

OWNER'S MANUAL

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Serial Number

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

Serial Number : _____

To You, Our Customer:

Thank you for selecting a TOHATSU product. You are now the proud owner of an excellent outboard engine that will service you for many years to come.

We would like to point out that carefree usage can only be assured on condition that this manual is read through in its entirety and the maintenance routines described later in this manual are followed carefully. Should difficulty arise with the engine, please follow the troubleshooting procedures listed at the end of this manual. If the problem persists, contact an authorized TOHATSU service shop or your dealer.

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

TOHATSU CORPORATION

NOTICE: DANGER/WARNING/CAUTION/Note

Before operating your outboard motor, be sure to thoroughly read and understand this Owner's Manual and follow all of the instructions shown. Of particular importance is information preceded by the words "DANGER," "WARNING," "CAUTION," and "Note." Always pay special attention to such information to ensure safer and trouble-free operation at all times.

DANGER

Failure to observe will result in severe personal injury or death.

WARNING

Failure to observe could result in severe personal injury or death.

YOUR TOHATSU OUTBOARD MOTOR

OWNER REGISTRATION AND IDENTIFICATION

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

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

* : In this manual, "dealer" always means an authorized TOHATSU dealer.

PRE-DELIVERY CHECK

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

Limited 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 limited warranty will not apply to the normal wear and tear of parts, adjustments, tune-ups, or to any damage caused by:

- 1) Use or operation NOT conforming to the instructions described in this owner's manual,
- 2) Participation in or preparation for racing or other competitive activities,
- 3) Water entering the engine or the engine room,
- 4) Damage of an accidents, collisions, contact with foreign materials, or submersion.
- 5) Growth of marine organisms on motor surfaces.
- 6) Any other careless use or operation.
- 7) Normal deterioration.

The limited warranty does not cover maintenance items. The following items are some examples not to be covered by the limited warranty.

spark plugs, anode, trim-tub, propeller, fuel filter, oil filter, carbon brush, starter rope, shear-pin, split-pin, bolt-nut-washer, wire cable, rubber goods: pump impeller, oil seal, "O"-ring, fuel pipe, primer bulb, etc., viny tube.

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

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

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DANGER

Failure to observe will result in severe personal injury or death.

WARNING

Failure to observe could result in severe personal injury or death.

▲ CAUTION

Failure to observe could result in minor personal injury or product or property damage.

Note:

This instruction provides special information to facilitate the use or maintenance of the outboard or to clarify important points.

EMERGENCY STOP SWITCH

The stop switch will cut off the engine when the stop switch line is pulled out. This line can be attached to the body of the operator, effectively preventing injuries from the propeller in case he/she falls overboard.

We highly recommend use of the stop switch line because it can save the life of the operator if something bad happens. However, we would also like to point out the drawbacks of the switch. Accidental activation of the switch (such as the line being pulled out in heavy seas) could cause passengers to lose their balance and even fall overboard, or it 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 500 mm line is coiled and can be extended to a full 1,300 mm.

WARNINGS

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

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

SERIOUS INJURY IS LIKELY IF A PERSON IN THE WATER MAKES CONTACT WITH 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 of 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 be acquainted with its correct maintenance. Please comply with all instructions on lubrication and maintenance, and return the engine to the dealer or service shop for periodic inspection at the prescribed intervals.

Troublefree operation cannot be expended unless the engine receives adequate periodic maintenance. If maintenance is performed periodically, it is not likely that a costly overhaul will ever be required.

USE OF SERVICE SHOP

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

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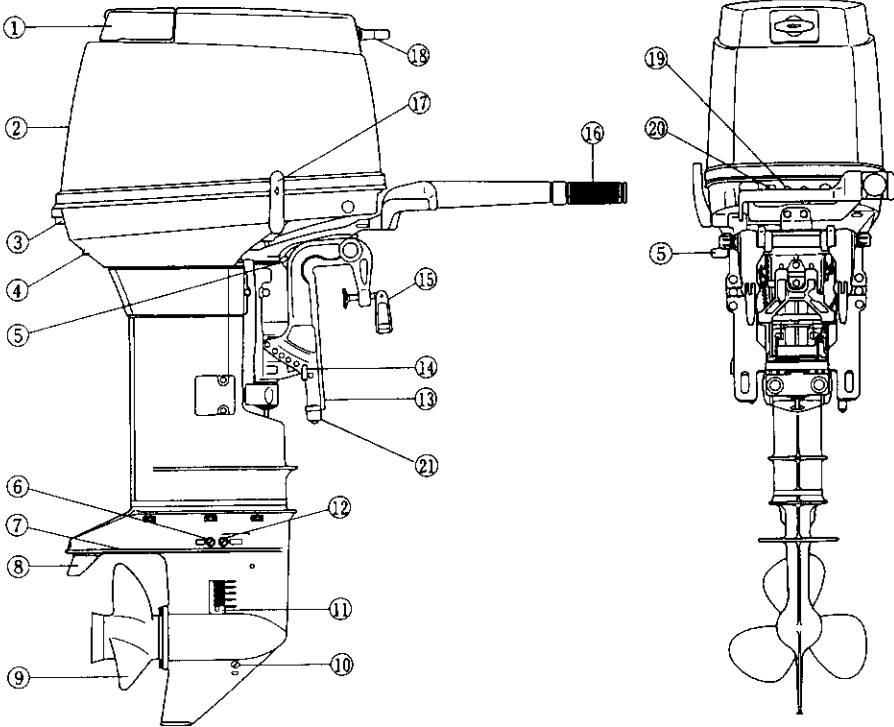
1. SPECIFICATIONS

Model	40D2 F	40D2 50D2 EF	40D2 50D2 EFO
Overall Length, mm (Approx.)	1,107		
Overall Width, mm (Approx.)	381		
Overall Height, mm S • L • UL	1,225 • 1,352 • 1,479		
Transom Height, mm S • L • UL	403 • 530 • 657		
Weight, kg (Approx.) S • L • UL	72 • 73.5 • 75	77 • 78.5 • 80	78.5 • 80 • 81.5
Max. Output, kW	40D2: 29.4, 50D2: 36.8		
Full Throttle Speed range, rpm	40D2: 5,000–5,700, 50D2: 5,150–5,850		
No. of Cylinders	3		
Piston Displacement, mL	697		
Bore & Stroke, mm	68 × 64		
Exhaust System	Through hub exhaust		
Lubrication	Premixed Fuel	Auto mixing	
Fuel Mixing Ratio	50:1	120:1 – 50:1	
Cooling System	Forced water cooling		
Starting System	Electric starter motor		
Ignition	Flywheel Magneto C.D. Ignition		
Spark Plugs	40D2: NGK B7HS-10/BR7HS-10 or Champion L-82C/RL-82C (1.0mm gap) 50D2: NGK B8HS-10/BR8HS-10 or Champion L-78C/RL-78C (1.0mm gap)		
Alternator	12V, 130W (12V, 11A)		
No. of Trim Adjustments	6		
Engine Oil	Genuine Motor Oil or recommended one (TCW- III)		
Gear Oil	Genuine Gear Oil or API GL5, SAE #80 to #90, approx. 500 mL		
Fuel Tank Capacity, litter (US gal)	25 (6.6)		
Engine Oil Capacity, litter (US gal)	—		Approx. 2.0 (0.53)
Gear Reduction Ratio	13 : 24		
Fuel	Unleaded regular gasoline pump posted 87 Octane (research octane rating of 91)		

Model	40D2 EFTO	50D2 EPO	40D2 EPTO
Overall Length, mm (Approx.)	1,107	630	
Overall Width, mm (Approx.)	381	340	355
Overall Height, mm S • L • UL	1,225 • 1,352 • 1,479	1,212 • 1,339 • 1,466	
Transom Height, mm S • L • UL	403 • 530 • 657		
Weight, kg (Approx.) S • L • UL	89.5 • 91 • 92.5	74.5 • 76 • 77.5	85.5 • 87 • 88.5
Max. Output, kW	40D2: 29.4, 50D2: 36.8		
Full Throttle Speed range, rpm	40D2: 5,000–5,700, 50D2: 5,150–5,850		
No. of Cylinders	3		
Piston Displacement, mL	697		
Bore & Stroke, mm	68 × 64		
Exhaust System	Through hub exhaust		
Lubrication	Auto mixing		
Fuel Mixing Ratio	120:1 – 50:1		
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Alternator	12V, 130W (12V, 11A)		
No. of Trim Adjustments	5	6	5
Engine Oil	Genuine Motor Oil or recommended one (TCW- III)		
Gear Oil	Genuine Gear Oil or API GL5, SAE #80 to #90, approx. 500 mL		
Fuel Tank Capacity, liter (US gal)	25 (6.6)		
Engine Oil Capacity, liter (US gal)	Approx. 2.0 (0.53)		
Gear Reduction Ratio	13 : 24		
Fuel	Unleaded regular gasoline pump posted 87 Octane (research octane rating of 91)		

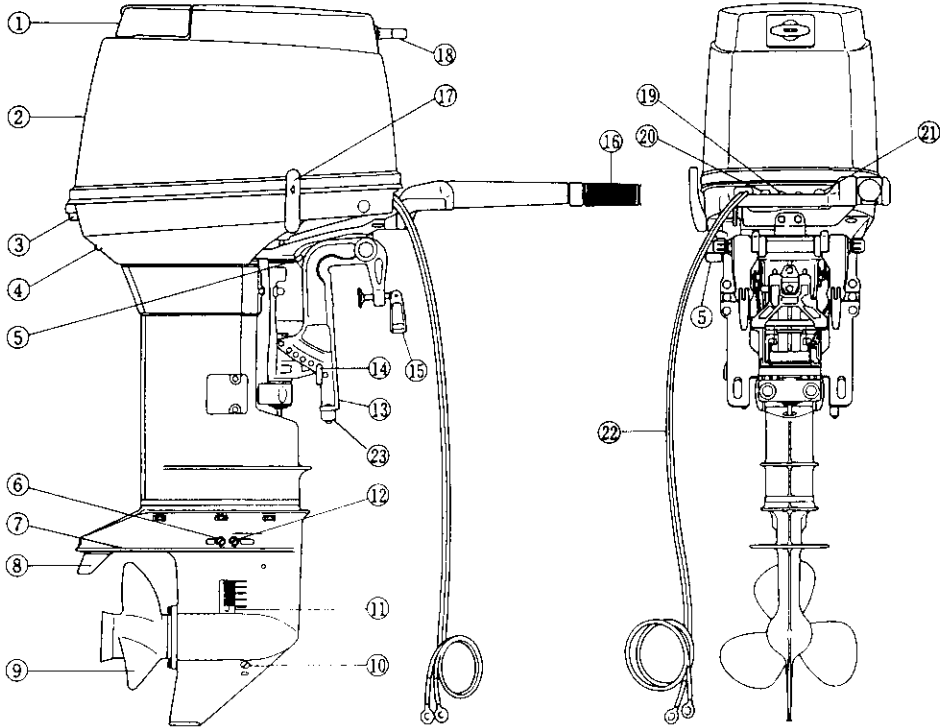
2. NAMES OF PARTS

40D₂F



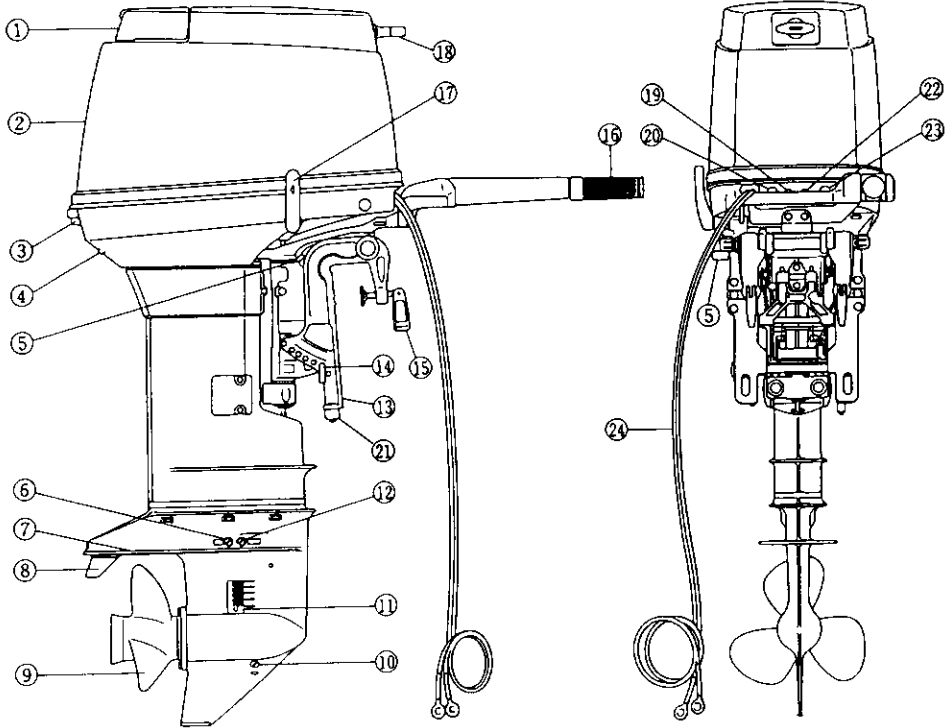
- | | | |
|--------------------------|--------------------|---------|
| ① Tilt Handle | ⑪ Water Strainer | ⑳ Anode |
| ② Upper Motor Cover | ⑫ Oil Plug (upper) | |
| ③ Hook Lever | ⑬ Stern Bracket | |
| ④ Water Check Port | ⑭ Thrust Rod | |
| ⑤ Reverse Lock Lever | ⑮ Clamp Screw | |
| ⑥ Water Plug | ⑯ Throttle Grip | |
| ⑦ Anti-ventilation Plate | ⑰ Shift Lever | |
| ⑧ Trim Tab | ⑱ Starter Handle | |
| ⑨ Propeller | ⑲ Stop Switch | |
| ⑩ Oil Plug (lower) | ㉑ Choke knob | |

40D₂EF/50D₂EF



- | | | |
|--------------------------|--------------------|-----------------|
| ① Tilt Handle | ⑪ Water Strainer | ⑳ Main Switch |
| ② Upper Motor Cover | ⑫ Oil Plug (upper) | ㉑ Battery Cords |
| ③ Hook Lever | ⑬ Stern Bracket | ㉒ Anode |
| ④ Water Check Port | ⑭ Thrust Rod | |
| ⑤ Reverse Lock Lever | ⑮ Clamp Screw | |
| ⑥ Water Plug | ⑯ Throttle Grip | |
| ⑦ Anti-ventilation Plate | ⑰ Shift Lever | |
| ⑧ Trim Tab | ⑱ Starter Handle | |
| ⑨ Propeller | ㉑ Stop Switch | |
| ⑩ Oil Plug (lower) | ㉒ Choke knob | |

40D₂EFO/50D₂EFO

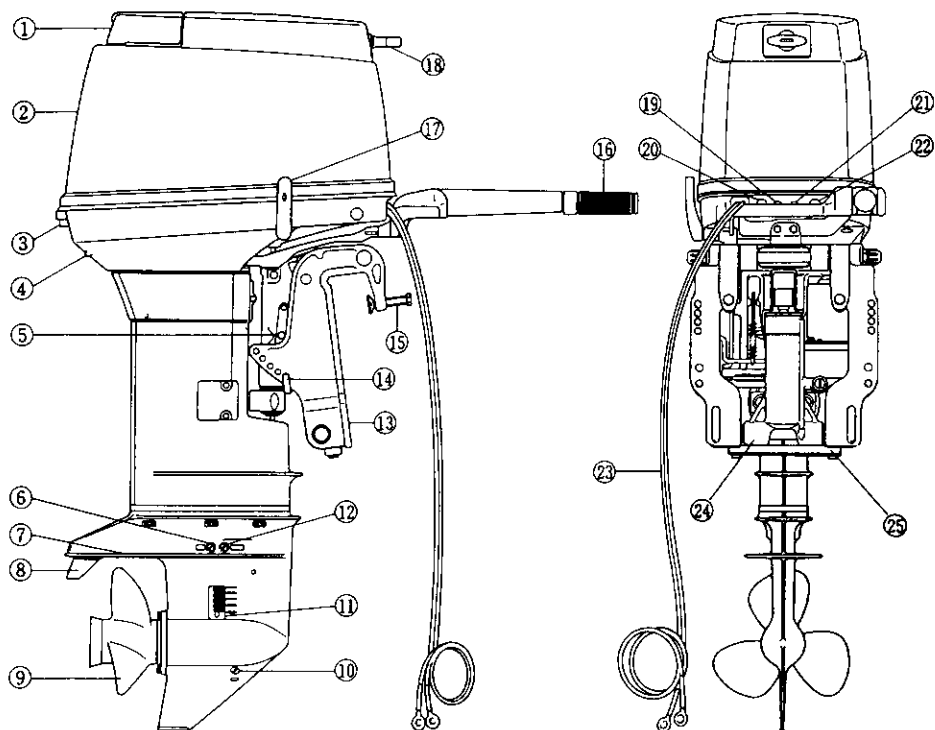


- ① Tilt Handle
- ② Upper Motor Cover
- ③ Hook Lever
- ④ Water Check Port
- ⑤ Reverse Lock Lever
- ⑥ Water Plug
- ⑦ Anti-ventilation Plate
- ⑧ Trim Tab
- ⑨ Propeller
- ⑩ Oil Plug (lower)

