Model a spur pinion gear shaft with square drive end and detail it on an A3 drawing

Software: PTC Creo

Task statement

Create a solid part model and an associated A3 detail drawing of a spur pinion gear shaft with a square drive end and a center hole. Work in millimetres. Name the part file creo-ex-13.prt and the drawing creo-ex-13.drw.

The shaft is a single turned part, 92 long overall, built on one axis. From the left end:

- Journal: Ø15, 13 long.
- Hub: Ø23, 14 long.
- Spur gear: 40 outside diameter, 31 root diameter, 15 face width. C1 chamfers on the tooth edges.
- Second hub: Ø23. The span from the start of the first hub to the end of this hub is 47.
- Right shaft: Ø15 to the right end. C1.5 chamfer at the end face.

Add an R3 fillet where each hub meets the gear root. Cut a square drive on the last 16 of the right end, 12 across the flats, with a 2 dimension at the start of the flats. Add a 60° center hole to KS B 0410, type A, size 2, in the right end face.

Model the gear teeth evenly spaced around the shaft axis on a Ø36 pitch circle. Size the tooth form with these values:

- A tooth tip width of 1.2.
- R10 flank arcs.
- A separate dimension of 4 at the tooth.

Produce a drawing of the part on an A3 sheet with these views:

- A front view with the axial dimensions 13, 14, 15, 47, 16 and 92, the diameters 15, 23, 40, 23 and 15, and the 2 dimension at the square drive.
- A full longitudinal section view, hatched, showing the 31 root diameter, R3 and C1.5.
- An end view showing the tooth form (R10, 4 and 1.2) and the 12 square across flats.
- An isometric shaded view.

Annotate C1 on the gear and add the center hole note "KS B 0410 60° A 2,".

Rubrics

- **R1:** The model shall be a single solid part 92 mm long overall along one axis.
- **R2:** The model shall have Ø15 shaft sections at both ends, with a left journal length of 13 mm.
- **R3:** The model shall have Ø23 hub sections on both sides of the gear, with the first hub 14 mm long and a 47 mm span from the start of the first hub to the end of the second hub.
- **R4:** The model shall have a spur gear 15 mm wide with a 40 mm outside diameter and a 31 mm root diameter, with teeth evenly spaced around the shaft axis.
- **R5:** The model shall have C1 chamfers on the gear tooth edges.
- **R6:** The model shall have R3 fillets where the hubs meet the gear.
- **R7:** The model shall have a square drive 12 mm across flats extending 16 mm from the right end.
- **R8:** The model shall have a C1.5 chamfer on the right end and a center hole in the right end face.
- **R9:** The drawing shall contain a front view, a hatched longitudinal section view, an end view showing the

teeth and an isometric view.

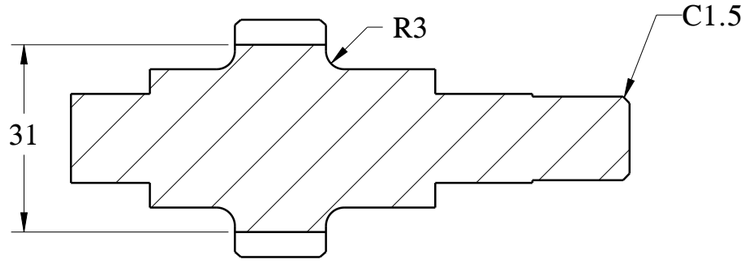
- **R10:** The drawing shall dimension the lengths 13, 14, 15, 47, 16 and 92.
- **R11:** The drawing shall dimension the diameters 15, 23 and 40 in the front view and 31 in the section view.
- **R12:** The drawing shall annotate R3, C1, C1.5, R10, 4, 1.2, 2 and 12.
- **R13:** The drawing shall carry the center hole note "KS B 0410 60° A 2,".
- **R14:** The drawing shall be on an A3 sheet.
- **R15:** The drawing shall be file creo-ex-13.drw, referencing the part file creo-ex-13.prt.

