



VIKING

outboard motor
owner's manual

EATON'S OF CANADA

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3.5 H.P. SPECIFICATIONS

HORSEPOWER — 3.5 Brake H.P. @ 4500 R.P.M.

ENGINE — Two-Cycle, Single Cylinder.

BORE AND STROKE — $2\frac{1}{8}$ " x $1\frac{9}{16}$ "

DISPLACEMENT — 5.18 C.I. In.

CARBURETOR — Float Feed.

CONNECTING ROD — Die Cast Aluminum — Cast-In Bronze Bearing.

CRANKSHAFT — Molded Nodular Iron. Precision Ground Finish.

FUEL TANK — Pressed Aluminum Tank — 5 U.S. Pints or 4 Imperial Pints.

PROPELLER SHAFT AND DRIVE SHAFT — Stainless Steel. Hardened, Ground and Polished.

PROPELLER — Aluminum: $7\frac{1}{2}$ " Dia. x $4\frac{1}{2}$ " Pitch — Left Hand Rotation.

COOLING — Air Cooled.

TRANSOM HEIGHT — 15".

WEIGHT — 29 Lbs.

6 H.P. SPECIFICATIONS

HORSEPOWER — 6 Brake H.P. @ 4500 R.P.M.

ENGINE — Two-Cycle, Twin Cylinder, Alternate Firing.

BORE AND STROKE — $2\frac{1}{8}$ " x $1\frac{11}{16}$ "

DISPLACEMENT — 10.6 C.I. In.

CARBURETOR — Float Feed.

CONNECTING ROD — Die Cast Aluminum — Cast In Bronze Bearing.

CRANKSHAFT — Forged Nickel Steel, Cased Needle Upper Main Bearing, Bronze Lower Main, Center Main and Thrust Bearings.

FUEL TANK — Separate Steel Tank — 6 U.S. Gallons, 5 Imperial Gallons.

PROPELLER AND DRIVE SHAFT — Stainless Steel, Hardened, Ground and Polished.

PROPELLER — Aluminum Alloy — $7\frac{1}{2}$ " Dia., $7\frac{1}{2}$ " Pitch, Right Hand Rotation.

COOLING — Water Cooled — Positive Displacement Type Water Pump.

TRANSOM HEIGHT — 15".

WEIGHT — 55 Lbs.

TILT LOCK — Positive Tilt Lock Permits Engine to Remain in Tilted Position When Not in Use.

RECOMMENDED OPERATING RANGE — 4000, 5000 R.P.M.

9.2 H.P. SPECIFICATIONS

HORSEPOWER — 9.2 Brake H.P. @ 4750 R.P.M.

ENGINE — Two Cycle, Twin Cylinder, Alternate Firing.

BORE AND STROKE — $2\frac{1}{8}$ " x $1\frac{1}{16}$ "

DISPLACEMENT — 14.97 Cu. In.

CARBURETOR — Float Feed.

CONNECTING ROD — Forged Nickel Steel — Uncased Needle Bearings at Crankshaft, Cased Needle Bearings at Piston Pin.

CRANKSHAFT — Forged Nickel Steel — Cased Needle Bearings at Lower Main Bearing, Bronze Center Main and Thrust Bearings.

FUEL TANK — Separate Steel Tank — 6 U.S. Gallons, 5 Imperial Gallons.

PROPELLER AND DRIVE SHAFT — Stainless Steel, Hardened, Ground and Polished.

PROPELLER — Aluminum Alloy — 8" Dia., 8" Pitch, Right Hand Rotation.

COOLING — Water Cooled — Positive Displacement Type Water Pump

TRANSOM HEIGHT — 15"

WEIGHT — 55 lbs.

TILT LOCK — Positive Tilt Lock Permits Engine to Remain in Tilted Position When Not in Use.

RECOMMENDED OPERATING RANGE — 4000-5500 R.P.M.

15 H.P. SPECIFICATIONS

HORSEPOWER — 15 Brake H.P. @ 4500 R.P.M.

ENGINE — Two Cycle, Twin Cylinder, Alternate Firing.

BORE AND STROKE — $2\frac{7}{16}$ " x $2\frac{1}{4}$ "

DISPLACEMENT — 19.96 Cu. In.

CARBURETOR — Float Feed.

CONNECTING ROD — Forged Nickel Steel — Uncased Needle Bearings at Crankshaft, Cased Needle Bearings at Piston Pin.

CRANKSHAFT — Forged Nickel Steel — Cased Roller Bearings at Upper and Lower Main, Uncased Needle Bearings at Center Main with Bronze Thrust Bearing.

FUEL TANK — Separate Steel Tank — 6 U.S. Gallons, 5 Imperial Gallons.

PROPELLER AND DRIVE SHAFT — Stainless Steel, Hardened, Ground and Polished.

PROPELLER — Aluminum Alloy — $8\frac{1}{2}$ " Diameter, 8" Pitch, Right Hand Rotation.

COOLING — Water Cooled — Positive Displacement Type Water Pump.

TRANSOM HEIGHT — 15" or 20"

WEIGHT — 74 lbs. for Standard Shaft Model.

TILT LOCK — Positive Tilt Lock Permits Engine to Remain in Tilted Position When Not in Use.

RECOMMENDED OPERATING RANGE — 4000-5000 R.P.M.

35 H.P. SPECIFICATIONS

HORSEPOWER — 35 Brake H.P. @ 4750 R.P.M.
ENGINE — Two-Cycle, Twin Cylinder, Alternate Firing,
ELECTRIC AND MANUAL START, NEGATIVE GROUND,
MAGNETO IGNITION SYSTEM.
BORE AND STROKE — 3" x 2.540".
DISPLACEMENT — 35.9 Cu. In.
CARBURETOR — Float Feed.
CONNECTING ROD — Forged Nickel Steel, Caged Roller
Bearings at Crankshaft. Cased Needle Bearings at Piston Pin.
CRANKSHAFT — Forged Nickel Steel, Ball Bearings at Upper
Main, Caged Rollers at Center and Lower Main.
FUEL TANK — Separate Steel Tank — 6 U.S. Gallons, 5 Im-
perial Gallons.
PROPELLER AND DRIVE SHAFT — Stainless Steel, Hardened,
Ground and Polished.
PROPELLER — Aluminum Alloy — 10³/₈" Diameter, 11¹/₂"
Pitch, Right Hand Rotation.
COOLING — Water Cooled, Thermostatically Controlled, Pos-
itive Displacement Type Water Pump.
TRANSOM HEIGHT — 15" or 20".
WEIGHT — 116 Lbs. for Standard Shaft Model.
TILT LOCK — Positive Tilt Lock Permits Engine to Remain in
Tilted Position When Not in Use.
RECOMMENDED OPERATING RANGE — 4400-5100 R.P.M.

50 H.P. SPECIFICATIONS

HORSEPOWER — 50 Brake H.P. @ 4750 R.P.M.
ENGINE — Two-Cycle, Twin Cylinder, Alternate Firing,
ELECTRIC START, NEGATIVE GROUND, MAGNETO IG-
NITION SYSTEM.
BORE AND STROKE — 3³/₁₆" x 2.800".
DISPLACEMENT — 44.7 Cubic Inches.
CARBURETOR — Float Feed.
CONNECTING RODS — Forged Nickel Steel, Caged Roller
Bearings at Crankshaft. Cased Needle Bearings at Piston Pin.
CRANKSHAFT — Forged Nickel Steel, Ball Bearings at Upper
Main, Caged Rollers at Center and Lower Main.
FUEL TANK — Separate Steel Tank, 6 U.S. Gallons, 5 Imperi-
al Gallons.
PROPELLER SHAFT AND DRIVE SHAFT — Stainless Steel,
Hardened, Ground and Polished.
PROPELLER — Aluminum Alloy, 10³/₈" Diameter, 12¹/₂" Pitch,
Right Hand Rotation.
COOLING — Water Cooled, Thermostatically Controlled, Pos-
itive Displacement Type Water Pump.
TRANSOM HEIGHT — 15" or 20".
WEIGHT — 134 Lbs. for Standard Shaft Model.
TILT LOCK — Positive Tilt Lock Permits Engine to Remain in
Tilted Position When Not in Use.
RECOMMENDED OPERATING RANGE — 4400-5100 R.P.M.

GENERAL INFORMATION

SERVICE RECOMMENDATIONS

Do not attempt to make repairs or adjustments not specifically covered in this manual. Should you ever need technical assistance, please contact your Authorized Viking Service Facility.

INFORMATION REQUESTS

When asking for technical assistance be sure to give complete information. Include the Model Number, Serial Number, Purchase Date and place of purchase and State Briefly the trouble you are having.

IDENTIFICATION PLATE

An identification plate that lists the engine Model and Serial number is located on the side of the steering handle on 35 HP models and under the engine cover on the forward flap of the stern plate on 4, 9.2, 13, 15 and 20 HP models.

INSTALLING ENGINE

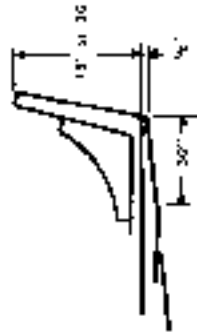
BOAT TRANSOM

Your new Viking Outboard (if a standard shaft model) is designed to be installed on a boat with a vertical transom height of 15" for a long shaft model. The correct transom height is 20". Proper installation height is essential to obtain maximum forward thrust from your engine.

