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TITAN FITTINGS

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ISO 9001:2015

US THREAD CHART

IDENTIFICATION GUIDE

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ABBREVIATIONS

NPTF	National Pipe Tapered Fuel
NPSM	National Pipe Straight Mechanical
ISO	International Standards Organization
SAE	Society of Automotive Engineers
JIC	Joint Industrial Council
NFPA	National Fluid Power Association
BSP	British Standard Pipe
DIN	Deutsche Industrial Norme
JIS	Japanese Industrial Standard
BSPT	British Standard Pipe Tapered
BSPP	British Standard Pipe Parallel

FLUID PORT AND CONNECTOR IDENTIFICATION

Because of their varied use in fluid piping systems, ports and connectors need to be correctly identified when adding or replacing hoses or tubes in your specific system.

A thread standard identifies the form, angle, diameter and pitch. ASME B1 .1 and ISO 261 are examples commonly used by thread manufacturers. The American Society of Manufacturing Engineers, American National Standards Institute, International Organization for Standardization, SAE International, British Association, and Deutsches Institut fŸr Normung are a few of the organizations responsible for developing these standards.

FLUID PORT AND CONNECTOR IDENTIFICATION TOOLS:

Calipers:

Used to measure inner and outer thread diameters.

Thread Pitch Gauge:

Used to measure the number of threads per inch, as well as thread to thread spacing in the case of metric connections.

Before you begin measuring, be sure the threads are in good condition. Distorted or worn out threads can give you inaccurate measurements. Once you determine that the threads are in good condition, measure and note the diameter. (An I.D./O.D. caliper is a suitable tool for this.) Match the dimensions provided in this guide with your recorded measurements. You should be aware that due to manufacturing tolerances, your measurements may not specifically match those included in this guide.

You'll need to determine the spacing of the threads, per square inch (or thread to thread distances for metric connections), after measuring the diameter. It is important to be sure the thread pitch gauge properly fits on the threads to get the best accuracy. Note and compare your measurements with those in this guide.

For accurate measurement of four-bolt flanges, use a caliper to measure the port hole diameter of the bolt, and note that number. Then, measure the distance from center to center of the bolt holes, and note the longest spacing.

Dash Numbers:

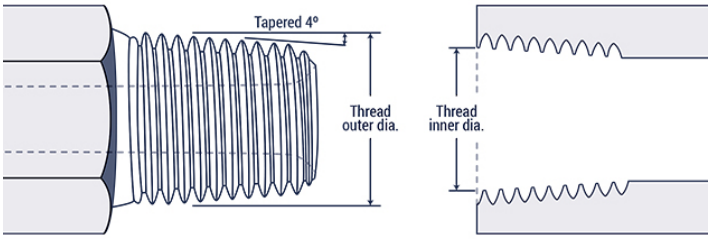
The sizes of tubes and fluid pipes generally use an abbreviation called a dash number. When describing a fluid pipe or a tube using dash numbers, only the top number of the fraction is used. The bottom number is always 16 and is generallyignored. (Also, be aware that dash numbers are nominal.)
e.g. -8 size is equal to 8/16", or 1/2"

* Because metric measurements are actual sizes of a tube or a fluid pipe, dash numbers do not apply. For example, an M10x0.5 has threads on the outside of 10 mm with thread spacing of 0.5 mm.

AMERICAN CONNECTIONS

NATIONAL PIPE TAPERED FUEL (NPTF) :

A connector with a dryseal thread, where the connection between the male and the female threads form a seal when the two threads are squeezed together (e.g. threads deformation). Teflon and pipe dope are typically used if this seal alone is not adequate. This connection is common in fluid piping systems - however, it is not recommended by the National Fluid Power Association (NFPA) for use hydraulic systems.



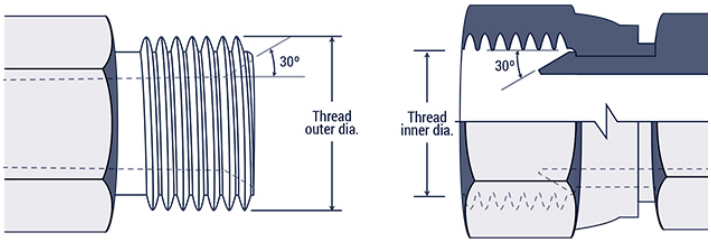
NOTE: The NPTF and BSPT connector are similar in appearance, however they are not interchangeable.

