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AMERICAN NATIONAL STANDARDS INSTITUTE • A NATIONAL STANDARD FOR FLUID POWER

Hydraulic fluid power — Directional control valve — Method for determining the metering characteristics

(Revision and redesignation of ANSI/B93.66M-1983)

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Descriptors: control variable, displacement control variable; specified flow rate; flow rate; work port; specified pressure differential bar; pressure, load bar; pressure differential, measured bar; pressure, specified bar; pressure differential, tare bar; viscosity; aeration; filtration.

AMERICAN NATIONAL STANDARD

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Foreword

This Forward is not part of American National *standard Hydraulic fluid power — Directional control valve — Method for determining the metering characteristics*, ANSI/(NFPA)T3.5.14 R1-1997, (Revision and redesignation of ANSI/B93.66M-1983).

The Hydraulic Valve Section, T3.5, met on 21 September 1994 and a recommendation was made to revise this standard. The document will be updated to revise the references and add other information.

At the 8 February 1995 meeting of T3.5 the proposed Title, Scope and Purpose (TSP) was reviewed and approved. David Prevallet (Dana Corp.) agreed to serve as project chairman.

The TSP was approved by the Technical Board at their 13 April 1995 meeting.

Draft No. 1 was prepared by NFPA's Technical Staff and forwarded to Mr. Prevallet for his review.

At the 20 September 1995 meeting of T3.5 a recommendation was made to send this document out for General Review. NFPA Technical Staff prepared the document for General Review on 29 September 1995.

The General Review closed with comments from six companies. At the 14 February 1996 meeting of T3.5, the comments were incorporated into the document. Headquarters received the marked up draft on 27 February 1996. The changes were incorporated into the document and T3.5 was mail balloted for approval to put this document on the 11 April 1996 Technical Board agenda for approval to ballot. At the 11 April 1996 Technical Board meeting this document was approved for Ballot.

The document was updated at Headquarters and sent out for Ballot on 13 May 1996. Balloting closed with no negative votes and six approval votes with editorial comments. All of the editorial comments were taken care of before Balloting closed.

This document was granted final approval at the 15 August 1996 Technical Board meeting contingent upon an favorable report from Richard McAfee, the T3.5 new Chairman. A favorable report was received on 11 September 1996.

Project Group Members who developed this standard:

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On 16 September 1996, ANSI/(NFPA)T3.5.14 R1 was submitted to ANSI Committee B93 for Ballot. Balloting closed with no negative comments. ANSI granted final approval to this document on 24 January 1997.

The membership roster of Standards Committee B93 at the time of Ballot:

Jack C. McPherson
Chairman

Daniel B. Shore
Vice Chairman

Shirley C. Seal
Secretary

American Society of Agricultural Engineers
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Compressed Air & Gas Institute
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Fluid Controls Institute, Inc.
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Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit. Some hydraulic valves are required to modulate flow or pressure with some specific relationship between the valve control input and resultant output. The relationships between the valve control input and the output flows for a given inlet pressure and output pressure are the metering characteristics of the product. The metering characteristics of a hydraulic directional control valve may be an important consideration when selecting a valve as part of a system.

Hydraulic fluid power — Directional control valve — Method for determining the metering characteristics

1 Scope

This standard is intended to:

– include the determination of the metering characteristics of a fluid power directional control valve;

– provide a uniform procedure for obtaining and reporting the metering characteristics of a fluid power directional control valve.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this document. At the time of publication, the editions indicated were valid. All documents are subject to revision, and parties to agreements based on this document are encouraged to investigate the possibility of applying the most recent editions of the documents indicated below. NFPA maintains registers of currently valid NFPA/ANSI standards.

ANSI/B93.2-1986, *Fluid power systems and products — Glossary*.

ANSI/(NFPA)T2.12.1-1993, *Hydraulic fluid power — Systems and products — Method of measuring average steady-state pressure*.

ANSI/(NFPA)T2.12.10-1993, *Recommended practice — Hydraulic fluid power — Systems and products — Testing general measurement principles and tolerances*.

ANSI/IEEE 268-1992, *Metric Practice*.

ISO 1000:1992, *SI units and recommendations for the use of their multiples and of certain other units*.

ISO 1219-1:1991, *Fluid power systems and components — Graphic symbols and circuit diagrams — Part 1: Graphic symbols*.

ISO 3448:1992, *Industrial liquid lubricants — ISO viscosity classification. Technical corrigendum 1:1993*.

ISO 4411:1986, *Hydraulic fluid power — Valves — Determination of pressure differential/flow characteristics*.

ASTM/D 445-1988, *Standard Test Methods for Kinematic Viscosity and Opaque Liquids*.

3 Definitions

For definitions of other terms used, see ANSI/B93.2.

control variable(s): The variables(s) which cause the controlled flow characteristic(s) of the valve to change.

displacement control variable: Mechanical displacement, volume or electrical current used to control valve output.