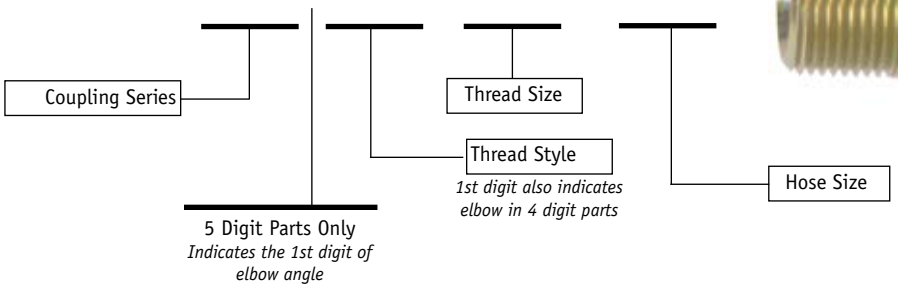
Part #9516-32-32



Pulsar offers a wide variety of couplings to suit various user requirements. They are separated into the following general styles:

Series	Description
2000-	Push-on hose couplings
3000-	Reusable fittings for one and two wire braid hoses
3500-	Reusable fittings for SAE100R5 dimension hoses
4000-	Swage or crimp fittings for teflon hose
4100-	Reusable fittings for teflon hose
5000-	Two-piece (separate stem and ferrule) crimp fittings for most hoses
8600-	Interlock (internal skive) two-piece crimp fittings for spiral hoses
9200/9400-	One-piece (integral stem and ferrule) crimp fittings for most hoses
9500-	One-piece crimp fittings for spiral hoses

...Within these broad divisions, the last two digits will specify the thread style, as detailed above. Angle fittings are designated by inserting the degree of the angle as the third digit. For example, a 5005 would indicate a two-piece crimp fitting with a female JIC thread, and a 5095 would indicate a similar fitting but with a 90° elbow. Five digit part numbers are used for less common (particularly metric) fittings where some uncertainty may be caused by inserting the elbow number in the third position. Dash sizes following the base part number indicate first the nominal thread or tube size, and lastly the nominal hose diameter. Please note that for truck hoses, notably SAE100R5 and SAE100R14, the nominal hose size does not exactly match the actual inside diameter, since these hoses were designed to replace common copper tubing. For example, 151-06 hose measures 5/16" I.D., since it was designed to replace 3/8" ("-06") copper tubing, which measures 5/16" I.D.

Part Number Suffix Designations:

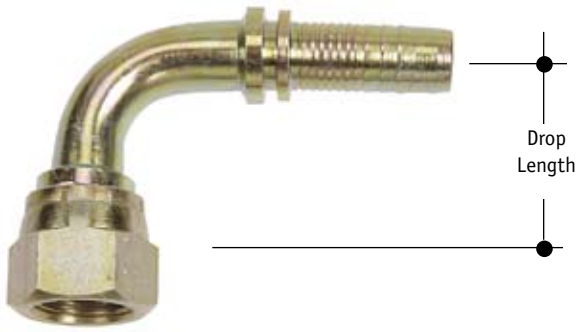
Suffix	Designation
B...	Brass construction
BH...	Bulkhead
C...	Compact block elbow or Cat style flanges
F...	Forged construction
H...	Code 62 high pressure flange, high temperature hose, or large hex
K...	Flange half kits and Komatsu flange style
L...	Long elbow coupling or adapter
N...	Double-nut female swivel coupling or non-conductive hose
P...	Poclain flange (two-bolt)
S...	Skive type coupling or hose
SS...	Stainless steel construction
T...	Twin line hose
X...	Swivel connector for couplings or live swivel for adapters
XL...	Extra-long elbow or adapter

Summary of Thread Designations

00 ..... Hose Mender
01 ..... Ball Sleeve/Standpipe
02 ..... Inverted Flare Female
03 ..... Triple Thread Female
04 ..... SAE 45° Female
05 ..... JIC 37° Female
06 ..... NPSM Female Swivel
08 ..... NPTF Solid Female
09 ..... SAE Code 61 Flange
09C..... Cat Style Flange
09F..... Poclain Flange (4 bolt)
09H ..... SAE Code 62 Flange
09K ..... Komatsu Flange
09P ..... Poclain Flange (2 bolt)
11 ..... O-Ring Boss Male
12 ..... Inverted Flare Male
13 ..... Triple Thread Male
14 ..... SAE 45° Male
15 ..... JIC 37° Male
16 ..... NPTF Male
26 ..... BSPP Female
27 ..... BSP Flat Seat Female
29 ..... Grease Fitting Female
36 ..... BSPP Parallel Male
38 ..... BSPT Tapered Male
60 ..... Compression
61 ..... Metric Standpipe
63 ..... DIN 24°/60° Light Female
64 ..... DIN 24° Heavy Female
65 ..... DIN L. O-Ring Female
66 ..... DIN H. O-Ring Female
67 ..... French GAZ Female
68 ..... Komatsu Metric Female
69 ..... JIS 30° Flare Female
70 ..... Compression Air Brake
71 ..... French Standpipe
72 ..... DIN 60° Male
73 ..... DIN 24° Light Male
74 ..... DIN 24° Heavy Male
77 ..... French GAZ Male
78 ..... Komatsu Metric Male
83 ..... ORFS Female
93 ..... ORFS Male

