

## Література

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### **IMPULSE METHOD OF CONTROL OF THE STATE OF HYDROFICED TRANSMISSIONS OF PASSENGER CARS**

Violation of control actions in hydraulic transmissions (GT) of passenger cars is the cause of slipping of discs in friction packs of clutches or brake bands with drums and the appearance of «jolts» (bumps) when the gears are turned on and off. Such malfunctions arise due to incorrect signals from sensors of automatic transmissions (AT) or an electronic control unit (ECU) for the engine and transmission, failure of the AT ECU, wear of elements of the hydraulic control unit, in particular, electromagnetic control valves.

When slippage occurs, determined by the difference in the speeds of the turbine wheel and the automatic transmission output shaft, the ECU increases the pressure supplied to the actuators by means of the electromagnetic control valves. If, when the pulse frequency or the current to the solenoid valve increases to the maximum permissible value, the ECU detects slipping in the AT, then the emergency mode is automatically activated and the driver is informed with a message on the instrument panel.

High amplitudes of dynamic loads and jolt when engaging or shifting gears, which carry shock loads on the GT elements, are not perceived by the ECU in any way. These negative processes damage friction clutches, pistons, friction elements, rings, brake bands and planetary mechanisms up to complete destruction, which is the cause of partial or complete failure of the automatic transmission. The main cause of "jerking" is the wear of the solenoid control valves. If they are repaired or replaced in a timely manner, the service life of the gearbox can be extended. To fix the blows, the author has developed an impulse method for obtaining information.

At the moment of impact, perceived in the passenger compartment, there is a sharp filling of the sub-piston space with working fluid and an increase in pressure in the brakes of the planetary gear set, leading to an abrupt change in the rotational speed of the automatic gearbox shafts.

It is advisable to use the information obtained by the pulsed method for diagnosing GTs to diagnose the technical condition of the automatic gearbox and localize faults in the elements of the hydraulic control unit of the automatic gearbox, as well as to adjust the pressure supplied to the brake clutches and belts in order to reduce the loads on the GT parts, to increase the resource and improving the smoothness of the ride.

In order to improve the accuracy of information on the technical state of the electromagnetic control valves obtained by the pulse diagnosis method, an objective diagnosis of their hydraulic parameters is carried out. For this, a stand was developed [1], consisting of a reservoir with a liquid for automatic transmissions, a pump with a reducer, a tested solenoid valve-regulator, an ECU, a power supply with adjustable current strength, a heating element, a thermometer, a manometer and an ammeter. A liquid heated to a certain temperature under pressure is supplied by a pump to the tested regulator valve. The ECU analyzes the received data, compares it with the regulatory information in accordance with the technical documentation, giving recommendations on the suitability of the solenoid valve and the technical condition of the GT as a whole.

#### Literature

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### **ОСОБЛИВОСТІ ОПЕРАТИВНОГО КОНТРОЛЮ ВИТРАТИ ПАЛИВА ТА ПАРАМЕТРІВ ТЕХНІЧНОГО СТАНУ ВАНТАЖНИХ ТРАНСПОРТНИХ ЗАСОБІВ В ЕКСПЛУАТАЦІЇ**

Практика експлуатації вантажних транспортних засобів (ТЗ) вимагає забезпечення раціональної витрати палива та параметрів їх технічного стану з урахуванням відповідних умов експлуатації. Процеси визначення і отримання параметрів витрати палива, технічного стану та швидкості руху транспортних засобів в одночасній реалізації за умовами експлуатації, режимами роботи операторів тощо можуть базуватись на застосуванні засобів інформаційних систем оперативного контролю ТЗ.