



STEAM TRAP INSTALLATION CONCEPTS

SINGLE AND MANIFOLD

We intend to show you various ways to install Armstrong drawn stainless steel inverted bucket steam traps.

We of course recognize that there usually is a difference in installation problems with new installation versus existing installation.

Also, there is a different set of conditions involved in manifolding traps together versus single trap installation. Let's examine these four areas.

1. A SINGLE TRAP INSTALLATION ON A NEW INSTALLATION:

The majority of new installations are returning the condensate back to the boiler. The most common way to return the condensate is in a return pipe overhead in the same pipe rack that holds the pipe that delivered the steam to the unit. (See Figure 1.)

As shown, you end up with a "U" and the following type of traps can be installed at locations A, B, C, and D.

- A. Trap Pak, Disc, Thermostatic
- B. 1811, Disc, Thermostatic
- C. U-1010 with strainer
- D. U-1010, 1010, 1010 with tube connections, Disc, Thermostatic

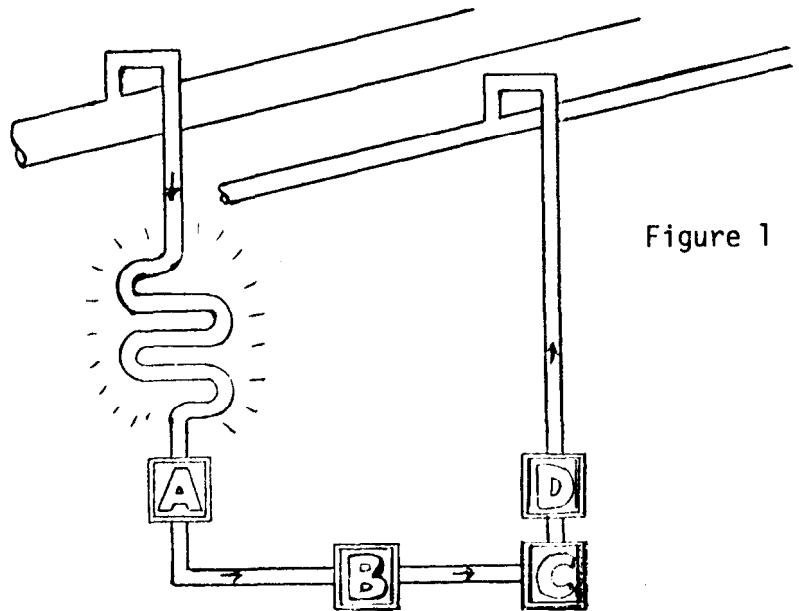


