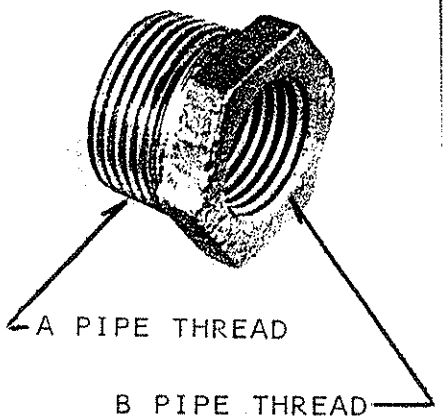
MALLEABLE IRON FITTINGS

BLACK AND GALVANIZED TYPE

HEX BUSHINGS



A	B	BLACK	GALV	STEEL	PART NUMBER
1/4	1/8			*	23-09212-001
3/8	1/8			*	23-09212-005
1/2	1/8	*			23-09212-007
3/4	1/8	*			23-09212-011
1	1/8		*		23-09212-002
3/8	1/4			*	23-09212-006
1/2	1/4	*			23-09212-008
3/4	1/4	*			23-09212-012
1	1/4		*		23-09212-003
1-1/4	1/4		*		23-09212-004
2	1/4		*		23-09212-026
1/2	3/8	*			23-09212-009
3/4	3/8	*			23-09212-013
1	3/8		*		23-09212-015
1-1/4	3/8		*		23-09212-010
1-1/2	3/8		*		23-09212-021
2	3/8		*		23-09212-027
3/4	1/2	*			23-09212-014
1	1/2		*		23-09212-016
1 1/4	1/2		*		23-09212-018
1-1/2	1/2		*		23-09212-022
2	1/2		*		23-09212-028
2-1/2	1/2		*		23-09212-033
3	1/2		*		23-09212-039
1	3/4	*			23-09212-017
1-1/4	3/4		*		23-09212-019
1-1/2	3/4		*		23-09212-023
2	3/4		*		23-09212-029
2-1/2	3/4		*		23-09212-034
3	3/4		*		23-09212-040
1-1/4	1	*			23-09212-020
1-1/2	1		*		23-09212-024
2	1		*		23-09212-030
2-1/2	1		*		23-09212-035
3	1		*		23-09212-041
1-1/2	1-1/4	*			23-09212-025
2	1-1/4		*		23-09212-031
2-1/2	1-1/4		*		23-09212-036
3	1-1/4		*		23-09212-042
2	1-1/2	*			23-09212-032
2-1/2	1-1/2		*		23-09212-037
3	1-1/2		*		23-09212-043
2-1/2	2	*			23-09212-038
3	2		*		23-09212-044
3	2-1/2		*		23-09212-046

23-1202

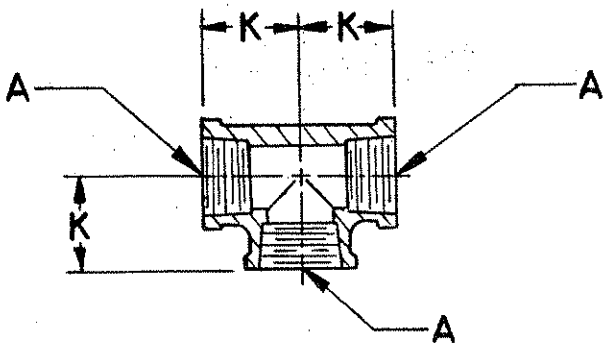
General Use Part

PRINT ISSUED		TITLE	PART NO.
		TEE, TRIPLE INTERNAL AUTOMOTIVE PIPE SAE STD	23-1202
LAST CHG. LTR.	B		SHEET 1 OF 1

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
B	DL	3-23-73	Revised & Redrawn: J #A0184

SKETCH



PART NUMBERS

A THREAD (NPTF)	K MAX.		FREIGHTLINER PART NUMBER
1/16-27	0.53		23-1202-001
1/8 -27	0.58		-002
1/4 -18	0.76		-003
3/8 -18	0.88		-004
1/2 -14	1.08		-005

ENGINEERING NOTES

(1) Material: Cast Aluminum

2. Must meet SAE J530 standards

COMPILED	DL	DATE DRAWN		MATERIAL	
APPROVED		3-23-73		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

ns

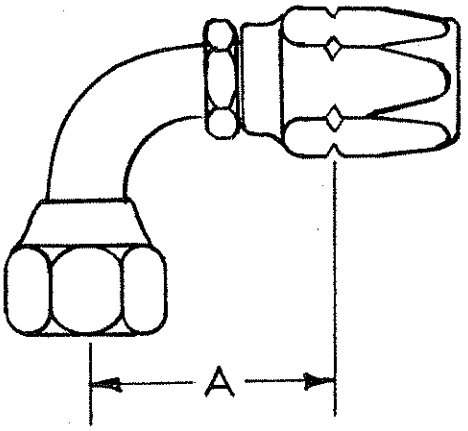
E-183

A23-2609

General Use Part

PRINT ISSUED		TITLE	PART NO.
		ELBOW ASSY, 90° SAE SWIVEL	A23-2609
LAST CHG. LTR.	A		SHEET 1 OF 1

SKETCH



PART NUMBERS

OD TUBE 16ths	SAE THREAD	A LENGTH		MANUFACTURER'S NUMBER STX*		FREIGHTLINER PART NUMBER
4	7/16-20	.91		27228- 4- 4S		A23-2609-004
6	5/8 -18	1.06		27234- 6- 6S		-006
8	3/4 -16	1.31		27228- 8- 8S		-008
10	7/8 -14	1.44		27228-10-10S		-010
12	1-1/16-14	1.94		27234-12-12S		-012

* 27228 Series has 37°/45° Dual Seal Angles
27234 Series has 45° Flare Only

ENGINEERING NOTES

(1) Material: Steel

WAS	CHG	BY	DATE

WAS	CHG	BY	DATE
Rev'd & Redrawn: J#A0390	A	HJR	5-18-73

ns

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rollins	5-18-73		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

A23-2610

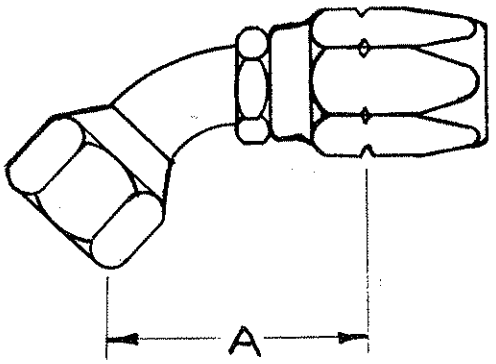
General Use Part

PRINT ISSUED	TITLE	PART NO.
	ELBOW ASSY, 45° SAE SWIVEL	A23-2610
LAST CHG LTR. A		SHEET 1 OF 1

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	HJR	5-18-73	Revised & Redrawn; J #A0390

SKETCH



PART NUMBERS

OD TUBE 16ths	SAE THREAD	A DIM.		MANUFACTURER'S NUMBER STX*		FREIGHTLINER PART NUMBER
4	7/16-20	1.00		27227- 4- 4S		A23-2610-004
6	5/8 -18	1.16		27233- 6- 6S		-006
8	3/4 -16	1.55		27227- 8- 8S		-008
10	7/8 -14	1.75		27227-10-10S		-010
12	1-1/16-14	2.00		27233-12-12S		-012

* 27227 series has SAE-J1C Dual Seal Angles.
27233 series has SAE Seal Angle Only.

ENGINEERING NOTES

(1) Material: Steel

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rollins	5-18-73		(1)	

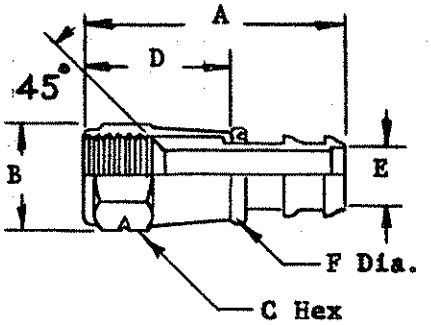
ns

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

Compiled	L. BRYANT	TERMINAL ASSY, HOSE LOW PRESSURE	A23- 2602
Approved	CLO.		
Issued	11-17-66		
Last Chg Letter	B	FREIGHTLINER CORPORATION PORTLAND, OREGON	

SKETCH



ASSEMBLY NUMBERS (Material: Brass[b] or steel[s])

FREIGHTLINER FITTING NUMBER [a]	ID HOSE 16THS	SAE THREAD	MANUFACTURERS' NUMBERS				
			b. AQ	s. PH	b. STX	b. WH	
A23- 2602-004	4	7/16-20	4797-4B	1/4-4-30882-1	434-4-4	10004B-404	B
A23- 2602-006	6	5/8-18	4739-6B	3/8-6-30882-1	442-6-6	10006B-406	B
A23- 2602-008	8	3/4-16	4797-8B	1/2-8-30882-1	434-8-8	10008B-408	B

a. Last dash number of fitting shows dash size of hose, [illegible].

DIMENSIONS*

ID HOSE 16THS	A LENGTH	B ACROSS FLATS	C FLAT WIDTH	D CUT-OFF FACTOR	E INSIDE DIAMETER	F HOSE CUP OUTSIDE DIA.
4	1.56	.56	.31	.75	.17	.62
6	1.75	.75	.31	.88	.30	.75
8	2.00	.88	.35	1.00	.39	.88

*Dimensions in Inches.(Dimensions may vary somewhat among various manufacturers.)

ENGINEERING NOTES

1.Quality of material, manufacture, finish and workmanship, to be not less than the current applicable specifications of SAE J530.

EXAMPLE OF ASSY NO.: A23 - 2602 - 006

Group No.(Gen'l Use Part)
Category (Hose Fitting) — Type (Low Pres. 45° SAE Swivel)
O.D. Tube Size in 16ths

CHG	BY	DATE	WAS
B			

CHG	BY	DATE	WAS
A	DEC	8-4-67	(WH) 00904B Series
A	DEC	8-4-67	(PH) 30682-1, 30882-1
B	HJR	11-30-72	23-2600; Rev'd Format; J #60500

Was FC 2602 Series

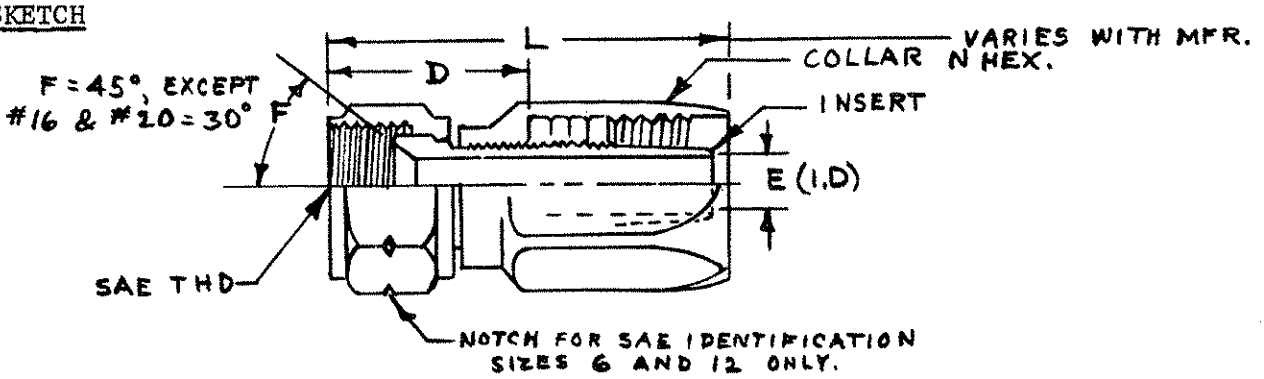
Form E-46

A23-2604

General Use Part

PRINT ISSUED	TITLE	PART NO.
9/13/71	SWIVEL ASSY, SAE 45° FLARE, STL.	A23-2604
LAST CHG. LTR. D		SHEET 1 OF 1

SKETCH



PART NUMBERS

HOSE SIZE	SAE THREAD	MANUFACTURER'S NUMBER (More Below) --- AQ	IB	PH	STX	SPK		FREIGHTLINER PART NUMBER
4	7/16-20	401-4S	BC 04-04NS	20822-4-4	323-4	462-4		A23-2604-004
6	5/8-18	-6S	BC 06-06NS	-6-6	-6	-6		-006
8	3/4-16	-8S	BC 08-08NS	-8-8	-8	-8		-008
10	7/8-14	-10S	BC 10-10NS	-10-10	-10	-10		-010
12	1-1/16-14	-12S	BC 12-12NS	-12-12	-12	-12		-012
16	1-5/16-14	406-16S	BC 16-16NS	23222-16-16	324-16	463-16		-016
20	1-5/8-14	-20S	BC 20-20NS	23222-20-20	324-20	-		-020

(Sketch Dimensions)

HOSE SIZE	D Approx	E	L Approx	N Hex	
4	1.00	.19	1.75	.62	
6	1.12	.31	2.05	.81	
8	1.38	.41	2.52	.94	
10	1.50	.50	2.80	1.12	
12	1.50	.62	3.02	1.25	
16	1.38	.78	2.60	1.44	
20	1.50	1.05	2.86	1.75	

MFR'S NO. (More Above) WH		FREIGHTLINER PART NUMBER
06904A-604		A23-2604-004
06906A-406		-006
06908A-608		-008
06910A-610		-010
06912A-412		-012
06916A-X16		-016
06920A-X20		-020

ENGINEERING NOTES

1. Material: - Steel
2. Construction shall conform to the pertinent specifications of SAE Std. J516 for hose fittings for use on SAE 100R5 hydraulic hose.
3. Application: For use with SAE 100R5 hydraulic hoses per SAE Standard J517 (Ref. Freightliner hose specification 48-2004).
4. Next assemblies: A23-2242 thru A23-2250.

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
B	HJR	8-25-71	PH, STX & WH added -020
C	HJR	10-19-72	A23-2604; J #60270
D	HJR	12-18-72	Restore "A" prefix; J #60500

COMPILED	HJR	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED		1-26-71		1	4

Portland FREIGHTLINER CORPORATION Oregon 97208

A23-2606

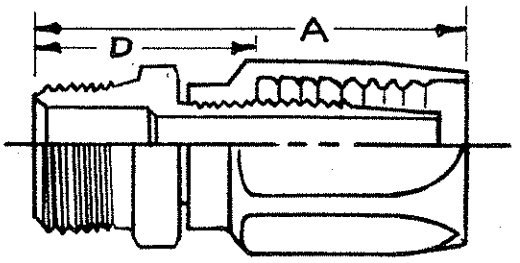
General Use Part

PRINT ISSUED	TITLE	PART NO.
4/20/71	TERMINAL ASSY, HOSE MEDIUM PRESSURE MALE PIPE, STEEL	A23-2606
LAST CHG. LTR. C		SHEET OF

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
B	HJR	3-31-71	PH No's Revised; Redrawn
C	HJR	5-18-73	Add "A" prefix; I#A0390

SKETCH



PART NUMBERS

HOSE SIZE (NOM)	PIPE THREAD NPTF	D	A	MANUFACTURER'S NUMBER					FREIGHTLINER PART NUMBER
				AQ	PH	STX	WH		
4	1/8-27	.92	1.68	412-2-4S	20120-2-4	326-2-4	06904-102		A23-2606-004
6	1/4-18	1.23	2.13	412-4-6S	20120-4-6	326-4-6	06906A-104		-006
8	3/8-18	1.33	2.48	412-6-8S	20120-6-8	326-6-8	06908A-106		-008
10	1/2-14	1.59	2.88	412-8-10S	20120-8-10	326-8-10	06910A-108		-010
12	3/4-14	1.67	3.24	412-12-12S	20120-12-12	326-12-12	06912A-112		-012
16	3/4-14	1.53	2.80	412-12-16S	20120-12-16	326-12-16			-016

ENGINEERING NOTES

(1) Material: Steel

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		3-30-71		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

B

GENERAL USE PART

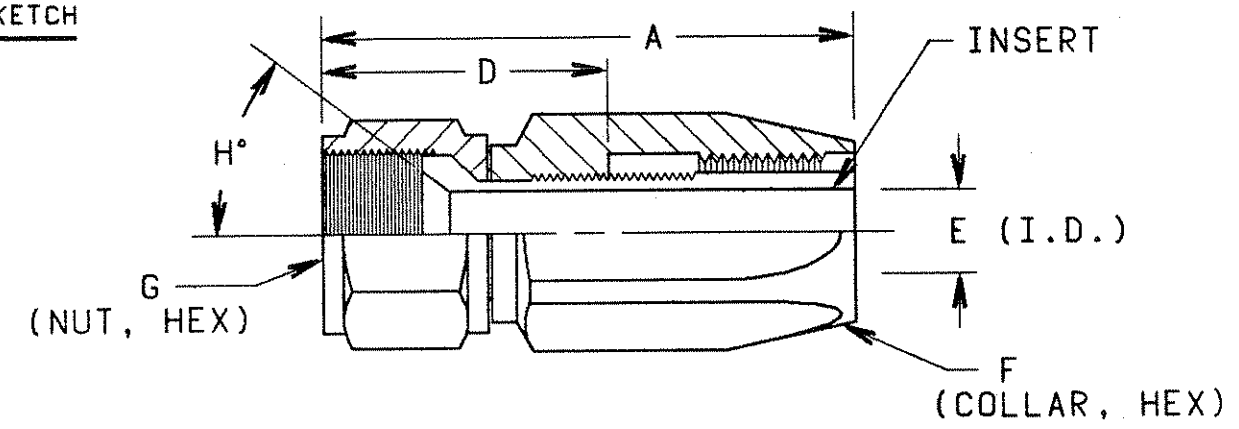
A23-02608

ORIGINAL JOB NO.	TITLE	PART NO.
0715C	TERMINAL ASSY, HOSE REUSEABLE TYPE FOR MEDIUM PRESSURE 37° JIC SWIVEL, STEEL	A23-02608
LAST CHG LTR: D		SHEET 1 OF 1

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

CHANGE INFORMATION	DATE	BY	JOB NO.	TR
REVISED & REDRAWN	01-10-84	FEF	0715C	D

SKETCH



PART NUMBERS

OD TUBE SIZE	SAE THREAD	MANUFACTURER'S NUMBERS					FREIGHTLINER PART NUMBER*
		AQ	PH	STX	WH	SPK	
1/4	7/16-20	411-4S	3/16-4 20622-1	319-4	06904A-604	461-4	A23-02608-004
3/8	9/16-18	411-6S	5/16-6 20622-1	319-6	06906A-606	461-6	-006
1/2	3/4 -16	411-8S	13/32-8 20622-1	319-8	06908A-608	461-8	-008
5/8	7/8 -14	411-10S	1/2-10 20622-1	319-10	06910A-610	461-10	-010
3/4	1 1/16-12	411-12S	5/8-12 20622-1	319-12	06912A-612	461-12	-012
1	1 5/16-12	411-16S	7/8-16 20622-1	319-16	06916A-616	461-16	-016

*DASH NUMBER=O.D. TUBE SIZE IN SIXTEENTHS OF AN INCH.

REFERENCE DIMENSIONS

OD TUBE SIZE	A	D APPROX	E (I.D.)	F COLLAR, HEX	G NUT, HEX	H DEGREES	
1/4	VARIES AMONG MANUFACTURER'S	1.000	3/16	.625	.625	37°	
3/8		1.125	5/16	.812	.750	37°	
1/2		1.375	13/32	.938	.875	37°	
5/8		1.500	1/2	1.125	1.000	37°	
3/4		1.500	5/8	1.250	1.250	37°	
1		1.375	13/16	1.438	1.500	37°	

ENGINEERING NOTES

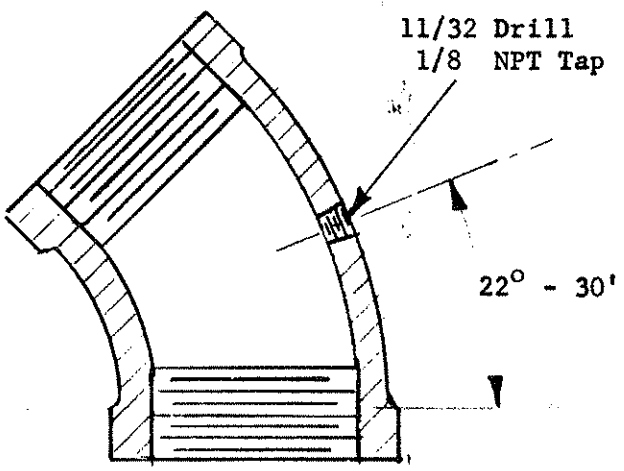
(1) MATERIAL: STEEL.

2. HOSE AND FITTINGS MUST BE FROM THE SAME MANUFACTURER PER SALES STANDARD CHANGE NOTICE DATED 03-02-67 BY H. JOY, WHEN MANUFACTURER IS SPECIFIED BY CUSTOMER.

COMPILED	FEF	DATE DRAWN	CADAM ORIGINAL	MATERIAL	MASTER NUMBER	
APPROVED		01-10-84		(1)	05115	000D1

23-9015

PRINT ISSUED		TITLE	PART NO.
		ELBOW, 45°, 3/4 STD. DRY SEAL PIPE MODIFIED	23-9015
LAST CHG. LTR.	F		SHEET OF



CHG	BY	DATE	WAS

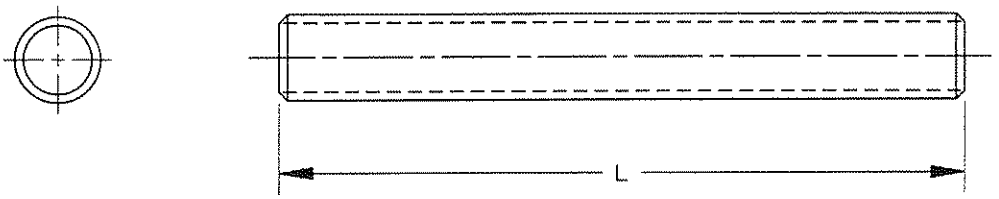
CHG	BY	DATE	WAS
F	PRJ	12-16-68	B Size Drawing

① Malleable Iron - Meets SAE J530 Standards

COMPLIED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	[illegible]	12-16-68		①	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 97208

DRAWN	CGD	TITLE	DRAWING NUMBER	
APPRV	DAJ	NIPPLE, ALL THREAD CONDUIT	23-09018	
DATE	07/20/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. J
CATIA ORIGINAL				



L LENGTH	THREAD SIZE (NPT)	FREIGHTLINER PART NUMBER
3	3/4 - 14	23-09018-001
3-1/4	3/4 - 14	23-09018-002
4	3/4 - 14	23-09018-003
5	3/4 - 14	23-09018-004
6	3/4 - 14	23-09018-005
6-1/2	3/4 - 14	23-09018-006
3	1/2 - 12	23-09018-007
4	1/2 - 14	23-09018-008
5	1/2 - 14	23-09018-009
6	1/2 - 14	23-09018-010
7	1/2 - 14	23-09018-011
8	1/2 - 14	23-09018-012
9	1/2 - 14	23-09018-013

ENGINEERING NOTES:

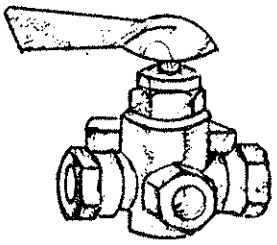
1. MATERIAL: STEEL-CONDUIT

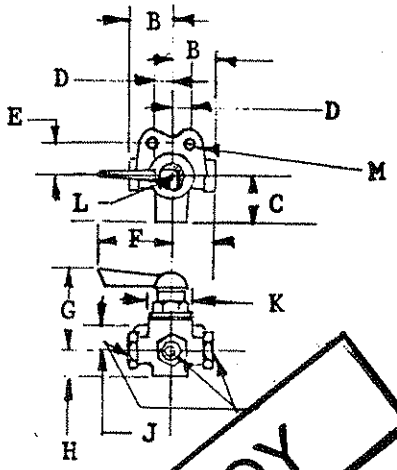
CHG	JOB NO	DATE	BY	REVISION
J	PA2042-95	07/20/99	CGD	REVISED AND REDRAWN IN CATIA

23-9092

PRINT ISSUED	TITLE	PART NO.
1-20-69	VALVE, SHUT OFF - 3-WAY - FEMALE	23-9092
LAST CHG. LTR. B		SHEET OF

CHG	BY	DATE	WAS





REMOVE & DESTROY

DASH NUMBER	PIPE THD. A					F	G	H	J	K	PORT HOLE L	MTG. HOLE M
-001	[illegible]		15/16	[illegible]/8	21/32	1-1/2	1-45/64	1/2	1/2	29/32	3/16	17/64
-002	1/4	1-1/8	1-1/8	1/2	11/16	2-1/16	2-1/16	21/32	19/32	1-1/16	5/16	17/64
-003	3/8	1-5/16	1-5/16	1/2	27/32	2-9/16	2-29/64	23/32	5/8	1-1/4	7/16	17/64

CHG	BY	DATE	WAS
B	PRJ	12-30-68	B Size Drawing

(1.) Brass Forging

COMPILED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	KJA	12-30-68		(1)	VEHICLE

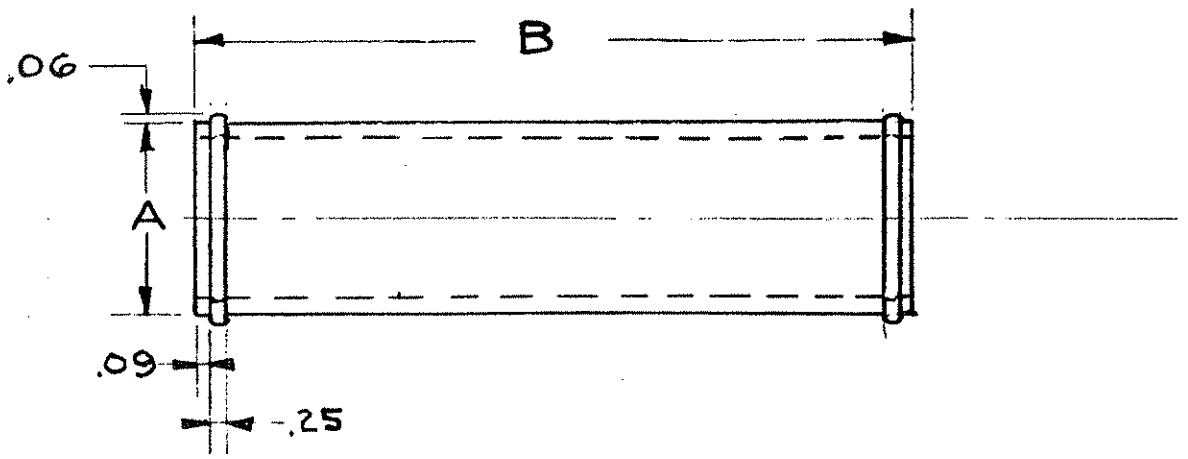
Portland FREIGHTLINER CORPORATION Oregon 97208

23-9099

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
D	PRJ	12-16-68	B Size Drawing
E	LFG	3-27-69	Add Material Thickness

PRINT ISSUED		TITLE	PART NO.
		FITTINGS, RADIATOR ALUMINUM TUBE	23-9099
LAST CHG. LTR.	E		SHEET OF



DASH NUMBER	NOM SIZE (O.D.) A	LENGTH (in) B
--0	2-1/2	8
--1	2-1/2	11
--2	2-1/4	10

Remove all burrs. (E)

(1.) Round Aluminum Tubing - 6061-T6 - .125 Wall Thickness

COMPLIED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K.J.A.	12-16-68		(1)	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 97208

12-28-8

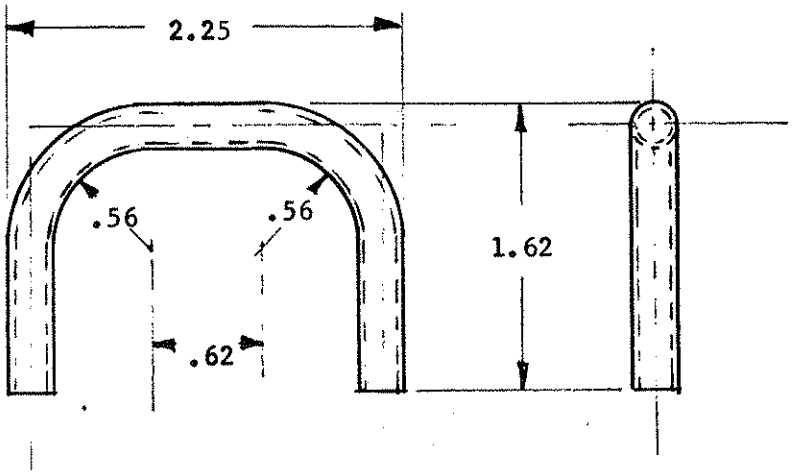
4-3-9

23-9106

PRINT ISSUED	TITLE	PART NO.
12-23-68	FITTING, U; DASH PANEL VALVE	23-9106
LAST CHG. LTR. A		SHEET OF

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	PRJ	12-16-68	C Size Drawing



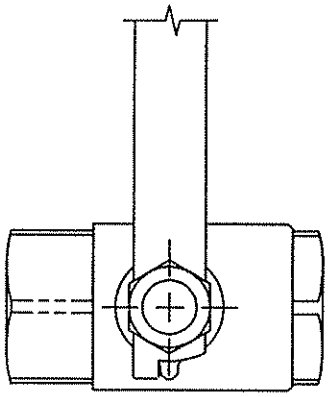
① 1/4" O.D. Copper Tubing

		DATE DRAWN		MATERIAL	NEXT ASSY. NO.
COMPLIED	PRJ	12-16-68		①	VEHICLE
APPROVED	K.J.A.				

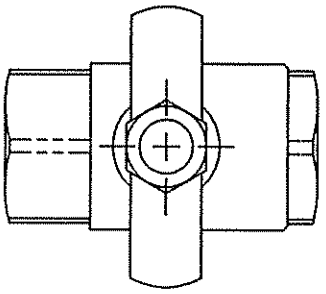
Portland FREIGHTLINER CORPORATION Oregon 97208

DRAWN	PCK	TITLE	ITEM NUMBER
APPRV	ANF	VALVE ASSY, BALL	A23-09108
DATE	02/15/89	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

SKETCH:



-000, -001, -004
LEVER HANDLE



-006
-005
'T' HANDLE

SPECIFICATION NUMBERS:

PIPE SIZE	HANDLE TYPE	MANUFACTURER'S NUMBER				FREIGHTLINER NUMBER
		FNI	PH	VOS	APV	
1/2	LEVER		XV500P-8	59 62 10/NPT	70-103-B2	A23-09108-000
3/4	LEVER		XV500P-12	59 62 11/NPT		-001
3/8	LEVER		XV500P-6	59 62 09/NPT		-004
1/2	TEE	1/2 8901T	XV500P-8-04	59 62 10NPTB		-005
3/8	TEE		XV500P-6-04	59 62 09/NPTB		-006

ENGINEERING NOTES:

1. MATERIAL: BRASS (NICKEL PLATING OPTIONAL).
2. HANDLES SHOWN IN OFF POSITION.
3. TEMPERATURE RANGE: -30° C TO 180° C (-20° F TO 350° F)

CHG	JOB/RLSE NO	DATE	BY	REVISION
P	P8298F-01	11/07/90	SJT	ADDED -005 & GEOMETRY FOR -005.
R	569093-02	11/23/93	ERK	ADDED -006
S	569093-03	01/11/94	ERK	-006: VNDR # TO 59 62 09/NPTB FROM 59 62 09 NPT.
T	PA2042-70	02/13/96	ERK	ADDED PH TO MANUFACTURER'S LIST
U	PA2042-71	08/18/96	JCT	ADDED PH NUMBERS TO -001 -005

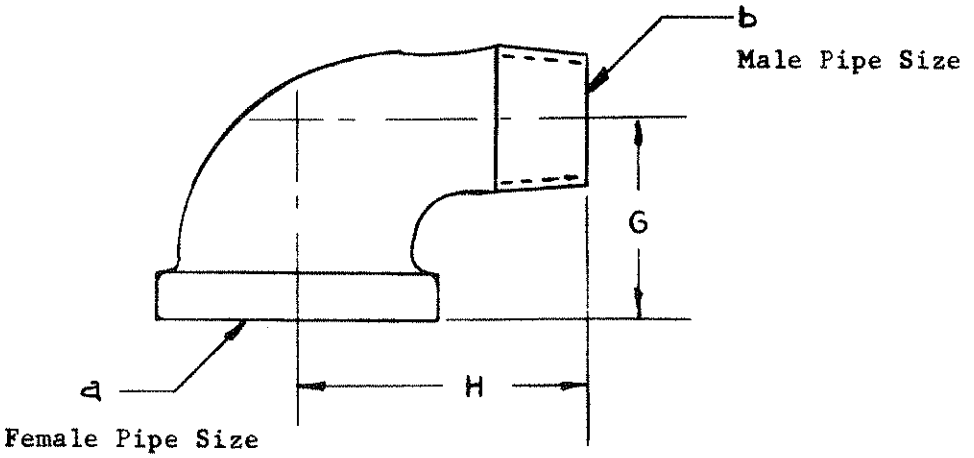
23-9144

General Use Part

PRINT ISSUED		TITLE	PART NO.
		ELBOW, REDUCER	23-9144
LAST CHG. LTR.	A		SHEET 1 OF 1

American Standard Taper, Dry Seal Pipe Thread

SKETCH



PART NUMBERS

FL DASH NO	PIPE SIZE a	PIPE SIZE b	G	H		FREIGHTLINER PART NUMBER
-000	3/8	1/4	1-1/16	1-1/16		23-9144-000
-001	1/2	3/8	1-3/16	1-3/16		-001
-002	3/4	1/2	1-5/16	1-3/8		-002
-102		3/8	1-5/16	1-3/8		-102
-003	1	3/4	1-1/2	1-9/16		-003
-103		1/2	1-1/2	1-9/16		-103
-004	1-1/4	1	1-3/4	1-13/16		-004
-104		3/4	1-3/4	1-13/16		-104
-005	1-1/2	1-1/4	2	2-1/16		-005
-105		1	2	2-1/16		-105
-006	2	1-1/2	2-1/4	2-3/8		-006
-106		1-1/4	2-1/4	2-3/8		-106
-007	2-1/2	2	2-11/16	2-3/4		-007
-008	3	2-1/2	3-1/16	3-5/16		-008

ENGINEERING NOTES

(1) **MATERIAL:** Cast Malleable Black Iron

COMPLIED	K.J.A	DATE DRAWN		MATERIAL	
APPROVED	K.J.A	9-25-68		(1)	

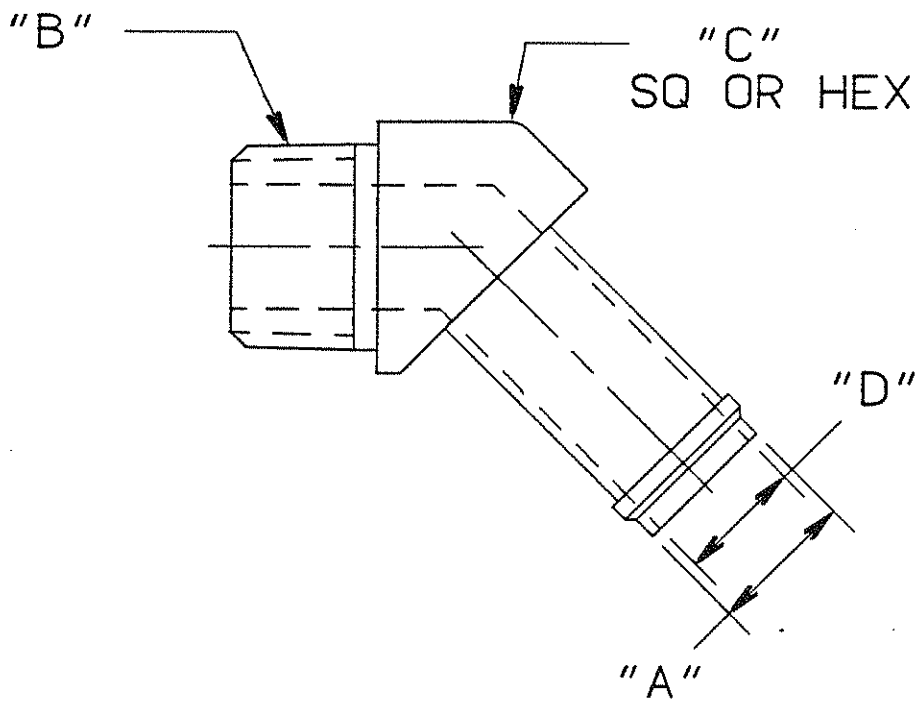
Portland FREIGHTLINER CORPORATION Oregon 97208

CHG	BY	DATE	WAS	JOB NO

CHG	BY	DATE	WAS	JOB NO
A	HJR	6-17-75	Added -102 thru -106	40751

E-183

DRAWN	CBW	TITLE	ITEM NUMBER
APPRV	PCK	ELBOW, 45° HOSE TO PIPE	23-09149
DATE	10/20/89	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



"A" HOSE I.D.	"B" THREAD (NPTF)	"C" ACROSS FLATS	"D" HOLE DIA.	MANUFACTURER'S NUMBER			FREIGHTLINER PART NUMBER
				DIV	PH ⚠4	AIRWAY (BRENNAN)	
3/4	3/4-14	1-1/8	.64	16163*	QHB 8224	4503-12-12	23-9149-000
3/8	3/8-18	13/16	.30			4503-6-6	23-9149-001

* ALTERNATE 844-12

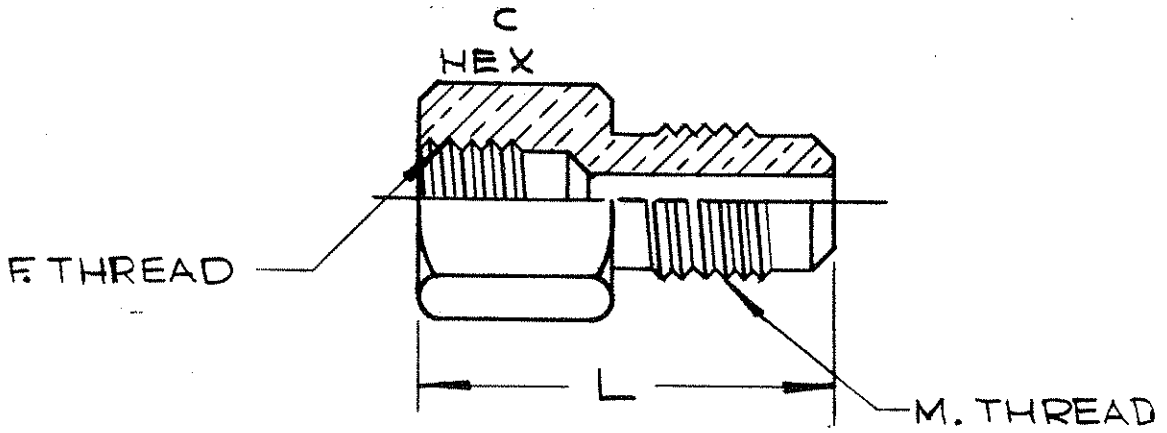
NOTES:

1. MATERIAL: STEEL, AISI 12L14 OR EQUIVILENT.
2. FINISH: ZINC PLATE, PER FREIGHTLINER SPEC 49-00005-403.
3. MUST MEET PERTINENT PROVISIONS OF SAE J1231, FIGURE NO. 430360 (REF STDS SAE J514 AND SAE J962, FIG2, STYLE B)

⚠4. MATERIAL: BRASS

CHG	JOB/RLSE NO	DATE	BY	REVISION
D	PX0222-10	10/20/89	PCK	REDRAWN. ADDED -001

PRINT ISSUED	TITLE	PART NO.
0-5-68	ADAPTER, MALE FLARE TO MALE FLARE	23-9153
LAST CHG. LTR.		SHEET 1 OF 1



FREIGHTLINER PART NUMBER	TUBE SIZE M	TUBE SIZE F	THREAD M	THREAD F	MFR PART NUMBERS IB	MFR PART NUMBERS PH
23-9153-023	1/4	3/8	7/16-20	5/8 -18	661-F 1/4 to 3/8	661-FHD-4-6
23-9153-024	1/4	1/2	7/16-20	3/4 -16	661-F 1/4 to 1/2	661-FHD-4-8
23-9153-032	3/8	1/4	5/8 -18	7/16-20	661-F 3/8 to 1/4	661-FHD-6-4
23-9153-034	3/8	1/2	5/8 -18	3/4 -16	661-F 3/8 to 1/2	661-FHD-6-8
23-9153-042	1/2	1/4	3/4 -16	7/16-20	661-F 1/2 to 1/4	661-FHD-8-4
23-9153-043	1/2	3/8	3/4 -16	5/8 - 8	661-F 1/2 to 3/8	661-FHD-8-6
23-9153-045	1/2	5/8	3/4 -16	7/8 -14	661-F 1/2 to 5/8	661-FHD-8-10
23-9153-054	5/8	1/2	7/8 -14	3/4 -16	661-F 5/8 to 1/2	661-FHD-10-8
23-9153-056	5/8	3/4	7/8 -14	1-1/16-14	661-F 5/8 to 3/4	———
23-9153-064	3/4	1/2	1-1/16-14	3/4 -16	661-F 3/4 to 1/2	———
23-9153-065	3/4	5/8	1-1/16-14	7/8 -14	661-F 3/4 to 5/8	———

REFERENCE DIMENSIONS

FREIGHTLINER PART NUMBER	LENGTH* INCHES	INSIDE DIA IN	C HEX
23-9153-023	1.19	.22	7/8
23-9153-024	1.38	.22	1
23-9153-032	1.12	.31	3/4
23-9153-034	1.44	.31	1
23-9153-042	1.25	.44	13/16
23-9153-043	1.38	.44	7/8
23-9153-045	1.69	.45	1-1/8
23-9153-054	1.62	.53	1
23-9153-056	1.97	.55	1-5/16
23-9153-064	1.69	.72	1-1/8
23-9153-065	1.88	.72	1-1/8

*Approximate, Variable

EXAMPLE OF PART NUMBER

23 - 9153 - 023

- 23 — GROUP (GENERAL USE PART)
- 9153 — CONSECUTIVE NUMBER
- 023 — 1/2 FEMALE TUBE SIZE; 1/2 MALE TUBE SIZE

COMPILED	EHM	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K.J.A	8-12-68		BRASS	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 97208

WAS | DATE | BY | CHG

23-9172

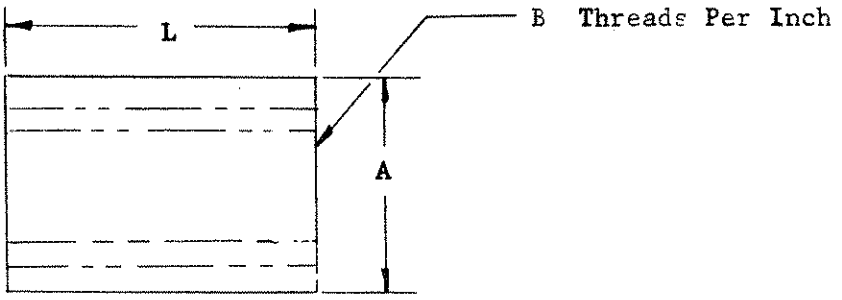
General Use Part

PRINT ISSUED	TITLE	PART NO.
7/9/71	PIPE COUPLING AIR TO AIR STRAIGHT STEEL	23-9172
LAST CHG. LTR. A		SHEET OF

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	RWG	6-29-71	9163-004, Revise Format

SKETCH



PART NUMBERS

PIPE SIZE	B	L	A	FREIGHTLINER PART NUMBER
1/4	18	13/16	9/16	23-~~9172-004~~

ENGINEERING NOTES

(1) Material: Steel

COMPILED	K. J. A	DATE DRAWN		MATERIAL	
APPROVED	K. J. A	9-26-68		(1)	

10-3-68

Portland FREIGHTLINER CORPORATION Oregon 97208

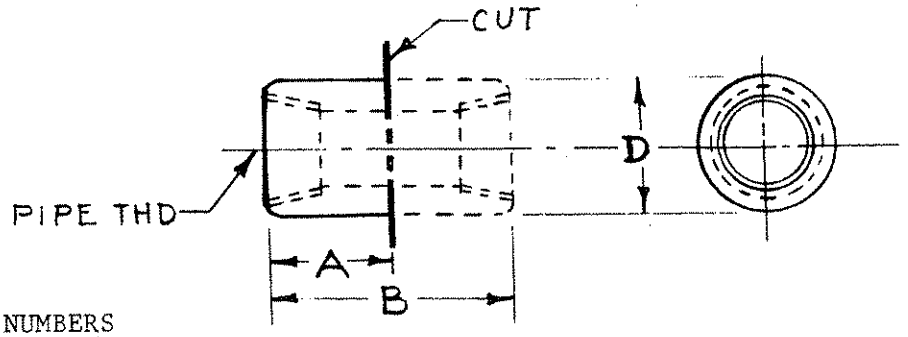
E-183

23-9173

General Use Part

PRINT ISSUED		TITLE	PART NO.
		HALF COUPLING, PIPE ASA PLAIN, STEEL	23-9173
LAST CHG LTR	A		SHEET 1 OF 1

SKETCH



PART NUMBERS

PIPE THREAD (2)	A (APPROX.)*	B (REF)	D (REF)		MAKE FROM MATERIAL (1)	FREIGHTLINER PART NUMBER
NPSF						
1/8 -27	.41	.81	.563		23-9215-001	23-9173-000
1/4 -18	.59	1.19	.719		-002	-001
3/8 -18	.59	1.19	.875		-003	-002
1/2 -14	.78	1.56	1.063		-004	-003
3/4 -14	.81	1.62	1.313		-005	-004
1 -11½	1.00	2.00	1.576		-006	-005
1-1/4 -11½	1.03	2.06	1.900		-007	-006
1-1/2 -11½	1.03	2.06	2.200		-008	-007
2 -11½	1.06	2.12	2.750		-009	-008
NPTF						
2-1/2 - 8	1.56	3.12	3.250		-010	-009
3 - 8	1.62	3.25	4.000		-011	-010

* Without allowance for cut.

ENGINEERING NOTES

(1) Material: 23-9215-Series Plain Coupling. Each 23-9215-Series coupling makes two pieces 23-9173-XXX.

(2) AISI specs require Standard Merchant Couplings to be straight tapped (NPSF) 1/8" thru 2", and taper tapped (NPTF) 2½" thru 6".

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	HJR	7-13-72	Rev'd & Redrawn:J#85600

ns

		DATE DRAWN		MATERIAL	
COMPILED	HJR	7-13-72		(1)	
APPROVED	Rollins				

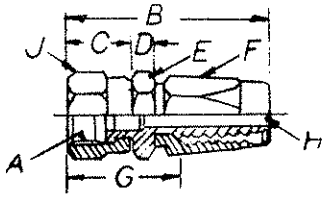
Portland FREIGHTLINER CORPORATION Oregon 97208

23-9182

PRINT ISSUED	TITLE	PART NO.
3/29/71	COUPLING, REUSABLE, FEMALE SWIVEL IMPERIAL EASTMAN'S FITTINGS FOR HYTRON TYPE L6 HOSE	23-9182
LAST CHG. LTR. A		SHEET 1 OF 2

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	HJR	3-16-71	REVISED, REDRAWN, STATUS TO SERVICE ONLY



37° JIC and 45° SAE Flare

DASH NO.	HOSE I.D.	TUBE O.D.	A THD NF	B	C	D	E	F	G	H	J
-001	1/8	No Fitting For This Size Hose Available									
-002	3/16	1/4	7/16 -20	1-59/64	43/64	1/4	9/16	9/16	1- 1/4	9/16	9/16
-003	1/4	3/8	5/8 -18	2-3/16	11/16	1/4	5/8	11/16	1-5/16	13/64	5/8
-004	5/16	3/8	5/8 -18	2-35/64	47/64	5/16	3/4	3/4	1-9/16	17/64	3/4
-005	3/8	1/2	3/4 -16	2-29/32	27/32	5/16	7/8	7/8	1-23/32	.290	7/8
-006	1/2	5/8	7/8 -14	3-9/32	29/32	3/8	1	1-1/16	1- 29/32	29/64	1
-007	5/8	No Fittings For This Size Hose Available									
-008	3/4	No Fittings For This Size Hose Available									

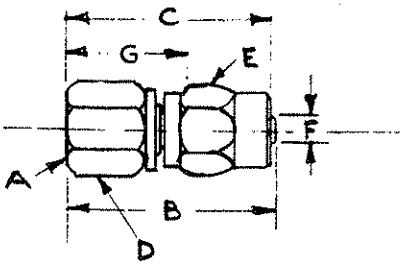
(1.) Steel, cadmium plated with clear chromate finish.

COMPILED	KJA	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K, J, A.	12-12-68		(1)	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 97208

REVISED & REDRAWN
2-12-69

PRINT ISSUED		TITLE	PART NO.
		COUPLING, REUSABLE, FEMALE SWIVEL IMPERIAL EASTMAN'S FITTINGS FOR HYTRON TYPE L6 HOSE	23-9182
LAST CHG. LTR.			SHEET 2 OF 2



37° JIC and 45° SAE Flare

DASH NUMBER	HOSE I.D.	TUBE O.D.	THD. NF A	B	C	D	E	F	G
-001	1/8	1/4	7/16-20	1-17/64	1-13/64	9/16	7/16	.086	53/64
-002	3/16	1/4	7/16-20	1-25/64	1-21/64	9/16	1/2	.140	51/64
-003	1/4	3/8	5/8-18	1-5/8	1-9/16	3/4	5/8	.203	15/16
-004	5/16	3/8	5/8-18	1-5/8	1-9/16	3/4	3/4	.265	15/16
-005	3/8	1/2	3/4-16	1-13/16		7/8	13/16	.328	1-1/8
-006	1/2	5/8	7/8-14	2		1	1	.453	1-1/4
-007	5/8	3/4	1-1/16-14	2-1/32		1-1/4	1-1/8	.578	1-5/32
-008	3/4	3/4	1-1/16-14	2-5/32		1-1/4	1-1/4	.703	1-5/32

① Steel, cadmium plated with clear chromate finish.

COMPLIED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	H.L.A	12-12-68		①	VEHICLE

Portland 12-16-68 FREIGHTLINER CORPORATION Oregon 97208

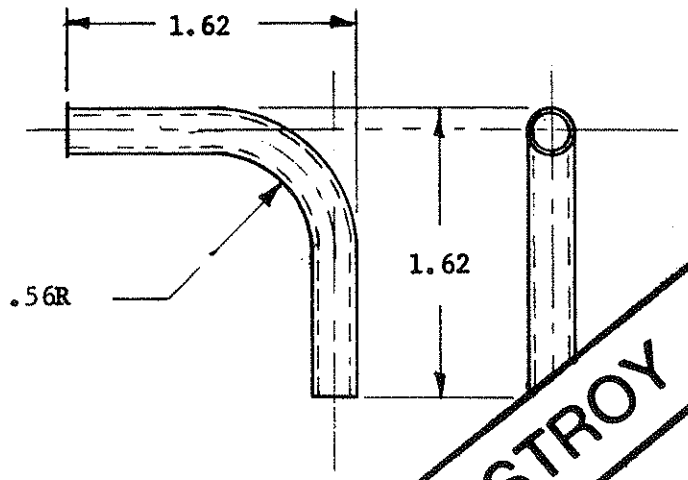
CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
—	KJA	2-12-69	REVISED & REDRAWN

PRINT ISSUED	TITLE	PART NO.
12-23-68	FITTING, EL, DASH PANEL VALVE	23-9194
LAST CHG. LTR.		SHEET OF

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS



REMOVE & DESTROY

1. 1/4" O.D. Copper Tubing

COMPLIED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	R.J.A	12-16-68		(1)	VEHICLE

WAS 23-9104-1

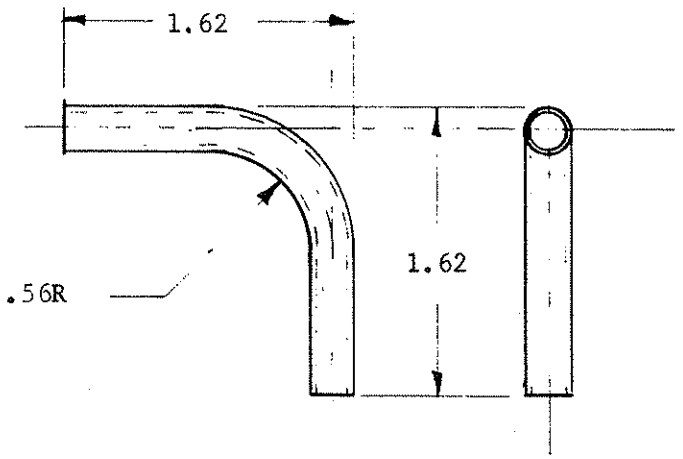
Portland FREIGHTLINER CORPORATION Oregon 97208

23-9194

PRINT ISSUED	TITLE	PART NO.
12-23-68	FITTING, EL, DASH PANEL VALVE	23-9194
LAST CHG. LTR.		SHEET OF

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS



1. 1/4" O.D. Copper Tubing

COMPLIED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	R.J.A	12-16-68		1	VEHICLE

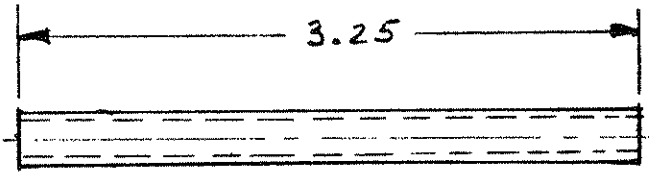
WAS 23-9106-1

Portland FREIGHTLINER CORPORATION Oregon 97208

PRINT ISSUED	TITLE	PART NO.
12-23-68	FITTING, STRAIGHT, DASH PANEL VALVE	23-9195
LAST CHG. LTR.		SHEET OF

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS



REMOVE & DESTROY

① 1/4" O.D. Copper Tubing - Type K

COMPLIED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED		12-16-68		①	VEHICLE

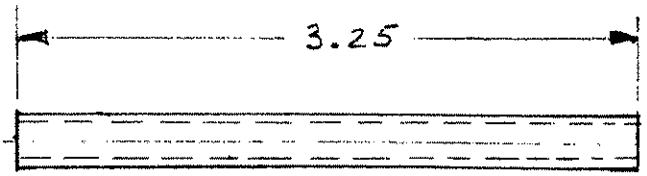
WAS 23-9106 -0

Portland FREIGHTLINER CORPORATION Oregon 97208

PRINT ISSUED	TITLE	PART NO.
12-23-68	FITTING, STRAIGHT, DASH PANEL VALVE	23-9195
LAST CHG. LTR.		SHEET OF

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS



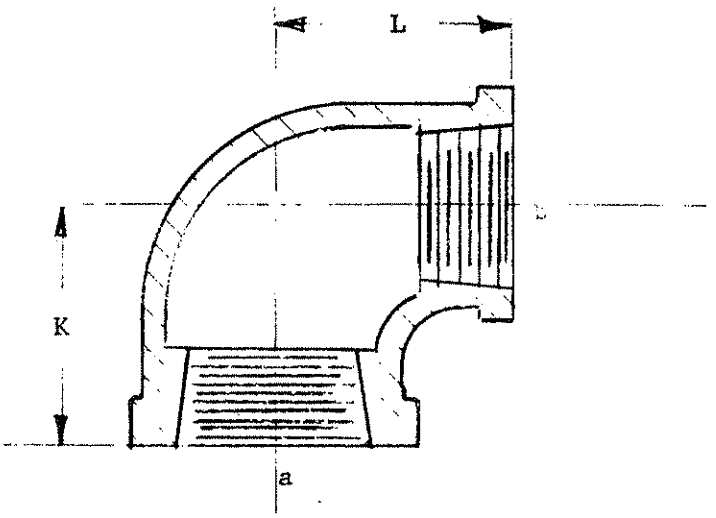
(1) 1/4" O.D. Copper Tubing - Type K

COMPLIED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	[illegible]	12-16-68		(1)	VEHICLE

WAS 23-9106 -0

23-9199

PRINT ISSUED	TITLE	PART NO.
1-23-64	ELBOWS, PIPE - STD. 90° REDUCER	23-9199
LAST CHG. LTR.		SHEET OF



DASH NUMBER	THD. (NPTF) a	THD. (NPTF) b	K	L	DASH NUMBER	THD. (NPTF) a	THD. (NPTF) b	K	L
-001	1/4	1/8	3/4	3/4	-014	1-1/4	1/2	1-7/16	1-5/8
-002	3/8	1/4	7/8	7/8	-015	1-1/2	1-1/4	1-13/16	1-13/16
-003	3/8	1/8	13/16	7/8	-016	1-1/2	1	1-13/16	1-7/8
-004	1/2	3/8	1-1/16	1-1/16	-017	1-1/2	3/4	1-11/16	1-13/16
-005	1/2	1/4	1	1-1/16	-018	2	1-1/2	2	2-1/8
-006	3/4	1/2	1-3/16	1-1/4	-019	2	1-1/4	1-15/16	2-1/16
-007	3/4	3/8	1-1/8	1-1/8	-020	2	1	1-15/16	2-1/16
-008	3/4	1/4	1-1/8	1-1/8	-021	2	3/4	1-5/8	2
-009	1	3/4	1-5/16	1-3/8	-022	2-1/2	2	2-3/8	2-5/8
-010	1	1/2	1-1/4	1-5/16	-023	2-1/2	1-1/2	2-3/8	2-5/8
-011	1	3/8	1-1/4	1-5/16	-024	3	2-1/2	2-11/16	3
-012	1-1/4	1	1-9/16	1-5/8	-025	3	2	2-1/2	2-7/8
-013	1-1/4	3/4	1-7/16	1-5/8	-026	4	3	3-5/16	3-5/8

(1) Malleable Iron

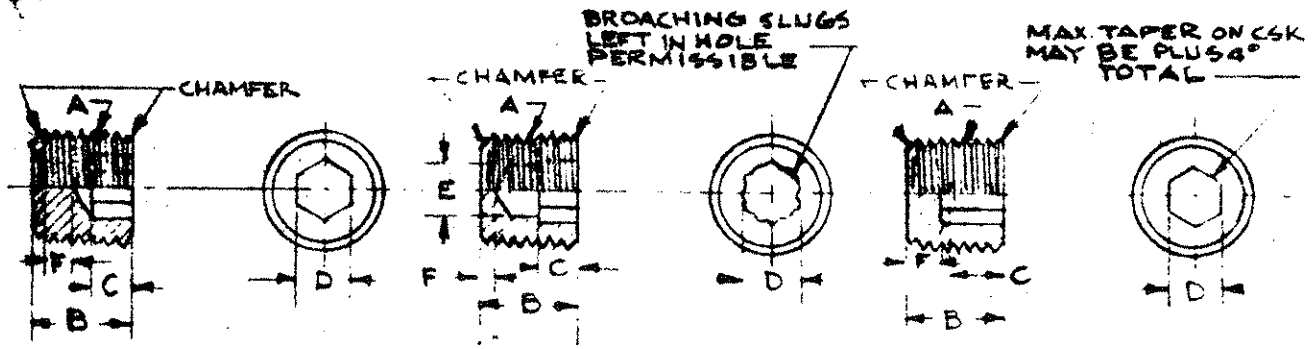
COMPILED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K.J.A	12-26-68		(1)	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 97208

CHG | BY | DATE | WAS

CHG | BY | DATE | WAS

PRINT ISSUED	TITLE	PART NO.
1-17-69	PLUGS, HEX COUNTERSUNK HEADLESS PIPE STEEL OR CAST IRON	23-9200
LAST CHG. LTR. A		SHEET OF



DASH NUMBER	A	B	C	BROACHED OR UPSET				CAST		
	DRYSEAL BODY THREAD (NPTF)	LENGTH	SOCKET DEPTH (MIN)	D SOCKET WIDTH	E MAX STEEL	E MAX CI	F WALL THKNS (MIN)	D SOCKET WIDTH	F WALL THICKNESS FERROUS MIN	F WALL THICKNESS NON-FERROUS MIN
-001	1/16	.290 .310	.12	.156 .161	.161	.161	0.06	.156 .161	.06	.06
-002	1/8	.290 .375	.12	.188 .193	.193	.193	0.06	.188 .193	.08	.06
-003	1/4	.445 .475	.19	.250 .255	.225	.261	0.06	.250 .255	.10	.07
-004	3/8	.445 .475	.19	.313 .318	.318	.323	0.06	.313 .318	.13	.08
-005	1/2	.590 .630	.25	.375 .380	.381	.386	0.09	.375 .380	.16	.09
-006	3/4	.600 .640	.31	.563 .568	.570	.570	0.09	.563 .568	.18	.10
-007	1	.750 .790	.38	.625 .630	.633	.633	0.12	.625 .630	.20	.11

Steel or Cast Iron - SAE Std. J531

COMPILED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K.TH	1-6-69			VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 97208

WAS

CHK BY DATE

23-9200

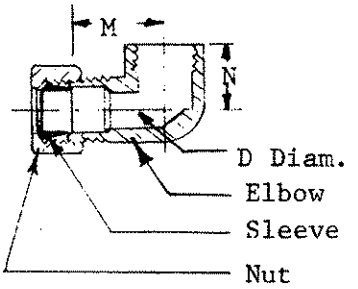
23-9205

PRINT ISSUED	TITLE	PART NO.
2-26-70	90° FEMALE ELBOW NYLON TUBE TO PIPE FORGED BRASS	23-9205
LAST CHG LTR: A		SHEET 1 OF 1

CHG	BY	DATE	WAS	JOB NO
A				

CHG	BY	DATE	WAS	JOB NO
A	HJR	5-29-75	Format; Notes 2, 3	*A0746

SKETCH



PART NUMBERS

TUBE SIZE	PIPE THREAD	STRAIGHT THREAD	M	N	D DIAM.	FREIGHTLINER PART NUMBER	PARKER HANNIFIN PART NO.*
1/8	1/8	5/16-24	.69	.50	.094	23-9205-001	170NT-2-2
3/16	1/8	3/8-24	.78	.50	.125	-002	-3-2
1/4	1/8	7/16-24	.75	.50	.188	-003	-4-2
1/4	1/4	7/16-24	.81	.64	.188	-004	-4-4
5/16	1/4	1/2-24	.88	.61	.250	-005	-5-4
3/8	1/8	9/16-24	.75	.88	.312	-006	-6-2
3/8	1/4	9/16-24	.91	.61	.312	-007	-6-4
3/8	3/8	9/16-24	.97	.66	.281	-008	-6-6
3/8	1/2	9/16-24	1.03	.75	.312	-009	-6-8
1/2	1/4	11/16-20	1.00	1.09	.406	-010	-8-4
1/2	3/8	11/16-20	.94	.72	.406	-011	-8-6
1/2	1/2	11/16-20	1.12	.83	.406	-012	-8-8
5/8	1/2	13/16-18	1.19	.83	.500	-013	-10-8
5/8	3/4	9/16-24	1.19	.73	.312	-014	-6-12

ENGINEERING NOTES

① Material: Brass (59 CU -39 Zn -2 Pb) ASTM B283, CA377. *Part number includes Brass Nut PH/61C-# and Delrin Sleeve PH/60PT-#.

2. Must meet applicable current requirements of Federal Motor Vehicle Safety Standard No. 106.

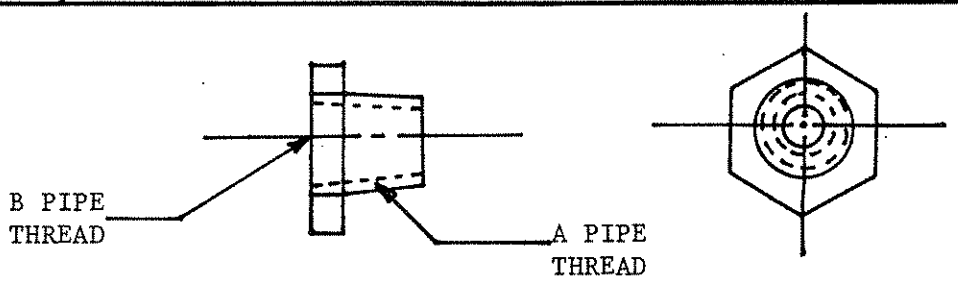
3. Information for Engineering Department use only:
Use 23-9292 series (extruded) elbow instead of this (forged) part whenever space considerations permit.

COMPILED	KJA	DATE DRAWN		MATERIAL	
APPROVED	K. J. A	2-12-70		①	

A

ORIGINAL JOB NO.	TITLE	PART NO.
	BUSHING, PIPE	23-9212
LAST CHG LTR G	HEX HEAD	SHEET 1 OF 1

SKETCH



PART NUMBERS (G)

A PIPE THREAD	B PIPE THREAD	MATERIAL 1	FREIGHTLINER PART NUMBERS 23-09212 BLACK (2)	FREIGHTLINER PART NUMBERS 23-09212 GALV. (3)
1/4	1/8	S	-001	-101
1	1/8	CM	-002	-102
1	1/4	CM	-003	-103
1-1/4	1/4	CM	-004	-104
3/8	1/8	S	-005	-105
3/8	1/4	S	-006	-106
1/2	1/8	M	-007	-107
1/2	1/4	M	-008	-108
1/2	3/8	M	-009	-109
1-1/4	3/8	CM	-010	-110
3/4	1/8	M	-011	-111
3/4	1/4	M	-012	-112
3/4	3/8	M	-013	-113
3/4	1/2	M	-014	-114
1	3/8	CM	-015	-115
1	1/2	CM	-016	-116
1	3/4	M	-017	-117
1-1/4	1/2	CM	-018	-118
1-1/4	3/4	CM	-019	-119
1-1/4	1	M	-020	-120

(G)

A PIPE THREAD	B PIPE THREAD	MATERIAL 1	FREIGHTLINER PART NUMBERS 23-09212 BLACK (2)	FREIGHTLINER PART NUMBERS 23-09212 GALV. (3)
1-1/2	3/8	CM	-021	-121
	1/2	CM	-022	-122
	3/4	CM	-023	-123
	1	CM	-024	-124
	1-1/4	M	-025	-125
2	1/4	CM	-026	-126
	3/8	CM	-027	-127
	1/2	CM	-028	-128
	3/4	CM	-029	-129
	1	CM	-030	-130
	1-1/4	CM	-031	-131
	1-1/2	M	-032	-132
2-1/2	1/2	CM	-033	-133
	3/4	CM	-034	-134
	1	CM	-035	-135
	1-1/4	CM	-036	-136
	1-1/2	CM	-037	-137
	2	M	-038	-138
3	1/2	CM	-039	-139
	3/4	CM	-040	-140
	1	CM	-041	-141
	1-1/4	CM	-042	-142
	1-1/2	CM	-043	-143
	2	CM	-044	-144
	2-1/2	CM	-046	-146

ENGINEERING NOTES:

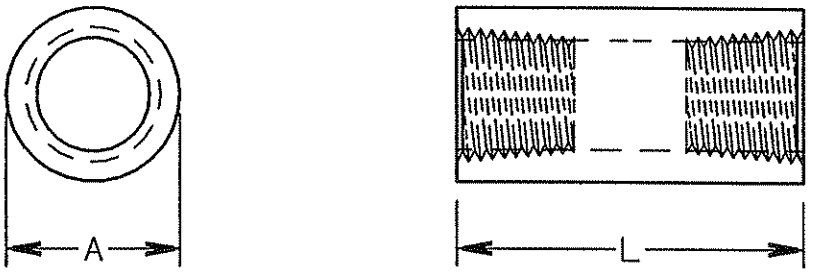
1. Material: Malleable Black Iron (M), Steel (S) and Cast Iron or Malleable (CM)
2. Finish: Black or Galvanized
3. Galvanized finish prefered.

COMPILED	HJR	DATE DRAWN	U.O.M.	MATERIAL	MASTER NUMBER
APPROVED	ROLLINS	12-30-71	EA	1	05050 000D1

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
F		HJR	9-30-85	Add dash nos. Redraw J #84270
G		FHF	9-30-85	Add -101 thru -146 Add Notes 2 & 3

DRAWN	HJR	TITLE COUPLING-PIPE ALUMINUM	ITEM NUMBER 23-09214
APPRV	ROLLINS		
DATE	11/20/72	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



PART NUMBERS:

PIPE SIZE	THREADS PER INCH	O.D. (A)	LENGTH (L)		FREIGHTLINER PART NUMBER
1/8	27	.59	.94		23-09214-000
1/4	18	.75	1.03		-001
3/8	18	.91	1.16		-002
1/2	14	1.06	1.31		-003
3/4	14	1.34	1.56		-004
1	11 1/2	1.62	1.81		-005
1 1/4	11 1/2	1.97	2.06		-006
1 1/2	11 1/2	2.23	2.31		-007
2	11 1/2	2.72	2.56		-008
3	8	3.94	3.06		-010

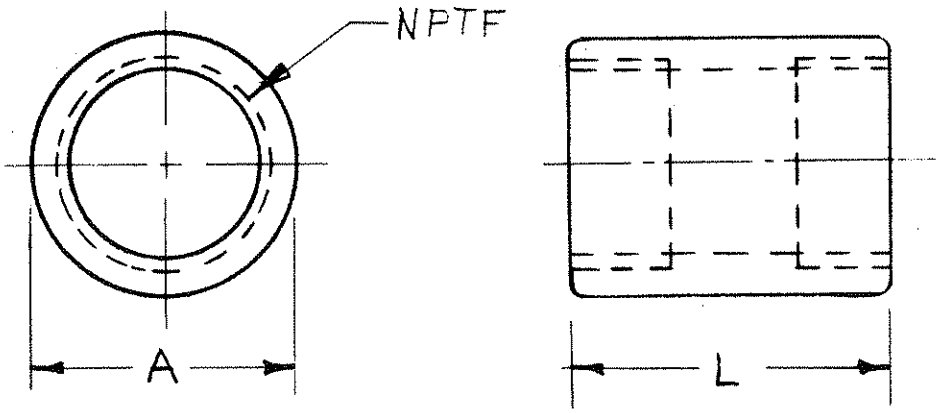
1. TAPERED THREAD IN ACCORDANCE WITH ANSI B2.1.
2. MATERIAL: ALUMINUM ALLOY 6061 T6.

CHG	JOB/RLSE NO	DATE	BY	REVISION
F	P1453J-01	08/10/93	ERK	REDRWN:REV OD'S AND LENGTHS, REMVD -009,-011,&-012

General Use Part

PRINT ISSUED		TITLE	PART NO.
		COUPLING, PIPE ALUMINUM	23-9214
LAST CHG LTR	E		SHEET 1 OF 1

SKETCH



PART NUMBERS

PIPE SIZE *	THREADS PER INCH	A O.D.	L LENGTH		FREIGHTLINER PART NUMBER
1/8	27	.62	.94	(E)	23-9214-000
1/4	18	.75	1.00		-001
3/8	18	.88	1.12		-002
1/2	14	1.06	1.38		-003
3/4	14	1.31	1.56	(E)	-004
1	11-1/2	1.62	1.75		-005
1-1/4	11-1/2	1.88	2.12		-006
1-1/2	11-1/2	2.20	2.75		-007
2	11-1/2	2.75	2.12		-008
2-1/2	8	3.25	3.12		-009
3	8	4.00	3.25		-010
3-1/2	8	4.62	3.38		-011
4	8	5.00	3.50		-012

* AISI specifications require Standard Merchant Couplings to be straight tapped 1/8" thru 2", end taper tapped 2-1/2" thru 6".

SPECIFICATIONS

(1) Material: Aluminum

CHG	BY	DATE	WAS
C	HJR	11-20-72	Add -006, -007. Redraw; Job #60290
D	HJR	6-18-73	Add -008 thru -012; J #A0492

CHG	BY	DATE	WAS	JOB NO
E	PEF	10-26-83	.75 & 1.62 TO .94 & 1.56	81138

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rollins	11-20-72		(1)	

ns

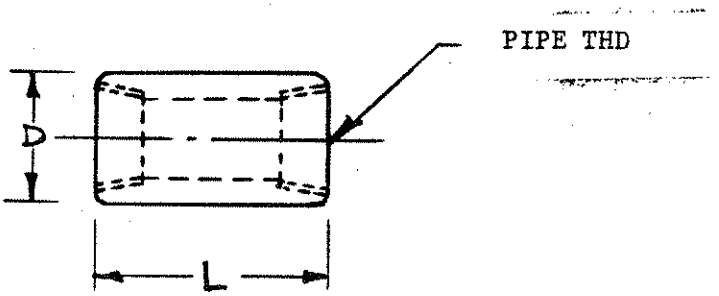
Portland FREIGHTLINER CORPORATION Oregon 97208

23-9215

General Use Part

PRINT ISSUED	TITLE	PART NO.
9-13-71	PIPE COUPLING ASA STEEL	23-9215
LAST CHG. LTR. C		SHEET 1 OF 1

SKETCH



PART NUMBERS

PIPE THREAD (2)	L LENGTH	D OUTSIDE DIA.		FREIGHTLINER PART NUMBERS (C) PLAIN	FREIGHTLINER PART NUMBERS (C) GALVANIZED (4)
1/8 - 27	13/16	.563		23-9215-001	23-9215-101
1/4 - 18	1- 3/16	.719		-002	-102
3/8 - 18	1- 3/16	.875		-003	-103
1/2 - 14	1- 9/16	1.063		-004	-104
3/4 - 14	1- 5/8	1.313		-005	-105
1 - 11-1/2	2	1.576		-006	-106
1-1/4 - 11-1/2	2- 1/16	1.900		-007	-107
1-1/2 - 11-1/2	2- 1/16	2.200		-008	-108
2 - 11-1/2	2- 1/8	2.750		-009	-109
2-1/2 - 8	3- 1/8	3.250		-010	-110
3 - 8	3- 1/4	4.000		-011	-111

ENGINEERING NOTES

(1) Material: Steel

(2) Threads to conform to SAE Standard J476. Standard Merchant couplings to be straight tapped 1/8" through 2" and taper tapped 2-1/2" through 6".

(C)3 Finish: Plain or Galvanized

(C)4 Galvanized finish preferred.

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	HJR	8-27-71	BLACK IRON; OLD FORMAT
B	HJR	7-7-72	Lengths Revised; "D"
C	EHF	9-30-85	Added; J #85600 Add 101-111 & Notes 3&4

ns

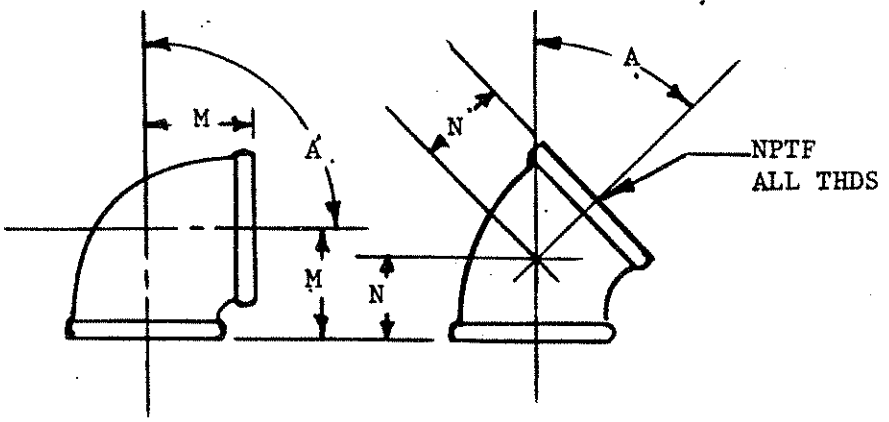
COMPILED	HJR	DATE DRAWN	UOM	MATERIAL	MASTER NUMBER
APPROVED		8-27-71	EA	(1)	05050 000D1

Portland FREIGHTLINER CORPORATION Oregon 97208

E-183

ORIGINAL JOB NO.	TITLE	PART NO.
A0413	ELBOW, PIPE, 90 AND 45	23-9217
LAST CHG LTR: E	IRON	SHEET 1 OF 1

SKETCH



PART NUMBERS (E)

PIPE SIZE NPTF	M	N		A ANGLE (DEG.)	FREIGHTLINER PART NUMBERS BLACK	GALVANIZED (3)
1/8	11/16	1/2		45	23-9217-001	23-9217-101
				90	-002	-102
1/4	13/16	3/4		45	-003	-103
				90	-004	-104
3/8	15/16	13/16		45	-005	-105
				90	-006	-106
1/2	1-1/8	7/8		45	-007	-107
				90	-008	-108
3/4	1-5/16	1		45	-009	-109
				90	-010	-110
1	1-1/2	1-1/8		45	-011	-111
				90	-012	-112
1-1/4	1-3/4	1-5/16		45	-013	-113
				90	-014	-114
1-1/2	1-15/16	1-7/16		45	-015	-115
				90	-016	-116
2	2-1/4	1-11/16		45	-017	-117
				90	-018	-118
2-1/2	2-11/16	1-15/16		45	-019	-119
				90	-020	-120
3	3.08	2.17		45	-021	-121
				90	-022	-122

ENGINEERING NOTES:

1. Material: Malleable Iron
2. Finish: Black or Galvanized
3. Galvanized finish preferred.

COMPILED	HJR	DATE DRAWN	U.O.M.	MATERIAL	MASTER NUMBER
APPROVED		2-9-71	EA	1	05100 000D1

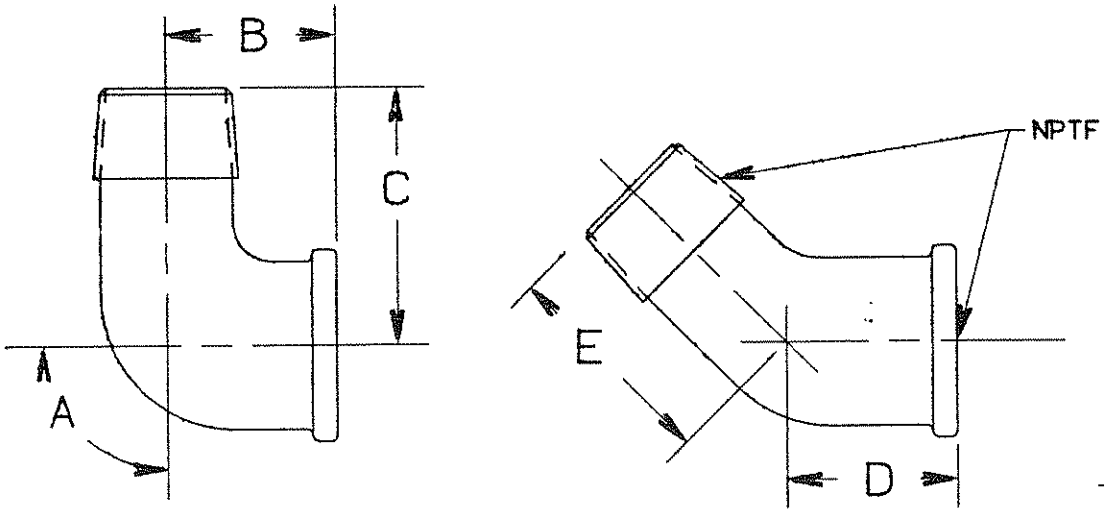
CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR
REV'D, REDRAWN	2-9-71	HJR		C
ADD -021,-022 A0413	5-18-73	HJR		D
ADD -101 thru -122	9-30-85	FHF		E
ADD NOTES 2 & 3				(E)

(E)

E

DRAWN	PCK	TITLE	ITEM NUMBER
APPRV	ANF	ELBOW, STREET, 45° & 90° MALLEABLE IRON, BLACK	23-09218
DATE	03/15/89	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



PIPE THREAD NPTF	ANGLE A	B	C	D	E	FREIGHTLINER PART NUMBER
1/8 - 27	45			11/16	7/8	23-09218-001
1/8 - 27	90	11/16	1			23-09218-002
1/4 - 18	45			3/4	15/16	23-09218-003
1/4 - 18	90	13/16	1-3/16			23-09218-004
3/8 - 18	45			13/16	1	23-09218-005
3/8 - 18	90	15/16	1-7/16			23-09218-006
1/2 - 14	45			7/8	1-1/8	23-09218-007
1/2 - 14	90	1-1/8	1-5/8			23-09218-008
3/4 - 14	45			1	1-5/16	23-09218-009
3/4 - 14	90	1-5/16	1-7/8			23-09218-010
1- 11 1/2	45			1-1/8	1-7/16	23-09218-011
1- 11 1/2	90	1-1/2	2-1/8			23-09218-012
1 1/4-11 1/2	45			1-5/16	1-11/16	23-09218-013
1 1/4-11 1/2	90	1-3/4	2-7/16			23-09218-014
1 1/2-11 1/2	45			1-7/16	1-7/8	23-09218-015
1 1/2-11 1/2	90	1-15/16	2-11/16			23-09218-016
3 - 8	90	3-1/16	4-1/2			23-09218-038

MATERIAL: MALLEABLE IRON, CLASS 150, BLACK PER ANSI B16.3 AND FED. WW-P-521

CHG	JOB/RLSE NO	DATE	BY	REVISION
F	P3236E-01	03/15/89	PCK	REDRAWN, DIMENSIONS CORRECTED

23-9219

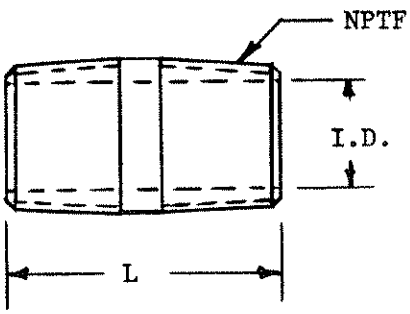
General Use Part

PRINT ISSUED	TITLE	PART NO.
1-15-71	NIPPLE, LONG BLACK IRON PIPE	23-9219
LAST CHG. LTR. A		SHEET 1 OF 1

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	DL	3-11-74	1¼-11½: J#A0581

SKETCH



PART NUMBERS

NPTF ② PIPE SIZE AND THREAD	DASH NUMBERS LENGTH OF NIPPLE (INCHES)									
	1½	2	2½	3	3½	4	4½	5	5½	6
1/8-27	-011	-012	-013	-014	-015	-016	-017	-018	-019	-020
1/4-18	-021	-022	-023	-024	-025	-026	-027	-028	-029	-030
3/8-18	-031	-032	-033	-034	-035	-036	-037	-038	-039	-040
1/2-14	-041	-042	-043	-044	-045	-046	-047	-048	-049	-050
3/4-14		-062	-063	-064	-065	-066	-067	-068	-069	-070
1-11½		-082	-083	-084	-085	-086	-087	-088	-089	-090
1¼-11½		-102	-103	-104	-105	-106	-107	-108	-109	-110
1½-11½		-122	-123	-124	-125	-126	-127	-128	-129	-130
2-11½			-163	-164	-165	-166	-167	-168	-169	-170
2½- 8				-204	-205	-206	-207	-208	-209	-210
3- 8				-244	-245	-246	-247	-248	-249	-250
3½- 8				-284	-285	-286	-287	-288	-289	-290
4- 8				-324	-325	-326	-327	-328	-329	-330

ENGINEERING NOTES

① 48-0023 Series Sched 40 Black Iron Pipe

② NPTF = Dryseal American Standard Taper Pipe Thread (Ref. SAE Standard J476)

COMPILED	H.J.R.	DATE DRAWN		MATERIAL	
APPROVED	[signature]	8-12-70		①	

Portland FREIGHTLINER CORPORATION Oregon 97208

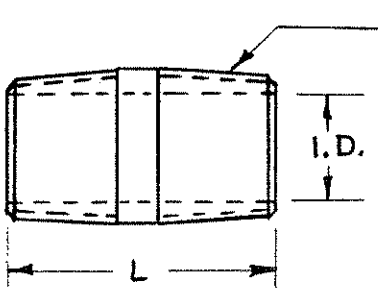
M/F

23-9220

General Use Part

PRINT ISSUED	TITLE	PART NO.
	NIPPLE, CLOSE BLACK IRON PIPE	23-9220
LAST CHG. LTR.		SHEET 1 OF 1

SKETCH



PART NUMBER

NOM. PIPE SIZE	TAPER PIPE THREAD*	INSIDE DIAMETER (INCHES)	CROSS SECTION INTERNAL AREA (SQ. IN.)	LENGTH (APPROX.) (INCHES)		FREIGHTLINER PART NUMBER
			SCHEDULE 40 PIPE			
1/8	1/8-27	0.269	0.0568	.75		23-9220-001
1/4	1/4-18	0.364	0.1041	.88		-002
3/8	3/8-18	0.493	0.1910	1.00		-003
1/2	1/2-14	0.622	0.3040	1.12		-004
3/4	3/4-14	0.824	0.5330	1.38		-005
1	1 -11 1/2	1.049	0.8640	1.50		-006
1 1/4	1 1/4-11 1/2	1.380	1.495	1.62		-007
1 1/2	1 1/2-11 1/2	1.610	2.036	1.75		-008
2	2	2.067	3.355	2.00		-009
2 1/2	2 1/2- 8	2.469	4.788	2.50		-010
3	3 - 8	3.068	7.393	2.62		-011
3 1/2	3 1/2- 8	3.548	9.886	2.75		-012
4	4 - 8	4.026	12.73	2.88		-013
			SCHEDULE 80 PIPE			
1/8	1/8-27	0.215	0.0364	.75		-101
1/4	1/4-18	0.302	0.0716	.88		-102
3/8	3/8-18	0.423	0.1405	1.00		-103
1/2	1/2-14	0.546	0.2340	1.12		-104
3/4	3/4-14	0.742	0.432	1.38		-105
1	1 -11 1/2	0.957	0.710	1.50		-106
1 1/4	1 1/4-11 1/2	1.278	1.283	1.62		-107
1 1/2	1 1/2-11 1/2	1.500	1.767	1.75		-108
2	2	1.939	2.953	2.00		-109
2 1/2	2 1/2- 8	2.323	4.24	2.50		-110
3	3 - 8	2.900	6.61	2.62		-111
3 1/2	3 1/2- 8	3.364	8.89	2.75		-112
4		3.826	11.50	2.88		-113

SPECIFICATIONS

(1) Material: Black iron to meet ASTM A120.

2. Threads to conform to SAE Standard J476 Dryseal Pipe Threads.

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	HJR	5-3-73	Add Sched 80; J #A0383

ns

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rollins	5-3-73		(1)	

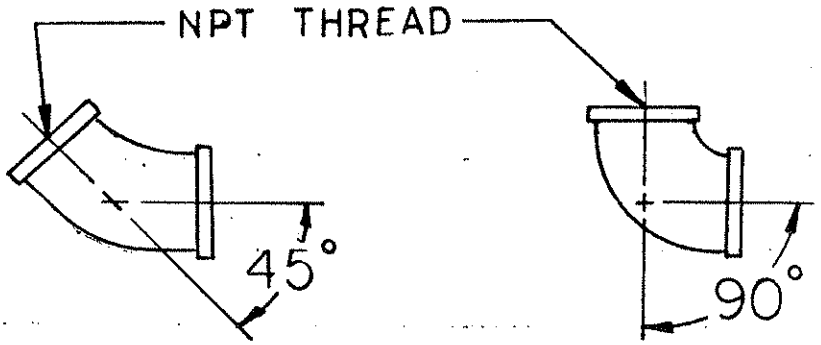
Portland FREIGHTLINER CORPORATION Oregon 97208

23-09222

General Use Part

PRINT ISSUED	TITLE	PART NO.
	ELBOW PIPE ALUM./ STAINLESS STL.	23-09222
LAST CHG. LTR. A		SHEET 1 OF

SKETCH



PART NUMBERS

SIZE NPT THREAD		ALUMINUM ① 45°	STAINLESS ① 45°	ALUMINUM ① 90°	STAINLESS ① 90°
1/8-27		23-09222-001	23-09222-051	23-09222-002	23-09222-052
1/4-18		23-09222-003	23-09222-053	23-09222-004	23-09222-054
3/8-18		23-09222-005	23-09222-055	23-09222-006	23-09222-056
1/2-14		23-09222-007	23-09222-057	23-09222-008	23-09222-058
3/4-14		23-09222-009	23-09222-059	23-09222-010	23-09222-060
1-11½		23-09222-011	23-09222-061	23-09222-012	23-09222-062
1 1/4-11½		23-09222-013	23-09222-063	23-09222-014	23-09222-064
1 1/2-11½		23-09222-015	23-09222-065	23-09222-016	23-09222-066
2-11½		23-09222-017	23-09222-067	23-09222-018	23-09222-068

① Material: Aluminum 6061-T6; stainless steel type 303 or 304.

2. Finish: Plain

CHG	BY	DATE	WAS Job No.

