FUEL PUMPS / REGULATOR TECHNICAL INFORMATION

Holley offers a wide selection of both mechanical and electric fuel pumps for a variety of street performance and race applications. Selecting the proper fuel pump for your vehicle, however, begins with understanding your engine's fuel requirements.

FUEL REQUIREMENTS

Typically, at wide open throttle, full power, an engine requires 0.5 lbs. of fuel per horsepower every hour. A gallon of gasoline weighs approximately 6 lbs. Therefore an engine rated at 350 horsepower will require about 175 pounds (29 gallons) of fuel every hour.

(350HP x .5 lbs = 175 lbs of fuel
175 lbs/6 lbs = 29 gallons per hour)

FUEL PRESSURE AND VOLUME

The relationship of pressure to volume is inversely proportional. That is, as pressure increases the volume will decrease, everything else being equal. A certain amount of fuel pressure is always required to maintain engine performance by assuring that fuel is available on demand. Also, other factors and conditions must be taken into account such as acceleration G-forces and friction within the fuel system itself. At the same time,however, an adequate fuel volume is needed to ensure that the proper amount of fuel can always flow to the engine, especially during peak demand situations. A basic understanding of this critical pressure/volume relationship is needed when designing the proper fuel supply system for your vehicle.

Fuel line sizes

FUEL LINE SYSTEM

The fuel line system should be routed to avoid running near hot spots, such as various exhaust system components, and designed to promote maximum fuel flow. Most factory stock fuel systems utilize 5/16" fuel lines. This size works well on street applications with stock engines. When the horsepower requirements go up, however, the inadequacy of this line size soon becomes apparent. A #6 (3/8") line size is sufficient for all street performance applications and some racing applications. #8 (1/2") fuel lines are used on everything else, including alcohol applications. Avoid using rubber fuel lines, or use them sparingly, for two reasons. First, rubber is more resistant to the flow of fuel than any hard line. An actual pressure loss can be measured over distance. Second, for safety's sake, it's not a good idea to use rubber fuel line, especially when using a high pressure performance fuel pump.

FUEL LINE FITTINGS

Like the fuel line, fuel line fittings are also a very important element in the total fuel line system and should not be overlooked. Obviously, the fittings should be the same size as the fuel line. Also, if at all possible, you want to minimize the use of 90° fittings. Avoid sharp turns or bends in the fuel line routing; these cause undue restrictions to the flow of fuel.

MECHANICAL PUMPS

Various Holley mechanical fuel pumps are available. 110 GPH pumps are designed for street/strip applications where substantially higher than stock fuel delivery requirements are necessary. 3/8" inlet and outlet ports are utilized and, with fuel shut-off pressure in the area of 6-1/2 - 8 PSI, a regulator is not required. 130+ GPH pumps are available when maximum fuel delivery is desirable. 1/2" inlet and outlet ports are included and fuel shut-off pressure is between 7-1/2 - 9 PSI. A pressure regulator is definitely required. Both the 110 GPH and 130+ GPH pumps utilize a high capacity fuel valve design that will ensure an adequate fuel supply is always available.

ELECTRIC PUMPS

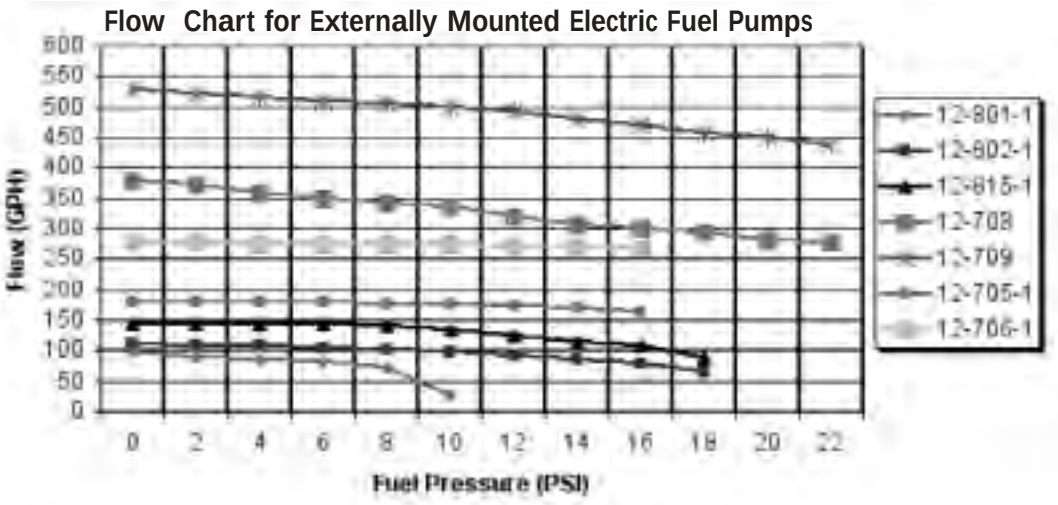
Holley offers a complete line of electric in-tank and externally-mounted pumps.

