TOHATSU

OUTBOARDS

50•40

OWNERS MANUAL

TOHATSU M40D • M50D

OWNER REGISTRATION AND INDENTIFICATION

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

Warranty

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

The warranty does not extend to faults arising from incorrect installation or maltreatment and becomes void if the unit is altered, modified or repaired by any other than the company or service center appointed by Tohatsu.

Please note that the warranty covers only your Tohatsu product. It does not extend to your boat, trailer, associated equipment or other accessories.

Please read this manual carefully, and use the product in accordance with the instructions set forth herein.

Serial Number

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

Serial Number :_____

To you the Customer

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

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

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

Tohatsu Corporation

NOTICE

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

EMERGENCY STOP SWITCH

A safety switch in the steering Handle or in the Remote Control Box will cut off the engine when the safety switch line is pulled out. This line connects to the wrist of the operator, effectively preventing injuries from the propeller if he falls overboad. We highly recommend use of the safety switch line, since it can save the life of the operator if bad things come to worse. However, we would also like to point out the drawbacks of the switch to the operator. Accidental activation of the switch (such as the line being pulled in heavy seas), could cause passengers to lose their balance, fall overboard, and could result in loss of power in heavey sears, strong currents or high winds. Loss of control while mooring is another potential hazard

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

WARNING

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

WARNING

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

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

It is the operator's responsibility to perform all safety checks and to ensure that all lubrication and maintenance instructions are complied with for safe operation It is also the operator's responsibility to return the unit to the local dealer for periodic inspection.
Correct periodic maintenance and good care of this outboard engine will lessen the chance for problems and keep overall operating expenses at a minimum.

SERVICING, REPLACEMENT PARTS & LUBRICANT.

Only let an authorized TOHATSU service shop perform servicing or maintenance on this product. Be sure to use original Tohatsu parts and Tohatsu lubricants only.

MAINTENANCE

As the owner of this outboard engine, you should have acquanted yourself with the correct maintenance of the same. Please comply with all instructions on lubrication and maintenance, and return the engine to the dealer for periodic inspection at the prescribed intervals.
Troublefree operation cannot be expected unless the engine receive correct periodic maintenance and is taken good care of. Moreover, if such maintenance is performed periodically, it is not likely that a costly overhaul would ever be required.

CONTENTS

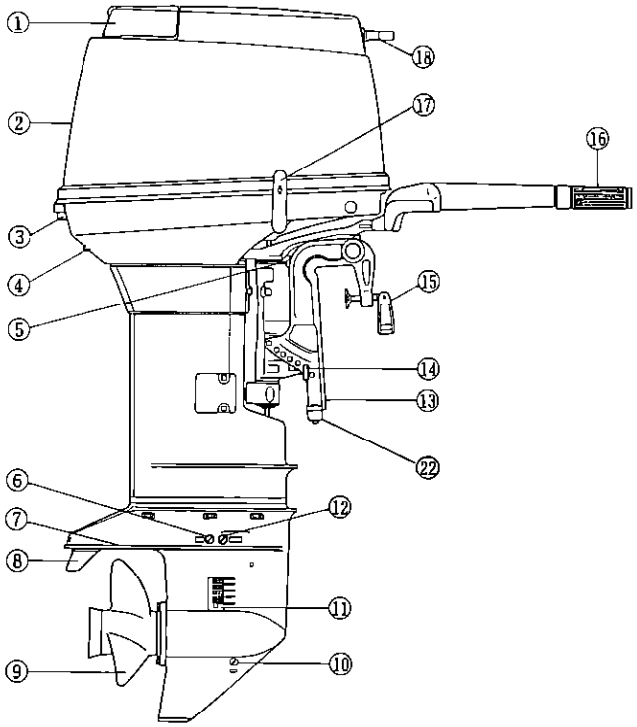
SPECIFICATIONS

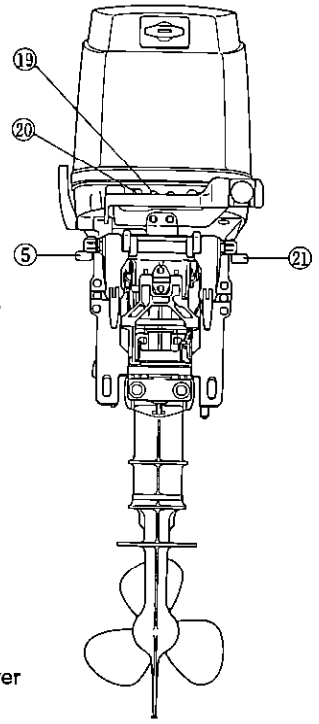
Note: Overall height and weight of L transom are shown in the table below.

MODEL	M40D	M40DEF	M40DEFO	M40DEFTO	M40DEPO	M40DEPTO
	–	M50DEF	M50DEFO	M50DEFTO	M50DEPO	M50DEPTO
Overall Length, mm(in.)	1,107 (43.58)				630 (24.80)	
Overall Width, mm(in.)	381 (15.00)				340 (13.39)	355 (13.98)
Overall Height, mm(in.)	1,352 (53.23)				1,319 (51.93)	
Weight, Kg (lbs)	69(152.12)	73.5(162.04)	75(165.35)	82(180.78)	70.5(155.43)	77.5(170.86)
Transom Height, mm(in.)	S: 403 (15.87) L: 530 (20.87) LL: 605 (23.82) UL: 657 (25.87)					
Max. output, KW(PS)	29.42 (40 PS)					
	36.78 (50 PS)					
Full Throttle Speed Range	40PS 4,500 ~ 5,500					
	50PS 5,000 ~ 5,700					
No. of cylinders	3					
Piston Displacement CC(in.3)	697 (42.53)					
Bore x Stroke, mm(in)	68 x 64 (2.68 x 2.52)					

Exhaust System	through propeller hub exhaust				
Lubrication	manual mixing in fuel oil tank		Auto-mixing system		
Fuel Mixing Ratio	50:1(after completing break-in)				
Cooling System	forced water cooling				
Starting System	recoil hand starter	recoil hand starter and electric starter		electric starter	
Ignition	break pointless C.D. Ignition				
Spark plugs	M40D	NGK B7HS-10 or Champion L-82 (1.0 mm gap)			
	M50D	NGK B8HS-10 or Champion L-78 (1.0 mm gap)			
Trim Stages	6		5	6	5
Engine oil	genuine TOHATSU Engine Oil "SUPER GOLD"				
Gear oil	Tohatsu gear oil (API GL5, SAE#80 or #80W)				
Fuel Tank Capacity	22.7 liters (6 U.S. gal.)				
Engine Oil Tank Capacity	–	2 liters (0.528 U.S. gal.)			
Gear Reduction Rato	13 : 24				

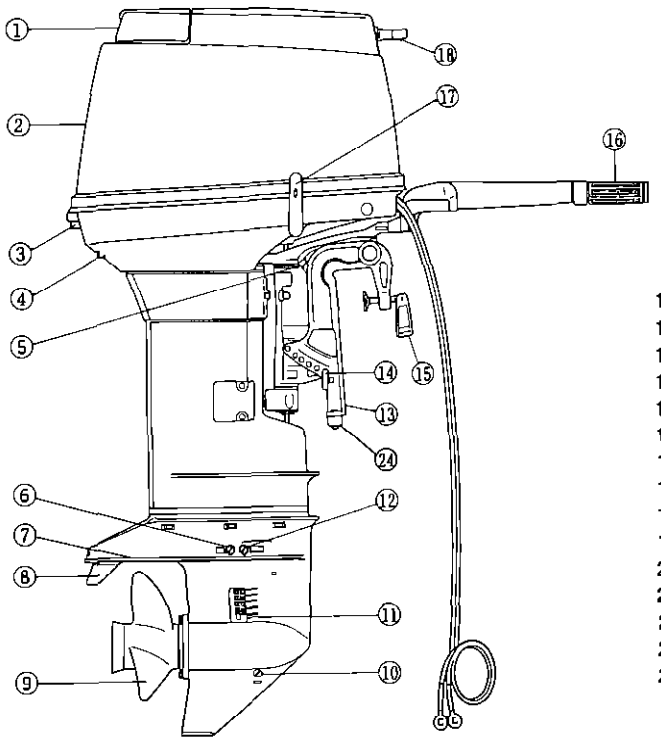
M40D





1. Tilt Handle
2. Upper Motor Cover
3. Hook Lever
4. Water Check Port
5. Tilt Stopper Lever
6. Water Plug
7. Anti Cavitation 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. Safety Switch
20. Choke knob
21. Reverse locking Lever
22. Anode

M40DEF/M50DEF



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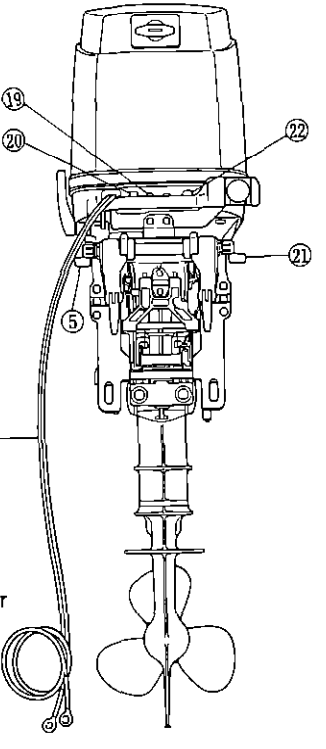
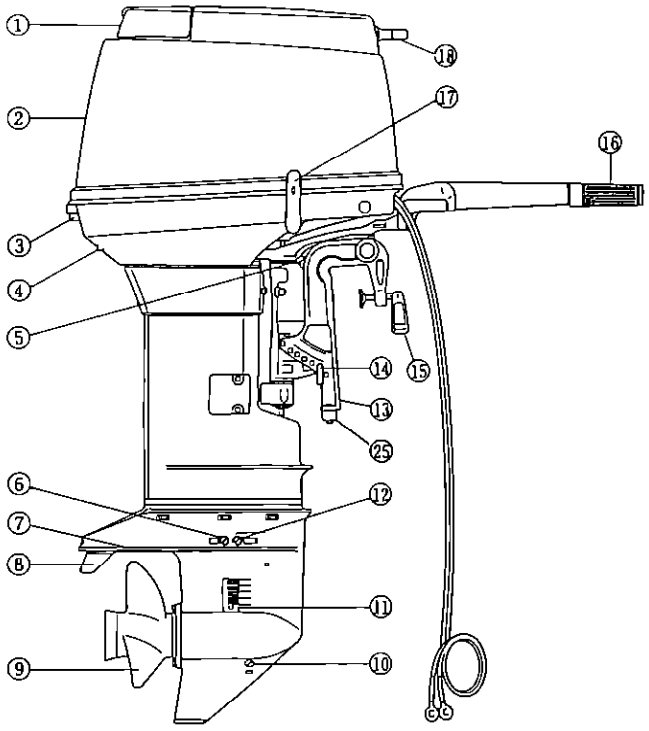
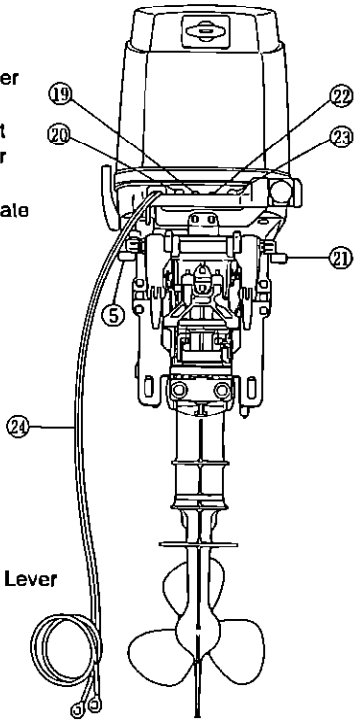
16. Throttle Grip
17. Shift Lever
18. Starter Handle
19. Safety Switch
20. Choke knob
21. Reverse locking Lever
22. Main Switch
23. Battery Cords
24. Anode



M40DEFO/M50DEFO





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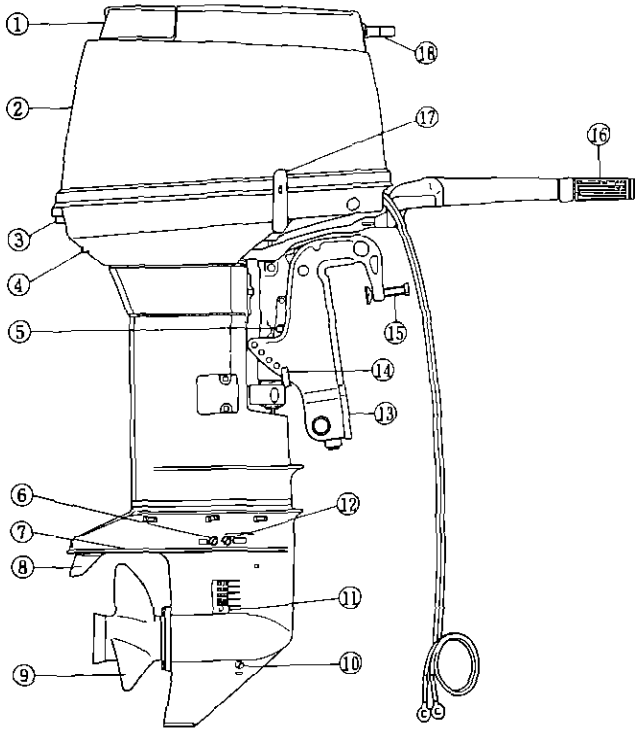
17. Shift Lever
18. Starter Handle
19. Safety Switch
20. Choke knob
21. Reverse Locking Lever
22. Pilot Lamp
23. Main Switch
24. Battery Cords
25. Anode

M40DEFTO/M50DEFTO



1. Tilt Handle
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3. Hook Lever
4. Water Check Port
5. Tilt Stopper Lever
6. Water Plug
7. Anti Cavitation Plate
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9. Propeller
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11. Water Strainer
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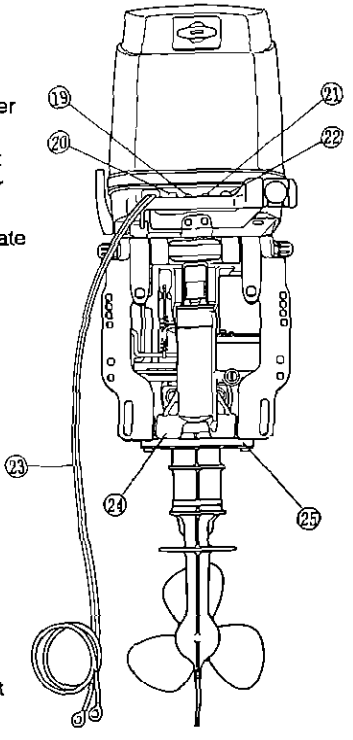
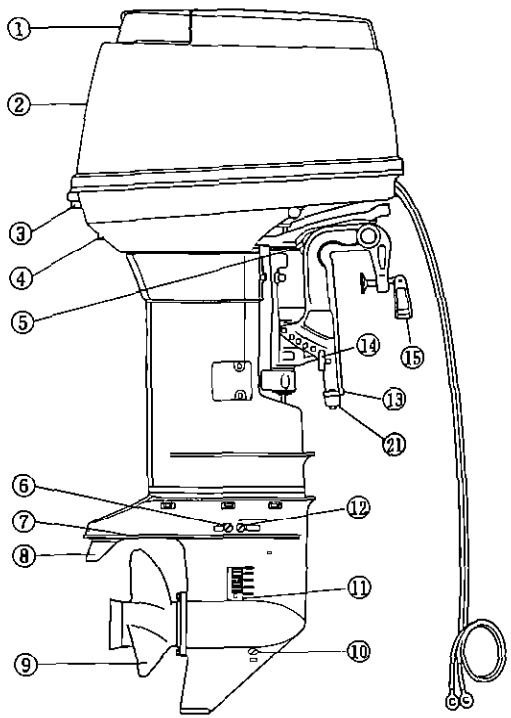
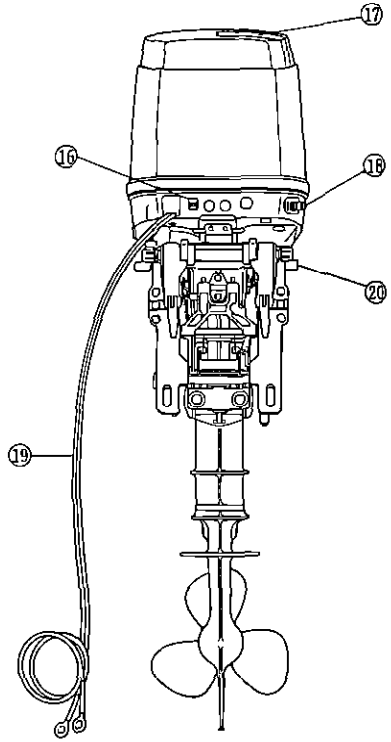
14. Thrust Rod
15. Clamp Screw
16. Throttle Grip
17. Shift Lever
18. Starter Handle
19. Safety Switch
20. Choke knob
21. Pilot Lamp
22. Main Switch
23. Battery Cords
24. Power Trim & Tilt
25. Anode



