

# Instruction Manual



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Instrument Model Number \_\_\_\_\_

Instrument Serial Number \_\_\_\_\_

# Weld-In Tank Shell

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## Section 1 General

### 1.1 DESCRIPTION

This manual contains welding instructions for the various Anderson Flush Mount Weld-In Tank Shells. Be sure to identify the model that you will be installing, and to properly follow all procedures as listed.

**CAUTION:** Failure to utilize proper welding techniques or good welding practices may result in improper installation, warping of the shell, or damage to the vessel. As these issues are not covered under the product warranty, be sure to utilize properly trained installation personnel and proper welding and cutting tools.

Shell Number	Description
71060-A0003	Insulated Vessel - Standard Flange - 316L
71060-A0004	Uninsulated Vessel - Standard Flange - 316L
71060-A0005	Insulated Vessel - Pressure Vessel Flange - 316L
71060-A0006	Uninsulated Vessel - Pressure Vessel Flange - 316L
71060-A0007	Insulated Vessel - Standard Flange - Hastelloy
71060-A0008	Uninsulated Vessel - Standard Flange - Hastelloy
71060-A0009	Insulated Vessel - Heavy Duty Pressure Vessel Flange - 316L

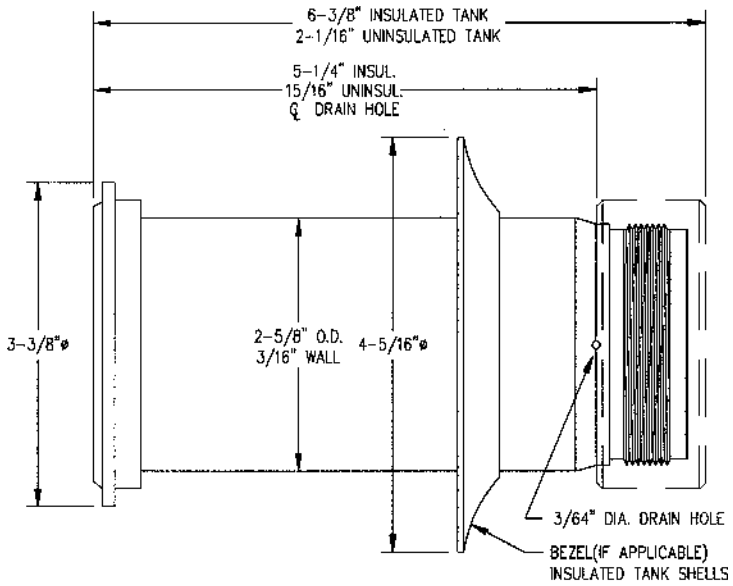
**Table 1**

Be sure to check shipping carton upon removal of parts. If carton shows evidence of damage, notify carrier immediately. Contents of package should include:

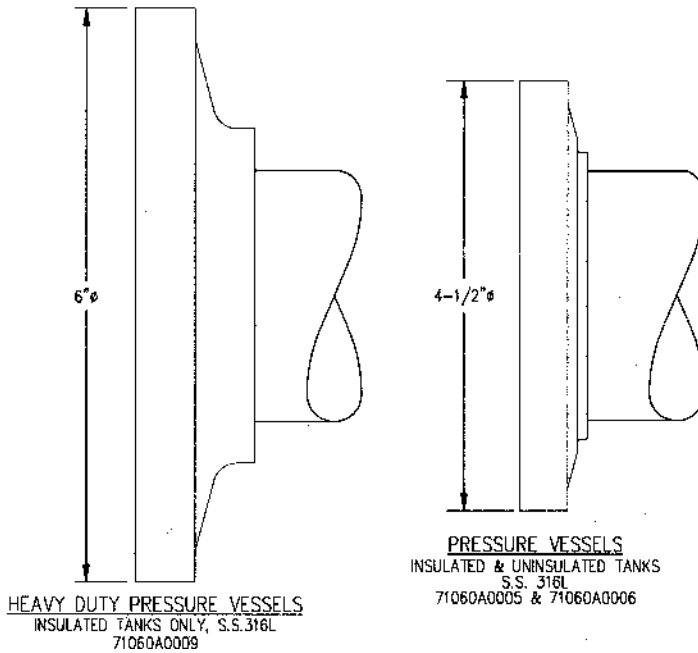
**Tank Shell:** Each shell should have a pair of cupped washers held in place by a threaded rod. DO NOT discard these parts. They will be used to construct a welding jig during final installation.

