TRACEBOOST

Installation Guide

AMETEK®

APPLICATION OVERVIEW

TraceBOOST™ is intended for pipe heating applications which feature a large temperature difference between the heating medium (i.e., steam) and the process.

Ideal applications have the following characteristics; maintaining bulk or average process temperature and the temperature difference between the heating media and the process temperature exceeds 70°F (40°C).

Applications with less than 70°F (40°C) temperature difference between the heating media and the process temperature or applications that require uniform pipe wall temperatures should consider a CSI ControTrace engineered heating system.

TraceBOOST Tracing features a 2-inch wide enhancer which significantly improves the heat transfer from conventional ½-inch stainless steel or copper tube tracing. Heat transfer compound (HTC) is used to ensure good conductive heat transfer between the tubing, TraceBOOST element, and piping.

The number of TraceBOOST tracers required for a given piping system is dependent upon the heating medium, pipe material, pipe size, insulation, and ambient conditions. If your plant standards already specify the number of conventional tube tracers use the conversion table below to determine the equivalent number TraceBOOST tracers.

TraceBOOST Jackets are available for heating valves and other components. Jackets should generally be installed before the tracing. Reference TraceBOOST Jacket Install Guide.

Specified Conventional Tube Tracers		
Carbon Steel Process Pipe	Stainless Steel Process Pipe	Suggested TraceBOOST Tracers
2-3	2	1
4-7	3-5	2
8-10	6-8	3
11-14	9-11	4

When no plant standard exists or for large projects contact factory for design services.

MAXIMUM CIRCUIT LENGTH

Total tracer length should conform to circuit length calculations on right, to prevent excessive pressure loss in the heating medium:

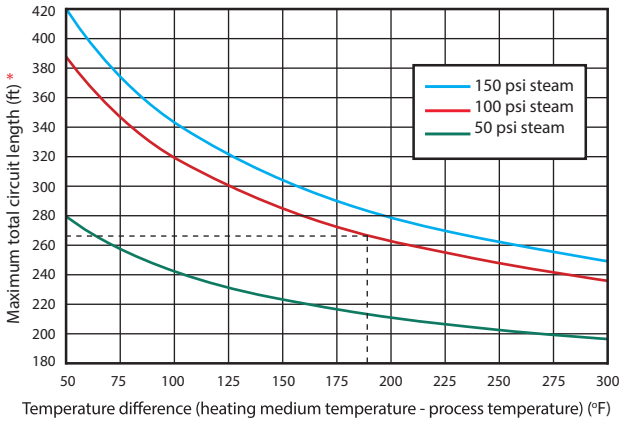
1. Subtract the process maintain temperature from the steam temperature.
2. Find the result along the bottom.
3. Follow it up to the intersection with the appropriate steam pressure.
4. The maximum total circuit length is found on the left.

Example:
If your plant standard to maintain a 150°F process line with 100 psig steam is five ½" tube tracers then:

- From Table 1, use two TraceBOOST tracers.
- The temperature of 100 psig saturated steam is 338°F. The difference between the process temperature and the steam temperature is 188°F (338°F – 150°F =188°F).
- The total circuit length is 265'.

Chart 1: Indicates Maximum Total Circuit Length Calculations with a 10% Pressure Drop

TraceBOOST Maximum Circuit Length



* Maximum circuit length includes: supply, tracing and return.

CIRCUIT LAYOUT

STEAM SUPPLY & CONDENSATE RETURN

When laying out the tracing runs, it is best to run the tracing from a high elevation in the piping system to a low elevation without intermediate pockets. Tubing should be run in parallel and in direct contact with the process piping as shown in Figure 1.

