



SES's SARASWATI INSTITUTE OF TECHNOLOGY

Mechanical Department

Sub: Mechanical Engineering Drawing
Class: SYME- Div: A and B

Sub Code: 17305
Year: 2017-18

Assignment No. 01

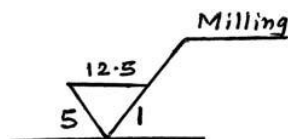
Draw conventional representation for the following:

1. Materials
 - a. Metals
 - b. Glass
 - c. Packing (Rubber)
 - d. Liquid
 - e. Concrete
2. Conventional breaks
 - a. Round section
 - b. Pipe or tubing
 - c. Wood rectangular section
 - d. I section and T Section
3. Shafts, bearings
 - a. Serrated shaft
 - b. Splined shaft
 - c. Bearing
 - d. Straight knurling
 - e. Diamond knurling
4. Joints
 - a. Socket joint
 - b. Reducing socket
 - c. Cross pipe joint
 - d. Gate valve
 - e. Globe valve
 - f. Check valve
 - g. External screw thread
 - h. Internal screw tread
5. Gears
 - a. Spur gear & Bevel gear
 - b. Worm gear & Rack and pinion gear
6. Springs
 - a. Compression spring with circular section
 - b. Compression spring with square section
 - c. Semi-elliptic leaf spring with eyelets or eyeholes
7. Counter sunk and counter bore
8. Sections
 - a. Half section
 - b. Offset section
 - c. Removed section & Revolved section

Assignment No. 02

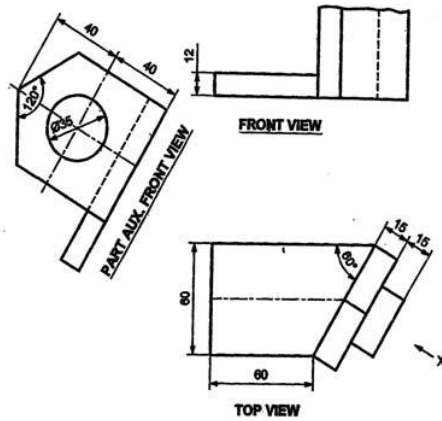
1. Draw following geometric characteristics controls.
 - a. Circularity
 - b. Angularity
 - c. Straightness
 - d. Profile of any surface
 - e. Flatness
 - f. Cylindricity
 - g. Line profile
 - h. Surface profile
 - i. Perpendicularity
 - j. Parallelism
 - k. Concentricity
 - l. Position
 - m. Symmetry
2. Draw following welding symbols
 - a. Spot weld
 - b. Single U butt weld
 - c. Single V butt weld
 - d. Convex Double V butt weld
 - e. Seam weld
 - f. Single – bevel butt weld
 - g. Single J. butt weld.
 - h. Fillet weld
 - i. Concave fillet weld
 - j. Flat single V butt weld
 - k. Single V butt weld with broad root face
 - l. Single U butt weld with broad root face
3. Two rectangular plates are to be welded with each other along the length. The thickness and length of both plates is 12 mm and 60 mm respectively. The plates are to be 'V' butt welded with convex counter. Prepare welding drawing.
4. With a neat sketch represent following terms used for limits and fits :
 - a. Basic size
 - b. Lower deviation of shaft
 - c. Tolerance zone of hole
 - d. Zero line
5. Show machining symbols to represent direction of lay for the following :
 - a. Approximately radial relative to the center of the surface.
 - b. Parallel to the plane of projection of the view.
6. The hole size is $\phi 20^{+0.018}_{-0.000}$ and shaft size is $\phi 20^{+0.023}_{+0.012}$. Determine the type of fit between hole and shaft.

