



INSTRUCTION TO SERVICE

ITS: 4974

SECTION:	219 Engine & Transmission
WRITTEN BY:	Shaun Cardinal
SUBJECT:	Combining Gear Box Upgrade

ITS 4974

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PROCEDURE:

1. Turn the main battery disconnect switch to the “OFF” position.
2. Raise coach in accordance with the New Flyer Service Manual.
3. Remove driveshaft guard. Retain hardware for reuse.
4. Apply strap though both ends of driveshaft at yokes to prevent extension.
5. Support driveshaft with stand.
6. Disconnect driveshaft from combination gearbox output flange. Retain bolts for reuse, discard locknuts.

Refer to Figure 1.



FIGURE 1: DRIVESHAFT DISCONNECTION.

7. Remove and discard 3 bolts and retaining endplate from the output flange. **Refer to Figure 2.**
8. Run a tap onto bolt holes to remove old Loctite compound.



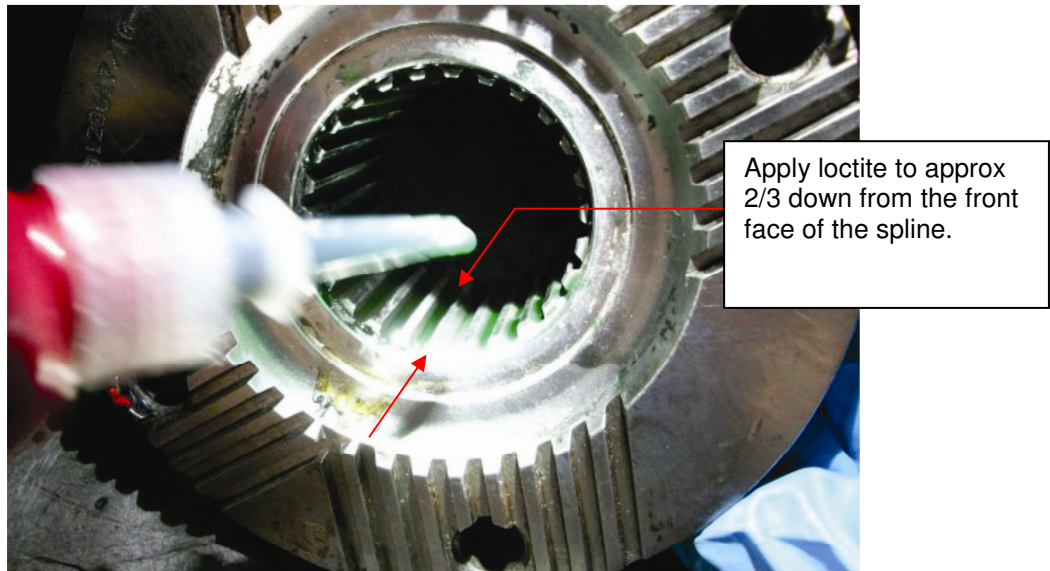
FIGURE 2: GEARBOX OUTPUT FLANGE.

9. Remove and clean output flange with de-greasing solvent (NF PN: 6405975). Refer to Figure 3 and Appendix A (directions to use product).



FIGURE 3: CLEAN OUTPUT FLANGE.

10. Allow to dry and spray on Loctite primer (**NF PN: 6405973**) to splines of the output flange. Allow primer to set-up. Apply Loctite retaining compound (**NF PN: 6406066**) to splines of the output flange. **Refer to Figure 4 and Appendix B (directions to use product).**



Apply Loctite 635 as shown on the inside as shown.

