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<b>WP0002</b>	<b>3</b>	<b>23/03/2022</b>

# LOCKJAW ADAPTOR WELDING PROCEDURE – BASIC

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## WELDING SAFETY

Welding, cutting and any allied process are a significant safety risk. Before undertaking any of these processes ensure that all precautions have been considered or implemented as per welding safety standards AS1674: 2007 or ANSI Z49.1: 2005 or equivalent globally recognized standard.

Of particular note please ensure the following is adhered to:

- Wear correct PPE including
  - Full sleeve non-flammable work wear. (No gaps)
  - Non-flammable welding gloves
  - Steel capped work boots
  - Safety glasses
  - Hearing protection
  - Full face welding shield
- Suitable ventilation is available for the person completing the operation.
- Welding is an electrical risk ensure the area where welding is to be conducted is not damp or wet.
- Welding is a fire risk ensure the area where welding is to be conducted is free of any thing flammable and that suitable fire extinguishers are easily available.
- If welding is to be conducted in an area where other people are working, ensure welding flash shields are utilized.
- Good general housekeeping to ensure the work area is safe and free of clutter.

Ensure appropriate tags for your workplace and work environment are used.

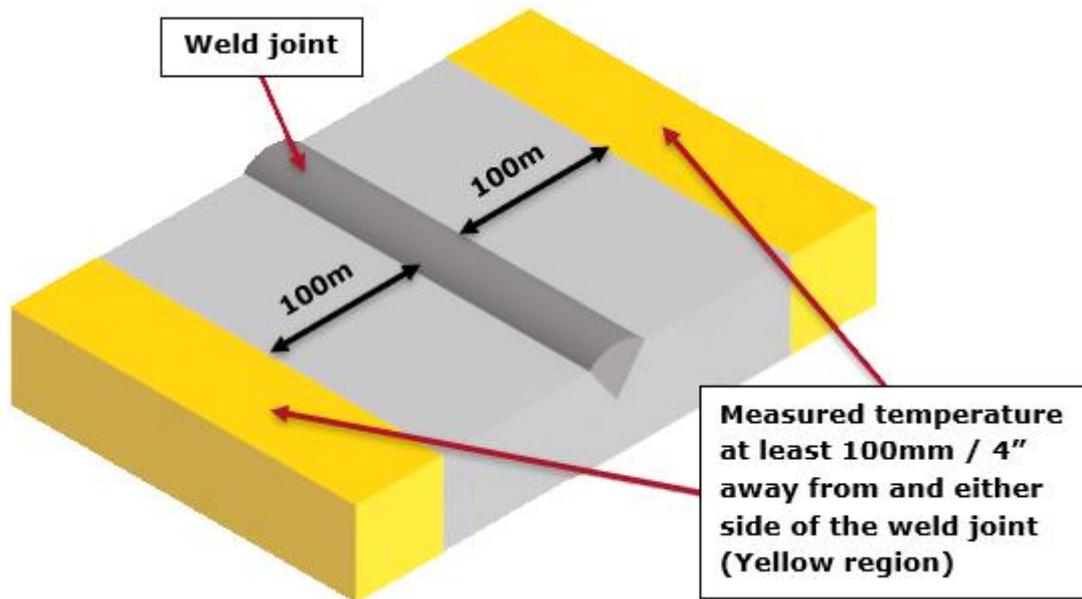
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## WELDING PROCESS AND PREHEAT NOTICE



Please ensure that you follow the Thermal Treatment (Preheat) procedure stated in this welding procedure. Preheat of the weld area prior to commencing welding will help ensure weld quality, reduce the occurrence of cracking and other problems that can result in costly rework. The weld area must be heated to 150°C, measured at least 100mm / 4" away from and either side of the weld joint and maintained between 150°C and 250°C throughout the welding process.

The warranty may be void on Talon Weld-On components if the specified process is not followed correctly.

