



# Shear Frustration

Seizing a unique opportunity to work around broken timing chain guide bolts

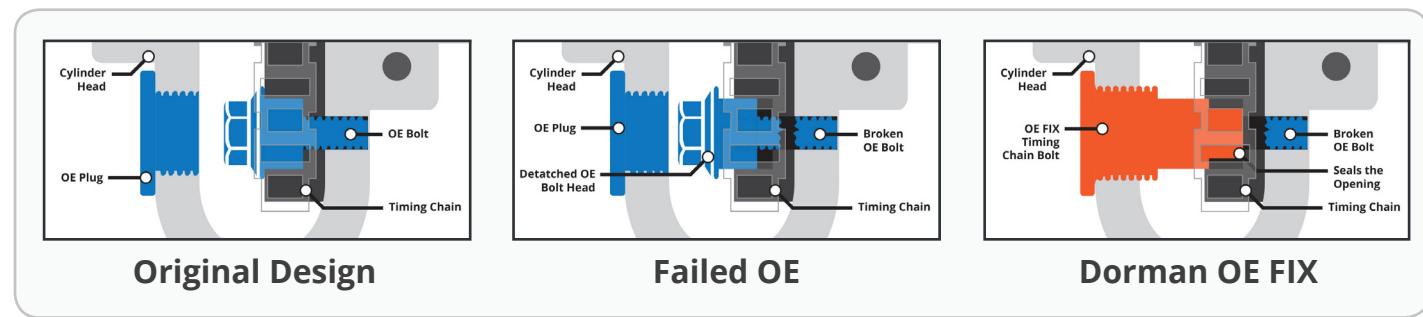
Extracting what's left of a sheared-off bolt from inside a cylinder head is almost never an easy task. In fact, it often requires removing the head from the engine and tapping out the old bolt to finish most jobs. And when that sheared bolt happens to secure a critical piece of engine hardware, there's simply no ignoring it.

The timing chain guide bolt on General Motors' popular Ecotec four-cylinder engines is one such piece of critical hardware, and one that routinely fatigues and breaks off during normal use. The unmistakable rattle of a



**917-954**

General Motors 2017-00, Saab 2010-03



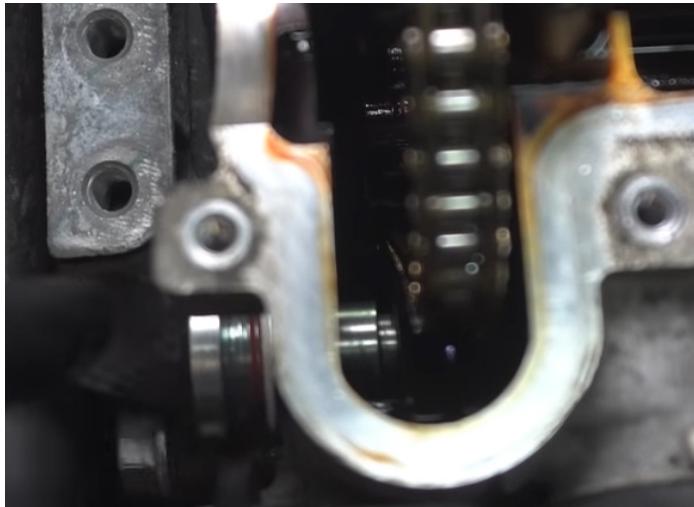
loose timing chain confirms the guide has inevitably broken free in the head and requires immediate attention.

While this kind of damage might spell catastrophe on some engines, GM may have unintentionally left room for a clever last-chance repair. That failure-prone bolt securing the timing chain guide to the inner section of the cylinder head is installed through an opening in the outer wall of the cylinder head. This access opening is normally sealed with a threaded plug to keep moisture



## AFTERMARKET CASE STUDY

and other contaminants out of the engine, but because it is concentrically aligned with the bolt hole, it also provides a secondary mounting point for a new guide bolt.



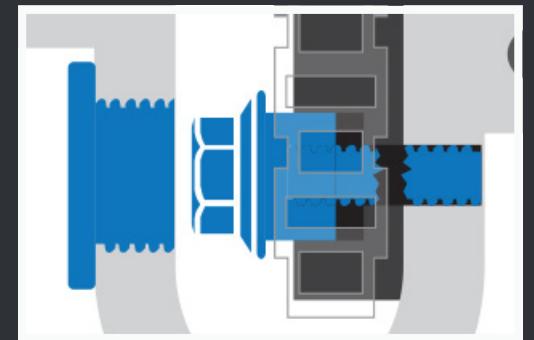
"When we realized these two threaded holes were aligned with each other, we figured there was an opportunity to create a time-saving solution for shops and DIYers who can't afford to remove the head and extract a broken bolt," says Gabe Kovacs, Innovation Product Manager at Dorman Products.

Our redesigned timing chain guide bolt is essentially two parts in one, functioning as both mounting bolt and debris plug. It mounts through the existing outer access hole in the cylinder head where the plug would normally be and features a reinforced stud that reaches where the original bolt sheared off, securing the timing chain guide to the head.

This solution saves hours of labor and hundreds of dollars in replacement parts that would otherwise be required to remove the cylinder head to remove the old bolt.

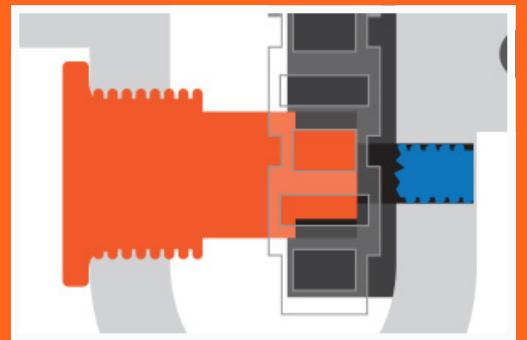
"Since the original components are accessibly mounted at the upper front part of the engine, swapping out the broken bolt for the replacement typically takes just a few minutes," says Kovacs. "Simply remove the original plug, use a magnetic tool to remove the loose broken bolt, then install the new bolt and torque it to specs. It's that easy." 

## ENGINE TIMING CHAIN GUIDE BOLT



### OE Problem:

The OE design requires labor-intensive drilling and tapping to remove the original bolt.



Reduces labor time by eliminating the need to remove the cylinder head during installation, saving time and money.

***This solution saves hours of labor and hundreds of dollars in replacement parts.***