

## SAC-1 Articulated Connector

### Crack Repair Procedure

#### SAC-1 Male Casting

For maximum crack depth of 0.25”\*

1. Remove Sac-1 cover per (Cardwell Westinghouse SAC-1 Articulated Connector Inspection and Maintenance Manual) clean the surface area of the top stitch weld and visually inspect for crack. If crack is present then proceed to STEP 2.
2. Uncouple the connector, verify crack using dye penetrate or magnetic particle inspection. If crack is present, proceed to remove the spherical ball and liner from male casting per (Cardwell Westinghouse SAC-1 Articulated Connector Inspection and Maintenance Manual).
3. Measure length and depth of the crack, if the crack is within 1.5” long and .25 Deep processed to the next step.
4. The entire defect must be removed by grinding prior to weld repair. The area to be welded must have the sides contoured to provide for the application of a sound weld. Verify crack removal using dye penetrate or magnetic particle inspection.
5. Locally and uniformly pre-heat the casting crack area of the loop between 300° F and 400° F. Welding shall be accomplished while the casting is maintained at a temperature above 200° F. **DO NOT EXCEED 400° F.**
6. Before repair welding insert the weld cover into the casting bore to protect bore surface from weld splatter. Figure 1 is a visual guide for installing the Weld Cover.
7. Over-build the repair area using E9015, E9016, or E9018 low hydrogen coated electrodes or equivalent welding wire and wire manufacturer’s recommended shield/cover gas for gas-shielded welding.
8. Allow repaired casting to slowly cool to ambient temperature. NOTE: **DO NOT** accelerate cooling by forced air, water, or other means. **If ambient temperature is 40° F or below**, cover the casting with an insulating blanket and allow the repaired casting to slowly cool to 200° F.
9. Blend repair area smooth to the surrounding surfaces by grinding. Check for weld cracks and incomplete fusion using dye penetrate or magnetic particle inspection.

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10. Insert bore GO Gauge into casting bore to ensure bore dimensions are sufficient to properly install race liner and ball assembly. See Figure 2 for application drawing for the bore GO Gauge.

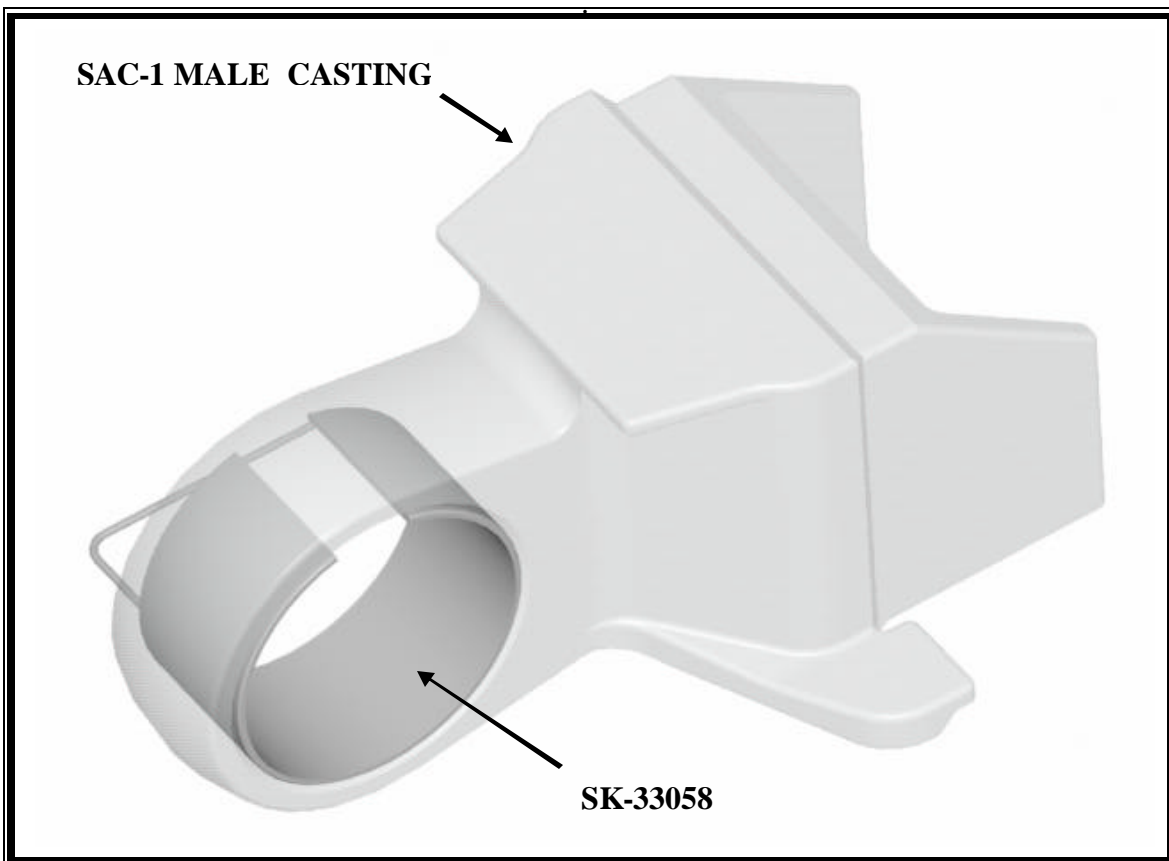
**NOTE: Welders MUST be qualified and use procedures contained in AWS 15.1, in position welding is to be performed.**

