
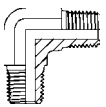
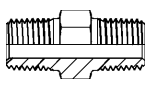
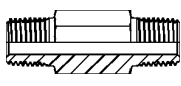
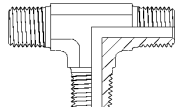
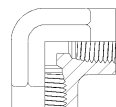
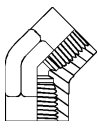
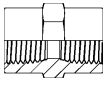
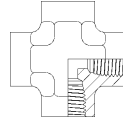
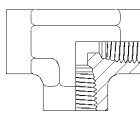
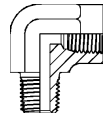
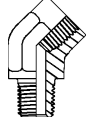
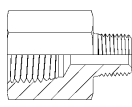
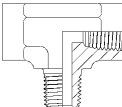
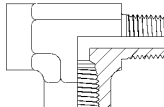
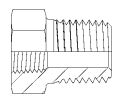

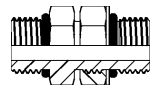
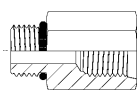
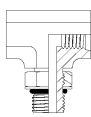
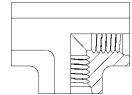
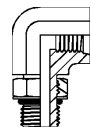
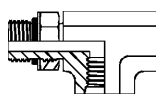

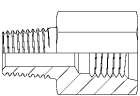
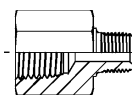
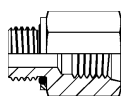
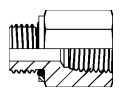
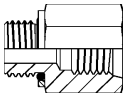
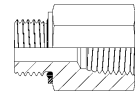
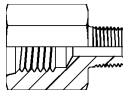
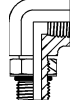
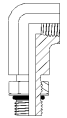
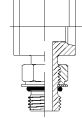
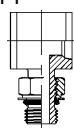
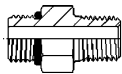
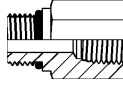


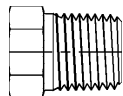
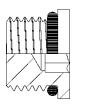
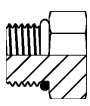
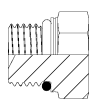
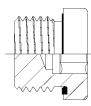
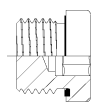
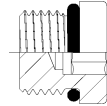




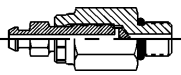
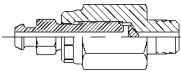

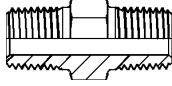
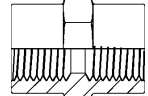



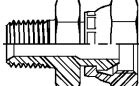
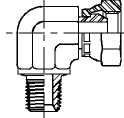
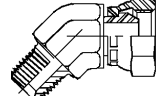
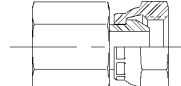
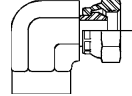
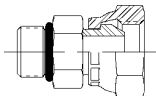
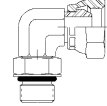
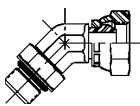
# ***Industrial Pipe Fittings and Adapters Metric and Inch***



***The World Standard***

 <p><b>Industrial Pipe Fittings</b></p>	<p><b>CR</b> Male Pipe Elbow</p>  <p>Page H16</p>	<p><b>FF</b> Pipe Nipple</p>  <p>Page H16</p>	<p><b>FFF</b> Long Pipe Nipple</p>  <p>Page H17</p>	<p><b>RRS</b> Male Pipe Tee</p>  <p>Page H17</p>	<p><b>DD</b> Female Pipe Elbow</p>  <p>Page H18</p>
<p><b>DD45</b> Female Pipe 45° Elbow</p>  <p>Page H18</p>	<p><b>GG</b> Pipe Coupling</p>  <p>Page H19</p>	<p><b>KMMOO</b> Female Pipe Cross</p>  <p>Page H19</p>	<p><b>MMO</b> Female Pipe Tee</p>  <p>Page H20</p>	<p><b>CD</b> Street Elbow</p>  <p>Page H20</p>	<p><b>CD45</b> Street Elbow 45°</p>  <p>Page H21</p>
<p><b>FG</b> Expander / Adapter</p>  <p>Page H21</p>	<p><b>MMS</b> Male Branch Tee</p>  <p>Page H22</p>	<p><b>MRO</b> Male Run Tee</p>  <p>Page H22</p>	<p><b>PTR</b> Pipe Thread Reducer</p>  <p>Page H23</p>		
 <p><b>SAE Straight Thread Adapters</b></p>	<p><b>F5OHAO</b> Straight Thread Union</p>  <p>Page H24</p>	<p><b>F5OG5</b> Straight Thread Reducer / Expander</p>  <p>Page H25</p>	<p><b>G5G5JAO</b> Straight Thread Branch Tee</p>  <p>Page H26</p>	<p><b>G5G5JG5</b> Female Straight Thread Tee</p>  <p>Page H26</p>	<p><b>AOEG5</b> Straight Thread Elbow</p>  <p>Page H27</p>
<p><b>AOG5JG5</b> Straight Thread Run Tee</p>  <p>Page H27</p>	 <p><b>Conversion Adapters</b></p>	<p><b>F3HG5</b> Male BSPP/ Female SAE</p>  <p>Page H28</p>	<p><b>F3HG</b> Male BSPP/ Female NPT</p>  <p>Page H28</p>	<p><b>F4OHG5</b> Male BSPP/ Female SAE</p>  <p>Page H29</p>	<p><b>F4OHG</b> Male BSPP/ Female NPT</p>  <p>Page H29</p>
<p><b>F8OHG5</b> Male Metric/ Female SAE</p>  <p>Page H30</p>	<p><b>F8OHG</b> Male Metric/ Female NPT</p>  <p>Page H30</p>	<p><b>FHG5</b> Male NPT/ Female SAE</p>  <p>Page H31</p>	<p><b>AOEG</b> Male SAE/ Female NPT</p>  <p>Page H31</p>	<p><b>AOE4G</b> Male SAE/Female NPT-Long Elbow</p>  <p>Page H32</p>	<p><b>A87LPOEG87LP</b> Male ISO 6149 Female ISO 6149</p>  <p>Page H34</p>
<p><b>A4OEG4M</b> Male BSPP Female BSPP</p>  <p>Page H34</p>	<p><b>F5OF</b> Male SAE/ Male NPT</p>  <p>Page H32</p>	<p><b>F5OG</b> Male SAE/ Female NPT</p>  <p>Page H33</p>	 <p><b>Plugs and Bleed Adapters</b></p>	<p><b>HHP</b> Hollow Hex Pipe Plug</p>  <p>Page H35</p>	<p><b>HP</b> Hex Head Pipe Plug</p>  <p>Page H35</p>
<p><b>HP5ON</b> Hollow Hex Plug (SAE Straight Thread)</p>  <p>Page H36</p>	<p><b>P5ON</b> Hex Head Plug (SAE Straight Thread)</p>  <p>Page H36</p>	<p><b>P87OMN</b> Hex Head Plug (ISO 6149)</p>  <p>Page H37</p>	<p><b>VSTI-M-ED</b> Hollow Hex Plug (Metric DIN 3852)</p>  <p>Page H37</p>	<p><b>VSTI-R-ED</b> Hollow Hex Plug (BSPP DIN 3852)</p>  <p>Page H38</p>	<p><b>VSTI-M-OR</b> Hollow Hex Plug (ISO 6149)</p>  <p>Page H38</p>

**Visual Index**

<p><b>P5ONBA</b> Straight Thread O-ring Bleed Adapter</p>  <p>Page H39</p>	<p><b>HPBA</b> Male Pipe Bleed Adapter</p>  <p>Page H39</p>	<p><b>BSP Adapters</b></p> 	<p><b>FF33M</b> BSPT Pipe Nipple</p>  <p>Page H40</p>	<p><b>GG44M</b> BSPP Pipe Coupling</p>  <p>Page H40</p>	<p><b>RI-ED</b> BSPP Reducing Adapter/Expander</p>  <p>Page H41</p>
<p><b>RI</b> BSPP Reducing Adapters/Expander</p>  <p>Page H42</p>	<p><b>Pipe (NPSM) Swivel Adapters</b></p> 	<p><b>0107</b> Male Pipe Adapter</p>  <p>Page H43</p>	<p><b>2107</b> Male Pipe Elbow</p>  <p>Page H44</p>	<p><b>3107</b> 45° Male Pipe Elbow</p>  <p>Page H45</p>	<p><b>0207</b> Female Pipe Adapter</p>  <p>Page H45</p>
<p><b>2207</b> Female Pipe Elbow</p>  <p>Page H46</p>	<p><b>0507</b> Straight Thread Adapter</p>  <p>Page H46</p>	<p><b>2507</b> Straight Thread Elbow</p>  <p>Page H47</p>	<p><b>3507</b> 45° Straight Thread Adapter</p>  <p>Page H47</p>		



## Introduction



There are many types of threads used throughout the world. This Section contains adapters with just a few of those many thread types including: NPT, NPTF, NPSM, BSPT, BSPP, SAE UN/UNF, and Metric. All the threads in this section are made to industry specifications with conformance shown in Table H1.

Thread	Standard
NPT	ANSI B1.20.1, FED-STD-H28/7
NPTF	SAE J476, ANSI B1.20.3, FED-STD-H28/8
NPSM	ANSI B1.20.1, FED-STD-H28/7
BSPT	BS 21, ISO 7/1
BSPP	BS 2779, ISO 228/1
Metric	ISO 261, ANSI B1.13M, FED-STD-H28/21
UN/UNF*	ANSI B1.1, FED-STD-H28/2

\*Class 2A or 2B

**Table H1 — Thread Conformance Standards**

The next few pages describe the application and assembly methods for the adapters using the various threads above.

## Design and Construction

Shaped products (elbows, tees and crosses) are hot forged and machined, while straights are manufactured from cold drawn barstock. Where applicable, these products are made in conformance with the design criteria of the society of Automotive Engineers Standards, SAE J514, J530.

**Standard material Specifications:** The standard materials used in the manufacture of Industrial Pipe and Adapter fittings are shown in Table H2.

Pipe Fittings, Adapters and	Steel		Stainless Steel		Brass	
	ASTM	Type	ASTM	Type	ASTM	Type
Forged Bodies	A576	1214/1215	A182	316	B124	CA377
Bar Stock Bodies	A108	12L14	A479	316	B16 B453	CA360 CA345

**Table H2 — Standard Material Specifications for Industrial Pipe Fittings and Adapters**

Note: Upon request, pipe fittings, adapters and plugs could be furnished in materials other than those shown in the materials specifications chart.

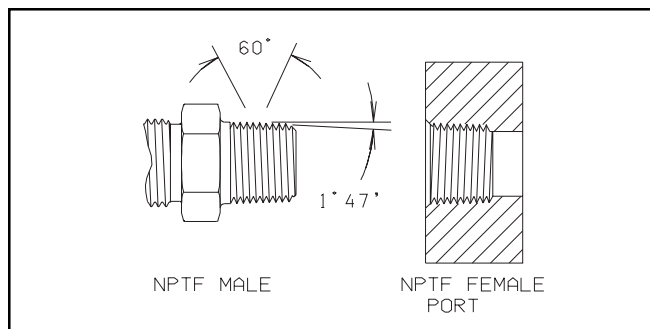
Parker Fluid Connector products made from steel and brass, for the most part, have NPTF threads. Stainless steel products may have NPT or slightly modified NPT threads to minimize the chance of galling on assembly.

**Finish** - Zinc with Yellow Chromate is used on all standard steel products. Stainless steel fittings are passivated.

## Industrial Pipe Fittings (NPT and NPTF)

### How Tapered Pipe Threads Work

Industrial Pipe Fittings use NPT and NPTF (Dryseal) tapered pipe threads. These threads feature a 60° flank angle and 1°47' taper, as shown in Figure H1.

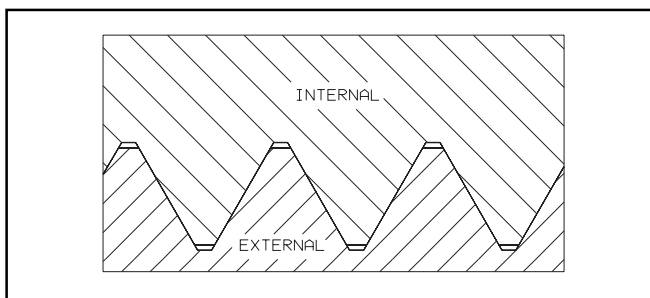


**Fig. H1 — Dryseal American Standard Taper Pipe Thread — NPTF**

### How A Leak Free Joint Is Achieved

NPT threads, when assembled without a sealant, leave a spiral leak path at the crest-root junction as shown in Figure H2. To seal pressurized fluid, NPT threads need a suitable sealer.

NPTF threads (Dryseal), on the other hand, when assembled, do not leave such spiral leak path. This is because they have controlled truncation at the crest and root, ensuring metal to metal crest-root contact prior to, or just as the male-female thread flanks make contact as seen in Figure H3. Upon further tightening, the thread crests are flattened out until the flanks also make metal to metal contact as seen in Figure H4. Thus, theoretically at least, there is no passage left for the fluid to leak, provided all surfaces are flawless and dimensions exact. In the real world, however, this is not the case and a sealant/lubricant is necessary to achieve a leak free joint even with NPTF threads. The sealant/lubricant fills all imperfections in the surfaces affecting the seal and provides lubrication to ease assembly and minimize galling.



**Fig. H2 — NPT — Wrench Tight-No Crest-Root Contact, Flank Contact Only**

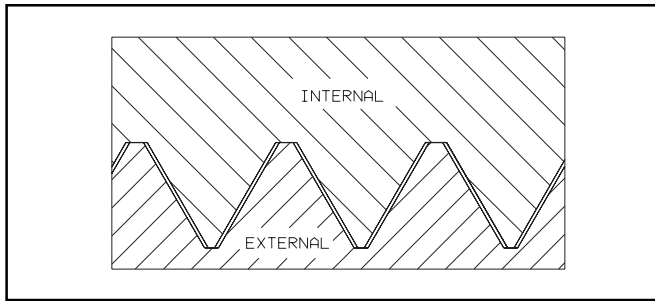


Fig. H3 — NPTF — Hand Tight-Crest to Root Contact

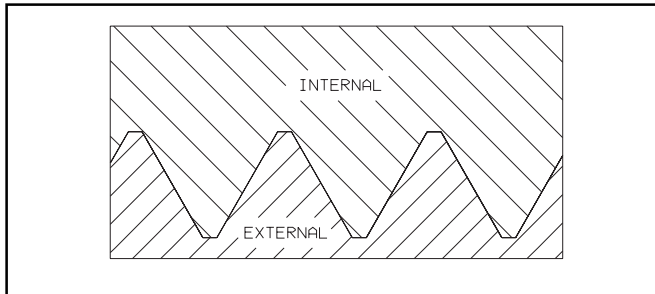


Fig. H4 — NPTF — Wrench Tight-Crest to Root and Flank Contact

It is easier to obtain a seal with NPTF threads than it is with NPT threads because of the metal to metal contact along the full thread profile. Therefore, they are preferred over NPT in high pressure hydraulic applications.

### Type of Sealant/Lubricant

Sealant/Lubricants assist in sealing and provide lubrication during assembly, reducing the potential for galling. Pipe thread sealants are available in various forms such as dry pre-applied, tape, paste and anaerobic liquid.

Pre-applied sealants, such as “Vibraseal” (registered trademark of Loctite Corporation) and powdered “Teflon” (registered trademark of DuPont) are usually applied to connectors by the manufacturer. Connectors with some of these sealants may be remade a few times without needing additional sealant. Vibraseal may also help reduce loosening due to vibration.

Teflon tape, if not applied properly, can contribute to system contamination during assembly and disassembly. In addition, because of Teflon’s high lubricity, fittings can be more easily over tightened; and it does not offer much resistance to loosening under vibration.

Paste sealants can also contribute to system contamination, if not applied properly. They are also messy to work with; and some types require a cure period after component installation, prior to system start up.

Anaerobic liquids are available from several manufacturers and perform sealing as well as thread locking functions. They are applied to the connectors by the user and require a cure period prior to system start up. Some are soluble in common hydraulic fluids and will not contaminate the system. For proper performance they need to be applied to clean and dry components, carefully following the manufacturer’s directions.

For proper application of the sealants see assembly on page A43, and follow the manufacturer’s recommendation.

## Pressure Holding Capacity

Dryseal taper pipe threads have the highest strength of any commonly used port connection to withstand static pressure load (blow-off resistance). This pressure holding capacity depends mainly on the following factors:

- Strength of connectors and port materials.
- Total number of threads engaged.
- Quality of threads of the mating parts.

Extensive testing has been conducted by the Fluid Connector Divisions of Parker to determine the pressure at which failure occurred in the form of leakage or burst with pipe threaded (NPTF) joints. Tests were conducted on production parts made from low carbon steel forgings as well as barstock, using hardened steel test blocks for male threads and low carbon steel plugs for female threads.

## Sealing of Pipe Threads

Pipe threads have very high pressure holding (blow-off resistance) capability. However, their ability to create and maintain seal in a dynamic (high cycle pulsating with attendant shocks and vibration) applications depends on many factors, including the following:

- Quality of threads (surface, form and dimensions) of both the port and the connector.
- Type and application of the sealant.
- Joint tightness.
- Port and connector material combination (difference in thermal expansion).
- Severity of application — amount and severity of vibration, shocks (hydraulic as well as mechanical) and thermal cycling involved.
- Procedure followed in positioning (orienting) shaped connectors.
- Sensitivity of female pipe threads in shaped connectors to over tightening.
- Number of times the joint is re-assembled and the extent to which proper procedure is followed.
- Clamping and routing.

The more of the above factors that are involved in making a connection, the greater is its propensity for leakage. Thus, the propensity for leakage of a pipe threaded joint can vary from extremely low to very high depending on its favorable/unfavorable mix of the above factors in an application.

Past experience has shown and extensive testing has confirmed that:

- Connectors with larger pipe threads have a higher tendency to leak than those with smaller ones. This is because larger threads have more chances for surface imperfections and dimensional inaccuracies; and, being heavier, they are more prone to handling damage. They probably don’t always get tightened properly as they require larger wrench clearances and more effort.
- Connectors with female pipe threads have a higher tendency to leak than those with male pipe threads. This is because female pipe threads machined in connectors tend to expand under pressure spikes and repeated assembly, causing eventual loss of seal.

## Technical Data

- (c) Shaped connectors with pipe threads have a higher tendency to leak than straight ones because shapes are apt to see higher loosening moments (hose pull, accidental bumping, etc.) than straight ones. They are also more prone to handling damage than straight ones because the forgings are softer than the barstock. Brazed connectors are more susceptible to damage than forged ones due to their even softer (HRB 50-60) condition. Also, it is difficult to always tighten shapes with pipe threads to an optimum tightness level because of orientation requirements.

Thus, connectors with pipe threads, except for straight ones with 3/4-14 NPTF and smaller male pipe threads, have low reliability for leak free operation in dynamic applications. Therefore, where no leakage can be tolerated, SAE straight thread (SAE J1926/ISO 11926), SAE four bolt split flange (SAE J518/ISO 6162) and ISO 6149 port connections are recommended.

### Recommended Working Pressures

Some manufactures rate their pipe threaded products very aggressively, i.e. they use one value for all products with pipe threads of a given size, based on burst/leakage tests with male threaded barstock parts. These are very misleading and can lead to leakage or even more serious problems.

We believe the correct way to rate the pipe threads is by taking into consideration the type of product (barstock or forged with male or female threads) and severity of the application.

Working pressures for pipe threaded ends of connectors are arrived at by applying a design factor, based on severity of application. The pressure tables are based on these factors,

### Application Guidelines

As seen in the pressure tables, straight connectors with 3/4-14 NPTF and smaller male pipe threads have very high pressure holding capability and seal reliability when used in applications without make and break (such as maintenance) requirements. They are also well suited for low cycle non-pulsating applications with pressures in excess of 6,000 psi.

As noted earlier, connectors with pipe threads, except for straight connectors with 3/4-14 NPTF and smaller male pipe threads, have low reliability for leak free operation in dynamic applications. Therefore, they are not preferred where a leak free joint is required.

While a pipe thread connection can be disassembled and re-assembled in low pressure systems, it is not intended to be a make and break connection. When connectors are known to be disassembled and re-assembled repeatedly, pipe connections are not preferred for high pressure systems.

For the above applications, a port connection with an elastomeric seal, such as SAE straight thread port (SAE J1926/ISO 11979) or SAE four bolt split flange (SAE J518/ISO 6162) and ISO 6149 is recommended.

For application where sealants can't be used, consult the manufacturer.

## Assembly



Please refer to pages A41 through A43 for recommended assembly procedures for the pipe and straight thread products shown in this section. See Table H3 for pipe thread assembly Turns From Finger Tight values.

Pipe Thread Size NPTF	T.F.F.T.
1/8 - 27	2 - 3
1/4 - 18	2 - 3
3/8 - 18	2 - 3
1/2 - 14	2 - 3
3/4 - 14	2 - 3
1 - 11 1/2	1.5 - 2.5
1 1/4 - 11 1/2	1.5 - 2.5
1 1/2 - 11 1/2	1.5 - 2.5
2 - 11 1/2	1.5 - 2.5

Table H3 — Assembly Turns From Finger Tight (T.F.F.T) Values For Steel and Brass Pipe Threads

## Trouble Shooting Guide

Problem	Solution
There is no sealant used or sealant has worn thin.	Apply new sealant and re-tighten to specification.
Threads are galled.	Replace fitting and/or component.
Fitting screws in too far into the port.	Port opened up or cracked Replace component.
Threads are severely nicked.	Replace fitting.
Seals initially but vibrates loose after some time.	Replace with SAE straight thread port.

