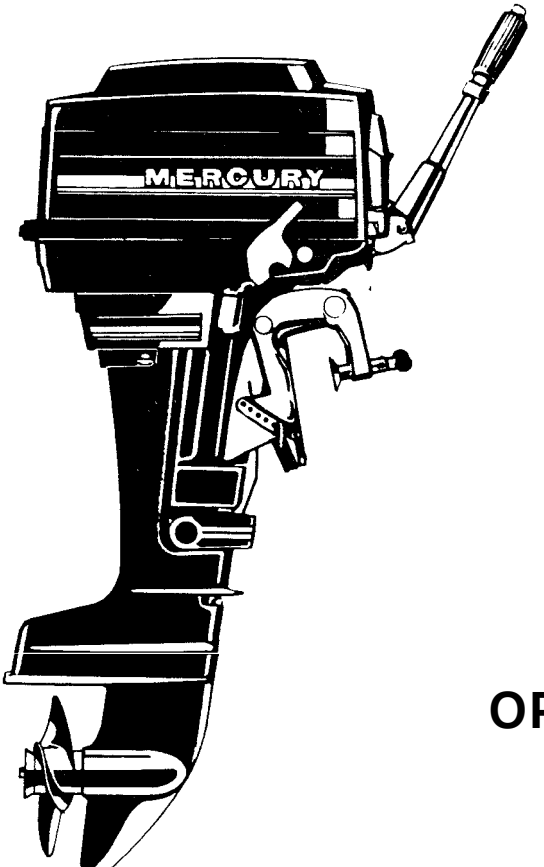


MERCURY

MERC
4.5 • 7.5
9.8

OPERATION AND MAINTENANCE MANUAL

90-99865 (ENGLISH)

GENERAL INFORMATION

IMPORTANT OWNER IDENTIFICATION and REGISTRATION INFORMATION

It is essential that your selling dealer fills out the Motor Registration Card completely and mails it to the Branch/Distributor immediately upon sale of the new product. It identifies name and address of the original purchaser, product model and serial number, date of sale, type of use and selling dealer's code, his name and address. The dealer also certifies that you are the original purchaser and user of the product.

See Warranty Policy and information on outside back cover of this book.

IMPORTANT: Read this book carefully and thoroughly, particularly SAFETY WARNING, CAUTION and IMPORTANT information in bold type, such as this paragraph.

DIRECTIONAL REFERENCES

All directional references are given as they appear when viewing boat from stern, looking toward bow.

SERIAL NUMBER

The serial number is stamped into the serial number plate on the swivel bracket. This number is the manufacturer's key to numerous engineering details which apply to your motor. When ordering parts, accessories and tools, or when corrrsponding with the dealer in regard to service matters, always specify model and serial number.

MERCURY MARINE
DIVISION OF BRUNSWICK CORPORATION
FOND DU LAC, WISCONSIN 54935 U.S.A.

MARINE POWER - EUROPE
DIVISION OF BRUNSWICK S.A.
PETIT-RECHAIN, BELGIUM

MERCURY MARINE LTD.
MISSISSAUGA, ONTARIO
CANADA

MERCURY MARINE PTY. LTD.
DANDENONG, VICTORIA 3175
AUSTRALIA

PERIODIC CHECKUP

After 20 hours, an inspection should be performed by an Authorized Outboard Dealer at local rates and paid for by the owner.

After the 20-hour check, your outboard should be taken to an Authorized Dealer every 100 hours of operation - or at least once each year - for lube changr, tuneup, etc.

To find the Authorized Service facilities in your locality, or when traveling, refer to the classified or yellow pages in the local telephone directory under "Outboard Motors" or "Marine Engines."

This owner's publication includes operation and service instructions. If disassembly or replacement, particularly of internal parts, is required, the owner is advised to see an Authorized Service Dealer and not to attempt the repair work himself.

SPECIFICAPIONS

	Merc 9.8-7.5	Merc 4.5
Bore	50.8mm (2.00")	50.8mm (2.00")
Stroke	44.5mm (1-3/4")	44.5mm (1-3/4")
Piston Displacement	180cc (11 Cu. In.)	90cc (5.5 Cu. In.)
Recommended Spark Plug	Champion QL-77M	Champion QL-78V
Spark Plug Gap	1.02mm (.040")	

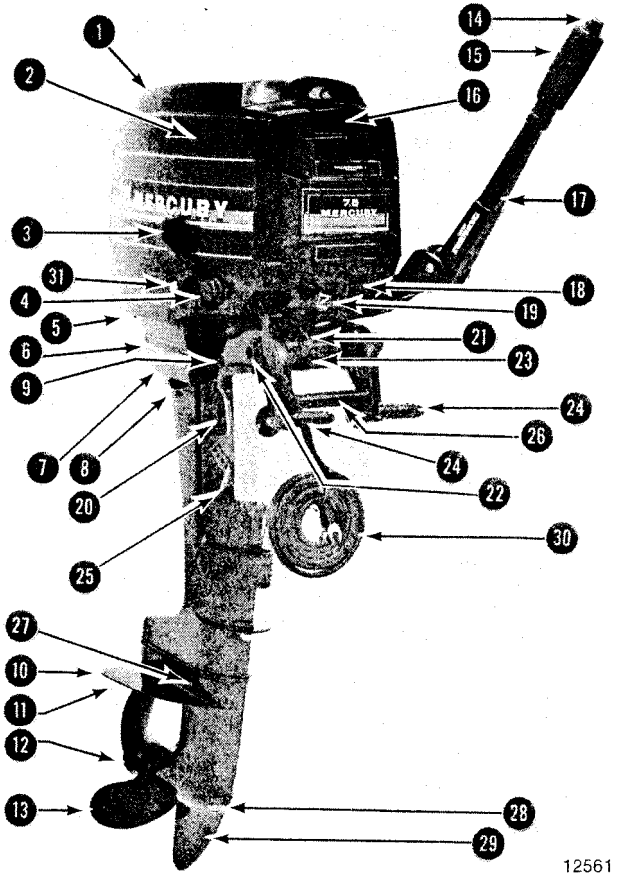
	Merc 9.8	Merc 7.5	Merc 4.5
Crankshaft Horsepower ①	9.8	7.5	4.5
Propshaft kilowatts ②	6.0	4.8	2.6
RPM Range	4500-5500		
Fuel Tank Capacity*			
Liters	11-1/11.	11-1/4	11-1/4
Imperial Gals.	2-1/2	2-1/2	2-1/2
U.S. Gallons	3	3	3

* Additional capacity for oil included.

① Horsepower measured on run-in engines at the crankshaft technically in accordance with BIA 310-77.

② Measured at the propshaft in accordance with ICOMIA 28.

Printed in U.S.A.



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1 2-Cyl. Merc 7.5E Shawn

1 - Tilt Handle
2 - Cowling
3 - Shift Lever
4 - Stop Button
5 - Cowl Release Lever
6 - Trim Cover
7 - Exhaust Relief Outlet
8 - Flushing Plug Screw
9 - Tilt Stop Lever
10 - Anti-Cavitation Plate
11 - Water Intake
12 - Jet Prop Exhaust
13 - Propeller
14 - Troll Set
15 - Twist Grip Throttle
16 - Starter Handle
17 - Steering Handle
18 - Fuel Connector
19 - Choke Knob
20 - Serial Number Plate
21 - Troll Lever
22 - Tilt Tube
23 - Carrying Handle
24 - Thumb Screw
25 - Tilt Lock Pin
26 - Clamp/Swivel Bracket
27 - Lubricant Vent Screw
28 - Lubricant Fill Plug
29 - Skeg
30 - Electrical Harness
31 - Electric Start Button

MOTOR INSTALLATION

OUTBOARD MOTOR MOUNTING

SAFETY WARNING: Before operating motor, it is advisable to bolt the motor to the transom. During operation, clamp screws should be checked occasionally for tightness on the transom. Failure to bolt motor to transom may result in damage to boat, loss of motor and possible injury to occupants of boat.

