



**NFPA/T3.6.54 R1-1997 (R2009)**  
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AN INDUSTRY STANDARD FOR FLUID POWER

**Hydraulic fluid power – Cylinders ports –  
SAE straight thread O-ring and four-bolt flange ports –  
ISO straight thread O-ring and four-bolt flange ports –  
Heavy duty and light duty square head tie rod cylinders**

**(Revision and redesignation of ANSI/B93.75M-1987)**

Descriptors: fluid power, industrial hydraulic fluid power cylinder, port sizes, square head cylinder, straight thread cylinder, four-bolt flange

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## Foreword

This Foreword is not part of *Hydraulic fluid power — Cylinder ports — SAE straight thread O-ring and four-bolt flange ports — ISO straight thread O-ring and four-bolt flange ports — Heavy duty and light duty cylinders*, (NFPA)T3.6.54 R1-1997 (Revision of ANSI/B93.75M-1987).

At the T3.6 Cylinders meeting on 24 March 1993 it was decided to update this documents reference section. Gregory Pesch (Hanna Corp.) agreed to serve as Project Chairman. All members of T3.6 were included in the Project Group. The TSP was approved by the Technical Board at their 20 May 1993 meeting.

At the T3.6 meeting on 18 August 1993 the Project Group agreed that after the SAE reference number was updated by project Chairman Pesch, the document should be sent out for General Review.

The document was updated and a few minor editorial changes were made. The document was sent out for General Review on 25 October 1993. The General Review closed with comments from four companies.

At the 9 February 1994, T3.6 meeting, the title of the document was changed from *Hydraulic fluid power — Cylinder ports — SAE straight thread O-ring and four-bolt flange ports — Heavy duty and light duty cylinders*. The new title of the document is *Hydraulic fluid power — Cylinder ports — SAE straight thread O-ring and four-bolt flange ports — ISO straight thread O-ring and four-bolt flange ports — Heavy duty and light duty cylinders*.

The Project Group revised the document and at their 21 September 1994 meeting voted to send the document out for Second General Review. The document was sent out for Second General Review on 20 October 1994. The Second General Review closed with comments from two companies. Project Chairman Pesch wrote to the commentators on 9 February 1995 and both signed off by 16 February 1995. Headquarters received the revised document from Project Chairman Pesch on 13 February 1995.

T3.6 met on 8 February 1995 and voted to put this document on the Technical Board agenda for approval to Ballot. This document was approved for Ballot at the 13 April 1995 Technical board meeting.

This document was sent out for Ballot on 17 April 1995. Balloting closed with two negative comments. Both negative commentators asked that the document be changed to metric dimensions. At the 11 April 1996 Technical Board meeting Donald Selke reviewed the history of this document. At the General Review stage it was asked that metric units be added. This is an inch document, however, the committee added the units. At the Ballot stage the committee was asked to delete the original U.S. units. The committee believes that since this is an inch document, the U.S. units should be retained. The Technical Board agreed with the T3.6 Committee and approved the document with the editorial changes from the two commentators to be added.

The updated document was received at Headquarters on 21 March 1997.

Project Group members who developed this standard:

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Parker Hannifin Corp.

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NFPA/T3.6.54 R1-1997 (R2009)

# Hydraulic fluid power — Cylinder ports — SAE straight thread O-ring and four-bolt flange ports — ISO straight thread O-ring and four-bolt flange ports — Heavy duty and light duty square head tie rod cylinders

## 0 Introduction

In fluid power systems, power is transmitted and controlled through a fluid (liquid or gas) under pressure within an enclosed circuit.

One component of such systems is the fluid power cylinder. This is a device which converts power into linear mechanical force and motion. It usually consists of a movable element, such as a piston and piston rod, plunger, or ram operating within a cylindrical bore.

The square head cylinder is a specific design initially developed for industrial (in plant) use. It is manufactured and sold as an interchangeable component by a majority of suppliers. Standardization of O-ring port sizes in this document is further recognition of this interchangeability.

## 1 Scope

**1.1** This standard includes recommended sizes of SAE and ISO straight thread O-ring and four-bolt flange ports in NFPA standard heavy duty and light duty hydraulic cylinders.

**1.2** This standard intends to:

- encourage the use of SAE O-ring sealed ports;
- promote cylinder interchangeability by establishing uniform O-ring port recommendations.

**1.3** This standard only applies to the dimensional criteria of products manufactured in conformance with this standard. It does not apply to their functional characteristics.

## 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 maintain registers of currently valid NFPA standards.

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

(NFPA)T3.6.7 R2-1996, *Fluid power systems and products — Square head industrial cylinders — Mounting dimensions.*

ISO 6149-1-1993, *Connections for fluid power and general use — Ports and stud ends with ISO 261 threads and O-ring sealing — Part 1: Port with O-ring in truncated housing.*

ISO 6162:1994, *Hydraulic fluid power — Four-screw split-flange connections for use at pressures of 2,5 MPa to 40 MPa (25 bar to 400 bar) — Type I metric series and type II inch series.*

SAE J1926-1:1988, *Specification for Straight Thread O-ring Boss Port.*

SAE J846-1989, *Coding System for Identification of Fluid Conductors and Connectors.*

SAE J518-1993, *Hydraulic Flanged Tube, Pipe, and Hose Connections, Four-Bolt Split Flange Type.*