CHG	BY	DATE	WAS Job No.
A	HJR	1-29-76	Rev'd & Redrawn 58398

COMPILED	HJR	DATE DRAWN		Material	
APPROVED		1-29-76		①	

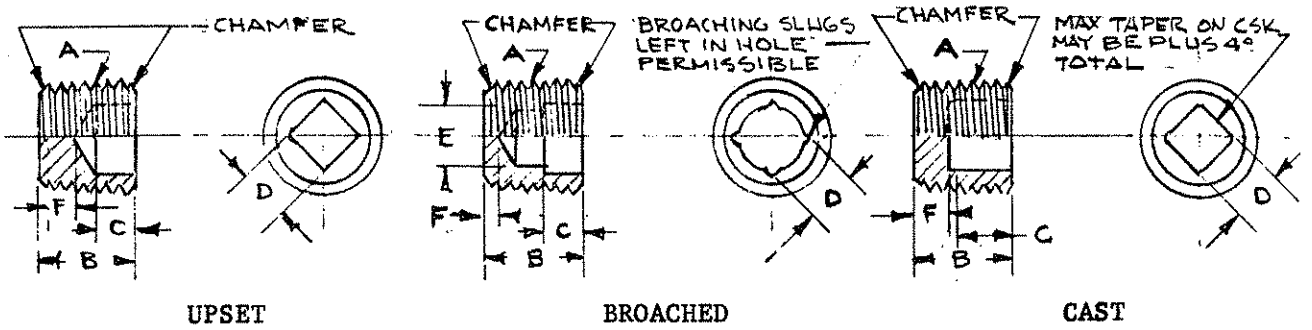
Portland FREIGHTLINER CORPORATION Oregon 97208

23-9223

General Use Part

PRINT ISSUED	TITLE	PART NO.
2/19/71	PLUG, PIPE SQUARE SOCKET, STL.	23-9223
LAST CHG. LTR. B		SHEET 1 OF 1

SKETCH



UPSET BROACHED CAST

PART NUMBERS

DASH NUMBER	A	B	C	BROACHED OR UPSET			CAST		
	DRYSEAL THD (NPTF)	BODY LENGTH	SOCKET DEPTH (MIN.)	D SOCKET WIDTH	E HOLE DIA. (MAX)	F WALL THKNS. (MIN.)	D SOCKET WIDTH	WALL MIN.	
-000	1/16	.290 .310	.12	.130 .135	.143	.06	.13 .14	.06	
-001	1/8	.290 .310	.12	.192 .197	.209	.06	.19 .21	.08	
-002	1/4	.445 .475	.19	.255 .260	.278	.06	.26 .28	.10	
-003	3/8	.445 .475	.19	.319 .324	.345	.06	.32 .35	.13	
-004	1/2	.590 .630	.25	.382 .387	.410	.09	.38 .41	.16	
-005	3/4	.600 .640	.31	.508 .513	.553	.09	.51 .54	.18	
-006	1	.750 .790	.38	.508 .513	.553	.12	.51 .54	.20	

ENGINEERING NOTES

(1.) Steel or Cast Iron - SAE Std. J531

COMPILED	PRJ	DATE DRAWN		MATERIAL	
APPROVED	ICJ, A	1-6-69		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

B

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	PRJ	1-17-69	B SIZE DWG.
B	HJR	2-9-71	RETITLED, REV'D FORMAT

WAS B-SIZE

E-183

23-9225

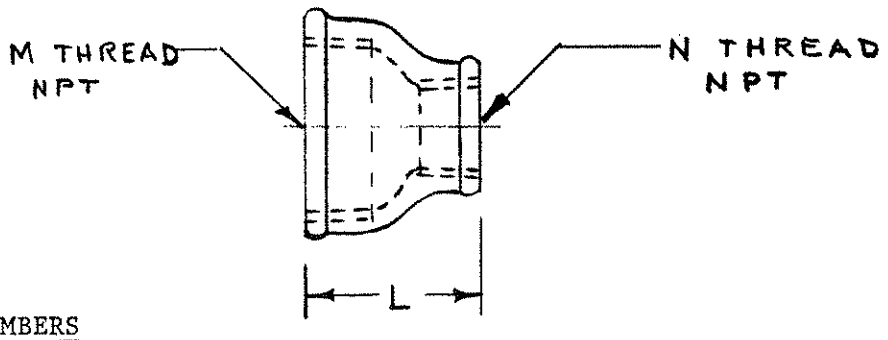
General Use Part

PRINT ISSUED	TITLE	PART NO.
4/20/71	REDUCER, BANDED AM. STD. PIPE, BLACK IRON	23-9225
LAST CHG. LTR. C		SHEET / OF /

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
B	HJR	3/26/71	REVISED AND REDRAWN
C	HJR	1-14-71	-011 = 3/4; Job #84470

SKETCH



PART NUMBERS

PIPE SIZE M	PIPE SIZE N	L		FREIGHTLINER PART NUMBER
1/4	1/8	1		23-9225-001
3/8	1/4	1- 1/8		-002
1/2	3/8	1- 1/4		-003
3/4	1/2	1- 7/16		-004
1	3/4	1-11/16		-005
				-006
3/8	1/8	1- 1/8		-007
1/2	1/4	1- 1/4		-008
3/4	3/8	1- 7/16		-009
1	1/2	1-11/16		-010
1	3/8	1-11/16		-011

ENGINEERING NOTES

(1) Material: Malleable Iron, Black

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		3-26-71		(1)	

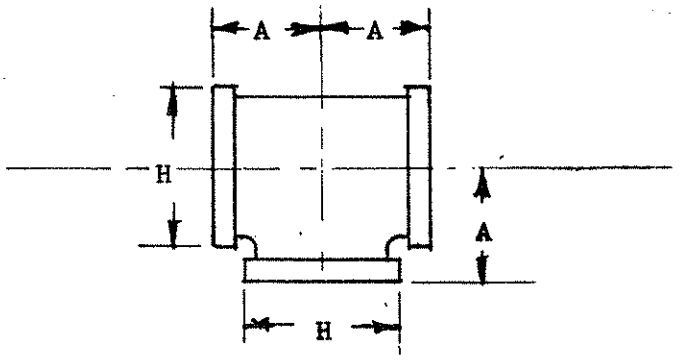
Portland FREIGHTLINER CORPORATION Oregon 97208

93-9226

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	PRJ	1-3-69	B Size Drawing

PRINT ISSUED	TITLE	PART NO.
1-15-69	TEES, ASA-STD PIPE	23-9226
LAST CHG. LTR. A		SHEET OF



DASH NUMBER	NOM. SIZE	THDS/IN	A	H
-001	1/8	27	0.69	0.693
-002	1/4	18	0.81	0.844
-003	3/8	18	0.95	1.015
-004	1/2	14	1.12	1.197
-005	3/4	14	1.31	1.458
-006	1	11-1/2	1.50	1.771
-007	1-1/4	11-1/2	1.75	2.153
-008	1-1/2	11-1/2	1.94	2.427
-009	2	11-1/2	2.25	2.963
-010	2-1/2	8	2.70	3.589
-011	3	8	3.08	4.285
-012	3-1/2	8	3.42	4.843
-013	4	8	3.79	5.401
-014	5	8	4.50	6.583
-015	6	8	5.13	7.767

(1.) Malleable Iron - ASA B16.

COMPILED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K.J.A.	1-3-69		(1)	VEHICLE

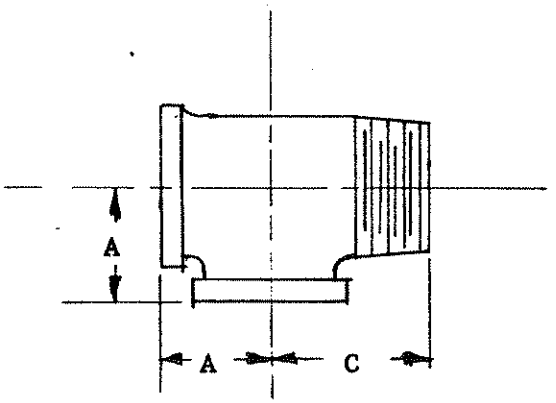
Portland FREIGHTLINER CORPORATION Oregon 97208

23-9227

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
B	PRJ	1-3-69	B Size Drawing

PRINT ISSUED	TITLE	PART NO.
12-0-69	TEES, SERVICE, ASA STD PIPE	23-9227
LAST CHG. LTR. B		SHEET OF



DASH NUMBER	NOM. SIZE	THDS/IN. (NPTF)	A	C
-001	1/8	27	11/16	1
-002	1/4	18	13/16	1-3/16
-003	3/8	18	15/16	1-7/16
-004	1/2	14	1-1/8	1-5/8
-005	3/4	14	1-5/16	1-7/8
-006	1	11-1/2	1-1/2	2-1/8
-007	1-1/4	11-1/2	1-3/4	2-7/16
-008	1-1/2	11-1/2	1-15/16	2-11/16
-009	2	11-1/2	2-1/4	3-1/4
-010	2-1/2	8	2-11/16	3-13/16
-011	3	8	3-1/8	4-1/2
-012	3-1/2	8	3-7/16	--
-013	4	8	3-3/4	5-11/16
-014	5	8	4-1/2	--
-015	6	8	5-1/8	--

(1.) Malleable Iron - ASA B16c

COMPLIED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K.J.A.	1-3-69		(1)	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 97208

23-9234

General Use Part

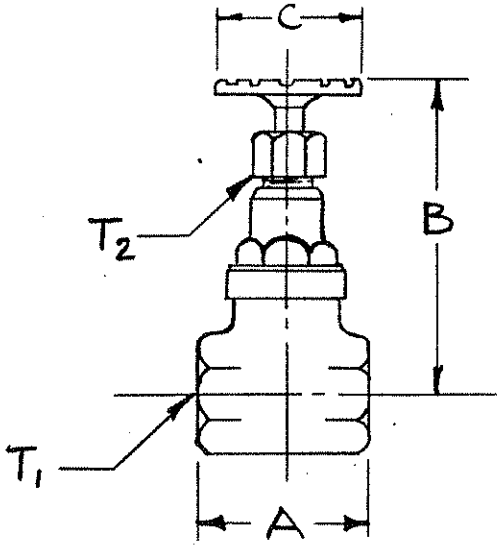
PRINT ISSUED		TITLE	PART NO.
		VALVE, GATE	23-9234
LAST CHG. LTR.	E		SHEET 1 OF 1

CHG	BY	DATE	WAS
D	DL	2-27-73	2.06, 4.38, 2.06, J #A0131
E	YJY	6-2-82	ADDED RWT, 275

JOB NO 4592B

CHG	BY	DATE	WAS
B	HJR	6-16-72	Revised & Redrawn; Add T2: J #30220
C	HJR	12-11-72	BSP.Tr. for -004 only; J #65560

SKETCH



PART NUMBER

A LENGTH	B HEIGHT	C DIAMETER	T_1 (NPT)	T_2 (NPT)	MANUFACTURER'S NO. (2) PEG	RWT		FREIGHTLINER PART NUMBER
1.75	3.25	1.50	1/4 - 18					23-9234-001
1.81	3.25	1.50	3/8 - 18					-002
1.94	3.75	1.75	1/2 - 14					-003
1.937	3.562	2.187	*	*	1068	275		-004
2.44	5.12	2.56	1 - 11½					-005
2.88	5.75	2.75	1-1/4 - 11½					-006

*T_1 = 3/4-14 BSP.Tr. and T_2 = 3/8-19 BSP.Tr. (=British Standard Pipe Thread).

SPECIFICATIONS

(1) Brass or Bronze, 125 psi W.O.G., Wedge Disc, Non-Rising Stem

(2) Any substitution must have approval of Corporate Engineering.

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rollins	6-16-72		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

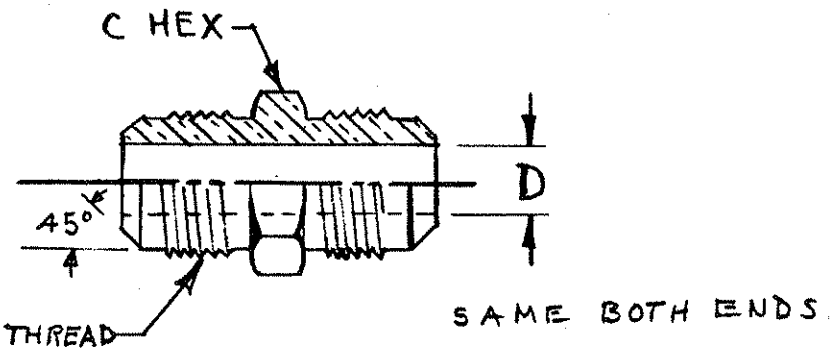
E-183

23-9241

General Use Part

PRINT ISSUED	TITLE	PART NO.
10/25/71	UNION, REFRIGERATION TUBE	23-9241
LAST CHG. LTR. A		SHEET 1 OF 1

SKETCH



PART NUMBERS

NOM. TUBE O.D.	SAE THREAD	D REF.	MANUFACTURER'S NUMBER STX	PH	WH		FREIGHTLINER PART NUMBER
1/4			SF1017- 4- 4B	42F- 4	42X4		23-9241-001
3/8			- 6- 6B	- 6	X6		-002
1/2			- 8- 8B	- 8	X8		-003
5/8			-10-10B	-10	X10		-004
3/4	1-1/16-14	.62	-12-12B	-12	X12		-005

ENGINEERING NOTES

(1) Material: Brass per SAE Std J513.

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	HJR	10-6-71	Rev'd, Redrawn, Add Mfrs

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		10-6-71		(1)	

ns

Portland FREIGHTLINER CORPORATION Oregon 97208 A

23-9242

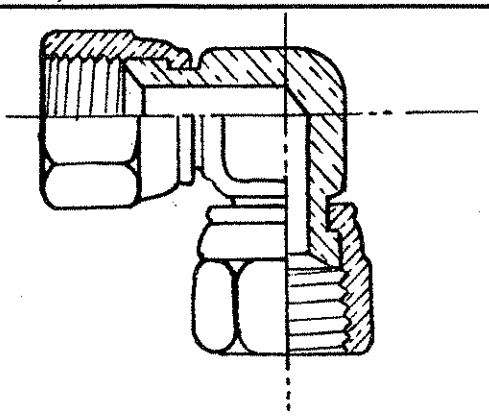
General Use Part

PRINT ISSUED		TITLE	PART NO.
		ELBOW, 90°, EXTERNAL FLARE ADAPTER TO EXTERNAL FLARE ADAPTER, REFRIGERATION TUBE	23-9242
LAST CHG. LTR.	A		SHEET 1 OF 1

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	HJR	12-30-71	Add Mfr Nos.; Redraw; J#84600

SKETCH



PART NUMBERS

THREAD		MANUFACTURER'S NUMBER		FREIGHTLINER PART NUMBER
		STX		
7/16-20		SF15008- 4- 4B		23-9242-001
5/8 -18		- 6- 6B		-002
3/4 -16		- 8- 8B		-003
7/8 -14		-10-10B		-004
1-1/16-14		-12-12B		-005

ENGINEERING NOTES

(1) Material: Brass, SAE Std. J513c

		DATE DRAWN		MATERIAL	
COMPILED	HJR	12-30-71		(1)	
APPROVED	Rollins				

ns

Portland FREIGHTLINER CORPORATION Oregon 97208

F-183

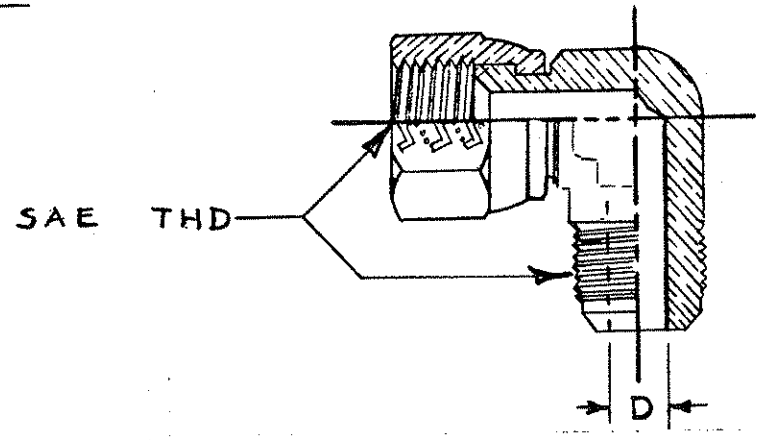
A

23-9243

General Use Part

PRINT ISSUED	TITLE	PART NO.
5/24/71	SWIVEL, 90° SAE/SAE	23-9243
LAST CHG LTR. C		SHEET OF

SKETCH



PART NUMBERS

NOMINAL TUBE O.D.	SAE THREAD	D +.006 −.003	MANUFACTURER'S NUMBER STX		FREIGHTLINER PART NUMBER
1/4	7/16-20	.188	SF15009-4-4B		23-9243-001
3/8	5/8 -18	.312	* SF15009-6-6B		-002
1/2	3/4 -16	.406	** SF15009-8-8B		-003
5/8	7/8 -14	.531	SF15009-10-10B		-004
3/4	1-1/16-14	.656	SF15009-12-12B		-005

*18389-6-6B alternate
**18389-8-8B alternate

ENGINEERING NOTES

(1) Material: Brass SAE Std J513

CHG	BY	DATE	WAS	JOB NO
C	HJR	11-14-75	Cancel "B" Chg. 18389-#-#B Alt.	A0783

CHG	BY	DATE	WAS	JOB NO
A	HJR	5-12-71	Rev. & Redrawn; Mfr. Nos. Added	—
B	HJR	10-6-75	SF15009-6-6B & SF15009-8-8B	A0783

B
B

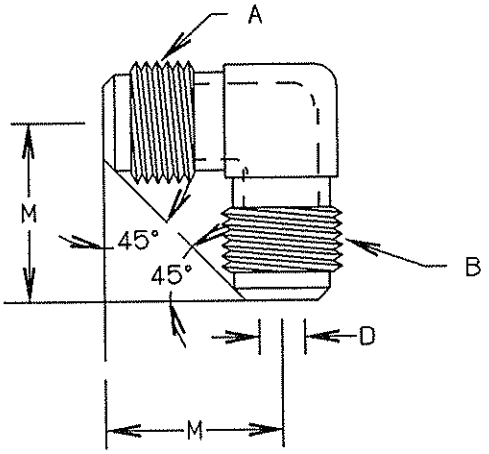
ns

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		5-12-71		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

C B

DRAWN	HJR	TITLE ELBOW-90° UNION, BRASS	ITEM NUMBER 23-09244
APPRV	RON		
DATE	05/11/71	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



TUBE SIZE	STRT THREAD (A)	STRT THREAD (B)	M	FLOW DIA. (D)	MFG'S NO. PH	FREIGHTLINER PART NUMBER
-4	7/16-20	7/16-20	.86	.189	155F-4	23-09244-001
-8	3/4-16	3/4-16	1.31	.408	155F-8	23-09244-003
10	7/8-14	7/8-14	1.39	.502	155F-10	23-09244-004
12	1-1/16-14	1-1/16-14	1.63	.625	155F-12	23-09244-005

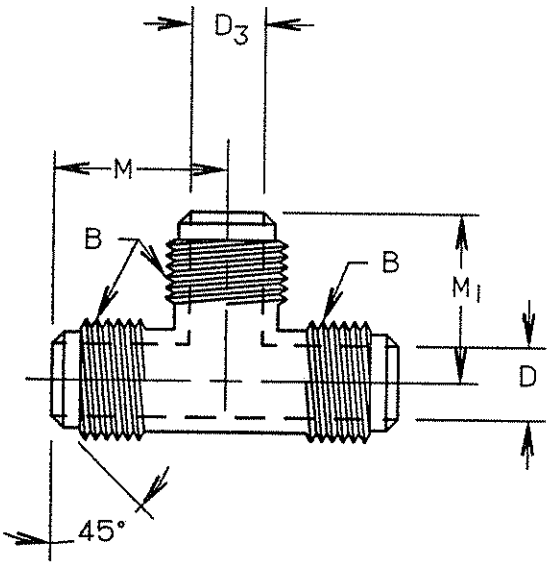
1. MATERIAL: BRASS
2. INDUSTRY STANDARD: SAE 010201, SAE J512

CHG	JOB/RLSE NO	DATE	BY	REVISION
C	P3946H-02	11/30/95	ERK	REDRAWN; 23-09244-210 REMOVED

DRAWN	SJT	TITLE TEE UNION SAE 45	ITEM NUMBER 23-09245
APPRV	RDF		
DATE	02/28/91	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

UNLESS OTHERWISE NOTED, ALL DIMENSIONS IN INCHES.

SKETCH:



PART NUMBERS:

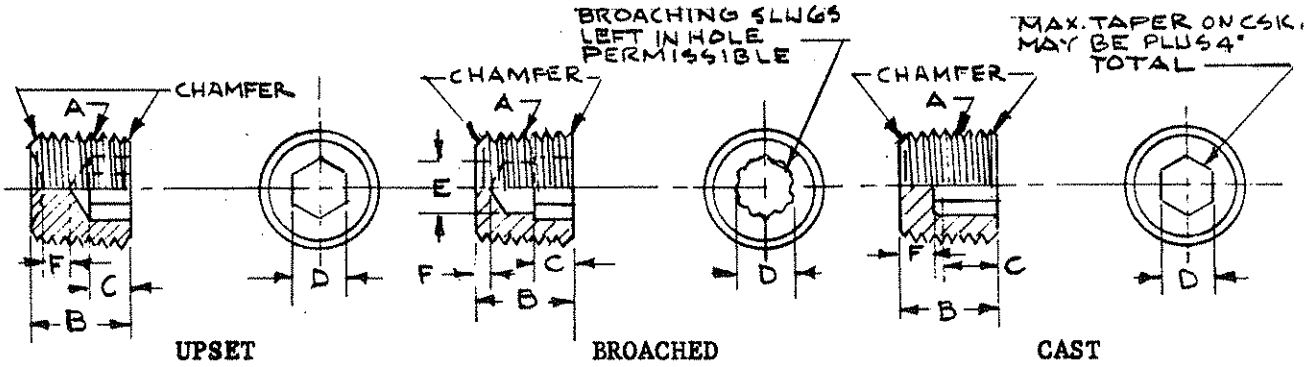
NOM TUBE O.D. RUNS	D RUNS	B THREAD SAE RUNS	NOM TUBE O.D. BRCH	D_3 BRCH	B THREAD SAE BRANCH	M	M_1	MANUFACTURER'S NUMBER		FREIGHTLINER PART NUMBER
									PH	
1/4	.188	7/16-20	1/4	.188	7/16-20	.81	.81		144F-4	23-09245-001
3/8	.281	5/8-18	3/8	.281	5/8-18	1.04	1.04		144F-6	23-09245-002
1/2	.406	3/4-16	1/2	.406	3/4-16	1.22	1.22		144F-8	23-09245-003
3/8	.281	5/8-18	1/4	.188	7/16-20	1.04	.89		144F-6-6-4	23-09245-006
1/2	.406	3/4-16	3/8	.281	5/8-18	1.20	1.07		144F-8-8-6	
5/8	.500	7/8-14	5/8	.500	7/8-14	1.39	1.39		144F-10	23-09245-004

1. MATERIAL: BRASS, SAE STD J513(REF FIG NO 010401)
2. DIMENSIONS PER SAE J513. ABOVE DIMENSIONS FOR REFERENCE ONLY.

CHG	JOB/RLSE NO	DATE	BY	REVISION
B	PN0274-07	02/28/91	SJT	REDRAWN, ADDED -006, DELETED -003, -004, -005
C	PA2024-78	04/26/91	PCK	REVISED 244F-4 TO READ 144F-4 (23-09245-001)
D	PA2029-83	04/26/91	K R	ADDED 23-09245-003, -004

23-9246

PRINT ISSUED	TITLE	PART NO.
1-11-69	PLUGS, HEX COUNTERSUNK HEADLESS FILLER & DRAIN STEEL OR CAST IRON	23-9246
LAST CHG. LTR.		SHEET OF



DASH NUMBER	A DRYSEAL THD (NPTF)	B BODY LENGTH	C SOCKET DEPTH (MIN.)	BROACHED OR UPSET				CAST		
				D	E MAX.		F WALL THKNS. (MIN.)	D SOCKET WIDTH	F WALL THKNS.	
					STEEL	OTHER			FERROUS MIN.	NON-FERROUS MIN.
-001	1/16	.250 .270	.09	.156 .161	.161	.161	.06	.156 .161	.06	.06
-002	1/8	.260 .280	.09	.188 .193	.193	.193	.06	.188 .193	.08	.06
-003	1/4	.395 .425	.16	.250 .255	.255	.261	.06	.250 .255	.10	.07
-004	3/8	.395 .425	.16	.313 .318	.318	.323	.06	.313 .318	.13	.08
-005	1/2	.520 .560	.19	.375 .380	.381	.386	.09	.375 .380	.16	.09
-006	3/4	.530 .570	.19	.563 .568	.570	.570	.09	.563 .568	.18	.10
-007	1	.670 .710	.25	.625 .630	.633	.633	.12	.625 .630	.20	.11

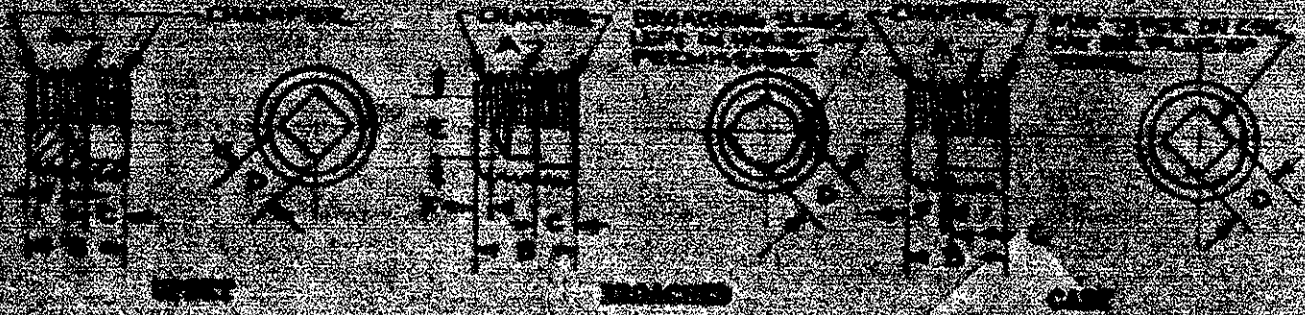
WAS | DATE | BY | CHG

WAS | DATE | BY | CHG

(1.) Steel or Cast Iron - SAE Std. J531

COMPLIED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	R.T.A	1-6-69		(1)	VEHICLE

PART NO.	TITLE	SIZE
1-12121	PLUG, SQUARE CUP/RECESS HEADLESS KELOX & HEAD STEEL 3R CAST IRON	23-9248



PART NUMBER	A	B	C	D	E	F	G	H
	NOMINAL THREAD (NPTF)	PORT LENGTH	SOCKET DEPTH	SOCKET DIA.	HEX. WIDTH ACROSS FLATS	SOCKET WIDTH	HEX. HEIGHT FERROUS	HEX. HEIGHT NON-FERROUS
-001	1/8	.250	.06	.135	.343	.06	.15 .16	.04	.06
-002	1/4	.250	.06	.192 .197	.389	.06	.19 .21	.06	.06
-003	3/8	.395 .423	.16	.235 .240	.479	.06	.16 .26	.10	.07
-004	1/2	.395 .423	.16	.319 .324	.545	.06	.22 .25	.13	.08
-005	3/4	.520 .548	.19	.382 .387	.610	.09	.28 .41	.16	.09
-006	3/4	.520 .570	.19	.506 .513	.553	.09	.33 .34	.16	.10
-007	1	.670 .720	.25	.506 .513	.553	.13	.35 .36	.20	.11

REMOVE & DESTROY

(L) Steel or cast iron - SAE Std. J531

COMPILED	PBJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K.V.T.A.	1-6-69		(L)	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 97208

CHG | BY | DATE | WAS

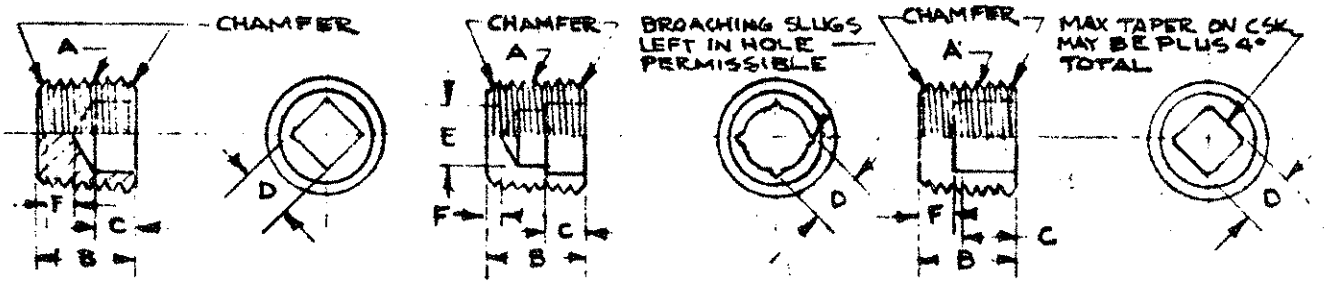
E-165

23-9248

WAS				
DATE				
BY				
CHG				

WAS				
DATE				
BY				
CHG				

PRINT ISSUED	TITLE	PART NO.
1-17-69	PLUGS, SQUARE COUNTERSUNK HEADLESS FILLER & DRAIN STEEL OR CAST IRON	23-9248
LAST CHG. LTR.		SHEET OF



UPSET BROACHED CAST

DASH NUMBER	A	B	C	BROACHED OR UPSET			CAST		
	DRYSEAL THREAD (NPTF)	BODY LENGTH	SOCKET DEPTH MIN	D SOCKET WIDTH	E HOLE DIA MAX	F WALL THKNS (MIN)	D SOCKET WIDTH	F WALL THICKNESS FERROUS MIN	F WALL THICKNESS NON-FERROUS MIN
-001	1/16	.250 .270	.09	.130 .135	.143	.06	.13 .14	.06	.06
-002	1/8	.260 .280	.09	.192 .197	.209	.06	.19 .21	.08	.06
-003	1/4	.395 .425	.16	.255 .260	.278	.06	.26 .28	.10	.07
-004	3/8	.395 .425	.16	.319 .324	.345	.06	.32 .35	.13	.08
-005	1/2	.520 .560	.19	.382 .387	.410	.09	.38 .41	.16	.09
-006	3/4	.530 .570	.19	.508 .513	.553	.09	.51 .54	.18	.10
-007	1	.670 .710	.25	.508 .513	.553	.12	.51 .54	.20	.11

(1) Steel or cast iron - SAE Std. J531

COMPILED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K.V.A.	1-6-69		(1)	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 97208

23-9249

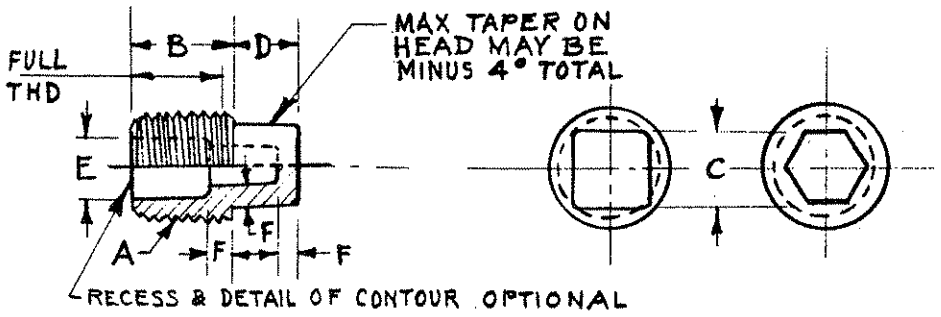
General Use Part

PRINT ISSUED		TITLE	PART NO.
		PLUG, SQUARE OR HEX INSIDE HEAD PIPE STEEL OR CAST IRON	23-9249
LAST CHG LTR.	A		SHEET 1 OF 1

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	HJR	6-15-73	Rev'd & Redrawn; J#A0489

SKETCH



PART NUMBERS

A		B	C	D		E	F	FREIGHTLINER PART NUMBER
THREAD SIZE	FULL THREAD LENGTH	BODY LENGTH	HEAD WIDTH	SQUARE INSIDE HEAD	HEX INSIDE HEAD	RECESS	WALL THICKNESS MIN.	
1/16	.30	.330 .350	.214 .221	.178 .193	.163 .178	—	—	23-9249-001
1/8	.30	.330 .350	.276 .283	.240 .255	.225 .240	—	—	-002
1/4	.46	.495 .525	.370 .377	.280 .300	.260 .280	—	—	-003
3/8	.46	.495 .525	.428 .440	.310 .335	.285 .310	.31	.13	-004
1/2	.61	.660 .700	.553 .565	.380 .410	.350 .380	.38	.16	-005
3/4	.62	.670 .710	.615 .627	.440 .470	.410 .440	.56	.18	-006
1	.77	.830 .870	.803 .815	.500 .540	.460 .500	.75	.20	-007

ENGINEERING NOTES

(1) Material: Steel or Cast Iron - SAE Std. J531

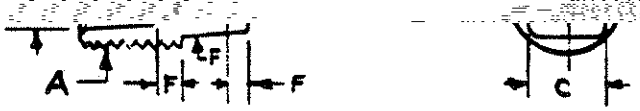
COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rollins	6-21-73		(1)	

ns

Portland FREIGHTLINER CORPORATION Oregon 97208

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	HJR	5-21-73	Rev'd & Redrawn; J#5355



RECESS & DETAIL OF CONTOUR OPTIONAL

PART NUMBERS

A DRYSEAL THREAD PTF SHORT	FULL THREAD LENGTH	B BODY LENGTH	C HEAD WIDTH	D	E	F WALL THICK-NESS		FREIGHTLINER PART NUMBER
1/16-27	0.26	.290-.310	.214-.221	.178-.193				23-9250-001
1/8 -27	.27	.290-.310	.276-.283	.240-.255				-002
1/4 -18	.41	.445-.475	.370-.377	.280-.300				-003
3/8 -18	.41	.445-.475	.428-.440	.310-.335	.31	.13		-004
1/2 -14	.53	.590-.630	.553-.565	.380-.410	.38	.16		-005
3/4 -14	.55	.600-.640	.615-.627	.440-.270	.56	.18		-006
1 -11½	.69	.750-.790	.803-.815	.500-.540	.75	.20		-007

SPECIFICATIONS

(1) Material: Steel or Cast Iron per SAE Std J531.

2. Finish: Plain

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rollins	5-21-73		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

ns

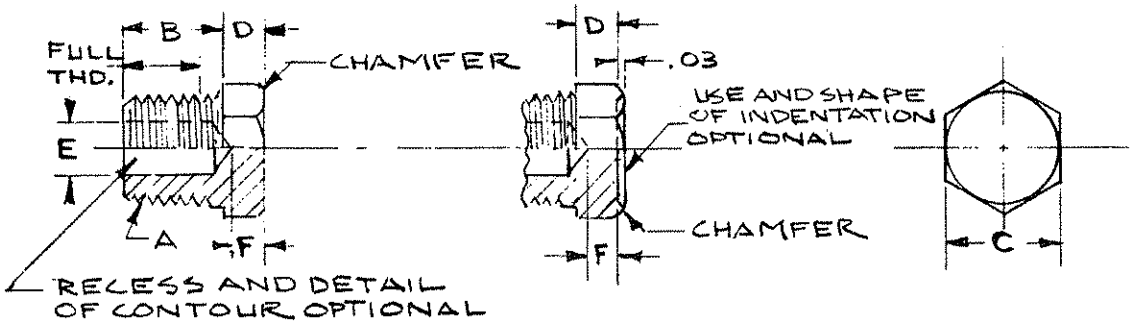
E-183

23-9251

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS

PRINT ISSUED	TITLE	PART NO.
1-17-69	PLUGS, HEXAGON OUTSIDE HEAD PIPE STEEL OR CAST IRON	23-9251
LAST CHG. LTR.		SHEET OF



DASH NUMBER	A (NPTF) SIZE	A (NPTF) FULL THREAD LENGTH	B SHOULDER LENGTH	C HEAD WIDTH	D HEAD HEIGHT	E RECESS DIA (MAX)	F WALL THICKNESS (MIN)
-001	1/16	.30	.37	.304 .315	.151 .162	.10	.09
-002	1/8	.30	.37	.428 .440	.181 .194	.16	.12
-003	1/4	.46	.56	.551 .565	.181 .194	.25	.12
-004	3/8	.46	.56	.674 .690	.212 .227	.38	.16
-005	1/2	.61	.75	.860 .877	.212 .227	.50	.16
-006	3/4	.62	.75	1.044 1.065	.304 .323	.69	.19
-007	1	.77	.94	1.292 1.315	.304 .323	.88	.19

(1.) Steel or Cast Iron - SAE Std. J531

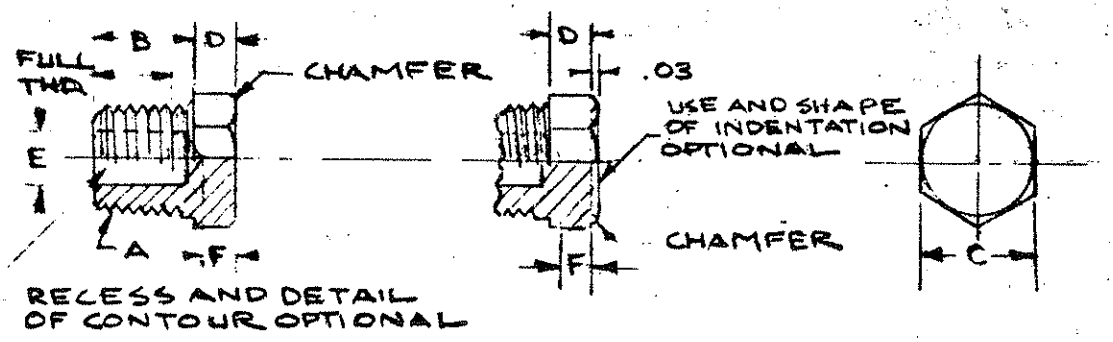
COMPLIED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	[illegible]	1-7-69		(1)	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 97208

PRINT ISSUED	TITLE	PART NO
1-11-69	PLUGS, HEXAGON OUTSIDE HEAD FILLER & DRAIN STEEL OR CAST IRON	23-9252
LAST CHG. LTR.		SHEET OF

WAS

CHG	BY	DATE



DASH NUMBER	A (NPTF)		B	C	D	E	F
	SIZE	FULL THREAD LENGTH	SHOULDER LENGTH	HEAD WIDTH	HEAD HEIGHT	RECESS DIA (MAX)	WALL THICKNESS (MIN.)
-001	1/16	.26	.32	.364 .315	.151 .162	.10	.09
-002	1/8	.27	.32	.428 .440	.181 .194	.16	.12
-003	1/4	.41	.49	.551 .565	.181 .194	.25	.12
-004	3/8	.41	.49	.674 .690	.212 .227	.38	.16
-005	1/2	.53	.64	.860 .877	.212 .227	.50	.16
-006	3/4	.55	.65	1.044 1.065	.304 .323	.69	.19
-007	1	.69	.81	1.292 1.215	.304 .323	.88	.19

WAS

CHG	BY	DATE

(1) Steel or Cast Iron - SAE Std. J531

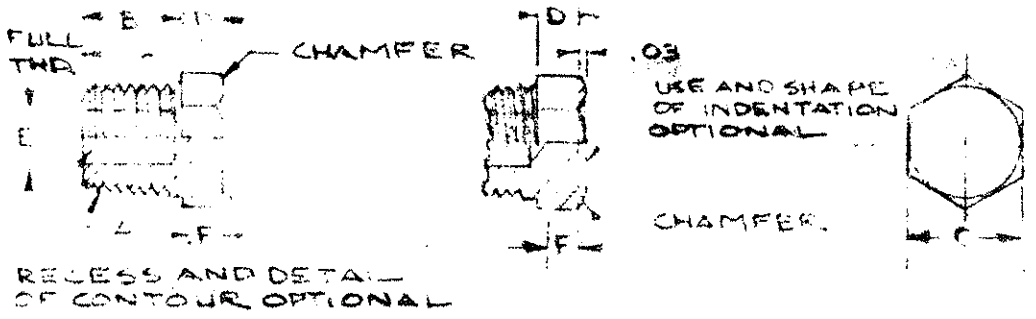
COMPLIED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	T.J.A.	1-7-69		(1)	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 97208

PRINT ISSUED	TITLE	PART NO.
1-17-69	PLUGS, HEXAGON OPTIONAL HEAD FILLER & DRAIN ALUMINUM ALLOY	23-9255
LAST CHG LTR		SHEET OF

WAS

CHG	BY	DATE



DASH NUMBER	A (NPTF) SIZE	A (NPTF) FULL THREAD LENGTH	B SHOULDER LENGTH	C HEAD WIDTH	D HEAD HEIGHT	E RECESS DIA (MAX)	F WALL THICKNESS (MIN.)
-001	1/16	.26	.32	.364 .315	.151 .162	.30	.09
-002	1/8	.27	.32	.428 .440	.181 .194	.36	.12
-003	1/4	.41	.49	.551 .565	.181 .194	.25	.12
-004	3/8	.41	.49	.674 .690	.212 .227	.38	.16
-005	1/2	.53	.64	.860 .877	.212 .227	.50	.19
-006	3/4	.55	.65	1.044 1.065	.304 .323	.69	.19
-007	1	.69	.81	1.292 1.215	.304 .323	.88	.19

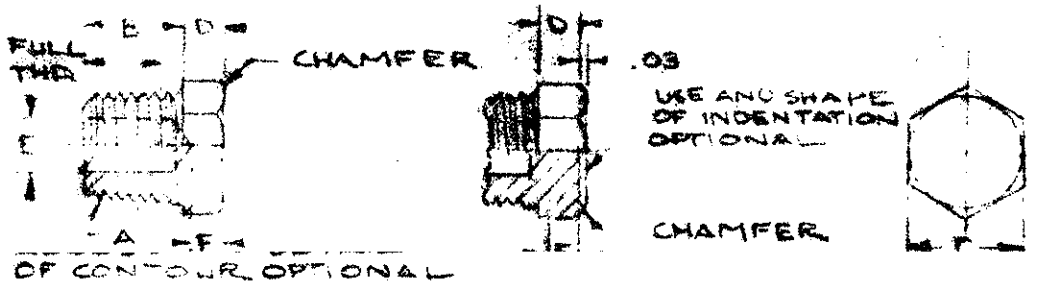
1. Aluminum Alloy - SAE Std. J531

COMPILED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K.J.A	1-7-69		1	VEHICLE

PRINT ISSUED	TITLE	PART NO.
1-17-69	FITTING, HEXAGON SWIVEL HEAD FEMALE & MALE BRASS OR BRONZE	23-9256
LAST CHG. LTR		SHEET OF

23-9256

CHG	BY	DATE	WAS



DASH NUMBER	A (NPTF) SIZE	A (NPTF) FULL THREAD LENGTH	B SHOULDER LENGTH	C HEAD WIDTH	D HEAD HEIGHT	E RECESS DIA (MAX)	F WALL THICKNESS (MIN.)
-001	1/16	.26	.32	.366 .313	.131 .362	.10	.09
-002	1/8	.27	.32	.428 .440	.181 .194	.16	.12
-003	1/4	.41	.49	.551 .565	.181 .194	.25	.12
-004	3/8	.41	.49	.674 .688	.212 .227	.38	.16
-005	1/2	.53	.64	.860 .877	.212 .227	.50	.16
-006	3/4	.55	.65	1.064 1.065	.304 .323	.69	.19
-007	1	.69	.81	1.292 1.215	.304 .323	.88	.19

(1) Brass or Bronze - SAE Std. J531

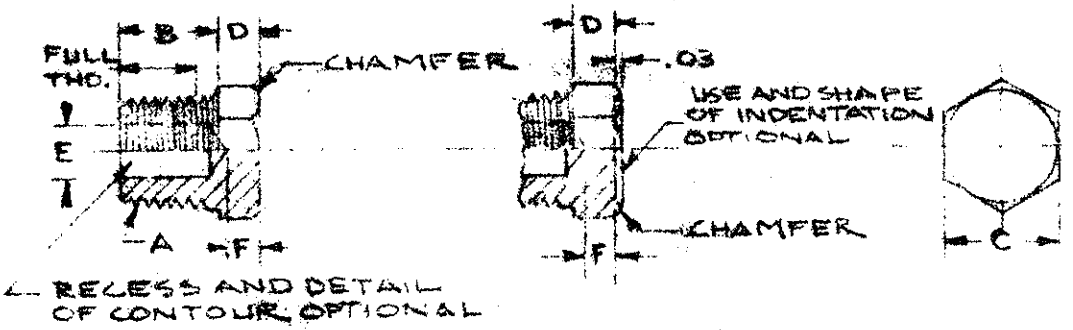
COMPLIED	P&J	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED		1-7-69		(1)	VEHICLE

23-9257

PRINT ISSUED	TITLE	PART NO
1-17-69	**PLUG, BREATHER OUTSIDE HEAD PIPE ALUMINUM ALLOY**	23-9257
LAST CHG. LTR.		SHEET OF

WAS

CHG	BY	DATE



DASH NUMBER	A (NPTF) SIZE	A (NPTF) FULL THREAD LENGTH	B SHOULDER LENGTH	C HEAD WIDTH	D HEAD HEIGHT	E RECESS DIA (MAX)	F WALL THICKNESS (MIN)
-001	1/16	.30	.37	.304 .315	.151 .162	.38	.09
-002	1/8	.30	.37	.428 .440	.181 .194	.16	.12
-003	1/4	.46	.56	.551 .565	.181 .194	.25	.12
-004	3/8	.46	.56	.674 .690	.212 .227	.38	.16
-005	1/2	.61	.75	.860 .877	.212 .227	.50	.16
-006	3/4	.62	.75	1.064 1.065	.304 .323	.69	.19
-007	1	.77	.94	1.298 1.315	.304 .323	.88	.19

WAS

CHG	BY	DATE

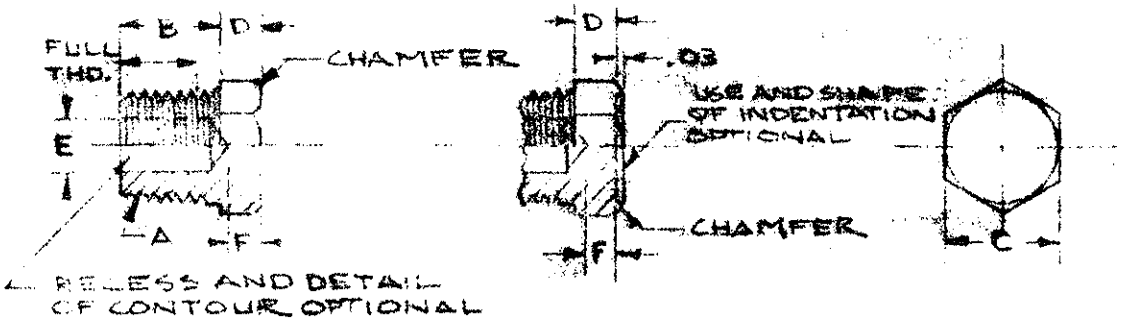
(1) Aluminum Alloy - SAE Std. J531

COMPLIED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED		1-7-69		(1)	VEHICLE

PRINT ISSUED	TITLE	PART NO.
1-17-69	PLUGS, HEXAGON OUTSIDE HEAD PIPE BRASS OR BRONZE	23-9258
LAST CHG. LTR.		SHEET OF

WAS

CHG	BY	DATE



DASH NUMBER	A (NPTF) SIZE	A (NPTF) FULL THREAD LENGTH	B SHOULDER LENGTH	C HEAD WIDTH	D HEAD HEIGHT	E RECESS DIA (MAX)	F WALL THICKNESS (MIN)
-001	1/16	.30	.37	.304 .313	.151 .162	.10	.09
-002	1/8	.30	.37	.428 .440	.181 .194	.16	.12
-003	1/4	.46	.56	.551 .565	.181 .194	.25	.12
-004	3/8	.46	.56	.674 .690	.212 .227	.38	.16
-005	1/2	.61	.75	.860 .877	.212 .227	.50	.16
-006	3/4	.62	.75	1.044 1.063	.304 .323	.69	.19
-007	1	.77	.94	1.282 1.313	.304 .323	.88	.19

WAS

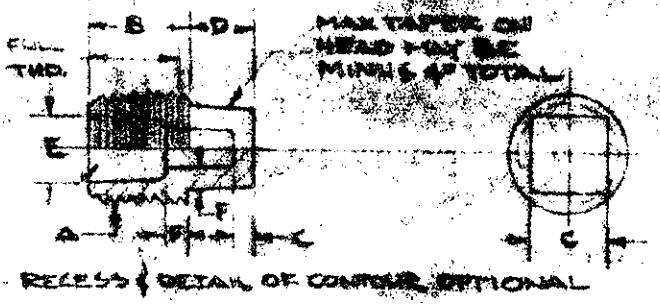
CHG	BY	DATE

(1) Brass or Bronze - SAE Std. J531

COMPLIED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED		1-7-69		(1)	VEHICLE

23-9259

PRINT ISSUED	TITLE	PART NO
1-17-69	[illegible], SQUARE & [illegible] INSIDE HEAD FILLER & DRAIN ALUMINUM ALLOY	23-9259
LAST CHG LTR		SHEET OF



BASE NUMBER	A		B	C	D		E		WALL THICKNESS (MIN.)			
	THREAD SIZE	FULL THREAD LENGTH	HEX LENGTH	HEAD WIDTH	SQUARE HEAD	HEX HEAD	MAXIMUM	MINIMUM	F MAXIMUM	F MINIMUM	G MAXIMUM	G MINIMUM
-001	1/16	.26	.290 .310	.214 .221	.178 .193	.163 .170	--	--	--	--	--	--
-002	1/8	.27	.290 .310	.276 .283	.240 .255	.225 .240	--	--	--	--	--	--
-003	1/4	.41	.445 .475	.370 .377	.280 .300	.260 .280	--	--	--	--	--	--
-004	3/8	.41	.445 .475	.428 .440	.310 .335	.285 .310	.31	.36	.13	.11	.13	.08
-005	1/2	.53	.590 .630	.553 .565	.380 .430	.350 .380	.38	.53	.16	.12	.16	.08
-006	3/4	.55	.600 .640	.615 .627	.440 .470	.410 .440	.56	.72	.75	.18	.18	.10
-007	1	.69	.750 .790	.803 .815	.500 .540	.440 .500	.75	.93	.20	.14	.20	.11

WAS / DATE / BY / CHG

WAS / DATE / BY / CHG

(1) Aluminum Alloy - SAE Std. J531

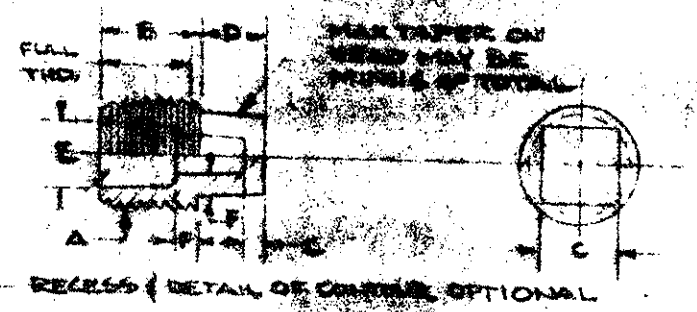
COMPILED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY NO
APPROVED	[illegible]	1-7-69		(1)	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 9720[illegible]

E-183

23-9260

PRINT ISSUED	TITLE	PART NO.
1-17-69	[illegible] BRASS OR [illegible]	23-9260
LAST CHG. LTR		SHEET OF



DASH NUMBER	A	B	C	D		E		WALL THICKNESS (MIN.)			
								F		G	
	THREAD SIZE	FULL THREAD LENGTH	BODY LENGTH	HEX WIDTH	HEX FLAT MIN	HEX FLAT MAX	MIN	MAX	MIN	MAX	MIN
-001	1/16	.26	.290 .310	.216 .221	.176 .193	.152 .176	--	--	--	--	--	--
-002	1/8	.27	.290 .310	.276 .283	.240 .255	.215 .240	--	--	--	--	--	--
-003	1/4	.41	.445 .475	.370 .377	.280 .300	.260 .280	--	--	--	--	--	--
-004	3/8	.41	.445 .475	.428 .440	.340 .355	.315 .330	.31	.36	.13	.11	.13	.08
-005	1/2	.53	.590 .630	.553 .565	.380 .400	.350 .380	.38	.53	.16	.12	.16	.07
-006	3/4	.55	.600 .640	.615 .627	.440 .470	.410 .440	.36	.72	.75	.18	.18	.10
-007	1	.69	.750 .790	.803 .815	.500 .540	.460 .500	.75	.93	.20	.14	.20	.11

1. Brass or Bronze - SAE Std. J531

COMPILED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K.JA	1-7-69		(1)	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 97208

CHG	BY	DATE	WAS

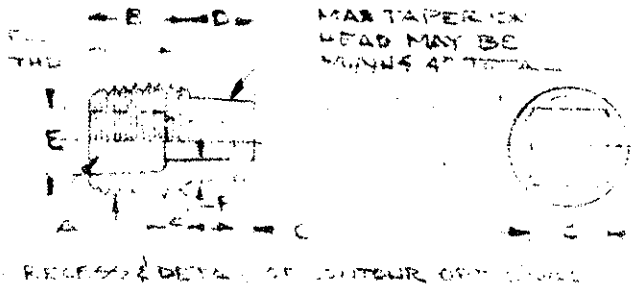
CHG	BY	DATE	WAS

23-9261

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS

PRINT ISSUED	TITLE	PART NO.
1-17-69	PLUGS, SQUARE & HEX INSIDE HEAD PIPE ALUMINUM ALLOY	23-9261
LAST CHG. LTR.		SHEET OF



DASH NUMBER	A		B	C	D		E		WALL THICKNESS (MIN.) F		C	
	THREAD SIZE	FULL THREAD LENGTH	BODY LENGTH	HEAD WIDTH	SQUARE HEAD	HEX INSIDE HEAD	FERROUS	NON-FERROUS	FERROUS	NON-FERROUS	FERROUS	NON-FERROUS
-001	1/16	.30	.330 .350	.214 .221	.178 .193	.163 .178	--	--	--	--	--	--
-002	1/8	.30	.330 .350	.276 .283	.240 .255	.225 .240	--	--	--	--	--	--
-003	1/4	.46	.495 .525	.370 .377	.280 .300	.260 .280	--	--	--	--	--	--
-004	3/8	.46	.495 .525	.428 .440	.310 .335	.285 .310	.31	.36	.13	.11	.13	.0
-005	1/2	.61	.660 .700	.353 .565	.380 .410	.350 .380	.38	.53	.16	.12	.1	.0
-006	3/4	.62	.670 .710	.615 .627	.440 .470	.410 .440	.56	.72	.18	.13	.18	.
-007	1	.77	.830 .870	.803 .815	.500 .540	.460 .500	.75	.93	.20	.14	.20	.1

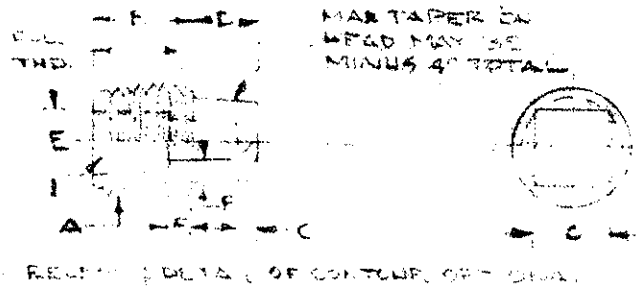
(1.) Aluminum Alloy - SAE Std. J531

COMPILED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K.J.A.	1-7-69		(1)	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 9720

23-9262

PRINT ISSUED	TITLE	PART NO.
1-17-69	PLUGS, SQUARE & HEX INSIDE HEAD PIPE BRASS OR BRONZE	23-9262
LAST CHG. LTR		SHEET OF



DASH NUMBER	A		B	C	D		E		WALL THICKNESS (MIN.) F		G	
	THREAD SIZE	FULL THREAD LENGTH	BODY LENGTH	HEAD WIDTH	SQUARE HEAD	HEX INSIDE HEAD	FERROUS	NON-FERROUS	FERROUS	NON-FERROUS	FERROUS	NON-FERROUS
-001	1/16	.30	.330 .350	.214 .221	.178 .193	.163 .178	--	--	--	--	--	--
-002	1/8	.30	.330 .350	.276 .283	.240 .255	.225 .240	--	--	--	--	--	--
-003	1/4	.46	.495 .525	.370 .377	.280 .300	.260 .280	--	--	--	--	--	--
-004	3/8	.46	.495 .525	.428 .440	.310 .335	.285 .310	.31	.36	.13	.11	.13	.0
-005	1/2	.61	.660 .700	.553 .565	.380 .410	.350 .380	.38	.53	.16	.12	.1	.0
-006	3/4	.62	.670 .710	.615 .627	.440 .470	.410 .440	.56	.72	.18	.13	.1	.1
-007	1	.77	.830 .870	.803 .815	.500 .540	.460 .500	.75	.93	.20	.14	.20	.1

WAS | DATE | BY | CHG

WAS | DATE | BY | CHG

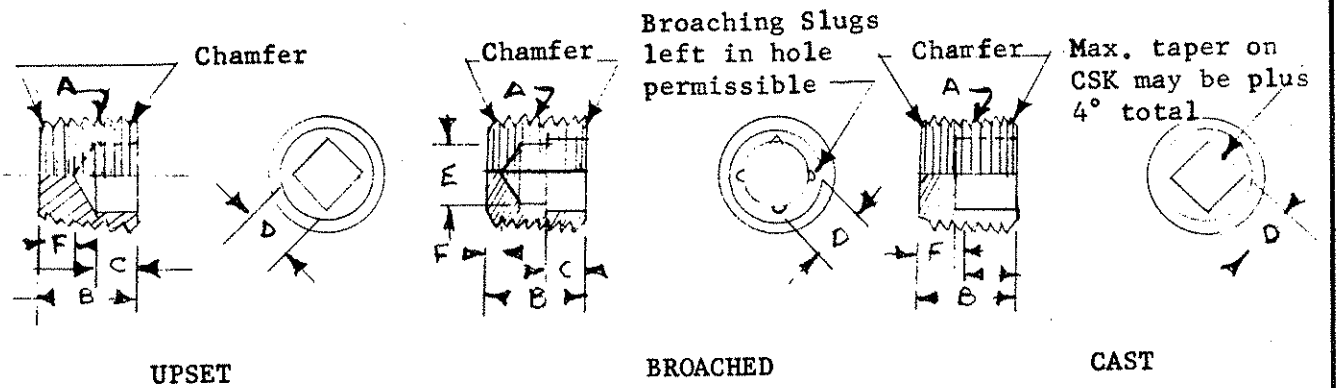
(1.) Brass or Bronze - SAE Std. J531

COMPILED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K.J.A.	1-7-69		(1)	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 97208

-9263

PRINT ISSUED	TITLE	PART NO.
	PLUGS, SQUARE COUNTERSUNK HEADLESS FILLER & DRAIN ALUMINUM ALLOY	23-9263
LAST CHG. LTR.		SHEET OF



UPSET BROACHED CAST

DASH NUMBER	A DRYSEAL THREAD (NPTF)	B BODY LENGTH	C SOCKET DEPTH MIN.	BROACHED OR UPSET			CAST		
				D SOCKET WIDTH	E HOLE DIA MAX	F WALL THKNS (MIN)	D SOCKET WIDTH	F WALL THICKNESS FERROUS MIN	F WALL THICKNESS NON-FERROUS MIN
-001	1/16	.250 .270	.09	.130 .135	.143	.06	.13 .14	.06	.06
-002	1/8	.260 .280	.09	.192 .197	.209	.06	.19 .21	.08	.06
-003	1/4	.395 .425	.16	.255 .260	.278	.06	.26 .28	.10	.07
-004	3/8	.395 .425	.16	.319 .324	.345	.06	.32 .35	.13	.08
-005	1/2	.520 .560	.19	.382 .387	.410	.09	.38 .41	.16	.09
-006	3/4	.530 .570	.19	.508 .513	.553	.09	.51 .54	.18	.10
-007	1	.670 .710	.25	.508 .513	.553	.12	.51 .54	.20	.11

WAS | DATE | BY | CHG

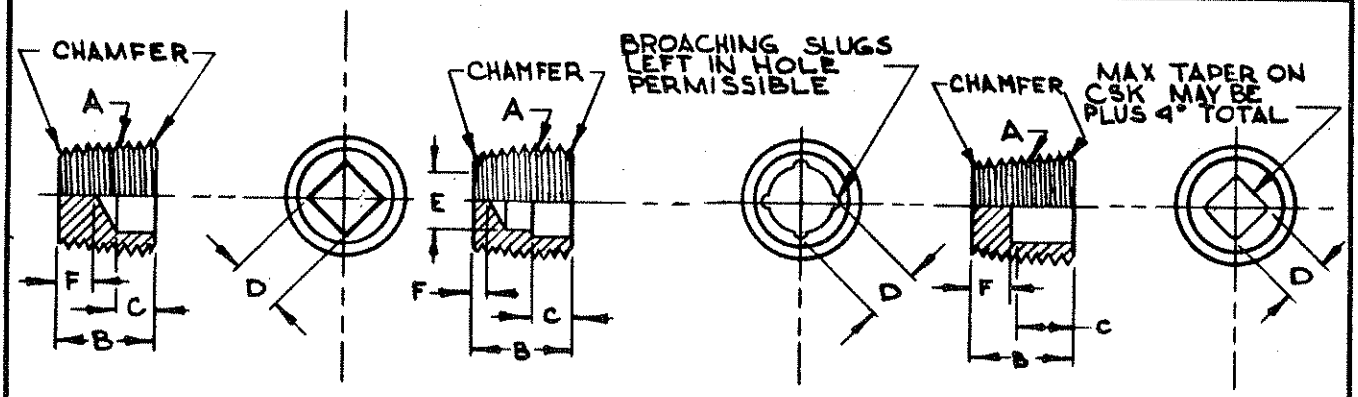
WAS | DATE | BY | CHG

(1) Aluminum Alley-SAE Std. J531

COMPILED	KJA	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	ICTA	9-29-69		(1)	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 97208

PRINT ISSUED	TITLE	PART NO.
	PLUGS, SQUARE COUNTERSUNK HEADLESS FILLER & DRAIN BRASS OR BRONZE	23-9264
LAST CHG. LTR.		SHEET OF



DASH NUMBER	A	B	C	BROACHED OR UPSET			CAST		
	DRYSEAL THREAD (NPTF)	BODY LENGTH	SOCKET DEPTH MIN.	D SOCKET WIDTH	E HOLE DIA MAX	F WALL THKNS MIN	D SOCKET WIDTH	F WALL THICKNESS FERROUS MIN	F WALL THICKNESS NON-FERROUS MAX
-001	1/16	.250 .270	.09	.130 .135	.143	.06	.13 .14	.06	.06
-002	1/8	.260 .280	.09	.192 .197	.209	.06	.19 .21	.08	.06
-003	1/4	.395 .425	.16	.255 .260	.278	.06	.26 .28	.10	.07
-004	3/8	.395 .425	.16	.319 .324	.345	.06	.32 .35	.13	.08
-005	1/2	.520 .560	.19	.382 .387	.410	.09	.38 .41	.16	.09
-006	3/4	.530 .570	.19	.508 .513	.553	.09	.51 .54	.18	.10
-007	1	.670 .710	.25	.508 .513	.553	.12	.51 .54	.20	.11

(1) Brass or Bronze - SAE Std. J531

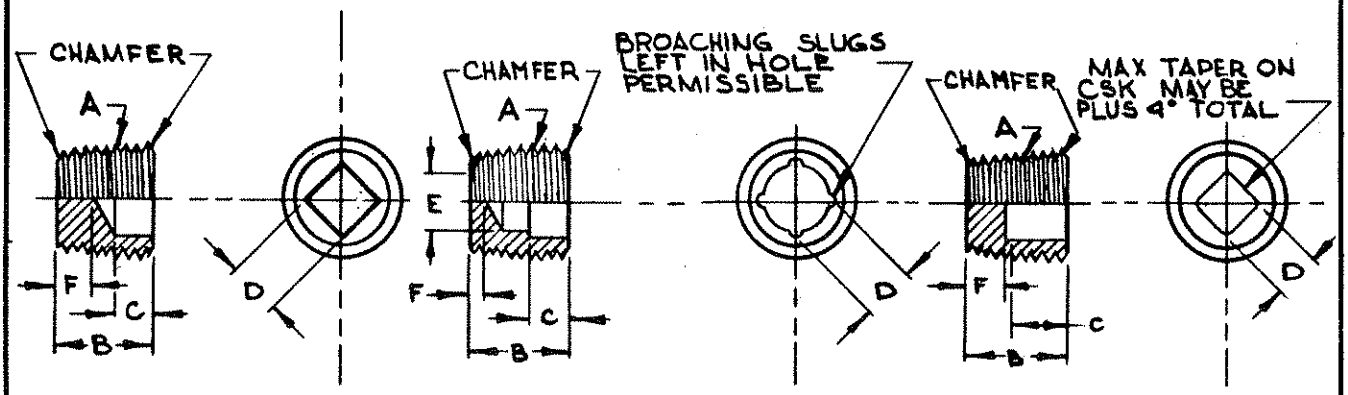
COMPILED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	KJA	1-6-69		(1)	Vehicle

Portland FREIGHTLINER CORPORATION Oregon 97208

WAS | DATE | BY | CHG

23-9265

PRINT ISSUED	TITLE	PART NO.
	PLUGS, SQUARE COUNTERSUNK HEADLESS PIPE ALUMINUM ALLOY	23-9265
LAST CHG. LTR.		SHEET OF



DASH NUMBER	A DRYSEAL THD (NPTF)	B BODY LENGTH	C SOCKET DEPTH (MIN.)	BROACHED OR UPSET			CAST		
				D SOCKET WIDTH	E HOLE DIA. (MAX.)	F WALL THKNS. (MIN.)	D SOCKET WIDTH	F WALL THICKNESS	
								FERROUS MIN.	NON-FERROUS MIN.
-001	1/16	.290 .310	.12	.130 .135	.143	.06	.13 .14	.06	.06
-002	1/8	.240 .310	.12	.192 .197	.209	.06	.19 .21	.08	.06
-003	1/4	.445 .475	.19	.255 .260	.278	.06	.26 .28	.10	.07
-004	3/8	.445 .475	.19	.319 .324	.345	.06	.32 .35	.13	.08
-005	1/2	.590 .630	.25	.382 .387	.410	.09	.38 .41	.16	.09
-006	3/4	.600 .640	.31	.508 .513	.553	.09	.51 .54	.18	.10
-007	1	.750 .790	.38	.508 .513	.553	.12	.51 .54	.20	.11

CHG	BY	DATE	WAS

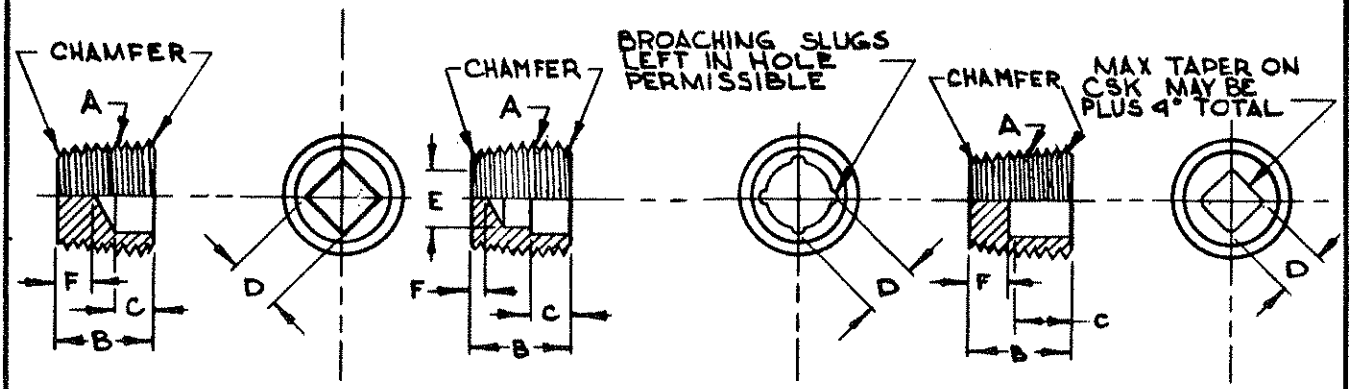
CHG	BY	DATE	WAS

(1) Aluminum Alloy - SAE Std. J531

COMPILED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	KJA	1-6-69		(1)	Vehicle

Portland FREIGHTLINER CORPORATION Oregon 97208

PRINT ISSUED	TITLE	PART NO.
	PLUGS, SQUARE COUNTERSUNK HEADLESS PIPE BRASS OR BRONZE	23-9266
LAST CHG. LTR.		SHEET OF



DASH NUMBER	A DRYSEAL THD (NPTF)	B BODY LENGTH	C SOCKET DEPTH (MIN.)	BROACHED OR UPSET			CAST		
				D SOCKET WIDTH	E HOLE DIA. (MAX)	F WALL THKNS. (MIN)	D SOCKET WIDTH	F WALL THICKNESS	
								FERROUS	NON-FERROUS
								MIN.	MAX.
-001	1/16	.290 .310	.12	.130 .135	.143	.06	.13 .14	.06	.06
-002	1/8	.240 .310	.12	.192 .197	.209	.06	.19 .21	.08	.06
-003	1/4	.445 .475	.19	.255 .260	.278	.06	.26 .28	.10	.07
-004	3/8	.445 .475	.19	.319 .324	.345	.06	.32 .35	.13	.08
-005	1/2	.590 .630	.25	.382 .387	.410	.09	.38 .41	.16	.09
-006	3/4	.600 .640	.31	.508 .513	.553	.09	.51 .54	.18	.10
-007	1	.750 .790	.38	.508 .513	.553	.12	.51 .54	.20	.11

(1) Brass or Bronze - SAE Std. J531

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS

COMPILED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	KJA	1-9-69		(1)	Vehicle

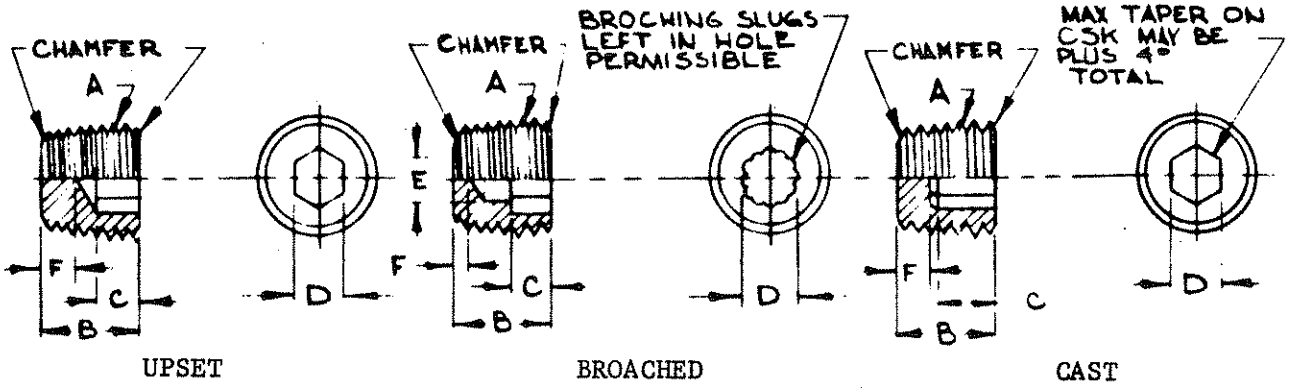
Portland FREIGHTLINER CORPORATION Oregon 97208

23-9267

WAS				
CHG	BY	DATE		

WAS				
CHG	BY	DATE		

PRINT ISSUED	TITLE	PART NO
1-17-69	PLUGS, HEX COUNTERSUNK HEADLESS FILLER & DRAIN ALUMINUM ALLOY	23-9267
LAST CHG LTR		SHEET OF



DASH NUMBER	A DRYSEAL THD (NPTF)	B BODY LENGTH	C SOCKET DEPTH (MIN.)	BROACHED OR UPSET				CAST		
				D SOCKET WIDTH	E MAX		F WALL THKNS (MIN.)	D SOCKET WIDTH	F WALL THKNS	
					STEEL	OTHER			FERROUS MIN	NON-FERROUS MIN
-001	1/16	.250 .270	.09	.156 .161	.161	.161	.06	.156 .161	.06	.06
-002	1/8	.260 .280	.09	.188 .193	.193	.193	.06	.188 .193	.08	.06
-003	1/4	.395 .425	.16	.250 .255	.255	.261	.06	.250 .255	.10	.07
-004	3/8	.395 .425	.16	.313 .318	.318	.323	.06	.313 .318	.13	.08
-005	1/2	.520 .560	.19	.375 .380	.381	.386	.09	.375 .380	.16	.09
-006	3/4	.530 .570	.19	.563 .568	.570	.570	.09	.563 .568	.18	.10
-007	1	.670 .710	.25	.625 .630	.633	.633	.12	.625 .630	.20	.11

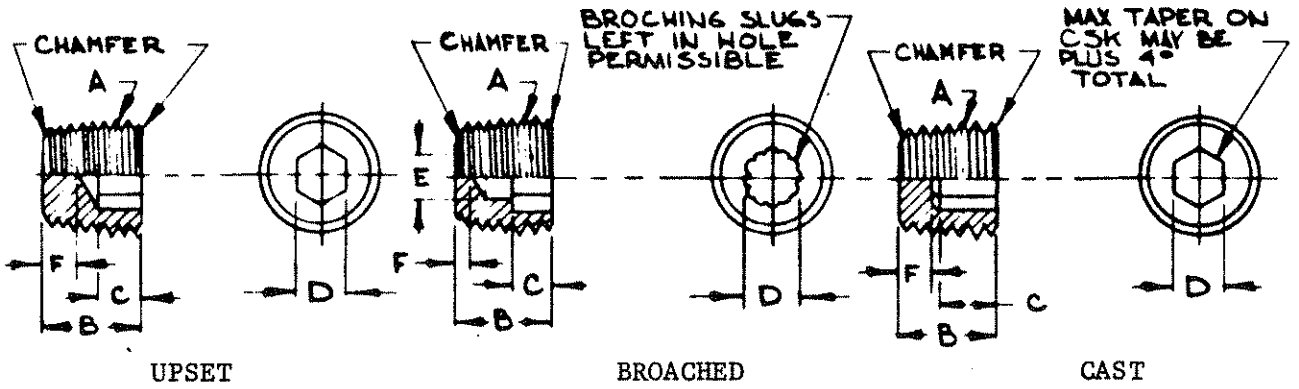
(1) Aluminum Alloy - SAE Std J531

COMPILED	PRJ.	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	[illegible]	1-6-69		(1)	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 97208

23-9268

PRINT ISSUED	TITLE	PART NO
1-7-69	PLUGS, HEX COUNTERSUNK HEADLESS FILLER & DRAIN BRASS OR BRONZE	23-9268
LAST CHG LTR		SHEET OF



UPSET BROACHED CAST

DASH NUMBER	A DRYSEAL THD (NPTF)	B BODY LENGTH	C SOCKET DEPTH (MIN.)	BROACHED OR UPSET				CAST		
				D SOCKET WIDTH	E MAX STEEL	E MAX OTHER	F WALL THKNS. (MIN.)	D SOCKET WIDTH	F WALL THKNS. FERROUS MIN.	F WALL THKNS. NON-FERROUS MIN.
-001	1/16	.250 .270	.09	.156 .161	.161	.161	.06	.156 .161	.06	.06
-002	1/8	.260 .280	.09	.188 .193	.191	.193	.06	.188 .193	.08	.06
-003	1/4	.395 .425	.16	.250 .255	.255	.261	.06	.250 .255	.10	.07
-004	3/8	.395 .425	.16	.313 .318	.318	.323	.06	.313 .318	.13	.08
-005	1/2	.520 .560	.19	.375 .380	.381	.386	.09	.375 .380	.16	.09
-006	3/4	.530 .570	.19	.563 .568	.570	.570	.09	.563 .568	.18	.10
-007	1	.670 .710	.25	.625 .630	.631	.631	.12	.625 .630	.20	.11

(1) Brass or Bronze - SAE Std. J531

COMPILED	P.R.J.	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K.J.G.	1-6-69		(1)	VEHICLE

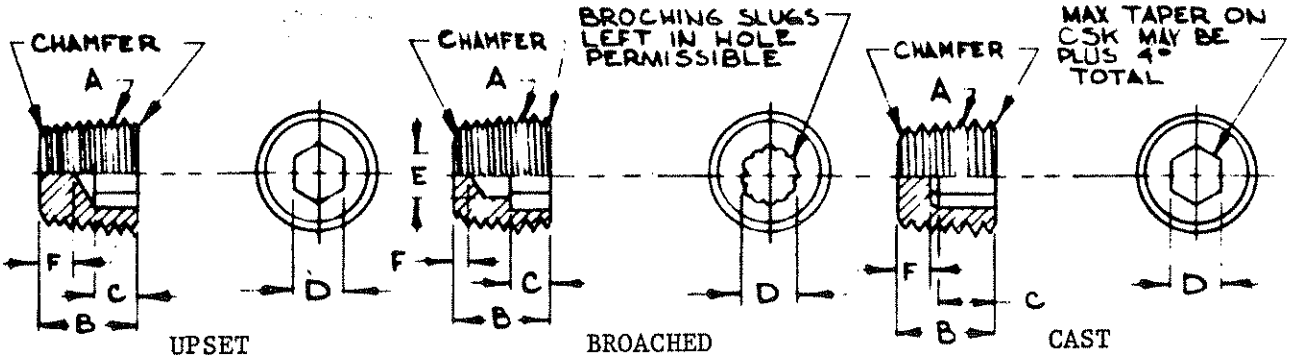
Portland FREIGHTLINER CORPORATION Oregon 97208

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS

3-9269

PRINT ISSUED	TITLE	PART NO
1-17-69	PLUGS, HEX COUNTERSUNK HEADLESS PIPE ALUMINUM ALLOY	23-9269
LAST CHG LTR		SHEET OF



DASH NUMBER	A DRYSEAL THD (NPTF)	B BODY LENGTH	C SOCKET DEPTH (MIN)	BROACHED OR UPSET				CAST		
				D SOCKET WIDTH	E MAX STEEL	E MAX OTHER	F WALL THKNS (MIN)	D SOCKET WIDTH	F WALL THICKNESS FERROUS MIN	F WALL THICKNESS NON FERROUS MIN
-001	1/16	.290 .310	.12	.156 .161	.161	.161	0.06	.156 .161	.06	.06
-002	1/8	.290 .310	.12	.188 .193	.193	.193	0.06	.188 .193	.08	.06
-003	1/4	.445 .475	.19	.250 .318	.225	.261	0.06	.250 .318	.10	.07
-004	3/8	.445 .475	.19	.313 .318	.318	.323	0.06	.313 .318	.13	.08
-005	1/2	.590 .630	.25	.375 .380	.381	.386	0.09	.375 .380	.16	.09
-006	3/4	.600 .640	.31	.563 .568	.570	.570	0.09	.563 .568	.18	.10
-007	1	.750 .790	.38	.625 .630	.633	.633	0.12	.625 .630	.20	.11

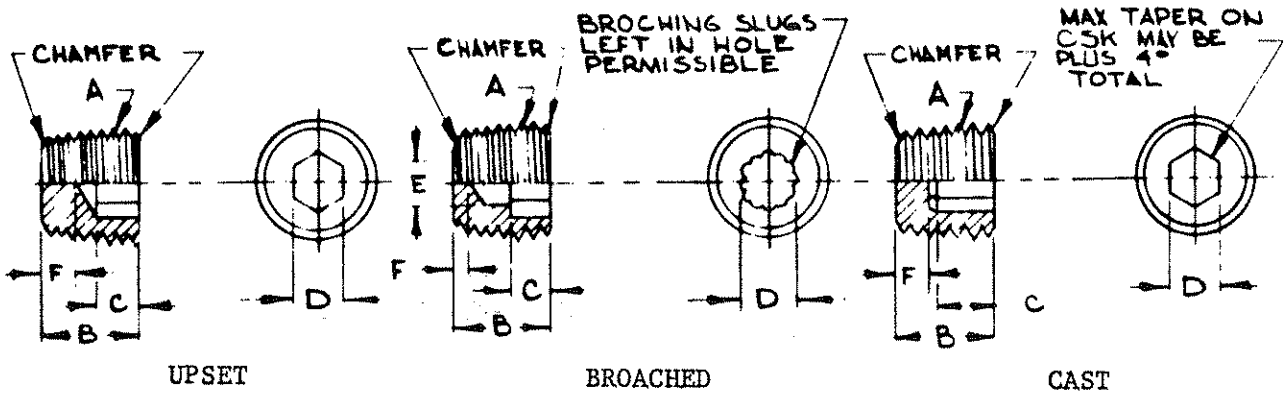
CHG	BY	DATE	WAS

CHG	BY	DATE	WAS

① Aluminum Alloy - SAE Std. J531

COMPILED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K.J.A.	1-6-69		①	VEHICLE

PRINT ISSUED	TITLE	PART NO
1-17-69	PLUGS, HEX COUNTERSUNK HEADLESS PIPE BRASS OR BRONZE	23-9270
LAST CHG LTR		SHEET OF



UPSET BROACHED CAST

DASH NUMBER	A	B	C	BROACHED OR UPSET				CAST		
	DRYSEAL THREAD (NPTF)	BODY LENGTH	SOCKET DEPTH (MIN)	D SOCKET WIDTH	E MAX STEEL	E MAX OTHER	F WALL THKNS	D SOCKET WIDTH	F WALL THICKNESS FERROUS MIN	F WALL THICKNESS NON FERROUS MIN
-001	1/16	.290 .310	.12	.156 .161	161	161	0.06	.156 .161	.06	.06
-002	1/8	.290 .310	.12	.188 .193	193	193	0.06	.188 .193	.08	.06
-003	1/4	.445 .475	.19	.250 .255	225	261	0.06	.250 .255	.10	.07
-004	3/8	.445 .475	.19	.313 .318	318	323	0.06	.313 .318	.13	.08
-005	1/2	.590 .630	.25	.375 .380	381	386	0.09	.375 .380	.16	.09
-006	3/4	.600 .640	.31	.563 .568	570	570	0.09	.563 .568	.18	.10
-007	1	.750 .790	.38	.625 .630	633	633	0.12	.625 .630	.20	.11

(1) Brass or Bronze - SAE Std. J531

COMPILED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	[signature]	1-6-69		(1)	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 97208

CHG	BY	DATE	WAS

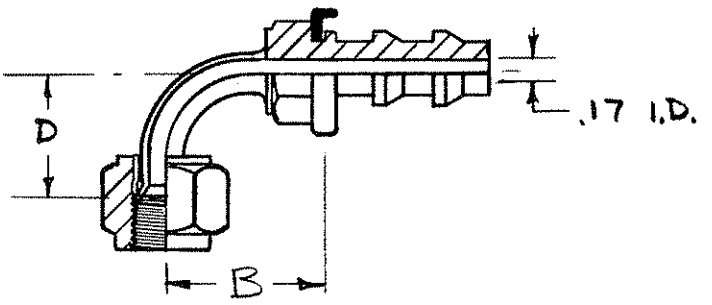
CHG	BY	DATE	WAS

A23-9274

CHG	BY	DATE	WAS

PRINT ISSUED	TITLE	PART NO.
9-11-69	Terminal Assy, Hose Low Pressure SAE 90° Swivel	A23-9274
LAST CHG. LTR. A		SHEET 1 OF 1

SKETCH



PART NUMBERS

ID Hose 16ths	SAE Thread	B	D	Manufacturer's Number STX		Freightliner Part Number
4	7/16-20	.72	68	26561-4-4		A23-9274-004

a. Last dash number of fitting shows dash size of hose.

SPECIFICATIONS

(1) Quality of material, manufacture, finish and workmanship, to be not less than the current applicable specifications of SAE J530. (STEEL)

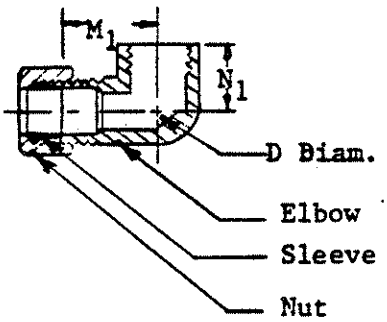
CHG	BY	DATE	WAS
A	HJR	5-18-73	Rev'd Format, B & D Added; J #A0390

COMPILED	SJF	DATE DRAWN		MATERIAL	
APPROVED	LOG.	7-23-69		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

PRINT ISSUED	TITLE	PART NO.
2-26-70	90° FEMALE ELBOW NYLON TUBE TO FEMALE PIPE EXTRUDED BRASS	23-9292
LAST CHG LTR: A		SHEET 1 OF 1

SKETCH



PART NUMBERS

M_1	N_1	STRAIGHT THREAD	D	PIPE THREAD	TUBE SIZE	FREIGHTLINER PART NUMBER	PARKER HANNIFIN PART NO.*
.67	.54	3/8-24	.125	1/8	3/16	23-9292-001	270NT-3-2
.67	.54	7/16-24	.188	1/8	1/4	-002	-4-2
.69	.66	7/16-24	.188	1/4	1/4	-003	-4-4
.69	.56	1/2-24	.250	1/8	5/16	-004	-5-2

ENGINEERING NOTES

(1) Material: Brass CA345 or CA360. *Part Number includes Brass Nut PH/61C-# and Delrin Sleeve PH/60PT-#.

2. Must meet applicable current requirements of Federal Motor Vehicle Safety Standard No. 106.
3. Information for Engineering Department use only:
   Use this elbow in preference to 23-9205 forged version whenever space considerations permit.

COMPILED	KJA	DATE DRAWN		MATERIAL	
APPROVED	7-10	2-12-70		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

CHG	BY	DATE	JOB NO	WAS
A	IIJR	5-29-75	Format;Notes2,3,*A0746	

E-183

23-9293

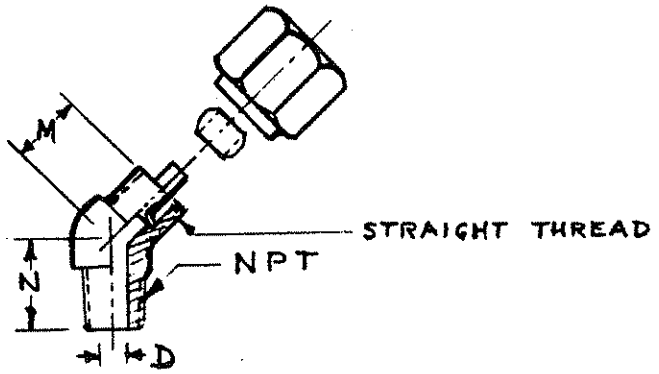
General Use Part

PRINT ISSUED	TITLE	PART NO.
	ELBOW, 45° NYLON TUBE TO MALE PIPE	23-9293
LAST CHG. LTR. E		SHEET 1 OF 1

CHG	BY	DATE	WAS
			JOB NO
			A0659
D	HJR	12-2-74	1/8 NPT
E	RP	3-26-82	A0660-011
			E07555

B

SKETCH



PART NUMBERS

TUBE SIZE	PIPE THREAD	STRAIGHT THREAD	M	N	D	MANUFACTURER'S NUMBER PH		FREIGHTLINER PART NUMBER
1/4	1/8	7/16-24	.66	.56	.188	179NT-4-2		23-9293-001
1/4	1/4	7/16-24	.56	.84	.188	-4-4		-002
5/16	1/8	1/2 -24	.59	.66	.250	-5-2		-003
3/8	1/8	9/16-24	.62	.66	.312	-6-2		-004
3/8	1/4	9/16-24	.62	.84	.312	-6-4		-005
3/8	3/8	9/16-24	.69	.88	.312	-6-6		-006
1/2	3/8	11/16-24	.75	.88	.406	-8-6		-007
5/8	3/8	13/16-18	.75	.88	.406	-10-6		-008
5/8	1/2	13/16-18	.75	.88	.406	-10-8		-009
3/4	1/2	1-18				Q-NT-7986		-011 (E)

C
C

CHG	BY	DATE	WAS
A	HJR	12-31-71	Revised & Redrawn J#84610
B	HJR	4-8-74	Long Nut; J #A0600
C	HJR	6-11-74	Add -008, -009, FMVSS

C

ENGINEERING NOTES

(1) Material: Brass (59 CU -39 Zn -2 Pb) ASTM B283, CA 377

2 Must meet applicable current requirements of Federal Motor Vehicle Safety Standard #106.

		DATE DRAWN		MATERIAL	
COMPILED	HJR	12-31-71		(1)	
APPROVED	Rollins				

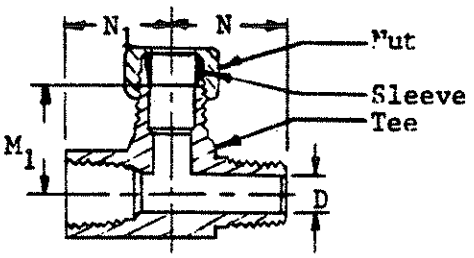
ns

Portland FREIGHTLINER CORPORATION Oregon 97208

E D C B A

PRINT ISSUED	TITLE	PART NO.
7-9-71	ADAPTER TEE NYLON TUBE TO PIPE FORGED BRASS	23-9294
LAST CHG. LTR B		SHEET 1 OF 1

SKETCH



PART NUMBERS

D	N_1	N	M_1	TUBE SIZE	PIPE THREAD	STRAIGHT THREAD	FREIGHTLINER PART NUMBER	PARKER HANNIFIN PART NO.*
.188	.66	.75	.63	1/8	1/8	5/16-24	23-9294-001	176 NT-2-2
.188	.66	.75	.69	1/4	1/8	7/16-24	-002	-4-2
.312	1.00	1.00	.81	3/8	1/4	9/16-24	-003	-6-4

ENGINEERING NOTES

1 Mat'l: Brass ASTM-B283 or CA 377. *Part Number includes Brass Nut PH/61C-# and Delrin Sleeve PH/60PT-#.

2. Must meet applicable current requirements of Federal Motor Vehicle Safety Standard No. 106.

COMPILED	KJA	DATE DRAWN		MATERIAL	
APPROVED		2-12-70		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

A	RMG	6-23-71	-003 pipe thd. was 1/4"
B	IIJR	5-29-75	Format;Notes1,2,*A0746

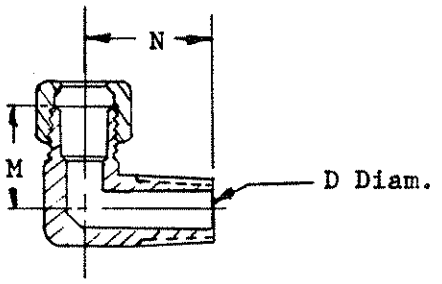
23-9295

PRINT ISSUED		TITLE	PART NO.
		90° MALE ELBOW NYLON TUBE TO MALE PIPE FORGED BRASS	23-9295
LAST CHG. LTR	B		SHEET 1 OF 1

CHG	BY	DATE	WAS	JOB NO

CHG	BY	DATE	WAS	JOB NO
A	HJR	5-23-75	Add Notes 2 & 3	A0741
B	RP	3-26-82	169NT-12-8	E0755

SKETCH



(3) Information for Engineering Dept. use only: Use 23-9296 extruded brass elbow instead of this (forged) elbow whenever space considerations permit.

