

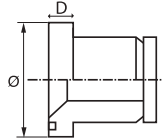
SELECTING THE CORRECT COUPLING


ENGINEERING AND TECHNICAL DATA

FLANGE COUPLINGS

SAE FL

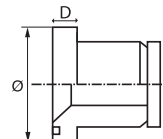
SAE 'O' ring flange.
Code 61.




	Nominal size	mm	D
08FL	1/2"	30.2	6.8
12FL	3/4"	38.1	6.8
16FL	1"	44.5	8.0
20FL	1.1/4"	50.8	8.0
24FL	1.1/2"	60.3	8.0
32FL	2"	71.4	9.6

SAE FLH

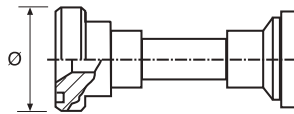
SAE 'O' ring flange high-pressure.
Code 62.




	Nominal size	mm	D
08FLH	1/2"	31.8	7.8
12FLH	3/4"	41.3	8.8
16FLH	1"	47.6	9.5
20FLH	1.1/4"	54.0	10.3
24FLH	1.1/2"	63.5	12.6
32FLH	2"	79.4	12.6

FLK

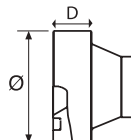
Komatsu type
'O' ring flange.




	Nominal size	mm
10FLK	5/8"	34.2

FLC

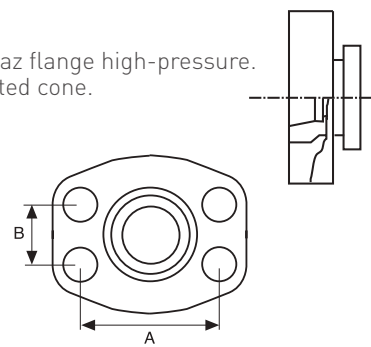
Caterpillar type 'O' ring flange.




	Nominal size	mm	D
12FLC	3/4"	41.4	14.2
16FLC	1"	47.6	14.2
20FLC	1.1/4"	54.0	14.2
24FLC	1.1/2"	63.5	14.2
32FLC	2"	79.5	14.2

FG FPFL

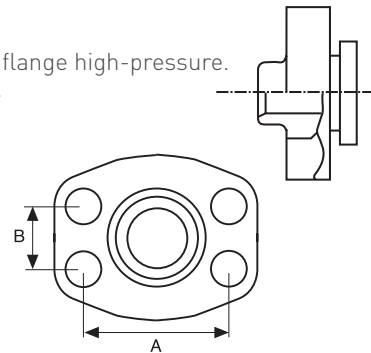
Female French Gaz flange high-pressure.
24° Poclain inverted cone.




	A mm	B mm
17FPFL	40.0	18.2
21FPFL	40.0	18.2
27FPFL	50.8	23.8
34FPFL	57.3	27.3

FG MPFL

Male French Gaz flange high-pressure.
24° Poclain cone.



	A mm	B mm
17MPFL	40.0	18.2
21MPFL	40.0	18.2
27MPFL	50.8	23.8
34MPFL	57.3	27.3

'O' RINGS

-size	FBSPORX 70 / ** 80 SHORE mm	MFFOR 90 SHORE mm	FL 70 SHORE mm	FLH 90 SHORE mm	PWSP 90 SHORE mm	FPWX 90 SHORE mm
-4	5.5 x 1	7.65 x 1.78			7.1 x 1.6	10.0 x 2.0
-5		8.50 x 1.78			7.1 x 1.6	10.0 x 2.0
-6	7.1 x 1.6	9.25 x 1.78			7.1 x 1.6	10.0 x 2.0
-8	11.1 x 1.6	12.42 x 1.78	18.64 x 3.53	18.64 x 3.53		
-10	12.1 x 1.6	15.6 x 1.78				
-12	15.1 x 1.6	18.77 x 1.78	24.99 x 3.53	24.99 x 3.53		
-16	20.1 x 1.6	23.52 x 1.78	32.92 x 3.53	32.92 x 3.53		
-20	27.1 x 1.6	29.87 x 1.78	37.69 x 3.53	37.69 x 3.53		
-24	32.1 x 1.6 **		47.22 x 3.53	47.22 x 3.53		
-32	44.17 x 1.78		56.75 x 3.53	56.75 x 3.53		

Tube mm	FDHORX 90 SHORE mm	FDLORX 90 SHORE mm
6	4.0 x 1.5	4.0 x 1.5
8	6.0 x 1.5	6.0 x 1.5
10	7.5 x 1.5	7.5 x 1.5
12	9.0 x 1.5	9.0 x 1.5
14	10.0 x 2.0 *	
15		12.0 x 2.0
16	12.0 x 2.0	
18		15.0 x 2.0
20	16.3 x 2.4	
22		20.0 x 2.0
25	20.3 x 2.4	
28		26.0 x 2.0
30	25.3 x 2.4	
35		32.0 x 2.5
38	33.3 x 2.4	
42		38.0 x 2.5

