

OWNERS MANUAL

FISHER-PIERCE
BEARCAT 55

Antique Boat Museum

WELCOME ABOARD

This Manual will help you get the most performance and the best service from your new Bearcat.* It will acquaint you with the engine and tell you how to get the optimum performance from your rig. It is a maintenance guide and a troubleshooting reference in the chance a problem stops you on the water. Keep it on hand aboard your boat.

With few exceptions the maintenance can be done by the owner. For the more involved maintenance, or

for repair, *any* and *every* Fisher-Pierce Bearcat engine dealer is trained and equipped to help you. Each dealer is ready and willing to treat you as his customer. If you move or plan a boating trip, a card to us will bring you an up-to-date list of Bearcat dealers across the nation.

We invite you to write and tell us what you think of our engine or our Dealers—favorably, we hope. But good or bad, your thoughts will be appreciated.

(*Always Mention Engine Serial Number.)

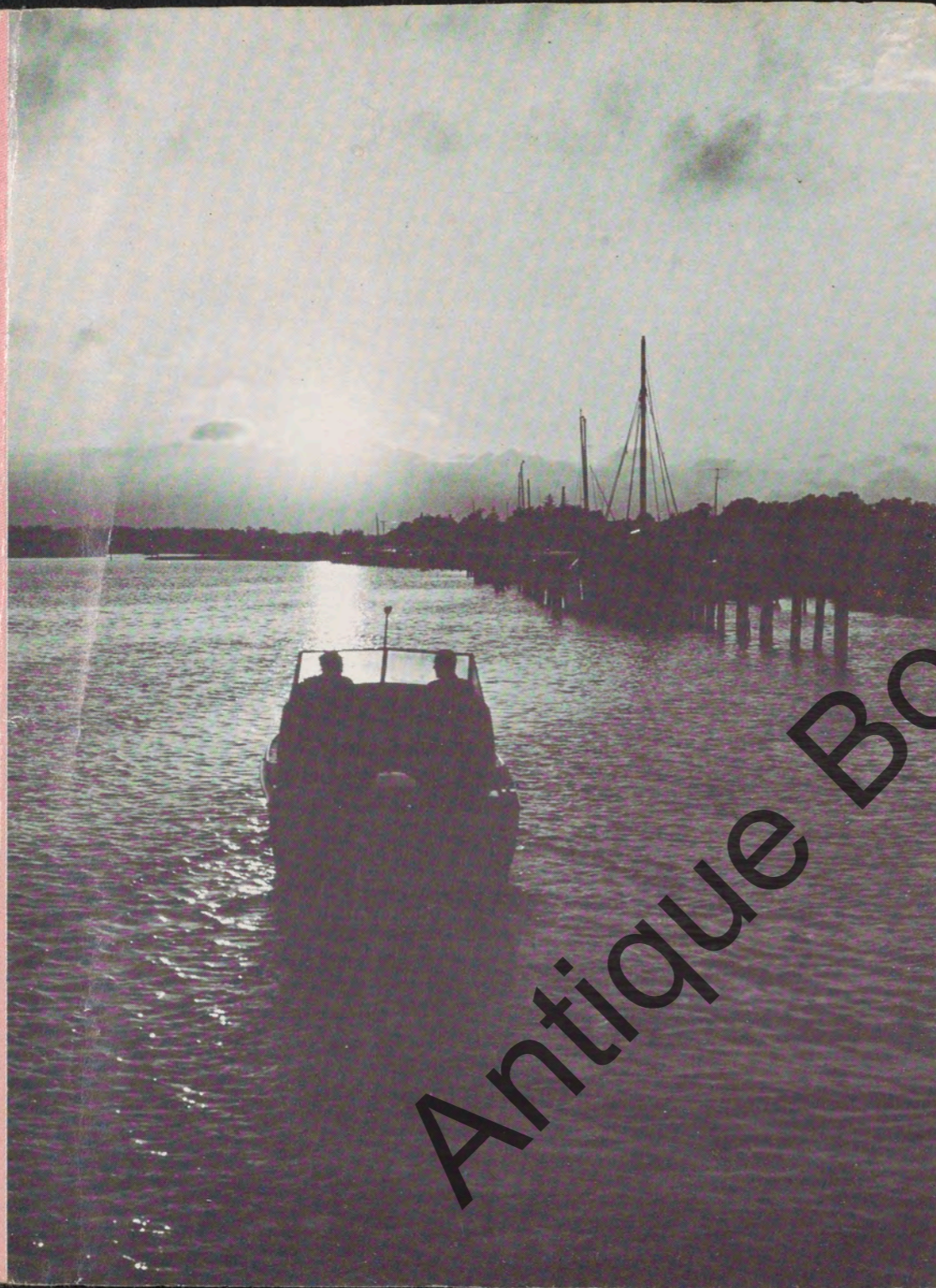
Owner's Record of Motor

Motor Serial No.

Date Purchased

Ignition Key No.

Dealer From Whom Purchased



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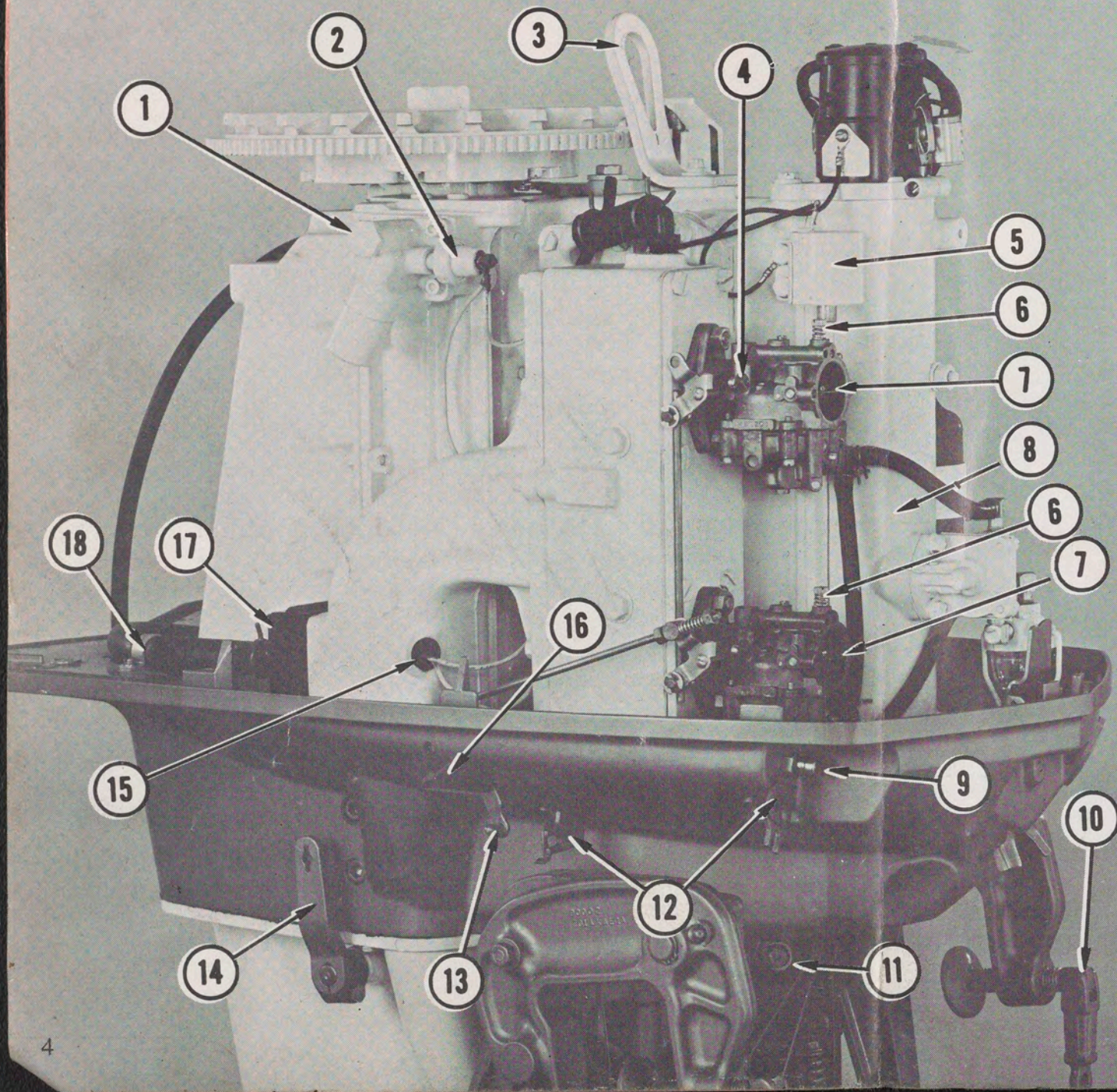
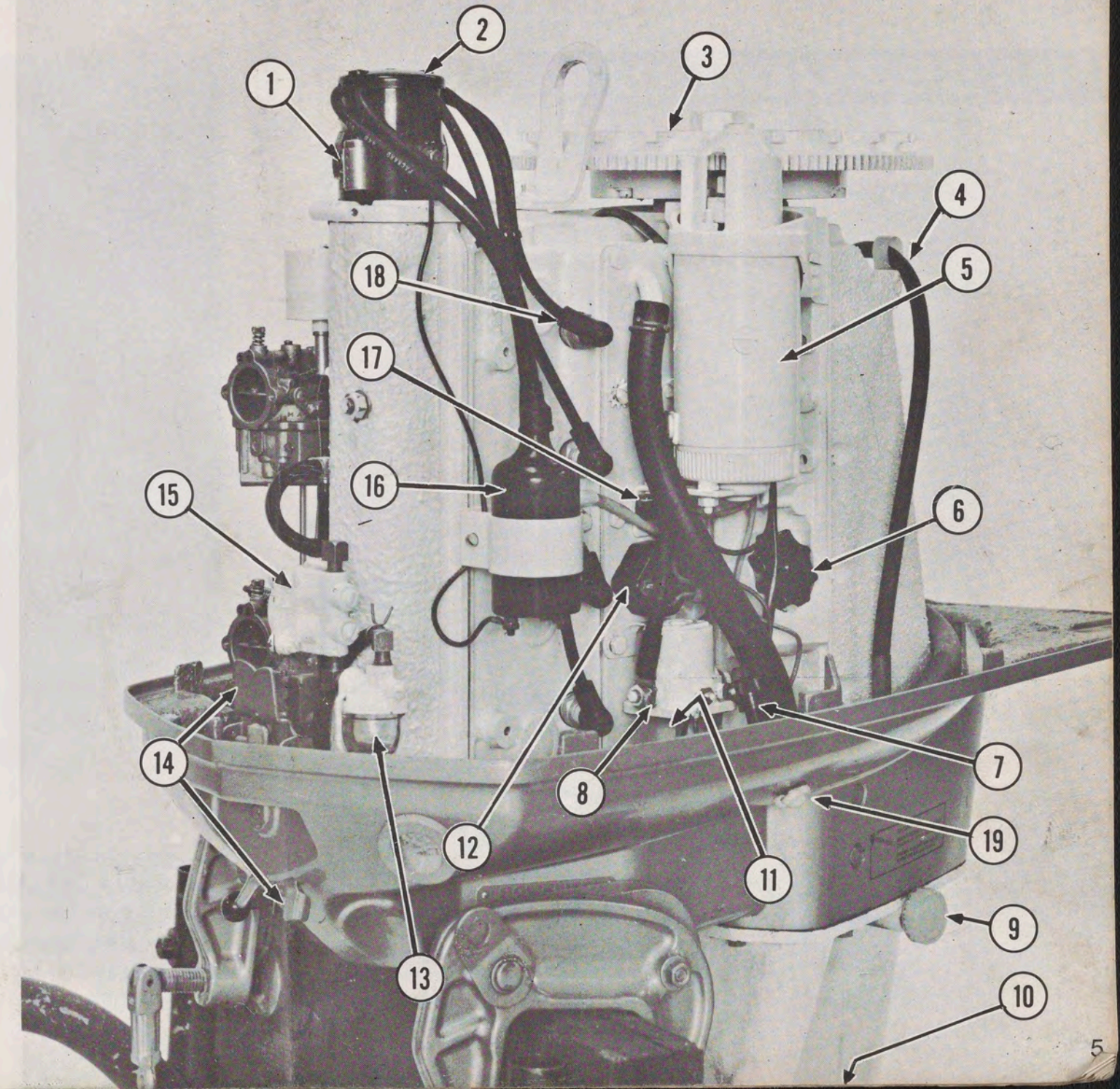