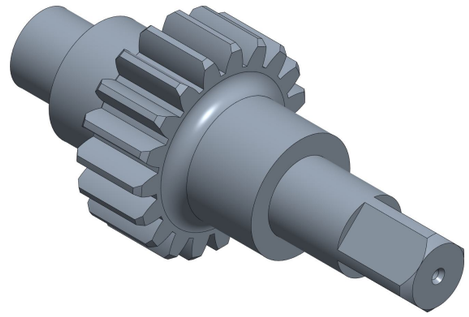
Input files

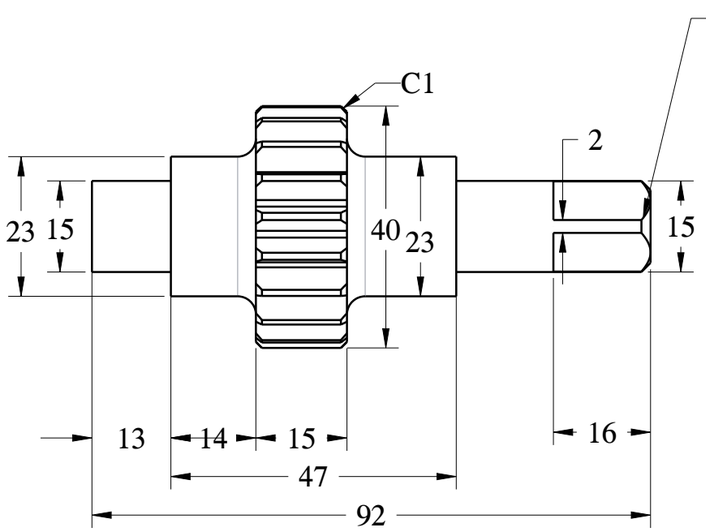
- task_files/diagrams/diagram_01.pdf
- task_files/diagrams/diagram_01.png
- task_files/diagrams/diagram_01_detail01.png

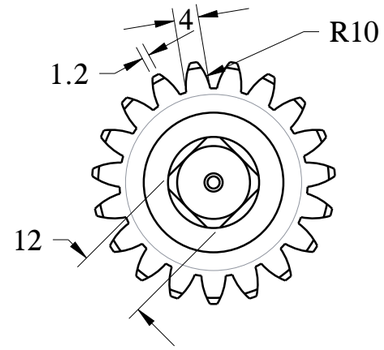
Deliverables

- **.drw:** output_files/project_files/creo-ex-13.drw.1: The native deliverable is a Creo part file (creo-ex-13.prt) of the spur pinion gear shaft and a Creo drawing file (creo-ex-13.drw) holding the dimensioned A3 sheet with front, section, end and isometric views.
- **.prt:** output_files/project_files/creo-ex-13.prt.1: The native deliverable is a Creo part file (creo-ex-13.prt) of the spur pinion gear shaft and a Creo drawing file (creo-ex-13.drw) holding the dimensioned A3 sheet with front, section, end and isometric views.







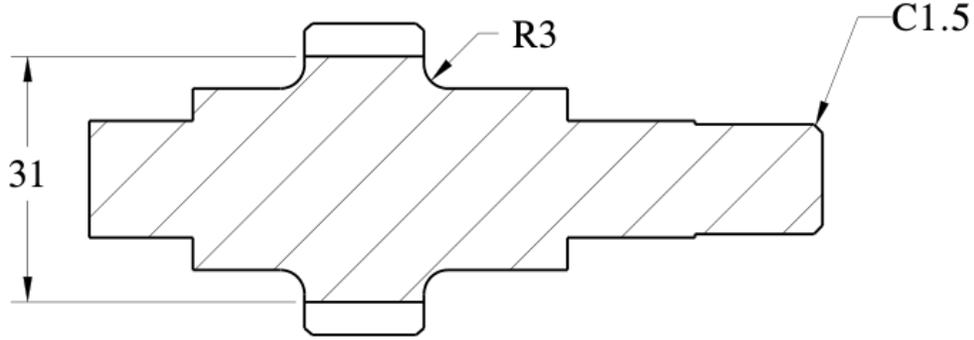


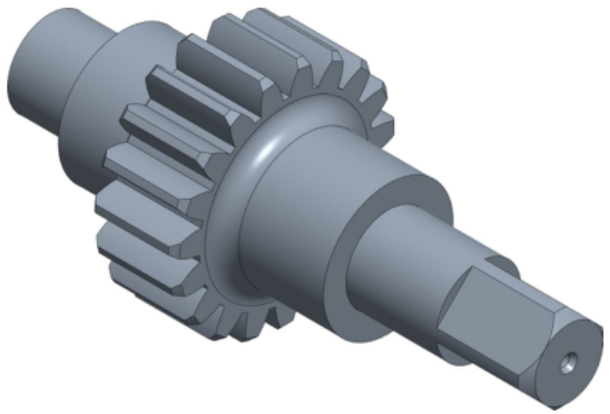
NOTES
1. DO NOT SCALE THE DRAWING; USE THE FIGURED DIMENSIONS.

