

Release Bearing Noise with Pedal Down

Background

Occasionally, drivers notice clutch noises coming from the release bearing assembly which are assumed to indicate imminent ball bearing failure. This prompts them to have the clutch changed. However, the result is that in an overwhelming number of instances, no defect is found in the clutch or its release bearing, and a costly clutch change was needlessly performed.

Description of Condition Creating Concern

The condition which creates the driver concern is a noise or vibration coming from the clutch pedal only while it is being pushed and only while the engine is running.

Hardware Analysis

After detailed analysis, Valeo has found that in virtually all instances the ball bearings are essentially in as-new condition. The primary sources of the noise and vibration were found to be as follows:

1. Grease Contamination - Laboratory tests show that noisy / vibrating release bearings are most often caused by grease contaminated with microscopic particles of sand and metal. When the contaminated grease is cleaned and replaced with clean grease, the problem is fixed. The leading causes of this contamination are:

- Dirt in grease at servicing location from either dirt in the grease supply lines or lack of fitting or gun cleanliness.
- Excessive dirt/dust inside the clutch housing from operation without a hand-hole cover or operation in unusually dusty conditions.
- Operation with less than a full charge of grease in the housing (the grease forms a protective barrier to keep dirt/dust out of the ball bearing).

2. Insufficient Clutch Freeplay - Grease is made up of fine oil suspended in a soap base. The heat of operation causes the oil to weep out of the soap base and lubricate the ball bearing. A clutch running without freeplay will overheat the bearing and use up all the oil before the next lube service is due. This will cause the bearing to become dry.

3. Insufficient Grease - Lack of service lubrication or running too long between lube service points will allow the bearing to become dry.



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4. Wrong Grease - Use of clinging chassis type greases can keep the grease from working its way into the ball bearing or the grease may require too high a temperature to give up its oil. Sometimes greases with incompatible chemistry can harden into a non-functional cake. The result in all of these cases is a dry bearing.

5. Vehicle Sensitivity - Sometimes a certain mix of truck components can combine to produce a noticeable level of clutch pedal vibration. This includes certain truck model/engine/drivetrain combinations, engines with high crankshaft end play or certain engine driven accessories. Some truck clutch release linkages actually amplify normal ball bearing rotational noises, common to all clutch manufacturers.

Conclusion

The ball bearings used in truck clutch release bearings are greatly oversized with a huge excess load capacity compared to their duty cycle requirements. Bearings are sized to fit input shaft clearances.

Therefore, in the vast majority of cases clutch pedal noise and vibration are produced by non-damaging causes and continued operation with good grease and adjustment maintenance will yield full normal expected life.

Recommendations

To maximize clutch life and minimize noise and vibration these guidelines should be followed:

- Be sure the grease supply and lines are clean
- Wipe off the grease fitting and gun tip prior to greasing
- Always replace the hand hole cover after servicing
- For unusually dusty conditions, all points of dirt entry into the clutch housing should be sealed
- Be sure the bearing housing is full of grease before the truck is put in service so the grease can act as a dirt barrier
- Use routine maintenance practices to ensure that correct freeplay is always present
- Perform a regular lubrication service
- Use an approved NLGI grade 2 or 3 grease, intended for ball bearing applications with chemistry compatible with the lithium complex base of the Unirex N2 originally supplied in the bearing.\