Haynes shows you how

BMW 3-Series and Z4 (99-05) Includes 2006 325ci/330ci Coupe and Convertible models Haynes Online Manual.

1 General information

Clutch

All models with a manual transmission are equipped with a single dry plate clutch which consists of five main components; a friction disc, pressure plate, diaphragm spring, cover and release bearing.

The friction disc is free to slide along the splines of the transmission input shaft, and is held in position between the flywheel and the pressure plate by the pressure exerted on the pressure plate by the diaphragm spring. Friction lining material is riveted to both sides of the friction disc. These models utilize a Self-Adjusting Clutch (SAC), which compensates for friction disc wear by altering the attitude of the diaphragm spring fingers by means of a sprung mechanism within the pressure plate cover. This ensures a consistent clutch pedal feel over the life of the clutch.

The diaphragm spring is mounted on pins, and is held in place in the cover by circular fulcrum rings.

The release bearing is located on a guide sleeve at the front of the transmission, and the bearing is free to slide on the sleeve under the action of the release arm, which pivots inside the bellhousing.

The release mechanism operates by the clutch pedal and hydraulic pressure. The pedal acts on the master cylinder pushrod and then hydraulically on a slave cylinder that's mounted on the bellhousing. This operates a clutch release lever by a pushrod from the slave cylinder.

When the clutch pedal is depressed, the release arm pushes the release bearing against the center of the diaphragm spring, thus pushing the center of the diaphragm spring inward. The diaphragm spring acts against the fulcrum rings in the cover, and so as the center of the spring is pushed in, the outside of the spring is pushed out, so allowing the pressure plate to move backwards away from the friction disc.

When the clutch pedal is released, the diaphragm spring forces the pressure plate into contact with the friction linings on the friction disc, and simultaneously pushes the friction disc forward on its splines, forcing it against the flywheel. The friction disc is now firmly sandwiched between the pressure plate and the flywheel, and drive is taken up.

Driveline

Power is transmitted from the transmission to the rear axle by a two-piece driveshaft, joined behind the center bearing by a slip joint - a sliding, splined coupling. The slip joint allows slight fore-and-aft movement of the driveshaft. The forward end of the driveshaft is attached to the output flange of the transmission either by a flexible rubber coupling or a universal flange joint. On some models, a vibration damper is mounted between the front of the driveshaft and coupling. The middle of the driveshaft is supported by a center bearing that is bolted to the vehicle body. Universal joints are located at the center bearing and at the rear end of the driveshaft, to compensate for movement of the transmission and differential on their mountings and for any flexing of the chassis.

The differential assembly includes the drive pinion, the ring gear, the differential and the output flanges. The drive pinion, which drives the ring gear, is also known as the differential input shaft and is connected to the driveshaft via an input flange. The differential is bolted to the ring gear and drives the rear wheels through a pair of output flanges bolted to driveaxles with constant velocity (CV) joints at either end. The differential allows the wheels to turn at different speeds when cornering.

The driveaxles deliver power from the differential output flanges to the rear wheels. The driveaxles are equipped with constant velocity (CV) joints at each end. The inner CV joints are bolted to the differential flanges and the outer CV joints engage the splines of the wheel hubs, and are secured by a large nut.

Major repair work on the differential assembly components (drive pinion, ring-and-pinion, and differential) requires many special tools and a high degree of expertise, and therefore should not be attempted by the home mechanic. If major repairs become necessary, we recommend that they be performed by a BMW service department or other qualified repair shop.