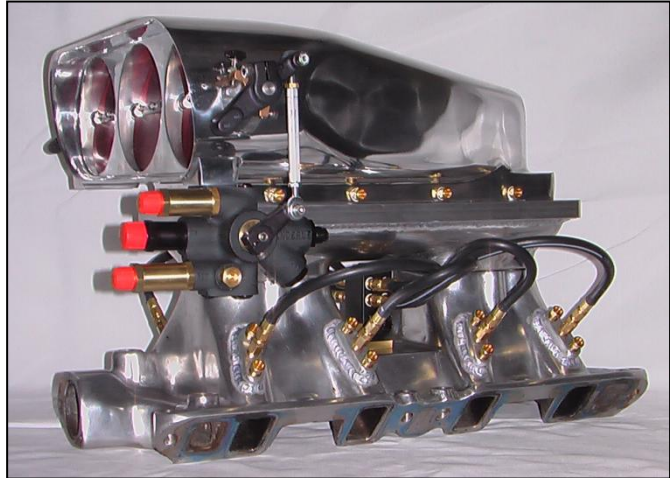


Tunnel Ram Injector Kit

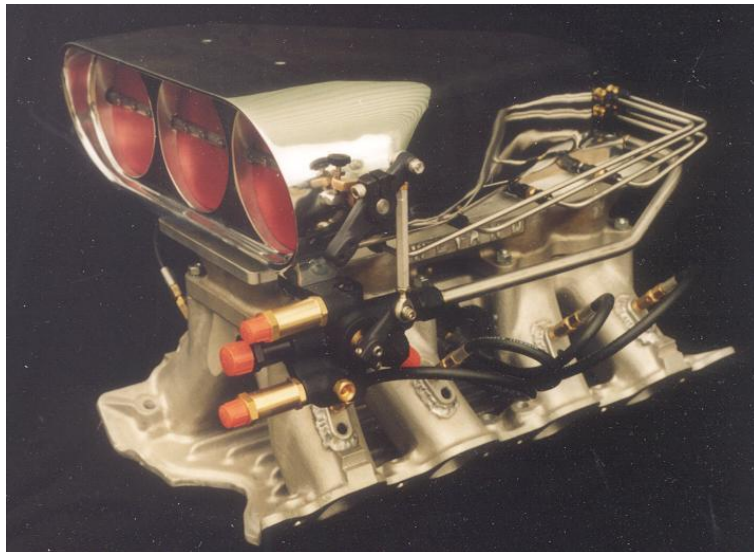
For all types of engines



LOWE Fuel Systems

Phone (Inside Australia) 0411-699 535

<http://www.kenlowe.com.au>

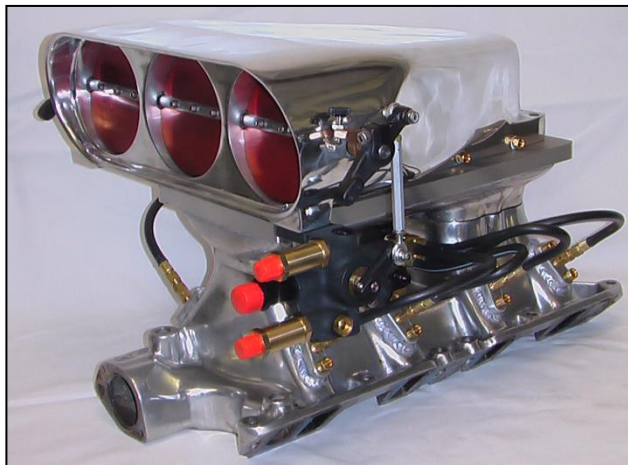


In drag racing applications there are a lot of reasons to use a tunnel ram type injector instead of the old style stack injector. Although at wide open throttle there is a small increase in performance with the tunnel ram as the butterflies are not in the port runners to disturb the air flow.