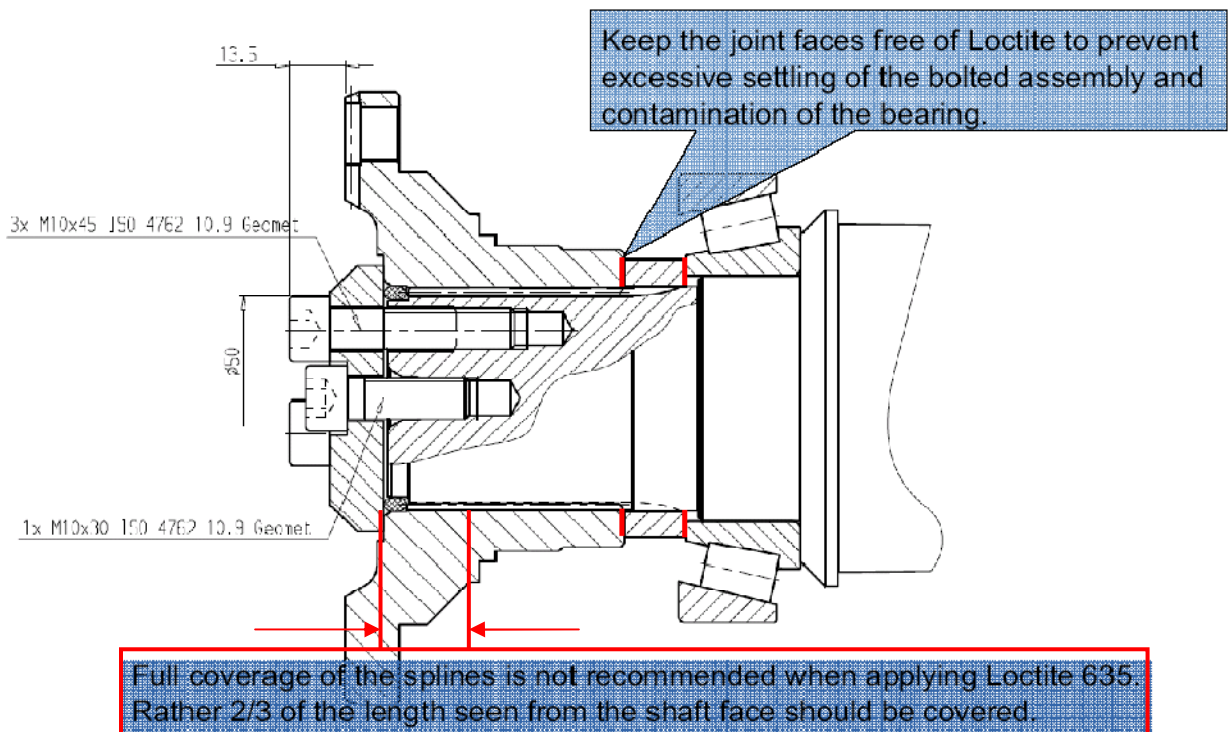


FIGURE 4: APPLY LOCTITE COMPOUND

11. Inspect shaft seal for signs of leakage. If seal shows signs of leakage, replace with **NF PN: 6407548**. Refer to **Figure 4A and Appendix C**.