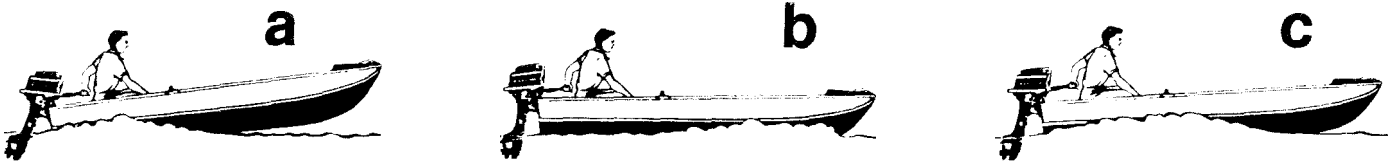
Your motor is designed for a recommended transom height. To avoid damage to transom and to prevent motor from working loose during operation, it is important that clamp (thumb) screws are tightened securely and equally. Thumb screw grips should be in (or near) a horizontal plane to allow full tilt up and turn of motor. Failure to observe this thumb screw position could result in damage to steering parts.

TILT ANGLE ADJUSTMENT

Holes are provided in the clamp bracket to permit changing location of tilt lock pin for proper adjustment of tilt angle. Adjust tilt angle so that boat rides level (Figure 2)

(2) How to Plane a Boat

a WRONG! Bow lip
b WRONG! Bow Down
c RIGHT! Plane or Even keel



ELECTRICAL ACCESSORIES CONNECTIONS

Any accessories, such as horns, running lights, etc., should be installed with electrical connections attached directly to the battery terminals via the screws on the battery lugs.

LIGHTING CIRCUIT (Merc 9.8-7.5)

Manual starting Merc 9.8-7.5 engines are equipped with a lighting circuit which supplies 60 watts of regulated AC power (via lighting harness on engine) for operation of auxiliary lighting. A 16-gauge wire is recommended for auxiliary light wiring.

PROPELLER RECOMMENDATIONS

PROPELLERS

For propeller recommendations applying to your particular boat, consult your dealer. Using an improper propeller can cause serious damage to your outboard motor.

SAFETY WARNING: When installing or removing propeller, place a block of wood between the anti-cavitation plate and propeller to prevent accidental motor starting and to protect the Rands from propeller blades while removing the propeller nut.

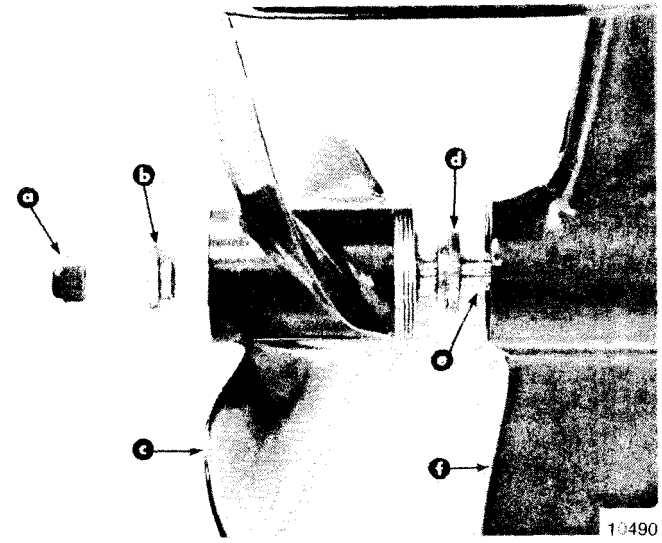
INSTALLING PROPELLER

1. To aid in future removal of the propeller, liberally coat the propeller shaft splines with one of the following Quicksilver products:
   — Special Lubricant 101
   — 2-4-C Multi-Lube
   — Perfect Seal
2. Slide collar arid propeller onto shaft.
3. Place washer and nut (Figure **3)** on end of propeller shaft and, with wood block still in place, tighten nut securely.

REMOVING PROPELLER

1. Place a flat block of wood between anti-cavitation plate and propeller.
2. Remove propeller shaft nut and washer. (Figure 3)
3. Slide propeller off shaft.

3 **Propeller Removal and Installation**



a Propeller Nut
b Splined Washer
c Quicksilver Propeller
d Collar
e Propeller Shaft
f Gear Housing

FUEL MIXTURE AND FUEL SYSTEM

INSTALLING FUEL TANK

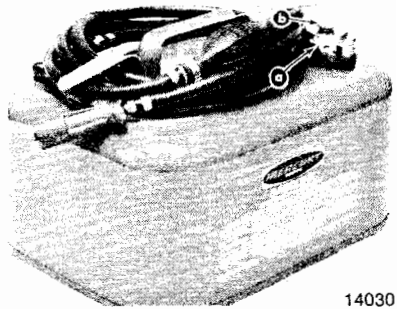
1. Place fuel tank in position in bottom of boat. (Figure 4)

2. Connect fuel line to motor by inserting twist connector into receptacle in bottom cowl. (Figure 5) Arrange the fuel line so that it cannot become pinched, kinked, sharply bent or stretched during operation of the motor. Check with the motor in far left and right turn positions.

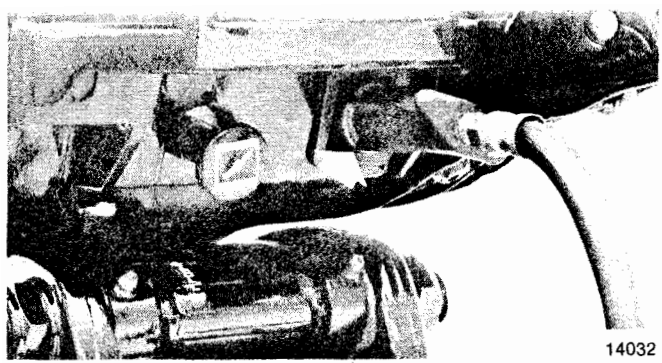
CAUTION: Use CARE when transporting fuel tanks, whether in a boat or car. DO NOT fill fuel tanks to maximum capacity. Cool gasoline expands considerably and builds up pressure in the fuel tank due to higher outside temperatures. This can cause fuel leakage and a potential fire hazard.

4 **Remote Fuel Tank**

a Filler Cap
b Vent Screw



5 Twist Connector



GASOLINE-OIL SELECTION

Use any gasoline. that will satisfactorily operate an automobile engine, and Quirksilver Formula 50-D 2-Cycle Outboard Lubricant. If 50-D oil is not available, consult your Authorized Dealer for an acceptable oil.

CAUTION: The use of other than Formula 50-D Oil or an acceptable oil may cause piston scoring, bearing failure or both. DO NOT, under any circumstances, use multi-grade or other highly-detergent automobile oils or oils which contain metallic additives. Use of improper gasolines and/or oil can cause serious damage to **your** outboard motor.

FUEL MIXTURE

Use a 50:1 gasoline-oil ratio as shown in the following chart.

Type Oil	Metric Measure	Imperial Measure	U.S. Measure
Formula 50-D	400cc oil to each 20 liters of gasoline	15 Imp. oz. oil to each 5 Imp. gals. gasoline	12 U.S. oz. oil to each 5 gallons gasoline
Other Acceptable Oils	Use at oil manufacturer's recommended gasoline/oil ratio, not to exceed 50:1.		

CORRECT FUEL MIXING PROCEDURE

CAUTION: Observe fire prevention rules, particularly the matter of smoking. Mix **fuel** outdoors or at least in a well-ventilated location.

