New 1957—1965 Corvette Fuel Meter Covers by Larry Linder

Problem: I have a broken 65 fuel meter cover and there are none on the planet.

The fuel meter cover sits on top of the fuel meter, it mounts the vent filter that is under the steel cover (silver cad), the vent tube that connects to the plenum, and most import the diaphragm cover. Under the covers is the needle and seat, rectangular float mounting pylons and depending on the year a circular pylon protruding downward above the spill valve. It connects the fuel inlet filter and the starting bypass lines in 57 and 65. It is a very important part of the injector and the reproduction of the part was most difficult because of the variation in design over the years and its multitude of fittings and functions.

Background: The fuel meter covers are easily damaged because they were a diets part and the fuel filter on some models is cantilevered at the fuel inlet fitting. Anytime you change the filter, fuel pump or bump the fuel line there is the possibility of breaking the inlet part of the cover. Some have use Teflon tape to seal inlet fitting but managed to break their cover by over tithing the fitting. Every time the diaphragm cover screws are tightened or removed to replace the diaphragm the mounting screws get looser and then strip out. There have been a limited number of covers available from cannibalized units and all but a few have been used up. Repairs have been to weld up the covers, remember these are die cast, and re machine the inlet / bypass port, try to get the float pylons aligned, and then discover that as you remove weld to make it look presentable you find pits and different colors of metal. When you are done it may not work, its expensive and ugly to say the least. Not what you want for your car. Before going on the hunt for a used cover one needs to know what to look for and find out what fits what production year.

Covers Used in production:

Figure 1 is an early 57 fuel meter cover. It can be identified by a large circular barrel shaped sprew near the fuel inlet. This was used on early and mid 57 production. It also uses a short vent tube.

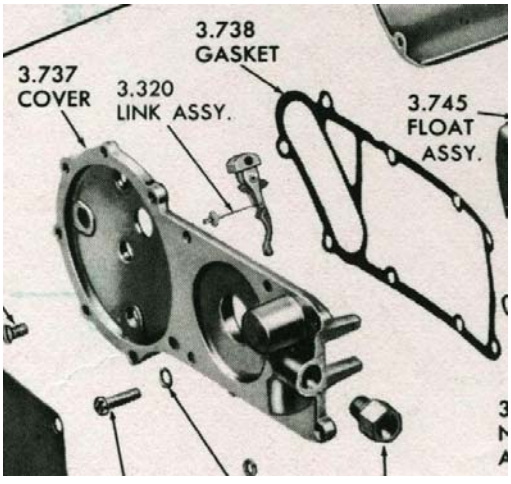

Figure 1 Early 57 FI Fuel Meter Cover

Later 57 covers can be identified by it lack of the pylon on the bottom side under the diaphragm cover , no anti siphon cover protrusion in cover , no vent tube hole, and a 3/16 fuel bypass connection in a boss near the fuel inlet.

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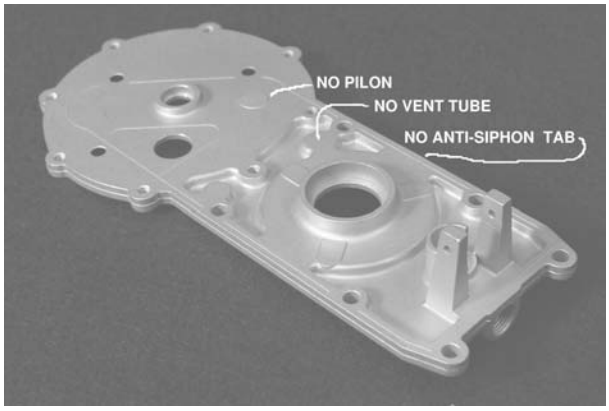

Figure 2: 57 FI Fuel Meter Cover Bottom

Figure 3: 57 Fuel Meter Cover Top is unique because of its small starting bypass line that directs fuel directly from engine fuel pump to spiders and absence of anti siphon cover projection, vent tube hole, and large projection at sprew (to bottom of fuel inlet).

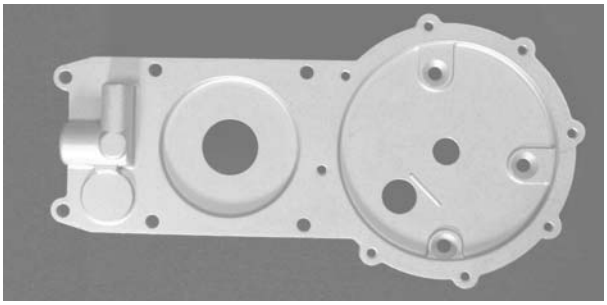

Figure 3: 57 FI Fuel Meter Top View

58– 62 (PN:) A 58 – 64E cover is similar to the 57 -1. This cover has the same small boss for the fuel bypass line as the 57 but it is not drilled. It also has an cover projection to cover the anti-siphon valve (top center), it has a conical pylon under the diaphragm cover that is over the fuel bypass valve. Figure 4 is the top view of the 58 – 64E.