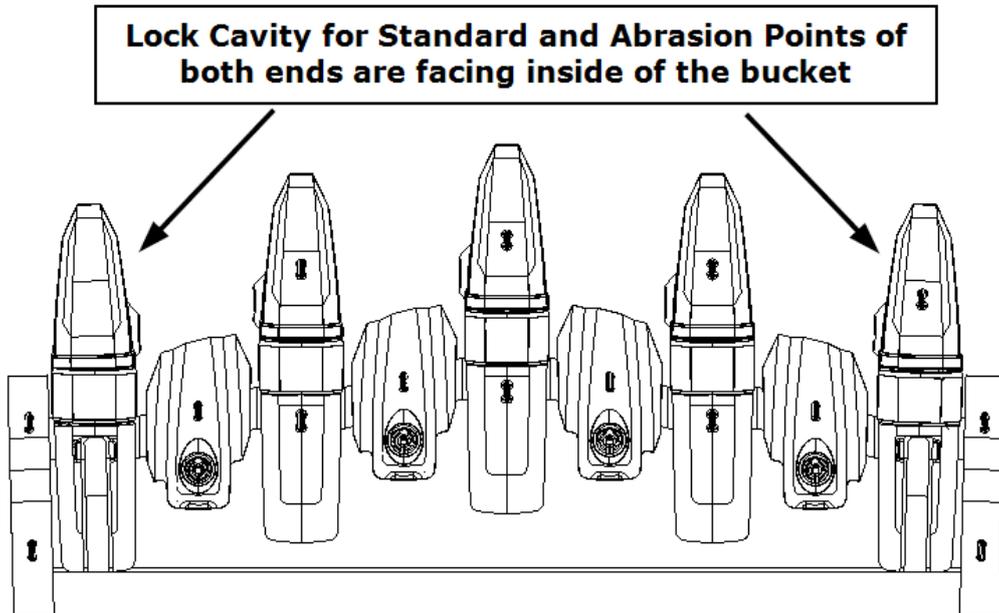


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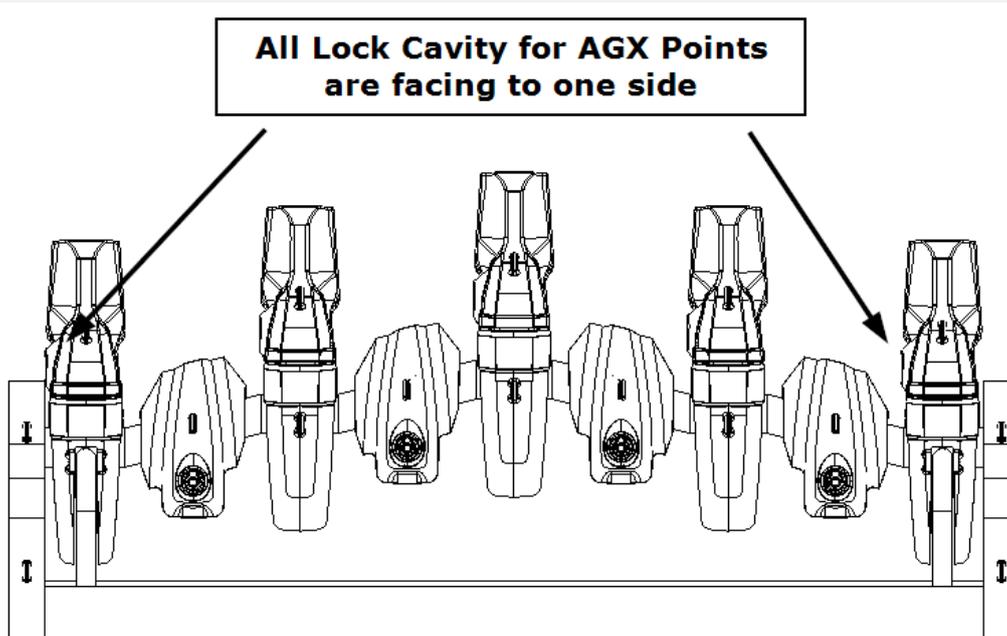
## TALON WELDING SETUP

### GET POSITION

During the welding process, please ensure position of the Cast Corner Adaptor is correct, and the Lock Cavity for Standard and Abrasion Point must be facing inside of the bucket.



On the other hand, please ensure all Lock Cavity for AGX Point must be facing to one side.

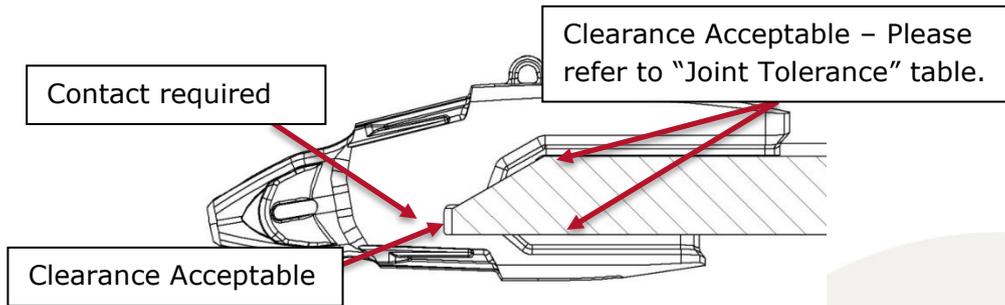


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### WELD PREPARATION

The surfaces to be welded must be good and free from scale, grease, paint, water, or any other contaminants. Preparation of the weld surfaces may be achieved by sand blasting, shot blasting, grinding, sanding, air carbon arc gouging, or a combination of any these processes. Should the air carbon arc gouging process be used, finish the surface by grinding to remove all carbon slag.

