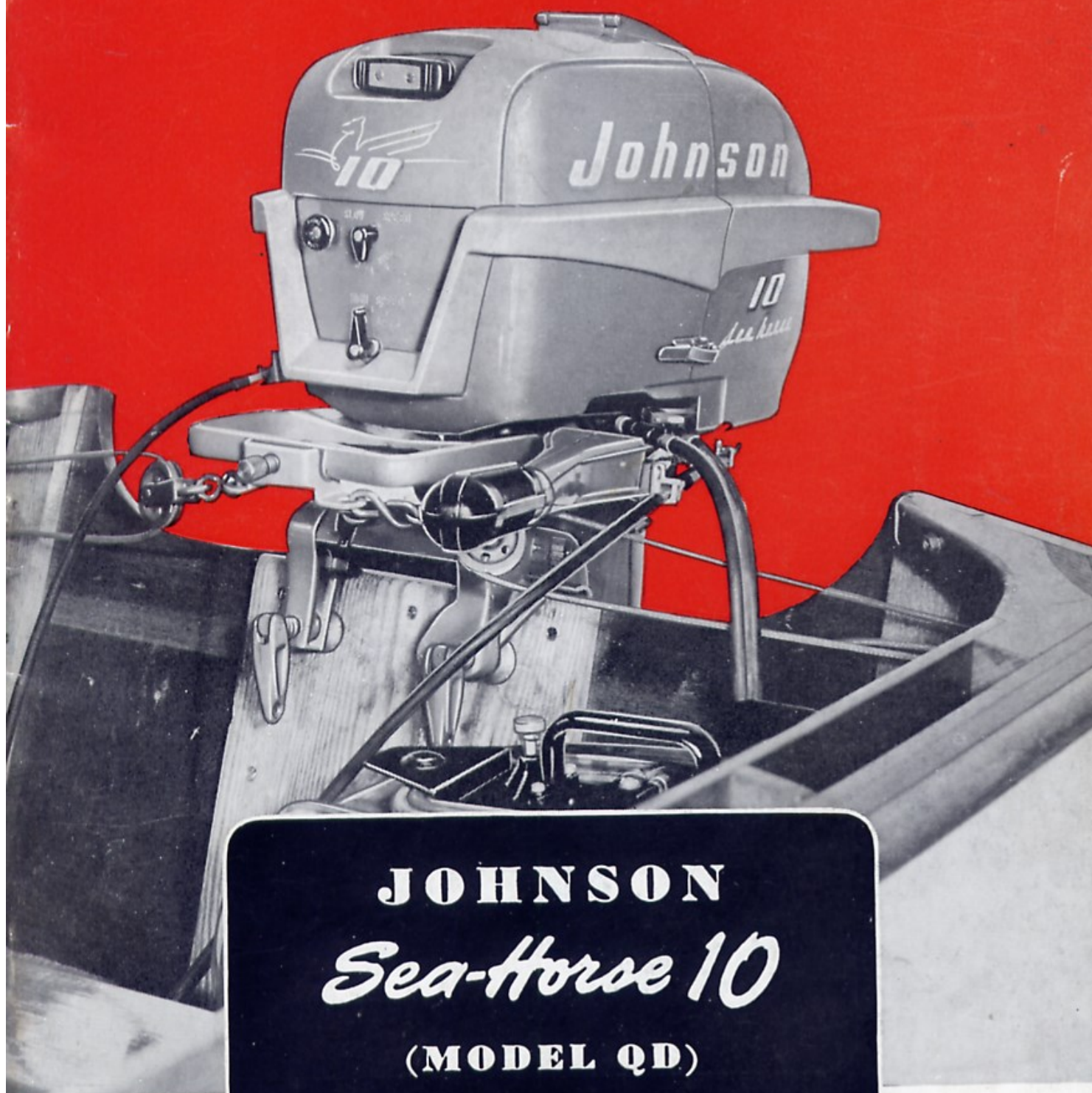


Operating Instructions



JOHNSON

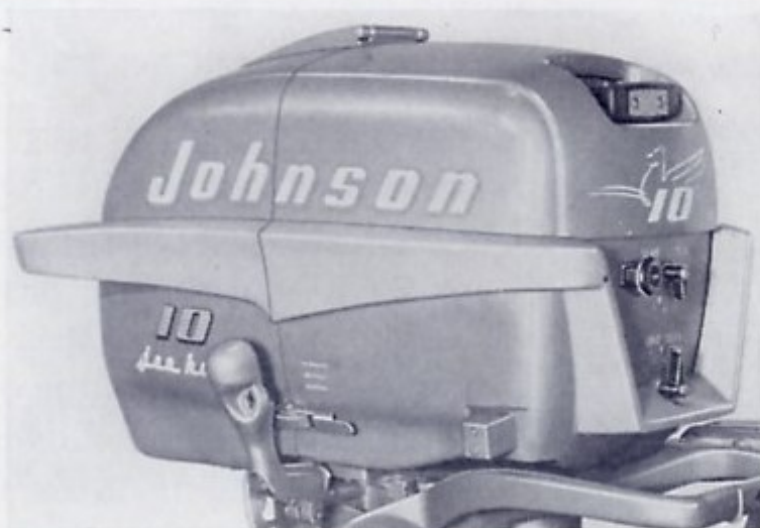
Sea-Horse 10

(MODEL QD)

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

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introduction

Your new Johnson Sea Horse 10 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. Practice until their operation becomes an instinctive habit. Then you'll not find yourself sometime “doing the wrong thing at the right time” and vice versa.

The Johnson Model QD 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 slow, consistent trolling speed.

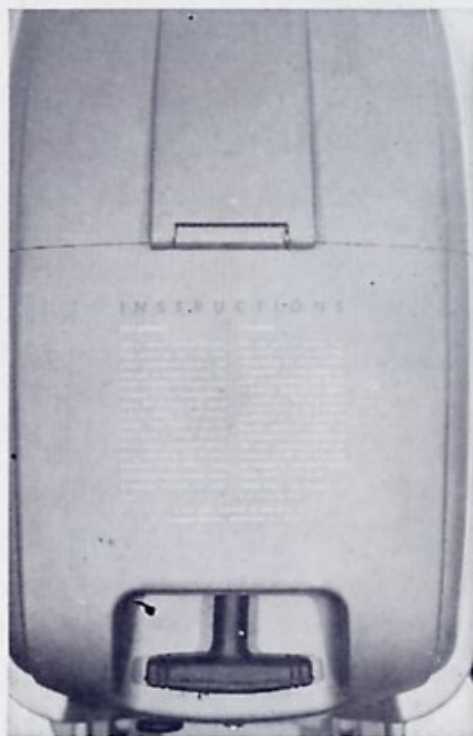
If you will take good care of your Johnson motor, rest assured it will take good care of you.

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 priced 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 ash 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

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 per gallon of gasoline.

Procedure: Pour into the fuel tank (Fig. 1) 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.

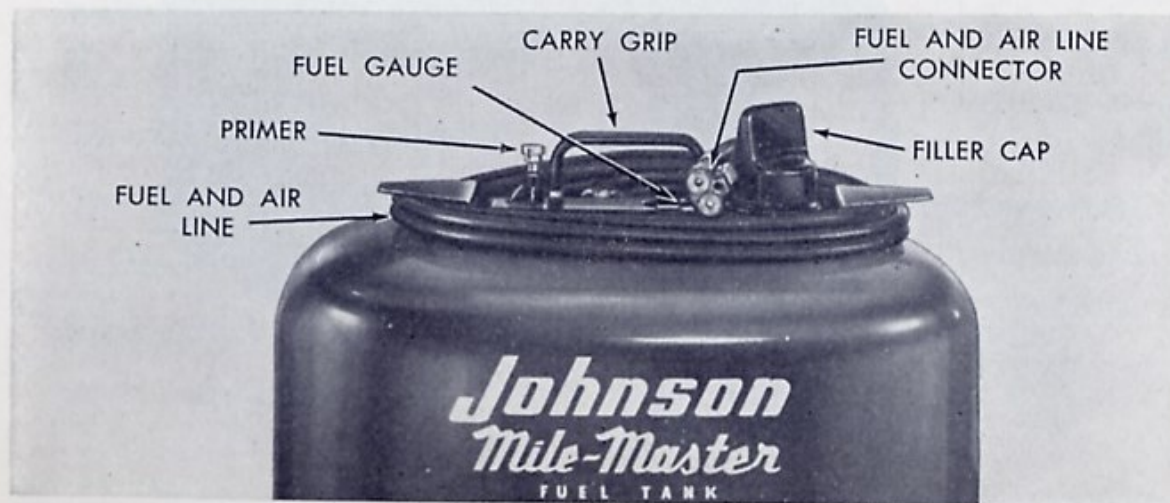
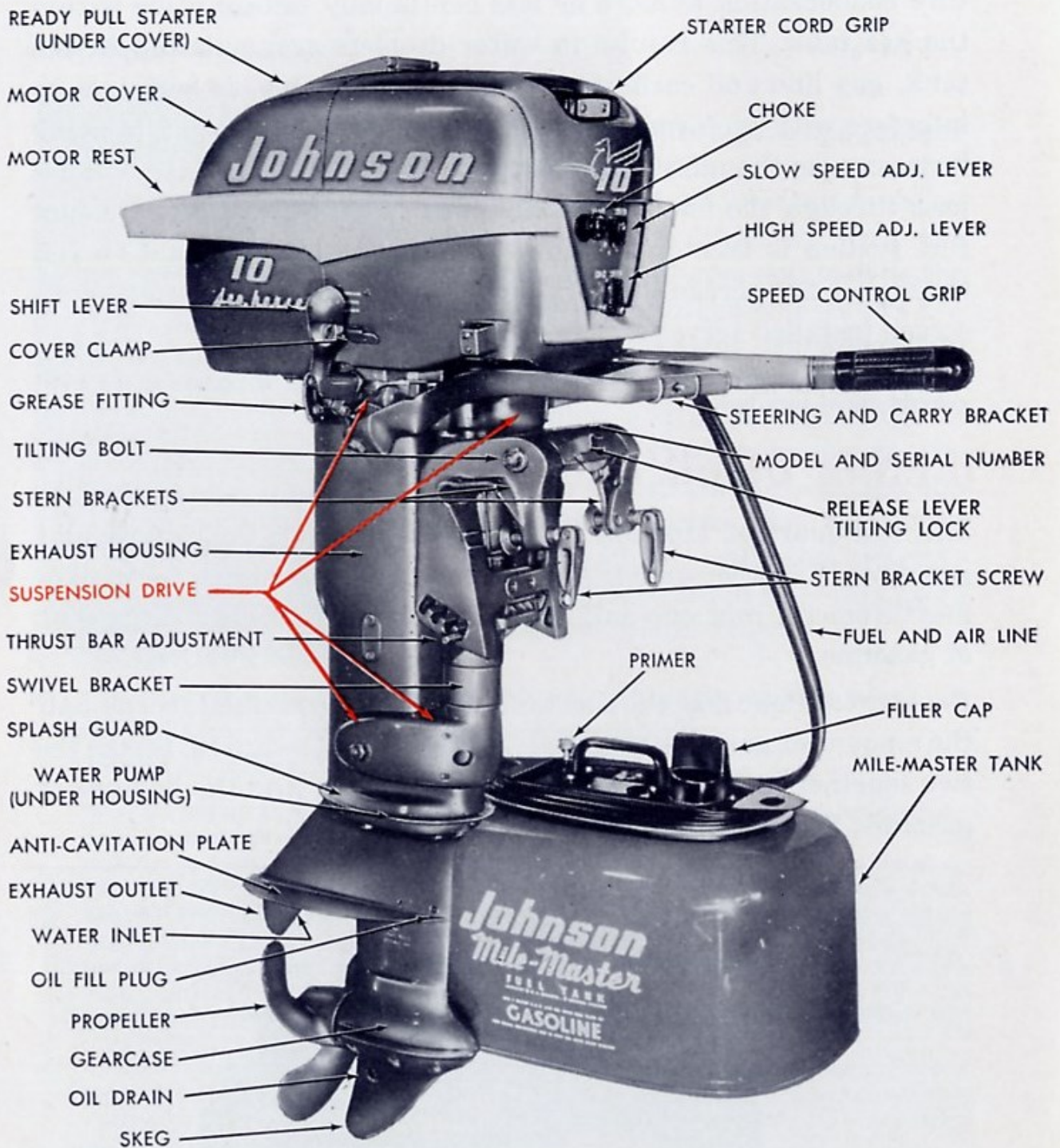


Figure 1



J O H N S O N M O D E L Q D

4



model QD



specification chart

POWER HEAD	Two cycle—Alternate Firing 2 Port—Automatic Intake
Bore and Stroke	2 3/8" x 1 7/8"
No. of Cylinders	2
O.B.C. Certified Brake H.P. at 4000 R.P.M.	10.0
Piston Displacement	16.6 Cu. In.
Weight	QD—67 1/2 lbs. (App.)* QDL—69 lbs. (App.)*
Length	QD—43 13/32" (QDL 48 13/32")
Width	11 3/16"
Propeller Dia. Pitch	9" x 8" 3 Blade
Fuel Tank Capacity	6 Gal.
Starting	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.)	QD 15" QDL 20"

5

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 (Fig. 2). To insure maximum performance, transom should be of correct height. Recommended transom (stern) vertical height for Model QD is 15 inches—QDL is 20".

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 (Fig. 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 overall performance. This will result in some loss of

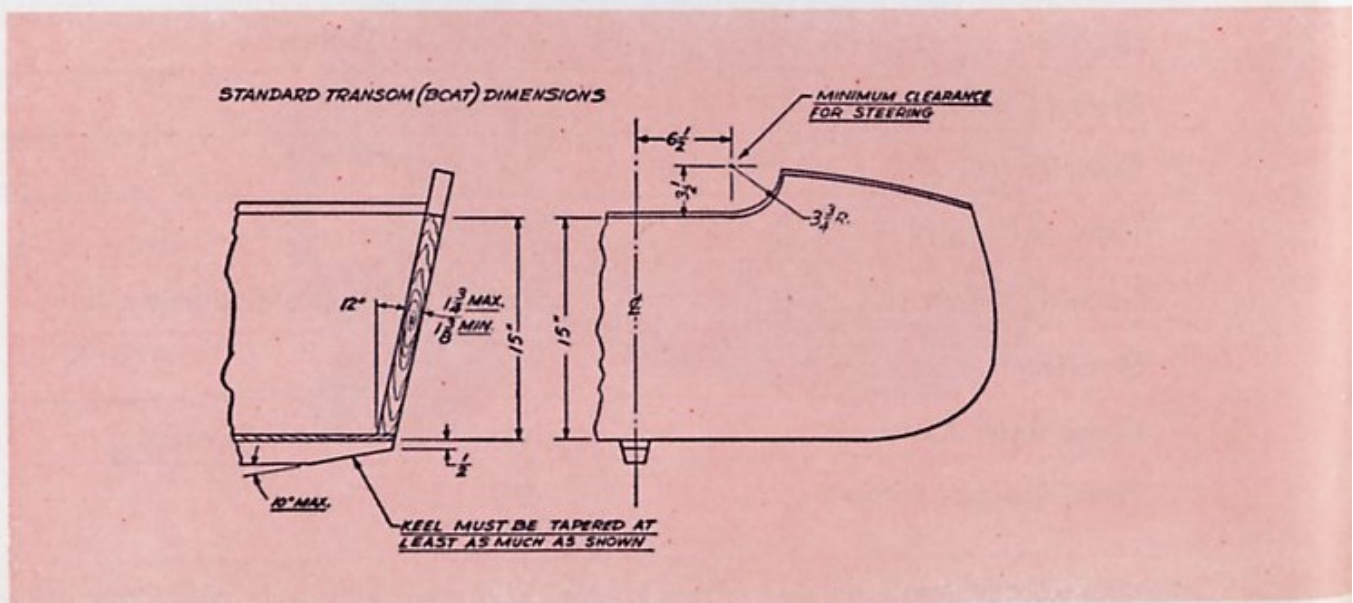


Figure 2



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 up the transom in excess of $\frac{1}{4}$ " to $\frac{1}{2}$ ". The resulting built up section is rarely of sufficient strength to carry the motor load.

