
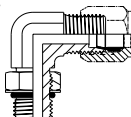
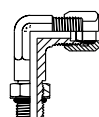
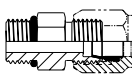
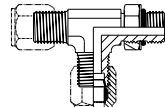
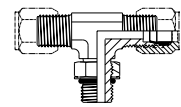
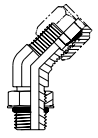

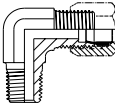
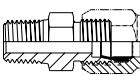
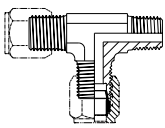
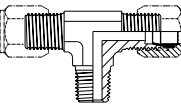
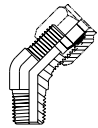

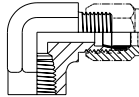
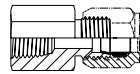
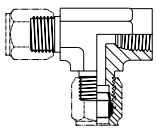
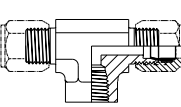

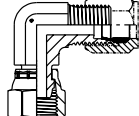
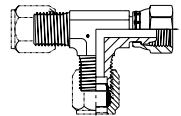
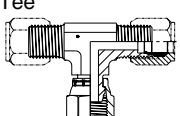

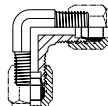
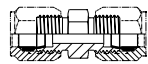
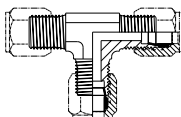
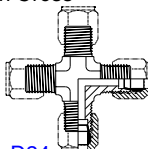
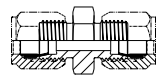
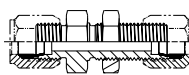
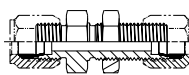
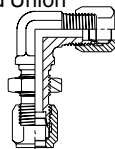

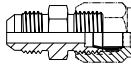
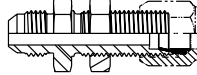




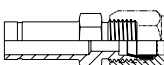


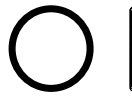


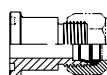
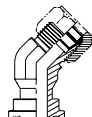


Ferulok® Bite Type Fittings



The Fitting Authority

<p>Flareless Tube to Straight Thread UNF</p> 	<p>C5BU Straight Thread Elbow</p>  <p>Page D12</p>	<p>CC5BU Long Straight Thread Elbow</p>  <p>Page D12</p>	<p>F5BU Straight Thread Connector</p>  <p>Page D13</p>	<p>R5BU Straight Thread Run Tee</p>  <p>Page D14</p>	<p>S5BU Straight Thread Branch Tee</p>  <p>Page D14</p>
<p>V5BU Straight Thread 45° Elbow</p>  <p>Page D15</p>	<p>Flareless Tube to Male NPTF</p> 	<p>CBU Male Elbow</p>  <p>Page D16</p>	<p>FBU Male Connector</p>  <p>Page D17</p>	<p>RBU Male Run Tee</p>  <p>Page D18</p>	<p>SBU Male Branch Tee</p>  <p>Page D18</p>
<p>VBU Male 45° Elbow</p>  <p>Page D19</p>	<p>Flareless Tube to Female NPTF</p> 	<p>DBU Female Elbow</p>  <p>Page D19</p>	<p>GBU Female Connector</p>  <p>Page D20</p>	<p>MBU Female Run Tee</p>  <p>Page D20</p>	<p>OBU Female Branch Tee</p>  <p>Page D21</p>
<p>Flareless Tube to Swivel Nut</p> 	<p>C6BU Swivel Nut Elbow</p>  <p>Page D21</p>	<p>R6BU Swivel Nut Run Tee</p>  <p>Page D22</p>	<p>S6BU Swivel Nut Branch Tee</p>  <p>Page D22</p>	<p>Flareless Tube to Flareless Tube</p> 	<p>EBU Union Elbow</p>  <p>Page D23</p>
<p>HBU Union</p>  <p>Page D23</p>	<p>JBU Union Tee</p>  <p>Page D24</p>	<p>KBU Union Cross</p>  <p>Page D24</p>	<p>LHBU Large Hex Union</p>  <p>Page D25</p>	<p>Bulkhead Unions</p>  <p>Page D25</p>	<p>WBU Bulkhead Union</p>  <p>Page D25</p>
<p>WEBU Bulkhead Union Elbow</p>  <p>Page D26</p>	<p>Flareless Tube to 37° Flare Adapter</p> 	<p>XHBU Union Adapter</p>  <p>Page D26</p>	<p>XHBU2 Bulkhead Union Adapter</p>  <p>Page D27</p>	<p>Auxiliary Components</p>  <p>Page D27</p>	<p>BU Nut</p>  <p>Page D27</p>
<p>FNU Cap</p>  <p>Page D28</p>	<p>PNU Tube End Plug</p>  <p>Page D28</p>	<p>TRBU Tube End Reducer</p>  <p>Page D29</p>	<p>TU Ferrule</p>  <p>Page D29</p>	<p>WLN Bulkhead Locknut</p>  <p>Page C51</p>	<p>SAE O-Ring Straight Thread Port O-Ring</p>  <p>Page B45</p>
<p>Code 61 Flange Adapter</p> 	<p>BUEQ1 Code 61 Elbow</p>  <p>Page J17</p>	<p>BUHQ1 Code 61 Connector</p>  <p>Page J17</p>	<p>BUVQ1 Code 61 45° Elbow</p>  <p>Page J18</p>		

Introduction

The basic bite type fitting was first developed in Europe in the early 1930s. The Ferulok fitting was later developed by Parker Hannifin and introduced to the U.S. market in the mid-1940s. The Ferulok fitting design utilizes a combination of proven European features, coupled with many innovative product improvements instituted by Parker Hannifin. Today, the Ferulok fitting design and performance capabilities far exceed the strict requirements of SAE and military standards.

The Ferulok fitting is a flareless fitting that consists of a body, a one-piece precision machined ferrule, and a nut. On assembly, the ferrule “bites” into the outer surface of the tube with sufficient strength to hold the tube against pressure, without significant distortion of the inside tube diameter.

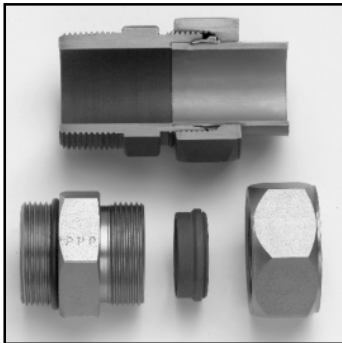


Fig. D1 — Ferulok components (fitting body, sleeve and nut), and Ferulok fitting cutaway

The ferrule also forms a pressure seal against the fitting body. Ferulok fittings allow the fitting assembler to visually inspect the bite quality, thus significantly minimizing the risk of improper assembly and related service problems.

Ferulok fittings are especially suitable for use with tube wall thicknesses ranging from medium to extra heavy. (Please refer to the [Table D2](#), “Recommended “Min./Max” Tube Wall Thickness for Ferulok.”) Ferulok’s robust construction and proven sealing characteristics have gained it worldwide popularity in diverse markets and applications. Ferulok fittings are routinely used in markets, such as: Machine tools, chemical, military, oil refineries, paper making, thermoplastics processing, etc.

Design and Construction

The three components of Ferulok fittings are designed and manufactured to produce a high pressure, leak-free joint upon proper assembly.

The Ferulok Body. Ferulok fitting bodies are available in over thirty-one configurations. The shaped products (i.e. elbows, tees, crosses) are hot forged, then machined to the stringent Ferulok fitting specifications. The forging process used by Parker further improves the strength and metallurgical properties of the fitting material.

Straight products are made from cold drawn bar stock. The cold drawing operation ensures consistently tight dimensional tolerances, as well as: significantly improved strength.

The Ferulok Ferrules. Ferulok fitting ferrules are precision machined with all dimensions and surfaces, particularly the critical bite edges, monitored on an on-going basis. Ferrules

are then heat treated in a manner that provides the hardness, strength, and toughness necessary to satisfy the demanding service conditions that exist in industry today.

The Ferulok Nuts. Ferulok fitting nuts are either cold formed to size and shape, or machined from cold drawn material. The cold forming and cold drawing operations provide a more tightly packed grain structure, thus improving the material’s strength. In addition, cold forming significantly improves the fatigue properties or endurance limits of the nuts.

Standard Material Specifications

The standard materials used in the manufacture of Ferulok fittings are shown below.

Ferulok Fittings	Steel		Stainless Steel	
	ASTM	Type	ASTM	Type
Forged Bodies	A576	1214/1215	A182	316
Bar Stock Bodies	A108	12L14	A479	316
Cold Formed Tube Nuts	A576	C1010	A479	316L
Bar Stock Tube Nuts	A108	12L14	A479	316
Tube Ferrules	A108	12L14	A564	630

Table D1 — Standard Material Specifications for Ferulok Fittings

Note: On request, Ferulok can be furnished in materials other than those shown in the material specifications chart.

Finish: Steel fittings are zinc gold chromated. Stainless steel fittings are passivated.

Conformance Standards

SAE Standard — Ferulok fittings satisfy the Hydraulic Flareless Tube Fittings Standard J514 published by the Society of Automotive Engineers (SAE).

NFPA / Hydraulic Standard — Ferulok fittings meet or exceed the performance requirements of National Fluid Power Association (NFPA), NFPA T3.8.3 standard for separable tube fittings for hydraulic fluid power applications.

A.S.M.E. Code For Pressure Piping — (American Society of Mechanical Engineers (ASME), “Code for Pressure Piping”). Ferulok fittings meet the flareless fitting design described in this code, and fully satisfy the code’s specifications for flareless fittings intended for use with pressure piping.

Military Specification - MIL-F-18866 — Some Ferulok parts conform to the requirements of specification sheets MS518XX under MIL-F-18866, and others do not. Please [contact the Tube Fitting Division](#) for conformance details.

Note: The above specification is approved for use by all departments and agencies of the Department of Defense for **non-aircraft** applications including ground support equipment. Ferulok fittings meet SAE J514, while the MS518XX specification sheets have not kept up with SAE J514. This is why some of the Ferulok parts do not conform to the MS requirements. The military and SAE are currently in the process of working out the details so the military can use SAE J514 conforming parts and cancel the military specification.



U.S. Army Ordnance Department Specifications — Ferulok fittings are fully qualified for the latest approved series of Ordnance Drawings 51811 through 51843 for flareless tube fittings used on ordnance vehicles. (Across the flats dimensions for sizes 2, 3, 5, & 14 forged fittings do not conform.)

U.S. Coast Guard — Ferulok fittings satisfy the applicable requirements of ASTM F1387, standard specification for performance of mechanically attached fittings.

How Ferulok Fittings Work

In assembly, the ferrule is driven forward on the tube by the nut during pre-set. As the ferrule moves forward it contacts the tapered seat area of the body, which causes the ferrule to cam inward into the tube. The leading edge of the hardened ferrule is thus able to make a clean 360 degree cut into the outside diameter of the tubing. This cut in the tubing is often referred to as a "Bite"; thus the term: Bite Type Fitting. As the ferrule makes its bite, a small ridge of tube material is plowed up in front of the ferrule.

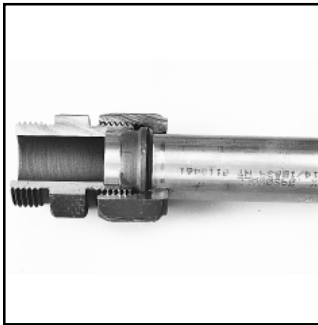


Fig. D2 — Ferrule enters fitting body

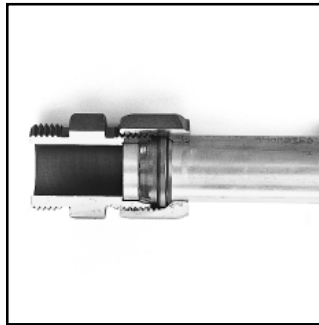


Fig. D3 — Ferrule cams inward and "bites" tubing

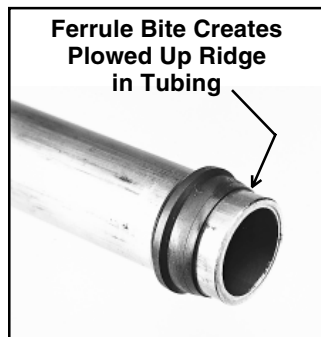


Fig. D4 — Plowed up ridge of tubing at ferrule's bite edge

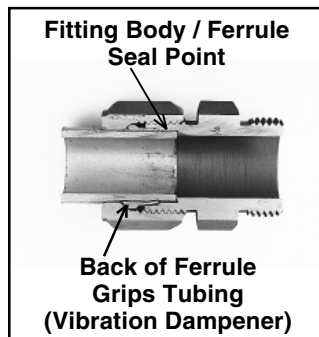


Fig. D5 — Ferrule bows and grips tubing at rear

The intimate contact of this tube ridge with the ferrule's front face and bite edge gives the fitting its ability to retain high pressure without leaking or blowing off. When properly assembled to the recommended tubing, Ferulok fittings will consistently seal until the applied pressure is high enough to cause tube burst.

Additionally, as the ferrule bites into the tubing, its mid-section bows and the inside diameter of the back area firmly grips the tubing. This keeps service stresses, particularly flexural and vibration loadings from being concentrated in the bite area, and adversely affecting the life of the connection.

A second seal point is also effected by the hard contact of the ferrule with the tapered seat area of the fitting body.

Table D2 provides the minimum and maximum values for wall thickness.

Tube Wall Thickness

Size		Steel St. Steel
O.D. Inches	Dash Number	SAE Flareless Ferulok
1/8	-2	.010 - .035
3/16	-3	.020 - .049
1/4	-4	.028 - .065
5/16	-5	.028 - .065
3/8	-6	.035 - .095
1/2	-8	.049 - .120
5/8	-10	.058 - .120
3/4	-12	.065 - .120
7/8	-14	.072 - .120
1	-16	.083 - .148
1 1/4	-20	.095 - .188
1 1/2	-24	.095 - .220
2	-32	.095 - .220

Table D2 — Recommended "Min./Max" Tube Wall Thickness for Ferulok

Maximum tube wall thickness is based on the pressure holding capability of Ferulok fittings. Tubing above the recommended range can be used. However, the pressure holding capability of the tube should be closely observed so as not to exceed the pressure capability of the fitting.