If the transom is too high, propeller slippage (cavitation) may result, affecting general performance and proper cooling of the engine.

If the transom is too low, the lower unit will be riding too low in the water, causing excessive drag.

Interference from the keel is frequently the cause of propeller cavitation. By tapering the keel as shown, this can be eliminated. Keel should be faired from a point 24" ahead of the transom so that at the transom the keel is no more than 1/2" in thickness.



MOUNTING ENGINE

Mount the engine at the center of the transom and tighten the stern bracket clamp screws alternately by hand until tight. If the engine is not centered on the transom, the forward of the propeller will tend to cause the boat to run off course and create bad steering and control.

Do Not Use a Wrench to Tighten the Clamp Screws as the Brackets May Be Damaged.



Check the tightness of the clamp screws occasionally during operation. The stern brackets and clamp screws not only support the weight of the engine but also are subjected to thrust loads, shock loads and steering stresses. Tight clamp screws will guard against damage to the transom and also prevent the engine from working loose during operation.

NOTE:

The 15" transom on 13 HP models, due to the immense amount of thrust generated by the propeller, if the stern bracket that the engine is fastened to the transom, applying the force provided in the lower end of the stern bracket, the propeller will tend to secure the engine to the transom. You will be assured against loss of the engine when the boat is at full speeds in when the engine is idling in the water.

When you check the method to secure the engine, make sure that the stern bracket remains visible to both sides to allow for proper backing and shifting. When installing the propeller, be sure the bolts through the transom should be torqued liberally to prevent water leakage.

This procedure of securing the engine should not be attempted until the full position of the engine on the transom has been determined.

CURVED AND REVERSE ANGLE TRANSOMS

Most outboards do not adapt well to mounting on curved or reverse angle transoms. In order to mount the engine on boats with these types of transoms, shafts will be required between the stern brackets and hull transom in order to have a flat vertical or slightly declined transom mounting surface.

ADJUSTING ENGINE ANGLE

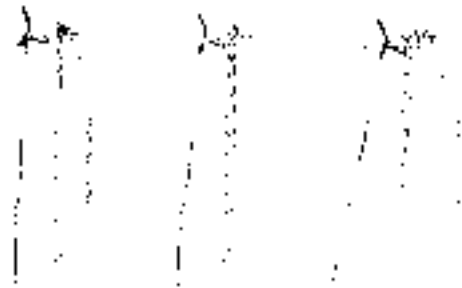
Under ideal conditions efficiency is greatest with the motor unit operating in a level position. As the center thrust of the propeller is then applied parallel to the direction of motion.

The angle of the engine is easily adjusted by changing the position of the angle adjusting bar in the holes or slots provided in the stern brackets.

Important:

On 6.5 H.P. models, after the correct adjustment has been determined, tighten the wing nut on the angle adjusting bar securely using a suitable tool.

If the engine is tilted too near to the transom, the boat of the bow will "dig in" or "pleat". If it is tilted too far away from the transom, the bow will ride high and the boat may "gallop" or "porpoise". If the engine races or responds on sharp turns, lower the adjustment until the correct position is found.



TILTING ENGINE / 3.5 H.P. Models

Before cranking, close the carburetor shut-off valve as a precautionary measure against fuel spilling into the boat. (Refer to illustration under "Adjusting Carburetor" for location of shut-off valve.)

Tilt the engine up and out of the water by grasping the back of the fuel tank and pulling up and all the way forward. The engine will remain tilted until released normally to the operating position. **THE ENGINE WILL NOT TILT UP OF WATER WHEN IN REVERSE OPERATING POSITION. Refer to Reverse Lock.)**

TILTING ENGINE / 6 and 9.2 H.P. Models

To tilt your engine up out of the water, push the tilt release lever down, and disengage the engine by the back of the support plate, pull the engine out and forward, out of the water until the tilt stop engages. The engine will automatically lock in the tilted position.

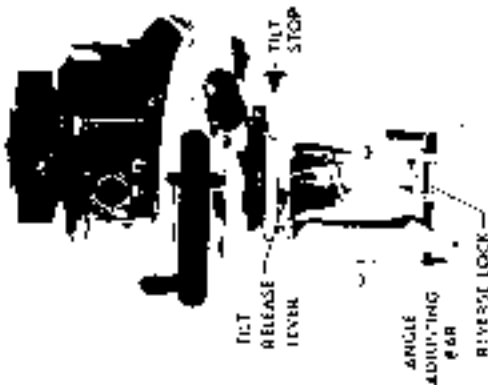
To tilt the engine lock down, pull the tilt stop forward and allow the engine to slide to the

top to the normal operating position. The engine should automatically lock in the tilted position. However, if the lock does not engage, push the tilt release lever down to lift the reverse lock clear of the lock bar. Push or slide down any remaining auxiliary and then return the tilt release lever to the "up" or locked position. This will lock the engine in the normal operating position. A 10 second interval from tilting up under load or deceleration or normal average target loads.



TILTING ENGINE/15 H.P. Models

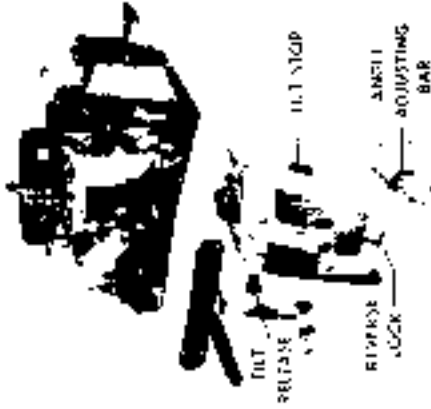
To tilt your engine up out of the water, push the tilt release lever down and grasping the engine by the rear carrying handle pull the engine up out of the water until the tilt stop engages. To tilt back down, pull out tilt stop knob and allow engine to slowly return to the operating position. After engine has been tilted back down, make sure to return the tilt release lever to the "up" or locked position. This will lock the engine in the normal operating position and prevent it from tilting up under rapid deceleration or high reverse thrust loads.



TILTING ENGINE/35 and 50 H.P. Models

To tilt your engine out of the water, first make sure it is pointed straight ahead then pull the tilt release knob out and grasp the engine by the handle on the back of the engine cover. Pull the engine up and forward out of the water until the tilting limit is reached. Then push the tilt stop lever back to lock the engine in the tilted position.

To tilt the engine back down, grasp the handle on the back of the engine cover and pull slightly forward. Pull the tilt stop lever forward to release the engine and slowly return the tilting to the operating position. After the engine is tilted back down, make sure to return the tilt release knob to the "up" or locked position. This will lock the engine in the normal operating position and prevent it from tilting up under rapid deceleration or high reverse thrust loads.



REVERSE LOCK/3.5 H.P. Models

Your engine is equipped with a reverse lock that prevents it from tilting up when operating in reverse. Use from forward position. BE EXTREMELY CAREFUL WHEN OPERATING IN REVERSE. IF YOU STRIKE AN UNDERWATER OBJECT, THE SHOCK WILL BE TRANSMITTED DIRECTLY TO THE HOAT TRANSOM AND ENGINE MAY BE DAMAGED.



INSTALLING REMOTE CONTROLS TO ENGINE

15 H.P. Models

1. Install remote control cable in to the engine mounting flange through the 2" opening in the center of the engine flange. **NOTE:** Before locating the control cables, it must be guaranteed that all necessary hardware is in place to allow the cables to pass freely.
2. Install the through and gear shift end connectors in the control cables. (The large sliding-leaded connector should be installed in the throttle cable, and the small connector in the gear cable.)
3. Remove gear cable clamp (A) from support plate. Position cable along gear shift cable on the deck in the cable clamp line directly over support plate. Fit over securely.
4. Remove thru cable clamp (B) from bracket. Press on cable clamp over throttle cable so that the clamp is directly over the cable line. It's over the deck in the throttle cable line with each clamp assembly in place. Tighten securely.
5. **GEAR SHIFT CABLE:** With the shift lever in "Neutral" (check by turning propeller) adjust the cable end connector so that the line at the end of the cable is exactly centered in the end connector. Slip on the shift lever (C). Slide the end connector into the sleeve and attach the connector to the shift lever. Slip the retaining sleeve forward to lock the shift lever in the shift lever.
6. **THROTTLE CABLE:** Before installing the throttle cable, refer to the "Safety" section of this manual. Then, with the throttle fully raised, adjust the gear spring loaded throttle end connector so that the hole in the connector is 3/8" (3/16" if you prefer) to the right of the hole in the connector. The distance between the hole in the connector and the hole in the cable should be 1/8".



FIGURE 1
THROTTLE CABLE



FIGURE 2
GEAR SHIFT CABLE

NOTE: The throttle end connector is spring loaded to assure strength during operation. Should the throttle end connector break, it drops in place over the fuel and can be removed from the motor to assist in use.

