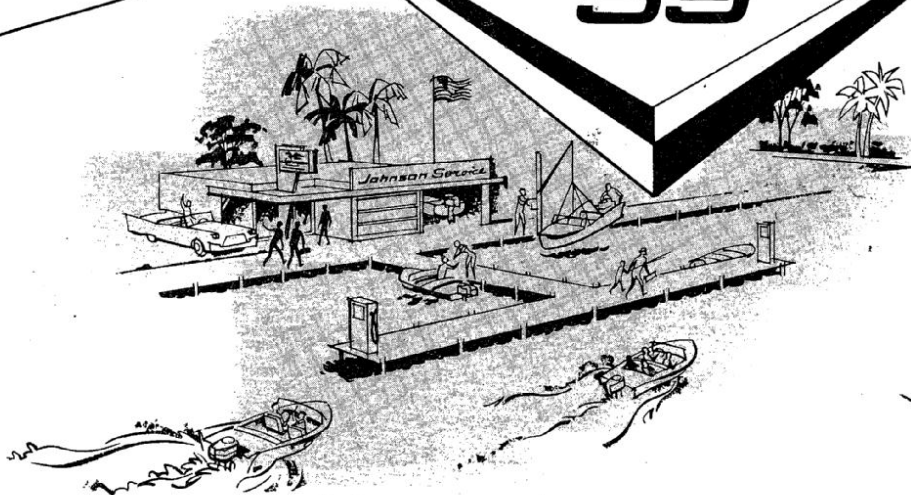
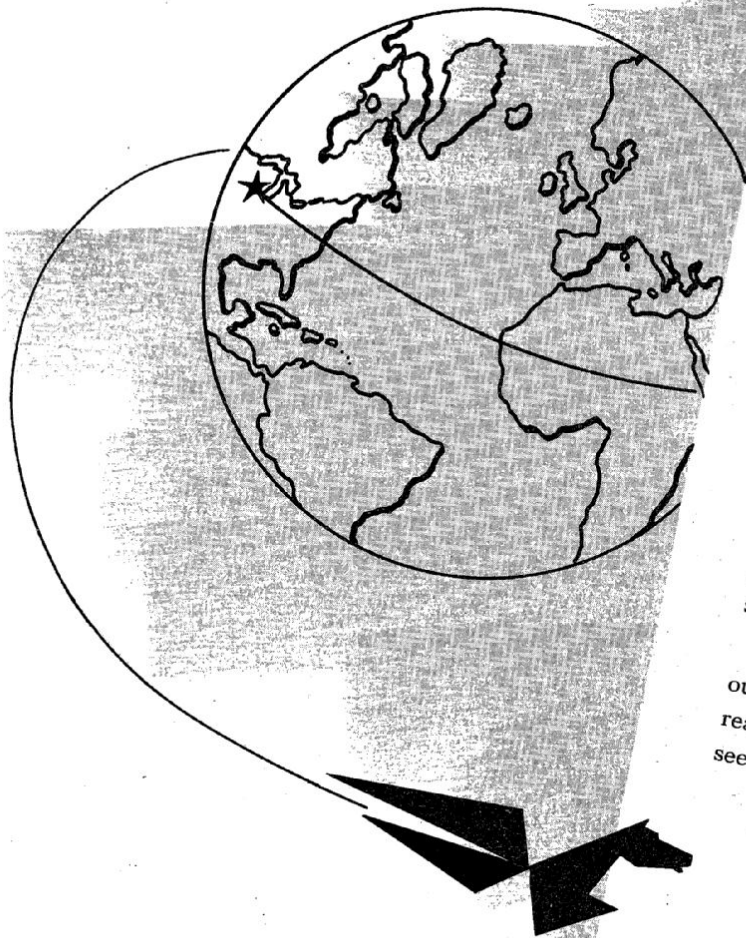


Johnson

Owner's Manual '59



SEA-HORSE $5\frac{1}{2}$ HP MODELS CD · CDL



Welcome Aboard

Welcome into the family of Johnson Sea-Horse owners — we are glad you chose a Johnson.

Your new Johnson Sea-Horse is designed and constructed to give you a maximum in service and performance. Please study this instruction book for your motor in order to have a complete understanding of its operation and take full advantage of its many built in features.

Your Johnson Sea-Horse is produced under the finest quality controlled methods and built to give you many hours of dependable 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 Sea-Horse motor.

With this policy uppermost in our minds, it has been our endeavor to place a Johnson Service Station within easy reach of every Johnson Sea-Horse owner. Away from home, see the Dealer's Service Station list included with each motor.

Dependably yours,

JOHNSON MOTORS

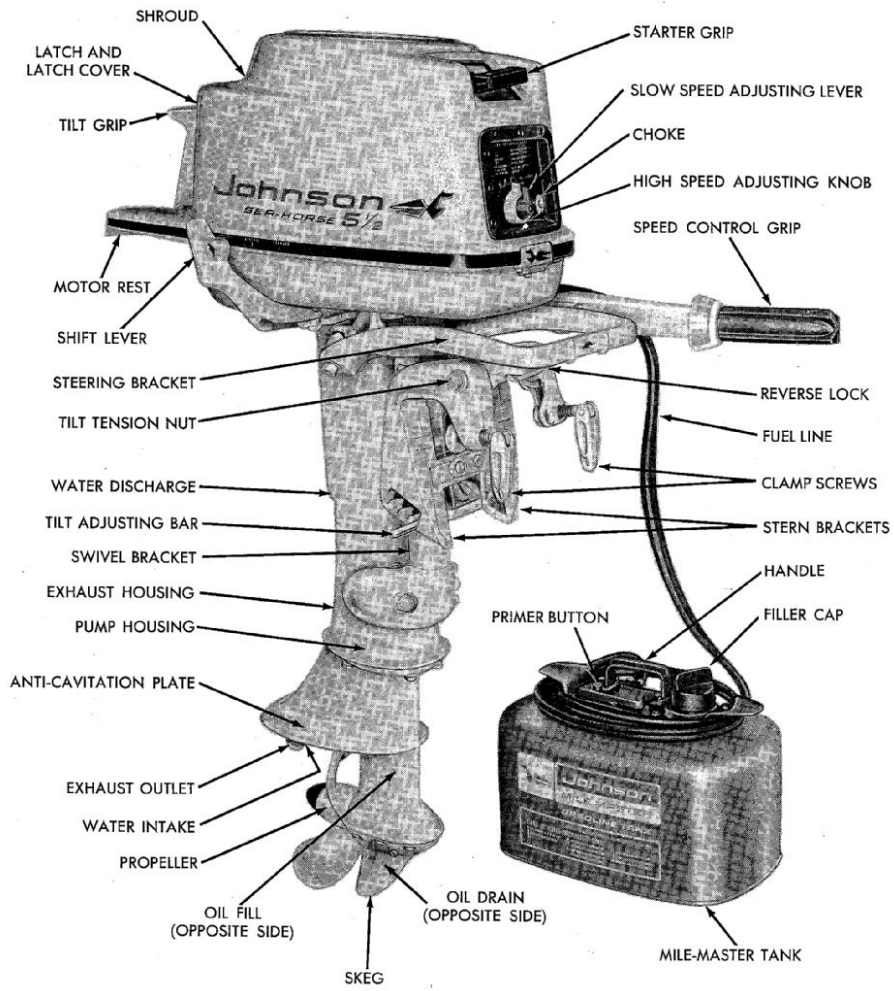
Index



	Page		Page		Page
SPECIFICATIONS	5	Tilt Tension Adjustment	11	Cleaning Magneto Points	17
HERE'S HOW TO INSTALL		Carburetor Adjustment	11	Cooling	17
YOUR MOTOR	6	Emergency Starting	11	Cleaning Fuel Filter	18
Proper Transom Height		Removing Motor From Boat	11	Cleaning Carburetor Float	
is Important	6	TAKING CARE OF YOUR MOTOR	12	Chamber	18
Securing Motor to Boat	6	Gear Lubrication	12	Before Storing Your Motor	20
Reverse Lock	6	Removing Propeller	13	After Storing — Before Using	20
Angle Adjustment	7	Drive Pin Replacement	13	Three Point Check List	20
HOW TO GET STARTED	8	Lubrication Chart	13	EQUIPMENT FOR YOUR BOAT	22
Breaking In	8	Removing Motor Shroud	14	HOW TO GET PEAK	
What Gasoline and Oil to Use	8	Spark Plug Recommendation		PERFORMANCE	23
Fuel Mixture	8	and Replacement	14	Propeller	23
Fuel Connection	8	Freezing Temperatures	14	Transom Height	23
Starting	8	Motors Dropped Overboard		Angle Adjustment	23
Stopping	9	(Not Running)	15	Carburetor Adjustment	23
EASY OPERATION —		Motors Dropped Overboard		Gasoline	23
SIMPLE ADJUSTMENTS	10	(Running)	15	Remote Controls	23
Proper Angle Adjustment	10	Motors Dropped Overboard		SAFETY SUGGESTIONS	24
How to Shift and		(In Salt Water)	15	REGISTRATION AND INSURANCE	26
Control Speed	10	Adjusting Carburetor Levers	16	WHERE TO FIND MODEL	
Reverse Operation	10	Care of Motor When Operated		AND SERIAL NUMBER	26
Steering Tension Adjustment	10	in Salt Water	16	WARRANTY	27
		Magneto Points Adjustment	17		

