

INTERNATIONAL
STANDARD

ISO
4579

First edition

**Aerospace — Drives, internal, TORX®
PARALOBE® drive — Geometrical
definition, gaging and technical
requirements**

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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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 procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 4, *Aerospace fastener systems*. ISO/PRF 4579

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The International Organization for Standardization (ISO) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent.

ISO takes no position concerning the evidence, validity and scope of this patent right.

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Aerospace — Drives, internal, TORX® PARALOBE® drive — Geometrical definition, gaging and technical requirements

1 Scope

This document specifies basic dimensions, characteristics and engineering requirements for TORX® PARALOBE®¹⁾ recesses in aerospace fasteners.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4580, *Aerospace — Drive, internal, TORX® PARALOBE®, driver bit — Geometrical definition, gaging and technical requirements*

NASM1312-25, *Fastener Test Methods – Method 25 – Driving Recess Torque Quality Conformance Test*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

recess

geometry in a fastener that allows attaching a tool in order to induce a torque to enable tightening and untightening of a fastener

3.2

driver bit

tool to induce a torque into a fastener's *recess* (3.1)

3.3

configuration

shape and geometry of the cross section of a *recess* (3.1) or external drive

3.4

optimum recess torque

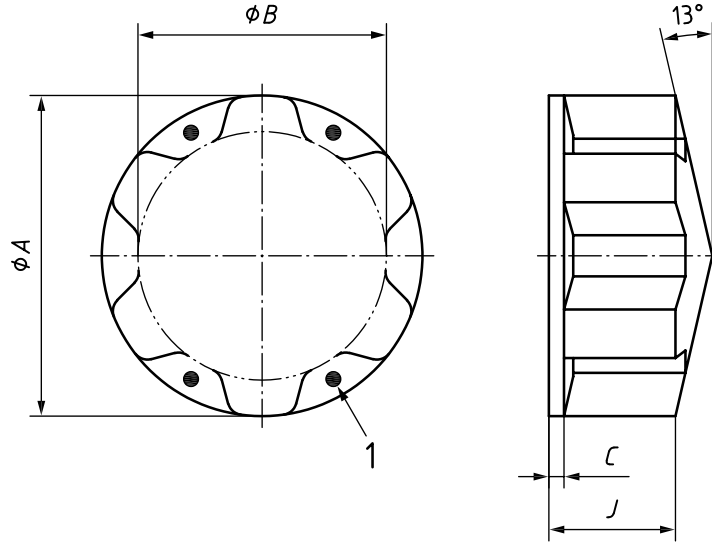
torque in a *recess* (3.1) when the recess is able to transfer the ultimate torque of the *driver bit* (3.2)

1) TORX PARALOBE is the trademark of a product supplied by Acument Intellectual Properties, LLC, 6125 Eighteen Mile Road, Sterling Heights, MI 48314, USA. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of the products named. Equivalent products may be used if they can be shown to lead to the same results.

4 Basic fastener recess configuration

4.1 General

The basic recess configuration shall be in accordance with [Figure 1](#).



Key

ϕA recess diameter

ϕB recess inscribed diameter

C recess counterbore depth (per fastener standard)

J recess depth (per fastener standard)

1 recess trademark (the recess trademark appears as four raised dots as shown and is used for drive sizes 10SI and larger)

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Figure 1 — Basic recess configuration

4.2 Recess dimensions — metric and inch

Table 1 — Recess dimensions — metric and inch^a

| Drive code | Drive size descriptor | ϕA | | ϕB | |
|------------|-----------------------|-----------------|-------|---------------------------|-------|
| | | Recess diameter | | Recess inscribed diameter | |
| | | mm | inch | mm | inch |
| 001 | 1SI | 0,94 | 0.037 | 0,69 | 0.027 |
| 002 | 2SI | 1,07 | 0.042 | 0,76 | 0.030 |
| 003 | 3SI | 1,27 | 0.050 | 0,90 | 0.036 |
| 004 | 4SI | 1,44 | 0.057 | 1,05 | 0.042 |
| 005 | 5SI | 1,56 | 0.062 | 1,17 | 0.046 |
| 006 | 6SI | 1,87 | 0.074 | 1,45 | 0.057 |
| 007 | 7SI | 2,20 | 0.087 | 1,69 | 0.067 |
| 008 | 8SI | 2,54 | 0.100 | 1,96 | 0.077 |
| 009 | 9SI | 2,74 | 0.108 | 2,11 | 0.083 |
| 010 | 10SI | 3,00 | 0.118 | 2,29 | 0.090 |

^a The dimensions in this table are rounded. Therefore the general formula for converting inches into mm cannot be used.