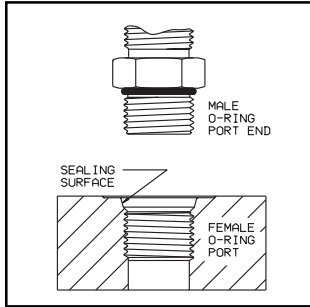
Table H4 — Industrial Pipe Fittings and Adapters Trouble Shooting Hints

## Features, Advantages & Benefits

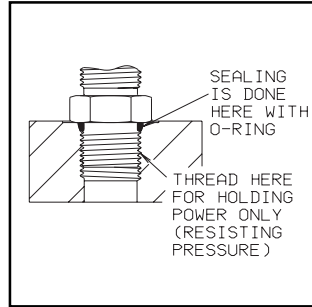
- Compact Size** — Pipe port and end provide very compact connection — especially useful in tight places.
- Adaptability** — Pipe fittings can be used in systems using pipe or tubing.
- High Temperature Capability** — Metal to metal sealing makes pipe fittings especially suitable for low pressure, high temperature applications.
- Wide Spread General Use** — Pipe fittings are the oldest of all fittings used in varied applications ranging from household plumbing to high technology instrumentation. They are especially suited for low pressure general use such as air, water, gas, oil and chemical processing.
- Availability** — Pipe fittings and adapters are readily available in a broad range of sizes, materials and configurations.

# SAE Straight Thread Adapters

## How Do SAE Adapters Work



**Fig. H5 — SAE Straight Thread O-ring Port**



**Fig. H6 — SAE Straight Thread O-ring Port Assembly**

Parker fittings incorporating SAE Straight Thread O-Ring port studs [shown in this section](#) are for connection with the SAE Straight Thread port (SAE J1926/1, ISO 11926) as [shown on page A19 in the General Technical section](#). When properly assembled, they provide the best leak-free port connection available.

Basic port machining dimensions for this industry standard port are given [on page A19](#) in the General Technical Section. For counterbore and thread tapping tools for this port [see page N44 in the Tube Fabrication Equipment section](#).

## Assembly

The assembly procedure for the SAE Straight Thread port connection can be [found in the General Technical Section, Section A](#). The tightening torque values for SAE Straight Thread Connectors can be found on the subsequent tables.

SAE Straight Thread Adjustable Fitting (Steel)			
SAE Port Size	SAE Port Thread Size	Assembly Torque	
		in. lbs.	ft. lbs.
2	5/16 - 24	65 ± 5	5.5 ± 0.5
3	3/8 - 24	130 ± 10	11 ± 1.0
4	7/16 - 20	170 ± 10	14 ± 1.0
5	1/2 - 20	260 ± 15	22 ± 1.0
6	9/16 - 18	320 ± 20	27 ± 2.0
8	3/4 - 16	500 ± 25	42 ± 2.0
10	7/8 - 14	720 ± 30	60 ± 2.5
12	1 1/16 - 12	960 ± 50	80 ± 5.0
14	1 3/16 - 12	1260 ± 75	105 ± 6.0
16	1 5/16 - 12	1380 ± 75	115 ± 6.0
20	1 5/8 - 12	2700 ± 150	225 ± 12.0
24	1 7/8 - 12	3000 ± 150	250 ± 12.0
32	2 1/2 - 12	3900 ± 200	325 ± 15.0

**Table H5 — Port End Assembly Torques for SAE Straight Thread O-Ring Adjustable Fittings**

**Note:** Assembly torque — use upper limits of torque ranges for stainless steel fittings. Values in above chart are for lubricated assemblies. Lubricant is strongly recommended for threads, o-rings and contact surfaces of stainless steel assemblies.

SAE Straight Thread Non-Adjustable Fitting (Steel)			
Fitting Size	SAE Port Thread Size	Assembly Torque	
		in. lbs.	ft. lbs.
2	5/16 - 24	90 ± 5	7.5 ± 0.5
3	3/8 - 24	170 ± 10	14 ± 1.0
4	7/16 - 20	220 ± 15	18 ± 1.0
5	1/2 - 20	260 ± 15	22 ± 1.0
6	9/16 - 18	320 ± 20	27 ± 2.0
8	3/4 - 16	570 ± 25	48 ± 2.0
10	7/8 - 14	1060 ± 50	90 ± 5.0
12	1 1/16 - 12	1300 ± 50	110 ± 5.0
14	1 3/16 - 12	1750 ± 75	145 ± 6.0
16	1 5/16 - 12	1920 ± 25	160 ± 6.0
20	1 5/8 - 12	2700 ± 150	225 ± 12.0
24	1 7/8 - 12	3000 ± 150	250 ± 12.0
32	2 1/2 - 12	3900 ± 200	325 ± 15

**Table H6 — Port End Assembly Torques for SAE Straight Thread O-Ring Non-Adjustable Fittings**

**Note:** Assembly torque — use upper limits of torque ranges for stainless steel fittings. Values in above chart are for lubricated assemblies. Lubricant is strongly recommended for threads, o-rings and contact surfaces of stainless steel assemblies.

SAE Straight Thread O-ring Plugs (Steel)					
Fitting Size	SAE Port Thread Size	Hollow Hex Head Plug (HP5ON) Assembly Torque		Hex Head Plug (P5ON) Assembly torque	
		in. lbs.	ft. lbs.	in. lbs.	ft. lbs.
2	5/16 - 24	35 ± 5	3 ± .5	90 ± 5	7.5 ± .5
3	3/8 - 24	60 ± 5	5 ± .5	170 ± 10	14 ± 1
4	7/16 - 20	135 ± 10	11 ± 1	220 ± 15	18 ± 1
5	1/2 - 20	180 ± 10	15 ± 1	260 ± 15	22 ± 1
6	9/16 - 18	220 ± 10	18 ± 1	320 ± 20	27 ± 2
8	3/4 - 16	550 ± 20	46 ± 2	570 ± 25	48 ± 2
10	7/8 - 14	900 ± 50	75 ± 5	1060 ± 50	90 ± 5
12	1 1/16 - 12	1020 ± 50	85 ± 5	1300 ± 50	110 ± 5
14	1 3/16 - 12	1550 ± 75	130 ± 6	1750 ± 75	145 ± 6
16	1 5/16 - 12	1600 ± 75	135 ± 6	1920 ± 75	160 ± 6
20	1 5/8 - 12	2700 ± 150	225 ± 12	2700 ± 150	225 ± 12
24	1 7/8 - 12	3000 ± 150	250 ± 12	3000 ± 150	250 ± 12
32	2 1/2 - 12	3900 ± 200	325 ± 15	3900 ± 200	325 ± 15

**Table H7 — Port Assembly torques for Straight Thread O-ring Plugs**

**Trouble Shooting Guide —  
 SAE Straight Thread**

Problem	Solution
Leakage from port	O-Ring missing or torn. Replace with new O-Ring and retighten to appropriate specification.
Leakage from port	Fitting not tightened properly, tighten to appropriate specification.
Leakage from port	Adjustable stud not assembled properly, repeat with appropriate assembly procedure as outlined in General Technical Section, Section A. Tighten to appropriate torque specification.
Fitting vibrates loose	Re-evaluate system: clamping, routing, stressed joint, etc.
Threads damaged	Replace fitting and/or component.

Table H8 — SAE Straight Thread Trouble Shooting Hints

**Features, Advantages and Benefits —  
 SAE Straight Thread**

- Elastomeric Seal** — SAE Straight Thread O-Ring connections offer a high seal reliability, especially in dynamic and shock loading applications. The O-Ring seal offers a high tolerance to minor surface imperfections and damage.
- Infinite Positioning of Shaped Fittings** — Due to the design of shaped fittings incorporating adjustable SAE Straight Thread connections, they allow for infinite positioning of the port end. Aligning for tube and hose connections is much easier as compared to tapered pipe threads/ports. Female and male thread damage is diminished as well because SAE Straight Threads do not incorporate the metal to metal thread sealing of tapered threads.
- Reusability** — Since the sealing and mechanical holding functions are separated, the SAE Straight Thread male studs can be re-used many times simply by changing the O-ring.

**Pipe (NPSM) Swivel Adapters**

**How Do NPSM Swivels Work?**

NPSM swivel adapters are for use with male NPT/NPTF hose fittings with a 30 degree seat. NPSM adapters do not seal on the threads like most pipe threads, they seal on the nose of the NPSM swivel and the seat on the male NPT/NPTF pipe thread. This creates a metal to metal seal as shown in figure H7.

**Assembly**

The most important preparation prior to assembly is to make certain that the mating male NPT/NPTF pipe thread has a 30 degree seat as shown in figure H8.

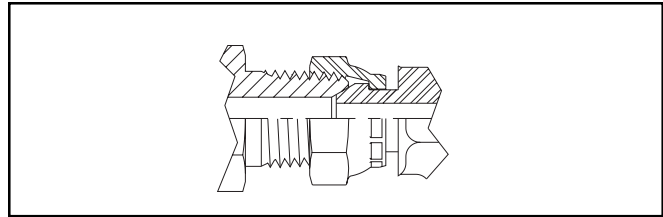


Figure H7 — Illustration showing how NPSM swivel adapters seal on mating chamfer in male pipe thread.

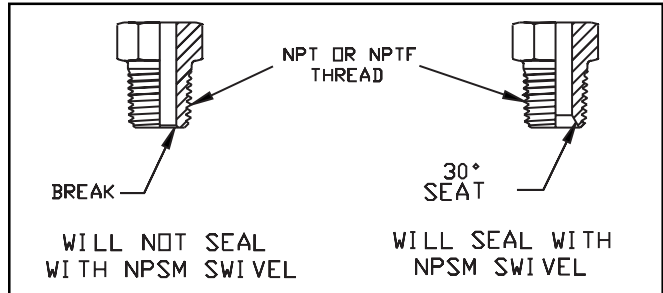


Figure H8 — Illustration showing the required 30° seat on NPT/NPTF threads for NPSM swivel to seal

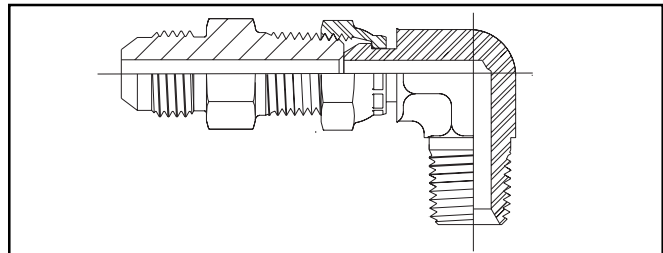


Figure H9: Chamfer of NPT/NPTF male thread does not provide appropriate contact for a reliable seal with cone of NPSM swivel.

A chamfer or break will not suffice as a sealing surface (Figure H9). A full internal 30° seat is required with a typical surface of 125 Ra. See SAE J516 for complete dimensional and other requirements.

Inspect both the NPSM swivel adapter and mating male NPT/NPTF seat for any visible burrs, nicks, or thread damage. These problems may inhibit a tight connection and sealing.

**Final Assembly**

Thread the NPSM swivel end onto the male NPT/NPTF end until finger tight. The NPSM swivel should thread completely onto the male NPT/NPTF thread, until the male and female seats mate. The threads should not become tight before seats mate. To assure seat-to-seat contact, check for relative movement between the two fittings by “rocking” or rotating the fittings. If possible, “rock” or rotate the fittings, re-tighten until there is no relative movement. Next, tighten the swivel nut connection using the Flats From Finger Tight values shown in the Table H1. (Note: The use of pipe thread sealants, TFE tape or other adhesives is neither required nor recommended to ensure a leak-free connection.) The torque values are provided for reference only.



**Technical Data**

NPSM Size in.	Steel Assembly			Stainless Steel Assembly F.F.F.T
	Torque (+10%, -0%)		F.F.F.T.	
	in.-lbs.	ft.-lbs.		
1/8	108	9	1.0 - 1.5	1.0 - 1.5
1/4	156	13	1.0 - 1.5	1.0 - 1.5
3/8	192	16	1.0 - 1.5	1.0 - 1.5
1/2	396	33	1.0 - 1.5	1.0 - 1.5
3/4	516	43	1.0 - 1.5	1.0 - 1.5
1	696	58	1.0 - 1.5	1.0 - 1.5
1 1/4	1320	110	1.0 - 1.5	1.0 - 1.5
1 1/2	2520	210	1.0 - 1.5	1.0 - 1.5
2	3720	310	1.0 - 1.5	1.0 - 1.5

**Table H1: Assembly values for NPSM (Parker 07) swivel connections**

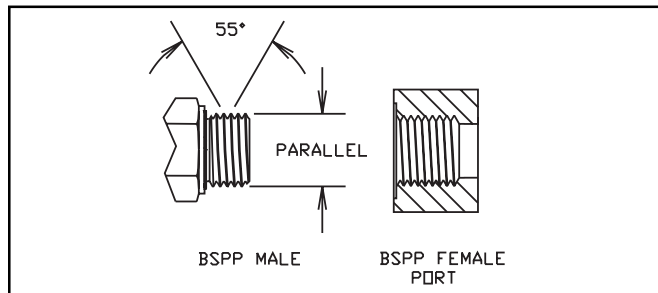
**Notes:**

1. Assembly Torque — Torque are for lubricated carbon steel fittings only.
2. F.F.F.T. — The flats from finger tight assembly method is recommended for steel, stainless steel or brass fittings.
3. F.F.F.T. — For stainless steel fittings, a suitable lubricant should be applied to contacting surfaces. Permatex Anti-Seize Lubricant is recommended.
4. F.F.F.T. (Flats From Finger Tight) — In the correct initial reference position, the angular male seat of swivel connector must be seated and in light contact with 30° female surface of fitting for hose connector body. If necessary, a wrench should be used to pull nut and seats to this initial reference position. For final assembly, the nut should now be tightened to the appropriate number of F.F.F.T. as shown in chart. Where necessary, a second wrench should be used to prevent unwanted rotation of fitting body, hose connector stem, etc.
4. Assembly Torque & F.F.F.T. — Torque and F.F.F.T. values shown in the chart are for use with compatible fittings and connectors from Parker Hannifin Corporation.

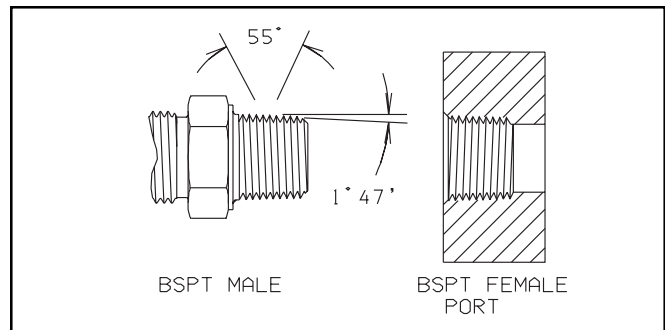
**BSP Fittings**

**How Do BSP Fittings Work?**

In Europe, Japan and many other former Commonwealth nations the British Standard Pipe thread form, BSP, is still used extensively to connect pipes and components in hydraulic systems. The BSP thread is offered in a straight (parallel) variety known as BSPP and a tapered variety known as BSPT. These threads feature a 55° flank angle and the British Whitworth thread profile as shown in figures H9 and H10.



**Figure H9 — British Standard Pipe, Parallel — BSPP**



**Figure H10 — British Standard Pipe, Tapered — BSPT**

BSPT Threads seal identical to NPT/NPTF thread forms.

Fittings in this section that use BSPT thread will have many of the same benefits and short comings of NPT threads. Therefore, these fittings will require the same preparation and assembly techniques that NPT fittings require. The BSPT thread is designed to thread into and seal in a female BSPT or BSPP port.

Fittings in this section with male BSPP threads will utilize a primary sealing method such as an o-ring and retaining ring. Additional sealing methods such as a cutting face or an EO-Lastic seal are also available on other fittings within the catalog. These BSPP fittings are all designed to thread into a female BSPP port, however, the seal is created with one of the aforementioned sealing methods, not with the threads. It is also important to note that these BSPP threads seal on the port surface or spotface, not in an o-ring gland or chamfer as SAE and ISO-6149 straight thread do. A detail of the BSPP port is shown on page A21.

**Assembly**

Fittings with BSPT thread should be prepared and assembled using the assembly methods for NPT/NPTF threads shown on page A42. Use the Turns From Finger Tight method of assembly values shown on Table H9 for proper make up.

Pipe Thread Size BSPT	T.F.F.T.
1/8 - 27	2 - 3
1/4 - 18	2 - 3
3/8 - 18	2 - 3
1/2 - 14	2 - 3
3/4 - 14	2 - 3
1 - 11 1/2	1.5 - 2.5
1 1/4 - 11 1/2	1.5 - 2.5
1 1/2 - 11 1/2	1.5 - 2.5
2 - 11 1/2	1.5 - 2.5

**Table H9 — Assembly Turns From Finger Tight (T.F.F.T) Values For BSPT Threads**

Fittings with BSPP threads will require a female ISO-1179 (DIN 3852, Part 2) BSPP port conforming to the dimensions shown on page A21 to seal properly. The General Technical Section, Section A, outlines the proper assembly procedure of this thread form.

## Metric Fittings

### How Do Metric Fittings Work?

#### ISO 9974 / (DIN 3852, Part 1)

In Europe, primarily in Germany the traditional metric parallel thread form is still used extensively to connect components in hydraulic systems. This metric thread is designed to thread into and seal in a female Metric parallel port conforming to ISO-9974 (DIN-3852, Part 1). Fittings in this section with male metric threads will utilize a primary sealing method such as an o-ring and retaining ring. Additional sealing methods such as a cutting face or an EO-Lastic seal are also available on other fittings within the catalog. These metric threads are all designed to thread into a female metric port. Sealing is accommodated with one of the aforementioned sealing methods, not with the threads. It is also important to note that these male metric threads seal on the port surface or spotface, not in an o-ring gland or chamfer as SAE and ISO-6149 straight threads do. A detail of this metric port is [shown on page A22](#).

#### Assembly

Fittings with these metric parallel threads will require a female ISO-9974 (DIN 3852, Part 1) Metric port conforming to the dimensions [shown on page A22](#) to seal properly. The [General Technical Section, Section A](#), outlines the proper assembly procedures of this thread form.

#### ISO-6149

To minimize further proliferation of additional port thread styles, the International Standards Organization Technical Committee 131 has completed the development of a world standard leak-free port connection. It is recommended that this port, ISO-6149, to be specified in all new hydraulic fluid power applications. Parker and other fluid connector manufacturers are expanding product offering to incorporate the ISO-6149 male port studs as a standard on many tube fitting products. Parker offers the ISO-6149 male stud end several tube fitting products including: Seal-Lok, EO, EO-2, Pipe, Plugs, etc.

This port, utilizes metric parallel threads for mechanical holding power and a sealing method copied from the proven success of the SAE Straight Thread (O-ring in chamfer). A detail of this metric port is [shown on page A18](#).

#### Assembly of ISO 6149

Fittings with these ISO 6149 male parallel threads will require a female ISO-6149 port conforming to the dimensions [shown on page A18](#) to seal properly. The assembly procedure for the straight or adjustable versions of ISO-6149 male studs mirror that of SAE Straight Thread O-Ring male studs. This assembly procedure can be found in the [General Technical Section page A44](#).

**Recommended Working Pressure, PSIG**

These recommended working pressures represent the capability of the subject fitting. Nevertheless, in some instances, the wall thickness or type of tubing, hose, or hose connector, assembled to the fitting may dictate the maximum pressure to which the assembly should be exposed. It is strongly suggested that these fitting working pressure charts be used in conjunction with appropriate pressure charts for tubing or hose during the fitting selection process.

Refer to the definition of pressure rated static and pressure rated dynamic. The following values are based on a minimum design factor of 4:1 for dynamic and 3:1 for static applications.

**Pressure, Rated Static** – The maximum pressure that a pressure containing envelope is capable of sustaining in an application not exceeding 30,000 operating cycles in a system free of pressure surges, shocks, vibration, and temperature excursions.

**Pressure, Rated Dynamic** – The maximum fluctuating pressure load that a pressure containing envelope is capable of sustaining for a minimum of one million operation cycles without failure.


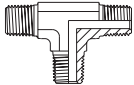
SIZE	STATIC			DYNAMIC		
	STEEL	SS	BRASS	STEEL	SS	BRASS
	1/8	7000	7000	4550	5000	5000
1/4 X 1/8	7000	7000	4550	5000	5000	3250
1/4	7000	7000	4550	5000	5000	3250
3/8 X 1/8	7000	7000	4550	5000	5000	3250
3/8 X 1/4	7000	7000	4550	5000	5000	3250
3/8	6000	6000	3900	4500	4500	2925
1/2 X 1/8	7000	7000	4550	5000	5000	3250
1/2 X 1/4	7000	7000	4550	5000	5000	3250
1/2 X 3/8	6000	6000	3900	4500	4500	2925
1/2	4000	4000	2600	3000	3000	1950
3/4 X 1/4	5500	5500	3575	4000	4000	2600
3/4 X 3/8	5500	5500	3575	4000	4000	2600
3/4 X 1/2	4000	4000	2600	3000	3000	1950
3/4	4000	4000	2600	3000	3000	1950
1 X 1/4	4000	4000	2600	3000	3000	1950
1 X 3/8	4000	4000	2600	3000	3000	1950
1 X 1/2	4000	4000	2600	3000	3000	1950
1 X 3/4	4000	4000	2600	3000	3000	1950
1	2250	2250	1463	1750	1750	1138
1 1/4 X 3/4	3000	3000	1950	2500	2500	1625
1 1/4 X 1	2250	2250	1463	1750	1750	1138
1 1/4	2000	2000	1300	1500	1500	975
1 1/2 X 1	2250	2250	1463	1750	1750	1138
1 1/2 X 1 1/4	2000	2000	1300	1500	1500	975
1 1/2	2000	2000	1300	1500	1500	975
2 X 1 1/2	2000	2000	1300	1500	1500	975
2	1250	1250	813	1000	1000	650


\* Shaped connectors (elbows, tees and crosses) with pipe threads have low reliability for leak free operation in dynamic systems. For total leak free reliability in such systems, connectors with o-ring sealing such as SAE straight thread or SAE four bolt split flange are recommended.



