Replaces:
RN 1565:2023-04-21

Gearbox housings

Mechanical pre-machining

Content

Page

Changes

2023-11-07:
The following changed in comparison to RN 1565:2023-04-21:

a) Ch. 3.2: Addition of commission number-related processing
b) Ch. 6: Addition of the examination of implementation

1 Scope

This Factory Standard applies to the external mechanical pre-machining of gearbox housings, in particular regarding the machining of surfaces and bearing bores. It contains specifications regarding the type and scope of drilling and milling operations.

2 References

This standard shall apply in addition to the standards mentioned below and the rules issued by the classification societies. The applicable version of the standards listed below shall apply to all contents not covered by this factory standard.

RN 72	Packaging and preservation; Supply parts for production
RN 81	Tightening torques; Head screws with standard metric thread
RN 1908	General tolerances; dimensions without tolerance specification
RN 1936	Labelling; Raw material, parts and gearboxes
0-124-69224	Manufacturing instructions; shape and positional tolerances for gearbox housings

3 General specifications

3.1 Drawing data

Mechanical pre-machining is based on the released manufacturing drawing. For housing drawings with cross references to other applicable drawings, only the master drawing for machining is indicated in the order text. The applicable drawings contain the dimensions, which are not indicated in the master drawing.

3.2 Visual inspection

Prior to starting any machining operations, a visual inspection must be carried out to detect damages or material defects at an early stage (see chapter 5).

When processing project related more than one housing, it must be ensured that all individual housing parts remain connected for the purpose of traceability according to the marked commission numbers and are not interchanged.

3.3 Alignment

The individual parts of the housing are axially aligned in accordance with the basic references for first machining indicated in the housing drawing. Transverse thereto, the housing parts must be positioned symmetrically to each other.

3.4 Clearances

Depending on the order volume, the clearances at the separating surfaces of the housing parts must be checked and documented (see para. 5) after finishing machining the separating surfaces and, if applicable, after pre-drilling the bearing bores.

For checking the clearances, the housing parts must be aligned with each other (see chapter 3.3). The hub screws can be used to position the housing parts. DO NOT pin or tighten the screwed connections for the clearance check.

The permissible clearance is:

- 0.1 mm in the hub area and
- 0.3 mm in the area of the separating surfaces (see manufacturing instructions 0-124-69224).

If these values are exceeded, the separating surface must be additionally milled, after consultation with REINTJES.

3.5 Drilling positioning

Drilling patterns for housing covers located on the housing wall or on frames must be aligned symmetrically with the contour of the rough part while observing the inside dimensions.

3.6 Fixing individual parts

Before pre-machining the bearing bores, the housing parts must be pinned and screwed to each other. The tightening torques of the hub screws must be chosen such, that there is no clearance between the housing parts. The following torques are recommended:

Screw size ≤ M 30: 80 % of M_A acc. to RN 81

Screw size > M 30: $M_A \geq 1000$ Nm

3.7 Labelling

The labelling requirements of factory standard RN 1936 are to be complied.

4 Scope of machining

4.1 Examples and figures

Note: Some elements (cams, frames for covers, mounting brackets etc.) of the gearbox housings shown in the following figures are exemplary. However, unless otherwise specified in the text, the machining instructions always apply to <u>all</u> comparable elements.

