



Addressing Oil Leaks

Every automobile ever built will develop an oil leak at some point in its lifetime, and Subaru is no exception. Some Subaru models are better than others depending upon age and engine type. Typically, older models like Loyale and pre-Loyale DL, GL and GL-10 are much more leak prone than Legacy, Outback, Forester and Impreza. The reason for this can be attributed to Subaru's commitment to perfecting the horizontally opposed "boxer" engine.

Fixing oil leaks generally is an easy task -- once the leak is found, that is. Almost always, the part that causes the leak is fairly inexpensive. But equally as often the labor involved diagnosing and then getting to the troublesome part is what makes oil leak repair a frustrating and sometimes costly endeavor.

There are a few different ways to diagnose oil leaks, but nothing beats hands-on experience and good product knowledge. The reasons oil leaks develop are many and include heat in the engine compartment, the rotating motion of cams and crankshafts, which wear out seals and sometimes even groove the shafts, and different chemical compounds found in engine oil that can break down gaskets and cause seals to harden, thus losing their ability to keep oil in its place.

Clean Scene

All effective repairs start with accurate diagnosis, and accurate diagnoses starts with an understanding of the system coupled with having a clear look at what might be the cause of the malady. When it comes to oil leak diagnosis, this means starting with a clean engine. When washing down an engine or using solvents to clean suspected areas it is important that the residue from that process is captured and disposed of properly. This is not only good business practice and demonstrates your sensitivity to the environment, it also will keep you within local waste control laws. When in doubt, check with your chemical suppliers. They will be glad to educate you in the dos and don'ts of hazardous waste handling procedures.

Once the suspected area is clean, the next step may be nothing more than the simple matter of shining a lot of light on the area while running the engine and waiting to see what happens. More often than not, however, that won't be enough. UV lights, a.k.a. black lights, used in conjunction with a special chemical dye that is added to the engine's oil can be a godsend when trying to pinpoint the source of a troublesome leak. Typically, the dye is added to the oil and the customer is asked to drive

the car for a bit and then return to have the engine checked with the black light. Once the UV is shone on the engine, the leak becomes quite evident because it literally glows, and also leaves an obvious trail to follow back to the source.



A crankcase dye and a good UV light will help you track down the most mysterious leaks.

The Subaru Boxer Engine

Whatever leak-locating method you choose, there are some tricks that can be used to help narrow your search when working on a Subaru boxer engine. The front of the boxer has a broad three-piece timing cover that can be separated to reveal the timing belt(s) and its array of pulleys and guides. Removing the outer shell of the cover opens up a lot of potential leak areas to easier inspection. What's great about this design is that the outside cover seals the belts and pulleys from the elements so that in a trouble-free engine all those parts should be pretty clean; if things are grimy and/or oily then you are probably looking in the right area for the leakage point.

Items you can inspect with the outside covers off include the crankshaft front main seal, the front camshaft seals, various o-rings and the oil pump mechanism. If you aren't sure where the oil is coming from, put the crankshaft pulley back on, torque it to specification and start up the engine and watch what's going on. Sometimes an engine needs to be run at higher speeds before leaks will become obvious and this process will allow you to get an inside look without very much effort.

Pay attention to which of the covers shows the most evidence of oil. If the center cover is the wettest, it's a sure bet the oil leak is either the crankshaft seal, or perhaps something else in that general area. If the outside covers are the wettest,

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then you are obviously looking at cam seals, cam case seals, or something else in that area like a small crack or leaking expansion plug.

Carefully inspect the crankshaft seal. In fact, when replacing the crankshaft seal make sure you use the new type (brown in color, PN 806733030). This will go a long way in preventing a reoccurrence of the problem down the road.



Whenever you're replacing either a crank or cam seal, be sure you use the new type, which will be brown.

Remember the Justy?

Just when you might've thought that every old Justy on the road was probably about to be retired, gasoline prices started soaring, which makes the miserly three-cylinder a valuable commodity once more.

Subaru vehicles in general have not had many problems with oil leaks and are generally dry underneath. The Justy, which was produced for approximately eight years in the U.S. market, was built with a 1.2 liter 3-cylinder in-line engine (most unusual for Subaru!) and was equipped with either a carburetor or multi-point fuel injection system. Both versions are very reliable and have minimal oil leaks as they age. When they do leak, it is very important to effect a repair as soon as possible since the engine only has an oil capacity of three quarts.

