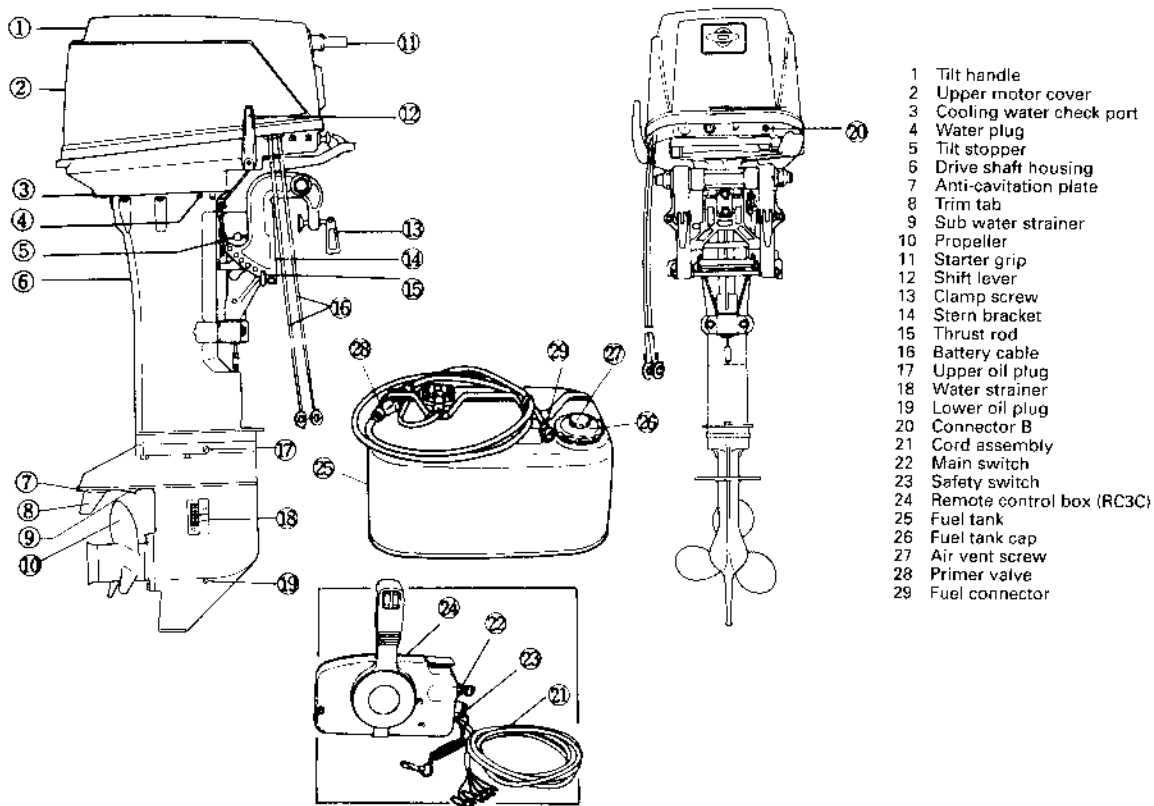
- 1 Tilt handle
- 2 Upper motor cover
- 3 Cooling water check port
- 4 Water plug
- 5 Tilt stopper
- 6 Drive shaft housing
- 7 Anti-cavitation plate
- 8 Trim tab
- 9 Sub water strainer
- 10 Propeller
- 11 Starter grip
- 12 Shift lever
- 13 Throttle grip
- 14 Clamp screw
- 15 Stern bracket
- 16 Thrust rod
- 17 Upper oil plug
- 18 Water strainer
- 19 Lower oil plug
- 20 Stop switch
- 21 Choke knob
- 22 Fuel tank
- 23 Fuel tank cap
- 24 Air vent screw
- 25 Primer valve
- 26 Fuel connector

M25C2EF/M30A3EF



- 1 Tilt handle
- 2 Upper motor cover
- 3 Cooling water check port
- 4 Water plug
- 5 Tilt stopper
- 6 Drive shaft housing
- 7 Anti-cavitation plate
- 8 Trim tab
- 9 Sub water strainer
- 10 Propeller
- 11 Starter grip
- 12 Shift lever
- 13 Throttle grip
- 14 Clamp screw
- 15 Stern bracket
- 16 Thrust rod
- 17 Upper oil plug
- 18 Water strainer
- 19 Lower oil plug
- 20 Battery cable
- 21 Stop switch
- 22 Choke knob
- 23 Connector B
- 24 Main switch
- 25 Fuel tank
- 26 Fuel tank cap
- 27 Air vent screw
- 28 Primer valve
- 29 Fuel connector

M25C2EP/M30A3EP



INSTALLATION

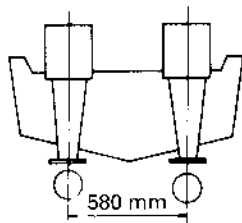
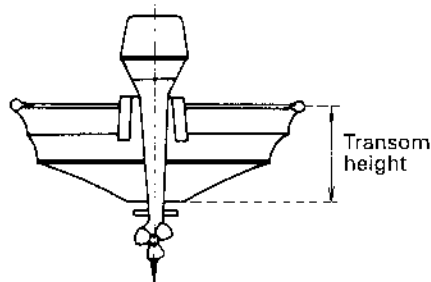
WARNING

Most boats are rated and certified in terms of their maximum horsepower limit, and this is shown on the boat's certification plate. Do not equip your boat with an outboard that exceeds this limit. If in doubt, contact your dealer.

Do not operate the engine unit if it has been securely mounted on the boat in accordance with the instructions below.

1. INSTALLATION

- Position the outboard motor at the center of the stern.



Twin motors, when installed, are to be spaced about 580 mm apart.

Fig. 1

- Clearance between anti-cavitation plate of the motor and bottom of the boat must be 30 to 50 mm (1.2" to 2").

NOTE: Select an outboard motor whose dimensions allow the clearance shown below.

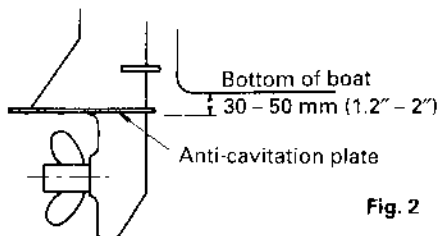


Fig. 2

- After positioning, fix the motor securely to the transom with clamp screw and bolt. Tie the motor to the hull with rope for safety.

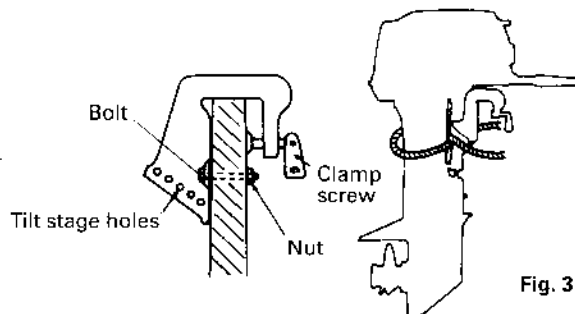


Fig. 3

Transom matching

NOTE:

Be sure that the anti-cavitation plate of the outboard is below the water surface when running with wide open throttle.

In case the above condition cannot be met due to a bottom shape of your boat, please consult the TOHATSU dealer.

2. TRIM ADJUSTMENT

Trim of the motor can be adjusted to suit the transom angle and loading conditions of your boat. Be sure to always maintain the anti-cavitation plate parallel to water level during cruising.

- **Correct trim:**
Maintain the thrust rod perpendicular to water level to keep your boat level during cruising.
- **Trim down:**
If the bow rises too high, causing unstable cruising, trim the thrust rod down. (Fig. 5)
- **Trim up:**
If the bow falls into water level when cruising, trim the thrust rod up. (Fig. 5)

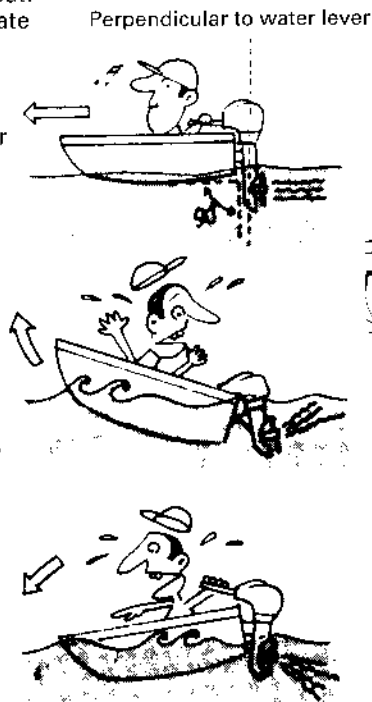


Fig. 4

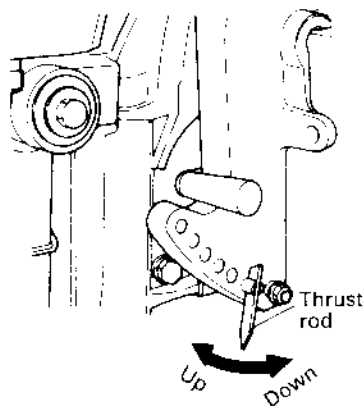


Fig. 5

3. INSTALLING THE REMOTE CONTROL DEVICE (RIGHT-HAND STEERING)

1) Positioning the remote-control box

Position the remote control box in a place that will not obstruct your handling of the control levers and switches. Confirm that there is no obstacle in the passage of remote control cables.

