Walbro Carburetor Repair

Where's the Beef?

The carb adapter plate to cylinder head gasket is known to become leaky from vibration of the engine. This IS NOT the gasket between the carb and the adapter plate. Usually two screws hold this adapter plate to the cylinder head, then the carb bolts to the adapter plate. When this adapter plate gasket starts leaking, the engine will start and die but never keep running. Replace this leaky gasket and the carb may not need to be serviced at all!

I have noticed a severe lack of information about repair of the carburetors on those gasoline power tools that we all have. I have seen countless weed-whackers, leaf blowers, and chain saws in the dump. Most likely the carburetor is why they quit running.

Certain hobby interest groups use these same carburetors for model boats, model airplanes, and go-cart engines. This group has offered several articles on the Internet, explaining what is typically wrong with the Walbro carburetors. When I read these articles, they were found to be lacking. They pointed out typical problems and sometimes conferred false understanding of the carburetor theory. After reading several of these articles, I still could not get my gas powered tools to run.

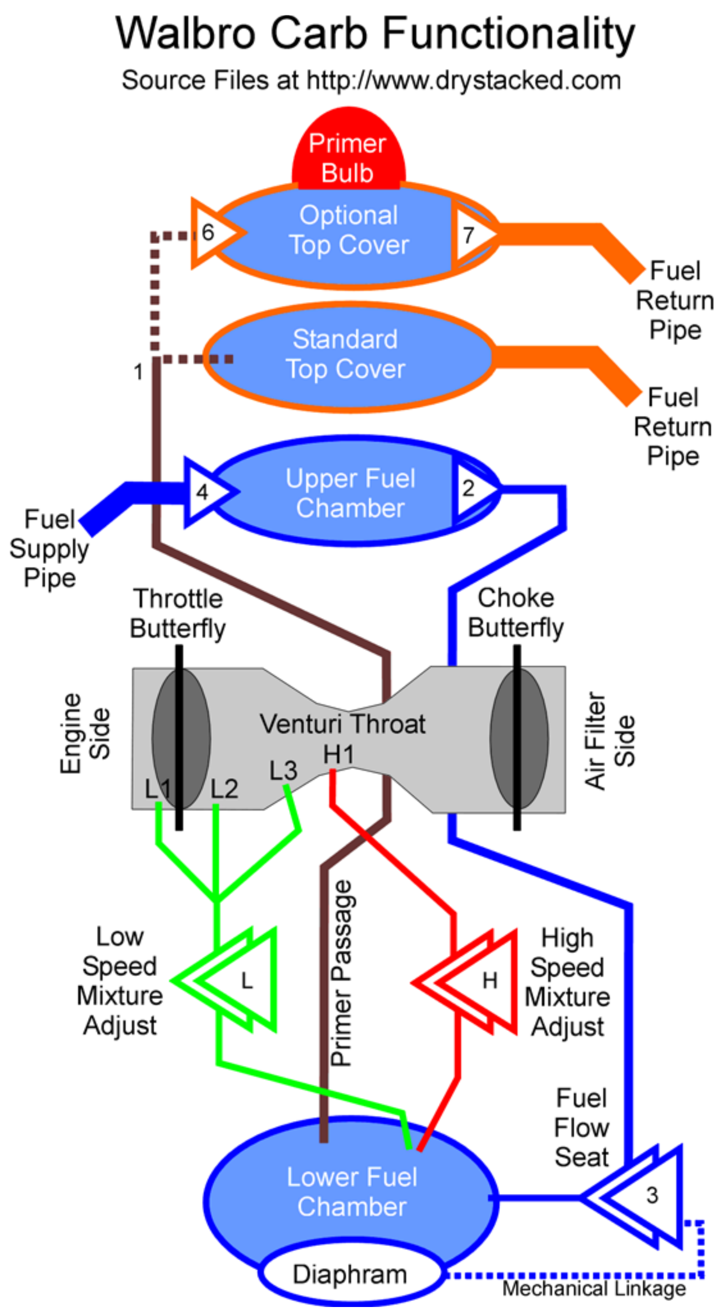

Figure 1. Walbro Carburetor Theory Diagram

I decided to develop a complete theory of operation with drawings and pictures so that all Walbro carburetors could be repaired. Indeed, after learning how the carburetor works, I was able to fix all three of my carburetors. My three Walbro carburetors included a WT363 on my weed-whacker, a WT391 on my chain saw, and a WA229 on my leaf blower. All of these power

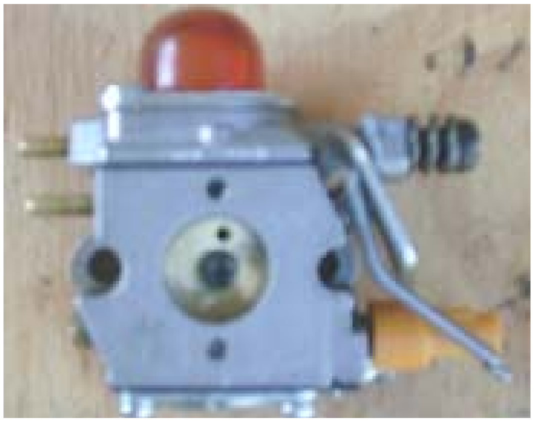

Figure 2. WA229 viewed from engine side.