Drop Length

The drop lengths listed in this catalog are the distance from the fitting seat to the center of the stem:



North American and British Pipe Thread Dimensions:

Pipe Thread (NPTF, NPSM)

Dash Size	Pipe Size	Pitch (threads per inch)	Male Thread O.D.	Female Thread I.D.
-02	1/8"	27	0.41"	0.37"
-04	1/4	18	0.54	0.49
-06	3/8	18	0.68	0.62
-08	1/2	14	0.84	0.76
-12	3/4	14	1.06	0.98
-16	1	11·1/2	1,31	1.24
-20	1·1/4	11·1/2	1.66	1.58
-24	1·1/2	11·1/2	1.90	1.82
-32	2	11·1/2	2.38	2.28

BSP Thread

Dash Size	Pipe Size	Pitch (threads per inch)	Male Thread O.D.	Female Thread I.D.
-02	1/8"	28	0.38"	0.35"
-04	1/4	19	0.52	0.47
-06	3/8	19	0.65	0.60
-08	1/2	14	0.82	0.75
-10	5/8	14	0.88	0.80
-12	3/4	14	1.04	0.97
-16	1	11	1.30	1.22
-20	1·1/4	11	1.65	1.56
-24	1·1/2	11	1.88	1.79
-32	2	11	2.35	2.26

Thread Identification:
Throughout the world, a somewhat confusing array of thread styles are now being used. Where most local distributors used to see only domestic designs, they are now faced with supplying replacement hoses and fittings of a multitude of styles, dimensions, and sealing methods. To be more easily understood these can be broken down into the following groups.

NPTF and NPSM Pipe Threads

Very common in North America is the NPTF tapered pipe thread, found in many industrial and agricultural applications. Tapered threads seal by an increasing interference of the threads as the fitting is tightened and the tapers engage. Pipe sealant is often used to ensure a good seal along the crests of the threads and to prevent galling (binding). NPSM threads are the same dimension but lack the taper, and so rely on a cone shaped seat on the female fitting to seal against a chamfered male. NPSM threads are typically used on female swivel adapters and are most common on farm equipment.

British Standard Pipe (BSP)

BSP threads seal in the same ways as NPT threads but are different dimensions, just, it sometime seems, to make life complicated for the distributor. BSP is very common on many types of European equipment as well as some Japanese machinery. The differences between BSP and NPT threads are detailed in the chart at the end of this section. BSP threads may be tapered but more often are parallel threads, with females relying on a cone seat for sealing. Male parallel threads seal with a chamfered end on a female with a cone seat, or with a copper gasket on a flat seat, with an o-ring in a recessed port, or finally with a bonded seal in a machined face port.

SAE and JIC Flare Fittings

In general, tube fittings were first designed to allow connections between components using steel or copper tubing. In North America the tubing was flared at the end and secured with a threaded nut and sometimes a back-up sleeve. Therefore this type of fitting is most commonly referred to as a flare fitting, either according to JIC (Joint Industrial Council) which called for a 37° flare for steel tubing, or SAE (Society of Automotive Engineers) which specified a 45° flare on the softer copper tubing most commonly found in low pressure automotive applications. Today JIC fittings are widespread in hydraulic applications, while SAE adapters are commonly brass and are usually confined to truck and plumbing markets.
Flare fittings are called by the size of tubing they connect to, rather than the thread dimension. For example a JIC in size "-08" is designed to connect to 1/2" O.D. tubing, but the fitting actually measures 3/4" on the outside of the thread. JIC and SAE thread dimensions match exactly in sizes -02, -03, -04, -05, -08, and -10, and so will often serve quite well when interchanged in low pressure applications, since only the seat angle varies, However in sizes -06, -12, and in larger sizes they will not interchange. Flare fittings can be readily identified by measuring the male thread dimension, the pitch (number of threads per inch), and the flare angle.

