

1954

# Operating Instructions



Antique Boat Museum

**JOHNSON**  
**ELECTRIC STARTING**  
*Sea-Horse "25"*  
**(MODEL RDE)**

705  
3034

JOHNSON MOTORS • WAUKEGAN, ILLINOIS • U.S.A.

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### introduction

Your new Electric Starting Johnson Sea-Horse 25 is designed and constructed to give you the maximum in service and performance for a motor of its size—take full advantage of the qualities built into it by understanding the details of its operation.

You should **STUDY** this Instruction Book—not just read it or glance through it. When you have done so, then take a little extra time to gradually become familiar with the controls.

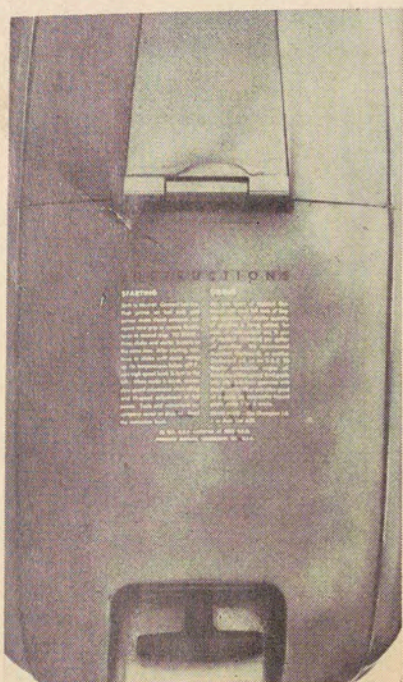
The Electric Starting Johnson Sea-Horse 25 (Model RDE) motor is powerful and fast, yet power and speed have not been stressed at the sacrifice of other necessary characteristics such as “hats off” acceleration and consistently slow speed.

If you will take good care of your Johnson motor, rest assured it will take good care of you.

JOHNSON MOTORS



**fuel mixture**



**Lubrication**

Since fuel vapors are first compressed in the crankcase of the engine, the most practical method of lubrication is by mixing the lubricating oil with the gasoline. Lubrication is obtained as the mixture of oil and gasoline enters the crankcase and is later transferred to the cylinders. Oil being less volatile than gasoline, a large portion of the oil in the fuel mixture remains in the crankcase to lubricate the bearings and other moving parts. The remainder enters the cylinder with the pre-compressed charge to aid in the lubrication of piston and piston rings.

*Oil:* We recommend Mobiloil Outboard or another outboard oil, or a regular SAE 30 grade automotive engine oil. Avoid use of low price third grade (ML) oils.

**NOTE:** Many first quality automotive engine oils are of the heavy duty type, indicating that they contain additives which are beneficial in minimizing ring-sticking and the formation of varnish and sludge deposits on pistons and engine interiors. Under certain conditions in two-cycle (outboard) engines, some additives may deposit excessive carbon on the spark plugs, thus causing missing or failure to fire the charge. Such deposits are not otherwise harmful to outboard engines, and proper amounts of suitable refinery-blended additives are beneficial because of their ability to maintain clean engine interiors; Mobiloil Outboard contains special, yet very effective, additives.

When changing from one oil to another because of spark plug difficulty caused by deposits, it is necessary to thoroughly clean the combustion chambers, ports and piston heads, as otherwise the existing deposits may continue to cause spark plug trouble.

*Gasoline:* Select a good quality of regular grade gasoline—where possible, premium grades, such as “ETHYL” gasoline should be avoided. “ETHYL” gasoline may shorten the life of the spark plugs.

Due to atmospheric conditions and temperature changes, moisture condensation is more or less continually taking place within

the gas tank. This results in water droplets accumulating in the tank, gas line and carburetor which, if excessive, is sufficient to interfere with performance of the motor, causing it to act, in many instances, as though it were starving for gasoline. (Water will not pass through the fine screens and small carburetor jets.) Be sure fuel system is free of moisture—likewise, all fuel should be run through a fine screen before pouring into gas tank. A funnel with screen installed serves this purpose nicely.

**CAUTION:** Benzol, which is sometimes used to blend with gasoline, is harmful to the motor—avoid use of such fuel.

**Mixing of oil and gasoline**

*Amount:* Mix one quart of Mobiloil Outboard to each full tank of regular gasoline. If smaller quantity of gasoline is being added, for ease of measurement mix one-half pint of Mobiloil Outboard to one gallon of gasoline.

*Procedure:* Pour into the fuel tank approximately one-half the amount of gasoline required. Add all the oil required. Shake the two together until they are thoroughly mixed. Add the balance of gasoline. Shake tank briskly to insure mixing.

Always use fresh gasoline and oil mixture.

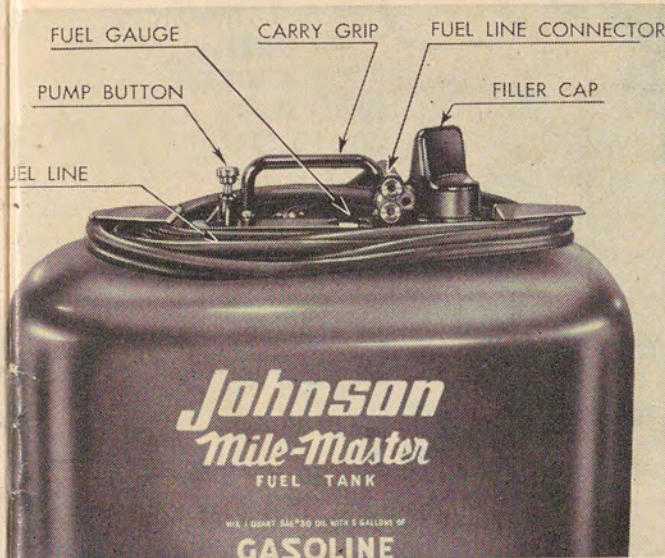


Figure 1

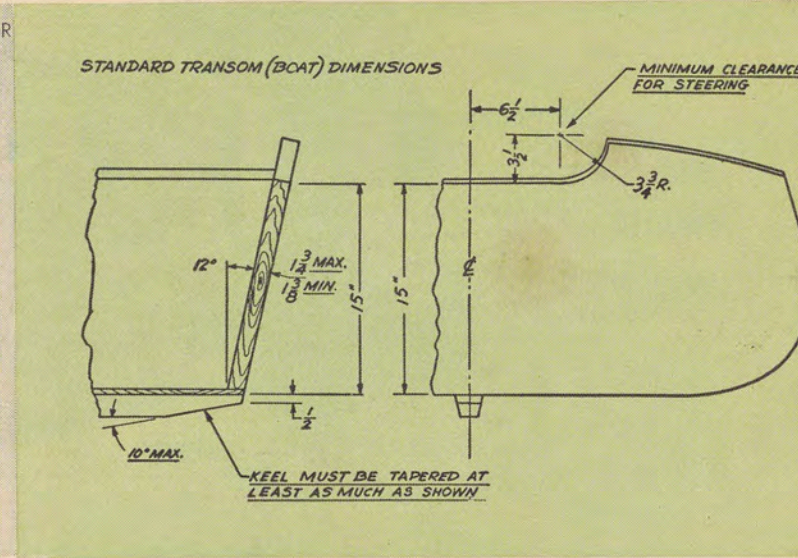
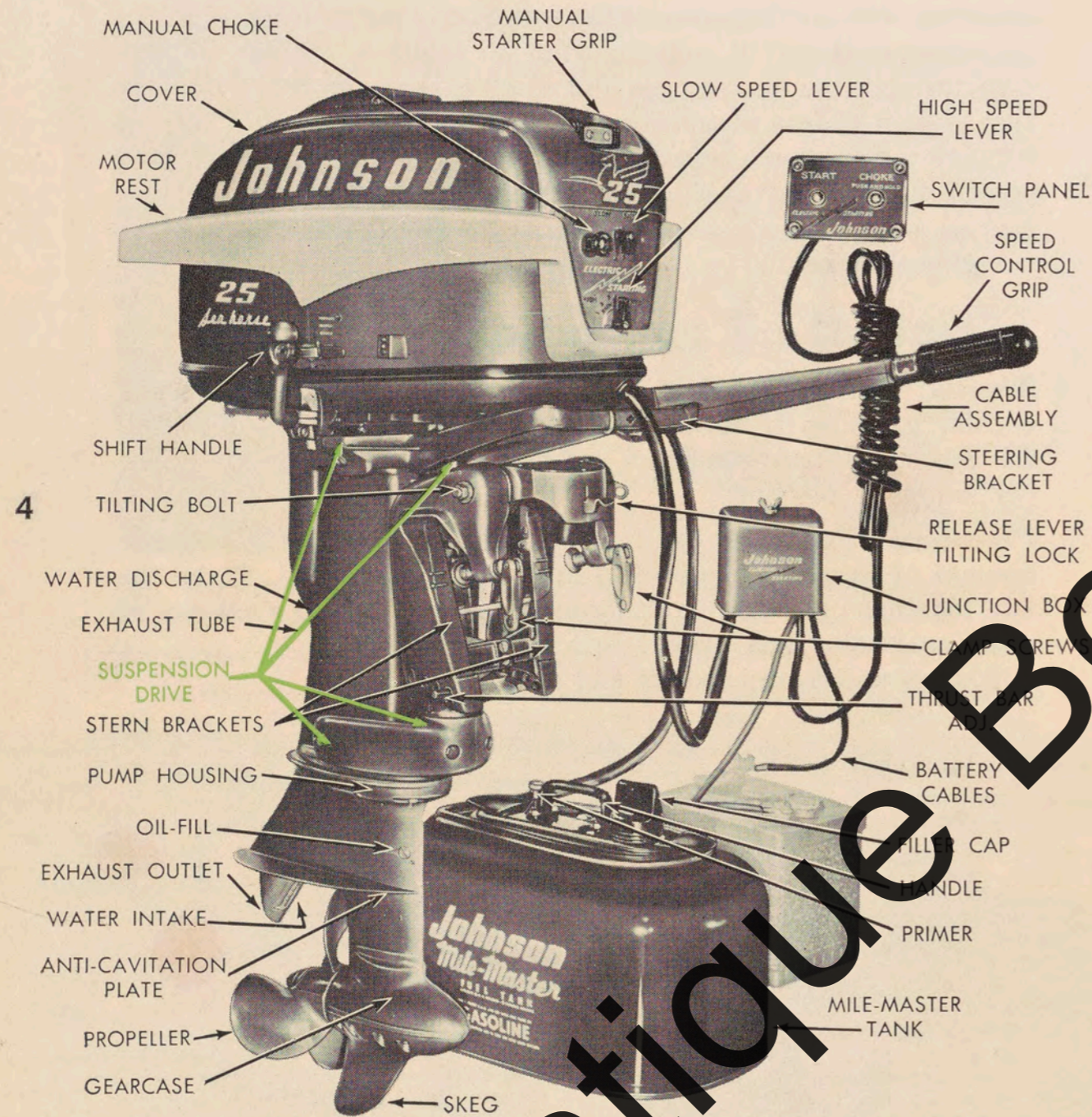


