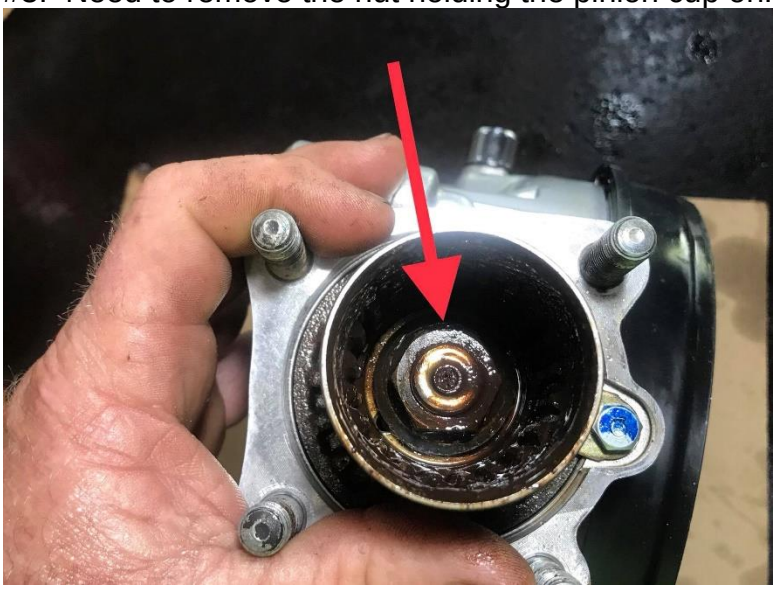
Final Drive Service – Updated 8/17/18

I've done this post before but found some new issues on the last few I've done and wanted to try and explain why I think it's happening.

#1: Since I've already done a final drive post and is in the group files in PDF form I will start with the final drive out. 2 plugs, the lower is the drain plug and the top is the full plug.

#2: I cut the top off an empty gallon jug and drained the old gear oil out.

#3: Need to remove the nut holding the pinion cup on.



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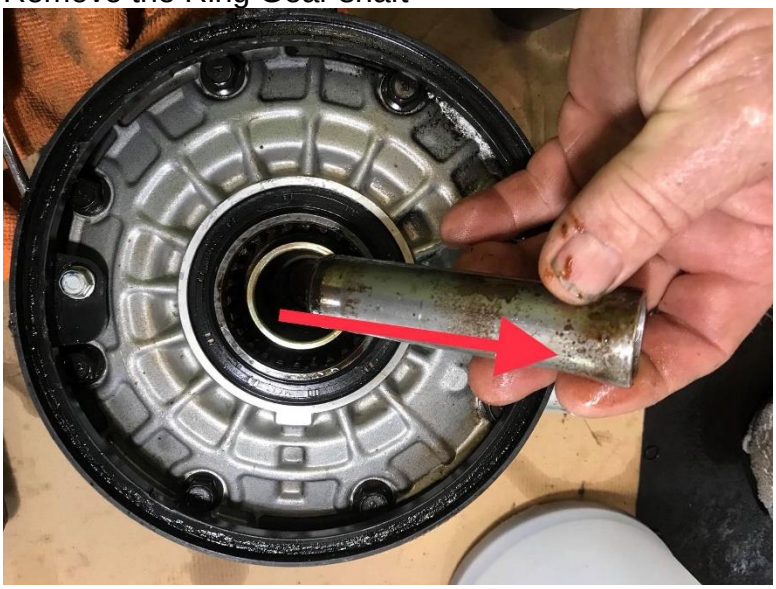
#4: Well I got the pictures out of line, but removing the pinion cup nut using an impact wrench.

Remove the pinion cup.

