Become a Greaser and Never Lose your Bearings Again!

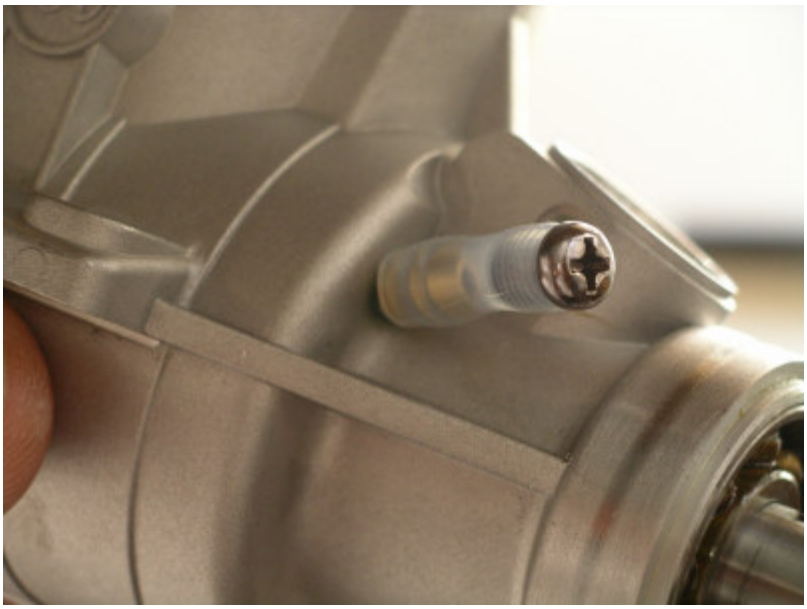
Well, never is a strong word but my editor wanted a catchy title to get your attention. What I can say is we are over 600 flights and counting on a set of $5 cheapo bearings in an OS140RX. This statistic is the most impressive of the engines under test because I didn't become convinced of this mod until this summer and other engines just don't have enough flights to brag about yet. We've modified the Mintor 170, OS160FX and Webra 1.45 and all are running well.

The originator of this idea is Art Wagner, an FAI pilot and serious tinkerer that I fly with often. I have already proven (and described previously in KF) the bearing life benefits of running out at the end of the day on FAI fuel (no nitro). This has worked well for me so Art thought about what the no nitro fuel was doing (washing out the nitric acid and leaving the engine lubricated) and thought that taking it a step further would be an interesting experiment. When our bearings are new, they are packed with grease from the factory and they feel silky smooth. As we use them most of the grease comes out and they begin to feel looser and the rolling balls can be detected. The question was whether this loss of grease was contributing to bearing wear. I did not join this experiment at the outset but after seeing disassembled engines after several hundred flights on this regimen I began to agree that it wasn't hurting anything and it might be helping.

The big idea here is to install a grease fitting in the lower crankcase to keep grease on the rear bearing. We all know how important oil is to lubricate our engine and keep it cool. Grease does the same thing but it is stickier and can seal/protect parts from the nasty exhaust byproducts (nitric acid in the 2-stroke exhaust goes down the intake ports and corrodes your bearings when your engine is sitting in your garage – this is the main reason 2-strokes burn bearings faster than 4-strokes). Grease also cushions parts, reduces rattle and sticks to fragments and foreign objects so they pass through the engine with less damage. Our test engines continue to show pristine piston sides with no scratches, as was common after several hundred flights with other maintenance regimens.

