ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 600

[AMS-FRL-2839-5]

Fuel Economy Test Procedures; CAFE Adjustments To Compensate for Changes in 1975 Test Procedures

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This final rule grants Corporate Average Fuel Economy (CAFE) adjustments to compensate for the effects of past test procedure changes. The CAFE adjustments are calculated for each manufacturer to directly compensate for the CAFE impact each manufacturer experienced as a result of the test procedure changes. Additionally, this rule grants fuel economy adjustments to compensate for the effects of test procedure changes on fuel economy results used for the purpose of assessing Gas Guzzler Taxes on 1981 and later model types. This rule also establishes the procedures which the Agency will follow in providing notice and opportunity for public participation in determining CAFE and gas guzzler adjustments for any future test changes. Finally, revised test vehicle mileage accumulation limits are established by this rule to maintain the stringency of the CAFE standards in future model years.

DATE: This final rule is effective July 31, 1985.

ADDRESS: Copies of material relevant to this rulemaking are contained in public docket no. A–83–44 at the U.S. Environmental Protection Agency, West Tower Lobby, Gallery I, 401 M Street, SW., Washington, D.C. 20460. The docket may be inspected between 8 a.m. and 4 p.m. on weekdays. As provided in 40 CFR Part 2, a reasonable fee may be charged for photocopying.

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SUPPLEMENTARY INFORMATION:

I. Background

The Energy Policy and Conservation Act (EPCA) requires that manufacturers' average fuel economies for passenger automobiles meet minimum standards in the 1978 and later model years, 15 U.S.C. 2001 *et seq.* These standards are the Corporate Average Fuel Economy (CAFE) standards. Since the stringency of the standards is a function of the test used to determine compliance, section 503(d) of EPCA specifies that EPA should determine each manufacturer's CAFE value using the test procedures and practices that EPA had used for the 1975 model year, or procedures which would yield "comparable results." Any change to the test procedures used by EPA for the 1975 model year which would necessarily result in a systematically lower average fuel economy than that measured by the 1975 model year procedures would increase the stringency of the CAFE standards. Conversely, any change that would necessarily result in a higher average fuel economy than that measured by the 1975 model year procedures would decrease the stringency of the CAFE standards. In either case, since EPA is not authorized to change the stringency of the CAFE standards through test procedure changes, a CAFE adjustment may be warranted.

After 1975, EPA made several test procedure changes to improve the ability of the test to predict actual fuel economy improvements to keep up with technological advances and to minimize test-to-test variability. In January 1982, the United States Court of Appeals for the Sixth Circuit ordered EPA to initiate rulemaking proceedings concerning procedures for establishing CAFE adjustment values. EPA responded by issuing a Notice of Proposed Rulemaking (NPRM) (48 FR 56526) on December 21, 1983, which proposed to apply an industry-wide CAFE adjustment of 0.2 miles per gallon (mpg) for passenger automobiles of 1980 and later model years to account for the effects of past changes in test procedures.

EPA also proposed that whenever new test procedure changes are implemented, EPA would determine whether CAFE adjustments are warranted by assessing all test changes and their industry-wide impact on CAFE results, and adjust CAFE results for any significant CAFE penalty imposed on a representative fleet. A "significant CAFE penalty" was defined as any change or group of changes that has at least a tenth of an mpg effect on CAFE results.

Since the Energy Tax Act of 1978 which imposes the "gas guzzler tax" also mandates use of EPA's 1975 model year test procedures or procedures yielding comparable results (26 U.S.C. 4064(c)(1), EPA additionally proposed a 0.2 mpg increase to the model type combined fuel economy for purposes of assessing the taxes on 1981 and later model types.

On December 7, 1984, EPA issued a supplement (49 FR 48024) to the December 21, 1983 NPRM. The supplemental NPRM proposed additional CAFE adjustments to compensate for test procedure changes which EPA had not considered previously. Industry-wide CAFE adjustments for the 1980 and later model years were proposed to account for the effects of changes in test fuel properties. Also, an industry-wide CAFE adjustment of 0.4 mpg was proposed for the 1981 model year to compensate for fuel efficient oils improvements which were not reflected in the fuel economy tests for that model year.

The intent of these proposals was to provide a CAFE adjustment in those circumstances where a systematic change in the test results, and thus in the stringency of the CAFE standards, would necessarily result from adoption of a revised procedure. However, consistent with past rulemakings and policy statements by EPA, no CAFE credit was proposed for procedure changes whose effect was to limit a manufacturer's ability to gain increases in its measured CAFE without increasing actual fuel economy by taking advantage of flexibilities that had existed in the 1975 test procedure. Closing such loopholes in fact yielded "comparable results" and thus maintained the stringency of the CAFE standards, since the fuel economy estimates on which Congress based the CAFE standards were generated before manufacturers had the incentive to use the flexibilities in the 1975 procedures. Similarly, no CAFE *debit* was proposed for changes which improved the ability of the test procedures to detect real fuel economy gains. Such test changes appropriately benefited those manufacturers which adopted fuel economy-improving design innovations, as Congress intended in establishing the CAFE standards.

For a comprehensive description of the background relating to this rulemaking, please refer to the preambles of the December 21, 1983 NPRM and the December 7, 1984 supplemental NPRM. In addition, a detailed discussion of the issues pertaining to this rulemaking is contained in the Summary and Analysis of Comments which is available in the public docket.

II. General Description of the Final Rule

The rules promulgated here today have the following provisions:

A. CAFE adjustment equations are established and made applicable to 1980 and later model years passenger automobile CAFE's to account for test procedure changes which involved

distance measurement, inertia weight categories, dynamometer controllers, laboratory humidity, exhaust gas samplers, test fuel properties and energy efficient oils. The equations provide CAFE adjustments by model year on a manufacturer-specific basis. The results of EPA's calculation of CAFE adjustments applying to specific manufacturers for the 1980 through 1984 model years are shown in Appendix A to this preamble. The adjustments were calculated and applied to each manufacturer's unadjusted CAFE prior to rounding to the nearest 0.1 mpg. (EPA calculated CAFE adjustments and revisions only for manufacturers whose CAFE's for past model years have been confirmed; revised CAFE's will be calculated for other manufacturers once their past CAFE's are confirmed.)

B. This rule defers final action on light truck CAFE adjustments; therefore, no light truck CAFE adjustments are granted by this rule. Light truck CAFE adjustments are addressed in a notice of proposed rulemaking appearing elsewhere in this issue of the **Federal Register.**

C. For the purpose of assessing the gas guzzler tax for 1980 and later model years, the CAFE adjustment equations are also made applicable to model type combined fuel economy values to account for past test procedure changes' effect on fuel economy test results.

D. All fuel economy test results used for passenger automobile CAFE calculations shall be adjusted to the approximate fuel economy test results at 4,000 miles if the test vehicle has accumulated more than 6,200 miles. This requirement will be effective beginning with the 1987 model year.

