Johnson, Evinrude, OMC, outboard motor, outboard motor repair, 9.5 hp, date/year of manufacture, water pump, carburetor,

Maintaining Johnson/Evinrude 9.5 hp 2 cycle outboards

1964 – 1973 (Information & normal repairs)

The 9.5 hp, shown below was built from 1964 to 1973, which was a the first of the low profile motor series, and is not a sleek looking motor in my opinion, with a squatty oversized motor cover and upper housing sitting on a standard lower unit. Someone after these came out coined the phrase "Turtle Motors" for these squatty motors.

There are some similarities between this motor and the earlier motors from 6 to 10 hp but with the powerhead setting lower and a shroud around the mid-section. The lower unit appears the same as the earlier QD, 10hp series motors, but with a outer shroud midsection. However it seems the engineers worked overtime in trying to find a place for needed parts to fit under this squatty cowling. These model numbers went from MQ-10 in 1964 through MQ-14 for 1968, then in 1969 the model # scheme changed. A 1969 was now a 9R69, a 1970 a 9R70 and so on through the 9R73 of 1973.

The understanding is that it was also basically a souped up version of the older 7.5 hp powerhead. Some experienced mechanics say the crankshaft did not stand up under heavy usage as a 9.5. But then in the early years of these motors was before the TWC-3 outboard oil came into being, so the use of ordinary automotive oil could have also have been a contributing factor because of a lesser degree of lubrication than currently available.

The earliest versions (1964 / 65) were known to vibrate a bit, so for 1966 they added special friction type motor dampener system. They had a dealer retro-fit using a special motor mount kit which improved things a lot. Aside from the low speed throttle stop being moved to the twist grip handle mount there really weren't significant changes to these motors.

Finding some key replacement parts may be a problem as some are now obsolete and getting awfully hard to find for the pre 1967s. One of those is the front motor mount. Grab hold of the flywheel (not running, of course!) and see if you can move the whole powerhead forward and aft. A small movement in the rubber mounting is normal, large movement is a broken mount ---all too common a issue on these old motors. At 1967 the motor mounts were improved.

Year of Manufacture : **This is important in any repair, for obvious reasons. Prior to 1979, Johnson used the last 2 digits of the year in the model number. As a model 10R78M, would indicate a 10 hp, Rope starter, 1978 year of manufacture and M model revision. Since this does not have in the code L between the hp designation and the year, that would mean it is a short shaft version. Evinrude in those years used a different 5 digit model code, as 10424S. The numbers you are looking for will be the first 3 numbers which equates to the hp and then the middle to the year, as 10 hp, the (4) equates to 1974 while the (S)would indicate a shorts shaft. Here is a *LINK* to help you determine any of the Johnsons. And here is the *LINK* for the Evinrudes. For those of you readers outside of the United States, here is another *LINK* that may better help with your motors.**

Sometimes the nameplate found on the LH side of the upper steering/clamping bracket can get removed. If this happens, you can still usually tell which motor it is by looking at the 25 cent size soft plug in the upper rear RH side of the block. I have heard from more than one person that their plug had numbers that do not match any of the codes, so this kind of backs up the idea of a change after the 1979 date, as the factory changed things as time went on. If you need to check on parts and do not have a actual parts list booklet, one of your best sources is http://www.crowleymarine.com/ They have a complete listing of about all of the Johnson and Evinrude motors showing exploded parts views with part numbers where you may be able order parts online from them. Or this one http://www.marineengine.com/parts/parts.html

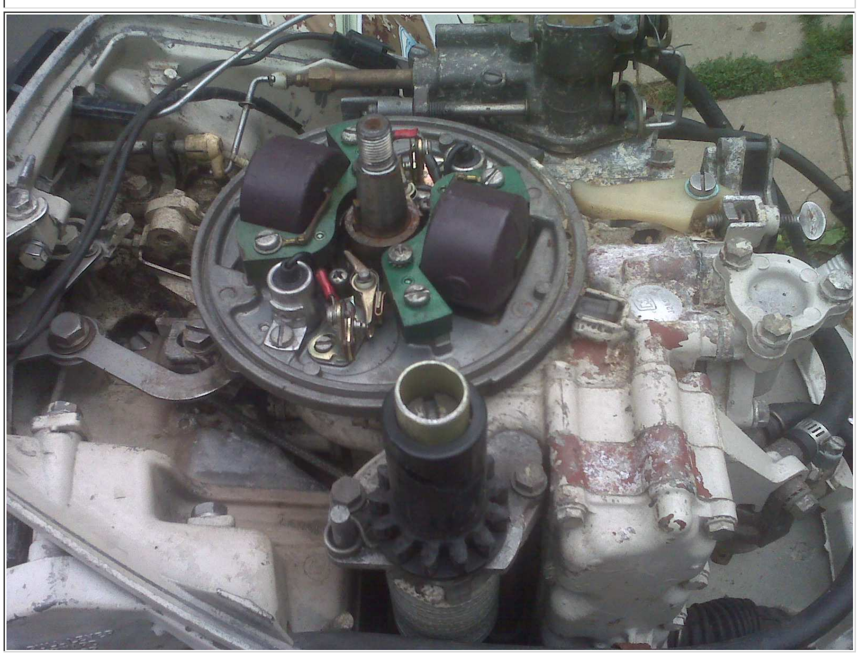
Removing Flywheel : **The flywheel nut requires a 3/4" socket to remove it as it sets inside a small cover (as seen in the second set of photos below) that covers the 3 puller holes. This cover does not allow a open/box or Crescent wrench to get enough grip on the minimal part of the nut to loosen it. The flywheel key #0120395 is used on many motors from 1.5hp up to 55hp (but not the same as the 9.9/15hp). It is 3/32" wide and not normally available at your local hardware store.**

Ignition System : **The ignition system is the magneto type, using points and condensers. Points are set at .020. To access information on how to change or set the points of this system CLICK HERE. This accesses the magneto article of the model that replaced this 9.5, the next later model 9.9, which uses the same basic ignition system but with external coils.**

If you are having what appears to be ignition problems check the breaker points operating cam. You could have two issues. This removable cam has a small portion on it with the word "SET" imprinted. This cam can be installed upside down, the word SET is simply telling you which side is up. It is not a position where one would set the points.

In the photo below you will notice the earlier idle jet controls to the carburetor as compared to the other following photos showing the later flexible cable type.

Magneto ignition system with flywheel off, showing the early idle linkage system & the opaque plastic slow speed stop with it's thumbscrew adjustment at the rear of the block



Starter : **The manual recoil starter pull handle is located on the front lower part of the front panel. The actual starter is basically a manual copy of the automotive type starter system used extensively on may of the small OMC motors. There was no provision for a electric starter.**

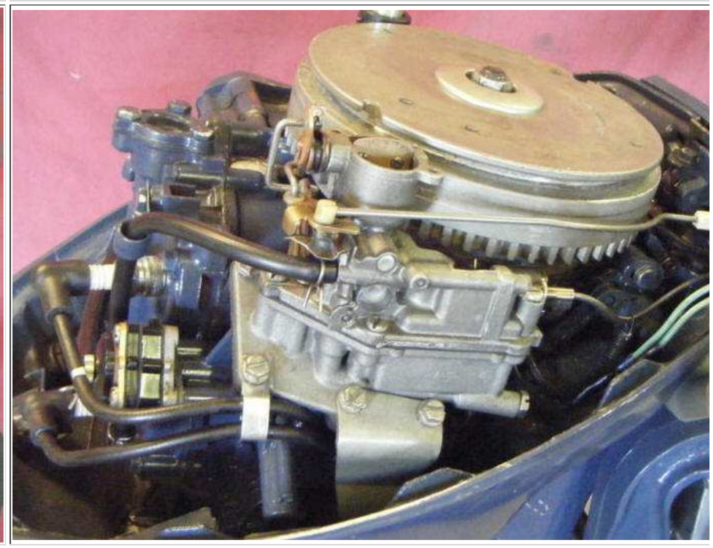
To replace the starter rope, remove the rope, turn the spool 18 turns counterclockwise using a large flat screwdriver. Use the handles of a pair of pliers or screwdriver or similar tool to wedge the pinion teeth into the flywheel teeth, so it can not retract. Reinsert the rope and tie a knot. Allow the spool to rewind the rope.