\*Contact the Engineering Department at Cardwell Westinghouse 773-483-7575 if:

1. Crack depth is greater than 0.25"
2. Crack length is greater than 1.5"

Attachments: Weld Cover and Bore Gauge Drawings

**Weld Cover Installation:**



**Figure 1: Bore Weld Shield Installation Diagram**

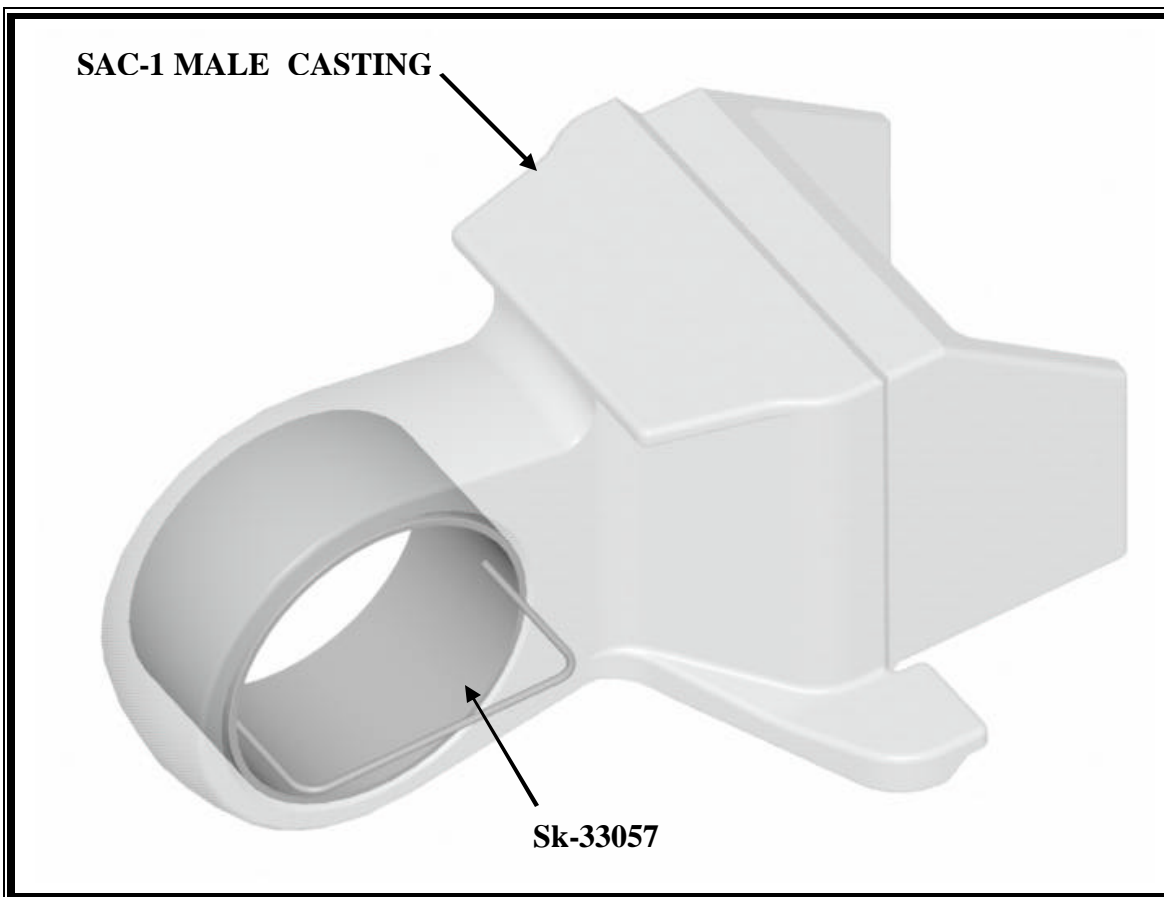
Weld Cover Installation Comments:

- (1) The weld repair area should be accessible from within the opening in the weld cover as shown above.
- (2) The weld cover should be installed with the handle on the opposite side of the casting from where the welding will be performed so the handle will not interfere with welding. See (Figure 1: Bore weld cover)

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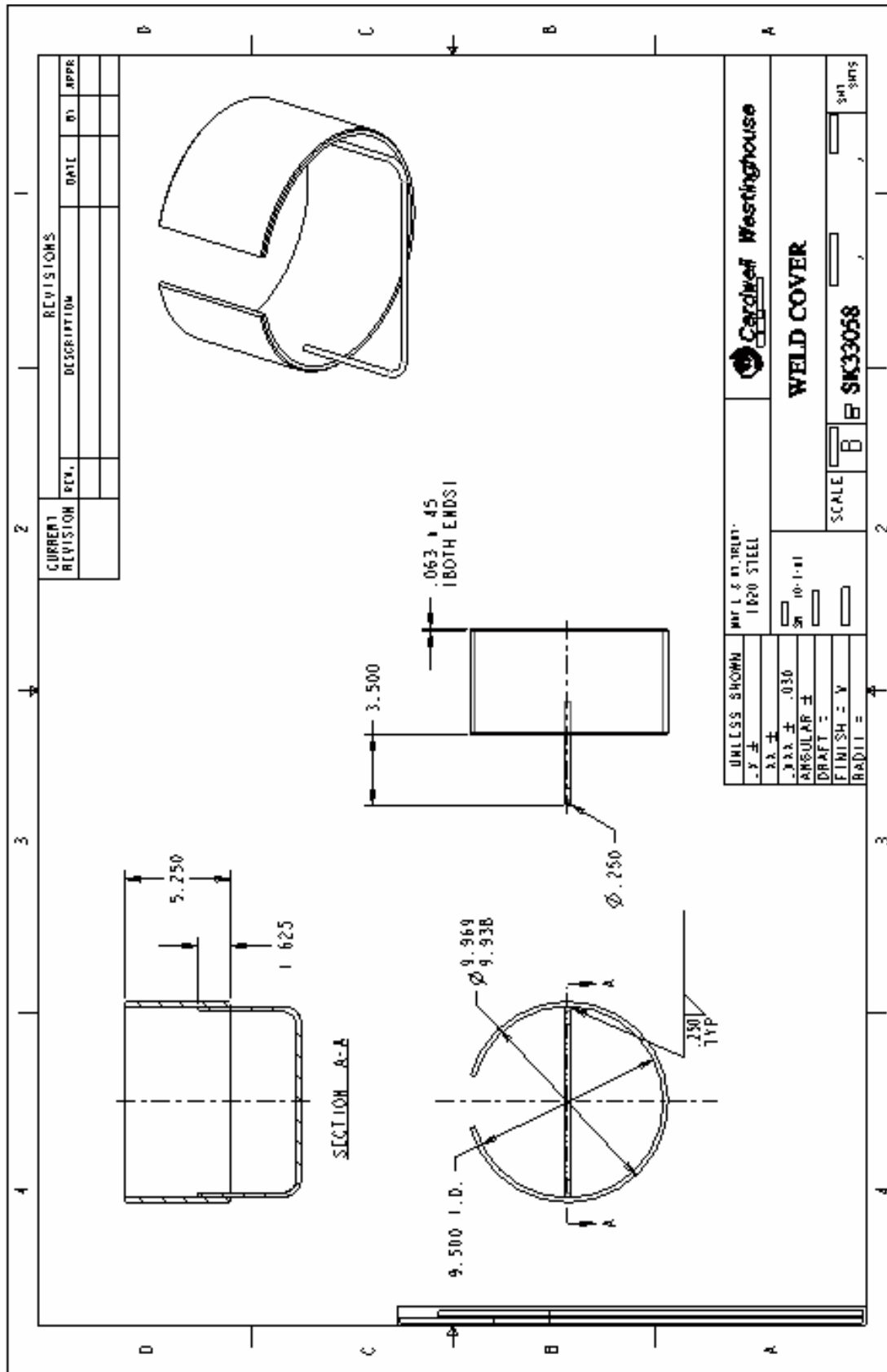
**Bore GO Gauge Comments:**