E. Regulations are adopted for calculating 1985 and later model year CAFE adjustments for the procedure changes addressed in the rulemaking. The methodology adopted is consistent with that used for calculating the 1980 through 1984 adjustments.

F. Regulations are also established for determining the CAFE effect of future test procedure changes. The procedure being adopted will consider each test procedure change and provide appropriate CAFE adjustments.

III. Discussion of Issues and Comments

The Summary and Analysis of Comments, as placed in the public docket, presents detailed explanations of the issues, summaries of the public comments, analyses of the comments, and recommendations. Following is an abbreviated discussion of the issues and EPA's decisions.

A. Inertia Test Weight Change

During dynamometer testing for emissions and fuel economy, the inertia effects of vehicle operation are simulated by setting the dynamometer mass loading to simulate the vehicle's weight. This is accomplished by engaging a series of flywheels. The weight simulation is not continuous: Rather, it is approximated by the increments available in these flywheels. Due to this approximation, many vehicles are tested at weight settings which are higher or lower than their actual weights. In 1975, these inertia weight increments were 250 lbs. up through 3,000 lbs., and 500 lbs. for inertia weight settings from 3,000 to 5,000 lbs. Except as explained below, vehicle weights were divided at the middle of these increments to determine at which inertia setting testing would be conducted. For example, the "3,500 lb." weight category included all vehicles which weighed from 3,251 lbs. to 3,750 lbs. Consequently, a vehicle in a class above 3,000 lbs. could be tested at an inertia weight setting as much as 250 lbs. higher or 250 lbs. lower than its actual weight.

Beginning with the 1980 model year, the test weight increments were halved or in some cases quartered, to improve the accuracy of inertia weight simulation. Now, for example, a vehicle in the 3,000 to 4,000 lb. weight range will be tested at a simulated weight setting no more than 62 lbs. higher or 62 lbs. lower than its actual weight. Since the inertia weight required to be accelerated and decelerated during driving can affect emissions and fuel economy, this reduction in inertia weight increments reduces the potential bias in emission and fuel economy test results due to inexact weight simulation. Additionally, the smaller increments make it easier for manufacturers to gain credit for vehicle weight reduction. Whereas prior to the 1980 model year, a manufacturer might have had to remove as much as 500 lbs. from a vehicle in the very popular 3,000 to 4,000 lb. weight range before it was tested at the next lower inertia weight setting, a weight reduction of no more than 125 lbs. assures testing at a lower test weight setting under the revised regulations.

In the December 1983 NPRM, EPA proposed an industry-wide credit for this change to smaller inertia weight increments. The goal of adopting the smaller increments was to improve the accuracy and minimize the potential bias that could result from testing vehicles at a simulated weight either too high or too low in comparison to actual vehicle weights. EPA did not expect that the change would either systematically increase or decrease fuel economy compared to the 1975 test procedures, and thus anticipated no effect on CAFE standard stringency. In fact, prior to implementing the change, EPA reviewed available data and determined that for the 1975 model year, vehicle weights were spread fairly uniformly across the inertia weight classes (42 FR 45642, September 12, 1977). Thus, when these classes were approximately halved to determine the new weight increments, no significant industry-wide impact was anticipated.

However, in preparing the CAFE adjustment NPRM, EPA carefully analyzed the current test weights compared to the old test weights. As first indicated by Ford, EPA determined that there was a slight increase in average test weight for one range of vehicle weights as a result of the change in inertia weight categories. The increase was caused by the elimination of the 1975 test procedures' discontinuity in weight simulation at 3,000 lbs. (i.e., the dynamometer had been adjustable in 250 lb. increments up to 3,000 lbs. but in 500 lb. increments above 3,000 lbs.). Under the old procedure, vehicles in the other inertia weight categories were tested at a weight which was the mid-point of the weight range in the category. (For example, vehicles in the weight category ranging from 3,251 to 3,750 lbs. were tested at 3,500 lbs.) In the 3,000 lb. inertia weight category, however, the vehicles ranged from 2,876 lbs. to 3,250 lbs., but were tested at 3,000 lbs. instead of 3,062 lbs., the mid-point. For this category only, the test weight simulated weights as much as 250 lbs. higher but only 125 lbs. lower than actual vehicle weight. Consequently, for a uniform distribution of vehicles across the 3,000 lb. category, the test weight was 62 lbs. lower than the average of the vehicle weights represented. In short, the 1975 3,000 lb. inertia weight category slightly biased the test weight, and thus the test results, in the manufacturers' favor. The change in inertia weight categories eliminated this bias, effectively making the CAFE standards more stringent.

In adopting the finer inertia weight increments, EPA made dynamometers adjustable in 125 lb. increments up through 4,000 lbs. and in 250 lb. increments above 4,000 lbs. This introduced a new discontinuity in weight simulations for the 4,000 lb. test weight. Like the discontinuity for the 3,000 lb. category under the 1975 procedures, this new discontinuity also results in an unbalanced test interval. Here, the weight category ranges from

62 lbs. below the test weight to 125 lbs. above the test weight. For a uniform distribution of vehicles across the weight category, the test weight is 31.5 lbs. too low to accurately simulate the average of the vehicle weights represented. The degree of missimulation is not as great as that for the 3,000 lb. category under the old procedures, however. Thus, the net effect of adoptng the new procedures was that the average test weight simulated on the dynamometer for the whole range of vehicles necessarily increased. This directional shift in stringency caused EPA to propose a CAFE adjustment for this test procedure change.

GM and Ford were the only commenters on this specific issue. GM, consistent with its comments on other issues, recommended that the adjustment for change in inertia weight simulation be manufacturer-specific (that is, a unique value calculated for each manufacturer based on its own product line). But GM went considerably further in departing from EPA's proposal. GM recommended that each individual test vehicle be adjusted to account for the difference between its current test weight and the test weight it would have been tested at under the old regulations. As stated above, one of the purposes of going to finer inertia weight increments was to improve the accuracy of the weight simulation and thus limit the potential fuel economy bias due to inexact weight simulation. This bias would result if the distribution of actual vehicle weights in an inertia weight category on average did not equal the simulated test weight for that inertia weight category. For example, if the average actual vehicle weight was above the test weight for an inertia weight category, the vehicles, on average, would be tested at a weight lower than their actual weight. Since fuel economy tends to increase with decreases in vehicle weight, such a too low test weight would result in inappropriately high fuel economy estimates. Conversely, if the average vehicle weight was *below* the test weight, the vehicles, on average, would be tested at a weight higher than their actual weight. Thus, their measured fuel economy would be inappropriately low.