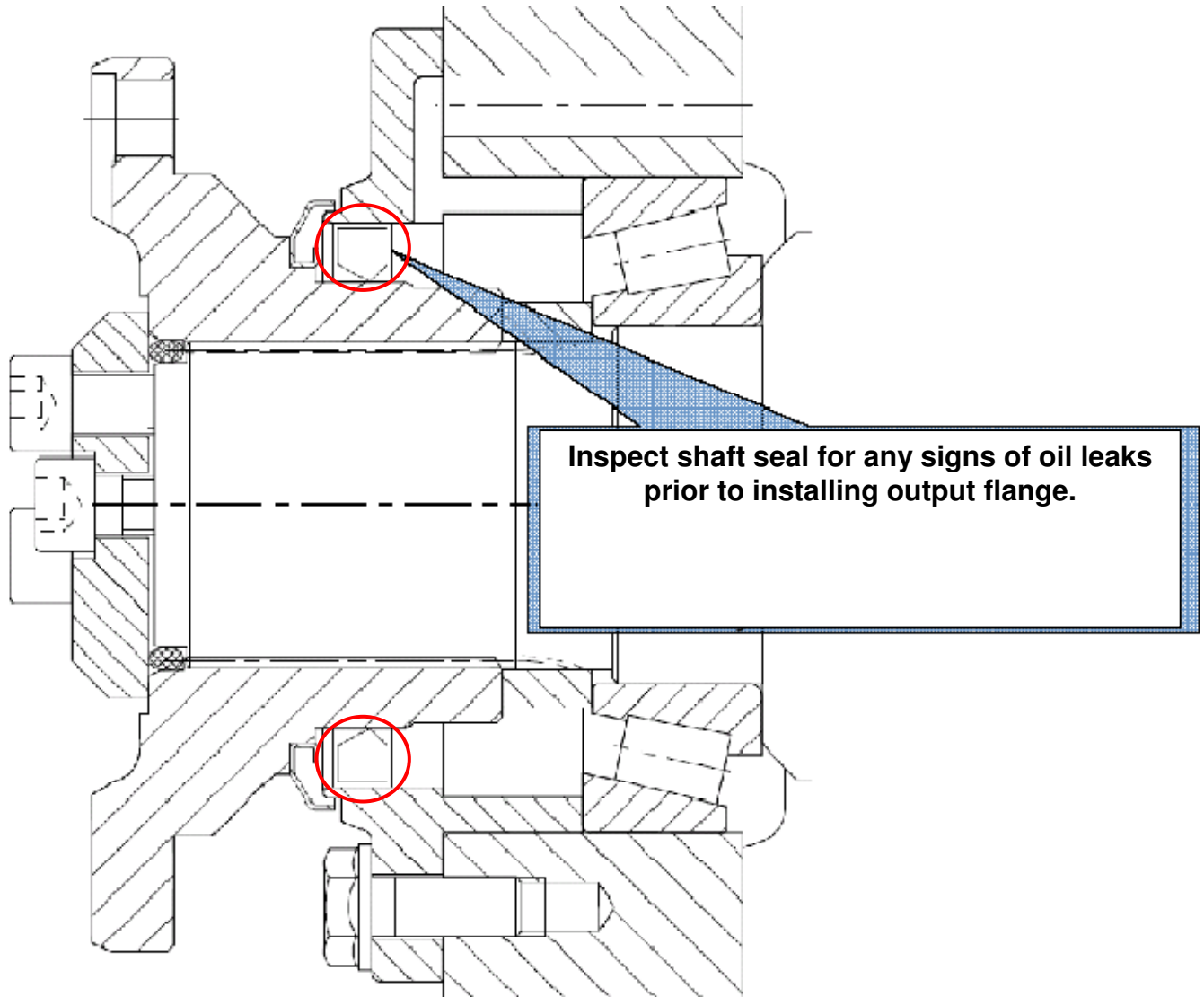
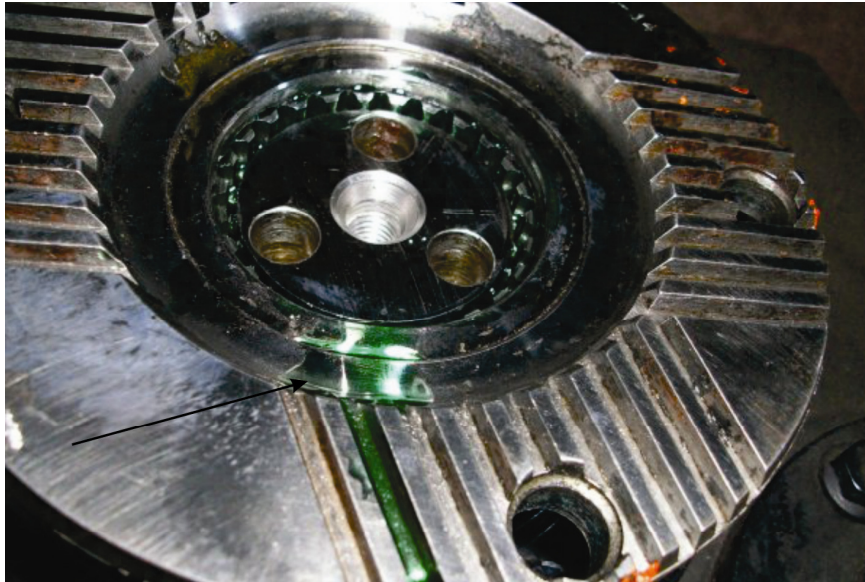