Mix fuel directly in the remote tank. Measure accurately the required amounts of oil and gasoline. Pour a small amount of gasoline into remote tank (Figure 4) and add a small amount of oil (about the same amount as gas). Mix thoroughly by shaking or stirring vigor-

ously, then add balance of oil and gasoline and mix again. Cleanliness is of prime importance in mixing fuel, as even a very small particle of dirt can cause carburetion trouble.

IMPORTANT: Always use fresh gasoline. When standing, gasoline forms certain gum and varnish deposits and, when kept in a tank for a length of time, may give carburetor trouble and cause spark plug fouling.

IMPORTANCE OF CONSISTENT FUEL MIXTURES

Carburetor idle adjustment is sensitive to furl mixture variations which result from use of different gasolines and oils or due to inaccurate measuring or mixing. This may necessitate frequent readjustment of the carburetor idle needle. Be consistent. Prepare each batch of fuel exactly the same as previous ones.

IMPORTANT: Using less than the recommended proportion of oil may result in very serious motor damage from lack of sufficient lubrication. Using more than the recommended proportion of oil will cause spark plug fouling, erratic carburetion excessive smoking and faster-than-normal carbon accumulation.

BREAK-IN PROCEDURE

CAUTION: Follow break-in procedure carefully.

Operate a new motor at varied throttle settings for the first hour (one hour). AVOID both wide-open-throttle operation and prolonged idle in cold water areas during this period.

After thr first hour (one hour) of operation, the motor is ready for normal operation and may be run at any speed. DO NOT EXCEED the full throttle RPM range listed in "Specifications", preceding.

OPERATION

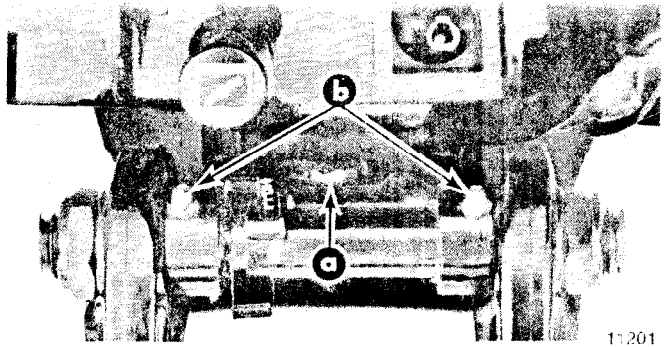
NOTICE: Models **7.5/9.8** ONLY: If your **motor** will be operated primarily in cold water areas [normal water temperature BELOW **50"** F **(10"** C)] **and/or** areas where extreme day-to-day temperature variations of **20"** F to **40"** F (-6" **C** to 5" C) are common, we recommend installation of a thermostat (OPTIONAL ACCESSORY for **7.5/9.8** models) in the engine cooling system.

A thermostat controlled cooling system maintains a constant, higher engine operating temperature, thus providing smoother engine operation, particularly at sloweroperating speeds. See an Authorized Servicing Dealer for this accessory.

CO-PILOT ADJUSTMENT

The co-pilot provides friction control in the steering mechanism. Recommended adjustment is such that the motor will remain in a fixed-course position without the need of manual control, yet will not be too tight to allow free and easy steering. Adjustment is attained by means of hexagon head screw in top face of swivel bracket. (Figure 6) Tighten the screw to increase friction; loosen to decrease friction. Loosen friction when using remote steering.

(6) Co-Pilot Adjustment - Merc 9.8-7.5-4.5



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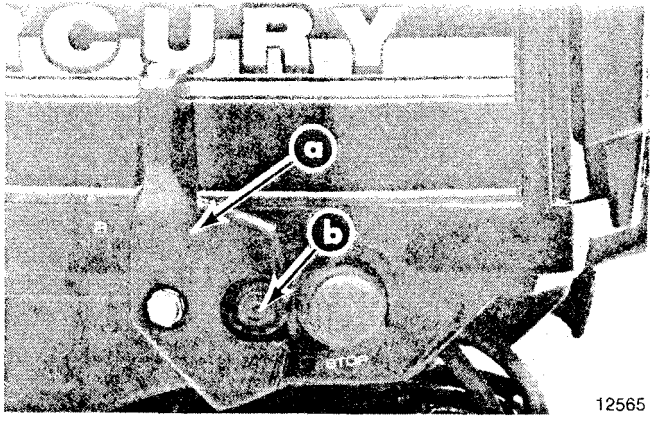
a Co-Pilot Adjustment Screw
b Tilt Tube Fittings

SHIFTING GEARS

Gear shift lever is located on right side of motor. (Figure 7) Gear positions are FORWARD (toward front), NEUTRAL (vertical, as shown in Figure 7) and REVERSE (toward rear).

7 Shift Lever and Merc 9.8E and 7.5E Electric Start Button



a Shift Lever
b Electric Start Button

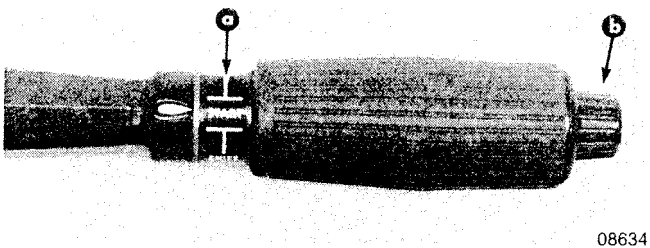
THROTTLE SETTINGS

Ring on twist grip throttle has three settings: "Fast," "Start" and "Shift Range." (Figure 8) The end of the twist grip has a friction device ("Troll Set") to hold throttle at a desired boat speed. (Figure 8) To set the desired speed, select the throttle setting by rotating the twist grip, then turn "Troll Set" clockwise. To release the drag, turn the "Troll Set" counterclockwise. FOR EMERGENCY THROTTLE OPERATION: Even though the "Troll Set" has been set to maintain a constant speed, the twist grip still can be turned manually to over-ride the setting without releasing the "Troll Set."

FOR EMERGENCY STOP: Depress "Stop Button" on bottom cowl (Figure 12).

If remote controls are used, approximately the first 45 degrees of control handle travel . . . forward and reverse . . . shifts the motor; the remainder of the control handle movement advances the throttle, forward or reverse.

(8) Twist Grip Throttle



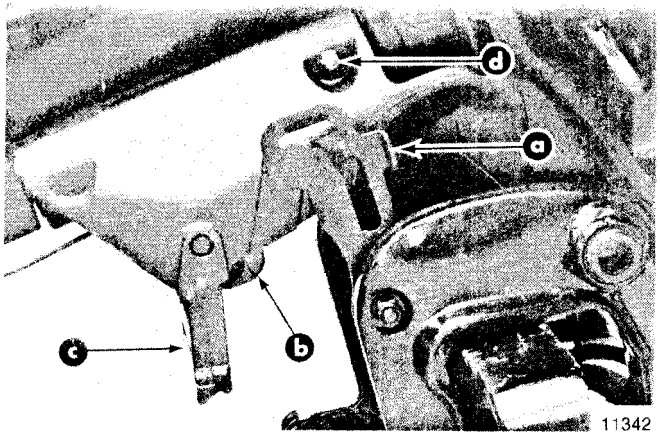
a Ring
b Troll Set

TILT STOP LEVER

Motor can be locked in tilt-up position by pulling tilt stop lever (Figure 9) with motor fully tilted.

IMPORTANT: Do not use tilt slop lever while trailering. Tilt motor and place a block of wood between clamp and swivel bracket.