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 (Fig. 3). Pay heed to this simple precaution.

precaution

Note that the stern bracket (port side) is designed 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 (Fig. 4). See your Johnson dealer for precautionary devices of this sort.

7

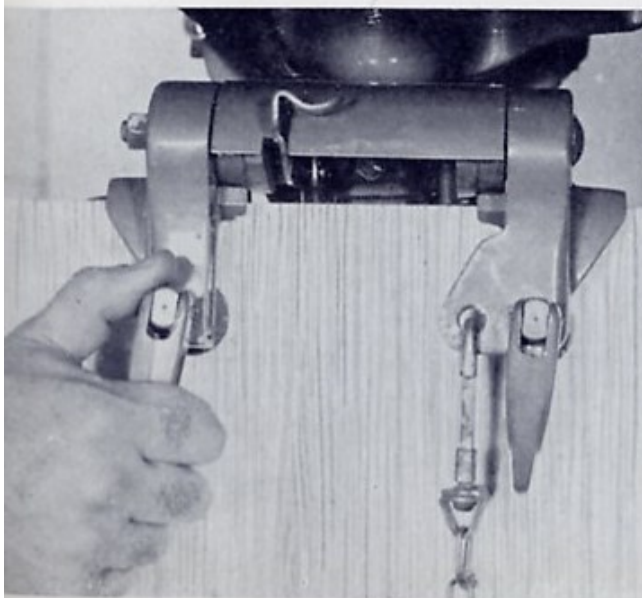


Figure 3

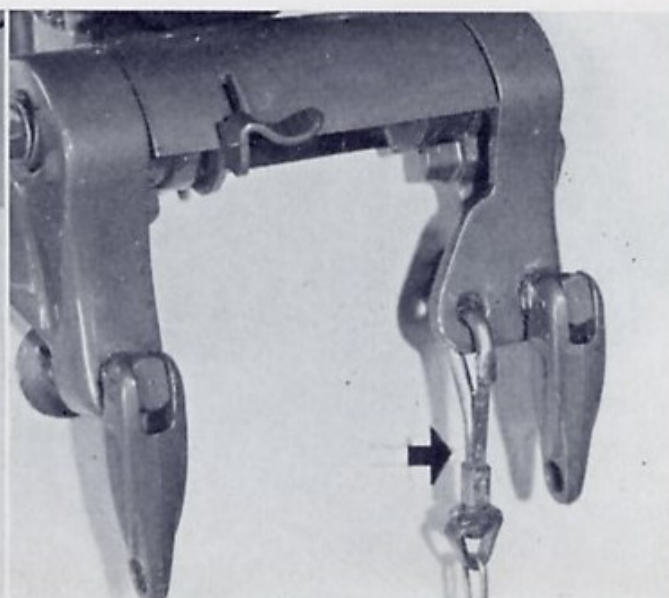


Figure 4



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 down on small lever against spring tension with thumb and forefinger, 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 casing is adjusted perpendicular to line of boat travel.

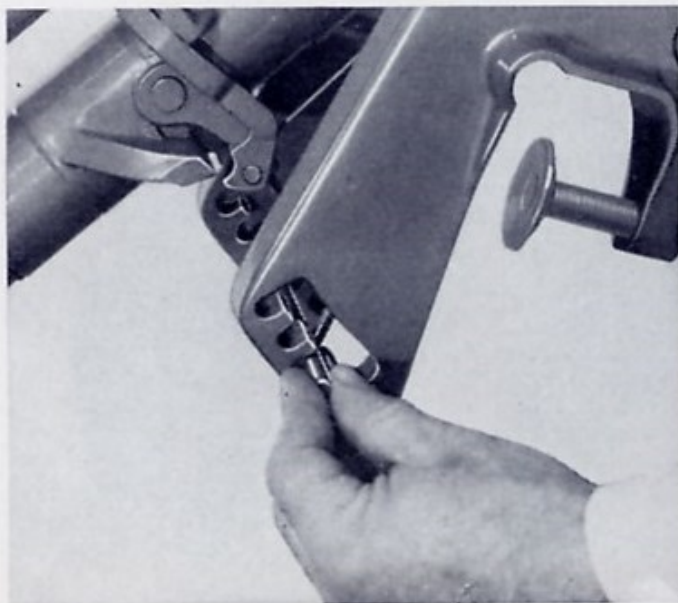


Figure 5

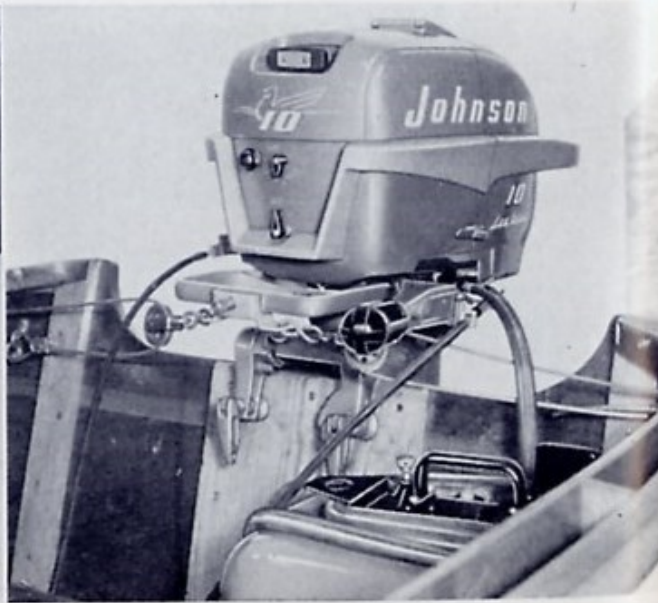


Figure 6



connecting fuel supply

The fuel container (Mile-Master Tank) should be placed in the boat at a convenient position near the operator (Fig. 6). The fuel line may be strung out along inside wall of the boat, allowing ample loop 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 (Fig. 7).

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 (Fig. 8).

To further facilitate operation of the motor, “neutral,” “reverse” and “forward” are provided, which permits starting in neutral—

9

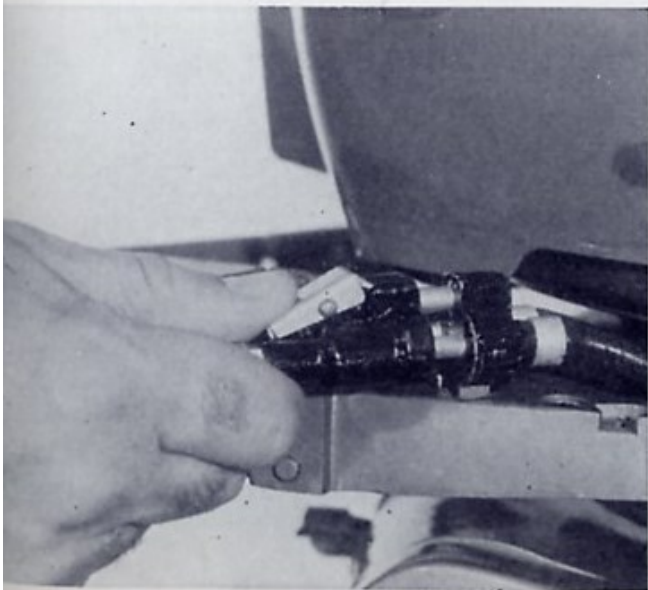


Figure 7

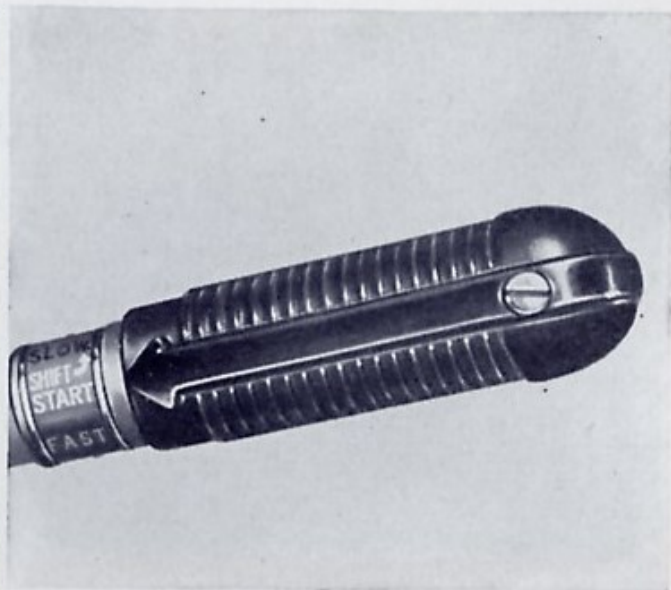


Figure 8



“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 (Fig. 9).

Provisions of necessity are made to automatically restrict motor speeds at the time “shifting” takes place and to guard against “racing” when shifted to neutral. Caution nevertheless should be exercised when operating in reverse. Do not speed up excessively—not more than required for maneuverability of the boat when in reverse gear.

10 It is possible to shift ONLY when the arrow on the speed control grip is set within the “shifting” range as indicated by position marked SHIFT and arrow on the steering arm (Fig. 8). Take note of this fact.

Note raised rib on which the arrow is embossed, running full length of the speed control grip—this provides ready reference to

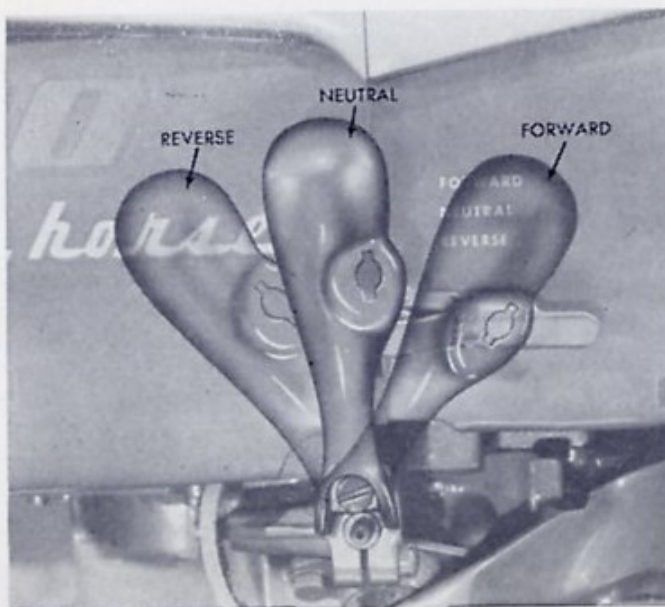


Figure 9

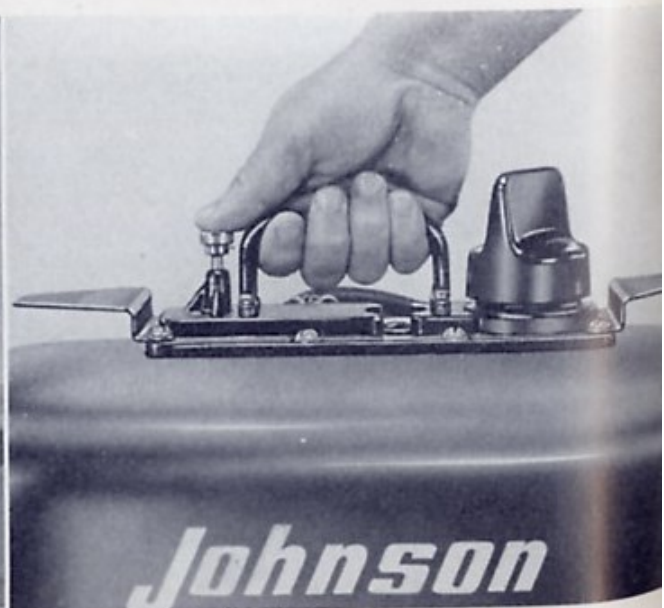


Figure 10



actual position of the control grip at all times, thus eliminating necessity of constantly referring to printed instructions on the steering arm. When on top, position indicates *Mid-Throttle*, which falls at *Starting* and at maximum end of the shifting range.

starting instructions

Since fuel is fed to the carburetor by means of pressure created within the crankcase of the motor and built up in the fuel tank, some arrangement is necessary to fill the carburetor on having attached the fuel line to the motor and prior to starting. This is accomplished by operation of a primer built into the mechanism of the fuel tank.

Fuel line connector is arranged to automatically close off the gasoline supply when disconnected from the motor.

1. Depress primer button on the tank several times as shown, Fig. 10. Note that the pressure required to operate the primer increases as the fuel line and carburetor fill up. THIS IS YOUR SIGNAL TO STOP PUMPING. It is not

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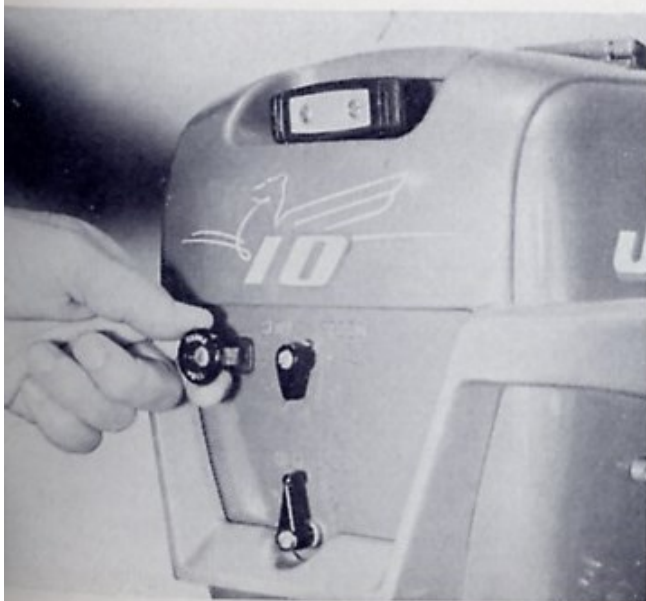


Figure 11

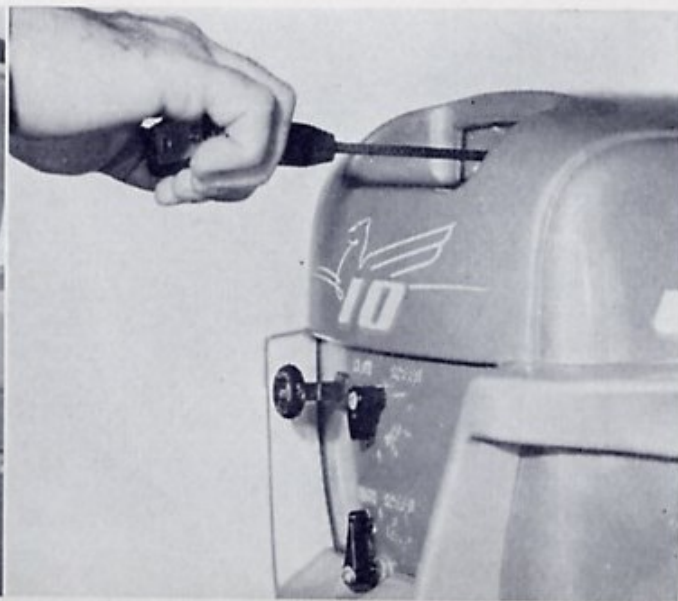


Figure 12



necessary to pump beyond this point. Fuel level is automatically maintained in the carburetor by pressure built up in the tank during operation of the motor.