Where the tunnel ram and hat type injector excel is at the idle environment. When you consider

that in drag racing most of the engine run time is at idle you realize the importance of the idle environment. With stack type injectors the problems stem from two facts. One the butterflies are located in the injector casting very close to the cylinder head and two there is no plenum below the butterflies connecting all the cylinders. Because the butterflies are located so low in the casting when you tighten down the manifold casting you distort the bores of the butterflies causing some butterflies to let in more air than others. Stack injectors recommend you adjust the butterflies to "square" them in the bores after installation. This does not help if the bores are out of round. You will

set the butterflies at installation while the engine is cold and when the engine is running it is hot. This expansion changes the relationship again. If you go back and retorque the manifold bolts that will change the relationship as well. Does this mean after each one of these things happens you must readjust the butterflies? You control the fuel delivery to each cylinder with nozzle size and pressure but matching that fuel volume with the correct amount of air is the job of the butterflies. With no plenum some will get more air than others. With a tunnel ram and hat injector the plenum allows each cylinder to get as much air as it needs. This keeps all cylinders idling at the same temperature. This is important since cylinder temperature is important on the starting line. If you have one or two cold cylinders the car must travel some distance before they warm up to operating temperature. This is a loss of power, which will result in a loss of performance. This injector assembly is calibrated for non supercharged methanol consumption applications.



**Flowed bolt on system –
 You supply acceptable tunnel ram
 manifold and fuel supply hoses and for
 only - \$ 4823.00 AUD + GST you get a complete fuel injection system.**

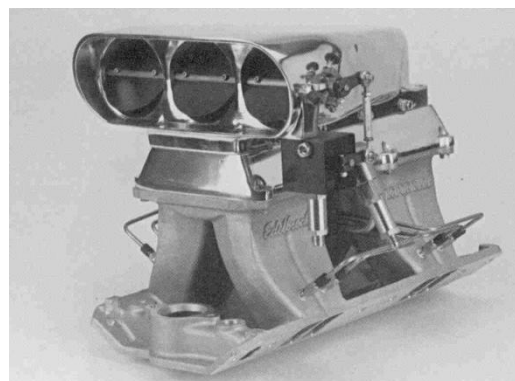


Includes, Hat assembly with barrel valve, distribution block, port nozzles, port nozzle holders, port nozzle lines, hat adapter to manifold, install hat adapter to manifold, drill tap for port nozzles (thick wall manifolds), distribution block mounting kit and installation, fuel pump, fuel pump belt drive, fuel shut off valve with fittings, flowed system with 200 page 31 chapter fuel injection instruction book.

Hat assembly includes: Polished aluminum injector hat, metering valve, idle and secondary check valve, bypass pills, distribution block, nozzles and rubber fuel delivery lines for the intake manifold nozzles. Price includes flowing if purchased with fuel pump below \$ 2566.00 Add for high flow barrel valve (recommended) \$ 100.00

See controls section for cables and linkages to connect throttle levers to the throttle pedal.

Hat, shaft and bflies only(for EFI applications)\$1299.00



Tunnel ram manifold

The use of a standard tunnel ram manifold makes installing the Bugcatcher or Birdcatcher Injector hat very easy. If you have your own manifold we can modify it to suit the hat assembly and add the ports for the nozzle holders in the port runners as shown above. If you do not have a tunnel ram manifold we can supply one.



If a commercial manufacturer makes a manifold to suit your application then usually all you have to do is have your manifold modified which we can do for you. Fabricated manifolds are always a last resort due to cost.

Adapter to hat for any tunnel ram type manifold. Currently there is only one prefabricated adapter from the hat to a tunnel ram and that suits an Edelbrock Victor Ram. There are a lot of applications that needs to be adapted to the hat that Edelbrock does not cover and for that it requires some fabrication.

We have found that both Offenhauser and Weiland make good tunnel ram manifolds for a lot of engines but all their manifolds have to be modified because they only suit carburetors. The good part is that our adapter even with the installation our adapter is just about the same price as the prefabricated adapter for the Edelbrock. If you do not have a manifold yet either we can supply one for you or provide you with some possible sources for the manifold. It is often better for you to get your manifold yourself as you know the intricacies of your engine combination.



Fuel System instruction book

(31 Chapter / 212 page) \$ 99.95

The process for installing the adapter is as shown below.

We have to cut the top off the tunnel ram plenum as shown above.

Then we weld on our adapter ring to the manifold.



This ring as shown will suit both the hat assemblies.

PN 35020-28330 \$ 198.00

Installation of this adapter your tunnel ram \$ 165.00

Port Nozzle installation

Since they were originally meant for carburetors all tunnel ram manifolds come stock undrilled for port nozzles. On most manifolds the port wall is too thin to support a threaded nozzle



holder so a threaded ring or block must be welded to the port runner for the nozzle holder to thread into.