(9) Tilt Stop



a Tilt Stop Lever
b Reverse Lock Lever
c Troll Bracket
d Swivel Bracket Fitting

STARTING PROCEDURE - MANUAL

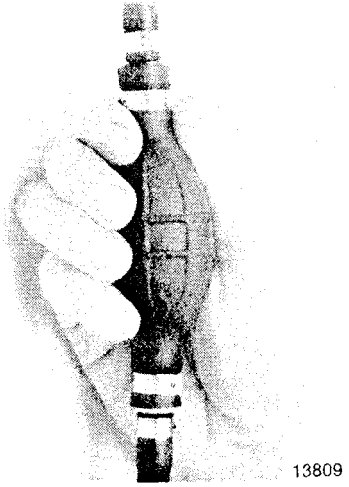
1 Be sure fuel tank contains a sufficient amount of fuel mixture, and that tank is properly secured in boat.

2. Connect fuel line to motor by inserting twist connector into receptacle on cowl. To lock, twist ⅛ turn clockwise, as shown in Figure 5.

3. Open air vent screw on fuel tank cap.

4. Prime fuel system by squeezing primer tube on fuel line. (Figure 10) When fully primed, bulb will feel firm.

5. Shift into neutral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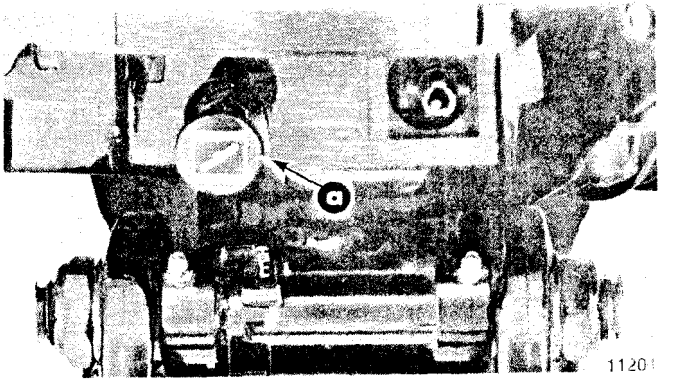
(10) Priming Fuel System

(11) Manual Choke (a) - Merc 9.8-7.5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SAFETY WARNING: Be sure that outboard is in "NEUTRAL" gear before attempting to start motor electrically or manually. If outboard starts while in gear, occupants may be thrown from boat.

0. Kotate twist grip throttle to "Stirt" position (Figure 8).

7. If the engine is cold, pull out the choke knob (Figure 11) to place the choke in "On" position (on Merc 4.5, set the choke in closed position as indicated by arrow). Use of the choke is not necessary if engine is warm.

8. With shift lever in neutral position, pull starter handle.

0. After pulling starter handle once, place manual choke in "Off" position and again pull starter handle to start motor. Should a cold motor falter after starting, quickly move choke "On" and "Off" several times until motor runs steadily.

IMPORTANT: Starter is automatic rewind type. Proper operating technique will add many hours of life to starter cable and to starter internal mechanism. Grasp handle firmly and pull outward slowly until engagement of ratchet mechanism can be felt. Then continue outward pull with a full, vigorous stroke. Do not release handle at end of stroke and allow it to snap back. Retain grip on handle and allow cable to rewind slowly. Ratchet release mechanism is designed so that starter cannot engage during **rewind.**

STARTING PROCEDURE - ELECTRIC

Merc 9.8 and 7.5

1. Connect battery leads to correct terminals on battery. Red lead of harness attaches to positive (+) post of battery and black lead to negative (-) post of battery. Use grease to prevent corrosion of terminals.

2. Be sure that fuel tank contains a sufficient amount of fuel mixture and that tank is properly secured in boat.

3. Connect fuel line *to* motor by inserting twist connector into receptacle on cowl. Lock by twisting ⅛-turn clockwise. (Figure 5)

4. Open air vent screw on fuel tank cap. (Figure 4)

5. Prime carburetor and fuel system by squeezing priming tube on fuel line. When fully primed, pressure will be felt. (Figure 10)

6. Shift into neutral.

7. Rotate twist grip throttle to "Start" position. (Figure 8)

8. Pull out the choke knob to place choke in "On" position.

IMPORTANT: Avoid use of choke during normal operation or if motor is warm.

9. With shift lever in neutral, press startrr button *to* actuate electric startrr. (Figure 7) As soon as motor starts to run. release button arid push choke knob in.

IMPORTANT: The starter motor is not designed for continuous operation, and serious damage may result if operated continuously for more than 30 seconds. Pause and allow the starter motor to cool off for 2 minutes.

10. If motor should falter, actuate manual choke.

OPERATION WITHOUT **BATTERY** (Electric Starting **Models)**

If desired (or in an emergency), electric starting models can be started and operated without a battery (either disconnected or removed). If the motor will be operated for extended periods, however, we recommend disconnecting both yellow/red alternator leads from the rectifier (insulate or position leads to prevent a completed circuit between leads) as a precaution against rectifier damage. (Figure 14)

SAFETY WARNING: Battery **leads MUST** BE taped off (insulated) or positioned in a manner that prevents a completed circuit between the **leads.**

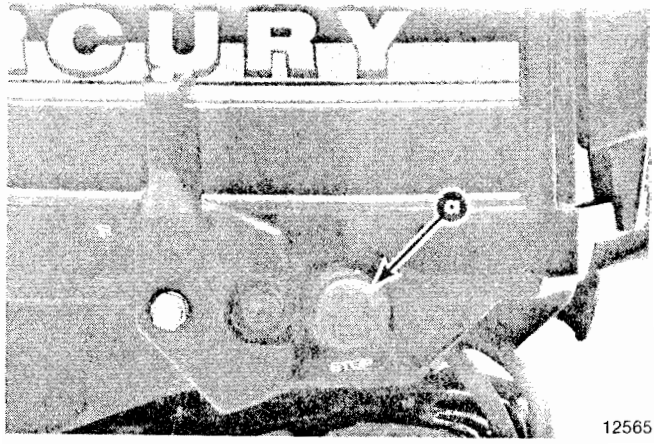
STOPPING PROCEDURE

If the motor is to remain installed on the boa . ready for immediate restart, stop by shifting into neutral and

depressing "Stop" button. (Figure 12) Hold "Stop" button down until motor has stopped running completely

Close air vent screw on fuel tank cap.

(12) Stopping (a) - Merc 9.8-7.5-4.5



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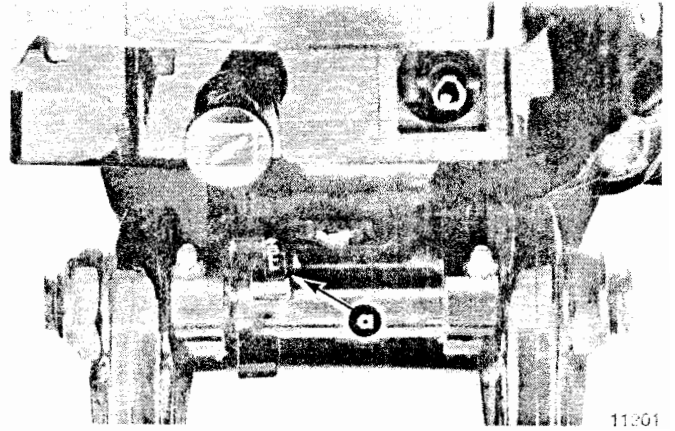
(13) Troll (a) - Merc 9.8-7.5-4.5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TILT-UP AND SHALLOW WATER TROLL LEVER OPERATION

Motor can be tilted up manually only when placed in "Forward" gear. (Figure 7)

Merc 9.8-7.5-4.5 motors can be placed in a shallow water "Troll" position and released from this position as follows:

1. Rrtard twist grip throttle to "Shift Range" (Figure 8) and shift into "Forward" (Figure 7).

2. Push lever in direction of "Troll." (Figure 13)

3. Tilt motor up manually to engage in shallow water "Troll" position.

4. To release from shallow water "Troll," retard throttle and shift to "Forward." Push lever to the side and down, then tilt motor manually to disengage from the "Troll" position.

