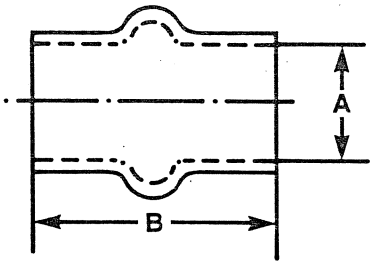
DONALDSON HUMP HOSE

Part Number	A Dimension	B Dimension
DN/PPP10 5608	3″	5¼″
DN/PPP11 4319	3½″	5¼″
DN/PPP10 5609	4″	5¼″
DN/PPP10 5610	5″	6″
DN/PPP10 5611	5½″	6″
DN/PPP10 5612	6″	6½″
DN/PPP10 5613	7″	6½″
DN/PPP11 2608	8″	5″



FREIGHTLINER HUMP HOSE

Part Number	Description
03-09177-000	Hump hose 5½″
03-09177-001	Hump hose 5″
03-09177-002	Hump hose 4″
03-09177-004	Hump hose 7″

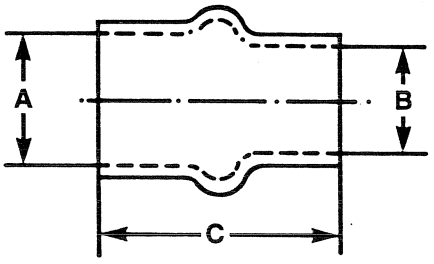


GRIFFITH RUBBER HUMP HOSE

Part Number	Description
GRR/HH6	Hump hose 6″
GRR/HH8	Hump hose 8″

DONALDSON HUMP HOSE REDUCER

Part Number	A Dimension	B Dimension	C Dimension
DN/PPP10 1290	3½″	3″	5″
DN/PPP10 1291	4″	3½″	5″
DN/PPP10 1293	5″	4″	5¾″
DN/PPP10 1891	5½″	4″	5¾″
DN/PPP10 3516	5½″	5″	5¾″
DN/PPP11 2611	6″	5″	6″
DN/PPP10 1294	6″	5½″	6″
DN/PPP11 2610	7″	6″	5½″
DN/PPP11 4315	8″	6″	5½″
DN/PPP11 2609	8″	7″	6″

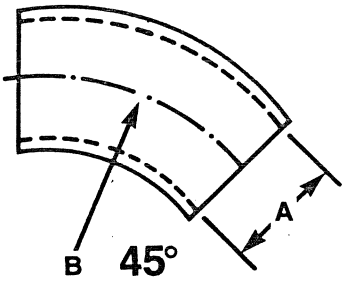


FREIGHTLINER HUMP HOSE REDUCERS

Part Number	Description
03-12461-001	Hump hose reducer 5″ to 6″
03-12461-002	Hump hose reducer 5½″ to 6″
03-12461-003	Hump hose reducer 6″ to 7″
03-12461-004	Hump hose reducer 6″ to 8″
03-12461-005	Hump hose reducer 7″ to 8″

DONALDSON 45° RUBBER ELBOWS

Part Number	A Dimension	B Dimension
DN/PPP10 5544	3″	3¼″
DN/PPP10 9331	3½″	3½″
DN/PPP10 5545	4″	3¾″
DN/PPP10 9021	5″	4.13″
DN/PPP10 5546	5½″	4.38″
DN/PPP10 5547	6″	5″
DN/PPP10 5548	7″	5.56″
DN/PPP11 2606	8″	6½″
DN/PPP11 4313	10″	8½″

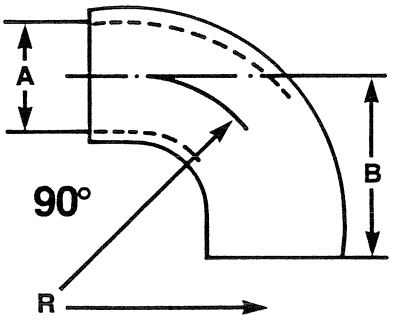


FREIGHTLINER 45° RUBBER ELBOWS

Part Number	Description
03-09590-001	5″ Rubber elbow
03-09884-000	6″ Rubber elbow
03-12463-000	7″ Rubber elbow
03-12463-001	8″ Rubber elbow

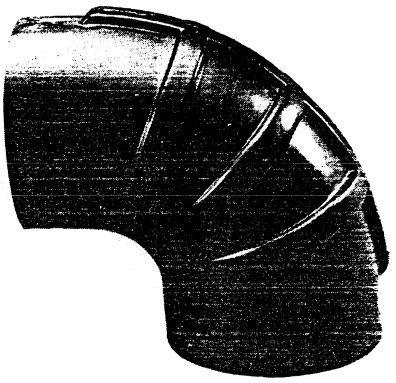
DONALDSON 90° RUBBER ELBOWS

Part Number	A Dimension	B Dimension	R Dimension
DN/PPP10 5532	3″	5″	3¼″
DN/PPP11 4318	3½″	5½″	4″
DN/PPP11 4318	3½″	5½″	4″
DN/PPP10 5533	4″	5¾″	4.13″
DN/PPP11 3733	4½″	5¾″	3½″
DN/PPP10 7844	5″	6″	4.13″
DN/PPP10 5534	5½″	6.38″	4.63″
DN/PPP10 5535	6″	7″	5″
DN/PPP10 5536	7″	7.56″	5.56″
DN/PPP11 2605	8″	8½″	6½″
DN/PPP11 4314	10″	10½″	8½″



FREIGHTLINER 90° RUBBER ELBOWS

Part Number	Description
03-09589-001	5″ Rubber elbow
03-13431-000	5½″ Rubber elbow
03-09875-000	6″ Rubber elbow
03-12464-000	7″ Rubber elbow
03-12464-001	8″ Rubber elbow

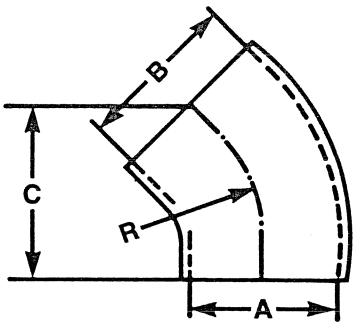


HUNTINGTON 90° RUBBER ELBOW

Part Number	Description
HUN/90 HL6SR	6″ Elbow (short radius)

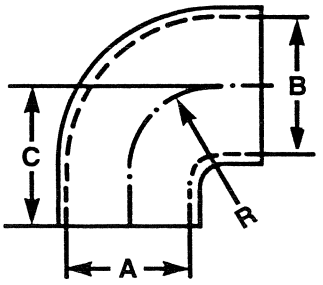
DONALDSON 45° RUBBER ELBOW REDUCERS

	A Dimension	B Dimension	C Dimension	R Dimension
DN/PPP13 3338	5½"	6"	6.44"	4.88"
DN/PPP13 3339	6"	7"	7.38"	5.56"



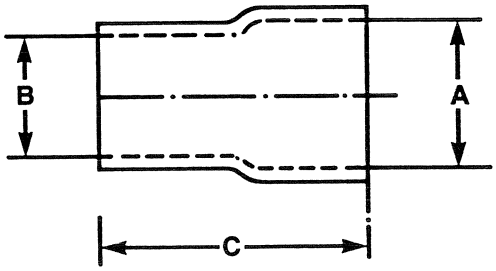
DONALDSON 90° RUBBER ELBOW REDUCERS

	A Dimension	B Dimension	C Dimension	R Dimension
DN/PPP12 3462	3"	3½"	3½"	2¼"
DN/PPP12 1482	4"	5"	5¾"	3¾"
DN/PPP14 3895	5"	6"	7¼"	3¾"
DN/PPP12 8990	5½"	7"	6¼"	4.38"
DN/PPP11 7724	5½"	6"	6¾"	5"



DONALDSON STRAIGHT RUBBER REDUCERS

	A Dimension	B Dimension	C Dimension
DN/PPP10 4087	2"	1½"	2½"
DN/PPP10 2948	2"	1¾"	2½"
DN/PPP10 4088	2¼"	2"	2½"
DN/PPP10 4089	2½"	2"	2½"
DN/PPP10 4090	2½"	2¼"	2½"



FREIGHTLINER 90° RUBBER ELBOW REDUCERS

Part Number	Description
03-13429-000	6" to 5½" Elbow reducer
03-13430-000	7" to 5½" Elbow reducer
03-13432-000	6" to 5½" Elbow reducer, short legs

KILSBY AIR INTAKE TUBING

Part Number	Description
KTS/4AT	4" Aluminum air intake tubing, 10 foot lengths
KTS/5AT	5" Aluminum air intake tubing, 10 foot lengths
KTS/55AT	5½" Aluminum air intake tubing, 10 foot lengths
KTS/6AT	6" Aluminum air intake tubing, 10 foot lengths
KTS/7AT	7" Aluminum air intake tubing, 10 foot lengths
KTS/8AT	8" Aluminum air intake tubing, 10 foot lengths

FREIGHTLINER TURBO SILICONE HOSE

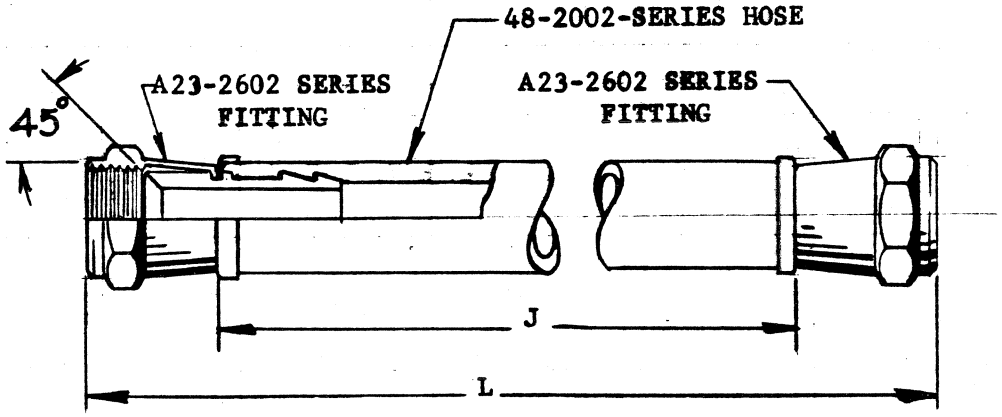
Part Number	Description
01-16540-000	4" Silicone Turbo Hump Hose, 6½" Length
01-16541-005	4" Silicone Turbo Straight Hose, 5" Length
01-16541-006	4" Silicone Turbo Straight Hose, 6" Length
01-16541-008	4" Silicone Turbo Straight Hose, 8" Length

Compiled	L. BRYANT	HOSE ASSEMBLY LOW PRESSURE SAE SWIVEL TO SAE SWIVEL BRASS FITTINGS	A23-2202 THRU A23-2204
Approved	[illegible]		
Issued	11-17-66		
Last Chg Letter	A	FREIGHTLINER CORPORATION PORTLAND, OREGON	

WAS A23-2202 THRU A23-2204

CHG	BY	DATE

SKETCH



ASSEMBLY NUMBERS

	I.D. HOSE 16ths	THREAD SAE	TERMINAL NUMBER (2 REQ'D)	HOSE NUMBER	HOSE LENGTH "J" (INCHES)	MAX WORK PRESS PSI	FREIGHTLINER ASSEMBLY NUMBER*
	4	7/16-20	A23-2602-004	48-2002-004	L-1.50	250	A23-2202-L
	6	5/8- 18	A23-2602-006	48-2002-006	L-1.75	250	A23-2203-L
	8	3/4- 16	A23-2602-008	48-2002-008	L-2.00	250	A23-2204-L

ASSEMBLY PROCEDURE:

Cut hose to length squarely and cleanly.
Push hose over barbed stem of fitting until it bottoms snugly against hex section or shoulder of fitting.
Avoid use of lubricants, and keep parts clean.

WAS L48-2002-#; 23-1602-#; J #60500

CHG	BY	DATE
A	HJR	11-30-72

Example of part no: A23- 2203-036

- A23- Assembly
- 2203- Group No: (Gen'l use part)
- Category (Hose)
- -036 Length in inches
- Basic Size (tube OD in 8ths of in.)
- Type: (Low pres., single fiber braid)

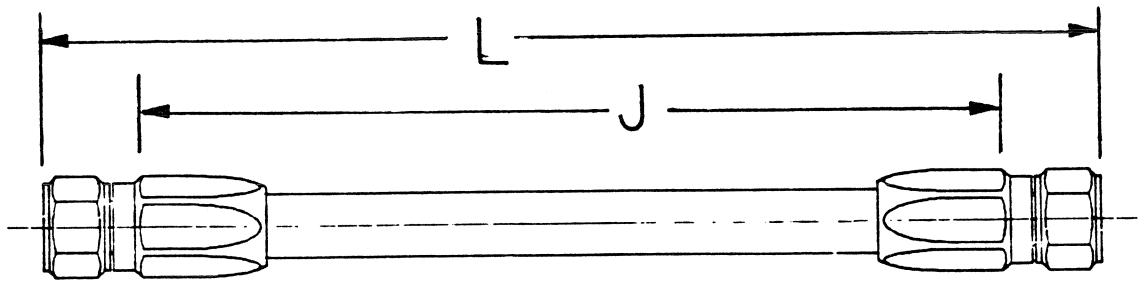
*Indicate L (Length) in inches to complete part number.

Was [illegible]202 Series

Form E-46

ORIGINAL JOB NO.	TITLE	PART NO.
	HOSE ASSEMBLY, WIRE BRAID	A23-02232
LAST CHG LTR K		SHEET 1 OF 1

SKETCH



PART NUMBERS

HOSE SIZE	SAE THREAD	FITTINGS	HOSE		MAX. WORKING PRESSURE (PSI)	MIN. BEND RADIUS	FREIGHTLINER ASSEMBLY NUMBER
		FREIGHTLINER NUMBER	FREIGHTLINER NUMBER	J LENGTH			
4	7/16-20	A23-9495-004	48-00121-004	L - 2.00	1500	.75	A23-2232-L
6	5/8 -18	-006	-006	L - 2.00	1000	1.25	A23-2233-L
8	3/4 -16	-008	-008	L - 2.25	1000	1.75	A23-2234-L
10	7/8 -14	-010	-010	L - 2.50	875	2.25	A23-2235-L
12	1-1/16-14	-012	-012	L - 2.75	750	2.75	A23-2236-L
16	1-5/16-14	-016	-016	L - 2.50	375	3.50	A23-2238-L
20	1-5/8 -14	-020	-020	L - 2.16	300	4.50	A23-2240-L

ENGINEERING NOTES

1. The assembled hose must qualify under all the latest provisions of test requirements for SAE 1402 hose assemblies, and must meet applicable current requirements of Federal Motor Vehicle Safety Standard #106.

2. Part Number Example: A23-2232-036

   General Use Part — Assembly Length in Inches (36")

   Assembly Number

(3.) Material: Fittings, Steel; Hose, Single Wire Braid Reinforced Meeting SAE J 1402 Standards.

CAUTION: Hose and fittings used in the above assemblies must be from the same manufacturer.

CHANGE INFORMATION					LTR
Revised and Redrawn	Add Caution Note	Dwg No Was A23-2232/ A22-2240			
DATE	10-16-86	10/17/88			
BY	FHF	AF			
JOB NO.	7042D	P*A078-67			
LTR	J	K			

COMPILED	FHF	DATE DRAWN		MATERIAL	MASTER NUMBER
APPROVED	TJW	1-10-71		(3)	05160 000D1

A23-2242 thru A23-2250

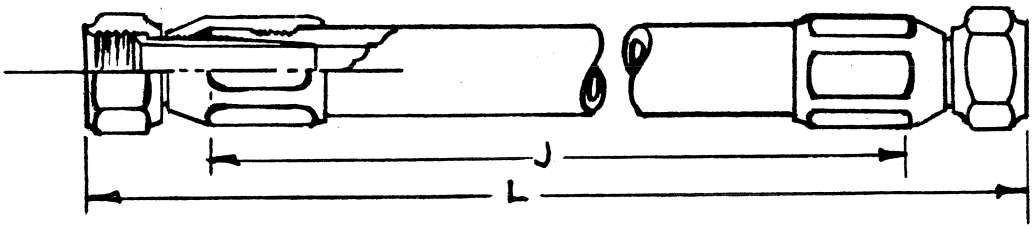
General Use Part

PRINT ISSUED	TITLE	PART NO.
9/13/71	HOSE ASSY, MEDIUM PRESSURE SAE SWIVEL ENDS 100 R5	A23-2242 thru 2250
LAST CHG. LTR. D		SHEET 1 OF 1

CHG	BY	DATE	WAS
D	RP	1-18-80	REMOVED TYPE D E039

C

SKETCH



ASSEMBLY NUMBERS

OD * TUBE 1/16's	THREAD SAE	TERMINALS (1) 2 REQ'D	HOSE (1) NUMBER	HOSE (1) LENGTH J (IN)	WORKING PRESSURE PSI (MAX) (2)	BEND MIN. R. (IN.)	FREIGHTLINER ASSEMBLY NUMBER
4	7/16-20	A23-2604-004	48-2004-004	L-2.00	3000	3.00	A23-2242-L
6	5/8 -18	-006	-006	2.31	2250	4.00	A23-2243-L
8	3/4 -16	-008	-008	2.75	2000	4.62	A23-2244-L
10	7/8 -14	-010	-010	3.00	1750	5.50	A23-2245-L
12	1-1/16-14	-012	-012	3.00	1500	6.50	A23-2246-L
16	1-5/16-14	-016	-016	3.00	800	7.38	A23-2248-L
20	1-5/8 -14	-020	-020	3.00	625	9.00	A23-2250-L

*Copper tube sizes.

ENGINEERING NOTES

(1) Material: (See Table) Assembled hose must meet all latest provisions of test requirements for SAE J1402 Hose Assemblies.
CAUTION: Hose & fittings used in an assembly must be from the same manufacturer.

(2) Pressure ratings and physical dimensions meet requirements of SAE 100 R5 hydraulic hose.

CHG	BY	DATE	WAS
A	HJR	8-26-71	Rev'd, Redrawn.
			A23-2250 Added
B	HJR	10-19-72	A23-2604-XXX; J#60270
C	DL	3-22-73	23-2604-XXX; J #53278

ns

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rmj	8-26-71		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

D MF C

A23-02252 THRU A23-02258

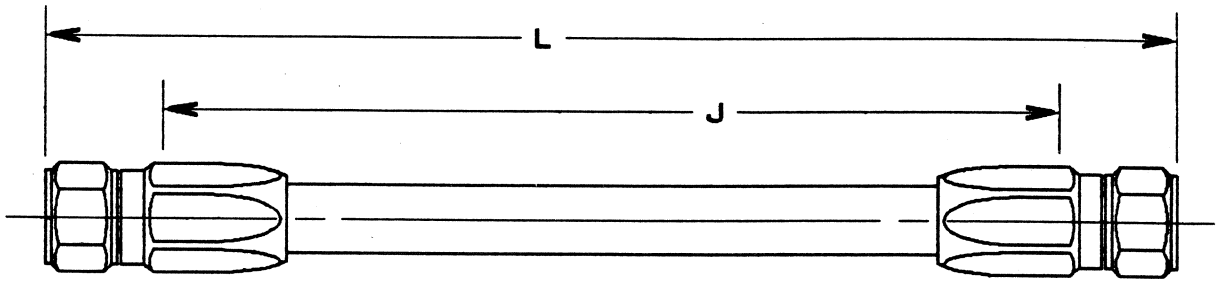
GENERAL USE PART

ORIGINAL JOB NO.	TITLE	A23-02252 THRU A23-02258
5625C	HOSE ASSEMBLY, MEDIUM PRESSURE 37° J.I.C. SWIVEL ENDS	
LAST CHG LTR B		SHEET 1 OF 1

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
B1	5625C	DJL	11-21-84	REVISED & REDRAWN
B2	5625C	DJL	11-21-84	1-5/16-14 TO 1-5/16-12

SKETCH:



ASSEMBLY NUMBERS:

HOSE SIZE	SAE THREAD SIZE	HOSE FITTINGS (2 REQUIRED)	HOSE	HOSE LENGTH J (IN)	MAX WORKING PRESS (PSI)	MIN BEND RAD (IN)	FREIGHTLINER ASSEMBLY NUMBER
-4	7/16-20	A23-2608-004	48-2004-004	L-2.00	3000	3.00	A23-02252-L*
-6	5/8 -18	A23-2608-006	48-2004-008	L-2.31	2250	4.00	A23-02253-L
-8	3/4 -16	A23-2608-008	48-2004-008	L-2.75	2000	4.62	A23-02254-L
-10	7/8 -14	A23-2608-010	48-2004-010	L-3.00	1750	5.50	A23-02255-L
-12	1-1/16-14	A23-2608-012	48-2004-012	L-3.00	1500	6.50	A23-02256-L
-16	1-5/16-12	A23-2608-016	48-2004-016	L-3.00	800	7.38	A23-02258-L

*TO COMPLETE THE ASSEMBLY NUMBER ADD A THREE DIGIT NUMBER EXPRESSING THE HOSE ASSEMBLY LENGTH, L, IN INCHES.

EXAMPLE: A23-02254-048 IS A -8 HOSE ASSEMBLY 48 INCHES LONG.

ENGINEERING NOTES:

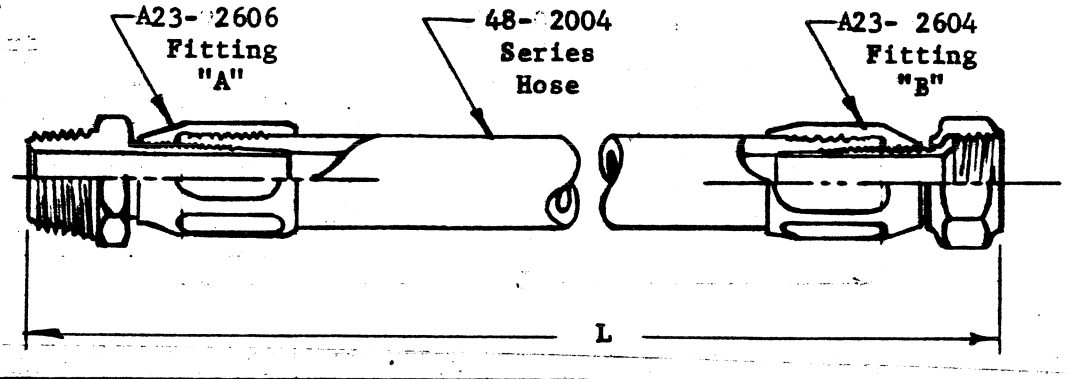
(1) MATERIAL: SEE TABLE. ASSEMBLED HOSE MUST MEET ALL LATEST PROVISONS OF SAE J1402 HOSE ASSEMBLIES.

CAUTION: HOSE AND FITTINGS USED IN ABOVE ASSEMBLIES MUST BE FROM THE SAME MANUFACTURER.

2. PRESSURE RATINGS AND PHYSICAL DIMENSIONS MUST MEET REQUIREMENTS OF SAE J100 R5 HYDRAULIC HOSE.

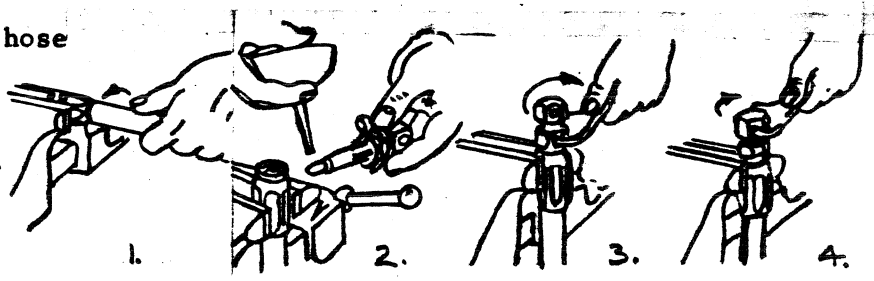
COMPILED	DJL	DATE DRAWN	CADAM ORIGINAL	MATERIAL	MASTER NUMBER	
APPROVED	DJL	11-21-84		(1)	05160	00001

Compiled	K.J.R.	HOSE ASSEMBLY MEDIUM PRESSURE SAE SWIVEL TO MALE PIPE REUSABLE STEEL FITTINGS	A23- 2282 thru A23- 2288
Approved	K.J.A.		
Issued	9-5-68		
Last Chg Letter	B	FREIGHTLINER CORPORATION PORTLAND, OREGON	



HOSE ASSEMBLY NUMBER	MAX WORK PRES psi	OD TUBE 16ths	TERMINAL A		TERMINAL B		HOSE SPEC
			PIPE THREAD N.P.T.	NUMBER	THREAD S.A.E.	NUMBER	
A23-2282-L	3000	4	1/8-27	A23-2606-004	7/16-20	A23-2604-004	48-2004-004
2283-L	2250	6	1/4-18	-006	5/8 -18	-006	-006
2284-L	2000	8	3/8-18	-008	3/4 -16	-008	-008
2285-L	1750	10	1/2-14	-010	7/8 -14	-010	-010
2286-L	1500	12	3/4-14	-012	1-1/16-14	-012	-012
2288-L	800	16	3/4-14	-016	1-1/16-14 (PTT THD)	-016	-016

ASSEMBLY PROCEDURE: (1) Cut hose square to length required with fine-tooth hacksaw or cut-off wheel. Put socket in vise and screw hose counter-clockwise into socket until hose bottoms. Back off ¼ turn.



An assembly tool is required for single wire braid hose in sizes 1/4" through 3/4". The assembly tool must be oiled when nipple threads are oiled.

(2) Oil nipple threads, assembly tool mandrel, and inside of hose LIBERALLY.

(3) Male End: Push assembly tool into nipple. Oil. Screw nipple clockwise into socket and hose. Tighten nipple until snug against socket.

(4) Swivel End: Tighten nipple and nut on assembly tool. Oil. Screw nipple clockwise into socket and hose. Leave 1/32" to 1/16" clearance between nut and socket so nut will swivel. The assembled hose must qualify under all the latest provisions of test requirements for SAE 40R2 Type D Hose Assemblies.

Example of Part No.: A23- 2284-036
- Prefix (Assembly)
- Group No: (Gen'l Use Part)
- Category (Hose)
- Basic Size (Tube OD in 8ths of inch)
- TYPE: (Med. Pres, Single Wire Braid)
- Length in Inches (36)

*Indicate L (length) in inches to complete part number.

CHG	BY	DATE	WAS
-	-	--	FC 2208 Series
A	LFG	4-3-69	Add A23-2283 thru 86 to
			tab. Delete J Dimension
B	HJR	5-18-73	Add prefix "A" to

CHG	BY	DATE	WAS
-	-	-	fittings; J #A0390

2282 thru 2288

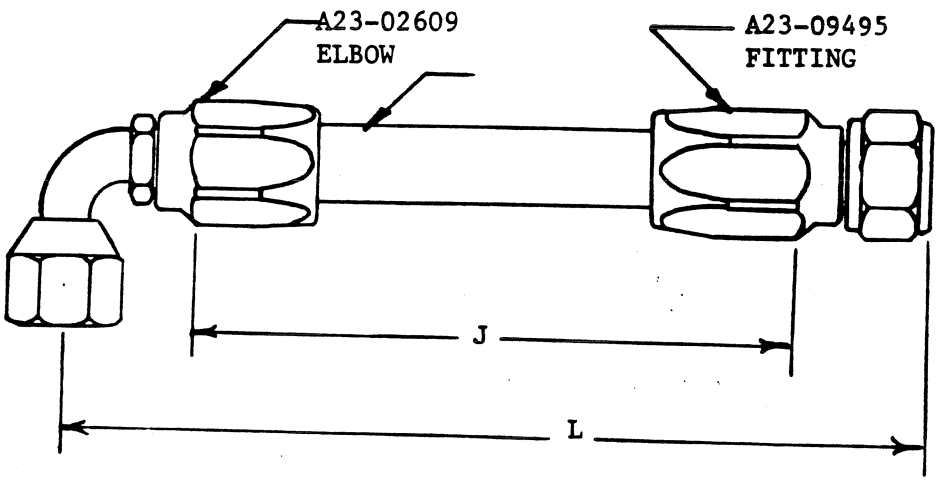
Form E-46

4-9-69

ORIGINAL JOB NO.		TITLE	PART NO.
1/29/71		HOSE ASSEMBLY SAE 90 TO SAE SWIVEL	A23-02292 TO A23-02296
LAST CHG LTR	F		SHEET 1 OF 1

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
F	6969D	FHF	3-20-86	Revised and Redrawn

SKETCH:



PART NUMBERS:

HOSE SIZE	SAE THREAD	TERMINALS		HOSE		MAX. WORKING PRESSURE (PSI)	MIN. BEND RADIUS	FREIGHTLINER ASSEMBLY NO.
		90 ELBOW	STRAIGHT FITTING	F/L NUMBER	J LENGTH			
		A23-02609	A23-09495	48-00121				
4	7/16-20	-004	-004	-004	L - 1.81	1500	2.00	A23-2292-L
6	5/8 -18	-006	-006	-006	L - 2.12	1000	2.75	A23-2293-L
8	3/4 -16	-008	-008	-008	L - 2.62	1000	4.62	A23-2294-L
10	7/8 -14	-010	-010	-010	L - 2.88	875	5.50	A23-2295-L
12	1-1/16-14	-012	-012	-012	L - 3.98	750	6.50	A23-2296-L

ENGINEERING NOTES:

1. The assembled hose must qualify under all the latest provisions of test requirements for SAE 40R2 Type D-2 hose assemblies.

