BMW ZF6HP26

STUCK IN PARK

COMPLAINT: A 2002 BMW 745Li arrives at the shop on a tow truck. When the vehicle was started, the steering wheel paddle shift controls were operated to select drive. The technician observed the gear shift position indicator lamps go from park to neutral to drive and then it immediately returned to park.

CAUSE: The rubber "bridge seal" that goes between the Mechatronic (valve body) Assembly and the pump had blown out, (Refer to Figure 1).
With the "Bridge Seal" being damaged, a significant loss of system pressure occurred, this caused a lack of sufficient clutch pressure resulting in slippage. The TCM recognized this as the Input Speed Sensor maintained a reading when it should have been zero rpm while in gear with the brakes applied.
At this time the TCM commanded the transmission back into park in an effort to prevent any further transmission damage from occurring.

CORRECTION: Replace the bridge seal. BMW vehicles equipped with "shift by wire" are controlled by an "E" type valve body referred to as a "Mechatronic Module". The alternative is an "M" type valve body which has a conventional manual valve and gear selector lever. The "E" type does not have a manual valve, it has a rod that is actuated by solenoids which moves the internal linkage to engage and disengage park as well as other gear selection. There is a pre-loaded barrel spring mounted on a rotating lever that operates the park rod with the tension of the spring pushing the lever and rod into the park position. To release park, the MV3 and MV2 solenoids are energized. (Refer to Figure 2).
The park rod, as well as the location of the MV2 and MV3 solenoids can be seen in Figure 3. The MV3 Solenoid is mounted on the back side of the park lock cylinder which is on the valve body. Inside the cylinder there is a piston which connects to the rotating lever. When the MV3 Solenoid is OFF, a shaft extends out from the solenoid, pushing the rear of the piston and lever into the park position. When a command is requested to release park, the MV3 Solenoid is energized and the shaft retracts. At this time the MV2 Solenoid is also energized and it supplies fluid pressure to a chamber inside the front area of the cylinder which pushes the piston, rotating lever and park rod into the released position.
One example of the garage shift by wire controls is seen in Figure 4, this is the shift lever that signals the computer for gear selection. The selector lever operates as follows:

Position R: To select reverse the foot brake must be applied and the selector lever must be pushed up to the end of its travel.

Position N: If the neutral position is desired while in reverse, a downward tap on the selector lever is all that is needed. From the drive position, an upward tap on the selector lever is all that is required. From the park position, a tap on the lever in either direction will place the vehicle in neutral. Neutral will automatically be selected when the ignition is turned off but the key remains in the cylinder. Park will automatically be selected after 30 minutes unless N is selected before 30 minutes has elapsed at which time an additional 30 minutes is added to the time in neutral.

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CORRECTION continued:

Position D: Depress the foot brake and pull the selector lever to its fullest travel in a downward direction.

Position P: Park engages by a push of a button built into the selector lever. Park automatically disengages when R, N or D is selected when the engine is running. Park will automatically engage when the ignition key is removed from the cylinder.

The results of selector lever operation is displayed on the instrument cluster as shown in Figure 5.
Some vehicles will have the selector lever as well as steering wheel mounted paddles as seen in Figure 6.

There are many safety features related to this system such as a message display center in the instrument cluster informing the driver of a problem.
Should the vehicle get stuck in park, and the vehicle needs to be moved, there is an emergency park release lever under the dash. The handle is located behind a locked access panel. The ignition key will unlock this access panel revealing the handle which is connected to a cable which when pulled or pushed, will mechanically release or engage park.

SERVICE INFORMATION:

Bridge Seal.....ZF Part Number 0501215718

Many thanks to Reno Partipilo, Sal Scardina and Joe Russo from Continental Transmission in Bridgeview, IL, for sharing their experience with us and for providing some of the photos that made this bulletin possible.