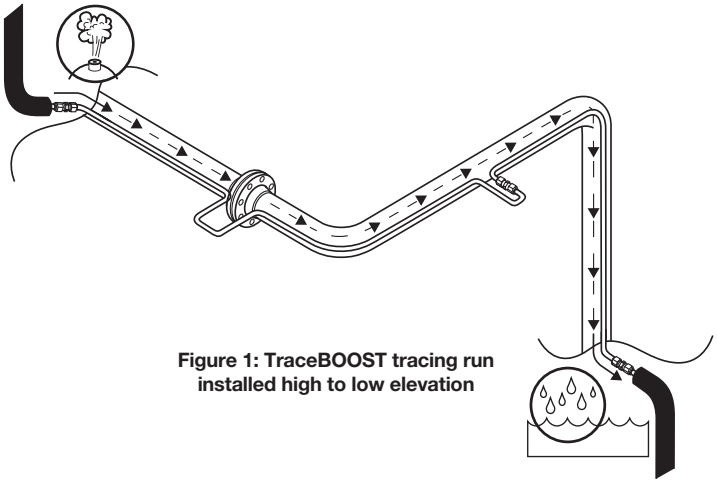
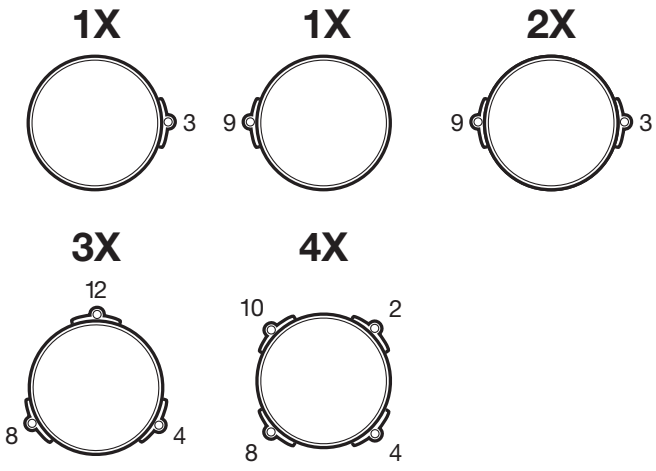


Figure 1: TraceBOOST tracing run installed high to low elevation

TRACER LOCATION ON PIPING

Tracers should be evenly spaced around the pipe. A single tracer located on the top of the pipe should be avoided. Suggested placement is shown in Figure 2.

Figure 2: Typical TraceBOOST tracing positions on piping.

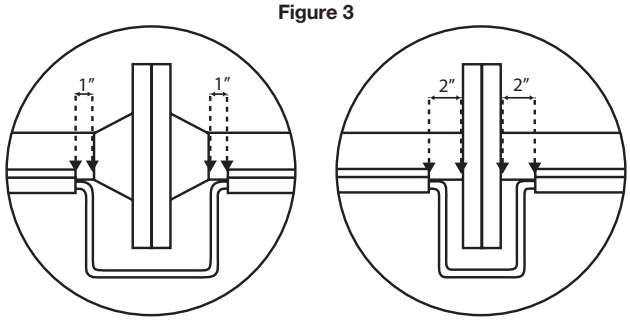


For piping which requires only 1 or 2 TraceBOOST tracers, the 3 and 9 o'clock positions are best for avoiding potential interferences with pipe supports, high-point vents, and low-point drains.

RUNNING TRACERS PAST FLANGES

When running tracers past flanges, the tubing should be formed to allow the TraceBOOST enhancer to fit within 2 inches of the back of a slip-on flange or within 1 inch of the back of a weld-neck flange. See Figure 3.

Figure 3

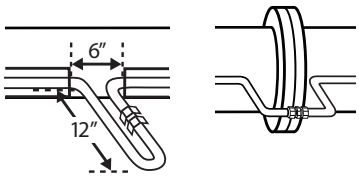


Weld-Neck Flange **Slip-On Flange**

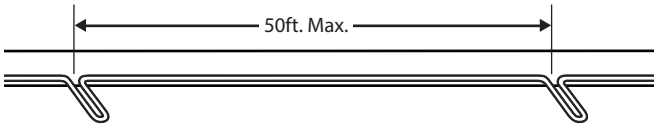
EXPANSION LOOPS

Expansion loops are required to prevent the tracing from losing contact with the pipe due to the thermal expansion.

