

Almost everything you ever wanted to know About Carburetor Rebuild Kits

To rebuild your carburetor in a professional manner there are a few simple and precision tools that you need to have in your toolbox.

A pop-off gauge is a must. A small machinist brass and stainless steel brush, an old tooth brush, a small tip screw driver that will fit the screws that hold your carburetor together, a couple of old cake pans (one to hold some cleaning solvent in for washing and one for parts), a small can of WD-40 or Marvel Mystery Oil, a bottle of good castor based oil, a dial caliper and a precision machined fulcrum arm gauge to fit your carburetor. If it's a Tillotson carburetor an inlet seat gasket line up fixture, a box of Q-tips and a roll of lint free paper towels (an old t-shirt will substitute for the paper towels). An air compressor is nice to have but if you don't have one go down to the local auto parts house and get a couple of cans of pressurized brake cleaner, a pair of tweezers and a small pair of side cutters. Last, but not least, a handful of pop-off springs. For those that don't have the special tools needed to rebuild your carburetor with we have made them available in kit form to fit your needs and you can get them from us or any EC Distributing/Carroll LTD distributor.

In the complete carburetor kits (RK for Tillotson, check carburetor page for your carburetor to see what kit fits) there is no fuel strainer screen in the kit. Cleaning the fuel strainer screen is where the toothbrush comes into play or take the easy way out and replace it.

We will do the Tillotson kits first because these carburetors are used for 85% of small engine racing worldwide. Next we will do the Walbro line of kits and then Mikuni and finish off with the world of exotic carburetors that are used in Formula A and Formula Super A.

Tillotson carburetors fall into two different groups or types. There are double pump carburetors or three plate stack and single pump which is a two-plate stack. For the most part it is thought that the three-plate stack, which is referred to as a double pumper, is for alky only and a single pump or two stack plate carburetor for gas only. This is not true. A double pump carburetor does not have a double fuel pump built into it. The extra plate that you have is what is referred to as a double pumper Tillotson carburetor and its purpose is to double up the volume of fuel that is in the carburetor. This extra amount of fuel in the carburetor is preferred for alky burning engines or the HR series of gas carburetors because of the size of the carburetor. Now if you have a two-plate carburetor and you think that you have a fuel problem because of volume and it's legal for the class that you run you can put the three-plate stack on your carburetor. These plate stacks are designed to fit any HL or HR series carburetor.

As we get into the Tillotson gasket/diaphragm kits and complete rebuild service kits we will be referring to Tillotson carburetor series numbers that will match up to the part number of the kit. Which Tillotson carburetor do you have? Good question. Turn your carburetor over and on the bottom side of the carburetor there is a number stamped on it. The first two capital letters and the next three numbers are the ones you want to look at. These are the two letters and three numbers that tell you which carburetor you have. The rest of the numbers or letter after the first three numbers are only the series of the carburetor and the date that the carburetor was built and doesn't relate to the needed part number for gasket/diaphragm kits or complete rebuild kits.

The first kit that we will address is a DG-4HL. This is the gasket and pump kit that is used in the three plate or double pump carburetors for alky or gas. A DG-4HL has the plate gaskets, fuel pump diaphragm, inlet valve diaphragm and main metering diaphragm. Now when you do a service to your carburetor these are the parts that you need.

Some of the steps that you need to do when you use any of the following kits: coat the gaskets and the diaphragm sealing surfaces with your castor oil. The reason that you do this is so that at the races if you need to get into the carburetor quickly you can do so without having one of the gaskets stick and tear on you. How often do you need to replace these gaskets and diaphragms? Some service their carburetor before they go to the next race weekend or meet and during the day will replace the fuel pump diaphragm just before they go out to qualify. This fuel pump diaphragm can be bought separately as can any Tillotson part. This part number is #237-154.

DG-4HL Tillotson gasket/diaphragm kit fits the HL-314G, HL-348A thru E, HL-355A thru E, HL-360B & C, HL-368, HL-380A & B, HR-181B and HR-191G. This Tillotson gasket/diaphragm kit is for all two-plate or single pumper Tillotson gas carburetors. We may have missed a carburetor series number on this one. If we did and your carburetor has a single pump stack on it and is in the HL Series this kit will service it for you. This kit can also be used for all European made Formula A and Formula Super A carburetors like Ibea, Baroni, and Hubchen just to name a few.