If everything is already assembled and you need to adjust the tension, no need to make it too complicated. Pull the rope out so you have 2-3 free rounds/grooves for the rope on the spindle. Jam the spool as mentioned above. Take the rope out of the handle and 'thread' it around the free grooves in the spindle, then out back to the handle again. Test.

Compression : **Compression on these motors may seem lower than some of the others. Displacement of the these 9.5 hp motors is 15.2 Cubic Inches with a Wide Open Throttle of 4500 RPMs. Where the later 9.9/15 HP motors utilized 13.2 CI at 5000/6000 RPM, where higher RPM increases the HP. A normal compression reading of 65# to 75# appears to be fine for this motor.**

If you'll notice, the unique starter system on this motor is geared pretty low, presumably to make pulling the rope easier. As a result you don't get the crank speed you do on some other motor designs. This will also effect your compression test. You might try using a rope wrapped around the flywheel as a comparison, using this method, you will get a faster RPM plus also a higher compression reading.

For those used to working on other brands of outboard motors, it seems that smaller hp OMCs are designed with a lower compression ratio than Mercurys. However it may be because of the type of starter and the slower flywheel rotational speed produced by this starter. As long as it starts, who cares.

Evinrude 9.5 left side view with cover off	Evinrude 9.5 right side view with cover off. This motor has the later post 68 fuel pump.
	

Recommended Spark Plugs : **The recommended spark plug is a Champion J4C, however with a well used motor most old time mechanics would recommend a hotter plug, like the J6C especially if you do a lot of trolling. Or if you opt for the NGK brand, go for BR6S-8. These plugs use the 3/8" reach thread length, so do not try to use the 1/2" reach ones off the 9.9hp as the electrodes will become smashed by the top of the piston.**

Carburetor : **These motors have a unique carburetor system in that the carburetor sets near the rear of the motor, apparently a design to allow for the lower cowling profile. The carburetor is placed on the rear starboard side of the block, making the top 1/2 of the carburetor removal easy. It is rather unique in that the bottom 1/2 of the carburetor which includes the float bowl is bolted directly to the intake manifold, but not as readily removed as most of the other models as there is one flathead screw under the timing plate, that needs to be retarded to allow access to that screw head. A TIP HERE, when you get that flathead screw loose, it is best to reach in/under and use a 4**

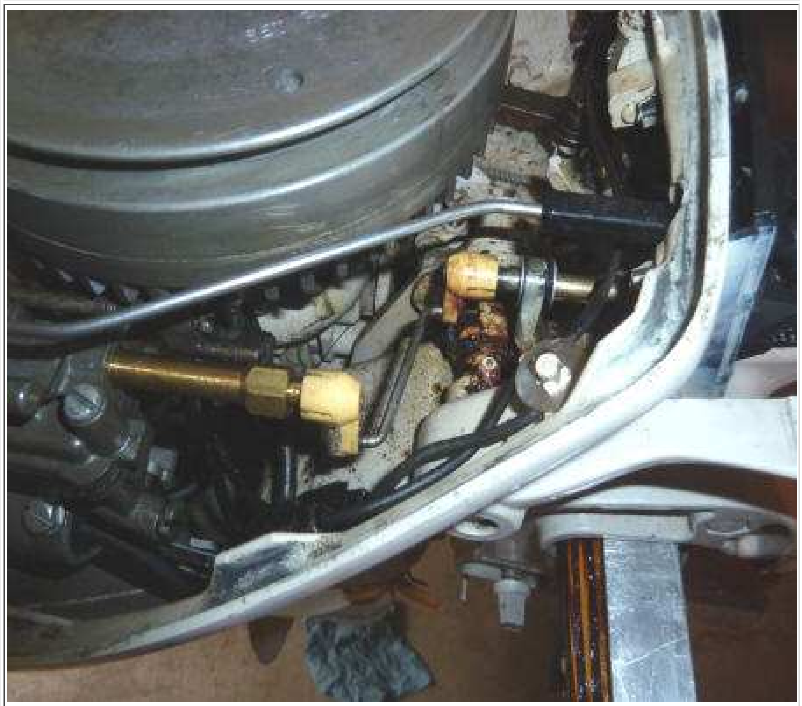
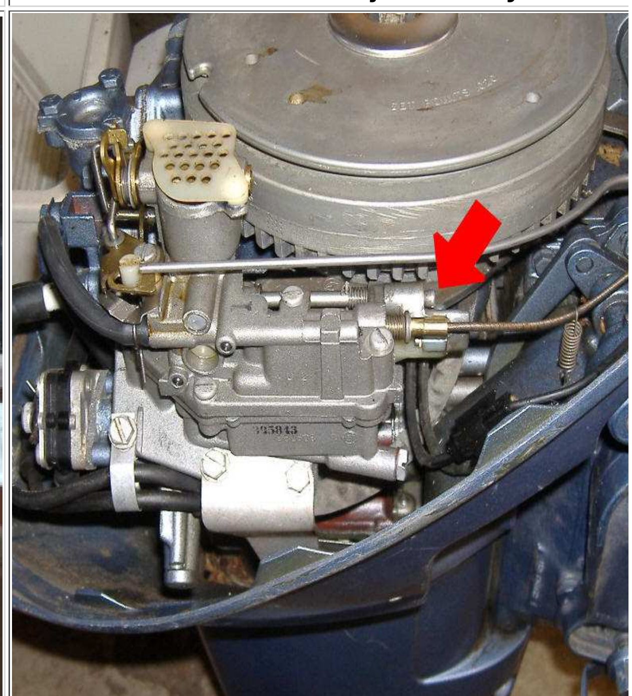
fingered pickup tool to retrieve the screw before it falls down between the actual exhaust housing and the outer shell. Then replace it with the same tool when reinstalling the carburetor. otherwise you may be turning the motor upside down, shaking it in hope to be able to retrieve the lost screw.

To remove the top 1/2, just put in forward and throttle up (engine off) to get the stator cam out of the way for the front inside screw. You'll see when you go to remove it.

The choke linkage snaps into a white plastic clip mounted on the top brass linkage, this rod has an Ell on the rear pointing down. This down portion goes into the center hole in the plastic clip and the rod just snaps into the slot in front of the hole. Just pull it up and out of the snap in lips. However you need to pull the clip up and out of the brass lever it sets in so you do no loose it. The air intake (setting directly on top) is covered by a white plastic cover that has numerous holes in it that just snaps into holes in the carb, which acts as a air filter keeping debris out.

There are two types of idle adjustment linkages. The early version has a longer shaft protruding from the carburetor that is connected to the knob shaft by a pivoting linkage shaft. The later version uses a flexible speedometer type cable from the carburetor to the control knob in the front panel. It is my guestimate that the reason for the change came about because these powerheads vibrate considerably, especially at a trolling speed. The factory introduced a anti-vibration kit in 1967 to help alleviate this problem. I will guess that with the non flexible linkage of the previous series had problems that this anti-vibration and flexible carburetor idle system solved.

Also in the RH photo below, bolted to the bottom center of the carburetor is a 2" wide metal strip. This is part of the newer anti-vibration / dampener system, which came out in 1967 and involved some metal with fiber washers and springs. There was also more on the other side of the motor.

Here are the early carburetor idle linkage rods	Here a view of the carburetor, showing synchronization screw head (red arrow) and flexible idle jet cable system
	

To remove this rich lean adjustment for these later 9.5 hp motors, the quick and dirty way is to pop the knob off and unscrew the needle assembly from the carburetor, leaving the other end in the control panel. If you want to do it the other way, pop the knob off, and remove the circlip that is around the needle cable on the inside of the control panel. With that circlip off, you can slide the needle cable forward and remove the circlip that is around it on the outside of the control panel. Then you can slide the needle cable rearward, out of the control panel.

There are two types of float needles. The all metal one does not have a clip, the later ones with a soft tip does need the

clip. However I have seen transition needles that were the rubber tip but no clip. In addition, the one that uses a clip has a groove for it, the other one does not.

If the lean rich setting control knob on the front of cowling won't make any change in how the motor runs/not runs if the idle circuit inside the carburetor is not clear all the way to the throat of the carburetor. The initial setting for this rich/lean control should be backed out 3/4 turn from gently bottomed, you may have to rotate it up to possibly 2 full turns out, but 1 1/2 seems the norm.