- ⑪ Water Strainer
- ⑫ Oil Plug (upper)
- ⑬ Stern Bracket
- ⑭ Thrust Rod
- ⑮ Clamp Screw
- ⑯ Throttle Grip
- ⑰ Shift Lever
- ⑱ Starter Handle
- ⑲ Stop Switch
- ⑳ Choke knob

- ㉑ Anode
- ㉒ Pilot Lamp
- ㉓ Main Switch
- ㉔ Battery Cords

40D₂EFTO/50D₂EFTO

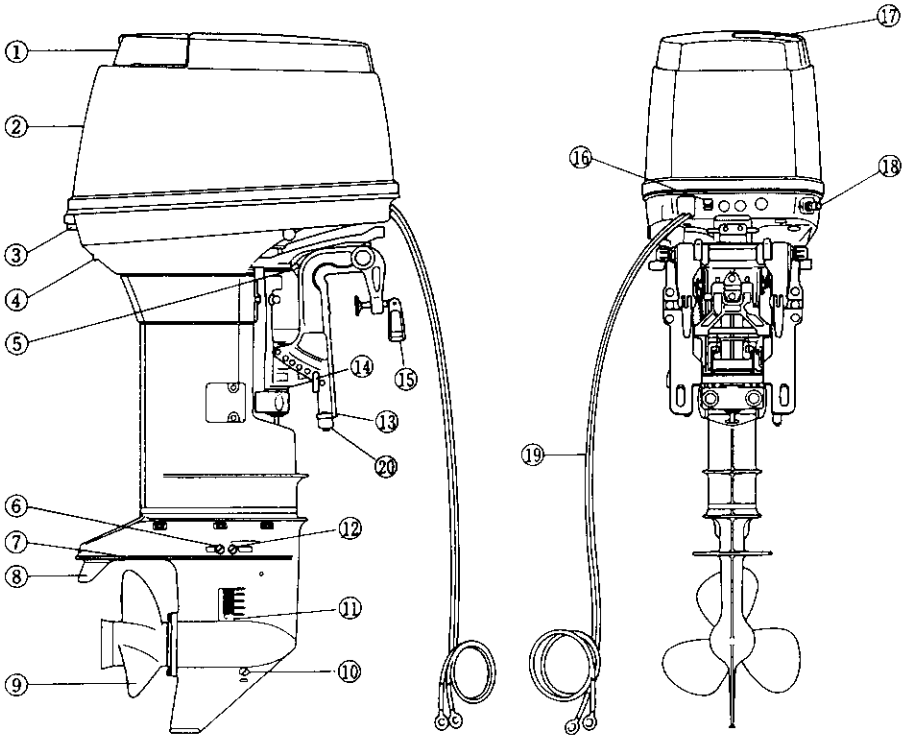


- ① Tilt Handle
- ② Upper Motor Cover
- ③ Hook Lever
- ④ Water Check Port
- ⑤ Tilt Stopper
- ⑥ Water Plug
- ⑦ Anti-ventilation Plate
- ⑧ Trim Tab
- ⑨ Propeller
- ⑩ Oil Plug (lower)

- ⑪ Water Strainer
- ⑫ Oil Plug (upper)
- ⑬ Stern Bracket
- ⑭ Thrust Rod
- ⑮ Clamp Screw
- ⑯ Throttle Grip
- ⑰ Shift Lever
- ⑱ Starter Handle
- ⑲ Stop Switch
- ⑳ Choke knob

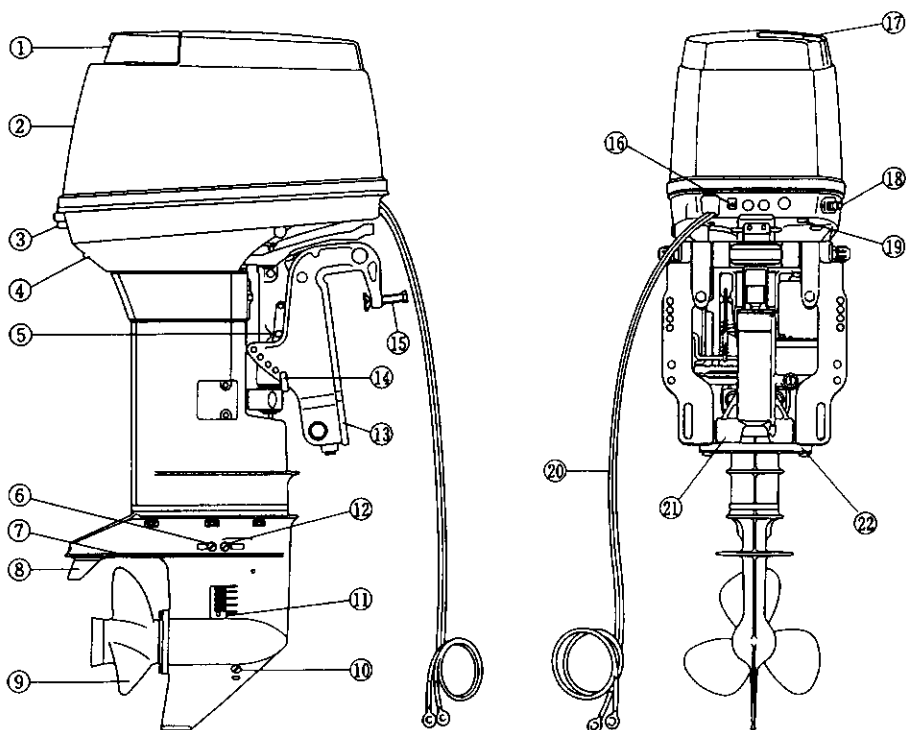
- ㉑ Pilot Lamp
- ㉒ Main Switch
- ㉓ Battery Cords
- ㉔ Power Trim & Tilt
- ㉕ Anode

40D₂EPO/50D₂EPO



- | | |
|--------------------------|--------------------|
| ① Tilt Handle | ⑪ Water Strainer |
| ② Upper Motor Cover | ⑫ Oil Plug (upper) |
| ③ Hook Lever | ⑬ Stern Bracket |
| ④ Water Check Port | ⑭ Thrust Rod |
| ⑤ Reverse Lock Lever | ⑮ Clamp Screw |
| ⑥ Water Plug | ⑯ Choke Knob |
| ⑦ Anti-ventilation Plate | ⑰ Filler Lid |
| ⑧ Trim Tab | ⑱ Fuel Connector |
| ⑨ Propeller | ⑲ Battery Cords |
| ⑩ Oil Plug (lower) | ⑳ Anode |

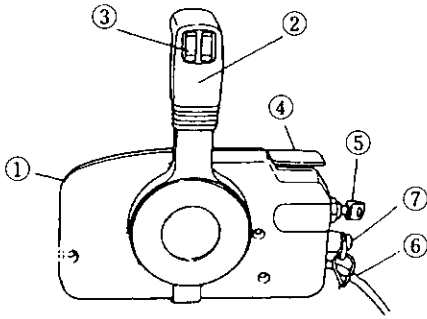
40D₂EPTO/50D₂EPTO



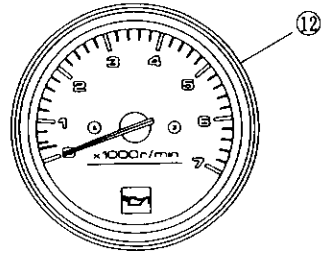
- ① Tilt Handle
- ② Upper Motor Cover
- ③ Hook Lever
- ④ Water Check Port
- ⑤ Tilt Stopper
- ⑥ Water Plug
- ⑦ Anti-ventilation Plate
- ⑧ Trim Tab
- ⑨ Propeller
- ⑩ Oil Plug (lower)

- ⑪ Water Strainer
- ⑫ Oil Plug (upper)
- ⑬ Stern Bracket
- ⑭ Thrust Rod
- ⑮ Clamp Screw
- ⑯ Choke Knob
- ⑰ Filler Lid
- ⑱ Fuel Connector
- ⑲ Power Trim & Switch
- ⑳ Battery Cords

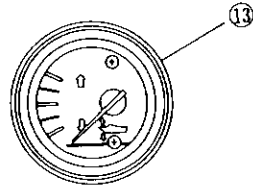
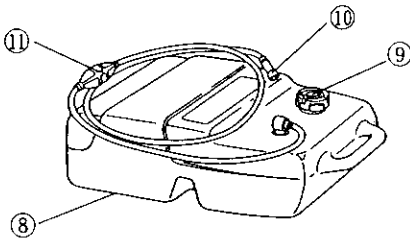
- ㉑ Power Trim & Tilt
- ㉒ Anode



for P Type



for P Type



for T Type

- | | |
|----------------------------|---------------|
| ① Remote Control Box | ⑪ Primer Bulb |
| ② Remote Control Lever | ⑫ Tachometer |
| ③ Power Trim & Tilt Switch | ⑬ Trim Meter |
| ④ Neutral Warm-up Lever | |
| ⑤ Main Switch | |
| ⑥ Harness B | |
| ⑦ Stop Switch | |
| ⑧ Fuel Tank | |
| ⑨ Air Vent Screw | |
| ⑩ Fuel Connector | |

3. ENGINE INSTALLATION ON BOAT

▲ WARNING

Most boats are rated and certified in terms of their maximum horsepower, 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 until it has been securely mounted on the boat in accordance with the instructions below.

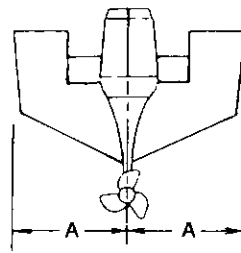
Note:

Consult your authorized dealer to receive the proper instructions or ask your dealer to mount the motor as necessary.

1 Installation

① Single-engine Installation

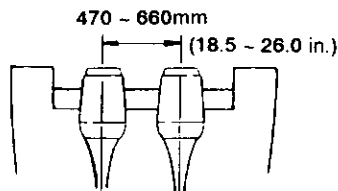
- Position the outboard engine at the exact center of the stern, and mount it using a cushioning pad or plate. (Fig. 1)



(Fig. 1)

② Twin-engine Installation

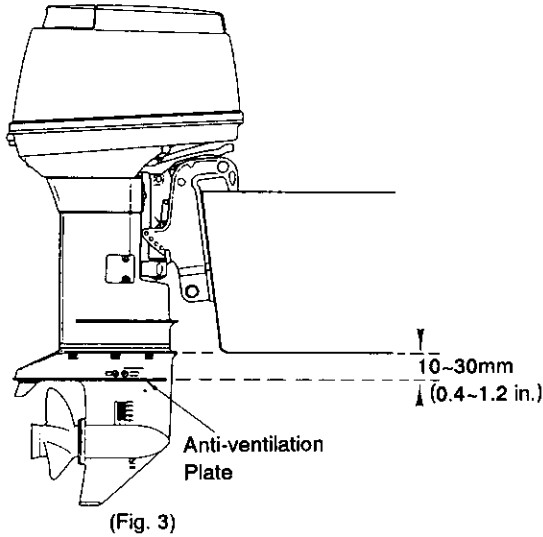
- Position the outboard engines 470~660mm (18.5 ~ 26.0 in.) apart, measured from an imagined center line of each engine, in the exact center of the stern. (Fig. 2)



(Fig. 2)

③ Transom Height

Install the engine with the Anti-ventilation Plate at a level 10 ~ 30mm below the bottom of the boat. (Fig. 3)



Transom Matching

Be sure that the anti-ventilation 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 your dealer.

▲ CAUTION

Overheating may occur if the Anti-ventilation Plate is at a level higher than the bottom of the boat, as a result of air sucking.

- If the height difference exceeds 10 ~ 30mm engine power performance is likely to be reduced as a result of increased water resistance to the gear case assembly.

④ Attaching the Stern Bracket

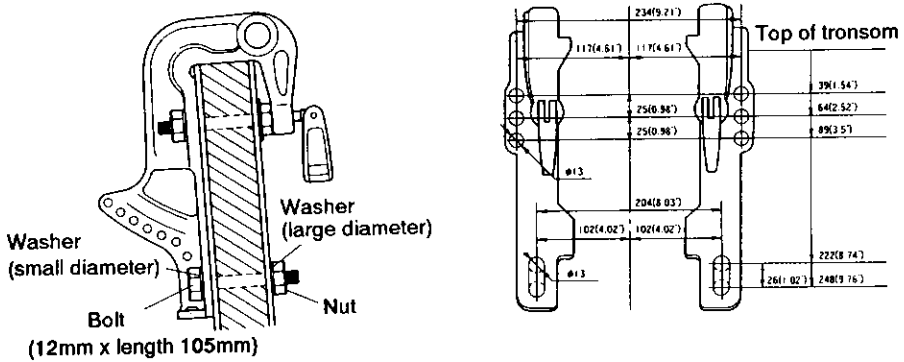
After positioning the Stern Bracket, fix it with clamp screws then drill four holes in the transom board, matching the holes in the Stern Bracket. Secure

the engine with the supplied bolts (M12 x 105mm) and nuts. Be sure to use the washers. The larger diameter washers use inside of the transom board and small diameter washers use outside of the stern bracket.

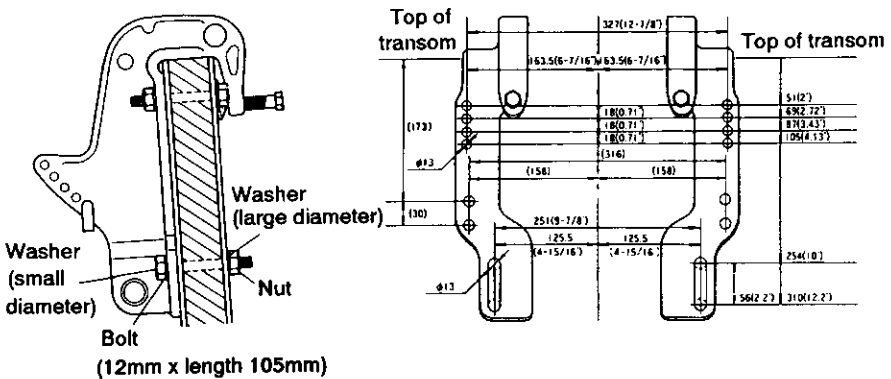
The mounting holes may be drilled beforehand by referring to the dimensional drawing.

2 Stern Bracket Dimensional Drawing

manual tilting model F • EF • EFO • EPO



with the Power Trim and Tilt model EFTO • EPTO



Note:

We recommend that the bolt head of the upper bolts face inward while the nuts are kept on the outside of the boat to prevent injury to the passengers.

Notes:

1. Apply sealing agent, such as silicon sealer, between the bolts and the transom board holes when tightening the bolt.
2. Be sure to fix the engine securely with the bolts.

3 Propeller Selection

A propeller must be selected so that the engine rpm measured at wide open throttle while cruising is within the recommended range;

40D₂ 5000 to 5700 rpm

50D₂ 5150 to 5850 rpm

For genuine propellers, refer to Propeller Table of this manual.

4. REMOTE CONTROL DEVICE & METERS

It is recommendable to consult with your dealer for installation and adjustment of the remote control device.

1 Installation of the Remote Control Cables (Box side)

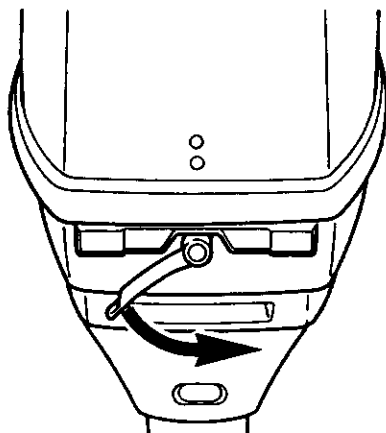
Follow the instruction manual provided with the remote control box.

2 Installation of the Remote Control Box on your boat

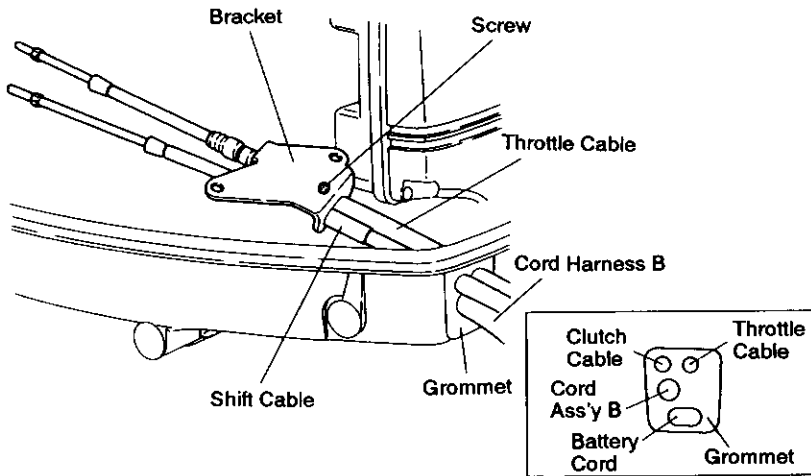
Follow the instruction manual provided with the remote control box.