Talon Adaptors **must** contact the lip plate as per the following diagram.



#### Joint Tolerance

Separation	Action
2.4mm / 3/32" or Less	No action required
Greater than 2.4mm / 3/32"	Build up the surface of part to be fitted to close gap.

- Please refer to detailed welding procedure WP0001 for more detail on building up joint separation.
- For further details on lip plate profiling please refer to the relevant layout drawing for your bucket.

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## WELDING PROCESS

Welding may be completed by any of the following processes:

- Gas Metal Arc Welding (GMAW)
- Flux-cored Arc Welding (FCAW)

A combination of GMAW or FCAW can be utilised.

The following table details **recommended** reference consumables:

Process	AWS	AS/NZS	ISO	Shielding Gas	Polarity
GMAW	AWS A5.18 ER70S-4	2717.1: ES4-GC/M-W503AH		100% CO2 Ar + 10-15%CO2 Ar + 15-25%CO2	DC+
GMAW	AWS A5.18 ER70S-6	2717.1: ES6-GC/M-W503AH		100% CO2 Ar + 10-15%CO2 Ar + 15-25%CO2	DC+
FCAW-G	AWS A5.20 E71T-1 H8	17632-B: T49 2 T1 1 CAU H10		100% CO2 Ar + 20-25%CO2	DC+
FCAW-G	AWS A5.18 E70C-6M H4	17632-B: T49 4 T15 0 MAU H5		Ar + 20-25%CO2	DC+/-
FCAW-S	AWS A5.20 E70T-7	17632-B: T49 Z T7 0 NA		NR	DC-
FCAW-S	AWS A5.20 E71T-8	17632-B: T49 3 T8-1NA-H15		NR	DC-

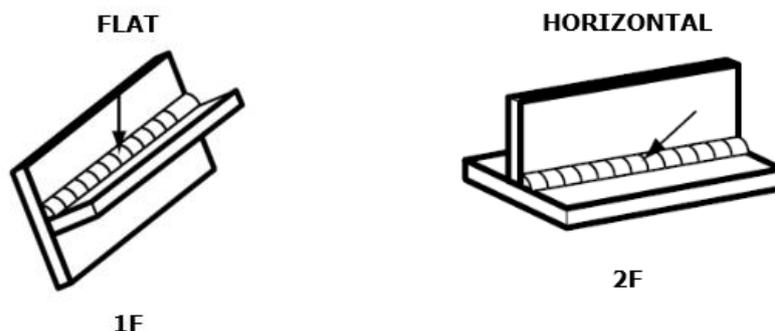
## ELECTRICAL PARAMETERS

The person completing the weld should refer to the manufacturer's specifications to determine the optimal settings to complete the weld. Actual voltage, welding current and Electrode Stick Out (E.S.O.) used will depend on machine characteristics, plate thickness, run size, shielding gas and operator technique etc.

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### WELDING POSITION

Welding of weld-on components of Talon's Lockjaw product line is recommended and shall be completed in the Flat 1F and Horizontal 2F. The other positions can be welded but the process should be adjusted to suit the applicable weld wire and equipment to ensure good weld strength and integrity.



### THERMAL TREATMENT

Material	Thickness	Min Preheat Temp	Max Interpass Temp
Talon GET Castings	All Weld-on Castings	150°C / 300°F	260°C / 500°F
ASTM A514 Steels	Greater than 63mm / 2-1/2"	120°C / 250°F	260°C / 500°F
400-450 BHN Abrasion Resistant Steel	Greater than 63mm / 2-1/2"	150°C / 300°F	260°C / 500°F