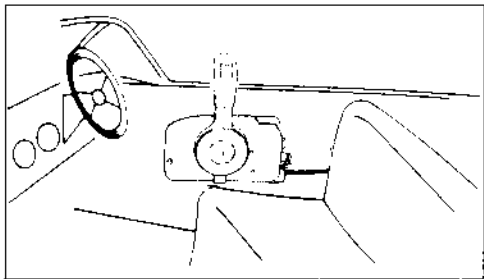
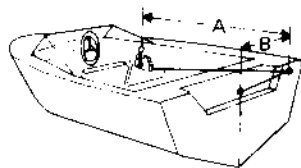


Fig. 6

2) Determining remote control cable length

A guideline for determining the proper length for a remote control cable is dimensions A plus B plus 300 mm (1 foot).

NOTE: Never sharply bend a remote control cable with a radius of 203 mm (8 inches) or less.



Center of stern

Fig. 7

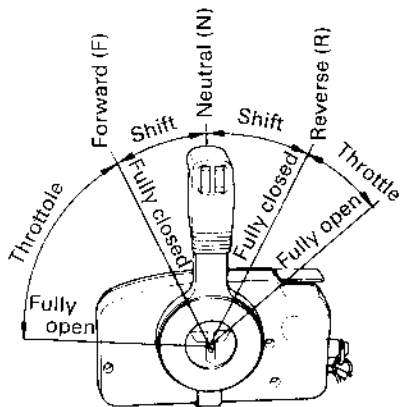


Fig. 8

3) Connecting remote control cable to the remote control box

- Remove the back plate by loosening two screws.
- Thread the remote control cables through the terminal eyes ① at a distance of more than 11 mm. Securely lock the terminal eyes with lock nuts ②.

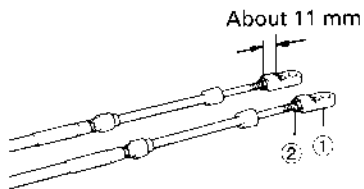


Fig. 9

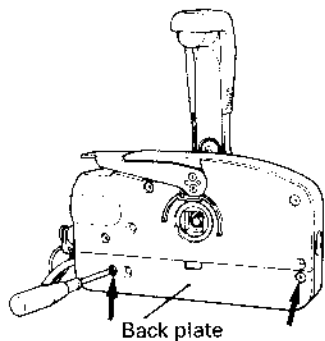


Fig. 10

- Press a neck of the shift remote control cable down into the clamp on the housing of remote control box. Connect the terminal eye to the shift arm with pin and E-ring. Insert a grommet, supplied with the remote control box, into the clamp.

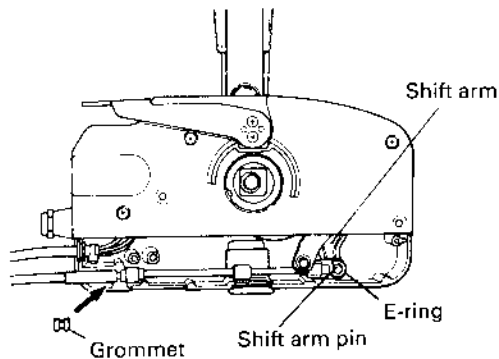


Fig. 11

- Connect the throttle remote control cable to the throttle arm in a manner similar to the shift remote control cable.
- Reinstall the back panel.
Install the remote control box with associated screws, spacers and nuts (three pieces each).

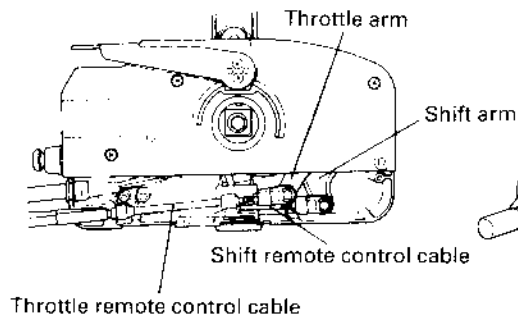


Fig. 12

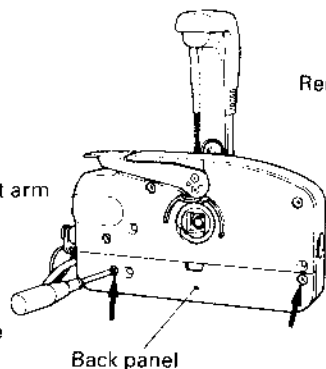


Fig. 13

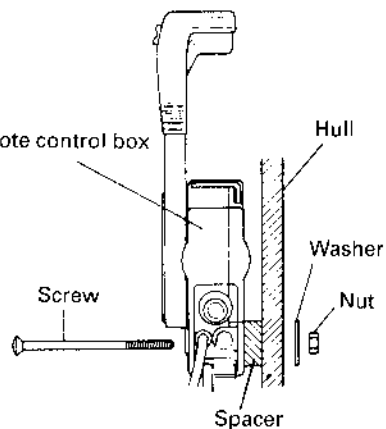
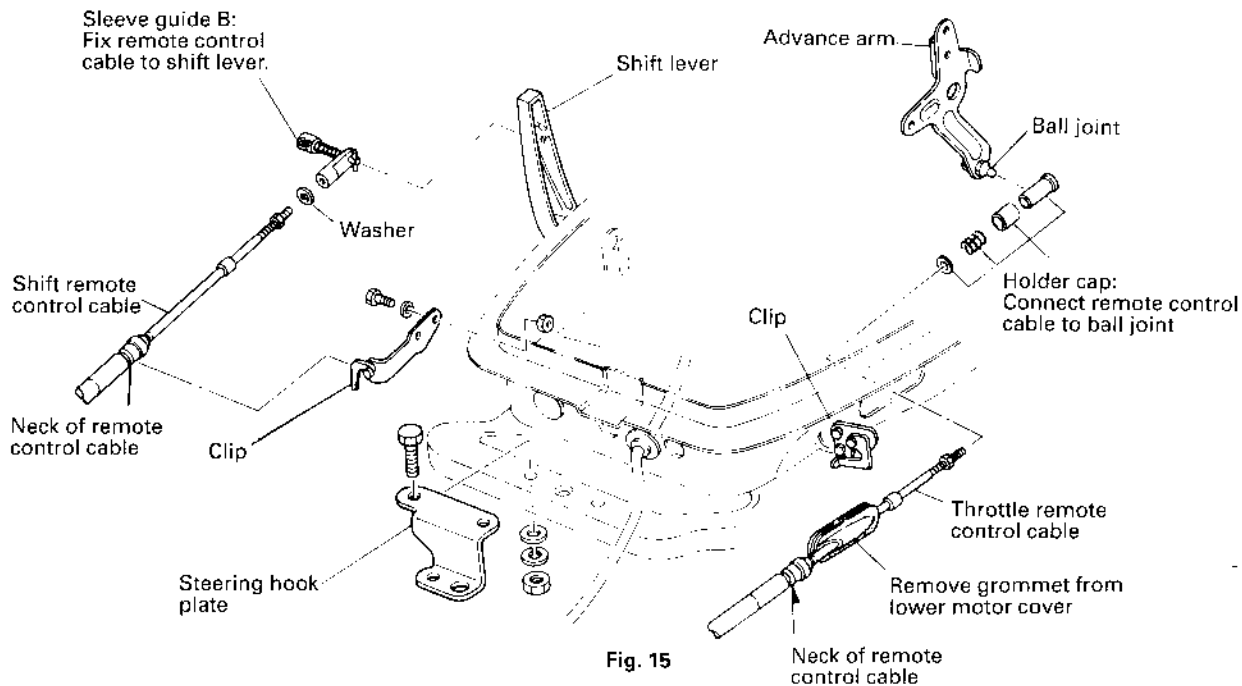


Fig. 14

4) Connecting remote control cable to the engine and attaching the cord assembly

— Attach the associated parts as shown below.



5) Attaching holder cap and sleeve guide B

Throttle side:

Slide an associated grommet onto an end of the cable, put a holder cap on it, and lock it with a nut, as shown.

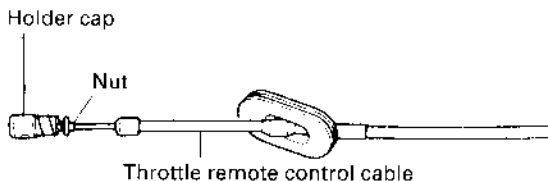


Fig. 16

Shift side:

Attach the sleeve guide B to the shift remote control cable, and lock it with a nut.

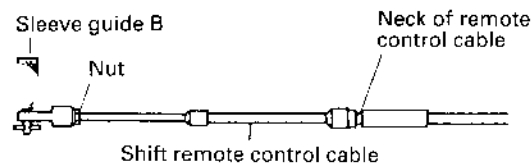


Fig. 17

6) Connecting the remote control cable to the engine

Throttle side:

Insert the throttle remote control cable into a hole of the advancer arm at the lower motor cover, attach the ball joint to the holder cap at the tip of the remote control cable, and fasten the remote control cable with a clip. Then attach a grommet to the lower motor cover.

NOTE: Place the control lever in Neutral (N), and the idling lever in Fully Closed position.

Shift side:

Insert the lock pin at the sleeve guide B into the shift lever attaching hole and turn it 90° to lock it, then fasten the remote control cable with a clip.

NOTE: Confirm the motion of the control lever: Turn the control lever to Forward (F) or Reverse (R) at 32° where the lever is latched. The shift lever will be moved to the shift-in position, and the throttle is fully opened when shifted further. Then confirm that throttle lever is fully closed when the control lever is shifted to Neutral. If the throttle is completely closed, reposition the holder cap on the engine, and reattach it.

7) Attach the cord assembly

- Connect the cord assembly from the remote control box to respective terminals through the lower motor cover, as illustrated.
- Fasten the cord assembly with clamps.

