

ONE OF THE most common problems with Harley-Davidson Sportsters is the so-called "oil blowby phenomenon," which is when oil escapes out of the air cleaner assembly and drips out all over the engine and your right leg while you ride. It's not an oil geyser by any means, but it can get annoying and does require frequent cleaning, especially when a free-flowing air cleaner assembly is installed as part of the very common "Stage 1" upgrade. Despite the fact the solution to this problem is relatively cheap, extremely easy to install, and

ter, drains to the bottom of the air cleaner assembly via gravity, and drips out onto the engine and everywhere else the wind blows it while you ride. This situation is greatly exacerbated when the bike has a less restrictive air cleaner assembly, such as the common Screamin' Eagle setup, which most riders utilize as part of their Stage 1 Sportster upgrades. And although this blowby issue is not a virtual certainty on every single Sportster, it is enough of a plague so as to be one of the most common concerns new owners express in the various online Sportster forums, and in advice columns such as

one nipple on the right side—onto which a rubber line (standard 3/8" fuel line works well) is connected. This line is run down to the bottom of the bike's frame, and terminated in a breather filter, as shown in Figure 5.

In so doing, all of the oil mist is now diverted into the horseshoe, out the nipple(s), and directly out of the end of the rubber hose—instead of out of the air cleaner and all over the side of the bike. Thus, it pays to direct the rubber hose away from anything you don't want to get covered in oily blowby—namely, aim it away from your tires! I've found that aiming it to one side directly to the ground (hose at midpoint of frame with about 1" of space between the hose's end and the ground) works very well.

BLOWBY PHENOMENON

The Oil Spitting Sportster Solution by Moshe K. Levy

very effective, many riders are unaware of it and have resorted to stuffing dishwashing sponges, paper towels, and even women's sanitary napkins into their air cleaner housings—or worse; just accepting the phenomenon as part of Sportster ownership. This article is meant to help people who want to rectify the oil blowby phenomenon in a cheap, quick and effective way.

Why is oil leaking out of your air cleaner? Many owners automatically assume that something is wrong with their Sportsters, and many Harley mechanics answer their concerns by saying something to the effect of, "That's just a part of riding a Sportster. Deal with it." Both sentiments are incorrect. In layman's terms, on late model Evolution motors (1991–present), there are crankcase breathers which let built-up crankcase pressure within the engine (essentially an air/oil mist) vent out of breather holes in the cylinder heads and into the inside of the air cleaner. See Figure 1 for a picture of the crankcase breather holes in the cylinder heads.

The idea, in theory, is that this air/oil mist expelled via the breather holes will be sucked back into the engine through the carburetor and burned up in the combustion process. The reality, however, is that this oily mist can sometimes build up faster than the motor can suck it in. As a result, the excess oil buildup soaks through the air fil-

MCN's "Downtime Files." Although there are a few variables that contribute to this situation (how tight your piston rings seal, how hard you ride, performance modifications, etc.), the situation is usually worst when your oil tank is completely full, you have a free-breathing air cleaner assembly, and you've ridden hard (70+ mph) for an extended period of an hour or more. An owner in this situation may suddenly find healthy streaks of escaped oil decorating the entire right side of his bike after only a few miles!

What you can do about this: The first step is to ignore people who tell you to "live with it," and to bypass temporary band-aid solutions like dishwashing sponges and the like. A variety of devices exist to solve this blowby problem once and for all. They are called "breather kits." A generic "horseshoe" type is shown in Figure 2, and shown installed in Figure 4.

The concept of the Breather Kit is simple—the two hollow bolts shown in Figures 2,3 screw the chrome "horseshoe" onto the heads' crankcase breathers (usually with some 1/2" x 18-gauge washers between the bolts, the horseshoe, and Z-brackets), so that the holes in the bolts line up perfectly with openings in the horseshoe when everything is tightened down. The hollow horseshoe has either one or two nipples—for reference, the horseshoe in Figure 2 shows