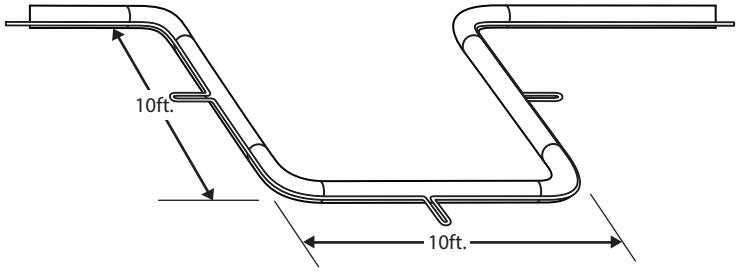
Jumpers and Unions are considered expansion loops as long as the projection is 12" minimum.



The maximum allowable straight-line distance between consecutive expansion loops is 50 ft. The maximum allowable straight line distance between a fitting and an expansion loop is 25 ft.



When the distance between fittings is 10 ft or greater, an expansion loop is required.



GENERAL INSTALL OVERVIEW

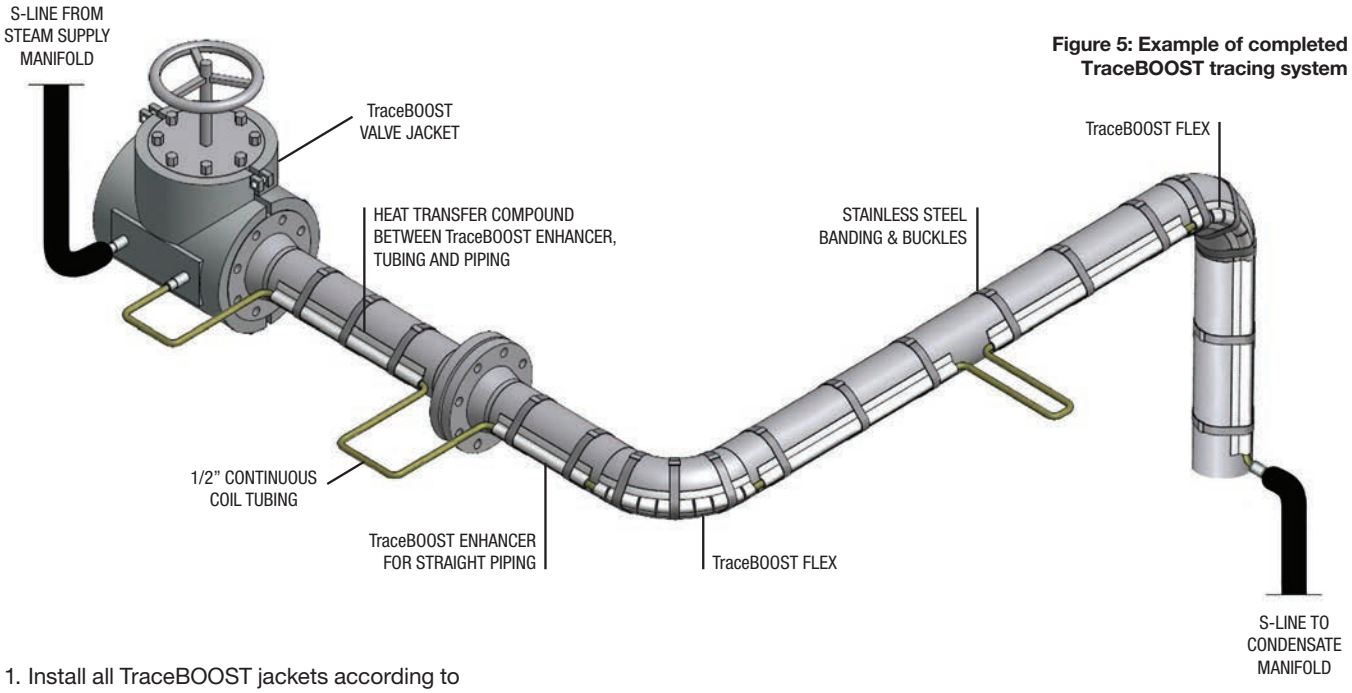
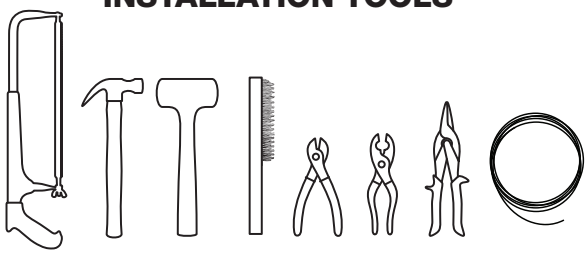