Figure 2



(MODEL RDE)

specification chart

POWER HEAD	Two Cycle—Alternate Firing Two Port—Automatic Intake
Bore and Stroke	2 7/8" x 2 3/4"
Number of Cylinders	2
O.B.C. Certified Brake H.P. at 4000 R.P.M.	25.0
Piston Displacement	35.7 Cu. In.
Weight	RDE—125 Lbs.* (App.) RDEL—127 Lbs.* (App.)
Length	RDE—47 15/32" RDEL—52 15/32"
Width	13 3/32"
Propeller Dia. Pitch	10 3/8" x 12 1/2" 3 Blade
Fuel Tank Capacity	6 Gals.
Starting	Electric and Ready Pull
Ignition	Magneto—Johnson
Make Carburetor	Johnson
Gear Ratio	12-21
Type of Exhaust	Underwater
Cooling System	Vari-Volume Water Pump
Steering	Pivot
Gear Shift Control	Neutral, Forward, Reverse
Stern Height (Max.)	RDE—15" RDEL—20"

JOHNSON MOTORS reserves the right to change weight, construction, materials or specifications without notice and without obligation.

\*Basic weight without Mile-Master Fuel Tank which weighs 13 pounds.

## installation on boat

### boat dimensions

Transom standards adopted by the boat building industry (through the OBC) are shown in Figure 2. To insure maximum performance, transom should be of correct height. Recommended transom (stern) vertical height for Model RDE is 15 inches.

If the transom is too high, "cavitation" will result to interfere with ultimate performance of the motor. This condition can be corrected by cutting the transom (stern) down to the proper height.

Interference from the keel is frequently the cause of propeller cavitation. It is advisable to taper the keel at the transom (stern) as illustrated (Figure 2).

- 6 In event the transom is too low, parts of the motor lower unit may drag in the water, causing a "rooster tail" to form behind the boat to affect over-all performance. This will result in some loss of speed and under extreme conditions, water may be caused to spray up against the bottom side of the motor. A condition of this nature is difficult to correct, as it is not practical to build the transom up in excess of  $\frac{1}{4}$  to  $\frac{1}{2}$  inch. The resulting built up section is rarely of sufficient strength to carry the motor load.

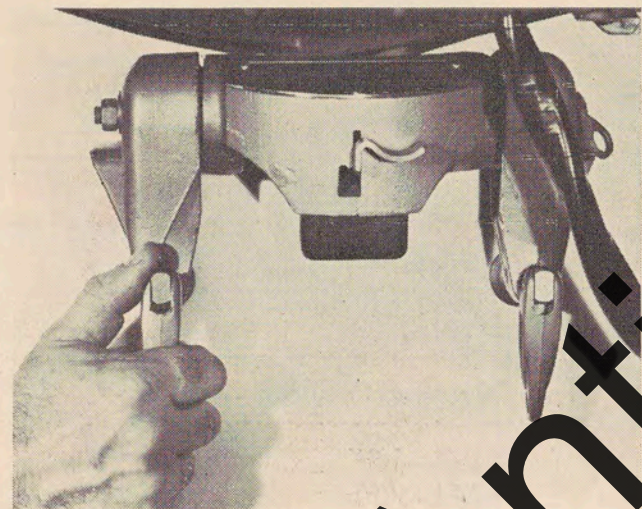


Figure 3

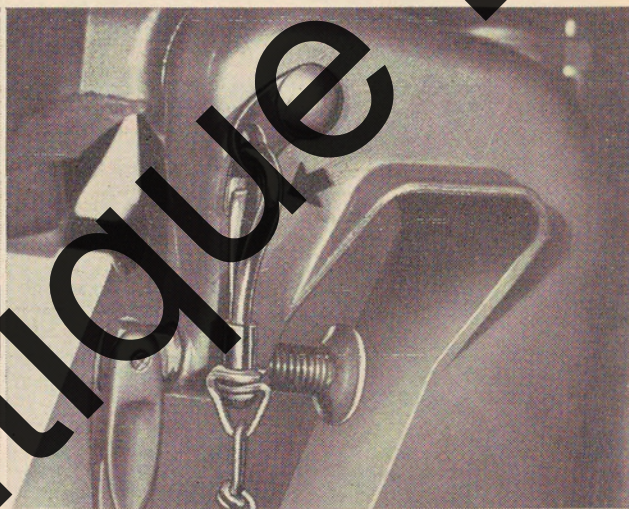


Figure 4

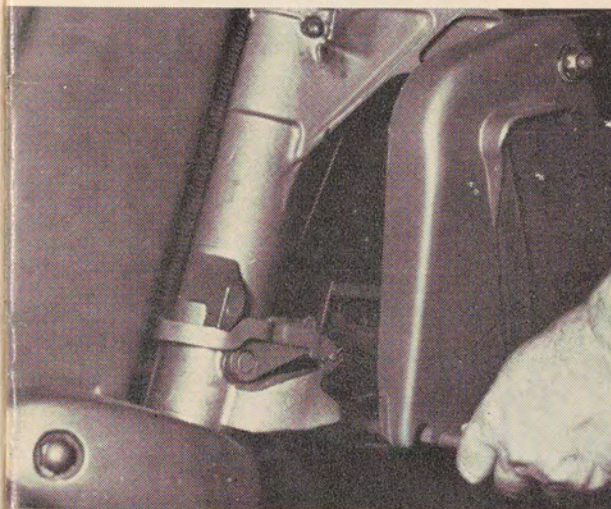


Figure 5

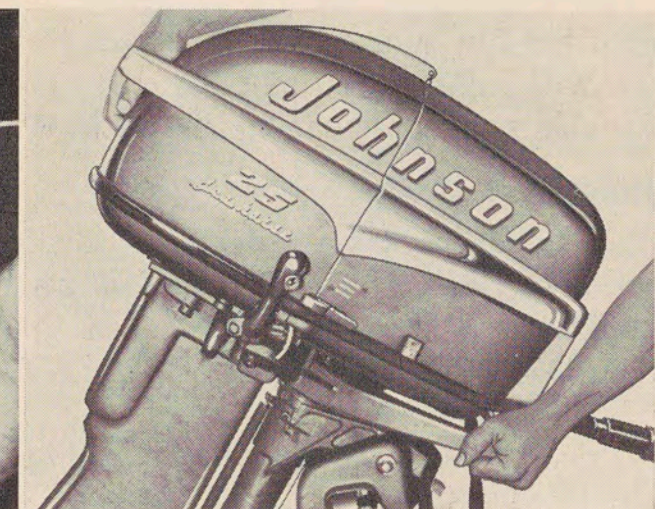


Figure 6

## securing motor to the boat

Tighten clamp screws *immediately* on placing the motor in position on transom of the boat to avoid possibility of loss overboard when starting and operating. Check periodically during operation of the motor to make certain the screws have not worked loose (Figure 3). Pay heed to this simple precaution.

### precaution

Note that a link has been provided for attaching a short length of rope, cable or chain to the motor for the purpose of anchoring to the boat, thus guarding against loss overboard in event the stern bracket clamp screws work loose (Figure 4). See your Johnson dealer for precautionary devices of this sort.

### angle adjustment

A simple means for adjusting the motor in a vertical position to make allowance for angle of the transom on the boat is provided, as shown (Figure 5). Transom (stern) angles vary somewhat; however, range of thrust bar adjustment is sufficient to accommodate angles usually encountered in most boats.