M40DEPO/M50DEPO





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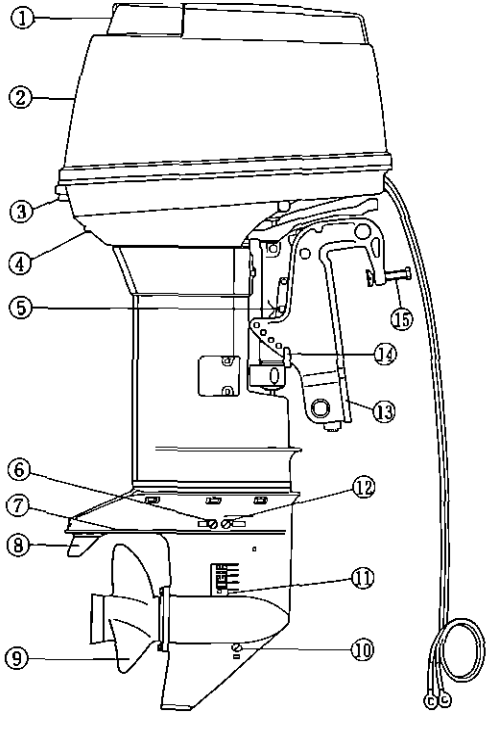
14. Thrust Rod
15. Clamp Screw
16. Choke Knob
17. Filler Lid
18. Fuel Connecter
19. Battery Cords
20. Reverse Locking Lever
21. Anode

M40DEPTO/M50DEPTO



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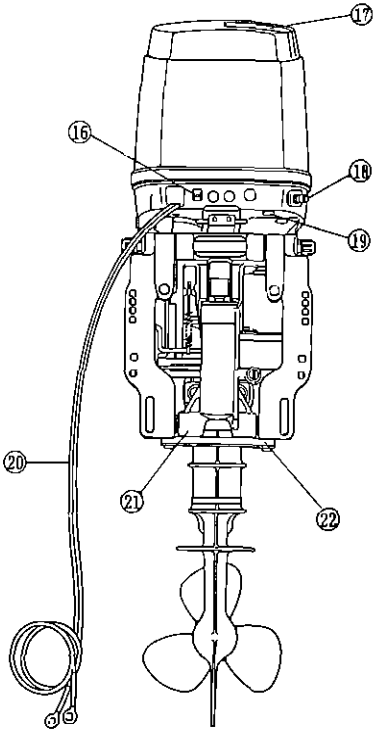


1. ENGINE INSTALLATION ON BOAT

⚠⚠ WARNING

The maximum horsepower rating of the engine is indicated on the CERTIFICATION PLATE on the engine itself. Be sure that the maximum engine horsepower rating does not exceed that recommended for your boat. It is very DANGEROUS to operate a boat with an overpowered engine.

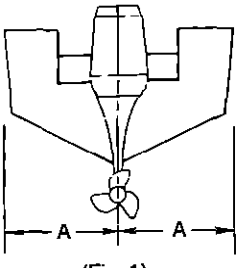
⚠⚠ WARNING

Do not operate the engine until it has been securely mounted on the boat in accordance with the instruction below.

1 Installation

① Sigle-engine Installation

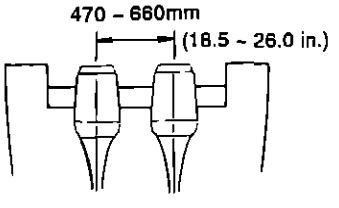
■ Position the outboard engine at the exact center of the stern, and mount it using a cushioning pad or plate. (Fig. 1)



(Fig. 1)

② Twin-engine Installation

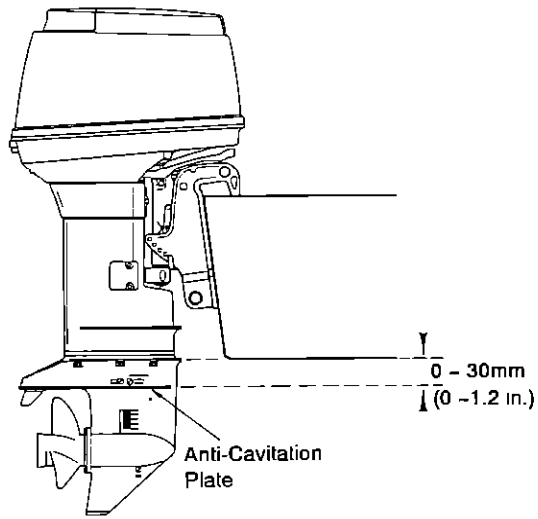
■ Position the outboard engines 470~660mm (18.5 ~ 26.0 in.) apart, measured from an imagined center line of each engine, in the exact center of the stern. (Fig. 2)



(Fig. 2)

③ Transom Height

Install the engine with the Anti-cavitation Plate at a level 0 ~ 30mm (0 ~ 1.18 in.) below the bottom of the boat. (Fig. 3)



(Fig. 3)

⚠ CAUTION

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

■ If the hight difference exceeds 0 ~ 30mm (0 ~ 1.18 in.) engine power perfromance is likely to be reduced as a result of increased water resistance to the gear case assembly.

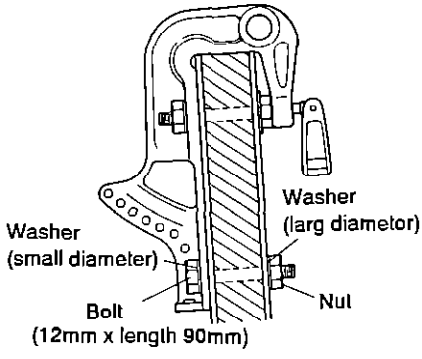
④ Attaching the Stern Bracket

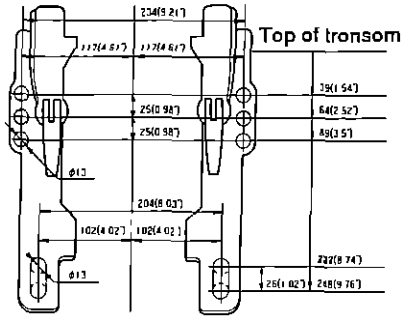
After positioning the Stern Bracket, fix it with clamp screws then drill four holes in the transom board, matching the holes in the Stern Bracket. Secure the engine with the supplied bolts (M12 x 90mm) and nuts. Be sure to use the washers The small diameter washers go with the bolts and the larger diameter washers go wit the nuts

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

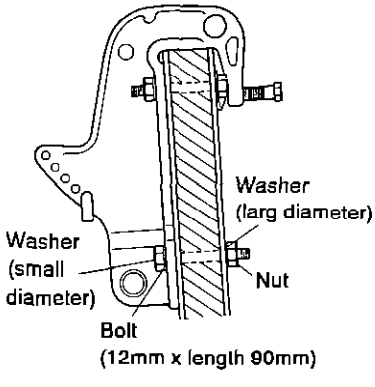
2 Stern Bracket Dimentional Drawing

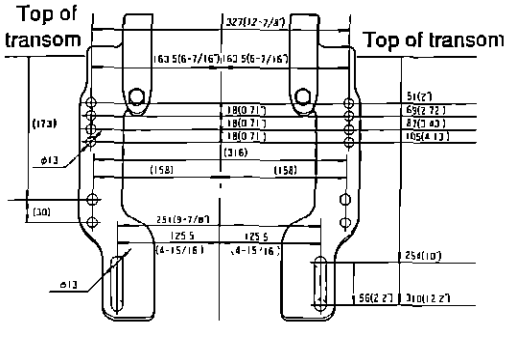
manual tilting model **M40D • M40DEF • M40DEFO • M40DEPO**
M50DEF • M50DEFO • M50DEPO





with the Power Trim and Tilt model **M40DEFTO • M40DEPTO**
M50DEFTO • M50DEPTO





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.

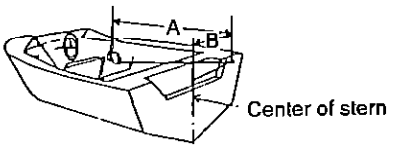
2. REMOTE CONTROL BOX

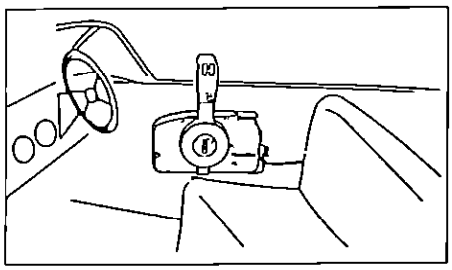
The following explains installation for right-hand driving.

1 Installing the Remote Control Box

- Position the Remote Control Box in a place that will not interfere with handling of controls, levers and switches. Confirm that there are no obstacles in the passage of remote control cables.

- Determining the Remote Control cable length:
  Use distances "A" and "B", as depicted in the illustrations, as guide lines for the Remote Control cable length, and add an additional 300mm (one foot).cable length = "A" + "B" + 300mm (one foot)





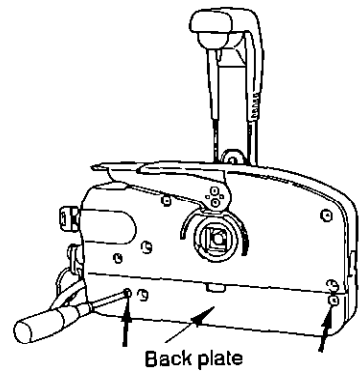
NOTE
Do not sharply bend the remote control cable to a radius of 203mm (8 in.) or less as this will interfere with cable operation.

⚠ CAUTION

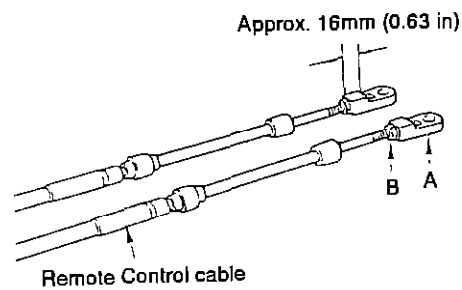
To prevent accidental running of the engine, which could result in an injury. DO NOT connect the battery until the installation of the Remote Control Box and the engine is complete.

2 Connecting the Remote Control Cable to the Remote Control Box.

① Remove the back plate by loosening two screws.

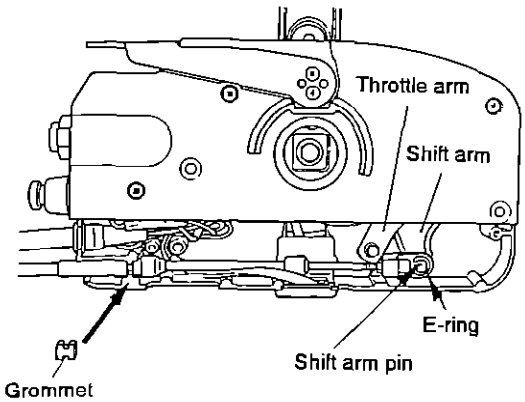


② Pass at least 11mm (0.43 in.) of the Remote Control cables through the terminal eyes A. Securely lock the terminal eyes with lock nuts B.



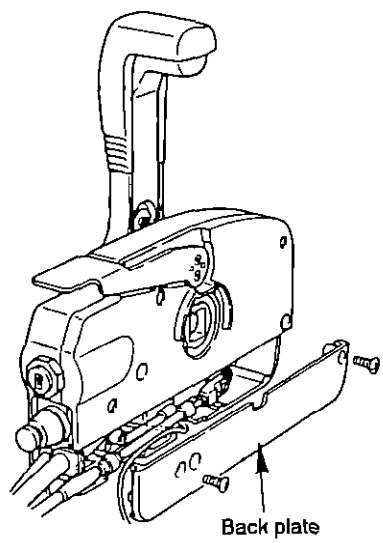
③ Engage the outer groove of the shift cable on the Remote Control side with the clamp groove of the housing. Insert a grommet, supplied with the Remote Control Box, into the clamp groove.

④ Insert the shift arm pin into the terminal eye, and lock it with the E-ring.

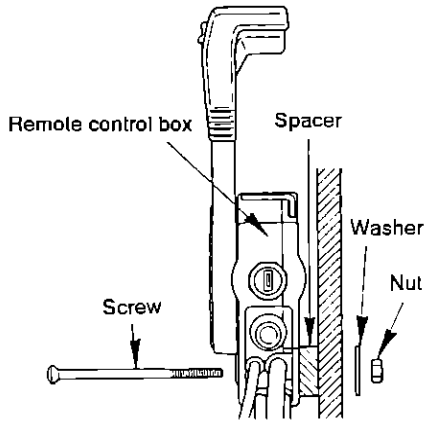


⑤ Connect the throttle cable to the throttle arm in the same way as the shift cable was connected.

⑥ Reinstall the back plate.

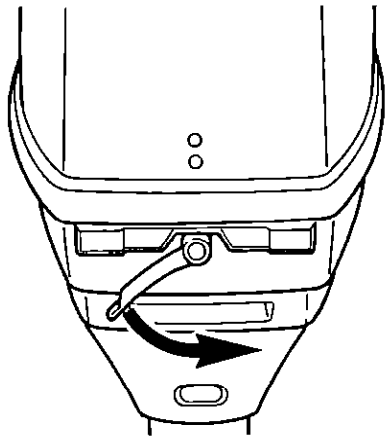


⑦ Install the Remote Control Box using the three screws, spacers, washers and nuts.

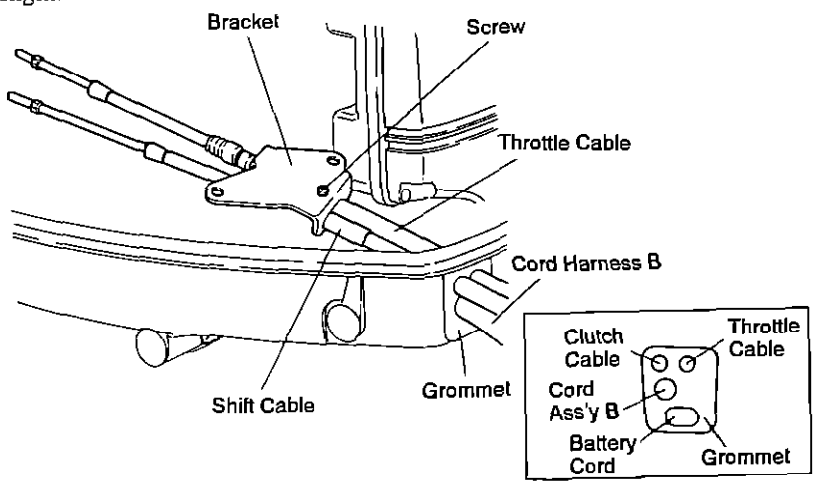


3 Connecting the Remote Control Cable to the engine.

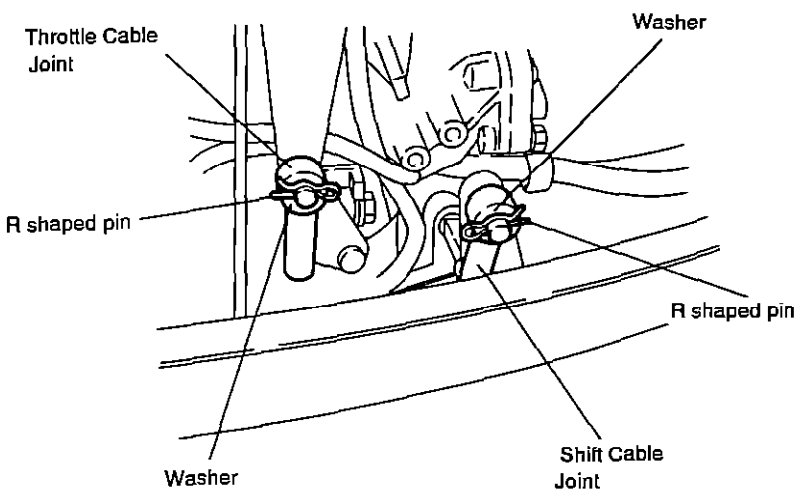
① Detach the upper engine cover by turning the lever.