7. Located on the motor mounting flange are two screws of lead which provide a means to install the remote control bearing. For installation, use a hole saw to cut a hole in the motor with an 1/8" diameter hole saw with a "loop" forward.

INSTALLING REMOTE CONTROLS TO ENGINE

35 and 50 H.P. Models

1. Install thru-throttle gear shift cable end connector in the 2" hole in the motor flange. (The large sliding-leaded connector should be installed in the throttle cable and the small connector in the gear cable.)
2. Remove gear cable clamp (A) from support plate. Position cable along gear shift cable on the deck in the cable clamp line directly over support plate. Fit over securely.
3. Remove thru cable clamp (B) from bracket. Press on cable clamp over throttle cable so that the clamp is directly over the cable line. It's over the deck in the throttle cable line with each clamp assembly in place. Tighten securely.
4. **GEAR SHIFT CABLE:** With the shift lever in "Neutral" (check by turning propeller) adjust the cable end connector so that the hole at the end of the cable is exactly centered in the end connector. Slip on the shift lever (C). Slide the end connector into the sleeve and attach the connector to the shift lever. Slip the retaining sleeve forward to lock the shift lever in the shift lever.
5. **THROTTLE CABLE:** Before installing the throttle cable, refer to the "Safety" section of this manual. Then, with the throttle fully raised, adjust the gear spring loaded throttle end connector so that the hole in the connector is 3/8" (3/16" if you prefer) to the right of the hole in the cable. The distance between the hole in the connector and the hole in the cable should be 1/8".



FIGURE 3
D.C.

ASSEMBLY OF ELECTRIC CONTROL CABLE TO IGNITION SWITCH

35 and 50 H.P. Models



"Neutral Lock" brass on the Throttle Tower Shaft. Refer to "E" in illustration.

6. **THRUSTLE CABLE:** NOTE: Before installing the Thrustle cable refer to "Throttle Stop" section of this manual. Tighten the Thrustle fully clockwise, adjust the large spring-loaded throttle and connecting so that the hole in the connector is 3/16" short from contacting to the upper hole in the connector stud located directly below the fuel pump (2).

NOTE: The Thrustle end connector is spring loaded to insure smooth throttle operation. Spread the Thrustle end connector until it drops in place over the end end connector stud

7. Slide the retaining sleeves on the rod and connectors back and attach cables to connector studs. Slide sleeves forward to lock cables in place.

CHECKING REMOTE CONTROL INSTALLATION

All Models

CAUTION: After the throttle and gear shift cables are installed, check to make sure the end connectors are in a minimum of 1/2" clearance engagement on the cables. Also, the sleeves are marked over the Thrustle shaft on 35 and 50 H.P. models and should be pushed as far as possible toward the center and connected so they do not interfere with the fuel filter cap when connected.

• Check the controls for correct operation by moving the up and down of the remote control box to the "Forward", "Neutral" and "Reverse" positions. With the control lever in the "Forward" and "Reverse" positions, the propeller should be locked firmly in gear. When in "Neutral," the propeller should turn freely.

NOTE: The final installation of your remote controls and adjustments other than those indicated above should be made by your Authorized Viking Service Facility.

REMOTE STEERING BRACKET

A remote steering bracket should be fitted which your engine is able to raise from steering. A bracket from your Authorized Viking Service Facility. When installed, the end beam and side of the steering bracket with clevis forward on 35 and 50 H.P. models. Connect the two sets of mounting holes. The other set of holes connect to engine mast be used.

1. Insert the back of the ignition switch and note the imprinted letters which appear next to each of the 5X terminals. Refer to wiring diagram. The letters denote the function of the terminal and to be used as an aid when assembling the lead wires to the switch.

2. The remote electric cable lead wires are secured to the terminals of the ignition switch using the screws and lock washers provided. When installing, run screw through hole in lead wire terminal, assemble lockwasher over screw and turn screw secure into switch terminal.

3. Attach lead wires to switch as follows:

- WHITE - empty set to terminal "M" UPPER (WHITE PAINT DOT)
- YELLOW - start terminal "S" (YELLOW PAINT DOT)
- GREEN - cranks to terminal "C" (GREEN PAINT DOT)
- RED - battery to terminal "B" (RED PAINT DOT)
- BLUE - ground to terminal "M" LOWER

NOTE: THE TERMINAL MARKED "I" IS NOT AND MUST NOT BE USED UNLESS OTHER ELECTRICAL ACCESSORIES ARE USED.

NOTE: The BLACK (Ground), ORANGE (Peak Indicator) and PURPLE and green set 35 and 50 H.P. Magneto Ignition Switch lead wires if not used should be individually covered with a sleeve, taped and folded back out of the way.

ASSEMBLY OF ELECTRIC CONTROL CABLE TO ENGINE

1. Route electric control cable over carrying handle and through ground nut on a side of control panel.
2. Remove the cable clamps (shown) on the port side of the support plate and install on a remote electric cable.
3. Back the port terminal plate connecting screws out until they begin to bind or resist.
4. Note: The screws are locked into the terminal plate to prevent their loss and are not intended to be removed.
5. Route the electric cable along the face of the support plate toward the back of the engine; on the back side of the engine terminal plate and attach to the terminal plate with the bonded ends of the lead wire terminals (shown) over terminal plate. Tighten screws securely.

5. The lead wires must be installed as illustrated in the diagram below.

NOTE: A label indicating the correct wiring sequence is provided on the exhaust port cover, directly alongside the engine terminal plate.



CAUTION: When installing the lead wires make sure that the bare metal ends of the different colored lead wires do not touch each other. If they do, the engine may not operate properly or will not operate at all.

6. Reinstall cable clamps and screws removed in step 2 above. Tighten securely.

PROPELLERS

Your engine is equipped with a propeller which will give you good all-around operating characteristics. However, the performance of such a propeller under special conditions can be improved by changing to a propeller that is designed for your particular boat and application.

The correct propeller will be determined by the boat design, the weight of the boat and the application. No one particular propeller can deliver optimum performance under the different conditions of boat design and applications that vary in present day boating. Each application requires the use of a propeller specifically designed for the purpose.

If a propeller is being changed to be made, it is very important that a technician be used for determining exactly I.P.M. with the new propeller. **THE I.P.M. MUST FALL WITHIN THE OPERATING LIMITS GIVEN ON THE SPECIFICATIONS PAGE OR SERVICEMANUAL TO THE ENGINE. MAY RESULT.** See your Authorized Viking Service Facility for more information on what to do, how to keep your motor and for information on what propellers are available.

PROPELLER MAINTENANCE

If the propeller is to be adjusted or badly nicked or clogged with weeds, a special servicing station will serve. If any of the servicing stations are used, the color of the engine should be noted or limited, and the propeller cleaned, replaced or repaired as soon as possible. As a safety measure, always carry a spare propeller, shear pins, propeller nut and cutter pin.

OPERATION

BREAK-IN PERIOD/ 3.5 H.P. Models

During the first hour of operation, the engine MUST be run with the throttle controlled to the maximum to which you can hold the "idle up" position. DO NOT run the engine below this speed for the first hour. This is to be done to insure adequate cooling during break-in. Do not use the engine for trading during the break-in period.

After the four 30 hour break-in is completed the engine may be operated at any speed desired.

Since this engine is designed operating temperatures may increase from time to time for the first 100 hours of operation.

If the engine should stop or slow down during this break-in allow it to cool for a short time and then restart the engine. Continue to operate as described above.

BREAK-IN PERIOD / 6 and 9.2 H.P. Models

During the first hour of operation, it is extremely important that care be exercised in properly breaking your new engine. Operate engine in gear with throttle control set between 2000 RPM and 3000 RPM as indicated on the engine. This speed will not be exceeded during the first hour of operation but may be reached at times even if as noted below.

NOTE: During the break-in period when the engine is running on starting four hours, bring the engine RPM up to a point where the fuel passages are fully open, reduce the throttle valve to lower the engine RPM to that also if and for one hour. This is of the break-in period and on a time operation check the operation of the water pump and cooling system in the engine. (Refer to "Checking Water Pump Operation".)

After the one hour break-in period has been completed the engine may be operated at any speed desired. No special fuel mixture is required during the break-in period for the 6 and 9.2 H.P. models. However, refer to recommended Fuel Mixture section for proper mixing instructions to be used.

BREAK-IN PERIOD / 15 Through 50 H.P. Models

BEFORE STARTING THROUGH 50 H.P. MODELS, READ THE FOLLOWING INSTRUCTIONS CAREFULLY: During the first ten (10) hours of operation it is recommended that a gas line to oil ratio of ONE (1) PART HEAVY DUTY OIL TO FIVE (5) PARTS OF GASOLINE (SAE 30) BE USED. AFTER THE FIRST TEN (10) HOURS OF OPERATION, USE REGULAR GRADE APPROPRIATELY OIL GRADE GASOLINE. BE USED. FOR FRESH MEASUREMENT MIX ONE (1) QUART OF OIL WITH SIX (6) GALLONS OF GASOLINE.

During the first hour of operation run throttle to 2000 with throttle control set between 2000 RPM and 3000 RPM.

From 3000 RPM to 2700 RPM speed must not be exceeded during the first hour of operation for any period of time except as noted below.