2. Move gear shift lever to center or "neutral" position (Fig. 9). DO NOT ATTEMPT TO START MOTOR IN GEAR.
3. Turn speed control grip to position marked "start" as indicated on the steering arm (Fig. 8); then advance control grip toward position "fast" until it "butts" against speed limit control for neutral operation.
4. Pull choke "out" to extreme limit (Fig. 11) (in temperature below 40° F, turn high speed lever to number one (1) to provide a richer starting fuel mixture.) *Warm motor* (immediately after previous running) choke not ordinarily required. In event motor fails to start on third attempt, pull choke to extreme limit.
5. Pull slowly on starter handle (Fig. 12) until starter engages motor, then pull rapidly to start motor. Allow starter cord to rewind before releasing grip to prevent injury to starter cord.

12



Figure 13

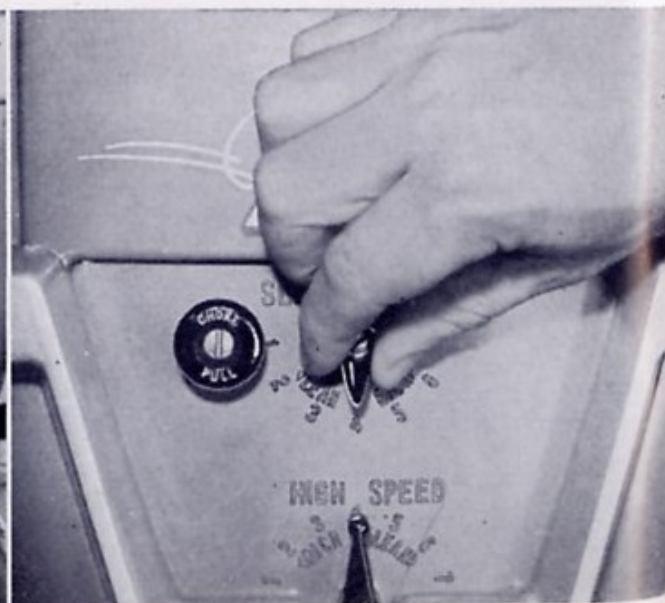


Figure 14



6. On having started motor—push choke in. Additional choking may be required momentarily after starting cold motor. THE MOTOR MAY BE OPERATED IN NEUTRAL POSITION FOR WARM UP OR AN INDEFINITE PERIOD AT THE OPTION OF THE OPERATOR.

7. Throttle motor down after starting—SNAP shift lever with QUICK ACTION to forward or reverse position as desired.
8. When in “forward” turn speed control grip toward position “fast” to gain speed, adjust high speed needle lever (Fig. 13) in fast position by turning to right or left as required.
9. To retard motor speed, turn speed control grip toward position “slow.” Adjust slow speed needle dial (Fig. 14) in slow position, by turning to right or left as required.
10. To stop motor, turn speed control grip to position “stop.” Hold until motor stops running.

13

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. A few moments spent in practice are well worth-while.

carburetor adjustment

The carburetor being of the two jet (float feed) type, is designed for maximum, efficient carburetion at all speeds, two adjustments 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 speed lever (Fig. 15) and high speed lever (Fig. 16). 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 No. 4 on the panel.

slow speed adjustment

14

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—see Fig. 14. 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.

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 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 Fig. 13.

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 (Fig. 17).

15

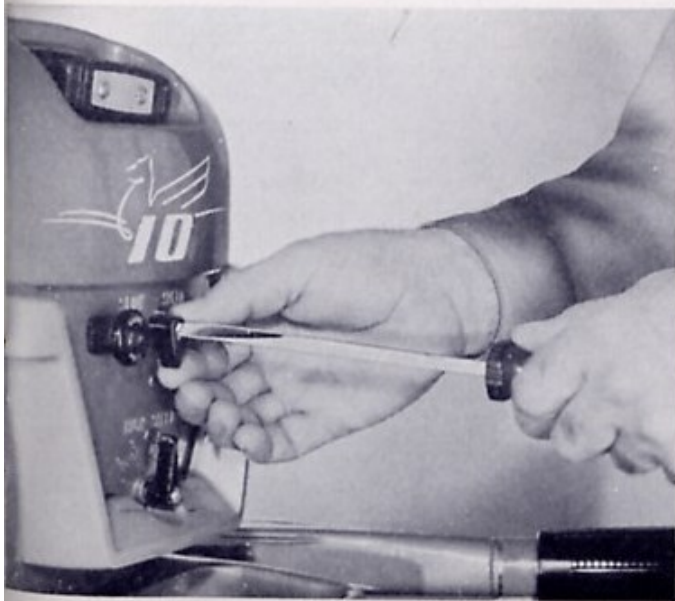


Figure 15



Figure 16



Note twin water inlets in the gear case (Fig. 18). During FORWARD operation of the motor, water is picked up by the cavity in the gear case 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 small holes, on both sides of the gear case and above the anti-cavitation plate, 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.

16

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 running, 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

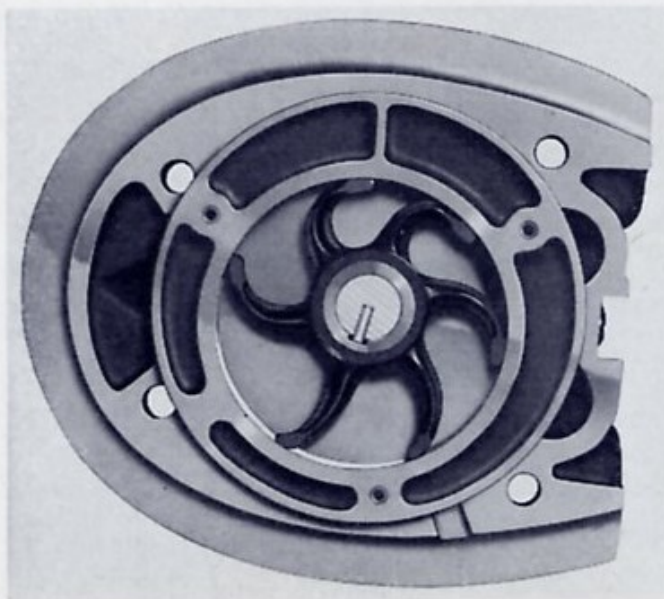


Figure 17

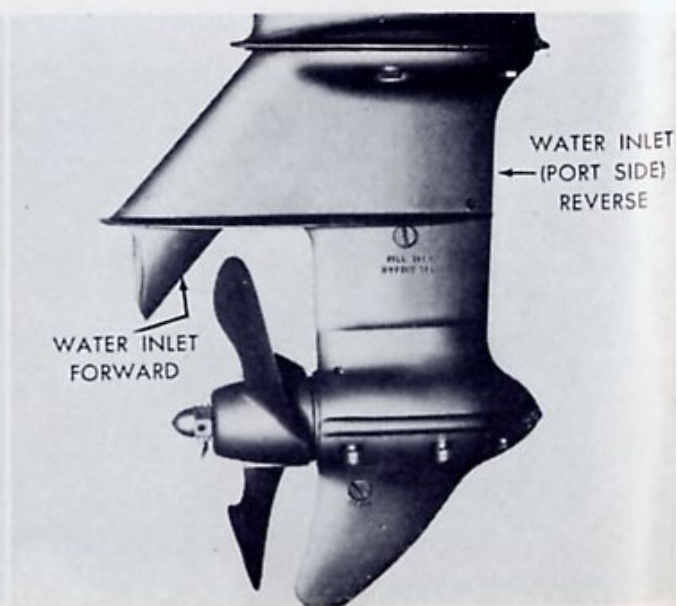


Figure 18



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.

Lubrication of gear case

GEAR HOUSING LUBRICANT: We recommend Mobilube GX90 or 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.

Check gear case 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.

filling of gear case

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 gear case through the vent plug with a pump type oil-can as shown (Fig. 19). Fill to level of the vent and replace screw. Capacity 6 fluid ounces.

17



Figure 19

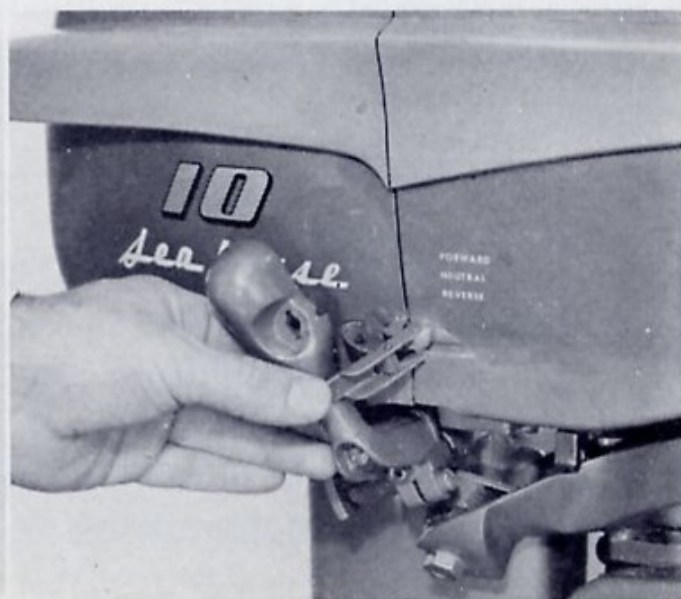


Figure 20



When checking for water in the gear case, it is necessary to, first—remove the vent screw, second—to 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 gear case should then be filled to the vent screw level and the vent 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.

18

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 gear case. Small pressure type oil cans suitable for this purpose are readily available through local automotive supply houses, hardware dealers, or your Johnson dealer.

spark plug

Recommended Spark Plug—Champion J6-J (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.



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. 20) to permit rear half being lifted upward (Fig. 21).

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 (Fig. 22). Shearing of propeller drive pins and possibility of otherwise damaging the motor are thus considerably minimized.

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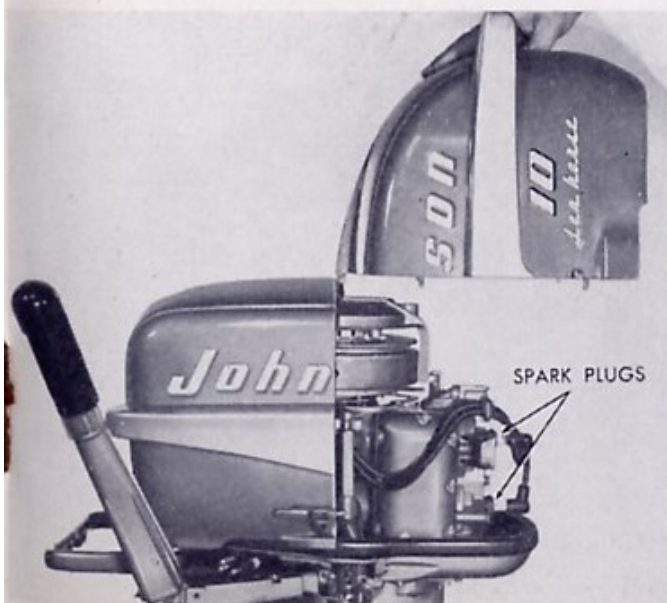


Figure 21

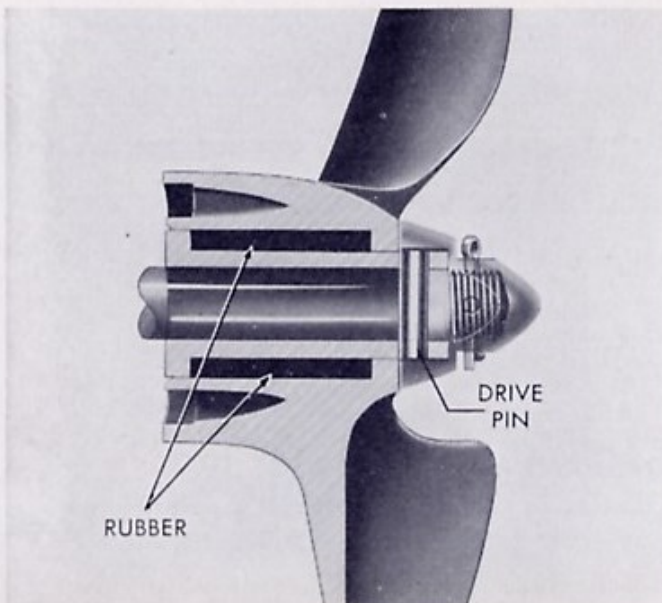


Figure 22



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

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

propeller drive pin replacement

In event the propeller strikes an underwater obstacle while in operation, the drive pin in the hub of the propeller may shear, allowing the motor to run free.

20

removal of broken pin

Remove cotter pin, nut and propeller. Remove the broken drive pin in the shaft by driving it out with a new pin or punch (Fig. 23).

replacement with new drive pin

The new drive pin should be placed in the hole so that approximately equal lengths project on each side of the shaft. The center of the pin is provided with a raised portion to prevent the pin from being lost while installing the propeller. It may be necessary to tap the drive pin into place. The propeller may then be placed on the shaft and rotated until the slot in the propeller hub engages the pin.

tightening of propeller nut

The nut should be tightened but slightly, as excessive pressure will cause partial shearing of the pin. The nut should be tight



enough to prevent existence of any play between the pin and the propeller hub. In event the cotter pin does not line up with the hole in the shaft, the nut may be tightened sufficiently to permit alignment in this respect.

steering friction adjustment

Steering friction may be adjusted to individual requirements by simply loosening or tightening the screw in the swivel bracket provided for this purpose (Fig. 24).

to adjust tension of tilting

21

To obtain adjustment of tilting tension, loosen or draw up on tilting bolt nut (large bolt attaching stern brackets to the swivel bracket) as required. Tension of tilt need not be too great, but just sufficient to maintain the motor in any position of "tilt."