The high speed jet is located in the float bowl which is located in the bottom 1/2 of the carburetor. It is in the hole behind the hex head plug in the very bottom front of the carburetor. Takes a well fitting screwdriver to get this jet out without damage. This carburetor must be absolutely, positively, squeaky CLEAN. It is very easily clogged, so may need to be checked often if there is a possibility of dirty fuel. DO NOT jam wires, drills, or whatever through the orifice making it larger in your attempts to clean it. This jet is a precision part. The motor will never work right again if you do.

The carburetor float is cork, sealed with shellac, they require replacement if they become saturated. Shellac is dissolved by the alcohol found in ethanol gasoline. These carburetor floats are not available aftermarket, but come with the OE repair kits, part #0382048. Be sure to use the clip that connects the float arm to the new needle. These clips were not used on the old float system, and are beneficial to use because of the possibility of the motor being laid on it's side during transport, the float may become stuck. This clip pulls the float down when the float bowl is empty. Also the float COULD get reinstalled upside down, as the pivot arm is not centered. There is a small lip that protrudes off the brass pivot arm. This lip is actually a float stop and is designed to bump/stop against the edge of the brass inlet jet.

To set the float on these motors, with the carburetor body held upside down, the float being viewed from the side, adjust the float so that the free end of the float (the end opposite the hinge pin) is ever so slightly off level than the other end. And when viewed from the end, make sure it is not cocked right or left.

As a suggestion, to do the final slow idle carburetor adjustment, make sure on the boat and on the water. If you are adjusting the low idle in a barrel or such, you could experience inconsistencies. Because in a barrel, the low setting of this engine, the carburetor inhales much their own exhaust which makes it difficult to get a accurate idle adjustment in a barrel unless you have the upper cowling off the motor.

If when priming the primer bulb you get fuel running out the carburetor air intake throat, this is normally caused by a clogged float bowl vent to the outside. This vent hole would be molded into the upper carburetor body. With the bowl off, in the upper carburetor float chamber on the inner side is a hole that will vent the bowl to atmosphere from the upper carburetor outer body. If it's clogged, fuel will find it's way through the high speed jet and out the throat, as the float will never rise to close it's valve.

The main throttle butterfly is operated by a horizontal shaft and a cam off the engine's timing plate when the twist grip throttle is rotated. This shaft is the inner of the 2 shown in the RH photo below. The outer is the idle jet shaft.

This carburetor has a built-in throttle advance when you pull the choke out.

This carburetor being a downdraft model which is susceptible to small things dropping into it and possibly holding a reed valve partially open. If you can not get it to run right after everything else, pull the carburetor and look to see if there is any debris holding one of the reed valves slightly open.

There is no aftermarket carburetor kit available for these motors. The BRP part # is 0382048, which includes the float. Available for $30.96 as of 5-2013. I am disappointed in this kit. It comes with, (like most) repair parts for both the early and late carbs but does not come with everything. On this carburetor, there is a 1/2" core plug on the outer part of the carb that is inline with 3 small holes in the carb throat. These holes had to be drilled through the access hole this core plug covers up. However INSIDE and under the core plug is a plastic filler plug #0312909 that is not included. On the one I repaired, it would be impossible to remove this plastic plug without destroying it. Oh yes, this kit also included a old style fuel pump cover gasket and filter screen.

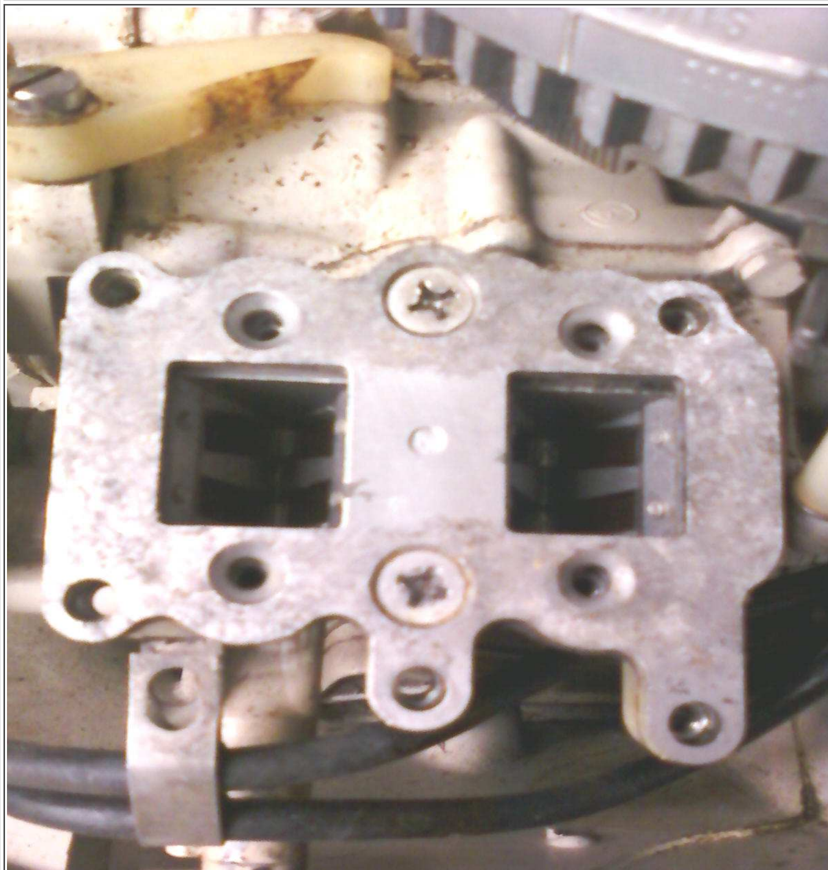
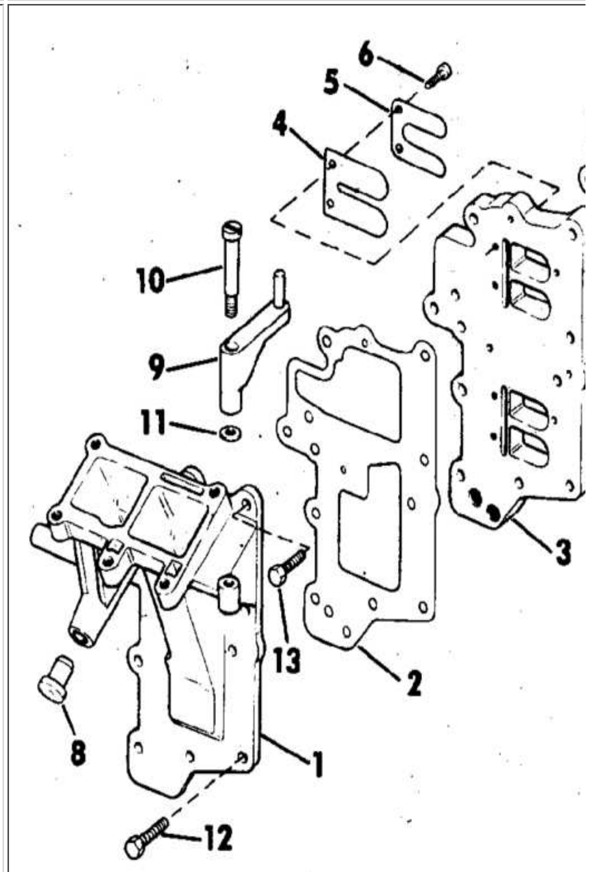
There could be many things to cause a poor or no idle situation, the high and low speed jets for this model must be absolutely clean. Good enough won't cut it on this carburetor, it has to be super clean.

The "link and synch" on this motor is important to be adjusted correctly. In the photo above the red arrow is pointing to the adjustment screw of the throttle follower. The shaft that this adjustment screw is on the forward end of has a tapered section under the screw head, which binds the follower arm in the set position, which in turn supplies spring tension on the carburetor follower.

There is supposed to be a mark on the timing plate cam that the throttle cam should be timed to be at when the carburetor butterfly starts to move. You can see the butterfly start to move by using a flashlight, by shining it through the breather holes, you can see the butterfly.

The motor being worked on was missing any indication of a timing mark even with the flywheel pulled off. But it appears to be that the timing plate cam has a dual transition from a flatter idle into a faster taper for high speed. This carburetor cam was set at the juncture of the timing plate transition where the high speed cam sharply increases.

