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New Technology for TPO & Polypropylene Repair Opens Up New Profit Opportunities for Recycler

Uni-Weld Ribbon, our new universal plastic repair system, has been very well received by the marketplace for its ability to repair virtually any type of plastic. Using the same simple method, high quality repairs can be made on any type of plastic.

Of course, no good body technician can leave well enough alone - they are always looking to gain a little more performance from their products. One such innovation comes from **Darren Kasparian** of Salt Lake Chrome Plating in Salt Lake City,

Utah. Darren has developed a **new technique to repair TPO** and polypropylene bumpers with the Uni-Weld. "I wasn't happy with any of the products out there for polypropylene" says Darren. "Once I figured out how to repair it with Uni-Weld, it opened up a whole new market for me. It's strong and fast but not all gobby-looking."

Darren's technique for Uni-Weld repair is to melt the 2045W Reinforcing Wire Mesh into the plastic first, then cover it over with the Uni-Weld.

"We had just about given up on trying to repair polypropylene. This has opened up a whole new market for me."

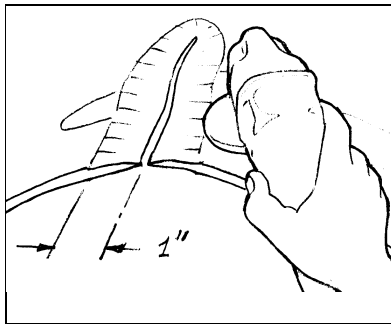
-Darren Kasparian

Like rebar in concrete, the **wire mesh takes the tension** from bending loads and transfers it to the substrate. The Uni-Weld, protected from high tensile forces, is able to resist tearing even when bent over a tight radius. The illustrations here show how to make the repair step-by-step. This technique also works very well for tab and mounting hole repair. Please call for complete written instructions for this new method.

One cautionary note: the plastic being repaired **must be a thermoplastic**, as TPO and polypropylene are. This technique *cannot* be used on thermoset urethane (PUR, RIM) as these types cannot be melted after they are manufactured. If you can't identify the plastic, we recommend using the standard Uni-Weld technique.

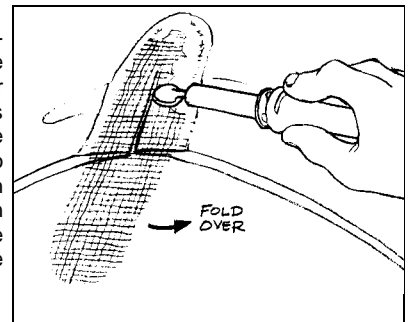
Step 1

After cleaning the area with 1000 Super Clean plastic cleaner, grind the area around the tear with a coarse disc in a slow speed grinder. Taper the area next to the groove slightly more. Undercut enough so that mesh will not be exposed after welding. Do this on both sides of the damage.



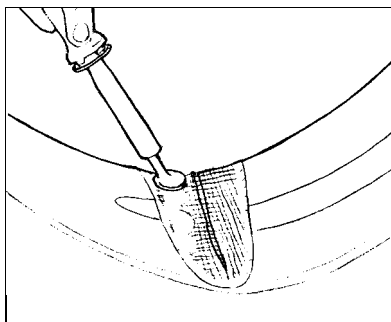
Step 2

Cut a piece of 2045W Reinforcing Wire Mesh large enough to cover the tear and wrap around both sides of the damage. Run the welder down the crack to fuse the tear. Melt the mesh into the surface except in the immediate vicinity of the tear, which allows the wire more area to bend.



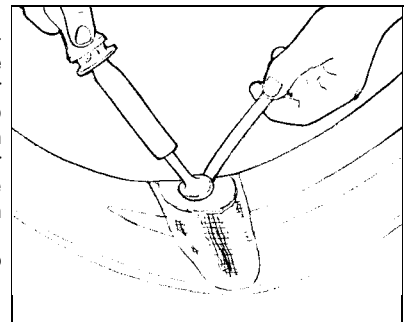
Step 3

Wrap the mesh around the edge and melt it in on the edge and the opposite side. After the plastic has cooled, sand the melted plastic with 80 grit by hand to remove the gloss. Uni-Weld will not adhere to a glossy, non-abraded surface. When sanding, try to minimize damage to the mesh.



Step 4

Cover the mesh with Uni-Weld Ribbon. Premelt one side of the ribbon, flip it over and stick the melted side to the bumper. Cut the ribbon with the edge of the welder tip and spread around the surface. Complete both sides. Using this technique, you don't have to build up the backside very thick.



