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Mining — Guidance on methods of verifying dimensions of sprocket assemblies for chain conveyors

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The main task of ISO technical committees is to prepare International Standards. In exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;
- type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/TR 8865, which is a Technical Report of type 3, was prepared by Technical Committee ISO/TC 82, *Mining*, Sub-Committee SC 2, *Components of coalface machinery using high-tensile round link chains*.

International Standard ISO 5613 : 1984 covering drive sprocket assemblies for mining chain conveyors specifies requirements for a range of sprocket assemblies for use with twin outboard assemblies. These assemblies incorporate sprocket rings designed to accept chains complying with ISO 610, shackle type connectors complying with ISO 1082 and scraper bars complying with ISO 5612.

The dimensions of the component parts of the sprocket assembly are laid down in ISO 5613 and these dimensions have to be verified in order to check compliance with the standard. It is stated that the methods to be used for the verification of the dimensions shall be agreed between the purchaser and the manufacturer (ISO 5613 : 1984, 4.3). A number of the dimensions specified, in particular those relating to the tooth profile of the sprocket, cannot be measured by the direct application of conventional measuring instruments and it was decided to give some guidance on the special techniques involved.

The member bodies participating in the work of ISO/TC 82/SC 2 studied the problem and it was found that a number of varying methods and instruments were used, all equally satisfactory if the appropriate dimensions were controlled to ensure compatibility with the other components of the chain assembly.

The committee therefore came to the conclusion that no one method or instrument need be adopted as the "standard" method but guidance would be helpful on certain general principles and essential features of the checking gauges. This document is therefore published in the form of a Technical Report rather than an International Standard.

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1 SCOPE

This Technical Report gives guidance on methods of verifying sprocket dimensions specified in ISO 5613. This document is intended to identify those dimensions which should be measured to ensure compatibility between chain and sprocket. Recommendations are made to facilitate the measurement of these dimensions without resorting to complicated measuring equipments or techniques.

2 REFERENCES

ISO 610:1990, High-tensile steel chains (round link) for chain conveyors and coal ploughs.

ISO 1082:1984, Mining - Shackle type connector units for chain conveyors.

ISO 5612:1990, Mining - Scraper bars for chain conveyors.

ISO 5613:1984, Mining - Drive sprocket assemblies for chain conveyors.

3 SIMPLE METHOD

One of the simplest systems of verifying compatibility is to wrap specially calibrated chain assemblies (comprising chain and connectors) around a sprocket on a purely 'go' - 'no go' basis; the assemblies being made to the upper and lower limits of the manufacturing tolerances given in the relevant ISO standard.

4 SPROCKET POCKET CHECKING GAUGE

There are many conventional methods and equipments available for use in determining the normal dimensions of the sprockets but special consideration is necessary for checking those dimensions which are virtually 'in space'. For this purpose most countries utilise a sprocket pocket checking gauge to provide the missing 'link'. Combinations of gauges are used to represent links from which measurements can be taken.

The sprocket pocket checking gauges used vary in detail but generally they conform to the dimensions shown in figure 1 and table 1.

5 APPLICATION OF CHECKING GAUGES

Some typical arrangements of gauges and measurements that can be taken to check compliance with ISO 5613, are shown in figures 2-8. Other dimensions, such as tooth pitch (figure 9) and angular displacement of teeth (figure 10) can also be checked using this type of gauge.

