
BODY

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60.1 Paint Coating

1 Warning and Precautions

1.1 Warning

Be sure to observe the following instructions before mixing paint and painting, to prevent property damage, personal injury or even death.

- (1) In the process of mixing and spraying paint, diffuse solvents can cause serious respiratory disease. It's necessary to operate in strict accordance with the manufacturers' instruction manual of paint, device and safety device. When performing the operation of this procedure, wear special labor protection appliances such as gas mask, anti-static clothing, protective glasses and gloves etc. to prevent injury.

1.2 Precautions

Never mix paint systems of different manufacturers or substitute products before mixing paint and painting. When incompatible products are mixed, the following phenomena will occur:

- (1) Primer peels off.
- (2) Adhesion between coatings is poor.
- (3) Curing is not completely.
- (4) Gloss is reduced.
- (5) Color accuracy is poor.
- (6) Coating is damaged (dent, bubble, wrinkle without gloss).

1.3 Precautions during Finish Varnish Maintenance and Repair

- (1) Avoid washing vehicle in direct sunlight.
- (2) Avoid using strong soap and chemical detergent.
- (3) Use the brushless automatic car-cleaning equipment.
- (4) Avoid using products containing acid and alkali.
- (5) Do not use a brush or broom to remove snow or ice.
- (6) After cleaning it completely, wipe the remaining rinse water immediately and forbid to make it dry on the surface. It is recommended to dry it with soft chamois leather.
- (7) When the defect on the surface can be eliminated by polishing, the vehicle can be polished.
- (8) If the surface defect is not serious, try to eliminate the repairing area.
- (9) Avoid removing too much celluloid paint, otherwise it cause the paint damage prematurely.
- (10) Use electric polishing device in strict accordance with the requirements recommended by the polishing manufacturer. Do not use wax or silicone products to cover the vortex imprinting (the imprinting will reappear soon and make the user unsatisfied).

1.4 Precautions of Anti-corrosion Treatment

- (1) When spraying sound insulation or anti-corrosive materials, preventive measures must be taken to avoid spraying into component openings (such as door locks, window regulator slots, window regulators and seat belt retractors) and any moving and rotating components. After spraying the materials, make sure that all drain holes on the body are open.
- (2) When using open flame to repair the body, it's necessary to remove the foamed sound insulation materials at the repair areas. When reinstalling the sound insulation materials, avoid inhaling dust that is harmful to the human body.
- (3) When performing the operation of this procedure, wear special protective glasses and gloves to prevent injury.
- (4) When the vehicle leaves the factory, it's necessary to deal with the body metal plates by means of spraying electrophoretic primer. After repairing and / or replacing parts, it's necessary to deal with all exposed metal surfaces with anti-rust primer.
- (5) If the original coating or anti-corrosive material is burnt during welding or heating operation, remove it and carry out anti-corrosion treatment again.

- (6) When carrying out collision service, the metal will be exposed, and it's necessary to spray these surfaces with special anti-corrosion materials.
- (7) Sealant can prevent water and dust from entering the vehicle and it has anti-corrosion function. The original sealed joint is obvious, if these seals are damaged, reseal to calibrate them. Reseal the connection of the newly replaced plate. The sealant used should be flexible after curing and painting. Fill the opening seams sealed with sealant with high consistency filler. Perform operation according to the instructions for the selected material.
- (8) The sound insulation material can control the general noise level in the vehicle. When the sound insulation layer is damaged due to service operation or replacing new panels, it's necessary to replace it with the same material.