7. State the meaning of the symbol shown in Fig.



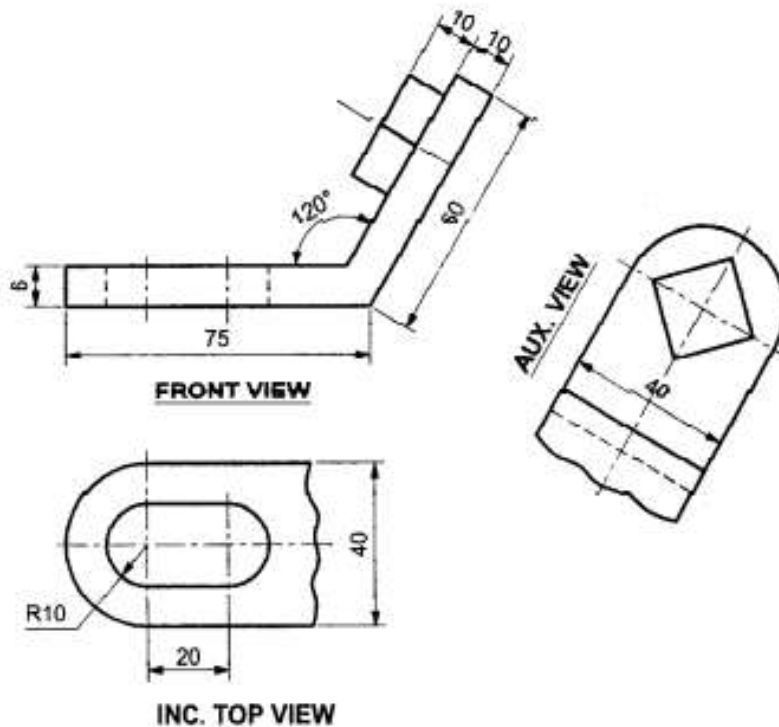
Assignment No. 03

1. Fig. shows incomplete front view, top view and part auxiliary front view complete the front view (use first angle method of projection).

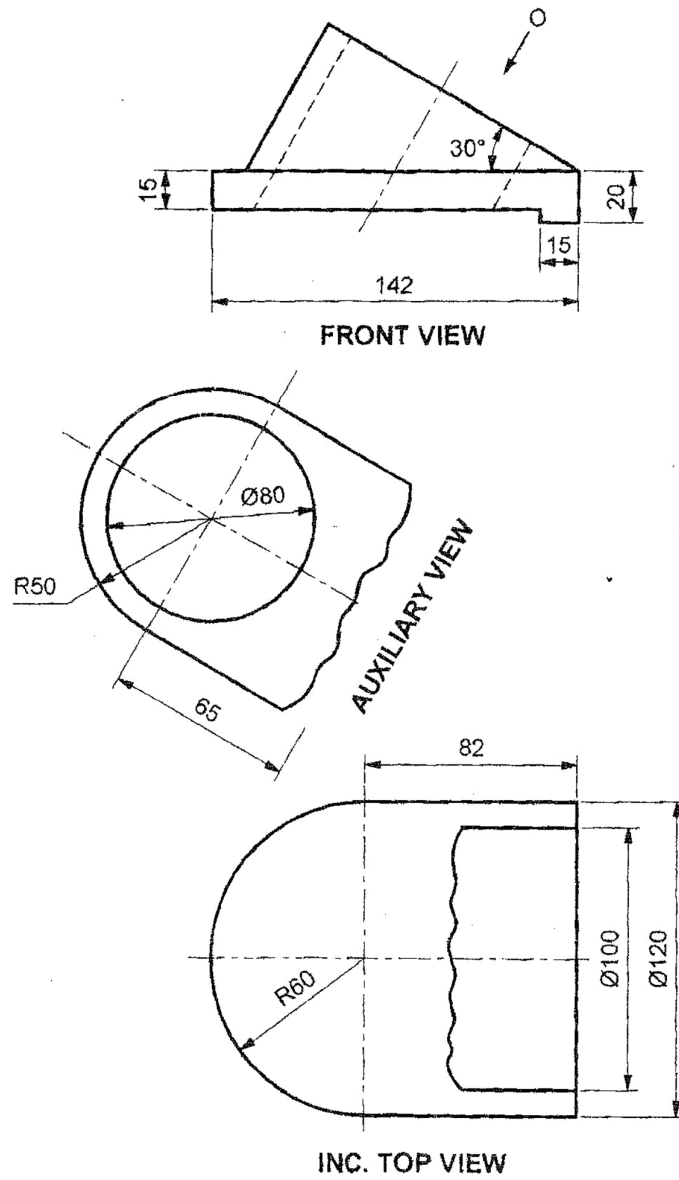


2.

Fig. No. 2 shows front view, incomplete top views and auxiliary view of an object. Redraw the given views and complete the top view (use first angle method of projection).



3. Figure shows the front view, incomplete top view and partial auxiliary view of a machine part. Using the given views complete the top view of the object.