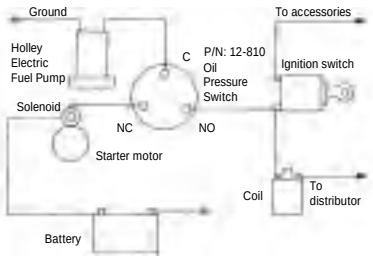
Holley externally-mounted electric fuel pumps are also available in various flow ratings. The "red" pump, **P/N 12-801-1**, is rated at 97 GPH and it is designed to work with stock or mildly modified engines. Pressure is pre-set to 7 PSI and a regulator is not required. The "blue" pump, **P/N12-802-1**, is rated at 110 GPH and it is designed for street/strip applications. Pressure is pre-set at 14 PSI and a regulator is included as part of the package. Neither pump is compatible with methanol or alcohol fuels nor should they be used with fuel injection systems. The "black" pump, **P/N 12-815-1**, is rated at 140 GPH and is designed to work with either gas or alcohol fuels. This one is similar to the "blue" pump but it kicks out more fuel. These pumps all feature a simple, yet rugged, rotor and vane design which has proved itself over the years.

Two very powerful "VOLUMAX" pumps are available for gasoline or alcohol fuels. They are **P/N 12-705-1**, rated at 180 GPH and **P/N 12-706-1**, rated at 275 GPH. These feature a gerotor pump design which is extremely efficient and quiet. Fuel pressure is pre-set at 15 PSI and both a pressure regulator and 3/8" return line to the tank are required. The high volume output of these pumps make them the natural choice for racers who will settle for nothing but the best. **NOTE:** Because of the design of these pumps, it is necessary to connect both fuel pump inlets to the fuel supply for proper operation.

Our electric in-tank line overs coverage for the most popular Ford, Chrysler, GM and Import applications. Utilizing a proven gerotor design, these pumps are available in either a 190 or 255 liter per hour (lph) flow rate.

Fuel Pumps / Regulator Technical Information





OIL PRESSURE SAFETY SWITCH

It's always a good idea to place a safety switch in the circuit when installing an electric fuel pump. Holley has one available under **P/N 12-810**. This switch will ensure that the electric pump will not work unless the engine has oil pressure. It will prevent the pump from running in a situation where the motor may stall with the ignition ON. Wiring the switch through the starter solenoid circuit energizes the pump on engine start-up. After the engine is running the switch continues to provide power to the pump as long as there is oil pressure to keep the switch turned on.
(SEE ILLUSTRATION)

FUEL PRESSURE GAUGES

There are a number of places where mechanical fuel pressure gauges could be effectively mounted. One place is just before the carburetor. Holley chrome dual feed fuel lines (except model 4500 DOMINATOR) and fuel blocks all have a tapped 1/8 NPT provision for this purpose. Another would be at the outlet side of the pressure regulator. The Holley four-port Pro-Series VOLUMAX regulator incorporates two pressure gauge taps expressly for this purpose. The electric fuel pressure gauge can be mounted inside the vehicle so that fuel pressure can be monitored while driving. This is possible because, unlike the mechanical gauges, fuel does not flow up to the gauge itself. The Holley electric gauge, **P/N 26-503**,utilizes a remote sending unit which is the primary fuel pressure sensor.

Holley offers a variety of fuel pressure gauges, depending on use. For carbureted vehicles there are two (2) mechanical and one (1) electric gauge available in the 0-15 PSI range.

Vehicles equipped with low pressure (up to 30 PSI) fuel injection systems (like throttle body fuel injection systems) can choose from two mechanical pressure gauges in the 0-30 PSI range.

FUEL FILTERS

What's the use of designing and building a good fuel line system and then choke it down with a restrictive fuel filter? It just doesn't make sense. Therefore, the fuel filter is another important consideration when building and designing your fuel system. A filter that's too small for a particular system is a potential high restriction area that will hinder performance by not allowing the fuel pump to perform to its maximum. Holley offers standard in-line filters that can be used on the street. For the Pro-Series VOLUMAX fuel pumps, Holley recommends using either Holley P/N 162-514 or 162-515 VoluMAX filters.