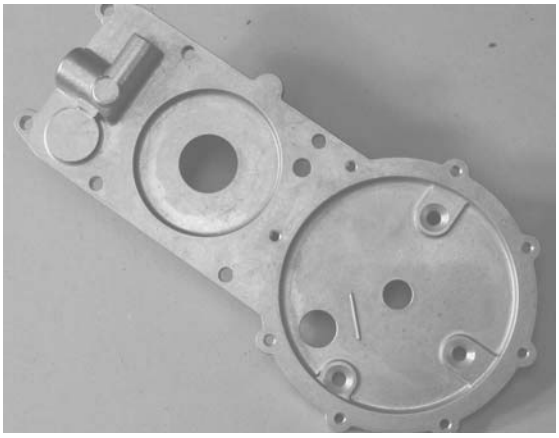

Figure 4: 58-64E FI Fuel Meter Top View

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Figure 5 is the bottom view of the 58-64E. The vent tube hole and anti-siphon projection are in front center of the cover. The pylon is clearly visible the imagined angle is due to graphics distortion. You can see the milled section on f loat pylons. This assures correct float clearance. Original covers are not milled and the float fit is sloppy causing need/seat problems.

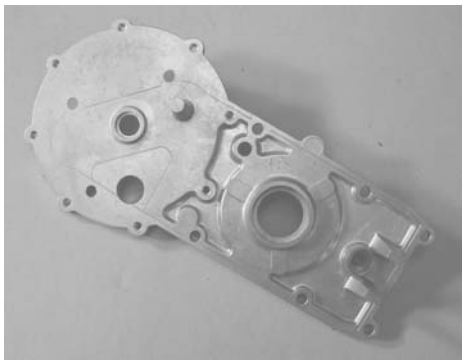

Figure 5: 58-62 FI Fuel Meter Cover Bottom View

64L – 65 (PN:)This cover is like the 58 – 64 but has a much larger boss on the inboard side for a 1/4 -28 threaded hole for a brass fitting that connects to a 3/16 fuel bypass line. this line connects directly to the starting solenoid which connects to the spider.

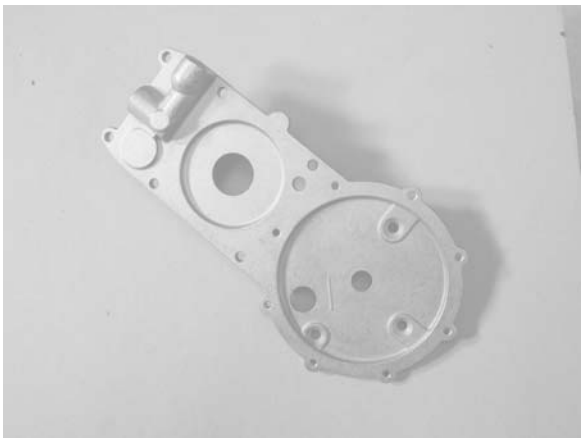

Figure 6: 65 FI Fuel Meter Top View

Bottom view/inboard side view of the 65 cover showing the threaded hole in the enlarged boss to the left side. Note the gasket traces, these are necessary to make sure the gaskets seal properly. Covers that have had these polished off in an attempt to flatten the cover will cause a fuel seepage around the edges of the fuel meter cover.