Figure 3. WT363 viewed from engine side.

tools had been in storage for two years and would no longer run. The two extreme trouble symptoms were no fuel at all, or to much fuel that wetted the spark plug.

These three carburetors just happen to represent most Walbro carburetors on power tools. The WT363 has a built in manual pumper and both low& high-speed mixture-adjusting screws. The WA229 has a manual pumper and only a single mixture-adjusting screw. The WT391 has no built in manual pumper (the pumper is external to the carb) and both low and high-speed mixture adjusting screws.

The term fuel pumper has been thrown around loosely in previous articles by others. The term manual pumper is a rubber bulb on the top of the carburetor that you depress and release to prime the carburetor. The carburetor itself is a fuel pumper in the way that it draws fuel from the fuel tank with no external pump and in any carb/tank position. The manual pumper is required to prime the carburetor before the engine will start. Some Walbro carburetors do not have the manual pumper and must rely upon an external manual pumper to prime the carburetor.

Figure Two shows the WA229 carburetor from a leaf blower. Please excuse the focus problem. The focus problem was not detected until after the leaf blower was reassembled. The red manual pumper bulb is on top. The black screw is the idle speed adjust, and the bottom right screw is the idle mixture adjust. This carburetor has a single mixture adjusting screw. This carburetor also has no choke lever. The choke is external to the carburetor. The top pipe on the left is the fuel return pipe, and the lower pipe on the left is the fuel supply pipe.

Figure Three shows a WT363 carburetor from a weed-whacker. Same focus issue. The difference from Figure Two is the choke lever top right of the picture, and both low and high mixture screws at the bottom right of the picture.

Figure Four shows a WT391 carburetor from a chain saw. Same focus issue. This carburetor has no manual pumper. The manual pumper is external to the carburetor. The upper left pipe is the fuel return pipe. The lower right pipe is the fuel supply pipe. The throttle and choke clevis are both on the left side of the picture. The idle speed

Figure 4. WT391 viewed from engine side.

screw is on the right side of the picture on the top cover. The low & high mixture screws are on the bottom right.

First the Theory

Lets jump right in and learn how the carburetor works. Once you understand the theory, then we can address common problems and their associated fixes.

Figure One will be referenced throughout this discussion. The carburetor has two fuel chambers, an upper chamber and a lower chamber. The upper chamber has a fuel supply pipe that connects to the fuel tank. The upper chamber also has two check valves (2) & (4) that only allow fuel to flow in the direction of the triangles. The upper chamber has an inter-chamber orifice that feeds fuel from the upper chamber down to the fuel flow seat (3) located in the lower chamber. There is also a primer passage port (1) that connects the lower chamber to the top carburetor cover plate.

Prime the Circuit

On the manual pumper style carburetors, a pumper bulb is installed within the top cover. Associated check valves (6) & (7) allow the pump to draw fuel from the lower chamber through the primer passage (1) and output the primer fuel to the return line back to the fuel tank. On non-pumper carbs, some external pump must draw fuel from the lower chamber thru passage (1) and out the return fuel line. In all cases the engine will not run until all the air has been removed from both the lower and upper chambers. As the primer action draws air from the lower chamber, it also draws air from the upper chamber via the fuel flow seat (3) until both chambers and the primer bulb are filled with fuel.

Idle Fuel Flow

The carburetor is now primed and ready to provide fuel to the engine. Note that both the low-speed adjust circuit and the high-speed adjust circuit draws fuel from the lower chamber. When the engine is warmed up and idling, then each engine intake cycle would create a pulse of vacuum at the engine side of the carburetor. Since the throttle butterfly is nearly closed, the L1 idle fuel port would see that vacuum pulse and draw fuel from the lower fuel chamber and the warm engine receives enough fuel to continue idling. As each intake cycle draws a short slug of fuel from the lower fuel chamber, this creates a slight vacuum in the lower fuel chamber. The lower chamber diaphragm senses this slight drop in pressure of the lower fuel chamber with respect to the outside atmospheric pressure on the other side of the diaphragm. This pressure offset causes the diaphragm to move towards the center of the carburetor, and the diaphragm pin presses on the flow control fulcrum lever, which momentarily overrides the spring to open the fuel flow seat.