In recommending that EPA adjust each test vehicle back to its old test weight, GM, in effect, recommends that EPA revert to the old system where the potential for this fuel economy bias was much greater than under the current procedures. As suggested in the above example, a manufacturer would benefit from this added bias if it had tended to design vehicles so that their weights fell predominantly in the upper regions of the old inertia weight classes. Such test weight undersimulation would result in a significantly higher CAFE for the manufacturer than warranted by its vehicle designs, which are more accurately evaluated under the current finer inertia weight increments.

Under GM's method, many manufacturers would receive substantially less credit than GM in the 1980 through 1984 model years, in some cases zero or a negative CAFE adjustment. This is because, most likely by chance, these manufacturers tended to have more vehicles situated below the old test weights for the old inertia weight classes rather than above the test weights, in contrast to GM. EPA has discovered no technical reason why one manufacturer operating under the current inertia weight test procedures would tend to have vehicles situated above the old test weights while another manufacturer would be expected to have its vehicles situated below the test weight. How current vehicles' weights, developed in light of the current inertia weight test procedures, look when overlaid on the old inertia weight categories is technically irrelevant. Thus, adopting GM's method would provide some manufacturers, including GM, with substantial CAFE credit and a seemingly random group of other manufacturers with significantly less credits or even debits just on the basis of where their vehicles' weights happen to fall relative to the old weight categories. Such a scheme could inappropriately penalize manufacturers for designing their vehicles in light of the new categories, which were introduced not only to better simulate actual vehicle weight, but to encourage manufacturers to take additional weight off their vehicles. Additionally, the GM methodology allows significant CAFE biasing in the future and erosion of the stringency of the CAFE standards. Therefore, it cannot be considered a credible methodology for determining CAFE adjustments.

GM's methodology does suggest one other consideration with respect to the inertia weight issue. Under GM's methodology, positive credits result if more vehicles are situated above a test weight than below the test weight. EPA does not deny that in actuality a specific manufacturer's vehicle weigths may not be symmetrically distributed such that the average actual vehicle weight coincides exactly with the dynamometer test weight. EPA acknowledged this in the rulemaking which adopted the revised inertia weight procedures. However, the clear purpose of the test procedure has always been to test vehicles *on average* at their *actual vehicle* weight. Disallowing CAFE credit for vehicles which under the old procedures would have been tested at a weight lower than their actual weight (whether resulting from random occurrence or intentional efforts by the manufacturer) preserves the purpose of the original inertia weight procedure.

In establishing the CAFE program, Congress did not intend for manufacturers to take advantage of flexibilities in the test procedure to derive CAFE increases which are not the result of design improvements or marketing shifts and which would not result in any improvement in actual fuel economy. GM's recommendation would effectively undo EPA's efforts to assure that only actual fuel economy gains are reflected in a manufacturer's CAFE. GM's approach would necessarily decrease the stringency of the standards intended by Congress and as a result must be rejected by EPA.

Ford accepted EPA's general proposal, but recommended a slightly different methodology for calculating the impact on CAFE of the inertia weight test procedure change. Ford only considered the impact on vehicles in the original 3,000 lb. weight class when evaluating the test procedure change. Ford recognized that the revised test procedure eliminated the undersimulation of vehicle weights that had existed in the 3,000 lb. weight class prior to the test procedure change. Ford's methodology calculates a credit based on this elimination of undersimulation. However, it does not account for the fact that a new area of undersimulation was created by the revised procedures at the 4,000 lb. test weight. This acts to benefit the industry in a similar fashion, though not to as great an extent, as the old procedure. This new benefit at 4,000 lbs. should be used to partially offset the loss of benefit at 3,000 lbs. Ford's methodology does not do this. The method proposed by EPA adjusts for inertia weight offsets occurring over the full range of possible weights. Therefore, Ford's recommendation is accepted in principle, but EPA's specific methodology is adopted since it more comprehensively adjusts for the change in test procedure.

The EPA methodology includes calculating manufacturer-specific CAFE adjustments for this change in inertia weight test procedure. Each manufacturer's CAFE is credited by the loss in fuel economy due to the procedural change in the 3,000 lb.

category. This credit is a function of the manufacturer's sales in the current 3,000 lb. inertia weight class, an estimate of the manufacturer's fuel economy for that class, and an industry-wide sensitivity factor which accounts for the expected fuel economy impact due to the average test weight increase of 62 lbs. in that class. This credit is reduced by the beneficial fuel economy impact resulting from the weight undersimulation introduced by the revised procedures in the 4,000 lb. category. The beneficial impact is a function of the manufacturer's sales in the 4,000 lb. equivalent test weight category, an estimate of the manufacturer's fuel economy for that category, and the same industry-wide sensitivity factor which is used to account for the expected fuel economy impact due to the average test weight undersimulation of 31.5 lbs. in that category. As suggested by Ford and GM, the value of this industry-wide sensitivity factor has been revised to more accurately represent the average effect of weight changes on fuel economy. (For further information on the derivation of the test weight sensitivity factor, see Section B of the Summary and Analysis of Comments, contained in the docket.)

EPA has determined that the net impact of the inertia weight adjustment should not be less than zero; that is, no manufacturer should receive a net debit as a result of this inertia weight test procedure change. This could have occurred in the case of a manufacturer with such a very limited product line that, for example, it had no sales in the 3,000 lb. inertia weight category and thus received no CAFE adjustment credit. Any sales in the 4,000 lb. inertia weight category would then lead to a net CAFE debit for that manufacturer. This is inappropriate for several reasons. First, EPA's approach to adjusting CAFE's does not—and cannot with available sales data—determine exactly where a manufacturer's 1975 model year vehicles actually fell in the old inertia weight categories. As a result, EPA cannot make a direct comparison between how a manufacturer's vehicles were distributed in 1975 and in later model years in order to compute precisely how much a manufacturer has been hurt or helped by the change in inertia weight categories. EPA's approach is most accurate for manufacturers with large, diverse product lines, since there is a greater likelihood that their vehicles were evenly distributed about the 1975 test weight settings and continue to be evenly distributed about the current settings. However, in the case of limited product line manufacturers, that theoretical symmetry is less likely and the possibility of unfair results is consequently increased. For example, if a manufacturer's few models happened to be in the lower end of the 4,000 lb weight class under both the 1975 and current test procedures, it has not benefited by the new undersimulation created by the test change, but remains subject to a continuing oversimulation of its vehicles' actual weight. It would hardly be fair in such cases to debit the manufacturer for a potential benefit it has never enjoyed.

B. Manufacturer-Specific CAFE Adjustments

EPA proposed *industry-wide* CAFE adjustments to account for the test procedure changes which impact CAFE measurements. Thus, the first NPRM would have provided all manufacturers with the same CAFE adjustment of 0.2 mpg. The Agency determined that this fixed level of credit would provide all of the most affected manufacturers (i.e., those failing or in jeopardy of failing the CAFE standard) with a reasonable CAFE adjustment which adequately compensated these manufacturers for the adverse CAFE impact of the test procedure changes addressed. Further, the uniform credit had the advantage of treating all manufacturers alike, thus preserving their competitive position in regard to CAFE compliance. Finally, the fixed credit was very easy to implement, minimizing the administrative burden on both the industry and the Agency.