O-Ring Boss (ORB) Thread

O-Ring Boss and JIC 37° fittings use the same thread sizes, but the ORB seal occurs on the rubber o-ring of the male ORB connector. The ORB straight thread female port has a machined seat where the o-ring fits and seats when the threads are tightened.

Inverted Flare

This connection is a compact design developed for automotive applications. Since the tubing is flared to 45° but fitted with a male threaded nut, it can attach directly into a port without an adapter.

O-Ring Face Seal (ORFS) Thread

The O-Ring Face Seal connection is a recent coupling innovation designed to minimize leakage, especially in high pressure applications. The o-ring fits in a recessed groove on the face of the straight thread male and seals when compressed onto the flat face of the female as the threads are tightened.

DIN 24° Cone

Unlike North American tube fittings, which rely on a flare for sealing, European fittings are designed with a ferrule which bites into the tubing when compressed by a threaded nut. They are generally referred to as "bite type" fittings. The most common is the German 24° cone DIN (Deutsches Institute fur Normung) fitting. The male fitting has a recessed 24° cone to accept either the metric sized tubing along with the bite ferrule and nut, or a female hose fitting with similar dimensions. For better sealing at high pressures, the female fitting may incorporate an o-ring. Styles with or without o-rings are interchangeable. Since fittings may be designed for light or heavy service, identification is obtained by measuring (in millimeters) the tube O.D., male thread O.D., and pitch expressed in distance from crest to crest.

DIN 60° Cone

In European automotive and other low-pressure applications, a 60° cone seat is sometimes used. Female hose fittings are often designed to interchange with 24° and 60° male fittings in sizes up to 22 mm.

French Metric Fittings

French metrics are very uncommon. They often are characterized by fractional tube sizes and fine threads.

Japanese JIS 30° Flare Parallel Pipe Thread

The JIS 30° flare connector utilizes BSPP threads but seals on a 30° female flare rather than a cone seat, much like the North American JIC 37° flare. This fitting is common on Toyota and other Japanese equipment.

Komatsu Metric 30° Flare

This Japanese connector combines metric dimension threads with a 30° flare seat and is found primarily on Komatsu equipment. Komatsu style flange fittings are discussed in the flange identification section.

Flange Connections

SAE 4-bolt flange connections are commonly used on mobile heavy equipment and other high pressure applications. There are two SAE series of flanges, code 61 standard series and code 62 high pressure series. Code 62 flanges have larger and thicker head diameters and use a different bolt size, bolt grade (8 instead of 5) and bolt hole pattern. Caterpillar style flanges are also available and feature a thicker 0.560" flange head and require special flange halves, but do conform to code 62 bolt hole patterns. Flange heads have a machined groove where the o-ring seats. The flange seal is achieved when the o-ring is compressed between the flange head and the smooth faced port. The flange head is secured to the port by two split flange clamp halves and four bolts. Other less common flanges include the Komatsu style flange in -10, and the very rare French Poclain style flanges. The Komatsu flange is available in 5000 series couplings, and Poclain flanges are listed with the 8600 series fittings.

Banjo Fittings

Banjo fittings are rare in modern hydraulic systems but still appear on diesel engines and automotive applications. Their advantage is that they make a very compact elbow where space is tight. Banjos are available in metric and BSP sizing. Identify the banjo by measuring the threads on the bolt. If it is BSP, the bolt will conform to BSP male parallel thread dimensions. If it is metric, the bolt will have a exact metric size O.D., with 1.5mm pitch, similar to DIN 24° male fittings.

Flange Dimensions:

	Port Size	Working Pressure	Flange O.D.	Flange Thickness	Bolt Hole Spacing	Bolt Size	Bolt Torque (in-lb)
Code 61 Flange							
-08	1/2"	5000 psi	1.19"	0.265"	1.50"	5/16-18 x 1·1/4"	175-225
-12	3/4	5000	1.50	0.265	1.88	3/8-16 x 1·1/4	250-350
-16	1	5000	1.75	0.315	2.06	3/8-16 x 1·1/4	325-425
-20	1·1/4	4000	2.00	0.315	2.31	7/16-14 x 1·1/2	425-550
-24	1·1/2	3000	2.38	0.315	2.75	1/2-13 x 1·1/2	550-700
-32	2	3000	2.81	0.375	3.06	1/2-13 x 1·1/2	650-800
-40	2·1/2	2500	3.31	0.375	3.50	1/2-13 x 1·3/4	950-1100
-48	3	2000	4.00	0.375	4.19	5/8-11 x 1·3/4	1650-1800
-64	4	500	5.00	0.442	5.13	5/8-11 x 2	1400-1600
Code 62 Flange							
-08	1/2	6000	1.25	0.305	1.59	5/16-18 x 1·1/4	175-225
-12	3/4	6000	1.63	0.345	2.00	3/8-16 x 1·1/2	300-400
-16	1	6000	1.88	0.375	2.25	7/16-14 x 1·3/4	500-600
-20	1·1/4	6000	2.13	0.405	2.62	1/2-13 x 1·3/4	750-900
-24	1·1/2	6000	2.50	0.495	3.12	5/8-11 x 2·1/4	1400-1600
-32	2	6000	3.13	0.495	3.81	3/4-10 x 2·3/4	2400-2600
Komatsu Flange							
-10	5/8	5000	1.34	0.265		Metric	
Cat Flange							
-12	3/4	6000	1.62	0.560	2.00	3/8-16 x 1·1/2	300-400
-16	1	6000	1.88	0.560	2.25	7/16-14 x 1·3/4	500-600
-20	1·1/4	6000	2.13	0.560	2.62	1/2-13 x 1·3/4	750-900