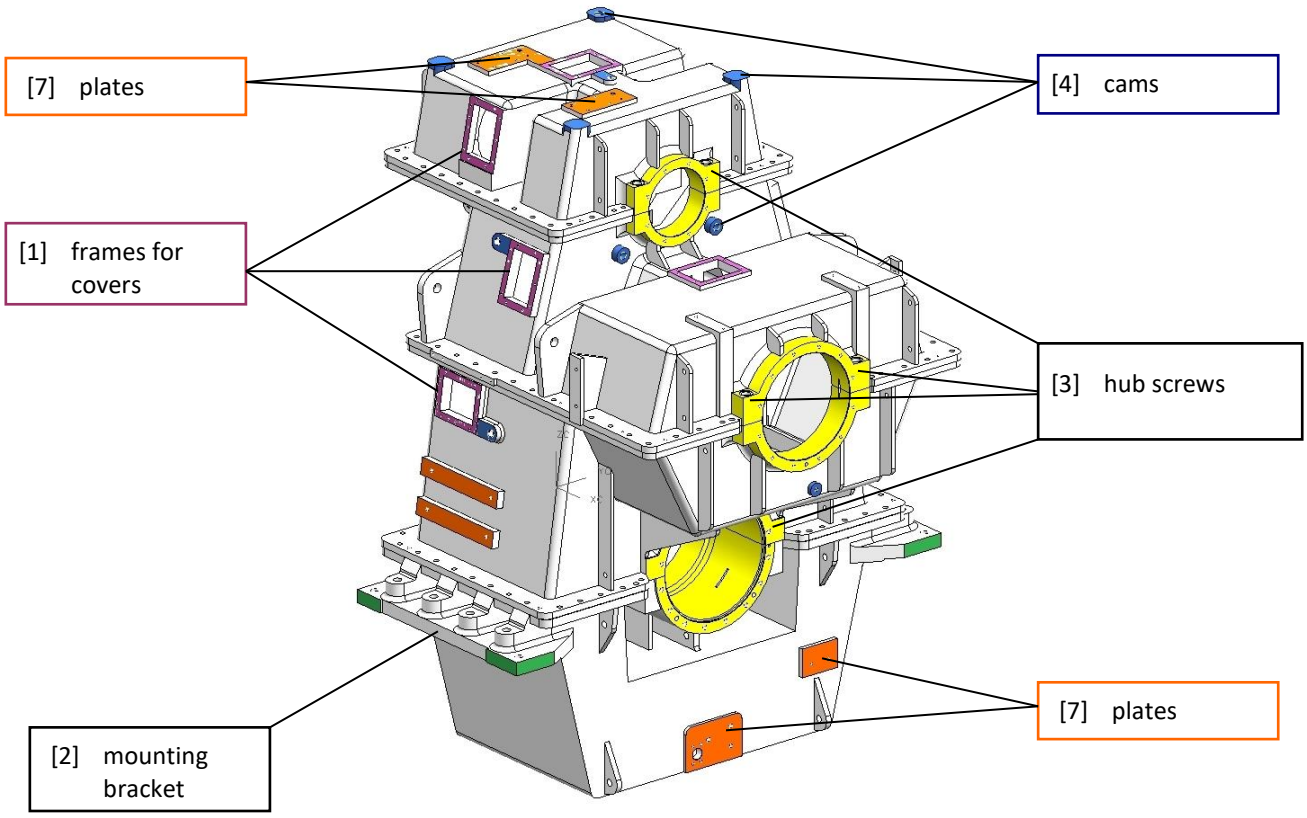

Figure 1

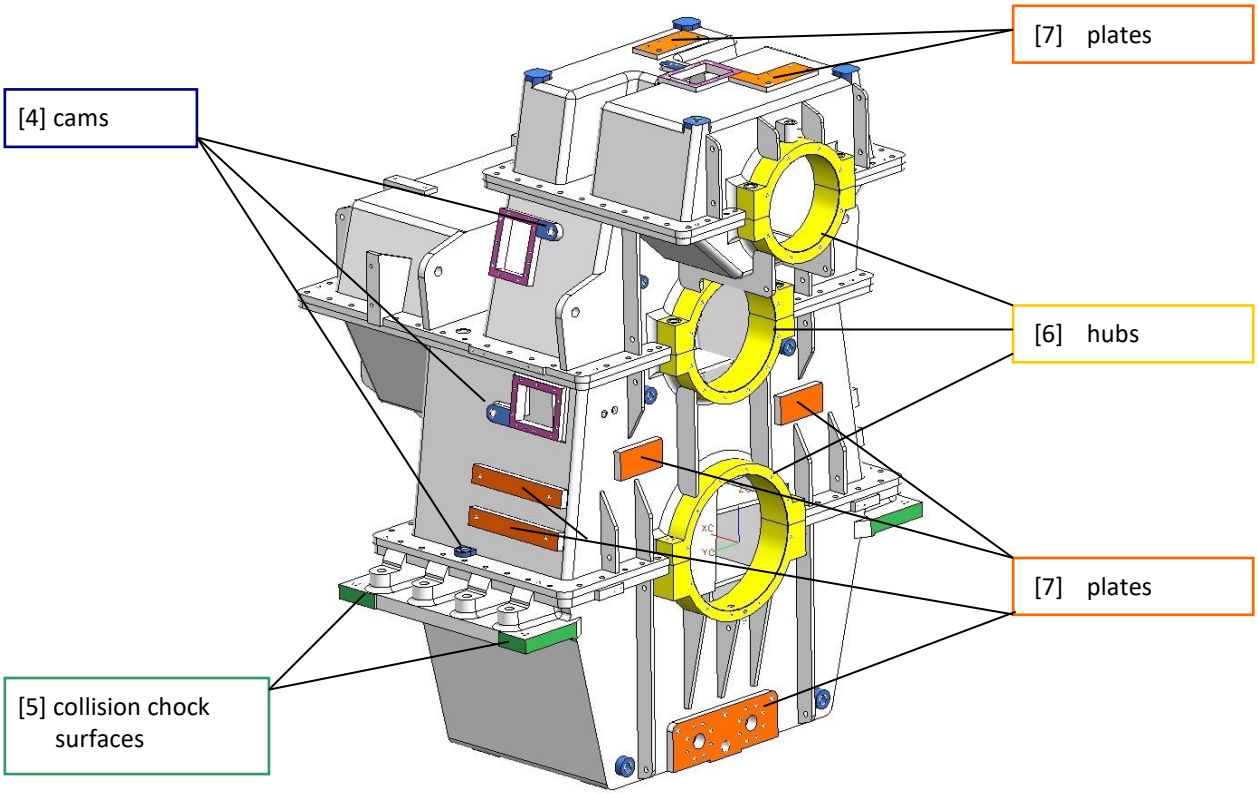