Carburetor Base/Intake Manifold : **The reed valves in these 9.5 motors were two different types. The change took place in 1972. Since these are mounted in the intake manifold, this manifold was changed. I have not heard of why this change was done, and I was not mechanicing, or exposed to this motor at that time.**

Here you see the early carburetor base with the reed boxes mounted directly below. At the upper left you can see the slow speed stop arm	Exploded view of late intake manifold a valves moved down & closer to the
	

Reed Valve Boxes : **As said above, the reed valves in these 9.5 motors were two different types. The early version used a set of reeds mounted in removable boxes that sat under the carburetor base and accessible only from that location. This adapter plate is held in place by two opposing Phillips head screws, which over time could become hard to remove without the aid of an impact driver as seen in the photo above. In this photo the reed box screws were already removed.**

Here is a top view of one of the boxes which has been removed	Here is the bottom view of the same reed box on the left, note the reed stops on the outside of the reeds
	

Throttle Linkage : **This linkage is rather different and complicated than you will generally see. The twist grip shaft has a small gear on the rear that engages a gear rack, so as you rotate the twist grip, this geared rack extends or withdraws. The rack shaft then engages a linkage plate that then engages another linkage plate, which ties to the timing plate. Rather complicated, but it works quite well.**

There is also a neutral safety lockout that prevents the motor's twist grip throttle from being advanced past the "START" position. This is simply a rod connected to the internal shifting linkage that abuts against a flathead screw from the twist grip linkage. This screw can be adjusted. However you can shift into either forward or reverse, then twist to a higher setting to start it.

Shown here is the throttle linkage system inside the cowling. The small arm to the right operates the neutral safety lockout, while the larger arm pointing rearward connects to the timing plate.

Recommended Fuel / Oil Mix : **The formula shown below will be on all modern 2 cycle oil sold in the last 30 years or so. On most all of the pints and quart plastic bottles of TWC-3 oils there will be a narrow clear vertical window on the edge of the bottles. On the sides of this window will have numbers representing ounces with Milliliters for other parts of the world. Or you can purchase special measuring containers showing different ratios and the amount of ounces needed.**

If your motor is one of these where you have to mix the oil, you need to know how much gasoline you will be needing, add the oil before you fill the fuel tank so that the oil mixes better that just dumping it in after you fuel up. However if that is not possible, guess, and add a majority of what you think it will take, fuel up, then add the rest matching the amount of gasoline you took on. If you are using portable fuel thanks, before hand, when you fill it, add 1 gallon at a time, use a clean 3/8" or 1/2" dowel, mark the dowel at each gallon and then use it as a measuring stick. This way you can refill a partly full tank with the known amount of oil.

Fuel/oil mix on all the OMC motors that have needle roller bearings (this motor included) is 50-1 of TCW-3 standard outboard oil. However I have found that since I troll much of the time, other than getting there and back, I like to use a mix of 75-1 but of a SYNTHETIC blend oil instead of the standard oil. This gives me at least the same or better motor lubrication, plus it gives me less smoke at a troll and the spark plugs last longer before fouling.

A quart has 32 ounces of oil in it. So for a portable 6 gallon tank to fill it using the 50:1 ratio would take 16 ounces, (1 pint) or 1/2 of the quart.

FUEL MIXING TABLE					
Gallons of Gasoline	Gasoline to Oil Ratio				
	Ounces of Oil to be Added				
	16:1	24:1	32:1	50:1	100:1
1	8	5	4	3	2
2	16	11	8	5	3
3	24	16	12	8	4
4	32	21	16	11	6
5	40	27	20	13	7
6	48	32	24	16	8

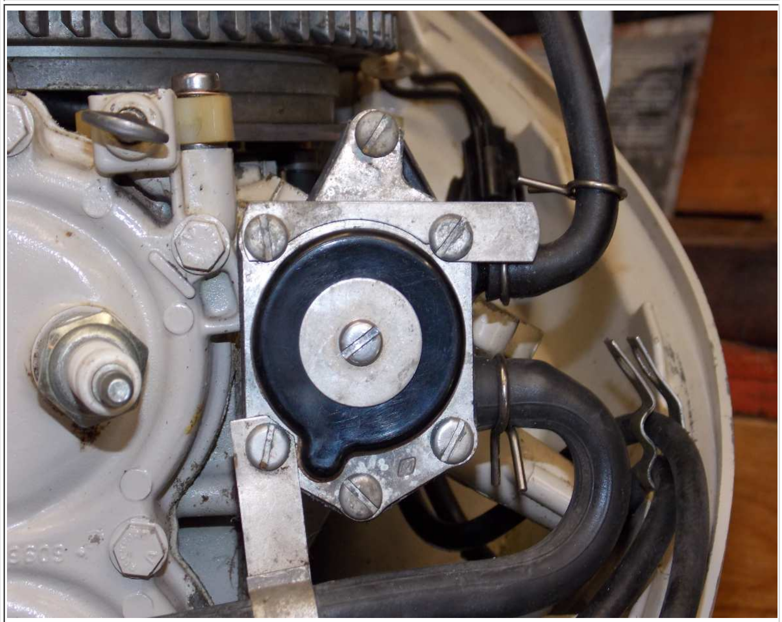
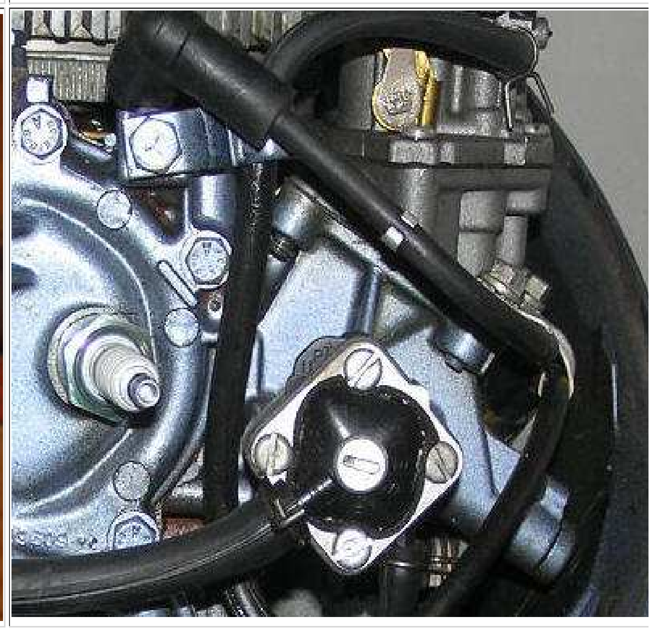
Fuel Pump : **When the 9.5 hp came out, it used a different larger based model fuel pump that had the cover unit rounded. It appears that this fuel pump was short lived (like 2 years) and was used on other motors as well, like**

at least the 6hp. Repair kits seem to be non-existent. However it is possible to convert over to the later small square style fuel pumps rather easily as the mounting gasket #0303615 is used on both styles of fuel pumps. In adapting the newer style pump, you will have to replace the two 10-24 X 1 1/2" mounting bolts with 2" bolts. They used the same lower mounting holes as shown on the same LH photo below for the later pumps.

When doing this conversion, you will have to replace and lengthen the discharge hose to the carburetor, then shorten the inlet hose.

There is a junction block located on the opposite side of the motor from the fuel pump that connects the fuel line from the quick coupler on the motor cowling to the line running to the carburetor.

In 1968 they went to the small square fuel pump. These later fuel pumps are pretty universal, the same one fitting most all these small motors up to 40 hp until about 1987. They are mounted basically the same as the previous versions, on the rear of the block/manifold and extends to the rear considerably below and behind the carburetor. For a link to the later small square pumps, rebuild procedure CLICK HERE.

Here you see the early style fuel pump	Here is the later style fuel pump
	

Idle Stop Adjustment : **The 64 -66 has an plastic adjuster (Idle stop setting) just rearward of the flywheel (spark plug side) that adjusts the armature plate stop. It has a thumb screw on it for easy adjustment, but you need to pull the cowling off to access it.**

In 1967, the idle speed adjustment knob moved to the base of the tiller handle, next to the fuel coupler. As seen in the photo below, on the side of the base of the tiller handle, there is an idle adjustment knob. Turn that knob to set the idle speed. There is enough friction on the knob shaft to lock the idle speed with the small dial. When this is adjusted this will allow you to return to a preset trolling speed and prevent it from cutting out at low idle.