#### Notes:

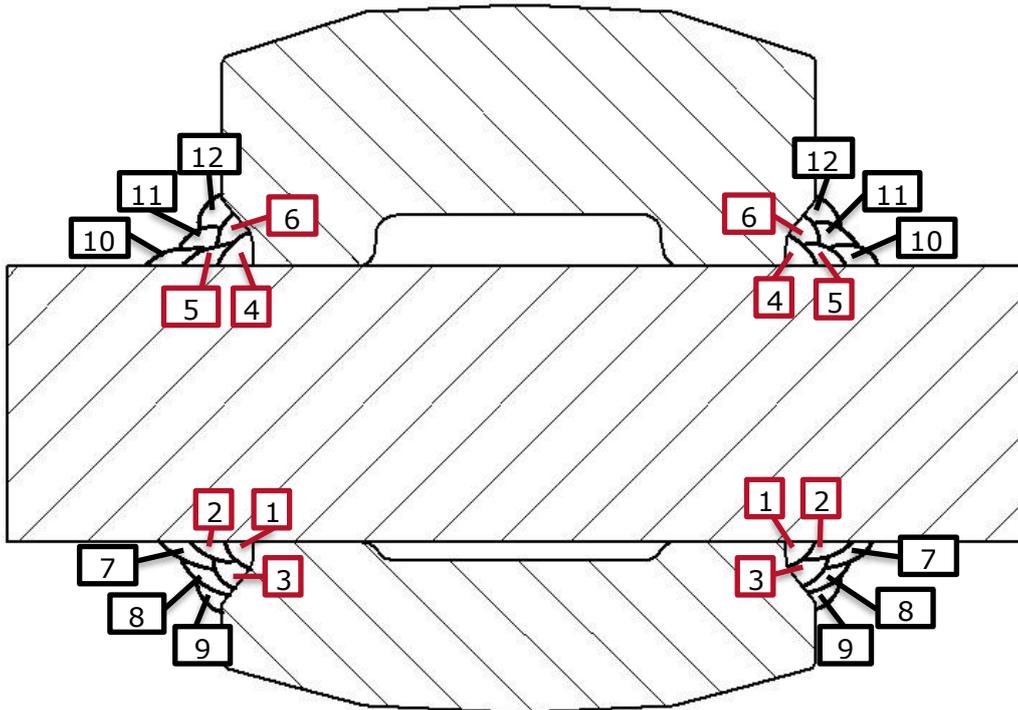
- If the ambient humidity is high and or the temperature is below 4°C / 40°F, the tabulated thermal treatment temperature should be increased by 27°C / 80°F. At no time should any material type or thickness be welded when the temperature of the steel is at or below 4°C / 40°F. This includes tack or spot welds or any allied process. Preheat must be applied as specified.
- All material within 100mm / 4" of the weld zone must be within the specified temperature.
- Cool weld slowly, for a minimum of 8 hours, utilising thermal blankets. Do not allow drafts or cool ambient temperatures to cool the parts or assembly. Cool down rate should not exceed 55°C / 130°F, per hour.
- If the ambient temperature is at or below 4°C / 40°F the part must be covered with a thermal blanket to insure the cool down rate above. Alternatively, the entire part maybe post-heated to 150 - 200°C / 300 - 400°F for four hours and then maybe air cooled.

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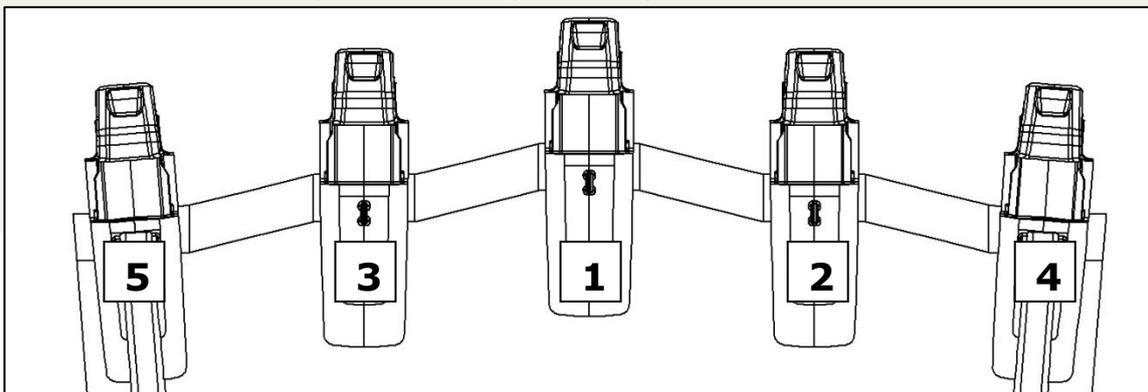
### WELDING SEQUENCE

Place Talon Adaptors on the lip plate in the desired locations to suit your bucket size and configuration. Preheat the lip plate and Talon Adaptors as required. Fix the Talon Adaptors in place with one 25mm / 1" tack weld at the root of the weld prep on either side of the top leg.

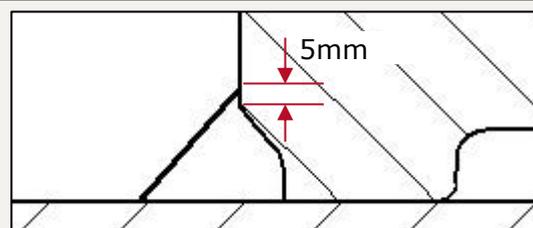
To minimize distortion, build the weld up using the following full weld run sequences. Alternating each group of 3 full weld runs between top and bottom legs and each Adaptor on the lip. Recommended bottom leg to top leg transfer sequence:



Recommended Talon Adaptor alternating weld sequence:



