

The evolution in **FLUID HORSEPOWER™** continues...

XRP ProPLUS Race Hose™

ANTI-STATIC PTFE COMPATIBLE WITH ALL AUTOMOTIVE FLUIDS AND FUELS

A highly compressed, non-porous matrix that is resistant to fuel permeation and diffusion.

SMOOTH INTERNAL TUBE

For superior flow rates, minimum pressure drops AND ease of clean-out, not possible in convoluted hoses.

EXTERNAL CONVOLUTIONS

Promotes hoop strength for vacuum resistance and supports tight bend flexibility.

NEW XRP RACE CRIMP HOSE ENDS

Black is "in" and it is our standard color; Blue and Super Nickel are options. Hundreds of styles are available. Your choice of full hex or lightweight turned down swivel nuts.

CRIMP COLLARS

Two styles allow XRP Race Crimp Hose Ends to be used on the ProPLUS Race Hose, Stainless Braided CPE Race Hose, XR-31 Black Nylon Braided CPE Hose and some convoluted PTFE hoses currently on the market. Black, Gold and Super Nickel.

YOUR CHOICE OF OUTER BRAIDS

XM - Lightweight XtraTemp Monofilament
XK - Aramid Fiber
XKS - Aramid Fiber with Silicone
XS - Stainless Steel
XT - Tube only for inside fuel cells

PATENTED MANUFACTURING PROCESS

Creates a full PTFE smooth-bore hose with external convolutions only on the outside of the tube wall, where they belong for flexibility, not on the inside where they can impede flow.

ProPLUS Xtreme Race Hose™

The Dry Sump Vacuum Race Hose

VACUUM SUPPORT

An engineered design with an externally wound stainless steel wire that provides great vacuum support and tight bend capability.

ANTI-STATIC PTFE TUBE

A high flowing, smooth bore, PTFE tube with external convolutions for flexibility. No internal convolutions that can cause flow restrictions.

YOUR CHOICE OF OUTER BRAIDS

XM - Lightweight XtraTemp Monofilament
XK - Aramid Fiber
XKS - Aramid Fiber with Silicone
XS - Stainless Steel



An exceptional achievement in race hose technology... Perhaps perfection.

ProPLUS Race Hose™ . . . THE EVOLUTION IN FLUID HORSEPOWER™

A hose system utilizing a carbon impregnated anti-static PTFE inner tube that is manufactured using a patented process that creates a smooth interior wall surface and convolutions only on the outside of the tube wall where they belong for increased flexibility and vacuum resistance. There are no convolutions on the inside where they can impede flow by causing turbulence and trapping contamination that can be very difficult to remove.

XRP® ProPLUS™ Race Hose has been designed and sized to directly target fully convoluted PTFE hose products in weight and bend radius while allowing for much greater flow rates due to the smooth inside tube wall. The smooth inside bore allows non-turbulent laminar flow capabilities and a hose assembly that can be cleaned out much easier than fully convoluted hoses.

Ten sizes in the range from -4 PLUS through -20. The PLUS sizes allow even larger I.D. hose options between normal size ranges to choose from. A choice of three braid options: **XS Stainless Steel, XM XtraTemp Monofilament, XK Aramid Fiber and XT Tube** (with no braid) for use inside fuel cells and vent lines. The anti-static PTFE tube is compatible with all automotive fluids and fuels including: Racing Gasoline, Ethanol, Methanol, Nitromethane and Flex-Fuel blends. XRP® ProPLUS Race Hose™ is much more resistant to permeation of liquids or gases than other PTFE hose products, due to its highly compressed, non-porous PTFE matrix.

Operating Temperature of ProPLUS XS -65° F to +500° F. Maximum Operating Pressure is reduced at temperatures over 160° C (320° F). ProPLUS XS is fully vacuum resistant up to 130° C (266° F). Consult with XRP, Inc. for information about vacuum reduction above these temperatures and for performance specifications on other braid coverings.

XS Grades - The Maximum Operating Pressure listed in the table should be reduced by 1% for each 1° C above 160° C (1% for each 1.8° F above 320° F) up to a maximum of 260° C (500° F).

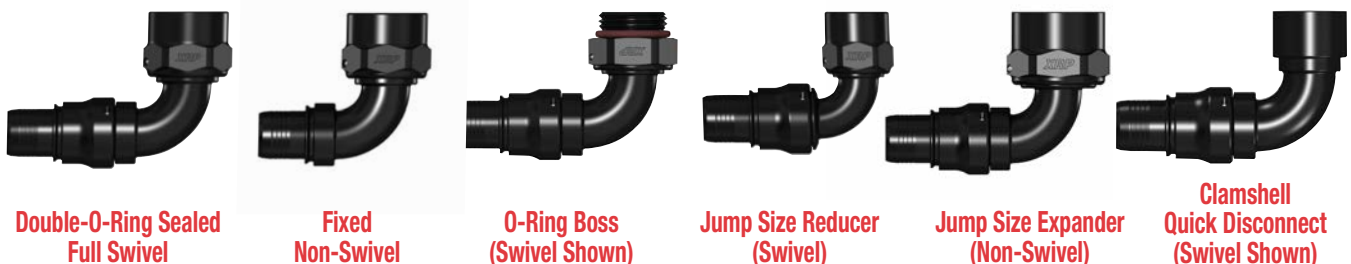
XM and XK Grades - The Maximum Operating Pressure listed in the table should be reduced by 1% for each 1° C above 130° C (1% for each 1.8° F above 266° F) up to a maximum of 180° C (356° F). See the full line XRP® ProPLUS Race Hose™ product brochure for complete details. **Consult with XRP on vacuum conditions for standard ProPLUS Race Hose with XM and XK braid.**

SIZE	HOSE PART NUMBER	HOSE I.D. INCHES	HOSE O.D. INCHES	MINIMUM BEND RADIUS IN INCHES	MAXIMUM OPERATING PRESSURE	WEIGHT LBS. PER FT.
-4 PLUS	333004XS	.270"	.378"	.75"	1280 psi	.062
	333004XM	.270"	.378"	.75"	250 psi	.038
	333004XK	.270"	.378"	.75"	900 psi	.038
	333004XT	.270"	.354"	1.50"	60 psi	.027
-6	333006XS	.312"	.420"	.75"	1220 psi	.084
	333006XM	.312"	.420"	.75"	250 psi	.048
	333006XK	.312"	.420"	.75"	850 psi	.050
	333006XT	.312"	.394"	1.50"	60 psi	.037
-6 PLUS	333007XS	.394"	.534"	1.00"	1160 psi	.107
	333007XM	.394"	.534"	1.00"	250 psi	.062
	333007XK	.394"	.534"	1.00"	810 psi	.067
	333007XT	.394"	.492"	2.00"	60 psi	.047
-8	333008XS	.465"	.607"	1.25"	1000 psi	.124
	333008XM	.465"	.607"	1.25"	250 psi	.074
	333008XK	.465"	.607"	1.25"	725 psi	.075
	333008XT	.465"	.555"	2.50"	60 psi	.051
-10	333010XS	.536"	.690"	1.50"	870 psi	.151
	333010XM	.536"	.690"	1.50"	250 psi	.093
	333010XK	.536"	.690"	1.50"	600 psi	.094
	333010XT	.536"	.640"	3.00"	58 psi	.074
-12	333012XS	.658"	.843"	2.00"	730 psi	.226
	333012XM	.658"	.843"	2.00"	250 psi	.131
	333012XK	.658"	.843"	2.00"	510 psi	.137
	333012XT	.658"	.787"	4.00"	44 psi	.108
-12 PLUS	333013XS	.780"	.953"	2.50"	610 psi	.257
	333013XM	.780"	.953"	2.50"	250 psi	.147
	333013XK	.780"	.953"	2.50"	430 psi	.158
	333013XT	.780"	.913"	5.00"	44 psi	.120
-16	333016XS	.875"	1.080"	2.75"	600 psi	.271
	333016XM	.875"	1.080"	2.75"	250 psi	.181
	333016XK	.875"	1.080"	2.75"	410 psi	.192
	333016XT	.875"	1.030"	5.50"	40 psi	.161
-16 PLUS	333017XS	1.040"	1.250"	3.00"	580 psi	.362
	333017XM	1.040"	1.250"	3.00"	250 psi	.214
	333017XK	1.040"	1.250"	3.00"	400 psi	.237
	333017XT	1.040"	1.193"	6.00"	29 psi	.180
-20						

XRP® Race Crimp Hose Ends™

XRP introduces a new lightweight crimp-on hose end series that utilizes one hose end design and two different crimp collar designs to assemble with four different hose types. The XRP® Race Crimp Hose End™ series consists of virtually every hose end style available in our other hose end products and more. In fact, there are more than 100 different configurations of ends available in most sizes. Use one style crimp collar to assemble with our Stainless Steel braided CPE Race Hose as well as our Black Nylon braided CPE XR-31 Hose. Use a different crimp collar to assemble with XRP CT Race Hose and certain other convoluted PTFE hose products as well as the all new XRP® ProPLUS Race Hose™ series. Available in straights, all normal angles in bent tube fixed and bent tube double O-Ring sealed full swivel. Styles in 37° JIC, Clamshell, O-Ring Boss, expander and reducer jump sizes, metrics and specials.