PART NUMBERS

D DIAM.	TUBE SIZE	STRAIGHT THREAD	PIPE THREAD	M	N	FREIGHTLINER PART NUMBER	PARKER HANNIFIN PART NO.
.125	3/16	3/8-24	1/8	.53	.75	23-9295-001	169NT-3-2
.188	3/16	3/8-24	1/4	.62	.89	-002	-3-4
.188	1/4	7/16-24	1/8	.62	.75	-003	-4-2
.188	1/4	7/16-24	1/4	.66	.94	-004	-4-4
.250	5/16	1/2-24	1/8	.62	.75	-005	-5-2
.312	3/8	9/16-24	1/8	.75	.72	-006	-6-2
.312	3/8	9/16-24	1/4	.75	.94	-007	-6-4
.312	3/8	9/16-24	3/8	.75	.94	-008	-6-6
.312	3/8	9/16-24	1/2	.94	1.17	-009	-6-8
.312	7/16	5/8-24	1/4	.84	1.09	-010	-7-4
.406	1/2	11/16-20	1/4	.94	1.00	-011	-8-4
.406	1/2	11/16-20	3/8	.94	1.12	-012	-8-6
.406	1/2	11/16-20	1/2	1.00	1.20	-013	-8-8
.406	5/8	3/16-18	3/8	1.06	1.09	-014	-10-6
.500	5/8	3/16-18	1/2	1.06	1.30	-015	-10-8
.500	5/8	3/16-18	3/4	1.16	1.13	-016	-10-12
.562	3/4	1-18	1/2	1.25	1.50	-017	Q-169NT-12-8 (B)
.562	3/4	1-18	3/4	1.25	1.56	-018	-12-12

ENGINEERING NOTES

(1) Material: Brass, Forged, ASTM B283, CA 377.
2. Must meet applicable current requirements of Federal Motor Vehicle Safety Standard No. 106.
(3) See above.

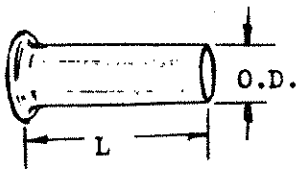
COMPILED	KJA	DATE DRAWN		MATERIAL	
APPROVED	K.J.A.	2-12-70		(1)	

Portland Oregon 97208

FREIGHTLINER CORPORATION

A
B

PRINT ISSUED	TITLE	PART NO.
6-1-70	BRASS INSERTS CONVERT COMPRESSION FITTINGS TO NYLON TUBE FITTINGS	23-9300
LAST CHG LTR K		SHEET 1 OF 1



O.D.	L	NYLON TUBE O.D.	FREIGHTLINER PART NUMBER	PARKER HANNIFIN PART NO.
.170	.531	1/4	23-9300-001	C3FT-4-40 (A)
.215	.588	5/16	-002	-5-40
.187	.531	5/16	-003	-5-62
.250	.562	3/8	-004	-6-62
.375	.719	1/2	-005	-8-62

(1) Material: Brass

WAS					
DATE					
BY					
CHG					

WAS					
DATE					
BY					
CHG					

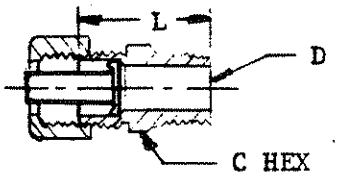
COMPILED	KJA	DATE DRAWN		MATERIAL	
APPROVED		2-12-70		(1)	

Portland FREIGHTLINER CORPORATION

23-930

PRINT ISSUED	TITLE	PART NO
2-26-70	MALE COUPLING NYLON TUBE TO MALE PIPE BRASS	23-9301
LAST CHG LTR: D		SHEET 1 OF 2

SKETCH



PART NUMBERS

D	C HEX	STRAIGHT THREAD	TUBE SIZE	PIPE THREAD	L	FREIGHTLINER PART NUMBER	PARKER HANNIFIN PART NO.*
.093	7/16	5/16-24	1/8	1/8	.75	23-9301-001	68NT-2-2
.125	7/16	3/8-24	3/16	1/8	.84	-002	-3-2
.125	9/16	3/8-24	3/16	1/4	1.03	-003	-3-4
.188	7/16	7/16-24	1/4	1/8	.88	-004	-4-2
.188	9/16	7/16-24	1/4	1/4	1.06	-005	-4-4
.188	11/16	7/16-24	1/4	3/8	1.09	-006	-4-6
.188	7/8	7/16-24	1/4	1/2	1.20	-007	-4-8
.250	1/2	1/2-24	5/16	1/8	.91	-008	-5-2
.250	9/16	1/2-24	5/16	1/4	1.12	-009	-5-4
.250	11/16	1/2-24	5/16	3/8	1.06	-010	-5-6
.218	9/16	9/16-24	3/8	1/8	.97	-011	-6-2
.312	9/16	9/16-24	3/8	1/4	1.16	-012	-6-4
.312	11/16	9/16-24	3/8	3/8	1.16	-013	-6-6
.312	7/8	9/16-24	3/8	1/2	1.44	-014	-6-8
.312	5/8	5/8-24	7/16	1/4	1.11	-015	-7-4
.281	11/16	11/16-20	1/2	1/4	1.22	-016	-8-4
.406	11/16	11/16-20	1/2	3/8	1.22	-017	-8-6
.406	7/8	11/16-20	1/2	1/2	1.50	-018	-8-8

ENGINEERING NOTES

1. Material: Brass CA345 or CA360. *Part Number includes Brass Nut PH/61C-# and Delrin Sleeve PH/60 PT-#.
2. Must meet applicable current requirements of Federal Motor Vehicle Safety Standard No. 106.

COMPILED	KJA	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K.J.O.	2-12-70		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

CHG	BY	DATE	WAS	JOB NO
A	D.L.	3-14-74	CORRECT VIEW	A0585
B	HJR	5-29-75	Add Notes 2,*	A0746
C	RP	3-24-82	SEE SHT 2	E0755
D	CHG	3-3-83	SEE SHT 2	G0508

CHG	BY	DATE	WAS	JOB NO

E-183

23-9301

PRINT ISSUED	TITLE	PART NO
2-2670	MALE COUPLING NYLON TUBE TO MALE PIPE BRASS	23-9301
LAST CHG LTR D		SHEET 2 OF 2

CHG	BY	DATE	WAS	JOB NO

CHG	BY	DATE	WAS	JOB NO
A	D.L.	3-14-74	SHT 1	A0585
B	HJR	5-29-75	See Sht. 1	A0746
C	RP	3-26-82	68NT-12-8	E0755
D	CMH	3-3-83	Q-68NT-12-8	60508

PART NUMBERS (CONT'D)

D	C HEX	STRAIGHT THREAD	TUBE SIZE	PIPE THREAD	L	FREIGHTLINER PART NUMBER	PARKER HANNIFIN PART NO.*
.406	1-1/16	11/16-20	1/2	3/4	1.41	23-9301-019	68NT-8-12
.406	13/16	13/16-18	5/8	3/8	1.25	-020	-10-6
.500	7/8	13/16-18	5/8	1/2	1.50	-021	-10-8
.500	1-1/16	13/16-18	5/8	3/4	1.47	-022	-10-12 (D) (C)
.562	1	1-18	3/4	1/2	1.52	-023	Q-NT-8427
.656	1-1/16	1-18	3/4	3/4	1.53	-024	-12-12
.750	1-1/8	1-1/8-18	7/8	3/4	1.25	-025	-14-12
.766	1-3/8	1-1/8-18	7/8	1	1.47	-026	-12-16

*Part Number includes Brass Nut PH/61C-# and Delrin Sleeve PH/60PT-#.

COMPILED	KJA	DATE DRAWN		MATERIAL	
APPROVED	[illegible]	2-12-70		See Sheet 1	

Portland FREIGHTLINER CORPORATION Oregon 97208 (D) (C)

E-183

23-9301

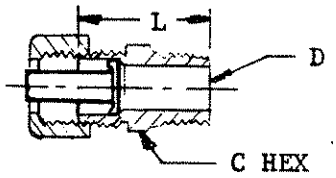
CHG	BY	DATE	WAS	JOB NO

A

CHG	BY	DATE	WAS	JOB NO
A	D.L.	3-14-74	CORRECT VIEW	A0585
B	HJR	5-29-75	Add Notes 2,*	A0746
C	RP	3-26-82	SEE SHT 2	E0755

PRINT ISSUED	TITLE	PART NO.
2-26-70	MALE COUPLING NYLON TUBE TO MALE PIPE BRASS	23-9301
LAST CHG LTR. C		SHEET 1 OF 2

SKETCH



PART NUMBERS

D	C HEX	STRAIGHT THREAD	TUBE SIZE	PIPE THREAD	L	FREIGHTLINER PART NUMBER	PARKER HANNIFIN PART NO.*
.093	7/16	5/16-24	1/8	1/8	.75	23-9301-001	68NT-2-2
.125	7/16	3/8-24	3/16	1/8	.84	-002	-3-2
.125	9/16	3/8-24	3/16	1/4	1.03	-003	-3-4
.188	7/16	7/16-24	1/4	1/8	.88	-004	-4-2
.188	9/16	7/16-24	1/4	1/4	1.06	-005	-4-4
.188	11/16	7/16-24	1/4	3/8	1.09	-006	-4-6
.188	7/8	7/16-24	1/4	1/2	1.20	-007	-4-8
.250	1/2	1/2-24	5/16	1/8	.91	-008	-5-2
.250	9/16	1/2-24	5/16	1/4	1.12	-009	-5-4
.250	11/16	1/2-24	5/16	3/8	1.06	-010	-5-6
.218	9/16	9/16-24	3/8	1/8	.97	-011	-6-2
.312	9/16	9/16-24	3/8	1/4	1.16	-012	-6-4
.312	11/16	9/16-24	3/8	3/8	1.16	-013	-6-6
.312	7/8	9/16-24	3/8	1/2	1.44	-014	-6-8
.312	5/8	5/8-24	7/16	1/4	1.11	-015	-7-4
.281	11/16	11/16-20	1/2	1/4	1.22	-016	-8-4
.406	11/16	11/16-20	1/2	3/8	1.22	-017	-8-6
.406	7/8	11/16-20	1/2	1/2	1.50	-018	-8-8

ENGINEERING NOTES

(1) Material: Brass CA345 or CA360. *Part Number includes Brass Nut PH/61C-# and Delrin Sleeve PH/60 PT-#.

2. Must meet applicable current requirements of Federal Motor Vehicle Safety Standard No. 106.

COMPILED	KJA	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K.J.A.	2-12-70		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

23-9301

PRINT ISSUED	TITLE	PART NO.
2-2670	MALE COUPLING NYLON TUBE TO MALE PIPE BRASS	23-9301
LAST CHG. LTR. C		SHEET 2 OF 2

CHG	BY	DATE	WAS	JOB NO

CHG	BY	DATE	WAS	JOB NO
A	D.L.	3-14-74	SHT 1	A0585
B	HJR	5-29-75	See Sht. 1	A0746
C	RP	3-26-82	68NT-12-8	E0755

PART NUMBERS (CONT'D)

D	C HEX	STRAIGHT THREAD	TUBE SIZE	PIPE THREAD	L	FREIGHTLINER PART NUMBER	PARKER HANNIFIN PART NO.*
.406	1-1/16	11/16-20	1/2	3/4	1.41	23-9301-019	68NT-8-12
.406	13/16	13/16-18	5/8	3/8	1.25	-020	-10-6
.500	7/8	13/16-18	5/8	1/2	1.50	-021	-10-8
.500	1-1/16	13/16-18	5/8	3/4	1.47	-022	-10-12
.562	1	1-18	3/4	1/2	1.52	-023	Q-68NT-12-8 (C)
.656	1-1/16	1-18	3/4	3/4	1.53	-024	-12-12
.750	1-1/8	1-1/8-18	7/8	3/4	1.25	-025	-14-12
.766	1-3/8	1-1/8-18	7/8	1	1.47	-026	-12-16

*Part Number includes Brass Nut PH/61C-# and Delrin Sleeve PH/60PT-#.

COMPILED	KJA	DATE DRAWN		MATERIAL	
APPROVED	[illegible]	2-12-70		See Sheet 1	

Portland FREIGHTLINER CORPORATION Oregon 97208

E-183

B C

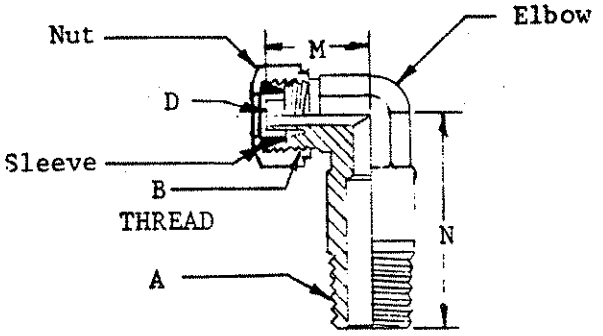
General Use Part

PRINT ISSUED	TITLE	PART NO.
8/20/71	ELBOW, 90°, LONG NYLON TUBE TO MALE PIPE	23-9302
LAST CHG LTR C		SHEET 1 OF 1

CHG	BY	DATE	WAS	JOB NO

CHG	BY	DATE	WAS	JOB NO
A	HJR	11-30-70	Revised & Retyped	
B	HJR	7-23-70	01550	
C	HJR	5-29-75	Add Notes 2,*	A0746

SKETCH



PART NUMBERS

TUBE O.D.	A PIPE THREAD	B SAE THREAD	M	N	D	MANUFACTURERS' NUMBERS			FREIGHTLINER PART NUMBER
						PH*			
1/4	1/8-27	7/16-24	23/32	1-3/8	.141	169 NTL			23-9302-001
1/4	1/4-18	7/16-24	23/32	1-3/8	.141				23-9302-002

ENGINEERING NOTES

(1) Material: Brass (59 Cu -39 Zn -2 Pb) ASTM B283, CA 377. *Part Number includes Brass Nut PH/61C-# and Delrin Sleeve PH/60PT-#.

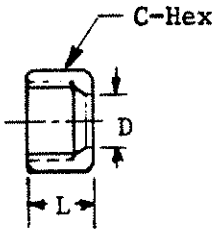
2. Must meet applicable current requirements of Federal Motor Vehicle Safety Standard No. 106.

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		11-30-70		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

PRINT ISSUED	TITLE	PART NO.
2-26-70	COMPRESSION NUT BRASS	23-9303
LAST CHG LTR: A		SHEET 1 OF 1

SKETCH



PART NUMBERS

TUBE SIZE	STRAIGHT THREAD	C HEX	L	D	FREIGHTLINER PART NUMBER	PARKER HANNIFIN PART NO.*
1/8	5/16-24	3/8	.38	.130	23-9303-001	61C-2
3/16	3/8-24	7/16	.41	.193	-002	-3
1/4	7/16-24	1/2	.44	.257	-003	-4
5/16	1/2-24	9/16	.44	.320	-004	-5
3/8	9/16-24	5/8	.47	.383	-005	-6
7/16	5/8-24	11/16	.50	.447	-006	-7
1/2	11/16-20	13/16	.62	.511	-007	-8
5/8	13/16-18	15/16	.62	.638	-008	-10
3/4	1-18	1-3/16	.69	.765	-009	-12
7/8	1-1/8-18	1-1/4	.63	.890	-010	-14

ENGINEERING NOTES

(1) Material: Brass, ASTM B-16, CA 360 or CA 345. *Part Number includes Brass Nut PH/61C-# and Delrin Sleeve PH/60PT-#.

2. Must meet applicable current requirements of Federal Motor Vehicle Safety Standard No. 106.

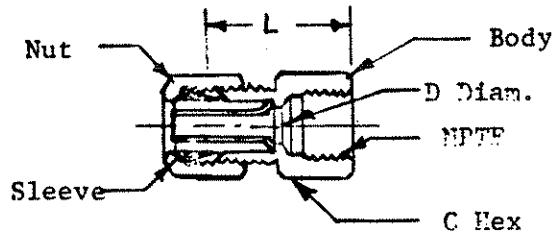
CHG	BY	DATE	WAS	JOB NO
A	HJR	5-29-75	Add Notes 2.*	A0746

COMPILED	KJA	DATE DRAWN		MATERIAL	
APPROVED	KJA	2-12-70		(1)	

General Use Part

PRINT ISSUED	TITLE	PART NO.
4-7-71	CONNECTOR NYLON TUBE TO INSIDE PIPE BRASS	23-9304
LAST CHG LTR C		SHEET 1 OF 1

SKETCH



PART NUMBERS

TUBE SIZE	PIPE THREAD	STRAIGHT THREAD	C HEX	D DIAM	L	MANUFACTURER'S NUMBERS PH *			FREIGHTLINER PART NUMBER
1/8	1/8	5/16-24	9/16	.094	.75	66NT-2-2			23-9304-001
3/16	1/8	3/8-24	9/16	.125	.79	-3-2			-002
	1/4		11/16		.89	-3-4			-003
1/4	1/8	7/16-24	9/16	.188	.78	-4-2			-004
	1/4		11/16		.95	-4-4			-005
5/16	1/8	1/2-24	9/16	.250	.81	-5-2			-006
	1/4		11/16		1.03	-5-4			-007
3/8	1/8	9/16-24	9/16	.312	.78	-6-2			-008
	1/4		11/16		1.06	-6-4			-009
	3/3		13/16		1.06	-6-6			-010
1/2	3/8	11/16-20	13/16	.338	1.16	-8-6			-011

ENGINEERING NOTES

1. Material: All parts brass except sleeve, which is Delrin. *Part Number includes Brass Nut PH/61C-# and Delrin Sleeve PH/60PT-#.
2. Must meet applicable current requirements of Federal Motor Vehicle Safety Standard No. 106.

CHG	WAS	DATE	BY	JOB NO.

CHG	WAS	DATE	BY	JOB NO.
A	Rev. Format & Title	2-18-71	HJR	A0717
B	Add-010,-011	12-10-74	HJR	
C	Add Notes 2,*	5-29-75	HJR	A0746

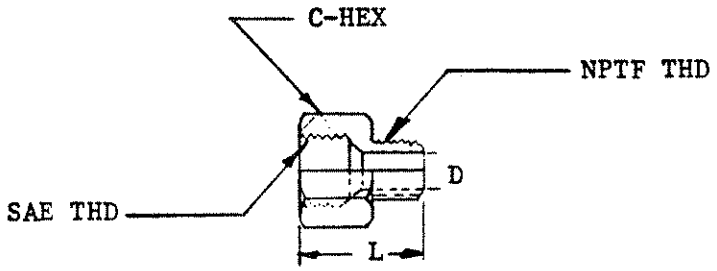
COMPILED	KJA	DATE DRAWN		MATERIAL	
APPROVED		2-12-70		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO.
12/16/70	ADAPTER FEMALE FLARE TO MALE PIPE	23-9306
LAST CHG LTR: A		SHEET OF

SKETCH



PART NUMBERS

TUBE SIZE	PIPE SIZE	SAE THREAD	L	C HEX (FLATS)	D	MANUFACTURERS' NUMBERS PH			FREIGHTLINER PART NUMBER
1/4	1/8	7/16-20	.91	5/8	.219	664FHD-4-2			23-9306-001
1/4	1/4	7/16-20	1.09	5/8	.261	664FHD-4-4			23-9306-002
3/8	1/4	5/8-18	1.28	13/16	.344	664FHD-6-4			23-9306-003
1/2	3/8	3/4-16	1.38	15/16	.406	664FHD-8-6			23-9306-004

ENGINEERING NOTES

(1) Material: Extruded Brass (61.50 Cu -35.25 Zn -3.25 Pb) ASTM B-16 CA 360
OR
(63.00 Cu -35.25 Zn -1.75 Pb) CA 345

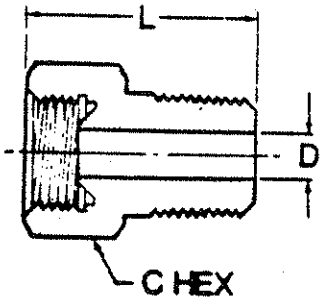
CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	HJR	11-30-70	(PH) 664NT; Redrawn

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		11-30-70		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

ORIGINAL JOB NO.	TITLE	PART NO.
	HALF UNION INVERTED FLARE TO MALE PIPE	23-09308
LAST CHG LTR: C		SHEET 1 OF 1



TUBE SIZE	PIPE THREAD	STRAIGHT THREAD	L DIM.	C HEX	D MINDIA	VENDOR PART NO. PH	FREIGHTLINER PART NO.
5/16	1/4	1/2 - 20	.97	19/32	.219	VS48IFHD-5-4	23-09308-008

NOTES:

1. Material: Brass CA345, CA360
2. Ref. SAE 040102, J512

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
C	4266D	FHF	6-15-87	REV. & REDRAWN

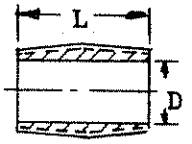
C

COMPILED	FHF	DATE DRAWN	MATERIAL		
APPROVED		6/4/87	1.		

23-9309

PRINT ISSUED	TITLE	PART NO.
2-26-76	CLOSED NIPPLE BRASS	23-9309
LAST CHG. LTR.		SHEET OF

CHG	BY	DATE	WAS



D	L	PIPE THREAD	FREIGHTLINER PART NUMBER	PARKER HANNIFIN PART NO.
.250	.75	1/8	23-9309-001	215PN-2
.375	.88	1/4	-002	-4
.500	1.00	3/8	-003	-6
.625	1.12	1/2	-004	-8
.880	1.31	3/4	-005	-12

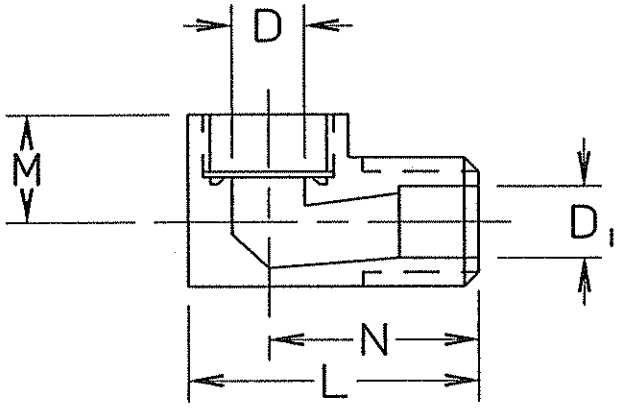
Material: Brass ASTM B-16, CA 360 or CA 345 (1)

CHG	BY	DATE	WAS

COMPILED	KJA	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	K.J.A	2-12-70		(1)	VEHICLE

Portland FREIGHTLINER CORPORATION Oregon 97208

DRAWN	KJA	TITLE HALF UNION ELBOW INVERTED FLARE TO MALE PIPE	ITEM NUMBER 23-09310
APPRV	KJA		
DATE	02/12/70	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



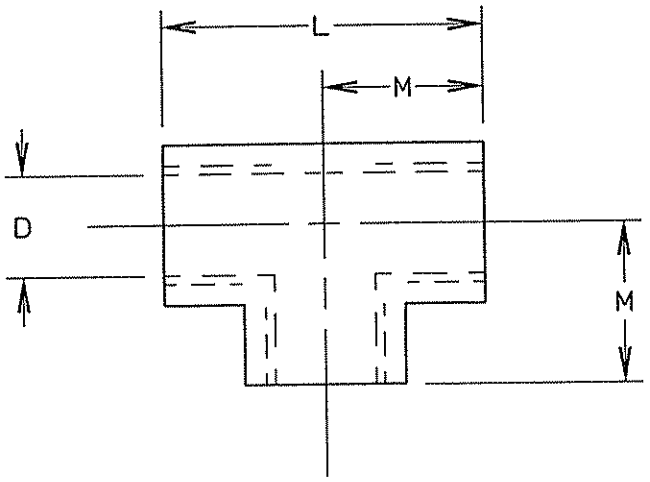
D_1	D	PIPE	TUBE	L	N	M	THREAD	VENDOR NUMBER PH	FREIGHTLINER NUMBER
.116	.125	1/8	3/16	.85	.67	.27	3/8-24	249IFHD-3-2	23-09310-002
.117	.188	1/8	1/4	.92	.69	.33	7/16-24	249IFHD-4-2	-003
.203	.219	1/8	5/16	.98	.66	.41	1/2-20	249IFHD-5-2	-005
.391	.406	3/8	1/2	1.48	.92	.53	3/4-18	249IFHD-8-6	-011

NOTES:

1. MATERIAL: C36000 BRASS
2. INDUSTRY STD: FIG. NO. 040202, SAE J246.
3. SUGGESTED VENDOR: PARKER-HANNIFIN OR EQUIVALENT
4. FITTING ASSEMBLY MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS-106.

CHG	JOB/RLSE NO	DATE	BY	REVISION
C	PH0588-23	08/15/94	DAJ	REDRAWN; REMOVED INACTIVE, ADDED -002 & -005

DRAWN	HJR	TITLE TEE - BRASS FEMALE PIPE	ITEM NUMBER 23-09311
APPRV	RGL		
DATE	10/05/71	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



PIPE THREAD	L	M	FLOW DIA.	VENDOR NUMBER	FREIGHTLINER PART NUMBER
				PH	
1/8	1.10	.55	.328	2203P-2	23-09311-001
1/4	1.38	.78	.422	2203P-4	23-09311-002
3/8	1.68	.84	.562	2203P-6	23-09311-003
1/2	2.14	1.07	.687	2203P-8	23-09311-004
3/4	2.40	1.20	.891	2203P-12	23-09311-005

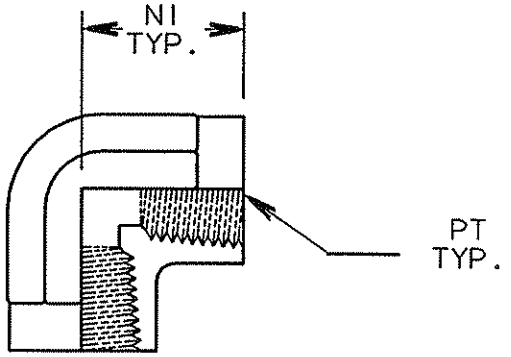
B

NOTES:

1. MATERIAL: BRASS
2. INDUSTRY STD: FIG. NO. 130438, SAE J530.
3. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

CHG	JOB/RLSE NO	DATE	BY	REVISION
B	PA2157-31	11/13/95	ERK	REDRAWN: ADDED -005

DRAWN	HJR	TITLE	ITEM NUMBER
APPRV	RON	ELBOW - 90 DEGREE FNPTF/FNPTF, BRASS	23-09312
DATE	10/05/71	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



PIPE THREAD NPTF	N1	VENDOR NUMBER		FREIGHTLINER PART NUMBER
		PH		
1/8	.55	2200P-2-2		23-09312-001
1/4	.78	2200P-4-4		-002
3/8	.84	2200P-6-6		-003
1/2	1.09	2200P-8-8		-004
3/4	1.36	3/4 DD-B		-006

B

NOTES:

1. MATERIAL: BRASS
2. INDUSTRY STANDARD: REF. SAE J40238.
3. FITTING ASSEMBLY MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.

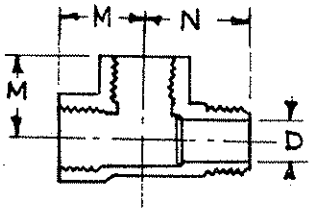
CHG	JOB/RLSE NO	DATE	BY	REVISION
B	424667-02	06/18/93	ERK	REDRAWN; -006 ADDED

23-9313

General Use Part X

PRINT ISSUED	TITLE	PART NO.
10/20/71	STREET TEE PIPE EXTRUDED BRASS	23-9313
LAST CHG. LTR. A		SHEET 1 OF 1

SKETCH



PART NUMBER

PIPE THREAD	M	N	D	MANUFACTURER'S NUMBER PH	MANUFACTURER'S NUMBER WH	MANUFACTURER'S NUMBER	FREIGHTLINER PART NUMBER
1/8	.55	.66	.219	2225P-2	3750X2		23-9313-001
1/4	.78	.91	.312	-4	3750X4		-002
3/8	.84	.97	.430		3750X6		-003
1/2	1.09	1.25	.562		3750X8		-004

ENGINEERING NOTES

(1) Material: Brass, ASTM B-16, CA360 or CA345

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	HJR	10-5-71	Rev'd Redrawn; Add -3, -4
B	RP	3-26-82	NC-R# DRAWN 10/5/71

ns

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		10-5-71		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

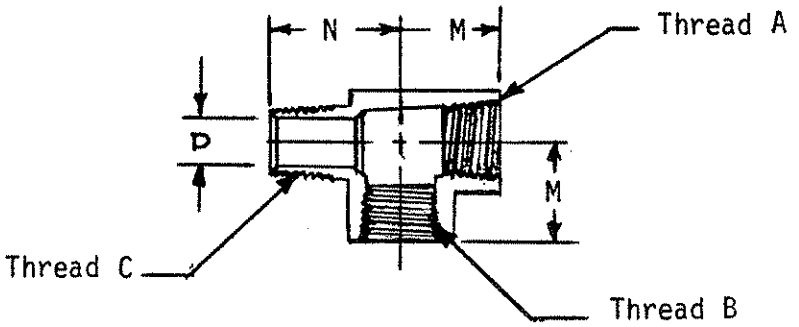
M/F A

E-183

ORIGINAL JOB NO.	TITLE	PART NO.
10/20/71	STREET TEE PIPE EXTRUDED PIPE	23-9313
LAST CHG LTR B		SHEET 1 OF 1

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A		HJR	10-5-71	Rev'd. Redrawn; Add -3, -4
B	E0755	RP	3-26-82	REV'D, REDRAWN, ADD-5



PART NUMBER

Pipe Thread A	Pipe Thread B	Pipe Thread C	M	H	D	Manufacturers Number		Freightliner Part Number
						PH	WH	
1/8	1/8	1/8	.55	.66	.219	2225P-2	3750X2	23-9313-001
1/4	1/4	1/4	.78	.91	.312	-4	3750X4	-002
3/8	3/8	3/8	.84	.97	.430		3750X6	-003
1/2	1/2	1/2	1.09	1.25	.562		3750X8	-004
3/8	3/8	1/2	1.09	1.25	.562	Q-P8020		-005

ENGINEERING NOTES

1 Material: Brass, ASTM B-16, CA360 or CA345

COMPILED	RP	DATE DRAWN		MATERIAL	
APPROVED		10-5-71		1	

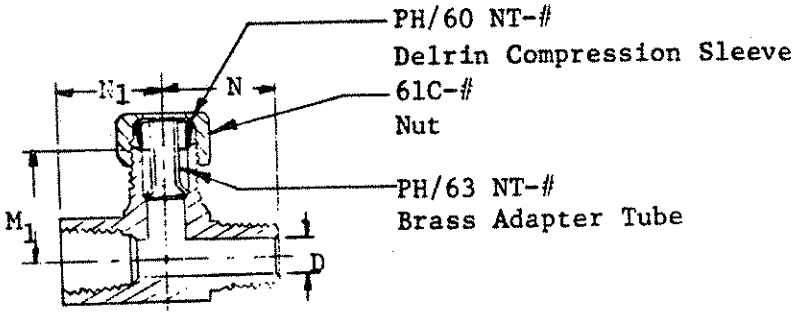
EAC-826

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO
2-26-92	ADAPTER TEE NYLON TUBE TO PIPE EXTRUDED BRASS	23-9315
LAST CHG LTR: A		SHEET 1 OF 1

SKETCH



PART NUMBERS

D	N_1	N	M_1	TUBE SIZE	STRAIGHT THREAD	PIPE THREAD	FREIGHTLINER PART NUMBER	PARKER HANNIFIN PART NO.
.125	.44	.56	.59	3/16	3/8-24	1/8	23-9315-001	276NT-3-2
.219	.47	.63	.59	1/4	7/16-24	1/8	-002	276NT-4-2

ENGINEERING NOTES

(1) Material: Body, Brass ASTM B 16, CA 360 or CA 345, Extruded.
2. This part must meet applicable current requirements of Federal Motor Vehicle Safety Standard #106.

CHG	BY	DATE	WAS
			JOB NO
A	HJR	6-16-75	Add Note2; Format A0751

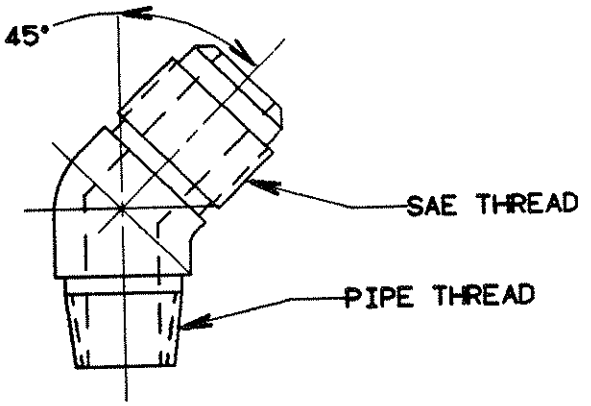
COMPILED	KJA	DATE DRAWN		MATERIAL	
APPROVED	[illegible]	2-12-70		(1)	

Portland [illegible] FREIGHTLINER CORPORATION Oregon 97208

DRAWN	DWP	TITLE	DRAWING NUMBER
APPRV	NER	ELBOW, 45°, MALE SAE 45° FLARE TO PIPE THD	23-09326
DATE	08-21-87	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2 / CHG. LTR. H
CADAM ORIGINAL			

UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCHES | UNIT OF MEASURE: INCH

SKETCH



TUBE SIZE	PIPE THD	SAE THREAD	MANUFACTURER'S NUMBER STX	MANUFACTURER'S NUMBER PH	MAT'L (1)	FREIGHTLINER PART NUMBER
1/4	1/8-27 1/4-18 3/8-18	7/16-20	SF1020- 2- 4B - 4- 4B - 6- 4B	159F- 4-2 4-4	B B B	23-9326-012 -022 -032
3/8	1/4-18 3/8-18 1/2-14	5/8-18	- 4- 6B - 6- 6B - 8- 6B	159F- 6-4 (2) 6-6	B B B	-023 -033 -043
1/2	1/4-18 3/8-18 1/2-14 3/4-14	3/4-16	- 4- 8B - 6- 8B - 8- 8B -12- 8B	159F- 8-6	B B B B	-024 -034 -044 -064
5/8	3/8-18 1/2-14 3/4-14 1/2-14	7/8-14	- 6-10B - 8-10B -12-10B	159F-10-8	B B B	-035 -045 -065
				3104-8-10S	S	-545
3/4	1/2-14 3/4-14	1 1/16-14	- 8-12B -12-12B		B B	-046 -066
1	1-11 1/2	1 5/16-12			S	-088
1 1/4	1 1/4-11 1/2	1 5/8-12			S	-100

•SEE SHEET TWO FOR ADDITIONAL MANUFACTURERS NUMBERS.

CHG	JOB NO	DATE	BY	REVISION
H	P1942E	08-21-87	DWP	REVISED & REDRAWN ON CADAM

M/F

DRAWN	DWP	TITLE	DRAWING NUMBER	
APPRV	NER	ELBOW, 45°, MALE SAE 45° FLARE TO PIPE THD	23-09326	
DATE	08-21-87	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2	CHG. LTR. H
CADAM ORIGINAL				

UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCHES | UNIT OF MEASURE: INCH

TUBE SIZE	PIPE THD	SAE THREAD	MANUFACTURER'S NUMBER		MAT'L (1)	FREIGHTLINER PART NUMBER
			IEA	WH		
1/4	1/8-27 1/4-18 3/8-18	7/16-20		54X4	B	23-9326-012
3/8	1/4-18 3/8-18 1/2-14	5/8-18		54X6	B	-023
1/2	1/4-18 3/8-18 1/2-14 3/4-14	3/4-16				
5/8	3/8-18 1/2-14 3/4-14	7/8-14				
	1/2-14		Z654-F-10X08		S	-545
3/4	1/2-14 3/4-14	1 1/16-14				
1	1-11 1/2	1 5/16-12		C5355X16	S	-088
1 1/4	1 1/4-11 1/2	1 5/8-12		C5355X20	S	-100

ENGINEERING NOTES

(1) MATERIAL: B= CA345 OR CA360 BRASS; S= STEEL (SEE TABLE) STEEL FITTINGS ARE TO BE CADMIUM PLATED, PLATING THICKNESS TO BE .0003/.0004. ALT PROCESS OF PLATING F/L 49-00012-130.

(2) USE (PH) Q-F-6149 FOR SPECIAL LOW PROFILE ELBOW AS REQUIRED FOR CLEARANCE THROUGH FRAME RAIL HOLES IN SOME APPLICATIONS.

CHG	JOB NO	DATE	BY	REVISION
H	P1942E	08-21-87	DWP	REVISED & REDRAWN ON CADAM

M/F

DRAWN	DWP
APPRV	NER
DATE	08-21-87
CADAM ORIGINAL	

TITLE
ELBOW, 45°, MALE
SAE 45° FLARE TO PIPE THD

FREIGHTLINER CORPORATION
PORTLAND, OREGON

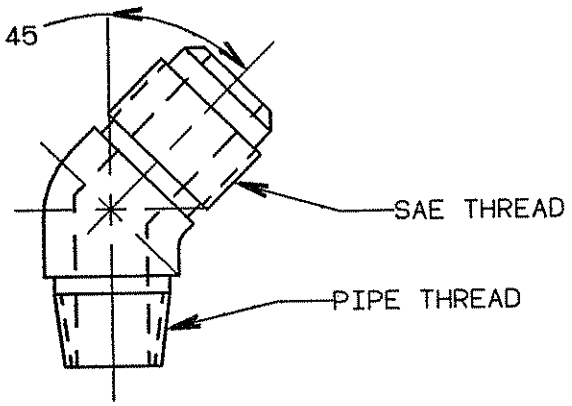
DRAWING NUMBER
23-09326

SHEET 1 OF 2

CHG. LTR. J

UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCHES

SKETCH:



TUBE SIZE	PIPE THD	SAE THREAD	MANUFACTURER'S NUMBER STX	MANUFACTURER'S NUMBER PH	MAT'L (1)	FREIGHTLINER PART NUMBER
1/4	1/8-27	7/16-20	SF1020- 2- 4B	159F- 4-2	B	23-9326-012
	1/4-18		- 4- 4B	4-4	B	-022
	3/8-18		- 6- 4B		B	-032
3/8	1/4-18	5/8-18	- 4- 6B	159F- 6-4 (2)	B	-023
	3/8-18		- 6- 6B	6-6	B	-033
	1/2-14		- 8- 6B		B	-043
1/2	1/4-18	3/4-16	- 4- 8B	159F- 8-6	B	-024
	3/8-18		- 6- 8B		B	-034
	1/2-14		- 8- 8B		B	-044
	3/4-14		-12- 8B		B	-064
5/8	3/8-18	7/8-14	- 6-10B	159F-10-8	B	-035
	1/2-14		- 8-10B		B	-045
	3/4-14		-12-10B		B	-065
	1/2-14			3104-8-10S	S	-545
3/4	1/2-14	1 1/16-14	- 8-12B		B	-046
	3/4-14		-12-12B		B	-066
1	1-11 1/2	1 5/16-12			S	-088
1 1/4	1 1/4-11 1/2	1 5/8-12			S	-100

*SEE SHEET TWO FOR ADDITIONAL MANUFACTURERS NUMBERS.

CHG	JOB NO	DATE	BY	REVISION
H	P1942E	08-21-87	DWP	REVISED & REDRAWN ON CADAM
J	P4721H-01	06/03/92	ERK	SEE SHEET 2, ADDED ALTERNATE ZINC PLATING.

DRAWN	DWP	TITLE	DRAWING NUMBER
APPRV	NER	ELBOW, 45°, MALE SAE 45° FLARE TO PIPE THD	23-09326
DATE	08-21-87	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2 / CHG. LTR. J
CADAM ORIGINAL			

UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCHES

TUBE SIZE	PIPE THD	SAE THREAD	MANUFACTURER'S NUMBER		MAT'L (1)	FREIGHTLINER PART NUMBER
			IEA	WH		
1/4	1/8-27 1/4-18 3/8-18	7/16-20		54X4	B	23-9326-012
3/8	1/4-18 3/8-18 1/2-14	5/8-18		54X6	B	-023
1/2	1/4-18 3/8-18 1/2-14 3/4-14	3/4-16				
5/8	3/8-18 1/2-14 3/4-14	7/8-14				
	1/2-14		Z654-F-10X08		S	-545
3/4	1/2-14 3/4-14	1 1/16-14				
1	1-11 1/2	1 5/16-12		C5355X16	S	-088
1 1/4	1 1/4-11 1/2	1 5/8-12		C5355X20	S	-100

ENGINEERING NOTES:

(1) MATERIAL: B= CA345 OR CA360 BRASS; S= STEEL (SEE TABLE)
STEEL FITTINGS ARE TO BE CADMIUM PLATED, PLATING THICKNESS TO BE .0003/.0004. ALTERNATE PROCESSES:
CADMIUM PLATE PER F/L 49-00012-130.
ZINC PLATE PER F/L 49-00005-203 EXCEPT THICKNESS TO BE .0002/.0004".

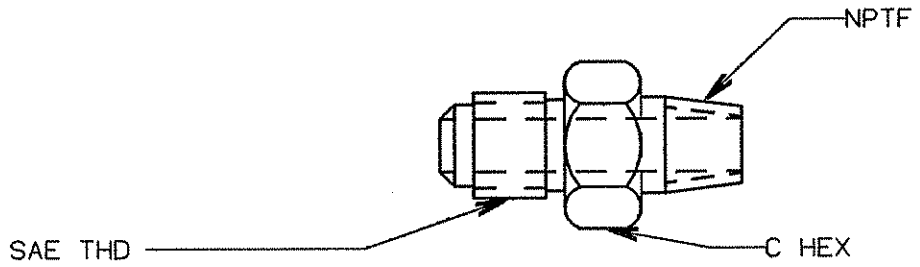
(2) USE (PH) Q-F-6149 FOR SPECIAL LOW PROFILE ELBOW AS REQUIRED FOR CLEARANCE THROUGH FRAME RAIL HOLES IN SOME APPLICATIONS.

J

CHG	JOB NO	DATE	BY	REVISION
H	P1942E	08-21-87	DWP	REVISED & REDRAWN ON CADAM
J	P4721H-01	06/03/92	ERK	ADDED ALTERNATE ZINC PLATING.

DRAWN	DWP	TITLE	DRAWING NUMBER
APPRV	NER	CONNECTOR, MALE SAE 45° FLARE TO PIPE THREAD	23-09327
DATE	08-24-87	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 3 / CHG. LTR. K
CADAM ORIGINAL			

UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCHES



TUBE SIZE	PIPE THD NPTF	MANUFACTURER'S NUMBER AQ	MANUFACTURER'S NUMBER IB	MANUFACTURER'S NUMBER PH	MAT'L (1)	FREIGHTLINER PART NUMBER
1/4	1/8	2000- 2- 4B	48-F-1/4X1/8	48F- 4- 2	B	23-9327-012
	1/4	- 4- 4B	-1/4X1/4	- 4- 4	B	-022
	3/8	- 6- 4B	-1/4X3/8	- 4- 6	B	-032
3/8	1/4	- 4- 6B	-3/8X1/4	- 6- 4	B	-023
	3/8	- 6- 6B	-3/8X3/8	- 6- 6	B	-033
	1/2	- 8- 6B	-3/8X1/2	- 6- 8	B	-043
1/2	1/4	- 4- 8B	-1/2X1/4	- 8- 4	B	-024
	3/8	- 6- 8B	-1/2X3/8	- 8- 6	B	-034
	1/2	- 8- 8B	-1/2X1/2	- 8- 8	B	-044
	3/4	-12- 8B	-1/2X3/4	- 8-12	B	-064
5/8	3/8	2000- 6-10B	48-F-5/8X3/8	48F-10- 6	B	-035
	1/2	- 8-10B	-5/8X1/2	-10- 8	B	-045
	3/4	-12-10B	-5/8X3/4	-10-12	B	-065
	1/2			0104-8-10S	S	-545
3/4	1/2	- 8-12B	-3/4X1/2	-12- 8	B	-046
	3/4	-12-12B	-3/4X3/4	-12-12	B	-066
1	3/4	2004-12-16S	48-F-1 X3/4	0109-12-16	S	-068
	1	-16-16S	-1 X1	-16-16	S	-088
1 1/4	1	-	-1 1/4X1		S	-080
	1 1/4	-20-20S	-1 1/4X1 1/4	-20-20	S	-100
1 1/2	1 1/2			-24-24	S	-122

SEE SHEET TWO FOR ADDITIONAL MANUFACTURERS NUMBERS.

FIRST TWO DIGITS OF THE DASH NUMBER INDICATE NOMINAL PIPE SIZE IN 1/8TH'S, THIRD DIGIT IS TUBE SIZE IN 1/8TH'S TO 1 INCH. OVER 1 INCH CODED.

CHG	JOB NO	DATE	BY	REVISION
J	P1942E	08-24-87	DWP	REVISED AND REDRAWN ON CADAM
K	P4721H-01	06/03/92	ERK	SEE SHEET 2, ADDED ALTERNATE ZINC PLATING.

DRAWN	DWP	TITLE	DRAWING NUMBER	
APPRV	NER	CONNECTOR, MALE SAE 45° FLARE TO PIPE THREAD	23-09327	
DATE	08-24-87			
CADAM ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 3	CHG. LTR. K

UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCHES

TUBE SIZE	PIPE THD NPTF	MANUFACTURER'S NUMBER			MAT'L (1)	FREIGHTLINER PART NUMBER
		STX	WH	IEA		
1/4	1/8	SF1011- 2- 4B	48X4		B	23-9327-012
	1/4	- 4- 4B	48X4X4		B	-022
	3/8	- 6- 4B			B	-032
3/8	1/4	- 4- 6B	48X6		B	-023
	3/8	- 6- 6B	48X6X6		B	-033
	1/2	- 8- 6B	48X6X8		B	-043
1/2	1/4	- 4- 8B	48X8X4		B	-024
	3/8	- 6- 8B	48X8		B	-034
	1/2	- 8- 8B	48X8X8		B	-044
	3/4	-12- 8B			B	-064
5/8	3/8	SF1101- 6-10B	48X10X6		B	-035
	1/2	- 8-10B	48X10		B	-045
	3/4	-12-10B			B	-065
	1/2			Z648-F-10X08	S	-545
3/4	1/2	- 8-12B	48X12		B	-046
	3/4	-12-12B	48X12X12		B	-066
1	3/4	SF1013-12-16S			S	-068
	1	-16-16S			S	-088
1 1/4	1	-16-20			S	-080
	1-1/4	-20-20			S	-100
1 1/2	1-1/2	-24-24			S	-122

ENGINEERING NOTES

(1) MATERIAL: EXTRUDED BRASS ROD (CA 345 OR CA 360) =B, STEEL =S. STEEL FITTINGS ARE TO BE CADMIUM PLATED. PLATING THICKNESS TO BE .0003/.0004. ALTERNATE PROCESSES:
CADMIUM PLATE PER F/L STADARD 49-00012-130.
ZINC PLATE PER F/L STANDARD 49-00005-203 EXCEPT THICKNESS TO BE .0002/.0004". K

2 FOR USE WITH COPPER, BRASS, ALUMINUM AND WELDED STEEL HYDRAULIC TUBING THAT CAN BE FLARED.

CHG	JOB NO	DATE	BY	REVISION
J	P1942E	08-24-87	DWP	REVISED & REDRAWN ON CADAM
K	P4721H-01	06/03/92	ERK	ADDED ALTERNATE ZINC PLATING

DRAWN	DWP	TITLE	DRAWING NUMBER	
APPRV	NER	CONNECTOR, MALE SAE 45° FLARE TO PIPE THREAD	23-09327	
DATE	08-25-87	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 3 OF 3	CHG. LTR. K
CADAM ORIGINAL				

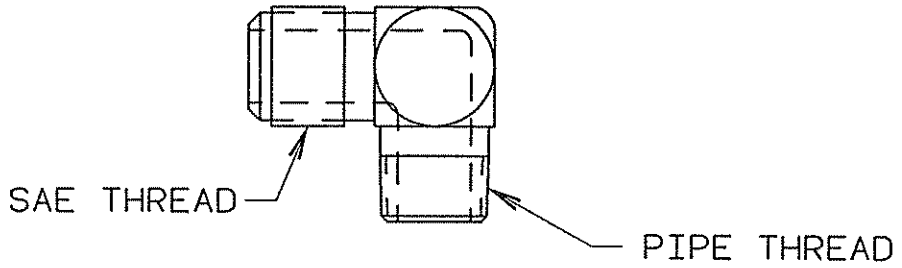
UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCHES

TUBE SIZE	PIPE THD NPTF	SAE THREAD OR (PTT)	C HEX	D DIA. MIN.
1/4	1/8	7/16 - 20	7/16	.188
	1/4		9/16	
	3/8		11/16	
3/8	1/4	5/8	5/8	.281
	3/8		11/16	
	1/2		7/8	
1/2	1/4	3/4	3/4	.312
	3/8		3/4	.406
	1/2		7/8	.406
	3/4		1-1/16	.406
5/8	3/8	7/8	7/8	.468
	1/2		7/8	.500
	3/4		1-1/16	.500
3/4	1/2	1-1/16 - 14	1-1/16	.562
	3/4		1-1/16	.625
1	3/4	1-5/16 - 14	1-3/8	.812
	1		1-3/8	.812
1-1/4	1	1-5/8 - 14	1-3/4	1.052
	1-1/4		1-3/4	1.031
1-1/2	1-1/2	1-7/8 - 14	2	1.281

CHG	JOB NO	DATE	BY	REVISION
J	P1942E	08-25-87	DWP	REVISED AND REDRAWN ON CADAM
K	P4721H-01	06/03/92	ERK	SEE SHEET 2, ADDED ALTERNATE ZINC PLATING.

DRAWN	FEF	TITLE	ITEM NUMBER
APPRV	DL	ELBOW - 90° MALE SAE 45° FLARE X PIPE THREAD	23-09328
DATE	06/28/84	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

SKETCH:



PART NUMBERS:

TUBE SIZE	PIPE THREAD	SAE THREAD OR (PTT)	MANUFACTURER'S NUMBER					F/L PART NUMBER 23-09328
			STX	PH		WH	IB*	
				FORGED	EXTRUDED			
							49F-	
	1/8-27	7/16-20	SF1024-2-4B	149F-4-2	249F-4-2	49X4	1/4X1/8	-012
1/4	1/4-18	7/16-20	SF1024-4-4B	149FHD-4-4	249F-4-4	49X4X4	1/4X1/4	-022
	3/8-18	7/16-20	SF1024-6-4B	149F-4-6	249F-4-6	49X4X6	1/4X3/8	-032
3/8	3/8-18	5/8-18	SF1024-6-6B	149F-6-6	249F-6-6	49X6X6	3/8X3/8	-033
	1/2-14	5/8-18	SF1024-8-6B	149FHD-6-8	249F-6-8	49X6X8	3/8X1/2	-043
1/2	1/4-18	3/4-16	SF1024-4-8B	149F-8-4	249F-8-4	49X8X4	1/2X1/4	-024
	1/2-14	3/4-16	SF1024-8-8B	149FHD-8-8	249F-8-8	49X8X8	1/2X1/2	-044
	3/8-18	7/8-14	SF1024-6-10B	149F-10-6	249F-10-6	49X10X6	5/8X3/8	-035
5/8	1/2-14	7/8-14	SF1024-8-10B	149FHD-10-8	249F-10-8	49X10	5/8X1/2	-045
	1/2-14	7/8-14		10SEF-S				-545
	3/4-14	7/8-14	SF1024-12-10B				5/8X3/4	-065
3/4	1/2-14	1 1/16-14	SF1024-8-12B			49X12	3/4X1/2	-046
	3/4-14	1 1/16-14	SF1024-12-12B		249F-12-12	49X12X12	3/4X3/4	-066
1	3/4-14	1 5/16-14	SF1045-12-16S					-068
1 1/4	1-11 1/2	1 5/8-14	SF1045-16-20S					-080

* FOR IB USE 49F-"TUBE SIZE" X "PIPE THREAD" FOR ORDERING.

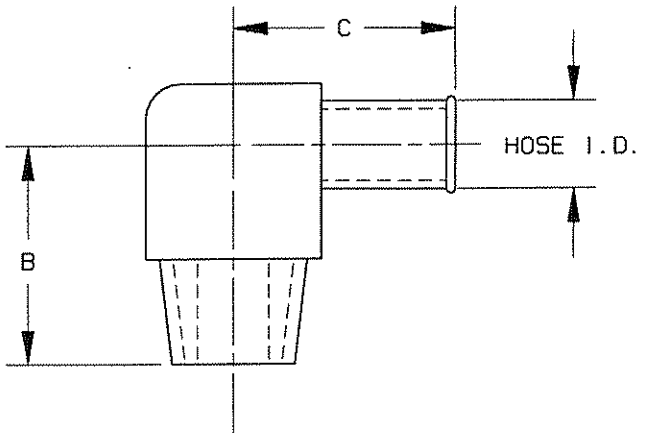
ENGINEERING NOTES:

1. MATERIAL: BRASS CA345 OR CA360 = B; STEEL = S. STEEL FITTINGS ARE TO BE CADMIUM PLATED, PLATING THICKNESS TO BE .0003/.0004. ALTERNATE PROCESS OF PLATING F/L 49-00012-130.
2. FOR USE WITH COPPER, BRASS, ALUMINUM AND WELDED STEEL HYDRAULIC TUBING THAT CAN BE FLARED.

NOT FOR NEW APPLICATIONS- USE 210502 000035

CHG	JOB/RLSE NO	DATE	BY	REVISION
M	433886-02	06/09/93	ERK	REDRAWN; VENDOR NUMBER ADDED TO -545.
N	PA2042-59	11/03/95	ERK	RMVD -023&-034, ADDED NOT FOR NEW APPLICATIONS NOTE

DRAWN	RDF	TITLE	DRAWING NUMBER	
APPRV	PCK	ELBOW-90°, BRASS HOSE BARB TO PIPE	23-09340	
DATE	10/13/89	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. V
CATIA ORIGINAL				



PIPE THREAD	HOSE ID	FLOW (MIN)	B	C	MANUFACTURER'S NUMBER PH	FREIGHTLINER PART NUMBER
3/4-14	3/4	.625	1.270	1.330	269HB-12-12	23-09340-001
1/4-18	5/8	.500	0.990	1.130	269HB-10-4	PH 269HB10 4
3/4-14	1	.750	1.625	1.810	Q-HB-8223	23-09340-003
1-11 1/2	1	.812	1.970	2.440	Q269HB-16-16	23-09340-004
1/2-14	3/4	.562	1.250	1.280	269HB-12-8	23-09340-005
1/2-14	5/8	.500	1.250	1.250	269HB-10-8	23-09340-006
1/2-14	3/8	.281	1.250	1.260	Q269HB-6-8	23-09340-007
1/2-14	1/2	.406	1.250	1.260	269HB-8-8	23-09340-008
1/2-14	1	.562	1.330	1.380	Q269HB-16-8	23-09340-009
3/8-18	1/2	.406	1.03	1.19	269HB-8-6	23-09340-010
3/8-18	5/8	.437	.990	1.16	269HB-10-6	PH 269HB10 6
3/8-18	3/8	.281	.880	1.19	269HB-6-6	PH 269HB6 6

V

ENGINEERING NOTES:

1. MATERIAL: BRASS - CA360 OR CA345.
2. ALL DIMENSIONS ARE REFERENCE ONLY.

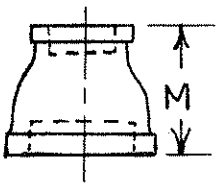
CHG	JOB NO	DATE	BY	REVISION
U	P02179-01	04/17/97	DAJ	REVISED AND REDRAWN IN CATIA
V	PA2042-98	12/08/99	LFB	ADDED PH269HB10 4.

23-9429 Sht 1 of 2

General Use Part

PRINT ISSUED	TITLE	PART NO.
2/26/71	REDUCER, PIPE, GALVANIZED	23-9429
LAST CHG. LTR.		SHEET 1 OF 2

SKETCH



PART NUMBERS

Size (NPTF)	Weight	M (Inches)	Freightliner Part No.
1/4 X 1/8	.08	1	23-9429-201
3/8 X 1/4	.14	1-1/8	-302
3/8 X 1/8	.12	1-1/8	-301
1/2 X 3/8	.17	1-1/4	-403
1/2 X 1/4	.17	1-1/4	-402
1/2 X 1/8	.14	1-1/4	-401
3/4 X 1/2	.29	1-7/16	-604
3/4 X 3/8	.23	1-7/16	-603
3/4 X 1/4	.24	1-7/16	-602
1 X 3/4	.42	1-11/16	-806
1 X 1/2	.37	1-11/16	-804
1 X 3/8	.33	1-11/16	-803
1 X 1/4	.32	1-11/16	-802
1-1/4 X 1	.70	2-1/16	-901
1-1/4 X 3/4	.62	2-1/16	-902
1-1/4 X 1/2	.59	2-1/16	-903
1-1/2 X 1-1/4	.96	2-5/16	-904
1-1/2 X 1	.84	2-5/16	-905
1-1/2 X 3/4	.82	2-5/16	-906
1-1/2 X 1/2	.76	2-5/16	-907
2 X 1-1/2	1.38	2-13/16	-908
2 X 1-1/4	1.34	2-13/16	-909
2 X 1	1.20	2/13/16	-910
2 X 3/4	1.18	2-13/16	-911
2 X 1/2	1.14	2-13/16	-912
2-1/2 X 2	2.48	3-1/4	-913
2-1/2 X 1-1/2	2.18	3-1/4	-914
2-1/2 X 1-1/4	2.06	3-1/4	-915
2-1/2 X 1	1.89	3-1/4	-916
3 X 2-1/2	3.49	3-11/16	-917
3 X 2	3.08	3-11/16	-918
3 X 1-1/2	3.02	3-11/16	-919
3 X 1-1/4	3.00	3-11/16	-920
3 X 1	3.01	3-11/16	-921
3-1/2 X 3	7.34	4	-922

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		11-4-70		(Reference Sht2)	

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO.
2/26/71	REDUCER, PIPE, GALVANIZED	23-9429
LAST CHG. LTR.		SHEET 2 OF 2

PART NUMBERS (Continued)

Size (NPTF)	Weight	M (Inches)	Freightliner Part No.
3-1/2 X 2-1/2	7.66	4	23-9429 -923
3-1/2 X 2	4.70	4	-924
4 X 3-1/2	6.20	4-3/8	-925
4 X 3	5.72	4-3/8	-926
4 X 2-1/2	5.33	4-3/8	-927
4 X 2	5.24	4-3/8	-928
4 X 1-1/2	5.40	4-3/8	-929
5 X 4	9.64	5-1/8	-930
6 X 4	14.03	5-7/8	-931

ENGINEERING NOTES

1. Ref. Fig. 678 Woodbury Cat. I, 1969.

(2) Material: Steel, Galv.

CHG	BY	DATE	WAS

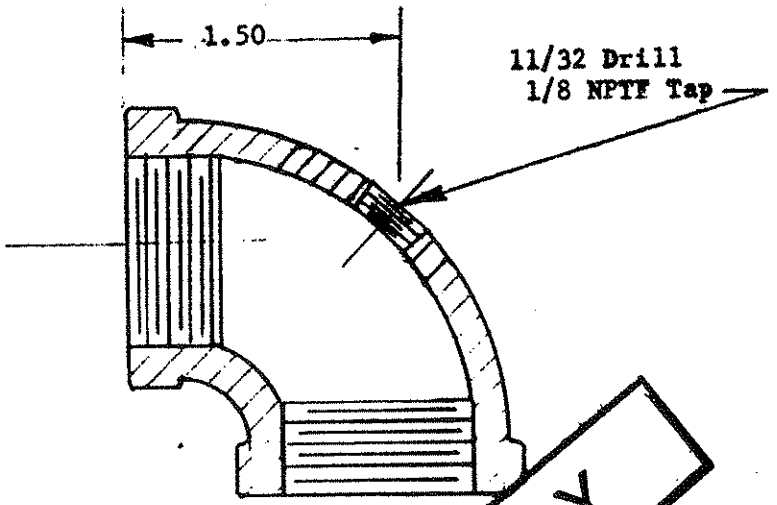
CHG	BY	DATE	WAS

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		11-4-70		(2)	

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO.
9-4-70	ELBOW, 90° 3/4 DRY SEAL STD. PIPE MODIFIED	23-9431
LAST CHG. LTR.		SHEET OF



REMOVE & DESTROY

CHG | BY | DATE | WAS

CHG | BY | DATE | WAS

(1.) Malleable Iron - Meets SAE J530 Standards

COMPLIED	PRJ	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	H.J.R.	8-28-70		(1)	VEHICLE

23-9458

General Use Part

PRINT ISSUED	TITLE	PART NO.
3/29/71	NIPPLE, PIPE LONG (BRASS)	23-9458
LAST CHG. LTR.		SHEET 1 OF 1

SKETCH



PART NUMBERS

SIZE		MANUFACTURER'S NUMBER					FREIGHTLINER PART NUMBER
PIPE THREAD	LENGTH	PH	W.H	GM			
1/8	1 1/2	215PNL-2-15	3327 x2	121830			23-9458 -115
1/4		-4-15	3327x4	144595			-215
3/8		-6-15					-315
1/2		-8-15					-415
3/4		-12-15					-615
1/8	2	-2-20	3328 x2	144587			-120
1/4		-4-20	3328 x4	149597			-220
3/8		-6-20					-320
1/2		-8-20					-420
3/4		-12-20					-620
1/8	2 1/2	-2-25	3329 x2	142851			-125
1/4		-4-25	3329x4	144598			-225
3/8		-6-25					-325
1/2		-8-25					-425
3/4		-12-25					-625
1/8	3	-2-30	3330x2	142852			-130
1/4		-4-30					-230
3/8		-6-30					-330
1/2		-8-30					-430
3/4		-12-30					-630
1/8	3 1/2	-2-35					-135
1/4		-4-35					-235
3/8		-6-35					-335
1/2		-8-35					-435
3/4		-12-35					-635
1/8	4	-2-40					-140
1/4		-4-40					-240
3/8		-6-40					-340
1/2		-8-40					-440
3/4		-12-40					-640
1/8	4 1/2	-2-45					-145
1/4		-4-45					-245
3/8		-6-45					-345
1/2		-8-45					-445
3/4		-12-45					-645
1/8	5	-2-50					-150
1/4		-4-50					-250
3/8		-6-50					-350
1/2		-8-50					-450
3/4		-12-50					-650
1/8	5 1/2	-2-55					-155
1/4		-4-55					-255
3/8		-6-55					-355
1/2		-8-55					-455
3/4		-12-55					-655
1/8	6	-2-60					-160
1/4		-4-60					-260
3/8		-6-60					-360
1/2		-8-60					-460
3/4		-12-60					-660

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS

ENGINEERING NOTES

(1) MATERIAL: BRASS

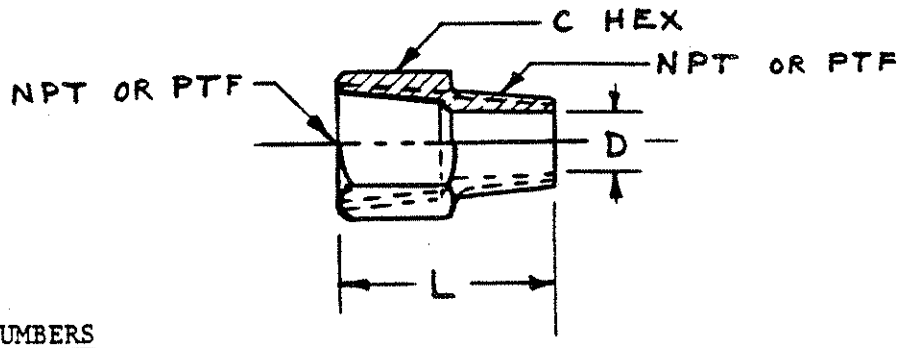
		DATE DRAWN		MATERIAL	
COMPILED	Ford	3-17-71		(1)	
APPROVED	Ford				

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO.
9 | 29 | 71	ADAPTER, HEX INSIDE PIPE TO OUTSIDE PIPE BRASS	23-9461
LAST CHG LTR: A		SHEET 1 OF 1

SKETCH



PART NUMBERS

INSIDE PIPE THREAD	OUTSIDE PIPE THREAD	L	C HEX	D	MANUFACTURER'S NUMBER PH	WH		FREIGHTLINER PART NUMBER
1/8	1/8	.88	9/16	.219	222P-2-2	3200x2		23-9461-001
1/4	1/8	1.06	3/4	.219	222P-4-2	3200x4x2		-002
1/4	1/8 *	.98	5/8	.219	222PS-4-2	—		-003
1/4	1/4	1.25	3/4	.302	222P-4-4	3200x4		-004
1/4	1/4 *	1.05	5/8	.344	222PS-4-S4	—		-005
3/8	1/4	1.25	7/8	.297	222P-6-4	3200x6x4		-006
3/8	3/8	1.25	7/8	.406	222P-6-6	3200x6		-007
3/8	3/8 *	1.25	13/16	.500	222PS-6-S6	—		-008
1/2	1/4 *	1.34	1	.312	222PS-8-S8	—		-009
1/2	3/8	1.47	1-1/16	.422	222P-8-6	3200x8x6		-010
1/2	1/2	1.69	1-1/16	.562	222P-8-8	—		-011

*Short SAE PTF Pipe Thread

ENGINEERING NOTES

(1) Material: Brass, CA345 or CA360.

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	HJR	9-14-71	WH Numbers Added

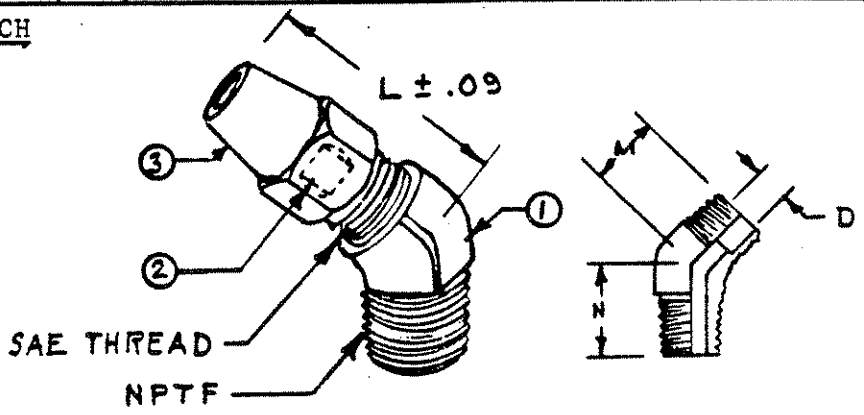
COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		4-26-71		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO.
3/29/71	ELBOW ASSY, AIR BRAKE, 45° COPPER TUBE TO MALE PIPE BRASS	A23-9493
LAST CHG LTR C		SHEET 1 OF 1

SKETCH



PART NUMBERS

TUBE O.D.	PIPE THD	SAE THD	L	M	N	D ± .006 .003	MANUFACTURER'S NUMBER PH *			FREIGHTLINER PART NUMBER
1/4	1/8	7/16-24	1.05	.42	.62	.188	279AB- 4-2			A23-9493-042
	1/4		1.15	.58	.74	.188	or 4-4			-044
							179AB-			
3/8	1/8	17/32-24	1.16	.59	.68	.188	6-2			-062
	1/4		1.61	.70	.84	.312	6-4			-064
	3/8		1.70	.79	.78	.312	6-6			-066
1/2	3/8	11/16-20	1.79	.83	.93	.406	8-6			-086
5/8	1/2	13/16-18	2.06	.92	1.15	.531	10-8			-108

*Components of 279AB-x-x (extruded body) or 179AB-X-X (forged body):

Key	Component	PH Number
①	Elbow	-
②	Sleeve	60AB-#
③	Nut	61AB-#

Corresponding first dash no. from PH Assy. No.

ENGINEERING NOTES

④ Material, all components: Brass; body extruded or forged.

5 Must meet applicable current requirements of Federal Motor Vehicle Safety Standard #106.

CHG	BY	DATE	WAS
C	HJR	7-30-74	Add FMVSS 106 Reg.
C1	HJR	7-30-74	J#A0659

CHG	BY	DATE	WAS
A	HJR	3-14-72	Forged alternate added
			Job #85330
B	HJR	12-4-72	Add "A" to no.:J#60560

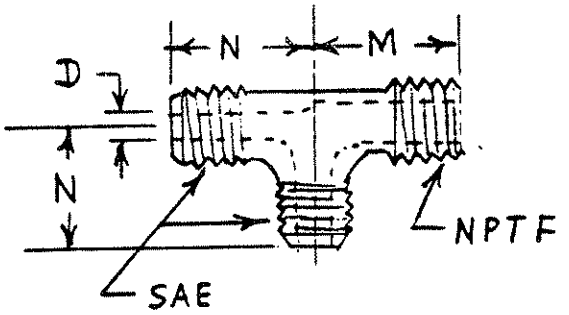
COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		2-5-71		④	

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO.
10/14/71	[illegible], MALE RUN 45° FLARE	23-9494
LAST CHG LTR C		SHEET 1 OF 1

SKETCH



PART NUMBERS

TUBE	THREAD		M	H	D	MANUFACTURER'S NUMBERS			FREIGHTLINER PART NUMBER
	PIPE	STRAIGHT			MIN	IB	PH	WH	
3/16	1/8	3/8 -24	.75	.75	.125	51-F 3/16x 1/8	151F-3-2	51X3	-031
1/4	1/8	7/16-20	.97	.97	.187	51-F 1/4 x 1/8	151F-4-2	51X4	23-9494-041
1/4	1/4	7/16-20	.97	.97	.187		151F-4-4		-042
5/16	1/4	1/2 -20	.94	.94	.218	51-F 5/16 x 1/4	151F-5-4		-051
3/8	1/4	5/8 -18	1.13	1.06	.281	51-F 3/8 x 1/4	151F-6-4	51X6	-061
3/8	1/8	5/8 -18	1.19	1.09	.281	51-F 3/8 x 1/8	151F-6-2		-062
1/2	3/8	3/4 -16	1.22	1.06	.406	51-F 1/2 x 3/4	151F-8-6	51X8	-081
1/2	1/2	3/4 -16	1.28	1.38	.406	51-F 1/2 x 1/2	151F-8-8		-082
5/8	1/2	7/8 -14	1.41	1.38	.508	51-F 5/8 x 1/2	151F-10-8		-101
3/4	1/2	1-1/16-14	1.63	1.50	.625	51-F 3/4 x 1/2	151F-12-8		-121
3/4	3/4	1-1/16-14	1.66	1.56	.625		151F-12-12		-122
5/16	1/8	1/2 -20	.91	.78	.219	51-F 5/16x 1/8	251F- 5- 2	51X5	-052
3/8	3/8	5/8 -18	1.87	1.09			151F-6-6		-066

ENGINEERING NOTES

1. Material: Cast, Forged, or Extruded Brass

2. Application: For use with copper, brass, aluminum and welded steel hydraulic tubing that can be flared.

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	[illegible]	1-27-71		1	

Portland FREIGHTLINER CORPORATION Oregon 97208

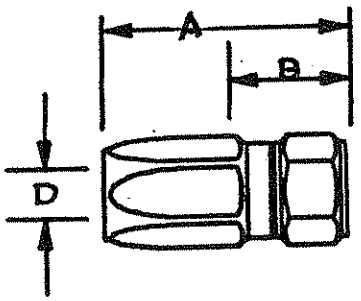
CHG	BY	DATE	WAS
A	HJR	10-5-71	Add -031, -052 & WH Nos.
B	DL	2-10-75	Add -066 I#A0733
C	HJR	5-19-75	51-F 3/8X3/4, 151F-6-6 I#A0736

WAS JOB NO. DATE BY CHG

F-183

ORIGINAL JOB NO.	TITLE	PART NO.
	SWIVEL ASSY, AIR BRAKE HOSE	A23-09495
LAST CHG LTR K	SAE, STEEL	SHEET 1 OF 1

SKETCH



PART NUMBERS

HOSE SIZE	SAE THREAD	D	A	B CUT FACTOR	MANUFACTURER'S NUMBER STX	MANUFACTURER'S NUMBER AQ		FREIGHTLINER PART NUMBER
4	7/16-20	.12	1.62	.89	7115-4BA	401-4B		A23-9495-004
5	1/2 -20	.17	1.69	.88	7115-5BA	401-5B		-005
6	5/8 -18	.23	1.86	1.01	7115-6BA	401-6B		-006
8	3/4 -16	.33	2.14	1.16	7115-8BA	401-8B		-008
10	7/8 -14	.42	2.35	1.28	7115-10BA	401-10B		-010
12	1-1/16-14	.55	2.48	1.33	7115-12BA	401-12B		-012
PARKER THREAD - TRIPLE TYPE								
16	1-5/16-14	.80	2.46	1.26	7116-16B	406-16B		-016
20	1-5/8 -14	1.02	2.62	1.50	7116-20B	406-20B		-020

ENGINEERING NOTES

1. Material: Nut and Socket: Steel, Nipple: Brass.
2. For use with hoses meeting the provisions of SAE Standard J 1402C for Table A1 air brake hose.
3. Must meet applicable current requirements of Federal Motor Vehicle Safety Standard #106.

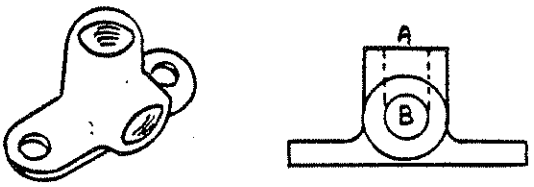
		DATE DRAWN		MATERIAL	MASTER NUMBER
COMPILED	FHF	10-22-71		(1)	05115 000D1
APPROVED	TJW				

LTR	JOB NO.	BY	
K	P3709E01	PCK	01/25/89 Revised Vendor Info
	7042D	FHF	10-[illegible]-86 Added AQ Numbers
			Revised & Redrawn

General Use Part

PRINT ISSUED	TITLE	PART NO.
3/31/71	ELBOW, ANCHOR PIPE TAP	23-9496
LAST CHG LTR		SHEET OF

SKETCH



PART NUMBERS

A & B (NPTF PIPE TAPS)	MANUFACTURER'S NUMBER PH	BW		FREIGHTLINER PART NUMBER
1/8-27	3200PDE-2			23-9496-001
1/4-18		201010		-002
3/8-18		233420		-003

ENGINEERING NOTES

① Material: Brass.

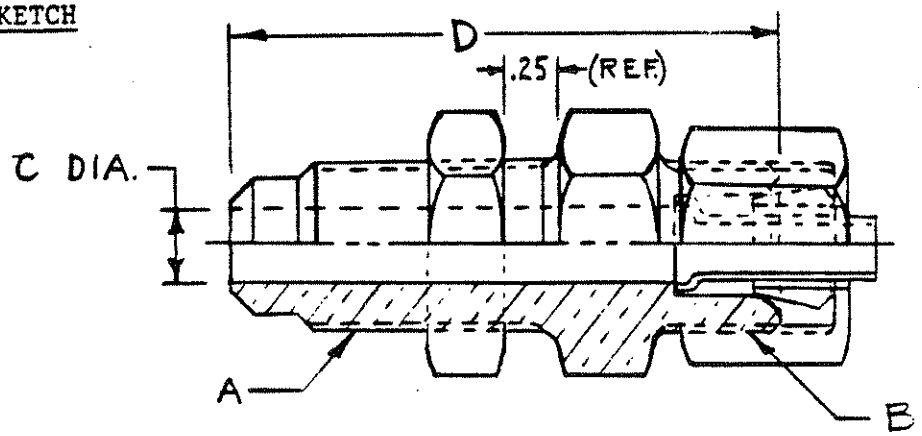
COMPILED	RG	DATE DRAWN		MATERIAL	
APPROVED		12-18-70		①	

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED		TITLE	PART NO
		FITTING, BULKHEAD NYLON TUBE TO 45° SAE FLARE	A23-9497
LAST CHG LTR	C		SHEET 1 OF 1

SKETCH



ASSEMBLY NUMBERS

A	B	C DIA.	D	MANUFACTURER'S NUMBER PH		STATUS	FREIGHTLINER ASSEMBLY NUMBER
				Q-2073		OBS	A23-9497-000
No4,45° Flare 7/16"-20"UNF	No4 NT	.188	1 17/32	Q-2749		C	-010
No6,45° Flare 5/8"-18"UNF	No6 NT	.281	1 3/4	Q-3843		C	-030
No8,45° Flare 3/4"-16"UNF	No8 NT	.406	1 15/16	Q-3844		C	-040
No10,45° Flare 7/8"-14"UNF	No10NT	.500	2 5/32	Q-3845		C	-050

ENGINEERING NOTES

① Material: Brass

2. Must meet applicable current requirements of Federal Motor Vehicle Safety Standard No106.

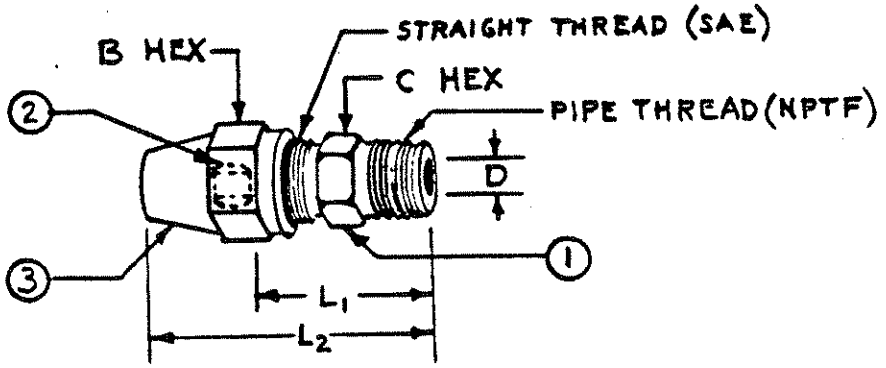
C	DL	12-3-74	Revised, Redrawn	A0654

COMPILED	DL	DATE DRAWN		MATERIAL	
APPROVED		12-3-74		①	

General Use Part

PRINT ISSUED	TITLE	PART NO
4/7/71	COUPLING ASSEMBLY, AIR BRAKE COPPER TUBE TO MALE PIPE	A23-9500
LAST CHG LTR C		SHEET 1 OF 1

SKETCH



ASSEMBLY NUMBERS

TUBE SIZE	PIPE THD	STRAIGHT THREAD	D +.006 -.003	L_1	L_2	MANUFACTURER'S NUMBER PH*			FREIGHTLINER ASSEMBLY NUMBER
1/4	1/8	7/16-24	.188	.88	1.45	68AB-4-2			A23-9500-042
1/4	1/4			1.09	1.66	68AB-4-4			-044
1/4	3/8			1.12	1.69	68AB-4-6			-046
3/8	1/8	17/32-24	.188	1.02	1.93	68AB-6-2			-062
3/8	1/4		.312	1.22	2.13	68AB-6-4			-064
3/8	3/8			1.22	2.13	68AB-6-6			-066
3/8	1/2			1.44	2.35	68AB-6-8			-06[illegible]
1/2	1/4	11/16-20	.312	1.32	2.28	68AB-8-4			-084
1/2	3/8		.406	1.32	2.28	68AB-8-6			-086
1/2	1/2			1.50	2.46	68AB-8-8			-08[illegible]
5/8	3/8	13/16-18	.406	1.38	2.52	68AB-10-6			-106
5/8	1/2		.500	1.57	2.71	68AB-10-8			-10[illegible]
3/4	1/2	1 -18	.531	1.67	2.92	68AB-12-8			-12[illegible]
3/4	3/4		.656	1.72	2.97	68AB-12-12			-212

*Components of 68AB-X-X:

KEY	COMPONENT	PH NUMBER
①	Body	-
②	Sleeve	60AB-#
③	Nut	61AB-#

- Use first of two dash numbers of PH assembly number.

ENGINEERING NOTES

④ Material, all components: Brass

5 Must meet applicable current requirements of Federal Motor Vehicle Safety Standard #106.

CHG	BY	DATE	WAS
A	HJR	3-9-72	68AB-10-8; J #85310
B	HJR	7-30-74	Add FMVSS 106 Reg. J#A0659
C	SK	12-8-77	UPDATED "D" DIM: #65420

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	[illegible]	12-18-70		④	

Portland FREIGHTLINER CORPORATION Oregon 97208

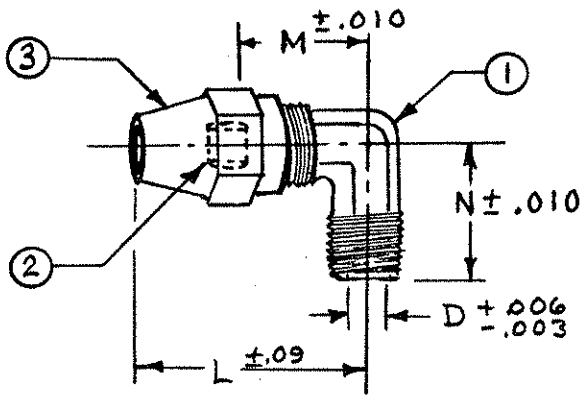
E-183

A23-9501

General Use Part

PRINT ISSUED	TITLE	PART NO.
4/7/71	ELBOW ASSY, 90°, AIR BRAKE COPPER TUBE TO MALE PIPE	A23-9501
LAST CHG LTR. A		SHEET 1 OF 1

SKETCH



ASSEMBLY NUMBERS

TUBE O.D.	PIPE THREAD	SAE STRAIGHT THREAD	L	M	N	D	MANUFACTURER'S NUMBER PH*		FREIGHTLINER ASSEMBLY NUMBER
1/4	1/8	7/16-24	1.18	.61	.66	.188	269AB-4-2		A23-9501-042
1/4	1/4		1.25	.68	.86		269AB-4-4		-044
1/4	3/8		1.66	.75	.86		269AB-4-6		-046
3/8	1/8	17/32-24	1.63	.72	.72	.312	269AB-6-2		-062
3/8	1/4		1.74	.78	.91		269AB-6-4		-064
3/8	3/8		1.77	.86	.91		269AB-6-6		-066
3/8	1/2		1.85	.94	1.09		269AB-6-8		-068
1/2	1/4	11/16-20	1.84	.88	.98	.406	269AB-8-4		-084
1/2	3/8		1.90	.94	1.08		269AB-8-6		-086
1/2	1/2		1.99	1.03	1.17		269AB-8-8		-088
5/8	3/8	13/16-18	2.14	1.00	1.04		269AB-10-6		-106
5/8	1/2		2.23	1.09	1.23	.531	269AB-10-8		-108
5/8	3/4	1 -18	2.33	1.18	1.32		269AB-12-8		-128

*Components of 269AB-X-X:

KEY	COMPONENT	PH NUMBER
①	Elbow	-
②	Sleeve	60AB-#
③	Nut	61AB-#

- Corresponding first dash number from PH assembly no.

ENGINEERING NOTES

④ Material, all components: Brass (elbow extruded).

A 5 Must meet applicable current requirements of Federal Motor Vehicle Safety Standard #106.

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	HJR	7-30-74	Add FMVSS 106 Reg. J#A0659
A1	HJR	7-30-74	

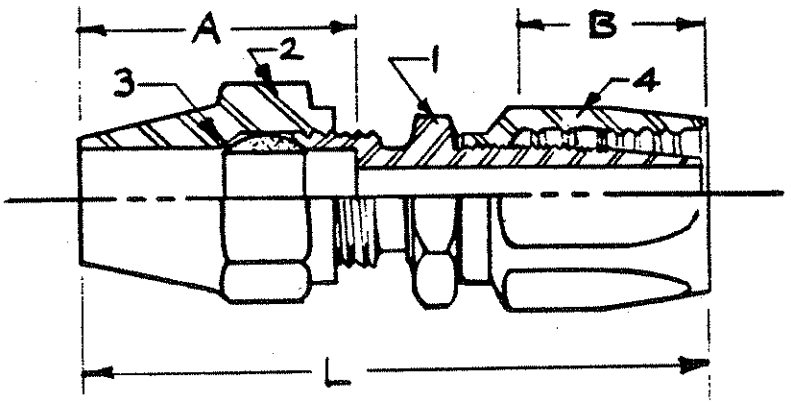
COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		12-18-70		④	

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO
6/8/71	UNION ASSEMBLY COPPER TUBE TO FLEX HOSE	A23-9527
LAST CHG LTR		SHEET OF

SKETCH



PART NUMBERS

TUBE SIZE	HOSE SIZE *	LENGTH L INCHES	MANUFACTURER'S NUMBERS			FREIGHTLINER ASSEMBLY NUMBER
			PH			
-10	-10		Q1114-10-10			A23-9527

*SAE Std J516 Fitting to Accept J517 Type 100R5 Hose

Components of A23-9527:

KEY	COMPONENT	PH NUMBER
1	Body	
2	Nut	
3	Sleeve	
4	Socket	

ENGINEERING NOTES

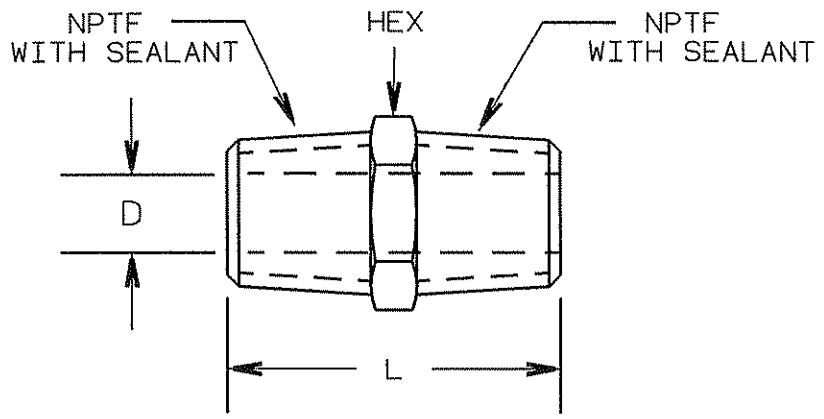
(1) Material: Brass, CA 345 or CA 360, extruded

2. Construction: Hose connection to accept 100R5 type hose per SAE Std J517. Tubing connection to accept std metal tubing of specified size.

		DATE DRAWN		MATERIAL	
COMPILED	HJR	4-9-71		(1)	
APPROVED					

Portland FREIGHTLINER CORPORATION Oregon 97208

DRAWN	HJR	TITLE	ITEM NUMBER
APPRV	RNH	NIPPLE - HEX BRASS	23-09530
DATE	01/21/71	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



PART NUMBERS:

PIPE THRD NPTF	L	C HEX	D	MANUFACTURER & NUMBER		FREIGHTLINER PART NUMBER
				PH		
1/8	.94	7/16	.219	VS216P-2		23-09530-002
1/4	1.38	9/16	.281	VS216P-4		-004
3/8	1.41	11/16	.438	VS216P-6		-006
1/2	1.81	7/8	.500	VS216P-8		-008
3/8	1.31	11/16	.438	VS216PS-6		-106

NOTES:

1. MATERIAL: BRASS
2. INDUSTRY STANDARD: REF. SAE 130137.
3. PARTS MUST BE SUPPLIED WITH "VIBRASEAL" APPLIED TO THE THREADS.
4. FITTING ASSEMBLY MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.