'O' rings meet dimensional requirements of ISO 8434-1 & 8434-4

* 'O' ring dimensions for 14mm tube meet DIN 3865

SELECTING THE CORRECT COUPLING

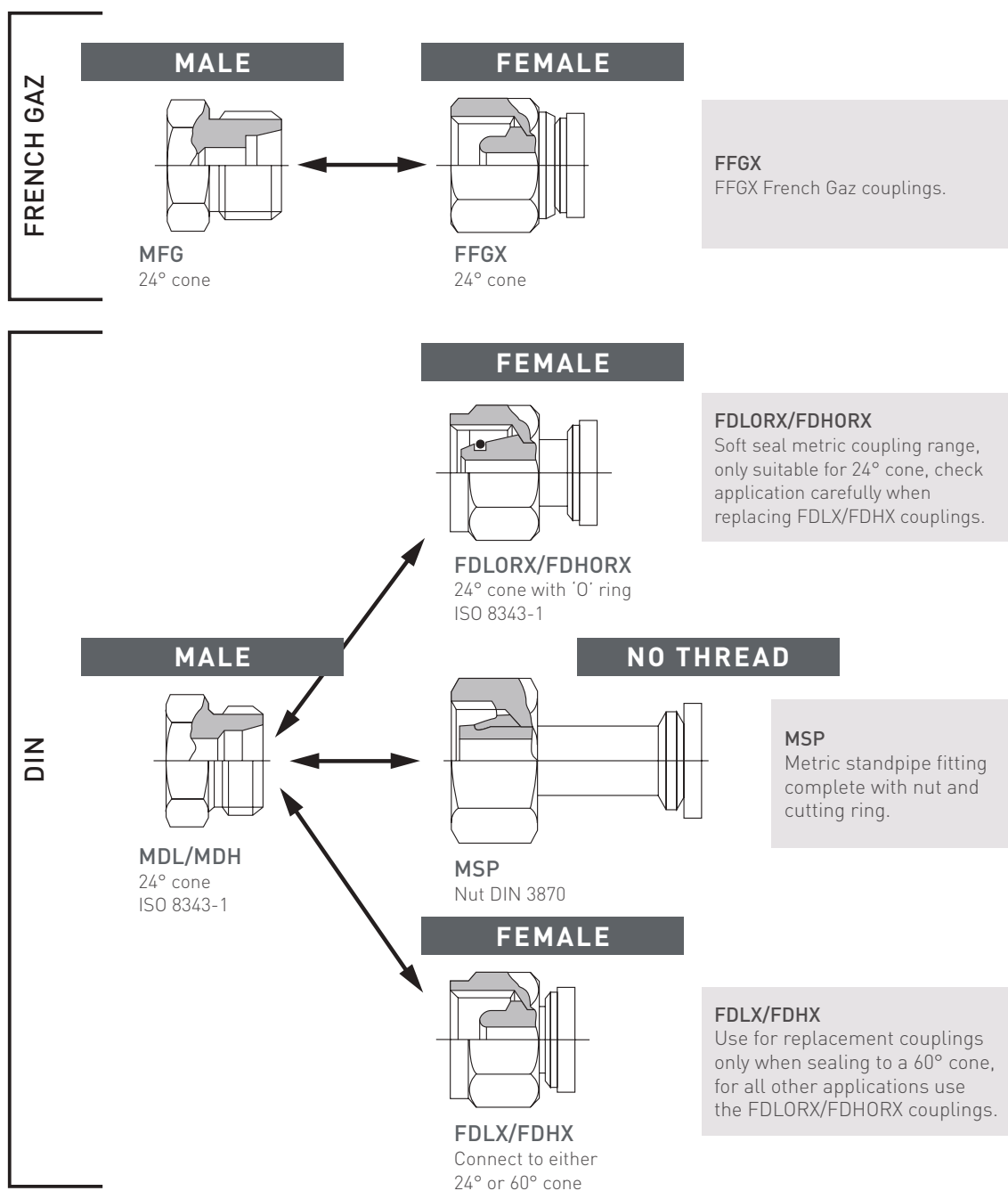
ENGINEERING AND TECHNICAL DATA

EASY IDENTIFICATION OF METRIC COUPLINGS

New applications for metric couplings

For all new metric applications always use the FDLORX or FDHORX Soft Seal couplings. The Soft Seal 'O' ring in the coupling cone provides additional sealing capability at the termination, at the initial startup as well as during the entire service life of the machine.











Vibrations cause the nuts to de-torque, therefore regular maintenance is required to prevent possible leak paths. Gates Soft Seal 'O' rings are not sensitive to vibration, therefore providing longer periods of cone-to-port sealing.



Following the steps below will enable you to identify an unknown coupling or adaptor thread in a short period of time.

Measure diameter of thread, outside of male threads and inside of female threads.



