SERVICE REFERENCE BOOK

"SEALING THE BODY"

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Tech Sez:

Probably you'll never lay your hands on a car that's got all the conditions we're gonna talk about in this book!

But, since trouble-shootin' a water or dust condition calls for knowin' where to look—we've got to give the car blanket coverage.

Of course, once you've laid your finger on the spot that's lettin' water or dust slip by, it's important to know what type of sealer to use and how to handle it. We'll cover that angle, too.

The whole idea, of course, is to make it easier for you to handle any sealing job that might come along—and do the kind of quality work that will keep the customers sold on you and your place of business.
Here's the index that'll tell you HOW to locate and seal the body.

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THE AUTOMOBILE BODY

As you know, the automobile body is made up of many flat and curved panels welded together to make the complete body shell. Although much care and planning goes into the construction of an automobile body, it is next to impossible to make the body airtight any more than it is possible to make a house airtight.

There are openings in some of these metal panels. These openings are for wires and cables, for brake and clutch pedals, for door and hood hinges, and so forth—openings you need in order to assemble the complete car.

These openings and most of the welded seams are sealed after the body is assembled. At some points, a welding sealer is placed between the flanges of the panels before they are spot-welded. The sealer flows out over the flange from the heat of welding, and seals the joint.
TYPES OF SEALERS AND CEMENTS

Using the right sealer and cements for the job is mighty important. This will assure proper adhesion and assure watertight joints and good appearance.

OUTSIDE SURFACES—Sealers used on outside surfaces, where appearance is a factor should be a hand-type that can be painted over. A suitable sealer of this type is available from Minnesota Mining and Manufacturing Company, 900 Fauquier Avenue, St. Paul 6, Minnesota, or their Adhesives and Coatings Division, 411 Piquette, Detroit 2, Michigan, under their trade name of “Scotch Calk.” Another suitable sealer is marketed by Rubber Seal Products Company, Inc., 43 W. Apple Street, Dayton 2, Ohio, identified as “RS-11.”
INSIDE SURFACES—Sealers used on inside surfaces, where appearance is not too important a factor, can usually be purchased locally at most hardware and supply stores. This is a heavy, fibrous-like material that can be rolled into wads or balls or used as long strips. It is generally marketed as ordinary house caulking compound, or as heavy sealing putty. A suitable caulking compound of this type is available from Minnesota Mining and Manufacturing Company, identified as "3M Body Caulking."

Ordinary house caulking compound can be applied to some places with a caulking gun, and can be painted. Compounds which contain asphalt cannot be painted successfully.

WINDSHIELD WEATHERSTRIP CEMENT — A suitable cement for sealing the windshield weatherstrip is available through Minnesota Mining and Manufacturing Company, identified as "3M Weatherstrip Adhesive." If used carefully, "Scotch Calk" can also be used.
DOOR WEATHERSTRIP CEMENT—Because of the “rolling compression” applied to the door weatherstrip by the “in-swinging” action of the doors, a special cement is required to hold the weatherstrip to the door. Such a cement is available through Minnesota Mining and Manufacturing Company, under their trade name “3M Special Weatherstrip Adhesive.” The box containing this cement carries a date beyond which it should not be used, since it loses some of its adhesive qualities with age. A special adhesive of this same type is now being used in production.

Another feature of this Special Weatherstrip Adhesive is that it will not soften when subjected to the hot rays of the sun.

This type of cement is also used for cementing luggage compartment lid and cowl ventilator lid weatherstrips.
WATER TEST FOR LEAKS

Considerable time and money can be saved in locating the sources of most water leaks by water-testing the area. This operation should be done with an ordinary garden hose, and it must be done carefully.

To make the water test, use a hose without a nozzle. Get a stream of water to flow about two inches out from the end of the hose.

When you're checking a windshield, for example, be careful to flow the water over only the area you want to test. If you are testing a vertical surface, for example, always start at the bottom and work up.

When you've located the place that needs sealing, be sure to use an air hose to blow out all of the moisture and dirt. The surface has to be clean and dry for the sealer to stick. Then seal that spot before you make further tests.
If a leak persists which makes it necessary to remove the windshield, clean off the old cement before you apply the new. Carbon tetrachloride will do the job, so will gasoline, but gasoline presents a fire hazard, so you have to be careful. But stay away from kerosene! It'll leave an oily film on the surface and the new cement won't stick.

CHECKING FOR BODY LEAKS

_Drain Trough_

Sometimes you have to start your checks for body leaks at the roof drain troughs. Water leaks at the troughs are often difficult to locate because it is hard to see whether the sealer is in place all along the trough. However, a water leak at the trough will show up on the headlining, around the body pillar, or on the floor from running down inside the pillar. It might even show up in the luggage compartment.