Figure 1

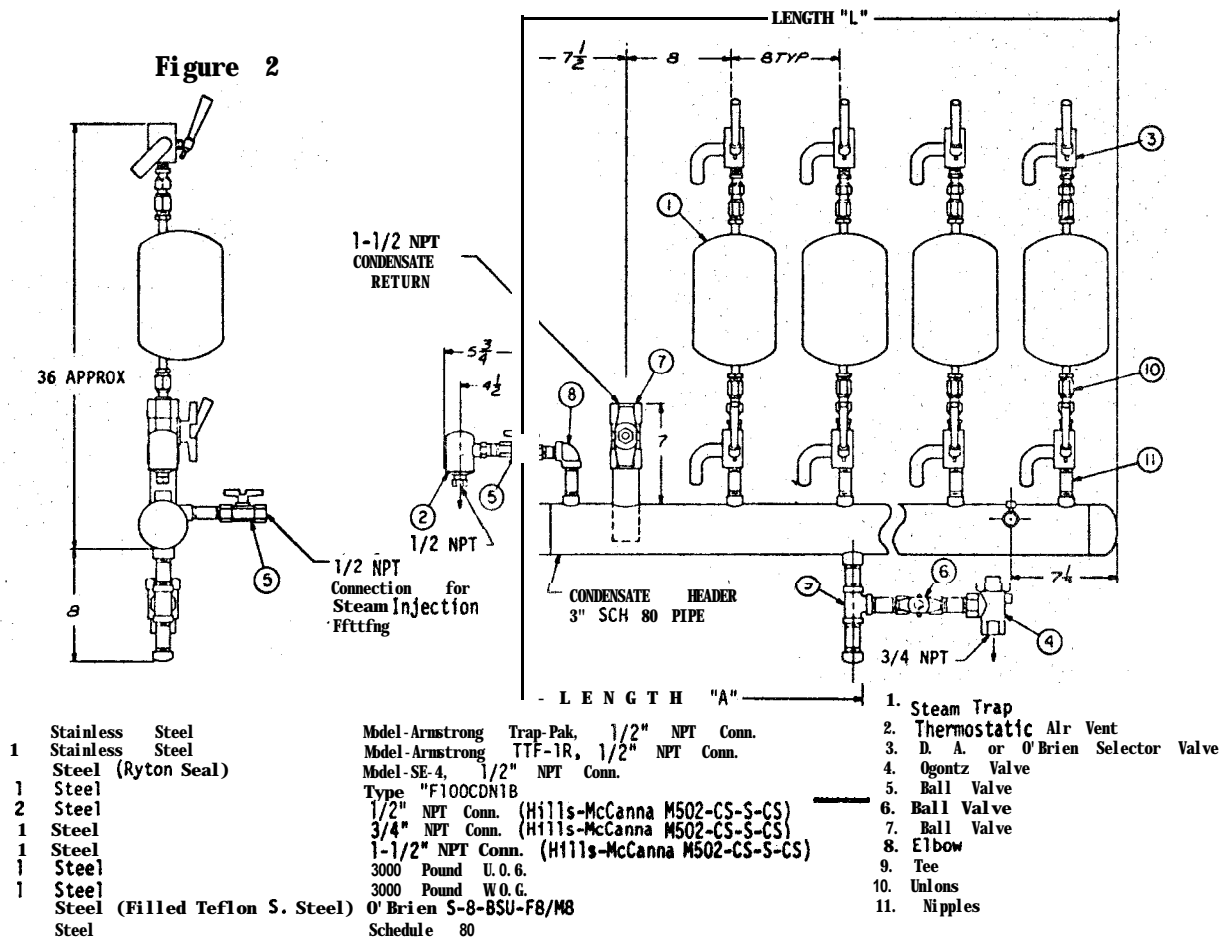
There is no additional cost involved when installing any of these traps.

We have only shown a trap but, depending on the customer's decision, shut-off valves before and after the trap can be installed along with unions, a strainer, a check valve, etc. The customer may also specify a bypass, but we recommend against this due to the possibility that the bypass might be left open, thus resulting in a large loss of live steam.

2. MANIFOLDING TRAPS ON "NEW" INSTALLATION:

A. Trap Pak Manifolding (Figure 2)

1. Two 3-way valves: Inlet valve can bleed off water ahead of trap in the pipe. Outlet valve can test operation of the trap.
2. Two unions: One can be used on inlet only if the pipe entry is not a problem so far as trap removal is concerned.
3. Thermostatic trap installed at high point on manifold to evacuate air/noncondensables on start-up: Condensate discharge pipe has a water seal because of its location. The air can't pass through the seal so this unit will open occasionally.