Ø										
9.5										9.5
9.9										9.9
10.3				1/8"-27 NPTF	2MP					10.3
10.5										10.5
11.0		7/16"-20 UNF 7/16"-20 UNF	6MX 6MS	7/16"-20 UNF 7/16"-20 UNF	6MX 6MSA	7/16"-20 UNF	6MS			11.0
11.5										11.5
11.7										11.7
11.9										11.9
12.0				M12 x 1.5	6MDL					12.0
12.5		1/2"-20 UNF	5MJ	1/2"-20 UNF 1/2"-20 UNF	5MX 5MSA	1/2"-20 UNF	5MS			12.5
12.9										12.9
13.0				1/4"-19 BSP	6MBSP					13.0
13.6	1/4"-19 BSP	6MBSP								13.6
13.9				1/4"-18 NPTF	6MP					13.9
14.0				M14 x 1.5	6MDL					14.0
16.1		9/16"-18 UNF	6MJ	9/16"-18 UNF 9/16"-18 UNF	6MXA 6MSA	9/16"-18 UNF 9/16"-18 UNF	6MS 6MSA			16.1
16.5										16.5
16.9										16.9
17.0										17.0
17.5		5/8"-18 UNF	6MS	5/8"-18 UNF	6MX					17.5
17.9										17.9
18.0				M18 x 1.5 5/8"-19 BSP	6MDL 6MSA					18.0
18.5										18.5
19.0										19.0
19.5										19.5
19.9										19.9
20.0										20.0
20.3										20.3
20.5										20.5
20.9										20.9
21.0										21.0
21.5										21.5
21.9										21.9
22.0										22.0
22.5										22.5
22.9										22.9
23.0										23.0
23.6										23.6
23.9										23.9
24.0										24.0
24.5										24.5
24.9										24.9
25.0										25.0
25.5										25.5
25.9										25.9
26.0										26.0
26.5										2

e.g. If inside diameter is 9.9 mm female would be 4FJX.

N.B. On MP/MB and MBSBPT/MT taper threads the maximum \emptyset is given.







Check the coupling or adaptor thread. With a thread gauge you can check the number of threads per inch (for imperial couplings or adaptors) or the pitch of the threads (for metric couplings or adaptors).









SELECTING THE CORRECT COUPLING

ENGINEERING AND TECHNICAL DATA







THREAD SIZE IDENTIFICATION GUIDE







						
9.1						
9.9						
10.3				1/8"-27 NPTF	2MP	
10.5						
11.0			7/16"-20 UNF 7/16"-20 UNF	4MJ 4MS	7/16"-24 UNS 7/16"-20 UNF	4MIX 4MFA
11.5						
11.7						
11.9						
12.0					M12 x 1.5	6MDL
12.5			1/2"-20 UNF	5MJ	1/2"-20 UNF 1/2"-20 UNF	5MIX 5MFA
12.9						
13.0					1/4"-19 BSP	4MBSPP
13.6	1/4"-19 BSP	4MBSPT				
13.9					1/4"-18 NPTF	4MP
14.0					M14 x 1.5	8MDL
14.1			9/16"-18 UNF	6MJ	9/16"-18 UNF	6MFA
						9/16"-18 UNF 9/16"-18 UNF 9/16"-18 UNF
14.5						6MB 4MFFOR 6MBX
15.2						
15.5						
15.7			5/8"-18 UNF	6MS	5/8"-18 UNF	6MIX
15.9						
16.0					M16 x 1.5 M16 x 1.5 3/8"-19 BSP	8MDH 10MDL 6MBSPP
16.5						
17.1	3/8"-19 BSP	6MBSPT				
17.3					3/8"-18 NPTF 11/16"-18 UNS	6MP 7MIX
17.5						11/16"-16 UN
						6MFFOR
18.0					M18 x 1.5 M18 x 1.5	10MDH 12MDL
18.5						
18.9			3/4"-16 UNF 3/4"-16 UNF	8MJ 8MS	3/4"-18 UNS 3/4"-16 UNF	8MIX 8MFA
19.1						3/4"-16 UNF 3/4"-16 UNF
20.0					M20 x 1.5 M20 x 1.5	12MDH 13MFG
20.5						
20.8					1/2"-14 BSP	8MBSPP
20.9						1/2"-14 BSP
21.5	1/2"-14 BSP	8MBSPT				8MBFF
21.6					1/2"-14 NPTF	8MP
22.0					M22 x 1.5 M22 x 1.5	14MDH 15MDL
22.1			7/8"-14 UNF 7/8"-14 UNF	10MJ 10MS	7/8"-14 UNF	10MFA
						13/16"-16 UN
22.5						7/8"-14 UNF 7/8"-14 UNF
22.8						10MB 10MBX
23.4	5/8"-14 BSP	10MBSPT			5/8"-14 BSP	10MBSPP
23.6						
24.0					M24 x 1.5 M24 x 1.5	16MDH 17MFG
24.4						
24.5						
25.0						
25.2						
25.3						1"-14 UNS
25.4						10MFFOR