The tiller handle has a spring tensioned positioner that holds it in two positions. Below and to the rear is a lever that locks the tiller handle. There is cast into the handle base "PULL LEVER UPWARD TO DROP HANDLE". This allows the handle to be raised or lowered more than what the tensioned adjustment allows.

Here is an idle adjustment knob for 67 thru 73 motors along with a handle lock lever

Tilt Lock: **When the engine is tilted up, it is held in place by the large rod (on the right when looking at the engine from the front side). In addition, there is a ratchet mechanism to the left (visible on the attached LH photo below) which prevents the engine being lowered by it's own weight.**

The ratchet is a friction device to let it tilt up easy, but go back down in a controlled decent fashion. The thru-bolt that goes though the brackets controls the amount of friction by tightening or loosening the nut. If it is too stiff, loosen the nut. If un-moveable, take it apart and see what is wrong with the friction cone part, it may just need to be greased. .

The RH photo below shows the motor base trim bracket adjustment. This has gears pinned to the shaft (you can just see parts of 2 teeth in the slot). By pushing in and rotating the exposed wrench activated knob, this geared shaft engages a geared rack that allows the bracket to be adjusted to match the transom angle of the boat.

To Adjust Tilt Angle : **Most older adjustment units are hard to move while bearing the weight of the motor, so you need to first tilt the motor up. You have to release lockout to tilt the motor.**

The Tilt Lock Selector is located to the lower right of the front of lower cover. The selector pushes the Tilt Lock Rod back to release the motor when in forward or possibly neutral so that it can be lifted up.

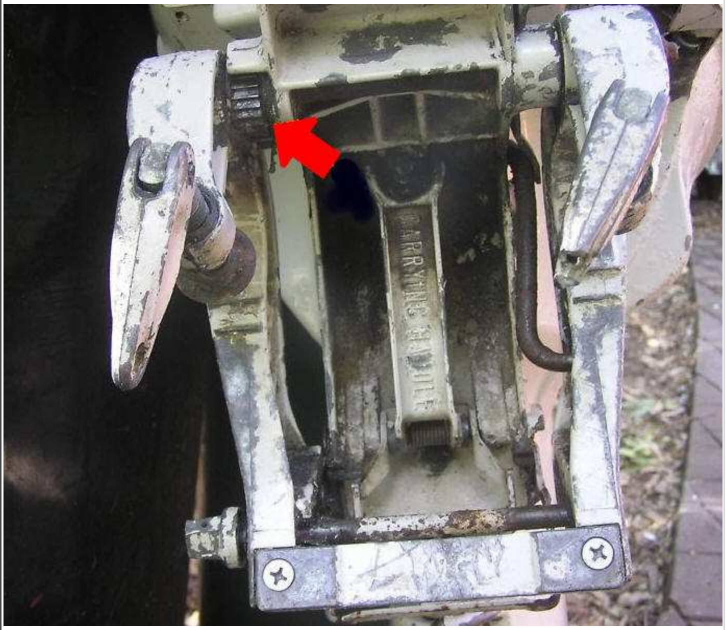
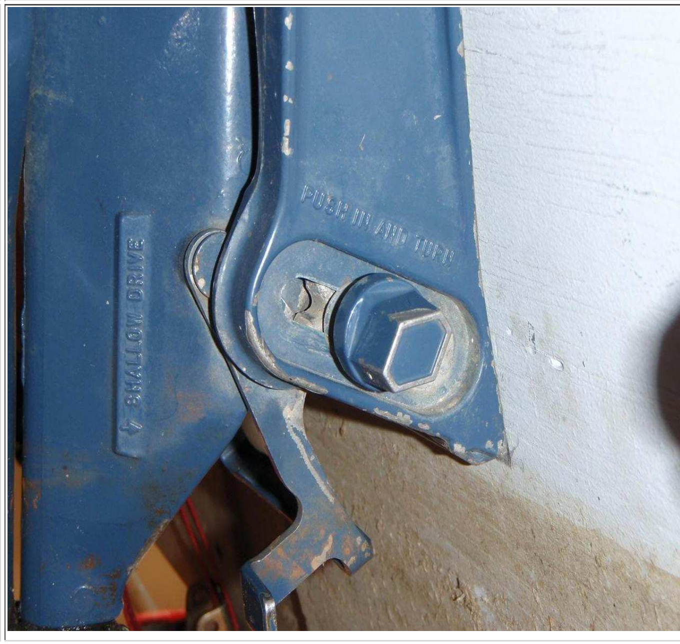
The spring loaded locking lever is connected to a wire (reverse lock wire) like part that looks like a bicycle spoke. It is supposed to release automatically when the motor is in neutral or forward gear and only lock in reverse. The adjustment is made to a small barrel-shaped connector on the lower end of the wire. The locking lever prevents the motor from swinging up and causing damage when running in reverse.

Put the shift lever in forward gear (it should work in neutral) to make sure that the motor is released to swing upward on the stern bracket. Push in the tilt lock and raise the motor. Push in and turn the knob to the desired position and return the motor to the running position. You should set the motor so that the cavitation plate is parallel to the water.

Check to be sure that the pin connecting the tilt rod selector to the tilt lock rod is in place or the rod will not move. On some models you can replace them with a small cotter pin. If the pin has deteriorated and you cannot replace it, you will have to reach around and move the Tilt Lock Rod back by hand in order to raise the motor or lower it. There are two upward positions in which the rod can be placed to hold the motor up.

When trailering with the motor tilted up, you can pull the Tilt lock Selector forward to lock the Tilt Rod Lock in place.

The shallow water bracket manually swings back to support the motor at an angle when in shallow water.

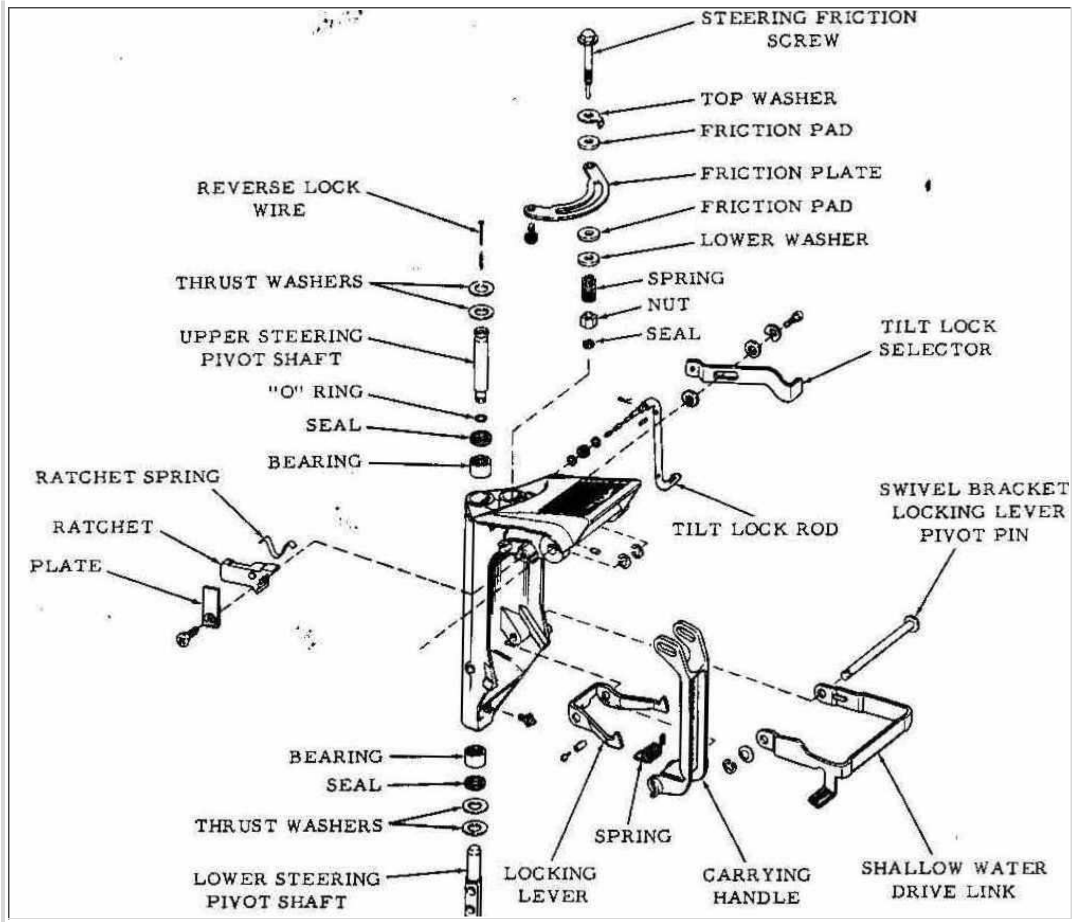
Tilt lock ratchet system	Motor base trim bracket adjustment
	

Trim Adjustment: **At the lower right of the above LH photo and the complete RH photo, you will see a knob of sorts that appears to be made to use a wrench on because of the flats on it. On the RH bracket near this knob will be "Push In And Turn". Behind the knob is a spring that lays over the shaft. Attached to the shaft are gears on each end. These gears engage into notches of the mounting clamp bracket. By pushing in on the knob and rotating it, you can rotate the gears, moving the bracket for trim adjustment of the motor.**

One thing here, the gears are small and attached by small (1/16") roll pins, which are a weak point and can result in a broken gear. If you have to replace a gear, the knob along with both gears are held onto the shaft by these roll pins, which need to be driven out very carefully.

