

TECHNICAL BULLETIN

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Clutch Problems Caused by Misalignment Between the Engine and Gearbox

Misalignment between the engine and gearbox of a vehicle is a common problem which is not fully understood or accepted in the market. The presence of a misalignment condition between the engine and gearbox of a vehicle will result in serious damage to the gearbox as well as premature and recurring clutch failures.

Most vehicles have two dowel pin or bush locations on the rear engine flange or front bellhousing flange, and some vehicles have a separate gearbox and bellhousing which also has dowel locations on the front gearbox flange and rear bellhousing flange. The dowel locations are designed to centralize the engine and gearbox to within 0,1mm, as it is impossible to centralize the engine and gearbox correctly by means of the gearbox mounting bolts and/or flywheel pilot bearing alone.

Misalignment is commonly caused by damaged or missing dowels or damaged dowel locating holes between the engine and gearbox, with the result that the engine and gearbox are no longer correctly centralized. Misalignment is also caused by bellhousing distortion or cracking, welding repairs to a damaged bellhousing, and engine or gearbox conversions where the adaptor plate or conversion bellhousing has missing or inaccurately-positioned dowel locations. Misalignment can also be caused by fitment errors such as trapping a wire, pipe or bracket between the engine and gearbox when fitting the gearbox, distortion of the sheet metal cover plate on the rear engine flange, or failure to clean old hardened dirt or sealant from the mating surfaces of the engine and gearbox flanges before fitting the gearbox.

Misalignment of the gearbox input shaft relative to the engine crankshaft in excess of the maximum permissible tolerance of 0,1mm causes rapid driven plate torsion damper spring, spring window, friction washer, hub spline and stop pin wear, cushion segment failure and premature driven plate failure, and will cause recurring clutch failures unless the misalignment condition is rectified. The rapid driven plate torsion damper assembly wear also results in severe driveline torsional vibration which can cause severe damage to the gears and bearings in the gearbox. Misalignment places excessive strain on the flywheel pilot bearing, resulting in premature and recurring pilot bearing failures and subsequent clutch non-release and noise problems in the vehicle. Misalignment also prevents the release bearing from centralizing itself on the cover assembly diaphragm, resulting in clutch shudder, vibration, severe diaphragm finger wear, premature release bearing failure, and severe gearbox input shaft sleeve wear.

Before fitting a new clutch to a vehicle, the old driven plate should be carefully inspected for evidence of excessive torsion damper spring, spring window, friction washer, hub spline and stop pin wear, and cushion segment failure which often indicate the presence of a misalignment condition.

Misalignment problems should be properly rectified by ensuring that all damaged or missing dowel locating pins or bushes are replaced with new parts and all dowel locating holes are undamaged. A new or undamaged secondhand bellhousing should be fitted if the dowel holes are damaged or the bellhousing is cracked or distorted as it is extremely difficult and expensive to attempt a proper repair of a damaged bellhousing. The entire front gearbox casing will require replacement where the bellhousing is an integral part of the gearbox casing.



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