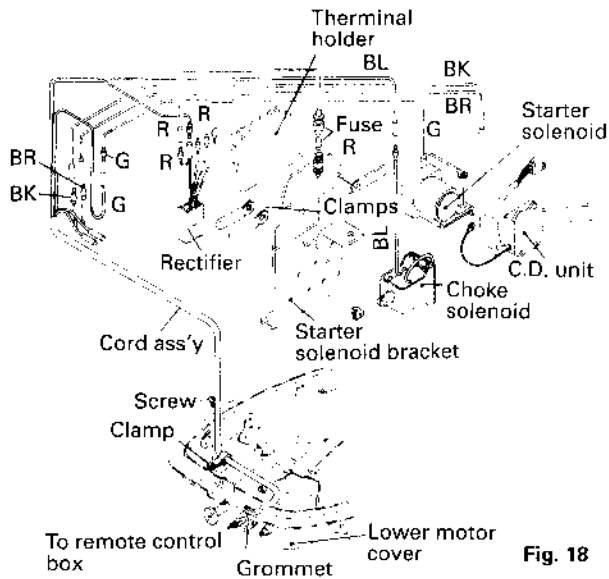


Fig. 18

- Then, connect the cables to their respective terminals at the cable terminal holder.

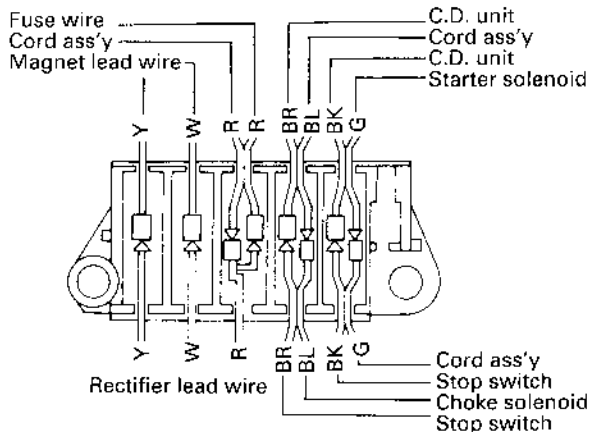


Fig. 19

4. ATTACHING THE DRAG LINK (SUPPLIED WITH EP TYPE)

3 drag link parts are available and assembled as illustrated below. Spacers may or may not be required depending on cable brands.

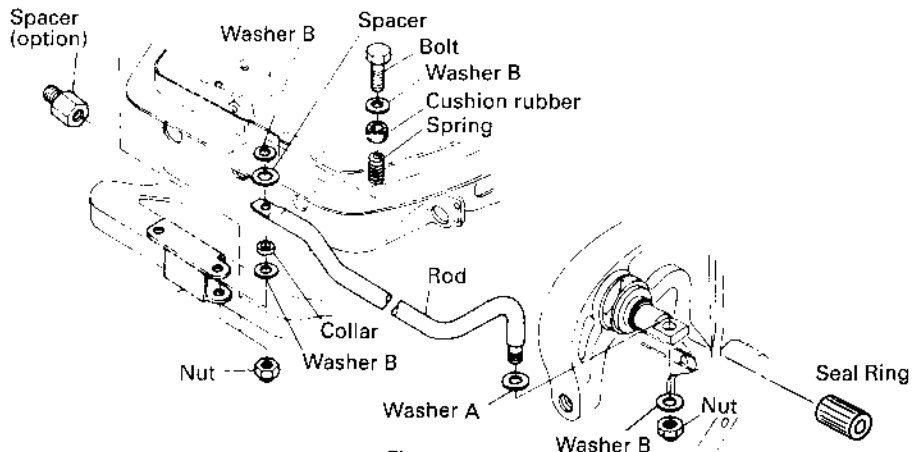


Fig. 20

5. FIXING THE BATTERY

Fix the battery securely to the hull in a place free from splashing water.

Connect a red cable to positive (+) terminal first and then a black cable to negative (-) terminal of the battery. Then put a red cap on the positive terminal. When disconnecting battery cables, be sure to disconnect the black cable first, and then the red cable.

A 12 V battery with a recommended capacity of 40 AH or over is recommended.

NOTES:

- Battery cables must be long enough to allow free steering.
- Battery cables must be arranged and protected from damage during steering, etc.
- With poor cable connections, the starter will fail to start.
- Battery will be damaged if the red and black cables are connected to the wrong terminals (reverse-connected).
- Battery must be fully charged before running the motor.

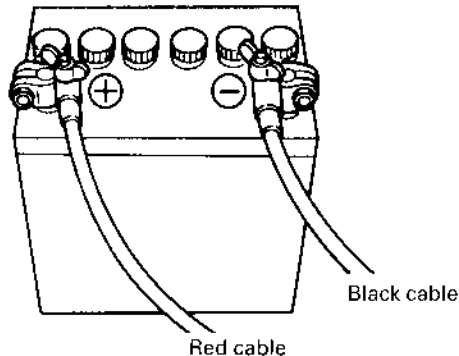


Fig. 21

DANGER

- Hydrogen gas is generated when charging a battery. Thus, keep the battery well ventilated during charging. Remove from boat, this will protect your hull, interior from damage. Electric sparks, cigarette smoking and other sources of fire must be avoided in the charging area to prevent explosion of the battery.
- The battery fluid (electrolyte) contains sulfuric acid. If electrolyte is spilled on the skin, clothes, etc. wash with plentiful of water and consult a medical doctor. Always use safety glasses and rubber gloves when handling the battery.

BEFORE USE

Precautions:

Use genuine Tohatsu engine oil to gasoline as follows.

1. FUEL (GASOLINE/ENGINE OIL MIXTURE)

- Check that the fuel in the fuel tank is enough for planned cruising. It is recommended to carry extra fuel to avoid running out while on the water, which can lead to accidents.
- Recommended fuel is a mixture of gasoline and genuine or recommended engine oil at a ratio of 50:1.

NOTE: For the first 10-hour break-in running of a new engine, use a fuel mixture at a ratio of 25:1.

- The use of poor quality fuel will shorten the life of a motor and cause trouble, including starting failure. It is recommended to use a high quality gasoline and genuine Tohatsu engine oil.

● FUEL AND LUBRICANT FOR TOHATSU OUTBOARD MOTORS

Fuel Gasoline

Fuel gasoline should be a minimum pump posted octane rating of 87 (91 by research octane rating). Gasoline containing alcohol, methanol (methyl), or ethanol (ethyl), may cause:

- Wear and damage on bearings, piston, piston rings and cylinder liners
- Corrosion on metal parts
- Deterioration of rubber parts and plastic parts

Fuel tank

When using a fixed fuel tank in place of genuine TOHATSU fuel tank, it is recommended to select a one with a structure facilitating interior cleaning.

Engine oil

Use a genuine TOHATSU engine oil or recommended one (TCW=3). TOHATSU will not recommend use of other two stroke engine oil.

Caution

Do not mix different brands of oil.

The mixing of different brands of oil or different kinds of oil even in same brand may cause jelling (gel), resulting in blockage of filter screens.

This may lead to serious engine damage, due to the lack of powerhead lubrication.

2. REQUIRED ITEMS AND GEAR TO BE CARRIED

- Legal on board gear
- Tool kit, spare spark plugs and split pins.
- Spare fuel (allowing one or more hours' cruising)

Fuel consumption as full speed: About 13 l/h for M25C2 and M30A3.

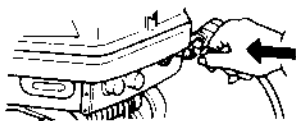


Fig. 22

RUNNING

1. STARTING

1) Preparation to start



- (1) Set the fuel connector to the engine side connector.
An arrow mark on the primer valve is to be lead to the engine.

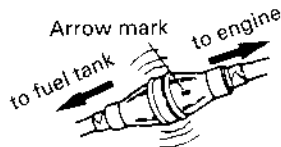


- (2) Loose the air vent screw on the tank cap.

For tanks with a fuel tank auto air-vent (optional)

There is no need to loosen the air vent screw. An air vent opens automatically when the connector is attached to the tank.

- (3) Feed fuel to the carburetor by squeezing the primer valve until firm.



Note: Do not operate Engines without cooling water.

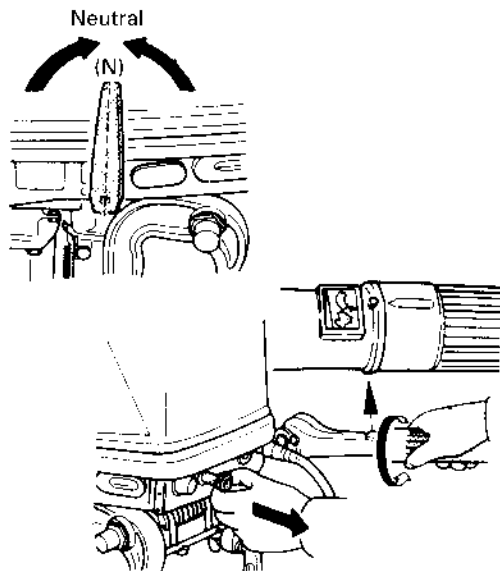
Note: Be sure that the shift is at neutral when starting the engine.
This model is provided with start in-gear protection.

CAUTION

If motor starts in gear, do not use, contact your authorized TOHATSU dealer.

M and EF TYPE

- (1) Confirm if the shift lever is in Neutral position.
- (2) Turn the handle grip until the bar mark on the grip faces the triangle mark on the steering handle.
- (3) Pull out the choke knob fully.
(No choke operation is necessary on warmed engine.)



EP TYPE

- Insert the key.
- Place the control lever at Neutral (N), and move the free acceleration lever to Open position.
- Turn the key to On position, and push it for choke operation.
(No need to push the key when the engine is warm.)