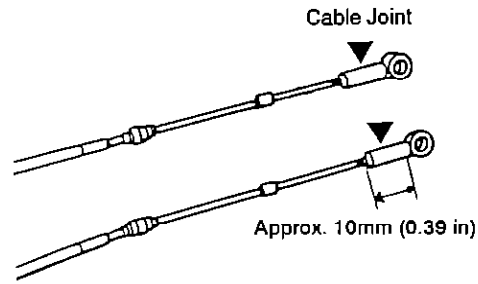
② Detach the bracket and set Cable Harness B and Remote Control Cables. Having fixed the Remote Control Cables to the bracket, tie them to the lower engine cover.



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

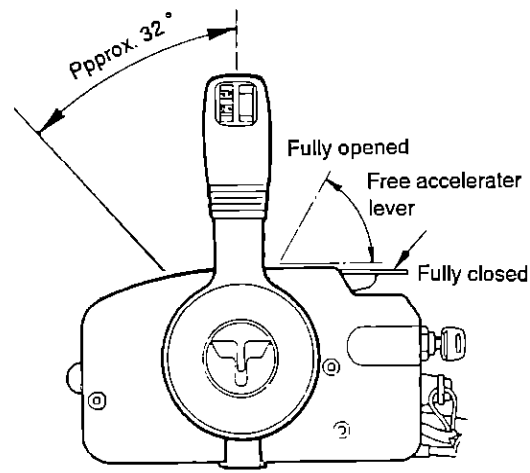


■ Pass at least 15mm (0.59 in.) of the Remote Control Cables through the terminal eyes. Securely lock the terminal eyes with lock nuts.

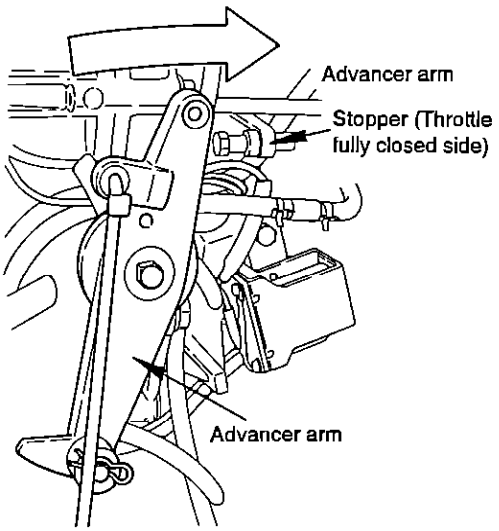


④ Move the Remote Control lever Forward, to Neutral and to Reverse to confirm the shift is working, and then set the lever to Neutral.

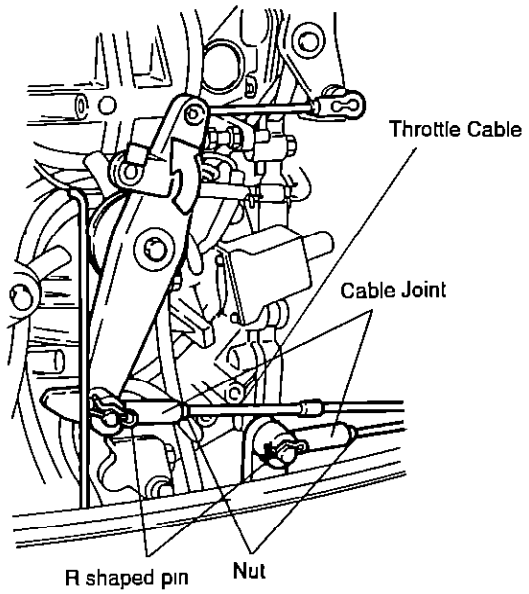
■ Double-check that the Remote Control Cables, the throttle cable and shift cable have been connected correctly Move the Remote Control Lever Forward until the first engaging point (approx. 32 °). The cable which is moved the first when the lever is turned, is a shift cable. Check that the shift lever 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.

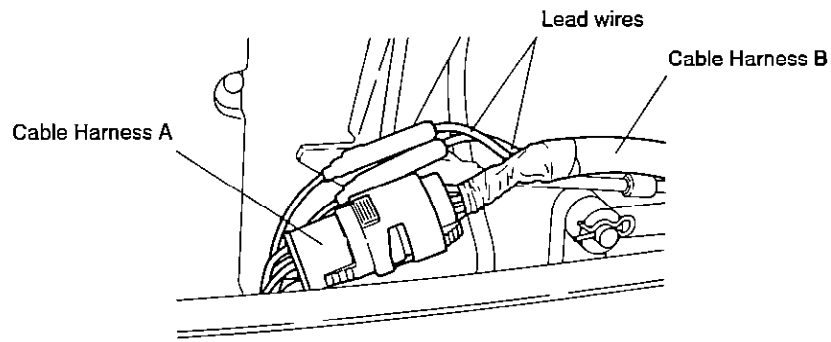


⑤ Adjust cable joint until the hole meets with the Advancer Arm pin. After adjustment, lock a cable joint with a nut and secure with R-shaped pin.



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.

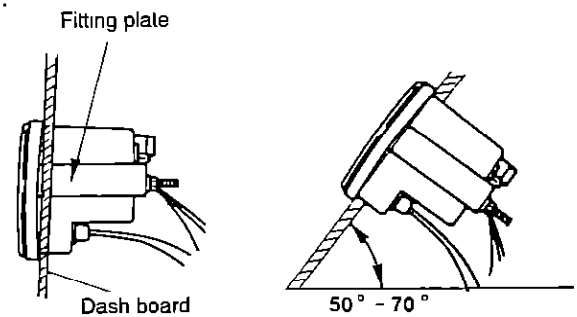


⚠⚠⚠ DANGER

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.

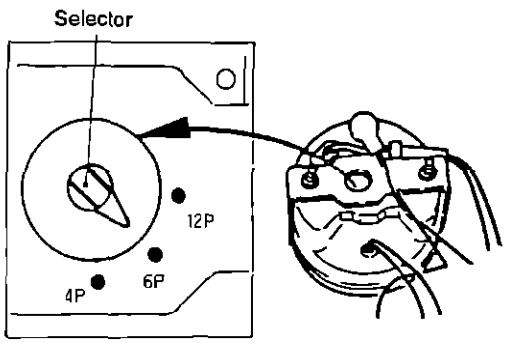
5 Installing the meters

Install the meters securely in the dashboard where they can be easily read and are not exposed to water splashes. The recommended doshboard 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.

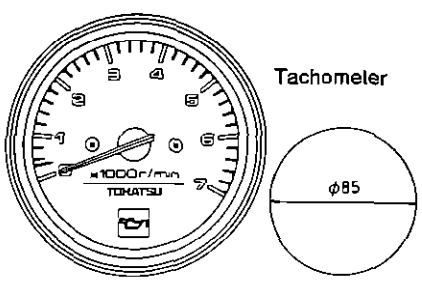


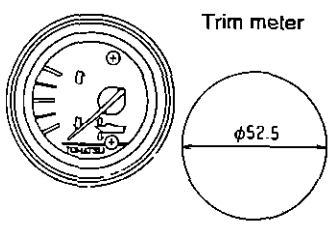
The dashboard inclination should be 50° ~ 70°

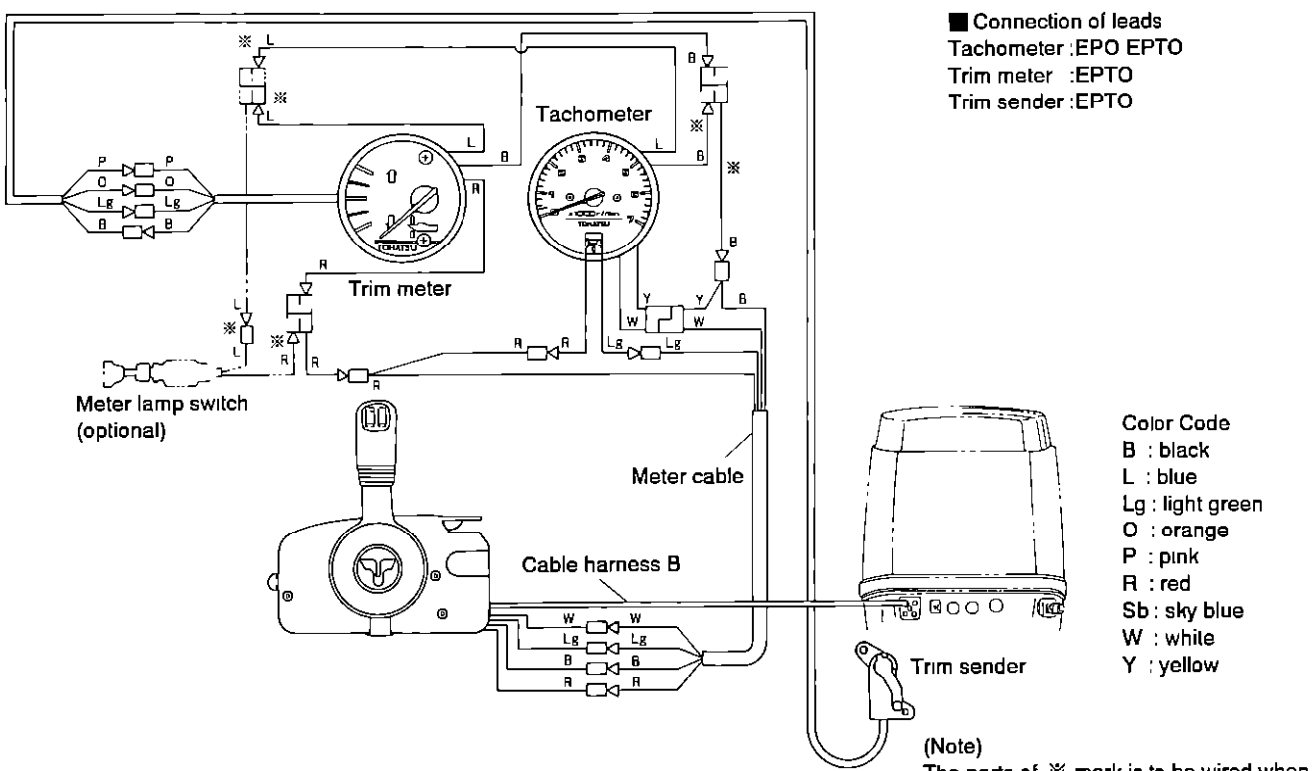
All models of the M40D and M50D series have six electric poles. Set the tachometer selector knob to "6P".



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.

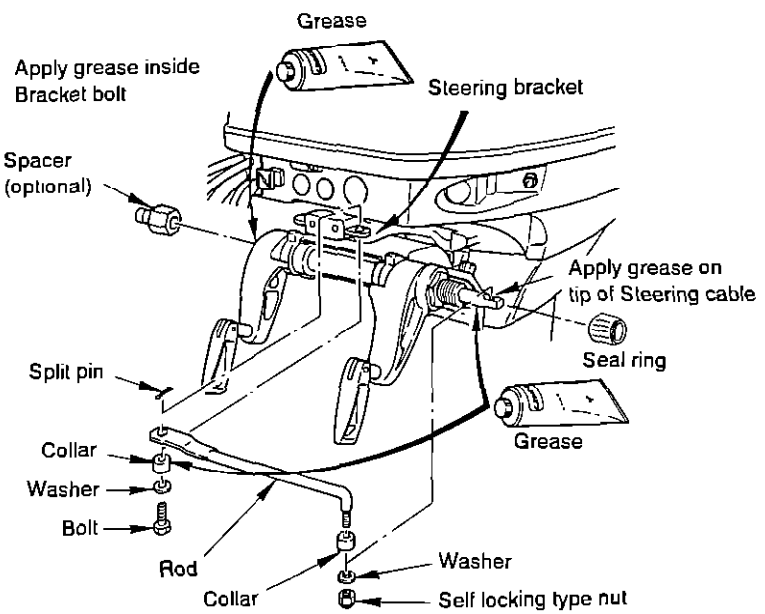
6 Installing the Drag Link Assembly

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 TOHATSU dealer is highly recommended.

NOTE
Depending on the steering cable manufacturer, spacers (optional) may by 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, appling a collar and washer. The bolt head must face downward. Secure with a split pin to the bolt.

NOTE
Apply TOHATSU grease in required places. *Apply TOHATSU grease inside the bracked bolt.*

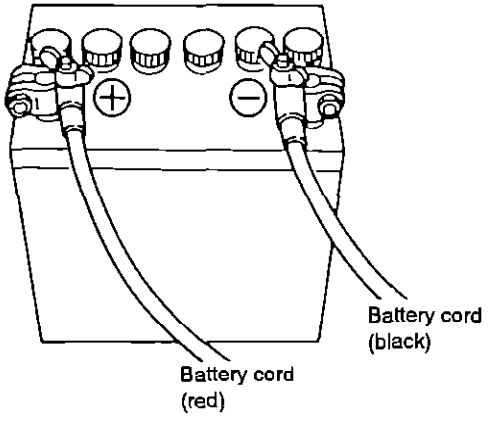


7 Battery

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 Required battery rating: 12V 70AH ~ 12V 100AH



NOTES
1. Battery cables should be of sufficient lenght 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.*

⚠⚠⚠ DANGER

- Hydrogen gas is generated when charging a battery. Thus, keep the battery well ventilated during charging.
  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.

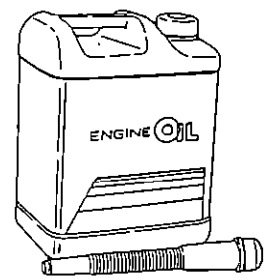
3. Fuel & Engine Oil

NOTES

1. *Use of Premium-rated gasoline (Super brand) is recommended.*
   The minimum octane rating is 89 (research octane rating 91).
2. *Do not use gasoline containing kerosene, alcohol, methanol. (methyl) or ethanol (ethyl).*
   Use of such gasoline brands will void the warranty and repair costs will be at the owner's expense
3. *Do not use white gasoline.*
4. *Do not use gasoline pre-mixed with oil, sold at gas stands, since the octane rating and oil grade are unknown*

Fuel tank capacity - - - 22.7 litters (6 U.S. gal)
Engine oil - - - - - - - - Use genuine TOHATSU Outboard Engine Oil. If this oil is not available, use another NMMA TC-W II certified Outboard Engine Oil from another manufacturer.

TOHATSU Engine Oil
"Super Gold"



⚠ 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 M40D • M40DEF M50D • M50DEF

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

M40DEFO • M40DEFTO • M40DEPO • M40DEPTO
M50DEFO • M50DEFTO • M50DEPO • M50DEPTO

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 (0.52 U.S. gal.)