The proper Ferulok assembly procedures as outlined on pages D4 to D6 are critical to the performance of the fitting. Ferulok works best with seamless or welded and drawn fully annealed tubing. SAE J356, SAE J524, SAE J525 (max. hardness, RB72) or equivalent specification steel tubing is recommended for steel Ferulok fittings. For stainless steel Ferulok fittings, types 304 and 316 of ASTM A269, ASTM A213 (max. hardness, RB 90) or equivalent stainless steel tubing is recommended.

Assembly

Ferulok fitting assembly consists of the following steps: 1) cutting, deburring and cleaning the tube; 2) pre-setting the ferrule to the tubing; 3) inspection after pre-set; and 4) assembly or installation.

Cutting, Deburring and Cleaning

Cut tubing reasonably square (within $\pm 1^\circ$) using a circular toothed cut-off saw, or a hacksaw with a fine tooth blade. A square cut can be easily attained when a hacksaw is used with Parker Tru-Kut sawing vise.

Lightly deburr the I.D. and O.D. of the tube end to remove burrs and sharp edges. The Parker IN-EX deburring tool is adequate for this task. If a hacksaw is used to cut the tubing, a suitable grade emery paper may be used to remove burrs.

Remove metal chips from tube end using a brush or compressed air. Wipe clean the I.D. and O.D. of the deburred tube end with a clean rag.

Caution: Use only seamless or welded and drawn tubing that is fully annealed for bending and flaring. (See Table A30 for tube selection information.)

Ferrule Pre-Setting

1. Using Hyferset Tool or Hydra-Tool — Full instruction on the use of the Hyferset pre-setting tool (shown below) is described in Parker Bulletin 4393-B1 which is included in the Hyferset Kit #611049C. (Contact Parker's Tube Fittings Division if Bulletin 4393-B1 is missing from kit).

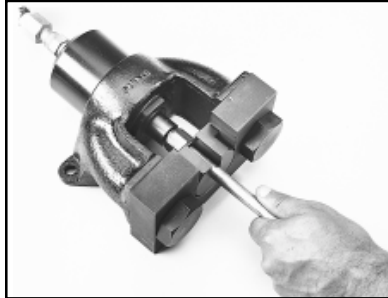


Fig. D6 — Hyferset Tool

Note: In order of preference, utilization of the Hyferset tool or Hydra-Tool (also available from Parker) to pre-set ferrule to tubing is the most desired method, particularly for fitting sizes larger than size 8. The Ferulset tool is the second choice; and pre-setting in the fitting body is the least desired method.

2. Using Ferulset Tool or Fitting Body — Ferulset pre-setting tools made from hardened steel are available for sizes 2 through 32. (See page N37.) To pre-set any of these sizes follow the instructions described below.



Fig. D7 — Lubricate thread and cone of tool and thread of nut.

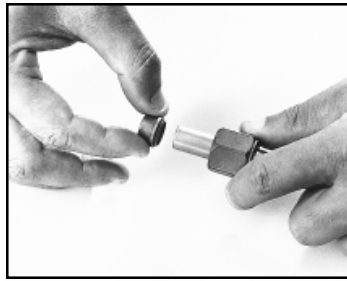


Fig. D8 — Slip nut and ferrule over deburred tube end. Be sure the long, straight end of the ferrule points toward tube end.

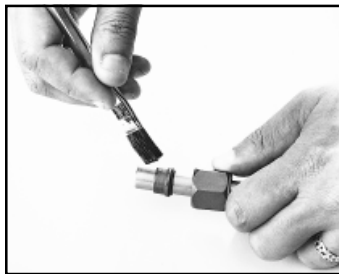


Fig. D9 — Lubricate ferrule.



Fig. D10 — Bottom tube end firmly on internal shoulder of Ferulset tool (or fitting body).

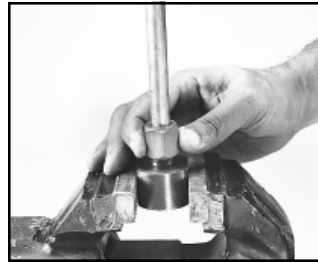


Fig. D11 — Manually screw nut onto Ferulset Tool or fitting body until finger tight.

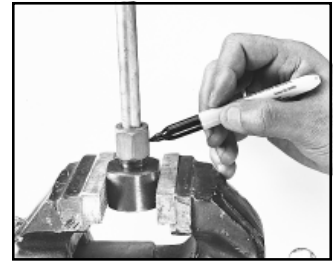


Fig. D12 — Make reference mark on nut and tube.

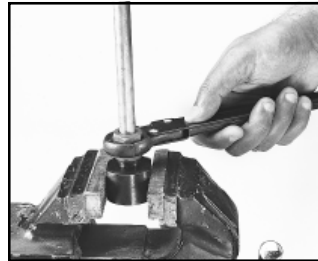


Fig. D13 — Hold tube steady against internal shoulder of Ferulset Tool or fitting body and tighten nut an additional 1 3/4 turns.

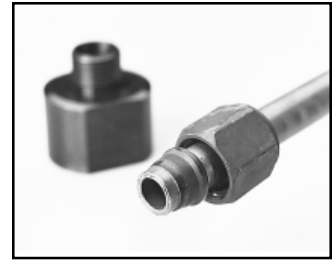


Fig. D14 — Loosen nut and check for proper pre-set. Use inspection criteria described below.

Ferrule Bite / Pre-Set Inspection

All Ferulok fitting tube joints must be disassembled and inspected for proper ferrule pre-set before final assembly for service. The following detailed inspection procedures must be followed regardless of the method used to pre-set the ferrule to the tube.

1. A ridge of metal (A) has been raised above the tube surface, to a height of at least 50% of the thickness of the ferrule's leading edge, completely around the tube.
2. While the leading edge of the ferrule may be coined flat (B) there is a slight bow to the balance of the pilot section (C).
3. The tail or back end of the ferrule is snug against the tube (D).

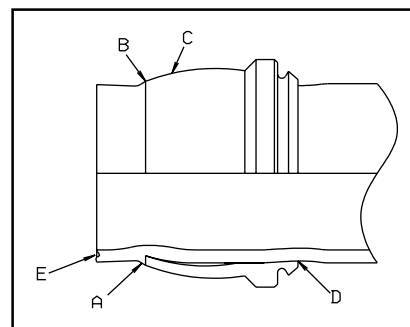


Fig. D15 — Ideal Pre-set

D

Technical Data

4. There is a slight indentation around the end of the tube (E) that indicates the tube was bottomed in the tool or fitting during pre-setting (if evidence of this complete contact is not visible the ferrule may not be properly pre-set).

5. Avoid rotating the ferrule. Steel ferrules should not be capable of moving back and forth along the tube beyond the bite area (a stainless steel ferrule will move more than steel because of its spring back characteristics).

Caution: Wrench torque should never be used as the gauge for reliable Ferulok pre-set and/or assembly (reliable pre-set and assembly of bite type fittings is dependent on the ferrule traveling a prescribed distance into the tapered fitting throat in order to bite into the tube and effect a strong grip and seal).

Assembly/Installation For Service

Use one of the following assembly/installation procedures, depending on the tooling used earlier to pre-set the ferrule to the tubing.

1. Fitting body used to pre-set ferrule — If the fitting body was used for ferrule pre-set, re-tighten the nut to the **same** fitting body used earlier in the pre-set. Tighten the nut until a sudden and noticeable wrench resistance is evident. **From this point, tighten the nut an additional 1/6 to 1/4 turn.** (An alternative method is to take the nut to the finger-tight position, then wrench tighten another 1/3 to 1/2 turn).

2. Hyferset, Hydra-Tool or Ferulset Tool Used to Pre-Set Ferrule — If one of these three tools was used for ferrule pre-set, select any appropriate fitting body and lubricate its thread. Conduct re-tightening identical to any of the methods described in procedure 1 (above).

3. Swivel nut assembly procedure (R6BU, C6BU and S6BU) — for final assembly of swivel nut end, a 3/4 turn from finger tight is required for all sizes.

Trouble Shooting Hints

Problems with bite type hydraulic fittings are most often traced to faulty Ferulset/assembly procedure.

Condition	Cause
Tube not bottomed	Check for the indentation on the tube end or compare the length from the end of the tube to the front end of the ferrule of a known good assembly to that of the assembly in question. This assembly should be scrapped. (Fig. D16)
Shallow bite	Inspect for turned up ridge of material. A failure to achieve this ridge can be traced either to the nut not being tightened enough or the tube not being bottomed against the stop which allowed the tube to travel forward with the ferrule. In some instances this assembly may be re-worked. (Fig. D17)
Over-set ferrule	Too much pressure or more than 1 3/4 turns from finger tight were used to pre-set ferrule, or the nut was severely over-tightened in final assembly. This assembly should be scrapped. (Fig. D18)
Ferrule cocked on tube	The ferrule may become cocked on the tube when the tube end is not properly lined up with the body. Generally, this condition is caused by faulty tube bending. All bent tube assemblies should drop into the fitting body prior to make up. This assembly should be scrapped. (Fig. D19)
No bite	If all of the prior checks have been made and the ferrule still shows no sign of biting the tube, it may be that the tube is too hard. This assembly should be scrapped. (Fig. D20)

Table D3 — Ferulok Fitting Trouble Shooting Hints

Caution: Pre-set tools such as the Ferulset and Hyferset are preferred for pre-setting ferrules prior to final assembly. However, when an actual fitting body is used to pre-set the ferrule, that body should be connected only to the specific ferrule it was used to pre-set.

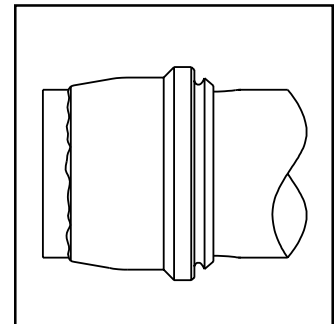


Fig. D16 — Tube not bottomed

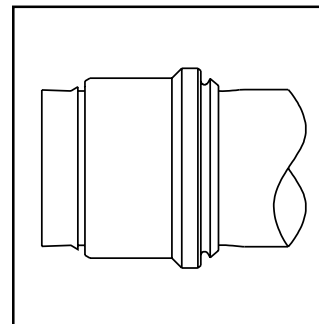


Fig. D17 — Shallow bite

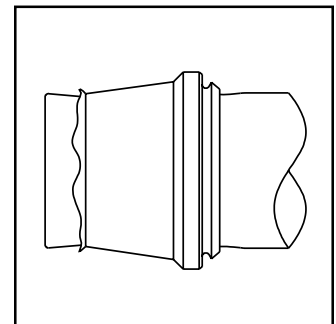


Fig. D18 — Over-set ferrule

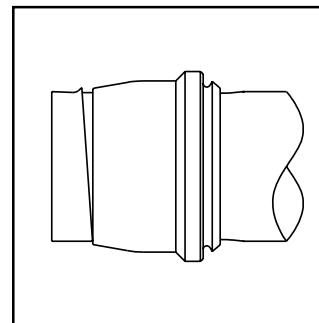


Fig. D19 — Ferrule cocked on tube

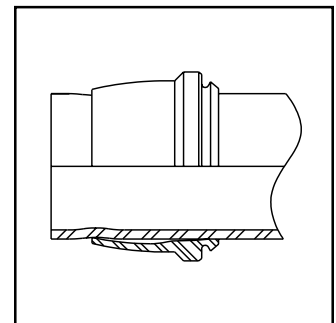


Fig. D20 — No bite

Features, Advantages & Benefits

- 1. Visible Bite** — The critical ferrule to tube bite is clearly visible to tube fitters and inspectors. The presence of the recommended bite virtually eliminates any risk of catastrophic blow-off. This is a very important safety feature.
- 2. Sealing Capability** — Ferulok fittings have demonstrated a remarkable ability to remain leak-free under various service conditions ranging from sealing high vacuum and small molecule gases to high pressure hydraulic fluids.
- 3. Distributed Stresses** — Stresses due to service flexural loading are distributed at several points in the joint, thus stress concentration in the bite is minimized.
- 4. Vibration Control** — The rear bevel of the ferrule firmly grips the tubing, thus dampening the effects of system vibration in the joint.
- 5. Envelope Size** — Ferulok fittings are comparatively small and compact, making it a suitable selection for plumbing in limited or tight space.
- 6. Temperature Rating** — Ferulok fittings are suitable for sub-zero through elevated temperature applications. Service temperature rating is limited by the material chosen.
- 7. Compatibility** — Since Ferulok fittings can be manufactured from a wide range of metals, its compatibility factor with various fluids and atmospheric conditions is virtually limitless. One simply has to select and specify Ferulok fittings from an acceptable material that best satisfies the service conditions.
- 8. Tube Wall** — Ferulok fittings are especially suitable for use with medium wall, heavy wall, and extra heavy wall tubing. (Please refer to Tube Wall Recommendations in [Table D2](#).)
- 9. Re-Usability / Remakeability** — Joints can be disassembled and reassembled many times to facilitate system maintenance. This reduces the labor and material costs that would otherwise result from tube and fittings replacement.
- 10. Assembly** — No expensive, complicated tooling is necessary to assemble Ferulok fittings. Assembly is simple when the procedures described on [pages D4 through D6](#) are followed.
- 11. Materials** — Ferulok fittings can be manufactured from almost any metallic material. The more popular materials currently used for Ferulok fittings are: Stainless steel, carbon steels and brass. On request the Tube Fittings Division will machine Ferulok fittings from other appropriate material specified by users.
- 12. Manufacture** — Ferulok fittings are manufactured under tight quality control which ensures that the product routinely satisfies or surpasses the requirements of the pertinent military and SAE standards.
- 13. Worldwide Popularity** — The bite type fitting design has worldwide acceptance and the metric version is especially popular in Europe.
- 14. Finish** — Steel Ferulok fittings have a zinc gold chromate finish. This finish provides good corrosion protection. Steel ferrules have a zinc phosphate finish which reduces assembly torque.
- 15. Black Nut** — Stainless steel tube nuts are pre-lubricated with a bonded dry film lubricant, making it unnecessary to use additional thread lubricant. Thread galling is eliminated and assembly torque is reduced as much as 50 percent.
- 16. Availability** — Ferulok fittings are available as standard in over thirty-one different configurations, and as many as twenty-seven different size combinations in some configurations.
- 17. Configurations** — Popular configurations for Ferulok fittings are shown in the Visual Index on [page D2](#). Other configurations can be manufactured on request.