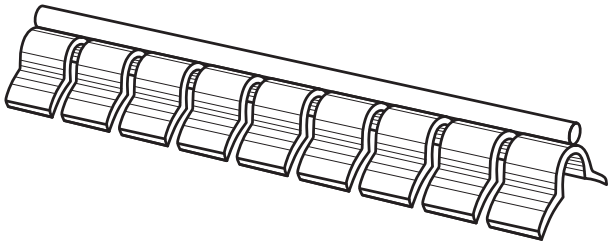
Figure 5: Example of completed TraceBOOST tracing system

1. Install all TraceBOOST jackets according to TraceBOOST Valve Jacket Install Guide.
2. Clean process pipe.
3. Temporarily position ½-inch tubing along the piping.
4. Bend flexible elements to desired shape
5. Dry fit TraceBOOST enhancers and cut to fit as required.
6. Apply HTC to TraceBOOST.
7. Install TraceBOOST over the tubing and permanently secure to the piping.

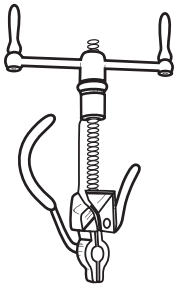
INSTALLATION TOOLS



PART NUMBERS

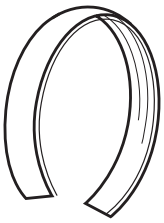


TB-X40 and TB-X80

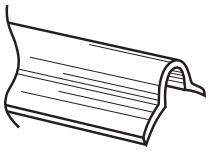


BAND TOOL

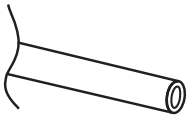
BUCKLE-SS-07-100



AND-SS-07-100



TB-010-BOX
TB-020-BOX
TB-040-BOX
TB-080-BOX



BCA4
BCB4
BCD4

BCE4
BCF4
BCM4

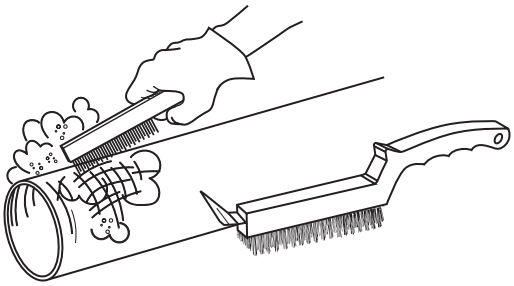
HTC-C-GAL

TB-PTYKNIFE

CLEAN ALL SURFACES

Before application of tubing, all piping and surfaces that will be in contact with HTC should be cleaned of loose dirt or other coarse debris.

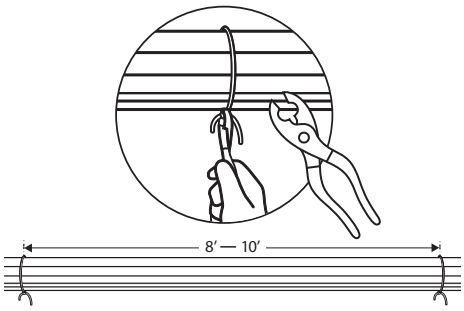
Figure 6: Clean surfaces with wire brush



TEMPORARY TUBING SUPPORT

Tubing should be temporarily held in place on the piping using readily available wire (16-gauge rebar tie wire is a good choice). Secure the tubing every 8-10 feet on straight runs, at the midpoint of every elbow, and on either side of each expansion loop or flange.

Figure 7: Secure with wire hanger every 8'-10'



CUT & DRY FIT

Prior to applying HTC, the TraceBOOST enhancer should be placed over the tubing to confirm fit.

