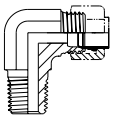
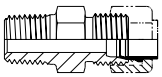
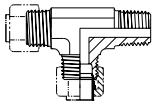
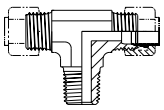
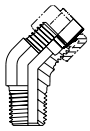
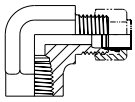
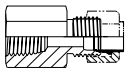
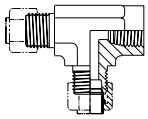
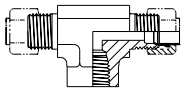
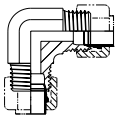
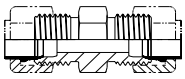
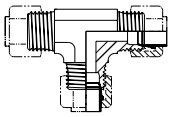
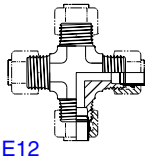
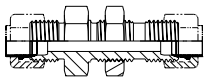
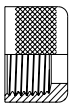
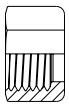
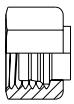
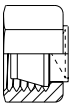
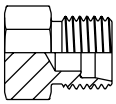
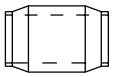
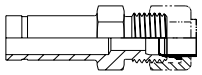
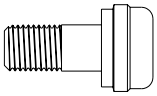
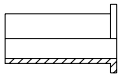
Parker
FluidConnectors

Intru-Lok® Flareless Bite Type Fittings

The Fitting Authority

Flareless Tube to Male NPTF	**CBI2** Male Elbow  Page E6	**FBI2** Male Connector  Page E6	**RBI2** Male Run Tee  Page E7	**SBI2** Male Branch Tee  Page E7	**VBI2** 45° Male Elbow  Page E8
Flareless Tube to Female NPTF	**DBI2** Female Elbow  Page E8	**GBI2** Female Connector  Page E9	**MBI2** Female Run Tee  Page E9	**OBI2** Female Branch Tee  Page E10	
Flareless Tube to Flareless Tube	**EBI2** Union Elbow  Page E10	**HBI2** Union  Page E11	**JBI2** Union Tee  Page E11	**KBI2** Union Cross  Page E12	
Bulkhead Union	**WBI2** Bulkhead Union  Page E12	**Auxiliary Compo-nents**	**BIP** Knurled Nut  Page E12	**BI2** Nut  Page E13	**BTI2** Nut and Ferrule  Page E13
FNI Cap  Page E14	**PNI** Plug  Page E14	**TIP** Expander / Insert  Page E14	**TI2** Ferrule  Page E15	**TRBI2** Tube End Reducer  Page E15	**T22I** Mountie  Page E16
T23UI Insert  Page E16					

Introduction

The Intru-Lok bite type fitting was developed by Parker Hannifin and introduced to the U.S. market in the late 1950's. This fitting addresses those applications that require a bite by the ferrule in brass, copper, aluminum and plastic tubing systems. The Intru-Lok 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.

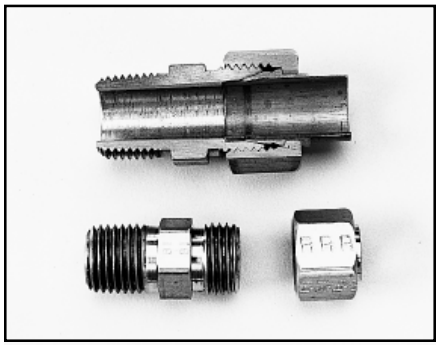


Fig. E1 — Assembled Intru-Lok (Ferrule "Bites" into tubing)

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

Intru-Lok fittings are routinely used in markets, such as: Machine tools, chemical, oil refineries, paper making, thermoplastics processing, air and lube lines, pilot lines, panel boards, etc.

Design and Construction

The three components of Intru-Lok fittings are designed and manufactured to produce a reliable, leak free joint upon assembly.

The Intru-Lok Body. Intru-Lok fittings' bodies are available in over fifteen configurations. The shaped products (i.e. elbows, tees, crosses) are hot forged, then machined to the stringent Intru-Lok fitting specifications.

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 Intru-Lok Ferrule. Intru-Lok fitting ferrules are precision machined with all dimensions and surfaces, particularly the critical bite edge, monitored on an ongoing basis.

The Intru-Lok Nuts. Intru-Lok fitting nuts are machined from cold drawn bar stock. The cold drawing operation provides 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 Specification. The standard materials used in the manufacture of Intru-Lok fittings are shown in Table E1.