These hose ends are available with our standard Full hex nuts or lighter weight Turned Down (TD) hex nuts. Hose end color options: Black, Blue and Super Nickel. Crimp collar color options: Black, Gold, Super Nickel and Raw Aluminum.



ProPLUS Xtreme Race Hose

The Dry Sump Vacuum Hose: XRP ProPLUS Xtreme Race Hose is a revolutionary new addition to the ProPLUS Race Hose product line that sets a new level of fluid transfer technology in race hose systems today. The engineering development of the ProPLUS Xtreme Race Hose has created a lightweight race hose product specifically designed to address the increasing vacuum collapse problems that are becoming more and more common in suction hoses used in dry sump racing engines today without having to resort to running an internal support coil that can impede flow. This is accomplished by winding a high tensile, 316 stainless steel wire around and within the external helical convolutions of the ProPLUS tube.

This helical wound wire provides an increased radial support (hoop strength) to the tube wall and an axial reinforcement to the web section form in the unique external convolution of the tube wall. The increased hoop strength of the wound wire support keeps the tube round in shape under vacuum conditions and resists collapse kinking when the hose is tightly bent or flexed. ProPLUS Xtreme provides a higher vacuum and tighter bend radius capability in the lightweight braided versions of the XM - Black XtraTemp Monofilament and XK - Aramid braided products over that of the standard ProPLUS Race Hose in those braid covers. This increased vacuum capability would otherwise only be capable in the heavier, full stainless steel braided version of the standard ProPLUS Race Hose.

The helical wound wire performs much like an internal support coil, but rather on the outside of the tube, not the inside, so there is no interference to the fluid flow through the inside of the hose tube. In addition to excelling in vacuum applications, ProPLUS Xtreme Race Hose is very suitable for the same pressure type of fluid transfer applications as the standard ProPLUS Race Hose.



ANTI-STATIC PTFE TUBE

A high flowing, smooth bore, PTFE tube with external convolutions for flexibility. No internal convolutions that can cause flow restrictions.

VACUUM SUPPORT

An engineered design with an externally wound stainless steel wire that provides great vacuum support and tight bend capability.

YOUR CHOICE OF OUTER BRAIDS

- XM - Lightweight XtraTemp Monofilament
- XK - Aramid Fiber
- XKS - Aramid Fiber with Silicone
- XS - Stainless Steel

An exceptional achievement in race hose technology...

SIZE	HOSE PART NUMBER	HOSE I.D. INCHES	HOSE O.D. INCHES	MINIMUM BEND RADIUS IN INCHES	MAXIMUM OPERATING PRESSURE
-10	334010XM	.536"	.690"	1.50"	250 psi
	334010XK	.536"	.690"	1.50"	600 psi
-12	334012XM	.658"	.843"	2.00"	250 psi
	334012XK	.658"	.843"	2.00"	510 psi
-12 PLUS	334013XM	.780"	.953"	2.50"	250 psi
	334013XK	.780"	.953"	2.50"	430 psi
-16	334016XM	.875"	1.080"	2.75"	250 psi
	334016XK	.875"	1.080"	2.75"	410 psi
-16 PLUS	334017XM	1.040"	1.250"	3.00"	250 psi
	334017XK	1.040"	1.250"	3.00"	400 psi
-20	334020XM	1.280"	1.555"	4.00"	125 psi
	334020XK	1.280"	1.555"	4.00"	380 psi

TECHNICAL SPECIFICATIONS

XRP ProPLUS Xtreme Race Hose is available in six I.D. sizes in both the braid coverings of XM - XtraTemp Monofilament with a maximum continuous working temperature of 392° F (200° C) and XK - Aramid fiber, and soon, XKS with a thin Black Silicone covering over the Aramid. A full stainless steel braid version is also available but most generally the Standard ProPLUS with full stainless steel braid will be suitable for those applications unless an even tighter bend radius capability is required.

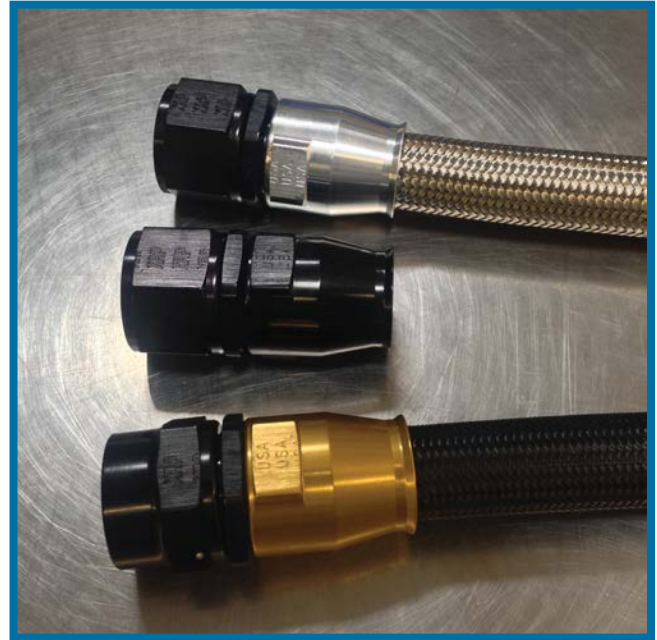
Hose operating temperature ranges from -65° F (-54° C) to +500° F (+260° C). Please note that the maximum working pressures and vacuum capabilities are affected by upper end temperature ranges. Please contact XRP, Inc. for consultation on specific applications over 400° F (204° C).

ProPLUS Reusable Hose Ends™

These new reusable hose ends, designed for use with the new XRP ProPLUS Race Hose, allow easy assembly without the need of a crimping machine. They will soon be available in straights, as well as in all our standard angled bent tube ends (30°, 45°, 60°, 90°, 120°, 150° and 180°), in both a fixed style and full swivel, O-Ring Boss (ORB) and jump sizes.

All XRP Hose ends are available with full hex swivel nuts or with light-weight turned down (TD) swivel nuts. Color options include: Black with either Gold, Black or Raw Aluminum sockets.

Our reusable hose ends will also fit some of the fully convoluted hose products in the market as well.



Installation Accessories for Race Crimp Hose Ends



CRIMPING MACHINE

For easy field installation of Race Crimp hose ends, our Crimping Machine is the best bet. Get fool proof installations every time. Carrying case included. Dies sold separately.



HOSE EXPANSION TOOL

This handy Hose Expansion Tool opens up the inside of XRP's ProPLUS Racing Hose to allow easy insertion of the hose ends for crimping. It replaces the tapered auger tooling used on most fully convoluted hose. Available in sizes 6 through 20.