Nearly all the commenters supported the proposal to adopt industry-wide CAFE adjustments. There major reasons were cited. First, commenters stated that industry-wide adjustments would be reasonably accurate for the purpose of providing appropriate CAFE adjustments. Second, the fixed factors would be simple to implement. The smaller manufacturers in particular feared that calculating manufacturer-specific factors would place a disproportionately large administrative burden on them compared to the large manufacturers. Third, many commenters believed that the existing data did not support manufacturer-specific sensitivity factors to determine, for example, the fuel economy impact of a unit of test weight or humidity change for each manufacturer's designs. Requiring the manufacturers to determine manufacturer-specific sensitivity factors would then place a very substantial economic burden on most manufacturers.

GM, however, strongly supported manufacturer-specific calculation of CAFE adjustments. GM cited several reasons for its recommendations. First, it believed that manufacturer-specific adjustments would be consistent with the EPCA which requires each manufacturer, independent of other manufacturers, to comply with the CAFE standards. Second, GM pointed out that the equations which EPA used to estimate the fuel economy impact of the test procedure changes were in part dependent on several factors which could vary between manufacturers, specifically, the base CAFE to which the adjustments would apply, the average highway and city fuel economy values, and the fuel economy sensitivity of particular vehicle designs to changes in weight and humidity. Third, GM believed that for its particular designs, the appropriate fuel economy adjustment factors to account for weight and humidity changes were higher than the values EPA used in its industry-wide calculation, in which case GM would warrant a larger CAFE credit. Fourth, as previously discussed in the inertia weight change context, GM's alternative methodology for adjusting CAFE's calculated manufacturer-specific credits. Under this methodology, the CAFE credits GM calculated for itself were considerably higher than what EPA had calculated for the inertia weight issue when developing its proposed industry-wide credits. GM determined that, due to these points, GM should receive a higher CAFE adjustment credit under its manufacturer-specific calculation than that provided by EPA's proposal.

After reviewing these comments, EPA has concluded that there are valid points on both sides of the issue. EPA agrees with GM that the equations EPA uses to determine CAFE adjustments do contain coefficients which vary among manufacturers. In particular, the base CAFE of a manufacturer's fleet can significantly affect the amount of CAFE credit that the manufacturer is due. For a number of the test procedure changes, the fuel economy impact is in direct proportion to the base level of fuel economy. Thus, a manufacturer with a higher base CAFE has been more adversely affected by these test procedure changes and therefore deserves a higher CAFE adjustment credit, than a manufacturer with a lower base CAFE. A similar argument can be made for credits dependent on a manufacturer's actual average city and highway fuel economy values.

In these circumstances, it is technically inaccurate to calculate adjustments using industry average base CAFE's and city and highway fuel economy values. Doing so necessarily overcompensates manufacturers with

lower than average fuel economy performance by awarding them credits which are greater than the CAFE penalty they incurred due to the test procedure changes. Conversely, manufacturers with high fuel economy values are undercompensated compared to the impact the test procedure changes had on their CAFE's.

The same type of CAFE adjustment dependence on actual fuel economy performance occurs in the case of the inertia weight issue. Here, the more technically appropriate CAFE adjustment is calculated using individual manufacturer sales and fuel economy performance for the affected 3,000 lb. and 4,000 lb. weight categories, rather than the industry-average fuel economies and sales EPA considered in developing the CAFE adjustment proposals.

Administratively, calculating CAFE adjustments on the basis of each manufacturer's base CAFE and city and highway fuel economy values is simple and straightforward. Similarly, it is not difficult to calculate a manufacturer's 3,000 lb. and 4,000 lb. vehicle fuel economies and sales volumes for the purpose of determining inertia weight credit. Sufficient data already exists in the CAFE program data base, and calculating adjustments on the basis of manufacturer-specific rather than industry-wide information adds no significant administrative burden.

Finally, although some smaller manufacturers feared that manufacturer-specific CAFE adjustments might in some way place a larger manufacturer at a competitive advantage, it appears that calculating CAFE adjustments on the basis of manufacturer-specific fuel economies does not introduce any anti-competitive pressure. Since the necessary data for calculating every manufacturer's CAFE adjustment is already in the CAFE data base, small manufacturers will not be disproportionately burdened by the adjustment procedures as compared to large manufacturers. Moreover, manufacturer-specific adjustments probably do a better job of restoring competitive position than industry-wide adjustments since those manufacturers who were most severely affected by the test procedure change would receive the proportionately higher CAFE adjustment credit they are due, while those manufacturers who were less affected would not receive a windfall.

After careful consideration of all the comments, EPA now agrees, in general, with GM's reasoning that manufacturer-specific adjustments are needed and that it is appropriate to calculate CAFE adjustment values on the basis of manufacturer-specific base CAFE, city and highway fuel economy performance and, for the inertia weight issue, on manufacturer-specific sales and fuel economies for the 3,000 lb. and 4,000 lb. weight categories.

GM also argued that it was technically appropriate to use manufacturer-specific factors to account for the fuel economy impact of the changes in test weight and laboratory humidity. EPA has determined that available data is insufficient to calculate such manufacturer-specific factors for individual manufacturers. Substantial additional data would be required, adding greatly to the cost borne by EPA and the industry of determining CAFE adjustments and substantially delaying the calculation of the adjustments while such data was procured. Further, review of available data does not support the GM hypothesis that different manufacturers have vehicle designs whose response to changes in test weight or humidity differs significantly. However, on the basis of the comments and test data supplied by manufacturers, EPA has revised the test weight and humidity sensitivity factors and has applied these revised sensitivity factors in calculating each manufacturer's CAFE adjustment. (See portions of preamble concerning inertia weight and humidity test procedure changes for discussion of the derivation of the sensitivity factors.)

C. Test Distance Measurement

In the 1975 model year, EPA calculated fuel economy by dividing the nominal test cycle distance (7.5 miles for the city cycle and 10.242 miles for the highway cycle) by the quantity of fuel consumed during the test. This test procedure was changed in 1976 (40 CFR 86.144) to require, beginning with the 1978 model year, measurement of the actual distance driven over the test and use of this measured distance in the fuel economy calculation. Ford later presented information to EPA which showed that the mean distance of the city driving cycle is actually 7.45 miles, 0.05 miles less than the nominal test cycle distance. This meant that the 1975 test procedure slightly overstated vehicles' fuel economy because it divided the amount of fuel consumed during the test into the nominal distance of 7.5 miles instead of the actual mean test cycle distance of 7.45 miles, which a vehicle would have accumulated if it had exactly followed the driving schedule. Thus, when EPA required that fuel economy be calculated according to actual distance driven, it eliminated the 1975 test's slight inherent bias in favor of manufacturers, thereby effectively increasing the stringency of the CAFE standards. Similarly, there was a slight difference between the nominal distance of the highway cycle (10.242) and the mean average highway cycle distance (10.256 miles).

