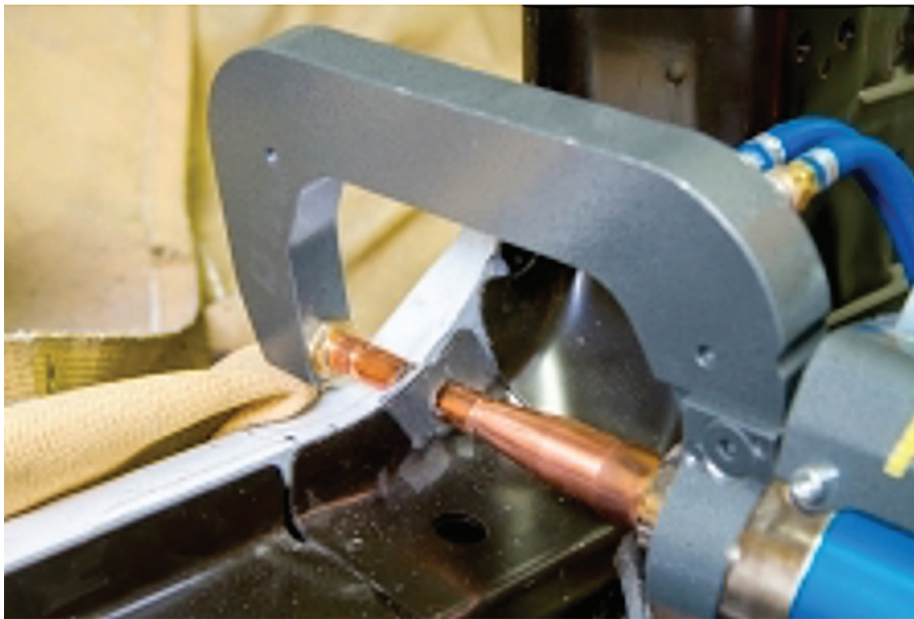


IS A SPOT WELDER A REQUIRED TOOL?



On today's vehicles, you are going to run into high-strength steel (HSS) and ultra-high-strength steel (UHSS) which will affect the attachment method that will be required when replacing body panels.

Most vehicle makers prefer the use of squeeze-type resistant spot welding (STRSW) for panel attachment due to the use of HSS & UHSS. The number of OEMs that allow conventional GMA welding on advanced vehicle structures will continue to decrease for many panel attachment applications. However, GMA welding will most likely continue to be used for sectioning, where allowed.

If the OEM requires/recommends the use of spot welds, a spot welder will be a necessary piece of equipment for the collision repair facility. In addition to this the OEM will most likely specify weld nugget sizes for both spot welding and MIG plug welds.

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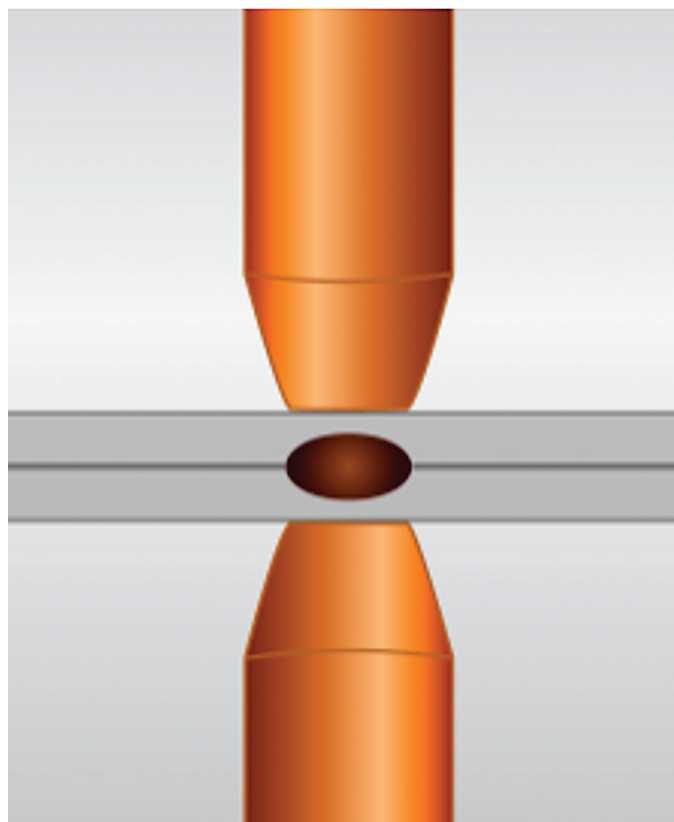
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Steel Spot and Plug Weld Nugget Size:

This information is typically found within vehicle-specific repair procedures or can be found under general welding guidelines.