NOTE: During the break-in period when the engine is mounted on its drive shaft, bring the engine RPM up to a point where both main bearings are fully engaged through the control in 2000 RPM and 3000 RPM in that operation for the 2000 RPM of the break-in period and continue operation.

Check the operation of the water pump and cooling system (properly refer to "Checking Water Pump Operation").

After the one hour break-in period has been completed, the engine may be operated at any speed desired. However, during the first ten (10) hours of operation it is imperative that the gas line to oil ratio of one (1) part heavy duty oil to five (5) parts of gasoline be used. After the first ten hours of operation no special fuel mixture is required. However, refer to the engine to oil ratio as described under "Recommended Fuel Mixture".

IMPROVEMENT

When the engine is used in COMMERCIAL, MARINE, OR HEAVY DUTY applications, it is imperative that a mixture of one (1) part heavy duty oil to five (5) parts of gasoline be used. (Refer to "Recommended Fuel Mixture".)

RECOMMENDED FUEL MIXTURE

3.5 H.P. Models

USE MARINE WHITE or REGULAR GRADE automotive gasoline (approximately 80 octane).

Throttle to mix one part of 20 pint of a high grade S.A.E. 30 motor oil with each gallon of gasoline.

IMPROVEMENT

As the use of premium approximately 85 octane with antiknock additive gasoline, gasolines and oils containing TEL or phosphorus additive additive purposes such as "Berkey" oils. Then in commercial, marine, or heavy duty applications, use a mixture of one (1) part heavy duty oil to five (5) parts of gasoline.

NOTE: Most outboard engine oils are designed for best performance.

venience in Water-Cooled Outboards. If your Air-Cooled Outboard seems to run hot and sluggish when operated for extended periods at full throttle, optimum performance may be obtained by using a No. 30 VM or MS grade of Automotive Type Oil.

USE ONLY THE RECOMMENDED OIL TO GASOLINE RATIO (regardless of the claim made by some manufacturers).

FOR A PROPER FUEL MIX

1. Use a clean, well-kept container.
2. Strain all fuel through a fine mesh filter. This will remove dirt and water, thus preventing fouling of the carburetor.
3. Fill container half full of fresh gasoline.
4. Add the correct amount of 1/2 pint (or gallon) of gasoline.
5. Shake container vigorously to assure proper mixture.
6. Add balance of gasoline and shake mixture again. Observe all fire prevention rules: mix fuel in a well-ventilated area (preferably outdoors), and avoid sparks and open flames.

RECOMMENDED FUEL MIXTURE

6 and 9.2 H.P. Models

USE MARINE WHITE or REGULAR GRADE automotive gas oil (approximately 50 percent). Properly mix one-third (1/3) pint of No. 30 VM or MS Outboard Engine Oil with each gallon of gasoline.

IMPORTANT: Avoid the use of Premium gasoline (approximately 95 octane) with outboard engines. Gasolines, gasolines and oils containing Triphenyl phosphorus additives or additive compounds such as "Exaltol" oils, "Turbo" compounds, "Teles" "Prestige" "Reclaiming" compounds, etc., are entirely unnecessary and are not recommended for use in your engine.

FOR A PROPER FUEL MIX

1. Use a clean, well-matched container.
2. Strain all fuel through a fine mesh filter.
3. Fill container half full of fresh gasoline.
4. Add the correct amount of oil (1/2 pint per gallon of gasoline).
5. Shake container vigorously to assure proper mixing.

6. Add balance of gasoline and shake mixture again. Observe all fire prevention rules -- mix fuel in a well-ventilated area (preferably outdoors) and avoid sparks and open flames.

NOTE: If the fuel tank is to be transported, or stored in an area subject to temperature increases, do not fill tank to top as spillage due to expansion of the fuel will occur. Close fuel tank vent screw on filler cap.

RECOMMENDED FUEL MIXTURE

15 Through 50 H.P. Models

IMPORTANT: BEFORE ATTEMPTING TO RUN YOUR NEW ENGINE, REFER TO THE "BREAK-IN PERIOD," The MANUAL, recommended fuel mixture after the first ten hours of operation have been completed is ONE (1) Part Heavy Duty Outboard Motor Oil (SAE 30) to FIFTY (50) PARTS OF MARINE WHITE or REGULAR GRADE (APPROXIMATELY 95 OCTANE) GASOLINE. For easy measurement, mix ONE (1) PART of oil with SEVEN (7) GALLONS of gasoline.

THIS MIXTURE MUST NOT BE USED UNTIL AFTER THE FIRST TEN (10) HOURS OF OPERATION HAVE BEEN COMPLETED.

IMPORTANT: When the engine is used in COMMERCIAL TACING OR HEAVY DUTY applications, it is imperative that a safe fuel to oil ratio of one (1) part heavy duty outboard motor oil (SAE 30) to twenty-four (24) parts of gasoline be used.

IMPORTANT: Avoid the use of PREMIUM (approximately 95 octane) with outboard engines. Gasolines and oils containing Triphenyl phosphorus additives or additive compounds such as "Exaltol" oils, "Turbo" compounds, "Teles", "Prestige" "Reclaiming" compounds, etc., are entirely unnecessary and are not recommended for use in your engine.

FOR A PROPER FUEL MIX:

1. Use a clean, well-matched container.
2. Strain all fuel through a fine mesh filter.
3. Pour one (1) gallon of gasoline into fuel tank. Six (6) 8 pint cans will do. Add one (1) pint of oil. Shake vigorously to mix. Add balance of gasoline and shake vigorously again. USE ONLY THE RECOMMENDED OIL (50 GASOLINE RATIO regardless of the claim made by some lubricants).

STARTING PROCEDURE / 3.5 H.P. Models

1. Be sure fuel tank has a sufficient amount of properly mixed fuel. Open vent screw on the fuel tank filler cap.
2. Open the carburetor shut-off valve.
3. Move the Magneto Control lever to the "START" position.
4. Set the high speed adjustment knob on the control panel at the "Start" position.
5. Upon a cold engine only, move the choke lever to the "Choke" position, over all the way forward.
6. Pull starter rope out slowly until you feel the starter engage, then give a smooth, fast pull.

The engine should start on the second or third pull. If it does not start on the third pull, check steps one through five and refer to the Troubleshooting in the back of this manual. However, when starting for the first time, several additional pulls on the starter may be required in order to initially prime the engine.

WHEN ENGINE STARTS

1. Open choke and allow engine to warm up. If engine "puffs" and begins to stall, move the choke lever to the "Warm-up" position, straight up and down, until engine runs smoothly.
2. Move the "high speed" adjustment knob to the "Run" position.

GETTING UNDERWAY

Simply advance the Magneto Control lever to "FAST" position and you are under way.

TO STOP

Move Magneto Control lever to "STOP" position.

REVERSE OPERATION

Your engine can be rotated through a full 360° circle. To stop engine in reverse, grasp the revolving shaft until engine is in reverse position. **CAUTION: REVERSE ENGINE SPEED TO HALF THROTTLE BEFORE TURNING ENGINE TO THE REVERSE OPERATING POSITION.**

STARTING PROCEDURE / 6 Through 35 H.P.

Manual Start Models

1. Make sure that the fuel tank has a sufficient amount of properly mixed fuel and that the vent screw located on the fuel tank filler cap or gauge is open.
2. On 6 through 15 H.P. models, remove the fuel tank to the engine by engaging the fuel line coupling with the bushing on the fuel tank. Pull back the lock ring and push the coupling into the bushing. Release the lock ring. It should snap back into place. Check coupling to make sure that it is square. Rotate the fuel supply line through the on-board starboard ground in the remote panel. Slide a fuel line clamp over end of fuel line and attach fuel line to fitting on fuel pump on starboard side of power head. Slide fuel line clamp up on fuel line to prevent it from detaching during operation.
3. Squeeze the plunger bulb in the fuel line several times to pump fuel from the fuel tank to the engine. Continue to squeeze until plunger bulb becomes firm.
4. Place "at engine" gear shift lever in "NEUTRAL" on 6 through 15 H.P. steering handle models. Place the remote control unit in the "START" position as outlined in the following sections for 35 H.P. remote control operated models.
- Newer Start Engine in Gear.
5. Put a cold engine, pull out choke.
6. On 6 through 15 H.P. steering handle models, turn twist grip throttle control to the "START" position.
7. Pull starter rope out slowly until the starter plunger gear engages with the flywheel, then give the rope a smooth, rapid, even pull.

The engine should start on the second or third pull. If it does not start, check steps 1 through 7 above and see the Troubleshooting list in the back of this book. However, when starting your engine for the first time, several additional pulls on the starter may be required in order to initially prime the engine.

WHEN ENGINE STARTS

Push choke red in and allow engine to warm up. If engine "pops" and begins to stall choke momentarily until it runs smoothly.

GEAR SHIFT — (AI Engine)

6 Through 15 H.P. Models

Your engine is equipped with a gear shift control to provide operation in "Forward," "Neutral" and "Reverse" gear. If the engine is not running, **DO NOT FORCE THE SHIFT LEVER.**

- Never shift with engine speed control set above "Shift" position. The gear shift mechanism will not disengage from forward or reverse gear to neutral gear at speeds above this setting.