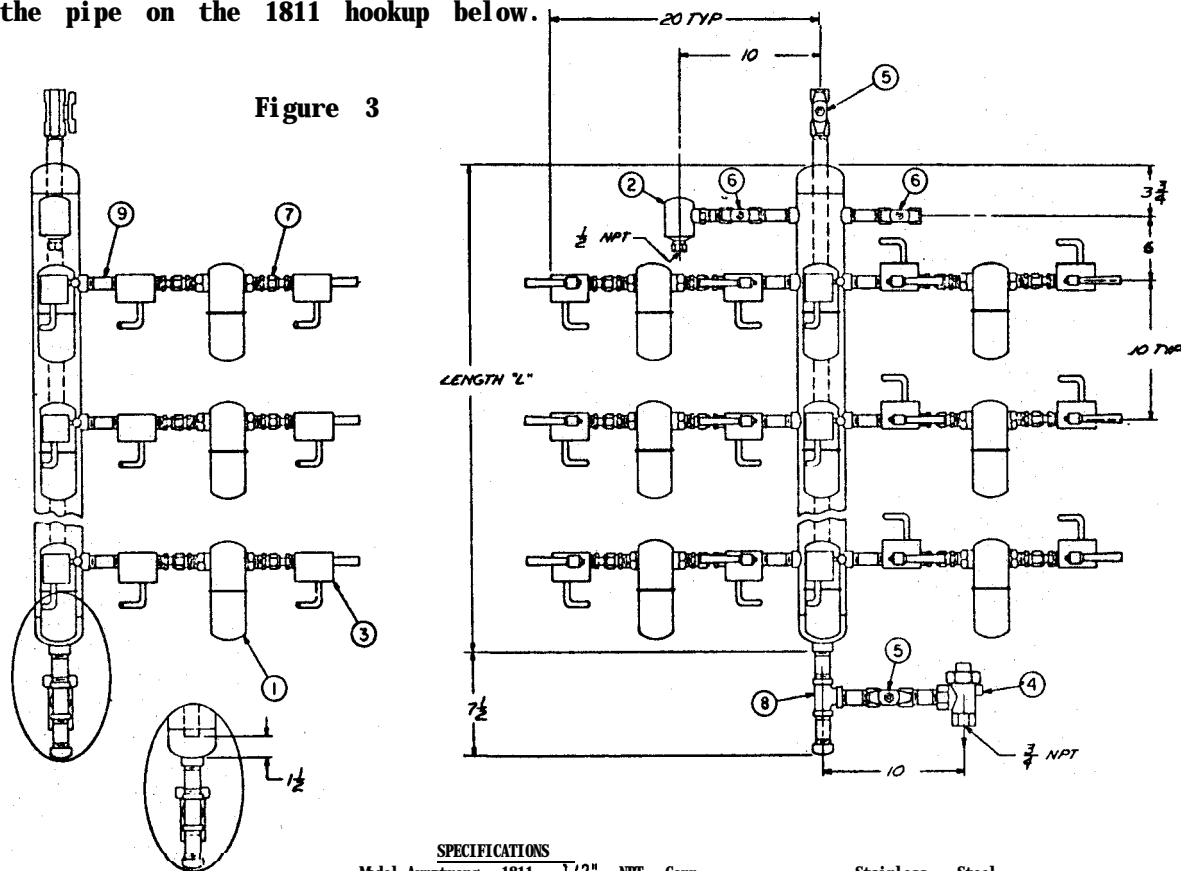


4. Optional temperature actuated valve installed on the bottom of manifold to drain entire manifold in the event steam is completely shut off to the manifold: You would not need this valve if the customer feels it is extremely unlikely that steam would even be entirely shut off to the manifold.
5. Another optional feature would be a steam injection fitting furthest from the return line. This would allow an operator to manually deliver steam to thaw the Trap Paks should there be a steam outage in freezing weather.

B. 1811s on a vertical manifold (Figure 3)

1. Two 3-way valves: Inlet 3-way valves can take the place of the 90° elbow and outlet 3-way acts as a block and test valve.
2. Two unions.
3. Optional strainer between inlet 3-way valve and union.

The reason for staggering the 1811s around the vertical manifold is so that you are not blowing down with the inlet 3-way valve directly onto the pipe on the 1811 hookup below.



