Hydraulics Technology 3: Advanced Hydraulics and Electro-Hydraulics

SKILL 14A: EXPLORING THE PRESSURE REDUCING VALVE

Name	Class/Period	Date

1. Overview

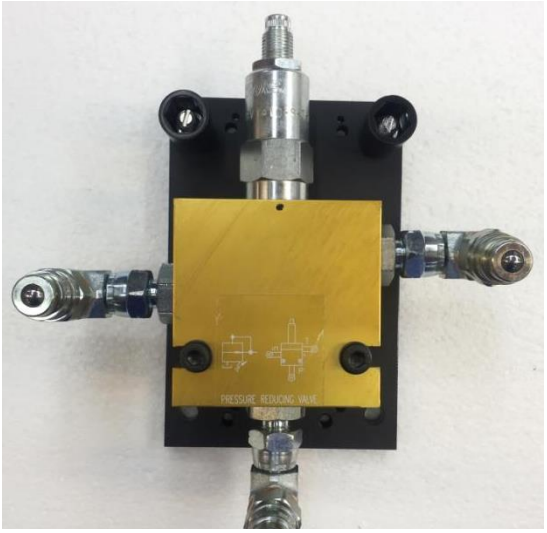
In this Skill Drill, you will implement a pressure reducing valve into a hydraulic circuit and observe the behavior of the system when you adjust the valve setting.

2. Performance Objective

- Implement a pressure reducing valve into a hydraulic system.

3. Required Materials

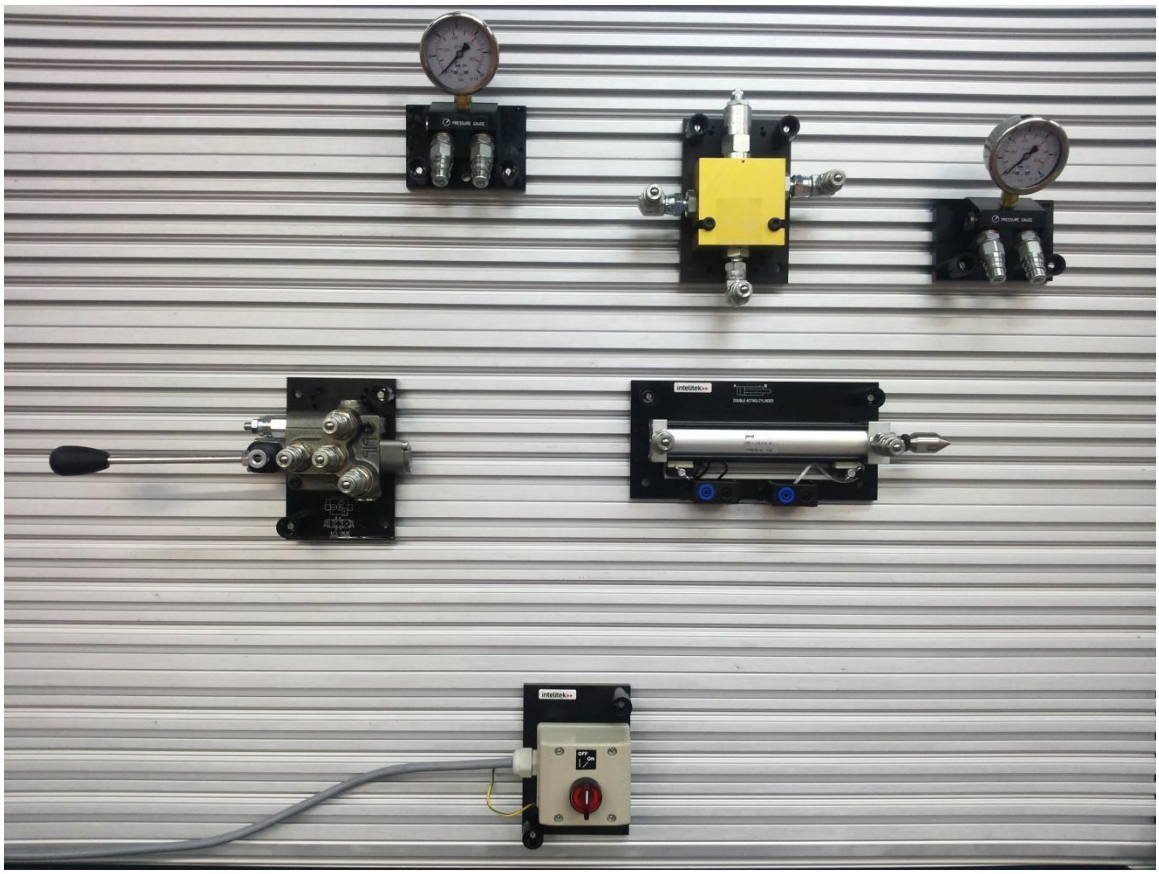
- JMTS panel
- Oil tray
- Hydraulic power pack
- T-connector
- Hoses of different lengths
- 4/3 closed-center valve
- Two pressure gauges
- Pressure reducing valve
- Double-acting cylinder
- Rags or paper towels
- Hex key set
- Wrench set
- Safety glasses
- Hex driver for mounting components