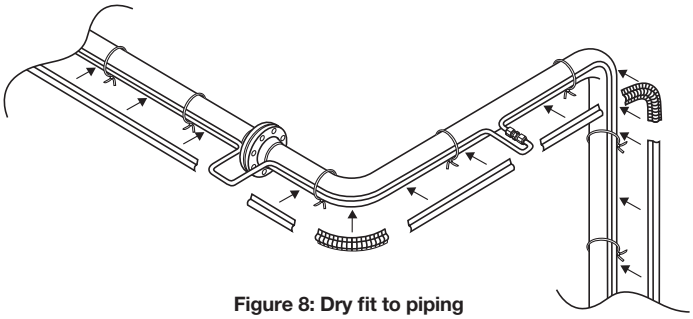
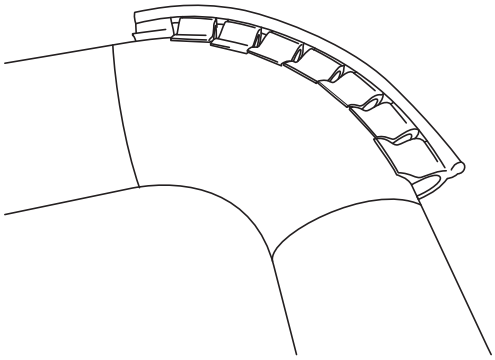


Figure 8: Dry fit to piping

There should be a small gap (approximately 1 inch) betw consecutive TraceBOOST enhancers along the tubing. Straight sections of TraceBOOST should be cut as needed to accommodate this fit.

Enhancers can be easily cut using a hacksaw, portable band saw or reciprocating saw.



Cut and bend flexible TraceBOOST to match the pipe contour at the desired install location. Gently hammer the element against the pipe for final contouring.

For 2" NPS and smaller elbows, heating is not always required. Where elbow heating is desired, cut short sections of straight TraceBOOST and attach them individually.

APPLY HTC

Application of CSI Grade-C HTC is critical to ensure good heat transfer between the tubing, TraceBOOST enhancer and piping.

Remove HTC from the can using the (flat edge) of the HTC Tool and apply to the concave side of the TraceBOOST enhancer completely filling the voids.

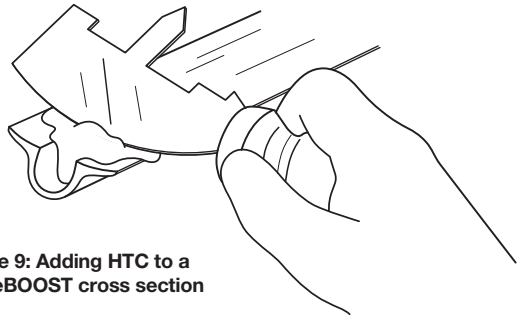


Figure 9: Adding HTC to a TraceBOOST cross section

Use the (grooved edge) of the HTC Tool to remove HTC from the center channel for tubing as shown below.

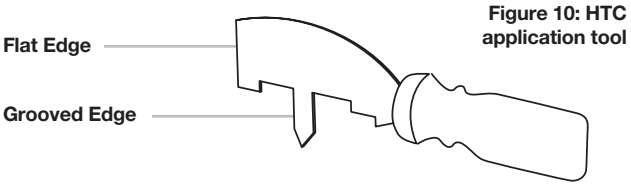
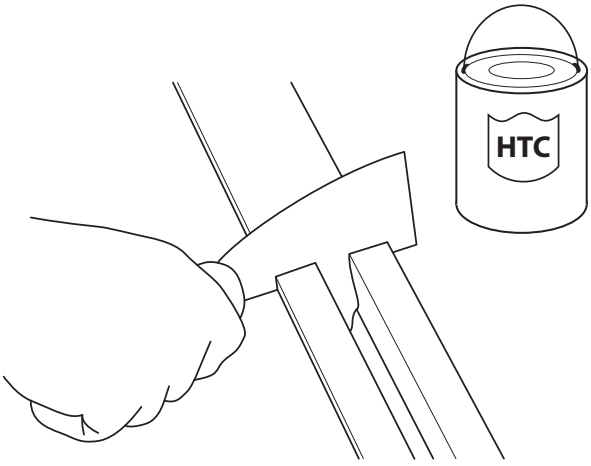