								
	1/4"-18 NPSM	4FPX	7/16"-20 UNF	4FJX				9.1
			7/16"-20 UNF	4FSX				9.9
								10.3
	M12 x 1.5	6FDLORX						10.5
	M12 x 1.5	6FDLX						11.0
			1/2"-20 UNF	5FJX				11.5
			1/2"-20 UNF	5FSX				11.7
	1/4"-19 BSP	4FBSPORX	1/4"-19 BSP	4FJISX				11.9
	3/8"-18 NPSM	6FPX						12.0
								12.5
	M14 x 1.5	8FDLX						12.9
	M14 x 1.5	6FDHORX	M14 x 1.5	4FKX				13.0
	M14 x 1.5	8FDLORX						13.6
			9/16"-18 UNF	6FJX	9/16"-18 UNF	4FFORX		13.9
								14.0
								14.1
								14.5
	M16 x 1.5	10FDLORX						15.2
	M16 x 1.5	8FDHORX						15.5
	M16 x 1.5	8FDHX						15.7
	M16 x 1.5	10FDLX						15.9
	3/8"-19 BSP	6FBSPORX	3/8"-19 BSP	6FJISX	3/8"-19 BSP	6FBFFX		16.0
	1/2"-14 NPSM	8FPX	5/8"-18 UNF	6FSX	11/16"-16 UN	6FFORX		16.5
								17.1
								17.3
								17.5
			3/4"-16 UNF	8FSX				18.0
			3/4"-16 UNF	8FJX				18.5
								18.9
	M20 x 1.5	12FDHORX						19.1
	M20 x 1.5	14FDLORX						20.0
	M20 x 1.5	12FDHX						20.5
	M20 x 1.5	13FFGX						20.8
	1/2"-14 BSP	8FBSPORX	1/2"-14 BSP	8FJISX	1/2"-14 BSP	8FBFFX		20.9
	3/4"-14 NPSM	12FPX			13/16"-16 UN	8FFORX		21.5
								21.6
								22.0
								22.1
	M22 x 1.5	14FDHORX	7/8"-14 UNF	10FJX				22.5
	M22 x 1.5	15FDLORX	M22 x 1.5	8FKX				22.8
	M22 x 1.5	14FDHX						23.4
	M22 x 1.5	15FDLX	7/8"-14 UNF	10FSX				23.6
								24.0
	5/8"-14 BSP	10FBSPORX			5/8"-14 BSP	10FBFFX		24.4
								24.5
								25.0
								25.2
								25.3
								25.4
								25.5
								25.6
								25.7
								25.8
								25.9
								26.0
								26.1
								26.2
								26.3
								26.4
								26.5
								26.6
								26.7
								26.8
								26.9
								27.0
								27.1
								27.2
								27.3
								27.4
								27.5
								27.6
								27.7
								2

SELECTING THE CORRECT COUPLING

ENGINEERING AND TECHNICAL DATA

						
26.0			M26 x 1.5	18MDL		
26.3			3/4"-14 BSP	12MBSPP		
26.9		1.1/16"-12 UN 1.1/16"-14 UNS	12MJ 12 MS	1.1/16"-12 UN 3/4"-14 NPTF	12MFA 12MP	1.1/16"-12 UN 1.1/16"-12 UN
27.0	3/4"-14 BSP	12MBSPT				12MB 12MBX
28.0						
28.2						
28.5						
30.0		1.3/16"-12 UN	14MJ	M30 x 1.5 M30 x 2.0 M30 x 2.0	21MFG 20MDH 22MDL	1.3/16"-12 UN 1.3/16"-12 UN
30.2						
30.6						
30.7						
31.3						
31.5						
31.8						
33.1				1"-11 BSP	16MBSPP	
33.2		1.5/16"-12 UN	16MJ	1.5/16"-12 UN	16MFA	1.5/16"-12 UN
33.7				1"-11.5 NPTF	16MP	
33.9	1"-11 BSP	16MBSPT				
34.0						
34.2						
34.4						
34.5						
36.0				M36 x 1.5 M36 x 2.0 M36 x 2.0	27MFG 25MDH 28MDL	
36.3						1.7/16"-12 UN
38.1						16MFFOR
39.2						
39.3						
40.5						
40.7						
41.2		1.5/8"-12 UN	20MJ			1.5/8"-12 UN
41.3						20MB
41.4						
41.8				1.1/4"-11 BSP	20MBSPP	
42.0				M42 x 2.0	30MDH	
42.5				1.1/4"-11.5 NPTF	20MP	
42.6						1.11/16"-12 UN
43.0						20MFFOR
43.5						
44.5						
45.0				M45 x 1.5 M45 x 2.0	34MFG 35MDL	
45.2						
45.5						
47.5		1.7/8"-12 UN	24MJ			
47.6						
47.7				1.1/2"-11 BSP	24MBSPP/24MU	
48.6				1.1/2"-11.5 NPTF	24MP/24MB	
48.7						
50.0						
50.8						
52.0				M52 x 1.5 M52 x 2.0 M52 x 2.0	42MFG 38MDH 42MZ52B	
54.0						
59.5				2"-11 BSP	32MU	
60.3						
60.5	2"-11 BSP	32MT				
60.7				2"-11.5 NPTF	32MP/32MB	
61.4						
63.3		2.1/2"-12 UN	32MJ			
63.5						
71.4						
79.4						
79.5						