**Outer Jacket Bezel:** Supplied with A3, A5, A7 & A9 style shells. Used when installing in insulated vessel to fill gap between shell and outer vessel skin.

## Section 2 Shell Dimensions



AIC FLUSH MNT.  
 INSULATED & UNINSULATED TANKS  
 71060A0003 & 71060A0004 (S.S. 316L)  
 71060A0007 & 71060A0008 (HASTELLOY)



HEAVY DUTY PRESSURE VESSELS  
 INSULATED TANKS ONLY, S.S. 316L  
 71060A0009

PRESSURE VESSELS  
 INSULATED & UNINSULATED TANKS  
 S.S. 316L  
 71060A0005 & 71060A0006

## Section 3 Shell Location and Tank Penetrations

**CAUTION:** When mounting near walls of tank alcoves, on the underside of vessels, near piping, etc. be sure to locate the shell so that sensors may be installed without interference. Using shell dimensions as given in Section 2, along with dimensions of the sensor to be installed in the shell (Refer to installation manual for that product), proper location can be determined.

Shell Number	Penetration (Vessel Lining)	Penetration (Outer Vessel Jacket)
71060-A0003	3.0 inches	3-3/8 inches
71060-A0004	3.0 inches	Does Not Apply
71060-A0005	4.5 – 4.510 inches max.	3-3/4 inches
71060-A0006	4.5 – 4.510 inches max.	Does Not Apply
71060-A0007	3.0 inches	3-3/8 inches
71060-A0008	3.0 inches	Does Not Apply
71060-A0009	6.0 – 6.010 inches max.	3-3/4 inches

**Table 2**

### 3.1 SINGLE WALL VESSELS

For a Single Wall Vessel, select the location on the vessel lining where the shell is to be installed. Cut the proper diameter penetration as given in Table 2. Use of a carbide-tipped hole saw provides the proper hole diameter and eliminates irregularly shaped holes. Any excess material removed from the tank jacket must be filled back in to the proper size prior to installation of the shell. Failure to maintain the correct size and shape hole can cause shell warping during welding.

### 3.2 DOUBLE WALL VESSELS

For Double Wall Vessels, select the location on the vessel lining where the shell is to be installed. Cut the proper diameter penetration as given in Table 2. Use of a carbide-tipped hole provides the proper hole diameter and eliminates irregularly shaped holes. Any excess material removed from the tank jacket must be filled back in to the proper size prior to installation of the shell. Failure to maintain the correct size and shape hole can cause shell warping during welding. Remove any insulation material that may be present between the outer and inner jacket. Locate the center of the outer jacket hole by projecting the center of the lining hole onto the outer jacket. The common axis for both holes should be perpendicular to both the lining and the outer jacket. Drill a small pilot hole in the outer jacket. Scribe and cut the proper diameter hole as shown in Table 2, for the outer jacket. Use the pilot hole as the center.

## Section 4 Shell Welding

### 4.1 Welding Models A3, A4, A7, A8

Using the appropriate figure, construct a weld jig as shown.