5 1/2

H
P
J
O
H
N
S
O
N



Specifications 5½ H. P. (MODELS CD AND CDL)

POWER HEAD Two Cycle — Alternate Firing
 Two Port — Automatic Intake
 Bore and Stroke 1-15/16" x 1½"
 Number of Cylinders 2
 Piston Displacement 8.84 Cubic Inches
 OBC Certified H.P. at 4000 R.P.M. 5½

FULL SPEED OPERATING

RANGE 3500 to 4500 R.P.M.
 GEAR RATIO 15:26
 IGNITION Magneto — Johnson
 MAGNETO BREAKER POINT GAP020"
 SPARK PLUG GAP030"
 CARBURETOR Johnson
 GEAR SHIFT
 CONTROL Neutral, Forward, Reverse

THROTTLE CONTROL Twist Grip Control —
 Ship-Master Remote Controls

PROPELLER 2-Blade 8" Dia. by 7¼" Pitch

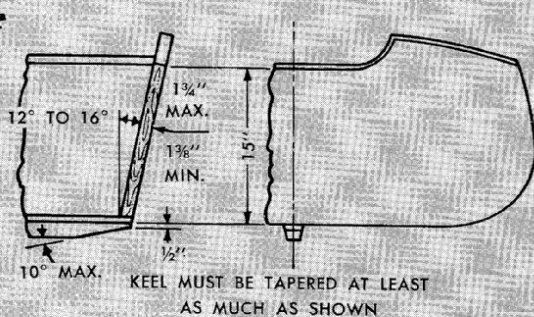
FUEL TANK

CAPACITY 4¼ Gals. Mile-Master Tank
 SPEED RANGE Slow Trolling to Over 12 MPH
 COOLING .. Thermostat and Vari-Volume Water Pump

	5½ H. P. (Model CD)	5½ H. P. (Model CDL)
Weight (Motor less Mile-Master Tank)	55½ lbs.	56½ lbs.
Weight of Mile-Master Fuel Tank (Empty)	10 lbs.	10 lbs.
Stern Height	15"	20"

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

STANDARD TRANSOM (BOAT DIMENSIONS)



MOTOR CLEARANCE REQUIREMENTS

Be sure that the transom dimensions, of the boat you select, provide proper clearance for your motor when it is in full tilted and maximum turned positions.

Plan now, in your boat selection, for the possibility of a larger motor in the future.

If you desire to build a boat — we recommend that you follow O.B.C. specifications available through your Sea-Horse Dealer.

Here's How To Install Your Motor

PROPER TRANSOM HEIGHT IS IMPORTANT

Your Johnson motor is designed to fit transoms which conform with transom standards adopted by the boat building industry and the Outboard Boating Club of America. The proper transom (stern) vertical height for the 5½ H.P. (Model CD) motor is 15 inches and, for the 5½ H.P. (Model CDL) motor is 20 inches (See page 5).

Proper transom height is essential to obtain maximum forward thrust from your motor.

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

If transom is too low this will produce drag, resulting in some loss of speed and undesirable spray.

Interference from the keel is frequently the cause of propeller cavitation. By merely tapering the keel as illustrated, this can be eliminated.

SECURING MOTOR TO BOAT

Locate the center of transom by measuring and install motor, visually aligning power head with the located

center. Immediately tighten clamp screws securely to avoid the possibility of loss overboard. Tighten clamp screws by hand only — do not use tools. Retighten clamp screws after approximately 30 minutes of operation. A lug is provided for attaching a safety chain or cable to the motor for anchoring to boat. **NOTE** — We recommend using a Johnson transom plate (available at Johnson dealers) to protect your boat and prevent loss of motor.

REVERSE LOCK

The reverse lock is designed to protect the boat and engine from excessive shock loads that normally occur if engine is permitted to tilt back and forth during abrupt deceleration and acceleration. By restraining the engine with reverse lock in "LOCK" position the thrust pad of the engine will always be against the thrust bar of the stern brackets, eliminating possibility of tilting under normal conditions. However, when traveling forward the reverse lock will release upon striking an underwater object, permitting motor to tilt. In addition, the lock position overcomes the thrust of the engine when normally operating in reverse.

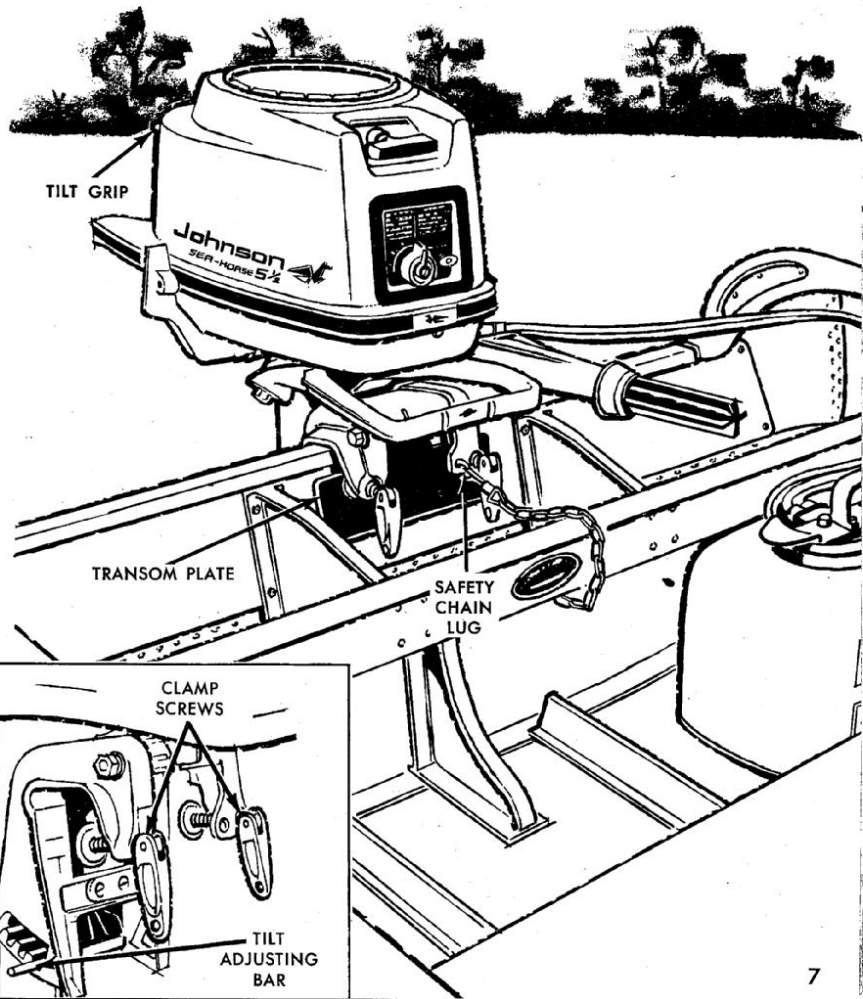
The reverse lock has two positions — “LOCK” and “RELEASE.” To tilt the motor, move reverse lock to “RELEASE” position, grasp the tilt grip at rear of the shroud and pull motor toward you. With the reverse lock in “LOCK” position the motor is held in a vertical position for starting and operation. For all normal operations the motor should be operated with reverse lock in “LOCK” position. It is advisable to place reverse lock in “RELEASE” position only when operating in shallow or obstructed waters.

CAUTION: Care should be exercised when operating in reverse as motor obviously has no tilt protection when going astern.

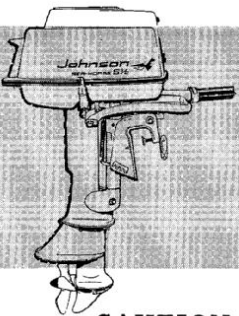
ANGLE ADJUSTMENT

The stern bracket has four notches for adjusting the motor to a vertical position to allow for transom angle. Adjust motor angle as follows:

1. Place reverse lock lever in “RELEASE” position and tilt motor away from transom.
2. Lift up on tilt adjusting bar and move bar in or out as necessary.
3. Move motor back against bar and place reverse lock in “LOCK” position so motor is perpendicular to water.