3 Connecting the Remote Control Cable to the engine.

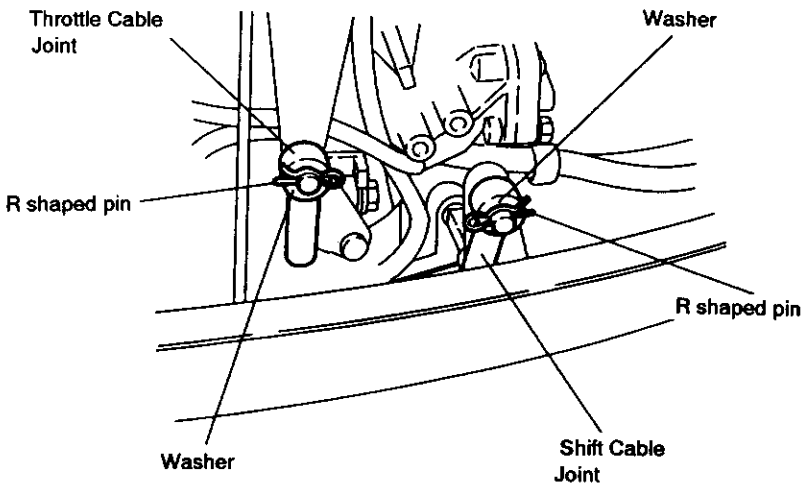
① Detach the upper engine cover by turning the lever.



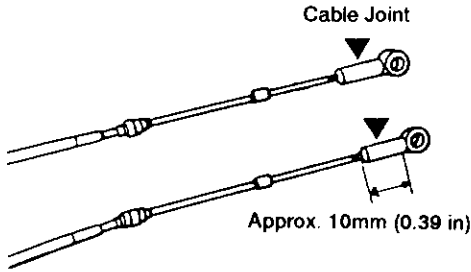
- ② Detach the bracket and set Cable Harness B and Remote Control Cables. Having fixed the Remote Control Cables to the bracket, tie them to the lower engine cover.



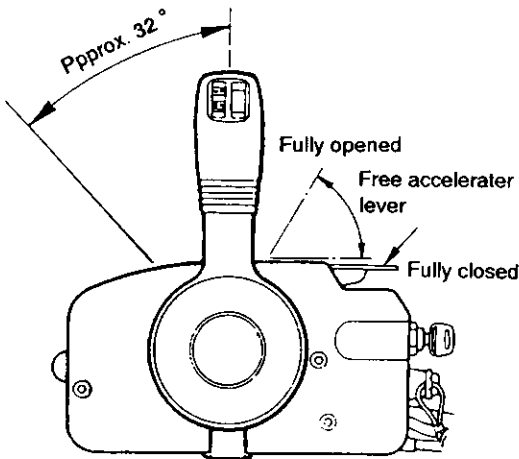
- ③ Detach the throttle and shift cable joints by removing the R-shaped pins.



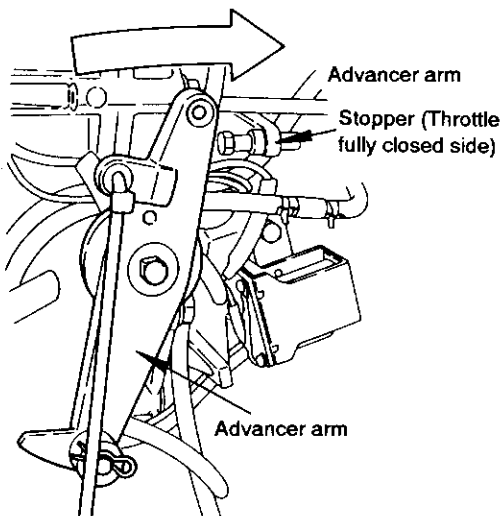
- Thread at least 15mm (0.59 in.) of the Remote Control Cables through the terminal eyes. Securely lock the terminal eyes with lock nuts.



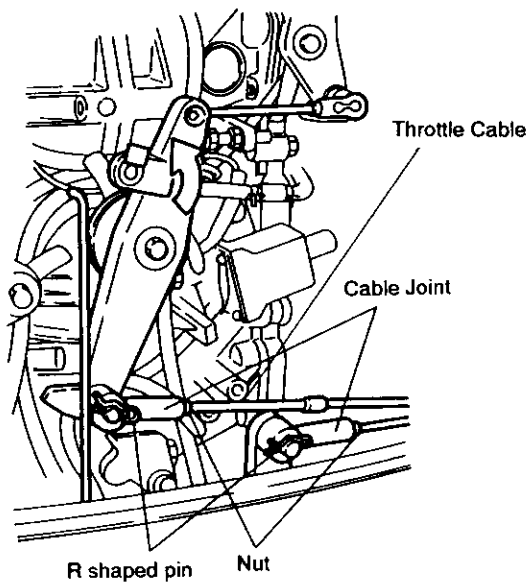
- ④ Move the Remote Control lever Forward, to Neutral and to Reverse to confirm the shift is working, and then set the lever to Neutral.
- Double-check that the Remote Control Cables, the throttle cable and shift cable have been connected correctly. Move the Remote Control Lever Forward until the first engaging point (approx. 32°). The cable which is moved the first when the lever is turned, is a shift cable. Check that the shift lever is in Neutral and the free accelerator lever is fully closed when the remote control cables have been connected.



- The advancer arm on the engine should have contact with the stopper of the carburetor throttle valve to enable it to be fully closed.

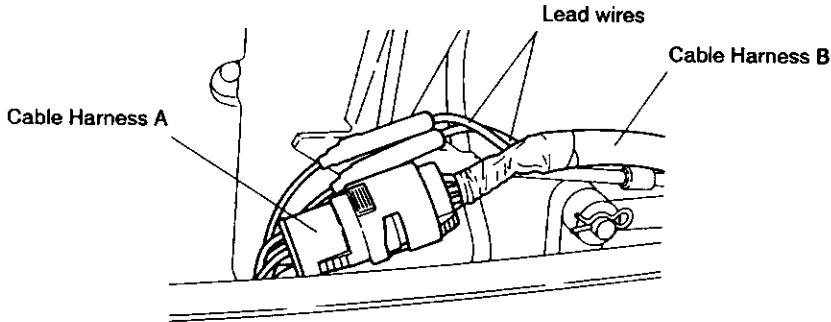


- ⑤ Adjust cable joint until the hole meets with the Advancer Arm pin. After adjustment, lock a cable joint with a nut and secure with R-shaped pin.



4 Connecting Cords and Cable

- ① Connect cable harness B to cable harness A.
- ② Connect pink and light blue leads from cable harness A and B to each other.

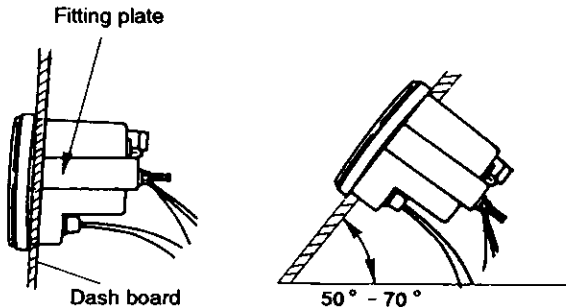


▲ CAUTION

Do not disconnect the electric couplers while the engine is running, as this will damage the C.D. unit and could result in a serious electric shock.

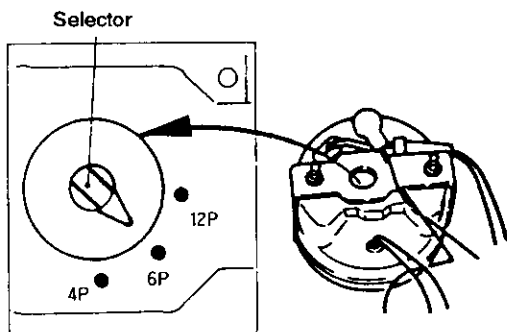
5 Installing the meters

Install the meters securely in the dashboard where they can be easily read and are not exposed to water splashes. The recommended dashboard thickness is 2~11mm (0.08 ~ 0.4 in.). For dashboards thicker than 11mm (0.4 in.), the fitting plate should be cut accordingly. Be sure to tighten the fitting nuts on the fitting plate evenly.

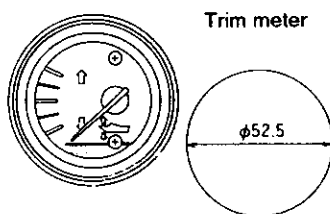
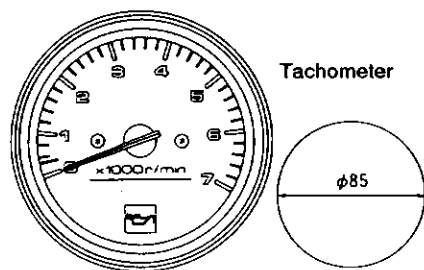


The dashboard inclination should be $50^{\circ} \sim 70^{\circ}$.

All models of the 40D₂ and 50D₂ series have six electric poles. Set the tachometer selector knob to "6P".



Cut holes with 85mm (3.346 in.) diameter for the tachometer and 52.5mm (2.067 in.) for the trim meter.



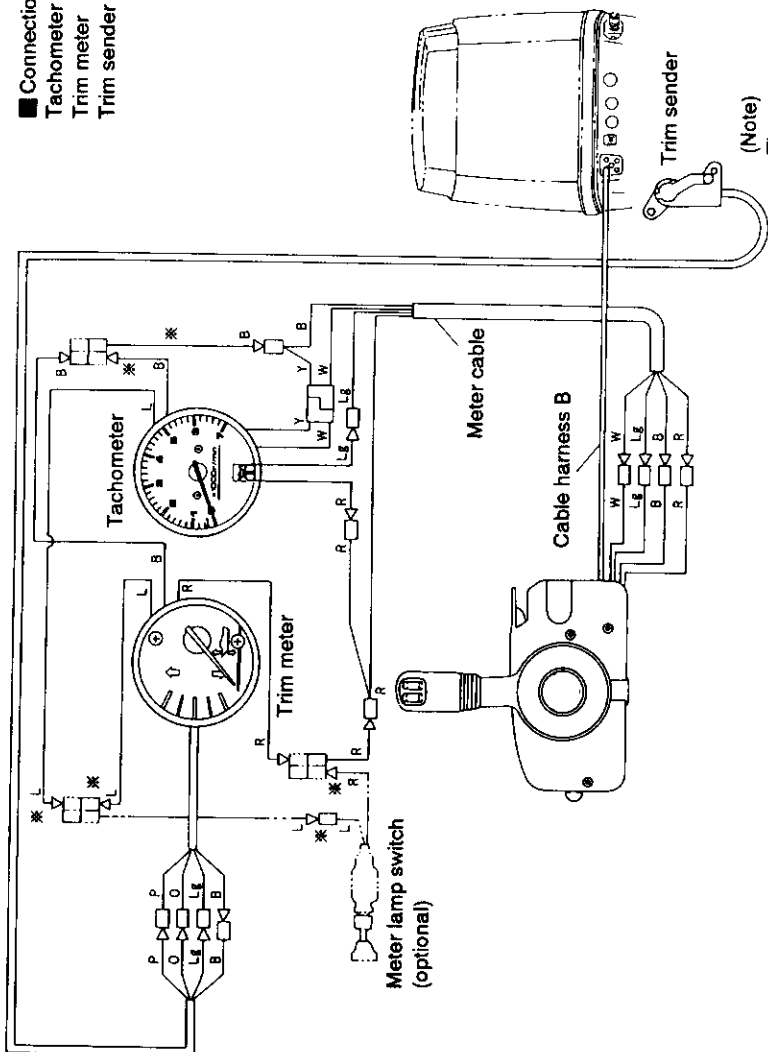
■ Connection of leads

Tachometer : EPO • EPTO

Trim meter : EPTO

Trim sender : EPTO

Color Code
 B : black
 L : blue
 Lg : light green
 O : orange
 P : pink
 R : red
 Sb : sky blue
 W : white
 Y : yellow



(Note)

The parts of ※ mark is to be wired when a Meter Lamp Switch (optional) is fixed.

6 Installing the Drag Link Assembly

Incorrect or unstable installation of the Drag Link Assembly can result in accidents while riding the boat or breakage of the hull.

Installation of the Drag Link Assembly by your dealer is highly recommended.

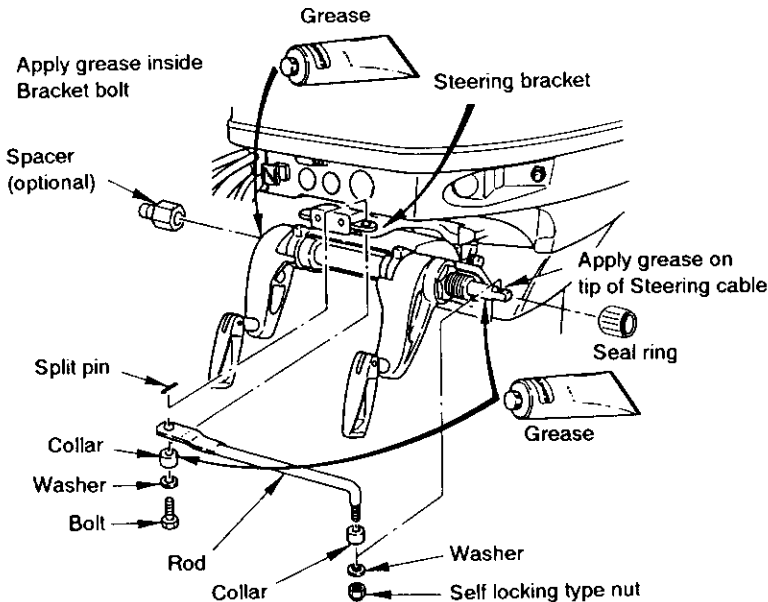
Note:

Depending on the steering cable manufacturer, spacers (optional) may be required.

- ① Connect the Drag Link Rod to the tip of the steering cable. Tighten the rod using self-locking nut, making sure the rod can swing freely.
- ② Connect the other tip of the rod to the steering bracket with a bolt, applying a collar and washer. The bolt head must face downward. Secure with a split pin to the bolt.

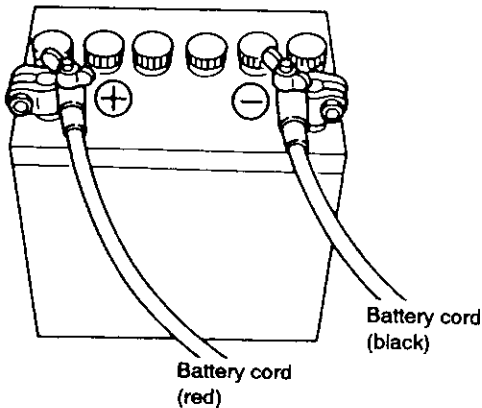
Note:

Apply grease in required places.
Apply grease inside the bracketed bolt.



7 Battery

- ① Keep the battery in the designated battery space of the boat, Secure it tightly and make sure it cannot be reached by water.
- ② Connect the positive (+) cable connector (with red tube) to the positive (+) terminal first. Then connect the negative (-) cable connector to the negative (-) terminal. When disconnecting the battery, always disconnect the negative (-) cable first.
- ③ A 12V battery with a recommended capacity of 70 AH or over is recommended.



Notes:

1. Battery cables should be of sufficient length to allow free movement of the engine.
2. Keep battery cables in a tidy arrangement, and protect them from damage (from steering, etc.)
3. The engine will not start if cable connectors are loosely connected.
4. The battery charging system will be damaged if the polarity (+ and -) is reversed.
5. Be sure the battery is fully charged prior to starting the engine.

▲ WARNING

- 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.

5. FUEL & ENGINE OIL

Fuel

Notes:

Gasoline

Unleaded regular gasoline is highly recommended for Outboard motors.

Gasoline should be a minimum pump posted octane rating of 87 (91 by research octane rating).

Gasoline containing alcohole, 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 capacity- - 25 liters (6.6 U.S. gal)

Engine oil - - - - - Use a genuine engine oil or recommended one (TCW3).

Will not recommend use of other two stroke engine oil.

Fuel Tank

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

▲ DANGER

Gasoline vapors are present, an errant spark could cause an explosion or fire.

- Do not smoke near gasoline.
- Do not overfill gasoline.
If any gasoline is spilt, wipe it up immediately.
- Stop the engine before fill gasoline into the fuel tank.

▲ CAUTION

DO NOT mix different brands of oil.

Mixing different brand of oil, or different type of oil even if the brand is the same, may cause gelling, resulting in possible filter screen blockage. This could result in serious engine damage because of impaired lubrication performance.

