NAPA GASKETS by FEL-PRO

The Seal That Solves It.™

Engine Repair Sealing Products:

Engine$aver® Parts

ENGINE$AVER® HARDWARE	Replacement Products	Repair Products	Installation Aids
Head Bolt Sets	X		
HeadSaver® Spacer Shims		X	
Crankshaft Repair Sleeves		X	
Sleeve 'N' Seal® Repair Sleeves		X	
Oil Pan SnapUps®			X
Valve Cover Load Spreaders®		X	
Cylinder Head Dowel Pins	X		
Exhaust Flange Bolt & Spring Kits	X		

NAPA Gaskets by Fel-Pro® are proven to make technicians' lives easier. But gaskets are just a part of the total engine repair and leak repair environment. Other products come into play as well, such as those in the Engine$aver line. This product line includes anything that has to do with engine assembly and disassembly. Engine$aver products are designed to help technicians perform specific tasks more quickly and easily. These specialty engine repair and leak repair components fall into three categories:

Replacement Products – Many engine parts must be replaced for complete, quality engine work. The replacement of such parts like dowel pins and cylinder head bolts can make the difference between customer satisfaction and an expensive comeback.

Repair Products – At times it's more efficient to repair a part, rather than replace a part. This is especially true of expensive engine parts like crankshafts and cylinder heads.

Installation Aids – These parts and tools speed the job of replacing gaskets.

Head Bolt Sets

Why they are needed:
Used bolts may not provide correct clamping force

Most manufacturers recommend that new head bolts be installed whenever the cylinder head is removed, because the old bolts stretch as a result of torque-to-angle tightening. New head bolts offer the most consistent clamping force possible between the head and block. Reusing old bolts isn't a good idea – they may not provide enough clamping force and they can break while being torqued. To help eliminate comeback repairs, OEM specs should be followed, and the bolts replaced.

NAPA AUTO PARTS Stores carry a complete line of head bolt sets, including Torque-To-Yield head bolts where required by the engine manufacturer. Fel-Pro head bolts, when installed new, assure the most consistent clamping force possible between the head and the block.

Head Gasket Spacer Shims

Why they may be needed: Machining of cylinder heads

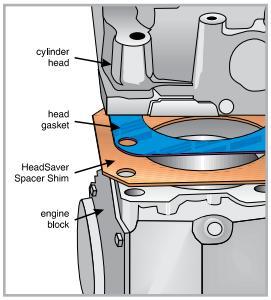
It is often necessary to machine a cylinder head in order to provide a surface smooth enough for sealing, or to bring an out-of-flat head back into specifications. The amount of metal removed depends on the condition of the head. If warpage is severe, or if the head has been surface-ground several times, enough material may have been removed to cause problems. Removing too much metal from the head can:

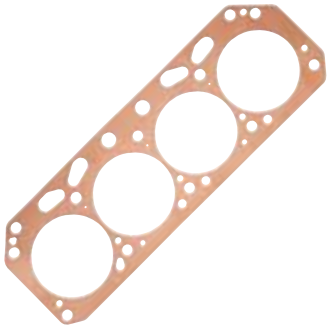
- Raise the compression ratio enough to cause serious detonation problems, which result in engine damage
- Retard overhead camshaft timing enough to affect engine performance
- Cause mechanical interference between valve heads and piston tops

HeadSaver® Spacer Shims solve the problem

Buying and installing new cylinder heads is one solution to this problem – and an expensive one. Another is to use a Fel-Pro® HeadSaver® spacer shim at a fraction of the cost of a new head. Installed between the block and a NAPA head gasket, these .020" thick, dead-soft copper shims serve as a replacement for the machined-away material. This restores proper compression ratios, restores valvetrain geometry in overhead cam engines, and can eliminate potential mechanical interference between engine components.

NOTE: A HeadSaver spacer shim is **NEVER** used by itself – only with a NAPA head gasket!





Whenever Spacer Shims are available, they will be listed along with the standard head gasket number in the NAPA catalog entry.

Repair Sleeves – Crankshaft

Why they may be needed: Crankshaft grooves at the rear main bearing seal area

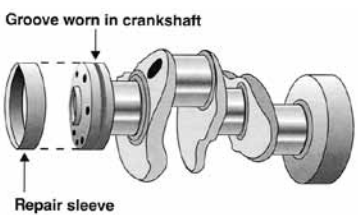
Although rear main bearing seals are softer than the steel parts they contact, dirt and other abrasive debris can collect under the seal lip area and cause a groove to wear into the crankshaft. The result is a leaky rear main seal. This is especially important on vehicles with a manual transmission.
Simply installing a new seal may not correct the leak. The technician's choices include:

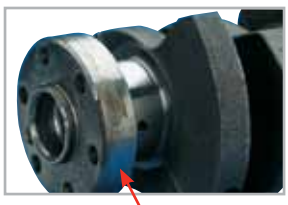
- Paying hundreds of dollars for a new crankshaft
- Welding and remachining the crankshaft sealing surface area
- Attempting to move the seal to a different position on the shaft

These alternatives are either too expensive, too time-consuming, or too risky to make them attractive.