FUEL PRESSURE REGULATORS

The needle and seat assemblies that are installed in Holley performance carburetors can satisfactorily control fuel pressure up to about 8 PSI. If the fuel pump is putting out more than 8 PSI, a regulator should be used to keep the fuel pressure within safe limits and avoid the possibility of flooding. Holley manufactures a number of regulators for most any need. A street regulator is available in either a satin finish (P/N 12-804) or a chrome finish (p/n 12-500). A performance regulator is available in either a satin finish (p/n 12-803) or a chrome finish (p/n 12-501). Both regulators feature a 3/8" NPT inlet port and two 3/8" NPT outlet ports with a .220" restriction (7/32"). The street version regulates pressure from 1 to 4 PSI while the performance version regulates pressure from 4-1/2 to 9 PSI. NOTE: These regulators are designed to work with a single carburetor installation. If two carburetors are used then two regulators will be required, one for each carburetor. Also, two of the P/N 12-803 regulators MUST be used when running a VOLUMAX fuel pump - one for each fuel bowl.

Holley also offers two VOLUMAX regulators. The first, P/N 12-704, is basically a larger version of the two previously mentioned regulators but with more flow capacity. This regulator features a single 1/2" NPT inlet port and two 1/2" outlet ports with a .437" restriction (7/16"). Fuel pressure is regulated from 4-1/2" to 9 PSI. The other regulator, P/N 12-707, is designed for dual carburetor installations. It features four "-6" AN (approximately 3/8") outlet ports and one "-8" AN (approximately 1/2") inlet port with a .437" (7/16") restriction. Three 1/8" NPT fuel pressure gauge ports are also included. Without a doubt these two Pro-Series regulators are the least restrictive, highest flowing, production regulators currently available.

INSTALLATION TIP - for vehicles without fuel return line to the tank: Install the regulator close to the carburetor. Fuel lines from the regulator to the carburetor should be #6 (3/8").

FUEL PUMPS / REGULATOR TECHNICAL INFORMATION

Following are various fuel system schematics for street and race applications. Although intended only as a guide, these designs have been successfully used in many performance applications.

Figure 1 – One (1) #12-802-1 "blue" pump feeding single carburetor, without fuel return line.

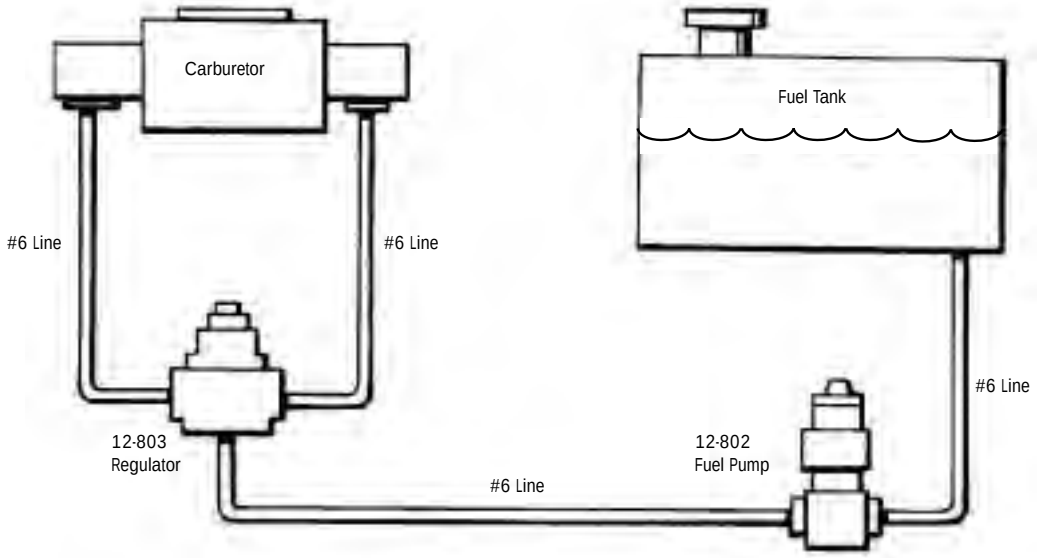


Figure 2 – One (1) #12-706-1 VOLUMAX pump feeding single carburetor.