1 Non Auto-mixing Model F • EF

Add engine oil into fuel oil tank. The mixing ratio with gasoline is 1 : 50 (one part oil and 50 parts gasoline). Mix well by hand. The mixing ratio during break-in running is 1 : 25.

Mixing Ratio

	Engine Oil	:	Gasoline
During break-in	1	:	25
After break-in	1	:	50

2 Auto-mixing Model EFO • EFTO • EPO • EPTO

The required amount of engine oil is automatically supplied from the oil tank, through the oil pump, according to the engine running conditions. Gasoline is fed over a separate feeding line.

▲ CAUTION

During break-in of the engine, engine oil must be added to the fuel gasoline in addition to the oil which is automatically supplied from the oil tank.

Mixing Ratio (during break-in on auto-mixing models)

	Engine Oil	:	Gasoline
During break-in	1	:	50
After break-in	Automatic. Fill up engine oil tank regularly		

① Alarm for Low Engine Oil Level

If the level in the oil tank falls below 0.4 liters (0.105 U.S. gal.) the Low Engine Oil alarm will be triggered.

The engine oil tank capacity is 2 liters (0.53 U.S. gal.)

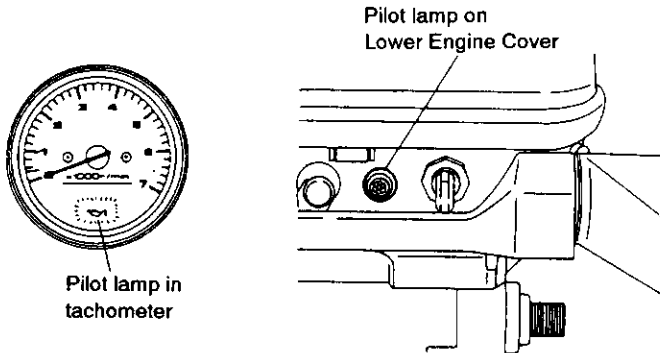
EPO • EPTO

The pilot lamp in the tachometer lights and the buzzer in the Remote Control Box sounds if the engine oil level falls below 0.4 liters (0.105 U.S. gal.)

EFO • EFTO

The pilot lamp on the front portion of the lower engine cover lights if the engine oil level falls below 0.4 liters (0.105 U.S. gal.)

When, the buzzer mounted on engine starts to sound.



Resetting the low oil level alarm

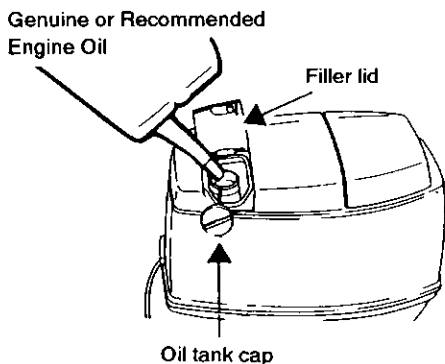
Reduce engine speed to trolling rpm and steer towards a safe area with calm water. Set the Remote Control Lever to Neutral (buzzer will stop).

Turn off the ignition switch, and fill up the oil tank with recommended engine oil.

Start the engine, and move the Remote Control Lever Forward carefully. Confirm that the indicator lamp goes out and the buzzer does not sound.

Replenishing oil in the engine oil tank.

1. Open the filler lid of the upper engine cover.
2. Remove the oil tank cap.
3. Fill up the tank with Genuine Engine Oil or recommended oil.



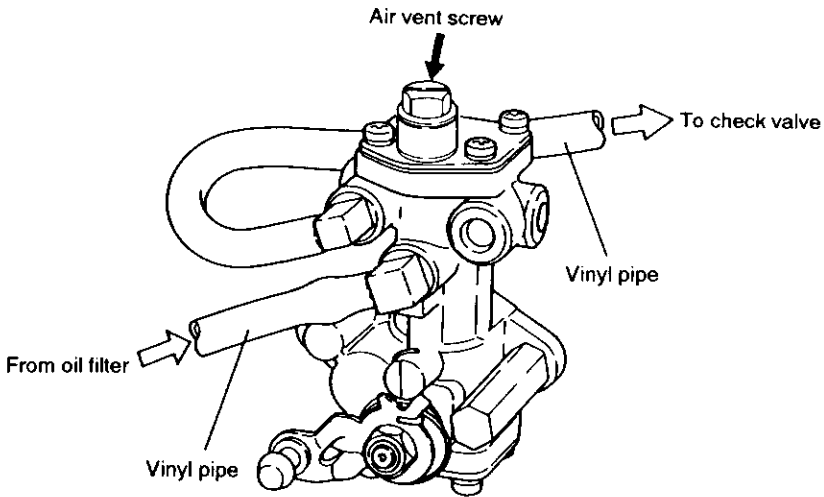
▲ CAUTION

1. In the unlikely event that gasoline by mistake is filled into the oil tank, drain the oil tank completely, and consult an authorized service shop for advice
2. Check the amount of oil in the oil tank visually before starting the engine. Running out of oil at sea is a cause for potential disaster.

② Oil pump air vent

Visually check whether there is air in the oil through the vinyl pipe connecting the oil tank with the oil pump. If present, purge the air as follows:

- Loosen the air vent screw on the oil pump to purge the air, and tighten it when all air, as seen through the vinyl pipe on the oil pump side, has been purged.



Note:

Wipe off any spilled oil with a rag, and dispose of it.

6. RUNNING

1 Break-in - - - - -10 hours

The most critical time in the life of your engine is the first 10 hours of operation. Correct operation during this break-in period will prolong the life of the engine and ensure optimum performance. Follow the procedures shown below carefully.

Time	Break-in method	Running Conditions
0 min -	Trolling or idling speed	Cruising at minimum speed
10 min -	Throttle opening < 1/2 about 3,000 rpm	-
1 hr -	Throttle opening < 3/4 about 4,000 rpm	Run with full throttle for 1min-10 min.
2 hrs -	Throttle opening 3/4 about 4,000 rpm	Run with full throttle for short time
10 hs -	Normal running	-

▲ CAUTION

- ① Severe engine damage may be caused if the break-in procedures described above are not observed.
- ② Change new gear oil after 10 hours break-in.

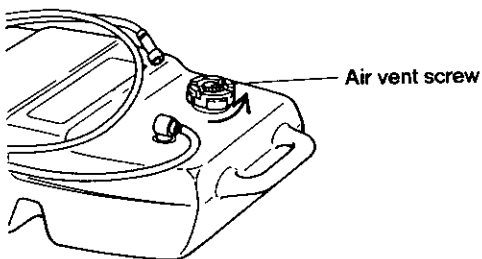
2 Starting

▲ CAUTION

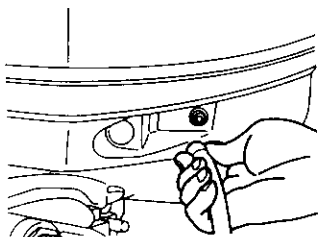
NEVER fill up portable fuel tanks on board to avoid fire or explosion resulting from spilled gasoline. If gasoline is ever spilled on board, wipe it up thoroughly. Fuel tanks must always be filled up on land.

① Preparations

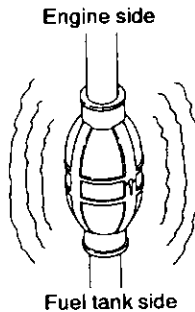
- (1) Loosen the air vent screw on the fuel tank cap.



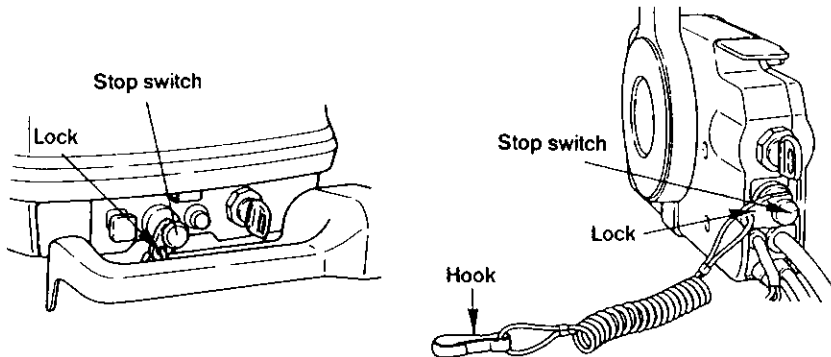
- (2) Connect the fuel connector to the engine.



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



(4) Install a lock in a stop switch.



▲ CAUTION

Be sure to connect the emergency stop line to your wrist. The engine is shut down if the stop line switch is disconnected. This is a safety measure, designed to protect the driver is thrown overboard.

▲ CAUTION

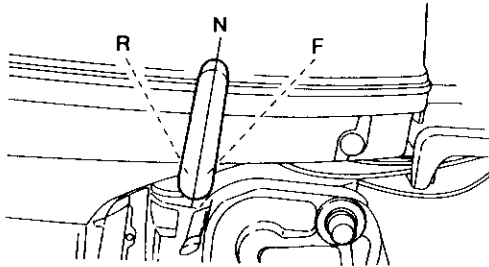
Do not drive engine without ample supply of cooling water.
If the cooling water supply is insufficient, cylinder wall scratch and damage of water pump impeller are likely.

②-1. Starting F

A. Set the shift lever to Neutral

Note:

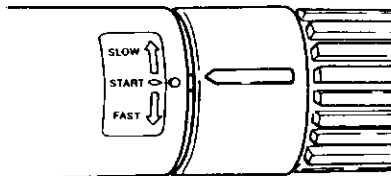
Be sure that the shift is at neutral when starting the engine.
This model is provided with start in-gear protection.



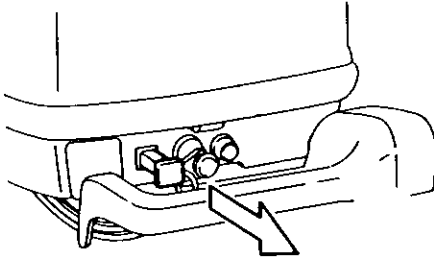
▲ CAUTION

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

B. Turn the throttle grip so that the indicator line meets the "START" mark.



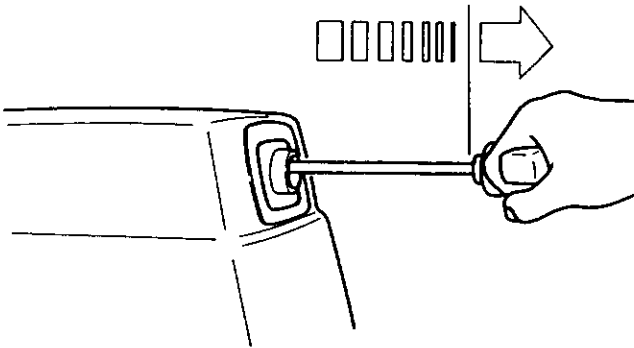
C. Pull the choke knob fully.



Note:

Operation of the choke knob is not required if the engine is warm.

D. Pull the starter rope slowly until resistance is met.
Give it a sharp tug to start the engine.



E. Turn the handle grip to its original position gradually once the engine has started.

F. Push back the choke knob slowly.

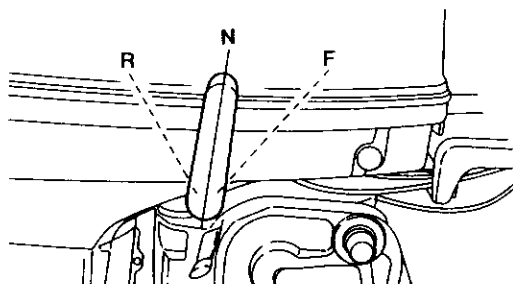
G. Carefully turn the throttle grip to "SLOW".

②-2. Starting EF • EFO • EFTO

A. Set the shift lever to Neutral

Note:

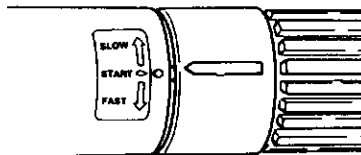
Be sure that the shift is at neutral when starting the engine.
This model is provided with start in-gear protection.



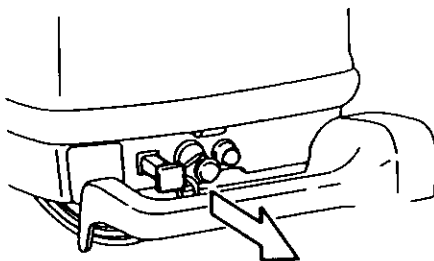
▲ CAUTION

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

B. Turn the throttle grip so that the indicator line meet the "START" mark.



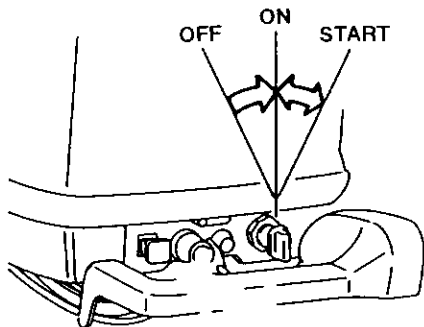
C. Pull the choke knob fully.



Note:

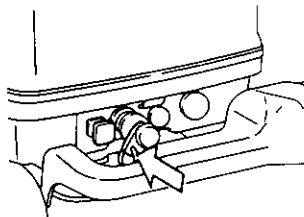
Operation of the choke knob is not required if the engine is warm.

- D. Turn the main switch key to ON, and further clockwise turning makes the electric starter working.

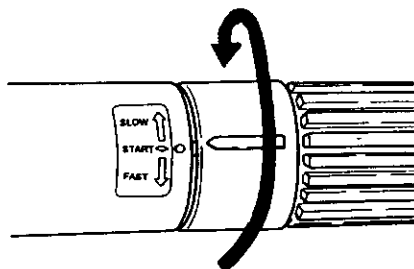


- E. Release the main switch key as soon as the engine starts. The key will return to the "ON" position automatically.

- F. Push back the choke knob slowly.



- G. Gradually turn the throttle grip to "SLOW".



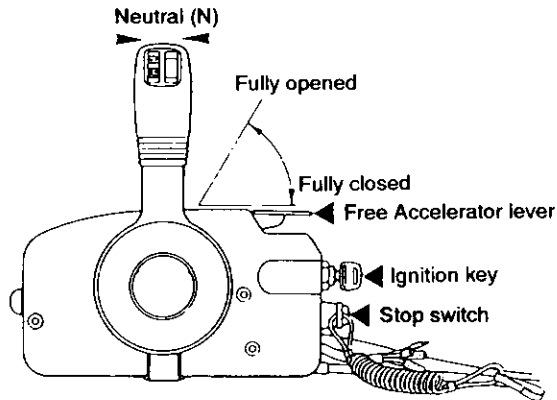
Notes:

"Important"

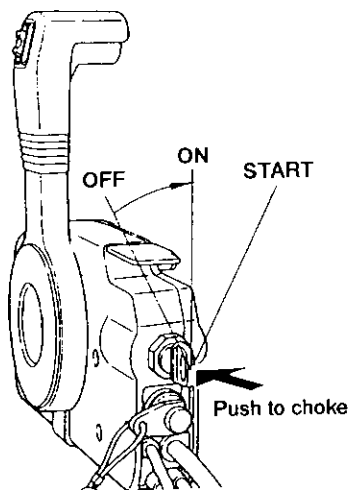
1. Extended operation of the starter motor will run the battery down. Operate the starter motor for maximum 5 seconds. If the engine does not start, wait for 10 seconds before operating the starter motor again.
2. NEVER operate the starter motor once the engine has started.
3. If the starter motor won't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

②-3. Starting **EPO • EPTO**

- (1) Insert the key into the ignition.
- (2) Set the Remote Control lever to Neutral (N), and move the accelerator lever to Open.



- (3) Turn the main switch key to ON, and push on it for choke operation.
(The key need not be pushed if the engine is warm.)



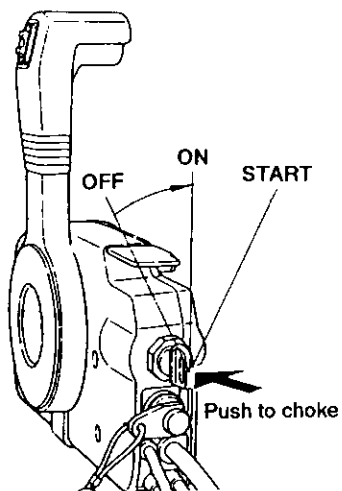
Note:

The free accelerator lever is inoperative unless the Remote Control lever is set to Neutral.

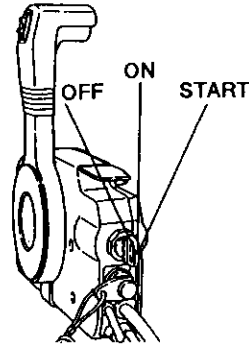
- (4) While keeping the key pressed, turn it to START.

Note:

If the engine is warm, there is no need to press the key for choking when turning it to START.



- (5) When the engine starts, release the key and allow it to return to ON.