PART NO.	SIZE	DESCRIPTION
328100	---	Hose Expansion Tool
328106	-6	Expansion Tool Die
328108	-8	Expansion Tool Die
328110	-10	Expansion Tool Die
328112	-12	Expansion Tool Die
328116	-16	Expansion Tool Die
328120	-20	Expansion Tool Die

PART NO.	DESCRIPTION
329000	Manual Hydraulic Pump
329100	Air Operated Hydraulic Pump
329306	-6 Race Crimp (RC) Crimp Die
329308	-8 Race Crimp (RC) Crimp Die
329310	-10 Race Crimp (RC) Crimp Die
329312	-12 Race Crimp (RC) Crimp Die
329316	-16 Race Crimp (RC) Crimp Die
329320	-20 Race Crimp (RC) Crimp Die



INSTALLATION TIPS



STAINLESS STEEL AND XR-31 HOSE ASSEMBLIES



Step 1



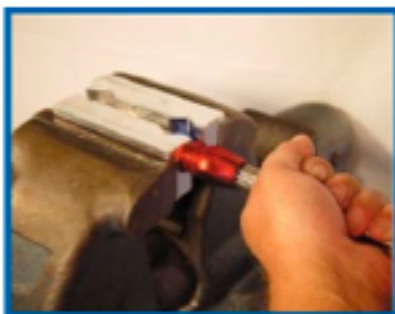
Step 2



Step 3



Step 4



Step 5



Step 6



Step 7

1 Wrap hose tightly with tape at cutting point. Using a fine tooth hacksaw, cable cutters or XRP Cut-Off Blade, cut the hose in the middle of the tape. **IMPORTANT:** Remove tape after cutting, being careful not to fray the braid. Failure to remove tape can impede hose assembly and lead to fitting blow off. Under no circumstances should tape be left on the hose during assembly.

2 Slip hose into socket to the depth indicated by the hose insertion mark on the outside of the socket. This should be just short of the back of the threads.

3 VERY IMPORTANT - Mark hose with tape or suitable marking device at rear of socket. This mark will later indicate to you if the hose has pushed out of the socket during assembly.

4 Using an anti-seize lubricant, liberally lubricate inside of hose and threads on the nipple.

5 Holding nipple horizontally in a vise, push socket end carefully with hose onto nipple with a turning motion and engage nipple threads into those of the socket. Continue tightening by hand as far as possible to make sure that the threads are properly mated and no cross threading has occurred.

6 Using a wrench, complete tightening assembly. When properly assembled, a small gap of .030" or less should exist between the socket and shoulder of the nipple.

7 VERY IMPORTANT - Check mark made on hose in Step 3 for any evidence of push-out.

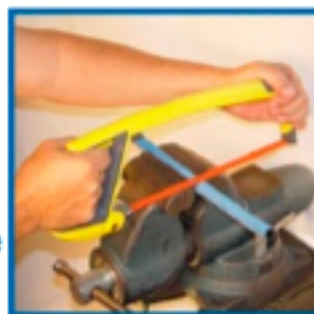
8 Hose assembly should be cleaned and tested to **twice the maximum operating pressure**. Hose assembly should also be checked for any leakage under **normal operating conditions**.

IMPORTANT SAFETY NOTE: When cutting, assembling or pressure testing any XRP hose and/or fittings, appropriate regulation protective eyewear should be worn at all times.

INSTALLATION TIPS

PUSH-ON HOSE ASSEMBLIES

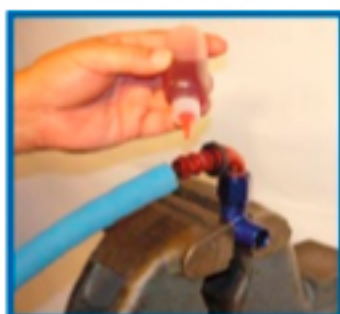
- 1 Using a fine tooth hacksaw or XRP Cut-Off Blade, cut the hose at the required length.
- 2 Clean away any loose debris from both ends and inside the hose. Secure a fitting in a bench vise and attach hose end to the fitting.
- 3 Lubricate the fitting tail and inside the hose. For easier fitting, you can use a hot air gun to gently warm the hose.
- 4 Push the hose over the fitting tail, until it is tight behind the hose finisher.
- 5 Hose assembly should be cleaned and tested to **twice the maximum operating pressure**. Hose assembly should also be checked for any leakage under **normal operating conditions**.



Step 1



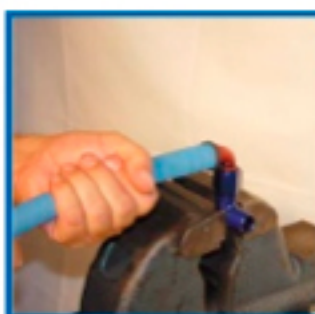
Step 2



Step 3

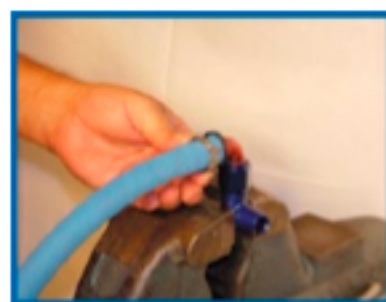


Step 4

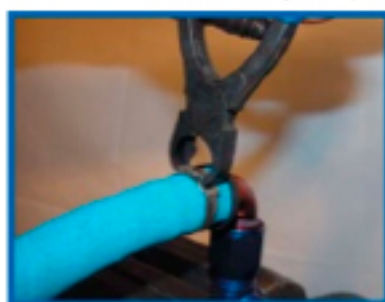


PUSH-ON CLAMP INSTALLATION

For severe race use, high temperature or oil line applications.



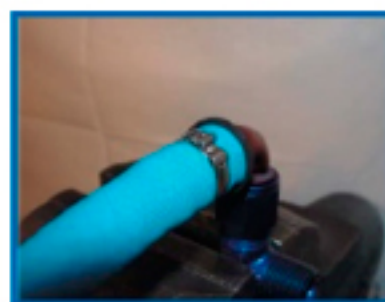
Step 1



Step 2



Step 3



Step 4

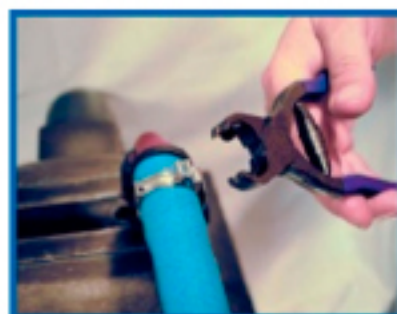
PUSH-ON CLAMP REMOVAL



Step 1



Step 2



Step 3

INSTALLATION TIPS

PTFE HOSE ASSEMBLIES



Step 1



Step 2



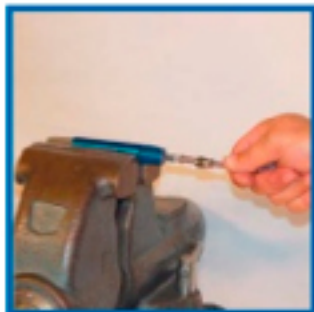
Step 3



Step 4



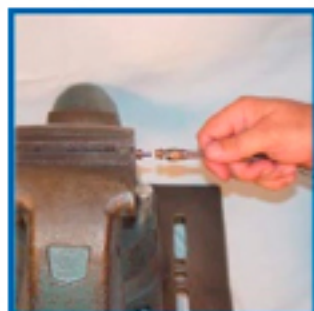
Step 5



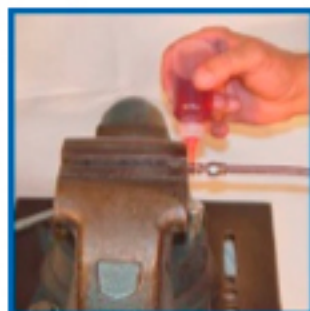
Step 6



Step 7



Step 8



Step 9

1 Wrap hose with tape at cut-off point and cut through the tape with a fine-tooth hacksaw or XRP Cut-Off Blade. **IMPORTANT: Remove tape and debur the tube.**

2 When braided PTFE hose is cut, one end will naturally try to flare away from the tube and the other end will remain tighter to the hose. Slip the socket onto the hose over the tighter end. Be sure the threads are facing the cut end as shown.

3 Position Separating Tool, **Part No. 821060** as seen on page 60, and clamp horizontally in the vise. Slip the hose on the mandrel of the tool.

