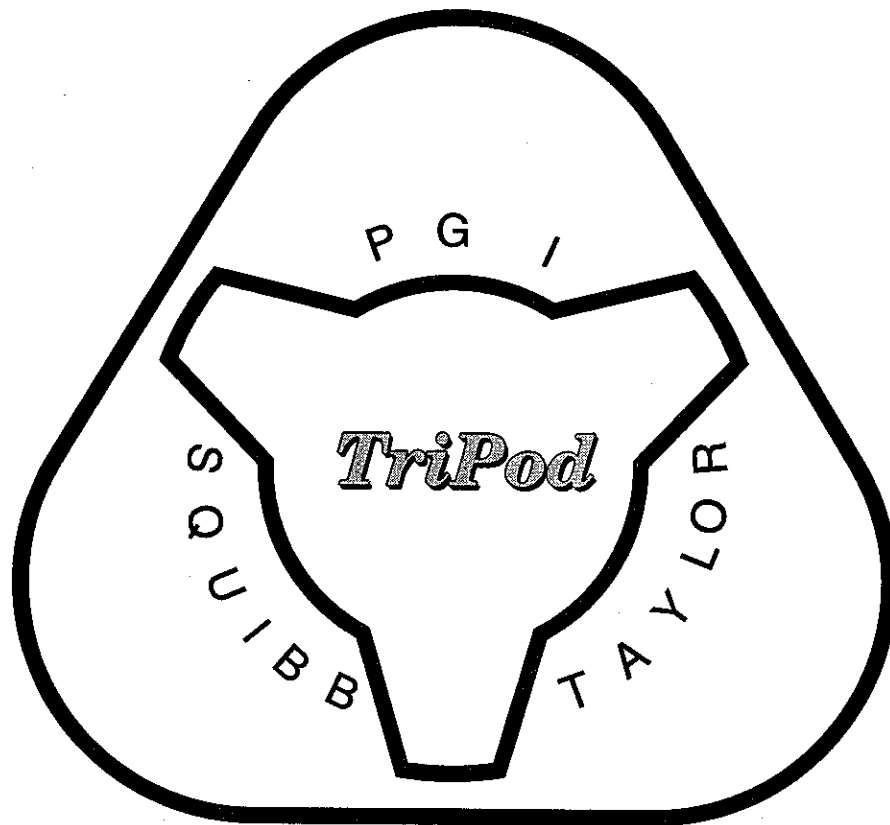


# ***TriPod<sup>TM</sup>***

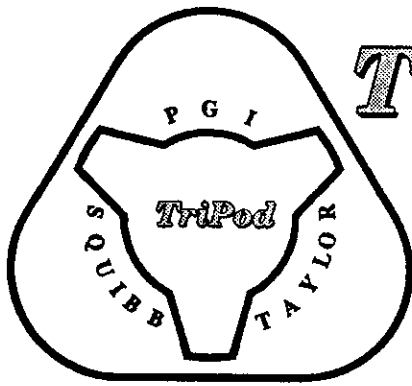
## ***TP3 Safety Coupler For Anhydrous Risers***



## ***INSTALLATION & OPERATING INSTRUCTIONS***

REV. 1 - 1/97

TP3-2019

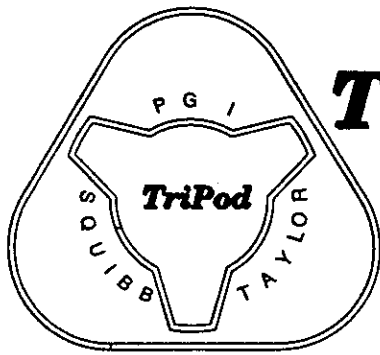


# **TriPod™ Safety Coupler**

## **For Anhydrous Risers**

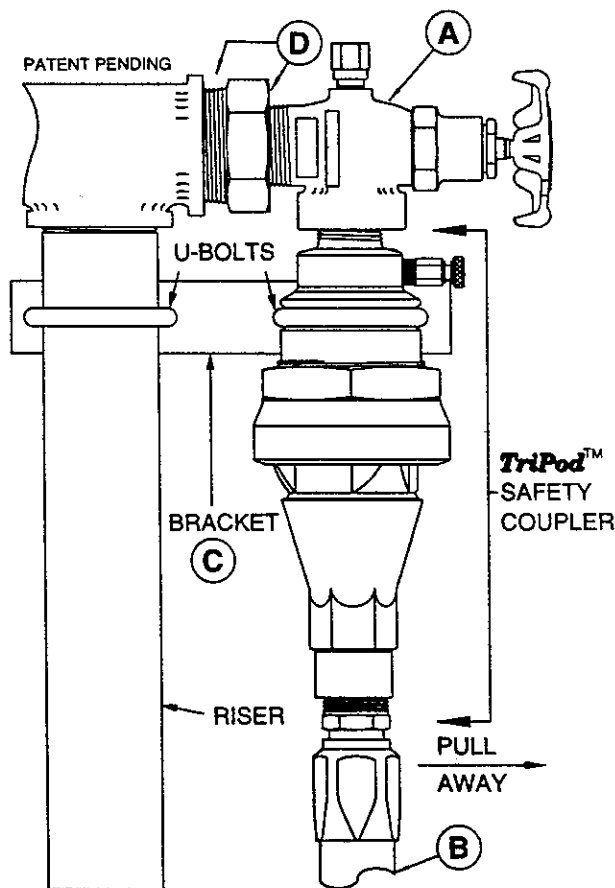
### **INSTALLATION & OPERATING INSTRUCTIONS**