2. Part number is completed by adding the assembly length in whole inches i.e., A23-02293-036 is a 36" hose assembly.

(3.) Material: Fittings, Steel; Hose, Single Wire Braid Reinforced Meeting SAE J 1402 Type D-2 Standards

COMPILED	FHF	DATE DRAWN		MATERIAL	MASTER NUMBERS
APPROVED	TJW	3-20-86		(3)	05160 000D1

A23-2292 thru A23-2296

General Use Part

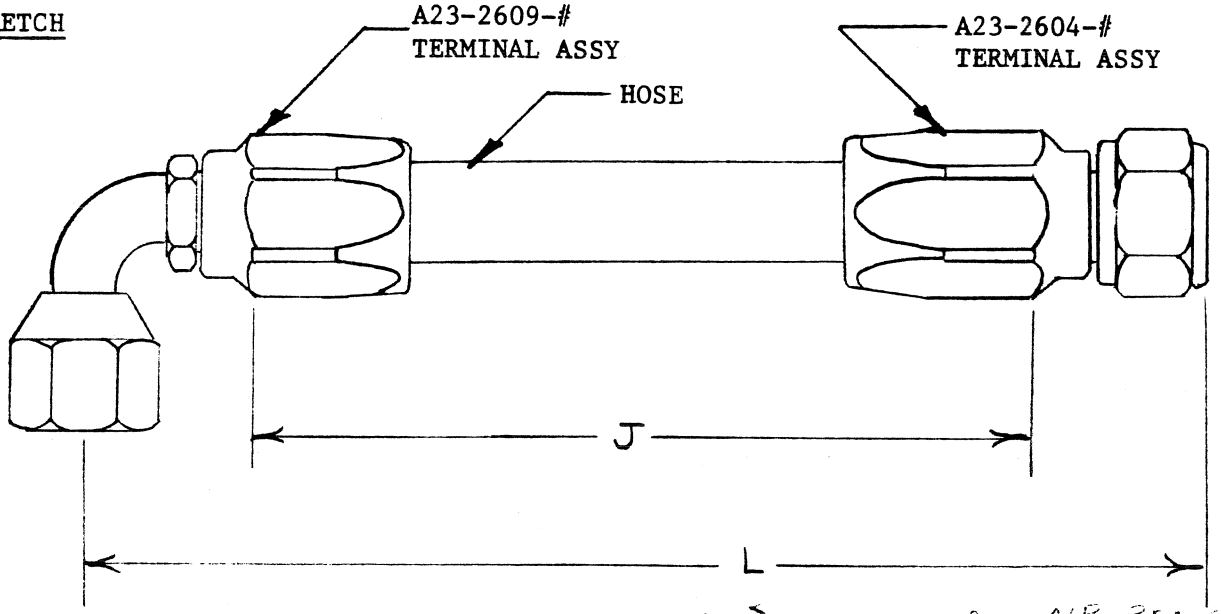
C

PRINT ISSUED	TITLE	PART NO.
1/29/71	HOSE ASSEMBLY, ~~AIR BRAKE~~ SAE 90° TO SAE SWIVEL	A23-2292 thru A23-2296
LAST CHG. LTR. E		SHEET 1 OF 1

CHG	BY	DATE	WAS
D	HJR	6-17-75	STATUS TO X2 (NOT REPLACED) JOB NO A0751
E	NRff	5-28-81	STATUS TO CURRENT 98317

B

SKETCH



Not for AIR BRAKE USAGE.

PART NUMBERS

(Fittings don't fit 48-00121-# Hose; use 48-02004 series Hose instead.)

HOSE SIZE	SAE THREAD	TERMINALS		HOSE		MAX. WORKING PRESSURE (PSI)	MIN. BEND RADIUS	FREIGHTLINER ASSEMBLY NO.
		90° ELBOW	STRAIGHT	F/L NO.	J LENGTH			
		A23-2609	A23-2604	48-00121				
4	7/16-20	-004	-004	-004	L - 1.81	1500	2.00	A23-2292-L
6	5/8 -18	-006	-006	-006	L - 2.12	1000	2.75	A23-2293-L
8	3/4 -16	-008	-008	-008	L - 2.62	1000	4.62	A23-2294-L
10	7/8 -14	-010	-010	-010	L - 2.88	875	5.50	A23-2295-L
12	1-1/16-14	-012	-012	-012	L - 3.98	750	6.50	A23-2296-L

CHG	BY	DATE	WAS
A	R.R.	1-10-71	Redrawn Revised
B	H.J.R.	5-10-73	Add 'A' prefix to Fitting Nos.; J #A0390
C	HJR	7-30-74	Add FMVSS 106 reg. J#A0659

B C

ENGINEERING NOTES

D-2

1. The assembled hose must qualify under all the latest provisions of test requirements for SAE 40R2 Type # hose assemblies, ~~and must meet applicable current requirements of Federal Motor Vehicle Safety Standard #106.~~
2. Part Number Example: A23-2293-036

General Use Part — Assembly Number (Size #6) — Assembly Length in Inches (36")

③ Material: Fittings, Steel; Hose, Single Wire Braid Reinforced Meeting SAE J 1402 Type # Standards

D-2

COMPILED	R. R.	DATE DRAWN		MATERIAL	
APPROVED		1-10-71		③	

E D C A

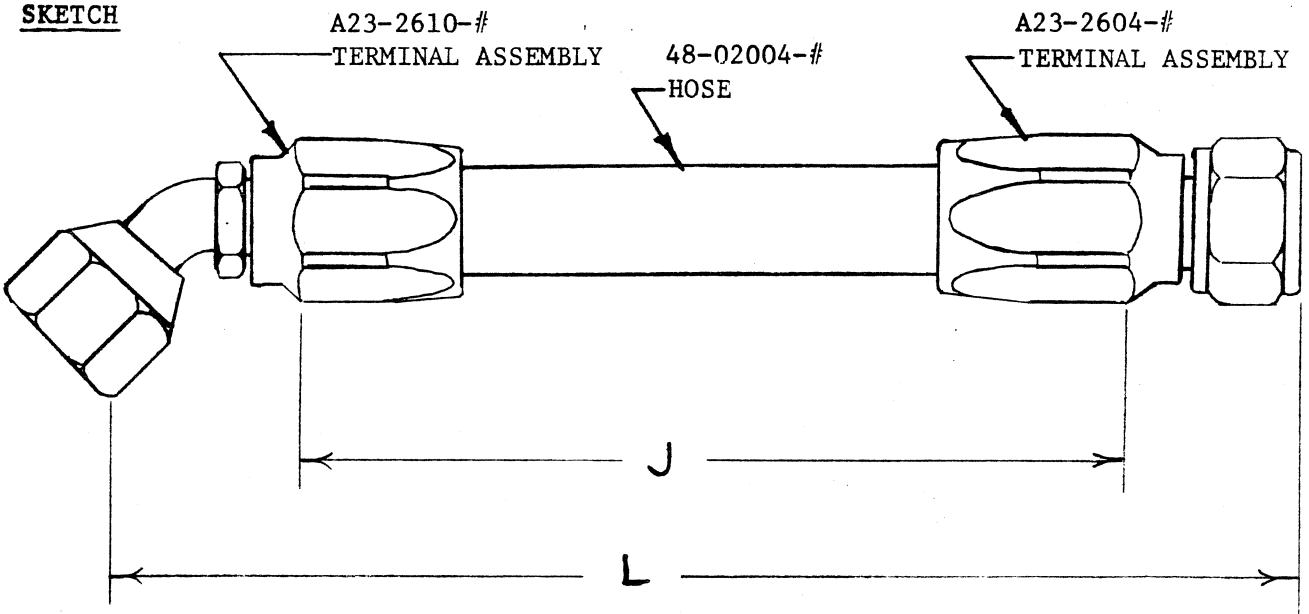
A23-2302 thru A23-2306

General Use Part

PRINT ISSUED	TITLE	PART NO.
D 1-29-71	HOSE ASSEMBLY SAE 45° TO SAE SWIVEL	A23-2302 thru A23-2306
LAST CHG. LTR. D		SHEET 1 OF 1

CHG	BY	DATE	WAS	JOB NO

SKETCH



PART NUMBERS

HOSE SIZE	SAE THREAD	TERMINALS		HOSE		MAX. WORKING PRESSURE (PSI)	MIN BEND RADIUS	FREIGHTLINER ASSEMBLY NO.
		45° ELBOW	STRAIGHT	F/L NO.	J LENGTH			
		A23-2610	A23-2604	48-02004				
4	7/16-20	-004	-004	-004	L - 2.00	1500	2.00	A23-2302-L
6	5/8 -18	-006	-006	-006	L - 2.31	1000	2.75	A23-2303-L
8	3/4 -16	-008	-008	-008	L - 3.09	1000	4.62	A23-2304-L
10	7/8 -14	-010	-010	-010	L - 3.50	875	5.50	A23-2305-L
12	1-1/16 -14	-012	-012	-012	L - 4.00	750	6.50	A23-2306-L

CHG	BY	DATE	WAS	JOB NO
A	R.R.	1-10-71	Redrawn	
B	HJR	5-7-73	23-2610, 23-2604	A0659
C	HJR	7-30-74	Add FMVSS 106	A0751
D	HJR	6-17-75	Delete Air Brk Req	

ENGINEERING NOTES

1. The assembled hose must qualify under all the latest provisions of test requirements for SAE 1402 Type D hose assemblies.

2. Part Number Example: A23-2303-036
   - A23 — General Use Part
   - 2303 — Assembly Number (Size #6)
   - 036 — Assembly Length in Inches (36")

(3.) Material: Fittings, Steel; Hose, Single Wire Braid Reinforced Meeting SAE J 1402 Type D Standards

COMPILED	R. R.	DATE DRAWN		MATERIAL	
APPROVED		1-10-71		(3.)	

Portland FREIGHTLINER CORPORATION Oregon 97208

23-9147

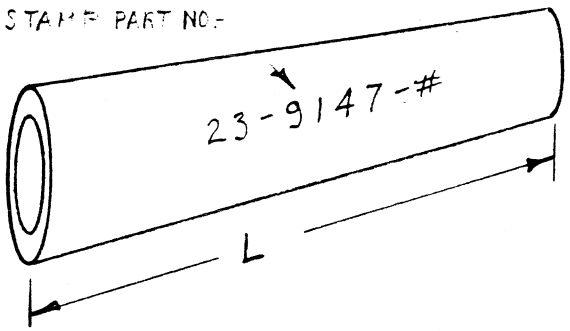
General Use Part

PRINT ISSUED		TITLE	PART NO.
		HOSE, HEATER 3/4 I.D., OIL RESISTANT	23-9147
LAST CHG LTR	A		SHEET 1 OF 1

CHG	BY	DATE	WAS

SKETCH

INK STAMP PART NO.-



PART NUMBERS

	MATERIAL (1)	FREIGHTLINER PART NUMBER *
	48-2009-075	23-9147-L

*To complete part number, add a 3-digit dash number, L, expressing length in whole inches. Thus, 23-9147-036 specifies a hose at least 36 inches, but less than 37 inches long.

CHG	BY	DATE	WAS
A	HJR	6-27-72	B Size; Rev'd, Redrawn; J #85720

ENGINEERING NOTES

(1) Material: See Table.

ns

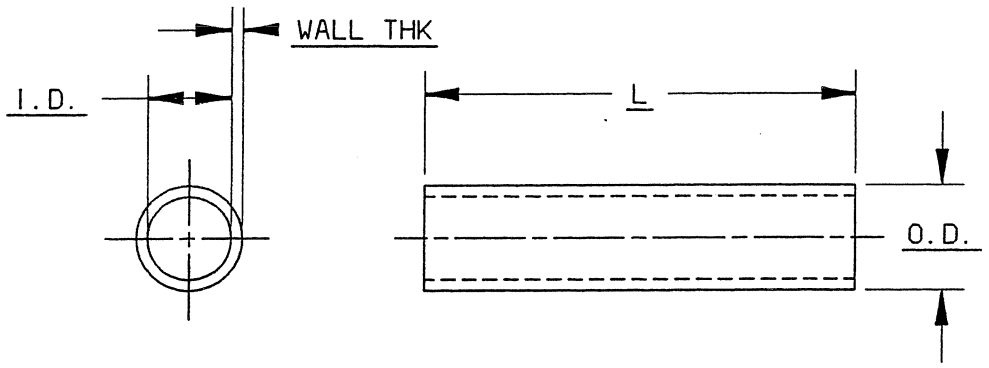
COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rollins	6-27-72		(1)	

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E-183

A

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE-NEOPRENE	23-09174	
DATE	03/02/98			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. E



MATERIAL	O.D.	I.D.	WALL THK	FREIGHTLINER PART NUMBER*
48-02019-125 (1)	1.58	1.25	.19	23-12498-L
48-02019-162	2.00	1.62	.19	23-09174-L

E

* COMPLETE PART NUMBER BY ADDING A 3 DIGIT DASH NUMBER EXPESSING THE LENGTH "L" IN INCHES. E.G. 23-09174-006 IS A 2.00 O.D. HOSE 6 INCHES LONG.

ENGINEERING NOTES:

(1) ALTERNATE MATERIAL: GT 133W 1.62 IN. OR AQ POH 1657 1.62 IN.

2. DIMENSIONS ARE FOR REFERENCE ONLY.

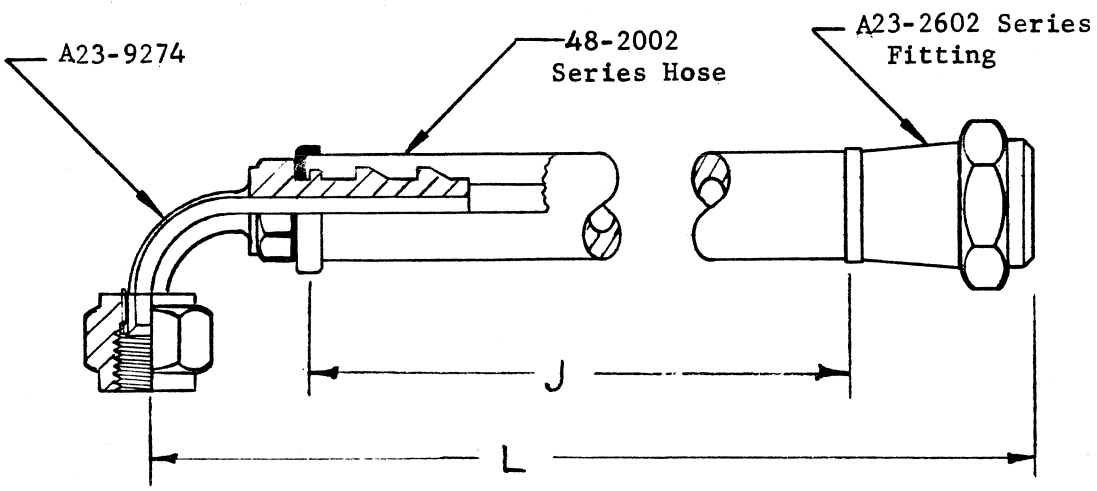
CHG	JOB NO	DATE	BY	REVISION
D	P00576-01	03/02/98	DAJ	REVISED AND REDRAWN IN CATIA, ADDED 23-12498-L.
E	PA2042-84	06/01/98	DAJ	O.D. 1.58 WAS 2.00 AND I.D. 1.25 WAS 1.62

A23-9275

CHG	BY	DATE	WAS

PRINT ISSUED	TITLE	PART NO.
9-17-69	Hose Assembly Low Pressure SAE 90° Swivel to SAE Swivel	A23-9275
LAST CHG. LTR. A		SHEET OF

SKETCH



PART NUMBER

Assembly Number*	ID Hose 16ths	Thread SAE	Terminal Number 2	Terminal Number 2	Hose		Max Work Press PSI
					Number 2	Length J	
A23-9275-L	4	7/16-20	A23-2602-004	A23-9274-004	48-2002-004	L-1.50	250

ENGINEERING NOTES

1. Assembly Procedure: Cut hose to length squarely and cleanly. Push hose over barbed stem of fitting until it bottoms snugly against hex section or shoulder of fitting. Avoid use of lubricants, and keep parts clean.

(2) Material: See table.

CHG	BY	DATE	WAS
A	HJR	5-18-73	Rev'd Format; 23-2602, 23-9274; J #A0390

* Indicate L (length) in inches to complete part number.

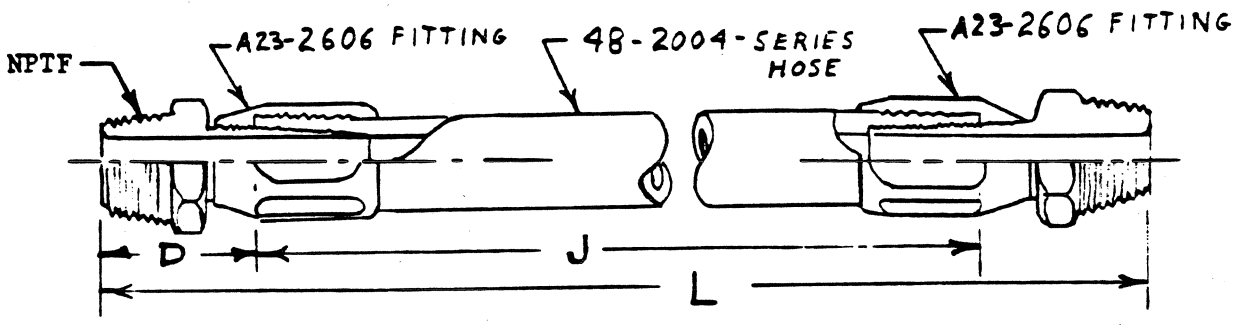
COMPILED	SJF	DATE DRAWN		MATERIAL	
APPROVED	LOG.	7-23-69		(2)	

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO.
4/20/71	HOSE ASSEMBLY MALE PIPE TO MALE PIPE	A23-9556 Thru A23-9561
LAST CHG LTR D		SHEET 1 OF 1

SKETCH



$J = L - 2D$

PART NUMBERS

HOSE SIZE	MAX WORK PRES psi	OD TUBE 16ths	TERMINALS (2 Req'd) PIPE THREAD N.P.T.	TERMINALS (2 Req'd) PART NUMBER	HOSE FREIGHTLINER SPECIFICATION NUMBER	HOSE LENGTH J	FREIGHTLINER ASSEMBLY NUMBER*
4	3000	4	1/8-27	A23-2606-004	48-2004-004	L-1.84	A23-9556-L
6	2250	6	1/4-18	-006	-006	L-2.46	A23-9557-L
8	2000	8	3/8-18	-008	-008	L-2.66	A23-9558-L
10	1750	10	1/2-14	-010	-010	L-3.18	A23-9559-L
12	1600	12	3/4-14	-012	-012	L-3.34	A23-9560-L
16	800	16	3/4-14	-016	-016	L-3.06	A23-9561-L

*To complete part number, add a three digit dash number expressing the length in inches. Thus, A23-9556-036 specifies an assembly 36 inches long.

ENGINEERING NOTES

1. Assemble fittings only to hose of brands warranted compatible by manufacturer.

CHG	BY	DATE	MOD EV
A	HJR	3-31-71	Hose lengths added. A0490
B	HJR	6-20-73	23-2606
C	HJR	7-30-74	Add FMVSS 106 A0659
D	HJR	6-17-75	Note 2 Air Brake A0751

		DATE DRAWN		MATERIAL	
COMPILED		3-23-71		See Table	
APPROVED					

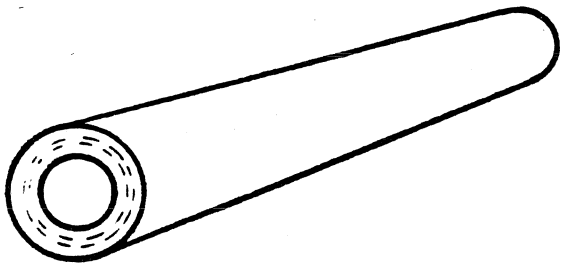
Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED		TITLE	PART NO.
		HOSE, COOLANT SYSTEM OIL RESISTANT HEAVY DUTY TYPE	23-10080
LAST CHG LTR	A		SHEET 1 OF 1

WAS			
CHG	BY	DATE	

SKETCH



PART NUMBERS

I.D. HOSE	WALL (REF.)	MATERIAL (1)		FREIGHTLINER PART NUMBER*
3.00	9/32	48-0098-300		23-10080-L

*To complete part number add a three digit dash number, L, indicating length in whole inches. Thus, 23-10080-015 specifies a length of hose at least fifteen inches but less than sixteen inches in length.

WAS			
CHG	BY	DATE	J# 21650
-	-	-	Delete description (Note 1); J #60130
A	HJR	9-28-72	

ENGINEERING NOTES

A (1) MATERIAL: See Table.

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED	Rollins	6-14-72		(1)	

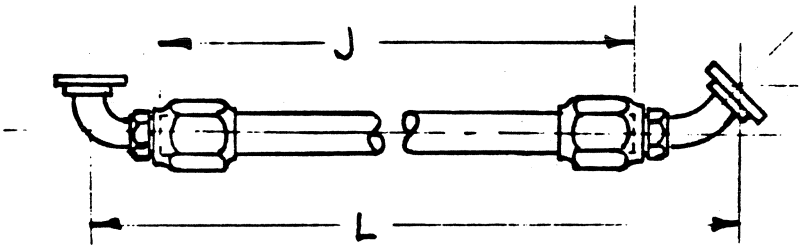
js

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED	TITLE	PART NO.
	HOSE ASSY, SPLIT FLANGE 1½ IN., 90° ELL TO 45° ELL	A23-10120
LAST CHG LTR		SHEET 1 OF 1

SKETCH



PART NUMBERS

SIZE		MATERIAL (1)				FREIGHTLINER PART NUMBER *
		FITTINGS		HOSE		
		90°	45°	NUMBER	J LENGTH	
24		23-10118-024	23-10119-024	48-02004-024	L-5.88	A23-10120-L

*Complete part number by adding a 3-digit dash number indicating length, L, in 1/10ths of an inch. Thus, for a 15½" Hose Assy, write A23-10120-155.

ENGINEERING NOTES

(1) Material: See Table Above

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS
	—	—	A01-11558; J #21650

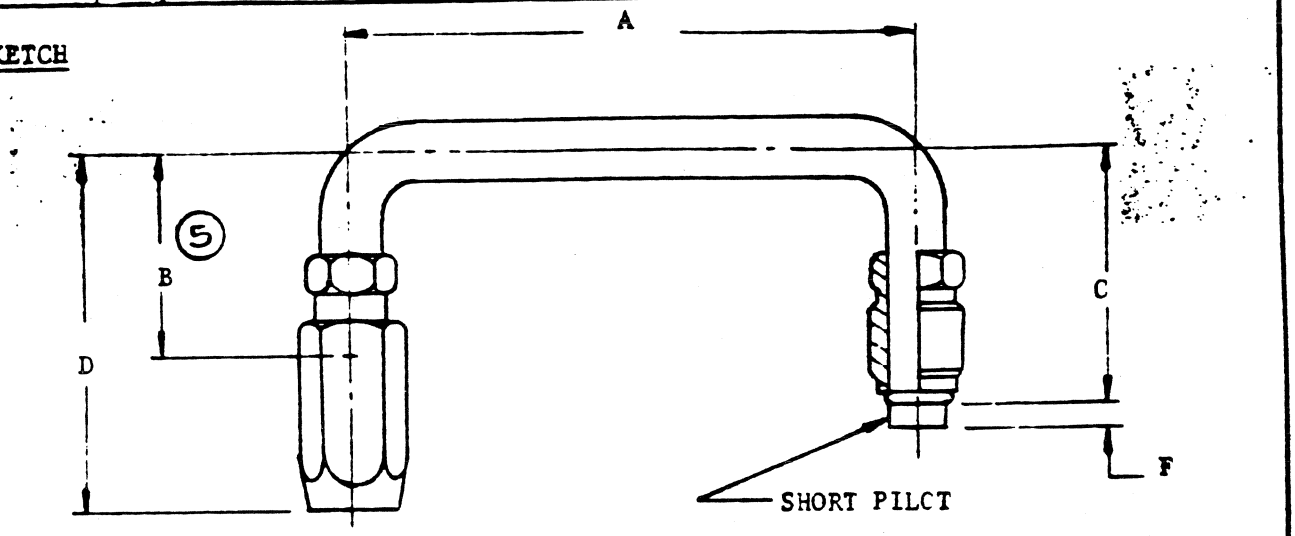
ns

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

Portland FREIGHTLINER CORPORATION Oregon 97208

PRINT ISSUED	TITLE	PART NO
	CONNECTOR, 180°, HOSE TO O-RING SHORT PILOT Freon	23-10339
LAST CHG LTR C		SHEET OF

SKETCH



PART NUMBERS

SAE THREAD	A	B (5)	C	D	F	RRF ID HOSE	RRF OD TUBE	MFR'S NUMBER AQ FC202 & FC 160 SERIES (4)	FREIGHTLINER PART NUMBER
7/8-14	3.98	2.125	2.198	3.75	.18	1/2	5/8	FC5022-1010S	23-10339-010

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.
5. Cutoff allowance.

CHG	BY	DATE	WAS

A		3-13-75	Added AQ Info.
B	HJR	1-2-76	Delete PH Nos.
C	WTT	5-27-81	SAE 1082 to Fleet 202A

CHG	BY	DATE	WAS
			JOB #
			A0675
			A0675
			A0796

COMPILED	D LeL	DATE DRAWN		MATERIAL	
APPROVED	CRS	2-14-75		(1)	

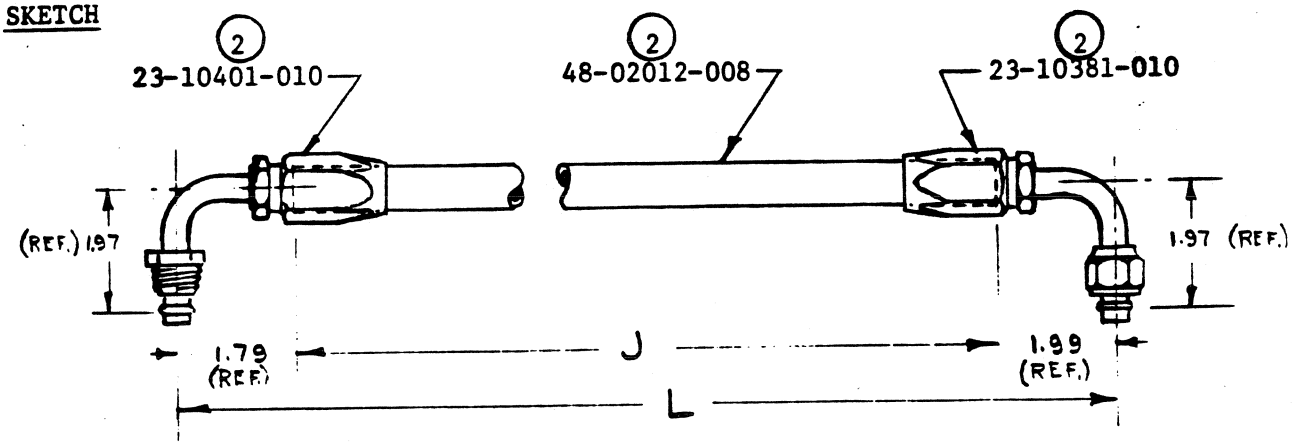
Portland FREIGHTLINER CORPORATION Oregon 97208

CB

General Use Part

PRINT ISSUED	TITLE	PART NO
	HOSE ASSEMBLY, AIR CONDITIONING O-RING, MALE SHORT PILOT 90° ELBOW (A) FEMALE LONG PILOT 90° ELBOW Freon	A23-10470
LAST CHG LTR B		SHEET 1 OF 1

SKETCH



PART NUMBERS

I.D. (REF.)	FITTINGS, 1 EACH REQ'D		HOSE		FREIGHTLINER PART NUMBER **
	PART NO.	PART NO.	SPEC. NO.	J LENGTH	
.50	23-10401-010	23-10381-010	48-02012 008	L-3.78	A23-10470-L

**Complete part number by adding 3-digit dash number, L, indicating assembly length in inches, thus: A23-10470-025 is a hose assembly 25 inches long (see sketch).

ENGINEERING NOTES

1. Assembly must meet current applicable requirements of SAE Std J51.
2. Only fittings and hose from the same manufacture can be used to make an assembly.

CHG	WAS	DATE	BY	JOB NO
—	—	—	—	A0675
A	Male 90° ELL	9-12-75	HJR	A0777
B	10023-81 WITH FREON	10-23-81		20248

		DATE DRAWN			
COMPILED	HJR	8-30-74			
APPROVED					

Portland FREIGHTLINER CORPORATION Oregon 97208

A B

M/F

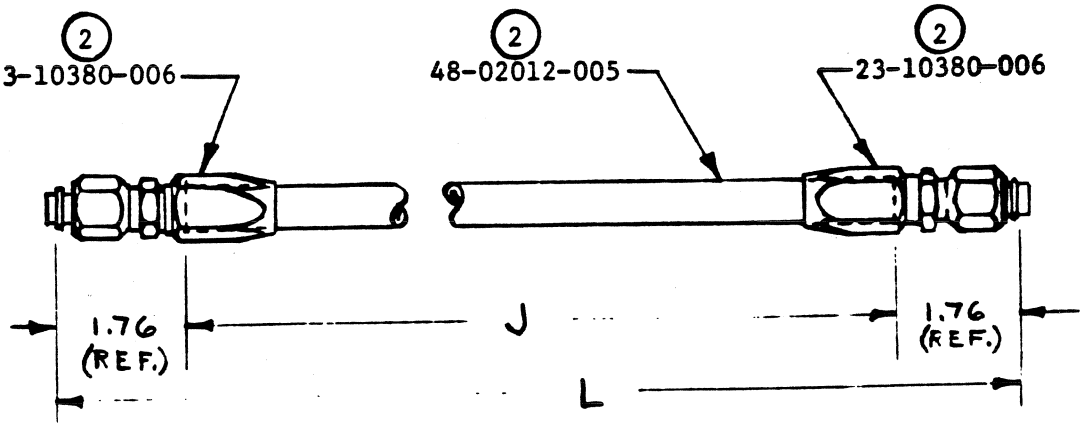
General Use Part

PRINT ISSUED	TITLE	PART NO
	HOSE ASSEMBLY, AIR CONDITIONING O-RING SWIVEL CONNECTORS, LONG PILOT Freon	A23-10471
LAST CHG LTR A		SHEET 1 OF 1

CHG	BY	DATE	WAS	JOB NO.

