

**Weld Bonding (Excluding Door Skin)**

<b>1</b>		<p><b>Host Panel Preparation</b></p> <p>Using a grade 80 abrasive belt, remove remaining weld nugget material from host panel. Prep remaining mating flanges on host panel with a coarse Scotch-Brite™ Belt to remove all adhesive, corrosion and coatings.</p>
<b>2</b>		<p><b>Mating Flange Panel Preparation</b></p> <p>Remove Ecoat from replacement panel mating flange areas using Scotch-Brite™ Belt or Clean N Strip disc.</p>
<b>3</b>		<p><b>Clean</b></p> <p>Clean host panel and replacement panel mating flange areas with a VOC compliant surface cleaner.</p>
<b>4</b>		<p><b>Dry Fit Panel</b></p> <p>Dry fit replacement panel and complete any necessary metal straightening at flanges areas.</p>
<b>5</b>		<p><b>Weld-Thru Primer</b></p> <p>Use Scotch-Brite™ Belt to prepare metal surfaces. Clean and apply weld-thru primer to all areas requiring MIG welding.</p>
<b>6</b>		<p><b>Spot Weld Surface Preparation</b></p> <p>Identify replacement spot weld sites and remove Ecoat using Scotch-Brite™ belt where spot weld tips will contact host and replacement panel. Remove panel once complete.</p>
<b>7</b>		<p><b>Pre-Assembly NVH Replacement</b></p> <p>If vehicle construction necessitates, apply NVH material or foams at original locations as required.</p>
<b>8</b>		<p><b>Apply Bonding Adhesive</b></p> <p>Apply adhesive to mating flange areas on host panel and replacement panel covering all bare metal areas. Apply additional bead of adhesive at mating flange areas.</p>
<b>9</b>		<p><b>Install Replacement Panel</b></p> <p>Install replacement panel to host panel. Clamp in place.</p>
<b>10</b>		<p><b>Spot Weld</b></p> <p>Spot weld while adhesive is uncured at prepared weld sites. Follow welder settings determined from test panel.</p>
<b>11</b>		<p><b>Adhesive Clean Up</b></p> <p>Remove clamps and tool excess adhesive squeeze-out from repair area prior to curing to seal the repair. <b>Note: Grinding to remove excess adhesive can expose bare metal, causing corrosion.</b></p>
<b>12</b>		<p><b>Post-Assembly Foam Replacement</b></p> <p>Apply foams at original locations as required.</p>

**⚠ WARNING**

Follow OEM and/or welder manufacturers' recommended procedure for making and testing welds. Before welding on a vehicle, test welds must be made to ensure proper weld quality and welding machine settings.

**Product List**

3M™ File Belt Sander, PN 28366



3M™ Cubitron™ II File Belt, grade 80+, PN 33446



Scotch-Brite™ Durable Flex Belt, CRS, PN 64475



Scotch-Brite™ Roloc™+ Clean N Strip XT Disc, PN 07470



Scotch-Brite™ Roloc™+ Clean N Strip TR Disc, PN 07466



3M™ Weld-Thru Coating II, PN 05917



3M™ NVH Dampening Material, PN 04274



3M™ Flexible Foam, 200mL, PN 08463



3M™ Panel Bonding Adhesive, 200mL, PN 08115; 200mL, PN 08116; 450mL DMS, PN 58115; 50mL, PN 38315



3M™ SMC/FRP Panel Adhesive, 200mL, PN 08219



3M™ Rigid Pillar Foam, 200mL, PN 08458



**Think About Your Health**

3M™ E-A-R™ Skull Screws™ Ear Plug, PN P1300



3M™ Half Facepiece Respirator, PN 07182



3M™ Lexa™ Protective Eyewear, PN 15200



# Protect Your Repairs

Corrosion protection is recommended for this type of repair.

Protect repairs with a self-healing, non-hardening formula

- 3M Cavity Wax Plus, PN 08852
- 3M™ Cavity Wax Plus Applicator Wand Kit, PN 08851

All OEMs recommend the application of internal anti-corrosion material during body repair, which includes cavity wax.