						
						26.0
						26.3
						26.9
						27.0
	M30 x 2.0 M30 x 2.0 M30 x 2.0 M30 x 2.0	20FDHORX 22FDLORX 20FDHX 22FDLX			13/16"-16 UN 12FFORX	28.0
	M30 x 1.5	21FFGX	1.3/16"-12 UN M30 x 1.5	14FJX 12FKX		28.2
						28.5
						30.0
	1"-11 BSP 1"-11.5 NPSM	16FBSPORX 16FPX	1"-11 BSP	16FJISX	1"-11 BSP 16FBFFX	1/2" - CODE 61 8FL
			1.5/16"-12 UN M33 x 1.5	16FJX 16FKX		30.2
						30.6
						30.7
						31.3
					1/2" - CODE 62	31.5
					8FLH	31.8
						33.1
						33.2
						33.7
						33.9
	M36 x 2.0 M36 x 2.0 M36 x 2.0	25FDHORX 28FDLORX 28FDLX				34.0
						34.2
	M36 x 1.5	27FFGX	M36 x 1.5	20FKX	1.7/16"-12 UN 16FFORX	5/8" - KOMATSU 10FLK
						34.4
						34.5
						36.0
						36.3
			1.5/8"-12 UN	20FJX		3/4" - CODE 61 12FL
	1 1/4"-11 BSP	20FBSPORX				38.1
						39.2
						39.3
					1.11/16"-12 UN 20FFORX	40.5
						40.7
						41.2
						3/4" - CODE 62 3/4" - CAT
						12FLH 12FLC
	M42 x 2.0	30FDHORX				41.3
						41.4
	M45 x 2.0 M45 x 1.5	35FDLORX 34FFGX				41.8
						42.0
						42.5
						42.6
						43.0
						43.5
					1" - CODE 61	16FL
	1.1/2" -11 BSP	24FBSPORX				44.5
			1.7/8"-12 UN	24FJX/24NJ		45.0
						45.2
						45.5
						47.5
					1" - CODE 62 1" - CAT	16FLH 16FLC
						47.6
						47.7
						48.6
					2"-12 UN 24FFORX/24FF	
	M52 x 2.0 M52 x 1.5 M52 x 1.5	38FDHORX 42RO52A 42FFGX				48.7
						1.1/4" - CODE 61 20FL
						50.0
						50.8
						52.0
						1.1/4" - CAT 1.1/4" - CAT
	2"-11 BSP	32NU				20FLC 20FLH
						54.0
					1.1/2" - CODE 61	24FL/24PA
						59.5
						60.3
						60.5
			2.1/2"-12 UN	32FJX/32NJ		60.7
						61.4
						63.3
						1.1/2" - CAT 1.1/2" - CODE 62
						24FLC 24FLH
					2" - CODE 61	32FL/32PA
					2" - CODE 62	32FLH
					2" - CAT	32FLC
						71.4
						79.4
						79.5

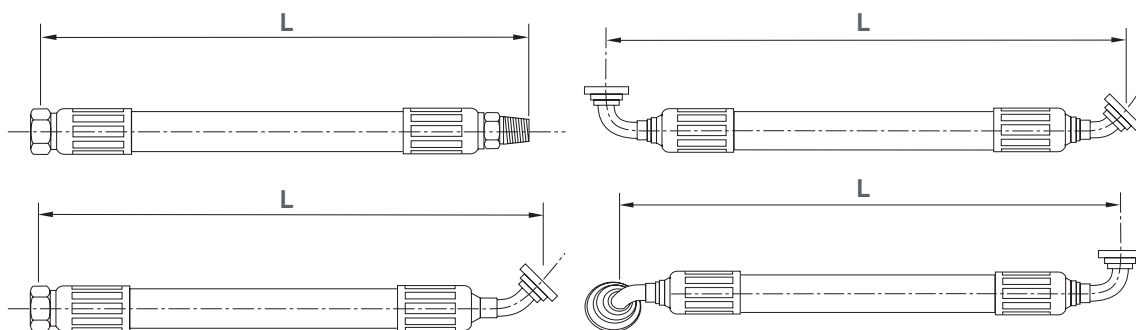
HOSE ASSEMBLY SELECTION AND INSTALLATION

ENGINEERING AND TECHNICAL DATA

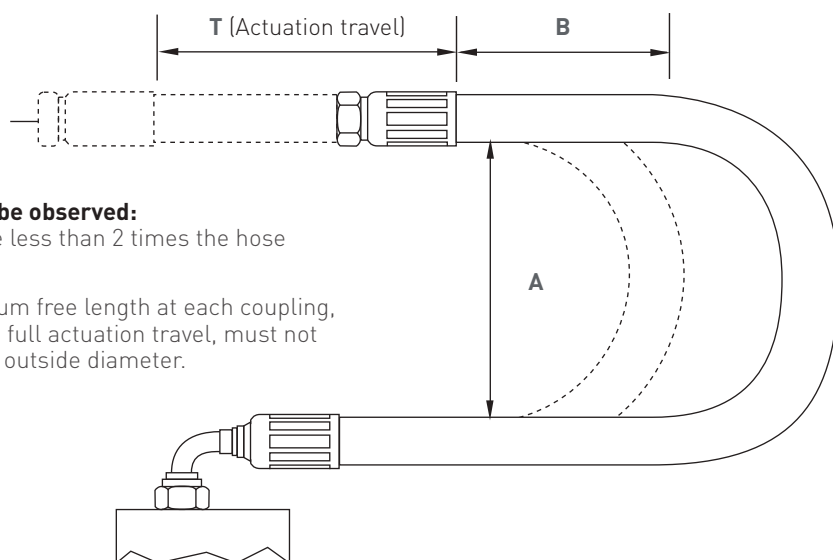
CALCULATING THE HOSE ASSEMBLY LENGTH

Hose assemblies are made according to overall length i.e. cone face to cone face, or where elbow couplings are used, to the centre line of the cone face.

