

Operating and General

Instructions

BIG TWIN
by Evinrude



it's years ahead!

25 HORSEPOWER
Slow Trolling
ROTO-MATIC CONTROL
GEARSHIFT
CRUIS-A-DAY TANK

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Catalog

EVINRUDE MOTORS • MILWAUKEE 16, WISCONSIN

In Canada: Evinrude Motors, Peterborough, Ontario



MODELS 4447-4448
AND 7512-7513

OPERATING AND GENERAL INSTRUCTIONS

EVINRUDE FLEETWIN

FLEETWIN MODELS 4447-4448

(For Mechanical Specifications See Page 27)

FOREWORD The Evinrude Fleetwin is simple to understand, easy to operate, and built to give first-class service, but before you attempt to operate motor, read pages 2 to 8 carefully. The remaining instructions are for later reference and may be read at leisure.

MAKE WARRANTY EFFECTIVE NOW MAKE OUR WARRANTY ON YOUR MOTOR EFFECTIVE by filling out Registration Card (packed in tool bag) and mailing immediately. BE SURE CORRECT MOTOR NUMBER, located on port side of stern bracket, appears on card.

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ASSEMBLY INSTRUCTIONS Starboard (right) and port (left) are designated while facing bow (front). The motor as packed for shipment, comes completely assembled ready to be attached to boat. The spark plugs are in place in cylinders and wires are properly attached. Gear housing has been filled with OIL.

TOOLS AND EQUIPMENT The STEERING HANDLE is also a screw driver and can be easily unscrewed when needed. A spark plug wrench and a small feeler gauge for spark plug and breaker point setting are enclosed with this manual.

ATTACHING MOTOR TO BOAT Our motors are designed for transoms that conform to S.A.E. boat standards. (See illustration Fig. 1). "A" denotes pitch or angle; "B", maximum transom thickness; "C", vertical transom height, not including keel.

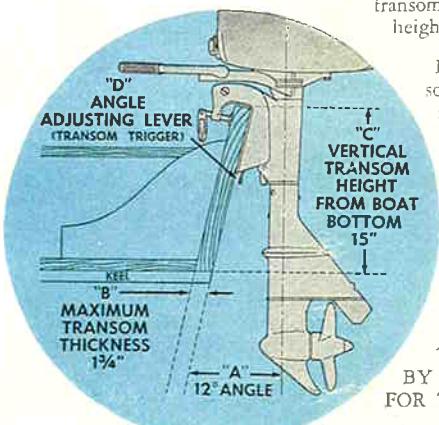


Fig. 1

CAUTION: It is "good insurance" to tie motor to boat with stout rope so that if motor becomes loose accidentally, rope will prevent loss overboard. Rope should be fastened to hole in stern bracket. (Fig. 3).

A short $\frac{3}{8}$ inch lag screw may also be screwed into outside of boat transom at a point where the slot in the bottom of the stern bracket will engage the head of lag screw, which should be left protruding about $\frac{3}{8}$ inch. Holes are provided in thumb screw handles thru which a padlock may be applied.

ANGLE ADJUSTMENT LEVER (Transom Trigger). (See illustration "D" Fig. 1). By tilting motor slightly and then lifting up on the lever and moving it either ahead or back, motor can be instantly adjusted to the desired angle. On some boats it may be necessary to correct angle adjustment to maintain motor in a vertical position when changing load from one to more passengers. Always try to arrange load so boat runs on an even keel.

LUBRICATION AND FUEL INSTRUCTIONS

Correct lubrication is the most important factor in the operation of an internal combustion engine, as it insures longer life and satisfactory performance.

In the Fleetwin's two-cycle engine, the lubrication of pistons, cylinders, crank-shaft and connecting rod bearings is solely supplied by oil which must be thoroughly MIXED with gasoline BEFORE it is poured into fuel tank. NEVER POUR CLEAR GASOLINE OR OIL INTO FUEL TANK.

Fuel tank capacity 1.1 Gallons or approximately 8 3/4 pints.

TYPE OF GASOLINE: Use a good grade of regular gasoline (such as used in automobiles). High octane or leaded fuel gives no advantage.

LUBRICANT: We recommend a high grade straight mineral oil of S.A.E. 30 body, such as Mobiloil Outboard or another outboard oil, or a REGULAR (NOT PREMIUM) type.

QUANTITY OF OIL REQUIRED: For the first four hours of operation, mix 3/4 pint of oil to each gallon of gasoline, and thereafter reduce quantity of oil to 1/2 pint to each gallon. Do not run motor faster than 2/3 speed for first four hours.

FUEL FILLER PLUG: For convenience, when filling fuel tank, hang filler plug over top of open filler plug cover. Turn counter-clockwise to open, clockwise to close.

STRAIN ALL FUEL: Due to condensation, water is often present in gasoline when you get it from the vendors. But it may also accumulate in your own fuel container from condensation due to changes in temperature.

Because the presence of water in fuel is a frequent cause of hard starting, all fuel should be poured through a fine mesh strainer. This will eliminate the water and also the dirt which might otherwise clog fuel passages. USE METAL CONTAINERS ONLY.

GEAR LUBRICATION: The Fleetwin's new design gear housing uses oil instead of grease. Remove plug on port side marked "LUB" (Fig. 2). Also remove the lower drain or vent plug on same side (Fig. 2) and with motor in a vertical position, permit housing to drain. Lay motor on its side and after replacing drain plug, fill housing with Mobilube GX-90 or any other good grade of oil suitable for automotive hypoid gears meeting U. S. Army spec. No. 2 — 105B grade 90. If hypoid gear oil is not available use a high grade oil of SAE 30 body such as Mobiloil Outboard or comparable straight mineral oil, until possible to replace with suitable hypoid lubricant. Check gear housing for oil after the first 5 hours of operation to be sure grease seals are tight, then periodically at least every 50 hours. The housing should be drained and refilled at the end of the season, before storing motor.
DO NOT USE GREASE.

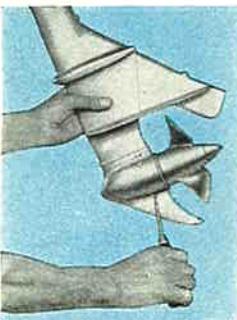


Fig. 2

EQUIPMENT NECESSARY WHEN OUTBOARDING

Although the following articles may not always be needed, it is advisable to have them aboard when motoring.

An extra can of fuel, properly mixed. The fuel capacity is about 8 3/4 pints and should run motor from 1 1/3 to 1 1/2 hours depending upon type of boat and boat load.

Funnel with strainer. Tools.

Rope to tie motor to boat. Extra spark plug.

Starting cord (see page 9, Fig. 7).

Oars and any equipment required by law when outboarding in federal waters. See page 25.

TLTING OF MOTOR: The tilting feature becomes very necessary in many situations. It is designed to permit self tilting when striking any submerged object while running in forward position. Care, however, should be taken in obstructed waters, not to operate motor at too high a speed. This tilting feature is also used when motor is not in operation, as in boat launching, beaching, rowing in shallow waters, etc.