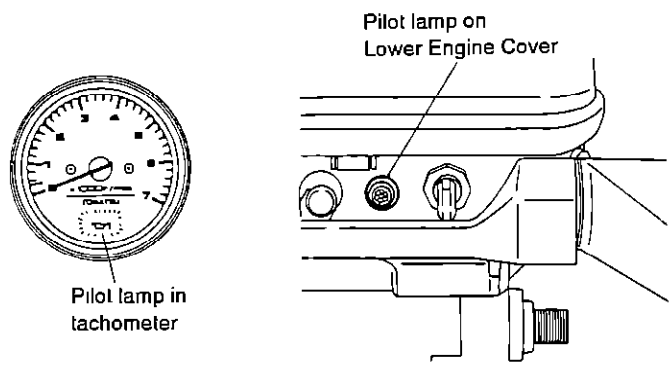
M40DEPO • M40DEPTO
M50DEPO • M50DEPTO

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.)

M40DEFO • M40DEFTO
M50DEFO • M50DEFTO

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

When, the buzzer mounted on engine starts to sound **(M50DEFO • M50DEFTO)**



A. Resetting the low oil level alarm

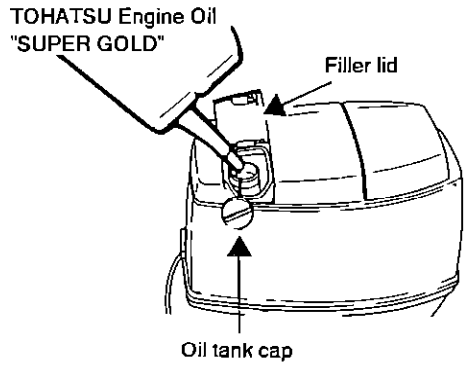
Reduce engine speed to trolling rpm and steer towards a safe area with calm water. Set the Remote Control Lever to Neutral (buzzer will stop).

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.

⚠⚠ WARNING

Be sure to stop the engine before oil replenishment.
If the engine is not stopped, your clothes may become caught in the flywheel or a fire could result from spilled oil. Wipe off any spilled oil afterward with a rag.



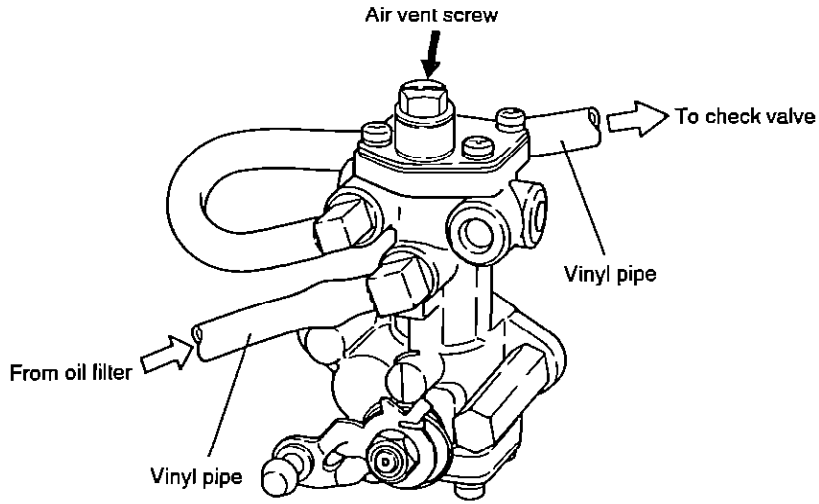
⚠ CAUTION

1. In the unlikely event that gasoline by mistake is filled into the oil tank, drain the oil tank completely, and consult an authorized TOHATSU 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 by burning or other proper manner.

4. Running

1 Break-in

① Perform break-in run according to the table below.

step	1 ➡	2 ➡	3 ➡	4 ➡	completion of break-in
throttle position	slow	under 1/2	1/2 to 3/4	approx. 3/4	
fuel to be consumed (U.S. gal.)	10minutes	1.5 liters (0.4)	4liters (1.06)	7liters (1.85)	–
engine speed	cruising at minimum speed	2,500 rpm to 3,000 rpm	3,000 rpm to 4,000 rpm	3,500 rpm to 4,500 rpm Apply full throttle run for one minute in every 30 minutes	Max.speed must not exceed M50D 5,700 / M40D 5,500 rpm.

② Fuel mixing ratio during break-in

	During break-in	After break-in
M40D • M40DEF M50D • M50DEF	Gasoline 25 : 1 Engine oil	Gasoline 50 : 1 Engine oil
M40DEFO • M40DEFTO M40DEPO • M40DEPTO M50DEFO • M50DEFTO M50DEPO • M50DEPTO	Gasoline 50 : 1 Engine oil	Automatic (fill up engine oil tank regularly)

⚠ CAUTION - AUTO-MIXING MODELS ONLY

1. In addition to the oil in the oil tank, gasoline mixed with engine oil (mixing ratio 50 : 1) is necessary during break-in of the engine.
2. Replenish the fuel tank with pure gasoline only after the first 10 hours of break-in have passed and the tank is completely emptied.

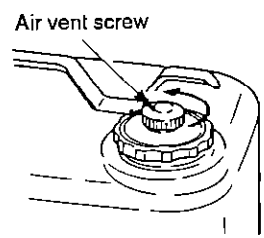
2 Starting

⚠ CAUTION

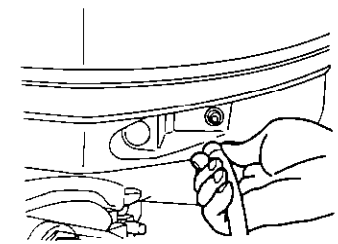
NEVER fill up portable fuel tanks on board to avoid fire or explosion resulting from spilled gasoline. If gasoline is ever spilled on board, wipe it up thoroughly. Fuel tanks must always filled up on land.

① Preparations

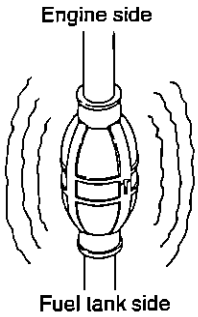
(1) Loosen the air vent screw on the fuel tank cap.



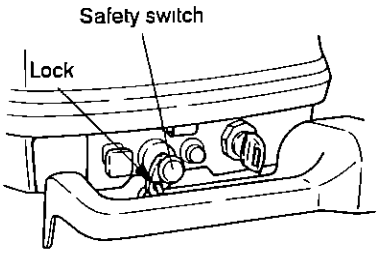
(2) Connect the fuel connector to the engine.

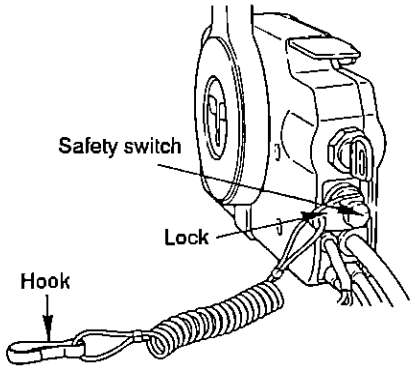


(3) Feed fuel to the carburetor by squeezing the primer bulb.



(4) Install a lock in a safety 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 from propeller injury if he is thrown overboard.
The engine will not start unless this switch has been properly connected and locked beforehand.

⚠⚠ WARNING-DAILY CHECK

Before moving out with the boat, confirm if the safety switch works normally by repeating the engine start and stop in several times.

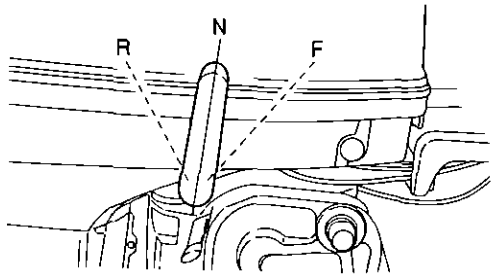
⚠ CAUTION

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.

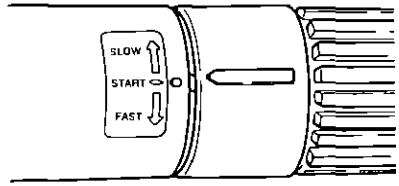
②-1. Starting M40D

A. Set the shift lever to Neutral

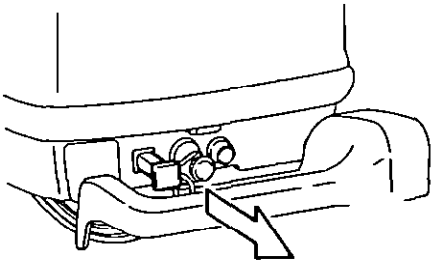
NOTE
Engine will only start when the shift lever is set to Neutral position.



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

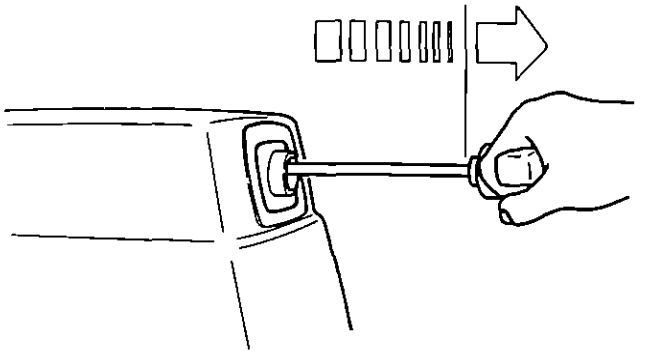


C. Pull the choke knob fully.



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.

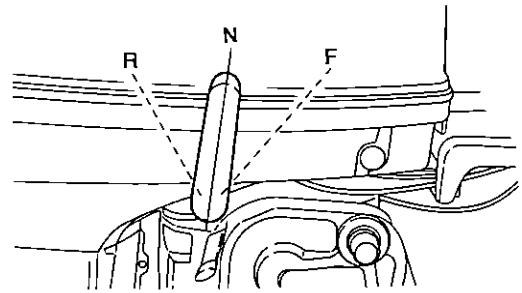
F. Push back the choke knob slowly.

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

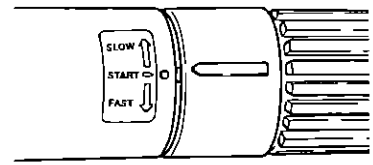
② -2. Starting M40DEF • M40DEFO • M40DEFTO
M50DEF • M50DEFO • M50DEFTO

A. Set the shift lever to Neutral

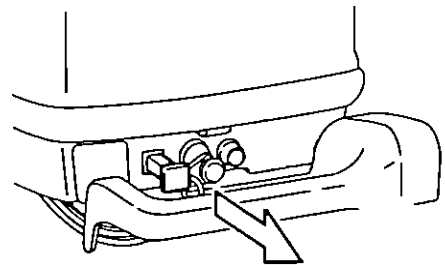
NOTE
Engine will only start when the shift lever is set to Neutral position.



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

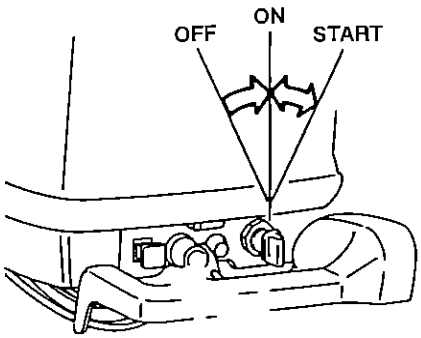


C. Pull the choke knob fully.



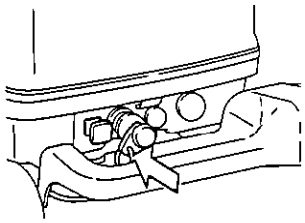
NOTE
Operation of the choke knob is not required if the engine is warm.

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

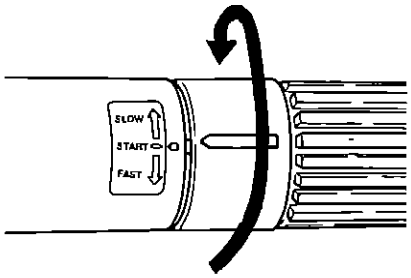


E. Release the ignition key as soon as the engine starts. The key will return to the "ON" position automatically.

F. Push back the choke knob slowly.



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



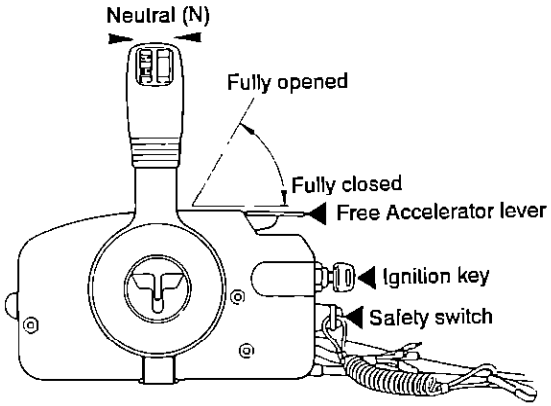
NOTES

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.

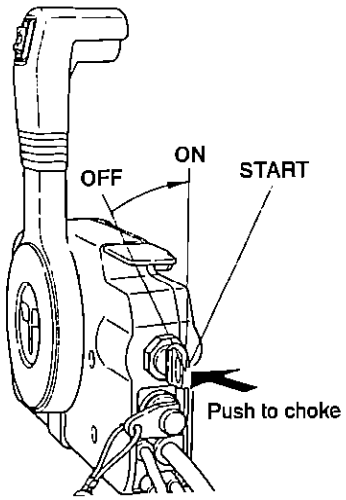
②-3. Starting M40DEPO • M40DEPTO M50DEPO • M50DEPTO

(1) Insert the key into the ignition.

(2) Set the Remote Control lever to Neutral (N), and move the accelerator lever to Open.



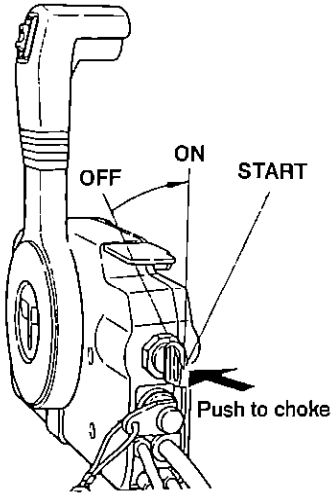
(3) Turn the ignition key to ON, and push on it for choke operation.
(The key need not be pushed if the engine is warm.)



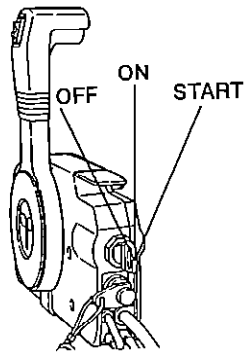
NOTE:
The free accelerator lever is inoperative unless the Remote Control lever is set to Neutral.

(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.