Intru-Lok Fittings	Brass	
	ASTM	Type
Forged Bodies	B124	CA377
Bar Stock Bodies	B16	CA360
	B453	CA345
Bar Stock Tube Nuts	B16	CA360
Tube Ferrules	B16	CA360

Table E1 — Standard Material Specifications for Intru-Lok fittings

How Intru-Lok 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 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 raised up in front of the ferrule.

Pressure Rating

The contact of the tube ridge with the ferrule's front face and bite edge gives the fitting its ability to retain pressure without leaking or blowing off. When properly assembled to the recommended tubing, Intru-Lok fittings will consistently seal up to 1500 psi in all sizes.

Assembly

Cut soft metal tube with tube cutter, circular toothed cut-off saw, or hacksaw with a fine tooth saw blade. A square cut can be attained with a hacksaw using Parker's Tru-Kut® Sawing Vise. Plastic tube can be cut with a plastic tube cutter, Parker part number PTC-001 (available from the Parflex Division).

Intru-Lok fittings are designed to permit tube entry and fitting make-up without removal of the nut and ferrule.

The tube is simply inserted through the nut and ferrule until it bottoms on the seat within the fitting body.

The nut should be screwed down finger tight, then wrench tightened 1 1/4 turns. (For low pressure instrument air service, 1 turn from finger tight is sufficient. This will also allow for the maximum number of remakes.)

Remake

The nut should be wrenched down until a sudden resistance to wrench force is evident. From this point wrench the nut 1/6 turn more to cause the ferrule to spring into its seal against the tube and fitting body.

Trouble Shooting Hints

Problems associated with bite type fittings are most often traced to faulty Pre-Set/Assembly.

Problem	Solution
Tube not bottomed	On soft metal tubing, check for the indentation on the tube end. For plastic tubing or soft metal, 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.
Shallow bite	Inspect for turned up ridge of material at the front of the ferrule. 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 reworked.
Over-set ferrule	More than 1 1/4 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.
Ferrule cocked on the 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.

Table E2 — Intru-Lok Fitting Trouble Shooting Hints

Features, Advantages & Benefits

1. Bite Type — The Intru-Lok ferrule bites into the tubing assuring a safe, leak free, vibration proof connection.

2. Tube Types — Intru-Lok fittings are equally effective on copper, aluminum, brass, nylon, PTFE, PVC, polyethylene and polyurethane tubing.

3. Pressure Rating — Intru-Lok is a 1500 psi fitting in all sizes through 1/2".

4. Material — Intru-Lok is manufactured from brass and all shaped fittings are machined from forgings for additional strength.

5. Temperature — Intru-Lok is suitable for use from -65°F through +400°F.

6. Make-up — The Intru-Lok fitting requires low assembly torque for make-up; joints can be disassembled and reassembled many times to facilitate system maintenance.

7. Availability — Intru-Lok fittings are available from stock in 15 standard configurations and sizes from 1/8" through 1/2". An international network of stocking distributors provide immediate delivery.

8. Captive Ferrules — Ferrules for Intru-Lok fittings are retained within the nut. This snap in feature permits the ferrule to be inserted or removed from the nut under finger pressure but the ferrule remains in place for fitting assembly.

9. Closer Tube Bends — Tube bends can begin adjacent to the end of the ferrule allowing tighter and neater installation.

10. Special Fittings — For special applications, the fittings can be furnished in different sizes and configurations upon request.

How To Order Intru-Lok Fittings

Nomenclature

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

Sizes

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

Materials

Brass is standard. Intru-Lok tube fittings for special applications can be furnished in almost any material suitable for machining.

Example

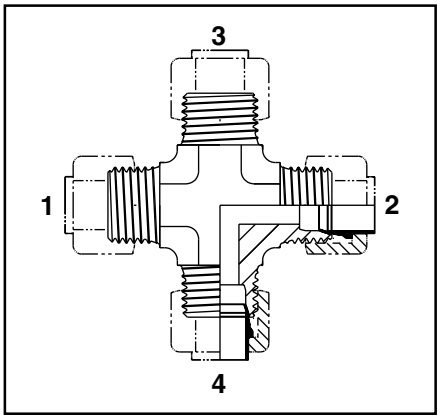
Fitting needed — Intru-Lok Brass Male Connector for 1/4" Male Pipe Thread. Part number 4-4 FBI2*-B.