Steering Friction Adjustment : **There is a friction plate directly under the powerhead cowling in front of the block. This plate is made of a arced steel plate with a arced slot in the center. There is a bolt with a friction washer going down thru this slot as shown in the above illustration. The bolt head is hex but also has a screwdriver slot in the top. With the upper cowling off and the motor centered pointing forward, you can reach down thru an access hole with the screwdriver then adjust this friction so the motor does not wobble back and forth when running at a idle.**

Exploded view of swivel bracket



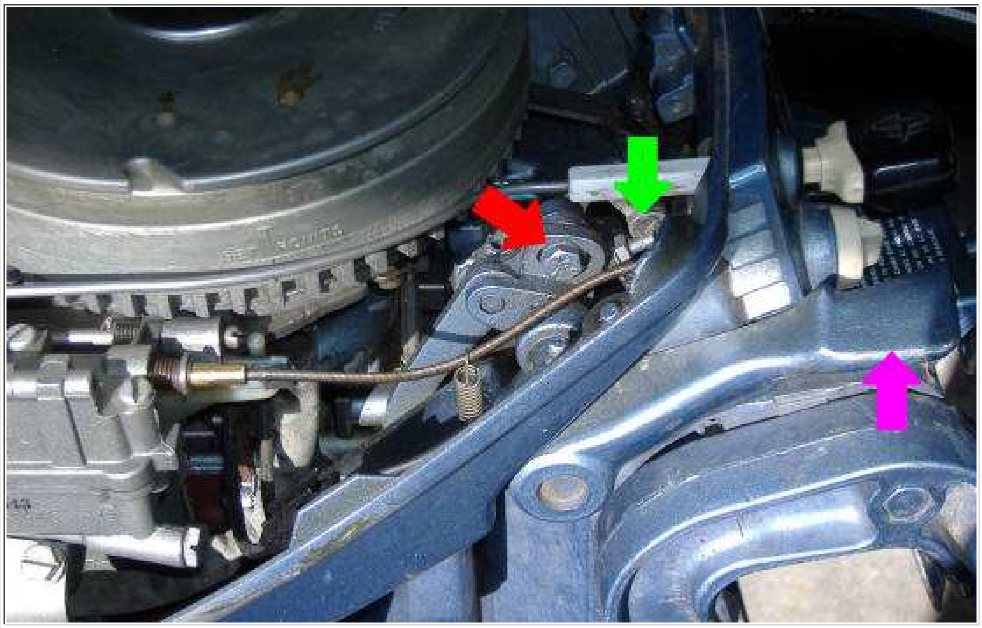
To Start : **The most common setting to start these 9.5 motors are with the twist grip handle turned up counter-clockwise to the neutral stop and with full choke, then after the engine warms up, ease it back clockwise to "shift" position.**

Start in Neutral / Shifting Adjustment : **This motor like many has a gear lockout feature where the motor needs to be in neutral or forward to be able to start. When in neutral, it limits the RPM of the motor. If it is then shifted into reverse, the peg is in a different location but also is a slightly higher rev limiter in reverse. However, you can start it in forward, with no limitation as to RPM. If you look at the photo below, the green arrow points to a slotted head screw under a peg on the shifting linkage. This screw can be adjusted to act as a bumper stop for the shifting linkage peg.**

If you need to make any adjustment in the position of the main shafting lever OR to adjust the above mentioned rev limiter, this is done using the bolt indicated by the red arrow.

The shifting lever itself is as indicated in the photo below by the purple arrow.

Here you can see the shifting linkage adjustments



Shift Gears : **On this model, the shift handle is on the outer starboard side (front RH looking forward). The positions are up for reverse and down for forward. The front panel of the motor has R/N/F printed vertically on the RH edge as seen in the photo LH below.**

Stop Button : **As seen in the photo on the left below there is a rubber covered button the size of a 1/2 dollar on front port (RH) side. This button just grounds out the ignition, killing the motor.**

Remote Controls : **It apparently was not originally designed for remote controls, however I have seen an aftermarket version and the one shown on the left below did appear later on OMC literature for accessories. This is evidenced by the taller shifting lever on the motor in the photos below. From what I see, it would be hard to convert this motor to remote throttle cables.**

<table>
<tr><th>Evinrude 9.5 front view</th><th>Evinrude 9.5 rear view</th></tr>
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Upper Cowling : **There were 2 different type of cowling latches, a twist lock that was made only in '64 and '65. They moved the release lever into the lower cowl in '66, but pretty much all the other parts on that are interchangeable.**

Here is the early cowling latch & early fuel pump	Here is the late cowling latch & late fuel pump
	

Lower Cover : **These motors utilized a split lower cover that surrounded the exhaust housing. This feature compounds repairs where a simple part may need to be replaced, but the whole cover needs to be removed to access it.**

Vibration Dampener : **This powerhead does a lot of shaking when running at a trolling speed. In 1967 it came out with a dampener system, which involved some metal brackets with fiber washers and springs. There was one mounted on the starboard side being attached by two of the carburetor base bolts. The port side unit was buried up under the recoil starter. These were attached to the motor and with the other end to the inner part of the side skirts. It appears that this was their cure, without changing any other parts.**

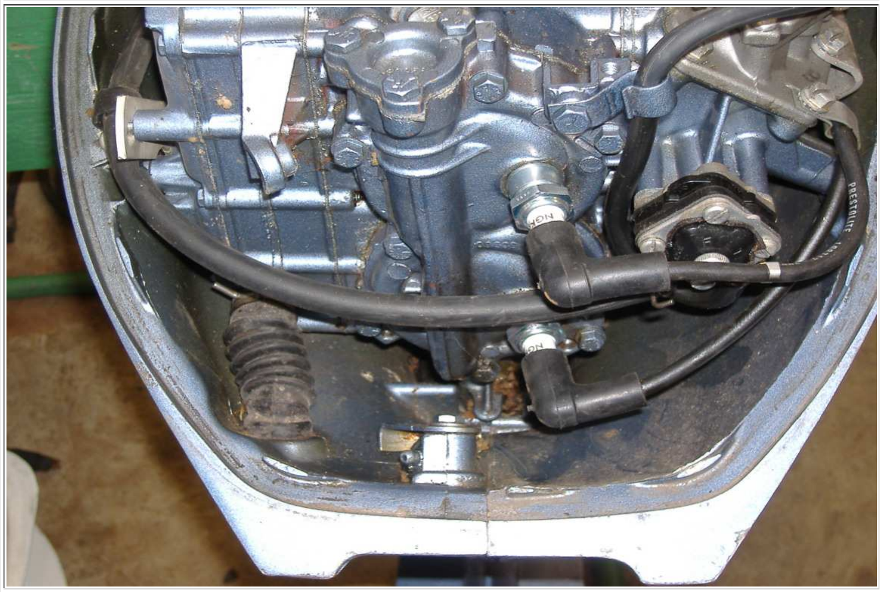
A reader of these articles found a New Old Stock retrofit damper kit and installed them on his motor. He said it was a much easier job than he had anticipated. There is adequate room to slip them in on the starboard side, and also on the port side after the starter recoil unit is removed, without other major parts removal. The only real issue was where to drill the mounting holes in the shrouds. Fortunately, the retrofit kit came with OMC templates for this. Having used it once, he does not believe that it is truly necessary, as even after being exceedingly careful in using the template to locate the holes, they (the holes) looked to be almost 1/8" out of the ideal position. He actually thinks one could do as well to pre-assemble the two units, lightly bolt them in place and then carefully estimate the places to drill.