Tilting is accomplished by grasping rear handle and pulling motor toward you. Never try to tilt motor by bearing down on steering handle. Before tilting motor make sure fuel valve is in "OFF" position, and vent screw is closed.

TLTING FRICTION: Proper tilting friction is set at factory, but through continued use, friction may have to be increased occasionally, so motor will retain a tilted position. To increase friction, first tilt the motor as far as it will go. Then, tighten the friction screws on both sides of stern bracket (Fig. 16), using a brace and bit screw driver. It is also necessary to hold the jam nut (Fig. 16) on the inside while tightening.

STARTING AND OPERATING INSTRUCTIONS

1. Open fuel valve by turning Fuel Valve Knob located on port side of control panel (Fig. 3) counter-clockwise as far as possible.
2. Open vent screw on top of Filler Plug by turning counter-clockwise.
3. Pull out Choke Knob located at starboard side of control panel (Fig. 3) all the way.
4. Turn High Speed Knob (large knob in center of control panel) (Fig. 3) to "RICH" position.
5. Set Speed Control Lever (Fig. 3) to "START NEUTRAL" position.
6. Pull up Clutch Control Button located at starboard side of motor on top of starter housing. (Fig. 3). This sets clutch to "NEUTRAL" position.

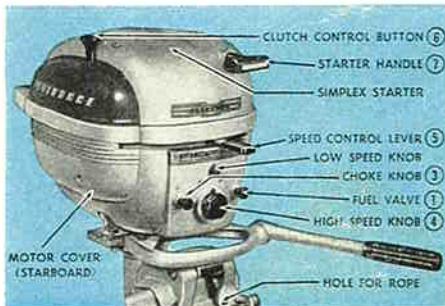


Fig. 3

- Pull Starter Handle slowly until starter engages, then pull forcibly (Do not pull cord out more than 30 inches). Repeat until motor starts. Allow starter cord to rewind before you release grip. Premature release of grip may injure starter or cord.
- After motor starts push in Choke Knob (Fig. 3) and push Clutch Control Button down. (Fig. 3) This engages clutch.



Fig. 4

"FASTER" or "SLOWER" as shown by indicators on control panel.

- To STOP motor move Speed Control Lever to extreme direction "STOP" as shown by indicator on control panel.

KEEP FUEL VALVE CLOSED when motor is not in operation.

FLOODING Flooding is a condition which can be created by OVER-CHOKING or sometimes cranking a warm or hot motor which may cause too much fuel to be drawn into crankcase and cylinders. The fuel mixture thus becomes too rich for combustion.

To correct, first note the approximate setting of the carburetor HIGH SPEED Knob, then close both High Speed Knob and Fuel Valve (Fig. 4) and pull Starter Handle until motor starts, allowing motor to run until it stops. Now, open Fuel Valve, reset HIGH SPEED Knob back to its original setting and follow instructions relative to starting WARM motor.

TO "START IN GEAR" NOTE: Clutch Control Button (Fig. 3) must be down before Speed Control Lever can be placed to "START IN GEAR"; otherwise above instructions apply.

STARTING WARM MOTOR Do not disturb High Speed Knob (Fig. 3) otherwise above instructions apply.

PROPER CARBURETOR ADJUSTMENTS Although both HIGH and LOW speed carburetor Knobs (located on control panel) (Fig. 4) are adjusted at the factory, due to difference in altitudes, climatic conditions and a possible change in fuel mixture, it may be necessary to re-adjust them under actual running conditions to obtain best performance. After motor gets under way, with Speed Control Lever fully advanced it is advisable to adjust the HIGH Speed Knob (Fig. 4) by slowly turning clockwise for leaner mixture and counter-clockwise for richer mixture, until motor runs smoothly at its highest speed.

To adjust LOW SPEED Knob (Fig. 4) slowly move SPEED CONTROL lever

toward "SLOW" position, then adjust the LOW SPEED Knob by slowly turning clockwise or counter-clockwise until motor runs smoothly at its lowest speed.

It may be necessary to again slightly re-adjust the HIGH SPEED Knob after LOW SPEED Knob is properly adjusted.

CAUTION: To eliminate the necessity of readjusting the carburetor adjusting knobs every time motor is used, it is advisable to measure the quantity of lubricating oil mixed with the gasoline very accurately. Also care should be taken that the same grade and type of both oil and gasoline are always used.

REVERSE The Fleetwin motor permits full 360° steering. Reversing is accomplished by turning motor one-half turn. It is advisable to slow the motor down to "START NEUTRAL" position before attempting to swing motor into reverse. The clutch may also be disengaged by pulling up on Clutch Control Button (Fig. 3) if so desired. A special lock arrangement built into the drive housing locks the motor against tilting while reversing. Use extra care while running in reverse, so as not to strike any obstruction, thus avoiding possible damage to lower unit parts, as tilting feature functions only in "FORWARD" position.

DUO-CLUTCH The Fleetwin motor is equipped with two separate clutches — namely NEUTRAL CLUTCH and SAFTI-GRIP-DRIVE — both of which are mounted on propeller shaft inside of the gear housing (Fig. 16-19) and constantly run in a bath of oil during motor operation.

NEUTRAL CLUTCH: The purpose of the "NEUTRAL CLUTCH" is to dis-engage the motor power from the propeller, which is done by pulling up on the Clutch Control Button. (Fig. 3) This permits easier and safer starting of motor and aids in the maneuverability of the boat in confined or crowded places. Engagement is accomplished by pressing the CLUTCH CONTROL BUTTON down. This shifting of clutch can be done only with the speed control lever at "START NEUTRAL" or slower positions.

The NEUTRAL CLUTCH can also be used when swinging motor into "REVERSE" position.

SAFTI-GRIP-DRIVE: The SAFTI-GRIP-DRIVE (Fig. 16-19) is an integral part of the DUO-CLUTCH and provides for propeller protection in shoal waters. Multiple discs release propeller on impact with underwater obstructions, absorbing all collision shocks and again gripping firmly for normal operations after obstruction has been passed over, thus preventing damage to propeller, gears, shafting and other mechanism. Should obstruction become jammed, locking propeller, the clutch will slip momentarily and then stall engine, thus avoiding the possibility of wearing out the clutch, and preventing undue strain on motor.

OPERATION OF FUEL VALVE The FUEL VALVE, (Fig. 4) located on port side of control panel, when closed stops flow of fuel from fuel tank to carburetor. This VALVE and vent screw on top of Filler Plug should always be closed when motor is not in operation, when transported or during storage.

TO AVOID FUEL LEAKAGE WHEN CARRYING OR HANDLING MOTOR It is important that the FUEL VALVE (Fig. 4) and vent screw are fully closed.

Toward end of run, just before stopping motor, close the FUEL VALVE and then permit motor to run for a minute or two, until it stops. This will drain the

carburetor and motor can then be carried without leakage. For complete safety, always empty fuel tank when transporting motor.

