Periodic Motor Vehicle Inspection in North Carolina: A Follow-up Study

by

Donald W. Reinfurt
Elizabeth G. House
Donald N. Levine

University of North Carolina
Highway Safety Research Center
Chapel Hill, North Carolina

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ABSTRACT

North Carolina's compulsory annual motor vehicle inspection program has been in operation since February of 1966. The primary purpose of this study is to examine the trends over the five-year period of the program and to present a follow-up to a previous HSRC report that presented statistics for the initial year of the program relative to failure rates and repair charges, and their relationship to vehicle age, mileage and presumed driving environment. In addition, this study examines differences in various car models with respect to failure rates for selected inspection items.

Over the five-year period, a general downward trend in failure percentages has been observed for every item except windshield wipers. The deviation of the trend for windshield wipers is a result of a revision in the inspection requirements for this item.

Inspection receipts of a special sample of 76,668 privately-owned passenger cars inspected in December 1968 were collected to provide statistics for comparison with those in the 1966 sample. Not only has the overall failure rate decreased from 70.1% in the 1966 sample to 33.8% in the 1968 sample, but the average repair charge (per vehicle with repair charge assessed) is generally lower for this sample than for the previous sample. Both samples indicate a positive association of both vehicle age and mileage with the percentage of vehicles failing inspection.

In terms of magnitude of December 1968 failure rates, headlights still rank first, followed again by license plate lights; steering and horn failures were again at the bottom of the list. The remaining rankings follow the general pattern of the 1966 rates (with the exception of windshield wipers which rank fifth whereas they previously ranked ninth). For nearly every inspection item the 1968 failure rate trends were significantly lower than the corresponding 1966 trends.

As in the previous study, urban cars accumulated less mileage and, in general, were newer than rural cars. Moreover, the average repair charge is still approximately 25 cents lower for rural cars than urban cars. In contrast to the 1966 results, however, a difference was found between rural and urban overall failure percentages with the overall urban percentages being significantly greater than the overall rural failure percentages. In addition, the urban failure rates were significantly greater than the rural rates for headlights, tail lights, steering mechanism, and foot brake. For the remaining seven items, no consistent rural-urban differences were noted.

Using the vehicle identification number (V.I.N.) program developed by HSRC, failure rates for several specific makes of cars were analyzed and a number of significant differences were found.

A questionnaire was sent to owners of a number of automobiles spotted on the highways throughout North Carolina. Results of this questionnaire reveal that (1) 70% of the 459 respondents considered the state's motor vehicle inspection program either of considerable or at least of some value and (2) 60% felt more confident in the safety of their car after inspection, with females expressing significantly more confidence than males.

The results of the 1968 sample indicate that North Carolinians are probably justified in expressing confidence in the program since, at the very least, the motor vehicle inspection program is reducing the proportion of cars with defective items and, it is hoped, reducing the number of motor vehicle crashes caused by mechanical failures.

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INTRODUCTION AND PROCEDURE

As a result of action by the 1965 North Carolina General Assembly, an annual motor vehicle inspection program was initiated in February of 1966 and has been in operation and improved continuously since that date. The goal of this program is to reduce the number of mechanically unsafe vehicles on North Carolina roads and subsequently to reduce or eliminate those motor vehicle crashes caused by mechanical failures.

This report is a follow-up to a previous HSRC report[1] that presented statistics for the initial year of the program relative to failure rates and repair charges, and their relationship to vehicle age, mileage and presumed driving environment (*i.e.,* rural or urban, based on the owner's address). Because such detailed information is not routinely collected by the Department of Motor Vehicles, special arrangements were made to collect the station copies of the vehicle inspection receipt and statement (see Figure 1) for those vehicles inspected in December 1968, exactly two years after the first sample. These completed forms were then converted onto computer tape for subsequent processing and analysis, the results of which are given in this report.

This follow-up study is based on a sample of 76,668 privately-owned passenger cars (as compared to 47,402 in the previous study). Again, trucks, trailers, buses, and motorcycles were omitted from the study as well as all passenger cars for which the receipt information was incomplete. To examine failure rates for selected car models (Chevrolet, Ford, Plymouth, Corvair, Falcon, Valiant, and Volkswagen) completion of the vehicle identification number (V.I.N.) was essential to identify the make of the car. Once again a number of cars were omitted from the study when the validity of odometer readings was suspect. (See the shaded area of Figure 2.) Relatively old cars with very low odometer readings was omitted due to the likelihood of odometer "recycling". Similarly, new cars with inordinately high odometer readings were eliminated since the tenths' digit was likely recorded. These restrictions, coupled with the deletion of the oldest cars, reduced the sample size considerably, but it is hoped the sample retained the cars with the most reliable information.

The follow-up study examines the following: general trends over the five-year period since the initiation of compulsory annual motor vehicle inspection in North Carolina; specific item failure rates for the December 1968 sample by mileage and/or model year; rural-urban differences in item failure rates; car model differences for the models described previously; and initial public reaction to compulsory motor vehicle inspection. The results of statistical tests comparing the two samples (December 1966 and December 1968) are given when appropriate.

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1 cf. Donald W. Reinfurt and Edward A. Pascarella, *Periodic Motor Vehicle Inspection in North Carolina: A Descriptive Study.* (Chapel Hill, N.C.: The University of North Carolina Highway Safety Research Center, 1969).

NORTH CAROLINA DEPARTMENT OF MOTOR VEHICLES

RECEIPT AND STATEMENT COVERING VEHICLE INSPECTION

OWNER JOHN THOMAS DOE

ADDRESS 111 FIRST STREET

CITY ANYWHERE, N.C.

LICENSE PLATE	MAKE OF VEHICLE	YEAR	VEHICLE IDENTIFICATION NUMBER
AK-1661	FORD	65	63K063665

MILEAGE: 43,731

TYPE OF VEHICLE: ☑ AUTO ☐ TRUCK ☐ TRAILER ☐ STA. WAGON ☐ BUS ☐ MOTORCYCLE

SAFETY EQUIPMENT	APPROVED INITIALLY	DISAPPROVED INITIALLY	CORRECTED DURING INSPECT.	REINSPECTED AND APPROVED
HEADLIGHTS		X	✓	
BEAM INDICATOR LIGHT	✓			
PARKING LIGHTS	✓			
LICENSE PLATE LIGHT	✓			
TAIL LIGHTS	✓			
STOP LIGHTS		X	✓	
CLEARANCE LIGHTS				
DIRECTIONAL SIGNALS	✓			
FOOT BRAKE	✓			
EMERGENCY BRAKE	✓			
STEERING MECHANISM	✓			
WINDSHIELD WIPER	✓			
HORN	✓			

INSPECTION FEE COLLECTED $ 1.50 REPAIR CHARGE MADE $ 1.00

STATION NO.	DATE	MECHANIC'S SIGNATURE
6851	12-26-69	William J. Smith

INSPECTION NO. 2936147 CERTIFICATE

REINSPECTION DATE	MECHANIC'S SIGNATURE

DISAPPROVED EQUIPMENT MAY BE REPAIRED BY THE OWNER OR AT A FIRM OF THE OWNER'S CHOICE AND BE RE-INSPECTED FREE OF CHARGE WITHIN 90 DAYS UPON PRESENTATION OF THIS RECEIPT TO THE SAME STATION CONDUCTING THE ORIGINAL INSPECTION; HOWEVER, THE INSPECTION DEADLINE IS NOT EXTENDED. OPERATION WITHOUT CURRENT "INSPECTION CERTIFICATE" OR DEFECTIVE EQUIPMENT SUBJECTS THE OPERATOR TO ARREST ACTION. INSPECTION FEE $1.50

YOUR SAFETY IS ON THE LINE! A246513

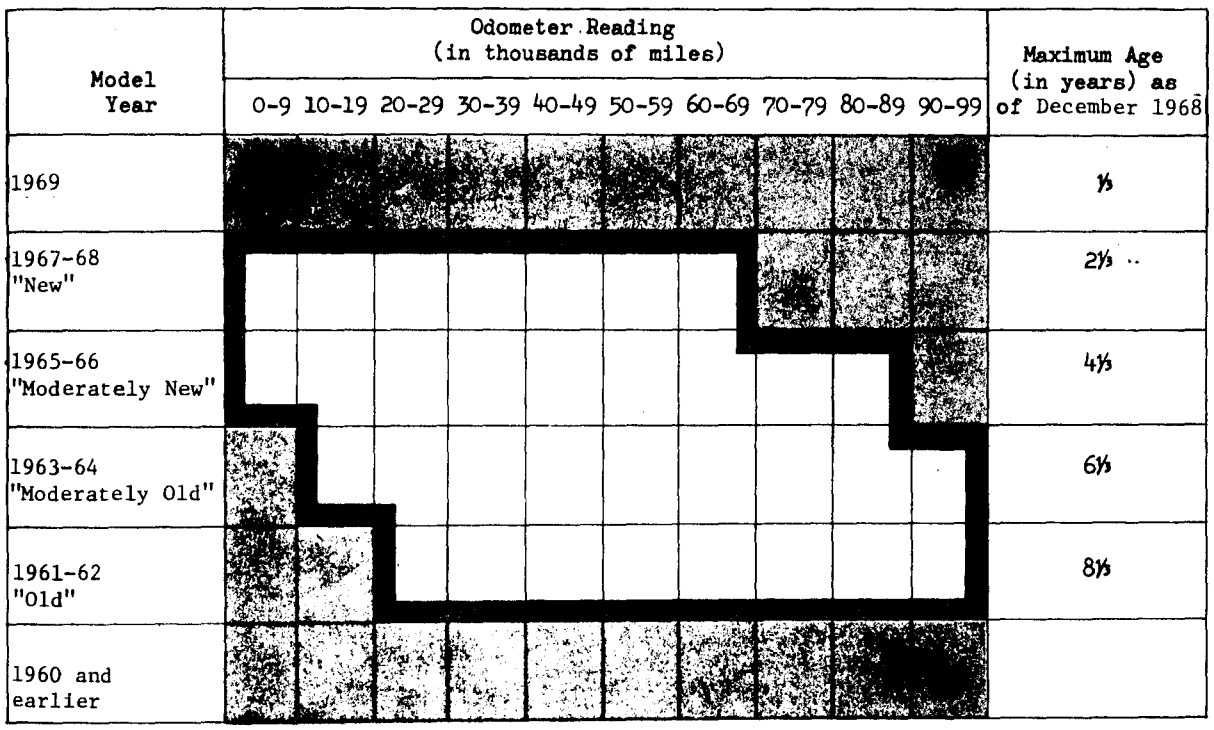
MOORE BUSINESS FORMS, INC., RALEIGH, N. C. M

FIGURE 1: VEHICLE INSPECTION RECEIPT

RESULTS

Annual Summary Results

The information presented in Table 1 was provided by the North Carolina Department of Motor Vehicles. As in the previous inspection report, there is generally a downward trend in failure percentages over the entire five-year period during which the program has been in operation. With two minor exceptions, the trend is uniform. There is an elevation in the windshield wiper failure rate for 1968 due primarily to a revision in the inspection requirement to include *both* wipers if the vehicle was originally equipped by its manufacturer with wipers on both the left and right sides. Prior to 1968, only the wiper on the driver's side of the vehicle was required to be in good working condition.



(Shaded region omitted from the major portion of this study)

FIGURE 2: STUDY DESIGN

Table 1: Annual summary statistics for the North Carolina motor vehicle inspection program

	1966	1967	1968	1969	1970
Total Number of Vehicles Inspected	2,206,553	2,331,124	2,497,797	2,596,355	2,694,061
Defective Items:					
Lights	1,341,154 (60.78%)*	821,891 (35.26%)	725,648 (29.05%)	686,239 (26.43%)	709,942 (26.35%)
Directional Signals	130,784 (5.92%)	121,706 (5.22%)	128,409 (5.14%)	120,101 (4.63%)	115,781 (4.30%)
Brakes	197,139 (8.93%)	142,613 (6.12%)	134,314 (5.38%)	110,239 (4.25%)	99,950 (3.71%)
Steering	55,199 (2.50%)	30,252 (1.30%)	27,224 (1.09%)	21,037 (0.81%)	19,436 (0.72%)
Windshield Wipers	66,332 (3.00%)	61,940 (2.66%)	99,018 (3.96%)	100,698 (3.88%)	98,535 (3.66%)
Horn	36,890 (1.67%)	29,900 (1.28%)	31,107 (1.25%)	28,801 (1.11%)	28,400 (1.05%)
Tires	†	†	†	55,940† (2.15%)	75,346 (2.80%)
Repair Charge per Inspected Vehicle**	$1.85	$0.99	$0.87	$0.95	$1.00

*Item failure rate = $\frac{\text{number of vehicles with defective item}}{\text{total number of vehicles inspected}}$

**Repair charge per inspected vehicle = $\frac{\text{total repair charges assessed}}{\text{total number of vehicles inspected}}$

†Tires required to be inspected as of the middle of May, 1969

The second exception appears in the category for tires. Since inspection of tires commenced around the middle of May, 1969, the corresponding failure rates were derived from less than eight months of tire inspections. Assuming that the same number of inspections were carried out each month in 1969, the failure rate for those cars with tires inspected (*i.e.,* those inspected after May 15, 1969) was approximately 3.45%. Thus, the downward trend actually exists for tire failure rates.

The impressive drop in the failure rate for lights after the first year has been replaced by a more modest but consistent annual reduction. It would appear that having light failures (primarily headlight) at the time of initial inspection subsequently has rendered the motorist more attentive to the lighting condition of the vehicle. To a lesser extent, the same holds true for the other inspection items.

The mandatory inspection fee added to the repair charge per inspected vehicle reflects the cost of motor vehicle inspection (M.V.I.) to North Carolina's motoring population. There is, however, an important omission from the repair charge per inspected vehicle. This figure does not include costs for repairs made elsewhere (*i.e.,* where the repairs are made somewhere other than where the inspection was carried out). Thus this is a conservative estimate of the dollar cost of M.V.I. Note the sudden increment in repair charge per inspected vehicle in 1969 after several decrements. This is most likely due to the addition of tires to the list of items that were inspected; it is conjectured that, although the majority of people probably have tires replaced or repaired elsewhere, the number of tires replaced at the inspection station is sufficient to account for the increment. The continued rise for 1970 probably reflects *all* vehicles being subject to tire inspections.

The Department of Motor Vehicles continues to compile monthly tabulations by individual inspection station within each county in North Carolina for each of the entries in Table 1. However, to examine item failure rates as related to vehicle age and/or mileage and to investigate overall performance two years into the program, a special sample of inspection receipts was collected which included all of the vehicles inspected in North Carolina during the month of December, 1968.

Distribution of the Sample by Mileage and Model Year

Figure 3 (see also Table A-1 in the Appendix) presents the mileage distributions by model year of vehicle for the 76,668 privately-owned passenger cars in the December, 1968, sample. As in the previous study, two-year intervals were selected to contrast four different ages in the life of the vehicle and will be referred to as "New" (*i.e.,* 1967-1968), "Moderately New" (*i.e.,* 1965-1966), "Moderately Old" (*i.e.,* 1963-1964), and "Old" (*i.e.,* 1961-1962).

It is clear from Figure 3 that the truncation of the sample has removed the majority of the "problem" vehicles from the study (*i.e.,* those older cars with recycled odometers and those newer cars with the sixth or tenths' digit recorded). Prior to trunction, there was a heaping of older cars in the lower mileage categories and the newer cars in the higher mileage categories.

Ideally, the cars in the truncated portion could be redistributed into the opposite end of the mileage spectrum and hence not be lost from the study. Examination of the various item failure rates indicates that not all of the cars in the region in question should be redistributed (*e.g.,* some of the Old cars had indeed gone less than 20,000 miles). Since there is no way of ascertaining which cars should be redistributed along with their associated item failures, it was deemed best to eliminate them from the study. The result is reliable inspection information on 76,668 privately-owned passenger cars.

as of the middle of May, 1969

*Item failure rate = $\frac{\text{total number of vehicles inspected}}{\text{total number of vehicles inspected}}$

**Repair charge per inspected vehicle = $\frac{\text{total repair charges assessed}}{\text{total number of vehicles inspected}}$

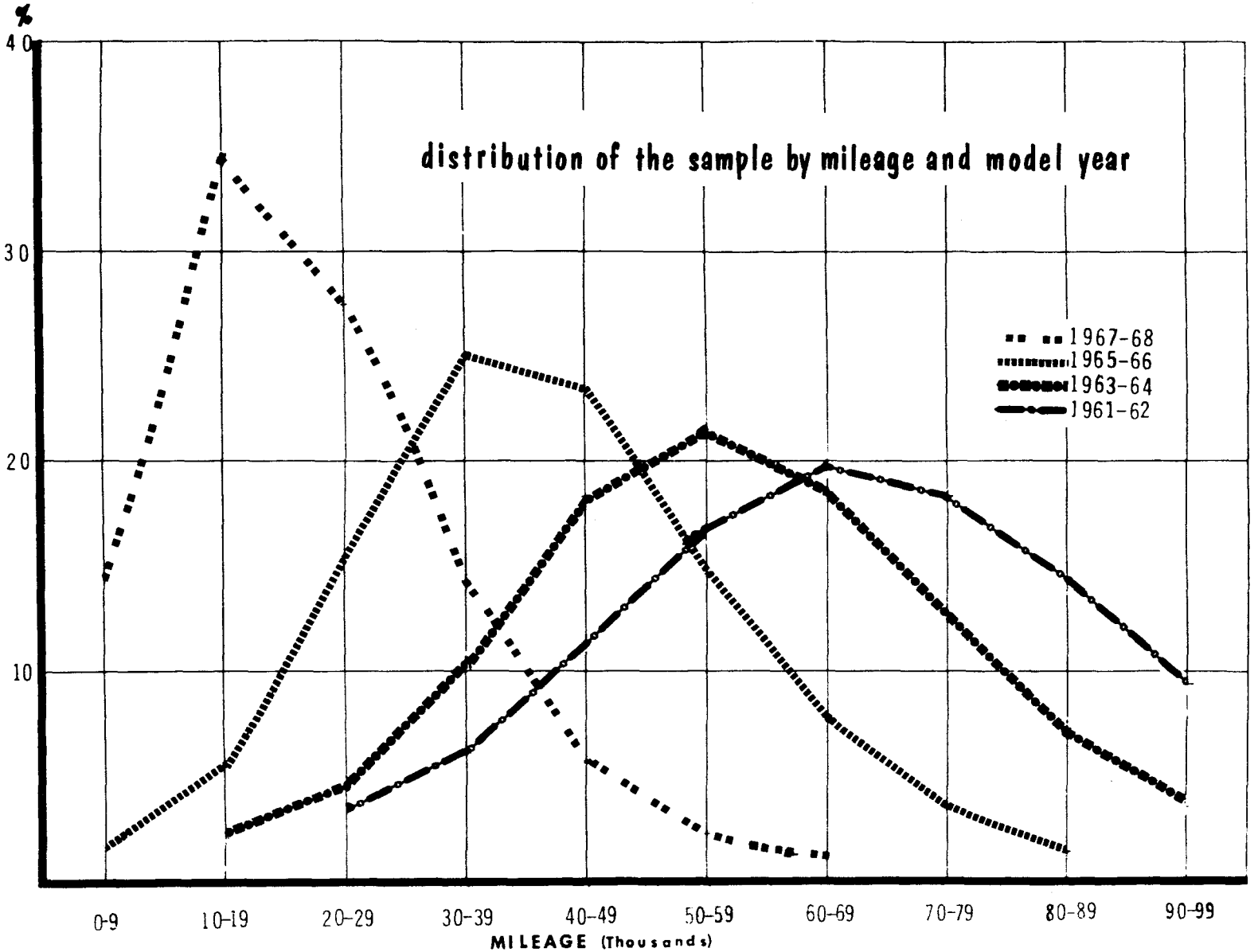


FIGURE 3: DISTRIBUTION OF THE SAMPLE BY MILEAGE AND MODEL YEAR

From Table A-1, it is seen that the overall median mileage is slightly under 42,000 miles or approximately 1000 miles less than in the previous study. As the oldest cars with predominantly recycled odometers have been eliminated from the study, the median mileage of 42,000 miles is undoubtedly an underestimate for the entire sample of cars inspected in December, 1968. This is comparable to the 43,000 median mileage observed previously. The median mileages for the New, Moderately New, Moderately Old, and Old categories are 20,000, 40,750, 56,500 and 66,000, respectively.

The 1965 model year represents the median age for these 76,668 cars inspected in December, 1968; *i.e.*, about 50% of these cars were at least three years old. This is comparable to the previous results where, as before, no cars over 8 1/3 years of age were studied.

As would be expected, the dispersion (or variance) of mileages within car groups increased with increasing car age.

FIGURE 3: DISTRIBUTION OF THE SAMPLE BY MILEAGE AND MODEL YEAR

Overall Failure Rates and Average Repair Charges

In the initial year of the program (1966), less than one out of every three cars had *all* items in satisfactory condition. Here, two years later, the situation is reversed with about two out of every three cars having *all* items passing inspection. Presumably, inspection standards have remained uniform. Thus, it would appear that compulsory M.V.I. has made the car owner more conscious of the condition of those items subject to inspection, thereby taking better care of these items when they do fail. In addition, the initial inspection undoubtedly detected and corrected some failures which just have not recurred. In fact, even the Old cars (1959-60 models) in the previous study showed a marked decline in failure rates over the two-year period for all items except the windshield wiper and horn even though they were now two years older.

