



AEROSPACE RECOMMENDED PRACTICE	ARP1709™	REV. A
	Issued 1983-06 Reaffirmed 2013-01 Cancelled 2024-03 Superseded by AS1709	
Coupling Assembly, Hydraulic Self Sealing, Quick Disconnect		

RATIONALE

ARP1709 has been specified on several SAE Aerospace Standard (AS) drawings. It was intended to be a “requirements” document, but since it was published as an ARP document, the contents were not mandatory—only recommended. Because of this, ARP1709 will be cancelled. All of its contents have already been incorporated into AS1709. Supersession of ARP1709 by AS1709 will make the specified contents mandatory.

CANCELLATION NOTICE

This technical report has been declared “CANCELLED” as of March 2024 and has been superseded by AS1709. By this action, this document will remain listed in the respective index, if applicable. Cancelled technical reports are available from SAE.

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Documents

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1. SCOPE:

- 1.1 This specification covers the requirements for aircraft, hydraulic, self sealing, quick disconnect couplings, for use in type II hydraulic systems (-65°F to +275°F temperature range) as defined by MIL-H-5440.
- 1.2 Classification: Hydraulic self sealing, quick disconnect couplings shall be of the following classes and types:

Class 1000: 1000 psi rated pressure.
Class 3000: 3000 psi rated pressure.
Class 4000: 4000 psi rated pressure.

Type I Quick Disconnects shall have a visual indication that they are completely connected and open to flow.

Type II Quick Disconnects shall have both a visual and touch indication that they are completely connected and open to flow.

2. APPLICABLE DOCUMENTS:

- 2.1 Issues of Documents: The following documents of the issue in effect on date of invitation for bids, or request for proposal, form a part of this specification to the extent specified herein:

2.1.1 Military Specifications:

MIL-H-5440	Hydraulic Systems: Design, Installation and Test of Aircraft, (General Specification for)
MIL-H-5606	Hydraulic Fluid, Petroleum Base, Aircraft and Ordnance
MIL-H-8775	Hydraulic System Components, Aircraft and Missile, General Specification for
MIL-H-25579	Hose Assembly, Tetrafluoroethylene, High Temperature, Medium Pressure, General Requirements for
MIL-H-83282	Hydraulic Fluid, Fire Resistant Synthetic Hydrocarbon Base, Aircraft
MIL-P-83461	Packing, Preformed, Petroleum Hydraulic Fluid Resistant, Improved Performance at 275°F
MIL-R-8791	Retainer, Packing, Hydraulic and Pneumatic, Tetrafluoroethylene Resin

2.1.2 Military Standards:

MIL-STD-129	Marking for Shipment and Storage
MIL-STD-130	Identification Markings of U.S. Military Property
MIL-STD-810	Environmental Test Methods

2.2 Other Publications:

Society of Automotive Engineers (SAE)

AIR 1047	A Guide for the Selection of Quick Disconnect Couplings for Aerospace Fluid Systems
ARP 24	Hydraulic Pressure Drop Determination of
ARP 603	Impulse Testing of Hydraulic Hose Assemblies, Tubing, and Fittings
ARP 614	Hose Assemblies, Aircraft and Missiles, High Temperature (450°F), High Pressure (4000 psig)
ARP 868	Pressure Drop Test for Fuel System Components
AS 1339	Hose Assembly, Tetrafluoroethylene, Lightweight, High Temperature, High Pressure 3000 psi (20684 KPa) Hydraulic and Pneumatic

3. REQUIREMENTS:

3.1 Qualification: The couplings furnished under this specification shall be a product which has been tested, and has passed the qualification tests specified herein, and has been approved by the procuring agency or prime contractor.