Figure 10: HTC application tool

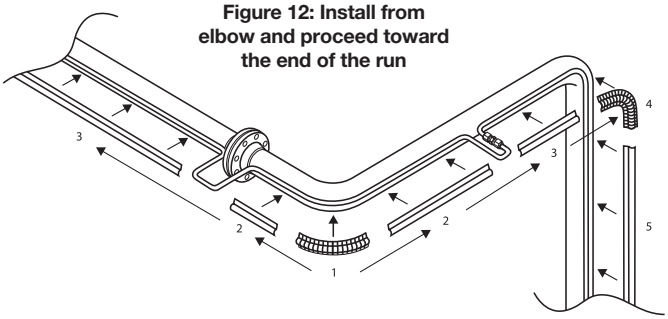
For greater ease of application, it is recommended that HTC cans be stored at room temperature.



FASTEN TRACEBOOST

Installation should begin at an elbow near the middle of the tubing run and proceed towards each end of the run. This approach minimizes any build-up of tubing which would result in poor fit between the tracing and piping.

Figure 12: Install from elbow and proceed toward the end of the run



REMOVE RETAINING WIRES

Before positioning the TraceBOOST over the tubing, the temporary tie wires should be removed for the section of tracing being installed.

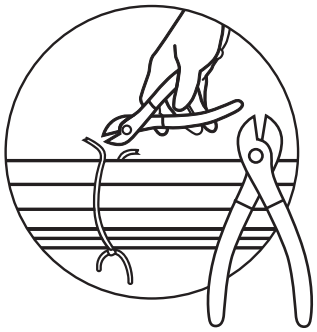


Figure 13: Remove tie wires with wire cutters

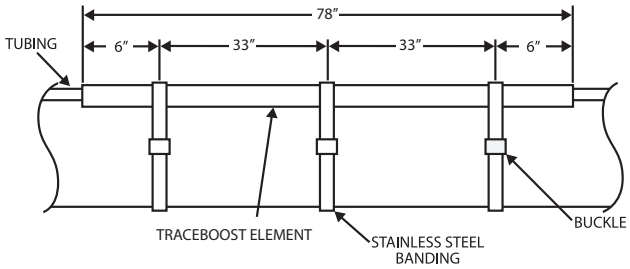
Press the TraceBOOST enhancer over the tubing until it touches the piping. Some HTC should squeeze out from underneath the TraceBOOST during the installation. Once installation is complete, excess HTC can be returned to the can for reuse.

All the TraceBOOST Tracing (around the pipe circumference) should be installed for a given 78 inch section of piping before moving to the next section of piping in the system.

SECURE WITH STEEL BANDS

After all TraceBOOST enhancers are pressed onto the piping for a given section, the TraceBOOST tracing must be secured to the piping using ¾-inch stainless steel bands. Each 78 inch section of TraceBOOST tracing should use three bands as shown below.*

Figure 14: 78" section with three bands

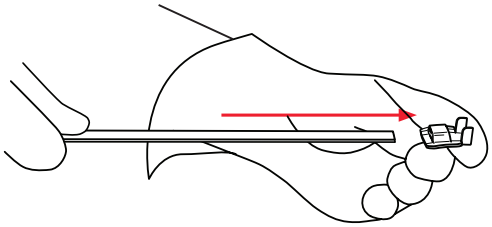


Each TraceBOOST Flex element should be banded on every 3rd or 4th miter section.

*Subject to change.