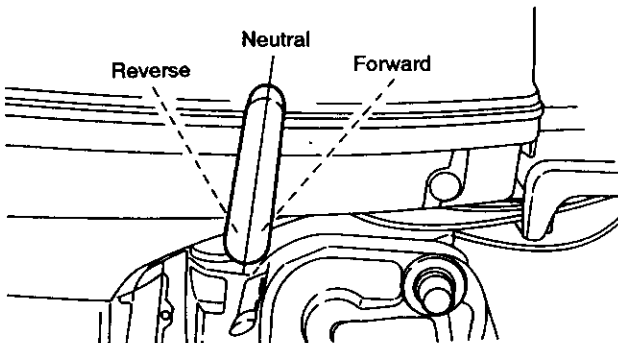
Notes:

"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.

3 Manual Rope Start - - - in case of trouble with the Recoll Starter or the Electric Starter Motor

- (1) Set the Shift Lever or the Remote Control Lever to Neutral.



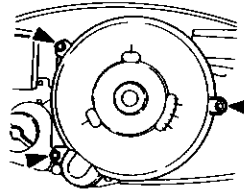
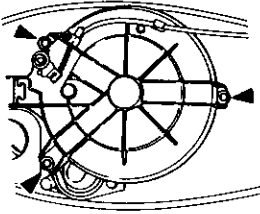
(2) Remove the Upper Engine Cover. Then,

● take off the Recoil
Starter Assembly

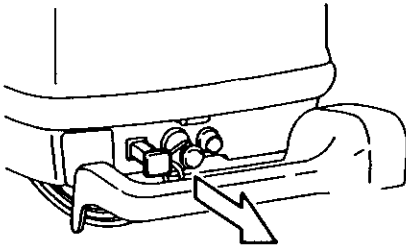
F • EF • EFO • EFTO

● take off the Flywheel Cover

EPO • EPTO

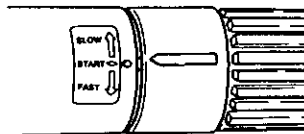


(3) Pull the choke knob

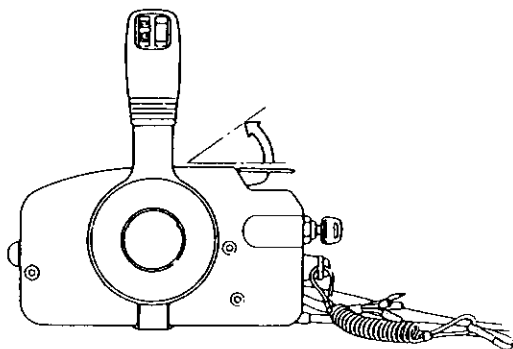


(4)-1 Turn the throttle grip so that the indicator line meets the "START" mark.

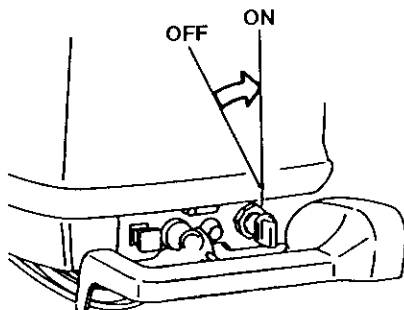
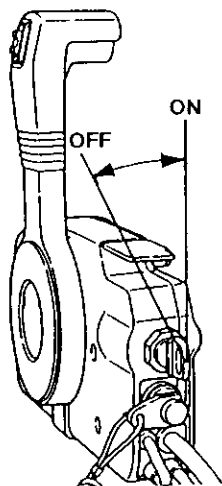
F • EF • EFO • EFTO



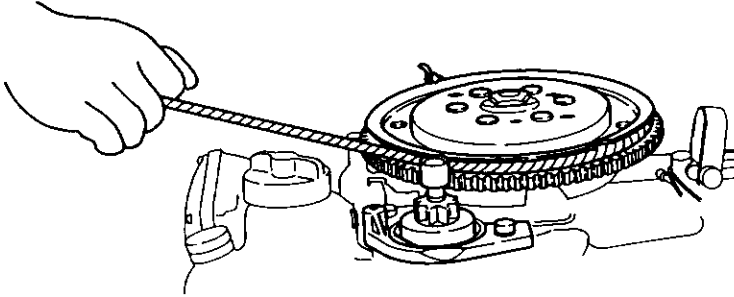
-
- (4)-2 Lift up the free accelerator lever $\frac{1}{3}$ to $\frac{1}{2}$ of its stroke.
EPO • EPTO



- (5) Turn the main switch key to "ON".
EPO • EPTO EF • EFO • EFTO



-
- (5) Wind the starter rope around the flywheel a few turns. Give it a sharp tug to start the engine. Use a socket wrench or similar to get a firm grip on the end of the rope.



▲ CAUTION

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

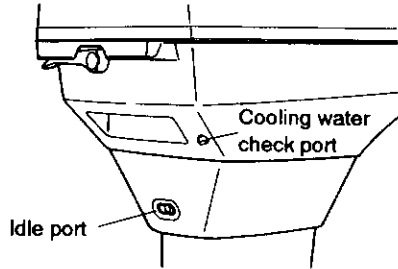
To prevent your clothes and other items from getting caught in the engine, do not install the flywheel cover nor the Upper Engine Cover after the engine is started with the starter rope. In this case be sure nobody sits in the vicinity of the engine, and run carefully. Immediately contact your dealer when reaching shore.

4 Warm-up

Before driving the boat, let the engine run at low speed for approximately three minutes to let it warm and allow the oil to circulate through the machine. If the engine is not warmed up beforehand, the engine life will shorten greatly. During the warm-up operation, confirm that cooling water is discharged from the check port and idle port.

▲ CAUTION

If cooling water is not discharged and engine operation is continued, the engine will overheat and damage occur.



- Engine speed
Proper idle speed after warm-up operation

Clutch engaged	Clutch disengaged
750 rpm	900 rpm

Do not exceed the full-throttle engine speed

Full-throttle engine speed
40D ₂ 5000~5700 rpm, 50D ₂ 5150~5850 rpm

5 Overheat buzzer and sensor

Standard equipment --

EF • EFO • EFTO • EPO • EPTO

The overheat buzzer will sound if the engine temperature exceeds the preset level. The engine speed will drop automatically.

If the buzzer sounds, indicating overheating, immediately move the Remote Control Lever to Neutral. Confirm that cooling water is discharged from the check port, and then stop the engine. Turn the main switch key OFF.

Remove dirt and other foreign matter clogging the water inlets on the gear case.

Note:

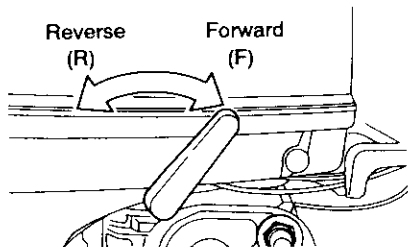
If the buzzer sounds frequently after restarting the engine, please contact your service shop.

7. OPERATION

1 Forward/Reverse Running

(1) F • EF • EFO • EFTO

Turn the throttle grip toward "SLOW" and move the Shift Lever quickly to Forward or Reverse when the engine speed has reached the lowest rpm.

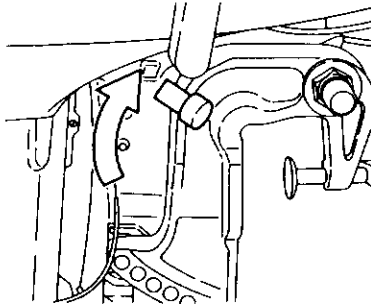


▲ CAUTION

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

▲ CAUTION

1. The engine must be at idling speed when the shift Lever is moved from Forward to Reverse.
2. Before moving the Shift Lever to Reverse, make sure the Reverse Lock is engaged (in up position).

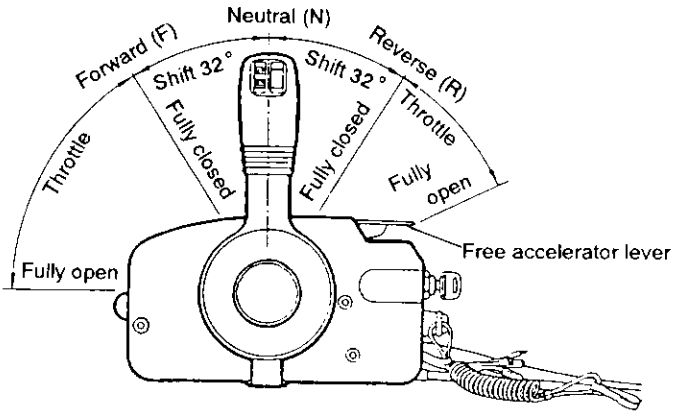


F • EF • EFO • EFTO

3. Do not increase the engine speed unnecessarily while reversing. To limit half throttle at max. is recommended when running to reverse.
4. The Shift Lever cannot be turned from Neutral to Reverse unless the throttle grip has been turned fully toward "SLOW".

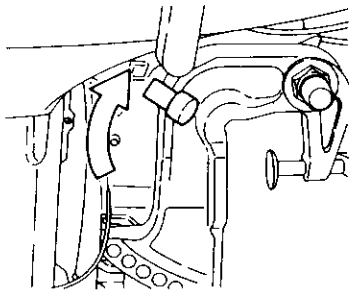
(2) EPO • EPTO

While pressing the lock button on the Remote Control lever upward, swiftly move the Lever to Forward (F) or Reverse (R) to the engaging point (approx. 32° forward or backward from Neutral). If the lever is moved further forward or backward, the throttle will open.



▲ CAUTION

1. The engine must be at idling speed when the Shift Lever is moved from Forward to Reverse.
2. Before moving the Shift Lever to Reverse, make sure the Reverse Lock is engaged (in up position).



EPO • EPTO

3. Do not increase the engine speed unnecessarily while reversing. (The throttle opening is limited to $\frac{1}{2}$ while reversing.)

Note:

The Remote Control Lever becomes inoperative unless the free accelerator lever is in the fully closed position.

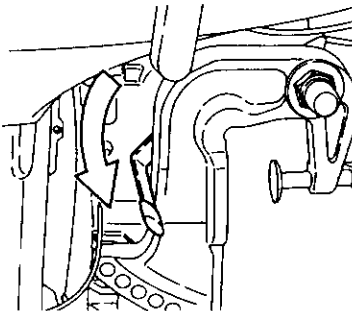
2 Shallow water running

▲ CAUTION

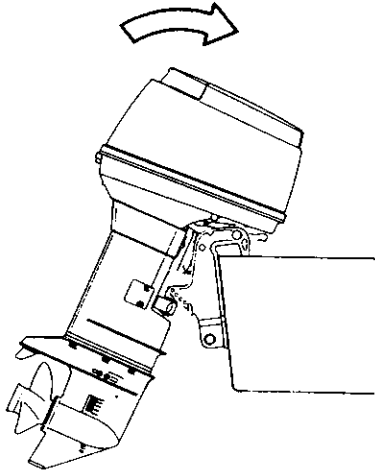
- When in shallow water running, take care that the water strainer is submerged at all times and that water is continuously running out of the cooling water check port.
- Be sure to run slowly when using the shallow water drive. Running at higher speeds will result in lack of control and may cause damage 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.

(1) F • EF • EFO • EPO

- ① Set the Reverse Lock Lever provided on the starboard side to "Release" by turning it downward.



-
- ② Tilt the engine up approx. 45° and lower it. The engine will now be set to the shallow water setting.



- ③ Releasing the shallow water setting
- Turn the Reverse Lock Lever upward to set them in "LOCK" position.
 - Tilt up the engine slightly and then let it go down. The shallow water setting is then released.
 - The engine is released from shallow water setting, and be locked at normal running position.
- (2) EFTO • EPTO
Tilt up the engine using the Power Trim & Tilt system.

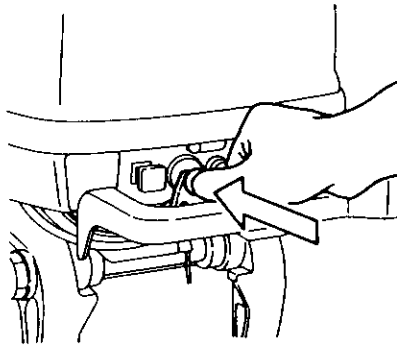
3 Stopping the engine

▲ CAUTION

NEVER stop the engine immediately after a full throttle run. Keep it running for two or three minutes at idling speed (Shift Lever set to Neutral) to allow it to cool down.

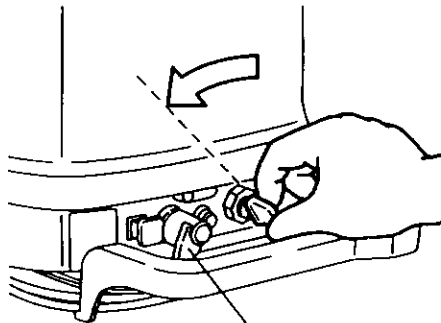
(1) F

- ① Reduce the engine speed to idling rpm.
- ② Keep pressing on the Stop Switch or pull out the lock plate. The engine will then stop.



(2) EF • EFO • EFTO

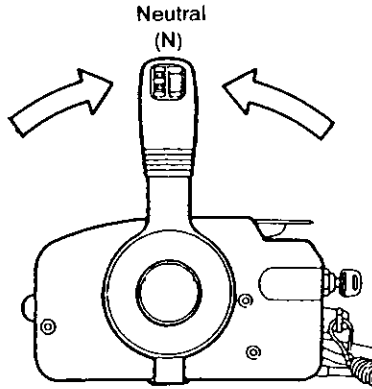
- ① Reduce the engine speed to idling rpm.
- ② Turn the Main Switch to "OFF", keep pressing on the stop Switch or pull out the lock plate. The engine will then stop.



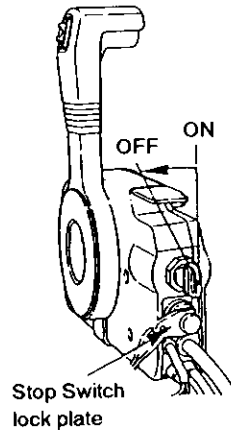
Stop Switch
lock plate

(3) EPO • EPTO

- ① Move the Remote Control lever to Neutral and let the engine idle for 2 - 3 minutes to allow it to cool down.



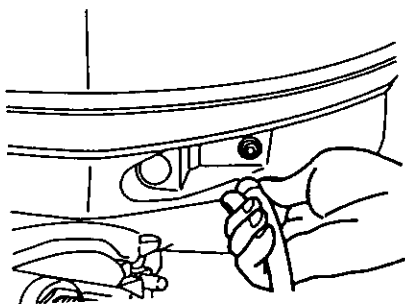
- ② Turn the main switch key counter-clockwise or pull out the stop switch. The engine stops.
The engine can also be stopped by pressing on the stop switch.



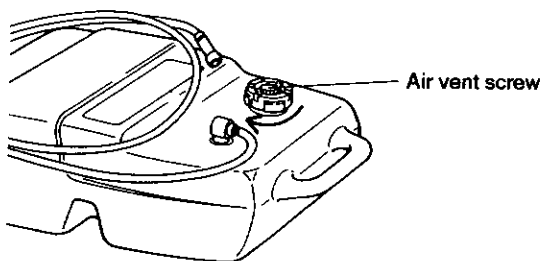
Notes:

1. When the engine stopped, close the air vent screw on the fuel tank.
2. Disconnect the fuel connector from the engine.
3. Disconnect the cables from the battery if the engine will not be used for an extended period of time.

-
- ③ Disconnect the fuel connector from the engine.



- ④ Close the air vent screw on the fuel tank cap.
Resin tank



8. TRIM ADJUSTMENT

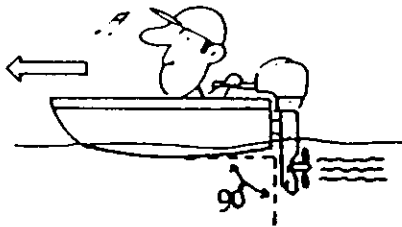
The following instructions explain how to set the best trim angle of the boat.

1 F • EF • EFO • EPO

The trim angle is adjusted by setting the thrust rod in the correct thrust rod hole.

■ Proper Trim Angle

The trim angle is optimum when the boat is parallel to the water surface while running.



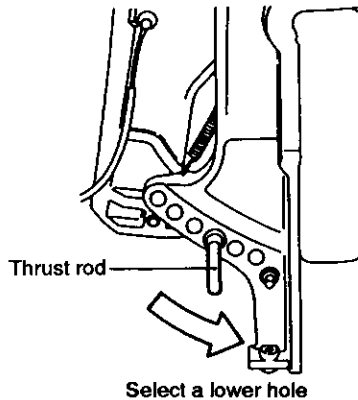
■ Improper Trim Angle (bow rises too high)

If the trim angle is excessive, the bow will rise out of the water and the speed will decrease.

Furthermore, the bow may sway or the bottom may slam the water while cruising.