Note that four notches are cast into the quadrant of each stern bracket to permit proper thrust bar adjustment by simply bearing

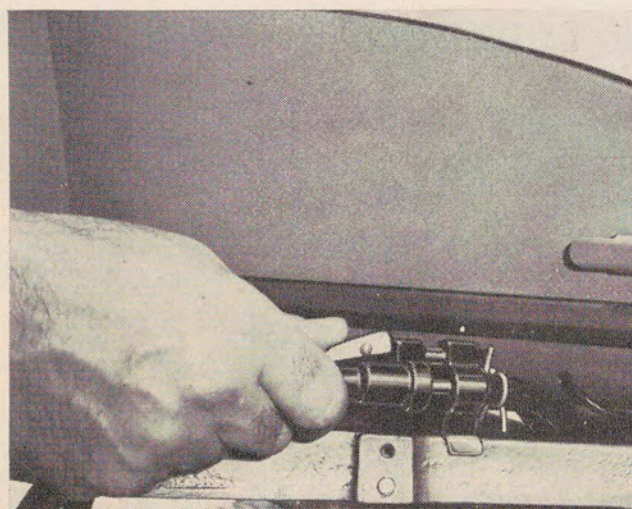


Figure 7

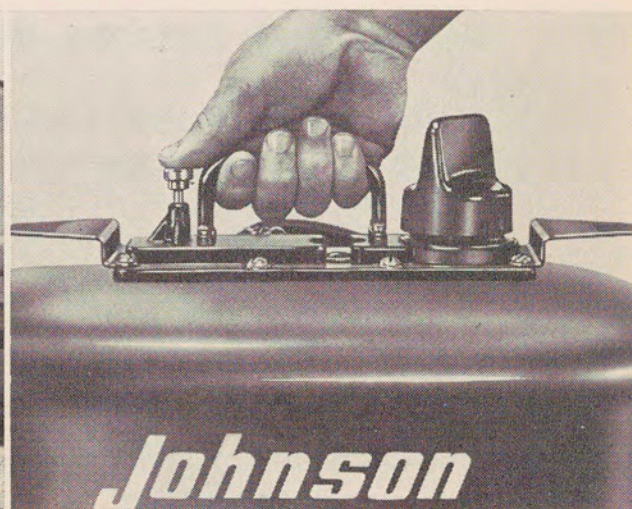


Figure 8

down on small lever against spring tension with thumb and fore-finger, then moving assembly (thrust bar) in or out as desired.

To accomplish this adjustment, (1) hang motor on transom of the boat, (2) release tilting lock (see tilting lock, page 22) tilt motor out far enough to set thrust bar in second notch (from transom), (3) tilt motor back against thrust bar—correct position for the motor is vertical to line of boat travel (boat laying level on water under normal loaded condition), (4) in event motor does not come to rest in a vertical position, move thrust bar to next notch as required.

The motor may have a tendency to pull or steer to one side if tilted too far in or out with respect to boat transom. Steering tension will balance and co-pilot only when the driveshaft bearing is adjusted perpendicular to line of boat travel.

**tilting of motor**

All Johnson motors are designed to tilt (while boat is in forward motion) when lower unit strikes an underwater object. Motor should be operated at slow speed in shallow waters. **DO NOT ATTEMPT TO TILT MOTOR BY BEARING DOWN ON STEERING HANDLE!**

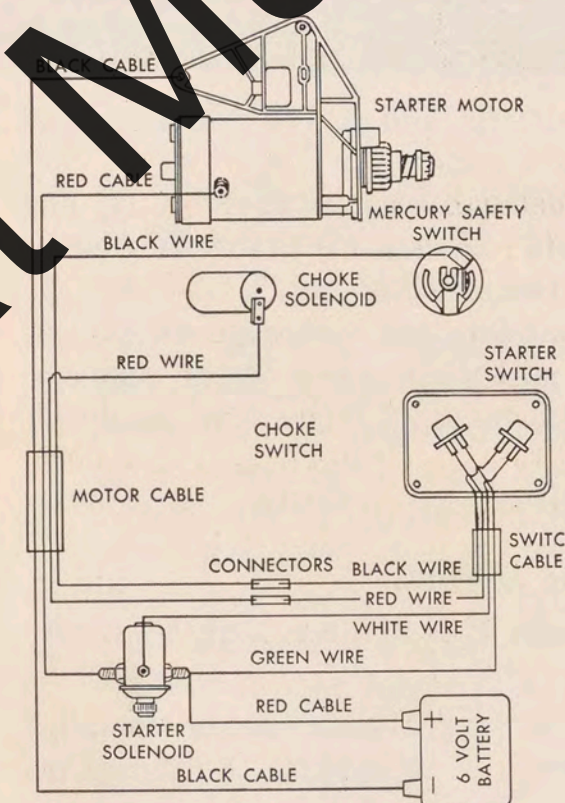
If desired to tilt motor when beaching, rowing in shallow water, etc., release tilting lock (Figure 25) and grasp rear of shroud (Figure 6) pull motor toward you.



**connecting fuel supply**

The Mile-Master Tank (Figure 1) should be placed in the boat at a convenient position near the operator. The fuel line may be strung out, allowing ample room for steering as the motor is pivoted from side to side. The fuel line connector can then readily be attached to the coupling on the motor provided for this purpose—simply compress small lever on the fitting and slide into position as shown (Figure 7).

**installation of electric starting**



All of the electric equipment, except the battery, is included with the Model RDE motor for a complete installation.

A 6 volt, 100 ampere-hour capacity storage battery may be procured through your Johnson Sea-Horse dealer or local automotive accessory store.

A schematic wiring diagram of the electric starting mechanism is shown here—however, for complete instructions regarding installation and wiring of this equipment see separate pamphlet provided with the Model RDE motor.

**operating instructions**

“Spark” and “throttle” are synchronized by a system of linkage to correctly proportion degree of spark advance with respect to volume of fuel charge admitted throughout entire speed range of the motor. Desired motor speeds (within capacity of the motor) are thus obtained by manipulation of the control grip (Figure 14)



or the throttle lever (Figure 9) if operating with JOHNSON SHIP-MASTER REMOTE CONTROL.

To further facilitate operation of the motor, "neutral," "reverse" and "forward" are provided, which permits starting in neutral—"out of gear." The motor may be started at the dock and run at idle speeds for warming up purposes or until ready for power application. It may then be "shifted" into reverse or forward as required to suit the particular occasion—of extreme importance when docking or operating out of congested areas.

Shifting is accomplished by an arrangement of gears in the gear-case through linkage with the shifting lever conveniently located for ease of operation (Figure 13). If operating with JOHNSON SHIP-MASTER CONTROL see Figure 9.

Motor speeds are limited when shifting, and also to guard against racing when in neutral position.

Caution should be exercised when operating in reverse. Do not speed up excessively—not more than required for maneuverability of the boat.

Care should be exercised when accelerating motor speed. Do not accelerate rapidly with the motor partly tilted out of the water—it is to your advantage not to do so to avoid damage to boat and motor.

#### starting instructions

##### (with johnson ship-master remote control)

1. Attach fuel line connector from Mile-Master tank to motor (Figure 7).
2. Depress pump button on the tank several times as shown (Figure 8). Note that pressure required to operate the pump increases as the fuel line and carburetor fill up—this is your signal to stop pumping. It is not necessary to pump beyond this point—priming is required only after having attached the fuel line. Fuel level is automatically maintained in the carburetor by pressure built up in the tank during operation of the motor.
3. Move throttle lever to "LOW" position and the shift lever to NEUTRAL position. DO NOT START MOTOR IN GEAR!

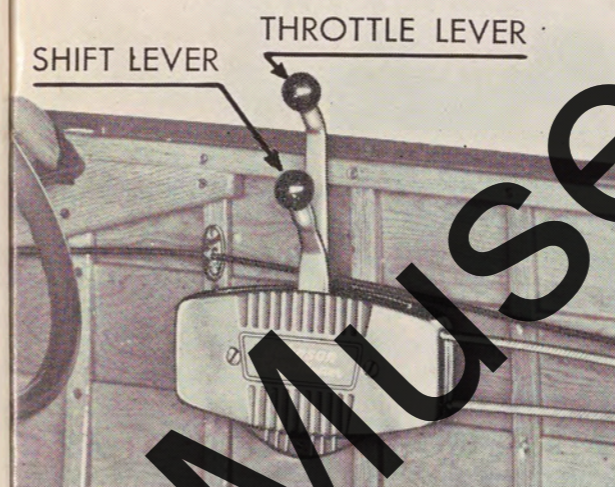


Figure 9

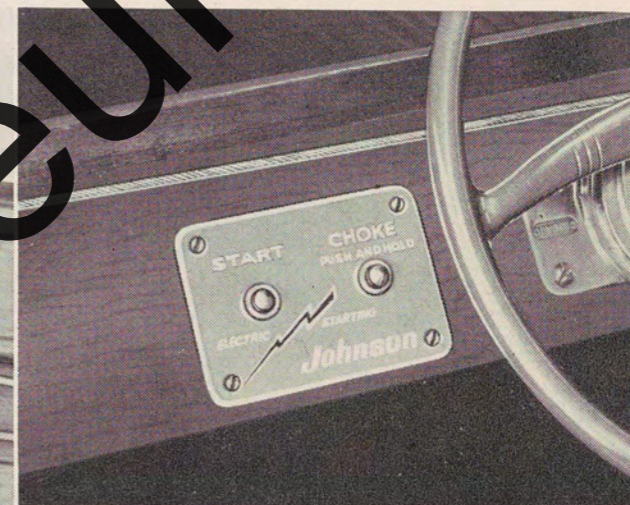


Figure 10

4. Advance throttle lever toward FAST until it stops (Figure 9). Throttle and shift lever are now in position to start motor.
5. Set HIGH and SLOW speed dials to number 4.
6. COLD MOTOR—Press choke and starter buttons at the same time to start motor (Figure 10). After starting, additional choke may be required until motor warms up. (In temperatures below 40° F. turn high speed dial to number 6 to start. After starting readjust high speed dial to number 4.)  
WARM MOTOR—(Immediately after previous running)—Choke ordinarily not required to start motor.  
*Note:* An electric cut-out switch is provided to shut off the electric starter mechanism when throttle lever is set beyond one-half throttle.
7. Reduce motor speed before shifting—snap shift lever with QUICK ACTION to Forward position (Figure 11) or Reverse position (Figure 12) as desired.
8. To increase motor speed, advance throttle lever toward Fast position.
9. After motor is warmed up, reduce speed and adjust Slow Speed dial, by turning dial to left or right, to best idling position.
10. When in Forward position increase motor speed to full power

and adjust High Speed dial, by turning dial to left or right, for best running position.

