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AUTOMOBILE PAINTING

Reference Section  
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The Bureau receives numerous requests from the public for information on how to repaint or refinish an automobile. The word paint or finish is used in a broad sense to include enamels and lacquers. Possibly some of the more recent inquiries are the result of the war, because the original finish on many automobiles is at least ten years old. This finish was applied at the factory under automatically controlled conditions. An automobile may be refinished at a paint shop by an expert mechanic, or it may be refinished by the amateur who wishes to "paint his own automobile." The purpose of this letter circular is to assist the amateur.

Broadly speaking, there are two classes of finishing materials used on automobiles, viz., nitrocellulose spraying lacquers, and synthetic enamels of the alkyd type. Spraying lacquer is applied with a spray gun, as the material dries too fast for brushing. It is used widely on automobiles because of its quick-drying properties. However, the amateur should not attempt to use spraying lacquer unless he has had considerable experience in the use of a spray gun.

Synthetic baking enamel (alkyd type) is used by several large automobile manufacturers for finishing automobiles at the factory. It is also used by the expert mechanic for refinishing automobiles, provided baking ovens are available. This enamel is applied by spraying, and it generally dries too quickly for satisfactory brushing.

Synthetic enamel may also be obtained in air-drying types for either hand-brushing or spraying; the latter is the type used largely by automobile paint shops. However, for the amateur who wants to paint his own car, the material to buy (unless he is experienced with the spray gun) is an air-drying synthetic enamel (alkyd type) formulated for brush application. Under normal conditions, this enamel can be purchased in paint stores under well-known brand names. Good enamel of this type brushes easily and flows out well, and the brush marks level out (disappear). Under average conditions, a film of this enamel dries in about six hours, and is hard overnight. The film dries with a high gloss and the durability is excellent. By following certain precautions, the amateur can obtain a presentable job although it may not equal that done by an expert.

Having selected the correct type of enamel and a high-grade, 2-inch enamel brush, the surface of the car should be prepared for a good paint job. Assuming the old finish does not have to be removed, the following operations are suggested:

1. Wash the entire car using a good automobile soap and water being careful to remove all muddy accumulations and heavy deposits of grease and dirt. Grease may be removed with gasoline and a stiff brush. Allow the car to dry thoroughly. Do not use gasoline or other flammable liquids near a flame or in confined spaces.

2. Remove dents from body and fenders.

3. Take off removable parts, including spare tire and casing, hood, etc. Remove all dirt and grease from inside of hood.

4. Remove any rust spots by rubbing with waterproof sandpaper and water.

5. Sandpaper the entire car until it is very smooth, using No. 280 waterproof ("wet or dry") sandpaper and water. The smoother the surface the better will be the appearance of the finished job. Any rough areas are magnified when the enamel is applied.

6. Remove all dust, dirt, wax, etc., by going over the entire car with cloths saturated with an organic solvent such as gasoline, naphtha, xylol, carbon tetrachloride, etc. Keep renewing the cloths and the solvent so that they will remain clean. Be sure at this point to do the work thoroughly so that all grease and wax are removed - otherwise the drying and adhesion of the enamel may be impaired.

7. Touch up any bare metal with an automobile primer, obtainable in paint stores. The primer dries rapidly to a flat, dull red or brown color. When dry, these repaired portions should be sanded, being careful to feather out the edges of the spots.

8. Do not apply the enamel to the car exposed outdoors. Because of good lighting conditions, the amateur is tempted to do so. However, because of dust in the atmosphere, the finish will dry rough like sandpaper. Thus it is better to finish the car inside a clean garage that is well-lighted. About one hour before applying the enamel, sprinkle the floor with water to keep down the dust. Then go over the entire car with a "tack rag." This is called "tacking off" and its purpose is to remove all traces of dust particles on the surface. Tack rags can generally be purchased in paint stores.

9. Using a small camel's-hair brush, seal all crevices, joints, cracks (for example the crack between body and splash apron near the running board), etc., with the enamel (placed in a separate small container); allow to dry.

10. Then apply the enamel, using a new, high-grade, 2-inch enamel brush. Wash the brush in some paint thinner before using. Then work the enamel into the brush before applying it to the car.

11. For best results, wipe each panel with the tack rag just before painting. This operation will pick up any last traces of lint, dust, etc.

12. Apply the enamel by flowing on with the brush. Do one panel (for example a door) at a time. Then level off with cross (horizontal) strokes. Wipe excess enamel from the brush by drawing it across the edge of the container after each stroke. Then finish off by light downward (vertical strokes) picking up excess enamel after each stroke by drawing the brush across the edge of the container. This will avoid sagging or running of the enamel. Do not go back and attempt to retouch a panel after the enamel has been applied for about 10 minutes. Instead, finish each panel or section as just indicated before going ahead to the next area. It is suggested that the hood be done first by the method just outlined, so that the amateur can obtain practice and skill in application before going ahead on the body of the car.

13. After the car has been painted, leave it in the garage (with door closed) overnight for the finish to dry dust free.

If the old finish is checked and cracked, it should be completely removed. Use preferably a solvent type paint and varnish remover containing benzol, acetone, alcohol and some paraffin wax. After the old paint is removed, wash the car thoroughly with an organic solvent such as gasoline, naphtha, turpentine, xylol, carbon tetrachloride, etc., so as to remove all the paraffin wax - otherwise the new paint may not adhere to the bare steel. Care should be taken not to touch the clean, bare steel with bare hands or soiled cloths. Then apply a coat of automobile primer (suitable for brush application) previously described; a thin, uniform coat gives best results because it results in better adhesion and shows less brush marks. When dry, sand lightly and follow with a coat of synthetic enamel as just described. A quart of enamel is sufficient for the average car.

The following reference books on the subject may be helpful to the reader:

Practical Automotive Lacquering, by Wm. J. Miskella,  
Finishing Research Laboratories, Inc., Chicago, Ill.

Modern Automobile Painting, by Marvin J. Pearce.

Protective and decorative Coatings, Volume III, by  
J. J. Mattiello, John Wiley & Sons, Inc.

Automobile Painting, by F. N. Vanderwalker, F. J. Drake  
& Co., Chicago, Ill.