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# TriPod<sup>TM</sup> Safety Coupler

## PRINCIPLES OF OPERATION



THE TRIPOD SAFETY COUPLER IS DESIGNED TO PROVIDE PULL-AWAY PROTECTION FOR EACH HOSE AT THE RISER. IT'S NON-DESTRUCTIVE RELEASING MECHANISM WILL OPERATE RELIABLY WITH A PULL-AWAY FORCE IN ANY GENERALLY HORIZONTAL DIRECTION. IN ADDITION, THE FORCE NEEDED TO RELEASE THE COUPLING DOES NOT REQUIRE THAT THE RISER BE GREATLY RIGIDIZED. SO, IN MOST CASES, THE TRIPODS CAN QUICKLY BE INSTALLED IN EXISTING RISER PIPING.

ALL SS CONSTRUCTION TO ENSURE A LONG TROUBLE FREE OPERATING LIFE.

THE TRIPOD IS TYPICALLY INSTALLED BETWEEN THE RISER SHUTOFF VALVE (A) AND THE FILL HOSE (B). A REQUIRED SAFETY BRACKET (C) IS USED TO LIMIT THE AMOUNT OF TWIST THAT CAN OCCUR AT CONNECTION POINT (D) DURING A PULL-AWAY. THIS BRACKET MUST ALWAYS BE INSTALLED TO ASSURE PROPER OPERATION OF THE TRIPOD IN A PULL-AWAY. THE TRIPOD MUST BE KEPT IN A VERTICAL POSITION FOR A HORIZONTAL PULL TO RELEASE THE COUPLING.

THE MECHANICAL OPERATION OF THE TRIPOD DURING RELEASE IS SHOWN IN FIGURE 2. A RELEASE IS INITIATED WHEN A HORIZONTAL FORCE AT POINT (A) (DUE TO A PULL AWAY) OVERCOMES THE FRICTIONAL FORCES AT BOTH THE INNER AND OUTER BALL SOCKETS (B) AND (C) RESPECTIVELY. THE AMOUNT OF FRICTIONAL FORCE PRESENT WAS DETERMINED BY THE TIGHTNESS OF THE CATCH NUT.