Inch size	Dash size	Threads per Inch	Male Thread O.D. (in)		Female thread O.D (in)	
1/8	-2	27	13/32	0.41	3/8	0.38
1/4	-4	18	17/32	0.54	1/2	0.49
3/8	-6	18	11/16	0.68	5/8	0.63
1/2	-8	14	27/32	0.84	25/32	0.77
3/4	-12	14	1 1/16	1.05	1	0.98
1	-16	11 1/2	1 5/16	1.32	1 1/4	1.24
1 1/4	-20	11 1/2	1 21/32	1.66	1 19/32	1.58
1 1/2	-24	11 1/2	1 29/32	1.90	1 13/16	1.82
2	-32	11 1/2	2 3/8	2.38	2 5/16	2.30

NATIONAL PIPE STRAIGHT MECHANICAL (NPSM) :

A connection where the male thread (with a 300 internal chamfer), and female thread (with an inverted 300 seat), are both straight. When the two are threaded together, the tapered seat forms a leak-resistant connection. These connections are used widely across fluid power systems.

NOTE: A NPSM female and a chamfered NPTF male can form a seal together.

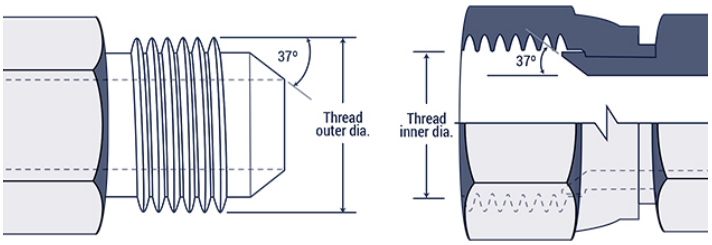


Inch size	Dash size	Threads per Inch	Male Thread O.D. (in)		Female thread O.D (in)	
1/8	-2	27	13/32	0.41	3/8	0.38
1/4	-4	18	17/32	0.54	1/2	0.49
3/8	-6	14	11/16	0.68	5/8	0.63
1/2	-8	14	27/32	0.84	25/32	0.77
3/4	-12	14	1 1/16	1.05	1	0.98
1	-16	11 1/2	1 5/16	1.32	1 1/4	1.24
1 1/4	-20	11 1/2	1 21/32	1.66	1 19/32	1.58
1 1/2	-24	11 1/2	1 29/32	1.90	1 13/16	1.82
2	-32	11 1/2	2 3/8	2.38	2 5/16	2.30

JIC 37° FLARE (SAE J514) :

This connection is widely used in hydraulic systems, and both the male and female connectors have straight threads and a 37º flare seat. The straight threads of each half hold the connection together, sealing the flared seats.

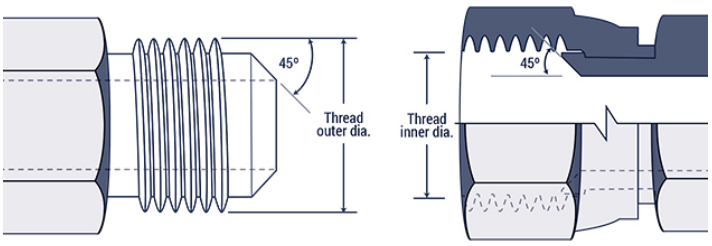
NOTE: Most SAE J514 threads are exactly the same as the SAE 45º flare threads, however their seating angles differ.



Inch size	Dash size	Thread Size	Male Thread O.D. (in)		Female thread O.D (in)	
1/8	-2	5/16 - 24	5/16	0.31	9/32	0.27
3/16	-3	3/8 - 24	3/8	0.38	11/32	0.34
1/4	-4	7/16 - 20	7/16	0.44	13/32	0.39
5/16	-5	1/2 - 20	1/2	0.50	15/32	0.45
3/8	-6	9/16 - 18	9/16	0.56	17/32	0.51
1/2	-8	3/4 - 16	3/4	0.75	11/16	0.69
5/8	-10	7/8 - 14	7/8	0.88	13/16	0.81
3/4	-12	1 1/16 - 12	11/16	1.06	1	0.98
7/8	-14	1 3/16 - 12	1 3/16	1.19	1 1/8	1.10
1	-16	1 5/16-12	1 5/16	1.31	1 1/4	1.23
1 1/4	-20	1 5/8 - 12	1 5/8	1.63	1 9/16	1.54
1 1/2	-24	1 7/8 - 12	1 7/8	1.88	1 13/16	1.79
2	-32	2 1/2 - 12	2 1/2	2.50	2 7/16	2.42

SAE 45° FLARE (SAE J512) :

Typically used with low pressure systems like refrigerant lines, fuel lines, and automotive applications, the SAE male and female connectors similarly have a 45° flare seat which forms the seal. The threads of both halves mesh together for a strong mechanical connection. The SAE 45° Flare connectors are exactly the same as the JIC 37° Flare connectors, however their seating angles differ.