DG-1HL Tillotson gasket/diaphragm kit (with a .006 thick pump skin) fits the HL-304E, HL-306B, HL-334A, HL-360A, HL-365, HL-383, HL-384 and HL-385.

DG-5HL Tillotson gasket/diaphragm kit (with a .004 thick pump skin) fits the HL-166, HL-357, and HL-383.

DG-3HS/T Tillotson gasket/diaphragm kit for the HT-8A. As a note of interest Tillotson designed this carburetor for the Jr. Control engines. Since it's development it has been found that this is a good carburetor for 2/stroke and 4/stroke engines for fun karts or any engine that needs a user-friendly carburetor and simple mounting to the engine.

DG-5HS/T Tillotson gasket/diaphragm kit for HS-175D, HS-230D. These carburetors are used for Rookie, Cadet and Jr. Class 2/stroke engines around the world.

Complete Carburetor Rebuild Kits

RK-104HL/R Tillotson rebuild service kit for HL-314G, HL-348A thru E, and HL-355A thru E, HL-360B & C, HL-380A & B, HR-181B and HR-191G.

For the most part this is one of those American things put together at Tillotson for your needs for Alky type carburetors that have double pump stacks (three plate carburetors) and used on the dirt tracks. This kit has all the needed gaskets, pumps as you can see plus the cork gasket and a flange gasket for your HL or HR carburetor. The kit also comes with a high volume Viton ® tipped un-captured inlet needle and the nickel-plated seat with seat gasket. This seat has 2 little holes at the bottom side of the seat that feeds two special tracks that are in some of the Tillotson carburetors. You also get a new welch plug. On any alky carb when you give it a complete rebuild you only do it half way if you don't pull this soft plug out and clean the low side fuel well. If you see any white alky dust in your carburetor for sure you need to pull this soft plug and clean under it. This is where the toothbrush and some brake clean comes into use. By no means use anything else in here to clean with because if you do you might damage or change the hole size of one of the by pass ports. (fuel and air metering holes). Change one of these hole sizes the least amount and your carburetor could become file 13 material. NOTE: When drilling a hole in the center of the old soft plug so you can put a pick into it and pop out the soft plug we recommend this is done with a drill bit kit or a flat bottom 1/8 inch mill, or regrind a 1/8 inch drill bit with a 10 degree angle on it. Then only just break through the top of the plug. Go any further and you just may find you have ruined the carburetor by drilling a hole right through the bottom floor of the low side fuel well. After you have cleaned the inside of the low side fuel well take the new soft plug and put it in the hole and with a small light hammer tap the top of the soft plug so that it flattens out a touch and seals off the fuel from being able to come in around the edges of the soft plug.

RK-103HL Tillotson rebuild service kit for HL-360B, HR-181, HR-191C, and HR-191G. The RK-103HL kit is also for the HL/HR line of double pump Tillotson carburetors. This kit contains the same gaskets and diaphragms as the RK-104HL/R. The needle is Viton ® tipped and designed to work with a captured arm. This needle and seat kit was originally to be used with gasoline for the fuel and sprint tracks (asphalt with left and right turns). This now makes the RK-103HL complete kit usable for 4/cycle engines as well as 2/cycles. This kit now can be used for all of the HL series Tillotson carburetors that are used for straight-line racers like Jr. Dragsters that use the HL-series carburetor with a captured needle and arm assembly. This type of needle and seat is also very happy on any asphalt sprint track or asphalt oval track with a 2/cycle or 4/cycle engine. The fuel for the day can now be alky or gasoline or whatever the class calls out for.

RK-117HL Tillotson rebuild service kit (with a .006 thick pump skin) for HL-304, HL-306, HL-334, HL-360A. This complete rebuild kit has the parts for a major rebuild for any of the above HL series single pump stack or 2 plate carburetors. This kit has the nickel seat and Viton ® needle. The main metering diaphragm in this kit is .006 thousandths thick (.010 mm). This kit is designed for racing and suitable for alky for the fuel because of the thinner main metering diaphragm.