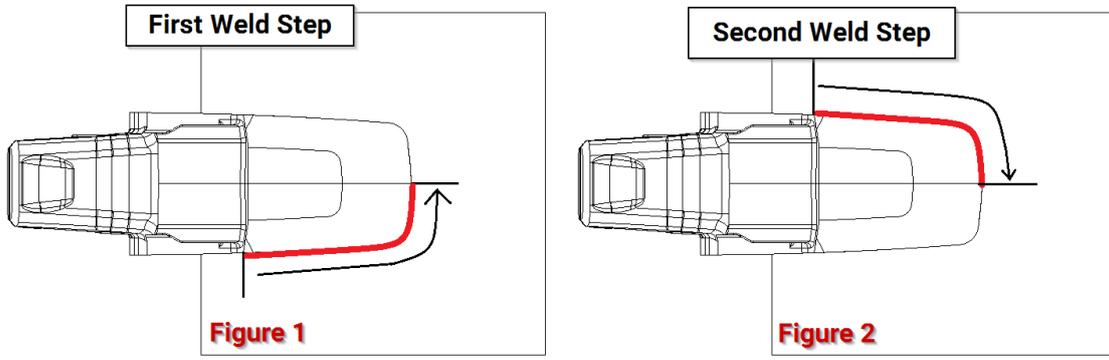
The final fillet weld size should be such that the weld leg is approximately 5mm above the edge of the cast weld prep in the Adaptor. The weld should not undercut the weld prep. The fillet should be equal legged. The weld should form a profile adjacent:



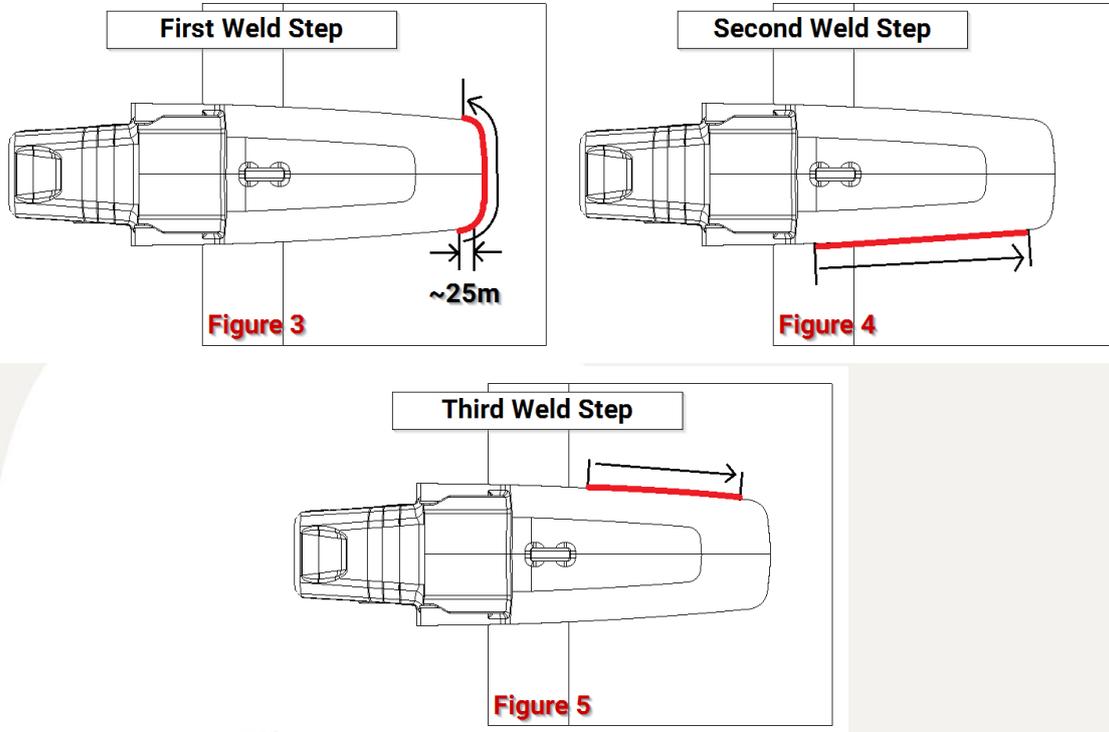
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**STANDARD ADAPTOR**

Always begin welding the Adaptors on the bottom leg. Use run-on (starter) and run-off tabs and a step welding process, to complete each full run. Vary the lengths of each step such that the stops are not in the same location. Complete three full runs around the bottom leg using the recommended steps as per Figure 1 and 2 then, turn the lip over.