Exhaust Housing : **There is a rubber corrugated boot (as seen in the photo below) that connects the exhaust housing to the outer middle cowling exhaust water outlet. This boot is notorious for becoming cracked and when this happens, you can again get exhaust gasses inside the engine cowling creating the same problem stated above. One way to test for this situation is to remove the cowling and then see if the idling improves. You may still get some contaminated air into the carburetor, but at least you have increased the odds of it getting better clean air. Your best option is to take it the lake or pond, then adjust it on the boat under a load, or if you must adjust it in a barrel, get a fan to blow the exhaust away from the motor and barrel because in a barrel you do not have as much a chance to dissipate any exhaust gas that the engine may be re-breathing.**

With reference to the above issue, make sure it runs and idles properly with the hood on ... another common problem with no available parts. However IF you can find a replacement boot it is not that hard a job of replacing it. The boot is held onto the block by a large snap clamp and is just inserted into the hole in the outer exhaust

housing. A tip to install it, is to lubricate it with some soapy water. It goes into a hole slightly smaller than the outer end of the boot, which snaps over the outer part of the hole, holding the boot in place.

Notice the bellows type rubber boot on the lower left



Exhaust Water Indicator : **This model doesn't have a overboard water indicator telltale "pee hole" like later models do. But there is a corrugated rubber boot hose(mentioned above) attached to the back of the engine block which comes out the back of the engine casing just under the cowling. You should be seeing a healthy broken-up water spray as seen in the running motor in the red trash can farther down in this article. At higher speeds, less exhaust comes out, so the water sort of runs out.**

Here is a running motor, notice the overboard water blubbering out the rear

Water mix will only spray out that hole when the thermostat is open. So until the motor warms up, it should be dry for possibly the first minute or so when started cold. In the photo below, you will see the thermostat cover plate center top of the photo held in by the 3 bolts.

Water Intake : **These motors main water supply to the water pump comes from a screened tube right behind the prop in the exhaust outlet. Water is forced into the screened intake to the water pump by the prop thrust. Some users report that when running these motors in a barrel, (usually a small one) that the prop has to be installed & usually in gear as apparently they need to get more water pushed to the water pump by the prop to get enough to cool when running at over an idle.**

There is a also a stainless steel intake plate with a few holes near the water pump area on the left side above the cavitation plate shown in the photos below. Flush kits for this motor are rather scarce. There is really no provision currently available for a easy muff system to run this motor out of a tank. But there is hope.

Water Pump: **The operation of most marine water pumps using a rubber vaned impeller is, the cavity between the vanes is what makes it pump water. As the off-center impeller rotates, the cavity enlarges, drawing in a gulp of water. As it continues to rotate, the cavity becomes smaller, and squeezes the water out and up the water tube to the powerhead.**

These pump housings are pot metal, and can become pitted, replace them with a new water pump assembly if needed. There is also a stainless bottom plate, this plate has to be positioned with the suction hole in the proper location/relationship as indicated in the photos. If you are just replacing the impeller, you can tell which way is up by observing the wear of the impeller on this plate. The impeller fits in this stainless cup liner which gives a very long lasting situation. In most cases you will never need to replace the water pump assembly, just the impeller. Sometimes the rubber impeller becomes un-bonded to the metal hub.

Also changing the water pump impeller is not as easy as the others because the water supply tube to the powerhead will many times come undone at the powerhead which it is a problem getting it back in place.

9.5 hp impeller installed in upper housing before final assembly

There is a rubber grommet at the top of the water inlet tube where it enters the lower part of the block. There is the possibility where this grommet may become decayed to where a good connection may effect the water flow into the motor, however this appears rare in the real world. The water outlet from the block apparently just exits into the

exhaust housing cavity, which creates cooling and eliminating paint being burned. This exhaust water blubbers out the single hole in the upper rear of the exhaust housing along with some exhaust. There is no water overboard tell tale like on the later motors, only this misty water exhaust mix.

One thing to realize is that this exhaust blubbering may be more until the motor warms up enough to open the thermostat.

Aftermarket Water Flushing Adapter Cover : **These motors main water supply to the water pump comes from a screened tube right behind the prop in the exhaust outlet which utilizes the thrust from the prop to push water up to the water pump. This method of water intake does not allow the newer type of flushing muffs to be used. Flush kits were made for a while for this motor but now are not currently made and are rather scarce. But there is hope.**

On the LH (port side) of the exhaust housing just above the anti-cavitation plate there thin stainless steel plate (the factory nomenclature is water bypass cover) which is held in by 2 screws. In this plate are 4 small clamshell type scoops that is designed to put water into the water pump when the motor is in reverse, as shown in the photo on the left below. This is common to many different size of these motors up to 10hp in these years up to about 1974. It was designed to supply water to the water pump when the motor was in reverse, however some motor owners think it is there for added water intake during forward running so you may see them in stalled either way.

I have since talked to a old time marine mechanic about the direction of those holes. Either he did not understand what I was saying or since his son took over the business and he has been out for a number of years, he forgot or did not pay any attention at the time. After looking at as many as I can come onto, I now have concluded that the scoops probably were originally installed forward. A few of these have this plates were painted over originally and little evidence that it had ever been off, as seen in the LH photo below. Plus if you look at a factory exposed drawing, these arrear to be on the forward end.

AND thinking about it, this would supplement a partially plugged intake screen behind the prop, which seems common with these motors.

The thought of them facing rearward IF they are indeed a reverse intake, sounds plausible, however when in reverse, you would at minimal speed and will not be doing this for a extended period of time, so possibly either way would suffice.

The right photo below is from a 10hp is an commercial aftermarket adapter (no longer available) with a 3/8" course thread placed inward in the rearward part. This allows the usage of Mercury's Quick-Silver Flushing Device described below. This flush plate apparently was NOT designed to be used when running, only for flushing, however this motor was a running motor, with no evidence of failure. Since these are no longer made, you can fashion one by using the original plate as a sample and soldering/brazing, (even epoxy) a 3/8" course nut onto the outside of it to screw the flushing adapter into. Or if your intention is to leave it in place and run the motor that way, I would solder the nut on the inside to give less resistance and less chance of debris hanging up on anything exposed.

Evinrude with original reverse water inlet plate	Johnson 10 hp QD with aftermarket flush plate adapter
	

Shaft Length : **Most of these motors you will see are short shafts, however they did make a longs-haft as shown in the photo below. From what I can tell probably just a long-shaft 5" extension off an earlier 10 HP QD motor.**