ALTERNATIVE FIXES

Which brands work? What about crank vent kits? Should you drill the oil drain holes in the rocker boxes? The generic breather kit solution proposed herein works as well as anything else I've tried, for about \$50 total and 30 minutes of installation time. They are available for your Sportster through every major vendor outlet (V-Twin Manufacturing, Drag Specialties, Custom Chrome, Biker's Choice, etc.) at your local shop. Naturally, there are more expensive solutions—you can buy \$200 fancy billet breather kits; stainless breather line instead of rubber; tiny \$100 canisters with five-cent umbrella valves in them sold as "crank vents" (ref: MCN August 2001), kits that require drilling or modification of the drain holes in the rocker boxes, or even \$150 billet chrome "catch cans" which trap the oil that the breather hose spews out. There are a myriad of ways you can turn this project into an excuse to spend much more money and time, but from a functional perspective, you will gain little or nothing. The goal of this project, which the \$50 kits accomplish just as well as the \$200+ kits, is merely to eliminate the oil blowby from entering the air cleaner assembly, instead routing it via the breather hose to wherever the owner chooses to exhaust the mist. In this way, the bike always stays clean and dry, and the problem is solved without the aid of dishwashing sponges, paper towels and other such temporary solutions.

BASIC INSTALLATION TIPS

For some reason, much like the infamous oil debate, the issue of breathers is often filled with rumors and incorrect informa-

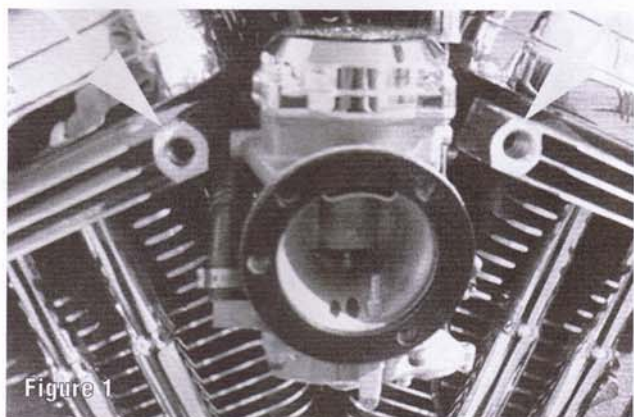


Figure 1

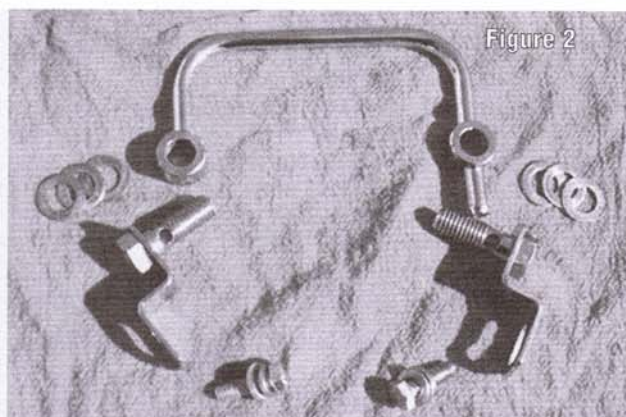


Figure 2

Figure 1: The arrows point to the crankcase breather holes in the cylinder heads. Figure 2: The components of a typical "horseshoe style" breather kit.

tion. For the record, most of these generic breather kits (such as V-Twin Manufacturing's p/n 31-0434 shown herein) do work with the common Screamin' Eagle air cleaner assembly. For reference, see Figure 3: The Screamin' Eagle air cleaner backplate with horseshoe breather installed.

Figure 4 illustrates how a properly installed breather looks from the perspective of looking at the Screamin' Eagle backplate head-on. The original breather holes in the backplate itself must be plugged up. The preferred way to do this is to use common stainless steel hardware as shown, but some use tape instead. Hardware is obviously more durable, and don't forget to use Loc-Tite! The other holes in the backing plate are used to secure the breather's Z-brackets on the rear side, with the supplied bolts coming through the Z-brackets and backplate, and threaded into the aluminum stand-offs as shown. See Figure 6 for further detail.

Because the breather assembly moves the air cleaner's backplate away from the carburetor, you will need to make sure that the carburetor's opening is still sealed flush and

gasketed to the backplate once everything is tightened down. In my experience, the most effective way to install this type of breather is to seat the carburetor on the manifold and install the breather assembly, leaving everything finger tight. Next, mount the backplate to the breather's Z-brackets with the supplied hardware, threaded into the aluminum standoffs on the front side. Now, tighten down the hollow breather bolts themselves—do not over-tighten these, as they are hollow and break easily! The last step, once everything else is done and the breather/backing plate is fully secured, is to tighten the three allen screws going through the venturi ring and holding the carburetor to the backing plate. Doing this pulls the carburetor out slightly, towards the secured backing plate, as the carburetor's face crushes the gasket sandwich between the carburetor's opening and the backing plate, ensuring a tight seal. Once this is done, put the air filter back in place and button up the air cleaner cover.