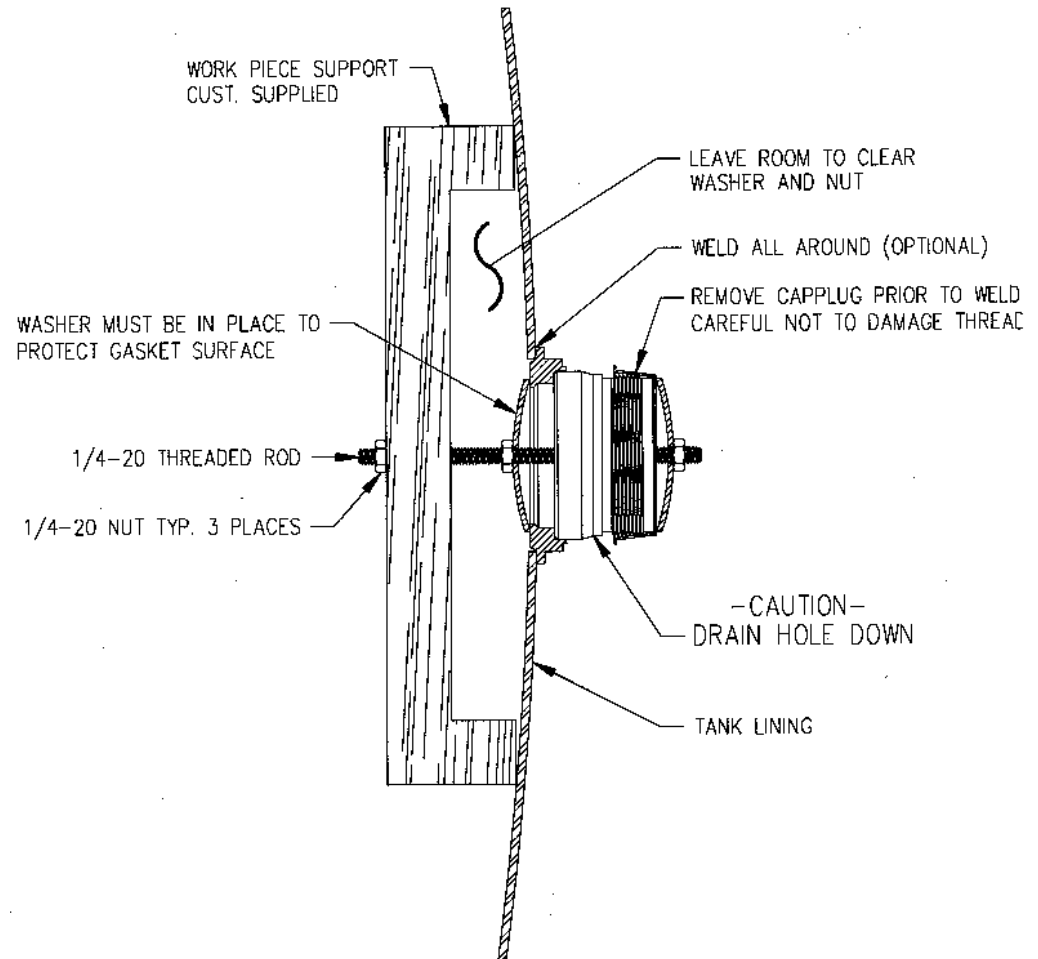


Figure 1 - Shell Style A4 or A8

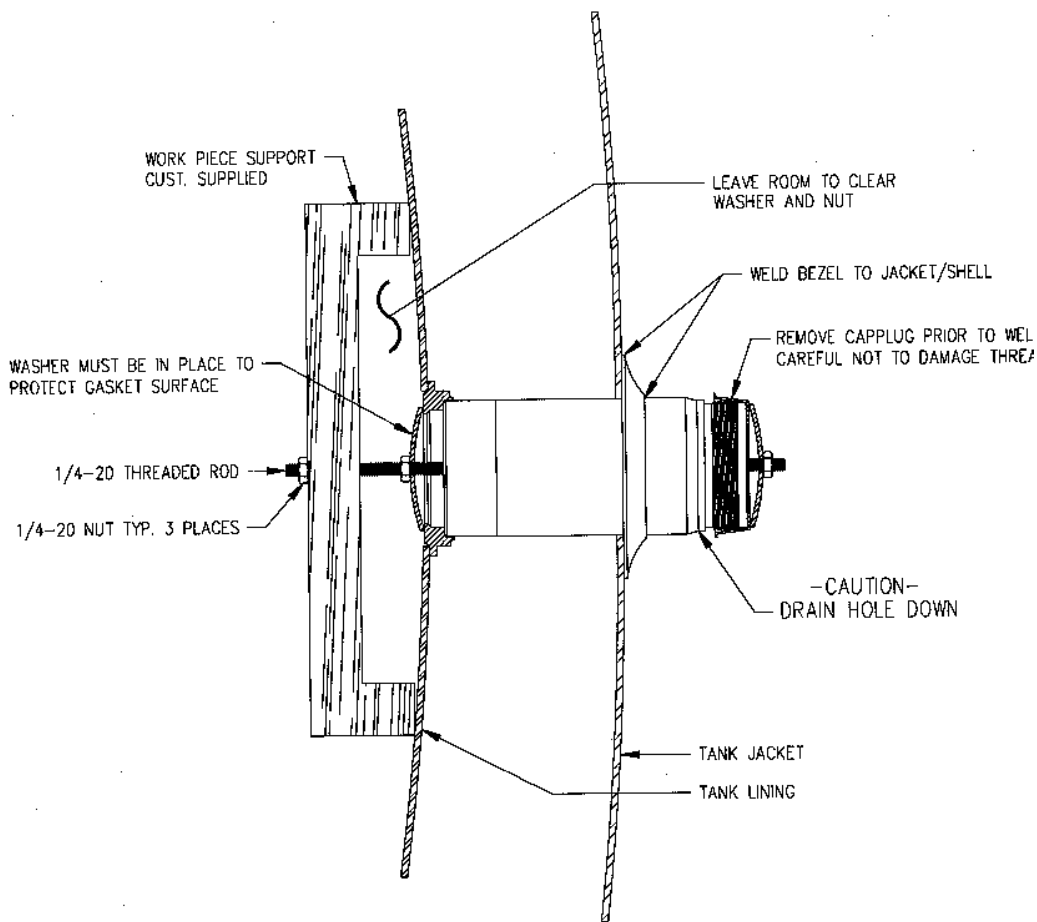


Figure 2 - Shell Style A3 or A7

To prepare for welding, from outside the vessel, insert the shell and washer assembly so that the flange (diaphragm) end of the shell fits into the hole cut through the vessel lining. Position the drain hole downward. From inside the vessel, slip the wooden yoke (Installer provided) over the threaded rod. Engage the 1/4-20 nut onto the rod at each end, and tighten so that the entire assembly is secured in place.

Next, referring to the following figure, TACK WELD the shell to the vessel lining at TWELVE places, 30 degrees apart. As illustrated in the diagram, tack at positions 1-7-2-8-3-9-4-10-5-11-6-12, in that sequence. Remove the wooden yoke, but leave the cupped washers in place. The washers serve to protect the shell face from weld spatter or other possible damage.

Alternately weld from points 1-2, 7-8, 2-3, 8-9, 3-4, 9-10, 4-5, 10-11, 5-6, 11-12, 6-7, and 12-1 in that sequence. Back purging the ENTIRE vessel/shell area with inert gas is required while welding root pass. Allow ample air cool time between welding sections to prevent distortion. Welds should be cooled to 120 degrees F. Rapid cooling with compressed air is acceptable. Overlap sections as necessary to complete weld. Repeat the same sequence to weld the outside of the vessel. Complete welding passes must be alternated from inside to outside of tank for all passes. Use multiple passes at lower welder settings to minimize shell warping.

NOTE: Verify ID of flange at inside of vessel - MUST NOT EXCEED 2.160". Measure this area after each completed weld pass.

For Insulated Vessels, a bezel is supplied to slip onto the shell from the threaded end. Use extreme care in welding. Follow good welding practices (Heat / Cool) to prevent shell distortion.

With all welding complete, grind and polish all welds to an acceptable finish. DO NOT grind over the entire inside face of the shell. Removing excess material will result in a poor fit of the sensor to the shell.