CHG	BY	DATE	WAS	JOB NO
—	—	—	—	A0675
A	WTT	3-27-81	10027 To Freon	202A

SKETCH



PART NUMBERS

I.D. (REF.)		FITTING	HOSE		FREIGHTLINER PART NUMBER**
		2 EACH REQ'D PART NO.	SPEC NO.	J LENGTH	
.31		23-10380-006	48-02012-005	L- 3.52	A23-10471-L

**Complete part number by adding 3-digit dash number, L, indicating assembly length in inches, thus: A23-10471-025 is a hose assembly 25 inches long (see sketch).

ENGINEERING NOTES

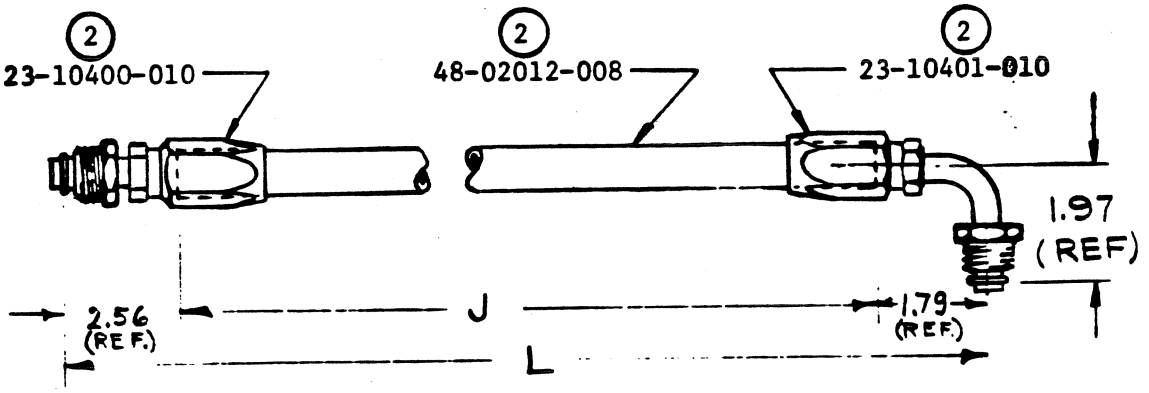
1. Assembly must meet current applicable requirements of SAE Std J51.
2. Only fittings and hose from the same manufacturer can be used to make an assembly.

COMPILED	HJR	DATE DRAWN			
APPROVED	CB	8-30-74			

General Use Part

PRINT ISSUED	TITLE	PART NO
	HOSE ASSEMBLY, AIR CONDITIONING O-RING, MALE SHORT PILOT TO MALE 90° ELBOW Freon	A23-10431
LAST CHG LTR: A		SHEET 1 OF 1

SKETCH



PART NUMBERS

I.D. (REF.)	FITTINGS, 1 EACH REQ'D		HOSE		FREIGHTLINER PART NUMBER **
	PART NO.	PART NO.	SPEC. NO.	J LENGTH	
.50	23-10400-010	23-10401-010	48-02012-008	L- 4.35	A23-10431-L

**Complete part number by adding 3-digit dash number, L, indicating assembly length in inches, thus: A23-10431-025 is a hose assembly 25 inches long (see sketch).

ENGINEERING NOTES

1. Assembly must meet current applicable requirements of SAE Std J51.
2. Only fittings and hose from the same manufacturer can be used to make an assembly.

CHG	BY	DATE	WAS
			JOB NO
A	WITT	3-27-81	10047 TO FREON
			A0675
			201A

		DATE DRAWN			
COMPILED	HJR	8-30-74			
APPROVED	GB				

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A

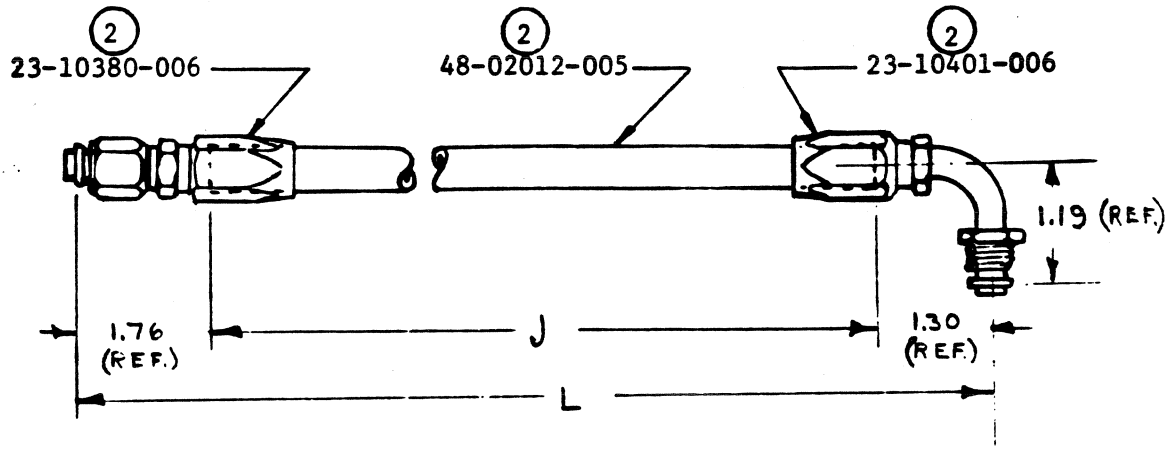
General Use Part

PRINT ISSUED		TITLE	PART NO
		HOSE ASSEMBLY, AIR CONDITIONING O-RING SWIVEL TO MALE 90° ELBOW Freon	A23-10600
LAST CHG LTR	A		SHEET 1 OF 1

CHG	BY	DATE	WAS	JOB NO

CHG	BY	DATE	WAS	JOB NO
—	—	—	—	A0675
A	WITT	3-27-81	10087 TO FREON	2024

SKETCH



PART NUMBERS

I.D. (REF.)	FITTINGS, 1 EACH REQ'D		HOSE		FREIGHTLINER PART NUMBER**
	PART NO.	PART NO.	SPEC NO.	J LENGTH	
.31	23-10380-006	23-10401-006	48-02012-005	L- 3.06	A23-10600-L

**Complete part number by adding 3-digit dash number, L, indicating assembly length in inches, thus: A23-10600-025 is a hose assembly 25 inches long (see sketch).

ENGINEERING NOTES

1. Assembly must meet current applicable requirements of SAE Std J51.
2. Only fittings and hose from the same manufacturer can be used to make an assembly.

COMPILED	HJR	DATE DRAWN			
APPROVED		8-30-74			

Portland FREIGHTLINER CORPORATION Oregon 97208

M/F

A

A23-10648 thru A23-10650

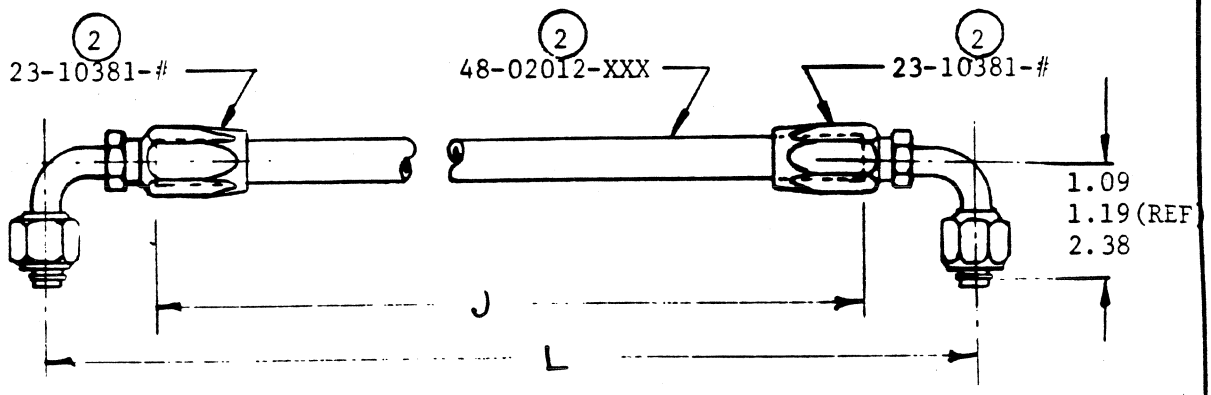
General Use Part

PREVIOUSLY ISSUED	TITLE	PART NO
	HOSE ASSEMBLY, AIR CONDITIONING O-RING, 90° SWIVEL CONNECTORS	A23-10648thruA23-10650
LAST CHG LTR B		SHEET 1 OF 1

CHG	BY	DATE	WAS	JOB NO

CHG	BY	DATE	WAS	JOB NO
—	—	—	—	A0675
A	SB	2-20-78	AD'D 23-10381-010	70202
B	SW	9-12-80	"Current Applic."	97180

SKETCH



PART NUMBERS

T THREAD	I.D. REF.	FITTING 2 EACH REQ'D PART NO.	HOSE SPEC. NO.	J LENGTH	FREIGHTLINER PART NUMBER**
5/8-18	.31	23-10381-006	48-02012-005	L-3.14	A23-10648-L
3/4-16	.51	-008	-008	L-3.46	A23-10649-L
1-1/16-14	.50	1 EACH REQ'D PART NO. 23-10381-010	1 EACH REQ'D PART NO. 23-10381-210	48-02012-008	L-4.80	A23-10650-L

**Complete part number by adding 3-digit dash number, L, indicating assembly length in inches, thus: A23-10649-025 is a hose assembly 25 inches long (see sketch).

ENGINEERING NOTES (B)

1. Assembly must meet the Permeability, Bursting Strength (1705 psi) and Tensile Test of Assembly requirements of SAE Std. J51.

(2) Only fittings and hose from the same manufacturer can be used to make an assembly.

		DATE DRAWN			
COMPILED	HJR	8-30-74			
APPROVED					

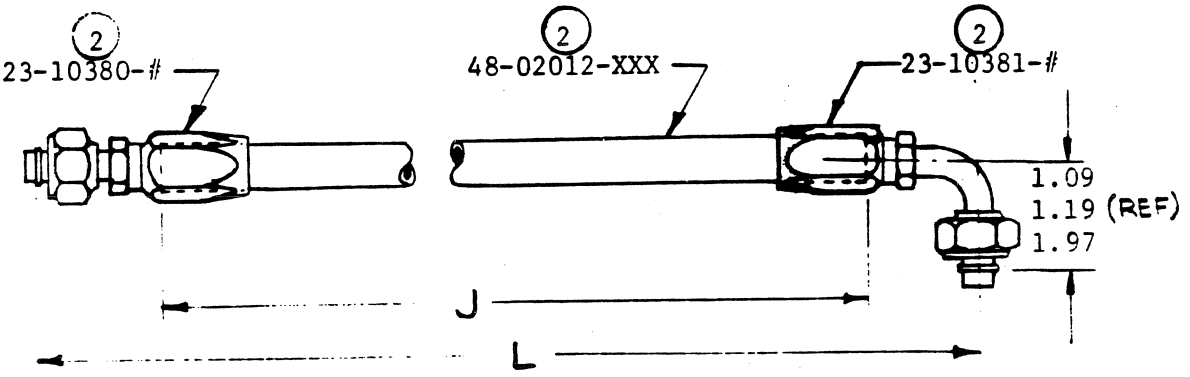
Portland FREIGHTLINER CORPORATION Oregon 97208

A23-10651 thru A23-10653

General Use Part

PRINT ISSUED		TITLE	PART NO
		HOSE ASSEMBLY, AIR CONDITIONING O-RING, SWIVEL LONG PILOT TO 90° SWIVEL	A23-10651thruA23-10653
LAST CHG LTR	B		SHEET 1 OF 1

SKETCH



PART NUMBERS

STRAIGHT THREAD	I.D. REF.	FITTINGS, 1 EACH REQ'D		HOSE		FREIGHTLINER PART NUMBER **
		PART NO.	PART NO.	SPEC. NO.	J LENGTH	
5/8-18	.31	23-10380-006	23-10381-006	48-02012-005	L-3.33	A23-10651-L
3/4-16	.41	-008	-008	-006	L-3.76	A23-10652-L
7/8-14	.50	-010	-010	-008	L-4.22	A23-10653-L

**Complete part number by adding 3-digit dash number, L, indicating assembly length in inches, thus: A23-10652-025 is a hose assembly 25 inches long (see sketch).

ENGINEERING NOTES

(B)

1. Assembly must meet the Permeability, Bursting Strength (1750 psi) and Tensile Test of Assembly Requirements of SAE Std. J51.

(2) Only fittings and hose from the same manufacturer can be used to make an assembly.

CHG	WAS	BY	DATE	JOB NO.

CHG	WAS	BY	DATE	JOB NO.
—	—	—	—	A0675
A	50/ [illegible]	JK	6-17-77	[illegible]
B	"Current Applic."	SW	9-12-80	97480

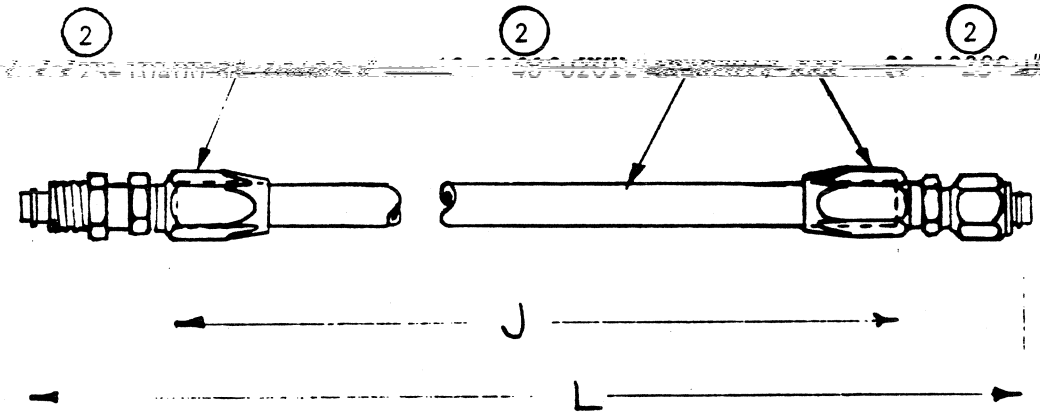
COMPILED	HJR	DATE DRAWN			
APPROVED		8-30-74			

Portland FREIGHTLINER CORPORATION Oregon 97208

General Use Part

PRINT ISSUED		TITLE	PART NO
		HOSE ASSEMBLY, AIR CONDITIONING O-RING, MALE SHORT PILOT TO SWIVEL	A23-10654thruA23-10656
LAST CHG LTR	B		SHEET 1 OF 1

SKETCH



PART NUMBERS

STRAIGHT THREAD	I.D. REF.	FITTINGS, 1 EACH REQ'D		HOSE		FREIGHTLINER PART NUMBER
		PART NO.	PART NO.	SPEC. NO.	J LENGTH	
5/8-18	.31	23-10400-006	23-10380-006	48-02012-005	L- 3.89	A23-10654-L
3/4-16	.50	-008	-008	-008	L- 4.31	A23-10655-L
7/8-14	.50	-010	-010	-008	L- 4.79	A23-10656-L

**Complete part number by adding 3-digit dash number, L, indicating assembly length in inches, thus: A23-10655-025 is a hose assembly 25 inches long (see sketch):

ENGINEERING NOTES (B)

1. Assembly must meet the Permeability, Bursting Strength (1750 psi) and Tensile Test of Assembly Requirements of SAE Std. J51.

(2) Only fittings and hose from the same manufacturer can be used to make an assembly.

CHG	BY	DATE	WAS
B	SW	9-12-80	"Current Appl

COMPILED	HJR	DATE DRAWN			
APPROVED		8-30-74			

Portland FREIGHTLINER CORPORATION Oregon 97208

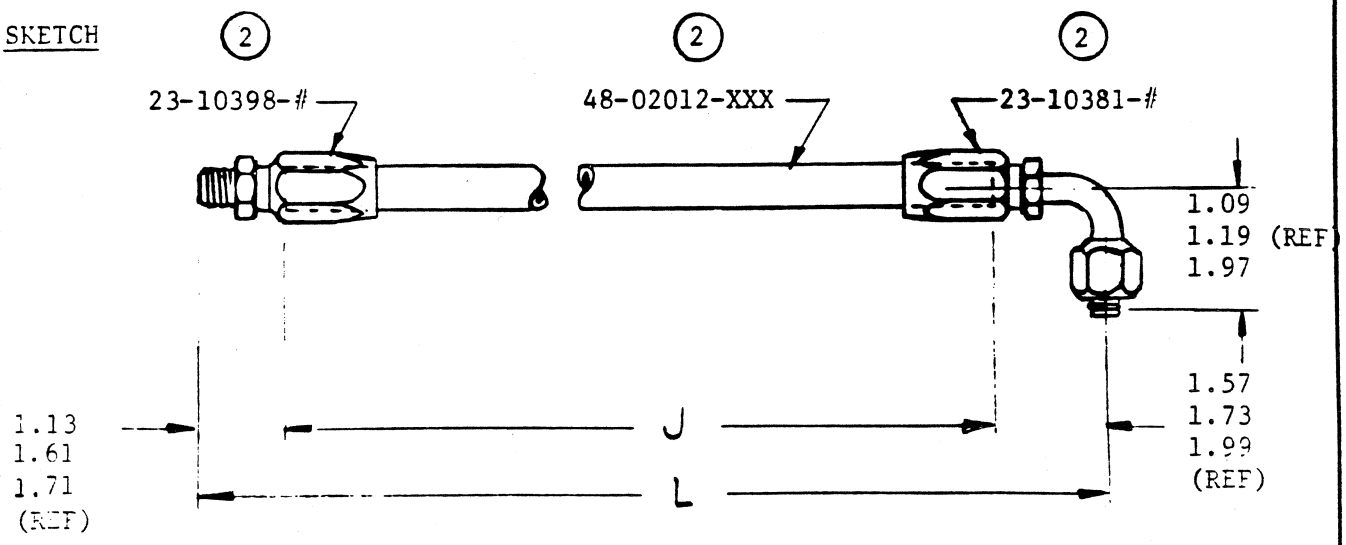
E-183

thru A23-10659

General Use Part

PR NT ISSUED		TITLE	PART NO
		HOSE ASSEMBLY, AIR CONDITIONING SAE 45° MALE FLARE TO O-RING 90° SWIVEL	A23-10657thruA23-10659
LAST CHG LTR	B		SHEET 1 OF 1

SKETCH



PART NUMBERS

SAE THREAD	I.D. REF.	FITTINGS, 1 EACH REQ'D		HOSE		FREIGHTLINER PART NUMBER **
		PART NO. .	PART NO. .	SPEC. NO.	J LENGTH .	
5/8-18	.31	23-10398-006	23-10381-006	48-02012-005	L-2.70	A23-10657-L
3/4-16	.38 (A)	-008	-008	(A) -006	L-	A23-10658-L
7/8-14	.50	-010	-010	-008	L-3.81	A23-10659-L

**Complete part number by adding 3-digit dash number, L, indicating assembly length in inches, thus: A23-10658-025 is a hose assembly 25 inches long (see sketch).

ENGINEERING NOTES (B)

1. Assembly must meet the Permeability, Bursting Strength (1750 psi) and Tensile Test of Assembly Requirements of SAE Std. J51.

(2) Only fittings and hose from the same manufacturer can be used to make an assembly.

CHG	WAS	DATE	BY	JOB NO
—	—	—	—	A0675
A	—	10-15-77	JK	05151
B	Current Applic.	9-12-80	SW	9-1180

COMPILED	HJR	DATE DRAWN			
APPROVED		8-30-74			

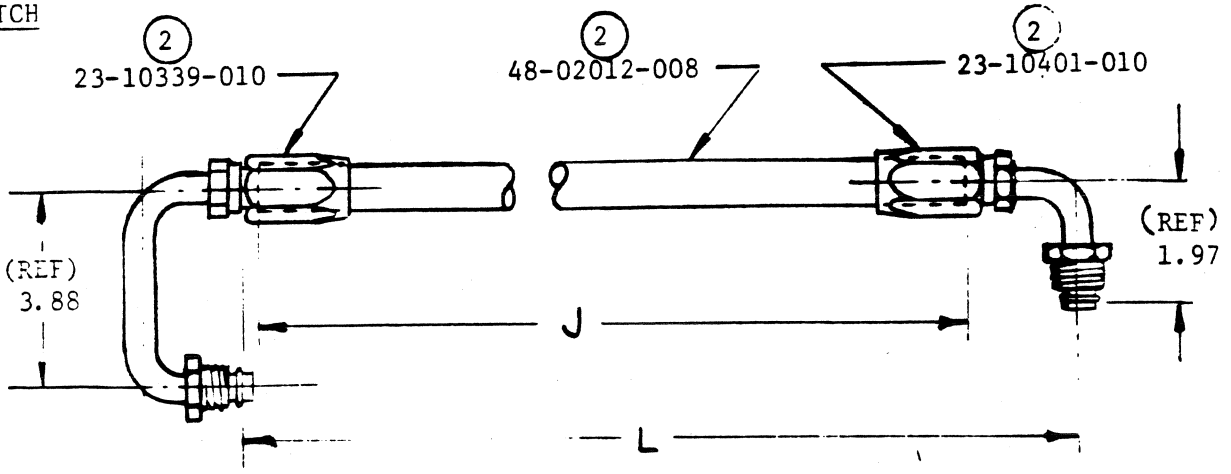
Portland FREIGHTLINER CORPORATION Oregon 97208

M/F

General Use Part

PRINT ISSUED		TITLE	PART NO
		HOSE ASSEMBLY, AIR CONDITIONING O-RING, 180° MALE ELBOW TO 90° MALE ELBOW	A23-10660
LAST CHG LTR	B		SHEET 1 OF 1

SKETCH



PART NUMBERS

T THREAD	I.D. REF.	FITTINGS, 1 EACH REQ'D		HOSE		FREIGHTLINER PART NUMBER**
		PART NO.	PART NO.	SPEC. NO.	J LENGTH	
7/8-14	0.50	23-10339-010	23-10401-010	48-02012-008	L-	A23-10660-L

**Complete part number by adding 3-digit dash number, L, indicating assembly length in inches, thus: A23-10660-025 is a hose assembly 25 inches long (see sketch).

ENGINEERING NOTES (B)

1. Assembly must meet the Permeability, Bursting Strength (1750 psi) and Tensile Test of Assembly Requirements of SAE Std. J51.
2. Only fittings and hose from the same manufacturer can be used to make an assembly.

JOB NO.	WAS	DATE	BY	CHG
80547	*Current Applic.	9-12-80	SW	B

COMPILED	HJR	DATE DRAWN			
APPROVED		8-30-74			

Portland FREIGHTLINER CORPORATION Oregon 97208

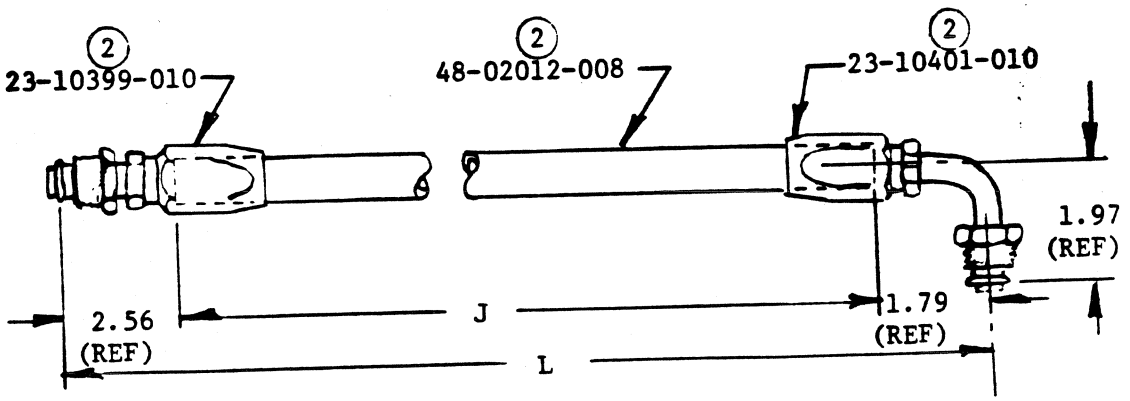
B

E-183

General Use Part

PRINT ISSUED	TITLE	PART NO
	HOSE ASSEMBLY, AIR-CONDITIONING O-RING, MALE LONG PILOT TO MALE 90° ELBOW Freon	A23-10741
LAST CHG LTR: A		SHEET 1 OF 1

SKETCH



PART NUMBERS

I.D. (REF)	FITTINGS, 1 EACH REQ'D		HOSE		FREIGHTLINER PART NUMBER**
	PART NO.	PART NO.	SPEC NO.	J LENGTH	
.50	23-10399-010	23-10401-010	48-02012-008	L-4.35	A23-10431-L

**Complete part number by adding 3-digit dash number, L, indicating assembly length in inches, thus: A23-10741-025 is a hose assembly 25 inches long (see sketch).

ENGINEERING NOTES

1. Assembly must meet current applicable requirements of SAE Std J51.
(2) Only fittings and hose from the same manufacturer can be used to make an assembly.

COMPILED	RLE	DATE DRAWN 5-6-75			
APPROVED	GRS				

Portland FREIGHTLINER CORPORATION Oregon 97208

A M/F

CHG	BY	DATE	WAS

CHG	BY	DATE	WAS	JOB NO
A	WITT	3-27-81	10617 TO FREON	C0261 2024

kh

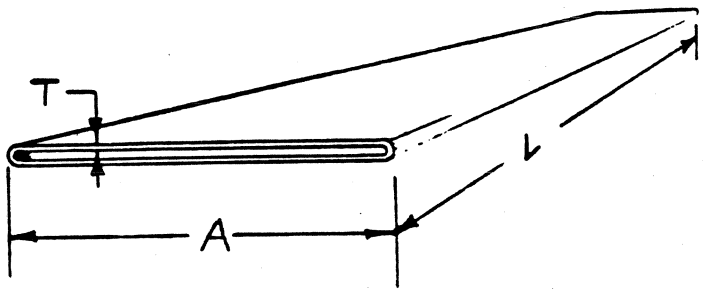
E-183

23-10849

General Use Part

PRINT ISSUED	TITLE	PART NO.
	TUBE, POLYETHYLENE	23-10849
LAST CHG LTR. A		SHEET 1 OF 1

SKETCH



PART NUMBERS

T (inches)	A (inches)	L (in, min)		MANUFACTURER'S NUMBER COC		FREIGHTLINER PART NUMBER
.0015ga	3.00	18.00		*		23-10849-300

*Order by description: "3.00 in. wide X 18.00 in. long X .0015ga Polyethylene tube."

ENGINEERING NOTES

(1) MATERIAL: Polyethylene

2. FINISH: As produced.

CHG	BY	DATE	WAS	JOB NO
A				

CHG	BY	DATE	WAS	JOB NO
A	HJR	7-17-75	2.00	A0764
—	—	—	—	A0764

kh

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		7-16-75		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

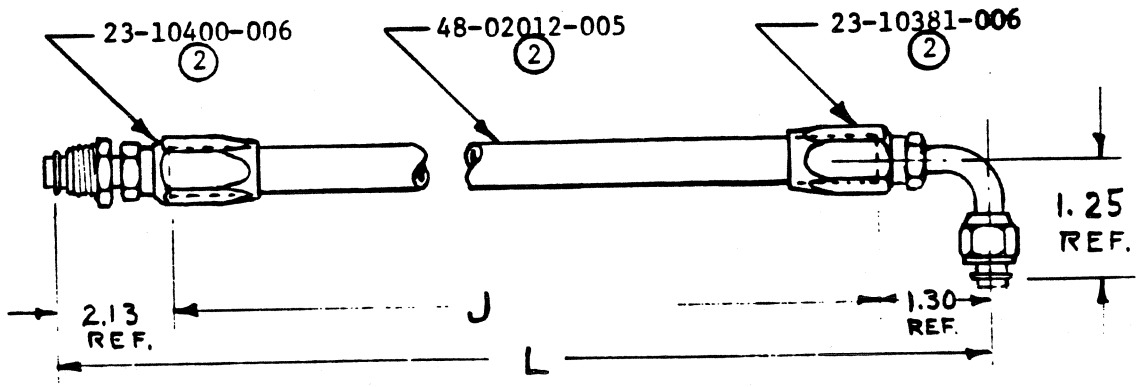
E-183

General Use Part

PRINT ISSUED		TITLE	PART NO
		HOSE ASSEMBLY, AIR-CONDITIONING O-RING, MALE SHORT PILOT TO FEMALE LONG PILOT 90° ELBOW Freon	A23-10880
LAST CHG LTR	C		SHEET 1 OF 1

CHG	BY	DATE	WAS	JOB NO

SKETCH



PART NUMBERS

I.D. (REF.)	FITTINGS, 1 EACH REQ'D		HOSE		FREIGHTLINER PART NUMBER*
	PART NO. (2)	PART NO. (2)	SPEC. NO. (2)	J LENGTH	
.38	23-10400-006	23-10381-006	48-02012-005	L-3.44	A23-10880-L

*Complete part number by adding 3-digit dash number, L, indicating assembly length in inches, thus: A23-10880-025 is a hose assembly 25 inches long (see sketch).

