



TECHNICAL SERVICE BULLETIN

REF.: BODY
NO.: BO91-020
DATE: SEPTEMBER 6, 1991
MODEL: ALL MODELS

PREVENTION AND REPAIR OF ACID RAIN DAMAGE

Page 1 of 6

Information contained in this TSB supercedes Volume 10, Body No. 043 (Revised)

CONDITION & CAUSE:

“Acid Rain” is the result of rainwater or other airborne moisture made acidic by industrial chemical impurities in the atmosphere. If these resulting acidic compounds settle and remain in contact on an exposed vehicle, especially the horizontal areas on the hood, roof, and decklid, significant damage to the painted surfaces can occur.

PREVENTION OF DAMAGE:

While the quality and durability of paint on Toyota vehicles is continuously being improved, it remains the responsibility of the dealer to protect and maintain the quality of the vehicle’s paint finish after receipt at the dealership. Frequent vehicle washing as often as daily during high heat and humidity periods should be performed 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.

INSPECTION & REPAIR:

Acid rain damage can typically be identified on vehicles by the presence of visible stains on the paint surface which resemble hard water spots. Unlike water spots however, acid rain damage cannot be removed by washing procedures.

Also, because acid rain can “etch” and soften the paint, normal buffing or polishing repair procedures should not be attempted as this can result in visible depressions in the paint surface. In those cases where acid rain damage is **Minor**, neutralization and buffing with a liquid-type paint “finishing” product may provide an adequate repair. Only specially formulated products such as described in this publication should be used for that purpose.

PREVENTION AND REPAIR OF ACID RAIN DAMAGE (CONT'D)

BO91-020 2/6

Moderate damage will usually require neutralizing, color-sanding, as well as buffing. **Severe** damage extending to a depth greater than 1/2 mil of the clearcoat on a pearl or metallic color, or 1 mil on a solid color, will require neutralization, sanding and repainting.

Unfortunately, for other than **Minor** acid rain damage (requiring only a buffing-type repair procedure), 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 and then measuring the amount of paint removed with either a magnetic or digital-type Film Thickness Gauge.

The following repair instructions are intended for use by qualified body/paint technicians and should not be attempted by inexperienced personnel.

REPAIR PROCEDURE FOR MINOR ACID RAIN DAMAGE

LIGHT BUFFING ONLY

Materials and supplies necessary for this procedure:

- Liquid automotive washing soap, baking soda, water pail
- Recommended buffing/polishing pads:

3M Products

"Finesse-It II" System

Wool Pad (yellow, less aggressive) P/N 05705

Wool Pad (white, more aggressive) P/N 05700

"Perfect-It" System

Foam Pad (Dk. Grey, least aggressive) P/N 05725 (Requires 05717 B/U Pad)

-OR-

Meguiar's Products

"Hi-Tech Finesse" System

Foam Pad (yellow, less aggressive) P/N W-1000

Foam Pad (pink, more aggressive) P/N W-7000

Foam Pad (white, least aggressive – final polishing only) P/N W-9000

- Recommended Buffing/Polishing Compounds:

3M Products

"Finesse-It II"

Finishing Material P/N 05928

"Perfect-It"

Foam Pad Glaze P/N 05995 (Light Color Paints)

Foam Pad Glaze P/N 05996 (Dark Color Paints)

Meguiar's Products

"Hi-Tech Finesse" System

No. 1 Machine Cleaner (more aggressive) P/N M-0132

No. 2 Hi-Tech Cleaner (less aggressive) P/N M-0232

No. 3 Machine Glaze (more aggressive) P/N M-0332

No. 9 Hi-Tech Swirl Remover (less aggressive) P/N M-0932

REPAIR STEPS:

1. Move vehicle out of direct sunlight and allow paint surfaces to cool if necessary. Dark painted colors become warmer in direct sunlight and require a longer period to cool off.
2. With vehicle surfaces cool, wash with automotive liquid soap & water.
3. Neutralize any remaining acid with solution containing 1 tsp. of baking soda per quart of water (solution may be evenly applied using a commercial grade plastic garden sprayer).
4. Take accurate measurements of paint film thickness in several locations on an affected body panel (decklid is recommended due to consistent surface flatness). Record measurement on a short piece of masking tape attached to panel area adjacent to measurement area prior to buffing.