2 System Overview

2.1 Description & Operation

■ Paint Coating Description

Paint is a kind of mixed liquid, which can be applied on a variety of base material. After the paint is dry, it forms a solid paint film to protect the base material and beautify the appearance. When the vehicle is delivered out of the factory, the following four layers of paint have been applied to make it have good anti-corrosion and gloss. It mainly consists of the following types:

- Electrophoretic primer
- Intermediate paint
- Pigmented paint
- Celluloid paint (transparent external coating)

■ Main functions of electrophoretic primer:

- Anti-rust
- Improve the adhesion during working
- Provide limited filling capability

■ Functions of intermediate paint:

- Filling capability
- Isolation/sealing
- Serve as the pigmented paint

■ Main functions of pigmented paint:

- Enrich the color
- Improve the gloss

■ Functions of celluloid paint:

- It contains ultraviolet-proof materials, which can resist the ultraviolet rays in the sun.
- Resist the corrosion of environmental dust (acid rain) on the paint surface.
- Make the paint surface friction resistant.
- Make paint surface have better gloss.

■ Requirements of Spraying Paint

- Restore the repaired part to its original appearance; During repair, it is necessary to observe the spraying paint process specified by the manufacturer, refer to Tips on Spraying Process of Paint with Rigid Surface.

2.2 Daily Maintenance of Vehicle Paint Surface

The maintenance of the body aims mainly to prevent the early aging and damage of the coating to keep the body clean and beautiful. In addition, keeping the body clean helps to find the damage of the body coating at any time to repair it in time.

■ Washing Body

- It's necessary to wash the body frequently to keep good paint surface and beauty of the body. However, it should not be performed in strong sunlight or in low temperature condition. In any case, do not wash it until body surface cools. Wash the dirt on the body surface with pressure water flow when using spraying-water washing, and then scrub the body surface with soft and clean sponge or towel from top to bottom. If car detergent is used, wash it with large amount of water. When using the high-pressure washing machine, do not turn the nozzle directly to transmission, steering gear, radiator, engine cover, rubber

protective parts of various components and external ornaments. After washing the car, use high-quality white gauze to dry the body surface. Never use gasoline, kerosene, trichloroethylene, strong alkaline water and alcohol to scrub the body surface and organic glass surface.

■ Cleaning Body

- Before using the wax on the car body coating, remove the oxide, road dirt, oil stain and the dirt that cannot be cleaned firstly. Do not scrape off the asphalt or gasoline stains on the body and bumper, and do not use gasoline or fabric decontamination agent, but use special decontamination products to remove them in time.
- For cleaning of body exterior ornaments and light alloy, firstly use soapy water or water that adds a small amount of decontamination agent or detergent, and then wash with a large amount of water. For scrubbing of windshield and door glass, it is better to use the washer fluid supplied by EXEED service station so as to obtain high-quality scrubbing effect, instead of using silicone based products.

■ Waxing and Polishing Body

- Waxing the body surface is one effective method that protects the gloss of paint coating surface. Wax can protect the paint coating surface well because after waxing, enough grease is kept on the paint surface, which cuts off the contact between water, air and the paint coating, and the coating is free from oxidization, which can effectively prevent the body surface from being eroded. Before waxing, make sure that the body surface is clean and dry; if the paint surface is discolored or oxidized, it's necessary to paint it before waxing.
- It's better to use the waxing tool for polishing wax. If not, wax it with a soft napkin or a soft and lint-free cotton or flannel. Because waxing will change in the sunlight in most cases, sometimes there will be spots on the body surface when waxing in the sunlight, do not wax it in the direct sunlight.
- Water droplet test can be used to check if waxing the body is good. If the water forms a water ball on the body surface, it proves there is the wax layer, otherwise, it needs to be cleaned and waxed.
- Do not wipe off the wax on the body too early and polish it after drying. Polishing the body paint should be carried out when the surface is clean and dry with a polisher (or by hand). Polishing any plastic parts is forbidden.

■ Restoring Scratch on Body Surface

- When the scratch on the body surface is not serious and does not reach the metal, the special paint repair spraying tank can be used. Spraying the paint marked the same color to the scratch surface. The repaired paint will be dry in the air.
- If the scratch on the body surface has damaged the metal with rust stain, remove the rust firstly, then scratch the putty with rubber or nylon scraper, and then perform general repair treatment for the paint and coating surface.