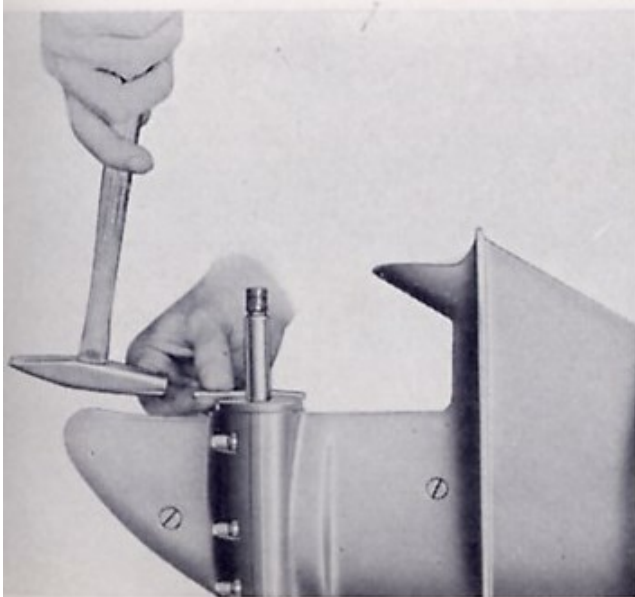


Figure 23

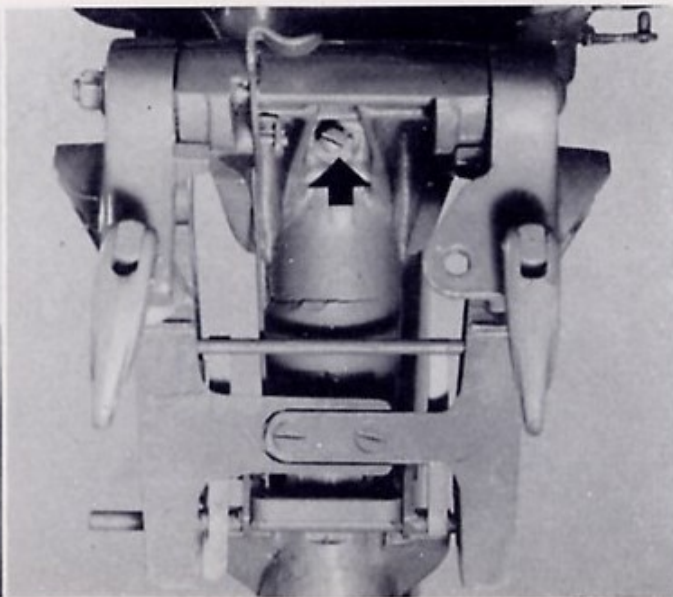


Figure 24



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 (Fig. 25) then tilt; set at running position (Fig. 26) when submerging the gearcase for operation.

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

22

to remove motor cover

To remove the motor cover assembly, place shift lever in reverse position (out of way) and release latches on both sides of the rear half as shown (Fig. 20). Lift rear half (Fig. 21) and release the

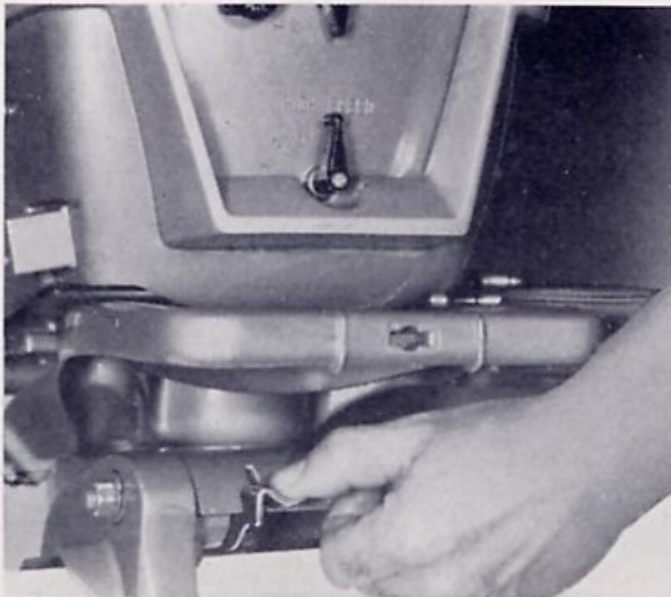


Figure 25

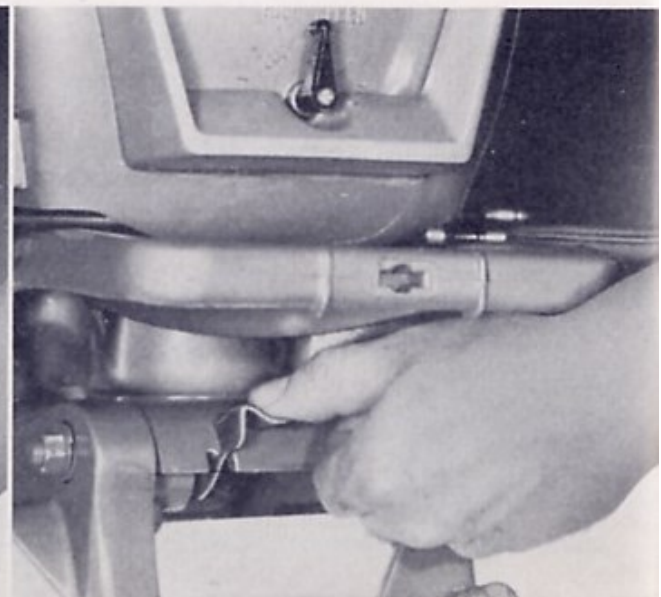


Figure 26



rubber strap hook from starter housing (Fig. 27). Move entire motor cover assembly slightly forward to clear the rubber covered lugs that hold front half of motor cover in position, then lift off. Assemble in reverse order.

the ready pull

This simple device is built into the motor for the express purpose of eliminating the necessity of manually wrapping the cord around the starting pulley for cranking (Fig. 28). It consists of a pawl arrangement about which are coiled a return spring and the starting cord and a ratchet mounted on top of the magneto flywheel.

With motor idle and with motor running, the pawls are held in closed position (disengaged from the ratchet on the flywheel). When pulling on the starting cord, the pawls are automatically released to engage the ratchet on the flywheel, thus cranking effort is applied to start the motor.

Upon having started the motor, pawls automatically disengage the flywheel ratchet and "Ready Pull" remains idle; consequently, no action takes place until the motor is started again. There are no

23

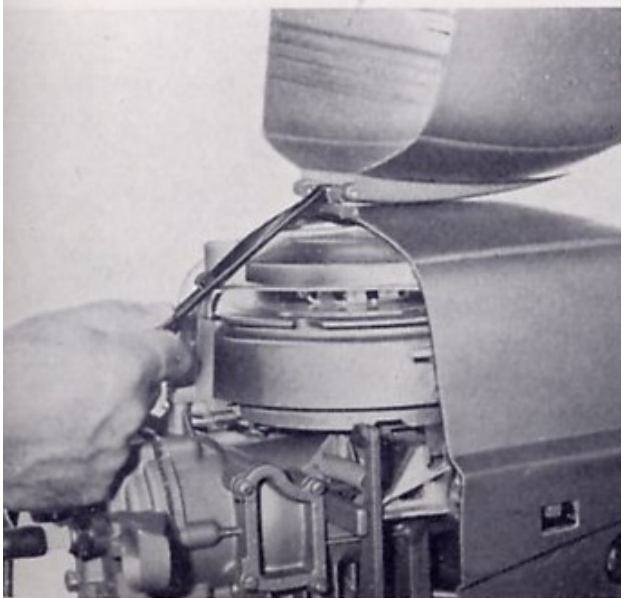


Figure 27

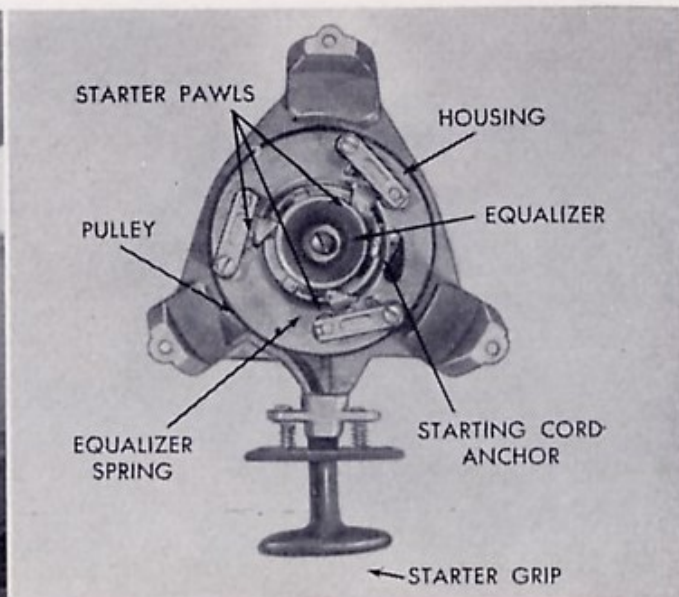


Figure 28



“Ready Pull” parts in action while the motor is in operation.

Care of the “Ready Pull”—Under no circumstances let the starting grip “snap” back into position after cranking by letting go. Retain hold of the grip until the cord has returned to normal position. Care should be exercised in this respect to prevent possible injury to the “Ready Pull,” cover and starting cord.

emergency starting

In the event that the Ready Pull fails to operate, broken starting cord, etc., it is still possible to start your motor. Simply remove the motor cover and the Ready Pull (Fig. 28). Wrap a piece of $\frac{1}{4}$ " cord clockwise around the emergency starting pulley (Fig. 29) part of the flywheel assembly. Start motor in usual manner.

Contact your Johnson dealer if the Ready Pull is damaged.

24

to install new starting cord:

1. Remove motor cover and starter assembly from motor.
2. Place starter assembly in vise as illustrated (Fig. 30).
3. Remove fragments of broken or damaged cord.

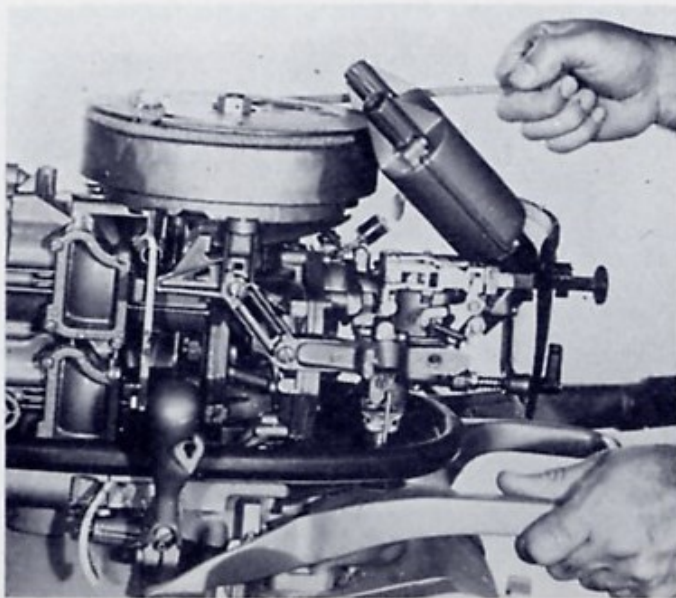


Figure 29

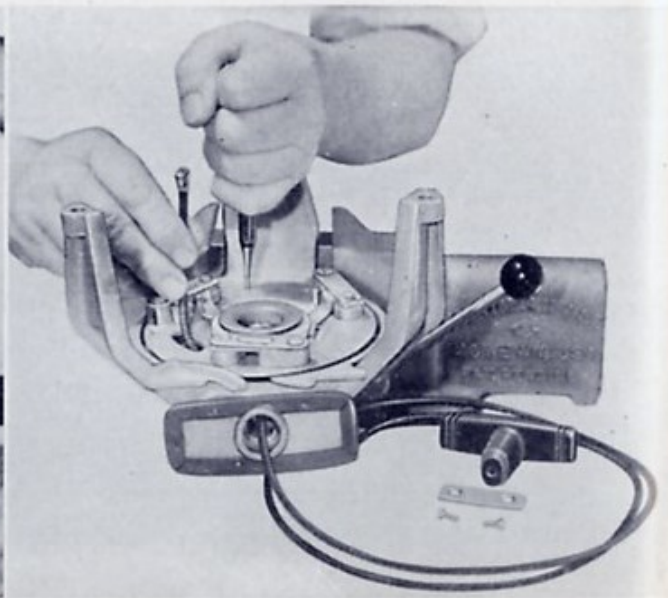


Figure 30



4. Obtain new cord . . . use only special cord provided by manufacturer.
5. Insert punch in hole of pulley provided for this purpose. Turn pulley against tension of spring until all of the tension is taken up, then permit pulley to unwind one quarter ($\frac{1}{4}$) turn.
6. Insert cord as illustrated. (End opposite anchor on cord through slot in pulley.)
7. Attach grip to cord.
8. Gradually release tension on pulley until all of the cord is taken up.
9. Attach starter assembly and motor cover to motor.

hard starting or failure to start is caused by

1. Gas tank empty.
2. Failure to pull choke.
3. Failure to fill carburetor bowl using fuel primer on tank.
4. Clogged fuel line and/or screen in gas tank.
5. Water in gasoline.
6. Carburetor needles not properly adjusted (see carburetor adjustment).
7. Improperly mixed fuel.
8. Fouled or defective spark plug.
9. Loose or disconnected spark plug leads.
10. Loose electrical connections.
11. Magneto breaker points corroded or out of adjustment.

25

overheating is caused by

1. Water pump not operating.
2. Water inlet obstructed.
3. Water tube disconnected, loose or clogged with foreign matter.
4. Boat transom too high, allowing air to reach water inlet.
5. Insufficient oil in the fuel mixture.



excessive vibration or rough running is caused by

1. Carburetor needles set too rich (open too far).
2. Motor loose on boat.
3. Propeller blades out of pitch (striking submerged obstructions).

Look for a sheared propeller drive pin in event the motor suddenly commences to "race" with little or no forward boat speed. Be certain too, that transom height of the boat does not exceed 15"—Model QD, 20" Model QDL—see page 6.

cleaning of gasoline filter

The gasoline filter element and bowl are located immediately below the carburetor as an integral assembly and accessible for inspection or cleaning on removal of the motor cover as described on page 22 —"To Remove Motor Cover."

26

Observe first the amount of foreign matter in the filter (glass) bowl to determine necessity of cleaning. If required to clean, unscrew "square" nut below the glass bowl to permit its removal. (Fig. 31). Care should be taken at this time to avoid loss or damage

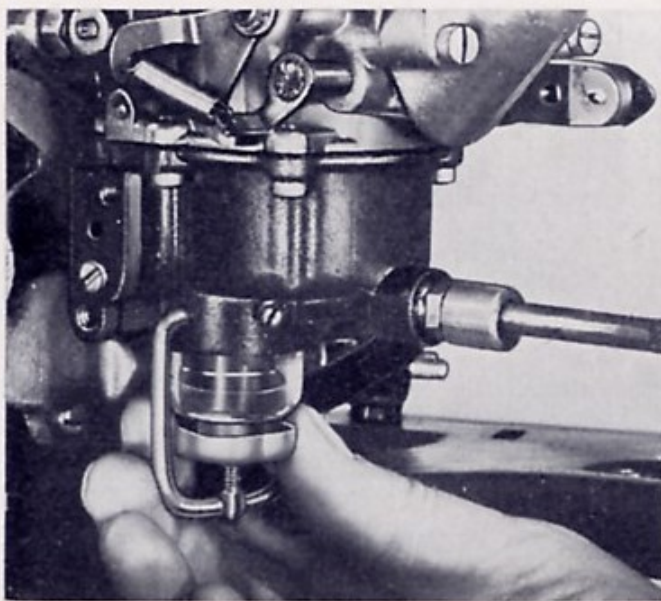


Figure 31

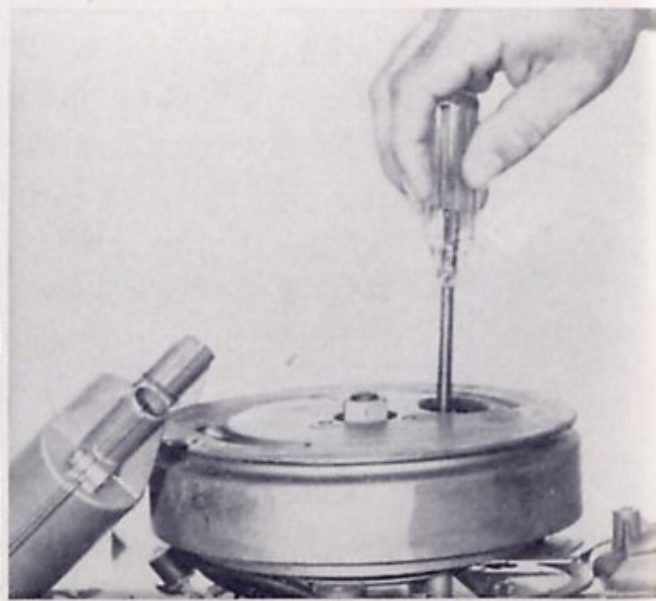


Figure 32



to the gasket placed between the filter bowl and body of the assembly. The filter element may be freed for cleaning by removing the center screw holding it in place—wash filter element in a container of alcohol.

assembling of filter

The filter should be assembled in reverse order of that described above—taking care that the gasket between the bowl and filter body is replaced in the same relative position it had prior to disassembly.

