DEPARTMENT OF MECHANICAL ENGINEERING
17MECC93- HYDRAULICS AND PNEUMATIC SYSTEM LAB (UG)
STANDARD OPERATING PROCEDURE

Name of the Lab./facility	HYDRAULICS AND PNEUMATIC SYSTEM
Purpose	To impart practice in hydraulic circuit and pneumatic circuit, to apply the practical training by using trainer kit and to apply the skills to design a circuit for any application
Scope	To Undergo practical skill training in hydraulic system and toUndergo practical skill training in pneumatic system
Responsibility	Faculty Incharge, HOD/MECH

STANDARD OPERATING PROCEDURE FOR THE STUDY OF SPEED CONTROL CIRCUIT ON HYDRAULIC TRAINER

- Set relief valve pressure setting to zero
- Connect various hoses from supply and tank to the valve. Connect A & B ports to either side of actuator
- Turn motor on
- Keep the valve in neutral position (Position2)
- Increase relief valve pressure setting to 5 bar, observing the pressure gauge.
- Now the valve spool is moved to left or right to observe the movement of the piston rod in forward or reverse directions.

PRECAUTIONS TO BE FOLLOWED

- Do not conduct an experiment without the complete knowledge of its operating procedure.
- Wear tight fitting clothes and thick leather shoes.
- In case of any injury, use the FIRST AID KIT.
- Report any fault (or) damage in the equipment to inform the lab in charge.
- Use stop watches, thermometers and accessories carefully.
- Do not wear watches (or) bracelets while working in the equipment's.
- Do not remove safety guards or parts of any equipment.

RECORD TO BE MAINTAINED

- Laboratory Manual containing the experiments that can be performed with the equipment
- Maintenance Record

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STANDARD OPERATING PROCEDURE FOR STUDY OF SEQUENCING CIRCUIT ON HYDRAULIC TRAINER

- Arrange the components according to the circuit diagram
- Put valve 7 in neutral position.
- Start the pump and shift valve 7 towards right direction
- Observe the flow of oil towards cylinder 13 and sequence valve 8. The cylinder 23 extends however cylinder 12 does not move immediately. After sometime, valve 8 opens and cylinder 12 extend
- Shift valve 7 towards left direction. Observe that the retraction of cylinders 12 and 13 takes simultaneously.

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STANDARD OPERATING PROCEDURE FOR STUDY OF SYNCHRONIZING CIRCUIT ON HYDRAULIC TRAINER

- Switch on the three phase connection given to Induction motor
- Rotate pressure relief valve anticlockwise direction for two minutes
- By observing the pressure gauge of pressure line adjust pressure between 12 to 15 kgf/cm²
- Check oil level in tank to be full shown by indicator

PRECAUTIONS TO BE FOLLOWED

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- In case of any injury, use the FIRST AID KIT.
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STANDARD OPERATING PROCEDURE FOR STUDY OF REGENERATIVE CIRCUIT ON HYDRAULIC TRAINER

- Switch on the three phase connection given to Induction motor
- Rotate pressure relief valve anticlockwise direction for two minutes
- By observing the pressure gauge of pressure line adjust pressure between 12 to 15 kgf/cm²
- Check oil level in tank to be full shown by indicator

PRECAUTIONS TO BE FOLLOWED

- Do not conduct an experiment without the complete knowledge of its operating procedure.
- Wear tight fitting clothes and thick leather shoes. In case of any injury, use the FIRST AID KIT.
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STANDARD OPERATING PROCEDURE FOR COUNTERBALANCING CIRCUIT ON HYDRAULIC TRAINER

- Switch on the three phase connection given to Induction motor
- Rotate pressure relief valve anticlockwise direction for two minutes
- By observing the pressure gauge of pressure line adjust pressure between 12 to 15kgf/cm²
- Check oil level in tank to be full shown by indicator

PRECAUTIONS TO BE FOLLOWED

- Do not conduct an experiment without the complete knowledge of its operating procedure.
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- In case of any injury, use the FIRST AID KIT.
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STANDARD OPERATING PROCEDURE FOR THE STUDY OF ISO/GIS FLUID POWER SYMBOLS

- To study the ISO/GIS fluid power symbols
- To study miscellaneous fluids drawing elements
- To study the pressure control valves
- To study the specific fluids circuit elements
- To study about the flow control valves

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STANDARD OPERATING PROCEDURE FOR DESIGN AND ASSEMBLY OF HYDRAULIC / PNEUMATIC CIRCUIT

- Switch on the three phase connection given to Induction motor
- Rotate pressure relief valve anticlockwise direction for two minutes
- By observing the pressure gauge of pressure line adjust pressure between 12 to 15 kgf/cm²
- Check oil level in tank to be full shown by indicator
- Observe the reciprocating motion of double acting cylinder and hydraulic motor by varying the Pressure, using pressure knob.
- Observe the rotary motion of hydraulic motor

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STANDARD OPERATING PROCEDURE FOR SIMULATION OF PNEUMATIC LOGIC CIRCUITS

- To Ensure sufficient air pressure is available as input in the FRL unit.
- The connections are made as per the circuit diagram .
- The inlet port 1 of the 5/2 DCV (1) and 3/2 push button (2) is connected from the FRL unit.
- The outlet port 2 of the 5/2 DCV (1) and 3/2 push button (2) is connected to the two AND Gate AND Gate port is connected to pilot operated 5/2 DCV 5/2 DCV port is connected to blank end of double acting cylinder.
- The forward stroke occurs during the following condition

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