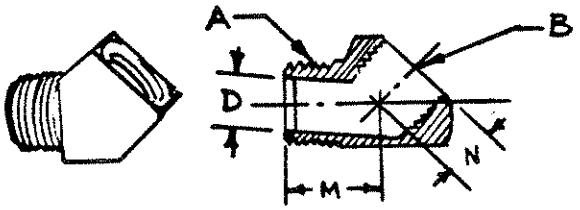
B

CHG	JOB/RLSE NO	DATE	BY	REVISION
A	P1213F-01	03/24/92	ERK	REVISED AND REDRAWN; ADDED THREAD SEALANT
B	PN0495-02	02/01/93	ERK	RESTATED SPECIFICATIONS, REVISED VENDOR NUMBERS

General Use Part

PRINT ISSUED	TITLE	PART NO.
10/25/71	ELBOW, STREET, 45° BRASS	23-9531
LAST CHG LTR: A		SHEET OF

SKETCH



PART NUMBERS

A PIPE THD	B PIPE THD	M	N	D	MANUFACTURER'S NUMBER PH	WH		FREIGHTLINER PART NUMBER
1/8	1/8	.50	.38	.219	2214P-2-2	3350X2		23-9531-202
1/4	1/4	.70	.56	.312	-4-4	3350X4		-404
3/8	3/8	.78	.56	.438	-6-6	3350X6		-606
1/2	1/2	1.00	.75	.562	-8-8	3350X8		-808

ENGINEERING NOTES

① Material: Brass CA345 or CA360.

CHG	BY	DATE	
A	HJR	10-5-71	Add WH Nos.

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		1-26-71		①	

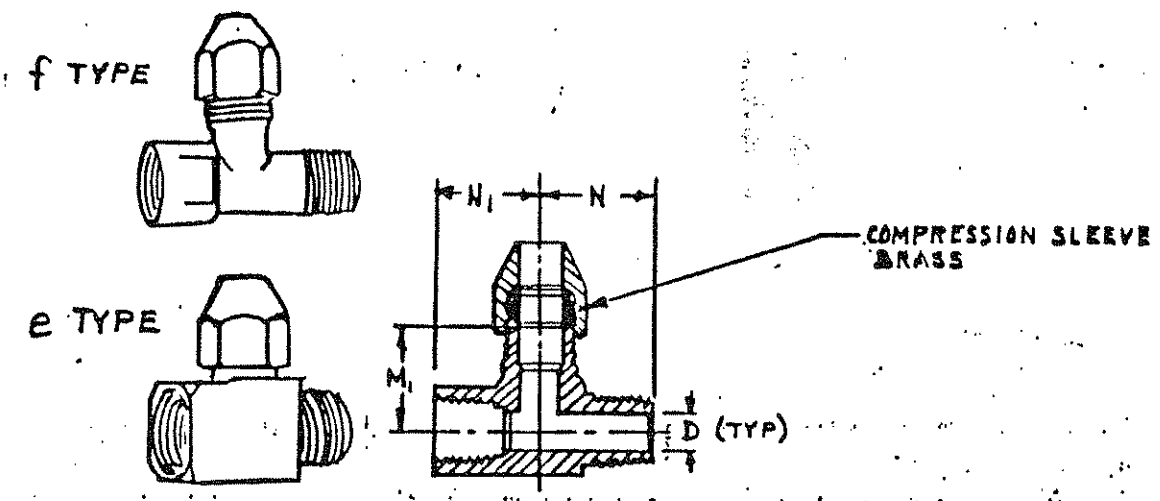
Portland FREIGHTLINER CORPORATION Oregon 97208 A

23-9597

General Use Part

PRINT ISSUED	TITLE	PART NO.
5/10/71	TEE, ADAPTER PIPE RUN, COMPRESSION BRANCH	23-9597
LAST CHG LTR B.		SHEET 1 OF 1

SKETCH



PART NUMBERS

TUBE SIZE	PIPE THREAD	STRAIGHT THREAD	M_1	N	N_1	D	*	MANUFACTURER'S NUMBER			FREIGHTLINER PART NUMBER
								PH	WH		
1/4	1/8	7/16-24	.69	.75	.66	.188	f	176CL-4-2	176x4		23-9597-401

*e = extruded, f = forged

ENGINEERING NOTES

(1) Material: Brass, Forged (f) or Extruded (e)

CHG	BY	DATE	WAS
A	HJR	4-26-71	WH No.'s Added, PH Rev'd
B	PCK	11/21/88	Revised Vendor Number P*A078-86

CHG	BY	DATE	WAS

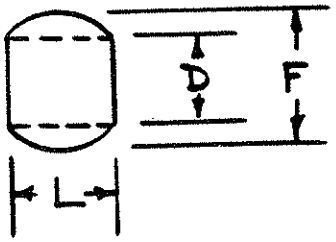
COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	RJH	1-29-71		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO
3/29/71	SLEEVE, AIR BRAKE BRASS	23-9599
LAST CHG LTR: A		SHEET OF

SKETCH



PART NUMBERS

TUBE SIZE	D ±.002	F ±.002	L ±.005	MANUFACTURER'S NUMBER PH		FREIGHTLINER PART NUMBER
4	.255	.322	.250	60AB-4		23-9599-004
6	.382	.461	.313	-6		-006
8	.507	.594	.375	-8		-008
10	.632	.734	.438	-10		-010
12	.758	.874	.500	-12		-012

ENGINEERING NOTES

(1) Material: Brass

CHG	BY	DATE	
A	HJR	2-16-71	Status to X_1

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		2-16-71		(1)	

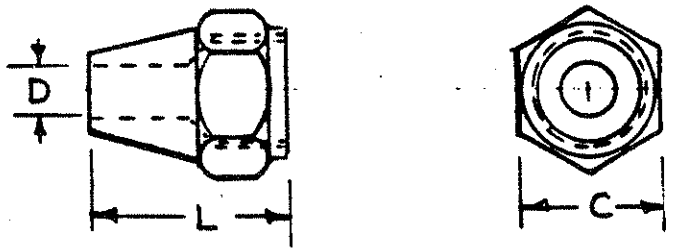
Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED		TITLE	PART NO.
		NUT, AIR BRAKE	23-9600
LAST CHG LTR	B		SHEET OF

SAE/120111

SKETCH



PART NUMBER

TUBE	THREAD	C	L	D	MANUFACTURER'S NUMBER		FREIGHTLINER PART NUMBER
					PH		
1/4	7/16-24	1/2	.75	.257	61AB-4		23-9600-004
5/16	1/2 -24	9/16	.87	.320	-5		-005
3/8	9/16-24	5/8	.94	.383	-6		-006
1/2	11/16-20	13/16	.94	.511	-8		-008
5/8	13/16-18	15/16	1.20	.638	-10		-010
3/4	1 -18	1- 1/8	1.31	.765	-12		-012

ENGINEERING NOTES

(1) Material: Brass CA360 or CA345.

A	HJR	5-29-75	Add Note 2	A0746		
B	HJR	7-28-75	Delete 106 FMVSS	A0769		

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		2-6-71		(1)	

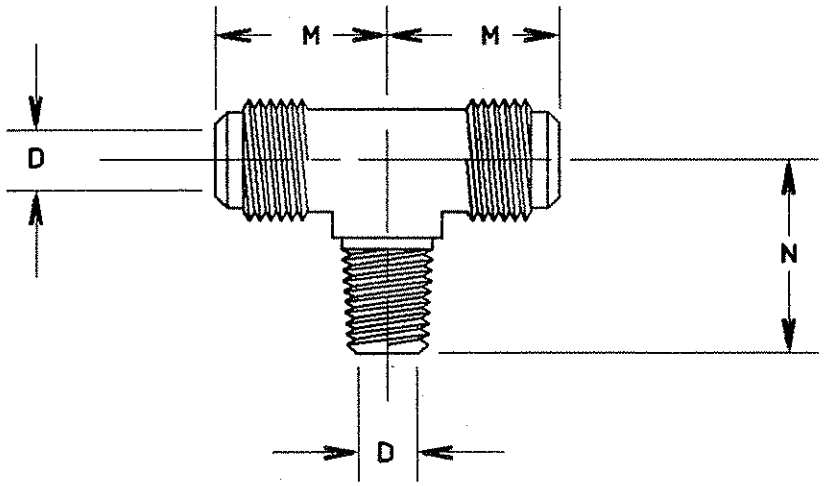
Portland FREIGHTLINER CORPORATION Oregon 97208

GENERAL USE PART

23-09601

ORIGINAL JOB NO.	TITLE	PART NO.
4259C	TEE, MALE BRANCH 45° FLARE	23-09601
LAST CHG LTR: B		SHEET 1 OF 1

SKETCH:



PART NUMBERS:

TUBE SIZE	PIPE THREAD	STRAIGHT THREAD	M	N	FLOW DIA D	MANUFACTURER'S NUMBER PH*	IB	WH	FREIGHTLINER PART NUMBER
1/8	1/8	5/16-24	.66	.72	.187	145F- 2- 2			23-9601-022
3/16	1/8	3/8 -24	.73	.73	.219		45-F 3/16X1/8	45X 3	23-9601-032
1/4	1/8	7/16-20	.81	.72	.188	145F- 4- 2	45-F 1/4 X1/8	45X 4	23-9601-042
1/4	1/8	7/16-20	.79	.76	.219				23-9601-042
1/4	1/4	7/16-20	.88	1.01	.312		45-F 1/4 X1/4		23-9601-044
3/8	1/4	5/8 -18	1.00	.88	.281	145F -6- 4	45-F 3/8 X1/4	45X 6	23-9601-064
3/8	1/4	5/8 -18	.98	1.04	.312				23-9601-064
3/8	3/8	5/8 -18	1.00	.98	.312	145F -6- 6	45-F 3/8 X3/8		23-9601-066
3/8	3/8	5/8 -18	1.06	1.12	.281				23-9601-066
3/8	1/2	5/8 -18	1.09	1.22	.281	145F- 6- 8			23-9601-068
1/2	1/4	3/4 -16	1.22	1.09	.312	145F- 8- 4			23-9601-084
1/2	3/8	3/4 -16	1.22	1.17	.406	145F- 8- 6	45-F 1/2 X3/8	45X 8	23-9601-086
1/2	3/8	3/4 -16	1.19	1.12	.406				23-9601-086
1/2	1/2	3/4 -16	1.22	1.12	.562	145F -8- 8	45-F 1/2 X1/2		23-9601-088
5/8	3/8	7/8 -14	1.44	1.22	.406	145F-10- 6			23-9601-106
5/8	1/2	7/8 -14	1.44	1.44	.500	145F-10- 8	45-F 5/8 X1/2	45X10	23-9601-108
3/4	1/2	1-1/16-14	1.66	1.50	.562	145F-12- 8	45-F 3/4 X1/2		23-9601-208
3/4	3/4	1-1/16-14	1.62	1.56	.625	145F-12-12	45-F 3/4 X3/4		23-9601-212

* 1XX = FORGED

ENGINEERING NOTES:

(1) MATERIAL: BRASS CA345 OR CA360

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A1	4259B	DJL	12-06-84	REVISED & REDRAWN
A2	4259B	DJL	12-06-84	DELETED -062(NU)
B1	6321D	CD	09-18-86	DELETED MFG. NO.
B2	6321D	CD	09-18-86	DELETED 'S' FROM MFG.NO

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

COMPILED	DJL	DATE DRAWN	CADAM ORIGINAL	MATERIAL	MASTER NUMBER	
APPROVED	DJL	12-06-84		(1)	05080	000D1

EAC-826

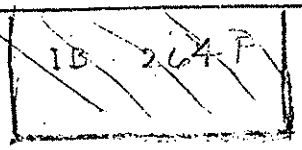
PORTLAND FREIGHTLINER CORPORATION OREGON 97208

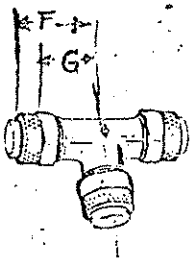
23-9631

General Use Part

PRINT ISSUED	TITLE	NO.
4/30/71	TEE, UNION PLASTIC TUBING	23-9630
LAST CHG. LTR. A		SHEET 1 OF 1

SKETCH





PART NUMBERS

TUBE O.D.	F	G	MANUFACTURER'S NUMBER IB	FREIGHTLINER PART NUMBER
1/8	13/16	5/8	264-P x 1/8	23-9631-002
3/16	25/32	5/8	264-P x 3/16	-003
1/4	27/32	5/8	264-P x 1/4	-004
3/8	7/8	21/32	264-P x 3/8	-006
1/2	1 3/4	27/32	264-P x 1/2	-008

ENGINEERING NOTES

① Material: Body of tee, Brass forging SAE CA377; Nut, Brass bar stock SAE CA 360; Sleeve, high density polyethylene.

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	HJR	2-5-71	STATUS TO X1

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		2-5-71		①	

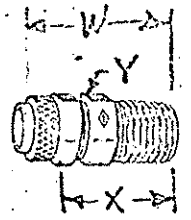
Portland FREIGHTLINER CORPORATION Oregon 97208

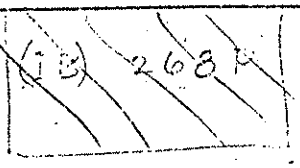
E-183

General Use Part

PRINT ISSUED	TITLE	NO.
4/30/71	CONNECTOR, PLASTIC TUBING	23-9631
LAST CHG. LTR. A		SHEET OF

SKETCH





PART NUMBERS

O.D. TUBE	PIPE THD NPTF	W	X	Y	MANUFACTURER'S NUMBER IB		FREIGHTLINER PART NUMBER
1/8	1/8	31/32	25/32	7/16	268-P x 1/8 x 1/8		23-9631-202
3/16	1/8	1	27/32	7/16	3/16 x 1/8		-302
1/4	1/8	1	13/16	7/16	1/4 x 1/8		-402
1/4	1/4	1-3/16	1	9/16	1/4 x 1/4		-404
1/4	3/8	1-7/32	1-1/32	11/16	1/4 x 3/8		-406
3/8	1/4	1-1/4	1-1/32	9/16	3/8 x 1/4		-604
3/8	3/8	1-1/4	1-1/32	11/16	3/8 x 3/8		-606
1/2	3/8	1-11/64	1-3/32	11/16	1/2 x 3/8		-806

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	HJR	2-5-71	STANDARD X.

ENGINEERING NOTES

① Material: Brass SAE CA360, except sleeve, which is high density polyethylene.

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		2-5-71		①	

Portland FREIGHTLINER CORPORATION Oregon 97208

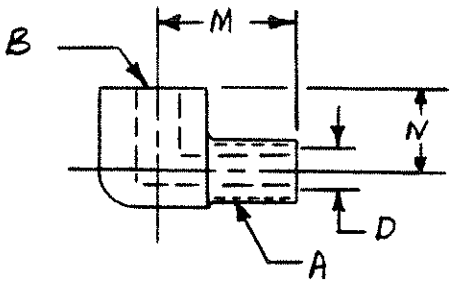
F-183

23-9656

General Use Part

PRINT ISSUED	TITLE	PART NO.
3/29/71	ELBOW, STREET, 90° BRASS	23-9656
LAST CHG. LTR. A		SHEET OF

SKETCH



PART NUMBERS

A PIPE THREAD	B PIPE THREAD	M	N	D	MANUFACTURER'S NUMBER PH	WH		FREIGHTLINER PART NUMBER
								23-9656-
1/8	1/8	.81	.59	.188	1202P-2-2			001
1/8	1/8	.63	.48	.219	2202P-2-2	3400X2		002
1/8*	1/8*	.56	.34	.188		W3400X2		003
1/8f	1/8f	.84	.50	.188	1202PL-2-2			004
1/4	1/8	.84	.53	.219	2202P-4-2			005
1/4	1/8	.72	.53	.219		3400X4X2		006
1/4	1/4	1.09	.69	.312	1202PS-4-4			007
1/4	1/4	.84	.45	.302	2202P-4-4			~~008~~
1/4*f	1/4*f	.78	.47	.266	1202PSL-4-4	W3400X4		009
1/4	1/4	.91	.72	.312		3400X4		010
1/4f	1/4f	1.22	.89	.281	1202PHD-4-4			011 (A)
3/8	3/8	1.25	.78	.406	1202P -6-6			012 (A)
3/8	3/8	.97	.54	.406	2202P-6-6			013 (A)
3/8	3/8	.97	.78	.438		3400X6		014
1/2	1/2	1.47	1.03	.562	1202P-8-8			015
1/2	1/2	1.25	1.03	.562	2202P-8-8	3400X8		016
3/4	3/4	1.38	1.12	.750		3400X12		017

* PTF Short Taper Pipe Threads
f With Flats

ENGINEERING NOTES

(1) Material: Brass

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
A	BT	8-17-83	REVISED -012, -013 / 37438

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		3-2-71		(1)	

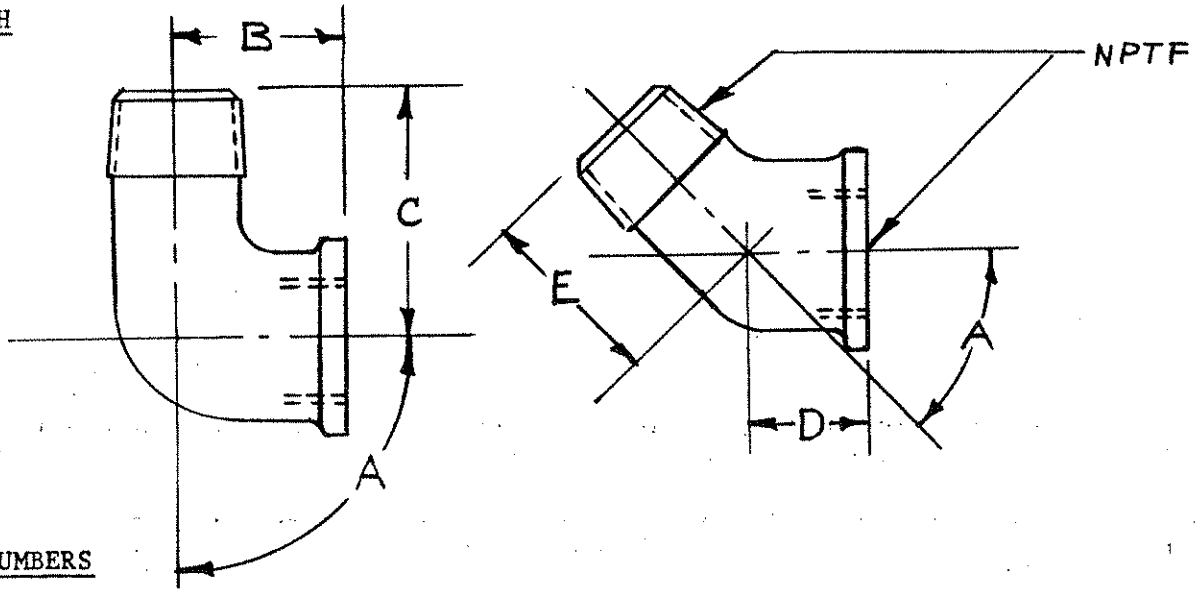
Portland FREIGHTLINER CORPORATION Oregon 97208

A

General Use Part

PRINT ISSUED	TITLE	PART NO.
3/29/71	ELBOW, STREET, 90° & 45° GALVANIZED STEEL	23-9658
LAST CHG. LTR.		SHEET OF

SKETCH



PART NUMBERS

PIPE SIZE NPTF	ANGLE (DEG)	B	C	D	E		FREIGHTLINER PART NUMBER
1/8-27	45			11/16	13/16		23-9658-001
	90	11/16	1				-002
1/4-18	45			5/8	15/16		-003
	90	13/16	1-3/16				-004
3/8-18	45			11/16	1-1/16		-005
	90	15/16	1-7/16				-006
1/2-14	45			13/16	1-3/16		-007
	90	1-1/8	1-5/8				-008
3/4-14	45			15/16	1-5/16		-009
	90	1-5/16	1-7/8				-010
1-11-1/2	45			1-1/16	1-1/2		-011
	90	1-1/2	1-1/8				-012
1-1/4-11-1/2	45			1-1/4	1-11/16		-013
	90	1-3/4	1-5/16				-014

ENGINEERING NOTES

(1) Material: Galvanized Steel

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS

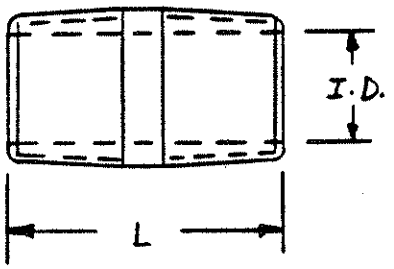
COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		3-8-71		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO
3/29/71	NIPPLE, CLOSE GALV. IRON PIPE	23-9659
LAST CHG LTR		SHEET OF

SKETCH



PART NUMBERS

NPTF (2) PIPE SIZE & THREAD	INSIDE DIAMETER (INCHES)	CROSS SECTION INTERNAL AREA (SQ.IN.)	APPROXIMATE LENGTH, L (INCHES)		FREIGHTLINER PART NUMBER
1/8-27	0.269	0.0568	.75		23-9659-001
1/4-18	0.364	0.1041	.88		-002
3/8-18	0.493	0.1910	1.00		-003
1/2-14	0.622	0.3040	1.12		-004
3/4-14	0.824	0.5330	1.38		-005
1 -11-1/2	1.049	0.8640	1.50		-006
1 1/4-11-1/2	1.380	1.495	1.62		-007
1 1/2-11-1/2	1.610	2.036	1.75		-008
2 -11-1/2	2.067	3.355	2.00		-009
2 1/2-8	2.469	4.788	2.50		-010
3 -8	3.068	7.393	2.62		-011
3 1/2-8	3.548	9.886	2.75		-012
4 -8	4.026	12.73	2.88		-013

ENGINEERING NOTES

(1) Material: 48-00124 Series Sched. 40 Galv. Iron Pipe

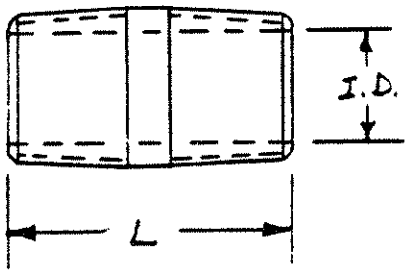
(2) NPTF = Dryseal American Standard Taper Pipe Thread (Ref. SAE Std. J476.)

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	E.W.J	3-3-71		(1)	

General Use Part

PRINT ISSUED	TITLE	PART NO
3/29/71	NIPPLE, LONG GALVANIZED IRON PIPE	23-9660
LAST CHG LTR		SHEET OF

SKETCH



PART NUMBERS

NPTF (2) PIPE SIZE AND THREAD	DASH NUMBERS LENGTH OF NIPPLE (INCHES)									
	1½	2	2½	3	3½	4	4½	5	5½	6
1/8-27	-011	-012	-013	-014	-015	-016	-017	-018	-019	-020
1/4-18	-021	-022	-023	-024	-025	-026	-027	-028	-029	-030
3/8-18	-031	-032	-033	-034	-035	-036	-037	-038	-039	-040
1/2-14	-041	-042	-043	-044	-045	-046	-047	-048	-049	-050
3/4-14		-062	-063	-064	-065	-066	-067	-068	-069	-070
1-11-1/2		-082	-083	-084	-085	-086	-087	-088	-089	-090
1-1/4-11-1/2		-102	-103	-104	-105	-106	-107	-108	-109	-110
1-1/4-11-1/2		-122	-123	-124	-125	-126	-127	-128	-129	-130
2-11-1/2			-163	-164	-165	-166	-167	-168	-169	-170
2-1/2- 8				-204	-205	-206	-207	-208	-209	-210
3- 8				-244	-245	-246	-247	-248	-249	-250
3-1/2- 8				-284	-285	-286	-287	-288	-289	-290
4- 8				-324	-325	-326	-327	-328	-329	-330

ENGINEERING NOTES

(1) Material: 48-00124 Series Schedule 40 Galvinized Iron Pipe

2 NPTF = Dryseal American Standard Taper Pipe Thread (Ref. SAE Standard J476)

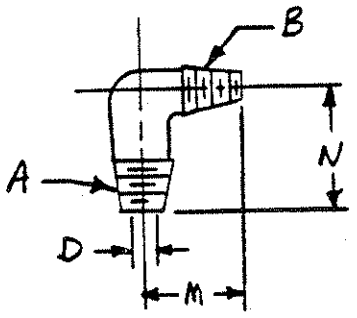
COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	E.J.	3-3-71		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO
3/29/71	ELBOW, 90°, MALE PIPE STEEL	23-9692
LAST CHG LTR: A		SHEET 1 OF 1

SKETCH



PART NUMBERS

A PIPE SIZE	B PIPE SIZE	D	M APPROX	N APPROX	MANUFACTURER'S NUMBER STX			FREIGHTLINER PART NUMBER
1/8-27	1/8-27	.22	.74	.74	SF1094-2-2S			23-9692-022
1/8-27	1/4-18	.22	.74	1.05	-2-4S			-024
1/4-18	1/4-18	.30	1.05	1.05	-4-4S			-044
1/4-18	3/8-18	.30	1.11	1.14	-4-6S			-046
3/8-18	3/8-18	.42	1.14	1.14	-6-6S			-066
3/8-18	1/2-14	.42	1.23	1.42	-6-8S			-068
1/2-14	1/2-14	.55	1.42	1.42	-8-8S			-088
3/4-14	3/4-14	.74	1.55	1.55	-12-12S			-212
1-11-1/2	1-11-1/2	.96	1.95	1.95	-16-16S			-216

ENGINEERING NOTES

(1) Material = Steel

CHG	BY	DATE	
A	DS	7-21-78	Brass to Steel 74684

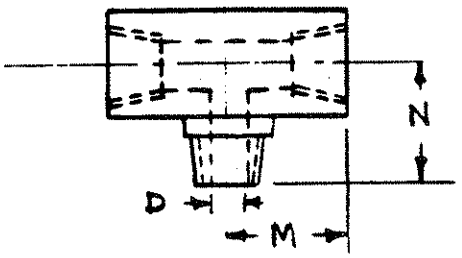
COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Ecell	3-5-71		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO
3/29/71	TEE, MALE BRANCH, PIPE	23-9693
LAST CHG LTR		SHEET OF

SKETCH



PART NUMBERS

PIPE SIZE NPTF	M	N	D	MAT. (1)	MANUFACTURER'S NUMBER PH	AQ*	WH		FREIGHTLINER PART NUMBER
1/8-27	.55	.66	.219	B	2224P-2		3600X2		23-9693-002
				S		2091-2-2S			-102
1/4-18	.76	.89	.312	B	2224P-4		3600X4		-004
				S		2091-4-4S			-104
3/8-18	.97	1.23	.42	B			3600X6		-006
				S		2091-6-6S			-106
1/2-14	1.23	1.52	.55	B					-008
				S		2091-8-8S			-108
3/4-14	1.34	1.70	.74	B					-012
				S		2091-12-12S			-112
1-11½	1.62	2.08	.96	B					-016
				S		2091-16-16S			-116

* "S" Suffix - Steel (Cad. Plated)

ENGINEERING NOTES

(1) Material: B = Brass, S = Steel (Cad. Plated)

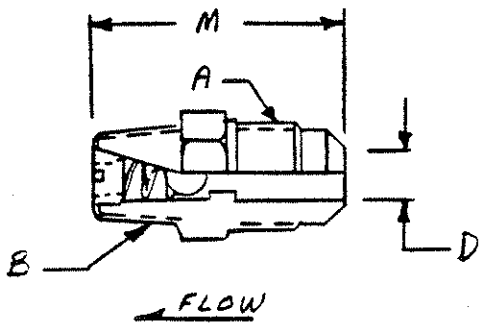
COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		3-8-71		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO
3/29/71	CONNECTOR, BALL CHECK 45° FLARE TO PIPE THREAD	23-9694
LAST CHG LTR		SHEET OF

SKETCH



PART NUMBERS

A. FLOW TOWARD PIPE THREAD (AS SHOWN)

TUBE SIZE	A STRT THD.	B PIPE SIZE	D	M APPROX	MANUFACTURER'S NUMBER IB	WH [2]		FREIGHTLINER PART NUMBER
3/16	3/8 -24	1/8	.16	.94	43F -3/16x1/8			23-9694-032
1/4	7/16-20	1/8	.22	1.12	43F -1/4 x1/8	43x4R		-042
5/16	1/2 -20	1/8	.25	1.16	43F -5/16x1/8	43x5R		-052
3/8	5/8 -18	1/4	.31	1.44	43F -3/8 x1/4	43x6R		-064
7/16	11/16-16	1/4	.34	1.56	43F -7/16x1/4			-074
1/2	3/4 -16	3/8	.40	1.62	43F -1/2 x3/8			-086

B. FLOW TOWARD FLARE END (OPPOSITE) [2]

1/4	7/16-20	1/8	.22	1.12		43x4		-142
5/16	1/2 -20	1/8	.25	1.16		43x5		-152
3/8	5/8 -18	1/4	.31	1.44		43x6		-164

ENGINEERING NOTES

(1) Material: Brass

2 Flow direction may be reversed by reversing position of ball and spring.

		DATE DRAWN		MATERIAL	
COMPILED	SJF	3-12-71		(1)	
APPROVED					

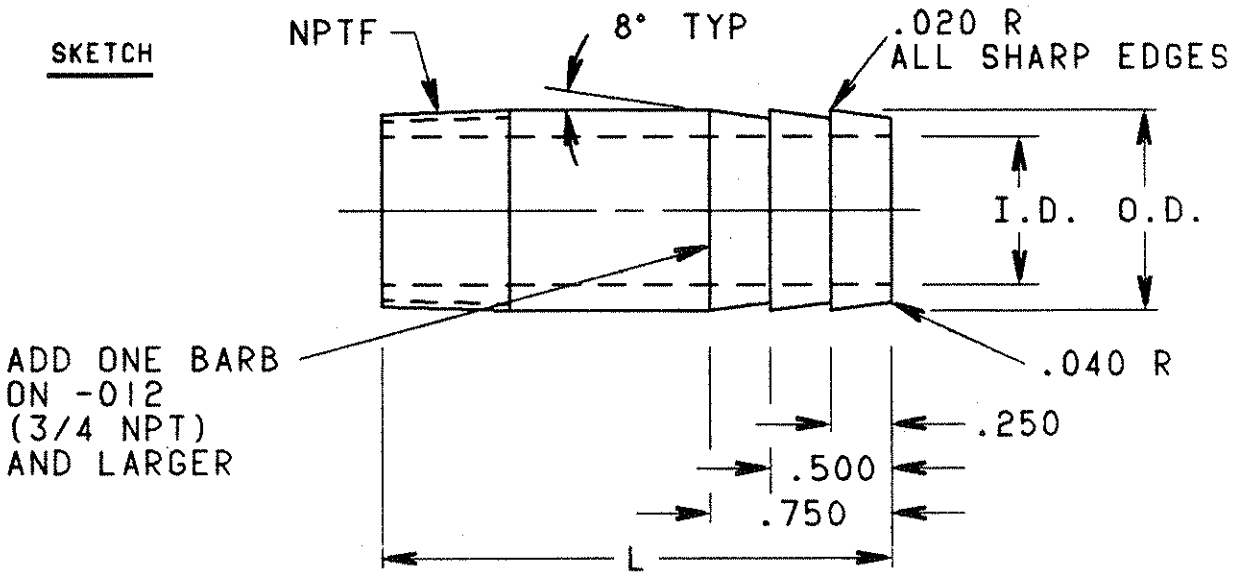
Portland FREIGHTLINER CORPORATION Oregon 97208

GENERAL USE PART

23-09697

ORIGINAL JOB NO.	TITLE	PART NO.
9822B	NIPPLE HOSE CONNECTOR	23-09697
LAST CHG LTR: D		SHEET 1 OF 1

SKETCH



PART NUMBERS

PIPE THREAD (NPTF)	L	I.D. REF	O.D. REF	WALL (IN)	MATERIAL (1)	ALT MATL (2)	FREIGHTLINER PART NUMBER
1/8-27	1.620	.269	.405	.068	48-00124-001	48-00880-024	23-09697-002
1/4-18	1.750	.364	.540	.088	48-00124-002	48-00880-042	-004
3/8-18	1.880	.493	.675	.091	48-00124-003	48-00880-057	-006
1/2-14	2.120	.622	.840	.109	48-00124-004	48-00880-085	-008
3/4-14	2.120	.824	1.050	.113	48-00124-006	48-00880-112	-012

ENGINEERING NOTES

(1) MATERIAL: PIPE, ASA STD GALVANIZED, PER FREIGHTLINER SPECIFICATION 48-00124-#.

(2) ALT MATERIAL: LEADED STEEL TUBING PER FREIGHTLINER SPECIFICATION 48-00880-#.

CHANGE INFORMATION			
LTR	JOB NO.	BY	DATE

CHANGE INFORMATION			
LTR	JOB NO.	BY	DATE
D	9822B	FEF	01-11-84
			REVISED & REDRAWN

COMPILED	FEF	DATE DRAWN	CADAM ORIGINAL	MATERIAL	MASTER NUMBER	
APPROVED		01-11-84		(1) (2)	05120	000D1

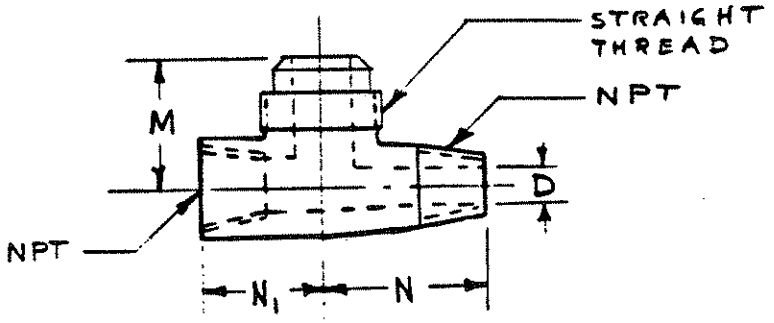
PORTLAND D FREIGHTLINER CORPORATION OREGON 97208

EAC-826

General Use Part

PRINT ISSUED	TITLE	PART NO.
5/7/71	TEE, ADAPTER PIPE RUN, 45° FLARE BRANCH	23-9698
LAST CHG LTR		SHEET OF

SKETCH



PART NUMBERS

TUBE SIZE	PIPE THD	STRAIGHT THREAD	M	N	N_1	D	MANUFACTURER'S NUMBER			FREIGHTLINER PART NUMBER
							PH	WH		
3/16	1/8	3/8 -24	.75	.75	.44	.125	256F-3-2	56x3		23-9698-302
1/4	1/8	7/16-20	.88	.76	.47	.187	256F-4-2	56x4		23-9698-402

ENGINEERING NOTES

(1) Material: Brass, CA345 or CA360, or equal.

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		4-27-71		(1)	

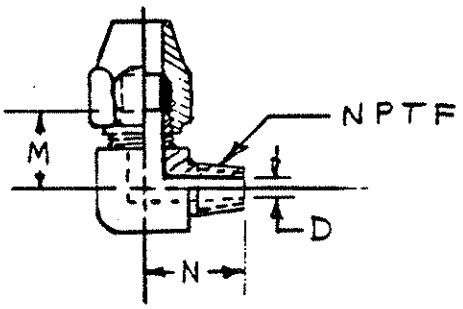
Portland FREIGHTLINER CORPORATION Oregon 97208

E-183

General Use Part

PRINT ISSUED	TITLE	PART NO
5/18/71	ELBOW, 90° MALE PIPE/COMPRESSION	23-9727
LAST CHG LTR		SHEET 1 OF 1

SKETCH



PART NUMBERS

TUBE SIZE	PIPE THREAD	STRAIGHT THREAD	M *	N *	D	MANUFACTURER'S NUMBER PH	WH		FREIGHTLINER PART NUMBER
1/8	1/8	5/16-24	.60	.67	.095	269CL-2-2	169x2		23-9727-022
3/16	1/8	3/8 -24	.60	.67	.125	269CL-3-2	169x3		-032
1/4	1/8	7/16-24	.57	.72	.188	269CL-4-2	169x4		-042
1/4	1/4	7/16-24	.60	.75	.188	269CL-4-4	169x4x4		-044
3/8	1/4	9/16-24	.73	.92	.312	269CL-6-4	169x6		-064
3/8	3/8	9/16-24	.84	.97	.312	269CL-6-6	169x6x6		-066
1/2	1/4	11/16-20	.84	.94	.406	269CL-8-4	169x8x4		-084
1/2	3/8	11/16-20	.94	1.12	.406	269CL-8-6	169x8		-086
1/2	1/2	11/16-20	1.00	1.20	.406	169CLS-8-8	169x8x8		-088
5/8	1/2	13/16-18	1.06	1.30	.500	169CLS-10-8	169x10		-108
3/4	1/2	1 -18	1.25	1.50	.562	169CLS-12-8	169x12		-128

*These dimensions may vary for different manufacturers.

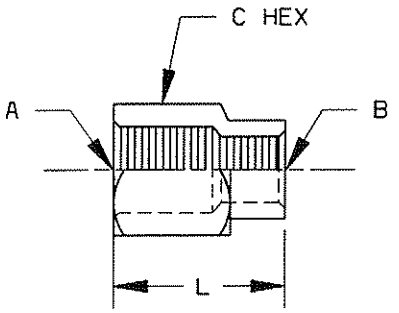
ENGINEERING NOTES

(1) Material: Brass, CA 345 or CA 260, or equal.

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		4-29-71		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

DRAWN	LFB	TITLE REDUCER, HEX FEMALE PIPE TO FEMALE PIPE	DRAWING NUMBER 23-09728
APPRV	DAJ		
DATE	12/09/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. B
CATIA ORIGINAL			



"A" PIPE THREAD	"B" PIPE THREAD	"C" HEX SIZE	"L"	MANUFACTURER'S NUMBER		FREIGHTLINER PART NUMBER
				WH	PH	
1/4	1/8	.75	.97	3300X4X2	208P-4-2	23-09728-402
1/2	3/8	1.06	1.38	3300X8X6	208P-8-6	23-09728-806

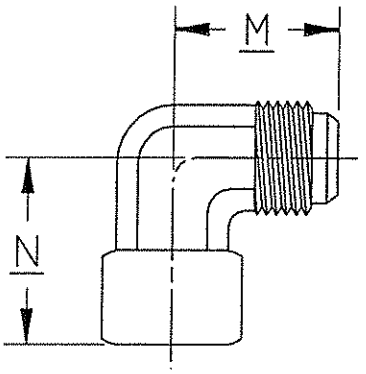
ENGINEERING NOTES

1. MATERIAL: BRASS, CA360.
2. FINISH: PLAIN.
3. INDUSTRY STANDARD: SAE J530, FIG 130138.

CHG	JOB NO	DATE	BY	REVISION
B	PA2042-98	12/09/99	LFB	REVISED AND REDRAWN IN CATIA.

ADRIENNE CHILBERG

DRAWN	HJR	TITLE	DRAWING NUMBER
APPRV	HJR	ELBOW-90°, FEMALE PIPE/45° FLARE	23-09756
DATE	04/29/71	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. D
CATIA ORIGINAL			



	HOSE SIZE (REF)	PIPE THREAD	SAE 45° STRAIGHT THREAD	DIMENSIONS M	DIMENSIONS N	FLOW DIA	MANUFACTURER/NUMBER	FREIGHTLINER PART NUMBER
D	1/4	1/8	7/16-20	.86	.50	.188	PH 150F-4-2	23-09756-042
	3/8	1/8	5/8-18	1.04	.89	.281	PH 150F-6-2	23-09756-062
	3/8	1/4	5/8-18	1.07	.67	.281	PH 150F-6-4	23-09756-064
	3/8	3/8	5/8-18	1.14	.67	.281	PH 150F-6-6	23-09756-066
	1/2	3/8	3/4-16	1.25	.69	.406	PH 150F-8-6	23-09756-086
	1/2	1/2	3/4-16	1.36	.94	.406	PH 150F-8-8	23-09756-088
	5/8	1/2	7/8-14	1.48	1.01	.500	PH 150F-10-8	23-09756-108

SPECIFICATIONS:

1. MATERIAL: BRASS, CA 377
2. ALTERNATE SUPPLIER: WEATHERHEAD CORP (WH)

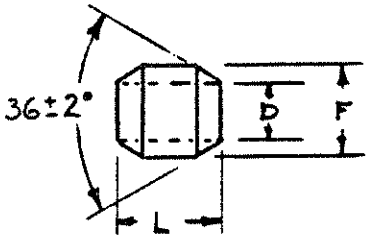
CHG	JOB NO	DATE	BY	REVISION
B	P00978-13	12/19/96	DAJ	REVISED AND REDRAWN IN CATIA, ADDED -062.
C	PA2042-76	04/17/97	DAJ	REVISED NOTE 1, DIM M AND N, AND FLOW DIA ON -064
D	PA2042-78	08/08/97	DAJ	DIM 'N' ON -042 WAS .90

SALES & SERVICE ONLY X 1

General Use Part

PRINT ISSUED	TITLE	PART NO
8/20/71	SLEEVE, COMPRESSION	23-9760
LAST CHG LTR		SHEET 1 OF 1

SKETCH



PART NUMBERS

TUBE SIZE	D	F	L*	MANUFACTURER'S NUMBER PH	WH		FREIGHTLINER PART NUMBER
1/8	.130	.19	.19	60C- 2	60 x 2		23-9760-002
3/16	.193	.27	.22	- 3	3		-003
1/4	.255	.34	.25	- 4	4		-004
5/16	.318	.41	.25	- 5	5		-005
3/8	.383	.47	.25	- 6	6		-006
7/16	.447	.53	.31	- 7	7		-007
1/2	.507	.59	.38	- 8	8		-008
5/8	.638	.72	.38	-10	10		-010
3/4	.765	.88	.38	-12	12		-012
7/8	.890	1.00	.41	-14			-014
1	1.015	1.17	.56		16		-016

*May vary slightly between manufacturers.

ENGINEERING NOTES

(1) Material: Brass CA345 or CA360

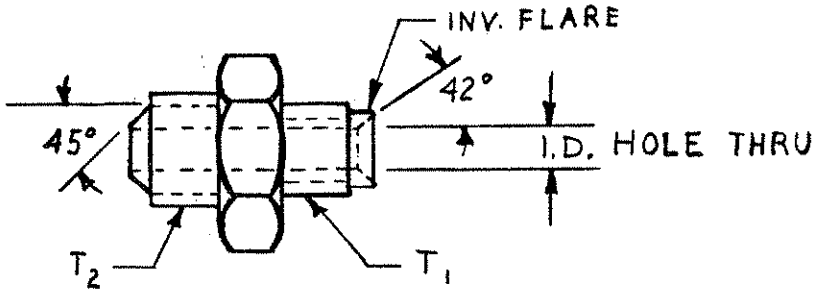
COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		8-5-71		(1)	

23-9922

General Use Part

PRINT ISSUED	TITLE	PART NO.
	ADAPTER SAE TO MALE INV. FLARE	23-9922
LAST CHG. LTR.		SHEET 1 OF 1

SKETCH



PART NUMBERS

THREAD T_1	THREAD T_2	O.D. TUBE SIZE	I.D.	MANUFACTURER'S NUMBER AQ	MANUFACTURER'S NUMBER	FREIGHTLINER PART NUMBER
7/16-24	7/16-20	1/4	.18	200001-4-4B		23-9922-404
1/2 -20	1/2-20	5/16	.23	-5-5B		-505
1/2 -20	5/8-18	3/8	.23	-5-6B		-506
5/8-18	5/8-18	3/8	.30	-6-6B		-606
3/4-18	5/8-18	3/8	.30	-8-6B		-806
3/4-18	3/4-16	1/2	.40	-8-8B		-808

ENGINEERING NOTES

① Material: Brass, CA 345 or CA 360, extruded.

CHG	BY	DATE	WAS

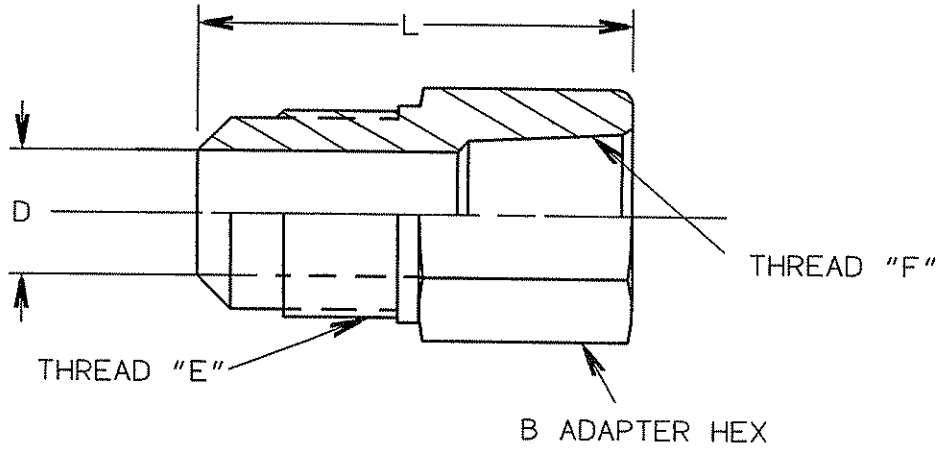
CHG	BY	DATE	WAS
1	1	~	Job No. 84190

ns

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rollins	12-30-71		①	

Portland FREIGHTLINER CORPORATION Oregon 97208

DRAWN	PCK	TITLE	ITEM NUMBER
APPRV	ANF	CONNECTOR-HEX SAE 45 DEG FLARE TO INSIDE PIPE	23-09924
DATE	08/24/90	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



TUBE SIZE	STRAIGHT THREAD "E"	PIPE THREAD "F"	"L"	"B" HEX ACROSS FLATS	"D"	VENDOR PART NO PH	FREIGHTLINER PART NUMBER
1/4	7/16-20	1/8	1.01	9/16	.188	46F-4-2	23-09924-042
1/4	7/16-20	1/4	1.23	11/16	.188	46F-4-4	23-09924-044
1/4	7/16-20	3/8	1.26	13/16	.188	46F-4-6	23-09924-046
5/16	1/2-20	1/4	1.26	11/16	.219	46F-5-4	23-09924-054
3/8	5/8-18	1/2	1.60	1	.282	46F-6-8	23-09924-068
1/2	3/4-16	1/2	1.73	1	.408	46F-8-8	23-09924-088
5/8	7/8-14	3/8	1.57	7/8	.500	46F-10-6	23-09924-106
5/8	7/8-14	1/2	1.80	1	.500	46F-10-8	23-09924-108

D

D

NOTES:

1. MATERIAL: BRASS C36000
2. SUGGESTED VENDOR; PARKER-HANNIFIN OR EQUIVALENT
3. DIMENSIONS AND PERFORMANCE PER SAE J513, FIG NO 010103

CHG	JOB/RLSE NO	DATE	BY	REVISION
A	PA2024-40	08/24/90	PCK	REVISED AND REDRAWN.
B	PX0406-09	03/18/91	PCK	ADDED 23-09924-046
C	PX0405-12	05/17/91	ANF	ADDED 23-09924-054
D	PH0488-73	01/22/93	ERK	ADDED 23-09924-068 AND 23-09924-088

23-9926

General Use Part

PRINT ISSUED	TITLE	PART NO.
	PIPE CAP, PLAIN	23-9926
LAST CHG. LTR.		SHEET 1 OF 1

SKETCH



PART NUMBERS

PIPE THREAD NPT	FREIGHTLINER PART NUMBERS	
	STEEL	ALUMINUM
1/8	23-9926-012	23-9926-512
1/4	-025	-525
3/8	-038	-538
1/2	-050	-550
3/4	-075	-575
1	-100	-600
1-1/4	-125	-625
1-1/2	-150	-650
2	-200	-700
2-1/2	-250	-750
3	-300	-800
3-1/2	-350	-850
4	-400	-900

ENGINEERING NOTES

(1) Materials: Low Carbon Steel, Cast Iron or Malleable Iron; or Aluminum

WAS	CHG	BY	DATE

WAS	CHG	BY	DATE
Job #84560	—	—	—

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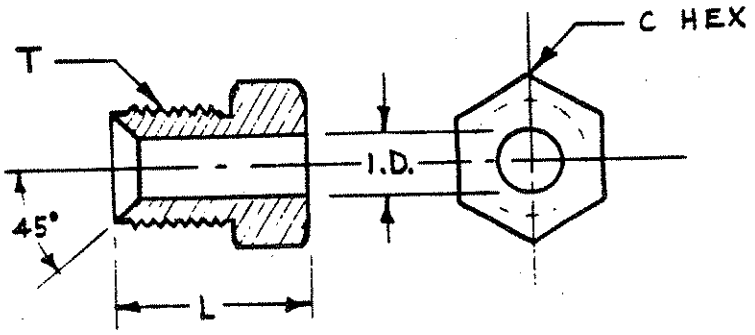
COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rollins	1-26-72		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO.
	NUT, STD, INVERT FLARE	23-10040
LAST CHG LTR		SHEET 1 OF 1

SKETCH



PART NUMBERS

TUBE SIZE	T THREAD	C HEX	L APPX	I.D.	MAT'L	MANUFACTURER'S NUMBER PH	IB	WH	FREIGHTLINER PART NUMBER
1/8	5/16-28	5/16	.52	.132		41IF- 2	-	-	23-10040-002
1/4	7/16-24	7/16	.56	.257		- 4	41WB-1/4	100 x 4	23-10040-004
3/8	5/8 -18	5/8	.66	.381		- 6	3/8	6	-006
					B				
1/2	3/4 -18	3/4	.74	.507		- 8	1/2	8	-008
5/8	7/8 -18	7/8	.80	.632		-10	5/8	-	-010
3/4	1-1/16-16	1-1/16	.88	.757		-12	3/4	-	-012
1/8	5/16-28	5/16	.52	.132		41IFS- 2	41 W-1/8	105 x 2	23-10040-102
1/4	7/16-24	7/16	.56	.257		- 4	1/4	4	-104
3/8	5/8 -18	5/8	.66	.381		- 6	3/8	6	-106
					C				
1/2	3/4 -18	3/4	.74	.507		- 8	1/2	8	-108
5/8	7/8 -18	7/8	.80	.632		-10	5/8	10	-110
3/4	1-1/16-16	1-1/16	.88	.766		-12	3/4	12	-112

ENGINEERING NOTES

(1) Material: Brass CA360 or CA345 = B
Cadmium Plated Steel = C

WAS	DATE	BY	CHG

WAS	DATE	BY	CHG
J #85530	—	—	—

		DATE DRAWN		MATERIAL	
COMPILED	HJR	4-28-72		(1)	
APPROVED	Rollins				

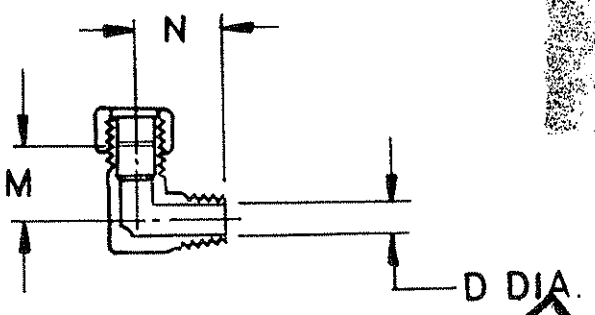
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Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO.
	ELBOW, 90° MALE PIPE/COMPRESSION	23-10101
LAST CHG. LTR.		SHEET 1 OF 1

SKETCH



PART NUMBERS

TUBE SIZE	PIPE THREAD	STRAIGHT THREAD	M *	N *	D	MA	S NUMBER	FREIGHTLINER PART NUMBER
3/16	1/8	3/8 -24	.53	.75		3		23-10101-032
1/4	1/8	7/16-24	.62			69x4		-042

REMOVE & DESTROY

*These dimensions may vary for different manufacturers.

ENGINEERING NOTES

(1) Material: Brass, CA 345 or CA 260, or equal.

CHG	BY	DATE	WAS
-	-	-	J #A0076

CHG	BY	DATE	WAS

ns

COMPILED	DL	DATE DRAWN		MATERIAL	
APPROVED	Rollins	3-2-73		(1)	

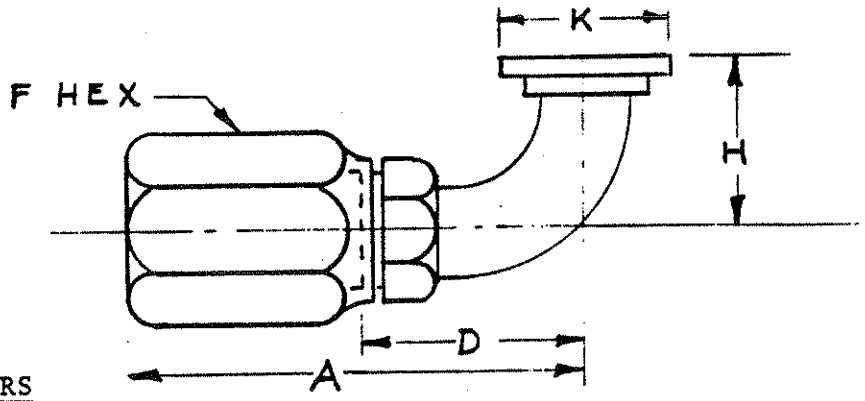
Portland FREIGHTLINER CORPORATION Oregon 97208

E-183

General Use Part

PRINT ISSUED	TITLE	PART NO
	ELBOW, 90°, SPLIT FLANGE	23-10118
LAST CHG LTR		SHEET 1 OF 1

SKETCH



PART NUMBERS

SIZE	A	D	F HEX	H	K	MANUFACTURER'S NUMBER STX	MANUFACTURER'S NUMBER AQ		FREIGHTLINER PART NUMBER
8	2.88	1.73	.94	1.62	1.19	410- 8- 8S	4779- 8S		23-10118-008
12	3.74	2.17	1.25	2.12	1.50	-12-12S	-12S		-012
16	3.55	2.28	1.44	2.38	1.75	-16-16S	-16S		-016
20	4.02	2.65	1.75	2.50	2.00	-20-20S	-20S		-020
24	4.42	2.97	1.94	2.75	2.38	-24-24S	-24S		-024

ENGINEERING NOTES

(1) Material: Steel

2. For use with SAE 100R5 Hose.

CHG	BY	DATE	WAS
			J #21650

CHG	BY	DATE	WAS

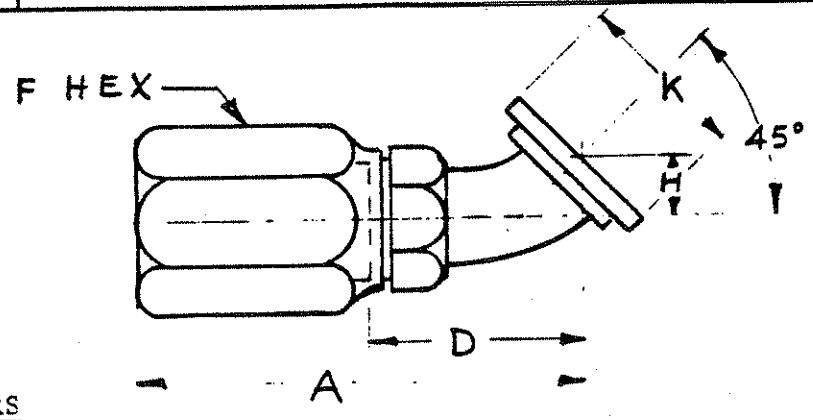
COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rolling	8-30-72		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO
	ELBOW, 45°, SPLIT FLANGE	23-10119
LAST CHG LTR		SHEET 1 OF 1

SKETCH



PART NUMBERS

SIZE	A	D	F HEX	H	K	MANUFACTURER'S NUMBER			FREIGHTLINER PART NUMBER
						STX	AQ		
8	3.44	2.30	.94	1.00	1.19	408- 8- 8S	4777- 8S		23-10119-008
12	4.02	2.45	1.25	1.00	1.50	-12-12S	-12S		-012
16	3.80	2.53	1.44	1.12	1.75	-16-16S	-16S		-016
20	4.12	2.75	1.75	1.12	2.00	-20-20S	-20S		-020
24	4.38	2.92	1.94	1.12	2.38	-24-24S	-24S		-024

ENGINEERING NOTES

(1) Material: Steel

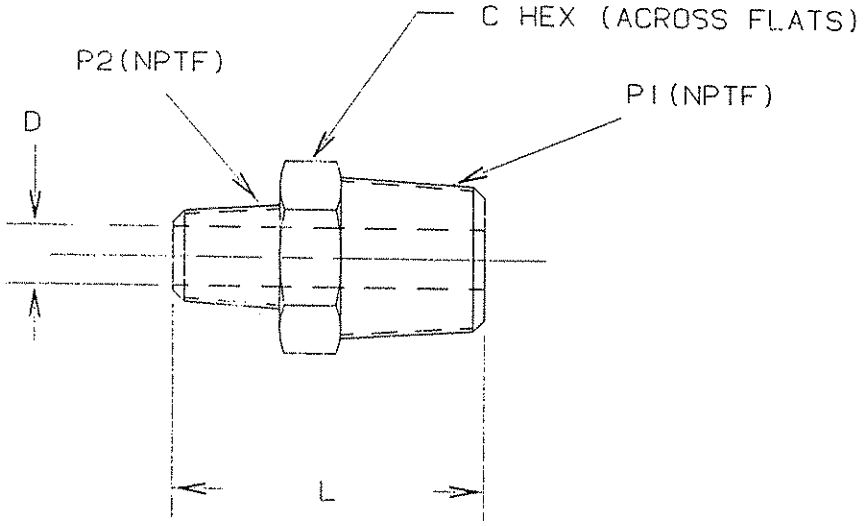
2. For use with SAE 100R5 Hose.

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rollins	8-30-72		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

WAS J #21650 DATE CHG BY

DRAWN	RWR	TITLE	ITEM NUMBER
APPRV	PCK	NIPPLE, HEX, REDUCER	23-10159
DATE	01/29/90	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2

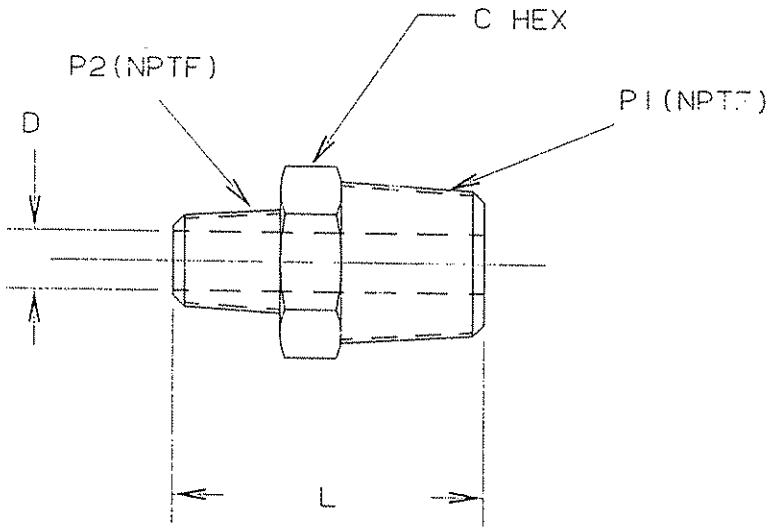


PIPE THREAD P1	PIPE THREAD P2	L*	C	D	MANUFACTURER'S NO		FREIGHTLINER PART NUMBER
					PH	AQ	
1/4	1/8	1.19	.563	.209	216P-4-2		23-10159-042
3/8	1/8	1.20	.688	.209	216P-6-2		-062
3/8	1/4	1.41	.688	.302	216P-6-4		-064
1/2	3/8	1.62	.875	.440	216P-8-6		-186
3/4	1/2	1.69	1.375	.562	216P-12-8		-128

* MAY VARY AMONG DIFFERENT MANUFACTURERS
MATERIAL: BRASS, C36000
INDUSTRY STANDARD: FIG NO. 130137, SAE J530(REF)

CHG	JOB/RLSE NO	DATE	BY	REVISION
C	P8048G-01	01/29/90	PCK	REDRAWN. REVISED VENDOR NOS. ADDED SHT 2
D	PH0659-08	09/21/95	ERK	ADDED -186
E	PH0718-A3	06/17/97	JNH	ADDED -128

DRAWN	RWR	TITLE	ITEM NUMBER
APPRV	PCK	NIPPLE, HEX, REDUCER	23-10159
DATE	01/29/90	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2



PIPE THREAD P1	PIPE THREAD P2	L*	C	D	MANUFACTURER'S NO			FREIGHTLINER PART NUMBER
					PH	AQ		
1/2	1/4	1.70	7/8	.281	1/2X1/4FF-S	2083-8-4S		23-10159-084
1/2	3/8	1.70	7/8	.406	1/2X3/8FF-S			-086

* MAY VARY AMONG DIFFERENT MANUFACTURERS
MATERIAL: STEEL, AISI 12L14
INDUSTRY STANDARD: FIG.NO. 140137, SAE J514(REF)

CHG	JOB/RLSE NO	DATE	BY	REVISION
C	P8048G-01	01/23/90	PCK	REDRAWN.REVISED VENDOR NOS.ADDED SHT 2
D	PH0659-08	09/21/95	ERK	ADDED -186, SEE SHEET #1
E	PH0718-A3	06/17/97	JNH	SEE SHEET #1

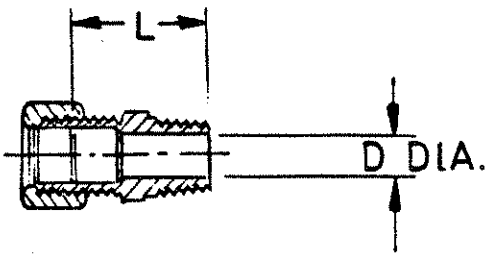
General Use Part

PRINT ISSUED	TITLE	PART NO.
	CONNECTOR ASSEMBLY TUBING TO MALE PIPE	A23-10198
LAST CHG LTR		SHEET 1 OF 1

WAS | DATE | BY | CHG

WAS J #A0110 | DATE - | BY - | CHG -

SKETCH



ASSEMBLY NUMBERS

TUBE SIZE	PIPE THREAD	STRAIGHT THREAD	D DIA.	L	MANUFACTURER'S NUMBER PH		FREIGHTLINER ASSEMBLY NUMBER
1/4	1/8	7/16-24	.188	.88	68C-4-2		A23-10198-042
1/4	1/4			1.06	68C-4-4		-044
1/4	3/8			1.09	68C-4-6		-046
3/8	1/8	9/16-24	.218	.97	68C-6-2		-062
3/8	1/4		.312	1.16	68C-6-4		-064
3/8	3/8		.312	1.16	68C-6-6		-066
3/8	1/2		.312	1.44	68C-6-8		-068
1/2	1/4	11/16-20	.281	1.22	68C-8-4		-084
1/2	3/8		.406	1.22	68C-8-6		-086
1/2	1/2		.406	1.50	68C-8-8		-088

ENGINEERING NOTES

(1) Material, all components: Brass

COMPILED	DL	DATE DRAWN		MATERIAL	
APPROVED	Rollins	3-2-73		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

ns

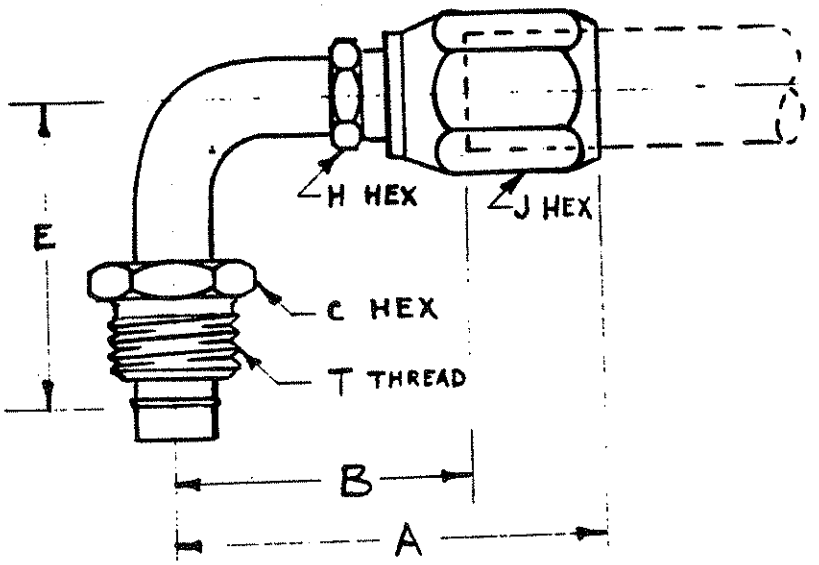
General Use Part

PRINT ISSUED	TITLE	PART NO.
	ELBOW 90°, HOSE TO MALE O-RING LONG PILOT Freon	23-10301
LAST CHG LTR B		SHEET 1 OF 1

CHG	BY	DATE	WAS	JOB NO.

CHG	BY	DATE	WAS	JOB NO.
—	—	—	—	A0675
A	[illegible]	3-13-75	Added AO Info.	A0675
B	WITT	3.27.81	SAE 100R7 TO FREON	2021

SKETCH



PART NUMBERS

T THREAD	A PH	A AQ	B PH	B AO	REF C HEX	E PH	E AO	REF J HEX	MFR'S NUMBER PH 510A SERIES ④	MFR'S NUMBER AQ FC202 & FC 160 SERIES ④	FREIGHTLINER PART NUMBER
5/8-18	2.16	2.72	1.30	1.82	.62	1.19	2.02	.75	25M51-6-5	FC7474-0606S	23-10301-006
7/8-14	3.26	3.28	1.79	1.99	.88	1.97	2.45	1.06	-10-8	-1010S	-010

ENGINEERING NOTES

(1) Material: Steel

2, Finish: Cadmium Plate

3. For use with hose from the same manufacturer that makes the fitting.

(4.) This is an approved vendor. The vendor's part number is for reference only.

		DATE DRAWN		MATERIAL	
COMPILED	HJR	8-22-74		(1)	
APPROVED	[signature]				

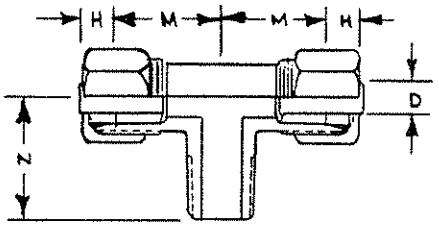
Portland FREIGHTLINER CORPORATION Oregon 97208 B A

23-10318

General Use Part

PRINT ISSUED	TITLE	PART NO.
	TEE MALE BRANCH	23-10318
LAST CHG LTR: A		SHEET 1 OF 1

SKETCH



PART NUMBER

Tube Size	Pipe Thrd	Straight Thrd	M	N	Flow Dia D	H	Manufacturer's Number PH	Freightliner Part Number
1/8	1/8	5/16-24	.56	.75	.094	.25	272NTA-2-2	23-10318-000
3/16	1/8	3/8-24	.59	.75	.125	.25	272NTA-3-2	-001
1/4	1/8	7/16-24	.62	.75	.139	.25	272NTA-4-2	-002
1/4	1/4	7/16-24	.69	1.03	.139	.25	272NTA-4-4	-003
3/8	1/4	9/16-24	.81	1.03	.218	.27	272NTA-6-4	-005
1/2	3/8	11/16-20	.94	1.19	.333	.32	272NTA-8-6	-006
5/8	1/2						272NTA-10-8	-007

ENGINEERING NOTES

(1) Material: Brass

2. Finish: Plain

3. Must meet applicable current requirements of Federal Motor Vehicle Safety Standard #106.

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
—	—	—	J# A0669
A	FHF	8-19-85	Update Vendor #, 2928D

COMPILED	D. LeL.	DATE DRAWN		MATERIAL	MASTER NUMBER
APPROVED		8-19-74		(1)	05080 000D1

Portland FREIGHTLINER CORPORATION Oregon 97208

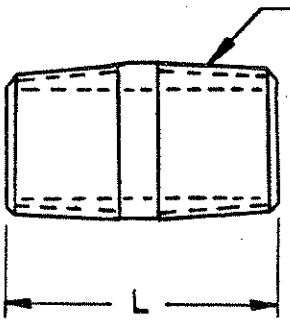
A

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
-	DL	3-15-74	J #A0587

PRINT ISSUED	TITLE	PART NO.
	NIPPLE, CLOSE ALUMINUM PIPE	23-10320
LAST CHG. LTR.		SHEET 1 OF 1

SKETCH



PART NUMBER

NPTF PIPE SIZE & THREAD (2)	LENGTH (APPROX.) (INCHES)		FREIGHTLINER PART NUMBER
1/8-27	.75		23-10320-001
1/4-18	.88		-002
3/8-18	1.00		-003
1/2-14	1.12		-004
3/4-14	1.38		-005
1 -11 1/2	1.50		-006
1 1/4-11 1/2	1.62		-007
1 1/2-11 1/2	1.75		-008
2	2.00		-009
2 1/2- 8	2.50		-010
3 - 8	2.62		-011
3 1/2- 8	2.75		-012
4 - 8	2.88		-013

SPECIFICATIONS

(1) Material: Aluminum, 6061-T6 Schedule 40 Pipe

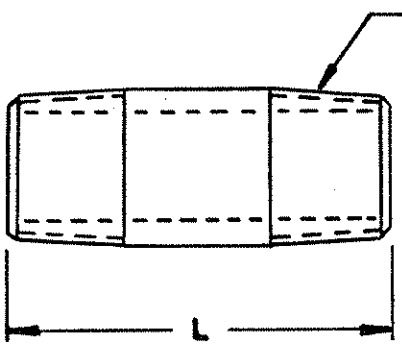
(2) Threads to conform to SAE Stand J476 Dyseal Pipe Threads.

COMPILED	D. Le L.	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	Jim S.	3-19-74		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

PRINT ISSUED	TITLE	PART NO.
	NIPPLE, LONG ALUMINUM PIPE	23-10321
LAST CHG. LTR.		SHEET 1 OF 1

SKETCH



PART NUMBERS

NPTF PIPE SIZE AND THREAD (2)	DASH NUMBERS LENGTH OF NIPPLE (INCHES)									
	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
1/8-27	-011	-012	-013	-014	-015	-016	-017	-018	-019	-020
1/4-18	-021	-022	-023	-024	-025	-026	-027	-028	-029	-030
3/8-18	-031	-032	-033	-034	-035	-036	-037	-038	-039	-040
1/2-14	-041	-042	-043	-044	-045	-046	-047	-048	-049	-050
3/4-14		-062	-063	-064	-065	-066	-067	-068	-069	-070
1 11-1/2		-082	-083	-084	-085	-086	-087	-088	-089	-090
1 1/4-11-1/2		-102	-103	-104	-105	-106	-107	-108	-109	-110
1 1/2-11-1/2		-122	-123	-124	-125	-126	-127	-128	-129	-130
2 11-1/2			-163	-164	-165	-166	-167	-168	-169	-170
2 1/2-8				-204	-205	-206	-207	-208	-209	-210
3-8				-244	-245	-246	-247	-248	-249	-250
3 1/2-8				-284	-285	-286	-287	-288	-289	-290
4-8				-324	-325	-326	-327	-328	-329	-330

ENGINEERING NOTES

(1) 48-00426 Series Sched 40 Aluminum Pipe

(2) NPTF = Dryscal American Standard Taper Pipe Thread (Ref. SAE Standard J476)

CHG	BY	DATE	WAS

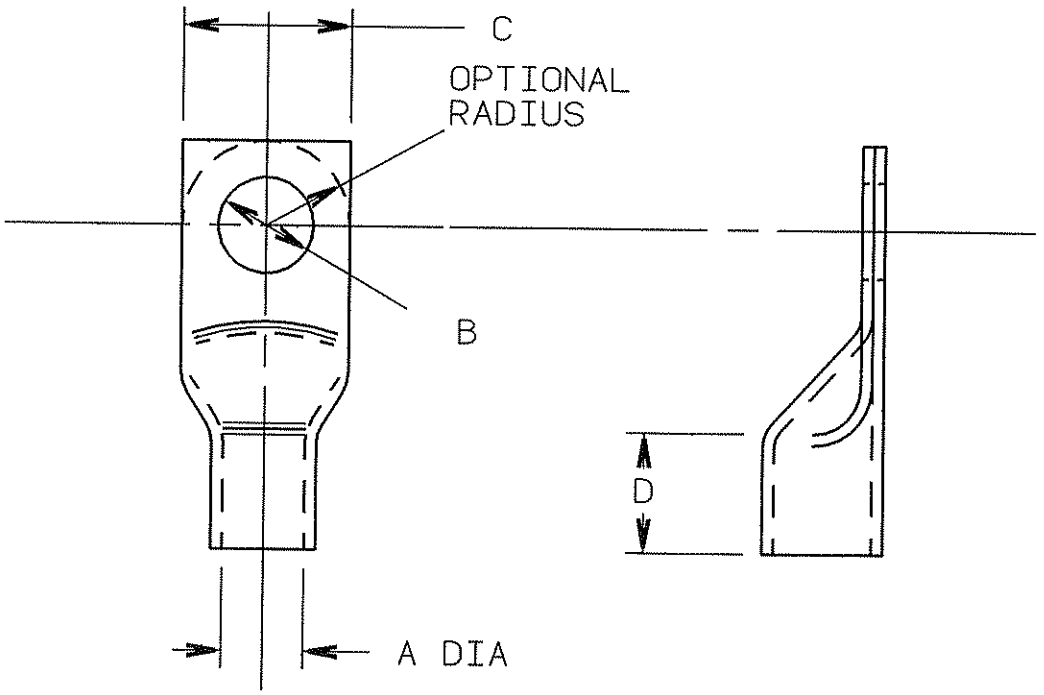
CHG	BY	DATE	WAS
-	DL	3-15-74	J #A0587

COMPILED	D. Le L.	DATE DRAWN		MATERIAL	NEXT ASSY. NO.
APPROVED	Jim S	3-19-74		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

DRAWN	DJL	TITLE TERMINAL-LUG BATTERY CABLE	ITEM NUMBER 23-10379
APPRV	DJL		
DATE	06/06/85	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

SKETCH:



PART NUMBERS:

A DIA	B STUD SIZE	C	D	CABLE SIZE (GA.)	MANUFACTURER'S NUMBER			FREIGHTLINER PART NUMBER
					ASI	MOLEX	AMY	
.370	.375	.63	.500	2	321600	BCL 238PL	2381-1	23-10379-010
.370	.500	.75	.550	2	-	BCL 212PL	2503-1	23-10379-011
.500	.500	.81	.620	2/0	606296-2	BCL2012PL	T-20501-3	23-10379-021
.500	.375	.81	.620	2/0	606296-1	BCL2038PL	T-20381-2	23-10379-023
.550	.500	.88	.620	3/0	606297-2	BCL3012PL	T-30501-1	23-10379-031
.550	.375	.88	.620	3/0	606297-1	BCL3038PL	T-30381-1	23-10379-033
.656	.500	1.03	.750	4/0	607884-3	BCL4012PL	T-40501-1	23-10379-041
.656	.375	1.03	.750	4/0	607884-2	BCL4038PL	T-40381-1	23-10379-043

ENGINEERING NOTES:

(1) MATERIAL: LEAD COATED OR TIN PLATED COPPER

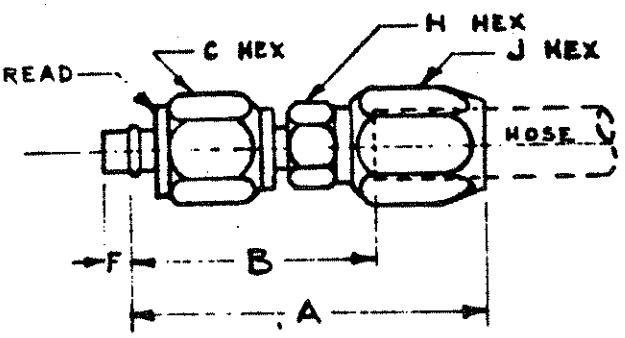
2 ONLY SOURCES SHOWN ABOVE MAY BE USED FOR THIS TERMINAL. NO ALTERNATE SOURCES MAY BE USED UNLESS APPROVED BY PRODUCT ENGINEERING

CHG	JOB/RLSE NO	DATE	BY	REVISION
J	PN0436-62	02/19/93	ERK	REDRAWN; ADDED 23-10379-010
K	P1022J-01	05/18/93	ERK	ADDED -011, AMY NUMBER FOR -010, "B" TO STUD SIZE

General Use Part

PRINT ISSUED	TITLE	PART NO.
	CONNECTOR, HOSE TO O-RING SWIVEL LONG PILOT	23-10380
LAST CHG. LTR. D	Freon	SHEET 1 OF 1

SKETCH



PART NUMBER

T THREAD	A AO	B AO	REF C HEX	REF H HEX	REF J HEX	F	MFR'S NUMBER AQ FC202 & FC 160 SERIES (4)	FREIGHTLINER PART NUMBER
5/8-18	2.75	1.85	.75	.50	.75	.28	FC7048-0606S	23-10380-006
3/4-16	3.25	2.10	.88	.81	1.06	.38	-0808S	-008
7/8-14	3.47	2.18	1.06	.81	1.06	.38	-1010S	-010

ENGINEERING NOTES

(1) Material: Steel

2. Finish: Cadmium Plate

3. For use with hose from the same mfg. that makes the fitting.

(4.) This is an approved vendor. The vendor's part number is for reference only.

CHG	BY	DATE	WAS JOB NO.
D	WHT	3-27-81	10087 To FRCON 202A

CHG	BY	DATE	WAS	NOW
A	RLR	3-13-75		A0675
B	RLR	5-6-75	Added AQ Info.	A0675
C	HJR	1-2-76	2049 to 2048	C0261
			Delete PH Nos.	A0796

COMPILED	RJR	DATE DRAWN		MATERIAL	
APPROVED		8-23-74		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

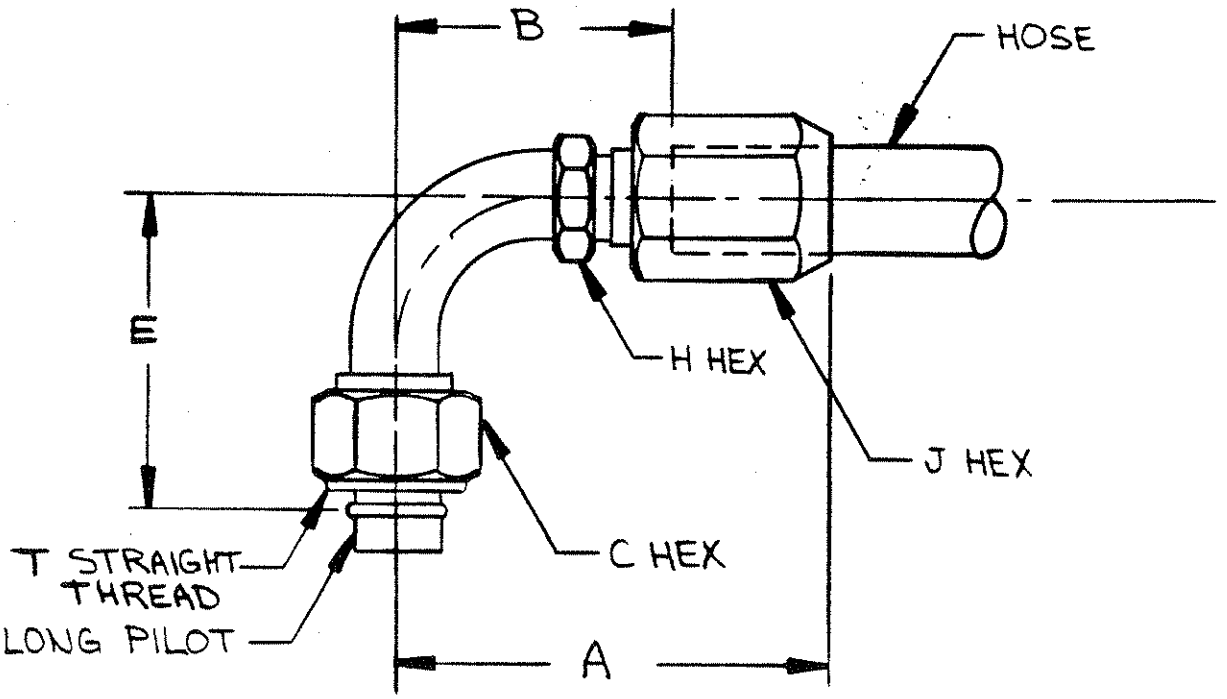
D B A

23-10381

General Use Part

ORIGINAL JOB NO.	TITLE	PART NO.
F0296	ELBOW 90°, HOSE TO O-RING LONG PILOT	23-10381
LAST CHG LTR H		SHEET 1 OF 1

SKETCH:



PART NUMBERS:

T THREAD	A REF	B REF	C REF HEX	H REF HEX	J REF HEX	E	HOSE SIZE REF	MFR'S NUMBER (4) AQ	FREIGHTLINER PART NUMBER
5/8-18	2.72	1.82	.75	.75	.81	1.17	5/16	FC7573-0606S	23-10381-005
3/4-16	3.50	2.35	.88	.88	.94	1.24	3/8	-0808S	-008
7/8-14	4.22	2.93	1.06	1.0	1.2	1.50	1/2	-1010S	-010
1-1/16 -14	4.69	3.40	1.25	1.25	1.2	1.99	1/2	-1210S	-210
5/8-18	3.90	3.00	.75	.75	.81	4.75	5/16	FJ9339-0606S	-016
5/3-18	2.72	1.82	.75	.75	.81	2.25	5/16		-106
3/4-16	3.50	2.35	.88	.88	.94	2.25	3/8		-108

ENGINEERING NOTES:

(1) MATERIAL: Steel.
2. FINISH: Cadmium Plated.
3. For use with hose from the same mfg. that makes the fitting.
(4) This is an approved vendor. The vendor's part number is for reference only.

PRE-RELEASE PRINT

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR
REVISED & REDRAWN	10-5-82	DS	F0296	H

COMPILED	RAP	DATE DRAWN		MATERIAL	
APPROVED		10-5-82		(1)	

EAC-826

Portland FREIGHTLINER CORPORATION Oregon 97208

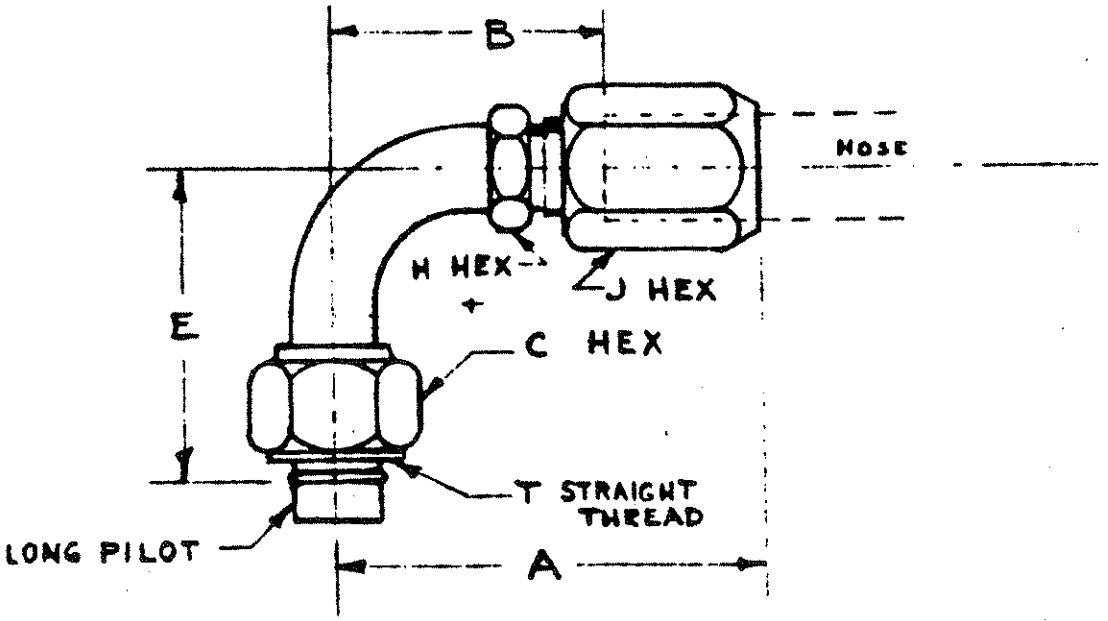
H

General Use Part

PRINT ISSUED	TITLE	PART NO.
	ELBOW 90°, HOSE TO O-RING LONG PILOT Freon	23-10381
LAST CHG LTR G		SHEET 1 OF 1

CHG	BY	DATE	WAS	JOB NO.
D	FM	4 FEB 80	ADDED -016	E0438
E	FM	22 MAY 80	ADDED AQ to -016	E04
F	YJY	7/25/80	Delete 32948-6-6S	97209
G	WTT	3-27-81	10027 To FREON	ZOZA

SKETCH



PART NUMBERS

T THREAD	A AO	B	REF C HEX	REF H HEX	REF J HEX	E AO	MFR'S NUMBER STX	MFR'S NUMBER AQ TC202 & FC160SERIES (4)	FREIGHTLINER PART NUMBER
5/8-18	2.47	1.57	.75	.50	.75	1.17		FC7573-0606S	23-10381-006
3/4-16	2.88	1.73	.88	.62	1.06	1.24		-0808S	-008
7/8-14	3.28	1.99	1.06	.75	1.06	1.50		-1010S	-010
1-1/16-14	3.60	2.40	1.25	.88	1.06	1.99		-1210S	-210
5/8-18	3.90 / 2.47	3.00 / 1.57	.75	.50	.75	6.00	(F)	FJ9339-0606S	-016

CHG	BY	DATE	WAS
A	HZ	3-13-75	Added AQ Info.
B	HJR	1-2-76	Delete PH Nos.
C	HJR	10-8-76	Rev'd H & E dims

ENGINEERING NOTES

(1) Material: Steel.
2. Finish: Cadmium Plated.
3. For use with hose from the same mfg. that makes the fitting.
(4) This is an approved vendor. The vendor's part number is for reference only.

COMPILED	HJR	DATE DRAWN		MATERIAL
APPROVED		8-22-74		(1)

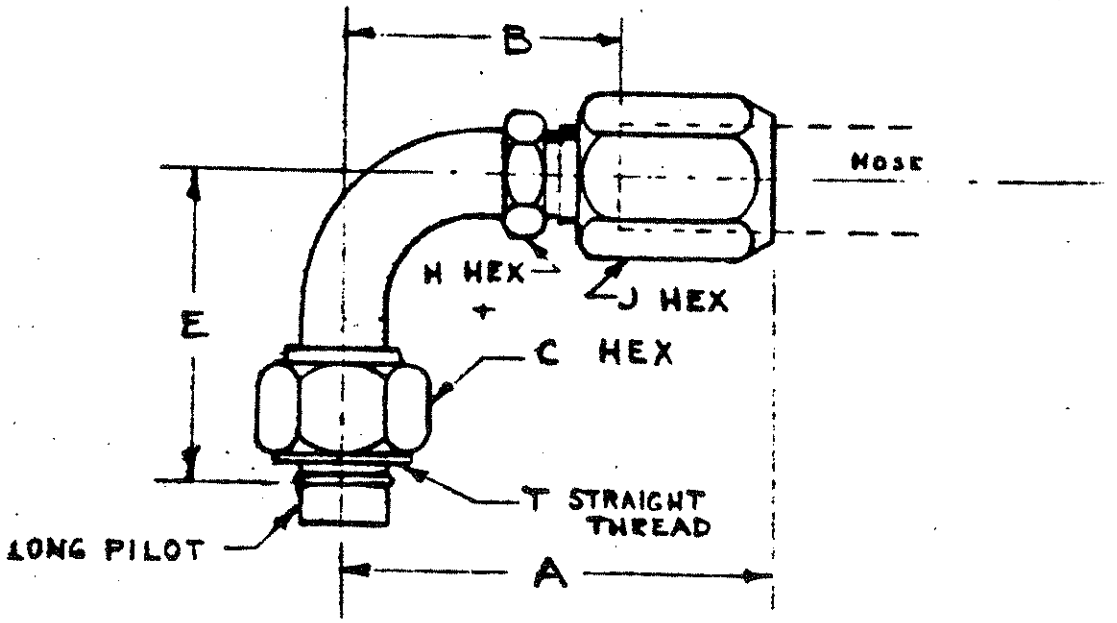
Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED		TITLE	PART NO
		ELBOW 90°, HOSE TO O-RING LONG PILOT 100R7	23-10381
MAT'L CHG LTR	F		SHEET 1 OF 1

CHG	BY	DATE	
D	FH	4 FEB 80	ADDED - JT6 WAS - JOB NO. E0438
E	FH	22 MAY 80	ADDED AQ to -0616 E0438
F	YJY	7/25/80	Delete 32948-6-6S 97209

SKETCH



PART NUMBERS

T THREAD	A	A AQ	B	REF C HEX	REF H HEX	REF J HEX	E	E AQ	MFR'S NUMBER STX	MFR'S NUMBER AQ FC202 & FC160SERIES (4)	FREIGHTLINER PART NUMBER
5/8-18		2.47	1.57	.75	.50	.75		1.17		FC7573-0606S	23-10381-006
3/4-16		2.88	1.73	.88	.62	1.06		1.24		-0808S	-008
7/8-14		3.28	1.99	1.06	.75	1.06		1.50		-1010S	-010
1-1/16-14		3.60	2.40	1.25	.88	1.06		1.99		-1210S	-210
5/8-18		3.90	3.00	.75	.50	.75		6.00	(F)	J9339-0606S	-016
		2.47	1.57								

CHG	BY	DATE	
A		3-13-75	Added AQ Info. WAS - A0625
B	HJR	1-2-76	Delete PH Nos. A0796
C	HJR	10-8-76	Rev'd H & E dims 62209

ENGINEERING NOTES

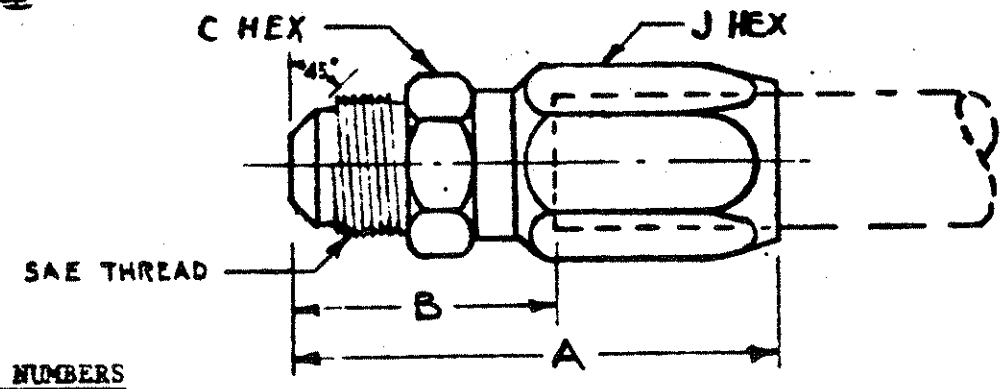
(1) Material: Steel.
2. Finish: Cadmium Plated.
3. For use with SAE 100 R7 Hose.
(4) This is an approved vendor. The vendor's part number is for reference only.

