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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

SURFACE VEHICLE STANDARD

SAE J1036

REAF. APR93

Issued 1973-06
Reaffirmed 1993-04-16

Superseding J1036 JAN85

Submitted for recognition as an American National Standard

DIMENSIONAL STANDARD FOR CYLINDRICAL HYDRAULIC COUPLERS FOR AGRICULTURAL TRACTORS

Foreword—This reaffirmed document has been changed only to reflect the new SAE Technical Standards Board format.

1. ***Scope***—This SAE Standard specifies the essential interface dimensions, the installation dimensions, and the operating requirements for hydraulic couplers employed to transmit hydraulic power from agricultural tractors to agricultural implements and farmstead equipment as defined in SAE J1150.

2. ***References***

2.1 Applicable Documents—The following publication forms a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply.

2.1.1 SAE PUBLICATION—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J1150—Terminology for Agricultural Equipment

2.2 Definitions—The couplers consist of two parts:

2.2.1 FEMALE PART—The part which provides a cavity to receive the male part. The female part is considered a part of the tractor's hydraulic system, and shall accept and function with a male part which complies with the data in the table.

2.2.2 MALE PART—The probe which fits and locks into the cavity in the female part. The male part is considered a part of the cylinder, motor, and/or implement hydraulic system.

3. ***Field of Application***—This document applies to couplers used on hydraulic lines other than those used for the braking system which must be connected or disconnected frequently to allow the transference of implement and farmstead equipment from one tractor to another.

4. ***Dimensional Characteristics***—The coupler shall comply with Figure 1 and the data in Table 1.

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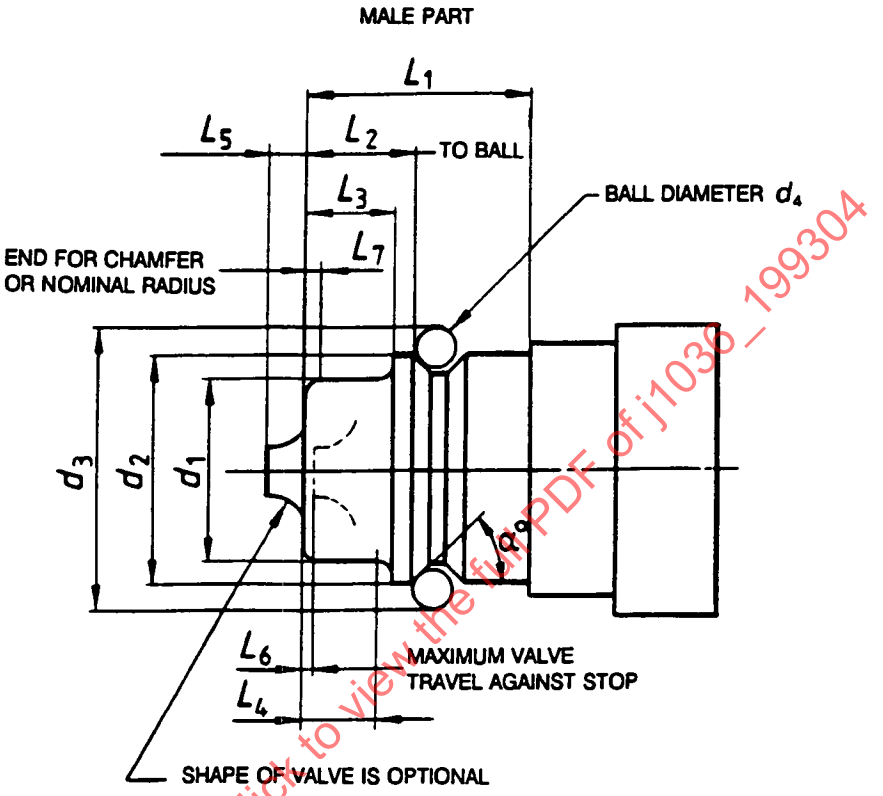

NOTES:

1. The configuration of the coupler shown is solely for the purpose of illustration and to give dimensional references. It is not intended to give design requirements.

2. Dimension L_2 applies when the balls of diameter d_4 are held at a gauge diameter of d_3 and also against the flank of the ball groove nearest the nose of the valve.

FIGURE 1—HYDRAULIC COUPLER

TABLE 1—DIMENSIONAL CHARACTERISTICS OF HYDRAULIC COUPLER
Dimensions in millimeters

Detail		Size	Remarks
d_1	max	20.56	
	min	20.48	
d_2	max	23.74	—
	min	23.66	—
d_3		30.30	Gauge Diameter (See Note 2)
d_4		4.762	—
L_1	min	24.00	—
L_2	max	11.79	See Note 2
	min	11.66	See Note 2
L_3	max	9.4	—
	min	9.2	—
L_4	min	8.50	Length of Diameter d_1
L_5	max	4.32	Valve Protrusion
L_6		0.0-0.5	—
L_7	max	1.5	—
α	max	46°	—
	min	44°	—

5. *Operating Requirements*

5.1 The pressure drop through the male coupler during operation shall not be greater than 1.75 kPa (1.75 bar) with a flow of 45 L/min, using oil having a viscosity of 32 mm^2/s.[1]

5.2 The working pressure of the coupler shall be based on a maximum relief valve pressure of 25 MPa (250 bar). The male part of the disconnected coupler shall withstand a minimum pressure of 70 MPa (700 bar).

5.3 The coupler shall be capable of being connected by hand with a pressure of 700 kPa (7 bar) in either of the valves.

5.4 The female coupler shall be so constructed that, when suitably mounted, it will disconnect with a pull on the male part of not more than 1.7 kN applied longitudinally, when subjected to an internal pressure of 17.5 MPa (175 bar). On disconnection, the amount of spill shall not exceed 6 mL.

5.5 If the coupler is swivel-mounted, this shall allow a total angular deviation of 60 degrees with respect to an axis parallel to the longitudinal axis of the tractor.

5.6 The force required to fully open the valve in the male part, when there is no pressure in the coupler, shall not exceed 45 N.

[1] 1 mm^2/s = 1 cSt

5.7 If a stop is not provided in the female part, the valve spring load shall be sufficient to prevent closure of the valve in the male part on rapid application of a high rate of flow.

5.8 The travel of the valve in the male coupler is to be limited as shown in Table 1 and Figure 1. (The document does allow double travel of the valve in the female coupler to be provided when necessary to facilitate coupling with pressure in the hydraulic lines.)

5.9 Seals and other materials are to be compatible with SAE 20 mineral oils and additives normally used in tractor hydraulic systems.

6. ***Location Zone of Female Part of Coupler on Tractor***—The preferred position for the female couplers shall be as close as practical to the longitudinal axle of tractor and in line with or above the top link mounting point.

PREPARED BY THE SAE AGRICULTURAL TRACTOR TECHNICAL COMMITTEE