UDC 744.42 : 003.62

December 1986

Technical drawings

Representation in normal projection

Sections

DIN 6 Part 2

Technische Zeichnungen; Darstellung in Normalprojektion; Schnitte

This standard, together with
DIN ISO 6433, September 1982 edition,
DIN 6 Part 1, and
DIN 5 Part 10, December 1986 editions,
supersedes DIN 6, March 1968 edition.

In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

See Explanatory notes for connection with ISO 128 – 1982 published by the International Organization for Standardization (ISO).

1 Field of application

This standard applies to the representation of sections in technical drawings and other technical documentation, regardless of the manner of their preparation (manual or computer-aided).

2 Concepts

2.1 Cutting plane

A cutting plane is an imaginary plane at which the object represented is cut through.

2.2 Section area

The section area is the area which would be revealed by cutting through the object at the cutting plane.

2.3 Cutting line

The cutting line is the line indicating the position of a cutting plane, or the sectioning axis in the case of two or more cutting planes.

Note. The cutting line is a chain thick line (DIN 15 – J line).

2.4 Section

A section is the resultant view of an object at one or more cutting planes parallel to the plane of the drawing which reveals detail lying in the cutting plane of beyond it.

2.5 Horizontal section

A horizontal section is a section taken horizontally through an object at one cutting plane (generally as seen from above).

2.6 Vertical section

A vertical section is a section taken vertically through an object, the cutting plane being at right angles to the view from the front.

2.7 Frontal section

A frontal section is a vertical section through an object, the cutting plane being parallel to the view from the front (generally as seen from the front).

2.8 Removed section

A removed section is a section representing the smallest section area of all possible cutting planes.

2.9 Full section

A full section is the projection [1]) of an object that is drawn wholly in section.

2.10 Half section

A half section is the representation of a symmetrical object which, divided by the centre line, is drawn half in outside view.

2.11 Partial section

A partial section is a representation in which only part of an object is drawn in section.

2.11.1 Local section

A local section is a representation in which only part of an object in a view is represented in section.

2.11.2 Local detail

A local detail is a local section representing only part of the object, without the corresponding sectional view.

3 Representation of sections

The general rules covering the arrangement of views (see DIN 6 Part 1) shall also apply, as appropriate, for sections and removed sections.

See DIN 15 Parts 1 and 2 for types of line and line thicknesses.

See DIN 6774 Part 1 for rules for preparation and lettering.

Edges and outlines lying in cutting planes, previously hidden and revealed by the imaginary sectioning of the object, shall be represented by continuous thick lines (DIN 15 – A lines) (see figure 1).

[1]) See DIN 5 Part 10 for the definition of this concept.

Continued on pages 2 to 8

3.1 Identification of section areas

The section areas shall be distinguished by hatching as specified in DIN 201*).

Areas of a section of the same component shall be hatched in an identical manner in all related views (see figure 1).

Adjacent components shown in sections shall not be hatched.

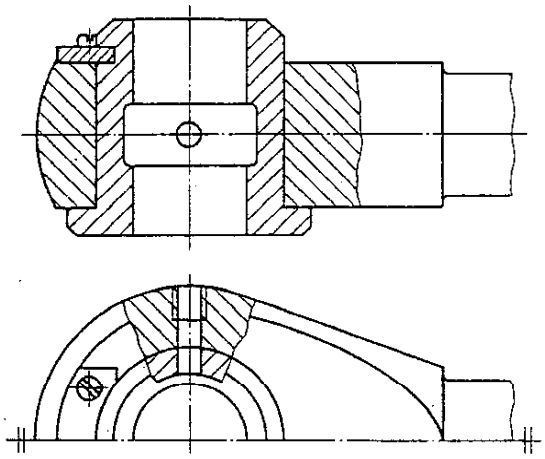


Figure 1.

Thin sections may be shown entirely black as specified in DIN 201*).

The use of colours on master drawings is not recommended. In exceptional cases, where their use is unavoidable, their significance shall be explained on the drawing or in related documentation.