In December, 1966, the mean percentage of cars with at least one initial failure item rose steadily with age of vehicle from 59.5% to 78.8% and with mileage from 50.9% to 81.0%. In contrast, the overall failure rates for those cars inspected in December, 1968, ranged from a low of 24.4% for the New cars to a high of 44.7% for the Old cars and from a low of 19.6% for the lowest mileage vehicles to a high of 47.7% for the highest mileage vehicles.

As previously, there is a strong positive association between the increasing failure rates and increasing vehicle age and/or mileage. That is, the farther a car had traveled and/or the older the car was, the more likely it was that a failure would be recorded among the safety items inspected. The failure rate curves converge with increasing mileage (see Figure 4) indiciating that the mileage effect on the failure rates is not the same across all age groups (*e.g.*, accumulated mileage would seem to have the greatest effect on failure rates for the New cars as indicated by the slope of the corresponding curve). Thus, there is a joint effect (or interaction) of vehicle age and mileage on the overall failure rates.

The average repair charge (A.R.C.), as presented in Figure 5, is given by the ratio of the total repair charges indicated on the inspection receipts to the total number of vehicles for which repair charges were assessed and hence is different from the "repair charge per inspected vehicle" discussed in the previous section. As in the previous study, a small porportion of those vehicles that failed inspection had no repair charges recorded on the inspection receipt. If the repairs were not performed at this same inspection station, no repair charge would appear on the ticket. If the repairs were made at this same inspection station, either the mechanic neglected to record the charge or the repairs were so minor that no charge was made. Since these events are probably relatively infrequent, it appears that the A.R.C. is only a slight underestimate of the associated cost of repairs to those car owners whose cars failed inspection.

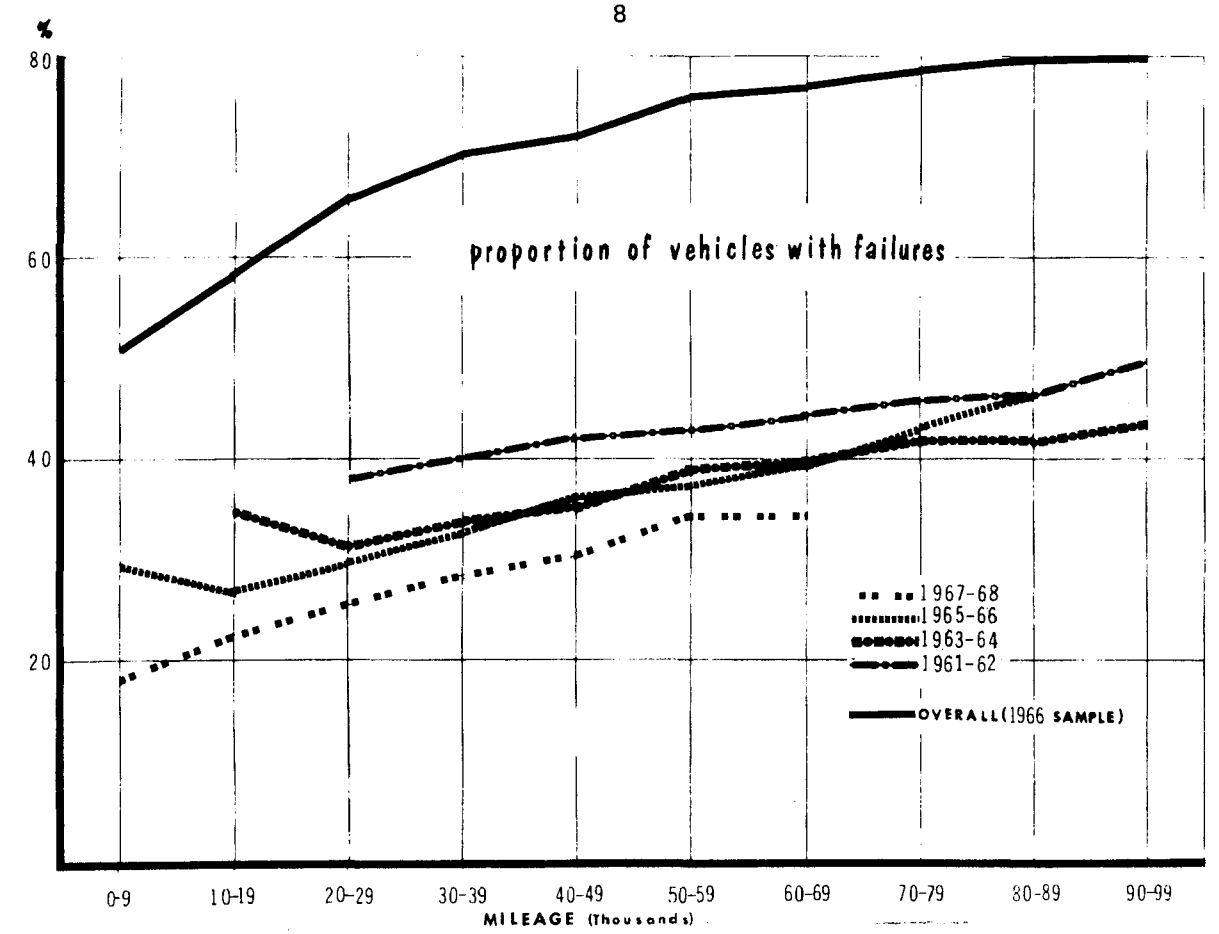


FIGURE 4: PROPORTION OF VEHICLES WITH FAILURES

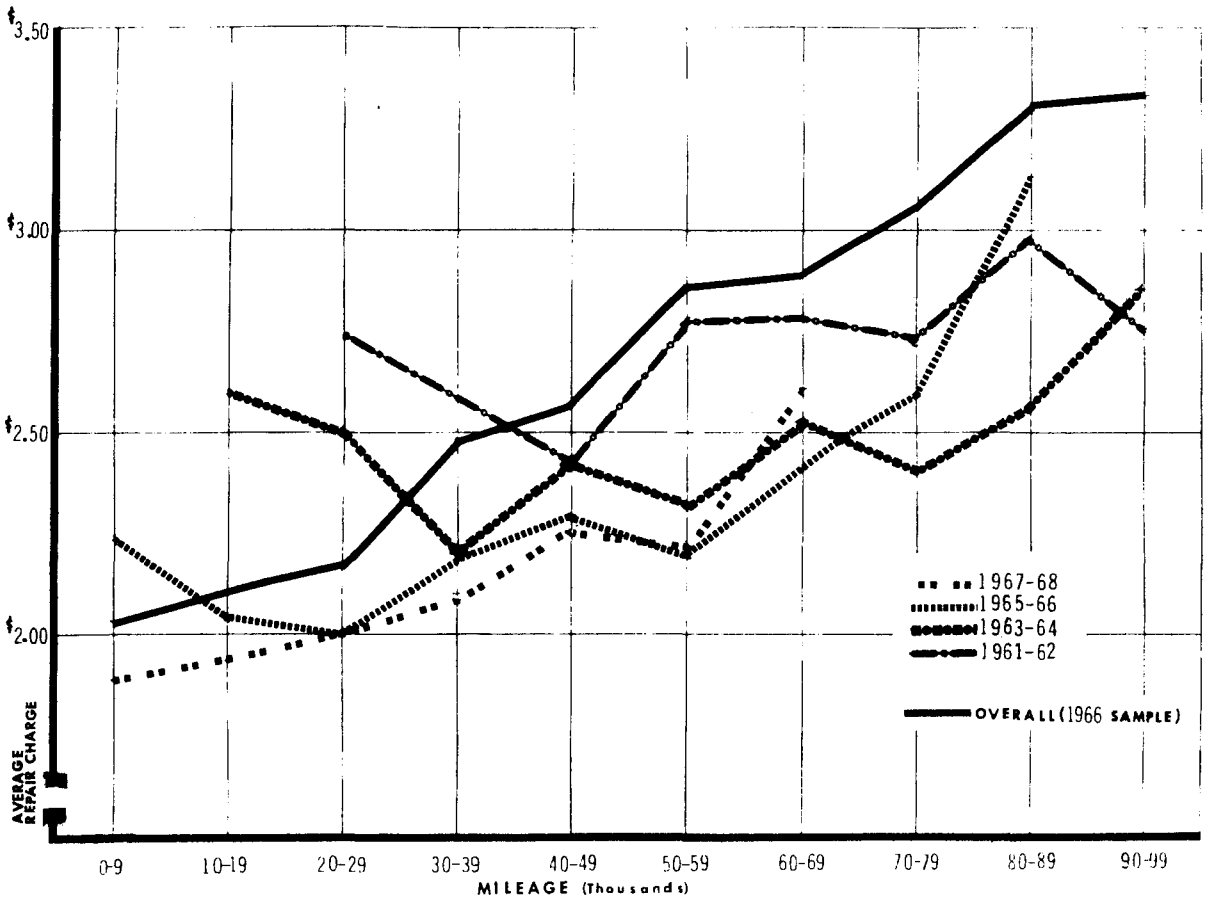


FIGURE 5: AVERAGE REPAIR CHARGE

Quite surprisingly, with the rising cost of living, the A.R.C. is generally *lower* than for the December 1966 sample. Evidently the major repairs predominated in the initial year of compulsory M.V.I. with lesser repairs being required in subsequent years. Again, there is a trend of increasing A.R.C. with increasing vehicle age (ranging from a law of $1.86 to a high of $2.81) and with increasing vehicle mileage (ranging from a low of $1.94 to a high of $2.83). The overall A.R.C. is $2.36 compared to $2.62 in the previous study.

Failure Rates for Individual Inspection Items

In this section, overall failure rates for the eleven inspection items are presented both by mileage and by model year comparing the results of the December 1968 sample with those from the initial year of inspection. In addition, the joint effect of vehicle age and mileage on the various item failure rates is examined.

In the previous report, a brief description of the inspection specifications was presented as each item was introduced. These specifications will not be repeated herein except for windshield wipers, which underwent a considerable change.

In general, the various regression analyses[2] that were performed revealed positive linear trends in item failure rates over both mileage and vehicle age, although the rate of increase (*i.e.,* slope of the curve) varied with the item being considered. Mantel-Haenszel tests[3] (aimed at relative risk of failure) indicated significantly reduced failure rates in December 1968 for nearly every item across both the mileage dimension and the model year dimemsion.

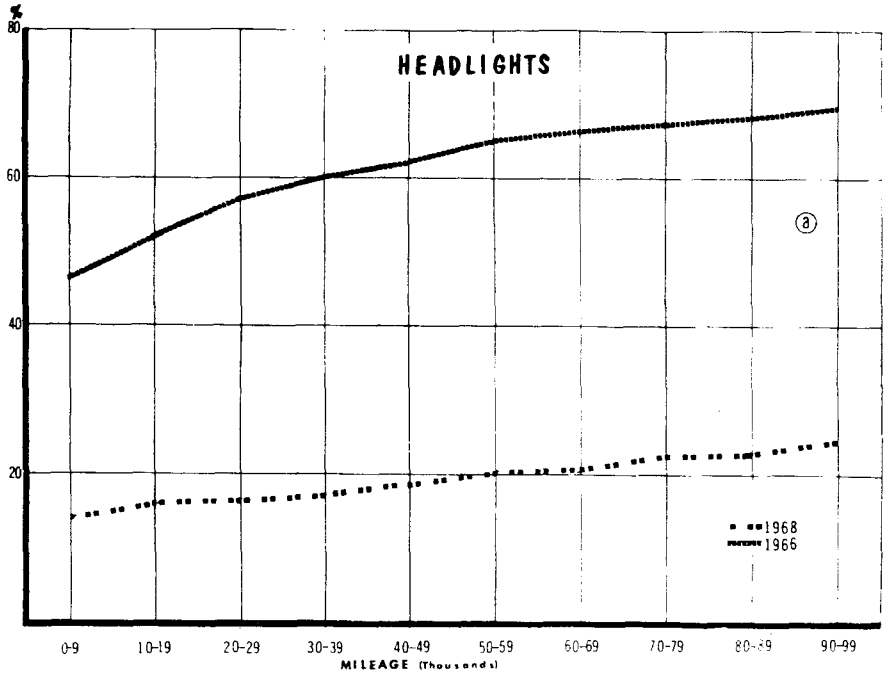
Headlights

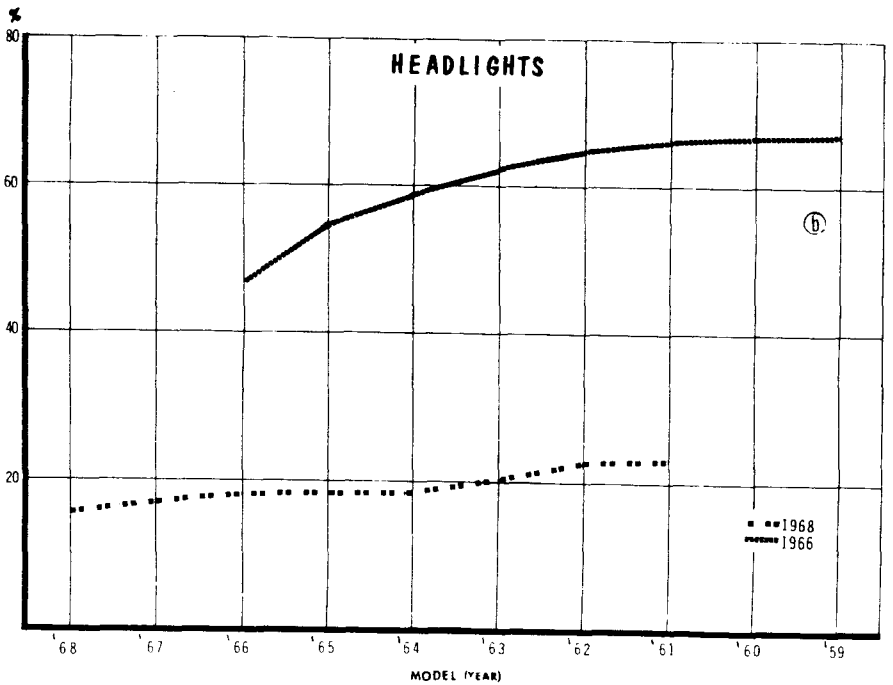
From Figures 6a and 6b, it is clear that there is a significant reduction in the headlight failure rate for the 1968 inspection sample. Whereas in 1966 the overall failure rate was 61.0% with a range of 45.9% to 69.8%, two years later the failure rate had dropped to an overall 18.7% with a range of 13.6% to 26.1%. Throughout both the mileage and vehicle age spectra, the headlight failure rates have been reduced by about two-thirds.

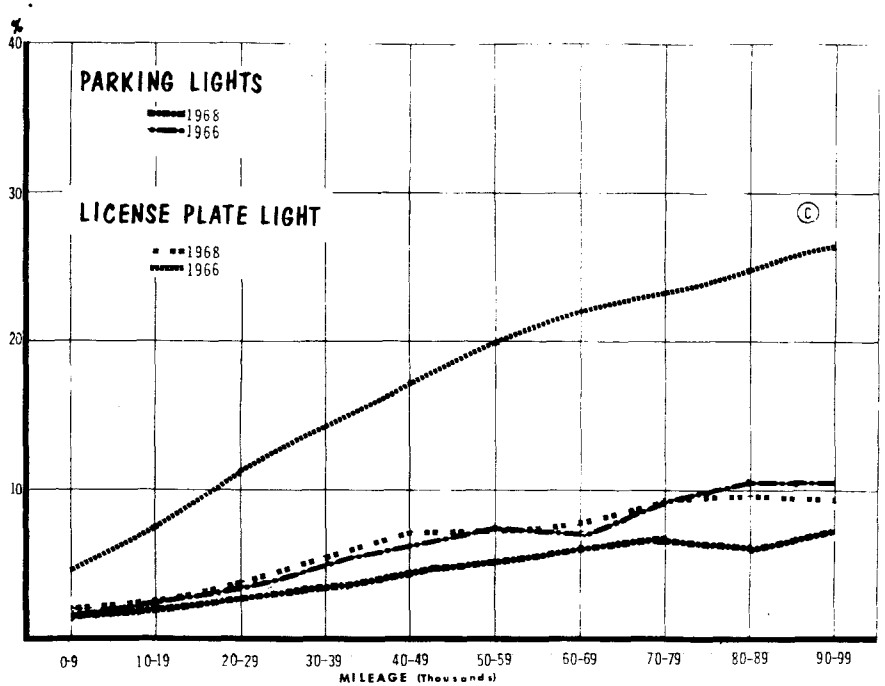
Figure 7a displays the degree of interaction between age of car and mileage on headlight failures. It might be useful to keep a few guidelines in mind when interpreting the graphs dealing with interaction. If there were little or no interaction between age and mileage on a particular failure rate, the graph would consist of essentially four parallel lines which would slope upward as mileage increased. The positive slope would indicate that as mileage increased the failure rates increased and that different age cars had different failure rates; in addition the lines being parallel would indicate that the effect of mileage is the same regardless of how old the cars are (*e.g.,* if an Old car with 20 thousand miles had a failure rate twice as high as a Moderately New car with 20 thousand miles, then an Old car with 70 thousand miles would have a failure rate twice as high as a Moderately New car with 70 thousand miles). On the other hand, if there were a consistent interaction between age and mileage, the four lines of the graph would tend to merge. If the merging occurred with increasing mileage, this would indicate that the more miles a car has on it the less difference it makes on the failure rates whether the car is old or new. Figure 7a indicates that there is considerably less interaction for headlight failures in the 1968 sample than in the 1966 sample. One explanation could be that many headlights were being corrected for the first time in 1966. In 1968, on the other hand, headlight failures were probably sporadic occurrences and thus there was less likelihood of a pattern of interaction emerging.

2 Norman R. Draper and Harry Smith, Jr., *Applied Regression Analysis* (New York: John Wiley & Sons, 1967) p. 7 *passim.*

3 Nathan Mantel and William M. Haenszel,"Statistical aspects of the analysis of data from retrospective studies of disease" *Journal of the National Cancer Institute* 22 (1959), p. 719-748.







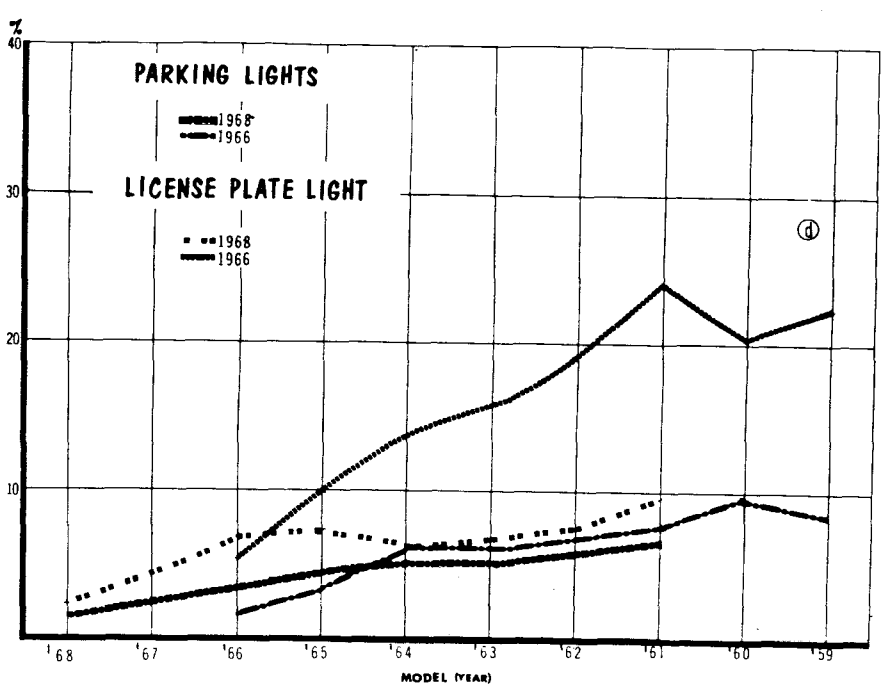
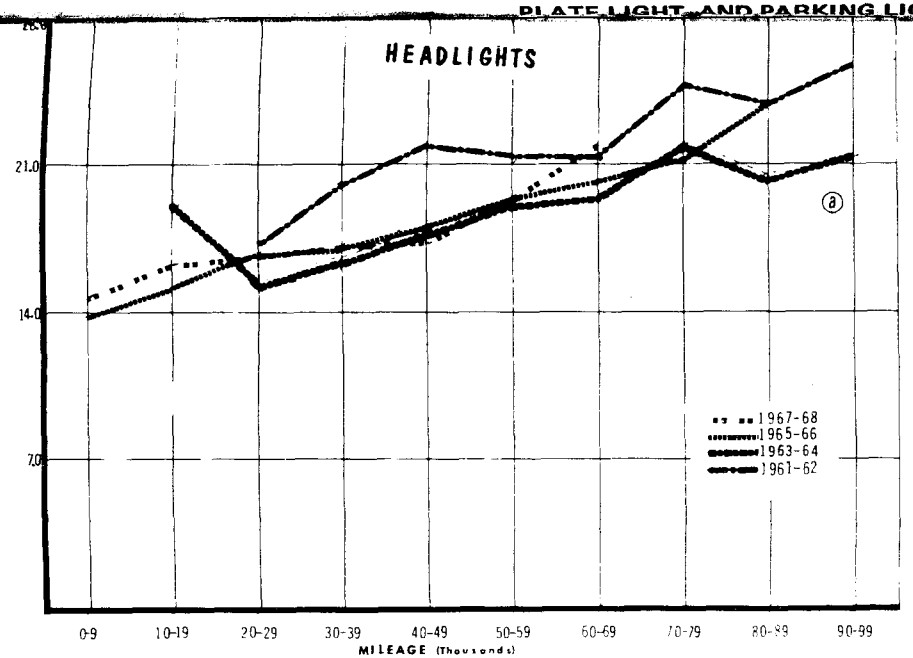
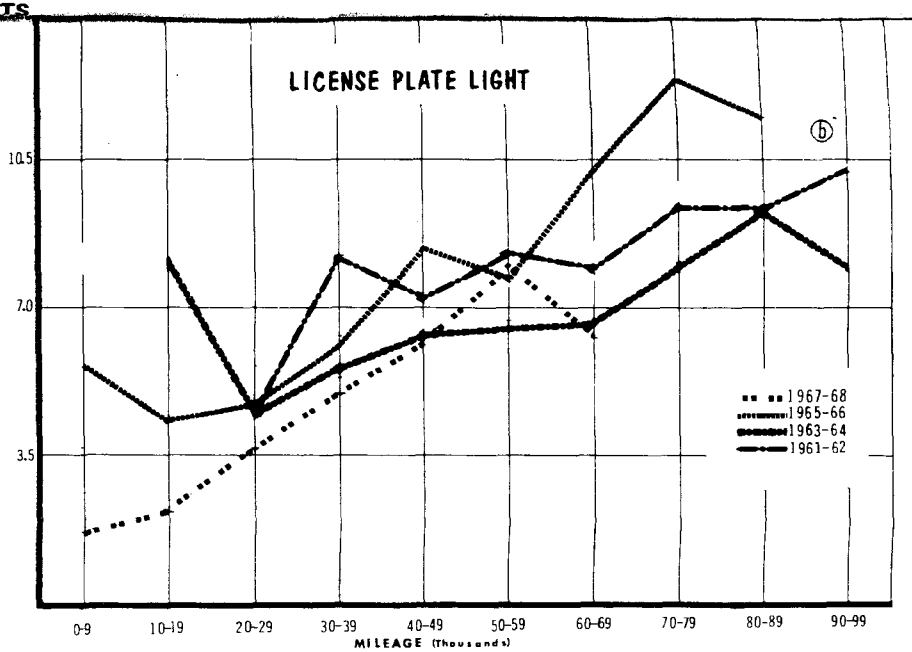