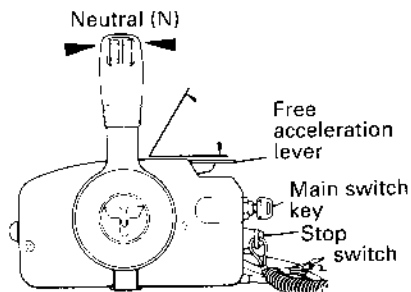


Fig. 26

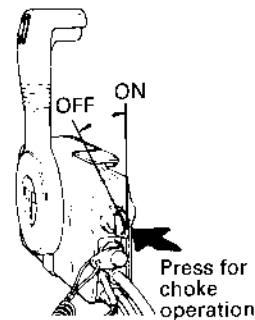
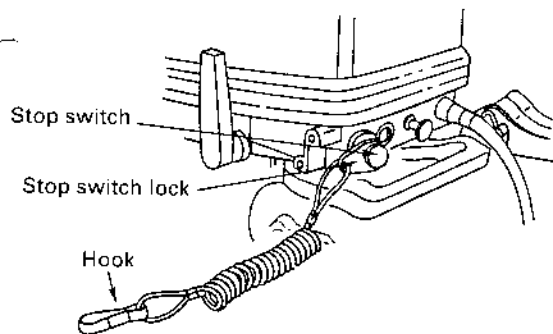


Fig. 27

2) Fit the lock in the stop switch



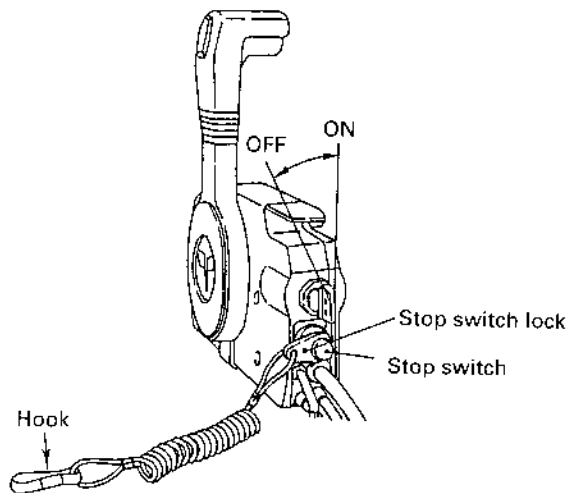
WARNING

Be sure to connect the emergency stop lanyard to your body. The engine will shut down if the stop lanyard is disconnected.

Note: The engine will not start unless this switch has been properly connected and locked beforehand.

WARNING-Daily Check

Before moving out with the boat, confirm that the emergency stop switch works normally by starting and stopping the engine several times.



3) Starting

M TYPE

— Gently pull the recoil starter until you feel the ratchet engage. Then give it a sharp tug.

NOTE: After pulling the choke knob for engine starting, push it back to original position.

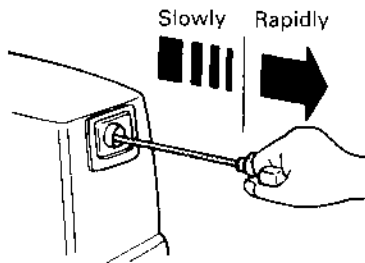


Fig. 28

NOTES "IMPORTANT"

1. Extended operation of the starter motor will run the battery down. Operate the starter motor for maximum 5 seconds. If the engine does not start, wait for 10 seconds before operating the starter motor again or starter will be damaged.
2. NEVER operate the starter motor once the engine has started.
3. If the starter motor won't turn over, check that the battery terminal connections are tight and the battery is fully charged.

EF TYPE

— Push the starter button.

— After the engine starts, release the button.

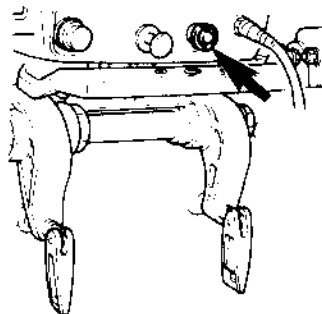


Fig. 29

EP TYPE

- Insert, push and turn the key to "START" position.
JTE: When restarting a warm engine, do not push the key; merely turn it to "START" position.
- When the engine starts, release the key, and it will return automatically to original position.

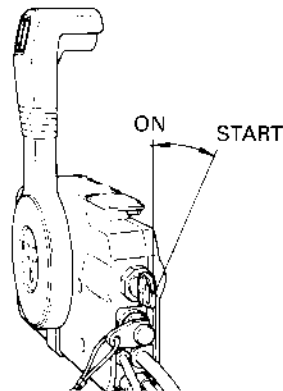


Fig. 30

4) Starting guideline

Temperature	Starting procedure
Over 25°C (77°F)	Turn the throttle grip to original position, pull the choke knob and recoil starter once. Turn the throttle grip to "START" position, push the choke knob back, then pull the recoil starter until the engine starts.
15°C to 25°C (59° to 77°F)	Turn the throttle grip to "START" position, and pull the choke knob and recoil starter once. Push the choke knob back, and pull the recoil starter until the engine starts.
Below 15°C (59°F)	Turn the throttle grip to "START" position, pull the choke knob and the recoil starter until combustion occurs. Then push the choke knob back, and pull the recoil starter until the engine starts.

5) Starter trouble . . . for emergency

- Remove the recoil starter.
- Wind a pull rope around the flywheel.
- Use a 10 mm socket wrench as a pull grip as shown below.

NOTE

Confirm that the shift lever is in Neutral.

CAUTION

Be careful that you clothes or other items do not get caught in the rope or other engine parts.

To prevent your clothes and other items from getting caught in the engine, do not install the recoil starter and the upper engine cover after the engine is started with the starter rope.

Immediately contact an authorized TOHATSU service shop when reaching shore.

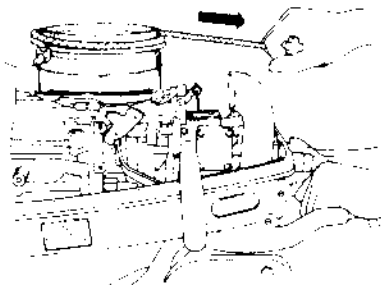


Fig. 31

Break-in running

1) Break-in running time 10 hours

Time	0 min.~	10 min.~	1 hr.~	2 hrs.~	10 hrs.~
Method of break-in run	Trolling or idling	Throttle opening <1/2 about 3,000 rpm	Throttle opening <3/4 about 4,000 rpm	Throttle opening 3/4 about 4,000 rpm	Normal running
Running conditions	Cruising at minimum speed		Full-throttle run is allowed for 1 min. in 10 min.	Full-throttle run is allowed for a short time.	

2) The gasoline-oil mixture ratio.

- 25:1 when using genuine TOHATSU engine oil or recommended one (TCW=3)
- The use of poor quality fuel will shorten the life of a motor and cause trouble, including starting failure. It is recommended to use a high quality gasoline and genuine or recommended Engine Oil.

2. WARM-UP

Run the engine at a low speed for about three minutes for warm-up operation before cruising, permitting the oil to circulate throughout the machine; otherwise, the life of the engine will be shortened greatly. During warm-up operation, confirm that cooling water is discharged from its check port.

CAUTION: If cooling water is not discharged, and operation continues, the engine will be overheated, causing troubles.

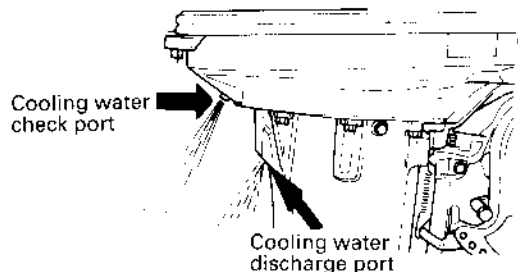


Fig. 32

Engine speeds:

Proper idle speeds for warm-up operation are as follows:

Model	Clutch in	Clutch off
M20A3, M25C2 EF and EP	850 to 950 rpm	1,000 to 1,200 rpm

Do not exceed the following full-throttle engine speeds.

Model	Full-throttle engine speed
M25C2, M30A3 EF and EP	4,800 to 5,500 rpm

PROPELLER SELECTION

A propeller must be selected so that the engine rpm measured at wide open throttle while cruising is within the recommended range, 4,800 to 5,500 rpm. For genuine TOHATSU propellers, refer to page 49 of this manual.

3. FORWARD AND REVERSE

WARNING

It may be dangerous to attempt shifting at high RPM. Be sure to slow down to trolling or idling rpm before shifting.

M and EF TYPE

1) Forward

Turn the throttle grip to "SLOW" position, and move the shift lever to "Forward (F)" position swiftly when the engine speed drops to its lowest level.

2) Reverse

Move the shift lever to "Reverse (R)" position swiftly when the engine speed drops to its lowest level.

NOTE: Confirm that the reverse lock lever is at "Lock" position.

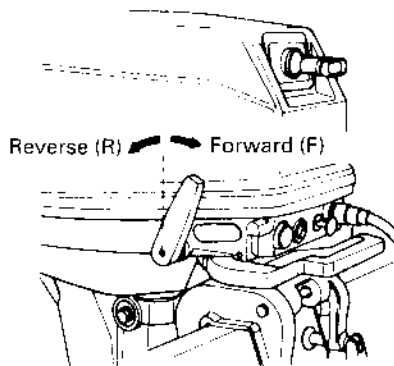


Fig. 33

EP TYPE

1) Forward

Move the Free accel lever to the lower position, then shift the control lever to "Forward (F)" position.

NOTE: Forward running is not possible unless the Free accel lever is at the lower position.

2) Reverse

Operate the clutch only when the engine operates at idle speed. To change Forward to Reverse, first idle the engine and shift into Neutral. With the engine still running, slowly engage and gradually increase reverse speed.