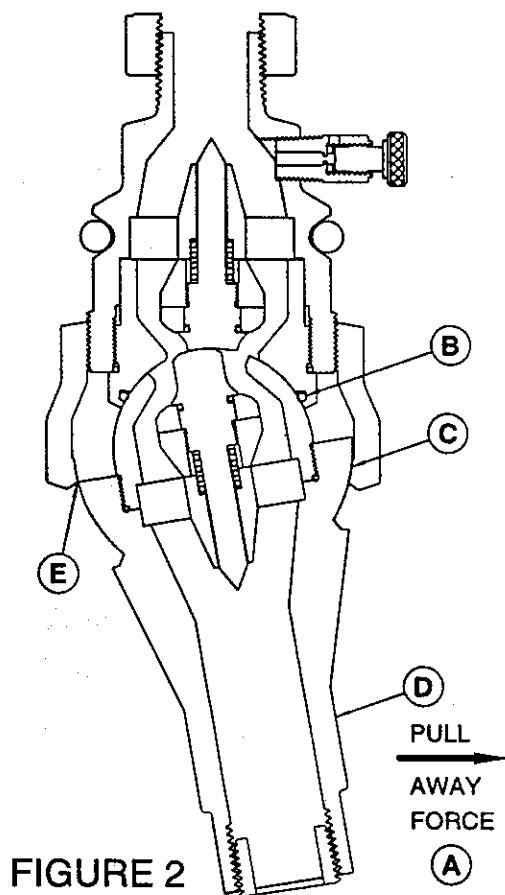


FIGURE 2

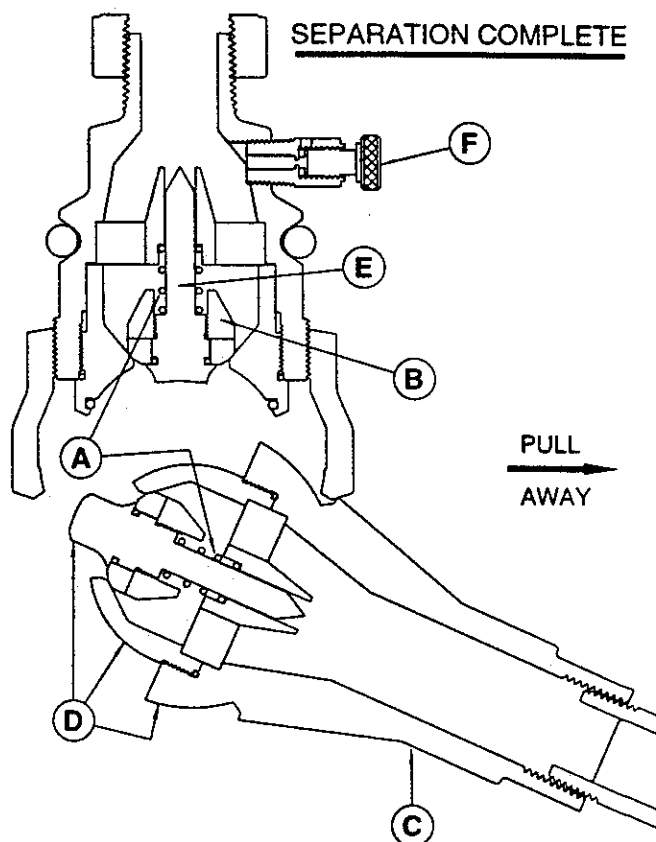


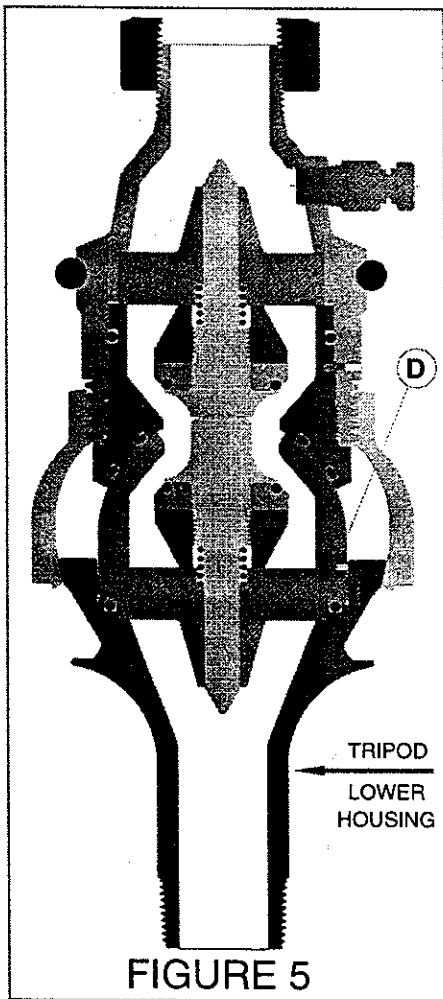
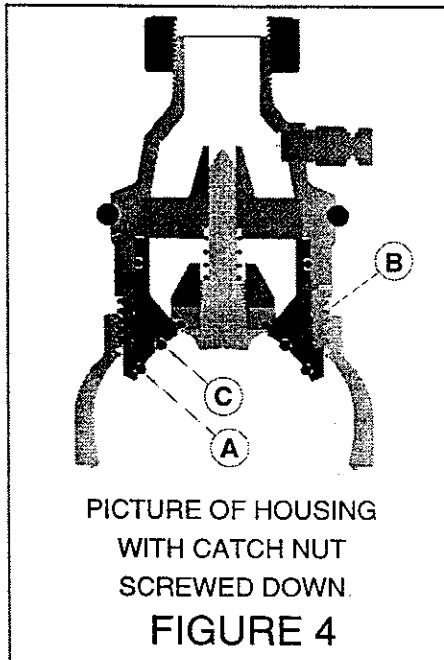
FIGURE 3

AS THE TRIPOD SWIVEL PIVOTS, ONE OR TWO OF THE THREE TRIPOD LEGS TRAVELS DOWN TOWARD THE LIP (E) OF THE CATCH NUT. WHILE THE ROTATION IS OCCURRING THE O-RING ON THE INNER BALL SOCKET (B) MAINTAINS THE PRODUCT SEAL AND WILL CONTINUE TO DO SO UNTILL RELEASE OCCURS. EVENTUALLY ONE OR TWO LEGS (DEPENDING ON - PULLAWAY DIRECTION) ROTATE PAST LIP (E) AND THE TRIPOD LOWER HOUSING ASSEMBLY WILL DROP FREE OF THE UPPER HOUSING AND CATCH NUT ASSEMBLY.

AFTER RELEASE OCCURS THE TWO BACK CHECK VALVES WILL CLOSE VERY QUICKLY TO MINIMIZE PRODUCT RELEASE AS SHOWN IN FIGURE 3. THE BACK CHECKS AND ASSIST SPRINGS (A) ARE STAINLESS STEEL AND THE SEALING SEATS ARE TEFLON TO ENSURE PROPER OPERATION ON A PULLAWAY. THE TRIPOD SWIVEL WITH THE BACK CHECK CLOSED REMAINS ATTACHED TO THE FILL HOSE AND FOLLOWS THE PULLAWAY VEHICLE UNTIL STOPPED. DAMAGE TO THE TRIPOD LOWER HOUSING IS MINIMIZED BY HARDENING THE EXPOSED AREAS (D)

AFTER PROPER BLEED DOWN OF THE SYSTEM AS DESCRIBED UNDER "OPERATING INSTRUCTIONS" THE LOWER HOUSING AND HOSE ARE QUICKLY RECONNECTED TO THE UPPER HOUSING ASSEMBLY TO PUT THE RISER BACK IN OPERATION.

8. - INSPECT FOR THE PRESENCE OF THE SEALING O-RINGS (A) AND (C) IN FIGURE 4. IF THEY ARE MISSING OR CUT, REPLACE THEM NOW.



