Performance Engineering & Manufacturing, LLC

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IMPORTANT INSTRUCTIONS FOR THE INSTALLATION OF A QUICK CHANGE RING & PINION SET

WE RECOMMEND THAT YOU READ THIS SET OF INSTRUCTIONS BEFORE BEGINNING THE INSTALLATION OF THE NEW QUICK CHANGE RING & PINION SET. CORRECT INSTALLATION CAN MEAN THE DIFFERENCE BETWEEN EXTENDED GEAR LIFE AND PREMATURE FAILURE.

1. Always verify your gear ratio is correct. Dividing ring gear tooth count by the pinion tooth count can check this. EG. Ring Gear Tooth Count of 7 and Pinion Gear Tooth Count of 34, 34 divided by 7 = 4.86:1. 8/33 = 4.12:1.
2. Remove axles, side bells & tubes. Removing the right (drivers) side bell first will allow you to remove the spool and ring gear.
3. Remove used loaded pinion gear with bearings and remove lower shaft and bearings.
4. Check pinion bore for burrs and remove if necessary with emery cloth.
5. Make sure the center section is clean from chemicals or lube which are flammable materials.
6. If you didn't buy a loaded pinion gear install and load pinion bearings with RH posi nut.
7. Lube tapered roller bearings and posi nut and snug nut for assembly.
8. Apply dry threadlock to retain pinion nose bearing during assembly so it does not fall off.
9. Use an oven to heat your center section to 270-300 degees Farenheight. USE CAUTION, Magnesium can be ignited. Do not use a Cutting Torch to heat your center section, temperatures over 350 degrees can cause a loss of heat treat and damage the casting.
10. Lubricate pinion bores and drop in loaded pinion when the center section is still warm.
11. Use soft hammer to make sure pinion is seated.
12. Install lower shaft with the front ball bearing first then the rear bearing.
13. Slide on the pinion spacer and pinion retainer. Torque pinion retainer bolts to 20-25 ft lbs.
14. All bolts threaded into aluminum or magnesium should use anti-seize.
15. Install front seal plate and torque bolts to 20-25 ft lbs.
16. Let center section return to room temperature befor you adjust pinion bearing preload. Retorque all.
17. Torque tapered roller bearings on pinion to 15-20 inch lbs of rotational preload. When set snap on posi nut retaining cap. Do not force. It has multiple locations.

    Both lash and crush are adjusted by inserting and removing shims behind the carrier bearings. Lash is the amount of play between the ring-and-pinion gear teeth. It can be adjusted by changing the amount of shimmed distance between the left- and right-side carrier bearings. The total amount of shimmed distance sets the crush, while the manner in which the total amount is split between the two bearings sets the lash. The process of getting both of these amounts correct is quite labor intensive and usually requires installing and removing the bearings and shims several times. To help this process use a set of setup bearings that have been ground on the inside diameter to allow them to slide onto the carrier assembly easily without having to be pressed on. You can do the same with a set of old bearings and a hand grinder.

18. Install ring gear on spool or carrier. Clean back of ring gear with emery cloth or stone to make sure there are no burrs. Torque ring gear bolts in a cross pattern to 60 ft lbs and use red threadlock (do not re-use ring gear bolts).
19. Install checking bearings on spool or carrier (checking bearings have been ground out to slide easily on the spool or carrier journals).
20. *If you are re-using spool bearings you may be able to leave bearings installed on your spool.*

21. Remove o-rings and seals from bells.
22. Stand left side tube with bell up. Set in spool with bearings in position.
23. Set center section on bell without o-ring or seal. It must sit flat.
24. Sit right side bell on top of center section. If right side bell has full contact with center section you need to add shims so there is a .007" gap for aluminum spool and .015" for steel spool.
25. You now have the proper shim pack thickness.
26. Make sure the thrust block or wear pad is backed off from the ring gear.
27. Add shims from the shim pak behind the ring gear side of the spool till back lash has been removed. Then install the remainder of the shims behind the right side spool bearing.
28. Bolt on right side bell and check backlash. It should be between .004 and .006. If backlash is too high shims from the right side must be moved to the left side.
29. When required backlash is met, the checking spool bearings can be removed and regular spool bearings can be installed with shims in place.
30. Install new bell seals and O-rings with lubricant.
31. Make sure thrust block is installed before assembly
32. Bolt together the center section with thru bolts and torque to 35 ft lbs.
33. Re-check the backlash, must be .004 to .008. Make sure there are no tight spots. If backlash is not correct you must swap the shims until proper backlash is achieved.
34. Adjust ring gear thrust block or wear plate for .008 to .010 clearance. Tighten the jam nut on the thrust block.
35. You are now ready to install your rear cover and change gears, then put your quick change rear end back in your car.

TORQUE SPECIFICATIONS – set at 68-72 degrees F

THREADED RING GEAR BOLTS 3/8" – 60 ft lbs. and use Red thread lock
PINION BEARINGS WITH RIGHT HAND POSI NUT 15-20 inch lbs. with New Bearings
PINION RETAINER BOLTS 25 ft lbs.
PINION BACKLASH .004 -.008"
FRONT SEAL PLATE BOLTS 20-25 ft lbs.
SIDE BELL TORQUE 7/16" - 35 ft. lbs.

LUBE

Fill the Center Section though the top or through the pinion inspection plug on the right side bell. Remove oil level plug on the front of the right rear bell and fill until lube runs out. The required amount of Premium 85-140 weight lube is approximately 4 quarts. Proper maintenance is a must to protect the working life of your gear set. Periodically inspect the oil level and add oil if necessary, inspect vent for cleanliness and function, and inspect for oil leakage. Do Not Overfill. Maintain level at 2" below axle centerline when the car is level.

RING & PINION BREAK IN PROCEDURE

STREET VEHICLE BREAK IN:

1. Operate the car at normal street driving speed for around 10 miles (25-45 mph).
2. Let the rear end cool 30 minutes.

CIRCLE TRACK BREAK IN:

1. Drive the car at slow speed for 6 laps (1/2 mile oval).
2. Let the rear end cool 30 minutes.
3. Drive the car again at slow speed for 6 laps.
4. Drive the car at full speed 2-3 laps.
5. Let the rear end cool 30 minute