Identification and Correction

Paint Defects
Overview

- “Paint & Body Defects” is one of the 3 most consistent indicators when inspecting for ‘prior repairs’ that could ultimately indicate structural repairs, existing damage or alterations.
- Use this guide to better understand the various paint and body defects.
Correcting Paint Conditions

- Corrective processes not involving refinishing operations must maintain proper UV protection
  - Check film thickness before starting
  - Check film thickness after correction
  - If more than 0.3-0.5* mil of clearcoat is removed the affected area should be re-painted
    - *Varies by OEM paint process
Paint Condition List

- Acid Rain
- Industrial Fallout
- Water Spotting
- Scratches
- Environmental Contamination
- Polishing marks
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- Clouding / Mottling
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- Sanding Marks - Topcoats
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- Pinholes - Topcoats
- Pinholes - Substrates
- Solvent Pop
- Runs
- Peroxide Staining
Acid Rain

○ Cause
  ○ Rain containing airborne contaminants from manufacturing processes, chemical industries, and power stations
  ○ Contaminants may become acidic or alkaline when combined with water (sulfur dioxide - acidic, cement dust - alkaline)

○ Prevention
  ○ Avoid heavily contaminated atmospheres
  ○ Wash surface immediately after exposure to remove and neutralize the contaminants

○ Remedy
  ○ Neutralize the surface with mild detergent and water, thoroughly rinse
  ○ Sand, and polish
  ○ Sand, and repaint
Industrial Fallout

- **Cause**
  - Iron and steel particles from heavy industry, foundries, railroads

- **Prevention**
  - Thoroughly wash vehicle immediately after exposure
  - Protect vehicle from exposure to such environments, cover if possible

- **Remedy**
  - Clean surface with a suitable solution to dissolve the particles, neutralize, then polish
  - Remove particles, sand, and repaint
Water Spotting

- **Cause**
  - Droplets of water on paint which is not sufficiently cured due to:
    - Excessive film thickness, drying time too short
    - Failure of cross linking due to moisture contamination
    - Unsuitable thinner
- **Prevention**
  - Follow technical recommendations
  - Ensure lids are tightly replaced after using hardeners
- **Remedy**
  - Remove marks by polishing
  - Sand, isolate and repaint
Scratches

- **Cause**
  - Frequent use of brush or soft cloth automated car wash facilities
  - Wiping a dry surface instead of rinsing with water
- **Prevention**
  - Maintain and protect the finish with quality, non-silicone polish or wax
  - Rinse vehicle, never dry wipe the surface
- **Remedy**
  - Polish
  - For severe scratches, sand and repaint
Environmental Contamination

- **Cause**
  - Bird droppings, acid rain, other environmental influences

- **Prevention**
  - Immediately clean and neutralize the contamination with mild detergent and water before etching starts

- **Remedy**
  - Neutralize, sand, and polish
  - Neutralize, sand, and repaint
Polishing Marks

- **Cause**
  - Top coat not through-dried
  - Sandpaper too coarse
  - Unsuitable polish
  - Polishing through layers on edges

- **Prevention**
  - Thoroughly dry top coat, if necessary re-bake
  - Use suitable polish and equipment
  - Use correct sandpaper
  - Use polish, free of ammonia

- **Remedy**
  - Thoroughly dry topcoat and re-polish
  - Thoroughly dry topcoat, sand and repaint
Stonechip

- **Cause**
  - High use of gravel roads
  - Frequent highway use
  - Following vehicles too close
  - Improper film build

- **Prevention**
  - Careful driving habits
  - Proper film builds
  - Anti-chipping paint systems

- **Remedy**
  - Sand and repaint with proper systems
Corrosion

- **Cause**
  - Paint removed by chipping or scratching exposing bare metal
  - Inadequate pre-treatment of metal
  - Rust not removed before application of coatings
  - Metal surface contaminated before application of coatings

- **Prevention**
  - Remove all rust before applying coatings
  - Properly pre-treat metal substrates
  - Use correct coating materials

- **Remedy**
  - Thoroughly remove all rust
  - Sand and repaint with proper systems
Orange Peel / Texture

- **Cause**
  - Incorrect spray pressure, gun setup, viscosity, technique, or application temperature
  - Wrong combination of solvents or non-system solvents
  - Substrate not sanded thoroughly

- **Prevention**
  - Follow recommendations on technical data sheets
  - Prepare and sand substrate correctly
  - Use recommended gun set up
  - Always use system thinners

- **Remedy**
  - Sand and polish
  - Sand and repaint
Dirt Inclusions

- **Cause**
  - Various types of contamination typically introduced during the application or drying process

- **Prevention**
  - Proper vehicle/technician cleaning procedures, booth/spray equipment maintenance, material preparation, masking, etc.

