ADVANCED JOINING TECHNIQUES IN COLLISION REPAIR

Scott VanHulle
I-CAR
ABOUT I-CAR AND VISION

About I-CAR
I-CAR®, the Inter-Industry Conference on Auto Collision Repair, is an international not-for-profit organization dedicated to providing the information, knowledge and skills required to perform complete, safe and quality repairs.

Vision
That every person in the collision repair industry has the information, knowledge and skills required to perform complete, safe and quality repairs for the ultimate benefit of the consumer.
WHY THIS INFORMATION IS VITAL

Marcia & Matthew Seebachan - the consumer!

https://youtu.be/WhilpT13I9E
REPAIRABILITY IS ALL ABOUT MPa

- 600 MPa and higher is not repairable regardless of composition
- Provide repairability documentation for below 600 MPa
- Provide a “do not straighten” statement for over 600 MPa

Source: WorldAutoSteel
MIG/MAG WELDING

- HSS welding wire 980 MPa
- Weld nugget size charts
  - Dependent on panel stack
- Distinct weld symbols
- Used where spot-welding arms cannot reach

5. Install the quarter panel (1) accordingly.
   - 450 mm braze seam (2)
   - 53 spot welds (3)
   - 7 plug weld (4).
   - 156 mm braze seam (5)
SQUEEZE-TYPE RESISTANCE SPOT WELDER (STRSW)

- Some auto set features
  - Specific welder settings on UHSS
- Current generation STRSW
  - 10,000 amps+
  - 990 lbs or 540 daN+ at the tips
MIG BRAZING

- Pulse capable machines
- Short-circuit and pulse welding currently used
  - Open butt-joint, lap joint, plug, slots, and double hole
- Attachment to UHSS and outer body panels
WELD BONDING

- Weld Bonding
  - Structural Adhesive
  - Panel Bonding Adhesive
  - Urethane Adhesive
    - sometimes used for roofs as a replacement for laser welded/brazed solutions
RIVET BONDING

• SPR
  • Repair facilities with this equipment have increased greatly
• Blind
  • Structural rivets
  • Used where STRSW cannot be used and HAZ is an issue
• Exact number of attachment points
• Repair attachment method can be a different method
• The more details that can be provided the better, that is:
  • Which parts need to be removed for access?
  • Can a removed part be reused?
DON’T FORGET ABOUT GENERAL INFORMATION

- Every collision is different
- Give the collision repair professional guidance
- Can’t be a repair procedure for every situation
- Can a bracket be removed?
- Can a tear be welded below a certain MPa?
- Identification of the MPa using a detailed graphic
• Alternate repair strategies
  • Attachment brackets that hold reinforcements in place
  • Part assembly replacement
  • More adhesive repairs
  • Different fasteners
  • More combinations of all attachment methods
INFORMATION IN TECHNICIAN’S HANDS

- Alternate strategies than traditional path
- QR code on parts to grant access to procedures?
- Vehicle graphic that links to the procedure for each part?
- Apps?
- Collaborations with various information companies?
FOR MORE INFORMATION

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