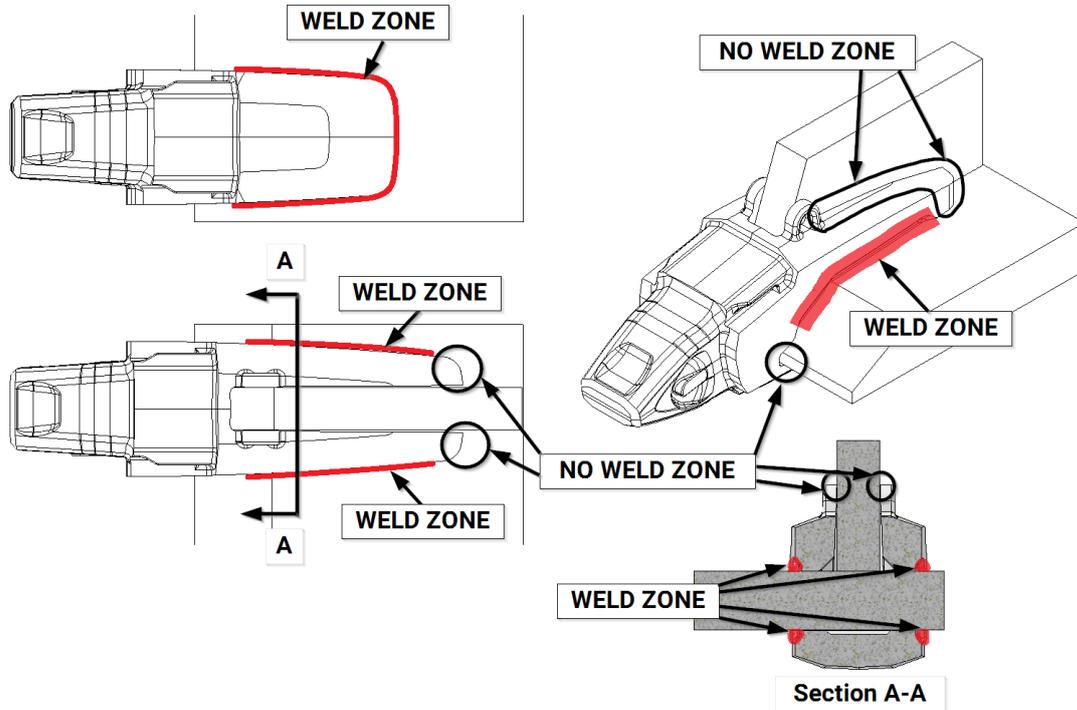
Complete three full runs around the top leg as per the step sequence detailed in Figures 3, 4 and 5 below. Again, vary the lengths of each step such that the stops are not in the same location and ensure run-on (starter) and run-off tabs are utilized. Once three full runs around the top leg have been completed, turn lip over and continue welding, following the alternating Adaptor and top and bottom sequences detailed on page 7.



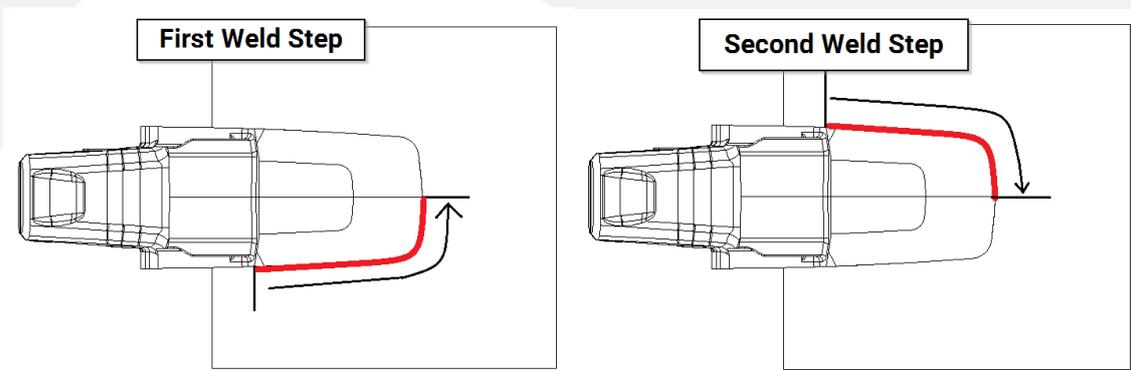
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### STRADDLE-LEG ADAPTORS

Position the Talon Straddle Leg Adaptor in the corner of the bucket, such that the split top leg straddles the bucket wall or cheek plate. As for the Standard Adaptor the Straddle Leg Adaptor should contact on the top surface and leading edge of the lip. When welding Talon Straddle Leg Adaptors please refer to the WELD/ NO WELD ZONES detailed in the following figures:

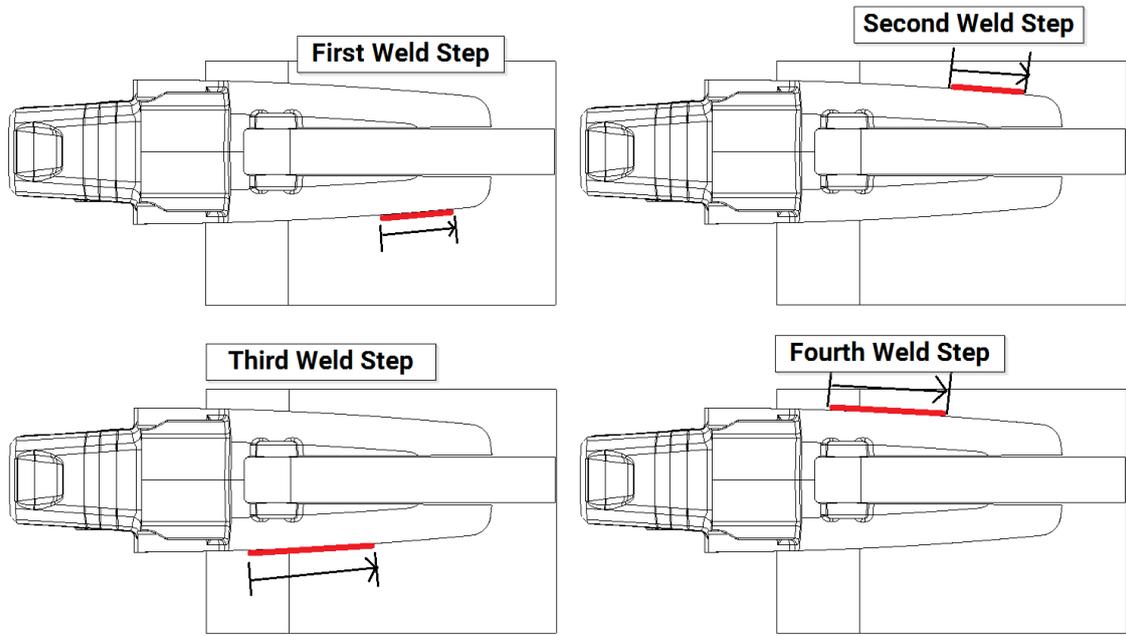


Preheat and fix the Adaptors in place with one 25mm/1" tack weld at the root of the weld prep on either side of the top leg in the weld zone. Begin welding on the bottom of the Adaptor and complete the first welding sequence as per the Talon Standard Adaptors, as follows:



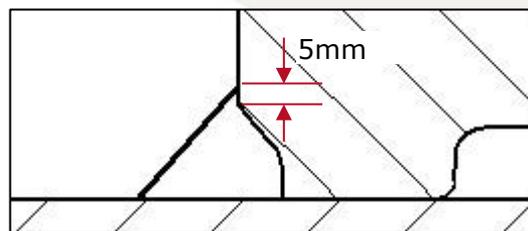
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Alternate welding between top and bottom legs every three complete weld runs as per the welding sequence detailed previously on page 7 for Talon Adaptors. Ensure that the length of each weld step is varied so that the stops are not in the same location and ensure run-on (starter) and run-off tabs are utilized. The recommended weld step sequence for the top leg is detailed in the figures on the following page:



Continue to alternate welding between the top and bottom of the Talon Straddle Leg Adaptor and alternate between Adaptors as described on page 7 until the full weld size is achieved.

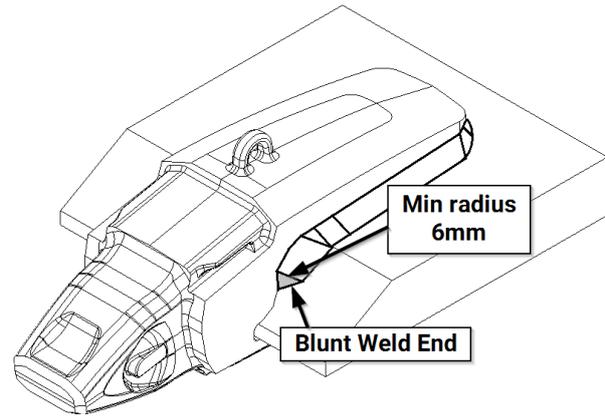
The final fillet weld size should be such that the weld leg is approximately 5mm above the edge of the cast weld prep in the Adaptor. The weld should not undercut the weld prep. The fillet should be equal legged. The weld should form a profile as follows:



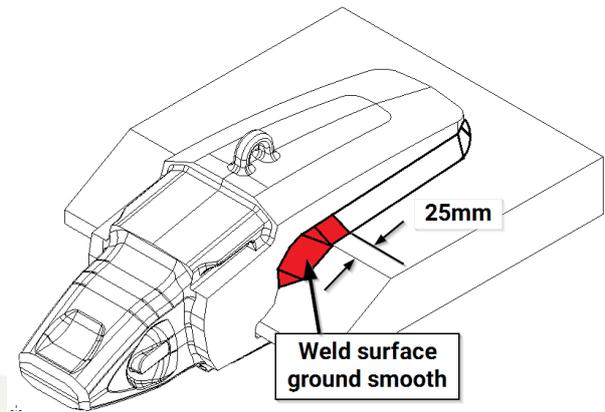
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### WELD FINISHING

