

Hydraulic Tube Fittings, Pressure Ratings

The hydraulic tube fittings represented in this catalog conform to the performance requirements specified in SAE J514, SAE J518, SAE J1231, SAE J1453, SAE J1926, ISO 11926 and related standards.

The working pressure ratings listed below are based on a 4:1 design factor for minimum burst. As specified in SAE J514 and SAE J1453, these are dynamic pressure ratings and the fittings are capable of passing a cyclic endurance (impulse) test for one million cycles at 133% of the corresponding working pressure.

The rated working pressure for any fitting is based on the lowest pressure rated fitting end. For example, a fitting

may include one -4 (1/4") male 37° tube end and one -6 (3/8") male pipe end. From the tables below, the rated working pressure for the -4 male 37° tube end is 34.5 MPa (5,000 psi) and the rated working pressure of the -6 (3/8") male pipe end is 21 MPa (3,000 psi). The rated working pressure of the fitting would be 21 MPa (3,000 psi).

For proper performance, the design of any hydraulic system should take into consideration the rated working pressures for each of the components of the system, including standard ratings for hose and tubing components and assemblies. For any application, sufficient testing should be performed to assure safe and satisfactory performance.

Table P1. Pressure Ratings for 37° Flared Tube Ends, 37° Female Swivels, O-Ring Port Plugs and Straight Thread Stud Ends (Inch)

Nominal Tube Size		Thread Size (Notes 1&2)	Working Pressures							
Nom SAE Dash Size	Nom Inch Tube O.D.	SAE J514 Flared Tube End and SAE J1926/3/ ISO 11926-3 O-Ring Port Thread Size	37 Degree Flared Tube Ends, Unions and Bulkheads		37 Degree Female Swivels		SAE J514 (Inch) Port Plugs and Stud Ends Per SAE J1926/3/ISO 11926-3			
			MPa	psi	MPa	psi	Port Plugs/Non-Adjustable Studs		Adjustable Studs	
			MPa	psi	MPa	psi	MPa	psi	MPa	psi
-2	1/8	5/16-24 UNF	34.5	5,000	34.5	5,000	34.5	5,000	34.5	5,000
-3	3/16	3/8-24 UNF	34.5	5,000	34.5	5,000	34.5	5,000	34.5	5,000
-4	1/4	7/16-20 UNF	34.5	5,000	31	4,500	34.5	5,000	31.5	4,500
-5	5/16	1/2-20 UNF	34.5	5,000	27.5	4,000	34.5	5,000	27.5	4,000
-6	3/8	9/16-18 UNF	34.5	5,000	27.5	4,000	34.5	5,000	27.5	4,000
-8	1/2	3/4-16 UNF	31	4,500	27.5	4,000	31	4,500	27.5	4,000
-10	5/8	7/8-14 UNF	24	3,500	21	3,000	24	3,500	21	3,000
-12	3/4	1-1/16-12 UN	24	3,500	21	3,000	24	3,500	21	3,000
-14	7/8	1-3/16-12 UN	21	3,000	17	2,500	21	3,000	17	2,500
-16	1	1-5/16-12 UN	21	3,000	17	2,500	21	3,000	17	2,500
-20	1 1/4	1-5/8-12 UN	17	2,500	14	2,000	17	2,500	14	2,000
-24	1 1/2	1-7/8-12 UN	14	2,000	10.5	1,500	14	2,000	10.5	1,500
-32	2	2-1/2-12 UN	10.5	1,500	8	1,125	10.5	1,500	8	1,125

1) Threads per SAE J475 Class 2A ext. Class 2B int. (Ref. ISO-263/ISO-R725)

2) Unified class 2B threads apply to swivel nuts and with minor diameter modified to class 3B limits for locknuts

Table P2. Pressure Ratings for Fittings With NPTF Pipe Threads and Adapter Unions

Nominal Pipe Size		Thread Size		Working Pressures			
Nom SAE Dash Size	Nom Inch Pipe O.D.	Dryseal Pipe Thread (NPTF ¹) Male and Female	Straight Pipe Thread (NPSM ²) Female Swivels	Fittings With NPTF Pipe Threads		Adapter Unions	
				MPa	psi	MPa	psi
-2	1/8	1/8-27	1/8-27	34.5	5,000	34.5	5,000
-4	1/4	1/4-18	1/4-18	27.5	4,000	34.5	5,000
-6	3/8	3/8-18	3/8-18	21	3,000	27.6	4,000
-8	1/2	1/2-14	1/2-14	21	3,000	24.1	3,500
-12	3/4	3/4-14	3/4-14	17	2,500	15.5	2,250
-16	1	1-11-1/2	1-11-1/2	14	2,000	13.8	2,000
-20	1 1/4	1-1/4-11-1/2	1-1/4-11-1/2	8	1,150	11.2	1,625
-24	1 1/2	1-1/2-11-1/2	1-1/2-11-1/2	7	1,000	8.6	1,250
-32	2	2-11-1/2	2-11-1/2	7	1,000	7.8	1,125

