# Workshop

# CAST ADRIFT

## Need plastic or rubber parts? Why not make them yourself?

### Things you'll need:

- ✓ Smooth-On PMC-121/30 mould making rubber kit
- ✓ Smooth-On PMC-790 (Parts A and B)
- ✓ Smooth-on Universal Mould Release
- ✓ Black Pigment
- ✓ Castin'craft clear casting resin (for plastic parts)
- ✓ Enamel in the colour of the original plastic item (for plastic parts)
- ✓ Measuring cup
- ✓ Mould containers
- ✓ Rags
- ✓ Lacquer thinner for clean-up

Everyone has heard stories about old cars that were driven straight from the dealership to a garage and left there for 30-50 years. It does happen occasionally. I saw a 1942 Chrysler like that a few years ago. It seems its owner drove the car only a few miles before enlisting in the military to do his part in WW II. Sadly, he never returned. His widow didn't drive, so she used the old sedan to store her collection of magazines.

As a result, the car looked almost brand new in the 1980s when it was pulled from the shed in which it had been stored. Nevertheless, the rubber seals around its windows and doors had deteriorated, and the plastic on its beautiful dash had warped and deteriorated. Forty years had taken their toll on these eminently biodegradable items. Finding replacements would have been difficult. I didn't get the car. But I have since learned how to make plastic and rubber parts myself.

Plastic parts are a bigger challenge to obtain than rubber. Many were unique to a given year, so unless you are doing up a common make you're out of luck as far as repro or NOS (New Old Stock) replacements go. However, all is not lost. Using modern resins and casting polymers you can make your own fairly easily. And rubber parts are even easier than plastic ones thanks to RTV (Room Temperature Vulcanizing) rubber products.

Of course, RTV rubber isn't really rubber any more than your car's tyres are. Natural rubber was replaced long ago by more durable silicone, butyl and urethane synthetics for most applications. Latex is the exception. It is the only "rubber" product that is still made out of natural rubber. But neither natural rubber nor any of the synthetics is actually black.

Ever noticed those white tyres on horseless carriages? They were made of natural, unpigmented rubber. Manufacturers started putting black pigment into tyres to make them less vulnerable to rot and less prone to showing scuffs and dirt. When you make your own rubber replacement parts you will want to add pigment too.

### Rubber Parts

Casting rubber items is easy if you have a good original to work with. The item doesn't have to be perfect. You can use plasticine to smooth out cracks if necessary, and you can even make whole prototypes out of low-fire modelling clay available from crafts stores if you have to. Prototypes can also be made of wood or metal.

You will need mould dams in order to contain the liquid urethane moulding solution until it cures. Lots of people build boxes out of strips of wood, but I have found that small plastic boxes and bowls such as those you would use for leftovers in your refrigerator or to organise small items in your office work very well if you spray them with a little mould release first. Pick these up at variety stores.

Temperature is important to the chemical processes involved, so work in an area that can be maintained at 20 degrees Centigrade. You will also need adequate ventilation because, though the fumes aren't obnoxious, they can be dangerous to breathe. Finally, you will want to wear latex gloves to protect your hands.

Spray a fine mist of mould release on both the mould dam and the prototype you wish to replicate. It's a good idea to spread this around with a fine brush, let it set, then shoot on another fine mist. Let the mould release dry for at least 15 minutes before proceeding.

Place the item to be reproduced in the mould dam, making sure that you will have at least 13 mil of mould above the item after the mould making mixture is poured into the dam. Be sure to arrange the item so you will have a minimum amount of undercutting. Extensive undercutting will mean that your flexible rubber mould will eventually split and become useless because of twisting and flexing.

If the prototype requires a great deal of undercutting, you may want to arrange it so you can cut the mould into two pieces using a utility knife in order to extricate it. Insert locator pins such as dowels or nails to register the two halves of your mould together before you cut it in half. You may also need to cut a hole from which to pour the casting material, or just insert a plastic soda straw for a sprew.