1. Steam Trap
2. Thermostatic Air Vent
3. D.A. or O'Brien Selector Valve
4. Dgontz Valve
5. Ball Valve
6. Ball Valve
7. Unions
8. Tee
9. Nipples

SPECIFICATIONS

Model-Armstrong 1811, 1/2" NPT Conn.
 Model-Armstrong TTF-1R, 1/2" NPT Conn.
 Model-SE-4, 1/2" NPT Conn.
 Type F100 CON18
 1/2" NPT Conn. (Hills-McCanna M502-CS-S-CS)
 3/4" NPT Conn. (Hills-Mtanna M502-CS-S-CS)
 O'Brien S-B-BSU-FWMS
 3000 Pound U. O. G.
 Schedule 80

Stainless Steel
 1 Stainless Steel
 Steel (Ryton Seal)
 1 Steel
 2 Steel
 2 Steel
 Steel (Filled Teflon S. Steel)
 1 Steel
 Steel

You cannot under freezing conditions completely drain the 1811 trap but when you open the outlet 3-way, you drain a portion of the trap thereby creating an air space where the ice can expand if the water freezes in the 1811 trap. Also, lab tests show the other three 1811s shut-off won't freeze if this whole package is insulated and the bottom 1811 is live and discharging into the vertical manifold.

C. U-1010 Series with strainer (Figure 4)

Recommended hardware:

1. Two Z-way valves: One an inlet block valve (Optional) and the other a blow-off valve for the strainer.
2. One 3-way valve on outlet for block and test purposes.

The main advantages of this hookup is that if the customer/contractor wants a strainer and two unions around the trap, the U-1010 with strainer series is less costly to the contractor than buying the separate pieces and assembling. Also, if one of the steam lines have to be shut off in freezing weather, the operator can close the outlet block valve and open the blow valve to completely drain all the water out of the line and the steam trap to prevent ice. Another feature is that when the trap finally does wear out, unions being straight thread won't seize up, only the trap is replaced and not the strainer/blow valve. The strainer also has a full size screen like the Y-type strainer.-

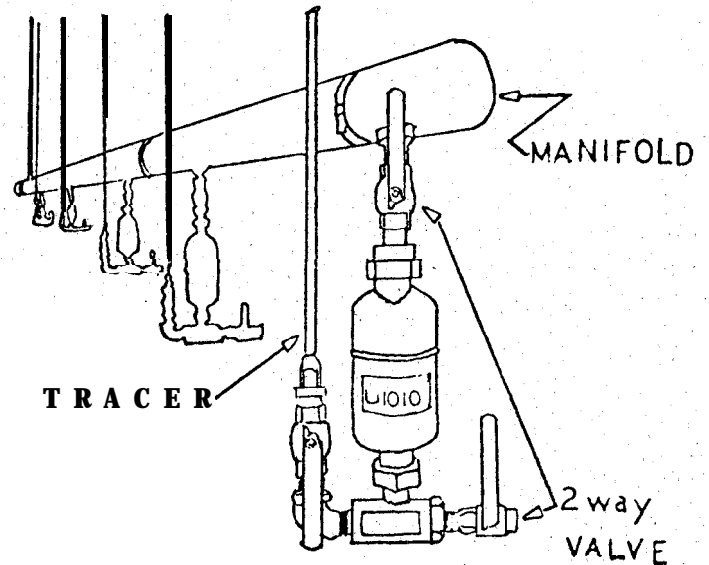


Figure 4

D. U-1010 Series (Figure 5)

This might be the unit to recommend if the customer/contractor does not want a strainer. They may put a strainer at the point where they take the steam off the steam line before branching out to do the tracing.

