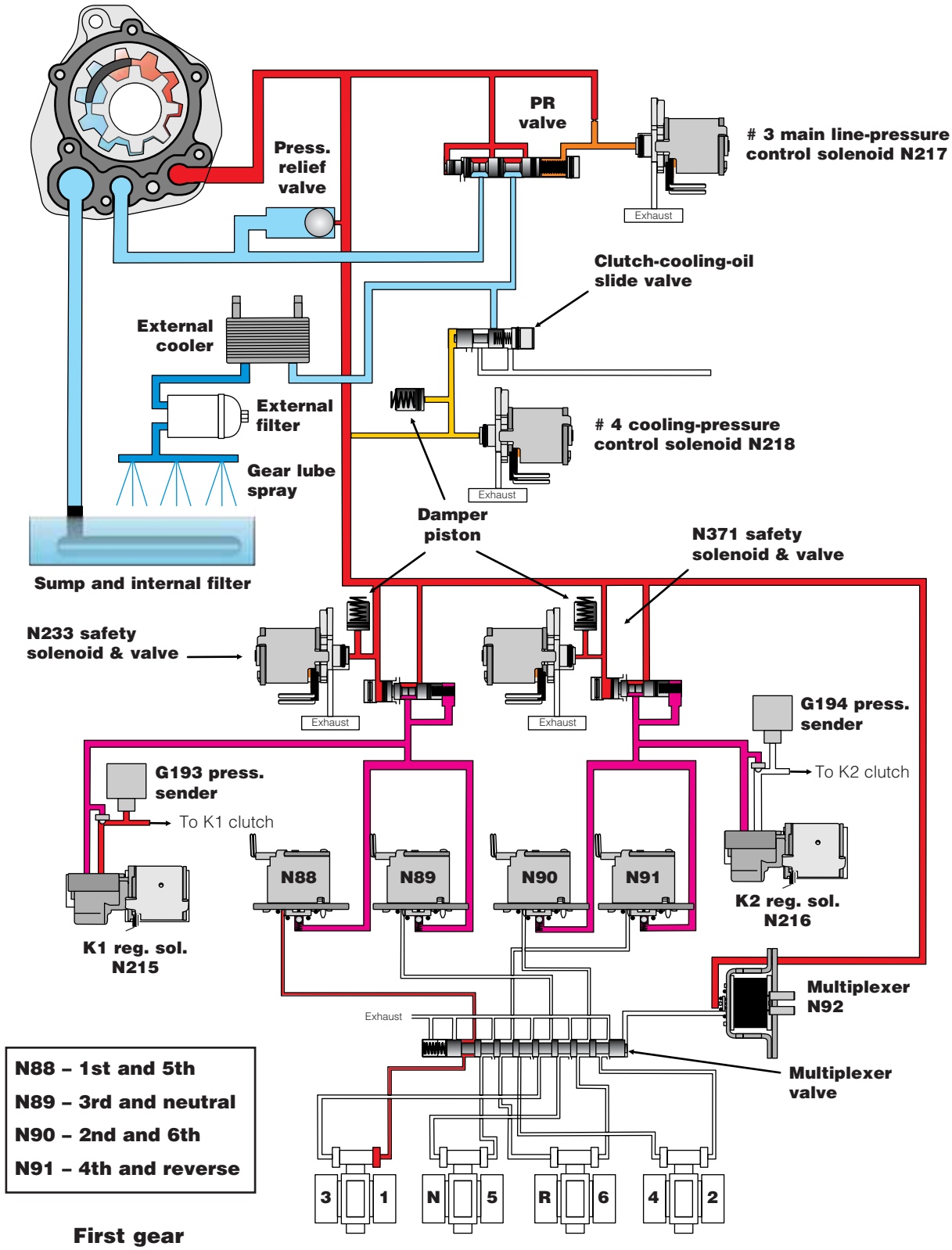
Figure 8

Hydraulic Details



N88 – 1st and 5th
N89 – 3rd and neutral
N90 – 2nd and 6th
N91 – 4th and reverse

First gear

should this sensor fail, the transmission computer uses signals from the gear-oil temperature sensor G93 and the control-unit temperature sensor G510, both inside the transmission computer.

• Input-shaft speed sensor 1 (G501) and input-shaft speed sensor 2 (G502) are both Hall-effect sensors inside the transmission computer. These sensors are excited by the wheel-speed sensors mounted on each shaft. These signals are used in conjunction with the input-speed signal (G182) to determine the output slip of clutches K1 and K2. Besides using these signals to tailor clutch-slip control, it also can determine whether the right gear ratio has been selected. If sender G501 fails, only second gear can be achieved. If sensor G502 fails, only 1st and 3rd can be achieved.