D

Recommended Working Pressure, PSIG

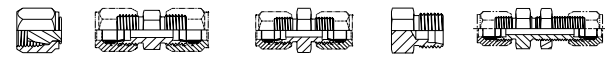
These recommended working pressures represent the capability of the subject fitting. Nevertheless, in some instances, the wall thickness or type of tubing, hose, or hose connector, assembled to the fitting may dictate the maximum pressure to which the assembly should be exposed. It is strongly suggested 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. [Contact Parker](#) for working pressures for all other materials not shown. 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.

				
	STATIC		DYNAMIC	
SIZE	STEEL	SS	STEEL	SS
2	10000	12000	6000	6000
3	10000	12000	6000	6000
4	10000	12000	6000	6000
5	10000	12000	6000	6000
6	10000	12000	6000	6000
6-4	10000	12000	6000	6000
8	8500	10200	5000	5000
8-4	8500	10200	5000	5000
8-6	8500	10200	5000	5000
10	8000	9600	5000	5000
10-4	8000	9600	5000	5000
10-6	8000	9600	5000	5000
10-8	8000	9600	5000	5000
12	7000	8400	4500	4500
12-4	7000	8400	4500	4500
12-6	7000	8400	4500	4500
12-8	7000	8400	4500	4500
12-10	7000	8400	4500	4500
14	6000	7200	4000	4000
14-6	6000	7200	4000	4000
14-10	6000	7200	4000	4000
14-12	6000	7200	4000	4000
16	6000	7200	4000	4000
16-12	6000	7200	4000	4000
16-14	6000	7200	4000	4000
20	5000	6000	3000	3000
20-12	5000	6000	3000	3000
20-16	5000	6000	3000	3000
24	4000	4800	2000	2000
24-20	3000	3600	2000	2000
32	2000	2400	1500	1500

				
	STATIC		DYNAMIC	
SIZE	STEEL	SS	STEEL	SS
2	10000	12000	5000	5000
3	10000	12000	5000	5000
4	10000	12000	5000	5000
5	10000	12000	5000	5000
6	10000	12000	5000	5000
6-4	10000	12000	6000	6000
8	8500	10200	5000	5000
8-4	8500	10200	5000	5000
8-6	8500	10200	5000	5000
10	8000	9600	5000	5000
10-4	8000	9600	5000	5000
10-6	8000	9600	5000	5000
10-8	8000	9600	5000	5000
12	7000	8400	4500	4500
12-4	7000	8400	4500	4500
12-6	7000	8400	4500	4500
12-8	7000	8400	4500	4500
12-10	7000	8400	4500	4500
14	6000	7200	4000	4000
14-6	6000	7200	4000	4000
14-10	6000	7200	4000	4000
14-12	6000	7200	4000	4000
16	6000	7200	4000	4000
16-12	6000	7200	4000	4000
16-14	6000	7200	4000	4000
20	5000	6000	3000	3000
20-12	5000	6000	3000	3000
20-16	5000	6000	3000	3000
24	3000	3600	2000	2000
24-20	3000	3600	2000	2000
32	2000	2400	1500	1500

Recommended Working Pressure, PSIG

SIZE	STATIC		DYNAMIC	
	STEEL	SS	STEEL	SS
	2	6500	6500	5000
3	6500	6500	5000	5000
4	6500	6500	5000	5000
4-5	6000	6000	5000	5000
4-6	6000	6000	5000	5000
5	6000	6000	5000	5000
6	6000	6000	5000	5000
6-8	6000	6000	5000	5000
8	6000	6000	5000	5000
8-10	5500	5500	4500	4500
8-12	5000	5000	4000	4000
10	5500	5500	4500	4500
10-12	5000	5000	4000	4000
12	5000	5000	4000	4000
12-16	4000	4000	3000	3000
14	4000	4000	3000	3000
14-16	4000	4000	3000	3000
16	4000	4000	3000	3000
16-12	4000	4000	3000	3000
16-20	3500	3500	2500	2500
20	3500	3500	2500	2500
20-24	2500	2500	2000	2000
24	2500	2500	2000	2000
24-32	2000	2000	1500	1500
32	2000	2000	1500	1500

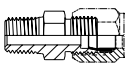
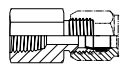
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10	5500	5500	4500	4500
12	5000	5000	4000	4000
14	4000	4000	3000	3000
16	4000	4000	3000	3000
20	3000	3000	2500	2500
24	3000	3000	2000	2000
32	2000	2000	1500	1500

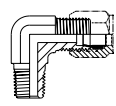
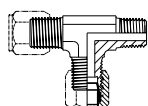
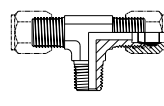
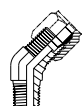
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	STEEL	SS	STEEL	SS
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6	8000	8000	5000	5000
8	8000	8000	5000	5000
10	5500	5500	4500	4500
12	5000	5000	4000	4000
16	4000	4000	3000	3000
20	3000	3000	2500	2500

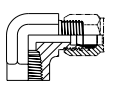
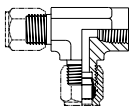
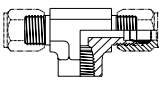
SIZE	STATIC		DYNAMIC	
	STEEL	SS	STEEL	SS
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4-5	8000	9600	5000	5000
4-6	8000	9600	5000	5000
4-10	7500	9000	5000	5000
5	8000	9600	5000	5000
6	8000	9600	5000	5000
6-8	8000	9600	5000	5000
8	8000	9600	5000	5000
8-10	7500	9000	5000	5000
8-12	7000	8400	4500	4500
10	7500	9000	5000	5000
10-12	7000	8400	4500	4500
12-8	7000	8400	4500	4500
12	7000	8400	4500	4500
12-16	5500	6600	4000	4000
14	5500	6600	4000	4000
14-16	5500	6600	4000	4000
16	5500	6600	4000	4000
16-12	5500	6600	4000	4000
16-20	4000	4800	3000	3000
20	4000	4800	3000	3000
20-24	4000	4800	3000	3000
24	4000	4800	3000	3000
24-32	2500	3000	2000	2000
32	2500	3000	2000	2000

D

Recommended Working Pressure, PSIG

					
		FBU		GBU	
SIZE	STATIC		DYNAMIC		
	STEEL	SS	STEEL	SS	
2	8000	9600	5000	5000	
2-4	8000	9600	5000	5000	
3	8000	9600	5000	5000	
4	8000	9600	5000	5000	
4-4	8000	9600	5000	5000	
4-6	8000	9600	5000	5000	
4-8	8000	9600	5000	5000	
5	8000	9600	5000	5000	
5-4	8000	9600	5000	5000	
6	8000	9600	5000	5000	
6-2	8000	9600	5000	5000	
6-6	8000	9600	5000	5000	
6-8	8000	9600	5000	5000	
8	8000	9600	5000	5000	
8-4	8000	9600	5000	5000	
8-8	8000	9600	5000	5000	
8-12	5500	6600	4000	4000	
10	6000	7200	4500	4500	
10-6	6000	7200	4500	4500	
12	5500	6600	4000	4000	
12-8	5500	6600	4000	4000	
14	4000	4800	3000	3000	
16	4000	4800	3000	3000	
16-12	4000	4800	3000	3000	
20	3000	3600	2500	2500	
24	3000	3600	2500	2500	
32	2500	3000	2000	2000	

									
		CBU*		RBU*		SBU*		VBU*	
SIZE	STATIC		DYNAMIC						
	STEEL	SS	STEEL	SS					
2	8000	8000	5000	5000					
2-4	8000	8000	5000	5000					
3	8000	8000	5000	5000					
4	8000	8000	5000	5000					
4-4	8000	8000	5000	5000					
4-6	8000	8000	5000	5000					
4-8	8000	8000	5000	5000					
5	8000	8000	5000	5000					
5-4	8000	8000	5000	5000					
6	8000	8000	5000	5000					
6-2	8000	8000	5000	5000					
6-6	8000	8000	5000	5000					
6-8	8000	8000	5000	5000					
8	8000	8000	5000	5000					
8-4	8000	8000	5000	5000					
8-8	8000	8000	5000	5000					
8-12	5500	5500	4000	4000					
10	6000	6000	4500	4500					
10-6	6000	6000	4500	4500					
12	5500	5500	4000	4000					
12-8	5500	5500	4000	4000					
14	4000	4000	3000	3000					
16	4000	4000	3000	3000					
16-12	4000	4000	3000	3000					
20	3000	3000	2500	2500					
24	3000	3000	2500	2500					
32	2500	2500	2000	2000					

							
		DBU*		MBU*		OBU*	
SIZE	STATIC		DYNAMIC				
	STEEL	SS	STEEL	SS			
2	7000	7000	5000	5000			
3	7000	7000	5000	5000			
4	7000	7000	5000	5000			
4-4	7000	7000	5000	5000			
5	7000	7000	5000	5000			
6	7000	7000	5000	5000			
6-6	6000	6000	4500	4500			
6-8	4000	4000	3000	3000			
8	4000	4000	3000	3000			
8-4	8000	8000	5000	5000			
8-8	4000	4000	3000	3000			
10	4000	4000	3000	3000			
12	4000	4000	3000	3000			
14	4000	4000	3000	3000			
16	2250	2250	1750	1750			
20	2000	2000	1500	1500			
24	2000	2000	1000	1000			
32	1250	1250	1000	1000			

* 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.

How to Order Information

How to Order Ferulok Fittings

Nomenclature

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

Sizes

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

Materials

Type 316 Stainless Steel and Steel. Ferulok tube fittings for special applications can be furnished in almost any material suitable for machining.

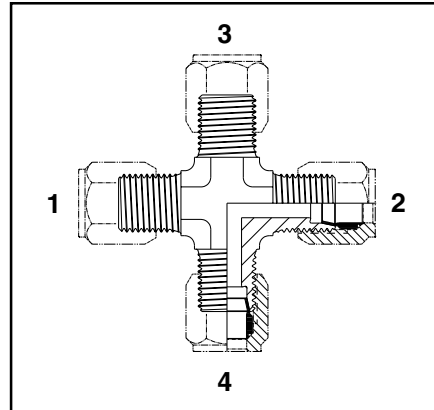
Example

Fitting needed — Ferulok Stainless Steel Male Connector for 1/4" O.D. Tube and 1/4" Male Pipe Thread. Part number 4-4FBU-SS.

<u>4-4</u>	<u>F</u>	<u>B</u>	<u>U</u>	-	<u>SS</u>
1/4" Tube O.D. (4/16") 1/4" Male Pipe Thread	Male Connector	Assembled Fitting	Parker Ferulok		Material Stainless Steel

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 [Parker Tube Fittings Division](#).

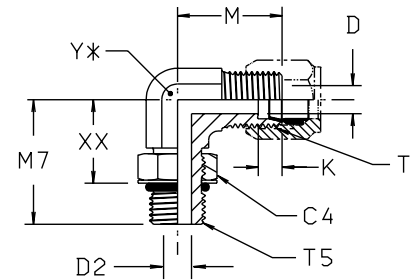
Straight Thread Elbow

C5BU

Flareless tube end / straight thread O-ring

SAE 080220

Part Number Information
C5U - Body only **MS518XX***
C5BU - Assembled fitting
C5OU - Body only with O-ring



*Y—ACROSS WRENCH FLATS

All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	T5 PORT THD UN/UNF-2A	C4 HEX (inch)	D DRILL (inch)	D2 DRILL (inch)	K (inch)	M (inch)	M7 (inch)	XX AFTER ASSY (inch)	Y (inch)	STANDARD MATERIAL FROM STOCK		
												S	SS	B
3 C5BU	3/16	3/8-24	3/8-24	1/2	0.125	0.125	0.24	0.84	0.94	0.64	7/16	•	•	
4 C5BU	1/4	7/16-20	7/16-20	9/16	0.203	0.203	0.24	0.89	1.03	0.67	7/16	•	•	
5 C5BU	5/16	1/2-20	1/2-20	5/8	0.234	0.234	0.26	0.95	1.13	0.77	9/16	•	•	
6 C5BU	3/8	9/16-18	9/16-18	11/16	0.282	0.282	0.26	1.05	1.25	0.86	9/16	•	•	
6-8 C5BU	3/8	9/16-18	3/4-16	7/8	0.282	0.422	0.26	1.14	1.45	1.01	3/4	•	•	
8 C5BU	1/2	3/4-16	3/4-16	7/8	0.422	0.422	0.31	1.25	1.45	1.01	3/4	•	•	
8-6 C5BU	1/2	3/4-16	9/16-18	11/16	0.422	0.282	0.31	1.27	1.33	0.94	3/4	•	•	
8-10 C5BU	1/2	3/4-16	7/8-14	1	0.422	0.500	0.31	1.34	1.70	1.20	7/8	•	•	
8-12 C5BU	1/2	3/4-16	1 1/16-12	1 1/4	0.422	0.656	0.31	1.43	1.94	1.35	1 1/16	•	•	
10 C5BU	5/8	7/8-14	7/8-14	1	0.500	0.500	0.36	1.42	1.70	1.20	7/8	•	•	
12 C5BU	3/4	1 1/16-12	1 1/16-12	1 1/4	0.656	0.656	0.36	1.58	1.94	1.35	1 1/16	•	•	
12-8 C5BU	3/4	1 1/16-12	3/4-16	7/8	0.656	0.422	0.36	1.58	1.63	1.19	1 1/16	•	•	
12-10 C5BU	3/4	1 1/16-12	7/8-14	1	0.656	0.500	0.36	1.58	1.78	1.28	1 1/16	•	•	
12-16 C5BU	3/4	1 1/16-12	1 5/16-12	1 1/2	0.656	0.875	0.36	1.73	2.05	1.46	1 5/16	•	•	
16 C5BU	1	1 5/16-12	1 5/16-12	1 1/2	0.875	0.875	0.42	1.73	2.05	1.46	1 5/16	•	•	
16-12 C5BU	1	1 5/16-12	1 1/16-12	1 1/4	0.875	0.656	0.42	1.73	2.05	1.46	1 5/16	•	•	
20 C5BU	1 1/4	1 5/8-12	1 5/8-12	1 7/8	1.093	1.093	0.42	1.89	2.25	1.66	1 5/8	•	•	
24 C5BU	1 1/2	1 7/8-12	1 7/8-12	2 1/8	1.344	1.344	0.49	2.02	2.39	1.80	1 7/8	•	•	
32 C5BU	2	2 1/2-12	2 1/2-12	2 3/4	1.813	1.813	0.49	2.45	2.89	2.23	2 1/2	•	•	

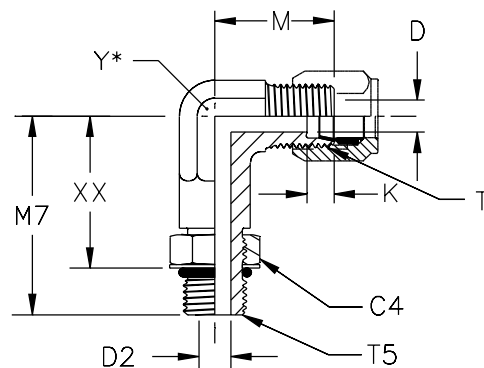
*See page D3.