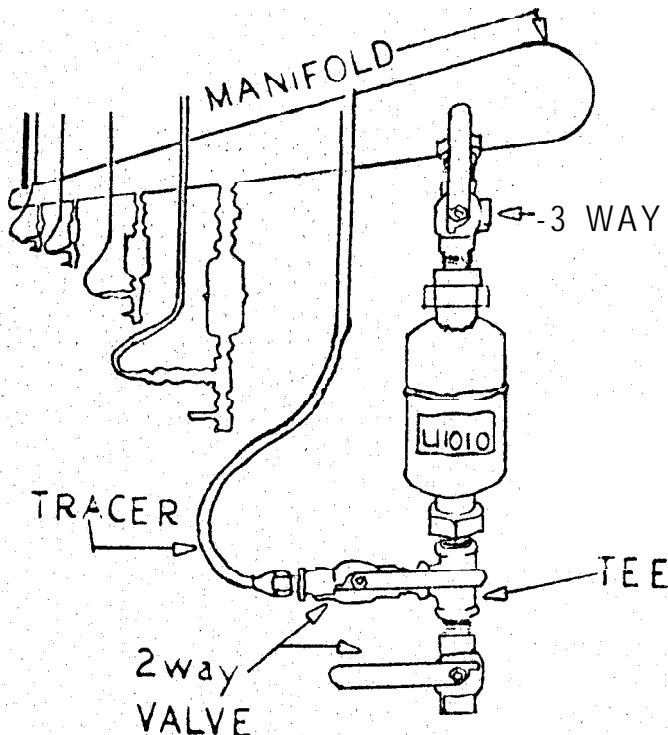


Figure 5

Recommended Hardware:

1. One, 3-way valve on outlet to block and test.
2. Two, Z-way valves. One (optional) for inlet block purpose. The other (optional) on the bottom of tee (optional) at the inlet of the trap for blowing on start-up and for draining line and trap if the steam is shut off in freezing weather.

E. 1010 Series (Figure 6)

There could be an occasion when a customer/contractor would not want unions or even block or drain valves. This sketch depicts a plain 1010 hookup with no hardware.

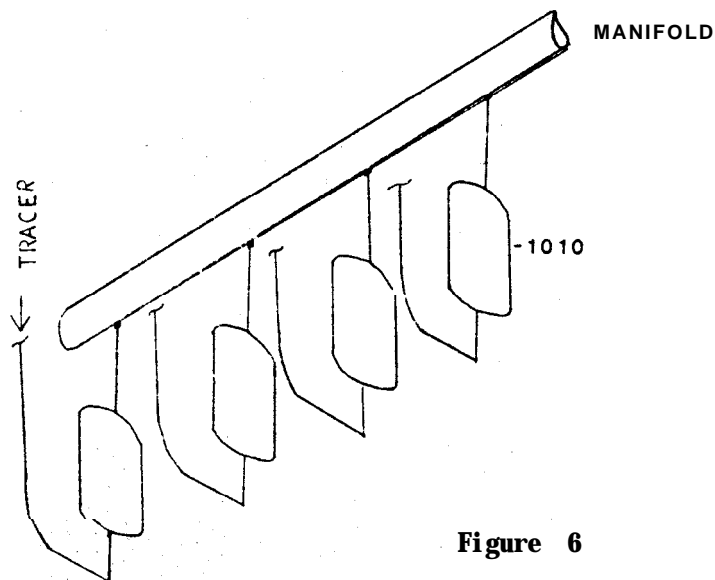


Figure 6

F. 1010 Series with Union on Inlet (Figure 7)

This depicts a hookup where the trap can be removed by breaking the union and screwing the trap out of the manifold. You could install a 3-way on the trap outlet for block and test purposes. A tee could also be installed at the inlet with a valve to drain the line and trap in the event the steam was shut off during freezing weather.