FIGURE 1

1. Relief Valve Screw
2. Oil Pressure Sensing Switch
3. Lifting Bracket
4. Idle Stop Screws
5. Choke Solenoid
6. Idle Mixture Screws
7. Carburetors
8. Carburetor Inlet Silencer
(not shown)
9. Fuel Inlet Fitting
10. Transom Clamp Screws
11. Reverse Lock
12. Control Cable Anchor Clamps
13. Throttle Bellcrank
14. Shift Lever
15. Temperature Sensing Switch
16. Water Telltale
17. Thermostat and By-Pass Valve
18. By-Pass Water Line

FIGURE 2



1. Condenser
2. Distributor
3. Flywheel
4. Breather Vent Line
5. Starting Motor
6. Oil Fill
7. Rectifier Fuse
8. Starting Solenoid
9. Oil Level Indicator
10. Oil Drain Plug
11. Junction Block
12. Rectifier
13. Fuel Filter
14. Cover Clamp
15. Fuel Pump
16. Coil
17. Hi-Lo Regulator Switch
18. Spark Plug
19. Cylinder Block Drain

SECTION ONE

PREPARATION

1-1 REGISTRATION CARD

Be sure to fill out and send in your registration card as soon as you receive your new motor. The serial number is stamped on the identification plate.

1-2 ENGINE COVER

Remove the engine cover for access to the powerhead. Squeeze the cover clamp (Fig. 2 - No. 14) to release the latch, then tap and lift the front of the cover up and pull it up and out.

To install the cover, slip the two brackets at the rear of the cover into the holes in the mounting plate, then swing the front of the cover down and back until it snaps into place and the cover clamps separate. Push up on the cover to be sure it is properly latched.

1-3 HOISTING AND HANDLING

The lifting bracket on the top of the powerhead (Fig. 1 - No. 3) is designed to balance and support the motor properly when hoisting. It's best to support the motor on a transom-type mount whenever it is off the boat. If a transom-type mount is not available, lay the motor in a position where it is supported by the two points of the "V" at the rear of the powerhead. Always keep the propeller end at a lower level than the powerhead — this will prevent any possibility of oil draining into the cylinders.

1-4 CHECKING THE GEAR HOUSING OIL LEVEL

Although the gear housing was filled with oil at the factory, the

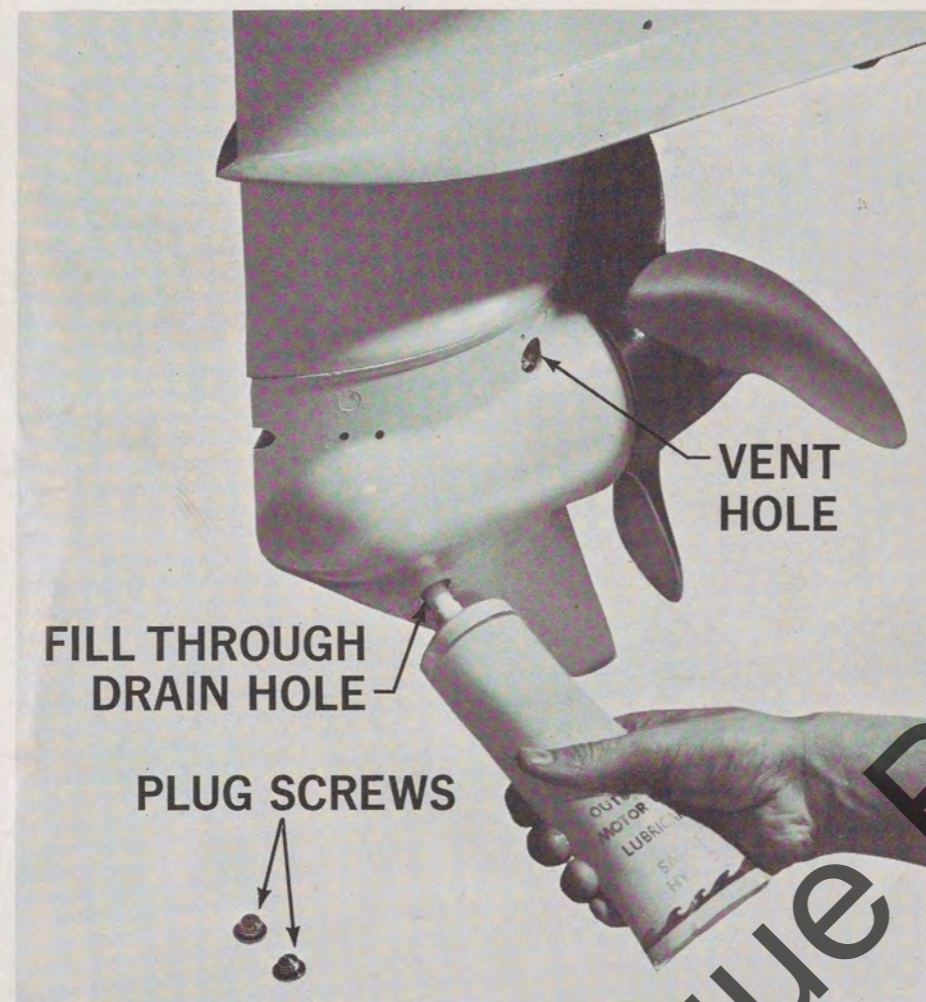


FIGURE 3

oil level should be checked, by your dealer or yourself, before the motor is run. Allow the motor to stand in a vertical position for a few minutes, then slowly remove the vent plug screw and gasket. (See figure 3.) Oil should appear at the vent hole. If it does not, add oil (see Section 4-2, page 18) until the level reaches the vent hole.

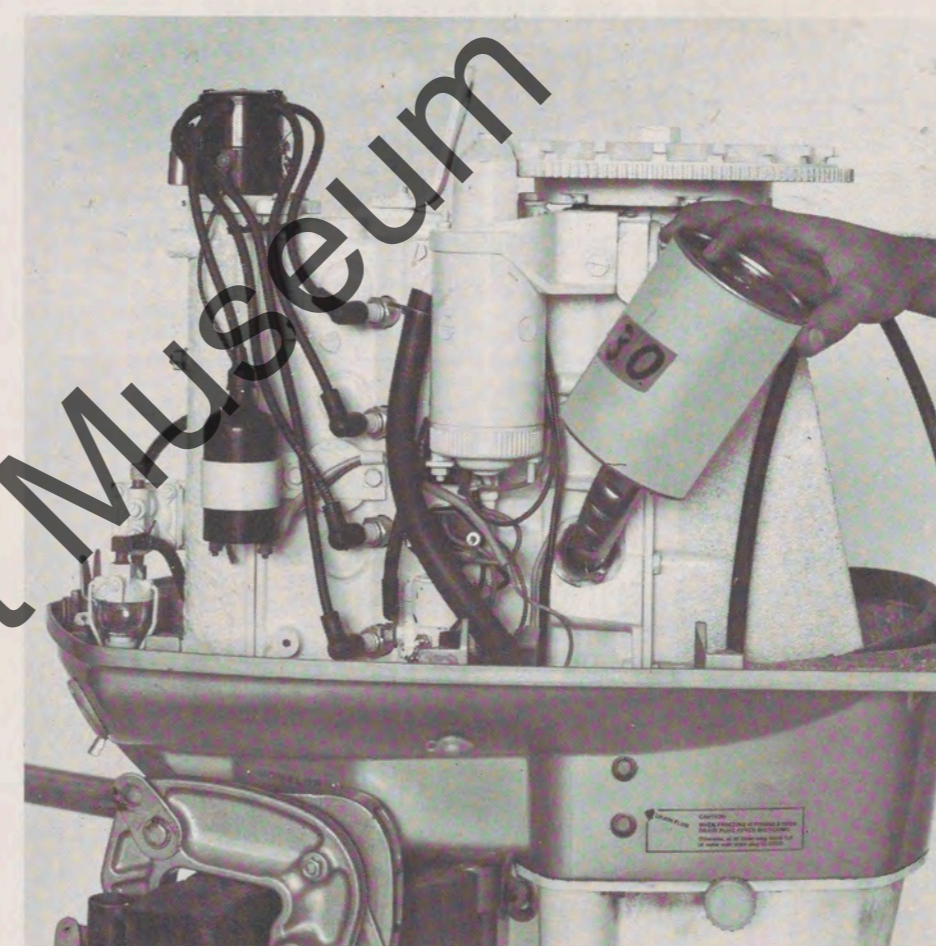


FIGURE 4

1-5 FILLING THE CRANKCASE SUMP

With the motor in a vertical position, remove the oil filler cap and fill the sump with $2\frac{1}{4}$ quarts of a good quality Medium Detergent, SAE 30 motor oil, marked for Service MS. (See figure 4.) When operating in temperatures below 32°F , use SAE 10 oil of the same specifications. Be sure that the oil drain plug on the left side of the upper leg is tight. Oil may also be added through the dip-stick opening, without removing the engine cover, by using a special filler



FIGURE 5

tube. THE OIL LEVEL SHOULD BE CHECKED EACH TIME THE MOTOR IS USED. (See figure 5.)

After operation, you may notice a trace of oil "weeping" through some of the powerhead gaskets. This is a normal operating condition with all 4-cycle engines, and needs no further attention than an occasional wiping with a clean rag. However, if an oil leak should develop causing noticeable depletion of the engine oil quantity, stop the engine and see your nearest Bearcat dealer.

1-6 PROPELLER SELECTION

To develop full 55 horsepower the engine must turn between 5500 and 6000 RPM at full throttle. The propeller "bite" or pitch (distance of advance for one turn) must be chosen so that with the engine turning between 5500 and 6000 RPM — the propeller advance is enough to *drive the boat at that speed which demands 55 horsepower*, no more, no less. The table furnishes an approximate guide. A tachometer tells the story completely. It is most desirable to have one permanently installed as it facilitates navigating, engine tune-up, and lets you keep track of your boat's performance. A serviceman can use a portable tachometer to determine propeller selection.

Too low a pitch allows engine overspeed at full throttle; too high a pitch, besides limiting power, causes engine to "lug" or operate in a straining condition. Both can be damaging but overspeed is most hazardous.