4 Move the hose with a twisting motion, allowing the edge of the Separating Tool to get under the braid and begin to flare it away from the tube. This will allow the olive to be installed.

5 Remove the hose from the mandrel and push the olive onto the tube and under the outer braid.

6 Slip the hose with the olive on the tube back on the mandrel of the Separating Tool, still in the vise. Push forward on the tube, allowing the flaring edge of the tool to firmly seat the olive on the tube. The mandrel of the tool will prevent the tube from collapsing inside the olive and keep it sized properly.

7 Remove the hose from the Separating Tool and inspect the tube inside the olive, making sure it is pushed fully forward and that the olive is under the outer braid. Check inside of tube for any debris or damage.

8 Position nipple end in vise and firmly clamp. Slip the hose and olive carefully onto the nipple stem. It should go on easily.

9 Apply an oil or anti-seize lubricant to the nipple threads.

10 While holding the hose, firmly on the nipple in the vise, move the socket on the hose forward over the flared braid and olive. Carefully engage the socket onto the nipple's threads and tighten by hand. Make certain that the threads are engaged correctly and you do not cross-thread them. Continue to tighten by hand.

11 Using a wrench, finish tightening the socket onto the nipple stem. When properly assembled, a small space between the nipple hex and the socket of .030" or less should exist when the socket feels tight. The socket should not tighten easily on up to the nipple's hex shoulder. If this happens, it is an indication that the braid may not be properly retained between the socket and the olive.

12 Clean and test assembly at **twice the maximum operating pressure**. Recheck assembly for leaks under **normal operating conditions**.



Step 10



Step 11

IMPORTANT SAFETY NOTE: When cutting, assembling or pressure testing any XRP hose and/or fittings, appropriate regulation protective eyewear should be worn at all times.

INSTALLATION TIPS

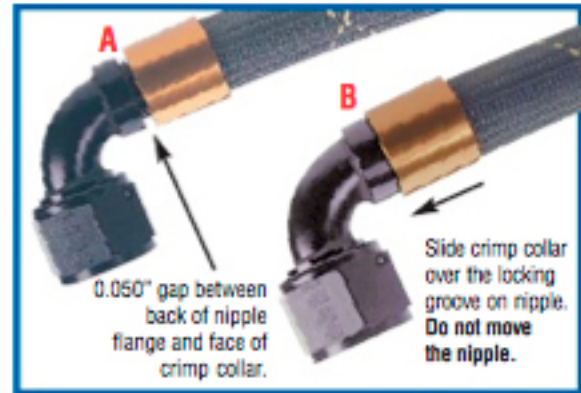
HS-79 & HS-79 WITH CSM HOSE ASSEMBLIES



1 Use the XRP Hose Cut-Off Blade to cut the hose to the proper length. The toothless knife edge wheel will provide a clean and square cut. May be used on stainless steel braided hose also.



2 Slip the crimp collar over the hose until the inside flange of the collar is against the face of the hose.



3 Push the nipple into the hose until the back of the nipple's locking flange is approximately 0.050" away from the face of the crimp collar, as shown at A. Without moving the nipple, carefully slide the crimp collar over the nipple until the collar's locking flange engages the locking groove on the nipple, as shown in B.



4 Insert the lower half of the crimp die into the crimping machine, making sure it is placed under the spring steel clips to hold it in place.



5 Position the hose assembly into the crimp die. Be careful not to disturb the nipple and collar placement.



6 Place the upper half of the crimp die over the assembly in the crimper.



7 Install the tapered die pusher ring plate over the crimp die. Push the plate down by hand, until the crimp die is snug on the crimp collar. Make sure the die covers the entire length of the collar.



8 Place the pusher cone into the crimp machine and pump the handle until the cone just contacts the pusher ring plate. Now, recheck! Make certain that the crimp collar is fully covered by the crimp die and the nipple has not moved.



9 Continue pumping the handle until the crimp die cage is completely closed and the pressure on the gauge indicates 4,000 to 5,000 psi. Larger sizes may require more pressure. Each die has been manufactured to provide the proper finished diameter crimp. Pressure test and inspect the finished hose assembly.

IMPORTANT SAFETY NOTE: When cutting, assembling or pressure testing any XRP hose and/or fittings, appropriate regulation protective eyewear should be worn at all times.

INSTALLATION TIPS

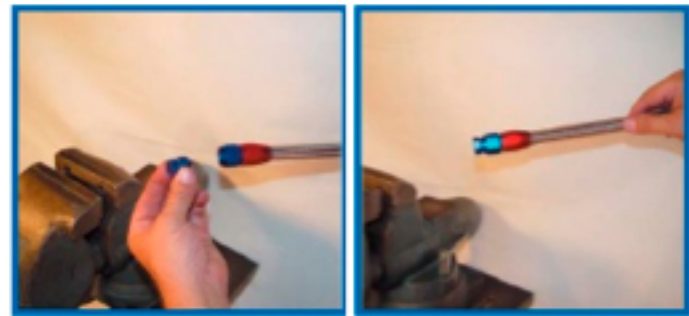
FYRE JACKET INSTALLATION

1 FYRE JACKET is easiest to install at the time of hose assembly. However, with a bit more effort, it may be installed onto an already existing hose assembly. Assemble one hose end and insert a threaded plug into the female end fitting. Wrap tape around the opposite end of the hose to prevent it from snagging the inside of the FYRE JACKET and keep any debris out of the hose during installation. Plug off both end fittings if covering a previously assembled hose.

2 Cut the FYRE JACKET to the proper length and slip it over the unassembled end of the hose or, if installing on an existing assembly, one of the plugged end fittings.

3 While a helper pushes the hose forward into the FYRE JACKET, he can grab the installed end of the FYRE JACKET and try to pull it toward him and onto the hose. USING GREAT CAUTION and with proper eye protection on both you and your helper, apply a VERY SMALL amount of compressed air into the open end of the FYRE JACKET while your helper continues to grab the FYRE JACKET and pull it onto the hose. The compressed air should be only sparingly applied to just slightly expand the FYRE JACKET and allow it to slide easily over the hose. DO NOT INFLATE THE FYRE JACKET as this could cause injury or death.

4 Center the FYRE JACKET on the hose using the compressed air under the FYRE JACKET, if necessary. Install the remaining hose end fitting if needed. Tape or seal the cut ends of the FYRE JACKET as needed to prevent any fluids from wicking into the exposed fibers. Silver silicone FYRE TAPE, part no. 320200, is excellent for this protection.



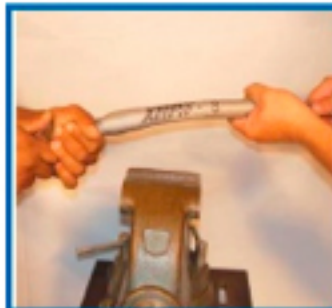
Step 1



Step 2



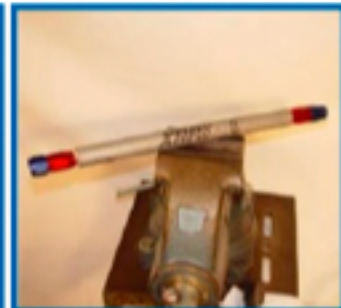
Step 3



Step 4



Completed



OVERBRAID INSTALLATION

1 Slide overbraid over the hose and stretch until snug.

2 Mark length and cut the ends with tin snips.

3 Reconnect hose to end fitting and secure with clamp or hose finisher as desired.



Step 1



Step 2

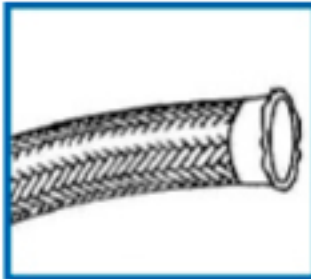


Step 3

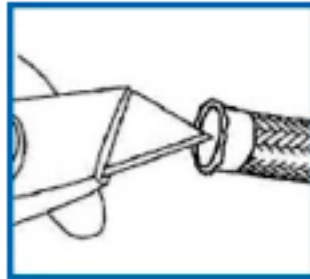
IMPORTANT SAFETY NOTE: When cutting, assembling or pressure testing any XRP hose and/or fittings, appropriate regulation protective eyewear should be worn at all times.