FIGURE 4A: SHAFT SEAL INSPECTION.

12. Install output flange onto output shaft. Wipe away excess Loctite compound. **Refer to Figure 4B.**



Remove any excess Loctite 635 on the outside surface.

FIGURE 4B: REMOVE EXCESS RETAINING LOCTITE 635.

13. Install new O-ring (NF PN: 6403696). **Refer to Figure 5.**

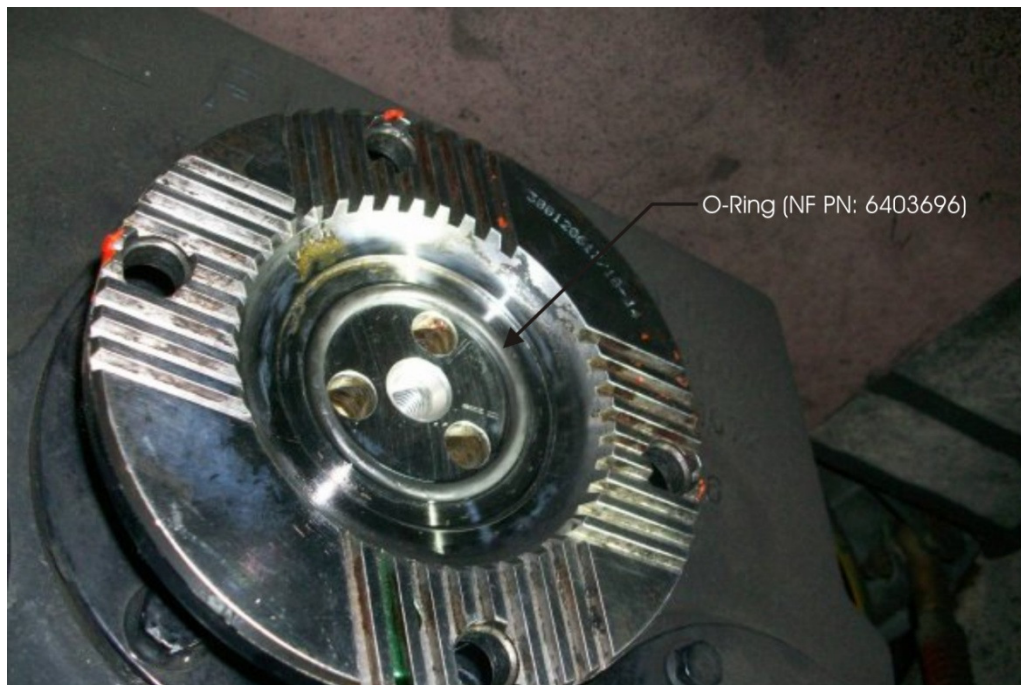


FIGURE 5: INSTALL NEW O-RING

14. Apply Loctite 242 (**NF PN: 8110440**) into the four mounting holes the new hardware is installed in (three M10x45 10.9 bolts, **NF PN: 6405972**, and one M10x30 12.9 bolt **NF PN: 6405973**). Loosely install with 4 bolt pattern endplate (**NF PN: 6404293**). The 30 mm bolt is for the center, the 45 mm bolts are for the 3 outer holes. **Refer to Figure 6.**

