



From the Garage

by Paul Hunter

HOW CARS GOT COLOURS



For the first quarter of the 20th century almost all automobile bodies were painted by hand, with brushes. Nothing held back car production, like painting. It was the manacle, the iron boot of the industry. Paint technology had not kept up with advances in other areas of mass production. Major automakers could assemble a car in four to five hours, but it took three to eight weeks to paint it. Into the 1920s many car bodies were built by independent suppliers. These companies had sprawling paint areas that housed as many as 20,000 bodies at a time, yet they still had trouble keeping up with the ever-increasing demand. As

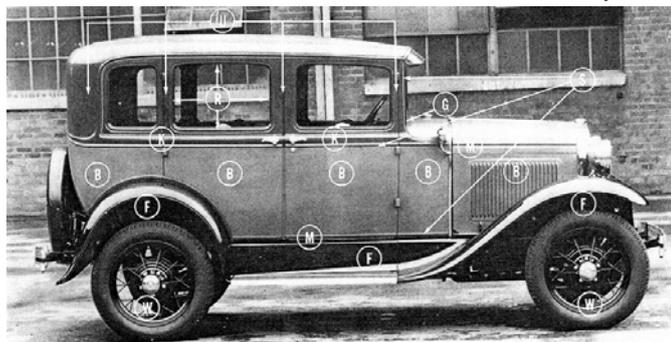
one maker observed, without a faster method of painting, "it would have been necessary to put a roof over the entire state of Michigan." The logistics of moving bodies around the huge sheds was a nightmare in itself. First, un-mounted bodies were dollied from prep and sanding areas to huge paint rooms. Then after the paint had been painstakingly applied, they were transferred to long, low sheds into which warm, filtered air was pumped to speed drying. Manufacturers made virtue of necessity by boasting about the time and effort they put into painting. When Hudson introduced its inexpensive Essex closed coach for \$622, the sales literature trumpeted: "The finish has not been slighted as there are 25 paint operations, this being fully up to the normal number." In reality, manufacturers longed to eliminate this final vestige of hand-craftsmanship from their production lines-not just because of the time and space it required but because paint men, being skilled workers, were the only segment of the industry's labor force with a strong, independent union.

To apply varnish without leaving brush marks, painters had to be patient and meticulous. Each coat was brushed on at right angles to the one before it. Between color coats, bodies were rubbed with ever-finer grades of pumice and sandpaper. After four to eight color coats, the painter flowed on one or two final coats of clear varnish. Topcoats had the consistency of molasses, and each one took a week or two to air-dry. (Heat drying was out because it caused cracks in the thick, clear coats. To keep down lint and dust, painters often wore no shirts. Even on the hottest days they coated their chests and arms with linseed oil. For finish coats, painters used two badger hair brushes; one to apply the finish and a smaller brush to pick off the dust and lint which they called "lice". Paint rooms were kept hospital clean and brightly lit. They often had tiled white walls and there was usually a central drain in the concrete floor so that the entire room could be hosed down. Despite the strict precautions, there were always "lice" in the air.

After all that exacting work and care, a varnish job lasted only two to three years. Freshly applied varnish had tremendous depth - almost a glow - but within a year or so it would begin to oxidize and darken. Colors became clouded, clear topcoats turned yellow, and surfaces started to crack. Raindrops magnified sunlight like tiny lenses, leaving permanent spots. Bird droppings were worse. Wealthy car owners often ordered two custom bodies for each chassis and returned one to the coach builder every year for refurbishing and a total re-varnish.

Black absorbed more heat than lighter colors and therefore dried faster. That's partly why from 1914 through 1925 Ford offered the Model T in "any color as long as it's black." Black varnish, which used a carbon base, also resisted ultraviolet sunlight, so it lasted longer. Finishing a model T body in black varnish took about a week. This was still too long for Henry Ford, so he kept looking for faster painting methods. One alternative to hand-applied varnish was baked enamel. Bicycle manufacturers had used baked enamel for years and automakers started experimenting with it around 1908. Baked enamel could be flowed or sprayed onto

metal and oven-dried in less than a day. It was tough, had good luster and needed very little handwork. Why then, weren't Ford and everyone else using baked enamel? In fact they did make some use of it, but baked enamel had its own set of drawbacks. At first it came just in black, because only Gilsonite, a black pigment derived from coal, could withstand the heat needed to bake it. That restriction was no problem for Ford, of course, but another difficulty was the heat itself. Many car bodies still used wooden framing and a body painted with baked enamel had to spend four and a half hours in a gas-fired oven at 450 degrees Fahrenheit, a temperature that would burn or split wooden members, so only bodies or parts with no wood in them could be finished in baked enamel. This explains why fenders, hoods, splash aprons, and radiator shells were so often black on early cars.



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| (R) Reveals | (M) Molding | (K) Belt |
| (W) Wheels | (S) Stripe | (F) Fenders and Shields |
| (B) Body Panels | (U) Upper and Back | (G) Rail-Front Belt |

Cars with all-steel bodies like the Dodges of 1915 and later, were painted entirely in black enamel. In a process pioneered by the Edward G. Budd Company, each Dodge took as little as one day to finish. By 1923 Henry Ford had removed much of the wood from his open body styles and ordered his body suppliers to use black baked enamel as well. But since Model T bodies still had wooden tacking strips, Ford avoided the 450-degree ovens by specifying six thin coats of baked enamel instead of one heavy one, with each coat fired at 165 degrees and each body passing through the oven six times. Body finishing now took about three days. Ford and other automakers also sometimes used a quick but crude process called japanning. This involved dipping a sheet-metal part into a vat of paint or spraying the part with a hose. The painted part was then hung up to air dry. A worker later came along and razored off the half-dried drips and runs. Japanning was suitable only for items containing no wood.

The long awaited breakthrough in automotive finishes arrived in 1923, when Duco lacquer became available. Duco was based on volatile nitrocellulose similar to guncotton in an acetate solvent, rather than the linseed oil of earlier varnishes, it had been developed by Du Pont for painting fabric airplane wings during World War 1. After the war chemists at Du Pont and General Motors figured out how to dissolve more pigment in the lacquer, how to help it adhere by pre-treating the steel and applying primers and how to keep it from softening and peeling; Duco cut painting time from weeks to days. It could be sprayed on with a gun, came in bright colors, didn't fade or yellow and was more flexible than varnish, yet it didn't need high-heat ovens. Painting became another unskilled task and the painters' union collapsed. As a result of savings on labour and storage, Duco cost less than baked enamel.

The first production car to use Duco was GM's 1924 Oakland. Since chemists still had trouble achieving a high gloss, the Oakland came with a soft, satin finish that was billed as "True Blue". Chevrolet offered Duco in several additional colors for 1925 and in 1926 Du Pont made Duco available to the entire auto industry.

Some low-volume coach builders stayed with varnish for a while, but by 1929 most of them had switched. "Lacquer finish was general", said Autobody in its review of the 1929 New York automotive show, "and so well executed that only expert examination would have detected any difference between the finish at this Salon and that of the pre-lacquer salon of, say 1923, at which no custom builder would admit the possibility of this new finish ever displacing the old-time varnish 'for cars of this class'".

By Michael Lamm, Stockton California
Reprinted from the Willamette Valley Model A Club

See the article on our Club Technical night at Linkup Paint Supplies. Linkup Paint Supplies are the NZ agent for Valspar/De Beers Automotive Paint and they have colour matched the Model A Ford Colours as per the Antique Ford Repaint Manual- Paul