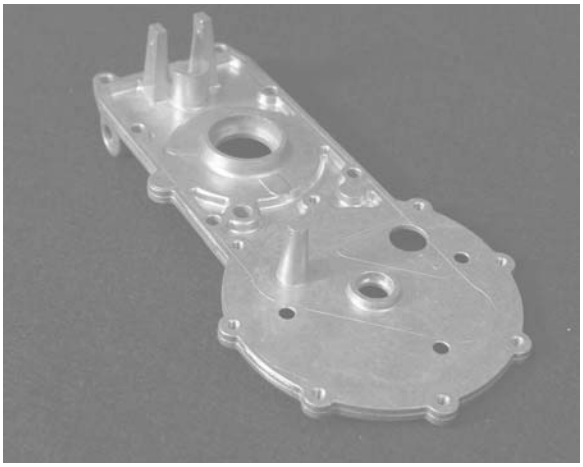

Figure 7: 65 FI Fuel Meter Bottom View

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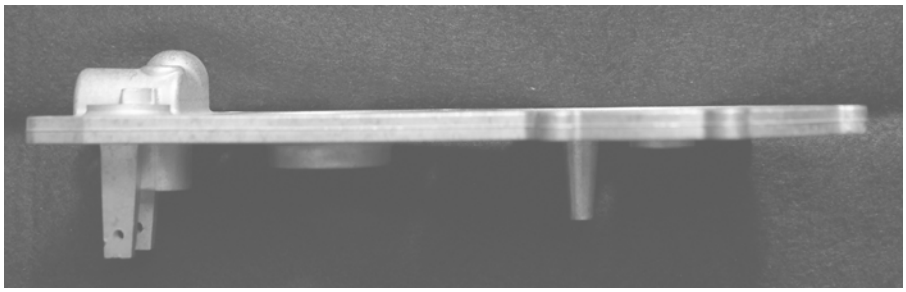
Now that we knew what we were looking for we were unable to find acceptably good covers at any price. The alternative was to build our own but with some important improvements.

Design improvements: Rules of the game. All design improvements must be non detectable from the outside.

1. Most of the improvements are in the type of material used for the castings and closer tolerances. Some areas are thicker for added strength in critical areas such as under the fuel inlet. The material is a higher strength aircraft quality aluminum alloy that has the same finished color as the original and good machining characteristics. This reduces the likelihood of a broken cover due to the cantilevered fuel filter, over torquing the fuel inlet fitting, and higher strength threads for the diaphragm cover. All holes and critical dimensions are machined to maintain tolerances, such as the float mounting pylon to float clearance.

2. Correct parting line in the casting: Getting the parting lines correct was a challenge as the original part was cast using a die cast as in (match plate). The new covers had to have different sprews (vents where metal is poured into or gases leave), to make sure the mold is filled evenly and completely. With a CNC mill and a special tool the sprews were removed so they are very difficult to detect their presences.



3. Cover flatness, and accuracy of the mounting and hole placement. One problem with most thin casting is that they are subject to warp. These casting are straightened in a manner to protect the gasket traces. These are the small raised trace that makes the gasket seal properly. Never sand the bottom of a cover to straighten it as you will destroy the ridge that makes the gasket seal.

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How we designed the covers:

We built a complete set of casting prints and machining prints for each cover in a CAD system. The prints were then printed as 1:1 on a plotter. An optical comparator was used to measured the location of all holes and machined surfaces, between know original parts, sections of parts, an NOS fuel meter and diaphragm cover to make sure everything fit perfectly. After we accomplished this we found that there was a mistake in the original prints that was never corrected!

The CAD drawing were processed by a casting CAM software to produce the pre-warped dimensions for machining the molds. The pre-warping is necessary to compensate for metal shrinkage. If the molds were identical to the part – the parts would be small by some dimension after they cooled. The CAM software complains bitterly about any line in the drawing that was not a perfect junction, this a common problem with most CAD and CAM systems. A sample set of covers were produced and checked against good original covers, machined and fit to an injector pump for testing - perfect fit.

The covers as delivered from the foundry are very presentable. During the machining operation every critical dimension and surface is machined using a CNC mill and a number of fixtures to hold the cover in position. The end result of the careful attention to all details is a reproduction cover that is identical to the original. When placed side by side the people picked up the reproduction and said "that this was the original cover" or could not tell the difference.

Three of the four covers are reproduced, the 57-2, 58-64E, and 64L-56.

The second 57-1 cover was not included because it was only used for several months of production and a number of original spares exit.

Assemble it correctly:

Use a tread sealer such as "leak lock" (no Teflon tape) to seal fittings, avoid fuel leaks and over torquing. A very small amount of "leak lock" is applied to start of threads and the fittings installed in the cover. Let it dry for a few hours. There will be no visible compound on the threads and it will never leak. A good flair nut wrench is necessary to remove fittings. Leak lock is solvable in acetone – low temp lacquer thinner.

Remember even a small flake of Teflon tape and your injector will never operate again without an expensive overhaul and maybe a new spider.

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After we built some for my own use a number of folks wanted fuel meter covers for their units. A number were cast and machined and are now available from MicroControls in Xenia, Ohio.

See the FI Spiders at "micro-controls.com" look in the Corvette parts section of their web site.

Several quality restoration shops have these fuel meter covers:

John Degregory
649 Humphrey RD
Greensburg, PA 15601
1 724 832 3786

Jim Thorpe
C / O
Sue McIntyre
PO Box 563
Andalusia, IL 61232
1 309 798 5129
suezque61@sbcglobal.net

The contents of this article are the sole opinion of the author.

Larry Linder