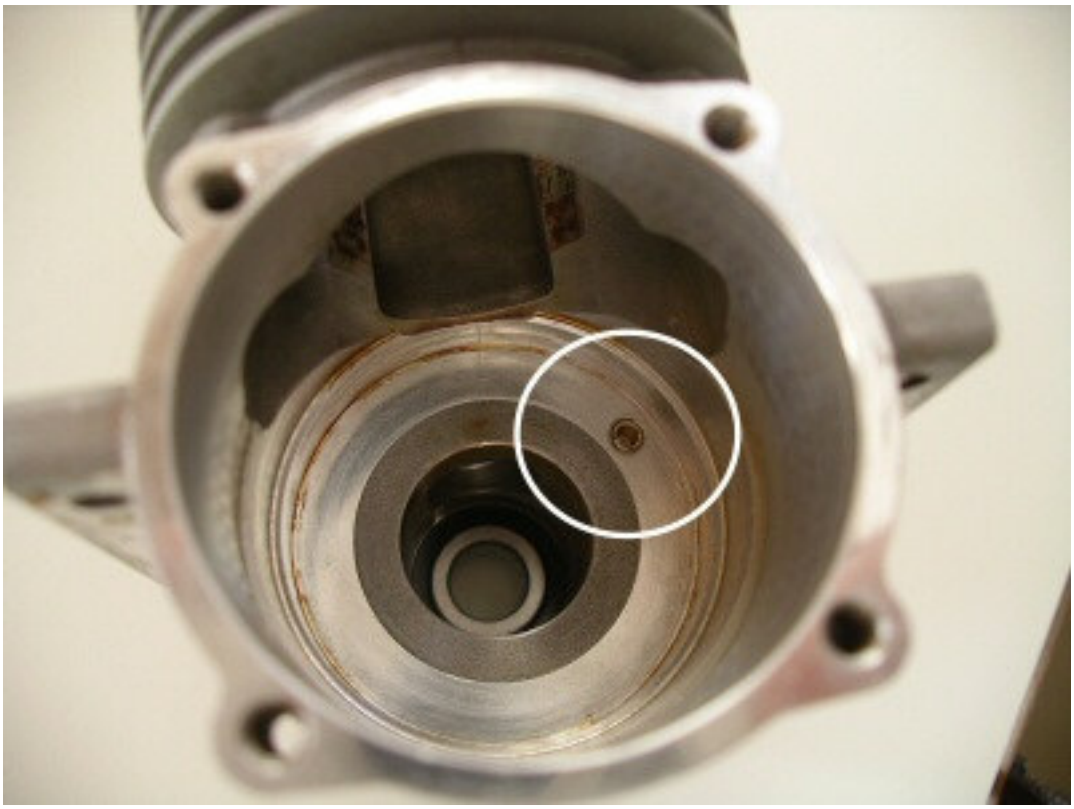
When your bearings are packed with grease at the beginning of the flying day, the first start will require you to let the engine come up to temperature and blow out some of the grease. Any extra that you might have packed in will get blown out after maybe 30 seconds of mid throttle running and after that there will me no noticeable effect. I know there are stainless steel bearings available for most engines these days, and these really help improve bearing life but they don't protect other moving parts. The residual grease that gets to the connecting rod ends and ring can not hurt. I can't yet comment on conrod life but I can say that "greasers" improve an engine's compression, which smoothes idle and eases hand starting.

Consider modifying your engine the next time you have to replace your bearings so you can get a good comparison of the before and after. The way we do it is to install a 10-32 or 4mm pressure tap into the front of the rear bearing at a location that will let you access it without removing the engine from the plane. Here's a photo of the finished product with a cap over the pressure fitting made from fuel tubing that has been plugged.