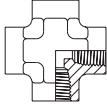
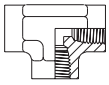
SIZE	STATIC			DYNAMIC		
	STEEL	SS	BRASS	STEEL	SS	BRASS
	1/8	10000	12000	6500	6000	7200
1/4 X 1/8	9500	11400	6175	6000	7200	3900
1/4	9500	11400	6175	6000	7200	3900
3/8 X 1/8	8000	9600	5200	6000	7200	3900
3/8 X 1/4	8000	9600	5200	6000	7200	3900
3/8	8000	9600	5200	6000	7200	3900
1/2 X 1/8	6500	7800	4225	5000	6000	3250
1/2 X 1/4	6500	7800	4225	5000	6000	3250
1/2 X 3/8	6500	7800	4225	5000	6000	3250
1/2	6500	7800	4225	5000	6000	3250
3/4 X 1/4	5500	6600	3575	4000	4800	2600
3/4 X 3/8	5500	6600	3575	4000	4800	2600
3/4 X 1/2	5500	6600	3575	4000	4800	2600
3/4	5500	6600	3575	4000	4800	2600
1 X 1/4	4000	4800	2600	3000	3600	1950
1 X 3/8	4000	4800	2600	3000	3600	1950
1 X 1/2	4000	4800	2600	3000	3600	1950
1 X 3/4	4000	4800	2600	3000	3600	1950
1	4000	4800	2600	3000	3600	1950
1 1/4 X 3/4	3000	3600	1950	2500	3000	1625
1 1/4 X 1	3000	3600	1950	2500	3000	1625
1 1/4	3000	3600	1950	2500	3000	1625
1 1/2 X 1	3000	3600	1950	2000	2400	1300
1 1/2 X 1 1/4	3000	3600	1950	2000	2400	1300
1 1/2	3000	3600	1950	2000	2400	1300
2 X 1 1/2	3000	3600	1950	2000	2400	1300
2	3000	3600	1950	2000	2400	1300


SIZE	STATIC			DYNAMIC		
	STEEL	SS	BRASS	STEEL	SS	BRASS
	1/16	10000	12000	6500	6000	7200
1/8	10000	12000	6500	6000	7200	3900
1/4 X 1/8	10000	12000	6500	6000	7200	3900
1/4	10000	12000	6500	6000	7200	3900
3/8 X 1/8	10000	12000	6500	6000	7200	3900
3/8 X 1/4	10000	12000	6500	6000	7200	3900
3/8	10000	12000	6500	6000	7200	3900
1/2 X 1/4	10000	12000	6500	6000	7200	3900
1/2 X 3/8	10000	12000	6500	6000	7200	3900
1/2	10000	12000	6500	6000	7200	3900
3/4 X 1/2	10000	12000	6500	6000	7200	3900
3/4	10000	12000	6500	6000	7200	3900
1	9000	10800	5850	6000	7200	3900
1 1/4 X 1	6500	7800	4225	5000	6000	3250
1 1/4	6500	7800	4225	5000	6000	3250
1 1/2	4000	4800	2600	3000	3600	1950
2	3000	3600	1950	2500	3000	1625

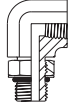
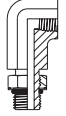
**Recommended Working Pressure, PSIG**

							
		STATIC			DYNAMIC		
SIZE	STEEL	SS	BRASS	STEEL	SS	BRASS	
1/8	10000	10000	6500	6000	6000	3900	
1/4 X 1/8	10000	10000	6500	6000	6000	3900	
1/4	10000	10000	6500	6000	6000	3900	
3/8 X 1/8	9000	9000	5850	6000	6000	3900	
3/8 X 1/4	9000	9000	5850	6000	6000	3900	
3/8	9000	9000	5850	6000	6000	3900	
1/2 X 1/4	8500	8500	5525	6000	6000	3900	
1/2 X 3/8	8500	8500	5525	6000	6000	3900	
1/2	8500	8500	5525	6000	6000	3900	
3/4 X 1/2	5500	5500	3575	4000	4000	2600	
3/4	5500	5500	3575	4000	4000	2600	
1	4000	4000	2600	3000	3000	1950	
1 1/4 X 1	3000	3000	1950	2500	2500	1625	
1 1/4	3000	3000	1950	2500	2500	1625	
1 1/2	3000	3000	1950	2500	2500	1625	
2	3000	3000	1950	2000	2000	1300	

					
F80HG					
		STATIC		DYNAMIC	
SIZE	STEEL	SS	STEEL	SS	
M10-1/8	8000	9600	5000	6000	
M12-1/4	8000	9600	5000	6000	
M14-1/4	8000	9600	5000	6000	
M16-3/8	8000	9600	5000	6000	
M16-1/2	6500	7800	5000	6000	
M18-3/8	8000	9600	5000	6000	
M18-1/2	6500	7800	5000	6000	
M22-1/2	4500	5400	3500	4200	
M27-3/4	4500	5400	3500	4200	
M33-1	4000	4800	3000	3600	


													
		STATIC			DYNAMIC								
SIZE	STEEL	SS	BRASS	STEEL	SS	BRASS							
1/8	7000	7000	4550	5000	5000	3250							
1/4 X 1/8	7000	7000	4550	5000	5000	3250							
1/4	7000	7000	4550	5000	5000	3250							
3/8 X 1/8	6000	6000	3900	4500	4500	2925							
3/8 X 1/4	6000	6000	3900	4500	4500	2925							
3/8	6000	6000	3900	4500	4500	2925							
1/2 X 1/4	4000	4000	2600	3000	3000	1950							
1/2 X 3/8	4000	4000	2600	3000	3000	1950							
1/2	4000	4000	2600	3000	3000	1950							
3/4 X 1/2	4000	4000	2600	3000	3000	1950							
3/4	4000	4000	2600	3000	3000	1950							
1	2250	2250	1463	1750	1750	1138							
1 1/4 X 1	2000	2000	1300	1500	1500	975							
1 1/4	2000	2000	1300	1500	1500	975							
1 1/2	2000	2000	1300	1500	1500	975							
2	1250	1250	813	1000	1000	650							

					
FHG5					
		STATIC		DYNAMIC	
SIZE	STEEL	SS	STEEL	SS	
1/4-6	6000	7200	4500	5400	
3/8-8	5000	6000	4000	4800	
1/2-10	4000	4800	3000	3600	

							
		STATIC			DYNAMIC		
SIZE	STEEL	SS	BRASS	STEEL	SS	BRASS	
6 - 1/4	6000	6000	3900	5000	5000	3250	
8 - 1/4	6000	6000	3900	5000	5000	3250	
8 - 3/8	6000	6000	3900	4500	4500	2925	
8 - 1/2	4000	4000	2600	3000	3000	1950	
10 - 1/4	5500	5500	3575	4500	4500	2925	
10 - 3/8	5500	5500	3575	4500	4500	2925	
10 - 1/2	4000	4000	2600	3000	3000	1950	
10 - 3/4	4000	4000	2600	3000	3000	1950	
12 - 1/2	4000	4000	2600	3000	3000	1950	
12 - 3/4	4000	4000	2600	3000	3000	1950	
14 - 1/2	4000	4000	2600	3000	3000	1950	
14 - 3/4	4000	4000	2600	3000	3000	1950	
16 - 1/2	4000	4000	2600	3000	3000	1950	
16 - 3/4	4000	4000	2600	3000	3000	1950	
16 - 1	2250	2250	1463	1750	1750	1138	
20 - 1	2250	2250	1463	1750	1750	1138	
20 - 1 1/4	2000	2000	1300	1500	1500	975	
24 - 1	2250	2250	1463	1750	1750	1138	
24 - 1 1/2	2000	2000	1300	1500	1500	975	
32 - 1	2000	2000	1300	1500	1500	975	
32 - 1 1/2	2000	2000	1300	1500	1500	975	
32 - 2	1250	1250	813	1000	1000	650	

\* Shaped connectors (elbows, tees and crosses) with pipe threads have low reliability for leak free operation in dynamic systems. For total leak free reliability in such systems, connectors with o-ring sealing such as SAE straight thread or SAE four bolt split flange are recommended.

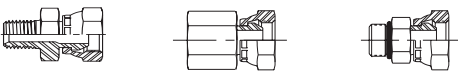
**Recommended Working Pressure, PSIG**



**F50G**

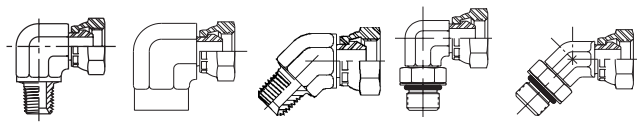
SIZE	STATIC			DYNAMIC		
	STEEL	SS	BRASS	STEEL	SS	BRASS
6 - 1/4	8000	9600	5200	6000	7200	3900
8 - 1/4	8000	9600	5200	6000	7200	3900
8 - 3/8	8000	9600	5200	6000	7200	3900
8 - 1/2	6500	7800	4225	5000	6000	3250
10 - 1/4	7500	9000	4875	5500	6600	3575
10 - 3/8	7500	9000	4875	5500	6600	3575
10 - 1/2	6500	7800	4225	5000	6000	3250
10 - 3/4	5500	6600	3575	4000	4800	2600
12 - 1/2	6500	7800	4225	5000	6000	3250
12 - 3/4	5500	6600	3575	4000	4800	2600
14 - 1/2	5500	6600	3575	4000	4800	2600
14 - 3/4	5500	6600	3575	4000	4800	2600
16 - 1/2	5500	6600	3575	4000	4800	2600
16 - 3/4	5500	6600	3575	4000	4800	2600
16 - 1	4000	4800	2600	3000	3600	1950
20 - 1	4000	4800	2600	3000	3600	1950
20 - 1 1/4	3000	3600	1950	2500	3000	1625
24 - 1	3500	4200	2275	2500	3000	1625
24 - 1 1/2	3000	3600	1950	2000	2400	1300
32 - 1	2500	3000	1625	2000	2400	1300
32 - 1 1/2	2500	3000	1625	2000	2400	1300
32 - 2	2500	3000	1625	2000	2400	1300

\* Shaped connectors (elbows, tees and crosses) with pipe threads have low reliability for leak free operation in dynamic systems. For total leak free reliability in such systems, connectors with o-ring sealing such as SAE straight thread or SAE four bolt split flange are recommended.




**0107                      0207                      0507**

SIZE	STATIC			DYNAMIC		
	STEEL	SS	BRASS	STEEL	SS	BRASS
1/8	6650	7980	4323	5000	6000	3250
1/4	6650	7980	4323	5000	6000	3250
3/8	5320	6384	3458	4000	4800	2600
1/2	4655	5586	3026	3500	4200	2275
3/4	2993	3591	1945	2250	2700	1463
1	2660	3192	1729	2000	2400	1300
1 1/4	2161	2594	1405	1625	1950	1056
1 1/2	1663	1995	1081	1250	1500	813
2	1496	1796	973	1125	1350	731




**2107                      2207                      3107                      2507                      3507**

SIZE	STATIC			DYNAMIC		
	STEEL	SS	BRASS	STEEL	SS	BRASS
1/8	6650	6650	4323	5000	5000	3250
1/4	6650	6650	4323	5000	5000	3250
3/8	5320	5320	3458	4000	4000	2600
1/2	4655	4655	3026	3500	3500	2275
3/4	2993	2993	1945	2250	2250	1463
1	2660	2660	1729	2000	2000	1300
1 1/4	2161	2161	1405	1625	1625	1056
1 1/2	1663	1663	1081	1250	1250	813
2	1496	1496	973	1125	1125	731



**HP50N                      P50N                      P50NBA**

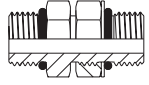
SIZE	STATIC			DYNAMIC		
	STEEL	SS	BRASS	STEEL	SS	BRASS
2	10000	12000	6500	6000	7200	3900
3	10000	12000	6500	6000	7200	3900
4	10000	12000	6500	6000	7200	3900
5	9000	10800	5850	6000	7200	3900
6	9000	10800	5850	6000	7200	3900
8	9000	10800	5850	6000	7200	3900
10	8000	9600	5200	6000	7200	3900
12	8000	9600	5200	6000	7200	3900
14	7000	8400	4550	5500	6600	3575
16	7000	8400	4550	5500	6600	3575
20	5000	6000	3250	4000	4800	2600
24	4000	4800	2600	3000	3600	1950
32	2500	3000	1625	2000	2400	1300



**P87OMN**

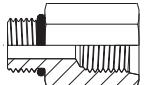
SIZE	STATIC			DYNAMIC		
	STEEL	SS	BRASS	STEEL	SS	BRASS
M10	10500	12600	6825	8000	9600	5200
M12	12000	14400	7800	9000	10800	5850
M14	12000	14400	7800	9000	10800	5850
M16	12000	14400	7800	9000	10800	5850
M18	12000	14400	7800	9000	10800	5850
M22	8000	9600	5200	6000	7200	3900
M27	8000	9600	5200	6000	7200	3900
M33	8000	9600	5200	6000	7200	3900
M42	5500	6600	3575	4000	4800	2600

**Recommended Working Pressure, PSIG**




**F50HAO**

SIZE	STATIC			DYNAMIC		
	STEEL	SS	BRASS	STEEL	SS	BRASS
2	6500	7800	4225	5000	6000	3250
3	6500	7800	4225	5000	6000	3250
4	6500	7800	4225	5000	6000	3250
5	6000	7200	3900	5000	6000	3250
6	6000	7200	3900	5000	6000	3250
8	6000	7200	3900	5000	6000	3250
10	5500	6600	3575	4500	5400	2925
12	5000	6000	3250	4000	4800	2600
14	4000	4800	2600	3000	3600	1950
16	4000	4800	2600	3000	3600	1950
20	3500	4200	2275	2500	3000	1625
24	2500	3000	1625	2000	2400	1300
32	2000	2400	1300	1500	1800	975



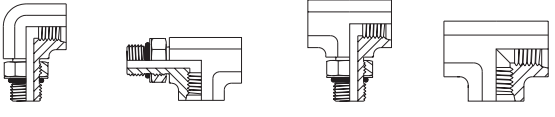
**F50G5**

SIZE	STATIC			DYNAMIC		
	STEEL	SS	BRASS	STEEL	SS	BRASS
4-5	6000	7200	3900	4500	5400	2925
4-6	6000	7200	3900	4500	5400	2925
6-4	6000	7200	3900	4500	5400	2925
6-8	5000	6000	3250	4000	4800	2600
8-6	6000	7200	3900	4500	5400	2925
8-10	4000	4800	2600	3000	3600	1950
10-6	6000	7200	3900	5000	6000	3250
10-8	5000	6000	3250	4000	4800	2600
10-12	4500	5400	2925	3500	4200	2275
12-8	6000	7200	3900	4500	5400	2925
12-10	4000	4800	2600	3000	3600	1950
12-14	3000	3600	1950	2000	2400	1300
12-16	3000	3600	1950	2000	2400	1300
14-10	5000	6000	3250	4000	4800	2600
14-12	4500	5400	2925	3500	4200	2275
16-8	6000	7200	3900	5000	6000	3250
16-12	4500	5400	2925	3500	4200	2275
16-20	3500	4200	2275	2500	3000	1625
20-10	4000	4800	2600	3000	3600	1950
20-12	4000	4800	2600	3000	3600	1950
20-16	3000	3600	1950	2000	2400	1300
20-24	2000	2400	1300	1500	1800	975
24-12	3000	3600	1950	2000	2400	1300
24-16	3000	3600	1950	2000	2400	1300
24-20	3000	3600	1950	2000	2400	1300
32-24	2000	2400	1300	1500	1800	975



**F40HG**

SIZE	STATIC			DYNAMIC		
	STEEL	SS	BRASS	STEEL	SS	BRASS
1/8 x 1/8	8000	9600	5200	5000	6000	3250
1/4 x 1/4	8000	9600	5200	5000	6000	3250
3/8 x 3/8	8000	9600	5200	5000	6000	3250
1/2 x 1/2	4500	5400	2925	3500	4200	2275
3/4 x 3/4	4500	5400	2925	3500	4200	2275
1 x 1	4500	5400	2925	3500	4200	2275



**AOEG5    AOG5JG5    G5G5JAO    G5G5JG5**

SIZE	STATIC			DYNAMIC		
	STEEL	SS	BRASS	STEEL	SS	BRASS
4	6500	6500	4225	5000	5000	3250
6	6000	6000	3900	5000	5000	3250
8	6000	6000	3900	5000	5000	3250
10	5500	5500	3575	4500	4500	2925
12	4000	4000	2600	3000	3000	1950
16	4000	4000	2600	3000	3000	1950

For pressure ratings for adapters not shown, please contact the Tube Fittings Division.

**How to Order**

**How to Order Industrial Pipe Fittings and Adapters**

**Nomenclature**

Pipe fitting part numbers are constructed from symbols that identify the size and style of the fitting and material used.

**Sizes**

2 (1/8") through 32 (2"). Tube sizes are determined by the number of sixteenths of an inch in the tube O.D.

**Materials**

Type 316 Stainless Steel, Steel and Brass. Pipe fittings for special applications can be furnished in almost any material suitable for machining.

**Example**

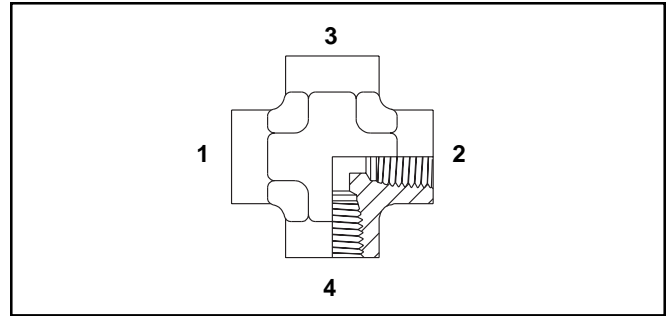
Fitting needed — (Pipe fitting) — Steel Male Connector for 1/4" Female Port to 1/8" Female Port.

Part number: 1/4 x 1/8 FF

<u>1/4</u>	<u>X</u>	<u>1/8</u>	<u>FF</u>	—	<u>S</u>	<u>BP</u>
1/4" male pipe thread		1/8" male pipe thread	pipe nipple		Material steel	Bulk Pack (where avail.)

**Crosses and Tees**

For tees — first size the run (1 to 2) and then the branch (3). For crosses — first size the run (1 to 2) and then the branch (3 to 4).



**Special Fittings**

If design or configuration is questionable please provide a detailed sketch, drawing or sample part to the Tube Fittings Division.



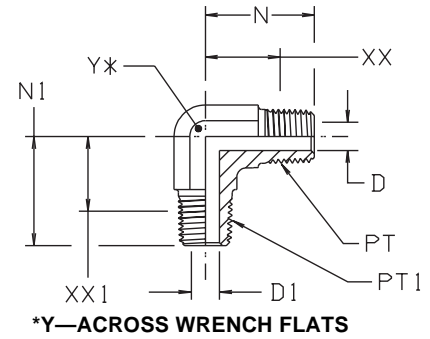
# Male Pipe Elbow

## CR

Male pipe thread / male pipe thread  
SAE 140237\*

\*Not shown in SAE J514, but coded per SAE J846.