INSTALLATION TIPS

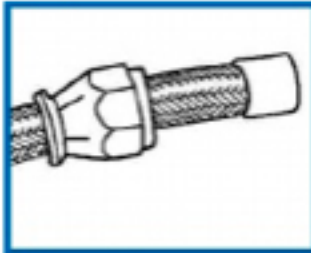
AIR CONDITIONING HOSE & FITTINGS



Step 1



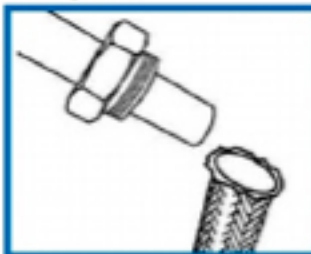
Step 2



Step 3



Step 4



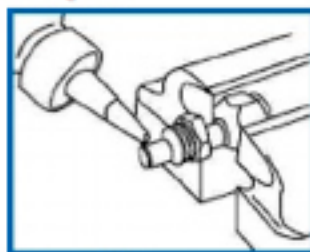
Step 5



Step 6



Step 7



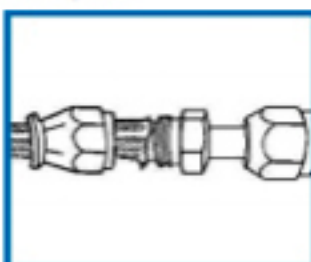
Step 8



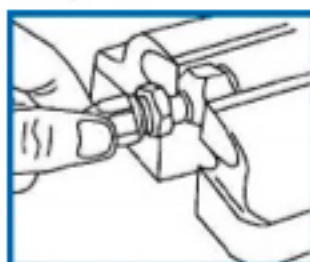
Step 9



Step 10



Step 11



Step 12

1 Wrap hose with tape at cut-off point and cut through the tape with a fine-tooth hacksaw or XRP Cut-Off Blade. **Make a clean, straight cut.**

2 Remove burrs and debris. Clean hose thoroughly before assembly.

3 Insert the hose through the socket with the threads facing in the direction that the nipple will be inserted.

4 Once the socket is slid onto the hose, carefully remove **all** the tape.

5 Gently insert an Aeroquip FT1038A hose tool (available from XRP) or the fitting nipple end into the inside diameter opening of the blue core tube of the A/C hose.

6 Using a slow rotating motion, roll the hose tool or nipple end around the inside of the hose so that the braid separates from the tube as shown. Do not stretch the tube out too much or it will not fit into the sleeve in Step 7.

7 Push the sleeve over the end of the blue tube and under the wire braid by hand. To position the sleeve, push the hose end against a flat surface. Check to see that the tube stock butts against the O-ring on the inside of the sleeve. **Do not kink or damage the hose or a new piece must be cut and used.**

8 Lubricate the nipple with refrigerant oil.

9 Insert lubricated nipple into the hose.

10 Use a rotating motion until the nipple has bottomed out into the sleeve. **Be very careful not to kink or crush the hose.**

11 With the nipple fully inserted, slide the socket back up on the hose to the nipple threads.

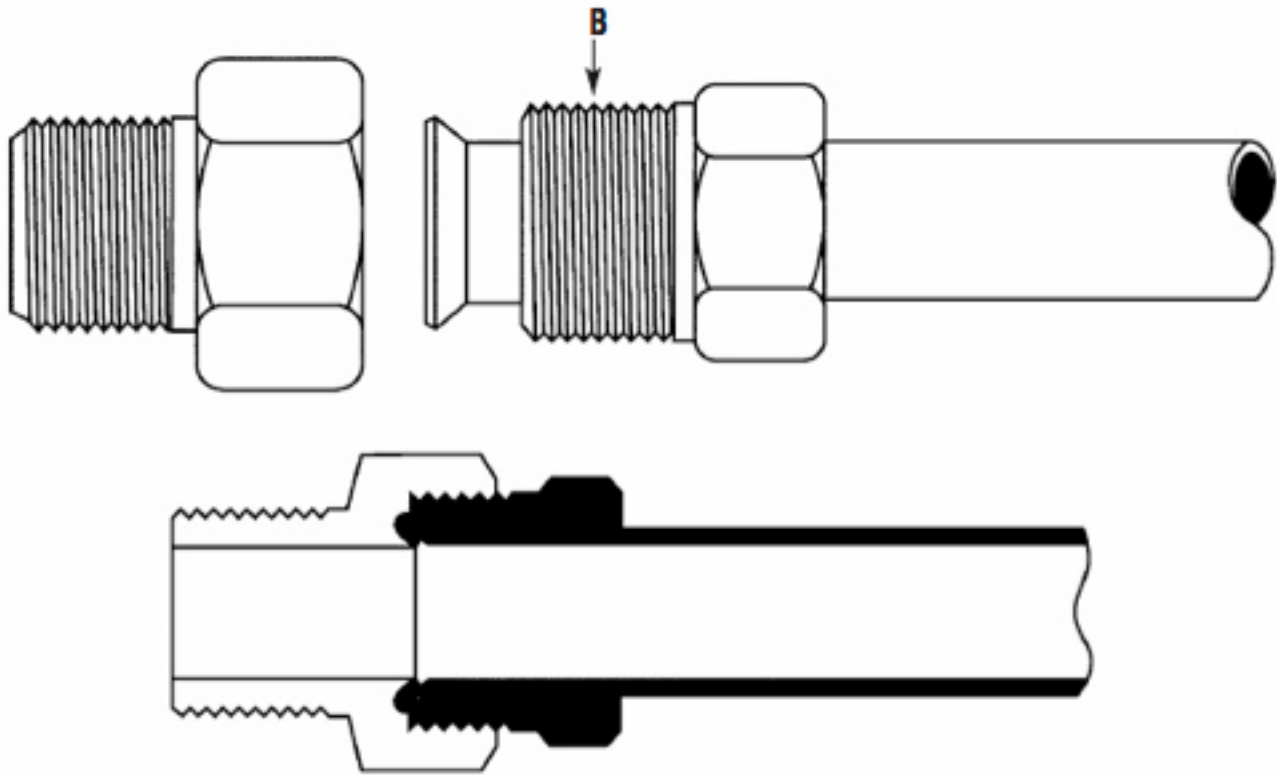
12 With the nipple end held securely in a vise, hand tighten the socket to the nipple. Then, using a wrench, tighten the socket the rest of the way onto the nipple. It is OK if the hose rotates during this process. **Do not overtighten the threads as this could cause stripping.**

13 Repeat Steps 2 through 12 to complete the other end of the hose assembly. Once assembled, **remove any contaminants from the hose before installing it into the A/C system.**

IMPORTANT SAFETY NOTE: When cutting, assembling or pressure testing any XRP hose and/or fittings, appropriate regulation protective eyewear should be worn at all times.

TECHNICAL INFORMATION

INVERTED FLARE FITTINGS

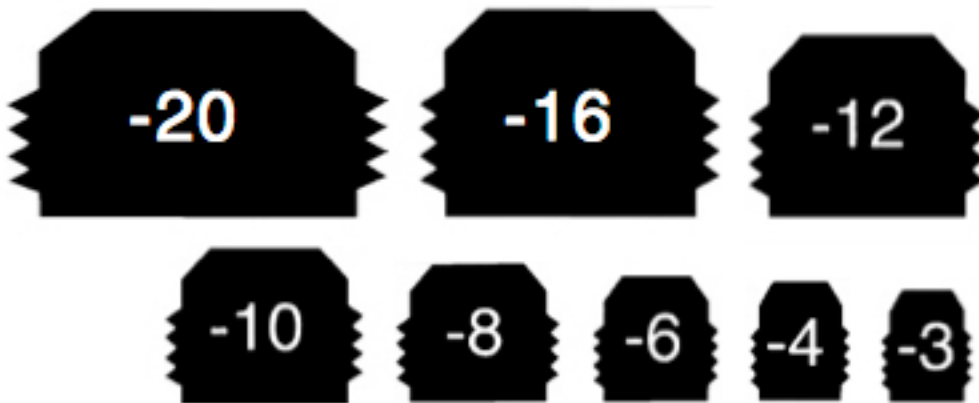


TUBE O.D.	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1
THREAD SIZE-B	5/16-28	3/8-24	7/16-24	1/2-20	5/8-18	11/16-18	3/4-18	7/8-18	1-1/16-16	1-3/16-16	1-5/16-16

This chart shows the common thread sizes for inverted flare fittings and tubing.

