Model a motorcycle rear chain sprocket with lightening cutouts and hub boss

Software: Siemens NX

Task statement

Model a motorcycle rear chain sprocket as a single solid part in millimetres. Then produce a dimensioned drawing of it, following the supplied dimensioned diagrams: diagram_01.png, diagram_01_detail01.png, diagram_01_detail02.png, diagram_01_detail03.png and diagram_01_detail04.png.

The sprocket is a flat toothed plate with a raised cylindrical hub boss at its centre. The boss stands proud on both faces of the plate.

Geometry:

- Overall envelope: 272 mm across the front view horizontally and 271.63 mm vertically. The overall thickness across the hub boss is 40 mm.
- Teeth: chain-roller teeth with rounded roots run around the full periphery.
- Hub boss: outer radius R40, with a through bore of radius R30.
- Bolt holes: five small round through-holes on a circle around the boss.
- Lightening cutouts: five through-cutouts in the web, each roughly triangular and arranged in a swirl pattern. Their corners are rounded; the dimensioned corner radius is R9.5.
- Locating dimensions in the front view:
  - Horizontal chain: 90.97, 45.03, 74.44 and 61.56 (totalling 272).
  - Vertical chain: 70.36, 65.45, 79.35 and 56.46 (totalling 271.63).

The finished part must be one closed solid body built from planar and cylindrical faces only.

Save the model as the part file SPROCKET_WHEEL.prt.

Create a separate drawing part, SPROCKET_WHEEL_dwg1.prt, that references the model. Use one A1 sheet in third-angle projection, with labelled views:

- FRONT VIEW: carries the R40 and R9.5 radii and the Ø60 (R30) bore.
- A side view: carries the 40 thickness dimension.
- ISOMETRIC VIEW.

Fill in the title block with a title and a drawing number, and state that all dimensions are in millimetres.

Rubrics

- **R1:** The model shall consist of a single solid body.
- **R2:** The model shall have an overall extent of 272 mm by 271.63 mm in the sprocket plane.
- **R3:** The model shall have an overall thickness of 40 mm measured across the hub boss.
- **R4:** The model shall have a cylindrical hub boss of outer radius R40 projecting beyond both faces of the toothed plate.
- **R5:** The model shall have a central through bore of radius R30 in the hub boss.
- **R6:** The model shall have chain teeth with rounded roots around the full periphery of the plate.
- **R7:** The model shall have five lightening through-cutouts in the web, with rounded corners dimensioned R9.5.
- **R8:** The model shall have five round through-holes arranged around the hub boss.

- **R9:** The model shall be built entirely from planar and cylindrical faces.
- **R10:** The drawing shall contain labelled front, side and isometric views.
- **R11:** The drawing shall dimension the front view with R40, R9.5 and the Ø60 (R30) bore.
- **R12:** The drawing shall dimension the 40 overall thickness.
- **R13:** The drawing shall have a title block with a title, a drawing number and size A1, and state that dimensions are in millimetres.
- **R14:** The model shall be saved as part file SPROCKET_WHEEL.prt in millimetre units.
- **R15:** The drawing shall be held in a separate part file SPROCKET_WHEEL_dwg1.prt whose views reference the SPROCKET_WHEEL model.

Input files

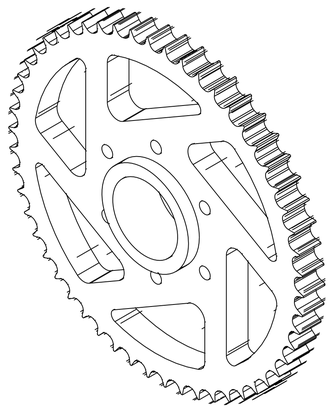
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- task_files/diagrams/diagram_01_detail04.png