For each intake cycle of the engine, the engine draws a small amount of fuel from the lower fuel chamber past the low speed mixture circuit. The drawn fuel opens the fuel flow seat and the engine vacuum actually draws the fuel from the fuel supply pipe via the upper chamber. When that intake cycle ends, the fuel flow seat (3) closes and waits for the next engine intake cycle. A warm engine at idle is when you would adjust the low-speed mixture screw.

Let us take a tour of the fuel path from the tank while the engine is idling. Fuel leaves the tank and arrives at the fuel supply pipe. It passes through check valve (4) into the upper fuel chamber. Then it passes through check valve (2) and down to the fuel flow seat (3). It passes through this open seat and flows into the lower fuel chamber. It then passes around the idle mixture screw to L1. From there it is draw into the engine for combustion.

No Such Thing as Fuel Pressure Regulator

I have read where some people call the lower fuel chamber a fuel pressure regulator. This is simply not true. There is no fuel pressure in the lower chamber. The fuel in the lower chamber remains at atmospheric pressure or less. When this fuel pressure tries to decrease, then the fuel flow seat opens which keeps the lower fuel chamber at atmospheric pressure. This allows the engine intake vacuum to draw fuel from the fuel tank via the path described in the previous paragraph. The fuel flow seat must close between engine intake pulses to keep the lower fuel chamber primed and full of fuel. If the fuel flow seat does not close, then fuel could siphon back to the venturi and the lower chamber will loose its prime. The engine would starve on fuel because the next intake cycle would draw air from the lower chamber and not fuel from the lower chamber.

Multi-position Fuel Float System

The entire process described above is simply a multiple position fuel flow system. This carburetor will run in most any position because there is no surface float to keep the lower fuel chamber full. Instead, the combination of diaphragm and fuel flow seat and check valves simply allows replacement fuel from the fuel tank via the upper chamber to replace any fuel drawn from the lower fuel chamber. For this to work there can be no air in the lower chamber or the upper chamber. When the fuel flow seat closes, it locks the lower chamber with fuel and holds prime. There are check valves (2) & (4) in the upper chamber which holds prime for the upper chamber. Note that the fuel return pipe is not used during engine operation. It is only used to expel excess fuel during primer bulb action. When the primer bulb is not in use, then the check valves (6) & (7) seal the primer cavity from the upper fuel chamber and from the fuel return pipe.

Staged Fuel Circuits

The idle fuel circuit is called a staged fuel metering circuit. As the throttle butterfly starts to open, it will uncover L2, which doubles the amount of fuel that can be drawn from the fuel tank. It is doubled because you now have two holes open to the engine vacuum, hence twice the fuel flow. This is required because the opened throttle butterfly now allows double the air flow to the engine intake. As the throttle butterfly opens more, the L3 port now feeds fuel for three times the fuel flow to the engine to compensate for three times the air flow past the throttle butterfly.

It should be obvious that three idle stages will be less than optimum but much better than a single stage. In complicated carburetors, there will be six or more ports that allow six or more idle mixture stages as the carburetor throttle is slowly opened. These three idle stages provide reasonable idle mixture control as the engine throttle is slowly opened.

The staged idle circuit adds more fuel as the throttle is opened in an attempt to keep the engine from leaning out as the throttle allows more air into the engine. As the throttle is opened even more, then the high-speed port H1 starts providing the majority of fuel to the engine due to its size and its location at the venturi area. At full throttle, the engine is drawing little fuel from the idle circuits and nearly all of the fuel from the high-speed circuit. This happens because the engine intake vacuum drops while the throttle is fully open. This reduced vacuum has less effect on drawing fuel from the idle circuits. The high-speed circuit on the other hand is located at the venturi that is the highest vacuum point in the carburetor, so most of the engine fuel is drawn from this large port H1. This is when you would adjust the high-speed mixture screw.

Physical Carburetor Features

Manual Pumper Fault Isolation

Figure 5. WT363 top plate with check valve removed.

First we will look at the manual pumper. If your carburetor has the optional manual pumper top cover, it will look similar to **Figure Two**. There is a rubber bulb that you press and release until it fills up with fuel. Some small air bubbles at the top of the bulb is acceptable. If the bulb will not fill with fuel then up to four conditions could be present. The fuel tank may be empty, the fuel pickup filter is plugged, the fuel bulb is cracked, or the manual pumper check valves (6) & (7) are not working. If your carburetor does not have a manual pumper, remove the fuel return tubing and apply a vacuum to the carburetor fuel return pipe. If you don't get fuel, then you have a fuel supply or carb problem.