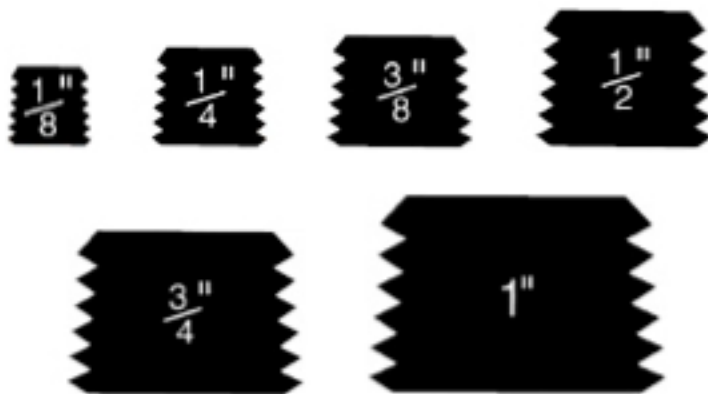
TECHNICAL INFORMATION

UNDERSTANDING AN THREAD SIZES Use the figures below to determine the AN thread size before ordering. The chart at the right shows the corresponding metal tube outer diameter and thread size for each size.



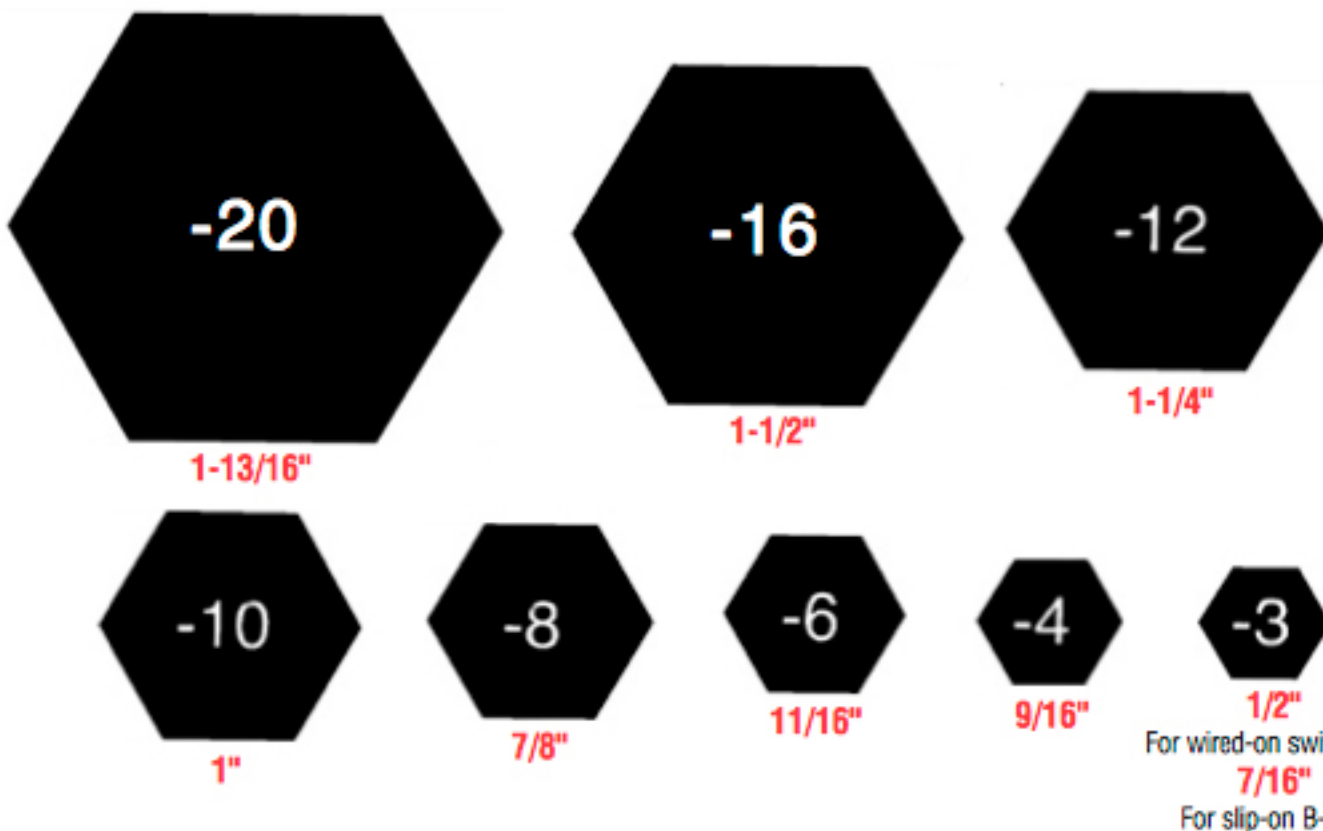
AN SIZE	METAL TUBE O.D.	THREAD SIZE
3	3/16"	3/8"-24 UNJ
4	1/4"	7/16"-20 UNJ
5	5/16"	1/2"-20 UNJ
6	3/8"	9/16"-18 UNJ
8	1/2"	3/4"-16 UNJ
10	5/8"	7/8"-14 UNJ
12	3/4"	1-1/16"-12 UNJ
16	1"	1-5/16"-12 UNJ
20	1-1/4"	1-5/8"-12 UNJ

UNDERSTANDING NPT THREAD SIZES Use the figures below to determine the NPT thread size before ordering. The chart at the right shows the corresponding thread size, threads per inch, outer diameter and closest AN fitting size for each.



PIPE THREAD SIZE	THREADS PER INCH	PIPE O.D.	CLOSEST AN FITTING SIZE
1/8"	27	.405"	4
1/4"	18	.540"	6
3/8"	18	.675"	8
1/2"	14	.840"	10
3/4"	14	1.050"	12
1"	11-1/2	1.315"	16
1-1/4"	11-1/2	1.660"	20

DETERMINING B-NUT SIZES Use the figures below to determine the B-nut size before ordering.



TECHNICAL INFORMATION

STANDARD TORQUE LIMITS FOR HOSE AND TUBE COUPLING NUTS

*Inch Pounds Shown

TUBE O.D.	HOSE SIZE	NUT HEX	A	B	C
1/4"	-4	9/16"	50-65	135-150	100-120
3/8"	-6	11/16"	110-125	270-300	210-250
1/2"	-8	7/8"	210-250	400-500	340-420
5/8"	-10	1"	300-350	650-700	400-480
3/4"	-12	1-1/4"	425-500	900-1000	725-850
1"	-16	1-1/2"	600-700	1200-1400	900-1150
1-1/4"	-20	2"	680-800	1200-1400	900-1150

$$\frac{\text{*Inch Pounds}}{12} = \text{Foot Pounds}$$

Over tightening of hose and tube coupling nuts will cause **thread and seal damage** and can result in **leakage**. Torque values are for threads lubricated with hydraulic fluid, 30 weight motor oil or antiseize compound.