Straight Thread Elbow

CC5BU

Flareless tube end / straight thread O-ring

Part Number Information
CC5U - Body only
CC5BU - Assembled fitting
CC5OU - Body only with O-ring

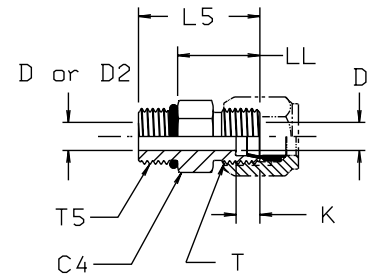


All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	T5 PORT THD UN/UNF-2A	C4 HEX (inch)	D DRILL (inch)	D2 DRILL (inch)	K (inch)	M (inch)	M7 (inch)	XX AFTER ASSY (inch)	Y (inch)	STANDARD MATERIAL FROM STOCK		
												S	SS	B
4 CC5BU	1/4	7/16-20	7/16-20	9/16	0.203	0.203	0.24	0.89	1.43	1.07	7/16	•	•	
6 CC5BU	3/8	9/16-18	9/16-18	11/16	0.282	0.282	0.26	1.05	1.72	1.33	9/16	•	•	
8 CC5BU	1/2	3/4-16	3/4-16	7/8	0.422	0.422	0.31	1.25	2.02	1.58	3/4	•	•	
10 CC5BU	5/8	7/8-14	7/8-14	1	0.500	0.500	0.36	1.42	2.39	1.89	7/8	•	•	
12 CC5BU	3/4	1 1/16-12	1 1/16-12	1.25	0.656	0.656	0.36	1.58	2.69	2.10	1 1/16	•	•	
16 CC5BU	1	1 5/16-12	1 5/16-12	1.5	0.875	0.875	0.42	1.73	3.13	2.54	1 5/16	•	•	

Straight Thread Connector

F5BU



Flareless tube end / straight thread O-ring

SAE 080120

Part Number Information
 F5U - Body only **MS518XX***
 F5BU - Assembled fitting
 F5OU - Body only with O-ring

All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	T5 PORT THD UN/UNF-2A	C4 HEX (inch)	D DRILL (inch)	D2 DRILL (inch)	K (inch)	L5 (inch)	LL AFTER ASSY (inch)	STANDARD MATERIAL FROM STOCK		
										S	SS	B
2 F5BU	1/8	5/16-24	5/16-24	7/16	0.094	0.094	0.19	1.00	0.70	•		
3 F5BU	3/16	3/8-24	3/8-24	1/2	0.125	0.125	0.24	1.05	0.75	•	•	
4 F5BU	1/4	7/16-20	7/16-20	9/16	0.203	0.203	0.24	1.13	0.77	•	•	
4-5 F5BU	1/4	7/16-20	1/2-20	5/8	0.203	0.234	0.24	1.13	0.77	•	•	
4-6 F5BU	1/4	7/16-20	9/16-18	11/16	0.203	0.281	0.24	1.20	0.81	•	•	
4-10 F5BU	1/4	7/16-20	7/8-14	1	0.203	0.500	0.24	1.40	0.90		•	
5 F5BU	5/16	1/2-20	1/2-20	5/8	0.234	0.234	0.26	1.13	0.77	•		
6 F5BU	3/8	9/16-18	9/16-18	11/16	0.281	0.281	0.26	1.22	0.83	•	•	
6-8 F5BU	3/8	9/16-18	3/4-16	7/8	0.281	0.422	0.26	1.28	0.84	•	•	
8 F5BU	1/2	3/4-16	3/4-16	7/8	0.422	0.422	0.31	1.38	0.94	•	•	
8-6 F5BU	1/2	3/4-16	9/16-18	13/16	0.422	0.281	0.31	1.28	0.89	•		
8-10 F5BU	1/2	3/4-16	7/8-14	1	0.422	0.500	0.31	1.50	1.00	•	•	
8-12 F5BU	1/2	3/4-16	1 1/16-12	1 1/4	0.422	0.656	0.31	1.67	1.08	•	•	
10 F5BU	5/8	7/8-14	7/8-14	1	0.500	0.500	0.36	1.56	1.06	•	•	
12 F5BU	3/4	1 1/16-12	1 1/16-12	1 1/4	0.656	0.656	0.36	1.78	1.19	•	•	
12-8 F5BU	3/4	1 1/16-12	3/4-16	1 1/8	0.656	0.422	0.36	1.75	1.19	•	•	
12-16 F5BU	3/4	1 1/16-12	1 5/16-12	1 1/2	0.656	0.875	0.36	1.81	1.22	•		
16 F5BU	1	1 5/16-12	1 5/16-12	1 1/2	0.875	0.875	0.42	1.81	1.22	•	•	
16-12 F5BU	1	1 5/16-12	1 1/16-12	1 3/8	0.875	0.656	0.42	1.81	1.22	•		
16-20 F5BU	1	1 5/16-12	1 5/8-12	1 7/8	0.875	1.093	0.42	1.91	1.31	•		
20 F5BU	1 1/4	1 5/8-12	1 5/8-12	1 7/8	1.093	1.093	0.42	1.91	1.31	•	•	
24 F5BU	1 1/2	1 7/8-12	1 7/8-12	2 1/8	1.344	1.344	0.49	1.97	1.37	•	•	
6-4 F5BU	3/8	9/19-18	7/16-20	5/8	0.281	0.203	0.26	1.19	0.83	•		
10-12 F5BU	5/8	7/8-14	1 1/16-12	1 1/4	0.500	0.500	0.36	1.73	1.14	•		
32 F5BU	2	2 1/2-12	2 1/2-12	2 3/4	1.813	1.813	0.49	2.13	1.53	•		

*See page D3.



Straight Thread Run Tee

R5BU

Flareless tube ends / straight thread O-ring

SAE 080428

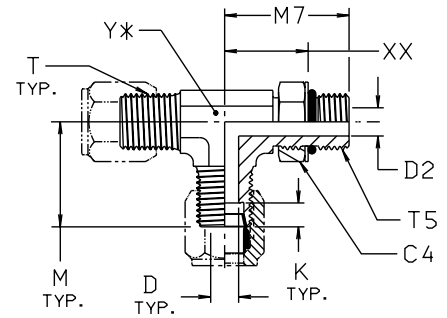
Part Number Information

R5U - Body only **MS518XX***

R5BU - Assembled fitting

R5OU - Body only with O-ring

All dimensions are in inches



*Y—ACROSS WRENCH FLATS

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	T5 PORT THD UN/UNF-2A	C4 HEX (inch)	D DRILL (inch)	D2 DRILL (inch)	K (inch)	M (inch)	M7 (inch)	XX AFTER ASSY (inch)	Y (inch)	STANDARD MATERIAL FROM STOCK		
												S	SS	B
4 R5BU	1/4	7/16-20	7/16-20	9/16	0.203	0.203	0.24	0.89	1.03	0.67	7/16	•	•	
6 R5BU	3/8	9/16-18	9/16-18	11/16	0.282	0.282	0.26	1.05	1.25	0.86	9/16	•	•	
8 R5BU	1/2	3/4-16	3/4-16	7/8	0.422	0.422	0.31	1.25	1.45	1.01	3/4	•	•	
10 R5BU	5/8	7/8-14	7/8-14	1	0.500	0.500	0.36	1.42	1.70	1.20	7/8	•	•	
12 R5BU	3/4	1 1/16-12	1 1/16-12	1 1/4	0.656	0.656	0.36	1.58	1.94	1.35	1 1/16	•	•	
16 R5BU	1	1 5/16-12	1 5/16-12	1 1/2	0.875	0.875	0.42	1.73	2.05	1.46	1 5/16	•	•	

*See page D3.

Straight Thread Branch Tee

S5BU

Flareless tube ends / straight thread O-ring
O-ring on branch

SAE 080429

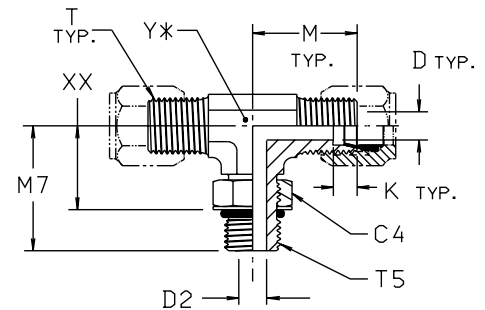
Part Number Information

S5U - Body only **MS518XX***

S5BU - Assembled fitting

S5OU - Body only with O-ring

All dimensions are in inches



*Y—ACROSS WRENCH FLATS

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	T5 PORT THD UN/UNF-2A	C4 HEX (inch)	D DRILL (inch)	D2 DRILL (inch)	K (inch)	M (inch)	M7 (inch)	XX AFTER ASSY (inch)	Y (inch)	STANDARD MATERIAL FROM STOCK		
												S	SS	B
4 S5BU	1/4	7/16-20	7/16-20	9/16	0.203	0.203	0.24	0.89	1.03	0.67	7/16	•	•	
6 S5BU	3/8	9/16-18	9/16-18	11/16	0.282	0.282	0.26	1.05	1.25	0.86	9/16	•	•	
8 S5BU	1/2	3/4-16	3/4-16	7/8	0.422	0.422	0.31	1.25	1.45	1.01	3/4	•	•	
12 S5BU	3/4	1 1/16-12	1 1/16-12	1 1/4	0.656	0.656	0.36	1.58	1.94	1.35	1 1/16	•	•	
16 S5BU	1	1 5/16-12	1 5/16-12	1 1/2	0.875	0.875	0.42	1.73	2.05	1.46	1 5/16	•	•	

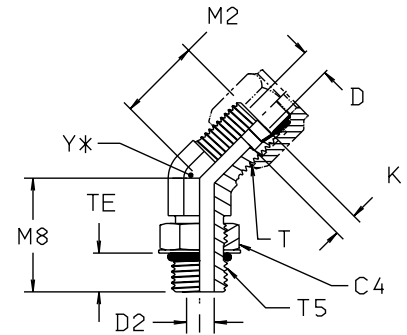
*See page D3.

45° Straight Thread Elbow **V5BU**

Flareless tube end / straight thread O-ring

SAE 080320

Part Number Information
 V5U - Body only **MS518XX***
 V5BU - Assembled fitting
 V5OU - Body only with O-ring



*Y—ACROSS WRENCH FLATS

All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	T5 PORT THD UN/UNF-2A	C4 HEX (inch)	D DRILL (inch)	D2 DRILL (inch)	K (inch)	M2 (inch)	M8 (inch)	TE AFTER ASSY (inch)	Y (inch)	STANDARD MATERIAL FROM STOCK		
												S	SS	B
4 V5BU	1/4	7/16-20	7/16-20	9/16	0.203	0.203	0.24	0.70	1.05	0.36	7/16	•	•	
6 V5BU	3/8	9/16-18	9/16-18	11/16	0.282	0.282	0.26	0.83	1.14	0.39	9/16	•	•	
8 V5BU	1/2	3/4-16	3/4-16	7/8	0.422	0.422	0.31	0.98	1.30	0.44	3/4	•		
12 V5BU	3/4	1 1/16-12	1 1/16-12	1 1/4	0.656	0.656	0.36	1.27	1.73	0.59	1 1/16	•		
16 V5BU	1	1 5/16-12	1 5/16-12	1 1/2	0.875	0.875	0.42	1.36	1.86	0.59	1 5/16	•		

*See page D3.