Port nozzle weld bungs for thin wall port runners \$ 165.00+

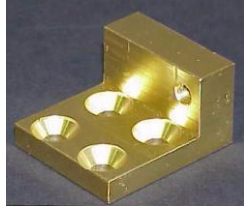
Install port nozzle weld bungs for think wall port runners \$ 150.00+

Install port nozzles in thick port runner walls \$ 85.00+

The nozzle holders shown are for a special application with an option for nitrous nozzles. Note: On some manifolds the port wall is thick enough to support the threaded nozzle holder so all you have to do on that manifold is just drill and tap to suit.

Distribution block and mounting

In this set up it is a good idea to locate the distribution block down on the manifold lower than the barrel valve. A distribution block mounting bracket is PN 35216-95580 \$ 55.00+



Installation of distribution mounting block. \$ 20.00+

Fuel System instruction book (31 Chapter / 212 page)\$ 99.95

Fuel pump PN 35571-30030 \$ 885.00+

Constant flow fuel injection requires the correct size fuel pump for the application. Too large or too small both will create problems. For a fuel pump drive, select belt drive if you are using a stock type water pump. If you have an electric remote water pump or do not use a water pump you can use a cam drive otherwise a belt drive kit is an option.



EZ Start valves – Recommended

In all applications where you are using an on board starter to start the engine keeping the fuel primed to the nozzles is a problem. We have a special one way check valve for top of fuel pump or top of the fuel shut off valve. The EZ Start holds the fuel in the fuel system to prevent it from draining back into the tank. When the fuel drains back into the tank it pulls air in through the nozzles and the fuel system must refill the hoses before it will run making the engine more difficult to start as it has to purge the air from the system before it will run.

35774-10006 -6 Easy Start valve \$ 59.00+

35774-10008 -8 Easy Start valve \$ 69.00+



Fuel shut off valve

3 way Fuel shut off valve **1.295 body** –8 ports with -8 fittings
PN 35775-00602 \$ 255.00

See control section for levers and cables to allow driver to operate this valve from inside the drivers compartment.

35090-35209 Over-center spring mount bracket & kit.

This kit holds the fuel shut off in the open position preventing it from moving closed while the engine is running, yet it allows you to close the fuel shutoff easily.

PN 35090-35209 \$ 95.00



Fuel System instruction book

(31 Chapter / 212 page)\$ 99.95



Fuel pump drives

With constant flow fuel injection the size of the fuel pump is critical and the fuel pump speed is directly related to engine rpm.

You have two ways you can drive the fuel pump. One is **belt drive** and the other is **cam drive**. The good point about belt drive is that it leaves the front of the engine free for other hardware and the fuel pump is mounted very low insuring the pump has easy access to the fuel. The downside is that the fuel pump is mounted low and is not very accessible. It is harder to get the fuel pump off and on with a belt drive. The belt and belt adjustment can cause problems as well.

Cam drive mounts the fuel pump on the front timing cover and drives the pump off the front of the cam as the name implies. Here the fuel pump gives easy access. Design of the fuel tank is important here as you want to make sure the tank is designed with the fuel level above the level of the pump.

Note: On the belt drive application the fuel pump is mounted backwards to the cam drive the fuel pump operating rotation is different. IF you do not change the operating rotation of the fuel pump it will not pump fuel to the barrel valve and your unit will not work.

Fuel pump hex drive adapter only

Some applications may allow you to make your own pump mount.

For this situation we offer a fuel pump hex drive

PN 39225-00001 \$ 95.00

Thrust bearing and 4ea .032 spacer washers

PN 39225-00002 \$ 45.00



Belt drive for fuel pump

Most Non Chevy fuel injection applications use a belt drive kit to drive the pump unless a cam drive front cover or gear drive is available for the engine application.