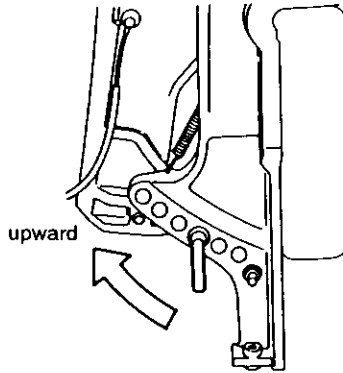
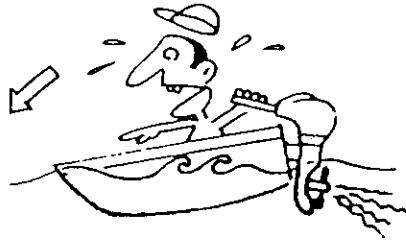
In this case, decrease the trim angle by setting the thrust rod in a lower hole.



■ Improper Trim Angle (bow dips into the water)

If the trim angle is too small, the bow will dip into water, the speed will decrease, and water may enter the boat.

In this case, the trim angle should be increased by setting the thrust rod in a higher hole.



Select a higher hole

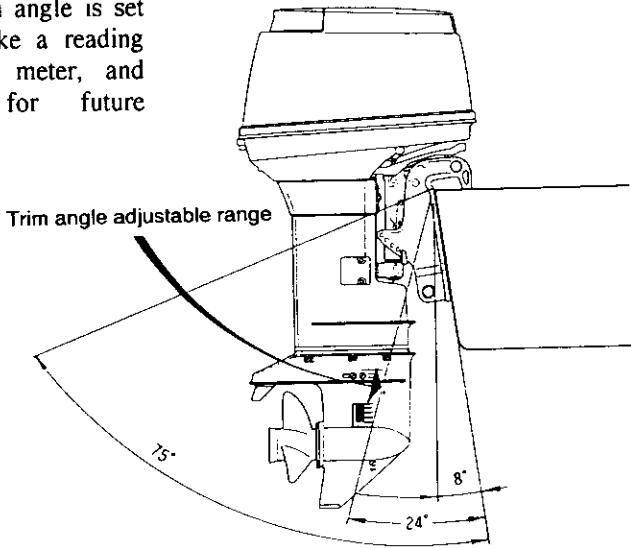
2 EFTO • EPTO

The provided Power Trim & Tilt can be adjusted to set the desired trim angle of the engine in relation to the transom shape, planning speeds and load. It is imperative that the trim angle is adjusted correctly. Incorrect adjustment will cause the boat to sway, deteriorate engine performance and may cause unsafe steering conditions.

⚠ CAUTION

The Power Trim & Tilt can be set to any trim angle, however, avoid cruising with the engine tilted in the tilt range. Operating the boat in this manner, the engine may suck air into the water cooling system, resulting in engine overheating.

- How to use the trim meter:
When the trim angle is set as desired, take a reading off the trim meter, and record it for future reference.

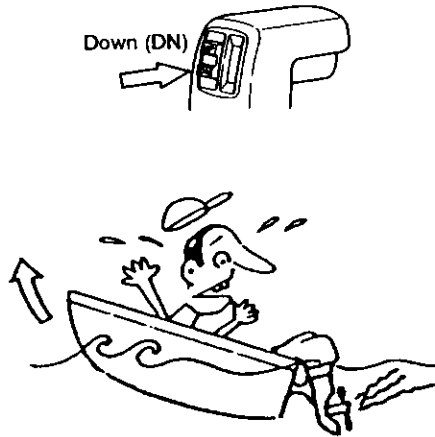


- Improper Trim Angle (bow rises too high)

If the trim angle is excessive, the bow will rise out of the water and the speed will decrease.

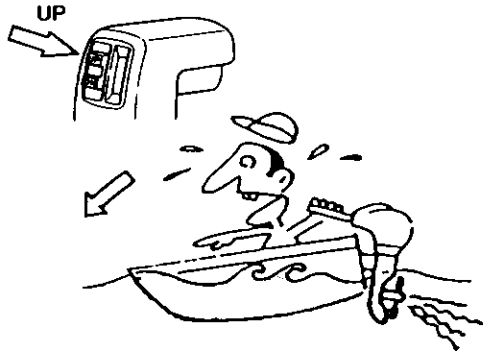
Furthermore, the bow may sway or the bottom may slam the water while cruising.

In this case, decrease the trim angle by flicking the switch on the Remote Control Level to "DN".



■ Improper Trim Angle (bow dips into the water)

If the trim angle is too small, the bow will dip into the water, the speed will decrease, and water may enter the boat. In this case, the trim angle should be increased by flicking the switch on the Remote Control Lever to "UP".



■ Proper Trim Angle

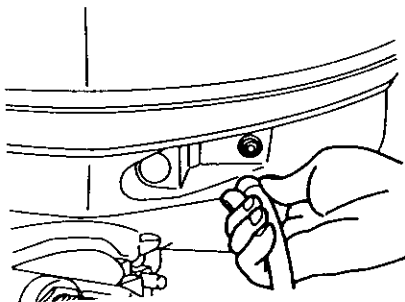
The trim angle is optimum when the boat is parallel to the water surface while running.

9. MOORING WITH THE ENGINE TILTED UP

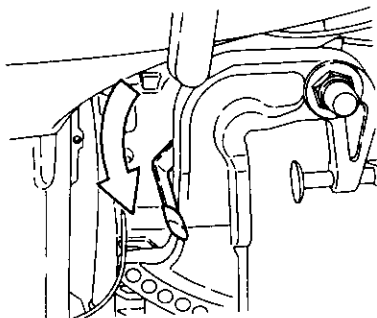
When the engine has been stopped and it will not be used for a long time or when mooring in shallow water, tilt the engine up to prevent damage on the propeller and gear case.

(1) F • EF • EFO • EPO

① Disconnect the fuel connector from the engine.



② Set the Reverse Lock Lever on the starboard side to "RELEASE" by turning it downward.



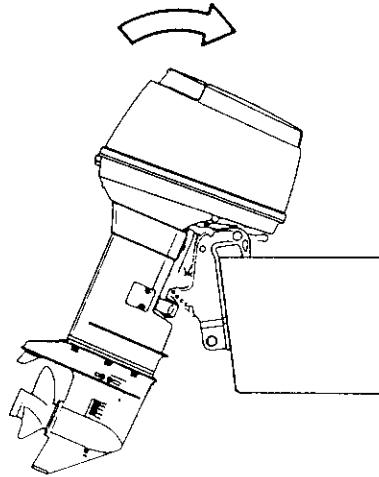
▲ WARNING

Tilt Up or Down

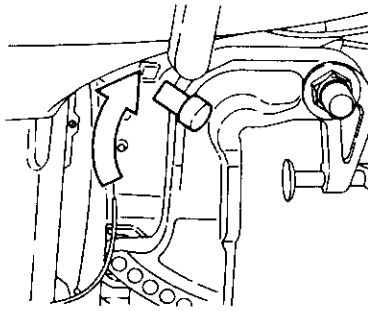
When tilting up or down, be sure that no finger or hand is placed in between the swivel bracket and stern bracket.

Be sure to tilt down the outboard slowly.

-
- ③ Tilt the engine up entirely. The tilt will lock in the raised position.

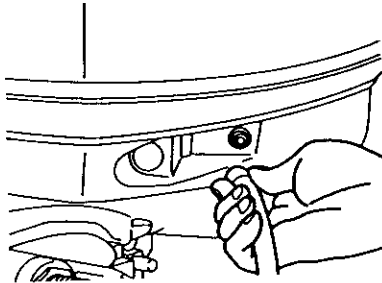


- ④ To tilt the engine down. Turn the Reverse Lock Lever upward (toward "LOCK"). Tilt the engine up slightly and then let it go down. (The Reverse Lock will be set automatically.)

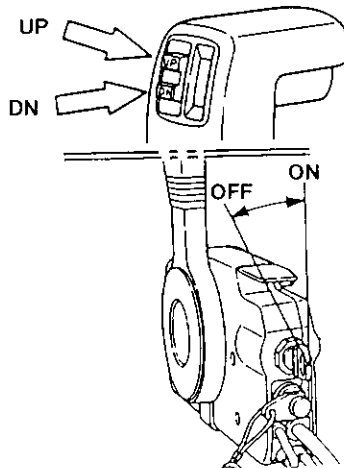


(2) EFTO • EPTO

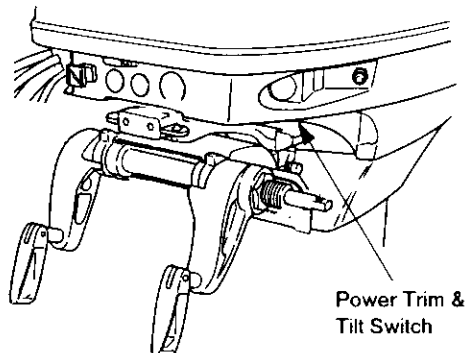
- ① Disconnect the fuel connector from the engine.



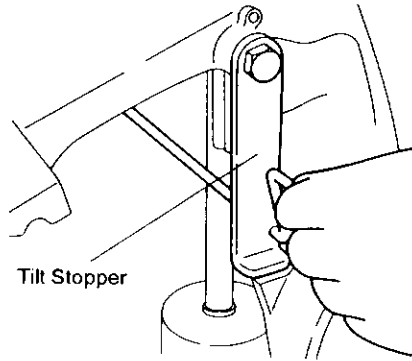
- ② Operate the Power Trim & Tilt switch on the Remote Control Lever and tilt the engine up. (The Main Switch must be "ON".)



- ③ The engine can also be tilted up using the switch provided under the Lower Engine Cover. (The Main Switch need not be turned "ON" in this case.)

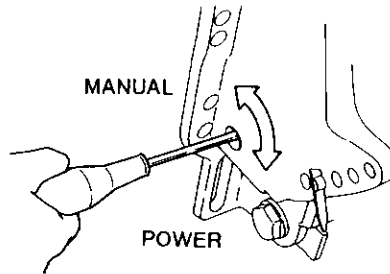


-
- ④ Lock the tilt with the Tilt stopper after the engine has been tilted up.



⑤ Manual tilting

If the battery is dead, and the Power Trim & Tilt Switch thus inoperative, turn the manual valve a few turns in the Manual direction. This will allow manual tilting of the engine.



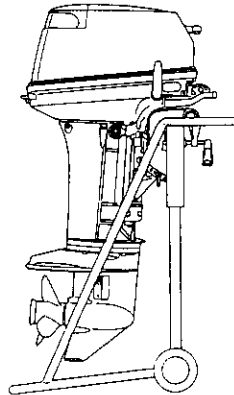
10. REMOVING AND CARRYING THE MOTOR

(1) Removing the motor

- ① Stop the engine.
- ② Disconnect the fuel connector, the remote control cable, the battery cords, bracket fixing bolts and nuts etc.
- ③ Remove the motor from the hull and completely drain the water from the gear case.

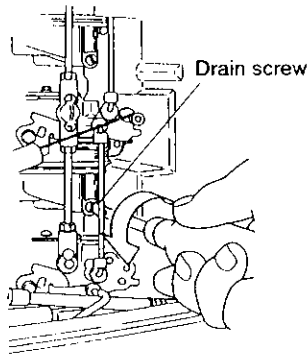
(2) Carrying the motor

Be sure to keep the engine vertical posture whenever you carry the motor.



NOTE:

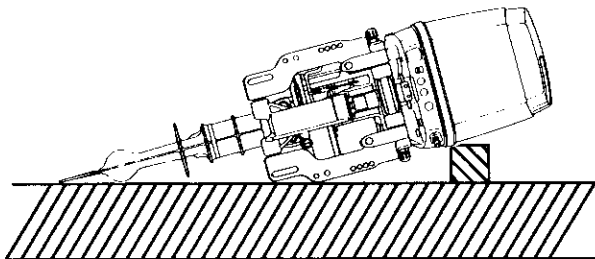
- If, do not carry the engine at upright position, loosen the drain screw on the carburetors to drain fuel from them.



▲ CAUTION

Beware of explosion danger. Spilled and vaped gasoline may easily catch fire and explode. Be sure to fully discharge gasoline from the carburetors when transporting the engine. Wipe off spilled gasoline with a rag.

- When carrying or putting the engine up for storage, make sure the side with the electric pump of the Power Trim and Tilt down otherwise air will enter the pump system for the Power Trim and Tilt operation.



(3) Storing the motor

Keep the motor vertical posture when you store it.

Note:

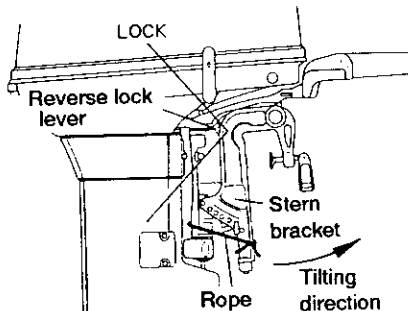
If you store the motor horizontal posture, lay the motor same as above figure.

EF/EFO/EPO Type

▲ WARNING

When taking out the motor from package or storing the motor taking out from the boat, never release the reverse lock lever. Otherwise it is dangerous since the stern bracket is not locked and up.

- * Do not touch or get caught the reverse lock lever with a hand or foot.
- * Fix the stern bracket with a rope.
- * Be careful not to let a child touch with the reverse lock lever.
- * Be careful to the tilting direction of the stern bracket to avoid a personal injury hitting the jumping outboard.

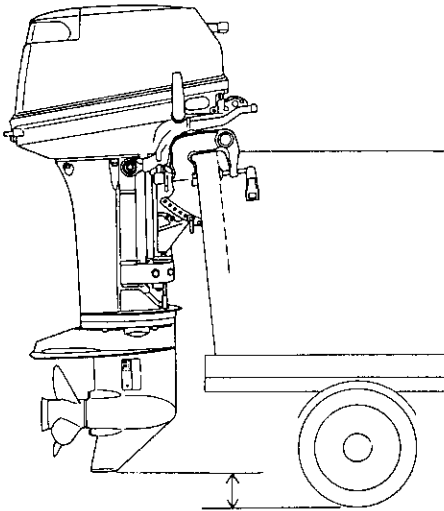


(4) Trailing

▲ CAUTION

When trailing the engine installing on a boat, the motor should be in a running position fully tilting down. Trailing at tilted up condition of the motor may cause of damage to the motor, boat, etc. by unexpected tilt lock release getting a shock when trailing.

If trailing the motor at tilt down position is unavailable, fix the motor securely using a device (like a transom saver bar) at the tilting up position.



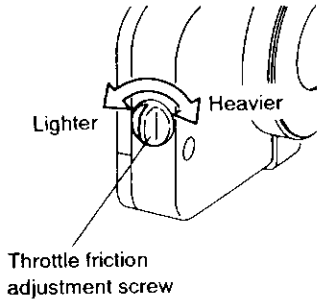
11. ADJUSTMENT

1 Remote Control Lever Load

EPO • EPTO

(Throttle friction adjustment screw)

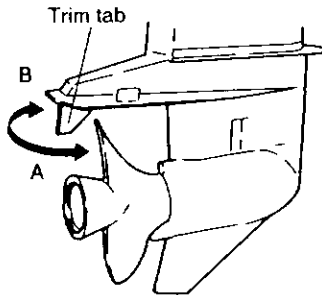
To adjust the load of the Remote Control Lever, turn the throttle friction adjustment screw on the front of the Remote Control Box. Turn clockwise to increase the load and counter-clockwise to decrease it.



2 Trim Tab Adjustment

If straight-line cruising can not be achieved, adjust the trim tab located under the anti-ventilation plate.

- If the boat veers toward the right, direct the trim tab towards A.
- If the boat veers toward the left, direct the trim tab towards B.



Notes:

1. The trim tab also acts as an anode to prevent electrolytic corrosion. Thus do not paint or grease this part.
2. 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 over time wear down.

3 Steering Load Adjustment

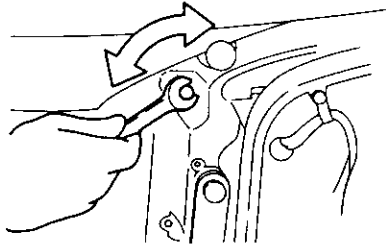
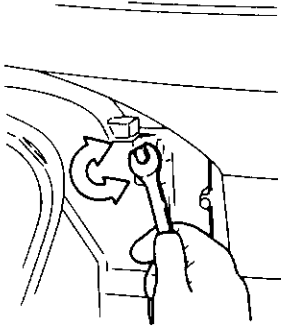
Steering load can be adjusted by turning the steering adjust bolt on the Swivel Bracket.

Turn clockwise to increase the load

Turn counter-clockwise to decrease the load

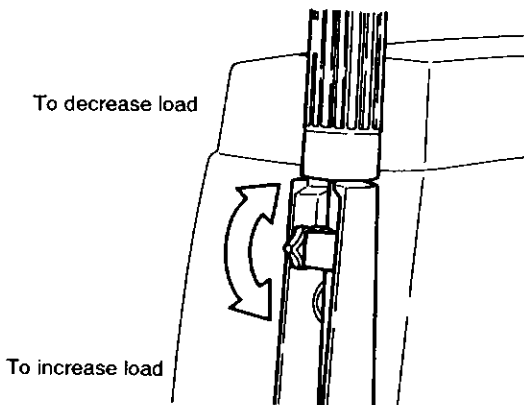
F • EF • EFO • EPO

EFTO • EPTO



4 Throttle Grip Turning Load Adjustment

Turn the friction adjustment screw on the steering handle to adjust the turning load of the throttle grip.