The manual pumper check valves work with air when no fuel is available. Simply disconnect the fuel return line from the carburetor and hold your finger over the end of the carburetor return fuel pipe. Now pump the pumper several times and listen carefully as you remove your finger from the fuel return pipe. If the check valves (6) & (7) are working, you will hear a hiss as the slight pressure caused by the pumping action escapes from the fuel return pipe. If you get this hiss, then the pumper and associated check valves are working properly. You could also use a pressure gauge to see if pressure is developed but that usually requires pipe size adapters. Reinstall the return fuel line when completed with this test.

Figure 6. Top plate bottom view.

Next you should remove the fuel supply tubing from the lower carburetor fuel supply pipe and pull a vacuum on the fuel tank supply line tubing. If fuel comes out, then the problem is in the carburetor. If fuel doesn't come out, fix the tank/supply line problem or fill the tank with fuel.

Although it is not likely, I guess it could be possible that the fuel return tubing to the fuel tank could become plugged. To verify, remove the fuel return tubing from the return pipe and try to blow air pressure through the return fuel tubing into the tank with the tank fill cap removed. If you hear air hissing into the tank then the fuel return line is not plugged.

We're Going In

If the pumper is the problem or carburetor is the problem, then carburetor removal and disassembly

Figure 7. WT363 top of carburetor body.

is required. It is important that you don't mix up the return and supply fuel lines. Mark them so that you know which is which during reassembly. Removal of the carburetor, although tedious, can usually be accomplished with a minimum of tools. Just keep track of how to reassemble later. If you have a digital camera, take some pictures to aid in reassembly. Just make sure that your pictures are in focus before you start disassembly. You can also make a sketch of how things are connected. The more information you sketch, the better. What seems obvious now, could quickly turn into confusion later.

Disassemble in a clean and well lighted area. Work on a flat surface large enough that you wont loose small parts. Count and note how many turns closes the mixture control screws (screwed all the way in) for future assembly. Use some carburetor cleaner to clean the outside of the carburetor before disassembly. Another section will fully describe carburetor internal cleaning.

Manual Pumper Components

This section will describe how to examine the manual pumper portion of the carburetor. To understand this section, you must refer to Figures five, six, seven and eight. **Figure Five** shows the top plate removed from the WT363 carburetor. The rubber primer bulb and attaching ring plate are not shown in this picture. It does show the pumper check valve (7) removed from the top plate. The center hole of the top plate holds this rubber check valve and the small hole is a check valve (6) (uses the outer flapper ring of the above described rubber check valve) that feeds down through the carburetor body to the lower chamber.

Figure Six shows the bottom view of the top pumper cover. The small center hole connects to the small hole in **Figure Five**. This same small hole (1) on **Figure Seven** is the passage that connects the lower chamber to the primer bulb via the top cover. The large hole on the left side (within the gasket area) is ported to the carburetor mounting flange (engine side) and is normally blocked off by the carburetor to engine gasket.

Figure Seven shows the top of the carburetor body. Hole (1) is the passage to the lower fuel

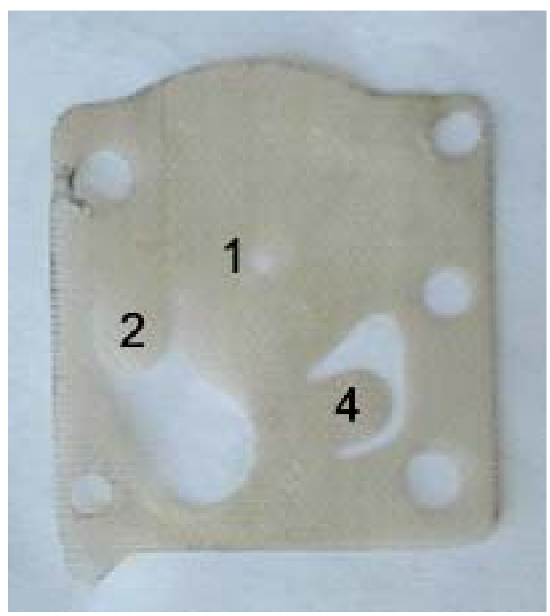

Figure 8. Carburetor body check valve wafer.

chamber. Hole (4) connects to the fuel supply pipe, hole (5) connects to the upper fuel chamber, and hole (2) also connects to the upper fuel chamber. The cavity (2) in **Figure Six** connects the carburetor body hole (2) to the carburetor body hole (3). The cavity (4) in **Figure Six** connects the fuel supply pipe to the upper fuel chamber via holes (4) and (5).