Mix up the rubber mould making compound. Add Smooth-on PMC-121/30 (a soft, mould making formula) one part A to one part B in a measuring cup. I use the disposable graduated cups available from crafts stores. Don't get sloppy about the mixture ratio because if you do, your mould may never cure or could become brittle. Stir the mixture slowly for a full three minutes, scraping the bottom and sides of the cup, in order to mix it thoroughly.

Slowly pour the mixture into your mould, being careful not to trap air bubbles. Let this cure for at least 16 hours before disturbing it, and make sure it is kept at a steady 65-70 degrees Fahrenheit during the process. Moderately higher ambient temperatures will hasten curing time a little, but don't rush it. Turn your disposable measuring cup upside down on a piece of newspaper when you are through pouring. The residue will cure and pop out, leaving the cup reusable.

Once the part has cured for the required time you can then heat it to 65 degrees Centigrade for four to eight hours to increase durability but this is not necessary unless you will be making a large quantity of items using it.

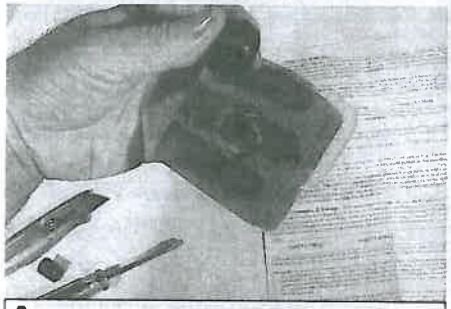
When the mould has completely cured, gently remove the prototype by pushing it out. Your new mould should be a perfect female version of your prototype. Check it for air bubble problems, then proceed with mixing the material for the duplicate item.

I used a Smooth-On PMC-790 rubber compound to make the rubber spacer I needed because it is a much stiffer, more resilient compound. You need to mix the PMC-790 at a ratio of one part A to two parts B and be sure to stir it carefully for at least three minutes as before. This time you also need to add a couple of drops of black pigment for that authentic look.

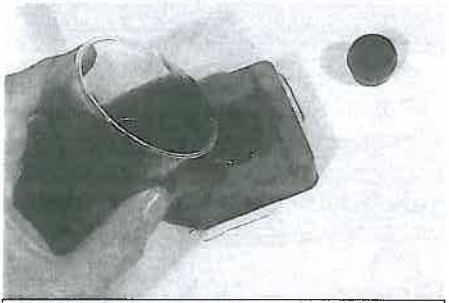
Again, pour the compound into the mould slowly until it slightly overfills so as to allow for any shrinkage in curing. Let the part cure for 16 to 24 hours. When you pop it out, you will have a perfect replica. Virtually any rubber part can be made this way with a little imagination. For long weather-strips, make a mould of wood using a router, then shellac it and shoot it with a little mould release. You can make just about anything you might need with Smooth-On polyurethane rubber compound and a good mould.


**1.** The first step is to make a mould. For that we used a PMC-120/30 soft compound.

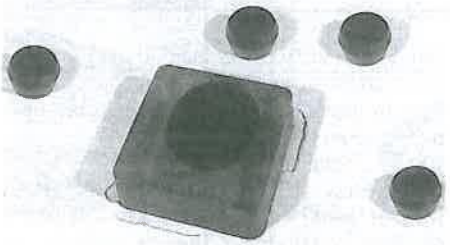

**2.** Lightly mist the mould dam and prototype part with a little mould release, then brush it in. Mist again and let dry for at least 15 minutes.



**3.** Gently pop out the prototype. It should coax out easily, but be careful not to tear the mould.



**4.** Pour in rubber compound slowly to prevent bubbles and slightly over-fill to allow for shrinkage.



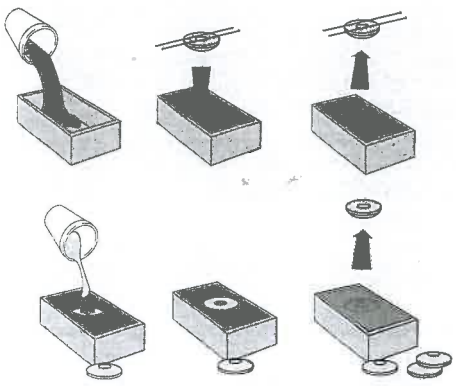
**5.** Your mould can be used to make many parts. Why not help other restorers by making extras?