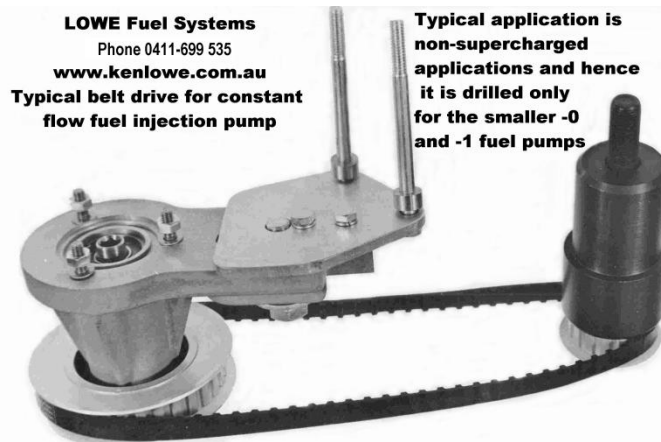
Complete belt drive kit \$395.00

392 Belt drive fuel pump kit
PN 35225-80003 \$ 395.00

426 Belt drive fuel pump kit
PN 35225-0004 \$ 395.00

Ford 351C/W Belt drive fuel pump kit
PN 35225-80005 \$ 395.00

Universal belt drive fuel pump kit
PN 35225-80009 \$ 395.00



Fuel pump extensions

Some applications require a fuel pump extension. On some cam drive applications the fuel pump has to be moved forward to clear some items. In supercharged applications the pump has to be moved forward to clear the blower drive belt. This application requires a 5" extension. Some can use a 2.5" extension. On some non supercharged applications you may have to move the fuel pump forward to clear the harmonic balancer. This requires a special 2.5" notched extension as the harmonic balancer fits very close to the timing cover on a small block Chevy.



Extension assemblies include bearing and driveshaft

Four different configurations

- A. 2.5" – no notch – pn 35225-25100 Price \$ 315.00 +
- B. 2.5" – notch – pn 35225-25101 Price \$ 335.00 +
- C. 5" – no notch – pn 35225-50100 Price \$ 345.00 +
- D. 5" – notch – pn 35225-50101 Price \$ 360.00 +

All fuel pump extensions are drilled on the mounting flange for a standard 4 bolt mounting. Small fuel pumps are all the asymmetrical three bolt mount and the extension of your choice may have to be drilled and tapped to 1/4" UNC after the correct rotation has been determined upon installation.

Fuel System instruction book

(31 Chapter / 212 page)\$ 99.95



Controls and levers



Fuel shut off cables, brackets, levers, joints and clips.

Fuel shut off lever

53360-22123	Fuel shut off lever 3mm thick - Chassis mount	.....	\$ 22.00+
53360-22126	Fuel shut off lever 6mm thick - Chassis mount	.....	\$ 29.00+
53155-32620	Cable clamp .(Full clamp)	.....	\$ 21.75+
53155-32621	Cable clamp .(1/2 clamp)	.....	\$ 19.75+
53347-10100	3/16 Male thread (SAE) 3/16" Cable end	.....	\$ 35.00+



Fuel shut off cable mount at pump *****

53090-35073	Enderle 80A and Hilborn 150A fuel shut off cable mount	.....	\$ 65.00+
53090-35093	Enderle 990-1100 fuel shut off cable mount 0 degree ...	.....	\$ 59.00+
53090-35103	Enderle 990-1100 fuel shut off cable mount 5 degree ...	.....	\$ 59.00+
53090-35113	Enderle 990-1100 fuel shut off cable mount 7 degree ...	.....	\$ 59.00+
53090-35173	Enderle 990-1100 fuel shut off cable mount 7 degree double cable mounting (front and/or side)	.....	\$ 72.00+
	Enderle fuel shut off over center spring mount kit		\$ 65.00+
53090-35306	Enderle fuel shut off over center spring mount kit to suit -8 fuel shut off bodies (1.295) Red anodized	.....	\$ 75.00+
53090-35206	Enderle fuel shut off over center spring mount kit to suit -8 fuel shut off bodies (1.485) Gold anodized	.....	\$ 75.00+
53155-01000	Cable bracket quick release clip	.....	\$ 25.00+
53347-10100	3/16 Male thread (SAE) 3/16" Cable end	.....	\$ 35.00+

Throttle cable mount at injection *****

53155-01000	Cable housing quick release clip (stainless steel)	.....	\$ 25.00+
53385-13020	Enderle throttle arm return spring mount	.....	\$ 7.50+
53680-12050	Spring,throttle return 1/4" x 5"	.....	\$ 12.00+
53680-12390	Spring,throttle return 3/8" x 6.5"	.....	\$ 15.00+
53155-01000	Throttle bracket quick release clip	.....	\$ 25.00+
53347-10100	3/16 Male thread (SAE) 3/16" Cable end	.....	\$ 35.00+