KEY

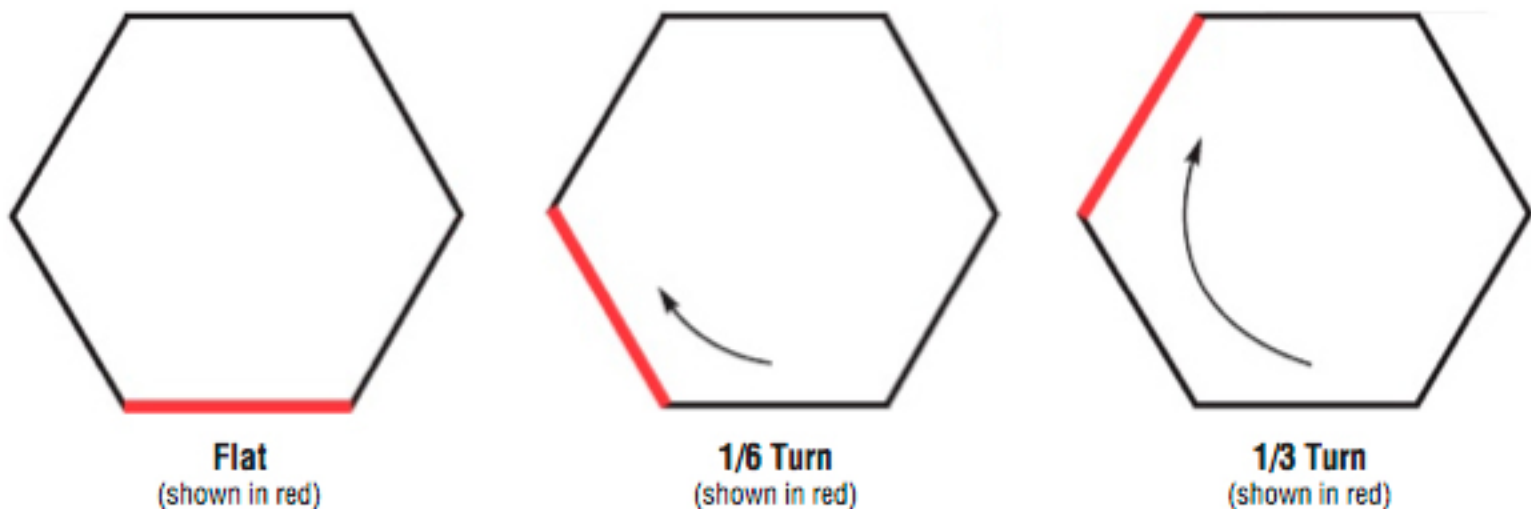
A - Steel or aluminum flared fitting nuts and tube sleeves, AN818 and AN819: used on aluminum tube.

B - Steel or aluminum flared fitting nuts and tube sleeves, AN818 and AN819: used on steel tube.

C - Steel or aluminum flared fitting hose coupling nuts.

Where use of a torque wrench is not feasible, use a conventional wrench to tighten the coupling nuts. Tighten until a distinct increase in the torque is noted. Continue tightening an additional 1/6 of a turn. Back off the nut. Again, tighten until a distinct increase in the torque is noted. Continue tightening an additional 1/6 to 1/3 of a turn.

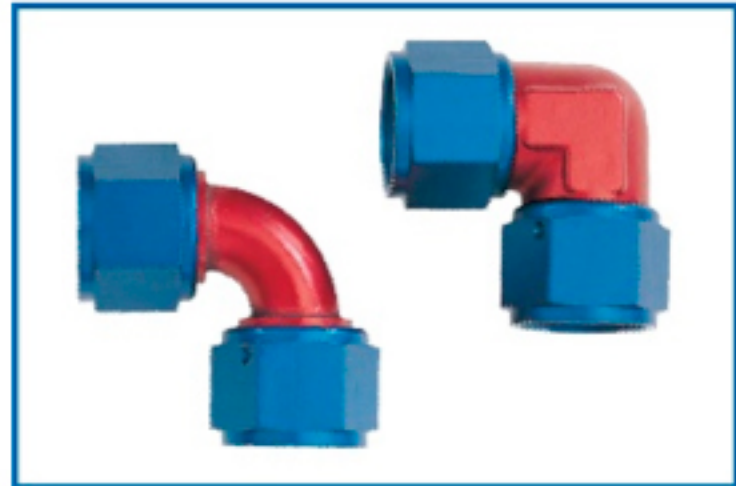
NOTE: One hex flat = 1/6 of a turn



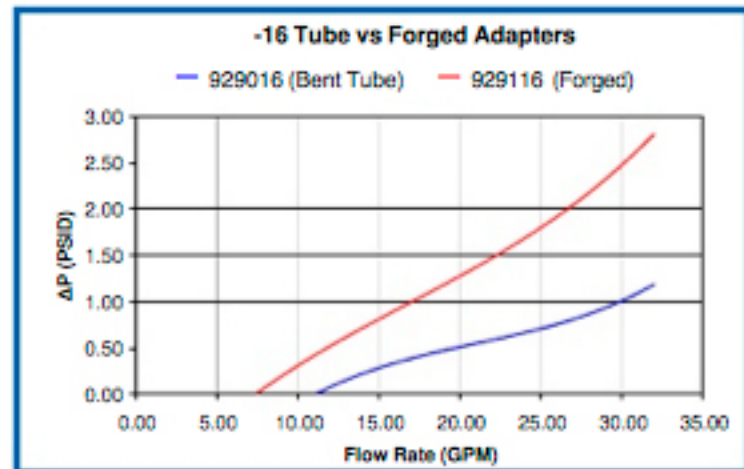
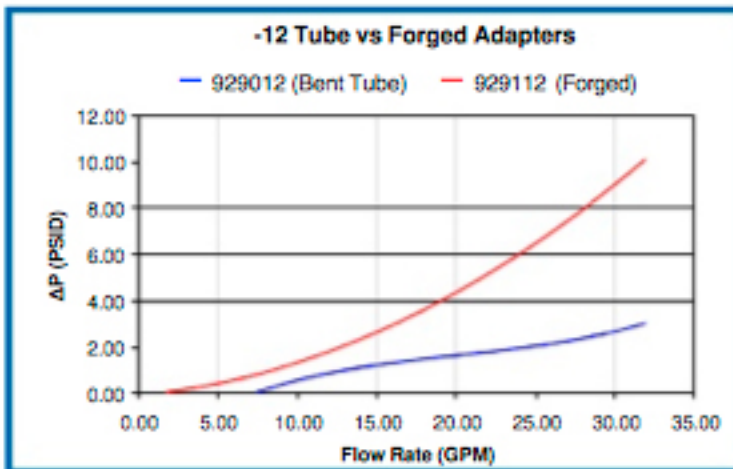
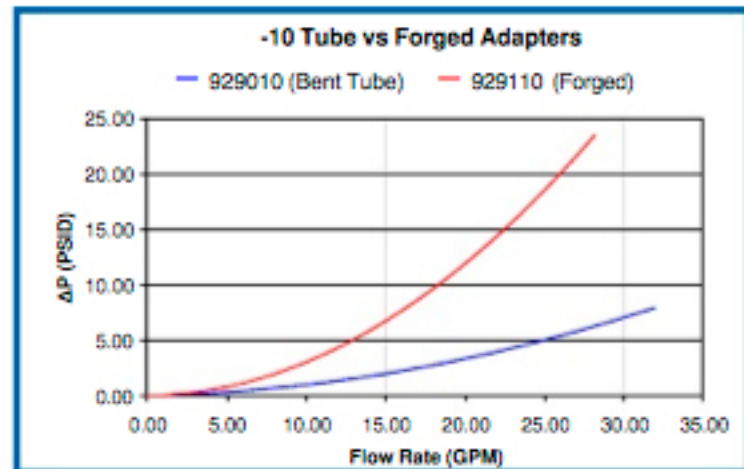
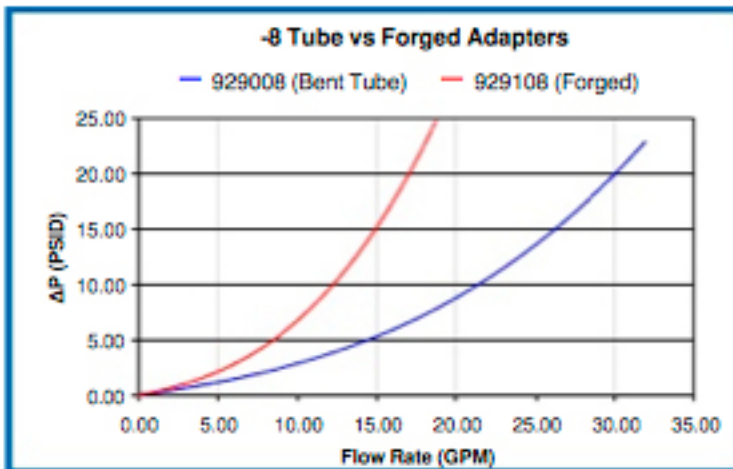
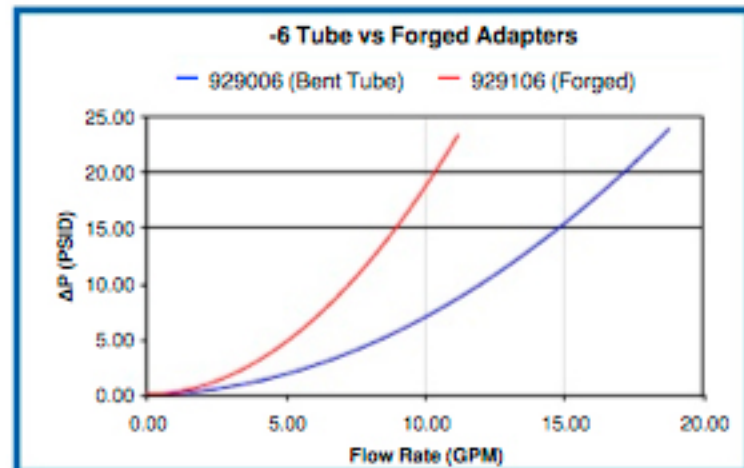
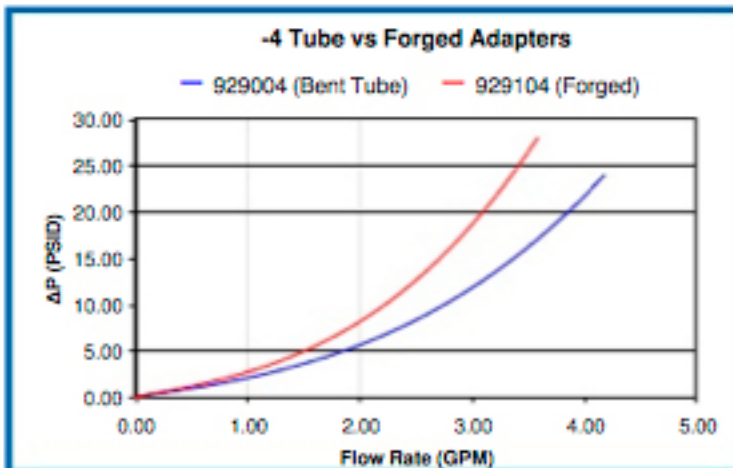
TECHNICAL INFORMATION