When determining the length of hose assemblies, provide sufficient length to prevent bending strain from localising at the back of the coupling. In the figure below dimension "B" allows for a strain section of hose beyond the coupling to prevent concentration of bending strain. "T" designates the amount of travel. "A" indicates the smallest diameter to which the hose should be bent (2x minimum bend radius).



T (Actuation travel)



2 critical dimensions must be observed:

1. Dimension 'A' must not be less than 2 times the hose minimum bend radius.
2. Dimension 'B', the minimum free length at each coupling, taking into account 'T' the full actuation travel, must not be less than 2 times hose outside diameter.

CAUTION

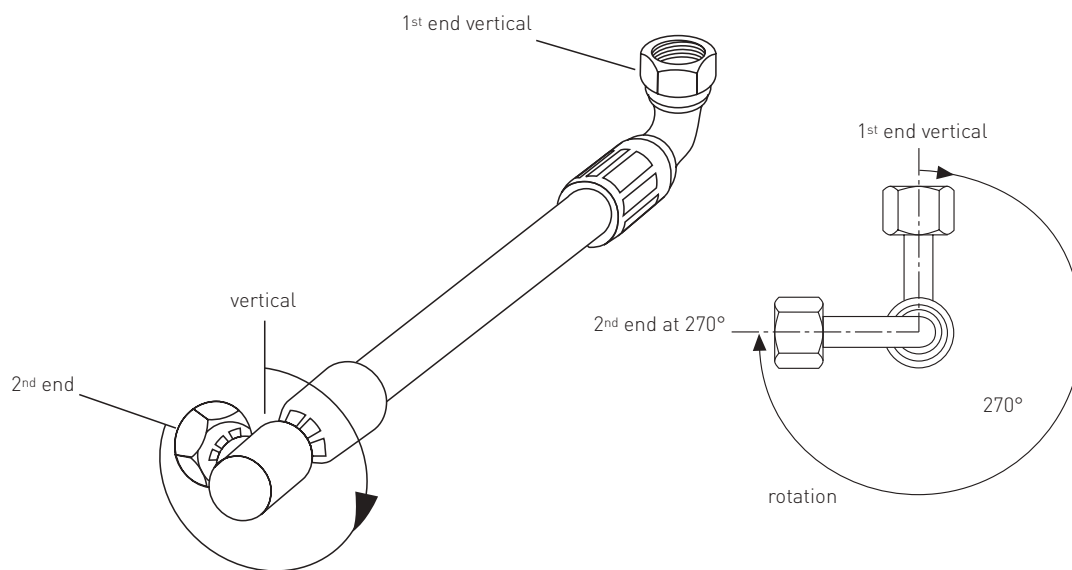
When cutting hose, always wear safety glasses and avoid loose fitting clothing. Ear protection is also strongly recommended. Ensure adequate ventilation.

Fitting orientation

Fitting orientation is necessary when a hose assembly requires two angled couplings that are not in line when viewed from one end of a hose. Fittings must be orientated to each other to ensure proper installation with minimal stress on the hose from twisting.

Fitting orientation is measured from the centerline of the first coupling held in a vertical position and looking at the assembly from the second end by measuring in a clockwise direction.

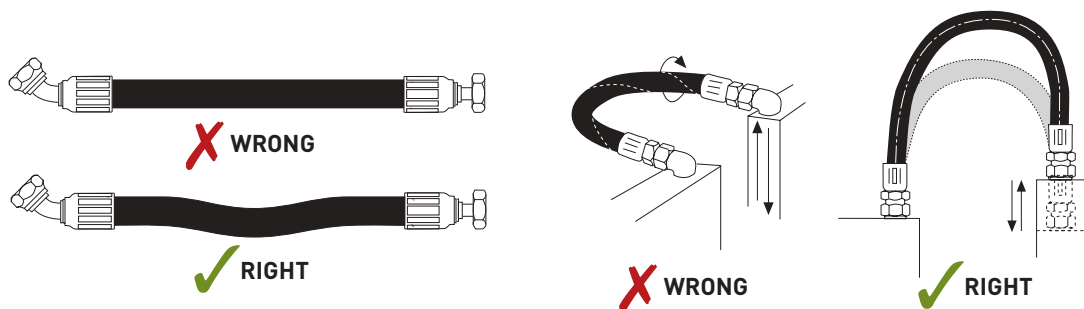
Orientation angle tolerance should be ± 3 degrees for assemblies equal or less than 600 mm and ± 5 degrees for assembly lengths over 600 mm.