Male Elbow CBU

Flareless tube end / male pipe end

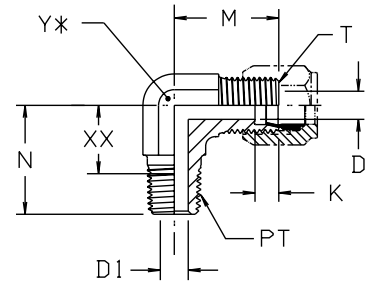
SAE 080202

Part Number Information

CU - Body only **MS518XX***

CBU - Assembled fitting

All dimensions are in inches



*Y—ACROSS WRENCH FLATS

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	PT PORT THD NPTF	D DRILL (inch)	D1 DRILL (inch)	K (inch)	M (inch)	N (inch)	XX AFTER ASSY (inch)	Y (inch)	STANDARD MATERIAL FROM STOCK		
											S	SS	B
2 CBU	1/8	5/16-24	1/8-27	0.094	0.188	0.19	0.78	0.72	0.49	7/16	•	•	
3 CBU	3/16	3/8-24	1/8-27	0.125	0.188	0.24	0.84	0.72	0.49	7/16	•	•	
4 CBU	1/4	7/16-20	1/8-27	0.203	0.188	0.24	0.89	0.78	0.55	7/16	•	•	
4-4 CBU	1/4	7/16-20	1/4-18	0.203	0.281	0.24	1.03	1.09	0.75	9/16	•	•	
4-6 CBU	1/4	7/16-20	3/8-18	0.203	0.406	0.24	1.13	1.22	0.87	3/4	•	•	
5 CBU	5/16	1/2-20	1/8-27	0.234	0.188	0.26	0.95	0.81	0.58	9/16	•	•	
5-4 CBU	5/16	1/2-20	1/4-18	0.234	0.281	0.26	1.03	1.09	0.75	9/16	•	•	
6 CBU	3/8	9/16-18	1/4-18	0.282	0.281	0.26	1.05	1.09	0.75	9/16	•	•	
6-2 CBU	3/8	9/16-18	1/8-27	0.282	0.188	0.26	1.05	0.88	0.65	9/16	•	•	
6-6 CBU	3/8	9/16-18	3/8-18	0.282	0.406	0.26	1.14	1.22	0.87	3/4	•	•	
6-8 CBU	3/8	9/16-18	1/2-14	0.282	0.531	0.26	1.23	1.47	1.01	7/8	•	•	
8 CBU	1/2	3/4-16	3/8-18	0.422	0.406	0.31	1.25	1.22	0.87	3/4	•	•	
8-4 CBU	1/2	3/4-16	1/4-18	0.422	0.281	0.31	1.25	1.16	0.82	3/4	•	•	
8-8 CBU	1/2	3/4-16	1/2-14	0.422	0.531	0.31	1.34	1.47	1.01	7/8	•	•	
8-12 CBU	1/2	3/4-16	3/4-14	0.422	0.719	0.31	1.42	1.59	1.11	1 1/16	•	•	
10 CBU	5/8	7/8-14	1/2-14	0.500	0.531	0.36	1.42	1.47	1.01	7/8	•	•	
10-6 CBU	5/8	7/8-14	3/8-18	0.500	0.406	0.36	1.42	1.28	0.95	7/8	•	•	
12 CBU	3/4	1 1/16-12	3/4-14	0.656	0.719	0.36	1.58	1.59	1.11	1 1/16	•	•	
12-8 CBU	3/4	1 1/16-12	1/2-14	0.656	0.531	0.36	1.58	1.59	1.13	1 1/16	•	•	
14 CBU	7/8	1 3/16-12	3/4-14	0.718	0.719	0.36	1.66	1.69	1.21	1 5/16	•	•	
16 CBU	1	1 5/16-12	1-11 1/2	0.875	0.938	0.42	1.73	1.97	1.40	1 5/16	•	•	
16-12 CBU	1	1 5/16-12	3/4-14	0.875	0.719	0.42	1.73	1.78	1.30	1 5/16	•	•	
20 CBU	1 1/4	1 5/8-12	1 1/4-11 1/2	1.094	1.250	0.42	1.89	2.38	1.79	1 5/8	•	•	
24 CBU	1 1/2	1 7/8-12	1 1/2-11 1/2	1.344	1.500	0.49	2.02	2.64	2.05	1 7/8	•	•	
32 CBU	2	2 1/2-12	2-11 1/2	1.813	1.938	0.49	2.45	3.00	2.39	2 1/2	•	•	

*See page D3.

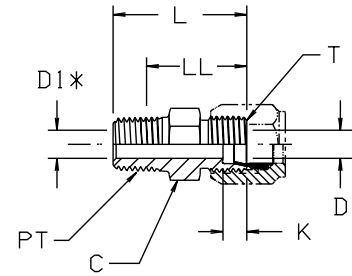
Male Connector FBU

Flareless tube end / male pipe end

SAE 080102

Part Number Information
FU - Body only **MS518XX***
FBU - Assembled fitting

All dimensions are in inches



*D1—DRILL MAY BE PRESENT DUE TO MANUFACTURERS OPTION PER SAE J514

TUBE FITTING PART #	HOSE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	PT PORT THD NPTF	C HEX (inch)	D DRILL (inch)	D1 DRILL (inch)	K (inch)	L (inch)	LL AFTER ASSY (inch)	STANDARD MATERIAL FROM STOCK		
											S	SS	B
2 FBU		1/8	5/16-24	1/8-27	7/16	0.094	0.187	0.19	1.03	0.80	•	•	
2-4 FBU		1/8	5/16-24	1/4-18	9/16	0.094	0.281	0.19	1.25	0.91	•	•	
3 FBU		3/16	3/8-24	1/8-27	7/16	0.125	0.187	0.24	1.09	0.86	•	•	
4FBU	0111-2-4	1/4	7/16-20	1/8-27	1/2	0.203	0.187	0.24	1.13	0.90	•	•	
4-4 FBU	0111-4-4	1/4	7/16-20	1/4-18	9/16	0.203	0.281	0.24	1.33	0.99	•	•	
4-6 FBU		1/4	7/16-20	3/8-18	3/4	0.203	0.406	0.24	1.33	0.98	•	•	
4-8 FBU	0111-8-4	1/4	7/16-20	1/2-14	7/8	0.203	0.531	0.24	1.58	1.12	•	•	
5 FBU	0111-2-5	5/16	1/2-20	1/8-27	9/16	0.234	0.187	0.26	1.13	0.90	•	•	
5-4 FBU	0111-4-5	5/16	1/2-20	1/4-18	9/16	0.234	0.281	0.26	1.33	0.99	•	•	
6 FBU	0111-4-6	3/8	9/16-18	1/4-18	5/8	0.281	0.281	0.26	1.34	1.00	•	•	
6-2 FBU	0111-2-6	3/8	9/16-18	1/8-27	5/8	0.281	0.187	0.26	1.16	0.93	•	•	
6-6 FBU	0111-6-6	3/8	9/16-18	3/8-18	3/4	0.281	0.406	0.26	1.34	0.99	•	•	
6-8 FBU	0111-8-6	3/8	9/16-18	1/2-14	15/16	0.281	0.531	0.26	1.60	1.14	•	•	
8 FBU	0111-6-8	1/2	3/4-16	3/8-18	13/16	0.422	0.406	0.31	1.44	1.09	•	•	
8-4 FBU	0111-4-8	1/2	3/4-16	1/4-18	13/16	0.422	0.281	0.31	1.44	1.10	•	•	
8-8 FBU	0111-8-8	1/2	3/4-16	1/2-14	7/8	0.422	0.531	0.31	1.69	1.23	•	•	
8-12 FBU		1/2	3/4-16	3/4-14	1 1/8	0.422	0.718	0.31	1.75	1.27	•	•	
10 FBU	0111-8-10	5/8	7/8-14	1/2-14	15/16	0.500	0.531	0.36	1.75	1.29	•	•	
10-6 FBU	0111-6-10	5/8	7/8-14	3/8-18	15/16	0.500	0.406	0.36	1.56	1.21	•	•	
10-12 FBU		5/8	7/8-14	3/4-14	1 1/8	0.500	0.718	0.36	1.83	1.35	•	•	
12 FBU	0111-12-12	3/4	1 1/16-12	3/4-14	1 1/8	0.656	0.718	0.36	1.88	1.40	•	•	
12-8 FBU	0111-8-12	3/4	1 1/16-12	1/2-14	1 1/8	0.656	0.531	0.36	1.88	1.42	•	•	
14 FBU	0111-12-14	7/8	1 3/16-12	3/4-14	1 1/4	0.718	0.718	0.36	1.88	1.40	•	•	
16 FBU	0111-16-16	1	1 5/16-12	1-11 1/2	1 3/8	0.875	0.937	0.42	2.08	1.51	•	•	
16-12 FBU	0111-12-16	1	1 5/16-12	3/4-14	1 3/8	0.875	0.718	0.42	1.88	1.40	•	•	
20 FBU		1 1/4	1 5/8-12	1 1/4-11 1/2	1 11/16	1.093	1.250	0.42	2.19	1.60	•	•	
24 FBU		1 1/2	1 7/8-12	1 1/2-11 1/2	2	1.344	1.500	0.49	2.28	1.69	•	•	
32 FBU		2	2 1/2-12	2-11 1/2	2 3/4	1.812	1.937	0.49	2.47	1.86	•	•	

*See page D3.

Note: The Hose Fitting part number includes the body only.



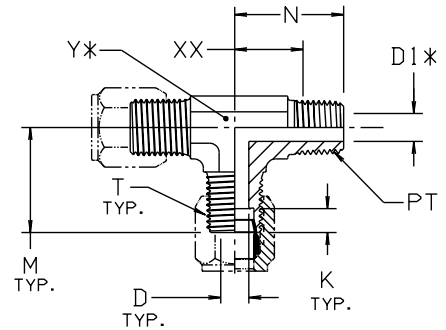
Male Run Tee RBU

Flareless tube ends / male pipe end

SAE 080424

Part Number Information
RU - Body only **MS518XX***
RBU - Assembled fitting

All dimensions are in inches



*D1—DRILL MAY BE PRESENT
DUE TO MANUFACTURERS
OPTION PER SAE J514

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	PT PORT THD NPTF	D DRILL (inch)	D1 DRILL (inch)	K (inch)	M (inch)	N (inch)	XX AFTER ASSY (inch)	Y (inch)	STANDARD MATERIAL FROM STOCK		
											S	SS	B
4 RBU	1/4	7/16-20	1/8-27	0.203	0.188	0.24	0.89	0.78	0.55	7/16	•	•	
4-4-4 RBU	1/4	7/16-20	1/4-18	0.203	0.281	0.24	1.03	1.09	0.75	9/16	•	•	
5 RBU	5/16	1/2-20	1/8-27	0.234	0.188	0.26	0.95	0.81	0.58	9/16	•	•	
6 RBU	3/8	9/16-18	1/4-18	0.282	0.281	0.26	1.05	1.09	0.75	9/16	•	•	
8 RBU	1/2	3/4-16	3/8-18	0.422	0.406	0.31	1.25	1.22	0.87	3/4	•	•	
8-8-8 RBU	1/2	3/4-16	1/2-14	0.422	0.531	0.31	1.34	1.47	1.01	7/8	•	•	
10 RBU	5/8	7/8-14	1/2-14	0.500	0.531	0.36	1.42	1.47	1.01	7/8	•	•	
12 RBU	3/4	1 1/16-12	3/4-14	0.656	0.719	0.36	1.58	1.59	1.11	1 1/16	•	•	
14 RBU	7/8	1 3/16-12	3/4-14	0.718	0.719	0.36	1.62	1.69	1.21	1 5/16	•	•	
16 RBU	1	1 5/16-12	1-11 1/2	0.875	0.938	0.42	1.73	1.97	1.40	1 5/16	•	•	

*See page D3.

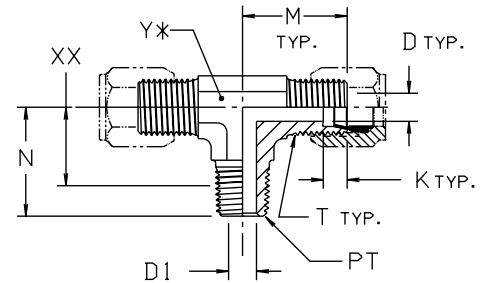
Male Branch Tee SBU

Flareless tube ends / male pipe end

SAE 080425

Part Number Information
SU - Body only **MS518XX***
SBU - Assembled fitting

All dimensions are in inches



*Y—ACROSS WRENCH FLATS

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	PT PORT THD NPTF	D DRILL (inch)	D1 DRILL (inch)	K (inch)	M (inch)	N (inch)	XX AFTER ASSY (inch)	Y (inch)	STANDARD MATERIAL FROM STOCK		
											S	SS	B
2 SBU	1/8	5/16-24	1/8-27	0.094	0.188	0.20	0.78	0.72	0.49	7/16	•	•	
4 SBU	1/4	7/16-20	1/8-27	0.203	0.188	0.24	0.89	0.78	0.55	7/16	•	•	
4-4-4 SBU	1/4	7/16-20	1/4-18	0.203	0.281	0.24	1.03	1.09	0.75	9/16	•	•	
5 SBU	5/16	1/2-20	1/8-27	0.234	0.188	0.26	0.95	0.81	0.58	9/16	•	•	
6 SBU	3/8	9/16-18	1/4-18	0.282	0.281	0.26	1.05	1.09	0.75	9/16	•	•	
8 SBU	1/2	3/4-16	3/8-18	0.422	0.406	0.31	1.25	1.22	0.87	3/4	•	•	
8-8-8 SBU	1/2	3/4-16	1/2-14	0.422	0.531	0.31	1.34	1.47	1.01	7/8	•	•	
10 SBU	5/8	7/8-14	1/2-14	0.500	0.531	0.36	1.42	1.47	1.01	7/8	•	•	
12 SBU	3/4	1 1/16-12	3/4-14	0.656	0.719	0.36	1.58	1.59	1.11	1 1/16	•	•	
14 SBU	7/8	1 3/16-12	3/4-14	0.718	0.719	0.36	1.66	1.66	1.18	1 5/16	•	•	
16 SBU	1	1 5/16-12	1-11 1/2	0.875	0.938	0.42	1.73	1.97	1.40	1 5/16	•	•	

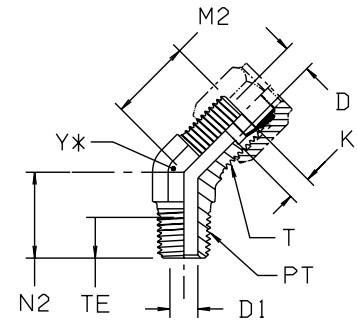
*See page D3.