FORWARD

To go forward:

1. Turn wheel throttle control so that pointer on the handle is at the "SHIFT" position or stop.
2. Move shift lever to "FORWARD."
3. Advance throttle control.

REVERSE

To go in reverse:

1. Turn wheel throttle control so that the pointer on the handle is at the "SHIFT" position or stop.
2. Move shift lever to "REVERSE."
3. Advance throttle control.

TO STOP

1. Return wheel throttle control to "SHIFT" position and shift engine into "NEUTRAL" gear lever position or ahead down. Turn wheel throttle control to "STOP" position.

To provide a means of stopping 6 through 35 TLP manual start models operated with remote controls, an ignition shutoff switch kit, Model 167, has been developed and is available from your Authorized Viking Service Facility.

If this kit is installed, depress the shutoff switch button to stop the engine. If the kit is not installed it will be necessary to "choke" the engine until it stops when using single lever remote controls.

When the Twin Lever remote control is used, there are two methods that can be used to stop the engine if the shutoff switch kit is not installed:

1. The throttle stop screw should be turned to a point where it is inoperative. This will allow the magnets to be retarded to a point where either the output is no longer high enough to sustain magnetization or the idle stop switch on the magneto stops the engine.
2. The throttle stop screw can be adjusted to maintain a set idle speed with the throttle fully retarded (see "Throttle Stop"). If this method is used it will be necessary to "choke" the engine to stop.

STARTING PROCEDURE

35 and 50 H.P. Electric Start Models

CONNECTING BATTERY

Extreme caution must be exercised when connecting the battery cables to the battery. **THE RED CABLE MUST BE CONNECTED TO THE (+) POSITIVE TERMINAL OF THE BATTERY, AND THE BLACK TO THE (-) NEGATIVE TERMINAL.** Failure to connect the battery cables correctly will result

in serious damage to the electrical system of the engine.

NOTE: A 12 Volt battery with a minimum rating of 50 Amp. Hrs. is recommended to insure instant starting and long starter motor life.

IMPORTANT

When making dual engine installations of electric start models, it is absolutely necessary that engines with the same Ground Polarity be used. An installation of one Positive Ground and one Negative Ground engine **CAN NOT** be made.

Consult your Authorized Service Facility for additional information.

BATTERY CARE

The battery is actually the "heart" of your new engine in that without it, your engine will not start. Therefore, it is important that it be maintained at a good & full charge rate at all times.

The battery should be periodically inspected and recharged according to the battery manufacturer's specifications.

IMPORTANT: Keep battery cells filled to level indicated. Never charge a battery without checking water level.

For best battery performance make sure battery connections are **CLEAN** and **TIGHT**.

ELECTRIC STARTER

The electric starter used is a light weight, high output motor which requires a certain amount of special attention and care. If operated incorrectly failure and expensive repairs can be expected.

NEVER operate the starter motor for a continuous period of more than 15 seconds before allowing intermittent cooling periods of not less than three (3) minutes. If the engine fails to start, check the Trouble Check List and the steps outlined under Starting Procedure.

IGNITION SWITCH

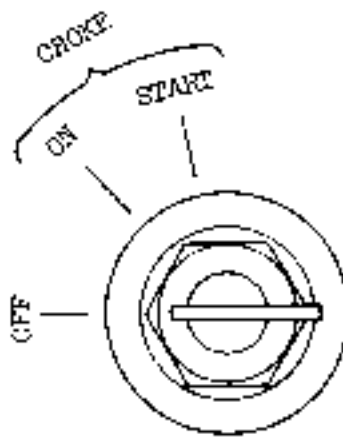
Your electric start engine is equipped with a four position ignition switch: **START, CHOKE, ON AND OFF.**

START Turn key to extreme right until it stops.

ON Turn key to right one notch.

OFF Turn key to extreme left until it stops.

CHOKE The Choke position of the switch can be utilized in either the "ON" or "START" positions. Simply depress or push key into barrel of switch in either position. As long as the key is depressed, choking will continue. When it is released, choking stops.



STARTING PROCEDURE — 35 and 50 H.P. Electric Start Models

1. Make sure that the fuel tank has a sufficient amount of properly mixed fuel and that the vent screw located on the fuel tank filler cap or gauge is open.
2. Connect the fuel tank to the engine by engaging the fuel line coupling with the bushing on the fuel tank. Push back the lock ring and push the coupling onto the bushing. Release the lock ring. It should snap back into place. Check coupling to make sure that it is secure.
3. Route the fuel supply line through the center-startward compartment in the control panel. Slide a fuel line clamp over end of fuel line and attach fuel line to fitting on fuel pump on starboard side of power head. Slide fuel line clamp up on fuel line to prevent fuel line from detaching during operation.
4. Squeeze the prime bulb in the fuel line several times to pump fuel from the fuel tank to the engine. Continue to squeeze until prime bulb becomes firm.
5. Place the remote control unit in the "START" position as outlined in the following sections.
6. Engage the electric starter motor by turning the ignition key all the way to the right. For a cold engine, choke engine at the same time by pushing the key into the barrel of the switch.
7. After engine has started, release the key and allow it to return to the "N" position. If engine pops and begins to stall, choke engine again by pushing key into barrel of the switch. Continue the choking operation until engine is thoroughly warmed up.

NOTE: The starter motor will not engage unless the engine is in "NEUTRAL" gear. A neutral interlock switch prevents the starter from engaging while in "FORWARD" or "REVERSE" gear.

8. After engine has warmed up, return remote controls to the "NEUTRAL" position and proceed as outlined on following pages.

TO STOP

1. Return remote control unit to "Neutral" position.
2. Turn ignition key to the "OFF" position all the way to the left.

STARTING A WARM ENGINE — All Models

Proceed as above but do not choke. If the engine fails to fire after several attempts, then use the choke.

ENGINE FLOODING — All Models

Flooding, a condition where the fuel-air mixture is too rich for combustion, usually occurs only when a warm engine is over-choked or cranked with the throttle setting reduced below the "START" position. Generally, a cold engine that has not fired is not flooded. If engine is flooded, open choke, advance throttle control to the start position and continue cranking until it fires. (Observe caution for electric starter motors.)

OPERATION WITH SYNCHRO-DRIVE SINGLE LEVER REMOTE CONTROLS (For Use On All \diamond Through 50 H.P. Models)

The Synchro-Drive Single Lever remote control provides simplicity and ease of operation. Both the shift and throttle control are combined into a single operating lever.

The Synchro Drive remote control is available for both Right and Left hand mounting. Order control Model 163 for Right Hand Mounting and Model 163 for Left Hand Mounting.

STARTING

To start engines equipped with Synchro-Drive, Single Lever Controls, proceed as follows:

1. Pull out "Neutral Throttle Knob." This inactivates the gear shift mechanism and allows the engine speed to be increased for neutral warm-up and starting.
2. Hold 9.2 HF. Models — Advance remote control lever until the word "START" on the "at engine" lever is in line with the lever. Push up with the arrow on the steering handle. Mark R line on the control box to indicate this position for future use. **DO NOT ADVANCE ENGINE SPEED BEYOND THIS POINT WHEN IN NEUTRAL GEAR.**



FORWARD

With Neutral throttle knob pushed in, move control lever forward.

REVERSE

With Neutral throttle knob pushed in, move control lever back.

15, 35 and 50 H.P. Models — Advance remote control lever until it stops.

3. Start engine as outlined under "STARTING PROCEDURE."
4. After engine has warmed up, move control lever to "NEUTRAL" position and push in neutral throttle knob.
5. Move the control lever ahead for "FORWARD" and pull back for "REVERSE" operation.

CAUTION: To avoid damaging the shifting mechanism and shoe pin, always shift with a quick snapping action — never "ease" engine into gear.

TO STOP

Return control lever to "NEUTRAL" position, turn ignition key to "OFF" position, depress (push) starting switch button. If your engine is not equipped with an ignition switch, or an ignition starting switch, "CHOKE" the engine until it stops.

NEUTRAL

Control Lever straight up and down Neutral throttle knob pushed in.

IMPORTANT

Adjust the throttle stop as outlined on the following pages to establish the correct idle speed.



CAUTION: Excessive ease when operating in reverse at too high a speed may cause water to be taken into the boat over the transom.

OPERATION OF TWO LEVER REMOTE CONTROLS (Used On 6 Through 50 H.P. Models)

STARTING

1. Place shift lever in "NEUTRAL" position.

2. 6 and 9.2 H.P. Models: Advance throttle control lever until the word "START" on the "ICE ENGINE" twist grip throttle control lines up with the arrow on the steering handle. Mark a line on the control box to indicate this position for future use. **DO NOT ADVANCE ENGINE SPEED BEYOND THIS POINT WHEN IN NEUTRAL GEAR.**

3. 15, 35 and 50 H.P. Models: Advance throttle lever until it stops. **NOTE:** The throttle lever may move only a slight amount but this will be more than adequate to obtain the correct starting speed.

3. Start engine as outlined under "STARTING PROCEDURE."

4. After engine has warmed up retard throttle to "SEMI" position.

5. To go forward — snap the gear shift lever all the way forward with a quick snapping action and advance throttle lever.