The drain trough is sealed on top at the roof panel, and on the underside at the roof rail. It is also sealed at the inner edge.
If you find that the headlining is wet, it's a pretty good sign that the sealing at the drain trough needs attention. So put new sealer along the entire length, from front to back, above the trough. Then seal any spot on the underside where necessary. **Be sure that the seam just below the front end of the drip molding, where the cowl side panel joins the cowl upper panel, is completely sealed.**

**Cow and Windshield Area**

Leaks at the cowl and windshield area are not so difficult to find because they are out in the open. The nature of the leak makes it easier to find. For example, if the water drips down under the instrument panel, there's some spot fairly high up that needs sealing. So it's a good idea to take a look at the front of the body.
Actually there are four panels that make up the dash. The upper cowl panel is welded all across the front, joining the front dash panel to the two cowl side panels. Then, the cowl side panels are welded to the front dash panel. These welded seams should be sealed with heavy caulking compound. If they aren’t sealed, you’ll have dampness under the floor mat, and at the bottom of the cowl trim panel.

You have to be mighty careful to seal up the pad fastener openings, and the openings where the wires come through the dash panel. A wad of heavy caulking compound over these openings will do the trick. All of these places may not need sealing, but it’s best to play safe and take care of all of them.
Other possible causes of dampness under the front floor mat are the seams around the toe-board cover which closes the opening for the clutch and brake pedals. Also, around the rubber cover where the steering column goes through the toe-board. Sealing these points with caulking compound will keep the water out.

Water can sometimes get into the front compartment through the hood hinge bracket stud holes where the studs go through the cowl side panels. Water can then run down inside the front door hinge pillar. Wads of caulking compound placed on the studs will seal them. Also put a ribbon of sealer around the top and sides of the hinge bracket.

It’s best to start the water test of the cowl windshield area at the cowl ventilator. We start at the cowl ventilator because we’d have water all over everything if we started at the windshield first. With someone inside the front compartment with a flashlight to look for leaks, run water over the ventilator.
If water comes in at the ventilator, adjust the operating linkage to place more compression on the weatherstrip. It may be necessary to file the slot in the operating linkage to get more travel of the lid.

If a water test shows water is coming in around the windshield wiper pivots, remove the pivot cover and gasket. Coat both sides of the new gasket with rubber cement. Install the gasket and cover and put sealer on the screw threads. A good seal can be obtained by removing the cover and sealing the opening in the cowl panel through which the pivot projects, using a hand-type caulking compound that won't harden.
There are two possible sources of water leaks at the windshield. Between the weatherstrip and the body metal fence, and between the weatherstrip and the glass itself.

To water-test the windshield always start at one lower corner and work across the bottom to the other corner with the hose. Have someone inside with a piece of chalk to mark any spots that show leakage.
Then start at the lower corner and work up the side of the glass and slowly across to the center. Complete the test by starting at the other corner and working up and across to the center.

If water is getting through at any point you'll have to remove the outer molding. This will make it easier to seal the glass and weatherstrip.

On Plymouth, and some Dodge models, you'll find it a lot easier to get this molding off and on again if you remove the garnish molding and pull out the locking retainer. (See Vol. 5, No. 12, MTSC Reference Book for details on this operation.)

Using a wooden wedge, pry the weatherstrip away from the metal fence. At the same time, apply windshield weatherstrip sealer between the fence and the weatherstrip.
If the leak is between the weatherstrip and the glass, pry the weatherstrip away from the glass and put some sealer in between.

**Doors and Windows**

The first step in checking the doors and windows for leaks is to make certain that all doors and windows are properly fitted. You can't expect a door to be weathertight if it doesn't fit properly, or doesn't compress the weatherstrip. You can't seal a door that doesn't fit properly!

The new "BODY SERVICE" manual (a supplementary publication of the MTSC) will give you all of the necessary information about fitting doors and windows.

If you know that the doors fit properly, but still do not make a good seal, test the weatherstrip compression by closing the door on a shipping tag. If you can pull the tag out easily, the weatherstrip isn't sealing at that point. So, shim out the weatherstrip.
After using solvent to free the weatherstrip from the door, put a strip of body elastic sealer tape on the door, using the recommended weatherstrip cement. Coat the tape and the weatherstrip with cement, and let it dry.