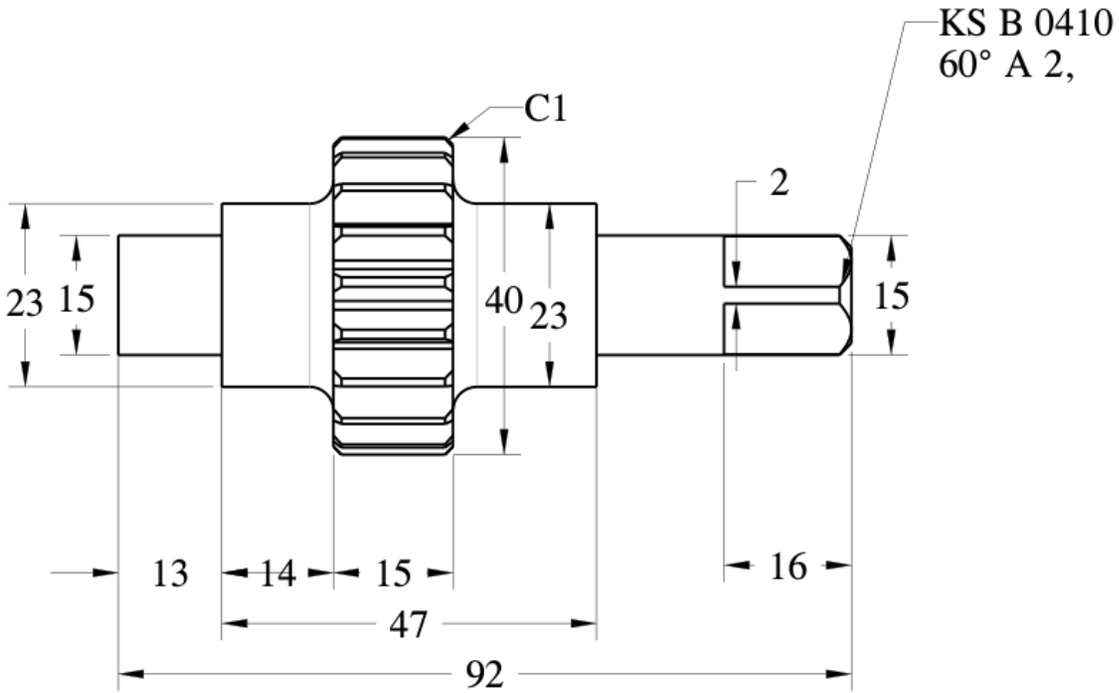
UNITS	SCALE	PROJECTION
AS SHOWN	**AS SHOWN**	

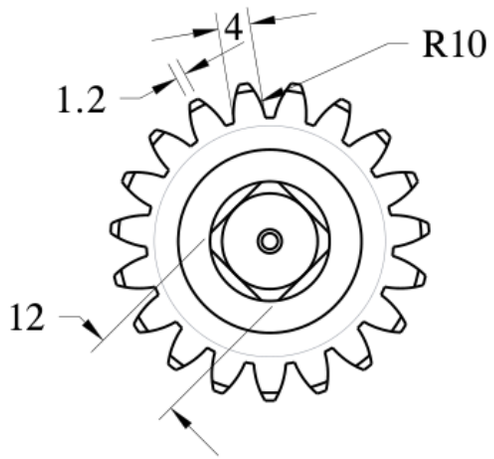
TITLE	SIZE
SPUR PINION GEAR SHAFT WITH SQUARE DRIVE END AND DETAIL IT ON AN A3 DRAWING	**A3**

DRAWING NO.	REV	SHEET
MKV-52A75EDC-01	**0**	**1 OF 1**


R3
C1.5
31




KS B 0410
60° A 2,
C1
2
23
15
40
23
15
13
14
15
16
47
92


4
R10
1.2
12