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		8-22-74		(1)	

Typical Use Part

PRINT ISSUED		CONNECTOR, HOSE TO SAE 45° MALE FLARE	PART NO 23-10398
LAST ENG. LTR	C	Freon	SHEET 1 OF 1

SKETCH



PART NUMBERS

THREAD	A	B	I.D. HOSE REF	C HEX REF	J HEX REF	MFR'S NUMBER	AQ FC202 & FC 160 SERIES	FREIGHTLINER PART NUMBER
1/2-20	2.08	.96	.25	.56	.62			23-10398-005
5/8-18	2.23	1.13	.31	.62	.75		4402-6S	-006
3/4-16	3.08	1.61	.50	.88	.88		4402-8S	-008
7/8-14	3.18	1.71	.50	.94	1.06		4402-10S	-010

ENGINEERING NOTES

1. Material: Steel
2. Finish: Cadmium Plate
3. For use with hose from the same mfg. that makes the fitting.
4. This is an approved vendor. The vendor's part number is for reference only.

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		8-22-74		1	

Portland FREIGHTLINER CORPORATION Oregon 97208

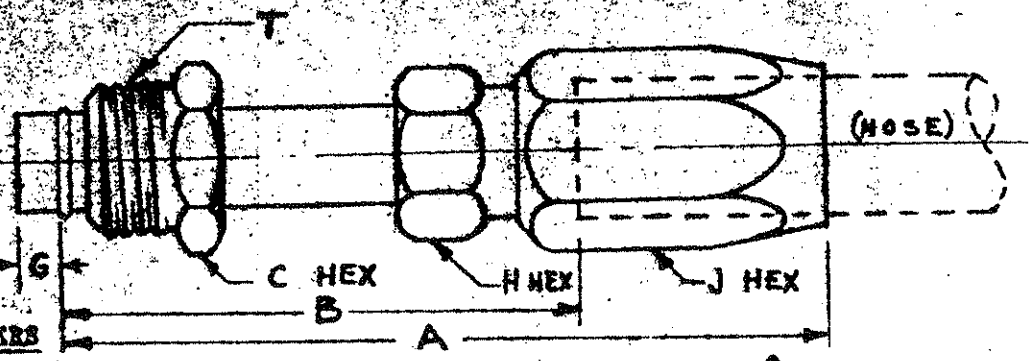
CHG	BY	DATE	WAS JOB NO.
A		3-13-75	Added AQ Info. A0675
B	HJR	1-2-76	Delete PH Nos. A0796
C	WITT	3-27-81	Horn to Frame 202A

E-183

General Use Part

Last Used on:	TITLE: CONNECTOR, HOSE TO MALE O-RING LONG PILOT	PART NO. 23-10399
D	Freon	SHEET 1 OF 1

SKETCH



PART NUMBERS

T THREAD	A	AO	B	AO	REF C HEX	REF H HEX	REF J HEX	G PILOT	MFR'S [illegible] 20? & SERIES	FREIGHTLINER PART NUMBER
5/8-18		2.75		1.02	.62	.50	.75	.28	C7049-0606S	23-10399-006
3/4-16		3.25		1.27	.75	.81	1.06	.3[illegible]	-0808S	-008
7/8-18		3.47		1.42	.88	.81	1.06		-1010S	-010

REMOVE & DESTROY

ENGINEERING NOTES

1. Material: [illegible]
2. Finish: Cadm[illegible] Plate
3. For use with Hose from the same mfg. that makes the fitting.
4. This is an approved vendor. The vendor's part number is for reference only.

CHG	BY	DATE	
A	RZB	3-13-75	Added AO Info.
B	HJR	1-2-76	Delete PH Nos.
C	HJR	10-13-77	5/8-18 To 7/8-18
D	WTT	8-27-81	10087 To Freon 12A

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	[signature]	8-22-74		1	

Portland FREIGHTLINER CORPORATION Oregon 97208

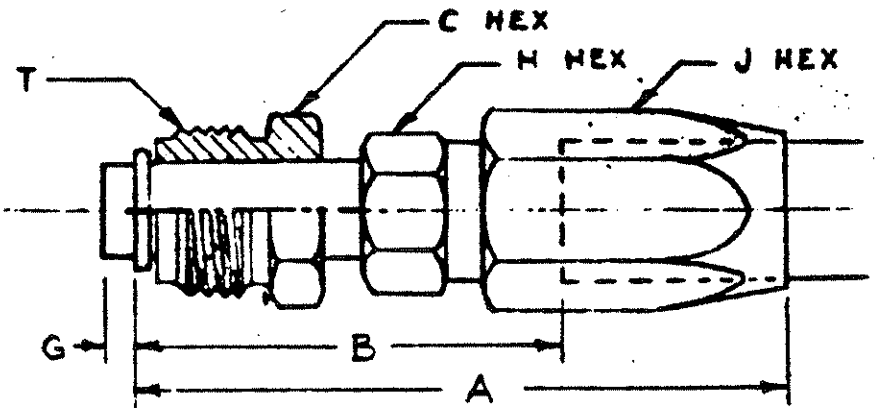
BC D A

E-183

General Use Part

PRINT ISSUED		TITLE	PART NO
		CONNECTOR, HOSE TO MALE O-RING SHORT PILOT Freon	23-10400
LAST CHG LTR	C		SHEET 1 OF 1

SKETCH



PART NUMBERS

T THREAD	A AO	B AO	REF C HEX	REF H HEX	REF J HEX	G	MFR'S NUMBER AQ FC202 & FC 160 SERIES (4)	FREIGHTLINER PART NUMBER
5/8-18	2.85	1.95	.62	.50	.75	.18	FC7646-0606S	23-10400-006
3/4-16	3.25	2.10	.75	.69	1.06	.18	-0808S	-008
7/8-14	3.67	2.38	.88	.81	1.06	.18	-1010S	-010

ENGINEERING NOTES

(1) Material: Steel
2. Finish-Cadmium Plate
3. For use with hose from the same mfg. that makes the fitting.
(4) This is an approved vendor. The vendor's part number is for reference only.

CHG	BY	DATE	WAS	JOB NO
A	[illegible]	3-13-75	Added AQ Info.	A0637 A1167
B	HJR	1-2-76	Delete PH Nos.	A0796
C	WITT	9-23-81	10087 TO FREON	202A

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	[illegible]	11-5-74		(1)	

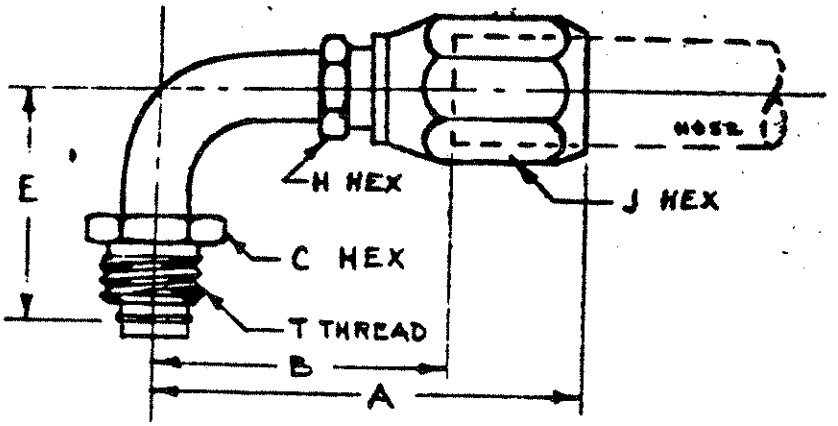
kh

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED		TITLE	PART NO
		ELBOW, 90°, HOSE TO MALE O-RING SHORT PILOT	23-10401
LAST CHG LTR	D		Freon SHEET 1 OF 1

SKETCH



PART NUMBERS

T THREAD	A	B	REF C	E	REF J	MFR'S NUMBER	FREIGHTLINER PART NUMBER
	AO	AO	HEX	AO	HEX	AQ FC202 & FC 160 SERIES	
5/8-18	2.47	1.57	.62	1.58	.75	FC7662-0606S	23-10401-006
7/8-18	3.28	1.99	.88	1.88	1.06	-1010S	-010

ENGINEERING NOTES

1. Material: Steel
2. Finish: Cadmium Plate
3. For use with hose from same mfg. that makes the fitting.
4. This is an approved vendor. The vendor's part number is for reference.

CHG	BY	DATE	WAS	JOB
D	WTT	3-27-81	10021 TO FREON	207
A	BJR	3-13-75	Added AO Info.	AO
B	HJR	1-2-76	Delete PH Nos.	AO/96
C	JK	10-13-77	7/8-14 TO 7/8-18	65077

COMPILED	BJR	DATE DRAWN		MATERIAL	
APPROVED		11-06-74		1	

Portland FREIGHTLINER CORPORATION Oregon 97208

3-10676

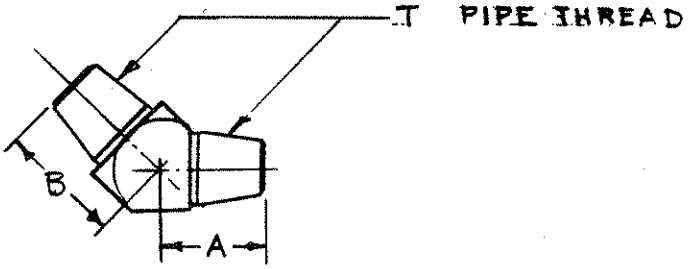
General Use Part

PRINT ISSUED		TITLE	PART NO
		ELBOW, 45°, STEEL EXTERNAL PIPE/EXTERNAL PIPE	23-10676
LAST CHG LTR	A		SHEET 1 OF 1

CHG	BY	DATE	WAS	JOB NO.

CHG	BY	DATE	WAS	JOB NO.
---	---	---	-----	A0691
A	DGS	07-08-83	REVISED TABLE	0121B

SKETCH



PART NUMBERS

T PIPE THREAD	B	A		MANUFACTURER'S NUMBER AQ		FREIGHTLINER PART NUMBER
1/8 - 27	.58	.67		-2-2S		-002
1/4 - 18	.86	.85		2247-4-4S		23-10676-004
3/8 - 18	.95	.95		-6-6S		-006
1/2 - 14	1.17	1.13		-8-8S		-008
3/4 - 14	1.09	1.24		-12-12S		-012
1 - 11½	1.48	1.48		-16-16S		-016
1¼- 11½	1.54	1.88		-20-20S		-020

ENGINEERING NOTES

(1) Material: Steel

2. Finish: Plain

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	CSB	10-22-74		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

A

M/E

E-183

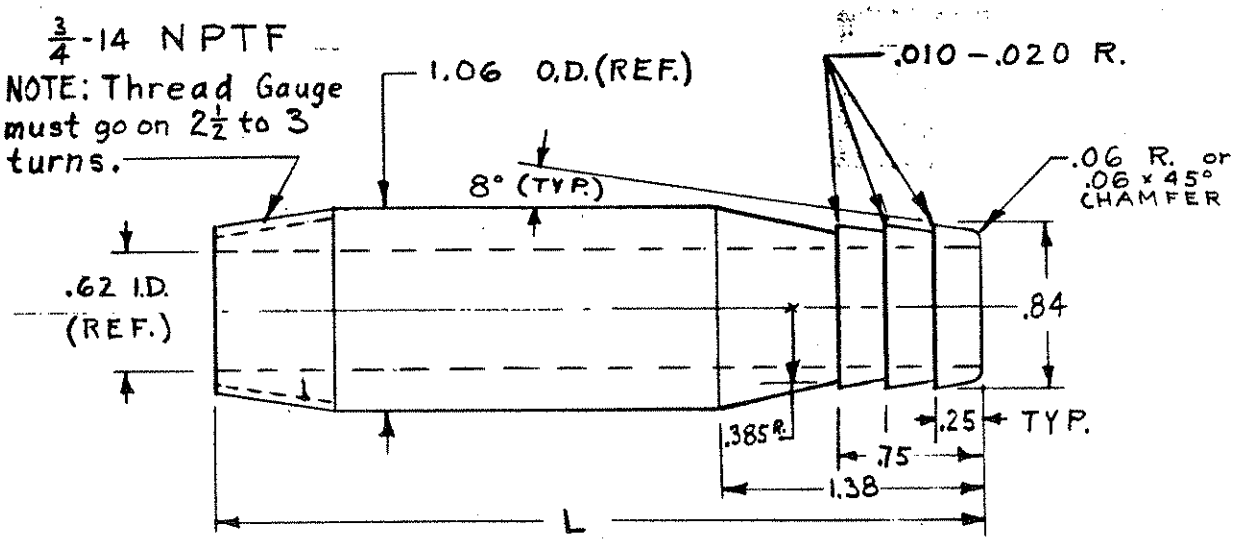
23-10739

General Use Part

PRINT ISSUED	TITLE	PART NO.
	CONNECTOR, HOSE 3/4 NPTF TO 3/4 ID HOSE	23-10739
LAST CHG. LTR. D		SHEET 1 OF 1

CHG	BY	DATE	WAS	JOB NO.
D	FEF	8-2-84	-25 REP'D BY 23-11687-075	2392C

SKETCH



PART NUMBERS

LENGTH	MFG.'s NO. PH	DESCRIPTION	REPLACED BY	FREIGHTLINER PART NUMBER *
		(See Sketch)		23-10739-L
2½"	125HBL-12-12		23-11687-075	23-10739-25

* To complete part number add 3- digit dash number indicating length, L, in inches and 1/10 th's of an inch in increments of one half inch. Thus, for a connector 10½ inches long write 23-10739-105.

CHG	BY	DATE	WAS	JOB NO.
—	—	—	—	C0410
A	RLE	9-12-75	Added note 3	C0410
B	HJR	9-14-76	Gauge Note Added	61940
C	SK	12-6-78	Added -25	71036

ENGINEERING NOTES

(1) MATERIAL: Steel, 48-00880-122; 48-00926-256, alternate.

2. FINISH: Zinc or Cadmium plated.

3. Connector must be at least 2.20" long for adequate pipe thread.

COMPILED	H,J,R.	DATE DRAWN		MATERIAL	MASTER NUMBER	
APPROVED		12-12-74		(1)	06145	00001

Portland FREIGHTLINER CORPORATION Oregon 97208

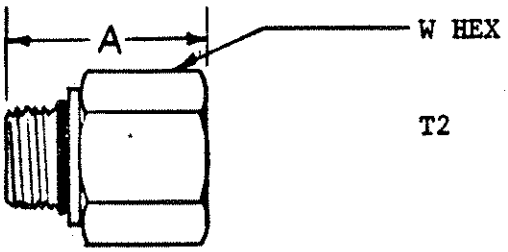
DC B A MC

E-183

General Use Part

ORIGINAL JOB NO.	TITLE	PART NO.
61091	ADAPTER, STRAIGHT THREAD WITH O-RING/FEMALE PIPE	23-10996
LAST CHG LTR —		SHEET 1 OF 1

SKETCH



PART NUMBERS

T1	T2	TUBE O.D.	A	W HEX	MANUFACTURER'S PART NUMBER PH		FREIGHTLINER PART NUMBER
3/4-16	1/2-14	1/2	1.44	1-1/8	0502-8-8		23-10996-088

ENGINEERING NOTES

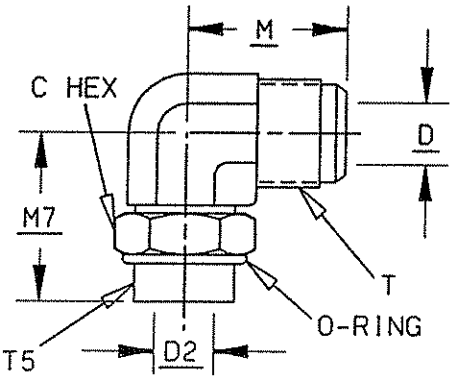
① MATERIAL: Carbon Steel
2. FINISH: Plain

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		8-11-76		①	

CHANGE INFORMATION | DATE | BY | JOB NO. | LTR

CHANGE INFORMATION | DATE | BY | JOB NO. | LTR

DRAWN	DAJ	TITLE	DRAWING NUMBER
APPRV	DAJ	ELBOW-90°, STEEL 37° FLARE END/ST THRD, O-RING	23-11000
DATE	09/05/97		
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2 / CHG. LTR. L



	T TUBE END UN/UNF-2A	T5 PORT THD UN/UNF-2A	C HEX	M	M7	D DRILL	D2 DRILL	VENDOR NUM PH	FREIGHTLINER PART NUMBER
	7/16-20	7/16-20	9/16	0.89	1.03	.172	.172	4 C50X	23-11000-044
	9/16-18	9/16-18	11/16	1.06	1.25	.297	.297	6 C50X	23-11000-066
	3/4-16	9/16-18	11/16	1.25	1.36	.391	.297	8-6 C50X	23-11000-068
	9/16-18	3/4-16	7/8	1.14	1.45	.297	.391	6-8 C50X	23-11000-086
	3/4-16	3/4-16	7/8	1.25	1.45	.391	.391	8 C50X	23-11000-088
	7/8-14	3/4-16	7/8	1.45	1.55	.484	.391	10-8 C50X	23-11000-089
	3/4-16	1 1/16-12	1 1/4	1.42	1.94	.391	.609	8-12 C50X	23-11000-128
	3/4-16	7/8-14	1	1.34	1.70	.391	.484	8-10 C50X	23-11000-108
	7/8-14	7/8-14	1	1.45	1.70	.484	.484	10 C50X	23-11000-110
	7/8-14	1 1/16-12	1 1/4	1.53	1.94	.484	.609	10-12 C50X	23-11000-210
	1 1/16-12	7/8-14	1	1.66	1.78	.609	.484	12-10 C50X	23-11000-012
	1 1/16-12	3/4-16	7/8	1.66	1.63	.609	.391	12-8 C50X	23-11000-812
	1 1/16-12	1 1/16-12	1 1/4	1.66	1.94	.609	.609	12 C50X	23-11000-212
J	1 1/16-12	1 5/16-12	1 1/2	1.81	2.05	.609	.844	12-16 C50X	23-11000-612
	1 5/16-12	3/4-16	7/8	1.81	2.05	.844	.391	16-8 C50X	23-11000-816
	1 5/16-12	1 1/16-12	1 1/4	1.81	2.05	.844	.609	16-12 C50X	23-11000-216
	1 5/16-12	1 5/16-12	1 1/2	1.81	2.05	.844	.844	16 C50X	23-11000-616
L	1 5/16-12	1 5/8-12	1 7/8	2.01	2.25	.844	1.078	16-20 C50X	23-11000-716
K	1 5/8-12	1 5/16-12	1 1/2	2.06	2.25	1.078	.844	20-16 C50X	23-11000-620
	1 5/8-12	1 5/8-12	1 7/8	2.06	2.25	1.078	1.078	20 C50X	23-11000-720
L	1 5/8-12	1 7/8-12	2 1/8	2.20	2.39	1.078	1.312	20-24 C50XS	23-11000-420

CHG	JOB NO	DATE	BY	REVISION
J	937831-02	09/05/97	DAJ	REVISED AND REDRAWN IN CATIA, ADDED -612.
K	961738-02	12/22/97	DAJ	ADDED -620.
L	961738-08	01/28/98	DAJ	ADDED -716 AND 420.

DRAWN	DAJ	TITLE ELBOW-90°, STEEL 37° FLARE END/ST THRD, O-RING	DRAWING NUMBER 23-11000
APPRV	DAJ		
DATE	09/05/97		
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2 / CHG. LTR. L

SPECIFICATIONS:

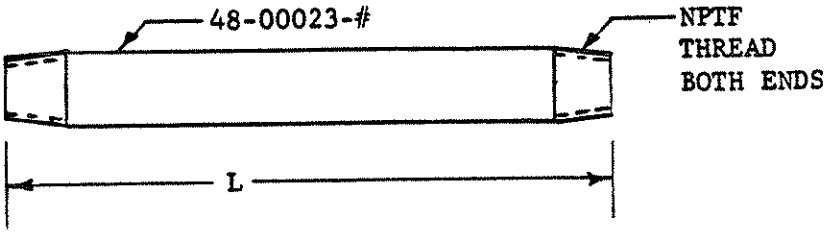
1. MATERIAL: STEEL
2. FINISH: CAD OR ZINC PLATED
3. INDUSTRY STANDARD: SAE 070220

CHG	JOB NO	DATE	BY	REVISION
J	937831-02	09/05/97	DAJ	REVISED AND REDRAWN IN CATIA, ADDED -612.
K	961738-02	12/22/97	DAJ	ADDED -620.
L	961738-08	01/28/98	DAJ	ADDED -716 AND -420, SEE SHEET 1.

General Use Part

ORIGINAL JOB NO.	TITLE	PART NO.
A0844	PIPE, THREADED ENDS BLACK, WELDED	23-11001
LAST CHG LTR –		SHEET 1 OF 1

SKETCH



PART NUMBERS

NPTF PIPE SIZE & THREAD	MATERIAL (1)		FREIGHTLINER PART NUMBER *
1/8-27	48-00023-001		23-11001-0xx
1/4-18	-002		-1xx
3/8-18	-003		-2xx
1/2-14	-004		-3xx
3/4-14	-006		-4xx
1 - 11½	-008		-5xx
1¼ - 11½	-010		-6xx
1½ - 11½	-012		-7xx
2 - 11½	-020		-8xx
2½ - 8	-025		-9xx

* Last two digits of the dash number indicate length in whole inches. Example: For 3/4" Pipe 8" long, threaded both ends, write 23-11001-408.

ENGINEERING NOTES

(1) Material: 48-00023-Series Schedule 40 Black Iron Pipe.
2. Finish: Black.

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		10-6-76		(1)	

CHANGE INFORMATION | LTR | JOB NO. | BY | DATE

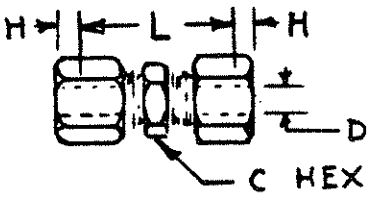
CHANGE INFORMATION | LTR | JOB NO. | BY | DATE

23-11002

General Use Part

PRINT ISSUED	TITLE	PART NO.
A0847	UNION, NYLON TUBE	23-11002
LAST CHG LTR —		SHEET 1 OF 1

SKETCH



PART NUMBERS

TUBE SIZE	STRAIGHT THREAD	C HEX	L	D	H	MANUFACTURER'S NUMBER PH		FREIGHTLINER PART NUMBER
1/4	7/16-24	7/16	.81	.139	.25	62NT-4		23-11002-004
5/16	1/2 -24	1/2	.87	.194	.26	-5		-005
3/8	9/16-24	9/16	.97	.214	.22	-6		-006
1/2	11/16-20	11/16	1.10	.338	.32	-8		-008

ENGINEERING NOTES

(1) MATERIAL: Brass
2. FINISH: Plain

WAS	DATE	BY	CHG

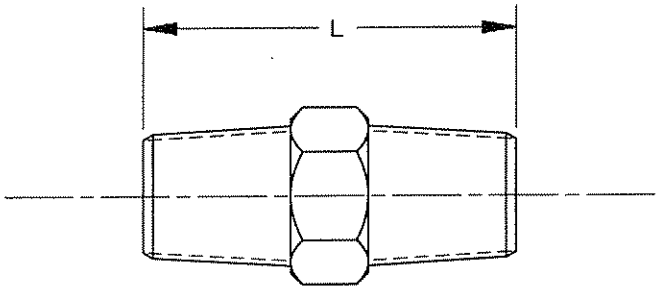
WAS	DATE	BY	CHG

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		10-20-76		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

DEBBIE

DRAWN	LFB	TITLE	DRAWING NUMBER
APPRV	DAJ	NIPPLE-EXTERNAL PIPE EXTERNAL THREAD	23-11034
DATE	11/30/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. A
CATIA ORIGINAL			



NOM PIPE SIZE	TAPER PIPE THREAD	LENGTH (APPROX) (INCHES)	MANUFACTURER'S NO.		FREIGHTLINER PART NUMBER
			PH	AO	
1/8	1/8-27	1.06	1/8 FF-S	2083-2-2S	23-11034-002
1/4	1/4-18	1.45	1/4 FF-S	2083-4-4S	23-11034-004
3/8	3/8-18	1.45	3/8 FF-S	2083-6-6S	23-11034-006
1/2	1/2-14	1.89	1/2 FF-S	2083-8-8S	23-11034-008

A

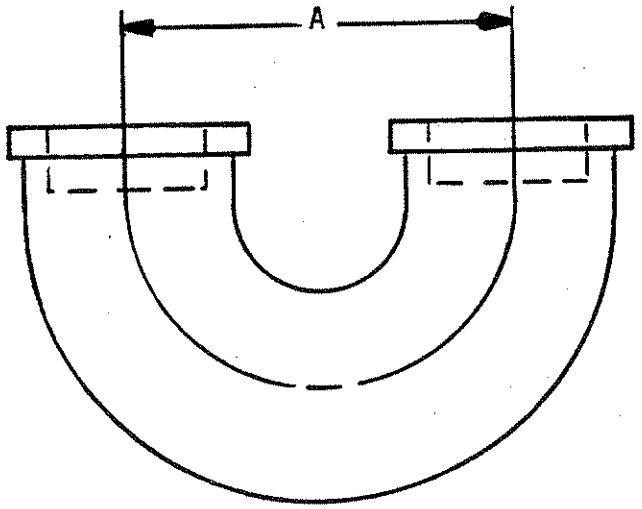
ENGINEERING NOTES:

1. MATERIAL: STEEL-SAE 140137.
2. FINISH: ZINC WITH GOLD CHROMATE.

CHG	JOB NO	DATE	BY	REVISION
A	PA2042-98	11/30/99	LFB	REVISED AND REDRAWN IN CATIA. ADDED PH NUMBERS.

ORIGINAL JOB NO.	TITLE	PART NO.
D1630	RETURN BEND, OPEN	23-11038
LAST CHG LTR —		SHEET 1 OF 1

F16 666 Standard Malleable



Part Numbers

		Size	Weight	A	Freightliner Part Number
		3/4	.74	2.00	23-11038-000

CHANGE INFORMATION

LTR	JOB NO.	BY	DATE

CHANGE INFORMATION

TR	JOB NO.	BY	DATE

ENGINEERING NOTES

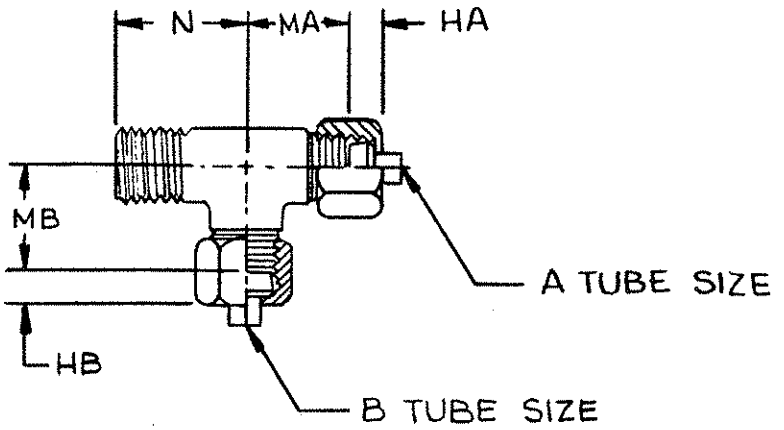
1 Material Cast Malleable Black Iron

COMPILED	Taylor	DATE DRAWN		Material	
APPROVED	FF	8/22/79		1	

ORIGINAL JOB NO.	TITLE	PART NO.
C1500 A	TEE, MALE RUN NYLON TUBE TO NPT	23-11219
LAST CHG LTR B		SHEET 1 OF 1

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A1	1156B	TN	1-21-83	Revised & Redrawn
A2	1156B	TN	1-21-83	Added - 003
B	3184B	DJL	10-22-84	REV. -003 MFG'S P/N

SKETCH



PART NUMBERS

A Tube Size	B Tube Size	Pipe Thread	N	MA	MB	HA	HB	Mfg's Part No. PH*	Freightliner Part Number*
1/8	1/8	1/8	.69	.62	.62	.25	.25	171NT-2-2	23-11219-000
1/4	1/4	1/8	.75	.62	.62	.25	.25	171NT-4-2	23-11219-001
3/8	3/8	1/4	1.03	.81	.81	.27	.27	171NT-6-4	23-11219-002
3/8	1/4	1/4	1.03	.81	.76	.25	.27	Q-NTA-9056	23-11219-003

ENGINEERING NOTES

(1) Material: CA 360, CA 345, or CA 377 brass.

* The part numbers include a brass nut & an acetal sleeve.

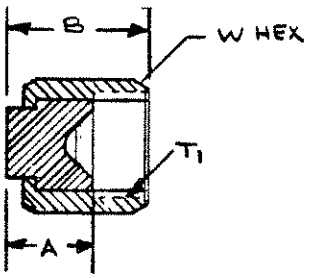
2 This part must meet applicable current requirements of Federal Motor Vehicle Safety Standard No. 106.

COMPILED	T.N.	DATE DRAWN		Material	MASTER NUMBER	
APPROVED		01-21-83		(1)	05080	000D1

EAC-826 Portland FREIGHTLINER CORPORATION Oregon 97208 B A

ORIGINAL JOB NO.	TITLE	PART NO.
B1326	FITTING CAP, FEMALE	23-11266
LAST CHG LTR A		SHEET 1 OF 1

SKETCH



PART NUMBERS ④

T_1 STRAIGHT THREAD	"A" DIM.	"B" DIM.	W HEX	MANUFACTURERS NO.		FREIGHTLINER PART NUMBER
				PH	STX	
5/16-24	.38	.54	3/8	06CP-2	--	23-11266-002
7/16-20	.34	.61	9/16	-4	1229-4S	-004
9/16-18	.47	.72	11/16	-6	-6S	-006
3/4-16	.53	.84	7/8	-8	-8S	-008
1-1/6-12	.66	1.02	1-1/4	-12	-12S	-012
1-5/16-12	.63	1.12	1-1/2	-16	-16S	-016

ENGINEERING NOTES

① MATERIAL: Steel [illegible]

2 FINISH: Cadmium or Zinc Plated

3 SAE 070112

④ AEROQUIP and WEATHERHEAD are also approved vendors; space precludes specific listings.

PRE-RELEASE PRINT

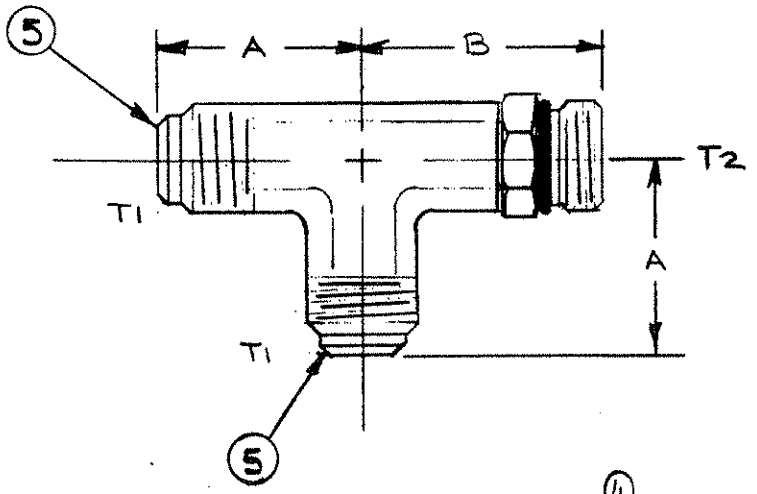
		DATE DRAWN		MATERIAL	
COMPILED	EGGIMAN			①	
APPROVED	Morrison				

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A	H0117	[illegible]	7-19-83	REVISED NOTES, ADD STX

ORIGINAL JOB NO.	TITLE	PART NO.
B1326	STRAIGHT THREAD RUN TEE O-RING	23-11267
LAST CHG LTR B		SHEET 1 OF 1

SKETCH



PART NUMBERS (4)

T_1 STRAIGHT THREAD	T_2 STRAIGHT THREAD	A DIM.	B DIM.	MANUFACTURERS NO. PH	MANUFACTURERS NO. STX	FREIGHTLINER PART NUMBER
5/16-24	5/16-24	.77	.91	053T-2-2	--	23-11267-022
7/16-20	7/16-20	.89	1.03	-4-4	1090-4-4S	-044
9/16-28	9/16-18	1.06	1.25	-6-6	-6-6S	-066
3/4-16	3/4-16	1.25	1.45	-8-8	-8-8S	-088
1-1/16-12	1-1/16-12	1.66	1.94	-12-12	-12-12S	-212
1-5/16-12	1-5/16-12	1.81	2.05	-16-16	-16-16S	-216

ENGINEERING NOTES

(1) MATERIAL: Steel (Cadmium Plated)

2 FINISH: Cadmium or Zinc Plate

3 SAE 070428

(4) AEROQUIP and WEATHERHEAD are also approved vendors; space precludes specific listings.

(5) Seal Angle: 37°

Use with JIC Swivel Fittings.

CHANGE INFORMATION			
LTR	JOB NO.	BY	DATE
A	H0117	Howard	7-19-83
B	B8369C	SWJ	2-4-86

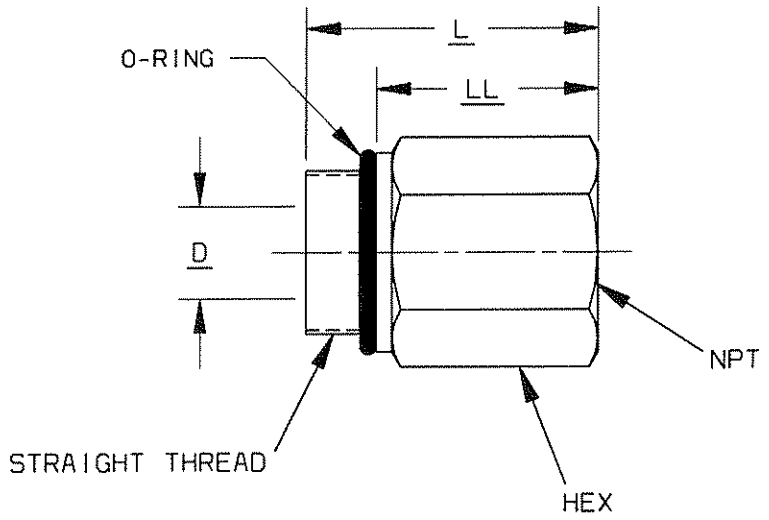
ADD STY & REVISED NOTES
ADDED NOTE 5.

COMPILED	MDE	DATE DRAWN		MATERIAL	
APPROVED	Morrison			(1)	

FREIGHTLINER CORPORATION Oregon 97208

B M/F P. M/F

DRAWN	RLE	TITLE	DRAWING NUMBER	
APPRV	K H	ADAPTER-STEEL, MALE ST THRD O-RING/FEMALE PIPE	23-11290	
DATE	10/24/80	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2	CHG. LTR. E
CATIA ORIGINAL				



D	STRAIGHT THREAD	NPT	HEX	L	LL	SUPPLIER PH	F/L SPEC NO.
.172	7/16-20	1/4-18	3/4	1.16	.80	4-1/4 F50G-S	PH 0502 4 4
.297	9/16-18	1/4-18	3/4	1.16	.77	6-1/4 F50G-S	23-11290-064
.391	3/4-16	1/2-14	1 1/8	1.50	1.06	8-1/2 F50G-S	23-11290-088
.391	3/4-16	3/8-18	7/8	1.28	.84	8-3/8 F50G-S	PH 0502 8 6
.500	7/8-14	1/4-18	1	.81	.31	10-1/4 F50G-S	PH 0502 10 4
.500	7/8-14	3/8-18	1	1.31	.81	10-3/8 F50G-S	PH 0502 10 6
.500	7/8-14	1/2-14	1 1/8	1.53	1.03	10-1/2 F50G-S	PH 0502 10 8
.500	7/8-14	3/4-14	1 3/8	1.63	1.13	10-3/4 F50G-S	PH 0502 10 12
.656	1 1/16-12	1/2-14	1 1/4	1.41	.82	12-1/2 F50G-S	23-11290-128
.656	1 1/16-12	3/4-14	1 3/8	1.72	1.13	12-3/4 F50G-S	23-11290-212

CHG	JOB NO	DATE	BY	REVISION
C	E00334-06	03/25/97	DAJ	REVISED AND REDRAWN IN CATIA, ADDED -128.
D	PA2042-78	08/11/97	DAJ	CHARTED VENDOR NUMBERS TO PRINT.
E	B05977-03	02/07/00	LFB	ADDED 23-11290-148. SEE SHEET 2.

DRAWN	RLE	TITLE	DRAWING NUMBER	
APPRV	K H	ADAPTER-STEEL, MALE ST THRD O-RING/FEMALE PIPE	23-11290	
DATE	10/24/80	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2	CHG. LTR. E
CATIA ORIGINAL				

	D	STRAIGHT THREAD	NPT	HEX	L	LL	SUPPLIER PH	F/L SPEC NO.
E	.719	1 3/16-12	1/2-14	1 3/8	1.06	.47	14-1/2 F50G-S	23-11290-148
	.844	1 5/16-12	3/4-14	1 1/2	1.50	.91	16-3/4 F50G-S	PH 0502 16 12
	.875	1 5/16-12	1 11-1/2	1 5/8	1.88	1.29	16-1 F50G-S	PH 0502 16 16
	1.078	1 5/8-12	1 11-1/2	1 7/8	1.00	.41	20-1 F50G-S	PH 0502 20 16

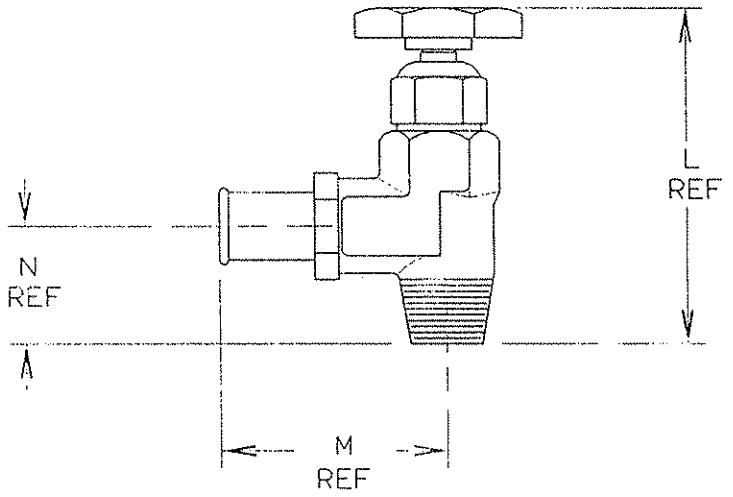
SPECIFICATIONS:

1. MATERIAL: STEEL BODY, NITRILE (BUNA N) O-RING.
2. FINISH: CAD OR ZINC PLATED
3. ALL DIMENSIONS ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
C	E00334-06	03/25/97	DAJ	REVISED AND REDRAWN IN CATIA, ADDED -128.
D	PA2042-78	08/11/97	DAJ	CHARTED VENDOR NUMBERS TO PRINT.
E	B05977-03	02/07/00	LFB	ADDED 23-11290-148.

DRAWN	RDF	TITLE VALVE, SEAT TYPE HOSE TO MALE PIPE	ITEM NUMBER 23-11317
APPRV	PCK		
DATE	03/06/89	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

SKETCH:



PART NUMBERS:

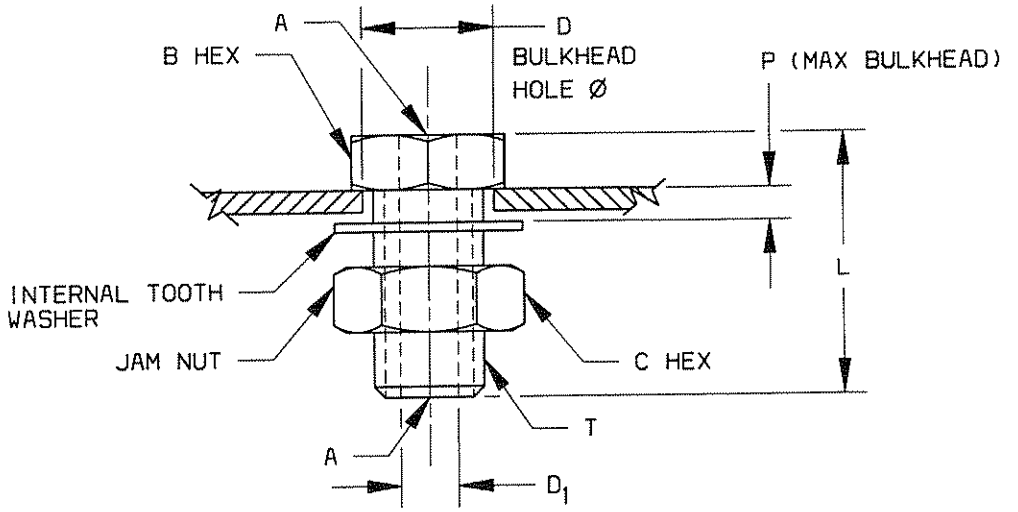
TUBE ID	PIPE THD	FLOW	L		M	N	MANUFACTURER'S NO.	FREIGHTLINER SPECIFICATION NUMBER
			OPEN	CLOSED			PH	
3/4	1/2	.563	4.300	3.700	2.312	1.344	SV404P-12-8	23-11317-000
5/8	1/2	.468	4.300	3.700	2.312	1.344	SV404P-10-8	23-11317-001
3/8	3/8	.281	2.650	2.350	1.360	.940	SV404P-6-6	23-11317-002

ENGINEERING NOTES:

1. MATERIAL: BRASS
2. THREADS TO CONFORM TO SAE STANDARD J476 DRYSEAL PIPE THREAD.
3. WORKING PRESSURE RANGES: UP TO 150 PSI.
4. PARKER-HANNIFIN NOMENCLATURE IS "TRUCK VALVE."

CHG	JOB/RLSE NO	DATE	BY	REVISION
C	PA2006-22	03/06/89	RDF	TITLE REVISED TO"SEAT TYPE"
D	PA2042-03	12/12/91	K R	VSSV404P-12-8 WAS VSQ-V-9154
E	PN0495-01	01/11/93	ERK	REMOVED THREAD SEALING COMPOUND.
F	894285-07	06/20/97	DAJ	ADDED -002.

DRAWN	DLL	TITLE	DRAWING NUMBER	
APPRV	DLL	FITTING-STRAIGHT FEMALE PIPE BULKHEAD	A23-11319	
DATE	12/02/80	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. D
CATIA ORIGINAL				



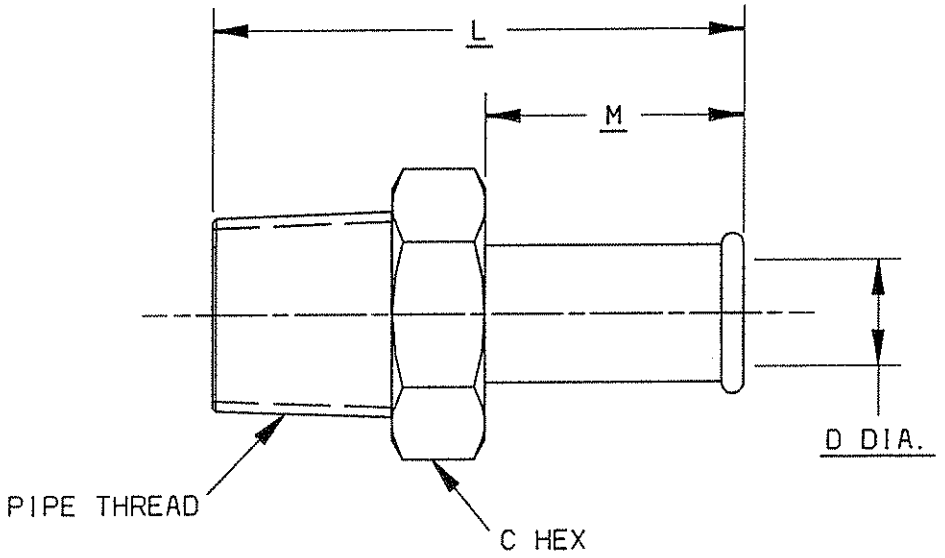
A PIPE THREAD	T STRAIGHT THREAD	B HEX	C HEX	P MAX	L	FLOW D_1	BULKHEAD HOLE DIA D	VENDOR NO. PH	FREIGHTLINER NUMBER
1/8	5/8-18	.875	.937	.89	1.50	.328	11/16	207ACBH-2	A23-11319-001
3/8	1.00-14	1.125	1.25	.62	1.31	.570	1 1/16	207ACBH-6	A23-11319-002
1/2	1 1/8-14	1.25	1.38	.75	1.50	.688	1 3/16	207ACBH-8	A23-11319-000
3/4	1 5/16-12	1.50	1.50	.65	1.50	.891	1 3/8	Q207ACBH-12	A23-11319-003

SPECIFICATIONS:

1. MATERIAL: BRASS BODY AND JAM NUT. STEEL LOCKWASHER.
2. INDUSTRY STD: REFERENCE SAE J530.

CHG	JOB NO	DATE	BY	REVISION
B	PH0588-23	08/15/94	DAJ	REDRAWN ADDED -001.
C	P05620-01	06/02/98	TCM	ADDED -002.
D	PA2042-93	11/24/99	LFB	ADDED SOLID TO DRAWING. ADDED -003.

DRAWN	PCK	TITLE	DRAWING NUMBER	
APPRV	ANF	CONNECTOR HOSE BARB TO MALE PIPE	23-11321	
DATE	08/24/89	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. H
CATIA ORIGINAL				



	HOSE ID	PIPE THREAD	C HEX	L	M	D DIA (FLOW)	MANUFACTURER'S NUMBER PH	FREIGHTLINER PART NUMBER
	3/4	1/2	7/8	1.87	.880	.625	VS68HB-12-8	23-11321-000
	5/8	3/8	3/4	1.62	.880	.500	VS68HB-10-6	23-11321-001
	5/8	1/2	7/8	1.81	.880	.500	VS68HB-10-8	23-11321-002
	1/2	1/4	5/8	1.500	.780	.406	VS68HB-8-4	23-11321-003
	3/8	3/8	11/16	1.500	.780	.281	VS68HB-6-6	681 997 04 71
F	1/2	3/8	11/16	1.500	.780	.406	VS68HB-8-6	23-11321-004
G	1	3/4	1-1/8	2.120	1.00	.812	VS68HB-16-12	681 997 01 71
G	1	1/2	1-3/16	2.00	1.00	.562	391417-S100	23-11321-005
H	1/2	1/2	7/8	1.73	.780	.406	VS68HB-8-8	23-11321-006

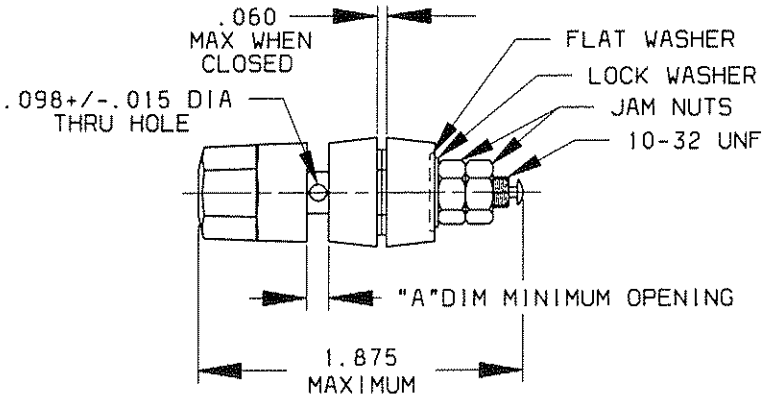
ENGINEERING NOTES:

1. MATERIAL: BRASS - CA360 OR CA345.
2. THREADS TO CONFORM TO SAE STANDARD J476 DRYSEAL PIPE THREAD.
3. TEMPERATURE AND WORKING PRESSURE RANGE: -65°F TO 250°F @ 150 PSI MAX.
4. APPLY VIBRA-SEAL THREAD COMPOUND.

CHG	JOB NO	DATE	BY	REVISION
F	P02179-01	04/17/97	DAJ	REVISED AND REDRAWN IN CATIA, ADDED -004.
G	PA2042-82	12/22/97	DAJ	ADDED TWO PART NO'S, 5/8 WAS 9/16, .880 WAS .875
H	P01943-11	03/26/98	DAJ	ADDED -006

23-11328 , H , ,POST-BINDING

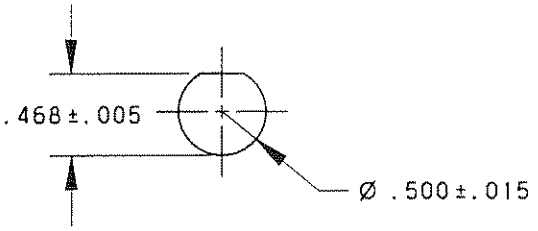
DRAWN	MCH	TITLE	DRAWING NUMBER	
APPRV	CRC	POST-BINDING POWER/GROUND	23-11328	
DATE	04/29/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. H



"A" DIM	APPROVED SUPPLIERS				COLOR	FREIGHTLINER PART NUMBER
	CEY	PSO		ALD		
.188				920-0561	BLK	23-11328-001 (3)
.125/.250	260BPETE	260B	899-103		BLK	23-11328-002
.188				920-0563	RED	23-11328-006 (3)
.125/.250	260RPETE	260R	899-102		RED	23-11328-007

ENGINEERING NOTES:

1. MUST FIT A .500 DIA "D" STYLE MOUNTING HOLE AS SHOWN BELOW (-002 & -007 ONLY). -001 & -006 MUST FIT A .500 +/-.015 DIA MOUNTING HOLE.



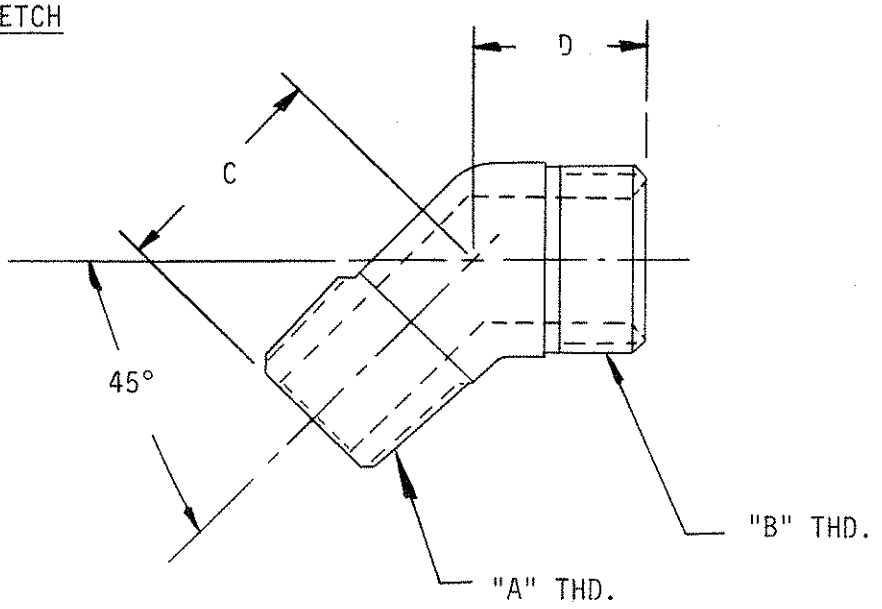
2. BINDING POST TO ACCEPT STANDARD BANANNA PLUG, A .080 PHONE TIP PLUG, STARNDED OR SOLID WIRE UP TO 14 AWG, A SPADE FORK AND AN ALIGATOR CLIP.

(3) 8-24 AND 10-24 THREAD ACCEPTABLE (-001 & -006 ONLY).

CHG	JOB NO	DATE	BY	REVISION
H	P06764-01	04/29/99	MCH	REVISED AND REDRAWN IN CATIA. "CEY" WAS "SUP".

ORIGINAL JOB NO.	TITLE	PART NO.
E0618	ELBOW, 45° MALE ADAPTER PIPE THREAD TO STRAIGHT THREAD	23-11341
LAST CHG LTR A		SHEET 1 OF 1

SKETCH



PART NUMBERS

"A" NPTF	"B" UNF-2A	"C"	"D"	MANUFACTURER'S NUMBER			FREIGHTLINER PART NUMBER
				PH	STX		
3/8-18	3/4-20	.94	.70	0-7348	40051-6-8 B		23-11341-000

ENGINEERING NOTES

1. MATERIAL: CA 360 F.C. Brass

CHANGE INFORMATION				
LTR	JOB NO.	BY	DATE	
A	0488A	NTW	1-21-82	STX 40051-6-8S TO STX40051-6-8

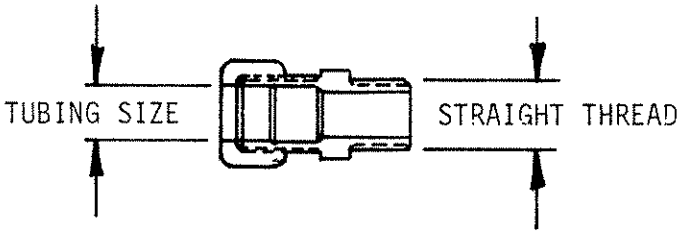
COMPILED	Dang	DATE DRAWN			UNIT OF MEASURE
APPROVED	Satterlee	6/29/81			EA.

EAC-830

Portland **FREIGHTLINER CORPORATION** Oregon 97208

M/F

ORIGINAL JOB NO.	TITLE	PART NO.
B1496	CONNECTOR ASSEMBLY TUBING TO STRAIGHT THREAD	A23-11342
LAST CHG LTR		SHEET OF



TUBE SIZE	STRAIGHT THREAD	MANUFACTURER'S NUMBER		FREIGHTLINER ASSEMBLY NUMBER
		PH		
1/4	7/16-24			A23-11342-001

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

COMPILED	AS	DATE DRAWN			
APPROVED		7/8/81			

EAC-826

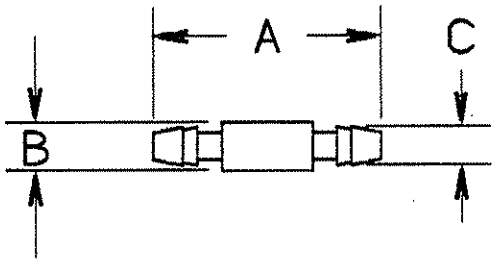
Portland

FREIGHTLINER CORPORATION

M/F Oregon 97208

DRAWN	RDF	TITLE	ITEM NUMBER
APPRV	PCK	CONNECTOR, BARB TUBING	23-11346
DATE	04/06/89	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

SKETCH



PART NUMBERS

TUBING ID	A	B	C	ARS	PH	VPL	FREIGHTLINER PART NUMBER
.125	1.188	0.250	0.200	AWL50P (1)	507A (1)	N230 2 (2)	23-11346-125

ENGINEERING NOTES

MATERIAL :

(1) BRASS

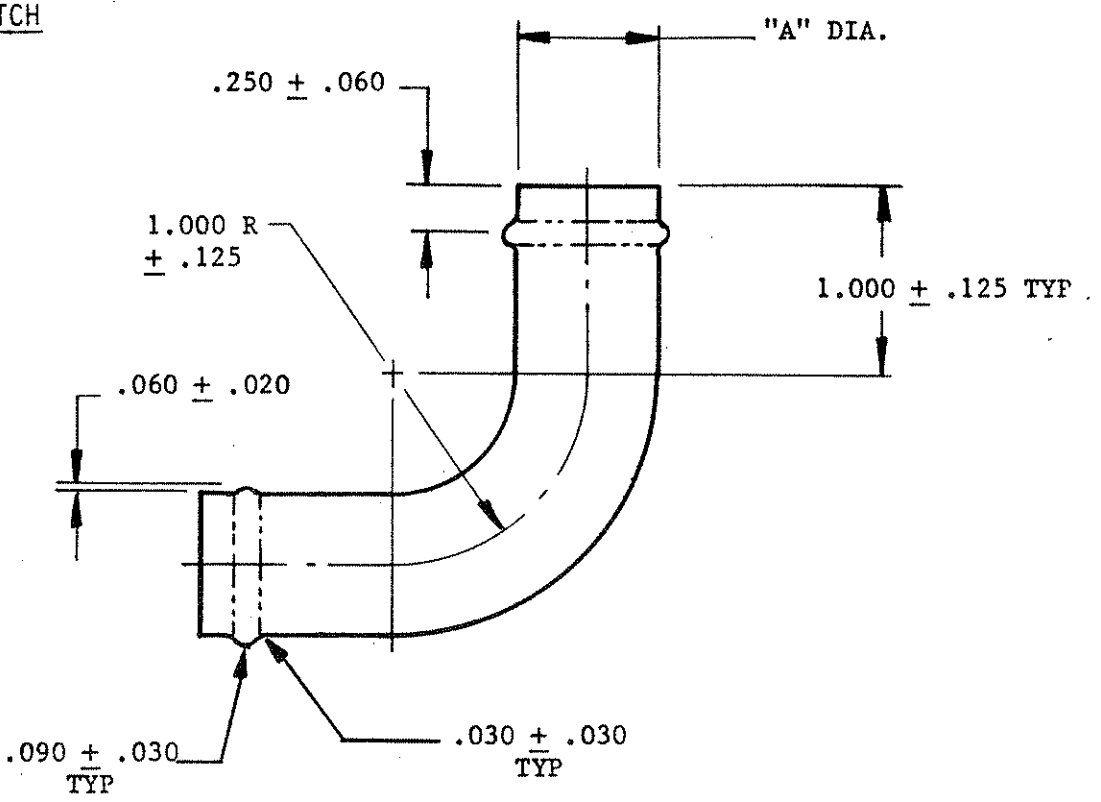
(2) NYLON, BLACK

CHG	JOB/RLSE NO	DATE	BY	REVISION
D	P4121F-01	04/16/89	RDF	REDRAWN , ADDED VPL N230 2

ORIGINAL JOB NO.	TITLE	PART NO.
M0230	ELBOW, HEATER, 90 DEG.	23-11373
LAST CHG LTR D		SHEET 1 OF 1

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
D	M0349	FHF	2-26-86	.060 R ± .020 to .090 ± .030 & .030 ± .030

SKETCH



PART NUMBER

	"A" DIA ±.015		Freightliner Part Number
	.750		23-11373-000
	.625		23-11373-100

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A1	M0238	DL	9-12-83	Was C1927
A2	M0238	DL	9-12-83	Alum to Copper
B	M0349	FHF	6-11-85	Add -100, A Dim
C	M0349	FHF	8-15-85	Add "Last Chg Ltr"

ENGINEERING NOTES

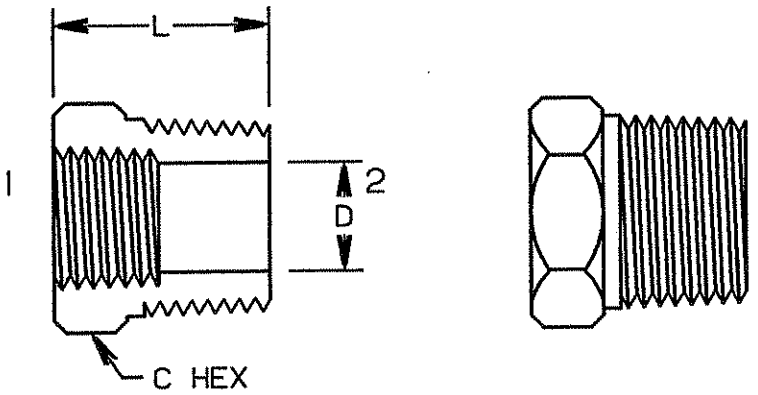
1. Material: Copper
2. Wall thickness: .049

COMPILED	D. Le L.	DATE DRAWN		Material	Master Number	
APPROVED	CLK	2-9-82		1	05100	000D1

EAC-830

Portland FREIGHTLINER CORPORATION Oregon 97208

DRAWN	AJS	TITLE BUSHING - PIPE BRASS	ITEM NUMBER 23-11359
APPRV	ED		
DATE	10/19/81	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



1 PIPE THREAD	2 PIPE THREAD	C HEX	L	FLOW DIA.D	MFG PART NO. PH	FREIGHTLINER PART NUMBER
1/8	1/4	9/16	.75	.328	VS209P-4-2	23-11359-001
1/8	3/8	11/16	.75	.328	VS209P-6-2	23-11359-002
1/4	3/8	11/16	.75	.422	VS209P-6-4	23-11359-003
1/8	1/2	7/8	1.00	.328	VS209P-8-2	23-11359-007
1/4	1/2	7/8	1.00	.422	VS209P-8-4	23-11359-004
3/8	1/2	7/8	1.00	.562	VS209P-8-6	23-11359-005
3/8	3/4	1 1/8	1.00	.562	VS209P-12-6	23-11359-008
1/2	3/4	1 1/8	1.00	.688	VS209P-12-8	23-11359-006

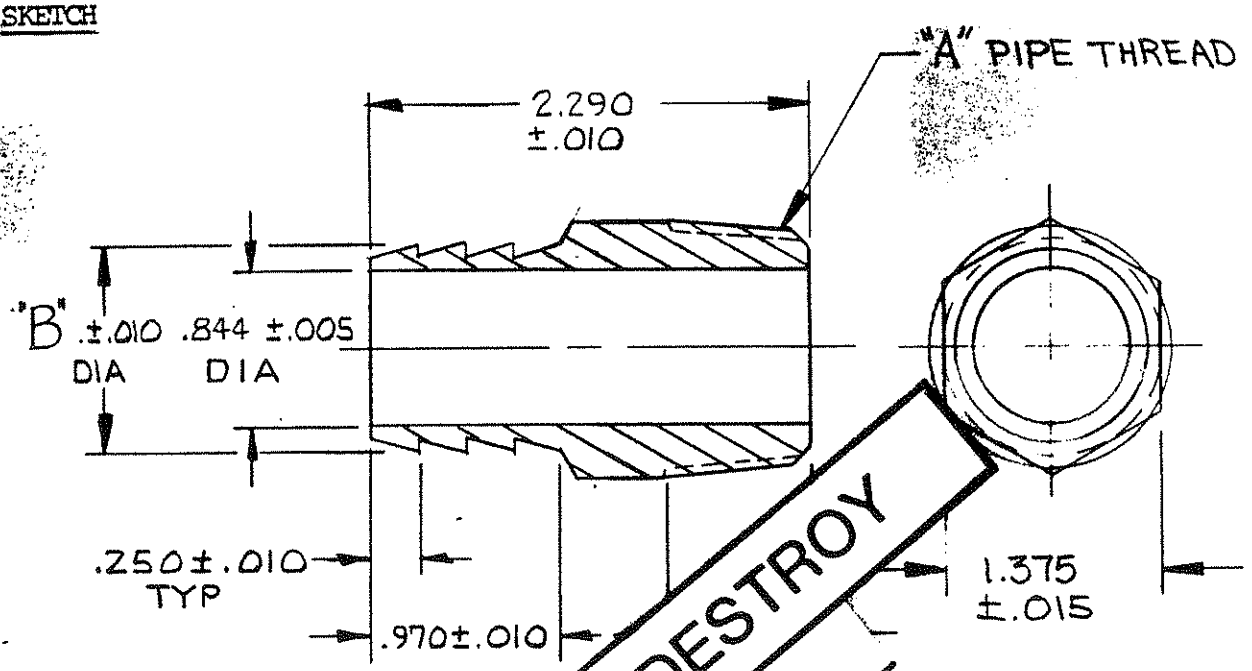
ENGINEERING NOTES:

1. MATERIAL: BRASS
2. MUST MEET APPLICABLE PROVISIONS OF FMVSS 106.
3. MALE PIPE THREADS TO BE COATED WITH "VIBRASEAL".

CHG	JOB/RLSE NO	DATE	BY	REVISION
D	P2213J-01	11/29/93	ERK	REDRAWN: ADDED -007 AND -008.

ORIGINAL JOB NO.	TITLE	PART NO.
F0245	HOSE BARB TO MALE PIPE	23-11376
LAST CHG LTR B		SHEET 1 OF 1

SKETCH



REMOVE & DESTROY

PART NUMBERS

"A" PIPE THREAD	"B"	OR P/N	FREIGHTLINER PART NUMBER
1"-11½ NPTF		(PH) Q-HB1-8173 (A)	23-11376-000 (B)

MATERIAL:

CA 360 F.C. BRASS

COMPILED	E.R.H.M.	DATE DRAWN			
APPROVED	TD	6-02-82			

CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A	F0245	ERHM	7/7/82	Q-HB7970 → Q-HB18173
B	F0245	CL	7-27-82	SEE M/F HISTORY

ORIGINAL JOB NO.	TITLE	PART NO.
M0132	FITTING, PERMANENT SAE 45° SWIVEL	23-11417
LAST CHG LTR A		SHEET 1 OF 2

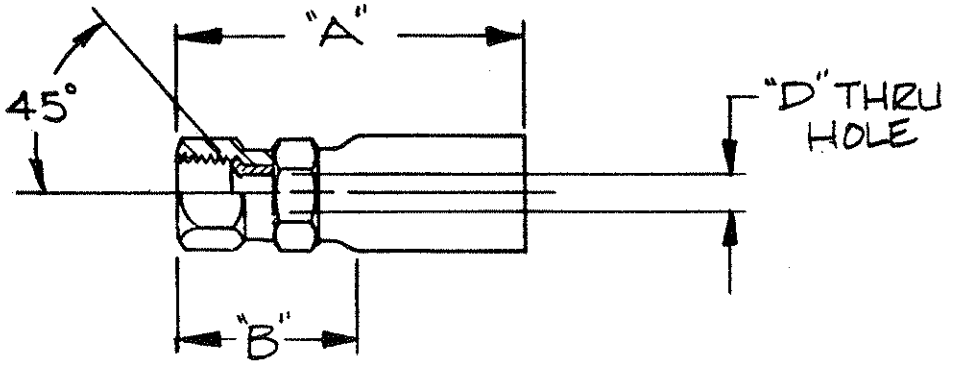
SCOPE

This specification describes swivel fitting for use with SAE 100R7 thermo plastic hose.

APPLICATION

Low - Med pressure hydraulic applications.

SKETCH



PART NUMBERS

See sheet 2 for more part numbers

Hose Size	Thread	(2) A	(2) B	(2) D	Manufacturers Part No. AQ	GT	STX	PK	Freightliner Part No.
# 3	7/16-20	2.20	1.20	.10	FC5811 -0403S	3PCT -4FSX	34767 -4-3$	10655 (A) -4 -3	23-11417-003
# 4	7/16-20	2.52 2.48	1.27	.15	FC5811 -0404S	4PCT -4FSX		10655 -4 -4	-004
# 5	1/2-20		1.20	.20	FC5811 -0505S	5PCT -5FSX		10655 -5 -5	-005
# 6	5/8-18	2.76	1.32	.28	FC5811 -0606S	6PCT -6FSX		10655 -6 -6	-006
# 8	3/4-16	3.11	1.46	.38	FC5811 -0808S	8PCT -8FSX		10655 -8 -8	-008
STYLE					Swage	Swage	Crimp	Swage	

Notes

1. Material: Steel, cadmium or zinc electroplated.
2. Dimensions vary between manufacturers. Aeroquip's dimensions are shown.
3. Hose used with this fitting must be supplied by the same manufacturer as the fitting.
4. Fittings may be optional dual angle seat per SAE J516b. PK part numbers have been revised to reflect this option. (106 series fits both 45° + 37° adapters)

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A1	M0132	RDF	11-07-83	10655 was 10855. added Note 4.

COMPILED	MS	DATE DRAWN			
APPROVED	PP/GS	7-7-82			

ORIGINAL JOB NO.	TITLE	PART NO.
M0132	FITTING, PERMANENT SAE 45° SWIVEL	23-11417
LAST CHG LTR A		SHEET 2 OF 2

MORE PART NUMBERS

Hose Size	Thread	IB	SMQ	WH			
#3	7/16-20	HAQ3-04NS	3903-03544	24303 E604			
#4	7/16-20						
#5	1/-20						
#6	5/8-18						
#8	3/4-16						
STYLE		CRIMP	SWAGE	CRIMP			

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A	M0132	RDF	11-07083	See Sheet 1

COMPILED	RDF	DATE DRAWN			
APPROVED	RDF	1/19/83			

EAC-826

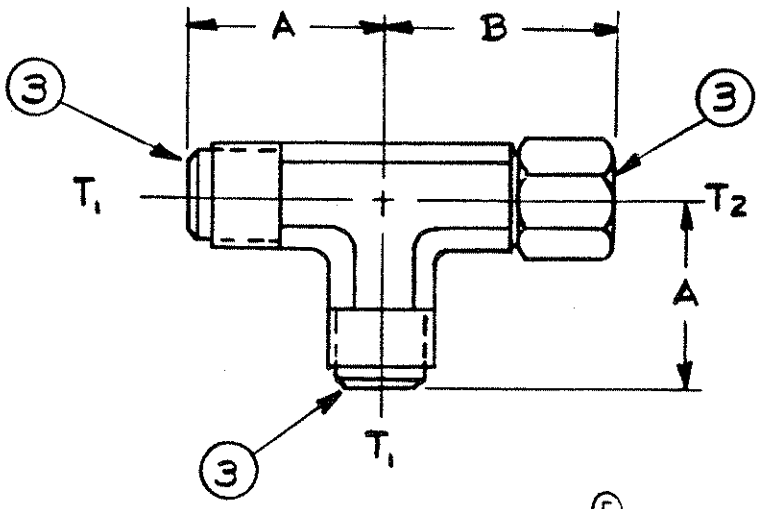
Portland FREIGHTLINER CORPORATION Oregon 97208

M/F

General Use Part

ORIGINAL JOB NO.	TITLE	PART NO.
H0117	TEE, STRAIGHT THREAD SWIVEL RUN	23-11469
LAST CHG LTR		SHEET 1 OF 1

SKETCH:



PART NUMBERS: ⑤

T_1 STRAIGHT THREAD	T_2 STRAIGHT THREAD	A DIM.	B DIM.	MANUFACTURER'S NO. PH	MANUFACTURER'S NO. STX	FREIGHTLINER PART NUMBER
5/16-24	5/16-24	.77	.97	063T- 2- 2	--	23-11469-022
7/16-20	7/16-20	.89	1.00	- 4- 4	1007- 4- 4S	-044
9/16-28	9/16-18	1.06	1.25	- 6- 6	- 6- 6S	-066
3/4 -16	3/4 -16	1.25	1.38	- 8- 8	- 8- 8S	-088
7/8 -14	7/8 -14	1.45	1.62	-10-10	-10-10S	-110
1-1/16-12	1-1/16-12	1.66	1.75	-12-12	-12-12S	-212
1-5/16-12	1-5/16-12	1.81	2.00	-16-16	-16-16S	-216

ENGINEERING NOTES:

① MATERIAL: Steel
2 FINISH: Cadmium or Zinc Plated
③ SEAL ANGLE: 37°
Use with JIC Swivel Fittings
4 SAE 070432
⑤ AEROQUIP and WEATHERHEAD are also approved vendors; space precludes specific listings.

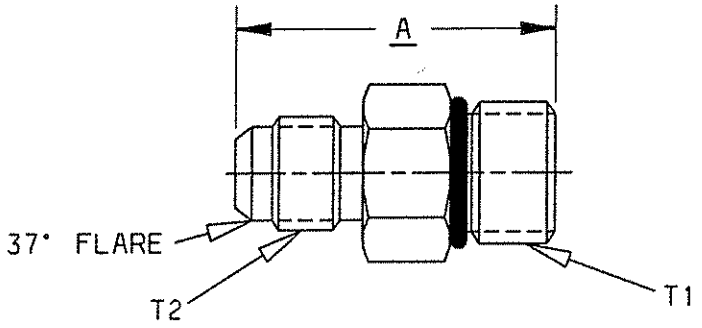
PRE-RELEASE PRINT

COMPILED	HOwen	DATE DRAWN		MATERIAL	
APPROVED		6/23/83		①	

CHANGE INFORMATION | DATE | BY | JOB NO. | LTR

CHANGE INFORMATION | DATE | BY | JOB NO. | LTR

DRAWN	DAJ	TITLE	DRAWING NUMBER
APPRV	DAJ	CONNECTOR-STRAIGHT THREAD WITH O-RING	23-11470
DATE	06/30/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. G
CATIA ORIGINAL			



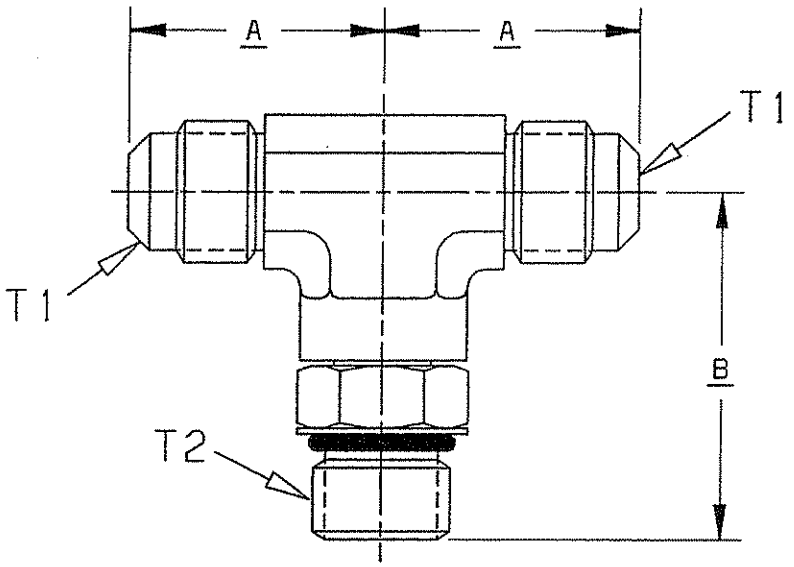
	STRAIGHT THREAD		TUBE OD	A	MFR'S NO.		FREIGHTLINER PART NUMBER
	T1	T2			PH		
	7/16-20	7/16-20	1/4	1.23	4 F50XS		23-11470-044
	9/16-18	9/16-18	3/8	1.30	6 F50XS		23-11470-066
	9/16-18	3/4-16	1/2	1.44	8-6 F50XS		23-11470-068
	3/4-16	9/16-18	3/8	1.38	6-8 F50XS		23-11470-086
	3/4-16	3/4-16	1/2	1.48	8 F50XS		23-11470-088
	3/4-16	7/8-14	5/8	1.64	10-8 F50XS		23-11470-089
	7/8-14	9/16-18	3/8	1.50	6-10 F50XS		23-11470-106
	7/8-14	3/4-16	1/2	1.59	8-10 F50XS		23-11470-108
	7/8-14	7/8-14	5/8	1.70	10 F50XS		23-11470-110
	7/8-14	1-1/16-12	3/4	1.88	12-10 F50XS		23-11470-112
D	1-1/16-12	7/8-14	5/8	1.86	10-12 F50XS		23-11470-210
	1-1/16-12	1-1/16-12	3/4	1.97	12 F50XS		23-11470-212
	1-1/16-12	1-5/16-12	1	1.99	16-12 F50XS		23-11470-216
	1-5/16-12	1-5/16-12	1	2.05	16 F50XS		23-11470-616
	1-5/8-12	1-5/8-12	1-1/4	2.17	20 F50XS		23-11470-720
	1-1/16-12	1-5/8-12	1-1/4	2.13	20-12 F50XS		23-11470-220
E	1-7/8-12	1-5/8-12	1-1/4	2.24	20-24 F50XS		23-11470-420
	1-5/16-12	1-5/8-12	1-1/4	2.33	20-16 F50XS		23-11470-716
	1-5/16-12	7/8-14	5/8	1.89	10-16 F50XS		23-11470-610
	1-5/16-12	1-1/16-12	3/4	1.99	12-16 F50XS		23-11470-612
F	7/8-14	1-5/16-12	1	2.08	16-10 F50XS		PH 0503 10 16
G	1-1/16-12	3/4-16	1/2	1.77	8-12 F50XS		PH 0503 12 8
	1-5/8-12	1-5/16-12	1	2.13	16-20 F50XS		PH 0503 20 16

ENGINEERING NOTES:

1. MATERIAL: BODY-STEEL
   O-RING- NITRILE (BUNA N) OR EQUIVALENT
2. FINISH: ZINC W/ YELLOW CHROMATE
3. INDUSTRY STANDARD: SAE J514 (FIG. 070120)
4. AEROQUIP AND WEATHERHEAD ARE ALSO APPROVED VENDORS.

CHG	JOB NO	DATE	BY	REVISION
D	P02686-03	06/30/97	DAJ	REVISED & REDRAWN IN CATIA, ADDED -210 & RMVD WASHER.
E	P03175-68	02/25/98	DAJ	ADDED -420.
F	938452-09	03/20/98	DAJ	ADDED -716, -610, -612, AND PH NUMBERS.
G	PA2042-83	03/23/98	DAJ	REV'D PH 0503 12 8 AND PH 0503 20 16.

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	TEE - STRAIGHT THREAD O-RING BRANCH, 37° (JIC)	23-11471	
DATE	08/14/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. C
CATIA ORIGINAL				



	T1 STRAIGHT THREAD	T2 STRAIGHT THREAD	DIMENSIONS		MFR'S NO.		FREIGHTLINER PART NUMBER
			A	B	PH	STX	
C	7/16-20	7/16-20	0.89	1.03	4 S50X-S		23-11471-044
	3/4-16	3/4-16	1.25	1.45	8 S50X-S		23-11471-088
	1-1/16-12	1-1/16-12	1.66	1.94	12 S50X-S		23-11471-212
	1-5/16-12	1-5/16-12	1.81	2.05	16 S50X-S		PH 253T16 16

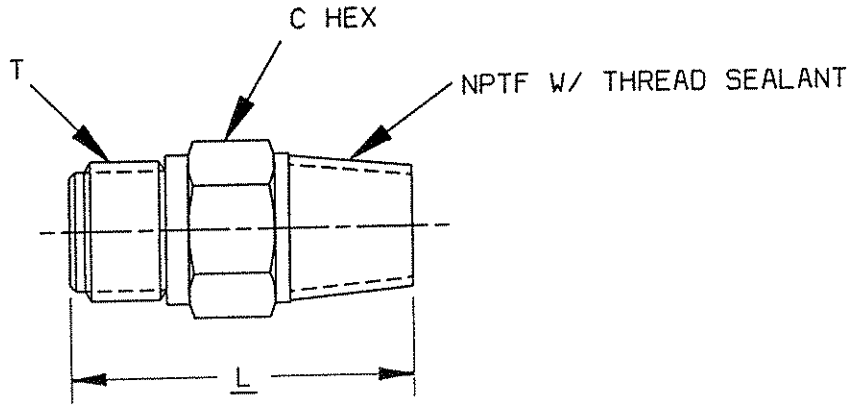
ENGINEERING NOTES:

C

1. MATERIAL: BODY - STEEL, O-RING - NITRILE (BUNA N)
2. FINISH: ZINC PLATE WITH CHROMATE FINISH
3. T1 SEAL ANGLE IS 37°, USE WITH JIC SWIVEL FITTINGS.
4. SAE J514, FIGURE 070429
5. AEROQUIP AND WEATHERHEAD ARE ALSO APPROVED VENDORS.

CHG	JOB NO	DATE	BY	REVISION
B	PA2042-78	08/14/97	DAJ	REVISED AND REDRAWN IN CATIA, RMVD INACTIVE PARTS.
C	PC3202-27	07/14/98	DAJ	ADDED -044, REVISED NOTE 1, 2 & 3, AND VENDOR P/N'S.

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	CONNECTOR JIC 37°/NPTF	23-11472	
DATE	02/25/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. E
CATIA ORIGINAL				



SIZE DIA.	T TUBE END	PT NPTF	C HEX	L LENGTH	MFR'S NO. PH	FREIGHTLINER PART NUMBER
1/4	7/16-20	1/8-27 1/4-18	1/2 9/16	1.22 1.42	VS0103-2-4 VS0103-4-4	23-11472-012 23-11472-022
3/8	9/16-18	1/4-18	5/8	1.43	VS0103-4-6	23-11472-023
1/2	3/4-16	1/4-18 3/8-18 1/2-14 3/4-14	13/16 13/16 7/8 1 1/8	1.53 1.53 1.78 1.86	VS0103-4-8 VS0103-6-8 VS0103-8-8 VS0103-12-8	23-11472-024 23-11472-034 23-11472-044 23-11472-064
5/8	7/8-14	3/8-18 1/2-14	15/16 15/16	1.70 1.89	VS0103-6-10 VS0103-8-10	23-11472-035 23-11472-045
3/4	1 1/16-12	3/4-14 1-11 1/2	1 1/8 1 3/8	2.06 2.25	VS0103-12-12 VS0103-16-16	23-11472-066 23-11472-086
1	1 5/16-12	1-11 1/2	1 3/8	2.30	VS0103-16-16	23-11472-088
1 1/4	1 5/8-12	1 1/4-11 1/2 1-11 1/2	1 11/16 1 11/16	2.45 2.42	VS0103-20-20 VS0103-16-20	23-11472-100 23-11472-080

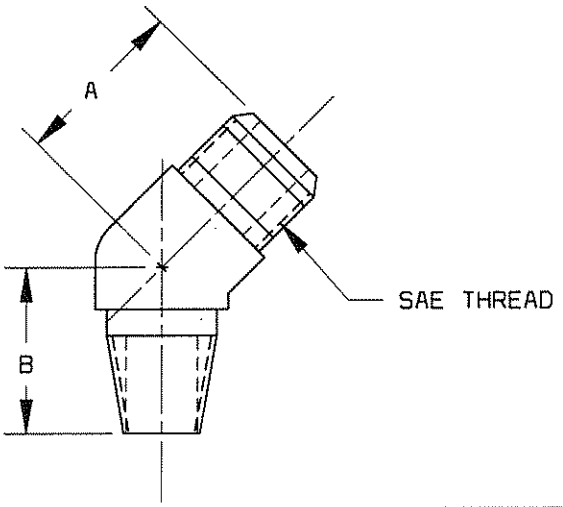
E

ENGINEERING NOTES:

1. MATERIAL: STEEL
2. FINISH: CAD OR ZINC PLATE
3. INDUSTRY STANDARD: REF SAE 070102
4. PARTS MUST BE SUPPLIED WITH 'VIBRASEAL' APPLIED TO THE THREADS.
5. FITTINGS ASSEMBLY MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.
6. DIMENSIONS SHOWN ABOVE ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
E	P03175-68	02/25/98	DAJ	REVISED & REDRAWN IN CATIA, ADDED -080.

DRAWN	LFB	TITLE ELBOW-45° MALE JIC 37° FLARE TO PIPE THREAD	DRAWING NUMBER 23-11473
APPRV	DAJ		
DATE	02/15/00	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. E
CATIA ORIGINAL			



TUBE SIZE	SAE THREAD	PIPE THREAD	A	B	MANUFACTURER PH	FREIGHTLINER PART NUMBER
1/4	7/16-20	1/8-27	.72	.64	4 VTX	23-11473-012
		1/4-18	.82	.86	4-4 VTX	23-11473-022
3/8	9/16-18	1/4-18	.83	.86	6 VTX	23-11473-023
		3/8-18	.87	.95	6-6 VTX	23-11473-033
		1/2-14	1.06	1.17	6-8 VTX	23-11473-043
1/2	3/4-16	1/4-18	.98	.95	8-4 VTX	23-11473-024
		3/8-18	.98	.95	8 VTX	23-11473-034
		1/2-14	.99	1.17	8-8 VTX	23-11473-044
		3/4-14	1.04	1.20	8-12 VTX	23-11473-064
5/8	7/8-14	3/8-18	1.11	.98	10-6 VTX	23-11473-035
		1/2-14	1.11	1.17	10 VTX	23-11473-045
		3/4-14	1.28	1.20	10-12 VTX	23-11473-065
3/4	1 1/16-12	1/2-14	1.28	1.20	12-8 VTX	23-11473-046
		3/4-14	1.28	1.20	12 VTX	23-11473-066
1	1 5/16-12	3/4-14	1.47	1.29	16-12 VTX	23-11473-068
		1-11 1/2	1.47	1.48	16 VTX	23-11473-088

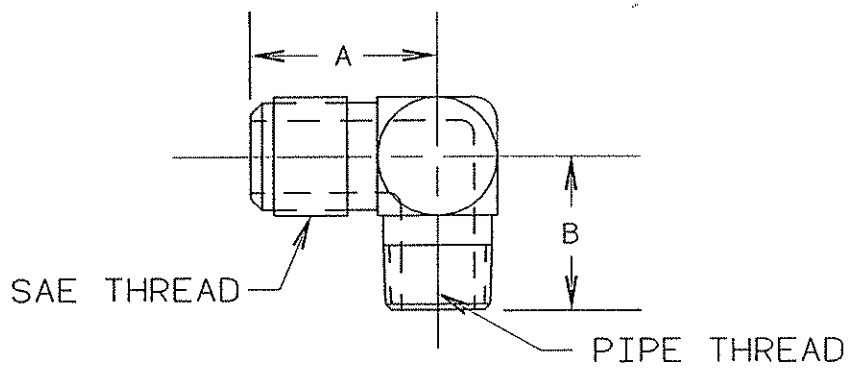
ENGINEERING NOTES:

1. MATERIAL: STEEL
2. INDUSTRY STANDARD: REF SAE 070302.
3. FINISH: CADMIUM OR ZINC PLATED.
4. FITTING ASSY MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.

CHG	JOB NO	DATE	BY	REVISION
E	P06456-03	02/15/00	LFB	REDRAWN IN CATIA.

DRAWN	H. OWEN	TITLE	ITEM NUMBER
APPRV	-	ELBOW, 90° MALE JIC 37° FLARE TO PIPE THREAD	23-11474
DATE	06/23/83	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

SKETCH:



PART NUMBERS:

TUBE SIZE	SAE THREAD OR (PTT)	PIPE THREAD	A	B	MANUFACTURER'S NUMBER PH			FREIGHTLINER PART NUMBER
						ALTERNATE		
1/4	7/16-20	1/8-27	0.89	.78	4 CTX-S	2103-2-4		23-11474-012
		1/4-18	1.05	1.09	4-4 CTX-S	2103-4-4		-
3/8	9/16-18	1/4-18	1.06	1.09	6 CTX-S	2103-4-6		-
		3/8-18	1.14	1.22	6-6 CTX-S	2103-6-6		-033
		1/2-14	1.23	1.44	6-8 CTX-S	2103-8-6		-
1/2	3/4-16	1/4-18	1.25	1.16	8-4 CTX-S	2103-4-8		-024
		3/8-18	1.25	1.22	8 CTX-S	2103-6-8		-034
		1/2-14	1.34	1.47	8-8 CTX-S	2103-8-8		-044
		3/4-14	1.42	1.59	8-12 CTX-S	2103-12-8		-064
5/8	7/8-14	3/8-18	1.45	1.30	10-6 CTX-S	2103-6-10		-
		1/2-14	1.45	1.47	10 CTX-S	2103-8-10		-045
		3/4-14	1.53	1.59	10-12 CTX-S	2103-12-10		-065
3/4	1 1/16-12	1/2-14	1.66	1.56	12-8 CTX-S	2103-8-12		-
		3/4-14	1.66	1.59	12 CTX-S	2103-12-12		-066
1	1 5/16-12	3/4-14	1.81	1.72	16-12 CTX-S	2103-12-16		-068
		1-11 1/2	1.81	1.97	16 CTX-S	2103-16-16		-069
1 1/4	1 5/8-12	1-11 1/2	2.06	2.06	20-16 CTX-S	2103-16-20		-080

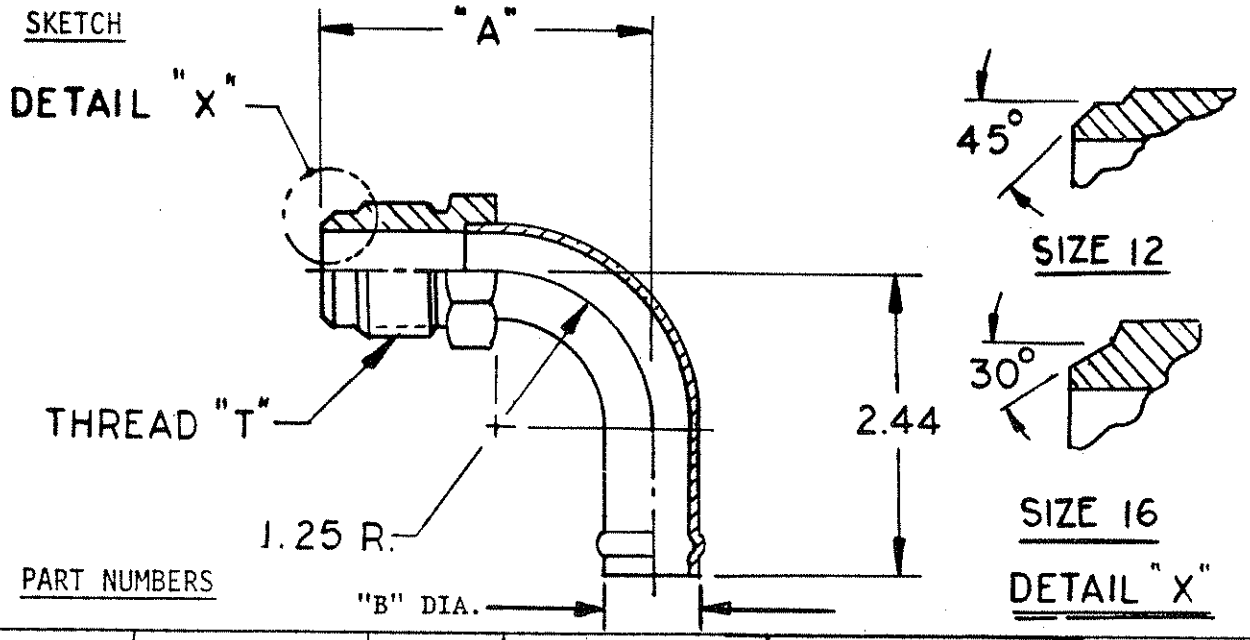
ENGINEERING NOTES:

1. MATERIAL: STEEL
2. FINISH: CADMIUM OR ZINC PLATED
3. SAE 070202

CHG	JOB/RLSE NO	DATE	BY	REVISION
D	467315-59	06/19/92	ERK	REV & RDRWN; ADD ALT. VNDR PN'S, RMV'D -022/23/35/43/46
E	P1123E-01	10/28/92	ERK	-045: VNDR PN TO 2103-8-10 FROM 2103-10-10.
F	550783-04	10/28/94	DAJ	ADDED -064.