Recognizing that the test procedure change consistently yielded lower CAFE results than the 1975 procedures, EPA proposed providing a CAFE correction to compensate for this change. EPA estimated that on an industry-wide basis a CAFE credit of approximately 0.1 mpg for the 1978 and later model years was due.

The commenters were satisfied with EPA's derivation of the CAFE adjustment for distance measurement. However, they stated that one parameter used in the EPA equation, the highway/city fuel economy ratio, should be revised. EPA had derived this parameter from the EPA Emissions Factors data base, a data base used to assess in-use fuel economy and emissions but not used to determine manufacturers' CAFE's. Ford stated that it would be more appropriate to use the EPA/manufacturer certification and fuel economy data base for consistency in the derivation of the CAFE adjustment.

EPA concurs that the highway/city fuel economy ratio used should be derived from the EPA/manufacturer data base. This is the data base from which CAFE values are calculated and all other correction parameters are obtained where possible. Thus, the distance correction term of this rule's CAFE adjustment equation uses highway/city fuel economy ratios which are derived from the EPA/manufacturer final CAFE data base.

D. Dynamometer Controllers

EPA proposed a CAFE adjustment to compensate for EPA's laboratory equipment change from manual to automatic dynamometer load controllers. The CAFE adjustment for automatic dynamometer controllers uses the highway/city fuel economy ratio in a fashion similar to the adjustment for distance measurement. As with the distance measurement issue, the only comments specific to this issue addressed the source of the highway/city fuel economy ratio. Since it is a more appropriate data base, the dynamometer controller term of this final rule's CAFE adjustment equation uses highway/city fuel economy ratios which are derived from the EPA/manufacturer final CAFE data base. The CAFE adjustments due to dynamometer controller changes have not changed significantly from the proposal.

E. Laboratory Humidity

In 1977, EPA raised the humidity level in its laboratory from a nominal 50 grains/pound (gr./lb.) to a nominal 75 gr./lb. This higher humidity level was maintained until February 1980 at which time the nominal humidity was returned to 50 gr./lb. Since measured fuel economy generally decreases when laboratory humidity is increased, EPA proposed a CAFE adjustment for the period when the EPA laboratory humidity increased from a nominal 50 gr./lb. to a nominal 75 gr./lb. (The actual average for this period was 71 gr./lb.) EPA calculated CAFE credits ranging from 0.01 mpg to 0.02 mpg for the major domestic manufacturers in the 1978–1980 model years as a result of this change in laboratory humidity level.

Ford and GM both commented that a larger CAFE adjustment for humidity is justified for several reasons. First, they pointed out that the EPA humidity level in 1975 was 49 gr./lb., not 52 gr./lb. as used in EPA's calculation of the proposed humidity correction. This difference would directionally increase the CAFE adjustment. Second, they noted that the EPA laboratory humidity level is presently higher than the 1975 humidity because of an April 1983 humidity monitoring instrumentation change which was not addressed in the proposal. Third, they asserted that the humidity/fuel economy sensitivity factor used by EPA was lower than that indicated by their data.

EPA's analysis of the comments revealed the need to revise the calculation of CAFE adjustments related to humidity issues. EPA's investigation confirmed that the baseline 1975 model year humidity level was approximately 49 gr./lb. This investigation also revealed that the average annual EPA laboratory humidity level varied slightly from year to year. Further, the April 1983 change in the type of humidity measuring equipment used in the EPA laboratory resulted in approximately a 5 gr./lb. increase in actual humidity. Finally, the humidity/fuel economy sensitivity factor required revision to correct for limitations in EPA's data base and calculations pointed out by manufacturers' comments and data. (For a discussion of the basis for EPA's revised humidity/fuel economy sensitivity factor, see Section E of the Summary and Analysis of Comments, found in the docket.) These changes have been incorporated in the term which compensates for the effect of laboratory humidity in the CAFE adjustment equation.

GM also requested additional credit for a humidity related change it made in its laboratory practice which hurt its fuel economy. Prior to EPA's installing the new humidity measuring equipment discussed above, GM installed the same equipment in its own facility. GM requested additional CAFE credit for its loss in calculated fuel economy at its facility between the time it installed the new humidity equipment and the time EPA adopted it.

GM's request must be rejected since it would provide fuel economy credit on the basis of laboratory practices largely within the control of individual manufacturers. Manufacturers are required to maintain a reasonable level of correlation with the EPA facility. However, EPA is not equipped to consider how each manufacturer's individual laboratory practices may affect fuel economy; the potential issues are too numerous and in many cases not precisely quantifiable. EPA's laboratory thus serves as the standard of comparability for all other laboratories. If manufacturers cannot maintain reasonably close correlation with the EPA facility, proportionately more of the manufacturer's vehicles are tested at EPA or the manufacturer's fuel economy testing program is halted until the cause of the lack of correlation can be corrected. Consequently, consideration of only those changes made in EPA's laboratory practice (coupled with the requirement for adequate correlation) provides a sufficient measure of CAFE impact.

F. Constant Volume Samplers

GM requested CAFE credits for the effects of malperforming constant volume samplers (CVS's) at the EPA laboratory. In November 1981, EPA reported that some or all of the CVS's had not been operating properly at critical flow conditions prior to September 1981 causing slightly non-proportional sampling. EPA modified the CVS's to correct the problem, installed monitoring and warning systems to insure that the problem would not occur in the future, and performed a test program to characterize the potential impact of the malperforming equipment on emissions and fuel economy measurements.

EPA's study [1] in 1982 was unable to ascertain the exact effect of the equipment malperformance on fuel economy. The effect depends on the degree of non-proportional sampling that existed and on individual test vehicle characteristics as they affect the sampling system. However, the degree of non-proportional sampling that occurred is not known. EPA's ongoing correlation program with the industry failed to detect this problem, as did the routine calibration and quality audit checks that were periodically performed. In addition, it is not known how long the CVS samplers were in non-critical flow. While EPA believes the samplers were operating properly when installed in 1975, it is possible the checks performed at that time could not detect this non-critical flow condition. Alternatively, the non-critical flow condition could have existed for a comparatively short period of time, thus affecting fewer tests. This uncertainty makes it impossible to calculate precise CAFE adjustments based on the exact adverse impact of non-critical flow.