FIGURE 6 a-d: FAILURE RATES BY MILEAGE AND BY MODEL YEAR FOR HEADLIGHTS, LICENSE PLATE LIGHT, AND PARKING LIGHTS

HEADLIGHTS

FIGURE 6 a-d: FAILURE RATES BY MILEAGE AND BY MODEL YEAR FOR HEADLIGHTS, LICENSE PLATE LIGHT, AND PARKING LIGHTS





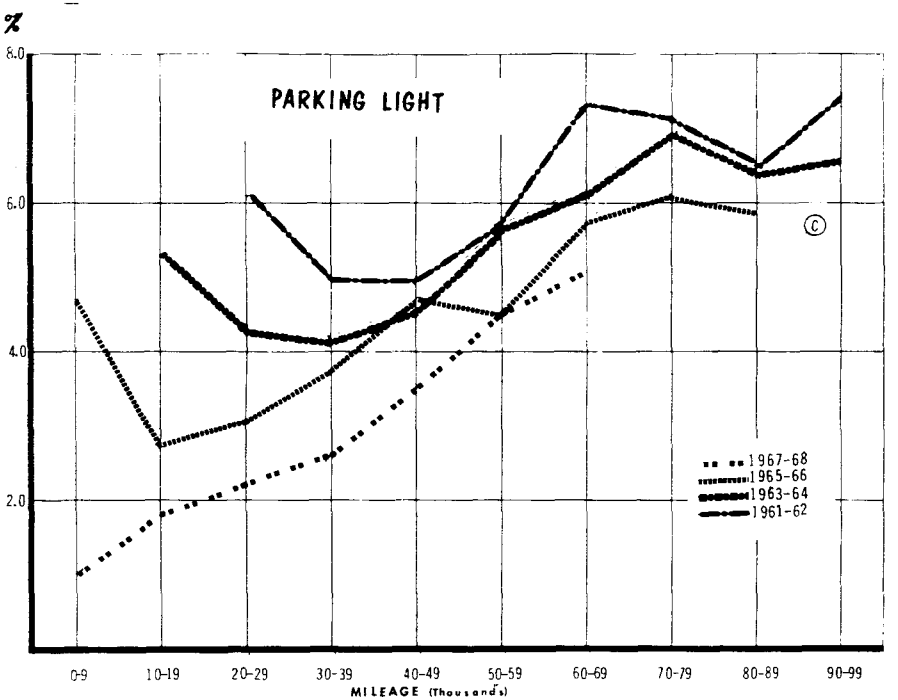


FIGURE 7 a-c: FAILURE RATES BY MILEAGE AND MODEL YEAR FOR HEADLIGHTS, LICENSE PLATE LIGHT, AND PARKING LIGHTS

It should also be noted that the failure rate curves by model year (particularly for the Old and Moderately Old cars) occasionally show a brief initial decline. This is most likely due to some vehicles with recycled odometers remaining in the sample in these low mileage categories.

Headlights continue to have the highest failure rates of any equipment component subject to periodic inspection. Is this due to inherently greater failures for this item? Is this due to the mechanical and structural features associated with the alignment process? Headlights represent an area where special work is probably needed to reduce the failure rates regardless of the reason for the high rates.

License Plate Light

The significant reduction of license plate light failures for the 1968 sample over the 1966 sample is obvious from Figure 6c. The overall failure rates decreased from 15.9% for the 1966 sample to 6.0% for the latter sample. The 1968 failure rates were consistently lower for each mileage group and remained more constant over mileage than the 1966 rates. The 1968 failure rates are considerably lower (usually less than half as high) for all model years with the exception of the 1966 model (see Figure 6d), and, as was true for mileage, the 1968 rates are more constant over model year than the previous sample. The fact that the 1966 model represented the newest cars in the 1966 sample, whereas these model cars were 2 years old in 1968, explains the higher rates for this model in the 1968 sample. The age of the car should be kept in mind when interpreting all failure rates by model year; that is, the 1966 cars in the 1966 sample are comparable to the 1968 cars in the 1968 sample, the 1965 cars in the 1966 sample are comparable to the 1967 cars in the 1968 sample, and so forth.

Figure 7b indicates little consistent interaction between age and mileage and, as mentioned previously, the 1968 failure rates appear more constant than the 1966 failure rates regardless of age of car and mileage.

Parking Lights

Figure 6c indicates that, although the 1968 failure rates are consistently and significantly lower than the 1966 rates, the percentage decrease (28.8%) is small relative to the percentage decrease seen in headlight failures (69.3%) and license plate light failures (62.3%). (The overall parking light failure rates decreased from 5.9% in 1966 to 4.2% in 1968).

Figure 6d reveals the same situation as for license plate lights—the 1965 and 1966 models produced higher rates in the 1968 sample due to the relative ages of the cars. Taking age of the vehicle into account, the 1968 rates are consistently lower than the 1966 rates.

A good example of interaction is presented in Figure 7c. Model year appears to make a large difference in failure rates at the low end of the mileage scale whereas at the higher end of the scale, the model year appears to make much less of a difference (*i.e.*, the parking light failure rates for high mileage cars are about the same regardless of the age of the vehicle).

Stop Lights

The overall stop light failure rate was reduced from 3.8% in 1966 to 2.8% in 1968. Figure 8a indicates a typical pattern of increasing rates over mileage for both samples with a smaller slope for the more recent sample. At first glance, it appears from Figure 8b that the 1968 rates are higher than the 1966 rates. For model year this is generally true, but when the relative ages of the cars are considered (as discussed in the previous section) it is apparent that, for the same age car, the 1966 rates are consistently higher. Figure 9a reveals little consistent interaction between age and mileage. It would appear from the slopes of the curves that model of vehicle rather than mileage accounts for most of the difference in failure rates.

Tail Lights

The 1968 failure rates are significantly lower than the 1966 rates for each mileage category, with an overall reduction from 3.3% to 2.8% (see Figure 8a). Figure 8b indicates that this is the first item examined thus far for which the more recent failure rates by age of vehicle are not consistently lower than the earlier failure rates. The 1968 rates are higher for the new cars and one-year-old cars. The differences are so small, however, that they can probably be attributed to sampling variation. For the 1968 sample, the 1967-1968 model group has lower rates than the other three model groups. These three groups appear to be very similar over model year and mileage (see Figure 9b).

Foot Brake and Directional Signals

Figures 8c and 8d indicate that the failure rates for these two items follow similar trends. Both items demonstrate increasing rates over mileage for both inspection samples except for the more recent failure rates which are consistently and significantly lower. The overall failure rate for the foot brake decreased from 4.9% in 1966 to 3.0% in 1968; the overall failure rate for directional signals decreased from 5.4% in 1966 to 4.5% in 1968. Both items also demonstrate similar patterns for model year of car. For comparable model years (according to age of car), the 1968 rates are consistently lower than those in the earlier period. Both 1966 rates and 1968 rates increased with age, but the former rates increased at a much greater rate than the latter rates. Thus, for instance, a 5-year-old car in 1966 had a foot brake failure rate over twice as great as a 5-year-old car in 1968.

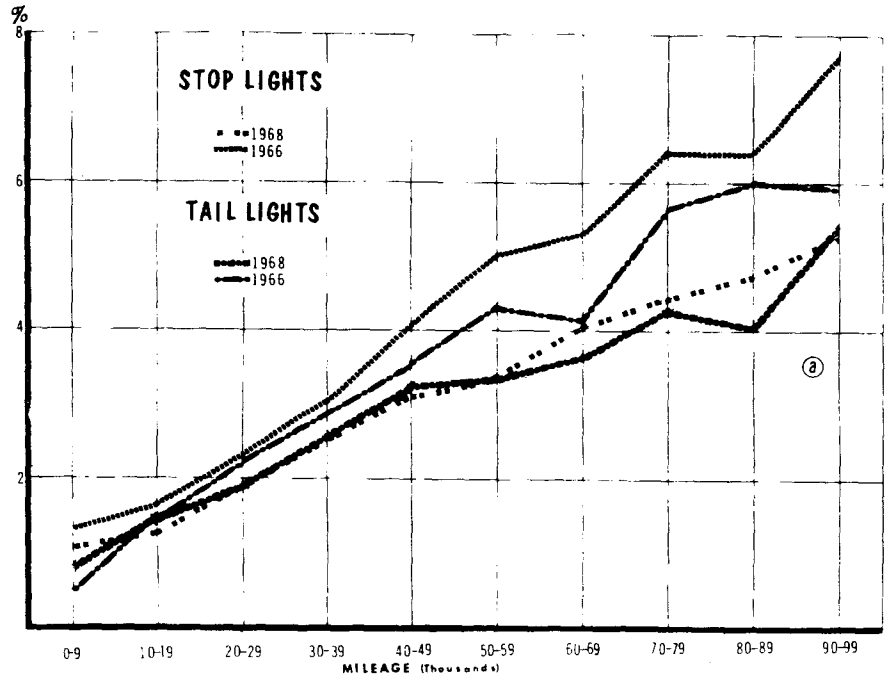
It can be observed from Figure 9c that age appears to be more important to foot brake failure rates than mileage. The directional signal rates also appear to be more affected by age than mileage and seem to group themselves into three model groupings instead of four (see Figure 9d).

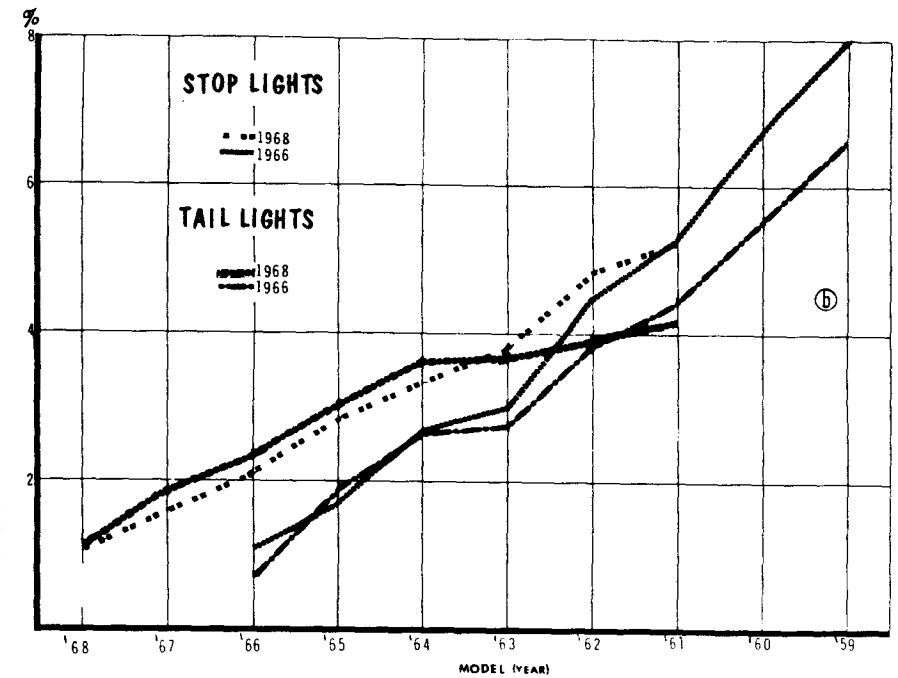
Windshield Wipers

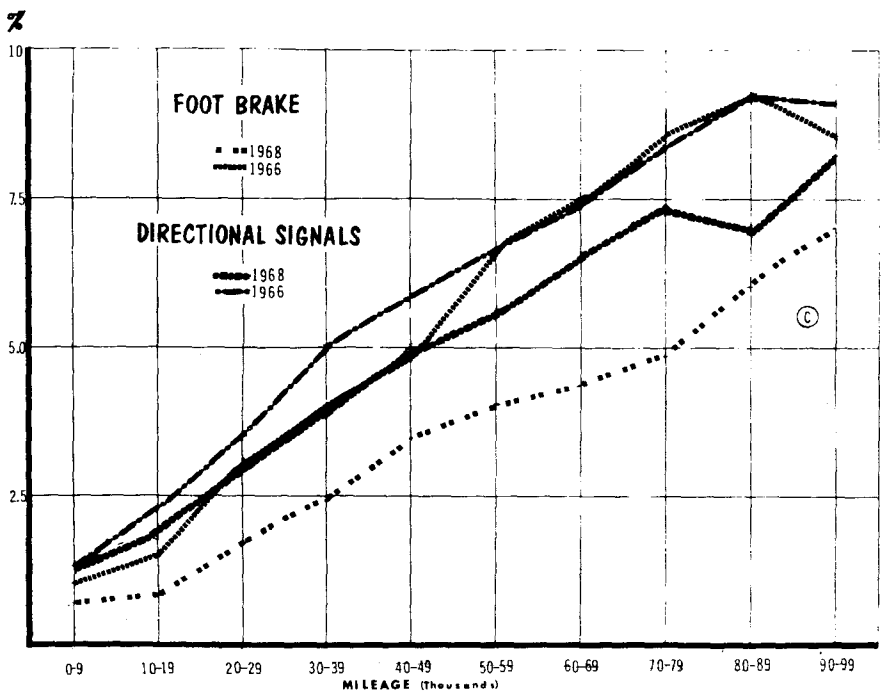
> All motor vehicles which are equipped with a permanent windshield shall be equipped with a device for cleaning snow, rain, moisture, or other matter from the windshield. If any vehicle is originally equipped by its manufacturer with wipers on *both* right and left sides, *both* wipers shall be in good working order.

This is the only item for which the 1968 rates are consistently and significantly higher than the 1966 rates for each mileage category (see Figure 10a). Both samples show considerable increases as mileage increases (from 0.8% to 6.2% for the 1968 sample and from 0.4% to 4.7% for the 1966 sample), with a 1968 overall rate of 3.4% compared to a 2.3% failure rate in 1966. Figure 10b reveals the same trend over model year—the 1968 rates are consistently higher for each model (as well as each comparable age car) than those for the 1966 sample. The contrast in trends for this item are certainly caused by the revision of the regulations; people in general would be less concerned about keeping the windshield wiper on the passenger's side in working order than on the driver's side.

Figure 11a indicates that for cars driven over 40 thousand miles, the 63-64 model cars have higher rates than the 61-62 models. These differences appear small and might possibly be attributed to sampling variability.







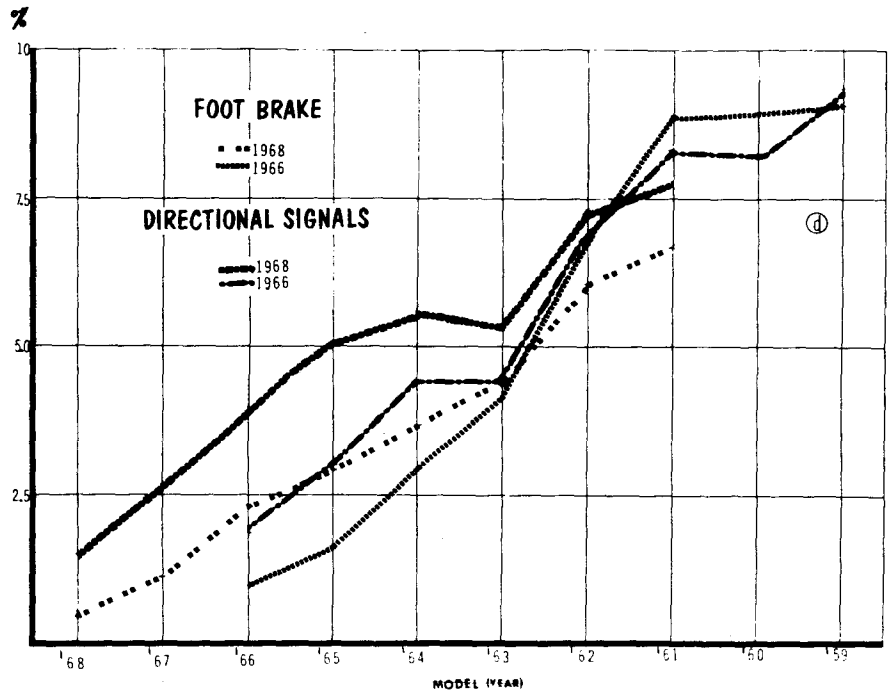
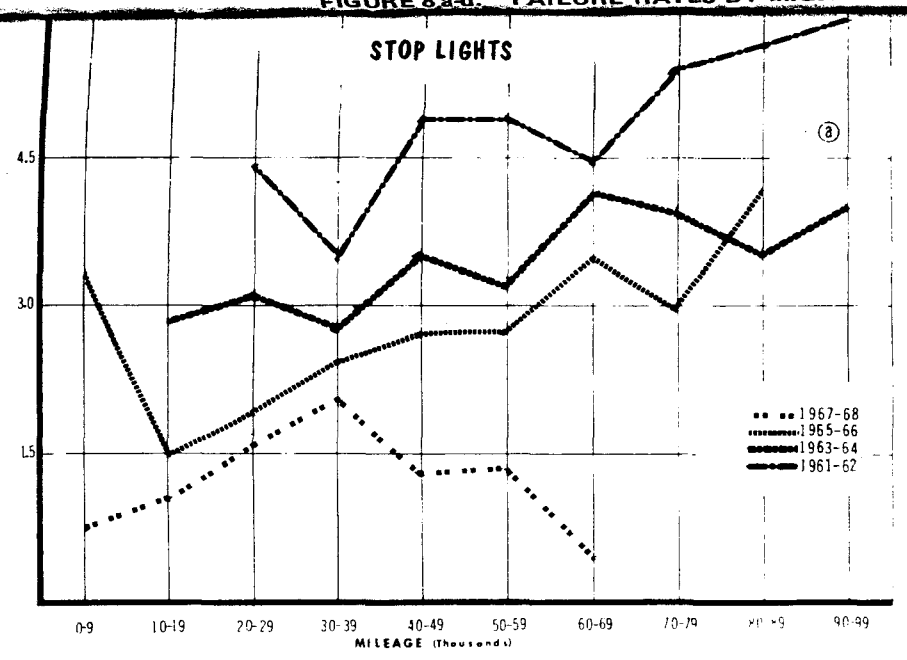


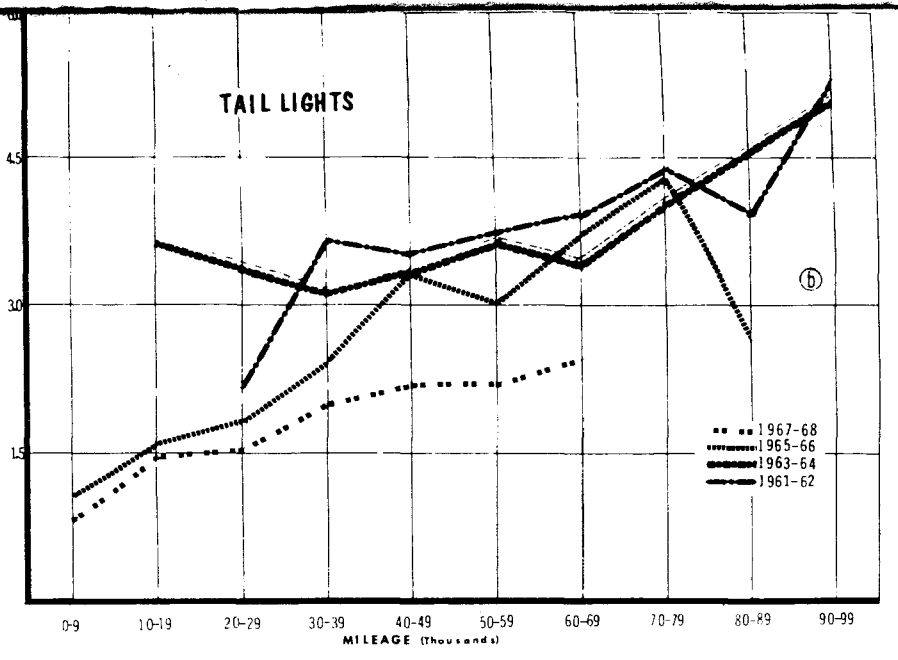
FIGURE 8 a-d: FAILURE RATES BY MILEAGE AND BY MODEL YEAR FOR STOP LIGHTS, TAIL LIGHTS,