CHG	BY	DATE	WAS	JOB NO
—	—	—	—	G0691
A	HJR	9-12-75	23-10401-006	A0777
B	HJR	12-22-75	Add note *	A0796
C	WITT	3-27-81	100R7 TO FREON	2024

ENGINEERING NOTES

(1.) Assembly must meet current applicable requirements of SAE Std J51.
(2) Fittings and hose from the same manufacturer must be used to make an assembly.

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		8-25-75		(1)	

Portland FREIGHTLINER CORPORATION Oregon 97208

M/F

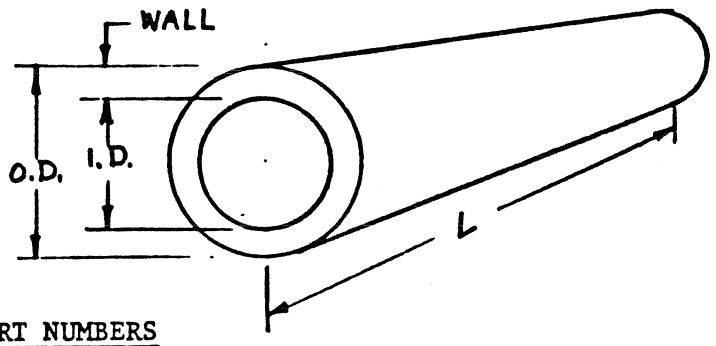
23-109

PRINT ISSUED		TITLE	PART NO.
		HOSE, COOLANT SILICONE RUBBER	23-10978
LAST CHG LTR	A		SHEET 1 OF 1

CHG	BY	DATE	WAS	JOB

CHG	BY	DATE	WAS	JOB
A	PCK	07/11/88	REVISED DRAWING NO. BLOCK	A0828 327919-78

SKETCH



PART NUMBERS

I.D.	O.D. (Ref.)	WALL THICKNESS (Ref.)	MATERIAL (1)	FREIGHTLINER PART NUMBER *
1/2	15/16		48-02010-050	23-10978-L
5/8	1- 1/16		-062	79-L
3/4	1- 3/16		-075	23-10980-M
7/8	1- 5/16	.170	-088	81-L
1	1- 7/16		-100	82-L
1-1/8	1--9/16	to	-112	83-L
1-1/4	1-11/16		-125	84-L
1-3/8	1-13/16	.221	-138	85-L
1-1/2	1-15/16		-150	86-L
1-5/8	2- 1/16		-162	87-L
1-3/4	2- 3/16		-175	88-L
2	2- 7/16		-200	89-L
2-1/4	2- 9/16		-225	23-10990-L
2-3/8	2-11/16		-238	91-L
2-1/2	2-13/16		-250	92-L
2-3/4	2-15/16		-275	93-L
3	3- 7/16		-300	94-L
3-1/2	3-15/16		-350	95-L

* Complete part number as follows:
L = 3 digit dash number expressing length in inches.
M = 3 digit dash number expressing length in feet.

ENGINEERING NOTES:

1 Material: See Table
2. Finish: Plain

COMPILED	HJR	DATE DRAWN		MATERIAL	
APPROVED		7-8-76			

Portland FREIGHTLINER CORPORATION Revised 8-2-88

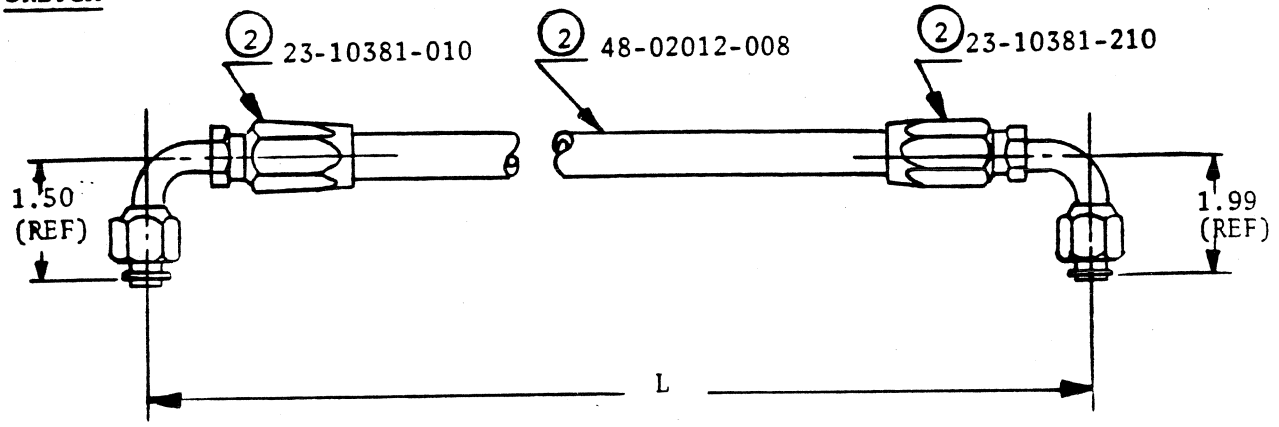
ORIGINAL M/F

E-193

ORIGINAL JOB NO.	TITLE	PART NO.
C1300 B1500 B	HOSE ASSEMBLY, AIR CONDITIONING	A23-11220

LAST CHG LTR		O-RING 90° SWIVEL CONNECTORS 100R7	SHEET 1 OF 1

SKETCH



PART NUMBERS

I. D. (REF)	FITTINGS, 1 EACH REQUIRED		HOSE	FREIGHTLINER PART NUMBER * *
	PART NO.	PART NO.	SPEC. NO.	
.50	23-10381-010	23-10381-210	48-02012-008	A23-11220-L

* * Complete part number by adding 3-digit dash number, L, indicating assembly length in inches, thus: A23-10431-025 is a hose assembly 25 inches long (see sketch).

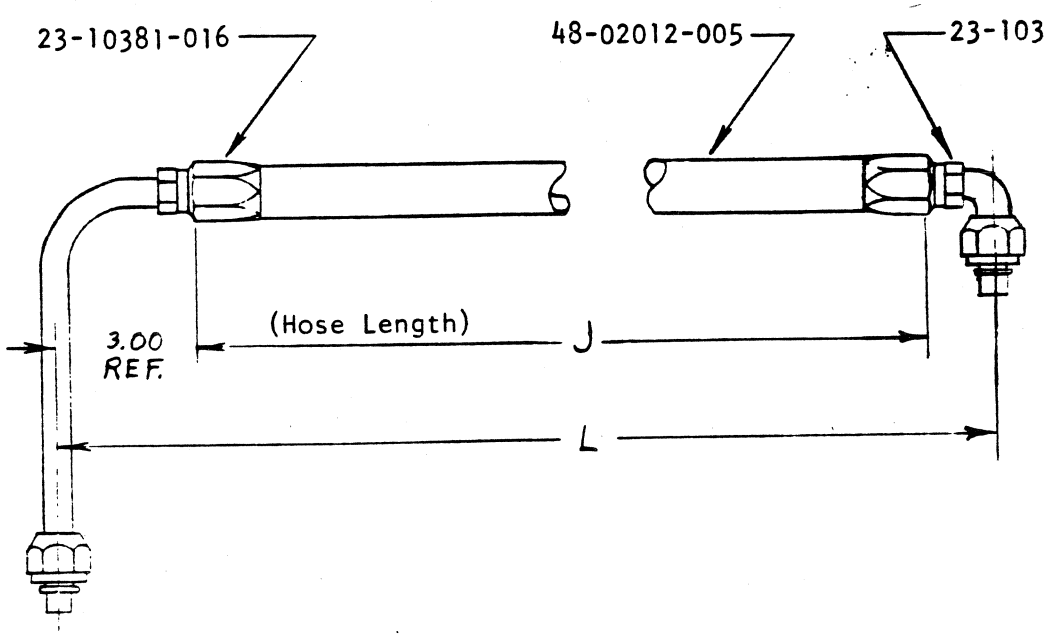
ENGINEERING NOTES

1. Assembly must meet current applicable requirements of SAE Std J51.
2. Only fittings and hose from the same manufacturer may be used to make an assembly.

COMPILED	BLF	DATE DRAWN			
APPROVED	NJA	9-19-79			

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

ORIGINAL JOB NO.	TITLE	PART NO.
E0438	HOSE ASSEMBLY, AIR CONDITIONING O-RING SWIVEL CONNECTORS. LONG PILOT 100R7	A23-11274
LAST CHG LTR: A		SHEET 1 OF 1



I.D. (REF.)	FITTINGS, 1 EACH REQUIRED		HOSE		FREIGHTLINER PART NUMBER **
	PART NO.	PART NO.	SPEC. NO.	J LENGTH	
.31	23-10381-006	23-10381-016	48-02012-005	L-4.76	A23-11274-L

NOTES:

1. Assembly Must Meet Current Applicable Requirements of SAE Std. J51.
2. Only Fittings and Hose From the Same Manufacturer Can Be Used to Make An Assembly.
3. Complete part number by substituting 3 digit dash number for L indicating assembly length in inches, thus: A23-11274-025 is a hose assembly 25 inches long (See sketch)

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR
22-10381-016				
	7-10-81	NR	0111 A	

COMPILED	FM	DATE DRAWN			
APPROVED					

ORIGINAL JOB NO.		TITLE	PART NO.
M0132		HOSE ASSY. THERMOPLASTIC, SAE 100R7 (SAE 45° SWIVEL TO 45° SWIVEL)	A23-11411
LAST CHG LTR	B		SHEET 1 OF 2

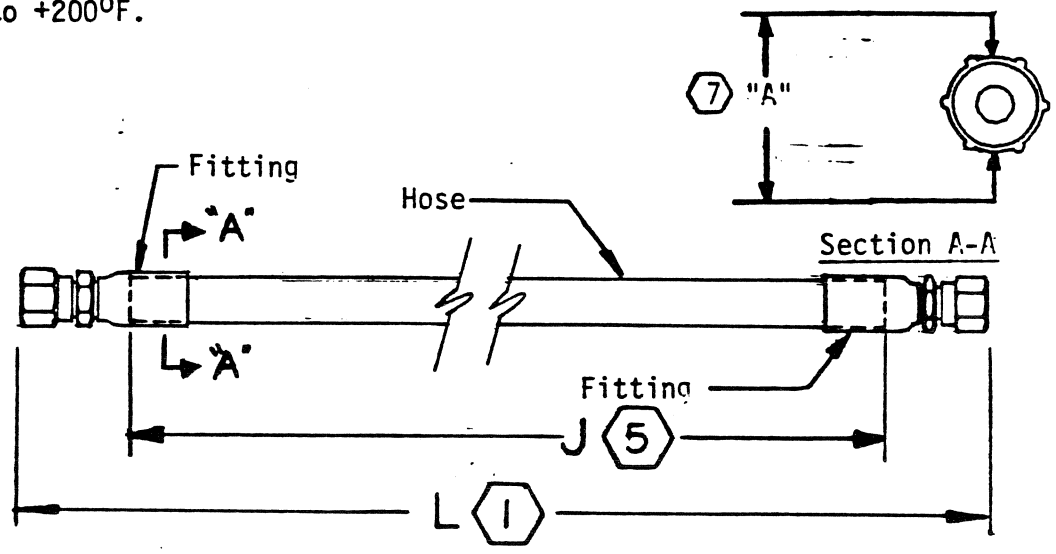
LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A	M0132	ITP	8-12-83	Added Cut length info
B	R2512E-01	RDF	3-23-88	Revised & redrawn

SCOPE

This specification describes hose assys. which comply with SAE 100R7. These hoses are made from reinforced thermoplastic materials, and are intended to be used with petroleum, water base and synthetic fluids with a temperature range -40°F to +200°F.

SKETCH



ENGINEERING DATA

Hose Size (6)	Fitting Thread Size	Max. Hose O.D.	Min. Burst Pressure lb/in.^{2}	Proof Pressure lb/in.^{2}	Max Working Pressure lb/in.^{2}	Min Bend Radius in	"A" Dia (7)
# 3	7/16-20	.430	12,000	6,000	3,000	3.50	.480 / .500
# 4	7/16-20	.513	11,000	5,500	2,750	4.00	.560 / .580
# 5	1/2-20	.590	10,000	5,000	2,500	4.50	
# 6	5/8-18	.700	9,000	4,500	2,250	5.00	
# 8	3/4-16	.860	8,000	4,000	2,000	7.00	

COMPILED	MS	DATE DRAWN			
APPROVED		7-7-82			

ORIGINAL JOB NO.	TITLE	PART NO.
M0132	HOSE ASSY. THERMOPLASTIC, SAE 100R7 (SAE 45° SWIVEL TO 45° SWIVEL)	A23-11411/A23-11416
LAST CHG LTR A		SHEET 1 OF 2

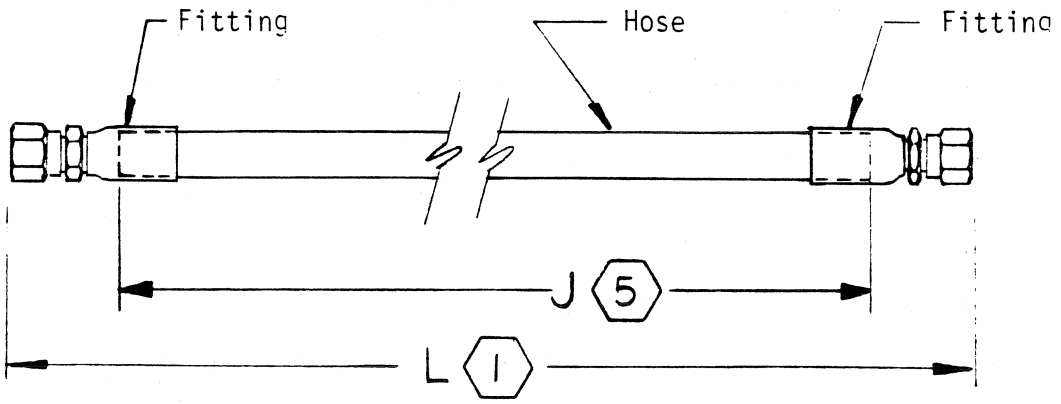
LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A	M0132	TTP	8-12-83	Added Cut length info

SCOPE

This specification describes hose assys. which comply with SAE 100R7. These hoses are made from reinforced thermoplastic materials, and are intended to be used with petroleum, water base and synthetic fluids with a temperature range -40°F to +200°F.

SKETCH



ENGINEERING DATA

Hose Size *	Fitting Thread Size	Max Hose O.D.	Min. Burst Pressure lb/in.^{2}	Proof Pressure lb/in^2	Max Working Pressure lb/in^2	Min Bend Radius in
# 3	7/16-20	.423	12,000	6,000	3,000	3.50
# 4	7/16-20	.513	11,000	5,500	2,750	4.00
# 5	1/2-20	.590	10,000	5,000	2,500	4.50
# 6	5/8-18	.700	9,000	4,500	2,250	5.00
# 8	3/4-16	.860	8,000	4,000	2,000	7.00

*Hose size = Hose I.D. in 16ths.

COMPILED	MS	DATE DRAWN			
APPROVED		7-7-82			

Portland **FREIGHTLINER CORPORATION** Oregon 97208

ORIGINAL JOB NO.	TITLE	PART NO.
M0132	HOSE ASSY. THERMOPLASTIC, SAE 100R7	A23-11411/A23-11416
LAST CHG LTR A		SHEET 2 OF 2

PART NUMBERS

Hose Size	Fitting Part Number	Cutting Length "J"	Hose Specification Number	Freightliner Assy. No. (1)
# 3	23-11417-3	L - 2.400	48-2018-3	A23-11411 - L
# 4	23-11417-4	L - 2.500	48-2018-4	A23-11412 - L
# 5	23-11417-5	L - 2.500	48-2018-5	A23-11413 - L
# 6	23-11417-6	L - 2.700	48-2018-6	A23-11414 - L
# 8	23-11417-8	L - 3.000	48-2018-8	A23-11415 - L

Notes

(1) Dash number equals length of hose assy. in inches.

2. Hose assemblies must be assembled from hose and fittings made by the same manufacturer.

3. Crimping or swaging to be carried out using equipment, dies, procedures and test methods approved by the manufacturer of the hose and fittings.

4. Hose assemblies to conform to the latest provisions of test procedures SAE J343d.

(5) J equals hose assy length in inches minus cut-off allowance for fittings.

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A	M0132	TTR	8-12-83	Added Cut length info.

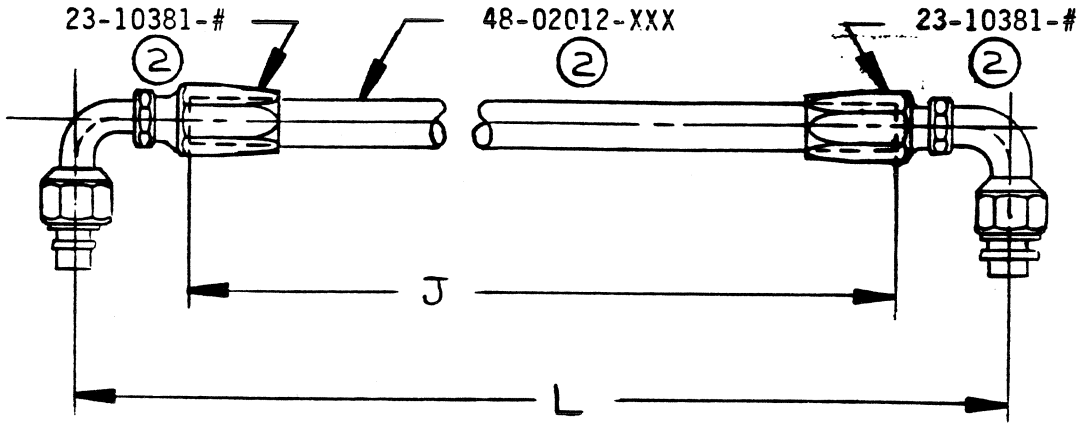
COMPILED	MS	DATE DRAWN			
APPROVED	[illegible]	7-7-82			

A23-11420 - A23-11421

General Use Part

ORIGINAL JOB NO.	TITLE	PART NO.
F0296	HOSE ASSEMBLY, AIR CONDITIONING O-RING, 90° SWIVEL CONNECTORS	A23-11420 - A23-11421
LAST CHG LTR		SHEET 1 OF 1

SKETCH:



PART NUMBERS:

T THREAD	I.D. REF.	FITTINGS - 1 EACH REQUIRED PART NO.	PART NO.	HOSE SPEC. NO.	HOSE J LENGTH	FREIGHTLINER PART NUMBER**
5/8-18	.31	23-10381-106	23-10381-006	48-02012-005	L-3.14	A23-11420-L
3/4-16	.41	-108	-008	-006	L-3.46	-11421-L

**Complete part number by adding 3-digit dash number, L, indicating assembly length in inches, thus: A23-11420-025 is a hose assembly 25 inches long (see sketch).

ENGINEERING NOTES:

1. Assembly must meet the Permeability, Bursting Strength (1705 psi) and Tensile Test of Assembly requirements of SAE Std. J51.

(2) Only fittings and hose from the same manufacturer can be used to make an assembly.

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

PRE-RELEASE PRINT

COMPILED	RAP	DATE DRAWN			
APPROVED		9/22/92			

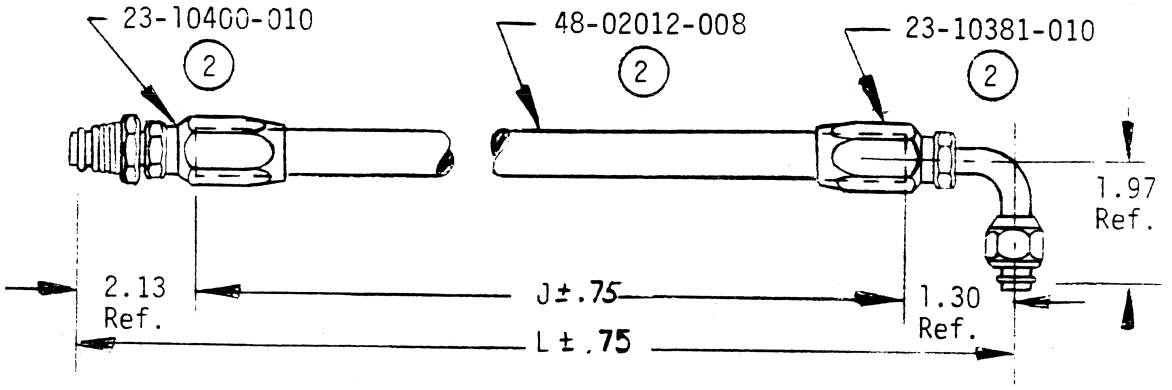
EAC-826

Portland FREIGHTLINER CORPORATION Oregon 97208

A23-11438

General Use Part

ORIGINAL JOB NO.	TITLE	PART NO.
M0184	HOSE ASSEMBLY, AIR-CONDITIONING O-RING, MALE SHORT PILOT TO FEMALE SHORT PILOT 90° ELBOW	A23-11438
LAST CHG LTR: A		SHEET 1 OF 1



I.D. (REF.)	FITTINGS, 1 EACH REQ'D		HOSE		FREIGHTLINER PART NUMBER*
	PART NO. (2)	PART NO. (2)	SPEC. NO. (2)	J LENGTH	
.50	23-10400-010	23-10381-010	48-02012-008	L-4.22	A23-11438-L

*Complete part number by adding 3-digit dash number, L, indicating assembly length in inches, thus: A23-11438-025 is a hose assembly 25 inches long (see sketch).

ENGINEERING NOTES

(1) Assembly must meet current applicable requirements of SAE Std J51.

(2) Fittings and hose from the same manufacturer must be used to make an assembly.

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A	9812 B	TTR	12-13-83	ADDED ±.75 (2 PL). TPr

COMPILED	PWS	DATE DRAWN				
APPROVED	[illegible]	3-24-83			05160	000D1

EAC - 832

Portland

FREIGHTLINER CORPORATION

Oregon 97208

A

GENERAL USE PART 05170 00001

ORIGINAL JOB NO.	TITLE	PART NO.
8923B	TUBING, FLEXIBLE 100% ELASTOMERIC, WIRE REINFORCEMENT	23-11628 Thru 23-11631
LAST CHG LTR		SHEET 1 OF 1

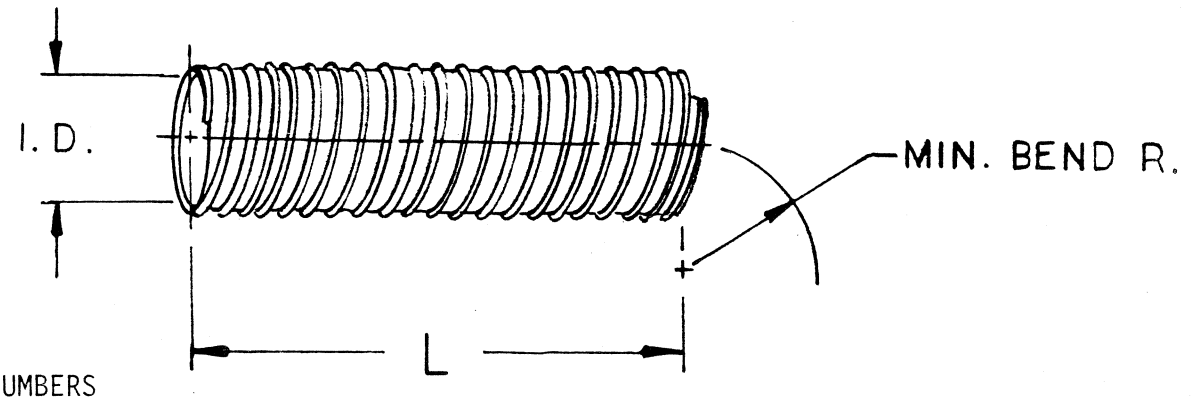
CHANGE INFORMATION

LTR	JOB NO.	BY	DATE

CHANGE INFORMATION

LTR	JOB NO.	BY	DATE

SKETCH



PART NUMBERS

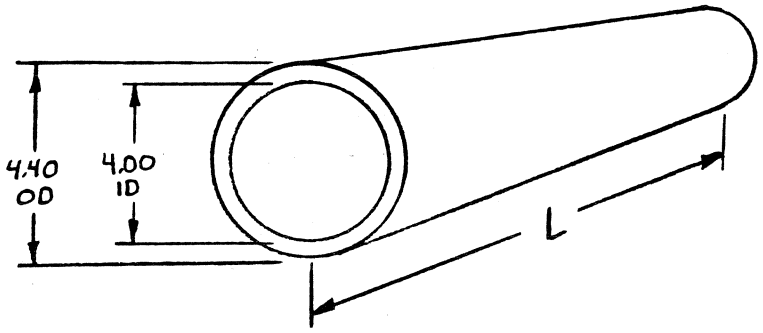
NOM. SIZE (I.D.)	MIN. CTRLINE BEND R.		FREIGHTLINER MATERIAL SPECIFICATION NO.	FREIGHTLINER PART NUMBER*
1.50	75		48-02299-150	23-11628-L
2.50	1.25		48-02299-250	23-11629-L
3.00	1.50		48-02299-300	23-11630-L
3.50	1.75		48-02299-350	23-11631-L

*Add a three digit dash number, L, to indicate length of hose in inches, thus: 23-11628-033 is a 1.50 dia. Flex hose 33 inches long.

COMPILED	DLL	DATE DRAWN			
APPROVED	CLK	12-2-83			

ORIGINAL JOB NO.	TITLE	PART NO.
F0376	HOSE, TURBO SILICONE RUBBER	23-11679
LAST CHG LTR		SHEET 1 OF 1

SKETCH:



PART NUMBERS:

MATERIAL		FREIGHTLINER PART NUMBER
48-02020-004		23-11679-L

L = Length of Tube in Inches

Example: A 6" section is 23-11679-006

CHANGE INFORMATION				
LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

CHANGE INFORMATION				
LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

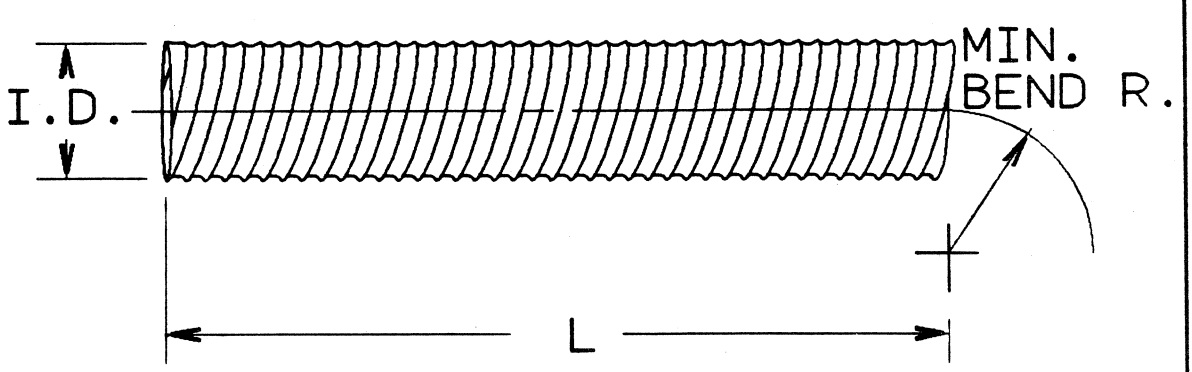
COMPILED	PITEL	DATE DRAWN	UNITS		MASTER NUMBER	
APPROVED		7/23/84	EACH		05150	000D1

M/F

23-11722 THRU 23-11729

ORIGINAL JOB NO.		TITLE	PART NO.
M0340		TUBING, FLEXIBLE EPDM ELASTOMER, WIRE REINFORCED	23-11722 THRU 23-11729
LAST CHG LTR	-		SHEET 1 OF 1

SKETCH



PART NUMBERS

NOM. SIZE (I.D.)	MIN. CTRLINE BEND R.	FREIGHTLINER MATERIAL SPECIFICATION NO.	FREIGHTLINER PART NUMBER*
1.50	.75	48-02299-150	23-11722-L
2.00	1.00	48-02299-200	23-11723-L
2.50	1.25	48-02299-250	23-11724-L
3.00	1.50	48-02299-300	23-11725-L
3.50	1.75	48-02299-350	23-11726-L
4.00	2.00	48-02299-400	23-11727-L
5.00	2.50	48-02299-500	23-11728-L
6.00	3.00	48-02299-600	23-11729-L

*ADD A THREE DIGIT NUMBER, L, TO INDICATE LENGTH OF HOSE IN INCHES, THUS 23-11722-033 IS A 1.50 DIA. FLEX HOSE 33 INCHES LONG.