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

5. Buff the affected areas. Regardless of system preference, it is essential that all repairs begin by using the least aggressive pads and liquid compounds. Remember to periodically measure the paint film thickness during the buffing process. Either system should provide desired repair results (on **Minor** acid rain damaged vehicles) within a short period of time (approximately 30 minutes per vehicle).
- Using 3M's "Finesse-It" system, begin with a "yellow" wool buffing pad (less aggressive than the 3M's "white" wool pad which is also available).
 - Meguiar's equivalent "Finesse" system utilizes a combination of #2 & #9 liquid compounds with yellow (less aggressive) or pink (more aggressive) buffing/polishing pads and white pad (least aggressive for final polishing).

Note: Meguiar's #1 and #3 liquid compound system is more aggressive and can be subsequently used with care if increased abrasive action is desired.

- Very lightly affected areas may alternatively be buffed using 3M's recently introduced "Perfect-It" system which utilizes a single buffing/polishing pad similar to Meguiar's white foam pad, in conjunction with appropriate designated compounds.

REPAIR PROCEDURE FOR MODERATE ACID RAIN DAMAGE

COLOR SANDING & BUFFING

Materials and supplies necessary for this procedure:

- #1500 or #2000 grit wet-dry sandpaper which has been pre-soaked in clean water.
- Soft foam rubber hand-sanding pad
 - 3M P/N 05530; *Meguiar's* P/N E7200 or equivalent.
- Liquid automotive washing soap, water pail, hand-held spray pump bottle.
- Variable speed rotary buffer, speed range 1200 – 1800 rpm (dual-action buffers may not adequately remove sanding scratches).
- Buffing system of choice (refer to materials listed under repair of **Minor** damage).

REPAIR STEPS:

1. Move vehicle out of direct sunlight and allow paint surfaces to cool if necessary. Dark painted colors become warmer in direct sunlight and require a longer period to cool off.
2. With vehicle surfaces cool, wash with soap and water and then neutralize any remaining acid with a baking soda and water solution (one tablespoon baking soda to one quart of water), followed with a thorough fresh water rinse.
3. Mixing liquid automotive washing soap in a pail of clean water (follow manufacturers mixing instructions) and immerse recommended wet-dry sandpaper. Allow sandpaper to soak for several minutes.
4. Using a #1500 or #2000 grit wet-dry sandpaper with a soft foam rubber sanding pad, carefully color sand affected paint areas. To maintain the cleanest possible working surface and prevent clogging of paper, frequently apply clean water from a hand-held spray pump bottle. 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. Film thickness gauges like the ELCOMETER 211 (magnetic) or equivalent, ELCOMETER 300 or Fischer Deltascope MP2 (both digital) or equivalent, are ideal instruments to monitor paint film thickness during the color sanding operation. 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 on clear coats, or 1 mil on solid colors. Also, be certain to always sand in one direction and never in a circular pattern.***

REPAIR STEPS (CONT'D):

5. After affected areas have been sanded, install one of the recommended buffing pads and set buffer speed in the range of 1200 – 1800 rpm for a *Meguiar's* foam pad; 1500 –1800 rpm for *3M's* wool pads.

Note:

- When *Meguiar's #2 Hi-Tech Cleaner* is used, the *#9 Hi-Tech Swirl Remover* should also be used to produce a final finish.
 - If *Meguiar's* more aggressive *#1 Machine Cleaner* is used, the *#3 Machine Glaze* should be used to produce a final finish.
 - **Regardless of manufacturer, never use different buffing/polishing compounds on the same pad.**
6. Based on manufacturer guidelines, apply recommended buffing/polishing material sparingly to about a 2 sq. ft. 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.

CAUTION: Use only light pressure on the buffer to prevent burn-through damage to the paint surface.

7. Carefully inspect the buffed paint area for remaining acid spots. If any are found, further sanding and polishing is necessary.
8. 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, 1 mil on solid colors.
9. Following completion of color sanding procedure, carry out final buffing/polishing procedure to achieve a hi-gloss finish.

REPAIR PROCEDURE FOR SEVER ACID RAIN DAMAGE

SANDING AND REPAINTING:

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

1. Wash vehicle surface using mild automotive soap & 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*).

REPAIR STEPS (CONT'D):

2. Using a dual action (DA) sander, completely sand affected areas as required to eliminate any depressions in paint surface.

Note: While it is recommended to sand down into the primer coat, the underlying Electro-Deposition (ED) coat should not be exposed as it provides essential corrosion protection.

3. Finish sanding the surface with wet-dry sandpaper using grit # as recommended by paint manufacturers.
4. Wash vehicle surface using mild automotive soap and water. Rinse with Deionized Water until all residue is removed from the surface. Clean sanded areas with an appropriate silicone/wax remover (*DuPont 3939, PPG DX330/DX380* or equivalent*).
5. 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.

* **Check with State and Local ordinances regarding use and disposal of all chemicals.**