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Metal Working		
<b>1</b>		<p><b>Pre-Cleaning</b> Pre-wash/clean vehicle prior to disassembly (power wash undercarriage area at repair).</p>
<b>2</b>		<p><b>Surface Prep</b> Use a Scotch-Brite™ Clean N Strip disc or a Scotch-Brite™ Belt to remove paint/coating in low points of damage in preparation for dent pulling.</p>
<b>3</b>		<p><b>Dent Pulling</b> Pull low spots of dent using preferred dent pulling method and equipment.</p>
<b>4</b>		<p><b>Final Prep</b> Use a grade 80 Roloc™ grinding disc to remove weld nuggets from dent pulling operation.</p>
<b>5</b>		<p><b>Clean and Inspect</b> Clean with all purpose cleaner and degreaser. Blow off with clean, dry air. Inspect damage area to determine if additional metal straightening is required.</p>

Product List	
<p>3M™ Car Wash Soap Concentrate, 1 gallon, PN 38377</p>	
<p>3M™ All Purpose Cleaner and Degreaser Concentrate, 1 gallon, PN 38350</p>	
<p>Scotch-Brite™ Roloc™+ Clean N Strip XT Disc, PN 07470</p>	
<p>Scotch-Brite™ Roloc™+ Clean N Strip TR Disc, PN 07466</p>	
<p>3M™ File Belt Sander, PN 28366</p>	
<p>Scotch-Brite™ Durable Flex Belt, CRS, PN 64475</p>	
<p>3M™ Cubitron™ II Fibre Roloc™ Disc, grade 80+, 3 in., PN 33392</p>	

Think About Your Health	
<p>3M™ E-A-R™ Skull Screws™ Ear Plug, PN P1300</p>	
<p>3M™ Half Facepiece Respirator, PN 07182</p>	
<p>3M™ Lexa™ Protective Eyewear, PN 15200</p>	

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Steel Part Replacement		
<b>1</b>		<b>Pre-Cleaning</b> Pre-wash/clean vehicle prior to disassembly (power wash undercarriage area at repair).
<b>2</b>		<b>Panel Cutting</b> Identify OEM recommended sectioning location, scribe or mark with tape on the vehicle. Trim repair area using preferred cut-off wheel. Use grade 36 file belt in hard to reach areas to cut top panel and avoid damage to host panel.
<b>3</b>		<b>Sealer/Coating Removal</b> Use Scotch-Brite™ Clean N Strip disc to remove seam sealer and coatings from large easy to access areas. Use CRS Scotch-Brite™ Belt to remove coatings and seam sealers in hard to reach areas and along pinch weld flanges to expose spot weld locations.
<b>4</b>		<b>Spot Weld Removal</b> Using grade 36 or 60 abrasive belt, grind spot weld to remove weld from top panel. Note top panel thickness. <b>Use caution when grinding to only grind top panel and limit cutting into host/interior panel.</b> Use belt thickness as a gauge — stop grinding when back of belt is flush with exterior panel. Grade 80 belt can be used to remove welds from thinner steels.
<b>5</b>		<b>Panel Separation</b> Separate exterior panel from the host panel. <b>DO NOT force separation in areas where the weld isn't completely removed; go back to step 4 and finish weld removal before continuing.</b>
<b>6<sub>A</sub></b>		<b>Surface Preparation</b> Using a grade 80 abrasive belt, remove remaining weld nugget material from host panel.
<b>6<sub>B</sub></b>		<b>Surface Preparation</b> Clean and prep remaining mating flanges on host and replacement panel with a coarse Scotch-Brite™ Belt where necessary.
<b>7<sub>A</sub></b>		<b>MIG Plug Weld Dressing</b> Use a grade 80 abrasive belt to dress replacement MIG welds. Grind weld. <b>Use caution to avoid damage to adjacent areas.</b>
<b>7<sub>B</sub></b>		<b>Continuous Weld Dressing</b> Use a 3 in. grade 60 grinding disc to dress continuous MIG welds at sectioning joint. Grind weld. <b>Use caution to limit amount of grinding done to adjacent areas.</b>
<b>8</b>		<b>Weld Cleaning</b> Use a CRS Scotch-Brite™ Belt to clean weld site in preparation for subsequent operations.