REMOVING MOTOR FROM BOAT When removing motor from boat it is important to keep powerhead higher than lower unit, to prevent water from entering into cylinders and crankcase through exhaust ports.

Therefore, while lifting motor off boat, hold in an upright position until all water has drained from lower unit.

WRITE US If you are in need of information see your dealer or write us immediately for service on your motor. Our Service Department is always ready to cheerfully and promptly answer your letter, and to make helpful suggestions.

When writing, be sure to give Motor Model, Name and Serial Number.

The following instructions to be read at leisure.

CYLINDER CONSTRUCTION

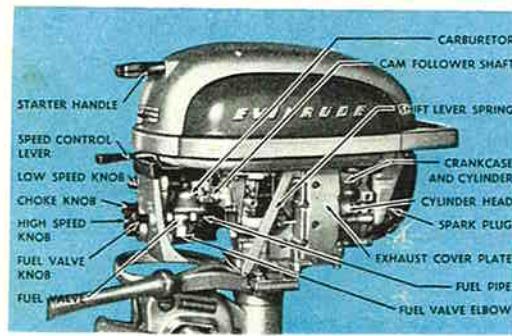


Fig. 5

SIMPLEX STARTER . . . EMERGENCY STARTING

This starter is built to give the best possible service. However, should starter failure occur, motor can still be continued in service by removing starter. This is accomplished by removing the four screws holding it to fuel tank, two in front on top of starter and two in rear below fuel tank. (Fig. 6). Next remove screw holding filler plug strap and starter can then be lifted off of fuel tank. A length of $\frac{1}{4}$ " cord with a knot tied on one end can be placed into notched pulley atop flywheel, wound clockwise, and started in usual manner (see Fig. 7).

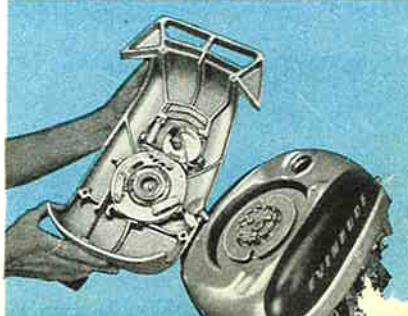


Fig. 6

If trouble appears to be in starter, we recommend it be sent to dealer for repairs while motor continues in use.

CO-PILOT AND STEERING ADJUSTMENT The Co-Pilot is your relief steersman, helps you keep a true course. It provides a cushioned, yielding grip, holding course, whenever you let go of steering handle.

Proper adjustment is made at factory. Should Co-Pilot steering become too loose, adjustment can be made by tightening screw located on upper port side of pivot bearing.

SPARK PLUG The Champion J6J spark plugs should be used. They are carefully adjusted to .030 inch gap at factory, but continued use may necessitate resetting. A gage for this is provided in tool kit. Use end marked "Spark Plug".

When placing spark plugs into cylinders, be sure gaskets are intact, and tighten plugs securely. (Wrench furnished in tool kit). It is important that spark plug terminals are tightened with pliers.

RUBBER SPARK PLUG HOOD

Magneto high tension wires are equipped with special spark plug hoods, (Fig. 8) that fit tightly over spark plug and prevent plugs from shorting due to moisture.

When attaching wire to spark plug, press hood down securely and give hood a half turn to right.

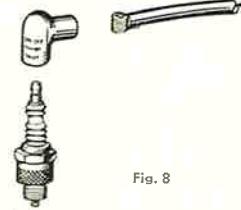


Fig. 8

CARBURETOR (Fig. 9-10) The Carburetor is designated as a single barrel horizontal type, having throttle and choke valves.

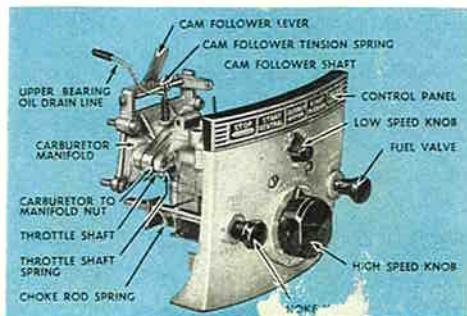


Fig. 9

Carburetion is controlled by a butterfly type throttle valve. A single jet supplies fuel at high speed. This jet has a separate angle jet located ahead of it, which acts as an air bleed. A high speed adjusting needle protrudes from front of carburetor and is regulated by large Knob located in center of control panel (Fig. 9).

Two low speed jets are located in ceiling of throat

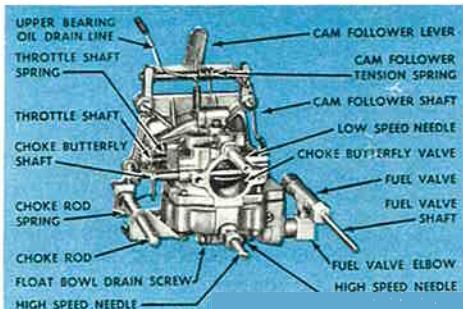


Fig. 10

A butterfly type choke valve for starting is located just ahead of Venturi and is controlled by a choke knob (Fig. 9) located on starboard side of control panel.

IMPORTANT — KEEP CARBURETOR CLEAN No matter what precaution is used in straining fuel before filling fuel tank, there is always a chance of dirt, sediment, or water accumulating in tank or pipe, therefore it is advisable to clean the carburetor at regular intervals. To do this first remove motor covers, then remove fuel pipe from shut off valve (Fig. 5) and drain tank. Remove four screws holding manifold to crankcase, (care should be taken in removal that reed plate which is set in manifold does not drop out) and remove complete carburetor and manifold assembly. (Since control panel is fastened to carburetor it will also be removed with carburetor) (Fig. 9).

To clean and drain float bowl remove small brass screw located in front at bottom of bowl. (Fig. 10)

FUEL FILTER: The fuel filter assembly is located in the bottom starboard side of fuel tank, (Fig. 11) to which the fuel line is attached. It consists of a porous metal element, which is inserted vertically in bottom of tank, and is about 2 inches in length.

The extremely fine porosity of this metal filters out all foreign matter, water etc., permitting only the fuel to pass through. Due to its large outer area, it may never become totally clogged, but can be removed for occasional cleaning. To remove filter, remove starboard motor cover, disconnect fuel line (Fig. 11) and unscrew filter fitting from Tank (Fig. 11). Tank should preferably be empty as there is no shut-off at this point. It may be wise to flush out tank with clean fuel before replacing filter.

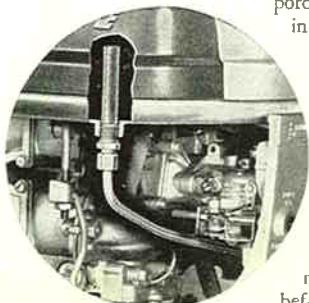


Fig. 11

of carburetor and supply fuel when the throttle valve is closed. The fuel is brought to these jets through a small tube with a fitting, which passes up through the high speed jet. The proper mixture for low speed is regulated by an AIR ADJUSTING NEEDLE protruding from upper front of carburetor and is controlled by the LOW SPEED Adjusting Knob (Fig. 9) near top of control panel.