**NOTE:** ON A DISCONNECT, IT IS NOT UNUSUAL FOR THE LARGER SEALING O-RING (A) IN FIGURE 4 TO BLOW OUT OF THE RING GROOVE AND LODGE AT THE BASE (D) OF THE TRIPOD SWIVEL MALE BALL AS SHOWN IN FIGURE 5.

9. - SCREW THE CATCH NUT DOWN (OFF) UNTIL THE INTERNAL THREADS ARE SLIGHTLY EXPOSED AS SHOWN IN FIGURE 4 (B).

**NOTE:** THE CATCH NUT IS SCREWED DOWN TO THIS POSITION SO THE BACK CHECKS WILL NOT INTERFERE WITH EACH OTHER WHEN THE SWIVEL IS HUNG IN THE CATCH NUT.

10. - TAKE THE TRIPOD SWIVEL WITH HOSE ATTACHED AND HANG IT IN THE CATCH NUT AS SHOWN IN FIGURE 5.

11. - WHILE HOLDING THE TRIPOD SWIVEL, SCREW THE CATCH NUT ONTO THE HOUSING (UP) UNTIL HAND TIGHT.

**NOTE:** BE SURE TO HOLD THE SWIVEL IN A VERTICAL POSITION WHILE RUNNING UP THE CATCH NUT OR THE SWIVEL WILL DISENGAGE.

12. - TIGHTEN THE CATCH NUT 1/4 TURN WITH A PIPE WRENCH ON IT'S WRENCH AREA AS SHOWN IN FIGURE 6.

13. - GRAB THE HOSE FITTING BY HAND AND TRY TO MOVE THE TRIPOD SWIVEL. IF IT CAN BE MOVED BY HAND, TIGHTEN THE CATCH NUT 1/16 TURN OR LESS AND TRY AGAIN.

**NOTE:** STRIKING THE HOSE FITTING WITH THE HEEL OF YOUR HAND TO SEE IF IT WILL MOVE, IS ALSO A TECHNIQUE THAT CAN BE USED.

**CAUTION:** DO NOT OVERTIGHTEN THE CATCH NUT. IT MUST BE TIGHT ENOUGH TO NOT DISENGAGE WITH NORMAL HOSE HANDLING BUT SHOULD NOT BE TIGHTENED PAST THAT POINT.

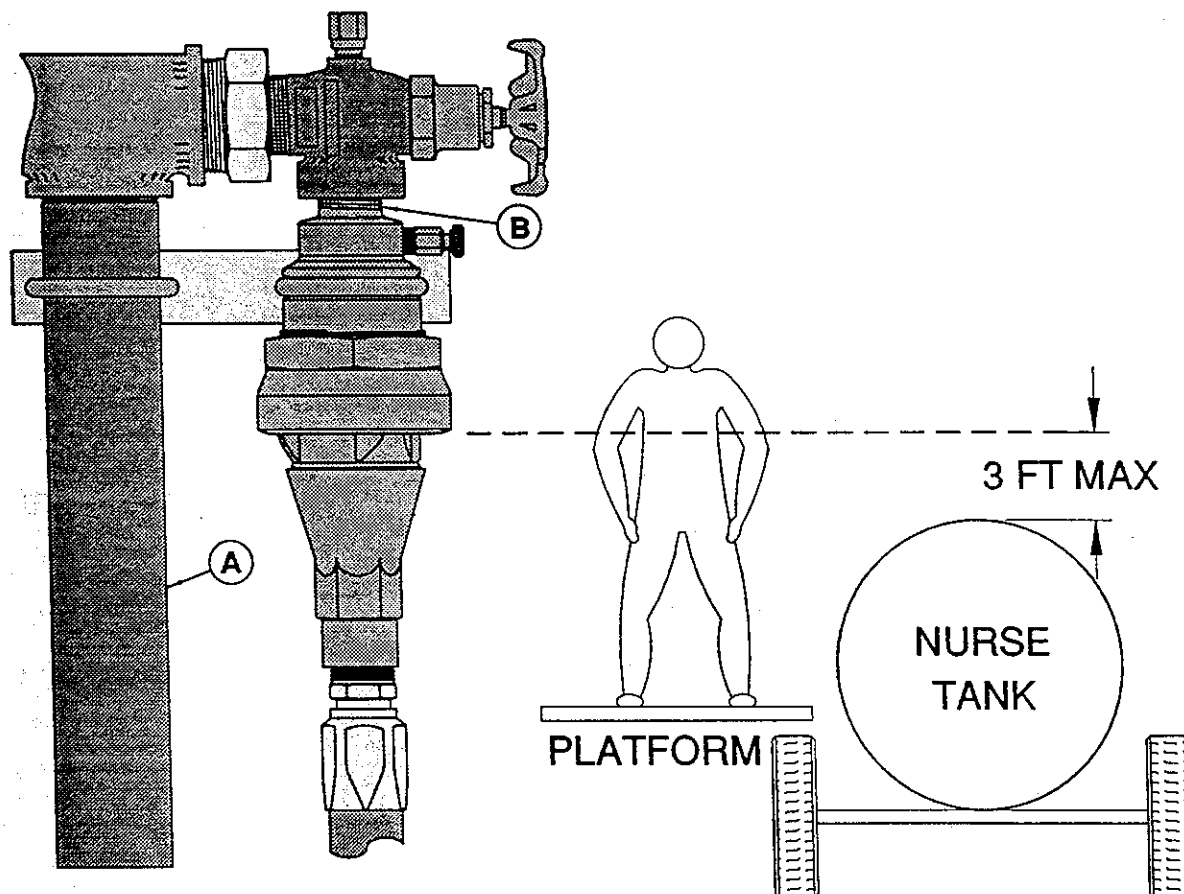
**NOTE:** THERE IS NO NEED TO KEEP TRIPOD HOUSINGS AND SWIVELS MATCHED AS RECEIVED FROM THE FACTORY. ANY PARTICULAR SIZE SWIVEL WILL WORK ON ANY SAME SIZED HOUSING.