3.2 Parts and features of parts not to be represented as sectioned

For the sake of clarity, it is customary to represent certain parts or features of a part unsectioned, even if they lie in the cutting plane.

These include all components in a general arrangement or subunit drawing (assembly drawing)[2]) which are represented in their longitudinal direction and which do not exhibit any cavities or hidden recesses, e.g. shafts, bolts, pins, feather keys, cotters, screws (see figures 2 to 4).

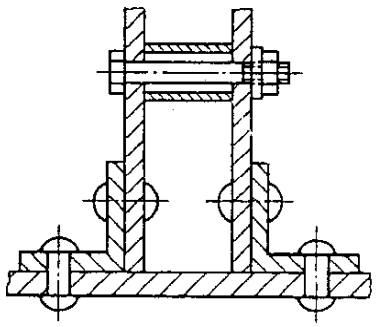


Figure 2.

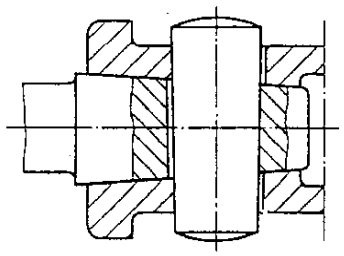


Figure 3.

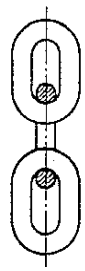


Figure 4.

These also include all features which are intended to stand out from the basic shape or profile of a body as solid features, e.g. ribs, webs, spokes (see figures 5 and 6). Features of this kind may be represented in a view by a continuous thin line (DIN 15 – B line) if the form of the feature needs to be shown (see figure 6).

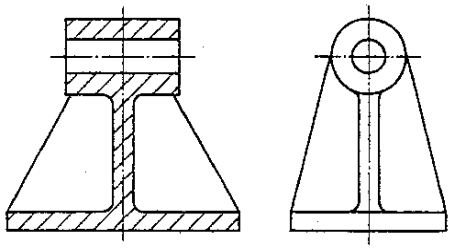


Figure 5.

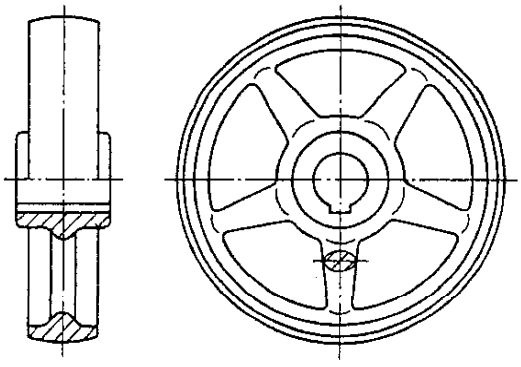


Figure 6.

*) At present at the stage of draft.

[2]) See DIN 199 Part 1 for the definition of this concept.

3.3 Arrangement and representation of cutting planes

Where the location of a single cutting plane is obvious, no indication of its position is required (see figures 7 and 8).

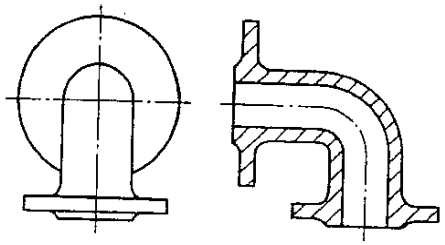


Figure 7.

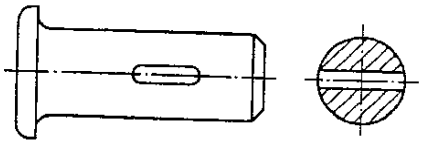


Figure 8.

Where the location of a cutting plane in an object is not obvious, it shall be indicated by a cutting line, (DIN 15 – J line) or (DIN 15 – H line)[3].

The cutting lines shall be drawn thick only at the outlines of the object, and if necessary at changes of direction. The viewing direction towards the cutting plane shall be indicated in such cases by arrows (see figures 9, 11, 12 and 13).