When installing a new weatherstrip on a door you have to be sure that the cement is "tacky" dry before you apply the weatherstrip, and then wait for it to thoroughly dry before closing the door. When the doors close there is a tendency to "roll" the weatherstrip, and if the cement isn't thoroughly dry, the act of closing the door will roll the weatherstrip off the door. Here is the recommended procedure: Coat the door and the weatherstrip with the recommended cement and let dry at least twenty minutes before you apply the weatherstrip to the door. After the weatherstrip has been pressed into place, leave the door open for at least two hours before you close it. The drying time for the cement, both before and after the weatherstrip is applied to the door, can be accelerated by using a heat lamp. However, if you can persuade the customer to let you keep his car overnight you'll be sure the cement is thoroughly dry before the door is closed.
On Plymouth and Dodge models using the strap-type hinge, the hinge openings in the pillars are sealed. Be sure the seal is in place; otherwise water will run down inside the pillar and out on the floor of the car.

In some cases you might find that the glass is too loose in the run channels, allowing water to blow around the edge of the glass. Or you might even be getting wind-whistle at this point.

In those cases, the best thing to do is to install strips of body elastic sealer tape behind the glass run, between the glass run and the door. That means you'll have to remove the garnish molding and unfasten the glass run at the top.
If you notice dampness on the door trim panel it usually means that the water shield at the door lock opening in the inner panel has slipped out of place. So, remove the trim panel and reinstall the shield over the opening. On De Soto and Chrysler models, the water shield should cover the whole door inner panel.

While you have the trim panel removed make sure the drain holes in the bottom of the door frame are not plugged up.

**Ventilator Wings, Plymouth and Dodge Models**

Water leaks around, or through, the front and rear door ventilator wings may be due to improperly adjusted wing assemblies, resulting in distortion of the weatherstrip. If excessive clearance is found between the vent wing and the weatherstrip, or between the glass and window opening, the garnish molding should be removed and the vent wing adjusted to the opening.
Water drainage around the bottom of the front door vent wing to the interior of the door may follow the flange at the top of the inner door panel to the inner side of the door and drain to the floor.

THIS IS THE HARD WAY!

To correct this condition the garnish molding should be removed and a pad of hand-type sealer placed on top of the inner door panel flange just below the vent wing. This will direct any water at this point toward the inside of the door shell where it can drain out through the holes in the bottom of the door.
Coach Joints

There are three coach joints at the center pillar, one at the top, and one at each side of the pillar. If the weatherstrip doesn’t follow the shape of these joints and seal them, you may notice dampness on the door trim panels and the rear floor mat.

Water which enters through the vertical coach joints above the door openings will channel down inside the door garnish molding to the trim panel.

If water gets past the horizontal joint directly above the pillar, it will drain down inside the pillar and dampen the rear floor mat. All of these joints should be sealed, and then painted to make a neat job.
Rear Deck Lid Area

Before checking for leaks at the rear deck lid area, check the fit of the lid before you do any sealing. Like the doors, the rear deck lid must fit correctly in the deck opening. If it doesn’t, adjustments will have to be made at the hinges or at the lock striker. (See “BODY SERVICE” MTSC booklet for details.)

Now you are ready to make a water test of the lid area. Again someone will have to get inside the luggage compartment with a flashlight and a piece of chalk to mark spots that need sealing.

Like the windshield, we start the water test at the bottom of the lid and work slowly toward the top, on each side. Then work across the top of the lid.

If you find water leaks along the seam at the junction of the weatherstrip trough and the deck upper panel, pack sealer the full length of the underside of the seam.
When installing a new weatherstrip in the trough of the rear deck opening, coat the trough and the weatherstrip with weatherstrip cement. Allow it to become "tacky" dry. Then start the installation at one lower corner. Be mighty careful when installing the weatherstrip not to stretch it or let it bunch up at the corners. Stretching will reduce the compression qualities of the rubber. And if it bunches at the corners, the lid won't seal properly.

Floor Pan Area

Although the deck lid fits properly, don't overlook the floor pan area. Road splash could get into the body through any openings in the floor pan seams. If these joints are not properly sealed you may find some dampness on the ends of the rear seat cushions, or on the rear quarter trim panel.

Assuming that the belt molding clip bolt holes and the luggage compartment lid are properly sealed, you should check the wheel-house-to-floor-pan seams.
To quickly locate the leak at the wheelhouse seams, have someone keep a weather-eye out for leaks as you play the hose under the fenders. When you locate the openings, seal them with heavy caulking compound.

You may find that you are getting a leak into the luggage compartment from a spot just forward of the wheelhouse, between the wheelhouse and the rear quarter inner panel. This is a difficult place to reach, and means that you'll probably have to take the rear seat cushion and rear seat back out to gain access to the seam to seal it. Heavy caulking compound should be used here, too.