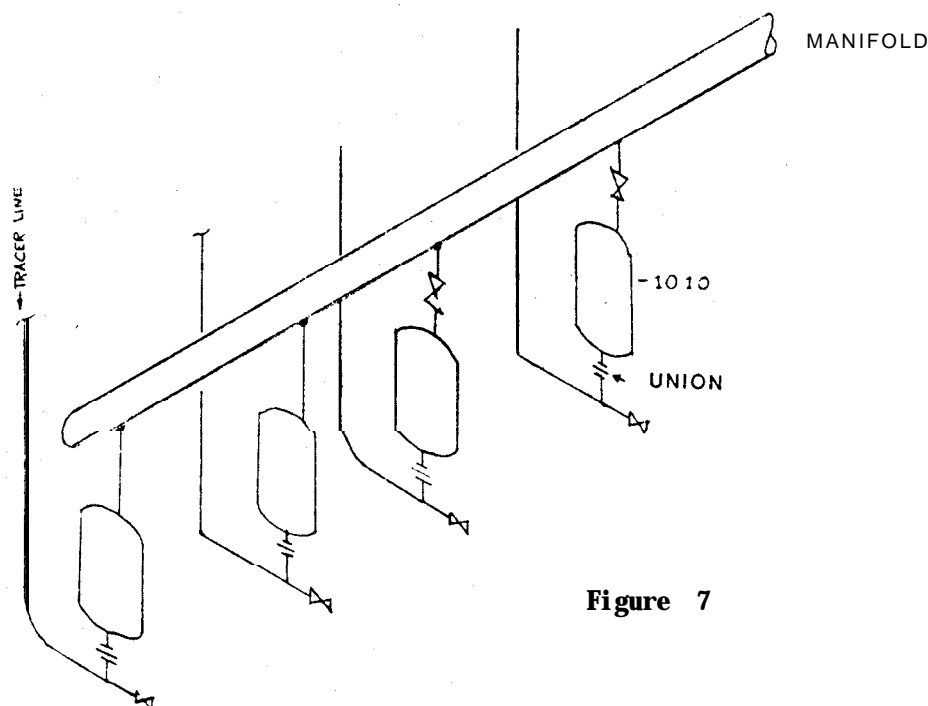


Figure 7

- G. 1010 with tube connection on Inlet and screwed connection on outlet (Figure 8)

This may be a very popular item as this would be more economical than a 1010 with one union on inlet if tubing is run to the trap.

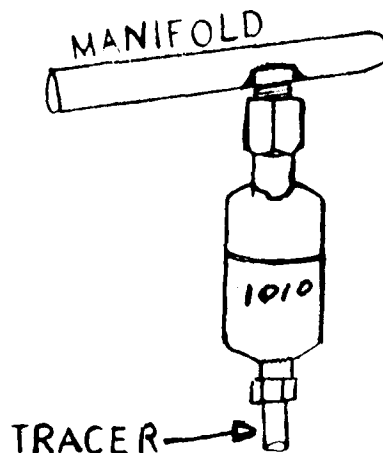


Figure 8

2. Single trap installation on existing installation:

First, look at a single trap installation where the condensate is being returned overhead (see Figure 9).