The arrowheads (DIN 15 – A line) shall have an included angle of approximately 15° and their length shall be approximately 1,5 times that of dimension arrowheads; the tip of the arrow shall touch the cutting line.

3.3.1 Cutting planes at an angle to each other

When two cutting planes lie at an angle to each other, the section shall be represented as if the section areas were lying in a single plane (see figure 9).

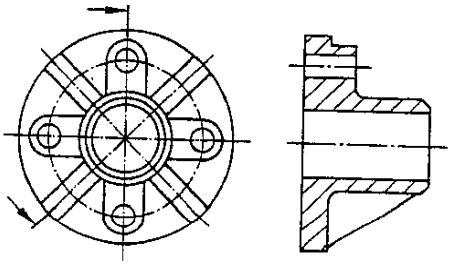


Figure 9.

When circular bodies, e.g. flanges, are shown in section, the holes may be shown revolved into the cutting plane. In such cases, there is no need for the sectioning axis to be indicated (see figure 10).

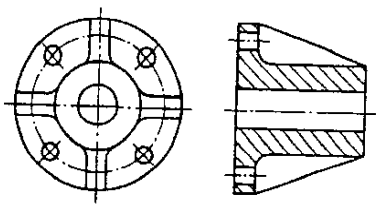


Figure 10.

Figure 11 shows an object sectioned in two parallel planes, and in a plane lying at an angle and connecting the two parallel planes. In the section, the zone comprising the angled plane appears as a projection.

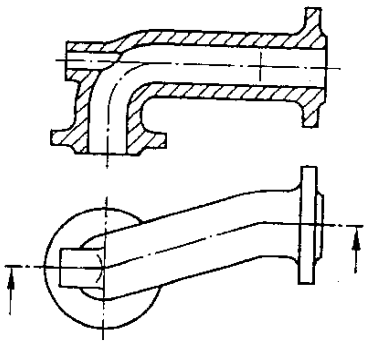


Figure 11.

3.3.2 Offset parallel cutting planes

When an object is sectioned by two or more offset parallel planes, the position of the cutting planes and the sectioning axis shall be indicated by an appropriately inflected cutting line, and the viewing direction identified by arrows (see figure 12).

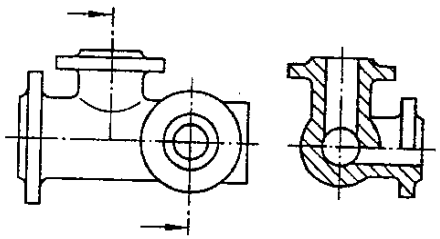


Figure 12.

When offset parallel cutting planes are limited by a common centre line, the hatching lines denoting the offset section areas are usually drawn staggered where they meet this centre line (see figure 13). Where no misunderstanding is likely, they may also be drawn straight through (see figure 12).

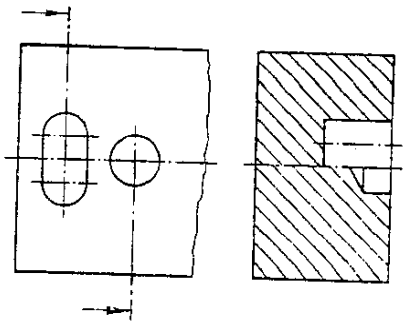


Figure 13.

[3] According to DIN 15 Part 2, preference is to be given to type J lines rather than to type H lines.

3.4 Assignment and identification of sections

Additional identification is necessary if sections or removed sections cannot be clearly assigned to their cutting planes. In such cases, the position of the separate cutting planes or the sectioning axis shall be indicated as defined in subclause 3.3 and identified by capital letters placed above or to the right of the arrow line.

The capital letters shall be placed at the start and finish, and if necessary at the changes of direction, of the cutting lines and also directly above the corresponding sections or removed sections, numbers being added if necessary in cases where the alphabet is not sufficient.

