

insider info.

WRX Turbo Cool Down Procedure

It is not necessary to perform a “cool down/idling” procedure on Subaru WRX turbo models, as was recommended with past turbo models. “The current 2.0 liter turbo engine has a far greater cooling capacity and, coupled with technology advances, makes this practice no longer necessary. This explains why information about a cool down is not included in the Impreza Owner’s Manual.

The heat contained in the turbocharger begins to vaporize the coolant at the turbocharger after the engine is stopped. This hot vapor then enters the coolant reservoir tank, which is the highest point of the coolant system. At the same time the vapor exits the turbocharger, coolant supplied from the right bank cylinder head flows into the turbo. This action reduces the turbocharger temperature. This process will continue until the vaporizing action in the turbocharger has stopped or cooled down.



WRX 2.0 Liter Turbocharger

Three Bond Sealer

The Subaru H-6 engine timing chain cover is sealed with Three Bond 1280B sealer. Subaru of America has located a source this sealer in the U.S. The sealer should be ordered from your Subaru parts department under part number S0A5499100. One tube can be used for approximately seven engines.

If you are working on an H-6 that requires this sealer, be sure to use Three Bond 1280B and not Three Bond 1215.

Knocking Or Tapping Noise: 2.5 Liter Engine

Before condemning a 2.5 liter engine for having an engine knock or a valve tap, make certain that all the spark plug wires are firmly connected to their corresponding spark plugs. The spark plugs are deeply recessed in the cylinder heads, so the sound that is produced by a loose plug wire can easily be confused with valve tap or piston slap.

Engine Noises

Engines in some 1997 and later Subaru vehicles have been fitted with solid valve lifters. These lifters help increase the power of the engines. Some of these engines use a lifter setup that requires the use of a shim to adjust the clearance. A characteristic of this setup is a slight tapping noise, heard especially at idle. The intensity of the noise may vary with engine temperature. Typically, this noise is not apparent in the passenger compartment. No attempt should be made to repair this noise because it is a characteristic of the system.

Assembling 1997 And Newer Engines

When assembling 1997 and newer engines, please remember that on vehicles with non-hydraulic lifters, special precautions must be taken to ensure that no valves are bent during the assembly process. There is no longer any clearance between a fully opened valve and a piston near top dead center. This means that you must position the crankshaft and the camshafts properly before installing the cylinder heads. After the head is in place, do not turn the crank or move the cams in the wrong directions.

Before installing the heads, the crankshaft should be positioned with the crank sprocket aligned with the mark on the block. The camshafts should be installed on the heads with the cam lobe in their “zero lift” position. On the passenger’s side head, this position will be the same as the belt installation position, so position the cams that way prior to bolting them to the head. On the dri-

ver's side head, however, this position is approximately 80 degrees counterclockwise from the belt installation position for the intake cam and approximately 45 degrees clockwise from the belt installation position for the exhaust cam. So hold the cams appropriately while bolting them to the head. After the cylinder heads are installed, the cams can carefully be aligned with their corresponding marks by rotating the driver's intake cam 80 degrees clockwise and the driver's exhaust cam 45 degrees counterclockwise.

Oil Pumps: Replacement Versus Resealing

When diagnosing a leaking oil pump, don't automatically replace it with a new pump

when a simple reseal will do. The only time a pump should be replaced is if the housing is porous, cracked, or damaged in some other manner.

Valve Shim Measurement

Several Subaru engines use shims to adjust valve clearance. If you don't have a micrometer, acquire one that is calibrated in millimeters. Even though the service interval for adjusting the valves is 100,000 miles, there are 16 of them per four-cylinder engine, so proficiency is a plus.

Leaking Front Crankshaft Oil Seals

If you encounter a 2.5 liter engine with a leaking or dislodged front crankshaft oil seal, consider the oil pump as a possi-

ble cause. It may be necessary to remove the oil pump and examine the rear sealing plate of the oil pump. The screws holding the rear sealing plate may be loose. Some have been reportedly backed out 1/16-inch. This allows oil to exit the pump rotor area and get into the oil pump body where it is pressurized. This pressurized oil pushes on the seal, causing it to leak or pushes it out of its mounting.