While high pitch, low RPM benefits fuel economy a little, there is a loss in acceleration "dig out" for skiing, and in performance in rough water. It is worth the effort to get the propeller just right.

Engines will be shipped with 11" pitch propellers unless otherwise specified. We recommend carrying a spare, and there may be advantage in having a different pitch if the boat may perform substantially different duty (e.g., cruising, fishing and trolling versus water skiing). A 1" pitch difference is recommended in such cases.

Never use a bronze propeller which causes engine corrosion in salt water and puts added strain on clutch in any water due to excess weight.

1-7 PROPELLER INSTALLATION

Remove the cotter pin, propeller nut (turn counterclockwise) and drive pin. (See figure 7.) Slide the propeller onto the shaft, line up the drive pin holes in the propeller hub and the shaft, then

PROPELLER SELECTION CHART

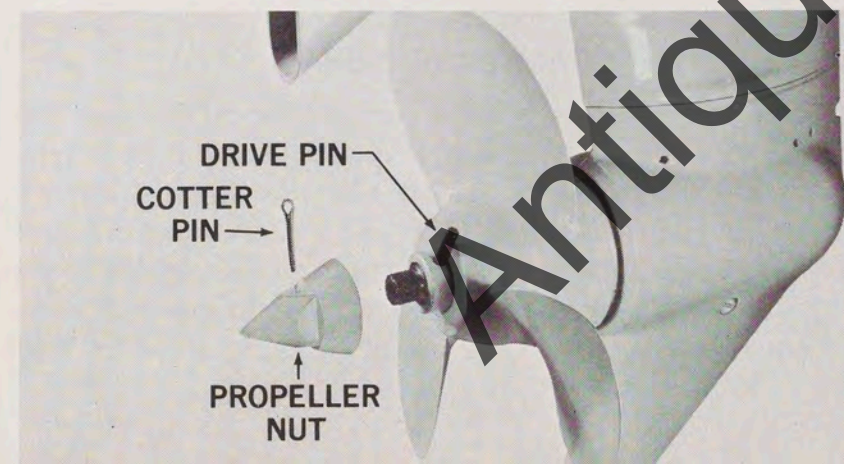
Part Number	No. of Blades	Diameter and Pitch	Boat Size	Recommended Application
98052-14	3	11½" x 14"	Light boats	Light Loads
90852-13	3	11½" x 13"	15'-16' Runabouts	1-4 Passengers
90852-12	3	11½" x 12"	15'-16' Runabouts	Loads & Skis
90852-11	3	11½" x 11"	16'-17' Runabouts	Loads & Skis
90852-10	3	11½" x 10"	18'-20' Offshore Cruisers	All Loads
90852-09	3	11½" x 9"	21'-22' Cruisers	All Loads
91400-09	4	11½" x 9"	19'-26' Cruisers or House Boats	All Loads
91400-08	4	11½" x 8"	House Boats 25' & over or Commercial Boats	All Loads
91400-07	4	11½" x 7"	House Boats (35') & over or Commercial Boats	Heavy Loads
90852-12	3	11½" x 12"	18'-20' Offshore Cruisers	All Loads
90852-11	3	11½" x 11"	21'-24' Cruisers	All Loads

Select a propeller which will allow the engine to operate at 5500 RPM. In no case should engine speed exceed 6000 RPM. The lower the full throttle RPM, the lower the fuel consumption will be.

FIGURE 6

insert the drive pin. Install the propeller nut on the propeller shaft far enough to line up the cotter pin hole in the shaft with two of the holes in the nut. **THE NUT IS NOT INTENDED TO LOCK THE PROPELLER.** Install the cotter pin.

FIGURE 7



SECTION TWO

INSTALLATION OF MOTOR AND CONTROLS

2-1 REVERSE LOCK

The reverse lock is a spring-loaded clamp which prevents the lower unit from bouncing up and down in a heavy sea, or from swinging up when the propeller is working in reverse. While the boat is moving forward, the reverse lock allows the lower unit to "kick up" if an underwater obstacle is encountered. For adjusting the tilt angle, beaching the boat, or mooring with the lower unit out of the water, the reverse lock may be released manually by pulling out the reverse lock knob (figure 8) and moving it to the right. Always be sure to re-engage the reverse lock before starting the motor.

2-2 TILT LATCH

To swing the lower unit out of the water for mooring or inspection, release the reverse lock, then grasp the shroud handle and tilt the motor until the tilt latch can be pushed into locked position, as shown in figure 9.

NOTE: Always trailer with the motor in a vertical position. If there is insufficient road clearance, block the motor to provide clearance — do not use the tilt latch.

2-3 POSITIONING ROD

The positioning rod holds the motor at the desired tilt angle for proper angle of propeller thrust. To change the tilt angle: tilt the motor up, turn the positioning rod so the bent end faces straight up (figure 10) and the swivel tip points straight out, then remove

the rod. Insert the rod into the pair of holes giving the desired tilt angle, twist the bent end down, lower the motor, and engage the reverse lock. Be sure the swivel tip of the rod points down in the locked position.

NOTE: For dual motor installations, be sure to install the positioning rods with the bent ends outboard, *before* mounting the motors on the transom.

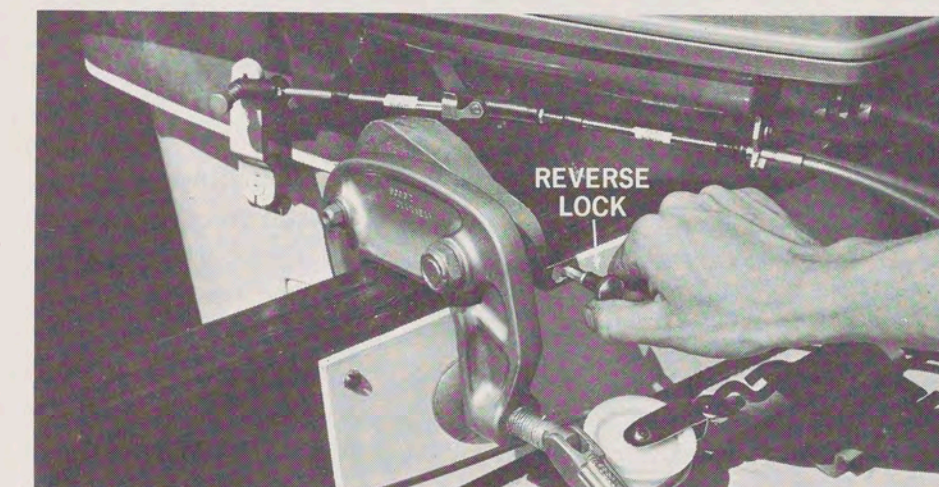


FIGURE 8

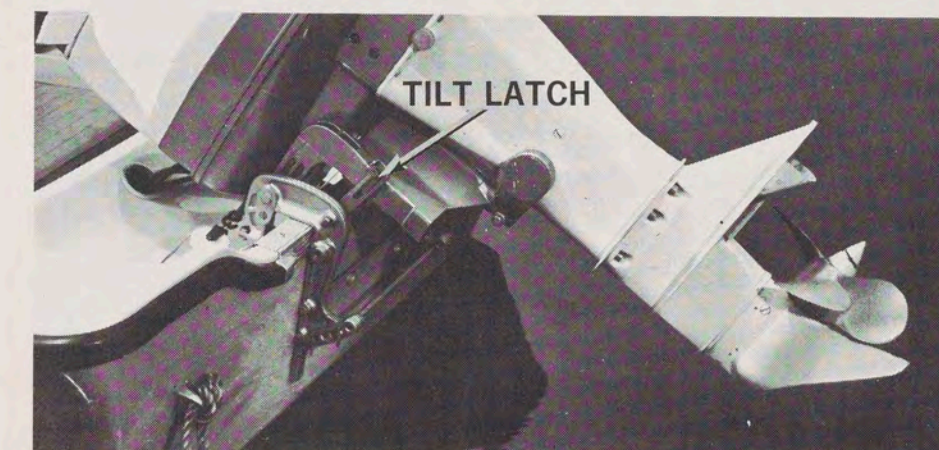


FIGURE 9

2-4 MOUNTING THE MOTOR ON THE TRANSOM

A single motor should be mounted directly on the center line of the boat. (See figure 11.) Dual motors should be mounted twenty-six inches apart (measuring from the fore-aft center line of each motor) and equidistant from the center line of the boat.

Preliminary trim adjustments should be made by: **FIRST**, setting the motor tilt angle so that the cavitation plate is parallel to the planing surface (rear third) of the hull; **THEN**, if necessary, adjusting the height of the motor on the transom until the cavitation plate is approximately one inch below the transom chine. (See figure 11.)

Semi-planing round or "V" bottom hulls, dual motor installations in particular, may require motor height adjustment. To raise the motor, use wooden shims under the transom clamps — later, when correct height has been established, replace the shims with a wooden block, cut to proper width and thickness.

Tighten the transom clamp screws securely **BY HAND**. Stress on the clamps during high speed operation is severe, and is even more pronounced in rough water. Check the transom clamp screws after the first hour of operation and every time the motor is used. . . . **KEEP THE CLAMP SCREWS TIGHT.**

NOTE: Before the motor can be bolted in final position, the boat should be loaded normally, and speed trials to select optimum motor trim position should be completed. Refer to Section 3, paragraph 3-7, for final trimming instructions.

Two safety bolt holes are provided in each transom clamp. When the motor has been mounted in its final position, drill a $\frac{3}{8}$ " hole through one of the holes in each clamp and through the transom, then install two $\frac{3}{8}$ " bolts, washers, and nuts to secure the motor. Seal the bolts to prevent leakage.



FIGURE 10

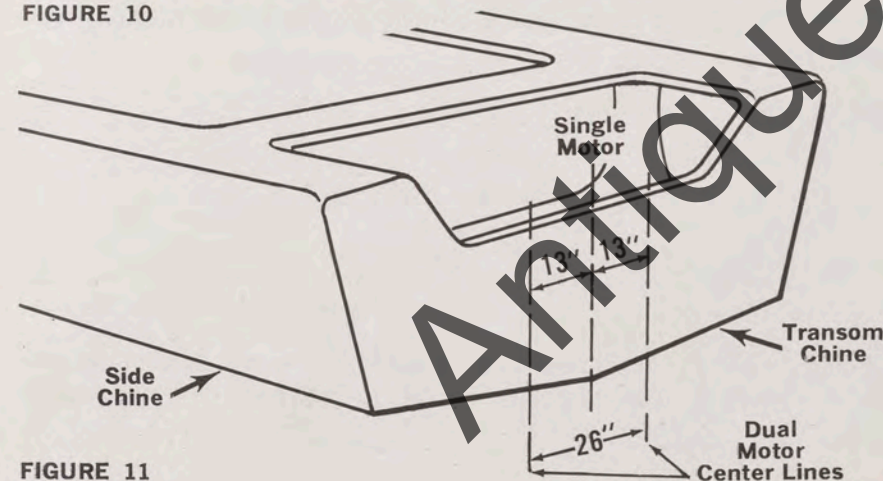


FIGURE 11

2-5 BATTERY SELECTION AND INSTALLATION

To insure ample electrical power for starting and for accessories, use a good quality 12 volt marine battery of at least 60 ampere hours capacity. The battery should be installed in a covered, insulated, and well ventilated battery box as shown in figure 12. The box should then be secured to the deck with a shock cord to prevent shifting. Ventilation is necessary to allow corrosive battery gases to escape. Insulating and covering battery will help prevent current leakage by keeping out dirt and moisture.