■ Maintenance of Bottom Protective Layer

- There is a protective layer on the bottom of the car, which has a permanent anti-chemical corrosion and mechanical trauma. The car bottom may contact with the road during driving, causing damage to the protective layer of the car bottom. It needs regular inspection and timely service.

■ Treatment of Cavity Anti-corrosion

- If the external temperature is very high, the wax may flow out of the cavity, which can be removed with a plastic scraper. At this time, pay attention to safety and environmental protection. All cavities that may be corroded on the car have been filled with wax for anti-corrosion before leaving factory. Maintenance is free in general condition.

3 Specifications

3.1 Paint Specifications

No.	Material Name	Note
1	Khaki white pearl paint	/
2	Blood red flashing finish paint	/
3	Princess blue metallic finish paint	/
4	Dazzling orange metallic finish paint	/

No.	Material Name	Note
5	Carbon crystal black metallic finish paint	/
6	Celadon gray metallic finish paint	/

4 Diagnostic Information and Steps

4.1 Problem Symptoms Table

Hint:

Use symptoms table below to help determine cause of problem. The black box in the table means the treatment method of product defects.

Symptom	Cause Analysis	Treatment Method
Efflorescence	1. The paint film is strongly eroded, such as strong ultraviolet ray. 2. The paint mix ratio is not correct during application. 3. Light and weather resistance of coating is poor. 4. Do not wash the car frequently or do not wash it completely. 5. The selected car cleaner is not suitable or the polishing wax is too coarse.	1. Polishing and beatifying treatment. ☐ 2. General grinding, polishing and beatifying treatment. ☐ 3. Depth grinding, polishing and refurbishing treatment. ☐ 4. Local spraying paint and repair. ☒
Peeled off Paint on Plastic Parts	1. The adhesion between the coating and the base material is too poor or the upper coating is harder than the lower coating. 2. The coating is too thick, and the paint film is eroded by moisture, acid and alkali in the air. 3. The recoatability of the lower coating is not good, or the treatment is not good; the upper coating have defects such as pinholes, exposed bottom, etc.	1. Polishing and beatifying treatment. ☐ 2. General grinding, polishing and beatifying treatment. ☐ 3. Depth grinding, polishing and refurbishing treatment. ☐ 4. Local spraying paint and repair. ☒
Honeycomb cracks	1. Do not mix primer coating completely before spraying it. 2. Finish paint coating is too thick. 3. Floating coating is too thick.	1. Polishing and beatifying treatment. ☐ 2. General grinding, polishing and beatifying treatment. ☐ 3. Depth grinding, polishing and refurbishing treatment. ☐ 4. Local spraying paint and repair. ☒
Bird Droppings Erosion	1. Bird droppings erode.	1. Polishing and beatifying treatment (mild erosion). ☒ 2. General grinding, polishing and beatifying treatment (moderate erosion). ☒ 3. Depth grinding, polishing and refurbishing treatment. ☐ 4. Local spraying paint and repair (-severe erosion). ☒
Abrasion Imprinting	1. The paint film harness is not enough. 2. Hard objects scratch.	1. Polishing and beatifying treatment (minor scratches). ☒

Symptom	Cause Analysis	Treatment Method
		2. General grinding, polishing and beatifying treatment (rough scratches). ■ 3. Depth grinding, polishing and refurbishing treatment. □ 4. Local spraying paint and repair (-scratch). ■
Corrosion	1. The paint film at the edge is thinner. 2. Collision damage causes corrosion. 3. Acid and alkali erode.	1. Polishing and beatifying treatment. □ 2. General grinding, polishing and beatifying treatment. □ 3. Depth grinding, polishing and refurbishing treatment. □ 4. Local spraying paint and repair (It is necessary to repair metal plate before spraying paint and repairing if there is serious corrosion). ■