Figure Eight shows the body check valve wafer. This wafer has two flaps (2) & (4) that act as check valves. It also has hole (1) that connects the carburetor body lower chamber passage to the top cover fuel primer bulb circuit.

Fuel Pumper Operation

When you push on the primer bulb, the primer rubber check valve closes the small hole **Figure Five** and forces fuel out of the fuel return pipe (large center hole **Figure Five**). When you release the bulb, the small hole draws air from the lower fuel chamber via hole (1). When a slight vacuum is created in the lower chamber, then the chamber passage draws fuel from the upper fuel chamber via the fuel flow seat (3) and check valve (2). When the upper fuel chamber fills with fuel via flapper check valve (4), then the lower chamber can fill with fuel. After several pumps, the carburetor fuel return pipe squirts out excess fuel when the primer bulb is full of fuel. That is the simple explanation. The long explanation follows.

When the primer bulb is pressed then released, the bulb check valves cause a low pressure at hole (1) of the carburetor body **Figure Seven**. This passage relays the low pressure down to the lower fuel chamber. The lower fuel chamber experiences this low pressure and the diaphragm opens the fuel flow seat (3). The fuel flow seat is shown in **Figure Seven** hole (3).

Hole (3) has the fuel filter-screen removed so that the brass fuel flow seat can be seen. This low pressure comes up and out of hole (3), pulls open the flap over hole (2), that is connected to the upper chamber. The low pressure relayed into the upper chamber is connected by the top plate cavity (4) to the carburetor body holes (4) and (5). This low pressure at hole (5) opens the flap over hole (4), and this low pressure is relayed to the fuel supply pipe, which draws fuel from the fuel tank.

As the manual pumper bulb is pressed and released, this first fills the upper chamber with fuel, and then fills the lower chamber with fuel. With both chambers filled with fuel, the primer bulb itself fills with fuel. This is how the carburetor gets primed. When you stop pressing the primer bulb, system balance is achieved and the fuel flow seat (3) closes because the lower chamber fuel pressure is equal to atmospheric pressure, so the diaphragm stops pushing the fuel flow valve seat open and the spring forces the seat closed. This seals the lower chamber from the upper chamber. The flapper check valve (4) in **Figure Eight** seals the upper chamber from the fuel supply pipe. The flapper check valve (2) in **Figure Eight** seals the upper chamber from the lower chamber. The rubber check valves (6) & (7) in the top cover primer cavity also seals the optional primer chamber from both the upper fuel chamber and the fuel return pipe. All three chambers are now sealed so that prime will not be lost.

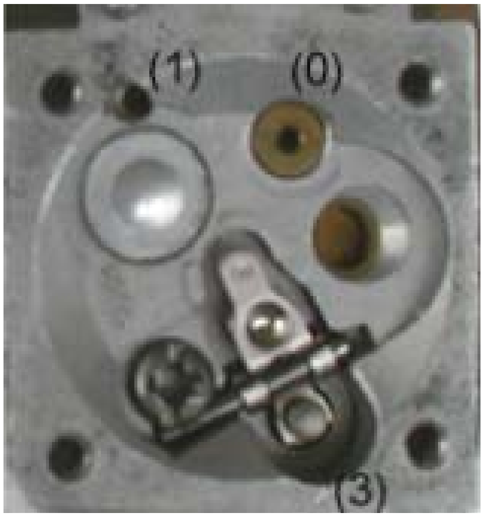

Figure 9. WA363 Lower chamber with diaphragm removed.

Lower Fuel Chamber Description

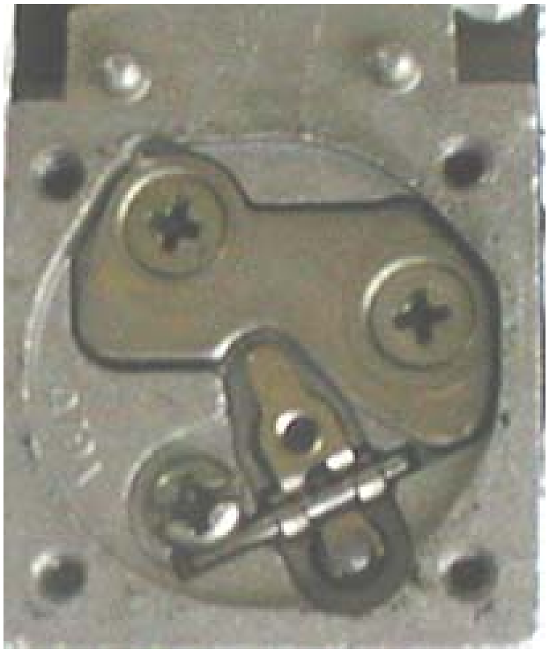

Figure 10. WA229 Lower chamber with diaphragm removed.