Deliverables

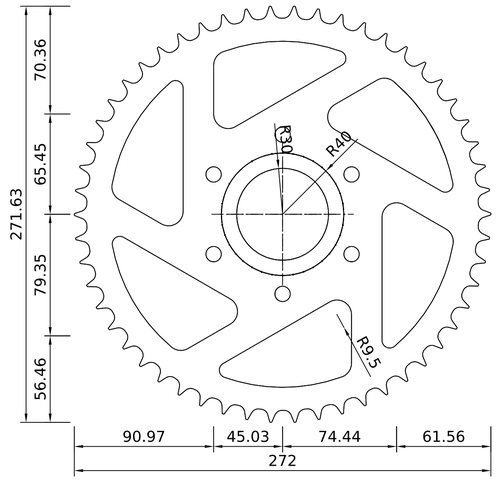
- **.prt:** output_files/project_files/SPROCKET_WHEEL_dwg1.prt: The native deliverable is SPROCKET_WHEEL.prt, containing the single-body sprocket solid, plus SPROCKET_WHEEL_dwg1.prt, holding the A1 dimensioned drawing that references it.
- **.prt:** output_files/project_files/SPROCKET_WHEEL.prt: The native deliverable is SPROCKET_WHEEL.prt, containing the single-body sprocket solid, plus SPROCKET_WHEEL_dwg1.prt, holding the A1 dimensioned drawing that references it.
- **.stp:** output_files/project_files/SPROCKET_WHEEL.stp: STEP export of the model in the same units.



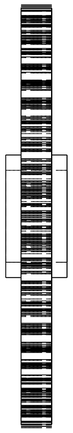
TOP VIEW



ISOMETRIC VIEW



FRONT VIEW



RIGHT SIDE VIEW

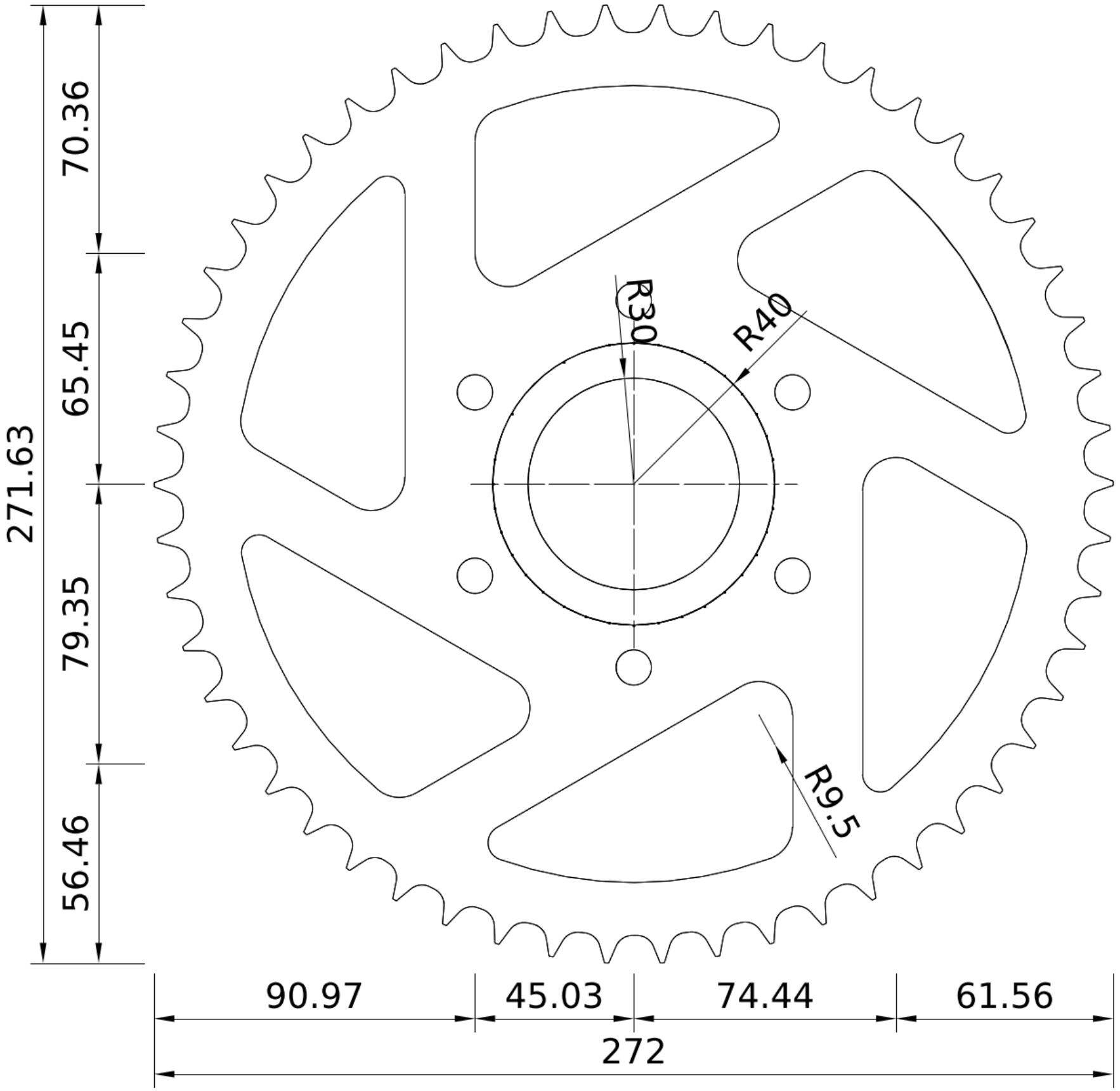
NOTES
1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.
2. DO NOT SCALE THE DRAWING; USE THE FIGURED DIMENSIONS.
3. VIEWS IN THIRD ANGLE PROJECTION.