4-4	F	B	I2	-	B
1/4" Tube O.D. (4/16") 1/4" Male Pipe Thread	Male Connector	Assembled Fitting	Parker Intru-Lok		Material Brass

* A captive ferrule and nut (BTI2) are provided in all sizes. The “2” in the basic part number indicates this assembly level.

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

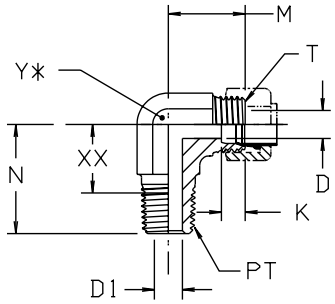
If design or configuration is questionable please provide a detailed sketch, drawing or sample part to the Tube Fittings Division.

E

Male Elbow

CBI2

Flareless tube end / male pipe end



*Y—ACROSS WRENCH FLATS

Part Number Information
CI - Body only
CBI2 - Assembled fitting

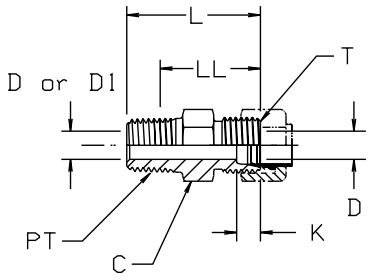
All dimensions are in inches

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)	M (inch)	N (inch)	XX AFTER ASSY (inch)	Y (inch)	STANDARD MATERIAL FROM STOCK B
2 CBI2	1/8	5/16-24	1/8-27	0.093	0.188	0.19	0.66	0.69	0.49	5/16	•
3 CBI2	3/16	3/8-24	1/8-27	0.125	0.188	0.23	0.56	0.67	0.49	3/8	•
4 CBI2	1/4	7/16-20	1/8-27	0.203	0.188	0.23	0.59	0.69	0.55	7/16	•
4-4 CBI2	1/4	7/16-20	1/4-18	0.203	0.281	0.23	0.72	0.91	0.75	9/16	•
5 CBI2	5/16	1/2-20	1/8-27	0.234	0.188	0.25	0.80	0.74	0.60	9/16	•
5-4 CBI2	5/16	1/2-20	1/4-18	0.234	0.281	0.25	0.78	0.91	0.75	9/16	•
6 CBI2	3/8	9/16-18	1/4-18	0.282	0.281	0.25	0.72	0.91	0.75	9/16	•
6-2 CBI2	3/8	9/16-18	1/8-27	0.282	0.188	0.25	0.72	0.81	0.65	9/16	•
6-6 CBI2	3/8	9/16-18	3/8-18	0.282	0.406	0.25	0.86	1.00	0.87	3/4	•
6-8 CBI2	3/8	9/16-18	1/2-14	0.282	0.531	0.25	1.00	1.27	0.90	5/8	•
8 CBI2	1/2	3/4-16	3/8-18	0.422	0.406	0.31	0.88	1.00	0.87	3/4	•
8-4 CBI2	1/2	3/4-16	1/4-18	0.422	0.281	0.31	0.88	1.06	0.82	3/4	•
8-8 CBI2	1/2	3/4-16	1/2-14	0.422	0.531	0.31	1.09	1.38	1.01	7/8	•