How To Get Started



BREAKING IN

No breaking in is required. No extra lubrication is required. Frequently check operation of water pump (See Cooling).

CAUTION — Do not start or operate motor out of water as it will result in damage to water pump, overheating and too high r.p.m.

WHAT GASOLINE AND OIL TO USE

Use regular automotive gasoline or White Marine gasoline. Higher octane fuels may be used but generally offer no advantages.

We recommend using a reputable outboard motor oil or a regular SAE 30 grade automotive engine oil (not heavy duty). Avoid use of low price, third grade (ML) oils.

The use of additive compounds such as "break-in" oils, "tune-up" compounds, "tonics," "friction reducing" compounds, etc. are entirely unnecessary and are not recommended for use in your motor.

FUEL MIXTURE

1/3 PINT OF OIL PER GALLON OF GASOLINE

If Mile-Master tank is empty, pour one gallon of gasoline into tank (4 gallon capacity). Add correct amount of oil and fill tank with gasoline. **Be sure filler cap is tight** to maintain constant pressure.

Use only the recommended oil to gasoline mixture ratio regardless of the claims made for some lubricants.

FUEL CONNECTION

Place Mile-Master Tank in boat so tank will not shift around. Be sure fuel line is not wedged under tank and allow fuel line slack to permit steering.

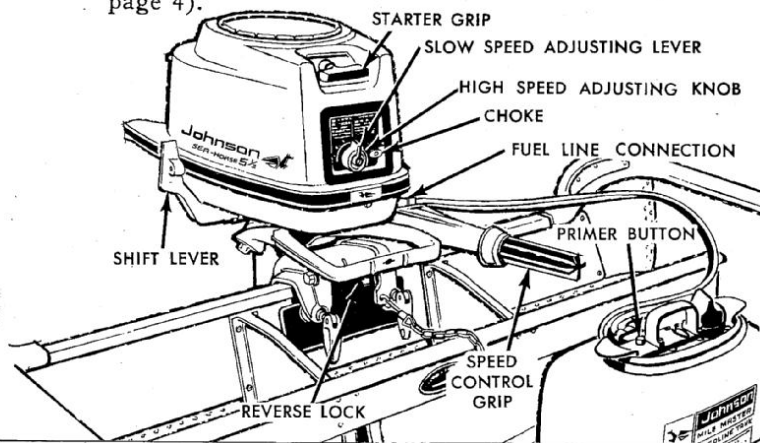
Slide fuel line connector onto motor coupling until locking lever snaps into position.

To disconnect fuel line depress locking lever on fuel line connector and pull off.

STARTING

1. Move shift lever to **NEUTRAL** position.
2. Turn speed control grip to position marked **START** on steering handle.
3. Set reverse lock lever in "**LOCK**" position.
4. Attach fuel line from Mile-Master tank to motor.

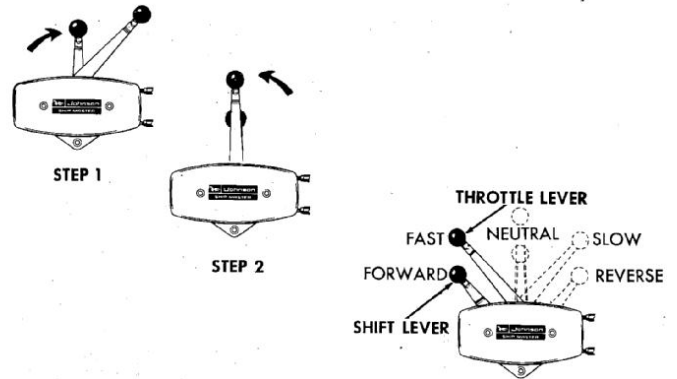
5. Depress, by hand, the primer button on Mile-Master tank several times until pressure is felt on button.
6. Set SLOW SPEED adjusting lever and HIGH SPEED adjusting knob between No. 3 and 4. In cold temperatures turn high speed lever to No. 5 or 6 for a richer mixture. Re-adjust between No. 3 and 4 after motor is started and warmed up.
7. Pull out choke.
8. Pull starter grip slowly until starter engages, then pull rapidly. Allow starter cord to rewind before releasing starter handle to prevent damage to starter assembly.
9. After starting motor, push choke in. Additional choking may be necessary to keep cold motor running. Reduce motor speed after starting. **CAUTION** — Do not shift unless speed control grip is set in "SHIFT" position.
10. Check to be sure that a spray of water is coming out of the water discharge when operating motor (see page 4).



STOPPING

1. Turn speed control to STOP position.

STARTING with Ship-Master Remote Control—Two Lever



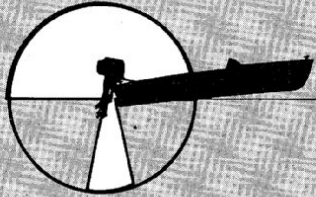
1. Move shift lever to neutral position (do not start motor in gear).
2. Move throttle lever to center position.
3. Follow steps 3 through 9 under **STARTING**. **CAUTION:** Do not shift unless throttle lever is set at slow position.

STOPPING with Ship-Master Remote Control—Two Lever

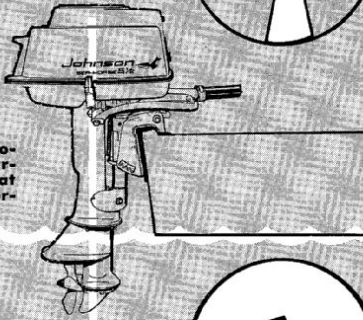
1. Move throttle lever to extreme slow position.

Easy Operation-Simple Adjustments

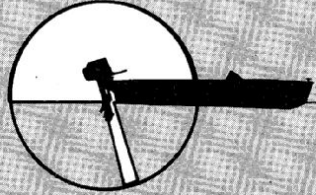
If boat moves with bow lifted — lower unit too far out.



If direction of propeller thrust is parallel to line of boat travel, motor is correctly adjusted.



If bow of boat digs — lower unit too far in.



PROPER ANGLE ADJUSTMENT

The vertical angle of the motor on the boat must be adjusted properly to obtain best performance from the motor and boat. The correct angle can only be determined by observing how the boat operates at full speed. (See "How to Get Peak Performance.") The angle adjustment should be made when trim and load distribution change.

HOW TO SHIFT & CONTROL SPEED — Manually SHIP-MASTER REMOTE CONTROL — Two Lever

Reduce throttle to slow speed range before shifting and SNAP shift lever with QUICK ACTION to forward, neutral or reverse position, as desired. To control motor speed, move throttle control toward FAST or SLOW position.

PRECAUTION: To avoid damage to shifting mechanism, do not attempt shifting to forward or reverse when motor is not running.

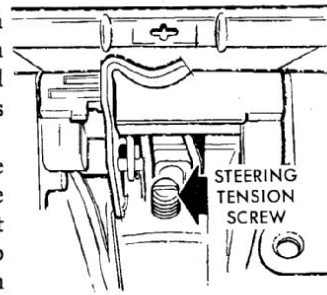
REVERSE OPERATION

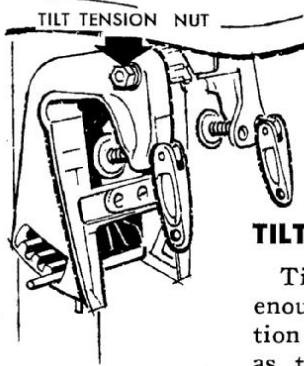
Place reverse lock in "LOCK" position. Motor will not tilt when operating in reverse. Avoid striking underwater obstructions to prevent damage to motor and boat.

STEERING TENSION ADJUSTMENT

Adjust steering tension with motor mounted to boat by simply loosening or tightening screw in swivel bracket. Steering tension should be adjusted so you can feel a slight drag when turning. This will facilitate smooth steering.

If steering wheel is used the steering tension screw should be adjusted so that no drag can be felt when turning motor from side to side. No tension is required when steering wheel is used.





