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## Axle Test Rig

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### Block Programming and Real-Time Testing

This test rig is an example of DTE's advanced control capability. This rig has the following features:

- Two 35 Kip Actuators
- Two 28 Kip Actuators
- 75GPM hydraulic power unit
- Two 80 GPM control manifolds
- 4 channels of closed loop control
- 12 channels of data acquisition

### Control system

This 4-channel real time digital control system has the following capabilities:

- Block cycle programming
- Iteration to compensate for a non-linear transfer function
- Play-back of RPC® and OTF® files
- 12 additional channels of strain-gage data acquisition
- Full rig control with integrated HPS and HCM
- Amplitude control

### Loading system

Standard fatigue rated actuators have a relatively soft piston rod that is chrome plated. The chrome plating has a surface hardness of 58-62 Rockwell C. High frequency applications often wear the chrome out quickly, because the base material is too soft. DTE has worked with advanced seal manufacturers to develop stringent surface finish requirements that will allow the use of harder surface finishes (70-74 Rockwell C for the black coating, and 86-90 Rockwell C for



the tungsten carbide coating). These finishes, combined with the harder materials and Teflon seals, result in an actuator that has an extremely long life.

The fatigue rated actuators in this project use chrome plated piston rods- DTE's standard design. Alternative materials available from DTE are; stainless steel for applications requiring corrosion resistance, proprietary black rod coating that provides longer life than standard chrome rods, and the heavy-duty tungsten-carbide rod coating for extremely demanding applications.