- **Remedy**
  - Sand, and polish
  - Sand, and repaint
Adhesion Problems with Plastics

- **Cause**
  - Insufficient cleaning, drying (tempering)
  - Incorrect primer has been used

- **Prevention**
  - Clean and degrease properly
  - Temper parts before priming
  - Ensure proper solvents evaporation
  - Use suitable adhesion primer

- **Remedy**
  - Remove damaged finish and repaint
  - Steam clean, sand, clean and repaint
Adhesion Problems - Clearcoat

- **Cause**
  - Excessive coat thickness of basecoat
  - Intermediate and final flash-off times of the basecoat too short
  - Wrong mixing ratio for clearcoat and hardener

- **Prevention**
  - Allow proper flash off time
  - Apply proper film thickness
  - Mix clearcoat correctly

- **Remedy**
  - Sand and repaint
Clouding / Mottling

- **Cause**
  - Incorrect spray viscosity, technique, flash off times, spray temperature
  - Defective spray gun setup, incorrect spray pressure
  - Unsuitable thinners

- **Prevention**
  - Use correct viscosity and spray gun setup
  - Keep spray gun parallel to object
  - Use correct thinner with sufficient flash off time
  - Observe recommendations in technical data sheets

- **Remedy**
  - Use droplet method before spraying clear
  - After clear has thoroughly dried, sand surface and repaint
Contamination (Fish-eyes / Silicone)

- **Cause**
  - Oil, wax, grease or silicone contamination
  - Contaminated air supply
  - Use of polishes or aerosol sprays containing silicone (e.g. interior cleaners or dressings)
  - Insufficient cleaning

- **Prevention**
  - Regular maintenance of air supply
  - Thoroughly clean with a suitable wax and grease remover

- **Remedy**
  - Apply light coats of basecoat until defect is covered
  - Sand panel, clean / isolate, and repaint
  - If required, use fish-eye eliminator
Peeling Problems

- **Cause**
  - Substrate not sufficiently prepared (rust, grease, moisture, poor sanding or cleaning)
  - Use of incompatible material or an incompatible substrate
  - Flash off and drying times too short
  - Condensation of substrate due to temperature changes

- **Prevention**
  - Follow application recommendations
  - Degrease and prepare substrate carefully
  - Keep to specified drying times
  - Use compatible product systems

- **Remedy**
  - Sand damaged area and repaint
Sanding Marks - Topcoats

- **Cause**
  - Sanding paper too coarse
  - Soft, solvent reversible substrates
    - e.g. acrylic lacquer (T.P.A.)
  - Insufficient film build

- **Prevention**
  - Solvent test to identify soft, reversible substrates (T.P.A.)
  - Isolate soft finishes
  - Use recommended sandpaper
  - Apply proper film thickness

- **Remedy**
  - Thoroughly dry affected area
  - Sand, isolate, and repaint
Sanding Marks - Substrate Preparation

- **Cause**
  - Insufficiently sanded polyester stopper
  - Insufficient isolation of the polyester before topcoat application

- **Prevention**
  - Use suitable sanding paper
  - Isolate polyester areas with 2K filler

- **Remedy**
  - Thoroughly sand damaged area and repaint
Loss of Gloss / Matting

- **Cause**
  - Film thickness/air humidity
  - Solvent-sensitive substrate
  - Incorrect mixing or contaminated hardener, or unsuitable thinner
  - Insufficient airflow in oven or interrupted baking

- **Prevention**
  - Follow application recommendations on technical data sheets
  - Close hardener cans firmly after use
  - Ensure sufficient airflow in oven and do not interrupt baking cycle

- **Remedy**
  - Sand and polish
  - Sand and repaint
Hiding Power (Coverage, Opacity)

- **Cause**
  - Substrate not uniform (effect finishes)
  - Color coat film build too low
- **Prevention**
  - Spray a uniform substrate
  - Spray sufficient color to obtain opacity
- **Remedy**
  - Sand and repaint
Color Off-shade

 Cause
   - Weathered surface
   - Incorrect spraying technique
     - too wet or dry, poor opacity
   - Incorrect spray gun setup or PSI
   - Incorrect mixing
   - Variations of the OEM finish (multiple color shades)

 Prevention
   - Check color for variations
   - Mix color correctly
   - Spray a test panel for verification
   - Apply with recommended procedures
   - Use blending techniques

 Remedy
   - Polish adjoining panel for color verification
   - Blend the color
   - Tint the color, sand, repaint
Clearcoat Yellowing

- **Cause**
  - Wrong or contaminated hardener
  - Insufficient clearcoat film thickness

- **Prevention**
  - Ensure lids are tightly replaced after using hardeners
  - Follow technical recommendations
  - Use system hardeners

- **Remedy**
  - Sand and repaint
Moisture Blisters

- **Cause**
  - Residue of sanding water in corners, edges, crevices, or below decorative strips
  - Contaminated air supply
  - Insufficient isolation of polyesters
  - Ambient humidity too high

- **Prevention**
  - Always remove exterior trim
  - Blow and dry carefully
  - Check air supply equipment regularly

- **Remedy**
  - Remove contaminated finish and repaint
Adhesion Problems - Polyester