BRIDGE SEAL

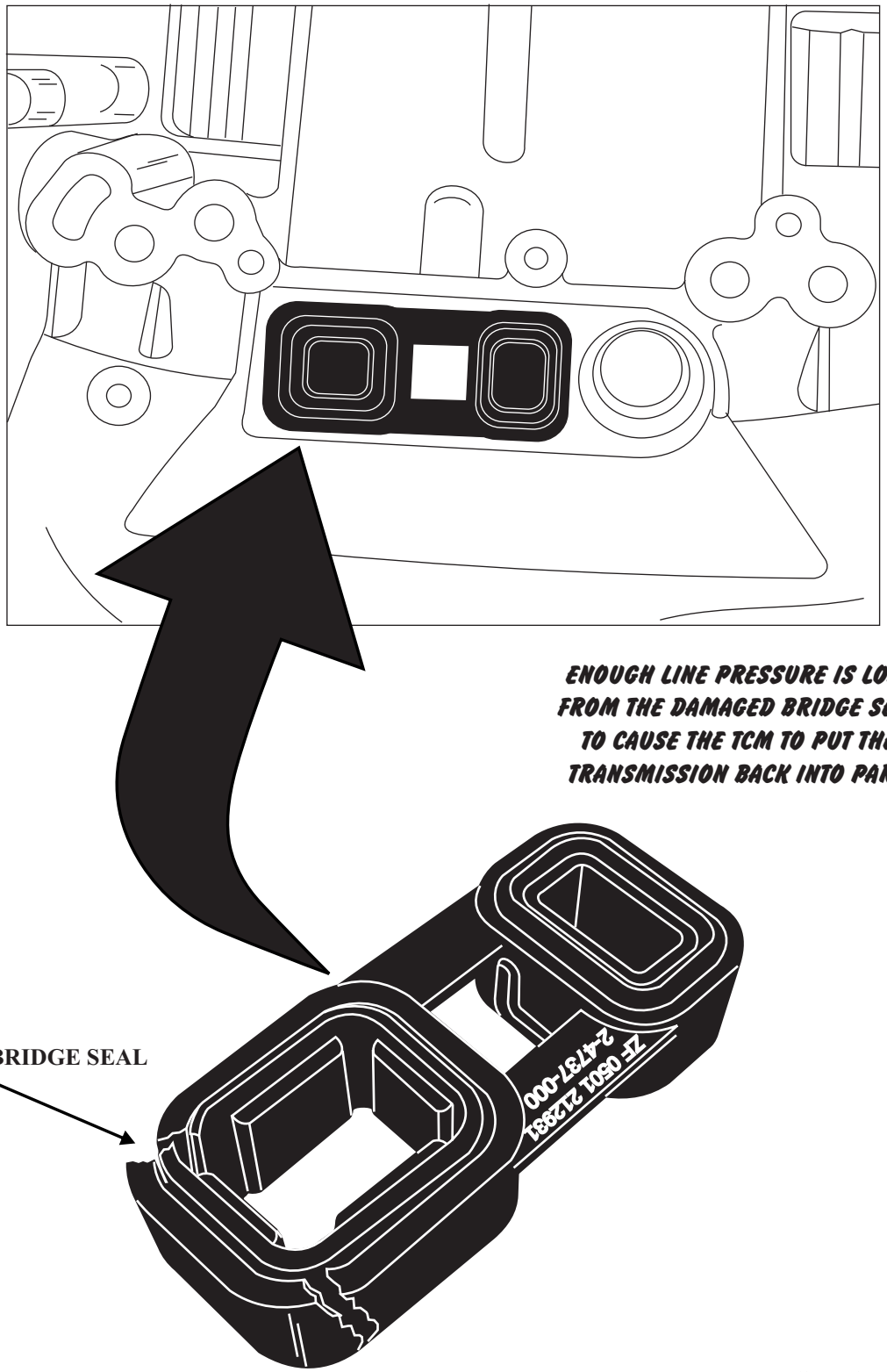

Figure 1

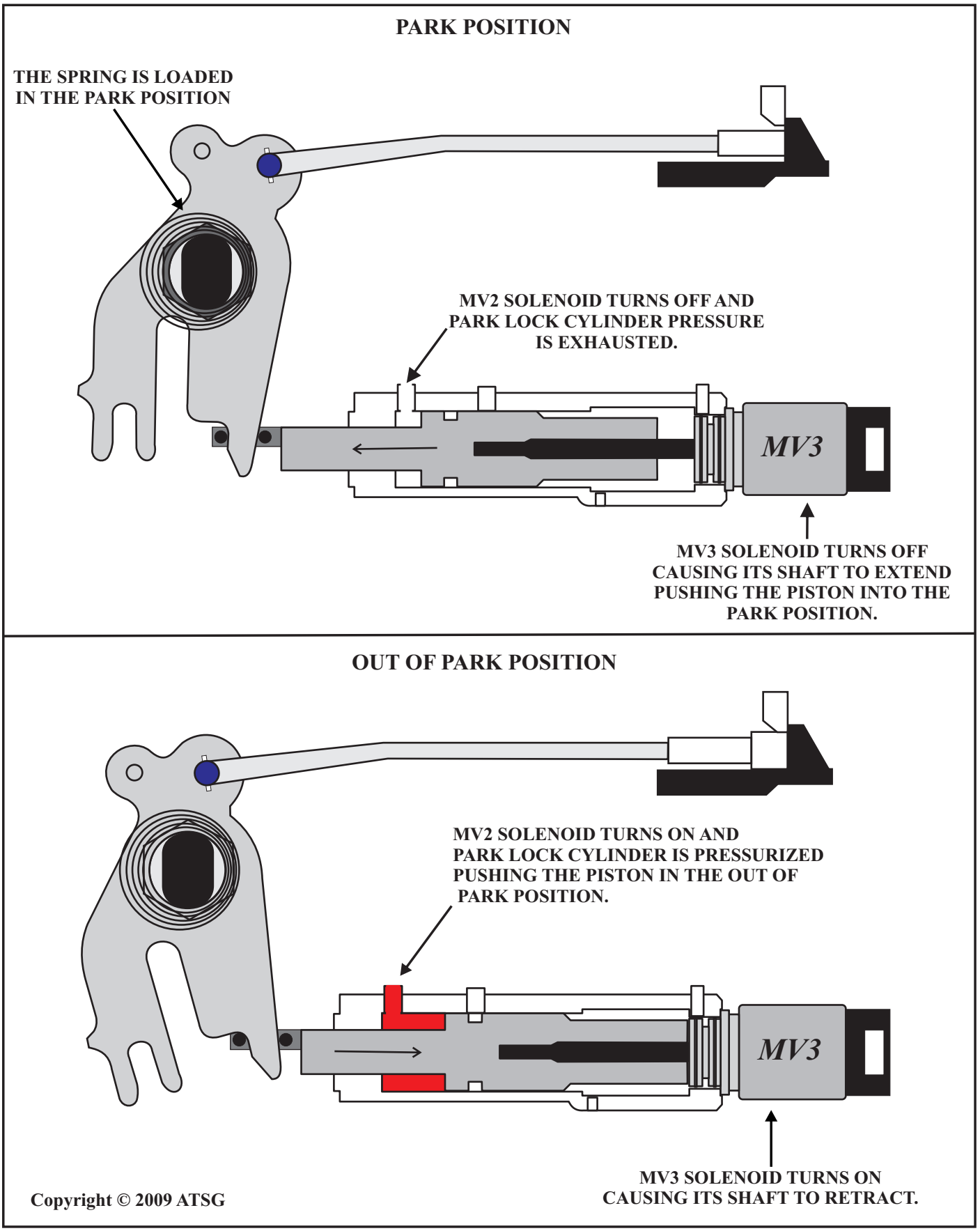