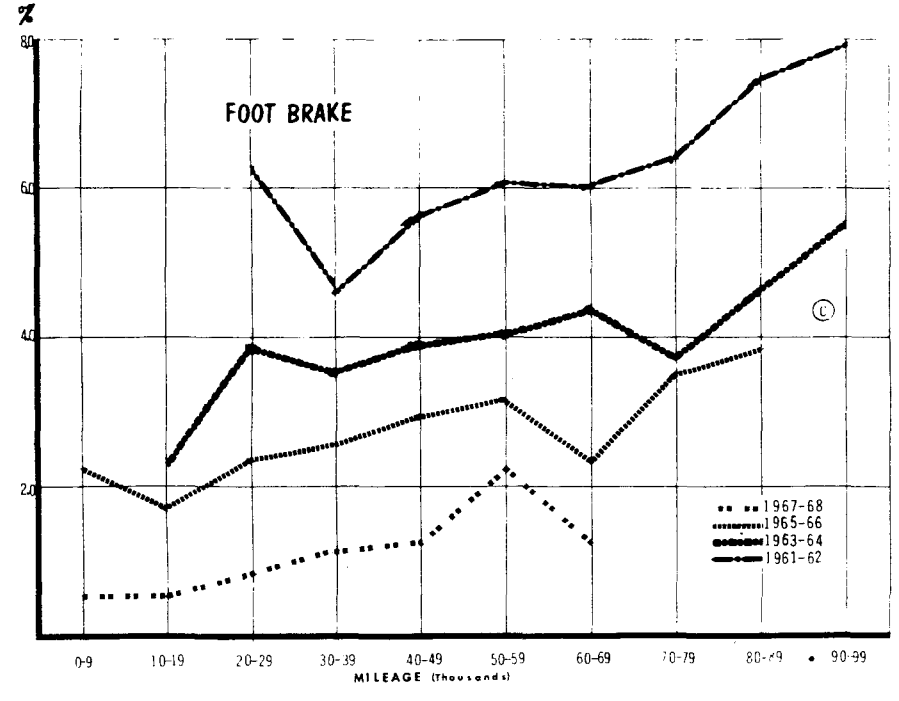
STOP LIGHTS

TAIL LIGHTS

FIGURE 8 a-d: FAILURE RATES BY MILEAGE AND BY MODEL YEAR FOR STOP LIGHTS, TAIL LIGHTS,







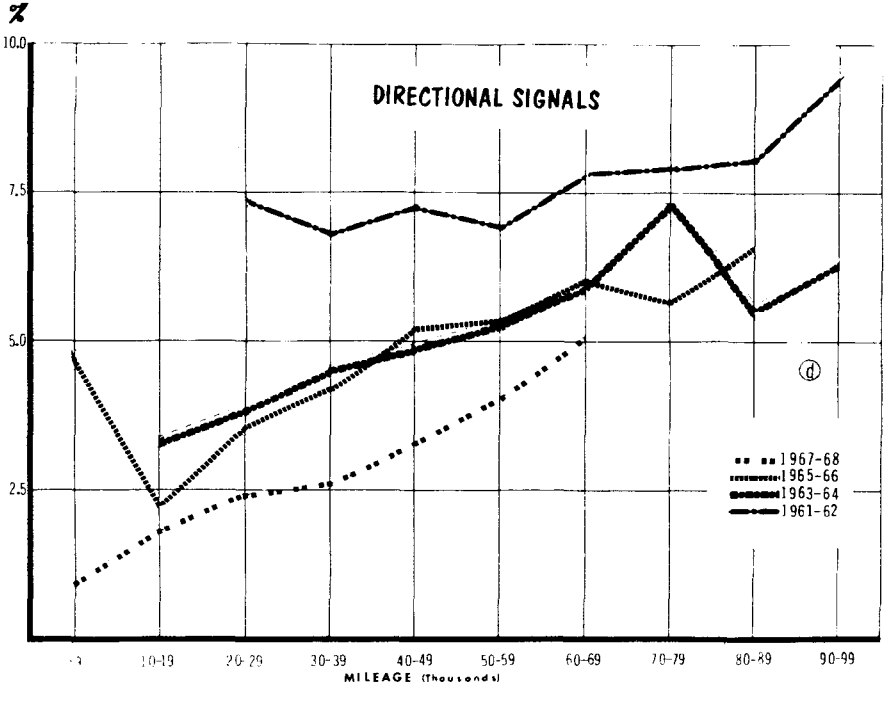


FIGURE 9 a-d: FAILURE RATES BY MILEAGE AND MODEL YEAR FOR STOP LIGHTS, TAIL LIGHTS, FOOT BRAKE, AND DIRECTIONAL SIGNALS

Horn

The 1968 overall failure rate (0.9%) for the horn is the second lowest failure rate, whereas it was the lowest failure rate in the previous study (1.0%)—the lowest 1968 rate is for steering (0.6%). The horn failure rates for both periods are very close for each mileage category, and any differences seen are probably random variations (see Figure 10a). Figure 10b indicates that, when the models are compared by age, any difference between the 1966 rates and the 1968 rates are also probably random variations. Hence, there was not much change in horn failure rates, but since the rates were so low to begin with there was little room for change (at least for a reduction in rates).

No unusual patterns are obvious from Figure 11b relative to the joint effect of age and mileage on the horn failure rates.

Steering

The 1968 failure rate (0.6%) for steering is the lowest overall rate of all items due for inspection. The 1966 steering failure rate was 1.4%, so there has been some improvement for steering (the improvement over the mileage dimension is significant). Figure 10c indicates that the former rates increased over mileage to a considerably greater degree than the latter rates (*i.e.*, the former increased from 0.3% to 3.4%; the latter from 0.2% to 1.4%). When age of car is considered, the 1966 rates are consistently equal to or greater than the comparable 1968 rates (see Figure 10d). An apparent recycling effect is occurring for the Moderately Old cars in the latter sample (see Figure 11c). No clear pattern of a joint effect of age and mileage on the steering failure rate is apparent.

Emergency Brake

Figure 10c shows that mileage appears to have had a much greater effect on emergency brake failures in the earlier sample than in the later one. The rates for 1966 ranged from 1.0% to 6.4% with an overall rate of 3.6%, while the 1968 rates ranged from 0.6% to 2.8% with an overall rate of 1.6%. Age also appears to have had a greater effect on brake failures in the first sample of inspection results (see Figure 10d). The 1966 rates by model year ranged from 1.1% to 6.8%; the corresponding 1968 rates ranged from 0.5% to 3.1%.

For some reason the '65-'66 model cars appear to have emergency brake failure rates consistently higher over the range of mileages than the '63-'64 models (see Figure 11d). The same phenomena was attributed to sampling variation when seen in windshield wipers; however, the difference for emergency brake failures appears to be more than sampling variation. The interesting aspect is that this same feature is apparent for the 1966 sample—the '65-'66 models are higher, although not as consistently higher, than the '63-'64 models.

Comparisons by Place of Residence

The same criterion used for the 1966 sample was used here to assign a car to either the urban or rural category—a car was considered urban if the driver listed either a street address or a post office box number in a North Carolina community with a population of at least 2,500 at the time of the 1960 census. Otherwise, it was considered a rural vehicle. As a result, about 48 percent of the vehicles in the sample were urban, and 52 percent were rural. Although both the 1966 sample and the 1968 sample consisted of about half rural and half urban cars, it is noteworthy that whereas in the 1966 sample slightly more than half were urban (52%), in the 1968 sample slightly more than half were rural.

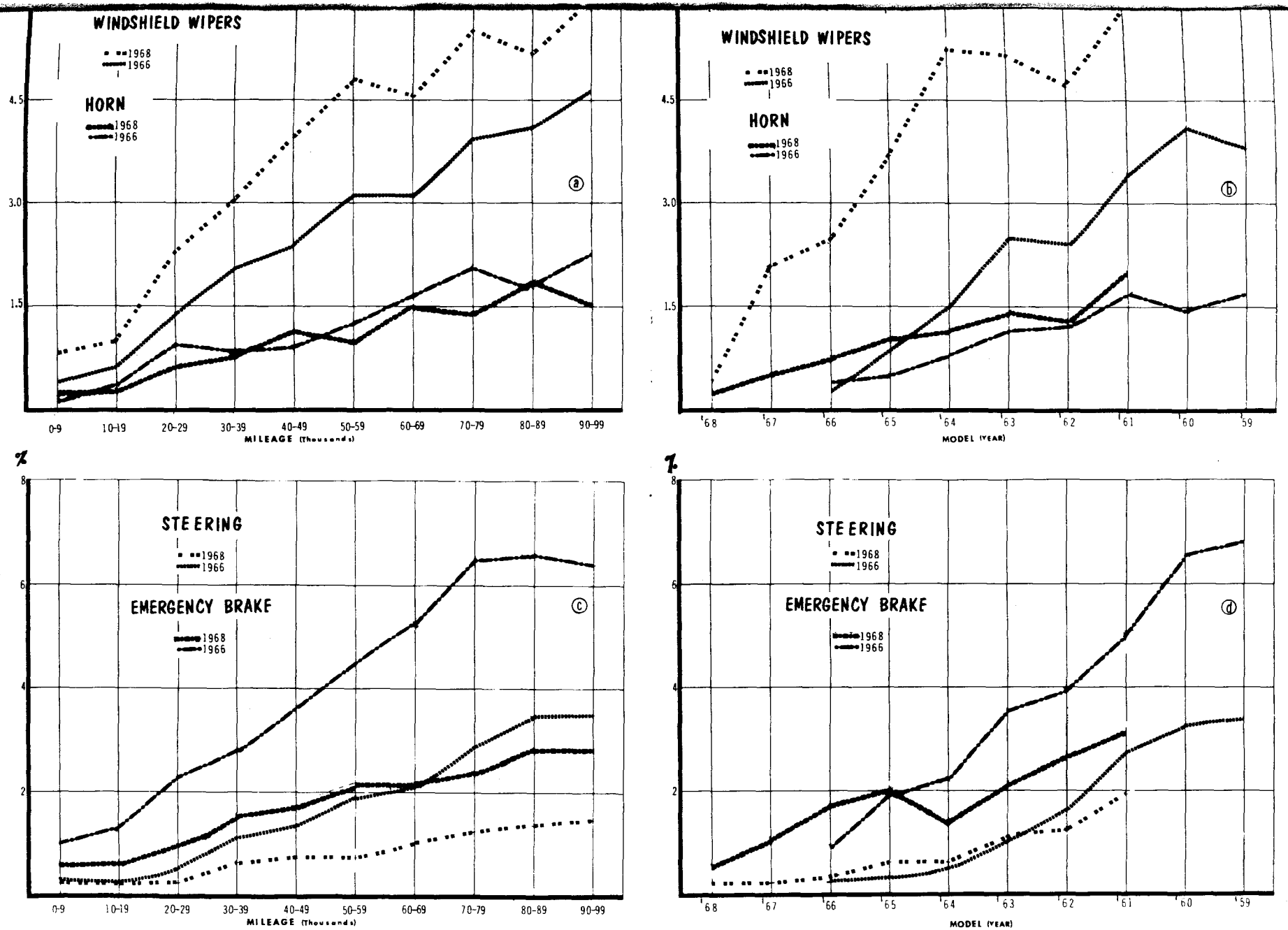
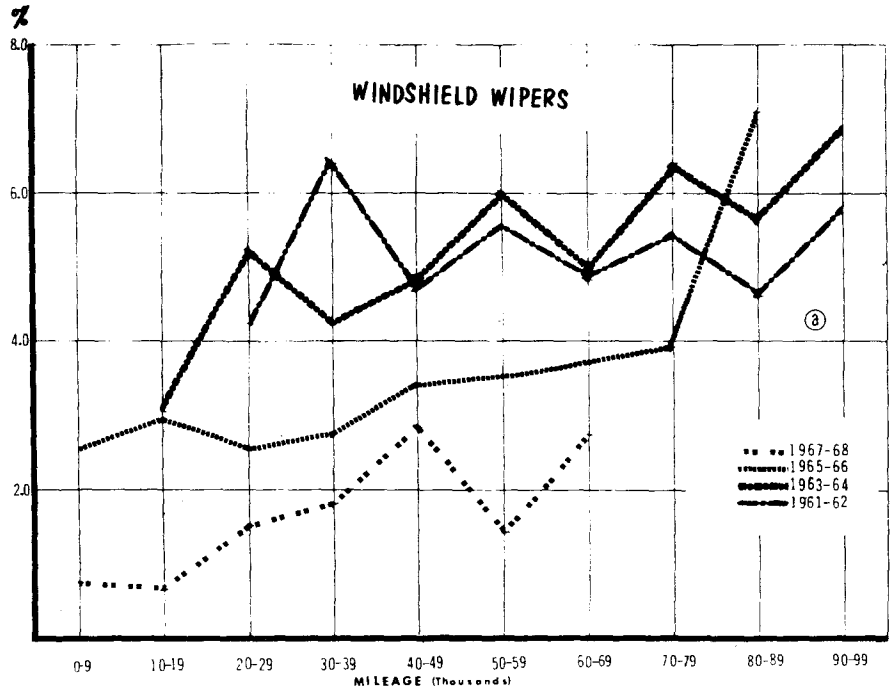
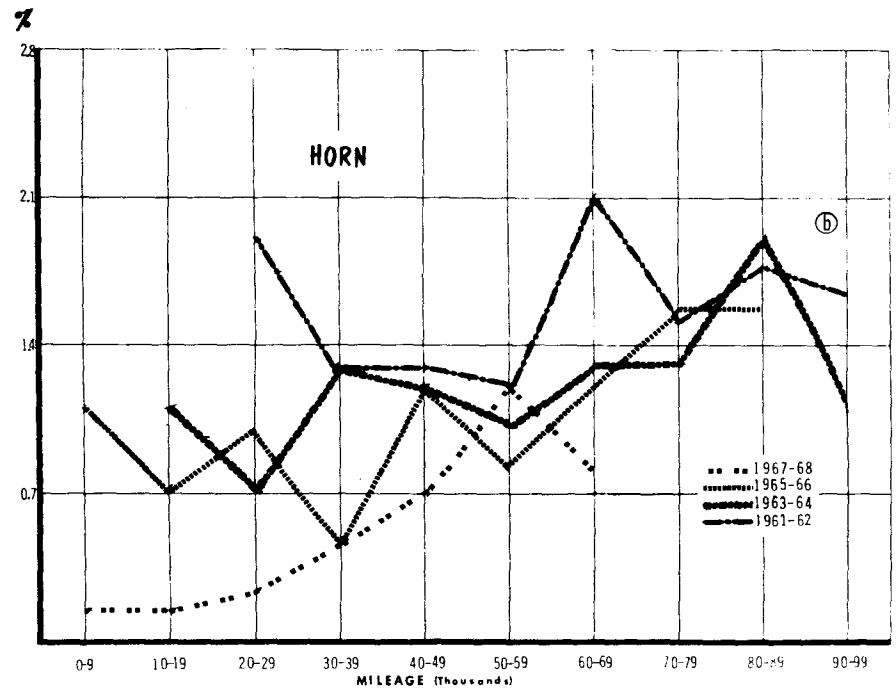
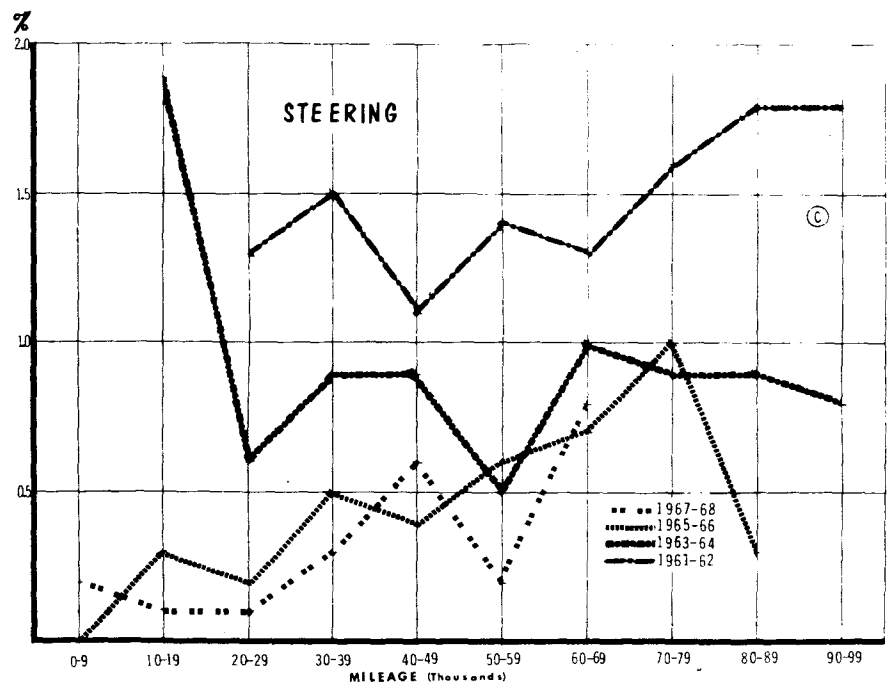


FIGURE 10 a-d: FAILURE RATES BY MILEAGE AND BY MODEL YEAR FOR WINDSHIELD WIPERS, HORN, STEERING, AND EMERGENCY BRAKE







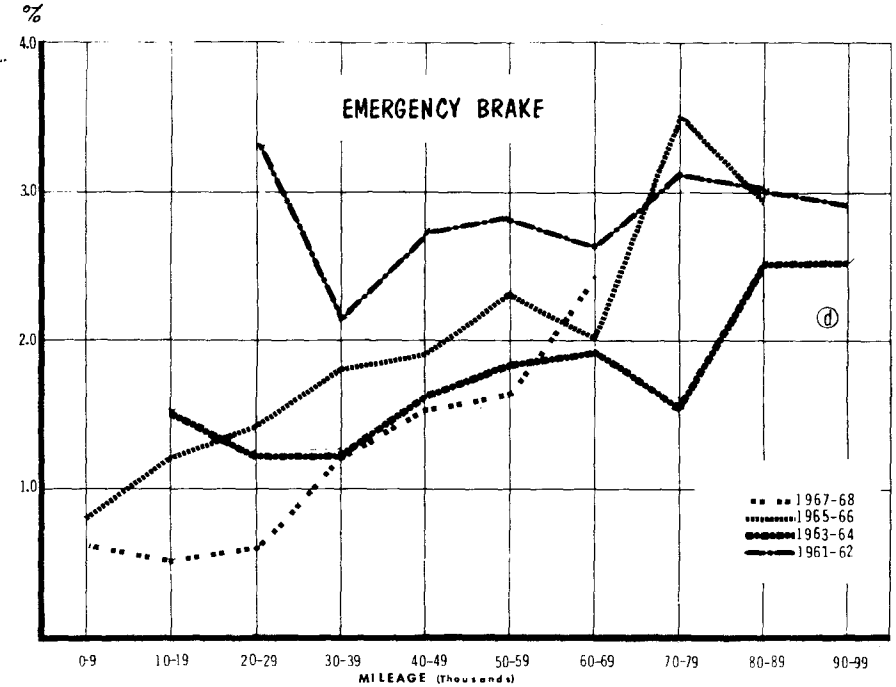


FIGURE 11 a-d: FAILURE RATES BY MILEAGE AND MODEL YEAR FOR WINDSHIELD WIPERS, HORN,

As in the previous study, the urban cars accumulated less mileage than rural cars (median mileages of approximately 39,400 and 44,000, respectively) and are newer in general than the rural cars.

The average repair charge for urban vehicles decreased from $2.72 in 1966 to $2.47 in 1968; the average repair charge for rural vehicles decreased from $2.50 in 1966 to $2.25 in 1968 with urban repair charges again approximately 25 cents higher than rural repair charges.

While previously there were no consistent differences between the overall failure percentages for urban and rural vehicles, for those vehicles in the 1968 sample the overall urban failure percentages were significantly greater than the overall rural failure percentages (the average urban failure rate was 34.2%, the average rural failure rate was 33.8%). In addition, the rural rates were not greater than the urban rates for any item, whereas previously the failure rates for both the *parking light* and the *emergency brake* were higher for the rural vehicles. (No consistent rural-urban differences were observed for these two items.)

The report on the results of the 1966 sample indicated that urban *headlight* failure rates exceeded those for rural vehicles through the 50-59 thousand mile interval; after 60 thousand miles, the rural failure rates were considerably greater than those for urban vehicles. With the exception of the 90-99 thousand mile interval, the 1968 urban headlight failure rates were consistently and significantly higher than the rural failure rates by about three percentage points.

Of the remaining inspection items, there were no longer any consistent rural-urban differences in the *stop light* failure rates, but the urban failure rates for the 1968 sample were now significantly greater for the *tail light* and the *steering mechanism.* As in the 1966 sample, the rural failure rates for the *foot brake* were significantly lower than those for the urban vehicles (with perhaps more stop-and-go traveling). For the remaining four items—*directional signals, license plate light, windshield wipers,* and *horn*—once again in 1968 no consistent rural-urban differences were noted.