45° Male Elbow VBU

Flareless tube end / male pipe end

SAE 080302

Part Number Information
VU - Body only **MS518XX***
VBU - Assembled fitting



*Y—ACROSS WRENCH FLATS

All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	PT PORT THD NPTF	D DRILL (inch)	D1 DRILL (inch)	K (inch)	M2 (inch)	N2 (inch)	TE AFTER ASSY (inch)	Y (inch)	STANDARD MATERIAL FROM STOCK		
											S	SS	B
3 VBU	3/16	3/8-24	1/8-27	0.125	0.188	0.24	0.64	0.53	0.23	7/16	•		
4 VBU	1/4	7/16-20	1/8-27	0.203	0.188	0.24	0.70	0.64	0.23	7/16	•	•	
4-4 VBU	1/4	7/16-20	1/4-18	0.203	0.281	0.24	0.81	0.86	0.34	9/16	•		
5 VBU	5/16	1/2-20	1/8-27	0.234	0.188	0.26	0.75	0.66	0.23	9/16	•		
6 VBU	3/8	9/16-18	1/4-18	0.282	0.281	0.26	0.83	0.86	0.34	9/16	•	•	
8 VBU	1/2	3/4-16	3/8-18	0.422	0.406	0.31	0.98	0.95	0.35	3/4	•		
10 VBU	5/8	7/8-14	1/2-14	0.500	0.531	0.36	1.08	1.17	0.46	7/8	•		
12 VBU	3/4	1 1/16-12	3/4-14	0.656	0.719	0.36	1.27	1.20	0.48	1 1/16	•		
14 VBU	7/8	1 3/16-12	3/4-14	0.718	0.719	0.36	1.34	1.30	0.48	1 5/16	•		
16 VBU	1	1 5/16-12	1-11 1/2	0.875	0.938	0.42	1.36	1.48	0.57	1 5/16	•		
20 VBU	1 1/4	1 5/8-12	1 1/4-11 1/2	1.093	1.250	0.42	1.45	1.67	0.59	1 5/8	•		

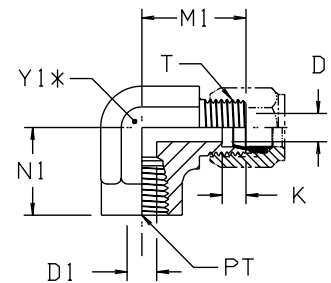
*See page D3.

Female Elbow DBU

Flareless tube end / female pipe end

SAE 080203

Part Number Information
DU - Body only **MS518XX***
DBU - Assembled fitting



*Y—ACROSS WRENCH FLATS

All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	PT PORT THD NPTF	D DRILL (inch)	D1 DRILL (inch)	K (inch)	M1 (inch)	N1 (inch)	Y1 (inch)	STANDARD MATERIAL FROM STOCK		
										S	SS	B
4 DBU	1/4	7/16-20	1/8-27	0.203	0.328	0.24	0.89	0.66	9/16	•	•	
4-4 DBU	1/4	7/16-20	1/4-18	0.203	0.422	0.24	1.03	0.88	3/4	•	•	
5 DBU	5/16	1/2-20	1/8-27	0.234	0.328	0.26	0.95	0.66	9/16	•		
6 DBU	3/8	9/16-18	1/4-18	0.282	0.422	0.26	1.05	0.88	3/4	•	•	
6-6 DBU	3/8	9/16-18	3/8-18	0.282	0.563	0.26	1.13	1.02	7/8	•	•	
8 DBU	1/2	3/4-16	3/8-18	0.422	0.563	0.31	1.23	1.02	7/8	•	•	
8-4 DBU	1/2	3/4-16	1/4-18	0.422	0.422	0.31	1.23	0.88	3/4	•	•	
8-8 DBU	1/2	3/4-16	1/2-14	0.422	0.688	0.31	1.34	1.23	1 1/16	•	•	
10 DBU	5/8	7/8-14	1/2-14	0.500	0.688	0.36	1.42	1.23	1 1/16	•	•	
12 DBU	3/4	1 1/16-12	3/4-14	0.656	0.906	0.36	1.58	1.36	1 5/16	•	•	
14 DBU	7/8	1 3/16-12	3/4-14	0.718	0.906	0.36	1.62	1.42	1 5/16	•		
16 DBU	1	1 5/16-12	1-11 1/2	0.875	1.125	0.42	1.73	1.63	1 5/8	•		
20 DBU	1 1/4	1 5/8-12	1 1/4-11 1/2	1.093	1.469	0.42	2.08	1.70	1 7/8	•		
24 DBU	1 1/2	1 7/8-12	1 1/2-11 1/2	1.344	1.719	0.49	2.58	2.08	2 1/2	•		

*See page D3.

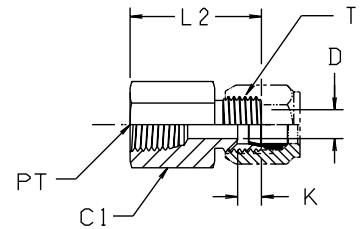
Female Connector GBU

Flareless tube end / female pipe end

SAE 080103

Part Number Information
GU - Body only **MS518XX***
GBU - Assembled fitting

All dimensions are in inches



TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	PT PORT THD NPTF	C1 HEX (inch)	D DRILL (inch)	K (inch)	L2 (inch)	STANDARD MATERIAL FROM STOCK		
								S	SS	B
2 GBU	1/8	5/16-24	1/8-27	9/16	0.094	0.19	1.05	•		
4 GBU	1/4	7/16-20	1/8-27	9/16	0.203	0.24	1.09	•	•	
4-4 GBU	1/4	7/16-20	1/4-18	3/4	0.203	0.24	1.29	•	•	
5 GBU	5/16	1/2-20	1/8-27	9/16	0.234	0.26	1.08	•		
6 GBU	3/8	9/16-18	1/4-18	3/4	0.281	0.26	1.31	•	•	
6-6 GBU	3/8	9/16-18	3/8-18	7/8	0.281	0.26	1.34	•	•	
6-8 GBU	3/8	9/16-18	1/2-14	1 1/8	0.281	0.26	1.59	•	•	
8 GBU	1/2	3/4-16	3/8-18	7/8	0.422	0.31	1.47	•	•	
8-4 GBU	1/2	3/4-16	1/4-18	7/8	0.422	0.31	1.46	•	•	
8-8 GBU	1/2	3/4-16	1/2-14	1 1/8	0.422	0.31	1.69	•	•	
10 GBU	5/8	7/8-14	1/2-14	1 1/8	0.500	0.36	1.77	•	•	
12 GBU	3/4	1 1/16-12	3/4-14	1 3/8	0.656	0.36	1.89	•	•	
14 GBU	7/8	1 3/16-12	3/4-14	1 3/8	0.718	0.36	1.86	•		
16 GBU	1	1 5/16-12	1-11 1/2	1 5/8	0.875	0.42	2.13	•	•	
20 GBU	1 1/4	1 5/8-12	1 1/4-11 1/2	2	1.093	0.42	2.22	•		
24 GBU	1 1/2	1 7/8-12	1 1/2-11 1/2	2 3/8	1.344	0.49	2.23	•		

*See page D3.

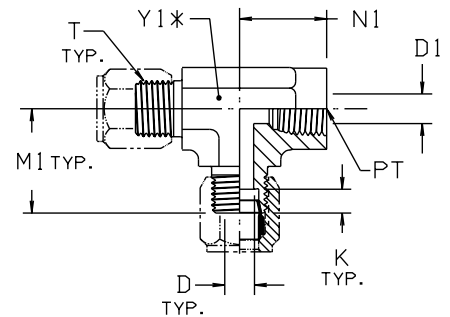
Female Run Tee MBU

Flareless tube ends / female pipe end

SAE 080426

Part Number Information
MU - Body only **MS518XX***
MBU - Assembled fitting

All dimensions are in inches



*Y—ACROSS WRENCH FLATS

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	PT PORT THD NPTF	D DRILL (inch)	D1 DRILL (inch)	K (inch)	M1 (inch)	N1 (inch)	Y1 (inch)	STANDARD MATERIAL FROM STOCK		
										S	SS	B
4 MBU	1/4	7/16-20	1/8-27	0.203	0.328	0.24	0.89	0.66	9/16	•		
6 MBU	3/8	9/16-18	1/4-18	0.282	0.422	0.26	1.05	0.88	3/4	•		
8 MBU	1/2	3/4-16	3/8-18	0.422	0.563	0.31	1.23	1.02	7/8	•		
10 MBU	5/8	7/8-14	1/2-14	0.500	0.688	0.36	1.42	1.23	1 1/16	•		
12 MBU	3/4	1 1/16-12	3/4-14	0.656	0.906	0.36	1.58	1.36	1 5/16	•		
16 MBU	1	1 5/16-12	1-11 1/2	0.875	1.125	0.42	1.73	1.62	1 5/8	•		

*See page D3.

Female Branch Tee

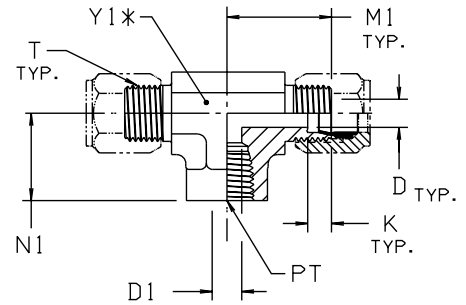
OBU

Flareless tube ends / female pipe end

SAE 080427

Part Number Information
OU - Body only **MS518XX***
OBU - Assembled fitting

All dimensions are in inches



*Y—ACROSS WRENCH FLATS

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	PT PORT THD NPTF	D DRILL (inch)	D1 DRILL (inch)	K (inch)	M1 (inch)	N1 (inch)	Y1 (inch)	STANDARD MATERIAL FROM STOCK		
										S	SS	B
4 OBU	1/4	7/16-20	1/8-27	0.203	0.328	0.24	0.89	0.66	9/16	•	•	
4-4-4 OBU	1/4	7/16-20	1/4-18	0.203	0.422	0.24	1.03	0.88	3/4	•	•	
6 OBU	3/8	9/16-18	1/4-18	0.282	0.422	0.26	1.05	0.88	3/4	•	•	
8 OBU	1/2	3/4-16	3/8-18	0.422	0.563	0.31	1.23	1.02	7/8	•	•	
10 OBU	5/8	7/8-14	1/2-14	0.500	0.688	0.36	1.42	1.23	1 1/16	•	•	
12 OBU	3/4	1 1/16-12	3/4-14	0.656	0.906	0.36	1.58	1.36	1 5/16	•	•	
14 OBU	7/8	1 3/16-12	3/4-14	0.718	0.906	0.36	1.62	1.42	1 5/16	•	•	
16 OBU	1	1 5/16-12	1-11 1/2	0.875	1.125	0.42	1.73	1.62	1 5/8	•	•	
20 OBU	1 1/4	1 5/8-12	1 1/4-11 1/2	1.093	1.469	0.42	2.08	1.70	1 7/8	•	•	

*See page D3.

Swivel Nut Elbow

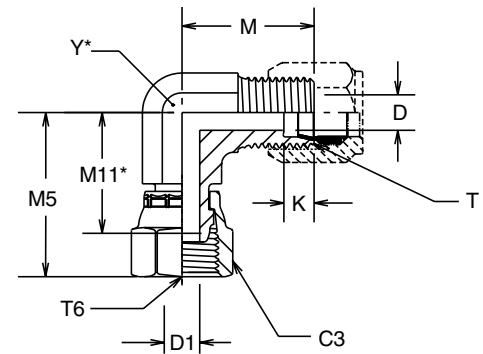
C6BU

Flareless tube end / swivel nut end

SAE 080221

Part Number Information
C6U - Body only **MS518XX***
C6BU - Assembled fitting

All dimensions are in inches



*Y—ACROSS WRENCH FLATS
*M11—CENTER TO END OF MATING PART

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	T6 SWIVEL UN/UNF-2B	C3 HEX (inch)	D DRILL (inch)	D1 DRILL (inch)	K (inch)	M (inch)	M5 (inch)	M11 (inch)	Y (inch)	STANDARD MATERIAL FROM STOCK		
												S	SS	B
4 C6BU	1/4	7/16-20	7/16-20	9/16	0.203	0.203	0.24	0.89	1.05	0.75	7/16	•	•	
6 C6BU	3/8	9/16-18	9/16-18	11/16	0.282	0.282	0.26	1.05	1.28	0.94	9/16	•	•	
8 C6BU	1/2	3/4-16	3/4-16	7/8	0.422	0.422	0.31	1.25	1.47	1.07	3/4	•	•	
10 C6BU	5/8	7/8-14	7/8-14	1	0.500	0.500	0.36	1.42	1.61	1.20	7/8	•	•	
12 C6BU	3/4	1 1/16-12	1 1/16-12	1 1/4	0.656	0.656	0.36	1.58	1.77	1.29	1 1/16	•	•	
16 C6BU	1	1 5/16-12	1 5/16-12	1 1/2	0.875	0.875	0.42	1.73	1.86	1.43	1 5/16	•	•	
20 C6BU	1 1/4	1 5/8-12	1 5/8-12	2	1.093	1.093	0.42	1.89	2.08	1.66	1 5/8	•	•	

*See page D3.