Figure 2

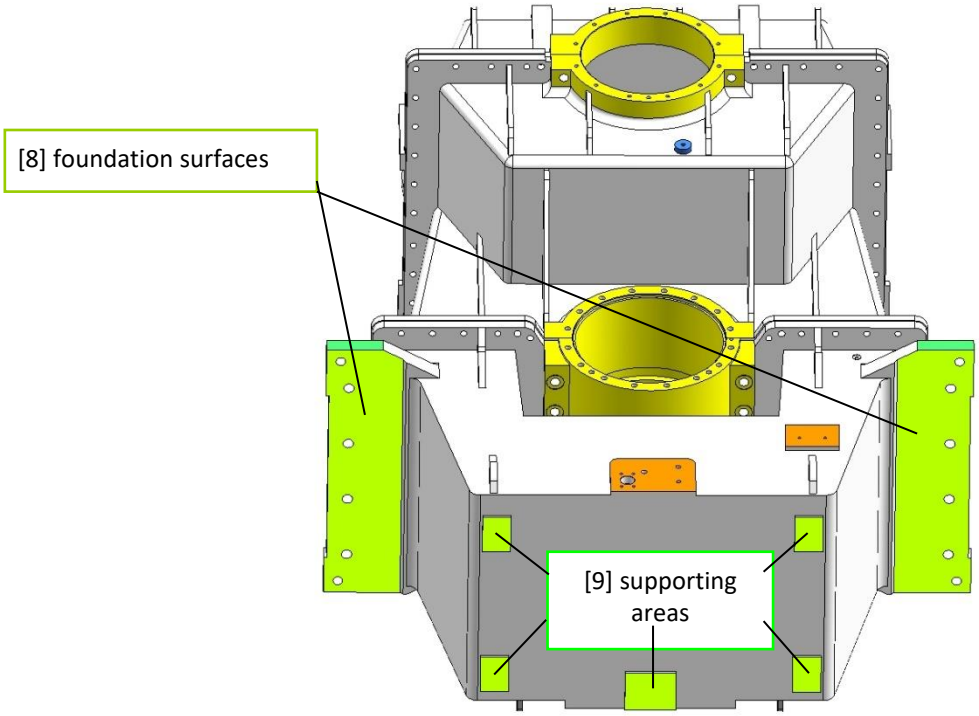

Figure 3