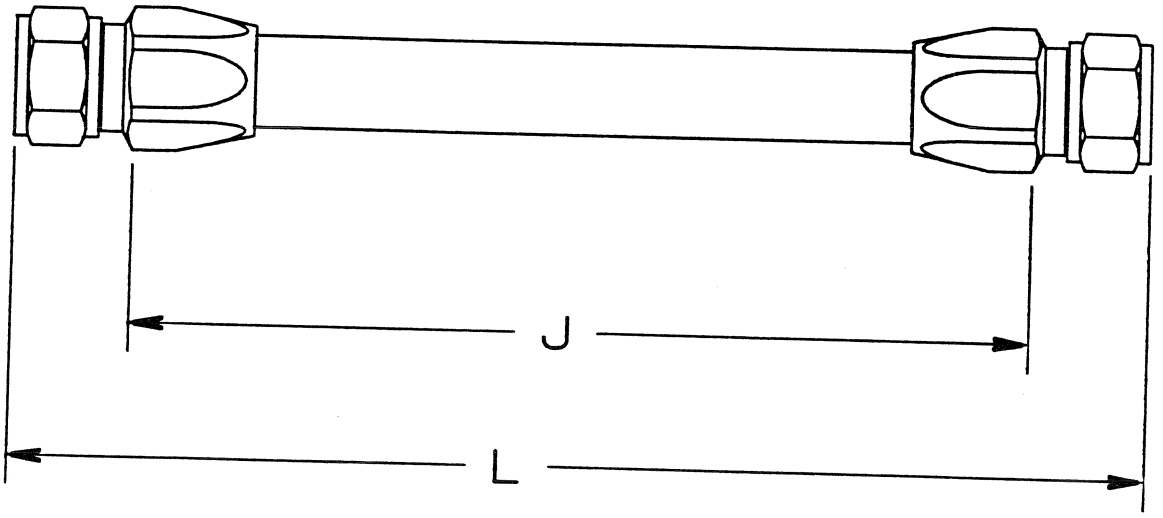
CHANGE INFORMATION				
LTR	JOB NO.	BY	DATE	

CHANGE INFORMATION				
LTR	JOB NO.	BY	DATE	

COMPILED	EB	DATE DRAWN	CADAM ORIGINAL		MASTER NUMBER	
APPROVED	DLL	05-14-85			05170	000D1

PORTLAND FREIGHTLINER CORPORATION OREGON 97208

DRAWN	PCK	TITLE	ITEM NUMBER
APPRV	ANF	HOSE ASSEMBLY, STEERING RETURN LINES JIC 37° SWIVEL ENDS	A23-11767
DATE	07/08/88	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



HOSE SIZE	SAE THREAD SIZE	HOSE FITINGS (2 REQUIRED)	HOSE	HOSE LENGTH J(IN)	MAX WORKING PRESSURE (PSI)	MIN BEND RAD (IN)	FREIGHTLINER ASSEMBLY NUMBER*
-4	7/16-20	A23-11719-004	48-00121-004	L-2.00	2000	.75	A23-11767-L
-5	1/2-20	A23-11719-005	48-00121-005	L-2.00	1500	1.00	A23-11768-L
-6	9/16-18	A23-11719-006	48-00121-006	L-2.00	1500	1.25	A23-11769-L
-8	3/4-16	A23-11719-008	48-00121-008	L-2.25	1250	1.75	A23-11770-L
-10	7/8-14	A23-11719-010	48-00121-010	L-2.50	1000	2.25	A23-11771-L
-12	1-1/16-12	A23-11719-012	48-00121-012	L-2.75	750	2.75	A23-11772-L
-16	1-5/16-12	A23-11719-016	48-00121-016	L-2.50	400	3.50	A23-11773-L
-20	1-5/8-12	A23-11719-020	48-00121-020	L-2.16	300	4.50	A23-11774-L

*TO COMPLETE THE ASSEMBLY NUMBER ADD A THREE DIGIT NUMBER EXPRESSING THE HOSE ASSEMBLY LENGTH.L, IN INCHES.

EXAMPLE: A23-11771-048 IS A -10 HOSE ASSEMBLY 48 INCHES LONG

1. HOSE AND FITTINGS MUST BE FROM THE SAME MANUFACTURER

CHG	JOB/RLSE NO	DATE	BY	REVISION
C	408281-08	07/08/88	PCK	REDRAWN/DOCUMENTED

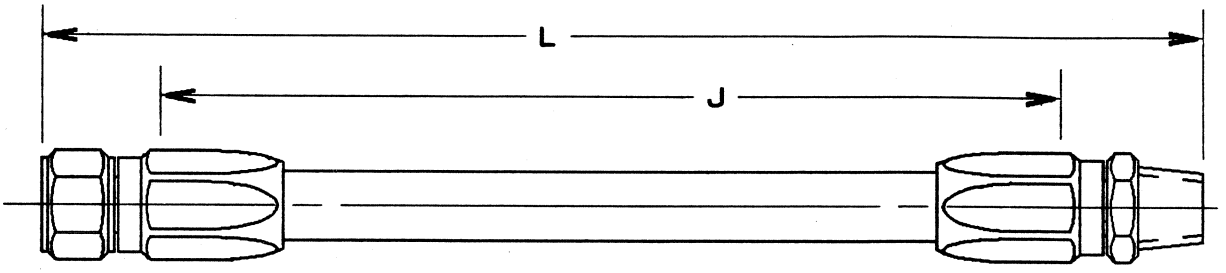
GENERAL USE PART

A23-11781

ORIGINAL JOB NO.		TITLE	
H0205		HOSE ASSEMBLY JIC 37° SWIVEL AND MALE PIPE FITTINGS	A23-11781
LAST CHG LTR	B		SHEET 1 OF 1

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR

SKETCH:



ASSEMBLY NUMBERS:

PIPE THREAD SIZE	HOSE SIZE	HOSE	JIC FITTING	PIPE FITTING	HOSE LENGTH (IN)	FREIGHTLINER ASSEMBLY NUMBER
3/4-14	16	48-00121-016	A23-11719-016	A23-11780-016	L-2.75	A23-11781-L

CHANGE INFORMATION	DATE	BY	JOB NO.	LTR
23-11780-000 TO -016	08-02-85	EAM	H0205	A
ADDED NOTE 1	06-27-86	BT	7042D	B

*TO COMPLETE THE ASSEMBLY NUMBER ADD A THREE DIGIT NUMBER EXPRESSING THE HOSE ASSEMBLY LENGTH, L, IN INCHES.

EXAMPLE: A23-11781-015 IS A HOSE ASSEMBLY 15 INCHES LONG.

1. HOSE & FITTINGS USED IN THE ABOVE ASSEMBLY MUST BE FROM THE SAME MANUFACTURER.

COMPILED	EAM	DATE DRAWN	CADAM ORIGINAL	MATERIAL	MASTER NUMBER	
APPROVED	EAM	06-27-85			05160	000D1

PORTLAND FREIGHTLINER CORPORATION OREGON 97208

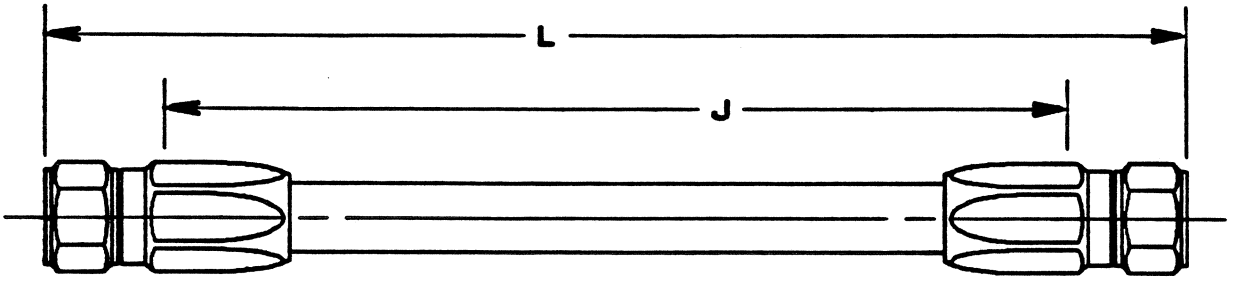
M/F

ORIGINAL JOB NO.	TITLE	PART NO.
H0188	HOSE ASSEMBLY MEDIUM PRESSURE 37° J.I.C., SWIVEL ENDS, SPECIAL RATE	A23-12005
LAST CHG LTR B		SHEET 1 OF 1

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION

LTR	JOB NO.	BY	DATE	CHANGE INFORMATION
A	PH0188	FHF	12-2-87	AQ 4411 8S To A23-026
B	6231E	FHF	1/28/88	Revise "Material"

SKETCH:



ASSEMBLY NUMBERS:

HOSE SIZE	SAE THREAD SIZE	HOSE FITTINGS 2 REQUIRED	HOSE	HOSE LENGTH J INCHES	MAX WORKING PRESSURE (PSI)	FREIGHTLINER ASSEMBLY NUMBER
8	3/4-16	A23-02608-008***	48-25003	L-2.75"	2175**	A23-12005-L*

* To complete the assembly number add a three digit number expressing the hose assembly length (L), in inches.

Example: A23-12005-048 is a hose assembly 48 inches long.

ENGINEERING NOTES:

1. Material: See table. Assembled hose must meet all provisions of SAE J343 (Latest Revision).

   Caution: Hose and Fittings used in above assemblies must be from the same manufacturer.

**Ref. 10/08/87 and 11/17/87 memos from D. Lauer (Aeroquip) to D. Ruuhela and 12/23/87 memo from H. Cooke (Stratoflex) certifying this rating on file with Corporate Engineering Standards.

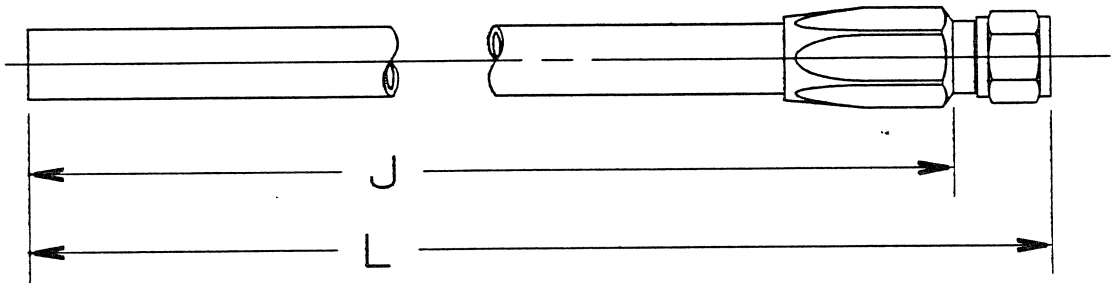
***Alternate Fitting for use with Aeroquip hose: AQ/4411-8S

COMPILED	Larson	DATE DRAWN 11-5-87			
APPROVED	Kalish				

BA M/F

DRAWN	RWR	TITLE	ITEM NUMBER
APPRV	PCK	HOSE ASSY- WBRD#6, 1 FTG	A23-12028
DATE	03/02/89	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

SKETCH



PART NUMBER

NOM SIZE	SAE THREADS	FITTING	HOSE		MAX WORKING PRESSURE (PSI)	MIN. BEND RADIUS	FREIGHTLINER ASSEMBLY NUMBER**
		FREIGHTLINER NUMBER	FREIGHTLINER NUMBER	J LENGTH			
6	5/16-18	A23-9495-006	48-00121-006	L-1.00	1000	1.25	A23-12028-060

**COMPLETE PART NUMBER BY ADDING 3-DIGIT DASH NUMBER, INDICATING ASSEMBLY LENGTH IN INCHES, THUS: A23-12028-060 IS A HOSE ASSEMBLY 60 INCHES LONG(SEE SKETCH).

ENGINEERING NOTES:

1. THE ASSEMBLED HOSE MUST QUALIFY UNDER ALL THE LATEST PROVISIONS OF TEST REQUIREMENTS FOR SAE 1402 HOSE ASSEMBLIES, AND MUST MEET APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD #106.

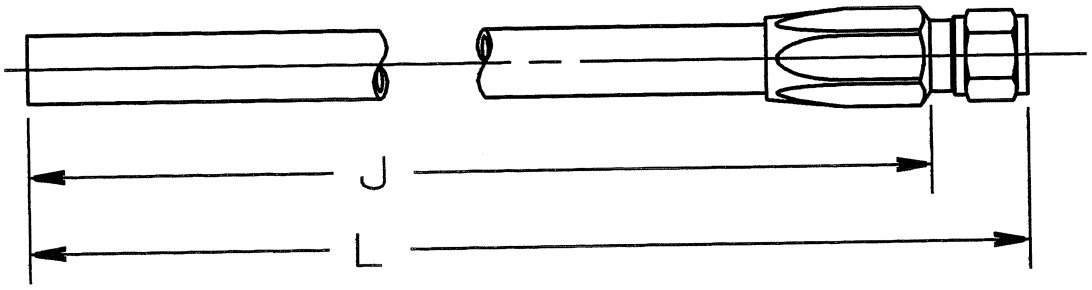
2. MATERIAL: FITTING, STEEL
HOSE, SINGLE WIRE BRAID REINFORCED MEETING SAE J 1402 STANDARDS.

CAUTION: HOSE AND FITTING USED IN THE ABOVE ASSEMBLY MUST BE FROM THE SAME MANUFACTURER.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P*C162-11	03/02/89	RWR	DOCUMENTED

DRAWN	SJT	TITLE	ITEM NUMBER
APPRV	RDF	HOSE ASSEMBLY #4, 1 FTG	A23-12070
DATE	10/03/90	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1

SKETCH



PART NUMBER

NOMINAL SIZE	SAE THREADS	FITTING	HOSE		MAX WORKING PRESSURE (PSI)	MIN. BEND RADIUS	FREIGHTLINER PART NUMBER
		FREIGHTLINER NUMBER	FREIGHTLINER NUMBER	J LENGTH			
4	7/16-20	A23-09495-004	48-00121-004	L-0.89	1000	3.00	A23-12070-L*

A

*COMPLETE PART NUMBER BY ADDING 3-DIGIT DASH NUMBER, INDICATING ASSEMBLY LENGTH IN INCHES, THUS: A23-12070-060 IS A HOSE ASSEMBLY 60 INCHES LONG(SEE SKETCH).

ENGINEERING NOTES:

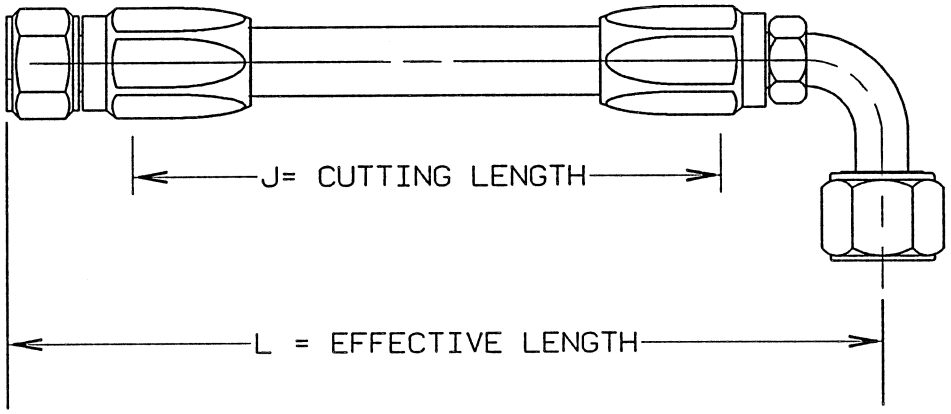
1. THE ASSEMBLED HOSE MUST QUALIFY UNDER ALL THE LATEST PROVISIONS OF TEST REQUIREMENTS FOR SAE 1402 HOSE ASSEMBLIES, AND MUST MEET APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD #106.

2. MATERIAL: FITTING,STEEL.
HOSE,SINGLE WIRE BRAID REINFORCED MEETING SAE J 1402 STANDARDS.

CAUTION: HOSE AND FITTING USED IN THE ABOVE ASSEMBLY MUST BE FROM THE SAME MANUFACTURER.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P5199F-01	10/03/90	SJT	INITIAL RELEASE
A	P2823J-01	01/10/94	ERK	REDRAWN; HOSE MATERIAL CHANGED

DRAWN	ERK	TITLE	ITEM NUMBER
APPRV	JMS	HOSE ASSY - JIC 37° FLARE STRAIGHT TO 90° ELBOW	A23-12117
DATE	08/26/92	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



HOSE SIZE	SAE THREAD SIZE	FITTINGS		HOSE	HOSE LENGTH "J"	MAX. WORKING PRESS. (PSI)	MIN. BEND RAD.	FREIGHTLINER ASSEMBLY NUMBER
		STRAIGHT	ELB90					
6	9/16-18	A23-02608-006	PH 23920 6 6	48-02004-006	L-2.54	2250	4.00	A23-12117-L
12	1-1/16-12	A23-02608-012	23-12288-012	48-02004-012	L-3.89	1500	6.50	A23-12289-L

TO COMPLETE THE ASSEMBLY NUMBER ADD A THREE DIGIT NUMBER EXPRESSING THE HOSE ASSEMBLY LENGTH "L" IN INCHES.

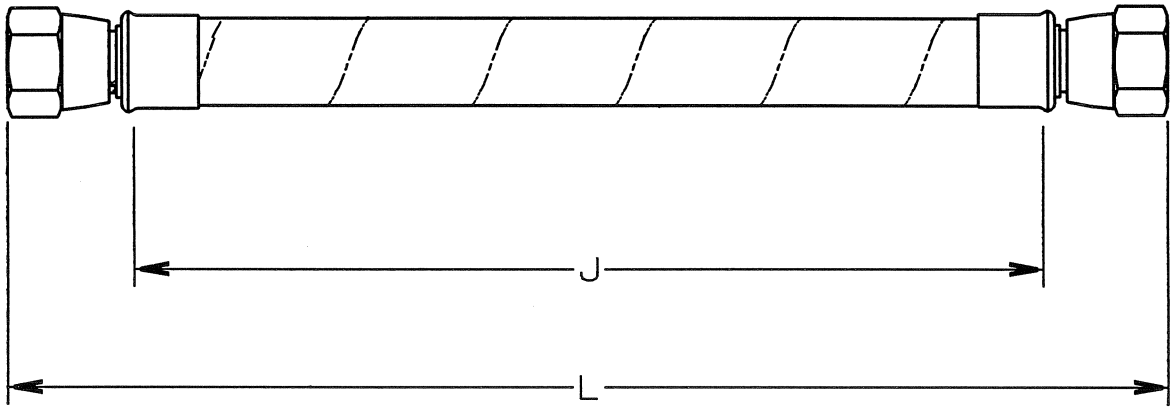
EXAMPLE: A23-12117-085 IS A #6 HOSE ASSEMBLY 85 INCHES LONG.

ENGINEERING NOTES:

1. THE ASSEMBLED HOSE SHALL MEET ALL PROVISIONS OF SAE J1402.
2. ALL DIMENSIONS ARE IN INCHES.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	485397-37	08/26/92	ERK	DOCUMENTED
A	PA2157-28	10/27/95	DAJ	REVISED AND REDRAWN. ADDED A23-12289-111.

DRAWN	ERK	TITLE	ITEM NUMBER
APPRV	AQ	HOSE ASSEMBLY HYDRAULIC, HIGH TEMPERATURE	A23-12131
DATE	12/17/92	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



HOSE SIZE	SAE THREAD SIZE	HOSE FITTINGS (2 REQUIRED)	HOSE	HOSE LENGTH (J) Ⓐ	MAX WORKING PRESSURE (PSI)	MIN BEND RAD (IN)	FREIGHTLINER ASSEMBLY NUMBER
4	7/16-20	A23-12130-004	48-25060-004	L-1.62	400	2.50	A23-12131-L
6	5/8-18	A23-12130-006	48-25060-006	L-1.62	400	3.00	A23-12132-L
8	3/4-16	A23-12130-008	48-25060-008	L-2.38	400	4.00	A23-12133-L

*TO COMPLETE THE ASSEMBLY NUMBER ADD A THREE DIGIT NUMBER EXPRESSING THE HOSE ASSEMBLY LENGTH (L) IN INCHES.

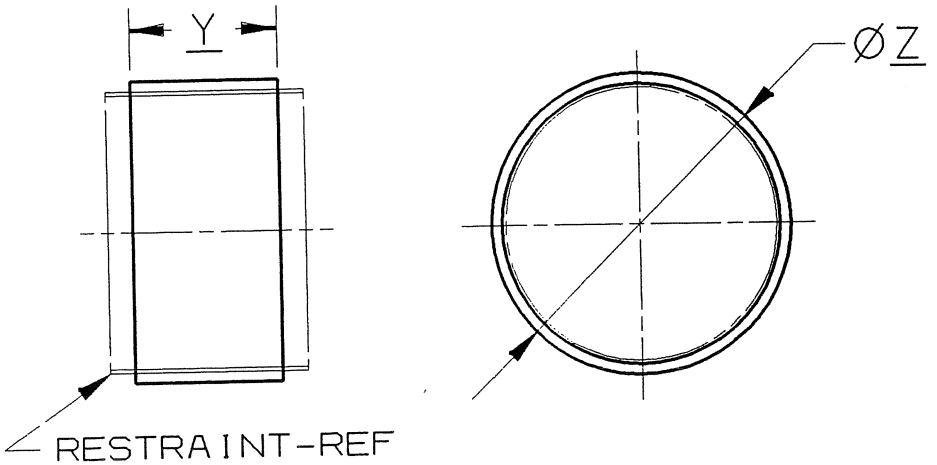
EXAMPLE: A23-12132-050 IS A #6 HOSE ASSEMBLY 50 INCHES LONG.

HOSE AND FITTINGS MUST BE FROM THE SAME MANUFACTURER.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PH0539-01	12/17/92	ERK	INITIAL RELEASE
A	PA2042-35	04/22/93	ERK	REVISED HOSE CUT LENGTH

ADRIENNE CHILBERG

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	CLAMP-HOSE SHRINK BAND	23-12219	
DATE	02/07/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. A
CATIA ORIGINAL				



HOSE SIZE	DIMENSIONS		GATES NO.	F/L SPEC NO.
	Y	Z		
0.375	0.556	0.983	7405-4002	23-12219-037
0.625	0.810	1.268	7405-4004	23-12219-062
0.750	0.810	1.382	7405-4005	23-12219-075
1.000	0.810	1.711	7405-4006	23-12219-100
1.250	1.157	2.024	7405-4007	23-12219-125
1.750	1.157	2.633	7405-4009	23-12219-175
2.000	1.157	2.951	7405-4010	23-12219-200
2.250	1.157	3.238	7405-4011	23-12219-225
2.500	1.157	3.562	7405-4012	23-12219-250
2.750	1.157	3.843	7405-4013	23-12219-275
3.000	1.157	4.142	7405-4014	23-12219-300

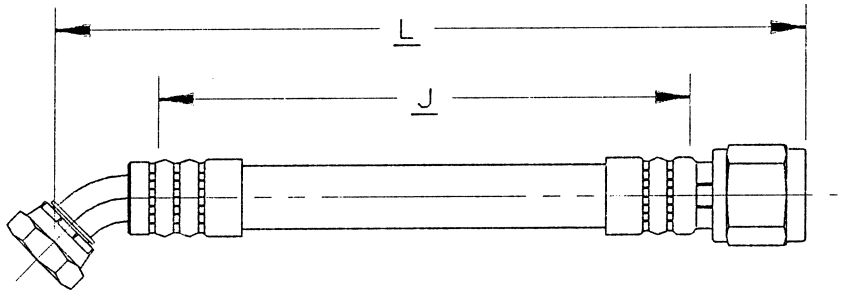
SPECIFICATIONS:

1. MATERIAL: GATES FORMULATION 8600-100
2. DIMENSIONS ABOVE FOR REFERENCE ONLY.
3. APPROVE SOURCE: GATES RUBBER CO. (POWER GRIP SB CLAMPS)
4. REQUIRES A HEAT GUN FOR INSTALLATION.

CHG	JOB NO	DATE	BY	REVISION
-	P01794-03	02/07/97	DAJ	INITIAL RELEASE
A	P01794-05	02/18/97	JCT	ADDED HOSE SIZES 1.25, 1.75, 2.75. REV. Z DIMENSIONS.

DRIENNE CHILBERG

DRAWN	DAJ	TITLE	DRAWING NUMBER
APPRV	DAJ	HOSE ASSY-WIRE BRAID 45° ELBOW TO SWIVEL, 37° JIC, STEEL	A23-12225
DATE	04/03/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2 / CHG. LTR. A
CATIA ORIGINAL			



HOSE SIZE	THREAD	FITTINGS		HOSE		PSI (MAX)	BEND RADIUS (MIN)	FREIGHTLINER PART NUMBER
		ELBOW A23-12418	FITTING A23-12299	48-25003	J			
20	1-5/8-12	-020	-020	-020	L-4.18	625	9	A23-12225-L

ENGINEERING NOTES:

A 1. THE HOSE ASSEMBLY MUST MEET THE APPLICABLE REQUIREMENTS OF SAE J517, SAE J343, AND SAE J1019.

2. PART NUMBER EXAMPLE: A23-12225-015, THE DASH NUMBER DENOTES AN ASSEMBLY 15 INCHES IN LENGTH.

A 3. MATERIAL: ELBOW FITTING-STEEL NIPPLE, STEEL NUT ANDL SHELL; SWIVEL FITTING-STEEL NIPPLE, STEEL NUT AND SHELL; HOSE-SINGLE WIRE BRAID REINFORCED, MEDIUM PRESSURE.

CAUTION: HOSE AND FITTINGS USED IN THE ABOVE ASSEMBLIES MUST BE FROM THE SAME MANUFACTURER.

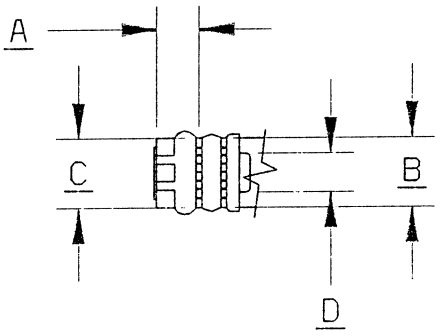
4. LABEL REQUIRED FOR AFTERMARKET APPLICATIONS.

5. SEE SHEET 2 FOR CRIMP DIMENSIONS.

CHG	JOB NO	DATE	BY	REVISION
-	820878-01	04/03/97	DAJ	INITIAL LOAD
A	PA2042-76	04/16/97	DAJ	NOTE 1 AND 3, AND DIM A ON SHT 2 WERE REVISED.

CRIENNE CHILBERG

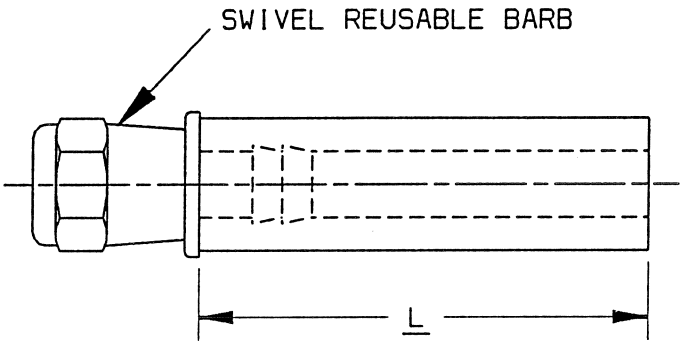
DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSY-WIRE BRAID 45° ELBOW TO SWIVEL, 37° JIC, STEEL	A23-12225	
DATE	04/03/97	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2	CHG. LTR. A
CATIA ORIGINAL				



HOSE SIZE	CRIMP DIMENSIONS (MIN/MAX)			
	A	B	C	D(MIN)
20	.63/.67	1.420/1.440	1.405/1.425	.846

CHG	JOB NO	DATE	BY	REVISION
-	820878-01	04/03/97	DAJ	INITIAL LOAD
A	PA2042-76	04/16/97	DAJ	NOTE 1 AND 3 ON SHT 1, AND DIM A WERE REVISED.

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSEMBLY STRAIGHT SWIVEL, BARBED	A23-12312	
DATE	02/19/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. E
CATIA ORIGINAL				



HOSE SIZE	THREAD SAE	FITTING	HOSE	MAX WORKING PRESS (PSI)	MIN BENDING RADIUS	FREIGHTLINER PART NUMBER*
8	3/4-16	681 997 01 72	48-25049-008	250	5.00	A23-12312-L
8	9/16-18	23-12492-068	48-25049-008	250	5.00	A23-12493-L

* COMPLETE PART NUMBER BY ADDING A THREE DIGIT DASH NUMBER EXPRESSING LENGTH 'L' IN INCHES. (E.G. A23-12312-016 IS A HOSE 16 INCHES LONG).

ENGINEERING NOTES:

1. CAUTION: THE HOSE AND FITTING USED IN THE ABOVE ASSEMBLIES MUST BE FROM THE SAME MANUFACTURER.

2. ALL DIMENSIONS ARE IN INCHES.

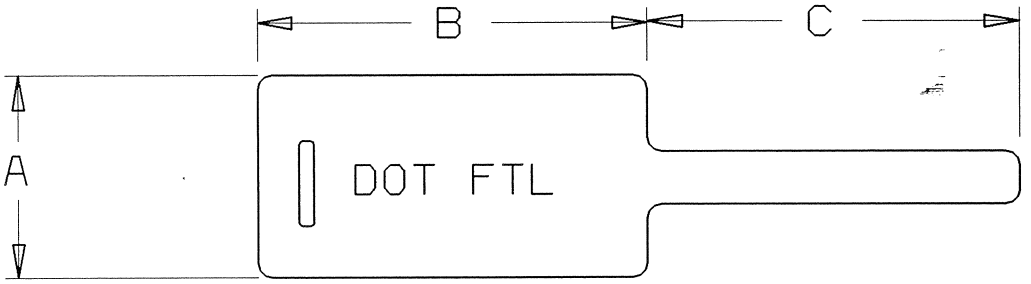
CHG	JOB NO	DATE	BY	REVISION
D	951074-11	02/19/98	DAJ	REVISED & REDRAWN IN CATIA, ADDED A23-12493-L.
E	PA2042-83	03/20/98	DAJ	REVISED PART NUMBER NOTATION.