When cutting planes are disposed at an angle or parallel to one another, the sectioning axis (start, changes of direction, and finish) shall be additionally identified by serial numbers (see figure 14) or by letters in alphabetical order (see figure 15) if this makes the drawing easier to read or less ambiguous.

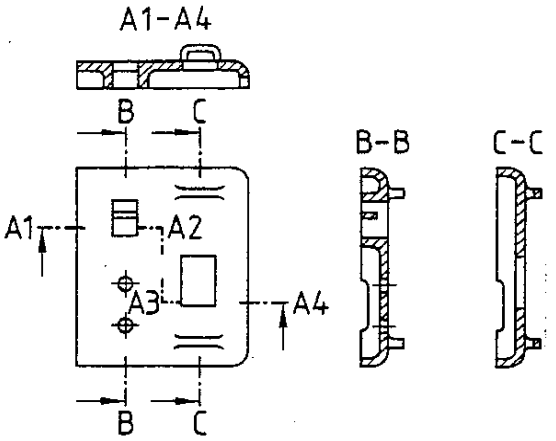


Figure 14.

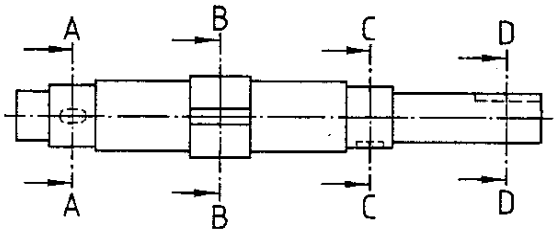


Figure 16.

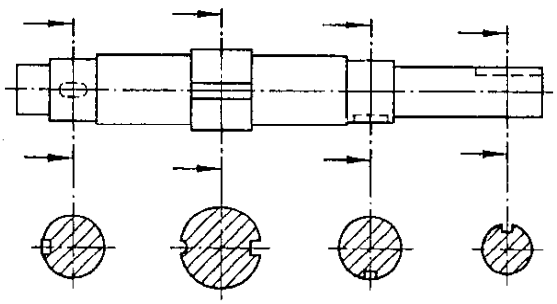


Figure 17.

Note re figure 15. If the section area merges into a view, the boundary between the two shall be represented by a break line (see sectioning axes D–E and F–G in the side view).

When several sections or removed sections of an object are represented in the same projection position, the relative position of each section shall be identified (see figure 16).

Outlines and edges beyond a cutting plane may be omitted if they contribute nothing to a clear understanding of the object represented (see figure 16, section A–A).

When several cutting planes are taken through elongated objects, e.g. shafts, the removed sections may also be placed directly below the corresponding cutting planes. When such removed sections are symmetrical, their allocation may be indicated by joining the cutting lines to the corresponding centre lines. In such cases, there is no need for additional identification by capital letters (see figure 17).

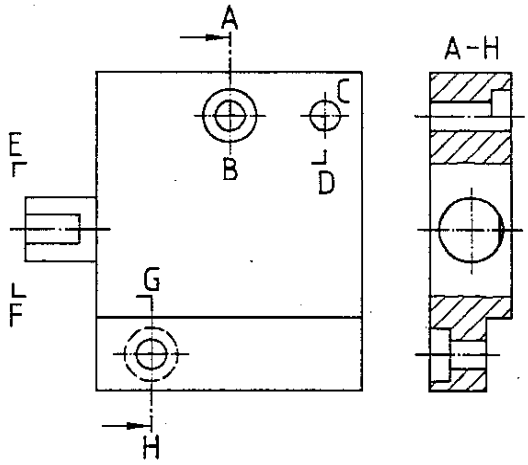
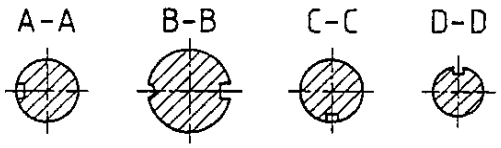


Figure 15.