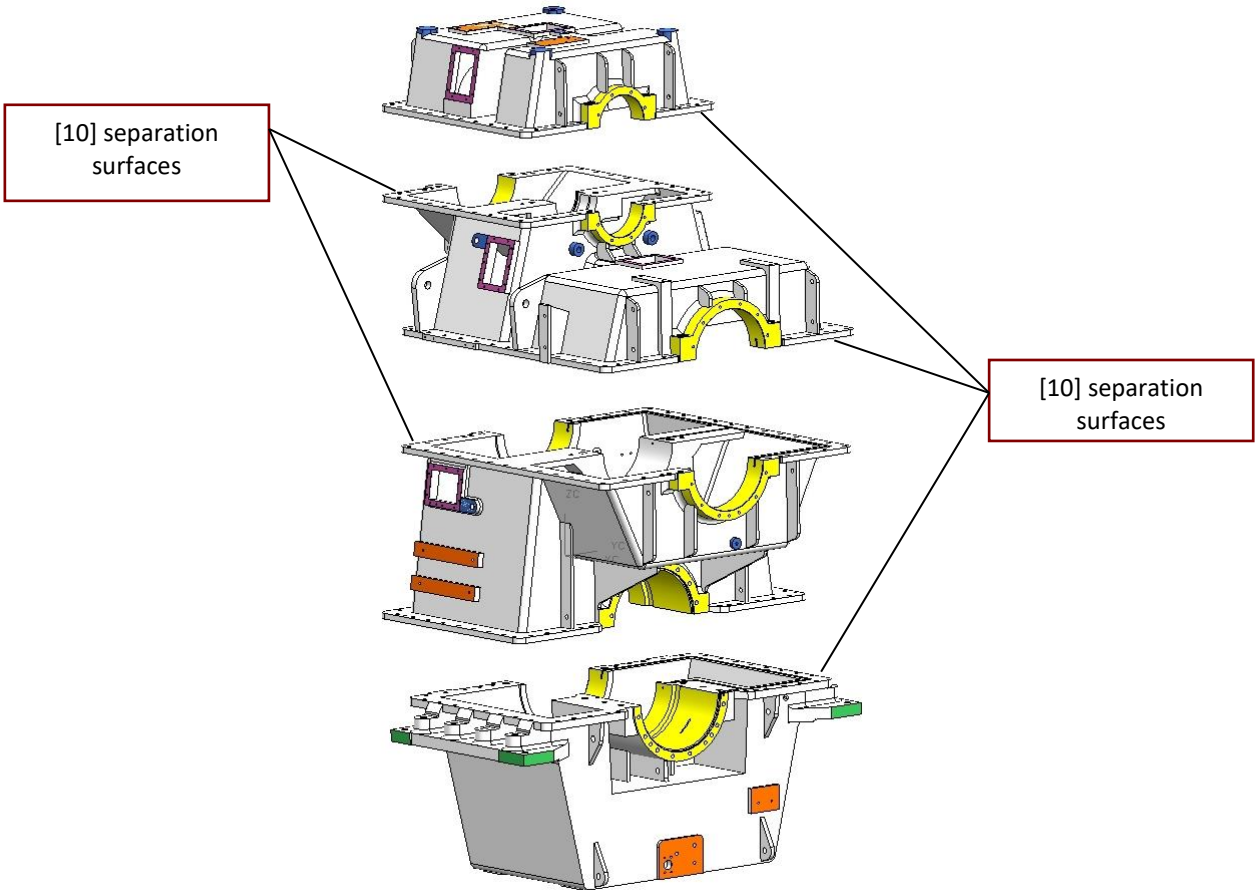

Figure 4

4.2 Milling

The following surfaces must be milled:

