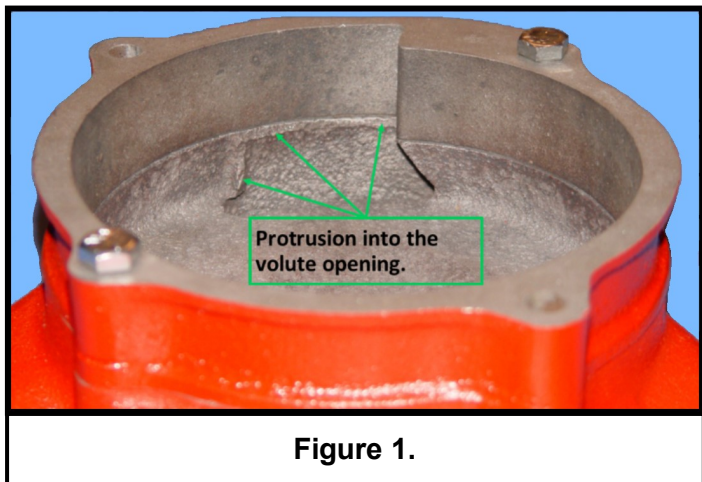


POTENTIAL OBSTRUCTION TO COOLANT FLOW IN Y-BLOCK TIMING CHAIN COVER

This article discusses a potential casting protrusion that may slow coolant flow in your Y-Block engine. It appears the volute opening was cast closed with a thin perimeter and then broken out of the timing chain cover later in the manufacturing process. The intent was for the volute opening to break flush with the inner surface of the timing chain cover to provide smooth coolant flow. Unfortunately, some of the breaks were not as clean as intended and resulted in part of the casting protruding into the volute opening, as shown by the green pointers in Figure 1.

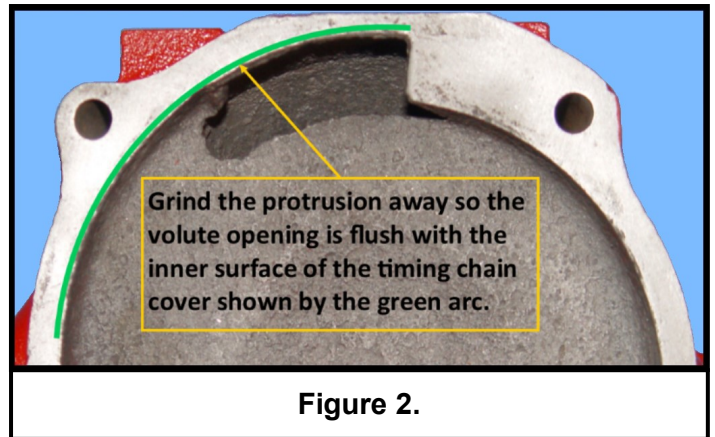


I initially observed this when I was sandblasting a timing chain cover in preparation to serve as a mounting point to show the difference between the original and the A-432 water pump spacers.

While this protrusion is visible when photographed with good lighting and from this angle, it is not as apparent when the timing chain cover is attached to the engine in the engine bay. In fact, during the removal and installation of several prototype water pump spacers, I never noted the status of our volute opening.

So, after becoming aware of the potential problem, I removed our water pump and spacer and discovered a protrusion approximately the size of the one pictured in Figure 1.

The good news is that the protrusion can be carefully ground away to make the opening flush with the inner surface of the timing chain cover in the area shown by the green reference line in figure 2. After the grinding is complete, you must thoroughly flush the water jacket to remove all grinding debris.



An excellent tool to grind the protrusion away is a 1/2 inch SC-5 Tungsten Carbide Burr Rotary File Cylindrical Shape with Radius End Double Cut with 1/4" Shank as shown in Figure 3.

I purchased the one pictured on Amazon for \$11.00.

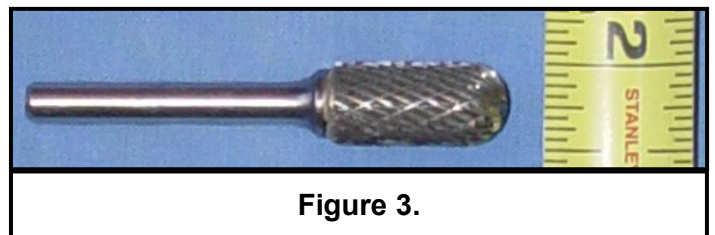
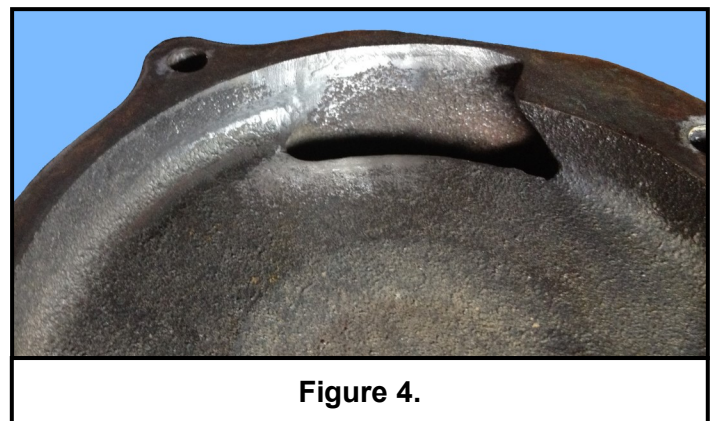
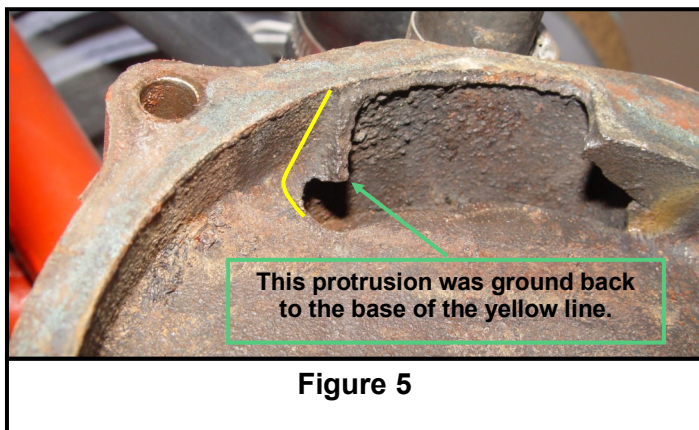


Figure 4 shows our volute opening after I ground off the protrusion and smoothed the edges of the volute opening.



The *Arizona Classic Thunderbird Club* does a Tech Day each year, and at the 2018 session, I showed the redesigned water pump spacer and the example of a protrusion on the timing chain cover shown in Figure 1. After the presentation, one of the first Club Members to install the A-432 said that because this problem was not known when he had his spacer installed, he did not have the timing chain cover checked and was concerned about the possibility of a protrusion. I offered to help him pull the water pump and spacer to check. A couple of days later, he brought his Thunderbird over, and we removed the water pump and spacer and discovered the worst protrusion I have seen to date! And the chunk of casting in the volute opening shown in Figure 5 had gone unnoticed for over 62 years!



Because of the location of the volute opening, you are not likely to notice the casting protrusion unless you were specifically looking for it.

Because this issue has only recently come to light, most Thunderbird owners have no idea if their volute opening is the result of a clean break or not. If you don't know the condition of yours, I suggest you make a note to check it the next time your water pump is removed. And if you are having your timing chain cover removed from the engine, do not miss the opportunity to check for and remove any protrusion.

One final point on this issue is that while the effect is more significant on Thunderbirds because of the spacer, it applies to all Y-Blocks.

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