Comparison of Inspection Results for Selected Car Models

Two groups of car models were selected for analysis; one group represents the "Big Three" models—(standard) Chevrolet, (standard) Ford, and (standard) Plymouth; the other group represents the compact cars—Corvair, Falcon, Valiant and Volkswagen (Beetle, Karmann-Ghia). The model years 1961-1968 were included for each car make.

Essentially, three sets of analyses were performed. The members of the "Big Three" were compared to each other; the members of the compacts were compared to each other; and finally the members of the "Big Three" were compared to the compacts. All trends were examined over the mileage groupings.

Mantel-Haenszel tests were run to examine differences in selected failure rate trends between the various car models. The reader is cautioned to examine general trends in the data rather than any specific data point. Abrupt departures from a general trend usually are caused by exceedingly small sample sizes. For ease of presentation, the specific levels of significance will not be mentioned; all significant results have p-values of 0.05 or less.

Overall Failure Rates

Chevrolet, Ford and Plymouth have similar overall failure rate trends over mileage (see Figure 12a). The average overall failure rates are Chevrolet, 36.3%; Ford, 35.7%; and Plymouth, 33.4%.

FIGURE 11 a-d: FAILURE RATES BY MILEAGE AND MODEL YEAR FOR WINDSHIELD WIPERS, HORN,

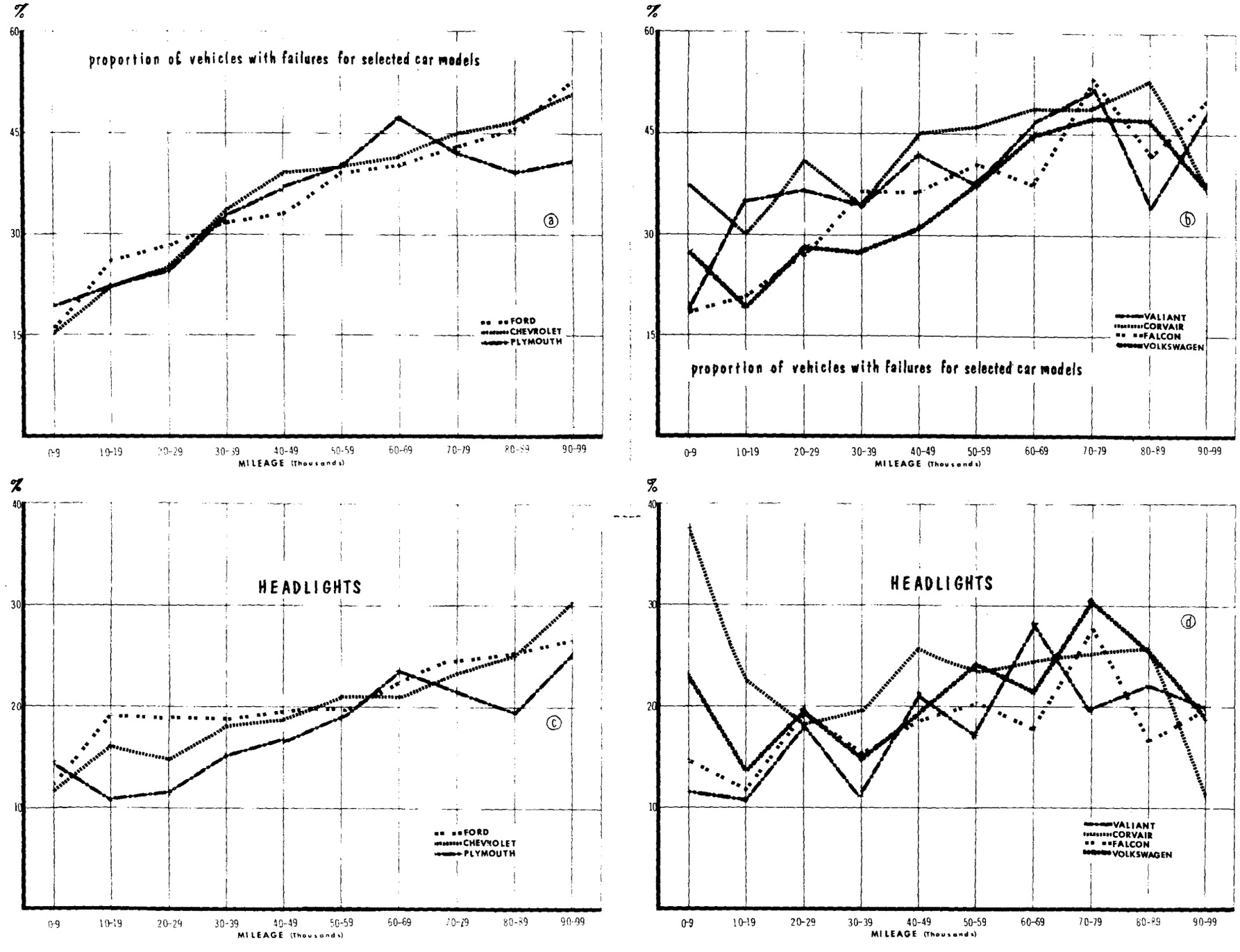


FIGURE 5.12 a-b-c-d PROPORTION OF VEHICLES WITH FAILURES FOR SELECTED CAR MODELS

Comparisons within the compact group indicate that the Corvair had significantly higher overall failure rates by mileage than either the Falcon or VW and that the Valiant had higher overall failure rates than the VW. This is reflected by the corresponding average overall failure rates of 44.9% for Corvair, 40.0% for Valiant, 38.3% for Falcon and 32.0% for VW (see Figure 12b).

Corvair and Valiant both had significantly higher overall failure rate trends than any of the Big Three (*i.e.*, Chevrolet, Ford, or Plymouth).

Headlights

As seen in Figure 12c, the headlight failure rates over mileage for Plymouth are significantly lower than for either Chevrolet or Ford. (The average headlight failure rates are 16.2% for Plymouth, 19.5% for Chevrolet, and 20.5% for Ford—see Table A-22). Ford and Chevrolet do not differ significantly in headlight failure rate trends.

From Figure 12d, it can be seen that the Corvair headlight failure rates over mileage are significantly higher than either Valiant or Falcon. (The overall headlight failure rates are: Corvair, 23.2%; VW, 19.8%; Falcon, 19.0%; and Valiant, 18.5%).

Corvair headlight failure rates are also significantly greater than those for either Chevrolet or Plymouth, while the VW headlight failure rates are significantly greater than those for the Plymouth.

Foot Brake

There appear to be some real differences between the foot brake failure rates of the various car models. Since foot brake failures could be a serious factor in producing an accident situation, special attention could be directed at what is responsible for the differences between the models with high foot brake failure rates and those with correspondingly low rates.

Ford has a significantly higher foot brake failure rate trend over mileage than either Chevrolet or Plymouth (see Figure 13a), with corresponding overall failure rates of 4.5% for Ford, 3.1% for Chevrolet, and 2.0% for Plymouth.

Among the compacts (see Figure 13b), the VW has a significantly higher foot brake failure rate trend than Corvair (overall rates of 4.9% and 4.3%, respectively).

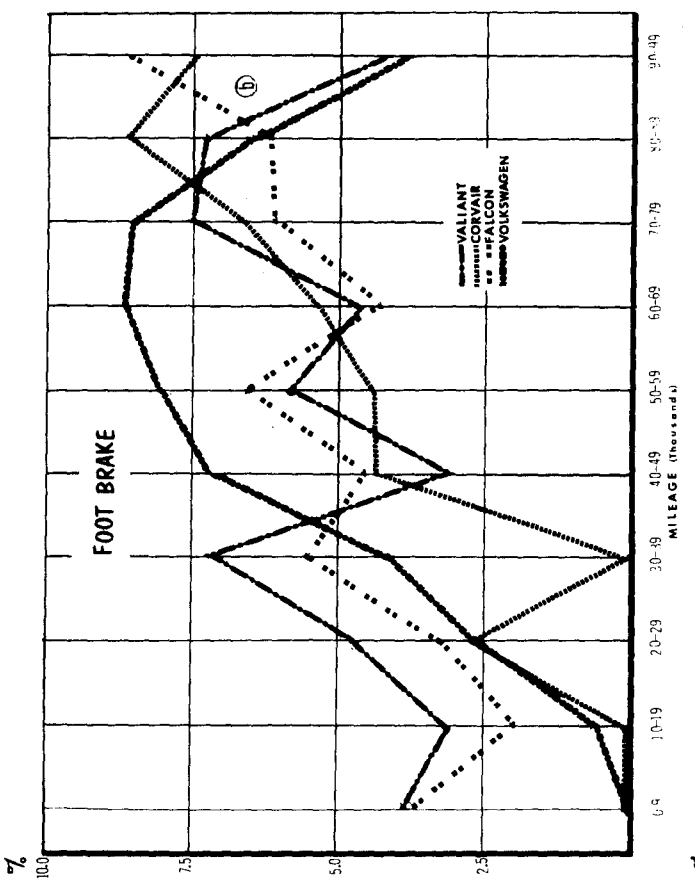
In addition, the foot brake failure rates for VW are significantly greater over the mileage dimension than any of the Big Three; the trends for Falcon (with an overall rate of 5.1%) and for Valiant (with an overall rate of 5.0%) are both significantly higher than for either Chevrolet or Plymouth.

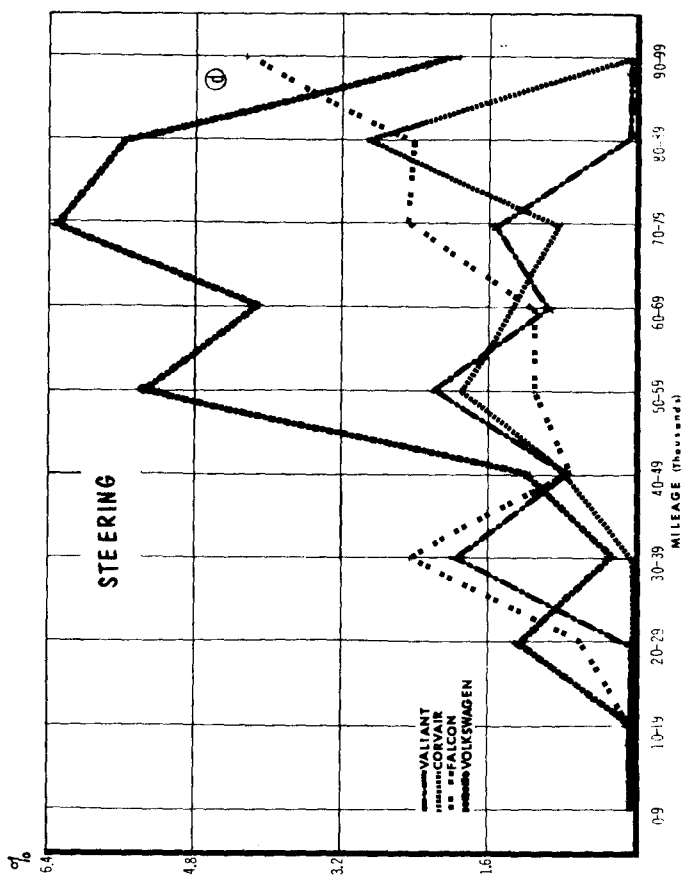
Steering

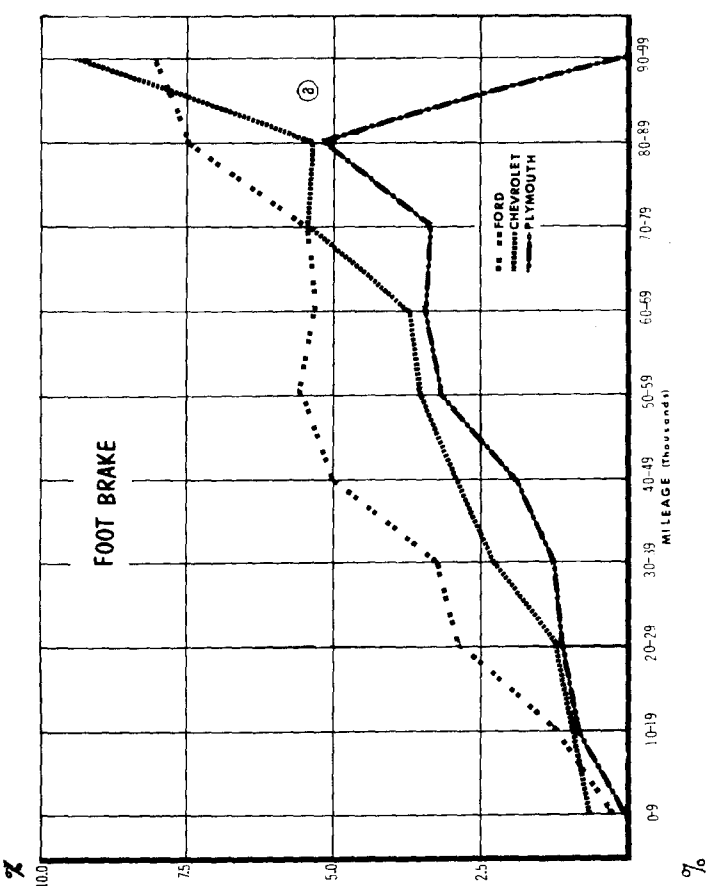
Although the failure rates for steering are lower in general than for the foot brakes, nevertheless attention might be directed at what makes the failure rates higher for some models than for others.

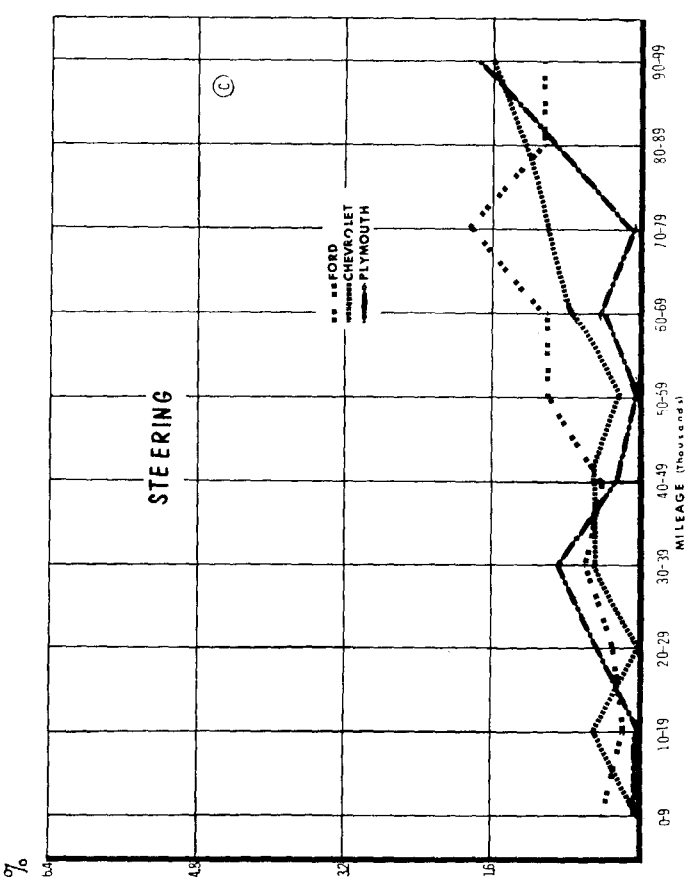
FIGURE 12 a-b. PROPORTION OF VEHICLES WITH FAILURES FOR SELECTED CAR MODELS

MILEAGE (Thousands)









FAILURE RATES FOR SELECTED CAR MODELS

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The failure rate trends for Ford, Chevrolet, and Plymouth are similar with corresponding overall rates of 0.8%, 0.5%, and 0.4%, respectively (see Figure 13c and Table A-22).

For the compacts however, the steering failure rate trend for VW is significantly higher than Falcon, Valiant, and Corvair (those differences are evident from Figure 13d). The corresponding overall rates are 2.1% for VW, 1.6% for Falcon, 1.0% for Valiant, and 1.0% for Corvair. In addition, the trend for Falcon is significantly elevated over that for Corvair.

VW and Falcon also have significantly higher steering failure rate trends than all three of the standard models. In addition, Valiant has a significantly higher trend in steering failure rates than Plymouth.

Stop Lights

As indicated in Figure 14a, the stop light failure rate trend for Ford is significantly lower than either the one for Plymouth or the one for Chevrolet (the corresponding overall rates are Ford, 1.9%; Plymouth, 3.4%; and Chevrolet, 3.6%).

The only significant difference in trends for compacts is that VW stop light failures are generally greater than those for Falcon (see Figure 14b). The overall failure rates are Valiant 3.8%; Corvair, 3.5%; VW, 3.5%; and Falcon, 3.1%.

Not only does Ford have a lower failure rate trend than the other two standard makes, it also has a significantly lower trend than all four of the compacts.

Horn

Contrary to the trend for stop lights, Ford has a significantly *higher* horn failure rate trend than both Chevrolet and Plymouth (see Figure 14c). The overall horn failure rates are Ford, 1.3%; Chevrolet, 0.8%; and Plymouth, 0.3%.

Figure 14d reveals the significantly greater VW horn failure rate trend over the other three compacts. The overall horn failure rates are VW, 3.1%; Falcon, 1.4%; Corvair, 1.2%; and Valiant, 0.8%.

Obviously, the VW failure rate trend is also significantly greater than all three of the standard models. Falcon's horn failure rate trend is significantly greater than Chevrolet's and Plymouth's, and Corvair's horn failure rate trend is elevated over that for Plymouth.

Survey Of Initial Public Reaction To Compulsory Motor Vehicle Inspection

In November of 1967, a questionnaire was sent to owners of a number of automobiles which had been spotted on the highways throughout North Carolina. Among other things, this questionnaire contained items regarding the respondent's attitudes toward the state's motor vehicle inspection program begun in 1966.

A total of 495 of the 582 questionnaires (85%) were completed and returned; in addition to completing the items relating to inspection, 193 respondents (39%) added comments regarding the program.

In order to determine whether males feel differently about vehicle inspection than females, the responses were examined by sex of respondent. It was also hypothesized that drivers of older cars might feel differently about

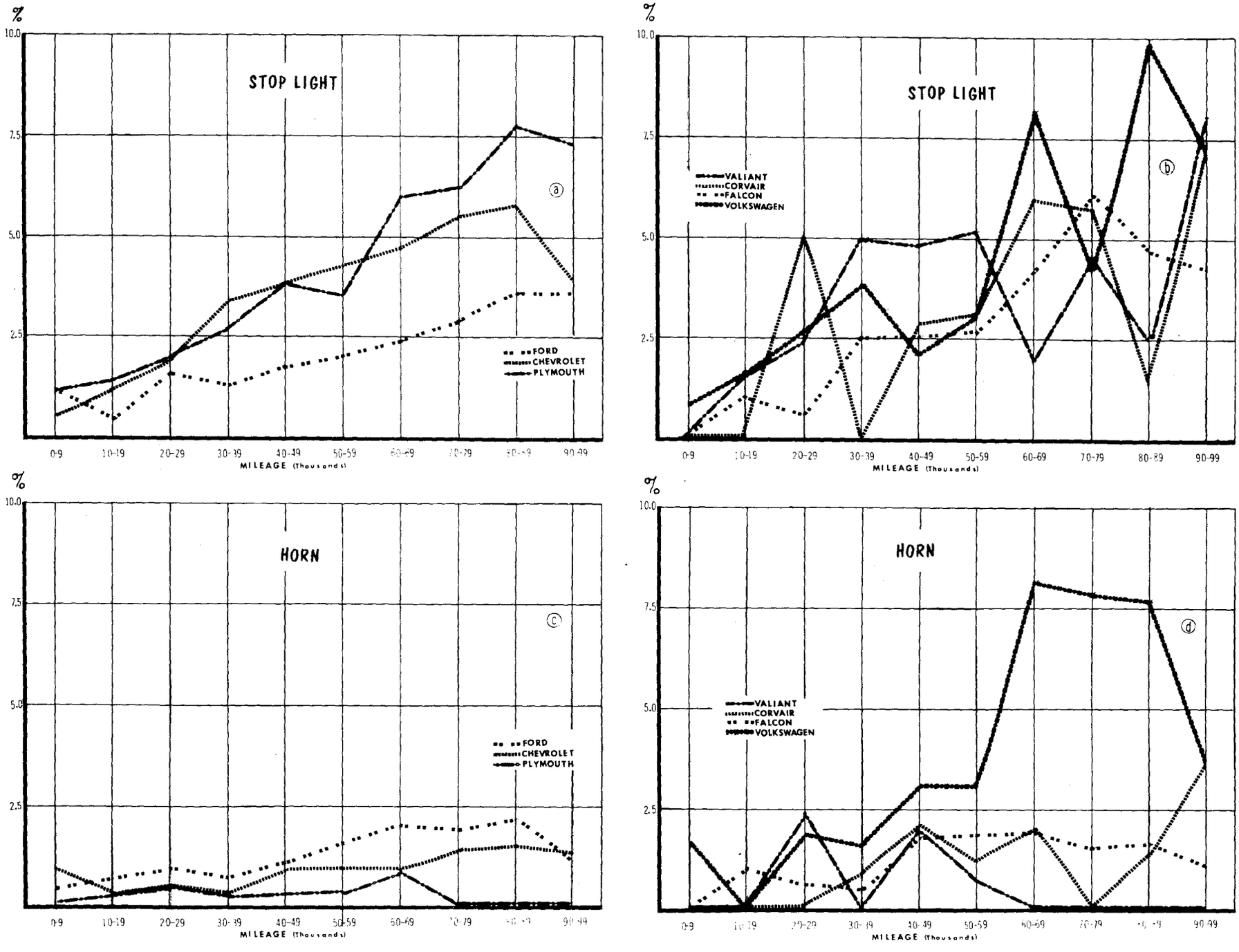

FIGURE 14 a-d: STOP LIGHT AND HORN FAILURE RATES FOR SELECTED CAR MODELS

vehicle inspection than drivers of newer cars which may be in less need of repair. Hence, age of car was considered in analyzing the results. Presence or absence of seat belts in the automobile was used as the criterion for classifying an automobile as new or old. Automobiles with seat belts are, in almost all instances, 1964 models or newer, while automobiles without seat belts are, on the whole, older models.