EPA was also unable to discern from a controlled study a mathematically predictable pattern to the effects of the CVS malperformance on test vehicle fuel economy. The study did establish that for the vehicles used in the evaluation higher fuel economy was achieved using equipment at critical flow. Test conditions were established to simulate the worst out-of-critical flow conditions found. Under these conditions, the average fuel economy effect was estimated at: 0.6 percent of the city fuel economy value and 1.0 percent of the highway fuel economy value. The study also established that the impact varied across vehicles. However, the study did not test enough vehicles of the various designs in the industry's fleet to establish a specific fleet-wide impact. To test enough vehicles would have been unreasonably costly and time-consuming and was not warranted considering the uncertainty in the degree of non-critical flow and the time period over which non-critical flow existed.

Although these uncertainties make precise, manufacturer-specific adjustments impossible, it is clear that the malperforming CVS's did have some adverse impact on fuel economy test results. EPA has decided to provide CAFE adjustments in the 1980 through 1982 model years for this issue based on the average maximum effects determined in its limited study and as applied to the average portion of vehicle fuel economy tests conducted at EPA's test facility for the 1980 through 1982 model years. This is consistent with the suggestions of GM. EPA is confident that this CAFE adjustment fully compensates for the maximum adverse impact on manufacturers' CAFE that could have resulted from the non-critical flow

[1] See EPA report No. EPA–AA–EOD–84/2, "Non-Proportional Sample Rates in a Critical Flow Venturi Constant Volume Sampler: Effects on Federal Emission Test Fuel Economy, January, 1982.

operation of EPA's constant volume samplers.

G. Fuel Efficient Oils

In comments on the original NPRM, both GM and Ford proposed that manufacturers be granted CAFE credit due to EPA's prohibition on the use of fuel efficient oils in test vehicles during 1980 and 1981 model year testing. Beginning with the 1982 model year, EPA approved the use of oils which improve fuel economy by, on average, 1.8 percent. This approval was based on in-use oil availability data gathered during the 1981 model year, so the approval came too late for 1981 model year testing. EPA subsequently determined that such fuel-efficient oil was generally available during the 1981 production year and was typically recommended for consumer use in 1981 model year vehicles by the automobile manufacturers. Therefore, EPA proposed in the supplemental NPRM an additional 0.40 mpg (1.8 percent of the 22 mpg CAFE standard for 1981) industry-wide CAFE credit for the 1981 model year only. EPA did not propose fuel efficient oil credits for the 1980 model year, since fuel efficient oil availability and usage did not appear to be sufficient.

In their comments on the supplemental NPRM, GM and Ford both claimed they are due more CAFE credits for the fuel efficient oils issue than EPA proposed. They argued that manufacturers deserve CAFE credit for 1980, as well as 1981, based on their claim that fuel efficient oils were available in 1980. GM commented that it recommended to its customers in the 1980 model year use of higher quality engine oils labeled with the American Petroleum Institute (API) designation "SF" and oils which were labeled as "Energy Saving", "Gas Saving" or the like. Additionally, GM provided a list of energy efficient oils which were available to consumers in 1980. EPA had previously accepted the "SF" designation as adequately denoting for consumers oils with fuel-efficient properties; however, the "SF" designation only came into use midway through the 1980 model year. GM's list indicated, though, that fuel-efficient oils were available and adequately labeled throughout 1980, making their usage likely.

After considering the comments, EPA has concluded, within the constraints of its general policy, that a CAFE credit is appropriate for both the 1980 and 1981 model years. EPA has reached this conclusion based on the likelihood that fuel-efficient oil was recommended, available and used by consumers during the 1980 and 1981 model years.

GM and Ford also contended that manufacturers should be awarded a 2 percent, instead of 1.8 percent, CAFE credit for 1980 and 1981, since the Department of Transportation (DOT) in setting the 1981 through 1984 CAFE standards assumed a 2 percent fuel economy improvement from the use of improved engine oils. Moreover, GM claimed an additional 0.2 percent CAFE penalty for model years 1982 and later because the March 17, 1981 EPA approval for use of fuel-efficient oils effectively allowed use of only those oils offering up to a 1.8 percent improvement in fuel economy. Finally, GM and Ford requested that EPA remove all restrictions on the use of energy efficient oils during fuel economy testing for 1986 and later model years.

EPA considers its general requirement, that the oils used in test vehicles be representative of what is likely to be used by consumers, to be appropriate policy. EPA has always, including in the 1975 base year, required the use of representative oils to ensure that the fuel economy improvements measured by the test will probably be realized by the consumer as well. The current guidelines automatically allow manufacturers to upgrade test vehicle oils if oils in the marketplace improve. Furthermore, EPA's stated policies do not preclude alternative means to demonstrate that a given oil will likely be used by consumers. On the other hand, the guidelines prevent a manufacturer from using its sophisticated test and screening capabilities to locate and use in the fuel economy program the very best oil. If there is not a reasonable likelihood that the typical driver will be able to locate and use an oil of similar fuel savings capability, its use in the fuel economy program would result in unrepresentatively high fuel economy benefit. EPA thus considers it appropriate to maintain its general policy of denying the use of a fuel saving oil (and, hence, denying commensurate CAFE credit) unless such oils can be shown to be representative.

Regarding the magnitude of the credit for the 1980 and 1981 model years, when EPA approved the use of fuel efficient oils for the 1982 model year, it specified that the test vehicle oil could not provide more than the sales-weighted average fuel economy improvement offered by oils labeled "SF". Subsequent manufacturer surveys of the marketplace indicated the average improvement to be 1.8 percent. Therefore, EPA has decided to grant 1980 and 1981 model year fuel efficient oils CAFE credit equal to the 1.8 percent maximum improvement allowed for fuel efficient oils in test vehicles.

EPA disagrees with GM and Ford that an additional 0.2 percent credit is due based on DOT projections. In setting the 1981–1984 model year CAFE standards, DOT projected several technological improvements as options to improve fuel economy. One option, improved lubricants, was estimated to improve fuel economy by 2 percent. However, DOT decided not to set the standards so high that all of the technological options would be necessary within the period of 1981–1984. DOT stated that implementation of all of the technological options would result in average fuel economy levels in excess of 27.5 mpg. Thus, the standards which DOT promulgated were believed to be achievable without the full estimated benefit of improved lubricants being realized. Most importantly, EPA's approval for use of energy efficient oils which improve fuel economy by 1.8 percent was based on the fuel economy improvement of actual oils, representatively available and, therefore, expected to be used in typical service. DOT's 2 percent benefit, in contrast, was an estimate of potential improvement.

As indicated above, the EPA policy does not have a prescribed maximum limit on the percent fuel economy improvement that oils used in testing can contribute. A manufacturer can receive approval to use oils offering fuel economy improvements greater than the 1.8 percent level which was approved for GM. However, approval will only be granted if the guidelines of the EPA policy are met, thus providing assurance that these oils will be representative of oils in production vehicles as built and used in service. EPA has taken specific and appropriate steps to assure that manufacturers are properly credited for the use of fuel efficient lubricants representative of those readily available and in use in the field. The difference between the EPA's approval of GM's use of oils which improve fuel economy 1.8 percent and DOT's two percent fuel economy improvement represents the difference between actual test results and estimated potential. Consequently, EPA finds that the 1.8 percent CAFE credit appropriately compensates manufacturers for fuel economy lost as a result of EPA's past prohibition against use of fuel efficient oils in test vehicles. This final rule uses the 1.8 percent figure to calculate CAFE adjustments for fuel efficient oils.