Male Connector

FBI2

Flareless tube end / male pipe end



Part Number Information
FI - Body only
FBI2 - Assembled fitting

All dimensions are in inches

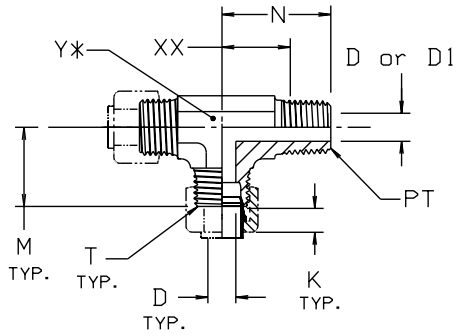
TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	PT PORT THD NPTF	C HEX (inch)	D DRILL (inch)	D1 DRILL (inch)	K (inch)	L (inch)	LL AFTER ASSY (inch)	STANDARD MATERIAL FROM STOCK B
2 FBI2	1/8	5/16-24	1/8-27	7/16	0.093	0.188	0.19	0.86	0.63	•
3 FBI2	3/16	3/8-24	1/8-27	7/16	0.125	0.188	0.23	0.81	0.58	•
4 FBI2	1/4	7/16-20	1/8-27	7/16	0.203	0.188	0.23	0.88	0.65	•
4-4 FBI2	1/4	7/16-20	1/4-18	9/16	0.203	0.281	0.23	1.08	0.74	•
4-8 FBI2	1/4	7/16-20	1/2-14	7/8	0.203	0.531	0.23	1.31	0.85	•
5 FBI2	5/16	1/2-20	1/8-27	1/2	0.234	0.188	0.25	0.94	0.71	•
5-4 FBI2	5/16	1/2-20	1/4-18	9/16	0.234	0.281	0.25	1.14	0.80	•
6 FBI2	3/8	9/16-18	1/4-18	9/16	0.282	0.281	0.25	1.17	0.83	•
6-2 FBI2	3/8	9/16-18	1/8-27	9/16	0.282	0.188	0.25	0.97	0.74	•
6-6 FBI2	3/8	9/16-18	3/8-18	11/16	0.282	0.406	0.25	1.19	0.84	•
6-8 FBI2	3/8	9/16-18	1/2-14	7/8	0.282	0.531	0.25	1.42	0.96	•
8 FBI2	1/2	3/4-16	3/8-18	3/4	0.422	0.406	0.31	1.28	0.93	•
8-4 FBI2	1/2	3/4-16	1/4-18	3/4	0.422	0.281	0.31	1.27	0.93	•
8-8 FBI2	1/2	3/4-16	1/2-14	7/8	0.422	0.531	0.31	1.50	1.04	•

Male Run Tee
RBI2

Flareless tube ends / male pipe end

Part Number Information
RI - Body only
RBI2 - Assembled fitting

All dimensions are in inches



*Y—ACROSS WRENCH FLATS

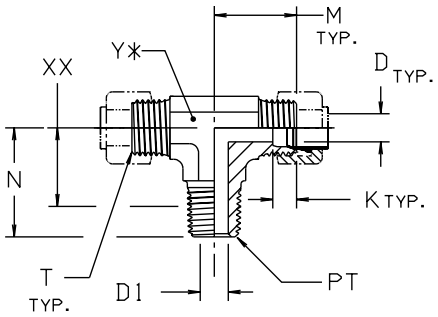
TUBE FITTING PART #	OD (inch)	T TUBE END UN/UNF-2A	PT PORT THD NPTF	D DRILL (inch)	D1 DRILL (inch)	K (inch)	M (inch)	N (inch)	XX AFTER ASSY (inch)	Y (inch)	STANDARD MATERIAL FROM STOCK B
2 RBI2	1/8	5/16-24	1/8/27	0.093	0.188	0.19	0.63	0.69	0.45	5/16	•
3 RBI2	3/16	3/8-24	1/8-27	0.125	0.188	0.23	0.59	0.69	0.45	3/8	•
4 RBI2	1/4	7/16-20	1/8-27	0.203	0.188	0.23	0.59	0.69	0.55	7/16	•
4-4-4 RBI2	1/4	7/16-20	1/4-18	0.203	0.281	0.23	0.75	0.98	0.75	9/16	•
6 RBI2	3/8	9/16-18	1/4-18	0.282	0.281	0.25	1.05	1.07	0.83	9/16	•

Male Branch Tee
SBI2

Flareless tube ends / male pipe end

Part Number Information
SI - Body only
SBI2 - Assembled fitting

All dimensions are in inches



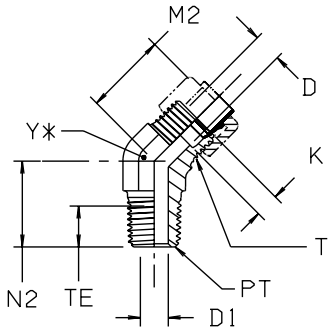
*Y—ACROSS WRENCH FLATS

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 B
2 SBI2	1/8	5/16-24	1/8-27	0.093	0.188	0.19	0.63	0.69	0.49	7/16	•
4 SBI2	1/4	7/16-20	1/8-27	0.203	0.188	0.23	0.61	0.78	0.64	3/8	•
4-4-4 SBI2	1/4	7/16-20	1/4-18	0.203	0.281	0.23	0.75	0.98	0.75	3/8	•
6 SBI2	3/8	9/16-18	1/4-18	0.282	0.281	0.25	0.72	0.91	0.75	9/16	•