NOTE: Confirm that the reverse lock lever is at "Lock" position.

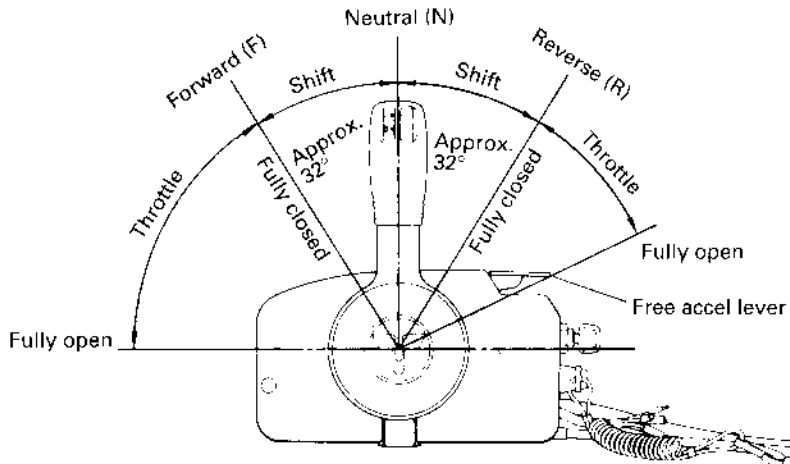


Fig. 34

4. STOPPING

M and EF TYPE

Reduce the speed to trolling speed by turning the throttle grip to "Slow" position.

- 2) Place the shift lever at Neutral (N).
- 3) Press the stop switch until the engine stops completely, or pull the stop switch lock.

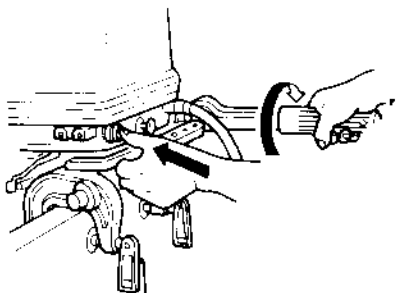


Fig. 35

EP TYPE

- 1) Place the remote control lever at Neutral (N), and idle the engine.
- 2) Turn the key to "OFF" position, or pull the stop switch lock.

IMPORTANT:

- After the engine stops, tighten the air vent screw on the tank cap.
- Disconnect the fuel connector from the engine.
- For the EF and EP types, disconnect cables from the battery when not in use for extended periods.

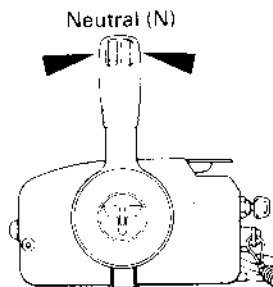


Fig. 36

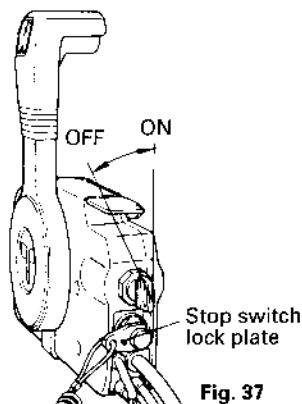


Fig. 37

5. TILT ADJUSTMENT

WARNING

When tilting up or down, be sure that no finger or hand is placed in between the swivel bracket and stern bracket. Be sure to tilt down the outboard slowly.

1) Tilt up

Turn the reverse lock lever to release, fully tilt the motor up. Then lower the tilt lever for tilt-lock.

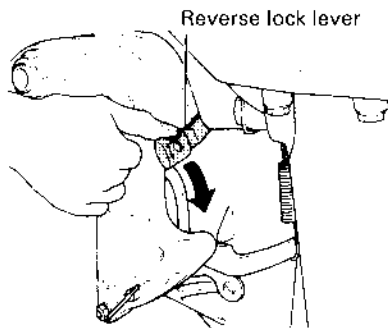


Fig. 38

2) Tilt down

Fully tilt the motor up, and pull the tilt lever upward to release the tilt-lock. Then lower the motor slowly. The motor will be automatically tilt-locked.

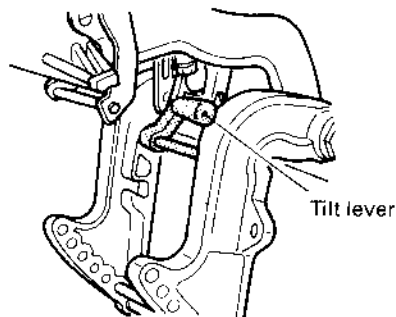


Fig. 39

6. OPERATION IN SHALLOW WATER

1) Shallow water operating position

Turn the reverse lock lever to release, set the motor at shallow water operating position by lowering tilt lever while the motor is being tilted up.

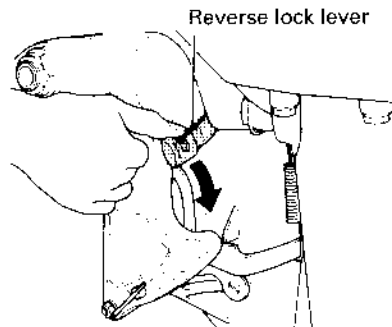


Fig. 40

2) Tilt down

Slightly tilt the motor up, and pull the tilt lever upward to release it from shallow water operating position, and then tilt it down.

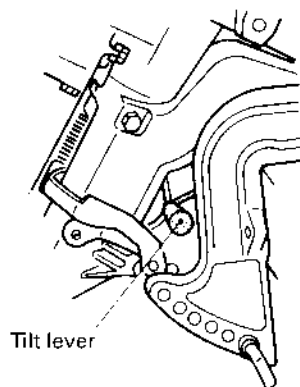


Fig. 41

CAUTION

- When in shallow water running, take care that the water strainer is submerged at all times and that water is continuously running out of the cooling water check port. Be sure to run slowly when using the shallow water drive. Running at higher speeds will result in lack of control and may cause damage the gear case.
- Make sure that the motor does not strike the bottom, especially when running in REVERSE. If the motor strikes the bottom while reversing, the impact is transmitted to the transom, risking damage to both the motor and the boat.

7. REMOVING THE MOTOR

- 1) Stop the engine.
- 2) Disconnect fuel connector from the motor. (Fig. 42)
- 3) Remove the motor from the hull and completely drain water from the gear case.
Be sure to keep the engine higher than the propeller whenever you carry the motor.
- 4) Rest the motor on the ground with the handles facing upward. (Fig. 43)

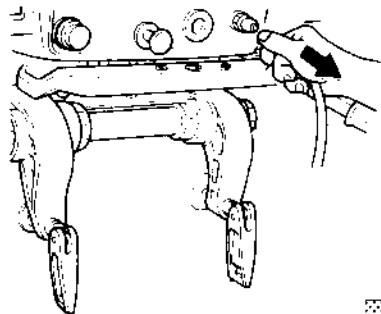


Fig. 42

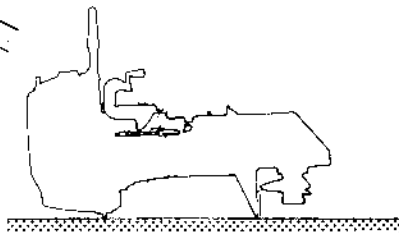


Fig. 43

ADJUSTMENT

1. STEERING FORCE

Steering force can be adjusted according to your preference with the steering adjust bolt.
Turn clockwise for heavier steering.
Turn counterclockwise for lighter steering.

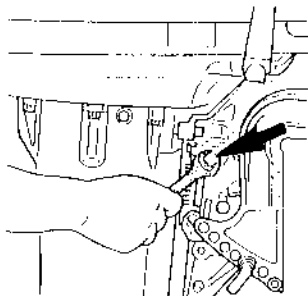


Fig. 44

2. TRIM TAB ADJUSTMENTS

If straight-line cruising cannot be achieved, adjust the trim tab located under the anticavitation plate.

■ If the boat veers toward the right, set the trim tab in the direction of A. (Fig. 45)

If the boat veers toward the left, set the trim tab in the direction of B. (Fig. 45)

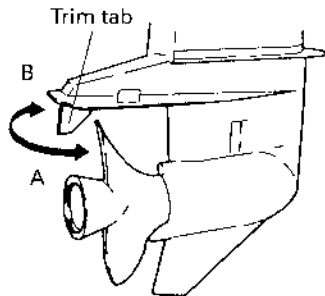


Fig. 45

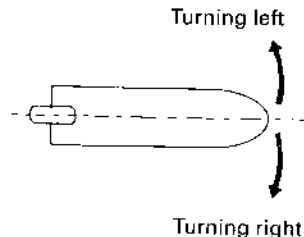


Fig. 46

NOTE

1. The trim tab also acts as an anode to prevent galvanic corrosion. Thus do not paint or grease this part.
1. After adjustment, securely tighten the trim tab fixing bolt.
3. Check for looseness of the bolt and the trim tab at regular intervals. Due to corrosion, the trim tab will wear down over time.

INSPECTION AND MAINTENANCE

1. DAILY INSPECTION

Perform the following checks before and after use.