Oil Leaks

The engine oil and automatic transmission fluid used in Subaru vehicles are similar in color. When diagnosing an oil leak and it has a reddish color, don't automatically assume it is automatic transmission fluid. It might be engine oil. A quick way to find

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Whether you are looking for information on a 2001 Legacy Ignition Coil, or a 2004 Baja Reduction Drive Gear, the STIS web site has the service manual documentation you need.

But service manuals are only the beginning; we've filled the web site with Service Bulletins, Subaru TechTIPS,

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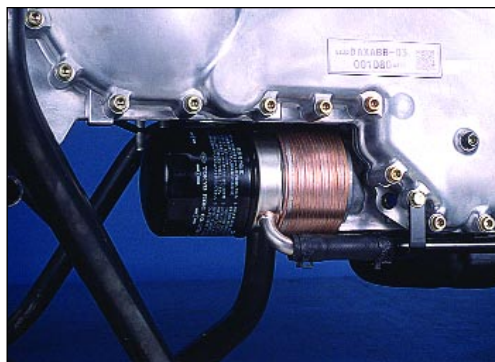
out is to take a sample of the oil and place it on a clean white paper towel. If the sample turns brown on the paper towel, it is engine oil. If it stays red, it is automatic transmission fluid.

Oil Filters: H-4 Versus H-6 Engines

Subaru H-4 engines come from the factory with an OEM P/N 15208AA060 oil filter. The same part number is used for replacement. H-6 engines come with an OEM P/N 15208AA031, and SOA5165109 is used as a replacement.

Both filters have the same physical dimensions as far as threads, O-ring, and bypass valve opening pressure (23 p.s.i.) are concerned. However, the H-4 filter has 141 square inches of filtration surface, while the H-6 filter has 201 square inches of filtration surface.

The H-4 filter should not be used on the H-6 engine. Using the H-4 filter may cause it to become contaminated faster and allow the bypass valve to open, allowing unfiltered oil to circulate through the engine.



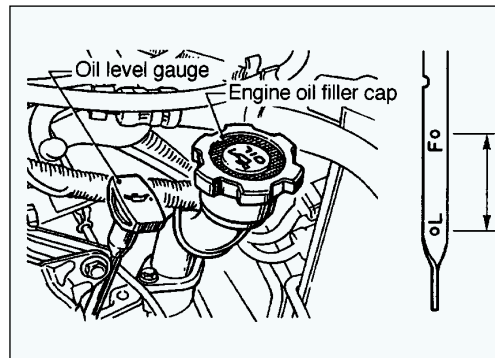
H-6 Engine On Stand w/Oil Filter

Cold Engine Noises

Beginning with the 1997 model, the 2.2 and 2.5 engines were made more fuel efficient, more powerful and have a flatter, more usable torque curve than in previous years.

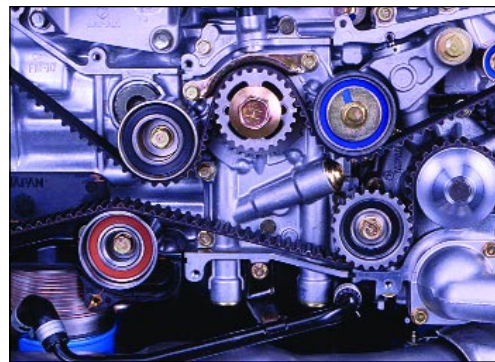
Some of these engines may exhibit some engine noise during the warm-up period after a cold start-up. This noise is a consequence of the engine improvements and is not, in any way, an indication of any engine problem. A light engine knock, after cold start, that gradually dissipates as the engine warms up and is virtually

undetectable (from inside the vehicle) once the engine has reached operating temperature, is a normal characteristic of these engines. Repair attempts to reduce this type noise are generally unsuccessful.



Checking Oil Level and Quality

If you have a vehicle in which an engine noise is other than that as described above, be sure to take the time to check all possible causes prior to condemning the internal components of the engine. Before replacing parts in an attempt to eliminate engine noise, the engine should be inspected externally and internally for another source of noise. A look at the engine oil is a good place to start. New engines will have a small amount of metal particles in them, but after that should be relatively free of metal.



Timing Belt, Idlers and Tensioner

Another area to look at would be the timing belt tensioner and the belt and sprockets. There have been cases where noises under the belt covers and from external components have made noises that sounded like a deep internal knock.