Check seal for damage or leaking

Remove the Ring Gear shaft



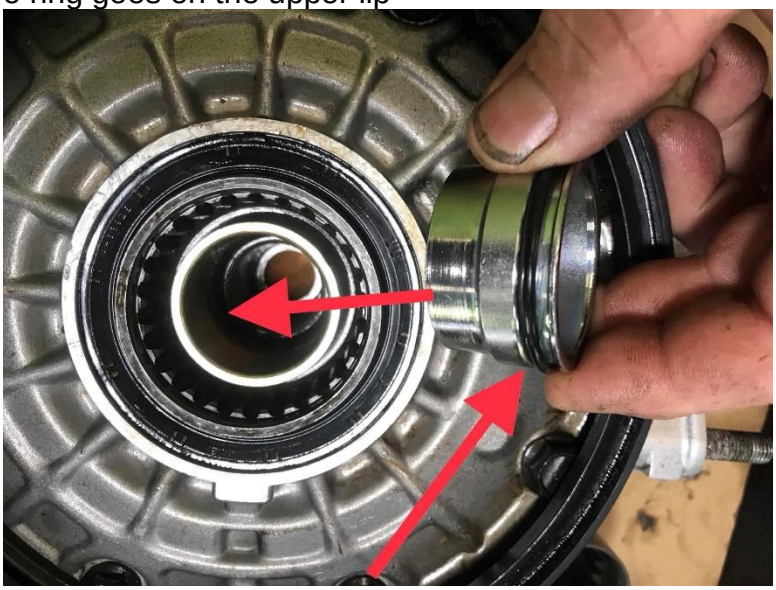
Inside the pinion cup checking for spline wear, this looks really good for 60,000 miles

The pinion cup has 3 small holes in it, this one is on the side and notice the way it's beveled. When the pinion cup spins this part is below the seal down into the housing that holds the gear oil. As the ring gear turns and splashes oil around the inside of the case this hole picks up small amounts of oil forcing it into the pinion cup.

So starting with the arrow on the left, the beveled hole picks up oil and brings it into the pinion cup through the hole marked by the center arrow and then drains back into the case through the hole marked by the arrow on the right side.

So another view it comes in the left hole through the outside beveled hole then drains back into the case exiting out the ride side hole that has the notch on the outside bottom of the cup. Very important to make sure these holes are clean when reassembled and not to clog them with too much grease in the pinion cup

The part I have in my hand is actually called an o ring holder. There is one already in the final drive I just wanted to show what it looks like taken out and the placement of the o ring goes on the upper lip



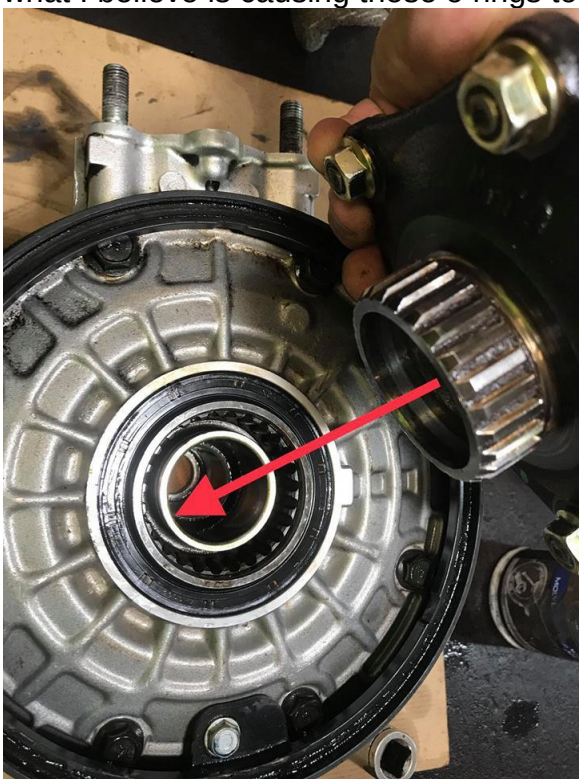
I found this on the last 3 bikes I've taken apart, the o ring has been forced to the bottom of the o ring holder instead of being at the top where it's supposed to be.

You pretty much need a pick of some sort to remove it either way. This O ring is commonly called the elusive 3rd o ring, often missed when serviced.

This is the part # for that o ring and shown where it is supposed to set on the o ring holder piece.