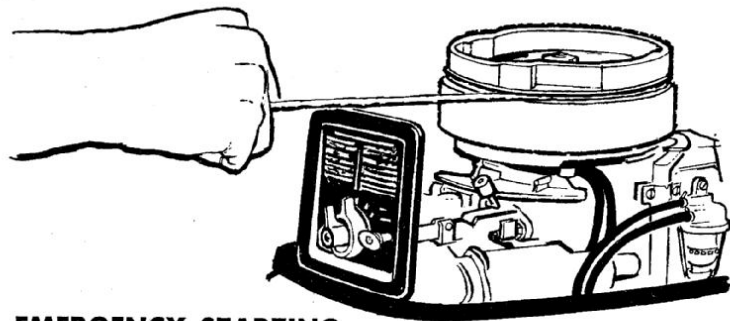
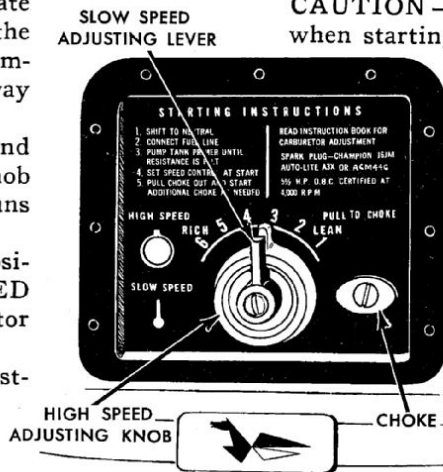
TILT TENSION ADJUSTMENT

Tighten tilt tension nut only enough to hold motor in any position of tilt. Do not adjust too tight as this will increase pressure required to release the reverse lock.

CARBURETOR ADJUSTMENT

Changes in fuel, altitude and climate may make it necessary to readjust the carburetor to obtain the best performance. Do it as follows when underway and motor is warm.

1. Move throttle control to FAST and adjust HIGH SPEED adjusting knob (turn left or right) until motor runs smoothly at highest speed.
2. Move throttle control to SLOW position. Then adjust SLOW SPEED lever (turn left or right) until motor idles smoothly.
3. Recheck HIGH SPEED knob adjustment.



EMERGENCY STARTING

If Ready Pull starter fails, remove motor shroud (see page 14). Remove three screws attaching starter and lift it off. If the pull cord on the starter is broken it may be long enough to use as an emergency cord. If it is not long enough, use a 1/4 inch cord with a knot tied in one end, place knot in pulley notch and wrap cord around clockwise. Start motor as described on page 8. **CAUTION** — Be sure shift lever is in neutral position when starting motor.

REMOVING MOTOR FROM BOAT

Disconnect remote control, if used, and fuel line from motor. Loosen the clamp screws and lift motor vertically from boat. Hold motor in upright position to allow water to drain out. Do not place motor in a position where the lower unit will be higher than the power head — any water remaining in the exhaust tube may run into the cylinders and cause serious damage.

Taking Care Of Your Motor

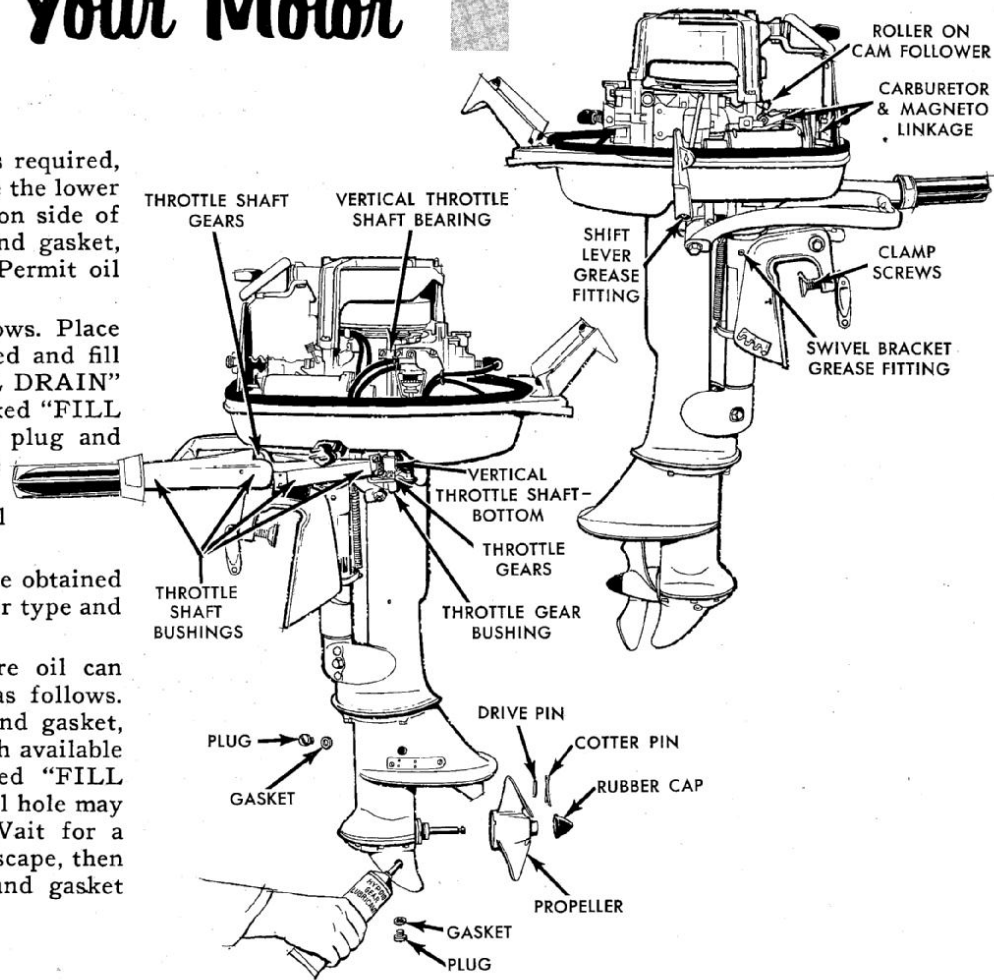
GEAR LUBRICATION

When a complete change of lubricant is required, place motor in vertical position and remove the lower plug and gasket, marked "OIL DRAIN" on side of gearcase. Then remove the upper plug and gasket, marked "FILL WITH HYPOID OIL." Permit oil to drain completely.

We recommend refilling gearcase as follows. Place a tube of hypoid oil SAE 90 as illustrated and fill gearcase through lower hole marked "OIL DRAIN" until lubricant appears at upper hole marked "FILL WITH HYPOID OIL." Replace upper plug and gasket securely before removing the tube from the lower hole. This will create an air lock and hold the oil in gearcase until lower plug and gasket can be secured.

If the recommended hypoid oil cannot be obtained in a tube, use a pressure oil can of the sealer type and follow same procedure as above.

In the event that the tube or pressure oil can (sealer type) are not available, proceed as follows. Drain gearcase and replace lower plug and gasket, marked "OIL DRAIN." Fill gearcase with available oil can through upper plug hole marked "FILL WITH HYPOID OIL." Air bubbles at fill hole may give impression that gearcase is full. Wait for a few minutes to permit air in gearcase to escape, then add more oil to fill. Replace fill plug and gasket securely.



REMOVING PROPELLER

Remove rubber cap, cotter pin and drive pin. Propeller is now free and may be removed from the shaft. Reassemble in reverse order, using new cotter pin if necessary. NOTE — Make certain the cap properly engages grooved end of the propeller shaft and is correctly "seated" to insure its holding fast. Use genuine Johnson drive pin for maximum protection.

DRIVE PIN REPLACEMENT

The motor has a shock absorber drive to prevent shearing the drive pin if the propeller hits an obstruction. However, if the drive pin becomes worn or bent it can be easily replaced. CAUTION — To prevent accidental starting of the motor do not rotate the propeller when the motor is in gear. BE SURE SHIFT LEVER IS IN NEUTRAL POSITION.

To replace drive pin, remove the rubber cap and damaged drive pin. The damaged drive pin can be driven out with a new pin when it is installed. Replace the rubber cap after inserting new drive pin.

LUBRICATION CHART FOR 5½ H. P.

LUBRICATION POINT	LUBRICANT	HOW OFTEN	
		FRESH WATER	SALT WATER
Gearcase	6.18 ounces — SAE 90 Automotive hypoid gear lubricant. In Emergency Only use outboard motor oil or another SAE 30 engine oil, but replace with hypoid gear lubricant as soon as possible.	First 5 hrs. of operation. Check oil level and add if necessary. Check oil level at least every 50 hrs. of operation. Drain and fill gearcase once each season.	Same as "Fresh Water"
Swivel Bracket	OMC Type A Lub. (Use grease gun)	60 days	30 days
Shift Lever	OMC Type A Lub. (Use grease gun)	60 days	30 days
Throttle Gears	OMC Type A Lub.	60 days	30 days
Clamp Screws	OMC Type A Lub.	60 days	30 days
Throttle Shaft Gears	OMC Type A Lub.	60 days	30 days
Throttle Shaft Bushings	SAE 90 Automotive Hypoid Oil	60 days	30 days
Vertical Throttle Shaft Bearing	SAE 90 Automotive Hypoid Oil	60 days	30 days
Throttle Gear Bushing	SAE 90 Automotive Hypoid Oil	60 days	30 days
Vertical Throttle Shaft Bottom	SAE 90 Automotive Hypoid Oil	60 days	30 days
Carb. and Magneto Linakge	SAE 90 Automotive Hypoid Oil	60 days	30 days
Roller on Cam Follower	SAE 90 Automotive Hypoid Oil	60 days	30 days

NOTE — "How Often" refers to periods of operation.