Figure 2

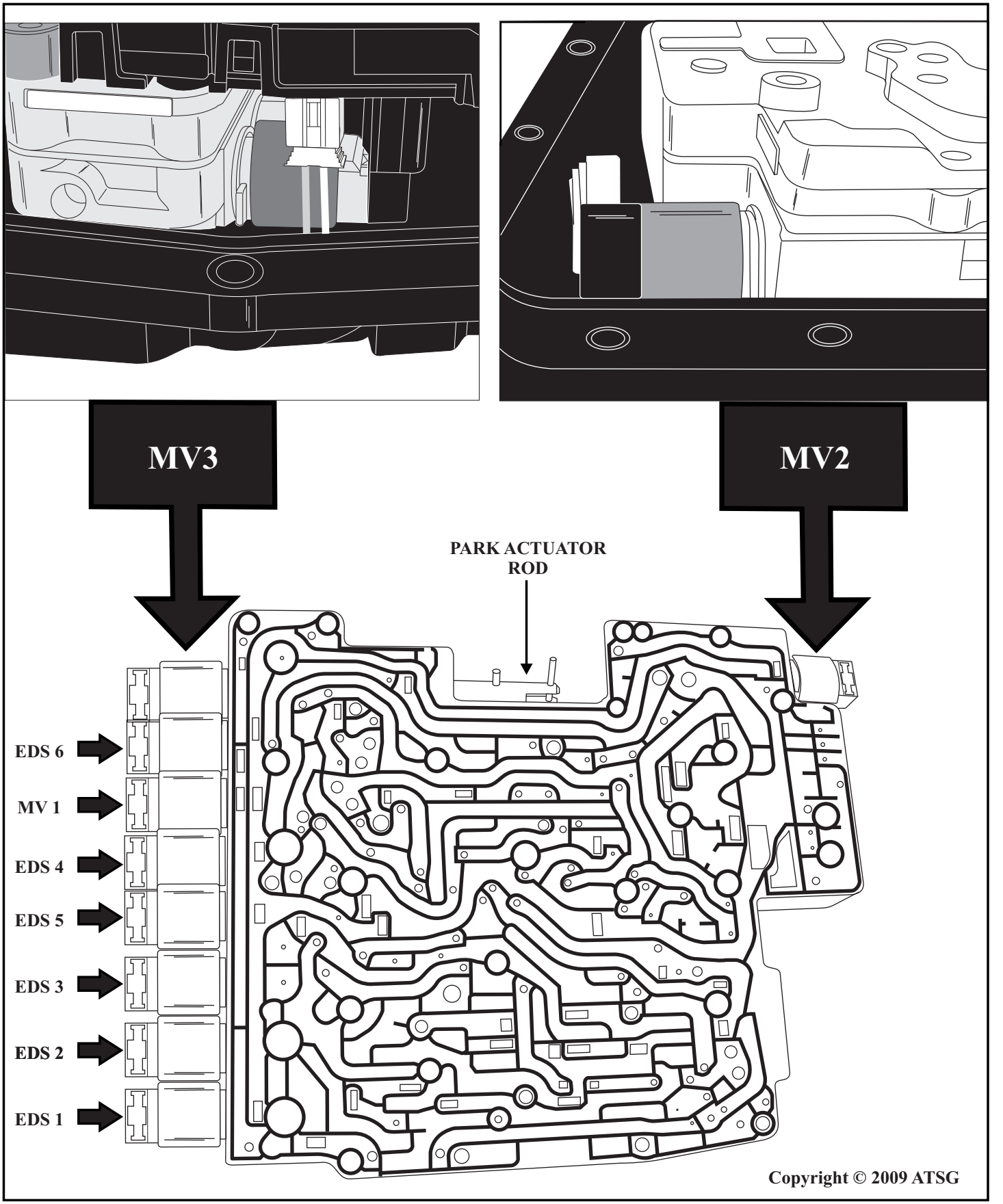
MV3
MV2
PARK ACTUATOR ROD
EDS 6
MV 1
EDS 4
EDS 5
EDS 3
EDS 2
EDS 1
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Figure 3