SHALLOW WATER OPERATION

CAUTION: When shift lever is in "Neutral" or **"Reverse"** position, lower unit is locked in normal operating position. Shock load of impact could cause transom breakage, particularly **when** boat is backing up. Proceed cautiously when in reverse motion and be careful of underwater obstructions. Do not accelerate motor to high RPM.

OPERATION IN SALT WATER

Prior to operation in salt water, it is recommended that the cowl be removed, and the entire powerhead be sprayed with an approved corrosion and rust preventive.

DON'TS

1. Don't operate motor out-of-&dlr or with flushing attachment, or water pump impeller will be damaged. Read "Flushing" instructions carefully, following.

2. Don't operate motor with tilt lock pin removed.

3. Don't try to shift gears unless twist grip throttle is in "Shift Range" position.

4. Don't ease into engagement. A firm, quick shift is recommended.

5. **Do not tilt motor up with steering handle.**

CAVITATION

Cavitation, which is evident when the motor speeds up but boat speed is reduced, is caused by one of the following:

1. Propeller operating too close to the surface.
2. Transom too high.
3. Tilt angle adjusted so that lower unit is too high.
4. Boat riding stern-high because of improper loading. (Figure 2)
5. Propeller fouled by weeds, rope, etc.
6. Damaged or broken propeller blades. Broken blade usually is indicated by excessive vibration.
7. Propeller safety clutch slipping due to damage.

WATER PUMP OPERATION

Normal water pump operation is indicated by a steady, "tell-tale" stream of water issuing from a small hole at the rear of the bottom cowl while the motor is running. (Figure 1)

IMPORTANT: On 9.8 and 7.5 models, which are equipped with a thermostat (OPTIONAL ACCESSORY) in the cooling system (Figure 14), a "tell-tale" stream is NOT visible until the engine reaches normal operating temperatures, and the thermostat opens (5 to 45 seconds, depending upon engine RPM and water temperature).

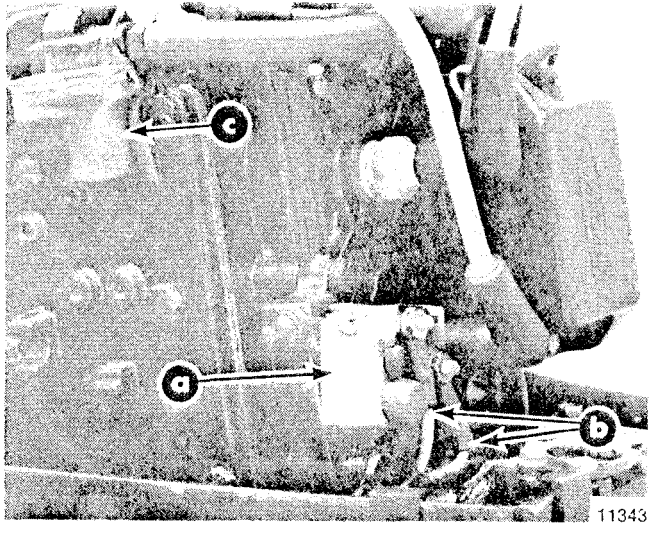
If the "tell-tale" is intermittent or absent during operation (frryuent visual check), STOP MOTOR IMMEDIATELY, and

- Check gear housing water intake for possible restriction (wreds, mud. etc.).
- Check "tell-tale" hose for possible restriction (use a piece of wire).
- Models 9.8 arid 7.5 equipped with thermostat: Check thermostat and/or thermostat housing for possible restriction and/or thermostat malfunction. (Figure 14)

If no restriction is evident, a malfunction has occurred at some other point within the cooling system, possibly the water pump itself

Operation with a defective water pump or obstruction in the cooling system will cause overheating and severe engine damage. Refer the motor to an Authorized Service facility.

(14) Rectifier/Alternator Leads - Merc 9.8 and 7.5



a Rectifier
b Yellow/Red Alternator Leads
c Thermostat Housing (Optional Accessory)

SAFETY WARNING: If the motor will not be operated for a period of time, if it is to be removed from the boat, or if it is to be tilted up, we recommend the following practice to prevent spillage from the carburetor throat and bowl and to prevent gum formations in the carburetor during storage:

1. **Disconnect the fuel line.**
2. **Allow motor to run at idling speed until it stops of its own accord, indicating the carburetor has run dry**

REMOVING MOTOR FROM BOAT

When removing, keep motor in an upright position, resting on its skeg, until all water has drained from the drive shaft housing. If the motor is placed on its side while water remains trapped in the drive shaft housing, some water may enter the cylinders through the exhaust ports and cause internal damage.

ADJUSTMENTS/MAINTENANCE

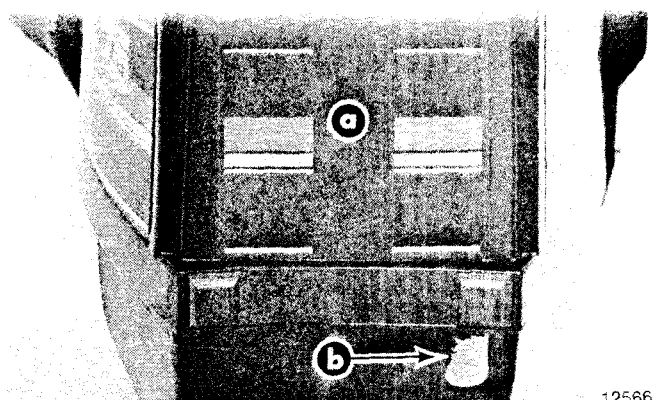
REMOVING TOP COWL

MERC 9.8-7.5: Remove top cowl by pushing cowl release lever on rear of bottom cowl and lifting cowl off (up and forward). (Figure 15)

MERC 4.5: Pull the two latch pin levers outward from side of bottom cowl (Figure 16) and lift top cowl off (up and forward).

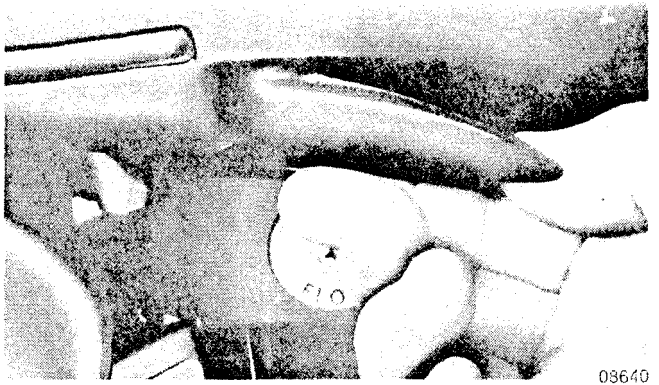
Avoid operation of motor with cowling removed.

(15) Removing Top Cowl - Merc 9.8-7.5



a Top Cowl
b Top Cowl Latch

(16) Removing Top Cowl - Merc 4.5



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CARBURETOR ADJUSTMENT

The carburetor has a fixed high-speed jet, but an idle mixture adjustment is provided.

IDLE MIXTURE ADJUSTMENT (FIGURE 17)

Idle mixture cannot be adjusted effectively while in "Neutral", or motor will sputter and stop when shifted to "Forward" because of "no load" condition while adjusting.

If carburetors are out of adjustment so motor cannot be started, turn idle mixture screw inward (clockwise) until it seats lightly, then back out 1½ turns. (Turning tight will damage the needle and seat.) This approximate setting will permit starting.

