

Major and Minor Body Repairs

The Common Steps for the Minor Body Repair are as below.

- Determining the extent of the damage.
- Removal of debris from behind the panels.
- Repairs with a washer welder or hammer and dolly.
- Panel shrinking(drawing operation).
- Removal of small dents and bulges and repairs with a file.
- Filling with plastic filler or putty or solder.
- Rust proofing the back side of panels.
- Completion of repairs.

1. Repairing of small dents:

There are four Main Steps to repair the Small Dents.

1. Repair with a Washer Welder
2. Repair with the Suction Cups
3. Repair with the Hammer & Dolly blocks
4. Repair with the Additional Putty

There are two things which are done before the repairing start with the washer welder. And those are as below:

A. Determining the Extent of Damage:

Before beginning the repair, determine the extent of the damage. The illustration on the right shows an example of a damaged vehicle which has sustained an impact near the centre of the door (on the molding). The inspection reveals that sections have plastic deformation which means that the body line and the shaded areas of the panel will not return to their original shape without working the metal.

Therefore, if the body line and portions are repaired, the portions with shaded lines should be returned to their original shape by working the metal.

B. Removing the Paint Film on the Panel Surface:

Remove the paint from the damaged (dented) area before welding the washers to the sheet metal.

1. REPAIR OF DENTS AND BULGES WITH THE WASHER WELDER:

The rigidity of the panel is maintained by the body line. If the body line of a panel is deformed, it will be warped spreading over a large portion of the panel. If the body line is repaired correctly, the strain on the panel will decrease. The procedure is as follows:

There are cases where the greatest deformation is to the body line and its repair alone will not eliminate the entire warp. This is because the panel has not only lost its rigidity from deformation of the body line, but the general surfaces, etc. of the panel have also been stretched by plastic deformation. In such cases, contraction of panel (drawing operation) is necessary to remove the stress.

With this in mind, repairs can be performed easily.



WASHER WELDER

2. REPAIRS WITH A SUCTION CUPS.

Sometimes the small dents are removed with the help of the suction cup. When it pressed on the vehicle surface due to vacuum the cup of rubber is sticked to the vehicle surface and the body or dent can be pulled out. But the capacity of this cup is very low. Only small dents can be removed out through this method.

3. REPAIRS WITH A HAMMER AND DOLLY.

Repairing body panels with a hammer and dolly requires expertise, so in many cases, the repair procedure has been changed to the washer welding method, since this technique does not require nearly as much expertise as a hammer and dolly operations. However, using a hammer and dolly in areas where your hand will reach is generally the better; it is easier and shortens working time. Generally the hammer and dolly method is used for; repairs, but in places where it is difficult to get the hand in, repairs are done with a spoon. The figures below show some ordinary dollies and spoons and examples of normal use.



HAMMER AND DOLLY

- I. Determining the Extent of Damage:** Determine how far the dent extends into the panel.
- II. Removal of Foreign Substances from the Back Side of the Panel:** Remove mud, undercoat, etc., so that the dolly or spoon can be in direct contact with the back side of the panel.
- III. Selection of a Hammer, Dolly or Spoon:** The hammer, dolly or spoon must have a curvature that is the same as or smaller than, the panel which is being repaired. Panels with a convex (indented) surface should not be struck with a flat hammer because the edges of the hammer will leave small scars on the surface of the metal.
- IV. Rough finishing with a Body Puller:** Use a body puller to rough finish the affected area. By changing the attachments on the body puller, places with high rigidity, such as wheel housings, (quarter panels) or front fender can be rough finished and repaired.

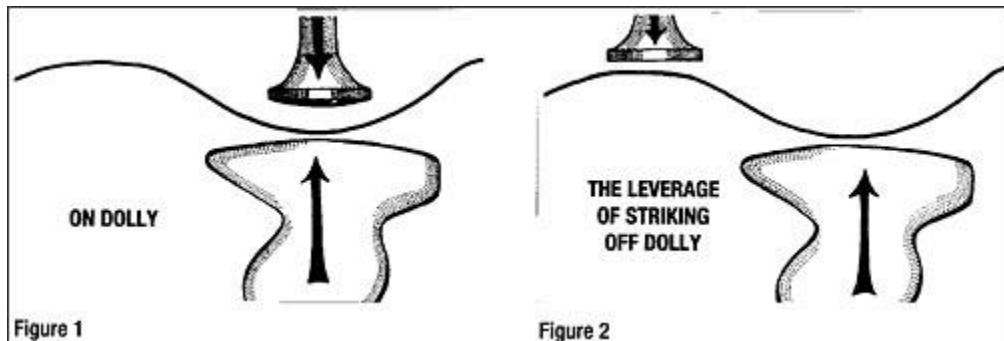
Methods to do work with Hammer and Dolly Blocks

I. Hammer-on-Dolly Method

Hammer-on-Dolly repairs are used to smooth shallow dents and bulges. Place a dolly against the back side of the panel directly behind the bulge and use a hammer from the front side to flatten the bulge. There will be a slight rebound as a result of the hammer hitting the dolly. The dolly will hit the back side of the panel and as the force of the dolly pressing against the panel is increased, the flattening action will also increase.