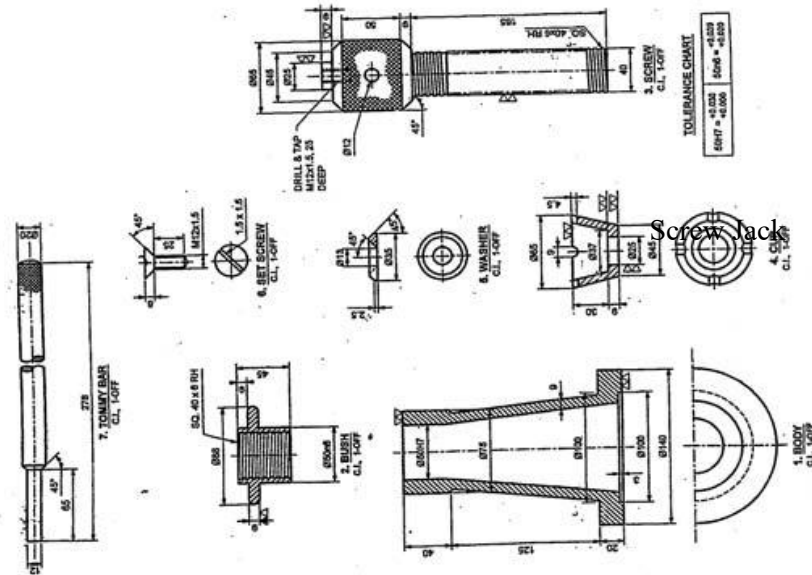


Assignment No. 04

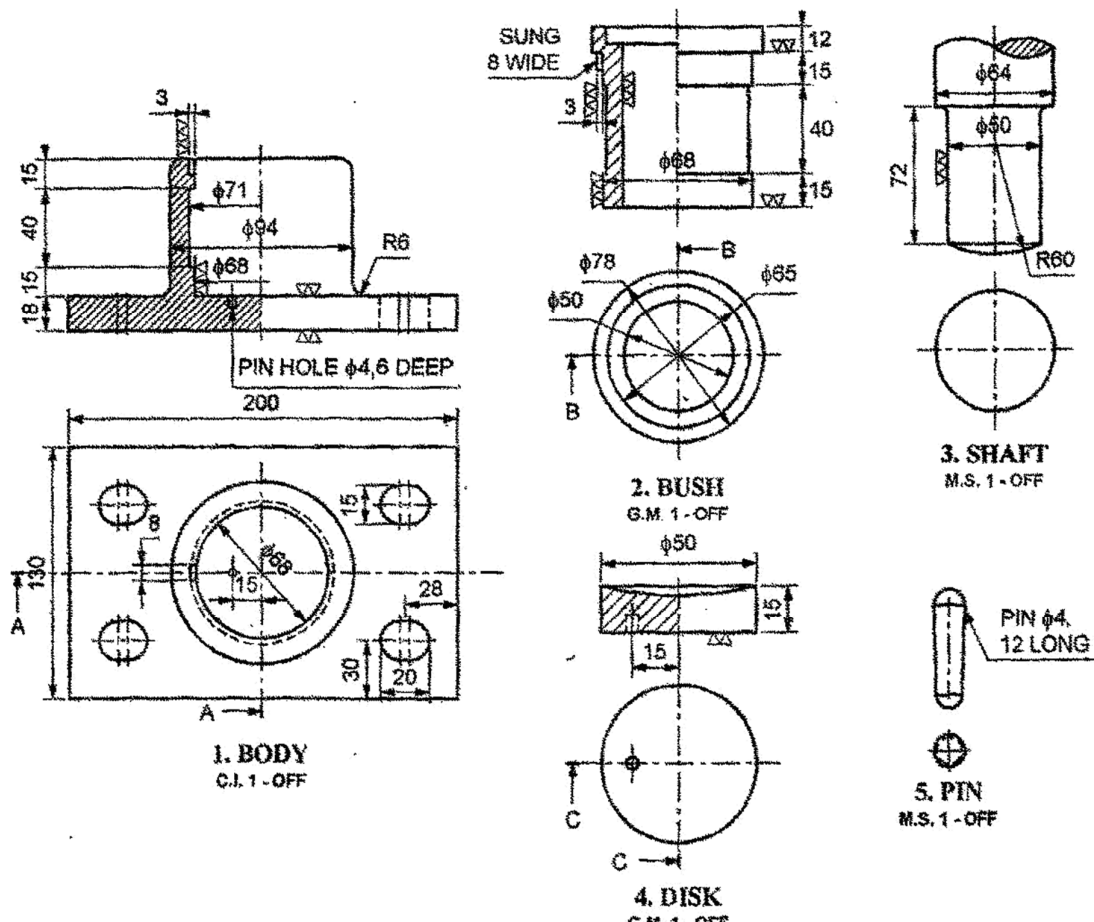
1. A cone base diameter 70 mm and axis height 80 mm is kept on the H.P. on its base. It is penetrated by horizontal cylinder of diameter 34 mm with its axis parallel to V.P. and intersecting the axis of the cone at a distance of 20 mm above the base of the cone. Draw the projections of solids showing curves of intersection. Length of cylinder is 100 mm.
2. A vertical cone, base 80 mm diameter and axis 100 mm long resting on H. P. is penetrated by a horizontal cylinder of 50 mm diameter. The axis of cylinder is 30 mm above the base of cone and 10 mm in front of the axis of cone. Draw the projections showing curves of intersection. Assume suitable length of penetrating cylinder.
3. A vertical cylinder of 60 mm diameter is penetrated by another cylinder of the same size. The axis of penetrating cylinder is parallel to both H.P. and V.P. and is 12 mm away from the axis of the vertical cylinder and in front of observer. Draw the projections of solids showing curves of intersection. Assume the axis length of vertical and horizontal cylinder 100 mm and 110 mm respectively.
4. A vertical cylinder of 80 mm diameter and 100 mm length is penetrated by another cylinder of same size. The axis of penetrating cylinder is parallel to H. P. and V. P. and 10 mm away from the axis of vertical cylinder. Draw the projections showing curves of intersection.