ORIGINAL JOB NO.	TITLE	PART NO.
M0238	ADAPTER, PIPE/TUBING 90° MALE FLARED CONN. TO BEADED TUBE CONN.	23-11633
LAST CHG LTR D		SHEET 1 OF 1

SKETCH



PART NUMBERS

SIZE	THREAD "T"	"A" DIM ±.06	"B" DIA. ±.015	MANUFACTURER'S NUMBER STX	FREIGHTLINER PART NUMBER
12-12	1-1/16 - 14	2.38	.750	37521-12-12S	23-11633-012
16-12	1-5/16 - 14	2.10	.750	37521-16-12S	23-11633-016
12-10	1-1/16 - 14	2.62	.625	37521-12-10S	23-11633-112
16-10	1-5/16 - 14	2.34	.625	37521-16-10S	23-11633-116

SPECIFICATIONS

1. Material: Steel
2. Finish: Cad. Plate

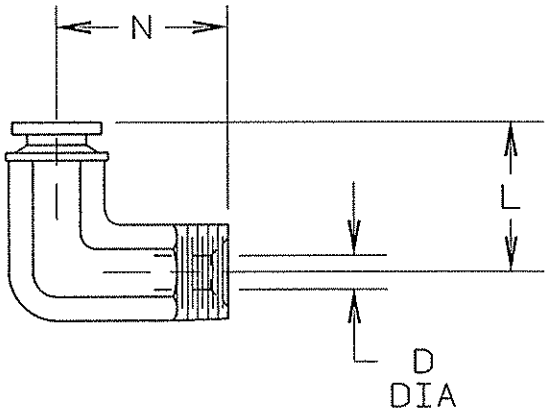
LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A	M0349	EF	6-11-85	ADD -112, -116, B DIM
B	M0349	FHF	8-15-85	ADD 'LAST CHG LTR'
C	5060D	FHF	3-18-86	REV -112, -116 ADD MTR NO.
D	7727D	TTR	7-21-86	REVISED -112 & -116

COMPILED	D.LeL.	DATE DRAWN			Master Number	
APPROVED	BBK	12-7-83			05050	000D1

E-183A Litho in USA Portland

FREIGHTLINER CORPORATION Oregon 97208

DRAWN	FEF	TITLE	ITEM NUMBER
APPRV	DJL	ELBOW-90° MALE NYLON TUBE TO PIPE	23-11648
DATE	02/28/84	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



PART NUMBERS:

TUBE SIZE	PIPE THREAD	D	L	N	MANUFACTURER'S NUMBER		FREIGHTLINER PART NUMBER
					PH		
1/4	1/8-27	.188	.83	.69	169PLNS-4-2		23-11648-000

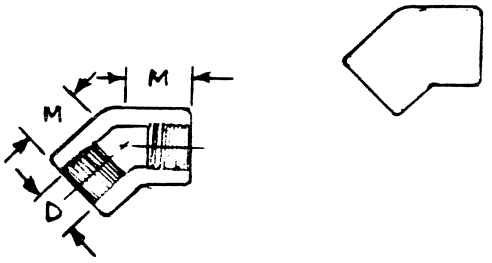
ENGINEERING NOTES:

(1) MATERIAL: BRASS, FORGED ASTM B283, CA377.

2. MUST MEET ALL APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD NUMBER 106.

CHG	JOB/RLSE NO	DATE	BY	REVISION
B	PA2042-66	03/27/96	ERK	REDRAWN; DIMENSIONS REVISED

ORIGINAL JOB NO.	TITLE	PART NO.
3799C	ELBOW FEMALE 45° BRASS	23-11662
LAST CHG LTR		SHEET OF



Pipe Thread	M	D	Manufacturer's Number			Freightliner Part Number
			PH			
1/8	.450	.328	2201P-2-2			23-11662-001

ENGINEERING NOTES:

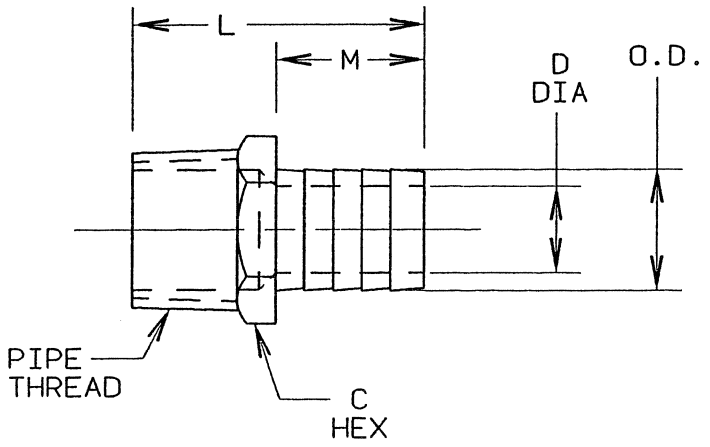
1 Material: Brass CA345, CA360 or CA377

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

COMPILED	RP	DATE DRAWN	Material	Module No.	Master No.
APPROVED		5-18-84	1	000	05100

DRAWN	RDF	TITLE	ITEM NUMBER
APPRV	PCK	CONNECTOR HOSE BARB TO MALE PIPE	23-11687
DATE	12/15/89	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



PART NUMBERS:

I.D. HOSE SIZE	PIPE THREAD	C HEX	L	M	O.D.	D DIA	MANUFACTURER'S NUMBER	FREIGHTLINER PART NUMBER
							PH	
1/4	1/8	7/16	1.54	.97	.290	.187	VS125HBL-4-2	23-11687-025
3/8	1/4	9/16	1.64	.97	.415	.281	VS125HBL-6-4	23-11687-038
3/8	3/8	11/16	1.71	.97	.415	.281	VS125HBL-6-6	23-11687-039
3/4	3/4	1 1/16	1.88	.97	.790	.562	VS125HBL-12-12	23-11687-075
1.00	3/4	1-1/16	2.08	1.17	1.03	.875	VS125HBL-16-12	23-11687-100
1.00	1	1-3/8	2.23	1.17	1.03	.875	VS125HBL-16-16	23-11376-000

ENGINEERING NOTES:

(1) MATERIAL: BRASS.

2 PARTS MUST BE SUPPLIED WITH VIBRASEAL APPLIED TO THREADS.

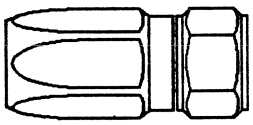
CHG	JOB/RLSE NO	DATE	BY	REVISION
B	379168-90	12/15/89	RDF	REDRAWN, ADDED -100
C	PA2042-03	01/23/92	K R	ADDED 23-11376-000
D	PH0588-09	05/23/94	ERK	ADDED 23-11687-025
E	649448-04	10/12/94	DAJ	ADDED 23-11687-039

GENERAL USE PART

A23-11719

ORIGINAL JOB NO.	TITLE	A23-11719
H0205	SWIVEL ASSEMBLY, JIC 37°	
LAST CHG LTR: A		SHEET 1 OF 1

SKETCH:



ASSEMBLY NUMBERS:

HOSE SIZE	SAE THREAD SIZE	MANUFACTURER'S NUMBER			FREIGHTLINER ASSEMBLY NUMBER
		STX	AQ		
-4	7/16-20	7117- 4S	411-4S		A23-11719-004
-5	1/2-20	7117- 5S	411-5S		A23-11719-005
-6	9/16-18	7117- 6S	411-6S		A23-11719-006
-8	3/4-16	7117- 8S	411-8S		A23-11719-008
-10	7/8-14	7117-10S	411-10S		A23-11719-010
-12	1-1/16-12	7117-12S	411-12S		A23-11719-012
-16	1-5/16-12	7117-16S	411-16S		A23-11719-016
-20	1-5/8-12	7117-20S	411-20S		A23-11719-020

ENGINEERING NOTES:

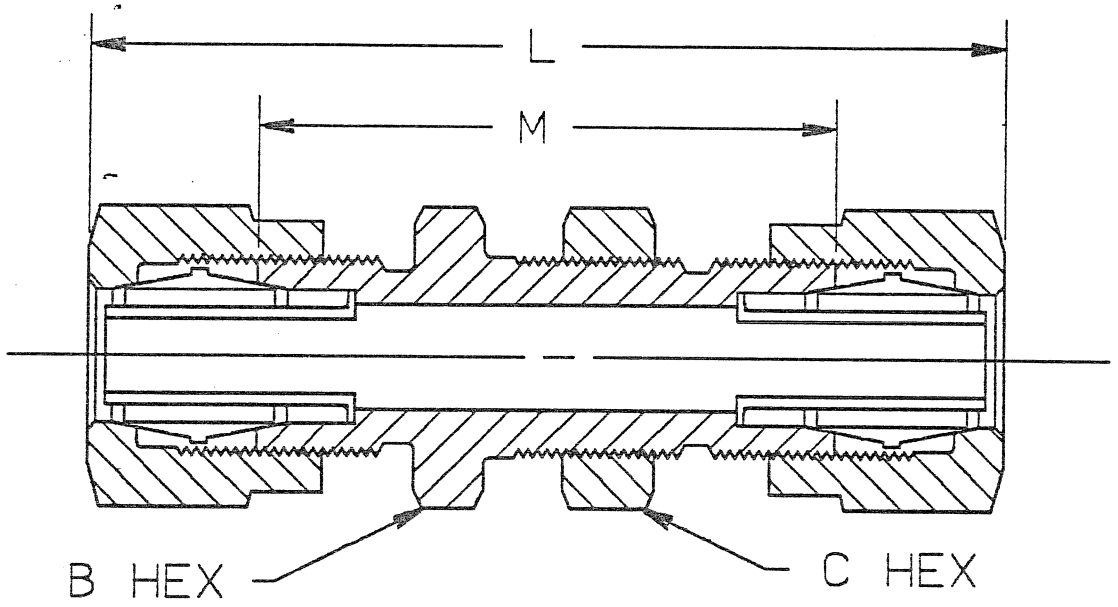
1. STX 7117 SERIES TO BE SUPPLIED WITH CAD NUT.
   (TO DISTINGUISH FROM SAE 45°)

COMPILED	EAM	DATE DRAWN	CADAM ORIGINAL	MATERIAL	MASTER NUMBER	
APPROVED	EAM	06-14-85			06146	000D1

CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A	7042D	BT	06-27-86	ADDED AQ NUMBERS

DRAWN	PCK	TITLE	ITEM NUMBER
APPRV	ANF	FITTING, BULKHEAD UNION NYLON TUBING	23-11730
DATE	09/12/90	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



TUBE SIZE	STRAIGHT THREAD	B HEX	C HEX	L	M	MANUFACTURER'S PART NUMBER	FREIGHTLINER PART NUMBER
1/4	7/16-24	9/16	9/16	2.00	1.38	62NBH-4	23-11730-000
3/8	17/32-24	11/16	3/4	2.00	2.50	62NBH-6	23-11730-001
1/2	11/16-20	13/16	1	2.90	1.91	62NBH-8	23-11730-002
5/8	13/16-18	15/16	1	3.0	2.01	62NBH-10	23-11730-003

ENGINEERING NOTES

(1) MATERIAL: BRASS C36000

2. MUST MEET APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD 106.

CHG	JOB/RLSE NO	DATE	BY	REVISION
A	PX2401-21	09/12/90	PCK	REDRAWN. ADDED 23-11730-003

GENERAL USE PART

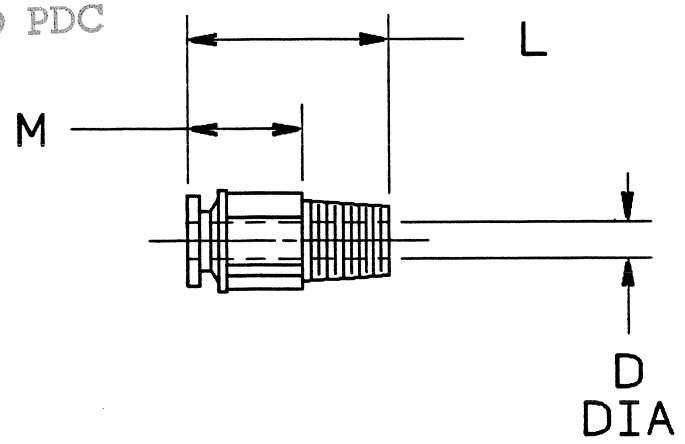
23-11732

ORIGINAL JOB NO.		TITLE	PART NO.
N0194		CONNECTOR, MALE NYLON TUBE TO PIPE	23-11732
LAST CHG LTR	A		SHEET 1 OF 1

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

SKETCH:

RECEIVED
APR 11 1988
CHICAGO PDC



PART NUMBERS:

TUBE SIZE	D DIA	L DIM	M DIM	PIPE THREAD	MANUFACTURER'S NUMBER		FREIGHTLINER PART NUMBER
					PH		
1/4	.188	.96	.57	1/8-27	VS68PL-4-2		23-11732-000
1/8	.078	.96	.53	1/4-NPTF	VS68PL-2-4		23-11732-001

ENGINEERING NOTES:

(1) MATERIAL: BRASS, CA377.

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A	P-L005	BT	02-20-86	ADD -001 & VS;DELETE MASTER NO.

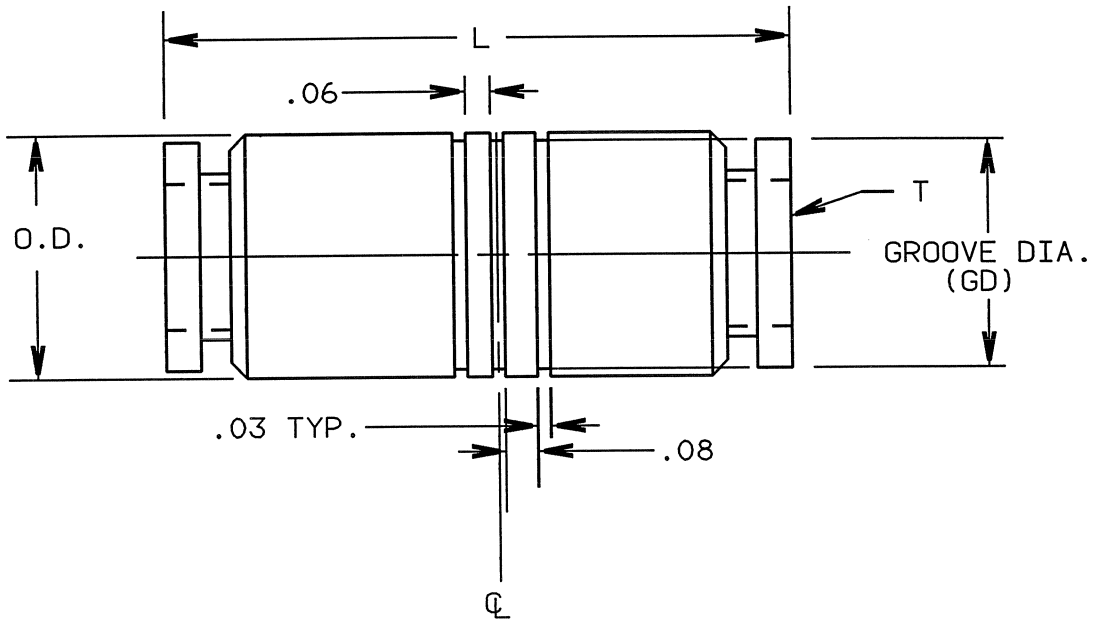
COMPILED	TNN	DATE DRAWN	CADAM ORIGINAL	MATERIAL	
APPROVED	DJL	05-28-85		(1)	

PORTLAND FREIGHTLINER CORPORATION OREGON 97208

M/F

EAC-826

DRAWN	JTA	TITLE UNION - TUBE BRASS	ITEM NUMBER 23-11776
APPRV	DRS		
DATE	06/21/85	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



	O.D. REF	L REF	T TUBE SIZE	GROOVED	GROOVE DIA. (GD)	MFG'S NO. PH	FREIGHTLINER PART NO.
B	.390	1.27	1/8	YES	.37	S-1474	23-11776-125
C	.500	1.28	1/4	NO	-	62PL-4	23-11776-250

ENGINEERING NOTES:

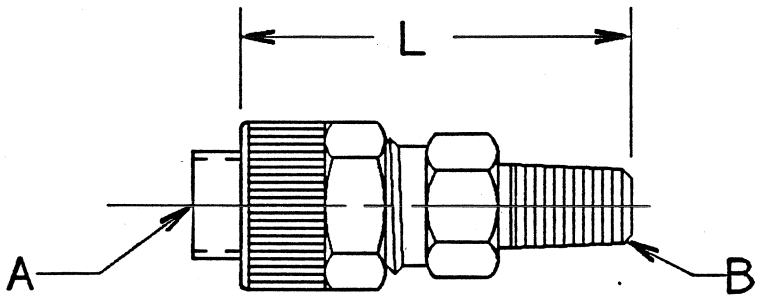
1. MATERIAL: BRASS

CHG	JOB/RLSE NO	DATE	BY	REVISION
B	P1038J-02	06/23/93	ERK	REDRAWN;ADDED -125, REMOVED GROOVES FROM -250.
C	P3051J-05	02/15/94	ERK	23-11776-250: OD TO .500 FROM .470.

ORIGINAL JOB NO.	TITLE	PART NO.
G0218	MALE CONNECTOR	23-11777
LAST CHG LTR		SHEET 1 OF 1

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

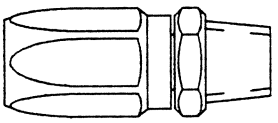


L	A TUBE SIZE	B PIPE SIZE	MANUFACTURERS NO.			FREIGHTLINER PART NO.
					PH	
1.030	1/4	1/16			68P-4-1	23-11777-250

COMPILED	JTA	DATE DRAWN	CADAM ORIGINAL		MASTER NUMBER	
APPROVED	DRS	06-21-85			05045	00001

DRAWN	RDF	TITLE HOSE FITTING, MALE PIPE	ITEM NUMBER A23-11780
APPRV	PCK		
DATE	05/19/89	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

SKETCH:



ASSEMBLY NUMBERS:

HOSE SIZE	PIPE THREAD SIZE	MANUFACTURER'S NUMBER			FREIGHTLINER ASSEMBLY NUMBER
		STX	AQ		
-06	1/4-27	726-4-6S	412-4-6S		A23-11780-006
-16	3/4-14	726-12-16S	412-12-16S		A23-11780-016

FOR ASSEMBLY WITH 48-00121 HOSE.
HOSE AND FITTING MANUFACTURER MUST BE THE SAME.

MATERIAL: AISI 12L14 OR EQUIVALENT

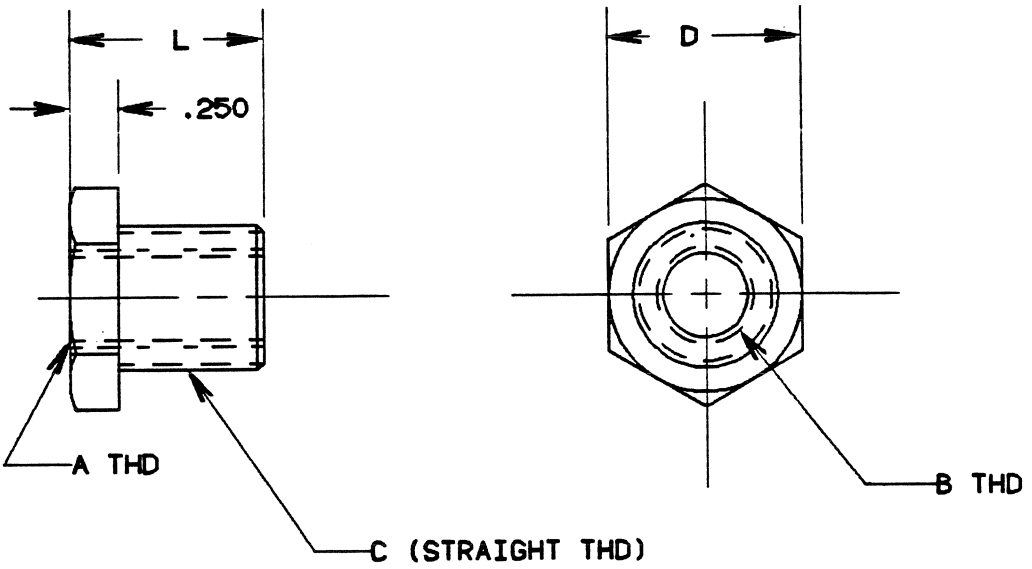
FINISH: CADMIUM PLATING PER QQ-P-416 TYPE 1, CLASS 3

CHG	JOB/RLSE NO	DATE	BY	REVISION
B	365325-90	05/30/89	RDF	REDRAWN, ADDED -006

GENERAL USE PART

ORIGINAL JOB NO.	TITLE	PART NO.
N0185	BODY COUPLING ANCHOR BRASS	23-11808
LAST CHG LTR: -		SHEET 1 OF 1

SKETCH:



PART NUMBERS:

A THREADS	B THREADS	C THREADS	L DIM.	D DIM.	MANUFACTURERS PART NUMBER PH		FREIGHTLINER PART NUMBER
1/8 NPT	1/8 NPT	5/8-18	1.500	.875	2515-00151		23-11808-000
1/4 NPT	1/4 NPT	3/4-16	1.000	.875	2515-00155		23-11808-001
1/4 NPT	1/4 NPT	3/4-16	1.500	1.000	2515-00152		23-11808-002
3/8 NPT	3/8 NPT	1- 14	1.375	1.125	2515-00153		23-11808-003

ENGINEERING NOTES:

1. MATERIAL: BRASS PER SAE J461 CA345, CA360, ETC.
2. FINISH: PLAIN

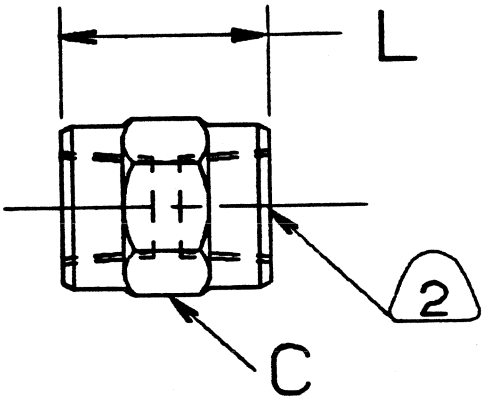
COMPILED	SJF	DATE DRAWN	CADAM ORIGINAL	UNIT OF MEASURE	MASTER NUMBER	
APPROVED	DJL	10-24-85		EA	05030	000D1

CHANGE INFORMATION | DATE | BY | JOB NO. | LTR

CHANGE INFORMATION | DATE | BY | JOB NO. | LTR

GENERAL USE

ORIGINAL JOB NO.	TITLE	PART NO.
Z0151	PIPE COUPLING TAPER THREAD, BRASS	23-11837
LAST CHG LTR		SHEET 1 OF 1



2

PIPE THEAD	L LENGTH	C HEX	PARKER HANNIFIN PART NUMBER	FREIGHTLINER PART NUMBER
1/8-27	.75	1/2	207P-2	23-11837-001
1/4-18	1.12	3/4	207P-4	23-11837-002
3/8-18	1.12	7/8	207P-6	23-11837-003
1/2-14	1.50	1-1/16	207P-8	23-11837-004

ENGINEERING NOTES

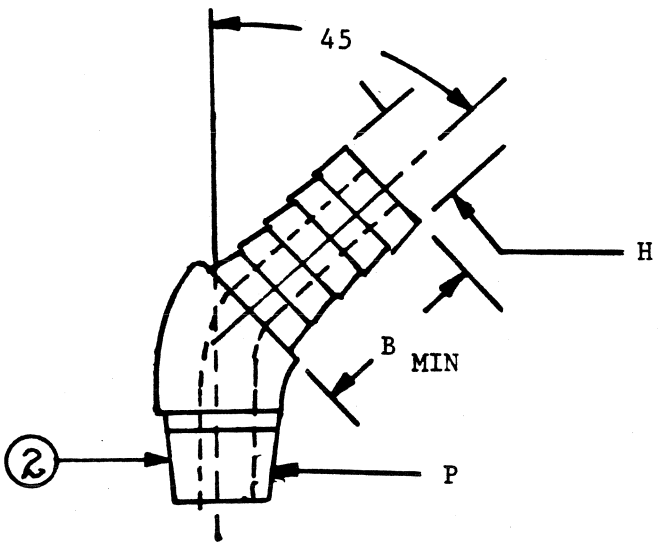
1. MATERAIAL: BRASS

(2) THREADS ARE STANDARD DRYSEAL TAPER PIPE THREADS CONFORM TO SAE STANDARDS.

COMPILED	RDS	DATE DRAWN	CADAM ORIGINAL		MASTER NUMBER	
APPROVED	NER	08-01-86			05030	000D1

CHANGE INFORMATION
LTR | JOB NO. | BY | DATE
LTR | JOB NO. | BY | DATE

ORIGINAL JOB NO.	TITLE	PART NO.
9040D	ELBOW MALE HOSE TO PIPE 45	23-11853
LAST CHG LTR —		SHEET 1 OF 1



HOSE SIZE	BARB SIZE H DIM	B DIM	P NPT	MANUFACTURER'S NUMBER ACB 2	MANUFACTURER'S NUMBER DVI	FREIGHTLINER PART NUMBER
3/8	.415 ± .015	.625	1/8		239E6 2	23-11853-000
3/8	.415 ± .015	.625	1/4	VSHE1 45 6B		-001
3/8	.415 ± .015	.625	3/8	VSHE1 45 6C		-002

ENGINEERING NOTES:

(1.) Material: Brass

(2.) Includes "Vibraseal" on pipe thread.

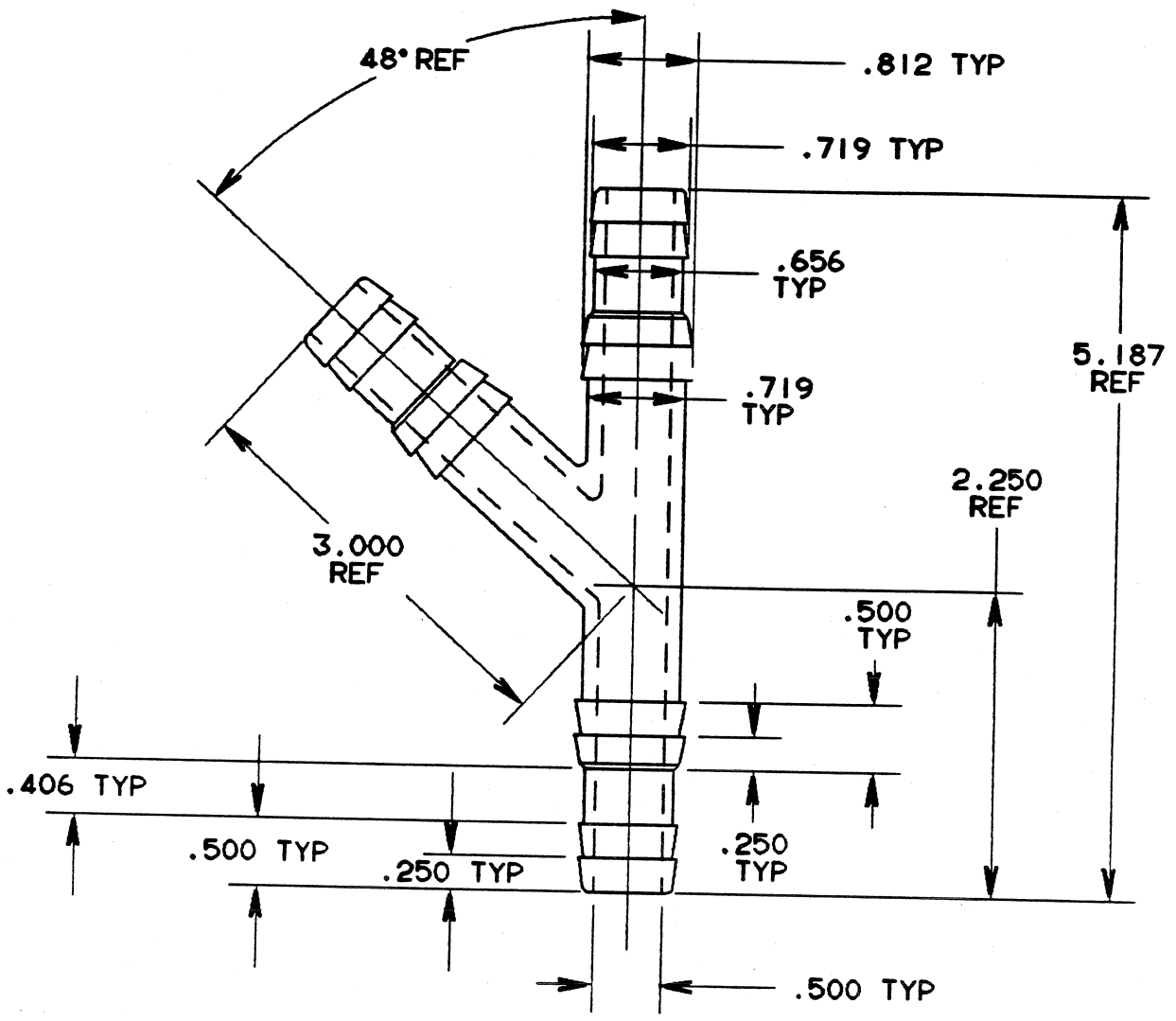
COMPILED	NER	DATE DRAWN	MATERIAL		MASTER NUMBER
APPROVED	FHF	11-17-86	(1)		05100 000D1

CHANGE INFORMATION | LTR | JOB NO. | BY | DATE

CHANGE INFORMATION | LTR | JOB NO. | BY | DATE

23-11854

ORIGINAL JOB NO.	TITLE	PART NO.
3850D	Y-NYLON TEE	23-11854
LAST CHG LTR		SHEET 1 OF 1



CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR
INITIAL RELEASE	03-09-87	DWP	3850D	-

PART NUMBERS

I.D.	MANUFACTURER'S NUMBER EVR	FREIGHTLINER PART NUMBER
.500	H-3875	23-11854-000

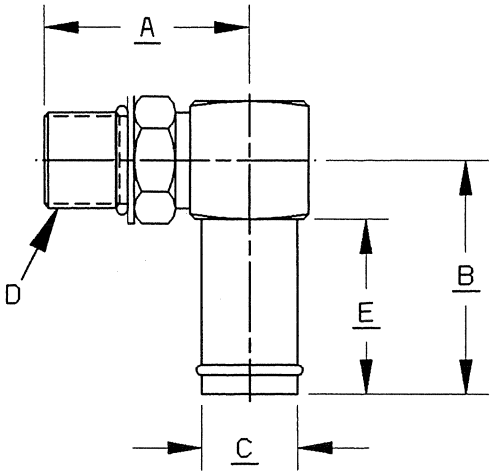
ENGINEERING NOTES

1. MATERIAL: DUPONT ZYTEL NYLON #77G-33 33%, GLASS REINFORCED, TYPE 612
2. TOLERANCES: ±.010 UNLESS OTHERWISE NOTED

COMPILED	DWP	DATE DRAWN	CADAM ORIGINAL	UNIT OF MEASURE	
APPROVED	SEE	12-22-86		EA	

PORTLAND FREIGHTLINER CORPORATION OREGON 97208

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	ADAPTER-ELBOW, 90° SAE O-RING TO HOSE	23-11858	
DATE	10/22/97			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. G



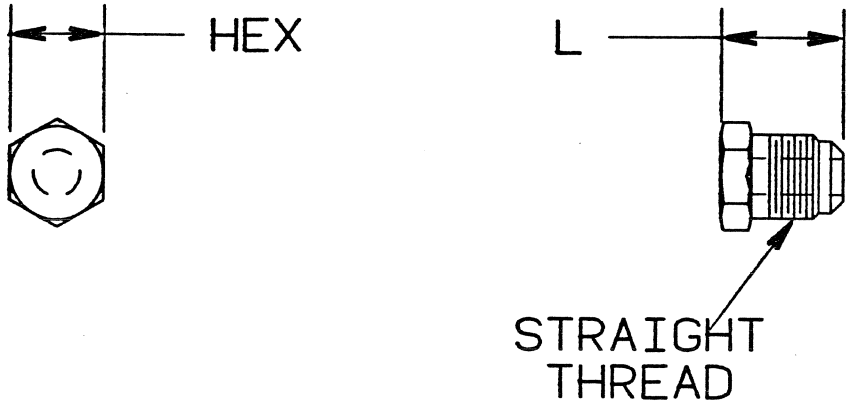
	DIMENSIONS					VENDOR/PN			FREIGHTLINER PART NUMBER
	A	B	C	D	E	PH	AQ	AIRWAY(BRENNAN)	
	1.44	1.94	.50	3/4-16	1.50	25TB-8-8	-	4601-08-08-NWO	23-11858-008
	1.51	2.03	.62	3/4-16	1.50	25TB-8-10	-	4601-10-08-NWO	23-11858-810
	1.92	2.16	.75	1 1/16-12	1.50	25TB-12-12	-	4601-12-12-NWO	23-11858-012
	2.03	2.44	1.00	1 5/16-12	1.63	25TB-16-16	-	4601-16-16-NWO	23-11858-016
	2.34	2.57	1.00	1 5/8-12	1.63	25TB-20-16	-	4601-20-16-NWO	23-11858-116
	2.17	2.44	1.00	1 1/16-12	1.63	25TB-12-16	-	4601-16-12-NWO	23-11858-216
G	1.69	2.03	0.62	7/8-14	1.50	25TB-10-10		4601-10-10-NWO	23-11858-010

ENGINEERING NOTES:

1. MATERIAL: BODY, LOCKNUT, AND WASHER: STEEL
   O-RING: NITRILE (BUNA-N)
2. FINISH: ZINC W/YELLOW CHROMATE
3. DIMENSIONS PER SAE J514, J962, ABOVE DIMENSIONS FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
E	921775-07	10/22/97	DAJ	REVISED AND REDRAWN IN CATIA, ADDED -216.
F	P03956-03	09/29/98	DAJ	ADDED 23-11858-810.
G	F10200-07	11/02/98	DAJ	ADDED 23-11858-010.

DRAWN	RDF	TITLE PLUG, FLARED SEAL	ITEM NUMBER 23-12016
APPRV	PCK		
DATE	08/22/88	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



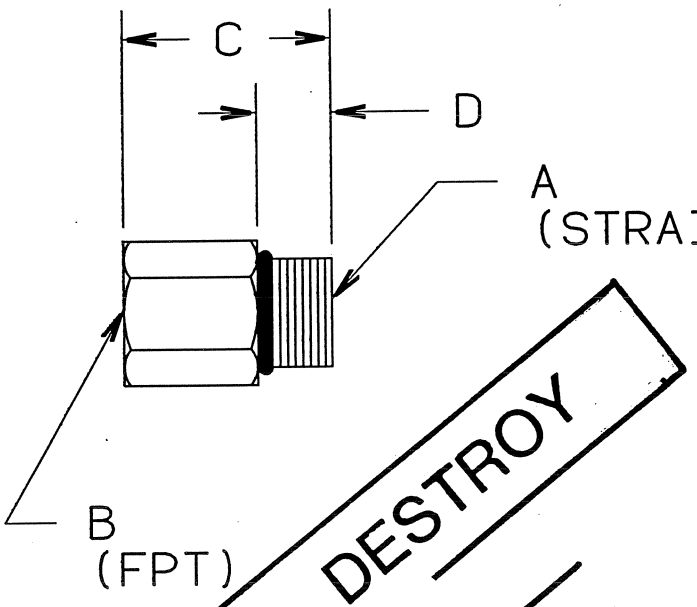
TUBE SIZE	THREAD	HEX	LENGTH	MFR		FREIGHTLINER PN
				CODE	PN	
1/4	7/16-20	7/16	.69	PH	639F-4	23-12016-002
3/8	5/8-18	5/8	.88	PH	639F-6	23-12016-001

REF. STANDARD: FIG NO.010109 SAE J513

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	330953-92	08/22/88	RDF	DOCUMENTED

DRAWN	KEH	TITLE ADAPTER-O RING	ITEM NUMBER 23-12021
APPRV	BAM		
DATE	11/01/88	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

SKETCH



REMOVE & DESTROY

A THREADS	B	C	D (MM)	FREIGHTLINER PART NUMBER
9/16-18	1/4"	.7	9.9	23-12021-001

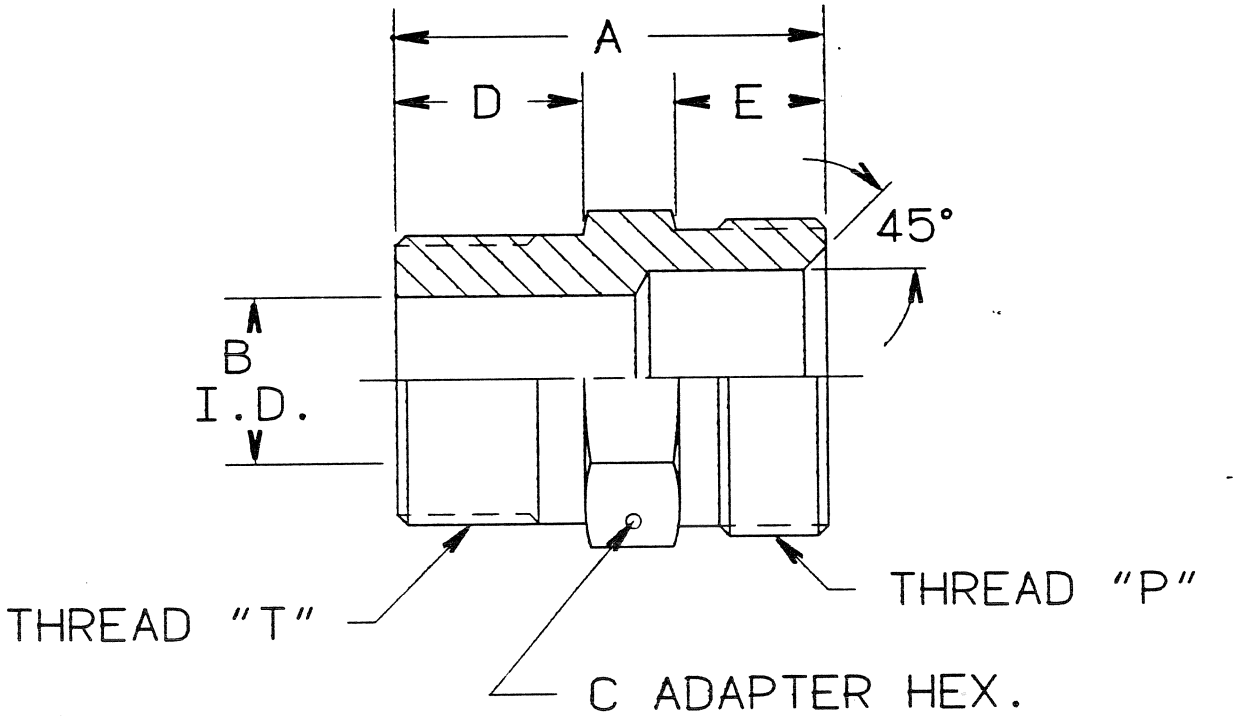
ENGINEERING NOTES:

1 MATERIAL:

VENDOR: PARKER HANNIFIN
PART #: PH 6-4 F50G S
OR EQUIVALENT

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	442408-05	11/05/88	KEH	DOCUMENTED

DRAWN	PCK	TITLE ADAPTER-MALE PIPE TO AIR BRAKE	ITEM NUMBER 23-12029
APPRV	ANF		
DATE	03/09/89	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



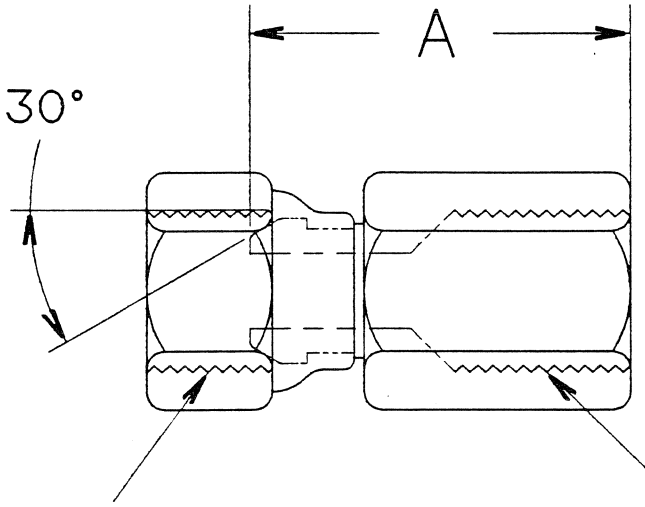
DASH SIZE	PIPE THREAD "T"	STRAIGHT THREAD "P"	A	B MIN.	C ACROSS FLATS	D	E	FREIGHTLINER PART NUMBER
6-8	3/8-18	3/4-20	1.12	.435	.75	.49	.38	23-12029-001

NOTES

1. MATERIAL: C36000 BRASS
2. SUGGESTED VENDOR; STRATOFLEX (18326-6-8B27) OR EQUIVALENT
3. PART SUPPLIED WITH THREAD SEALING COMPOUND APPLIED

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P5818E-01	03/09/89	PCK	DOCUMENTED

DRAWN	WLB	TITLE ADAPTER-PIPE	ITEM NUMBER 23-12032
APPRV	BAM		
DATE	03/22/89	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



THREAD P1	THREAD P2	A	FREIGHTLINER PART NUMBER
2-11 1/2	2-11 1/2	2.12	23-12032-001

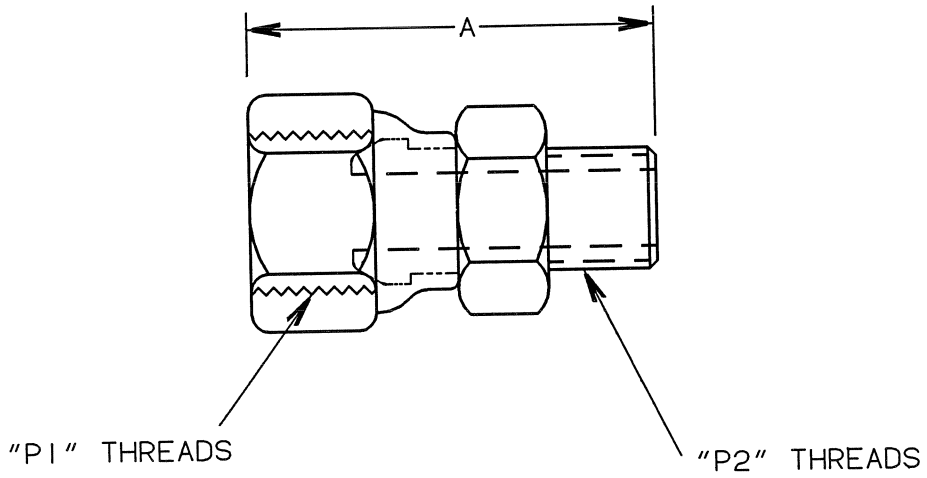
ENGINEERING NOTES:

MATERIAL: STEEL

DIMENSIONS AND MATERIAL PROPERTIES PER SAE 140131

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	409734-03	03/23/89	WLB	DOCUMENTED

DRAWN	YATES	TITLE	ITEM NUMBER
APPRV	ELLISON	ADAPTER-STRAIGHT THREAD O-RING FEMALE SWIVEL	23-12037
DATE	05/01/89	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



	"P1" THREAD NPSM	"P2" THREAD UNF	A REF	MANUFACTURER PH		FREIGHTLINER PART NUMBER
B	3/8-18	9/16-18	1.32	0507 6 6		23-12037-001
A	1/4-18	7/16-20	1.32	0507 4 4		PH 0507 4 4
A	1/4-18	9/16-18	1.35	0507 6 4		PH 0507 6 4

ENGINEERING NOTES:

MATERIAL: STEEL,AISI 12L14 OR EQUIVALENT

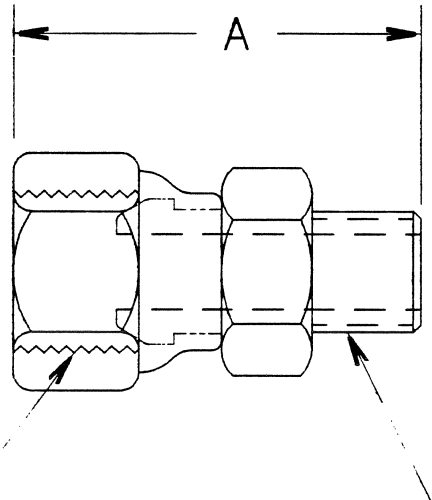
DIMENSIONS PER SAE FIG NO. 140157

REF. STANDARD : SAE J514

FINISH : CADMIUM PLATING PER MIL QQ-P-416
TYPE 1,CLASS 3

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PA2006-39	05/01//89	BGY	DOCUMENTED
A	PL0295-03	01/14/93	ERK	ADDED VNDR #'S;CHARTED PH 0507 4 4 & PH 0507 6 4
B	PA2042-34	03/17/93	ERK	CORRECTED THREAD SIZES.

DRAWN	YATES	TITLE	ITEM NUMBER
APPRV	ELLISON	ADAPTER-STRAIGHT THREAD O-RING FEMALE SWIVEL	23-12037
DATE	05/01/89	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



THREAD P1 NPSM	THREAD P2 UNF	A REF	FREIGHTLINER PART NUMBER
3/8-18	9/16-18	1.32	23-12037-001

ENGINEERING NOTES:

MATERIAL: STEEL, AISI 12L14 OR EQUIVALENT

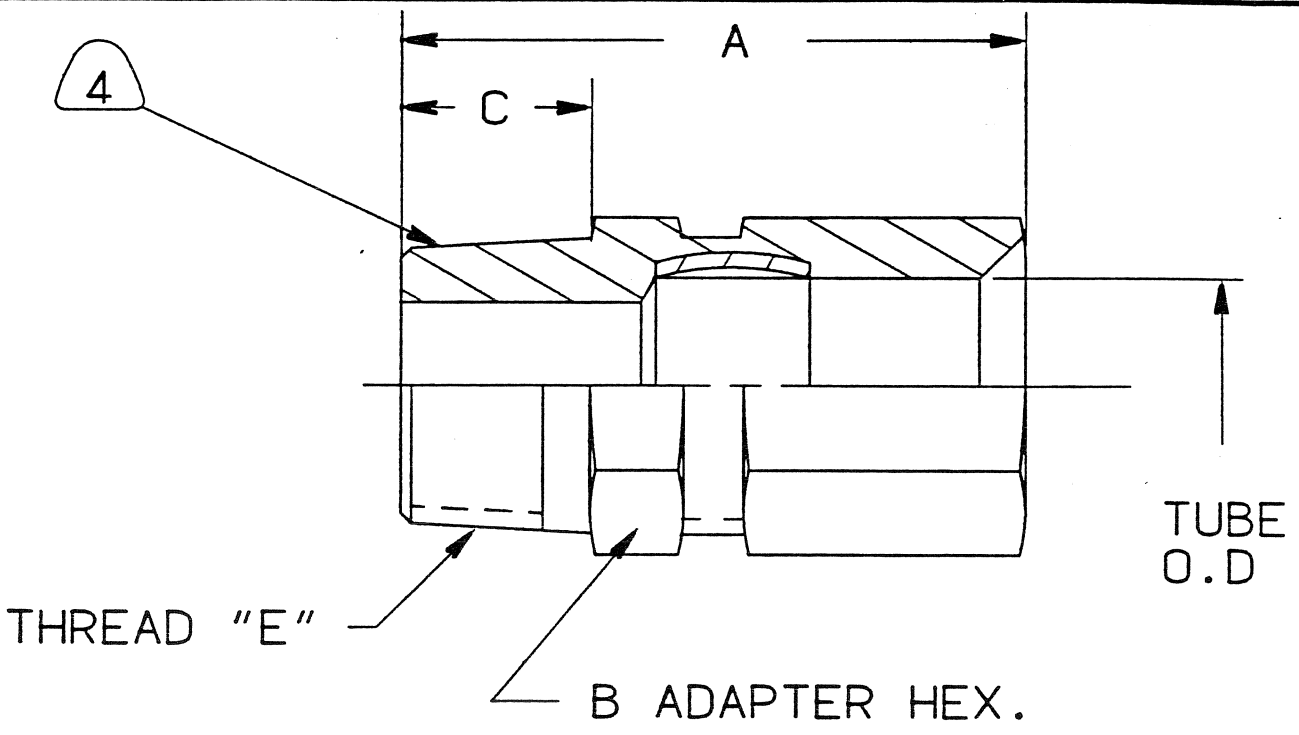
DIMENSIONS PER SAE FIG NO. 140157

REF. STANDARD : SAE J514

FINISH : CADMIUM PLATING PER MIL QQ-P-416 TYPE 1, CLASS 3

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PA2006-3905/01//89		BGY	DOCUMENTED

DRAWN	DFM	TITLE	ITEM NUMBER
APPRV	ANF	CONNECTOR-FLARELESS MALE PIPE TO TUBING	23-12051
DATE	10/02/89	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



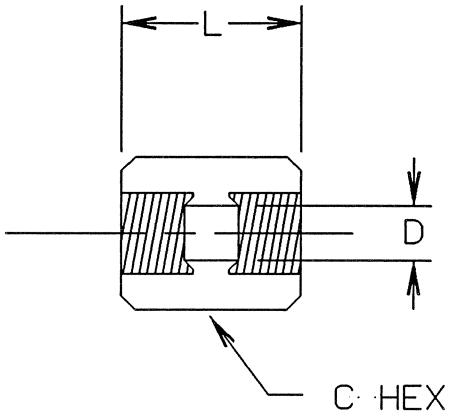
DASH SIZE	PIPE THREAD "E"	TUBE OD	A	B HEX. ACROSS FLATS	C		FREIGHTLINER PART NUMBER
3	1/8 NPTF	3/16	1.35	.438	.375		23-12051-001

NOTES

1. MATERIAL: CARBON STEEL AISI 12L14 OR EQUIV.
2. SUGGESTED VENDOR; PARKER-HANNIFIN (VS3-FBU-S) OR EQUIVALENT
3. DIMENSIONS AND PERFORMANCE PER SAE J514, REF 080102, 080115A OR B, 080110. ABOVE DIMENSIONS FOR REFERENCE ONLY.
4. PART SUPPLIED WITH THREAD SEALING COMPOUND APPLIED
5. FINISH: BLACK OXIDE

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PX0405-01	10/02/89	PCK	DOCUMENTED

DRAWN	RAR	TITLE	ITEM NUMBER
APPRV	RLP	UNION-INV.FLR	23-12060
DATE	12/11/89	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



TUBE SIZE	STRAIGHT THREAD	L	C HEX	D FLOW DIA	FREIGHTLINER PART NO.
1/4	7/16-24	.63	9/16	.188	23-12060-001

A

NOTES:

1. MATERIAL: C36000 BRASS
2. INDUSTRY STANDARD: SAE FIG. 040101, SAEJ512 EXCEPT FOR HEX.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PX2403-07	12/11/89	RAR	DOCUMENTED
A	P4782N-01	01/25/96	ERK	HEX 9/16 IPO 17/32

DRAWN	SDR	TITLE PLUG, JIC 37 FLARE	ITEM NUMBER 23-12075
APPRV	PCK		
DATE	11/29/90	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



SIZE	THREAD	HEX	LENGTH	MFR		FREIGHTLINER PART NUMBER
				CODE	PN	
6	9/16-18	5/8	.84	PH	6PNTX-S	23-12075-000
10	7/8-14	15/16	1.10	PH	10PNTX-S	23-12075-001

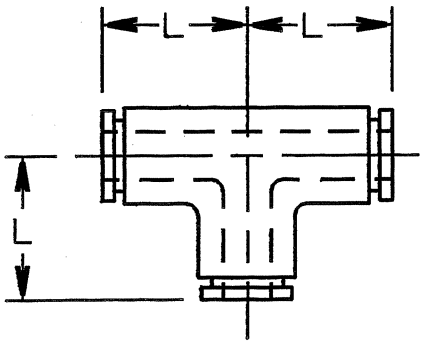
REF. STANDARD: FIG NO.070109 SAE J514

MATERIAL: STEEL AISI 12L14

FINISH: CADMIUM PLATE PER FREIGHTLINER SPECIFICATION 49-00012-130

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PF2023-01	11/29/90	SDR	DOCUMENTED
A	P01388-01	10/22/96	DAJ	ADDED -000

DRAWN	SJT	TITLE	ITEM NUMBER
APPRV	KR	UNION TEE, PUSH LOCK	23-12092
DATE	07/25/91	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



PART NUMBERS:

TUBE SIZE	L DIM	MANUFACTURER'S NUMBER		FREIGHTLINER PART NUMBER
		PH	LEG	
1/4	1.01	164PL-4	3104 56 00 DOT	23-12092-001

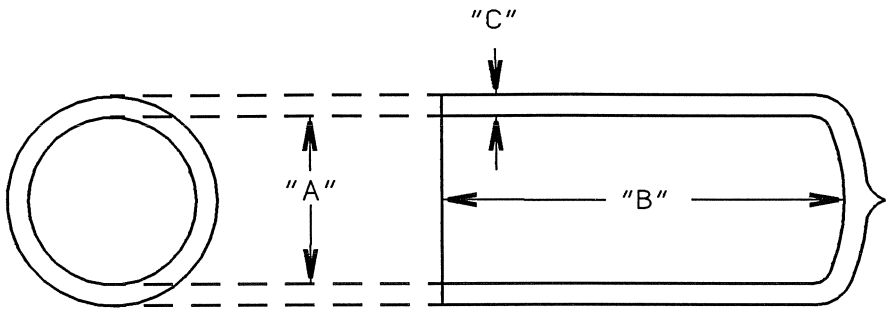
ENGINEERING NOTES:

1. MATERIAL: BRASS.

B

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P2126H-03	07/25/91	SJT	INITIAL RELEASE
A	P2126H-04	10/16/91	SJT	CORRECTED PH # FOR 1/4" TUBE SIZE
B	P3301J-01	12/15/93	ERK	REMOVED "DOT" REFERENCE

DRAWN	ERK	TITLE CAPS - PLASTIC VINYL	ITEM NUMBER 23-12113
APPRV	SJK		
DATE	07/24/92	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



"A" I.D. (INCHES)	"B" LENGTH (INCHES)	"C" WALL THICK. (INCHES)	COLOR	VENDOR	FREIGHTLINER PART NUMBER
				ARDEN	
.281	1.500	.053	YELLOW		23-12113-002
.437	1.000	.055	BLACK		23-12113-001
.437	1.000	.055	RED	08-86593	23-12113-003
.750	.750	.060	RED	08-86873	23-12113-004

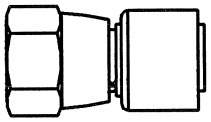
SPECIFICATIONS:

1. MATERIAL: ---------- VINYL PLASTISOL
2. HARDNESS:(ASTM D 2240) ---------- 75 SHORE A
3. TENSILE:(ASTM D 412)---------- 775 PSI.
   BREAK:(ASTM D 412)---------- 1850 PSI.
4. % ELONGATION (ASTM D 412)---------- 440%
5 DIELECTRIC STRENGTH (ASTM D 149)------- 320 VOLTS/MIL ±25V.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PN0436-05	07/24/92	ERK	DOCUMENTED
A	P0574J-02	05/18/93	ERK	ADDED -002.
B	P1107J-02	08/25/93	ERK	ADDED -003.
C	P1107J-05	01/26/94	ERK	ADDED -004.

DRAWN	ERK	TITLE	ITEM NUMBER
APPRV	AQ	SWIVEL ASSEMBLY - JIC 45° BRASS	A23-12130
DATE	12/16/92	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

SKETCH:



ASSEMBLY NUMBERS:

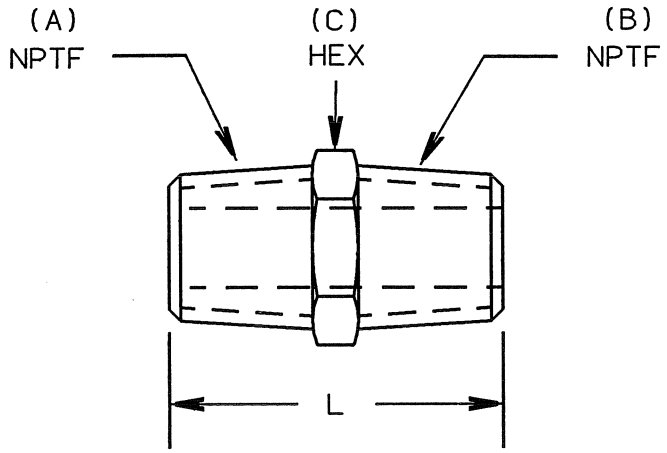
SIZE	THREAD SIZE (UNF)	MANUFACTURER'S NUMBER		FREIGHTLINER ASSEMBLY NUMBER
		PH Ⓐ		
4-4	7/16-20	10663-4-4B		A23-12130-004
6-6	5/8-18	10863-6-6B		A23-12130-006
8-8	3/4-16	10663-8-8B		A23-12130-008

ENGINEERING NOTES:

1. MATERIAL: NIPPLE-BRASS, NUT AND SOCKET-CAD PLATED STEEL (CLEAR).
2. 45° SEAT PER SAE J516.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PH0539-01	12/16/92	ERK	INITIAL RELEASE.
A	PA2042-35	04/22/93	ERK	REVISED MANUFACTURER'S NUMBERS

DRAWN	ERK	TITLE	ITEM NUMBER
APPRV	ERK	NIPPLE - HEX MNPTF/MNPTF, BRASS	23-12152
DATE	06/18/93	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



PART NUMBERS:

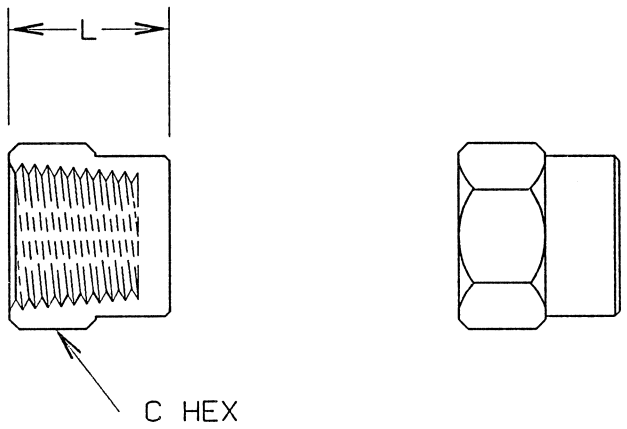
A THRD NPTF	B THRD NPTF	C HEX	L	MANUFACTURER & NUMBER		FREIGHTLINER PART NUMBER
				PH		
3/4-14	1/2-14	1 1/8	1.96	3/4X1/2 FF-B		23-12152-128

NOTES:

1. MATERIAL: BRASS
2. INDUSTRY STANDARD: REF. SAE 140137.
3. FITTING ASSEMBLY MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	424667-02	06/18/93	ERK	INITIAL RELEASE

DRAWN	ERK	TITLE CAP-PIPE BRASS	ITEM NUMBER 23-12157
APPRV	JTA		
DATE	08/06/93	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



PART NUMBERS:

PIPE THREAD	C HEX	L		MANUFACTURER	FREIGHTLINER PART NUMBER
				PH	
1/8	9/16	.50		213P-2	PH 213P2
1/4	11/16	.63		213P-4	23-12157-004
1/2	1 1/16	.87		213P-8	23-12157-008

A

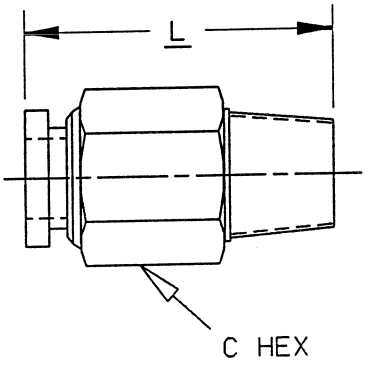
NOTES:

1. MATERIAL: BRASS
2. FITTING ASSEMBLY MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	773448-09	08/06/93	ERK	INITIAL RELEASE
A	PA2157-E9	04/08/96	DAJ	ADDED -004

ADRIENNE CHILBERG

DRAWN	DAJ	TITLE	DRAWING NUMBER
APPRV	DAJ	CONNECTOR-MALE PIPE, PUSH-IN	23-12158
DATE	07/23/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. G
CATIA ORIGINAL			



T TUBE SIZE	PIPE THREAD (NPTF)	C HEX	L (REF)	TUBE SUPT.	MFR'S NO. PH	FREIGHTLINER PART NUMBER
1/4	1/8	1/2	0.96	YES	VS68PMT-4-2	23-12158-000
1/4	1/4	9/16	1.08	YES	VS68PMT-4-4	23-12158-004
1/4	3/8	3/4	1.17	YES	VS68PMT-4-6	23-12158-005
3/8	1/8	3/4	1.35	YES	VS68PMT-6-2	23-12158-002
3/8	1/4	3/4	1.37	NO	VS68PM-6-4	23-12158-001
3/8	1/4	3/4	1.37	YES	VS68PMT-6-4	23-12158-003
3/8	3/8	3/4	1.31	YES	VS68PMT-6-6	23-12158-006
1/2	1/4	7/8	1.57	YES	VS68PMT-8-4	23-12158-007
1/2	3/8	7/8	1.57	YES	VS68PMT-8-6	23-12158-008
1/2	1/2	7/8	1.57	YES	VS68PMT-8-8	23-12158-010
5/8	3/8	1	1.88	YES	VS68PMT-10-6	23-12158-009

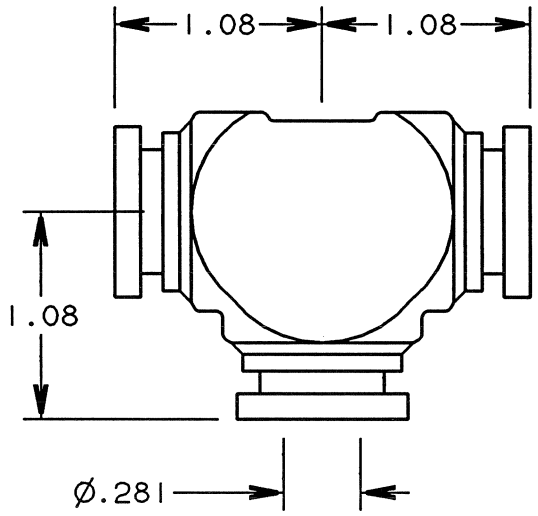
E
G
F

ENGINEERING NOTES:

1. MATERIAL: BRASS
2. FITTING MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.
3. PARTS MUST BE SUPPLIED WITH "VIBRASEAL" APPLIED TO THREADS.

CHG	JOB NO	DATE	BY	REVISION
E	P03235-01	07/23/97	DAJ	REVISED & REDRAWN IN CATIA. ADDED -008.
F	PA2042-78	08/07/97	DAJ	TITLE WAS REVISED. ADDED -009.
G	P04530-06	03/13/98	DAJ	ADDED -010.

DRAWN	ERK	TITLE UNION - TEE PUSH-IN, BRASS	ITEM NUMBER 23-12163
APPRV	APM		
DATE	10/29/93	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



TUBE O.D.	MFG'S NO.		FREIGHTLINER PART NO.
	ALKON	PH	
3/8	AQ64-DOT-6	264PMT-6	23-12163-001

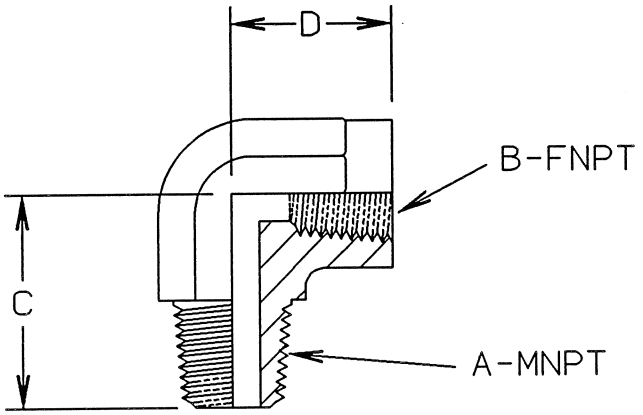
A

ENGINEERING NOTES:

1. MATERIAL: BRASS
2. FITTING MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.
3. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P3518H-01	10/29/93	ERK	INITIAL RELEASE
A	P3911J-01	06/24/94	ERK	ADDED ALKON PRODUCT NO.

DRAWN	ERK	TITLE	ITEM NUMBER
APPRV	WJK	ELBOW - STREET MALE/FEMALE, STEEL	23-12180
DATE	04/29/94	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



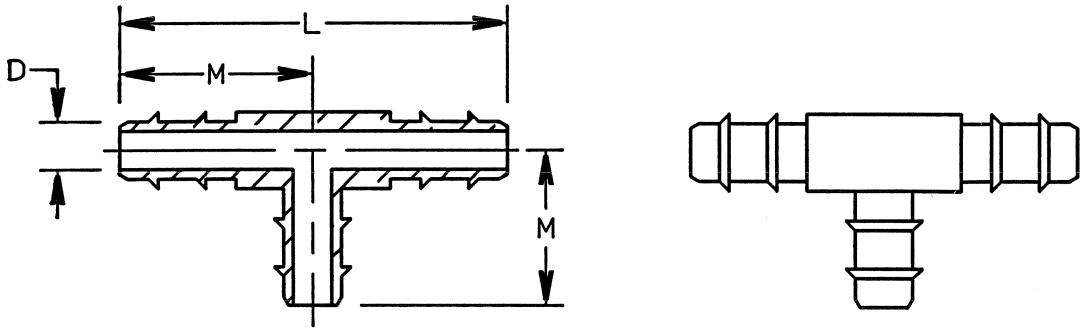
A MNPT	B FNPT	C	D	VENDOR NUMBER PH	FREIGHTLINER PART NUMBER
1/8-27	1/8-27	0.78	0.66	1/8 CD-S	23-12180-022
3/4-14	3/4-14	1.59	1.36	3/4 CD-S	23-12180-120

NOTES:

1. MATERIAL: STEEL
2. INDUSTRY STD: SAE J40239

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PF0786-09	04/29/94	ERK	INITIAL RELEASE.
A	P6330F-03	01/25/96	ERK	ADDED -022

DRAWN	ERK	TITLE TEE BARBED UNION	ITEM NUMBER 23-12182
APPRV	ENS		
DATE	05/23/94	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



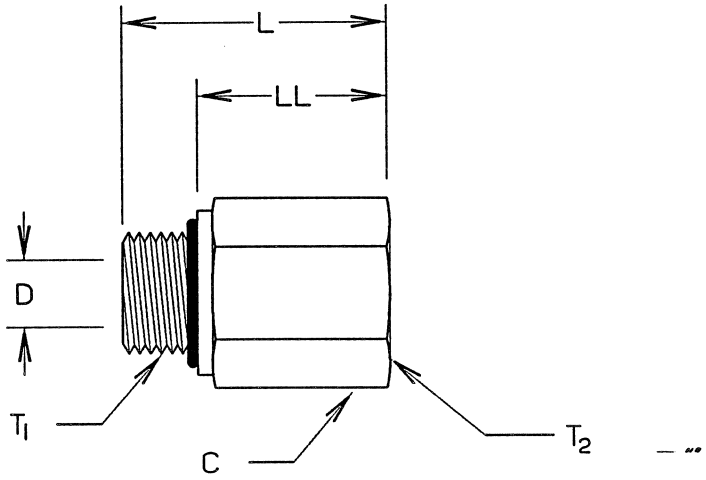
TUBE O.D.	L	M	FLOW DIA.D	MANUFACTURER'S NUMBER	FREIGHTLINER PART NUMBER
				PH	
1/4	1.25	.63	.120	224-4	23-12182-025

ENGINEERING NOTES:

MATERIAL: BRASS

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PH0588-09	05/23/94	ERK	INITIAL RELEASE

DRAWN	DAJ	TITLE	ITEM NUMBER
APPRV	ERK	ADAPTER-FEMALE PIPE STRAIGHT O-RING/FEMALE PIPE	23-12191
DATE	09/01/94	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



D	T_1 STRAIGHT THREAD	T_2 NPT	C HEX	L	LL	MANUFACTURER PH	FREIGHTLINER PART NUMBER
0.391	3/4-16	3/8-18	7/8	1.28	0.84	0502-8-6	PH 0502 8 6
0.656	1 1/16-12	1/2-14	1 1/4	1.41	0.82	12-1/2 F50G-S	23-12191-001

B

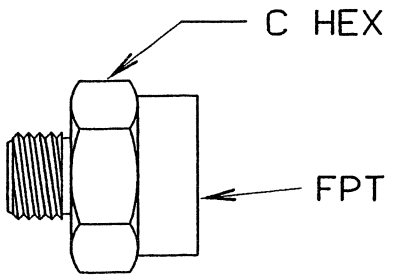
NOTES:

1. MATERIAL: STEEL
2. FINISH: CAD OR ZINC PLATE.
3. DIMENSIONS SHOWN ABOVE ARE FOR REFERENCE ONLY.

USE 23-11290

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	713919-02	09/01/94	DAJ	INITIAL LOAD
A	PF0952-05	10/26/94	DAJ	ADDED -002
B	PA2157-31	11/14/95	ERK	RMVD -002, REVISED -001 MFG'S PN, ADDED NOTE

DRAWN	DAJ	TITLE CONN-TUBING/PIPE FEMALE	ITEM NUMBER **23-12193**
APPRV	ERK		
DATE	10/12/94	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



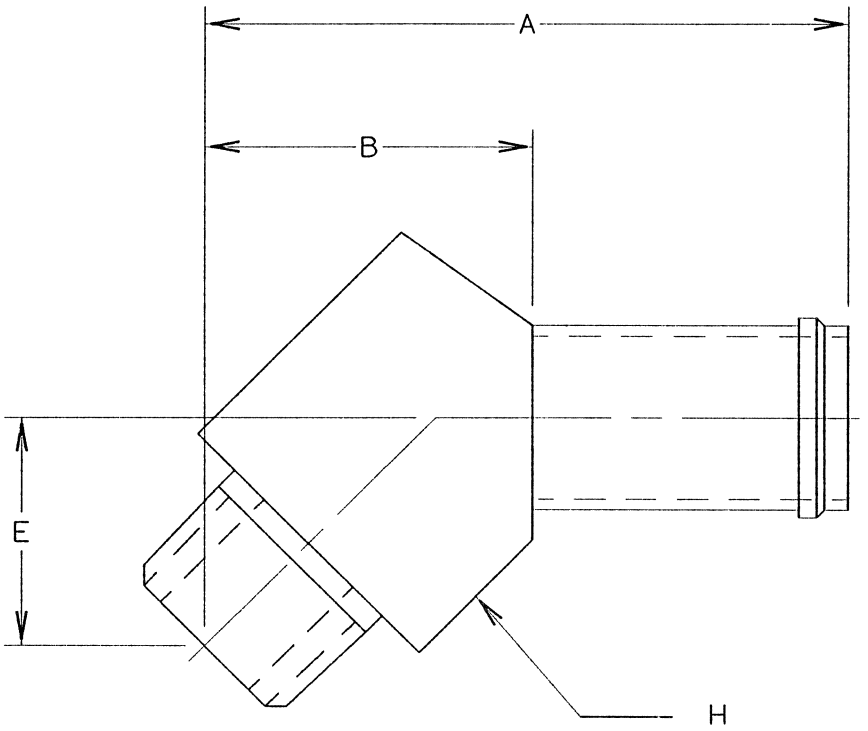
TUBE SIZE	FPT	C HEX	FLOW DIA.	MANUFACTURER	FREIGHTLINER PART NUMBER
				PH	
1/2	3/8	13/16	.406	66C-8-6	23-12193-000

NOTES:

1. MATERIAL: BRASS
2. INDUSTRY STANDARD: REF. SAE 100103 BA.
3. FITTING ASSEMBLY MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	649448-04	10/12/94	DAJ	INITIAL LOAD

DRAWN	ERK	TITLE	ITEM NUMBER
APPRV	EJA	ELBOW, 45° MALE NPTF/BEADED	23-12206
DATE	01/23/95	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



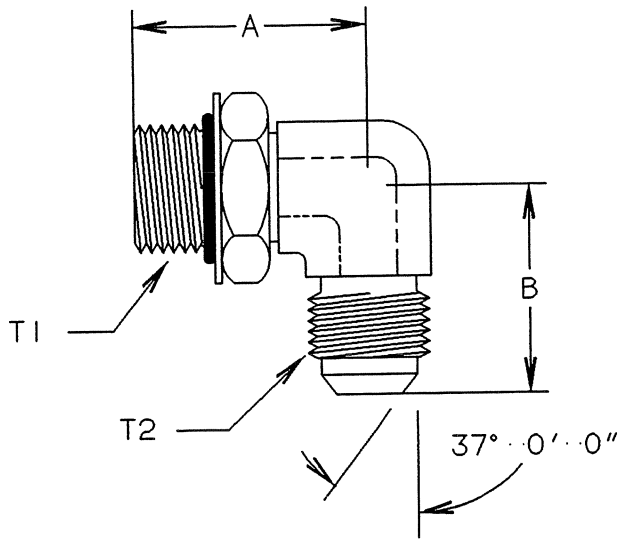
HOSE SIZE	THREAD (NPTF)	A	B	E	"H" HEX	MANUFACTURER'S NUMBER		FREIGHTLINER PART NUMBER
						PH	AIRWAY (BRENNAN)	
1	1	3.19	1.56	1.04	1.50	31TB-16-16		23-12206-001

NOTES:

1. MATERIAL: STEEL, AISI 12L14 OR EQUIVILENT.
2. FINISH: ZINC PLATE, PER FREIGHTLINER SPEC 49-00005-403.
3. CLAMPS CONFORM TO SAE J1508, TYPE "F", STYLE 4

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	712419-01	01/23/95	ERK	INITIAL RELEASE

DRAWN	DAJ	TITLE	ITEM NUMBER
APPRV	DAJ	STRAIGHT THREAD ELBOW 37° TUBE END/STR THD W/VITON O-RING	23-12216
DATE	02/04/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



T1 STRAIGHT THREAD	T2 STRAIGHT THREAD	TUBE O.D.	A	B	MFG'S NUMBER PH(4)	FREIGHTLINER PART NUMBER
7/8-14	3/4-16	1/2	1.70	1.34	8-10 C50X-S VITON	23-12216-108

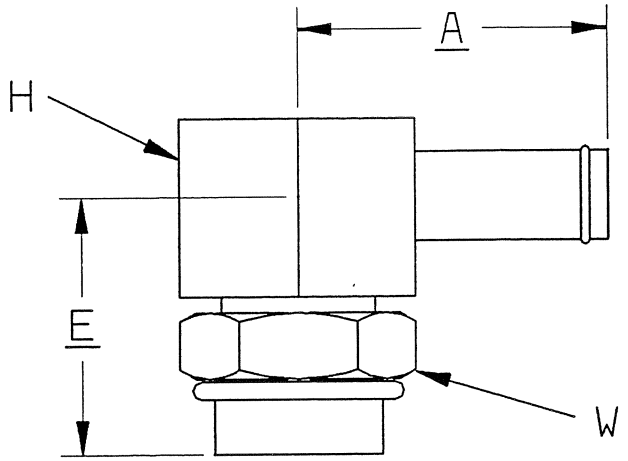
ENGINEERING NOTES:

1. MATERIAL: STEEL
2. FINISH: CADMIUM OR ZINC PLATE
3. FITTING CONFORMING TO SAE J514 FOR TYPE 070220
(4) O-RING: VITON CONFORMING TO SAE J515 TYPE 3

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P00891-01	02/04/97	DAJ	INITIAL RELEASE

ADRIENNE CHILBERG

DRAWN	DAJ	TITLE ELBOW-90° HOSE BARB, O-RING	DRAWING NUMBER 23-12220	
APPRV	DAJ			
DATE	03/04/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -
CATIA ORIGINAL				



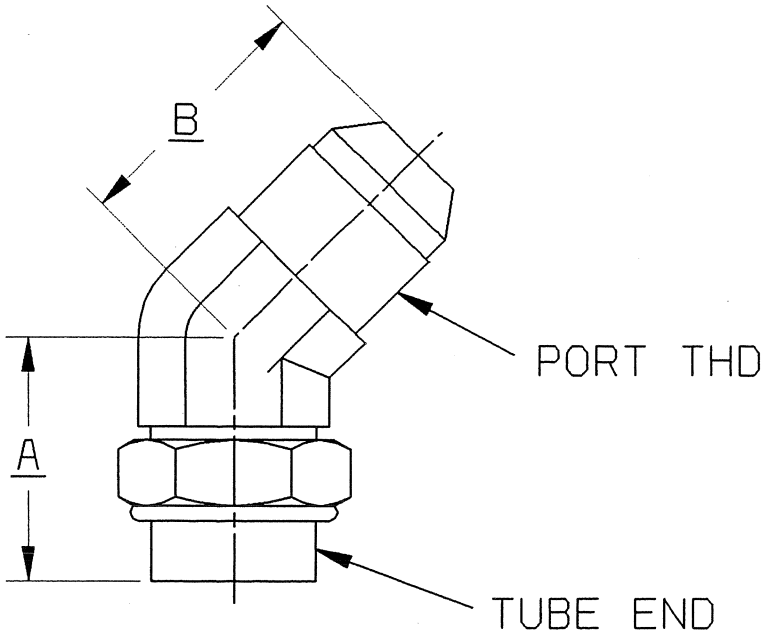
HOSE SIZE	TUBE END UN/UNF-2A	HEX H	HEX W	A	E	FL SPEC NO.
3/4	7/8-14	1 5/16	1 1/4	2.16	1.69	23-12220-012

SPECIFICATIONS:

1. MATERIAL: STEEL
2. FINISH: CAD OR ZINC PLATED
3. ALL DIMENSIONS ARE FOR REFERENCE ONLY.
4. SUGGESTED VENDOR: PARKER-HANNIFIN OR EQUIVALNET.

CHG	JOB NO	DATE	BY	REVISION
-	P01153-52	03/04/97	DAJ	INITIAL RELEASE

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	ELBOW-45°, STEEL 37° FLARE END, O-RING	23-12222	
DATE	03/03/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. A
CATIA ORIGINAL				



	TUBE O.D.	TUBE END UN/UNF-2A	PORT THD UN/UNF-2A	A	B	F/L SPEC NO.
A	1 1/4	1 5/8-12	1 5/8-12	1.91	1.59	23-12222-720

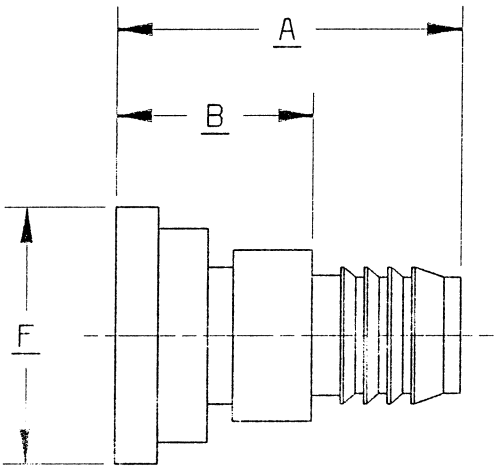
SPECIFICATIONS:

1. MATERIAL: STEEL
2. FINISH: CAD OR ZINC PLATED
3. INDUSTRY STANDARD: SAE 070320
4. ALL DIMENSIONS ARE FOR REFERENCE ONLY.
5. SUGGESTED VENDOR: PARKER-HANNIFIN OR EQUIVALNET.

CHG	JOB NO	DATE	BY	REVISION
-	P02064-02	03/03/97	DAJ	INITIAL RELEASE
A	PA2042-85	10/21/98	DAJ	-720 WAS -202.

ORIENNE CHILBERG

DRAWN: DAJ	TITLE: FITTING-SAE CODE 61 FLANGE STRAIGHT	DRAWING NUMBER: 23-12223	
APPRV: DAJ			
DATE: 03/10/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET: 1 OF 1	CHG. LTR.: A
CATIA ORIGINAL			



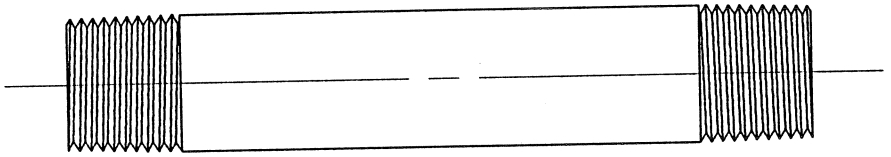
FLANGE (INCH)	HOSE SIZE (INCH)	A	B	F	F/L SPEC NO.
2	2	4.32	2.49	2-13/16	23-12223-032

SPECIFICATIONS:

1. FINISH: STEEL
2. FINISH: CADMIUM OR ZINC PLATED
3. VENDOR: PARKER-HANNIFIN 1588-32-32 OR EQUIVALENT

CHG	JOB NO	DATE	BY	REVISION
-	P01153-52	03/10/97	DAJ	INITIAL RELEASE
A	PA.042-76	04/16/97	DAJ	SPEC NO WAS -000. ADDED VENDOR P/N.

DRAWN	ERK	TITLE NIPPLE STEEL, SCHED. 80	ITEM NUMBER 23-12244
APPRV	DL		
DATE	05/19/95	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

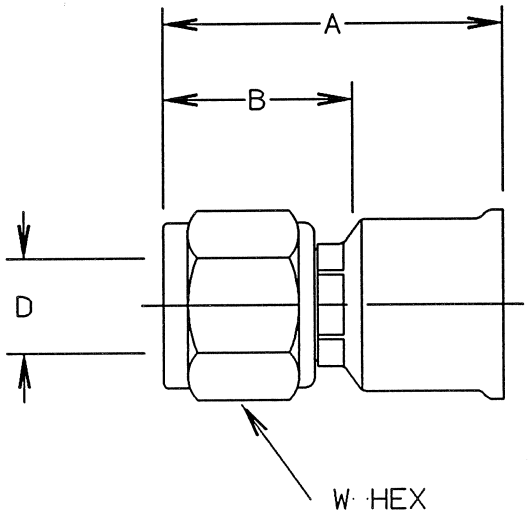


NPT PIPE SIZE & THREAD	LENGTH (INCHES)		FREIGHTLINER PART NUMBER
1 1/4 -11 1/2	8		23-12244-121

1. MATERIAL: STEEL, SCHED. 80, BLACK

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	550101-35	05/19/95	ERK	INITIAL RELEASE

DRAWN	DAJ	TITLE	ITEM NUMBER
APPRV	ERK	SWIVEL ASSY-HOSE, SAE, STEEL	A23-12247
DATE	05/23/95	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



	HOSE SIZE	THREAD	DIMENSION			W HEX	SUPPLIER	FREIGTHLINER PART NUMBER
			A	B	D		PH	
A	4	7/16-20	1.67	0.80	.14	9/16	16826-4-4BA	A23-12247-004
	6	5/8-18	1.83	0.98	.23	3/4	10826-6-6BA	A23-12247-006
	8	3/4-16	1.91	1.08	.31	7/8	16826-8-8BA	A23-12247-008
	10	7/8-14	2.17	1.22	.42	1	16826-10-10BA	A23-12247-010
B	12	1-1/16-14	2.19	1.19	.52	1-1/4	10826-12-12BA	A23-12247-012

ENGINEERING NOTES:

1. MATERIAL: BRASS NIPPLE, STEEL NUT AND SHELL

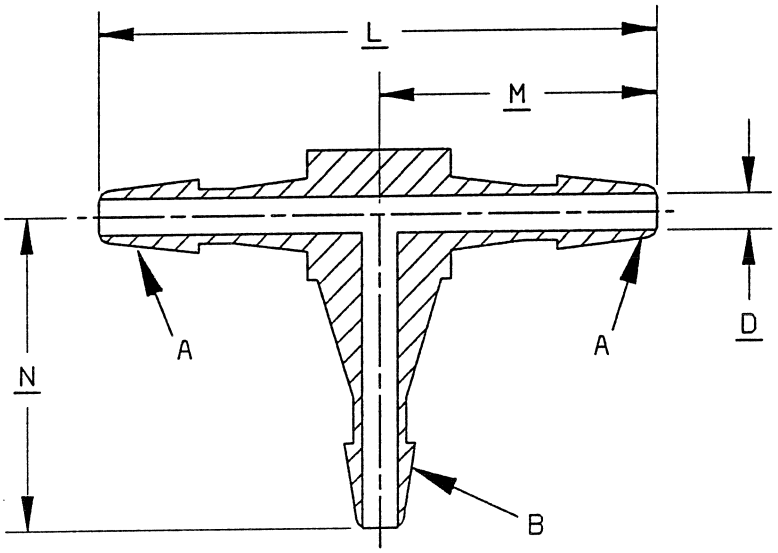
2. FOR USE WITH HOSES MEETING THE PROVISIONS OF SAE STANDARD J 1402 FOR TABLE A1 AIR BRAKE HOSE.

3. MUST MEET APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD #106.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PF0984-02	05/23/95	DAJ	INITIAL LOAD
A	PF0984-03	08/09/95	DAJ	ADDED -004
B	PN0648-01	01/02/96	DAJ	ADDED -012

ADRIENNE CHILBERG

DRAWN: DAJ	TITLE: FITTING - PLASTIC TEE	DRAWING NUMBER: 23-12282	
APPRV: DAJ			
DATE: 03/26/98	FREIGHTLINER CORPORATION, PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. A
CATIA ORIGINAL			



FLOW DIA. D	TUBE I.D. A	TUBE I.D. B	DIMENSIONS L	DIMENSIONS M	DIMENSIONS N	VENDOR/PN	FREIGHTLINER PART NUMBER
.047	.096	.125	.74	.37	.28	PH / MP15TUB2N	23-12282-001
.094	.125	.125	1.00	.50	.50	PH / MP2TUB2N	23-12282-002
-	-	-	-	-	-	VALUE PLASTICS/T40-2 (3)	23-12282-003

A

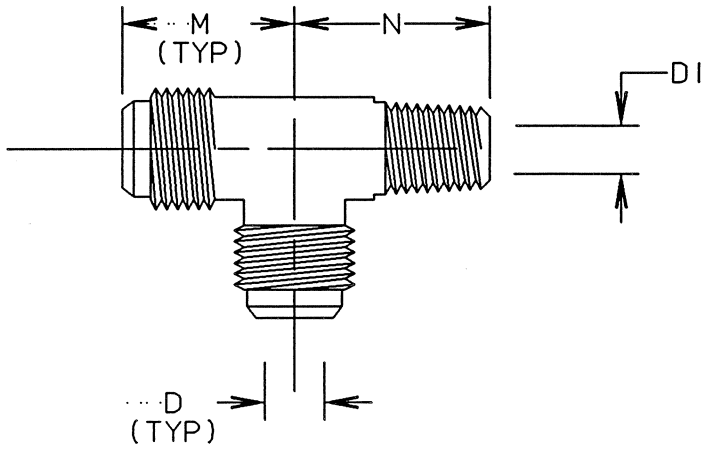
ENGINEERING NOTES:

1. MATERIAL: POLYPROPYLENE
2. COLOR: NATURAL
(3) COLOR: BLACK

CHG	JOB NO	DATE	BY	REVISION
A	P2D360-48	03/26/98	DAJ	REVISED AND REDRAWN IN CATIA, ADDED -003.