- separation surfaces of housing [10]
- frames for covers [1]
- plates [7]
- foundation surfaces and plate surfaces [7], [8] completely for every individual part

IMPORTANT: DO NOT mill front-end and lateral surfaces on mounting brackets (collision chock surfaces [5]).

All surfaces on the bottom sides of housing parts, such as supporting areas [9], foundation surfaces [8], must be milled according to drawing.

The following surfaces must be pre-milled with 2 mm machining allowance per side:

- front ends of hubs [13]
- planar and contact surfaces inside the housing

The oil distribution grooves must be cut into the separating surfaces. The connection between the groove and the bearing bore is made by REINTJES after all machining operations have been finished.

4.3 Pre-drilling

- Bearing bores must be pre-drilled with a machining allowance of 4 mm (referred to the drilling diameter).

4.4 Drillings and threads

Drillings and threads must be made:

- in the frames for covers [1]
- in the top of the top part of the housing (cams [4] and plates [7])
- in the separating surfaces [10]
- for the hub screws [3]
- for the oil dipstick [12]
- for tapered pins and cylindrical pins in the separating surfaces [10]

DO NOT drill

- holes in the foundation areas of the gearboxes (mounting brackets, see [2], [8])
- holes in the front ends (engine and propeller side) of the hubs [13]
- holes for the front-end cylindrical pins [14]
- tapped holes [11] for cover in the hub (series SVA and SVAL)
- tapped holes [15] for oil deflector plate or wheelhouse