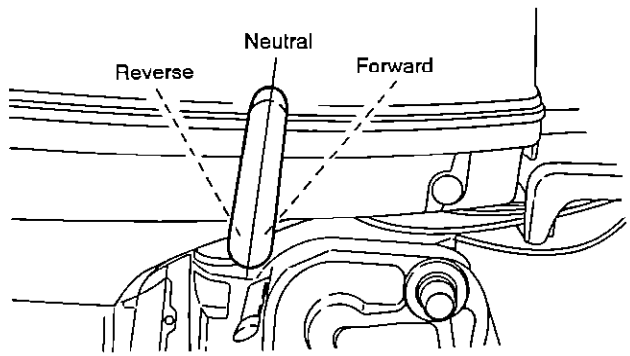


NOTES:

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.*

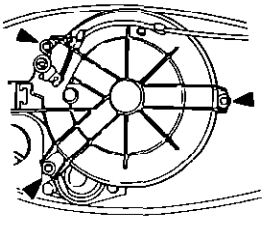
3 Manual Start - - - in case of trouble with the Recoil Starter or the Electric Starter Motor

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

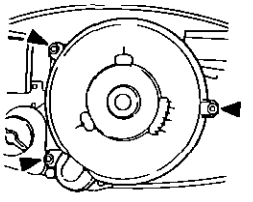


(2) Remove the Upper Engine Cover. Then,

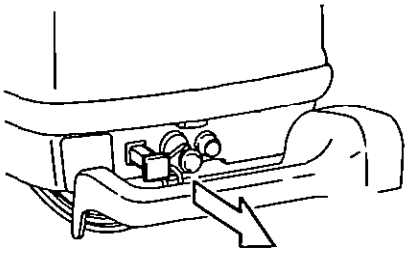
- take off the Recoil Starter Assembly
  M40D • 40DEF
  M40DEFO • M40DEFTO
  M50DEF
  M50DEFO • M50DEFTO



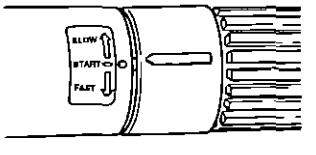
- take off the Flywheel Cover
  M40DEPO • M40DEPTO
  M50DEPO • M50DEPTO



(3) Pull the choke knob

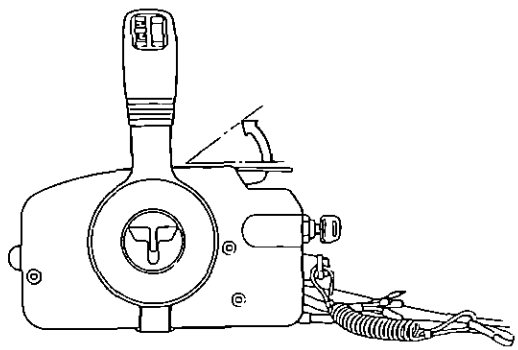


(4)-1 Turn the throttle grip so that the indicator line meets the "START" mark.
M40D • M40DEF
M40DEFO • M40DEFTO
M50DEF
M50DEFO • 50DEFTO



(4)-2 Lift up the free accelerator lever ⅓ to ½ of its stroke.

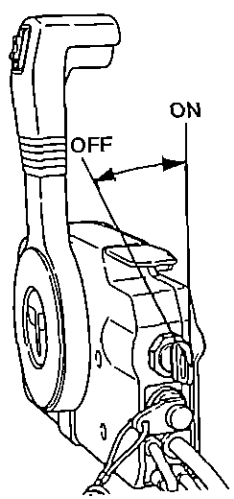
M40DEPO • M40DEPTO
M50DEPO • M50DEPTO

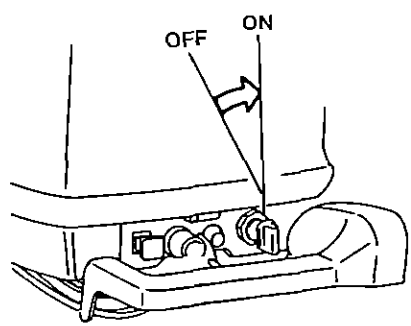


(5) Turn the ignition key to "ON"

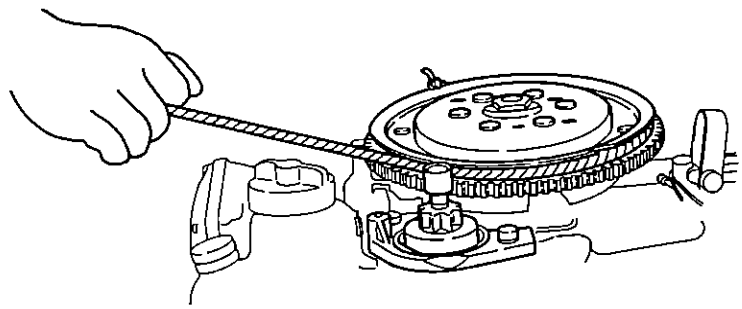
M40DEPO • M40DEPTO
M50DEPO • M50DEPTO

M40DEF • M40DEFO • M40DEFTO
M50DEF • M50DEFO • M50DEFTO





(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

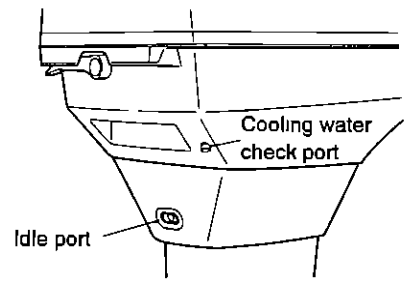
Be careful that your clothes or other items do not get caught in the rope or other engine parts.
To prevent your clothes and other items to get caught in the engine, do not reinstall the flywheel cover nor the Upper Engine Cover after the engine is started with the starter rope. In this case be sure nobody sits in the vicinity of the engine, and run carefully.
Immediately contact an authorized TOHATSU dealer when reaching shore.

4 Warm-up

Before driving the boat, let the engine run at low speed for approximately three minute 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 for warm-up operation

Clutch engaged	Clutch disengaged (reference)
650 - 700 rpm	850 - 900 rpm

Do not exceed the full-throttle engine speed

Full-throttle engine speed
M40D 4500~5500rpm, M50D 5000~5700 rpm

5 Overheat buzzer and sensor

Optional accessory -- M40DEF • M40DEFO • M40DEFTO
M40DEPO • M40DEPTO
Standard equipment -- M50DEF • M50DEFO • M50DEFTO
M50DEPO • M50DEPTO

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

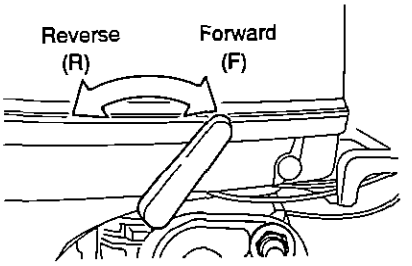
NOTE:
If the buzzer sounds frequently after restarting the engine, please contact an authorized TOHATSU service shop.

5. OPERATION

1 Forward/Reverse Running

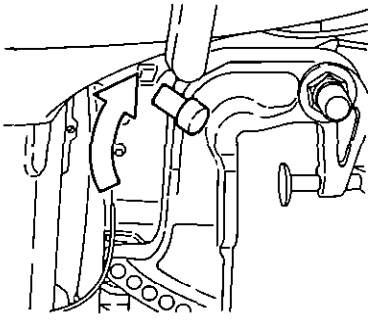
(1) M40D • M40DEF • M40DEFO • M40DEFTO
M50DEF • M50DEFO • M50DEFTO

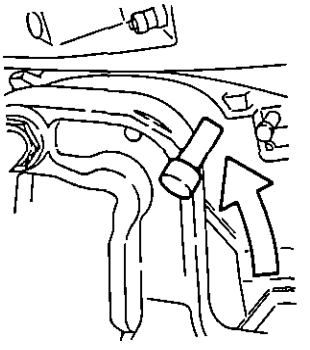
Turn the throttle grip toward "SLOW" and move the Shift Lever quickly to Forward or Reverse when the engine speed has reached the lowest r.p.m.



⚠ CAUTION

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

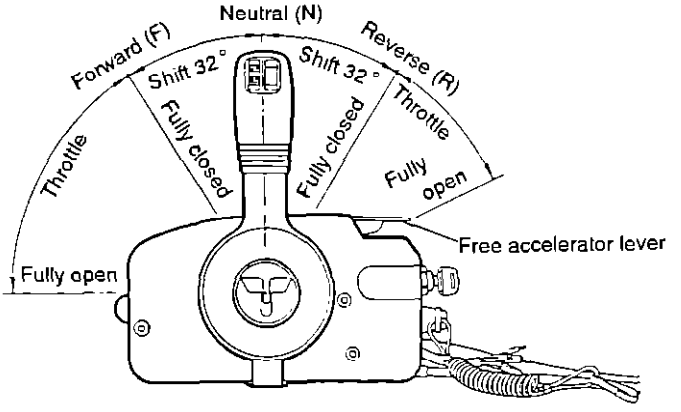




3. Do not increase the engine speed unnecessarily while reversing. To limit half throttle at max. is recommended when running to reverse.
4. The Shift Lever cannot be turned from Neutral to Reverse unless the throttle grip has been turned fully toward "SLOW".

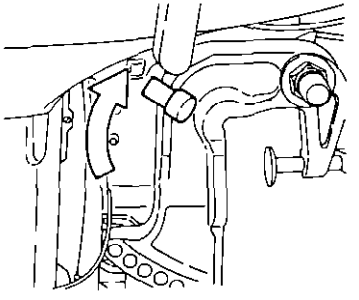
(2) M40DEPO · M40DEPTO
M50DEPO · M50DEPTO

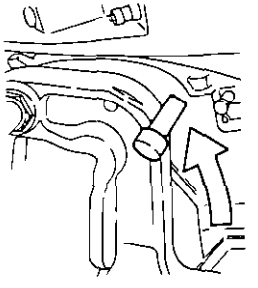
While pressing the lock button on the Remote Control lever upward, swiftly move the Lever to Forward (F) or Reverse (R) to the engaging point (approx 32° forward or backward from Neutral). If the lever is moved further forward or backward, the throttle will open.



⚠ CAUTION

1. The engine must be at idling speed when the Shift Lever is moved from Forward to Reverse, or vice versa.
2. Before movimg the Shift Lever to Reverse, make sure the Reverse Lock and the Tilt Stopper are engaged (in up position).





3. Do not increase the engine speed unnecessarily while reversing. (The throttle opening is limited to ½ while reversing.)

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

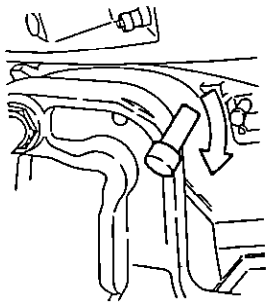
2 Shallow water running

⚠ CAUTION

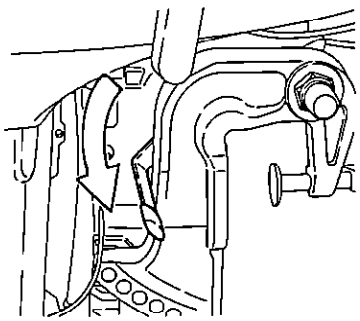
1. Run the engine at trolling speed in shallow water.
2. Pay attention that the cooling water inlet port on the gear case assembly is always below water level when running using the shallow water setting.

(1) M40D • M40DEF • M40DEFO • M40DEPO
M50DEF • D50DEFO • M50DEPO

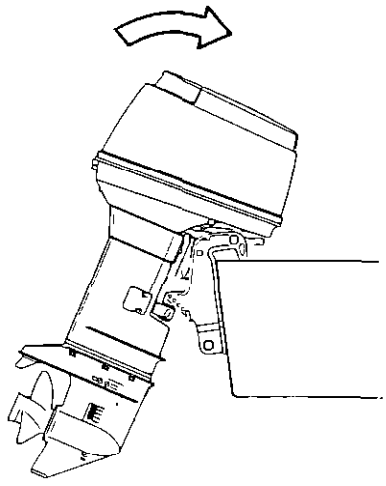
① Set the Reverse Lock Lever on the port side to "RELEASE" by turning it downward



② Set the Tilt Stopper Lever provided on the starboard side to "Release" by turning it downward.



③ Tilt the engine up approx. 45 ° and lower it. The engine will now be set to the shallow water setting.



④ Releasing the shallow water setting

a. Turn the Reverse Look Lever and the Tilt Stopper Lever upward to set them in "LOCK" position.

b. Tilt up the engine slightly and then let it go down. The shallow water setting is then released.

c. The engine is released from shallow water setting, and be locked at normal running position.

(2) M40DEFTO • M40DEPTO
M50DEFTO • M50DEPTO

Tilt up the engine using the Power Trim & Tilt system.

3 Stopping the engine

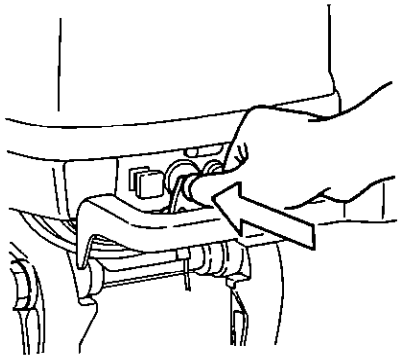
⚠ CAUTION

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) M40D

① Reduce the engine speed to idling rpm.

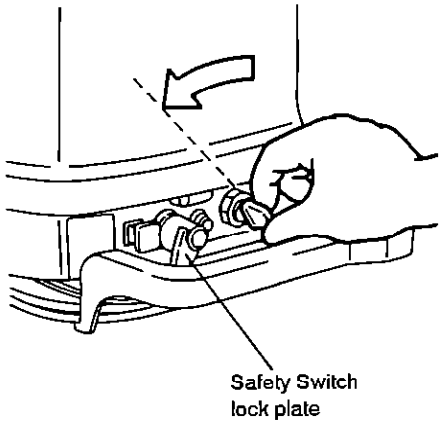
② Keep pressing on the Safety Switch or pull out the lock plate. The engine will then stop



(2) M40DEF • M40DEFO • M40DEFTO
M50DEF • M50DEFO • M50DEFTO

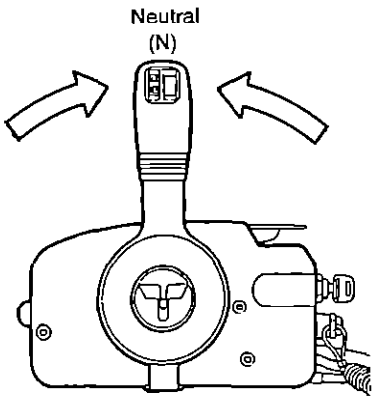
① Reduce the engine speed to idling r.p.m.

② Turn the Main Switch to "OFF", keep pressing on the Safety Switch or pull out the lock plate. The engine will then stop.

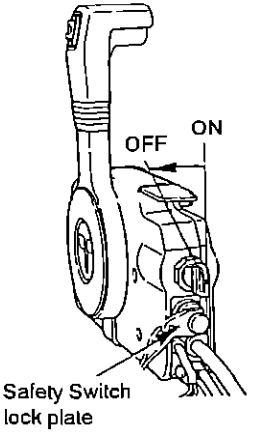


(3) M40DEPO • M40DEPTO
M50DEPO • M50DEPTO

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

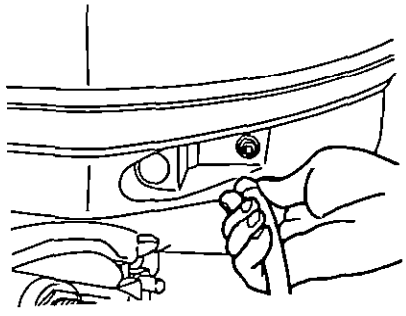


② Turn the ignition key counter-clockwise or pull out the safety switch. The engine stops.
The engine can also be stopped by pressing on the safety switch.

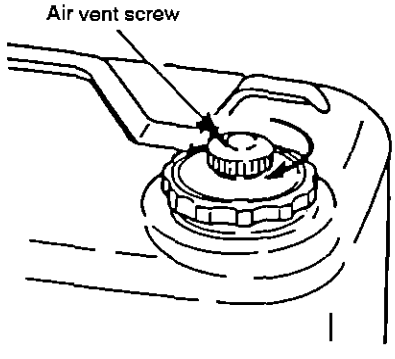


NOTES:
1 When the engine stopped, close the air vent screw on the fuel tank.
2. Disconnect the fuel connector from the engine
3. Disconnect the cables from the battery if the engine will not be used for an extended period of time.

③ Disconnect the fuel connector from the engine.



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



6. TRIM ADJUSTMENT

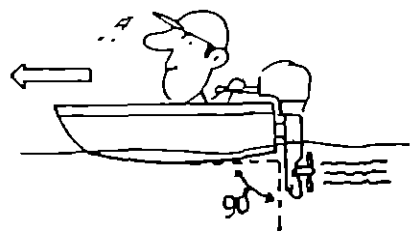
The following instructions explain how to set the best trim angle of the boat.