Saturn Fenders and Doors - Three Ways to Fix, Take Your Pick

From the 1953 Corvette to the Fiero, APV vans, and Saturn cars of today, General Motors has led the automotive industry in introducing new applications of plastic to the mass market.

The Saturn cars are the first to have all vertical body panels molded in thermoplastics. These panels have proven popular with consumers due to their rust and dent resistance. The plastic panels are so popular that they have become a Saturn trademark. In fact, when GM brings over the Opel Vectra as Saturn's new big car, it will be redesigned to include thermoplastic vertical body panels.

Saturns use three types of thermoplastic body panels: TPO for the bumpers, Pulse for the door skins, and GTX for the fenders and quarter-panels.

Pulse is a blend of polycarbonate and ABS (PC/ABS) by Dow Plastics. GTX is a blend of Polyphenylene Oxide and Polyamide (PPO/PA) by GE Plastics. GTX is used on other applications by GM, including the fenders on the Buick Park Avenue, Pontiac Bonneville, and Olds 98.

If you're reading this, you probably don't care so much *what* they're made of, but rather **how to repair them**. Fortunately, nothing could be easier, because you can take your pick of three ways to fix these plastics, depending on what type of damage and what you're comfortable with.

Weld Repairs

Let's talk about doing weld repairs first. We recommend weld repairs because they'll give you the strongest repair in most cases. Being a blend of PC and ABS, the Pulse

door skins can be repaired using the plastic welder with either the 5003R7 polycarbonate rod or the 5003R3 ABS rod. The GTX fenders and quarters are a nylon alloy and can be repaired using the 5003R6 Nylon rod.

In either case, you'll need to **pre-heat the groove** before you start welding. The melting temperatures for these more rigid plastics are much higher than softer plastics like TPO (see table), so the welder can't put in enough heat to get the base material up to temperature. You need to help the welder by preheating the groove with a high-temp heat gun.

After using the heat gun, you'll find that the welder brings the substrate to the melting point very quickly. Melt the rod into the groove and use the foot of the welder to work the rod and the substrate together. Work only about an inch or so at a time. Periodically back off, and pre-heat the next section with the heat gun before continuing your weld pass.

Insta-Weld Repairs

Many times it's difficult to access the backside of some damaged areas, making weld repairs difficult. This is especially true in the tight channels on the edge of Saturn door panels, which commonly are cracked

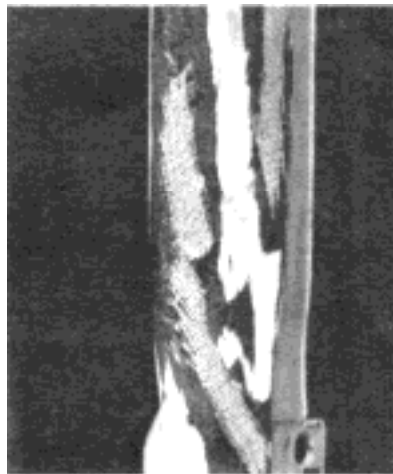
along the corners. Such cracks are easily repaired using our Insta-Weld line of instant adhesives. Insta-Weld works well on rigid, non-olefin plastics like Pulse and GTX.

To make the repair, line the part up and use Insta-Weld 1 thin

adhesive to make an instant bond. This will hold the parts together while you finish the repair.

After you clean the surface with some 1000 Super Clean plastic cleaner, the stages of repair will be as follows:

1) Using a die grinder, grind out a channel on the front side about a half inch wide down the center of the crack.



Cracks in the edge of a Saturn door repaired using Insta-Weld and fiberglass cloth.

2) Cut a piece of fiberglass cloth about the size of the channel, but slightly narrower so that it will be flush with the surface when you're finished.

3) Spread some 2250 Insta-Weld 2 thick adhesive into the channel, then quickly lay your pre-cut fiberglass cloth into the groove (please wear some rubber gloves for

this!). Once you get the cloth into position, press it into the Insta-Weld and try to moisten the fibers of the fiberglass completely. You may need to apply more Insta-Weld to completely moisten the fibers and fill the channel.

4) Quick cure the Insta-Weld with our 2303 Activator. This will cause the bond to achieve 20% strength within a matter of seconds, allowing you to continue your work immediately.

5) Rough grind the backside of the crack where accessible. Cut fiberglass cloth and glue on with 2250 Insta-Weld. Moisten the fibers completely. Spray on the activator, and you're done!

By spreading the instant adhesive over a wider area and reinforcing its tensile strength with the glass fibers, the repair is not only quick but strong and durable.