- To stop motor, reduce motor speed until throttle lever stops against Slow position.

DO NOT ATTEMPT SHIFTING TO FORWARD OR REVERSE WHEN MOTOR IS NOT RUNNING.

CAUTION—DO NOT PRESS STARTER BUTTON WHEN MOTOR IS RUNNING.

**starting instructions**

*(without johnson ship-master remote control)*

- Attach fuel line connector from Mile-Master tank to motor (Figure 7).
- Depress pump button on the tank several times as shown (Figure 8). Note that pressure required to operate the pump increases as the fuel line and carburetor fill up—this is your signal to stop pumping. It is not necessary to pump beyond this point—priming is required only after having attached the fuel line. Fuel level is automatically maintained in the carburetor by pressure built up in the tank during operation of the motor.
- Move gear shift lever to center or NEUTRAL position (Figure 13). DO NOT START MOTOR IN GEAR!

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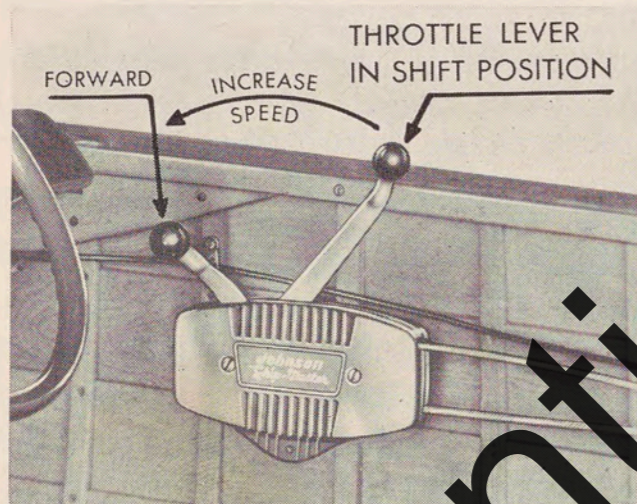


Figure 11

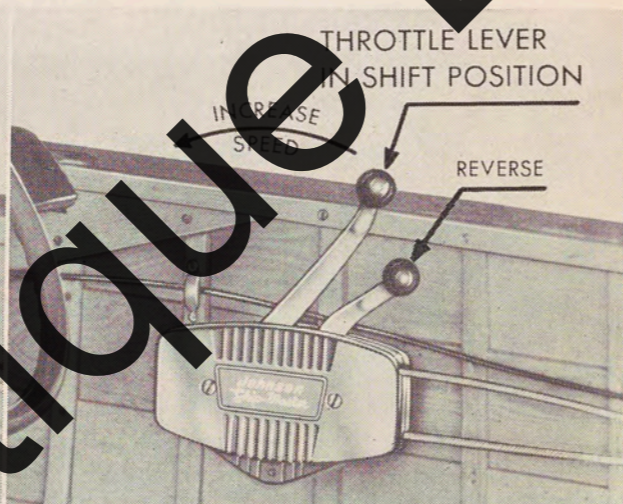


Figure 12

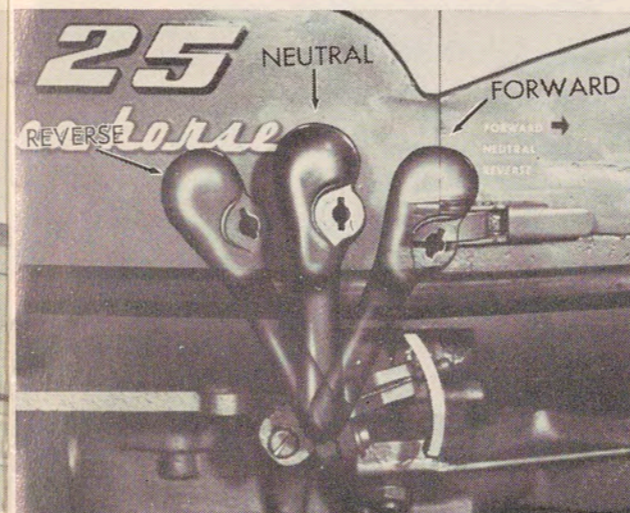


Figure 13

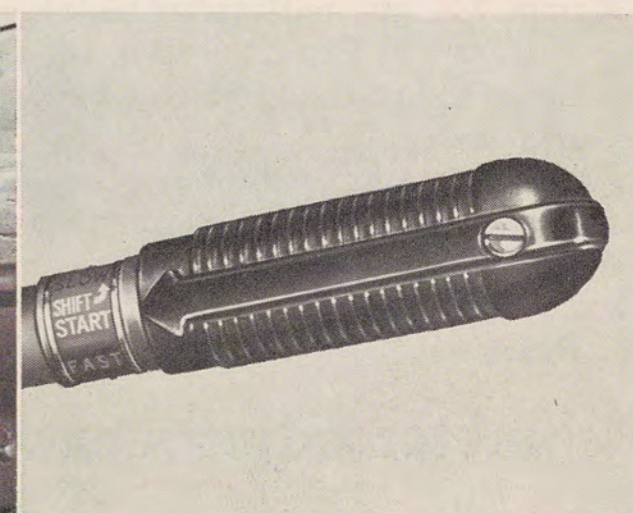


Figure 14

- Turn speed control grip to position marked START as indicated on the steering arm (Figure 14), then turn control grip toward FAST position until it stops against speed limit control for neutral operation.

- Set HIGH and SLOW speed dials to number 4.

- COLD MOTOR—Press choke and starter buttons (Figure 10) at the same time to start motor. After starting, additional choke may be required until motor warms up. (In temperatures below 40° F. turn high speed dial to number 6 to start. After starting, readjust high speed dial to number 4.)

WARM MOTOR—(Immediately after previous running)—Choke ordinarily not required to start motor.

Note: An electric cut-out switch is provided to shut off the electric starter mechanism when throttle lever is set beyond one-half throttle.

- Reduce motor speed before shifting—SNAP shift lever with QUICK ACTION to FORWARD position or REVERSE position (Figure 13) as desired.
- When in FORWARD turn speed control grip toward FAST to gain speed.
- After motor is warmed up, reduce motor speed and adjust Slow Speed Dial by turning dial to left or right, to best idling position.

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10. When in FORWARD position increase motor speed to full power and adjust High Speed Dial, by turning dial to left or right, for best running position.
11. To stop motor, turn speed control grip to position marked STOP.

DO NOT ATTEMPT SHIFTING TO FORWARD OR REVERSE WHEN MOTOR IS NOT RUNNING!

CAUTION—DO NOT PRESS STARTER BUTTON WHEN MOTOR IS RUNNING!

The above starting instructions are given in step by step form—it is advisable to become familiar with each detail prior to actually operating the motor.

#### emergency starting

In case of electric starting switch failure, an emergency starting arrangement is provided in the junction box. Remove junction box cover and observe the knurled cap at the base of the solenoid (Figure 15). Remove the cap and push up on the extending plunger (Figure 16). This will make contact between battery and starter motor.

In the event that starter failure still persists, the Model B motor is equipped with a manually operated starter and choke (Page 4) that may be used at the option of the operator.

Manual choke—pull choke knob out to extreme limit of choke.

Manual starter—pull starter handle slowly until starter engages, then pull rapidly. Repeat until motor starts. Allow starter cord to rewind before releasing starter handle—this is to avoid damage to starter assembly.

NOTE: An arrangement is provided to automatically lock the manually operated starter mechanism when the speed control grip is set beyond one-half ( $\frac{1}{2}$ ) throttle.

SHIFT TO NEUTRAL WHEN STARTING—DO NOT START IN GEAR!

#### carburetor adjustment

The carburetor being of the two jet (float feed) type, is designed for maximum, efficient combustion at all speeds, two adjustments

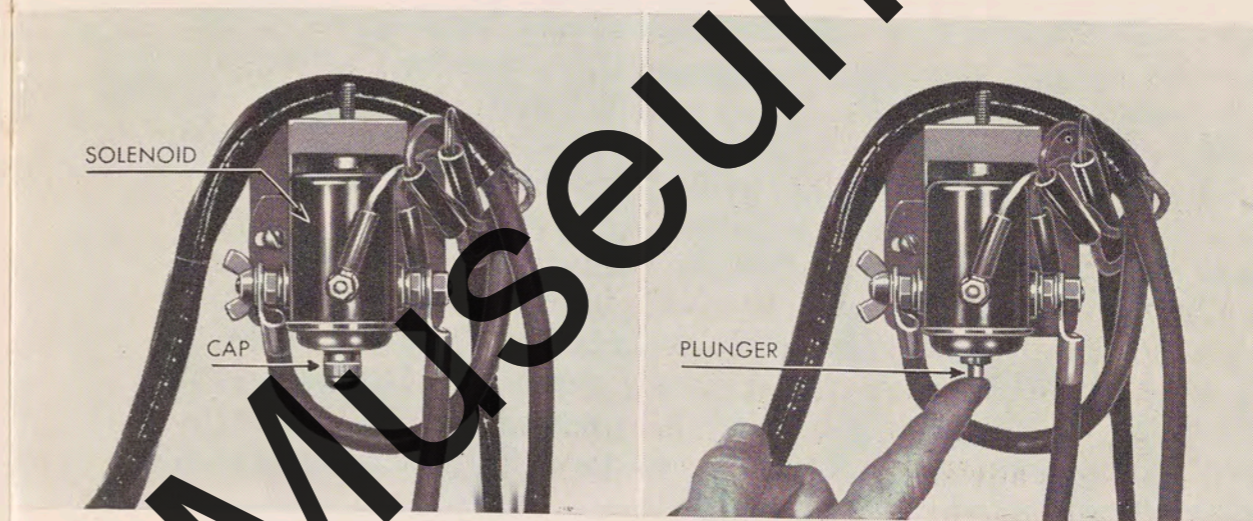


Figure 15

Figure 16

are thus required, namely; high and slow speed. Both high and slow speed needles are adjusted at the factory with provisions for limited variations to compensate for atmospheric conditions. However, if ultimate adjustment does not fall within the limited range or in case of repairs, proceed as follows:

The slow and high speed levers are held firmly in position on their respective adjusting needle shaft by expansion of slotted serrated ends as a result of drawing up on the counter-sunk head screws.