- **Cause**
  - Substrate not carefully prepared
  - Polyester material unsuitable for galvanized substrate
  - Too high surface temperature while forced drying
  - Undercured - too much or too little hardener

- **Prevention**
  - Clean and sand thoroughly
  - Follow the manufacturer's instructions for forced drying
  - Use proper mixing ratio
  - Ensure the hardener is thoroughly mixed

- **Remedy**
  - Sand the damaged repair-area well
  - Repair and repaint
Edge Mapping Due to Solvent Penetration

**Cause**
- Insufficient isolation where topcoat was sanded through to substrate
- Isolated with unsuitable filler
- Filler incorrectly applied
- Insufficient drying of substrate

**Prevention**
- Solvent Test to identify soft substrates
- Apply only several thin coats of 2K Primer Filler
- Avoid sanding through to soft substrate

**Remedy**
- Thoroughly dry affected area
- Sand, isolate, and repaint
Wrinkling, Rippling, Lifting

- **Cause**
  - Finish not fully cured (synthetic resin finishes)
  - Unsuitable substrate (aerosol paints, acrylic lacquer or nitrocellulose)
  - Excessive film build

- **Prevention**
  - Solvent test
  - Remove or isolate solvent-sensitive substrates
  - Ensure sufficient drying
  - Avoid excessive film thickness

- **Remedy**
  - Remove finish in affected area and repaint
Shrinkage / Edge Mapping

- **Cause**
  - Substrate not fully cured
  - Subsequent coats applied too soon to preparatory materials
  - Excessive film thickness
  - Sanding paper too coarse

- **Prevention**
  - Solvent test to identify soft substrates
  - Do not apply polyester products directly to soft substrates
  - Isolate with 2K filler, applying thin coats with sufficient inter-coat flash off
  - Dry prep materials thoroughly
  - Use proper grit sandpaper
  - Follow recommendations

- **Remedy**
  - Thoroughly dry affected area
  - Sand, isolate if necessary, and repaint
Striping / Banding

- **Cause**
  - Spray technique or PSI, material viscosity, or spray gun setup
  - Flash off time too short
  - Unsuitable thinner for application conditions

- **Prevention**
  - Follow application recommendations
  - Choose suitable spray gun setup
  - Keep spray gun parallel to object
  - Follow manufacturer's product system

- **Remedy**
  - Ensure even application
  - Keep spray gun in good working order
  - Thoroughly dry, sand, and repaint
Pinholes

- **Cause**
  - Fiberglass bodies
  - Insufficient mixing of polyesters
  - Solvent popping that has been sanded to open the top
  - Insufficient isolation of polyesters

- **Prevention**
  - Thoroughly mix polyesters
  - Do not sand solvent pop or completely remove defect before repainting
  - Isolate polyesters correctly
  - Use a sprayable polyester filler

- **Remedy**
  - Remove damaged finish
  - Sand and apply a sprayable polyester filler, prime, and repaint
Pinholes - Substrate Preparation

- **Cause**
  - Substrate insufficiently dried
  - Polyester material not sufficiently isolated
  - Pores not deeply sanded

- **Prevention**
  - Allow prep materials to dry thoroughly
  - Thoroughly sand pinholes and repaint
  - Thoroughly sand, re-apply polyester and repaint

- **Remedy**
  - Thoroughly dry affected area
  - Sand, isolate, and repaint
Solvent Pop

- **Cause**
  - Solvent or air trapped in film escapes during drying leaving pop marks
  - Caused by incorrect spray viscosity, spray pressure, flash off time, or improper drying
  - Incorrect choice of hardeners and thinners
  - Over application of material resulting in excessive film build
  - Incorrect drying of primer / fillers

- **Prevention**
  - Apply film at proper thickness
  - Allow proper flash off time
  - Follow technical recommendations

- **Remedy**
  - After drying, repaint without sanding (within 24 hours) or scuff with a gray scuff pad
  - After drying and sanding apply a sprayable polyester, or remove damaged layers; then sand, prime and repaint
Runs

- **Cause**
  - Incorrect spray viscosity, flash off time, technique, or film thickness
  - Defective spray gun, incorrect gun setup, or spray pressure
  - Temperature of paint, substrate or room too low
  - Incorrect choice of hardener and/or thinner

- **Prevention**
  - Follow technical recommendations
  - Ensure that the spray gun is in good working order
  - Warm object and material up to room temperature of 20°C / 68°F
  - Use correct combination of hardener and thinner

- **Remedy**
  - Sand and polish
  - Sand and repaint
Peroxide Staining from Hardener in Polyester Body Filler

- **Cause**
  - Incorrect addition of hardener
  - Insufficient mixing

- **Prevention**
  - Use recommended amount of hardener
  - Check quantity of hardener, mix by weight or use a dispensing machine
  - Mix thoroughly

- **Remedy**
  - Remove polyester and re-do repair or
  - Sand, isolate with a sprayable polyester, prime and repaint
Sources

- DuPont Refinishing Systems
- Matt Arias, Director of Manheim Arbitration