All dimensions are in inches



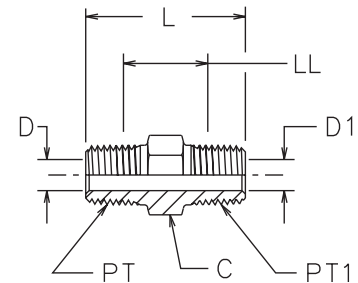
TUBE FITTING PART #	HOSE FITTING PART #	PT PORT THD NPTF	PT1 PORT THD NPTF	D DRILL	D1 DRILL	N	N1	XX AFTER ASSY.	XX1 AFTER ASSY.	Y	STANDARD MATERIAL FROM STOCK		
											S	SS	B
1/8 CR	2101-2-2	1/8-27	1/8-27	0.187	0.187	0.78	0.78	0.55	0.55	7/16	•	•	•
1/4 CR	2101-4-4	1/4-18	1/4-18	0.281	0.281	1.09	1.09	0.75	0.75	9/16	•	•	•
3/8 CR	2101-6-6	3/8-18	3/8-18	0.406	0.406	1.22	1.22	0.87	0.87	3/4	•	•	•
3/8 x 1/4 CR	2101-6-4	3/8-18	1/4-18	0.406	0.281	1.22	1.22	0.87	0.87	3/4	•	•	•
1/2 CR	2101-8-8	1/2-14	1/2-14	0.531	0.531	1.47	1.47	1.01	1.01	7/8	•	•	•
1/2 x 3/8 CR	2101-8-6	1/2-14	3/8-18	0.531	0.406	1.47	1.28	1.01	0.82	7/8	•	•	•
3/4 CR	2101-12-12	3/4-14	3/4-14	0.719	0.719	1.59	1.59	1.11	1.11	1 1/16	•	•	•
3/4 x 1/2 CR	2101-12-8	3/4-14	1/2-14	0.719	0.531	1.59	1.47	1.11	0.99	1 1/16	•	•	•
1 CR	2101-16-16	1-11 1/2	1-11 1/2	0.938	0.938	1.97	1.97	1.40	1.40	1 5/8	•	•	•
1 x 3/4 CR	2101-16-12	1-11 1/2	3/4-14	0.938	0.719	1.97	1.78	1.40	1.30	1 5/16	•	•	•
1 1/4 CR	2101-20-20	1 1/4-11 1/2	1 1/4-11 1/2	1.250	1.250	2.22	2.22	1.63	1.63	1 7/8	•	•	•
1 1/2 CR	2101-24-24	1 1/2-11 1/2	1 1/2-11 1/2	1.500	1.500	2.34	2.34	1.75	1.75	1 7/8	•	•	•

# Pipe Nipple

## FF

Male pipe thread / male pipe thread  
SAE 140137

All dimensions are in inches



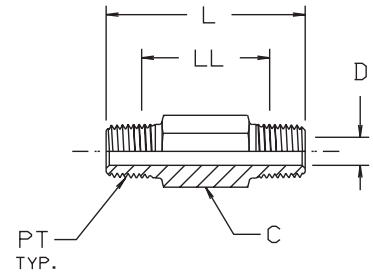
TUBE FITTING PART #	HOSE FITTING PART #	PT PORT THD NPTF	PT1 PORT THD NPTF	C HEX	D DRILL	D1 DRILL	L	LL AFTER ASSY.	STANDARD MATERIAL FROM STOCK		
									S	SS	B
1/8 FF	0101-2-2	1/8-27	1/8-27	7/16	0.188	0.188	1.06	0.59	•	•	•
1/4 x 1/8 FF	0101-2-4	1/4-18	1/8-27	5/8	0.281	0.188	1.25	0.68	•	•	•
1/4 FF	0101-4-4	1/4-18	1/4-18	5/8	0.281	0.281	1.45	0.77	•	•	•
3/8 x 1/8 FF	0101-2-6	3/8-18	1/8-27	3/4	0.406	0.188	1.45	0.87	•	•	•
3/8 x 1/4 FF	0101-4-6	3/8-18	1/4-18	3/4	0.406	0.281	1.45	0.76	•	•	•
3/8 FF	0101-6-6	3/8-18	3/8-18	3/4	0.406	0.406	1.45	0.75	•	•	•
1/2 x 3/8 FF	0101-6-8	1/2-14	3/8-18	7/8	0.531	0.406	1.70	0.89	•	•	•
1/2 x 1/4 FF	0101-4-8	1/2-14	1/4-18	7/8	0.531	0.281	1.70	0.90	•	•	•
1/2 FF	0101-8-8	1/2-14	1/2-14	7/8	0.531	0.531	1.89	0.96	•	•	•
3/4 x 1/4 FF	0101-4-12	3/4-14	1/4-18	1 1/8	0.719	0.281	1.78	0.96	•	•	•
3/4 x 1/2 FF	0101-8-12	3/4-14	1/2-14	1 1/8	0.719	0.531	1.96	0.84	•	•	•
3/4 FF	0101-12-12	3/4-14	3/4-14	1 1/8	0.719	0.719	1.96	0.70	•	•	•
1 FF	0101-16-16	1-11 1/2	1-11 1/2	1 3/8	0.938	0.938	2.34	1.19	•	•	•
1 x 3/4 FF	0101-12-16	1-11 1/2	3/4-14	1 3/8	0.719	0.719	2.09	1.04	•	•	•
1 1/4 x 1 FF	0101-16-20	1 1/4-11 1/2	1-11 1/2	1 3/4	1.250	0.938	2.45	1.28	•	•	•
1 1/4 FF	0101-20-20	1 1/4-11 1/2	1 1/4-11 1/2	1 3/4	1.250	1.250	2.48	1.29	•	•	•
1 1/2 FF	0101-24-24	1 1/2-11 1/2	1 1/2-11 1/2	2	1.500	1.500	2.61	1.42	•	•	•
2 FF	0101-32-32	2-11 1/2	2-11 1/2	2 1/2	1.938	1.938	2.83	1.61	•	•	•



# Long Pipe Nipple FFF

Male pipe thread / male pipe thread

All dimensions are in inches



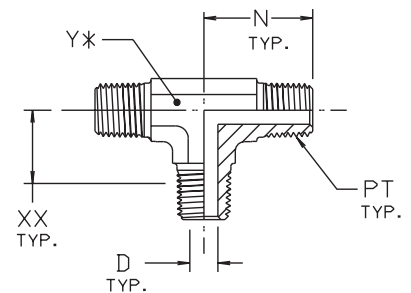
TUBE FITTING PART #	PT PORT THD NPTF	C HEX	D DRILL	L	LL AFTER ASSY.	STANDARD MATERIAL FROM STOCK		
						S	SS	B
1/8 x 1.5 FFF	1/8-27	7/16	0.188	1.50	1.03		•	•
1/8 x 2.0 FFF	1/8-27	7/16	0.188	2.00	1.53		•	•
1/8 x 2.5 FFF	1/8-27	7/16	0.188	2.50	2.03		•	•
1/8 x 3.0 FFF	1/8-27	7/16	0.188	3.00	2.53		•	•
1/4 x 1.5 FFF	1/4-18	5/8	0.281	1.50	0.82		•	•
1/4 x 2.0 FFF	1/4-18	5/8	0.281	2.00	1.32		•	•
1/4 x 2.5 FFF	1/4-18	5/8	0.281	2.50	1.82		•	•
1/4 x 3.0 FFF	1/4-18	5/8	0.281	3.00	2.32		•	•
1/4 x 4.0 FFF	1/4-18	5/8	0.281	4.00	3.32		•	•
1/2 x 2.0 FFF	1/2-14	7/8	0.531	2.00	1.07		•	•
1/2 x 3.0 FFF	1/2-14	7/8	0.531	3.00	2.07		•	•

# Male Pipe Tee RRS

Male pipe thread (all three ends)

SAE 140437

All dimensions are in inches



\*Y—ACROSS WRENCH FLATS

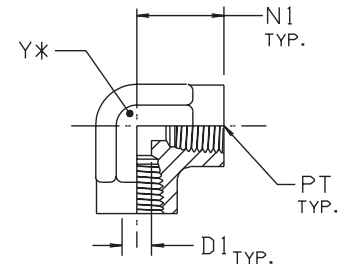
TUBE FITTING PART #	PT PORT THD NPTF	D DRILL	N	XX AFTER ASSY.	Y	STANDARD MATERIAL FROM STOCK		
						S	SS	B
1/8 RRS	1/8-27	0.188	0.78	0.55	7/16		•	•
1/4 RRS	1/4-18	0.281	1.09	0.75	9/16		•	•
3/8 RRS	3/8-18	0.406	1.22	0.87	3/4		•	•
1/2 RRS	1/2-14	0.531	1.47	1.01	7/8		•	•



# Female Pipe Elbow DD

Female pipe thread / female pipe thread  
SAE 140238

All dimensions are in inches



\*Y—ACROSS WRENCH FLATS

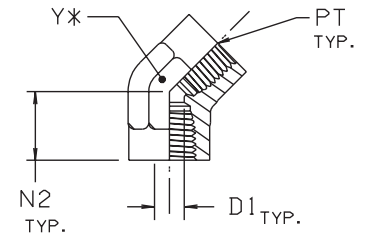
TUBE FITTING PART #	HOSE FITTING PART #	PT PORT THD NPTF	REF D1 DRILL	N1	Y	STANDARD MATERIAL FROM STOCK		
						S	SS	B
1/8 DD	2202-2-2	1/8-27	0.328	0.66	9/16	•	•	•
1/4 DD	2202-4-4	1/4-18	0.422	0.88	3/4	•	•	•
3/8 DD	2202-6-6	3/8-18	0.563	1.02	7/8	•	•	•
1/2 DD	2202-8-8	1/2-14	0.688	1.23	1 1/16	•	•	•
3/4 DD	2202-12-12	3/4-14	0.891	1.36	1 5/16	•	•	•
1 DD	2202-16-16	1-11 1/2	1.125	1.63	1 5/8	•	•	•
1 1/4 DD	2202-20-20	1 1/4-11 1/2	1.469	1.70	1 7/8	•		
1 1/2 DD	2202-24-24	1 1/2-11 1/2	1.703	2.08	2 1/2	•		

1 1/2 DD Hex does not conform to MS/SAE.

# 45° Female Pipe Elbow DD45

Female pipe thread / female pipe thread  
SAE 140338

All dimensions are in inches



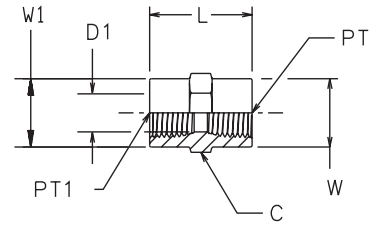
\*Y—ACROSS WRENCH FLATS

TUBE FITTING PART #	HOSE FITTING PART #	PT PORT THD NPTF	REF D1 DRILL	N2	Y	STANDARD MATERIAL FROM STOCK		
						S	SS	B
1/4 DD45	4202-4-4	1/4-18	0.422	0.69	3/4	•		
3/8 DD45	4202-6-6	3/8-18	0.563	0.75	7/8	•		
1/2 DD45	4202-8-8	1/2-14	0.688	0.94	1 1/16	•		
3/4 DD45	4202-12-12	3/4-14	0.891	1.00	1 5/16	•		
1 DD45	4202-16-16	1-11 1/2	1.125	1.19	1 5/8	•		

# Pipe Coupling GG

Female pipe thread / female pipe thread  
SAE 140138

All dimensions are in inches



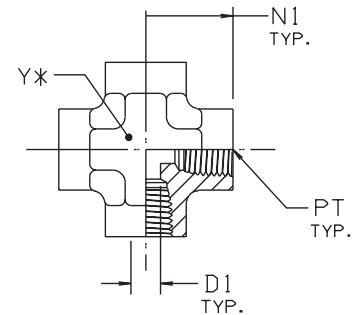
TUBE FITTING PART #	HOSE FITTING PART #	PT PORT THD NPTF	PT1 PORT THD NPTF	C HEX	REF D1 DRILL	L	W	W1	STANDARD MATERIAL FROM STOCK		
									S	SS	B
1/8 GG	0202-2-2	1/8-27	1/8-27	5/8	0.328	0.75	0.63	0.63	•	•	•
1/4 x 1/8 GG	0202-2-4	1/4-18	1/8-27	3/4	0.328	0.94	0.75	0.63	•	•	•
1/4 GG	0202-4-4	1/4-18	1/4-18	3/4	0.422	1.13	0.75	0.75	•	•	•
3/8 x 1/8 GG	0202-2-6	3/8-18	1/8-27	7/8	0.328	1.03	0.88	0.63	•	•	•
3/8 x 1/4 GG	0202-4-6	3/8-18	1/4-18	7/8	0.422	1.13	0.88	0.75	•	•	•
3/8 GG	0202-6-6	3/8-18	3/8-18	7/8	0.563	1.13	0.88	0.88	•	•	•
1/2 x 1/4 GG	0202-4-8	1/2-14	1/4-18	1 1/8	0.422	1.38	1.13	0.75	•	•	•
1/2 x 3/8 GG	0202-6-8	1/2-14	3/8-18	1 1/8	0.563	1.50	1.13	0.88	•	•	•
1/2 GG	0202-8-8	1/2-14	1/2-14	1 1/8	0.688	1.50	1.13	1.13	•	•	•
3/4 x 1/4 GG	0202-4-12	3/4-14	1/4-18	1 3/8	0.422	1.55	1.36	0.75	•	•	•
3/4 x 1/2 GG	0202-8-12	3/4-14	1/2-14	1 3/8	0.688	1.88	1.36	1.13	•	•	•
3/4 GG	0202-12-12	3/4-14	3/4-14	1 3/8	0.891	1.53	1.38	1.38	•	•	•
1 GG	0202-16-16	1-11 1/2	1-11 1/2	1 5/8	1.125	1.89	1.63	1.63	•	•	•
1-1/4 GG	0202-20-20	1 1/4-11 1/2	1 1/4-11 1/2	2	1.469	1.94	2.00	2.00	•	•	•
1-1/2 GG	0202-24-24	1 1/2-11 1/2	1 1/2-11 1/2	2 3/8	1.703	1.94	2.38	2.38	•	•	•



# Female Pipe Cross KMMOO

Female pipe thread (all four ends)  
SAE 140538

All dimensions are in inches



\*Y—ACROSS WRENCH FLATS

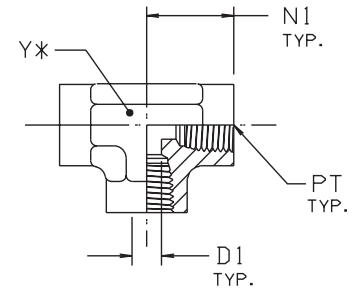
TUBE FITTING PART #	HOSE FITTING PART #	PT PORT THD NPTF	REF D1 DRILL	N1	Y	STANDARD MATERIAL FROM STOCK		
						S	SS	B
1/8 KMMOO	022X-2	1/8-27	0.328	0.66	9/16	•	•	•
1/4 KMMOO	022X-4	1/4-18	0.422	0.88	3/4	•	•	•
3/8 KMMOO	022X-6	3/8-18	0.563	1.02	7/8	•	•	•
1/2 KMMOO	022X-8	1/2-14	0.688	1.23	1 1/16	•	•	•
3/4 KMMOO	022X-12	3/4-14	0.891	1.36	1 5/16	•	•	•
1 KMMOO	022X-16	1-11 1/2	1.125	1.63	1 5/8	•	•	•

# Female Pipe Tee

## MMO

Female pipe thread (all three ends)  
SAE 140438

All dimensions are in inches



\*Y—ACROSS WRENCH FLATS

TUBE FITTING PART #	HOSE FITTING PART #	PT PORT THD NPTF	REF D1 DRILL	N1	Y	STANDARD MATERIAL FROM STOCK		
						S	SS	B
1/8 MMO	022T-2-2	1/8-27	0.328	0.66	9/16	•	•	•
1/4 MMO	022T-4-4	1/4-18	0.422	0.88	3/4	•	•	•
3/8 MMO	022T-6-6	3/8-18	0.563	1.02	7/8	•	•	•
1/2 MMO	022T-8-8	1/2-14	0.688	1.23	1 1/16	•	•	•
3/4 MMO	022T-12-12	3/4-14	0.891	1.36	1 5/16	•	•	•
1 MMO	022T-16-16	1-11 1/2	1.125	1.63	1 5/8	•	•	•
1 1/4 MMO	022T-20-20	1 1/4-11 1/2	1.469	1.70	1 7/8	•		
1 1/2 MMO	022T-24-24	1 1/2-11 1/2	1.703	2.08	2 1/2	•		

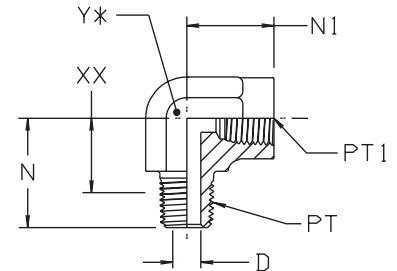
1 1/2 MMO hex does not conform to MS/SAE.

# Street Elbow

## CD

Male pipe thread / female pipe thread  
SAE 140239

All dimensions are in inches



\*Y—ACROSS WRENCH FLATS

TUBE FITTING PART #	HOSE FITTING PART #	PT PORT THD NPTF	PT1 PORT THD NPTF	D DRILL	N	N1	XX AFTER ASSY.	Y	STANDARD MATERIAL FROM STOCK		
									S	SS	B
1/8 CD	2102-2-2	1/8-27	1/8-27	0.188	0.78	0.66	0.55	9/16	•	•	•
1/4 CD	2102-4-4	1/4-18	1/4-18	0.281	1.09	0.88	0.75	3/4	•	•	•
1/4 x 1/8 CD	2102-4-2	1/4-18	1/8-27	0.281	1.09	0.66	0.75	9/16	•	•	•
3/8 CD	2102-6-6	3/8-18	3/8-18	0.406	1.22	1.02	0.87	7/8	•	•	•
3/8 x 1/4 CD	2102-6-4	3/8-18	1/4-18	0.406	1.22	0.88	0.87	3/4	•		
3/8 x 1/2 CD	2102-6-8	3/8-18	1/2-14	0.406	1.28	1.23	0.93	1 1/16	•		
1/2 CD	2102-8-8	1/2-14	1/2-14	0.531	1.47	1.23	1.01	1 1/16	•	•	•
1/2 x 3/8 CD	2102-8-6	1/2-14	3/8-18	0.531	1.48	1.25	1.02	7/8	•		
1/2 x 3/4 CD	2102-8-12	1/2-14	3/4-14	0.531	1.59	1.36	1.13	1 5/16	•		
3/4 CD	2102-12-12	3/4-14	3/4-14	0.719	1.59	1.36	1.11	1 5/16	•	•	•
3/4 x 1/2 CD	2102-12-8	3/4-14	1/2-14	0.719	1.59	1.23	1.11	1 1/16	•		
1 CD	2102-16-16	1-11 1/2	1-11 1/2	0.938	1.97	1.63	1.40	1 5/8	•	•	•
1 1/4 CD	2102-20-20	1 1/4-11 1/2	1 1/4-11 1/2	1.250	2.38	1.70	1.79	1 7/8	•		
1 1/2 CD	2102-24-24	1 1/2-11 1/2	1 1/2-11 1/2	1.500	2.64	2.08	2.05	2 1/2	•		

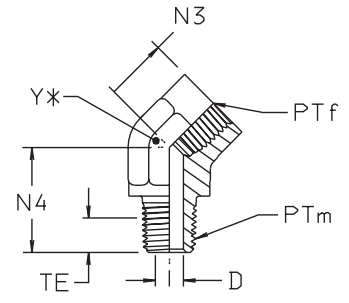
1 1/2 CD hex does not conform to MS/SAE.

# 45° Street Elbow

## CD45

Male pipe thread / female pipe thread  
SAE 140339

All dimensions are in inches



\*Y—ACROSS WRENCH FLATS

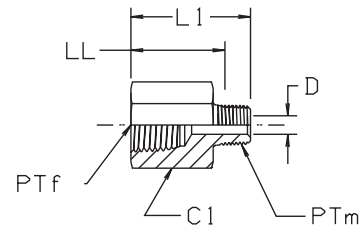
TUBE FITTING PART #	HOSE FITTING PART #	PTm PORT THD NPTF	PTf PORT THD NPTF	D DRILL	N3	N4	TE AFTER ASSY.	Y	STANDARD MATERIAL FROM STOCK		
									S	SS	B
1/8 CD45	3102-2-2	1/8-27	1/8-27	0.188	0.47	0.72	0.23	9/16	•	•	•
1/4 CD45	3102-4-4	1/4-18	1/4-18	0.281	0.63	1.05	0.34	3/4	•	•	•
3/8 CD45	3102-6-6	3/8-18	3/8-18	0.406	0.72	1.06	0.35	7/8	•	•	•
1/2 CD45	3102-8-8	1/2-14	1/2-14	0.531	0.91	1.34	0.46	1 1/16	•	•	•
3/4 CD45	3102-12-12	3/4-14	3/4-14	0.719	0.97	1.38	0.48	1 5/16	•	•	•
1 CD45	3102-16-16	1-11 1/2	1-11 1/2	0.938	1.13	1.72	0.57	1 5/8	•	•	•

# Expander / Adapter

## FG

Female pipe thread / male pipe thread  
SAE 140139

All dimensions are in inches



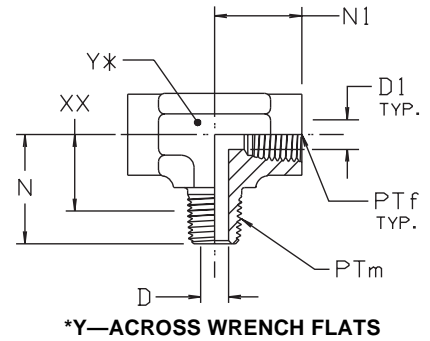
TUBE FITTING PART #	HOSE FITTING PART #	PTm PORT THD NPTF	PTf PORT THD NPTF	C1 HEX	D DRILL	L1	LL	STANDARD MATERIAL FROM STOCK		
								S	SS	B
1/8 FG	0201-2-2	1/8-27	1/8-27	5/8	0.188	1.04	0.80		•	
1/4 x 1/8 FG	0201-4-2	1/8-27	1/4-18	3/4	0.188	1.21	0.97	•	•	•
1/4 FG	0201-4-4	1/4-18	1/4-18	3/4	0.281	1.39	1.05		•	•
3/8 x 1/8 FG	0201-6-2	1/8-27	3/8-18	7/8	0.188	1.25	1.02		•	
3/8 x 1/4 FG	0201-6-4	1/4-18	3/8-18	7/8	0.281	1.44	1.10	•	•	•
3/8 FG	0201-6-6	3/8-18	3/8-18	7/8	0.406	1.44	1.09		•	•
1/2 x 1/8 FG	0201-8-2	1/8-27	1/2-14	1 1/8	0.188	1.50	1.27	•	•	•
1/2 x 1/4 FG	0201-8-4	1/4-18	1/2-14	1 1/8	0.281	1.69	1.35	•	•	•
1/2 x 3/8 FG	0201-8-6	3/8-18	1/2-14	1 1/8	0.406	1.69	1.34	•	•	•
1/2 FG	0201-8-8	1/2-14	1/2-14	1 1/8	0.531	1.87	1.23		•	•
3/4 x 1/4 FG	0201-12-4	1/4-18	3/4-14	1 3/8	0.281	1.75	1.41	•	•	•
3/4 x 1/2 FG	0201-12-8	1/2-14	3/4-14	1 3/8	0.531	1.93	1.48	•	•	•
1 x 1/2 FG	0201-16-8	1/2-14	1-11 1/2	1 5/8	0.531	2.19	1.73	•		
1 x 3/4 FG	0201-16-12	3/4-14	1-11 1/2	1 5/8	0.719	2.18	1.71	•	•	
1 1/4 x 1 FG	0201-20-16	1-11 1/2	1 1/4-11 1/2	2	0.938	2.46	1.90	•		