The most common leaks found with this engine are at the valve cover gasket and the o-rings used to seal the bolts that secure the valve cover to the cylinder head. As this vehicle ages, it is also possible to have an oil leak coming from the distributor. Both of these leaks are easily visible and not difficult to diagnose. The valve cover simply leaks down onto the cylinder head itself because the Justy engine leans slightly forward. The distributor is a "tongue-and-groove" type and uses an o-ring behind the housing for sealing. When the distributor leaks an oil trail is easily seen right below it.

However, it is important to also examine the inside of the distributor to see if the internal seal is leaking, which would be in evidence when the distributor cap is removed.

Loyale

The Subaru Loyale was sold in the U.S. for about ten years and had four types of fuel systems: multi point fuel injection, single point fuel injection, turbocharged fuel injection and carburetion. Out of all Subaru models, the Loyale is the most prone to oil leakage. Sometimes, when conducting an oil change a technician can be startled by how wet the bottom of the Loyale engine can be. And one wonders where to start because it can look like oil is leaking from everywhere at once. Yet, more than likely the car runs just like new. As strange as it may seem as long as the oil level is kept full, serious problems (other than the leakage, of course) are rare.

The cam case covers and the sealant that is used on them cause the most common leaks found on this model. Leaks could also develop from the camshaft support seals, o-rings, engine oil pump seals and o-rings, the oil pan gasket and the valve covers. Often, more than one of these areas will be leaking simultaneously. Basically, as the vehicle ages it starts to make more sense to reseal the engine from the short block out than to repair just one or two of the leaks because there is so much labor involved tearing apart just one side of the engine. It is not only easier to do both sides, but more economical for your customer.



When those lifters start tapping, don't make the mistake of replacing the oil pump when a faulty O-ring could be what's letting air into the lubrication circuit.



With rear crankshaft seals, direct inspection is difficult while the engine is in the car, so you've got to use some logical thinking.

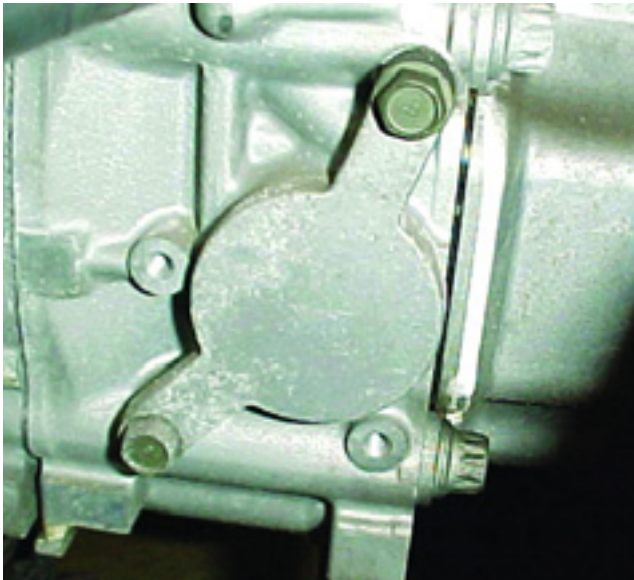
Impreza

The Impreza model line has been around for about thirteen years and has been produced in various engine sizes from a 1.8-liter boxer up to the current WRX and STI turbocharged 2-liter engines. All of these engines are pretty sound and have had minimal problems when it comes to oil leaks. The most common issue that you will encounter is from valve cover gaskets and cam and crankshaft oil seals. Diagnosing a crankshaft oil seal leak is pretty easy since the timing belt cover will have a distinctive drip mark at the very bottom or the center belt cover will be wet with oil near the oil pump.



If a valve cover leak occurs, make sure you replace the little bolt seals too.