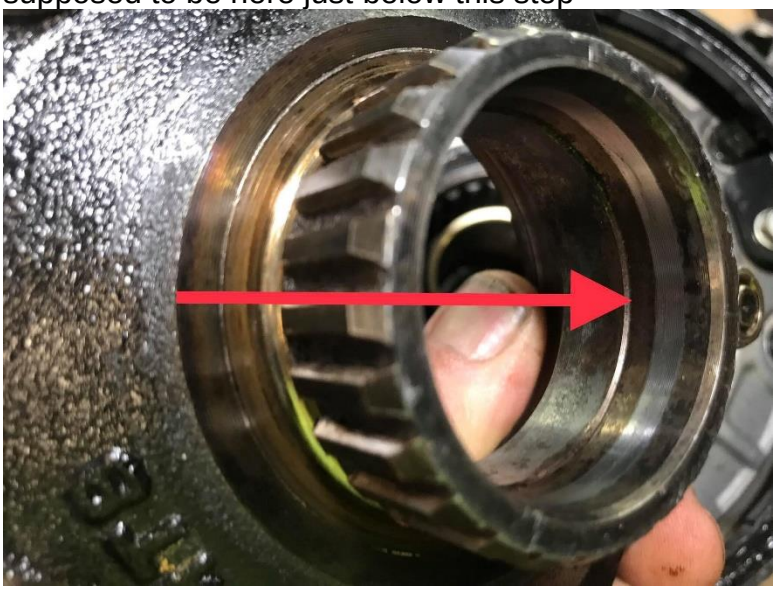
These are the part #’s for the 3 o rings needed along with the thrust washer

When the drive flange is installed over the o ring holder it’s important to get it on straight or it will catch the o ring and push it to the bottom. Not putting this on yet just showing what I believe is causing these o rings to get pushed down?



Another view of the o ring holder out to show how it fits into the drive flange

When the drive flange is put into the final drive over the o ring holder, the o ring is supposed to be here just below this step



You wouldn’t normally be able to see this but because I have a spare o ring holder I can show how the drive flange sets over it and the o ring is up inside

So if the wheel isn’t brought together to the final drive evenly it would catch the o ring and move it out of the spot it’s supposed to be

Another view of the drive flange which goes into the wheel dampers and then gets pushed together like shown minus the wheel. If the wheel was leaning like this and pushed together the o ring would be pushed to the bottom

This o ring goes onto the drive flange splines at the bottom

O ring shown in place

Then coat real good with your choice of Lubricant. The manual calls for Molybdenum disulfide paste. I couldn't find anything on the Moly 60 everyone talks about it calling for? Not saying it's not there but even if it is, it's obsolete now. The manual also calls for motor oil of API code SF and SG which is also obsolete now. The manual is 20 years old, oils and lubricants are leaps and bounds ahead of what they were 20 years ago. So do some research on this, the VRCC web page has days worth of reading on this subject. I will say this though I just rebuilt a final drive and the paperwork from the factory said to use a lubricant containing at least 40% Molybdenum disulfide.
I have been using Bel Ray waterproof Assembly Lube which contains 45% Molybdenum disulfide. Not saying that's what you should use just what I've been using?

Put a good coating down inside the hub also all the way down and then install the o ring in the groove at the top of the o ring holder

On the other side of the drive flange you need to install the plastic thrust washer. This is about a $5 part that if left out will destroy your wheel. I have one here that it got left out on I can show you pictures of. To me it’s worth changing out every time you service the final drive? So coat the inside of the flange with your Molybdenum where the thrust washer sets

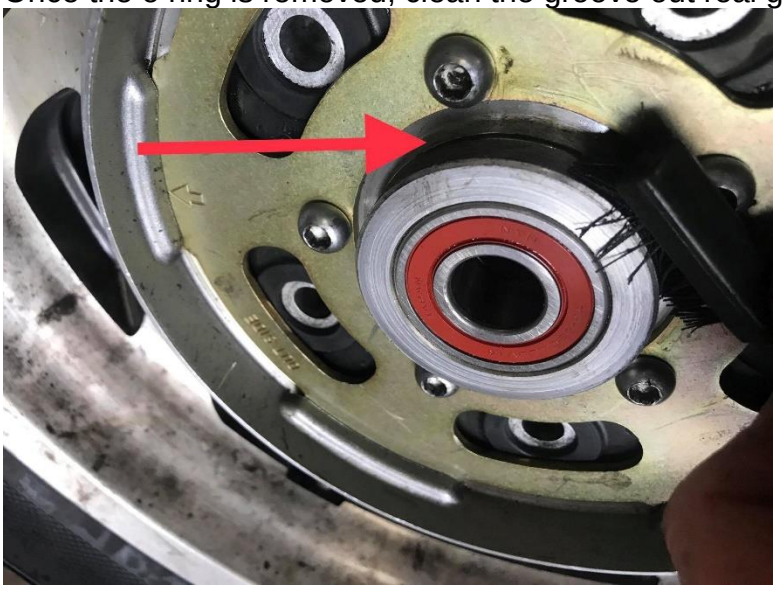
Then set the washer on top of the lube

Then put ya some more on top of it.