1 M40D • M40DEF • M40DEFO • M40DEPO
M50DEF • M50DEFO • M50DEPO

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

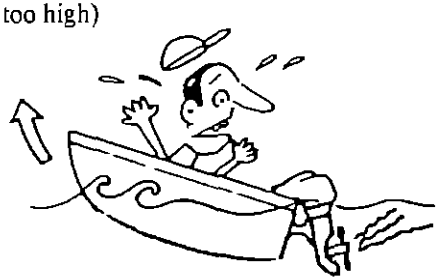
■ Proper Trim Angle

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

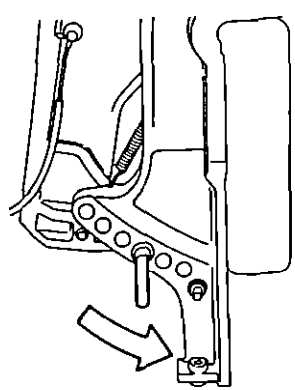


■ Improper Trim Angle (bow rises too high)

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

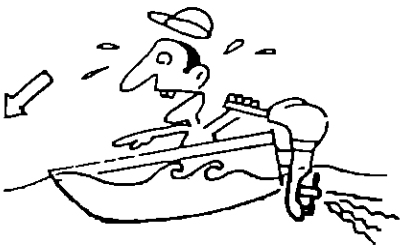


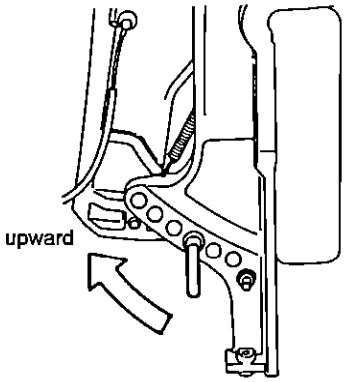
Select a lower hole

■ 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

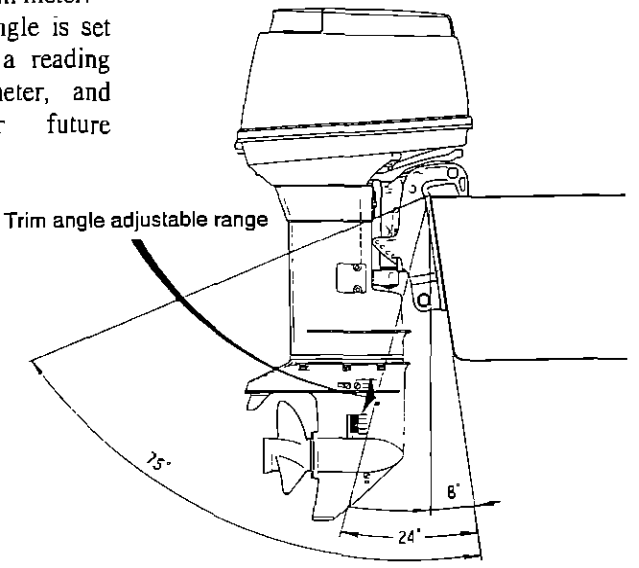
2 M40DEFTO • M40DEPTO
M50DEFTO • M50DEPTO

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.

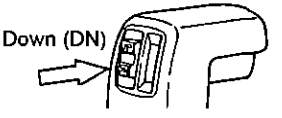
⚠ CAUTION

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

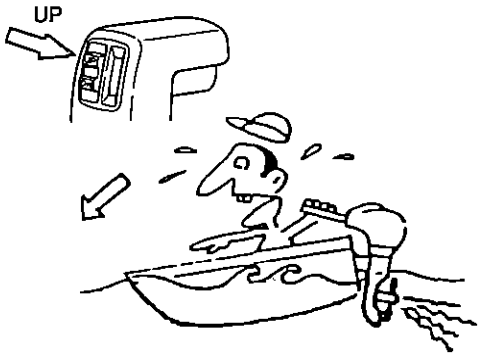


■ Improper Trim Angle (bow rises too high)
If the trim angle is excessive, the bow will rise out of the water and the speed will decrease.
Furthermore, the bow may sway or the bottom may slam the water while cruising.
In this case, decrease the trim angle by flicking the switch on the Remote Control 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

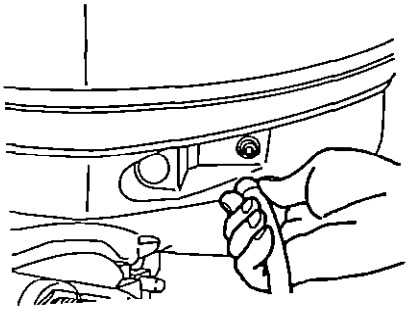
The trim angle is optimum when the boat is parallel to the water surface while running.

7. MOORING WITH THE ENGINE TILTED UP

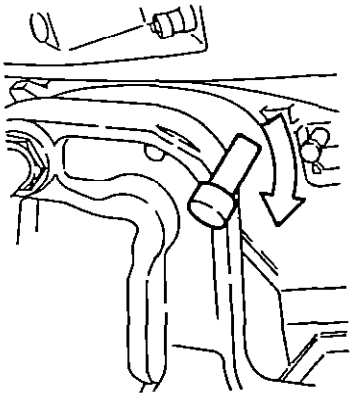
When the engine has been stopped and it will not be used for a long time or when mooring in shallow water, tilt the engine up to prevent damage on the propeller and gear case.

(1) M40D • M40DEF • M40DEFO • M40DEPO
M50DEF • M50DEFO • M50DEPO

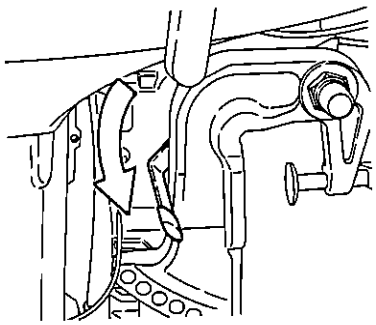
① Disconnect the fuel connector from the engine.



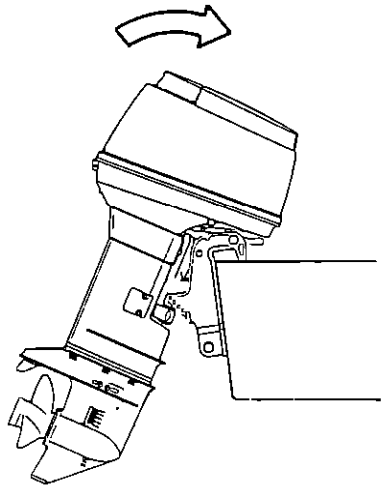
② Set the Reverse Lock Lever on the port side to "RELEASE" by turning it downward.



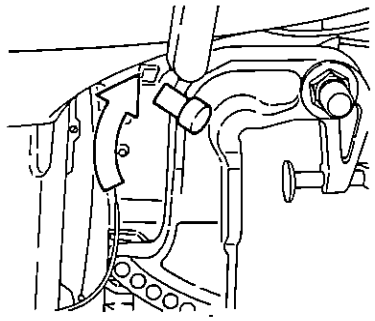
③ Set the Tilt Stopper Lever on the starboard side to "RELEASE" by turning it downward.



④ Tilt the engine up entirely. The tilt will lock in the raised position.

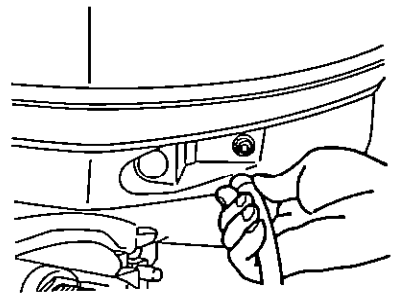


⑤ To tilt the engine down. Turn the Tilt Stopper Lever upward (toward "LOCK"). Tilt the engine up slightly and then let it go down. (The Reverse Lock will be set automatically.)

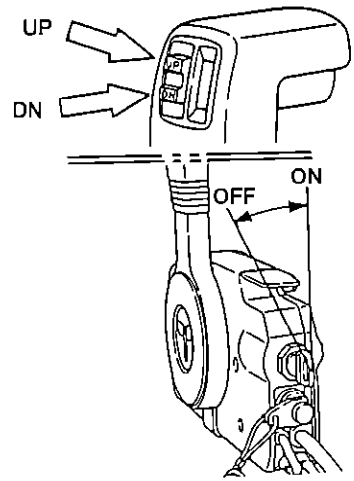


(2) M40DEFTO • M40DEPTO
M50DEFTO • M50DEPTO

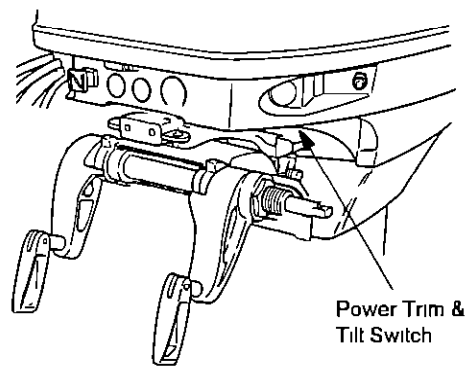
① Disconnect the fuel connector from the engine.



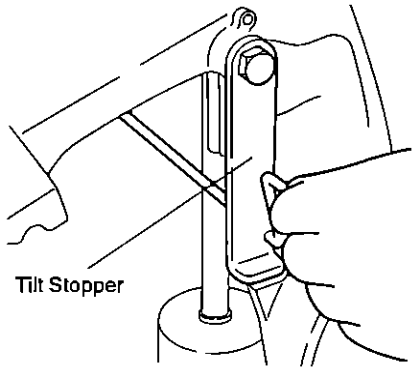
② Operate the Power Trim & Tilt switch on the Remote Control Lever and tilt the engine up. (The Main Switch must be "ON".)



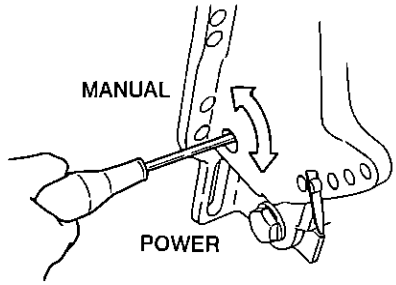
③ The engine can also be tilted up using the switch provided under the Lower Engine Cover. (The Main Switch need not be turned "ON" in this case)



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.



⚠ CAUTION

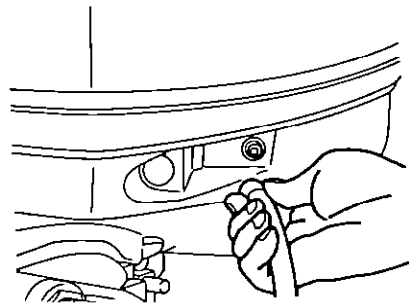
Screw the manual valve fully (20 ~ 30 kg-cm 17.4 ~ 26 in-lb).
Pressurized oil in the reservoir tank may spurt out.

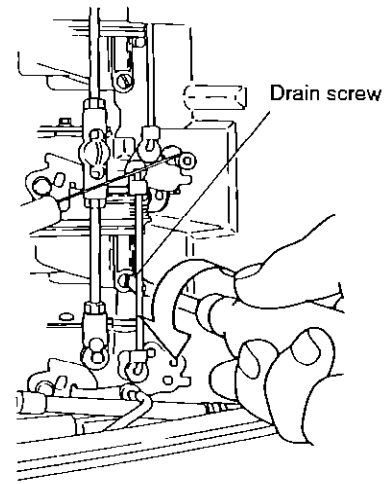
8. DISMOUNTING THE ENGINE FROM THE BOAT

① Stop the engine, disconnect the fuel connector and loosen the drain screws on the carburetors to discharge fuel from them.

⚠ CAUTION

Beware of explosion danger. Spilled and vapored 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.

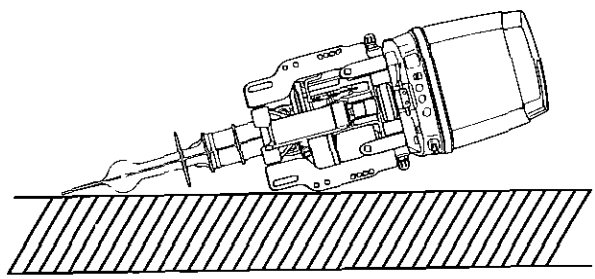




② Disconnect the Steering Cable, the Remote Control Cables, the electrical cables and the battery cables.

③ Remove the engine from the boat. Keep the engine in an upright position until water stops dripping from the gear case
Always carry the engine at a higher position than the propeller when carrying the unit.

④ 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.

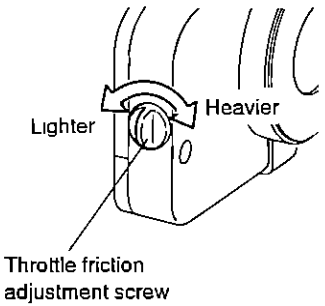


9. ADJUSTMENT

1 Remote Control Lever Load (M40DEPO • M40DEPTO)

(Throttle friction adjustment screw)

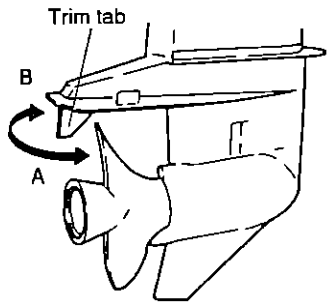
To adjust the load of the Remote Control Lever, turn the throttle friction adjustment screw on the front of the Remote Control Box. Turn clockwise to increase the load and counter-clockwise to decrease it.

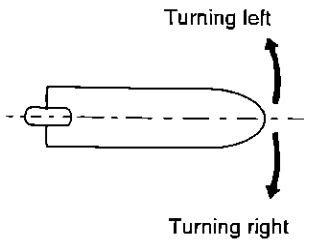


2 Trim Tab Adjustment

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

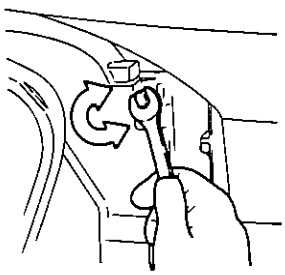
Steering load can be adjusted by turning the steering adjust bolt on the Swivel Bracket.

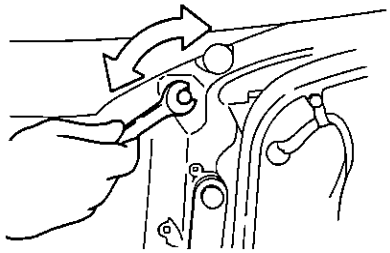
Turn clockwise to increase the load

Turn counter-clockwise to decrease the load

M40D • M40DEF
M40DEFO • M40DEPO
M50DEF
M50DEFO • M50DEPO

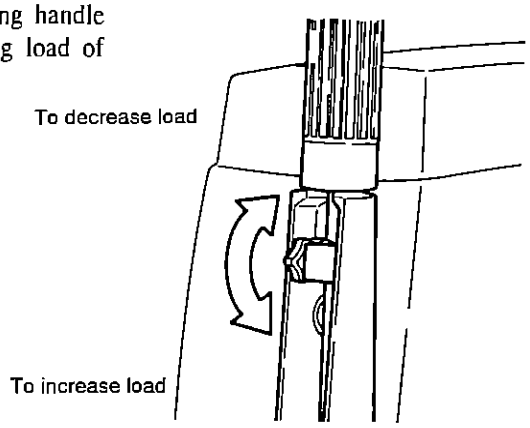
M40DEFTO • M40DEPTO
M50DEFTO • M50DEPTO





4 Throttle Grip Turning Load Adjustment

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



10. INSPECTION AND MAINTENANCE

Perform the following checks and inspection before and after use.