## Plastic Trim

If you can get your hands on good pieces from another car, you can easily make moulds from them out of casting resin available from crafts stores. Casting resin is especially good for making replacement knobs, escutcheon plates and horn buttons but can also be used for more ambitious projects.

Prototypes can be made of wood, metal or even low-temperature-fired modelling clay. A machinist can easily make prototypes for round escutcheon plates and horn buttons out of aluminum. Sculpted panels can be shaped out of soft pine and sanded to shape. Even fibreboard will work if it is given several coats of shellac to seal it.

Pouring casting resin requires essentially the same technique as pouring urethane for rubber parts. Just follow the mixing instructions carefully, mix thoroughly and let the parts cure for the necessary amount of time as described in the instructions on the cans of casting resin.

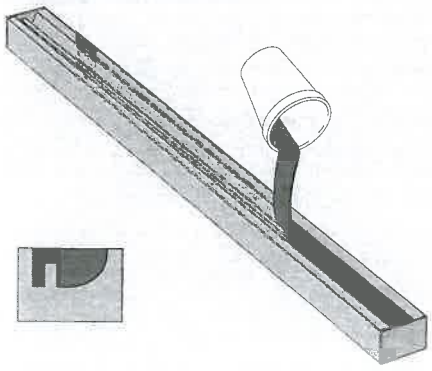


Here is one way to make escutcheon plates using rubber or plaster of Paris for a mould.

Casting resin is clear, yellowish or amber coloured and is transparent. Dies can be used to tint the plastic, but this seldom gives you the effect you need. To make sure your replicated parts match original items on your dash, take an original to an automotive paint store and have them mix up a pint of matching enamel.

While you are there, pick up a little reducer, some flexing agent and a little bit of clear enamel. Prime the parts, then shoot on a coat of enamel. Let that flash over, then mix some clear into the colour paint and shoot the parts again for a translucent plastic look. Once parts have cured they can be buffed and polished by hand.

If you need to drill holes in your plastic parts, use a drill press if possible, and run the drill at low speed so as not to overheat and melt the plastic. Threads can also be cut into plastic items, but it is good idea to also use a little super glue inside to help things such as knobs stay in place.



Routed or assembled wooden moulds can be used for weather-strip. Shellac them before using.

## Resources

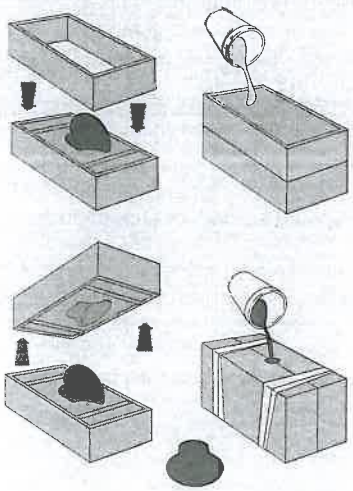
**Good sources for casting materials are:**

**New Zealand**
**Polymer Development Group LTD.**
**114 Harris Rd, Tamaki**
**Auckland**
**9-274-1405**

**Australia**
**Rowe Trading**
**4 Holder Ave**
**Richmond**
**South Australia**
**6-6234-0000**
**E-mail: www.rowetrading.com.au**

Plaster of Paris moulds can also be made for plastic parts, though they too need to be given a coat of shellac and a squirt or two of mould release. Until rubber mould making compound came along, plaster of Paris was the mainstay of mould making for years, but it has since become less popular due to its rigidity and fragility.

As a final note, you may want to make extra parts and place an ad in our magazine. Chances are other restorers are having a hard time finding replacements for the same items. You might even be able to pay for your time and materials, and you may help save other classics in the process. ■



Some parts may require a two-part mould. Here is one way to do it using plaster of Paris for the mould. Another way is to cast the part in rubber and then cut the mould apart.