2-6 CONNECTING THE BATTERY CABLE (See fig. 13)

Run the battery cables through the rubber-lined opening on the forward port (left) side of the engine mounting plate. (See figure 14.) Connect the negative (-) cable (identified by a black collar) to the water jacket screw nearest the top spark plug. (See figure 13.) Connect the positive (+) cable (identified by a red collar) to the rear terminal of the starting solenoid. Next connect the battery cable clamps securely to the battery terminals. Then put the positive (red collar) battery cable onto the positive (+) terminal stud and tighten the wing nut.

Tap the end of the negative cable against the negative battery terminal. If no spark jumps, connect the cable to the battery. If a spark does jump, check for improper electrical connections. After assembly, coat the terminals with grease to help prevent corrosion.

CAUTION: Always tilt the lower unit out of the water when motor is not in use. Not only will this minimize corrosion of the motor itself but also of electrical equipment throughout the boat. These other items corrode when they remain connected to battery positive because of leakage through moisture first to the water, thence to the engine or "ground" and finally to battery negative. Corrosion thus attacks anything permanently connected to battery positive. *This is why it is most important always to locate turn off switches in the positive lead.*

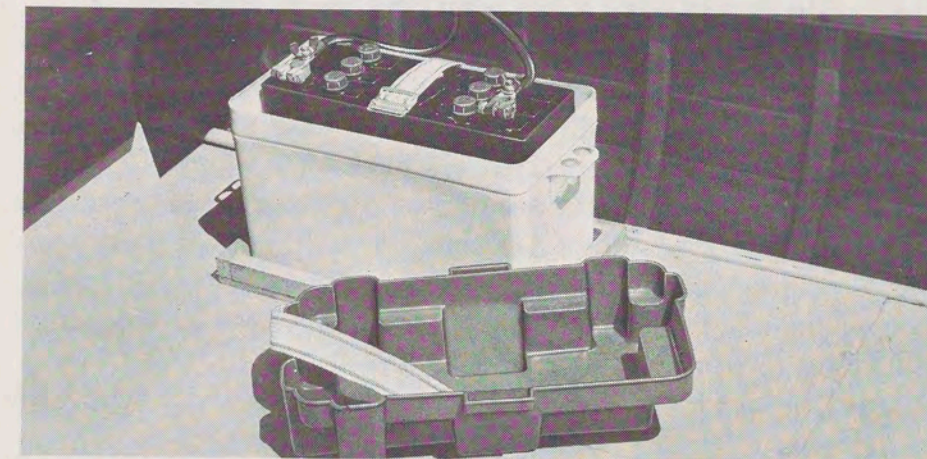


FIGURE 12

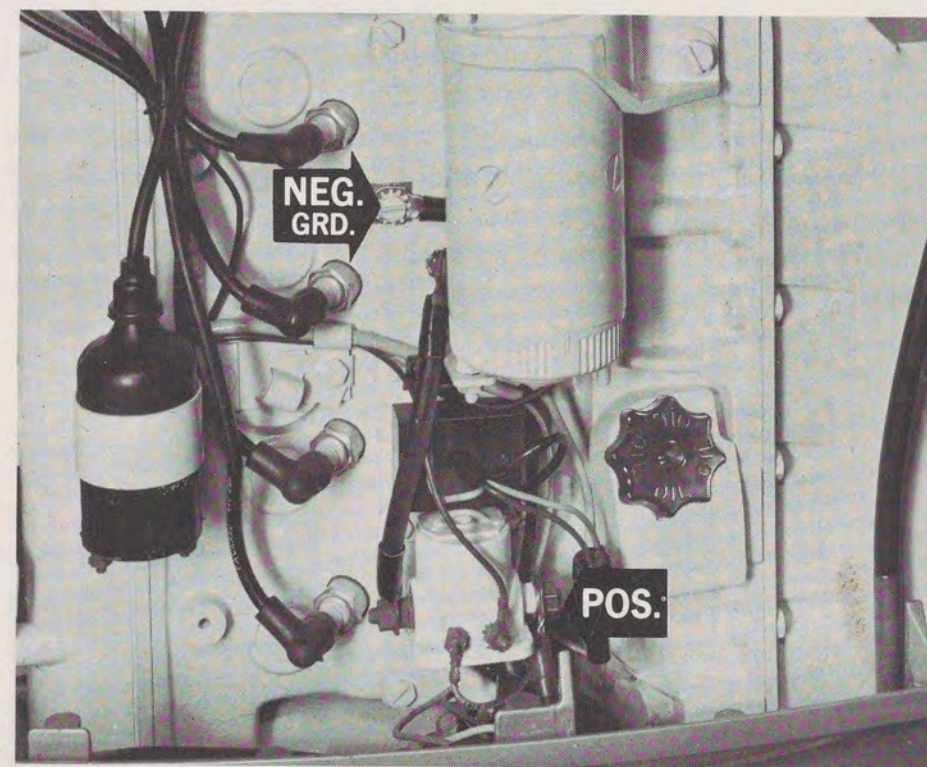


FIGURE 13

2-7 HI-LO REGULATOR SWITCH

The alternator, which is standard equipment on your new Bearcat, is superior to a generator because it provides charging current to the battery, even at idling speeds. The rate of charge is controlled by a manually operated HI-LO switch (figure 2, #17) which has been set in LO position at the factory. This position provides a charging rate of 5-8 amperes, sufficient for most operating requirements. The HI position charging rate of 10-15 amperes should be used only when the current demand on the battery is heavy; as when many electrical devices are used.

NOTE: Check battery water at frequent intervals. Even at low charge it may overcharge and lose water to the point where you will not be able to start on a cold morning.

2-8 STEERING

Your Bearcat dealer can supply you with the correct steering attachment required to connect the motor to the remote steering control included with your boat. The remote steering attachment shown in figure 14 can be used with all push-pull or cable type steering control systems, and with all dual engine installations (figure 15).



FIGURE 14

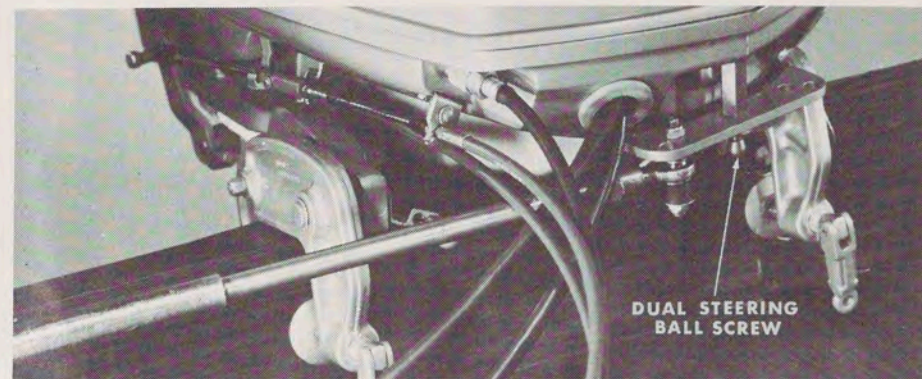


FIGURE 15

2-9 REMOTE CONTROLS

Installation instructions are included with each Fisher-Pierce Bearcat Remote Controls; FOLLOW THE INSTRUCTIONS CAREFULLY. Keep ignition key "OFF" until battery has been connected. After installation, check the controls for smooth operation and make sure that no binding occurs at any point. Throttle shaft, choke shaft and all linkages should be protected with Valvoline X-ALL grease, or equivalent.

2-10 FUELING UP

IMPORTANT

For maximum safety during refueling follow these simple precautions:

1. Remove your Bearcat fuel tank from the boat before filling.
2. If larger fuel-tanks are installed, connect grounding clips to the tank to eliminate spark danger.
3. Make sure that the pump nozzle contacts the filler neck solidly.
4. Wipe up all spillage immediately.
5. On cabin cruisers, close all doors and vents to prevent gas fumes from being drawn into the cabin.

Here you enjoy a unique 4-cycle advantage — just fill your fuel tank with 6 gallons of clean, fresh, regular grade gasoline or

marine gasoline of 92 octane minimum. DO NOT, under any circumstances, use marine white gasoline, except a premium grade, and then only in emergency for one or two tanks full. (Regular grade "white" knocks, all grades give rapid valve wear.) If knocking or "pinging" occurs, use next higher grade of fuel. No mixing of gas and oil is necessary; no special hard-to-get gasoline is required. Replace the cap when your tank is full, then open the vent by turning the vent screw on top of the cap counterclockwise. (See figure 16.) The gauge on the top of the tank indicates the amount of gasoline left in the tank.

Install tank in a location where the fuel line will not be kinked or pinched, then connect the fuel line to the tank and the motor. The arrow on the primer bulb, which indicates the direction of fuel flow, should point toward the motor. The fuel line couplers are of the quick-connect type — pull back the knurled collar of the coupler, push the coupler over the fitting on the engine (figure 15) or tank, and release the collar. Pulling back on the collar will release the coupler from the fitting. Check to be sure there is enough slack in the line to allow the motor to steer freely. If rough water is anticipated, keep movable objects away from the fuel line and use a tank hold-down to secure the tank. After connecting the fuel line, squeeze the primer bulb (figure 17) several times until it becomes firm. (This means that gasoline has filled the fuel line and carburetors.)



FIGURE 16

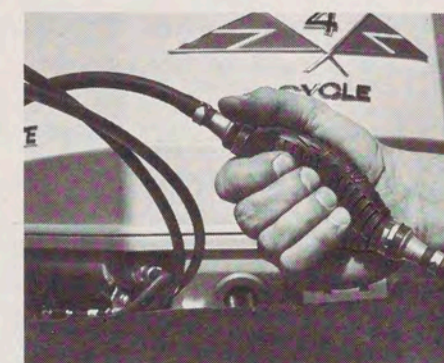


FIGURE 17

SECTION THREE

OPERATION

3-1 BEARCAT REMOTE CONTROL

The Fisher-Pierce Bearcat control system groups all functions conveniently within the reach of one hand.

The small neutral throttle lever opens the throttle for "COLD STARTING" and for warming up the engine. When the neutral throttle is advanced past idle, an interlock inside the control box prevents shifting.

Returning the neutral throttle lever to "SHIFT POSITION" (horizontal) reduces engine speed to idle and frees the shift interlock. The large control lever shifts the gears and also actuates the throttle. When it is in "NEUTRAL" position, the propeller is disengaged.

TO MOVE FORWARD, center the small neutral throttle lever at "SHIFT POSITION" then move the control lever quickly and firmly to "AHEAD" position. Pushing the lever further forward increases engine and boat speed. Jamming the lever in too hard or easing it in too slowly causes excessive wear on the shift mechanism.

FOR BACKING, move the control lever to "ASTERN" position to make the propeller rotate in the opposite direction. Always be sure the reverse lock is engaged before shifting to "ASTERN." (See page 9.) Motor speed in "ASTERN" is limited to prevent shipping water over the transom. When backing up, the motor does not have "kick-up" protection — avoid hitting underwater obstacles.