Remove the screws from the center of the slow and high speed levers (Figure 17). The levers are now free to be removed from respective shafts.

Carefully insert small screw-driver in slot of slow speed needle and turn (clockwise) to the right until needle comes to rest *gently* on its seat. Be careful not to injure the seat by turning down too tightly. Then back off (turn left) about  $1\frac{1}{4}$  turns.

Adjust high speed needle in like manner, turning needle until it rests *gently* on its seat, then back off (turn left) about  $\frac{1}{3}$  turn.

Replace levers and center screws. Before securing the center screws arrange both levers to position Number 4 on the panel.

#### slow speed adjustment

Start motor as instructed—run at “Fast” speed until normal operating temperature has been reached. It may be necessary to temporarily adjust high speed lever (turn lever right or left) so that



motor will run at high speed. Throttle down to "slow speed range." Turn lever to right or left as required to obtain best setting for slow speed.

(Note: Turning needles to left enriches the fuel mixture—that is, increases proportion of fuel to air to result in rich mixture. An excessively rich mixture is indicated by "rough" running of the motor. "Spitting or coughing" in the carburetor is indicative of a lean mixture, caused by turning needle too far to right.)

Loosen center screw to properly arrange lever, without disturbing position of the slow speed needle (this is IMPORTANT). Should lever tend towards binding on the needle shaft, it may become necessary to pull it free entirely to permit rearranging its position without affecting adjustment of the needle at this time. Arrange lever to position Number 4 on panel. Push lever back onto the shaft so that the face of the lever is flush with the end of the needle shaft. This will permit lever to engage limitation stop on the panel. Tighten center screw to firmly secure lever. Atmospheric conditions may necessitate slight variation from time to time—limited range provided in this respect should be sufficient, nevertheless.

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**high speed adjustment**

(Must be performed only after final slow speed adjustment has been made.) Start motor as instructed—run at "fast" speed until normal operating temperature has been reached. Hold throttle at

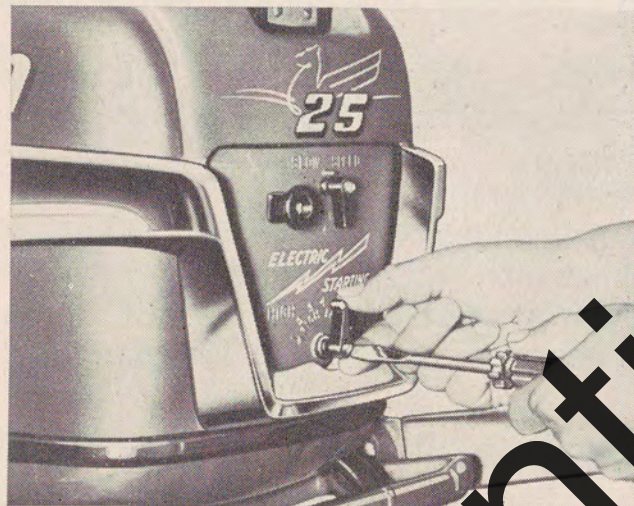


Figure 17

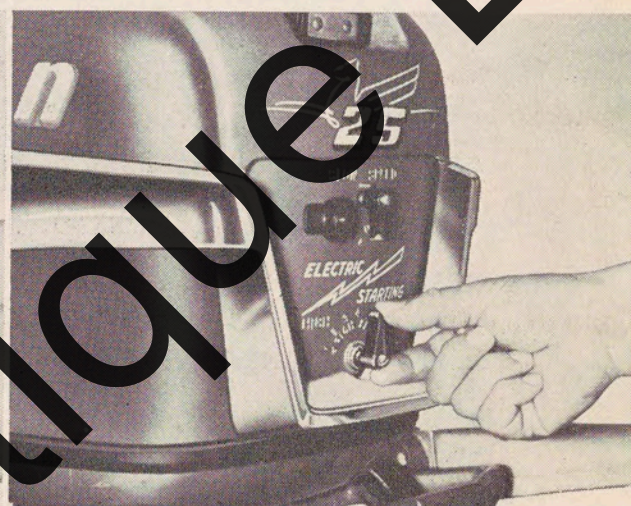


Figure 18

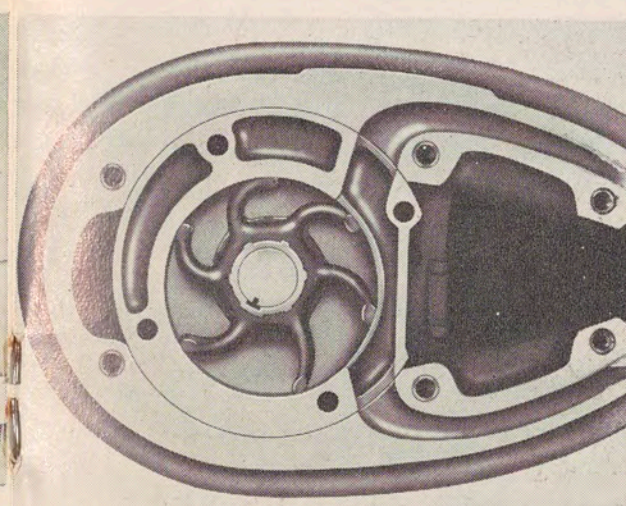


Figure 19

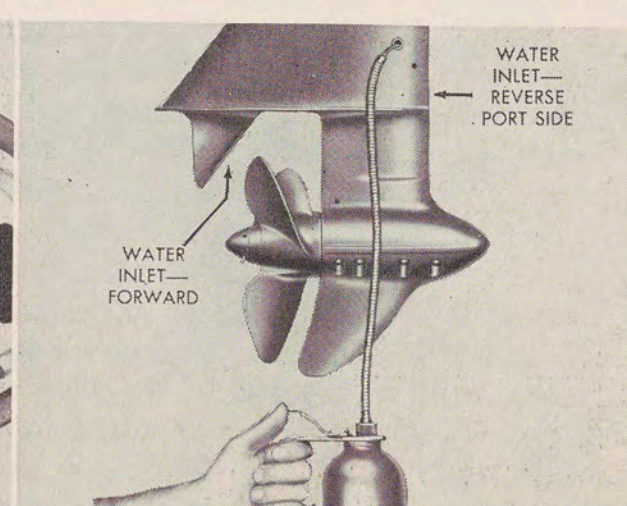


Figure 20

fast speed and turn lever to left or right as required to obtain best setting for top speed performance. Rearrange lever as described above to position Number 4 on panel—see Figure 18.

**cooling**

Water for cooling purposes is provided by action of the Vari-Volume pump, which functions as a displacement pump at slow motor speeds and as a centrifugal pump during operation in the higher speed ranges (Figure 19).

Note two water inlets in the gearcase (Figure 20). During FORWARD operation of the motor, water is picked up by the cavity in the gearcase immediately back of the propeller and forced through the cooling system, later to be discharged at the outlet in the exhaust tube provided for this purpose. Water enters the cooling system through the cover plate holes above the anti-cavitation plate (port side) when operating in REVERSE.

Ordinarily the cooling system requires little or no attention and continues to function during operation of the motor provided the water inlets are submerged, open and free of obstruction. Take care when maneuvering in shallow, muddy water.

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**break-in of new motor**

Do not operate this motor at continuous full power for the first



hour of operation. After approximately 15 minutes of part throttle operation, it is permissible to run at full power for a few seconds followed by a minute or two of part throttle operation. This may be repeated frequently and the period of full power gradually increased until a total of one hour operation has elapsed. After one hour, the motor may be run at full power. Extra oil is NOT required during break-in.

### lubrication of gearcase

#### type of gear lubricant

**Gear Housing Lubricant:** We recommend Mobilube GX90 or any other good grade of SAE 90 automotive (hypoid) gear lubricant. If hypoid lubricant is not available, in emergency use Mobiloil Outboard or other SAE 30 engine oil until recommended lubricant can be obtained.

#### 18 filling of gearcase

Where a complete change of lubricant is required, the fill and drain plugs should both be removed. Drain out all of the oil, water or residue; replace the drain plug, then fill the gearcase through the vent plug with a pump-type oil-can as shown (Figure 20). Fill to level of the vent and replace screw. Capacity 11 fluid ounces.

When checking for water in the gearcase, it is necessary to, first; remove the fill screw, second; loosen the drain screw partly to allow enough of the lubricant to run out to determine whether or not water is present. If there is no water, the drain screw may be retightened without an excessive loss of lubricant. The gearcase should then be filled to the fill screw level and the fill screw replaced. When refilling with pressure gun, fill from bottom—oil drain hole. Check condition of gasket on both screws to avoid possibility of leaks. Replace, if necessary.

