

# *Magnets As A PDR Alternative?*

## **Overview...**

Magnetic Induction devices have been a popular tool for the collision industry due to its versatile uses. In a recent issue of a collision related magazine advertisement read "Do-It-Yourself Electromagnetic Paintless Dent Repair...no drilling, no picks, no PDR techs, no interior trim removal" and also "Works on all sizes of soft dents and remove nickel size dents in 3-5 seconds." If this claim is true, this tool can open new top-line opportunities and potential bottom-line savings for the industry. The Manheim Technical Center wanted to prove or disprove the claim was indeed true and whether or not it can be a cost effective alternative to dents that cannot be removed with traditional paintless dent repair (PDR) techniques without harming the substrate, finish, employee and quickly.

## **What is a Magnetic Inductor?**

Induction heaters by design concentrate heat to electrically conductive material by subjecting it to an alternating electromagnetic field. This creates a circulating current (known as 'eddy' currents) where the molecules of the substrate try to move with the changing current and create friction. Friction causes heat in an accelerated pace. The concentrated heat is generated within the substrate and not the induction system itself. A general rule is that the more conductive a substrate is the easier to heat via induction system. Steel is the most common of ferrous material that is heated but also some non-ferrous like aluminum can be heated but not as easily (only 10% of steel). Induction systems are either water or air cooled (ambient or forced).

## **What is PDR?**

Paintless Dent Repair is a process that "removes dents, dings, creases and hail damage from vehicles without affecting the original factory finish...dings and dents can come from everything from runaway shopping carts to hail storms"<sup>1</sup> Paintless dent repair is a cost effective alternative to traditional collision repairs. Technicians skilled in the art of PDR are typically mobile (value added benefit). Companies like the PDR world leader Dent Wizard trains their technicians thoroughly enough to offer a 100% satisfaction guaranteed commitment to their customers. The use of PDR has been a cost effective repair solution for the insurance companies (hail catastrophe), rental car industry, auto dealers and miscellaneous vehicle buyers and sellers at the auto auctions.

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<sup>1</sup> [www.dentwizard.com](http://www.dentwizard.com)

## Testing the induction system vs. PDR...

The system came with two attachments (pad and tip). The attachment used for the PDR test was the tip. Dents tested range in size, location, substrate type and substrate thickness.

Dent sizes tested include:

- ① Less than 1"
- ① 1" to 3"
- ① 3" to 6"
- ① 6" to 9"
- ① 9" to 12"
- ① Greater than 12"

Dent locations include areas with and without body/contour lines along with work-hardened areas:

- ① Hood
- ① Hood edges
- ① Roof
- ① Fenders
- ① Fender lips
- ① Doors
- ① Door Edges
- ① Quarter panels
- ① Pillars

Dent substrate types include:

- ① Steel
- ① Aluminum

The inductor replicates an older repair methodology that required a fine flame to heat the work area, the metal would change its shape (required technician finesse) followed by a quenching period where the technician cools the metal to lock in the new shape. The flame method came with more flaws (fire hazard to employee, vehicle and shop). As the inductor heated up the dents were supposed to disappear (per induction manufacturer demonstrator). The smaller dents did not disappear or change as the depressions surface area was too small to pull out. This was the case for all of the dents from less than 1" to 6" to 9" on steel substrates regardless of panel. The larger dents were minimized but still remained. Either traditional PDR follow up or bodywork would be needed to finish the larger dents. The aluminum tests were even worse. The metal was heated but the time the substrate took to heat to a reasonable temperature was too long. The aluminum substrate did not hold the heat as well as the steel substrate. The panel heated to 200° Fahrenheit within seconds on the steel substrates. The paint started to burn

around 220° Fahrenheit. The panels remained warm enough to the touch that identified another opportunity that is more realistic for the inductor.

The graphic removal processes vary by shop to shop. From hot water pressure to oven cleaner, the Internet is loaded with 'ways to remove stickers'. The inductor is another alternative for graphic removal. The inductor can also be used to heat urethanes than hold stationary glass in place. Moldings and trim that is adhered using double-sided tape can be removed or repositioned. Bolts are loosened easier as well.

### **Does dent removal matter in the lanes?**

The popularity of this repair is partially fueled by its return in the lanes. Dents in certain places (ex. Driver's door) on the vehicle presents an opportunity cost. If the dent is not repaired and witnessed by potential buyers, it may influence a lower bid price or no price at all. The lack of bids drive the price down and creates a gap between what the seller wanted and what is worth at that present moment in that current condition. For a buyer that is unaware of the amazing work a highly trained PDR technician can perform, may assume the vehicle needs expensive bodywork. The time for transport, the shop to write an estimate, schedule the work, complete the work to the manufacturer standards is time away from the dealership. The dent if repaired will add to the overall condition and value of the vehicle.

### **Summary**

To answer the question about magnetic induction replacing traditional PDR is easier after the testing session. While the process failed to pull dents, additional opportunities surfaced for other repairs. Paintless dent repair a is value added repair while it proving itself in the auction lanes and companies like Dent Wizard continue to maintain a high level of quality backed by a satisfaction guarantee that the others will not deliver. In the spirit of the popular Mythbusters™ television show: Magnets as a PDR alternative...Busted.