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3M™ Car Wash Soap Concentrate, 1 gallon, PN 38377	
3M™ All Purpose Cleaner and Degreaser Concentrate, 1 gallon, PN 38350	
3M™ Green Corps™ Cut-Off Wheel, 3 in. x 1/32 in., PN 01989; 3 in. x 1/16 in., PN 01990	
Scotch-Brite™ Roloc™+ Clean N Strip XT Disc, PN 07470	
Scotch-Brite™ Roloc™+ Clean N Strip TR Disc, PN 07466	
3M™ File Belt Sander, PN 28366	
Scotch-Brite™ Durable Flex Belt, CRS, PN 64475	
3M™ Cubitron™ II File Belt, grade 36+, PN 33443; grade 60+, PN 33445; grade 80+, PN 33446	
3M™ Pistol Grip Disc Sander, PN 28547	
3M™ Cubitron™ II Fibre Roloc™ Disc, grade 60+, 3 in., PN 33391	

Think About Your Health	
3M™ E-A-R™ Skull Screws™ Ear Plug, PN P1300	
3M™ Half Facepiece Respirator, PN 07182	
3M™ Lexa™ Protective Eyewear, PN 15200	

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- 3M™ Cavity Wax Plus Applicator Wand Kit, PN 08851



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Door Skin Replacement		
<b>1</b>		<p><b>Door Frame Preparation</b></p> <p>Using a grade 80 abrasive belt, remove remaining weld nugget material from door frame. Clean and prep remaining mating flanges on door frame with a coarse Scotch-Brite™ belt.</p>
<b>2</b>		<p><b>Clean</b></p> <p>Clean door frame and replacement panel mating flange areas with a VOC compliant surface cleaner.</p>
<b>3</b>		<p><b>Replacement Skin Prep</b></p> <p>Scuff replacement skin mating flange areas using Scotch-Brite™ hand pad.</p>
<b>4</b>		<p><b>Dry Fit Panel</b></p> <p>Dry fit replacement panel and complete any necessary metal straightening at flanges areas. Remove door skin in preparation for adhesive application.</p>
<b>5</b>		<p><b>NVH Replacement</b></p> <p>Apply NVH material at original locations on intrusion beam.</p>
<b>6</b>		<p><b>Apply Bonding Adhesive</b></p> <p>Re-clean bonding surfaces with a VOC compliant surface cleaner. Apply adhesive to door frame covering all bare metal areas. Apply an additional bead of adhesive at mating flange areas to ensure proper bond line thickness.</p>
<b>7</b>		<p><b>Install Door Skin</b></p> <p>Install replacement door skin onto door frame. Crimp hem flange using hammer and dolly. Clamp as necessary. (For aluminum panels, follow OEM recommended flanging procedures.)</p>
<b>8</b>		<p><b>Clamp and Cure</b></p> <p>Follow recommended adhesive clamp and cure times. Clean any adhesive squeeze-out from hem flange area with a VOC compliant cleaner.</p>
<b>9</b>		<p><b>Seam Sealing</b></p> <p>Re-apply seam sealer to hem flange as required following general seam sealing guidelines.</p>

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3M™ Cubitron™ II File Belt, grade 80+, PN 33446	
Scotch-Brite™ Durable Flex Belt, CRS, PN 64475	
Scotch-Brite™ Durable Flex Hand Pad, MX-HP, 4-1/2 in. x 9 in., Very Fine, PN 64659	
Scotch-Brite™ 7447 PRO Hand Pads, Very Fine, 6 in. x 9 in., PN 64926	
3M™ NVH Dampening Material, PN 04274	
3M™ Urethane Seam Sealer, PN 08361	
3M™ MSP Seam Sealer, PN 08370	
3M™ Panel Bonding Adhesive, 50mL, PN 38315; 200mL, PN 08115; 200mL, PN 08116; 450mL DMS, PN 58115	
3M™ SMC/FRP Panel Adhesive, 200mL, PN 08219	
3M™ Bare-Metal Seam Sealer 200mL, PN 08310; 600mL DMS, PN 58310	
3M™ EZ Sand Multi-Purpose Flexible Adhesive, 200mL, PN 05887; 600mL DMS, PN 55887	

Think About Your Health	
3M™ E-A-R™ Skull Screws™ Ear Plug, PN P1300	
3M™ Half Facepiece Respirator, PN 07182	
3M™ Lexa™ Protective Eyewear, PN 15200	