Many shade tree mechanics defeat one of the primary benefits of the breather kit

when they install breathers, by routing the breather hose into the air cleaner backplate, on the inside of the air filter itself. This is, in fact, what most instruction sheets specify to do, but it essentially defeats the primary purpose of the breather in the first place. Worse, it allows the added oily blowby mist directly into the combustion mix of your engine. The engine is designed to ignite a mixture of gas and air on the combustion cycle—adding a heavy oil mist to this mixture greatly contributes to excess carbon formation in the combustion chambers and on piston tops, as the oil burns along with the gas and air. Obviously, this leads to an eventual decline in the performance and reliability of the motor in the long term, through this and other related factors (such as increased carbon-induced detonation, fouled plugs, and more). So, the lesson is, if you have your breather hose routed into your air cleaner backplate, reroute the hose to the atmosphere with a breather as described herein, and plug up the hole in your backing plate with hardware. Your engine will thank you for it.



Figure 3

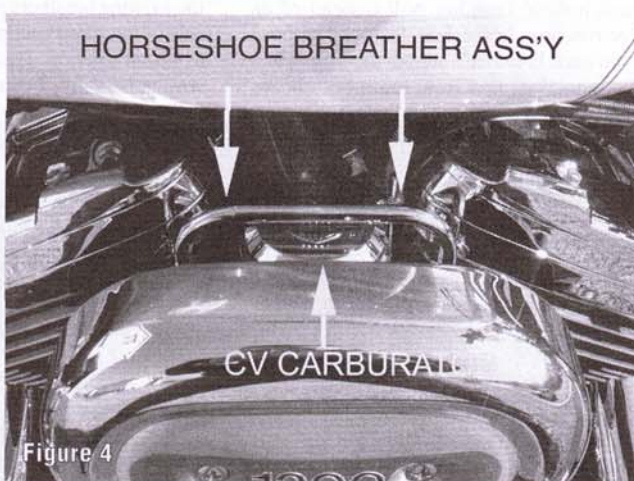


Figure 4

Figure 3: Note the hollow bolts, which mount the "horseshoe" to the cylinder heads via the threaded breather holes shown in Figure 1. Figure 4: The "horseshoe style" breather kit installed with CV carburetor and Screamin' Eagle air cleaner assembly.

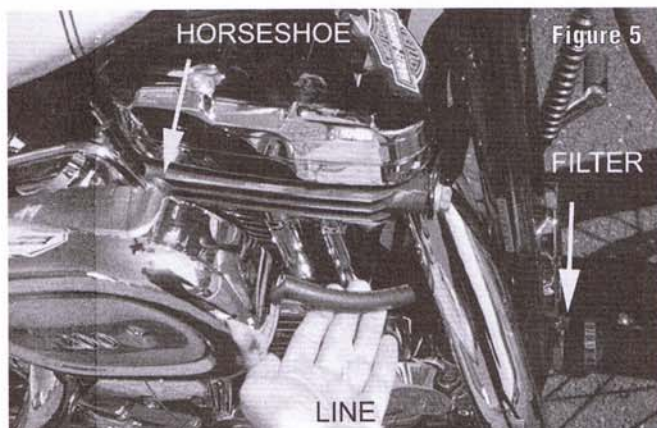


Figure 5: The breather hose runs from the horseshoe nipple down to the bottom of the frame, and is capped with a breather filter (highlighted by arrow). A good mounting place for the breather filter is the center front of the frame, using the existing mounting hole directly under the voltage regulator.