Lubrication of magneto oiler felt

27

The magneto is provided with a lubricating felt riding against the breaker cam to minimize wear on the breaker arm cam follower. 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.

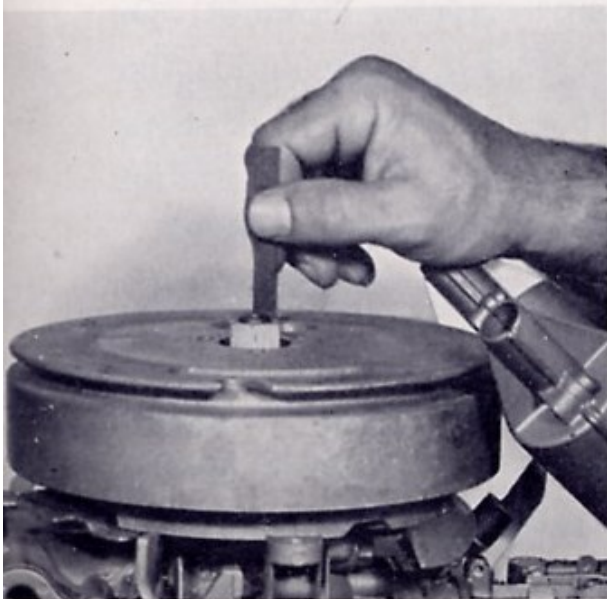


Figure 33

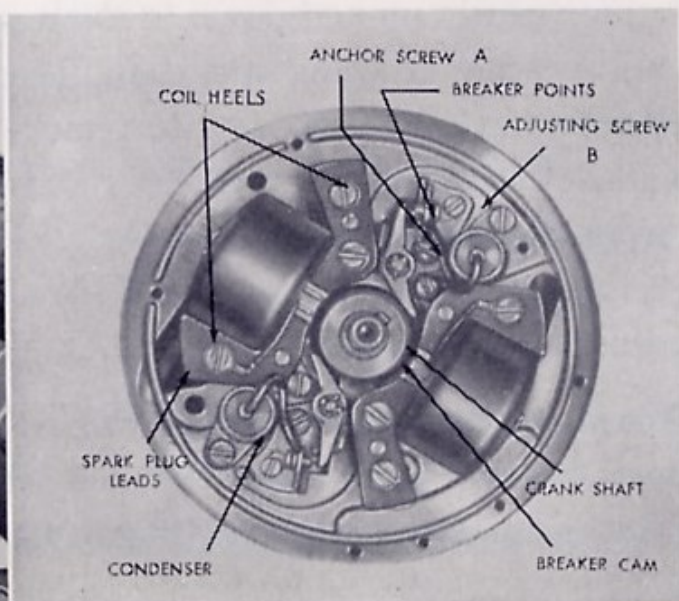


Figure 34



magneto breaker point cleaning and adjustment

From time to time it may be necessary to clean and adjust the magneto breaker points. Storing the motor in a damp place, or in a closed space where the humidity is relatively high, may create a condition affecting performance of the breaker points to cause faulty ignition.

disassembly and preparation for access to breaker points

28

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

cleaning operation

Carefully spread points with blunt instrument (Fig. 32) (small screw driver), insert point dresser. Release points, work point dresser gently up and down to clean point surfaces (Fig. 33). On completion of cleaning operation, insert strip of paper and in like manner work up and down to remove possible traces of dressing material left on point surfaces. See your Johnson Service Station for further corrective measures.

adjusting operation

Correct breaker point gap setting is .020" full open. To adjust, loosen breaker point assembly anchor screw "A" (Fig. 34) slightly—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—turn left to increase gap, right to reduce. Check with .020" feeler strip. Tighten anchor screw "A" to secure position of the assembly. Repeat procedure for adjusting other point assembly.

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.

29

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".)

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.

The swivel bracket and shift lever are provided with a grease fitting for periodical lubrication.

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



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

Do not cover the motor with a canvas hood or other device unless proper arrangements have been made for ample ventilation. The motor is well protected against weather under normal circumstances.

preparations for storage

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

- 30** Prior to storing the motor, run it on an extremely rich mixture (choke out) so that it will discontinue running. Purpose of this operation is to completely flood inside of the motor with oil-gasoline mixture while in storage.

Check for accumulated water in the gear case. See page 17. 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.

Remove spark plugs; pour about a tablespoonful of clean oil through each spark plug opening. Turn flywheel slowly by pulling on the starter cord grip, to distribute oil on cylinder walls. Replace spark plugs.



Drain all fuel from the Mile-Master tank, gas line and carburetor. Remove and clean gasoline filter element—see page 26.

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.

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.

31

care of the motor when operated in salt water

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

Under no circumstances permit the gear case to remain submerged when the motor is not in use for long periods of time.

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, including inside surface of motor cover.



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.

32

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

Work as much water as possible out of the cylinders and crankcase by turning the motor over slowly in upright and inverted positions.

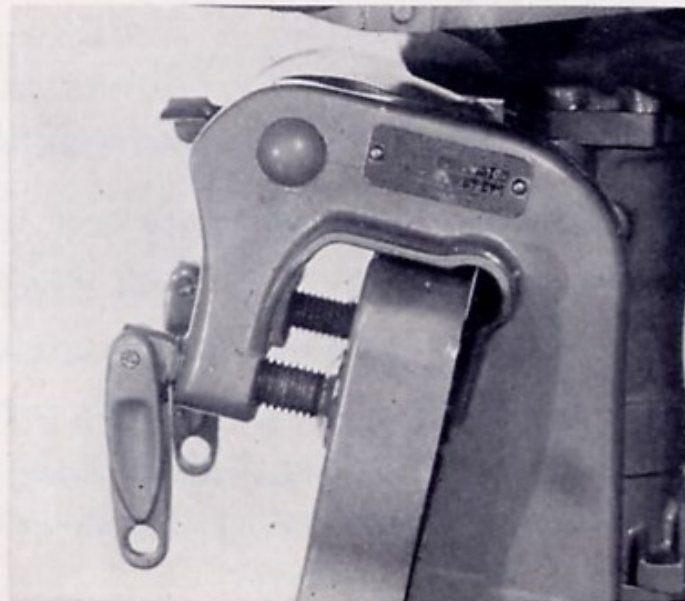


Figure 35



Pour small amount of oil into each cylinder.

Blow off armature plate with air pressure, if available; wipe dry with cloth. Set in warm, dry place. Allow ample time for thorough drying—make certain no water remains about the coils.

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

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 walls 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.

33

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 stern bracket (port side) as shown (Fig. 35) and on the plug on the starboard side of the cylinder.



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 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 (Enclosed in Tool Kit).

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

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 expressly in lieu of all other warranties and representations expressed or implied and of all other liabilities in connection with the sale or use of any 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 trade 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 racing outboard motors or 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.**

36

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.



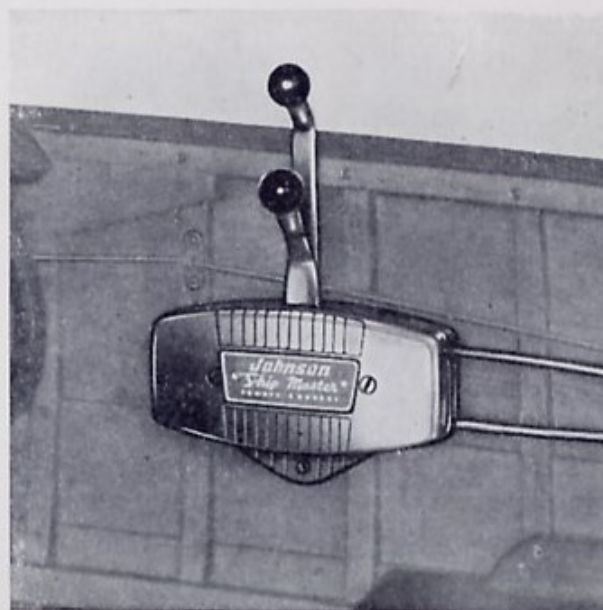
2. An efficient whistle or horn. (Only if over 16 ft. long).
3. Fire extinguishers are not required on outboard motor boats less than 26 feet in length of open construction not carrying passengers for hire (effective Dec. 18, 1953). All outboard cruisers and runabouts which are decked or partially decked 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) 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 sixteen 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.

SHIPMASTER REMOTE CONTROL

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 Remote Control Kit—consult the Johnson dealer.

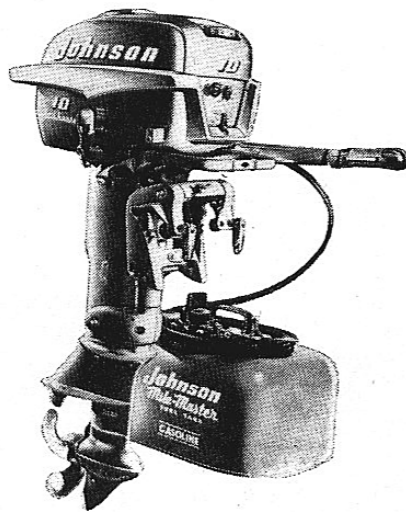




PARTS CATALOG

FOR

Models QD-16 and QDL-16



SEA-HORSE 10

JOHNSON MOTORS

Waukegan, Illinois, U. S. A.

Be Sure to Specify Model and Serial Number of Motor When Ordering Parts

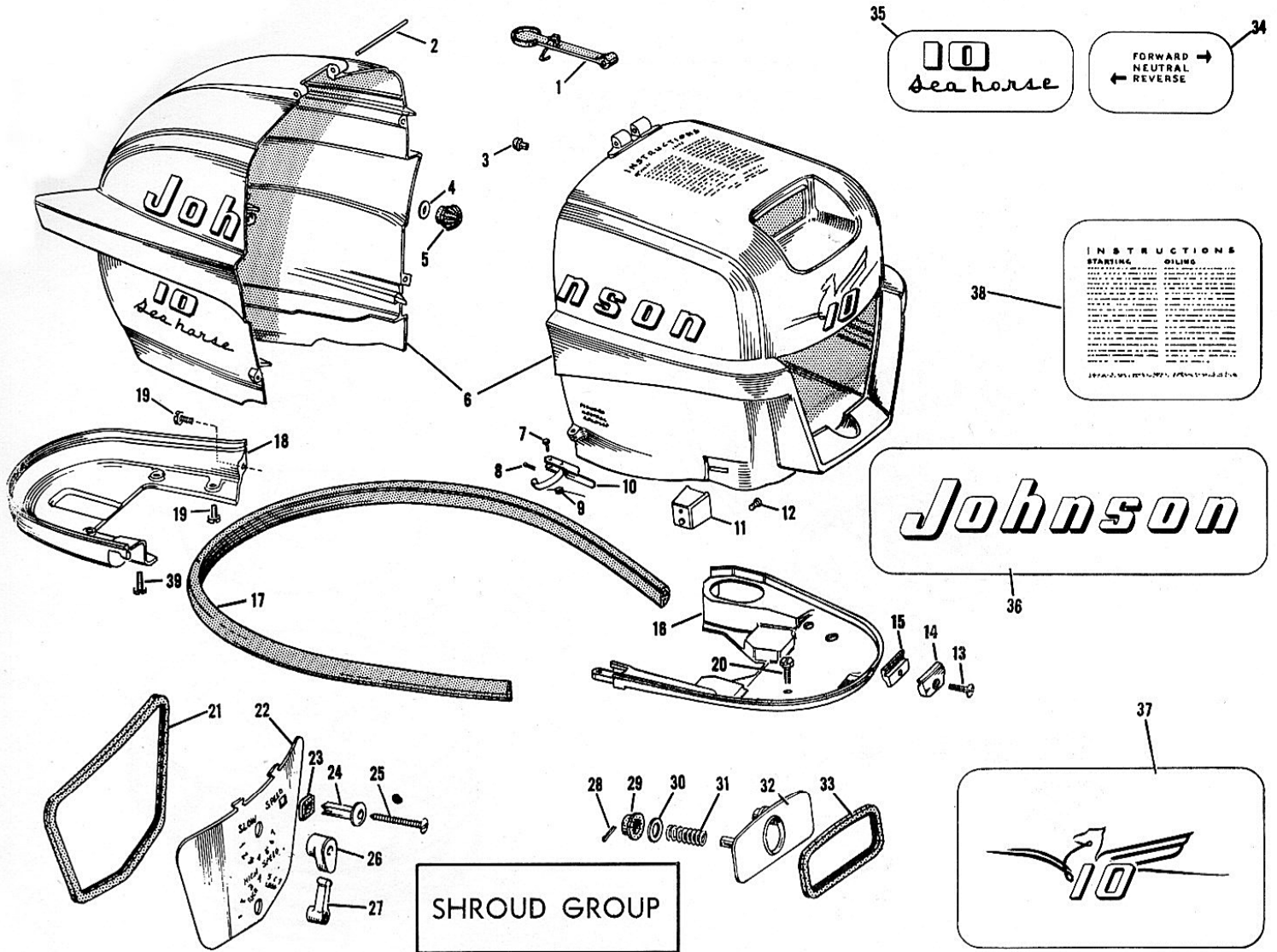


PHOTO AND PART NUMBERS

Photo No.	Part No.	Name of Part	Photo No.	Part No.	Name of Part
1	376432	Clip & Strap Assembly	23	303796	Grommet
2	303536	Hinge Pin	24	303718	Choke Knob
3	203290	Bumper	25	302761	Screw
4	303565	Washer	26	303847	Adjusting Lever - Slow Speed
5	303564	Bumper	27	303521	Adjusting Lever - High Speed
6	376403	Shroud & Transfer Assy.	28	41-163	Cotter Pin
7	303522	Pin	29	303535	Grommet
8	303590	Cotter Pin	30	202065	Washer
9	303519	Spring	31	303518	Spring
10	376129	Clamp & Lever Assembly	32	303528	Cover
11	303538	Boss	33	303529	Grommet
12	19-189	Screw	34	303824	Transfer - Gear Shift
13	304022	Screw	35	303826	Transfer - Sea Horse - 10 - Port & Star
14	304021	Clamp - Outer	36	304073	Transfer - Johnson - Port & Star
15	304020	Clamp - Inner	37	303827	Transfer - Sea Horse - 10 - Front
16	304004	Motor Cover - Lower - Front	38	303825	Transfer - Starting & Oiling Instructions
17	304014	Seal	39	304013	Screw
18	304005	Motor Cover - Lower - Rear			
19	304012	Screw			
20	304015	Screw			
21	303537	Grommet			
22	303534	Panel			