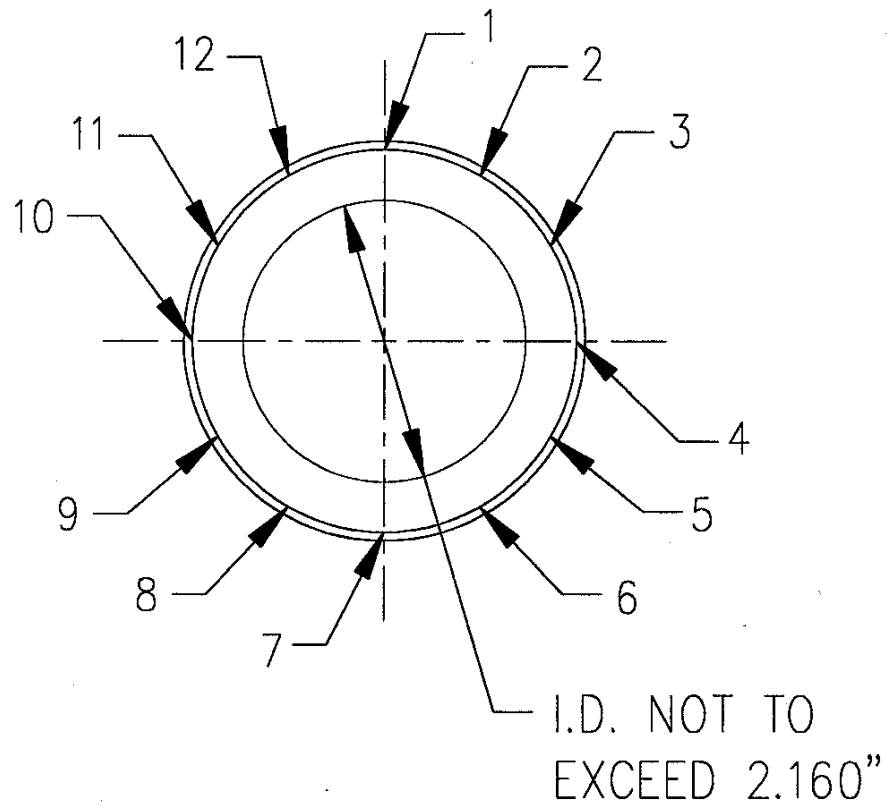


Figure 3 – Weld Sequence



## 4.2 Welding Models A5, A6, or A9

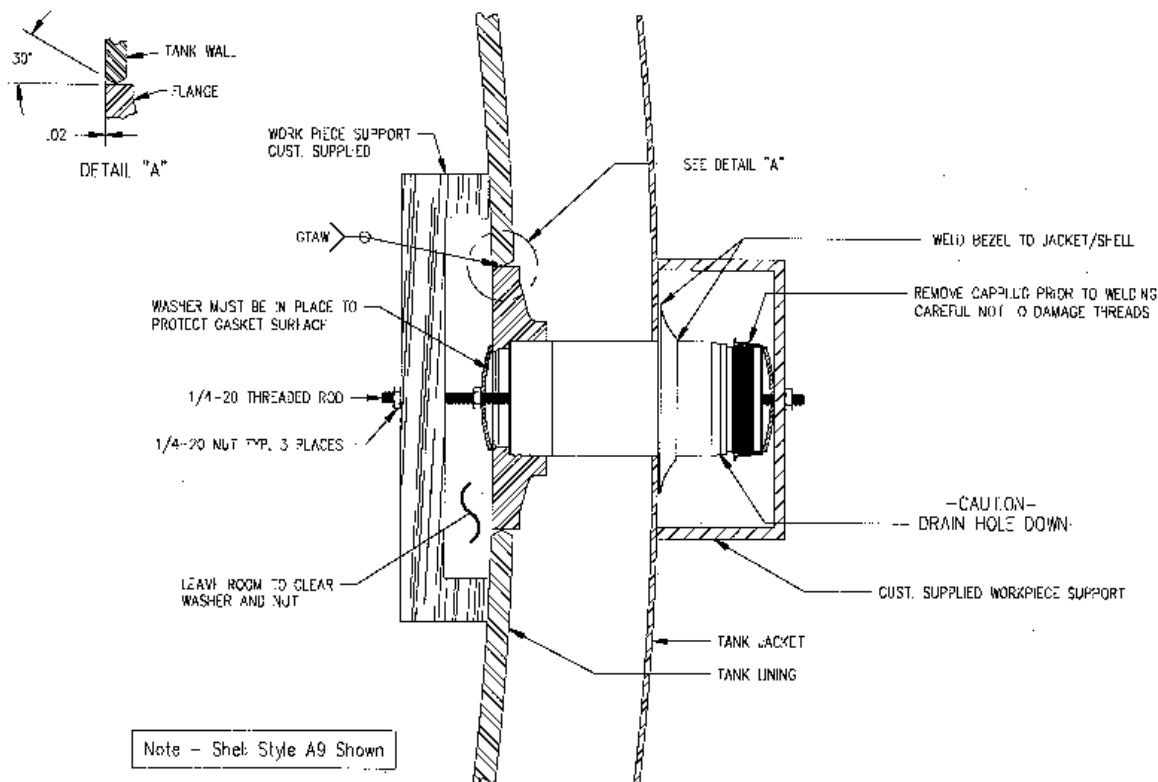


Figure 4 - Shell Style A5, A6 or A9

Bevel opening to 30 degree angle or less as shown in above figure. A smaller angle reduces the amount of filler needed and reduces distortion of the shell. Bevel size should be equal on inside and outside of wall. Fit opening to shell flange with no greater than .010" clearance. A line to line fit is suggested. Any gaps between shell and tank lining over .010" must be filled and rebeveled prior to shell installation. Position flange with drain hole toward floor, and recess face of flange .02" from inside surface of vessel (See Detail "A" on figure above).

To prepare for welding, insert the shell and washer assembly so that the flange (diaphragm) end of the shell fits into the hole cut through the vessel lining. From inside and outside the vessel, slip the wooden yokes (Installer provided) over the threaded rod. Engage the 1/4-20 nut onto the rod at each end, and tighten so that the entire assembly is secured in place.

Next, referring to the following figure, TACK WELD the shell to the vessel lining at TWELVE places, 30 degrees apart. As illustrated in the diagram, tack at positions 1-7-2-8-3-9-4-10-5-11-6-12, in that sequence. Remove the wooden yoke, but leave the cupped washers in place. The washers serve to protect the shell face from weld spatter or other possible damage.

Alternately weld from points 1-2, 7-8, 2-3, 8-9, 3-4, 9-10, 4-5, 10-11, 5-6, 11-12, 6-7, and 12-1 in that sequence. Back purging ENTIRE vessel/shell area with inert gas is required while welding root pass. Allow ample air cool time between welding sections to prevent distortion. Welds should be cooled to 120 degrees F. Rapid cooling with compressed air is acceptable. Overlap sections as necessary to complete weld. Repeat the same sequence to weld the outside of the vessel. Complete welding passes must be alternated from inside to outside of tank for all passes. Use multiple passes at lower welder settings to minimize shell warping.

