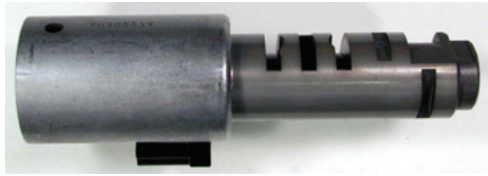


# Electromagnetic Linear Solenoid for Direct Clutch Pressure Control

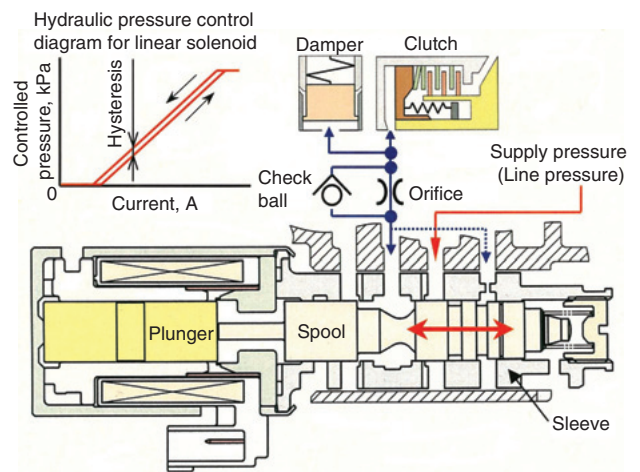


Recent vehicles with automatic transmission (AT) require a multi-staged AT, which can ensure optimum gear ratios at all times from start to high-speed drive, in order to realize attractive drive including fuel efficiency and power performance.

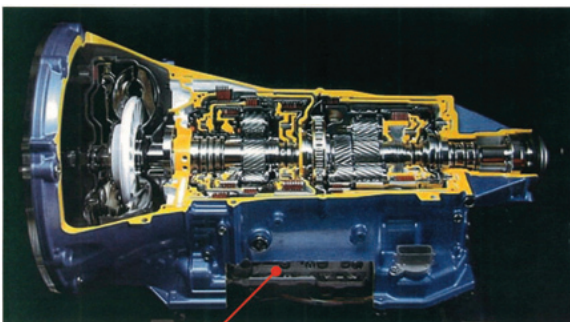
For the world first 8-speed AT of a domestic high class vehicle, JTEKT has developed and commercialized a linear solenoid which can accurately and directly control higher clutch fluid pressure of shift change.

## Features

- 1) High pressure control  
High electromagnetic force has been achieved with reduction of magnetism loss through utilization of a plunger with non-magnetic plating as the thin film type plain bearing and the air gap.
- 2) High precision hydraulic control  
By ensuring smooth action of sliding part surfaces with friction-reduction technology, hydraulic pressure control with minimum hysteresis has been realized.
- 3) High flow rate discharge  
By the use of high electromagnetic force design and spool structure for reduction of flow force, change of controlling pressure in response to fluid flow in and out to the clutch during shift change has been minimized.



## Contribution to AT Vehicles

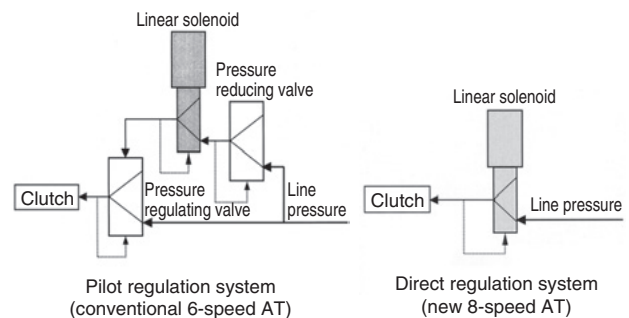


Valve body: incorporating 4 linear solenoids made by JTEKT

8-speed AT installed in domestic high class vehicle

- 2) Down-sizing of AT and improved fuel efficiency  
In addition to reduction of component parts and 8-speed AT adoption, the linear solenoid which can directly control the clutch fluid pressure simplifies drastically the fluid pressure circuit, removing the pressure reducing valve and the pressure regulating valve.
- As this solenoid makes it possible to build an 8-speed AT almost as compact as the conventional 6-speed AT, it contributes to improvement in fuel efficiency.

- 1) Smooth and refined drive  
The linear solenoid that can accurately and directly control the clutch fluid pressure contributes to relief of shift shock and shortening of shift response time.



(Electronics Engineering Department 2, Steering System Operations Headquarters)