Item	Points to Check	Action
Fuel System	<ul style="list-style-type: none"> • Check the amount of fuel in the tank. • Check for dust or water in the fuel filters. • Check rubber pipes for oil leakage 	Replenish Clean Replace
Electrical Equipment	<ul style="list-style-type: none"> • Check that the main switch functions normally. • Check that the battery electrolyte level and specific gravity are normal. • Check for loose connections on battery terminal. • Check that the emergency stop switch functions normally and makes sure the lock plate is present. • Check cords for loose connections and damage. • Check the spark plugs for dirt, wear and carbon built-up. 	Remedy or replace Replenish or recharge Retighten Remedy or replace Correct or replace Clean or replace
Throttle System	<ul style="list-style-type: none"> • Check that the choke solenoid and valve for the carburetor works normally. • Check if the carburetor and magneto work normally when turning the throttle grip, and also check links for looseness. 	Replace Correct
Recoil Starter	<ul style="list-style-type: none"> • Check ropes for wear and damage. • Check the latchet for engagement. 	Replace Correct or replace
Clutch and Propeller System	<ul style="list-style-type: none"> • Check that the clutch engages correctly when operating the remote control. • Visually check the propeller for bent or damaged blades. • Check that the propeller nut is tightened and the split pin is present. 	Adjust Replace
Installation of Motor	<ul style="list-style-type: none"> • Check all the motor installation bolts with the boat. • Check the thrust rod installation. 	Tighten Tighten
Cooling Water	<ul style="list-style-type: none"> • Check that cooling water is discharged from the cooling water check port after the engine has started. 	
Tools and Spares	<ul style="list-style-type: none"> • To be ready tools and spare parts for replacing spark plugs, propeller, etc. • Check if the spare rope is provided. 	
Steering Devices	<ul style="list-style-type: none"> • Check working of steering handle and remote control. 	
Other parts	<ul style="list-style-type: none"> • Check if the anode and trim tab are securely installed. • Check the anode and trim tab for corrosion and deformation. 	Repair if necessary. Replace

1) Washing

After use in sea water or polluted water, wash all enclosures and water cooling system with fresh water.

- Remove the water plug from the motor, and screw in the associated flushing plug (hose adapter). Connect a hose to the flushing plug to flush out the inside of the motor with water. (Be sure to seal the water strainer and sub water strainer, located at the gear case, with tape.)

IMPORTANT: Before washing through the flushing plug, remove the propeller.
Before long-term storing, wash the motor.

- With the shift lever in Neutral (N), run the engine at a low speed so that water flushes out the cooling system to remove sea water and mud.

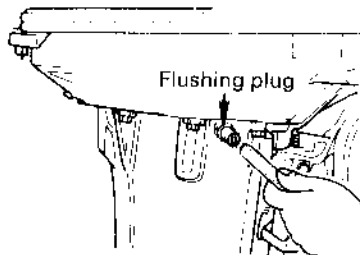


Fig. 47

2) Replacing the propeller

A worn-out or bent propeller will deteriorate the motor's performance, and cause engine trouble.

- Withdraw split pin, and remove propeller nut and washer.
- Pull the propeller toward you and remove it.
- Apply genuine Tohatsu grease to the propeller shaft before mounting a new propeller.

IMPORTANT: Before removing the propeller, remove the spark plug cap to protect the propeller from damage.

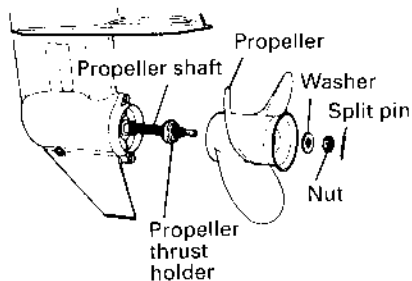


Fig. 48

3) Replacing the spark plug

If the electrode is fouled or has carbon deposits, clean or replace it with a new one as necessary.

- Remove the engine cover.
- Remove the spark plug by turning counter-clockwise while tapping it gently, using 21 mm socket wrench and handle.

Use genuine TOHATSU spark plugs (NGK B7HS-10 or BR7HS-10) or recommended ones (CHAMPION L 82 C with gap 1.0).

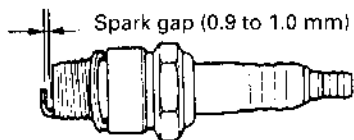


Fig. 49

4) Replacing the anode (Trim tab)

To prevent electrolytic corrosion of the outboard motor, anodes are fitted on the gear case and in the cylinder.

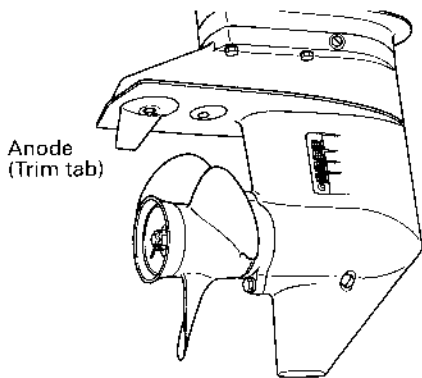


Fig. 50

IMPORTANT:

- For replacing anode, remove the spark plug cap not to run the engine and check and renew the anode.
- If the anode has worn out or no anode is fitted on the outboard motor, aluminum parts will get corrosion which lead painting peeled off and damage.
- Do not leave the consumed anodes on the outboard, or the outboard may be corroded.

2. PERIODIC INSPECTION

Periodic Inspection Checklist

It is important to inspect and maintain your outboard motor regularly. At each interval on the chart below be sure to perform the indicated servicing. Maintenance intervals should be determined according to the number of hours or number of months, whichever comes first.

Item	Servicing Interval			Action	Remarks	
	10 hours or 1 month	50 hours or 3 months	Every 100 hours or 6 months			
Fuel System	*Carburetor	☉	☉	☉	Strip, clean and adjust. Adjust idling	
	Fuel filter	☉	☉	☉	Check and clean.	
	Piping			☉	Check and clean.	
	Fuel tank	☉	☉	☉	Clean	
Ignition	Spark plugs	☉	☉	☉	Check gaps. Remove carbon deposits.	
	*Ignition timing	☉		☉	Adjust timing.	
Starting System	*Starter motor			☉	Check for salt deposits and battery cable condition.	
	Battery	☉	☉	☉	Installation, fluid quantity, gravity	
	Starter rope	☉	☉	☉	Check for wear or damage	
Lower Unit	Propeller	☉	☉	☉	Bend of blades damage, wear	
	Gear oil	☉	☉	☉	Change of oil or replenishment and water leak	Replace impeller every 12 months
	Water pump		☉	☉	Check for wear or damage	
Bolts and Nuts	☉	☉	☉	Retighten		
Sliding and Rotating Parts. Grease Nipples.		☉	☉	Apply and pump in grease.		
Outer Equipment	☉	☉	☉	Check corrosion		
Anode and Trim Tub		☉	☉	Check corrosion and deformation	Replace	

For checking the items marked with *, consult with the TOHATSU dealer.

Changing gear oil

1) Remove oil plugs (upper and lower), and drain gear oil completely.

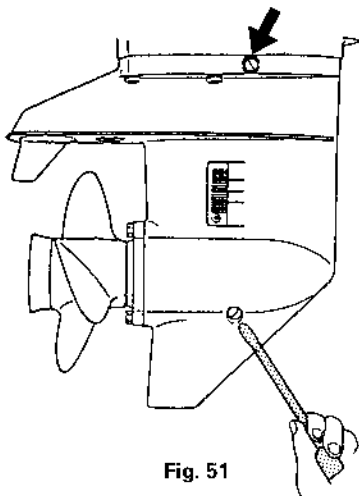


Fig. 51

2) Insert an oil tube nozzle into the lower oil plug hole, and fill gear oil by squeezing the oil tube until oil flows out of the upper plug hole.

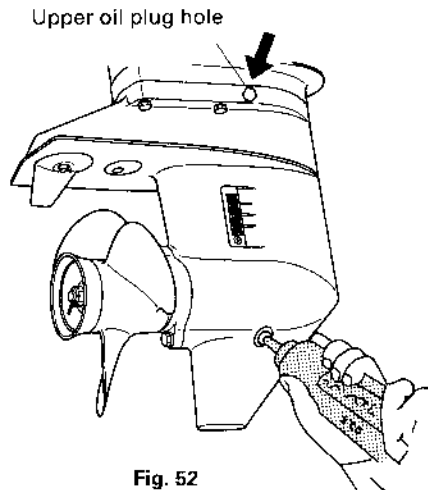


Fig. 52

NOTE: Use a genuine TOHATSU gear oil or recommended one (GL-5: SAE #80 to #90). Required volume: about 250 cc.

- 3) Install the upper oil plug, and then remove oil tube nozzle and install the lower oil plug.

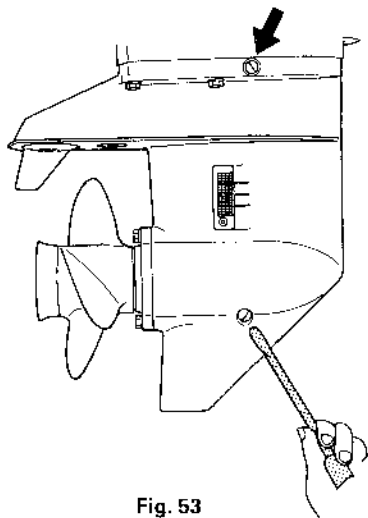


Fig. 53

Cleaning the tank and filters

Cleaning fuel Tank

Water or dirt in the fuel tank may cause engine trouble.

Clean the tank at specified times or after long time storage (over three months).

Fuel filters are provided inside the fuel tank and at the engine.

- Unscrew four screws, remove the housing, and then clean the fuel filter.

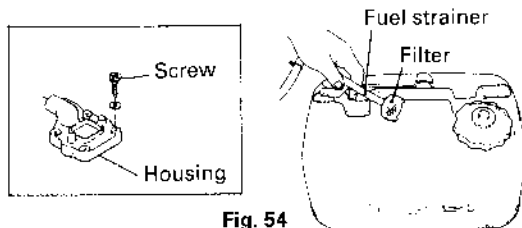


Fig. 54

- Remove the cap, then clean the fuel filter at the engine.