6. To go in reverse — pull shift lever all the way in the rear with a quick snapping action and advance throttle.



NEUTRAL
Gear shift lever straight up and down—throttle lever at idle position.



FORWARD
Gear shift lever all the way forward—throttle lever forward.



REVERSE
Gear shift lever all the way back—throttle lever forward.

CAUTION: Eyes—also face when operating in reverse as too much speed may cause water to be taken into the boat over the transom.

CAUTION: To avoid damaging the shifting mechanism and shear pin shaft with a quick snapping into reverse, never "yank" engine into gear.

- NEVER SHIFT WITH THROTTLE ABOVE A FAST IDLE.
- NEVER START ENGINE IN GEAR.

TO STOP

1. Retard throttle lever to "SHIFT" position.
2. Move shift lever to "NEUTRAL" position.
3. Turn ignition key to "OFF" position or depress the ignition starting switch button.

NOTE: On 1 and 9.2, 15 and 25 HP models (two models not equipped with the ignition starting switch, there are two methods that can be used to stop the engine.

1. 8.2 and 35 HP Models. The throttle stop screw should be turned to a point where it is inoperative. This will allow the throttle to be retarded to a point where the output is no longer high enough to sustain engine operation.

2. 15 HP Models. Turn the throttle stop screw "up" so that there is clearance between the top of the stop screw and the lower surface of the mounting bracket. This will allow the throttle to be retarded to a point where the ignition starting switch in the magneto shuts off the engine.

2. The throttle stop screw can be adjusted to maintain a set idle speed with the throttle fully extended (see "Throttle Stop"). If this method is used it will be necessary to "choke" the engine to stop.

THROTTLE STOP 6 and 9.2 H.P. Remote Control Models



Your engine, when equipped with remote controls, incorporates the use of a throttle stop which can be adjusted to establish the correct idle speed.

When using single lever remote controls, turn the throttle stop screw in or out as required to obtain an idling speed of 600-800 R.P.M. when in "Neutral". Gear and approximate R.P.M. are: "Forward" or "Reverse" gear, 1000 R.P.M.

When using Two-Lever Remote Controls, refer to section "TO STOP" under "OPERATION WITH TWO LEVER REMOTE CONTROLS."

THROTTLE STOP 13 H.P. Models

When operating your engine with single lever remote controls, the throttle stop must be adjusted to establish the correct idle speed (800 to 1,000 R.P.M.).

TO ADJUST

1. Place control lever in "NEUTRAL."
2. Turn the throttle stop screw "down" (clockwise), to increase the idle speed. Turn the throttle stop screw "up" (counter clockwise), to decrease the idle speed.

If you are not using remote controls, the throttle stop screw should be turned up so that there is 5/16" clearance between the top box portion of the throttle stop screw and the lower surface of the mounting bracket.

NOTE: When using two lever remote controls refer to section "To Stop" as listed under "Operation of Two Lever Remote Controls."

THROTTLE STOP 35 and 50 H.P. Models

Your engine is equipped with a throttle stop which can be adjusted to establish the correct idle speed. It is located on the Throttle Tower Shaft. See illustration on this page.

The throttle stop should be adjusted for an idling speed of approximately 700 to 800 R.P.M. when in "FORWARD" or "REVERSE" gear and from 400 to 500 R.P.M. when in "NEUTRAL" gear. To increase the idle speed, loosen the nut and turn the throttle stop screw "in." After decreasing idle speed turn the throttle stop screw "out." After adjusting, tighten lock nut securely.

When using Two-Lever Remote Controls, refer to section "TO STOP" under "OPERATION WITH TWO LEVER REMOTE CONTROLS."

COOLING / 3.5 H.P. Models

This is an air-cooled engine which dissipates engine heat to the air through cooling fins on the cylinder and on the exhaust portion of the engine leg. A fan incorporated on the flywheel blows an air stream over these fins to accelerate cooling.

A cooling tube that picks up water from the slipstream below the anti-cavitation plate circulates water up into the exhaust portion of the engine leg to cool the aluminum leg and lower exhaust portion of the cylinder.

• CAUTION: NEVER RUN YOUR ENGINE OUT OF WATER.

COOLING / 6 Through 50 H.P. Models

Your engine is water cooled by a water pump which acts as a displacement pump at low engine speeds and as a centrifugal pump at high engine speeds. The pump is located in the lower engine leg. CAUTION: The water pump has a rubber impeller which can be damaged by operation in excessively salty or sandy water.



Cooling water is picked up on the underside of the anti-cavitation plate just ahead of the propeller and is discharged after circulation through the power head, along with the exhaust gases.

- **CAUTION: NEVER RUN YOUR ENGINE OUT OF WATER.**

CHECKING WATER PUMP OPERATION

6 and 9.2 H.P. Models

Normal operation of the water pump is indicated by a spray of water issuing from the idle exhaust relief port located on the back of the engine leg. However, when running the engine at wide open throttle, little or no water at all will be visible. Water MUST clearly be visible at all other operating speeds. If, when operating at speeds below wide open throttle, this spray is not evident, STOP ENGINE IMMEDIATELY. Check cooling water intake passages on underside of anti-cavitation plate located just ahead of the propeller to make sure weeds or other foreign materials are not blocking the passages. If trouble persists contact your Authorized Viking Service Facility immediately. Operation of the motor with insufficient cooling water will result in severe internal damage due to overheating if not immediately corrected.

CHECKING WATER PUMP OPERATION

15 Through 50 H.P. Models

Normal operation of the water pump is indicated by a spray of water issuing from the idle exhaust relief port located on the back of the motor leg. If at any time during operation this spray is not evident STOP ENGINE IMMEDIATELY. Check cooling water intake passages on underside of anti-cavitation plate located just ahead of the propeller to make sure weeds or other foreign materials are not blocking the passages. If trouble persists, contact your Authorized Viking Service Facility immediately. Operation of the engine with insufficient cooling water will result in severe internal damage due to overheating if not immediately corrected.

THERMOSTAT

35 and 50 H.P. Models

Your engine is equipped with a thermostat that controls the temperature of the cooling water. This temperature control pro-

vides good idling characteristics and complete combustion of the fuel charge. The thermostat MUST NOT be removed for any reason.

ENGINE OVERHEAT INDICATOR

An Engine Overheat Indicator, Model 562, is available for 35 and 50 H.P. models. Contact your Authorized Viking Service Facility for more information.

EMERGENCY STARTING

3-5 H.P. Models

A starter roller has been provided on the flywheel which may be used to start the engine if the automatic rewind starter does not work.

To start, remove the starter assembly and wrap a rope or cord around the starter collar. Then follow normal starting procedure.

REMOVING STARTER ASSEMBLY

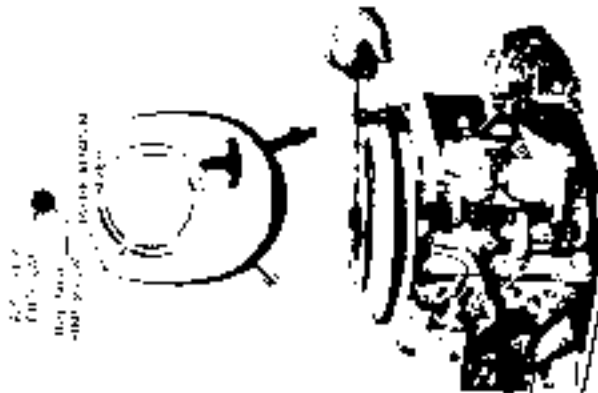
Remove the three screws which attach the starter assembly to the fuel tank and lift off starter.

EMERGENCY STARTING

6 Through 50 H.P. Models

A starter collar has been provided on the flywheel which may be used to start the engine if the regular starter does not work.

To start, remove the engine cover and wrap a rope around the starter collar. Then follow normal starting procedure.



SERVICING ENGINE

REMOVING COVER

6 Through 50 H.P. Models

To remove the engine cover, turn the Cover Release Lever located under the front carrying handle. Remove clockwise one half turn. Lift cover up and off.

ADJUSTING CARBURETOR

If engine is not performing correctly, check for other causes of trouble before readjusting carburetor. However, a change in temperature, humidity or barometric change may make carburetor adjustments necessary.

3.5 H.P. Models

The carburetor has two adjustment needles. The idle or low speed needle is accessible with a screwdriver through the hole in the lower section of the fuel tank skirt. Adjust by turning the low speed adjustment knob.

The high speed adjustment knob is located on the face of the control panel.



INITIAL SETTING

If the carburetor is set for out of adjustment thru the engine with not start, make an approximate setting. Turn the high speed adjustment knob on the face of the control panel all the way to the left (start position). Turn the idle adjustment needle

in clockwise until it seats lightly. **DO NOT OVERTIGHTEN AS NEEDLE AND SEAT MAY BE DAMAGED.** Back the screw out one full turn. The engine will start at this setting but the mixture may be too rich for normal operation.

