

APPLICATION STORY

Ogura Innovative Applications

Hydraulic control systems often use a spool valve for proportional control of a hydraulic cylinder. Ogura has worked with several OEM's to develop an actuator drive system that can remotely control, through a hand held operator, the position of a spool valve. The system allows the operator to get down from the cab of his heavy equipment and observe the work being done for better control of the process. An example would be to control the position of a hydraulically operated lifting boom.

If the remote operator fails for any reason, the actuator control system allows the actuator drive clutch to uncouple the motor from the spool valve drive system. This arrangement allows a spring mechanism to return the position of the spool to a safe "home position" or "zero speed position". In the event it no longer senses the operator, this will prevent the boom from ripping a hole in the side of a building and possibly causing the building to collapse, trapping all the workers inside.

The heart of the control system is an electric actuator which consists of a small DC motor driving a lead screw and nut that is connected to the valve

spool. The small DC motor has an Ogura FMC10 model clutch mounted on its output shaft. The clutch drives through a high ratio gear train, which drives the lead screw. The clutch is engaged all the time. The nut on the lead screw can run back and forth along the length of the lead screw depending if the motor runs CW or CCW. The nut is coupled to the positioning shaft, which connects either directly to the spool valve, or for retrofitting an existing application, it can be

clamped to the manual operator lever of a valve already used in the application. In the event of lost or conflicting signals from the remote operator, power to the actuator is terminated, the clutch then disengages the motor from the gear train allowing the return spring to move the spool valve to its home position.

Without the clutch, the spring would have to back drive the permanent magnet D.C. motor,

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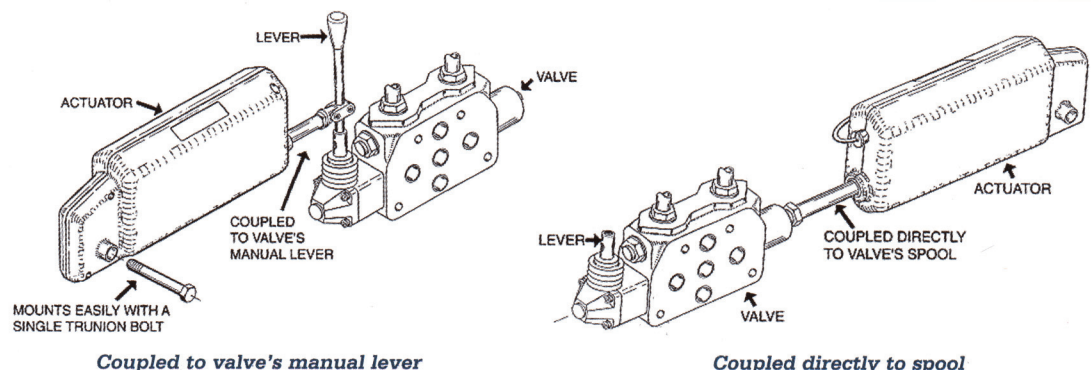


Typical truck with boom

which is impossible because of the high ratio.

The Ogura FMC10 is compact in size, (less than 35mm diameter x 27.9mm length), and rated at 8 in lbs. of torque. Ogura also offers clutches of this design for higher torque applications.

Other applications, which also require a similar "disconnect for manual control" option, include large ball or butterfly valves that are used in large process control pipe systems and automatic door systems on elevators, railcars, and buildings and throttle control actuators for large offroad equipment engines and marine engines.



Coupled to valve's manual lever

Coupled directly to spool