

Features, Stainless Steel Adjustable and O-Ring Fittings

O-ring ports and stud ends per SAE J1926/ISO 11926 are the preferred port connection for use in hydraulic systems on industrial equipment and commercial products. The adjustable and O-ring fittings described in this section provide a variety of options for connections between tube, hose or pipe ends to SAE J1926/1/ISO 11926-1 straight thread O-ring ports or SAE J518 four-bolt flange ports. Fitting styles are available with male 37 degree tube ends, female 37 degree swivel ends, male or female NPTF pipe ends, female pipe swivels, adjustable and non-adjustable O-ring studs and female O-ring ports.

The designs of the straight thread O-ring stud per SAE J1926/3/ISO 11926-3 and the 37 degree flared fitting tube end per SAE J514/ISO 8434-2 are identical for either inch or metric tubing. With the exception of stock size, the flared tube fittings described in this section are interchangeable with the equivalent "inch" straight thread O-ring stud fittings per ISO 8434-2. All 37 degree fitting styles are also available with the optional **Flare-O™** tube end design.

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.

Performance

Where applicable, fittings are designed and qualified to the requirements of SAE J514 and/or SAE J1926/3/ISO 11926-3. Four bolt flange ends conform to SAE J518.

Construction

Stainless steel fittings are machined from 316 stainless steel barstock or forgings. Fittings are passivated following machining.

Threads

Straight Threads: Internal and external straight threads conform to the Unified National Class 2A and Class 2B Series respectively, with modified minor diameters where specified.

NPTF Threads: Male and female pipe threads conform to the Dryseal American Standard Taper Pipe Thread (SAE J476a, NPTF) Series which will provide pressure tight joints without the use of a lubricant or sealer. Use of these fittings with non-dryseal NPT pipe or hose ends is not recommended for high-pressure applications.

Note: Where not functionally objectionable, use of a compatible lubricant/sealant is recommended for either NPT or NPTF threads to minimize the possibility of galling in assembly.

NPSM Swivels: Female threads for adapter union swivel nuts conform to the American Standard Straight Pipe Thread (NPSM) Series. These threads mate with either NPT or NPTF Series male threads to provide a mechanical connection between the adapter and mating male end. Sealing is provided by metal to metal contact between the machined 30 degree female seat on the NPT/NPTF male end and the nose of the swivel end. The NPSM swivel threads are not a sealing member.

Caution: For proper sealing, ensure that the mating male end has been machined with the proper 30 degree female seat.

Assembly Information

For assembly instructions, refer to the Technical Data Section for the appropriate fitting end. Also, refer to the Technical Data Section for recommendations regarding tubing pressure ratings, tube flares and hose/tube routing information. Please note the following:

Tubing for single flare tube ends should be either seamless or welded and drawn, fully annealed tubing per ASTM A213, ASTM A249 or ASTM A269 respectively.

For proper sealing with 37 degree flared fittings, flares for tubing should conform to the requirements of SAE J533. For heavy wall tubing, the optional tube preparation and single flare configuration specified in SAE J533 is also recommended. This optional configuration provides extended sealing surface contact area versus conventional flares.

In the design and fabrication of tubing or hose runs for any hydraulic system, precautions should be taken to allow for sufficient adjustment of the hose or tubing so that proper alignment can be attained at the fitting connections. Improper fit-up or misalignment should be corrected before final connections are made. Location of fitting connections should be planned to maximize accessibility. Whenever possible, use a torque wrench to tighten connections to the recommended torque.



Ordering Information

Size of fittings are indicated by dash number relating to sixteenths of an inch for the nominal O.D. of the tube size used. Example: 1/2 inch tube = 8/16 or (-8) size. For stainless steel fittings, an SS prefix indicates 316SS material. Stainless steel **Flare-O™** fittings use an FS prefix.

Order standard fittings from appropriate chart indicating required dash numbers. For example, SS6405-8-6-O is 1/2" O-ring stud end with 3/4-16 straight thread, and 3/8" female pipe thread. Jump size SS6405-16-8-O is 1" O-ring stud end with 1 5/16-12 straight thread and 1/2"

female pipe thread. Pictorial views for each fitting style indicate the correct numbering sequence for fitting ends.

Adjustable and O-ring fittings may be purchased in various stages of assembly. Catalog numbers include NWO as standard. For example, SS6801-10-10-NWO would be assembled with "N"- Nut, "W"- Washer and "O"- O-ring. SS6801-10-10NW would be assembled with "N"- Nut and "W"- Washer only.

If information is needed for jump sizes not shown, please contact customer service for engineering assistance.

Table SO1. Pressure Ratings for 37 Deg. Flared Tube Ends, 37 Deg. Female Swivels, O-Ring Port Plugs and Straight Thread Stud Ends (Inch)

Nominal Tube Size		Thread Size	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 (Notes 1&2)	37 Deg. Flared Tube Ends, Unions and Bulkheads		37 Deg. 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 SO2. 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 SO3. 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

Table SO4. 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.