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Panel Bonding (Excluding Door Skin)		
<b>1</b>		<p><b>Host Panel Preparation</b></p> <p>Using a grade 80 abrasive belt, remove remaining weld nugget material from host panel. Prep remaining mating flanges on host panel with a coarse Scotch-Brite™ Belt to remove all adhesive, corrosion and coatings.</p>
<b>2</b>		<p><b>Replacement Panel Preparation</b></p> <p>Remove Ecoat from replacement panel mating flange areas using Scotch-Brite™ Belt or Clean N Strip disc.</p>
<b>3</b>		<p><b>Clean</b></p> <p>Clean host panel and replacement panel mating flange areas with a VOC compliant surface cleaner.</p>
<b>4</b>		<p><b>Dry Fit Panel</b></p> <p>Dry fit replacement panel and complete any necessary metal straightening at flanges areas. Remove panel in preparation for adhesive application.</p>
<b>5</b>		<p><b>Weld-Thru Primer</b></p> <p>Use Scotch-Brite™ Belt to prepare metal surfaces. Clean and apply weld-thru primer to all areas requiring MIG welding.</p>
<b>6</b>		<p><b>Pre-Assembly NVH Replacement</b></p> <p>If vehicle construction necessitates, apply NVH material or foams at original locations as required.</p>
<b>7</b>		<p><b>Apply Bonding Adhesive</b></p> <p>Apply adhesive to mating flange areas on host panel and replacement panel, covering all bare metal areas. Apply an additional bead of adhesive at mating flange areas to ensure proper bond line thickness.</p>
<b>8</b>		<p><b>Install Replacement Panel</b></p> <p>Install replacement panel to host panel. Clamp in place and make required welds on rear vertical seams, cosmetic joints, or where otherwise recommended by the directions for use, or the OE manufacturer. Follow recommended adhesive clamp times.</p>
<b>9</b>		<p><b>Adhesive Clean Up</b></p> <p>Tool excess adhesive squeeze-out from repair area prior to curing to seal the repair. <b>Note: Grinding to remove excess adhesive can expose bare metal, causing corrosion.</b></p>
<b>10</b>		<p><b>Post-Assembly Foam Replacement</b></p> <p>Apply foams at original locations as required.</p>

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3M™ Cubitron™ II File Belt, grade 80+, PN 33446	
Scotch-Brite™ Durable Flex Belt, CRS, PN 64475	
Scotch-Brite™ Roloc™+ Clean N Strip XT Disc, PN 07470	
Scotch-Brite™ Roloc™+ Clean N Strip TR Disc, PN 07466	
3M™ Weld-Thru Coating II, PN 05917	
3M™ NVH Dampening Material, PN 04274	
3M™ Flexible Foam, 200mL, PN 08463	
3M™ Panel Bonding Adhesive, 200mL, PN 08115; 200mL, PN 08116; 450mL DMS, PN 58115; 50mL, PN 38315	
3M™ SMC/FRP Panel Adhesive, 200mL, PN 08219	
3M™ Rigid Pillar Foam, 200mL, PN 08458	

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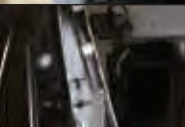

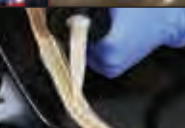


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<b>7</b>		<p><b>Pre-Assembly NVH Replacement</b></p> <p>If vehicle construction necessitates, apply NVH material or foams at original locations as required.</p>
<b>8</b>		<p><b>Apply Seam Sealer</b></p> <p>Apply urethane or MSP seam sealer to mating flange areas on host panel and replacement panel covering all bare metal areas. Apply additional bead of sealer at mating flange areas.</p>
<b>9</b>		<p><b>Install Replacement Panel</b></p> <p>Install replacement panel to host panel. Clamp in place.</p>
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3M™ NVH Dampening Material, PN 04274	
3M™ Flexible Foam, 200mL, PN 08463	
3M™ Urethane Seam Sealer, PN 08361; PN 08362	
3M™ MSP Seam Sealer, PN 08370	
3M™ Rigid Pillar Foam, 200mL, PN 08458	

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- 3M™ Cavity Wax Plus Applicator Wand Kit, PN 08851



All OEMs recommend the application of internal anti-corrosion material during body repair, which includes cavity wax.