3-2 TEMPERATURE AND OIL PRESSURE WARNING SYSTEM

A red warning light glows with the ignition switch on when: (1) oil pressure is below a set figure; (2) water temperature exceeds a safe level.

With a warm engine it is not abnormal for the light to show at idle speed because of reduced oil pressure. It is *NOT* normal or allowable for water circulation as shown by the squirting tell-tale to cease. The light should go out when engine speed is increased to approximately 1000 rpm.

If, due to a damaged water pump, tell-tale water stops at idle, immediately increase idle speed to restore it. Do this either by adjusting lower idle stop screw (figure 1, #4) or small neutral throttle lever. Do not resume slow idle until pump is corrected or pump may be damaged to the point of failure at all speeds.

Warning light at speeds above idle or when under way may be sign of potentially serious trouble. STOP the engine immediately and check for trouble as instructed in paragraph 5.1, Page 20, before the condition responsible for the warning damages the engine seriously.

SPECIAL CONTROLS

When the Bearcat engine is bought for use on boats provided with their own shift and throttle controls, it is provided only with a simple dash panel containing warning light and ignition-choke, starter key switch. Starting procedures outlined apply (Sec. 3-3). NOTE: Some controls do not have a limitation on the fast-idle adjustment in neutral, so care must be taken not to advance the throttle to a dangerous point when starting. The same warning applies to starting in gear on controls which permit this.

3-3 STARTING THE ENGINE

Turning the key one click to the right turns the ignition ON. Pushing the key IN, actuates the choke. Turning the key further to the right, with or without choke, cranks the engine.

1. Check to be sure that the fuel vent (figure 16) is open.
2. Squeeze the primer bulb (figure 17) until it becomes firm and fuel has filled the carburetors.
3. Shift large control lever to "NEUTRAL."
4. Turn ignition "ON"

To start a cold engine:

- a. Place neutral throttle lever opposite "START."
- b. Push key IN to choke and HOLD KEY IN while turning key clockwise to crank.
- c. If the engine fires but does *not* keep running, crank without choking. If the engine does not start after two or three attempts, use the choke once more by pushing key in while cranking to start.
- d. After the engine starts, move the neutral throttle lever into "SHIFT" position to reduce engine speed to idle and allow shifting into "AHEAD" or "ASTERN."

To start a hot engine:

- A hot engine usually starts without choke.
- a. Leave neutral throttle lever at "SHIFT"
 - b. Crank without choke.
 - c. If engine does not fire, use COLD START procedure.

CAUTION: To conserve the battery, and to keep the starting motor from overheating, never crank more than 30 seconds at a time. If motor has been cranked for 30 seconds, wait at least 5 minutes before the next try to allow starter to cool.

3-4 BY-PASS COOLING SYSTEM

A thermostat senses the temperature of cylinder block cooling water, allowing full flow when required, and cutting down supply until block attains a temperature of 120°+ (head temperature; cylinder sides run hotter). A by-pass water line and valve dumps unneeded water directly into the exhaust system, cooling and quieting it, and preventing heat corrosion. When fully opened, thermostat closes by-pass.

A tell-tale water discharge visibly demonstrates proper functioning of the cooling system, supplementing the warning light.

The block remains full of water after shut-down like most inboards — unlike most outboards. This greatly reduces rust and scale formation — but permits the hazard of freeze-up. A well marked drain is provided which should remain tightly closed unless danger of freezing exists. (A freeze-up will not usually damage the engine, but if repeated will at least lead to water leaks.)

If tell-tale stops flowing, try speeding up engine for a few seconds. If flow is not restored, try cleaning out tell-tale end which contains a flow restriction of small diameter, also water inlet above propeller. If flow is not restored, stop motor before it overheats and have trouble corrected by your dealer.

3-5 BREAK-IN

Your new Bearcat has been test run for you at the factory, and is ready for immediate service.

Avoid prolonged full throttle operation during the break-in period. Occasional bursts of speed are quite all right. Do change the throttle settings from time to time — try to cover the entire operating range. If there is any sign of overheating during break-in — light goes on — throttle down immediately.

Check the telltale frequently to be sure the water pump is operating properly.

Your motor may be operated as desired after 3 hours. Refer to the Periodic Maintenance Chart on page 19. It is important that your newly "broken-in" Bearcat be re-tuned to compensate for minor performance changes occurring during the break-in period.

3-6 CAVITATION

Cavitation occurs when the propeller instead of moving smoothly through the water, draws air down into the water and turns the mixture into a froth. Since this froth offers little resistance to the movement of the propeller, the motor will suddenly over-speed dangerously while the boat slows down.

Cavitation and excessive rpms may be caused by any one of the following:

1. Propeller operating too close to the surface of the water due to incorrect transom heights or tilt angle. (See figures 19 and 20.)
2. Fouled or damaged propeller. (Stop, tilt, remove weeds.)
3. Incorrect keel or hull design.
4. Plugging of "ram" hole in gear case leading edge allowing exhaust gases to exit through small holes near propeller.

3-7 TRIMMING FOR MAXIMUM PERFORMANCE

Trimming concerns all things done to obtain maximum boat running speed. Trimming also concerns those things done to permit optimum boat response to special conditions, such as a head-on chop, a large following sea or a sharp crosswind.

It is desirable to determine first the trim for optimum speed with a normal load and to use this trim under all normal conditions.

Most owners will have boats between 15 and 20 or more feet long designed to plane. Some owners will be operating larger or differently shaped boats intended for modest speed and for operating in a displacement or non-planing condition. The requirements for trim will differ as between these two categories.

3-7-A PLANING BOATS

A planing boat at speed is supported by impact of the water against its flattish bottom rather than by displacing its own weight of water as in the case of all boats when at rest. This force of impact of high speed water against the bottom lifts the planing boat so that as speeds increase less and less of the hull is in the water and there is less and less WETTED SURFACE. The two forces which limit boat speed with a given engine are (1) friction of water sliding along the wetted surface area, and (2) the force required to keep the boat running uphill over its bow wave or out of the hollow it creates as it runs along.

Accordingly, the object of trimming for speed is to reduce wetted surface by getting as much as possible of the hull out of water which in

turn is accomplished by trimming it for an efficient "climbing" attitude. The diagrams are suggestive.

3-7-B PLANING HULLS — SPECIAL CONDITIONS

Except in very confined bodies of water, various conditions of roughness will be encountered and proper trim for conditions at hand contributes more to comfort almost than the design of the boat. The wise skipper will see to this trim which *definitely includes* telling passengers where to sit.

In a head sea (waves coming towards your bow) comfort is at a minimum and usually but not always high speed is comfort's principal enemy. Get the bow up by slowing to a medium speed or moving weight aft or both. In very heavy head seas you will have to slow down so much that weight must be brought forward again to prevent bow rising too high. Sometimes running too slow lets the bow fall so far as to throw spray wildly and accentuate pitching.

In a crosswind most boats lean to windward. This has the effect of dropping the bow on the side the waves attack, in turn causing an increase of flying spray. Move crew to the leeward side away from the wind until boat trims level or slightly to leeward.

In a following sea (running same direction as waves) some boats are difficult or dangerous to handle. These are boats which can root or plow in front, permitting an overtaking wave to lift and carry the stern sideways. When this goes far enough, it is called broaching and can capsize a boat. It is most hazardous at river mouths or tidal inlets where incoming waves

meet outgoing current and become steep or cresting. Unless you are in breakers (and you shouldn't be!), do not worry about the wave astern coming in over the top. Trim weight moderately aft to keep bow light and use the throttle to keep away from the waves astern or avoid uselessly climbing the wave ahead. Keep your weight low and follow your natural instinct for balancing.

3-7-C DISPLACEMENT CRAFT

The trimming of large house boats, work boats or others intended for non-planing operation is more a question of obvious common sense — sometimes even of appearance. If you load the bow too much, you are trimming *by the head*. This will make steering difficult and motion uncomfortable. If you load the stern excessively, you are trimmed *by the stern* and will probably pound if there is any sea; also in a crosswind the boat will be somewhat uncontrollable because the wind will blow the bow to leeward.

3-7-D ALL HULLS

Keep them clean; repeat, **KEEP THEM CLEAN!** Any hull, fiberglass, wood or metal, left unprotected on a mooring in salt water and in some fresh water will accumulate weeds, barnacles or fouling. A very little of this cuts performance in half. You may see it in greatly increased fuel consumption. A good coat of anti-fouling before putting the boat in is a must in salt water, unless the boat is withdrawn, cleaned and dried every two weeks.

3-7-E MOTOR HEIGHT

See diagrams.

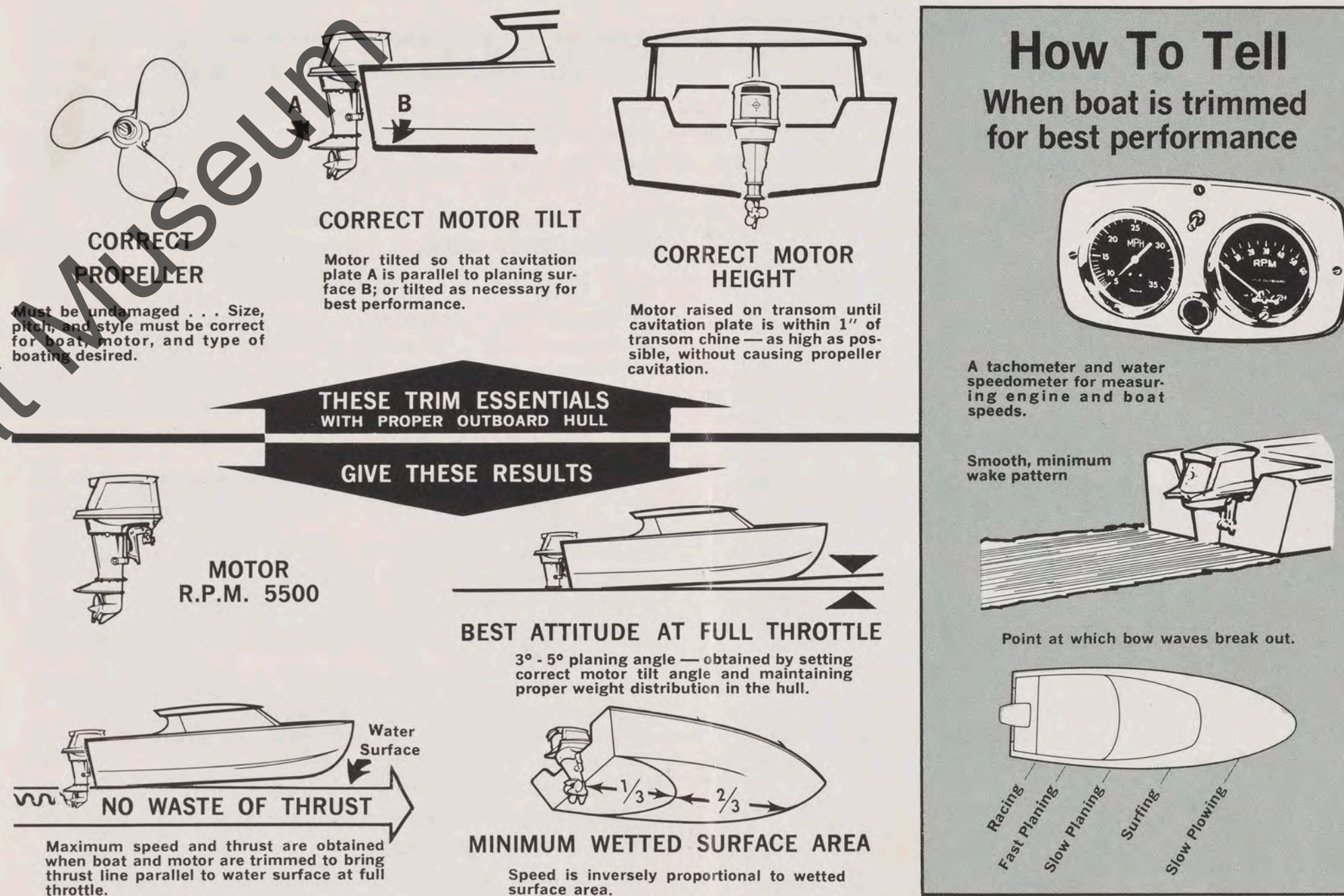


FIGURE 19

SECTION FOUR

MAINTENANCE

4-1 PERIODIC MAINTENANCE

Proper preventive maintenance as scheduled in the Periodic Maintenance Chart, will enable you to take full advantage of the performance, trouble-free design, and long life of your new Bearcat.