ADRIENNE CHILBERG

DRAWN: FHC	TITLE: LABEL-HOSE	DRAWING NUMBER: 23-12343	
APPRV: DAJ			
DATE: 04/17/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -
CATIA ORIGINAL			

SCOPE: THIS SPECIFICATION IDENTIFIES AN ALUMINUM LABEL.

APPLICATION: USED TO IDENTIFY FREIGHTLINER AS THE MANUFACTURER OF CRIMPED HOSE ASSEMBLIES IN ORDER TO MEET FMVSS 106.



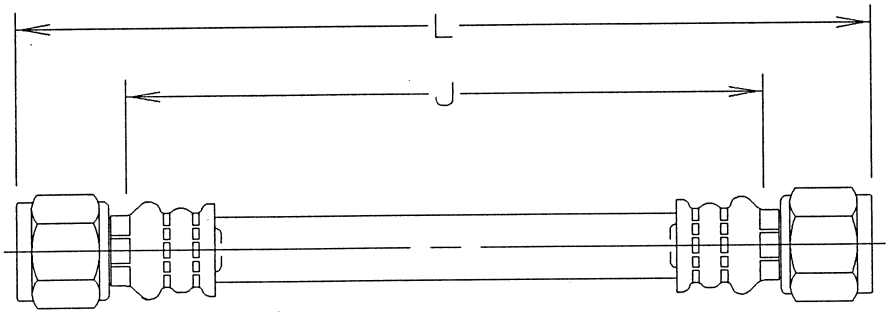
DIMENSIONS			HOSE SIZE	VENDOR PART NUMBER	FREIGHTLINER PART NUMBER	⚠2 VENDOR
A	B	C				
1.000	1.375	1.625	4,6,8	714-000	23-12343-000	T&T LABEL CO.
1.000	2.500	2.000	10,12,16	M-714-5	23-12343-001	
1.000	2.250	3.000	20	751598-2	23-12343-002	

ENGINEERING NOTES:

1. MATERIAL:.010 DEAD SOFT ALUMINUM
2. ⚠2 ALTERNATE SOURCES MAY BE USED ONCE APPROVED BY ENGINEERING.
3. DIMENSIONS SHOWN ARE REFERENCE ONLY.
4. TEXT MUST BE ETCHED,EMBOSSED,OR STAMPED IN BLOCK CAPITAL LETTERS AT LEAST ONE-EIGHTH OF AN INCH HIGH.

CHG	JOB NO	DATE	BY	REVISION
-	PN0648-03	04/18/96	FHC	INITIAL RELEASE

DRAWN	DAJ	TITLE	ITEM NUMBER
APPRV	ERK	HOSE ASSEMBLY WIRE BRAID	A23-12248
DATE	05/23/95	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2



	HOSE SIZE	THREAD	FREIGHTLINER PART NUMBER			PSI (MAX)	BEND RADIUS (MIN)	FREIGTHLINER PART NUMBER
			FITTINGS	HOSE	J			
A	4	7/16-20	A23-12247-004	48-00121-004	L-1.60	2000	0.75	A23-12270-L
	6	5/8-18	A23-12247-006	48-00121-006	L-1.96	1500	1.25	A23-12248-L
	8	3/4-16	A23-12247-008	48-00121-008	L-2.16	1250	1.75	A23-12249-L
	10	7/8-14	A23-12247-010	48-00121-010	L-2.44	1000	2.25	A23-12250-L
B	12	1-1/16-14	A23-12247-012	48-00121-012	L-2.38	750	2.75	A23-12303-L

ENGINEERING NOTES:

1. THE ASSEMBLED HOSE MUST QUALIFY UNDER ALL THE LATEST PROVISIONS OF TEST REQUIREMENTS FOR SAE 1402 HOSE ASSEMBLIES, AND MUST MEET APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD #106.
2. PART NUMBER EXAMPLE: A23-12248-036, THE DASH NUMBER DENOTES A 36 INCHES ASSEMBLY.
3. MATERIAL: FITTINGS, BRASS NIPPLE, STEEL NUT AND SHELL;
   HOSE, SINGLE WIRE BRAID REINFORCED MEETING SAE J 1402 STANDARDS FOR TABLE A1 AIR BRAKE HOSE.

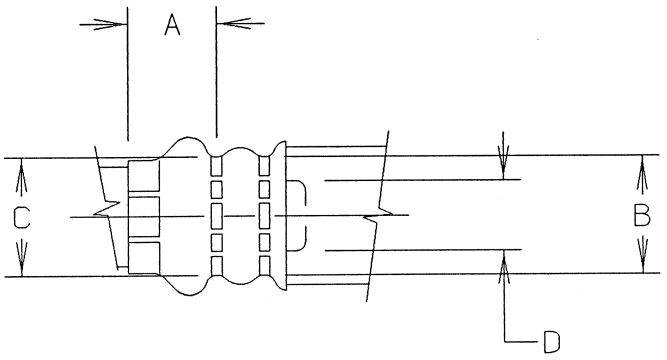
   CAUTION: HOSE AND FITTINGS USED IN THE ABOVE ASSEMBLIES MUST BE FROM THE SAME MANUFACTURER.

C 4. LABEL REQUIRED FOR AFTERMARKET APPLICATION.

5. SEE SHEET 2 FOR CRIMP DIMENSIONS.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PF0984-02	05/23/95	DAJ	INITIAL LOAD
A	PF0984-03	08/09/95	DAJ	ADDED A23-12270-L, REVISED PSI (MAX) CALL-OUTS.
B	PN0648-01	01/02/96	DAJ	ADDED P/N A23-12303
C	PN0648-02	02/18/96	DAJ	ADDED NOTE 4 AND SHEET 2.

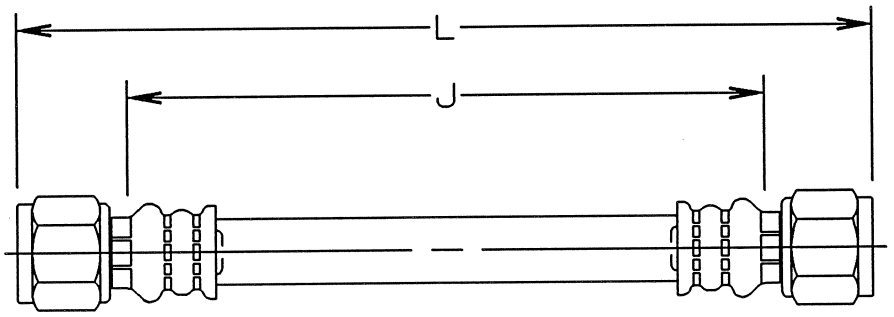
DRAWN	DAJ	TITLE HOSE ASSEMBLY WIRE BRAID	ITEM NUMBER A23-12248
APPRV	ERK		
DATE	05/23/95	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2



HOSE SIZE	CRIMP DIMENSIONS(MIN/MAX)			
	A	B	C	D(MIN)
4	.46/.50	.46/.48	.445/.465	.124
6	.46/.50	.575/595	.560/.580	.206
8	.46/.50	.67/.69	.655/.675	.268
10	.56/.60	.805/.825	.79/.81	.330
12	.56/.60	.915/.935	.90/.92	.412

CHG	JOB/RLSE NO	DATE	BY	REVISION
C	PN0648-02	02/18/96	DAJ	ADDED PAGE 2 AND NOTE 4, SEE PAGE 1.

DRAWN	ERK	TITLE	ITEM NUMBER
APPRV	ERK	HOSE ASSY, WIRE BRAID SWIVELS ALL STEEL	A23-12298
DATE	12/01/95	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2



HOSE SIZE	THREAD	FREIGHTLINER PART NUMBER			PSI (MAX)	BEND RADIUS (MIN)	FREIGTHLINER PART NUMBER
		FITTINGS	HOSE	J			
4	7/16-20	A23-12299-004	48-00121-004	L-1.60	2000	0.75	A23-12298-L
8	3/4-16	A23-12299-008	48-00121-008	L-2.16	1250	1.75	A23-12300-L
A 10	7/8-14	A23-12299-010	48-00121-010	L-2.44	1000	2.25	A23-12315-L
12	1-1/16-12	A23-12299-012	48-00121-012	L-2.68	750	2.75	A23-12316-L
16	1-5/16-12	A23-12299-016	48-00121-016	L-2.96	400	3.50	A23-12317-L
20	1-5/8-12	A23-12299-020	48-00121-020	L-3.00	300	4.50	A23-12318-L

ENGINEERING NOTES:

1. THE ASSEMBLED HOSE MUST QUALIFY UNDER ALL THE LATEST PROVISIONS OF TEST REQUIREMENTS FOR SAE 1402 HOSE ASSEMBLIES, AND MUST MEET APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD #106.

2. PART NUMBER EXAMPLE: A23-12298-036, THE DASH NUMBER DENOTES AN ASSEMBLY 36 INCHES IN LENGTH.

3. MATERIAL: FITTINGS, STEEL NIPPLE, STEEL NUT AND SHELL; HOSE, SINGLE WIRE BRAID REINFORCED MEETING SAE J 1402 STANDARDS FOR TABLE A1 AIR BRAKE HOSE.

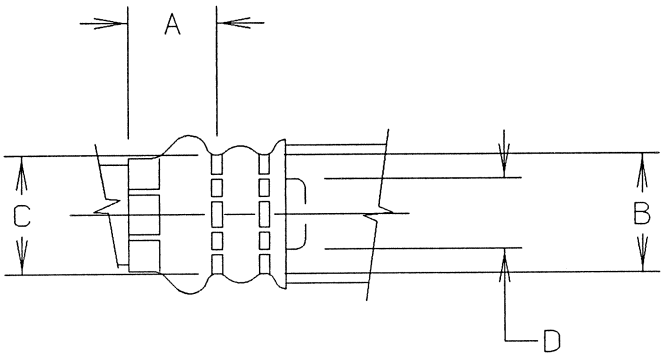
CAUTION: HOSE AND FITTINGS USED IN THE ABOVE ASSEMBLIES MUST BE FROM THE SAME MANUFACTURER.

A 4. LABEL REQUIRED FOR AFTERMARKET APPLICATIONS.

5. SEE SHEET 2 FOR CRIMP DIMENSIONS.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PA2157-37	12/01/95	ERK	INITIAL RELEASE
A	PN0648-02	02/06/96	DAJ	ADDED A23-12315 THRU A23-12318, NOTE 4&5, & SHT 2.

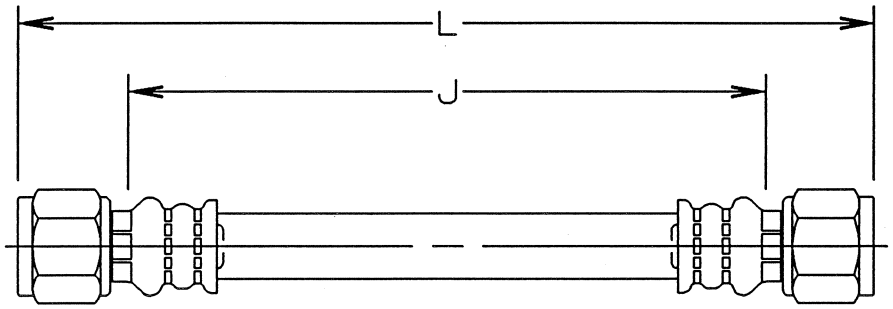
DRAWN	DAJ	TITLE	ITEM NUMBER
APPRV	ERK	HOSE ASSY, WIRE BRAID SWIVELS ALL STEEL	A23-12298
DATE	12/01/95	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2



HOSE SIZE	CRIMP DIMENSIONS(MIN/MAX)			
	A	B	C	D(MIN)
4	.46/.50	.46/.48	.445/.465	.124
8	.46/.50	.67/.69	.655/.675	.268
10	.56/.60	.805/.825	.79/.81	.330
12	.56/.60	.915/.935	.90/.92	.412
16	.59/.63	1.175/1.195	1.160/1.180	.648
20	.63/.67	1.420/1.440	1.405/1.425	.846

CHG	JOB/RLSE NO	DATE	BY	REVISION
A	PN0648-02	02/18/96	DAJ	ADDED PAGE 2 AND NOTE 4&5, SEE SHT 1.

DRAWN	DAJ	TITLE	ITEM NUMBER
APPRV	ERK	HOSE ASSEMBLY WIRE BRAID	A23-12308
DATE	01/12/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2



HOSE SIZE	THREAD	FREIGHTLINER PART NUMBER			PSI (MAX)	BEND RADIUS (MIN)	FREIGTHLINER PART NUMBER
		FITTINGS	HOSE	J			
16	1-5/16-14	A23-12307-016	48-00121-016	L-2.52	400	3.50	A23-12308-L
20	1-5/8-14	A23-12307-020	48-00121-020	L-2.68	300	4.50	A23-12309-L

ENGINEERING NOTES:

1. THE ASSEMBLED HOSE MUST QUALIFY UNDER ALL THE LATEST PROVISIONS OF TEST REQUIREMENTS FOR SAE 1402 HOSE ASSEMBLIES, AND MUST MEET APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD #106.

2. PART NUMBER EXAMPLE: A23-12308-036, THE DASH NUMBER DENOTES A 36 INCHES ASSEMBLY.

3. MATERIAL: FITTINGS, STEEL NIPPLE, NUT AND SHELL; HOSE, SINGLE WIRE BRAID REINFORCED MEETING SAE J 1402 STANDARDS FOR TABLE A1 AIR BRAKE HOSE.

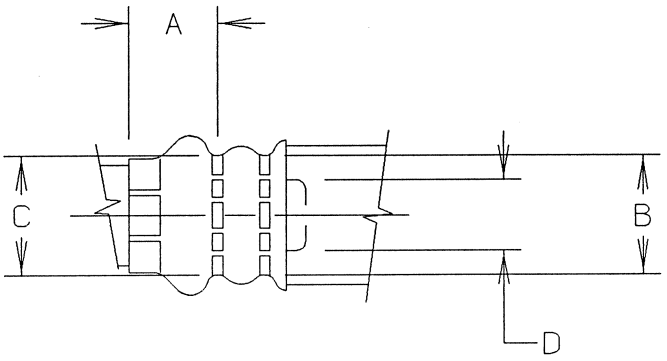
CAUTION: HOSE AND FITTINGS USED IN THE ABOVE ASSEMBLIES MUST BE FROM THE SAME MANUFACTURER.

A 4. LABEL REQUIRED FOR AFTERMARKET APPLICATION.

A 5. SEE SHEET 2 FOR CRIMP DIMENSIONS.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PN0648-01	01/12/96	DAJ	INITIAL LOAD
A	PN0648-02	02/18/96	DAJ	ADDED NOTES 4 & 5, AND SHEET 2.

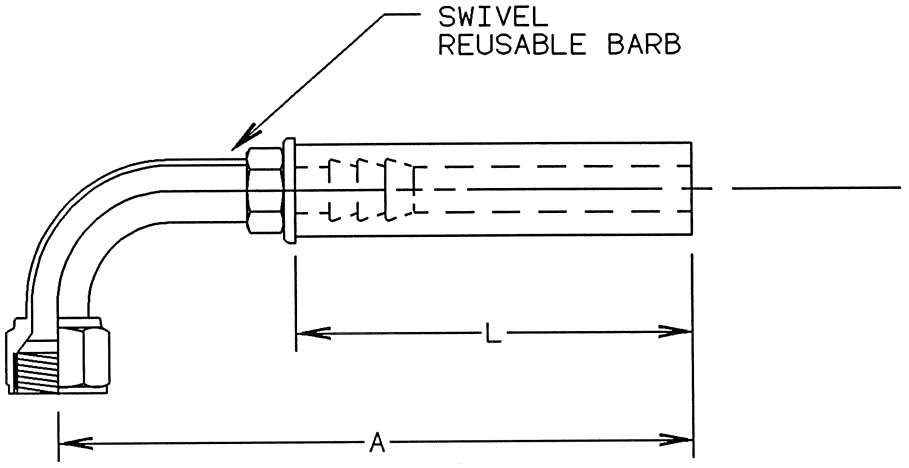
DRAWN	DAJ	TITLE HOSE ASSY WIRE BRAID	ITEM NUMBER A23-12308
APPRV	ERK		
DATE	01/12/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2



HOSE SIZE	CRIMP DIMENSIONS(MIN/MAX)			
	A	B	C	D(MIN)
16	.59/.63	1.175/1.195	1.160/1.180	.648
20	.63/.67	1.420/1.440	1.405/1.425	.846

CHG	JOB/RLSE NO	DATE	BY	REVISION
A	PN0648-02	02/18/96	DAJ	ADDED PAGE 2 AND NOTE 4, SEE PAGE 1.

DRAWN	ERK	TITLE	ITEM NUMBER
APPRV	SST	HOSE ASSEMBLY 90° SWIVEL, BARBED	A23-12311
DATE	01/23/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



ASSEMBLY NUMBERS

HOSE SIZE	S.A.E. THREAD SIZE	FITTING	HOSE		A	MAX WORKING PRESS (PSI)	MIN BEND RAD	FREIGHTLINER ASSEMBLY NUMBER
		37° SWIVEL A23-12310	48-25049	LENGTH "L"				
8	3/4-16	-008	-008	A-1.25	12	250	5.00	A23-12311-012
8	3/4-16	-008	-008	A-1.25	11	250	5.00	A23-12311-011

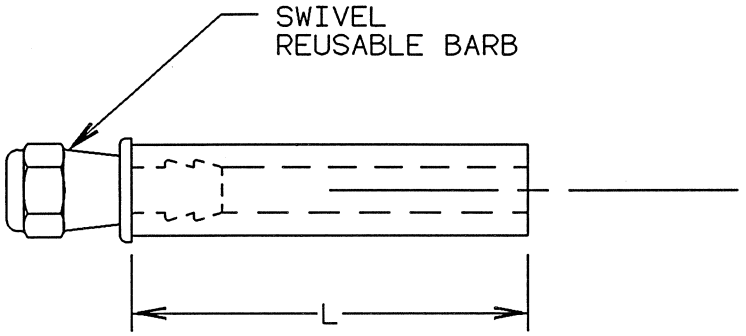
A

ENGINEERING NOTES:

1. CAUTION: THE HOSE AND FITTINGS USED IN THE ABOVE ASSEMBLIES MUST BE FROM THE SAME MANUFACTURER.
2. ALL DIMENSIONS ARE IN INCHES.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	728014-04	01/23/96	ERK	INITIAL RELEASE
A	PA2042-64	01/26/96	ERK	REMOVED SAE J1402 REFERENCE
B	P01100-01	09/11/96	JAS	ADDED -011

DRAWN	ERK	TITLE	ITEM NUMBER
APPRV	SST	HOSE ASSEMBLY STRAIGHT SWIVEL, BARBED	A23-12312
DATE	01/23/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



ASSEMBLY NUMBERS

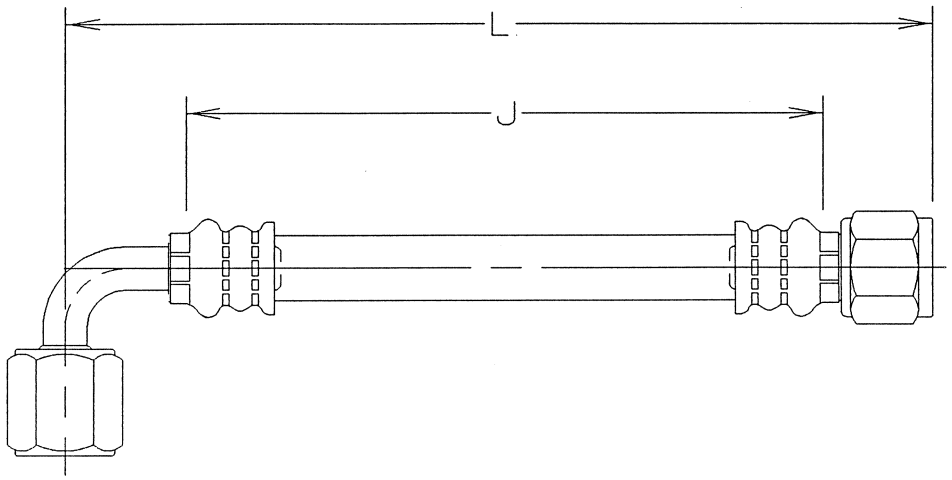
HOSE SIZE	S.A.E. THREAD SIZE	FITTING	HOSE		MAX WORKING PRESS (PSI)	MIN BEND RAD	FREIGHTLINER ASSEMBLY NUMBER
			48-25049	LENGTH "L"			
8	3/4-16	681 997 01 72	-008	16	250	5.00	A23-12312-016
8	3/4-16	681 997 01 72	-008	19	250	5.00	A23-12312-019
8	3/4-16	681 997 01 72	-008	24	250	5.00	A23-12312-024
8	3/4-16	681 997 01 72	-008	27	250	5.00	A23-12312-027
8	3/4-16	681 997 01 72	-008	72	250	5.00	A23-12312-072

ENGINEERING NOTES:

1. CAUTION: THE HOSE AND FITTING USED IN THE ABOVE ASSEMBLIES MUST BE FROM SAME MANUFACTURER.
2. ALL DIMENSIONS ARE IN INCHES.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	728014-04	01/23/96	ERK	INITIAL RELEASE
A	PA2042-64	01/26/96	ERK	REMOVED SAE J1402 REFERENCE
B	P4536N-01	04/17/96	DAJ	ADDED -019 AND -027
C	P4536N-03	06/14/96	GH	ADDED -024 AND -072

DRAWN	DAJ	TITLE	ITEM NUMBER
APPRV	ERK	HOSE ASSY, WIRE BRAID 90° ELBOW TO SWIVEL	A23-12323
DATE	02/14/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2



HOSE SIZE	THREAD	FITTINGS		HOSE		PSI (MAX)	BEND RADIUS (MIN)	FREIGTHLINER PART NUMBER
		ELBOW A23-12322	SWIVEL A23-12247	48-00121	J			
8	3/4-16	-008	-008	-008	L-2.51	1250	1.75	A23-12323-L
10	7/8-14	-010	-010	-010	L-2.71	1000	2.25	A23-12324-L

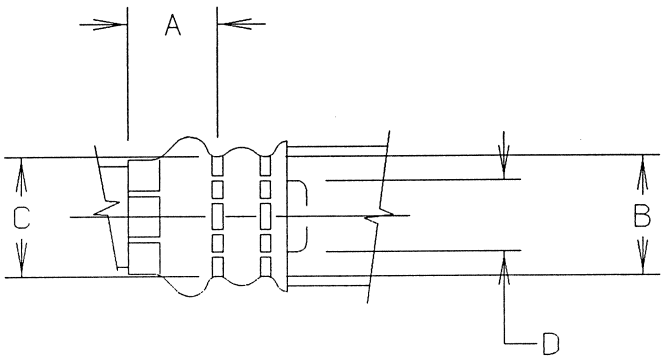
ENGINEERING NOTES:

1. THE ASSEMBLED 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: A23-12323-036, THE DASH NUMBER DENOTES AN ASSEMBLY 36 INCHES IN LENGTH.
3. MATERIAL: ELBOW FITTING, STEEL NIPPLE, STEEL NUT AND SHELL; SWIVEL FITTING, BRASS NIPPLE, STEEL NUT AND SHELL; HOSE, SINGLE WIRE BRAID REINFORCED MEETING SAE J 1402 STANDARDS FOR TABLE A1 AIR BRAKE HOSE.

   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/RLSE NO	DATE	BY	REVISION
-	PN0648-02	02/14/96	DAJ	INITIAL LOAD

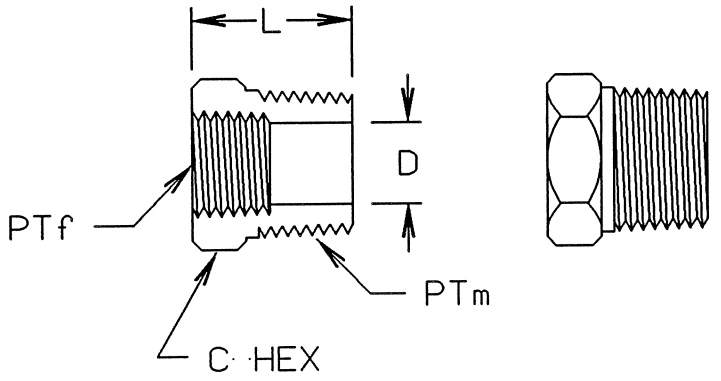
DRAWN	DAJ	TITLE	ITEM NUMBER
APPRV	ERK	HOSE ASSY, WIRE BRAID 90° ELBOW TO SWIVEL	A23-12323
DATE	02/14/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2



HOSE SIZE	CRIMP DIMENSIONS(MIN/MAX)			
	A	B	C	D(MIN)
8	.46/.50	.67/.69	.655/.675	.268
10	.56/.60	.805/.825	.79/.81	.330

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	PN0648-02	02/14/96	DAJ	INITIAL LOAD

DRAWN	ERK	TITLE REDUCER PIPE, STEEL	ITEM NUMBER 23-12327
APPRV	ERK		
DATE	03/04/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1



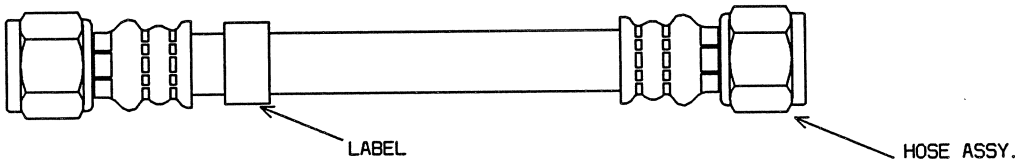
PTM NPTF	PTF NPTF	C HEX	L	D FLOW DIA.	MFG PART NO. PH	FREIGHTLINER PART NUMBER
1-11 1/2	1/2-14	1 3/8	1.36	.688	1 X 1/2 PTR-S	23-12327-001

ENGINEERING NOTES:

1. MATERIAL: STEEL
2. MUST MEET APPLICABLE PROVISIONS OF FMVSS 106.

CHG	JOB/RLSE NO	DATE	BY	REVISION
-	P2A141-22	03/04/96	ERK	INITIAL RELEASE

DRAWN	FHC	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSEMBLY WIRE BRAID	A23-12346	
DATE	04/23/96	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. A
CATIA ORIGINAL				



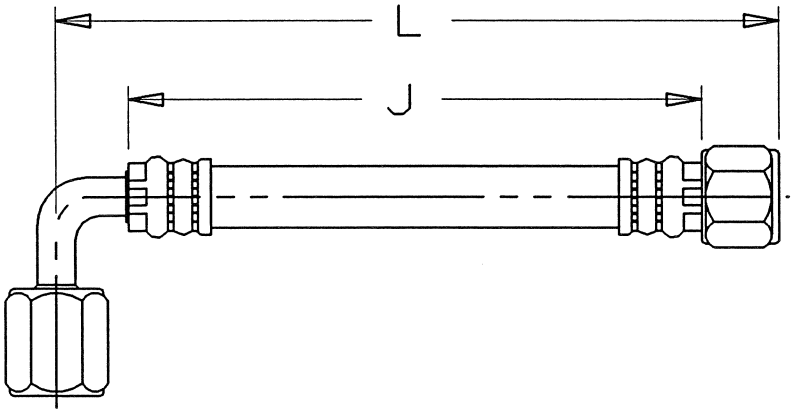
FREIGHTLINER PART NUMBER		FREIGTHLINER PART NUMBER
LABEL	HOSE ASSY	
24-00749-000	A23-12248-L	A23-12346-L
	A23-12249-L	A23-12347-L
24-00749-001	A23-12250-L	A23-12348-L
24-00749-000	A23-12270-L	A23-12349-L
	A23-12298-L	A23-12350-L
	A23-12300-L	A23-12351-L
24-00749-001	A23-12303-L	A23-12352-L
	A23-12308-L	A23-12353-L
24-00749-001	A23-12309-L	A23-12354-L
24-00749-001	A23-12315-L	A23-12355-L
	A23-12316-L	A23-12356-L
	A23-12317-L	A23-12357-L
24-00749-001	A23-12318-L	A23-12358-L
24-00749-000	A23-12323-L	A23-12359-L
24-00749-001	A23-12324-L	A23-12360-L

ENGINEERING NOTES:

1. THE ASSEMBLED HOSE MUST QUALIFY UNDER ALL THE LATEST PROVISIONS OF TEST REQUIREMENTS FOR SAE 1402 HOSE ASSEMBLIES, AND MUST MEET APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD #106.
2. PART NUMBER EXAMPLE: A23-12346-036, THE DASH NUMBER DENOTES A 36 INCHES ASSEMBLY.
3. ILLUSTRATION DEPICTS A STRAIGHT FITTING ASSEMBLY.

CHG	JOB NO	DATE	BY	REVISION
-	PN0648-03	04/23/96	FHC	INITIAL LOAD
A	PN0648-04	09/06/96	FHC	REV. LEVELS FROM 23-12343-000/002, RMVD NOTE 3.