RK-1HT Tillotson complete rebuild service kit for the HT-8A. This kit has all the small parts in it for a complete rebuild of the HT-8A Tillotson Carburetor.

RK-23HS Tillotson complete rebuild service kit for the HS-175D, HS-230D and HS-205A. This completes the listing of all of the Tillotson rebuild kits for all of the HL and HR series carburetors that we use for Karting, Jr. Dragsters, 1/4 Midgets and whatever.

RK-113HL Tillotson complete rebuild kit with a shorter seat with a .125 hole. This is used for gasoline (if you run alky you may need to use a Ram Flow custom needle & seat)

RK-114HL Tillotson complete rebuild kit for the HL-166B & C and HL-357A & B (with .006 fuel pump diaphragm).

Walbro Carburetor Kits

D10-WB Walbro gasket/diaphragm kit for the WB-3A and WB-20. Walbro WB-3A carburetors have been around since the beginning of time for the Yamaha KT-100 engines. This service kit comes with a Teflon pump along with the black rubber coated Kevlar® pump. We prefer using the rubber (black) pump because it pumps better even though the Teflon pump has a longer life.

D11-WB Walbro gasket/diaphragm kit for the WB-32. In Europe with the ever growing popularity of the Jr. Intercontinental Cadet Formula A class (JICA) has also become one for our Jr. Drivers here in the States. This way they have a stepping stone to work their way up to the Formula A and Formula Super A classes. It's also a very good carburetor for Stock Appearing and Outlaw classes.

K10-WB Walbro rebuild service kit for WB-3A and WB-20. This rebuild service kit is what is known as the 15 piece kit but now you can call it a 16 piece kit because it also has the new Teflon pump added to the kit. NOTE: The fuel strainer screen in this kit has to fine of a mesh for our racing needs. So clean the one in your carburetor or replace with the original one part #140-70.

K11-WB Walbro rebuild service kit for the WB-32. This is the same 16-piece kit as the K10-WB but comes with the un-captured main metering diaphragm. Can you get just this un-captured main metering diaphragm? Yes you can and the part number is 95-546.

D10-HDA Walbro gasket/diaphragm kit for the Walbro HDA-76. This is the service kit for the above carburetor and the Horstman special HPV series carburetors.

K20-HDA Walbro rebuild service kit for the Walbro HDA-76. This is the complete rebuild service kit and has 20 parts in it. You can use this kit for a major rebuild of the above carburetor and the Horstman special HPV series carburetors.

D10-WAT Walbro gasket/diaphragm kit for the Walbro WA-55B. When an engine makes too much power for some classes the smart thing to do is just put a smaller size carburetor on the engine. Restrictor plates open up a whole bunch of problems in making a carburetor tune and also lead to problems in the Tech Barn.

Anyway this service kit is for the WA-55B Walbro carburetor which is mounted to a spec manifold kit (part number JRLKIT-1) for the KT-100 Yamaha. This allows the Yamaha engine to be used in the 80cc Jr. 1 I.K.F. classes.

K10-WAT Walbro rebuild service kit for the Walbro WA-55B. This is the complete major rebuild kit for the WA-55B and has everything in it you need except for a screwdriver.

Next on our list are the Kits for the 34mm Mikuni Carburetor for 2 Cycle Controls and Open 2 Strokes

ECMK 34-36 Mikuni rebuild service kit for BMC-34. This pro rebuild kit is made up out of Mikuni parts and parts that we make for it. In this kit you get all of the pro service kit parts plus a seat that we hand finish and a Viton ® tip needle that we make to Mikuni specs.

BMC 34-34 Mikuni gasket/diaphragm kit for the BMC-34. This kit is just the gaskets, pumps and main diaphragm less the needle and seat assembly, fuel cap gasket and brass fuel inlet screen.

BM-34-35 Allen Bolt Kit. The fuel pump stack screws have always been a problem in striping out the heads so to cure this problem we have had allen bolt kits made as a replacement screw kit.

Now for some New E.C. Trix

These Direct Drive carburetors are single pump carburetors because of the R.P.M. that they have to turn up to. In South America they use Alky for their fuel in some parts of the country. To assure that these carburetors have enough fuel, Gasoline or Alky, on hand to handle the engines needs (2/cycle or 4/cycle) we have put together special Hi-Performance service kits and Complete rebuild service kits for them. We make up these kits with parts from Tillotson, Europe and E.C. Tillotson usa.