4-2 FILLING THE GEAR HOUSING

Use the best available grade of SAE 90 outboard gear oil. If the gear housing oil level is low, or to refill after draining, add oil as follows:

1. Remove the vent plug screw and "O" Ring on the port (left) side of gear housing. (See figure 3.)
2. Remove the drain plug screw and "O" Ring, also on the port side of gear housing, and quickly insert the nozzle of the tube into the drain hole.
3. Squeeze oil in, until the level reaches the vent hole. (12 ounces are required to fill an empty gear housing.)
4. Install the drain and vent plug screws and "O" Rings. Tighten securely.

Always fill through the drain hole with the vent plug screw removed. Filling through the vent hole will allow air to be trapped, and the gear housing will not be filled completely.

NOTE: If water is observed in the gear oil, let your Bearcat dealer check for the source of the leak.

4-3 PROPELLER DRIVE PIN REPLACEMENT

The cushion hub and drive pin are designed to protect the propeller, gears, and powerhead from damage when the propeller strikes an underwater obstacle. The cushion hub on the recommended propellers will absorb normal shocks and help prevent the drive pin from shearing. However, a very severe shock will shear the drive pin and allow the motor to run free.

A complete loss of propulsion, along with overspeeding of the motor, generally indicates a broken propeller drive pin. STOP THE ENGINE IMMEDIATELY.

To replace the drive pin, remove the cotter pin and the propeller nut, use the new pin to push the old one out, then re-install the propeller nut and cotter pin. (See figure 21.) Always carry at least one spare drive pin and cotter pin on board.

In an emergency, the longer piece of the old pin may be used if the motor is operated at very low throttle.

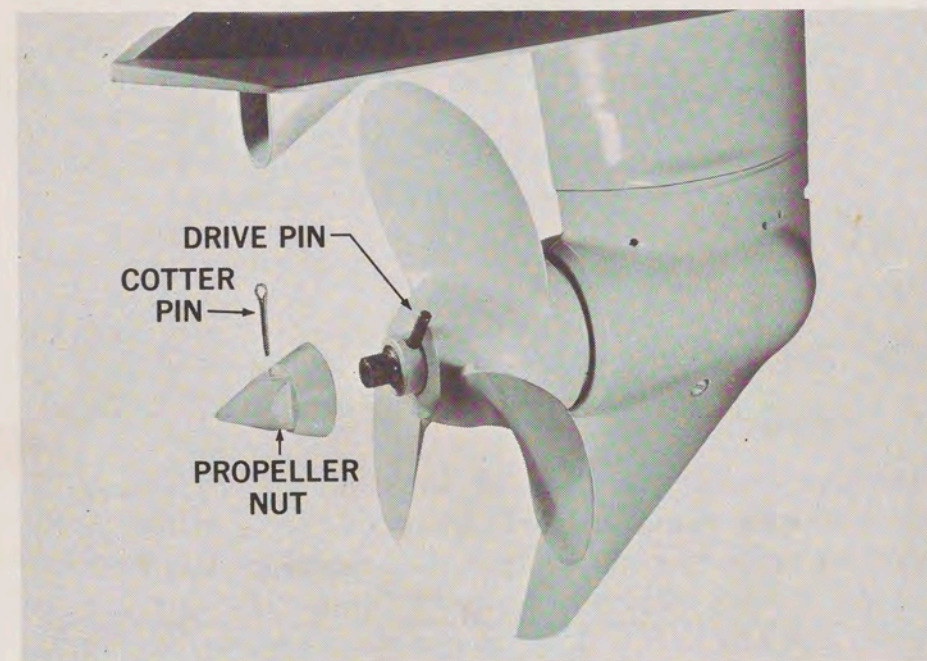


FIGURE 21

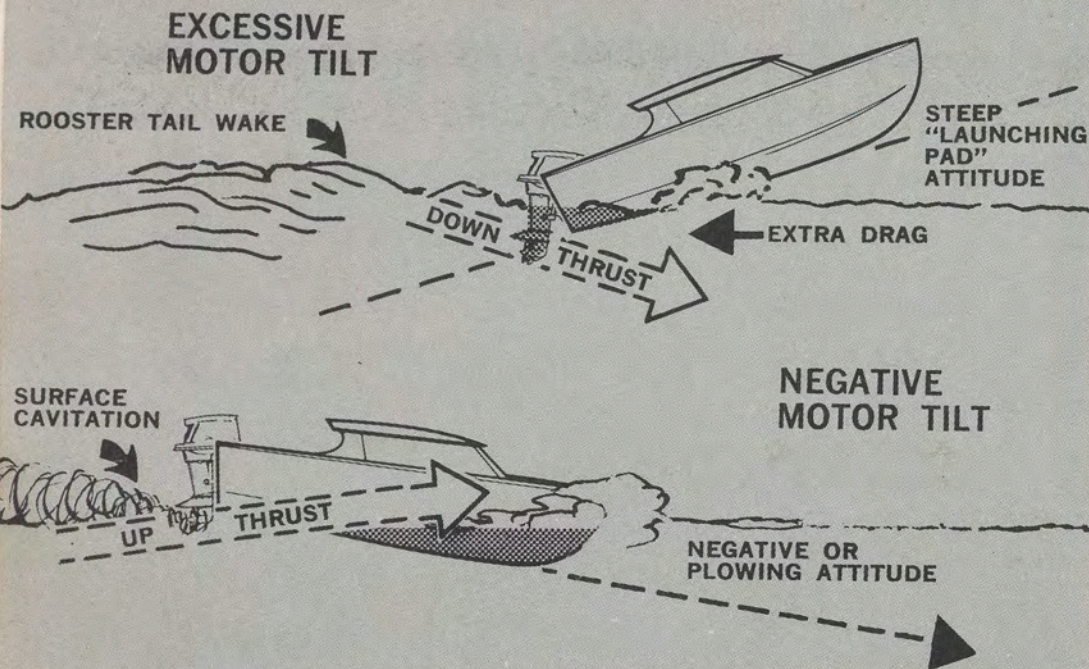
4-4

PERIODIC MAINTENANCE CHART

	Check After First 25 Hours of Operation	Every Time Motor Is Used	Monthly	Every 100 Hours of Motor Use
Crankcase Sump—check oil level		X		
Transom Clamp Screws—check tightness		X		
Transom Clamp Screws—lubricate*	X		X	
Shifting, Throttle, and Carburetor Linkage—lubricate*	X		X	
Pivot Bracket, Tilt Pins and Shift Lever Fittings—grease* X			X	X
Gear Housing—check lubricant level	X		X	
Battery Cables—check tightness and condition	X		X	
Battery—check water level	X		X	
Battery—check specific gravity				X
Gear Housing—drain and refill (capacity 12 oz.)				X
Crankcase Sump—change oil (capacity 2¼ qts.)	X			X
Spark Plugs—check gap (.025") and condition	X			X
Breaker Points—check gap (.020") and condition	X			X
Distributor—lubricate**				X
Fuel Filter—clean bowl and screen	X			X
Fuel Tank—clean vent and strainer	X			X
Carburetor—check adjustment	X			X
Entire Unit—check for general condition and all fasteners for tightness	X			X
Valves—check clearances (intake .012"-.014", Exhaust .015"-.017")				— end of operating season —
Cylinders—check compression				— end of operating season —

*Use Valvoline X-ALL Grease.

**Use lithium base grease on cam. Use two drops of engine oil on wick under rotor.



POWER WASTERS

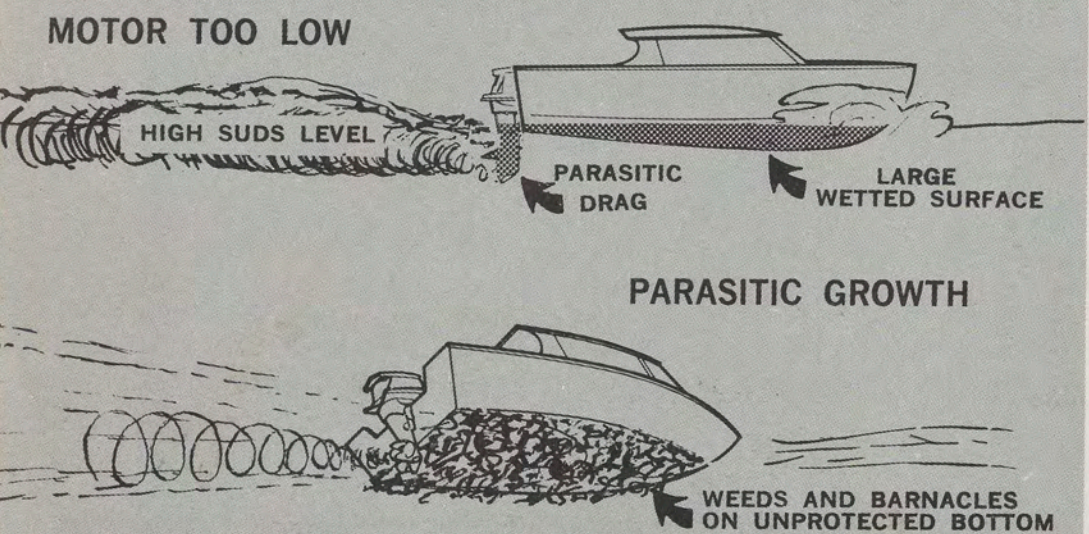


FIGURE 20

SECTION FIVE

EMERGENCY TROUBLE SHOOTING

The trouble-shooting procedures in this section cover only difficulties which can be fixed with a minimum of mechanical knowledge, and using only the tools listed on page 24.

Refer to this section in an emergency — if the trouble and remedy are covered, you should be able to start the motor and get to shore.

5-1 WARNING LIGHT GLOWS

Indication of dangerous trouble except under conditions mentioned in 3.2. The trouble is either low oil pressure or high water temperature, *OR* a faulty sensing switch or short circuit in the warning system. To determine which, and whether it is safe to continue operating, follow the procedure below.

Step one. Stop the engine and check the oil level.

If level is above "ADD," see step two.

If level is low, add oil to bring to "FULL" and start engine. If this does not cure trouble, see step two.

Step two. Start engine and check telltale.

