

Carburetor Class at Drag Racer Magazine

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Considering the increasing numbers of flow-through (Gerotor-style) fuel pumps finding their way onto Street/ Strip cars, this month's column is devoted to their capabilities, their advantages and potential shortcomings, and how to keep them pumping. Also we review fuel filters and how to select the best for your application.

Q: What are the chief pros and cons of the modern flow-through style of fuel pump?

A: The flow-through style is a constant-duty fuel pump, which pumps prodigious amounts of fuel, and serves equally well on street or strip use. Its electric motor is cooled by either leaded or unleaded fuel flowing through the motor casing; however, it does not tolerate methanol fuel. Some flow-through pumps are designed to include an internal replaceable fuel filter at the inlet port.

Since the Gerotor-style pumps produce more fuel than can be consumed at idle, the excess fuel is returned to the tank or cell via a fuel-pressure regulator and

fuel line. This arrangement keeps the fuel cool and moving. However, if the pump is mounted too high and/or starved of a good gravity-fed head of fuel or mounted such that it's denied a source of cooling air, the pump can overheat and damage to the internal gears and housings will result. This condition is exacerbated in stop/start conditions when the engine is using little fuel, the ambient temperatures are high, and the asphalt is hot. To dissipate excessive heat, use an 8-inch or 12-inch-long heat sink and place it in a source of cooling air.



A constant-duty rebuildable fuel pump with accompanying fuel-pressure regulator and heat sink, these pumps can be mounted either vertically or horizontally and include an internal filter.

Q: What are the key points when laying out a fuel delivery system for the flow-through pump?

A: Like most performance and racing fuel systems, the flow-through pump works in conjunction with a fuel filter placed at the inlet port of the pump and a fuel-pressure regulator placed before the carburetor or fuel injectors. The excess fuel is returned to the fuel tank or cell. To avoid the transfer of warm/hot aerated fuel, the points from where the fuel is discharged into the tank and drawn from the tank should be as far apart as possible. On carbureted vehicles, the returned fuel should be discharged above the fuel level near the front wall of the cell; on fuel-injected vehicles it should be discharged below the fuel level (about three-quarters down the tank) via a 3/8-inch bore tube.

On the suction side, whether carbureted or fuel injected, fuel should be drawn from the lowest rear regions of the tank or cell—preferably from a sump (a recessed area on cell bottom). As a minimum, use an AN-

10 (5/8-inch bore) hose to supply fuel to the pump. From the pump to the bypassing fuel-pressure regulator, use an AN-8 (1/2-inch bore) hose and from the regulator to the fuel tank or cell, use an AN-6 (3/8-inch bore).

To vent the fuel tank or cell to atmosphere, use a minimum hose size of AN-8 (1/2-inch bore). Use a vent filter, if possible, and terminate the vent line in an area where it cannot become blocked with debris or permit the ingress of water.

Q: Give me a few clues as to tuning and maintaining my flow-through pump.

A: With the engine running at idle, check the fuel pressure with a non-liquid-filled gauge (liquid-filled gauges are affected by ambient temperatures and can display false readings). Fuel pressure on a carbureted application should operate around 5.5 to 7.5 PSI and, depending upon the system, 40 to 60 PSI on a fuel-injected layout.

Obviously, a fuel pump works best when

supplied with adequate voltage; therefore, wire the pump through a relay to reduce voltage losses. Run a 12-gauge wire from the battery to the relay and from the relay to the pump, using a 25-amp fuse in the circuit to protect the pump. Use an 18-gauge wire to activate the relay. Solder the wire connections and shrink-wrap each wire if you can.



An 8-micron filter on a dry-break arrangement makes for easy servicing.

Q: With numerous fuel filter styles available which one is best for my drag racing application?

A: Dry-break filters are designed for convenience when examining the filter. They have minimal flow losses, and make use of a filter element compatible with either gasoline or alcohol. Inline filters mount in tight locations, have generous filtering areas,

and are especially suitable for tubular-chassied cars. However, for race-cars with rear-mounted cells and vane-style electric fuel pumps, the canister style is, probably, still the most popular. The fuel flow of the canister-style can enter through its axis and exit through its perimeter or vice-versa. These filters can be installed on the fuel cell and feed a directly mounted pump or one that's remotely mounted. This means that the end cap can be easily removed without disrupting the rest of the system and the element checked or replaced.

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Filters: dry-break, inline, and canister styles