NOTE: Before disassembly of the lower fuel chamber description, it is very important that you make a note of the thick gasket location with relation to the flexible diaphragm. If there is a thick gasket, make sure you note where that gasket is with respect to the carburetor body. Is the thick gasket between the carburetor body and the flexible diaphragm or is the thick gasket between the flexible diaphragm and the cover.

I have found two different lower chamber designs. One design has the low & high-speed mixture circuits feeding from the same orifice in the lower chamber unit. The other design has the low & high-speed circuits under a plate within the lower chamber.

Figure Nine shows the bottom view of a lower chamber with the chamber cover and diaphragm removed. This design has the common fuel circuit pickup orifice (0) and the primer passage port (1). The fuel flow seat (3) can also be seen.

Figure Ten shows the other design with fuel metering ports under the plate. **Figure Eleven** has the plate removed to reveal the fuel metering ports. The single mixture screw is between L2 and L3 (removed in this picture) and meters fuel for both low & high-speed operation.

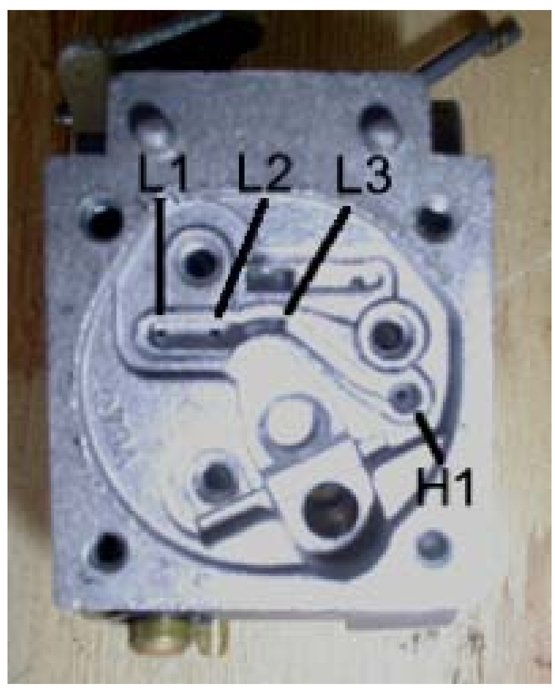

Figure 11. WA229 Lower chamber with plate removed.

With the **Figure Nine** style carb, you must look into the carburetor venturi area to see the fuel metering ports as shown in **Figure Twelve**. Remove the mixture screws, block the low and high mixture screw holes, and then spray carburetor cleaner into the pickup orifice (0) shown in **Figure Nine**. Observe that the spray comes out all the fuel metering ports in the venturi area. With the **Figure Eleven** style, you can see through the fuel metering ports into the venturi area (hold it up to strong light) and you can probe the ports to make sure they are free of debris.

The diaphragm and its associated mechanism requires some description. One side of the diaphragm has a small metal pin. This pin is about 6/32" long. The thick gasket is 5/32" thick, and the fuel flow fulcrum sets about 2/32" below the carburetor body. This allows 1/32" clearance for the fuel seat to fully close due to the fulcrum spring.

>>NOTE: Your carburetor may be different. If so, then you may not have a thick gasket at all, or the thick gasket may go between the diaphragm and the cover plate. In either case, when the diaphragm is properly installed, the pin will almost touch the fulcrum, and this should be your guide for thick gasket location when applicable.<<

Figure 12. WT363 Venturi view of fuel metering ports.

The diaphragm is installed with this pin side towards the carburetor. The pin presses upon the fuel flow fulcrum, which overrides the fulcrum spring and opens the fuel flow seat as the diaphragm moves towards the carburetor. This allows fuel to flow into the lower chamber when the pin side of the diaphragm has less pressure than the atmospheric pressure on the other side of the diaphragm. When the two pressures reach equilibrium, then the fulcrum spring forces the fuel flow seat (3) closed.

With the fuel flow seat closed, this fulcrum arm is positioned about 3/32" below the carburetor diaphragm mounting surface. Sometimes people mistakenly install the thick gasket in the wrong place. **As stated above, your carburetor could have no thick gasket or the thick gasket in the alternate location. This is why it is best to note the thick gasket location during disassembly. The thick gasket in the wrong location will either force the diaphragm pin to hold the fuel flow seat open, or it will prevent the pin from ever opening the fuel flow seat. This is a common mistake that will render the carburetor useless.**

If the diaphragm is not easily flexed, then it should be replaced. When replacing the diaphragm, ensure that the thick gasket is installed as described above. **Figure Thirteen** shows how the thick gasket is on the pin side of the diaphragm for many but not all carburetors. The silver pin in the center is what pushes on the fulcrum lever that overrides the spring and opens the fuel flow seat. The website listed in the footer has additional charts and gauges to help with fulcrum adjustment if necessary.