Order All Parts from Nearest Service Station or Dealer

MAGNETO GROUP

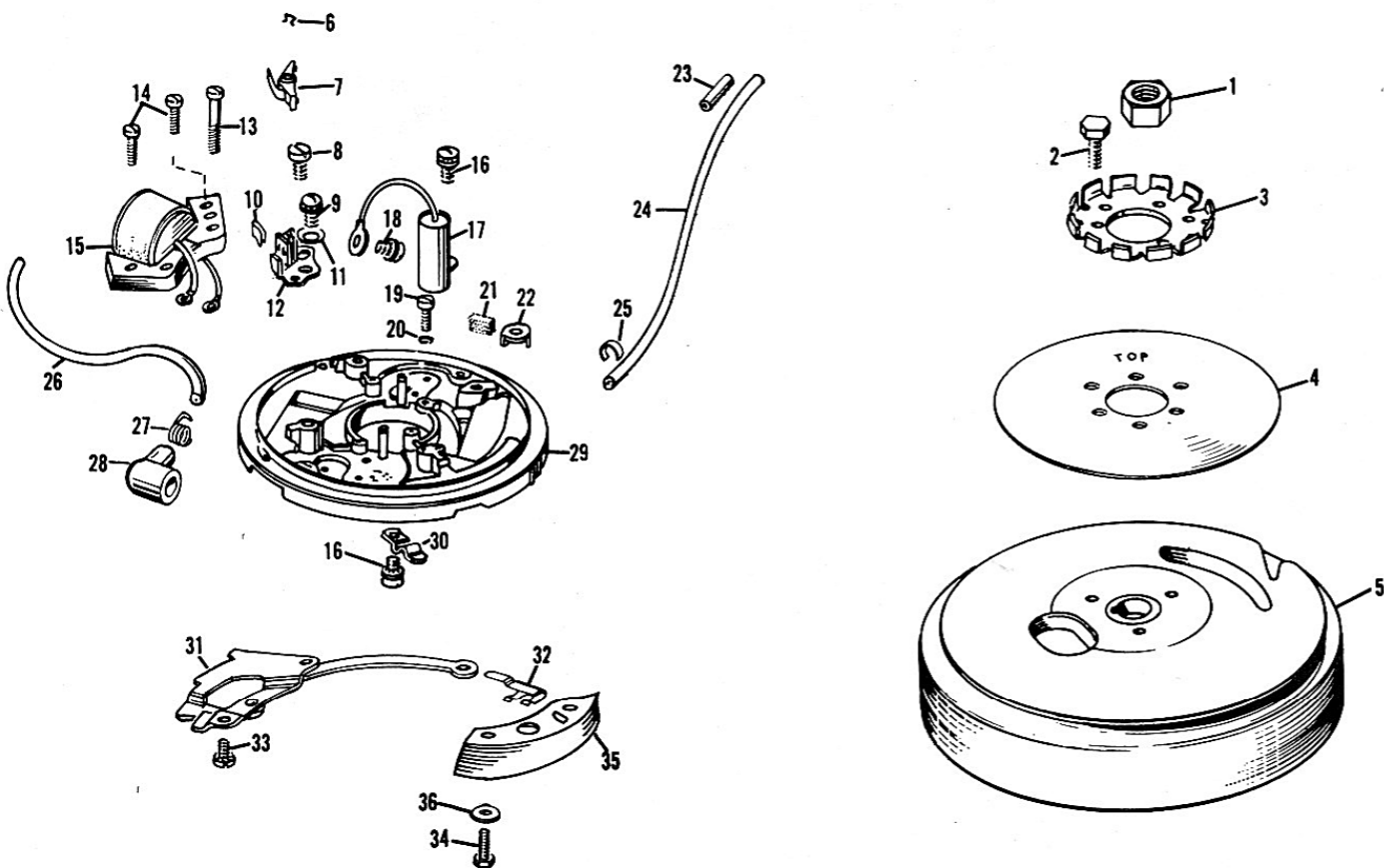


PHOTO AND PART NUMBERS

Photo No.	Part No.	Name of Part	Photo No.	Part No.	Name of Part
1	301988	Nut	19	510192	Screw
2	303289	Screw	20	3-28	Lockwasher
3	202111	Ratchet	21	510189	Oiler Wick
4	303249	Cover	22	510188	Oiler Clip
5	580155	Flywheel Assembly	23	510233	Insulating Sleeve
6	71-1052	Spring Clip	24	510234	High Tension Lead - Upper
7	580123	Breaker Arm Assembly (580148 Breaker Assembly Complete)	25	71-1239	Marker
8	510185	Eccentric Screw	26	510235	High Tension Lead - Lower
9	15-249	Screw	27	510231	Spring Terminal
10	510204	Clip	28	510232	Rubber Cover
11	510208	Bow Washer	29	580168	Armature Plate, Sleeve and Post Assembly (580153 Armature Plate Assembly Complete)
12	580122	Breaker Base Assembly (580148 Breaker Assembly Complete)	30	510218	Clamp
13	510191	Screw	31	376313	Link and Stop Assembly
14	510195	Screw	32	303146	Spring Clip
15	580118	Coil and Lamination Assembly	33	510193	Screw
16	510193	Screw	34	302750	Screw
17	510173	Condenser	35	203277	Cam
18	510194	Screw	36	300154	Washer

STARTER GROUP

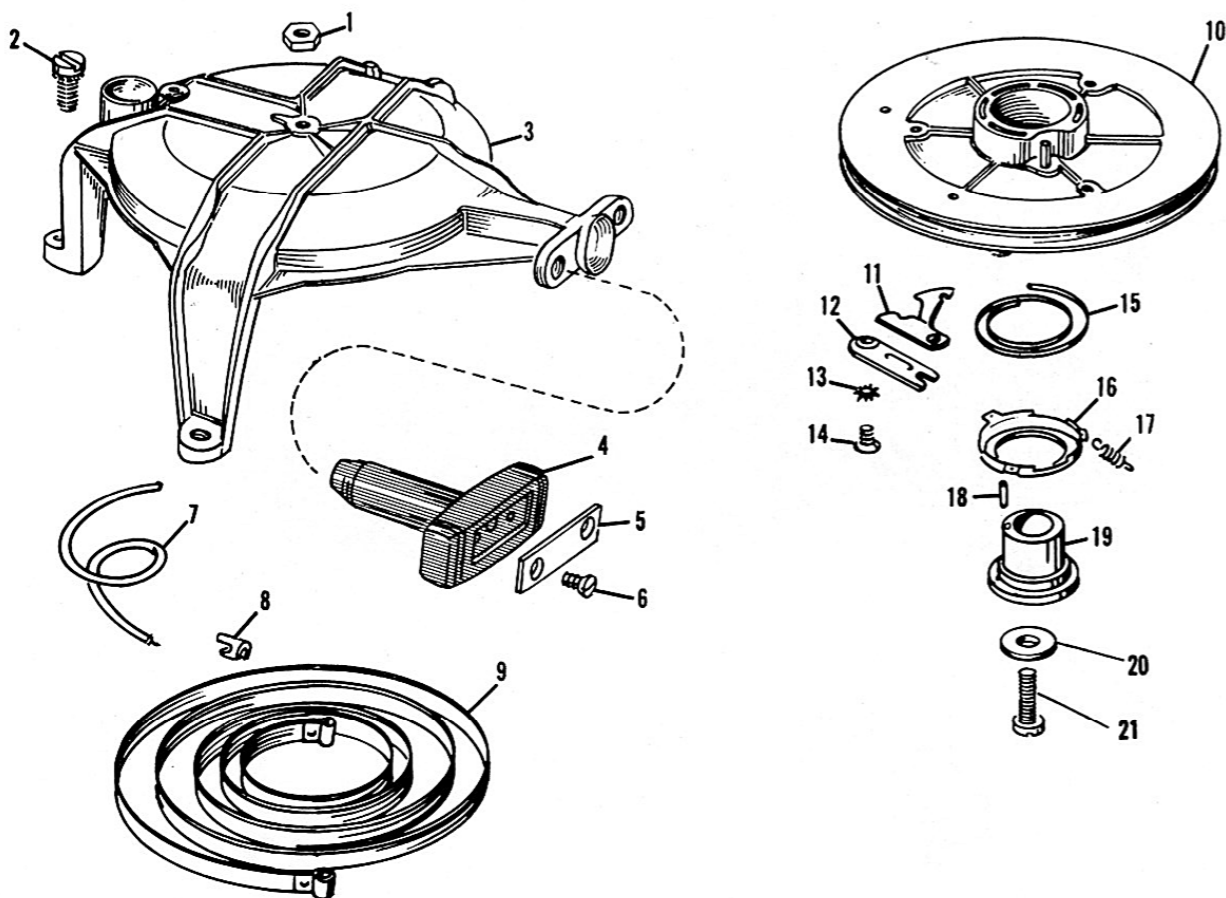


PHOTO AND PART NUMBERS

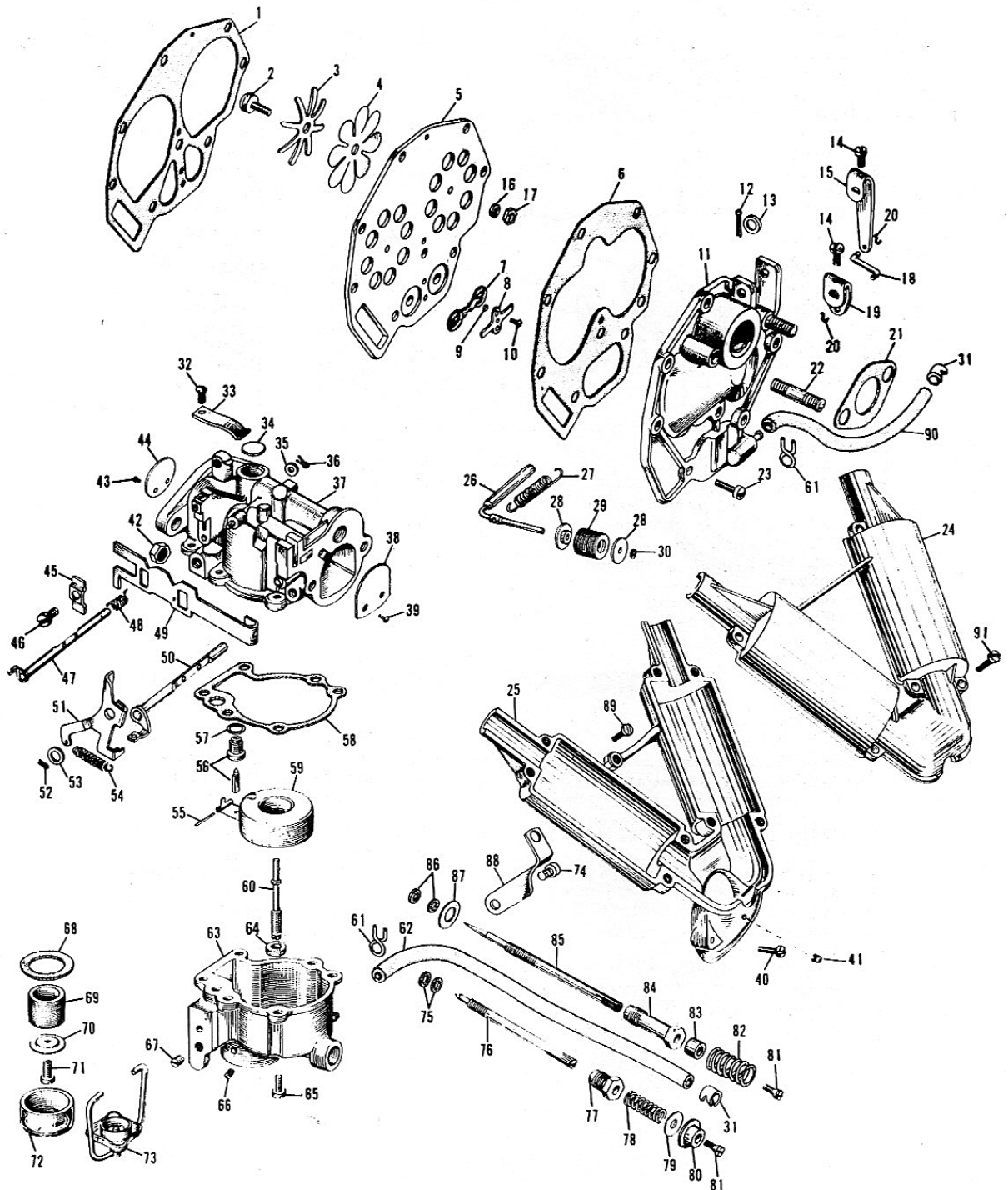
Photo No.	Part No.	Name of Part	Photo No.	Part No.	Name of Part
1	302103	Nut	11	202470	Starter Pawl
2	303288	Screw	12	202317	Retainer
3	376339	Starter Housing & Pin Assembly (376251 Starter Assembly Complete)	13	71-1026	Lockwasher
4	376132	Handle	14	302104	Screw
5	303516	Clamp Plate	15	302222	Friction Spring
6	41-205	Screw	16	202114	Equalizer Cup
7	*304096	Starter Rope	17	202155	Spring
8	41-314	Anchor	18	202156	Pin
9	41-197	Starter Spring	19	276643	Spindle & Pin Assembly
10	*376376	Starter Pulley Assembly	20	202356	Washer
			21	51-223	Screw

*Model QD and QDL-16 Motors built prior to Serial No. 1225643 order like part:

Photo No.	Part No.	Name of Part
7	42-137	Starter Rope
10	590646	Starter Pulley Assembly