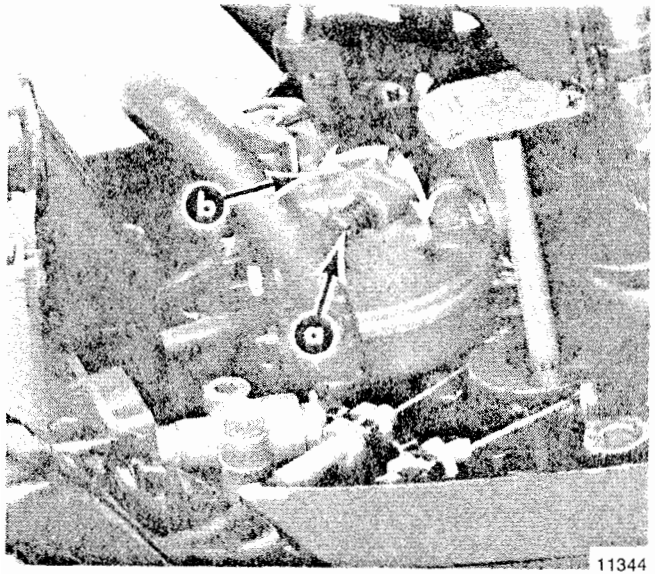
As soon as motor starts, allow for warmup (run for several minutes), then make final adjustment as follows:

1. With motor running at idling speed while in forward gear, turn idle mixture adjusting needle counterclockwise until motor starts to "load up" or fire unevenly, due to over-rich mixture. (Figure 17)

2. Slowly turn needle clockwise until cylinders fire evenly and motor picks up speed.

3. Continue turning clockwise until too lean a mixture is obtained, and motor slows down and misfires.

(17) Idle Adjustment



a Idle Adjustment
b Rich (Turn Left)
Lean (Turn Right)

4. Set adjustment screw halfway between rich and lean.
5. Do not adjust leaner than necessary to attain reasonably smooth idling. When in doubt, it is preferable to set mixture slightly rich rather than too lean.

SERVICING FUEL TANK FILTER (FIGURE 18)

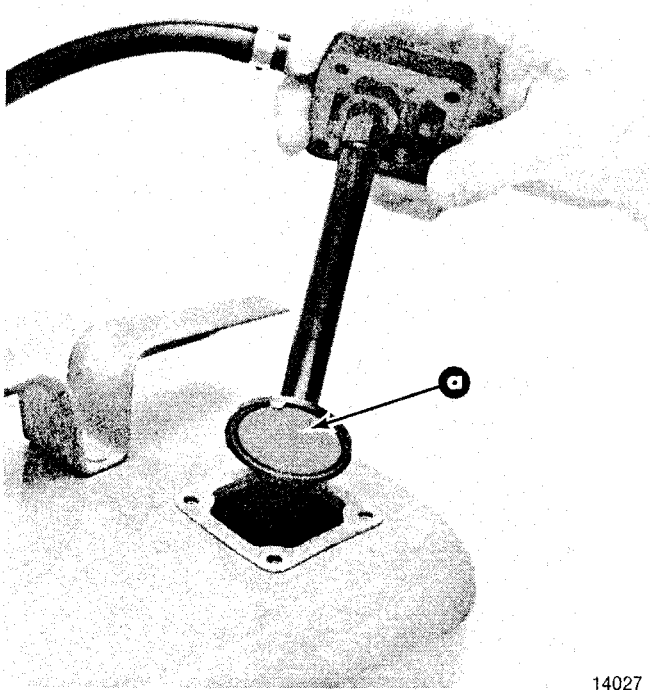
Detach the fuel line from fuel tank and remove fuel pick-up tube. The filter, a fine wire mesh, can be cleaned by rinsing in clean lead-free gasoline or kerosene.

SERVICING CARBURETOR FUEL FILTER/SCREEN

Carburetor fuel filter/screen is more than adequate to take care of all requirements under normal use. If, after all other checks, fuel filter/screen obviously is the cause of the trouble, clean or replace the fuel filter/screen, as necessary. (Figure 19)

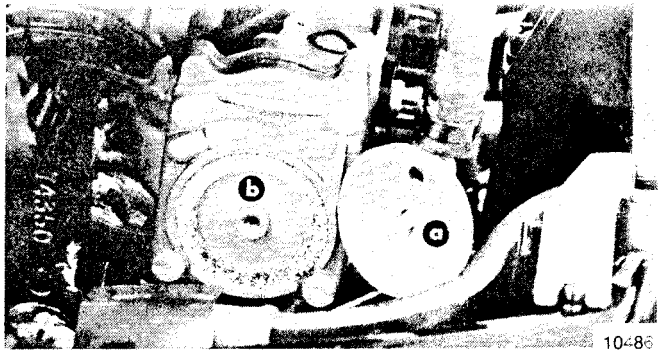
NOTE: Merc 4.5 filter/screen is located under the strainer cover on top of the carburetor.

(18) Fuel Tank Filter



a Fuel Tank Filter

(19) Carburetor Fuel Screen - Merc 9.8-7.5



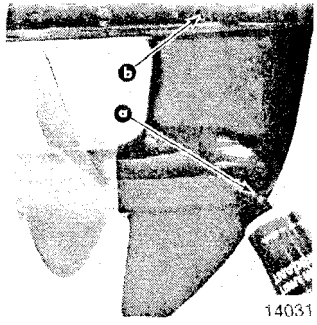
a Fuel Screen Cover
b Fuel Screen

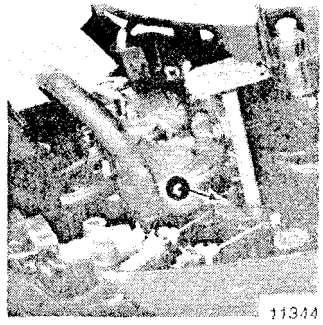
LUBRICATION (FIGURE 20)

Periodically (every 25 hour,) lubricate the lower drive unit with Quicksilver Super-Duty Outboard Gear Lubricant as follows:

IMPORTANT: Do not use regular automotive grease in the lower drive unit.

20 Lubrication





a Lubricant Filler Hole
b Air Vent Screw
c Throttle-Shift Linkage

1. Remove the lubricant fill plug, then the lubricant vent screw (be careful not to lose the accompanying washers).

IMPORTANT: Never apply lubricant to the lower unit without first removing lubricant vent screw, as the injected lubricant displaces air which must be allowed to escape so that the gear housing can be completely filled.

2. Insert lubricant tube into fill plug hole and inject lubricant until excess fluid starts to flow out of lubricant vent screw hole, indicating that the housing is filled.

3. Replace lubricant vent screw first then fill plug, taking special care that the washer is in place under the head of each so that water will not leak past the threads into the gear housing.

Lubricate the throttle-shift linkage (Figure 20), fittings on swivel bracket and swivel pin with Quicksilver Multipurpose Lubricant every 25 hours of operation or at least once a year.

Lubricate swivel bracket & swivel pin as follows:

1. Inject Multipurpose Lubricant into fitting on swivel bracket (Figure 1) until lubricant discharges at top of swivel pin.

2. Lubricate tilt tube fittings on front of swivel bracket. (Figure 6)

LUBRICATION CHART

Fig.	Description	Type Lubricant	Fresh Water Frequency	Salt Water Frequency
20	Gear Housing	Quicksilver Super-Duty Lubricant	After 1st 10 Days, Then Each 30 Days	Same as Fresh Water
1-9	Swivel Bracket and Swivel Pin	Quicksilver 2-4-C or Multipurpose Lubricant	Every 60 Days	Every 30 Days
6	Tilt Tube Fittings			
20	Throttle-Shift Linkage			
9	Reverse Lock Lever			
1	Thumb Screws	Quicksilver Anti-Corrosion Grease	Once in Season	Every 60 Days
3	Propeller Shaft	Quicksilver — Special Lubricant 101 — 2-4-C Multi-Lube — Perfect Seal		

NOTE: Lubricants, sealers, etc., ran he obtained from your Authorized Servicing Dealer.