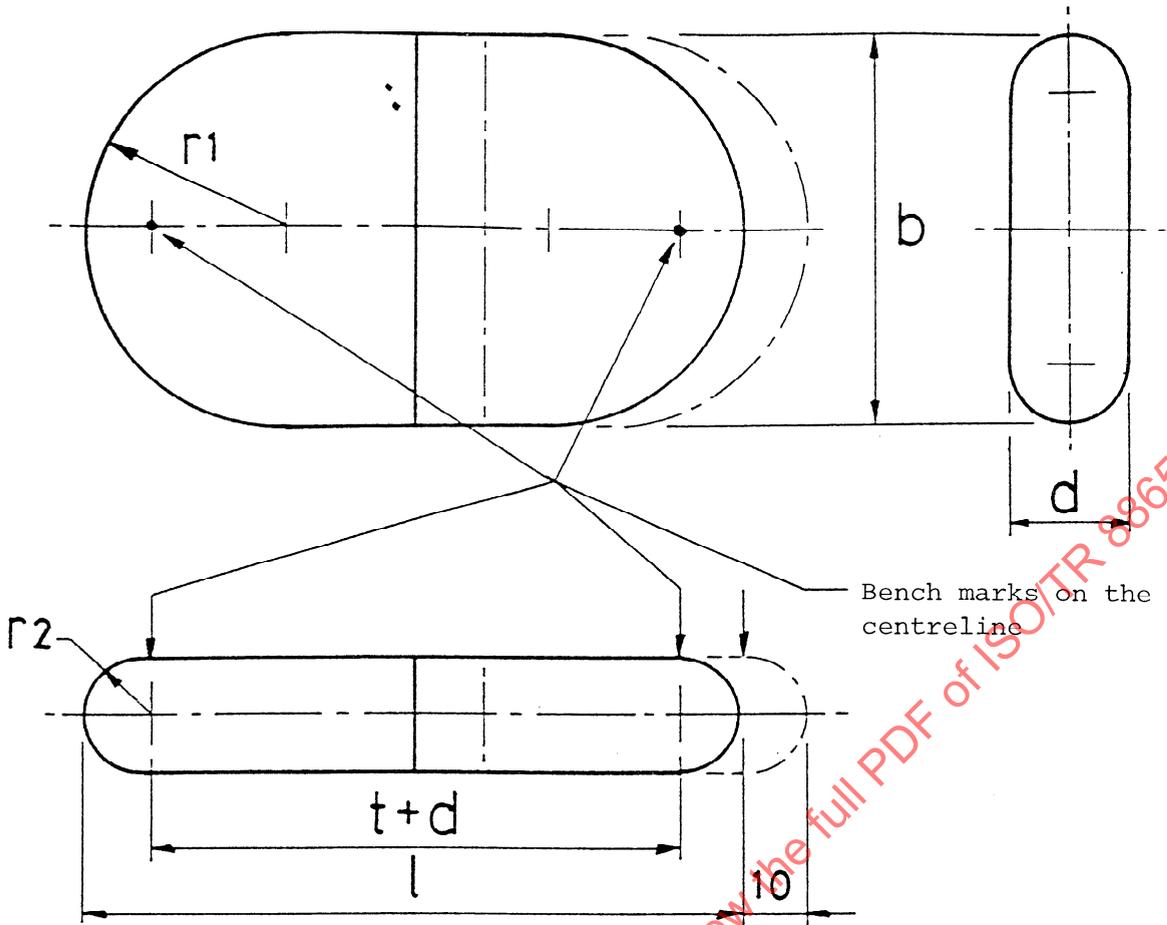


FIGURE 1 - Sprocket pocket checking gauge

NOTE - The length of the gauge link is adjustable from the minimum length l to the maximum length $l + 10$ mm.

TABLE 1 - Dimension of sprocket pocket checking gauge

Chain size	d	l	b	r ₁	r ₂
	0 -0,1	0 -0,1	0 -0,1	0 -0,1	0 -0,1
14 x 50	14	78	48	24	7
18 x 64	18	100	60	30	9
22 x 86	22	130	74	37	11
24 x 86	24	134	80	40	12
24 x 87,5	24	136	80	40	12
26 x 92	26	144	86	43	13

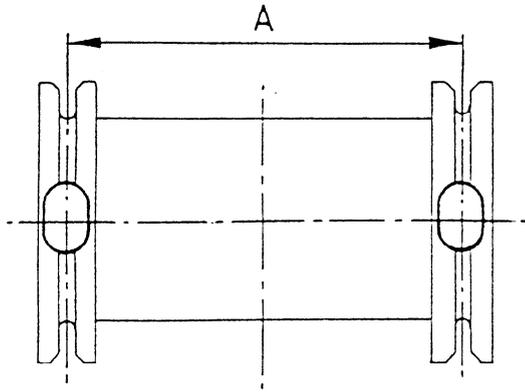


FIGURE 2 - Sprocket ring centres (Dimension A)

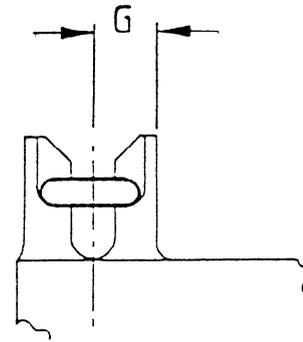


FIGURE 3 - Centreline of groove to inside face (Dimension G)