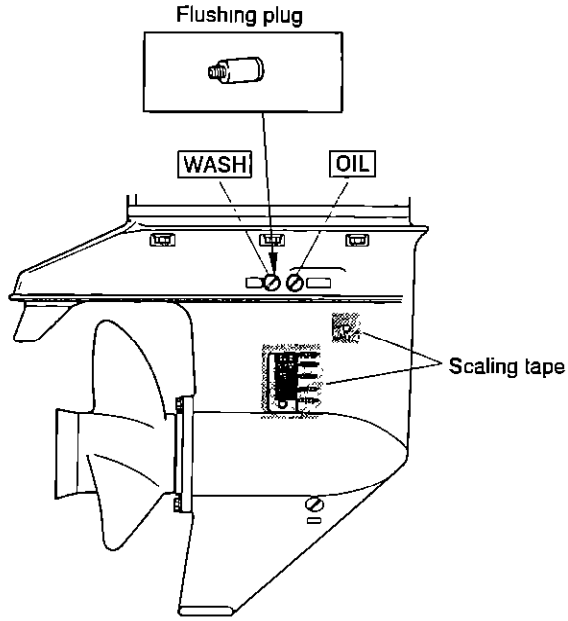
1 Daily Inspection

Item	Check	What to do
Fuel System	● Check the amount of fuel in the tank. ● Dust or water in the fuel filter.	Replenish Clean
Lubrication System	● Check the amount of engine oil in the oil tank. ● Dust or water in the oil filter.	Replenish Clean
Electrical Equipment	● Check the spark plugs for dirt, wear and carbon built-up. Spark plugs M40D: NGK B-7HS-10 or CHAMPION L-82C (1.0 mm gap) Spark plugs M50D: NGK B-8HS-10 or CHAMPION L-78C (1.0 mm gap)	Clean or replace
	● Check if the ignition switch functions normally.	Remedy or replace
	● Check if the battery electrolyte level and specific gravity are normal.	Replenish or recharge
	● Check for loose connections on battery terminal.	Retighten
	● Check if the safety switch functions normally and make sure the lock plate is present.	Remedy or replace
Throttle System	● Check if the choke solenoid for the carburetor works normally.	Replace
Clutch and Propeller System	● Check if the clutch engages correctly when operating the Remote Control.	Adjust
	● Check the propeller for bent or damaged blades. ● Check if the propeller nut is tightened and the split pin is present.	Replace
Others	● Check the anode for wear and/or deformation.	Tighten or replace
	● Check if the bolts on the stern bracket are securety tightened.	Tighten
	● Check if cooling water is discharged from the cooling water check port.	Remove clogging

■ 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.

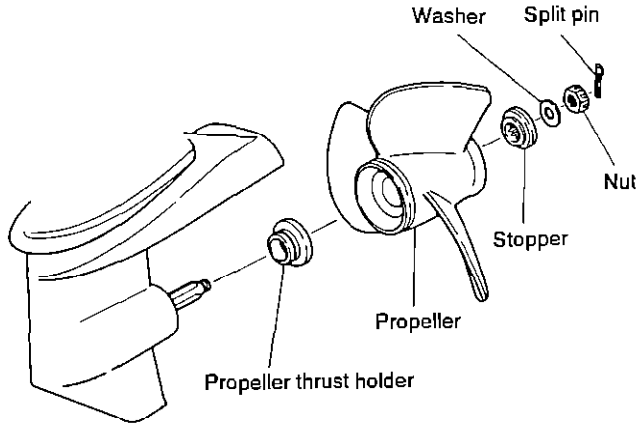
Run the engine at low speed with the Remote Control lever set to Neutral to flush out fresh water from the cooling system and in the process remove salt, mud and other foreign particles.

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.

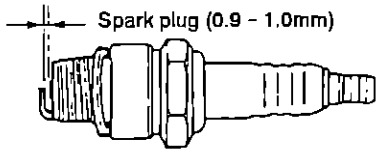
1. Pull out the split pin and remove the propeller nut and washer.
2. Remove the propeller by pulling toward you.
3. Apply genuine TOHATSU grease to the propeller shaft before mounting the new propeller
4. Fit the washer, securely tighten the nut and insert the split pin.



⚠ 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

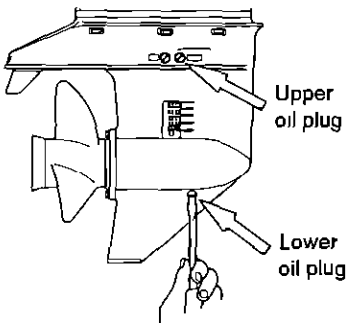
For periodic servicing, please contact your local Tohatsu dealer.

Item		Servicing Interval							What to do	Remarks
		Every 10 hours or 2 weeks	Every 30 hours or 1 month	Every 50 hours or 3 months	Every 100 hours or 6 months	Every year	Every 18 months	Every 2 years		
Fuel System	Carbu-retor *	○			○	○	○		Strip,clean and adjust. * idling adjustment.	
	Filter	○	○	○	○	○	○	○	Check and clean.	
	Piping	○	○	○	○	○	○	○	Check and clean.	
	Fuel tank			○	○	○	○	○	Clean	
Ignition	Spark plugs	○	○		○	○	○	○	Check gaps. Remove carbon deposits.	0.9 – 1.0mm
	Ignition timing			○	○	○	○	○	Adjust the timing.	
Starting System	Starter motor	○	○	○	○	○	○	○	Check for salt deposits and battery cable condition.	

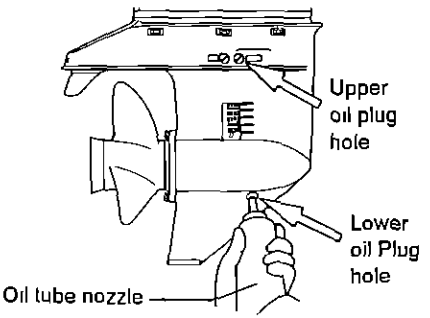
Lower System	Pro-peller	○	○	○	○	○	○	○	Check for bending. damage and blade wear.	
	Gear oil	○ Replace		○	○	○ Replace	○	○ Replace	Replenish or change if required. Check for water entry.	TOHATSU gear oil 500cc
Bolt and Nuts		○	○	○		○			Tighten properly.	
Sliding and Rotating Parts. Grease Nipples		○	○	○	○	○	○	○	Apply and pump in grease.	
Power Trim & Tilt		○			○	○	○	○	Check the power unit oil and refill. Check function of manual release valve.	
Engine Oil System	Oil tank	○			○	○	○	○	Check for leakage. damage, position of clips and filter conditions.	
	Oil pipe									
	Oil filter									

3 Changing Gear Oil

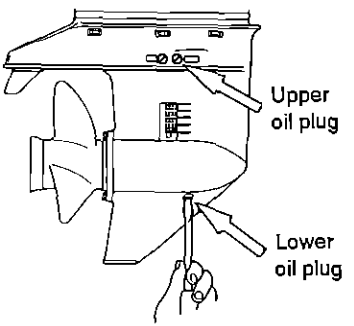
① Remove the oil plugs (upper and lower), and drain the gear oil completely.



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.

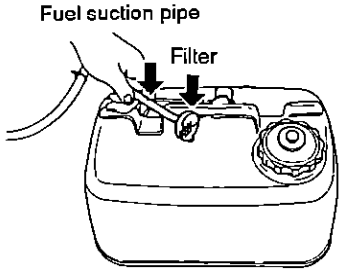


NOTE
Use only genuine TOHATSU gear oil or, if not available, an API (American Petroleum Institute) oil grade of GL5, or SAE #80 or SAE #80W. *Required volume: approx. 500cc (16.89 U.S. fluid oz)*

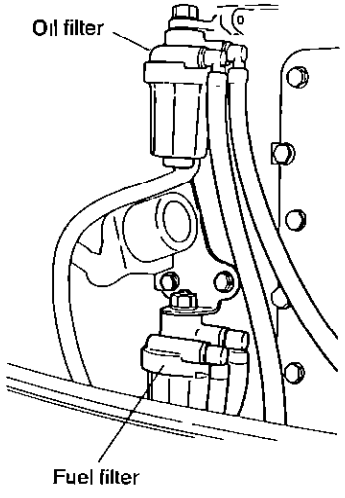
4 Cleaning the Filters

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

1. Remove the fuel tank housing by loosening the four screws. Then clean the fuel filter.



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

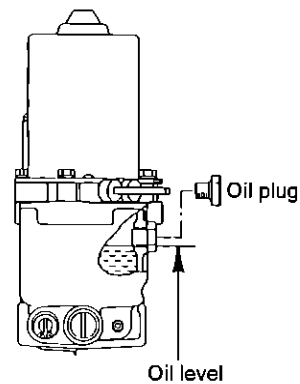


② Oil filter and oil tank. Check the oil tank and/or filter for entrapped water and dust.

1. Disconnect all pipes between the oil tank and oil pump of the outboar engine.
2. Clean out foreigh 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 page 35.

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



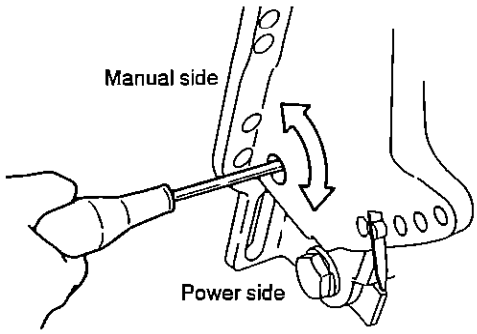
⚠ CAUTION

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 of Automatic Transmission Fluid (ATF DEXRON) is recommended. As shipped from the factory, NISSEKI ATF DEXRON oil has been used. To prevent oil gelling, do not mix with another brand. Drain the oil completely if another oil brand is to be used.

③ Air purging from the Power Trim and Tilt unit.

Entrapped air in the Power Tilt & 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.



11. WINTER STORAGE

When the boating season is over, this is good opportunity to have your engine serviced and overhauled by a TOHATSU service shop.

1 Engine

① Wash the engine exterior and flush the cooling water system thoroughly with fresh water. Let the water drain completely.
Wipe off 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 will be generated, causing the float valve to stick

③ Remove the spark plugs and feed TOHATSU Engine Oil. "SUPER GOLD" brand or storage fogging oil through the spark plug holes.
Storage fogging oil will be fed into the crank chamber from the air silencer attached to the carburetors, Turn the engine over several times while feeding oil into it to make sure it is evenly distributed.

④ Drain all oil from the engine oil tank and the engine oil filter cup. Clean the filer element with kerosene or a special cleaning liquid before storage. Otherwise the oil in the cup will deteriorate over the winter.

⑤ Apply grease to the propeller shaft.

⑥ Change the gear oil in the gear oil assembly.

⑦ Apply grease to all sliding parts, joints, bolts and nuts.

⑧ Use a dry cloth to completely wipe off water and salt from the electrical components.

⑨ Attach the upper engine cover, and then stand the engine vertically in a dry place.

2 Battery

① Disconnect the battery cables

② Clean the battery exterior with fresh water or compressed air. Wipe off sulfate, dirt and grease from the battery.

③ Apply grease or vaseline to the battery terminals.

④ Charge the battery completely before putting it away for the winter.

⑤ Recharge the battery once a month to prevent electric discharging and degradation of the electrolyte.

⑥ Store the battery with its cover attached in a dry place.

3 Electric Starter Motor

① Apply grease to the shaft and pinion gear of the electric starter motor.

12. PRE-SEASON CHECK

Have a TOHATSU service shop check the engine before the season starts.
If you would like to start using the engine without this check-up, at least be sure to check the following items yourself:

① Check the electrolyte level and specific gravity of the battery.
Measure the battery voltage and specific gravity of the battery.

Specific Gravity st 20℃	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	Full 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 with 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 taking the engine into use after winter storage.

1. In addition to the oil in the oil tank, use fuel and engine oil with the following mixing ratio and fill up the fuel tank completely with 22.7 liters (6 U.S. gal.):
   Mixing ratio: 50:1
   Use Premium (Super) gasoline and genuine TOHATSU Outboard Moter Oil. If this oil is not available, use another NMMA TC-WII certified Outboard Motor Oil from another manufacturer.
2. Warm up the engine for 3 minutes while keeping the Remote Control lever at Neutral.
3. Run the engine for 5 minutes at slow speed
4. Run the engine for 10 minutes at half speed.
   In steps 2 and 3 above, the oil used for winter storage inside the engine will be cleaned out, and optimum performance will be assured.
5. Air purge the oil filter assembly.
6. When the full volume, 22.7 liters (6 U.S. gal.), of gasoline mixed with oil has been used, fill up the tank with pure gasoline only.

If the above caution is not followed, SERIOUS DAMAGE may result on pistons, piston rings, bearings, and other parts.

13. IF THE ENGINE BECOMES SUBMERGED IN WATER

In case the engine becomes completely submerged in water, take the following counter-measures before handing it in for service at you TOHATSU service shop.

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 plentiful of TOHATSU engine oil "SUPER GOLD" brand 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 might be possible to start the engine. However, the electrical components and carburetors will soon deteriorate and become inoperative. Therefore, be sure to have the engine overhauled by a TOHATSU service shop as soon as possible.

14. 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 safety switch lock plate taken away to allow the water to drain completely.

15. 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 local TOHATSU 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	Ab-normally high engine speed	Ab-normally low engine speed	Cannot obtain high engine speeds	Over-heating of engine	Power Trim & Tilt inopera-tive	
●	●		●						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 carburator adjustment
●	●	●	●			●	●		Recirculation pipe broken
●	●	●	●		●	●	●		Use of non-specified spark plugs
●	●	●	●		●	●			Dirt or carbon deposits on spark plugs
●	●	●	●		●	●			No sparks or weak sparks
			●		●	●	●		Insuificient 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 inopera-tive	
		●		●	●	●	●		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

16. ACCESSORIES

Name			Remark
Servicing Tools	Tool Bag	1	
	Socket Wrench (21mm)	1	
	Socket Wrench (10 x 13)	1	
	Socket Wrench Handle	1	
	Pliers	1	
	Screwdriver (Phillips-type and flat head)	1	Adapter-type
Spare Parts	Emergency starter rope (1,600mm)	1	
	Spark Plug	2	NGK B7HS-10 M40D
		2	NGK B8HS-10 M50D
	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	RC 5A or RC 5B for M40DEPO
	Drag Link	1	M40DEPO
	Tachometer	1	M40DEPTO
	Trim meter	1	(M40DEPTO, M50DEPTO only) M50DEPO M50DEPTO
	Lead Wire for Meter	1	

17. PROPELLER SELECTION

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

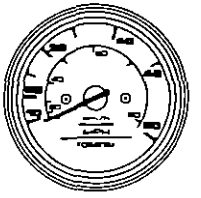
Heavier Load

Mark	Standard propeller on the model
※ 7	
8.5	
9	
10	
11	
12	M40D "LL" and "UL" transom
C 12.5	M40D "S" and "L" transom, M50D "LL" and "UL" transom
13	
C 13.5	M50D "S" and "L" transom
14	
C 14.5	

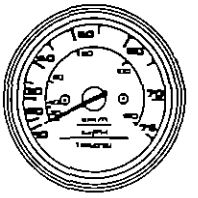
Lighter Load

NOTE: "※"shows propeller with four blades.

