

(R) Connections for Fluid Power and General Use - Hydraulic Couplings - Diagnostic**RATIONALE**

This SAE Project, S1-J1502-05-01 is intended to rationalize this standard with ISO 15171-1 (Connections for fluid power and general use - Hydraulic couplings for diagnostic purposes - Part 1: Coupling not for connection under pressure) and to accommodate the withdrawal of SAE J2244 and also add O-ring call-outs in accordance with SAE J515. The reinstatement of ISO 725 has also been included.

FOREWORD

SAE J1502 has been revised to update the metric stud end specifications to the new dimensions specified in ISO 6149-2 and to more clearly specify the test and performance requirements.

1. SCOPE

SAE J1502 specifies dimensions, performance requirements, and test procedures for the male half of a diagnostic coupler with either a metric M14x1.5 or an inch 9/16–18 straight thread stud end. The coupler is designed for use with a mineral based hydraulic fluid. It is used on machines specified in SAE J1116. It does not apply to the mating hydraulic quick action couplings not on the machine.

Diagnostic couplings in accordance with SAE J1502 may be used at a working pressure of 42 MPa. The permissible working pressure depends upon the materials, design, working conditions, application, etc.

Conformance to the dimensional information in this part of SAE J1502 does not guarantee rated performance. Each manufacturer should perform testing according to the specification contained in this document to ensure that components comply with the performance rating.

2. REFERENCES**2.1 Applicable Publications**

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 standards 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 as follows. Members of IEC and ISO maintain registers of currently valid International Standards.

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2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

- SAE J515 Specification for O-Ring Materials Used with Hydraulic Connectors
- SAE J1116 Categories of Off-Road Self-Propelled Work Machines
- SAE J1298 Connections for Fluid Power and General Use—Hydraulic Couplings—Diagnostic Port Sizes and Locations
- SAE J1926-2 Connections for General Use and Fluid Power - Ports and Stud Ends with ASME B1.1 Threads and O-ring Sealing - Part 2: Heavy-Duty (S Series) Stud Ends

2.1.2 ISO Publications

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

- ISO 261 ISO general-purpose metric screw threads - General plan
- ISO 4579-1 Tolerances for fasteners - Part 1: Bolts, screws and nuts product grades A, B, and C
- ISO 5598 Fluid power systems and components - Vocabulary
- ISO 6149-2 Connections for fluid power and general use - Ports and stud ends with ISO 261 threads and O-ring sealing - Part 2: Heavy duty (S) series stud ends - Dimensions, design, test methods and requirements
- ISO 9227 Corrosion tests in artificial atmosphere - Salt spray tests
- ISO 11926-2 Connections for fluid power and general use - Ports and stud ends with ISO 725 threads and O-ring sealing - Part 2: Heavy duty (S) series stud ends - Dimensions, design, test methods and requirements (This document is technically equivalent to SAE J1926-2)
- ISO 15171-1 Connections for fluid power and general use-Hydraulic couplings for diagnostic purposes - Part 1: Couplings not for connection under pressure
- ISO 19879 Metallic tube connections for fluid power and general use - Test methods for hydraulic fluid power connections

2.1.3 ASME Publications

Available from American Society of Mechanical Engineers, 22 Law Drive, P.O. Box 2900, Fairfield, NJ 07007-2900, Tel: 973-882-1170, www.asme.org.

- ASME B1.1 Unified Inch Screw Threads

2.1.4 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

- ASTM B 117 Method of Salt Spray (Fog) Test

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 ISO Publications

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

- ISO 725 ISO inch screw threads - Basic dimensions
- ISO 965-1 ISO general purpose metric screw threads - Tolerances - Part 1: Principles and basic data
- ISO 1302 Technical drawings - Method of indicating surface texture on drawings
- ISO 6508 Metallic materials - Hardness test - Rockwell test (scale A-B-C-D-E-F-G-H-K)

2.2.2 ASME Publications

Available from American Society of Mechanical Engineers, 22 Law Drive, P.O. Box 2900, Fairfield, NJ 07007-2900, Tel: 973-882-1170, www.asme.org.

- ASME B46.1 Surface Texture (Surface Roughness, Waviness and Lay)

2.2.3 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

- ASTM B 633 Standard Specifications for Electrodeposited Coatings of Zinc on Iron and Steel

3. DEFINITIONS

For the purposes of this document, the definitions given in ISO 5598 and the following definition apply.

3.1 QUICK ACTION

The joining of two components in a fashion with only hands and without wrenches and other mechanical means.

4. REQUIREMENTS

4.1 Material

4.1.1 Coupler Construction

Diagnostic couplers shall be manufactured from carbon steel that will satisfy the minimum pressure/temperature requirements specified. Couplers may be made by forging, cold forming, or machined from bar stock.

4.2 Performance

Male couplers shall meet the following performance requirements when tested per Section 5.

4.2.1 Working Pressure

Diagnostic couplings made of low-carbon steel shall be designated for use at a working pressure of 42 MPa.

4.2.2 Rated Flow

The coupler shall be rated to handle a flow of 3 L/min at a maximum pressure drop of 500 kPa with a maximum flow without malfunction of 15 L/min.

4.2.3 Application Temperature

Carbon steel fittings shall meet the working pressures when used at temperatures between -40 and +120 °C.

4.2.4 Cyclic Endurance (Impulse Test)

Couplers shall exceed one million impulse cycles when impulse tested per ISO 19879 at an impulse test pressure of 56 MPa

4.2.5 Proof Test

Couplers shall meet the minimum required proof pressure to verify a minimum of a 2:1 Proof to Working Pressure ratio.