**5.- REMOVE THE CATCH NUT AND LUBRICATE THE THREADS WITH A GOOD WEATHER RESISTANT HEAVY GREASE. SCREW THE CATCH NUT BACK ONTO THE HOUSING AND BACK TIGHTEN WITH A WRENCH SUFFICIENTLY TO PREVENT REMOVAL BY HAND. THIS IS TO GUARD AGAINST OFF SEASON THEFT OF THE CATCH NUT.**

**6. - CLOSE THE HOUSING BLEEDER**

## C- ALLOWABLE MOUNTING HEIGHT

THE TRIPOD PIVOT POINT, WHICH IS THE BOTTOM OF THE CATCH NUT, SHOULD NOT BE MORE THAN 3 FEET ABOVE THE NURSE TANK VALVES.



IF THE RISER DOES NOT MEET THIS REQUIREMENT EITHER:

1. - REDUCE THE RISER PIPE (A) HEIGHT; OR
2. - LOWER THE TRIPOD DOWN TO THE DESIRED HEIGHT BY INSTALLING A NIPPLE AT POINT (B) ABOVE.

**SAFETY RECOMENDATION:** KEEP THE TRIPOD PIVOT POINT BELOW CHEST HIGH TO THE PLATFORM OPERATORS. ON A PULLAWAY THE COUPLING DOES VENT SOME LIQUID AND VAPOR AS THE BACK CHECKS CLOSE.

## D- TRIPOD AND BRACKET INSTALLATION

### TYPE 1 RISER- (REFER TO TYPE 1 RISER DRAWING)

1. - CLOSE ALL 3 RISER VALVES, BLEED HOSE CONTENTS OFF UNDER WATER AND REMOVE THE LIQUID VAPOR HOSES FROM THE RISER VALVES.
2. - TEFLON TAPE THE MALE THREADS ON THE TP1 TRIPOD (A) AND INSTALL IT WRENCH TIGHT WITH THE HOLE FOR THE BLEEDER (B) TO THE RIGHT.
3. - INSTALL AND ADJUST THE BLEEDER SO THE BLEED PORT POINTS AWAY FROM THE OPERATOR AND LEAVE IT OPEN.
4. - LOOSELY INSTALL SUPPLIED U-BOLT (C) AND FACTORY DRILLED BAR (D) AS SHOWN IN THE TYPE 1 RISER DRAWING. THE FLAT SIDE (E) OF THE BAR MUST BE UP, OR THE CATCH NUT WILL INTERFERE LATER. WITH THE LONG BAR HELD IN PLACE, MARK THE BAR FOR HOLE DRILLING BY HOLDING U-BOLT (F) TO THE BAR TO MARK THE DRILL HOLE LOCATIONS. ALSO MARK THE BAR FOR CUTOFF SEVERAL INCHES OUT PAST THE RISER AT (G)

**CAUTION:** THE SAFETY BRACKET MUST BE INSTALLED TO LIMIT PIVOTING AT POINT (J) IN THE PIPING ASSEMBLY.

5. - SHOP DRILL TWO 7/16 HOLES FOR THE U-BOLT WHERE MARKED AND CUT THE BAR OFF AT (G) AS MARKED.

**WARNING:** IF THE BRACKET BAR SUPPLIED WILL NOT REACH FROM THE TRIPOD TO THE RISER PIPE THAT MEANS THE PIPE OR COUPLINGS AT (J) ARE TOO LONG. SHORTEN THE PIPE OR COUPLINGS SO THAT THE BAR SUPPLIED CAN BE INSTALLED.

6. - INSTALL THE DRILLED BAR AS SHOWN USING LOCK WASHERS AND FULLY TIGHTEN THE U-BOLT NUTS.

**CAUTION:** HIGH STRENGTH U-BOLTS ARE SUPPLIED WITH THIS UNIT. DO NOT SUBSTITUTE COMMON U-BOLTS FOR REPLACEMENTS.

- 7.- TAPE AND CONNECT THE TRIPOD LOWER HOUSING ASSEMBLY (H) TO THE HOSE FITTING, AND OPEN THE HOSE END VALVE.
8. - PLACE THE VAPOR TRIPOD IN SERVICE BY CONTINUING FROM STEP 8-PAGE 6 UNDER "RECONNECTION AFTER A PULL-AWAY"
9. - INSTALL AND PLACE THE TP2 OR TP3 TRIPOD IN THE LIQUID LINE USING EXACTLY THE SAME PROCEDURE AS WAS JUST COMPLETED TO INSTALL THE VAPOR (TP1) TRIPOD.