Check gearcase for oil after first five hours of operation to be sure it is filled. Then check periodically at least every 50 hours. Drain and refill at the end of the season.

See your Johnson dealer or gasoline service station with regard to obtaining a small quantity of hypoid oil in event it becomes necessary to occasionally add to the gearcase. Small pressure type oil cans suitable for this purpose are readily available through

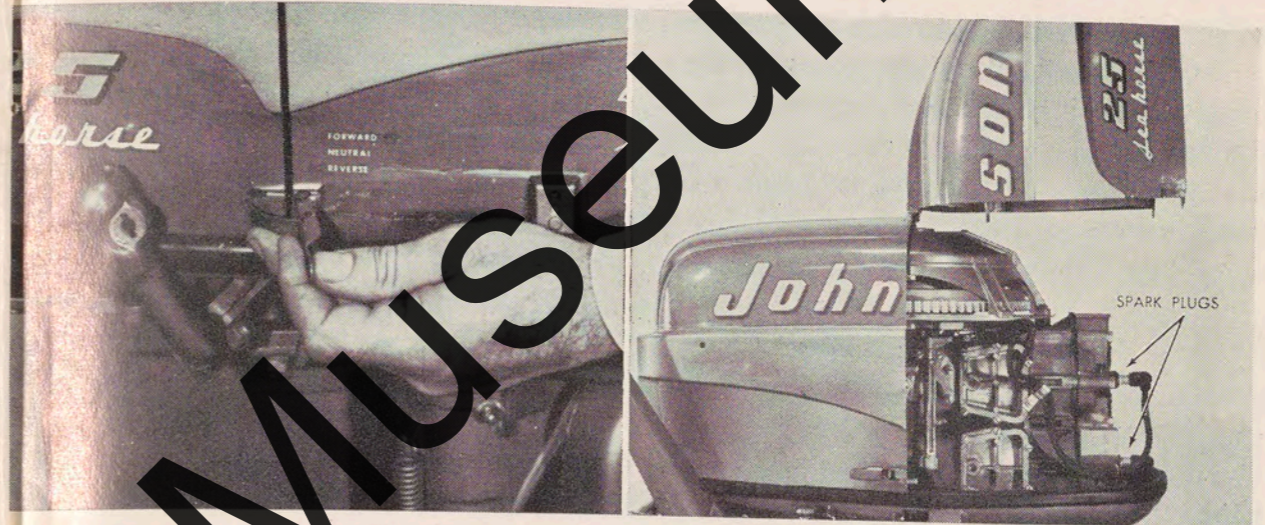


Figure 21

Figure 22

local automotive supply houses, hardware dealers, or your Johnson dealer.

### spark plugs

**Recommended Spark Plugs**—Champion J6-6 (formerly known as Champion J-10 Commercial) or Auto-Lite A3X. Adjust spark plug gap—.030.

#### causes of plug failure

A certain amount of spark plug replacement may be necessary, depending upon the quality of fuel and oil used in fuel mixture, and the amount of carbon deposit in the combustion chamber. If spark plug replacements become excessive, consult Johnson Service Station with respect to removing carbon from the pistons and the cylinder head. Seek his advice—based on experience, as to the best grade of oil and gasoline available in the locality.

Bits of carbon often break loose from the head of the piston and are apt to lodge between the points of the spark plug to short it out—result in misfiring. Firing usually can be restored by removal of the “bridging” carbon.

### spark plug replacement procedure

To gain access to the spark plugs for inspection and/or replacement, simply release latches on both sides of the motor cover (Fig-



ure 21) to permit rear half being lifted upward (Figure 22).

Detach rubber covered spark plug terminal, then remove spark plugs for inspection or replacement as required. Attach spark plug terminals and return cover to original position—make certain latches are properly seated and corresponding levers drawn into position to secure.

### rubber floated propeller

A rubber cushion has been installed between the propeller hub and propeller for purpose of absorbing "shock" in event the propeller blades strike an underwater obstruction during operation of the boat (Figure 23). Shearing of propeller drive pins and possibility of otherwise damaging the motor are thus considerably minimized.

The rubber cushion performs an additional function in case of the Model RDE in that it acts to reduce impact load on the reversing mechanism.

20

Under no consideration substitute propellers not provided with the rubber shock absorber, to avoid causing rapid wear of reverse mechanism.

### propeller drive pin replacement

In event the propeller strikes an underwater obstacle while in

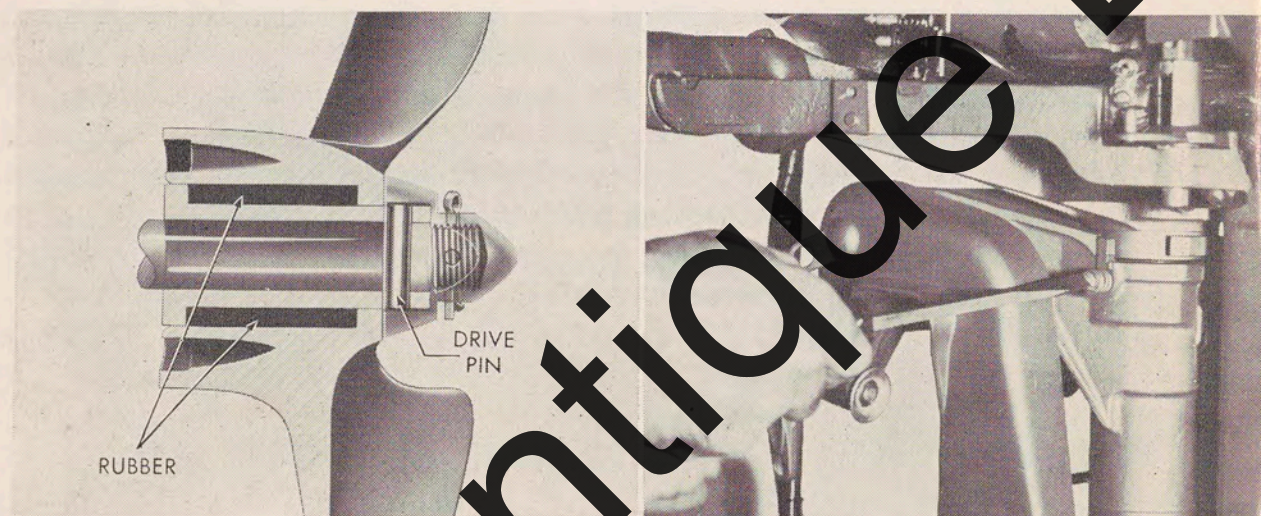


Figure 23

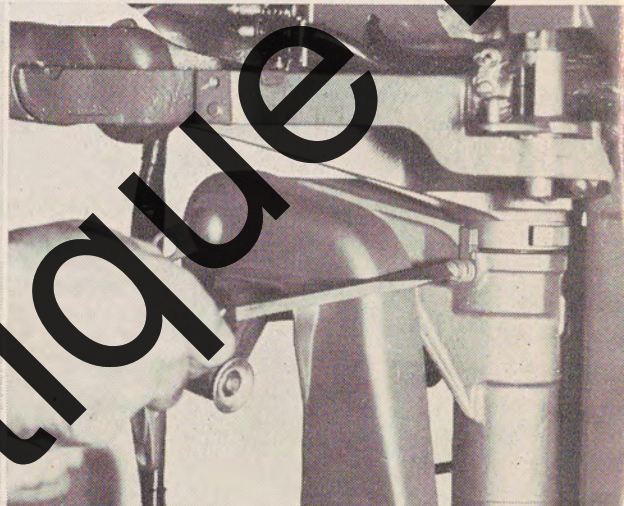


Figure 24

operation, the drive pin in the hub of the propeller may shear, allowing the motor to run free (Figure 23).

### removal of broken drive pin

Note that location of the propeller drive pin in this case is immediately back of the propeller nut which usually does not require removal of the propeller to install a new pin. To remove a sheared pin, remove the cotter pin followed by removal of the propeller nut—fragments of the sheared pin can then be driven out with the new pin after aligning propeller pin holes (propeller and shaft).

### replacement of new drive pin

It is a simple matter to install a new pin (be sure it is a genuine Johnson pin—engineered and constructed for the purpose). Insert pin through hole in the propeller shaft—replace and tighten the propeller nut. Nut is "capped" to fit over ends of the pin.

### tightening of the propeller nut

Draw up just enough to secure position of the propeller pin and to align cotter pin holes. Install cotter pin (preferably a new one) and secure.