REED PLATE: The reed plate (Fig. 12) is located between the carburetor manifold and crankcase and consists of two phosphor bronze reeds and two steel reed stops. The purpose of the reed plate is to entrap all fuel and air mixture which is sucked into the crankcase.



Fig. 12

As the general performance of the motor depends largely on the fit of these reeds, it is necessary that they seat flat on reed plate surface, assuring an air tight seal.

Although these reeds are designed to withstand the normal life of the motor, it is well to examine them anytime the carburetor is removed.

The reeds should be checked for dirt that may have become lodged between reed and reed plate or for possible fracture in the reeds themselves.

Care should be taken not to mar reed seat on plate and not to bend reeds during inspection.

COOLING SYSTEM

by the action of the "CENTRI-MATIC" pump, which consists of a single stage rubber impeller centrifugal pump. It functions as a positive full displacement pump (Fig. 13) assuring adequate water supply at the lowest motor speed. At the higher speeds, it becomes a centrifugal pump, (Fig. 14) as the increased water pressure bends back the impeller blades, decreasing the impeller diameter, thereby eliminating wear and conserving power. Under average conditions the pump should give satisfactory service for many seasons.

The water inlet (Fig. 16) is a slot located below exhaust outlet directly behind propeller where the constantly swirling slip-stream makes the inlet virtually clog-proof.

While operating motor at full speed, should it show signs of slowing down, immediately check water discharge at water outlet (Fig. 16) located at rear of motor somewhat above water level.

In case no water is being discharged, immediately shut off motor and check water inlet slot (Fig. 16) for obstruction. If no obstruction is found it may be necessary to check the pump itself.

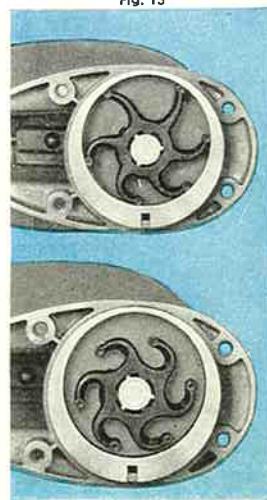


Fig. 13

Fig. 14

LARGE ADJUSTING KNOB FRICTION Should large adjusting knob become too loose and not retain proper setting it can be tightened to the desired friction by drawing up on the packing nut. After considerable use, it is desirable to add new packing in the nut which is located just behind the control panel. (Fig. 10)

UNIFIED SPEED CONTROL The spark and throttle are correctly synchronized under a single positive Speed Control Lever, which provides a perfect means of controlling the speed of the motor.

It consists of a cam plate fastened beneath the magneto base which travels with any movement of the Speed Control Lever. This plate contacts a cam follower lever (Fig. 10-11) on carburetor, which is connected directly to the throttle valve on the carburetor. The moving of the Speed Control Lever (Fig. 2) to "FAST" advances the spark and opens the throttle valve; to "SLOW" retards the spark and closes the throttle valve.

HOW TO REMOVE FLYWHEEL Never remove the flywheel of your motor unless it is absolutely necessary to do so. The only reasons for removing flywheel are for replacing points, condenser, coil or high tension wires, or for checking for loose or broken wires.

Remove motor covers and remove Fuel valve assembly from carburetor. (See instructions on Fuel Valve, page 7).

Remove Simplex Starter (See instructions on Simplex Starter Emergency Operation, page 8).

Remove Gasoline Tank by removing screws holding tank to motor, located underneath the tank. Two in front and two in rear. (Fig. 16).

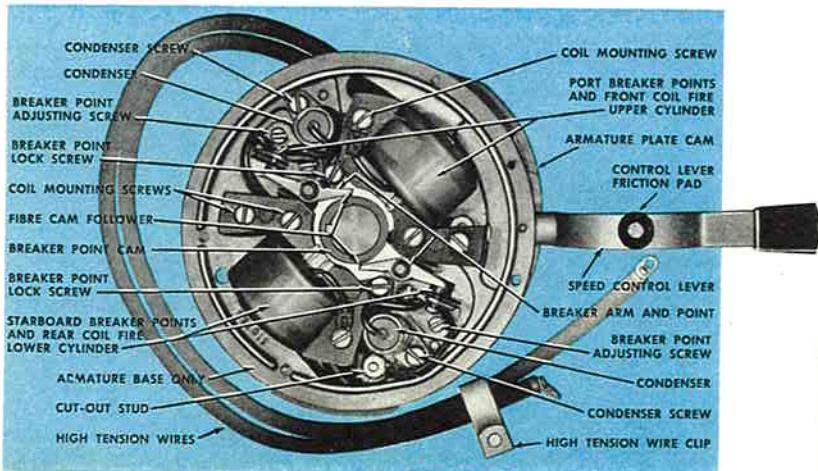


Fig. 15

Holding the flywheel rigid, unscrew the flywheel nut several turns, using a $\frac{3}{4}$ " wrench. Pull up on flywheel at the same time tapping flywheel nut several sharp blows with a hammer. When flywheel comes off, use care not to lose the key which holds flywheel and breaker point cam in engagement with crankshaft.

Should breaker point cam (Fig. 15) be removed for any reason be sure when replacing that side marked "TOP" is up.

Before replacing flywheel check key in crankshaft to make sure it is a tight fit also see that keyway in flywheel lines up perfectly with key on crankshaft. It is also advisable to place a few drops of oil on felt oiler (Fig. 15) and be sure breaker points are clean and dry. Make sure flywheel nut is tightened securely by using a hammer on wrench.

IGNITION TROUBLES AND HOW TO LOCATE THEM

In locating ignition trouble, the first and most common cause may be spark plugs. Remove plugs, and examine them carefully. Should the points and inner porcelain appear wet from either oil or water, plug is definitely fouled. Also check plugs for dirt across points, proper gap and for cracked porcelain.

If no faulty spark plugs are found, proceed to check strength of spark from magneto. Leaving plugs out of cylinder, remove rubber spark plug hoods and ground one high tension wire onto motor, then, holding the other one $\frac{1}{4}$ " away, pull on starter handle. A good spark should jump this gap.

Repeat this procedure on the other wire, and if there is any evidence of spark failure, it will then be necessary to check magneto. Before attempting to do this, read instructions "Adjustment of Magneto Breaker Points", page 13, and follow them carefully.