Figure 13. Thick gasket could be between the body & diaphragm as shown here, but not always.

Figure Fourteen shows the three parts that comprise the fuel flow seat. Reassembly of these parts can be quite irritating. Refer to **Figure Fifteen** for installation discussion. You must clip the needle pin grove into the fulcrum lever slot and hold the spring at recess (8) as you lower the fulcrum lever with installed pivot pin down into the carburetor body. Ensure that the needle pin drops into hole (3) while the pivot pin drops into slot (9). Compress the spring that is still in recess (8) with the other end straddling the bump on the fulcrum lever and press the assembly all the way down. Now

Figure 14. Fuel flow seat removable parts.

insert the screw at hole (10) and tighten the screw while maintaining pressure on the spring. Yes, it really can be done! My method is to leave the spring out during the above procedure. Before installing the screw at (10), lift the fulcrum just enough to insert the compressed spring, then install screw (10). To compress that small spring, insert a paper clip down through the center of the spring and slide the spring down the paper clip as it compresses. Now pull out the paper clip and snap the compressed spring into position.

When finished working on the lower chamber, install the diaphragm and metal cover, to keep foreign matter out of the lower chamber.

Troubleshooting Carburetor Problems

Typical Manual Pumper Problems

One common problem is when the primer bulb itself becomes cracked with age or torn from abuse. Replace the bulb if it is stiff, cracked, or torn. This bulb is NOT included in a carburetor repair kit.

Another common problem is when the fuel screen in **Figure Seven** hole (3) (screen is missing in this picture) becomes clogged with debris. This prevents fuel flow from the upper chamber down through the fuel flow seat into the lower chamber. Clean or replace this screen. Forced air might blow this screen out, so keep an eye on it and replace it if it blows out. The carburetor repair kit includes a new fuel screen.

The rubber check valve in the pumper top cover does not seem to go bad. It is NOT included in the carburetor repair kit.

There is a fuel filter in the supply fuel line inside the fuel tank. This can become clogged and require replacement. Refer to the section “Manual Pumper Fault Isolation” for further pumper checks.

Another problem is when the carburetor body check valve wafer **Figure Eight** becomes stiff from age, or has debris preventing closing of the flappers. Replace the wafer or remove the obstructing debris. The transparent wafer material seems to last much longer than the rubber wafer before becoming deformed.

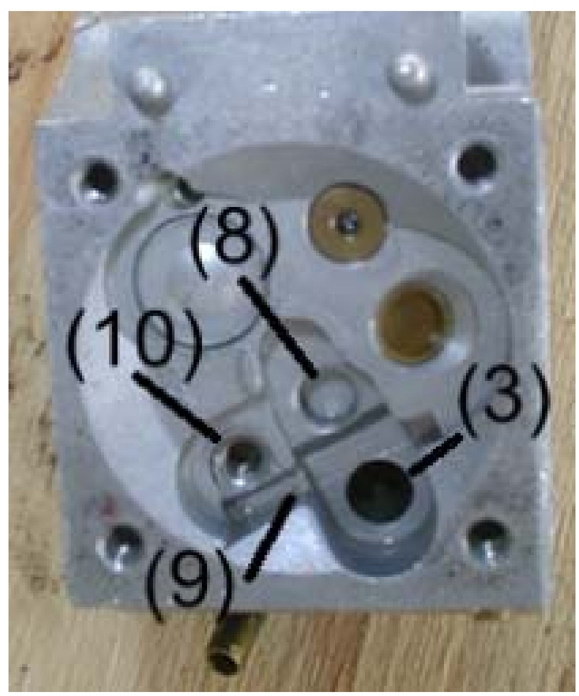

Figure 15. Fuel flow parts removed.

One of my problems was that the fuel flow seat was clogged and would not allow fuel to pass into the lower fuel chamber. The fuel flow needle valve must be removed and cleaned. Some times the needle seat rubber tip becomes soft and will not open properly. This rubber tip has a grey coating. If the coating has worn to reveal the orange rubber beneath, replace this needle valve because it will stick closed.

Typical Carburetor Problems

1. The fuel filter in the fuel tank is a likely culprit for fuel starvation symptoms. It is the first line of defense against fuel debris. This fuel filter can turn into a jello like substance which blocks fuel flow. This jello like substance forms as the gas/oil mixture ages.