SERVICING SPARK PLUGS

SAFETY WARNING: Do not touch or disconnect any ignition system parts while engine is running or while battery cables of electric starting models are connected. Do not remove spark plug connectors and hold them in your hand to check for spark while engine is running, as high voltage is present. Never attempt to turn engine over by hand with propeller or flywheel.

1. Remove spark plugs, clean and inspect. If the center electrode is eroded, replace with new spark plug.

2. Install spark plugs. Start the threads one or two turns with fingers to avoid danger of cross-threading. After seating plug finger-tight on gasket, an additional ¼-turn with a wrench will generally be sufficient to tighten. Do not overtighten.

3. Connect the spark plug leads to its respective spark plug.

PREPARATION FOR STORAGE OR SHIPMENT

1. Operate motor in water tank to flush cooling system. Disconnect the fuel line from the motor and allow motor to run at idling speed until it stops of its own accord, indicating that the carburetor has run dry.

2. Drain fuel tank.

3. Lubricate lower drive unit.

4. Remove spark plugs.

5. Rotate crankshaft to a position where the No. 1 (top) piston is at bottom dead center position. This can be determined by inserting a pencil or rod into the spark plug hole. Apply a Mercury

approved storage seal into the spark plug hole of the No. 1 cylinder, allowing time for some of the oil to drain into the crankcase via the transfer port:. Repeat this operation for the other cylinder, then install spark plugs and operate the starter vigorously to distribute oil around the inside of the crankcase and cylinders.

6. Clean the motor thoroughly, including all accessible powerhead parts. Install cowling and apply a thin film of clean, fresh motor oil to all painted surfaces.

7. To aid in future removal of the propeller, liberally coat the propeller shaft splines with one of the following Quicksilver products:
   - Special Lubricant 101
   - 2-4-C Multi-Lube
   - Perfect Seal

IMPORTANT: When storing outboard motor for the winter, be sure that all water is drained from the gear housing (thru the propeller herb). Trapped water may freeze and expand, thus cracking the gear housing and/or water pump housing.

Check and refill lower unit, as explained, before storage to protect against possible water leakage into gear housing which is caused by loose lubricant vent screw or loose fill plug. Be sure to replace gaskets under screws, replacing any damaged gaskets.

ATTENTION REQUIRED FOLLOWING OPERATION IN SALT WATER OR SILT

Even though the interior surfaces are treated to resist corrosion, there still is a possibility of a mechanical buildup of salt and sil deposits which no form of protective coating can prevent and which can be eliminated only by occasional flushing with fresh water.

1. When your outboard is left on the boat, tilt the motor out of the water.

2. Lubricate thumb screws with Quicksilver Anti-Corrosion Grease.

3. To aid in future removal of the propeller, liberally coat the propeller shaft splines with one of the following Quit-itsilver products
   - Special Lubricant 101
   - 2-4-C Multi-Lube
   - Perfect Seal

4. Entire powerhead can be sprayed with a coating of a Mercury approved rust preventive oil to protect the finish of all parts beneath the cowl. The exterior also can be sprayed or wiped *to* prevent salt corrosion from dulling the finish.

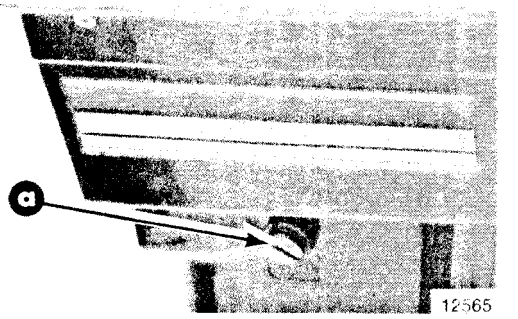
5. To flush motor:

   a. Remove flushing plug (marked "FLUSH") and washer from flushing hole. Plug is located beneath drive shaft trim cover on 9.8-7.5 HP models (Figure 21) and in right side of bottom cowl on 4.5 HP model (Figure 22).

   b. Connect flushing device and attach garden hose coupling with hose.

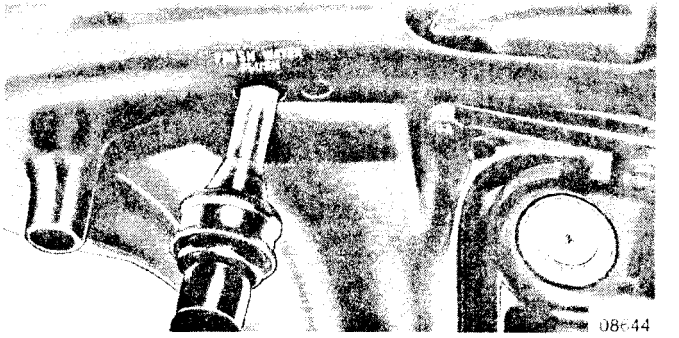
   c. Turn on water but DO NOT OPERATE the outboard while flushing. Water flow is strong enough that flushing can be done with water pressure provided from the water tap. DO NOT USE full water pressure.

(21) Flush Plug - Merc 9.8-7.5



a Flush Plug

(22) "FLUSH" Plug - Merc 4.5



While and after flushing, keep motor in upright position, resting on skeg, until all water has drained from drive shaft housing to prevent water from entering the powerhead via drive shaft housing and exhaust ports.

By following the preceding simple preventive maintenance operations at regular intervals, longer life will be added to your motor when used in salt water.

ATTENTION REQUIRED FOLLOWING COMPLETE SUBMERSION

In an effort to deter serious internal engine damage and avert expensive engine repairs, a motor, that has been submerged, requires IMMEDIATE service upon recovery.

1. Wash entire motor with clean, fresh water to remove mud, silt, weeds, salt, etc.

2. Remove the spark plug and purge the engine and carburetor of as much water as possible (''crank'' engine with spark plug holes facing downward).

3. If compressed air is available, ''blow-dry'' the engine internally and externally.

4. Pour a liberal amount of Quicksilver Engine Cleaner or Quicksilver Formula 50-D 2-Cycle Outboard Lubricant into the engine via the carburetor and spark plug hole.

5. Manually ''crank'' engine to distribute the lubricant within the engine, then drain excess lubricant from engine.

6. Reinstall spark plug and high tension lead.

IMPORTANT: If it appears that the engine DID NOT take in any foreign material (mud, sand, weeds, etc), and "cranks" freely, the engine should be started. If there is evidence that foreign material had entered the engine, the engine should be disassembled and cleaned (take motor to an Authorized Dealer for service).

7. Start engine and operate at low RPM for a minimum of 5 minutes, then run engine at varied throttle settings for an additional 15-20 minutes. (Normal operation will continue the drying-out process, displacing remaining moisture and providing internal lubrication.)

8. If engine performance still indicates engine troubie. take motor to an Authorized Dealer for further service.

TROUBLESHOOTING

IMPORTANT: The following chart is intended as a guide to aid in finding and correcting minor outboard motur malfunctions, should they occur. Possible causes are listed in order of probability and, even though some may appear to be quite obvious, these same causes often are overlooked when a problem occurs. If a problem cannot be located and corrected with the aid of the guide, see your Authorized Dealer for further service. For manual start engines, disregard references to electric starting.

SAFETY WARNING: Before attempting any checks or repairs, battery cables on electric start model MUST BE REMOVED from battery to prevent possible personal injury or damage to equipment.