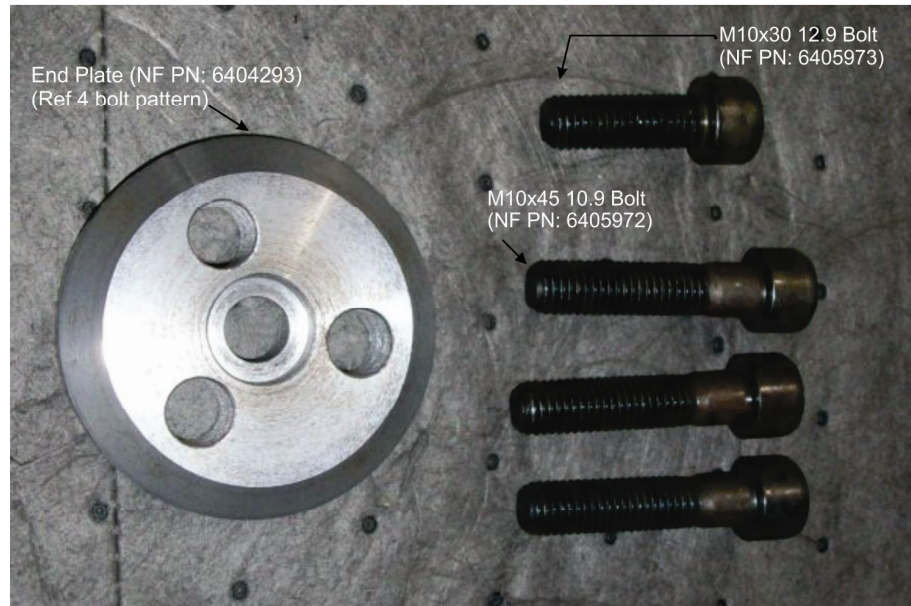
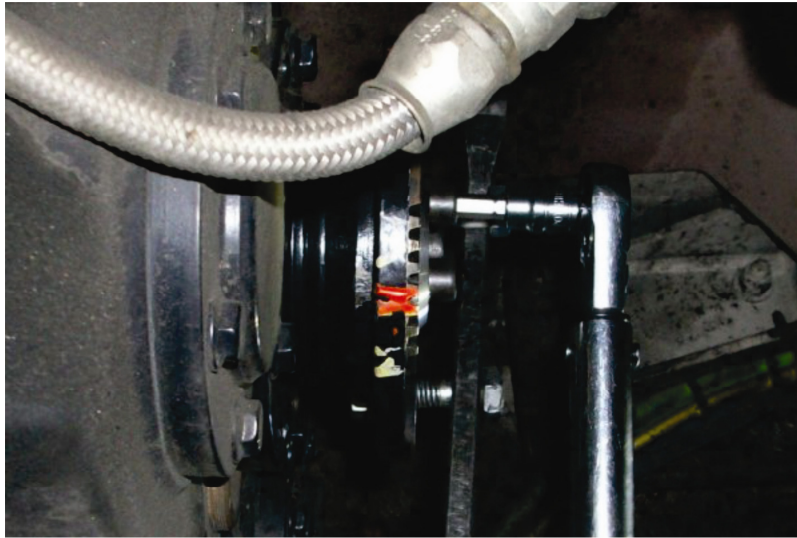


FIGURE 6: SHOWN VIEW OF NEW HARDWARE AND END PLATE.