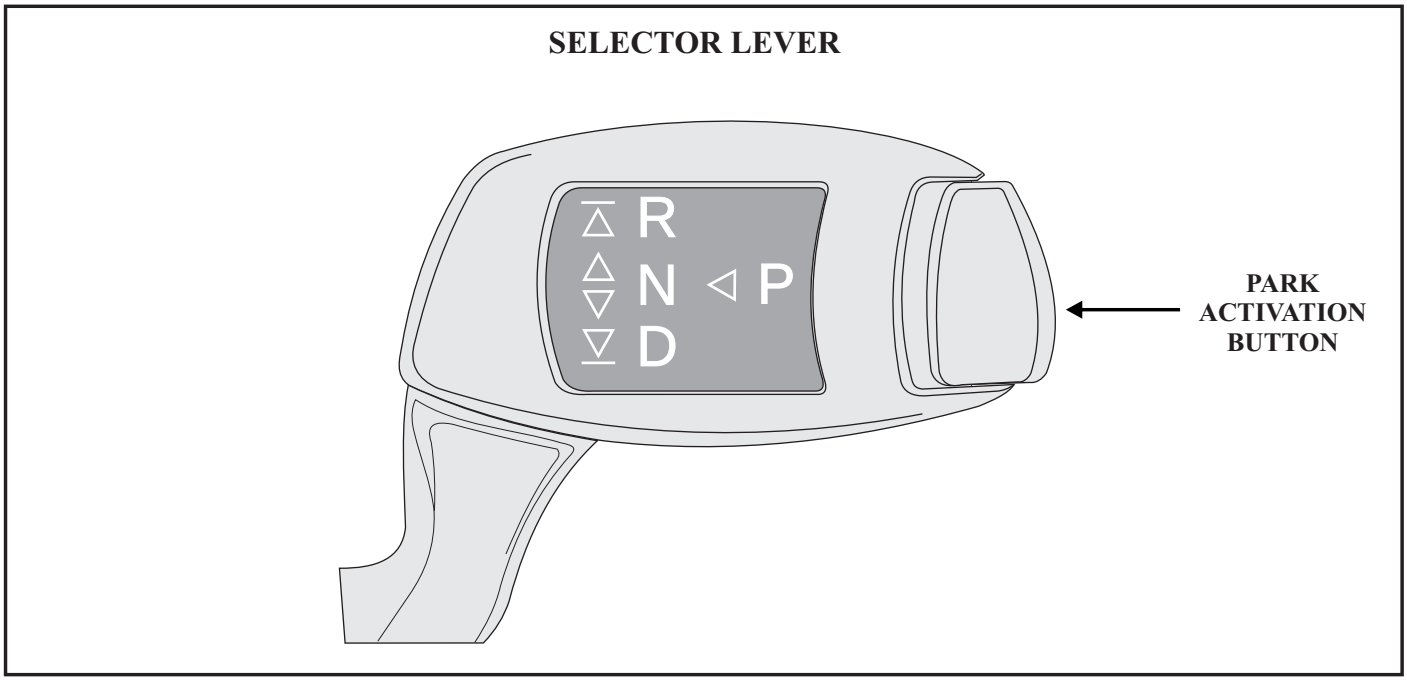

Figure 4

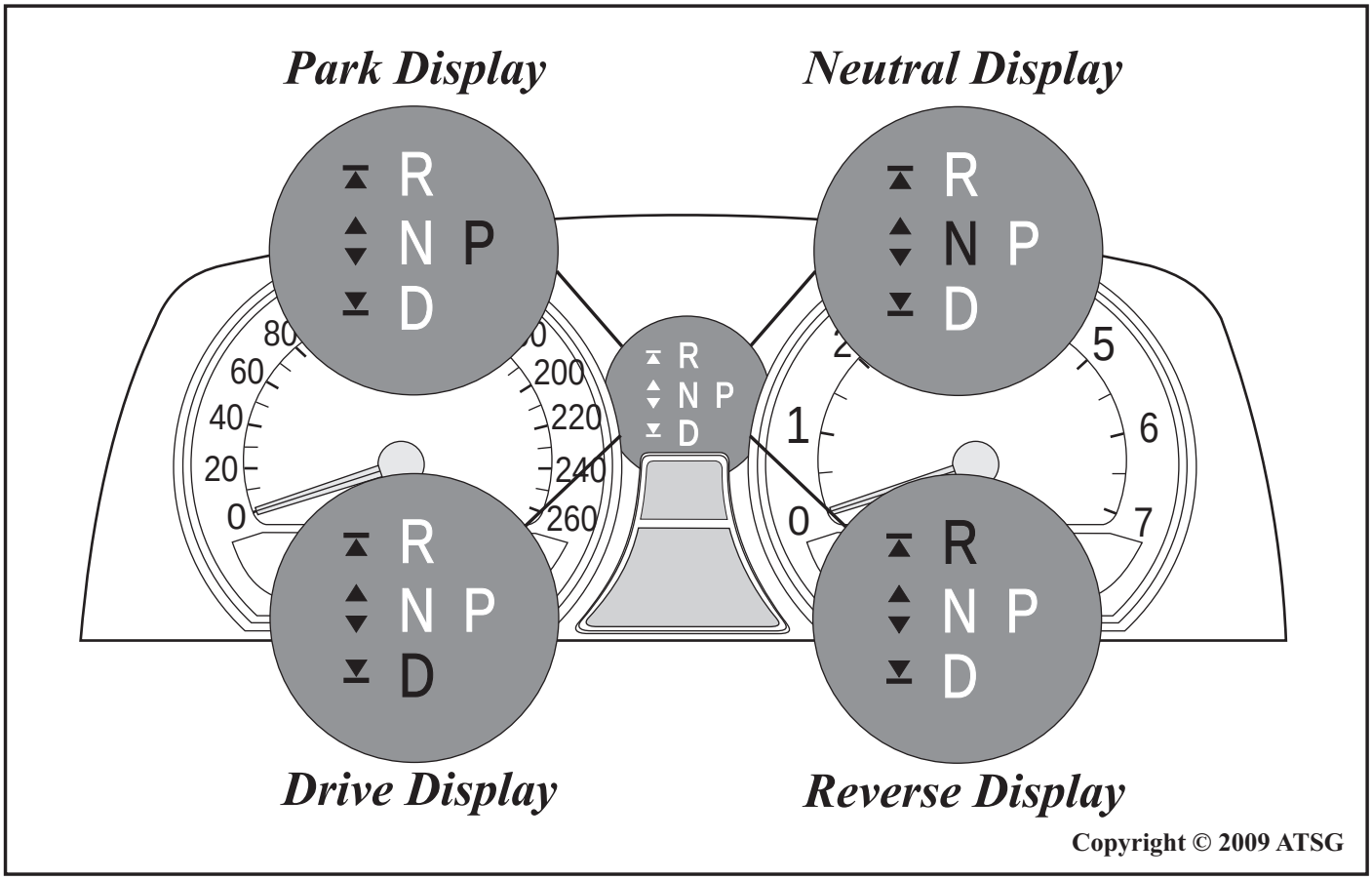