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**IMPORTANT NOTE:** There are of course many factors and variables that can affect an individual repair, so the technician and repair facility need to evaluate each specific application and repair process, including relevant vehicle, part and OEM guidelines, and determine what is appropriate for that repair.

# Aluminum Repair Procedures

## Body Repair

### Aluminum Rivet Bonding

1		<b>Host Panel Preparation</b> Using a grade 80 abrasive belt, remove remaining rivet material from host panel. Prep remaining mating flanges on host panel with a coarse Scotch-Brite™ Durable Flex Belt.
2		<b>Mating Flange Panel Preparation</b> Remove Ecoat from replacement panel mating flange areas using a Scotch-Brite™ Belt or Clean N Strip Disc.
3		<b>Dry Fit Panel</b> Dry fit replacement panel and complete any necessary metal straightening at flanges areas.
4		<b>Clean</b> Clean host panel and replacement panel mating flange areas with a VOC compliant surface cleaner.
5		<b>Rivet Preparation</b> Identify replacement rivet sites and prepare the surface for the type of rivet recommended by the manufacturer. (For blind or solid rivets, drill all necessary holes.) Remove panel once complete.
6		<b>Pre Assembly NVH Replacement</b> If vehicle construction necessitates, apply 3M™ NVH Dampening Material or 3M™ Flexible Foam at original locations as required.
7		<b>Apply Bonding Adhesive</b> Apply adhesive to mating flange areas on host panel and replacement panel covering all bare metal areas. Apply additional bead of adhesive at mating flange area to ensure proper bond line thickness.
8		<b>Install Replacement Panel</b> Install replacement panel to host panel taking care to avoid scraping off any adhesive during installation. Clamp in place.
9		<b>Install Rivets and Welds</b> Install replacement rivets to all areas as recommended by the OE manufacturer. <b>Note: Rivets must be installed while adhesive is uncured.</b> Weld cosmetic joints/splices as necessary or recommended by the OE Manufacturer.
10		<b>Adhesive Clean Up</b> Remove clamps and tool excess adhesive squeeze out from repair area prior to curing to seal the repair. An acid brush works well to remove adhesive from between clamps. <b>Note: Grinding to remove excess cured adhesive can expose bare metal, causing corrosion.</b>
11		<b>Post Assembly Foam Replacement</b> Apply foams at original locations as required.

### Product List

3M™ File Belt Sander, PN 28366



3M™ Cubitron™ II File Belt, grade 80+, PN 33446



Scotch-Brite™ Durable Flex Belt, CRS, PN 64475



Scotch-Brite™ Roloc™+ Clean N Strip XT Disc, PN 07470



Scotch-Brite™ Roloc™+ Clean N Strip TR Disc, PN 07466



3M™ NVH Dampening Material, PN 04274



3M™ Flexible Foam, 200mL, PN 08463

3M™ Panel Bonding Adhesive, 50mL, PN 38315; 200mL, PN 08115; 200mL, PN 08116; 450mL DMS, PN 58115



3M™ SMC/FRP Panel Adhesive, 200mL, PN 08219



3M™ Rigid Pillar Foam, 200mL, PN 08458

### Think About Your Health

3M™ E-A-R™ Skull Screws™ Ear Plug, PN P1300



3M™ Half Facepiece Respirator, PN 07182



3M™ Lexa™ Protective Eyewear, PN 15200



# Aluminum Repair Procedures

## Body Repair

### Aluminum Part Replacement

1



#### Pre-Cleaning

Prewash/clean vehicle prior to disassembly (power wash undercarriage area at repair).

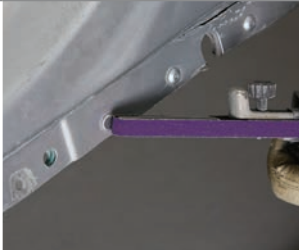
2



#### Sealer/Coating Removal

Use Scotch-Brite™ Clean N Strip Disc to remove seam sealer and coatings from large easy to access areas. Use CRS Scotch-Brite™ Belt to remove coatings and seam sealers in hard to reach areas and along pinch weld flanges to expose spot weld locations.