21

### steering friction adjustment

Steering friction may be adjusted to individual requirements by

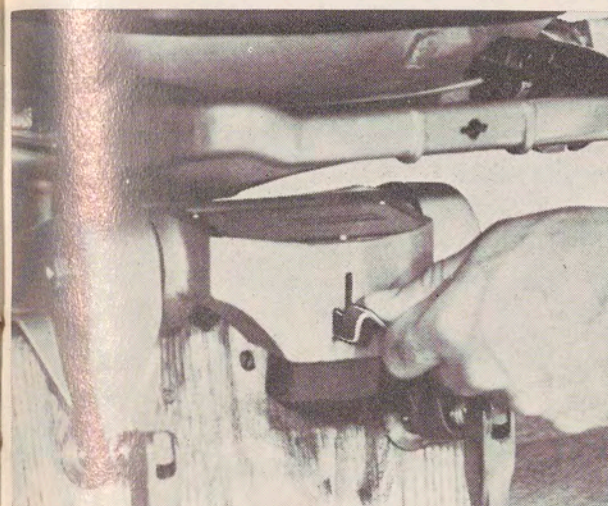


Figure 25

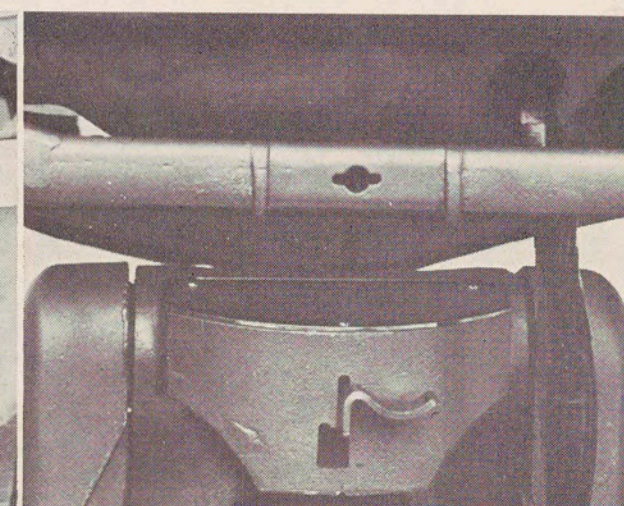


Figure 26

simply loosening or tightening the screw in the swivel bracket (port side) provided for this purpose (Figure 24).

### tilting lock

A trip release (spring loaded) arrangement of sufficient tension is made part of the tilting lock. The tilting lock prevents tilting when suddenly decelerating, yet permits tilt of the motor on shock of impact when striking underwater obstruction.

Normally operated by means of lever and linkage, the tilting lock may be released when desired by depressing lever and shifting slightly to left as in Figure 25 and restored by returning to normal running position as shown in Figure 26.

It is advisable to tilt the gearcase out of the water when not in use—set lever to release position (Figure 25) then tilt; set at running position (Figure 26) when submerging the gearcase for operation.

22

CAUTION—The motor does not tilt when operating in reverse.

### to remove motor cover

To remove the motor cover assembly, place shift lever in reverse position (out of the way) and release latches on both sides of the rear half as shown (Figure 21). Lift rear half (Figure 22) and



Figure 27



Figure 28

move entire motor cover assembly slightly forward to clear the lugs that hold front half of motor cover in position, then lift off. Assemble in reverse order.

### cleaning of gasoline filter

A gasoline filter is located on the port (right facing the motor) side of the power head, under the motor cover. The filter is made accessible for inspection and cleaning by removal of the motor cover.

#### cleaning of filter

First inspect the filter to determine necessity of cleaning by observing amount of foreign matter accumulated in the glass bowl. To remove the glass bowl and filter element for cleaning purposes, loosen the small wing screw above the bowl to free the assembly (Figure 27). Care should be taken to avoid losing the gasket. The filter element may then be removed by loosening the screw on the bottom end. Wash filter element in container of clean gasoline.

23

#### assembling of filter

The filter should be assembled in reverse order of that described above. Care should be taken that the gasket is replaced in the same relative position it had prior to disassembly.

### lubrication of magneto oiler felt

The magneto is provided with a lubricating felt riding against the breaker cam to minimize wear on the breaker point arms. To function properly, the felt requires an application of light machine oil at least once a year—five to six drops will do. See your Johnson Service Station.

### breaker point cleaning and adjustment

Platinum breaker points are employed in the magneto of the model RDE motor for maximum performance. It may be necessary from time to time to clean and adjust the breaker points (Figure 29).

**disassembly and preparation for access to breaker points**

Remove motor cover, starter housing and inspection cover. Turn flywheel (Figure 30) to position where port comes to rest above the points (two sets of breaker points are employed).

**cleaning operation**

As a temporary measure, carefully spread points with blunt instrument (small screw driver) insert strip of clean, smooth paper. Release points and work paper up and down to clean point surfaces.

Avoid use of point dresser unless points are pitted. Application of the point dresser should be followed by cleaning with a strip of smooth paper to remove any possible traces of dressing material left on the point surfaces. Replace breaker assembly if necessary. See your Johnson Service Station for further attention.

**adjusting operation**

Correct breaker point gap setting is .020 inch full open. To adjust, loosen breaker point assembly anchor screw "A" slightly (Figure 29)—just enough to permit shifting of the assembly. Ultimate adjustment is accomplished by turning adjusting screw "B" (eccentric) right or left as required to obtain recommended gap setting.

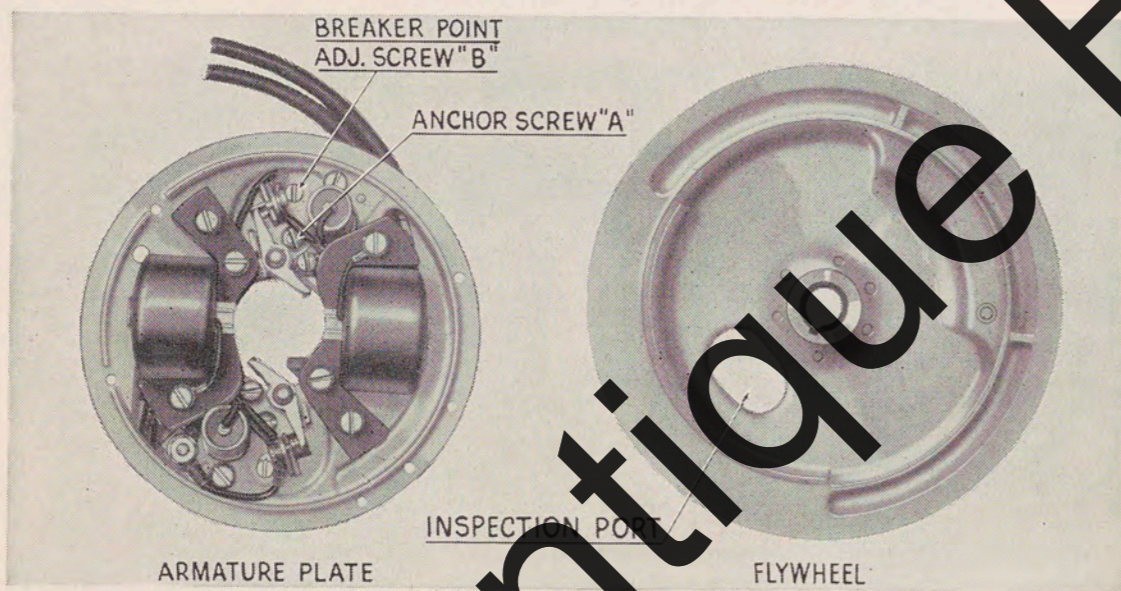


Figure 29



Figure 30

—turn left to increase gap—right to reduce. Check with .020 inch feeler strip. Tighten screw "A" to secure position of the assembly. Recheck with feeler strip. Repeat procedure for adjusting other point assembly. See your Johnson Service Station for further corrective measures.

**assembling**

Reassemble in reverse order of that described above.

**care of the motor**

The service obtained from this motor is dependent largely upon the care it is given. The following suggestions will assist in its proper maintenance.

Remove sediment bowl from filter periodically to free element and bowl of foreign substance which might have accumulated.

Inspect spark plugs occasionally. Clean and, if necessary, adjust gap. (Correct setting of gap, .030 inch.) Wipe off insulator or porcelain of spark plug and ignition leads with a dry cloth to remove residue.

Check breaker points as instructed.

Draw up on all nuts and screws at least once each season.

Remove drain and fill plugs from gearcase at frequent intervals to drain off water. Refill with Mobilube GX (90) as previously instructed.

Note grease fittings on swivel bracket and shift lever assemblies—grease periodically with automotive type of pressure gun (Figure 28). Grease frequently when operating in salt water areas.

The starter gear worm (electric starter motor) should be lubricated occasionally with a few drops of SAE No. 10W oil. If starter gear fails to engage flywheel gear, due to sticking on the starter worm, wash starter worm with kerosene and relubricate with SAE No. 10W oil. Consult your Johnson Dealer or Service Station if necessary.

Wipe off motor regularly with a damp cloth. A clean motor is readily accessible for inspection and less apt to foul.

Remove propeller nut periodically to inspect drive pin. Observe condition of propeller blades.

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## care of the battery

The charge condition of the battery should be checked with a hydrometer or sensitive volt meter every month or, in heavily used motors, after every 200 starts. If the battery is discharged rapidly it may not start when the hydrometer reading is under 1150.

A battery slowly discharges without being used. Therefore, the battery should be checked occasionally and recharged during the winter or other periods, even though the battery is not being used.

As in automobile use, the battery water level should be checked and refilled when needed. The plates should be covered at all times. Water reservoirs should not be completely filled. One-quarter to one-half inch of water over the plates is sufficient.

The battery terminal posts should be kept clean of corrosion. To help prevent corrosion, apply vaseline to the terminal posts before installing the terminals. Acid on the outside of the battery may be neutralized by washing with a solution of baking soda.

Contact manufacturer or dealer of battery for complete information regarding care of the battery.

## preparation for storage

No outboard motor should be placed in storage, especially winter storage without first considering the necessary precautions.

Prior to storing the motor, run it for about one-half (1/2) minute in choke position. Shut off motor before releasing choke to normal position. Purpose of this operation is to flood the inner parts of the power head with oil (oil in fuel mixture) while in storage.

Check for accumulated water in the gearcase. See page 18. Refill with gear lubricant, if necessary.