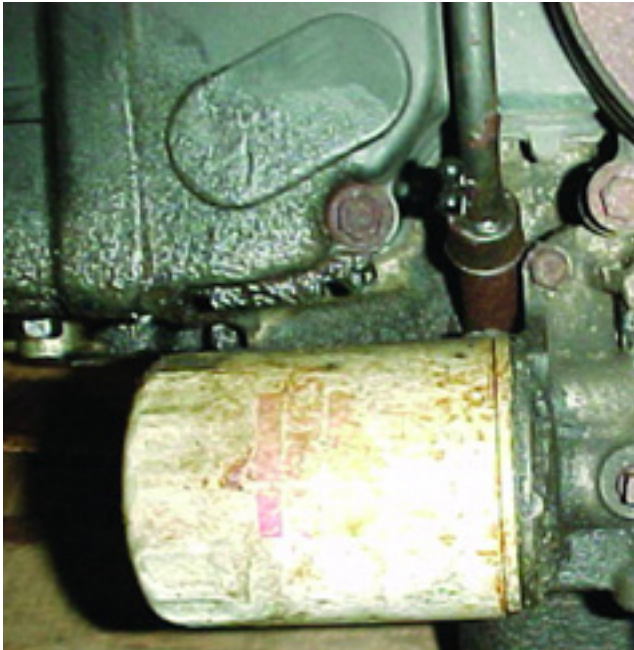
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This cam support holder is sealed with an O-ring that is a potential leak point.

An important thing to remember when replacing camshaft oil seals is to also replace the o-ring on the back of the right side (passenger) cylinder head. This is a support holder for that camshaft and is sealed with an o-ring. It is only on the right side as the left side is of different design. Valve cover gasket leaks are easy to see since the area right underneath the bottom of it will be wet.

On rare occasions there can be a leak from the separator plate located between the engine and transmission. This area was sealed with silicone from the factory and when it leaks a drip of oil coming down the back of the oil pan and out the ventilation opening in the bell housing will be evident.



If while doing an LOE, you see a leak above the oil filter, suspect the oil pump O-ring.

Another potential leak that surfaces as the vehicle gets older is caused by the oil cooler O-ring. This is easily visible when performing an oil change because oil will be noticed above where the filter seats and oil cannot leak “up” in this area. This leak is caused by heat that hardens or “dry rots” the O-ring.

Legacy

The Legacy is very much the same as the Impreza, thus it has many of the same characteristics when it comes to oil leaks. One of the big differences is that Legacy used a 2.5 liter DOHC engine in 1996 and 1997. With the extra camshaft on each side it is harder to diagnose what seal is leaking. But this is when the beauty of the boxer layout comes into play again. It is easy to see these leaks with the front covers removed as discussed above and the camshaft sprockets exposed. The design of this engine lets the ends of the camshafts stick out of the heads and the seal is located right behind the sprocket, so upon examination an oil trail will trickle right below the seal if it is leaking.

Forester

The Forester also is in the same category as both the Legacy and Impreza. It is built on the same platform as the Impreza and shares the same engines. Forester could have a camshaft or crankshaft oil seal leak, or the valve cover gaskets might need replacement over time, but one unique problem that did develop when the engine design changed to a 2.5 liter SOHC is with the spark plug wires. This new design had a long spark plug boot that went through the valve cover.



Various means have been used to seal the spark plug cavities in Subaru engines. We recommend replacing these whenever you're doing valve cover gaskets.

On occasion during spark plug servicing, the wire boot is found to be covered with oil. Unless you are knowledgeable of the product, you can be fooled and not realize that there is a seal inside the valve cover that protects the boot. Valve cover removal is necessary to replace these seals and even if not leaking they should be replaced whenever the valve cover is removed.

SVX

The SVX, which has become a valuable “cult” car, was built with a 3.0 liter boxer six. This was a very good engine with minimal oil leaks, but valve cover gaskets could develop a leak over time. The covers were designed with one large outer gasket and a circular gasket that was intended to cover the openings for the spark plugs. The oil pan was sealed with silicone, and it could leak. There is a wonderful silicone gasket maker, T-3 High Temperature Sealant, which is approved by SOA and made by 3M that works very well on all models that call for a formed-in-place gasket.

When diagnosing any type of oil leak on an SVX, make sure you're not being misled by leaks from the power steering system. Various hoses and metal power steering lines had small o-rings to seal their connections, and they often leaked. Because of the location of these components, what may look like an engine oil leak is often misdiagnosed. Look carefully at the color of the oil.

Many of the models in this article have no problem reaching 200,000 miles or more. But the perfect vehicle is yet to be built, and if driven long enough an oil leak will eventually develop. With a little technical knowledge and a good set of tools combined with some careful thought most leaks are pretty easy to find and fix. ■