**THIS IS NOT ONE WORD!**

Be sure to check the seam around the four gas tank strap supports on the floor pan in the luggage compartment. The tirewell-to-floor-pan seams should also be checked. In addition, check the gas-tank filler-neck-shield-to-rear-body-panel seams. Use heavy caulking compound at these seams.
Other sources of leaks that should be checked are the seams at the junction of the floor pan and the rear body panel.

Also, it's advisable to check the seal at the gas tank filler neck housing. If there is any evidence of leakage at this point, seal the seam with caulk- ing compound.

Occasionally you may find water leakage at the taillight opening if the gasket doesn't seal evenly against the opening. You can correct this condition by removing the taillight and sealing the edges of the opening in the fender with a hand-type sealer.

On Chrysler and De Soto models, there is a horizontal seam between the quarter panel and the rear body panel just below the taillight. There is also a vertical seam at this point, directly below the taillamp. This seam is provided with a filler strip. If water is noticed entering the luggage compartment at either seam, apply heavy caulking compound on the inside to seal them.
DUST LEAKS

Dust leaks into the body are generally aggravated by the manner in which the car is driven in dusty territory. A lower air pressure condition within the car will enable the higher outside air pressures to force dust into the body through even the smallest of openings.

If the car is driven in dusty areas with the cowl ventilator lid closed and the door ventilator wings open, it creates a lower air pressure condition within the car. This allows the higher outside air pressure to force dust into the body through even the smallest of openings.

So, open the cowl ventilator lid and close the vent wings. This will build up the pressure in the car and keep the dust from getting in.

Sometimes the dust gets into the car at the seams of the floor pans. Evidence of dust may also be visible around the doors, coach joints, hinge strap openings and at seams in the luggage compartment.
You can locate the dust leak points by visual inspection. Dust deposits will be heaviest at the point of entrance and then gradually diminish at the fringe areas. Before sealing these points, clean off all traces of dust with an air hose or solvent to provide a good adhesive surface for the sealer. Then apply heavy caulking compound.

You may find that dust is entering the car at a spot between the floor pan extension and the quarter panel. That spot is not welded, and isn’t supposed to be. So don’t weld it, just be sure that it is well covered with heavy caulking compound.
SEALING OF OTHER TYPE BODIES

On other types of bodies such as club coupe and convertible, the Belvedere, Suburban and the Savoy, you may find that water leaks may occasionally be found underneath the quarter trim panels. To eliminate these leaks, remove the panels and seal all openings. On the larger openings use a cloth-type adhesive tape usually available in paint and decorating stores. Drill a quarter-inch hole in the angle at the bottom edge of the largest access opening. This keeps water from damming up behind the tape. Smaller holes can be sealed with a hand-type sealer.

When taping over the ash tray openings, cut the tape at the sides and the bottom only so that the remaining material will act as a water shield.
General information regarding the sealing points of these bodies will be found in the "BODY SEALING" manual recently issued. Specific unusual conditions are mentioned below.
BELVEDERE MODELS ONLY—A gap above the quarter window upper glass run retainer and the roof should be sealed with hand-type sealer, pressed firmly into place. Smooth off with a cloth saturated with turpentine or thinner. Touch up with paint.

CLUB COUPES—A gap between the glass run and the outer edge of the body should be sealed by compressing hand-type sealer in the opening either at the front or the rear of the quarter glass. Smooth off and touch up with paint.

When sealing the drip molding of club coupes, seal the underside of the molding above the rear quarter window and the quarter panel.
SUBURBAN AND SAVOY—Joints between the floor pan, rear wheelhouse and quarter panels should be sealed with heavy caulking compound. To gain access to this area, it is necessary to remove the rear quarter trim panels.

AND THAT SOLVES OUR SEALING PROBLEMS
USE THE NEW TECH QUESTIONNAIRE FOR SESSION NO. 68 WHEN RECORDING YOUR ANSWERS TO THESE TEN QUESTIONS

Sealer for use on outside surfaces should be the type that can be painted. 

Use water under full pressure when testing a seam for leaks. 

When making a water test of a vertical surface always start at the top and work down. 

Kerosene should be used to remove old weatherstrip cement from the metal. 

A water leak at the roof drain trough may show up on the headlining, or even in the luggage compartment. 

The cowl ventilator lid operating linkage can be adjusted to provide more compression of the weatherstrip. 

When installing a new weatherstrip at the rear deck lid opening, start at one lower corner. 

Driving in dusty areas with the cowl ventilating lid open and the door vent wings closed will help prevent dust from entering the car. 

The seam at the junction of the rear floor pan extension and the rear quarter panel is welded. 

After cementing the weatherstrip to the door, close the door immediately so the compression of the weatherstrip will help to set the cement.