HOSE ASSEMBLY ROUTING TIPS

Proper hose installation is essential for satisfactory performance. As we have seen, if hose length is excessive, the appearance of the installation will be unsatisfactory and unnecessary cost of equipment will be involved. If hose assemblies are too short to permit adequate flexing and changes in length due to expansion or contraction, hose service life will be reduced.

The following diagrams show proper hose installations which provide maximum performance and cost savings. Consider these examples in determining the length of a specific assembly.

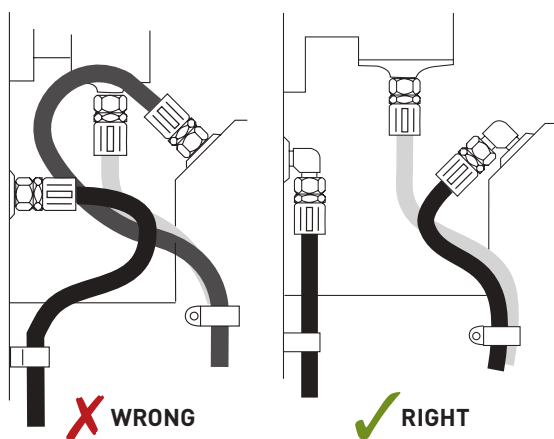


When hose installation is straight, allow enough slack in hose line to provide for length changes which will occur when pressure is applied.

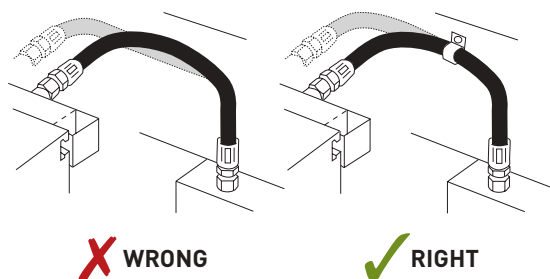
Prevent twisting and distortion by bending hose in same plane as the motion of the boss to which hose is connected.

HOSE ASSEMBLY SELECTION AND INSTALLATION

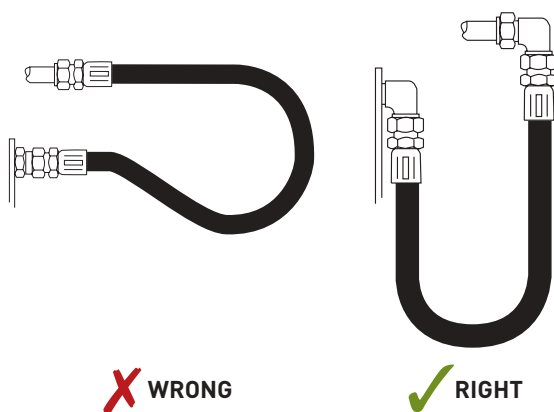
ENGINEERING AND TECHNICAL DATA



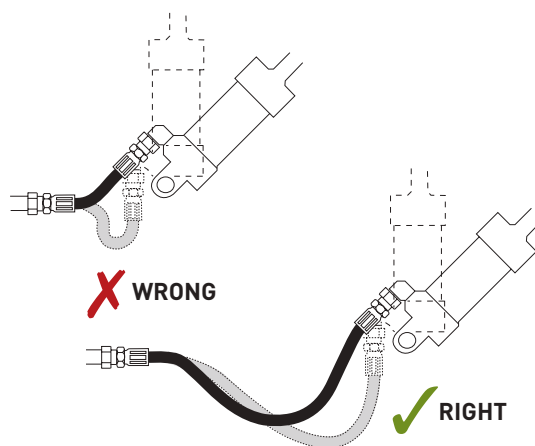
Route hose directly by using 45° and/or 90° adaptors and fittings. Avoid excessive hose length to improve appearance.



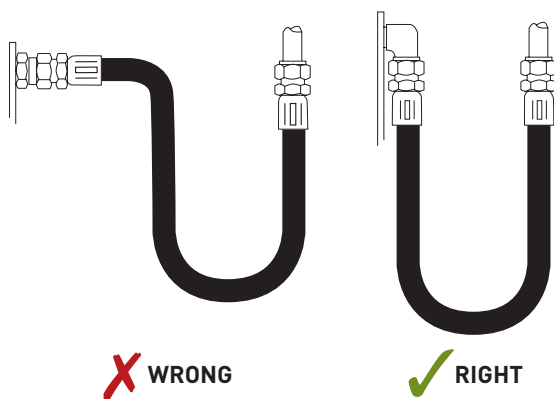
Avoid twisting of hose lines bent in two planes by clamping hose at change of plane.



When radius is below the required minimum, use an angle adaptor to avoid sharp bends.

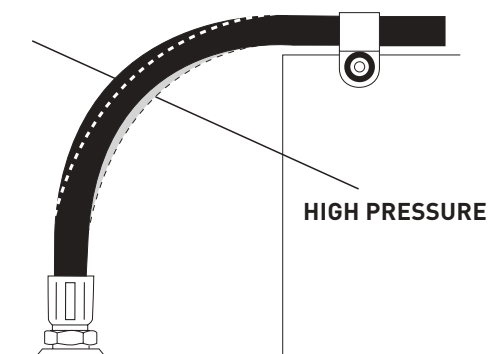


Adequate hose length is necessary to distribute movement on flexing applications and to avoid abrasion.