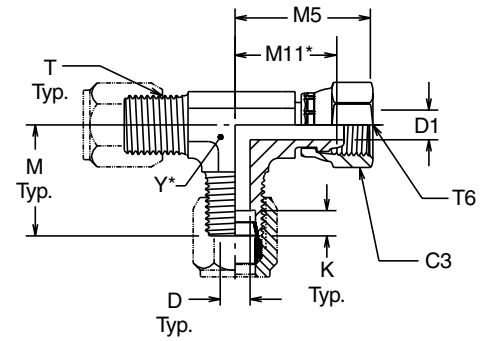
Swivel Nut Run Tee

R6BU

Flareless tube ends / swivel nut end

SAE 080432

Part Number Information
R6U - Body only **MS518XX***
R6BU - Assembled fitting



*Y—ACROSS WRENCH FLATS
*M11—CENTER TO END OF MATING PART

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	T6 SWIVEL UN/UNF-2B	C3 HEX (inch)	D DRILL (inch)	D1 DRILL (inch)	K (inch)	M (inch)	M5 (inch)	M11 AFTER ASSY (inch)	Y (inch)	STANDARD MATERIAL FROM STOCK		
												S	SS	B
4 R6BU	1/4	7/16-20	7/16-20	9/16	0.203	0.203	0.24	0.89	1.05	0.75	7/16	•	•	
6 R6BU	3/8	9/16-18	9/16-18	11/16	0.282	0.282	0.26	1.05	1.28	0.94	9/16	•	•	
8 R6BU	1/2	3/4-16	3/4-16	7/8	0.422	0.422	0.31	1.25	1.47	1.07	3/4	•	•	
12 R6BU	3/4	1 1/16-12	1 1/16-12	1 1/4	0.656	0.656	0.36	1.58	1.77	1.29	1 1/16	•	•	
16 R6BU	1	1 5/16-12	1 5/16-12	1 1/2	0.875	0.875	0.42	1.73	1.86	1.43	1 5/16	•	•	

*See page D3.

Swivel Nut Branch Tee

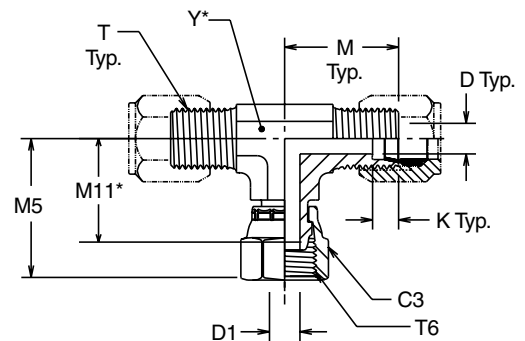
S6BU

Flareless tube ends / swivel nut end

SAE 080433

Part Number Information
S6U - Body only **MS518XX***
S6BU - Assembled fitting

All dimensions are in inches



*Y—ACROSS WRENCH FLATS
*M11—CENTER TO END OF MATING PART

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	T6 SWIVEL UN/UNF-2B	C3 HEX (inch)	D DRILL (inch)	D1 DRILL (inch)	K (inch)	M (inch)	M5 (inch)	M11 AFTER ASSY (inch)	Y (inch)	STANDARD MATERIAL FROM STOCK		
												S	SS	B
4 S6BU	1/4	7/16-20	7/16-20	9/16	0.203	0.203	0.24	0.89	1.05	0.75	7/16	•	•	
6 S6BU	3/8	9/16-18	9/16-18	11/16	0.282	0.282	0.26	1.05	1.28	0.94	9/16	•	•	
8 S6BU	1/2	3/4-16	3/4-16	7/8	0.422	0.422	0.31	1.25	1.47	1.07	3/4	•	•	
12 S6BU	3/4	1 1/16-12	1 1/16-12	1 1/4	0.656	0.656	0.36	1.58	1.77	1.29	1 1/16	•	•	

*See page D3.

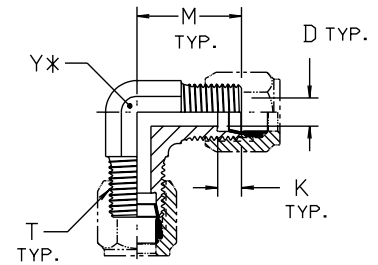
Union Elbow EBU

Flareless tube end / flareless tube end

SAE 080201

Part Number Information
EU - Body only **MS518XX***
EBU - Assembled fitting

All dimensions are in inches



*Y—ACROSS WRENCH FLATS

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	D DRILL (inch)	K (inch)	M (inch)	Y (inch)	STANDARD MATERIAL FROM STOCK		
							S	SS	B
2 EBU	1/8	5/16-24	0.094	0.19	0.78	7/16	•		
4 EBU	1/4	7/16-20	0.203	0.24	0.89	7/16	•	•	
5 EBU	5/16	1/2-20	0.234	0.26	0.95	9/16	•		
6 EBU	3/8	9/16-18	0.282	0.26	1.05	9/16	•	•	
8 EBU	1/2	3/4-16	0.422	0.31	1.25	3/4	•	•	
10 EBU	5/8	7/8-14	0.500	0.36	1.42	7/8	•	•	
12 EBU	3/4	1 1/16-12	0.656	0.36	1.58	1 1/16	•	•	
14 EBU	7/8	1 3/16-12	0.718	0.36	1.66	1 5/16	•		
16 EBU	1	1 5/16-12	0.875	0.42	1.73	1 5/16	•	•	
20 EBU	1 1/4	1 5/8-12	1.093	0.42	1.89	1 5/8	•		
24 EBU	1 1/2	1 7/8-12	1.344	0.49	2.02	1 7/8	•		
32 EBU	2	2 1/2-12	1.813	0.49	2.45	2 1/2	•		

*See page D3.

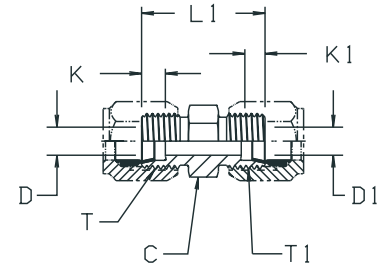
Union HBU

Flareless tube end / flareless tube end

SAE 080101

Part Number Information
HU - Body only **MS518XX***
HBU - Assembled fitting

All dimensions are in inches



TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	T1 TUBE END UN/UNF-2A	C HEX (inch)	D DRILL (inch)	D1 DRILL (inch)	K (inch)	K1 (inch)	L1 (inch)	STANDARD MATERIAL FROM STOCK		
										S	SS	B
2 HBU	1/8	5/16-24	5/16-24	7/16	0.094	0.094	0.19	0.19	1.02	•	•	
3 HBU	3/16	3/8-24	3/8-24	7/16	0.125	0.125	0.24	0.24	1.11	•		
4 HBU	1/4	7/16-20	7/16-20	1/2	0.203	0.203	0.24	0.24	1.19	•	•	
5 HBU	5/16	1/2-20	1/2-20	9/16	0.234	0.234	0.26	0.26	1.19	•	•	
6 HBU	3/8	9/16-18	9/16-18	5/8	0.281	0.281	0.26	0.26	1.24	•	•	
6-4 HBU	3/8	9/16-18	7/16-20	5/8	0.281	0.203	0.26	0.24	1.22	•	•	
8 HBU	1/2	3/4-16	3/4-16	13/16	0.422	0.422	0.31	0.31	1.42	•	•	
10 HBU	5/8	7/8-14	7/8-14	15/16	0.500	0.500	0.36	0.36	1.61	•	•	
12 HBU	3/4	1 1/16-12	1 1/16-12	1 1/8	0.656	0.656	0.36	0.36	1.81	•	•	
14 HBU	7/8	1 3/16-12	1 3/16-12	1 1/4	0.718	0.718	0.36	0.36	1.81	•		
16 HBU	1	1 5/16-12	1 5/16-12	1 3/8	0.875	0.875	0.42	0.42	1.81	•	•	
20 HBU	1 1/4	1 5/8-12	1 5/8-12	1 11/16	1.093	1.093	0.42	0.42	1.89	•	•	
24 HBU	1 1/2	1 7/8-12	1 7/8-12	2	1.344	1.344	0.49	0.49	1.96	•	•	
32 HBU	2	2 1/2-12	2 1/2-12	2 5/8	1.812	1.812	0.49	0.49	2.11	•	•	

*See page D3.

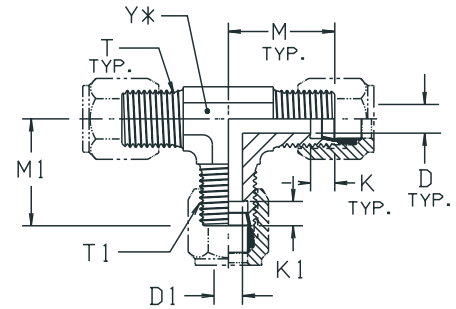


Union Tee JBU

Flareless tube end (all three ends)

SAE 080401

Part Number Information
JU - Body only **MS518XX***
JBU - Assembled fitting



*Y—ACROSS WRENCH FLATS

All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	T1 TUBE END UN/UNF-2A	D DRILL (inch)	D1 DRILL (inch)	K (inch)	K1 (inch)	M (inch)	M1 (inch)	Y (inch)	STANDARD MATERIAL FROM STOCK		
											S	SS	B
2 JBU	1/8	5/16-24	5/16-24	0.094	0.094	0.19	0.19	0.77	0.77	7/16	•		
3 JBU	3/16	3/8-24	3/8-24	0.125	0.125	0.24	0.24	0.84	0.84	7/16	•		
4 JBU	1/4	7/16-20	7/16-20	0.203	0.203	0.24	0.24	0.89	0.89	7/16	•	•	
5 JBU	5/16	1/2-20	1/2-20	0.234	0.234	0.26	0.26	0.95	0.95	9/16	•	•	
6 JBU	3/8	9/16-18	9/16-18	0.282	0.282	0.26	0.26	1.05	1.05	9/16	•	•	
8 JBU	1/2	3/4-16	3/4-16	0.422	0.422	0.31	0.31	1.25	1.25	3/4	•	•	
8-8-6 JBU	1/2	3/4-16	9/16-18	0.422	0.281	0.31	0.26	1.25	1.14	3/4	•		
10 JBU	5/8	7/8-14	7/8-14	0.500	0.500	0.36	0.36	1.42	1.42	7/8	•	•	
12 JBU	3/4	1 1/16-12	1 1/16-12	0.656	0.656	0.36	0.36	1.58	1.58	1 1/16	•	•	
14 JBU	7/8	1 3/16-12	1 3/16-12	0.718	0.718	0.36	0.36	1.66	1.66	1 5/16	•		
16 JBU	1	1 5/16-12	1 5/16-12	0.875	0.875	0.42	0.42	1.73	1.73	1 5/16	•	•	
20 JBU	1 1/4	1 5/8-12	1 5/8-12	1.093	1.093	0.42	0.42	1.89	1.89	1 5/8	•	•	
24 JBU	1 1/2	1 7/8-12	1 7/8-12	1.344	1.344	0.49	0.49	2.02	2.02	1 7/8	•	•	

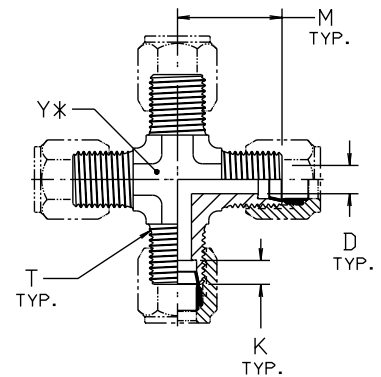
*See page D3.

Union Cross KBU

Flareless tube end (all four ends)

SAE 080501

Part Number Information
KU - Body only **MS518XX***
KBU - Assembled fitting



*Y—ACROSS WRENCH FLATS

All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	D DRILL (inch)	K (inch)	M (inch)	Y (inch)	STANDARD MATERIAL FROM STOCK		
							S	SS	B
4 KBU	1/4	7/16-20	0.203	0.24	0.89	7/16	•	•	
6 KBU	3/8	9/16-18	0.282	0.26	1.05	9/16	•	•	
8 KBU	1/2	3/4-16	0.422	0.31	1.25	3/4	•	•	
12 KBU	3/4	1 1/16-12	0.656	0.36	1.58	1 1/16	•		

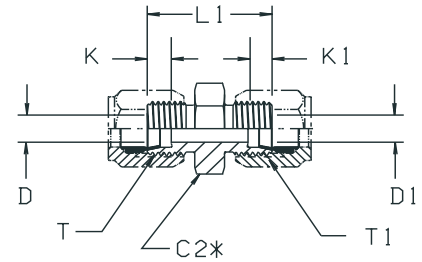
*See page D3.

Large Hex Union LHBU

Flareless tube end / flareless tube end

SAE 080119

Part Number Information
LHU - Body only **MS518XX***
LHBU - Assembled fitting



*C2—LARGE HEX ALLOWS FOR USE IN MS33649 PORT

All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	T1 TUBE END UN/UNF-2A	C2 HEX (inch)	D DRILL (inch)	D1 DRILL (inch)	K (inch)	K1 (inch)	L1 (inch)	STANDARD MATERIAL FROM STOCK		
										S	SS	B
4 LHBU	1/4	7/16-20	7/16-20	11/16	0.203	0.203	0.24	0.24	1.19	•	•	
6 LHBU	3/8	9/16-18	9/16-18	13/16	0.281	0.281	0.26	0.26	1.23	•	•	
6-4 LHBU	3/8	9/16-18	7/16-20	13/16	0.281	0.203	0.26	0.24	1.22	•	•	
8 LHBU	1/2	3/4-16	3/4-16	1	0.422	0.422	0.31	0.31	1.42	•	•	
8-6 LHBU	1/2	3/4-16	9/16-18	1	0.422	0.281	0.31	0.26	1.33	•	•	
10 LHBU	5/8	7/8-14	7/8-14	1 1/8	0.500	0.500	0.36	0.36	1.61	•	•	
12 LHBU	3/4	1 1/16-12	1 1/16-12	1 3/8	0.656	0.656	0.36	0.36	1.81	•	•	
16 LHBU	1	1 5/16-12	1 5/16-12	1 5/8	0.875	0.875	0.42	0.42	1.81	•	•	

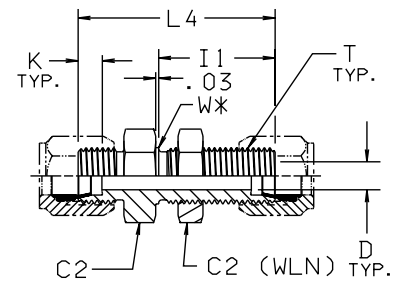
*See page D3.

Bulkhead Union WBU

Flareless tube end / flareless tube end

SAE 080601

Part Number Information
WU - Body only
WBU - Assembled fitting
WU-WLN - Body only with locknut



*W— BULKHEAD PILOT DIA. RECOMMENDED CLEARANCE HOLE +.015 OVER W DIA.