On the hub there is another o ring, this is the part #

It sets in a groove and need a pick to get it out

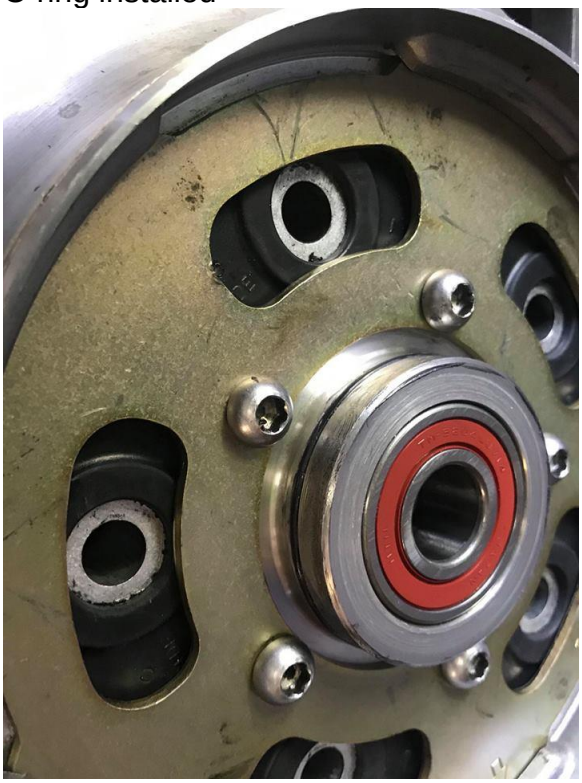
Once the o ring is removed, clean the groove out real good



Any old dried grease will hold the o ring from seating properly and make it stick out too far

Install a new o ring in the groove

O ring installed



Slop some more Moly on there

Put a nice even coat on it. Grease is cheaper than metal

Now drop the ring gear shaft in, small end first. The bell shaped end goes to the outside

Push it all the way down in till it seats

Where the pinion cup goes put a little regular grease on the seal

Then put some 3% Molybdenum disulfide grease on the upper part of the spline. When you put the pinion cup over it will push it on down the splines. If you put grease all the way down it you will end up with a bunch of grease where the holes in the pinion cup set onto. Again use what you want but I have been using Tractor Supply 3% Moly Extreme duty grease

I don’t put any grease inside the splines of the pinion cup already have enough on the shaft.

Install the pinion cup over the shaft splines

Put some serviceable thread lock on the nut threads

Install the nut and tighten it. The manual calls for 80 ft. Lbs of torque. I personally don't have a way to hold it while I torque it so it goes back on with my impact. Haven't had any issues with that

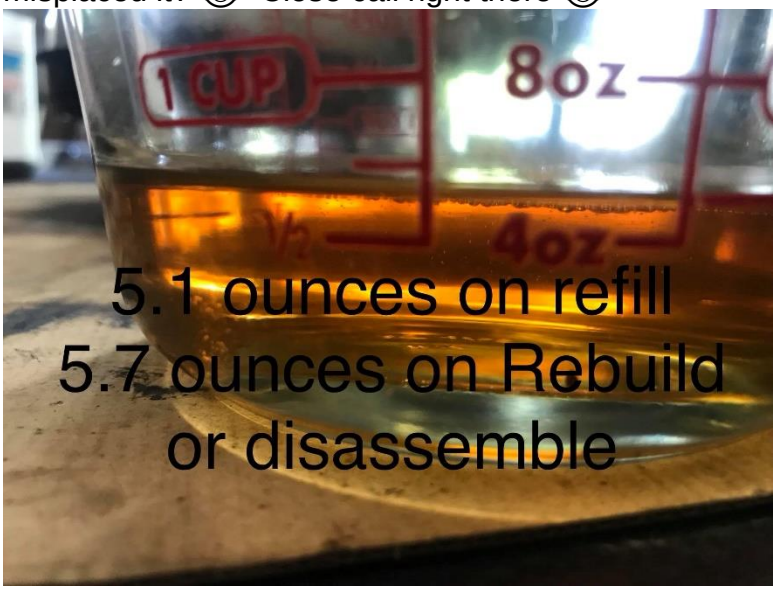
Coat the upper half of the pinion cup splines, again when you install the driveshaft it will push it down to the lower end, too much grease will plug the 2 holes which you don't want

