FEATURE ARTICLES

NEW TRAFFIC STRIPER DEVELOPED BY CALIFORNIA HIGHWAY ENGINEER

The California Division of Highways is replacing its fleet of traffic stripers with new machines capable of heating paint or other marking materials to any desired temperature up to 400 F. When materials are used that are designed to dry immediately when applied at such elevated temperatures, no protection of the newly placed stripe is required. The new machines can apply the materials at speeds up to 15 mph for a 12-inch wide double yellow line with black separator. Greater speeds may be obtained by increasing the power in the system.

The machine, for which patents are being applied, was designed by California's Equipment Design Engineer, Harry C. Ammon. It features a new and unique system of heating the materials that involves the direct conversion of mechanical energy to heat without going through the heat transfer processes. Included is an airless system for applying the material in three layers, with reflective materials (beads) applied between the second and third layers and on top of the final layer. An electronic temperature control system maintains the temperature at the desired level with an accuracy of ±1 F.

The machine is mounted on a Ford F-900 $4,000 GVW chassis, equipped with an Allison automatic transmission and a tandem drive rear axle with duplex tires on the rear. Paint guns and bead applicators, capable of placing three 4-inch lines simultaneously, are mounted at the centerline of the tandem axle on the left side of the vehicle and are retractable when the machine is moving between projects. Provision is made for painting two 4-inch lines on the right side of the machine from a similar outrigger between the axles, capable of any desired pattern of variations of skips or colors.

By positioning the guns outboard of the vehicle on the centerline of the tandem axles, the newly painted line exactly parallels the path of the rear wheels of the vehicle, and sudden variations in alignment are avoided.

A sulky is provided that is equipped with paint- and bead-dispensing equipment in the front of the machine. The sulky is used when painting a two-lane, two-way roadway. In this operation, the truck straddles the centerline and traffic can pass to the right and left of the machine without crossing the centerline. When the sulky is not in use, it is carried on a power-lift tailgate on the rear of the vehicle.

A dual system is provided so the truck may be driven from either the left or the right side. Provision for painting any desired pattern, such as "paint 9, skip 12," is included. The machine is equipped with two tanks, each with a

capacity of four barrels of yellow or white and a third tank with a capacity of two barrels of black. A pressurized bead-dispensing system holding up to 1 ton of beads is also provided.

The programmable skip line timer is of solid-state, integrated-circuit design. Electronic readout indicates travel speed in miles per hour and distance to the nearest 0.1 foot. Totalizers also record amount of each color painted to nearest 0.1 foot. The system is driven from the vehicle speedometer drive, thus requiring no additional "fifth wheel."

Startup time requires a maximum of 5 minutes from cold paint to application temperature. The system is loaded with the same pumps used for the painting operation at a rate of 30 gallons per minute from 50-gallon drums. Cleanup time at the close of the day involves only the closing of a few valves.

The material is heated only as it is used. A maximum of 3 gallons of hot material is in the system at any given time. Hot paint is continuously circulated through the guns so that uniformity of heat is maintained and hot material is always available at the gun.

All power required for the paint application system is provided by a diesel engine with a multiple power takeoff from which hydraulic pumps are driven. All power requirements are furnished by the hydraulic system, with the exception of the pneumatic bead-dispensing system and air-controlled valves on the paint guns, which are furnished with compressed air from an air-brake compressor on the diesel engine.

Current traffic striping practices, using paints at ambient temperatures, have required the placing of traffic cones or other protective devices on the wet paint until it dries to a no-pickup state. Usually, 30 minutes is required for such drying time. This means that the striping truck must carry one man for placing the cones, and a follow-up system for picking up the cones required at least one and usually two more people. The number of cones that could be carried on the striper has been a limiting factor as to the productivity of the machine. In other words, as soon as the machine ran out of cones it was necessary to stop the operation and wait until the pickup truck replaced the supply of cones. This means that at least half the time the whole paint system was waiting for its cone supply to be replaced. The hot paint system eliminates the need for a man to place the cones and also for two men to retrieve the cones. The only reason for halting the operation is to give the striping personnel a chance to relax periodically.

With the advent of this system for heating and applying the materials, an opportunity is afforded the paint and marking material industry to develop new formulations and compounds that may require heat, which will utilize the capability of this system.

Personnel requirements for traffic striping may be decreased 50 percent. Convenience to public traffic is greatly enhanced. California Highway Maintenance Work Standard for placing median barrier stripe using the conventional cold paint system is 3.7 man-hours per mile of stripe. Using the hot paint system, it is estimated that the labor requirement may be reduced to 0.6 man-hour per mile.

Transportation Safety Activities of HRB Cover Wide Range of Problems and Modes

James K. Williams*

In today's society, problems and needs change very rapidly. Programs, especially in the field of transportation safety, must be responsive to emerging needs.

While reviewing the current transportation safety program of the Highway Research Board, I want to stress that these programs are not static. They are tuned to changing needs and conditions. It is important to keep our focus on the future. At the same time, it can help our perspective to take an occasional fast glance over the shoulder to see just where we have been. This also serves to link up the past, present, and future.

The Highway Research Board traces its origin back to the 1920's, when other events affecting our national concern for highway safety were also occurring. A few years earlier, the Federal-Aid Road Act of 1916 was enacted by Congress. The Act made available federal aid for highways provided that the funding was matched by the states and was administered by state highway departments.

The United States entered the 1920's with a little over 9 million automobiles and trucks registered. By 1924, nearly 20 million vehicles were registered in the country. During the same year, more than 20,000 people were killed in automobile accidents. In 1925, gasoline tax laws were introduced that made it possible to estimate motor vehicle mileage. The 1925 traffic death rate was computed at 17.9 deaths per each 100 million miles of automobile travel.

It was during the early and middle 1920's that traffic accidents began to create widespread concern. Even these early years revealed the roots of our present-day traffic problem—inadequacies and deficiencies in roads, vehicles, and drivers.

The transition from horses to horsepower presented many problems. The main problem was to determine how to match highway design with performance requirements to make the roadways safer and more adequate for the vehicles and the users. Early research was scattered and isolated.

Out of this situation grew a concept for a coordinated national highway research program. The concept resulted in the organization of the Advisory Board on Highway Research in 1920 within the Division of Engineering of the National Research Council of the National Academy of Sciences. Four years later, the name was changed to the Highway Research Board.

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