FINAL ADJUSTMENT

1. Start engine and run until warmed up.
2. Advance throttle to wide open position.
3. Turn high-speed knob to the left (start position). With engine idling, adjust the high speed needle to the right (lean position) until engine fires evenly and picks up speed. Continue to turn to lean position until engine slows down or "stalls" because of too lean a mixture. Set adjuster on knob halfway between these two points. This will allow the adjustment knob in the "trim" range on the control panel.
4. Retard throttle to idle position and adjust low speed needle in the same manner. Do not turn out more than necessary to obtain smooth idling. It is better to have the idle setting a little rich rather than too lean.

ADJUSTING CARBURETOR

6 and 9.2 H.P. Models

The carburetor has two adjustment needles as illustrated. The top needle is the low speed or idle adjustment. The bottom needle is the high speed adjustment.



INITIAL SETTING

NOTE: BE SURE TO MAKE THE ADJUSTMENTS AS LISTED BELOW WHEN TUNING YOUR ENGINE FOR THE FIRST TIME.

IDLE ADJUSTMENT

Position the idle adjustment knob (starboard leech) on the face of the control panel so that it is engaged within the travel limits. The idle adjustment screw set the mixture for best speed at the factory so that only fine adjustments will be necessary.

HIGH SPEED ADJUSTMENT

Turn high speed adjustment screw on carburetor (port) side, also turn screws behind IDLE MIXTURE DIALS. AS NEAR FULL SPEED AS POSSIBLE, TURN THE HIGH SPEED SCREW OUT 1/8 TURN. The engine will start at this setting but mixture may be too rich for normal operation.

FINAL ADJUSTMENT

1. Start engine and run until warmed up.
2. Shift engine to "Forward" and advance the prop to wide-open position.
3. Turn high speed adjustment screw clockwise (decrease) about 1/4 turn, lower power and bring up "idle" or "idle" dial to set speed to 2700 RPM. Turn screws until the screws lock up with clockwise until cylinder and engine ticks up speed. Continue turning clockwise until engine slows down at "idle" because of the lean mixture. Set adjustment screw halfway between these two points. Turn the "idle" adjustment knob in the port of panel as necessary to obtain slightly greater idling. It is better to have the idle setting a little rich rather than too lean.
4. Forward throttle and shift engine to "Neutral." Turn the idle adjustment knob in the port of panel as necessary to obtain slightly greater idling. It is better to have the idle setting a little rich rather than too lean. If any other engine or adjustments are necessary, make a year Authorized Viking Service Facility call.

ADJUSTING CARBURETOR

15 Through 50 H.P. Models

The carburetor used has two separate fuel systems; a high speed system which governs the throttle in Neutral in 1 through 4 and a low speed system which governs the mixture at idle speeds. The high speed system is equipped with the factory with a float on top, accessible for when the float not be checked or altered except by an authorized Viking agent.

NOTE: Replenishment high speed jets by high speed jets are available. Carburetor year Authorized Viking Service Facility.

The low speed of idle system is controlled by an adjustable needle located at the top of the carburetor and can be adjusted as follows:

INITIAL SETTING

If the carburetor is out of adjustment in the port that the engine will not start, any speed that out by making an approach to idle setting. Turn the idle adjustment needle to "idle" or "idle" dial. It will be like the IDLE MIXTURE DIALS. AS NEAR FULL SPEED AS POSSIBLE, TURN THE IDLE SCREW OUT 1/8 TURN. The engine will start at this setting but the mixture may be too rich for normal operation.

FINAL ADJUSTMENT

Make the final carburetor adjustment as follows:

1. Start engine and run until warmed up.
2. Set controls in "NEUTRAL" position.
3. Turn the idle adjustment needle clockwise (decrease) until the engine ticks power and brings to "idle" or "idle" dial. Turn the idle adjustment screw slowly until the needle ticks up with clockwise until cylinder and engine ticks up speed. Continue turning clockwise until engine slows down at "idle" because of the lean mixture. Set adjustment screw halfway between these two points.
4. Forward throttle and shift engine to obtain slightly greater idling. It is better to have the idle setting a little rich rather than too lean.

SERVICING SPARK PLUGS

After starting, paying attention to position, or lack of power and signs of depletion, frequently replaced, insufficiently tightened or wrong type spark plugs. A frequent engine performance indicates that the spark plugs are in need of attention. Use the Check List procedure as follows:

1. Remove engine cover.
2. Disconnect spark plug leads (remove slightly clockwise and pull off).
3. Remove spark plug. Turn and inspect. If the tip of the insulator is fouled, cracked, broken, blistered, or if the electrode is burned away so that cannot be gapped at .000", then replace with new plugs.

The Correct Replacement Spark Plug Is As Follows:

3.5 H.P.	Champion DSJ
6 H.P.	Champion H10M
9.2 H.P.	Champion J44
15 H.P.	Champion E93
25 H.P.	Champion H11
50 H.P.	AC ACCORAK

4. Be sure to check the condition of the spark plug gaskets and clean the spark plug seats in the cylinder before re-installing spark plugs.
5. Install plugs in cylinder head. Turn spark plugs in until finger tight on the gasket, and then tighten with a wrench. The correct torque is .20-180 inch pounds for all models.
6. Install spark plug lead wires. The strapping inside the rubber terminal lead cover must be positioned to fit properly over spark plug terminal.

NOTE: On 15 H.P. models position spark plug lead wires so that the top lead wire is pointing "down" and the bottom lead wire is pointing "up."



SERVICING FUEL FILTERS

Fuel Strainer Bowl Screen 3.5 H.P. Models

Close the fuel tank shut-off valve and then unscrew retainer nut located below the fuel strainer bowl on the starboard and remove the bowl and wire screen. Screen may be cleaned by rinsing in clean gasoline. **CAUTION:** When cleaning strainer, exercise care so the strainer and bowl are not dropped overboard.

FUEL TANK FILTER — All 6 Through 50 H.P. Models



Remove the fuel supply line from the elbow on fuel tank and unscrew fuel tank adapter to remove the fuel pickup tube. The filter, a fine wire mesh screen, attached to the end of the pickup tube can be cleaned by rinsing in clean gasoline.

FUEL PUMP FILTER — 6 Through 13 H.P. Models

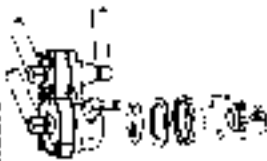
1. Remove engine cover.
2. Remove the fuel pump filter from the right side of the fuel pump located on the starboard side of the power head.
3. The filter, a fine wire mesh, can be cleaned by rinsing in clean gasoline.



FUEL PUMP FILTER BOWL SCREEN —

3.5 and 50 H.P. Models

Unscrew the retainer nut located below the sediment bowl on the fuel pump and remove the bowl and filter screen. The screen may be cleaned by rinsing in clean gasoline.



REPLACING SHEAR PIN

To prevent accidental starting put engine in neutral or disconnect spark plug wires.

1. Remove retainer pin from propeller shaft nut and remove nut and seal.

2. On 3.5 through 15 H.P. models, pull propeller from shaft to gain access to the shear pin. If the propeller is "frozen" to the shaft, a light tap with a block of wood will loosen it. On 35 and 50 H.P. models, the shear pin is located in the hub on the back of the propeller.

3. Remove damaged or broken shear pin. Drive out with new pin if necessary.

4. Install new shear pin and reassemble propeller seal, propeller shaft nut, and water pin.

LUBRICATING LOWER GEAR HOUSING

The grease in the lower gear housing should be checked after every 100 thirty hours of operation and refilled every 100 hours or at least once each season with a Non-Detergent Leaded Outboard Gear Oil (LGO), such as Texaco Outboard Gear Oil - T2500 or equivalent. DO NOT USE A CHLOROSULFONATED HYDROCARBON OIL UNDER ANY CIRCUMSTANCES.

TO DRAIN

With engine in an upright position, remove both the upper and lower plug screws and allow grease to drain completely.

TO REFILL

1. When all water and diluted grease has drained, insert nozzle of gear lubricant into lower screw hole.

2. Add lubricant until it appears at the top hole.

3. Reinstall top plug screw and washer.

4. Reinstall lower plug screw and washer. Tighten securely.

5. Allow engine to stand in an upright position for at least one-half (1/2) hour to permit the gear lubricant to completely fill all cavities in gear housing.

6. Remove top plug screw and washer and recheck gear lubricant level. Add grease as outlined below if necessary, to bring lubricant level up to top hole. Reinstall top screw and washer, tighten securely.

TO ADD GREASE

1. Remove lower plug screw and washer and insert nozzle of gear lubricant into lower screw hole. 4

2. Remove upper plug screw and washer.

3. Add lubricant until it appears at the upper hole.

4. Reinstall the upper plug screw and washer and tighten securely.

5. Reinstall the lower plug screw and washer and tighten securely.

STERN BRACKETS, STARTER DRIVE GEARS AND CONTROL LINKAGE

Lubricate all moving parts and control linkage with SAE No. 30 oil twice each season or after 100 hours required.

GREASE FITTINGS

Grease fittings are provided at critical points where bearing surfaces are not exposed externally. Using an automotive type grease gun and lubricant grease twice each season or after 100 hours required.