In this Skill Drill, you will use the pressure reducing valve for the first time. Like the pressure relief valve, its setting is adjusted by first unlocking the adjustment knob's nut using a wrench, adjusting the knob setting using a hex key, and then locking the nut again with a wrench.

4. Panel Setup

Secure the components to the panel as shown:



5. Inventory and Safety

Before beginning the Skill Drill, review this checklist and mark off each item as you complete it.

- ☐ All hardware components required for this Skill Drill are mounted on the panel.
- ☐ The hardware is mounted securely to the panel.
- ☐ The power pack is off, and the pressure gauge reads zero.
- ☐ You are wearing safety glasses.
- ☐ Hands, hair, and clothing are securely away from the work area of any moving parts.
- ☐ You are standing an arm's length away from the panel.
- ☐ The work area is clean and devoid of food or drink.

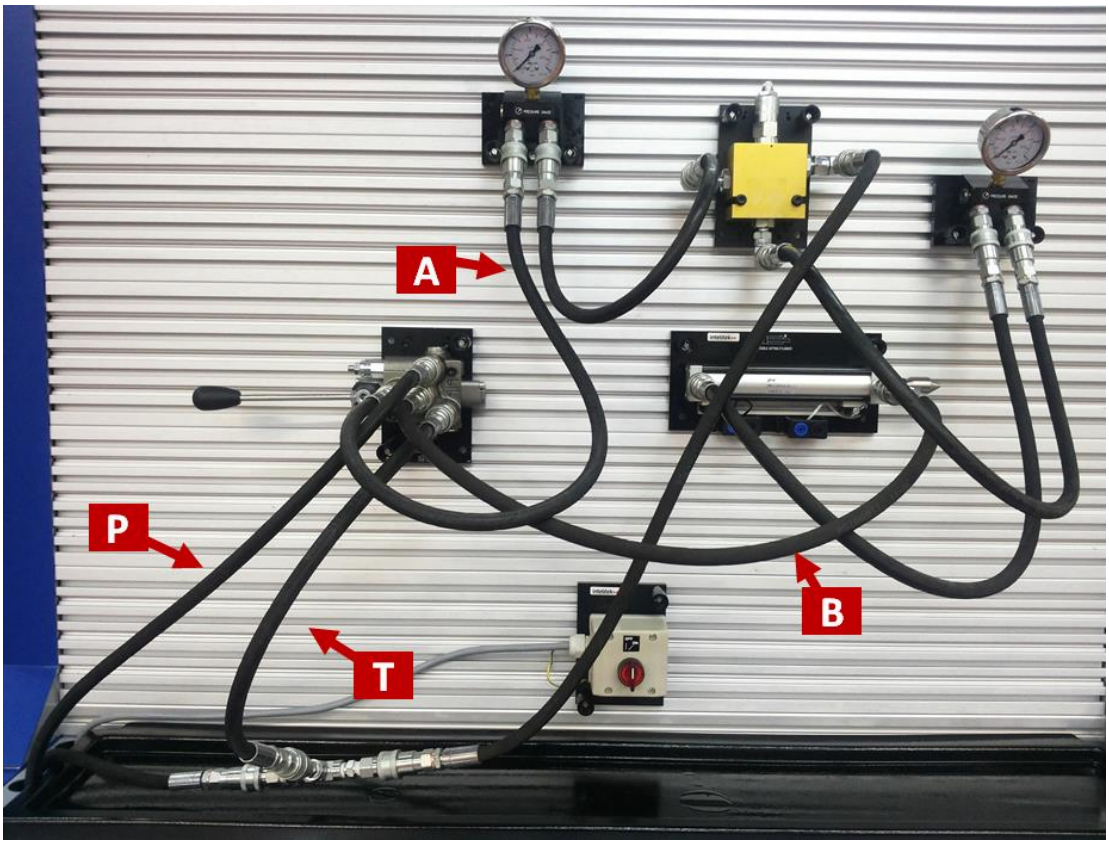
⃠ *Warning: Oil may leak from components and hoses. Be aware of oil leaking after disconnecting hoses from components. Do not get oil on your clothing!*

