

# The Sump Problem and Why the Sumpthing™ Works

By Dick Briggs

## **The Sump Problem:**

Between 1911 and 1999 Harley has fought the problem with oil being above the oil pump with a spring and ball as a check valve. When the ball valve, for various reasons, doesn't sit tightly on its seat it allows oil to flow out of the oil tank into the lower end of the engine. Harley engines were not designed to hold a supply of oil in the crankcases. When an engine having too much oil in the lower end is started, the oil pump can't get the oil out before the crankcase pressure starts to rise. The oil has no where to go but out the vents with the crankcase air pressure. The valve design is flawed and frequently fails all models equipped as such, creating one of Harley's most persistent and messy problems.

## **Attempted Solutions to the Sumped Engine:**

On the 1936-1964 big twin models the engine vent runs into the primary cover. With the help of a fan action, caused by a spinning clutch basket, this blew excess oil out of the primary thru a large hole in the back of the inner cover. The result? Oil all over back of bike and oil on the ground.

1965-1988 saw a significant improvement (cover up) of the problem with the solid, oil tight primary system. The vents were routed into the primary and to the oil tank. Some bikes thru that period actually could boast "no leaks at all under them." A bike could be sumping, and probably was, while the rider wouldn't even know it. HD tapped a line into the engine case to access a vacuum created by spinning engine parts in an attempt to vacuum the oil out of the primary cover. That line's other end is hooked directly to the bottom of the primary cover. It worked quite well if all seals and gaskets were in good condition. There is a huge draw back with this system. The primary chain housing is just that; a part of the bike that houses the primary chain, sprockets, chain adjuster, clutches and all sorts of moving, working, spinning and ultimately wearing parts that create metal filings, clutch debris (and in my own personal experience, a small piece of nylon adjuster shoe). All this flows back into the engine unfiltered and is rushed back through the return side of the pump and then to the oil filter and back into the oil tank. When riders realized this system was sending unfiltered trash into the lower end, the public stepped up with its own solution. Many riders disconnected all of HD's hard work, venting everything onto the ground. With bikes that sump, this again blew oil all over the bottom of the bike. NOTE: My personal bad experience involved a small piece of the adjuster shoe. It jammed the return gears shearing off the gear key spraying oil out the breather onto the rear tire. This made for a very scary 200 yards while I got the bike under control.

1989 and up: The EPA, HD riders and parking lot owners put HD under the gun. They developed a third solution by venting the engine into the air cleaner assembly. Any oily mist was taken thru the carburetor and burned. It worked great as a vent in a bike with no sump problems. Again, bikes were able to sump without the rider knowing. Some riders

would still get excess oil in the lower end. This would be caught up in the regular venting system being expelled into the air intake. Being that the system is only designed to handle a minimum amount of oil created by a correctly working check valve, excess oil would blow into and saturate the air filter. Eventually it would leak and be blown all over the bike during operation.

After 3 attempts, their solution to the pesky oil sump problem was this: put the oil below the pump. Problem solved after only 88 years! There are many very good selling after market venting products, ranging in price from cheap to expensive. They bypass the head to intake system keeping oil off the bike by, again, running lines to the ground.

The sumping problem creates further frustrations. Anyone who has ever tried starting a motorcycle that has been sitting for any length of time is well aware of how hard it can be and the amount of oil that comes spewing out of the engine vents. What most people don't realize is the oil that has accumulated in the lower end acts as a liquid brake shoe on the flywheels, making the leg or starter work extremely hard. Bike owners that complain about excessive oil out of the vents tend to also say their bikes are very cold blooded and will not go to an idle as quickly as other bikes. It is probably that the engine has an excessive amount of oil dragging on the flywheels, cams, and other moving parts. Once the oil warms up or is sent back to oil tank or spewed onto the ground, the flywheels are free to move about the engine cases again. Another good reason to resolve this issue, and maybe the most important, is the fact that we are dumping oil all over the ground. We need to consider what we are doing to the environment (that one is for the tree huggers).

On all bikes from 1936 to 1995, and on Softails from 1995 to 1999 there has been an extensive amount of time and money spent on trying to cover up a system that at best is mediocre. Until now no one has addressed the root of the sump problem: the ball, seat and spring check valve that does not work properly or in most cases not at all.

The Briggs Made Sumpthing™ is a specially designed electronic solenoid valve that absolutely stops the flow of oil when the bike is not running. It is designed with heat, vibration, and weather in mind. The valve body itself is made out of stainless steel with a seat and valve made out of the best materials available for its job. The solenoid is made out of special composites that are rated above 380° F. The valve and relay assembly on most bikes require about 1-1.5 hours installation.

The Sumpthing™ valve is placed in-line between the oil tank and the oil pump using common fittings in conjunction with the oil pumps existing check valve. The wires from the solenoid are easily disconnected in the unlikely event of a failure. The lead wires will be attached to the ignition switch or coil supply wire and the battery ground.

## **The Briggs Made Oil Pressure Relay Switch:**

In essence, this relay switch is an audio oil pressure warning device. We have built a low oil-pressure warning relay, which is included with all 12-volt Sumpthing™ valve kits. The relay has three terminals: positive, negative and load. The positive is connected to the ignition switch, the negative is connected to the oil pressure switch and the load is connected to the horn or any alternative sounding device. The relay has two adjustable dials. The first regulates the delay from the time the ground, via the oil pressure switch, is supplied until the load is activated (30 seconds is recommended). The second dial regulates the length of time the audio warning is sounded: about .5 seconds.

When the ignition switch is turned on, power is supplied to the relay. The oil pressure switch being at rest causes the ground. The 30-second delay gives the rider time to start the bike without the alert activating. If the oil pressure switch does not sense pressure within the 30 second set time, the relay will then activate for .5 seconds, sending power to the horn or audio device. This alerts the rider that 1) there is no oil pressure and 2) that his switch is on, eliminating dead batteries from leaving the switch on and walking away. If the bike is being driven down the road and the engine loses oil pressure for any reason, after 30 seconds, the relay will blow a warning. This alerts the rider to an oil pressure issue, avoiding a potentially expensive repair. The time delay relay can be installed on it's own on any engine that has an oil pressure switch making it a valuable device on it's own.

The Sumpthing™ and Oil Pressure Relay Switch can be ordered through Briggs Made Cycle Parts either as a complete kit or individually by using our online ordering system. If you have questions regarding these products, please go to our Contact Us page to send a message. We will gladly answer your concerns.