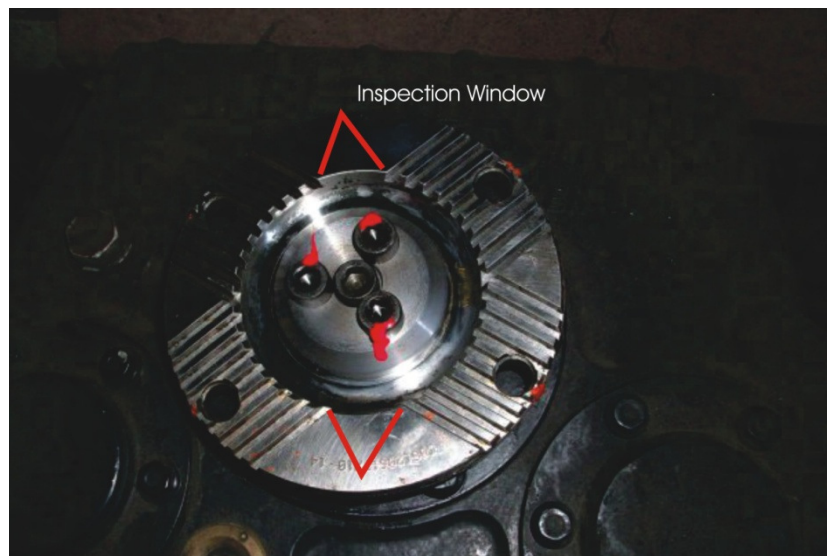
15. Torque bolts to **51 ft lb (62 NM)**. Torque the center bolt first, then the outer bolts. **Refer to Figure 7.**



Torque hardware wet to 62 NM.

FIGURE 7: SHOWN OPERATION OF INSTALLING BOLTS AND TORQUE.

16. Apply torque mark to the bolt heads so that they can be visually inspected. Ensure that the torque stripes are positioned so that they are clearly visible for external inspection through the small inspection windows between the cross-tooth flanges of the driveshaft and gearbox output flange. **Refer to Figure 8.**



Apply torque stripes as shown

Figure 8: Torque marks

17. Remove strap from driveshaft and reconnect the driveshaft to gearbox using bolts previously removed and new locknuts (**NF PN: 40N08000**). Torque hardware between **63-75 FT-LBS**. Apply torque strips on hardware. **Refer to Figure 9.**



Drive shaft re-attached to gear box with torque lines.

FIGURE 9: SHOWN APPLICATION OF THE DRIVE SHAFT RE-ATTACHED TO GEAR BOX.

18. Reinstall driveshaft guard.
19. Remove all tools and debris from work area to return coach to service.
20. If necessary, lower coach in accordance with the New Flyer Service Manual.
21. Turn the main battery disconnect switch to the "ON" position.



APPENDIX A

LOCTITE – CLEANER & DEGREASER (APPLICATION INSTRUCTIONS)

Directions for use:

1. Spray area generously with Loctite ODC-Free Cleaner & Degreaser.
2. Wipe surfaces when still wet with a clean cloth to remove all heavy contamination. If necessary, spray surfaces again to allow run-off of product.
3. Allow Loctite ODC-Free Cleaner & Degreaser to fully evaporate from parts prior to bonding to avoid solvent entrapment with the bond joint.
4. Apply the Loctite adhesive immediately after drying and assemble bond.

APPENDIX B

LOCTITE 7471 PRIMER (APPLICATION INSTRUCTIONS)

Directions for use:

1. Spray or brush on the activator on both mating surfaces to be bonded. For small gaps, treatment of only one surface may be adequate. Contaminated surfaces may need repeated treatment or special degreasing prior to activation to remove any dissolvable contamination. Porous surfaces may need two treatments of activator.
2. Allow the solvent time to evaporate under good ventilation until the surfaces are completely dry.
3. After activation, parts should be bonded within 7 days. Contamination of the surface before bonding should be prevented.
4. Apply the Loctite primer product to one or both surfaces and assemble parts immediately.
5. Where possible, move surfaces in relation to each other for a few seconds on assembly to properly distribute the adhesive and for maximum activation.
6. Secure the assembly and await fixturing before any further handling.

APPENDIX C
RADIAL SHAFT SEAL RING (RSSR) REPLACEMENT

RSSR PREPARATION:

1. Remove the original seal from the bearing cover (small pry bar or lever) ensuring that the output shaft splines are protected, and avoiding any contamination to the adjacent bearing and inner space of the gear case.
2. Clean the seat of the seal in the bearing cover.
3. Ensure the replacement RSSR is free from dust and dirt and undamaged (leave in the package until it is ready to be used). **(NF PN: 6407548)**.
4. Check running surface of the shaft and mounting holes for damage; ensure the inlet bevels on the shaft are free of burrs. Replace if required.