Need to install the drain plug, check the crush washer to make sure it's not damaged or wore out

Screw it in finger tight

Then tighten it, if you want to torque it the torque is 14 ft. Lbs.

If you want to measure the oil this is the manual specs on it. You may get in trouble using your wife's measuring cup if she catches you. Mine is out of town right now but I brought it out the other day when Rebuilding the fork seals. I forgot to take it back in when I got done with it. Before she left she was gonna make me a dump cake for desert while she was away. I came in for lunch and she asked me if I'd seen her big measuring cup? I said what the heck would I be doing with your measuring cup, you musta misplaced it? 😂 Close call right there 😂



So pour the gear oil into the final drive. Manual calls for 80 weight gear oil. I'm using Lucas synthetic 75-90w here.

So if your scared of your wife and want to try and do it without a measuring cup. If you can hold the final drive level in all directions the fluid should come up to just below the opening

Fluid to just an 1/8” below the bottom of this hole

Wipe a little oil on the o ring on the cap

Then install the cap

Snug it down no need to overtighten the o ring will seal it.
If you want to torque it the torque is 9 ft.lbs.

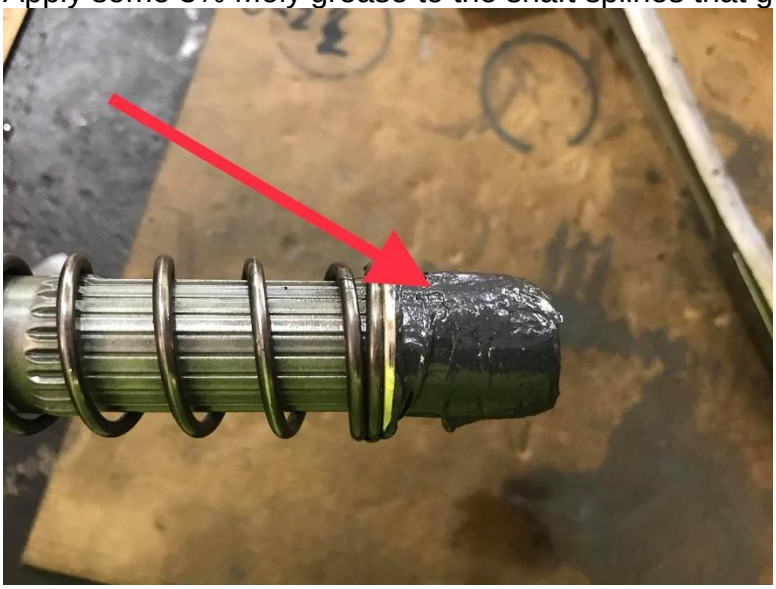
Ready for the driveshaft now

Clean the splines and check for wear, these look great

Clean and check the other end that goes into the pinion cup also. These look great

Check the oil seal for damage or hardness

Apply some 3% Moly grease to the shaft splines that go into the U joint



Make sure the stopper ring is on the end of the shaft going into the pinion cup and lube it with the 3% Moly grease. Don’t put any grease on the end of the shaft that might plug the pinion cup holes

Coat the splines real good on the sides, when it pushes in a lot of the grease will be pushed up against the shaft seal