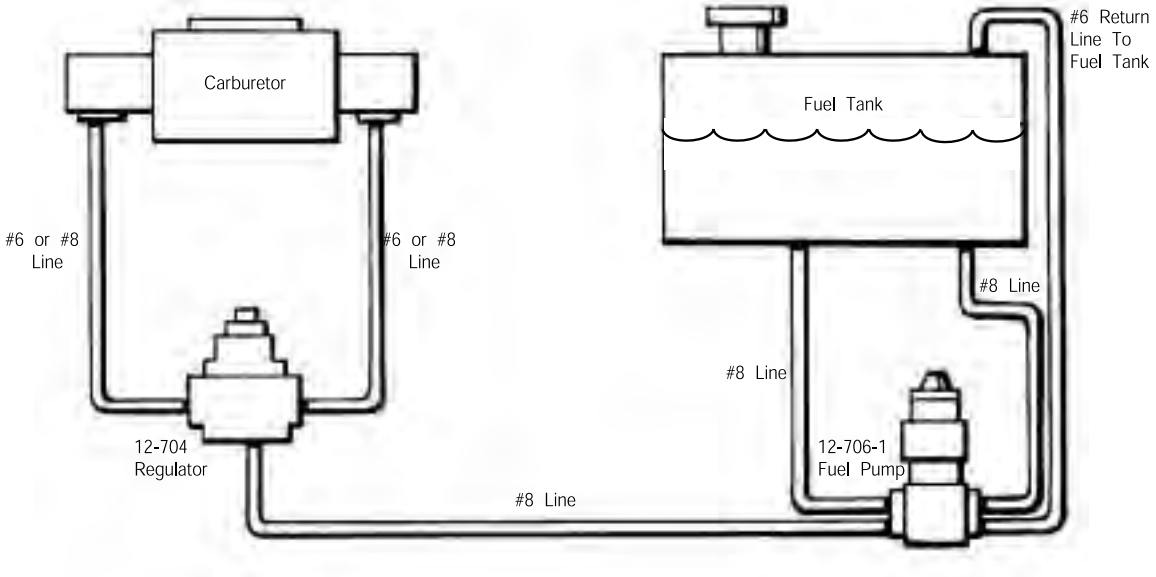


Figure 3 – Two (2) #12-802-1 “blue” pumps feeding single carburetor.

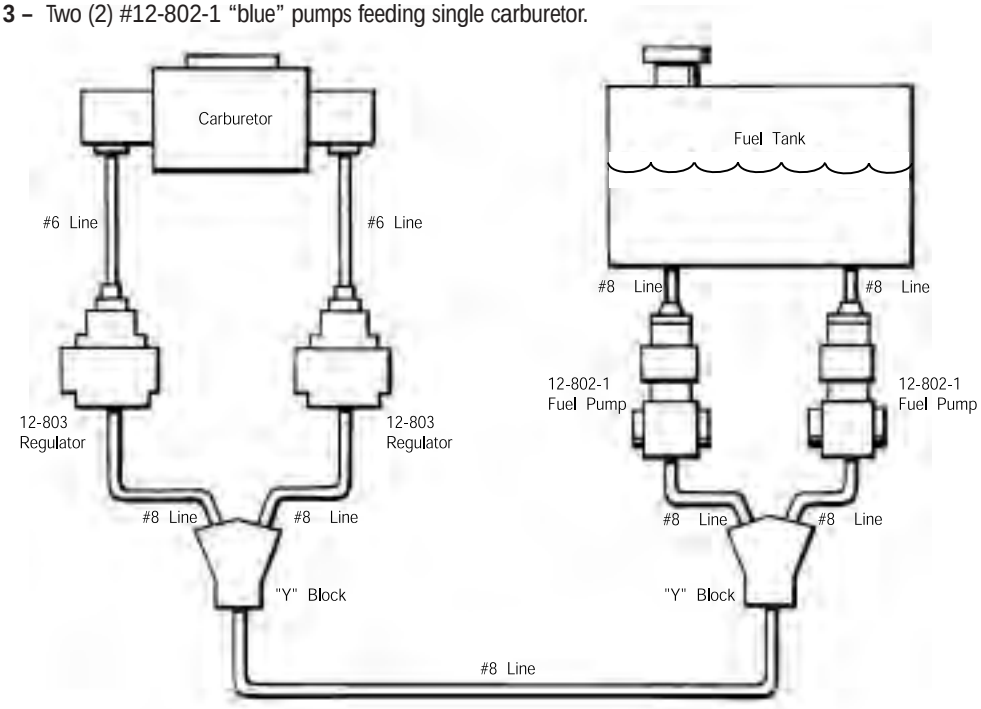


Figure 4 – One (1) #12-706-1 VOLUMAX pump feeding dual carburetors.