

## Automatic Transmission

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Today's engines combined with automatic transmission are able to think and act. With autonomous driving on the horizon, they are even beginning to see and communicate with each other. We have to get used to the idea of modern mechanics: everything is interconnected through sensors and interlaced mini computers. No shafts, couplings, joints, gearings are needed anymore. Cars are about to make an evolutionary leap, developing artificial intelligence. For automotive developers, replicating the human brain's talent for managing complexity efficiently is now a major goal.

The intelligent behavior of automatic transmissions has historically started over 50 years ago, well before the birth of the electronic control of the fuel supply of combustion engines. So from the first three-speed automatic gearbox we have now reached nine speeds and we have already begun to introduce an electric winding within the same gearbox, with the double task of both an electric motor supplementary to that of internal combustion and a generator for recharging special batteries.

**Maintenance and repair** Automatic transmission fluid (ATF) transmits power from the engine and also cools and lubricates the internal parts of the transmission. It also transmits the force through the solenoid valves to control all clutches - this is crucial for the correct gear change that must take place at the right time and with the exact speed. These valves are extremely busy and susceptible to wear. For example, serious problems could be caused by wear at the plunger sleeve in the lockup clutch control valve bore and generally in all solenoid bores.

Excessive heat is the number one enemy for automatic transmission fluids. "Burnt" ATF may change its tribological properties to such an extent that the transmission starts to malfunction. For instance, the driver may experience "shift flares" or rough shifts. The second enemy is dirt and metal particles whose circulation must be absolutely avoided,

but filters and magnets in the oil pan cannot provide full protection.

Even though a change of transmission fluid may not be listed as a part of regular service protocol in the car owner manual, it is highly recommended that ATF be replaced at specific mileage intervals, usually from 60,000 to 80,000 km. If necessary, the transmission should be flashed to guarantee more complete particle removal. Remember, that even slight particle contamination accelerates the wear rate enormously, since each particle will generate many new particles when trapped in between the rubbing surfaces. Most importantly, ATF flash should be done before any mechanical damage has occurred; otherwise you are risking a much heftier bill for valve body replacement or entire transmission replacement in the future. BIZOL offers his own experience in the field. Stay tuned for the next article related to different types of automatic Transmissions – Cleanliness – How to keep performance for life.

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