Thread Guide:

Male thread outside diameters in inches, and pitch in threads per inch.

Dash Size	JIC 37° Flare & O-Ring Boss	SAE 45° Flare	Inverted Flare	O-Ring Face Seal
-02	5/16 - 24	5/16 - 24	5/16 - 28	
-03	3/8 - 24	3/8 - 24	3/8 - 24	
-04	7/16 - 20	7/16 - 20	7/16 - 24	9/16 - 18
-05	1/2 - 20	1/2 - 20	1/2 - 20	
-06	9/16 - 18	5/8 - 18	5/8 - 18	11/16 - 16
-07			11/16 - 18	
-08	3/4 - 16	3/4 - 16	3/4 - 18	13/16 - 16
-10	7/8 - 14	7/8 - 14	7/8 - 18	1 - 14
-12	1·1/16 - 12	1·1/16 - 14	1·1/16 - 16	1·3/16 - 12
-14	1·3/16 - 12	1·1/4 - 12		
-16	1·5/16 - 12	1·3/8 - 12		1·7/16 - 12
-20	1·5/8 - 12			1·11/16 - 12
-24	1·7/8 - 12			2 - 12
-32	2·1/2 - 12			

Metric Thread Guide:

Male thread outside diameters in millimeters, and pitch in millimeters per thread. Dimension d reflects the tube size (mm) which will attach to the given thread. For example, a DIN 24° light male in size M18x1.5 will attach to a metric standpipe measuring 12mm outside diameter. The same female thread size in a DIN heavy pattern will connect to a 10mm O.D. standpipe.

Metric Size	DIN 60° Cone	DIN 24° Cone Light	DIN 24° Cone Heavy	French GAZ 24° Cone	30° Metric Komatsu
-12	M12x1.5	M12x1.5 d6			
-14	M14x a1.5	M14x1.5 d8			M14x1.5
-16	M16x1.5	M16x1.5 d10	M16x1.5 d8		M16x1.5
-18	M18x1.5	M18x1.5 d12	M18x1.5 d10		M18x1.5
-20			M20x1.5 d12		
-22	M22x1.5	M22x1.5 d15	M22x1.5 d14		M22x1.5
-24			M24x1.5 d16		M24x1.5
-26	M26x1.5	M26x1.5 d18			
-28					
-30	M30x1.5	M30x2.0 d22	M30x2.0 d20	M30x1.5d21.25	M30x1.5
-33					M33x1.5
-36		M36x2.0 d28	M36x2.0 d25	M36x1.5d26.75	M36x1.5
-38	M38x1.5				
-42			M42x2.0 d30		M42x1.5
-45	M45x1.5	M45x2.0 d35		M45x1.5d33.5	
-52	M52x1.5	M52x2.0 d42	M52x2.0 d38		

Fitting and Adapter Installation Torque:

Torque in ft.lb. for:

Dash Size	JIC Min	JIC Max	O-Ring Face Seal Min	O-Ring Face Seal Max	ORB Min	ORB Max	NPTF dry* Max
-02							20
-04	11	12	10	12	14	16	25
-05	14	15			18	20	
-06	18	20	18	20	24	26	35
-08	36	39	32	35	50	60	45
-10	57	63	46	50	72	80	
-12	79	88	65	70	125	135	55
-16	108	113	92	100	200	220	65
-20	127	133	125	140	210	280	80
-24	158	167	150	165	270	360	95
-32	245	258					120

** i) If thread sealant is used, maximum values should be decreased by 25%.*

ii) For male tapered threads coupled to NPSM parallel threads, maximum values should be decreased by 50%.

iii) Use only enough torque to achieve a seal, since NPTF sealing torques vary greatly.