If it is flowing, see step three.

If it is not flowing, stop the engine and check the water

intake.* If it is clogged, clear it and start engine. If it was clear, or if clearing it did not help, see step three.

Step three. Wet finger and carefully check temperature of exhaust elbow. (See figure 1.)

If it is only hand warm, disconnect wire from temperature switch (figure 1, #15). If light goes out, switch is faulty and engine may be run. If light remains on, see step 4.

Step four. SLOWLY unscrew the oil pressure sensing switch and increase engine speed.

If oil spurts from around the base of the switch, reinstall switch, proceed SLOWLY to shore and let your dealer check the engine.

If no oil spurts, oil pressure is low. STOP the engine and get a tow to shore.

***NOTE:** Occasionally, seaweed or other material may clog the water intake, resulting in a loss of cooling. When the engine is stopped, this material may drop away from the intake and normal operation may be resumed.

5-2 ENGINE WILL NOT START

A. Flooded Engine

Excessive cranking with choke on will flood the engine. To eliminate possibility and start if flooded, open neutral throttle lever all the way or main throttle half way; then crank by turning key without pushing to choke for 30 seconds, by which time it will fire and start if flooding was the problem.

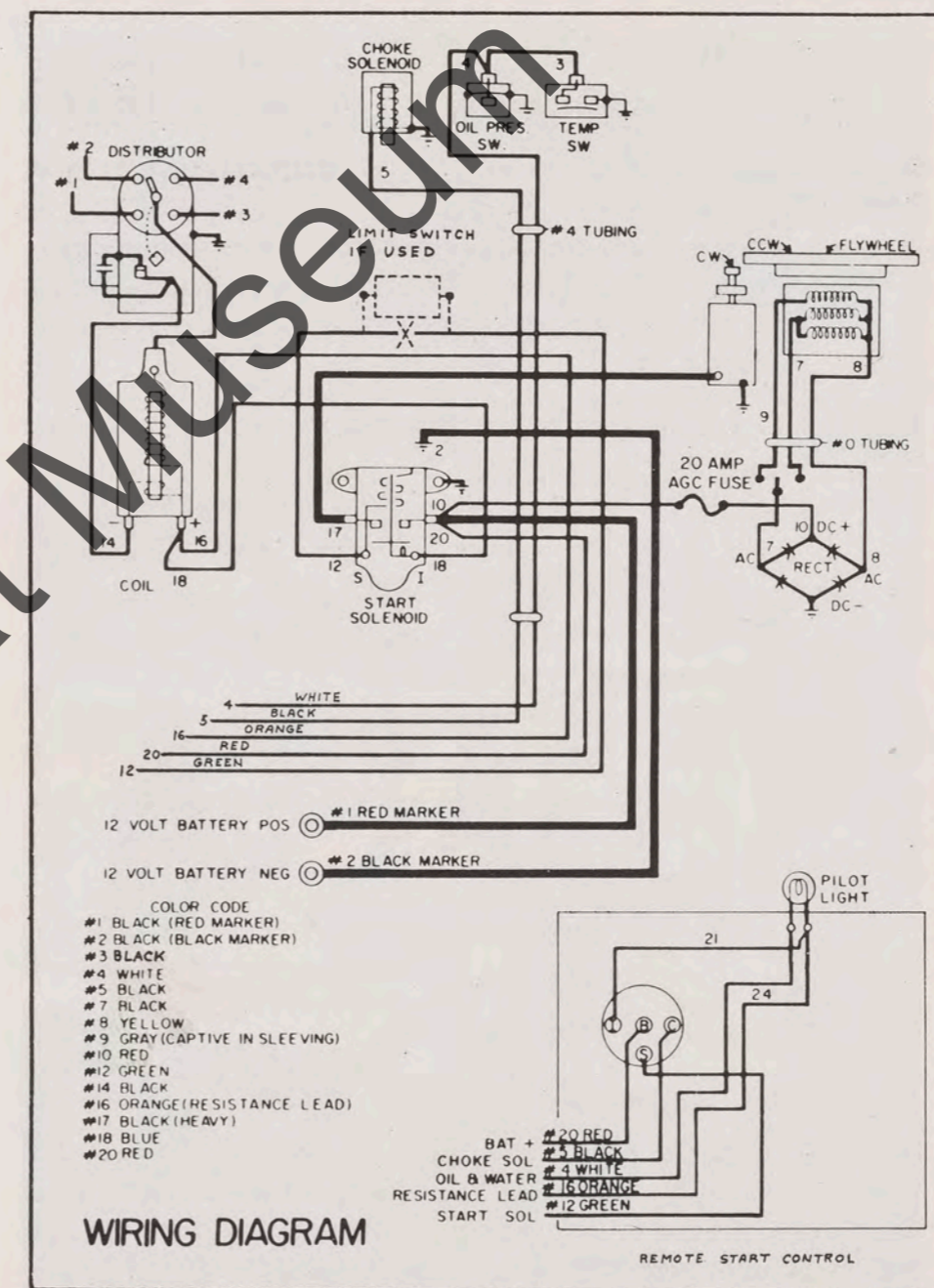


FIGURE 22

B. Engine Not Getting Fuel

1. Check to be sure there is fuel in the tank and that the vent is open. Also, be sure the fuel line is not pinched or kinked.
2. Pull down the locking clip of the plastic throttle terminal on the bellcrank (see figure 1, #13). Slide the terminal off the bellcrank pin. With the choke open, look down into a carburetor throat and move the bellcrank back and forth rapidly. Gasoline should spurt from the accelerator pump outlet, located just underneath the choke. If no fuel is seen, fuel is probably not getting to the carburetors. Re-connect the throttle terminal.
3. Pump the primer bulb. If it feels soft, pump it until it gets firm, then repeat step (2) above. If fuel is now seen, try to start the motor. If the bulb is already firm, remove the fuel line from the filter bowl and pump the bulb. If fuel spurts from the line, check for a clogged filter.
4. If the filter is clean, crank the engine and see if fuel spurts from the end of the line. If the fuel does not, the fuel pump is faulty, and fuel must be supplied to the carburetors by pumping the primer bulb by hand.
5. If the bulb was firm and no fuel spurted from the end of the line, check to be sure the quick-connect couplings are properly connected; and check for blockage between the primer bulb and the carburetors.
6. If the primer bulb will not become firm, check for breaks or leaks in the fuel line. If none are found, try holding the fuel tank at a higher level than the carburetors to bypass a faulty primer bulb.

C. Engine Not Getting Spark

Turn the ignition key on and remove the distributor cap (held by two spring clips). Rotate the flywheel by hand. You should hear or

see a spark jump between the distributor breaker points just as they open.

IF SPARK IS OBSERVED ACROSS THE POINTS, pull the heavy black wire out of the center terminal of the coil and wipe the end of the wire and the coil center terminal clean. Insert a screwdriver into the center terminal slot and hold the end of the wire about 1/4" away from the screwdriver blade, then open and close the breaker points. A strong blue spark should jump from the end of the wire to the screwdriver blade; if no spark is seen (or heard), the coil is faulty and must be replaced. If a spark is observed, check in this order:

1. Re-insert the wire. Be sure the wire is making good contact in the center terminal of the coil.
2. Remove the distributor cap and then clean the inside of the cap carefully. Re-install the cap.
3. Be sure the spark plug connectors are pushed all the way down on the spark plugs.
4. Be sure there is no water or salt on any of the wires or spark plugs.
5. Remove the spark plugs and check the firing ends. If they are coated with carbon, oil, or other accumulations, clean or replace them.

IF NO SPARK IS OBSERVED, be sure points open and close properly. Distributor point gap is .020", about the thickness of a matchbook cover. If points are satisfactory, check in this order:

1. Check for tight connections at both ends of each of these wires: # 14 (black) from — coil terminal to distributor, un-numbered black ground wire on opposite side of distributor, # 18 (blue) from + terminal of coil to "I" terminal of starting solenoid, # 16 (orange) from + terminal of coil to orange terminal of junction block.



FIGURE 23

2. With the ignition key turned on, remove the #14 (black) wire terminal from the distributor and touch it to the condenser bracket. If a spark jumps from the end of the wire to the bracket, the trouble is probably in the distributor.
3. If no spark jumped from the wire to the bracket in (2) above, try bypassing the orange resistance lead by connecting a jumper between the + terminal of the coil and the orange terminal of the junction block. Check for spark as in step (2). If there is a spark, re-connect #14 wire to the distributor and try to start the engine. If the engine now starts, do not run it any longer than necessary. Running without the resistor in the circuit puts an extra load on the ignition coil.
4. If there was no spark in step (3), reconnect # 14 wire, remove the end of the # 18 wire from the "I" terminal of the solenoid and connect it to the same solenoid terminal as the positive (red collar) battery cable. This bypasses the solenoid, ignition switch, and resistor. If you can now start the engine, *you will not be able to shut it off with the ignition key.* Stop the engine by removing one of the cables from the battery.

5-3 STARTING MOTOR WILL NOT CRANK ENGINE

If the starting motor will not crank the engine when the ignition key is turned, first check the rectifier fuse. If the fuse is intact, inspect the battery cable connections at the battery, solenoid, ground and starting motor for looseness or corrosion. If the connections are *clean* and *tight*, follow the instructions below to start the engine by hand.

If the fuse is blown, the battery may be discharged, indicating a current overload in the alternator charging circuit. Check all wiring for shorts resulting from loose connections or chafing. Do not replace the fuse unless you can correct the trouble. If the trouble cannot be located, see your nearest Bearcat dealer. Once the trouble has been corrected, install a new 20 Amp AGC fuse, then

start the engine electrically if possible or by hand. Have the battery checked and recharged if necessary.

5-4 HAND STARTING

A rope 4 to 5 feet long, with a knot in one end, and about 3/16" in diameter can be used, or purchase a starting rope from your dealer. Before starting the motor, be sure the battery is properly connected.

1. Remove engine cover.
2. Disconnect the plastic throttle terminal.
3. Open and close the throttles by hand 3 or 4 times to pump gasoline into the carburetor throats.
4. Place a match book cover behind the idle stop screw of one of the carburetors to slightly open the throttles.
5. Turn the ignition key "ON".
6. Catch the knot at the end of the rope under one of the flywheel fins, and wind the rope counterclockwise (one turn) around the flywheel fins. (See Figure 23.)
7. Be sure of your footing and give the rope a quick, hard pull to start the engine. Repeat if necessary. Be sure passengers are not in a position where they may be hit by the end of the rope.
8. After the engine starts, remove the matchbook cover to reduce engine speed to idle. Reconnect the throttle terminal.

5-5 ENGINE STARVES OR STOPS FROM LACK OF FUEL AT HIGH SPEED

If the primer bulb collapses during operation, something is interfering with fuel supply on the tank side of the bulb. Stop the engine. Check and open the tank vent. Sound of rushing air indicates this was the problem. Check for full engagement of hose connector or kink in line. Re-expansion of bulb indicates correction. If difficulty persists, proceed at low speed to shore and have your dealer check the fuel system.

5-6 EQUIPMENT TO CARRY ON BOARD

The list below suggests basic equipment which should be carried on board. Your nearest U.S. Coast Guard station and local authorities will be glad to tell you what additional equipment you are required by law to carry in your area.