45° Male Elbow

VBI2

Flareless tube end / male pipe end



*Y—ACROSS WRENCH FLATS

Part Number Information
VI - Body only
VBI2 - Assembled fitting

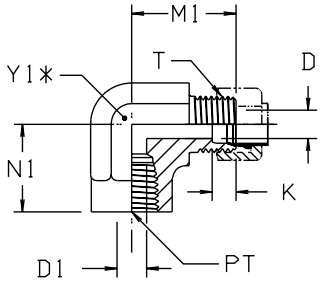
All dimensions are in inches

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
											B
4 VBI2	1/4	7/16-20	1/8-27	0.203	0.188	0.23	0.50	0.63	0.23	7/16	•
5 VBI2	5/16	1/2-20	1/8-27	0.234	0.188	0.25	0.59	0.63	0.23	9/16	•
6 VBI2	3/8	9/16-18	1/4-18	0.282	0.281	0.25	0.69	0.84	0.34	9/16	•

Female Elbow

DBI2

Flareless tube end / female pipe end



*Y1—ACROSS WRENCH FLATS

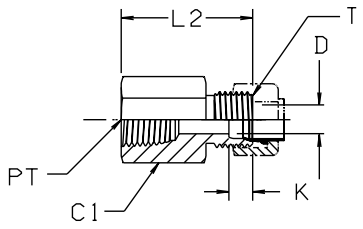
Part Number Information
DI - Body only
DBI2 - Assembled fitting

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
										B
2 DBI2	1/8	5/16-24	1/8-27	0.093	0.328	0.19	0.69	0.53	9/16	•
3 DBI2	3/16	3/8-24	1/8-27	0.125	0.328	0.23	0.66	0.53	9/16	•
4 DBI2	1/4	7/16-20	1/8-27	0.203	0.328	0.23	0.72	0.55	9/16	•
4-4 DBI2	1/4	7/16-20	1/4-18	0.203	0.422	0.23	0.84	0.69	3/4	•
6 DBI2	3/8	9/16-18	1/4-18	0.282	0.422	0.25	0.92	0.69	3/4	•
6-6 DBI2	3/8	9/16-18	3/8-18	0.282	0.563	0.25	1.00	0.81	7/8	•
8-8 DBI2	1/2	3/4-16	1/2-14	0.422	0.688	0.31	1.13	0.94	1	•

Female Connector

GBI2



Flareless tube end / female pipe end

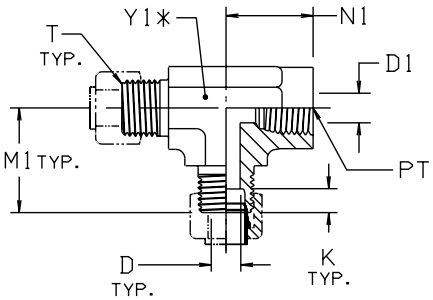
Part Number Information
GI - Body only
GBI2 - Assembled fitting

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 B
2 GBI2	1/8	5/16-24	1/8-27	9/16	0.093	0.19	0.78	•
3 GBI2	3/16	3/8-24	1/8-27	9/16	0.125	0.23	0.75	•
4 GBI2	1/4	7/16-20	1/8-27	9/16	0.203	0.23	0.80	•
4-4 GBI2	1/4	7/16-20	1/4-18	3/4	0.203	0.23	0.97	•
6 GBI2	3/8	9/16-18	1/4-18	3/4	0.282	0.25	0.98	•
6-2 GBI2	3/8	9/16-18	1/8-27	9/16	0.282	0.25	0.86	•
6-6 GBI2	3/8	9/16-18	3/8-18	7/8	0.282	0.25	1.08	•
6-8 GBI2	3/8	9/16-18	1/2-14	1 1/8	0.282	0.25	1.23	•
8 GBI2	1/2	3/4-16	3/8-18	7/8	0.422	0.31	1.16	•
8-4 GBI2	1/2	3/4-16	1/4-18	13/16	0.422	0.31	1.16	•
8-8 GBI2	1/2	3/4-16	1/2-14	1 1/8	0.422	0.31	1.31	•

Female Run Tee

MBI2



*Y1—ACROSS WRENCH FLATS

Flareless tube ends / female pipe end

Part Number Information
MI - Body only
MBI2 - Assembled fitting

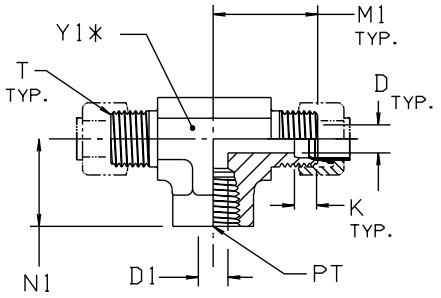
All dimensions are in inches

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 B
4 MBI2	1/4	7/16-20	1/8-27	0.203	0.328	0.23	0.72	0.53	9/16	•
6 MBI2	3/8	9/16-18	1/4-18	0.282	0.422	0.25	0.92	0.69	3/4	•

