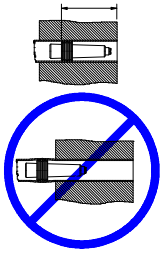


## CLOSE QUARTER RAM OPERATING INSTRUCTIONS

WHEN TUBESHEET THICKNESS ALLOWS  
INSTALLATION DEPTH = 1-3/4" MIN



**THE POP-A-PLUG MUST BE INSTALLED IN THE ROLLED SECTION WITHIN THE TUBESHEET.** The installed plug should never project beyond tubesheet face unless it is on the perimeter or in a thin tubesheet. If the tubesheet is not thick enough or the roll length is insufficient, install ring in rolled portion within the tubesheet even if pin projects beyond tubesheet. Any tube sleeves or shields must be removed from tubesheet plugging area prior to tube preparation and plugging. **NEVER HIT THE PIN WITH A HAMMER OR HEAVY OBJECT. P2-MUST NOT BE USED IN ANY HEATER IF THE TUBE IS NOT EXPANDED TO THE TUBESHEET.**

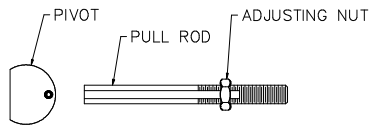


FIG A

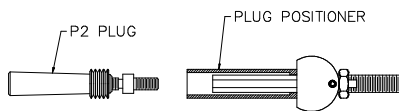


FIG B

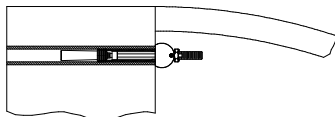


FIG C

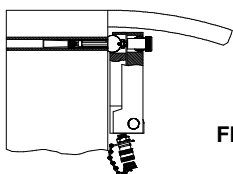


FIG D

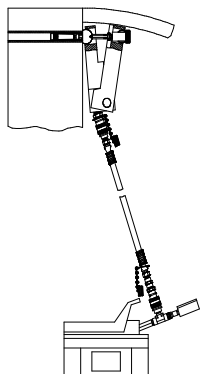


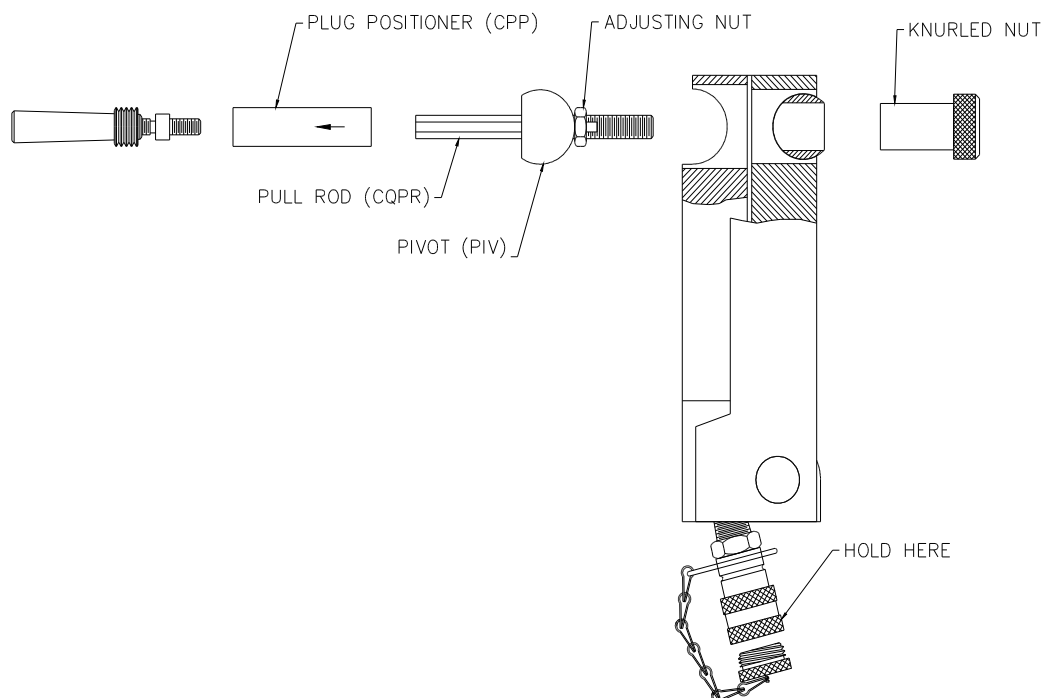
FIG E

1. Follow first five steps of P2-Instructions DC4010 for proper methods of tube preparation and plug sizing.
2. Remove any tapered plugs that will prohibit the ram from installing plugs to the desired depth within the tube sheet.
3. Slide the pull rod that matches the plug you are installing through the pivot as shown in Fig. A. Place the correct plug positioner over the pull rod (arrow on the plug positioner points to the plug). Thread the plug into the pull rod. Hand tighten the adjusting nut against the pivot.  
**Lubricate rounded surface of pivot and mating surface of ram with anti-seize prior to operation.**
4. If clearance within the heat exchanger allows, mate the pull rod with ram by inserting pull rod into ram and hand tightening knurled nut. Insert plug into tube to desired depth. Figure D.

**Restricted access applications:** Insert the plug end of assembly into prepared tube, resting the flat side of the pivot against the tubesheet face, Fig C. Couple ram to pull rod assembly seating the pivot into ram. Thread knurled nut onto pull rod removing all slack in assembly, figure D

***Be sure air and hydraulic hoses are properly connected. Failure to correctly seat and tighten hydraulic fittings will cause ram to lock in open position after activation.***

5. Never stand directly behind ram. Guide ram with hands to avoid cocking plug. Ram should be gripped at hydraulic connection
