

## Technical Service Bulletin

Date: 7/13/2006

Product Description: AMSOIL Oil Filters

Subject: Over Pressurization of AMSOIL Oil Filters

### OBJECTIVE:

To inform AMSOIL Dealers and customers of the possible causes and effects of oil filter over pressurization. Applications included are motorcycle, light truck, ATV, snowmobiles, small engine, and marine applications.

### ISSUES:

AMSOIL occasionally receives reports from Dealers and customers pertaining to leaking oil filter gaskets and deformed filters. These defects are mainly due to over pressurization of the lubrication system and are not related to filter defects.

### TECHNICAL DISCUSSION:

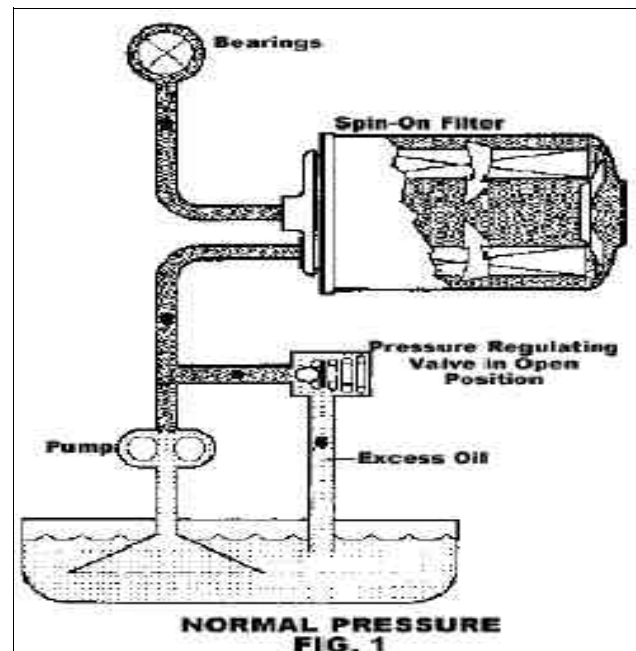
#### Lubrication System

A basic understanding how an engine's lubrication system functions is essential in understanding the reasons how and why an oil filter could fail due to over pressurization

Figure 1 is a simplified diagram of an engine's lubrication system showing the pump, regulating valve, filter and bearings. The oil pump supplies sufficient flow and pressure to lubricate the bearings, moving parts of the engine, and must produce adequate pressure to properly separate the bearings from the wear surface to prevent excessive wear. The purpose of the regulating valve is to provide sufficient internal pressure, which for most passenger cars and light trucks are between 40 PSI and 60 PSI. Under normal operating conditions, motorcycles and other small engines normally produce oil pressures ranging from 7 to 35 psi . (2)(3)

The upper limit of the oil pressure is controlled by a

regulating valve and is usually an integral part of the pump. The regulating valve is made up of a ball or plunger that regulates pressure with the aid of a spring. The spring is calibrated so that the plunger will lift off its seat when the oil pressure reaches the targeted value. Once the valve is open, the pressure remains fairly constant with only small changes occurring as the engine speed varies. The filter and all other components in the lube system are subjected to the pressure established by the regulating valve. If the pressure is excessive, filter damage may occur. (2)(3)



#### Causes of Failure

Excessive pressure can be caused for a number of reasons with the primary being the pressure regulating valve being stuck in the closed position or is sluggish and slow to respond. (2)(3)

Submitted By: RNH

Reviewed By: DY

Approval By: Alan Amatuzio

Date: July 12, 2006

Distribution: \_\_\_ Internal \_\_\_X All

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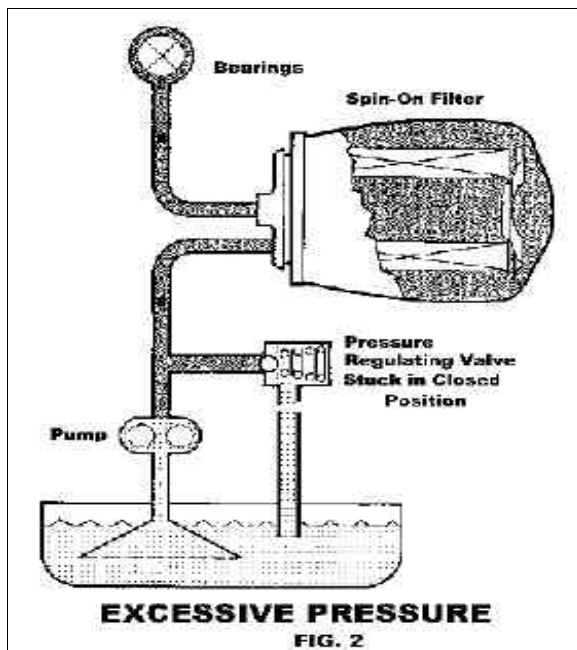
Product Description: AMSOIL, WIX, and Donaldson Oil Filters

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Figure 2 shows the system operating with the regulating valve stuck in the closed position. Under these conditions the pressure builds up equally on all components in the system until the pressure is relieved. If the regulating valve is freed, the pressure will return to normal. Normal operating pressure causes no permanent deformation of the filter body. When the system pressure reaches 150 PSI due to a faulty regulating valve, most filters become permanently deformed. At this pressure the lock seam will remain sound, but the gasket could leak. If the regulating valve still remains stuck, the pressure will increase further and the gasket between the filter and the base could be extruded. As a result, most of the oil in the engine will be lost. If the filter has been tightly screwed on to the engine, the gasket may not fail, but the filter crimp will separate as the pressure continues to rise. (2)(3)

Filter leakage can occur in high performance automobiles and light trucks that are modified to provide greater oil flow and pressure as stock filters are designed to only flow 8 to 11 gallons per minute. In these cases, high volume oil filters, such as Wix racing filters that flow up to 30 gallons per minute, are recommended.

Sport motorcycles such as the Suzuki Hayabusa and Honda CBR 1100 are high revving motorcycles that can also leak when the oiling system is modified to increase pressure and oil flow. High revving motorcycles have a normal operating oil pressure at 3000 rpm of approximately 32 psi. At 10,000 rpm the oil pressure could exceed 70 psi with the OEM recommended viscosity oil. High volume, high pressure oiling system modifications can contribute to leaking oil filter and gaskets, particularly if the operator were to start the motorcycle and not warm up the engine prior to hard use or where higher viscosity oil is used such as 20W-50 where 10W-30 or 10W-40 is recommended by the motorcycle manufacturer.



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### RECOMMENDATION:

AMSOIL, WIX and Donaldson oil filters are warranted for use in their intended application and where the equipment has not been modified from the original manufacturer's design. To determine the proper filter for the application, consult the AMSOIL Filter Catalog (G3000), the online look ups at [www.amsoil.com](http://www.amsoil.com), and the Power Sports Applications Guide (G2135). When in doubt of what filter to recommend consult AMSOIL Technical Service at (715)392-7101.

No warranty expressed or implied is made for use of AMSOIL, WIX, or Donaldson filters where the lubrication system pressure or flow has been increased from original manufacturer's design or where pressure relief valves fail causing system over pressurization.

### REFERENCES:

1. AMSOIL INC., "2006 Filter Applications and Cross Reference", AMSOIL Brochure No. G-3000, p. 634-639.
2. Filter Manufacturers Council, "Over Pressurized Lube Oil Filters," Technical Service Bulletin 83-1R2.
3. WIX Filtration Corporation., "2006 Application Catalog", Catalog 99600, p. 562-563.

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