Female Branch Tee

OBI2

Flareless tube ends / female pipe end



*Y1—ACROSS WRENCH FLATS

Part Number Information
OI - Body only
OBI2 - Assembled fitting

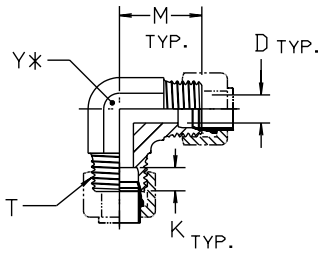
All dimensions are in inches

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 B
4 OBI2	1/4	7/16-20	1/8-27	0.203	0.328	0.23	0.72	0.53	9/16	•
4-4-4 OBI2	1/4	7/16-20	1/4-18	0.203	0.422	0.23	0.86	0.69	3/4	•
6 OBI2	3/8	9/16-18	1/4-18	0.282	0.422	0.25	0.92	0.69	3/4	•
8 OBI2	1/2	3/4-16	3/8-18	0.422	0.563	0.31	1.09	0.81	7/8	•

Union Elbow

EBI2

Flareless tube end / flareless tube end



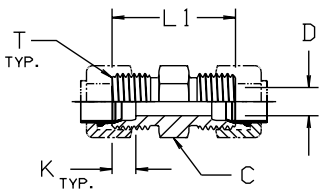
*Y—ACROSS WRENCH FLATS

Part Number Information
EI - Body only
EBI2 - Assembled fitting

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 B
4 EBI2	1/4	7/16-20	0.203	0.23	0.67	7/16	•
6 EBI2	3/8	9/16-18	0.282	0.25	0.72	9/16	•
8 EBI2	1/2	3/4-16	0.422	0.31	0.89	3/4	•

Union
HBI2



Flareless tube end / flareless tube end

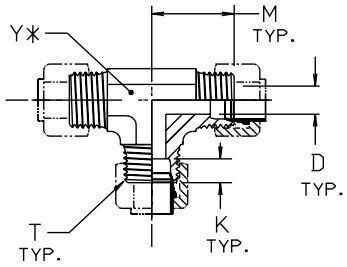
Part Number Information
HI - Body only
HBI2 - Assembled fitting

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)	L1 (inch)	STANDARD MATERIAL FROM STOCK B
2 HBI2	1/8	5/16-24	3/8	0.093	0.19	0.81	•
3 HBI2	3/16	3/8-24	3/8	0.125	0.23	0.75	•
4 HBI2	1/4	7/16-20	7/16	0.203	0.23	0.84	•
5 HBI2	5/16	1/2-20	1/2	0.234	0.25	0.91	•
6 HBI2	3/8	9/16-18	9/16	0.282	0.25	1.03	•
8 HBI2	1/2	3/4-16	3/4	0.422	0.31	1.19	•

E

Union Tee
JBI2



*Y—ACROSS WRENCH FLATS

Flareless tube end (all three ends)

Part Number Information
JI - Body only
JBI2 - Assembled fitting

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 B
2 JBI2	1/8	5/16-24	0.093	0.19	0.63	7/16	•
3 JBI2	3/16	3/8-24	0.125	0.23	0.59	7/16	•
4 JBI2	1/4	7/16-20	0.203	0.23	0.59	7/16	•
5 JBI2	5/16	1/2-20	0.234	0.25	0.66	9/16	•
6 JBI2	3/8	9/16-18	0.282	0.25	0.72	9/16	•
8 JBI2	1/2	3/4-16	0.422	0.31	0.88	3/4	•

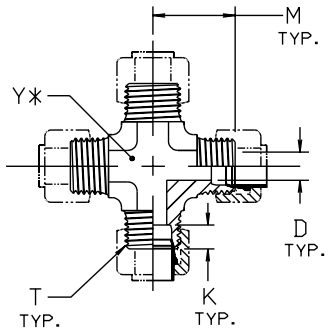
Union Cross

KBI2

Flareless tube end (all four ends)

Part Number Information
KI - Body only
KBI2 - 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
							B
4 KBI2	1/4	7/16-20	0.203	0.23	0.66	7/16	•
6 KBI2	3/8	9/16-18	0.282	0.25	0.78	1/2	•