UNITS	SCALE	PROJECTION
MILLIMETRES	1:2	

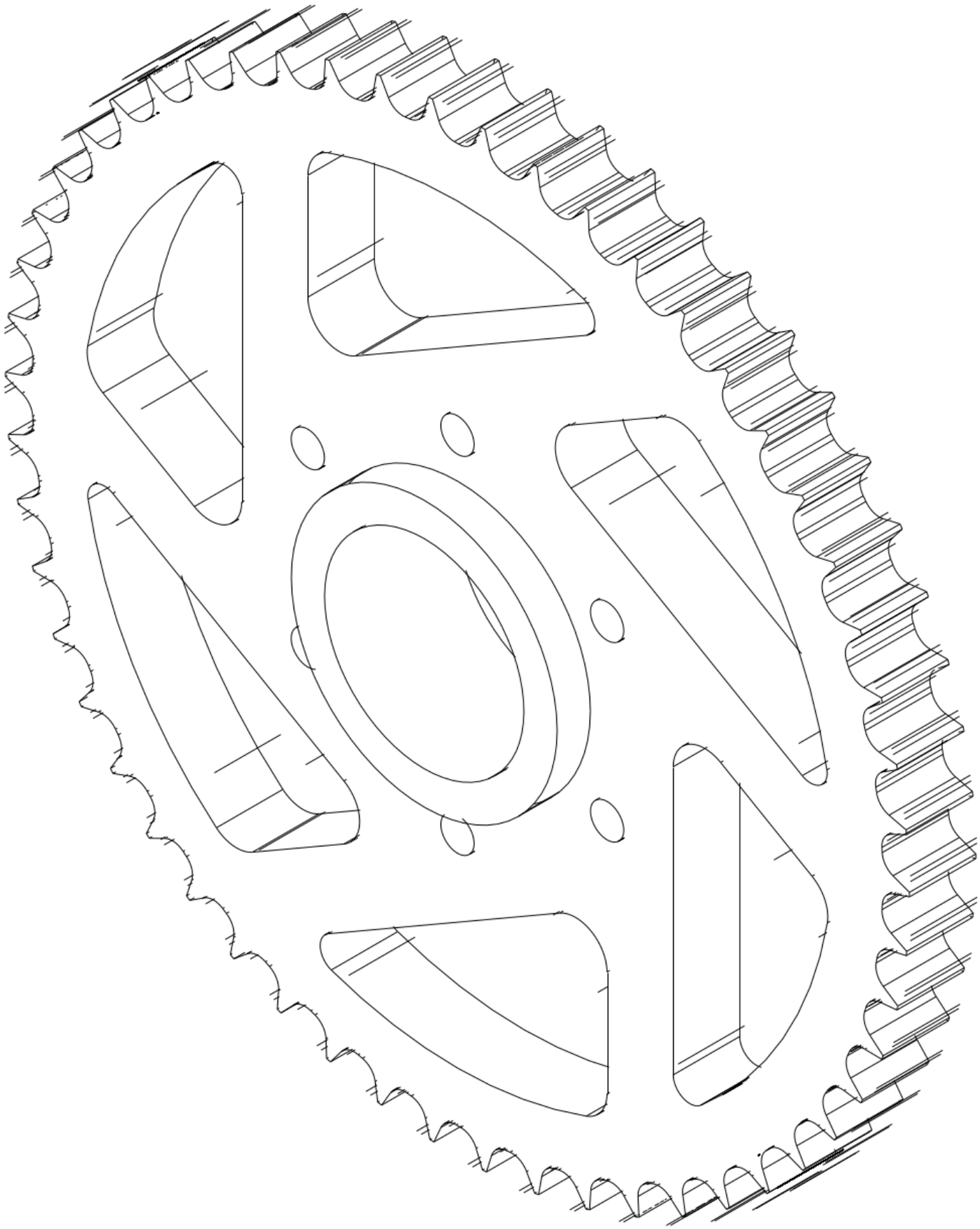
TITLE
MOTORCYCLE REAR CHAIN SPROCKET WITH LIGHTENING CUTOUTS AND HUB BOSS

SIZE **A1**

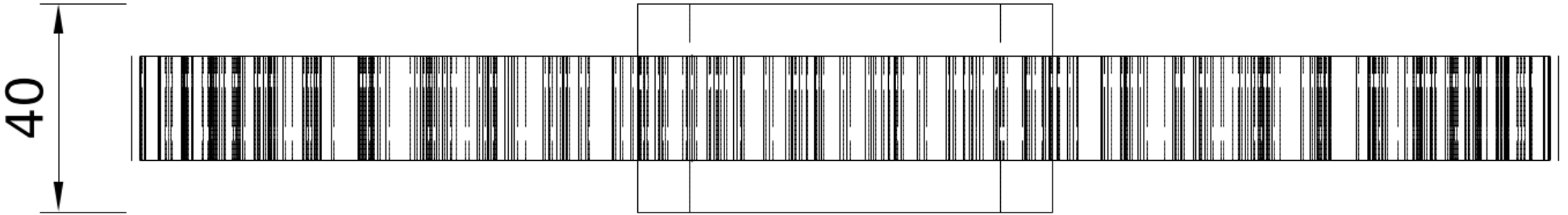
