TOYOTA
Technical Service Bulletin

Prevention and Repair of Acid Rain Damage

Service Category Vehicle Exterior

Section Exterior Panels/Trim

Market USA and Mexico

Toyota Supports ASE Certification

Applicability

YEAR(S)	MODEL(S)	ADDITIONAL INFORMATION
2025	4Runner HV, Crown Signia, RAV4 PHV	
1992 - 2025	4Runner, 86, Avalon, Avalon HV, Avanza, bZ4X, C-HR, Camry, Camry HV, Celica, Corolla, Corolla BR-Prod, Corolla Cross, Corolla Cross HV, Corolla Hatchback, Corolla HV, Cressida, Crown, Echo, FJ Cruiser, GR Corolla, Grand Highlander, Grand Highlander HV, Hiace, Highlander, Highlander HV, Hilux, iA, iM, Land Cruiser, Matrix, Mirai, MR2, Prius, Prius C, Prius PHV, Prius Prime, Prius V, Raize, RAV4, RAV4 EV, RAV4 HV, RAV4 Prime, Sequoia, Sequoia HV, Sienna, Sienna HV, Solara, Supra, Tacoma, Tacoma HV, Tundra, Tundra HV, Venza, Venza HV, Yaris, Yaris R, Yaris SD MEX-Prod, Yaris SD THAI-Prod, Yaris THAI-Prod	

REVISION NOTICE

December 06, 2024 Rev2:

- **Applicability has been updated to include 2025 model year RAV4 PHV vehicles.**

July 12, 2024 Rev1:

- **Applicability has been updated to include 2025 model year 4Runner Hybrid and Crown Signia vehicles.**

Any previous printed versions of this bulletin should be discarded.

Prevention and Repair of Acid Rain Damage

Applicability (continued)

SUPERSESSION NOTICE

The information contained in this bulletin supersedes Service Bulletin No. B091-020.

- **The entire bulletin has been updated.**

Service Bulletin No. B091-020 is obsolete and any printed versions should be discarded.

Introduction

Acid rain results from rainwater or other airborne moisture that become acidic due to industrial chemical impurities in the atmosphere. If these acidic compounds settle on an exposed vehicle, especially the horizontal areas such as the hood, roof, and decklid, significant damage to the painted surfaces can occur. Acid rain damage can typically be identified on vehicles by the presence of stains on the paint surface that resemble hard water spots. Unlike water spots however, acid rain damage cannot be removed by regular washing procedures. Also, because acid rain can etch and soften the paint, normal buffing or polishing repair procedures should not be attempted. This can cause further damage and result in visible depressions in the paint surface.

The following are the three major categories of acid rain damage:

- **Minor** damage: requires only buffing to repair.
- **Moderate** damage: usually requires neutralizing, color sanding, and buffing.
- **Severe** damage: extending beyond 1/2 mil of clearcoat on a pearl, metallic, or solid color, requires neutralization, sanding, and repainting.

NOTICE

The following process can be followed but with matte paint finish safe products ONLY. Using materials listed in this document can lead to paint damage to matte paints.

In cases where acid rain damage is minor, neutralization and buffing with a liquid-type paint finessing product may provide an adequate repair. Only specially formulated products outlined in this bulletin should be used for that purpose.

Prevention and Repair of Acid Rain Damage

Introduction (continued)

Unfortunately, other than minor damage, there is no simple method of determining the actual extent (depth) of acid penetration other than color sanding a representative affected area until there is no visible etching or depressions, followed by measuring the amount of paint removed with either a magnetic or digital-type film thickness gauge. The procedures in this bulletin are intended for use by qualified body/paint technicians and should not be attempted by inexperienced personnel.

It is the dealer's responsibility to protect and maintain the quality of the vehicle's paint finish after receipt at the dealership prior to the first sale. Perform frequent vehicle washing, as often as daily, during high heat and humidity periods to minimize the potential for paint damage due to acid rain exposure. This is especially important in geographical areas known for high frequency and concentration of acid rain and industrial fallout. Follow the Repair Procedure in this bulletin to address minor, moderate, and severe acid rain damage.

Warranty Information

OP CODE	DESCRIPTION	TIME	OFP	T1	T2
N/A	Not Applicable to Warranty	–	–	–	–

Required Tools & Equipment

REQUIRED TOOLS & MATERIAL	QUANTITY
Liquid Automotive Washing Soap, Baking Soda, Water Pail	As Needed
3M™ Finesse-It™ II Machine Polish (or Equivalent)	1
3M™ Perfect-It™ System (or Equivalent)	1
3M™ Finesse-It™ II Wool Pad (or Equivalent)	1
3M™ Perfect-It™ Foam Pad (or Equivalent)	1
#1500 or #2000 Grit Wet-Dry Sandpaper Pre-Soaked in Clean Water	As Needed
Variable Speed Rotary Buffer, Speed Range 1200 – 1800 rpm	As Needed
Elcometer® 211 Mechanical Coating Thickness Gauge, Magnetic (or Equivalent)	1
Fischer® Deltascope DMP30, Digital (or Equivalent)	1

Prevention and Repair of Acid Rain Damage

Repair Procedures

Prevention and Repair of Acid Rain Damage

Repair Procedure

Repair Procedure for Minor Damage

1. Move the vehicle out of direct sunlight to allow paint surfaces to cool.

   NOTE

   Dark painted colors become warmer in direct sunlight and require a longer period to cool.