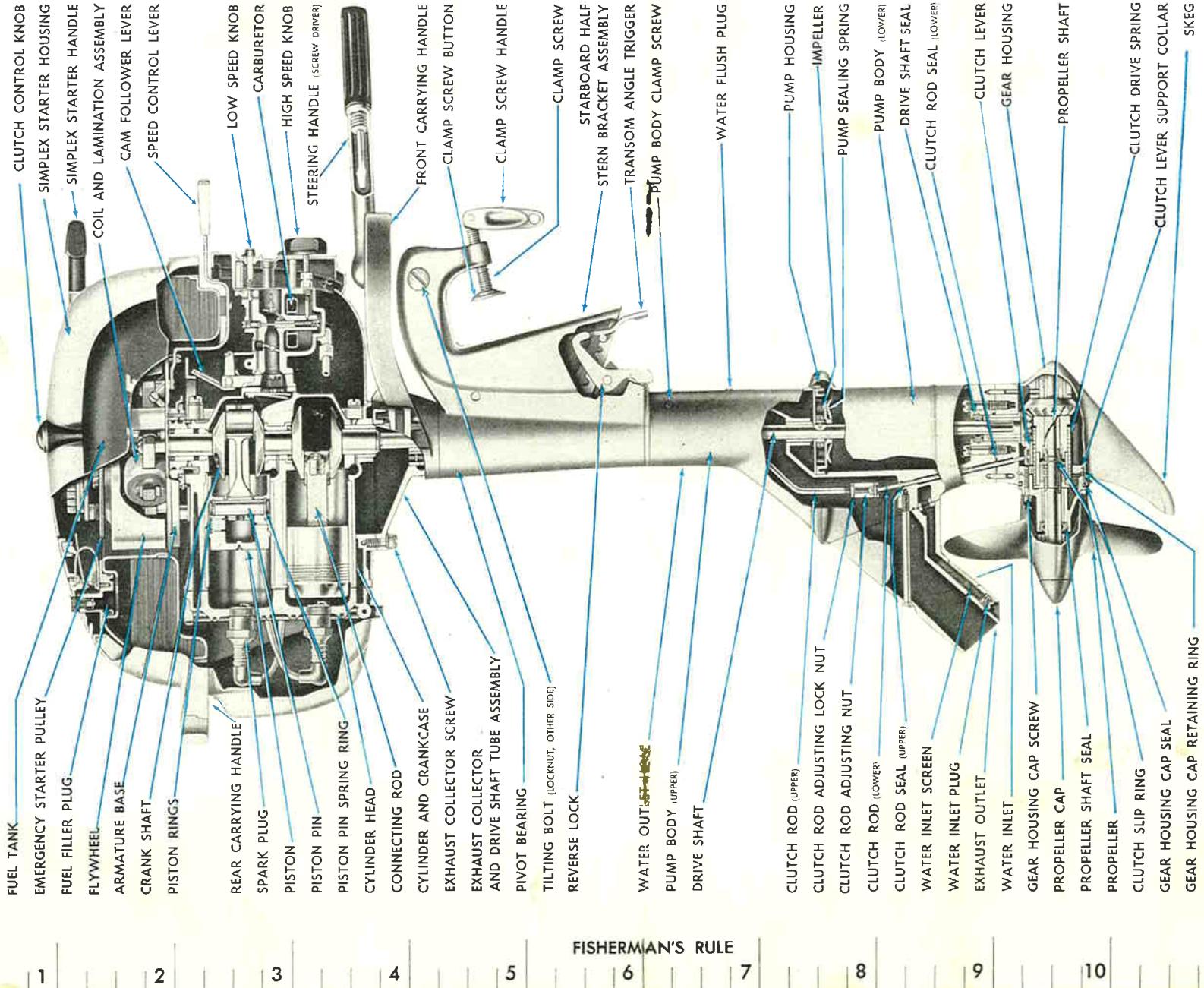
If trouble does not appear to be in breaker points, then check over the complete magneto base. Search for any broken or loose wires on coils, condensers, breaker assemblies, etc. If no visible defect is apparent, the trouble may be either in a coil or condenser, in which case it is advisable to send complete magneto to nearest dealer. (See instructions on removing flywheel, page 12). To remove magneto base from motor, remove high tension wire from spark plugs and then remove the four hold down screws located near center of base. (Fig. 15)

The magnet, composed of the improved "Alnico" steel, will retain its magnetic charge practically indefinitely. Therefore, the magneto should not be considered to have lost its "pep" until such diagnoses have been made by a competent authority.

ADJUSTMENT OF MAGNETO BREAKER POINTS

After extensive service, the breaker points may become dirty or out of adjustment. To check, it is necessary to remove simplex starter. (See Fig. 6) (See Simplex Starter Page 8). It is not necessary to remove flywheel, as there is a hole in

FLEETWIN WITH STARBOARD COVER REMOVED



When writing for instructions on motor refer to above illustration for names of parts.
Starboard (right) and port (left) are designated while facing bow. (front)

Fig. 17

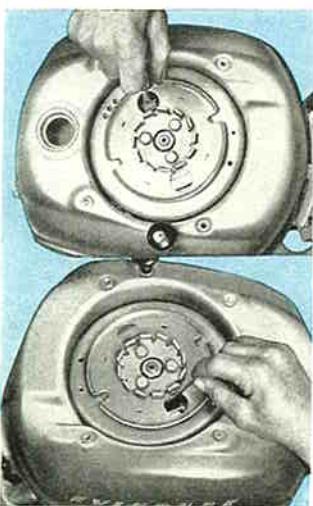


Fig. 18

flywheel for this purpose. (See Fig. 17-18). After removing starter, turn flywheel until one of the breakers lines up with hole, and then insert gage (furnished with motor). Use end marked "Breaker". Points should check .020". If necessary to re-adjust, insert screw driver through hole and loosen breaker point lock screw (Fig. 15). Now with screw driver turn breaker point adjusting screw (Fig. 15) clockwise to open points, anti-clockwise to close points. After proper adjustment has been made lock breaker by tightening breaker point lock screw (Fig. 15). Recheck points for correct gap.

Turn flywheel $\frac{1}{2}$ turn and repeat for other set of points.

If, after considerable service, points need filing or replacing or if it is necessary to check complete magneto base, flywheel will have to be removed. (See how to remove Flywheel, page 12). When adjusting points with flywheel removed, turn crankshaft until flywheel key is in line with fibre cam follower (Fig. 15) on breaker arm. This is the high

point of the cam, and breaker points should check .020".

The starboard breaker points fire the lower cylinder through the rear coil and the port breaker points fire the upper cylinder through the front coil. (Fig. 15)

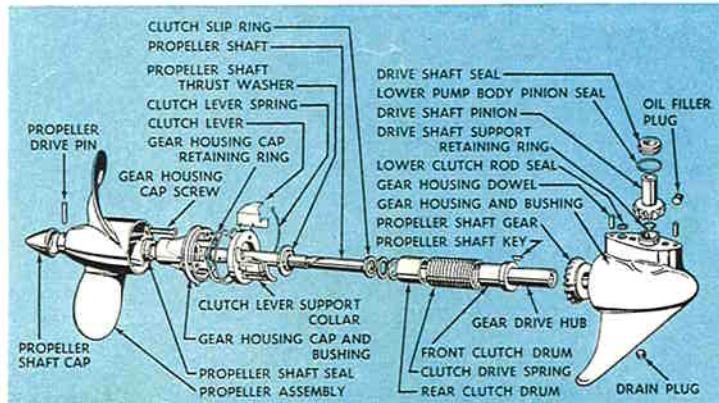


Fig. 19

point of the cam, and breaker points should check .020".