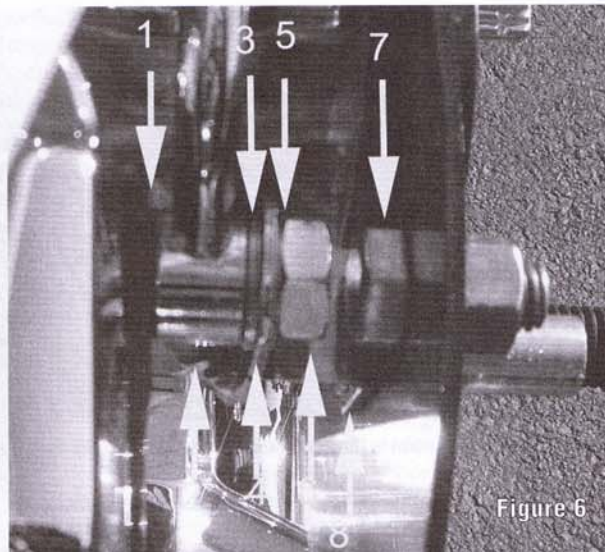


Figure 6: The rear of the Screamin' Eagle backplate with horseshoe style breather installed highlights the order of parts used in the installation of the V-Twin 31-0434 breather to the Screamin' Eagle air cleaner assembly. Specifically, from the crankcase breather outward (left to right as shown): 1) 1/2" x 18-gauge washer; 2) Chrome horseshoe; 3) 1/2" x 18-gauge washer; 4) Z-bracket—secure with bolt through backing plate and thread into aluminum standoff on backing plate's front side as shown in Figure 3; 5) 1/2" x 18-gauge washer; 6) Hollow breather bolt; 7) Old breather holes in backing plate—plug these up with hardware or tape (stainless hardware shown); 8) Bolt securing Z-bracket to backing plate, threaded into aluminum standoff on backing plate's front side as shown in Figure 3. Naturally, you perform the same installation procedure for the other end.

AFTERMARKET CARBURETORS

In general, the generic kits that work for a CV carburetor are available for aftermarket carburetors as well, most notably the popular S&S and Mikuni brands. The main thing to check for is physical clearance if using a horseshoe design breather. In my case, the chrome horseshoe clears my Mikuni HSR42's stepped top by only 2mm or so. In order to remove the Mikuni, I would need to also remove the horseshoe since the Mikuni doesn't fit under it, as a CV carburetor does. Thus, if the carburetor needs to be removed often, the solution is to use a Mikuni or similar breather kit, which uses a separate nipple (aiming down) per each hollow breather bolt instead of an overreaching horseshoe design. The hose from each breather's nipple then meet in a T-connection, and from there both hoses

are routed as detailed above (or, they can be run separately). See Figure 7. The price of a Mikuni breather is comparable to any other generic brand—about \$50.

STOCK AIR CLEANERS

Because of the sheer size and all-encompassing shape of the stock air cleaner backing plate, oil rarely manages to escape from Sportsters which have not had air cleaner upgrades. Yet, sometimes, it does happen—and those owners wonder what they can do. Unfortunately, the answer is nowhere near as easy as for the free-flowing air cleaners. The best solutions for stock air cleaners are pretty involved, usually requiring tapping the existing breathers and running lines outside of modified backplates—definitely not a bolt-on solution. This is one of the reasons why personally, I cannot understand why

anyone would keep the stock air cleaner in the first place. For \$70 or so, one can buy a free flowing unit, which would be, dollar-for-dollar, the best performance investment one can make. In addition to vastly superior performance, the addition of a proper breather is also far easier on the higher-performing free flow air cleaner than on the stock unit.

FINAL THOUGHTS

There are a few key points that are worth emphasizing here: The issue of oil blowby is indeed part of the Sportster experience, due to the basic design of the motor. Those running anything other than bone stock air cleaners have a very good chance of having to deal with the nuisance of oil escaping from the air cleaner assembly unless steps are taken to deal with the problem. Although not every single Sportster is affected, most are, and the extent of the problem rests on several variables as previously mentioned (and only gets worse as motors are modified for ever higher performance). Thus, due to the relatively low cost of the solution proposed and the relatively high probability of oil blowby becoming an issue without its implementation, a breather kit installed to vent to atmospheric pressure should automatically be part of any late-model Sportster's Stage 1 upgrade. Doing so will enable the owner to control the final location of the inevitable oily blowby, rather than to be at the mercy of it. Just be absolutely certain that oil mist will not end up on your tires! 🍌



Figure 7: The Mikuni breather kit installed with an HSR42 and Screamin' Eagle air cleaner assembly.