Table 2 presents, by age of vehicle and sex of respondent, the frequency of responses to the questionnaire item requesting the respondent's opinion of the value of the state's motor vehicle inspection program in reducing traffic accidents. About 70% of the respondents considered the program of considerable or at least some value. Neither sex of respondent nor age of car appears to make a difference in how the owners view the benefit of the inspection program.

Table 2. Frequencies (percentages)[a] of responses to first questionnaire item[b] concerning motor vehicle inspection by availability of seat belts and by sex of respondents

Response Categories	Availability of Seat Belts		Sex of Respondent		Total
	Available (n = 361)	Not Available (n = 98)	Male (n = 378)	Female (n = 81)	(n = 459)
Considerable value	125 (35%)	31 (32%)	122 (32%)	34 (42%)	156 (34%)
Some value	121 (34%)	43 (44%)	140 (37%)	24 (30%)	164 (36%)
Does not help because people would repair their cars anyway	8 (2%)	4 (4%)	12 (3%)	0 (0%)	12 (3%)
Waste of time because it's the driver and not the car that causes accidents	55 (15%)	15 (15%)	63 (17%)	7 (9%)	70 (15%)
Other	127 (35%)	28 (29%)	125 (33%)	30 (37%)	155 (34%)

[a] Because some respondents checked more than one alternative, the percentages do not total 100%.

[b] The item asked is "To what extent do you think motor vehicle safety inspection, as practiced in North Carolina, helps reduce traffic accidents?"

Table 3 presents the frequency of responses to the second questionnaire item concerned with whether the respondents had confidence in the safety of their car after it passed safety inspection.

Table 3. Frequencies (percentages) of responses to second questionnaire item[a] concerning motor vehicle inspection by availability of seat belts and by sex of respondents

Response Categories	Availability of Seat Belts		Sex of Respondent		Total
	Available (n = 361)	Not Available (n = 98)	Male (n = 378)	Female (n = 81)	(n = 459)
Yes	211 (58%)	64 (65%)	212 (56%)	63 (78%)	275 (60%)
No	142 (39%)	32 (33%)	157 (42%)	17 (21%)	174 (38%)
?	8 (2%)	2 (2%)	9 (2%)	1 (1%)	10 (2%)

[a] The item asked, "Did you feel more confident in the safety of your car after it passed safety inspection?"

About 60% of the respondents did indeed have more confidence as a result of the car passing vehicle inspection. Age of the car did not appear to make a difference in how confident the owners felt. Females, however, felt significantly more confident (p .01) than males in the safety of their car after inspection. Whether this difference reflects a greater tendency towards acquiescence on the part of women or whether it has to do with their general lack of knowledge regarding mechanical things cannot be determined at this time.

In summary, about 70% of the respondents considered the program as either of considerable or at least of some value. About 60% of the respondents felt more confident about the safety of their car after inspection with females expressing significantly more confidence than males.

DISCUSSION AND SUMMARY

There have been two major revisions in the compulsory motor vehicle inspection program in North Carolina since its initiation in February, 1966. The first, initiated in 1968, was to include *both* windshield wipers in the list of inspection items when the vehicle was originally equipped by its manufacturer with wipers on both the left and right sides. The second, initiated in May, 1969, was to incorporate tires in the list.

The revision in the windshield wiper requirement is responsible for the only real deviation from the general downward trend in failure percentages over the five-year period of the program. This deviation is observable as an elevation in the windshield wiper failure rate for 1968.

The addition of tires to the list of inspection items is probably responsible for a sudden increase in the repair charge per inspected vehicle in 1969 (the repair charge was $1.85 in 1966, $0.99 in 1967, $0.87 in 1968, $0.95 in 1969, and $1.00 in 1970).

For the special sample of 76,668 privately-owned passenger cars inspected in December 1968, the overall median mileage is slightly under 42,000 miles or approximately 1,000 miles less than in the previous study on periodic motor vehicle inspection in North Carolina. The 1965 model year represents the median age of the 76,668 cars inspected in December, 1968, *i.e.,* about 50% of the cars were at least three years old. This is comparable to the previous results.

In the initial study (December 1966 cars), the overall failure rate was 70.1% (*i.e.,* less than one out of every three cars had *all* items in satisfactory condition). For the December 1968 sample, the overall failure rate decreased to 33.8%. Quite surprisingly, considering the rising cost of living, the average repair charge (per vehicle with repair charges assessed) is generally *lower* in this study than for the December 1966 sample (overall average repair charge of $2.36 compared to $2.62 in 1966). As in the previous study, there is a positive association of both age of vehicle and mileage of vehicle with the percentage of vehicles failing inspection.

In terms of magnitude of December 1968 failure rates, headlights still rank first with an overall rate of 18.7% (a tremendous reduction over the December 1966 rate of 61.0%) followed again by license plate lights with a rate of 6.0% (as compared to 15.9% in the previous sample); steering and horn failures were again at the bottom of the list with rates of 0.6% and 0.9% respectively (as compared to 1.4% and 1.0% respectively for the previous sample). The remaining rankings of the 1968 failure rates follow the general pattern of the 1966 rates with the exception of windshield wipers. In the 1968 sample, windshield wipers rank fifth with an overall failure rate of 3.4%; they ranked ninth in the 1966 sample with an overall rate of 2.3%.

Mantel-Haenszel statistical tests aimed at relative risks of failure indicated significantly reduced failure rate trends in December 1968 over the failure rate trends in December 1966 for nearly every inspection item, across both the mileage dimension and the model year dimension. The major exception is the significantly higher windshield wiper failure rate trends in December 1968 over the corresponding trend in December 1966.

Consistent with the results of the previous study, the 1968 sample indicated that, in general, for the eleven inspection items, there were linear trends in increasing item failure rates with both increasing mileage and increasing vehicle age.

As in the previous study, the urban cars accumulated less mileage and were newer in general than rural cars. The average repair charge for urban vehicles decreased from $2.72 in the 1966 sample to $2.47 in the 1968 sample; the average repair charge for rural vehicles decreased from $2.50 in 1966 to $2.25 in 1968. The same approximately 25 cent urban-rural difference exists as in the previous study.

While previously there were no consistent differences between the overall failure precentages for urban and rural vehicles, for those vehicles in the 1968 sample the overall urban percentages were significantly greater than the overall rural failure percentages. In addition, for no individual item were rural rates greater than urban rates in the 1968 sample. The urban rates were significantly greater than the rural rates for headlights, tail lights, steering mechanism, and foot brake. For the remaining seven items in the 1968 sample, there were no consistent rural-urban differences noted.

The overall failure rate trends for the "Big Three" over mileage were similar with average overall rates of 36.3% for Chevrolet, 35.7% for Ford, and 33.4% for Plymouth. Within the compacts, Corvair had a higher overall failure rate trend than Falcon or VW, and Valiant had a higher overall trend than VW. Corvair and Valiant both had significantly higher failure rate trends than any of the Big Three. To simplify the summary of make-model trends for selected items, the significant findings are presented in outline form below (with, for example,"Corvair>Falcon" indicating that the failure rate trend for Corvair is significantly higher than that for Falcon for the specified item and "Plymouth<Chevrolet, Ford" indicating lower trends for Plymouth than for either Chevrolet or Ford).

Headlight

Plymouth	<	Chevrolet, Ford
Corvair	>	Valiant, Falcon, Chevrolet, Plymouth
VW	>	Plymouth

Foot Brake

Ford	>	Chevrolet, Plymouth
VW	>	Corvair, Chevrolet, Ford, Plymouth
Falcon	>	Chevrolet, Plymouth
Valiant	>	Chevrolet, Plymouth

Steering

VW	>	Falcon, Valiant, Corvair, Chevrolet, Ford, Plymouth
Falcon	>	Corvair, Chevrolet, Ford, Plymouth
Valiant	>	Plymouth

Stop Light

Ford	<	Plymouth, Chevrolet, Corvair, Falcon, Valiant, VW
VW	>	Falcon

Horn

Ford	>	Chevrolet, Plymouth
VW	>	Falcon, Corvair, Valiant, Chevrolet, Ford, Plymouth
Falcon	>	Chevrolet, Plymouth
Corvair	>	Plymouth

Results of a November 1967 questionnaire sent to owners of a number of automobiles spotted on the highways throughout North Carolina revealed that, of the 459 respondents, 70% considered the state's motor vehicle inspection program as either of considerable or at least of some value. About 60% of the respondents felt more confident in the safety of their car after inspection, with females expressing significantly more confidence than males. Whether this difference reflects a greater tendency towards acquiescence on the part of women or whether it has to do with their general knowledge (or lack thereof) regarding mechanical things cannot be determined at this time.

The trends observed in the 1968 sample were generally the same as those for the 1966 sample. The items with the highest failure rates in 1968 were essentially those with the highest failure rates in 1966. The general trend of higher failure rates for the older, higher mileage cars was again observed for 1968. As was mentioned in the previous report, this trend re-emphasizes the possibility of varying the content and depth of the inspection process depending on car mileage and age.

One of the most outstanding findings of this study was the consistent and significant reductions in 1968 failure rate trends over the 1966 trends for almost every inspection item. This would indicate that the motor vehicle inspection program is, at the very least, serving the purpose of reducing the proportion of cars with defective items.

The finding that certain car models have higher failure rates than others for various inspection items raises the possibility of investigating the factors responsible for these differences. It may be feasible to at least recommend the installation of the superior types of equipment in all car models.

APPENDIX: Supplementary Tables

NOTE: For Table A-1, the figures in parentheses represent the percentage distribution of the sample by model year for the 1968 sample with the corresponding percentages for the 1966 sample given in brackets; for Table A-2, the figures in parentheses represent the percentage of the respective samples failing inspection for the two periods; for Table A-3, the figures in parentheses represent the average repair charge in dollars (*i.e.,* charge per vehicle with repair charges assessed); for Tables A-4 through A-14, the figures in parentheses represent the percentage of the respective samples incurring the indicated safety equipment failures. The notation for Tables A-15 through A-22 for the selected car models is analogous to the other tables except for the fact that there is no comparison data available from the 1966 sample and hence no bracketed entries.

Table A-1. Distribution of Sample by Mileage and Model Year

MODEL YEAR	ODOMETER READING (in thousands)										TOTAL	TOTAL (by single years)	RURAL (by single years)	URBAN (by single years)
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99				
1967-68	3444 (14.5)	8221 (34.7)	6517 (27.5)	3357 (14.2)	1379 (5.8)	506 (2.1)	255 (1.1)	*	*	*	23679 (30.9)	11642 (15.2) 12037 (15.7)	5511 (13.9) 5952 (15.0)	6131 (16.5) 6085 (16.4)
1965-66	361 (1.7) [13.9]	1202 (5.7) [37.3]	3261 (15.6) [28.8]	5327 (25.4) [12.5]	4945 (23.6) [4.9]	3112 (14.9) [1.7]	1654 (7.9) [1.0]	769 (3.7)	312 (1.5)	*	20943 (27.3) [27.2]	8823 (11.5) [8.9] 12120 (15.8) [18.3]	4556 (11.5) [8.6] 6309 (16.0) [17.4]	4267 (11.5) [9.3] 5811 (15.7) [19.1]
1963-64	*	469 (2.4) [6.9]	891 (4.6) [18.1]	2036 (10.5) [26.0]	3574 (18.4) [21.5]	4205 (21.7) [13.6]	3607 (18.6) [7.5]	2497 (12.9) [3.5]	1384 (7.1) [1.6]	724 (3.7)	19387 (25.3) [30.7]	10166 (13.3) [15.8] 9221 (12.0) [14.9]	5458 (13.8) [15.4] 4978 (12.6) [14.6]	4708 (12.7) [16.1] 4243 (11.4) [15.1]
1961-62	*	*	479 (3.8) [4.9]	777 (6.1) [11.3]	1447 (11.4) [18.5]	2126 (16.8) [21.6]	2516 (19.9) [18.7]	2327 (18.4) [12.4]	1826 (14.4) [6.5]	1161 (9.2) [3.6]	12659 (16.5) [23.0]	7630 (10.0) [13.2] 5029 (6.5) [9.8]	4059 (10.3) [13.2] 2731 (6.9) [10.2]	3571 (9.6) [13.1] 2298 (6.2) [9.5]
TOTAL	3805 (5.0) [4.2]	9892 (12.9) [12.8]	11148 (14.5) [15.2]	11497 (15.0) [15.1]	11345 (14.8) [14.2]	9949 (13.0) [12.8]	8032 (10.5) [10.7]	5593 (7.3) [7.5]	3522 (4.6) [4.7]	1885 (2.5) [2.6]		76668		
RURAL	1525 (3.9) [3.6]	4690 (11.9) [11.5]	5501 (13.9) [14.4]	5736 (14.5) [14.5]	5771 (14.6) [14.2]	5307 (13.4) [13.2]	4442 (11.2) [11.4]	3254 (8.2) [8.4]	2117 (5.3) [5.6]	1211 (3.1) [3.3]			39554 (51.6) [47.8]	
URBAN	2280 (5.9) [4.9]	5202 (14.0) [14.1]	5647 (15.2) [16.0]	5761 (15.5) [15.7]	5574 (15.0) [14.2]	4642 (12.5) [12.6]	3590 (9.7) [10.0]	2339 (6.3) [6.8]	1405 (3.8) [4.0]	674 (1.8) [1.9]				37114 (48.4) [52.2]

														[52.2]
	[4.9]	[14.1]	[16.0]	[15.7]	[14.2]	[12.6]	[10.0]	[6.8]	[4.0]	[1.9]				

MODEL YEAR	ODOMETER READING (in thousands)										TOTAL	TOTAL (by single years)	RURAL (by single years)	URBAN (by single years)
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99				
1967-68	641 (18.6)	1832 (22.3)	1656 (25.4)	953 (28.4)	425 (30.8)	175 (34.6)	88 (34.5)	*	*	*	5770 (24.4)	2500 (21.5) 3270 (27.2)	1123 (20.4) 1536 (25.8)	1377 (22.5) 1734 (28.5)
1965-66	106 (29.4) [49.5]	320 (26.6) [56.6]	958 (29.4) [62.5]	1716 (32.2) [65.7]	1779 (36.0) [71.1]	1160 (37.3) [70.0]	651 (39.4) [70.3]	331 (43.0)	145 (46.5)	*	7166 (34.2) [59.5]	2897 (32.8) [52.3] 4269 (35.2) [63.0]	1496 (32.8) [52.0] 2149 (34.1) [62.8]	1401 (32.8) [52.5] 2120 (36.5) [63.2]
1963-64	*	162 (34.5) [64.0]	284 (31.9) [67.5]	670 (32.9) [69.8]	1281 (35.8) [70.9]	1641 (39.0) [74.4]	1436 (39.8) [75.1]	1064 (42.6) [77.2]	587 (42.4) [80.0]	312 (43.1)	7437 (38.4) [70.6]	3812 (37.5) [68.4] 3625 (39.3) [72.9]	2032 (37.2) [68.1] 1963 (39.4) [73.3]	1780 (37.8) [68.6] 1662 (39.2) [72.6]
1961-62	*	*	182 (38.0) [75.4]	314 (40.4) [74.9]	614 (42.4) [73.8]	905 (42.6) [77.2]	1107 (44.0) [78.5]	1104 (47.4) [78.3]	850 (46.5) [79.6]	588 (50.6) [80.9]	5664 (44.7) [76.7]	3331 (43.7) [75.9] 2333 (46.4) [77.8]	1763 (43.4) [76.4] 1292 (47.3) [79.3]	1568 (43.9) [75.4] 1041 (45.3) [76.4]
TOTAL	747 (19.6) [50.9]	2314 (23.4) [58.4]	3080 (27.6) [66.0]	3653 (31.8) [70.4]	4099 (36.1) [72.4]	3881 (39.0) [76.3]	3282 (40.9) [77.6]	2499 (44.7) [78.9]	1582 (44.9) [80.0]	900 (47.7) [81.0]		26037 (34.0) [70.5]		
RURAL	280 (18.4) [50.7]	999 (21.3) [56.8]	1472 (26.8) [64.8]	1764 (30.8) [69.9]	2024 (35.1) [72.2]	2020 (38.1) [76.5]	1799 (40.5) [78.5]	1443 (44.3) [80.7]	956 (45.2) [80.1]	597 (49.3) [81.2]			13354 (33.8) [71.0]	
URBAN	467 (20.5) [51.0]	1315 (25.3) [59.6]	1608 (28.5) [66.9]	1889 (32.8) [70.8]	2075 (37.2) [72.6]	1861 (40.1) [76.1]	1483 (41.3) [76.6]	1056 (45.1) [77.0]	626 (44.6) [80.0]	303 (45.0) [80.8]				12683 (34.2) [70.1]

Table A-3. Average Repair Charge

MODEL YEAR	ODOMETER READING (in thousands) 0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	TOTAL	TOTAL (by single years)	RURAL (by single years)	URBAN (by single years)
1967-68	496 (1.89)	1572 (1.93)	1442 (2.00)	839 (2.07)	385 (2.25)	156 (2.22)	73 (2.61)	*	*	*	4963 (2.01)	2118 (1.86) 2845 (2.13)	981 (1.65) 1374 (2.01)	1137 (2.04) 1471 (2.23)
1965-66	90 (2.24) [2.02]	282 (2.04) [2.00]	856 (2.00) [2.04]	1511 (2.18) [2.38]	1577 (2.29) [2.38]	1061 (2.18) [2.49]	596 (2.41) [2.52]	296 (2.58)	129 (3.13)	*	6398 (2.24) [2.11]	2558 (2.08) [2.05] 3840 (2.34) [2.13]	1332 (2.03) [1.97] 1976 (2.14) [1.98]	1226 (2.13) [2.11] 1864 (2.55) [2.25]
1963-64	*	141 (2.60) [2.28]	256 (2.50) [2.12]	579 (2.20) [2.31]	1149 (2.42) [2.27]	1479 (2.32) [2.52]	1291 (2.53) [2.57]	958 (2.40) [2.63]	542 (2.56) [2.99]	281 (2.85)	6676 (2.43) [2.34]	3422 (2.35) [2.23] 3254 (2.52) [2.45]	1845 (2.17) [2.09] 1772 (2.45) [2.36]	1577 (2.56) [2.35] 1482 (2.60) [2.52]
1961-62	*	*	166 (2.73) [2.48]	282 (2.59) [2.73]	547 (2.39) [2.70]	813 (2.78) [2.93]	1006 (2.77) [2.90]	1002 (2.72) [2.74]	783 (2.97) [3.24]	522 (2.75) [2.75]	5121 (2.74) [2.83]	3023 (2.69) [2.67] 2098 (2.81) [3.04]	1607 (2.68) [2.53] 1179 (2.70) [2.84]	1416 (2.71) [2.81] 919 (2.94) [3.26]
TOTAL	586 (1.94) [2.03]	1995 (1.99) [2.11]	2720 (2.09) [2.17]	3211 (2.19) [2.48]	3658 (2.34) [2.57]	3509 (2.38) [2.86]	2966 (2.59) [2.89]	2256 (2.56) [3.06]	1454 (2.83) [3.31]	803 (2.79) [3.34]		23158 (2.36) [2.62]		
RURAL	230 (1.72) [1.92]	886 (1.80) [2.03]	1323 (2.06) [2.01]	1565 (2.05) [2.35]	1828 (2.21) [2.41]	1855 (2.19) [2.69]	1630 (2.47) [2.75]	1328 (2.45) [2.93]	885 (2.62) [3.02]	536 (2.87) [3.20]			12066 (2.25) [2.50]	
URBAN	356 (2.09) [2.10]	1109 (2.14) [2.17]	1397 (2.13) [2.30]	1646 (2.33) [2.59]	1830 (2.47) [2.72]	1654 (2.59) [3.03]	1336 (2.74) [3.05]	928 (2.73) [3.21]	569 (3.16) [3.68]	267 (2.61) [3.57]				11092 (2.47) [2.72]

Table A-4. Head Light Failure

	(2.09) [2.10]	(2.14) [2.17]	(2.13) [2.30]	(2.33) [2.59]	(2.47) [2.72]	(2.59) [3.03]	(2.74) [3.05]	(2.73) [3.21]	(3.16) [3.68]	(2.61) [3.57]			(2.47) [2.72]

