



SPOT WELDING IN THE SAME SPOT TWICE

If there is one nearly universal rule when squeeze-type resistance spot welding during collision repair, it is to not make a repair spot weld over an original spot weld. But there's an exception to every rule, and the exception to this rule concerns some weld-bonded panels.

Weld bonding is an attachment method where spot welds are made on a flange through adhesive. At least two vehicle makers, Chrysler and Ford, recommend and provide procedures for weld bonding during repairs. Other vehicle makers warn against weld bonding during repairs. Audi and BMW for example, recommend applying twice as many spot welds to replace a weld-bonded joint.

THREE-LAYERED PANEL

The exception to the rule about spot welding in the same spot is from Audi and BMW when attaching a third replacement panel, such as a replacement outer panel, to an already weld-bonded joint. The recommendation is to fit-up the third panel with no adhesive, and locate the spot welds using the original spot weld locations (see Figure 1 and the illustration in Figure 2). The reasoning is that

the adhesive acts an insulator, even though the adhesive used by Audi is said to be conductive.

A weld-bonded joint is actually made by the spot welding electrodes burning through and displacing the adhesive. The adhesive encapsulates the weld (see Figure 3). But at the spot of the weld, there is just metal-to-metal contact, a conductive path.

The reason why the rule has always been to not weld in the same spot twice, is that the metal has been compressed at that point and hardened. The characteristics of the metal have somewhat changed. The vehicle makers that make the recommendation to use the original sites to attach a third panel think that there is less of a strength factor than trying to make a weld through the cured adhesive. A weld would still be made, but the current, trying to find a conductive path to the other electrode tip, would shunt through the closest existing weld. The new spot welds holding on the third panel might be weaker.

TEST PANELS

We wanted to try the theory out, but we did not have an OEM weld-bonded panel



Figure 1 - When attaching a third panel to an originally weld-bonded panel, the recommendation from at least two vehicle makers is to use no adhesive and the original weld locations.

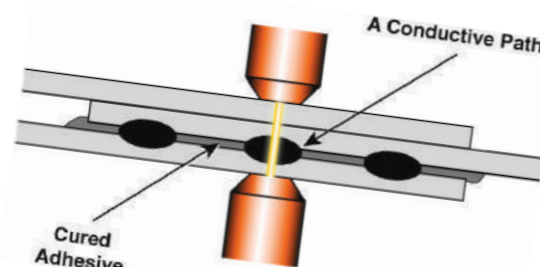


Figure 2 - This illustration shows the recommendation when attaching a third panel to an originally weld-bonded panel.



Figure 3 - In a successful weld-bonded joint, the spot weld is encapsulated by the adhesive.

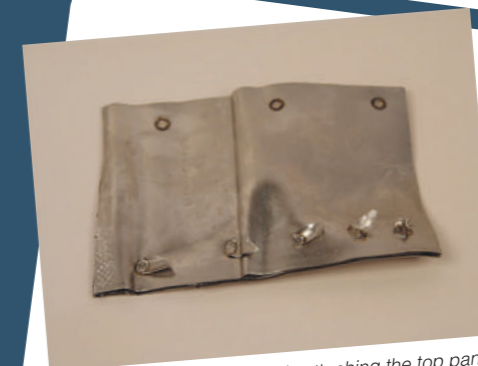


Figure 4 - The spot welds attaching the top panel, which has been peeled off, were made at the existing locations. There was good metal tearout.



Figure 5 - The spot welds attaching the top panel, which has been peeled off, were made between the existing locations. Metal tearout is minimal, and only on two of the welds.

from Audi or BMW available. We tried the procedure on coupons. For the adhesive, we used epoxy. The product maker warns against making a weld through epoxy adhesive after it has cured. We made two sets of weld-bonded coupons, making the "original" welds while the adhesive was still wet. After the adhesive was cured, we attached a third coupon using no adhesive. Finally, we peel-tested both samples to see the strength of the welds.

The sample in Figure 4 shows the results when we used the original spot weld locations to attach the third panel. There is large metal tearout with each weld. The sample in Figure 5 shows the results when we tried making spot welds between the original welds. There is some tearout on some of the welds, but it is evident these welds are weaker than the other sample.

CONCLUSION

Do not make repair spot welds over an existing OEM weld, unless the vehicle maker recommends it. Both Audi and BMW recommend using the original spot weld locations when attaching a third

replacement panel to two existing panels that have been weld-bonded at the factory. And both vehicle makers recommend using no adhesive to attach the third panel.

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