Taking Care Of Your Motor

REMOVING MOTOR SHROUD

Release the latch and tilt the latch cover away from rear of shroud. Lift the rear of shroud a little and move entire assembly slightly forward to release shroud from the front hook. Lift entire shroud assembly from motor. Reinstall shroud assembly in reverse order, making certain rubber seal fits properly between shroud and lower pan before securing the latch cover.

SPARK PLUG RECOMMENDATION AND REPLACEMENT

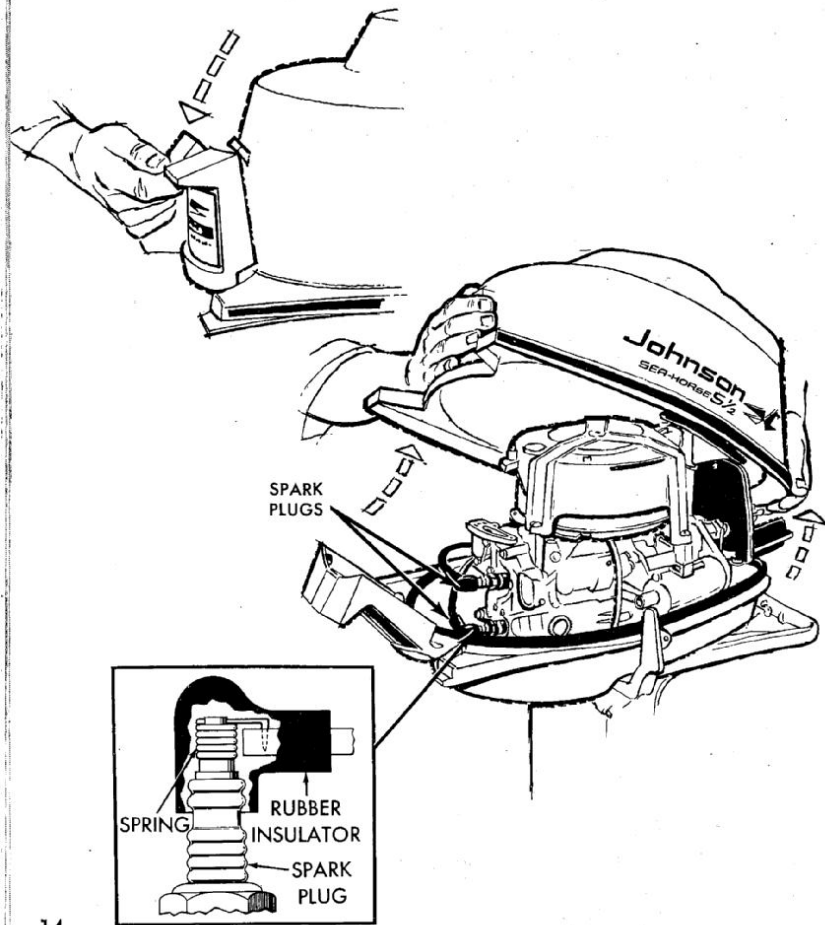
Using the correct spark plug is most important for efficient operation. The recommended spark plug for your motor is Champion J6JM, Auto-Lite A3X or AC-M44C. The proper spark plug gap is .030".

Detach rubber covered spark plug terminal (twist slightly counterclockwise and pull off). Remove spark plugs for inspection or replacement as necessary.

When reinstalling spark plug, clean the spark plug seat in cylinder head. Be sure spark plug gasket is in place and tighten plug securely. The spring inside rubber terminal lead cover must be positioned to fit properly over spark plug terminal (see illustration).

FREEZING TEMPERATURES

When operating in freezing temperatures, keep the lower unit submerged in the water at all times to avoid freezing and possible damage to the water pump. Be sure to completely drain water from cooling system when removing motor from boat (See — "Removing Motor from Boat" page 11).





MOTORS DROPPED OVERBOARD (Not Running)

1. Recover motor from water immediately, if possible.
2. Remove shroud, SLOW SPEED adjusting lever, HIGH SPEED adjusting knob, choke lever and control panel (page 14).
3. Disconnect spark plug leads and remove spark plugs.

CAUTION — Detach rubber covered spark plug lead covers and ground spark plug lead terminals by attaching them to motor block.

4. Work out as much water as possible by pulling the manual starter grip several times with motor in upright and inverted positions. Pour a small amount of oil through the spark plug hole into each cylinder and pull the manual starter grip several times to distribute the oil.
5. Remove starter housing and flywheel inspection port cover.
6. Blow air through the inspection port to remove water from magneto. Wipe magneto dry with a clean cloth, being sure no water stays between contact points.
7. Remove high speed needle to drain carburetor bowl.

CAUTION — Loosen needle packing nut before removing needle.

8. Reassemble parts you removed and follow starting instructions.

9. If motor fails to start, remove spark plugs again to see if water is present between electrodes.

Blow out any water from between electrodes and reinstall or replace with new ones. If the motor still fails to start **HAVE IT SERVICED IMMEDIATELY**. (When away from home, refer to your Service Station Listing.) Motors which have been submerged must be started or disassembled as soon as possible or expensive repairs will be necessary. To minimize damage, motor must be started or serviced within approximately 3 hours after recovering.

MOTORS DROPPED OVERBOARD (Running)

Follow the same procedure as Motors Dropped Overboard (Not Running). However, if there is any binding when flywheel is rotated (by pulling manual starter grip) it indicates a bent connecting rod and no attempt should be made to start the motor. **HAVE IT SERVICED IMMEDIATELY**.

MOTORS DROPPED OVERBOARD (In Salt Water)

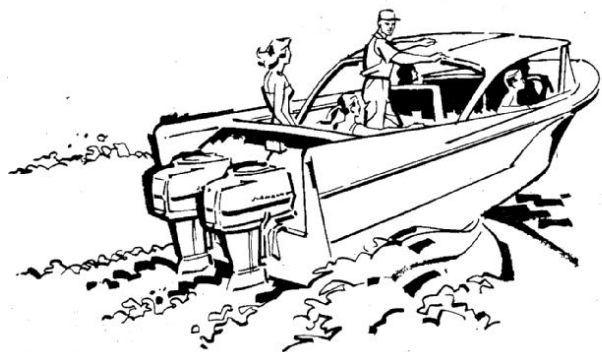
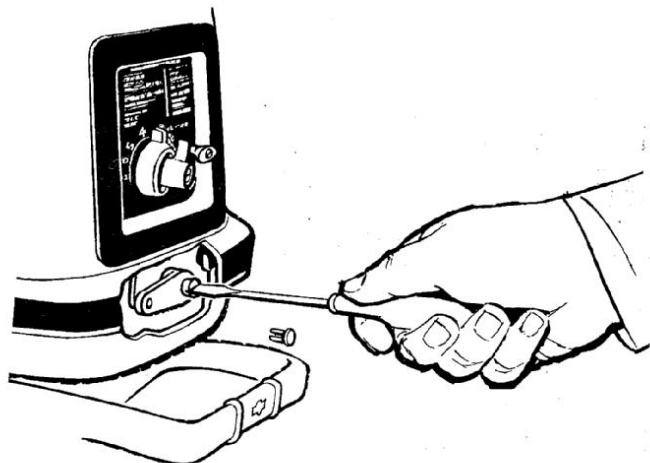
Follow same procedure as Motors Dropped Overboard (Not Running) and (Running) but take the motor to your Johnson dealer as soon as possible, even if it can be started, as salt water can cause excessive corrosion of magneto and internal parts.

Taking Care Of Your Motor

ADJUSTING CARBURETOR LEVERS

Make the following adjustment if the high speed lever or slow speed adjusting lever are removed or become loose on the shafts:

1. Remove shroud assembly (page 14).
2. Remove screws, high speed lever and slow speed adjusting lever from shafts. To gain access to high speed lever and screw remove plug in lower front pan. Do not remove the high speed adjusting knob.
3. Turn slotted speed shaft (through opening in lower front pan) with screw driver, until it seats gently (not too tight). Then turn it left $\frac{3}{4}$ turn.
4. Turn slotted slow speed shaft to the right, with screw driver, until it seats gently (not too tight). Then turn it left $1\frac{1}{2}$ turns.
5. Replace the levers so pointers on slow speed lever and high speed adjusting knob are set between Nos. 3 and 4. Be sure the shaft positions are not changed. Replace screws and tighten securely while holding levers in position.
6. Replace shroud assembly and the lower front pan plug.