9.5 longshaft motor

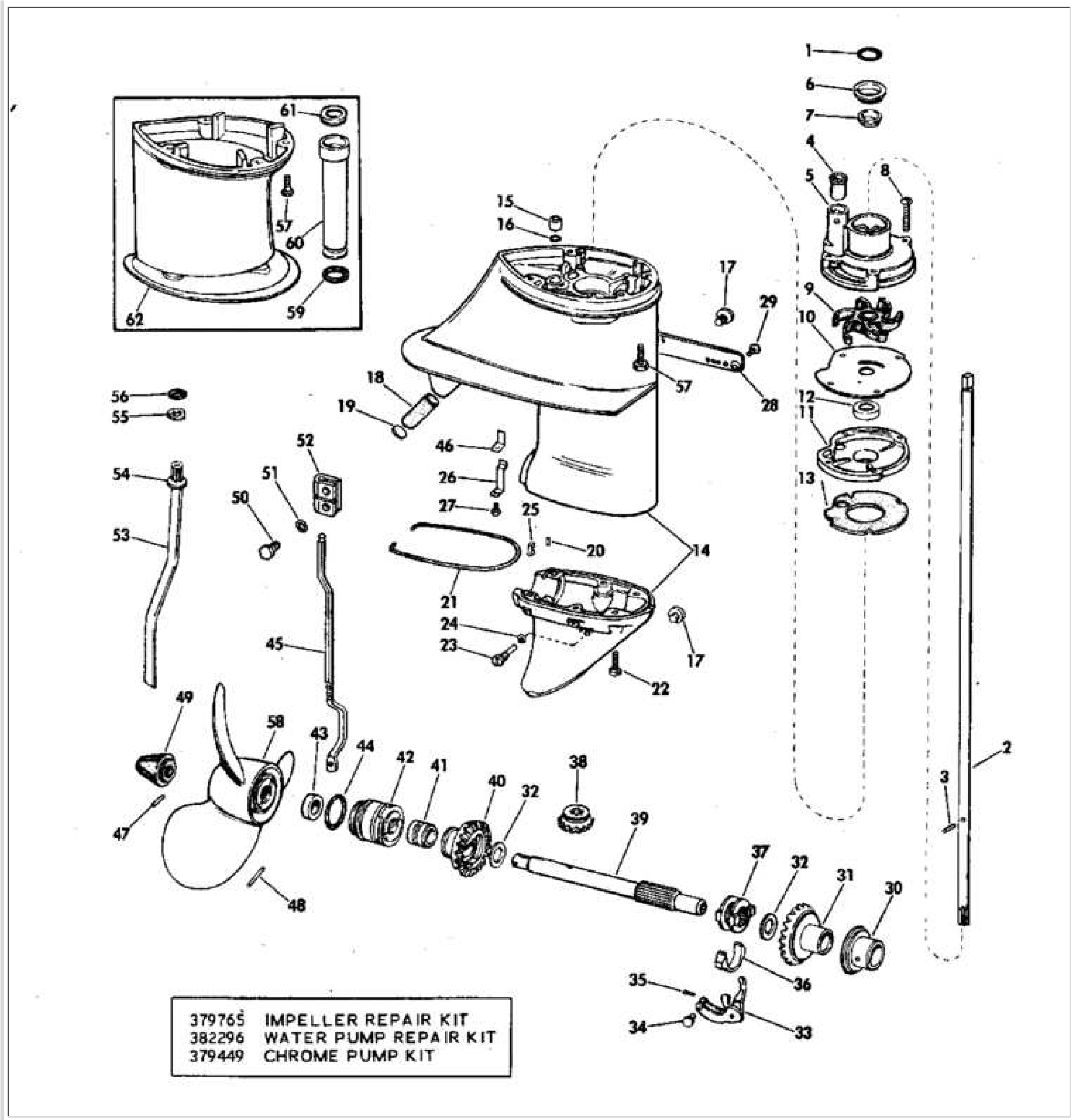
Lower Units : **The lower unit appears that they actually use the 4 bolt lower unit (gearcase) off the previous 10hp QD series.**

This copper water tube from the water pump to the powerhead is retained in the exhaust housing, just below the powerhead by a stainless steel push nut. A washer and o-ring then completes the seal with the powerhead. If this tube gets pulled out of the push nut, it may be almost impossible to reinstall it without removal of the powerhead. You may luck out by using a flash light and look close you'll see where it came from and with a lot of luck may be able to reinsert it, otherwise you may have to pull the powerhead.

And that is a very complicated job for the novice. The outer shell has to be split open and the motor comes out so you can get it apart. Lots of screws, links, and stuff. Really not bad if you know what you are doing, but for your first time, it will be a challenge.

For some reason the clutch dog slider gear seems to become worn and can cause the motor to jump out of forward gear. If this is the case new ones are impossible to find and good used ones are getting scarce. So you may consider pulling this apart and flopping ends with the clutch dog so that you are now using the not so much used reverse end of the slider for the forward gear.

Exploded view of gearcase



To check the oil level on these lower units, like most all of the ones that follow, there are two stainless steel flat head screws on the port (LH) side (#17 in the illustration above) . One is down below with the prop shaft and the other above the cavitation plate. The upper screw is the access hole for visually checking the oil level, and the lower is for putting oil into the lower unit and as seen in the photo below, the level is indicated by the blue arrow while the fill plug is shown by the red arrow.

The oil normally used is a 90 weight gear oil. It could be regular or synthetic oil. You can drain the oil by unscrewing both screws and allow the oil to drain out. If you are just topping it off, leave the upper screw in until you get the oil filler pump adapter threaded into the lower hole. Then remove the upper screw and pump oil into the lower hole until it starts to flow out the upper hole as seen in the photo on the right. It is best to replace the Nylon seal gasket under these screw heads at this time also. Replace the upper screw first, which will then lessen the chance of oil running out the bottom hole somewhat until you can get the lower screw and gasket screwed in.

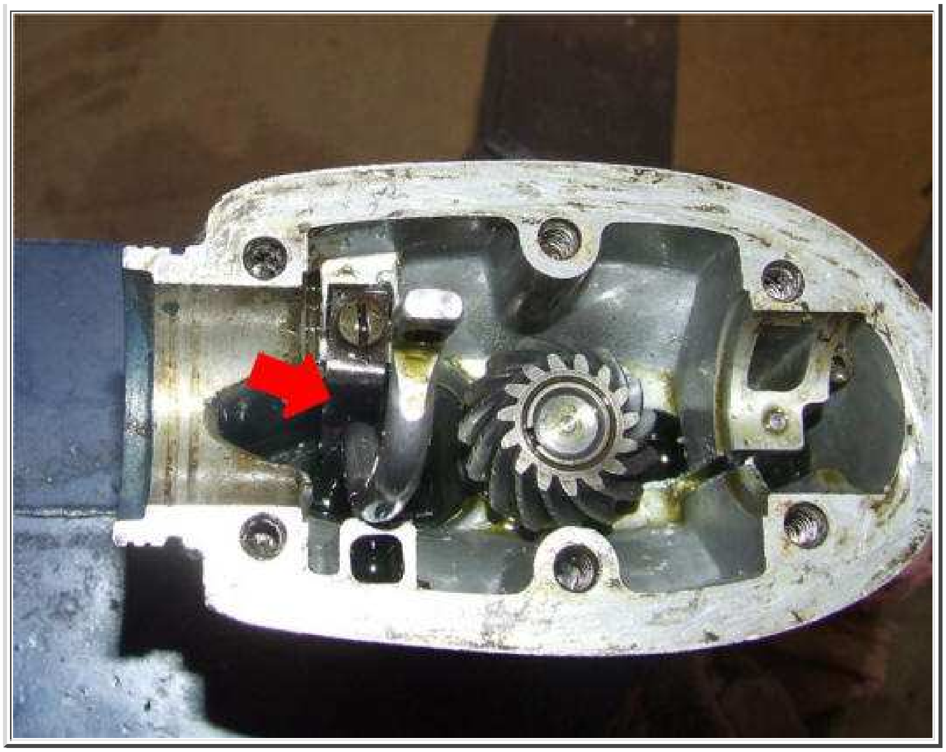
Oil fill & oil level screws	**Here a lower unit of a 9.9hp being filled, same principle on the 9.5hp**

Shift Lever Stops in Gearbox : **The positive click stops for the shifting lever is by a Ell shaped bent spring that snaps into notches on the shifting rod inside the lower unit (#26 in the exploded views above). This spring and a helper spring are screwed into the lower unit above the prop shaft which the spring detent mate into notches in the shifting rod. If your motor's stops are non-functioning, the spring and helper could be in fine shape, just that they had gotten slid out of position enough to not engage into the rod's notches. So this could be just a simple matter of realigning them then retightening the screw once the gearbox was apart. Notice when tightening the spring, the torque of tightening the screw rotates the spring, as seen below where this spring is slightly misaligned, this needs to be straightened before reassembly.**

In the photo below, with the bottom section of the gearbox removed along with the forward and reverse gears and the propshaft, you will note the shifting rod is arced around the LH side of the gear unit and a cotter pin which attaches it to the shifting yoke.

In the photo below, notice the 1/8" peg in the center of the front bearing recess. This peg goes into a recess in the front bearing housing to keep it from rotating.

The red arrow pointing to the area of the notches on the rod where the flat spring engages to secure it when in the selected gear



Prop: **In the early/mid 1970s OMC offered a accessory Lexan prop for the 9.5 hp. That is all they offered for a short time was the replacement 3-blade, 8 1/8 diameter, 8" pitch prop (part # 385940) but later they dropped them and reverted back to the aluminum props. That same prop was also spec'd as the replacement prop for 1958 - 63 10 hp motors.**

Exploded Parts Lists: **If you need to check on parts but do not have a actual parts list booklet, one of your best sources is http://www.crowleymarine.com/ They have a complete listing of about all of the Johnson and Evinrude motors showing exploded parts views with part numbers and you can order parts online from them.**

Back to Ramblings

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