BAND INSTALLATION STEPS

1



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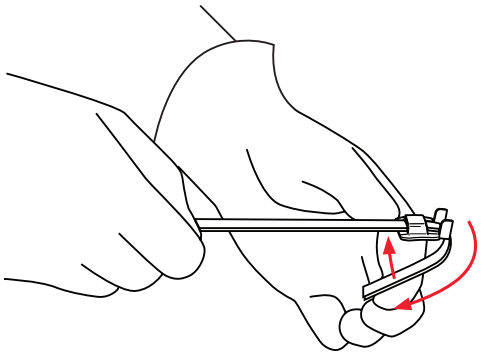

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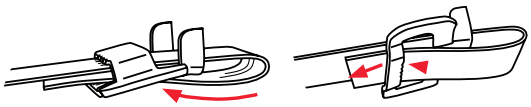

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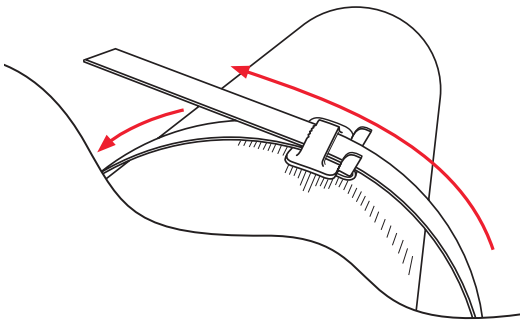

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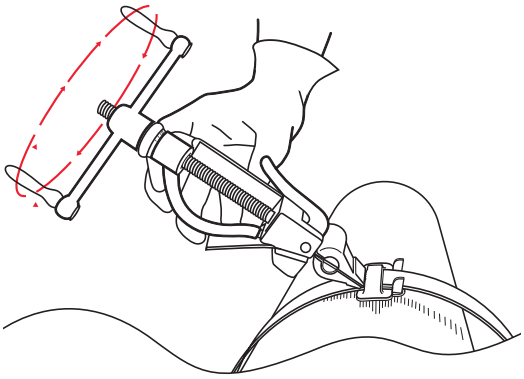

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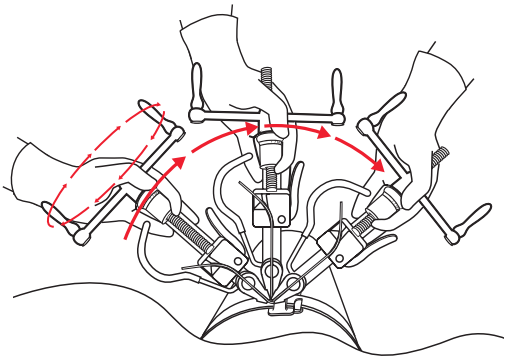

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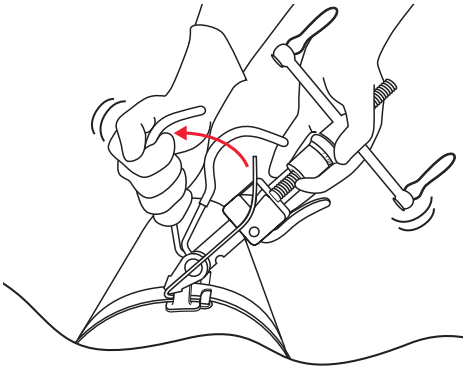