DRAWN	ERK	TITLE	ITEM NUMBER
APPRV	RSH	FTG-TEE, STEEL MALE RUN, 37°	23-12284
DATE	10/12/95	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

SKETCH:



PART NUMBERS:

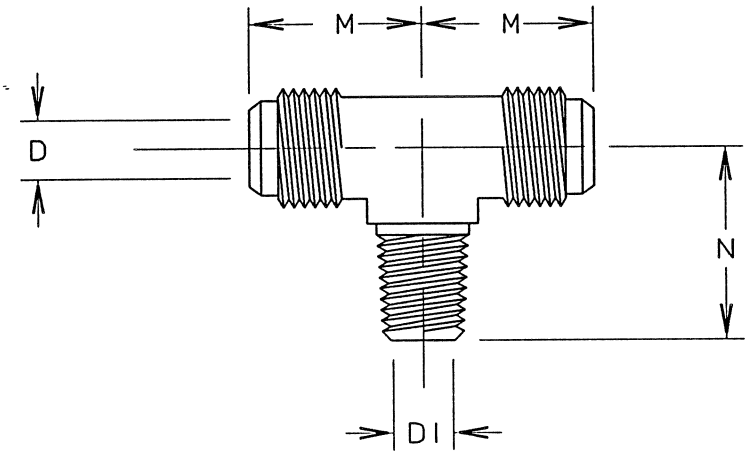
TUBE SIZE	PIPE THREAD	STRAIGHT THREAD	M	N	D	D1	MFG'S NO PH	FREIGHTLINER PART NUMBER
1/4	1/8-27	7/16-20	.89	.78	.172	.188	4 RTX-S	23-12284-042
1/4	1/4-18	7/16-20	1.05	1.09	.172	.281	4-4-4 RTX-S	23-12284-044

1. MATERIAL: STEEL
2. INDUSTRY STD: SAE 070424

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	813885-52	10/12/95	ERK	INITIAL RELEASE
A	P6330F-03	01/25/96	ERK	ADDED -044

DRAWN	ERK	TITLE	ITEM NUMBER
APPRV	RSH	FTG-TEE, STEEL BRANCH, 37°	23-12285
DATE	10/12/95	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

SKETCH:



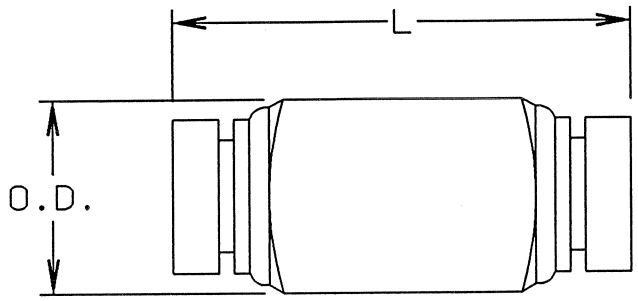
PART NUMBERS:

TUBE SIZE	PIPE THREAD	STRAIGHT THREAD	M	N	D	D1	MFG'S NO PH	FREIGHTLINER PART NUMBER
1/4	1/8	7/16-20	.89	.78	.172	.188	4 STX-S	23-12285-042

1. MATERIAL: STEEL
2. INDUSTRY STD: FIG. NO. 070425

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	813885-52	10/12/95	ERK	INITIAL RELEASE

DRAWN	ERK	TITLE UNION - TUBE BRASS, PM	ITEM NUMBER 23-12287
APPRV	DCL		
DATE	10/26/95	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



PART NUMBERS:

TUBE SIZE	O.D.	L	MFG'S NO. PH		FREIGHTLINER PART NO.
5/32	.406	1.60	62PM-5/32		23-12287-004
1/4	.50	1.34	62PMT-4		23-12287-001
3/8	.75	1.84	62PMT-6		23-12287-002
1/2	.88	2.12	62PMT-8		23-12287-003

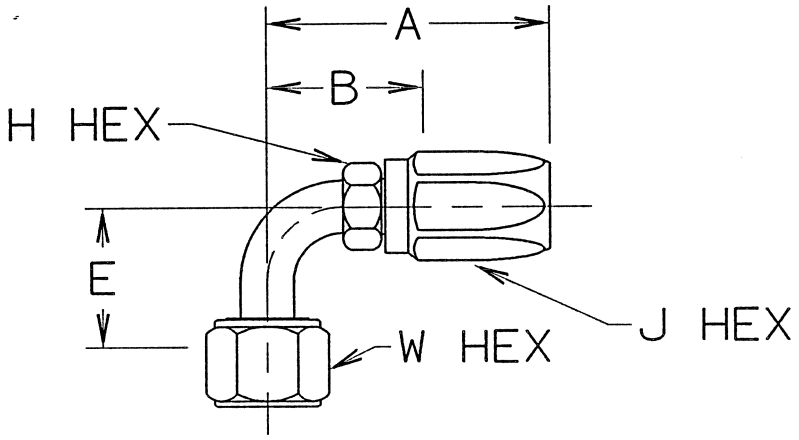
A

ENGINEERING NOTES:

1. MATERIAL: BRASS
2. FITTING MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P4616N-02	10/26/95	ERK	INITIAL RELEASE
A	678124-01	12/05/95	ERK	ADDED -004

DRAWN	DAJ	TITLE FITTING-ELBOW 90° , SWIVEL, JIC 37°	ITEM NUMBER 23-12288
APPRV	ERK		
DATE	10/27/95	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



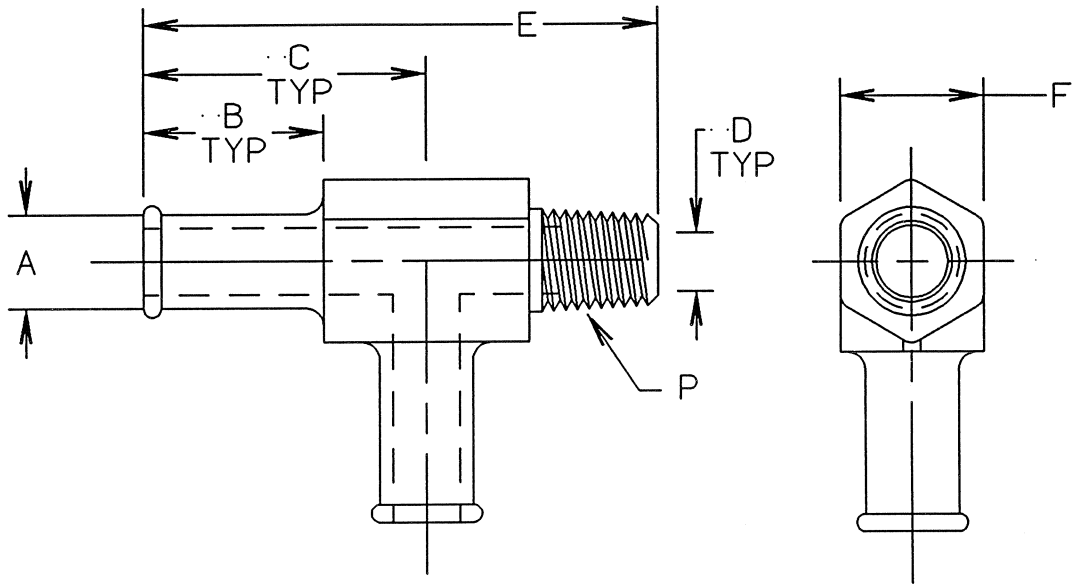
HOSE	HEX			DIMENSION			MANUFACTURER	FREIGHTLINER PART NUMBER
	H	J	W	A	B	E	PH	
12	7/8	1-1/4	1-1/4	3.89	2.39	1.82	23920-12-12	23-12288-012

ENGINEERING NOTES:

1. MATERIAL: STEEL
2. FINISH: ZINC PLATED

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PA2157-28	10/27/95	DAJ	INITIAL LOAD

DRAWN	ERK	TITLE TEE, BRASS BEADED HB TO MALE PIPE	ITEM NUMBER 23-12292
APPRV	GH		
DATE	01/25/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



PART NUMBERS:

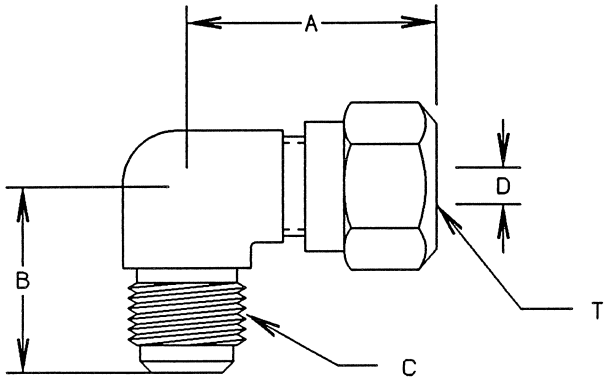
A	B	C	D	E	F	P NPTF	MANUFACTURER'S NUMBER PH	FREIGHTLINER PART NUMBER
.38	.78	1.12	.28	2.00	.547	1/8-27	Q171HB-6-2	23-12292-062

ENGINEERING NOTES:

1. MATERIAL: BRASS, MACHINED FROM CA360 OR CA377.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PA2157-55	01/25/96	ERK	INITIAL RELEASE

DRAWN	ERK	TITLE ELBOW-90° BRASS NTA/SAE 45° FLARE	ITEM NUMBER 23-12297
APPRV	ERK		
DATE	11/30/95	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



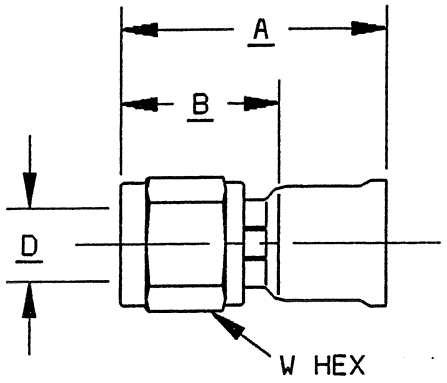
A	B	THREAD UNF-2A (C)	TUBE SIZE (T)	FLOW DIA. (D)	VENDOR NUMBER	FREIGHTLINER PART NUMBER
					PH	
.95	.78	7/16-20	1/4	.14	E-1126	23-12297-004

NOTES:

1. MATERIAL: BRASS
2. REFERENCE SAE J512 AND J246.
3. FITTING ASSEMBLY MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P3946H-02	11/30/95	ERK	INITIAL RELEASE

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	SWIVEL ASSY-HOSE ALL STEEL	A23-12299	
DATE	04/20/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. C
CATIA ORIGINAL				



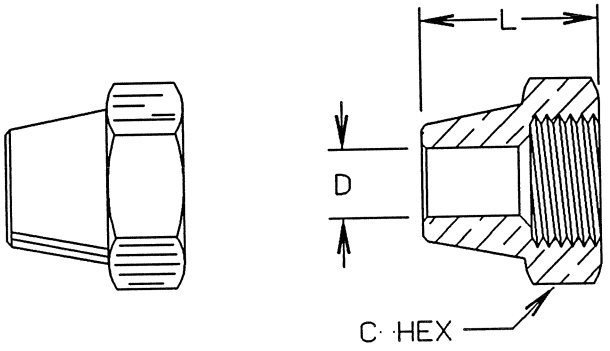
HOSE SIZE	THREAD	DIMENSION			W HEX	SUPPLIER	FREIGHTLINER PART NUMBER
		A	B	D		PH	
4	7/16-20	1.67	0.80	.14	9/16	16826-4-4	A23-12299-004
6	9/16-18	1.78	0.92	.23	11/16	10626-6-6	A23-12299-006
8	3/4-16	1.91	1.08	.31	7/8	16826-8-8	A23-12299-008
10	7/8-14	2.17	1.22	.42	1	16826-10-10	A23-12299-010
10	3/4-16	2.36	1.41	.42	7/8	16826-8-10	A23-12299-108
12	1-1/16-12	2.28	1.34	.52	1-1/4	10626-12-12	A23-12299-012
16	1-5/16-12	2.52	1.48	.75	1-1/2	10626-16-16	A23-12299-016
20	1-5/8-12	2.57	1.50	.95	2	16826-20-20	A23-12299-020

ENGINEERING NOTES:

1. MATERIAL: STEEL NIPPLE, NUT AND SHELL
2. FOR USE WITH HOSES MEETING THE PROVISIONS OF SAE STANDARD J1402-AI, J1402-AII, OR J517-100R5.
3. MUST MEET APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD #106.
4. SWIVEL SEAT: -006,-012,-016,-020 37° SEAT
   -004,-008,-010,-108 DUAL SEAT(37°/45°)

CHG	JOB NO	DATE	BY	REVISION
C	P03175-61	04/20/98	DAJ	INITIAL LOAD

DRAWN	ERK	TITLE NUT-SHORT 45° FLARE, BRASS	ITEM NUMBER 23-12302
APPRV	ERK		
DATE	12/19/95	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



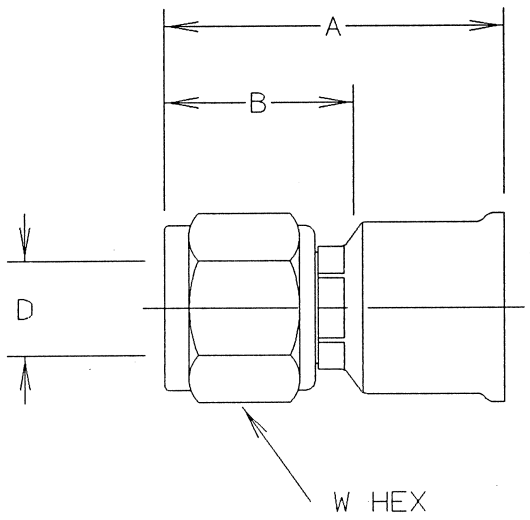
TUBE SIZE	STRAIGHT THREAD	C HEX	D	L	VENDOR NUMBER	FREIGHTLINER PART NUMBER
					PH	
1/4	7/16-20	9/16	.257	.75	41FS-4	
3/8	5/8-18	3/4	.382	1.00	41FS-6	
1/2	3/4-16	7/8	.507	1.12	41FS-8	
5/8	7/8-14	1 1/16	.632	1.31	41FS-10	23-12302-010

NOTES:

1. MATERIAL: BRASS
2. INDUSTRY STD: FIG. NO. 010110, SAE J512.
3. FITTING ASSEMBLY MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P2A141-18	12/19/95	ERK	INITIAL RELEASE

DRAWN	DAJ	TITLE	ITEM NUMBER
APPRV	ERK	SWIVEL ASSY-HOSE, SAE, 30°, STEEL	A23-12307
DATE	01/12/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



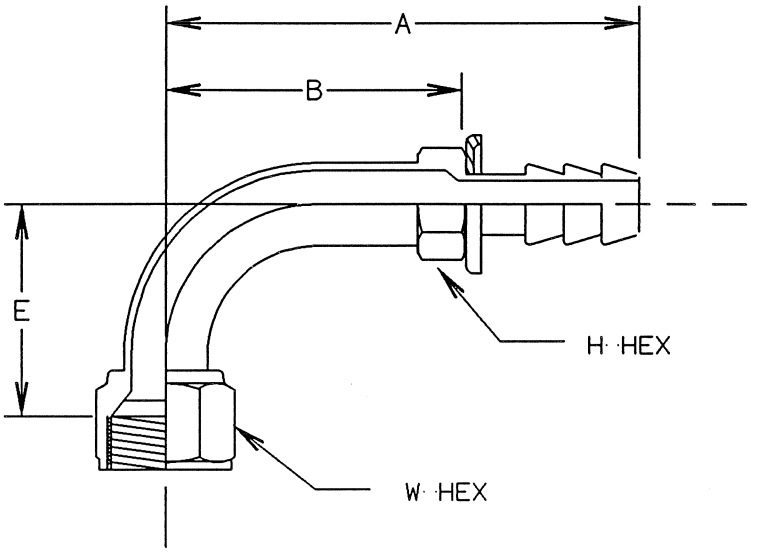
HOSE SIZE	THREAD	DIMENSION			W HEX	SUPPLIER	FREIGTHLINER PART NUMBER
		A	B	D		PH	
16	1-5/16-14	2.30	1.26	.75	1-1/2	13226-16-16	A23-12307-016
20	1-5/8-14	2.41	1.34	.95	2	13226-20-20	A23-12307-020

ENGINEERING NOTES:

1. MATERIAL: STEEL NIPPLE, NUT AND SHELL
2. FOR USE WITH HOSES MEETING THE PROVISIONS OF SAE STANDARD J 1402 FOR TABLE A1 AIR BRAKE HOSE.
3. MUST MEET APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD #106.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PN0648-01	01/12/96	DAJ	INITIAL LOAD

DRAWN	ERK	TITLE SWIVEL FEMALE JIC 37°	ITEM NUMBER A23-12310
APPRV	SST		
DATE	01/23/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



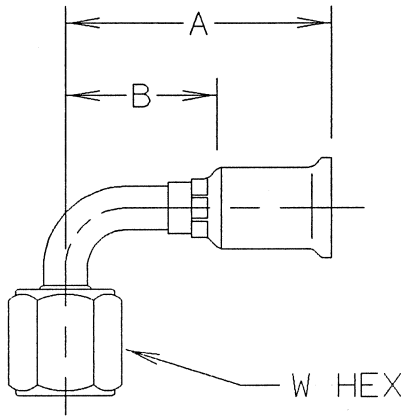
THREAD SAE	HOSE I.D. 16THS	A	B	E	H	W	VENDOR NUMBER PH	FREIGHTLINER PART NO.
3/4-16	8	2.30	1.25	1.09	5/8	7/8	33982-8-8-HT	A23-12310-008

A

1. MATERIAL: STEEL
2. FINISH: CAD OR ZINC PLATED

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	728014-04	01/23/96	ERK	INITIAL RELEASE
A	PA2042-64	01/26/96	ERK	REVISED E: 1.09 IPO .39

DRAWN	DAJ	TITLE	ITEM NUMBER
APPRV	ERK	ELBOW ASSY - 90° ALL STEEL	A23-12322
DATE	02/14/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



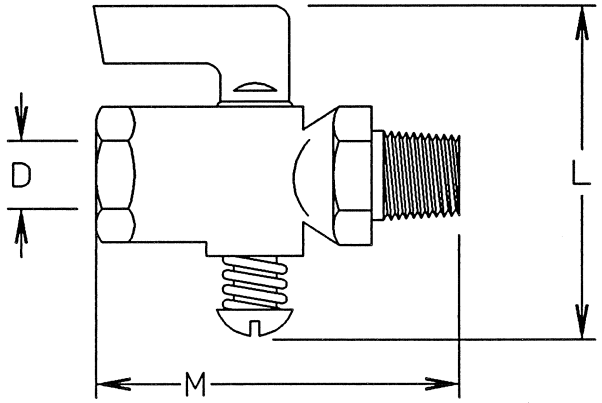
HOSE SIZE	THREAD	DIMENSION		W HEX	DIMENSION	FREIGTHLINER PART NUMBER
		A	B		PH	
8	3/4-16	2.33	1.43	7/8	13W26-8-8	A23-12322-008
10	7/8-14	2.81	1.49	1	13W26-10-10	A23-12322-010

ENGINEERING NOTES:

1. MATERIAL: STEEL NIPPLE, NUT AND SHELL
2. FOR USE WITH HOSES MEETING THE PROVISIONS OF SAE STANDARD J 1402 FOR TABLE A1 AIR BRAKE HOSE.
3. MUST MEET APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD #106.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PN0648-02	02/14/96	DAJ	INITIAL LOAD

DRAWN	ERK	TITLE SHUTOFF COCK BRASS	ITEM NUMBER 23-12333
APPRV	ERK		
DATE	03/15/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

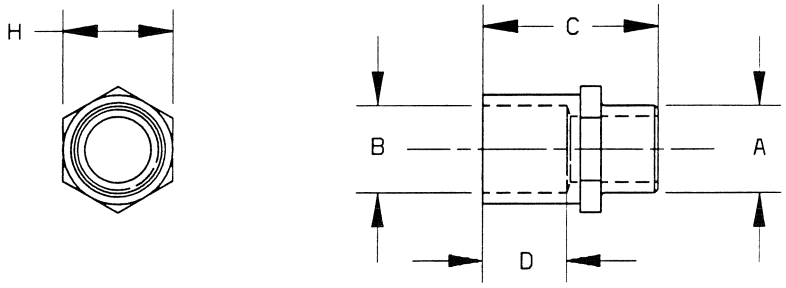


FEMALE PIPE THREAD	PIPE THREAD	L	M	FLOW DIA D	MANUFACTURER	FREIGHTLINER PART NUMBER
					PH	
1/8	1/8	1.89	2.20	.218	V402P-2-2	23-12333-002

1. MATERIAL: BRASS

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PA2157-B3	03/15/96	ERK	INITIAL RELEASE

DRAWN	FHC	TITLE ADAPTER-BRASS, SOLDER TO MALE PIPE	DRAWING NUMBER 23-12335	
APPRV	DAJ			
DATE	04/02/96			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. B



A PIPE THREAD	B TUBE O.D.	C OVERALL LENGTH	D INSERTION DEPTH	H HEX	MFR'S NUMBER PH	FREIGHTLINER PART NUMBER
3/4-14 NPTF	1.00	1.68	.62	1-1/8	S-3119	23-12335-000
3/4-14 NPTF	0.75	1.68	.62	1-1/16	S-4556	23-12335-001
1/2-14 NPTF	0.625	1.56	.50	7/8	S-4626	23-12335-002

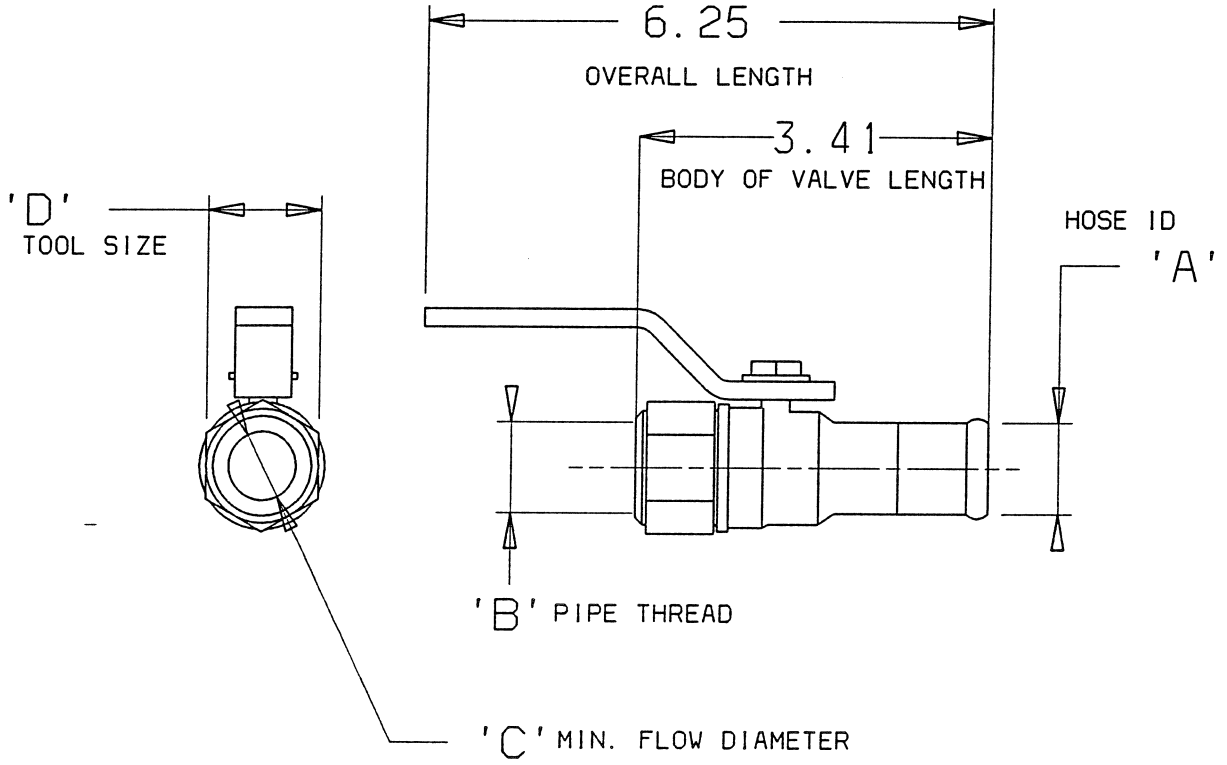
B

ENGINEERING NOTES:

1. MATERIAL: CA360 BRASS

CHG	JOB NO	DATE	BY	REVISION
-	PF1039-04	04/02/96	FHC	INITIAL RELEASE
A	P04095-02	12/05/97	DAJ	ADDED DIM D AND NOTE 2, REVISED NOTE 1 AND TITLE.
B	P07654-07	08/05/99	CGD	ADDED 23-12335-001/-002

DRAWN	FHC	TITLE	DRAWING NUMBER	
APPRV	DAJ	VALVE-BRASS, 1/4 TURN BALL HOSE BARB TO FEMALE PIPE	A23-12336	
DATE	04/02/96			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. A



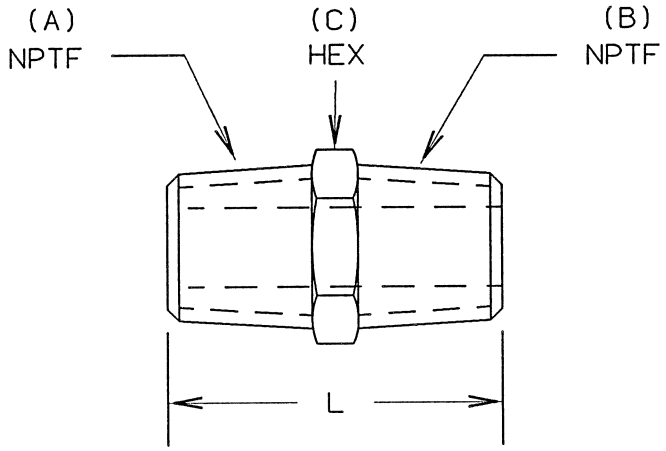
A	B	C	D	FREIGHTLINER PART NUMBER
1.00"	3/4-14 PTF	.685"	1.25"	A23-12336-000

ENGINEERING NOTES:

1. MATERIAL: BRASS
2. HANDLE SHOWN IN OPEN (ON) POSITION.
3. TEMPERATURE RANGE: -50°F TO +350°F.
4. APPROVED VENDOR: PARKER-HANNIFIN XV500P-12-16HB

CHG	JOB NO	DATE	BY	REVISION
-	PF1039-04	04/02/96	FHC	INITIAL RELEASE
A	P04095-02	12/05/97	DAJ	DIM 3.41 WAS 3.14, ADDED NOTE 4, & TITLE.

DRAWN	DAJ	TITLE NIPPLE - HEX MNPTF/MNPTF, STEEL	ITEM NUMBER 23-12340
APPRV	DAJ		
DATE	04/08/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



PART NUMBERS:

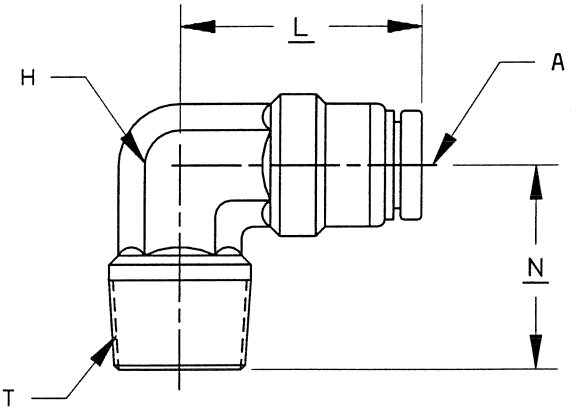
A THRD NPTF	B THRD NPTF	C HEX	L	MANUFACTURER & NUMBER		FREIGHTLINER PART NUMBER
				PH		
1/4-18	3/8-18	11/16	1.45	0101-4-6		23-12340-000

NOTES:

1. MATERIAL: STEEL
2. INDUSTRY STANDARD: REF. SAE 140137.
3 FITTING ASSEMBLY MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PA2157-E9	04/08/96	DAJ	INITIAL LOAD

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	ELBOW-90°, MALE PUSH-IN, NON-SWIVEL	23-12341	
DATE	07/23/97		SHEET 1 OF 1	CHG. LTR. H
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON		



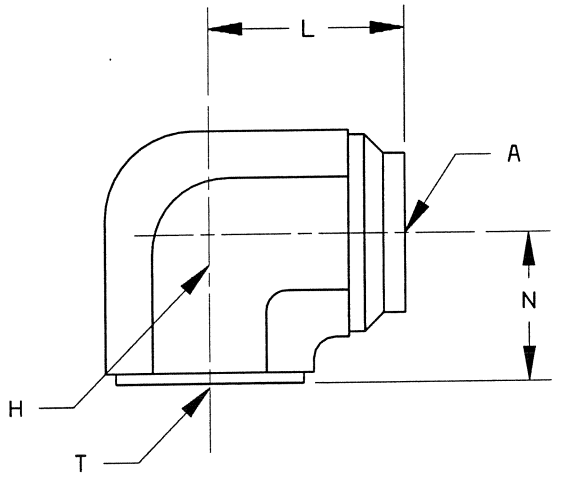
	"A" TUBE SIZE	"T" PIPE THREAD	"H" WRENCH FLATS	L	N	MFR'S NO. PH	FREIGHTLINER PART NUMBER
G	5/32	1/4-18	9/16	0.84	0.91	269PMNS-5/32-4	23-12341-010
	1/4	1/4-18	13/32	0.84	0.91	169PMTNS-4-4	23-12341-000
	1/4	1/8-27	13/32	0.84	0.69	169PMTNS-4-2	23-12341-001
	3/8	3/8-18	9/16	1.05	0.94	169PMTNS-6-6	23-12341-002
	1/4	3/8-18	1/2	0.84	1.06	169PMTNS-4-6	23-12341-003
H	1/2	1/4-18	11/16	1.17	1.06	169PMTNS-8-4	23-12341-011
	1/2	1/2-14	11/16	1.17	1.26	169PMTNS-8-8	23-12341-004
	3/8	1/4-18	9/16	1.05	0.94	169PMTNS-6-4	23-12341-005
	5/8	1/2-14	7/8	1.46	1.32	169PMTNS-10-8	23-12341-006
	3/8	1/2-14	11/16	1.12	1.26	169PMTNS-6-8	23-12341-007
	3/8	1/8-27	9/16	1.05	0.75	169PMTNS-6-2	23-12341-008
F	5/8	3/8-18	7/8	1.46	1.11	169PMTNS-10-6	23-12341-009

ENGINEERING NOTES:

1. MATERIAL: BRASS BODY AND COMPONENTS. SST TUBE SUPPORT, NITRILE TUBE SEAL.
2. FITTING MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.
3. DIMENSIONS ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
F	F25495-49	06/24/99	JNB	ADDED -009
G	P05498-02	11/19/99	LFB	ADDED -010, REVISED DIAGRAM TO SHOW A, H AND T.
H	P11639-01	02/22/00	LFB	ADDED -011.

DRAWN	DAJ	TITLE ELBOW-90°, FEMALE PUSH-IN, NON-SWIVEL	DRAWING NUMBER 23-12342
APPRV	DAJ		
DATE	04/08/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. B
CATIA ORIGINAL			



B

"A" TUBE SIZE	"T" PIPE THREAD	"H" WRENCH FLATS	L	N	MFR'S NO. PH	FREIGHTLINER PART NUMBER
1/4	1/8-27	11/16	0.84	0.56	170PMTNS-4-2	23-12342-000
5/32	1/8-27	9/16	0.84	0.37	270PMNS-5/32-2	23-12342-001

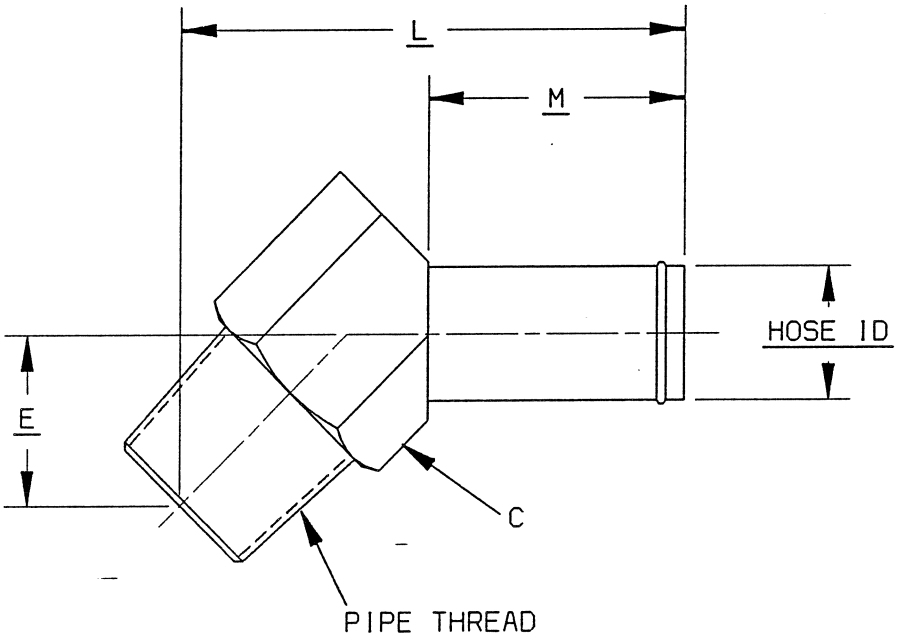
A

ENGINEERING NOTES:

1. MATERIAL: BRASS BODY AND COMPONENTS. SST TUBE SUPPORT, NITRILE TUBE SEAL.
2. FITTING MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.
3. DIMENSIONS ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	PA2157-E9	04/08/96	DAJ	INITIAL LOAD
A	P05498-02	11/19/99	LFB	REVISED AND REDRAWN IN CATIA. ADDED -001.
B	PA2042-98	12/06/99	LFB	ADDED N DIM AND LEADER TO H CALLOUT.

DRAWN	DAJ	TITLE ELBOW-45°, STL BEADED TUBE HOSE TO MALE PIPE	DRAWING NUMBER 23-12376
APPRV	DAJ		
DATE	02/23/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. B
CATIA ORIGINAL			



HOSE SIZE	PIPE THREAD	C HEX	E	L	M	MANUFACTURER'S P/N			FREIGHTLINER PART NUMBER
						DIV	PH	BRENNAN	
3/8	3/8-18	3/4	0.69	2.38	1.50	-	31TB-6-6	4503-6-6	23-09149-001
1/2	3/8-18	7/8	0.69	2.54	1.50	-	31TB-6-8	4503-8-6	23-12376-008
3/4	1/2-14	1-1/4	0.82	2.78	1.50	-	31TB-8-12	4503-12-8	PH 31TB8 12
3/4	3/4-14	1-1/4	0.86	2.82	1.50	16163*	31TB-12-12	4503-12-12	23-09149-000
1	3/4-14	1-1/2	0.86	3.01	1.63	-	31TB-12-16	4503-16-12	23-12376-016
1	1-11 1/2	1-1/2	1.04	3.19	1.63	-	31TB-16-16	4503-16-16	23-12206-001

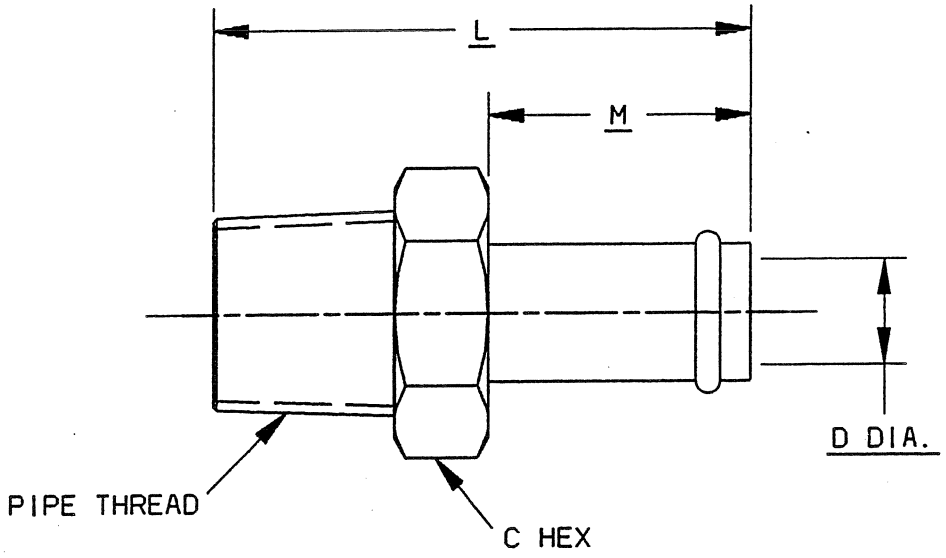
* ALTERNATE 844-12

SPECIFICATIONS:

1. MATERIAL: STEEL,
2. FINISH: ZINC PLATING W/ YELLOW CHROMATE
3. REFERENCE SAE J1231 (430360)
4. CLAMPS COMFORM TO SAE J1508.

CHG	JOB NO	DATE	BY	REVISION
B	P00152-06	02/23/98	DAJ	RVSD & RDRWN, CONSOLIDATED DWGS 23-12206 & 23-09149.

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	FITTING-STRAIGHT, STL BEADED TUBE HOSE TO MALE PIPE	23-12377	
DATE	02/02/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. C
CATIA ORIGINAL				



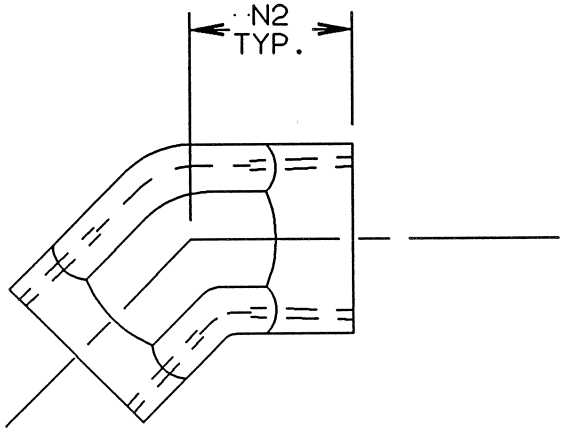
HOSE ID	PIPE THREAD	C HEX	L	M	MANUFACTURER'S NUMBER PH	FREIGHTLINER PART NUMBER
3/8	1/4-18	5/8	2.09	1.13	01TB-4-6 VS	23-12377-038
3/4	1/2-14	1	2.31	1.16	01TB-8-12 VS	PH 01TB8 12VS
2	2-11 1/2	2 5/8	3.53	1.75	01TB-32-32 VS	23-12377-200
C 3/4	3/4-14	1 1/8	2.31	1.16	01TB-12-12 VS	23-12377-075

ENGINEERING NOTES:

1. MATERIAL: STEEL
2. FINISH: ZINC WITH YELLOW CHROMATE PLATING.
3. PARTS MUST BE SUPPLIED WITH VIBRASEAL APPLIED TO THREADS.

CHG	JOB NO	DATE	BY	REVISION
C	P03938-01	02/02/98	DAJ	REVISED AND REDRAWN IN CATIA, ADDED 23-12377-075.

DRAWN	DAJ	TITLE	ITEM NUMBER
APPRV	DAJ	FITTING-ELBOW, 45° FEMALE PIPE THREAD	23-12380
DATE	06/07/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



I.D. HOSE SIZE	PIPE THREAD	WRENCH FLATS	N2	MANUFACTURER'S NUMBER	FREIGHTLINER PART NUMBER
				PH	
3/8	3/8-18	7/8	0.75	3/8 DD45-S	23-12380-006

ENGINEERING NOTES:

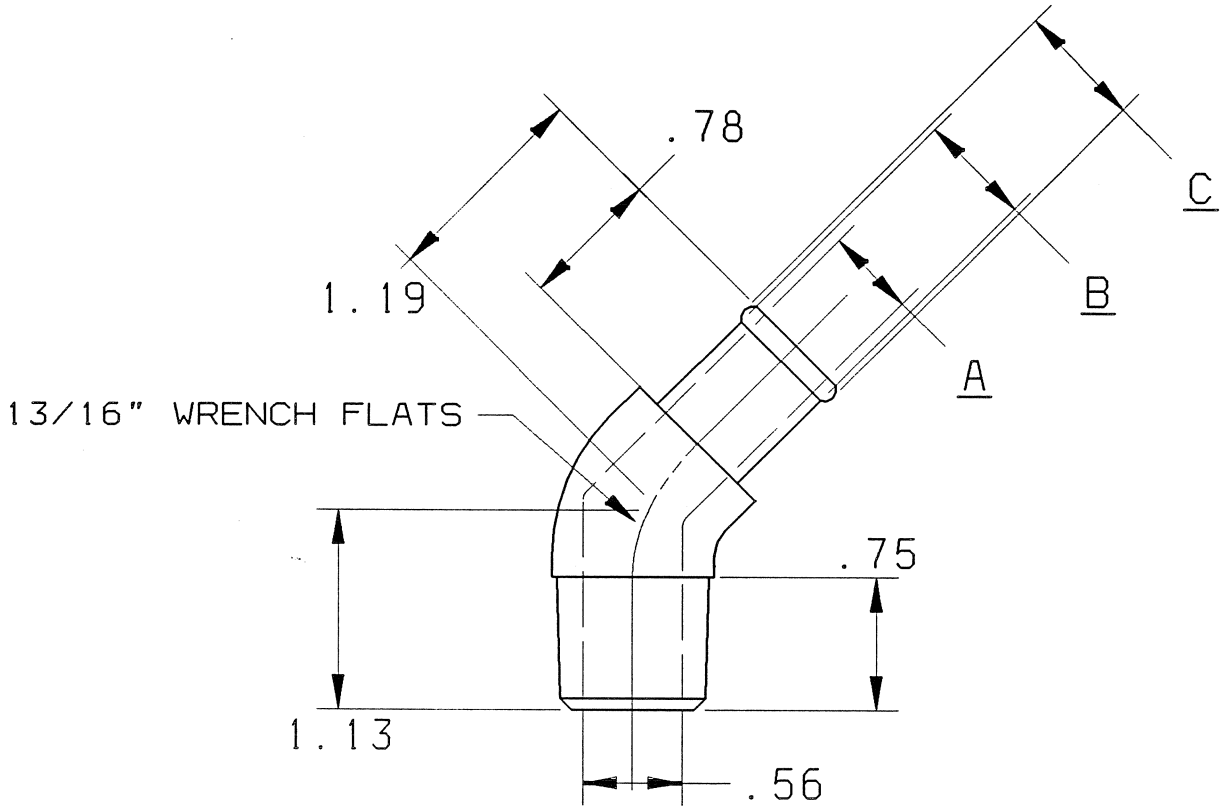
1 MATERIAL: STEEL

2 FINISH: ZINC WITH YELLOW CHROMATE PLATING.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PC3102-01	06/07/96	DAJ	INITIAL LOAD

DRIENNE CHILBERG

DRAWN	REK	TITLE ELBOW-45°, HOSE BARB TO MPT	DRAWING NUMBER 23-12386
APPRV	TJU		
DATE	06/06/96		
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -
UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCHES			



HOSE ID	MPT	A	B	C	VENDOR NUMBER PH	FRIGHTLINER NUMBER
5/8	1/2-14	.50	.63	.70	Q179HB-10-8	23-12386-010
3/4	1/2-14	.63	.750	.828	Q179HB-12-8	23-12386-012

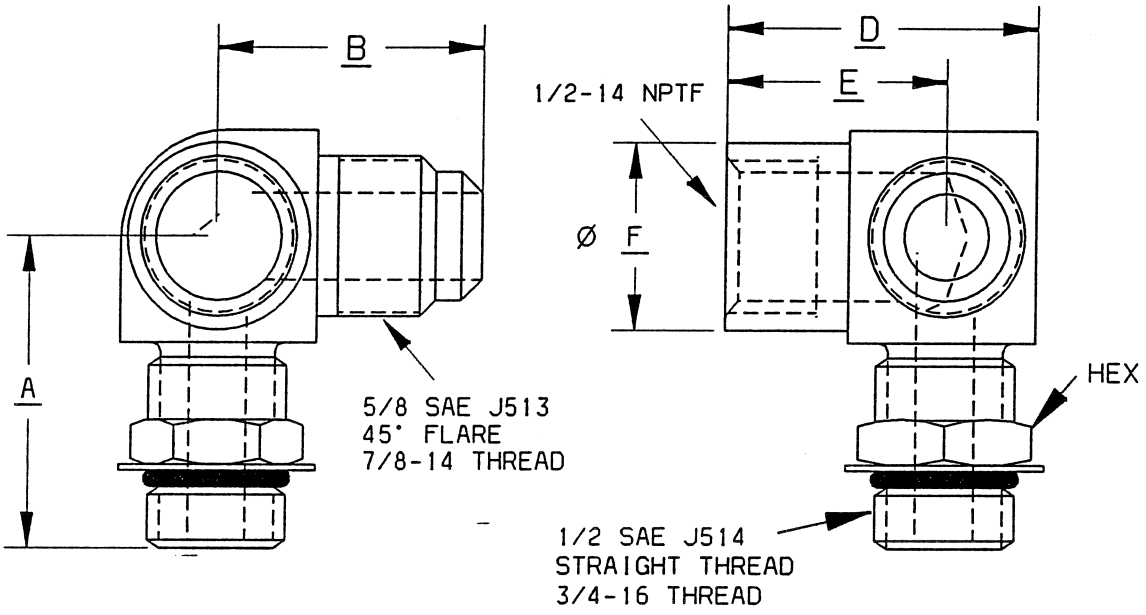
ENGINEERING NOTES:

1. MATERIAL: CA377 FORGE BRASS
2. SUGGESTED VENDOR: PARKER-HANNIFIN OR EQUIVALENT
3. ALL DIMENSIONS ARE REFERENCE ONLY.
4. SEE DRAFT2 AND DRAFT3 FOR VENDOR DRAWINGS.

CHG	JOB NO	DATE	BY	REVISION
-	P00450-0	06/06/96	REK	INITIAL RELEASE

ADRIENNE CHILBERG

DRAWN	FHC	TITLE	DRAWING NUMBER
APPRV	DAJ	TEE-FLARE, 90°	23-12392
DATE	08/13/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. A
CATIA ORIGINAL			



DIMENSIONS (NOMINAL)					HEX	MFR'S NO.	FREIGHTLINER
A	B	D	E	ØF		PH	PART NUMBER
1.98	1.47	1.72	1.22	1.06	7/8	SR23=12392-000	23-12392-000

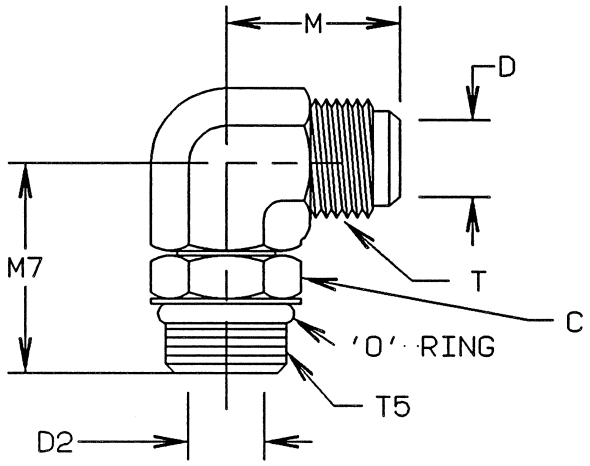
ENGINEERING NOTES:

1. MATERIAL: BODY-BRASS, CA360 OR EQUIVALENT
   O-RING- VITON OR EQUIVALENT

2. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	PF1038-16	08/13/96	FHC	INITIAL RELEASE
A	PA2042-82	12/23/97	DAJ	REVISED DIMENSIONS & VENDOR NO., RMVD DIM C.

DRAWN	DAJ	TITLE	ITEM NUMBER
APPRV	DAJ	ELBOW-90° , STAINLESS STEEL 37° FLARE END/ST THRD "O" RING	23-12393
DATE	09/04/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



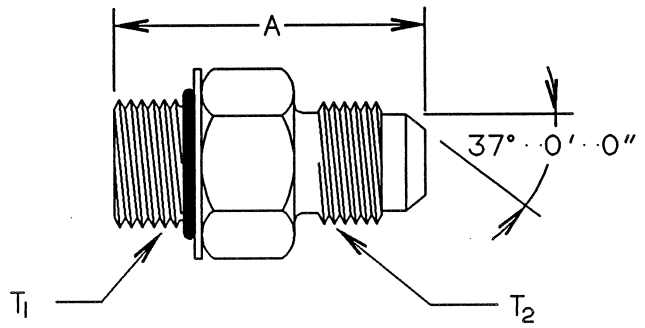
T TUBE END UN/UNF-2A	T5 PORT THD UN/UNF-2A	C HEX	M	M7	D DRILL	D2 DRILL	VENDOR NUMBER PH	FREIGHTLINER PART NUMBER
3/4-16	3/4-16	7/8	1.25	1.45	.391	.391	8 C50X-SS	23-12393-088

NOTES:

1. MATERIAL: STAINLESS STEEL
2. FINISH: PLAIN
3. INDUSTRY STD: SAE 070220

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P6739P-01	09/04/96	DAJ	INITIAL LOAD

DRAWN	DAJ	TITLE CONNECTOR-SST, STRAIGHT THREAD, WITH O RING	ITEM NUMBER 23-12394
APPRV	DAJ		
DATE	09/04/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



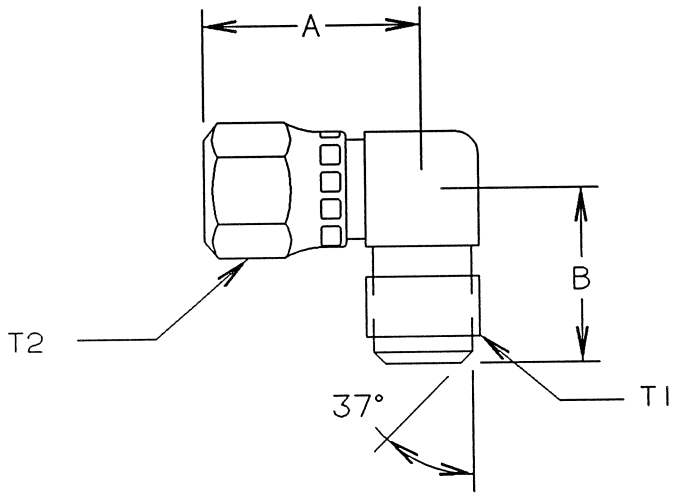
T_1 STRAIGHT THREAD	T_2 STRAIGHT THREAD	TUBE OD	HEX	A	MANUFACTURER'S NO.		FREIGHTLINER PART NUMBER
					PH	STX	
1 1/16-12	3/4-16	1/2	1-1/4	1.77	8-12 F50X-SS		23-12394-208
1 1/16-12	7/8-14	5/8	1-1/4	1.86	10-12 F50X-SS		-210

ENGINEERING NOTES:

1. MATERIAL: STAINLESS STEEL
2. FINISH: PLAIN
3. INDUSTRY STANDARD: SAE 070120.
4. AEROQUIP AND WEATHERHEAD ARE ALSO APPROVED VENDORS.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P6739P-01	09/04/96	DAJ	INITIAL LOAD

DRAWN	DAJ	TITLE ELBOW-90 DEGREE SWIVEL,SAE/SWIVEL,SST	ITEM NUMBER 23-12395
APPRV	DAJ		
DATE	09/04/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



NOMINAL TUBE O.D.	TUBE END UN/UNF-2A (T1)	SWIVEL UN/UNF-2B (T2)	A	B	MANUFACTURER PH	FREIGHTLINER PART NUMBER
1/2	3/4-16	3/4-16	1.38	1.25	8 C6X-SS	23-12395-000
1	1 5/16-12	1 5/15-12	2.00	1.81	16 C6X-SS	PH 3903 16 16SS

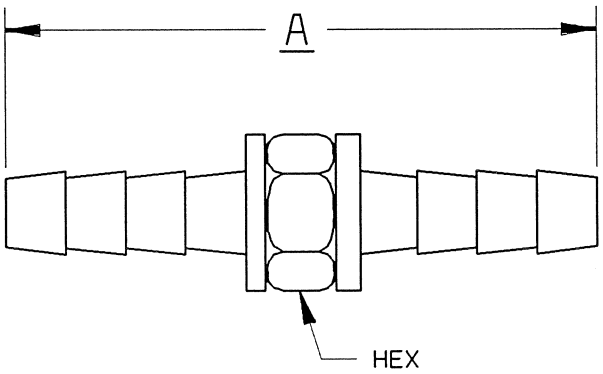
ENGINEERING NOTES:

1. MATERIAL: STAINLESS STEEL
2. FINISH: PLAIN
3. INDUSTRY STANDARD: SAE 070221

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P6739P-01	09/04/96	DAJ	INITIAL LOAD
A	PA2042-73	10/03/96	DAJ	ADDED 1 TUBE PN, NOTE 3 WAS SAE 520221, ADDED DIM.

)RIENNE CHILBERG

DRAWN	FHC	TITLE	DRAWING NUMBER	
APPRV	DAJ	UNION	23-12397	
DATE	09/24/96			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -



HOSE	HEX	DIMENSION A	MANUFACTURER PART NUMBER	FREIGHTLINER PART NUMBER
5/8	7/8	3.31	PH 38282 10 10 HT	23-12397-010
3/4	1-1/16	3.31	PH 38282 12 12 HT	23-12397-012

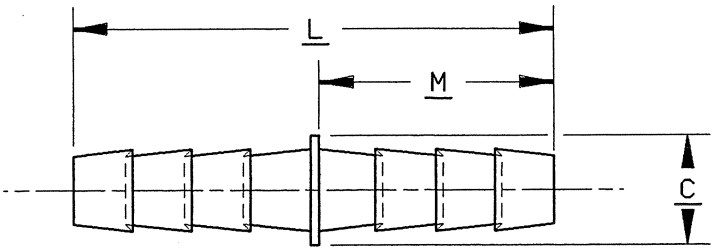
ENGINEERING NOTES:

1. MATERIAL: STEEL
2. FINISH: ZINC WITH YELLOW CHROMATE PLATING.

CHG	JOB NO	DATE	BY	REVISION
-	P6779P-01	09/24/96	FHC	INITIAL RELEASE
A	PA2042-73	10/07/96	DAJ	MFR NUMBER WAS PH 38282 10 HT AND PH 38282 12 HT.

ADRIENNE CHILBERG

DRAWN	FHC	TITLE	DRAWING NUMBER	
APPRV	DAJ	UNION	23-12404	
DATE	11/18/96			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -



HOSE	DIMENSION			MANUFACTURER PART NUMBER	FREIGHTLINER PART NUMBER
	C	L	M		
3/8	1/2	2.00	.97	PH 122HBL-6	23-12404-006

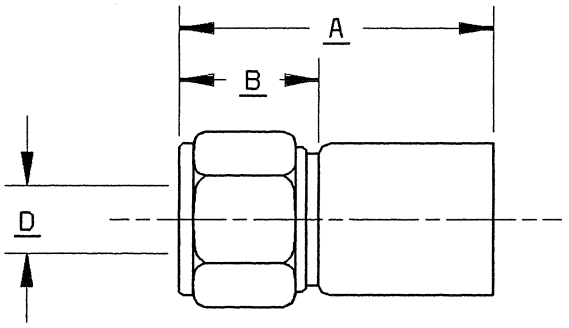
ENGINEERING NOTES:

1. MATERIAL: BRASS

CHG	JOB NO	DATE	BY	REVISION
-	P01320-10	11/18/96	FHC	INITIAL RELEASE

ADRIENNE CHILBERG

DRAWN	FHC	TITLE	DRAWING NUMBER	
APPRV	DAJ	SWIVEL ASSY-HOSE, SAE, 45°	A23-12406	
DATE	11/21/96			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -



HOSE SIZE	THREAD	DIMENSIONS			W HEX	SUPPLIER	FREIGHTLINER PART NUMBER
		A	B	D		PH	
6	5/8-18	1.65	0.80	0.30	3/4	10827-6-6BS	A23-12406-006
8	3/4-16	1.79	0.94	0.39	7/8	10827-6-8BS	A23-12406-008

ENGINEERING NOTES:

1. MATERIAL: BRASS NIPPLE AND NUT, STEEL SHELL.

2. FOR USE WITH HOSES MEETING THE PROVISIONS OF SAE STANDARD J 1402 FOR TABLE A1 AIR BRAKE HOSE.

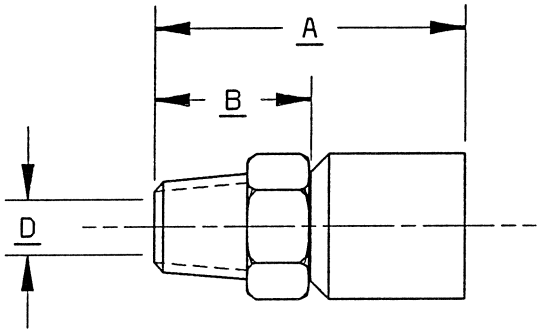
3. MUST MEET APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD #106.

CHG	JOB NO	DATE	BY	REVISION
-	P00339-03	11/21/96	FHC	INITIAL RELEASE

ADRIENNE CHILBERG

DRAWN	FHC	TITLE	DRAWING NUMBER	
APPRV	DAJ	CRIMP FITTING ASSY-HOSE MALE NPTF	A23-12407	
DATE	11/21/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. A
CATIA ORIGINAL				

A



HOSE SIZE	THREAD	DIMENSION			W HEX	SUPPLIER	FREIGHTLINER PART NUMBER
		A	B	D		PH	
6	3/8-18	1.72	0.87	0.30	11/16	10127-6-6BS	A23-12407-006
8	3/8-18	1.72	0.87	0.39	11/16	10127-6-8BS	A23-12407-008

ENGINEERING NOTES:

1. MATERIAL: BRASS NIPPLE AND NUT, STEEL SHELL.

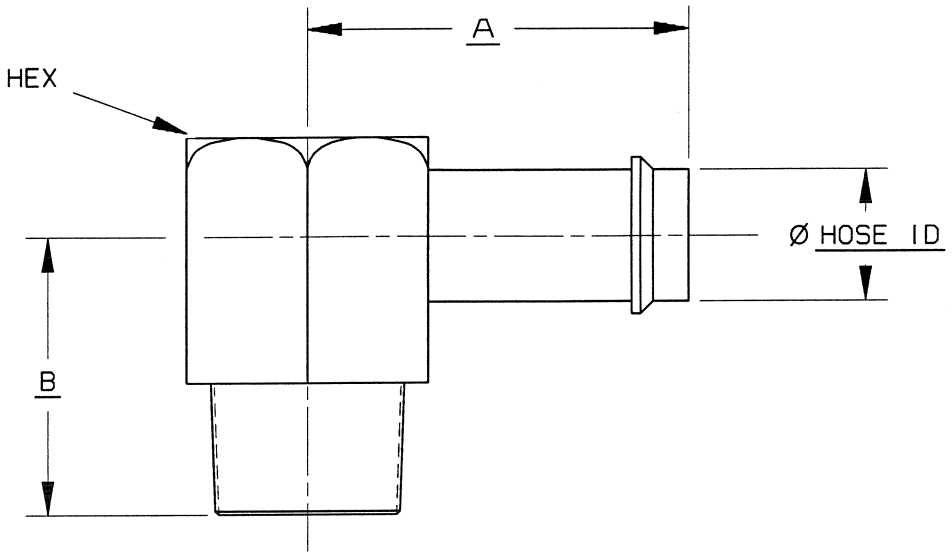
2. FOR USE WITH HOSES MEETING THE PROVISIONS OF SAE STANDARD J 1402 FOR TABLE A AIR BRAKE HOSE.

A

3. MUST MEET APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD #106.

CHG	JOB NO	DATE	BY	REVISION
-	P00339-03	11/21/96	FHC	INITIAL RELEASE
A	PA2042-82	04/17/97	DAJ	TABLE A WAS TABLE A1 IN NOTE 2. REVISED DWG TITLE.

DRAWN	FHC	TITLE ELBOW-90°, STEEL HOSE BARB TO PIPE	DRAWING NUMBER 23-12409
APPRV	DAJ		
DATE	11/22/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. B
CATIA ORIGINAL			



	PIPE THREAD	HOSE ID	A	B	HEX	MANUFACTURER'S NUMBER		FREIGHTLINER PART NUMBER
						DVI	PH	
	1/2-14	5/8	2.03	1.47	1 1/16	842-10-8	21TB-8-10	PH 21TB8 10
A	1/2-14	3/4	2.16	1.59	1 5/16	842-12-8	21TB-8-12	23-09340-002
	3/4-14	3/4	2.16	1.59	1 5/16	842-12	21TB-12-12	23-12409-012
B	3/4-14	1	2.44	1.59	1 5/8	-	21TB-16-12	23-12409-612
A	1-11 1/2	1	2.44	1.97	1 5/8	842-16-16	21TB-16-16	23-12409-016

ENGINEERING NOTES:

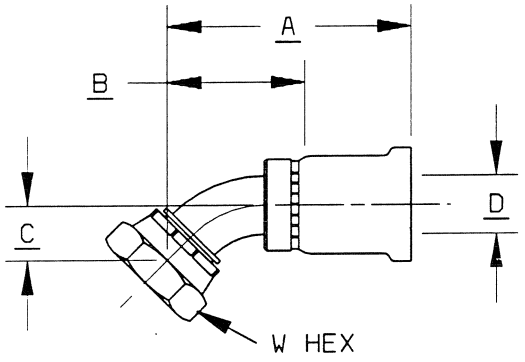
1. MATERIAL: STEEL-FINISH: CADMIUM OR ZINC PLATED FOLLOWED BY CHROMATE TREATMENT.

2. ALL DIMENSIONS ARE REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	P01153-18	11/22/96	FHC	INITIAL RELEASE
A	PA2042-76	04/21/97	DAJ	ADDED 23-09340-002 AND 23-12409-016 TO THE PRINT.
B	P09820-08	01/28/00	LFB	ADDED 23-12409-612.

A23-12418 , C , ELBOW-45 DEG

DRAWN	DAJ	TITLE ELBOW-45 DEG 37° JIC SWIVEL, ALL STEEL	DRAWING NUMBER A23-12418
APPRV	DAJ		
DATE	04/03/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. C
CATIA ORIGINAL			



	HOSE SIZE	THREAD	DIMENSION A	DIMENSION B	DIMENSION C	DIMENSION D	W HEX	SUPPLIER PH	FREIGHTLINER PART NUMBER
B	4	7/16-20	2.01	1.14	0.39	0.14	9/16	13V26-4-4	A23-12418-004
C	16	1-5/16-12	3.34	2.30	0.90	0.75	1-1/2	13726-16-16	A23-12418-016
	20	1-5/8-12	3.74	2.68	1.18	0.95	2.00	13726-20-20	A23-12418-020

ENGINEERING NOTES:

1. MATERIAL: STEEL NIPPLE, NUT AND SHELL

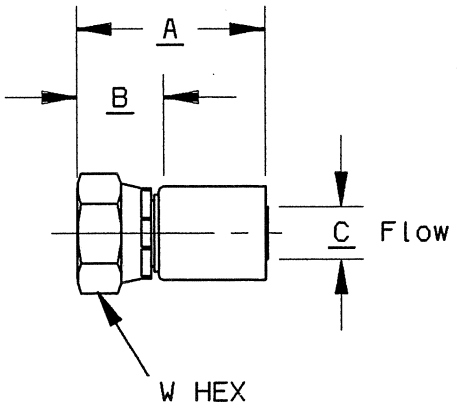
A 2. FOR USE WITH HOSES MEETING THE PROVISIONS OF SAE J1402-AI, J1402-AII, OR J517 100 R5.

3. MUST MEET APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD #106.

B 4. SWIVEL SEAT: -004 DUAL SEAT (37°/45°)
-016,-020 37° SEAT

CHG	JOB NO	DATE	BY	REVISION
-	820878-01	04/03/97	DAJ	INITIAL LOAD
A	PA2042-76	04/16/97	DAJ	REVISED NOTE 2
B	P07070-01	03/11/99	DAJ	ADDED -004 AND NOTE 4
C	P05051-53	06/04/99	IP	ADDED -016

DRAWN	DAJ	TITLE SWIVEL ASSY-HOSE FEMALE JIC, SAE	DRAWING NUMBER A23-12419
APPRV	DAJ		
DATE	04/07/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -
CATIA ORIGINAL			



HOSE SIZE	THREAD	DIMENSION			W HEX	SUPPLIER	FREIGHTLINER PART NUMBER
		A	B	C (ID)		PH	
6	5/8-18	1.40	0.95	19/64	3/8	10863-6-6B	A23-12419-006
8	3/4-16	1.88	1.02	25/64	7/8	16863-8-8B	A23-12419-008
8	7/8-14	2.04	1.18	25/64	1	16863-10-8B	A23-12419-108

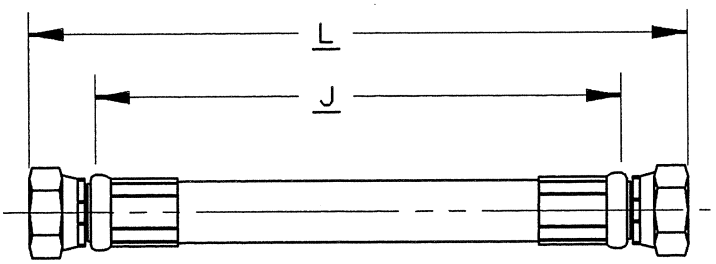
ENGINEERING NOTES:

1. MATERIAL: BRASS NIPPLE, NUT AND SHELL
2. FOR USE WITH DIESEL FUEL HOSE.
3. SWIVEL SEAT: -006 45° SEAT
   -008,-108 37°/45° DUAL SEAT

CHG	JOB NO	DATE	BY	REVISION
-	P01926-01	04/07/97	DAJ	INITIAL LOAD

ADRIENNE CHILBERG

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSY-FIBER BRAID SWIVEL, FEMALE TO FEMALE JIC, SAE	A23-12420	
DATE	04/07/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2	CHG. LTR. -
CATIA ORIGINAL				



HOSE SIZE	THREAD	FITTINGS	HOSE		PSI (MAX)	BEND RADIUS (MIN)	FREIGHTLINER PART NUMBER
		A23-12419	48-25245	J			
6	5/8-18	-006	-006	L-1.90	300	3	A23-12420-L
8	7/8-14	-108	-008	L-2.36	300	4	A23-12421-L

ENGINEERING NOTES:

1. PART NUMBER EXAMPLE: A23-12420-015, THE DASH NUMBER DENOTES AN ASSEMBLY 15 INCHES IN LENGTH.

2. MATERIAL: SWIVEL FITTINGS, BRASS NIPPLE, BRASS NUT AND SHELL;
   HOSE, SINGLE FIBER BRAID REINFORCED.
   CAUTION: HOSE AND FITTINGS USED IN THE ABOVE ASSEMBLIES MUST BE FROM THE SAME MANUFACTURER.

3. LABEL REQUIRED FOR AFTERMARKET APPLICATIONS.

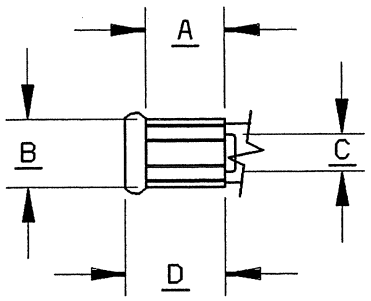
4. SEE SHEET 2 FOR CRIMP DIMENSIONS.

5. SWIVEL SEATS: A23-12420, 45° SEATS;
   A23-12421, 37°/45° DUAL SEATS.

CHG	JOB NO	DATE	BY	REVISION
-	P01926-01	04/07/97	DAJ	INITIAL LOAD

ADRIENNE CHILBERG

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSY-FIBER BRAID SWIVEL, FEMALE TO FEMALE JIC, SAE	A23-12420	
DATE	04/07/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2	CHG. LTR. -
CATIA ORIGINAL				

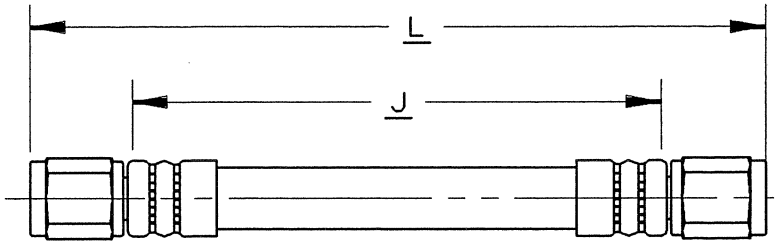


HOSE SIZE	CRIMP DIMENSIONS (MIN/MAX)			
	A	B*	C(MIN)	D
6	.41/.45	.600/.620	.260	.47/.59
8	.43/.47	.740/.760	.382	.49/.61

* MEASURED AT CENTER OF CRIMP LENGTH.

CHG	JOB NO	DATE	BY	REVISION
-	P01926-01	04/07/97	DAJ	INITIAL LOAD

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSY-FIBER REINFORCED, FEMALE/FEMALE, SWIVEL 45° FLARE	A23-12422	
DATE	04/08/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2	CHG. LTR. -
CATIA ORIGINAL				



HOSE SIZE	THREAD	FITTINGS	HOSE		PSI (MAX)	BEND RADIUS (MIN)	FREIGHTLINER PART NUMBER
		FEMALE A23-12406	48-25193	J			
6	5/8-18	-006	-006	L-1.60	225	1-3/4	A23-12422-L
8	3/4-16	-008	-008	L-1.88	225	2	A23-12423-L

ENGINEERING NOTES:

1. THE REQUIREMENTS HOSE MUST QUALIFY UNDER ALL THE LATEST PROVISIONS OF TEST REQUIREMENTS FOR SAE J1402 HOSE ASSEMBLIES, AND MUST MEET APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD # 106.

2. PART NUMBER EXAMPLE: A23-12422-065, THE DASH NUMBER DENOTES AN ASSEMBLY 65 INCHES IN LENGTH.

3. MATERIAL: FEMALE SWIVEL FITTING, BRASS NIPPLE AND NUT, STEEL SHELL; HOSE SINGLE FABRIC OR SPIRAL BRAID REINFORCED MEETING SAE J1402 STANDARDS AND DOT FMVSS 106.

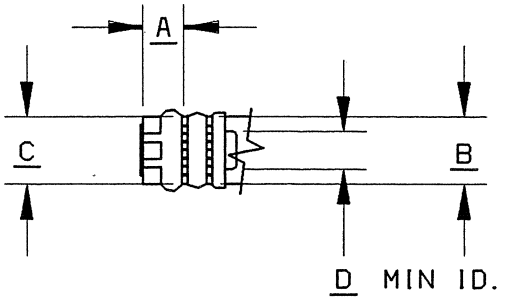
   CAUTION: HOSE AND FITTINGS USED IN THE ABOVE ASSEMBLIES MUST BE FROM THE SAME MANUFACTURER.

4. LABEL REQUIRED FOR AFTERMARKET APPLICATIONS.

5. SEE SHEET 2 FOR CRIMP DIMENSIONS.

CHG	JOB NO	DATE	BY	REVISION
-	P00339-04	04/08/97	DAJ	INITIAL LOAD

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSY-FIBER REINFORCED, FEMALE/FEMALE, SWIVEL 45° FLARE	A23-12422	
DATE	04/08/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2	CHG. LTR. -
CATIA ORIGINAL				

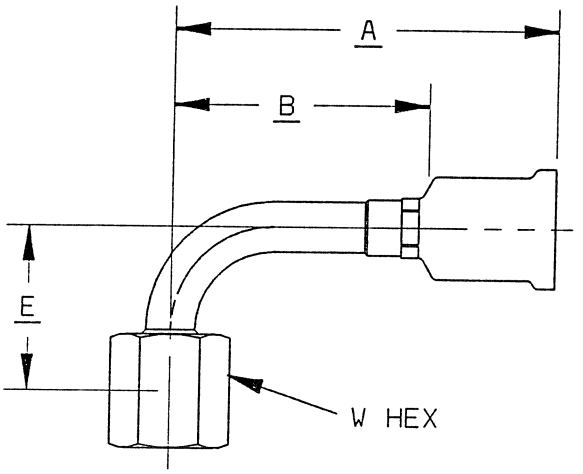


HOSE SIZE	CRIMP DIMENSIONS (MIN/MAX)			
	A	B	C	D(MIN)
6	.46/.50	.575/.595	.560/.580	.206
8	.46/.50	.67/.69	.655/.675	.268

CHG	JOB NO	DATE	BY	REVISION
-	P00339-04	04/08/97	DAJ	INITIAL LOAD

ADRIENNE CHILBERG

DRAWN	DAJ	TITLE	DRAWING NUMBER
APPRV	DAJ	ELBOW ASSY-90° ALL STEEL, 37° JIC	A23-12426
DATE	04/22/97		
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. A



	HOSE SIZE	THREAD	DIMENSION			W HEX	SUPPLIER PH	FREIGHTLINER PART NUMBER
			A	B	E			
A	6	9/16-18	1.98	1.12	0.85	11/16	13926-6-6	A23-12426-006
	12	1-1/16-12	2.88	1.93	1.82	1-1/4	13926-12-12	A23-12426-012
	16	1-5/16-12	3.30	2.26	2.14	1-1/2	13926-16-16	A23-12426-016

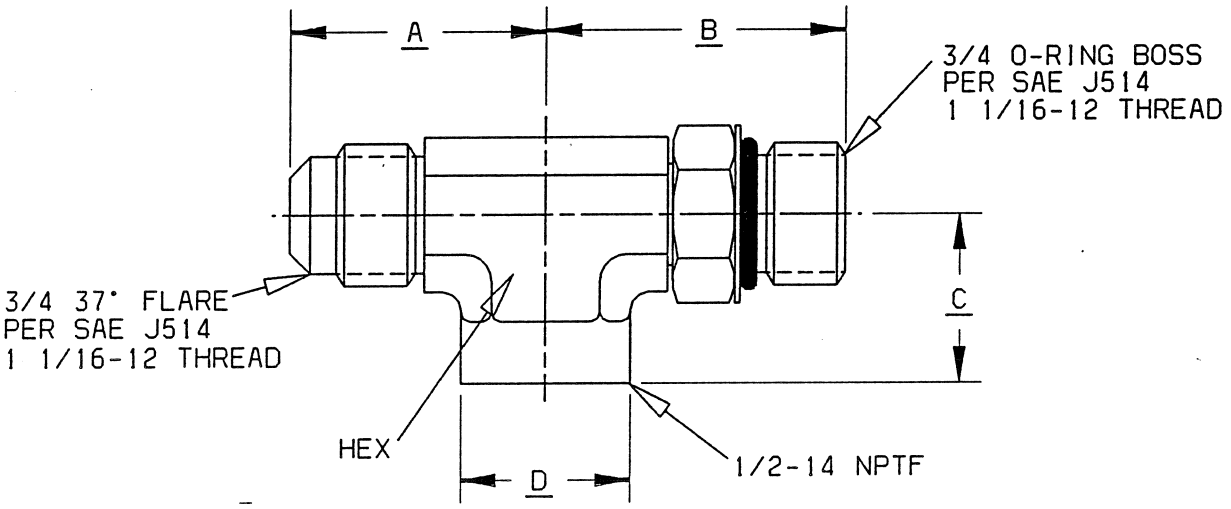
ENGINEERING NOTES:

1. MATERIAL: STEEL NIPPLE, NUT AND SHELL
2. FOR USE WITH HOSES MEETING THE PROVISIONS OF SAE STANDARD J1402-AI, J1402-AII, OR J517-100R5.
3. MUST MEET APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD #106.

CHG	JOB NO	DATE	BY	REVISION
-	P02738-03	04/22/97	DAJ	INITIAL LOAD
A	P03471-01	09/03/97	DAJ	ADDED -006

ADRIENNE CHILBERG

DRAWN: DAJ	TITLE: TEE-INLET FITTING	DRAWING NUMBER: 23-12442	
APPRV: DAJ			
DATE: 05/30/97	FREIGHTLINER CORPORATION, PORTLAND, OREGON	SHEET: 1 OF 1	CHG. LTR.: A
CATIA ORIGINAL			



DIMENSIONS				HEX (FLAT)	MFR'S NO.	FREIGHTLINER
A	B	C	D (Ø)		PH	PART NUMBER
1.66	1.94	1.27	1.06	1 1/16	12-12-8 XAOJG-S	23-12442-000

A

ENGINEERING NOTES:

1. MATERIAL: BODY-STEEL
   O-RING- NITRILE (BUNA-N)

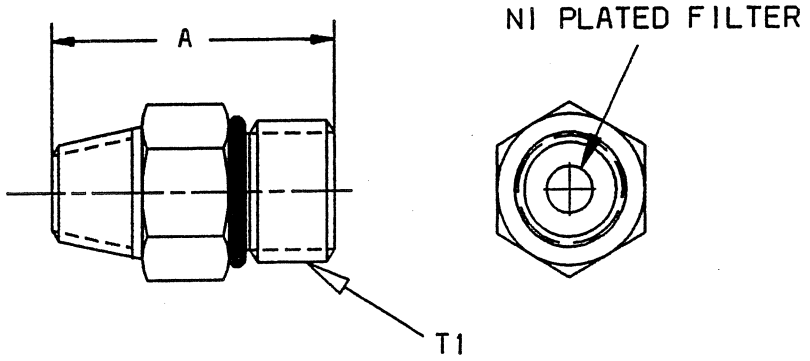
A

2. FINISH: ZINC AND YELLOW DICHROMATE

3. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	P01840-03	05/30/97	DAJ	INITIAL RELEASE
A	PA2042-82	12/23/97	DAJ	DIM C WAS 1.22, O-RING WAS VITON

DRAWN	J J	TITLE	DRAWING NUMBER	
APPRV	DAJ	CONNECTOR-STRAIGHT THREAD AND PIPE THREAD MALE/MALE	23-12449	
DATE	10/10/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. A
CATIA ORIGINAL				



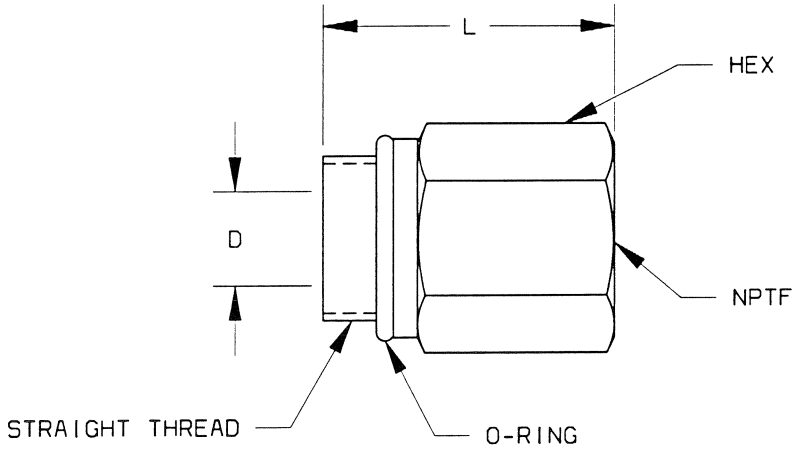
STRAIGHT THREAD	NOM PIPE THREAD	A	MFR'S INFORMATION		FREIGHTLINER PART NUMBER
T1	T2		PART NUMBER	SUPPLIER	
3/8-24	1/8-27	.9	1675-526	ENGINEERED PROD	23-12449-000
		1.5	1675-528	ENGINEERED PROD	23-12449-001

ENGINEERING NOTES:

1. MATERIAL: BODY-BRASS
   FILTER-NICKLE PLATED
2. FINISH: AS PRODUCED
3. ALL DIMENSIONS ARE FOR REFERENCE ONLY

CHG	JOB NO	DATE	BY	REVISION
-	P03692-01	10/10/97	J J	INITIAL RELEASE
A	P05007-01	04/28/98	DAJ	ADDED -001.

DRAWN	CGD	TITLE ADAPTER-BRASS, MALE ST THRD O-RING/FEMALE PIPE	DRAWING NUMBER 23-12450
APPRV	DAJ		
DATE	07/08/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. A
CATIA ORIGINAL			



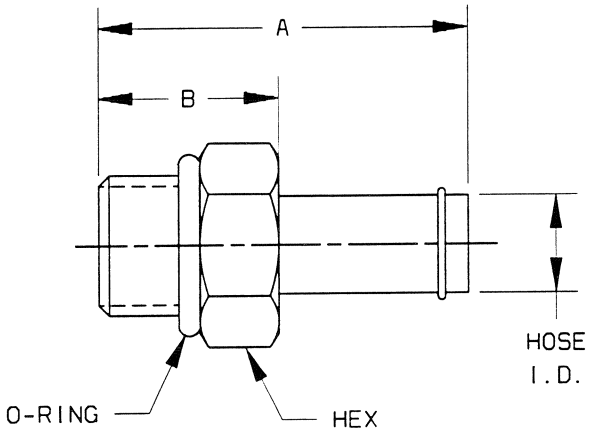
STRAIGHT THREAD	NPTF	D	L	HEX	SUPPLIER PH	FREIGHTLINER PART NUMBER	
3/8-24	1/8-27	.125	.81	9/16	S-3914	23-12450-000	
7/8-14	1/2-14	.500	1.15	1	222P-8-100RB	23-12450-001	A

ENGINEERING NOTES:

1. MATERIAL: BODY - BRASS
   O-RING - NITRILE (BUNA N)
2. INDUSTRY STANDARD: REF SAE J476, J514, AND J515.
3. ALL DIMENSIONS ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	P03692-01	10/10/97	J J	INITIAL RELEASE
A	P08261-09	07/08/99	CGD	ADDED 23-12450-001.

DRAWN	DAJ	TITLE CONN-STRAIGHT BARB, O-RING STRAIGHT THREAD	DRAWING NUMBER 23-12451
APPRV	DAJ		
DATE	10/08/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. B
CATIA ORIGINAL			



HOLE SIZE	A	B	STRAIGHT THREAD	HEX	MFG/PART NUMBER PARKER	FREIGHTLINER PART NUMBER
3/4	2.25	1.00	1 1/16-12	1 1/4	05TB-12-12	23-12451-212
1	2.38	1.00	1 1/16-12	1 1/4	05TB-12-16	23-12451-216
B 5/8	2.00	0.75	3/4-16	7/8	05TB-8-10	23-12451-810

ENGINEERING NOTES:

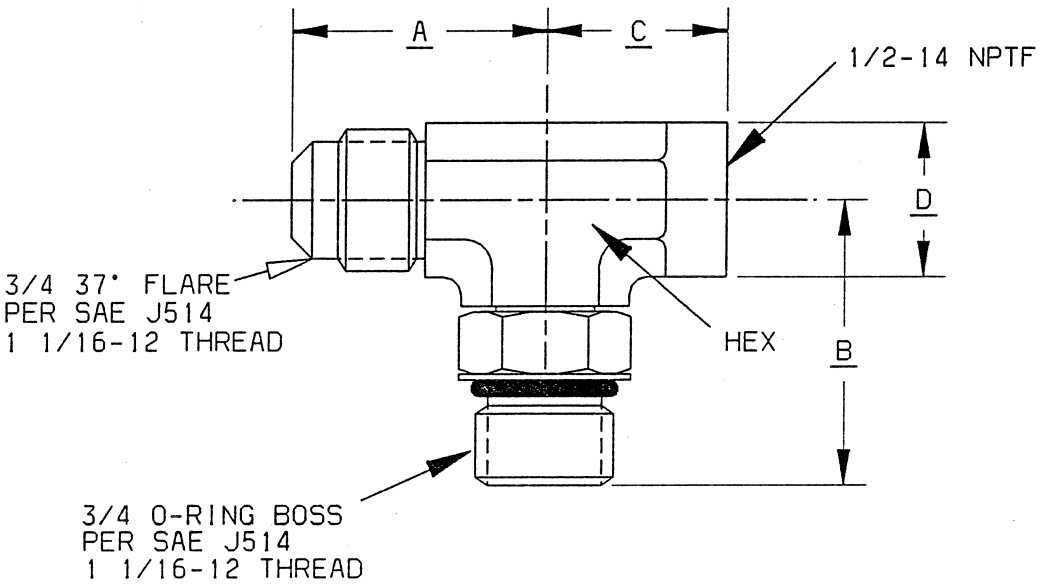
1. MATERIAL: BODY - STEEL, O-RING - NITRILE (BUNA N)
2. FINISH: ZINC WITH YELLOW CHROMATE
3. ALL DIMENSIONS ARE FOR REFERENCE ONLY

A

CHG	JOB NO	DATE	BY	REVISION
-	P03618-09	10/08/97	DAJ	INITIAL RELEASE
A	PA2042-82	12/23/97	DAJ	REVISED NOTE 1 AND 2
B	P09591-01	08/11/99	CGD	ADDED 23-12451-216 AND 23-12451-810

ADRIENNE CHILBERG

DRAWN	DAJ	TITLE TEE-INLET FITTING	DRAWING NUMBER 23-12455
APPRV	DAJ		
DATE	10/13/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -
CATIA ORIGINAL			



DIMENSIONS				HEX (FLAT)	MFR'S NO.	FREIGHTLINER
A	B	C	D (Ø)		PH	PART NUMBER
1.66	1.94	1.27	1.06	1 1/16	12-8-12 XGJAO-S	23-12455-000

ENGINEERING NOTES:

1. MATERIAL: BODY-STEEL
   O-RING-NITRILE (BUNA N)

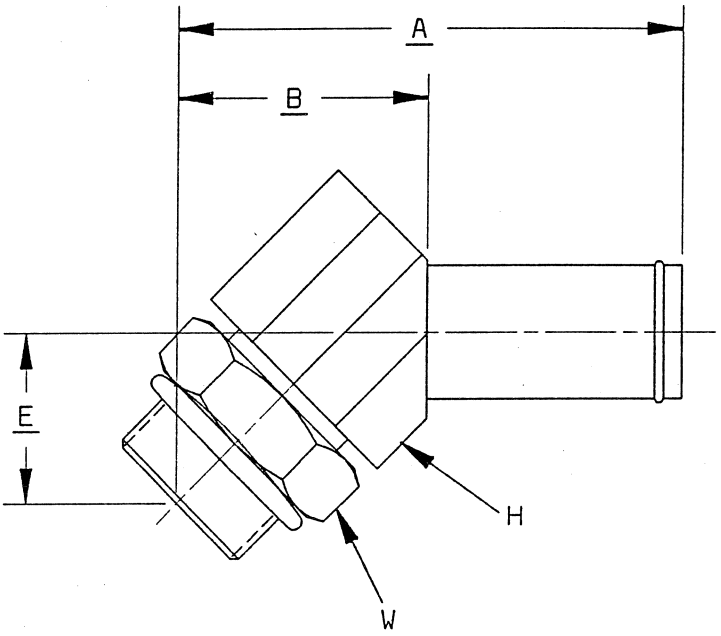
2. FINISH: ZINC AND YELLOW DICHROMATE

3. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	929110-01	10/13/97	DAJ	INITIAL RELEASE

ADRIENNE CHILBERG

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	ELBOW-45° HOSE BARB, O-RING	23-12457	
DATE	10/24/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -
CATIA ORIGINAL				



HOSE SIZE	TUBE END UN/UNF-2A	HEX H	HEX W	A	B	E	FL SPEC NO.
1/2	3/4-16	7/8	1	2.79	1.29	0.93	23-12457-008

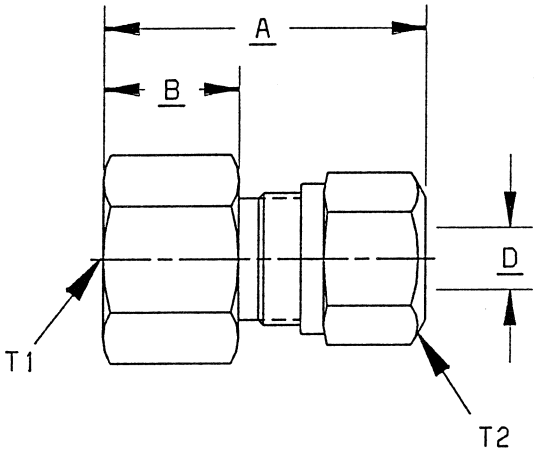
SPECIFICATIONS:

1. MATERIAL: BODY AND LOCKNUT - STEEL,
   O-RING - NITRILE (BUNA N)
2. FINISH: ZINC PLATING W/ YELLOW CHROMATE
3. ALL DIMENSIONS ARE FOR REFERENCE ONLY.
4. SUGGESTED VENDOR: PARKER-HANNIFIN (35TB-8-8)

CHG	JOB NO	DATE	BY	REVISION
-	P03618-13	10/24/97	DAJ	INITIAL RELEASE

ADRIENNE CHILBERG

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	CONNECTOR - NTA TO FEMALE 45° FLARE	23-12458	
DATE	10/28/97			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -



T1 STRAIGHT THREAD	T2 TUBE SIZE	DIMENSIONS			VENDOR/PN	FREIGHTLINER PART NUMBER
		A	B	D (FLOW DIA)	PH	
5/8-18	3/8	1.56	.66	.22	SRS-3944	23-12458-006
3/4-16	1/2	1.80	.75	.34	SRS-3943	23-12458-008

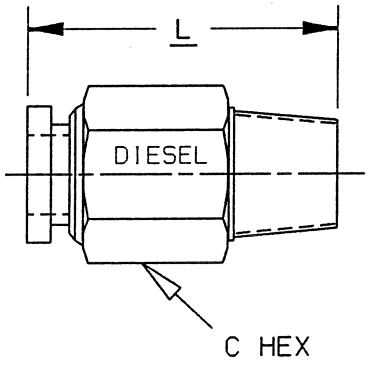
ENGINEERING NOTES:

1. MATERIAL: BRASS
2. INDUSTRY STANDARD: REF. SAE J246 AND J513
3. FITTING ASSEMBLY MUST BE MARKED ACCORDINGLY FOR COMPLIANCE W/ FMVSS 106.
4. ALL FITTINGS INCLUDE A COPPER FLARE GASKET.