**TYPE 2 RISER-** (REFER TO TYPE 2 RISER DRAWING)

1. - INSTALL THE VAPOR TRIPOD EXACTLY AS DESCRIBED ON PAGE 11 STEPS 1 THROUGH 8.
2. - INSTALL THE LIQUID SIDE TRIPOD BRACKETS (BARS) AS SHOWN IN THE TYPE 2 RISER DRAWING.

EACH TRIPOD IS ALWAYS SUPPLIED WITH A U-BOLT THAT CLOSELY FITS THE U-BOLT GROOVE ON THE TRIPOD AND A BAR PRE-DRILLED FOR THAT U-BOLT SPACING.

**NOTE:** ALWAYS POSITION BLEEDERS SO THEY VENT AWAY FROM OPERATORS.

**CAUTION:** THE SAFETY BARS MUST BE INSTALLED TO LIMIT POSSIBLE PIVOTING AT POINT (J) IN THE PIPING ASSEMBLY.

**NOTE:** WHEN MARKING THE BARS FOR THE FIELD DRILLED 7/16" HOLES AT (L) ON EACH BAR, KEEP THE SPACE (M) BETWEEN THE RISER PIPE AND THE BOLTS (N) TO LESS THAN 1/8".

**WARNING:** IF THE BRACKET BAR SUPPLIED WILL NOT REACH FROM THE TRIPOD TO THE RISER PIPE THAT MEANS THE PIPE OR COUPLINGS AT (J) ARE TOO LONG. SHORTEN THE PIPE OR COUPLINGS SO THAT THE BAR SUPPLIED CAN BE INSTALLED.

3. - PLACE THE LIQUID AND VAPOR TRIPODS IN SERVICE BY CONTINUING FROM STEP 8 ON PAGE 6 UNDER "RECONNECTION AFTER A PULL-AWAY".

**TYPE 3 RISER - (REFER TO TYPE 3 RISER DRAWING)**

1. - INSTALL THE LIQUID AND VAPOR TRIPODS AND SUPPORT BARS AS SHOWN IN THE TYPE 3 RISER DRAWING. EACH TRIPOD IS ALWAYS SUPPLIED WITH A U-BOLT THAT CLOSELY FITS THE U-BOLT GROOVE ON THE TRIPOD AND A PRE-DRILLED BAR FOR THAT U-BOLT SPACING.

**CAUTION:** THE SAFETY BARS MUST BE INSTALLED TO LIMIT POSSIBLE PIVOTING AT POINT **(J)** IN THE PIPING ASSEMBLY.

**NOTE:** WHEN MARKING THE BARS FOR THE FIELD DRILLED 7/16" HOLES AT **(L)** ON EACH BAR, KEEP THE SPACE **(M)** BETWEEN THE RISER PIPE AND THE BOLTS **(N)** TO LESS THAN 1/8".

**WARNING:** IF THE BRACKET BAR SUPPLIED WILL NOT REACH FROM THE TRIPOD TO THE RISER PIPE THAT MEANS THE PIPE OR COUPLINGS AT **(J)** ARE TOO LONG. SHORTEN THE PIPE OR COUPLINGS SO THAT THE BAR SUPPLIED CAN BE INSTALLED.

**(NOTE:** ALWAYS POSITION BLEEDERS SO THEY VENT AWAY FROM OPERATORS.

2. - PLACE THE LIQUID AND VAPOR TRIPODS IN SERVICE BY CONTINUING FROM STEP 8 ON PAGE 6 UNDER "RECONNECTION AFTER A PULL-AWAY)

## **TYPE 4 RISER - (REFER TO TYPE 4 RISER DRAWING)**

A TYPE 4 RISER IS IDENTICAL TO A TYPE 5 RISER EXCEPT THE QUAD SECTION OF THE RISER IS ORIENTED DIFFERENTLY TO THE NURSE TANKS.

1. - INSTALL THE TWO VAPOR TRIPODS AS SHOWN IN THE TYPE 4 RISER DRAWING.

**NOTE:** EACH TRIPOD IS ALWAYS SUPPLIED WITH A U-BOLT THAT CLOSELY FITS THE U-BOLT GROOVE ON THE TRIPOD AND A PRE-DRILLED BAR FOR THAT U-BOLT SPACING.

**CAUTION:** THE SAFETY BARS MUST BE INSTALLED TO LIMIT POSSIBLE PIVOTING AT POINT **(J)** IN THE PIPING ASSEMBLY.

WHEN MARKING THE BARS FOR THE 7/16" HOLES, KEEP THE SPACE **(M)** BETWEEN THE RISER PIPE AND THE BOLTS **(N)** TO LESS THAN 1/8".

2. - INSTALL THE LIQUID SIDE TRIPODS AND SUPPORT BARS AS SHOWN IN THE TYPE 4 RISER DRAWING.

**WARNING:** IF THE BRACKET BAR SUPPLIED WILL NOT REACH FROM THE TRIPOD TO THE RISER PIPE THAT MEANS THE PIPE OR COUPLINGS AT **(J)** ARE TOO LONG. SHORTEN THE PIPE OR COUPLINGS SO THAT THE BAR SUPPLIED CAN BE INSTALLED.