CARE OF MOTOR WHEN OPERATED IN SALT WATER

Never leave gear case in water when not in use for long periods of time. It is not necessary to flush cooling system after salt water operation. Rinse off exposed parts with fresh water and wipe with oily cloth. Move throttle to STOP position. Slowly pull manual starter grip several times to insure complete draining of the water pump.

CAUTION — Be extremely careful not to accidentally start the motor.

MAGNETO POINTS ADJUSTMENT

After extended use it may be necessary to adjust the magneto breaker points. The gap between the points should be set to .020 inches using a feeler gage. Proceed as follows:

1. Remove the shroud (page 14).
2. Remove the three screws attaching starter assembly and lift it off.
3. Remove the inspection port cover from flywheel.
4. Turn flywheel until one set of points can be seen through inspection port in flywheel.
5. Loosen the anchor screw. Turn adjusting screw left or right until feeler gage binds slightly between the points. Retighten the anchor screw.
6. Follow same procedure to adjust the other set of points.
7. Reassemble parts removed.

CLEANING MAGNETO POINTS

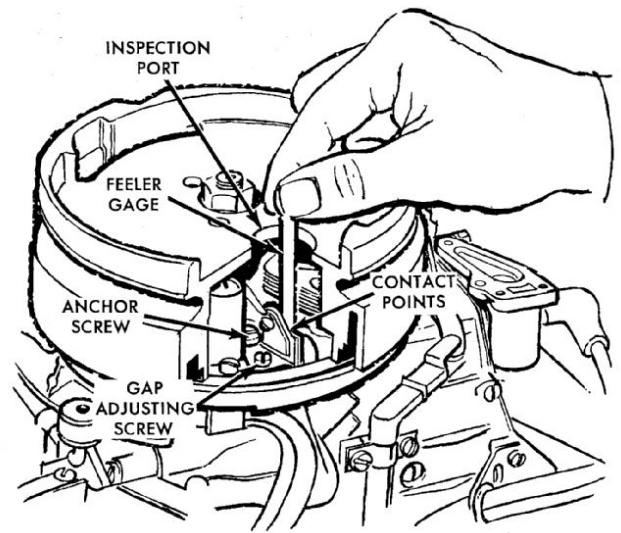
1. Follow Steps 1 to 4 inclusive under "Magneto Points Adjustment."
2. Wash each set of contact points with carbon tetrachloride.
3. Reassemble the parts removed.

COOLING

The motor has a thermostatically controlled water cooling system. Water temperature is accurately controlled for best performance and long motor life.

The vari-volume water pump operates as a centrifugal pump at high speeds and as a constant displacement pump at low speeds. Water is taken in through the water inlet located on the underside of the exhaust discharge, directly behind the propeller, and is expelled through the underwater exhaust and water discharge.

Check to be sure that a spray of water is coming out of water discharge when operating motor. If water is



not being discharged, stop the motor and check the water inlet. Remove any weeds or debris and start the motor. **DO NOT OPERATE MOTOR IF SPRAY OF WATER IS NOT COMING OUT OF DISCHARGE** (see frontispiece). Take the motor to your Johnson dealer.

Do not operate the motor if lower unit drags on the bottom because sand and silt can be forced into pump causing damage and extensive repairs. See Johnson Accessory Book for Chrome Pump Housing.

Taking Care Of Your Motor

CLEANING FUEL FILTER

If inspection shows sediment accumulation in glass bowl proceed as follows: (See Carburetor Exploded View)

Before removing filter obtain a new filter bowl gasket from your Johnson dealer. Disconnect fuel supply line from motor.

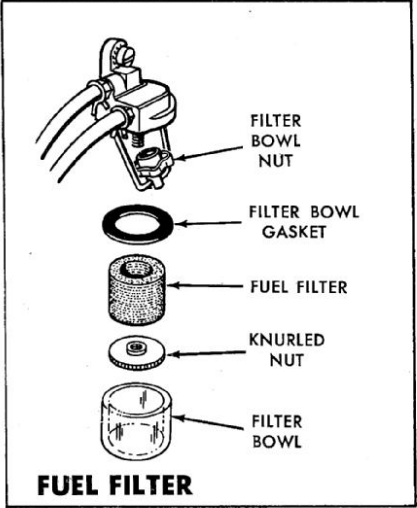
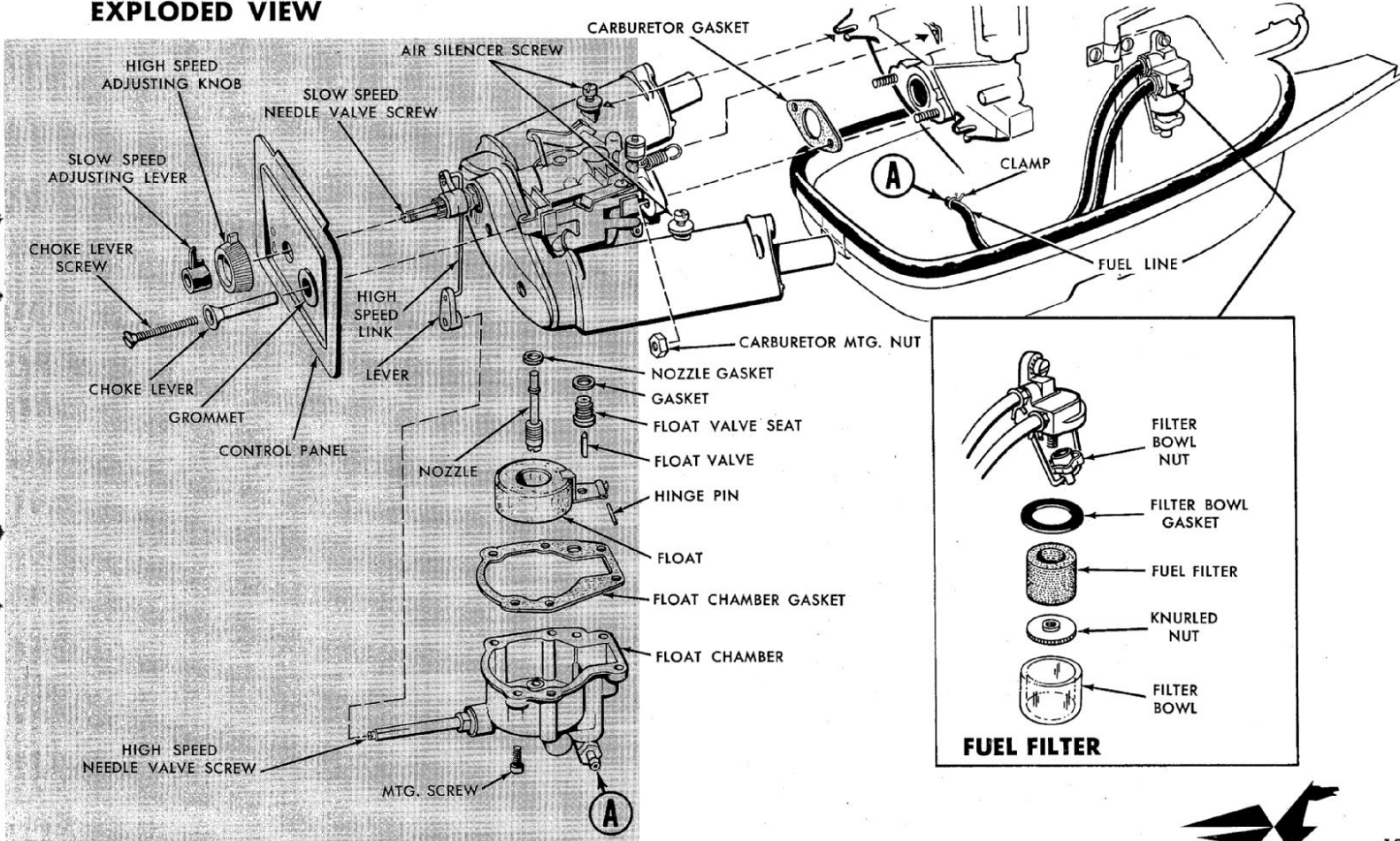
1. Loosen the filter bowl nut and remove the glass bowl.
2. Remove filter element by unscrewing knurled nut.
3. Wash filter element and bowl thoroughly in clean gasoline.
4. Assemble in the reverse order as described above. A new filter bowl gasket should be used; however, if new gasket is not available, use old gasket until new one can be obtained.
5. Tighten filter bowl nut securely.