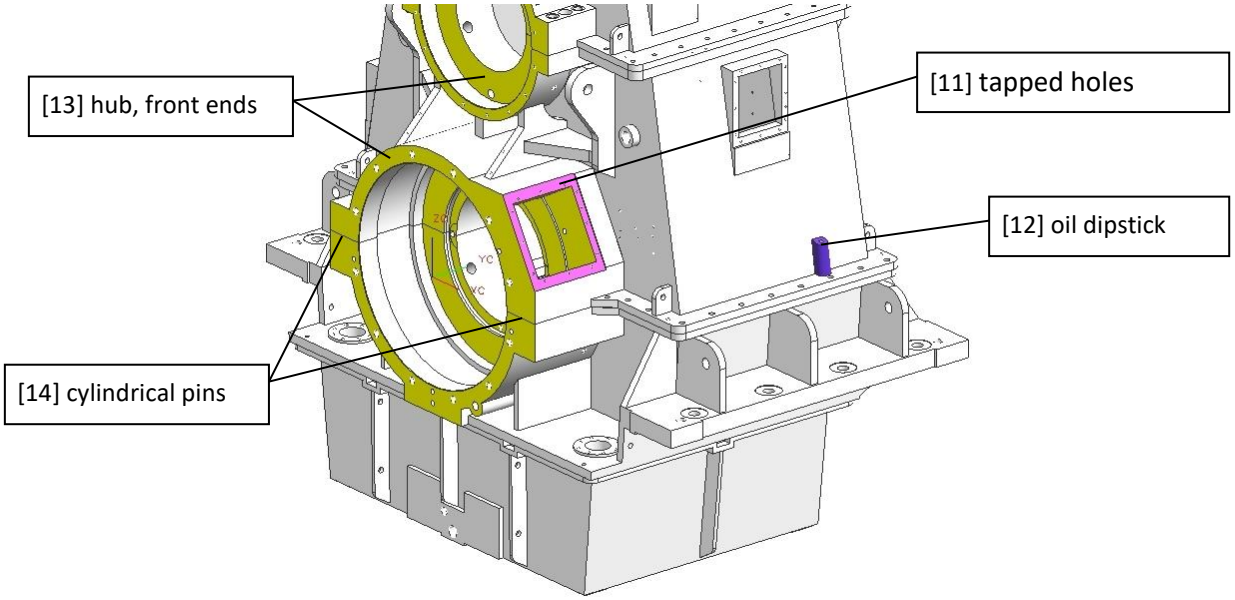

Figure 5

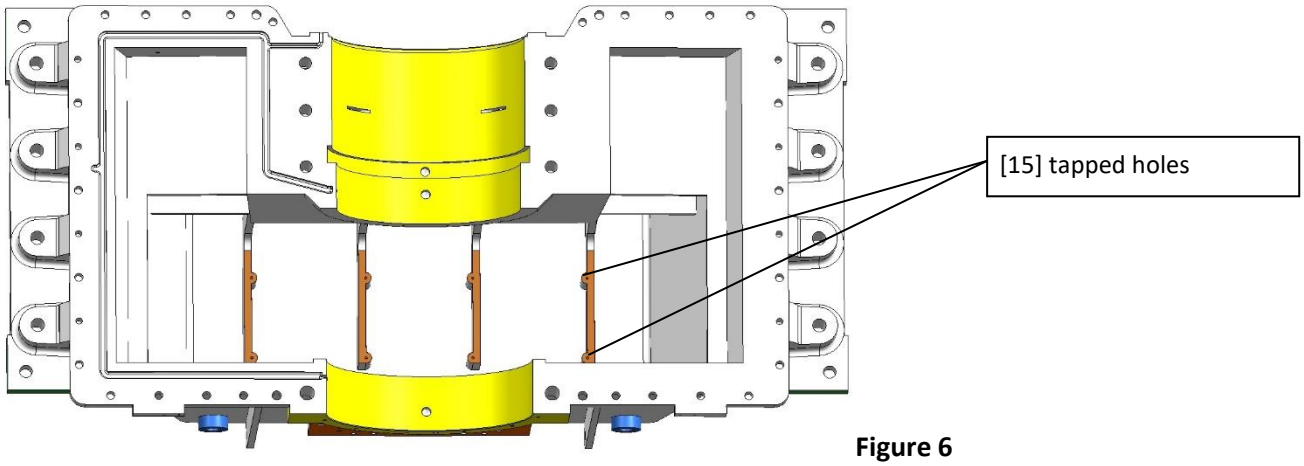

Figure 6

4.5 Other machining

All tapped holes in cams [4] and in the housing wall must be made according to drawing. The holes must be rectangular to the surface and must only be slightly deburred (approx. 1 x 45°).
Reworking pre-machined cams with hole is not permitted.

5 Documentation

REINTJES must immediately be informed of any manufacturing deviations, material defects or damages detected prior to or during machining.

If REINTJES, upon clarification of the matter, grants a deviation permit, these deviations or imperfections must be clearly and visibly marked and a problem report must be affixed to the respective part.

The clearances of the separating surfaces must be documented at the measuring spots directly on the housing in accordance with chapter 3.4. The marking must be made on the front end of the separating surface using a red or white felt tip.

6 Shipment

- All parts must be supplied clean and free from burrs.
  IMPORTANT: All drilling holes must be free from chips!
- The housing parts must be pinned and screwed to each other according to chapter 3.6. It is to be checked whether the processing was carried out commission number-related according to chapter 3.2.
- All covers must be fixed to the frames using all screws.
- The machined surfaces of all parts must be slightly preserved, e.g. with machine oil.
- DO NOT expose parts to direct climatic effects during shipment.
- The requirements of factory standard RN 72 Packaging and Preservation are to be complied.