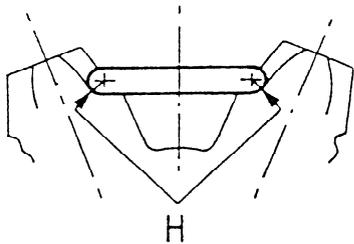


FIGURE 4 - Root radius (Dimension H)

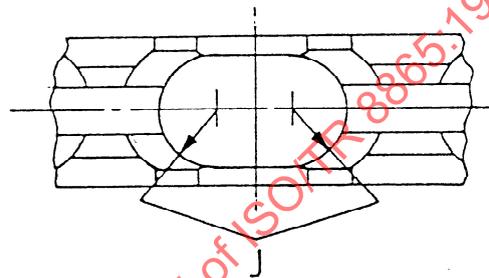


FIGURE 5 - Pocket plan radius (Dimension J)

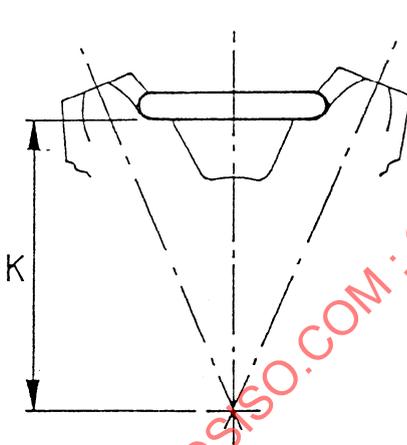


FIGURE 6 - Sprocket centre to bottom of pocket (Dimension K)

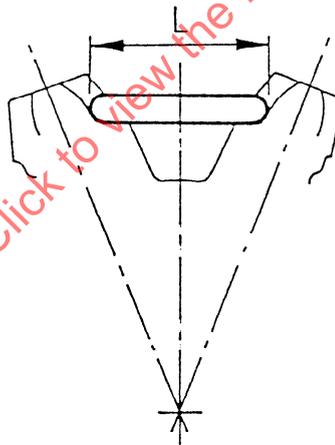


FIGURE 7 - Length of pocket (Dimension L)

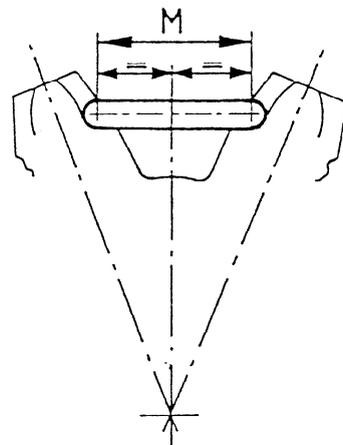


FIGURE 8 - Pocket centres (Dimension M)

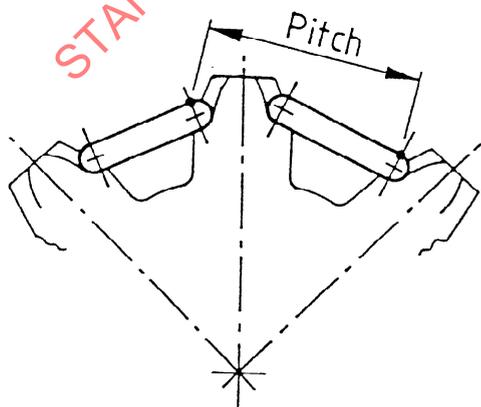


FIGURE 9 - Tooth pitch

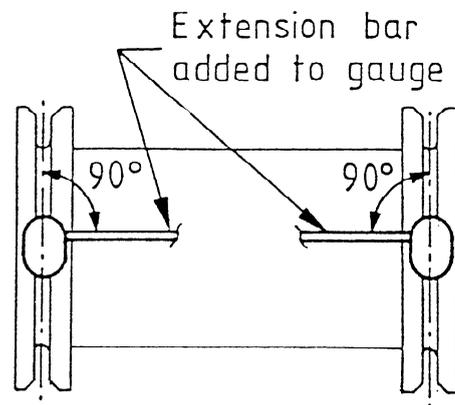


FIGURE 10 - Angular displacement of teeth across barrel

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