12. INSPECTION AND MAINTENANCE

Care of your outboard motor

To keep your motor in the best operating condition, it is very important that you perform daily, and periodic, maintenance as suggested in the maintenance schedules that follow.

▲ CAUTION

- Your personal safety and that of your passengers depends on how well you maintain your outboard motor. Carefully observe all of the inspection and maintenance procedures described in this section.
- The maintenance intervals shown in the checklist apply to an outboard motor in normal use. If you use your outboard motor under severe conditions such as frequent full-throttle operation or frequent operation in brackish water, maintenance should be performed at shorter intervals. If in doubt, consult your dealer for advice.
- We strongly recommend that you use only genuine replacement parts on your outboard motor. Damage to your outboard arising from the use of other than genuine parts is not covered under the warranty.

EPA Emissions Regulations

EPA (United States Environmental Protection Agency) has emission regulations and is controlling air pollution from new outboard motors. All new motors manufactured by us are certified to EPA as conforming to the requirements of the regulations. This certification is depend upon factory standards. Therefore, factory specifications must be followed when servicing emission related controls, or making adjustments.

Maintenance, replacement, or repair of the emission control devices and systems may be performed by any marine SI (Spark Ignition) engine repair establishment or individual.

1 Daily Inspection Checklist

Perform the following checks and inspection before and after use.

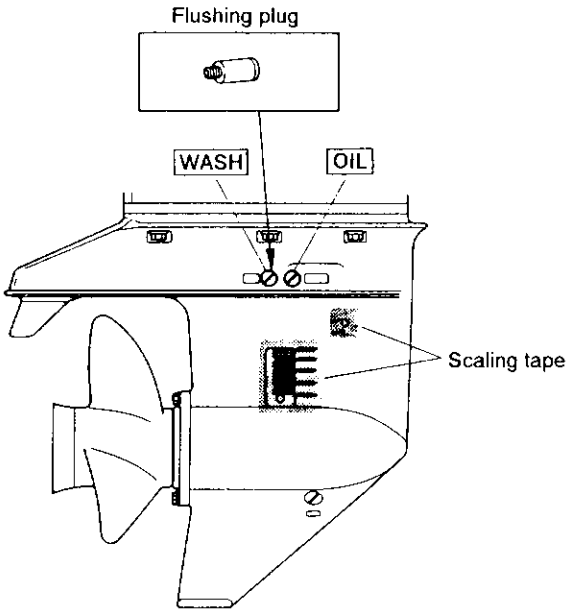
Item	Points to Check	Action
Fuel System	<ul style="list-style-type: none"> ● Check the amount of fuel in the tank. ● Check for dust or water in the fuel filter. ● Check rubber pipes for oil leakage 	Replenish Clean Replace
Lubrication System	<ul style="list-style-type: none"> ● Check the amount of engine oil in the oil tank. ● Check for dust or water in the oil filter. 	Replenish Clean
Electrical Equipment	<ul style="list-style-type: none"> ● Check the spark plugs for dirt, wear and carbon built-up. Spark plugs 40D₂: NGK B-7HS-10/NGK BR- 7HS-10 or CHAMPION L-82C/RL-82C (1.0 mm gap) Spark plugs 50D₂: NGK B-8HS-10/NGK BR- 8HS-10 or CHAMPION L-78C/RL-78C (1.0 mm gap) ● Check if the main switch functions normally. ● Check if the battery electrolyte level and specific gravity are normal. ● Check for loose connections on battery terminal. ● Check if the emergency stop switch functions normally and make sure the lock plate is present. ● Check cords for loose connections and damage. 	Clean or replace Remedy or replace Replenish or recharge Retighten Remedy or replace Correct or replace
Throttle System	<ul style="list-style-type: none"> ● Check if 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

Item	Points to Check	Action
Clutch and Propeller System	<ul style="list-style-type: none"> ● Check if the clutch engages correctly when operating the Remote Control. ● Check the propeller for bent or damaged blades. ● Check if 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
Power Trim & Tilt	<ul style="list-style-type: none"> ● Check working of the tilt up and down of the motor. 	
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

■ Washing with fresh water

When the engine has been used in salt water or polluted water, wash the exterior and flush the cooling passage with fresh water using the flushing plug.

Screw the included flushing plug (hose adapter) into the wash hole on the gear case. Connect a water hose to the flushing plug and flush out with water. (Be sure to secure the water strainer and sub-water strainer on the gear case beforehand.)



▲ WARNING

To prevent rotation of the propeller, remove it before flushing the passage.

Wash the engine before long-term storage.

Run the engine at low speed with the Remote Control lever set to Neutral to flush out fresh water from the cooling system and in the process remove salt, mud and other foreign particles.

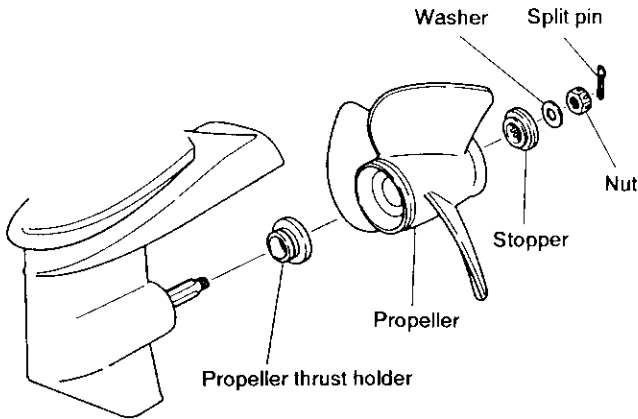
Note:

Run the engine at low speed when flushing the cooling system.

① Replacing the propeller

A worn or bent propeller will affect engine performance and may cause engine trouble.

1. Pull out the split pin and remove the propeller nut and washer.
2. Remove the propeller by pulling toward you.
3. Apply genuine grease to the propeller shaft before mounting the new propeller.
4. Fit the washer, securely tighten the nut and insert the split pin.

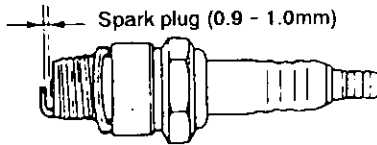


⚠ CAUTION

Before removing the propeller, remove the spark plug caps from the spark plugs for your safety.

② Replacing the spark plugs

1. Remove the upper engine cover.
2. Remove the spark plugs by turning counter-clockwise with the socket wrench (21mm) fitted with the handle. Tap lightly on the spark plugs if they are hard to turn.



▲ CAUTION

Do not touch the high tension cords running from the ignition coil to the spark plugs while the engine is running or it is turned by the electric starter motor, not even for testing the high tension cords or the spark plugs.

The high tension cords and the spark plugs generate very high electric voltage, which can cause a serious electric shock if touched.

2 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.

Your outboard motor should receive careful, and complete, inspection at 300 hours. This is the best time for major maintenance procedures to be carried out.

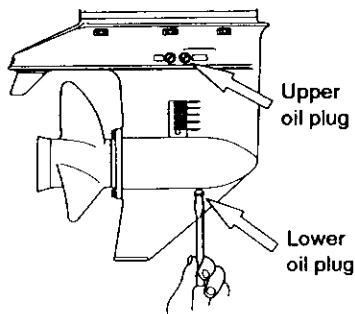
Item		Servicing Interval			Action	Remarks
		10 hours or 1 month	50 hours or 3 months	Every 100 hours or 6 months		
Fuel System	* Carbu- retor	<input type="radio"/>		<input type="radio"/>	Strip, clean and adjust. Adjust idling.	
	Fuel filter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Check and clean.	
	Piping			<input type="radio"/>	Check and clean.	
	Fuel tank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Clean	
Ignition	Spark plugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Check gaps. Remove carbon deposits.	
	* Ignition timing	<input type="radio"/>		<input type="radio"/>	Adjust timing.	
Starting System	* Starter motor			<input type="radio"/>	Check for salt deposits and battery cable condition.	
	Battery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Installation, fluid quantity, gravity	
	Starter rope	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Check for wear or damage	

Item		Servicing Interval			Action	Remarks
		10 hours or 1 month	50 hours or 3 months	Every 100 hours or 6 months		
Lower Unit	Pro-peller	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Bend of blades damage, wear	
	Gear oil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Change of oil or replenishment and water leak	
	Water pump		<input type="radio"/>	<input type="radio"/>	Check for Wear or damage	Replace impeller every 12 months
Bolt and Nuts		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Retighten	
Sliding and Rotating Parts. Grease Nipples			<input type="radio"/>	<input type="radio"/>	Apply and pump in grease.	
* Power Trim & Tilt		<input type="radio"/>		<input type="radio"/>	Check power unit oil level and refill. Check function of manual release valve.	
* Engine Oil System	Oil tank				Check for leakage, damage, position of clips, and filter conditions.	Repair or consult your dealer
	Oil pipe	<input type="radio"/>		<input type="radio"/>		
	Oil filter					
Outer Equipment		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Check corrosion	
Anode			<input type="radio"/>	<input type="radio"/>	Check corrosion and defomation	Replace

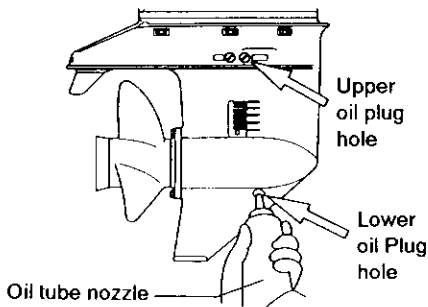
For checking the items marked with *, consult with your dealer.

3 Changing Gear Oil

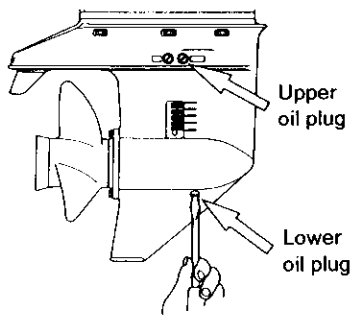
- ① Remove the oil plugs (upper and lower), and drain the gear oil completely.



- ② Insert the oil tube nozzle into the lower oil plug hole, and squeeze the tube until the oil flows out of the upper plug hole.



- ③ Install the upper oil plug. Then remove the oil tube nozzle and install the lower oil plug.



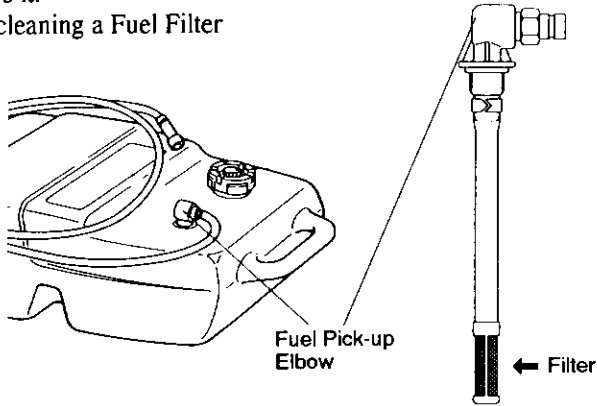
Note:

Use only genuine or recommended gear oil or, if not available, an API (American Petroleum Institute) oil grade of GL5 SAE #80 ~ SAE #90. Required volume: approx. 500mL (16.89 U.S. fluid oz)

4 Cleaning Tanks and Filters

- ① Fuel filters are provided inside the fuel tank and on the engine.

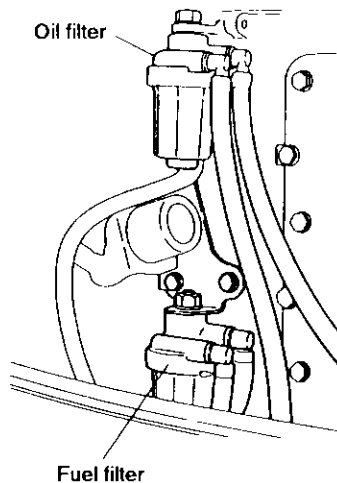
Loosen a Fuel Pick-up Elbow and remove it.
Then cleaning a Fuel Filter



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).

Clean the filters on the engine after removing the fuel filter cases.

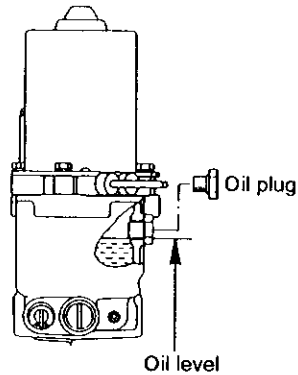


-
- ② Oil filter and oil tank. Check the oil tank and/or filter for entrapped water and dust.
1. Disconnect all pipes between the oil tank and oil pump of the outboard engine.
 2. Clean out foreign matter.
 3. Refit the pipes to the oil tank and pumps, and then fill up with new engine oil
 4. For air purging, refer to No. 5 Fuel & Engine Oil.

5 Checking and Refilling Oil In the Power Trim & Tilt.

- ① Check the oil level of the reservoir tank as shown on the right while the tank is kept in a vertical position. Tilt the engine up to check the oil level in the tank.

Remove the oil plug by turning counter-clockwise, then check if the oil level reaches the bottom line of the plug hole.



⚠ CAUTION

Do not fully unscrew the oil plug with the engine tilted down. Pressurized oil in the oil tank may spurt out.

② Recommended oil

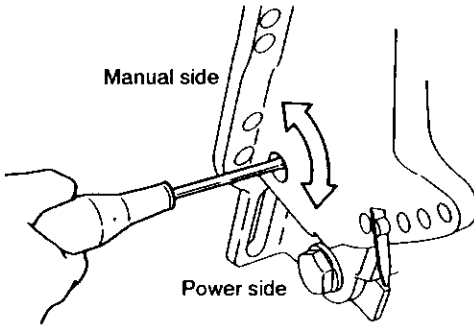
Use an automatic transmission fluid approved by GM.

Recommended oils are as shown below.

- MOBIL : MOBIL DTE #22, MOBIL ATF 220
- SHELL : SHELL DEXTRON-II, SHELL OIL #22 K22
- ESSO : ESSO AUTOMATIC TRANSMISSION OIL

③ Air purging from the Power Trim and Tilt unit.

Entrapped air in the Power Trim & Tilt unit will cause poor tilting movement. With the engine mounted on the boat, set the manual release valve to the Manual side, and tilt the engine manually up/down 5-6 times while checking the oil level. When done, close the valve by turning towards the Power side.



13. OFF-SEASON

▲ 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 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 vaseline 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.

14. PRE-SEASON CHECK

Have your 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 that the battery is secure and the battery cables installed properly.
- ③ Clean the engine oil filter.
- ④ Purge air in the vinyl pipe connecting the oil tank to the oil pump.
- ⑤ 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 pre-season storage.

1. In addition to the oil in the oil tank, mix engine oil with the fuel in the following mixing ratio and fill up the fuel tank completely with 25 liters (6.6 U.S. gal.):

Mixing ratio: Gasoline 50 : 1 Engine oil

Use unleaded gasoline and genuine Outboard Motor Oil. If this oil is not available, use another NMMA TC-W3 certified outboard motor oil from another manufacturer.

2. Purge any air from the oil filter assembly.
3. Warm up the engine for 3 minutes with the remote control lever in "NEUTRAL" position.
4. Run the engine for 5 minutes at the slowest speed.
5. 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.
6. When the full volume, 25 liters (6.6 U.S. gal.), of gasoline mixed with oil has been used, fill up the tank with pure gasoline only. (For the auto-mixing types)

15. CHECKING AFTER STRIKING UNDERWATER OBJECT

Striking sea bottom or underwater object may severely damage the outboard. Immediately bring the outboard to your 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 nuts, power trim and tilt bolts, and mount rubber cap bolts.

Ask to tighten loose bolts and nuts, 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.

16. IF THE ENGINE BECOMES SUBMERGED IN WATER

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

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

- ① Take it out of water immediately and wash it with fresh water to remove all traces of salt and dirt.
- ② Remove the spark plugs, and drain the engine completely of water.
Turn the flywheel several times, using the starter rope.
- ③ Inject a liberal amount of genuine engine oil or storage fogging oil into the engine through the spark plug holes and the air silencer.
Turn the flywheel several times with the starter rope while injecting the oil to make sure the oil is evenly distributed.
- ④ After the above steps, it is still possible for the internal engine parts to be damaged. The electrical components and carburetors will soon deteriorate and become inoperative. Therefore, be sure to have the engine completely overhauled by a service shop immediately.

17. PRECAUTIONS IN COLD WEATHER

When mooring in cold weather at sub-zero temperatures the water in the cooling water pump may freeze and severely damage the pump, impeller, and associated parts. To avoid this, submerge the lower half of the engine into the water, or tilt the engine and operate the electric starter motor for 5 seconds with the stop switch lock plate taken away to allow the water to drain completely.

18. TROUBLESHOOTING

If you encounter a problem with the engine, check the list below and locate the problem you are experiencing. Then follow the suggested remedies.