Crankshaft Repair Sleeves are the answer

By installing a Crankshaft Repair Sleeve, technicians can keep the repair cost low, get the vehicle running again quickly, and still provide an effective seal. It's an approach that's sure to be popular with price-conscious installers. A complete line of correctly-sized installation tools is also available to make crankshaft repair sleeves easier to press into place quickly and accurately. The correct tool is listed with the repair sleeve for each application in the NAPA catalog entry. When a crankshaft repair sleeve is available, it will be listed along with the proper installation tool. The contents label on the repair sleeve box also lists the correct installation tool to use.





Worn Groove

FEDERAL MOGUL

Repair Sleeves – Harmonic Balancer

Why they may be needed: Harmonic balancer grooves at the timing cover seal area

The front crankshaft oil seal is usually located in the timing cover, and seals against the shaft of the harmonic balancer (also called the vibration damper). The abrasive action of dust and dirt that gets under the oil seal can wear a groove in the shaft (or hub). Unless the groove is corrected or repaired when the seal is replaced, leakage may occur.

To correct this problem, the technician's choices include:

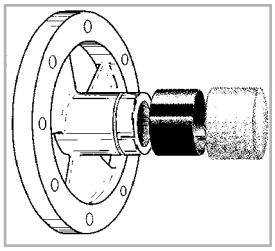
- Replacing the harmonic balancer
- Welding and remachining the shaft sealing surface area
- Taking a chance on repositioning the oil seal at a different location on the shaft

None of these options are desirable. Replacement of the balancer is costly. Welding and remachining the shaft is time-consuming and costly. Repositioning the oil seal runs the risk of a continuing leak and a costly comeback repair.

Fel-Pro® Sleeve 'N' Seal®

NAPA Gaskets offers Sleeve 'N' Seal – a thin, precision-made, durable repair sleeve that easily press-fits over the grooved shaft to provide a smooth surface for the seal lip to contact. Then a standard oil seal can be installed for a secure, leak-free seal. A complete line of correctly-sized installation tools is also available to make harmonic balancer repair sleeves press into place quickly and accurately. The recommended Sleeve 'N' Seal and the appropriate tool to use are listed in the NAPA catalog.

Worn Groove



Sleeve 'N' Seal is sold separately and also with a Timing Cover Set (TCS)

Oil Pan SnapUps®

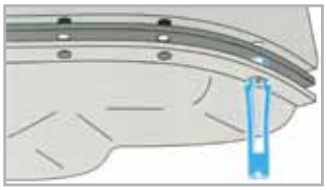
Why they may be needed: Correctly positioning the oil pan and its gasket is difficult when an engine is still in the vehicle

It is often a time-consuming and frustrating exercise to install an oil pan while holding the gaskets in place at the same time. If the oil pan and gasket are not properly aligned during installation, oil leakage is likely after the job is done.

Fel-Pro engineers have come up with an oil pan installation aid unequalled in the marketplace today. The NAPA Gaskets by Fel-Pro® line includes Oil Pan SnapUps,designed to hold up the pan and gaskets, and allow for quick, convenient bolt installation.

SnapUps oil pan installation aids are sold in engine sets for the most popular 5/16" (P/N **ES 72863**), 6mm (P/N **ES 72864**), and 8mm (P/N **ES 72865**) bolt applications and are reusable.

SnapUps are included with premium PermaDryPlus® oil pan gasket sets.



Valve Cover Load Spreaders®

Why they may be needed: Distorted valve cover flanges

On certain General Motors V6 and V8 engines, valve cover flanges tend to distort at the bolt holes. This presents a serious problem when trying to install a new valve cover gasket. Tightening the bolts often fails to achieve a secure seal because distortion of the flange results in low or uneven clamping force.

This problem was aggravated on certain vehicles where RTV sealant was used in place of gaskets and valve covers were made of thinner gauge steel.

Valve Cover Load Spreaders® (con't.)

RTV sealant is not a recommended solution for aftermarket sealing on these applications. Instead, technicians should use pre-cut gaskets. But because the thin valve covers are particularly subject to distortion, clamping force isn't always even and leaks may result. An alternative to purchasing and installing a new valve cover is using Load Spreaders.

Load Spreaders distribute the clamping force more evenly on the valve cover flange. This results in a better seal between the valve cover and the cylinder head – for just a fraction of the cost of a new valve cover. Load Spreaders install quickly and easily. Each Load Spreader set includes the pieces to service **ONE** valve cover only.

Cylinder Head Dowel Pins

Why they are needed:
Cylinder head dowel pins or pilot sleeves often become damaged during engine service or machining

Installing the head gasket on the damaged dowels, or without the pilots in place, can risk improper alignment of the gasket and cylinder head-to-engine block assembly. This can result in gasket leakage or mechanical engine damage. NAPA offers cylinder head alignment dowel pins and pilot sleeves assures proper gasket and casting alignment for an accurate seal and trouble-free engine operation.

Exhaust Flange Bolt & Spring Kits

Why they are needed:
Weakened exhaust springs can lead to leaks

Thermal expansion and contraction of the exhaust system can fatigue exhaust flange bolt springs and cause exhaust leaks. The bolts can become corroded and the bolt threads can become poorly defined, losing strength and clamping force. If worn bolts and springs are reused, they can cause possible failure during assembly.

NAPA Exhaust Flange Bolt & Spring Kits ensure a tight exhaust flange seal at the pipe joint. These kits are complete assemblies for one joint, including two bolts or studs, two springs, and two nuts (where required). These are all the pieces needed to complete the job and guarantee a leak-proof seal.