

Production Graphics

Time: 5 weeks

Part A Due - 25th March
Part B Due - 1st May

Problem:

An engineering company has a support bearing for a shaft that drives large machinery. The shaft continually wears the support-bearing bush making it an oval shape and causing the shaft to vibrate. Therefore the support bearing often has to be replaced. Problems arise because:

- Replacement is difficult as the shaft must be completely removed from all other machinery parts, and
- The entire support bracket needs to be replaced as it is a one piece item.

Brief:

Design new bearing support that has a cap that can be bolted to the support base it must include a 5mm brass bearing that can be replaced.

Note: this method only needs the 5mm brass bearings to be replaced and not the whole shaft support bracket or the bearing cap.

Specifications:

- The bearing cap must be held by two or more 12mm hexagonal head studs
- The base section must remain the same so it will fit the existing machinery
- The design is to have a 5mm brass bearing
- The bearing cap must be strong but not bulky therefore it is to have ribs
- All corners must have fillets – this gives added strength in the corners

Task A: Research/Investigate: Hand out of Shaft Support Bracket to be supplied.

- Draw a scatter graph of 'Shaft Support bracket' giving all details and requirements.
- Sketch at least two draft designs that could be used for the support bearing. Add comments that state: plus, minus or interesting points of the bearing and cap.
- From the sketches and comments, draw a neat sketch of each component of your final design showing all dimensions. Note: the sketches with dimensions should be sufficient to give to any drafts person to draw the object.
- Draw a neat pictorial sketch of the assembled shaft support.

Task B: Assembly drawing

Draw *a complete assembly drawing of the support bearing*. This must include: Draw a 3D CAD model of the original 'Shaft Support Bracket'

- Draw each part of the shaft support using inventor
- Create orthographic projections: Top and Front views of all components with dimensions.
- Create an assembly drawing, with all components assembled: Front view and an assembled sectional end view on centre line A-A (see original drawing).
- Create a parts list.

IDENTIFIER: 2

Marking Criteria

Knowledge & Understanding

| Area of Study Criteria | | A Accurate and comprehensive | B Substantial | C Basic | D Restricted | E Very Restricted |
|------------------------|---|---------------------------------|------------------|------------|-----------------|----------------------|
| A | pictorial sketch of the assembled shaft | | | | | |
| B | inventor parts of the shaft support | | | | | |
| B | Top and Front views of all components with dimensions | | | | | |
| B | parts list | | | | | |
| Result | | | | | | |

Reasoning

| Area of Study Criteria | | A Independent, Initiative and consistent, accurate | B Reasonably Proficient | C Reasonable ability and success | D Restricted ability, little success | E very limited ability, little success |
|------------------------|--|---|----------------------------|-------------------------------------|---|---|
| A | scatter graph | | | | | |
| A | two draft designs | | | | | |
| A | plus, minus or interesting | | | | | |
| A | sketches of each component with dimensions | | | | | |
| B | assembly drawings all parts | | | | | |
| B | Assembly: Front and sectional end | | | | | |
| Result | | | | | | |

Presentation

| Area of Study Criteria | | A Very High quality | B High quality | C Variable in Quality | D Lacking quality | E Poor quality |
|------------------------|---|------------------------|-------------------|--------------------------|----------------------|-------------------|
| A | Presentation of sketches & comments | | | | | |
| B | Drawing presentations: orthographic and 3D Models | | | | | |
| B | Drawing standards | | | | | |
| Result | | | | | | |