CARE AFTER OPERATION IN SALT WATER

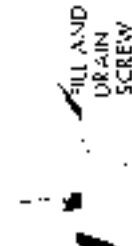
All engine parts that contact the water have been chemically treated to resist salt water corrosion. However, you should take some special precautions after turning your engine in salt water.

1. Always fill the engine fuel tank with water when not in use. (See Note 2 on "Operation In Freezing Temperatures").

2. Run engine in fresh water to flush out salt deposits.

3. Wash engine down with fresh water and periodically apply an automotive type wax to protect the finish.

4. Periodically remove the propeller and grease the propeller shaft.



OPERATION IN FREEZING TEMPERATURES

When operating the engine in freezing or near freezing temperatures, keep the lower unit submerged in the water. If the engine is tilted out of the water, water remaining in the cooling system on the lower unit may freeze and cause the related parts to rupture. If there is a chance of ice forming on the water, the engine should be removed from the water and drained completely. Any water left in the cooling system or lower unit may freeze and rupture the associated parts.

SUBMERGED ENGINE — FRESH WATER

If the engine is removed within a short time after being submerged try to start it as outlined below.

1. Remove spark plugs. With spark plug being facing down, turn engine over several times with hand starter to expel all water. Any cranks and pulleys with bearings to expel all water. Turn over repeatedly every 15 to 20 seconds. TAKE IT TO YOUR AUTHORIZED VIKING SERVICE FACILITY IMMEDIATELY. If it is not possible to have the engine serviced, immediately after submerging, the lower unit should be submerged in clean fresh water to prevent rust or corrosion until it can be serviced.
2. If fuel pump was submerged, drain all fuel from tank and flush with fresh fuel until all water is removed.
3. Oil and in-lub spark plugs.
4. Drain fuel lines and carburetor. Flush with fresh fuel until all water is removed.
5. Try starting 1/4 to 1/2 hour fresh fuel mixture. If engine starts, run for at least an hour or until all parts are thoroughly warmed up and all water is expel and then run at cruising speeds. If engine does not start or to a poor start, TAKE IT TO YOUR AUTHORIZED VIKING SERVICE FACILITY IMMEDIATELY.

SUBMERGED ENGINE — SALT WATER

Do not attempt to start an engine that has been submerged in salt water regardless of the length of time it is submerged. Perform

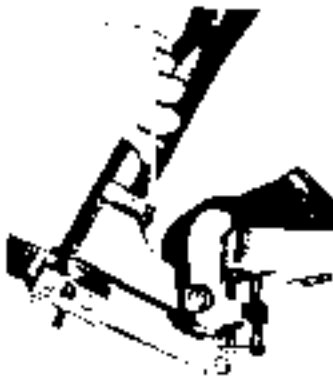
steps as listed below and TAKE IT DIRECTLY TO YOUR AUTHORIZED VIKING SERVICE FACILITY.

1. Remove spark plugs. With spark plug being facing down, turn engine over several times with hand starter to expel all water from the crankcase and cylinder.
2. Perform steps 2, 3 and 4 as listed under "Submerged Engine — Fresh Water". If it is not possible to have the engine serviced immediately after submerging, the powerhead should be submerged in clean, fresh water to prevent rust, oxidation or salt accumulation until it can be serviced.

ADJUSTING STEERING FRICTION

3.5 H.P. Models

Steering friction on 3.5 H.P. models is controlled through a reaction clamp and springs attached to the lower bracket. Adjust as desired by tightening or loosening hex nut indicated in Illustration.



ADJUSTING STEERING FRICTION

6 and 9.2 H.P. Models

Steering friction on 6 and 9.2 H.P. models is controlled through two set screws in the top rear action part of the steering bracket. Adjust as desired by tightening or loosening screws in location indicated in Illustration.



ADJUSTING STEERING FRICTION

15 H.P. Models

Steering friction on 15 H.P. Models is controlled by a friction plate attached to the swivel bracket. Adjusted as shown in illustration to obtain steering friction desired. Note: The power head is removed for illustrative purposes only and is not necessary for making the friction adjustment.



ADJUSTING STEERING FRICTION

35 and 50 H.P. Models

STEERING friction on 35 and 50 H.P. Models is controlled by a friction screw in the top-stacked side of the swivel bracket. Adjust as desired by tightening or loosening screw indicated in illustration.



REMOVING ENGINE FROM BOAT

To remove the engine from the boat, simply reverse the installation procedure (CAUTION: When removing the engine from the boat, maintain proper support to prevent sagging. Do not use a saw until all water has drained from the engine leg. Do not transport or store engine in a position where the lower unit is elevated above the powerhead, as water may drip into the powerhead through the exhaust ports and cause extensive damage.

NOTE When re-installing electric start models, make sure that the battery cables are connected properly. **RED CABLE TO THE POSITIVE (+) TERMINAL AND THE BLACK CABLE TO THE NEGATIVE (-) TERMINAL OF THE BATTERY.**

PROLONGED STORAGE

Before storing your engine for prolonged periods, it must be protected against rust and possible damage from freezing temperatures.

To Prepare Engine for Storage

1. If the engine has been operated in salt water, it is a good idea to flush out the cooling system with fresh water prior to storage. To do this run the test in a body of fresh water or to submerge the engine from the boat and run in a test tank.
2. Run the engine until it is thoroughly warmed-up. On 35 H.P. models, advance throttle control to the wide open position and close the engine until it stops.
3. For 5 through 30 H.P. models, when starting the engine for any period of time run the engine until it is thoroughly warmed-up. Then shut off the "Neutral" and allow engine to run in a test tank. Remove fuel line from fuel tank or on rim. Change a most persistent oil. Rapidly insert the oil into the carburetor at an intake for a period of ten (10) to twenty (20) seconds until the engine stops. The above procedures will coat the interior of the crankcase with a protective coating of oil.
4. When the oil has been removed from the water or test tank, and fuel line disconnected, turn the starter over several times to expel all water from the cooling system. Any water which is left in the cylinders may freeze and cause extensive damage.
5. Drain all fuel from lines and carburetor. On 35 H.P. models, also drain the fuel tank.

6. Remove spark plugs. Put an ounce or two of SAE 30 Engine Oil into each spark plug hole. Turn the engine over several times to distribute the oil. This will lubricate the pistons, rings and cylinder walls. Clean and re-gap spark plugs and re-install.
7. Drain all grease from lower gear housing as outlined under "Lubrication." Refill gear housing as outlined under "Lubricating Lower Gear Housing."
8. Lubricate all moving parts as outlined under "Lubrication"
9. Wipe engine down with a clean rag. Apply an automotive type wax to protect the finish and prevent rust or corrosion.
10. Remove the propeller and apply a coating of grease on propeller shaft Re-install propeller
11. Store engine in a dry, well ventilated area. Store in an upright position.

INSURE YOUR ENGINE

Many insurance companies offer protection contracts for your boat and outboard engine. In advance check your own equipment against damage, theft etc., as well as liability insurance for property damage and personal injury to others is available. It would be wise to contact your insurance agent for further information about adequate protection.

RECORD SERIAL NUMBER

For your convenience, blanks have been provided below to record your Engine Model Number, Serial Number, and Outboard Key Number. This information will be invaluable in case of loss or theft.

MODEL NO. _____

SERIAL NO. _____

OUTBOARD KEY NO. _____

TROUBLE CHECK LIST

Enter Deck Not Start
 Starts But Does Not Run
 Engine Starts
 Runs Not Idle
 Does Not Revolve (Full Power)

X	X	X	X	X	Remote Fuel Tank Not Connected
X	X	X	X	X	Battery Cables Not Connected
X	X	X	X	X	Battery Discharged
X	X	X	X	X	Remote Electric Cable Not Connected
X	X	X	X	X	Remote Controls in Need of Adjustment
X	X	X	X	X	Fuel Tank Empty
X	X	X	X	X	Fuel Shut-Off Valve Closed
X	X	X	X	X	Flooding Drain System Valve or Clogged
X	X	X	X	X	Fuel Line Kinked or Pinched
X	X	X	X	X	Fuel Filter Dirty or Clogged
X	X	X	X	X	Vent Screw Clacked obstructing Air Flow
X	X	X	X	X	Vent Screw on Fuel Tank Filler Cap Closed
X	X	X	X	X	Air Leak In Engine
X	X	X	X	X	Air Leak In Fuel System
X	X	X	X	X	Carburetor Passages Clogged or Dirty
X	X	X	X	X	Incorrect Fuel-Oil Mixture
X	X	X	X	X	Carburetor Out of Adjustment
X	X	X	X	X	Excess Flooding
X	X	X	X	X	Wrong Type Spark Plugs
X	X	X	X	X	Defective or Fouled Spark Plugs
X	X	X	X	X	Breaker Contact Points Out of Adjustment
X	X	X	X	X	Breaker Contact Points Burned or Pitted
X	X	X	X	X	Weak Ignition Coils
X	X	X	X	X	Weak or Defective Condenser
X	X	X	X	X	Spark Plug Lead Wires Interchanged
X	X	X	X	X	Frayed or Cracked Lead Wire Insulation
X	X	X	X	X	Disconnected, Grounded or Loose Wiring in Electrical System

* See Your Authorized Viking Outboard Service Facility