Order All Parts from Nearest Service Station or Dealer

CARBURETOR AND LEAF VALVE GROUP



Order All Parts from Nearest Service Station or Dealer

PHOTO AND PART NUMBERS FOR
CARBURETOR AND LEAF VALVE GROUP

Photo No.	Part No.	Name of Part	Photo No.	Part No.	Name of Part
1	303484	Gasket	47	376153	Throttle Shaft and Lever Assembly
2	301858	Screw	48	303765	Spring
3	302047	Leaf Stop	49	303143	Choke Rod
4	301965	Leaf	50	375993	Choke Shaft and Lever Assembly
5	303483	Leaf Plate	51	303144	Bellcrank
6	303486	Gasket	52	41-163	Cotter Pin
	(376260 Leaf	Plate Assembly)	53	85-54	Washer
7	302042	Check Valve	54	302747	Spring
8	302048	Spring	55	300096	Hinge Pin
9	302046	Spacer	56	375985	Float Valve and Seat Assembly
10	19-191	Screw	57	301996	Gasket
11	376114	Manifold, Nipple and Stud Assembly	58	302994	Gasket
12	41-163	Cotter Pin	59	375919	Float and Arm Assembly
13	303048	Washer	60	303618	Nozzle
14	302346	Screw	61	302647	Clamp
15	303540	Arm	62	203286	Hose
16	71-1487	Lockwasher	63	376404	Float Chamber & Nipple Assembly
17	85-64	Nut	64	302984	Gasket
18	303539	Link	65	71-1589	Screw
19	303491	Arm	66	303041	Screw
20	41-110	Pin	67	303125	Screw Plug
21	303531	Gasket	68	303122	Gasket
22	302822	Stud	69	303133	Filter Element
23	43-110	Screw	70	303134	Retainer
24	203352	Air Silencer - Upper Half	71	132509	Screw
25	203353	Air Silence - Lower Half	72	303121	Filter Bowl
26	303541	Cam Follower	73	376231	Filter Yoke Assembly
27	203276	Spring	74	43-147	Screw
28	303279	Bushing	75	43-123	Packing
29	203362	Roller	76	303159	Needle Valve - High Speed
30	203363	Retainer	77	300179	Nut
31	301822	Clamp	78	303518	Spring
32	302430	Screw	79	202065	Washer
33	303132	Spring	80	303535	Grommet
34	202310	Expansion Plug	81	551517	Screw
35	303048	Washer	82	303548	Spring
36	303049	Cotter Pin	83	303532	Sleeve
37	376253	Carb. Body, Bell- crank Shaft and Plug Assembly	84	303291	Nut
	(376120 Carburetor Assembly Complete)		85	303758	Needle Valve - Slow Speed
38	303126	Choke Valve	86	43-123	Packing
39	303760	Screw	87	203355	Washer
40	132346	Screw	88	303544	Bracket
41	203652	Button Plug	89	43-156	Screw
42	7-46	Nut	90	203287	Hose
43	303760	Screw	91	43-259	Screw
44	303495	Throttle Valve			
45	303117	Bracket			
46	131249	Screw			

Be Sure to Specify Model and Serial Number of Motor When Ordering Parts

POWER HEAD GROUP

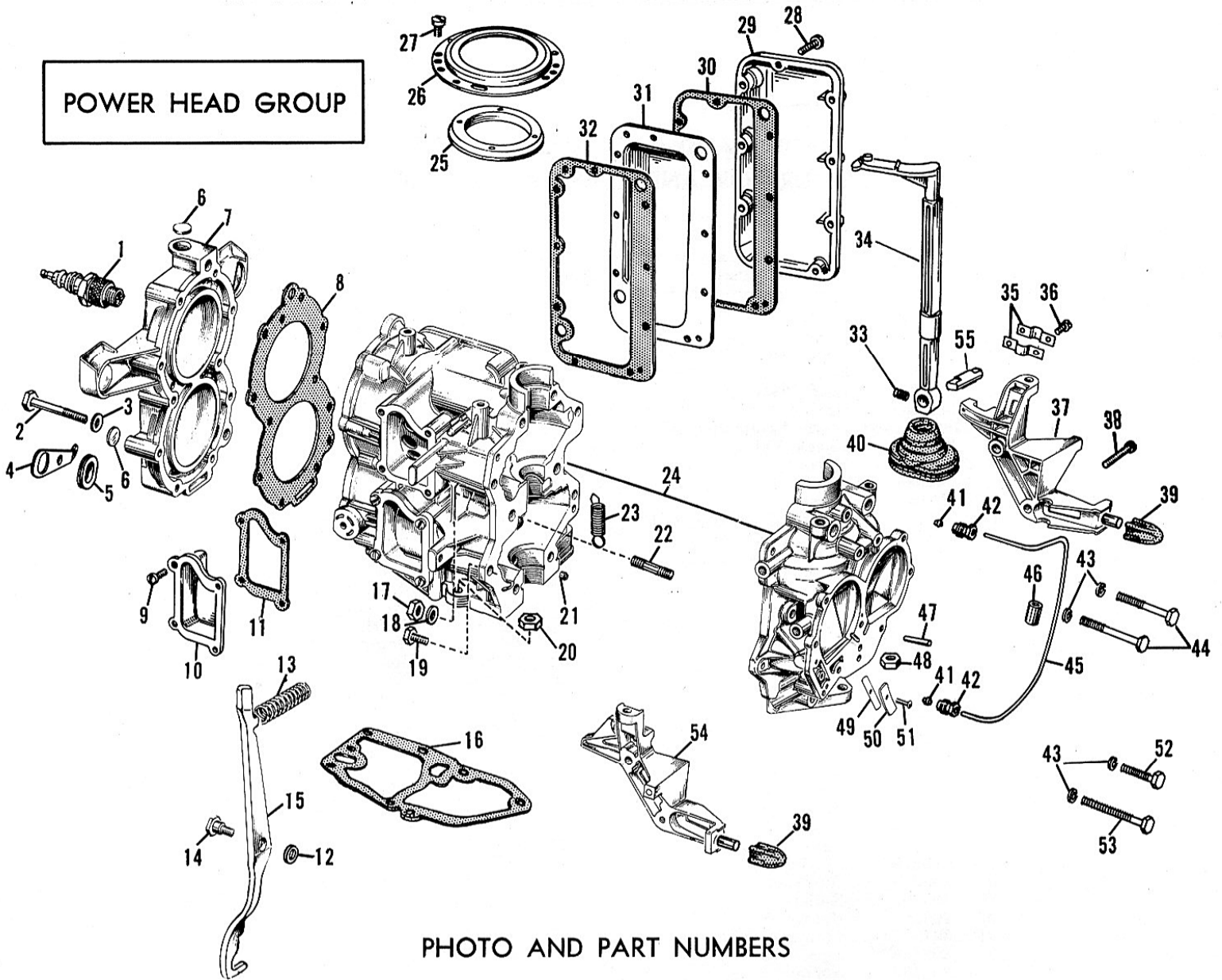


PHOTO AND PART NUMBERS

Photo No.	Part No.	Name of Part	Photo No.	Part No.	Name of Part	Photo No.	Part No.	Name of Part
1	*200322	Spark Plug (Champion J6J)	16	303892	Gasket	36	510193	Screw
1	*376290	Spark Plug (Auto-Lite A3X)	17	7-46	Nut	37	303919	Bracket - Port
2	302009	Screw	18	37-154	Washer	38	41-178	Screw
3	300399	Washer	19	51-135	Screw	39	303922	Bumper
4	300455	Anchor	20	7-46	Nut	40	304019	Grommet
5	300454	Grommet	21	302037	Dowel	41	11-61	Gland
6	19-51	Core Plug - Bottom	22	21-170	Stud	42	41-105	Packing Nut
6	27-309	Core Plug - Top	23	302827	Spring	43	37-154	Washer
7	376130	Cylinder Head Assembly	24	376335	Cylinder and Crankcase Assembly	44	300355	Screw
8	301862	Gasket	25	303277	Retaining Ring	45	376291	Oil Line Assembly
9	43-259	Screw	26	303278	Support	46	302811	Spacer
10	301848	Cover	27	41-223	Screw	47	300402	Taper Pin
11	301847	Gasket	28	132346	Screw	48	7-46	Nut
12	304051	Washer	29	303995	Cover	49	203235	Leaf Valve
13	302587	Spring	30	301853	Gasket	50	203248	Plate
14	302592	Screw	31	301849	Cover	51	19-191	Screw
15	303921	Shifter Lock	32	301854	Gasket	52	21-487	Screw
			33	303236	Spring	53	25-242	Screw
			34	**304159	Lever	54	303920	Bracket - Star
			35	303109	Bearing Clamp	55	304155	Pin

*We recommend either Champion or Auto-Lite Spark Plugs.

**Model QD and QDL-16 Motors built prior to Serial No. 1227814 order Part No. 376430.

Order All Parts from Nearest Service Station or Dealer

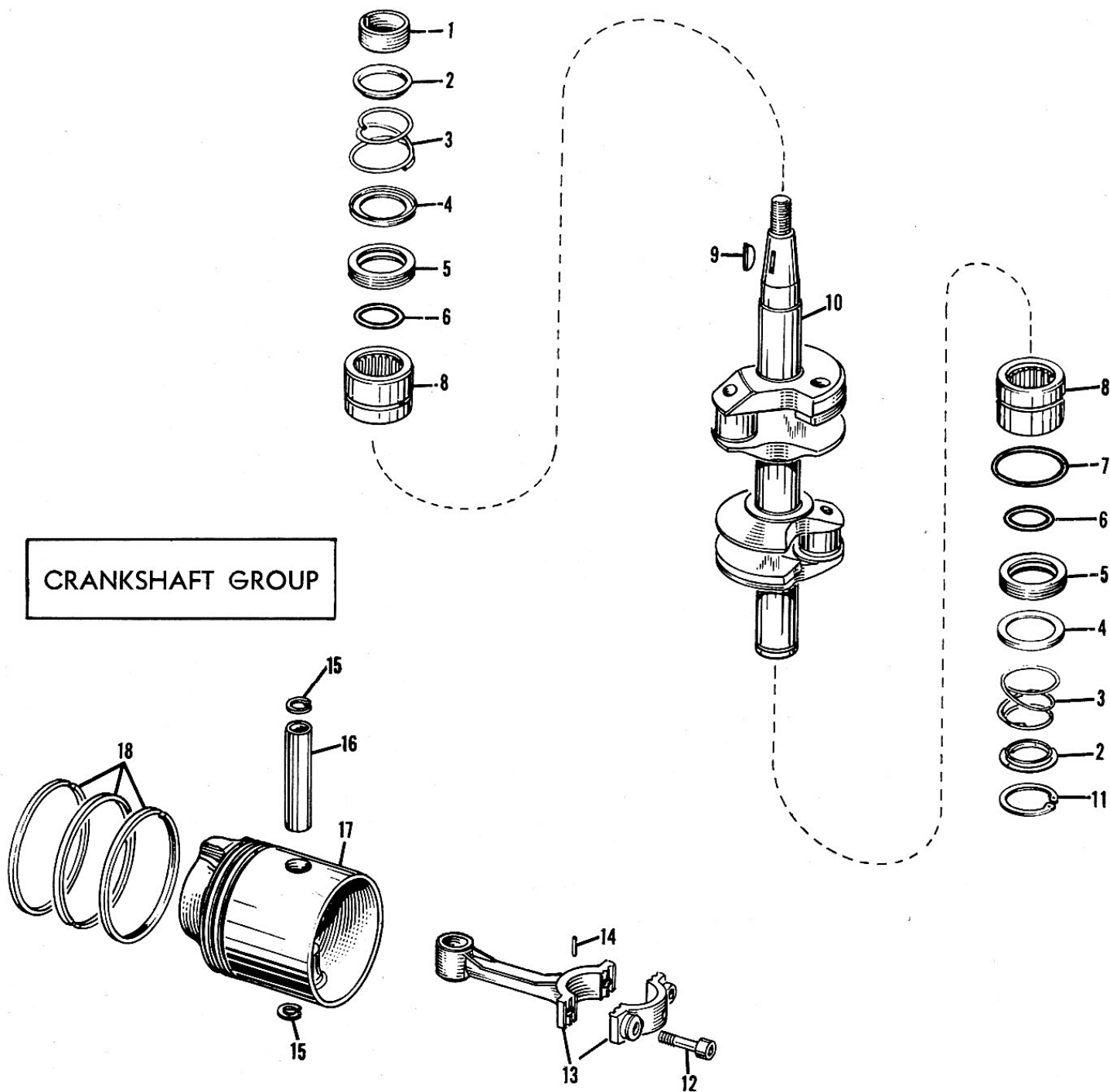


PHOTO AND PART NUMBERS

Photo No.	Part No.	Name of Part	Photo No.	Part No.	Name of Part
1	510168	Cam	13	376223	Connecting Rod Assembly
2	301857	Retaining Washer	14	27-148	Needle Bearing
3	301861	Spring	15	303712	Lock Ring
4	301860	Retaining Washer	16	303711	Wrist Pin
5	302036	Seal	17	376202	Piston Dowel Pin Assembly
6	301967	O-Ring		(376224 Piston, Connecting Rod - with rings - upper)	
7	302035	O-Ring		(376226 Piston, Connecting Rod - with rings - lower)	
8	302499	Needle Bearing Assembly	18	301787	Piston Rings
9	120395	Key			
10	376380	Crankshaft			
11	301859	Retaining Ring			
12	202967	Screw			