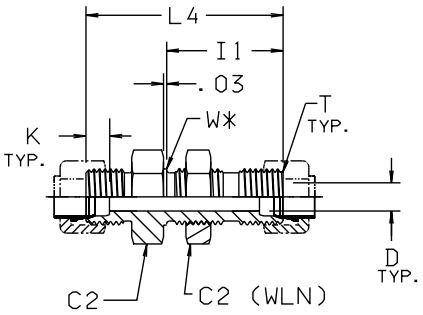
Bulkhead Union

WBI2

Flareless tube end / flareless tube end

Max panel thickness 3/8"
Part Number Information
WI - Body only
WI-WLN - Body with locknut
WBI2 - Assembled fitting

All dimensions are in inches



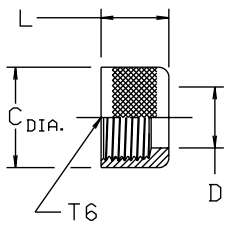
*W — BULKHEAD PILOT DIA.
RECOMMEND CLEARANCE
HOLE + .015 OVER W DIA.

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	C2 HEX (inch)	D DRILL (inch)	I1 (inch)	K (inch)	L4 (inch)	W DIA (inch)	STANDARD MATERIAL FROM STOCK
									B
4 WBI2	1/4	7/16-20	9/16	0.203	0.88	0.23	1.34	0.44	•
6 WBI2	3/8	9/16-18	11/16	0.282	0.94	0.25	1.56	0.56	•
8 WBI2	1/2	3/4-16	7/8	0.422	1.06	0.31	1.75	0.75	•

Knurled Nut

BIP

Flareless tube end knurled nut



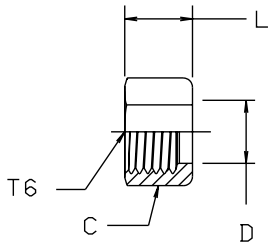
All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	T6 TUBE END UN/UNF-2B	D2 DIA. (inch)	D (inch)	L (inch)	STANDARD MATERIAL FROM STOCK
						B
4 BIP	1/4	7/16-20	0.50	0.26	0.39	•
6 BIP	3/8	9/16-18	0.63	0.38	0.42	•

Nut

BI2

Flareless tube end nut



All dimensions are in inches

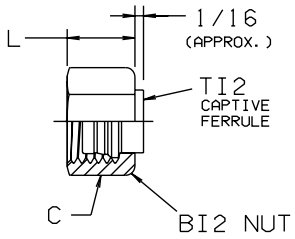
TUBE FITTING PART #	TUBE O.D. (inch)	T6 TUBE END UN/UNF-2B	C HEX (inch)	D (inch)	L (inch)	STANDARD MATERIAL FROM STOCK
						B
2 BI2	1/8	5/16-24	3/8	0.17	0.36	•
3 BI2	3/16	3/8-24	7/16	0.23	0.34	•
4 BI2	1/4	7/16-20	1/2	0.30	0.44	•
5 BI2	5/16	1/2-20	9/16	0.36	0.45	•
6 BI2	3/8	9/16-18	5/8	0.42	0.45	•
8 BI2	1/2	3/4-16	7/8	0.56	0.58	•

E

Nut and Ferrule

BTI2

Flareless tube end nut and ferrule



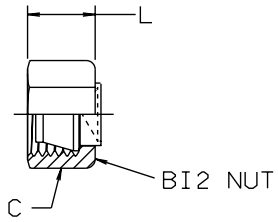
All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	C HEX (inch)	L5 (inch)	STANDARD MATERIAL FROM STOCK
				B
2 BTI2	1/8	3/8	0.36	•
3 BTI2	3/16	7/16	0.34	•
4 BTI2	1/4	1/2	0.44	•
5 BTI2	5/16	9/16	0.45	•
6 BTI2	3/8	5/8	0.45	•
8 BTI2	1/2	7/8	0.58	•

Cap

FNI

Flareless tube end plug



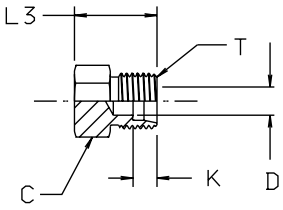
All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	C HEX (inch)	L5 (inch)	STANDARD MATERIAL FROM STOCK
				B
2 FNI	1/8	3/8	0.36	•
3 FNI	3/16	7/16	0.34	•
4 FNI	1/4	1/2	0.44	•
5 FNI	5/16	9/16	0.45	•
6 FNI	3/8	5/8	0.45	•
8 FNI	1/2	7/8	0.58	•