5. A vertical square prism base 50 mm side and height 90 mm is completely penetrated by a horizontal square prism, 35 mm side and axis length 90 mm so that their axes are 6 mm apart and in front of the observer. The axis of the horizontal prism is parallel to V.P. while the faces of both prisms are equally inclined to the V.P. Draw the projections of the prisms showing lines of intersections.
6. A vertical square prism of side of base 40 mm, axis height 75 mm has its faces equally inclined to V.P. A cylinder of diameter 40 mm and length 75 mm intersects the prism horizontally such that its axis bisects the axis of the prism. The plane containing the axes of both the solids is parallel to V.P. Draw the projections of solids showing curves of intersection.
7. A vertical square prism, side of base 35 mm and 80 mm long has its vertical faces equally inclined to V.P. It is penetrated by another square prism side of base 35 mm and axis length 80 mm so that, its axis is parallel to both H.P. and V.P. and is 10 mm in front of the axis of the vertical prism. The faces of the penetrating prism are equally inclined to H.P. Draw the projections of the prisms showing the lines of intersection.

Assignment No. 05

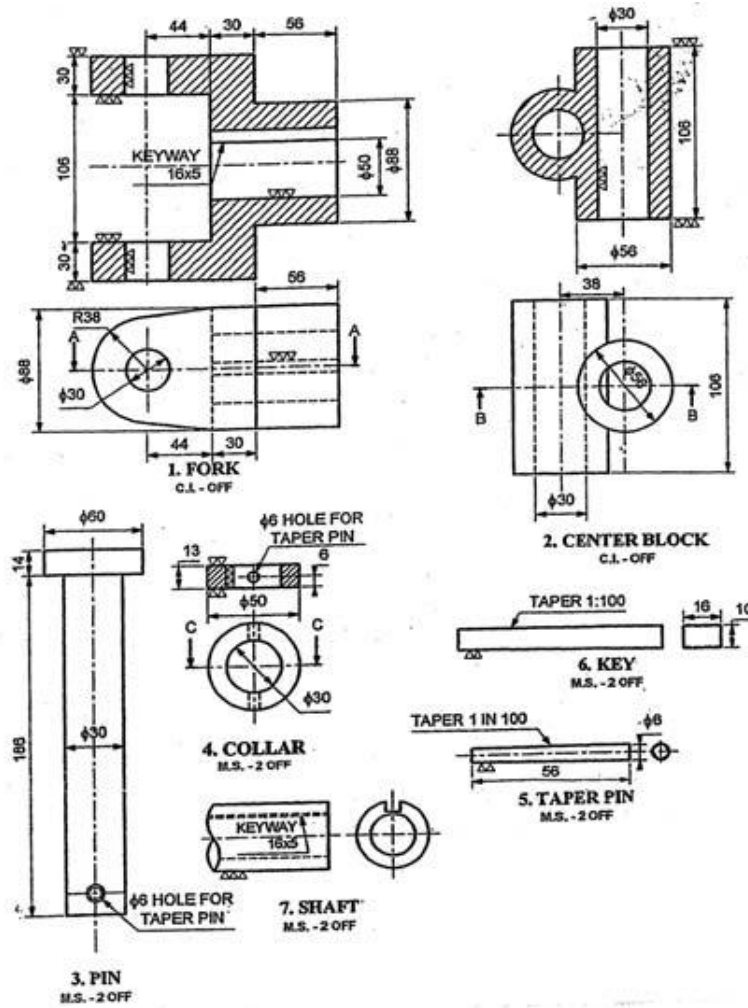
- Fig. shows details of screw jack. Draw sectional F.V. and T.V. of the assembly, prepare bill of material. Indicate type of fit.