Symptom	Cause Analysis	Treatment Method
Peeled off Paint	1. The adhesion between the coating and the base material is too poor or the upper coating is harder than the lower coating. 2. The coating is too thick, and the paint film is eroded by moisture, acid and alkali in the air. 3. The recoatability of the lower coating is not good, or the treatment is not good. 4. The upper coating have defects such as pinholes, exposed bottom, etc.	1. Polishing and beatifying treatment. □ 2. General grinding, polishing and beatifying treatment. □ 3. Depth grinding, polishing and refurbishing treatment. □ 4. Local spraying paint and repair (It is necessary to repair metal plate before spraying paint and repairing if there is serious corrosion). ■
Acid Rain Erosion	1. Acid rain erodes	1. Polishing and beatifying treatment (mild erosion). ■ 2. General grinding, polishing and beatifying treatment (moderate erosion). ■ 3. Depth grinding, polishing and refurbishing treatment. □ 4. Local spraying paint and repair (-severe erosion). ■
Loss of Gloss	1. The paint film is strongly eroded by acid, alkali, electric arc, sea water and salt mist. 2. The maintenance method of the paint film is not correct in the severe condition. 3. Durability of paint itself is not enough. 4. When the paint is applied, the incorrect mix ratio causes poor durability of the paint film.	1. Polishing and beatifying treatment (mild loss of gloss). ■ 2. General grinding, polishing and beatifying treatment (moderate loss of gloss). ■ 3. Depth grinding, polishing and refurbishing treatment. □ 4. Local spraying paint and repair (-severe loss of gloss). ■
Bubble	1. When the paint film is exposed to the humid environment for a long time, the moisture penetrates into the paint film and moisture raises bubbles when the temperature rises. 2. Base materials are corroded by penetrating materials. 3. The paint film is eroded by gasoline, acid and alkali.	1. Polishing and beatifying treatment. □ 2. General grinding, polishing and beatifying treatment. □ 3. Depth grinding, polishing and refurbishing treatment. □ 4. Local spraying paint and repair (It is necessary to repair metal plate before spraying paint and repairing if there is serious corrosion). ■

5 Removal & Installation

5.1 Examples of Common Paint Film Defects Treatment Process

- (1) Clean the surface to be polished with degreasing material before polishing.
- (2) Make the sponge wet firstly and squeeze out the excessive water.
- (3) Apply a small amount of polishing wax to the surface to be polished, and adjust the speed of polishing machine.
- (4) After the sponge contacts the paint surface, start the machine with the speed of 2500 - 3000 r/min. Then press it for 3 - 5 seconds gently before polishing.

⚠ Caution

- During operation, keep the machine moving smoothly and gently, and avoid operating too long to avoid overheating and burning the paint surface.

(5) Wipe off excessive polishing wax with waxing cloth.

5.2 Example of General Grinding, Polishing and Beatifying Treatment Process

- (1) Clean the surface to be polished with degreasing material before polishing.
- (2) Apply a appropriate amount of polishing paste to the surface to be polished, adjust the speed of polishing machine.
- (3) After the polishing wool pad contacts the paint surface, start the machine with the speed of 2500 - 3000 r/min.

⚠ Caution

- Keep the machine moving smoothly and gently and avoid grinding too much. Make sure that the grinding time is as short as possible and the grinding area is as small as possible.

(4) Make the sponge wet firstly and squeeze out the excessive water; Apply a small amount of polishing wax to the surface to be polished, and start the machine with the speed of 2500 - 3000 r/min after the sponge contacts the paint surface. Then press it for 3 - 5 seconds gently before polishing.

⚠ Caution

- During operation, keep the machine moving smoothly and gently, and avoid operating too long to avoid overheating and burning the paint surface.

5.3 Example of Depth Grinding and Polishing Treatment Process

- (1) Grind the damaged paint surface with # 2000 waterproof abrasive paper, make it parallel and contact with the paint surface to be ground, and carry out circular grinding.
- (2) Clean grinding dust on the surface.
- (3) Apply a appropriate amount of polishing paste to the surface to be polished, adjust the speed of polishing machine.
- (4) After the polishing wool pad contacts the paint surface, start the machine with the speed of 2500 - 3000 r/min.