Plug

PNI

Flareless tube end plug



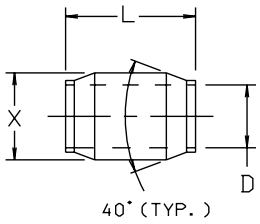
Part Number Information
PNI - Body only

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)	L3 (inch)	STANDARD MATERIAL FROM STOCK
							B
4 PNI	1/4	7/16-20	7/16	0.203	0.23	0.50	•
5 PNI	5/16	1/2-20	1/2	0.234	0.25	0.52	•
6 PNI	3/8	9/16-18	9/16	0.282	0.25	0.59	•
8 PNI	1/2	3/4-16	3/4	0.422	0.31	0.67	•

Expander / Insert

TIP

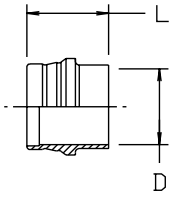


For use with BIP knurled nut and plastic tubing. Replaces BI2 nut and TI2 ferrule or BTI2 nut and ferrule.

All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	D3 (inch)	L (inch)	X DIA (inch)	STANDARD MATERIAL FROM STOCK
					B
4 TIP	1/4	0.14	0.45	0.22	•
6 TIP	3/8	0.22	0.45	0.30	•

Ferrule
TI2



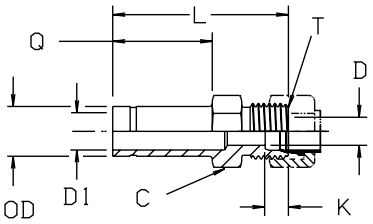
Flareless tube end sleeve

All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	D3 (inch)	L (inch)	STANDARD MATERIAL FROM STOCK
				B
2 TI2	1/8	0.13	0.35	•
3 TI2	3/16	0.19	0.39	•
4 TI2	1/4	0.26	0.40	•
5 TI2	5/16	0.32	0.42	•
6 TI2	3/8	0.38	0.41	•
8 TI2	1/2	0.51	0.52	•

E

Tube End Reducer
TRBI2



Flareless tube end reducer

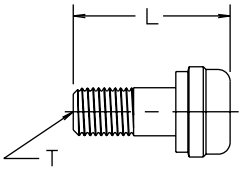
Part Number Information
TRI - Body only
TRBI2 - Assembled fitting

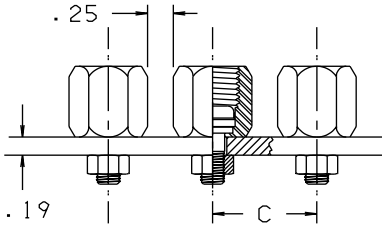
All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. REDUCTION (inch)	T TUBE END UN/UNF-2A	C HEX (inch)	D DRILL (inch)	D1 DRILL (inch)	K (inch)	L (inch)	OD DIA (inch)	Q (inch)	STANDARD MATERIAL FROM STOCK
										B
4-3 TRBI2	1/4-3/16	3/8-24	7/16	0.125	0.125	0.23	1.00	0.25	0.56	•
6-4 TRBI2	3/8-1/4	7/16-20	7/16	0.203	0.250	0.23	1.06	0.38	0.59	•
8-4 TRBI2	1/2-1/4	7/16-20	9/16	0.203	0.375	0.23	1.30	0.50	0.75	•

Mountie
T22I

Stud bolt plug



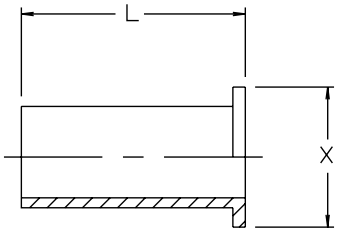


All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	T TUBE END UN/UNF-2A	LL (inch)	L (inch)	STANDARD MATERIAL FROM STOCK
					B
4 T22I	1/4	1/4-20	0.83	0.81	•
6 T22I	3/8	1/4-20	0.97	0.81	•

Insert
T23UI

Tube support



All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. (inch)	TUBE WALL THICKNESS (inch)	L (inch)	X DIA (inch)	STANDARD MATERIAL FROM STOCK
					B
4 T23UI	1/4	0.040	0.53	0.23	•
5 T23UI	5/16	0.062	0.56	0.29	•
6 T23UI	3/8	0.062	0.56	0.35	•
8 T23UI	1/2	0.062	0.64	0.47	•

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