When a drawing not only contains sections or removed sections, but also details drawn as enlargements and/or identified views, then, in order to avoid ambiguity, the capital letters used to identify these shall not be used for designating the cutting planes, as well.

Chamfers, counter sinks, undercuts and similar features need only be represented in views and sections in which they are recognizable and dimensioned. They may be omitted in the other views (see figure 18).

When several identical features are defined by a single representation, their position relative to each other and to another feature shall be indicated by centre lines and referencing (see figure 19).

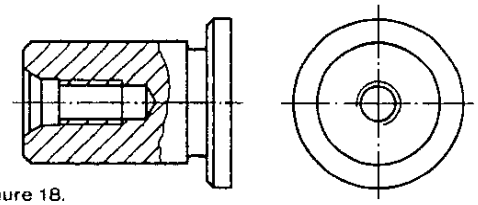


Figure 18.

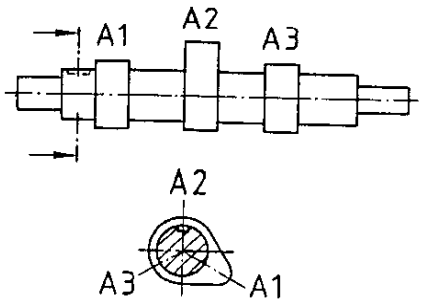


Figure 19.

3.5 Half section

Half sections are generally placed below, if the centre line is horizontal, and to the right of the centre line, if the latter is vertical (see figures 20 and 21).

Edges lying on the centre line in a half section shall be represented (see figure 20).

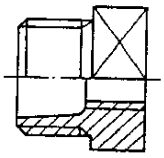


Figure 20.

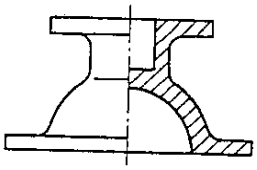


Figure 21.

3.6 Partial section

3.6.1 Local section

The break line of a local section shall not coincide with outlines, edges or temporary lines. It shall be drawn as a free-hand line (DIN 15 – C line) (see figure 22) or as a zigzag line (DIN 15 – D line).

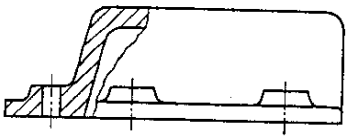


Figure 22.

3.6.2 Local detail

In the case of a local detail, the limiting of the section area by a break line is not necessary (see figure 23).

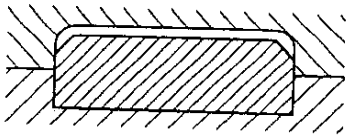


Figure 23.

3.7 Removed section

In the case of symmetrical removed sections that are not represented in their correct projected position beside their view (see figure 24), and in the case of sections of unsymmetrical profiles (see figures 25 and 26), the cutting planes and the corresponding sections shall be correlated and identified (see also subclause 3.4 and figure 16). In this case, a symbol indicating the rotation[4]) in the appropriate direction shall be appended to the letters identifying the section (see figure 26).

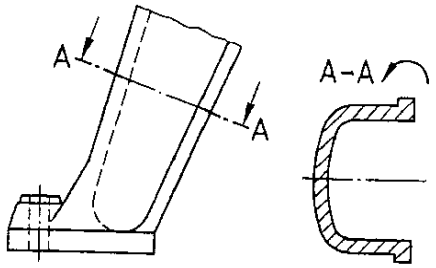


Figure 24.

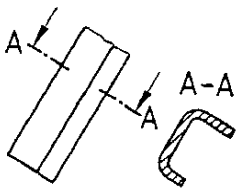


Figure 25.

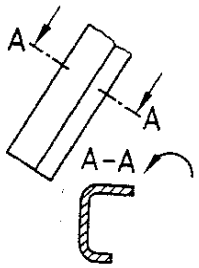


Figure 26.

3.8 Sections of permanent assemblies

In drawings of an assembly consisting of several parts that are joined together permanently (e.g. weldment drawing, rolling bearings), the individual components[5]) shall be hatched in different directions or with different spacing (see figure 27).