CLEANING CARBURETOR FLOAT CHAMBER

1. Remove the shroud assembly (page 14).
2. Loosen the slow speed needle valve screw and remove the slow speed adjusting lever and the high speed adjusting knob.
3. Remove choke lever screw. Slide off the control panel with choke lever and grommet.
4. Disconnect throttle arm spring from powerhead and loosen air silencer screws.
5. Remove the two carburetor mounting nuts. Remove carburetor and air silencer assembly.
6. Depress the fuel line clamp at bottom of carburetor and disconnect fuel line.
7. Loosen high speed needle valve screw, slide off lever and leave lever suspended on end of high speed link.
8. Remove the five mounting screws holding the float chamber to carburetor body.
9. Take out the hinge pin, float, float valve, seat, gasket, nozzle and nozzle gasket.
10. Clean the float chamber and component parts with fresh gasoline. Blow out fuel passages with compressed air (if available).
11. Reassemble the parts as illustrated. Be sure the hinge on the float is toward the bottom. Use new gaskets if old ones are damaged.

CARBURETOR EXPLODED VIEW



BEFORE STORING YOUR MOTOR

It's best to have your Johnson dealer service your motor prior to off-season storage. However, if you want to do it yourself, proceed as follows. Operate your motor in a test tank or on the boat with shift lever in neutral at approximately $\frac{1}{2}$ throttle, pull choke and leave it out until motor stops. This will lubricate and protect internal parts of the power head while motor is in storage. If the motor was last operated in salt water, we recommend it be run in fresh water before preparing it for storage.

1. Place motor on a stand in upright position. Remove the shroud (page 14).
2. Retard throttle all the way and move shift lever to neutral position. Slowly pull the manual starter grip several times to drain water from the water pump.
3. Drain and clean the carburetor float chamber, filter bowl and fuel line (page 18). Drain and clean fuel tank.
4. Remove the propeller. Clean and lubricate the shaft. Replace the drive pin if bent or worn.
5. Wipe over the entire external surface of the motor with a cloth soaked in light oil.
6. Store motor in an upright position in a dry and well ventilated room. To prevent accidental starting, retard throttle all the way.

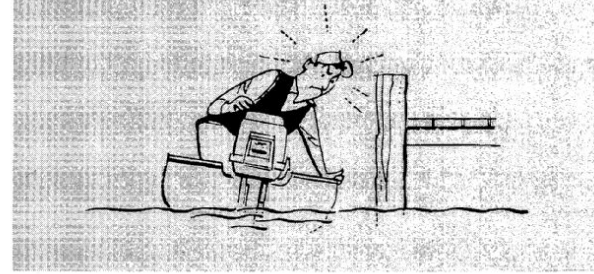
AFTER STORING — BEFORE USING

If you have properly stored your motor follow these suggestions.

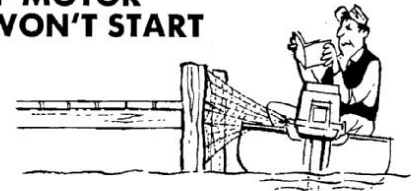
1. Remove and check spark plugs (see page 14). Clean or replace if necessary.
2. Check lower unit lubrication (see page 12).
3. Remove propeller and have it checked by your Johnson dealer. A slightly off-pitch propeller blade can rarely be distinguished on casual observation but will affect the performance of your motor.
4. Thoroughly clean any surfaces that need refinishing and touch up. Obtain paint from your Johnson dealer.
5. If possible, check motor in a test tank.

THREE POINT CHECK LIST

HARD STARTING



IF MOTOR WON'T START



IF MOTOR DOESN'T RUN SMOOTHLY



Your motor has been precisely engineered, assembled and tested for you to enjoy many hours of pleasant boating. However, as with any operating mechanism, it's possible to have some problems. If you have difficulty starting, or if the motor does not operate properly, only three things have to be checked — spark, fuel and compression — the three things which make it run.

CHECK YOUR FUEL SYSTEM FOR

Fuel in tank — Tank connection to motor — Proper carburetor adjustment — Carburetor primed — Choke pulled out — Proper fuel mixture — Loose fuel tank cap (Tighten) — Water in the fuel (Drain and refill with fresh fuel mixture) — Fuel tank resting on fuel line — Partially clogged fuel tank screen or fuel filter.

CHECK YOUR FUEL SYSTEM FOR

Fuel in tank — Fuel in carburetor (Be sure to prime it) — Clogged fuel line — Water in fuel (Drain and refill with fresh fuel mixture.)

CHECK YOUR FUEL SYSTEM FOR

Proper fuel mixture — Carburetor adjustment — Fresh fuel — Water in fuel (Drain and refill with fresh fuel mixture) — Partially clogged fuel lines, filter, fuel tank screen. Loose fuel tank cap (Tighten).

CHECK YOUR IGNITION SYSTEM FOR

Proper position of speed control — Loose electrical connections — Spark plugs carboned, burned, or wet — Improper type spark plugs — Incorrect gap in spark plugs — Incorrect gap in magneto points.

CHECK YOUR IGNITION SYSTEM FOR

Faulty spark plugs (Clean and adjust gap or replace) — Corroded magneto points (Clean and adjust or replace if necessary) — Disconnected spark plug leads.

CHECK YOUR IGNITION SYSTEM FOR

Loose ignition connections — Faulty spark plugs — Incorrect gap in spark plugs — Improper type spark plugs — Incorrect gap in magneto points — Improper contact between magneto points. If your motor doesn't run properly after checking the above list, take it to your Johnson dealer for service.

CHECK COMPRESSION

Pull manual starter grip slowly to determine whether or not your motor has good compression. Faulty compression can be caused by loose spark plugs. Be sure there is a gasket under spark plugs and that they are tight. If compression is still faulty and fuel system and ignition are working properly, take motor to your Johnson dealer for service check-up.

CHECK COMPRESSION

If fuel and ignition system are functioning properly, check compression as under "Hard Starting."

CHECK COMPRESSION

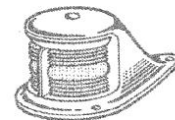
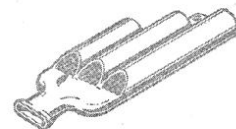
If fuel and ignition system are functioning properly, check compression as under "Hard Starting."

Equipment For Your Boat

If you intend to operate on navigable waterways, consult your local U. S. Coast Guard Office regarding current regulations governing your craft. If there is any doubt concerning regulations in your locality, write to U. S. Coast Guard Headquarters, Washington 25, D. C., Small Boats Numbering Division.

You are required by law to have the following equipment aboard:

1. A U. S. Coast Guard approved life jacket or "approved" buoyant cushion for each person aboard.
2. If over 16 ft. long, a warning device (mouth operated horn or whistle).
3. An approved type fire extinguisher. Outboard motorboats less than 26 feet in length of open construction, not carrying passengers for hire, are not required to carry fire extinguishers.
4. A combination light in the forepart of the boat, showing red to port, green to starboard, from right ahead to two points abaft the beam, visible for 1 mile. A white light aft showing all around the horizon, visible for 2 miles.



How To Get Peak Performance

Once you learn how to operate and maintain your motor you'll want to know what you can do to get smoother operation, better gas consumption and better performance from your boat. This section gives you a few hints to help you do this.

PROPELLER

This is the only part of your motor that transmits horsepower into miles per hour. The propeller furnished with your motor is the best for average operations, however, under special conditions, you may wish to change propellers.

On a light boat with light loads, a propeller with an increase in pitch from standard might be desirable. On a heavy boat with heavy loads use a propeller with less pitch than standard. In high altitudes use a propeller with less pitch. It is recommended that a tachometer be used in making propeller changes so as to keep the r.p.m. within the specifications of your motor. (See Specifications Chart). Check with your Johnson dealer before deciding what propeller to use.

TRANSOM HEIGHT

If the transom is too high the propeller will operate in turbulent water with lowered efficiency and poor cooling may result. If the transom is too low, excessive drag may result and your boat will not perform properly. Transom height should be as specified on page 6.

ANGLE ADJUSTMENT

The proper angle of tilt for the motor depends on the type of boat and load distribution. In the initial adjustment, if motor is mounted on boat which is not in the water, the cavitation plate of the motor should be parallel to the planing section of the bottom. If the lower unit is tilted too far forward the boat will plane on too much of its length and the bow will dig, which can be dangerous when in rough water with a following

sea. If the lower unit is too far out it will result in cavitation and loss of speed. Cavitation may also be caused by a bent propeller, weeds or other material caught on the propeller and gearcase, or an improperly designed keel. (See page 6). Another cause for loss in performance is moss or barnacles (primarily in salt water) collecting on the boat bottom.