3.2 General Specification: The requirements of MIL-H-8775 apply to this specification except as specified herein.

- 3.3 Materials: The coupling shall be constructed of materials that will not change the composition of or be adversely affected by hydraulic fluid conforming to MIL-H-5606 or MIL-H-83282. Other materials and fluids can be utilized for similar applications based on procuring agency requirements.
- 3.4 Design and Construction: The configuration, dimensions, and other details of design of the couplings shall conform to applicable Specification Control Drawings. The design objective shall be to obtain the smallest size and lightest weight commensurate with meeting performance requirements herein. When coupled, the coupling shall be such that it will permit fluid flow in either direction in accordance with the rated flow and pressure drop as specified in Table I. Flow shall not be blocked under surge conditions.
- 3.4.1 Temperature Range: Couplings shall be designed to operate throughout the temperature range of -65°F to +275°F (see para. 4.6.3).
- 3.4.2 Sealing and Fluid Loss: The couplings shall, when uncoupled, seal the ends of the disconnected lines at the point of disconnection and shall not permit external leakage during any phase of coupling or uncoupling. Fluid loss (spillage) as specified in Table II is not considered to be external leakage. Both halves of the coupling shall seal fluid under both low and high pressures (see para. 4.6.4).
- 3.4.3 Seals: Only MIL-P-83461 packing material and MIL-R-8791 retainer material shall be used with MIL-H-5606 hydraulic fluid. Packing and retainer material for other fluid shall be specified by the Procuring Agency.

Table I - Rated Flow and Pressure Drop

Dash No.	Equivalent Tube Size In Inches	Rated Flow GPM	Surge Flow GPM	Pressure Drop PSI (Max.)
-04	1/4	1.2	6	8
-06	3/8	3.5	17.5	8
-08	1/2	6.0	30	8
-10	5/8	10.5	52.5	8
-12	3/4	16.0	80	8
-16	1	29.0	87	8
-20	1 1/4	45.0	90	4
-24	1 1/2	60.0	120	4
-32	2	100.0	200	4

Table II - Air Inclusion and Fluid Loss

Dash No.	Equivalent Tube Size Inches	Air Inclusion Standard Cubic Centimeters (in. ³) (Max.)	Average Fluid Loss (Spillage) Per Operating Cycle Cubic Centimeter (inches ³) (Max.)
-04	1/4	0.10 (0.006)	0.05 (0.003)
-06	3/8	0.20 (0.012)	0.10 (0.006)
-08	1/2	0.40 (0.025)	0.20 (0.012)
-10	5/8	0.60 (0.037)	0.30 (0.018)
-12	3/4	1.00 (0.061)	0.50 (0.031)
-16	1	1.75 (0.110)	1.00 (0.061)
-20	1 1/4	2.00 (0.122)	1.20 (0.073)
-24	1 1/2	2.50 (0.153)	1.50 (0.092)
-32	2	3.00 (0.183)	2.00 (0.122)

- 3.4.4 Operation: The coupling shall be so designed that it can be coupled and uncoupled with a one handed simple motion and without special tools, while one half is held in a fixed mounting. It shall be possible to couple and uncouple with a static pressure, as shown in Table III, applied to both halves. The force, or torque, shall not exceed the values shown in Table III.

The Type I coupling shall have a clear and unmistakable visual indication that it is fully connected and open when viewed at 90° to the axis from any side.

The Type II coupling shall have a visual and touch feature to indicate the completely coupled condition, the touch feature shall be clear and unmistakable.

The coupling shall not inadvertently uncouple under a 20 G maximum load.

Table III - Coupling Forces With the Indicated Static Pressure Applied to Both Halves

Dash No.	Static Press. PSIG	Push-Pull Axial LBS.	Torque Rotation IN. LBS.
-04	60	30	15
-06	60	35	20
-08	60	40	25
-10	60	45	30
-12	50	50	40
-16	30	60	50
-20	20	60	60
-24	15	60	70
-32	10	60	80

- 3.5 Interchangeability: Couplings shall be interchangeable as a coupled assembly (not individual coupling halves). It shall be impossible to interconnect different tube sizes. Couplings of different pressure classes shall not be capable of cross coupling.