6. Skill Drill

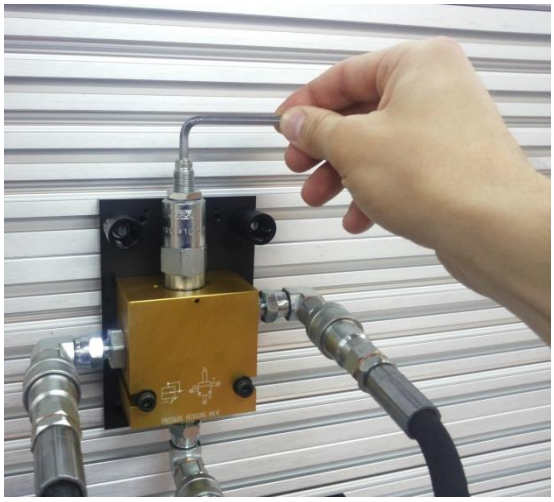
Procedure

Perform the following steps:

1. Complete the circuit's hydraulic connections:
    - Connect the pressure-out port of the hydraulic power pack to port P of the 4/3 closed-center valve.
    - Connect port A of the 4/3 valve to the left-side port of the left pressure gauge.
    - Connect the right-side port of the left pressure gauge to the In (A) port of the pressure reducing valve.
    - Connect port P of the pressure reducing valve to either port of the right pressure gauge.
    - Connect the right pressure gauge's other port to the rear port of the cylinder.
    - Connect port B of the 4/3 valve to the forward port of the cylinder.
    - Using a T-connector, connect port T of the 4/3 valve to port T of the pressure reducing valve and to the power pack's tank inlet port.



2. Turn the power pack on.
3. Shift the lever of the 4/3 valve back and forth through all three positions to extend and retract the cylinder. Keep your eye on the pressure gauges throughout and note the values.
4. Unlock the pressure gauge adjustment knob with a wrench. Adjust the relief setting using a hex key. Lock the knob after making the adjustment.



5. Shift the lever of the 4/3 valve back and forth through all three positions to extend and retract the cylinder and note the values on the pressure gauges. Try this several times for different pressure reducing valve settings. Note and share your observations.

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6. Turn the power pack off. Switch the hoses connected to the pressure reducing valve's In (A) and P ports.
7. Turn the power pack on and repeat steps 3-5. Does this make any difference to the operation of the circuit and/or the pressure reducing valve? Note and share your observations.

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8. Demonstrate your circuit's operation to your teacher and share your observations.
9. Return the pressure reducing valve's adjustment knob to its most-closed position.
10. Turn the power pack off.

7. Authentic Skill Assessment

Have your instructor verify that your work meets the requirements in the Performance Objectives and sign below. Place this Skill Drill Sheet in your Skills binder.

Instructor Signature	Date

8. Shutdown

Unless instructed otherwise by your teacher, review and complete each of the items on the checklist below.

- ☐ Switch off the power pump.
- ☐ Clean any oil spills using rags or paper towels.
- ☐ Disconnect all hoses and put them away.
- ☐ Remove the components mounted on the JMTS panel and store them securely unless instructed otherwise by your teacher.
- ☐ Check whether all materials required for this activity have been returned to their proper place at your lab station.