Push Pull cables

(Throttle, Fuel shutoff, Shifter, Parachute)

53140-00100	Push pull control cable 39" or 3'3"	\$ 75.00+
53140-00125	Push pull control cable 49" or 4'1"	\$ 75.00+
53140-00150	Push pull control cable 59" or 4'11"	\$ 75.00+
53140-00175	Push pull control cable 69" or 5'9"	\$ 76.00+
53140-00200	Push pull control cable 79" or 6'7"	\$ 77.50+
53140-00225	Push pull control cable 89" or 7'5"	\$ 79.00+
53140-00250	Push pull control cable 01" or 8'5"	\$ 82.50+
53140-00275	Push pull control cable 08" or 9'0"	\$ 85.00+
53140-00300	Push pull control cable 18" or 9'10"	\$ 91.00+
53140-00325	Push pull control cable 28" or 10'8"	\$ 92.00+
53140-00350	Push pull control cable 38" or 11'6"	\$ 92.00+
53140-00375	Push pull control cable 48" or 12'4"	\$ 99.00+
53140-00400	Push pull control cable 58" or 13'2"	\$ 102.00+
53140-00425	Push pull control cable 67" or 13'11"	\$ 105.00+
53140-00450	Push pull control cable 77" or 14'9"	\$ 109.00+
53140-00475	Push pull control cable 87" or 15'7"	\$ 115.00+
53140-00500	Push pull control cable 97" or 16'5"	\$ 121.00+
53155-32621	Cable clamp (.1/2 clamp)	\$ 21.50+
53155-01000	Cable bracket quick release clip	\$ 25.00+
53165-10000	Clevis 3/16unf with 3/16" pin	\$ 35.00+

Fuel Tank

Do not run the fuel back to the tank above the fuel pickup in the tank. The fuel must be returned to the tank as far away from the fuel pump pickup as possible. This gives any fuel returning to the tank that may be carrying air in the line to separate the air and the fuel. Any fuel return line that does not purge itself on the burn out or at the start of the engine must be returned to the tank and not the pump suction.

A lot of fuel tuners today are installing a nipple in the fuel pump inlet to return the fuel to so they don't agitate the fuel in the tank. This also reduces the fuel lines required on some cars. Also allow the complete fuel system to be installed on a flow bench so that when you flow the system the whole system is flowed much as it is on the car.

If your fuel tank is aluminum you can reduce the alcohol corrosion problem by getting your fuel tank anodized. This will coat and protect the tank. It won't stop the corrosion but it sure will slow it down.

Note: I do not recommend running any high pressure poppet return line back to pump suction as it might not purge during the burn out and purge any air it may have during the run. If your poppet is before the barrel valve and set for over 50 psi you must run it back to the tank. If your poppet is after the barrel valve and set for over 30 psi you must run it back to the tank.

Fuel tank vents must deliver air to the tank to replace the fuel used by the engine. The more fuel the engine uses the larger the tank vent must be. I recommend a minimum 1/2" inlet on all non-supercharged engines and 3/4" on all small-supercharged engines or with a 6-71 or 8-71 blowers. Use a 1" tank vent on large engines with large blowers up to Top Alcohol type engines. Vents must be designed to allow the tank to breathe the air in but not slosh the fuel out after a burn out. The rules state any car putting liquid on the racing surface will be disqualified. Although not always enforced by the officials if your car spills fuel it is a hazard for fire and the loss of a race due to disqualification.

If you are going to use the stock tank in the back of a sedan as the primary fuel tank then you have to make a surge tank in the front and feed the surge tank from the back tank with an electric fuel pump. The surge tank must be large enough to make one full pass down the race track. This is usually about two gallons or 8 liters. The tank must be vented with at least a 5/16" ID vent. Some racers will use a float bowl from a Holly mounted on the side of the surge tank to set the fuel level so the electric fuel pump will not over fill the tank. A large fuel pump is not necessary as it only has to keep the tank full and you have enough volume in the tank for one complete run. As you idle back to the pits the electric pump is working away refilling the surge tank. When possible make the surge tank as tall as possible with a -12 fitting on the bottom rear corner. Additionally add three -6 return ports to the tank in the opposite corner of the tank from the pump supply line.