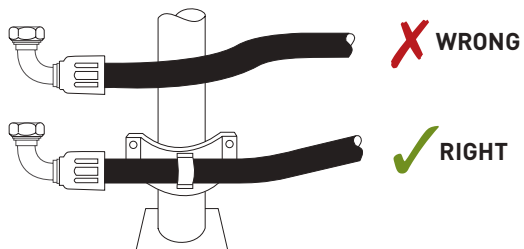


Use proper angle adaptors to avoid sharp twist or bend in hose.

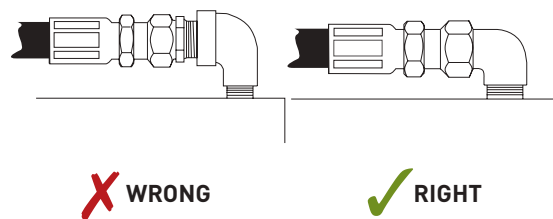
NO PRESSURE



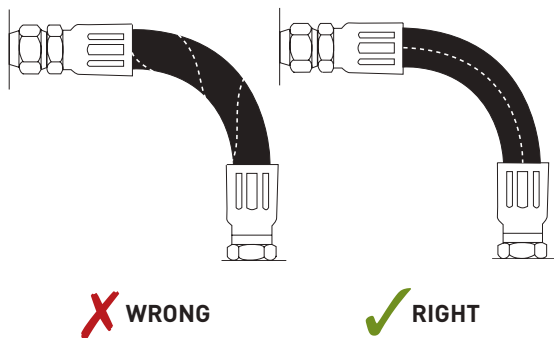
To allow for length changes when hose is pressurised, do not clamp at bends so that curves will absorb changes. Do not clamp high and low pressure lines together.



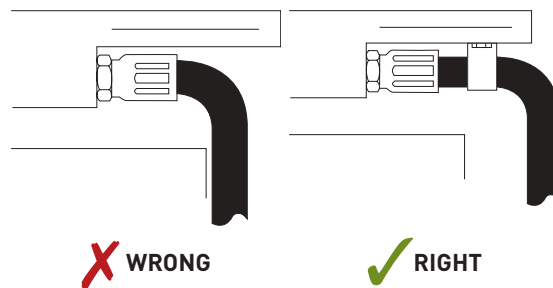
High ambient temperatures shorten hose life. Make sure hose is kept away from hot parts. If this is not possible, insulate the hose.



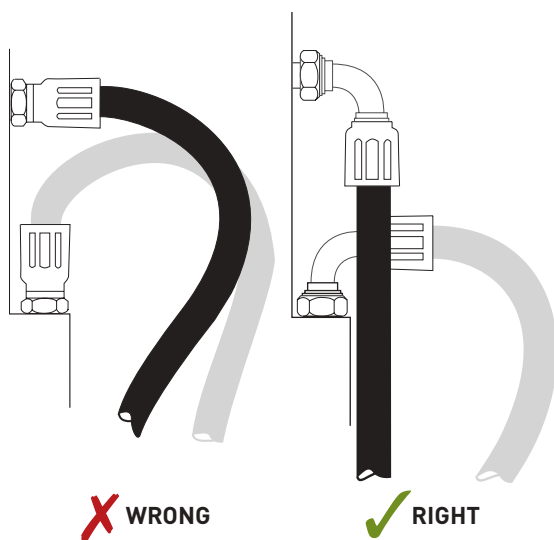
Reduce number of pipe thread joints by using proper hydraulic adaptors instead of pipe fittings.



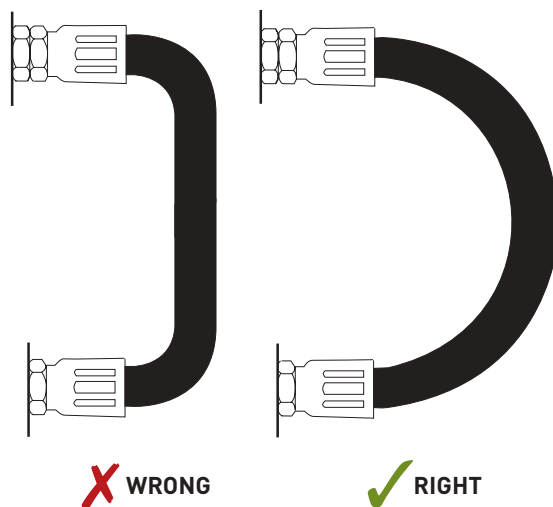
When installing a hose, make sure it is not twisted. Pressure applied to a twisted hose can result in hose failure or loosening of connections.



Run hose in the installation so that it avoids rubbing and abrasion. Often, clamps are required to support long hose runs or to keep hose away from moving parts. Use clamps of the correct size. Too large a clamp allows hose to move inside the clamp and causes abrasion.



Elbows and adaptors should be used to relieve strain on the assembly, and to provide neater installations which will be more accessible for inspection and maintenance.



To avoid hose collapse and flow restriction, keep hose bend radii as large as possible. Refer to hose specification tables for minimum bend radii.