



# Workshop bulletin: Commercial Vehicle Flywheels

## Repair kits

### COMMERCIAL VEHICLE FLYWHEELS – FUNCTION AND DAMAGE PATTERNS



#### Technical description

The flywheel is the coupling link between the engine and the clutch system and as such performs several tasks: owing to their design, internal combustion engines run uneven. Few cylinders and low rpm amplify the effect. Commercial vehicles generally operate at low engine speeds or run idle for a prolonged period of time. The flywheel is able to outbalance uneven running characteristics. It is bolted to the crankshaft and its mass yields a more even running of the engine. In addition, the flywheel, which is made from highgrade grey cast iron, supports the clutch and, together with the clutch pressure plate, acts as the clutch disk's friction partner. A centering rim or centering pins guarantee the precise alignment of the clutch. When cranking the engine, the pinion of the starter engages with the ring gear which is shrunk on the outer circumference of the flywheel. The flywheel centre carries the pilot bearing which supports the transmission input shaft.

When replacing the clutch or clutch components, it is crucial to proceed with great caution. There are many process steps to be followed precisely in order to avoid damage from the beginning. Any damage to the flywheel impairs the correct functioning of a new clutch.

#### SERVICE

- 1 repair kit contains:
- 1 oil seal
- 1 pivot bearing
- 1 set fixing bolts
- 1 set stretch bolts

#### VEHICLES

DAF, MAN, Mercedes-Benz.  
From 380 mm to 430 mm in diameter.

### Repair kits for flywheels

412 0040 10 GF/380 / GF 420 / TFZ 430 MAN	412 0041 10 GF 2/380 / TFZ 2/400	412 0042 10 GF 380 /GF 420 / TFZ 430 Merc.-Benz	412 0043 10 GF 2/380 / TFZ 2/400
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GF = Cast housing, flat flywheel  
TFZ = Diaphragm, flat flywheel, pull type  
2/ = Twin plate clutch



RepKit 412 0040 10



RepKit 412 0041 10



RepKit 412 0042 10



RepKit 412 0043 10

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\*4,6 ct/min. aus dem dt. Festnetz, für Anrufe aus Mobilfunknetzen können abweichende Preise gelten.

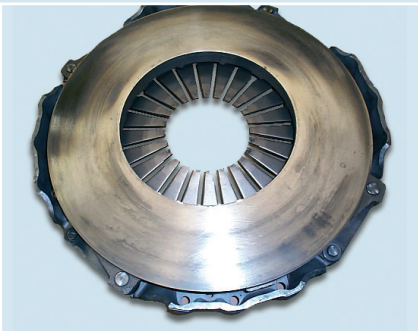




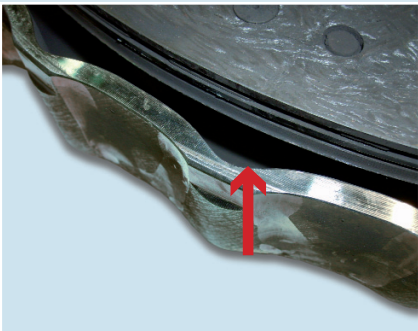
→ THE BASIC RULE IS

The proper functioning of a newly installed clutch is not guaranteed, unless the flywheel is replaced or at least resurfaced thoroughly. Here, it is essential not only to observe the specified tolerance values, but also to re-machine the bolting surface equally to the running surface. The flywheel thickness must never exceed the minimum value specified by the manufacturer.

1. Grooves and scores in the centering device (clutch cover centring)



The clutch is not centred on the centring rim prior to tightening the bolts. As a result, the clutch pressure is jammed and no parallel engagement is possible between clutch pressure plate, clutch disk and flywheel. The clutch disk starts to slip, localized heat is generated and hot spots occur on the flywheel. This can lead to the “vitrification” of the friction material. The inaccurate installation can also lead to clutch judder and clutch disengagement problems. Therefore, the flywheel must be replaced or at least resurfaced; the clutch pressure plate and disk must be replaced.



2. Flywheel damaged by heat / discoloured blue; hot spots, thermal cracks



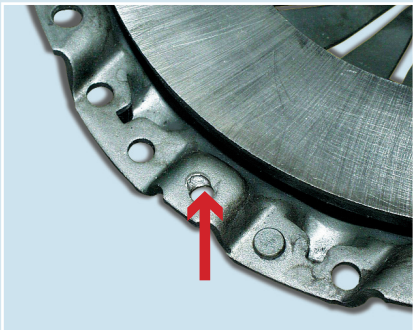
This damage pattern can result from a worn clutch, driver-induced clutch slip, start-off in high gear or from an ill-adjusted release system. Another cause could be contamination by oil or grease resulting from a defective shaft seal ring or an excessively greased profile shaft. The flywheel must be replaced. It is imperative to install a new pilot bearing. The clutch pressure plate and disk must be replaced. If the defect is due to excessive/contaminated oil or grease, it is also necessary to clean the clutch housing as well as the shaft seal rings on both the engine and transmission side.

3. Scores in the clutch lining on the flywheel side



The flywheel was not replaced or resurfaced when the clutch was replaced. The flywheel surface shows hot spots and is warped. The flywheel must be replaced or at least resurfaced; the clutch disk must be replaced. Also refer to damage pattern “Reflective surface, scores, thermal cracks”.

4. Misalignment of the centering pin/s, centering bores



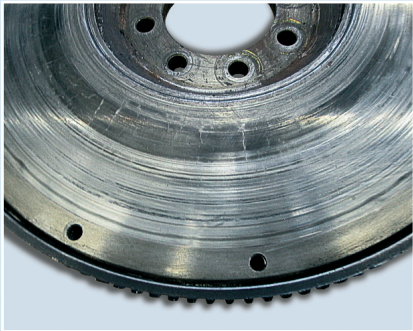
Failure to centre the clutch prior to tightening it causes a deformation of the centring pin and clutch cover. In this case, the flywheel and the clutch must be replaced.

5. Centering ring partially worn out



Improper handling is the likely cause of this damage pattern (the flywheel may have been dropped). Perhaps the clutch was installed out-of-centre, there may be contaminants or burrs on the centring rim or the clutch was not tightened crosswise. It could also be that the flywheel is distorted. In any of these cases the flywheel must be replaced. It is also recommended to replace the clutch, as the clutch cover can be distorted

6. Reflective surface, scores, thermal cracks



This damage signals excessive thermal load caused by worn friction linings, a defective clutch actuation system or handling error. The flywheel must be resurfaced or replaced, and the clutch disk inspected – as described in the section “Scores in the clutch lining on the flywheel side”.