2. When the vehicle temperature surfaces are cool, wash the vehicle surface with automotive liquid soap and water.

3. Neutralize any remaining acid with a solution containing one tablespoon of baking soda per quart of water, applying the solution with a commercial grade plastic garden sprayer.

4. Rinse the vehicle thoroughly with fresh water.

5. Take accurate measurements of paint film thickness in several locations on an affected body panel.

6. Record the measurements on a short piece of masking tape and attach it to the panel area adjacent to the measurement area.

   NOTICE

   To minimize the possibility of burning through or hazing paint surfaces, the following buffing procedures should be performed only by personnel experienced in rotary power buffing.

7. Buff the affected areas, using the least aggressive pads and liquid compounds.
   A. Periodically measure the paint film thickness during the buffing process.
   B. Buffing should provide the desired repair results within a short period of time (approximately 30 minutes per vehicle)

8. Very lightly affected areas may alternatively be buffed using 3M™ Perfect-It™ System (or equivalent).

Prevention and Repair of Acid Rain Damage

Repair Procedure (continued)

Repair Procedure for Moderate Damage

1. Move vehicle out of direct sunlight and allow paint surfaces to cool if necessary.

   NOTE

   Dark painted colors become warmer in direct sunlight and require a longer period to cool.

2. When the vehicle temperature surfaces are cool, wash the vehicle surface with automotive liquid soap and water.

3. Neutralize any remaining acid with a solution containing one tablespoon of baking soda per quart of water, applying the solution with a commercial grade plastic garden sprayer.

4. Rinse the vehicle thoroughly with fresh water.

5. Mix liquid automotive washing soap in a pail of clean water (follow manufacturers mixing instructions) and immerse recommended wet-dry sandpaper.

   NOTE

   Allow the sandpaper to soak for several minutes.

6. Using a #1500 or #2000 grit wet-dry sandpaper with a soft foam rubber sanding pad, carefully color sand affected paint areas.
   A. To maintain the cleanest possible working surface and prevent clogging of paper, frequently apply clean water from a hand-held spray pump bottle.
   B. During this process, wipe down sanded areas often to determine if spots have been removed.

   NOTE

   - When performing this procedure, be sure to measure paint film thickness before, during (continuously), and AFTER sanding with a film thickness gauge to prevent excess paint removal.
   - The ideal instruments to monitor paint film thickness during the color sanding operation are magnetic or digital thickness gauges.
   - Consult your local paint or tool jobber for pricing and availability. In all color sanding situations remove no more than a total of 1/2 mil of the clearcoat on pearl, metallic, and solid colors.
   - ALWAYS sand in one direction and never in a circular pattern.

Prevention and Repair of Acid Rain Damage

Repair Procedure (continued)

Repair Procedure for Moderate Damage (continued)

7. Install one of the recommended buffing pads, setting the buffer speed to 1200 – 1800 rpm for Meguiar's foam pads (or equivalent) or 1500 –1800 rpm for 3M™ wool pads (or equivalent).

   NOTE

   Regardless of manufacturer, NEVER use different buffing/polishing compounds on the same pad.

8. Based on manufacturer guidelines, apply recommended buffing/polishing material sparingly to about a 2 sq. ft. (0.186 sq. meter) section of the affected panel and wipe buffer pad once across the area.

   Begin and continue buffing area until haze of material is almost gone.

   NOTICE

   Use only LIGHT pressure on the buffer to prevent burn-through damage to the paint surface.

9. Carefully inspect the buffed paint area for remaining acid spots. If any are found, further sanding and polishing is necessary.

10. Continue to buff surface and if necessary, re-sand the remaining affected areas. Be sure to continuously measure the paint film thickness during sanding to prevent excess film removal. As stated previously, remove no more than 1/2 mil on clear coats and 1 mil on solid colors.

11. Following completion of color sanding procedure, carry out final buffing/polishing procedure to achieve a hi-gloss finish.

Prevention and Repair of Acid Rain Damage

Repair Procedure (continued)

Repair Procedure for Severe Damage

If it has been determined that the acid damage has penetrated more than 1/2 mil on a metallic, pearl color or solid color after color sanding, the following guidelines for sanding and repainting should be followed.

1. Wash vehicle surface using mild automotive soap and water, and rinse with deionized water until ALL residue is removed. Clean the affected areas with an appropriate silicone/wax remover (DuPont 3939, PPG DX330/DX380, or equivalent).

2. Using a dual action sander, completely sand the affected areas to eliminate any depressions in the paint surface.

   NOTE

   While it is recommended to sand down into the primer coat, the underlying electro deposition coat should NOT be exposed, since it provides essential corrosion protection.

3. Finish sanding the surface with wet-dry sandpaper using the grit number as recommended by paint manufacturers.

4. Wash vehicle surface using mild automotive soap and water.

5. Rinse with deionized water until ALL residue is removed from the surface.

6. Clean sanded areas with an appropriate silicone/wax remover (DuPont 3939, PPG DX330/DX380, or equivalent).

   NOTE

   While it is recommended to sand down into the primer coat, the underlying electro deposition coat should NOT be exposed, since it provides essential corrosion protection.

7. Apply a quality urethane enamel color coat or base coat/clear coat as required for maximum repair durability (lacquer-type paint is NOT recommended for this application). Follow the paint manufacturer’s recommendations for detailed application of paint as required.

   NOTE

   Check with state and local ordinances regarding the use and disposal of all chemicals.