CARBURETOR ADJUSTMENT

How to make the carburetor adjustments is described on pages 11 and 16. The carburetor setting may have to be changed due to changes in temperature, altitude, humidity, gasoline and other factors. In order to conserve fuel, adjust the carburetor toward the lean side. When adjusting the HIGH SPEED adjusting lever turn it toward the lean side until you hear a definite lowering of r.p.m.'s and your boat speed slows down. Then gradually turn lever toward RICH until boat speed increases and r.p.m.'s increase to a point at which the motor runs properly.

The SLOW SPEED lever should be adjusted so motor operates smoothly at slow speeds.

GASOLINE

Always use fresh gasoline. Gasoline which has been in a tank for a long period of time (several weeks) may cause spark plug failure and give you carburetor trouble. If you are having spark plug trouble, use white Marine gasoline, or change to a different brand of regular gasoline, if white Marine gasoline is not available. It may be necessary to try several brands to prevent spark plug trouble.

REMOTE CONTROLS

When installing remote controls be sure the throttle can be opened completely.

Safety Suggestions

Do not overload your boat.

Check your weather and tides before going out and have due regard for them.

Do not leave shore in a leaky or poorly constructed boat.

Don't hurry when operating your boat or when securing equipment and supplies for it — take your time and use caution.

Liquor and safe boating do not mix.

Have life preservers readily available and wear when conditions warrant.

Obtain local information and familiarize yourself with the locality in which you are going to operate your boat. Do not venture into dangerous or restricted waters.

Do not use gasoline stoves aboard your boat.

Keep bilges free from oil, waste, grease, etc.

Be sure your battery box is ventilated.

Do not use kapok-filled life preservers to sit upon, as such action compresses the filler and reduces its efficiency.

Do not operate near swimmers in the water.

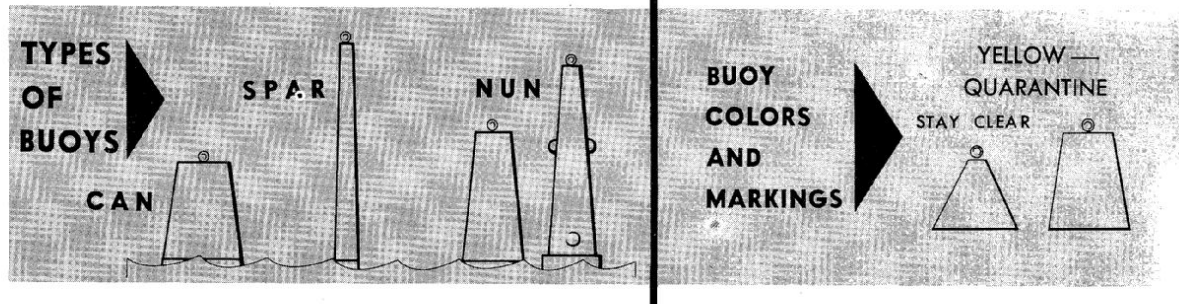
Provide lifebelts for children.

Do not be afraid of a boat — respect it.

Do not lie at anchor with short cable; allow sufficient scope.

Remember, your wake can damage others.

Always reduce speed through anchorage areas.



COLOR CODE



RED



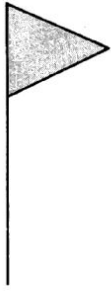
BLACK



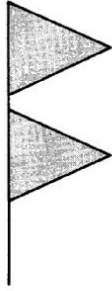
WHITE



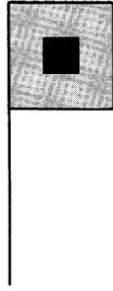
DAY SIGNALS (Flags)



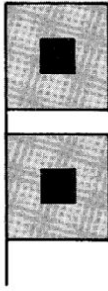
SMALL CRAFT
(WINDS UP TO
38 M.P.H.)



GALE
(WINDS UP TO
54 M.P.H.)

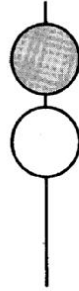


WHOLE GALE
(WINDS UP TO
72 M.P.H.)



HURRICANE
(WINDS 74 M.P.H.
AND UP)

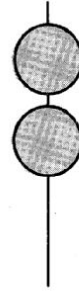
NIGHT SIGNALS (Lights)



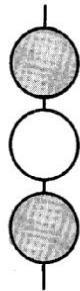
SMALL CRAFT
(WINDS UP TO
38 M.P.H.)



GALE
(WINDS UP TO
54 M.P.H.)



WHOLE GALE
(WINDS UP TO
72 M.P.H.)



HURRICANE
(WINDS 74 M.P.H.
AND UP)

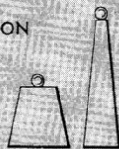
BLACK—ODD NUMBERS

KEEP BUOY ON
PORT SIDE
RETURNING



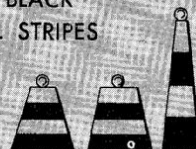
RED—EVEN NUMBERS

KEEP BUOY ON
STARBOARD
RETURNING



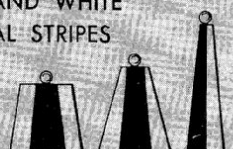
**RED AND BLACK
HORIZONTAL STRIPES**

DANGER
AND
OBSTRUCTIONS
STEER CLEAR

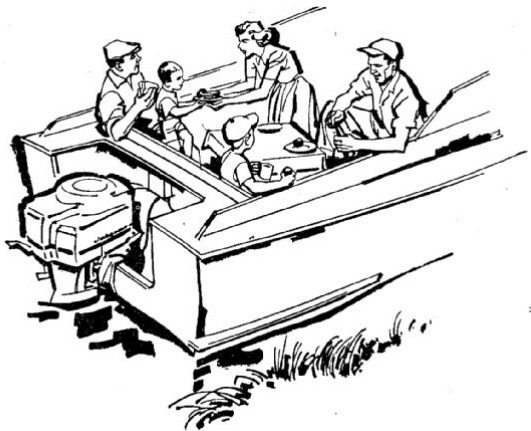


**BLACK AND WHITE
VERTICAL STRIPES**

MID-CHANNEL
PASS
CLOSE TO



Registration And Insurance



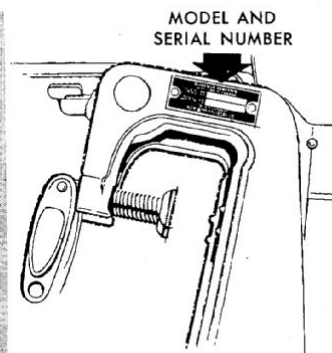
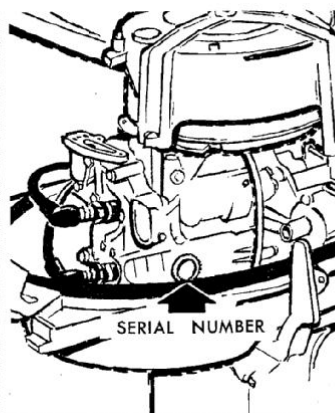
A registration card is to be filled out by your Johnson dealer at the time of purchase. Please supply him with the necessary information so he may properly register your motor.

Insurance on your outboard motor and/or boat should be procured as soon as practicable for protection against loss by fire, theft, etc. Write to Outboard Boating Club of America, 309 North Michigan Avenue, Chicago 1, Illinois for further details, or consult your local insurance agent.

WHERE TO FIND MODEL AND SERIAL NUMBER

The model and serial number are stamped on a nameplate attached to the stern bracket as illustrated. The serial number is also stamped on a plug located on the starboard (left side facing front of motor) side of the cylinder.

Additional copies available — 30¢ each.



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 months after initial use, or within one year from date of original purchase, whichever first occurs, 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 or operated in any other way than in accordance with our operating instructions. Nor does the warranty extend to repairs made necessary, by the use of inferior parts or accessories, or by the use of types of accessories not recommended by Johnson Motors.

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

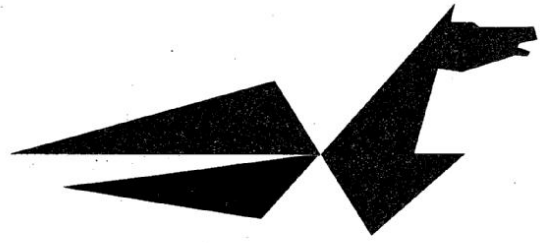
To make a claim under this warranty, contact the authorized Johnson dealer from whom motor was originally purchased or the nearest authorized Johnson dealer. Motors or parts thereof shipping to the factory for our inspection must show model and serial numbers, and must be shipped transportation charges prepaid.



Handwritten notes in the top right corner, including "P. 160" and "H. B. ...".



JOHNSON MOTORS



WAUKEGAN, ILL., U.S.A.