H. Test Fuel Properties

On August 19, 1984, subsequent to the close of the NPRM comment period, GM requested additional CAFE credits to compensate for changes in the properties of the test fuel used for gasoline-fueled vehicles that have occurred since the 1975 model year CAFE baseline. Certain fuel properties affect the calculated fuel economy because a chemical balance technique is used to measure fuel economy. If these test fuel properties change, the fuel economy results will not be consistent with the results that would have been achieved using 1975 test fuels. This constitutes a test procedure change; therefore, on December 7, 1984, EPA issued a supplemental NPRM which proposed to adjust manufacturers' CAFE's to compensate for variations of test fuel properties. EPA proposed to calculate test fuel adjustments annually, using average annual EPA test fuel properties. The primary issue in the supplemental NPRM was how to calculate the appropriate test fuel CAFE credit. Secondary issues included granting adjustments for future test fuel changes and adjustments for changes in diesel test fuel properties.

The comments received in response to the supplemental NPRM favored CAFE adjustments to account for variations in test fuel properties. As a method of calculating such adjustments, the equation proposed by GM in its August 1984 request was unanimously supported. In response to concerns EPA had expressed regarding an experimentally derived term, "R", used in the GM equation, Ford submitted data from over 200 vehicle tests which substantiated the value "R" used by GM. After analyzing the comments, EPA has concluded that the equation proposed by GM is technically correct and should be used to calculate CAFE adjustments for test fuel properties.

The supplemental NPRM also requested comments on the properties of test fuel in the baseline model year, 1975. The commenters recommended that EPA use the fuel properties which were defined by EPA in 1976 as historical average values and which correspond to the values used to establish the EPA fuel economy equation. Additionally, the commenters recommended a net heating value for the baseline fuel. This value was determined from the average historic fuel properties. Given that the properties of the test fuel used at the EPA laboratory in the 1975 model year are not know, EPA agrees with the commenters that the suggested fuel property values seem to be the most appropriate baseline. Therefore, this rule establishes the baseline test fuel properties to be:

Specific Gravity=0.739
Carbon Weight Fraction=0.866
Lower Heating Value=18,507 Btu/lb.

The final aspect of calculating this adjustment involves establishing the properties of test fuel used in the 1980 through 1985 model years. EPA proposed basing the credit on the fuels used by EPA during this period. The commenters generally stated that average industry-wide test fuel properties should be used for calculating adjustments, not just EPA data.

In the baseline model year of the CAFE standards, 1975, virtually all tests were performed at the EPA laboratory. In subsequent model years, EPA accepted test data from manufacturers' laboratories provided that their test results correlated well with EPA test results. If good correlation does not exist, the manufacturers' data is not accepted by EPA. Thus, the EPA laboratory is the standard against which all other laboratories are compared. Variation of the fuel used in the EPA laboratory consequently affects the standard by which all laboratories are compared.

EPA does not, however, have complete records of the fuels used by the EPA laboratory. Since the laboratories of EPA and the domestic manufacturers generally obtain their test fuel from the same supplier(s), it is logical to use average test fuel properties from the records of domestic manufacturer laboratories and the fuel suppliers to represent the properties of fuel used at the EPA laboratory in past model years. This rule uses such average fuel properties data to calculate the adjustments. The adjustments granted by this rule for test fuel variations are −0.8 percent for the 1980 model year, 0.10 percent for the 1981 model year, 0.75 percent for the 1982 model year, 1.34 percent for the 1983 model year, 1.29 percent for the 1984 model year and 0.68 percent for the 1985 model year.

The supplemental NPRM stated that EPA intended to analyze changes in diesel test fuel properties to determine if CAFE corrections are appropriate for the light-duty diesel category. Few comments and no data were received regarding diesel fuel. Volkswagen (VW) and GM supported EPA's intent to analyze diesel fuel. The Motor Vehicle Manufacturers Association (MVMA) and Ford both commented that there is no indication that an adjustment for diesel test fuel properties is necessary. EPA found that insufficient data are available to determine what, if any adjustment for diesel test fuel properties is necessary. Nonetheless, it is still possible that diesel fuel properties have varied and thus that some CAFE adjustment is due. (EPA is, in fact, seeking more data relevant to this issue in the NPRM on light truck CAFE's being published today.) Since an exact adjustment for diesel test fuel properties cannot be determined and since diesel-fueled vehicles constitute a small fraction of the overall vehicle fleet, EPA has decided to apply the gasoline test fuel adjustment to the vehicle fleet as a whole.

For future model years, EPA proposed granting adjustments based on the average annual properties of the fuel used by EPA. The commenters proposed several alternative approaches to future fuel-related adjustments. These included making test-specific adjustments, tightening the test fuel specifications, and making laboratory-specific fuels adjustments. These alternative approaches appear to have merit. However, changing the test fuel specifications or revising the equation which is used to calculate the fuel economy of a test to yield test-specific adjustments is beyond the scope of this rulemaking. This rule will grant future fuels adjustments based on the average annual properties of fuel used by EPA. However, EPA will pursue the suggested alternatives in a NPRM being issued concurrent with this final rulemaking.

I. Gas Guzzler Tax Applicability

Congress, in the Energy Tax Act of 1978, Pub. L. 95–618, established a tax schedule for those vehicles not achieving a minimum fuel economy level, commonly known as the Gas Guzzler Tax. The fuel economy levels were based upon EPA testing and calculation procedures in effect for the 1975 model year. Commenters noted that both the CAFE and the Gas Guzzler fuel economy levels are based on the 1975 model year procedures. Thus, the commenters stated, any correction factors applicable to CAFE should be applicable to Gas Guzzler Tax procedures. EPA agrees with this basic premise and will apply the correction factors determined for CAFE to the Gas Guzzler Tax calculation procedures.

Applying the correction factors to the model type Gas Guzzler Tax calculations that will occur after the effective date of this rule is straightforward. In the 1986 and later model years, any model type that meets or exceeds a 22.5 mpg fuel economy level will not be affected in any way. For those model types that are below

the 22.5 mpg fuel economy level there will be one additional step in the calculation procedures. A correction factor determined for each model type will be applied to the model type's fuel economy value prior to determining compliance with the gas guzzler standard and tax liability. This adjusted value will then be rounded to the nearest 0.1 mpg and the projected tax liability indicated in the tables of 40 CFR § 600.513 will be depicted on the fuel economy label.