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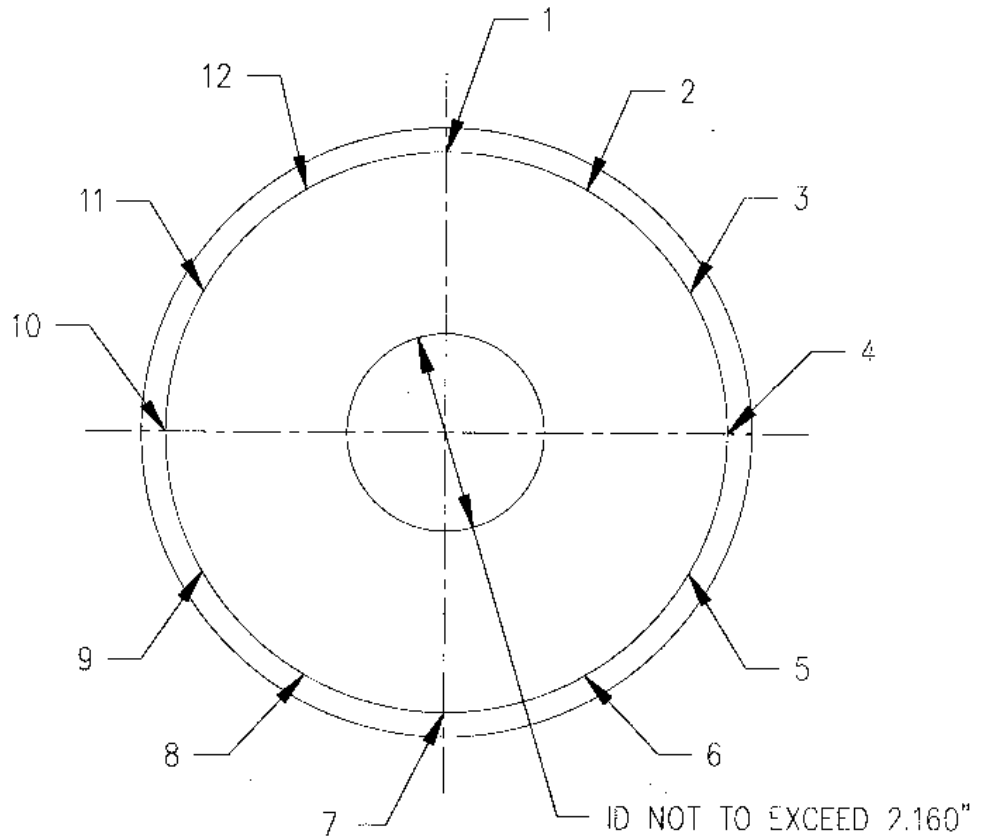


Figure 5 - WELD SEQUENCE

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## Appendix A

### ***Warranty and Return Statement***

These products are sold by The Anderson Instrument Company (Anderson) under the warranties set forth in the following paragraphs. Such warranties are extended only with respect to a purchase of these products, as new merchandise, directly from Anderson or from an Anderson distributor, representative or reseller, and are extended only to the first buyer thereof who purchases them other than for the purpose of resale.

#### ***Warranty***

These products are warranted to be free from functional defects in materials and workmanship at the time the products leave the Anderson factory and to conform at that time to the specifications set forth in the relevant Anderson instruction manual or manuals, sheet or sheets, for such products for a period of one year.

**THERE ARE NO EXPRESSED OR IMPLIED WARRANTIES WHICH EXTEND BEYOND THE WARRANTIES HEREIN AND ABOVE SET FORTH. ANDERSON MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE PRODUCTS.**

#### ***Limitations***

Anderson shall not be liable for any incidental damages, consequential damages, special damages, or any other damages, costs or expenses excepting only the cost or expense of repair or replacement as described above.

Products must be installed and maintained in accordance with Anderson instructions. Users are responsible for the suitability of the products to their application. There is no warranty against damage resulting from corrosion, misapplication, improper specifications or other operating condition beyond our control. Claims against carriers for damage in transit must be filed by the buyer.

This warranty is void if the purchaser uses non-factory approved replacement parts and supplies or if the purchaser attempts to repair the product themselves or through a third party without Anderson authorization.

#### ***Returns***

Anderson's sole and exclusive obligation and buyer's sole and exclusive remedy under the above warranty is limited to repairing or replacing (at Anderson's option), free of charge, the products which are reported in writing to Anderson at its main office indicated below.

Anderson is to be advised of return requests during normal business hours and such returns are to include a statement of the observed deficiency. The buyer shall pre-pay shipping charges for products returned and Anderson or its representative shall pay for the return of the products to the buyer.

Approved returns should be sent to:      ANDERSON INSTRUMENT COMPANY INC.  
156 AURIESVILLE ROAD  
FULTONVILLE, NY 12072 USA

ATT: REPAIR DEPARTMENT