6. Depress pump pedal, ram will stroke, figure E. As ram strokes, allow the ram to pivot away from the tubesheet. If the ram is rigidly held and not allowed to pivot, the Breakaway, pull rod, or ram may malfunction resulting in an improper plug installation. When plug "pops" immediately stop hydraulic pump. If the plug does not "pop" and the ram is fully opened, the plug is not properly installed. Stop and call E.S.T (numbers above) or your local representative for assistance. Close Quarters Ram will recoil when plug "pops". The recoil, in some cases, may cause the breakaway to fracture where it threads into the pull rod.
7. Depress front of hydraulic pump pedal, ram will retract
8. Remove knurled nut from pull rod assembly. Remove ram, remove pull rod assembly, and loosen adjusting nut. Although experience indicates that the breakaway stub will not unthread during normal heat exchanger operating conditions, the best practice is to remove the breakaway after plug installation. Thread next plug into pull rod assembly.



<b>P2-PLUGS RANGE COVERED BY PULL ROD ASSEMBLY</b>	<b>CLOSE QUARTER PULL ROD ASSEMBLY (1) (CQP)</b>	<b>CLOSE QUARTER PLUG POSITIONER (CPP)</b>
<b>P2-400 TO P2-440</b>	<b>CQP-400-440</b>	<b>CPP-400-440</b>
<b>P2-460 TO P2-500</b>	<b>CQP-460-500</b>	<b>CPP-460-500</b>
<b>P2-520 TO P2-580</b>	<b>CQP-520-580</b>	<b>CPP-520-580</b>
<b>P2-600 TO P2-680</b>	<b>CQP-600-680</b>	<b>CPP-600-680</b>
<b>P2-700 TO P2-780</b>	<b>CQP-700-780</b>	<b>CPP-700-780</b>
<b>P2-800 TO P2-860</b>	<b>CQP-800-860</b>	<b>CPP-800-860</b>

1. The Close Quarters Pull Rod Assembly is composed of a Pull Rod (CQPR), a Pivot (PIV), an Adjusting Nut, a Knurled Nut, and a Plug Positioner (CPP). The part numbers indicate the size range of plugs that the part is manufactured for. The Pivot and Plug Positioner are marked with this range. The Plug Positioner is also marked with an arrow that must point towards the plug.

**QUESTIONS?** Contact EST Group Customer Service at any of the following locations with questions.

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