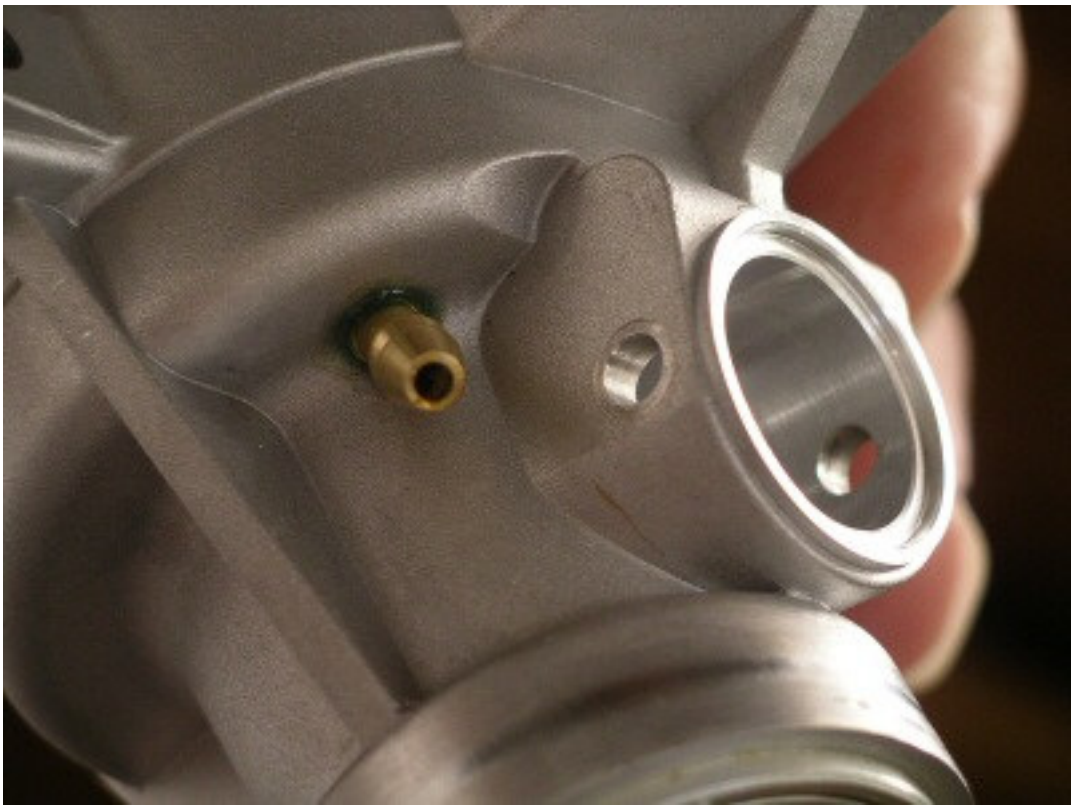
Capped grease fitting

The easiest way to drill and tap the hole for the pressure fitting is to drill from inside the crankcase. You want to drill the hole at a point where the injected grease will go directly onto the bearings. It's also helpful to drill at a slight outward angle so the grease port is easier to access and the plug is easier to put on/off. Since the engine must hold the outer bearing race firm but allow the inner race to rotate on the crankshaft there will be a ridge in your crankcase that lets the inner race rotate freely. Many engines have this ridge directly opposite the bearing balls so this can be used like a drill bit guide when drilling the hole. If this is not there, it's a good idea to use a punch because you don't want your bit wandering all about inside your engine. Once drilled with the proper bit, run a tap through and clean up the shards. Here's a picture of the final result with the pressure fitting installed, so refer to this picture to explain the drilling operation and the fitting installation.



Drilled and tapped mounting hole

The outside of the crankcase is not usually a flat surface. The Webra engines have a flat area, but others are not. Therefore we need to remove the hex flange on the pressure fitting so it will screw in as far as we want it to. Chuck the pressure fitting into your drill press (or firmly mount a hand drill on your bench) and let it rotate. Using a dremel and a cut off wheel, carefully grind away the hex flange so the pressure fitting can be mounted into the hole in the crankcase. Screw in your pressure fitting with ample amounts of JB Weld on the threads as a sealant. A little more JB Weld should be applied around the presure fitting base with a toothpick to really seal it and hold it in place. Under normal running of the engine the crankcase does not get that warm. The vaporized fuel actually keeps it somewhat cool so, if you were concerned, the JB Weld works fine for this.



JB Welded modified pressure fitting installed

This installation will require you to purchase the correct variant of bearings and configure them as follows. Ideally you want to find a bearing with metal shields. These will hold any extra grease you inject without deforming. Remove the shield on one side of the bearing and install the bearing with the open side facing the grease port. If you can only find bearings with rubber seals, that is OK, but you'll want to practice injecting grease before you reassemble everything because over loading the bearing could cause the rubber seal to be pushed out. Some engines have a crankshaft that has a full circle plate that protects the bearing. For these engines you can get away with open (no seals or shields) bearings but there is somewhat less grease retention in this setup so you'll want to get in the habit of greasing every day you fly.

The grease injection procedure is simple. Remove the pressure fitting cap with hemostats and install your makeshift grease gun. You could use a real grease gun, but it might be too bulky to carry around. We use a Monoject 422 syringe filled with grease and a length of fuel tubing. See photo.

Greasing injection procedure

There's very little pressure from inside the engine during operation so it would be possible to run a fuel tubing line from the fitting to a bulkhead fitting on your fuse to make this easier. Even though there's not as much pressure as you might think, you can't run the engine without capping the fitting. Once Art had one fall off during flight and the engine began to run poorly immediately. After that we learned that the fuel tube that makes up the plug needs a little help staying on the fitting, especially if you are sloppy and get grease all over the outside of the fitting. A small ring of fuel tubing, like we use to keep a clevis closed, should be used as a doubler to increase its holding power.

Here's an important lesson we learned that you need to know. Not all grease is created equal. For this to work well we need a light grease that contains no parrafin. This is a common additive but it seems to kill our glow fire and cause the grease to be globby instead of remaining like a thick liquid. I've had luck buying the cheap grease at Lowe's but bad luck buying random grease at AutoZone (they have several grades). After asking some people that know more we have settled on a specific grease that is commonly available at most auto supply stores. It is NAPA Multi-purpose lithium grease 715-1246

Being a greaser will reduce engine wear and expense and improve engine life and operation. Good luck with this.

Out of the box….