4.2.6 Burst Test

Diagnostic couplings shall meet the minimum burst pressure of 168 MPa to verify a minimum of a 4:1 Burst to Working Pressure ratio.

4.2.7 Vacuum Test

Couplings shall be capable of withstanding a vacuum of 95 kPa negative pressure for 5 min without leakage.

4.3 O-rings

O-rings for the stud end shall conform to the dimensions shown in Figure 1 and given in Table 1.

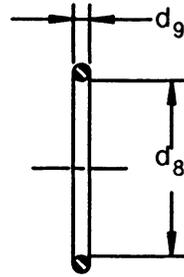


FIGURE 1 - O-RING

TABLE 1 - DIMENSIONS OF O-RING
Dimensions in millimeters

Thread	Inside Diameter d_8 Nom	Cross-section Diameter d_9 Nom	SAE J515 O-ring Dash Size	SAE J515 O-ring Size Ordering Code
M14x1.5	11.3	2.2	n/a	220x0113H
9/16-18	11.89	1.98	906	198x0118H

4.4 Design

4.4.1 Coupler Dimensions in Millimeters

Dimensions shall conform to those given in Figure 2.

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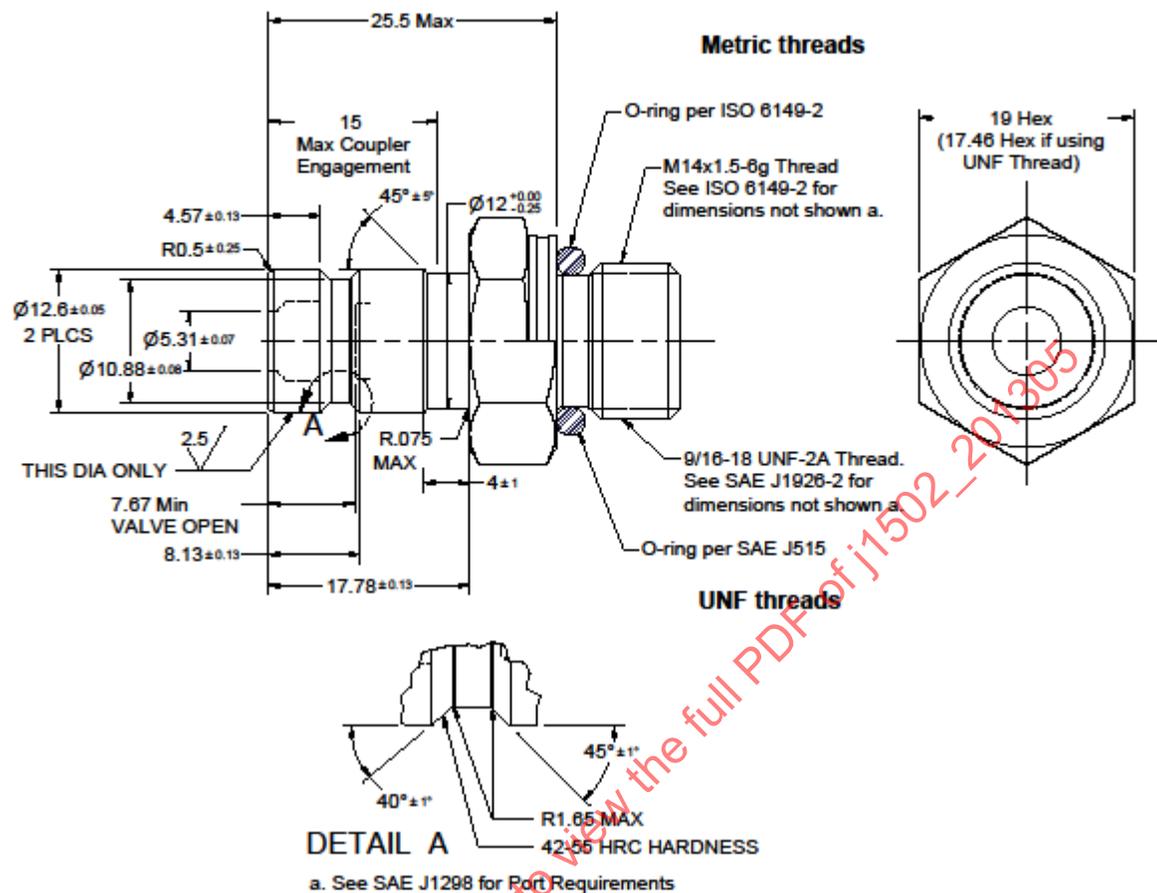


FIGURE 2 - DIAGNOSTIC COUPLER, METRIC AND INCH DESIGNS

4.4.2 Hex Tolerances

Hex tolerances across flats shall be in accordance with ISO 4759-1, product grade C. Minimum across corner dimensions are 1.092 times the nominal width across flats. The minimum side flat is 0.43 times the nominal width across flats.

4.4.3 Screw Threads

The screw threads on the stud end shall be metric screw threads to ISO 261 class 6g or inch threads to ASME B1.1 class 2A or 2B.

4.5 Manufacture

4.5.1 Workmanship

Workmanship shall conform to the best commercial practice to produce high quality couplers. Couplers shall be free from visual contaminants, all hanging burrs, loose scale, and slivers which might be dislodged in use, and any other defects that might affect the function of the parts.