Two-Part Epoxy Repair

Softening points for various plastic alloys (Deflection temps @ 264 lb/in²)

GTX (PPO/PA)	300 - 400 F
Pulse (ABS/PC)	200 - 250 F
Polypropylene (PP)	100 - 120 F
Thermoplastic Olefin (TPO)	100 - 120 F

GTX and Pulse are easy to repair with two-part epoxies because you don't need to worry about using an adhesion promoter. Using 2020 SMC Hardset Filler or 2021 Rigid Filler, you can make a strong and durable repair. We won't go through the steps here, but if you have any questions, please give us a call and ask for "The Book of Automotive Plastic Repair."

Chemistry 101: How Insta-Weld Works

In the last issue, we discussed how Insta-Weld adhesives are made and how to speed up the cure. You may be asking "How does the stuff work?" and "What are the benefits and drawbacks of Insta-Weld?"

First, we'll explain how the stuff works. Insta-Weld is acidic stabilized. This means that when the acid stabilizer is neutralized, the Insta-Weld is turned into a solid within seconds. Atmospheric moisture is basic (opposite of acidic) and works to neutralize the Insta-Weld. You might find the Insta-Weld curing faster in humid conditions and slower

in the winter. Activator is a solvent based material that contains a basic substance that is stronger than the atmospheric moisture and will neutralize the stabilizers quicker. We take care to formulate our activator with solvents that will not attack plastic.

When the Insta-Weld cures (polymerizes) it turns from a liquid to a solid. This process results in a molecular restructuring. **Insta-Weld molecules frantically rearrange** and rub together creating molecular friction. This friction generates heat. The heat creates faster curing which generates more heat and so on and so on. This process is called exotherming. With enough Insta-Weld and some very fast activator, **enough heat could be produced to melt through plastic.** On automotive plastic repairs, the amount used does not allow this. It does, however, create fusion of the Insta-Weld fillers by the Insta-Weld adhesive to the plastic body parts. Hence the name Insta-Weld. **No other adhesive will create this unique fusion of parts by the use of its own internally generated heat.** The white powdery coating on parts is caused when the heat generated during the cure vaporizes some adhesive and the vapor cures on the surface of the parts, leaving a white film. This is called blooming.

Prior to the use of Insta-Weld, two part epoxies were the most common *adhesive*. While still popular as an *adhesive*, epoxies are used mostly as *fillers*. Unlike epoxies, Insta-Weld requires no mixing, the cure time is faster, there is no waste, and because of the lower viscosity, it will wick its way into tight spaces. For Insta-Weld, the cost per bond is very low.

Explaining how Insta-Weld works also explains the benefits.... so **what are the drawbacks?** Insta-Weld will break down, ironically, with continued exposure to moisture. In body repairs, this is not a major issue as the repaired parts are painted and the Insta-Weld is completely covered. Because Insta-Weld bonds are rigid by nature, they do not work well on flexible plastics. For flexible plastics, use **2275-2 Insta Weld 3**. Insta-Weld can fill some *small* gaps especially when used in conjunction with Insta-Weld Weld Compound. However, we recommend that epoxies be used when large areas need to be filled.

When to use Insta-Weld

Because of the rigid bonds, Insta-Weld works best when used on rigid plastics. Some examples would be:

- ➔ SMC parts (use fiberglass tape for extra strength.
- ➔ ABS headlight frames and grilles.
- ➔ GTX plastic on Saturns and other GM cars.
- ➔ Pulse door skins on Saturns.
- ➔ Use your imagination. Try them on everything. They will either work or not work instantly!
- ➔ Insta-Weld also works well as a temporary bond when welding breaks in plastic.

Insta-Weld Tips

- 1) Store unopened bottles of Insta-Weld in refrigerator or freezer to prolong shelf life. When removing Insta-Weld from cold storage, allow time to reach room temperature before opening the bottle. This will help prevent condensation in the bottle.
- 2) DO seal the bottle tightly when not in use. DO NOT refrigerate after the bottle has been opened, because the air in the bottle will condense.
- 3) If you spill Insta-Weld, DO NOT use a cloth. This will cause polymerization and will generate heat. The adhesive may adhere the cloth or paper towel to your skin and burn. It is best to cover the Insta-Weld with an absorbent material or spray with Activator and scrape up the cured film.

Need More Copies?

We appreciate the positive response we received from you on our first issue of Plastic Pointers. We doubled our printing run this time, so if you'd like a few extra copies please give us a call. We also have other instructional materials available at your request.

Thanks for your feedback and comments. Please give us a call us anytime.