



NFPA Recommended Standard
NFPA/T3.5.1 R2-2002 (R2015)
Third edition
14 February 2002

AN INDUSTRY STANDARD FOR FLUID POWER

**Hydraulic fluid power –
Valves – Mounting surfaces**

(Revision of ANSI/B93.7M-1986)

Descriptors: hydraulic fluid power directional control valves compensated flow check pilot operated pressure sequence throttle unloading pressure relief valve interchangeability dimensional surfaces criteria mounting interfaces

published by

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Printed in the USA

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Foreword

This Foreword is not part of National Fluid Power Association Recommended Standard *Hydraulic fluid power – Valves – Mounting surfaces*, NFPA/T3.5.1 R2-2002 (Proposed revision of ANSI/B93.7-1986).

At the 6 March 1991 meeting, the NFPA Hydraulic Valve Section acknowledged the need to revise ANSI/B93.7-1986. Larry Coleman (Continental Hydraulics) agreed to serve as Project Chair. At the NFPA/T3.5 meeting on 19 August 1992, Jack Walrad (Vickers, Inc.) volunteered to be the Co-Chair.

At the 11 November 1992 project group meeting, it was recommended that NFPA/T3.5.36 and NFPA/T3.5.46 should be added to the document. Also, four ISO DO2 size interfaces would be added to the document. On 18 February 1993, Headquarters received a marked up document from Co-Chair Coleman with the changes to be made. These changes were incorporated into the document. Co-Chair Walrad discussed eventually putting the document into CETOP format and sent a copy of a CETOP document to Headquarters for the file.

At the 18 August 1993 meeting, Co-Chair Coleman made one change to the document and it was agreed upon by NFPA/T3.5 that the document was to be sent out for general review.

On 29 September 1993, the document was sent out for general review. The general review closed with comments from three companies. On 2 February 1994, Project Co-Chair Coleman wrote to the commentators and by 11 February 1994, all three commentators had signed off on their comments.

At the 9 February 1994 NFPA/T3.5 meeting, members agreed to send NFPA/T3.5.1 R2 out for a second general review after all the comments have been incorporated into the document. Comments from the second general review included a comment to change the word "interfaces" to "surfaces" in the title. The document was updated for the second general review and reviewed by the project group at their 25 May 1994 meeting. The TSP was updated and approved at the 18 August 1994 Technical Board meeting.

The document was sent out for second general review on 19 August 1994. The second general review closed with comments from four companies. The project group met on 8 February 1995 to review the comments received and decided that the document should be sent out for a third general review. Letters to the commentators were sent out on 20 February 1995.

Headquarters received a revised draft document on 18 January 1996. The document was revised and distributed at the 14 February 1996 NFPA/T3.5 meeting. No action on the document was taken at this meeting.

At the 22 May 1996 NFPA/T3.5 meeting, it was voted on to send the document out for third general review after Project Co-Chair Coleman reviewed the document.

On 27 August 1996, approval to send the document out for third general review was received from Project Co-Chair Coleman.

The document was sent out for third general review on 28 August 1996. At the 12 February 1997 Hydraulic Valve meeting, it was recommended to send the document out for a fourth general review after the four commentators signed off. The commentators signed off and the document was sent out for fourth general review on 16 May 1997.

The project group met on 11 February 1998 and discussed comments that were received on the fourth general review and were resolved. At the 11 February NFPA/T3.5 meeting a recommendation was made to send the document out for a fifth general review. A marked up document was received from Project Co-Chair Mr. Coleman on 30 March 1998. The fifth general review was circulated on 1 April 1999.

On 19 May 1999, the project group reviewed comments received from the fifth general review and recommended disposition. All comments were editorial, accompanied by votes of approval and addressing style, format or clarity, rather than the intended meaning. The group expects acceptance of the recommended dispositions and plans to propose a ballot draft at the September 1999 project group meeting.

On 29 March 2000, members reviewed the conference call draft, dated 23 March 2000, and the comments received from Mr. McAllister. Headquarters updated all mounting artwork sent from Mr. Coleman and centered all figures within the document. Members discussed the definition of surface roughness and surface flatness and agreed on the following for both definitions: they are not listed in ISO 5598 because they are too general; ISO 4287 only defines surface profile and roughness profile; and ISO 4288 describes how to measure surface roughness.

At the 17 May 2000 project group meeting, members reviewed the final ballot draft no. 2 and made changes to the document.

At the 31 October 2000 conference call, Mr. Coleman reviewed the conference call draft, dated 26 October 2000, and made changes to the document.

The final ballot was circulated on 6 January 2001 and closed 6 February 2001. At the 7 February 2001 project group meeting, members reviewed comments received from the fifth general review and recommended disposition.

At the 5 April 2001 Technical Board meeting, the Technical Auditor agreed that all comments from the final ballot had been resolved and the document had been updated. The Technical Board approved NFPA/T3.5's recommendation to publish.

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/jmv

Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit. Typical components found in such systems are hydraulic valves. These devices control flow direction, pressure or flow rate of liquids in the enclosed circuit.

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Hydraulic fluid power – Valves – Mounting surfaces

1 Scope

1.1 This standard includes mounting surfaces for the following:

- non-return (check) valves;
- compensated flow control valves;
- directional control valves;
- pilot operated non-return (check) valves;
- pressure control valves;
- pressure relief valves;
- sequence valves;
- throttle valves; and
- unloading valves.

1.2 This standard includes the following dimensional criteria:

- minimum surface width and length dimensions;
- sizes and locations of ports;
- sizes and locations of tapped holes for mounting fasteners; and
- sizes and locations of dowel or rest pins where required.

1.3 This standard provides the following general criteria:

- surface roughness and flatness;
- indication of appropriate radii; and
- indication of tolerances where pertinent.

1.4 This standard only applies to the dimensional criteria of products manufactured in conformance with this standard. It does not apply to their functional characteristics. The maximum working pressure for subplates and manifold blocks with this mounting surface shall be supplied by the manufacturer.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this document. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this NFPA document are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referenced to applies. NFPA maintains registers of currently valid NFPA standards.

ANSI/B93.9 *American National Standard Symbols for Marking Electrical Leads and Ports on Fluid Power Valves.*

ANSI/Y14.5M *Dimensioning and Tolerancing.*

ANSI/IEEE 268 *Metric Practice.*

ISO 273 *Fasteners – Clearance holes for bolts and screws.*