I would recommend adding a filler cap as well so if you want to remove the factory tank later you can fill the surge tank between rounds. Don't forget to add a drain port as well.

Tank Hardware



071120

Most fuel tanks for constant flow fuel injection need several ports to return the fuel back to the tank.

There is usually a minimum of two ports required. As a racer you have several options. One you can weld on two separate bungs but for a tidy



appearance you must be sure to keep them in line. Installing the minimum quantity will allow you to provide for your

needs, today. Many times later there is a desire to add an extra port or two for more returns as your fuel system gets a little more complicated. If you install the minimum number required then you have no expansion room without removing the tank and adding more ports. If you add at



least one more port than is necessary today and just plug it up until it is needed. We have made several different size billet weld bung blocks. We

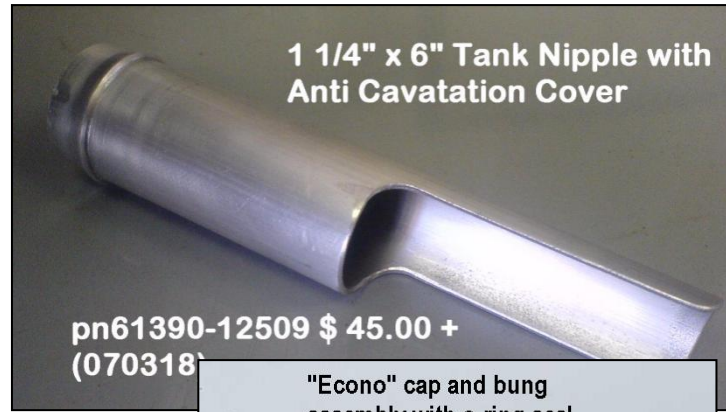
make both three and four hole and both dash 6 and dash 8 sizes plus blank threaded ones that allow you to drill and tap the sizes you want.

For appearance sake we make both the profiled and the straight side billet weld bung blocks to suit any customers needs.

Prices shown are racer cost prices. Wholesale volume purchases get a 15% discount if you purchase any three of the billet weld bung blocks on one order.



A lot of race car fuel tanks use the 1 1/4" supply hose. This size is used because it has flows that are adequate for everything up to Top Fuel and at 1 1/4" common radiator hose which is methanol compatible is inexpensive and readily available. Below is a weld nipple for your fuel tank that has an anti cavitation plate made into the top of the nipple. When this nipple is used in the tank it provides a certain amount of protection to prevent cavitation from when the pump draws the fuel from the tank it can also create a low pressure area in the fuel that can vortex into a path for the pump to draw air.



Big (2 1/2") Aluminum cap and aluminum bung assembly pn 61246-25011 \$ 99.00 +
"Econo" aluminum cap and aluminum weld bung assy (1 1/2") pn 61246-15001 \$ 63.00 +
"Econo" aluminum cap and aluminum weld bung assy (2") pn 61246-20001 \$ 73.00 +

Prices shown are racer cost prices. Wholesale volume purchases get a 15% discount if you purchase any three of the cap and bung assemblies on one order. 071120



Prices shown are racer cost prices. Wholesale volume purchases get a 15% discount if your purchase, of these weld bungs is over \$200.00 on one order. 071120

Weld Bung (female thread weld in tank fittings)

Dash 6 AN female weld bung	9/16" x 18 thread	pn 61125-60006	\$ 19.95
Dash 8 AN female weld bung	3/4" x 16 thread	pn 61125-60008	\$ 22.95
Dash 10 AN female weld bung	7/8" x 14 thread	pn 61125-60010	\$ 25.15
Dash 12 AN female weld bung	1 1/16" x 12 thread	pn 61125-60012	\$ 28.15
Dash 16 AN female weld bung	1 5/16" x 12 thread	pn 61125-60016	\$ 34.75
Dash 20 AN female weld bung	1 5/8" x 12 thread	pn 61125-60002	\$ 39.50



NPT - BSP weld bungs

NPT weld bungs.

