12hrs of total competition time.
1: (3hrs Machining – Centre Lathe)
2: (3hrs – Stainless Steel Tube Bending)
3: (3hrs – Fluid power - Pneumatics)
4: (3hrs – Laser Coupling/Shaft Alignment)

Skill Sets:

1: Machining - Centre Lathe:
The competitor will produce the part detail/s as per supplied blueprint/s *7, 1, 5, 8*
The material used for the challenge will be Cold Rolled Steel 2" to 3" in daimeter, there will be no digital readouts on the Centre Lathe's, dial indicators will be supplied for turning.

Tasks include:

- parallel turning
- shoulder turning
- taper turning
- undercutting
- internal boring
- tolerances ±0.001"

2: Stainless Steel Tube Bending:
With "Swagelok" tool's the competitor will produce the part detail/s as per supplied blueprint/s *7, 1, 5, 8*

The material used for the challenge will be stainless steel tubing with a diameter range of ¼" to 3/8".

Tasks include:

- Using the supplied blueprint/s the competitor will calculate the necessary lengths and allowances needed to produce the required part detail/s
- Preperation of given tubing for bending
- Bending of supplied Stainless Steel tubing to any the following angles:
  15°, 30°, 45°, 60°, 75°, 90°, 105°, 120°, 135°, 150°, 165° or 180°
- Perform the required hand tool operations to bend the supplied stainless steel tubing to the given specifications and tolerances
- Tolerances +/- 1/16"

3: Fluid Power – Pneumatics

Using the supplied pneumatic workstation ("Parker" components) the competitor will build a two or three cylinder Sequential or Cascade Pneumatic circuit to perform a required task[7, 1, 5, 8.]

Tasks include:

- creating
- drawing
- building
- troubleshooting
- using ANSI or ISO schematic symbols

4: Laser Coupling / Shaft Alignment

With a "Fixturlaser NXA Pro" the competitor will perform a Laser Shaft / Coupling Alignment including a Thermal Growth Offset calculation/s to the required tolerances for Rough & Precision alignment dependent on given R.P.M. [1,5,6, 7,8.]

Tasks include:

- pre-alignment checks
- rough alignment
- precision alignment
- proper use of alignment tools
- proper use of Laser Alignment equipment
- thermal growth calculation/s
- recording of required information