

Aeromotive, Inc. Technical Bulletin #802

From: Aeromotive Technical Department

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Re: Fuel Tanks and Cells: Pickup Tubes vs. Sumps and Stealth In-Tank Fuel Pumps

Today, the combination of EFI and modern engine technology have allowed us the freedom to create the ultimate street driven racecar. Ordinary combinations produce 300-500 HP and the stock EFI fuel system has proven flexible enough to cover that, but hardcore engine combinations now exceed this easily, with 600-800 FWHP possible with bolt on parts and serious combinations between 800-1,400 FWHP.

Go above 500-600 FWHP and we exceed the limits of a modified stock fuel system, requiring a complete fuel system makeover. The biggest obstacle to major upgrades is often the fuel tank itself. In the past, the debate often centered around whether to modify the stock tank or install a racing fuel cell. Today, many more options exist, thanks to a series of extraordinary product developments from Aeromotive.

There are many good reasons to retain the stock fuel tank, or to use a tank that fits in the stock location, in a high horsepower streetcar. Benefits include a greater capacity than most fuel cells, a mounting location outside the trunk using existing hardware and it has a fuel level sending to run the gauge in the dash.

The drawbacks to using the stock fuel tank are more numerous but less obvious. The stock pick-up/pump hanger is restrictive, requiring complete replacement with a fabricated assembly. When using a fabricated pickup with an externally mounted fuel pump like the A1000, the stock baffle is too small and poorly supplied with fuel from the main tank to support aggressive driving with the tank under 1/2 full.



Fabricated Pickup Tube

The baffle in a stock tank is also an issue during cruise and light load operating conditions. A high volume pump like the A1000 recycles the small volume of fuel in the stock reservoir aggressively, with the fuel picking up heat as it runs through the chassis, fuel rails and the engine compartment, leading to hot fuel handling problems. Symptoms include cavitation and vapor lock, fuel pressure drop under high load, and if ignored, exaggerated pump wear, not to mention possible damage to the engine caused by a lean condition.

Note: *Unlike a carbureted engine with a float bowl, if the pump sucks air with EFI it immediately causes a drop in fuel rail pressure, reducing injector flow and producing a lean condition that could create serious engine damage.*



P/N 18650 Baffled Sump

Welding a sump to the bottom of the stock tank has been a favorite trick since the early days of hot-rodding. The traditional sump design, a triangular tray welded over random holes cut into the tank bottom has worked fine with carbureted engines for decades. However, Aeromotive recognized this classic sump was totally wrong for EFI engines, missing a reservoir to hold fuel at the pickup point, and with no provision for a return port. A reservoir style sump was needed to keep fuel at the pickup point and the return had to be back in the reservoir but in a way that would avoid causing turbulence in the pickup area. This insight shaped the amazing baffled sump from Aeromotive. Drivability like a stock tank plus ability to feed big power? Check.

Committed to continuous research and development, Aeromotive introduces more exciting advancements, including the Stealth fuel cells for racing and high powered street cars. Pump options for the new Stealth Fuel Cells include the 340 Stealth, the A1000 and the Eliminator, capable of 300-1,800 HP and pre installed into the baffled Stealth fuel cell. Options include cells with 6-gallon, 15 and 20-gallon capacity. The 6-gallon Eliminator Stealth cell, along with exclusive Aeromotive regulators, fuel rails and filters, are now the factory fuel system of choice for Ford's Cobra Jet, Chevy's COPO Camaro and Dodge's Challenger Drag Pack race cars!



Aeromotive Cobra Jet Fuel System



P/N 17130 Mustang Stealth System

With late model performance exploding, and modern muscle cars developing 350-500 HP off the show room floor, today's enthusiast is able to produce 700-1,200 HP on the street with bolt-on modifications. This requires serious fuel delivery be available using the OEM fuel tank. Beginning with the 2003-1/2 C5 Corvette, Aeromotive developed the Stealth A1000 and Eliminator pumps for the stock Corvette fuel tank. This led to Stealth pumps for late model Mustangs and Camaros. Aeromotive has since developed complete Stealth systems for over 25 late model Ford and GM cars, including Stealth pumps, filters, fuel rails, regulators and power supply.

As the performance potential increases, EFI has steadily gained acceptance in the world of street-rods and muscle cars. Aeromotive is responding to this demand with a much expanded line of Stealth tanks for early factory muscle cars. These new Stealth tanks feature a billet hat, 340 Stealth Pump, fuel level sender and a large internal baffle, installed and ready to run.



P/N 18657 67-68 Camaro Stealth Tank



P/N 18688 Phantom 340 Stealth

As exciting as the expanding line of Stealth Tanks is, and as many doors as they open for blending a Classic Muscle car with a Late Model performance engine, the reality is that not every fuel tank for every vehicle is a candidate for its own Stealth tank. Perhaps the "Holy Grail" of performance fuel delivery would be the means to install a quiet, high performance fuel pump, in any tank, complete with baffling, like any late model OEM fuel tank, and with little to no fabrication or welding required.

Maybe the most remarkable new product, and one taking the street/strip and street-rod market by storm is the New Phantom, baffled, in-tank installation system. With a simple hole-saw and drill, the Phantom allows installation of a 200, 340, 420 and dual 340 (combined 680lph) pumps in virtually any fuel tank. The Phantom system is compatible with both EFI and Carbureted applications using the recommended Aeromotive bypass regulator.

Capable of supporting EFI engines making from 200-1,400 HP on gasoline, the Phantom is simply a game changer in the world of fuel delivery. Suitable for tanks from 6"-11" deep out of the box, and able to extend to a depth of 20" using available extension kits. The Phantom hat is low profile (under 1" thick) and the hat is only 4-3/4" in diameter, employing a proprietary gasket capable of sealing against the ribbed surface used to add strength to the thin gauge material used in OEM fuel tank construction. The Phantom comes complete with built-in outlet and return ports, electrical bulkheads to properly power the pump, a stainless steel pump hanger and an auxiliary vent port for higher horsepower applications.

From the remarkable Aeromotive baffled sump to Stealth pumps that fit the OEM tank, to Stealth Fuel Cells and the new Phantom, Aeromotive has your fuel delivery needs covered. There is a better way to feed the beast and Aeromotive has the modern fuel system components available to do it now!