# 2 pump system classroom exercise (hydraulic stand 1 to 4)

## Description of function:

* When operator manually operates the directional control valve in position 1 the piston in the cylinder shall move in positive direction.
* When the piston moves in positive direction, 2 pumps shall deliver oil to the system until the force on the piston is 500 kg.
* When the force on the piston exceeds 500 kg, only 1 pump shall deliver oil to the system.
* When operator manually operates directional control valve in position 2 the piston shall move in negative direction.
* When the piston moves in negative direction, 2 pumps shall deliver oil to the system.
* When the directional control valve is no operated, the system shall stop in the current position.
* Max. system pressure: 60 bar.

1. Draw the hydraulic circuit.
2. Connect the hydraulic system using the necessary components.
3. Set the system so the functionality is as described.

# Regeneration circuit classroom exercise (hydraulic stand 1 to 4)

## Description of function:

* When operator manually operates the directional control valve in position 1 the piston in the cylinder shall move in positive direction.
* When the piston moves in positive direction, it shall move with high speed and low power until the force on the piston is 500 kg.
* When the force on the piston exceeds 500 kg, it shall move with low speed and full power.
* When operator manually operates directional control valve in position 2 the piston shall move in negative direction.
* When the piston moves in negative direction it shall move with low speed.
* When the directional control valve is no operated, the system shall stop in the current position.
* Max. System pressure: 60 bar.

1. Draw the hydraulic circuit.
2. Connect the hydraulic system using the necessary components.
3. Set the system so the functionality is as described.

# Sequential laboratory exercise (hydraulic stand 3)

## Description of function:

* When operator manually operates the “Dead man switch” (directional control valve no 1) the pipe valve shall close and then the brake shall open.
* When the “Dead man switch” (direction control valve no 1) is not operated the brake shall apply and the pipe valve open.
* When operator manually operates the directional control valve no 2 in position 1 the load shall hoist.
* When operator manually operates the directional control valve no 2 in position 2 the load shall lower.
* When the directional control valve no 2 is no operated, the system shall stop in the current position.
* The load shall be secured against pressure loss (failsafe system)
* Max. system pressure: 60 bar.

1. Draw the hydraulic circuit.
2. Connect the hydraulic system using the necessary components.
3. Set the system so the functionality is as described.

# 2 pump laboratory exercise (hydraulic stand 1 or 4)

## Description of function:

* When operator manually operates the directional control valve no 1 in position 1 the pipe valve shall close.
* When operator manually operates the directional control valve no 1 in position 2 the pipe valve shall open.
* When the directional control valve no 1 is no operated, the pipe valve shall stop in the current position.
* When operator manually operates the directional control valve no 2 in position 1 the load shall hoist.
* When operator manually operates the directional control valve no 2 in position 2 the load shall lower.
* When the directional control valve no 2 is no operated, the load shall stop in the current position.
* Directional control valve no 1 shall be supplied from pump no 1.
* Max system pressure: 60 bar.
* Directional control valve no 2 shall be supplied from pump no 2.
* Max system pressure: 60 bar.
* The load shall be secured against pressure loss (failsafe system)
* Max. System pressure: 60 bar.

1. Draw the hydraulic circuit.
2. Connect the hydraulic system using the necessary components.
3. Set the system so the functionality is as described.