# Male Branch Tee

## MMS

Male pipe thread / female pipe thread  
SAE 140425

All dimensions are in inches



\*Y—ACROSS WRENCH FLATS

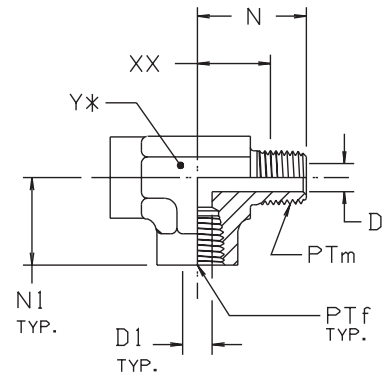
TUBE FITTING PART #	HOSE FITTING PART #	PTm PORT THD NPTF	PTf PORT THD NPTF	D DRILL	REF D1 DRILL	N	N1	XX AFTER ASSY.	Y	STANDARD MATERIAL FROM STOCK		
										S	SS	B
1/8 MMS	212T-2-2	1/8-27	1/8-27	0.188	0.328	0.78	0.66	0.55	9/16	•	•	•
1/4 MMS	212T-4-4	1/4-18	1/4-18	0.281	0.422	1.09	0.88	0.75	3/4	•	•	•
3/8 MMS	212T-6-6	3/8-18	3/8-18	0.406	0.563	1.22	1.02	0.87	7/8	•	•	•
1/2 MMS	212T-8-8	1/2-14	1/2-14	0.531	0.688	1.47	1.23	1.01	1 1/16	•	•	•
3/4 MMS	212T-12-12	3/4-14	3/4-14	0.719	0.891	1.59	1.36	1.11	1 5/16	•	•	•
1 MMS	212T-16-16	1-11 1/2	1-11 1/2	0.938	1.125	1.97	1.63	1.40	1 5/8	•	•	•

# Male Run Tee

## MRO

Male pipe thread / female pipe thread  
SAE 140424

All dimensions are in inches



\*Y—ACROSS WRENCH FLATS

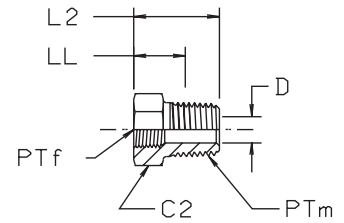
TUBE FITTING PART #	HOSE FITTING PART #	PTm PORT THD NPTF	PTf PORT THD NPTF	D DRILL	REF D1 DRILL	N	N1	XX AFTER ASSY.	Y	STANDARD MATERIAL FROM STOCK		
										S	SS	B
1/8 MRO	012T-2-2	1/8-27	1/8-27	0.188	0.328	0.78	0.66	0.55	9/16	•	•	•
1/4 MRO	012T-4-4	1/4-18	1/4-18	0.281	0.422	1.09	0.88	0.75	3/4	•	•	•
3/8 MRO	012T-6-6	3/8-18	3/8-18	0.406	0.563	1.22	1.02	0.87	7/8	•	•	•
1/2 MRO	012T-8-8	1/2-14	1/2-14	0.531	0.688	1.47	1.23	1.01	1 1/16	•	•	•
3/4 MRO	012T-12-12	3/4-14	3/4-14	0.719	0.891	1.59	1.36	1.11	1 5/16	•	•	•
1 MRO	012T-16-16	1-11 1/2	1-11 1/2	0.938	1.125	1.97	1.63	1.40	1 5/8	•	•	•

# Pipe Thread Reducer

## PTR

Male pipe thread / female pipe thread  
SAE 140140

All dimensions are in inches



TUBE FITTING PART #	HOSE FITTING PART #	PTm PORT THD NPTF	PTf PORT THD NPTF	C2 HEX	REF D DRILL	L2	LL	STANDARD MATERIAL FROM STOCK		
								S	SS	B
1/4 x 1/8 PTR	0102-4-2	1/4-18	1/8-27	5/8	0.328	0.86	0.52	•	•	•
3/8 x 1/8 PTR	0102-6-2	3/8-18	1/8-27	3/4	0.328	0.86	0.51	•	•	•
3/8 x 1/4 PTR	0102-6-4	3/8-18	1/4-18	3/4	0.422	0.86	0.51	•	•	•
1/2 x 1/8 PTR	0102-8-2	1/2-14	1/8-27	7/8	0.328	1.11	0.65	•	•	•
1/2 x 1/4 PTR	0102-8-4	1/2-14	1/4-18	7/8	0.422	1.11	0.65	•	•	•
1/2 x 3/8 PTR	0102-8-6	1/2-14	3/8-18	7/8	0.563	1.11	0.65	•	•	•
3/4 x 1/4 PTR	0102-12-4	3/4-14	1/4-18	1 1/8	0.422	1.17	0.69	•	•	•
3/4 x 3/8 PTR	0102-12-6	3/4-14	3/8-18	1 1/8	0.563	1.17	0.69	•	•	•
3/4 x 1/2 PTR	0102-12-8	3/4-14	1/2-14	1 1/8	0.688	1.17	0.69	•	•	•
1 x 3/8 PTR	0102-16-6	1-11 1/2	3/8-18	1 3/8	0.563	1.36	0.79	•	•	•
1 x 1/2 PTR	0102-16-8	1-11 1/2	1/2-14	1 3/8	0.688	1.36	0.79	•	•	•
1 x 3/4 PTR	0102-16-12	1-11 1/2	3/4-14	1 3/8	0.891	1.36	0.79	•	•	•
1 1/4 x 1/2 PTR	0102-20-8	1 1/4-11 1/2	1/2-14	1 3/4	0.688	1.47	0.87	•	•	•
1 1/4 x 3/4 PTR	0102-20-12	1 1/4-11 1/2	3/4-14	1 3/4	0.891	1.47	0.88	•	•	•
1 1/4 x 1 PTR	0102-20-16	1 1/4-11 1/2	1-11 1/2	1 3/4	1.125	1.47	0.88	•	•	•
1 1/2 x 3/4 PTR	0102-24-12	1 1/2-11 1/2	3/4-14	2	0.891	1.58	0.98	•	•	•
1 1/2 x 1 PTR	0102-24-16	1 1/2-11 1/2	1-11 1/2	2	1.125	1.58	0.99	•	•	•
1 1/2 x 1 1/4 PTR	0102-24-20	1 1/2-11 1/2	1 1/4-11 1/2	2	1.469	1.58	0.99	•	•	•
2 x 1 1/4 PTR	0102-32-20	2-11 1/2	1 1/4-11 1/2	2 1/2	1.469	1.75	1.14	•	•	•
2 x 1 1/2 PTR	0102-32-24	2-11 1/2	1 1/2-11 1/2	2 1/2	1.719	1.75	1.14	•	•	•



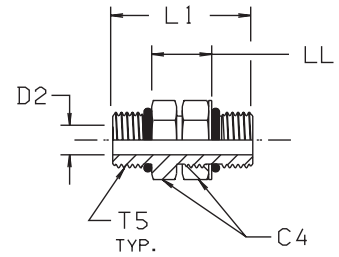
# Straight Thread Union

# F5OHAO

**Straight thread O-ring / straight thread O-ring adjustable**

Part Number Information  
 F5HA - Body only  
 F5OHAO - Assembled with O-rings

All dimensions are in inches

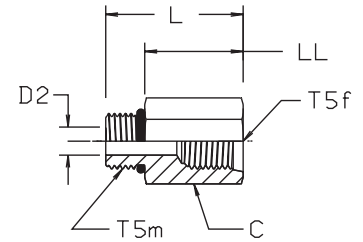


TUBE FITTING PART #	HOSE FITTING PART #	T5 PORT THD UN/UNF-2A	C4 HEX	D2 DRILL	L1	LL AFTER ASSY.	STANDARD MATERIAL FROM STOCK		
							S	SS	B
4 F5OHAO	0505-4-4	7/16-20	9/16	0.203	1.22	0.47	•	•	
6 F5OHAO	0505-6-6	9/16-18	11/16	0.297	1.41	0.59	•	•	
8 F5OHAO	0505-8-8	3/4-16	7/8	0.422	1.56	0.63	•	•	
10 F5OHAO	0505-10-10	7/8-14	1	0.484	1.81	0.75	•		
12 F5OHAO	0505-12-12	1 1/16-12	1 1/4	0.656	2.13	0.89	•		
16 F5OHAO	0505-16-16	1 5/16-12	1 1/2	0.875	2.13	0.89	•		
20 F5OHAO	0505-20-20	1 5/8-12	1 7/8	1.078	2.13	0.89	•		
24 F5OHAO	0505-24-24	1 7/8-12	2 1/8	1.344	2.13	0.89	•		
32 F5OHAO	0505-32-32	2 1/2-12	2 3/4	1.813	2.13	0.89	•		



Straight Thread Reducer / Expander

# F5OG5



Straight thread O-ring / female straight thread O-ring boss

SAE 090136

Part Number Information

F5G5 - Body only

F5OG5 - Assembled with O-ring

All dimensions are in inches

TUBE FITTING PART #	HOSE FITTING PART #	T5f PORT THD UN/UNF-2B	T5m PORT THD UN/UNF-2A	C HEX	D2 DRILL	L	LL AFTER ASSY.	STANDARD MATERIAL FROM STOCK		
								S	SS	B
4-6 F5OG5	0510-4-6	9/16-18	7/16-20	13/16	0.172	1.16	0.80	•		
6-4 F5OG5	0510-6-4	7/16-20	9/16-18	11/16	0.297	1.03	0.64	•		
6-8 F5OG5	0510-6-8	3/4-16	9/16-18	1 1/16	0.297	1.38	0.99	•		
8-6 F5OG5	0510-8-6	9/16-18	3/4-16	7/8	0.438	1.13	0.69	•		
8-10 F5OG5	0510-8-10	7/8-14	3/4-16	1 1/8	0.391	1.56	1.12	•		
10-6 F5OG5	0510-10-6	9/16-18	7/8-14	1	0.484	0.81	0.31	•		
10-8 F5OG5	0510-10-8	3/4-16	7/8-14	1	0.563	1.31	0.81	•		
10-12 F5OG5	0510-10-12	1 1/16-12	7/8-14	1 3/8	0.484	1.69	1.19	•		
12-8 F5OG5	0510-12-8	3/4-16	1 1/16-12	1 1/4	0.625	1.00	0.41	•		
12-10 F5OG5	0510-12-10	7/8-14	1 1/16-12	1 1/4	0.625	1.53	0.94	•		
12-16 F5OG5	0510-12-16	1 5/16-12	1 1/16-12	1 5/8	0.625	1.88	1.29	•		
16-8 F5OG5	0510-16-8	3/4-16	1 5/16-12	1 1/2	0.750	1.00	0.41	•		
16-10 F5OG5	0510-16-10	7/8-14	1 5/16-12	1 1/2	0.797	1.00	0.41	•		
16-12 F5OG5	0510-16-12	1 1/16-12	1 5/16-12	1 1/2	0.750	1.75	1.16	•		
16-20 F5OG5	0510-16-20	1 5/8-12	1 5/16-12	2 1/8	0.875	1.97	1.38	•		
20-12 F5OG5	0510-20-12	1 1/16-12	1 5/8-12	1 7/8	1.063	1.00	0.41	•		
20-16 F5OG5	0510-20-16	1 5/16-12	1 5/8-12	1 7/8	1.063	1.00	0.41	•		
20-24 F5OG5	0510-20-24	1 7/8-12	1 5/8-12	2 1/2	1.063	1.88	1.29	•		
24-12 F5OG5	0510-24-12	1 1/16-12	1 7/8-12	2 1/8	1.250	1.00	0.41	•		
24-16 F5OG5	0510-24-16	1 5/16-12	1 7/8-12	2 1/8	1.250	1.00	0.41	•		
24-20 F5OG5	0510-24-20	1 5/8-12	1 7/8-12	2 1/8	1.250	1.75	1.16	•		
32-24 F5OG5	0510-32-24	1 7/8-12	2 1/2-12	2 3/4	1.780	1.00	0.38	•		



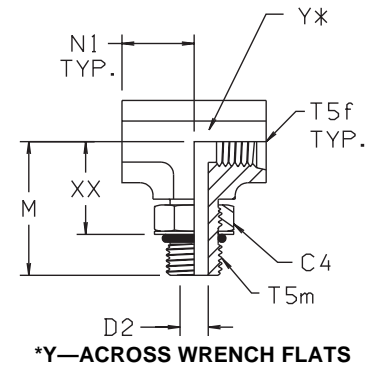
# Straight Thread Branch Tee

## G5G5JAO

Straight thread O-ring / female SAE straight thread

Part Number Information  
G5G5JA - Body only  
G5G5JAO - Assembled with O-ring

All dimensions are in inches



TUBE FITTING PART #	T5f PORT THREAD UN/UNF-2B	T5m PORT THREAD UN/UNF-2A	D2 DRILL	N1	C4	M	Y	XX AFTER ASSY.	STANDARD MATERIAL FROM STOCK		
									S	SS	B
4 G5G5JAO	7/16-20	7/16-20	.172	.63	9/16	1.23	3/4	.84	•		
6 G5G5JAO	9/16-18	9/16-18	.297	.75	11/16	1.38	7/8	.96	•		
8 G5G5JAO	3/4-16	3/4-16	.391	.88	7/8	1.59	1 1/16	1.10	•		
10 G5G5JAO	7/8-14	7/8-14	.484	1.02	1	1.81	1 1/16	1.25	•		
12 G5G5JAO	1 1/16-12	1 1/16-12	.609	1.21	1 1/4	2.00	1 5/16	1.35	•		
16 G5G5JAO	1 5/16-12	1 5/16-12	.844	1.33	1 1/2	2.25	1 5/8	1.60	•		

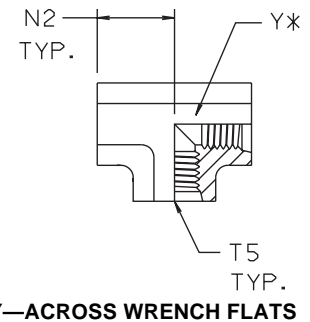
# Female Straight Thread Tee

## G5G5JG5

Female SAE straight thread - all 3 ends

Part Number Information  
G5G5JG5 - Body only

All dimensions are in inches



TUBE FITTING PART #	T5 PORT THREAD UN/UNF-2B	N2	Y	STANDARD MATERIAL FROM STOCK		
				S	SS	B
4 G5G5JG5	7/16-20	.74	3/4	•		
6 G5G5JG5	9/16-18	.86	3/4	•		
8 G5G5JG5	3/4-16	1.03	1 1/16	•		
10 G5G5JG5	7/8-14	1.18	1 1/16	•		
12 G5G5JG5	1 1/16-12	1.39	1 5/16	•		
16 G5G5JG5	1 5/16-12	1.52	1 5/8	•		

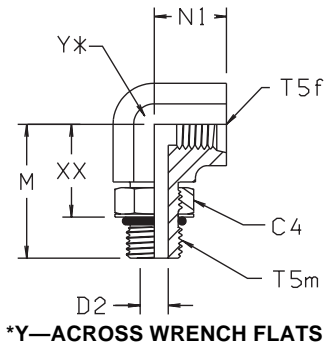
# Straight Thread Elbow

## AOEG5

Straight thread O-ring / female SAE straight thread

Part Number Information  
AEG5 - Body only  
AOEG5 - Assembled with O-ring

All dimensions are in inches



TUBE FITTING PART #	HOSE FITTING PART #	T5m PORT THREAD UN/UNF-2A	T5f PORT THREAD UN/UNF-2B	C4 HEX	D2 DRILL	M	N1	XX AFTER ASSY.	Y	STANDARD MATERIAL FROM STOCK		
										S	SS	B
4 AOEG5	2510-4-4	7/16-20	7/16-20	9/16	.172	1.23	.63	.84	3/4	•		
6 AOEG5	2510-6-6	9/16-18	9/16-18	11/16	.297	1.38	.75	.96	7/8	•		
8 AOEG5	2510-8-8	3/4-16	3/4-16	7/8	.391	1.59	.88	1.10	1 1/16	•		
10 AOEG5	2510-10-10	7/8-14	7/8-14	1	.484	1.81	1.02	1.25	1 1/16	•		
12 AOEG5	2510-12-12	1 1/16-12	1 1/16-12	1 1/4	.609	2.00	1.21	1.35	1 5/16	•		
16 AOEG5	2510-16-16	1 5/16-12	1 5/16-12	1 1/2	.844	2.26	1.33	1.61	1 5/8	•		

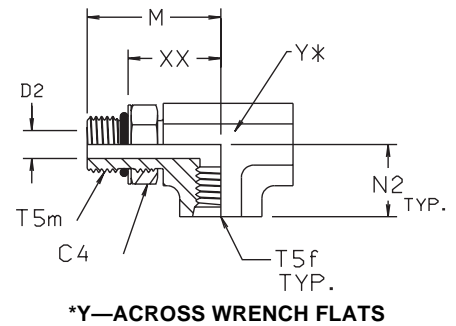
# Straight Thread Run Tee

## AOG5JG5

Straight thread O-ring / female SAE straight thread

Part Number Information  
AG5JG5 - Body only  
AOG5JG5 - Assembled with O-ring

All dimensions are in inches



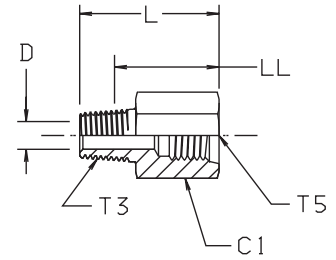
TUBE FITTING PART #	T5f PORT THREAD UN/UNF-2B	T5m PORT THREAD UN/UNF-2A	C4 HEX	D2 DRILL	M	N2	XX AFTER ASSY.	Y	STANDARD MATERIAL FROM STOCK		
									S	SS	B
4 AOG5JG5	7/16-20	7/16-20	9/16	.172	1.23	.74	.84	3/4	•		
6 AOG5JG5	9/16-18	9/16-18	11/16	.297	1.38	.86	.96	7/8	•		
8 AOG5JG5	3/4-16	3/4-16	7/8	.391	1.59	1.03	1.10	1 1/16	•		
10 AOG5JG5	7/8-14	7/8-14	1	.484	1.81	1.18	1.25	1 1/16	•		
12 AOG5JG5	1 1/16-12	1 1/16-12	1 1/4	.609	2.00	1.39	1.35	1 5/16	•		
16 AOG5JG5	1 5/16-12	1 5/16-12	1 1/2	.844	2.25	1.52	1.60	1 5/8	•		



# Conversion Adapter F3HG5

Male BSPT / female SAE straight thread

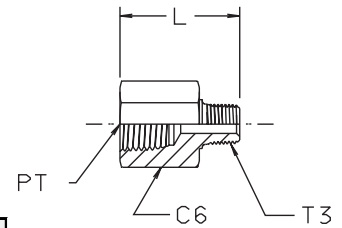
All dimensions are in inches



TUBE FITTING PART #	T5 PORT THD UN/UNF-2B	T3 PORT THD BSPT	D HEX	DRILL	L	LL AFTER ASSY.	STANDARD MATERIAL FROM STOCK		
							S	SS	B
1/8-4F3HG5	7/16-20	1/8-28	11/16	0.188	1.09	0.86			
1/8-5F3HG5	1/2-20	1/8-28	3/4	0.188	1.09	0.86			
1/4-6F3HG5	9/16-18	1/4-19	13/16	0.281	1.36	1.02			
3/8-8F3HG5	3/4-16	3/8-19	1	0.406	1.45	1.09			
1/2-10F3HG5	7/8-14	1/2-14	1 1/8	0.531	1.78	1.32			
3/4-12F3HG5	1 1/16-12	3/4-14	1 3/8	0.719	1.92	1.40			
1-16F3HG5	1 5/16-12	1-11	1 5/8	0.938	2.13	1.54			

# Conversion Adapter F3HG

Male BSPT / Female NPT



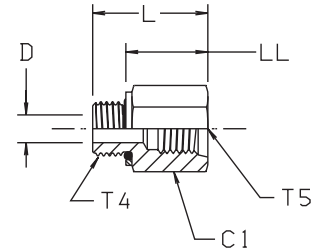
TUBE FITTING PART#	T3 MALE BSPT	PT FEMALE NPT	L (mm)	C6 Hex (in)	STANDARD MATERIAL FROM STOCK		
					S	SS	B
1/8x1/8F3HG	1/8	1/8	25	9/16	•		
1/4x1/4F3HG	1/4	1/4	34	3/4	•		
3/8x3/8F3HG	3/8	3/8	35	7/8	•		
1/2x1/2F3HG	1/2	1/2	47	1 1/8	•		
3/4x3/4F3HG	3/4	3/4	47	1 3/8	•		
1x1F3HG	1	1	58	1 5/8	•		

# Conversion Adapter F4OHG5

Male BSPP / female SAE straight thread

F4HG5 - Body only  
F4OHG5 - Assembled with O-ring and retaining ring

All dimensions are in inches



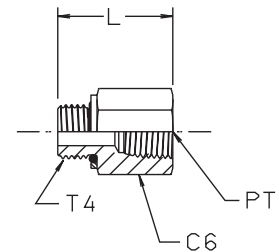
TUBE FITTING PART #	T4 PORT THD BSPP	T5 PORT THD UN/UNF-2B	C1 HEX	D DRILL	L	LL AFTER ASSY.	STANDARD MATERIAL FROM STOCK		
							S	SS	B
1/8-4F4OHG5	1/8-28	7/16-20	11/16	0.172	1.00	0.75	•		
1/4-6F4OHG5	1/4-19	9/16-18	13/16	0.297	1.25	0.89			
3/8-6F4OHG5	3/8-19	9/16-18	7/8	0.297	1.25	0.89			
3/8-8F4OHG5	3/8-19	3/4-16	1	0.391	1.33	0.97			
1/2-10F4OHG5	1/2-14	7/8-14	1 1/8	0.484	1.60	1.14			
3/4-12F4OHG5	3/4-14	1 1/16-12	1 3/8	0.609	1.74	1.28	•		
1-16F4OHG5	1-11	1 5/16-12	1 5/8	0.844	1.92	1.33			
1 1/4-20F4OHG5	1 1/4-11	1 5/8-12	2	1.078	1.95	1.36			

Replacement O-rings and Retaining Rings can be [found on page E20](#).