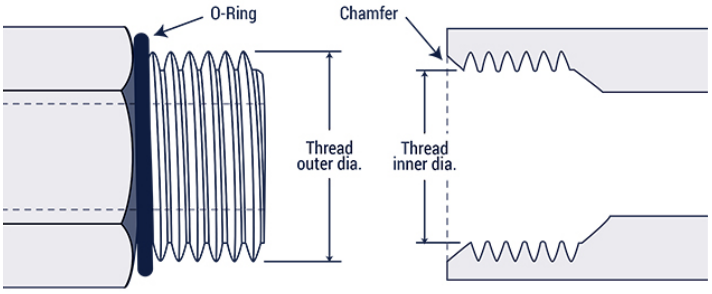


Inch size	Dash size	Thread Size	Male Thread O.D. (in)		Female thread O.D (in)	
1/8	-2	5/16 - 24	5/16	0.31	9/32	0.27
3/16	-3	3/8 - 24	3/8	0.38	11/32	0.34
1/4	-4	7/16 - 20	7/16	0.44	13/32	0.39
5/16	-5	1/2 - 20	1/2	0.50	15/32	0.45
3/8	-6	5/8 - 18	5/8	0.63	9/16	0.57
1/2	-8	3/4 - 16	3/4	0.75	11/16	0.69
5/8	-10	7/8 - 14	7/8	0.88	13/16	0.81
3/4	-12	1 1/16 - 14	11/16	1.06	1	0.99
7/8	-14	1 1/4 - 12	1 1/4	1.25	1 5/32	1.16
1	-16	1 3/8 - 12	1 3/8	1.38	1 9/32	1.29

SAE STRAIGHT THREAD O-RING (O-RING BOSS) :

SAE J1926-1 AND ISO 11296-1

A connection commonly found in high pressure hydraulic systems. While both halves have straight threads, the female has a sealing face and chamfer, and the male has an O-ring which when compressed into the opposing chamfer, forms the seal. The male and female threads mesh to form a solid connection.

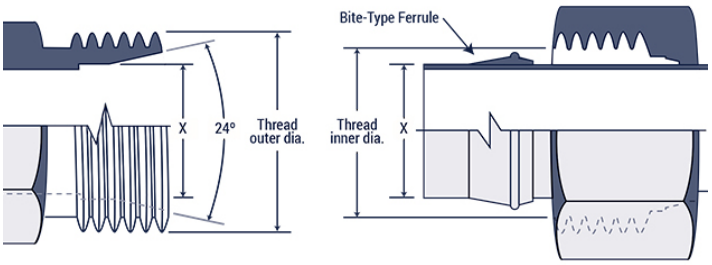


Inch size	Dash size	Thread Size	Male Thread O.D. (in)		Female thread O.D (in)	
1/8	-2	5/16 - 24	5/16	0.31	9/32	0.27
3/16	-3	3/8 - 24	3/8	0.38	11/32	0.34
1/4	-4	7/16 - 20	7/16	0.44	13/32	0.39

Inch size	Dash size	Thread Size	Male Thread O.D. (in)		Female thread O.D (in)	
5/16	-5	1/2 - 20	1/2	0.50	15/32	0.45
3/8	-6	9/16 - 18	9/16	0.56	17/32	0.51
1/2	-8	3/4 - 16	3/4	0.75	11/16	0.69
5/8	-10	7/8 - 14	7/8	0.88	13/16	0.81
3/4	-12	1 1/16 - 12	11/16	1.06	1	0.98
7/8	-14	1 3/16 - 12	1 3/16	1.19	1 1/8	1.10
1	-16	1 5/16 - 12	1 5/16	1.31	1 1/4	1.23
1 1/4	-20	1 5/8 - 12	1 5/8	1.63	1 9/16	1.54
1 1/2	-24	1 7/8 - 12	1 7/8	1.88	1 13/16	1.79
2	-32	2 1/2 - 12	2 1/2	2.50	2 7/16	2.42

COMPRESSION TUBE FITTINGS (SAE J514) :

The female connector includes a compression sleeve, a female nut, and a tube. The male connector has a 240 seat, which makes the seal with the female compression sleeve (the seal forms on the female side between the tubing and the compression sleeve). With non-flared tube fittings with straight threads, the male and female threads mesh to form a solid connection.