- (1) The gauge can be inserted from either side of the casting.
- (2) The entire width of the gauge should pass through the bore.

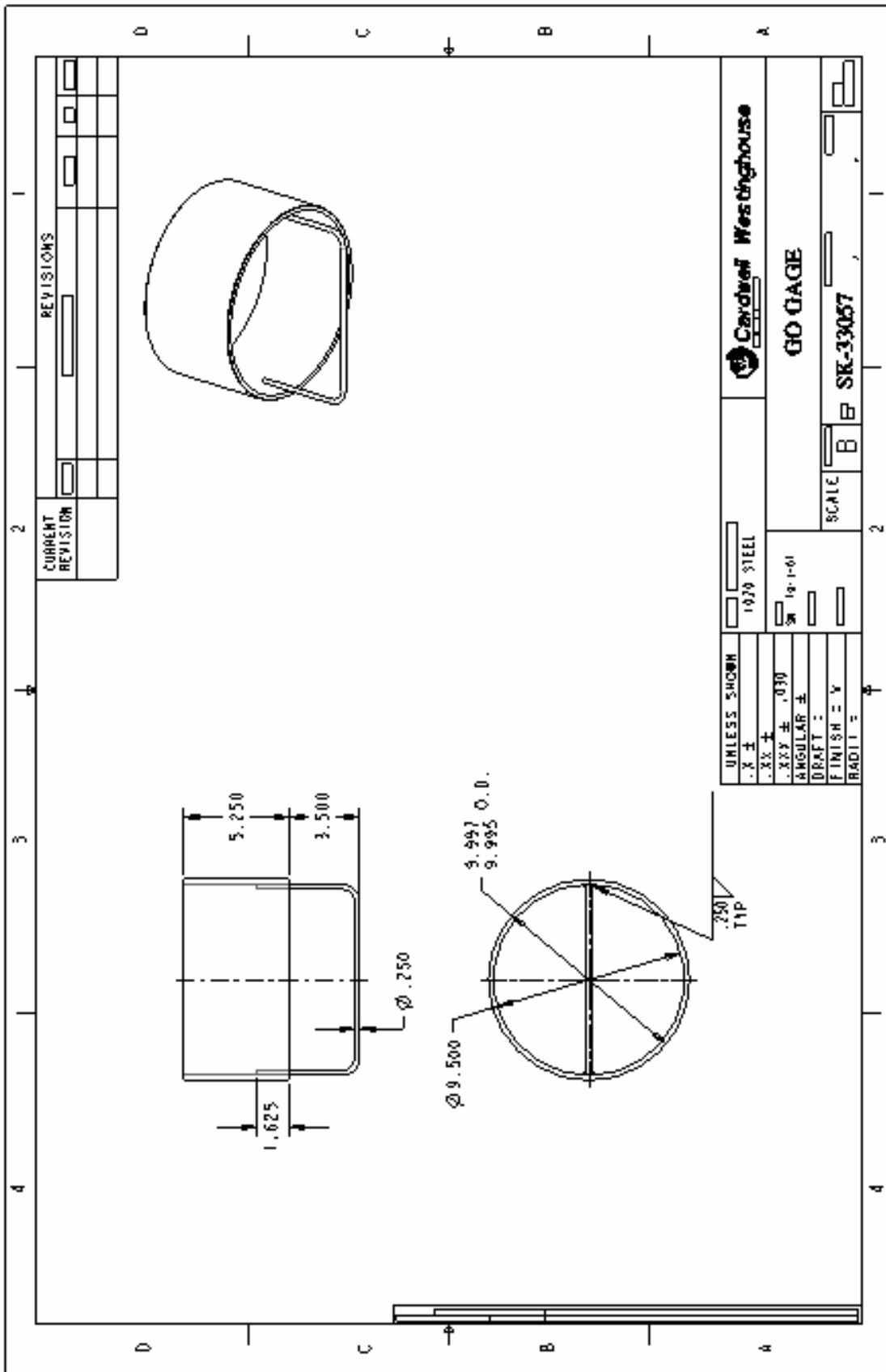


**Figure 2: Bore GO Gauge Application Figure**

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## SAC-1 Female Casting Zone 2

**For maximum crack depth of 0.25" and length 3"\***

1. Clean the surface area of the suspected crack and verify crack using dye penetrate or magnetic particle inspection. If crack is present then proceed to STEP 2.
2. The entire defect must be removed by grinding prior to weld repair. The area to be welded must have the sides contoured to provide for the application of a sound weld. Verify crack removal using dye penetrate or magnetic particle inspection. Measure crack depth after complete removal to verify **crack depth does not exceed 0.25"**. If crack depth and length exceed maximum values listed above contact Cardwell Westinghouse\* at the number(s) listed below to determine if exception can be allowed or if casting should be replaced.
3. **If ambient temperature is 40° F or below**, locally and uniformly pre-heat the casting. Welding shall be accomplished while the casting is maintained at a temperature above 40° F. **DO NOT EXCEED 400° F**.
4. Over build repair area using E9015, E9016, or E9018 low hydrogen coated electrodes or equivalent welding wire and wire manufacturer's recommended shield/cover gas for gas-shielded welding.
5. Allow repaired casting to slowly cool to ambient temperature. NOTE: **DO NOT** accelerate cooling by forced air, water, or other means. **If ambient temperature is 40° F or below**, cover the casting with an insulating blanket and allow the repaired casting to slowly cool.
6. Blend repair area smooth to the surrounding surfaces by grinding. Check for weld cracks and incomplete fusion using dye penetrate or magnetic particle inspection.

**NOTE: Welders MUST be qualified and use procedures contained in AWS 15.1**

\*Contact Production Engineering Department at Cardwell Westinghouse 773-483-7575 if:

3. Crack depth is greater than 0.25"
4. Crack length is greater than 3"
5. Crack crosses into another casting zone as specified in Cardwell Westinghouse

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