All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	C2 HEX (inch)	D DRILL (inch)	I1 (inch)	K (inch)	L4 (inch)	W (inch)	Max. Bulkhead Thickness	STANDARD MATERIAL FROM STOCK		
										S	SS	B
4 WBU	1/4	7/16-20	11/16	0.203	1.13	0.24	1.89	0.44	0.38	•	•	
6 WBU	3/8	9/16-18	13/16	0.281	1.17	0.26	1.98	0.56	0.40	•	•	
8 WBU	1/2	3/4-16	1	0.422	1.31	0.31	2.22	0.75	0.40	•	•	
10 WBU	5/8	7/8-14	1 1/8	0.500	1.45	0.36	2.48	0.88	0.37	•	•	
12 WBU	3/4	1 1/16-12	1 3/8	0.656	1.56	0.36	2.72	1.06	0.43	•	•	
16 WBU	1	1 5/16-12	1 5/8	0.875	1.56	0.42	2.72	1.31	0.43	•	•	

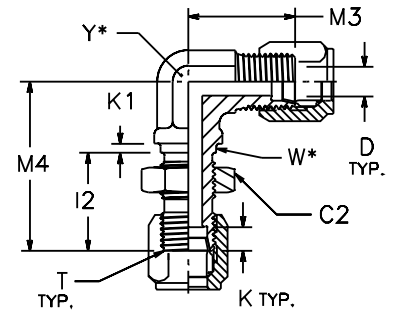


Bulkhead Union Elbow WEBU

Flareless tube end / flareless tube end

Part Number Information
WEU - Body only
WEBU - Assembled fitting

All dimensions are in inches



*Y — ACROSS WRENCH FLATS

W — BULKHEAD PILOT DIA.

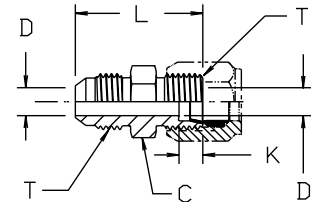
TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	C2 HEX (inch)	D DRILL (inch)	I2 (inch)	K (inch)	K1 (inch)	M3 (inch)	M4 (inch)	W DIA (inch)	Y (inch)	Max. Bulkhead Thickness	STANDARD MATERIAL FROM STOCK		
													S	SS	B
6 WEBU	3/8	9/16-18	13/16	0.281	0.98	0.26	0.09	1.08	1.7	0.56	9/16	0.26	•		
8 WEBU	1/2	3/4-16	1	0.422	1.12	0.31	0.13	1.33	1.97	0.75	3/4	0.30	•		

Union Adapter XHBU

Flareless tube end / 37° flare tube end

Part Number Information
XHU - Body only
XHBU - Assembled fitting

All dimensions are in inches



TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	C HEX (inch)	D DRILL (inch)	K (inch)	L (inch)	STANDARD MATERIAL FROM STOCK		
							S	SS	B
4 XHBU	1/4	7/16-20	1/2	0.172	0.24	1.19	•	•	
6 XHBU	3/8	9/16-18	5/8	0.297	0.26	1.28	•	•	
8 XHBU	1/2	3/4-16	13/16	0.391	0.31	1.47	•	•	
10 XHBU	5/8	7/8-14	15/16	0.484	0.36	1.69	•	•	
12 XHBU	3/4	1 1/16-12	1 1/8	0.609	0.36	1.94	•	•	
16 XHBU	1	1 5/16-12	1 5/8	0.844	0.42	1.97	•	•	
20 XHBU	1 1/4	1 5/8-12	1 3/4	1.078	0.42	2.00	•	•	
24 XHBU	1 1/2	1 7/8-12	2 1/8	1.312	0.49	2.16	•	•	

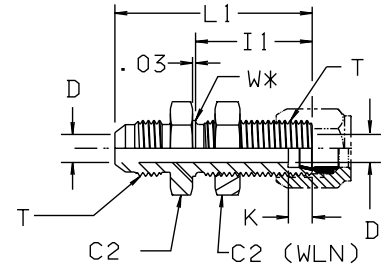
Bulkhead Union Adapter XHBU2

Flareless tube end / 37° flare tube end
Maximum panel thickness 3/8"

Part Number Information

- XHU2 - Body only
- XHBU2 - Assembled fitting
- XHU2-WLN - Body only with locknut

All dimensions are in inches



*W — BULKHEAD PILOT DIA.
RECOMMENDED CLEARANCE
HOLE +.015 OVER W DIA.



TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	C2 HEX (inch)	D DRILL (inch)	I1 (inch)	K (inch)	L1 (inch)	W (inch)	Max. Bulkhead Thickness	STANDARD MATERIAL FROM STOCK		
										S	SS	B
4 XHBU2	1/4	7/16-20	11/16	0.172	1.13	0.24	1.94	0.44	0.38	•	•	
6 XHBU2	3/8	9/16-18	13/16	0.297	1.17	0.26	2.08	0.56	0.40	•	•	
8 XHBU2	1/2	3/4-16	1	0.391	1.31	0.31	2.31	0.75	0.40	•	•	
10 XHBU2	5/8	7/8-14	1 1/8	0.484	1.45	0.36	2.56	0.88	0.37	•		
12 XHBU2	3/4	1 1/16-12	1 3/8	0.609	1.56	0.36	2.94	1.06	0.43	•		
16 XHBU2	1	1 5/16-12	1 5/8	0.844	1.56	0.42	2.95	1.31	0.43	•		

*Previously XH2BU

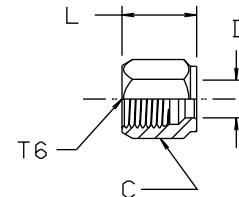
Nut BU

Flareless tube end nut

SAE 080110

- Part Number Information
- BU - Body only **MS518XX***

All dimensions are in inches



TUBE FITTING PART #	TUBE O.D. (inch)	T6 UN/UNF-2B	C HEX (inch)	D DRILL (inch)	L (inch)	STANDARD MATERIAL FROM STOCK		
						S	SS	B
2 BU	1/8	5/16-24	3/8	0.130	0.53	•	•	
3 BU	3/16	3/8-24	7/16	0.193	0.61	•	•	
4 BU	1/4	7/16-20	9/16	0.255	0.70	•	•	
5 BU	5/16	1/2-20	5/8	0.318	0.72	•	•	
6 BU	3/8	9/16-18	11/16	0.380	0.75	•	•	
8 BU	1/2	3/4-16	7/8	0.505	0.84	•	•	
10 BU	5/8	7/8-14	1	0.631	0.92	•	•	
12 BU	3/4	1 1/16-12	1 1/4	0.756	0.97	•	•	
14 BU	7/8	1 3/16-12	1 3/8	0.881	1.00	•	•	
16 BU	1	1 5/16-12	1 1/2	1.006	1.05	•	•	
20 BU	1 1/4	1 5/8-12	2	1.260	1.05	•	•	
24 BU	1 1/2	1 7/8-12	2 1/4	1.510	1.03	•	•	
32 BU	2	2 1/2-12	2 7/8	2.014	1.12	•	•	

*See page D3.

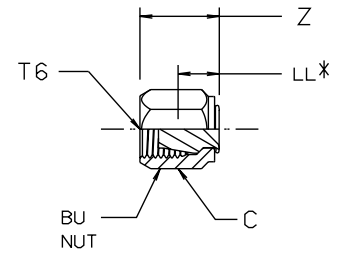
Cap FNU

Flareless tube end cap

SAE 080112

Part Number Information
FNU - Body only **MS518XX***

All dimensions are in inches



*LL—FITTING END TO REAR OF PLUG

TUBE FITTING PART #	TUBE O.D. (inch)	T6 UN/UNF-2B	C HEX (inch)	LL (inch)	Z (inch)	STANDARD MATERIAL FROM STOCK		
						S	SS	B
2 FNU	1/8	5/16-24	3/8	0.34	0.55	•	•	
4 FNU	1/4	7/16-20	9/16	0.36	0.73	•	•	
5 FNU	5/16	1/2-20	5/8	0.40	0.77	•	•	
6 FNU	3/8	9/16-18	11/16	0.42	0.80	•	•	
8 FNU	1/2	3/4-16	7/8	0.44	0.87	•	•	
10 FNU	5/8	7/8-14	1	0.47	0.98	•	•	
12 FNU	3/4	1 1/16-12	1 1/4	0.48	1.00	•	•	
16 FNU	1	1 5/16-12	1 1/2	0.58	1.08	•	•	
20 FNU	1 1/4	1 5/8-12	2	0.64	1.11	•	•	

*See page D3.

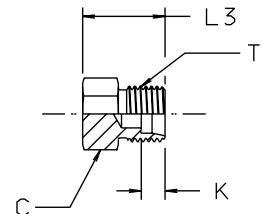
Plug PNU

Flareless tube end plug

SAE 080109

Part Number Information
PNU - Body only **MS518XX***

All dimensions are in inches



TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	C HEX (inch)	K (inch)	L3 (inch)	STANDARD MATERIAL FROM STOCK		
						S	SS	B
2 PNU	1/8	5/16-24	7/16	0.19	0.63	•	•	
4 PNU	1/4	7/16-20	1/2	0.24	0.72	•	•	
5 PNU	5/16	1/2-20	9/16	0.26	0.72	•	•	
6 PNU	3/8	9/16-18	5/8	0.26	0.75	•	•	
8 PNU	1/2	3/4-16	13/16	0.31	0.84	•	•	
10 PNU	5/8	7/8-14	15/16	0.36	0.97	•	•	
12 PNU	3/4	1 1/16-12	1 1/8	0.36	1.09	•	•	
16 PNU	1	1 5/16-12	1 3/8	0.42	1.09	•	•	

*See page D3.

Tube End Reducer TRBU

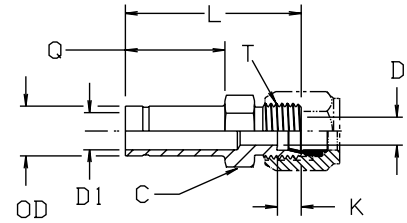
Flareless tube end reducer

SAE 080123

Part Number Information

TRU - Body only

TRBU - Assembled fitting



All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	OD (inch)	T TUBE END UN/UNF-2A	C HEX (inch)	D DRILL (inch)	D1 DRILL (inch)	K (inch)	L (inch)	Q (inch)	STANDARD MATERIAL FROM STOCK		
										S	SS	B
6-4 TRBU	3/8 to 1/4	0.38	7/16-20	1/2	0.203	0.250	0.26	1.61	0.88	•	•	
8-4 TRBU	1/2 to 1/4	0.50	7/16-20	9/16	0.203	0.375	0.31	1.73	1.00	•	•	
8-6 TRBU	1/2 to 3/8	0.50	9/16-18	5/8	0.281	0.375	0.31	1.77	1.00	•	•	
10-6 TRBU	5/8 to 3/8	0.63	9/16-18	11/16	0.281	0.500	0.36	1.86	1.09	•	•	
10-8 TRBU	5/8 to 1/2	0.63	3/4-16	13/16	0.422	0.500	0.36	1.95	1.09	•	•	
12-6 TRBU	3/4 to 3/8	0.75	9/16-18	13/16	0.281	0.625	0.36	1.94	1.16	•	•	
12-8 TRBU	3/4 to 1/2	0.75	3/4-16	13/16	0.422	0.625	0.36	2.03	1.16	•	•	
12-10 TRBU	3/4 to 5/8	0.75	7/8-14	15/16	0.500	0.625	0.36	2.16	1.16	•	•	
14-10 TRBU	7/8 to 5/8	0.88	7/8-14	15/16	0.500	0.875	0.36	2.14	1.16	•	•	
16-8 TRBU	1 to 1/2	1.00	3/4-16	1 1/16	0.422	0.844	0.42	2.05	1.13	•	•	
16-10 TRBU	1 to 5/8	1.00	7/8-14	1 1/16	0.500	0.844	0.42	2.11	1.13	•	•	
16-12 TRBU	1 to 3/4	1.00	1 1/16-12	1 1/8	0.656	0.844	0.42	2.25	1.13	•	•	
20-16 TRBU	1 1/4 to 1	1.25	1 5/16-12	1 3/8	0.875	1.031	0.42	2.28	1.16	•	•	
24-12 TRBU	1 1/2 to 3/4	1.50	1 1/16-12	1 5/8	0.656	1.250	0.49	2.45	1.25	•	•	
24-16 TRBU	1 1/2 to 1	1.50	1 5/16-12	1 5/8	0.875	1.250	0.49	2.45	1.25	•	•	
24-20 TRBU	1 1/2 to 1 1/4	1.50	1 5/8-12	1 7/8	1.093	1.250	0.49	2.45	1.25	•	•	

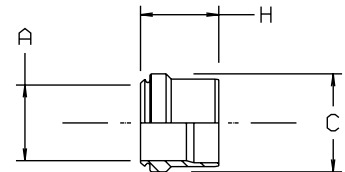


Ferrule TU

Flareless tube end sleeve

SAE 080115 Style A MS518XX*

All dimensions are in inches



TUBE FITTING PART #	TUBE O.D. (inch)	A (inch)	C (inch)	H (inch)	STANDARD MATERIAL FROM STOCK		
					S	SS	B
2 TU	1/8	0.13	0.24	0.29	•	•	
3 TU	3/16	0.19	0.31	0.33	•	•	
4 TU	1/4	0.26	0.37	0.36	•	•	
5 TU	5/16	0.32	0.43	0.37	•	•	
6 TU	3/8	0.38	0.50	0.39	•	•	
8 TU	1/2	0.51	0.66	0.43	•	•	
10 TU	5/8	0.63	0.78	0.44	•	•	
12 TU	3/4	0.76	0.93	0.48	•	•	
14 TU	7/8	0.88	1.06	0.48	•	•	
16 TU	1	1.01	1.19	0.48	•	•	
20 TU	1 1/4	1.26	1.45	0.48	•	•	
24 TU	1 1/2	1.51	1.69	0.48	•	•	
32 TU	2	2.01	2.21	0.51	•	•	

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*See page D3.