DRAWN	FHC	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSY, WIRE BRAID 90° ELBOW TO SWIVEL	A23-12382	
DATE	06/19/96	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
		ELBOW A23-12322	SWIVEL A23-12299	48-25174	J			
8	3/4-16	-008	-008	-008	L-2.51	3500	3.50	A23-12382-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 EXZAMPLE: A23-12382-065, THE DASH NUMBER DENOTES AN ASSEMBLY 65 INCHES IN LENGTH.

3. MATERIAL: ELBOW FITTING, STEEL NIPPLE, STEEL NUT AND SHELL; SWIVEL FITTING, BRASS NIPPLE, STEEL NUT AND SHELL; HOSE SINGLE WIRE BRAID REINFORCED MEETING SAE J 1402 STANDARDS FOR TABLE A1 AIR BRAKE HOSE.

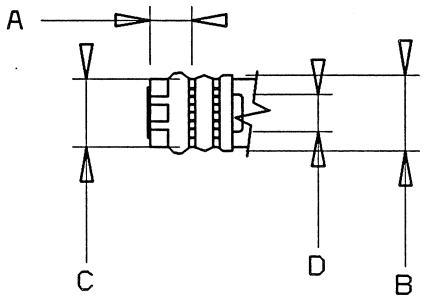
   CAUTION: HOSE AND FITTINGS USED IN THE ABOVE ASSEMBLIES MUST BE FROM THE SAME MANUFACTURER.

4. LABEL REQUIRED FOR AFTERMARKET APPLICATIONS.

5. SEE SHEET 2 FOR CRIMP DIMENSIONS.

CHG	JOB NO	DATE	BY	REVISION
-	695884-05	06/19/96	DAJ	INITIAL LOAD

DRAWN	FHC	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSY, WIRE BRAID 90° ELBOW TO SWIVEL	A23-12382	
DATE	06/19/96			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2	CHG. LTR. -

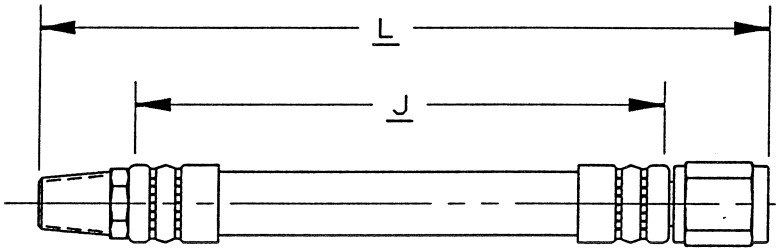


HOSE SIZE	CRIMP DIMENSIONS (MIN/MAX)			
	A	B	C	D(MIN)
8	.46/.50	.67/.69	.655/.675	.268

CHG	JOB NO	DATE	BY	REVISION
-	695884-05	06/19/96	FHC	INITIAL LOAD

ADRIENNE CHILBERG

DRAWN	FHC	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSY-FIBER REINFORCED, MALE PIPE TO FEM SWIVEL SAE 45°	A23-12398	
DATE	09/27/96			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2	CHG. LTR. B



HOSE SIZE	THREAD	FITTINGS		HOSE		PSI (MAX)	BEND RADIUS (MIN)	FREIGHTLINER PART NUMBER
		MALE A23-12407	FEMALE A23-12406	48-25193	J			
6	5/8-18	-006	-006	-006	L-1.67	225	1-3/4	A23-12398-L
8	3/4-16	-008	-008	-008	L-1.81	225	2	A23-12408-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: A23-12398-065, THE DASH NUMBER DENOTES AN ASSEMBLY 65 INCHES IN LENGTH.

3. MATERIAL: MALE PIPE FITTING-BRASS NIPPLE AND NUT, STEEL SHELL; FEMALE SWIVEL FITTING-BRASS NIPPLE AND NUT, STEEL SHELL; HOSE-SINGLE FABRIC OR SPIRAL BRAID REINFORCED MEETING SAE J 1402 STANDARDS AND DOT FMVSS 106.

   CAUTION: HOSE AND FITTINGS USED IN THE ABOVE ASSEMBLIES MUST BE FROM THE SAME MANUFACTURER.

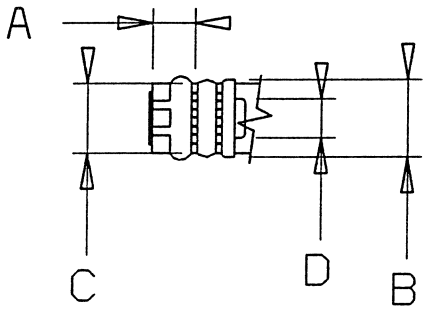
4. LABEL REQUIRED FOR AFTERMARKET APPLICATIONS.

5. SEE SHEET 2 FOR CRIMP DIMENSIONS.

CHG	JOB NO	DATE	BY	REVISION
-	P00339-03	09/27/96	FHC	INITIAL LOAD
A	PA2042-76	04/17/97	DAJ	REVISED NOTE 3 AND CRIMP DIMS ON SHT 2.
B	PA2042-82	12/23/97	DAJ	TITLE WAS "MALE TO FEMALE, SWIVEL 45° FLARE"

ADRIENNE CHILBERG

DRAWN	FHC	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSY-FIBER REINFORCED, MALE PIPE TO FEM SWIVEL SAE 45°	A23-12398	
DATE	09/27/96			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2	CHG. LTR. B

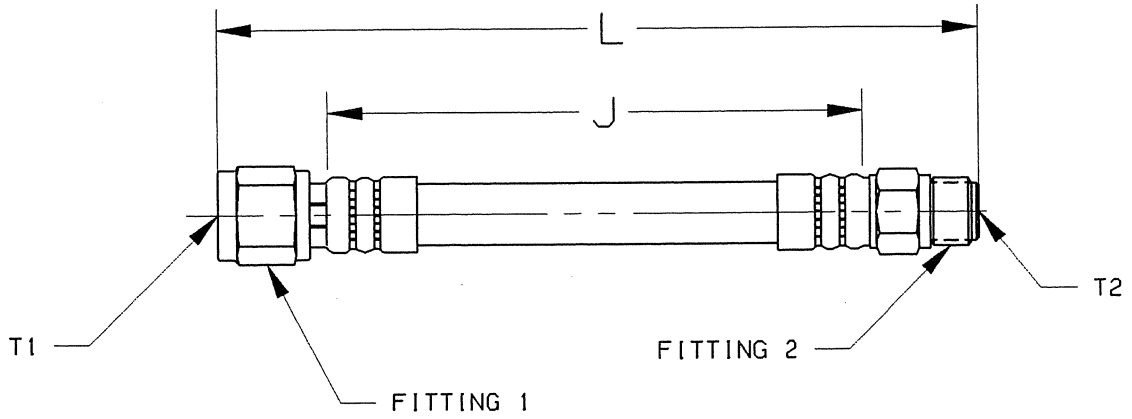


HOSE SIZE	CRIMP DIMENSIONS (MIN/MAX)			
	A	B	C (REF)	D (MIN)
6	.36/.40	.645/.555	.635	.248
8	.36/.40	.810/.820	.800	.330

A

CHG	JOB NO	DATE	BY	REVISION
-	P00339-03	09/27/96	FHC	INITIAL LOAD
A	PA2042-76	04/17/97	DAJ	REVISED NOTE 3 ON SHT 1 AND CRIMP DIMS.
B	PA2042-82	12/23/97	DAJ	TITLE WAS "MALE TO FEMALE, SWIVEL 45° FLARE"

DRAWN	IP	TITLE	DRAWING NUMBER	
APPRV	LKG	HOSE ASSY-WIRE BRAID 37°M/FLARE TO SWIVEL, 37°JIC, STL	A23-12469	
DATE	09/18/98	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
		FITTING 1 A23-12299	FITTING 2 23-12474	48-00121	J			
10	T1=7/8-14 T2=7/8-14	-010	-010	-010	L-2.71	1000	2-1/4	A23-12478-L
16	T1=1-5/16-12 T2=1-5/8-12	-016	-620	-016	L-3.29	400	3-1/2	A23-12479-L
20	T1=1-5/8-12 T2=1-5/8-12	-020	-020	-020	L-3.60	300	4-1/2	A23-12469-L

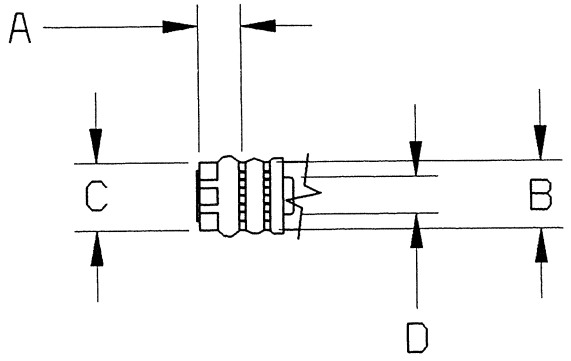
ENGINEERING NOTES:

1. THE HOSE ASSEMBLY MUST MEET THE APPLICABLE REQUIREMENTS OF SAE 1402-A1 AND DOT FMVSS106-A1.
2. PART NUMBER EXAMPLE: A23-12469-015, THE DASH NUMBER DENOTES AN ASSEMBLY 15 INCHES IN LENGTH.
3. MATERIAL: SWIVEL FITTING-STEEL NIPPLE, STEEL NUT AND SHELL; FLARE FITTING-STEEL NIPPLE, STEEL FLARE AND SHELL; HOSE-SINGLE WIRE BRAID REINFORCED, MEDIUM PRESSURE.

   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
-	P03175-93	09/18/98	IP	INITIAL LOAD

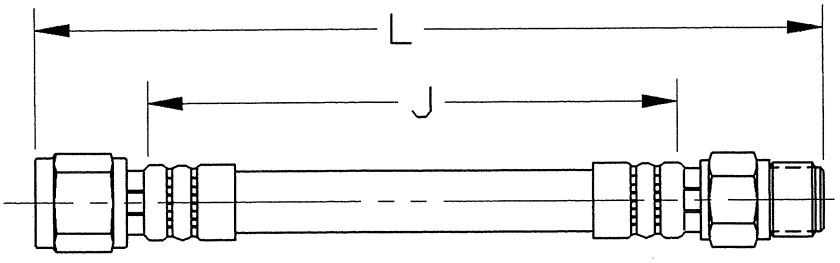
DRAWN	IP	TITLE	DRAWING NUMBER	
APPRV	LKG	HOSE ASSY-WIRE BRAID 37°M/FLARE TO SWIVEL, 37°JIC, STL	A23-12469	
DATE	09/18/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2	CHG. LTR. -
CATIA ORIGINAL				



HOSE SIZE	CRIMP DIMENSIONS (MIN/MAX)			
	A	B	C	D(MIN)
10	.56/.60	0.805/0.825	0.790/0.810	.330
16	.59/.63	1.175/1.195	1.160/1.180	.648
20	.63/.67	1.420/1.440	1.405/1.425	.846

CHG	JOB NO	DATE	BY	REVISION
-	P03175-93	09/18/98	IP	INITIAL LOAD

DRAWN	IP	TITLE	DRAWING NUMBER	
APPRV	LKG	HOSE ASSY-WIRE BRAID 37°M/ FLARE TO SWIVEL, 37° JIC, STL	A23-12472	
DATE	09/18/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2	CHG. LTR. -
CATIA ORIGINAL				



HOSE SIZE	THREADS	FITTINGS		HOSE		PSI (MAX)	BEND RADIUS (MIN)	FREIGHTLINER PART NUMBER
		SWVL FTG A23-12299	FLR FTG 23-12474	48-25003	J			
20	1-5/8-12	-020	-020	-020	L-3.60	625	9	A23-12472-L

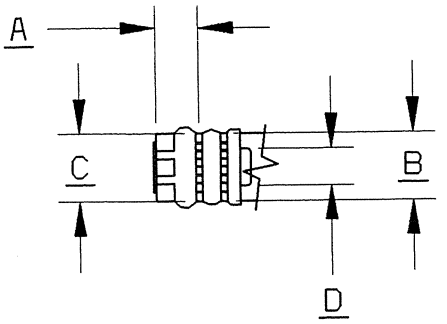
ENGINEERING NOTES:

1. THE HOSE ASSEMBLY MUST MEET THE APPLICABLE REQUIREMENTS OF SAE J517, SAE J343, AND SAE J1019.
2. PART NUMBER EXAMPLE: A23-12472-015, THE DASH NUMBER DENOTES AN ASSEMBLY 15 INCHES IN LENGTH.
3. MATERIAL: SWIVEL FITTING-STEEL NIPPLE, STEEL FLANGE AND SHELL; FLARE FITTING-STEEL NIPPLE, STEEL FLARE AND SHELL; HOSE-SINGLE WIRE BRAID REINFORCED, MEDIUM PRESSURE.

   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
-	P03175-93	09/18/98	IP	INITIAL LOAD

DRAWN	IP	TITLE	DRAWING NUMBER	
APPRV	LKG	HOSE ASSY-WIRE BRAID 37° M/ FLARE TO SWIVEL, 37° JIC, STL	A23-12472	
DATE	09/18/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2	CHG. LTR. -
CATIA ORIGINAL				

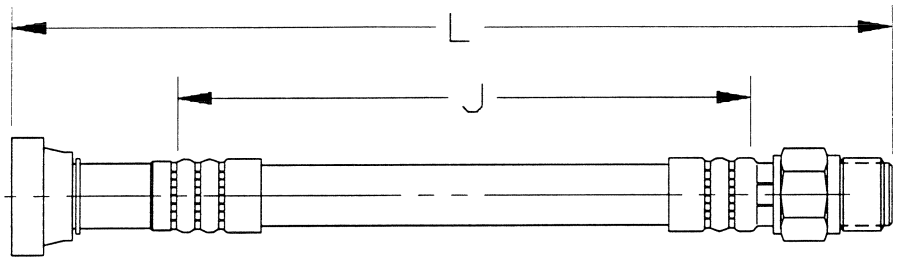


HOSE SIZE	CRIMP DIMENSIONS (MIN/MAX)			
	A	B	C	D(MIN)
20	.63/.67	1.460/1.480	1.445/1.465	.846

CHG	JOB NO	DATE	BY	REVISION
-	P03175-93	09/18/98	IP	INITIAL LOAD

DRAWN	IP	TITLE	DRAWING NUMBER	
APPRV	LKG	HOSE ASSY-WIRE BRAID CODE 61 FLG TO 37° MALE FLARE	A23-12473	
DATE	09/18/98			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2	CHG. LTR. B

B



B

HOSE SIZE	THREAD	FITTINGS		HOSE		PSI (MAX)	BEND RADIUS (MIN)	FREIGHTLINER PART NUMBER
		FLANGE 23-12475	FITTING A23-12474	48-25003	J			
20	1-5/8-12	-020	-020	-020	L-5.23	625	9	A23-12473-L

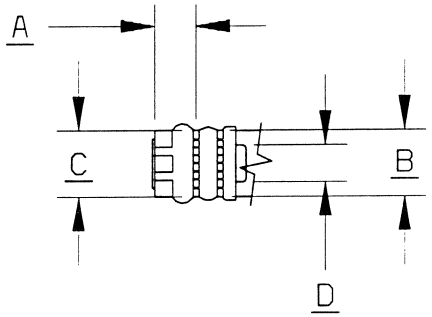
ENGINEERING NOTES:

1. THE HOSE ASSEMBLY MUST MEET THE APPLICABLE REQUIREMENTS OF SAE J517, SAE J343, AND SAE J1019.
2. PART NUMBER EXAMPLE: A23-12473-015, THE DASH NUMBER DENOTES AN ASSEMBLY 15 INCHES IN LENGTH.
3. MATERIAL: FLANGE FITTING-STEEL NIPPLE, STEEL FLANGE AND SHELL; FLARE FITTING-STEEL NIPPLE, STEEL FLARE AND SHELL; HOSE-SINGLE WIRE BRAID REINFORCED, MEDIUM PRESSURE.

   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
-	P03175-93	09/18/98	IP	INITIAL LOAD
A	P03175-D2	02/19/99	IP	WAS 23-12474-020 FITTING
B	P10227-03	10/27/99	LFB	WAS 23-12299-020. WAS L-4.63. ADDED FITTING.

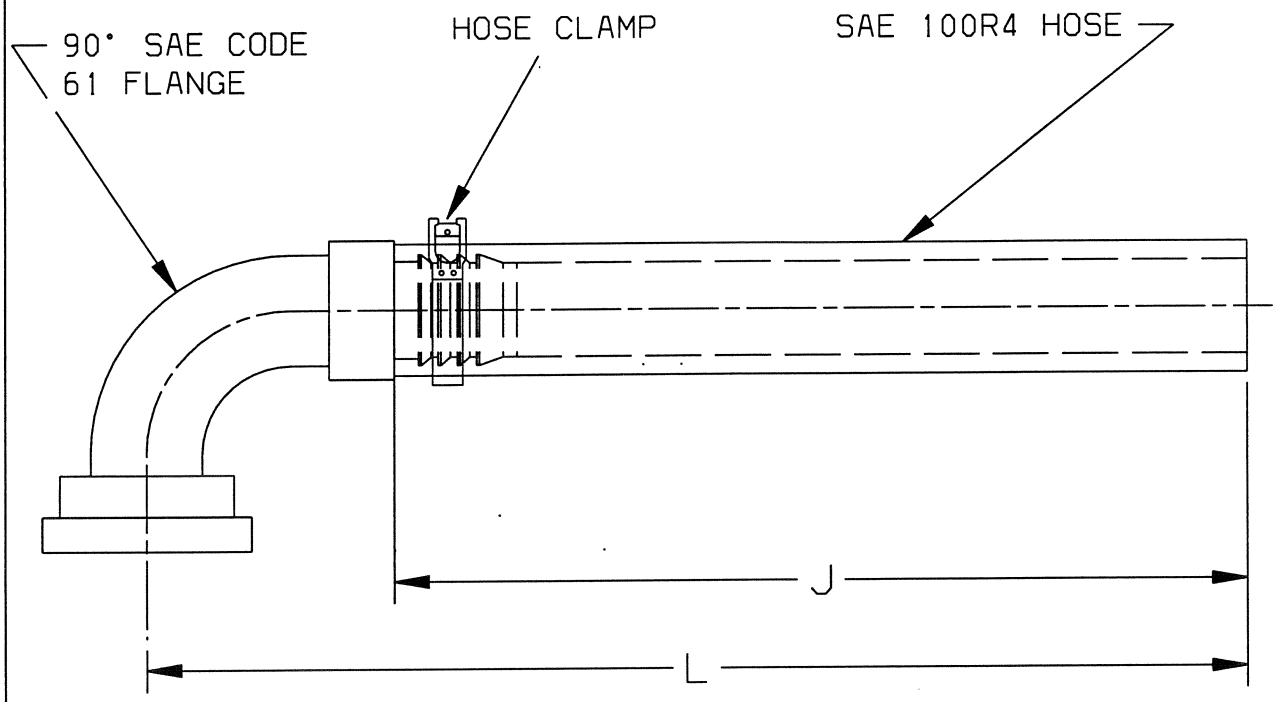
DRAWN	IP	TITLE	DRAWING NUMBER	
APPRV	LKG	HOSE ASSY-WIRE BRAID CODE 61 FLG TO 37° MALE FLARE	A23-12473	
DATE	09/18/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2	CHG. LTR. B
CATIA ORIGINAL				



HOSE SIZE	CRIMP DIMENSIONS (MIN/MAX)			
	A	B	C	D(MIN)
20	.63/.67	1.460/1.480	1.445/1.465	.846

CHG	JOB NO	DATE	BY	REVISION
-	P03175-93	09/18/98	IP	INITIAL LOAD
A	P03175-D2	02/19/99	IP	SEE SHEET 1.
B	P10227-03	10/27/99	LFB	SEE SHEET 1.

DRAWN	IP	TITLE	DRAWING NUMBER	
APPRV	LKG	HOSE ASSEMBLY 90° CODE 61 FLANGE	A23-12477	
DATE	09/18/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. B
CATIA ORIGINAL				



(A)

HOSE SIZE	FLANGE SIZE	FITTING 23-12476	HOSE 48-02015	CLAMP 23-12201	J	PSI (MAX)	MIN BEND RADIUS	FREIGHTLINER PART NUMBER
24	24	-024	-024	-175	L-2.46	50	10	A23-12477-L

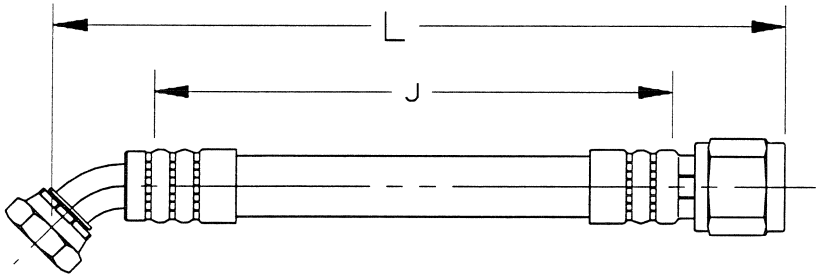
(B)

ENGINEERING NOTES:

1. CAUTION: THE HOSE AND FITTING USED IN THE ABOVE ASSEMBLY MUST BE FROM THE SAME MANUFACTURER.
2. ALL DIMENSIONS ARE IN INCHES.
3. PART NO. EXAMPLE: A23-12477-015. THE DASH NO. DENOTES AN ASSEMBLY 15 INCHES IN LENGTH.

CHG	JOB NO	DATE	BY	REVISION
-	P03175-93	09/18/98	IP	INITIAL RELEASE
A	P03175-D2	02/19/99	IP	WAS 23-11382-028
B	P05049-57	01/05/00	AJD	23-12201-175 WAS 23-12201-200

DRAWN	DAB	TITLE HOSE ASSY-WIRE BRAID 45° ELBOW TO SWIVEL, 37° JIC, STEEL	DRAWING NUMBER A23-12581
APPRV	DAJ		
DATE	02/10/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2 / CHG. LTR. A
CATIA ORIGINAL			



	HOSE SIZE	THREAD	FITTINGS		HOSE		PSI (MAX)	BEND RADIUS (MIN)	FREIGHTLINER PART NUMBER
			ELBOW A23-12418	FITTING A23-12299	48-00121	J			
A	16	1 5/16-12	-016	-016	-016	L-3.78	400	3 1/2	A23-12629-L
	20	1 5/8-12	-020	-020	-020	L-4.18	300	4 1/2	A23-12581-L

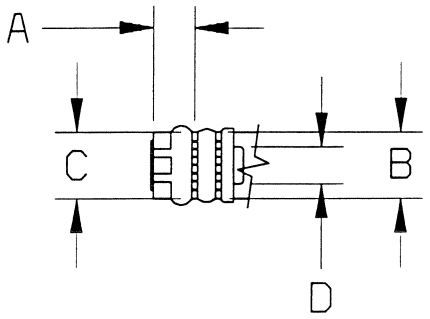
ENGINEERING NOTES:

1. THE HOSE ASSEMBLY MUST MEET THE APPLICABLE REQUIREMENTS OF SAE 1402-A1 AND DOT FMVSS 106-A1.
2. PART NUMBER EXAMPLE: A23-12581-086, THE DASH NUMBER DENOTES AN ASSEMBLY 86 INCHES IN LENGTH.
3. MATERIAL: ELBOW FITTING-STEEL NIPPLE, STEEL NUT AND SHELL; SWIVEL FITTING-STEEL NIPPLE, STEEL NUT AND SHELL; HOSE-SINGLE WIRE BRAID REINFORCED, MEDIUM PRESSURE.

   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
-	F19093-11	02/10/99	DAB	INITIAL LOAD
A	P05051-53	06/04/99	IP	ADDED A23-12629-L

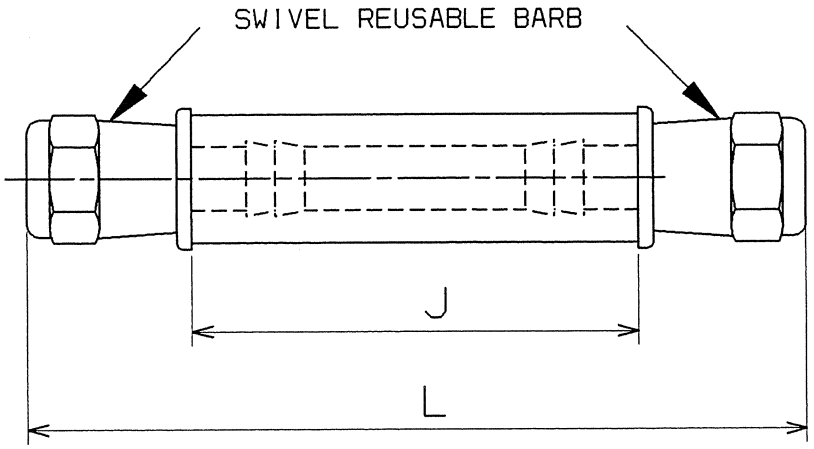
DRAWN	DAB	TITLE	DRAWING NUMBER
APPRV	DAJ	HOSE ASSY-WIRE BRAID 45° ELBOW TO SWIVEL, 37° JIC, STEEL	A23-12581
DATE	02/10/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2 / CHG. LTR. A
CATIA ORIGINAL			



	HOSE SIZE	CRIMP DIMENSIONS (MIN/MAX)			
		A	B	C	D(MIN)
A	16	.59/.63	1.175/1.195	1.160/1.180	.648
	20	.63/.67	1.420/1.440	1.405/1.425	.846

CHG	JOB NO	DATE	BY	REVISION
-	F19093-11	02/10/99	DAB	INITIAL LOAD
A	P05051-53	06/04/99	IP	SEE SHEET 1

DRAWN	IP	TITLE	DRAWING NUMBER	
APPRV	LKG	HOSE ASSEMBLY STRAIGHT SWIVEL, BARBED	A23-12482	
DATE	09/18/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. -
CATIA ORIGINAL				



HOSE SIZE	THREAD SAE	FITTINGS	HOSE		PSI (MAX)	MIN. BEND RADIUS	FREIGHTLINER PART NUMBER*
			48-25049	LENGTH J			
8	3/4-16	681 997 01 72	-008	L-1.92	250	5.00	A23-12482-L

* COMPLETE PART NUMBER BY ADDING A THREE DIGIT DASH NUMBER EXPRESSING LENGTH 'L' IN INCHES. (E.G. A23-12482-016 IS A HOSE ASSEMBLY 16 INCHES LONG).

ENGINEERING NOTES:

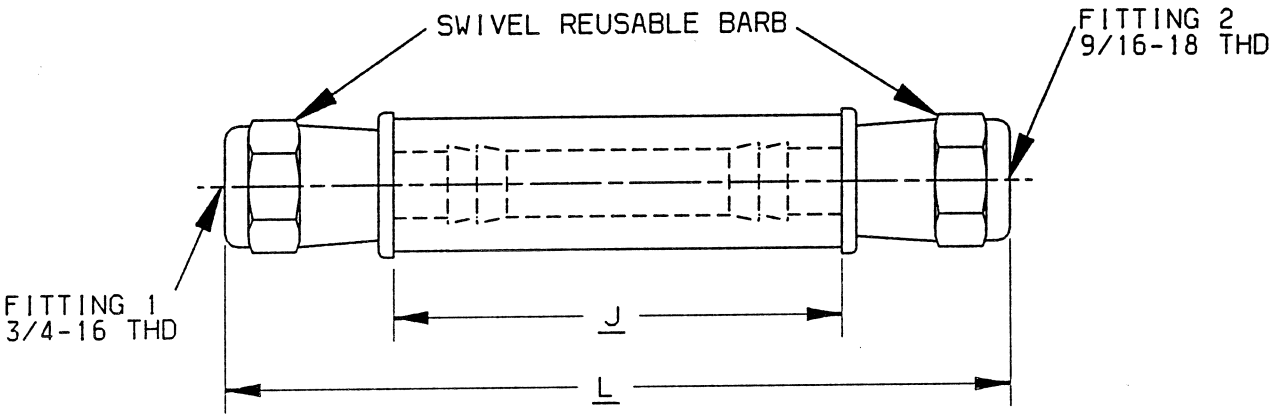
1. CAUTION: THE HOSE AND FITTINGS USED IN THE ABOVE ASSEMBLY MUST BE FROM THE SAME MANUFACTURER.

2. ALL DIMENSIONS ARE IN INCHES.

CHG	JOB NO	DATE	BY	REVISION
-	P03175-93	09/18/98	IP	INITIAL LOAD

DRIENNE CHILBERG

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSEMBLY STRAIGHT SWIVEL, BARBED	A23-12494	
DATE	02/20/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1	CHG. LTR. A
CATIA ORIGINAL				



HOSE SIZE	FITTING 1	HOSE	FITTING 2	J	WORKING PRESS MAX (PSI)	MIN BENDING RADIUS	FREIGHTLINER PART NUMBER*
8	681 997 01 72	48-25049-008	23-12492-068	L-1.81	250	5.00	A23-12494-L

* COMPLETE PART NUMBER BY ADDING A THREE DIGIT DASH NUMBER EXPRESSING LENGTH 'L' IN INCH. (E.G. A23-12494-012 IS A HOSE ASSEMBLY 12 INCHES LONG).