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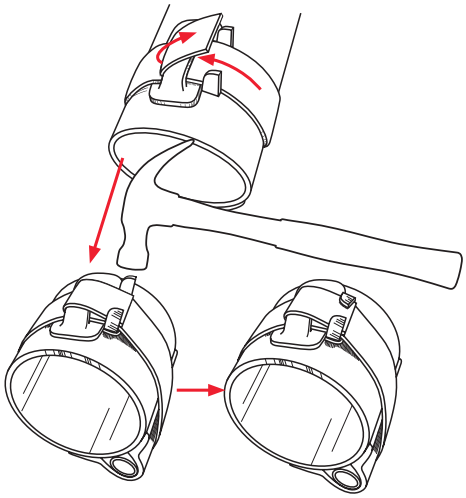
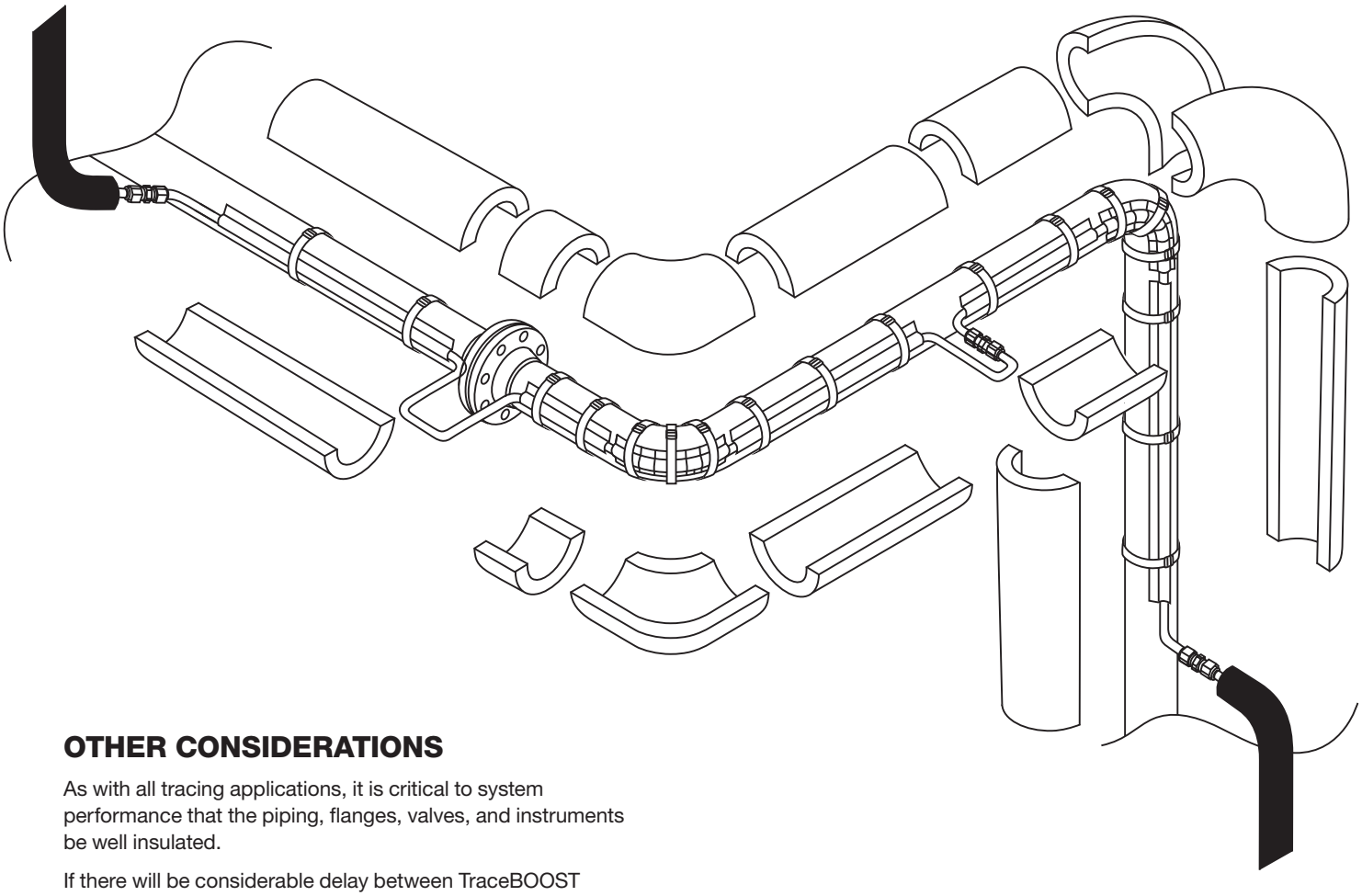


FINISHED INSTALLATION



OTHER CONSIDERATIONS

As with all tracing applications, it is critical to system performance that the piping, flanges, valves, and instruments be well insulated.

If there will be considerable delay between TraceBOOST tracing installation and piping insulation, consideration should be given to covering the piping with temporary weather protection until insulation is completed.

Each end of the TraceBOOST tracing runs must be connected to the heating medium supply/return manifold. O'Brien S-Line ½-inch pre-insulated tubing is recommended. Generally the length of steam supply tubing should not exceed 100 feet.

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