Order All Parts from Nearest Service Station or Dealer

DRIVESHAFT CASING GROUP

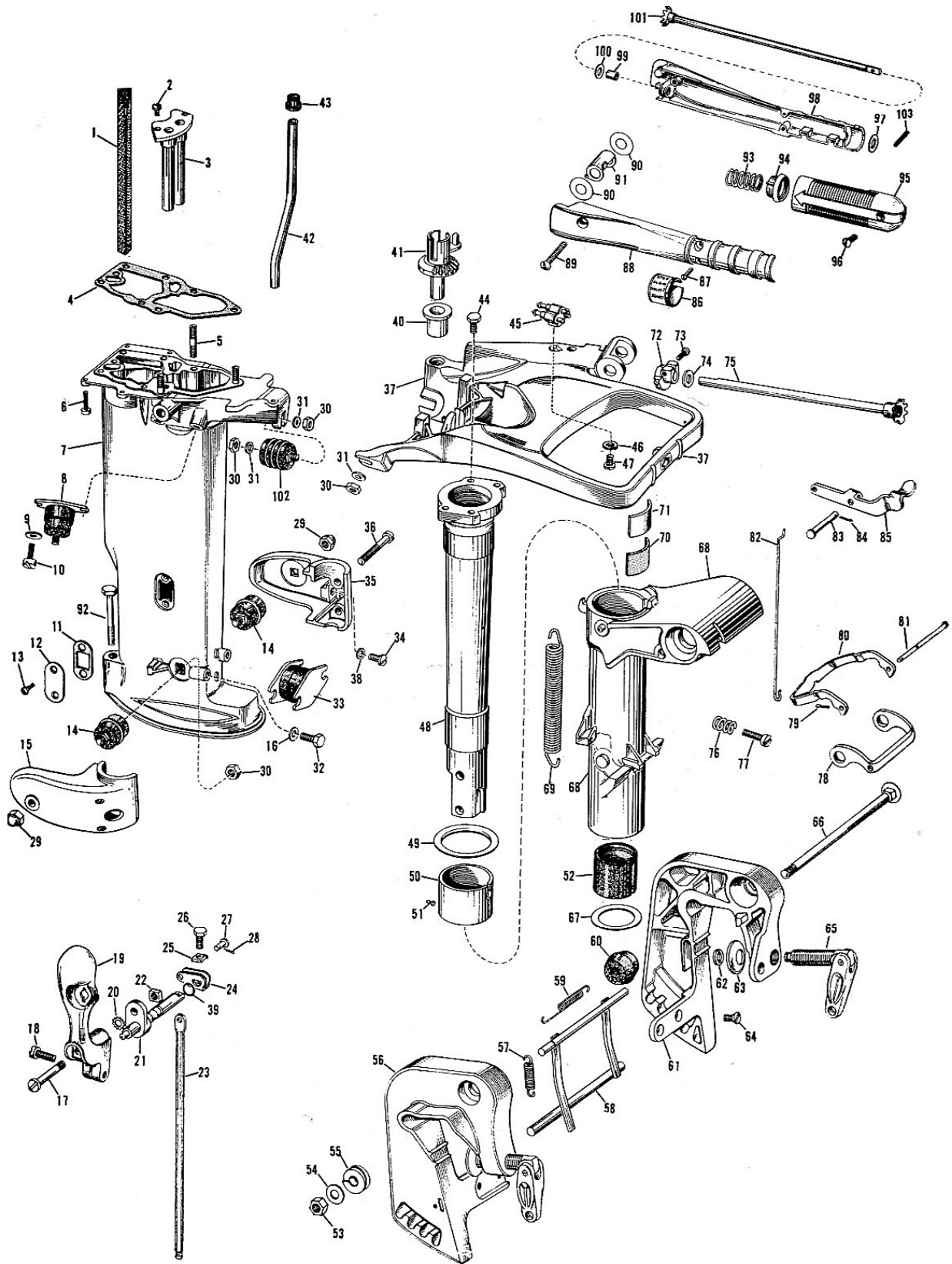


PHOTO AND PART NUMBERS FOR DRIVESHAFT CASING GROUP

Photo No.	Part No.	Name of Part	Photo No.	Part No.	Name of Part
1	304002	Baffle	54	25-196	Washer
2	25-74	Screw	55	302051	Spring
3	304880	Exhaust Loading Tube Assembly	56	376283	Stern Bracket As- sembly - Star
4	377070	Gasket	57	202021	Spring
5	15-149	Stud	58	376312	Tilting Lever Assembly
6	25-238	Screw	59	304095	Spring
7	376406	Exhaust Tube and Stud Assembly	60	301983	Conical Washer
8	303879	Rubber Mount - Upper Side	61	376284	Stern Bracket Assembly - Port
9	303887	Washer	62	302420	Retainer
10	39-176	Screw	63	41-48	Swivel Plate
11	304023	Gasket	64	303396	Screw
12	303862	Cover Plate	65	375742	Clampscrew, Swivel Plate & Retainer Assembly
13	302509	Screw	66	301984	Bolt
14	303880	Rubber Mount	67	303865	Thrust Washer
15	303897	Housing - Star	68	303840	Swivel Bracket
16	303886	Washer	69	303979	Spring
17	39-72	Screw	70	303843	Spacer
18	51-47	Screw	71	303844	Plate
19	376308	Shift Lever & Pin Assembly	72	303142	Pinion
20	303480	Lockwasher	73	71-1352	Screw
21	376307	Adjusting Lever & Shift Shaft Assy.	74	303107	Washer
22	303189	Nut	75	376306	Gear & Shaft Assembly - Short
23	303861	Shift Rod - Upper	76	551113	Spring
24	303720	Lever	77	132679	Screw
25	303721	Clip	78	303950	Link
26	303722	Screw	79	15-268	Cotter Pin
27	302504	Pin	80	303948	Locking Lever
28	301912	Cotter Pin	81	303949	Rod
29	303890	Acorn Nut	82	303978	Link
30	303889	Nut	83	303930	Pivot Shaft
31	303884	Washer	84	303049	Cotter Pin
32	303888	Screw	85	303980	Arm
33	303881	Rubber Mount	86	303110	Plate
34	303883	Screw	87	133452	Screw
35	303896	Housing - Port	88	303093	Steering Handle - Inner Half
36	303898	Screw	89	303078	Screw
37	376297	Steering Bracket & Bushing Assy.	90	303079	Washer
38	303886	Washer	91	303096	Cover
39	303191	O-Ring	92	302871	Screw
40	303854	Bushing	93	301656	Spring
41	*304157	Gear	94	303282	Friction Block
42	303917	Water Tube	95	303213	Grip
43	302497	Grommet	96	302710	Screw
44	21-171	Screw	97	303252	Washer
45	375788	Fuel Connector Assembly	98	376042	Steering Handle & Bushing Assembly
46	51-137	Lockwasher	99	302717	Bushing
47	21-359	Screw	100	302712	Washer
48	303853	Pilot Shaft	101	376416	Gear and Shaft Assembly - Long
49	303842	Thrust Washer	102	303878	Rubber Mount - Upper - Front
50	303846	Upper Liner	103	300346	Groove Pin
51	303696	Pin			
52	303841	Shock Absorber			
53	17-182	Nut			

*Model QD and QDL-16 Motors built prior to Serial No. 1227814 order Part No. 376430.

MODEL QDL-16 PARTS THAT DIFFER FROM MODEL QD-16

Photo No.	Part No.	Name of Part	Photo No.	Part No.	Name of Part
42	304037	Water Tube (QDL)	102	304153	Rubber Mount - upper front (QDL)
92	304135	Screw (QDL)			

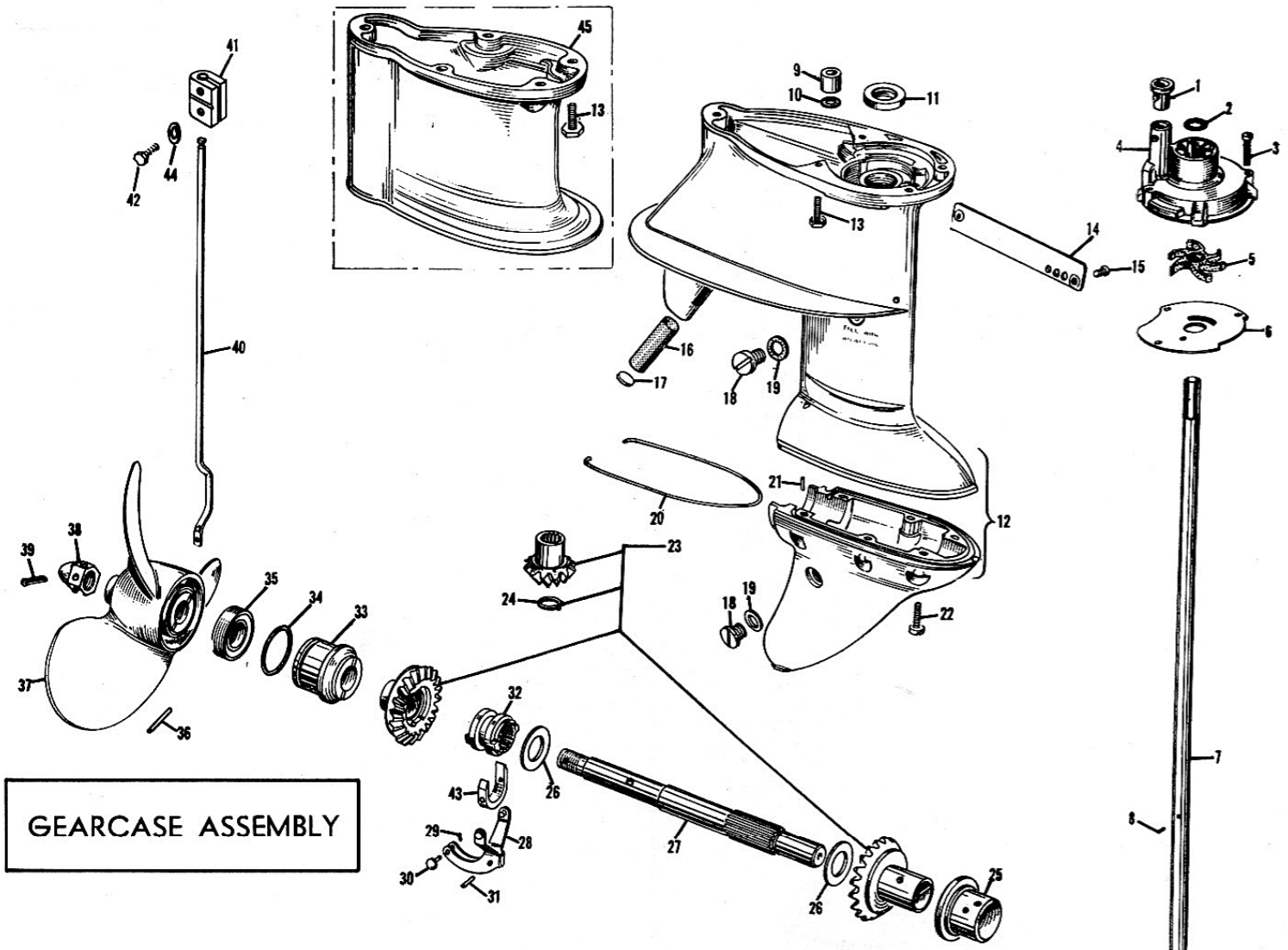


PHOTO AND PART NUMBERS

Photo No.	Part No.	Name of Part	Photo No.	Part No.	Name of Part
1	302497	Grommet	24	301883	Retaining Ring
2	303067	O-Ring	25	302496	Bearing
3	302508	Screw	26	301884	Thrust Washer
4	303070	Impeller Housing	27	302483	Propeller Shaft
5	375638	Impeller Assembly	28	375755	Shifter Lever and Pin Assembly
6	303069	Plate	29	15-268	Cotter Pin
7	303860	Driveshaft	30	302504	Pin
8	300771	Pin	31	302501	Pivot Pin
9	301878	Bushing	32	375711	Shifter Assembly
10	301877	O-Ring	33	375751	Gearcase Head and Bearing Assembly
11	41-62	Seal	34	302493	O-Ring
12	376402	Gearcase and Bearing Assembly	35	302495	Seal
13	302510	Screw	36	301923	Drive Pin
14	302505	Cover	37	375605	Propeller and Bushing Assembly
15	302509	Screw	38	132477	Nut
16	302757	Screen	39	302381	Cotter Pin
17	300314	Plug	40	303098	Shift Rod - Lower
18	27-283	Screw	41	303794	Connector
19	27-284	Washer	42	304024	Screw
20	302513	Seal	43	302500	Cradle
21	300611	Dowel	44	301551	Lockwasher
22	33-76	Screw			
23	375844	Pinion, Gears and Bushing Assembly			

MODEL QDL-16 PARTS THAT DIFFER FROM MODEL QD-16

7	304036	Driveshaft (QDL)	40	303257	Shift Rod (QDL)
13	302510	Screw (QDL)	45	304136	Gearcase Extension (QDL)

See page 11 for additional Model QDL-16 parts.

MILE MASTER FUEL TANK ASSEMBLY

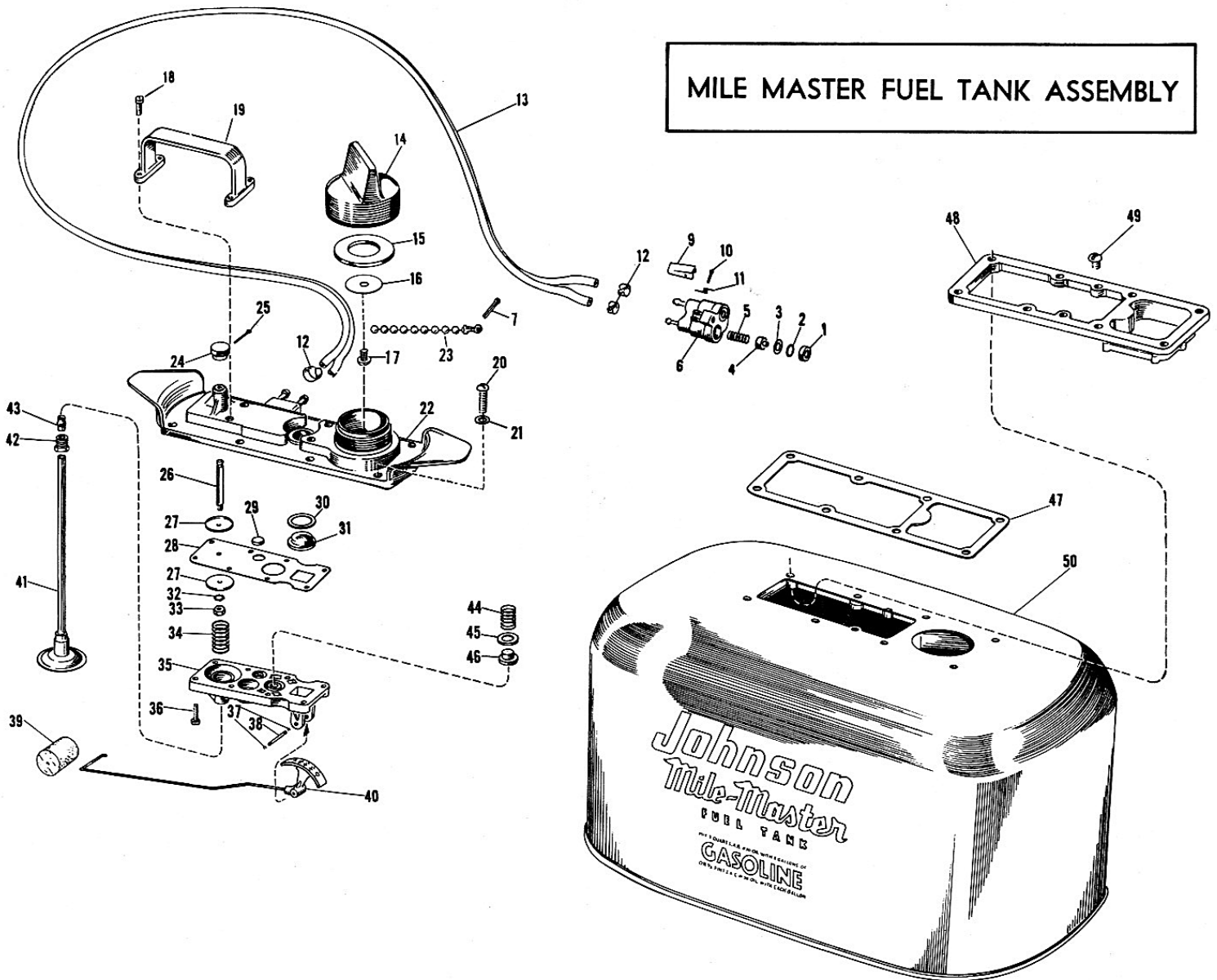


PHOTO AND PART NUMBERS

Photo No.	Part No.	Name of Part	Photo No.	Part No.	Name of Part
1	301828	Retainer	27	301800	Support
2	301824	O-Ring	28	302563	Diaphragm
3	301827	Washer	29	301802	Disc Valve
4	301826	Valve	30	302571	Seal
5	301825	Spring	31	302568	Glass
6	375587	Fuel Connector Assembly	32	301736	Lockwasher
7	15-213	Cotter Pin	33	21-195	Nut
9	301830	Lock	34	301803	Spring
10	301832	Rivet	35	302555	Housing
11	301829	Spring	36	13-558	Screw
12	301822	Hose Clamp	37	302654	Snap Ring
13	301821	Hose	38	302653	Pin
14	375817	Filler Cap Assembly	39	302559	Float
15	301835	Gasket	40	375778	Indicator Assembly
16	302560	Plate	41	375846	Foot Valve Assembly
17	301837	Screw	42	132691	Nut
18	13-558	Screw	43	13-304	Gland
19	302570	Handle	44	302135	Spring
20	304137	Screw	45	302137	Washer
21	301814	Gasket	46	302136	Valve
22	376276	Housing	47	302557	Gasket
23	301838	Chain	48	302556	Support
24	301815	Push Button	49	53-85	Screw
25	17-186	Cotter Pin	50	375774	Fuel Tank (Only)
26	302561	Push Rod			(375777 Fuel Tank Assembly Complete)

Order All Parts from Nearest Service Station or Dealer