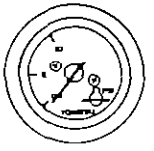
18. OPTIONAL ACCESSORIES



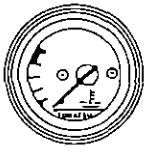
1. Speedometer (50MPH)



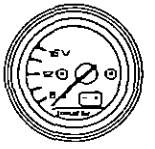
2. Speedometer (75MPH)



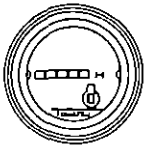
3. water Pressure Meter



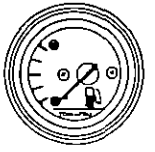
4. Water Temperature Meter



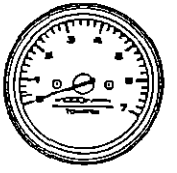
5. Voltmeter



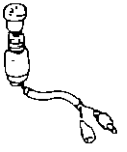
6. Hour Meter (engine operation hour counter)



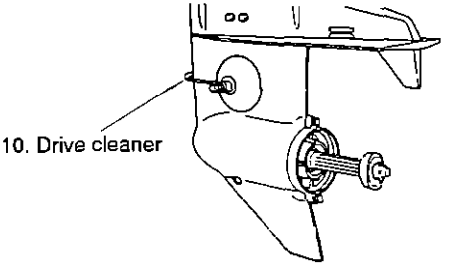
7. Fuel Meter

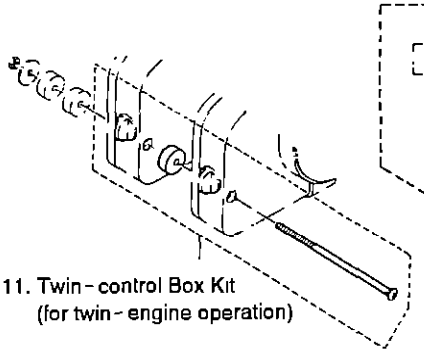


8. Tachometer

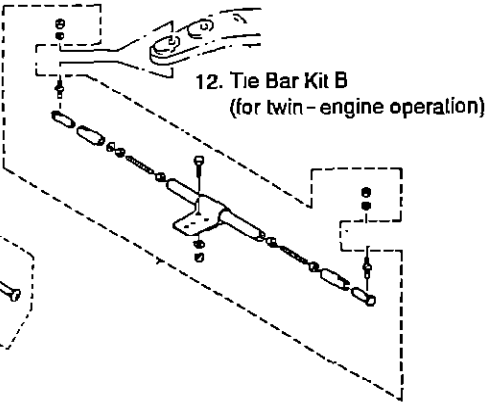


9. Meter Lamp Switch

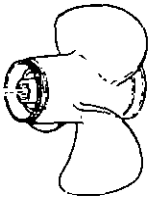




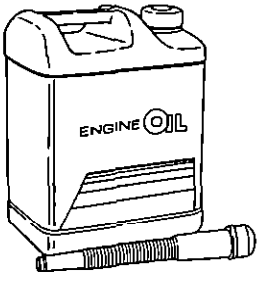
11. Twin-control Box Kit
(for twin-engine operation)



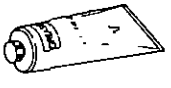
12. Tie Bar Kit B
(for twin-engine operation)



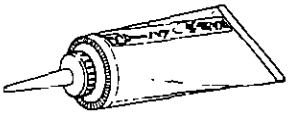
13. Propeller



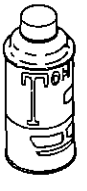
14. TOHATSU Engine Oil "SUPER GOLD"
brand 5 liters (1.3 U.S. gallons)



15. TOHATSU Grease
(50g, 250g)



16. TOHATSU Gear Oil
(260cc, 500)



17. Touch-up Spray

19. WIRING DIAGRAM

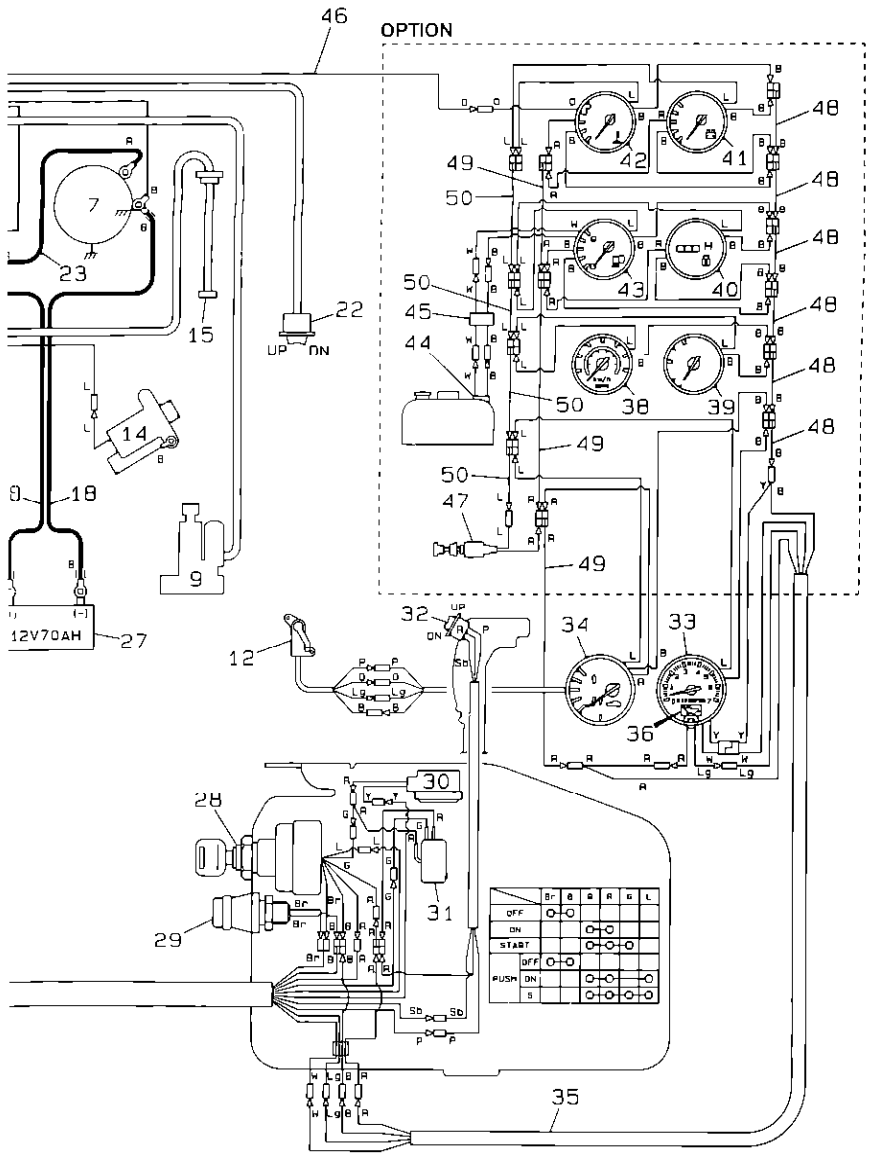
1 Pulser coil assembly
2 Alternator
3 Exciter coil
4 C.D. unit
5 Ignition coil
6 Rectifier complete
7 Starter motor
8 Starter solenoid
9 Power trim & tilt
10 Power trim & tilt solenoid switch A
11 Power trim & tilt solenoid switch B
12 Trim sender
13 Fuse
14 Choke solenoid
15 Oil level sensor
16 Over 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 Safety 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)

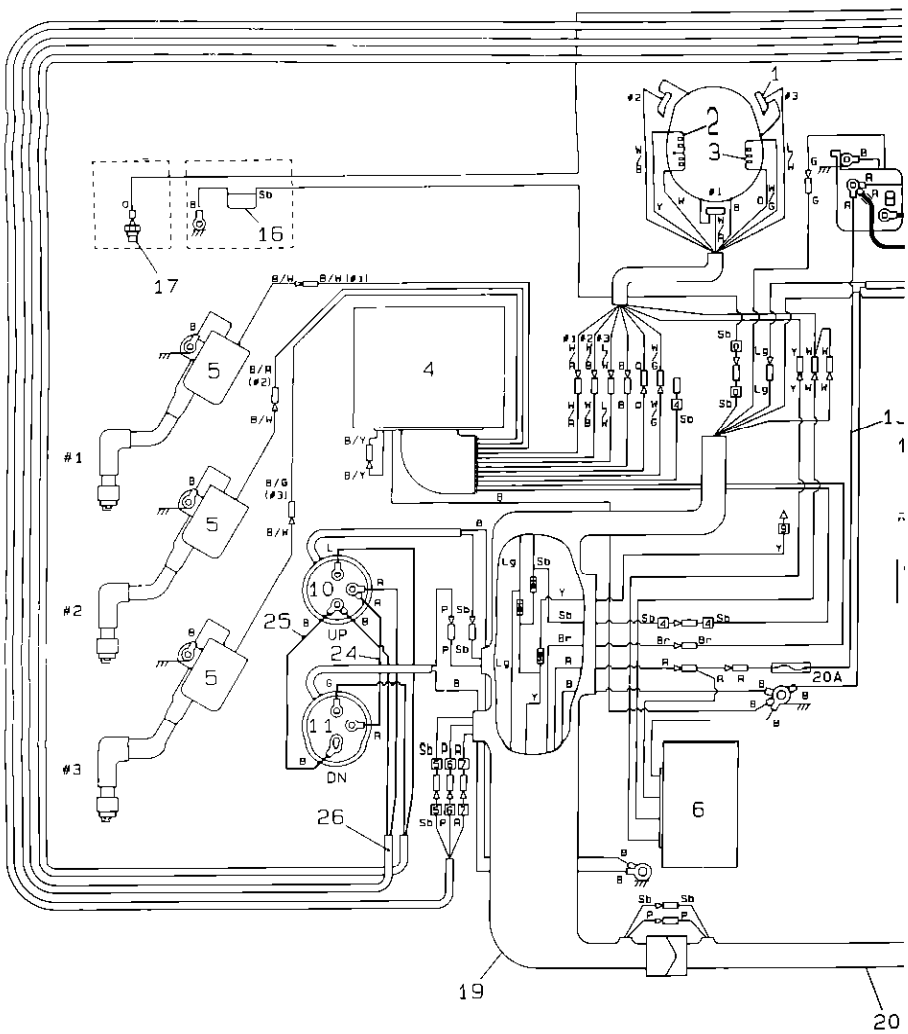
Abbreviation of color of lead

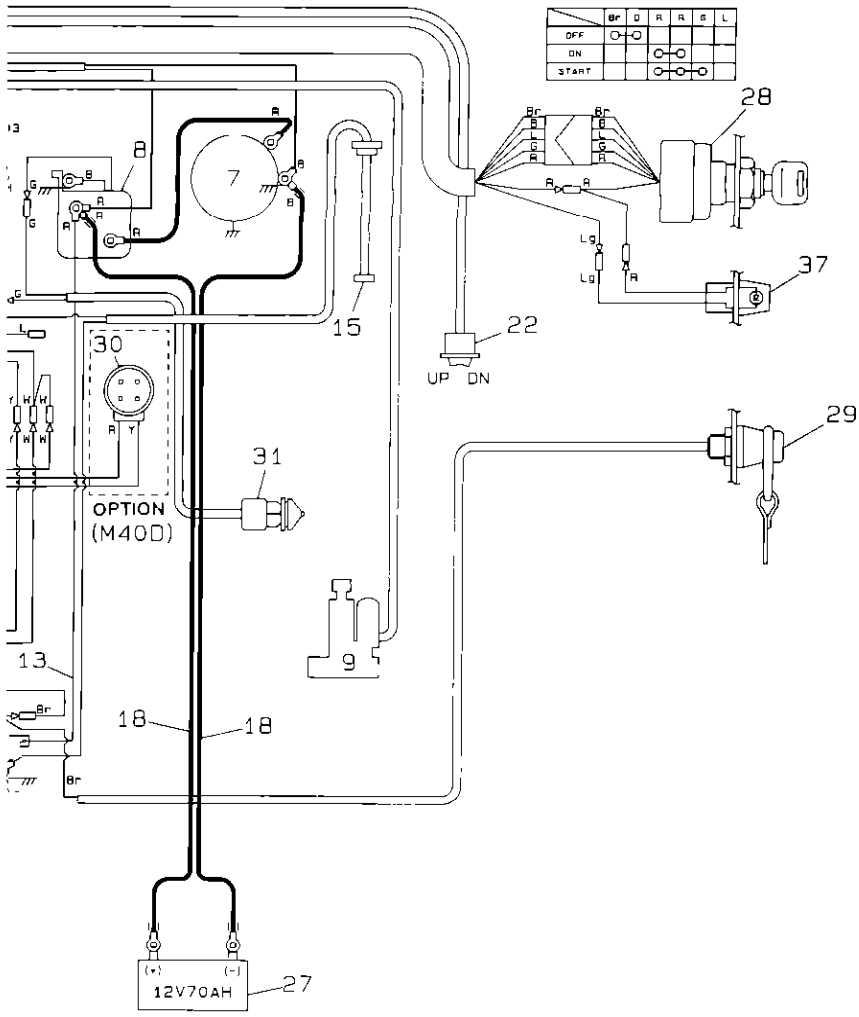
B : black
Br : brown
G : green
Lg : light green
O : orange
P : pink
R : red
Sb : Sky blue
W : white
Y : yellow
L : blu

Note: (/) shows striped color

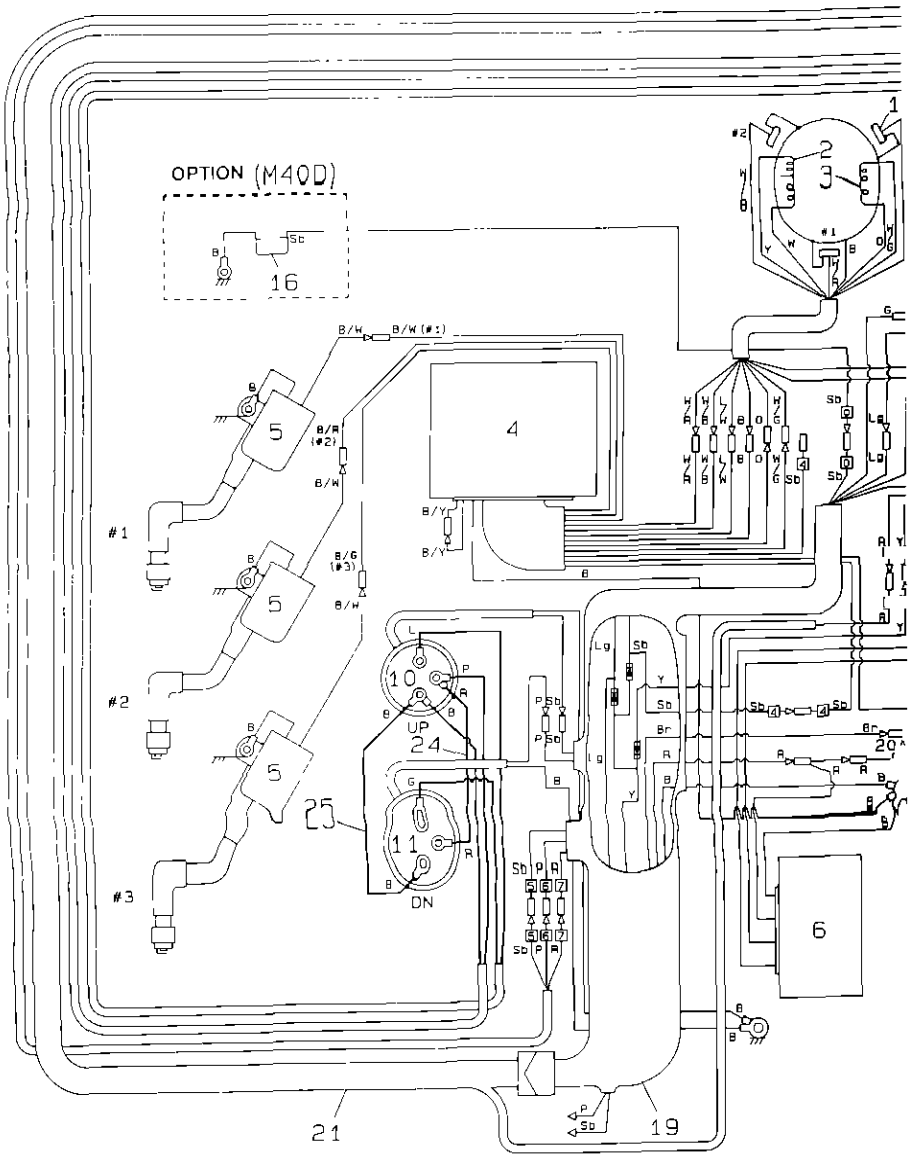

OPTION
46
48
49
50
45
44
47
42
41
43
40
38
39
7
23
15
22
UP
DN
14
18
9
12V70AH
27
12
32
UP
DN
34
33
36
30
28
29
31
35
OFF
ON
START
OFF
PUSH
ON

MODEL : EPO • EPTO




OFF
ON
START
28
37
22
UP DN
29
15
30
31
OPTION
(M40D)
9
13
18
18
12V70AH
27

MODEL : F • EF • EFO • EFTO



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