

# TRAINING

## INSTALLING AND COMMISSIONING SERVOVALVES AND SERVO-PROPORTIONAL VALVES

A practical hands-on course to help you reduce expensive down-time and repair costs in your hydraulic plant



Machine downtime can have a serious impact on your costs, your customers and your business reputation. Greater in-house expertise can increase the productivity and efficiency of your equipment and can speed up the diagnosis of any problems which arise.

Moog and the National Fluid Power Centre (NFPC) have formed a professional training partnership to provide hands-on training for those involved in the installation and commissioning of servo controlled systems.

### Why you should attend

- Achieve maximum performance and reliability from the Moog equipment fitted to your systems.
- Understand the particular hazards and safety implications associated with incorrect configuration, installation, commissioning, control and management of closed-loop electro-hydraulic systems.
- Learn how to trouble shoot, repair and re-commission your open-loop and closed-loop electro-hydraulic control systems.

### Who should attend

The course is aimed at engineers who already have some experience in commissioning hydraulic equipment, but now need to improve their skills in order to work effectively, efficiently and safely with open-loop and closed-loop electro-hydraulic systems.

This course is particularly suited to engineers working in the following industries: Test and Simulation, Offshore, Metals, Plastic Injection Moulding, Power Generation, Paper Production and any other application utilising servovalves, servo-proportional valves and high response proportional valves.

The specialised nature of this course requires each candidate to have a good knowledge of all aspects of conventional hydraulic systems (valves, prime movers, contamination control and circuit implementation). Prospective attendees will be asked to complete a short pre-course questionnaire - the purpose of which is to make sure that the course is suitable for each candidate's needs. Contact either the NFPC or Moog for a copy.

**Course Duration:** 2 days

### Dates/Location

28th and 29th April 2009  
21st and 22nd July 2009  
20th and 21st October 2009  
26 – 27 January 2010

All courses will be delivered at the NFPC, Carlton Road, Worksop, Nottinghamshire S81 7HP  
[www.nfpc.co.uk](http://www.nfpc.co.uk)

**Cost per candidate:** £999+vat

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## Course Outline

This course has been specifically designed to meet the needs of practitioners. Central to the course is a series of practical exercises dealing with the particular issues which are regularly encountered when installing and commissioning servo valves and servo-proportional valves.

Candidates will receive a comprehensive set of course notes, Moog technical literature and a Certificate of Attendance.

The first day of the course is spent in the classroom learning about the practicalities and implementation of closed-loop control systems. The second day of the course is spent in the training laboratory applying the techniques learnt on the first day.

The course will cover the following key areas: -

- Introduction to servovalves and servo-proportional valves, the differences between them and what they do in the circuits. Hydraulic symbols (ISO, DIN and ANSI versions).
- Servovalve installation requirements: holding down bolt torque limitations, air bleeds, pilot oil supply and drain configurations.
- Examination of the real hard facts about contamination, fluid cleanliness requirements and flushing procedures.
- Overview of open-loop and closed-loop control, Proportional (P), Integral (I) and Derivative (D) control algorithms, feed-forward techniques.
- Proprietary closed-loop controllers (analogue and digital), software implementation of control algorithms.
- Command signal types and sources.
- Feedback transducers (position, velocity, force), recognising faults in feedback circuits.
- Working safely with automatically controlled machinery and systems incorporating hydro-pneumatic accumulators.

## Gain practical fault finding knowledge

- Cable types, cable routes, connections, earthing, screening and noise.
- Pilot stage filters and nozzle blockage.
- Pilot pressure and drain pressure limitations.
- "Laquering", internal wear, internal corrosion.
- High and low temperature operation, the effects of entrained air.
- Using multimeters, calibrators, dataloggers and servovalve field test adaptors.
- Servovalve null adjustment.

## Practical Exercises

*Use Moog valves and controllers in the NFPC training laboratory to learn how to:*

- Configure and install a servovalve.
- Wire up a servovalve for open-loop control.
- Commission a closed-loop position control system using a servo-proportional valve and analogue (P) servoamplifier.
- Fault find using a servovalve checker (field test adaptor).

## Course Objectives

*On completion of this course, the delegate will have a greater understanding of:*

- Correct procedures for handling servovalves and servo-proportional valves (for maximum safety and reliability).
- Techniques of electro-hydraulic control in open-loop and closed-loop systems.
- Safe and effective installation and commissioning procedures for the valves and their associated electronic.
- Special techniques for logical troubleshooting and rapid fault diagnosis.
- How to maximise the benefit of contacting the Moog technical support team.

For more information about us visit  
[www.moog.co.uk/industrial](http://www.moog.co.uk/industrial)

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