# Conversion Adapter Male BSPP - Female NPT F4OHG

Male BSPP / Female NPT

Part Number Information  
F4HG - Body only  
F4OHG - Assembled with O-ring and retaining ring



TUBE FITTING PART #	T4 MALE BSPP	PT FEMALE NPT	L (mm)	C6 Hex (in)	STANDARD MATERIAL FROM STOCK		
					S	SS	B
1/8x1/8F4OHG	1/8	1/8	25	5/8	•		
1/4x1/4F4OHG	1/4	1/4	33	3/4	•		
3/8x3/8F4OHG	3/8	3/8	34	7/8	•		
1/2x1/2F4OHG	1/2	1/2	44	1 1/8	•		
3/4x3/4F4OHG	3/4	3/4	45	1 3/8	•		
1x1F4OHG	1	1	55	1 3/4	•		

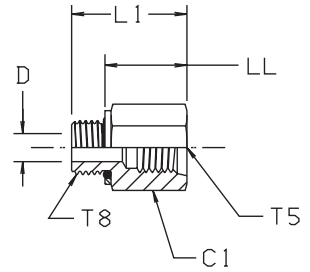
Replacement O-rings and Retaining Rings can be [found on page E20](#).

# Conversion Adapter F8OHG5

Male metric / female SAE straight thread

Part Number Information  
F8HG5 - Body only  
F8OHG5 - Assembled with O-ring and retaining ring

All dimensions are in inches



TUBE FITTING PART#	T8 PORT THD METRIC STR	T5 PORT THD UN/UNF-2B	C1 HEX	D	L1	LL	STANDARD MATERIAL FROM STOCK		
							S	SS	B
M10-4F8OHG5	M10x1	7/16-20	11/16	0.157	1.06	0.77	•		
M10-6F8OHG5	M10x1	9/16-18	7/8	0.157	1.07	0.78			
M14-6F8OHG5	M14x1.5	9/16-18	13/16	0.276	1.19	0.89			
M16-8F8OHG5	M16x1.5	3/4-16	1	0.354	1.31	0.95	•		
M18-8F8OHG5	M18x1.5	3/4-16	1	0.433	1.38	0.96	•		
M22-10F8OHG5	M22x1.5	7/8-14	1 1/8	0.512	1.50	1.04			
M27-12F8OHG5	M27x2	1 1/16-12	1 1/4	0.630	1.88	1.33			
M33-16F8OHG5	M33x2	1 5/16-12	1 5/8	0.866	1.91	1.36			
M42-20F8OHG5	M42x2	1 5/8-12	2	1.102	1.91	1.34			

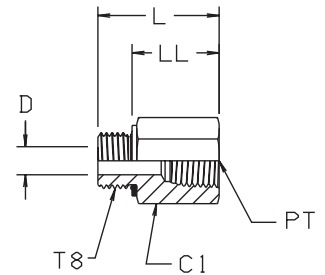
Replacement O-rings and Retaining Rings can be [found on page E21](#).

# Conversion Adapter F8OHG

Male metric straight thread / female pipe thread

Part Number Information  
F8HG - Body only  
F8OHG - Assembled with O-ring and retaining ring

All dimensions are in inches

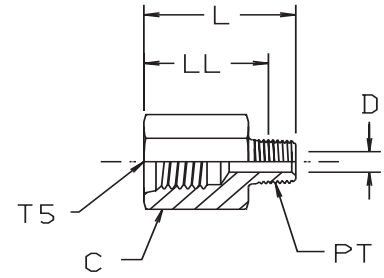


TUBE FITTING PART#	T8 PORT THD METRIC STR	PT NPTF	C1 HEX	D DRILL	L	LL	STANDARD MATERIAL FROM STOCK		
							S	SS	B
M10-1/8F8OHG	M10X1.0	1/8-27	9/16	.157	.99	0.64	•		
M12-1/4F8OHG	M12X1.5	1/4-18	3/4	.196	1.24	0.85	•		
M14-1/4F8OHG	M14X1.5	1/4-18	3/4	.281	1.24	0.85	•		
M16-3/8F8OHG	M16X1.5	3/8-18	7/8	.354	1.36	0.91	•		
M16-1/2F8OHG	M16X1.5	1/2-14	1 1/8	.354	1.58	1.13	•		
M18-3/8F8OHG	M18X1.5	3/8-18	15/16	.433	1.42	0.91	•		
M18-1/2F8OHG	M18X1.5	1/2-18	1 1/8	.433	1.67	1.16	•		
M22-1/2F8OHG	M22X1.5	1/2-14	1 1/8	.512	1.68	1.10	•		
M27-3/4F8OHG	M27X1.5	3/4-14	1 3/8	.630	1.87	1.20	•		
M33-1F8OHG	M33X2.0	1-11 1/2	1 5/8	.866	2.11	1.44	•		

Replacement O-rings and Retaining Rings can be [found on page E21](#).

# Conversion Adapter FHG5

Male Pipe / Female SAE Straight Thread

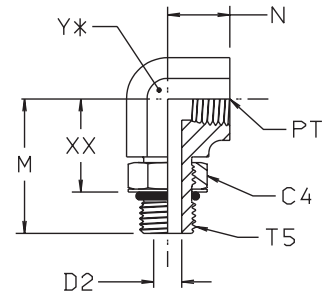


All dimensions are in inches

TUBE FITTING PART #	HOSE FITTING DIVISION PART #	T5 PORT THD UN/UNF-2B	PT PORT THD NPTF	C HEX	D DRILL	L	LL AFTER ASSY.	STANDARD MATERIAL FROM STOCK		
								S	SS	B
1/4-6 FHG5	0110-4-6	9/16-18	1/4-18	3/4	0.281	1.36	1.02	•		
3/8-8 FHG5	0110-6-8	3/4-16	3/8-18	1	0.391	1.50	1.15	•		
1/2-10 FHG5	0110-8-10	7/8-14	1/2-14	1 1/4	0.484	1.75	1.29	•		

# Female Elbow AOEG

Straight thread O-ring / female pipe thread



\*Y—ACROSS WRENCH FLATS

Part Number Information  
AEG - Body only  
AOEG - Assembled with O-ring

All dimensions are in inches

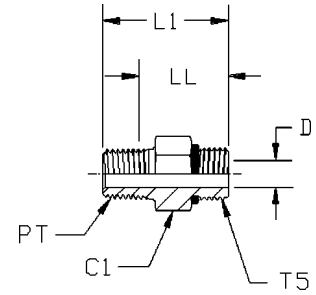
TUBE FITTING PART #	HOSE FITTING PART #	T5 PORT THD UN/UNF-2A	PT PORT THD NPTF	C4 HEX	D2 DRILL	M	N	XX AFTER ASSY.	Y	STANDARD MATERIAL FROM STOCK		
										S	SS	B
6-1/4 AOEG	2502-6-4	9/16-18	1/4-18	11/16	0.297	1.34	0.63	0.91	3/4	•		
8-3/8 AOEG	2502-8-6	3/4-16	3/8-18	7/8	0.391	1.47	0.63	0.98	7/8	•		
10-1/2 AOEG	2502-10-8	7/8-14	1/2-14	1	0.484	1.81	0.75	1.25	1 1/16	•		
12-3/4 AOEG	2502-12-12	1 1/16-12	3/4-14	1 1/4	0.609	2.00	0.81	1.35	1 5/16	•		
16-1 AOEG	2502-16-16	1 5/16-12	1-11 1/2	1 1/2	0.844	2.25	1.00	1.60	1 5/8	•		

# Male Pipe Adapter F5OF

Male straight thread O-ring / male NPT

Part Number Information  
F5F - Body only  
F5OF - Assembled with O-ring

All dimensions are in inches



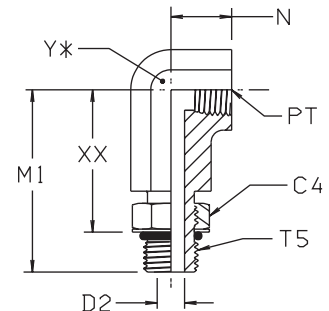
TUBE FITTING PART#	T5 PORT THD UN/UNF-2A	PT PORT THD NPTF	C1 HEX	D DRILL	L1	LL	STANDARD MATERIAL FROM STOCK		
							S	SS	B
4-1/8 F5OF	7/16-20	1/8-27	9/16	0.172	1.00	0.64	•		
6-1/4 F5OF	9/16-18	1/4-18	11/16	0.297	1.25	0.86	•		
6-3/8 F5OF	9/16-18	3/8-18	11/16	0.297	1.34	0.95	•		
8-3/8 F5OF	3/4-16	3/8-18	7/8	0.391	1.36	0.92	•		
8-1/2 F5OF	3/4-16	1/2-14	7/8	0.391	1.53	1.09	•		
10-1/2 F5OF	7/8-14	1/2-14	1	0.484	1.59	1.09	•		
12-3/4 F5OF	1 1/16-12	3/4-14	1 1/4	0.656	1.80	1.21	•		
16-1 F5OF	1 5/16-12	1-11 1/2	1 1/2	0.875	1.98	1.39	•		
20-1 1/4 F5OF	1 5/8-12	1 1/4-11 1/2	1 7/8	1.078	2.02	1.43	•		

# Extra Long Female Elbow AOE4G

Straight thread O-ring / female pipe thread

Part Number Information  
AE4G- Body only  
AOE4G - Assembled with O-ring

All dimensions are in inches



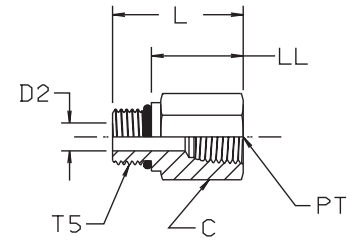
\*Y—ACROSS WRENCH FLATS

TUBE FITTING PART #	HOSE FITTING PART #	T5 PORT THD UN/UNF-2A	PT PORT THD NPTF	C4 HEX	D2 DRILL	M1	N	XX AFTER ASSY.	Y	STANDARD MATERIAL FROM STOCK		
										S	SS	B
8-3/8 AOE4G	5502-8-6	3/4-16	3/8-18	7/8	0.391	2.94	0.63	2.45	7/8	•		
10-1/2 AOE4G	5502-10-8	7/8-14	1/2-14	1	0.484	3.56	0.75	3.00	1 1/16	•		
12-3/4 AOE4G	5502-12-12	1 1/16-12	3/4-14	1 1/4	0.609	4.06	0.81	3.41	1 5/16	•		
16-1 AOE4G	5502-16-16	1 5/16-12	1-11 1/2	1 1/2	0.844	4.63	1.00	3.98	1 5/8	•		



# Female Pipe Adapter F50G

Straight thread O-ring / female pipe thread



Part Number Information  
F5G - Body only  
F50G - Assembled with O-ring

All dimensions are in inches

TUBE FITTING PART #	HOSE FITTING PART #	T5 PORT THD UN/UNF-2A	PT PORT THD NPTF	C HEX	D2 DRILL	L	LL AFTER ASSY.	STANDARD MATERIAL FROM STOCK		
								S	SS	B
4-1/8 F50G	0502-4-2	7/16-20	1/8-27	9/16	0.172	1.00	0.64	•		
4-1/4 F50G	0502-4-4	7/16-20	1/4-18	3/4	0.172	1.16	0.80	•		
5-1/4 F50G	0502-5-4	1/2-20	1/4-18	3/4	0.234	1.19	0.83			
6-1/4 F50G	0502-6-4	9/16-18	1/4-18	3/4	0.297	1.16	0.77	•	•	
6-3/8 F50G	0502-6-6	9/16-18	3/8-18	7/8	0.297	1.28	0.89	•		
8-1/4 F50G	0502-8-4	3/4-16	1/4-18	7/8	0.391	1.13	0.69	•		
8-3/8 F50G	0502-8-6	3/4-16	3/8-18	7/8	0.391	1.28	0.84	•		
8-1/2 F50G	0502-8-8	3/4-16	1/2-14	1 1/8	0.391	1.50	1.06	•	•	
10-1/4 F50G	0502-10-4	7/8-14	1/4-18	1	0.500	0.81	0.31	•		
10-3/8 F50G	0502-10-6	7/8-14	3/8-18	1	0.500	1.31	0.81	•		
10-1/2 F50G	0502-10-8	7/8-14	1/2-14	1 1/8	0.500	1.53	1.03	•	•	
10-3/4 F50G	0502-10-12	7/8-14	3/4-14	1 3/8	0.500	1.63	1.13	•		
12-1/2 F50G	0502-12-8	1 1/16-12	1/2-14	1 1/4	0.656	1.41	0.82	•		
12-3/4 F50G	0502-12-12	1 1/16-12	3/4-14	1 3/8	0.656	1.72	1.13	•		
14-1/2 F50G	0502-14-8	1 3/16-12	1/2-14	1 3/8	0.719	1.06	0.47	•		
14-3/4 F50G	0502-14-12	1 3/16-12	3/4-14	1 3/8	0.719	1.69	1.10	•		
16-1/2 F50G	0502-16-8	1 5/16-12	1/2-14	1 1/2	0.844	1.00	0.41	•		
16-3/4 F50G	0502-16-12	1 5/16-12	3/4-14	1 1/2	0.844	1.50	0.91	•		
16-1 F50G	0502-16-16	1 5/16-12	1-11 1/2	1 5/8	0.875	1.88	1.29	•		
20-1 F50G	0502-20-16	1 5/8-12	1-11 1/2	1 7/8	1.078	1.00	0.41	•		
20-1 1/4 F50G	0502-20-20	1 5/8-12	1 1/4-11 1/2	2	1.078	1.97	1.38	•		
24-1 F50G	0502-24-16	1 7/8-12	1-11 1/2	2 1/8	1.344	1.00	0.41	•		
24-1 1/2 F50G	0502-24-24	1 7/8-12	1 1/2-11 1/2	2 1/4	1.344	2.00	1.41	•		
32-2 F50G	0502-32-32	2 1/2-12	2-11 1/2	2 7/8	1.781	2.06	1.47			



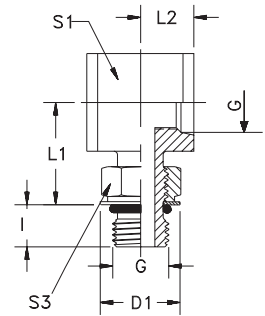
## Female Elbow

# A4OEG4M

Male BSPP / female BSPP

Part Number Information  
A4EG4M - Body only  
A4OEG4M - Assembled with O-ring

All dimensions are in inches



TUBE FITTING PART #	SERIES WORKING PRESSURE BAR/PSI	D1	G	I	L1	L2	S1	S3	STANDARD MATERIAL FROM STOCK		
									S	SS	B
2-2A4OEG4M	250 bar 3625 psi	15	G 1/8 A	6.5	18.5	7	15	14	•		

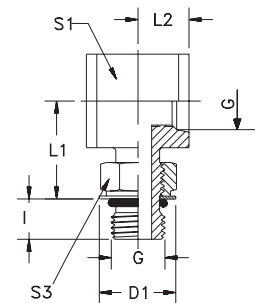
## Female Elbow

# A87LPOEG87LPM

Male ISO 6149 / female ISO 6149

Part Number Information  
A87LPEG87LPM - Body only  
A87LPOEG87LPM - Assembled with O-ring

All dimensions are in inches

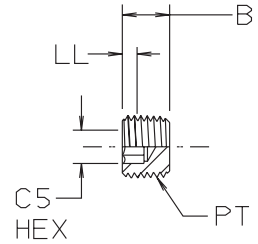


TUBE FITTING PART #	SERIES WORKING PRESSURE BAR/PSI	D1	G	I	L1	L2	S1	S3	STANDARD MATERIAL FROM STOCK		
									S	SS	B
M08A87LPOEG87LPM	250 bar	12.5	M8X1	8.5	13.5	7.5	15	12	•		
M10A87LPOEG87LPM	3625 psi	14.5	M10X1	8.5	14.5	7.5	15	14	•		
M12A87LPOEG87LPM		17.5	M12X1.5	11	17	10	20	17	•		
M14A87LPOEG87LPM		19.5	M14X1.5	11	18	10	20	19	•		

# Hollow Hex Pipe Plug HHP

Male pipe thread  
SAE 130109N

All dimensions are in inches



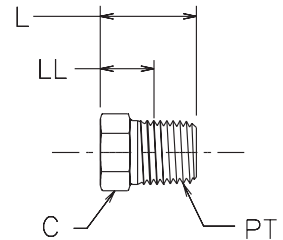
C5—ACROSS INTERNAL HEX FLATS

TUBE FITTING PART #	HOSE FITTING PART #	PT PORT THD NPTF	C5 INTERNAL HEX	B	LL	STANDARD MATERIAL FROM STOCK		
						S	SS	B
1/16 HHP	01HP-1	1/16-27	5/32	0.30	0.07	•		
1/8 HHP	01HP-2	1/8-27	3/16	0.30	0.07	•	•	•
1/4 HHP	01HP-4	1/4-18	1/4	0.46	0.12	•	•	•
3/8 HHP	01HP-6	3/8-18	5/16	0.46	0.11	•	•	
1/2 HHP	01HP-8	1/2-14	3/8	0.61	0.15	•		
3/4 HHP	01HP-12	3/4-14	9/16	0.62	0.14	•		

# Hex Head Pipe Plug HP

Male pipe thread  
SAE 130109E

All dimensions are in inches



TUBE FITTING PART #	HOSE FITTING PART #	PT PORT THD NPTF	C HEX	L	LL	STANDARD MATERIAL FROM STOCK		
						S	SS	B*
1/8 HP	01CP-2	1/8-27	7/16	0.56	0.33	•	•	•
1/4 HP	01CP-4	1/4-18	9/16	0.75	0.41	•	•	•
3/8 HP	01CP-6	3/8-18	11/16	0.78	0.43	•	•	•
1/2 HP	01CP-8	1/2-14	7/8	0.97	0.51	•	•	•
3/4 HP	01CP-12	3/4-14	1 1/16	1.06	0.58	•	•	•
1 HP	01CP-16	1-11 1/2	1 5/16	1.25	0.68	•	•	•

\*Brass plugs may have a partial drill.

# Hollow Hex Plug HP50N

Hollow hex / straight thread O-ring

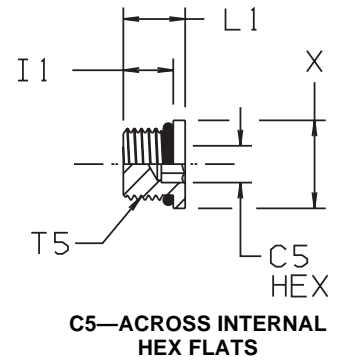
SAE 090109B

Part Number Information

HP5N - Body only

HP50N - Assembled with O-ring

All dimensions are in inches



TUBE FITTING PART #	HOSE FITTING PART #	T5 PORT THD UN/UNF-2A	C5 HEX	I1	L1	X DIA.	STANDARD MATERIAL FROM STOCK		
							S	SS	B
2 HP50N	05HP-2	5/16-24	1/8	0.30	0.39	0.44	•	•	
3 HP50N	05HP-3	3/8-24	1/8	0.30	0.39	0.50	•	•	
4 HP50N	05HP-4	7/16-20	3/16	0.36	0.46	0.56	•	•	
5 HP50N	05HP-5	1/2-20	3/16	0.36	0.46	0.63	•	•	
6 HP50N	05HP-6	9/16-18	1/4	0.40	0.49	0.69	•	•	
8 HP50N	05HP-8	3/4-16	5/16	0.44	0.59	0.88	•	•	
10 HP50N	05HP-10	7/8-14	3/8	0.50	0.63	1.00	•	•	
12 HP50N	05HP-12	1 1/16-12	9/16	0.59	0.75	1.25	•	•	
14 HP50N	05HP-14	1 3/16-12	9/16	0.59	0.75	1.38	•	•	
16 HP50N	05HP-16	1 5/16-12	5/8	0.59	0.75	1.50	•	•	
20 HP50N	05HP-20	1 5/8-12	3/4	0.59	0.75	1.88	•	•	
24 HP50N	05HP-24	1 7/8-12	3/4	0.59	0.77	2.13	•	•	

# Hex Head Plug P50N

Hex head / straight thread O-ring

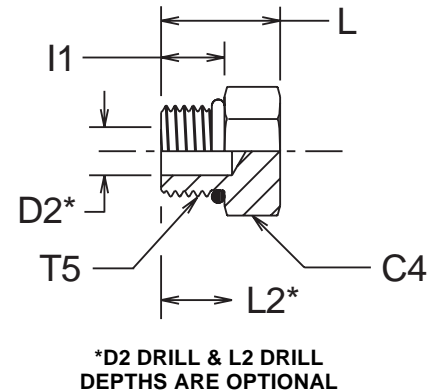
SAE 090109A

Part Number Information

P5N - Body only

P50N - Assembled with O-ring

All dimensions are in inches



TUBE FITTING PART #	HOSE FITTING PART #	T5 PORT THD UN/UNF-2A	C4 HEX	D2 DRILL	I1	L	L2	STANDARD MATERIAL FROM STOCK		
								S	SS	B
2 P50N	05CP-2	5/16-24	7/16	0.094	0.30	0.61	0.38	•	•	
3 P50N	05CP-3	3/8-24	1/2	0.125	0.30	0.61	0.34	•	•	
4 P50N	05CP-4	7/16-20	9/16	0.203	0.36	0.67	0.41	•	•	
5 P50N	05CP-5	1/2-20	5/8	0.234	0.36	0.67	0.39	•	•	
6 P50N	05CP-6	9/16-18	11/16	0.297	0.39	0.73	0.44	•	•	
8 P50N	05CP-8	3/4-16	7/8	0.422	0.44	0.80	0.44	•	•	
10 P50N	05CP-10	7/8-14	1	0.500	0.50	0.94	0.47	•	•	
12 P50N	05CP-12	1 1/16-12	1 1/4	0.656	0.59	1.09	0.59	•	•	
14 P50N	05CP-14	1 3/16-12	1 3/8	0.718	0.59	1.09	0.56	•	•	
16 P50N	05CP-16	1 5/16-12	1 1/2	0.875	0.59	1.13	0.50	•	•	
20 P50N	05CP-20	1 5/8-12	1 7/8	1.094	0.59	1.20	0.66	•	•	
24 P50N	05CP-24	1 7/8-12	2 1/8	1.344	0.59	1.27	0.34	•	•	
32 P50N	05CP-32	2 1/2-12	2 3/4	1.812	0.59	1.44	0.56	•	•	

# ISO 6149 Hex Head Plug P87OMN

Hex head / metric straight thread O-ring – ISO 6149

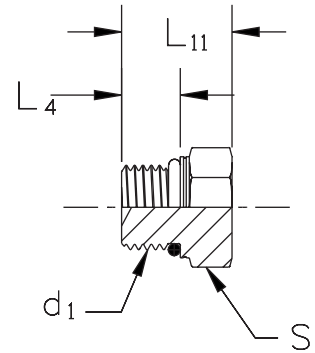
SAE J2244-4\* 62M0109A

Part Number Information

P87MN - Plug Only

P87OMN - Plug with O-ring

All dimensions in millimeters.