⚠ Caution

- Keep the machine moving smoothly and gently and avoid grinding too much. Make sure that the grinding time is as short as possible (3 - 5 seconds) and the grinding area is as small as possible.

(5) Make the sponge wet firstly and squeeze out the excessive water; Apply a small amount of polishing wax to the surface to be polished, and start the machine with the speed of 2500 - 3000 r/min after the sponge contacts the paint surface. Then press it for 3 - 5 seconds gently before polishing.

⚠ Caution

- During operation, keep the machine moving smoothly and gently, and avoid operating too long to avoid overheating and burning the paint surface.

5.4 Tips on Spraying Process of Paint with Rigid Surface**Hint:**

Take the wing as an example to illustrate the local spraying (paint repair) process.

⚠ Caution

- **All paint repairs on rigid surfaces must comply with Chery standards. Confirm the repair area and select the repair scope, such as partial repair, whole pair repair, and whole vehicle repair; If it is collision damage, perform the corresponding repair after repairing metal plate or spray paint after replacing parts according to the damage condition.**

- (1) If the scratch on the wing is severe, use local spraying (paint repair) process.
- (2) Grind (circularly grind) the damaged paint surface with # P500 wet (waterproof) abrasive paper.
- (3) Degrease and clean it with degreasant after grinding.
- (4) When spraying the primer, try to control the scope of the primer and make sure the coating at the edge should be gradual instead of stair-step shape.
- (5) Flash off for 4 - 5 minutes, and dry it and bake it for 20 - 30 minutes. The temperature of baking finish house is 70 - 80 °C.
- (6) After baking, carry out the wet polishing with # P800-1000 abrasive paper.
- (7) Grind it with # 2000 fine waterproof abrasive paper and expand grinding range.
- (8) After polishing is completed, use sticky gauze to remove dust before spraying the paint.
- (9) Spray the base coat.
 - Air pressure: 150 - 200 kPa
 - Spraying distance: 20 - 30 cm

⚠ Caution

- **The spraying range is slightly wider in one layer than in one layer for transition.**

- (10) Flash off for 2 - 3 minutes, and spray the second base coat until the interface position is not obvious.
 - Air pressure: 150 - 200 kPa
 - Spraying distance: 20 - 30 cm
- (11) Flash off for 4 - 5 minutes, and dry it for 20 - 30 minutes.
 - The temperature of baking finish house is 70 - 80 °C
- (12) After drying is completed, use sticky gauze to remove dust before spraying the varnish.
- (13) When spraying celluloid paint, the spraying range should cover the base coat range completely.
 - Air pressure: 150 - 200 kPa
 - Spraying distance: 20 - 30 cm
- (14) Flash off for 2 - 3 minutes, and spray the second celluloid paint, the spraying range should cover the first varnish range completely.
 - Air pressure: 150 - 200 kPa
 - Spraying distance: 20 - 30 cm
- (15) After spraying celluloid paint is completed, immediately replace it with barge saliva or add interface additive or thinner into the original celluloid paint.
- (16) Spray barge saliva or diluted celluloid paint for 2 - 3 times at interface position.
- (17) Bake it for 20 - 30 minutes in the baking finish house.
 - The temperature of baking finish house is 70 - 80 °C

5.5 Repairing Procedure of Paint Surface on Plastic Part Surface

Three basic requirements for the paint surface repairing on plastic part surface:

- The paint and plastic have certain adhesion without damaging mechanical properties.
- The paint film shall be flexible enough to deform with the plastic without cracks.
- The original particles and coarse texture on some plastic part surfaces.

Repairing procedure of paint surface on plastic part surface:

- Repairing of paint surface on plastic primer refers to the above local spraying process, and pay attention to low-temperature baking.

- Baking condition is 70 - 80 °C for 20 - 30 minutes.

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