The starboard breaker points fire the lower cylinder through the rear coil and the port breaker points fire the upper cylinder through the front coil. (Fig. 15)

HOW TO REMOVE PROPELLER SHAFT WITH DUO-CLUTCH ASSEMBLY AND GEARS

(See Illustration Fig. 19). Engage clutch, remove propeller cap and drive pin (Fig. 19) then remove propeller. Remove three screws holding gear housing cap in place, then remove cap. Remove propeller shaft by twisting clockwise and counter-clockwise while pulling out on shaft. Push in on clutch lever support collar (Fig. 19) and remove gear housing cap retaining ring (Fig. 19). Clutch lever support collar, propeller gear and drive gear can now also be removed. To re-assemble, reverse above procedure.

IN CASE OF TROUBLE

Gasoline and ignition troubles are by far the most prevalent ailments among all types of gasoline engines. Therefore, if your motor does not behave properly, it is wise to look for the most common form of trouble before attempting to dismantle the engine — don't try to find something when you don't really know what you're looking for.

If your motor has fuel properly mixed and carefully strained, but refuses to start, or behaves badly, consult the check chart. If you have no idea what the trouble may be, start making a systematic check through the list of symptoms described below. If you do this, the chances are ninety-nine out of a hundred that you'll quickly locate your trouble and be ready to remedy it.

CHECK CHART

The following chart aims to provide an outline for the systematic tracing down of trouble with the least amount of effort. Finding the cause of trouble usually suggests the remedy.

Motor won't start —

GASOLINE TROUBLE

Tank empty.

Shut-off valve closed.

Carburetor flooded, if motor is warm. Mixture too lean, if engine is cold.

Too much oil mixed with gasoline. Water in carburetor, tank or strainer. Pipe clogged.

Spray nozzle or feed hole in carburetor clogged.

Vent screw closed

NO SPARK

Wire to spark plug too close to motor covers.

Wire to breaker disconnected.

Wire to spark plug disconnected.

Water, oil, on breaker points.

Breaker points do not come together when flywheel is revolved.

Breaker points do not separate when flywheel is revolved.

SPARK PLUG FAULTY

Fouled with carbon, oil or moisture.

Porcelain cracked.

Center pole loose.

Points not properly adjusted—should be apart .030.

Motor overheats —

Lack of oil or water.

Motor knocks —

Spark too far advanced.

Carbon in cylinders (caused by too much oil in gasoline).

Motor too hot, causing pre-ignition.

Bearings loose or worn.

Piston or cylinder worn.

Flywheel nut loose.

Motor is stiff or cranks hard —

Rust in cylinder.

Bearings out of line.

Crankshaft bent.

Gear shaft bent.

No oil on bearings.

Water stops circulating —

Obstruction in water intake.
Leak in water system.
Motor not setting deep enough in water.

Poor compression —

Piston rings carbonized and stuck in groove.
Cylinder scored.
No oil in cylinder.

Motor misses —**WIRING**

Spark plug wire shorting on motor covers.
Broken or loose wiring.
Poor insulation.
Wires short circuited with moisture, oil or foreign material.

MAGNETO

Breaker points corroded.
Breaker points improperly spaced.
Weak coil.
Weak condenser.
Weak magnet.
Foreign matter or oil on breaker points.

CARBURETOR

Foreign matter in spray nozzle or needle valve or feed hole.
Supply impeded.
Water in carburetor.

IMPROPER CARBURETOR ADJUSTMENT

IMPROPER MIXTURE
Too rich (will slow down and knock).
Too lean (will knock).

LACK OF COMPRESSION

Lack of oil.
Scored cylinder.
Worn rings.
Rings stuck in grooves.

Motor vibrates —

No spark in one cylinder.
Loose pivot bearing.
Bent propeller wheel.
Motor loose on boat.
Too lean or rich a mixture of gas.

Motor runs but boat makes little or no progress —

Propeller blades bent.
Rope or other obstruction dragging in water.

Motor runs at excessive speed

Foreign matter on propeller or gear housing.

SALT WATER INSTRUCTIONS EVINRUDE MOTORS ARE BUILT FOR USE IN EITHER FRESH OR SALT WATER. Yet science has

not succeeded in developing any metal which is totally impervious to the corrosive action of salt water. The materials with which your motor is built are commercially "salt water proof".

A few instructions, easily carried out, will extend the life and satisfactory performance of your motor when it is used in salt water.

If you've been out on salt water all day, it isn't much trouble to flush your motor with fresh water when you come ashore. The cylinder jackets, water pipes and muffler jacket can all be easily flushed with fresh water by using a flushing nozzle. (Fig. 20) This nozzle is inserted in hole in upper pump body marked "WATER FLUSH", (Fig. 20) after removing the pipe plug.

Drain and fill Gear Housing per instructions on page 4 "GEAR LUBRICATION".

CARE OF MOTOR IN COLD WEATHER Your motor will freeze in cold weather just as the radiator of an automobile will, if not given proper attention. A frozen motor usually means cracked pipes and water jackets.

There is not the slightest danger of your motor freezing while running. But, when your motor is idle, or before storing it away in cold weather, drain the motor by setting it in an upright position and revolving flywheel. This lets the water out of the cylinder jackets and pipes, preventing costly freezing and bursting of parts.

Drain and fill Gear Housing per instructions on page 4 "GEAR LUBRICATION".

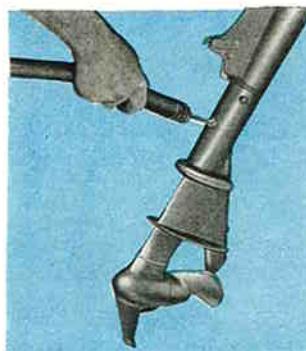


Fig. 20

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STORING THE MOTOR AWAY

If you are not going to use your motor for a while, don't store it away in a cellar or other place where it will be exposed to dampness or dust. No sportsman would do such a thing with his guns or fishing rods, and there is no reason why your motor should not receive the same care that would be accorded to other personal property of even less value. Dampness and dust may injure the magneto of your motor, cause deterioration and do other damage almost beyond repair.

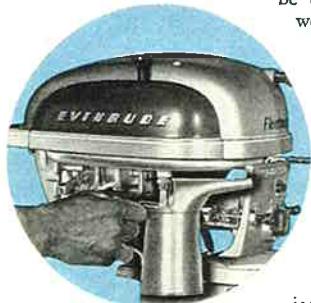


Fig. 21

When storing your motor away PUT IT IN A DRY PLACE. If it has been used in salt water, flush it thoroughly with fresh water, and let it dry before putting it away.

