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4HE EFFECT OF ZINC AND ZI ON COSMETIC CORROSION AN ACTUAL AUTOMOBILES AND TH NISMS WERE STUDIED 4HE MA CORROSION ON THE OUTSIDE C WEIGHT OF THE :N OR :N ALLO OF COATING 0ERFOR YEARS I DOOR HEMS WHERE :N RICH P WERE USED WHEREAS PERFOR THAN YEARS IN GALVANIZED :N COATING WEIGHT IN LAPPED THE PERFORATION DEPTH AND THE IRON RUSTS FORMED ON !MERICA SHOWED THAT THE PE IN HOT DIP GALVANIZED STEEL STAGES 4HE PERIOD DURING CONTROL CORROSION OF THE IMPORTANT ROLE IN DETERMIN TION OCCURS IN AUTOMOBILE DEICING S.

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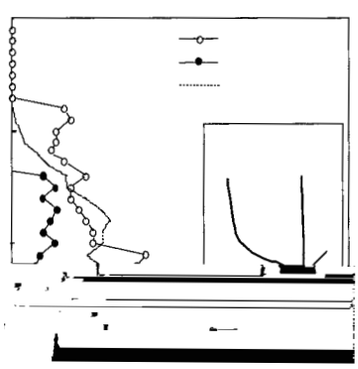
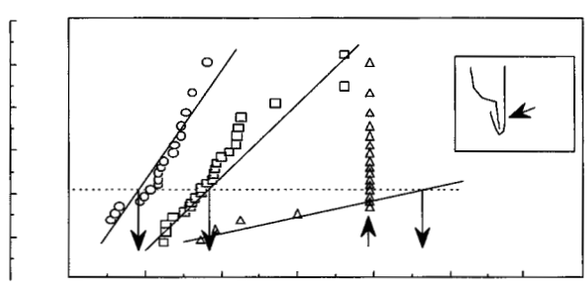
of the outer panel surface of the automobile body, and the effect of the coating weight is the controlling factor.

Perforation corrosion proceeds from the inner side of automotive outer panels to the outer side. Thus, when perforation corrosion is discovered by visual inspection, repair is extremely difficult. Perforation corrosion is considered the most important problem in automotive corrosion resistance. [5,6] shows the cross section of a door hem in an automobile which was used for 5 years in a part of North America where deicing salt is employed. Here, in the door hem, a zinc rich primer (ZRP; film thickness: 8–10
surface of the outer panel, and a CRS was used as the inner panel. [5,6] shows the corrosion depth profile at the inner surface of the outer panel (surface where ZRP was applied) and the inner panel (CRS) in the same part. It should be noted that the corrosion depth in the inner panel is a value corresponding to 1/2 of the total

tion, is a location parameter (the mode of the maximum depth of corrosion occurring at each location), and is a scale parameter. [6] shows the results when the maximum corrosion depth occurring at each location on the inner surface of the outer panel in the door hem was plotted in Gumbel probability plots of the maximum depth occurring at each location. It can be understood that both the location parameter and the scale parameter increase as the use period increases. This means that the distribution of the maximum corrosion depth shifts to the large side (increase in location parameter) and deviation increases (increase in) as the use period is extended. [6] shows the mode of the maximum depth of corrosion occurring in each part when analyzed by extreme value statistics (double exponential probability) for the Gumbel distribution. Assuming a sheet thickness of 0.8 mm, the perforation corrosion life of the zinc rich primer in the outer panel of the door hem was estimated at 6–7 years, and the perforation corrosion life of a hot-dip galvanized steel sheet with a heavy coating weight (120 g/m²) in a lapped side-sill part (outer) was estimated at more than 14 years.





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