PGK (Pro Gas Kit) gasket/diaphragm kit for Ibea, Baroni, Hubchen, Dap, Comer, Dino, Kilt, Itel System, P.C.R., whoever we left out and all Tillotson HL series carburetors. This kit comes with our special high volume fast action diaphragm, fuel pump diaphragm, brass fuel inlet screen and inlet fuel cap gasket. You just have to tell us which one you want in the kit when you order them. If you don't tell us which one you want we will send the thicker fuel pump diaphragm in the kit. What is the reason for the two-pump thickness? Good question. The thicker pump part # 237-141 life span is a little longer than the thin one. It's down side is that it won't move as fast at lower R.P.M. or when the pulse signal is soft to the carburetor. The thin pump part # 237-214. This pump is sometimes preferred for short tight tracks because it will pump more fuel faster at lower R.P.M. or with a weaker pulse signal. This pump is also well suited for any single pump carburetor when the fuel for the day is Alky. With any Direct Drive carburetor or alky burning engine, 2/cycle or 4/cycle these pumps should be changed often to assure positive carburetor tune.

PGK-1 Pro Gas Kit with .006 fuel pump diaphragm.

PGK-2 Pro Gas Kit with .004 fuel pump diaphragm.

CPGK complete rebuild service kit for Ibea, Baroni, Hubchen, Dap, Comer, Dino, Kilt, Itel System, P.C.R., whoever we left out and all Tillotson HL series carburetors. This kit has all of the special parts as the EC-PGK plus a special brass fulcrum arm for the European carburetors and a CNC machined high volume fuel flow inlet needle. An inserted needle seat and gasket plus a special pop-off spring is also in this complete kit.

This kit can also be used to up-date any Tillotson HL series single pump carburetor to the demands of today's' racing needs. These kits contain the same gaskets and diaphragms as the PGK.

CPGK-1 Complete Pro Gas Kit with .006 fuel pump diaphragm.

CPGK-2 Complete Pro Gas Kit with .004 fuel pump diaphragm.

Now that we have turned to the line of Pro parts we will take a quick look at needle and seat kits that are an added edge on the racetrack for you.

Needle and seats in all diaphragm carburetors fall into two groups or types. These are captured or un-captured types. As a general rule of thumb, a captured needle and seat assembly is preferred for carburetors that are used on the asphalt and for dirt racing an un-captured needle and seat assembly is the most preferred.

A captured needle and fulcrum arm, which makes up the assembly, means that the fulcrum arm has a fork on the end of it and this fork hooks into a machined slot on the end of the needle. The advantage of this type of needle and seat assembly is that as soon as there is a depression on the wet side of the carburetor and the metering diaphragm comes down, it over runs the pressure of the inlet needle spring (pop off pressure) and the needle is pulled off the seat. Now fuel is allowed to fill the wet side of the carburetor.

In an un-captured assembly the fulcrum arm is not hooked to the inlet needle and when the main metering diaphragm starts its travel down and starts to over ride the inlet spring tension the needle comes off the seat by what little pressure is supplied by the pump pressure of the carburetor and a fuel pump if the engine has one on it. Now that we have opened up this can of worms we have to go a little further.

Let's look at the needle in the needle and seat assembly as a door. Now this door is only allowed to open as far as you want it to or let it open. Now staying with the thought that the needle is the door part of the needle and seat assembly then the seat must be the size of the door. In short the Fat Lady can't sing her song if she can't get through the door opening and your engine won't be a happy camper if it can't get enough fuel to the wet side of the carburetor. This action has nothing to do with where the inlet seat pressure is (pop of pressure) but the adjustment of the fulcrum arm itself.

This would be the distance off the carburetor body or the topside of the metering diaphragm gasket to what we call the foot part of the fulcrum arm (end of the fulcrum arm where the striker pin of the main metering diaphragm comes in contact with the fulcrum arm) that will affect how far the door is able to open. The following information on heights relate to the distance off of the carburetor body with original equipment replacement main metering diaphragm gaskets.