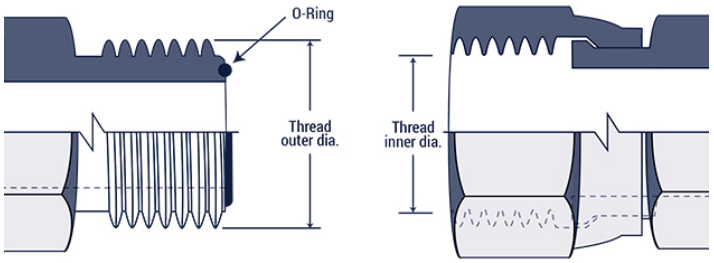


Inch size	Dash size	Thread Size	Male Thread O.D. (in)		Female thread O.D (in)	
1/8	-2	5/16 - 24	5/16	0.31	9/32	0.27
3/16	-3	3/8 - 24	3/8	0.38	11/32	0.34
1/4	-4	7/16 - 20	7/16	0.44	13/32	0.39
5/16	-5	1/2 - 20	1/2	0.50	15/32	0.45
3/8	-6	9/16 - 18	9/16	0.56	17/32	0.51
1/2	-8	3/4 - 16	3/4	0.75	11/16	0.69
5/8	-10	7/8 - 14	7/8	0.88	13/16	0.81
3/4	-12	1 1/16 - 12	11/16	1.06	1	0.98
7/8	-14	1 3/16 - 12	1 3/16	1.19	1 1/8	1.10
1	-16	1 5/16 - 12	1 5/16	1.31	1 1/4	1.23
1 1/4	-20	1 5/8 - 12	1 5/8	1.63	1 9/16	1.54
1 1/2	-24	1 7/8 - 12	1 7/8	1.88	1 13/16	1.79
2	-32	2 1/2 - 12	2 1/2	2.50	2 7/16	2.42

O-RING FACE SEAL (SAE J1453) :

These fittings join to form a highly leak resistive connection, in applications up to 6000 psi. Both halves

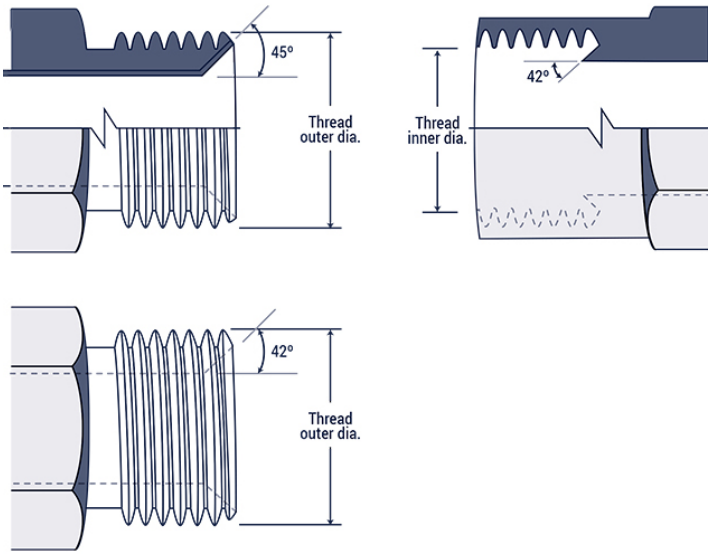
have a straight thread, with the female having a flat surface and the male connector containing an O-ring. The seal is made when the O-ring on the male compresses against the flat surface of the female. The outside nut on the female connector holds the connection together.



Inch size	Dash size	Thread Size	Male Thread O.D. (in)		Female thread O.D (in)	
1/4	-4	9/16 - 18	9/16	0.56	17/32	0.51
3/8	-6	11/16 - 16	11/16	0.69	5/8	0.63
1/2	-8	13/16 - 16	13/16	0.82	3/4	0.75
5/8	-10	1 - 14	1	1.00	15/16	0.93
3/4	-12	1 3/16 - 12	13/16	1.19	1 1/8	1.11
1	-16	1 7/16 - 12	1 7/16	1.44	1 3/4	1.36
1 1/4	-20	1 11/16 - 12	1 11/16	1.69	1 5/8	1.61
1 1/2	-24	2-12	2	2.00	1 15/16	1.92

SAE INVERTED FLARE (SAE J512) :

These connectors are widely used in the automotive industry. With the flared male tubing having a 450 seat, and the machined connector a 420 seat, the sealing surface is formed with the 420 seat on the end of the flare of the female connector. The male and female threads mesh to form a solid connection.