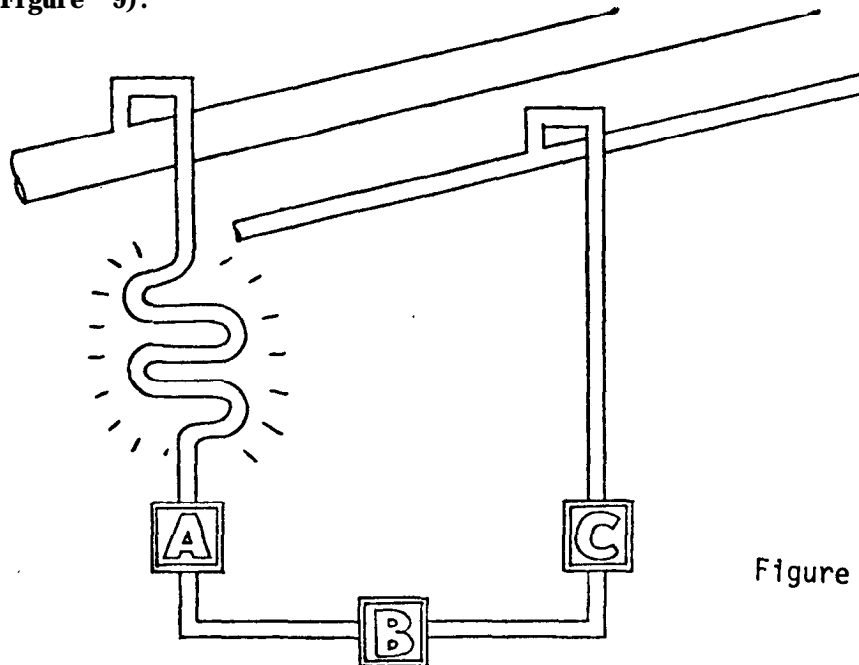


Figure 9

Normally, we will be replacing a disc or bellows type trap at A or B with a Trap Pak at A, an 1811 at B, a 1010, U-1010 with strainer, tube connection 1010 at C.

On single trap installations where condensate is being discharged to atmosphere, there will be a repiping cost in the case of the 1010s, U-1010s, tube connection 1010s, but usually not with the Trap Pak or 1811. Any repiping change can be easily justified when efficiency and long life factors are considered. First, obtain a figure from the customer on what he thinks it will cost to repipe. For

example, if he estimates high, \$70.00 per installation, you can point out that with just a 10#/hr. difference in efficiency between inverted bucket and disc, the customer will save \$21.60 per month assuming the traps are on continuously and steam is costing \$3.00 per thousand pounds to generate. This means in a little less than five months he has recouped his \$70.00 repiping cost. In addition, he has a minimum of 31 months (3 year guarantee) to save \$21.60 per month resulting in a savings of \$670.00 - the justification for repiping. If the customer is using the 1010 for replacement, there is no increase in first cost while there will be a minor increase in first cost if an 1811, tube connection 1010, or the Trap Pak is used. Any difference in first cost can be justified by the \$21.60 per month savings.

We also point out to the customer that uses strainers with blowdown valves installed ahead of the trap, he can free drain the trap and line manually by opening the blowdown valve if he uses a 1010 or tube connection 1010. (See Figure 10).

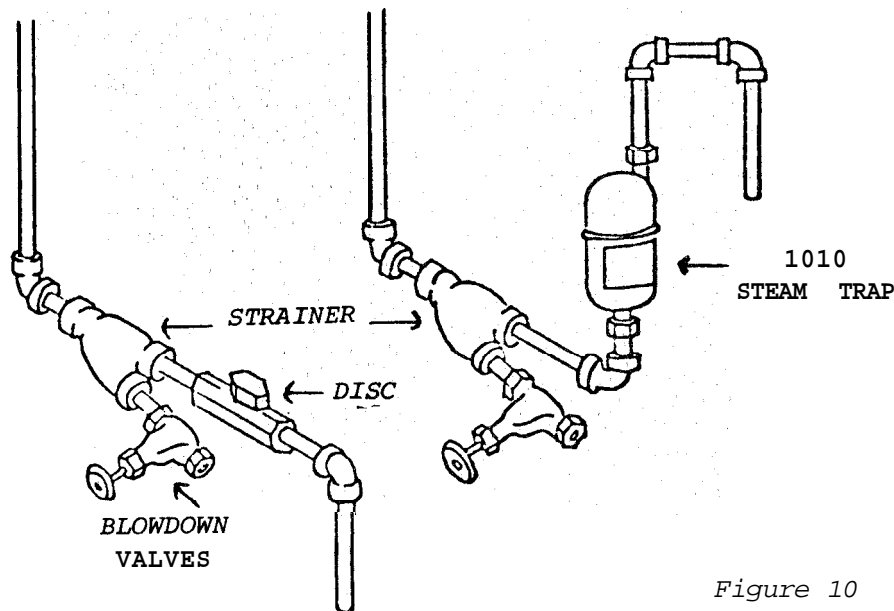


Figure 10

Usually, the distance between lines is less than 8" which is the minimum a Trap Pak requires, hence a new manifold will usually be required if the Trap Pak is used and the installation would be the same as a new installation. The justification would be based on a minimum savings of \$21.60 per month per trap.