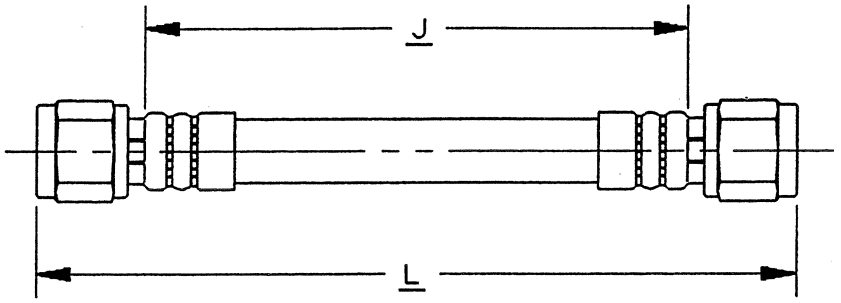
ENGINEERING NOTES:

1. CAUTION: THE HOSE AND FITTINGS USED IN THE ABOVE ASSEMBLIES MUST BE FROM THE SAME MANUFACTURER.

2. ALL DIMENSIONS ARE IN INCHES.

CHG	JOB NO	DATE	BY	REVISION
-	951074-11	02/20/98	DAJ	INITIAL LOAD
A	PA2042-83	03/20/98	DAJ	ADDED 'L' DIMENSION, 'J' DIMENSION WAS 'L'

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSY-WIRE BRAID STRAIGHT, 37° JIC, STEEL	A23-12504	
DATE	04/20/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2	CHG. LTR. -
CATIA ORIGINAL				



HOSE SIZE	THREAD	FITTING	HOSE		PSI (MAX)	BEND RADIUS (MIN)	FREIGHTLINER PART NUMBER
		A23-12299	48-25003	J			
20	1-5/8-12	-020	-020	L-3.00	625	9	A23-12504-L

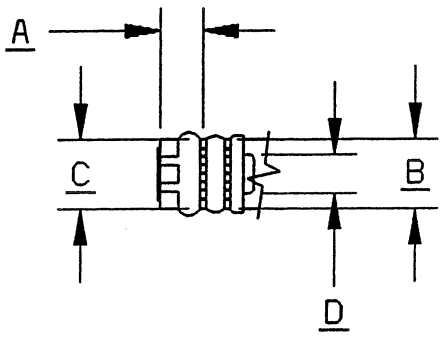
ENGINEERING NOTES:

1. THE HOSE ASSEMBLY MUST MEET THE APPLICABLE REQUIREMENTS OF SAE J517, SAE J343, AND SAE J1019.
2. PART NUMBER EXAMPLE: A23-12504-019, THE DASH NUMBER DENOTES AN ASSEMBLY 19 INCHES IN LENGTH.
3. MATERIAL: SWIVEL FITTINGS-STEEL NIPPLE, STEEL NUT AND SHELL; HOSE-SINGLE WIRE BRAID REINFORCED, MEDIUM PRESSURE.

   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
-	P03175-61	04/20/98	DAJ	INITIAL LOAD

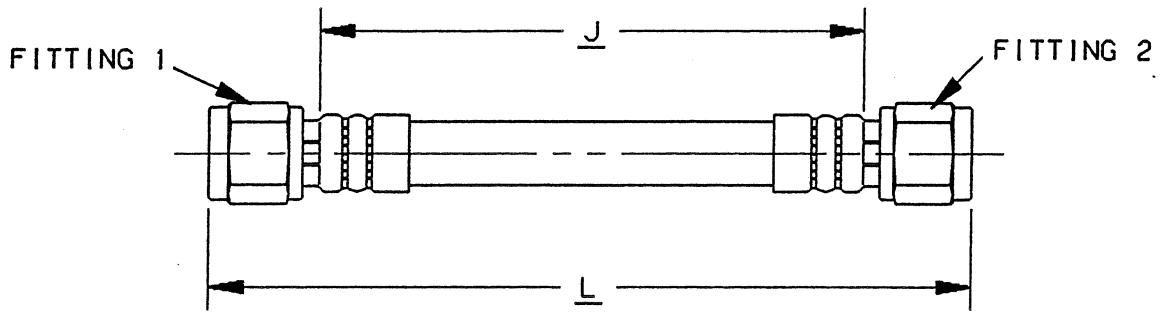
DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSY-WIRE BRAID STRAIGHT, 37° JIC, STEEL	A23-12504	
DATE	04/20/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2	CHG. LTR. -
CATIA ORIGINAL				



HOSE SIZE	CRIMP DIMENSIONS (MIN/MAX)			
	A	B	C	D(MIN)
20	.63/.67	1.46/1.48	1.445/1.465	.846

CHG	JOB NO	DATE	BY	REVISION
-	P03175-61	04/20/98	DAJ	INITIAL LOAD

DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSY-WIRE BRAID SWIVELS, ALL STEEL	A23-12505	
DATE	04/20/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2	CHG. LTR. -
CATIA ORIGINAL				



HOSE SIZE	FITTINGS		HOSE		PSI (MAX)	BEND RADIUS (MIN)	FREIGHTLINER PART NUMBER
	FITTING 1	FITTING 2	48-00121	J			
10	A23-12299-010	A23-12299-108	-010	L-2.63	1000	2.25	A23-12505-L

ENGINEERING NOTES:

1. THE ASSEMBLED HOSE MST QUALIFY UNDER ALL THE LATEST PROVISIONS OF TEST REQUIREMENTS FOR SAE 1402 HOSE ASSEMBLIES, AND MUST MEET APPLICABLE CURRENT REQUIREMENTS OF FEDERAL MOTOR VEHICLE SAFETY STANDARD #106.

2. PART NUMBER EXAMPLE: A23-12505-042, THE DASH NUMBER DENOTES AN ASSEMBLY 42 INCHES IN LENGTH.

3. MATERIAL: FITTINGS, STEEL NIPPLE, STEEL NUT AND SHELL; HOSE, SINGLE WIRE BRAID REINFORCED MEETING SAE J1402 STANDARDS FOR TABLE A1 AIR BRAKE HOSE.

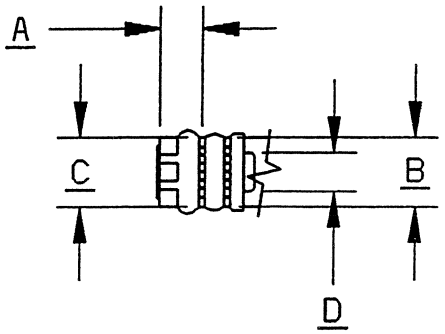
   CAUTION: HOSE AND FITTINGS USED IN THE ABOVE ASSEMBLIES MUST BE FROM THE SAME MANUFACTURER.

4. LABEL REQUIRED FOR AFTERMARKET APPLICATIONS.

5. SEE SHEET 2 FOR CRIMP DIMENSIONS.

CHG	JOB NO	DATE	BY	REVISION
-	P03175-61	04/20/98	DAJ	INITIAL LOAD

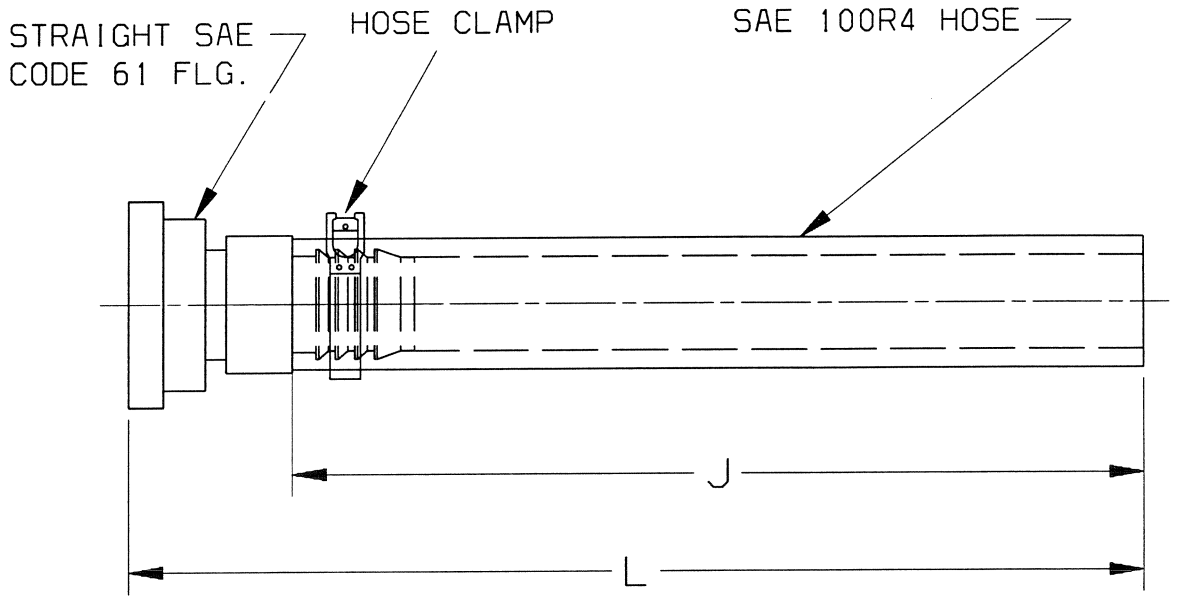
DRAWN	DAJ	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSY-WIRE BRAID SWIVEL, ALL STEEL	A23-12505	
DATE	04/20/98	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2	CHG. LTR. -
CATIA ORIGINAL				



HOSE SIZE	CRIMP DIMENSIONS (MIN/MAX)			
	A	B	C	D(MIN)
8	.46/.50	.67/.69	.655/.675	.268
10	.56/.60	.805/.825	.79/.81	.330

CHG	JOB NO	DATE	BY	REVISION
-	P03175-61	04/20/98	DAJ	INITIAL LOAD

DRAWN	IP	TITLE HOSE ASSEMBLY STRAIGHT CODE 61 FLANGE	DRAWING NUMBER A23-12584
APPRV	LKG		
DATE	02/19/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. A
CATIA ORIGINAL			



HOSE SIZE	FLANGE SIZE	FITTING 23-12223	HOSE 48-02015	CLAMP 23-12201	J	PSI (MAX)	MIN BEND RADIUS	FREIGHTLINER PART NUMBER
24	24	-024	-024	-175	L-2.07	50	10	A23-12584-L

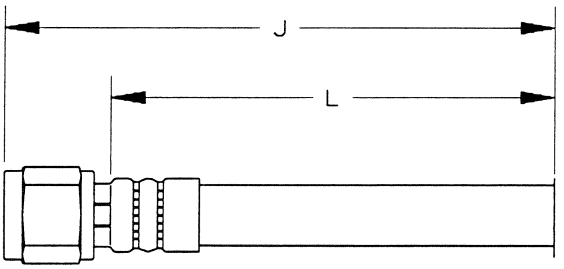
(A)

ENGINEERING NOTES:

1. CAUTION: THE HOSE AND FITTING USED IN THE ABOVE ASSEMBLY MUST BE FROM THE SAME MANUFACTURER.
2. ALL DIMENSIONS ARE IN INCHES.
3. PART NO. EXAMPLE: A23-12584-015. THE DASH NO. DENOTES AN ASSEMBLY 15 INCHES IN LENGTH.

CHG	JOB NO	DATE	BY	REVISION
-	P03175-D2	02/19/99	IP	INITIAL RELEASE
A	P10481-07	02/19/99	AJD	CLAMP SIZE WAS -200

DRAWN	CGD	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSEMBLY-FIBER BRAID, FEMALE FLARE SWIVEL	A23-12660	
DATE	06/17/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2	CHG. LTR. -



HOSE SIZE	THREAD	FREIGHTLINER PART NUMBER			PSI (MAX)	BEND RADIUS (MIN)	FREIGHTLINER PART NUMBER
		FITTING	HOSE	J			
6	5/8-18	A23-12247-006	48-25402-006	L+.98	500	1.00	A23-12660-L

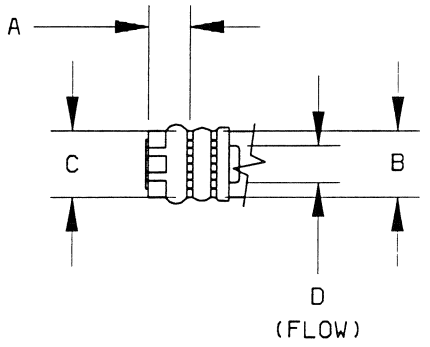
ENGINEERING NOTES:

1. THE HOSE ASSEMBLY MUST MEET THE APPLICABLE REQUIREMENTS OF SAE 1402-A1, SAE J1019, AND DOT FMVSS 106.
2. PART NUMBER EXAMPLE: A23-12260-036, THE DASH NUMBER DENOTES AN ASSEMBLY 36 INCHES IN LENGTH.
3. MATERIAL: FITTING - BRASS NIPPLE, STEEL NUT AND SHELL.
   HOSE - DOUBLE FIBER BRAID REINFORCED MEETING SAE J 1402 STANDARDS FOR TABLE A1 AIR BRAKE HOSE.

   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
-	P07783-01	06/17/99	CGD	INITIAL RELEASE

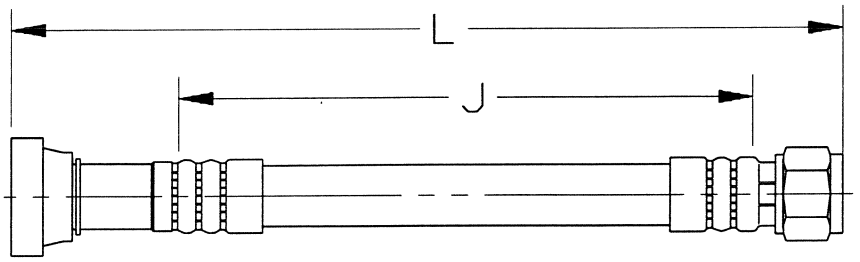
DRAWN	CGD	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSEMBLY-FIBER BRAID, FEMALE FLARE SWIVEL	A23-12660	
DATE	06/17/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2	CHG. LTR. -



HOSE SIZE	CRIMP DIMENSIONS (MIN/MAX)			
	A	B	C	D(MIN)
6	.46/.50	.575/.595	.560/.580	.206

CHG	JOB NO	DATE	BY	REVISION
-	P07783-01	06/17/99	CGD	INITIAL RELEASE

DRAWN	LFB	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSY-WIRE BRAID CODE 61 FLG TO SWIVEL, 37° JIC, STL	A23-12693	
DATE	10/27/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2	CHG. LTR. A



HOSE SIZE	THREAD	FITTINGS		HOSE		PSI (MAX)	BEND RADIUS (MIN)	FREIGHTLINER PART NUMBER
		FLANGE 23-12475	FITTING A23-12299	48-25003	J			
20	1-5/8-12	-020	-020	-020	L-4.63	625	9	A23-12693-L

ENGINEERING NOTES:

1. THE HOSE ASSEMBLY MUST MEET THE APPLICABLE REQUIREMENTS OF SAE J517, SAE J343, AND SAE J1019.

A 2. PART NUMBER EXAMPLE: A23-12693-015, THE DASH NUMBER DENOTES AN ASSEMBLY 15 INCHES IN LENGTH.

A 3. MATERIAL: FLANGE FITTING-STEEL NIPPLE, STEEL FLANGE AND SHELL; SWIVEL FITTING-STEEL NIPPLE, STEEL NUT AND SHELL; HOSE-SINGLE WIRE BRAID REINFORCED, MEDIUM PRESSURE.

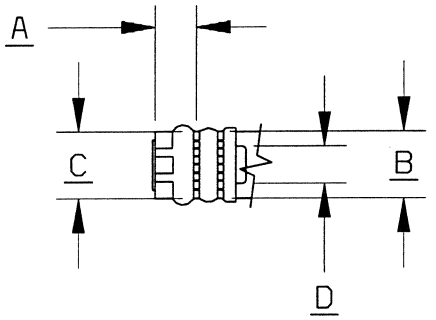
CAUTION: HOSE AND FITTINGS USED IN THE ABOVE ASSEMBLIES MUST BE FROM THE SAME MANUFACTURER.

4. LABEL REQUIRED FOR AFTERMARKET APPLICATIONS.

5. SEE SHEET 2 FOR CRIMP DIMENSIONS.

CHG	JOB NO	DATE	BY	REVISION
-	P10227-03	10/27/99	LFB	INITIAL LOAD
A	PA2042-98	11/26/99	LFB	12693 WAS 12473, SWIVEL WAS FLARE, NUT WAS FLARE.

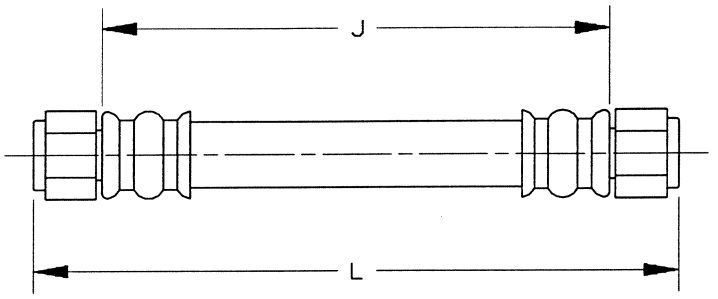
DRAWN	LFB	TITLE HOSE ASSY-WIRE BRAID CODE 61 FLG TO SWIVEL, 37° JIC, STL	DRAWING NUMBER A23-12693
APPRV	DAJ		
DATE	10/27/99		
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2 / CHG. LTR. A



HOSE SIZE	CRIMP DIMENSIONS (MIN/MAX)			
	A	B	C	D(MIN)
20	.63/.67	1.460/1.480	1.445/1.465	.846

CHG	JOB NO	DATE	BY	REVISION
-	P10227-03	10/27/99	LFB	INITIAL LOAD
A	PA2042-98	11/26/99	LFB	SEE SHEET 1.

DRAWN	LFB	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSY, REINFORCED ALTERNATIVE FUEL	A23-12747	
DATE	01/06/00	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2	CHG. LTR. -
CATIA ORIGINAL				



HOSE SIZE	THREAD	FREIGHTLINER PART NUMBER			PSI (MAX)	BEND RADIUS (MIN)	FREIGHTLINER PART NUMBER
		FITTINGS	HOSE	J			
8	3/4-16	A23-12247-008	48-25469-008	L-2.44	350	4 5/8	A23-12747-L

ENGINEERING NOTES:

1. MATERIAL: FITTINGS, BRASS NIPPLE, STEEL NUT AND SHELL:
   HOSE: WIRE BRAID REINFORCED MEETING CAN/CGA-8.1-M86 TYPE III.

   CAUTION: HOSE AND FITTINGS USED IN THE ABOVE ASSEMBLIES MUST BE FROM THE SAME MANUFACTURER.

2. PART NUMBER EXAMPLE: A23-12747-036. THE DASH NUMBER DENOTES A 36 INCH ASSEMBLY.

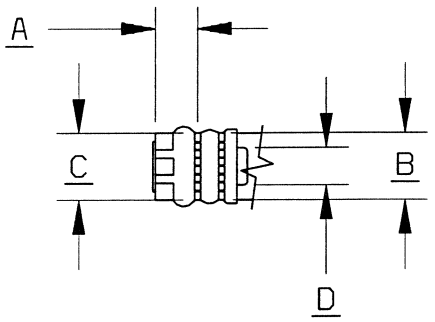
3. THE HOSE ASSEMBLY MUST COMPLY WITH ALL THE TEST REQUIREMENTS OF CANADIAN GAS ASSOCIATION. (C.G.A.) CAN/CGA-8.1-M86 TYPE III.

4. LABEL REQUIRED FOR AFTERMARKET APPLICATION.

5. SEE SHEET 2 FOR CRIMP DIMENSIONS.

CHG	JOB NO	DATE	BY	REVISION
-	G27652-03	01/06/00	LFB	INITIAL LOAD

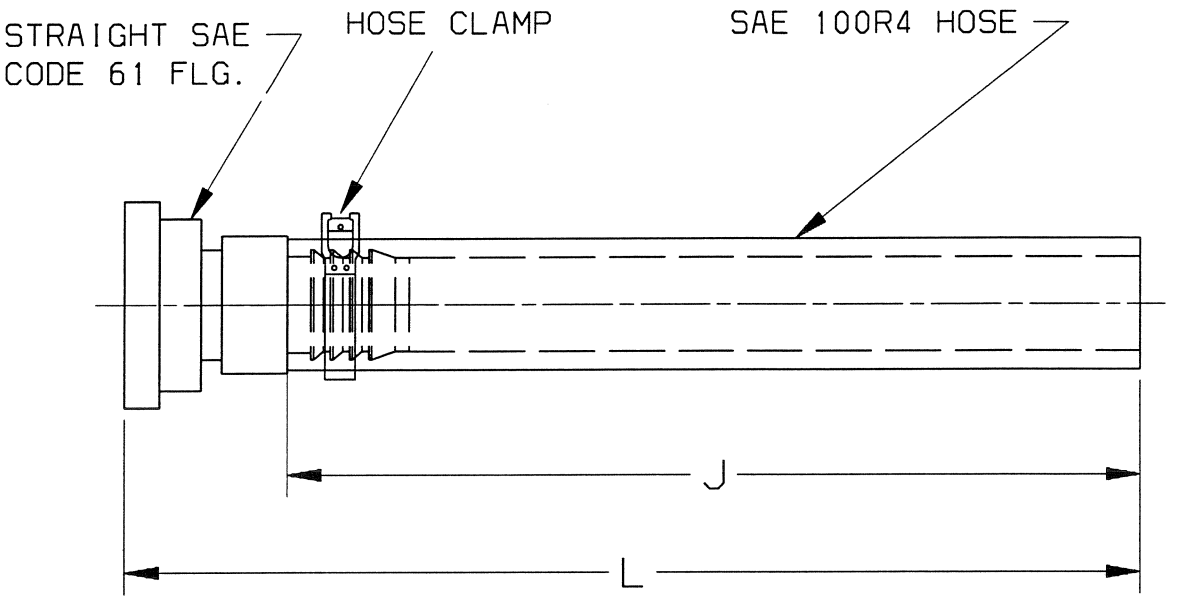
DRAWN	LFB	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSY, REINFORCED ALTERNATIVE FUEL	A23-12747	
DATE	01/06/00	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2	CHG. LTR. -
CATIA ORIGINAL				



HOSE SIZE	CRIMP DIMENSIONS (MIN/MAX)			
	A	B	C	D(MIN ID)
8	.46/.50	.710/.730	.695/.715	.268

CHG	JOB NO	DATE	BY	REVISION
-	G27652-03	01/06/00	LFB	INITIAL LOAD

DRAWN	IP	TITLE HOSE ASSEMBLY STRAIGHT CODE 61 FLANGE	DRAWING NUMBER A23-12584
APPRV	LKG		
DATE	02/19/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 1 / CHG. LTR. A
CATIA ORIGINAL			



HOSE SIZE	FLANGE SIZE	FITTING 23-12223	HOSE 48-02015	CLAMP 23-12201	J	PSI (MAX)	MIN BEND RADIUS	FREIGHTLINER PART NUMBER
24	24	-024	-024	-175	L-2.07	50	10	A23-12584-L

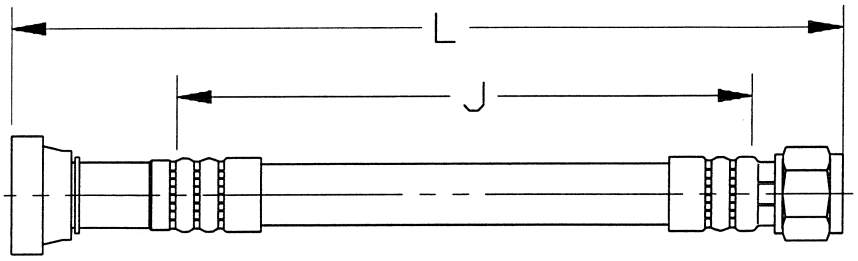
(A)

ENGINEERING NOTES:

1. CAUTION: THE HOSE AND FITTING USED IN THE ABOVE ASSEMBLY MUST BE FROM THE SAME MANUFACTURER.
2. ALL DIMENSIONS ARE IN INCHES.
3. PART NO. EXAMPLE: A23-12584-015. THE DASH NO. DENOTES AN ASSEMBLY 15 INCHES IN LENGTH.

CHG	JOB NO	DATE	BY	REVISION
-	P03175-D2	02/19/99	IP	INITIAL RELEASE
A	P10481-07	02/19/99	AJD	CLAMP SIZE WAS -200

DRAWN	LFB	TITLE HOSE ASSY-WIRE BRAID CODE 61 FLG TO SWIVEL, 37° JIC, STL	DRAWING NUMBER A23-12693
APPRV	DAJ		
DATE	10/27/99	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2 / CHG. LTR. A
CATIA ORIGINAL			



HOSE SIZE	THREAD	FITTINGS		HOSE		PSI (MAX)	BEND RADIUS (MIN)	FREIGHTLINER PART NUMBER
		FLANGE 23-12475	FITTING A23-12299	48-25003	J			
20	1-5/8-12	-020	-020	-020	L-4.63	625	9	A23-12693-L

ENGINEERING NOTES:

1. THE HOSE ASSEMBLY MUST MEET THE APPLICABLE REQUIREMENTS OF SAE J517, SAE J343, AND SAE J1019.

A 2. PART NUMBER EXAMPLE: A23-12693-015, THE DASH NUMBER DENOTES AN ASSEMBLY 15 INCHES IN LENGTH.

A 3. MATERIAL: FLANGE FITTING-STEEL NIPPLE, STEEL FLANGE AND SHELL; SWIVEL FITTING-STEEL NIPPLE, STEEL NUT AND SHELL; HOSE-SINGLE WIRE BRAID REINFORCED, MEDIUM PRESSURE.

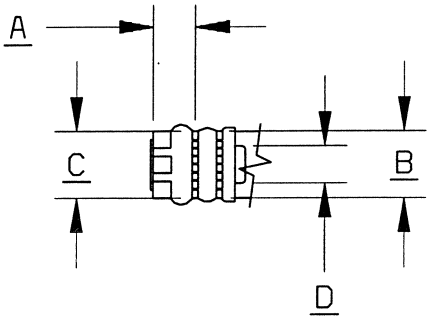
CAUTION: HOSE AND FITTINGS USED IN THE ABOVE ASSEMBLIES MUST BE FROM THE SAME MANUFACTURER.

4. LABEL REQUIRED FOR AFTERMARKET APPLICATIONS.

5. SEE SHEET 2 FOR CRIMP DIMENSIONS.

CHG	JOB NO	DATE	BY	REVISION
-	P10227-03	10/27/99	LFB	INITIAL LOAD
A	PA2042-98	11/26/99	LFB	12693 WAS 12473, SWIVEL WAS FLARE, NUT WAS FLARE.

DRAWN	LFB	TITLE HOSE ASSY-WIRE BRAID CODE 61 FLG TO SWIVEL, 37° JIC, STL	DRAWING NUMBER A23-12693	
APPRV	DAJ			
DATE	10/27/99			
CATIA ORIGINAL		FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 2 OF 2	CHG. LTR. A

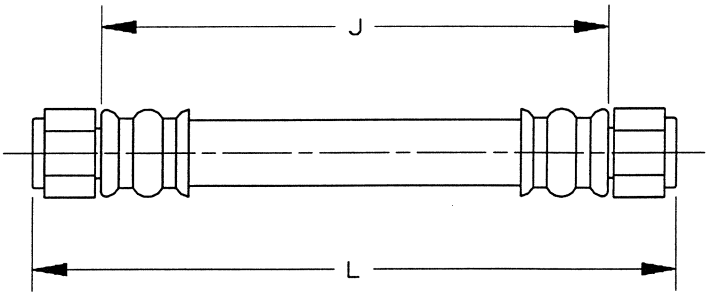


HOSE SIZE	CRIMP DIMENSIONS (MIN/MAX)			
	A	B	C	D(MIN)
20	.63/.67	1.460/1.480	1.445/1.465	.846

CHG	JOB NO	DATE	BY	REVISION
-	P10227-03	10/27/99	LFB	INITIAL LOAD
A	PA2042-98	11/26/99	LFB	SEE SHEET 1.

DEBBIE

DRAWN	LFB	TITLE	DRAWING NUMBER	
APPRV	DAJ	HOSE ASSY, REINFORCED ALTERNATIVE FUEL	A23-12747	
DATE	01/06/00	FREIGHTLINER CORPORATION PORTLAND, OREGON	SHEET 1 OF 2	CHG. LTR. -
CATIA ORIGINAL				



HOSE SIZE	THREAD	FREIGHTLINER PART NUMBER			PSI (MAX)	BEND RADIUS (MIN)	FREIGHTLINER PART NUMBER
		FITTINGS	HOSE	J			
8	3/4-16	A23-12247-008	48-25469-008	L-2.44	350	4 5/8	A23-12747-L

ENGINEERING NOTES:

1. MATERIAL: FITTINGS, BRASS NIPPLE, STEEL NUT AND SHELL:
   HOSE: WIRE BRAID REINFORCED MEETING CAN/CGA-8.1-M86 TYPE III.

   CAUTION: HOSE AND FITTINGS USED IN THE ABOVE ASSEMBLIES MUST BE FROM THE SAME MANUFACTURER.

2. PART NUMBER EXAMPLE: A23-12747-036. THE DASH NUMBER DENOTES A 36 INCH ASSEMBLY.

3. THE HOSE ASSEMBLY MUST COMPLY WITH ALL THE TEST REQUIREMENTS OF CANADIAN GAS ASSOCIATION. (C.G.A.) CAN/CGA-8.1-M86 TYPE III.

4. LABEL REQUIRED FOR AFTERMARKET APPLICATION.

5. SEE SHEET 2 FOR CRIMP DIMENSIONS.

CHG	JOB NO	DATE	BY	REVISION
-	G27652-03	01/06/00	LFB	INITIAL LOAD