Output-speed sensors G195 and G196 are also Hall-effect sensors inside the transmission computer. They, too, are excited by a wheel-speed sensor mounted on the shaft. By having two output-speed signals that are offset, the computer can detect direction of travel. The G195 sends a "high" signal and the G196 sends a "low" signal. As a redundancy should these sensors fail, ABS wheel-speed signals are substituted for both direction of travel and road speed.

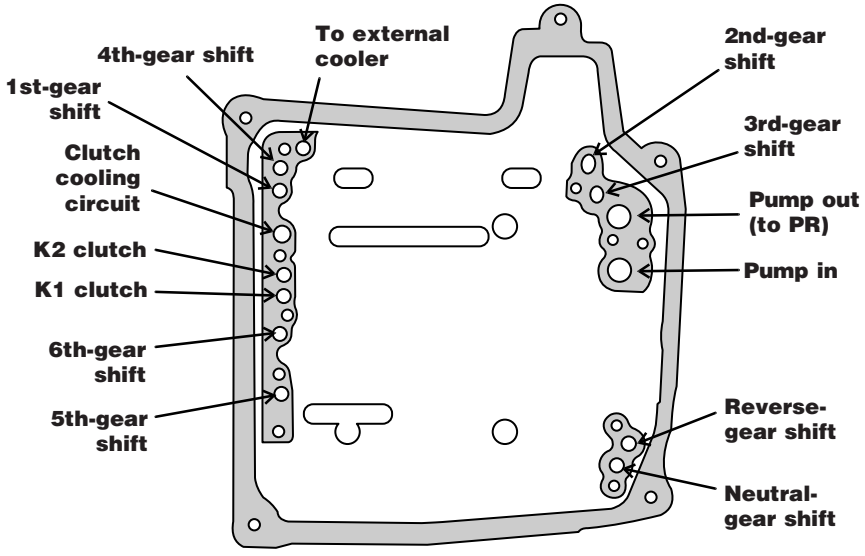
• Gear-oil temperature sender G93 and control-unit temperature sender G510 are both inside the Mechatronic transmission-control unit. With this unit being placed inside the transmission, the oil temperature can be monitored. These two sensor signals are used to check the Mechatronic's temperature, they are used to start a warm-up program and they check each other for faults. If an over temp is detected, measures are initiated to reduce oil temperature as rapidly as possible to avoid excessive heat generation in the