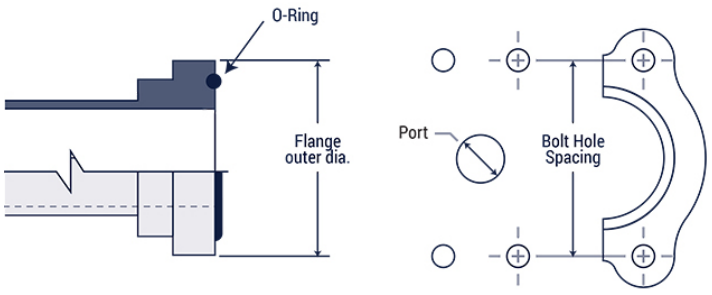


Inch size	Dash size	Thread Size	Male Thread O.D. (in)		Female thread O.D (in)	
1/8	-2	5/16 - 28	5/16	0.31	9/32	0.27
3/16	-3	3/8 - 24	3/8	0.38	11/32	0.34
1/4	-4	7/16 - 24	7/16	0.44	13/32	0.39
5/16	-5	1/2 - 20	1/2	0.50	15/32	0.45
3/8	-6	5/8 - 18	5/8	0.63	9/16	0.57
7/16	-7	11/16 - 18	11/16	0.69	5/8	0.63
1/2	-8	3/4 - 18	3/4	0.75	23/32	0.70
5/8	-10	7/8 - 18	7/8	0.88	13/16	0.81
3/4	-12	1 1/16 - 16	1 1/16	1.06	1	1.00

FOUR-BOLT FLANGE (SAE J518 AND ISO 6162) :

These commonly used in fluid power systems, and suitable for joining 1/2" - 3" hose or tube. The seal forms between the flat surface of the female port and the O-ring of the male (seated in the ring groove). A split clamp, using 4 bolts, hold the male/female together.

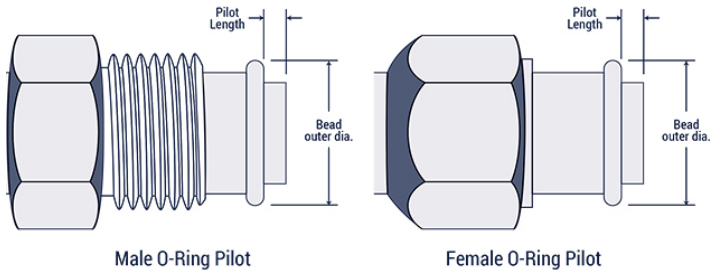
Note that there are two types of SAE J518 anges available: standard pressure (code 61), and high pressure (code 62).



Inch size	Dash size	Code 61 Bolt Spacing	Code 61 Flange O.D.	Code 62 Bolt Spacing	Code 62 Flange O.D.
1/2	-8	1 1/2	1 3/16	1 19/32	1 1/4
3/4	-12	1 7/8	1 1/2	2	1 5/8
1	-16	2 1/16	1 3/4	2 1/4	1 7/8
1 1/4	-20	2 5/16	2	2 5/8	2 1/8
1 1/2	-24	2 3/4	2 3/8	3 1/8	2 1/2
2	-32	3 1/16	2 13/32	3 13/16	3 1/8
2 1/2	-40	3 1/2	3 5/16	n/a	n/a
3	-48	4 3/16	4	n/a	n/a

O-RING PILOT THREADS :

These connections are typically seen in automotive and commercial air conditioning applications. Both halves of the connection have a pilot, making the seal by compressing the O-ring. The male and female threads mesh to form a solid connection.



Inch size	Dash size	Male Thread		Female thread	
		Thread size	Thread O.D.	Thread size	Thread I.D.
3/8	-6	5/8 - 18	5/8	5/8 - 18	9/16
1/2	-8	3/4 - 18	3/4	3/4 - 16	11/16
5/8	-10	7/8 - 18	7/8	7/8 - 14	13/16
3/4	-12	1 1/16 - 16	1 1/16	1 1/16 - 14	1

Inch size	Dash size	Long pilot		Short pilot	
		Bead O.D. (in)	Pilot Length (in)	Bead O.D. (in)	Pilot Length (in)
3/8	-6	0.52	0.28	0.52	0.19
1/2	-8	0.64	0.39	0.64	0.19
5/8	-10	0.77	0.39	0.77	0.19
3/4	-12	0.91	0.39	0.91	0.19