Do not hesitate to contact your dealer, as professional advice and assistance is the best way to keep the engine in optimum condition.

Difficult to start engine	Engine starts but stops soon	Poor idling	Unstable engine running speed or engine stops	Abnormally high engine speed	Abnormally low engine speed	Cannot obtain high engine speeds	Overheating of engine	Power Trim & Tilt inoperative	
●	●		●						Empty fuel tank
●	●	●	●		●	●	●		Incorrect connection of fuel system
●	●	●	●		●	●	●		Air enters fuel line
●	●	●	●		●	●	●		Deformed or damaged fuel pipe
●	●	●	●		●	●	●		Closed air vent on fuel tank cap
●	●	●	●		●	●	●		Clogged fuel filter, fuel pump or carburetor
●	●	●	●		●	●	●		Use of improper engine oil
●	●	●	●		●	●	●		Use of improper gasoline
●	●	●	●		●	●	●		Excessive supply of gasoline
●	●	●	●		●	●	●		Poor carburetor adjustment
●	●	●	●		●	●	●		Recirculation pipe broken
●	●	●	●		●	●	●		Use of non-specified spark plugs
●	●	●	●		●	●	●		Dirt or carbon deposits on spark plugs
●	●	●	●		●	●	●		No sparks or weak sparks
			●		●	●	●		Insufficient cooling water flow
		●	●			●	●		Faulty thermostat
				●		●	●		Propeller cavitation
				●	●	●	●		Incorrect propeller selection

Difficult to start engine	Engine starts but stops soon	Poor idling	Unstable engine running speed or engine stops	Ab-normally high engine speed	Ab-normally low engine speed	Cannot obtain high engine speeds	Over-heating of engine	Power Trim & Tilt inoperative	
		●		●	●	●	●		Damaged or bent propeller
				●	●	●	●		Unbalanced load in boat
				●		●	●		Transom too high
					●	●	●		Transom too low
●	●	●			●	●	●		Incorrect adjustment of throttle link
●	●	●			●	●	●		Incorrect adjustment of ignition timing
●									Insufficient battery capacity, loose terminals, corrosion
●									Faulty ignition switch or Power Trim & Tilt switch
●									Remote Control lever not set to Neutral
●									Safety switch lock plate not fitted
●								●	Incorrect wiring disconnected or broken wire
●									Starter motor failure
								●	Air in power trim & tilt unit


19. TOOL KIT AND SPARE PARTS

Name			Remark
Servicing Tools	Tool Bag	1	Adapter-type
	Socket Wrench (21mm)	1	
	Socket Wrench (10 x 13)	1	
	Socket Wrench Handle	1	
	Pliers	1	
	Screwdriver (Phillips-type and flat head)	1	
Spare Parts	Emergency starter rope (1,600mm)	1	
	Spark Plug	2	NGK BR7HS-10 40D2
		2	NGK BR8HS-10 50D2
	Slit Pin	1	Diameter x length 3 x 25mm
Parts Packaged with Engine ※	Bracket Fixing Bolts	4	12 mm
	Bracket Fixing Nuts	4	12 mm
	Washers A, B	4 each	A (large), B (small)
	Fuel Tank (with primer bulb)	1	
	Flushing Plug	1	For flushing cooling water passage
	Remote Control Box	1	for 40D2EPO 40D2EPTO 50D2EPO 50D2EPTO
	Drag Link	1	
	Tachometer	1	
	Trim meter	1	
	Lead Wire for Meter	1	

※ Not included as standard accessories in some markets.

20. PROPELLER TABLE

To ensure optimum performance, the propeller should match the boat type and its load.



Mark	Standard propeller on the model
※ 7	
8.5	
9	
10	
11	
12	40D ₂ "UL" transom
C 12.5	40D ₂ "S" and "L" transom, 50D ₂ "UL" transom
13	
C 13.5	50D ₂ "S" and "L" transom
14	
C 14.5	
C 16	

NOTE: "※" shows propeller with four blades.

PROPELLER

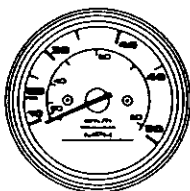
Use a genuine propeller.

A propeller must be selected so that the engine rpm measured at wide open throttle while cruising is within the recommended range.

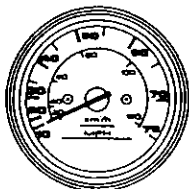
40D₂ 5000 to 5700 rpm

50D₂ 5150 to 5850 rpm

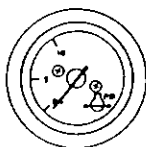
21. OPTIONAL ACCESSORIES



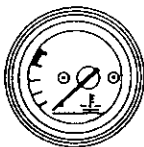
1. Speedometer
(50MPH)



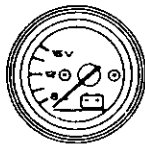
2. Speedometer
(75MPH)



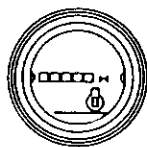
3. Water Pressure
Meter



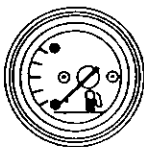
4. Water Temperature
Meter



5. Voltmeter



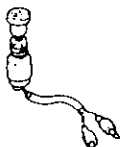
6. Hour Meter
(engine operation
hour counter)



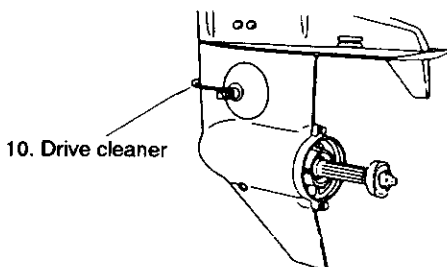
7. Fuel Meter



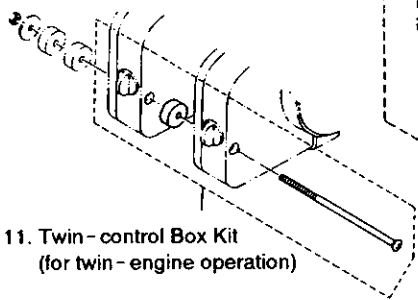
8. Tachometer



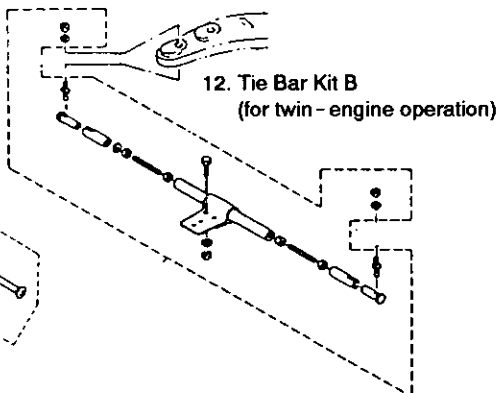
9. Meter Lamp Switch



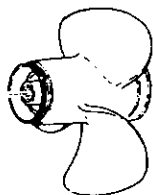
10. Drive cleaner



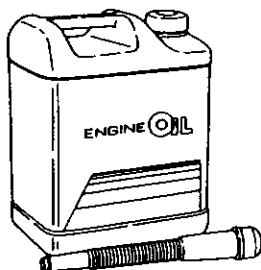
11. Twin-control Box Kit
(for twin-engine operation)



12. Tie Bar Kit B
(for twin-engine operation)



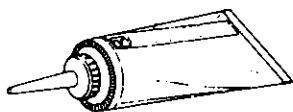
13. Propeller



14. Engine Oil
(0.4L, 1L, 4L, 20L)



15. TOHATSU Grease
(50g, 250g)



16. Gear Oil
(260mL, 500mL)



17. Touch-up Spray

22. WIRING DIAGRAM

- 1 Pulser coil assembly
- 2 Alternator
- 3 Exciter coil
- 4 C.D. unit
- 5 Ignition coil
- 6 Rectifier complete
- 7 Starter motor
- 8 Starter solenoid
- 9 Power trim & tilt
- 10 Power trim & tilt solenoid switch A
- 11 Power trim & tilt solenoid switch B
- 12 Trim sender
- 13 Fuse
- 14 Choke solenoid
- 15 Oil level sensor
- 16 Over heat sensor
- 17 Water temperature sensor
- 18 Battery cord
- 19 Cord assembly
- 20 Cord assembly B
- 21 Cord assembly C
- 22 Power trim & tilt switch B
- 23 Starter cord
- 24 Solenoid switch cord A
- 25 Solenoid switch cord B
- 26 Solenoid switch cord C
- 27 Battery
- 28 Main switch
- 29 Stop switch
- 30 Overheat buzzer

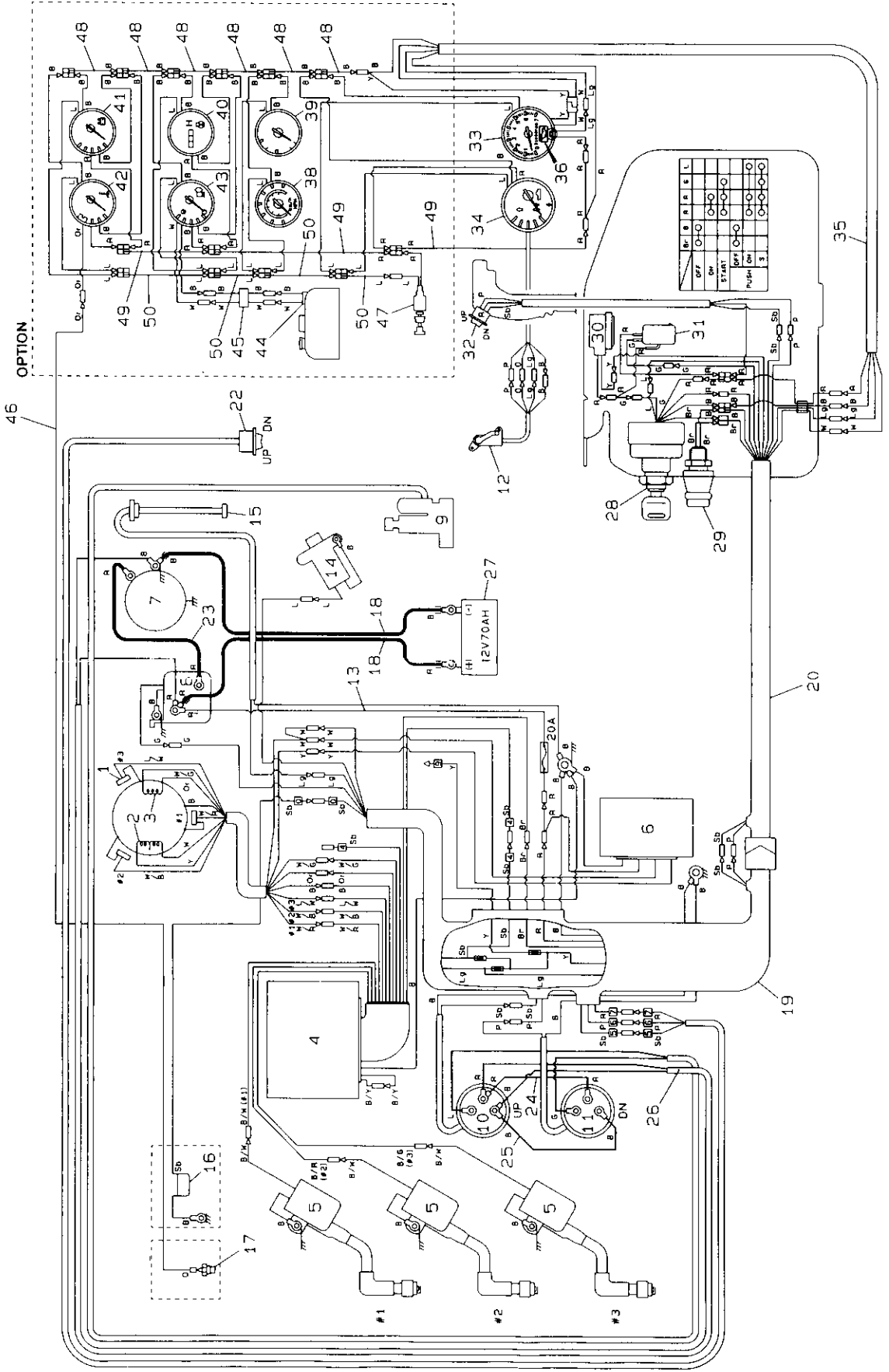
-
- 31 Neutral switch
 - 32 Power trim & tilt switch
 - 33 Tachometer
 - 34 Trim meter
 - 35 Meter lead
 - 36 Oil lamp
 - 37 Pilot lamp
 - 38 Speedometer
 - 39 Water pressure meter
 - 40 Hour meter
 - 41 Volt meter
 - 42 Water temperature meter
 - 43 Fuel meter
 - 44 Fuel gauge sensor unit
 - 45 Fuel meter cord
 - 46 Water temperature lead
 - 47 Meter lamp switch
 - 48 Assist cord (black)
 - 49 Assist cord (red)
 - 50 Assist cord (blue)

Abbreviation of color of lead

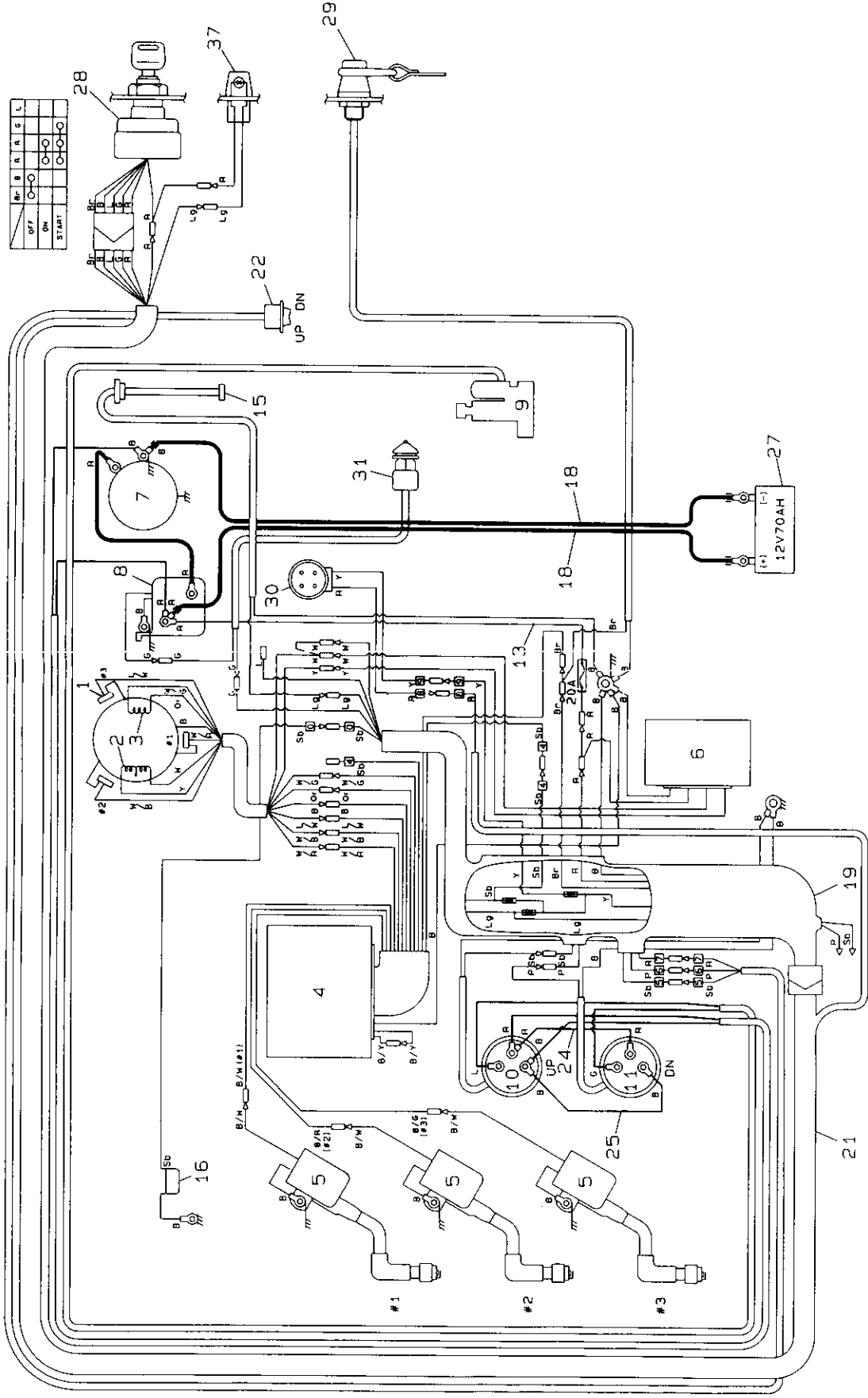
B : black	R : red
Br : brown	Sb : Sky blue
G : green	W : white
Lg : light green	Y : yellow
Or : orange	L : blu
P : pink	

Note: (/) shows striped color

MODEL : EPO • EPTO



MODEL: F • EF • EFO • EFTO



WARNING:

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.