SINCE A BAR AND BOLTS ARE SUPPLIED WITH EACH TRIPOD, THIS INSTALLATION WILL HAVE ONE BAR AND SEVERAL U-BOLTS AND BOLTS LEFT OVER.

THIS INSTALLATION REQUIRES FIELD DRILLING THE 7/16" HOLES TO FIT THE TRIPOD U-BOLT AT **(A)** THE TRIPOD -TO-TRIPOD BARS **(B)** SERVE TO ELIMINATE POSSIBILITY OF PIVOTING AT POINTS LABELED **(C)**. THE THIRD SHORT BAR **(D)** WILL ELIMINATE PIVOTING AT POINTS LABELED **(E)**. **ALL THREE BARS MUST BE INSTALLED FOR PROPER SAFETY.**

THE THIRD BAR (D) IS ATTACHED TO THE RISER PIPE AND ONE OF THE TRIPOD-TO-TRIPOD BARS AS SHOWN IN VIEW B-B ON THE RISER DRAWING. THIS BAR REQUIRES A FIELD CUT AT (P) AND TWO 7/16" HOLES DRILLED THRU THE BAR IN THE LONG DIRECTION. THE SMALL SUPPLIED U-BOLT IS USED AS SHOWN TO CONNECT THE CROSS (B) BAR TO THE (D) BAR.

**CAUTION:** DO NOT DRILL LONGWAYS THRU THE (B) BAR. THE HOLE WILL WEAKEN THE BAR.

3. - PLACE THE LIQUID AND VAPOR TRIPODS IN SERVICE BY CONTINUING FROM STEP 8 ON PAGE 6 UNDER "RECONNECTION AFTER A PULL-AWAY".

### **TYPE 5 RISER - (REFER TO TYPE 5 RISER DRAWING)**

A TYPE 5 RISER IS IDENTICAL TO A TYPE 4 RISER EXCEPT THE QUAD SECTION OF THE RISER IS ORIENTED DIFFERENTLY TO THE NURSE TANKS.

1. - INSTALL THE TWO VAPOR TRIPODS AS SHOWN IN THE TYPE 5 RISER DRAWING.

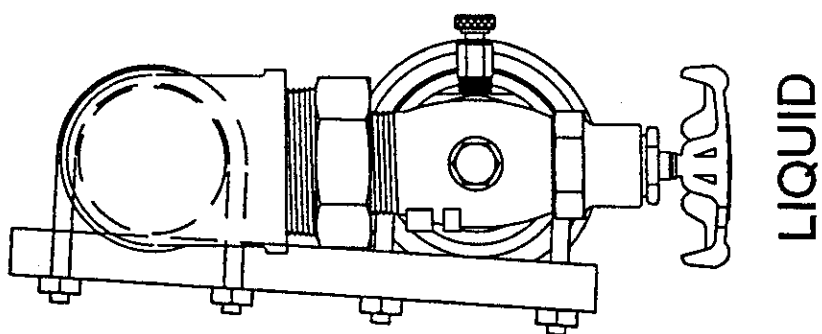
**NOTE:** EACH TRIPOD IS ALWAYS SUPPLIED WITH A U-BOLT THAT CLOSELY FITS THE U-BOLT GROOVE ON THE TRIPOD AND A PRE-DRILLED BAR FOR THAT U-BOLT SPACING.

**CAUTION:** THE SAFETY BARS MUST BE INSTALLED TO LIMIT POSSIBLE PIVOTING AT POINT (J) IN THE PIPING ASSEMBLY.

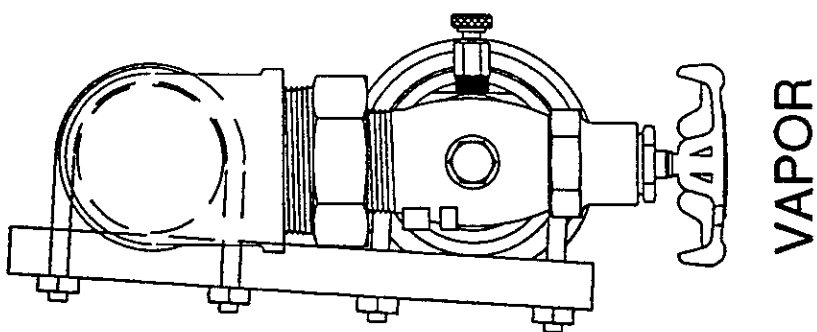
WHEN MARKING THE BARS FOR THE 7/16" HOLES, KEEP THE SPACE (M) BETWEEN THE RISER PIPE AND THE BOLTS (N) TO LESS THAN 1/8".

2. - INSTALL THE LIQUID SIDE TRIPODS AND SUPPORT BARS AS SHOWN IN THE TYPE 5 RISER DRAWING.