Drain the water out of the pipes and cylinder jackets as instructed under "CARE OF MOTOR IN COLD WEATHER". Drain all fuel from Fuel

Tank and Carburetor. (Fig. 21). It is also a wise precaution to remove the spark plugs, put a couple of teaspoonfuls of pure lubricating oil into the cylinders (Fig. 22) and then revolve the flywheel several times to spread the oil over the cylinder walls before putting the spark plugs back. Drain and fill Gear

Housing per instructions on page 4. "GEAR LUBRICATION". Wipe the entire motor with a cloth saturated with oil. (Fig. 23) An exterior film of oil won't hurt any piece of machinery, but dampness and rust WILL. When these instructions have been carried out, wrap the motor in a piece of canvas, an old blanket, or in heavy paper. (Fig. 24) and store in a dry place.

If these simple instructions are carried out, storing will not injure your motor in the least. Further, it will be ready to run faithfully when you are ready to use it again.

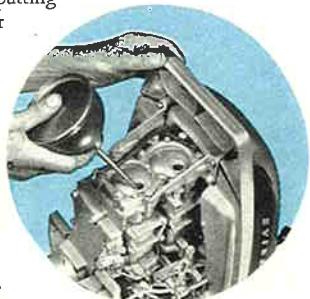


Fig. 22

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FLEETWIN

WHEN READY TO USE IT AGAIN

If your motor has been idle for some time, or has been stored without following the instructions, "Storing the Motor Away", it is a good plan to squirt a little pure lubricating oil into the cylinders through the spark plug holes. (Fig. 22) This done, the flywheel should be revolved a few times, to spread the oil around the cylinder walls.

When you take the motor out, clean it up. Inspect the gears, propeller shaft and bearings to see that they are in good condition. Fill Gear Housing per instruction on page 4 "GEAR LUBRICATION".

Clean the contact points (Fig. 15) by running a piece of hard paper or cardboard between them. If they are very dirty or rough, use a very fine file to polish them. See that the points are adjusted to correct gap.

Clean the fuel filter. Clean out the fuel tank, the fuel feed pipe and the carburetor.

Mix your gasoline and oil in a clean can, and in the right proportion. Strain all fuel; use only metal containers. Fill the tank. See that the fuel is flowing to the carburetor.

Thoroughly clean the spark plugs. Replace with new ones if cracked, broken, or badly burnt.

If, in going over the motor, you find any parts damaged, replace them at once.

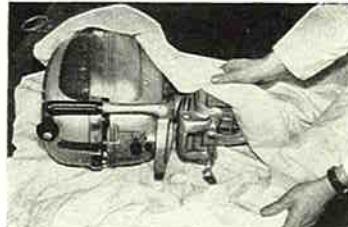


Fig. 23

Tighten up all screws and nuts.

Put the motor on the boat and start it. Carefully adjust the carburetor. See that cooling water is flowing.

After long, continuous, hard service, a very complete overhauling may be advisable. This should be done by an expert. If you desire, return the motor to our distributor or dealer, and you will get a workmanlike job at a fair charge for time and materials.

MOTORS THAT HAVE BEEN SUBMERGED

Accidents may happen to the most careful person, and it is by no means impossible to drop an outboard motor overboard. Careful boatmen safeguard themselves against such mishaps by tying a length of rope to their motors and tying the other end to the boat. A motor so secured cannot be lost.

A motor that has been submerged is temporarily out of commission. Such a motor must, of course, be dried out thoroughly before it can be restored to service.

For cleaning and drying motor, proceed as follows:

1. Drain and clean fuel tank, flushing thoroughly with clean gasoline.

2. Remove and clean carburetor (see instructions, page 10 — "Keep Carburetor Clean") fuel line and spark plugs. Make sure all water has been removed from these parts.
3. Hold motor in position with carburetor opening in crankcase down, and revolve flywheel slowly to remove water from cylinders and crankcase.
4. Check Spark as follows: Remove the spark plugs and make sure they are dry, then leaving plugs out of cylinder, attach the high tension wires to plugs and ground the plugs to some part of motor, and pull flywheel over rapidly with starter handle. A good spark should be produced at both spark plug points.
5. If no spark or a very faint spark is produced it is an indication that there is some water on the armature base or contact points. Remove magneto. (See instructions, page 12 — "How to Remove Flywheel".) After flywheel has been removed, thoroughly dry armature base, also breaker points and check points for proper spacing (.020).
6. Replace magneto and again check for spark as above. If still no spark is apparent, again remove flywheel and check complete magneto. (See instructions, page 13 — "Ignition Troubles and How to Locate Them"). If after thoroughly checking magneto a satisfactory spark is not produced, return complete magneto to nearest dealer.
7. Reassemble carburetor and fuel line.
8. Put about two to three tablespoonfuls of oil, of the kind you mix with gasoline, in each cylinder, through each spark plug hole, (Fig. 22) and with the spark plugs removed and both wires grounded rotate flywheel rapidly by pulling starter handle. Repeat this process several times, then put spark plugs in cylinders, fill fuel tank with new fuel mixture and proceed to start motor.
9. Due to the excess oil in cylinders as well as the possibility of some water which may still remain in cylinders, it may be necessary to remove and clean the spark plugs once or twice during the process of starting.

DON'T HESITATE TO WRITE US We realize that our business success depends largely upon the service that users derive from our products. We want every owner to feel that he is getting MORE THAN HIS MONEY'S WORTH in service out of his outboard.

If we can be of further help to you in increasing the pleasure you derive from your motor, don't hesitate to write us. Tell us your troubles — if you have any; also your joys. Such correspondence will receive prompt attention. Our Service Department is maintained for your benefit. When writing, give model, name and serial number.

FACTORY WARRANTY WE WARRANT each new unit to be free from defects in material and workmanship under normal use and service, our obligation under this warranty being limited to making good at the factory any part or parts thereof which shall, within three months after delivery of such unit to original purchaser, be returned to us with transportation charges prepaid, and which our examination shall disclose to our satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties and representations, expressed or implied, and of all other liabilities in connection with the sale or use of any unit.

This warranty shall not apply to any unit which shall have been repaired or altered outside the factory in any way so as to affect its stability or reliability, or in which other than our genuine parts have been installed, or which has been subject to misuse, negligence, accident or racing*, or operation at more than our recommended r.p.m. as expressed in the horsepower designation. We make no warranty in respect to trade accessories not of our manufacture inasmuch as they are usually warranted separately by their respective manufacturers.

All deliveries are contingent upon conditions beyond our control, but we will make replacements as promptly as the situation will permit.

*The use of the engine for racing voids our warranty. Should you risk the effects of using your motor for racing (resulting in increased revolutions), minimize the injurious effect by mixing $\frac{1}{2}$ pint of S.A.E. 60 high grade oil, such as Mobil oil Extra Heavy which is a straight mineral oil, with each gallon of gasoline.