Figure 5

STEERING WHEEL MOUNTED PADDLES

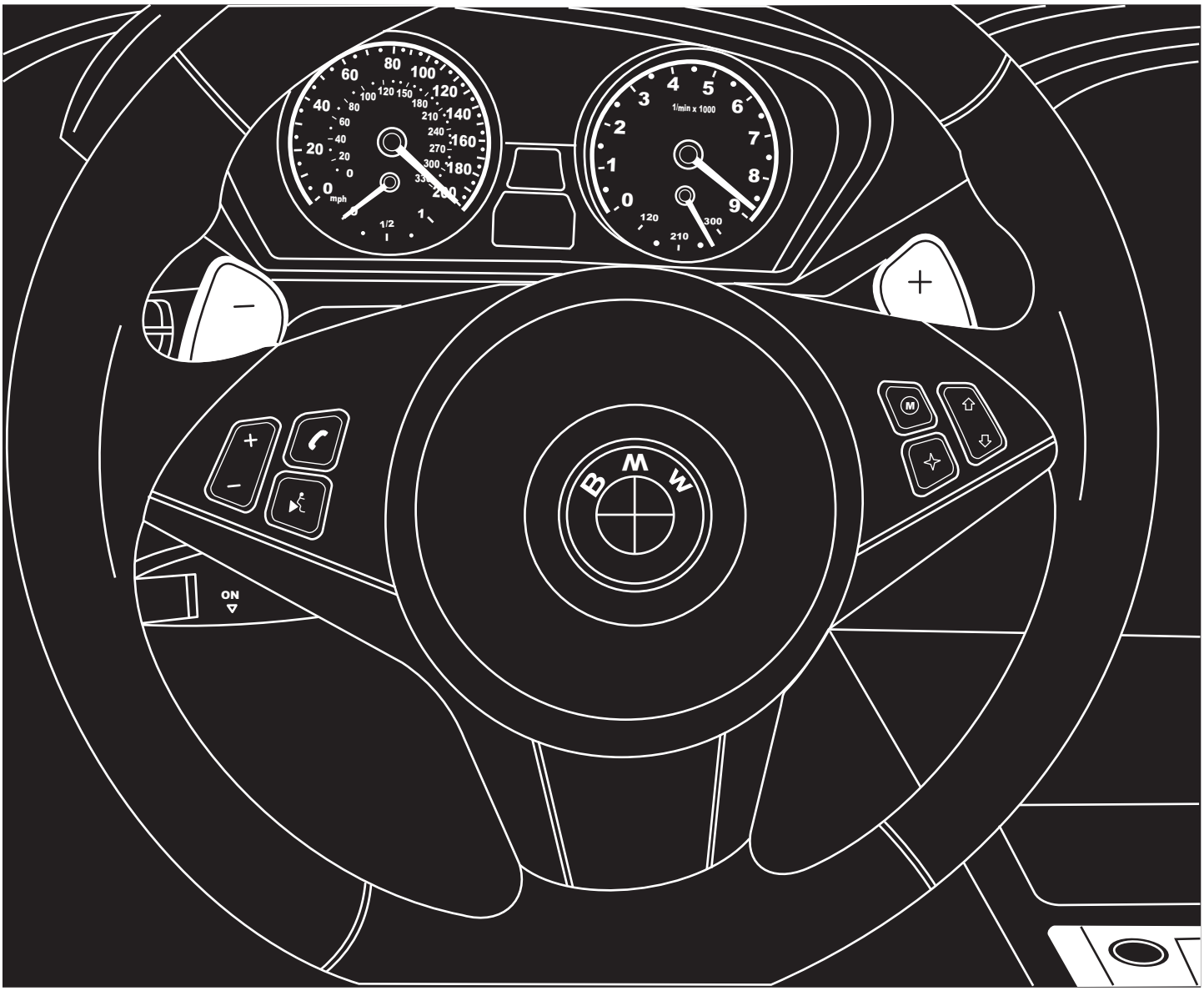

Figure 6