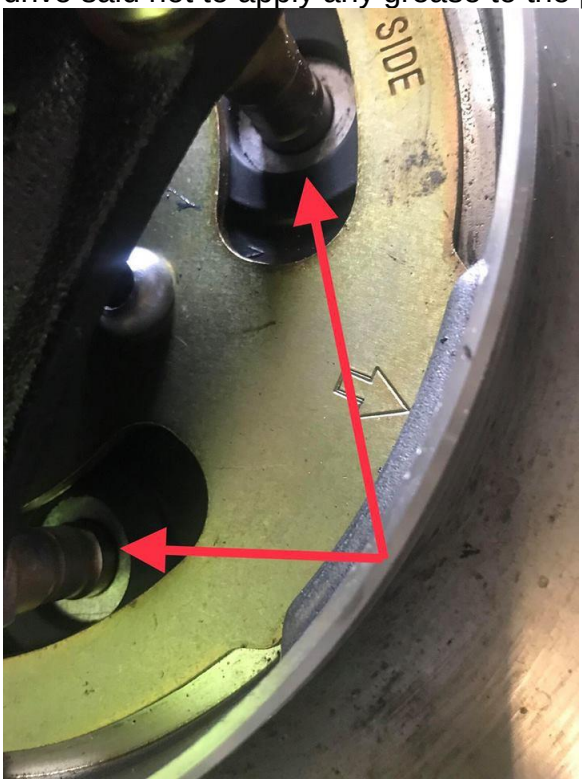
Wipe a little grease on the shaft seal to help it slide in also

Now you can insert the shaft into the pinion cup

Push it all the way in until it locks in place

Next install the drive flange onto the wheel hub

Align the flange pegs with the damper holes. Should have mentioned here to check the play in the dampers also. The new drive flange I ordered when rebuilding the last final drive said not to apply any grease to the pins on a 5 pin flange.

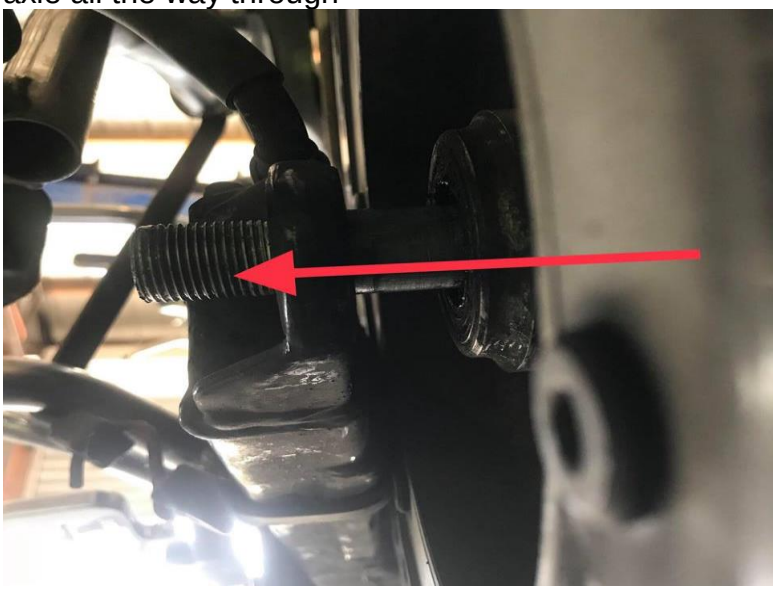


Push the flange all the way down tight onto the hub

So at this point you've shoved the driveshaft into the housing and I joint and started the 4 nuts on the driveshaft housing, don't tighten those yet, that will be last. When installing the wheel, bring the bike down or wheel up however y'all do yours? But align the center so the axle will slide through the final drive. Don't try to pull the wheel together just slide the axle through

Leave the space making sure the wheel is straight and push the axle all the way through the swingarm.

Don’t worry about the spacer on this side right now or the brake caliper just push the axle all the way through



Now the axle shoulder should be hitting the final drive and the threads on the other end through the swingarm hole

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Now you can keep it held over and pull the axle back enough to get the spacer into place

Still have enough room for the brake caliper bracket left

Slide the brake caliper bracket into place and push the axle back through the swingarm hole again

Rotate the caliper bracket up to align the slide bolt

Install the axle nut, torque to 84 ft.lbs.

Then install the slide bolt into the caliper bracket. Actually should be done before tightening the axle nut but got a picture in the wrong spot again.
Be sure to tighten the driveshaft 4 nuts last after torquing the axle also. I didn't show installing the shaft, this was more about getting the final drive on without pushing the o ring out of place.