TUBE FITTINGS PART #	d1 THREAD	L4 (mm)	L11 (mm)	S HEX (mm)	STANDARD MATERIAL FROM STOCK		
					S	SS	B
M8P87OMN	M8X1	8.5	16.2	12			
M10P87OMN	M10X1	8.5	16.2	14	•		
M12P87OMN	M12X1.5	11	18.5	17	•		
M14P87OMN	M14X1.5	11	19.5	19	•		
M16P87OMN	M16X1.5	11.5	21.5	22	•		
M18P87OMN	M18X1.5	12.5	23.5	24	•		
M20P87OMN	M20X1.5	12.5	24	27			
M22P87OMN	M22X1.5	13	25.5	27	•		
M27P87OMN	M27X2	16	32	32	•		
M30P87OMN	M30X2	16	32	36			
M33P87OMN	M33X2	16	32	41	•		
M42P87OMN	M42X2	16	34	50	•		
M48P87OMN	M48X2	17.5	35.5	55			
M60P87OMN	M60X2	17.5	33	65			

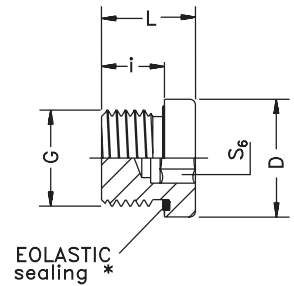
\*SAE J2244-4 is a draft standard.

Note: For replacement O-rings, [see page C28](#).

# Hollow Hex Plug VSTI M-ED

Male Metric Thread DIN 3852, form E EOlastic Seal

All dimensions in millimeters.



TUBE FITTINGS PART #	WORKING PRESSURE (bar/psi)	G METRIC THREAD	D	i	L	S6	TIGHTENING TORQUE (Nm)	STANDARD MATERIAL FROM STOCK		
								S	SS	B
VSTI10X1EDA3C	400 bar 5800 psi	M10 x 1	14	8	12	5	10	•	•	
VSTI12X1.5EDA3C		M12 x 1.5	17	12	17	6	20	•	•	
VSTI14X1.5EDA3C		M14 x 1.5	19	12	17	6	30	•	•	
VSTI16X1.5EDA3C		M16 x 1.5	22	12	17	8	35	•	•	
VSTI18X1.5EDA3C		M18 x 1.5	24	12	17	8	40	•	•	
VSTI20X1.5EDA3C		M20 x 1.5	26	14	19	10	50	•	•	
VSTI22X1.5EDA3C		M22 x 1.5	27	14	19	10	60	•	•	
VSTI26X1.5EDA3C		M26 x 1.5	32	16	21	12	70	•	•	
VSTI27X2EDA3C		M27 x 2	32	16	21	12	90	•	•	
VSTI33X2EDA3C		M33 x 2	40	16	22.5	17	140	•	•	
VSTI42X2EDA3C	250 bar 3620 psi	M42 x 2	50	16	22.5	22	240	•	•	
VSTI48X2EDA3C		M48 x 2	55	16	22.5	24	300	•	•	

\*For replacement ED seals, [see page J127](#).

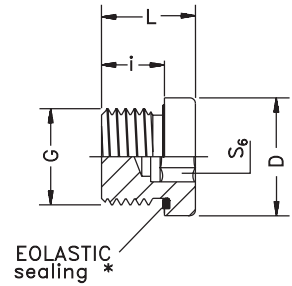
Note: Available with fluorocarbon (e.g., Viton) seals as a standard for steel fittings.



# Hollow Hex Plug VSTI R-ED

Male BSPP DIN 3852 form E EOLastic Seal

All dimensions in millimeters.



TUBE FITTINGS PART #	WORKING PRESSURE (bar/psi)	G THREAD BSP	D	i	L	S6	TIGHTENING TORQUE (Nm)	STANDARD MATERIAL FROM STOCK		
								S	SS	B
VSTI1/8EDA3C	400 bar	G 1/8 A	14	8	12	5	10	•	•	
VSTI1/4EDA3C	5800 psi	G 1/4 A	19	12	17	6	30	•	•	
VSTI3/8EDA3C		G 3/8 A	22	12	17	8	35	•	•	
VSTI1/2EDA3C		G 1/2 A	27	14	19	10	60	•	•	
VSTI3/4EDA3C		G 3/4 A	32	16	21	12	90	•	•	
VSTI1EDA3C		G 1 A	40	16	22.5	17	140	•	•	
VSTI1 1/4EDA3C	250 bar	G 1 1/4 A	50	16	22.5	22	240	•	•	
VSTI1 1/2EDA3C	3620 psi	G 1 1/2 A	55	16	22.5	24	300	•	•	

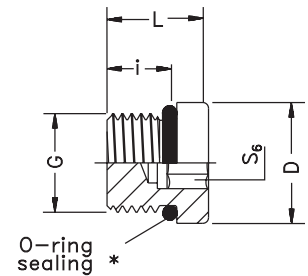
\*For replacement ED seals, see page J127.

Note: Available with fluorocarbon (e.g., Viton) seals as a standard for steel fittings.

# Hollow Hex Plug VSTI M-OR

ISO 6149 / DIN 3852-3

All dimensions in millimeters.



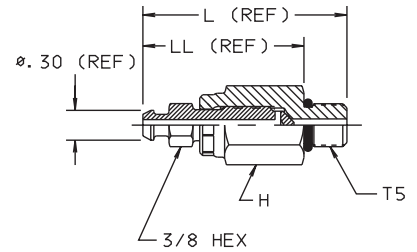
TUBE FITTINGS PART #	WORKING PRESSURE (bar/psi)	G METRIC THREAD	D	i	L	S6	TIGHTENING TORQUE (Nm)	STANDARD MATERIAL FROM STOCK		
								S	SS	B
VSTI10X1ORA3C	630 bar	M10 x 1	13	9.5	13.5	5	10	•		
VSTI12X1.5ORA3C	9130 psi	M12 x 1.5	17	11	16	6	20	•		
VSTI14X1.5ORA3C		M14 x 1.5	19	11	16	6	30	•		
VSTI16X1.5ORA3C		M16 x 1.5	21	12.5	17.5	8	35	•		
VSTI18X1.5ORA3C		M18 x 1.5	23	14	19	8	40	•		
VSTI22X1.5ORA3C	400 bar	M22 x 1.5	27	15	20	10	60	•		
VSTI27X2ORA3C		M27 x 2	32	18.5	23.5	12	90	•		
VSTI33X2ORA3C		M33 x 2	38	18.5	25	17	140	•		
VSTI42X2ORA3C		M42 x 2	48	19	25.5	22	240	•		

\*For replacement O-rings, see page C28.

Note: Available with fluorocarbon (e.g., Viton) O-rings as a standard for steel fittings.

# Straight Thread O-ring Bleed Adapter P5ONBA

Part Number Information  
P5NBA - Body Only  
P5ONBA - Assembled with O-ring

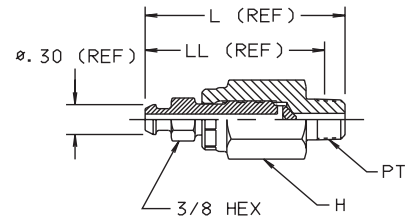


All dimensions are in inches

TUBE FITTING PART #	T5 PORT THD UN/UNF-2A	LL REF	L REF	H HEX	STANDARD MATERIAL FROM STOCK		
					S	SS	B
4 P5ONBA	7/16-20	1.62	2.05	11/16	•		

Tightening Torque for bleed screw is 35-40 in-lb.

# Male Pipe Bleed Adapter HPBA



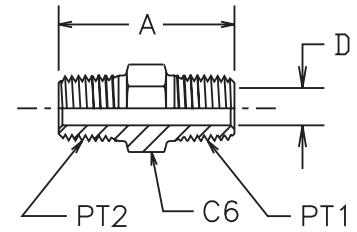
All dimensions are in inches

TUBE FITTING PART #	PORT THREAD	LL REF	L REF	H HEX	STANDARD MATERIAL FROM STOCK		
					S	SS	B
1/4 HPBA	1/4-18	1.86	2.20	11/16	•		

Tightening Torque for bleed screw is 35-40 in-lb.

# BSPT Pipe Nipple FF33M

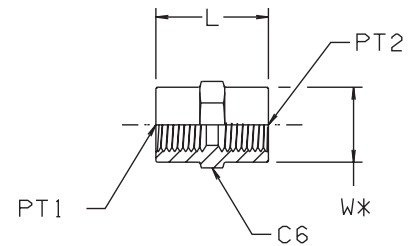
Male BSPT / Male BSPT



TUBE FITTING PART #	PT1 MALE BSPT	PT2 MALE BSPT	A (mm)	D (mm)	C6 Hex (mm)	STANDARD MATERIAL FROM STOCK		
						S	SS	B
1/8FF33M	1/8-28	1/8-28	21	4.8	10	•		
1/4 x 1/8FF33M	1/4-19	1/8-28	27	4.8	14	•		
1/4FF33M	1/4-19	1/4-19	29	7.0	14	•		
3/8 x 1/4FF33M	3/8-19	1/4-19	30	7.0	17	•		
3/8FF33M	3/8-19	3/8-19	30	10.3	17	•		
1/2FF33M	1/2-14	1/2-14	39	14.0	22	•		
1/2x3/8FF33M	1/2-14	3/8-19	43	10.3	22	•		
3/4FF33M	3/4-14	3/4-14	46	18.0	27	•		
3/4x1/2FF33M	3/4-14	1/2-14	50	13.5	27	•		
1 x 3/4FF33M	1-11	3/4-14	53	18.0	36	•		
1FF33M	1-11	1-11	59	23.5	36	•		

# BSPF Female Union GG44M

Female BSPP / Female BSPP



\*W DIAMETER MAY BE PRESENT DUE TO MANUFACTURING OPTION

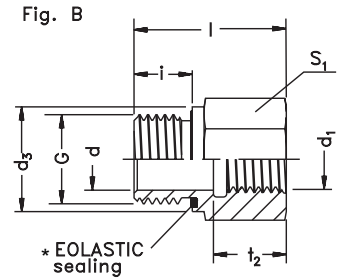
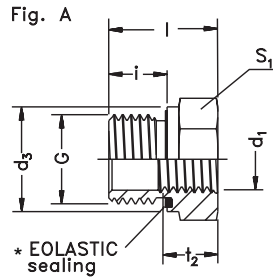
TUBE FITTING PART #	PT1 FEMALE BSPP	PT2 FEMALE BSPP	L (mm)	C6 Hex (mm)	STANDARD MATERIAL FROM STOCK		
					S	SS	B
1/8GG44M	1/8-28	1/8-28	19.0	14	•		
1/4GG44M	1/4-19	1/4-19	28.0	17	•		
1/4x1/8GG44M	1/4-19	1/8-28	24.0	17	•		
3/8GG44M	3/8-19	3/8-19	28.0	22	•		
3/8x1/4GG44M	3/8-19	1/4-19	28.0	22	•		
1/2GG44M	1/2-14	1/2-14	32.5	27	•		
1/2x3/8GG44M	1/2-14	3/8-19	31.0	27	•		
1GG44M	1-11	1-11	42.0	46	•		



# Reducing Adapter/Expander RI-ED

Male BSPP, DIN 3852, Form E  
Elastic Seal / Female BSPP

All dimensions in millimeters.



TUBE FITTINGS PART #	WORKING PRESSURE		G MALE THREAD BSPP	d1 FEMALE THREAD BSPP	d	d3	l	i	S1	t2	Fig.	STANDARD MATERIAL FROM STOCK		
	bar	psi										S	SS	B
RI1/8EDX1/4A3C	630	9130	G 1/8A	G 1/4	4	14	31	8	19	17	B	•	•	
RI1/8EDX3/8A3C	630	9130	G 1/8A	G 3/8	4	14	32	8	24	17	B	•	•	
RI1/4EDX1/8A3C	630	9130	G 1/4A	G 1/8	5	19	29	12	19	12	B	•	•	
RI1/4EDX3/8A3C	630	9130	G 1/4A	G 3/8	5	19	36	12	24	17	B	•	•	
RI1/4EDX1/2A3C	630	9130	G 1/4A	G 1/2	5	19	40	12	30	20	B	•	•	
RI1/4EDX3/4A3C	630	9130	G 1/4A	G 3/4	5	19	43	12	36	22	B	•	•	
RI3/8EDX1/8A3C	630	9130	G 3/8A	G 1/8	-	22	22.5	12	22	8	A	•	•	
RI3/8EDX1/4A3C	630	9130	G 3/8A	G 1/4	8	22	36	12	22	17	B	•	•	
RI3/8EDX1/2A3C	630	9130	G 3/8A	G 1/2	8	22	41	12	30	20	B	•	•	
RI3/8EDX3/4A3C	400	5800	G 3/8A	G 3/4	8	22	44	12	36	22	B	•	•	
RI1/2EDX1/8A3C	630	9130	G 1/2A	G 1/8	-	27	24	14	27	8	A	•	•	
RI1/2EDX1/4A3C	630	9130	G 1/2A	G 1/4	-	27	24	14	27	12	A	•	•	
RI1/2EDX3/8A3C	630	9130	G 1/2A	G 3/8	12	27	37	14	27	17	B	•	•	
RI1/2EDX3/4A3C	400	5800	G 1/2A	G 3/4	12	27	46	14	36	22	B	•	•	
RI1/2EDX1A3C	400	5800	G 1/2A	G 1	12	27	49	14	41	24.5	B	•	•	
RI1/2EDX11/4A3C	400	5800	G 1/2A	G 1 1/4	10	27	53	14	55	26.5	B	•	•	
RI3/4EDX1/4A3C	400	5800	G 3/4A	G 1/4	-	32	26	16	32	12	A	•	•	
RI3/4EDX3/8A3C	400	5800	G 3/4A	G 3/8	-	32	26	16	32	12	A	•	•	
RI3/4EDX1/2A3C	400	5800	G 3/4A	G 1/2	16	32	43	16	32	20	B	•	•	
RI3/4EDX1A3C	400	5800	G 3/4A	G 1	16	32	51	16	41	24.5	B	•	•	
RI3/4EDX11/4A3C	400	5800	G 3/4A	G 1 1/4	16	32	55	16	55	26.5	B	•	•	
RI3/4EDX11/2A3C	315	4560	G 3/4A	G 1 1/2	16	32	57	16	60	28.5	B	•	•	
RI1EDX1/4A3C	400	5800	G 1A	G 1/4	-	40	29	18	41	12	A	•	•	
RI1EDX3/8A3C	400	5800	G 1A	G 3/8	-	40	29	18	41	12	A	•	•	
RI1EDX1/2A3C	400	5800	G 1A	G 1/2	-	40	29	18	41	14	A	•	•	
RI1EDX3/4A3C	400	5800	G 1A	G 3/4	20	40	49	18	41	22	A	•	•	
RI1EDX11/4A3C	400	5800	G 1A	G 1 1/4	20	40	57	18	55	26.5	B	•	•	
RI1EDX11/2A3C	315	4560	G 1A	G 1 1/2	20	40	59	18	60	28.5	B	•	•	
RI11/4EDX1/2A3C	400	5800	G 1 1/4A	G 1/2	-	50	32	20	50	14	A	•	•	
RI11/4EDX3/4A3C	400	5800	G 1 1/4A	G 3/4	-	50	32	20	50	16	A	•	•	
RI11/4EDX1A3C	400	5800	G 1 1/4A	G 1	25	50	53	20	50	24.5	B	•	•	
RI11/4EDX11/2A3C	315	4560	G 1 1/4A	G 1 1/2	25	50	60	20	60	28.5	B	•	•	
RI11/2EDX1/2A3C	315	4560	G 1 1/2A	G 1/2	-	55	36	22	55	14	A	•	•	
RI11/2EDX3/4A3C	315	4560	G 1 1/2A	G 3/4	-	55	36	22	55	16	A	•	•	
RI11/2EDX1A3C	315	4560	G 1 1/2A	G 1	-	55	36	22	55	18	A	•	•	
RI11/2EDX11/4A3C	315	4560	G 1 1/2A	G 1 1/4	32	55	58	22	55	26.5	B	•	•	
RI2EDX11/2A3C	250	3620	G 2 A	G 1 1/2	40	72	65	24	70	28.5	B	•		

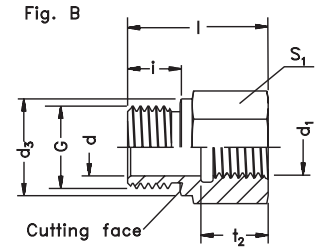
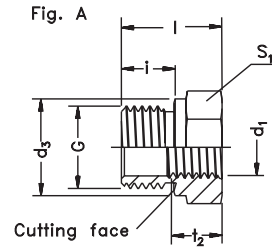
\*For replacement ED seals, see page J127.



# Reducing Adapter/Expander

# RI

Male BSPP, DIN 3852, Form B  
Cutting Face / Female BSPP



All dimensions in millimeters.

TUBE FITTINGS PART #	WORKING PRESSURE		G MALE THREAD BSPP	d1 FEMALE THREAD BSPP	d	d3	l	i	S1	t2	Fig.	STANDARD MATERIAL FROM STOCK		
	bar	psi										S	SS	B
RI1/8X1/4A3CX	630	9130	G 1/8A	G 1/4	4	14	31	8	19	17	B	•	•	•
RI1/8X3/8A3CX	630	9130	G 1/8A	G 3/8	4	14	32	8	24	17	B	•	•	•
RI1/4X1/8A3CX	630	9130	G 1/4A	G 1/8	5	18	28	12	19	12	B	•	•	•
RI1/4X3/8A3CX	630	9130	G 1/4A	G 3/8	5	18	36	12	24	17	B	•	•	•
RI1/4X1/2A3CX	630	9130	G 1/4A	G 1/2	5	18	40	12	30	20	B	•	•	•
RI1/4X3/4A3CX	400	5800	G 1/4A	G 3/4	5	18	43	12	36	22	B	•	•	•
RI3/8X1/8A3CX	630	9130	G 3/8A	G 1/8	-	22	22.5	12	22	8	A	•	•	•
RI3/8X1/4A3CX	630	9130	G 3/8A	G 1/4	8	22	36	12	22	17	B	•	•	•
RI3/8X1/2A3CX	630	9130	G 3/8A	G 1/2	8	22	41	12	30	20	B	•	•	•
RI3/8X3/4A3CX	400	5800	G 3/8A	G 3/4	8	22	44	12	36	22	B	•	•	•
RI1/2X1/8A3CX	630	9130	G 1/2A	G 1/8	-	26	24	14	27	8	A	•	•	•
RI1/2X1/4A3CX	400	5800	G 1/2A	G 1/4	-	26	24	14	27	12	A	•	•	•
RI1/2X3/8A3CX	400	5800	G 1/2A	G 3/8	12	26	36	14	27	17	B	•	•	•
RI1/2X3/4A3CX	400	5800	G 1/2A	G 3/4	12	26	46	14	36	22	B	•	•	•
RI1/2X1A3CX	400	5800	G 1/2A	G 1	12	26	49	14	41	24.5	B	•	•	•
RI1/2X11/4A3CX	250	3620	G 1/2A	G 1 1/4	10	26	53	14	55	26.5	B	•	•	•
RI3/4X1/4A3CX	400	5800	G 3/4A	G 1/4	-	32	26	16	32	12	A	•	•	•
RI3/4X3/8A3CX	400	5800	G 3/4A	G 3/8	-	32	26	16	32	12	A	•	•	•
RI3/4X1/2A3CX	400	5800	G 3/4A	G 1/2	16	32	41	16	32	20	B	•	•	•
RI3/4X1A3CX	400	5800	G 3/4A	G 1	16	32	51	16	41	24.5	B	•	•	•
RI3/4X11/4A3CX	250	3620	G 3/4A	G 1 1/4	16	32	55	16	55	26.5	B	•	•	•
RI3/4X11/2A3CX	250	3620	G 3/4A	G 1 1/2	16	32	57	16	60	28.5	B	•	•	•
RI1X1/4A3CX	400	5800	G 1A	G 1/4	-	39	29	18	41	12	A	•	•	•
RI1X3/8A3CX	400	5800	G 1A	G 3/8	-	39	29	18	41	12	A	•	•	•
RI1X1/2A3CX	400	5800	G 1A	G 1/2	-	39	29	18	41	14	A	•	•	•
RI1X3/4A3CX	400	5800	G 1A	G 3/4	20	39	47	18	41	22	B	•	•	•
RI1X11/4A3CX	250	3620	G 1A	G 1 1/4	20	39	57	18	55	26.5	B	•	•	•
RI1X11/2A3CX	250	3620	G 1A	G 1 1/2	20	39	59	18	60	28.5	B	•	•	•
RI11/4X1/2A3CX	250	3620	G 1 1/4A	G 1/2	-	49	32	20	50	14	A	•	•	•
RI11/4X3/4A3CX	250	3620	G 1 1/4A	G 3/4	-	49	32	20	50	16	A	•	•	•
RI11/4X1A3CX	250	3620	G 1 1/4A	G 1	25	49	52	20	50	24.5	B	•	•	•
RI11/4X11/2A3CX	250	3620	G 1 1/4A	G 1 1/2	25	49	60	20	60	28.5	B	•	•	•
RI11/2X1/2A3CX	250	3620	G 1 1/2A	G 1/2	-	55	36	22	55	14	A	•	•	•
RI11/2X3/4A3CX	250	3620	G 1 1/2A	G 3/4	-	55	36	22	55	16	A	•	•	•
RI11/2X1A3CX	250	3620	G 1 1/2A	G 1	-	55	36	22	55	18	A	•	•	•
RI11/2X11/4A3CX	250	3620	G 1 1/2A	G 1 1/4	32	55	58	22	55	26.5	B	•	•	•
RI2X11/2A3CX	250	3620	G 2A	G 1 1/2	40	68	62	24	70	28.5	B	•	•	•