DRAWING NO.	REV	SHEET
MKV-B2F8C4A2-01	**0**	**1 OF 1**



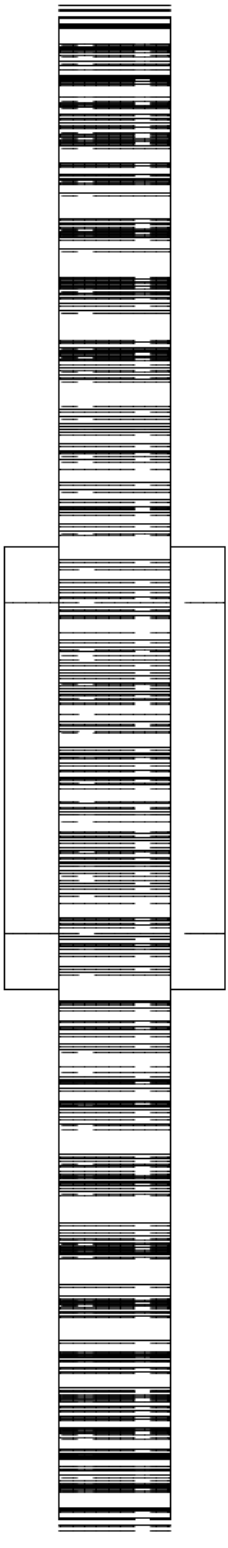
FRONT VIEW



ISOMETRIC VIEW



TOP VIEW



RIGHT SIDE VIEW

DETAIL 4 · VIEW 4 · SHEET ZONES F9-K11

MKV-B2F8C4A2-01 · SHEET 1 OF 1