Tips & Hints for Aluminum Dent Repair

Brought To You By:

Pro Line Systems Int'l Inc 305-793-9503

Facts About Aluminum Panels:

- Aluminum does NOT have a memory. It does NOT have a tendency to return to its original shape like steel which wants to spring back. As it is worked, aluminum gets harder and stiffer. So, the amount of straightening and pulling that can be done in one area is often limited and the sequence in which damaged areas are worked can be critical.
- A natural oxidation barrier forms on a bare aluminum surface immediately and must be removed before welding, filling, priming, or painting.
- Both heat treatable and non-heat treatable aluminum alloys may be heated during dent repair, but the allowable heat range for dent repair is generally between 400º and 570ºF. Above 570ºF aluminum loses its temper and the characteristics of the metal are changed.
- Aluminum is an excellent conductor of heat. It gets hot faster than steel, but it also cools quicker. So, repairs must be carefully planned and done quickly, but gently and under control.

General Rules For Aluminum Repair:

1. Tools for aluminum repair, (brushes, files, dollies, abrasives, etc.) should be reserved only for that purpose and stored separately.
2. The repair area should be contained, either in a separate room in the shop or an area separated by curtains.
3. Sanding and grinding should be done at a very low speed with 80 grit abrasive or finer and finished off with a stainless steel brush.
4. Both fume and/or dust containment systems should be considered either as portable or stationary. A dust containment system must be of the wet-mix type to reduce the chance of explosion.
5. To avoid cross contamination and galvanic corrosion, filings, grindings, and dust from aluminum should be vacuumed up, not blown off. Tools should be wiped down after use.
6. Dents should be worked from outside inward (from indirect damage toward direct) to avoid creating a high spot. However, body line edges may have to be repaired first due the work hardening characteristic of the metal.
7. Heat should never be applied to panel areas containing adhesive.

Tools Needed:

1. Stainless steel wire brush.
2. Propane torch or induction heater
3. Non-contact thermometer or another heat monitor such as heat crayons, paint, or strips, or a thermocouple.
4. Protective eyewear.
5. Acetone cleaner.

Using the *CompuSpot 180* Dent Pulling System:

1. Disable the vehicle electronics and safety restraint systems according to the OEM's recommendations.
2. Sand and clean the area to be worked with acetone.
3. If necessary due to the size and depth of the dent, heat the damaged area to 350 to 400° (Do not exceed 570°F) to relieve the stress, raise the low areas, and reduce the overall size of the dent. Take care not to burn the paint and coatings. Work the heat gun in a circular motion.
4. Allow the panel to cool and clean again with acetone, if necessary.
5. Apply the ground clamps so they are close to the work area with the dent being lined up directly between the grounds as much as possible.
6. Prepare the machine by setting the power. Select an aluminum stud size based upon the thickness of the panel (Note: For most thin panels like hoods, trunk lids, etc. the 4mm stud is sufficient). Load the aluminum stud in the electrode holder with only 1 or 2 threads showing as depicted in the manual. Most important **DO NOT TOUCH** the base of the stud with a bare finger. Oil from bare skin will make it difficult to apply the stud.
7. Apply the stud. Begin with lower power settings and test the stud for pulling strength. If the panel is very thick, or if the ground clamps are far apart or must be positioned so that the dent is not on a line between them, it may be necessary to increase the voltage. Do NOT press too hard with the stud gun.
8. Install the stud puller and position the lifter bar or puller pliers close at hand to be ready to pull. If a lifter bar is used on a medium or large size dent, there is of creating new damage while pulling. For deep or larger dents it is safer to use a pulling bridge to disperse the load.
9. Reheat the panel while measuring the temperature as before and pull the dent while the panel is still hot. Work quickly, but gently. Take care not to over pull.
10. Remove the stud with side cutters. Do not try to twist off or flex the stud from side to side.
11. File or sand the area as necessary. NOTE: Some spatter from the stud welding process is normal. An improperly cleaned panel, too high a voltage setting, and high humidity can all increase the amount of spatter.