GROOVING PATTERN STUDIES IN CALIFORNIA

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•GROOVES can be cut into pavement in a longitudinal (parallel to the centerline), transverse, or skewed direction. All grooving (except for a few short experimental sections) to date on California highways has been performed in a longitudinal direction. We are of the opinion that this leads to increased lateral stability and tends to guide the vehicle through a critical curve area. The entire lane width is grooved except for about 1 ft adjacent to each lane line or edge of pavement. This is done to preserve the lane line or markers and also to permit the use of vacuum devices that remove water and cutting residue concurrently with the grooving operation. This practice greatly reduces the hazard to traffic during the grooving operation.

Several patterns have been used in serration work. Width and depth of grooves have varied from 1/4 in. to slightly less than 1/8 in. (0.095 in.), and spacing of the cuts has varied from 3/8 to 1 in. center to center. This was done in order to determine the increase in friction factor, wear resistance, and possible vehicle handling problem of various patterns. In all cases the grooves were made in a longitudinal direction.

The various grooving patterns that have been explored and comments on their effectiveness follow.

The closest spaced pattern ever used in California was 1/8 in. by 1/8 in. at 3/8 in. centers. First used in 1960, this pattern was effective in raising the coefficient of friction; however, it caused spalling and was quite expensive to put down. It was used only three times.

Another pattern, 1/8 in. by 1/8 in. at 1/2 in. centers, has been used effectively since 1963 in increasing the coefficient of friction. It will spall if cut too deep; however, if a 0.095-in. blade is used for this pattern there is less tendency to spall. This pattern, cut with the 0.095-in. blade, was used in 1970 on a road where the coefficient of friction was very low. It is an excellent pattern for motorcycle ridability.

The standard California pattern is 1/8 in. by 1/8 in. at 3/4 in. centers, used first in 1966, or the thinner blade of 0.095 in., used first in 1968 to improve motorcycle ridability. This pattern has done an excellent job.

The use of two patterns, the first 1/8 in. by 1/8 in. at 1 in. centers and the second 1/4 in. at 1 in. centers, has been discontinued. The former is a good pattern for motor-

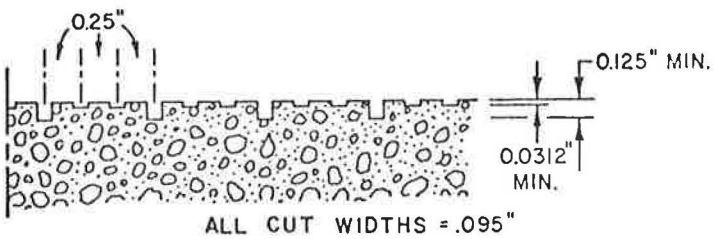

Figure 1. Style A grooving pattern (first used in 1970).

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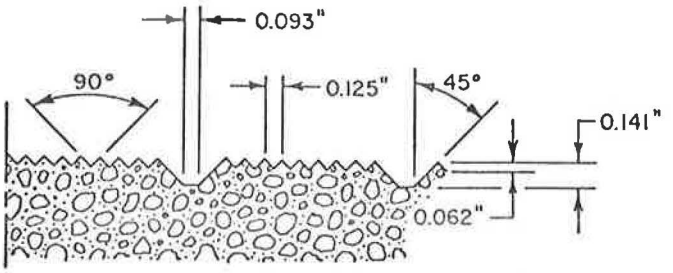

Figure 2. Style 15 grooving pattern (first used in 1968).

cycle ridability but does not raise the coefficient of friction appreciably. The latter is a standard airfield pattern but results in extremely poor ridability for both automobiles and motorcycles.

Style A grooving pattern (Fig. 1) was tried in areas having a low coefficient of friction. Because of the roughness of pavement surfaces, however, it was practically impossible to put this pattern down and to comply with depth specifications.

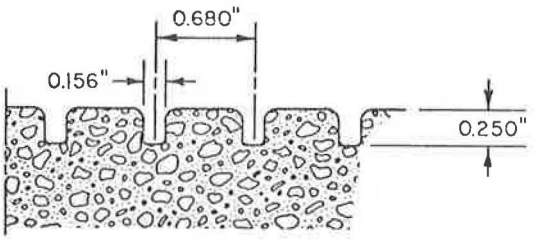

Figure 3. Style 9 grooving pattern (first used in 1967).

Style 15 (Fig. 2) is termed a "molded-head" pattern. Although Style 15 does an excellent job of increasing the coefficient of friction, it is a difficult pattern to apply and results in poor motorcycle ridability. This pattern is patented by Christensen Diamond Services Company.

Style 9 (Fig. 3) is also a "molded-head" pattern. Like Style 15, this pattern increases the coefficient of friction but results in poor motorcycle ridability. It has no advantages over a pattern cut with standard blades. This pattern is also patented by Christensen Diamond Services Company.