Table A-4. Head Light Failure

MODEL YEAR	ODOMETER READING (in thousands)										TOTAL	TOTAL (by single years)	RURAL (by single years)	URBAN (by single years)
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99				
1967-68	503 (14.6)	1330 (16.2)	1093 (16.8)	578 (17.2)	241 (17.5)	100 (19.8)	57 (22.4)	*	*	*	3902 (16.5)	1846 (15.9) 2056 (17.1)	790 (14.3) 910 (15.3)	1056 (17.2) 1146 (18.8)
1965-66	49 (13.6) [45.9]	180 (15.0) [51.5]	548 (16.8) [54.5]	911 (17.1) [56.8]	920 (18.6) [60.4]	617 (19.8) [61.9]	340 (20.6) [59.4]	164 (21.3)	77 (24.7)	*	3806 (18.2) [52.9]	1624 (18.4) [47.4] 2182 (18.0) [55.6]	801 (17.6) [46.8] 1066 (16.9) [55.5]	823 (19.3) [47.9] 1116 (19.2) [55.8]
1963-64	*	89 (19.0) [56.5]	137 (15.4) [58.6]	327 (16.1) [59.8]	662 (18.5) [60.7]	814 (19.4) [63.9]	718 (19.9) [64.9]	568 (22.7) [66.3]	286 (20.7) [69.8]	157 (21.7)	3758 (19.4) [60.8]	1882 (18.5) [58.9] 1876 (20.3) [62.7]	970 (17.8) [58.7] 973 (19.5) [63.3]	912 (19.4) [59.1] 903 (21.3) [62.2]
1961-62	*	*	84 (17.5) [64.8]	159 (20.5) [63.9]	324 (22.4) [63.6]	465 (21.9) [65.8]	546 (21.7) [66.4]	584 (25.1) [66.6]	439 (24.0) [66.7]	303 (26.1) [69.3]	2904 (22.9) [65.6]	1743 (22.8) [65.3] 1161 (23.1) [66.1]	896 (22.1) [65.5] 628 (23.0) [67.6]	847 (23.7) [65.0] 533 (23.2) [64.7]
TOTAL	552 (14.5) [46.6]	1599 (16.2) [52.7]	1862 (16.7) [57.4]	1975 (17.2) [60.4]	2147 (18.9) [62.1]	1996 (20.1) [65.4]	1661 (20.7) [66.2]	1316 (23.5) [67.6]	802 (22.8) [68.4]	460 (24.4) [69.0]		14370 (18.7) [61.0]		
RURAL	195 (12.8) [45.8]	646 (13.8) [51.0]	873 (15.9) [56.6]	915 (16.0) [60.3]	1037 (18.0) [61.9]	995 (18.7) [65.3]	861 (19.4) [67.7]	740 (22.7) [69.7]	466 (22.0) [69.7]	306 (25.3) [69.8]			7034 (17.8) [61.6]	
URBAN	357 (15.7) [47.1]	953 (18.3) [53.9]	989 (17.5) [58.0]	1060 (18.4) [60.6]	1110 (19.9) [62.2]	1001 (21.6) [65.5]	800 (22.3) [64.6]	576 (24.6) [65.3]	336 (23.9) [66.8]	154 (22.8) [67.8]				7336 (19.8) [60.5]

Table A-5. License Plate Light Failure

MODEL YEAR	ODOMETER READING (in thousands) 0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	TOTAL	TOTAL (by single years)	RURAL (by single years)	URBAN (by single years)
1967-68	56 (1.6)	175 (2.1)	232 (3.6)	161 (4.8)	84 (6.1)	40 (7.9)	16 (6.3)	*	*	*	764 (3.2)	250 (2.1) 514 (4.3)	127 (2.3) 251 (4.2)	123 (2.0) 263 (4.3)
1965-66	20 (5.5) [3.7]	50 (4.2) [6.7]	150 (4.6) [10.0]	322 (6.0) [12.8]	408 (8.3) [13.4]	236 (7.6) [12.6]	169 (10.2) [14.8]	95 (12.4)	36 (11.5)	*	1486 (7.1) [8.5]	615 (7.0) [5.5] 871 (7.2) [10.0]	323 (7.1) [5.6] 441 (7.0) [10.2]	292 (6.8) [5.5] 430 (7.4) [9.8]
1963-64	*	37 (7.9) [9.4]	37 (4.2) [11.6]	112 (5.5) [13.4]	221 (6.2) [15.7]	273 (6.5) [18.1]	238 (6.6) [20.8]	201 (8.0) [21.2]	129 (9.3) [20.9]	57 (7.9)	1305 (6.7) [14.8]	670 (6.6) [13.8] 635 (6.9) [15.9]	362 (6.6) [14.6] 341 (6.9) [16.7]	308 (6.5) [13.2] 294 (6.9) [15.1]
1961-62	*	*	21 (4.4) [14.0]	64 (8.2) [15.9]	104 (7.2) [19.7]	175 (8.2) [22.5]	198 (7.9) [23.3]	219 (9.4) [23.5]	172 (9.4) [28.3]	119 (10.2) [28.4]	1072 (8.5) [21.4]	584 (7.7) [19.3] 488 (9.7) [24.2]	327 (8.1) [19.4] 277 (10.1) [24.8]	257 (7.2) [19.3] 211 (9.2) [23.7]
TOTAL	76 (2.0) [4.6]	262 (2.6) [7.4]	440 (3.9) [11.3]	659 (5.7) [14.1]	817 (7.2) [17.2]	724 (7.3) [19.7]	621 (7.7) [22.0]	515 (9.2) [23.1]	337 (9.6) [25.0]	176 (9.3) [26.2]		4627 (6.0) [15.9]		
RURAL	27 (1.8) [5.1]	138 (2.9) [7.8]	205 (3.7) [11.2]	327 (5.7) [14.2]	418 (7.2) [16.9]	375 (7.1) [19.3]	336 (7.6) [22.4]	297 (9.1) [23.3]	201 (9.5) [24.6]	125 (10.3) [25.4]			2449 (6.2) [16.4]	
URBAN	49 (2.1) [4.2]	124 (2.4) [7.2]	235 (4.2) [11.4]	332 (5.8) [14.0]	399 (7.2) [17.4]	349 (7.5) [20.1]	285 (7.9) [21.5]	218 (9.3) [22.8]	136 (9.7) [25.5]	51 (7.6) [27.4]				2178 (5.9) [15.5]

Table A-6. Parking Light Failure

	(2.1) [4.2]	(2.4) [7.2]	(4.2) [11.4]	(5.8) [14.0]	(7.2) [17.4]	(7.5) [20.1]	(7.9) [21.5]	(9.3) [22.8]	(9.7) [25.5]	(7.6) [27.4]				(5.9) [15.5]

Table A-6. Parking Light Failure

MODEL YEAR	ODOMETER READING (in thousands)										TOTAL	TOTAL	RURAL	URBAN
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99		(by single years)		
1967-68	33 (1.0)	149 (1.8)	141 (2.2)	86 (2.6)	48 (3.5)	23 (4.5)	13 (5.1)	*	*	*	493 (2.1)	212 (1.8) 281 (2.3)	111 (2.0) 143 (2.4)	101 (1.6) 138 (2.3)
1965-66	17 (4.7) [1.2]	33 (2.7) [1.8]	98 (3.0) [3.1]	198 (3.7) [4.3]	231 (4.7) [4.1]	138 (4.4) [8.5]	94 (5.7) [7.0]	47 (6.1)	18 (5.8)	*	874 (4.2) [2.7]	317 (3.6) [1.5] 557 (4.6) [3.3]	176 (3.9) [2.1] 310 (4.9) [3.7]	141 (3.3) [1.1] 247 (4.3) [3.0]
1963-64	*	25 (5.3) [3.8]	37 (4.2) [3.8]	84 (4.1) [5.5]	160 (4.5) [6.8]	234 (5.6) [7.2]	221 (6.1) [6.9]	173 (6.9) [9.5]	87 (6.3) [11.1]	47 (6.5)	1068 (5.5) [5.9]	564 (5.5) [5.5] 504 (5.5) [6.3]	303 (5.6) [5.9] 265 (5.3) [7.0]	261 (5.5) [5.2] 239 (5.6) [5.7]
1961-62	*	*	29 (6.1) [5.1]	38 (4.9) [5.5]	71 (4.9) [6.0]	121 (5.7) [7.4]	183 (7.3) [6.4]	166 (7.1) [9.1]	117 (6.4) [9.3]	87 (7.5) [10.6]	812 (6.4) [7.1]	482 (6.3) [6.6] 330 (6.6) [7.8]	269 (6.6) [7.1] 194 (7.1) [8.3]	213 (6.0) [6.3] 136 (5.9) [7.2]
TOTAL	50 (1.3) [1.5]	207 (2.1) [2.5]	305 (2.7) [3.7]	406 (3.5) [5.3]	510 (4.5) [6.5]	516 (5.2) [7.7]	511 (6.4) [7.4]	386 (6.9) [9.3]	222 (6.3) [10.8]	134 (7.1) [10.7]		3247 (4.2) [5.9]		
RURAL	21 (1.4) [2.4]	94 (2.0) [2.7]	150 (2.7) [3.6]	216 (3.8) [5.7]	260 (4.5) [6.4]	281 (5.3) [8.7]	280 (6.3) [7.5]	227 (7.0) [10.5]	146 (6.9) [10.3]	96 (7.9) [11.0]			1771 (4.5) [6.5]	
URBAN	29 (1.3) [1.0]	113 (2.2) [2.5]	155 (2.7) [3.9]	190 (3.3) [5.0]	250 (4.5) [6.5]	235 (5.1) [6.8]	231 (6.4) [7.4]	159 (6.8) [8.0]	76 (5.4) [11.4]	38 (5.6) [10.3]				1476 (4.0) [5.5]

Table A-7. Stop Light Failure

MODEL YEAR	ODOMETER READING (in thousands)										TOTAL	TOTAL (by single years)	RURAL (by single years)	URBAN (by single years)
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99				
1967-68	25 (0.7)	85 (1.0)	106 (1.6)	68 (2.0)	18 (1.3)	7 (1.4)	1 (0.4)	*	*	*	310 (1.3)	114 (1.0) 196 (1.6)	54 (1.0) 88 (1.5)	60 (1.0) 108 (1.8)
1965-66	12 (3.3) [1.2]	18 (1.5) [1.2]	58 (1.8) [1.7]	129 (2.4) [2.5]	135 (2.7) [3.0]	83 (2.7) [4.5]	58 (3.5) [3.9]	22 (2.9)	13 (4.2)	*	528 (2.5) [1.7]	184 (2.1) [1.1] 344 (2.8) [1.9]	98 (2.2) [1.1] 158 (2.5) [2.1]	86 (2.0) [1.0] 186 (3.2) [1.9]
1963-64	*	13 (2.8) [2.8]	28 (3.1) [2.2]	58 (2.8) [2.5]	126 (3.5) [3.1]	136 (3.2) [3.4]	152 (4.2) [3.0]	98 (3.9) [3.6]	48 (3.5) [4.7]	29 (4.0)	688 (3.5) [2.8]	339 (3.3) [2.7] 349 (3.8) [3.0]	183 (3.4) [2.3] 187 (3.8) [2.9]	156 (3.3) [3.0] 162 (3.8) [3.1]
1961-62	*	*	20 (4.2) [4.4]	27 (3.5) [4.2]	70 (4.8) [4.8]	102 (4.8) [4.9]	111 (4.4) [5.2]	125 (5.4) [5.0]	104 (5.7) [5.1]	69 (5.9) [4.4]	628 (5.0) [4.8]	364 (4.8) [4.5] 264 (5.2) [5.3]	183 (4.5) [4.1] 143 (5.2) [5.6]	181 (5.1) [4.8] 121 (5.3) [5.0]
TOTAL	37 (1.0) [1.3]	116 (1.2) [1.6]	212 (1.9) [2.3]	282 (2.5) [3.0]	349 (3.1) [4.1]	328 (3.3) [5.0]	322 (4.0) [5.3]	245 (4.4) [6.4]	165 (4.7) [6.4]	98 (5.2) [7.8]		2154 (2.8) [3.8]		
RURAL	16 (1.0) [1.0]	51 (1.1) [1.5]	96 (1.7) [2.4]	131 (2.3) [3.0]	157 (2.7) [3.9]	160 (3.0) [4.7]	185 (4.2) [4.6]	137 (4.2) [6.1]	98 (4.6) [6.3]	63 (5.2) [7.9]			1094 (2.8) [3.8]	
URBAN	21 (0.9) [1.6]	65 (1.2) [1.6]	116 (2.1) [2.2]	151 (2.6) [3.0]	192 (3.4) [4.3]	168 (3.6) [5.3]	137 (3.8) [6.0]	108 (4.6) [6.8]	67 (4.8) [6.6]	35 (5.2) [7.5]				1060 (2.9) [3.9]

Table A-8. Tail Light Failure

MODEL YEAR	ODOMETER READING (in thousands) 0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	TOTAL	TOTAL (by single years)	RURAL (by single years)	URBAN (by single years)
1967-68	26 (0.8)	113 (1.4)	100 (1.5)	66 (2.0)	31 (2.2)	11 (2.2)	6 (2.4)	*	*	*	353 (1.5)	127 (1.1) 226 (1.9)	52 (0.9) 96 (1.6)	75 (1.2) 130 (2.1)
1965-66	4 (1.1) [0.3]	19 (1.6) [1.3]	59 (1.8) [1.5]	128 (2.4) [2.0]	162 (3.3) [3.6]	94 (3.0) [4.5]	61 (3.7) [3.9]	33 (4.3)	8 (2.6)	*	568 (2.7) [1.5]	200 (2.3) [0.7] 368 (3.0) [1.9]	84 (1.8) [0.8] 185 (2.9) [1.6]	116 (2.7) [0.6] 183 (3.1) [2.1]
1963-64	*	17 (3.6) [1.8]	29 (3.3) [2.0]	64 (3.1) [2.5]	118 (3.3) [2.7]	150 (3.6) [3.0]	123 (3.4) [2.9]	99 (4.0) [4.4]	62 (4.5) [5.5]	39 (5.4)	701 (3.6) [2.6]	370 (3.6) [2.6] 331 (3.6) [2.7]	191 (3.5) [2.4] 185 (3.7) [2.9]	179 (3.8) [2.8] 146 (3.4) [2.5]
1961-62	*	*	10 (2.1) [4.5]	28 (3.6) [3.8]	51 (3.5) [3.7]	78 (3.7) [4.0]	98 (3.9) [3.3]	103 (4.4) [4.9]	72 (3.9) [5.5]	62 (5.3) [4.1]	502 (4.0) [4.1]	294 (3.9) [3.8] 208 (4.1) [4.4]	163 (4.0) [3.9] 111 (4.1) [3.9]	131 (3.7) [3.8] 97 (4.2) [4.9]
TOTAL	30 (0.8) [0.5]	149 (1.5) [1.5]	198 (1.8) [2.2]	286 (2.5) [2.8]	362 (3.2) [3.5]	333 (3.3) [4.3]	288 (3.6) [4.1]	235 (4.2) [5.6]	142 (4.0) [6.0]	101 (5.4) [5.9]		2124 (2.8) [3.3]		
RURAL	14 (0.9) [0.5]	58 (1.2) [1.7]	89 (1.6) [2.0]	131 (2.3) [2.5]	165 (2.9) [3.3]	147 (2.8) [4.4]	172 (3.9) [4.1]	139 (4.3) [6.0]	85 (4.0) [5.0]	67 (5.5) [5.4]			1067 (2.7) [3.3]	
URBAN	16 (0.7) [0.4]	91 (1.7) [1.4]	109 (1.9) [2.3]	155 (2.7) [3.0]	197 (3.5) [3.7]	186 (4.0) [4.3]	116 (3.2) [4.1]	96 (4.1) [5.1]	57 (4.1) [7.4]	34 (5.0) [6.7]				1057 (2.8) [3.3]

MODEL YEAR	ODOMETER READING (in thousands) 0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	TOTAL	TOTAL (by single years)	RURAL (by single years)	URBAN (by single years)
1967-68	18 (0.5)	43 (0.5)	52 (0.8)	36 (1.1)	17 (1.2)	11 (2.2)	3 (1.2)	*	*	*	180 (0.8)	51 (0.4) 129 (1.1)	25 (0.5) 65 (1.1)	26 (0.4) 64 (1.1)
1965-66	8 (2.2) [0.9]	21 (1.7) [0.9]	74 (2.3) [1.7]	132 (2.5) [2.3]	144 (2.9) [2.2]	95 (3.1) [1.4]	38 (2.3) [2.3]	27 (3.5)	12 (3.8)	*	551 (2.6) [1.4]	205 (2.3) [0.9] 346 (2.9) [1.6]	107 (2.3) [0.7] 144 (2.3) [1.4]	98 (2.3) [1.2] 202 (3.5) [1.8]
1963-64	*	11 (2.3) [1.9]	35 (3.9) [2.7]	71 (3.5) [3.0]	139 (3.9) [3.2]	167 (4.0) [3.4]	154 (4.3) [4.0]	92 (3.7) [4.4]	64 (4.6) [4.8]	40 (5.5) [6.0]	773 (4.0) [3.4]	378 (3.7) [2.9] 395 (4.3) [4.1]	193 (3.5) [2.4] 211 (4.2) [3.9]	185 (3.9) [3.3] 184 (4.3) [4.2]
1961-62	*	*	30 (6.3) [8.1]	36 (4.6) [7.1]	81 (5.6) [6.2]	129 (6.1) [8.2]	150 (6.0) [7.7]	148 (6.4) [8.7]	137 (7.5) [9.3]	92 (7.9) [7.2]	803 (6.3) [7.7]	464 (6.1) [6.8] 339 (6.7) [8.9]	243 (6.0) [6.0] 173 (6.3) [8.6]	221 (6.2) [7.5] 166 (7.2) [9.1]
TOTAL	26 (0.7) [1.0]	75 (0.8) [1.5]	191 (1.7) [3.1]	275 (2.4) [4.0]	381 (3.4) [4.8]	402 (4.0) [6.6]	345 (4.3) [7.5]	267 (4.8) [8.6]	213 (6.0) [9.2]	132 (7.0) [8.6]		2307 (3.0) [4.9]		
RURAL	12 (0.8) [0.6]	36 (0.8) [1.2]	91 (1.7) [2.8]	116 (2.0) [3.6]	176 (3.0) [4.0]	204 (3.8) [6.2]	164 (3.7) [7.4]	161 (4.9) [8.0]	116 (5.5) [8.6]	85 (7.0) [8.2]			1161 (2.9) [4.7]	
URBAN	14 (0.6) [1.3]	39 (0.7) [1.7]	100 (1.8) [3.2]	159 (2.8) [4.3]	205 (3.7) [5.5]	198 (4.3) [7.0]	181 (5.0) [7.6]	106 (4.5) [9.3]	97 (6.9) [10.0]	47 (7.0) [9.2]				1146 (3.1) [5.1]

Table A-10. Directional Signal Failure

MODEL YEAR	ODOMETER READING (in thousands) 0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	TOTAL	TOTAL (by single years)	RURAL (by single years)	URBAN (by single years)

Table A-10. Directional Signal Failure

MODEL YEAR	ODOMETER READING (in thousands)										TOTAL	TOTAL (by single years)	RURAL (by single years)	URBAN (by single years)
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99				
1967-68	31 (0.9)	145 (1.8)	158 (2.4)	87 (2.6)	46 (3.3)	20 (4.0)	13 (5.1)	*	*	*	500 (2.1)	177 (1.5) 323 (2.7)	66 (1.2) 151 (2.5)	111 (1.8) 172 (2.8)
1965-66	17 (4.7) [1.1]	26 (2.2) [1.8]	115 (3.5) [3.1]	222 (4.2) [4.4]	257 (5.2) [4.1]	164 (5.3) [5.4]	100 (6.0) [3.1]	43 (5.6)	21 (6.7)	*	965 (4.6) [2.6]	344 (3.9) [1.8] 621 (5.1) [3.0]	177 (3.9) [1.6] 322 (5.1) [3.2]	167 (3.9) [1.9] 299 (5.1) [2.8]
1963-64	*	16 (3.4) [2.9]	33 (3.7) [3.3]	90 (4.4) [4.4]	173 (4.8) [3.5]	224 (5.3) [4.8]	213 (5.9) [5.9]	182 (7.3) [6.3]	75 (5.4) [6.0]	46 (6.4)	1052 (5.4) [4.4]	561 (5.5) [4.4] 491 (5.3) [4.3]	311 (5.7) [4.0] 265 (5.3) [4.4]	250 (5.3) [4.7] 226 (5.3) [4.3]
1961-62	*	*	35 (7.3) [5.5]	53 (6.8) [6.4]	105 (7.3) [6.6]	146 (6.9) [7.1]	196 (7.8) [8.1]	184 (7.9) [8.6]	146 (8.0) [8.7]	109 (9.4) [9.6]	974 (7.7) [7.4]	555 (7.3) [6.8] 419 (8.3) [8.3]	316 (7.8) [6.9] 238 (8.7) [8.4]	239 (6.7) [6.7] 181 (7.9) [8.2]
TOTAL	48 (1.3) [1.3]	187 (1.9) [2.3]	341 (3.1) [3.5]	452 (3.9) [5.0]	581 (5.1) [5.8]	554 (5.6) [6.6]	522 (6.5) [7.4]	409 (7.3) [8.3]	242 (6.9) [9.2]	155 (8.2) [9.1]		3491 (4.5) [5.4]		
RURAL	18 (1.2) [1.0]	75 (1.6) [2.4]	156 (2.8) [3.7]	228 (4.0) [4.6]	274 (4.7) [5.6]	302 (5.7) [6.4]	314 (7.1) [7.0]	228 (7.0) [8.3]	147 (6.9) [8.5]	104 (8.6) [8.6]			1846 (4.7) [5.4]	
URBAN	30 (1.3) [1.6]	112 (2.2) [2.2]	185 (3.3) [3.4]	224 (3.9) [5.4]	307 (5.5) [6.0]	252 (5.4) [6.8]	208 (5.8) [7.9]	181 (7.7) [8.3]	95 (6.8) [10.1]	51 (7.6) [9.8]				1645 (4.4) [5.4]