Suggested safety equipment

- One Coast Guard Approved Life Preserver for Each Passenger. First Aid Kit.
- Fire Extinguisher. Horn or Whistle (*range according to class of boat.*) Oars or Paddle. Flashlight. Navigational Lights, if boat is to be operated at night.
- Bucket (*for bailing or emergency sea anchor.*) Anchor and Line. Compass.

Spare Parts

- Propeller. Propeller Drive Pins. Propeller Nut Cotter Pins. Spark Plugs.
- Motor Oil. Starting Rope. Set of Breaker Points. Fuse.

Tools

- Spark Plug Wrench. Slip Joint Pliers. Large and Small Screwdrivers.
- Set of End Wrenches or Adjustable Wrench. Roll of Electrical Tape.

5-7 CARE OF SUBMERGED MOTOR

If your motor should ever be lost overboard, LEAVE IT SUBMERGED temporarily until you are sure that it can be disassembled, cleaned, and inspected immediately by your nearest Authorized Bearcat Dealer. If the motor is submerged in salt water, it should be recovered and re-submerged completely in COLD, fresh water, to reduce the effects of corrosion by oxidation until servicing can begin. However, if fresh water is not available leave the motor in the salt water. Bringing the motor to the surface will increase the danger of corrosion.

If the motor cannot be taken to your dealer's for immediate service, follow the instructions given below:

1. Remove the engine cover and wash the entire motor with clean, fresh water to remove salt, mud, and weeds.
2. Dry the entire motor thoroughly, including all wiring, the rectifier, and the inside of the distributor.

3. Drain the oil from the crankcase sump by removing the oil drain plug (figure 2) from the port side of the upper leg.
4. Remove and dry the spark plugs, then squirt oil into the spark plug holes and turn the flywheel counterclockwise slowly BY HAND. If the motor does not turn over easily, take it to your nearest Homelite dealer immediately. Attempting to start the motor in this condition will cause further damage.
5. If the flywheel turned easily by hand, crank at least two full turns until no more moisture is blown out of the spark plug holes.
6. Replace the oil drain plug, then pour 2¼ quarts of fresh oil through the oil filler.
7. Replace the spark plugs.
8. Drain any water from the filter bowl, fuel lines, and fuel tank. Add two cans of "Drygas" to a fresh tank of fuel.
9. Place the motor in a vertical position and remove carburetor intake muffler. Pump the throttles until no more water or gas spurts from the carburetor-accelerator pump jets.
10. Pour ½ pint of alcohol into each carburetor to absorb moisture.
11. Connect the fuel line and pump the primer bulb to fill the carburetors with fresh fuel, then try to start the motor. If it starts, allow it to warm up, and run it at least 15 minutes with no load at 4000 R.P.M.; then at least 30 minutes at full power under load to evaporate any water in the engine.

NOTE: Even if the motor starts after a salt water submersion, take it to your Bearcat dealer as soon as possible. Salt residue, unless removed, can cause damage to the electric starter, electrical system, and precision parts.

SECTION SIX

STORAGE

During long periods of idleness your engine should be properly stored to prevent corrosion. Your dealer is trained and equipped to prepare, store and return your engine ready to run. However, if you intend to store yourself, follow these suggestions:

6-1 MOTOR

1. Run engine in fresh water. (NEVER, even for a few seconds, run out of water.) Let it warm up and run at 3000 rpm in neutral. This will flush out the cooling system. Very important if motor has been operated in salt water.
2. With the engine running at 3000 R.P.M., pour or spray 1½-2 ounces of a preservative oil, such as "STORIZE," "CRC," or Automatic Transmission Fluid, into each carburetor simultaneously. When the engine begins to choke and lose speed, close the throttle and turn off the ignition immediately. The interior of the engine will now be coated with a protective film of oil. Failure to do this can lead to stuck valves.
3. Place a container under the carburetors and pump the throttles until no more fuel spurts from the accelerator pump jets. This will drain gasoline from the carburetors, and help prevent gum and varnish formation.
4. Back off the idle stop screws (counterclockwise) to be sure the throttles are tightly closed.
5. Remove motor from water, rinse both the powerhead and lower unit with fresh water, then wipe dry.
Drain block only if freezing is possible.
6. Coat distributor breaker cam with very light oil film.
7. Make sure that the drain holes in the lower leg and gear housing are clear, by running a thin length of wire into the holes.
8. Drain the gear housing and refill with fresh gear oil. Many

lower units have water in them. Draining and refilling before extended lay up prevents costly damage! (see page 18) Remove the propeller and coat the propeller shaft with gear oil.

9. Drain the oil from the oil sump and reinstall the drain plug. Refill the engine with fresh oil.
10. Coat all exposed metal parts of the motor with gear oil, or spray with a good preservative oil and protect the finish by wiping with a rag soaked in light oil.
11. Store the motor in a dry place, and in a vertical position on a transom type mount. DO NOT stand the motor on the skeg. Wrap the entire motor in a tarpaulin or heavy paper.
12. Salt water engines, unless regularly flushed with fresh water, accumulate rust and scale in the water jacket. The by-pass cooling system with which your engine is equipped retains water in the block at all times, thereby reducing exposure to oxidation and greatly delaying this accumulation. The formerly necessary practice of annual water-jacket clean out after the second operating season remains a wise precaution to prevent hot spots and possibly valve or block failure. This requires removal of powerhead and should be done by a Servicing Dealer, normally at winter lay-up.

6-2 BATTERY

Your battery will deteriorate by freeze-up if exposed to low temperatures unless fully charged. It may be stored and serviced either by your dealer or an automotive service station.

6-3 FUEL TANKS

Moisture condenses in empty tanks and leads to internal rusting and possible engine trouble or fuel leak. Either (1) flush and clean with fresh gasoline, drain and coat internally with rust-preventive oil; or (2) fill completely and add recommended amount of Drygas or equivalent.

Bearcat 4-Cycle 55 Horsepower Specifications

Engine Type	4-Cycle, Water Cooled	Lower Unit Gear Ratio	15:28 (1:1.87)
Number of Cylinders	4	Weight	234 lbs.
Bore and Stroke	2.750" x 2.50"	Lubrication System	Full Pressure Feed
Displacement	59.4 cubic inches	Fuel Pump	Cam Driven
Firing Order	1 — 3 — 4 — 2	Carburetion	Dual Side Draft Carburetors
Compression	9:1	Water Pump	Neoprene Impeller, Self-Priming, Stainless Steel Lined
Total Ignition Advance	43°	Engine Safety Device	Red light and horn signal high water temperature or low oil pressure
Spark Plug Type	Champion J6	Battery Voltage	12 volts, negative ground
Spark Plug Gap025"	Intake Valve Clearance012" — .014" cold
Distributor Point Gap020"	Exhaust Valve Clearance015" — .017" cold
Alternator Output	14 Amperes Max	Engine Speed	See Propeller Selection Chart
Rectifier Fuse	20 Ampere AGC		
Oil Sump Capacity	2¼ quarts		
Gear Housing Lubricant Capacity	12 ounces		

ACCESSORIES AVAILABLE FROM YOUR BEARCAT DEALER

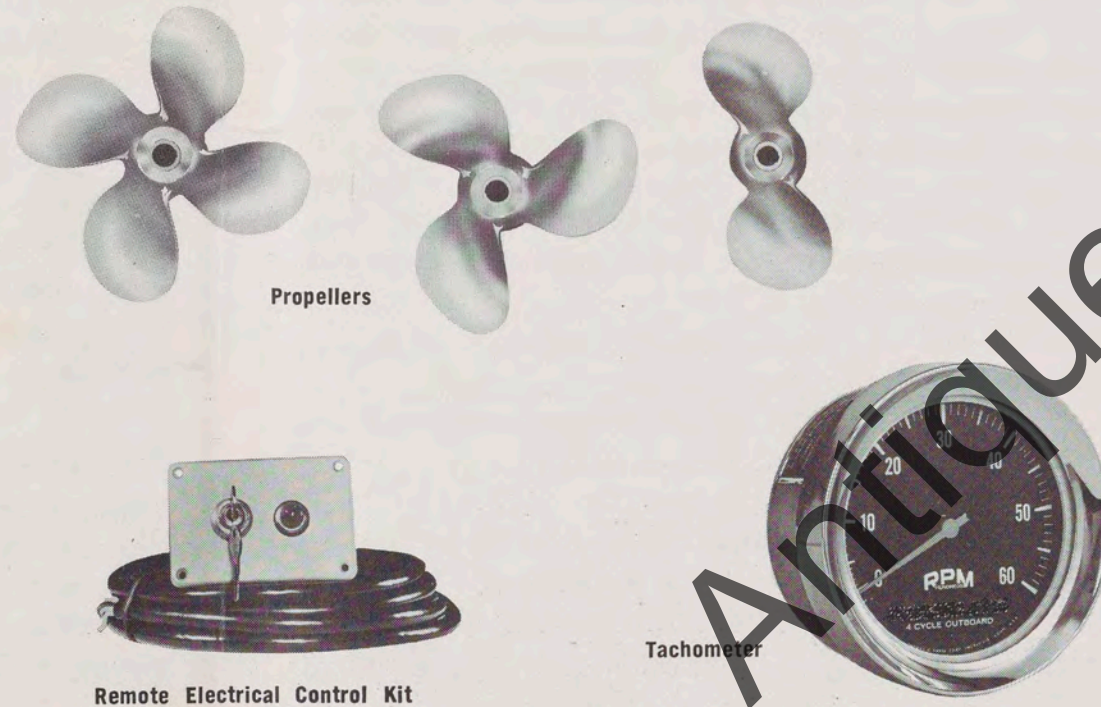
Propellers — a complete line of 2, 3, and 4 bladed propellers to match your specific application requirements.

Remote Electrical Control Kit — for use with boats having built-in shift and throttle controls. Provides remote starting with panel mounted ignition switch and warning light.

Tachometer — provides a precise indication of engine speed at all power settings and load conditions.

Dual Steering Control — used with the Remote Steering Bracket to couple dual engines.

Dual Remote Control Mounting Kit — for mounting controls used with dual engines.



Propellers

Remote Electrical Control Kit

Tachometer

FISHER-PIERCE BEARCAT 4-CYCLE OUTBOARD ENGINE

WARRANTY

We warrant each new outboard of our manufacture to be free from defects in material and workmanship under normal use and service, to original purchaser only. Our obligation under this warranty being limited to making good at our factory or factory branch any part or parts thereof which shall, within two years from date of original purchase, 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 engines.

Warranty limited to one year after delivery to the original purchaser if outboard is used for commercial purposes.

This warranty shall not apply to any engine which shall

have been repaired or altered outside the factory in any way so as to affect its stability, nor which has been subject to misuse, negligence or accident, or operated for racing purposes or operated in any other way than in accordance with our operating instructions. Nor does the warranty extend to repairs made necessary by the use of inferior parts or accessories, or by the use of types of accessories not recommended by Fisher-Pierce.

To make a claim under this warranty, contact the authorized Fisher-Pierce Bearcat dealer from whom engine was originally purchased or the nearest other such authorized dealer. Engines or parts thereof must not be returned to our factory unless tagged with a Return Authority number which will be provided on specific request. Tag must also show serial number and shipping charges must be prepaid.

Antique Boat Museum

THE FISHER-PIERCE CO., INC. ENGINE DIVISION 1149 HINGHAM ST., ROCKLAND, MASS. 02370

Part No. FP10102

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