RSSR INSTALLATION:

1. Using a mallet and a suitable contact surface that will distribute the light hammering motion (ex. A punch, bushing, etc), gently tap the seal into place. **See Fig C1.**

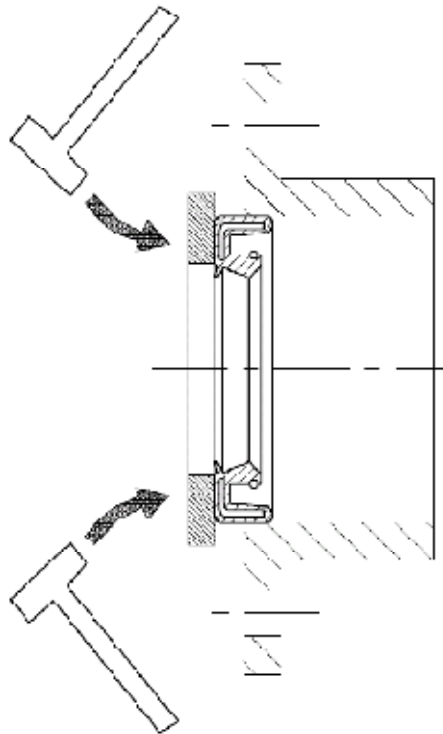
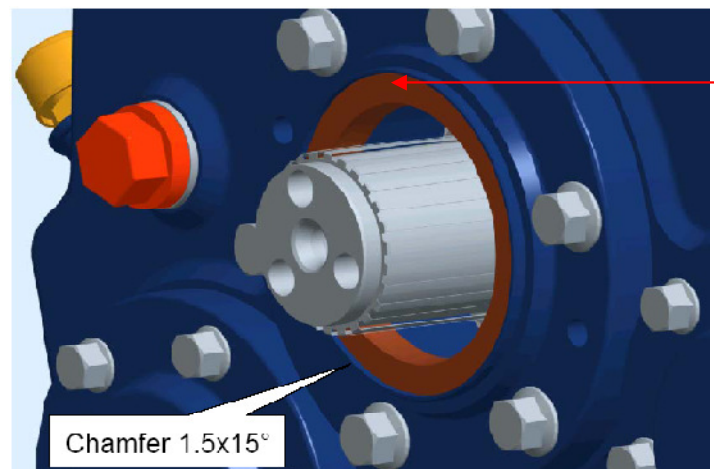
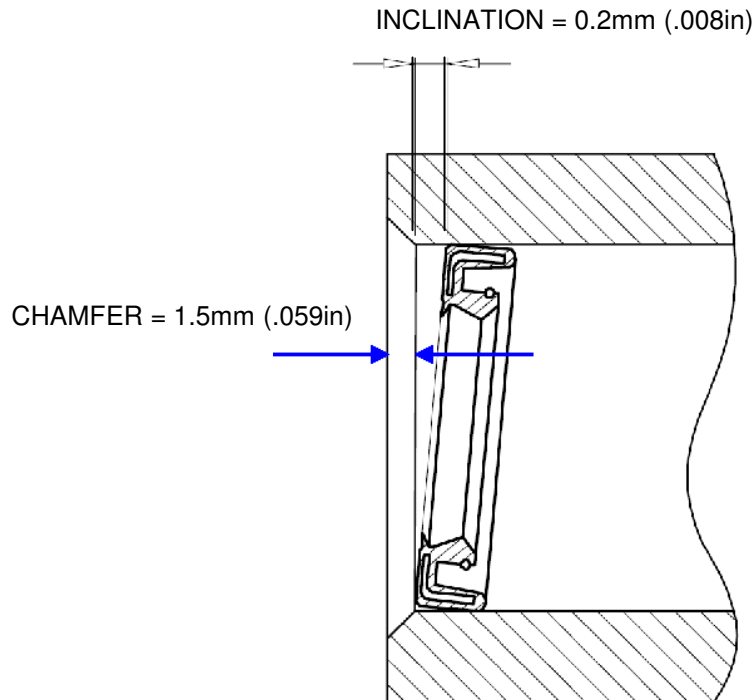


