

**MODEL 164.1**

with CODE (430) Offroad package

up to Model Year 08 /Modification Year 07

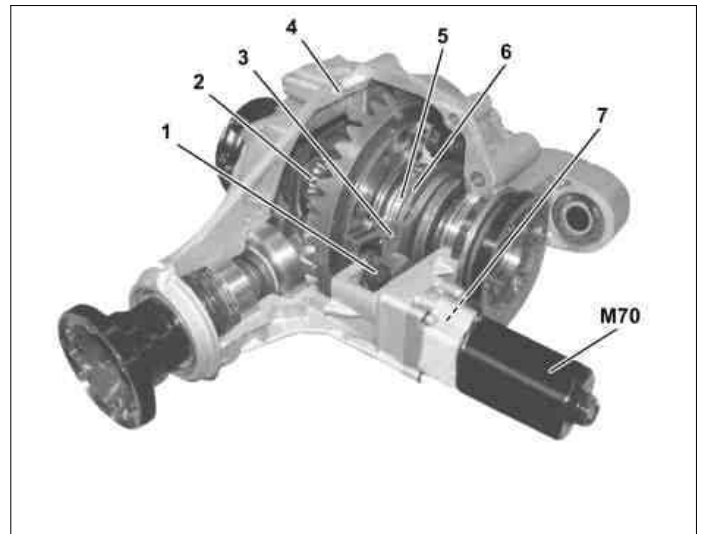
**MODEL 164.8**

with CODE (430) Offroad package

up to Model Year 08 /Modification Year 07

- 1 Spur gear
- 2 Differential side gear
- 3 Cam with ball ramp mechanism
- 4 Differential housing
- 5 Interwheel differential lock disk pack
- 6 Thrust ring
- 7 Magnetic brake

M70 Rear axle differential actuator motor



P28.60-2079-11

The driver can use a differential lock selector wheel (N72s34) located in the lower control panel (N72) to select between three different differential stages. The following differential settings are available in the "High" on-road ratio:

- 1st stage: The transfer case differential (interaxle differential lock) is locked automatically
- 2nd stage: The transfer case differential (interaxle differential lock) is locked manually (100 %)
- 3rd stage: The transfer case differential (interaxle differential lock) and the rear axle differential (interwheel differential lock) are locked manually (100 %)

The following differential settings are available in the "Low" offroad ratio:

- 1st stage: The transfer case differential (interaxle differential lock) is locked automatically
- Setting 2: The transfer case differential (interaxle differential lock) is manually locked (100 %) and the rear axle differential (interwheel differential lock) is automatically locked
- 3rd stage: The transfer case differential (interaxle differential lock) and the rear axle differential (interwheel differential lock) are locked manually (100 %)

Each differential setting has a red LED to indicate the active state.

**Specified locking torque**

When the lock is actuated, the transfer case control unit (N15/7) calculates a specified locking torque according to the current operating state.

The information about the specified locking torque is sent by the transfer case control unit via the CAN data bus to the rear axle differential lock control unit (N15/9). This pre-control of the locking torque has the following advantages:

- Ensuring traction for moving off
- Avoiding overbraking of the rear axle during manual downshifts
- Reducing the load change shock
- Avoiding oversteer or understeer under load

To allow calculation of the specified locking torque, the transfer case control unit requires the following information:

- Cornering recognition
- Tire tolerances
- Wheel speeds
- Vehicle speed
- Engine torque
- Accelerator pedal position

**Lock control**

The rear axle differential lock control unit regulates the distribution of the engine torque between the left and right rear wheels. The multidisk clutch (interwheel differential lock) is actuated via the rear axle differential actuator motor.

**Safety concept**

In the de-energized state (power failure) the interwheel differential lock is open.

When the rear axle differential actuator motor is actuated by the rear axle differential lock control unit, the rear axle differential actuator motor rotates the eccentric with ball ramp mechanism (3) via the spur gear (1). Due to the ball ramp mechanism installed on the cam, the balls run up to their "ramps" when the cam is turned. This produces an axial movement of the cam. The cam pushes the thrust ring (6) against the interwheel differential lock disk pack (5). This produces a defined friction torque in the disk pack. The differential housing (4) and the differential side gear (2) are mutually locked. In order to optimize fuel consumption, the position of the spur gear is maintained by the magnetic brake (7) in the rear axle differential actuator motor if the differential is permanently locked.

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#### Lock actuation on ABS/ESP control

The transfer case control unit must respond to the particular requirements of the ABS and ESP systems in order to avoid negative influences on directional stability and road adhesion. These requirements are made available to the rear axle differential lock control unit via the CAN data bus. For this purpose the transfer case control unit is capable of opening the interwheel differential lock. To guarantee this function, the following information is required:

- Deceleration at the rear axle
  - Vehicle speed
  - Signal ABS "active"
  - ESP requirement
  - Stop light signal
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#### Lock overload protection

The aim of the lock overload protection is to protect the interwheel differential lock against damage and guarantee the maximum possible availability of the lock function.



After ignition "OFF/ON" for >10 s the 1st. stage of the differential lock is automatically activated, at less than 10 s the currently selected differential stage remains active.

	Component description of transfer case control unit	N15/7	GF28.19-P-3200GZ
	Component description of rear axle differential lock control unit	N15/9	GF28.19-P-3500GZ
	Rear axle differential actuator motor, component description	M70	GF28.19-P-3501GZ
	Differential component description		GF28.50-P-1000GZ
	Multidisk clutch, component description		GF28.50-P-1100GZ