CHG	JOB NO	DATE	BY	REVISION
-	P00144-07	10/28/97	DAJ	INITIAL RELEASE

ADRIENNE CHILBERG

DRAWN	DAJ	TITLE	DRAWING NUMBER
APPRV	DAJ	CONNECTOR-MALE PIPE PUSH-IN, DIESEL FUEL	23-12459
DATE	10/28/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. A
CATIA ORIGINAL			



T TUBE SIZE	PIPE THREAD (NPTF)	C HEX	L (REF)	TUBE SUPT.	MFR'S NO. PH	FREIGHTLINER PART NUMBER
1/2	1/4	7/8	1.69	YES	VS68DFF-8-4	23-12459-007

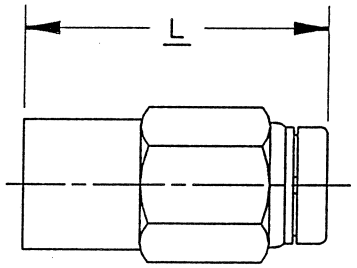
ENGINEERING NOTES:

1. MATERIAL: BRASS
2. FITTING MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.
3. PARTS MUST BE SUPPLIED WITH "VIBRASEAL" APPLIED TO THREADS.
4. DESIGNED FOR USE WITH NYLON REINFORCED FUEL TUBING, REF. 48-25024.

CHG	JOB NO	DATE	BY	REVISION
-	P03617-08	10/28/97	DAJ	INITIAL LOAD
A	PA2042-82	12/23/97	DAJ	ADDED NOTE 4, RVSD TITLE & ADDED "DIESEL" TO PART.

ADRIENNE CHILBERG

DRAWN	DAJ	TITLE CONN-PRESTOMATIC FEMALE PIPE TO TUBE	DRAWING NUMBER 23-12463
APPRV	DAJ		
DATE	11/07/97		
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -



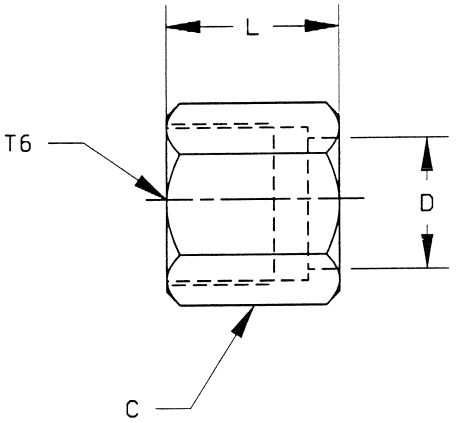
TUBE SIZE	PIPE THREAD	L	HEX	VENDOR/PN	FREIGHTLINER PART NUMBER
				PH	
1/4	1/8	1.22	9/16	66PMT-4-2	23-12463-042

ENGINEERING NOTES:

1. MATERIAL: BRASS
2. PART MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.

CHG	JOB NO	DATE	BY	REVISION
-	P04058-01	11/07/97	DAJ	INITIAL RELEASE

DRAWN	IP	TITLE NUT FLARE TUBE END, STEEL	DRAWING NUMBER 23-12470
APPRV	LKG		
DATE	09/18/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. A
CATIA ORIGINAL			



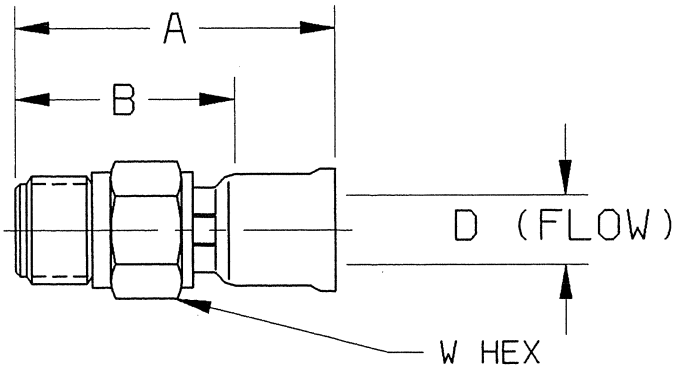
TUBE O.D.	T6 THREADS	C HEX	D	L	MFR'S NO. PH	FREIGHTLINER PART NUMBER
5/8	7/8-14	1	0.70	0.98	10BTX-S	23-12470-010
3/4	1-1/16-12	1.25	0.84	1.02	12BTX-S	23-12470-012
1-1/4	1-5/8-12	2	1.35	1.23	20BTX-S	23-12470-020

ENGINEERING NOTES:

1. MATERIAL: STEEL
2. FINISH: ZINC PLATING WITH YELLOW CHROMATE
3. INDUSTRY STANDARD: REF SAE J514, FIGURE 070110
4. DIMENSIONS SHOWN ABOVE ARE FOR REFERENCE ONLY

CHG	JOB NO	DATE	BY	REVISION
-	P03175-93	09/18/98	IP	INITIAL LOAD
A	P09452-01	08/04/99	CGD	ADDED 23-12470-012

DRAWN	IP	TITLE	DRAWING NUMBER	
APPRV	LKG	FITTING-STRAIGHT STEEL, 37° FLARE	23-12474	
DATE	09/18/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -
CATIA ORIGINAL				



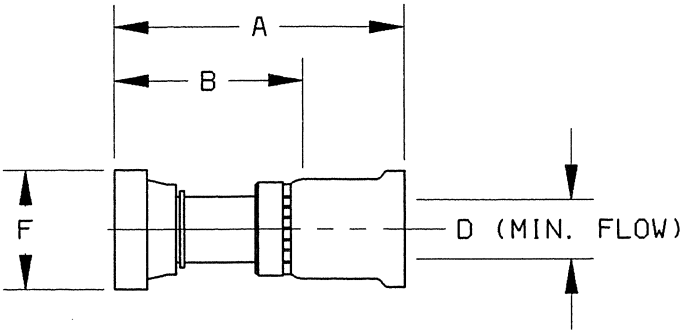
HOSE SIZE	THREAD	DIMENSION			W HEX	SUPPLIER	FREIGHTLINER PART NUMBER
		A	B	D		PH	
10	7/8-14	2.44	1.49	.42	15/16	10326-10-10	23-12474-010
16	1 5/8-12	2.85	1.81	.75	1-11/16	10326-20-16	23-12474-620
20	1 5/8-12	3.16	2.10	.95	1-7/8	10326-20-20	23-12474-020

ENGINEERING NOTES:

1. MATERIAL: STEEL
2. FINISH : ZINC PLATE WITH YELLOW CHROMATE
3. FOR USE WITH HOSES MEETING THE PROVISIONS OF SAE STANDARD J1402-AI, J1402-AII, OR J517-100R5.
4. REFERENCE SAE STANDARD J514 FOR MALE FLARE GENERAL AND DIMENSIONAL SPECIFICATIONS.

CHG	JOB NO	DATE	BY	REVISION
-	P03175-93	09/18/98	IP	INITIAL LOAD

DRAWN	IP	TITLE	DRAWING NUMBER	
APPRV	LKG	FITTING-STRAIGHT STEEL, CODE 61 FLANGE	23-12475	
DATE	09/18/98			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -



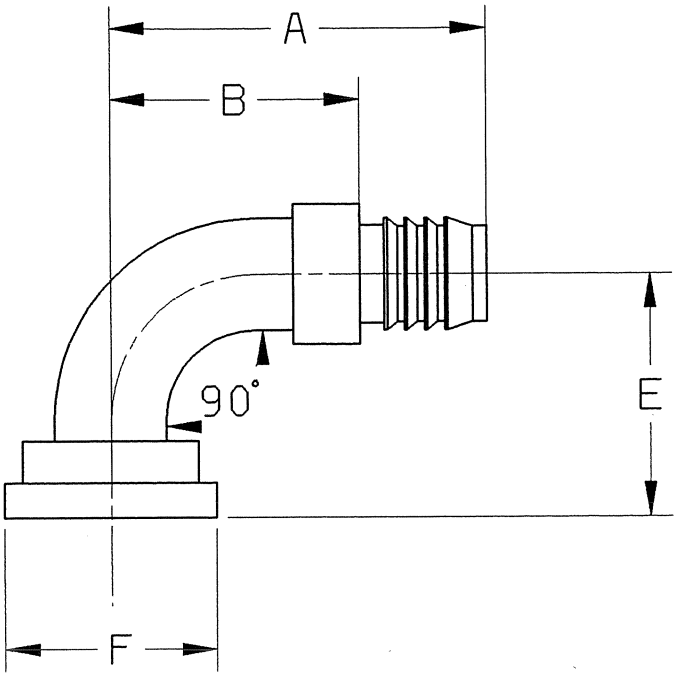
HOSE SIZE	FLANGE SIZE	DIMENSION				F DIA	SUPPLIER PH	FREIGHTLINER PART NUMBER
		A	B	D	-			
20	-20	4.19	3.13	0.95	-	2.00	11526-20-20	23-12475-020

ENGINEERING NOTES:

1. MATERIAL: STEEL
2. FINISH : ZINC PLATE WITH YELLOW CHROMATE
3. FOR USE WITH HOSES MEETING THE PROVISIONS OF SAE J1402-AI, J1402-AII, OR J517 100 R5.
4. REFERENCE SAE STANDARD J518 FOR FLANGE GENERAL AND DIMENSIONAL SPECIFICATIONS.

CHG	JOB NO	DATE	BY	REVISION
-	P03175-93	09/18/98	IP	INITIAL LOAD

DRAWN	IP	TITLE ELBOW-90° SAE CODE 61, FLANGE	DRAWING NUMBER 23-12476
APPRV	LKG		
DATE	09/18/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -
CATIA ORIGINAL			



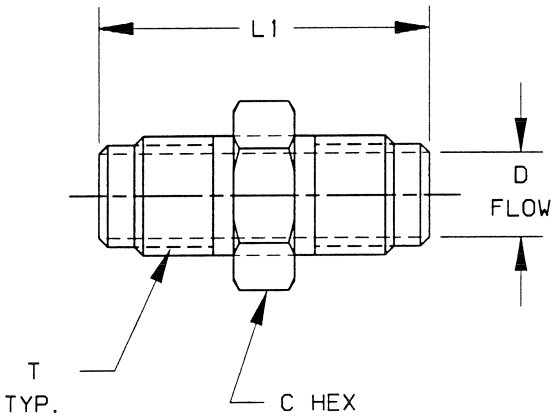
FLANGE (INCH)	HOSE SIZE (INCH)	A	B	E	F	F/L SPEC NO.
1-1/2	1-1/2	4.20	2.46	2.75	2-3/8	23-12476-024

SPECIFICATIONS:

1. MATERIAL : STEEL
2. FINISH : ZINC PLATE WITH YELLOW CHROMATE
3. VENDOR : PARKER-HANNIFIN 1988-24-24 OR EQUIVALENT
4. REFERENCE: SAE J518 FOR FLANGE GENERAL AND DIMENSIONAL SPECIFICATIONS

CHG	JOB NO	DATE	BY	REVISION
-	P03175-93	09/18/98	IP	INITIAL RELEASE

DRAWN	CGD	TITLE	DRAWING NUMBER	
APPRV	DAJ	CONNECTOR-UNION, STEEL, MALE 37° (JIC) FLARE	23-12481	
DATE	05/20/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. A
CATIA ORIGINAL				



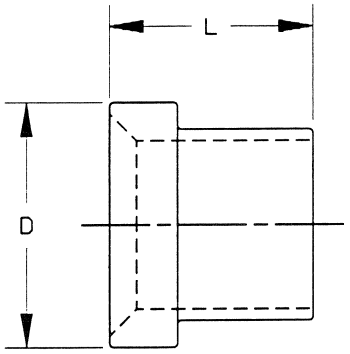
TUBE SIZE	DIMENSIONS				MFR'S NO.	FREIGHTLINER PART NUMBER
	T	L1	C	D	PH	
10	7/8-14	1.88	15/16	0.484	10 HTX-S	23-12481-010
12	1 1/16-12	2.16	1 1/8	0.609	12 HTX-S	23-12481-012
20	1 5/8-12	2.44	1 11/16	1.078	20 HTX-S	23-12481-020

ENGINEERING NOTES:

1. MATERIAL: STEEL
2. FINISH: ZINC PLATE WITH CHROMATE FINISH
3. INDUSTRY STANDARD: SAE J514, FIGURE 070101

CHG	JOB NO	DATE	BY	REVISION
-	P08776-01	05/20/99	CGD	INITIAL RELEASE
A	PA2042-95	07/23/99	CGD	REMOVED PH 0303 16 16B FROM SPEC, CORRECTED DWG

DRAWN	IP	TITLE SLEEVE 37° FLARE TUBE END, STEEL	DRAWING NUMBER 23-12483
APPRV	LKG		
DATE	09/18/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. A
CATIA ORIGINAL			



TUBE O.D.	L	D	MFR'S NO. PH	FREIGHTLINER PART NUMBER
5/8	0.66	0.80	10TX-S	23-12483-010
3/4	0.69	0.97	12TX-S	23-12483-012
1-1/4	0.91	1.53	20TX-S	23-12483-020

A

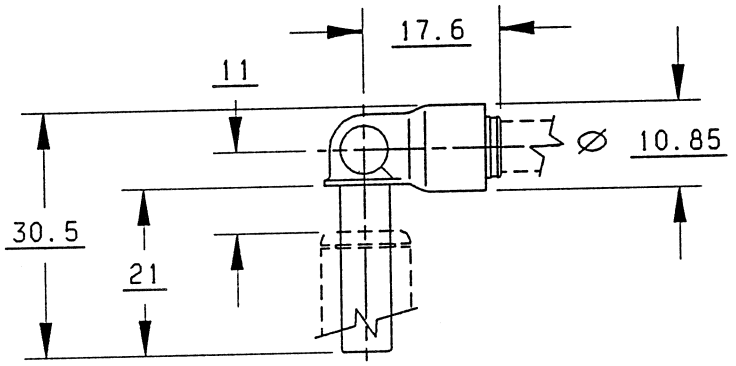
ENGINEERING NOTES:

1. MATERIAL: STEEL
2. FINISH: ZINC PLATING WITH YELLOW CHROMATE
3. INDUSTRY STANDARD: REF SAE J514, FIGURE 070115
4. DIMENSIONS SHOWN ABOVE ARE FOR REFERENCE ONLY

CHG	JOB NO	DATE	BY	REVISION
-	P03175-93	09/18/98	IP	INITIAL LOAD
A	P09452-01	08/04/99	CGD	ADDED 23-12483-012

ADRIENNE CHILBERG

DRAWN	DAJ	TITLE ELBOW-90 DEGREE PLUG-IN	DRAWING NUMBER 23-12486
APPRV	DAJ		
DATE	01/09/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -
CATIA ORIGINAL			



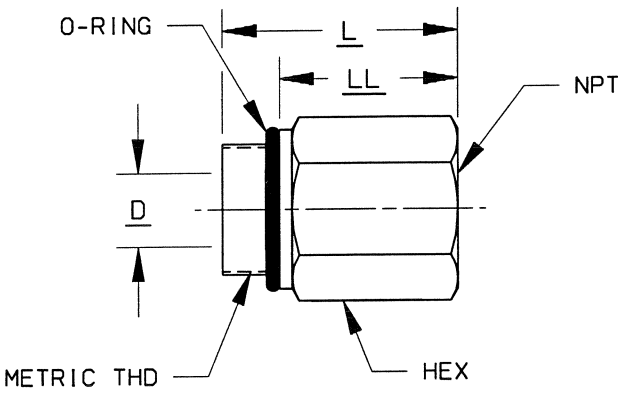
VENDOR P/N	FREIGHTLINER PART NUMBER
LEGRIS 3182 56 00DOT	23-12486-004

ENGINEERING NOTES:

1. MATERIAL: BODY - NYLON; COLLET - BRASS; O-RING - LOW TEMP. BUNA-N
2. WORKING PRESSURE (MAX): 250 psi
3. FOR COMPRESSED AIR USE ONLY.
4. DIMENSIONS ARE FOR REFERNCE ONLY.
5. PART HAS DOT MARKING.
6. TECHNICAL REFERENCE N182 56 00DOT

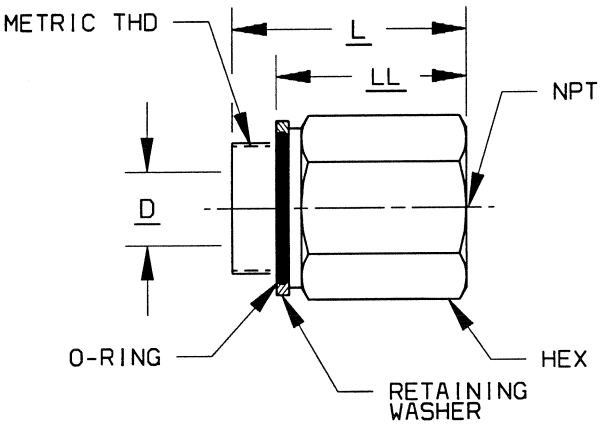
CHG	JOB NO	DATE	BY	REVISION
-	P04393-01	01/09/98	DAJ	INITIAL RELEASE

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	ADAPTER-STEEL, METRIC O-RING BOSS/FEMALE PIPE	23-12490	
DATE	02/10/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. B
CATIA ORIGINAL				



TYPE-"P"

(PORT SEAL)
FOR ISO 6149 O-RING PORT



TYPE-"S"

(SURFACE SEAL)
FOR ISO 9974 FLAT FACE PORT

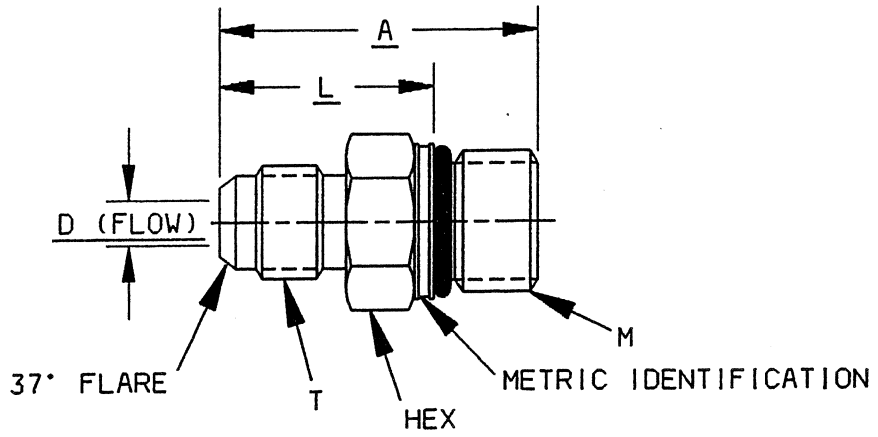
D MIN	METRIC THREAD	TYPE	NPT	HEX	L	LL	SUPPLIER PH	F/L SPEC NO.
.281	M14X1.5	P	1/4-18	3/4	1.24	0.85	M14-1/4F870HGS	23-12490-014
.354	M16X1.5	S	1/2-14	1 1/8	1.58	1.13	M16-1/2F80HGS	23-12490-016
.512	M22x1.5	S	1/2-14	1 1/8	1.68	1.10	M22-1/2F80HGS	23-12490-022
.630	M27X2.0	P	3/4-14	1 3/8	1.87	1.20	M27-3/4F870HGS	23-12490-027

ENGINEERING NOTES:

1. MATERIAL:
   BODY, RETAINER WASHER: STEEL
   O-RING: NITRILE (BUNA-N).
2. FINISH: ZINC PLATE W/CHROMATE FINISH.
3. ALL DIMENSIONS ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	P04433-01	02/10/98	DAJ	INITIAL LOAD
A	PA2042-83	02/16/98	DAJ	REVISED NOTES 1 AND 2, ADDED NOTE 4.
B	P07399-09	11/22/99	LFB	ADDED -016, -022 AND RE-PART NUMBERED -027.

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	CONNECTOR-METRIC THREAD MALE FLARE (JIC)/MALE O-RING	23-12503	
DATE	03/18/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. A
CATIA ORIGINAL				



	DIMENSIONS						MFR'S NO.	FREIGHTLINER
	T (IN)	M	A	L	D	HEX	PH	PART NUMBER
	7/16-20	M10 X 1	31.0	22.5	4.4	16.0	4M10F870MXS	23-12503-000
	9/16-18	M14 X 1.5	33.5	22.5	7.5	19.0	6M14F870MXS	PH 6M14F870MX S
A	3/4-16	M18 X 1.5	38.0	25.5	9.9	24.0	8M18F870MXS	23-12503-001
	3/4-16	M20 X 1.5	38.1	25.6	9.9	27.0	8M20F870MXS	PH 8M20F870MX S

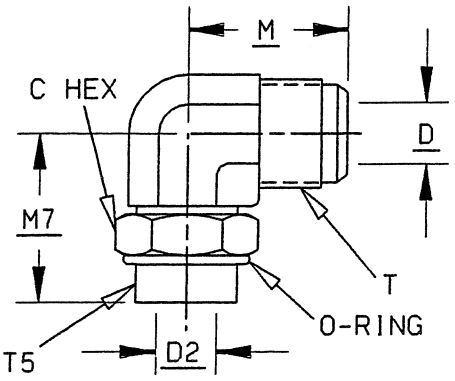
ENGINEERING NOTES:

1. MATERIAL: BODY-STEEL (12L14)
   O-RING- NITRILE (BUNA N)
2. FINISH: ZINC W/ YELLOW CHROMATE
3. INDUSTRY STANDARD: REF. SAE J514 AND ISO 6149-3

CHG	JOB NO	DATE	BY	REVISION
-	P02140-10	03/18/98	DAJ	INITIAL LOAD
A	P00576-04	06/03/98	DAJ	ADDED -001.

ADRIENNE CHILBERG

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	ELBOW-90°, BRASS, O-RING SAE 45/JIC 37, ST THRD TO METRIC	23-12511	
DATE	05/04/98			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -



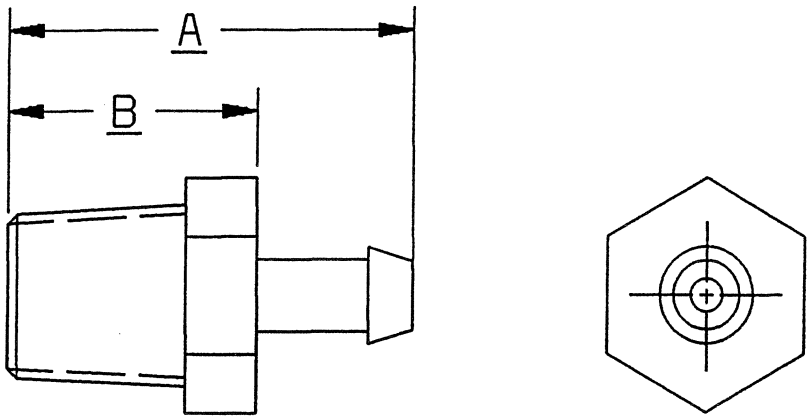
T TUBE END UN/UNF-2A	T5 PORT THD	C HEX	M	M7	D DRILL	D2 DRILL	VENDOR NUM PH	FREIGHTLINER PART NUMBER
7/8-14	M27-2	32MM	1.46	1.75	.500	.709	PE E1593	23-12511-000

ENGINEERING NOTES:

1. MATERIAL: BRASS
2. FINISH: AS PRODUCED
3. INDUSTRY STANDARD: ISO 6149-3

CHG	JOB NO	DATE	BY	REVISION
-	P05309-02	05/04/98	DAJ	INITIAL LOAD

DRAWN	JTJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	CONN-STRAIGHT BARB, NPT, BRASS	23-12514	
DATE	04/28/98			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -



HOSE SIZE	A	B	PIPE THREAD	HEX	MFG/PART NUMBER ENGINEERED PROD.	FL SPEC NO.
1/4	.540	.940	1/8-27	7/16	1675-011	23-12514-000

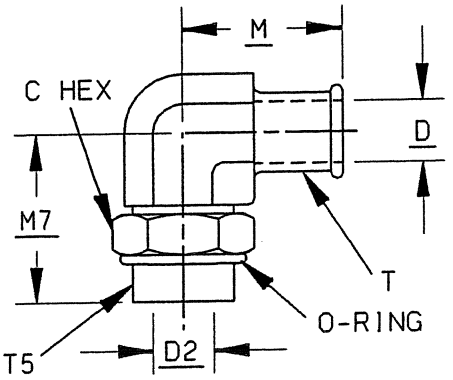
SPECIFICATIONS:

1. MATERIAL: BRASS.
2. ALL DIMENSIONS ARE FOR REFERENCE ONLY.
3. PARTS MUST BE SUPPLIED WITH "VIBRASEAL" APPLIED TO THREADS.

CHG	JOB NO	DATE	BY	REVISION
-	P05007-01	04/28/98	JTJ	INITIAL RELEASE

D. BROOKS

DRAWN	DAJ	TITLE ELBOW-90°, BRASS, METRIC HOSE BARB, O-RING	DRAWING NUMBER 23-12515
APPRV	DAJ		
DATE	05/14/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -
CATIA ORIGINAL			



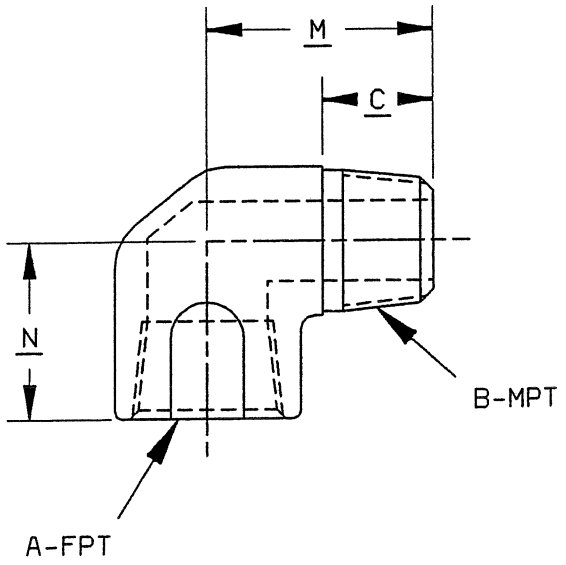
T HOSE BARB	T5 PORT THD	C HEX	M	M7	D DRILL	D2 DRILL	VENDOR NUM PH	FREIGHTLINER PART NUMBER
5/8	M27-2	32MM	1.36	1.75	.500	.709	PE E1584	23-12515-000

ENGINEERING NOTES:

1. MATERIAL: BODY, LOCK NUT & WASHER - BRASS
   O-RING - FLUOROCARBON
2. FINISH: AS PRODUCED
3. INDUSTRY STANDARD: ISO 6149-3

CHG	JOB NO	DATE	BY	REVISION
-	P03934-06	05/14/98	DAJ	INITIAL LOAD

DRAWN	DAJ	TITLE FITTING-ELBOW FPT TO MPT	DRAWING NUMBER 23-12516
APPRV	DAJ		
DATE	05/11/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -
CATIA ORIGINAL			



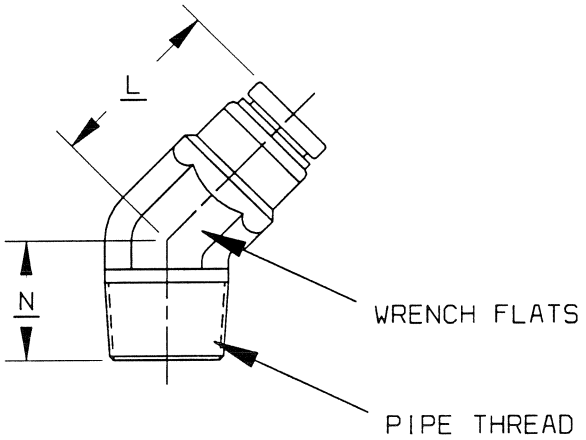
A FPT	B MPT	C	M	N	FLOW DIA (MIN)	VENDOR/PN PH	FREIGHTLINER PART NUMBER
1/2-14	3/8-18	.615	1.25	.97	.418	VSQ1202P-6-8	23-12516-000

ENGINEERING NOTES:

1. MATERIAL: BRASS, CA377, FORGE
2. INDUSTRY STD: FIG. NO. 130239, SAE J530
3. FITTING MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.
4. PARTS MUST BE SUPPLIED WITH "VIBRASEAL" APPLIED TO THREADS.

CHG	JOB NO	DATE	BY	REVISION
-	P05153-02	05/11/98	DAJ	INITIAL LOAD

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	ELBOW-45°, MALE PUSH-IN, NON-SWIVEL	23-12519	
DATE	05/15/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. E
CATIA ORIGINAL				



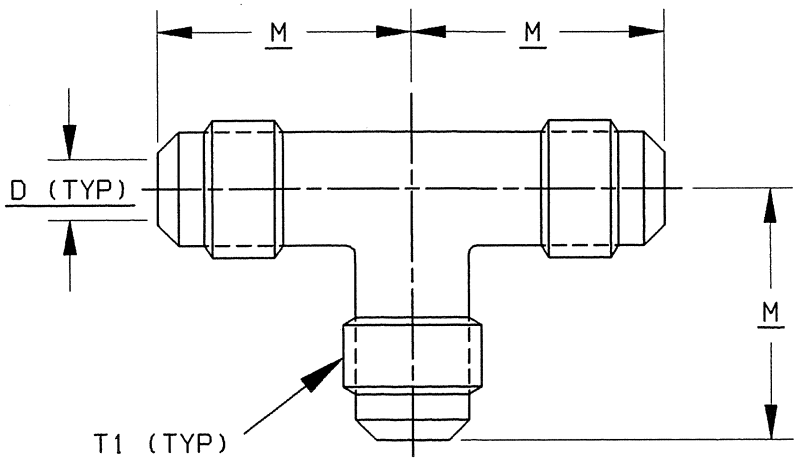
	WRENCH FLATS	TUBE SIZE	PIPE THREAD	L	N	MFR'S NO. PH	FREIGHTLINER PART NUMBER
	3/4	3/8	1/4-18	.99	.73	179PMTNS-6-4	PH 279PMTNS6 4
	13/16	1/2	1/4-18	1.28	.81	179PMTNS-8-4	PH 179PMTNS8 4
D	13/16	1/2	3/8-18	1.28	.81	179PMTNS-8-6	23-12519-806
	13/16	1/2	1/2-14	1.28	1.06	179PMTNS-8-8	23-12519-008
	9/16	1/4	1/8-27	.80	.56	179PMTNS-4-2	23-12519-402
	9/16	1/4	1/4-18	.90	.75	179PMTNS-4-4	23-12519-404
E	9/16	1/4	3/8-18	.80	.95	179PMTNS-4-6	23-12519-406
	3/4	3/8	1/8-27	.99	.55	179PMTNS-6-2	23-12519-602
	3/4	3/8	3/8-18	.99	.73	179PMTNS-6-6	23-12519-006
	1-1/16	5/8	3/8-18	1.22	.88	179PMTNS-10-6	23-12519-106
	1-1/16	5/8	1/2-14	1.22	1.06	179PMTNS-10-8	23-12519-108

ENGINEERING NOTES:

1. MATERIAL: BRASS BODY, SST TUBE SUPPORT
2. FITTING MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.

CHG	JOB NO	DATE	BY	REVISION
D	P08640-04	09/24/99	DAJ	ADDED -806.
E	P08647-14	10/27/99	LFB	ADDED -406.

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	TEE - UNION STEEL, 37° (JIC)	23-12524	
DATE	07/14/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. B
CATIA ORIGINAL				



A

TUBE SIZE	T1 STRAIGHT THREAD	DIMENSIONS		MFR'S NO.		FREIGHTLINER PART NUMBER
		D	M	PH		
1/4	7/16-20	.172	0.89	4 JTX-S		23-12524-000
1/2	3/4-16	.391	1.25	8 JTX-S		PH 033T8 8
3/4	1-1/16-12	.609	1.66	12 JTX-S		PH 033T12 12

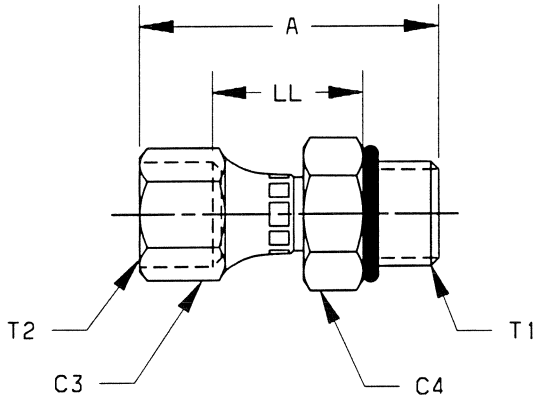
ENGINEERING NOTES:

1. MATERIAL: STEEL
2. FINISH: ZINC PLATE WITH CHROMATE FINISH
3. SAE J514, FIGURE 070401

B

CHG	JOB NO	DATE	BY	REVISION
-	PC3202-27	07/14/98	DAJ	INITIAL LOAD
A	PA2042-84	07/30/98	DAJ	REVISED TITLE, NOTE 3 WAS 070429, ADDED T1 LABELS.
B	PA2042-85	10/12/98	DAJ	070401 WAS 070429.

DRAWN	DAJ	TITLE CONN-STRAIGHT THREAD O-RING, 37° (JIC), FEMALE, SWIVEL	DRAWING NUMBER 23-12525
APPRV	DAJ		
DATE	07/14/98		
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. B



STRAIGHT THREAD		TUBE OD	A	LL	HEX C3	HEX C4	MFR'S NO.	FREIGHTLINER PART NUMBER
T1	T2						PH	
7/16-20	7/16-20	1/4	1.31	0.58	16MM	14MM	4 F650X-S	23-12525-000

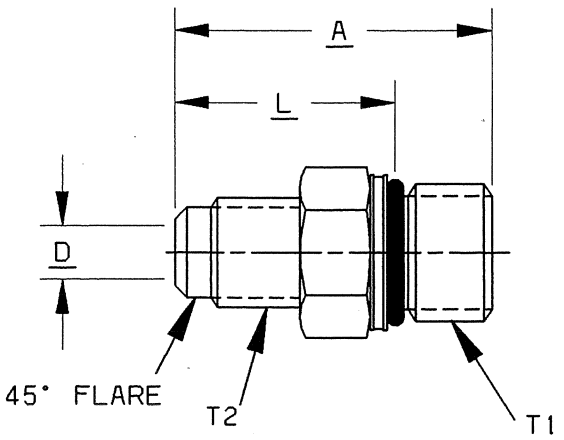
ENGINEERING NOTES:

1. MATERIAL: BODY-STEEL
   O-RING- NITRILE (BUNA N) OR EQUIVALENT
2. FINISH: ZINC PLATE W/ CHROMATE FINISH
3. INDUSTRY STANDARD: REFERENCE SAE J514

A

CHG	JOB NO	DATE	BY	REVISION
-	PC3202-27	07/14/98	DAJ	INITIAL LOAD
A	PA2042-84	07/30/98	DAJ	REVISED NOTE 2 & 3, THE TITLE, MFR NO WAS 4 F650X S.
B	PA2042-95	08/03/99	CGD	REVISED TO ADD SOLID MODEL IN SPEC.

DRAWN	DAJ	TITLE: CONN-STRAIGHT, METRIC THRD TO MALE FLARE (SAE)/MALE O-RING	DRAWING NUMBER: 23-12531
APPRV	DAJ		
DATE	07/13/98	FREIGHTLINER CORPORATION, PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. A
CATIA ORIGINAL			



A

STRAIGHT THREAD T1	STRAIGHT THREAD T2	TUBE OD	A	D	L	HEX	MFR'S NO. PH	FREIGHTLINER PART NUMBER
M27 X 2.0	7/8-14	5/8	1.87	0.50	1.24	1-1/4	48F-10-M27	23-12531-027
M27 X 2.0	1-1/16-14	3/4	1.99	0.63	1.36	1-1/4	48F-12-M27	23-12531-227

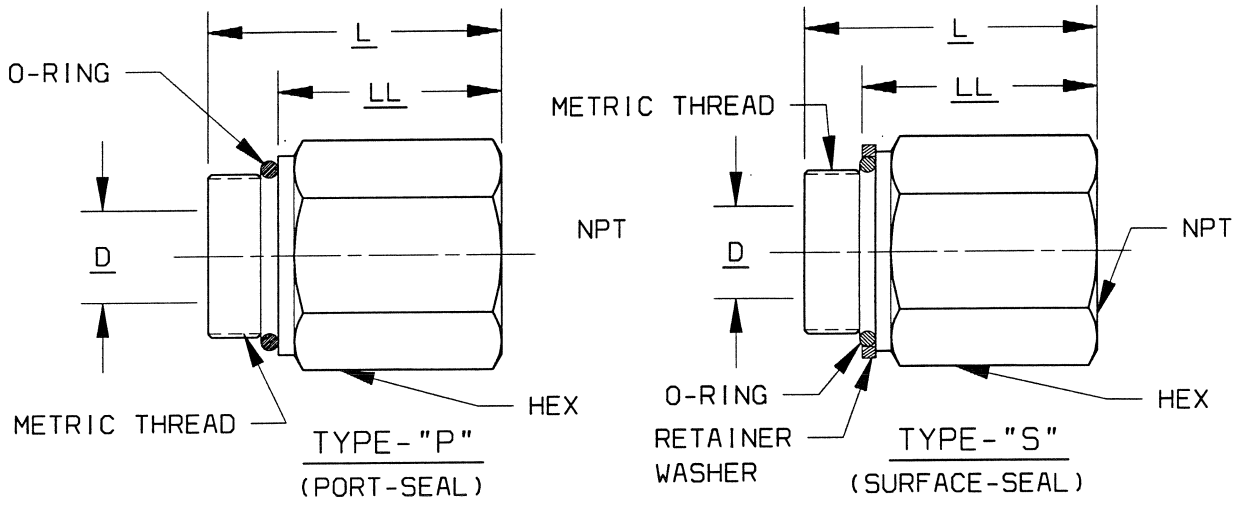
A

ENGINEERING NOTES:

1. MATERIAL: BODY- BRASS
   O-RING- FLUOROCARBON, BROWN IN COLOR
2. FINISH: AS PRODUCED
3. INDUSTRY STANDARD: T1 PER ISO 6149-3
   T2 PER SAE J512 45° FLARE

CHG	JOB NO	DATE	BY	REVISION
-	P05309-05	07/13/98	DAJ	INITIAL LOAD
A	P03938-14	09/11/98	DAJ	ADDED -227 & DIM 'D'&'L', O-RING MAT'L WAS VITON

DRAWN	DHW	TITLE: ADAPTER-BRASS, METRIC O-RING BOSS TO FEMALE PIPE	DRAWING NUMBER: 23-12536	
APPRV	DAJ			
DATE	01/19/99	FREIGHTLINER CORPORATION, PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. B
CATIA ORIGINAL				



	D MIN	METRIC THREAD	TYPE	NPT	HEX	L	LL	SUPPLIER PH	F/L SPEC NO.
	.236	M12X1.5	P	1/4-18	11/16	1.09	0.66	222P-4-M12	23-12536-000
	.177	M10X1.0	S	1/8-27	9/16	0.75	0.46	222P-2-M10R	23-12536-001
	.236	M12x1.5	S	1/4-18	11/16	1.09	0.71	222P-4-M12R	23-12536-002
	.295	M14X1.5	P	1/8-27	3/4	0.91	0.48	222P-2-M14	PH SRS4033
	.688	M27X2.0	P	1/2-14	1 1/4	1.32	0.69	222P-8-M27	PH S4030
B	.688	M26X1.5	S	1/2-14	1 1/4	1.25	0.69	222P-8-M26R	23-12536-004
B	.893	M33X2.0	P	3/4-14	1 5/8	1.49	0.86	SR222P-12-M33	23-12536-003

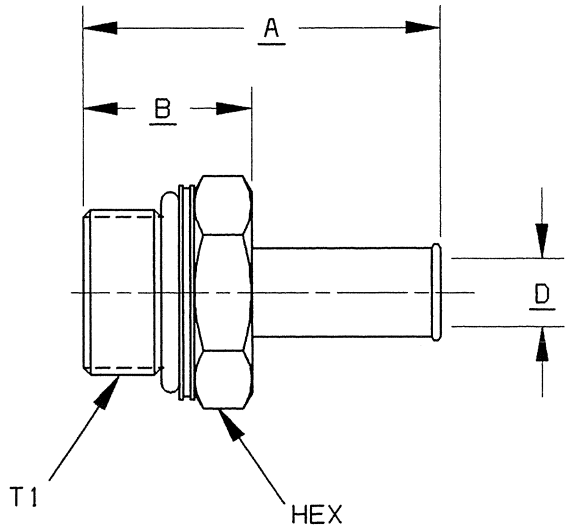
ENGINEERING NOTES:

1. MATERIAL:
   BODY, RETAINER WASHER: BRASS
   O-RING: FLUOROCARBON (HIGH TEMP, BROWN COLOR)

2. ALL DIMENSIONS ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	PF1027-23	01/19/99	DHW	INITIAL LOAD
A	PF1027-50	03/09/99	DHW	ADDED -002
B	P09136-05	02/14/00	LFB	ADDED -003 AND -004.

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	CONN-STRAIGHT HOSE BARB METRIC HI-TEMP O-RING	23-12545	
DATE	09/21/98			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -



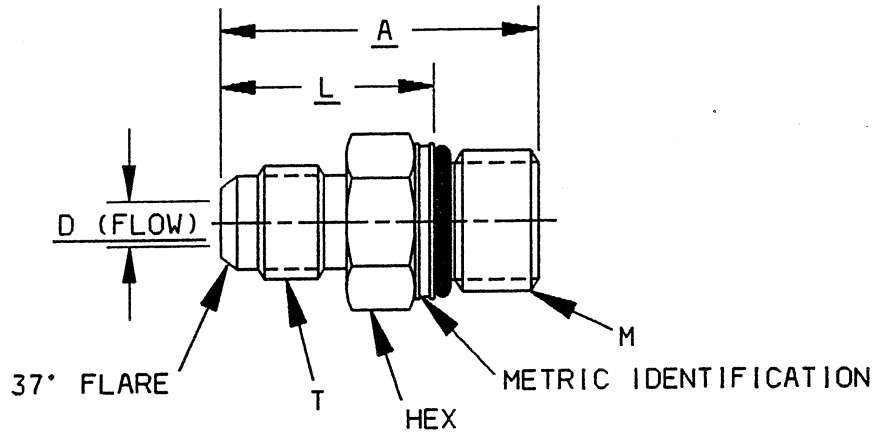
HOSE SIZE	A	B	D	T1-METRIC THREAD	HEX	MFG/PART NO. PARKER	FL SPEC NO.
5/8	1.77	0.99	0.50	M27X2	1 1/4	68HB-10-M27	23-12545-010
3/4	1.77	0.99	0.63	M27X2	1 1/4	68HB-12-M27	23-12545-012

SPECIFICATIONS:

1. MATERIAL: BODY- BRASS;O-RING- FLUOROCARBON, BROWN IN COLOR
2. FINISH: PLAIN
3. INDUSTRY STANDARD: T1 PER ISO 6149-3

CHG	JOB NO	DATE	BY	REVISION
-	P03934-10	09/21/98	DAJ	INITIAL RELEASE

DRAWN	DAJ	TITLE	DRAWING NUMBER
APPRV	DAJ	CONNECTOR-METRIC THRD TO MALE FLARE (JIC)/MALE HI-TEMP O-RING	23-12547
DATE	09/22/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -
CATIA ORIGINAL			



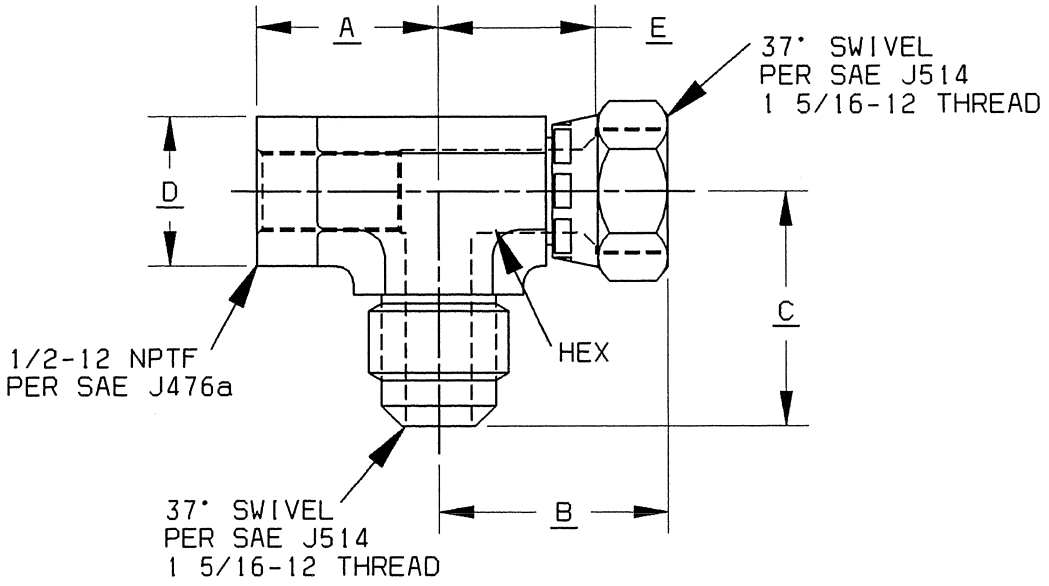
DIMENSIONS						MFR'S NO.	FREIGHTLINER
T (IN)	M	A	L	D	HEX	PH	PART NUMBER
1 1/16-12	M27 X 2	49.0	33.0	15.5	32.0	12M27F870MXS	23-12547-000

ENGINEERING NOTES:

1. MATERIAL: BODY-STEEL (12L14)
   O-RING- FLUOROCARBON, BROWN IN COLOR
2. FINISH: ZINC W/ YELLOW CHROMATE
3. INDUSTRY STANDARD: REF. SAE J514 AND ISO 6149-3

CHG	JOB NO	DATE	BY	REVISION
-	P05837-19	09/22/98	DAJ	INITIAL LOAD

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	TEE-FEMALE PIPE, 37° MALE FLARE, 37° FEMALE SWIVEL NUT	23-12554	
DATE	10/29/98			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -



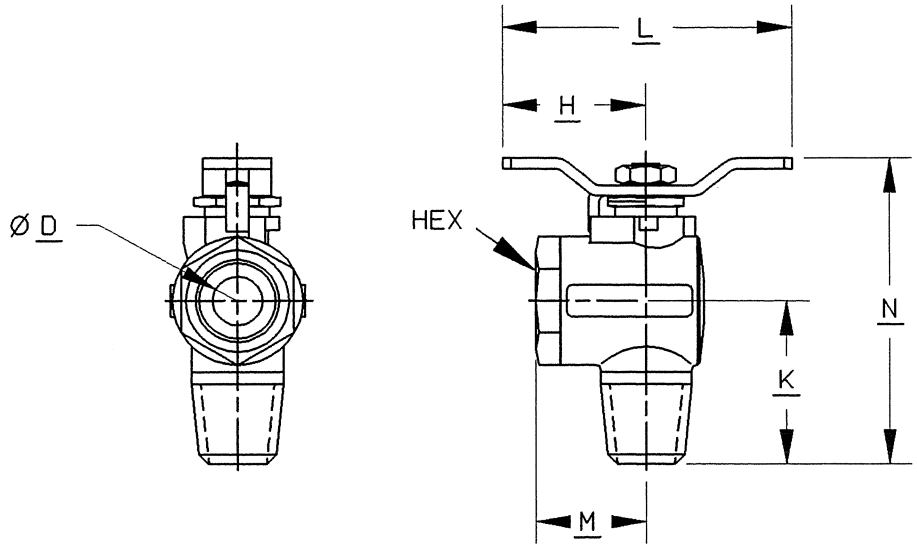
DIMENSIONS					HEX (FLAT)	MFR'S NO.	FREIGHTLINER
A	B	C	D (Ø)	E		PH	PART NUMBER
1.38	2.00	1.81	1.06	1.41	1 5/16	8-16-16 GX6JX-S	23-12554-000

ENGINEERING NOTES:

1. MATERIAL: BODY-STEEL
2. FINISH: ZINC W/ CHROMATE
3. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	P05051-07	10/29/98	DAJ	INITIAL RELEASE

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	VALVE ASSY-BALL, 90° T-HANDLE	A23-12562	
DATE	11/12/98			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -



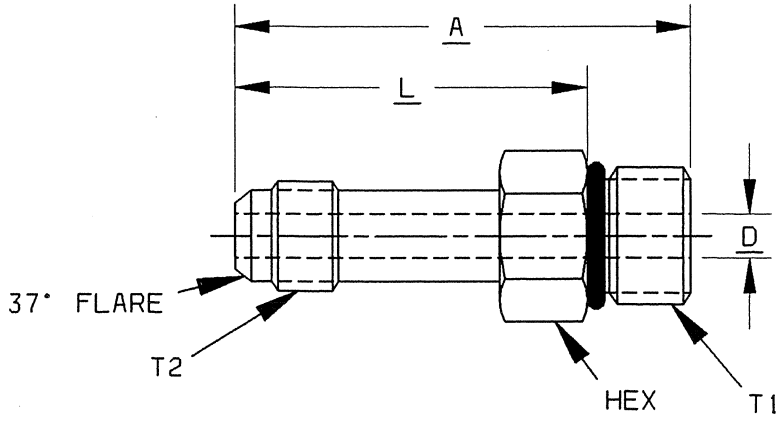
FLOW D	PIPE THREAD	DIMENSIONS					HEX	VENDOR/PN	FREIGHTLINER PART NUMBER
		H	K	L	M	N		PH	
.500	1/2	1.25	1.30	2.50	1.08	2.67	1 1/16	XV590P-8	A23-12562-008

ENGINEERING NOTES:

1. MATERIAL: BODY, SYEM AND RETAINER NUTS- BRASS
   SEATS AND SEALS- PTFE
   BALL- CHROME PLASTED BRASS
   HANDLE AND LOCKING NUT- NICKEL PLATED STEEL
2. HANDLE SHOWN IN THE "ON" POSITION.
3. TEMPERATURE RANGE: -50°F TO 350°F (-46°C TO 177°C)

CHG	JOB NO	DATE	BY	REVISION
-	P2D290-72	11/12/98	DAJ	INITIAL RELEASE

DRAWN	DAJ	TITLE CONNECTOR-STRAIGHT THREAD, LONG, WITH O-RING	DRAWING NUMBER 23-12564
APPRV	DAJ		
DATE	11/18/98		
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -



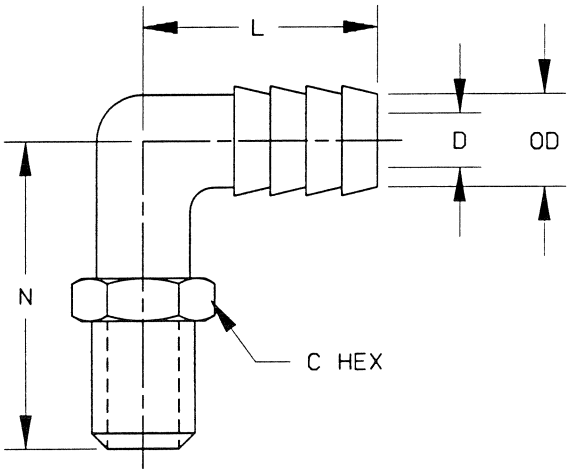
STRAIGHT THREAD T1	STRAIGHT THREAD T2	TUBE OD	A	D FLOW	L	HEX	MFR'S NO. PH	FREIGHTLINER PART NUMBER
7/16-20	7/16-20	1/4	2.08	.172	1.72	9/16	4 FF50X-S	23-12564-044

ENGINEERING NOTES:

1. MATERIAL: BODY-STEEL
   O-RING- NITRILE (BUNA N) OR EQUIVALENT
2. FINISH: ZINC W/ YELLOW CHROMATE
3. INDUSTRY STANDARD: SAE J514 (FIG. 070122)
4. AEROQUIP AND WEATHERHEAD ARE ALSO APPROVED VENDORS.

CHG	JOB NO	DATE	BY	REVISION
-	P06874-02	11/18/98	DAJ	INITIAL LOAD

DRAWN	CGD	TITLE	DRAWING NUMBER	
APPRV	DAJ	ELBOW-90°, THERMOPLASTIC, HOSE BARB TO MALE PIPE	23-12578	
DATE	06/25/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -



TUBE/ HOSE I.D.	PIPE THREAD NPTF	L	N	C HEX	O.D.	D FLOW	VENDOR NUMBER PH	FREIGHTLINER PART NUMBER
3/8	1/4-18	1.06	1.41	9/16	.425	.247	P6MEB4	23-12578-000

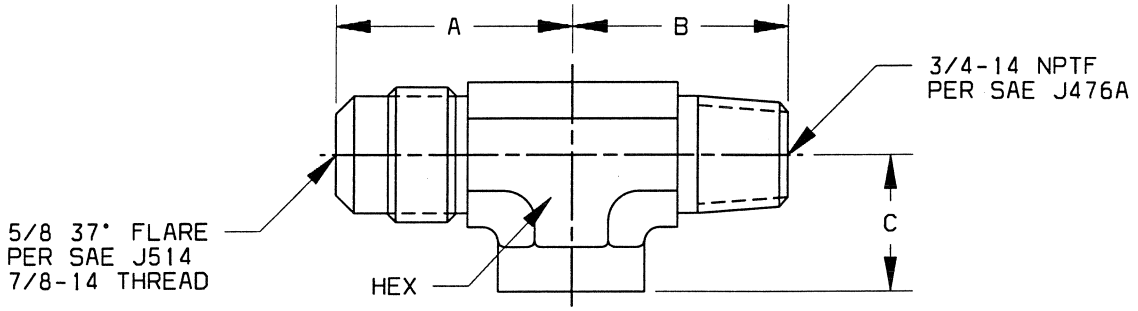
ENGINEERING NOTES:

1. MATERIAL: BLACK POLYETHYLENE
2. TEMPERATURE RANGE: -65°F TO +190°F (-54°C TO +88°C)

CHG	JOB NO	DATE	BY	REVISION
-	P09082-01	06/25/99	CGD	INITIAL RELEASE

23-12579 , A , TEE-SPECIAL

DRAWN: DAJ	TITLE: TEE-SPECIAL	DRAWING NUMBER: 23-12579	
APPRV: DAJ			
DATE: 05/30/97	FREIGHTLINER CORPORATION, PORTLAND, OREGON	SHEET: 1 OF 1	CHG. LTR.: A
CATIA ORIGINAL			



A

DIMENSIONS			HEX (FLAT)	MFR'S NO.	FREIGHTLINER
A	B	C		PH	PART NUMBER
1.73	1.69	1.36	1 5/16	10-12-12 XFJG-S	23-12579-000

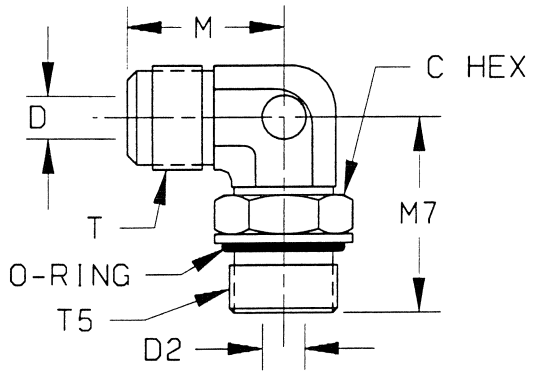
ENGINEERING NOTES:

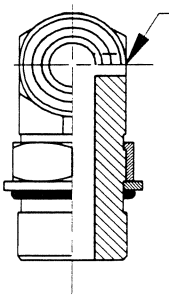
1. MATERIAL: STEEL
2. FINISH: ZINC PLATE W/CHROMATE FINISH
3. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	P01975-07	02/16/99	DAJ	INITIAL RELEASE
A	PA2042-93	07/15/99	CGD	7/8-14 WAS 1 1/16-12

DRAWN	KDK	TITLE	DRAWING NUMBER
APPRV	DAJ	ELBOW-90°, STEEL, 1/8 TAP 37° FLARE END/ST THRD, O-RING	23-12589
DATE	03/01/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. A
CATIA ORIGINAL			

A





TAP DRILL x 0.44 DEEP
1/8-27 NPTF THD.
INTERNAL DRYSEAL PIPE
(ONLY 4 PERFECT THDS.)

T TUBE END UN/UNF-2A	T5 PORT THD UN/UNF-2A	C HEX	M	M7	D DRILL	D2 DRILL	VENDOR NUM PH	FREIGHTLINER PART NUMBER
7/8-14	7/8-14	1	1.45	1.70	.484	.484	10 C50X-S 1/8TAP	23-12589-000

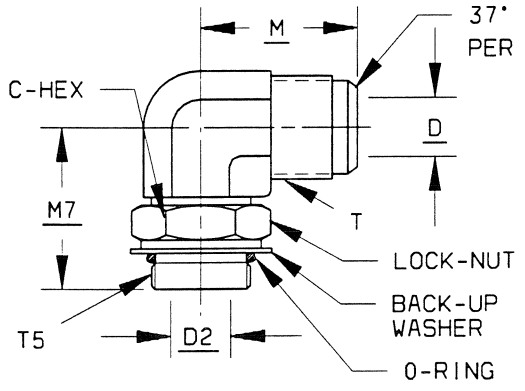
A

SPECIFICATIONS:

1. MATERIAL: STEEL BODY, LOCK NUT AND BACK-UP WASHER. NITRILE (BUNA-N) O-RING.
2. FINISH: ZINC PLATE WITH CHROMATE FINISH.
3. INDUSTRY STANDARD: FITTING: SAE J514, FIG. 070220. TAPPED HOLE: SAE J476A.
4. REFERENCE 23-11000-110 WITH 1/8-27 PIPE THREAD.

CHG	JOB NO	DATE	BY	REVISION
-	A13123-01	03/01/99	KDK	INITIAL LOAD
A	PA2042-97	10/14/99	LFB	REVISED SPECIFICATIONS, REVISED TAPPING CALLOUT.

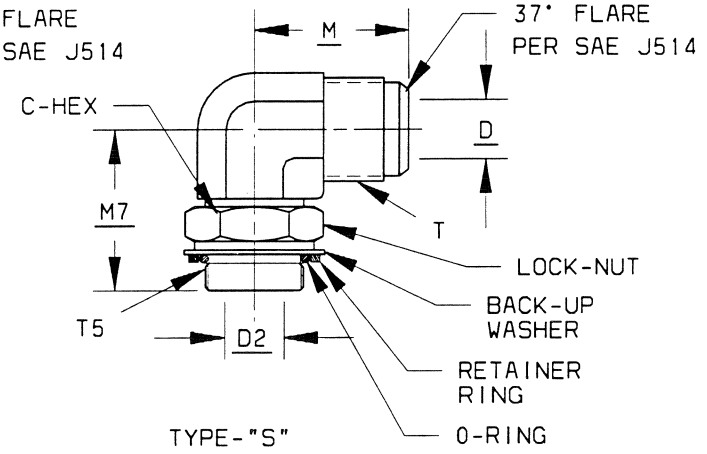
DRAWN	CGD	TITLE	DRAWING NUMBER
APPRV	DAJ	ELBOW-90°, STL, 37° MALE FLARE TO METRIC O-RING BOSS	23-12610
DATE	04/15/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. A
CATIA ORIGINAL			



TYPE-"P"

(PORT-SEAL)

FOR ISO 6149 O-RING PORTS



TYPE-"S"

(SURFACE-SEAL)

FOR ISO 9974 FLAT FACE PORTS

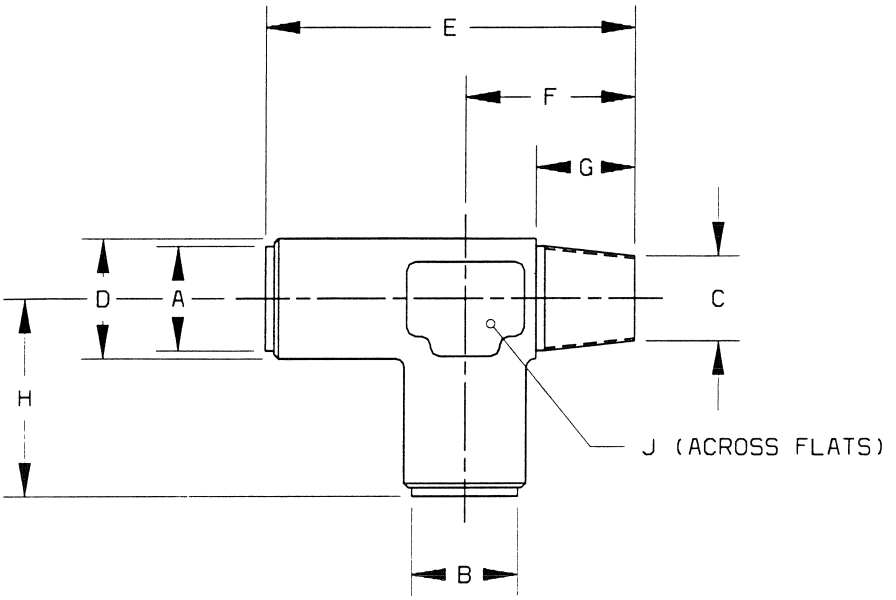
T FLARE THRD UN/UNF-2A	T5 METRIC THREAD	TYPE	C HEX	M	M7	D DRILL	D2 DRILL	VENDOR NUM PH	FREIGHTLINER PART NUMBER	
7/16-20	M10X1.0	P	14MM	0.89	0.98	0.172	0.177	4M10C870MXS	23-12610-000	
7/8-14	M22X1.5	S	27MM	1.45	1.70	0.484	0.551	10M22C80MXS	PH 10M22C80MXS	
1 5/16-12	M33X2.0	P	41MM	1.81	2.02	0.844	0.906	16M33C870MXS	23-12610-001	A
1 1/16-12	M22X1.5	S	27MM	1.66	1.97	0.609	0.551	12M22C80MXS	23-12610-002	

ENGINEERING NOTES:

1. MATERIAL:
   BODY, LOCK NUT, WASHER, RETAINER RING: STEEL
   O-RING: NITRILE (BUNA-N)
2. FINISH: ZINC PLATE WITH CHROMATE FINISH.
3. ALL DIMENSIONS ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	P07372-01	04/15/99	CGD	INITIAL LOAD
A	P09154-01	07/28/99	CGD	ADDED 23-12610-001/-002

DRAWN	CGD	TITLE	DRAWING NUMBER	
APPRV	DAJ	TEE-SIDE ADAPTER PUSH-IN	23-12618	
DATE	04/29/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. A
CATIA ORIGINAL				



TUBE SIZE		DIMENSIONS							MFR.S NO.	FREIGHTLINER PART NUMBER
A	B	C	D	E	F	G	H	J	NORGREN / PARKER	
3/8	3/8	1/4	0.69	2.05	0.96	0.56	1.08	0.71	95-4586-03 / 171PMTNS-6-4	23-12618-000
3/8	3/8	3/8	0.82	2.24	1.10	0.56	1.14	0.87	95-4586-10 / 171PMTNS-6-6	23-12618-001

A

ENGINEERING NOTES:

1. MATERIAL:
   BODY - BRASS BS 2874 CZ 122,CA377.
   O-RING - BUNA N (LOW NITRILE)

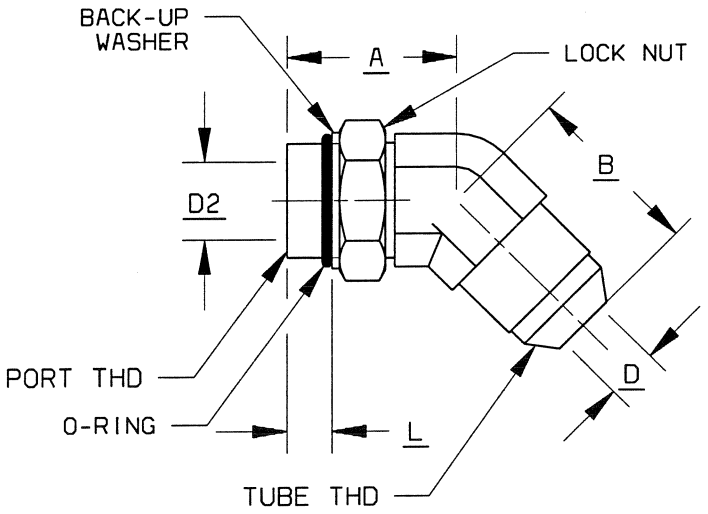
A

2. STANDARDS: MUST CONFORM TO SAE J1131.
3. FITTINGS MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.
4. DIMENSIONS SHOWN FOR REFERENCE ONLY.
5. WORKING PRESSURE (MAX): 0 TO 150 PSI.
6. WORKING TEMPERATURE: -40°F TO 220°F.

CHG	JOB NO	DATE	BY	REVISION
-	P04653-28	04/29/99	CGD	INITIAL RELEASE
A	PA2042-97	10/27/99	LFB	ADDED PARKER-HANNIFIN PART NO'S. ADDED CA377.

DEBBIE

DRAWN	CGD	TITLE	DRAWING NUMBER	
APPRV	DAJ	ELBOW-45 DEG, BRASS, O-RING BOSS TO SAE 45° MALE FLARE	23-12621	
DATE	05/07/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. A



	TUBE O.D.	TUBE THD UN/UNF-2A	PORT THD UN/UNF-2A	A	B	D	D2	L	FREIGHTLINER PART NUMBER
	1/2	3/4-16	3/4-16	1.30	.98	.406	.391	.49	23-12621-000
A	1/2	3/4-16	1 1/16-12	1.50	1.08	.406	.609	.67	23-12621-001
A	5/8	7/8-14	1 1/16-12	1.50	1.21	.500	.609	.67	23-12621-002

ENGINEERING NOTES:

1. MATERIAL: BRASS BODY, LOCK NUT, AND BACK-UP WASHER. FLUOROCARBON (VITON) O-RING.

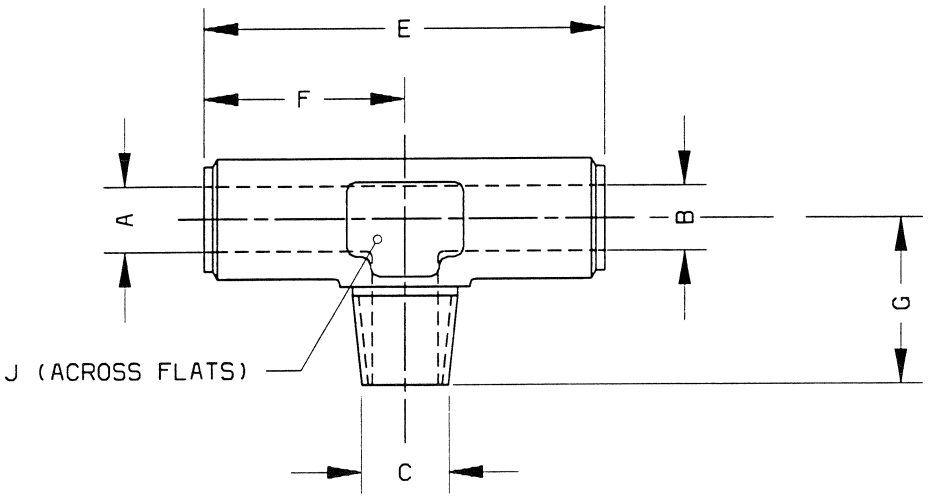
2. INDUSTRY STANDARD:
   BODY, LOCK NUT, AND BACK-UP WASHER: REF SAE J512 AND J514.
   O-RING: REF SAE J515, TYPE 3, FIG 1.

3. ALL DIMENSIONS ARE FOR REFERENCE ONLY.

4. SUGGESTED VENDOR: PARKER-HANNIFIN, SR159F-X-X OR EQUIVALENT.

CHG	JOB NO	DATE	BY	REVISION
-	F56755-36	05/07/99	CGD	INITIAL RELEASE
A	G27652-15	01/17/00	LFB	REVISED DIAGRAM. J514 WAS J515. ADDED -001 & -002.
				ADDED LINE TO NOTE 1. SR159F-X-X WAS SR159F-8-80RB.

DRAWN	CGD	TITLE	DRAWING NUMBER	
APPRV	DAJ	TEE-ADAPTER	23-12628	
DATE	05/28/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. A



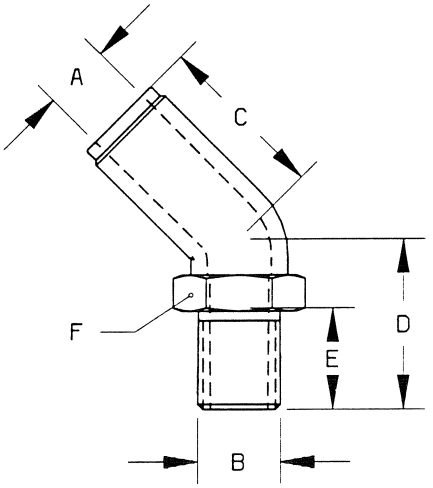
TUBE SIZE		DIMENSIONS					MFR.S NO.		FREIGHTLINER PART NUMBER
A	B	C	E	F	G	J	PH	NORGREN	
3/8	3/8	1/4	2.17	1.08	0.96	0.71	172PMTNS-6-4	95-4590-10	23-12628-000
1/2	3/8	1/2	2.59	1.34	1.25	0.88	172PMTNS-8-6-8	-	23-12628-001

ENGINEERING NOTES:

1. MATERIAL:
   BODY - BRASS BS 2874 CZ 122
   O-RING - BUNA N (LOW NITRILE)
2. STANDARDS: MUST CONFORM TO SAE J1131.
3. FITTINGS MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.
4. DIMENSIONS SHOWN FOR REFERENCE ONLY.
5. WORKING PRESSURE (MAX): 0 TO 150 psi
6. WORKING TEMPERATURE: -40°F TO 220°F

CHG	JOB NO	DATE	BY	REVISION
-	P04653-19	05/28/99	CGD	INITIAL RELEASE
A	P08640-04	09/24/99	DAJ	ADDED -001,PH PART NUMBER ON -000, RMVD DIM D & H

DRAWN	CGD	TITLE	DRAWING NUMBER	
APPRV	DAJ	ELBOW-45 DEG TEE, SIDE, PUSH-IN	23-12634	
DATE	06/14/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. A



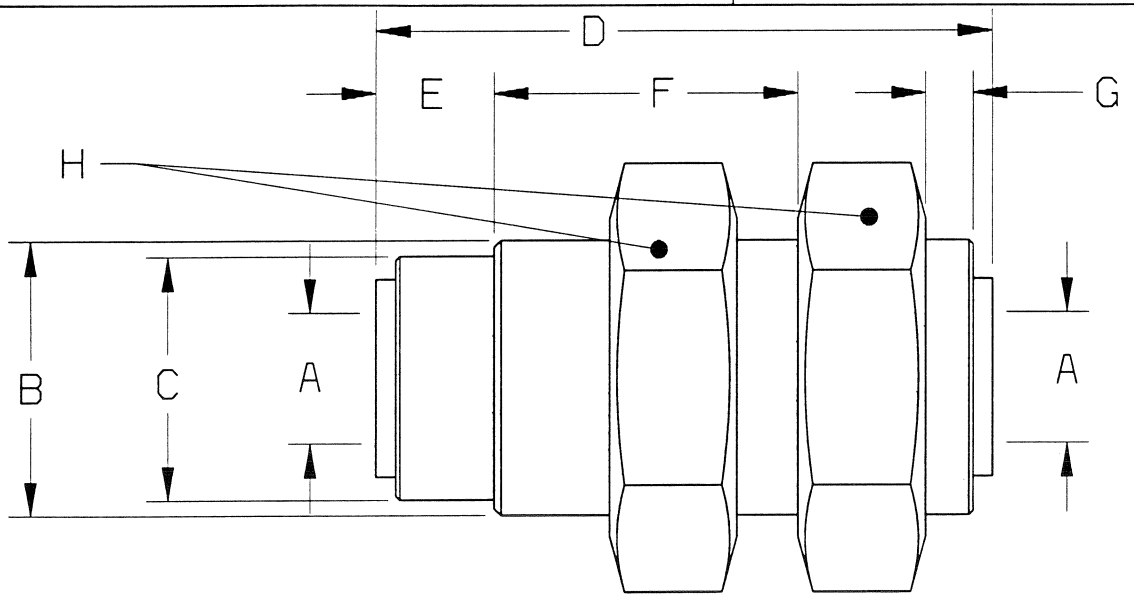
	A O/D TUBE	B NPTF	C	D	E	F HEX	VENDOR P/N NORGREN PARKER	FREIGHTLINER PART NUMBER
A	1/2	1/2	1.30 (33.0)	1.30 (33.0)	0.75 (19.1)	0.87 (22.0)	95 4600 30 179PMTNS-8-8	23-12634-000

ENGINEERING NOTES:

1. MATERIAL: BODY-BRASS BS 2874 CZ 122, CA377.
   O-RING- BUNA-N (LOW NITRILE).
2. FITTINGS MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.
3. DIMENSIONS ARE FOR REFERENCE ONLY.
4. MUST CONFORM TO SAE J1131.
5. A WORKING PRESSURE (MAX): 0 TO 150 PSI.
6. WORKING TEMPERATURE: -40°F TO 220°F.

CHG	JOB NO	DATE	BY	REVISION
-	P04653-22	06/14/99	CGD	INITIAL RELEASE
A	PA2042-97	10/27/99	LFB	ADDED PARKER P/N, NOTES 4, THRU 6. REVISED MAT'L NOTE.

DRAWN	GRL	TITLE	DRAWING NUMBER	
APPRV	DJ	BULKHEAD UNION	A23-12684	
DATE	09/09/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -

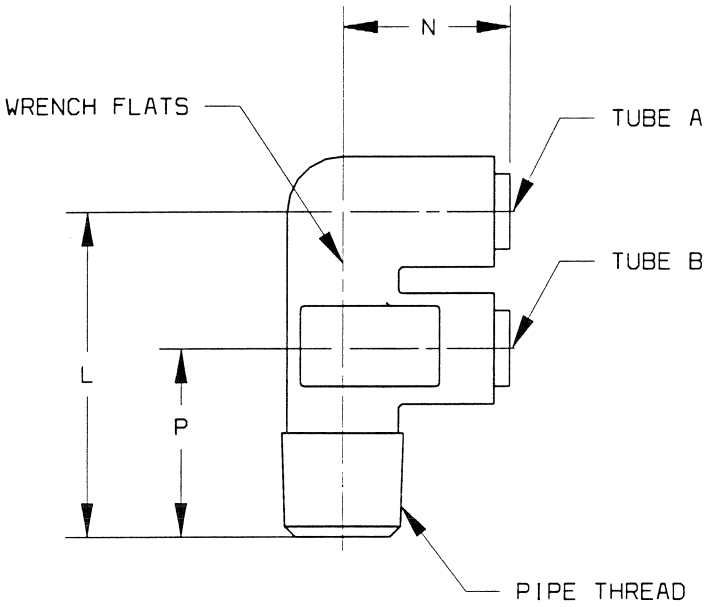


A TUBE O.D.	B THREAD	PART NUMBER NORGREN	PANEL HOLE Ø	Ø C	D	E	F (Max)	G (Min)	H A/F	INS DEPTH	F/L SPEC NO.
1/4"	M15X1.0	94 4507 04	0.61 (15.5)	-	1.41 (35.9)	-	0.87 (22.0)	0.08 (2.0)	0.87 (22.0)	.625 (15.8)	A23-12684-000
3/8"	M20X1.5	94 4507 06	0.81 (20.5)	0.70 (17.7)	1.75 (44.5)	0.33 (8.5)	0.87 (22.0)	0.08 (2.0)	1.06 (27.0)	.625 (15.8)	A23-12684-001
1/2"	M24X1.5	94 4507 07	0.97 (24.5)	0.85 (21.7)	2.02 (51.4)	0.63 (16.0)	0.87 (22.0)	0.08 (2.0)	1.18 (30.0)	.625 (15.8)	A23-12684-002

SPECIFICATIONS:

CHG	JOB NO	DATE	BY	REVISION
-	P07440-01	09/09/99	GRL	INITIAL RELEASE

DRAWN	LFB	TITLE	DRAWING NUMBER	
APPRV	DAJ	FITTING-F TYPE PUSH-IN	23-12700	
DATE	10/27/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -



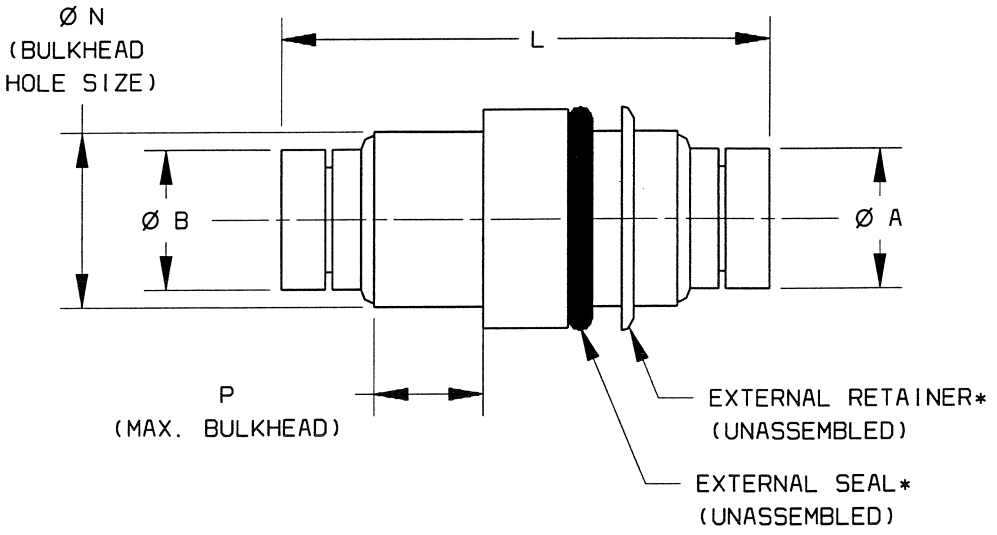
TUBE SIZE		PIPE THREAD	WRENCH FLATS	L	N	P	MFR'S NO		FREIGHTLINER PART NUMBER
A	B						NORGREN	PH	
1/4	1/4	3/8-18	5/8	1.92	.95	.90	95-4761-08	189PMT4-4-6	23-12700-000
3/8	1/4	3/8-18	3/4	2.87	1.19	1.00	95-4761-13	189PMT6-4-6	23-12700-001

ENGINEERING NOTES:

1. MATERIAL: BRASS BODY, SST TUBE SUPPORT, NITRILE O-RING.
2. FITTING MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.
3. FITTING MUST CONFORM TO SAE J1131.
4. DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	P08647-14	10/27/99	LFB	INITIAL RELEASE

DRAWN	LFB	TITLE FITTING-UNION, BULKHEAD 1/4 TUBE W/MOUNTING HARDWARE	DRAWING NUMBER 23-12701
APPRV	DAJ		
DATE	10/27/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. A
CATIA ORIGINAL			



*EXTERNAL RETAINER AND EXTERNAL SEAL ARE PACKAGED SEPARATELY.

TUBE SIZE					MFR'S NO PH	FREIGHTLINER PART NUMBER
A	B	L	N	P		
1/4	1/4	1.48	.512	.26	S-4664	23-12701-000
3/8	3/8	1.87	.762	.36	S-4665	23-12701-001

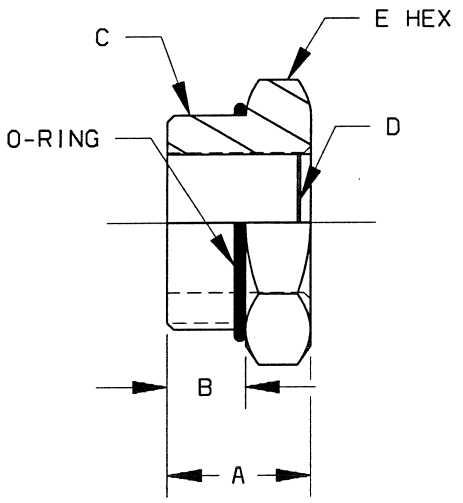
A

ENGINEERING NOTES:

1. MATERIAL: BRASS BODY, SST TUBE SUPPORTS, NITRILE SEALS, STEEL RETAINER.
2. FITTING MUST CONFORM TO SAE J1131.
3. FITTING MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.
4. DIMENSIONS ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	P08647-14	10/27/99	LFB	INITIAL RELEASE
A	P09989-03	01/04/00	LFB	ADDED -001.

DRAWN	LFB	TITLE	DRAWING NUMBER	
APPRV	DAJ	ADAPTER-REDUCER/EXPANDER STR THREAD	23-12728	
DATE	11/17/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -



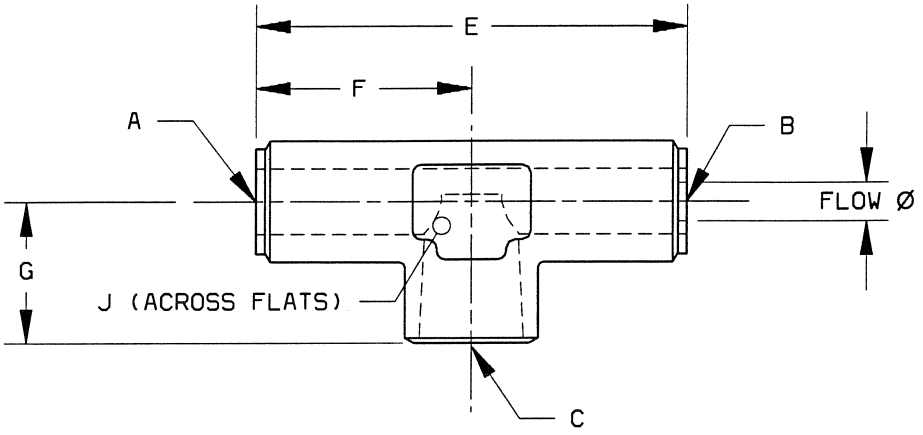
A	B	C EXTERNAL THREAD	D INTERNAL THREAD	E HEX	MFR'S NO PH	FREIGHTLINER PART NUMBER
1.16	.36	7/16-20	9/16-18	13/16	4-6 F50G5-S	23-12728-000
1.38	.39	9/16-18	3/4-16	1 1/16	6-8 F50G5-S	23-12728-001
1.75	.59	1 5/16-12	1 1/16-12	1 1/2	16-12 F50G5-S	230514 001005
1.00	.59	1 5/8-12	1 1/16-12	1 7/8	20-12 F50G5-S	230514 001004
1.00	.59	1 5/8-12	1 5/16-12	1 7/8	20-16 F50G5-S	230514 001006

ENGINEERING NOTES:

1. MATERIAL: STEEL AISI 12L14 OR EQUIVALENT.
2. FINISH: ZINC PLATE W/CHROMATE FINISH.
3. O-RING: NITRILE SAE J515A TYPE 1.
4. VENDOR: PARKER HANNIFIN OR EQUIVALENT.

CHG	JOB NO	DATE	BY	REVISION
-	P06232-16	11/17/99	LFB	INITIAL RELEASE

DRAWN	LFB	TITLE	DRAWING NUMBER	
APPRV	DAJ	TEE-BRANCH PUSH-IN TO FEMALE PIPE	23-12733	
DATE	05/28/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -
CATIA ORIGINAL				



TUBE SIZE		NPTF	DIMENSIONS				FLOW DIA	MFR'S NO.	FREIGHTLINER PART NUMBER
A	B	C	E	F	G	J		PH	
3/8	3/8	1/8-27	2.44	1.22	0.81	0.62	.22	177PMTNS-6-2	23-12733-000

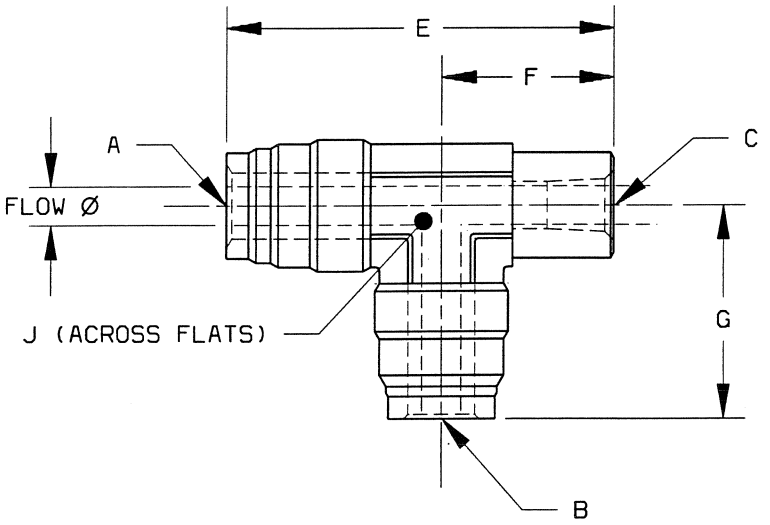
ENGINEERING NOTES:

1. MATERIAL: BRASS BODY AND COMPONENTS, SST TUBE SUPPORTS. NITRILE SEALS.
2. FITTING: MUST CONFORM TO SAE J1131.
3. FITTING MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.
4. DIMENSIONS SHOWN FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	P08646-20	12/01/99	LFB	INITIAL RELEASE

DEBBIE

DRAWN	LFB	TITLE	DRAWING NUMBER
APPRV	DAJ	TEE-RUN PUSH-IN TO FEMALE PIPE	23-12752
DATE	01/25/00	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -
CATIA ORIGINAL			



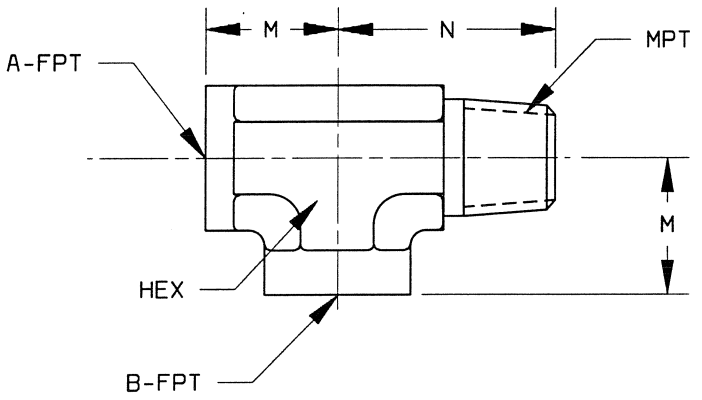
TUBE PORT		NPTF	DIMENSIONS				FLOW DIA	MFR'S NO.	FREIGHTLINER PART NUMBER
A	B	C	E	F	G	J		PH	
3/8	3/8	1/8-27	2.19	0.97	1.22	0.62	.22	Q178PMTNS-6-2	23-12752-000

ENGINEERING NOTES:

1. MATERIAL: BRASS BODY AND COMPONENTS, SST TUBE SUPPORTS. NITRILE SEALS.
2. FITTING: MUST CONFORM TO SAE J1131.
3. FITTING MUST BE MARKED ACCORDINGLY FOR COMPLIANCE WITH FMVSS 106.
4. DIMENSIONS SHOWN FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	P08646-22	01/25/00	LFB	INITIAL RELEASE

DRAWN	LFB	TITLE TEE-STREET STEEL	DRAWING NUMBER 23-12757
APPRV	DAJ		
DATE	02/05/00	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. -
CATIA ORIGINAL			



FPT A	FPT B	MPT	"M"	"N"	FLOW DIA	MFR'S NO. PH	FREIGHTLINER PART NUMBER
1/8	1/8	1/8	0.66	0.78	.220	012T-2-2	23-12757-002
1/4	1/4	1/4	0.88	1.09	.312	012T-4-4	23-12757-004
3/8	3/8	3/8	1.02	1.22	.440	012T-6-6	23-12757-006
3/4	3/4	3/4	1.36	1.59		012T-12-12	23-12757-012

ENGINEERING NOTES:

1. MATERIAL: STEEL
2. INDUSTRY STD: FIG. NO. 140424, SAE J530.
3. FITTING ASSY MUST BE MARKED ACCORNINGLY FOR COMPLIANCE WITH FMVSS 106.
4. ALL DIMENSIONS ARE FOR REFERENCE ONLY.

CHG	JOB NO	DATE	BY	REVISION
-	P11226-01	02/05/00	LFB	INITIAL RELEASE