Make certain that all the water has been drained from the cooling system. This may be accomplished by hanging motor in upright position and tilting the lower unit up and down two or three times. The foregoing information is especially important if the motor is subject to temperatures below freezing when not in use. Failure to take precautions may result in a bursted cylinder block or possible injury to the water channels.

Drain all fuel from the Mile Master tank, gas line and carburetor.



retor. Remove and clean gasoline filter element—see page 22.

Under no circumstances should the motor be stored in an inverted position. It should be hung on a rack similar to the manner in which it is mounted on a boat.

Remove battery and place in battery storage where charge condition may be checked occasionally and recharged when necessary.

## preparation for operation after storage

Remove spark plugs and crank motor briskly to clear cylinders of excess oil and/or fuel mixture. Clean and adjust spark plug gap to .030. Install new spark plugs if necessary.

Check screws and nuts for tightness; also condition of the propeller and drive pin.

Install battery and apply a coat of vaseline on battery posts before connecting the terminals.

## care of the motor when operated in salt water

Rinse exposed parts off with fresh water and wipe with oily cloth.

Remove motor cover at regular intervals for inspection of under cover parts. In event corrosion has taken place, carefully remove from affected parts. Spread thin film of oil over the area to guard against similar recurrence. Wipe exposed parts with oily cloth.

The spark plug porcelains should be wiped with an oily cloth (castor oil, if available) at the time of their installation and periodically thereafter. Purpose of this function is to reduce to a minimum formation of salt water residue on the porcelains, thus avoiding possibility of short circuiting to interfere with performance of the motor.

## if the motor is dropped overboard

Possibility of this occurrence can be eliminated entirely by exercising a few simple precautions. Make certain the stern bracket



clamp screws have been properly tightened to secure position of the motor on the boat. Check screws periodically during operation of the motor to guard against their having worked loose. Attach safety chain or rope to eyelet installed on the swivel bracket bolt for this purpose, anchoring opposite end at some convenient position on the stern of the boat.

However, if the motor unfortunately goes overboard, recover it immediately, if possible.

Remove carburetor and filter bowl, magneto and spark plugs. Remove traces of remaining water.

Remove the inspection band from the electric starter assembly and blow out all traces of water with air pressure, if available, and allow to dry.

When overboard in salt water, rinse armature plate and electric starter assemblies to avoid corrosive effects which may lead to difficulty later on. Blow off with air stream and allow to dry.

28 Install armature plate and flywheel. Ground spark plug leads to motor—this is important. Crank motor rapidly with starter cord to blow water out of cylinders and crankcase.

Replace all parts previously removed.

Start motor as instructed and allow to run until reasonably sure no water remains.

CAUTION: Do not, under any circumstances, attempt to start the motor until the armature plate has been thoroughly dried. Remaining drops of water are apt to set up a short circuit which may result in extensive repairs.

If the motor cannot be started, it should be disassembled at once to remove all traces of water clinging to the inside wall and motor parts. Each part should be dried and coated liberally with oil to prevent rusting. This is IMPORTANT—the motor should be attended to immediately. Consult your local Johnson Dealer or Service Station.

### register your motor

Your motor is known to the factory only by its Model and Serial Number, both of which are stamped on the name plate attached



to the swivel bracket as shown here (Figure 31) and on the plug located on the starboard side of the cylinder assembly.

For assistance in case of theft register the model and serial number of your motor with the factory—accomplished by filling in and returning the registration card (enclosed in the tool kit) to the factory.

Always provide model and serial number of the motor when ordering parts or otherwise seeking information regarding it.

### insurance

Insurance on your outboard motor and/or boat is available at nominal cost through the Outboard Boating Club of America. This insurance includes protection against loss by fire, theft, etc. Write direct to Outboard Boating Club of America, 309 North Michigan Avenue, Chicago 1, Illinois, for further details.

### johnson service

It has always been the belief of Johnson Motors that a sale does not complete the transaction between the manufacturer and the buyer. It establishes, rather, a new obligation—an obligation whereby Johnson Motors agrees to assist the buyer in obtaining utmost service from a Johnson Outboard Motor.

With this policy ever uppermost in our minds, we have built up

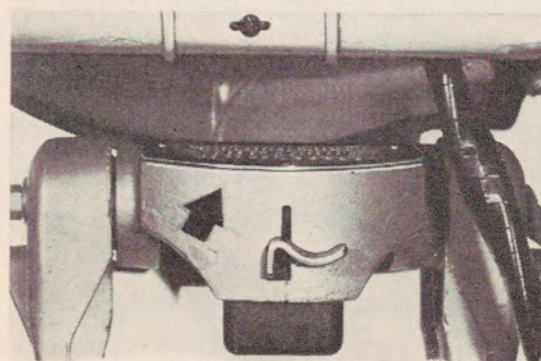
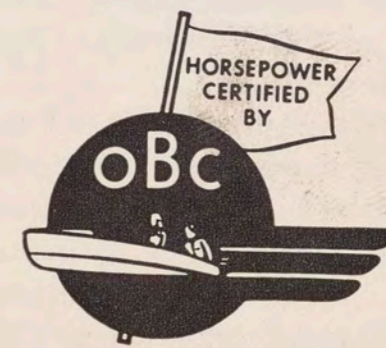


Figure 31



an organization that consists of a nation-wide network of Johnson Service Stations to give prompt and efficient service to owners of Johnson Outboard Motors.

The first step in this structure is the local Johnson Dealer, who is supplied with first-aid parts, enabling him to make emergency and minor repairs. Second, the Authorized Service Station, which carries a stock of parts and equipment necessary to properly service Johnson Outboard Motors. Third is the District Service Station, with a complete stock of parts for all models, tool equipment and factory trained mechanics capable of making extensive repairs.

It has, therefore, been our endeavor to place a Service Station within easy reach of every Johnson Outboard Motor owner. See Dealer Service Station list.

*Always consider the Mile-Master tank as part of the motor assembly—include it with the motor whenever requiring service.*

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## warranty

We warrant each new outboard motor of our manufacture to be free from defects in material and workmanship under normal use and service, our obligation under this warranty being limited to making good at the factory any part or parts thereof which shall, within three (3) months after delivery of such motor to original purchaser, be returned to us with transportation charges prepaid, and which our examination shall disclose to our satisfaction to have been thus defective; this warranty being expressed 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 motors.

This warranty shall not apply to any motor 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.

We make no warranty in respect to the accessories not of our manufacture, inasmuch as they are usually warranted separately by their respective manufacturers.



Because of the unusual strains and accidents to which such products may be subjected, we make no warranty of either material or workmanship in any of our products when used for racing.

Claims must be entered on motors or motor parts returned to the factory for inspection, repair or replacement. Request form No. SE-16 from local Johnson Dealer or Service Station. **This form should be filled in, signed by the motor owner and dealer or service station representatives and mailed to the factory with returned material, TRANSPORTATION CHARGES PREPAID.**

## your boat equipment

If you use your outboard motor on navigable waterways of the United States you are subject to the Federal Motor Boat Law which became effective April 25th, 1940.

NOTE: Navigable waters under Federal jurisdiction include the ocean and Gulf coasts, bays and rivers tributary to them, the Great Lakes and connecting waterways, any body of water which is customarily used for interstate navigation, or other specifically designated locations. If there is any doubt concerning the status of your locality, you can get a ruling from the Bureau of Marine Inspection and Navigation, Department of Commerce, Washington, D. C.

Under the law you are required to carry the following equipment on board your boat at all times:

1. Life preservers sufficient to sustain afloat every person on board. These may be either life vests or approved floating cushions.
2. An efficient whistle or horn. (Only if over 16 ft. long.)
3. Fire extinguishers are not required on outboard motor boats less than 26 feet in length of open construction not carrying passengers for hire (effective Dec. 18, 1953). All outboard cruisers and runabouts which are decked or partially decked over should carry fire extinguishers of approved type and capacity. Contact your local U. S. Coast Guard Office regarding current regulations.
4. To be exhibited from sunset to sunrise—
  - (a) A bright white light aft to show all around the horizon.
  - (b) A combined lantern to show green to starboard (right)

31

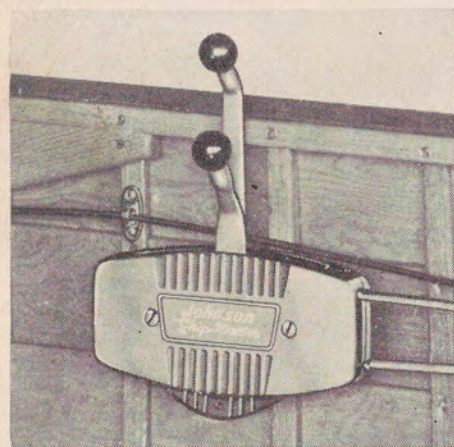


and red to port (left) carried in the fore part of the boat. Federal law also requires the numbering of all motor driven boats operated on navigable waters under Federal jurisdiction. However, numbering is not required on rowboats, canoes, or sailboats not exceeding 16 feet in length which are equipped with outboard motors, but which are designed for and used primarily with other means of propulsion.

Numbers are assigned upon application to the Officer in Charge, Marine Inspector, U. S. Coast Guard, having jurisdiction over the area in which the vessel is owned.

**REMOTE-STEERING, SPEED AND SHIFT CONTROL**

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A very satisfactory Johnson designed, Johnson built Ship-Master Remote control arrangement may be purchased from the local Johnson dealer. The motor comes equipped and ready for the remote installation—no drilling or special operations required except for installing the tiller cable, necessary pulleys, and of course, the steering wheel and remote control box which can be easily mounted for either right or left steering.

*Complete instructions are provided with each Ship-Master Remote Control Kit—consult the Johnson dealer.*



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