The body repairman should calculate the amount the panel to be worked will stretch as it is hammered. If this is not done, the panel will stretch and elongate too much. Since a great deal of body

repair experience is needed to accurately judge how much a panel will stretch, an inexperienced repairman should not rely entirely on this type of repair method.



II. Hammer-off-Dolly Method

This method permits the body man to make repairs without stretching the panel. The dolly hits the area of the panel which is dented on the back side and the hammer hits the bulging area from the front side.

4. REPAIRS WITH ADDITIONAL PUTTY.

The use of plastic body filler on panels is for only minor damage.

1. Straighten the damaged area. Try to get as close as possible to the original contour.
2. Grind the area to be filled. The #24 grit, open-coat disc can be used for the grinding operation. However, #16 grit will produce a rougher metal surface, resulting in a better bond for the plastic filler. Make certain that all low spots are free from paint, rust, and scale.
3. Mix enough plastic catalyst to fill the damaged area.
4. After mixing the plastic and catalyst thoroughly, apply a thin coat over the entire damaged area. It is better to spread the filler over the entire damaged area than to locate and fill only the low spots. Usually a large area can be worked smooth as easily as a smaller one. Make certain that the filler is bonded in all the low spots, with no air spaces present. Next, spread filler to the desired thickness.
5. Allow sufficient time for the filler to begin to set up. Hardening time is usually from 5 to 15 minutes in a normal shop temperature of 70° F.
6. With the grater file, remove the top, surface of the filler. The top surface of plastic filler will remain soft, regardless of the hardening time.
7. When the top surface of the filler has been removed with the grater file, the filler should be sanded with the blocking file. Usually this operation is done with #36 grit production type sandpaper. Avoid over sanding the plastic filler. You must accurately determine when the filled area has reached the same contour as the surrounding metal surface. Any filing done after the filler reaches the desired contour can only result in an inferior job. Frequent checks must be made during the filing operation by placing the edge of the file against the work. The edge of the file serves as a straightedge to indicate any high and low places which require attention. Overfilling is indicated by the filler area being slightly lower than the surrounding metal surface. Bear in mind that sandpaper files do not cut down the metal surface as readily as they do the plastic filler.

8. When the filler has been sanded to approximately the desired contour with the #36 grit sandpaper, install finer grit sandpaper on the blocking file. A finer grit is required to remove the deep sand scratches left from the coarse #36 grit. NOTE: The plastic filler should be smooth and free of sand scratches upon completion of the sanding operation. Numerous abrasives are available for sanding plastic body fillers.
9. Featheredge the painted surface surrounding the work area to remove all sand scratches. It is important that no sand scratches be visible in the work or the area surrounding the work upon completion of the job. Any remaining sand scratches will cause problems during the refinishing operation. These problems are explained in Section VII on refinishing.

Helpful Hints with Body Fillers:

Every auto body, technician should develop skill in the use of auto body fillers. As a matter of fact, certain types of body damage cannot be repaired in a satisfactory manner without the use of fillers. If, however, body fillers are used improperly, a poor job is likely, with reflections cast upon the auto body repair business as well as on the individual technician's reputation. In order to avoid common difficulties in using body fillers, the following helpful hints are offered:

- I. Do not attempt to apply body filler to unsanded metal.
- II. Do protect any moldings, glass, upholstery, or undamaged painted surface while applying body filler.
- III. Do protect any surrounding surface from hot sparks during the grinding procedure. These sparks can cause permanent damage to glass and can harm painted surfaces.
- III. Do not attempt to use any type of body filler until all available means have been utilized to straighten the damaged panel to approximately its original contour.
- IV. Do not apply plastic filler to areas which may receive moisture from the back. Moisture has a tendency to penetrate plastic filler, causing cracks and poor bonding.
- V. Do not apply plastic filler over painted surfaces. Plastic does not bond properly to unclean metal surfaces.
- VI. Do not apply plastic filler over metal that is rusted.
- VII. Do keep tools and equipments used in the application of fillers clean and good condition. They will work better and last longer.
- VIII. Do have a certain definite location for all tools and materials used for the body filling operations.
- IX. Do follow the directions suggested by the manufacturer for the use body fillers.