SERVICE POLICY In accordance with our warranty, parts will be repaired or replaced under the following conditions:

1. That permission has been expressly granted by manufacturer for return of parts.
2. That manufacturer's examination discloses actual defect.
3. That customer has paid or will pay transportation charges on replacement or repaired parts.
4. WE WILL NOT BE RESPONSIBLE FOR TIME SPENT AND WORK PERFORMED BY OTHERS THAN THE FACTORY, UNLESS SUCH REPAIRS ARE FIRST AUTHORIZED BY US IN WRITING.

Final decision as to defect rests solely with the factory at Milwaukee, Wisconsin, and no repairs or replacement agreement other than the above will be recognized.

SPURIOUS PARTS AND THE FACTORY WARRANTY

Be sure that you get genuine parts. Your dealer can be relied upon to furnish nothing else. There are, however, spurious parts for outboard motors, just as there are for all makes of automobiles, and nearly everything else mechanical. THE USE OF PARTS OTHER THAN THOSE MANUFACTURED BY US VOIDS OUR WARRANTY.

REPAIR SERVICE Dealers usually carry a complete stock of spare parts. If you need parts, or repair service, consult your dealer. If the name and address of the nearest dealer is not known, write us.

PARTS BOOKS Parts books for all current models are available. If you need a parts book, write us.

INSURE YOUR BOAT AND MOTOR AT SMALL COST

Through the Outboard Boating Club of America you may now insure your boat and/or motor on nearly the same basis as you would your motor car. Members of the Outboard Boating Club of America are entitled to the full privilege of this insurance service. Premiums are exceptionally low and include protection against fire, theft and marine perils. For further details write OUTBOARD BOATING CLUB OF AMERICA, 307 North Michigan, Chicago 1, Illinois.



THE IMPORTANCE OF QUIET OPERATION A noisy motor is unwelcome in the boating scene, and gives the sport of boating a black eye.

That is one big reason why Evinrude Motors has spent, and is continuing to spend, thousands of dollars annually to make Evinrude motors run more quietly.

We count on all Evinrude owners to cooperate with all their fellow boatmen and with us by:

Operating their motors as silently as possible.

Refusing to tamper with or removing all or any part of exhaust and silencing mechanisms.

Promptly repairing silencing mechanisms if these become faulty in operation.

Evinrude dealers recognize the desirability of having all outboards operate quietly, and will gladly cooperate with motor owners in reaching this worthy objective.

Your courtesy in conserving the quiet of the great outdoors will be gratefully recognized by all your boating and shoreside neighbors. We also will sincerely appreciate your cooperation.

"RULES OF THE ROAD FOR OUTBOARD OWNERS"†

1. Boats under sail always have the right of way.
2. Motor boats must keep clear of sailing craft and row boats at all times.
3. Always keep on the right side of the channel or fairway when possible.
4. Any boat overtaking another boat must keep out of the way.
5. When meeting another boat head on or nearly so, each boat shall alter its course to right so as to pass on the left side of the other and each boat should give one short blast of the whistle. In other words, always keep to the right.
6. If a boat is well over to the right in passing, it should keep straight on and give one toot to the whistle. If you are well over to the left, keep straight on and give two toots to the whistle. The other boat should do the same.
7. When two boats are crossing and approaching obliquely, the one that has the other on her own left side should keep her course and speed, and the one which has the other on her right side should get out of the way as best she can, but, if possible, not by crossing ahead. "The giving away vessel" should give one short toot if she is altering her course to right or two short toots if to left, which the boat that is holding her course should answer.
8. If for any valid reason you cannot comply with the rules or do not understand signals being given by another boat, give the danger signal, which is a number of short blasts, not less than four, and stop if necessary.
9. Never sound a whistle while underway unless necessary.

†Prepared by Outboard Boating Club of America.

EQUIPMENT REQUIRED ON FEDERAL WATERS

NOTE: No all-embracing definition of what constitutes Federal waters can be given. However, in general it may be said that craft operating on navigable waters in or opening into the Great Lakes, an ocean or gulf, and all navigable waters tributary to such waters upstream to the first lockless dam, are under Federal supervision and should carry the proper government equipment.

1. A bright white light aft to show all around the horizon. Visible at least 2 miles.*
2. Combination light in the fore part of boat showing green to starboard and red to port, from right ahead to two points abaft the beam on their respective sides. Visible at least 1 mile.*
3. A whistle or other sound-producing mechanical appliance capable of producing a blast of 2 seconds or more in duration. (On boats 16 feet or more in length.)
4. A life preserver or ring buoy (or approved cushion) for every person on board.
5. An approved fire extinguisher. Motor boats propelled by outboard motors and not carrying passengers for hire are not required to carry fire extinguishers.
6. Persons who operate any motor boat in a reckless or negligent manner so as to endanger life, limb or property of any person shall be termed guilty of a misdemeanor and, on conviction, shall be punished by a fine not to exceed \$2,000 or by imprisonment for a term not exceeding one year or by both such fine and imprisonment.

*From Sunset to Sunrise.

BOAT NUMBERS REQUIRED BY THE UNITED STATES COAST GUARD

We quote from the Department Regulations:

1. Application for numbers will be made by the owner or master to the collector of customs of the district in which the owner resides. The owner will then receive full instructions as to the number awarded, how it is to be placed on the vessel, etc.
2. The following undocumented vessels are required to be numbered:
 1. All boats equipped with permanently fixed engines.
 2. All boats over 16 feet in length equipped with detachable engines.
 3. All boats not more than 16 feet in length equipped with detachable engines as the ordinary means of propulsion.
3. The following undocumented vessels are not required to be numbered:
 1. All boats not exceeding 16 feet in length equipped with detachable engines and falling within the following classes:
 - (a) Rowboats and canoes designed and intended for the use of oars or paddles as the ordinary means of propulsion.
 - (b) Sailboats.
 - (c) Boats designed and used solely for the purpose of racing or operation incident to racing.

EVINRUDE
FLEETWIN

FLEETWIN MECHANICAL SPECIFICATIONS

MODEL 4447	For 15" boat transom (Standard length)
MODEL 4448	For 20" boat transom
HORSEPOWER	7.5 O.B.C. Certified B.H.P. at 4000 R.P.M.
NUMBER OF CYLINDERS	2
BORE AND STROKE	2 $\frac{1}{8}$ x 1 $\frac{3}{4}$ "
PISTON DISPLACEMENT	12.4 cubic inches
TYPE	2 cycle reed valve — alternate firing
GEAR RATIO	13:20
PROPELLER	8" diameter x 8" pitch, 2 blade
COOLING	Combination positive displacement and centrifugal
IGNITION	Evinrude high tension magneto
CARBURETOR	Horizontal float feed, throttle type, HIGH and LOW speed adjustments.
CONTROL	One lever synchronized spark and throttle
FUEL TANK CAPACITY	1.1 Gallons
STARTER	Simplex, self re-winding
REVERSE	360° Pivoting
CLUTCH (CONTROL)	Manually operated — Neutral and Forward
CLUTCH (PROPELLER SAFETY)	Automatic slipping and re-engaging
WEIGHT	47 pounds 5" longer model, 50 pounds

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