The end of the fillet weld closest to the bucket leading edge on the top and bottom of the lip shall be ground to a blunt end, typically one half the height of the weld. Round the edge off to the remainder of the weld with a minimum radius of 6mm / ¼". (See figure adjacent)

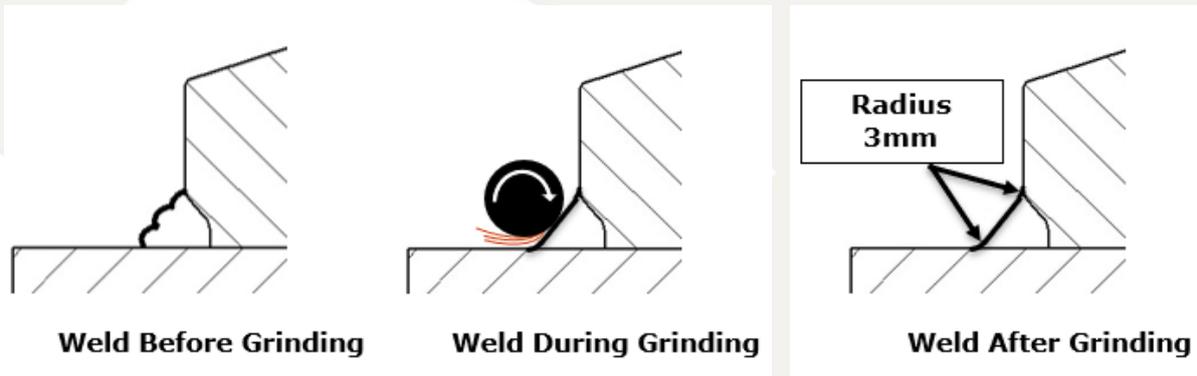


The surface of the fillet welds shall also be ground smooth for a minimum of 25mm / 1" back from the ends of the welds. For welds on the top surface of the lip that transition ramp face of the lip to the top surface of the lip. The surface of the weld shall be ground smooth from the weld end through to a minimum set back of 25mm / 1" back from the ramp face to top surface transition. (See figure adjacent)



Welds shall be ground such that the surface of the weld becomes a smooth surface free of any roughness or ripples associated with fresh welds. The toes of the weld shall transition smoothly, such that the transition exhibits a minimum of a 3mm / 1/8" radius.

Although various methods of grinding maybe used to remove the bulk of the weld roughness. Grinding shall be finished such that any remaining grinding markings are all perpendicular to the weld.



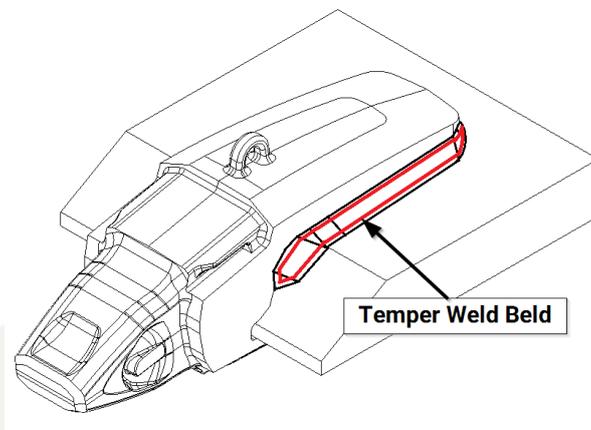
The end of the weld must be tapered and smooth prevent a stress riser at a change in restraint or profile location.

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It is recommended that all finished welds are inspected for cracks using either MPI or Dye Penetrant Inspection. It is preferable to use the MPI process. Any cracks detected must be completely gouged out and filled with weld. Finish the repair with grinding as detailed above and re-inspect for cracks.

**TEMPER OR ANNEALING WELD BEADS**

Tempering beads may be placed on both top and bottom leg finished welds. Such that the toe of the temper bead is approximately 4mm / 5/32” from the top or bottom toe of the finished Adaptor weld. Temper bead may be applied using either GMAW or FCAW, however, the electrode sizes shall be limited to 1.6mm / 1/16” in both cases. It is recommended that all welds are inspected for cracking using either MPI or Dye Penetrant Inspection once they have cooled to room temperature.



**CHANGE REGISTER**

Rev	Date	Changes from previous version
0	18/04/12	Original Issue
1	03/02/14	Template updated, images on pages 1 & 4 updated to match new revision parts
2	24/07/19	Content updated to match new revision parts; Address updated to match new office locations
3	23/03/2022	Update Welding Setup details and indicate correct positioning of Cast Corner adaptors design so that the lock cavity facing inside of the bucket