FLOW COMPARISON 90° BENT TUBE AND 90° FORGED ADAPTER FITTINGS

XRP has constructed its own in house flow testing facility for flow research and product development studies. We have been asked many times over the years what the flow restriction and pressure drop differences are between many different products. One of the most common asked questions is about the comparative differences between the bent tube 90° and the block or forged 90° hose ends or adapters. We are publishing some of the test results here to give our customers a better understanding about these differences. Obviously, with over 5,000 available products, we can't publish test data on every hose end, adapter or hose but we do have some very interesting information available and the resources to get answers to the technical questions.



On each graph shown below, the red line denotes the forged adapter and the blue line denotes the bent tube adapter.



FLUID SPECIFICATIONS - Tap Water, approximately +80° F. Specific Gravity .960

TECHNICAL INFORMATION

HOSE FLOW CAPACITIES PRESSURE DROP

Hose Dash Size	-4		-5		-6		-8		-10		-12		-16		-20		-24		-32		-40	-48	
Hose I.D. (Inches)	0.19	0.25	0.25	0.31	0.31	0.38	0.41	0.50	0.50	0.63	0.63	0.75	0.88	1.00	1.13	1.25	1.38	1.50	1.81	2.00	2.38	3.00	
0.25	10.0	3.1	3.1																				
0.5	19.0	6.0	6.0	2.7	2.7																		
1	40.0	12.0	12.0	5.5	5.5	2.4																	
2	95.0	24.0	24.0	10.0	10.0	4.8	3.5																
3	185.0	46.0	46.0	17.0	17.0	7.0	5.0	2.2	2.2														
4		78.0	78.0	29.0	29.0	12.0	8.0	3.0	3.0	1.2	1.2												
5		120.0	120.0	44.0	44.0	18.0	12.0	4.5	4.5	1.6	1.6	0.7											
8				95.5	95.0	39.0	26.0	10.0	10.0	3.6	3.6	1.4	0.6										
10					59.0	40.0	15.0	15.0	5.7	5.7	2.0	1.0	0.6										
12						80.0	52.0	20.0	20.0	7.2	7.2	2.6	1.5	0.8	0.4								
15							75.0	30.0	30.0	10.0	10.0	4.2	2.2	1.2	0.7	0.4							
18							107.0	40.0	40.0	15.0	15.0	6.3	3.0	1.5	0.7	0.6	0.4						
20								49.0	49.0	19.0	19.0	8.0	3.4	2.0	1.1	0.7	0.4	0.3					
25								72.0	72.0	26.0	26.0	11.0	5.5	3.0	1.6	1.0	0.6	0.4	0.2				
30										34.0	34.0	14.0	7.0	3.6	2.2	1.3	0.8	0.5	0.2	0.1			
35										47.0	47.0	19.0	9.5	5.0	2.8	1.7	1.1	0.7	0.3	0.2			
40												25.0	12.0	6.5	3.4	2.2	1.4	0.9	0.4	0.2			
50												36.0	17.0	9.0	5.3	3.3	2.0	1.3	0.5	0.4	0.2		
60												50.0	23.0	12.0	7.5	4.4	2.8	1.8	0.8	0.5	0.2		
70													31.0	17.0	9.3	6.0	3.8	2.4	1.0	0.7	0.3		
80													38.0	21.0	12.0	7.1	4.6	3.0	1.2	0.8	0.3	0.1	
90													49.0	27.0	15.0	9.0	5.9	3.8	1.5	1.0	0.5	0.1	
100														33.0	19.0	12.0	7.0	4.7	1.9	1.3	0.6	0.2	
150														60.0	36.0	22.0	13.0	8.5	3.4	2.2	1.0	0.3	
200															36.0	23.0	15.0	6.0	3.9	1.7	0.6		
250															54.0	33.0	22.0	8.5	5.3	2.5	0.8		
300																45.0	29.0	12.0	7.5	4.0	1.1		
400																	51.0	21.0	14.0	6.5	2.2		
500																		32.0	20.0	10.0	3.0		
800																					18.0	5.0	
1000																							10.0

Pressure drop in psi (pounds per square inch) per 10 feet of hose (smooth bore) without fittings.

Fluid specification: Specific gravity = 0.85; Viscosity = ν = 20 centistokes (C.S.), (20 C.S. = 97 S.S.U.)

Pressure drop values listed are typical of many petroleum based hydraulic oils at approximately +100° F (+38°C). Differences in fluids, fluid temperature and viscosity can increase or decrease actual pressure drop compared to the values listed.

Values rounded to the nearest 1/10 psi.

TECHNICAL INFORMATION

NOMOGRAPHIC CHART

Flow Capacity of Hose Assemblies at Recommended Flow Velocities

Using the formula: $\text{Area (in square Inches)} = \frac{0.321 \times (\text{U.S. gallons per minute})}{\text{Velocity (in feet per second)}}$

Determine the proper flow rate your system requires, then connect a straight edge from the selected flow rate to the recommended velocity range. The required hose I.D. will appear at the intersection of the straight edge and the middle axis. The example below shows the I.D. needed to transport 20 U.S. gallons per minute (GPM) fluid volume at a recommended velocity range of 7 to 36 feet per second.

Draw a straight line from **20 U.S. Gallons per Minute (on the axis on the far left)** to maximum **Recommended Velocity for Pressure Lines (on the axis on the far right)**. The line intersects **(the middle axis)** indicating a **3/4" Inside Diameter (-12) hose and Inside Area of hose of .45 square inches. This is the smallest hose that should be used.**

NOTE: We recommend use of oils with maximum viscosity of 315 S.S.U. at 100° F, operating at temperatures ranging between 65°F and 155°F.