FIGURE C1: SEAL INSTALLATION

2. Ensure the seal clears the 1.5mm (0.059in) chamfer of the mounting hole, and that the inclination of the seal is less than 0.2mm (.008in). **See Fig C2.**



RSSR
NF PN: 6407548

FIGURE C2: SEAL INSTALLATION

OUTPUT FLANGE PREPARATION:

1. Prior to installing output flange on new RSSM, clean the contact area of the sealing lip and apply a small amount of grease. **See Fig C3.**

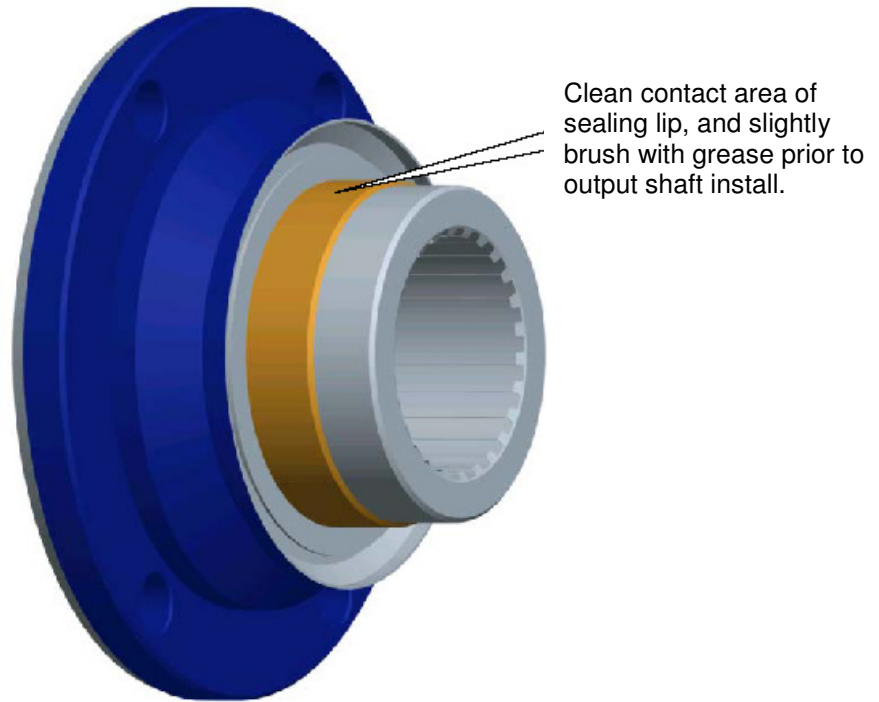


FIGURE C3: FLANGE PREP



LABOUR ESTIMATE

	Operation	Men	Hours	Labor Time M X HR
1	Replace gear box output flange bolts	2	2.0	4.0

PARTS REQUIRED

Item	Part Number	Description	Qty. per Coach	Units	Notes
1	8110440	LOCTITE-242	0.01	EA	
2	6405972	BOLT-M10X45 10.3	3	EA	
3	6405973	BOLT-M10X30 12.9	1	EA	
4	6403696	ORING-SIEMENS ISE GEAR BOX	1	EA	
5	6404293	PLATE-END, SCHB END	1	EA	
6	40N08000	NUT-HEX LOCK 1/2 NC	8	EA	
7	6406066	LOCTITE-635	1	EA	
8	6405974	LOCTITE-T7471 PRIMER 4.5OZ	0.2	EA	
9	6405975	LOCTITE-CLEANER/DEGREASER	0.5	GA	