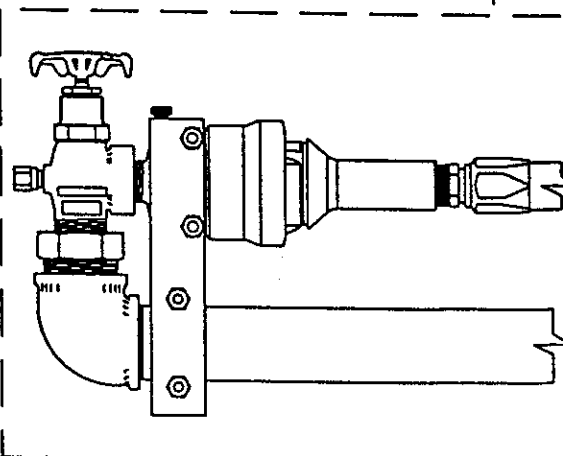
**WARNING:** IF THE BRACKET BAR SUPPLIED WILL NOT REACH FROM THE TRIPOD TO THE RISER PIPE THAT MEANS THE PIPE OR COUPLINGS AT (J) ARE TOO LONG. SHORTEN THE PIPE OR COUPLINGS SO THAT THE BAR SUPPLIED CAN BE INSTALLED.



# TYPE 1 RISER



VIEW →



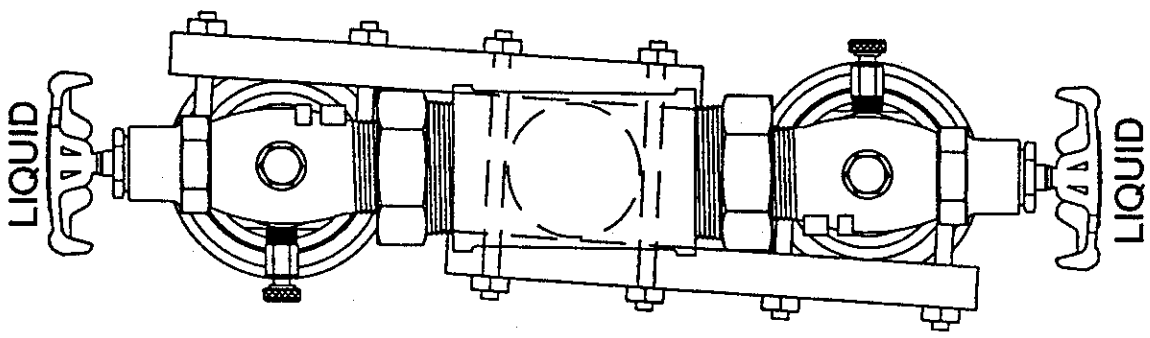
PULL  
AWAY

**NURSE TANK LOCATION**

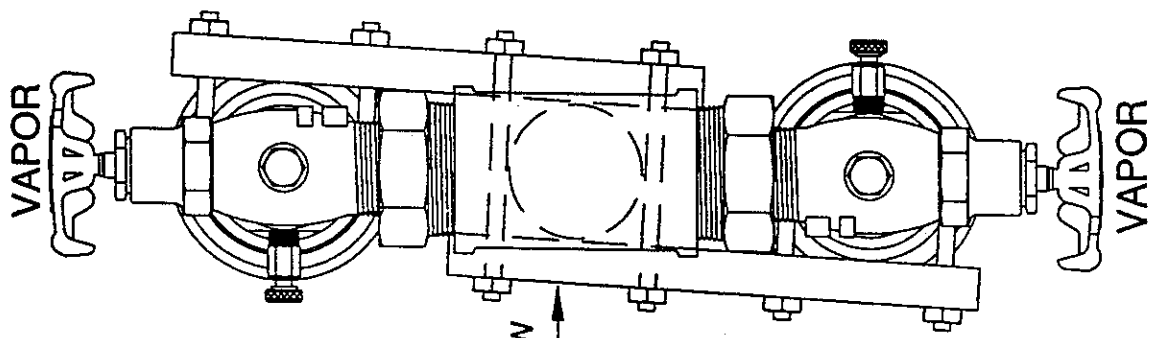
PULL  
AWAY

SURE9

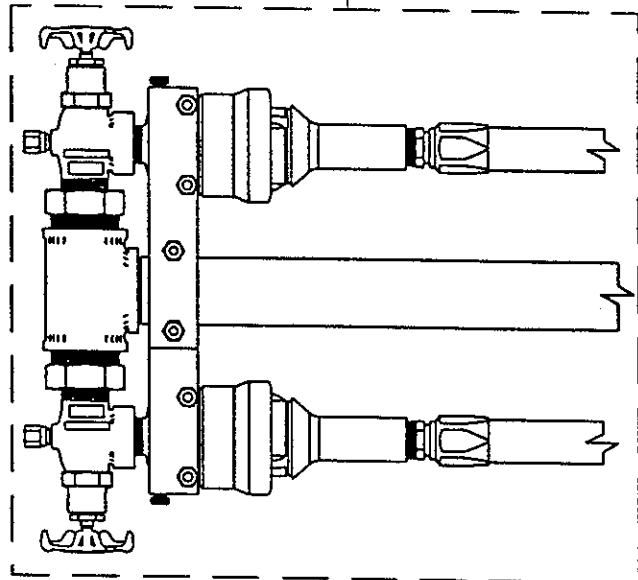
PULL  
AWAY  
NURSE TANK LOCATION  
PULL  
AWAY



**TYPE  
3  
RISER**



VIEW



PULL  
AWAY  
NURSE TANK LOCATION  
PULL  
AWAY

SURE7