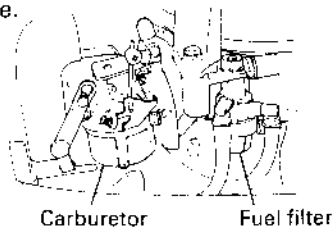


Fig. 55

3. WINTER STORAGE

WARNING

- 1 When the motor is out of the water, being transported, or in storage, always remove the positive (+) battery cable to prevent accidental starting of the engine. Accidental starting when the motor is out of the water will cause water pump failure, overheating and damage to the engine due to a lack of cooling water.
2. DO NOT disconnect the electrical harness when operating the motor. This model will continue to run and can be started with the electrical harness disconnected. Remove all spark plug connectors from the spark plugs when servicing the engine or propeller.

When your outboard motor is in storage, this is a good opportunity to have it serviced and overhauled by your TOHATSU dealer.

1 Engine

- ① Wash the engine exterior and flush the cooling water system thoroughly with fresh water. Let the water drain completely. Wipe off any surface water with an oily rag.
- ② Drain all fuel from the fuel pipes, fuel pump and carburetor, and clean these parts. To

prevent corrosion of the fuel tank, fill it up with engine oil-rich gasoline. Keep in mind that if gasoline is kept in the carburetor for a long time, gum and varnish will be generated, causing the float valve to stick.

- ③ Remove the spark plugs and feed genuine Engine Oil or storage fogging oil through the spark plug holes. The oil will be fed into the crank case from the air silencer attached to the carburetors. Turn the engine over several times while feeding the oil into it and make sure it is evenly distributed.
- ④ Apply grease to the propeller shaft.
- ⑤ Change the gear oil in the gear case.
- ⑥ Apply grease to all sliding parts, joints, nuts and bolts.
- ⑦ Use a dry cloth to completely wipe off water and salt from the electrical components.
- ⑧ Remove the fuel connector from the engine.
- ⑨ Stand the engine vertically in a dry place.

2 Battery

- ① Disconnect the battery cables.
- ② Clean the exterior of the battery with fresh water or compressed air. Wipe off any chemical deposits, dirt and grease from the battery.

- ③ Apply grease or baseline to the battery terminals.
- ④ Charge the battery completely before storing it for the winter.
- ⑤ Recharge the battery once a month to prevent it from discharging and the electrolyte from deteriorating.
- ⑥ Store the battery in a dry place with its cover attached.

CAUTION

- 1 Do not allow the battery to discharge, since it can be damaged by freezing.
2. When storing your outboard for the winter, open up all the water drain holes in the gear case to permit any remaining water to drain out. If a speedometer is installed, disconnect the pickup tube and allow it to drain, then reconnect it after draining. Trapped water may crack the gear case or water pump case as a result of expansion when frozen. Check and replenish the gear case with case specified Gear Oil before storing the motor, to avoid water leakage into the gear case due to a loose lubricant vent plug or grease fill plug. Inspect the gaskets under the lubricant vent and grease plugs, replace them if necessary, and reinstall the plugs.

3 Electric Starter Motor

Coat the pinion gear and shaft of the electric starter motor with grease.

4. PRE-SEASON CHECK

Have your TOHATSU dealer check the engine before the season starts, or if you prefer, be sure to check the following items yourself:

- ① Check the electrolyte level, and measure the voltage and specific gravity of the battery.

Specific Gravity at 20°C	Terminal Voltage (V)	Charge Condition
1.120	10.5	Fully discharged
1.160	11.1	1/4 charged
1.210	11.7	1/2 charged
1.250	12.0	3/4 charged
1.280	13.2	Fully charged

- ② Check the battery is secure and the battery cables installed properly.
- ③ Check that the shift and throttle function properly.
(Be sure to turn the propeller shaft when checking the shift function or else the shift linkage may be damaged.)

CAUTION

The following steps must be taken when first using the engine after winter storage.

1. Fill up the fuel tank completely with 22.7 liters (6 U.S. gals.):
Mixing ratio: Gasoline 25:1 Engine oil
Use premium (super) gasoline and genuine TOHATSU Outboard Motor Oil. If this oil is not available, use NMMA TC-W3 certified outboard motor oil.
2. Warm up the engine for 3 minutes in "NEUTRAL" position.
3. Run the engine for 5 minutes at the slowest speed.
4. Run the engine for 10 minutes at half speed.
In steps 2 and 3 above, the oil used for winter storage inside the engine will be cleaned out, and optimum performance will be assured.

5. IF THE MOTOR FALLS INTO WATER

After picking up, immediately bring the outboard to your TOHATSU dealer.

Following are the emergency measures to be taken on the submerged outboard.

- 1) Immediately take it out of the water, and wash it with fresh water to remove salt or dirt.
- 2) Remove the spark plug, and completely drain water from the engine by pulling the recoil starter several times.
- 3) Sufficiently inject genuine Tohatsu engine oil through the spark plug hole and into the crank case from the carburetor side. Pull the recoil starter several times to circulate the oil throughout the motor.

6. CHECKING AFTER STRIKING UNDERWATER OBJECT

Striking sea bottom or underwater object may severely damage the outboard. Immediately bring the outboard to the TOHATSU dealer and ask for the following checks.

- (1) Looseness or damage of power unit installation bolts, gear case and extension case bolts, propeller shaft housing bolts, upper and lower

mount rubber bolts, and mount rubber retainer bolts.

Ask to tighten loose bolts, and to replace damaged parts.

- (2) Deformation and damage of mount rubber, tilt stopper, thrust rod, gears and clutch, and propeller.

Ask to replace damaged or deformed parts.

7. PRECAUTIONS IN COLD WEATHER

If you cruise and moor your boat in cold weather as sub-zero temperatures, there is a danger of water freezing in the cooling water pump, which may damage the pump, impeller, etc. To avoid this, submerge the lower half of the motor into water, or pull the recoil starter several times to drain water completely, with the motor tilted up.

TROUBLESHOOTING

If you encounter a problem, consult the check list below to find its cause and to take the proper measure.

Your local Tohatsu dealer will always be happy to give you assistance and information.

Engine fails to start.	Engine starts but stops soon.	Poor idling	Poor acceleration	Engine speed abnormally high	Engine speed abnormally low	Cannot obtain high boat speed	Overheating of engine	Possible cause
●	●							Empty fuel tank
●	●	●	●		●	●	●	Incorrect connection of fuel system
●	●	●	●		●	●	●	Air entering in fuel line
●	●	●	●		●	●	●	Deformed or damaged fuel pipe
●	●	●	●		●	●	●	Closed air vent on fuel tank
●	●	●	●		●	●	●	Clogged fuel filter, fuel pump or carburetor
		●	●		●	●	●	Use of improper engine oil
●		●	●			●	●	Use of improper gasoline
●	●	●	●		●	●		Excessive oil in mixture
							●	Shortage of oil in mixture
●			●					Excessive supply of fuel
●	●	●	●		●	●	●	Poor carburetor adjustment
●	●	●	●			●	●	Recirculation pipe broken
●	●	●	●		●	●	●	Spark plugs other than specified
●	●	●	●		●	●		Dirts or bridge of spark plugs

Engine fails to start.	Engine starts but stops soon.	Poor idling	Poor acceleration	Engine speed abnormally high	Engine speed abnormally low	Cannot obtain high boat speed	Overheating of engine	Possible cause
●	●	●	●		●	●		No or weak spark
						●	●	Insufficient cooling water flow. Clogged or defective pump
		●				●	●	Faulty thermostat
			●	●		●	●	Cavitation
			●	●	●	●	●	Incorrect propeller selection
		●	●	●	●	●	●	Damaged or bent propeller
			●	●		●	●	Improper thrust rod position
			●	●	●	●	●	Unbalanced load position on boat
			●	●	●	●	●	Transom too high or too low
●								Short-circuit of engine stop switch
●		●	●		●	●		Incorrect adjustment of throttle link
●		●	●		●	●		Incorrect adjustment of ignition timing
●								Loose battery terminal connections. Corrosion
●								Discharged battery
●								Main switch trouble
●								Lock plate not fitted to stop switch
●								Disconnection of wire or loose ground connection
●								Insufficient battery capacity, loose terminal connections, corrosion

(EP and EF types)

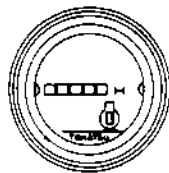
ASSOCIATED PARTS

	Associated parts	Quantity	Dimensions	Remarks
Service tools	Tool bag	1		
	Pliers	1		
	Socket wrench	1	10 × 13 mm	
	Socket wrench	1	21 mm	
	Socket wrench handle	1		
	Screwdriver	1		
Spare parts	Starter rope	1	1000 mm	
	Spark plug	1	NGK B7HS-10 or CHAMPION L82C (Gap: 1.0 mm)	
	Split pin	1		
*Other	Fuel tank	1		
	Primer bulb	1 set		
	Remote control box	1 set		(EP only)
	Remote control attachment	1 set		(EP only)
	Drug link	1 set		(EP only)
	Flushing plug	1		

Not included as standard accessories in some markets.