- Figure 2 shows the details of foot step bearing. Draw the following views of assembly
 - Sectional front view.
 - Top view.
 - Prepare bill of materials.

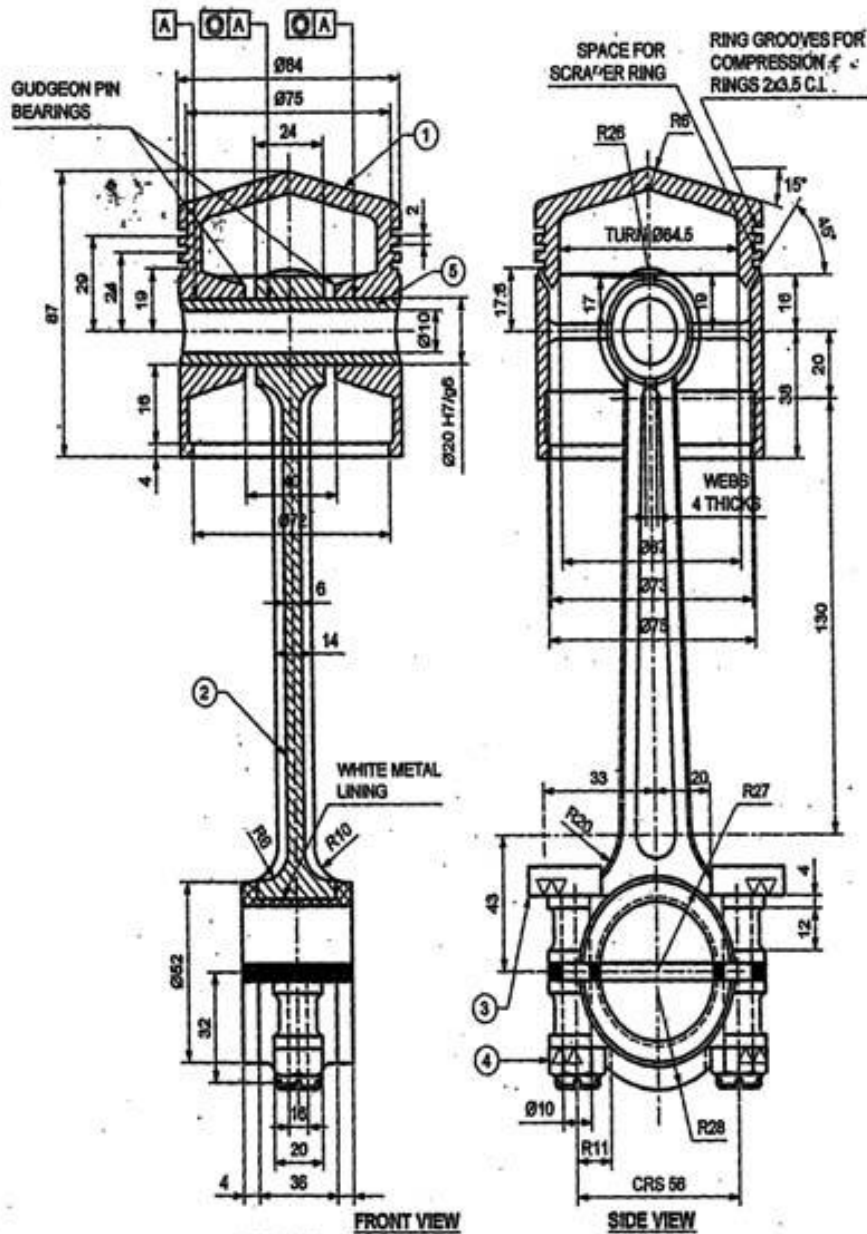


3. Fig. shows details of universal coupling. Draw sectional F.V., T.V. of the assembly and prepare bill of material. Indicate type of fit.