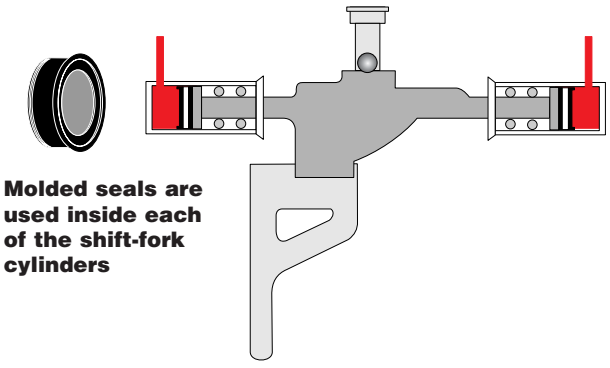
continues page 26

Figure 9

Figure 10

Figure 11





Molded seals are used inside each of the shift-fork cylinders

Figure 12

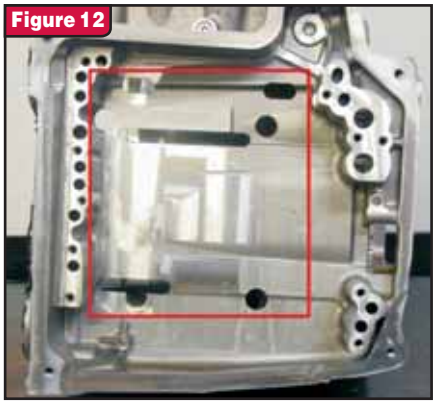


Figure 13

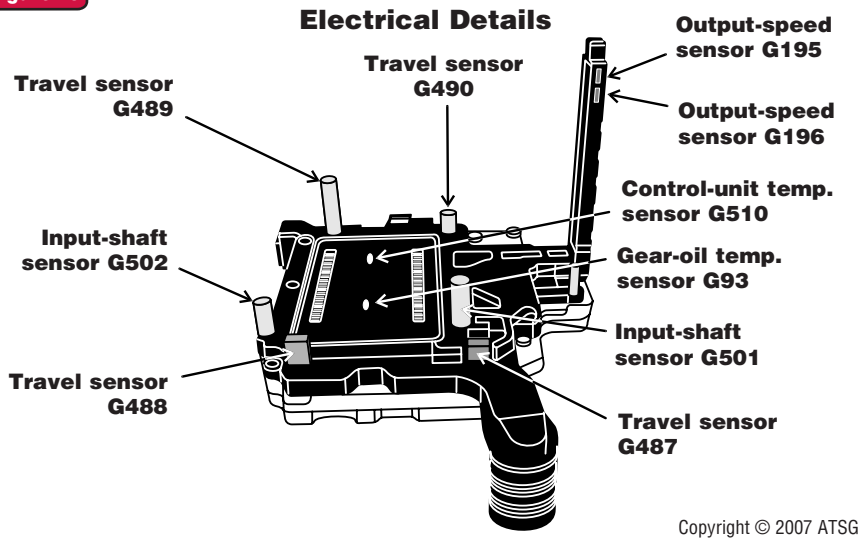
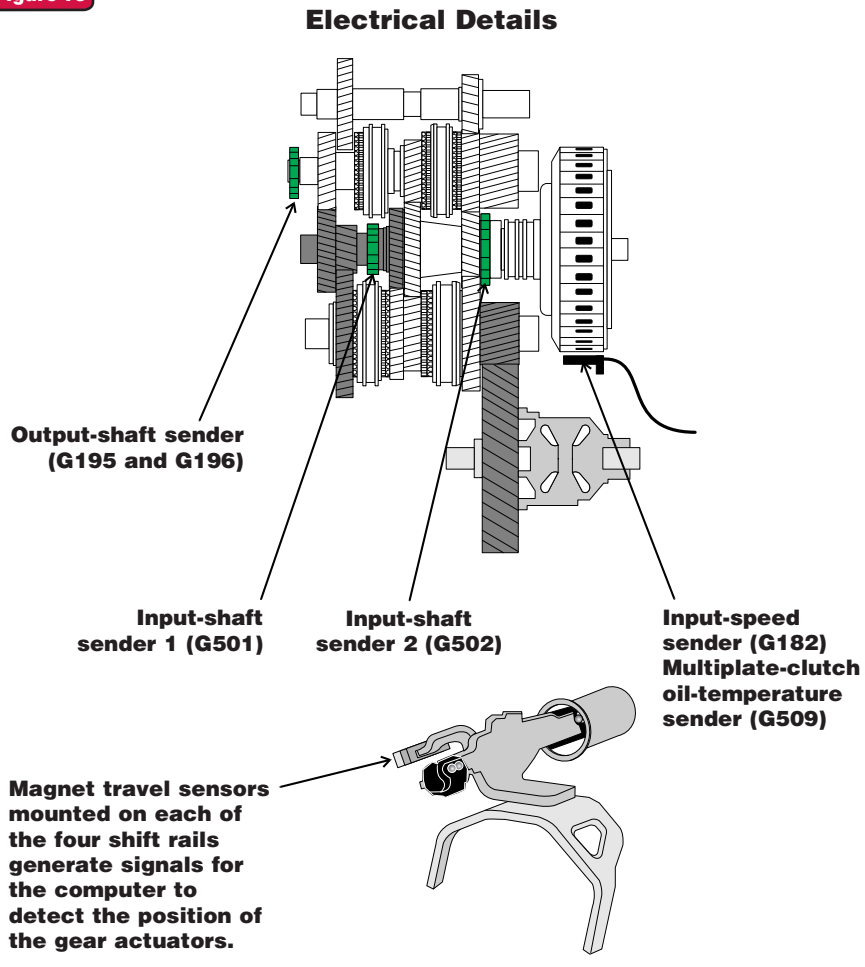


Figure 15



Travel sensor 1 (G487) detects 1st- and 3rd-gear positions
Travel sensor 2 (G488) detects 2nd- and 4th-gear positions
Travel sensor 1 (G489) detects 6th- and reverse-gear positions
Travel sensor 1 (G490) detects 5th- and neutral-gear positions

If a sensor should fail, that section of the gearbox will be isolated for non-use.

Figure 14

Mechatronic unit. At temperatures that exceed 138° C, the Mechatronic unit initiates a reduction in engine torque. Above 145° C, oil no longer is supplied to the K1 and K2 clutches, placing the transmission in neutral.

This concludes the series on the DSG 02E gearbox designed to give you an idea of the type of transmissions we can expect to see more of. Its compact design and the elimination of a torque converter are quite favorable for the manufacturer.

So now we have CVTs, DSGs, six-speed front- and rear-wheel-drive transmissions, AWD transmissions and, yes, there is now an eight-speed rear-wheel-drive transmission by ZF. It looks as if we could do well in the transmission business if we could buy parts. Is the right to rebuild being taken from us one transmission at a time? TD

The Bottom Line:

Tell us your opinion of this article:

Circle the corresponding number on the free information card.

96 Useful information.
97 Not useful information.
98 We need more information.