2. Debris in the mixture metering screws is often assumed to be the problem but seldom is the problem. Don't start twisting those mixture screws right away as most people do. It is unreasonable that debris is here because the filter-screen at the fuel flow seat (3) keeps this debris out of the lower chamber. If it is not in the lower chamber, then it can't be picked up by the mixture metering circuits. Of course, if the carburetor has remained unused for a great length of time, then the jello substance can be found here also.

3. The venturi fuel metering ports (Figures 11 & 12) can become clogged with residue from evaporating fuel. Soaking the carburetor body in carburetor cleaner and blowing out these metering ports with compressed air will usually fix this problem.

4. The fuel flow needle pin rubber tip (Figure 14) can become soft and sticky. There can also be a blockage in the fuel flow seat (3). Removal of the fuel flow needle pin is easy, but reinstalling it is quite tricky. That pesky little spring in **Figure Fourteen** makes the assembly quite difficult, although not impossible.

5. Another problem is when the diaphragm becomes stiff from age and no longer operates the fuel flow needle valve (3) properly. If the diaphragm is not easily flexed, then it should be replaced. When replacing the diaphragm, ensure that the diaphragm is fitted correctly for that style carburetor.

If you use the rigid gasket, make sure it is in the proper location. Refer to the note on page nine.

Disassemble, Clean, Reassemble

Disassemble

1. Always use eye protection while working with compressed air.

2. It is important that you don't mix up the return and supply fuel lines. Mark them so that you know which is which during reassembly. Removal of the carburetor, although tedious, can usually be accomplished with a minimum of tools. Just keep track of how to reassemble later. If you have a digital camera, take some pictures to aid in reassembly. Just make sure that your pictures are in focus before you start disassembly.

3. You can also make a sketch of how things are connected. The more information you sketch, the better. What seems obvious now, could quickly turn into confusion later. Disassemble in a clean and well lighted area. Work on a flat surface large enough that you wont loose small parts.

4. Count and note how many turns closes the mixture control screw(s) (screwed all the way in). Write this down for use during reassembly. Some mixture screws have a plastic limit cap to limit

screw turns. Just pull these plastic caps off and set aside. Use some carburetor cleaner to clean the outside of the carburetor before disassembly.

5. Remove the carburetor top cover by removing the single screw (no manual pumper) or the two screws (manual pumper). Inspect and replace the flapper wafer (Figure Eight) if required. Set aside the flapper wafer. Spray the top cover with carburetor cleaner as required.

6. Remove the mixture adjust screw(s) and spring(s), spray with carburetor cleaner and set aside.

7. Remove the four screws and the lower carburetor cover-plate and carefully remove the diaphragm without tearing it. Inspect the diaphragm for tears and stiffness. Identify the thick gasket location if present and make a not of the thick gasket location. Replace the diaphragm if required and set aside.

8. Remove the screw (10) in **Figure Fifteen**, and remove the three components shown in **Figure Fourteen**. Don't loose that spring that is under tension. Inspect the rubber tip for wear (silver coating worn off) and replace if required, and set aside.

9. Use a small pointed object to remove the fuel filter-screen (3) that is shown missing in **Figure Seven**. Inspect for holes and replace if needed. Clean the screen and set it aside.

Clean the Carburetor Body

Soak the carburetor body with carburetor cleaner for several minutes and then use air pressure to blow out all the passages.

Block the low and high mixture screw holes, and then spray carburetor cleaner into the pickup orifice (0) shown in **Figure Nine**. Observe that the spray comes out all the fuel metering ports in the venturi area. With the **Figure Eleven** style, you can remove the plate and see through the fuel metering ports into the venturi area (hold it up to strong light) and you can probe the ports to make sure they are free of debris. Replace this plate once the ports are clear.

Reassemble the Carburetor

Reverse steps 9 – 2 in the disassembly procedure above. For step 9, use a pencil eraser to insert the filter-screen. This will ensure that the screen is inserted level into the hole.

For step 8, follow the procedures described in the "Lower Fuel Chamber Description" section.

For step 7, ensure that the thick gasket (if used) is in the proper location with respect to he flexible diaphragm (see note on page Nine).

For step 4, reset the screw(s) turns to the noted turns away from fully closed (all the way in). If you suspect that the initial setting are wrong, or you didn't write down those settings, then set each mixture screw 1-1/4 turns from fully closed.

Reinstall the carburetor using steps 3 and 2.

Good luck with priming and starting the engine. Adjust the mixture screws as required. Once these adjustments are set, then reinsert the plastic limit caps removed in step 4.

This concludes this article. For corrections, a downloadable pin gauge, and a factory troubleshooting chart, refer to http://www.drystacked.com/misc.html

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