In general arrangement drawings or subunit drawings (assembly drawings), groups consisting of several permanently assembled parts (e.g. windings, rolling bearings)[6]) shall be hatched as a single part (see figure 28).

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[4]) See DIN 6 Part 1.

[5]) Those distinguished by different item numbers, for example.

[6]) Those indicated by an identical item number, for example.

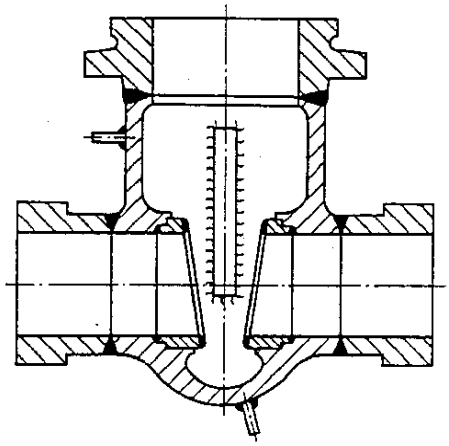

Figure 27.

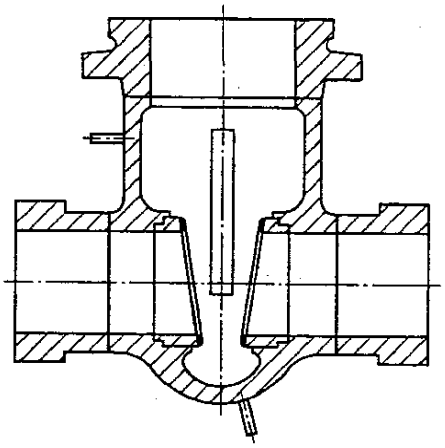

Figure 28.

3.9 Details lying in front of a cutting plane

Details lying in front of a cutting plane may be represented by chain thin double-dashed lines (DIN 15 – K lines) if this permits draughting economy without sacrificing clarity (see figure 29).

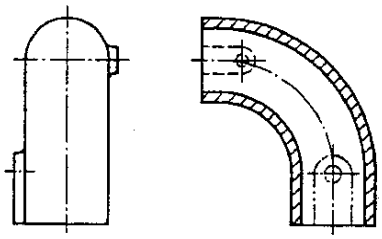

Figure 29.

Note. Chain lines (DIN 15 – F lines) for hidden edges and outlines are only drawn in sectional views if this is necessary for clarity.

Standards referred to

DIN	5 Part 10	Technical drawings; projections; concepts
DIN	6 Part 1	Technical drawings; representation in normal projection; views and special representations
DIN	15 Part 1	Technical drawings; lines; principles
DIN	15 Part 2	Technical drawings; lines; general application
DIN	199 Part 1	Terminology associated with technical drawings and item lists; drawings
DIN	201	(at present at the stage of draft) Technical drawings; hatching
DIN	6774 Part 1	Technical drawings; principles for the preparation of drawings for reproduction purposes

Other relevant standards

ISO 6433	Technical drawings; item numbers

Previous editions

DIN 36: 10.22.
DIN 6: 11.22X, 10.56, 03.68.

Amendments

The following amendments have been made in comparison with DIN 6, March 1968 edition.

a) The content has been subdivided into DIN 6 Parts 1 and 2, DIN 5 Part 10 and DIN ISO 6433.

b) The standard has been revised as regards its content and re-edited to take account of ISO 128 – 1982 (see Explanatory notes).

c) Simplified representations as specified in draft Standard DIN 30 Part 1, April 1982 edition, have been adopted.

Explanatory notes

This standard has been prepared on the basis of ISO 128 – 1982, Technical drawings; general principles of representation, and is intended to provide uniform basic rules for representation in technical drawings in all areas of use. See also "Explanatory notes" relating to DIN 6 Part 1.

Alphabetical index

International Patent Classification

B 42 D 15/00
B 43 L 13/00