Table 1 (continued)

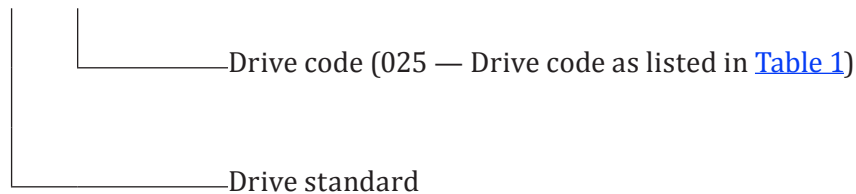
| Drive code | Drive size descriptor | $\varnothing A$ | | $\varnothing B$ | |
|------------|-----------------------|-----------------|-------|---------------------------|-------|
| | | Recess diameter | | Recess inscribed diameter | |
| | | mm | inch | mm | inch |
| 015 | 15SI | 3,56 | 0.140 | 2,74 | 0.108 |
| 020 | 20SI | 4,18 | 0.165 | 3,25 | 0.128 |
| 025 | 25SI | 4,80 | 0.189 | 3,67 | 0.145 |
| 027 | 27SI | 5,38 | 0.212 | 4,19 | 0.165 |
| 030 | 30SI | 5,96 | 0.235 | 4,62 | 0.182 |
| 040 | 40SI | 7,16 | 0.282 | 5,55 | 0.219 |
| 045 | 45SI | 8,41 | 0.331 | 6,62 | 0.261 |
| 050 | 50SI | 9,49 | 0.374 | 7,35 | 0.290 |
| 055 | 55SI | 12,03 | 0.474 | 9,59 | 0.378 |
| 060 | 60SI | 14,24 | 0.561 | 11,14 | 0.439 |
| 070 | 70SI | 16,66 | 0.656 | 13,14 | 0.518 |
| 080 | 80SI | 18,82 | 0.741 | 14,66 | 0.577 |
| 090 | 90SI | 21,40 | 0.843 | 16,88 | 0.665 |
| 100 | 100SI | 23,74 | 0.935 | 18,73 | 0.738 |
| 110 | 110SI | 25,64 | 1.010 | 19,66 | 0.774 |

^a The dimensions in this table are rounded. Therefore the general formula for converting inches into mm cannot be used.

4.3 Recess drive designation

The recess drive designation shall be as shown in the following example:

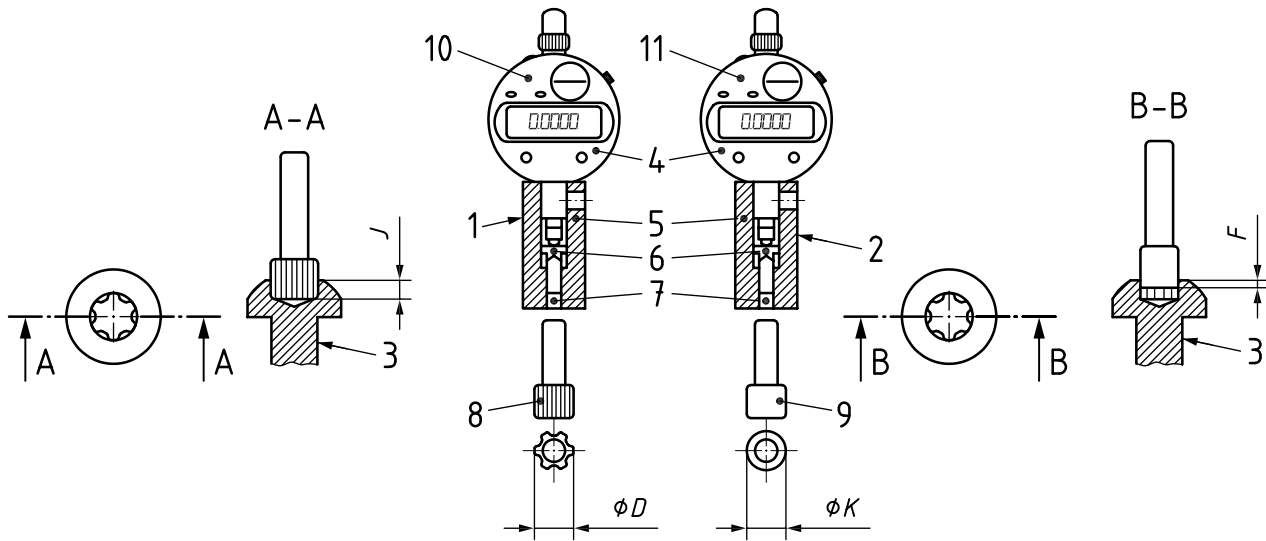
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5 Recess inspection

5.1 Gaging equipment

The recess is inspected with a penetration gage (see [Figure 2](#)).



Key

- J recess depth (per fastener standard)
- ϕD go gage element diameter (see Table 2)
- ϕK no-go gage element diameter (see Table 2)
- F no-go recess depth (per fastener standard)
- 1 go-gage identification marking
- 2 no-go gage identification marking
- 3 fastener
- 4 indicator
- 5 body
- 6 bushing
- 7 element
- 8 go gage element
- 9 no-go gage element
- 10 go gage assembly
- 11 no-go gage assembly

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Figure 2 — Go and no-go recess depth gages, penetration type gage assembly

The gage identification marking shall appear on the surface of the assembly body, along with the drive size descriptor and the gage series number.

EXAMPLE 1: For go gage:

25SI

TORX® PARALOBE®

25-SDI-770 Go

EXAMPLE 2: For no-go gage:

25SI

TORX® PARALOBE®

25-SDI-710 No-Go

5.2 Gaging procedure

Using the appropriate size gage (see Table 2), check the zero adjustment against a known flat surface. Insert the gage element into the recess and firmly push the top of the recess against the bottom of the gage body. Measure and record the gage depth. The reading shall be within acceptable limits per application fastener standard.