Trouble	Possible Cause	Remedy
A. Engine will not start	1. Fuel tank empty	1. Fill tank with clean, fresh fuel.
	2. Clogged fuel filter(s)	2. Clean or replace fuel filter(s).
	3. Restricted vent in gas tank	3. Open gas tank vent.
	4. Fuel system shutoff valve closed (if so equipped)	4. Open valve.
	5. Engine is cold or flooded	5. See "Engine Starting Procedures", preceding in manual.
	6. Weak or low capacity battery	6. Check condition of battery; use battery of recommended capacity.

Trouble	Possible Cause	Remedy
A. Engine will not start (Cont'd)	7. Loose or corroded Latter! connections	7. Tighten cables on battery. Clean battery terminals.
	8 Stale or contaminated fuel	8. Fill tank with clean, fresh fuel.
	9. Improper fuel-oil ratio	9. Mix fuel-oil thoroughly and to recommended ratio.
	10. Defective or wrong type spark plugs	10. See "Servicing Spark Plugs", preceding in manual.
	11. Poor connections or damaged ignition wiring	11. Check wires for wear or breaks and tighten all loose connections. Replace worn or broken wires.
B. Poor idling or engine misses while idling	1. Fouled spark plugs	1. See "Servicing Spark Plugs", preceding in manual.
	2. Fuel system obstruction	2. Check for pinched or kinked fuel line or other obstructions in fuel system.
	3. Stale or contaminated fuel	3. Fill tank with clean, fresh fuel.
	4. Throttle shutter(s) not closing completely	4. See Authorized Servicing Dealer for proper throttle adjustment.
	5. Defective ignition component	5. See Authorized Servicing Dealer for repair.
	6. Reed valve open or broken	6. See Authorized Servicing Dealer for repair.
C. Engine misfires at high speeds	1. Fouled or wrong type spark plugs	1. See "Servicing Spark Plugs", preceding in manual.
	2. Stale or contaminated fuel	2. Fill tank with clean, fresh fuel.
	3. Wrong fuel and oil mixture	3. Mix fuel and oil as instructed preceding in manual

C. Engine misfires at high speeds (Cont'd)	4. Poor connections or damaged ignition wiring	4. Check wires for wear or breaks and tighten all loose connections. Replace worn or broken wires.
	5. Improper carburetor mixture	5. See "Carburetor", preceding in this chart.
	6. Incorrect spark timing	6. See Authorized Servicing Dealer for proper synchronization.
	7. Engine overheating	7. See "G", "Engine Overheating", following in chart.
D. Battery will not hold charge (electric start models)	1. Corroded or loose battery terminals	1. Clean and tighten battery terminals.
	2. Low electrolyte level	2. Fill battery to recommended level.
	3. Worn out or inefficient battery	3. Replace battery with one of recommended capacity.
	4. Excessive use of electrical accessories	4. Use battery of recommended capacity.
	5. Defective rectifier	5. See Authorized Servicing Dealer for repair.
	6. Defective alternator	6. See Authorized Servicing Dealer for repair.
E. Motor speed faster than normal	1. Transom too high	1. Have outboard adjusted to proper transom height.
	2. Boat improperly loaded	2. Distribute load to place boat on an even plane.
	3. Tilt angle not correctly adjusted	3. Adjust tilt angle to achieve most efficient operation.
	4. Propeller of wrong pitch or diameter	4. Install correct propeller to operate outboard at its recommended RPM range.
	5. Propeller damaged.	5. Have propeller repaired or replaced.

Trouble	Possible Cause	Remedy
F. Motor speed slower than normal	1. Weeds or other foreign material tangled on gear housing	1. Remove and clean lower unit.
	2. Boat improperly loaded	2. Distribute load to place boat on an even plane.
	3. Tilt angle not correctly adjusted	3. Adjust tilt angle to achieve most efficient operation.
	4. Excessive oil in fuel mixture	4. Mix gas and oil to recommended ratio and mix thoroughly.
	5. Improper fuel	5. Use only recommended gas and oil in fuel mixture.
	6. Propeller damaged	6. Have propeller repaired or replaced.
	7. Propeller of wrong pitch or diameter	7. Install correct propeller to operate outboard at its recommended RPM range.
	8. Transom height too high or too low	8. Have outboard adjusted to proper transom height.
	9. Wrong type or fouled spark plugs	9. See "Servicing Spark Plugs", preceding in manual.
	10. Carburetor out of adjustment	10. See "Carburetor", preceding in manual.
G. Engine overheating	1. Cooling system clogged	1. Check water intake for restriction. See "Water Pump Operation", preceding in manual.
	2. Engine overloaded (cannot attain recommended RPM)	2. See "F", "Motor speed slower than normal", preceding in chart.
	3. Incorrect transom height and/or tilt angle adjustment	3. Readjust as necessary. See "Tilt Angle Adjustment" and "Conditions Affecting Operation", preceding in manual.

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G. Engine overheating (Cont'd)	4. Not enough oil in fuel mixture	4. Mix fuel-oil thoroughly and to recommended ratio.
	5. High speed fuel mixture excessively lean (jet size too small)	5. See "Carburetor", preceding in manual.
	6. Water pump failure	6. See "Water Pump Impeller Replacement", preceding in manual.
	7. Incorrect ignition timing	7. See Authorized Servicing Dealer for repair.

WARRANTY

I. We warrant each new Mercury Outboard Motor and accessories attached, :hereto, (hereafier referred to as "Product", manufactured by us, to be free from defects in material and workmanship.

II. This warranty shall become effective only upon our receipt of a completed Product Registration Card, which shall identify the Product so registered by serial number. This warranty shall remain in effect for a period of one (1) year from date of purchase.

III. Since this warranty applies to defects in material and workmanship, it doe- not apply to normal worn parts, adjustments, tuneups or to damage caused by: 1) Neglect, lack of maintenance, accident, abnormal operation or improper installation or service; 2) Use of an accessory or part not manufactured or sold by us; **3)** Operation with fuels, oils or lubricants which are not suitable for use with the Product; 4) Participating ir. or preparing for racing or other competitive activity or operating with a racing type lower unit; or 5) Alteration or removal of parts.

IV. Reasonable access must be provided to the product for warranty service This warranty will not apply to: 1) Haul-out, launch, towing and storage charges; telephone or rental charges of any type, inconvenience, loss of time or income; or other consequential damages; or 2) Removal and/or replacement of boat partitions or material because of boat design for necessary access to the Product.

V. Claim shall be made under this warranty by delivering the Product for inspection to a Mercury Marine dealer authorized to service the Purchaser's Product. If purchaser cannot deliver Product to such authorized dealer, he may give notice in writing to the area Mercury Marine distributor or Branch Manager or to the Company. Mercury Marine shall then arrange for the inspection and repair, provided such service is covered under this warranty. Purchaser shall pay for all related transportation charges and/or travel time. Further, if the service is not covered by this warranty, purchaser shall pay for all related labor and material. Any Product or parts shipped by purchaser for inspection or repair must he shipped with transportation charges prepaid.

The Owner's Registration MerCard is the only valid registration identification and must be presented at the time warranty service is required. Warranty claims will not be accepted without presentation of the MerCard.

VI. Our obligation under this Warranty shall be limited to repairing a defective part or at our option replacing such part or parts as shall be necessary to remedy any malfunction resulting from defects in material or workmanship as covered by this Warranty. We reserve the right to change or improve the design of any Product without assuming any obligation to modify any Product previously manufactured.

VII. This warranty is in lieu of all other warranties expressed or implied and may not be modified or extended by anyone, except that any qualification or restriction contained herein which is prohibited by any law where the Product is sold and such qualification or restriction only. is null and void. All other qualifications and restrictions of this warranty remain in full force arid effect. There are no warranties which extend beyond the description on the face hereof.

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