3



#### Rivet/Spot Weld Removal

Use grade 80 abrasive belt to remove spot welds or rivet head from top panel. Note top panel thickness. Use belt thickness as a gauge — stop grinding when back of belt is flush with exterior panel. **Follow OEM recommended procedures for removal of rivets and/or other fasteners, when they apply.**

4



#### Panel Separation

Separate exterior panel from the host panel. **DO NOT force separation in areas where the weld isn't completely removed, go back to step 3 and finish weld removal before continuing.**

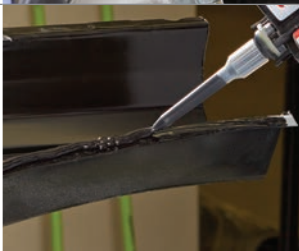
5



#### Surface Preparation

Prepare surfaces of host and replacement panel for bonding adhesive by using a Scotch-Brite™ Belt or Clean N Strip Disc.

6



#### Panel Installation

**Follow OEM recommendations where applicable.** Attachment methods may include panel bonding adhesive, self piercing rivets, huck rivets, etc.

### Product List

3M™ Car Wash Soap Concentrate, 1 gallon, PN 38377



3M™ All Purpose Cleaner and Degreaser Concentrate, 1 gallon, PN 38350



Scotch-Brite™ Roloc™ + Clean N Strip, XT Disc, PN 07470



Scotch-Brite™ Roloc™ + Clean N Strip TR Disc, PN 07466



3M™ File Belt Sander, PN 28366



Scotch-Brite™ Durable Flex Belt, CRS, PN 64475



3M™ Cubitron™ II File Belt, grade 80+, PN 33446



3M™ Panel Bonding Adhesive, 50mL, PN 38315; 200mL, PN 08115; 200mL, PN 08116; 450mL DMS, PN 58115



### Think About Your Health

3M™ E-A-R™ Skull Screws™ Ear Plug, PN P1300



3M™ Half Facepiece Respirator, PN 07182



3M™ Lexa™ Protective Eyewear, PN 15200



**Note: Use caution when working on aluminum parts. Use tools that have been cleaned properly or designated for use on aluminum to reduce potential cross contamination. Do not re-use abrasives that were previously used on steel repairs.**

## PROTECTOR TYPE

## DESCRIPTION

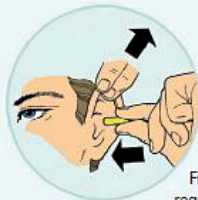
## HOW TO USE

## CARE & CLEANING

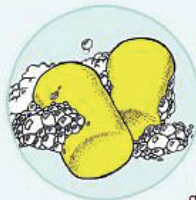
### Foam Plugs



Foam plugs, made from expandable slow-recovery foam, **provide the best combination of comfort and protection** for most users. They must be properly prepared for insertion. One size fits most. Once in the ear, foam plugs expand to provide a snug and secure custom fit. The two most common complaints about foam plugs ("not enough protection," and "they don't stay in") are almost always solved by greater practice and care in insertion.



**Slowly roll and compress** foam plugs into a very thin crease-free cylinder. While compressed, insert plug well into the ear canal. Fitting is easier if you reach around the head to pull the ear outward and upward during insertion.



Keep the plugs clean and free from material that can irritate the ear canal. They may be washed in mild liquid detergent and warm water. Squeeze excess water from the plugs and allow to fully air dry. Washing may be repeated several times. Discard plugs if they noticeably change their firmness or do not re-expand to their original size and shape.

### Premolded Plugs



Premolded plugs are made from flexible materials that are preformed to fit the ear. They are generally available with a joining cord to prevent loss. Although the version pictured at the left is a one-sized product, many premolded plugs are sold in two or more sizes and must be **individually sized for each ear**. If after a period of regular wear you've been unable to get used to your earplugs, try another size, type, or brand of hearing protector.



Reach around the back of your head and pull outward and upward on the ear while inserting the plug until you **feel it sealing**. This may seem tight at first, especially if you've never worn earplugs. Carefully twist the plug to break the seal for a slow, safe removal.



Premolded plugs will normally last several months or more depending upon the type, and environmental factors. They should be replaced if they shrink or swell, harden or soften, tear, crack, or become permanently deformed. Wash them in warm soapy water and rinse well. When dry, store them in a carrying case.

View [other air sanders, polishers, buffers](#) made by **3M** on our website.