

Tooling to cut Front Crankshaft Main Seal on XPAG Engine
 Seal size 36x48x10 Viton

<p>Top of cutter. I shortened the length of the front to 6mm from original design because it was hitting the crank timing gear journal lip before the cut was deep enough. Note the 3 cutters. I think we used 5mm diameter cutters and hand ground.</p>	
<p>Bottom of Cutter. 3 tapped holes are for set screws that hold cutters in place. They were placed too close to the inside hole, and as the hole was tapped it pushed metal into the hole. Subsequently had to use dremel tool to clean it up to allow smooth rotation on crankshaft.</p>	
<p>Side view of cutter. Hole in side is 1/4" for a turning handle.</p>	
<p>Alignment or indexing tool. Used to center and align sump and timing gear cover to the crankshaft upon assembly. Inside diameter is a snug but moveable fit on the crankshaft. Outside diameter is the size of the housing opening or seal size. This tool stays with the car for a long time, along with a note about how to use it and the correct sea.</p>	
<p>Cut housing. This is cut to the back of the original rope seal slot. Darker area is filled in JB Weld from a previous mechanics bad work. Picture taken while off car – we are assembling the engine now – so the alignment for the photo isn't perfect. Front of sump around housing still needs to be cleaned up.</p>	

Tooling to cut Front Crankshaft Main Seal on XPAG Engine
Seal size 36x48x10 Viton

Measurements of tools:

Diameter of cutter body	47.3 mm
Diameter of front of cutter body	32.0 mm
Length of cutter body	36.0 mm
Length of cutter body front lip	6.0 mm
Alignment tool length	50.0 mm
Alignment tool diameter	48.0 mm
Alignment tool inside hole diameter	25.0 mm

Suggested changes:

1. Lengthen the cutter body to about 60mm.
2. Determine exact length the front lip of the cutter body needs to be to hit the crankshaft timing gear flange and still cut to the back edge of existing seal slot. Make the lip a bit shorter than this to allow for engine variation.
3. Drill and tap 1/4" holes in sides of cutters to screw two handles for turning.
Benefits:
 - a. This leaves the center of the cutter open so a bolt/washer can be placed through the cutter into the crankshaft to provide pressure for the cutters. If this is done, the cutters should be set to cut clockwise so the bolt isn't unscrewed.
 - b. handles can be shaped to lean away from the front of the engine for more working space.
4. Move set screw tapped holes a small amount away from the center hole. Can't move too far out because you want the set screws to hit on the cutter in an area where they are totally encased in the cutter. Alternatively, a smaller set screw size could be used.
5. Improve the shape of the cutting edge on the cutting tooling. I'm not experienced in this, and the shape of the cutters was more of a straight scraper than was probably best.