As a sample let's use a Tillotson carburetor for the rest of this information. With gasoline for the fuel of the day, we like to have this measurement from the carb body to the fulcrum arm in the range of .085 to .075 thousands of an inch. This is all that is needed for gasoline as fuel. With an Alky burning engine we want to have .075 to .065. In short, as you can see, if the arm measurement from the carb body to the fulcrum arm foot is .065 verses .085 then the door is able to open further and this will let more fuel come into the wet side of the carburetor.

Most of these needle and seat assemblies are a bit on the pricey side, but we have to make them up by hand. One good thing about these seats is that once you have one of them it's a part that is good for the life of the carburetor. The needles are inexpensive and you can replace them as needed without buying a whole needle and seat kit. These kits are also package with the needed inlet needle spring for the carburetor you have which can also be purchased separately.

EC-014 *Un-captured Ram Flow Tillotson needle and seat kit for all HL and HR series Tillotson carburetors. This is an un-captured needle and seat assembly that was designed years ago for all alky carburetors used for dirt racing. The seat is hand machined and the inlet needle is made from a Viton ® tipped needle for the special machined seat that has holes machined in the side of the seat to increase the fuel flow. As with all of these special seats one is good for the life of the carburetor and the replacement of the inlet tip needles can be purchased for replacement as needed.*

EC-014A *Captured Ram Flow Tillotson needle and seat assembly for all HL and HR series Tillotson carburetors. This needle and seat assembly is the same as the EC-014 but comes with a captured arm and captured Viton ® tipped needle. This type of needle and seat kit is preferred for Asphalt Sprint tracks, Jr. Dragsters and 1/4 Midgets where fuel delivery is needed in a hurry. In short a faster fill on the wet side of the carburetor helps increase the torque of the engine from the start.*

EC-014B *Ram Flow captured inserted needle and seat assembly for all HL, HR, and European Formula A and Formula Super A carburetors. This needle and seat assembly we make up can pass more fuel than any on the market. It comes with a blue needle that is machined on the sides to allow fuel to travel up the sides of the needle. The seat is machined with a series of holes through the sides to also allow fuel to get into the wet side of the carburetor faster and an insert that fits into the bottom of the seat to control a perfect seal for the needle to rest on. This seat was designed more for the gasoline carburetors. For Direct Drive and Sprint 2 cycle racing this is the answer to solve fuel starvation.*

EC-014C Ram Flow un-captured needle and seat kit for HL-166B,C and HL-357A,B carburetors. With the Tillotson pipe line now being filled with the Viton ® tipped needles and the nickel seats we can now offer this complete kit with the new nickel seat, gasket, Viton ® tipped needle, fulcrum arm and special inlet spring for an up date of the carburetor that you have. This kit is recommended for dirt carburetors on gasoline or alky.

EC-014D Ram Flow captured needle and seat kit for all HL-166B,C and HL-357A,B carburetors. This is the same type of needle and seat kit as the EC-014C but comes with the captured needle and captured fulcrum arm. This kit is recommended for the sprint tracks and small Jr. Dragster engines. Gas or Alky.

EC-MIK 34-37 Mikuni Ram Flow un-captured needle and seat assembly for BMC-34 carburetors. This is an un-captured needle and seat assembly and works perfect for asphalt or dirt for this series of carburetor. The needle we make for this kit has a Viton ® red tip needle. The seat gets TLC handwork and comes with a copper gasket to assure you of no leaks around the seat surface. A new fulcrum arm and special needle inlet spring is also included with the kit. This kit will serve all your needs for gas or alky as a fuel. This needle and seat kit also helps offset the nightmares of fuel control and setting the pop-off pressure in the Mikuni carburetor.

Inlet needle springs: (pop-off springs) In these springs we have several different ones that we keep in stock. We're not going to list all of them because there are three different springs that handle most all needs. All three of these springs have a double wind coil on each end. This lets you cut off one full coil on one end or both and leave you with the must have flat bottom spring for constant inlet spring tension. Along with these special springs we have made a shim kit with .010 thick shims.

EC-998 Shim Kit. There are enough shims here to do two or three carburetors. That is if you don't drop them in the grass.

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