ACCESSORIES

OPTIONAL ACCESSORIES



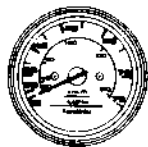
(1) Hour meter



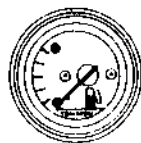
(2) Tachometer



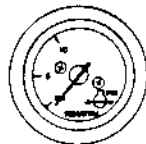
(3) Speedometer
(50 MPH)



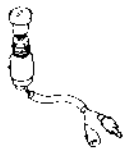
(4) Speedometer
(75 MPH)



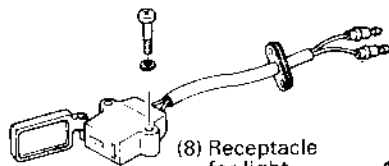
(5) Fuel meter



(6) Water pressure
meter



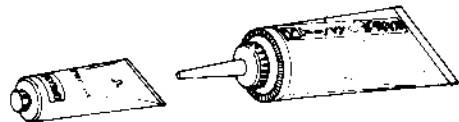
(7) Meter lamp switch



(8) Receptacle
for light
(12V-80W)



(10) Receptacle plug



(11) TOHATSU grease
(50 g, 250 g)

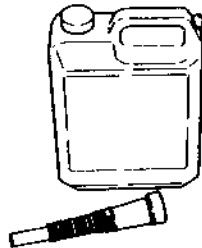
(12) TOHATSU gear oil
(260 cc, 500 cc)



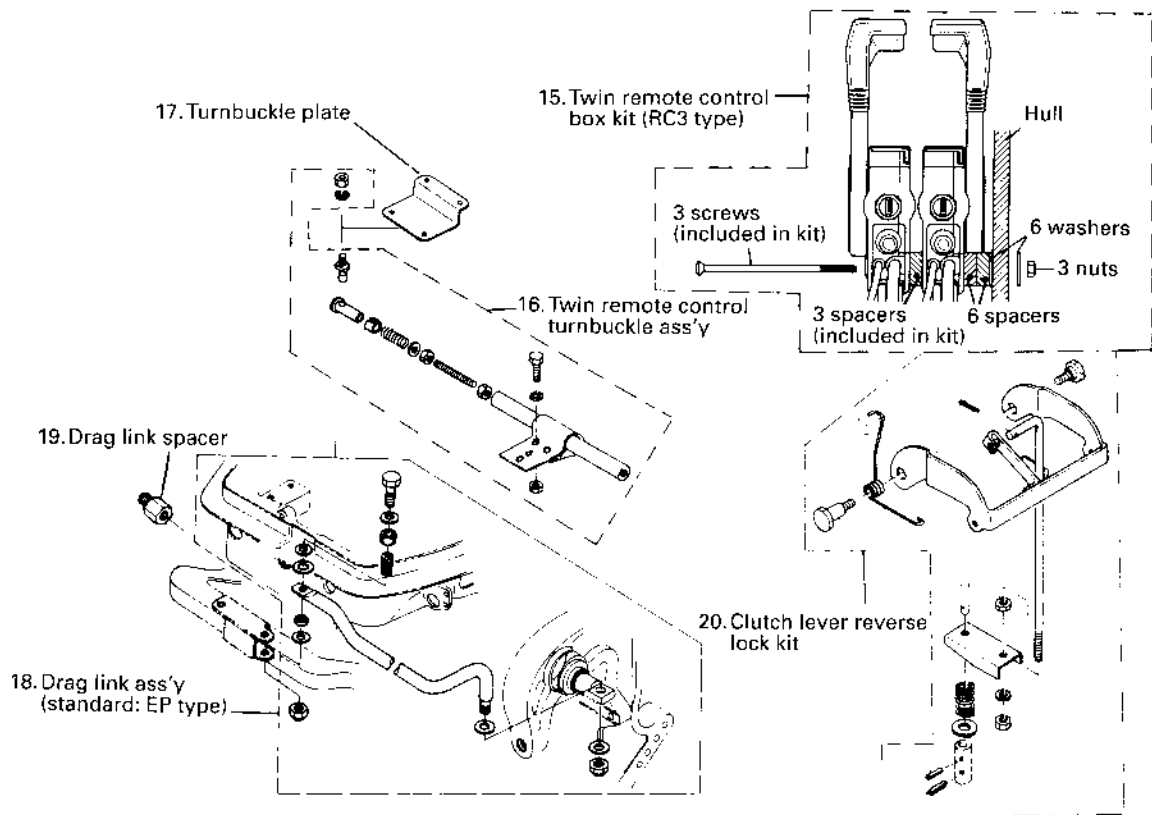
(13) Touch-up spray paint (300 ml)



(14) TOHATSU engine oil
(0.5 l, 1 l, 20 l)



(15) TOHATSU engine oil
SUPER GOLD (5 l)



AVAILABLE PROPELLERS

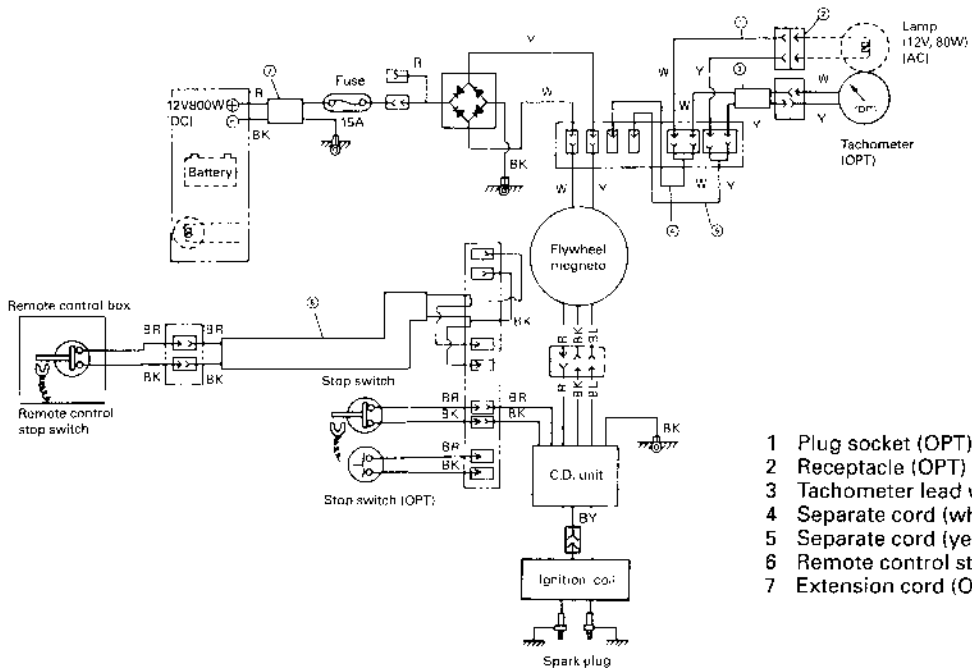
	Light duty boat ◀			▶ Heavy duty		
Mark	14 (E)	13 (D)	11 (C)	10 (B)	9 (A)	8 (F)
Dimensions (Blade × dia × pitch) mm	3 × 252 × 360	3 × 252 × 332	3 × 250 × 288	3 × 250 × 260	3 × 249 × 236	3 × 260 × 210
	Option	Transom S	Transom L,LL	Transom UL	Option	Option

Use a genuine TOHATSU propeller.

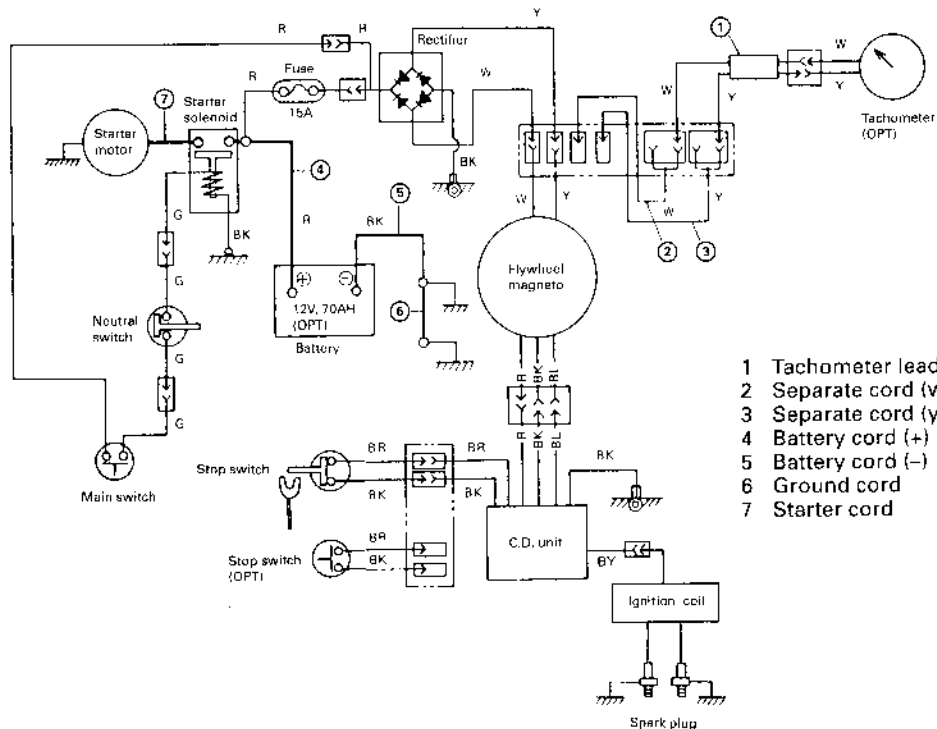
For a stainless propeller, use of the one designed specifically for TOHATSU outboard made by POWER TECH is recommended.

A propeller must be selected so that the engine rpm measured at wide open throttle while cruising is within the recommended range, 4,800 to 5,500 rpm.

WIRING DIAGRAMS



F TYPE



- 1 Tachometer lead wire (OPT)
- 2 Separate cord (white) (OPT)
- 3 Separate cord (yellow) (OPT)
- 4 Battery cord (+)
- 5 Battery cord (-)
- 6 Ground cord
- 7 Starter cord

 **TOHATSU CORPORATION**

Address: 4-9, 3-chome, Azusawa, Itabashi-ku, TOKYO 174, Japan
Cable: "TOHATSU TOKYO"
Telex: 272-2051 THT J
Facsimile: TOKYO (03)3969-7885(Gil-Gill)
Phone: TOKYO (03)3966-3111

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