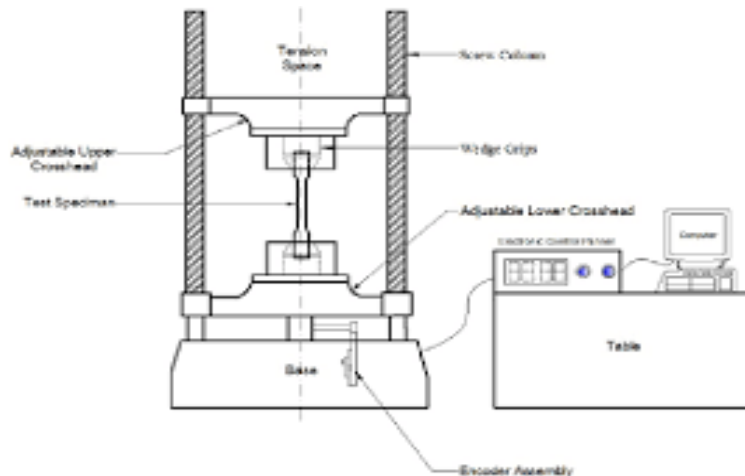


## **SHEAR TEST**

**Aim:-** To determine experimentally, the ultimate shear strength in double shear of mild steel rod.

**Apparatus used:-** Universal testing machine, Shear attachments, Vernier callipers.



**Theory :-** In direct shear test, the shearing stress is considered as uniformly distributed over the entire cross section. The shear force is applied by a suitable test rig, two different cases of shearing may arise, i.e. , single shear and double shear. In single shear shearing occurs across a single surface and in double shear shearing occurs across two surfaces. Knowledge of shear failure is important while designing any structures or machine components. Shear force causes the surface to go out of the alignment with each other and thus the material fails.

### **Procedure:-**

1. Insert the specimen in position and grip one end of the attachment in the upper portion and one end in the lower portion.
2. Switch on the main switch of universal testing machine machine
3. The drag indicator in contact with the main indicator.
4. Select the suitable range of loads and space the corresponding weight in the pendulum and balance it if necessary with the help of small balancing weights.
5. Operate (push) buttons for driving the motor to drive the pump.
6. Gradually move the head control level in left-hand direction till the specimen shears.
7. Down the load at which the specimen shears.
8. Stop the machine and remove the specimen

**Observation Table :-**

Diameter (mm)	Area of cross- section ( $A = \pi d^2/4$ )mm <sup>2</sup>	Failure load P (kg)	Double shear Strength= ( $P \times 9.81$ )/2A(N/mm <sup>2</sup> )		Percentage Error
			Actual Value	Entered Value	
5.91	27.42	1300	232.55	255	-9.65
5.95	27.79	1450	255.93	245	4.27
6	28.26	1500	260.35	220	15.50

**Average Double shear Strength= 249.61 N/mm<sup>2</sup>**

**Results:-** The shear test on mild steel specimen is found to be = 249.61 N/mm<sup>2</sup>