Assignment No. 06

1. Fig. shows the assembly of piston and connecting rod assembly. Draw the detail drawing of following parts.

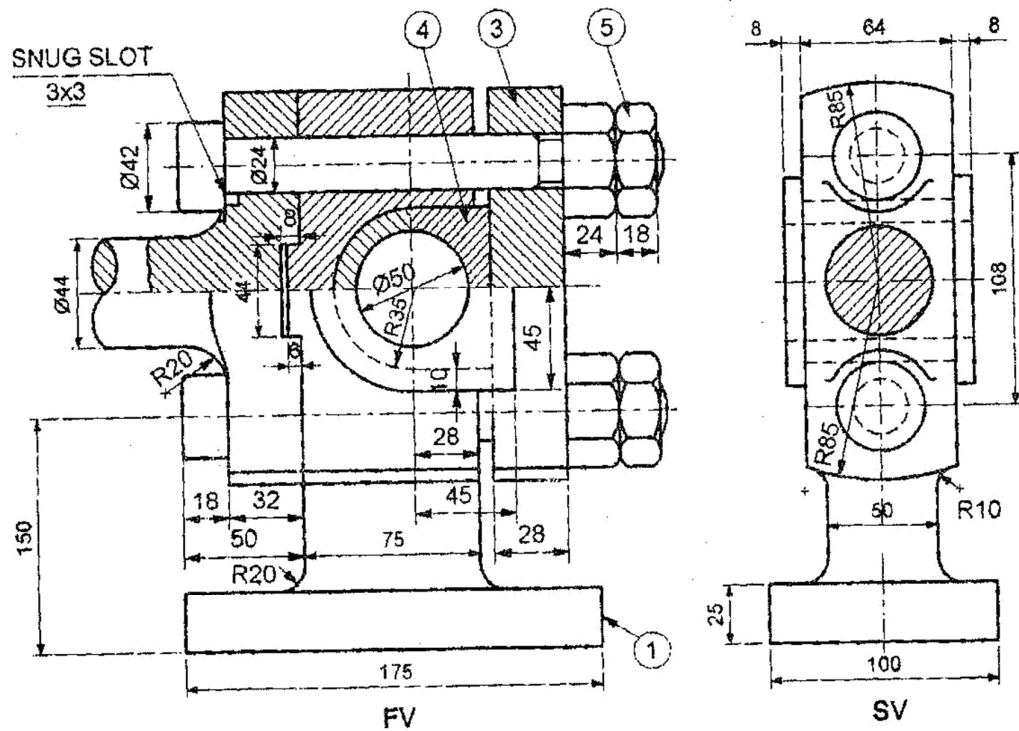


| PART NO. | PART NAME | MATL. | QTY. |
|----------|----------------|----------------|------|
| 1 | PISTON | ALLOY ALLOY | 1 |
| 2 | CONNECTING ROD | ALLOY STEEL | 1 |
| 3 | BIG-END BOLT | M.S. | 2 |
| 4 | CASTLE NUT | M.S. | 2 |
| 5 | GUDGEON PIN | HARDENED STEEL | 1 |

FIT CHART

| | |
|---------|---------------|
| 20H7/g6 | CLEARANCE FIT |
|---------|---------------|

2. Figure shows the half sectional front view and side view of an assembly of crosshead. Draw the part drawings of the components.



PART LIST

| PART NO. | PART NAME | MATL. | QTY. |
|----------|-----------------------|-------|------|
| 1 | CROSS BODY | C.I. | 1 |
| 2 | PISTON ROD END | C.I. | 1 |
| 3 | CAP | C.I. | 1 |
| 4 | BRASS (TWO HALVES) | G.M. | 1 |
| 5 | ROUND HEAD NUT & BOLT | M.S. | 2 |

Assembly of crosshead