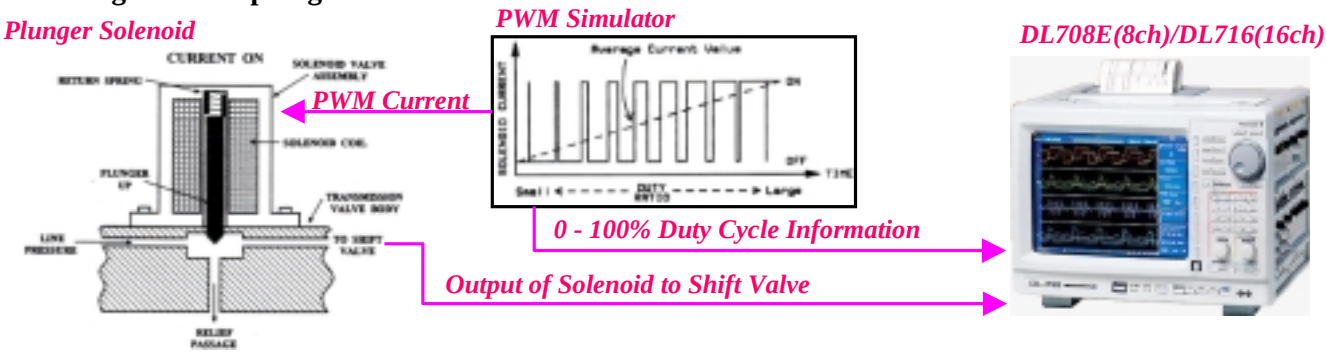
Testing Solenoids Used In Automatic Transmissions

[Application]

The solenoid is made up of fine copper wire wound around a thin-walled cylindrical form. The fluid control needle (the plunger) is a smooth sliding fit in the cylinder and, with no current applied to the coil, is held firmly against the pressure relief port by the return spring. Applying current to the solenoid pulls the plunger into the cylinder against the spring pressure and fluid passed through the relief passage. This reduces the fluid pressure in the system. In an automatic transmissions using electronic controls, the fluid pressure is controlled by pulsing the solenoid on and off rapidly using PWM (pulse width modulation). Testing the plunger involves monitoring the output of pressure to shift valves as the result of supplying a PWM signal to the plunger solenoid.



[Solution Features]

The Yokogawa Model DL708E(Eight-Channel)/DL716(16-Channel) provides the following solution for this application :

1. Real Time X-Y Display

Testing the solenoid plunger involves applying a PWM current to the solenoid, varying the duty cycle from 0% to 100% and back to 0% again. Monitoring the PWM current and measuring the pressure output from the solenoid is performed and graphed in an X-Y form by the DL708E.

2. Marker and/or Cursor Measurements in the X-Y Display Mode

In the X-Y mode, the duty cycle and pressure output measurements can be analyzed with the markers and cursors.