The I-CAR team has been researching OEM body and service repair manuals to provide the most up-to-date information on nugget size for spot welds when squeeze-type resistance spot welding (STRSW) and plug welds when GMA welding.

The "weld nugget" the OEM typically provides specs for is the nugget that you see after welding on the vehicle. What can get confusing is that the term "weld nugget" is used for the weld nugget you see before destructive testing and the fused metal you see after destructive testing.



Why does this matter? Because the measurements can be different. When you look at a spot weld, the weld nugget is pretty much what you see and is closely related to the fused metal. However, when you look at a plug weld, the outside diameter of the weld nugget is larger than the actual fused metal. This means that the weld nugget that we are discussing is larger than the fused weld nugget metal that you get after a destructive test.

If the OEM requires/recommends the use of spot welds, a spot welder will be a necessary piece of equipment for the collision repair facility.

If no OEM nugget size guidelines are available, below are some general recommendations to follow.

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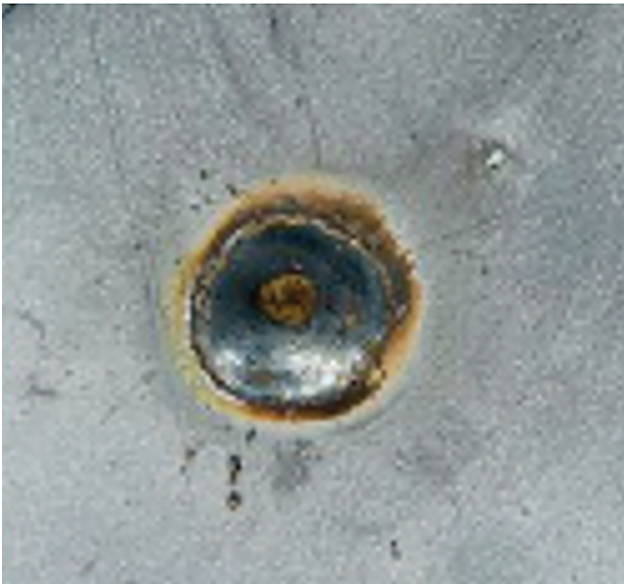
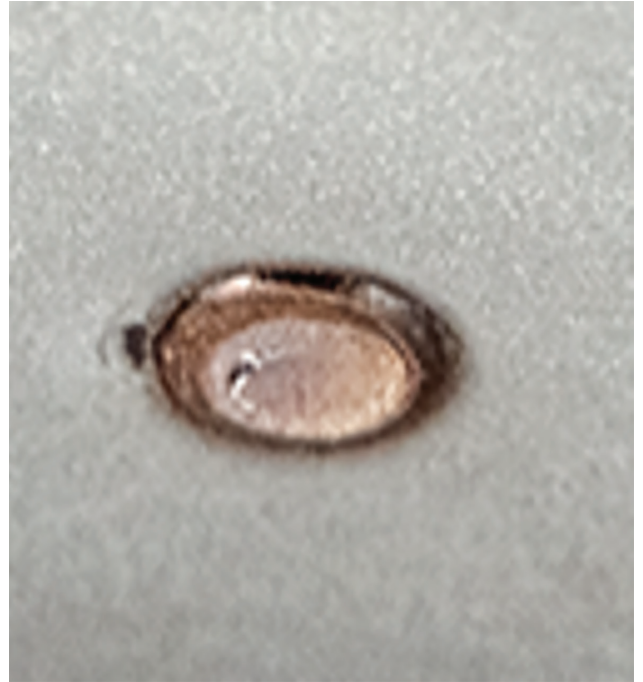
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General STRSW Steel Spot Weld Nugget Size

The size of the nugget will vary depending on the thickness of the metal. A general recommendation for a minimum nugget size is five times the thickness of one metal workpiece. For example, when spot welding two 1 mm pieces, the nugget should have a diameter of at least 5 mm.



General Steel GMA Plug Weld

Nugget Size

The plug weld should have a bead height of no more than 3 millimeters. To determine the total weld diameter:

- 6 mm hole = 8-10 mm
- 8 mm hole = 10-13 mm

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General Steel GMA Plug Weld Hole Size

Vehicle makers may have recommendations for plug weld hole size and location. If they do not, holes should be 8 millimeters if the flange width will support it.



Testing Your Welds

Destructive testing your STRSW and MIG welds is important, this should be done before any welding is started on the vehicle. This ensures the welder is set-up correctly and capable of delivering the weld strength required, most OEMs request this as part of the repair method. A destructive test of your test weld will confirm proper weld strength and nugget size, so make sure to follow these OEM welding requirements, to help ensure a complete, safe, and quality repair.