Table A-11. Windshield Wiper Failure

MODEL YEAR	ODOMETER READING (in thousands) 0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	TOTAL	TOTAL (by single years)	RURAL (by single years)	URBAN (by single years)
1967-68	23 (0.7)	53 (0.6)	97 (1.5)	60 (1.8)	38 (2.8)	7 (1.4)	7 (2.7)	*	*	*	285 (1.2)	46 (0.4) 239 (2.0)	24 (0.4) 123 (2.1)	22 (0.4) 116 (1.9)
1965-66	9 (2.5) [0.2]	35 (2.9) [0.4]	83 (2.5) [0.7]	144 (2.7) [1.4]	167 (3.4) [2.5]	109 (3.5) [0.4]	62 (3.7) [2.3]	30 (3.9)	22 (7.1)	*	661 (3.2) [0.7]	229 (2.6) [0.3] 432 (3.6) [0.9]	127 (2.8) [0.3] 212 (3.4) [0.9]	102 (2.4) [0.2] 220 (3.8) [1.0]
1963-64	*	14 (3.0) [1.2]	46 (5.2) [1.6]	86 (4.2) [1.9]	171 (4.8) [1.6]	252 (6.0) [3.0]	181 (5.0) [2.1]	160 (6.4) [3.6]	78 (5.6) [4.3]	50 (6.9)	1038 (5.4) [2.0]	545 (5.4) [1.5] 493 (5.3) [2.6]	297 (5.4) [1.3] 296 (5.9) [2.5]	248 (5.3) [1.7] 197 (4.6) [2.6]
1961-62	*	*	20 (4.2) [3.2]	50 (6.4) [2.5]	68 (4.7) [2.7]	116 (5.5) [2.9]	122 (4.8) [2.9]	125 (5.4) [3.2]	85 (4.7) [3.7]	67 (5.7) [2.3]	652 (5.2) [2.9]	357 (4.7) [2.5] 295 (5.9) [3.4]	192 (4.7) [2.6] 164 (6.0) [3.3]	165 (4.6) [2.5] 131 (5.7) [3.5]
TOTAL	32 (0.8) [0.4]	102 (1.0) [0.6]	246 (2.2) [1.4]	340 (3.0) [2.0]	445 (3.9) [2.3]	484 (4.9) [3.1]	372 (4.6) [3.1]	315 (5.6) [3.9]	185 (5.3) [4.0]	116 (6.2) [4.7]		2636 (3.4) [2.3]		
RURAL	14 (0.9) [0.5]	47 (1.0) [0.5]	131 (2.4) [1.0]	162 (2.8) [1.9]	231 (4.0) [2.3]	267 (5.0) [3.5]	230 (5.2) [3.1]	169 (5.2) [3.7]	101 (4.8) [4.2]	83 (6.9) [4.6]			1435 (3.6) [2.3]	
URBAN	18 (0.8) [0.3]	55 (1.1) [0.7]	115 (2.0) [1.7]	178 (3.1) [2.1]	213 (3.8) [2.3]	217 (4.7) [2.7]	142 (4.0) [3.1]	146 (6.2) [4.1]	84 (6.0) [3.8]	33 (4.9) [5.0]				1201 (3.2) [2.2]

Table A-12. Horn Failure

Table A-12. Horn Failure

MODEL YEAR	ODOMETER READING (in thousands)										TOTAL	TOTAL (by single years)	RURAL	URBAN
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99				
1967-68	8 (0.2)	20 (0.2)	19 (0.3)	18 (0.5)	9 (0.7)	6 (1.2)	2 (0.8)	*	*	*	82 (0.3)	21 (0.2) 61 (0.5)	9 (0.2) 27 (0.5)	12 (0.2) 34 (0.6)
1965-66	4 (1.1) [0.3]	8 (0.7) [0.2]	32 (1.0) [0.7]	24 (0.5) [0.9]	60 (1.2) [0.5]	26 (0.8) [1.4]	20 (1.2) [2.3]	12 (1.6)	5 (1.6)	*	191 (0.9) [0.5]	66 (0.7) [0.4] 125 (1.0) [0.5]	32 (0.7) [0.3] 65 (1.0) [0.5]	34 (0.8) [0.4] 60 (1.0) [0.6]
1963-64	*	5 (1.1) [0.5]	6 (0.7) [0.9]	27 (1.3) [0.8]	44 (1.2) [0.7]	42 (1.0) [1.3]	48 (1.3) [1.5]	33 (1.3) [2.8]	26 (1.9) [2.6]	8 (1.1)	239 (1.2) [1.0]	114 (1.1) [0.8] 125 (1.4) [1.1]	56 (1.0) [0.8] 83 (1.7) [1.3]	58 (1.2) [0.8] 42 (1.0) [1.0]
1961-62	*	*	9 (1.9) [1.7]	10 (1.3) [0.5]	19 (1.3) [0.8]	25 (1.2) [1.3]	53 (2.1) [1.5]	36 (1.5) [1.8]	33 (1.8) [1.8]	20 (1.7) [2.8]	205 (1.6) [1.4]	103 (1.3) [1.2] 102 (2.0) [1.7]	54 (1.3) [1.1] 64 (2.3) [1.7]	49 (1.4) [1.2] 38 (1.7) [1.6]
TOTAL	12 (0.3) [0.2]	33 (0.3) [0.4]	66 (0.6) [0.9]	79 (0.7) [0.8]	132 (1.2) [0.8]	99 (1.0) [1.3]	123 (1.5) [1.6]	81 (1.4) [1.9]	64 (1.8) [1.7]	28 (1.5) [2.1]		717 (0.9) [1.0]		
RURAL	2 (0.1) [0.4]	18 (0.4) [0.3]	32 (0.6) [0.7]	43 (0.7) [0.8]	63 (1.1) [0.9]	54 (1.0) [1.1]	76 (1.7) [1.8]	41 (1.3) [2.0]	42 (2.0) [1.2]	19 (1.6) [1.9]			390 (1.0) [1.0]	
URBAN	10 (0.4) [0.2]	15 (0.3) [0.4]	34 (0.6) [1.0]	36 (0.6) [0.8]	69 (1.2) [0.7]	45 (1.0) [1.4]	47 (1.3) [1.3]	40 (1.7) [1.7]	22 (1.6) [2.4]	9 (1.3) [2.3]				327 (0.9) [1.0]

Table A-13. Steering Failure

MODEL YEAR	ODOMETER READING (in thousands) 0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	TOTAL	TOTAL (by single years)	RURAL (by single years)	URBAN (by single years)
1967-68	8 (0.2)	9 (0.1)	7 (0.1)	10 (0.3)	8 (0.6)	1 (0.2)	2 (0.8)	*	*	*	45 (0.2)	19 (0.2) 26 (0.2)	10 (0.2) 15 (0.3)	9 (0.1) 11 (0.2)
1965-66	0 (0.0) [0.1]	4 (0.3) [0.1]	5 (0.2) [0.2]	27 (0.5) [0.4]	22 (0.4) [1.6]	19 (0.6) [0.0]	11 (0.7) [0.8]	8 (1.0)	1 (0.3)	*	97 (0.5) [0.3]	28 (0.3) [0.2] 69 (0.6) [0.3]	16 (0.4) [0.2] 22 (0.3) [0.4]	12 (0.3) [0.3] 47 (0.8) [0.2]
1963-64	*	9 (1.9) [0.1]	5 (0.6) [0.2]	18 (0.9) [0.8]	32 (0.9) [0.7]	23 (0.5) [1.1]	36 (1.0) [0.8]	22 (0.9) [1.6]	12 (0.9) [2.1]	6 (0.8)	163 (0.8) [0.7]	66 (0.6) [0.5] 97 (1.1) [1.0]	29 (0.5) [0.5] 45 (0.9) [0.9]	37 (0.8) [0.6] 52 (1.2) [1.0]
1961-62	*	*	6 (1.3) [1.7]	12 (1.5) [1.6]	16 (1.1) [1.6]	30 (1.4) [2.2]	33 (1.3) [2.5]	38 (1.6) [1.9]	32 (1.8) [2.8]	21 (1.8) [3.4]	188 (1.5) [2.1]	91 (1.2) [1.6] 97 (1.9) [2.7]	46 (1.1) [1.5] 47 (1.7) [3.0]	45 (1.3) [1.8] 50 (2.2) [2.4]
TOTAL	8 (0.2) [0.3]	22 (0.2) [0.2]	23 (0.2) [0.5]	67 (0.6) [1.1]	78 (0.7) [1.3]	73 (0.7) [1.9]	82 (1.0) [2.1]	68 (1.2) [2.8]	45 (1.3) [3.4]	27 (1.4) [3.4]		493 (0.6) [1.4]		
RURAL	4 (0.3) [0.1]	9 (0.2) [0.4]	12 (0.2) [0.3]	31 (0.5) [1.1]	35 (0.6) [1.3]	28 (0.5) [1.8]	38 (0.9) [2.1]	35 (1.1) [2.7]	20 (0.9) [3.2]	18 (1.5) [3.5]			230 (0.6) [1.4]	
URBAN	4 (0.2) [0.3]	13 (0.2) [0.1]	11 (0.2) [0.6]	36 (0.6) [1.1]	43 (0.8) [1.4]	45 (1.0) [2.0]	44 (1.2) [2.2]	33 (1.4) [2.9]	25 (1.8) [3.7]	9 (1.3) [3.1]				263 (0.7) [1.4]

Table A-14. Emergency Brake Failure

Table A-14. Emergency Brake Failure

MODEL YEAR	ODOMETER READING (in thousands) 0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	TOTAL	TOTAL (by single years)	RURAL (by single years)	URBAN (by single years)
1967-68	21 (0.6)	38 (0.5)	40 (0.6)	41 (1.2)	21 (1.5)	8 (1.6)	6 (2.4)	*	*	*	175 (0.7)	54 (0.5) 121 (1.0)	23 (0.4) 56 (0.9)	31 (0.5) 65 (1.1)
1965-66	3 (0.8) [0.9]	14 (1.2) [1.0]	47 (1.4) [1.9]	95 (1.8) [2.6]	96 (1.9) [3.5]	71 (2.3) [3.1]	33 (2.0) [3.9]	27 (3.5)	9 (2.9)	*	395 (1.9) [1.6]	152 (1.7) [1.1] 243 (2.0) [1.9]	86 (1.9) [0.9] 115 (1.8) [2.2]	66 (1.5) [1.3] 128 (2.2) [1.6]
1963-64	*	7 (1.5) [1.2]	11 (1.2) [1.9]	24 (1.2) [2.3]	58 (1.6) [2.9]	77 (1.8) [4.2]	67 (1.9) [4.5]	37 (1.5) [5.3]	35 (2.5) [6.0]	18 (2.5)	334 (1.7) [2.9]	136 (1.3) [2.2] 198 (2.1) [3.5]	81 (1.5) [2.3] 105 (2.1) [4.1]	55 (1.2) [2.1] 93 (2.2) [3.1]
1961-62	*	*	16 (3.3) [3.0]	16 (2.1) [3.5]	39 (2.7) [3.7]	60 (2.8) [4.0]	65 (2.6) [4.7]	72 (3.1) [5.3]	54 (3.0) [5.4]	34 (2.9) [5.4]	356 (2.8) [4.4]	200 (2.6) [3.9] 156 (3.1) [5.0]	116 (2.9) [4.2] 93 (3.4) [5.8]	84 (2.4) [3.6] 63 (2.7) [4.2]
TOTAL	24 (0.6) [1.0]	59 (0.6) [1.3]	114 (1.0) [2.3]	176 (1.5) [2.8]	214 (1.9) [3.6]	216 (2.2) [4.5]	171 (2.1) [5.2]	136 (2.4) [6.5]	98 (2.8) [6.6]	52 (2.8) [6.4]		1260 (1.6) [3.6]		
RURAL	9 (0.6) [1.0]	25 (0.5) [1.3]	59 (1.1) [2.4]	91 (1.6) [3.1]	97 (1.7) [3.7]	97 (1.8) [5.0]	108 (2.4) [6.3]	88 (2.7) [6.8]	65 (3.1) [6.9]	36 (3.0) [7.1]			675 (1.7) [4.1]	
URBAN	15 (0.7) [1.0]	34 (0.7) [1.4]	55 (1.0) [2.2]	85 (1.5) [2.5]	117 (2.1) [3.5]	119 (2.6) [4.0]	63 (1.8) [4.1]	48 (2.1) [6.2]	33 (2.3) [6.3]	16 (2.4) [5.2]				585 (1.6) [3.2]

Table A-15. STANDARD CHEVROLET - Overall Failure Rates

MODEL YEAR	ODOMETER READING (in thousands)										TOTAL
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	
1967-68	41 (13.9)	176 (20.1)	156 (21.5)	103 (25.1)	49 (28.2)	24 (36.4)	17 (54.8)	*	*	*	566 (22.0)
1965-66	11 (29.7)	22 (22.2)	111 (29.3)	259 (37.2)	302 (42.6)	167 (38.0)	98 (37.8)	43 (37.7)	18 (39.1)	*	1031 (37.1)
1963-64	*	34 (42.5)	33 (28.4)	109 (36.1)	209 (37.7)	278 (40.2)	243 (40.4)	170 (42.5)	110 (46.4)	59 (43.4)	1245 (39.9)
1961-62	*	*	31 (36.5)	55 (42.3)	97 (41.6)	150 (43.6)	189 (45.1)	209 (50.7)	156 (48.9)	137 (55.7)	1024 (46.8)
TOTAL	52 (15.7)	232 (22.0)	331 (25.3)	526 (34.2)	657 (39.3)	619 (40.1)	547 (41.7)	422 (45.6)	284 (47.2)	196 (51.3)	3866 (36.3)

Table A-16. STANDARD FORD - Overall Failure Rates

MODEL YEAR	ODOMETER READING (in thousands)										TOTAL
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	
1967-68	31 (15.3)	155 (24.7)	142 (25.0)	99 (28.0)	50 (32.1)	21 (31.3)	14 (38.9)	*	*	*	512 (25.5)
1965-66	9 (22.5)	40 (27.8)	108 (31.4)	188 (31.7)	172 (30.6)	142 (36.7)	84 (42.2)	32 (39.0)	24 (51.1)	*	799 (33.3)
1963-64	*	21 (36.2)	28 (30.4)	80 (37.7)	147 (35.4)	231 (41.1)	198 (35.2)	164 (41.5)	90 (41.1)	66 (57.9)	1025 (39.0)
1961-62	*	*	27 (52.9)	22 (38.6)	65 (44.5)	88 (43.6)	147 (48.7)	138 (48.8)	130 (50.6)	84 (50.3)	701 (47.8)
TOTAL	40 (16.5)	216 (26.1)	305 (28.9)	389 (32.0)	434 (33.9)	482 (39.6)	443 (40.3)	334 (43.9)	244 (46.7)	150 (53.4)	3037 (35.7)

Table A-17. STANDARD PLYMOUTH - Overall Failure Rates

MODEL YEAR	ODOMETER READING (in thousands)										TOTAL
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	
1967-68	31 (19.3)	62 (20.1)	71 (23.4)	49 (31.6)	29 (40.8)	5 (22.7)	2 (18.2)	*	*	*	249 (24.1)
1965-66	2 (22.2)	12 (34.3)	30 (27.3)	68 (32.7)	64 (37.4)	76 (43.9)	35 (51.5)	20 (47.6)	7 (58.3)	*	314 (37.9)
1963-64	*	6 (46.2)	5 (23.8)	22 (34.4)	41 (38.0)	39 (35.1)	53 (45.7)	33 (40.7)	22 (36.7)	16 (47.1)	237 (39.0)
1961-62	*	*	4 (57.1)	11 (57.9)	4 (22.2)	18 (52.9)	27 (50.9)	20 (39.2)	16 (37.2)	7 (33.3)	107 (43.5)
TOTAL	33 (19.4)	80 (22.5)	110 (24.9)	150 (33.6)	138 (37.5)	138 (40.6)	117 (47.2)	73 (42.0)	45 (39.1)	23 (41.8)	907 (33.4)

Table A-18. CORVAIR - Overall Failure Rates

MODEL YEAR	ODOMETER READING (in thousands)										TOTAL
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	
1967-68	1 (25.0)	3 (13.6)	9 (75.0)	1 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)	*	*	*	14 (32.6)
1965-66	2 (50.0)	8 (53.3)	11 (33.3)	18 (32.7)	30 (47.6)	14 (48.3)	9 (60.0)	5 (62.5)	0 (0.0)	*	97 (43.7)
1963-64	*	1 (33.3)	8 (42.1)	8 (23.5)	17 (37.8)	35 (44.9)	31 (43.7)	17 (44.7)	11 (52.4)	1 (25.0)	129 (41.2)
1961-62	*	*	4 (30.8)	10 (66.7)	16 (53.3)	27 (49.1)	35 (53.8)	37 (50.0)	27 (55.1)	9 (39.1)	165 (50.9)
TOTAL	3 (37.5)	12 (30.0)	32 (41.6)	37 (34.3)	63 (45.3)	76 (46.9)	75 (49.7)	59 (49.2)	38 (54.3)	10 (37.0)	405 (44.9)

Table A-19. FALCON - Overall Failure Rates

MODEL YEAR	ODOMETER READING (in thousands)										TOTAL
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	
1967-68	4 (17.4)	13 (22.0)	9 (20.9)	8 (42.1)	2 (28.6)	1 (50.0)	0 (0.0)	*	*	*	37 (24.2)
1965-66	1 (25.0)	6 (20.0)	22 (31.9)	29 (31.2)	32 (36.0)	21 (42.0)	12 (37.5)	3 (33.3)	0 (0.0)	*	126 (33.1)
1963-64	*	2 (15.4)	7 (29.2)	20 (39.2)	33 (33.3)	44 (41.5)	33 (31.4)	44 (55.0)	22 (45.8)	7 (31.8)	212 (38.7)
1961-62	*	*	6 (27.3)	16 (44.4)	36 (40.0)	42 (37.8)	53 (42.1)	60 (55.0)	31 (41.9)	39 (55.7)	283 (44.4)
TOTAL	5 (18.5)	21 (20.6)	44 (27.8)	73 (36.7)	103 (36.1)	108 (40.1)	98 (37.3)	107 (54.0)	53 (41.7)	46 (50.0)	658 (38.3)

Table A-20. VALIANT - Overall Failure Rates

MODEL YEAR	ODOMETER READING (in thousands)										TOTAL
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	
1967-68	3 (13.6)	13 (36.1)	8 (25.8)	4 (36.4)	5 (71.4)	3 (42.9)	0 (0.0)	*	*	*	36 (31.0)
1965-66	2 (50.0)	6 (37.5)	13 (43.3)	14 (36.8)	17 (43.6)	7 (38.9)	5 (33.3)	4 (80.0)	1 (50.0)	*	69 (41.3)
1963-64	*	4 (30.8)	7 (41.2)	14 (35.9)	26 (35.1)	28 (35.9)	27 (52.9)	17 (48.6)	3 (20.0)	5 (45.5)	131 (39.3)
1961-62	*	*	3 (60.0)	2 (16.7)	13 (52.0)	12 (37.5)	19 (50.0)	15 (55.6)	10 (41.7)	7 (50.0)	81 (45.8)
TOTAL	5 (19.2)	23 (35.4)	31 (37.3)	34 (34.0)	61 (42.1)	50 (37.0)	51 (48.1)	36 (53.7)	14 (34.1)	12 (48.0)	317 (40.0)

Table A-21. VW (Beetle, Karmann - Ghia) - Overall Failure Rates

MODEL YEAR	ODOMETER READING (in thousands)										TOTAL
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	
1967-68	30 (26.3)	55 (19.7)	66 (28.6)	28 (26.4)	11 (23.9)	4 (25.0)	1 (25.0)	*	*	*	195 (24.5)
1965-66	3 (37.5)	4 (14.8)	20 (19.4)	52 (28.0)	48 (30.2)	44 (39.3)	19 (37.3)	10 (41.7)	3 (37.5)	*	203 (29.9)
1963-64	*	1 (12.5)	15 (44.1)	19 (30.2)	34 (37.8)	40 (33.9)	45 (49.5)	26 (47.3)	14 (50.0)	4 (26.7)	198 (39.4)
1961-62	*	*	7 (70.0)	3 (18.8)	10 (27.8)	24 (45.3)	23 (46.9)	30 (49.2)	26 (47.3)	16 (41.0)	139 (43.6)
TOTAL	33 (27.0)	16 (19.1)	108 (28.6)	102 (27.5)	103 (31.1)	112 (37.5)	88 (45.1)	66 (47.1)	43 (47.3)	20 (37.0)	735 (32.0)

Table A-22. Headlight, Foot Brake, Steering, Stop Light, and Horn - Overall Failure Rates for Specific Car Models

CAR MODEL	HEADLIGHT	FOOT BRAKE	STEERING	STOP LIGHT	HORN
STANDARD CHEVROLET	2077 (19.5)	333 (3.1)	56 (0.5)	383 (3.6)	81 (0.8)
STANDARD FORD	1741 (20.5)	380 (4.5)	64 (0.8)	163 (1.9)	109 (1.3)
STANDARD PLYMOUTH	439 (16.2)	53 (2.0)	10 (0.4)	93 (3.4)	8 (0.3)
CORVAIR	209 (23.2)	39 (4.3)	9 (1.0)	32 (3.5)	11 (1.2)
FALCON	327 (19.0)	89 (5.1)	26 (1.6)	54 (3.1)	24 (1.4)
VALIANT	147 (18.5)	40 (5.0)	8 (1.0)	30 (3.8)	6 (0.8)
VW	455 (19.8)	112 (4.9)	49 (2.1)	81 (3.5)	70 (3.1)