1) Dryseal American Standard Taper Pipe Thread

2) American Standard Straight Pipe Thread for Mechanical Joints



Table P3. Pressure Ratings for ORFS Male Tube Ends, Female Swivels and Straight Thread Stud Ends (Inch)									
Nominal Tube Size		Thread Size (Notes 1&2)		Working Pressures					
Nom SAE Dash Size	Nom Inch Tube O.D.	SAE J1453 ORFS Tube End	SAE J1926/2 ISO 11926-2 O-Ring Port Thread Size	ORFS Tube Ends, Unions and Bulkheads		Heavy Duty Stud Ends Per SAE J1453, J1926/2/ISO 11926-2			
						Non-Adjustable Studs		Adjustable Studs	
				MPa	psi	MPa ⁽³⁾	psi	MPa ⁽³⁾	psi
-4	1/4	9/16-18 UNF	7/16-20 UNF	41.3	6,000	63	9,000	40	6,000
-5	5/16	5/8-18 UNF	1/2-20 UNF	41.3	6,000	63	9,000	40	6,000
-6	3/8	11/16-16 UNF	9/16-18 UNF	41.3	6,000	63	9,000	40	6,000
-8	1/2	13/16-16 UNF	3/4-16 UNF	41.3	6,000	63	9,000	40	6,000
-10	5/8	1-14 UNF	7/8-14 UNF	41.3	6,000	63	9,000	40	6,000
-12	3/4	1-3/16-12 UN	1-1/16-12 UN	41.3	6,000	40	6,000	40	6,000
-14	7/8	1-5/16-12 UN	1-3/16-12 UN	41.3	6,000	40	6,000	40	6,000
-16	1	1-7/16-12 UN	1-5/16-12 UN	41.3	6,000	40	6,000	31.5	5,000
-20	1 1/4	1-11/16-12 UN	1-5/8-12 UN	27.5	4,000	25	4,000	25	4,000
-24	1 1/2	2-12 UN	1-7/8-12 UN	27.5	4,000	25	4,000	20	3,000

1) Threads per SAE J475 Class 2A ext. Class 2B int. (Ref. ISO-263/ISO-R725)

2) Unified class 2B threads apply to swivel nuts and with minor diameter modified to class 3B limits for locknuts

3) MPa ratings for J1926/2/ISO 11926-2 stud ends are rationalized values as published in those standards.

Table P4. Pressure Ratings for Code 61 Four-Bolt Split Flange Ends								
Nominal Flange Size		Bolt Dimensions			Working Pressures @ Recommended Torque (Note: See Below)			
Nom SAE Dash Size	Nom Inch Pipe O.D.	Thread	Length		Maximum Recommended Working Pressure		Recommended Torque Range	
			mm	inch	MPa	psi	Nm	lb-in
-8	1/2	5/16-18	32	1-1/4	34.5	5,000	20-25	175-225
-12	3/4	3/8-16	32	1-1/4	34.5	5,000	28-40	250-350
-16	1	3/8-16	32	1-1/4	34.5	5,000	37-48	325-425
-20	1 1/4	7/16-14	38	1-1/2	27.6	4,000	48-62	425-550
-24	1 1/2	1/2-13	38	1-1/2	20.7	3,000	62-79	550-700
-32	2	1/2-13	38	1-1/2	20.7	3,000	73-90	650-800
-40	2 1/2	1/2-13	44	1-3/4	17.2	2,500	107-124	950-1100
-48	3	5/8-11	44	1-3/4	13.8	2,000	186-203	1650-1800
-56	3 1/2	5/8-11	51	2	3.4	500	158-181	1400-1600
-64	4	5/8-11	51	2	3.4	500	158-181	1400-1600
-80	5	5/8-11	57	2-1/4	3.4	500	158-181	1400-1600

Table P5. Pressure Ratings for Code 62 Four-Bolt Split Flange Ends								
Nominal Flange Size		Bolt Dimensions			Working Pressures @ Recommended Torque (Note: See Below)			
Nom SAE Dash Size	Nom Inch Pipe O.D.	Thread	Length		Maximum Recommended Working Pressure		Recommended Torque Range	
			mm	inch	MPa	psi	Nm	lb-in
-8	1/2	5/16-18	32	1-1/4	41.4	6,000	20-25	175-225
-12	3/4	3/8-16	38	1-1/2	41.4	6,000	34-45	300-400
-16	1	7/16-14	44	1-3/4	41.4	6,000	56-68	500-600
-20	1 1/4	1/2-13	44	1-3/4	41.4	6,000	85-102	750-900
-24	1 1/2	5/8-11	57	2-1/4	41.4	6,000	158-181	1400-1600
-32	2	3/4-10	70	2-3/4	41.4	6,000	271-294	2400-2600

Note: SAE J518, Code 61 and Code 62 Four-Bolt Split Flange connections are non-threaded port ends which utilize O-rings for sealing. They are assembled to ports with split flange clamp halves and clamping pressure is provided by bolts or socket head cap screws of SAE Grade 5 material or better as specified in SAE J429.

Rated design factor for these connections is dependent on the selected grade for the clamp bolts. Flanged head ends are incorporated into fittings having suitable means for attachment to tubes, pipes or hoses to provide connection ends.