- NPT weld bung - 1/8" NPT (female) aluminum weld bung pn 61125-50002 \$ 16.50
- NPT weld bung - 1/4" NPT (female) aluminum weld bung pn 61125-50004 \$ 18.50
- NPT weld bung - 3/8" NPT (female) aluminum weld bung pn 61125-50006 \$ 19.50
- NPT weld bung - 1/2" NPT (female) aluminum weld bung pn 61125-50008 \$ 21.50
- NPT weld bung - 3/4" NPT (female) aluminum weld bung pn 61125-50012 \$ 24.50
- NPT weld bung - 1" NPT (female) aluminum weld bung pn 61125-50016 \$ 29.50

BSP weld bungs

Below are BSP weld bungs. BSP is one thread (TPI) different than NPT in sizes less than 1/2". Larger than 1/2" they are the same TPI and will interchange.

- 61125-60002 1/8" BSP (female) aluminum weld bung \$ 16.50
- 61125-60004 1/4" BSP (female) aluminum weld bung \$ 18.50
- 61125-60006 3/8" BSP (female) aluminum weld bung \$ 19.50

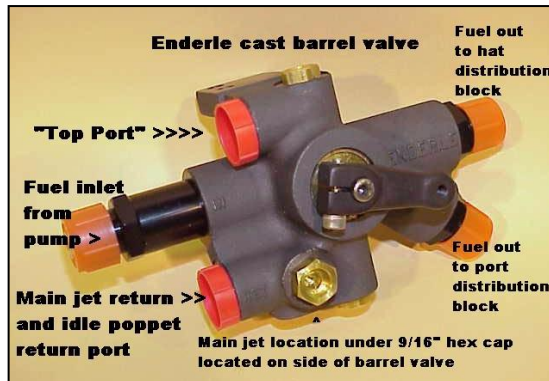
NOTE: BSP weld fittings have a small groove cut around the outside to distinguish the BSP from the NPT since they will look almost identical except for the TPI being one thread different.

- 1 1/4" x 3" tank nipple (weld on) pn 61390-12503 \$ 15.00
- 1 1/4" x 4" tank nipple (weld on) pn 61390-12504 \$ 16.50
- 1 1/4" x 5" tank nipple (weld on) pn 61390-12505 \$ 18.00
- 1 1/4" x 6" tank nipple (weld on) pn 61390-12506 \$ 19.50



All we need to ship your order is your credit card details and a shipping address. We accept Master Card and Visa. There is a printed number on the back of your credit card on the signature line. Would you give us the last three digits of that number. Please include your phone number as well. Prices are in AUD (Australian Dollars) + GST (if applicable) to convert to US dollars multiply by ~.85, GST does not apply to orders from outside Australia. Price does not include shipping. All prices are subject to change without notice. Prices must be verified at time of purchase only.

High flow barrel valve (recommended)



Electronic Fuel Injection

EFI applications only need a hat with shaft and butterflies, the adapter and tunnel ram manifold. The manifold is thick enough to drill and tap for the EFI nozzles. Use the standard EFI fuel pump, nozzles and computer to complete the package. Now you have the race looks with the performance and streetability of electronic fuel injection.

Polished Bugcatcher hat with butterflies and shaft \$ 1299.00

Adapter for Bird to tunnel ram manifold \$ 360.00

Tunnel Ram manifold \$ 645.00

Total package less GST and shipping is \$ 2404.00

It takes someone who has chased a tuning package with carburetors to appreciate the ease and simplicity of constant flow fuel injection (CFI). With CFI the fuel pump flows 100% of the fuel. This fuel is delivered to the jets and nozzles. The nozzles let the fuel flow into the engine and the jet lets the fuel flow back to the fuel tank. You adjust the fuel volume to the whole engine by changing just one jet called the Main Jet. If you decrease the size of this Main Jet you reduce the flow back to the fuel tank which will cause an increase in flow to the nozzles (into the engine). On a tunnel ram with two four barrel carbs to accomplish this you must change 8 jets not one jet like with CFI. Also CFI does not have restrictive venture to cope with to get the air to the engine and CFI will perform well using gasoline (petrol), methanol or nitro as the fuel flows are easily adjusted. The aluminum components of carburetors are sensitive to methanol and carburetors must be heavily modified to attempt to flow a much fuel as needed with methanol. For more information on CFI see the FI book.



Fuel System instruction book

(31 Chapter / 212 page) \$ 99.95

A necessity for any racers tool box.