If the pipe is broken at the entrance to the traps, the manifold can be turned over and 1010s, U-1010s, or tube connection 1010s can be installed as per new installation. Possibly, 1811s could be installed into the side of the existing manifold supply by rotating the manifold 90°.

The justification to rework the manifold with the 1010s, U-1010s, tube connection 1010s, or the 1811s would follow the same cost evaluation as we did on the single repiping cost.

If, for example, we had a 7 trap manifold and replaced it with inverted bucket steam traps, we would save \$21.60 per month times 7 traps or \$151.20 per month. In five months, we would save \$756 and in 31 months we would save \$4,687.20 -

quite a substantial savings.

It could be more of a problem to rework vertical manifolds due to space limitation. For example, replacing disc type traps with 1811s. (See Figure 11)

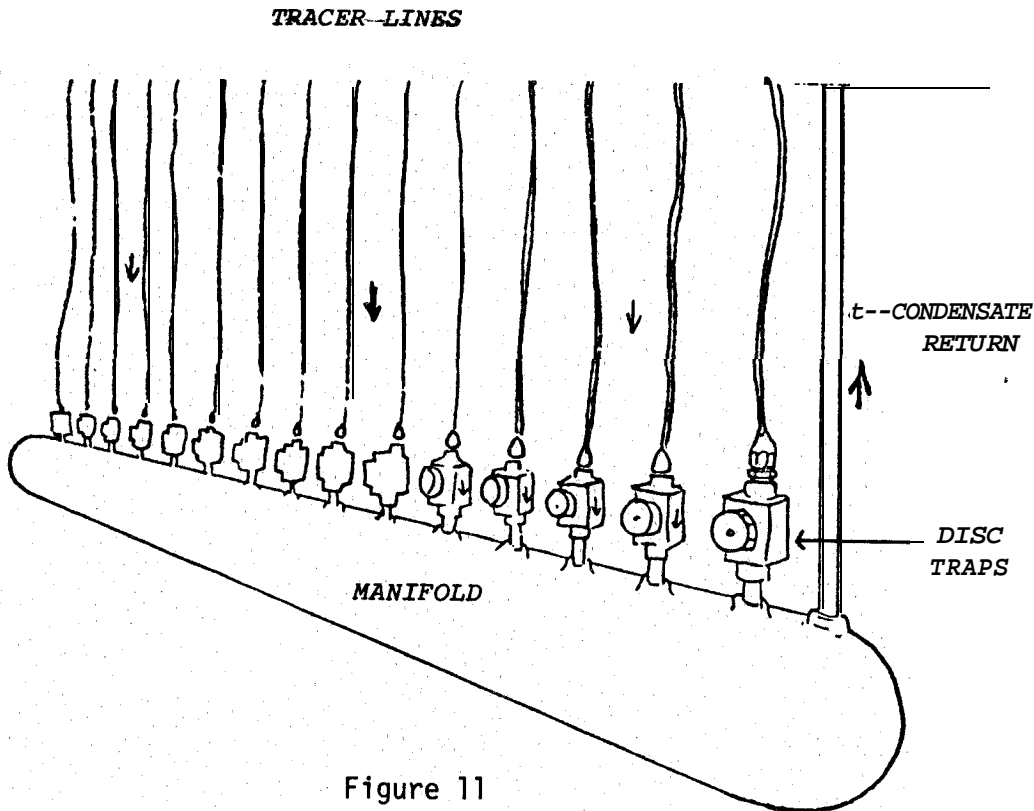


Figure 11

The existing manifold could be salvaged by staggering the inlet, plugging the remaining holes, and coming around the manifold in front and back.

Even if a complete new vertical manifold is required, it can be justified by the \$21.60 per month per trap advantage.

Never assume a customer is familiar with priming an inverted bucket trap when installing. Advise them of the proper procedure.