# Male Pipe Adapter

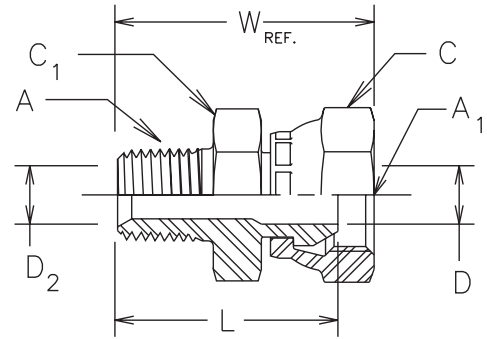
# 0107

NPSM swivel / male pipe thread

SAE 140130

Part Number Information  
0107 - Body only

All dimensions are in inches



TUBE FITTING PART #	PIPE SIZE	A PIPE THD NPTF	A1 SWIVEL THD NPSM	C HEX	C1 HEX	D DRILL	D2 DRILL	L	W	STANDARD MATERIAL FROM STOCK		
										S	SS	B
0107-2-2	1/8	1/8-27	1/8-27	9/16	9/16	.156	.188	0.94	1.09	•		
0107-2-4	1/8	1/8-27	1/4-18	11/16	5/8	.219	.188	1.06	1.24	•		
0107-4-4	1/4	1/4-18	1/4-18	11/16	11/16	.219	.281	1.25	1.43	•		
0107-4-6	1/4	1/4-18	3/8-18	7/8	13/16	.344	.281	1.25	1.45	•		
0107-4-8	1/4	1/4-18	1/2-14	1	15/16	.469	.281	1.44	1.44	•		
0107-6-4	3/8	3/8-18	1/4-18	11/16	11/16	.219	.406	1.31	1.49	•		
0107-6-6	3/8	3/8-18	3/8-18	7/8	7/8	.344	.406	1.31	1.51	•		
0107-6-8	3/8	3/8-18	1/2-14	1	15/16	.469	.406	1.44	1.73	•		
0107-8-6	1/2	1/2-14	3/8-18	7/8	7/8	.344	.531	1.50	1.70	•		
0107-8-8	1/2	1/2-14	1/2-14	1	1	.469	.531	1.62	1.91	•		
0107-8-12	1/2	1/2-14	3/4-14	1 1/4	1 1/4	.641	.531	1.69	2.04	•		
0107-12-8	3/4	3/4-14	1/2-14	1	1 1/8	.469	.719	1.62	1.91	•		
0107-12-12	3/4	3/4-14	3/4-14	1 1/4	1 1/4	.641	.719	1.69	2.04	•		
0107-12-16	3/4	3/4-14	1-11 1/2	1 1/2	1 1/2	.844	.719	1.80	2.17	•		
0107-16-12	1	1-11 1/2	3/4-14	1 1/2	1 3/8	.641	.938	1.94	2.29	•		
0107-16-16	1	1-11 1/2	1-11 1/2	1 1/2	1 1/2	.844	.938	2.00	2.37	•		
0107-16-20	1	1-11 1/2	1 1/4-11 1/2	1 7/8	1 3/4	1.141	.938	2.00	2.38	•		
0107-20-16	1 1/4	1 1/4-11 1/2	1-11 1/2	1 1/2	1 7/8	.844	1.250	2.09	2.46	•		
0107-20-20	1 1/4	1 1/4-11 1/2	1 1/4-11 1/2	1 7/8	1 7/8	1.141	1.250	2.09	2.47	•		
0107-24-24	1 1/2	1 1/2-11 1/2	1 1/2-11 1/2	2 1/8	2 1/8	1.359	1.500	2.19	2.61	•		
0107-32-32	2	2-11 1/2	2-11 1/2	2 5/8	2 5/8	1.813	1.938	2.37	2.80	•		



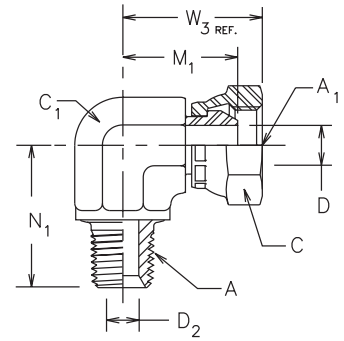
# Male Pipe Elbow

# 2107

NPSM swivel / male pipe thread

SAE 140230

Part Number Information  
2107 - Body only



All dimensions are in inches

TUBE FITTING PART #	PIPE SIZE	A PIPE THD NPTF	A1 SWIVEL THD NPSM	C HEX	C1 HEX	D DRILL	D2 DRILL	M1	N1	W3	STANDARD MATERIAL FROM STOCK		
											S	SS	B
2107-2-2	1/8	1/8-27	1/8-27	9/16	7/16	.156	.188	.70	.72	.85	•		
2107-4-4	1/4	1/4-18	1/4-18	11/16	9/16	.219	.281	.88	1.09	1.06	•		
2107-4-6	1/4	1/4-18	3/8-18	7/8	3/4	.344	.281	.99	1.09	1.28	•		
2107-6-4	3/8	3/8-18	1/4-18	11/16	3/4	.219	.406	.99	1.22	1.17	•		
2107-6-6	3/8	3/8-18	3/8-18	7/8	3/4	.344	.406	.99	1.22	1.28	•		
2107-6-8	3/8	3/8-18	1/2-14	1	3/4	.469	.406	1.04	1.22	1.33	•		
2107-8-6	1/2	1/2-14	3/8-18	7/8	7/8	.344	.531	1.06	1.47	1.35	•		
2107-8-8	1/2	1/2-14	1/2-14	1	7/8	.469	.531	1.11	1.47	1.40	•		
2107-8-12	1/2	1/2-14	3/4-14	1 1/4	1 1/16	.641	.531	1.30	1.47	1.65	•		
2107-12-6	3/4	3/4-14	3/8-18	7/8	1 1/16	.344	.719	1.19	1.59	1.48	•		
2107-12-8	3/4	3/4-14	1/2-14	1	1 1/16	.469	.719	1.24	1.59	1.53	•		
2107-12-12	3/4	3/4-14	3/4-14	1 1/4	1 1/16	.641	.719	1.30	1.59	1.65	•		
2107-16-12	1	1-11 1/2	3/4-14	1 1/4	1 5/16	.641	.938	1.47	1.97	1.82	•		
2107-16-16	1	1-11 1/2	1-11 1/2	1 1/2	1 5/16	.844	.938	1.54	1.97	1.91	•		
2107-20-20	1 1/4	1 1/4-11 1/2	1 1/4-11 1/2	1 7/8	1 5/8	1.141	1.250	1.73	2.38	2.11	•		
2107-24-24	1 1/2	1 1/2-11 1/2	1 1/2-11 1/2	2 1/8	1 7/8	1.359	1.500	1.89	2.64	2.31	•		
2107-32-32	2	2-11 1/2	2-11 1/2	2 5/8	2 1/2	1.813	1.938	2.27	3.00	2.70	•		

# 45° Male Pipe Elbow

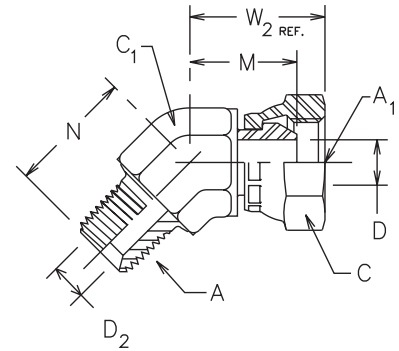
## 3107

NPSM swivel / male pipe thread

SAE 140330

Part Number Information  
3107 - Body only

All dimensions are in inches



TUBE FITTING PART #	PIPE SIZE	A PIPE THD NPTF	A1 SWIVEL THD NPSM	C HEX	C1 HEX forg	D DRILL	D2 DRILL	M	N	W2	STANDARD MATERIAL FROM STOCK		
											S	SS	B
3107-2-2	1/8	1/8-27	1/8-27	9/16	7/16	.156	.188	.62	.52	.77	•		
3107-4-4	1/4	1/4-18	1/4-18	11/16	9/16	.219	.281	.73	.86	.91	•		
3107-6-6	3/8	3/8-18	3/8-1/8	7/8	3/4	.344	.406	.81	.95	1.10	•		
3107-8-6	1/2	1/2-14	3/8-1/8	7/8	7/8	.344	.531	.81	1.17	1.10	•		
3107-8-8	1/2	1/2-14	1/2-14	1	7/8	.469	.531	.88	1.17	1.17	•		
3107-8-12	1/2	1/2-14	3/4-14	1 1/4	1 1/16	.641	.531	.87	1.20	1.22	•		
3107-12-8	3/4	3/4-14	1/2-14	1	1 1/16	.469	.719	.94	1.20	1.23	•		
3107-12-12	3/4	3/4-14	3/4-14	1 1/4	1 1/16	.641	.719	1.02	1.20	1.37	•		
3107-16-12	1	1-11 1/2	3/4-14	1 1/4	1 5/16	.641	.938	1.12	1.48	1.47	•		
3107-16-16	1	1-11 1/2	1-11 1/2	1 1/2	1 5/16	.844	.938	1.15	1.48	1.52	•		
3107-20-20	1 1/4	1 1/4-11 1/2	1 1/4-11 1/2	1 7/8	1 5/8	1.141	1.250	1.23	1.67	1.61	•		
3107-24-24	1 1/2	1 1/2-11 1/2	1 1/2-11 1/2	2 1/8	1 7/8	1.359	1.500	1.35	1.77	1.77	•		
3107-32-32	2	2-11 1/2	2-11 1/2	2 5/8	2 1/2	1.813	1.938	1.46	2.11	1.89	•		



# Female Pipe Adapter

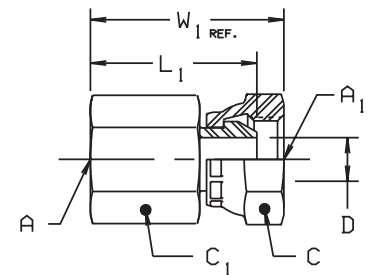
## 0207

NPSM swivel / female pipe thread

SAE 140131

Part Number Information  
0207 - Body only

All dimensions are in inches



TUBE FITTING PART #	PIPE SIZE	A PIPE THD NPTF	A1 SWIVEL THD NPSM	C HEX	C1 HEX	D DRILL	L1	W1	STANDARD MATERIAL FROM STOCK		
									S	SS	B
0207-2-2	1/8	1/8-27	1/8-27	9/16	9/16	.156	.87	1.02	•		
0207-4-4	1/4	1/4-18	1/4-18	11/16	11/16	.219	1.25	1.43	•		
0207-6-4	3/8	3/8-18	1/4-18	11/16	7/8	.219	1.31	1.49	•		
0207-6-6	3/8	3/8-18	3/8-18	7/8	7/8	.344	1.31	1.51	•		
0207-8-6	1/2	1/2-14	3/8-18	7/8	1	.344	1.45	1.65	•		
0207-8-8	1/2	1/2-14	1/2-14	1	1	.469	1.50	1.79	•		
0207-12-12	3/4	3/4-14	3/4-14	1 1/4	1 1/4	.641	1.62	1.97	•		
0207-16-16	1	1-11 1/2	1-11 1/2	1 1/2	1 1/2	.844	2.00	2.37	•		
0207-20-20	1 1/4	1 1/4-11 1/2	1 1/4-11 1/2	1 7/8	1 7/8	1.141	2.00	2.38	•		
0207-24-24	1 1/2	1 1/2-11 1/2	1 1/2-11 1/2	2 1/8	2 1/8	1.359	2.00	2.42	•		
0207-32-32	2	2-11 1/2	2-11 1/2	2 5/8	2 5/8	1.813	2.12	2.55	•		

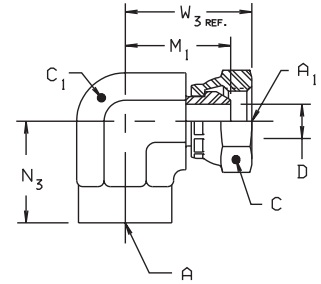
# Female Pipe Elbow

## 2207

NPSM swivel / female pipe thread

SAE 140231

Part Number Information  
2207 - Body only



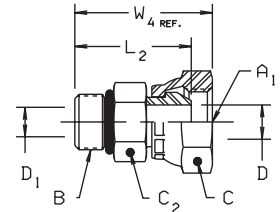
All dimensions are in inches

TUBE FITTING PART #	PIPE SIZE	A PIPE THD NPTF	A1 SWIVEL THD NPSM	C HEX	C1 HEX	D DRILL	M1	W3	N3	STANDARD MATERIAL FROM STOCK		
										S	SS	B
2207-2-2	1/8	1/8-27	1/8-27	9/16	9/16	.156	.80	.95	.66	•		
2207-4-4	1/4	1/4-18	1/4-18	11/16	3/4	.219	.99	1.17	.88	•		
2207-6-6	3/8	3/8-18	3/8-1/8	7/8	7/8	.344	1.06	1.26	1.02	•		
2207-8-8	1/2	1/2-14	1/2-14	1	1 1/16	.469	1.24	1.53	1.23	•		
2207-12-12	3/4	3/4-14	3/4-14	1 1/4	1 5/16	.641	1.47	1.82	1.36	•		
2207-16-16	1	1-11 1/2	1-11 1/2	1 1/2	1 5/8	.844	1.73	2.10	1.62	•		
2207-20-20	1 1/4	1 1/4-11 1/2	1 1/4-11 1/2	1 7/8	1 7/8	1.141	1.83	2.21	1.70	•		
2207-24-24	1 1/2	1 1/2-11 1/2	1 1/2-11 1/2	2 1/8	2 1/2	1.359	2.41	2.83	2.08	•		
2207-32-32	2	2-11 1/2	2-11 1/2	2 5/8	2 13/16	1.813	2.57	3.00	2.39	•		

# Straight Thread Adapter

## 0507

NPSM swivel / SAE O-ring boss  
SAE 140157



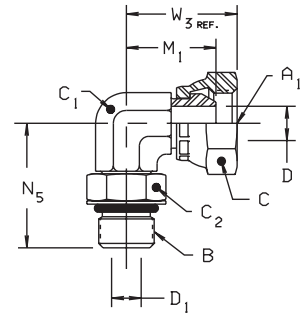
All dimensions are in inches

TUBE FITTING PART #	PORT SIZE	B PORT THD UN/UNF-2A	A1 SWIVEL THD NPSM	C HEX	C2 HEX body	D DRILL	D1 DRILL port	L2	W4	STANDARD MATERIAL FROM STOCK		
										S	SS	B
0507-4-4	4	7/16-20	1/4-18	11/16	9/16	.219	.219	1.14	1.32	•		
0507-6-4	6	9/16-18	1/4-18	11/16	11/16	.219	.219	1.17	1.35	•		
0507-6-6	6	9/16-18	3/8-18	7/8	11/16	.344	.344	1.17	1.37	•		
0507-6-8	6	9/16-18	1/2-14	1	3/4	.297	.297	1.28	1.57	•		
0507-8-4	8	3/4-16	1/4-18	11/16	7/8	.219	.391	1.25	1.43	•		
0507-8-6	8	3/4-16	3/8-18	7/8	7/8	.344	.344	1.25	1.45	•		
0507-8-8	8	3/4-16	1/2-14	1	7/8	.391	.391	1.27	1.56	•		
0507-8-12	8	3/4-16	3/4-14	1 1/4	1	.641	.391	1.44	1.79	•		
0507-10-8	10	7/8-14	1/2-14	1	1	.469	.469	1.44	1.73	•		
0507-12-8	12	1 1/16-12	1/2-14	1	1 1/4	.469	.469	1.59	1.88	•		
0507-12-12	12	1 1/16-12	3/4-14	1 1/4	1 1/4	.641	.641	1.62	1.97	•		
0507-16-16	16	1 5/16-12	1-11 1/2	1 1/2	1 1/2	.844	.844	1.75	2.12	•		
0507-20-20	20	1 5/8-12	1 1/4-11 1/2	1 7/8	1 7/8	1.078	1.078	1.83	2.21	•		
0507-24-24	24	1 7/8-12	1 1/2-11 1/2	2 1/8	2 1/8	1.312	1.312	1.97	2.39	•		
0507-32-32	32	2 1/2-12	2-11 1/2	2 5/8	2 3/4	1.781	1.781	2.06	2.49	•		

# Straight Thread Adapter

## 2507

NPSM swivel / SAE O-ring boss  
SAE 140257



All dimensions are in inches

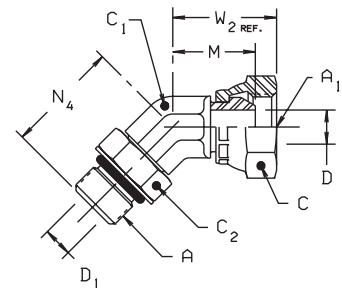
TUBE FITTING PART #	PORT SIZE	B PORT THD UN/UNF-2A	A1 SWIVEL THD NPSM	C HEX	C1 HEX	C2 HEX	D DRILL	D1 DRILL	M1	W3	N5	STANDARD MATERIAL FROM STOCK		
												S	SS	B
2507-4-4	4	7/16-20	1/4-18	11/16	7/16	9/16	.219	.172	.79	.97	1.03	•		
2507-6-4	6	9/16-18	1/4-18	11/16	9/16	11/16	.219	.297	.88	1.06	1.25	•		
2507-6-6	6	9/16-18	3/8-18	7/8	9/16	11/16	.344	.297	.90	1.10	1.25	•		
2507-6-8	6	9/16-18	1/2-14	1	3/4	11/16	.469	.297	1.04	1.33	1.26	•		
2507-8-6	8	3/4-16	3/8-18	7/8	3/4	7/8	.344	.391	.99	1.19	1.45	•		
2507-8-8	8	3/4-16	1/2-14	1	3/4	7/8	.469	.391	1.04	1.33	1.45	•		
2507-8-12	8	3/4-16	3/4-14	1 1/4	3/4	7/8	.641	.391	1.30	1.65	1.62	•		
2507-10-6	10	7/8-14	3/8-18	7/8	7/8	1	.344	.484	1.06	1.26	1.70	•		
2507-10-8	10	7/8-14	1/2-14	1	7/8	1	.469	.484	1.11	1.40	1.70	•		
2507-10-12	10	7/8-14	3/4-14	1 1/4	7/8	1	.641	.484	1.27	1.62	1.78	•		
2507-12-8	12	1 1/16-12	1/2-14	1	1 1/16	1 1/4	.469	.609	1.21	1.50	1.94	•		
2507-12-12	12	1 1/16-12	3/4-14	1 1/4	1 1/16	1 1/4	.641	.609	1.30	1.65	1.94	•		
2507-16-16	16	1 5/16-12	1-11 1/2	1 1/2	1 5/16	1 1/2	.844	.844	1.54	1.91	2.05	•		
2507-20-20	20	1 5/8-12	1 1/4-11 1/2	1 7/8	1 5/8	1 7/8	1.141	1.078	1.78	2.16	2.25	•		
2507-24-24	24	1 7/8-12	1 1/2-11 1/2	2 1/8	1 7/8	2 1/8	1.359	1.312	1.89	2.31	2.39	•		



# 45° Straight Thread Adapter

## 3507

NPSM swivel / SAE O-ring boss  
SAE 140357



All dimensions are in inches

TUBE FITTING PART #	PORT SIZE	B PORT THD UN/UNF-2A	A1 SWIVEL THD NPSM	C HEX	C1 HEX	C2 HEX	D DRILL	D1 DRILL	M	W2	N4	STANDARD MATERIAL FROM STOCK		
												S	SS	B
3507-4-4	4	7/16-20	1/4-18	11/16	7/16	9/16	.219	.172	.61	.79	1.05	•		
3507-6-6	6	9/16-18	3/8-18	7/8	9/16	11/16	.344	.297	.83	1.03	1.14	•		
3507-8-6	8	3/4-16	3/8-18	7/8	3/4	7/8	.344	.391	.82	1.02	1.30	•		
3507-8-8	8	3/4-16	1/2-14	1	3/4	7/8	.469	.391	.89	1.18	1.30	•		
3507-8-12	8	3/4-16	3/4-14	1 1/4	3/4	7/8	.641	.391	1.02	1.37	1.41	•		
3507-10-8	10	7/8-14	1/2-14	1	7/8	1	.469	.484	.88	1.17	1.52	•		
3507-12-12	12	1 1/16-12	3/4-14	1 1/4	1 1/16	1 1/4	.641	.609	1.02	1.37	1.73	•		
3507-16-16	16	1 5/16-12	1-11 1/2	1 1/2	1 5/16	1 1/2	.844	.844	1.15	1.52	1.86	•		

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