Specific modifications to the CAFE adjustment calculation must be made to make it applicable to the gas guzzler determination. If a model type fails to exceed the fuel economy level of the Gas Guzzler Tax, a fuel economy adjustment will be calculated. The gas guzzler adjustment will be determined using the model type fuel economy value (calculated prior to the application of any of the test procedure fuel economy adjustments) as the base fuel economy, rather than the corporate average fuel economy as in the case of the CAFE adjustment. Similarly, the model type city and highway fuel economy values will be used to determine the appropriate city-highway ratio rather than the corporate average city and highway fuel economy values. The gas guzzler fuel economy will be credited in proportion to the 3,000 lb. inertia weight class sales within the model type and debited in proportion to the 4,000 lb. equivalent test weight sales within the model type. Consistent with the determination made for CAFE adjustment, no net negative adjustment will be incorporated for the inertia weight issue.

Finally, the gas guzzler adjustment calculation, like the CAFE adjustment calculation, incorporates a correction coefficient to account for test procedure changes. The exact value of this coefficient can only be determined subsequent to the applicable model year because it is based, in part, on EPA laboratory data of average test fuel properties and humidity for that model year. Determination of this coefficient subsequent to the end of the model year does not present any problems with regard to calculating CAFE's or gas guzzler taxes. However, gas guzzler labels are determined prior to and during a model year. Thus, manufacturers need to know prior to the start of the model year the value of the coefficient to determine gas guzzler labels. Therefore, EPA must provide a correction coefficient to be used for gas guzzler label calculations prior to actual testing. For 1986 and later model years, the EPA laboratory plans to maintain a stable humidity level (approximately 5 grains/lb. above the baseline conditions) and use test fuels which are like the baseline fuels. Therefore, for gas guzzler labeling purposes, a fixed correction coefficient can be established which accounts for test procedure changes.

The stated modifications describe the administrative procedures that will be employed for model types whose Gas Guzzler Tax liability will be calculated after the effective date of the regulations. For those model types that have already been determined to be gas guzzlers, if requested by the manufacturer, EPA will recalculate the fuel economy values. These calculations will be made available to the affected manufacturers and furnished to the Internal Revenue Service (IRS). EPA has coordinated this possibility with the IRS which is responsible for administering the Gas Guzzler Tax. The IRS has indicated that it will review any change in tax liability on a case-by-case basis.

J. Revised Mileage Accumulation Limit

In the original NPRM, EPA proposed to revise the limit on fuel economy test vehicle's accumulated mileage from 10,000 miles to some appropriate mileage between 4,250 miles and 6,200 miles. The background to this proposal was provided in detail in the NPRM (at 48 FR 56532) and will not be repeated in detail here. Essentially, EPA's position is that since a vehicle's fuel economy tends to improve as it accumulates mileage, allowing vehicles to be tested at 10,000 miles instead of at an average of around 4,000 miles, as was the practice in 1975, effectively eases the CAFE standard that manufacturers must meet. Rather than restrict actual vehicle mileage, which could raise test vehicle cost to the manufacturers, EPA proposed mathematically adjusting fuel economy results for vehicles tested at high accumulated mileages to levels corresponding to a 4,000-mile accumulated mileage limit.

EPA first implemented an adjustment requirement in a rule published on October 13, 1981 (46 FR 50497), which required the adjustment of fuel economy data generated by emission-data vehicles tested at greater than 6,200 miles. This was done for both CAFE and fuel economy labeling purposes. Subsequently, on April 6, 1984 (49 FR 13832), EPA published a final rule requiring that all data generated by fuel economy data vehicles over 6,200 miles be adjusted to 4,000-mile levels for labeling (but not CAFE) purposes. Today's final rule extends the same requirement (i.e., that all data generated above the 6,200-mile limit be adjusted to 4,000-mile levels) to all CAFE data and additionally, revises the fuel economy adjustment for mileage accumulation equations.

EPA received extensive comments on the proposal, primarily from Ford, GM, and the MVMA. The two major issues raised in comments involve the appropriateness of imposing the lower mileage accumulation limit on the associated CAFE adjustment, and the statistical validity of the adjustment equation itself.

The premise that fuel economy improves with mileage accumulation was not disputed by any commenters. Also unchallenged was the point that the inflation of CAFE by testing vehicles at higher mileages does not reflect any design improvement which will result in reduction of in-use fuel consumption. However, the proposed application of a mileage accumulation limit on fuel economy test vehicles for CAFE purposes was hotly disputed, especially by the manufacturers that tend to test vehicles at higher average mileages.

The first issue to be considered is whether such a mileage accumulation limit should be implemented. Clearly, as test vehicle mileage increases, the effectiveness of the CAFE standards in improving fleet-average fuel ecomomy is compromised. EPA has documented the trend of higher mileage accumulation for test vehicles since 1975. Maintaining the stringency of the CAFE standards definitely requires the enforcement of a mileage accumulation limit.

The proposal to adjust the fuel economy results of all fuel economy test vehicles to the 4,000-mile level was based on the assumption that Congress set the CAFE standards based on 4,000-mile data. The 4,000-mile baseline assumption stems from the CAFE statute's requirement to use 1975 test procedures, which included a requirement that emission-data certification vehicles be tested at 4,000 ±250 miles. However, the actual baseline used to set CAFE standards is not traceable to a particular data base such as the emissions certification data base. Also, data from some running change vehicles used in emissions certification and fuel economy data vehicles used in the voluntary labeling program may have been considered in establishing the CAFE standards. These vehicles often have test mileages above 4,250 miles. When Congress finally set the standards, it did not address every detail of how the testing was to be done, but instead simply referred to the 1975 test procedures. Since a 1975 model year fuel economy calculation could have included test results from vehicles with

greater than 4,250 miles, EPA now agrees that adjusting test results from *all* vehicles to a 4,000-mile level, as proposed, is not appropriate.

However, the basis of the proposal remains valid. It is not appropriate for manufacturers to further erode the accuracy of the CAFE estimates by continuously increasing the test fleet's average mileage accumulation over the 1975 level. The tenor of this rulemaking is to correct for changes made in the way vehicles have been tested since 1975. EPA's analysis shows that average milege accumulation since 1975 has steadily increased. If corrections are to be made which credit manufacturers for lost fuel economy due to test procedures changes, similar corrections could be justified for inappropriately high test results. However, EPA did not propose a "negative" CAFE adjustment for prior model years for these potential gains since the adjustment is necessarily sensitive to each manufacturer's test fleets and could have severe impacts not anticipated by each manufacturer when testing was conducted. Instead, the Agency proposed to stop the CAFE erosion in future model years.

As stated above, the option to adjust *all* data back to a 4,000-mile level has been rejected. However, to maintain the stringency of the CAFE standards as envisioned by Congress, an alternative mileage accumulation limit should be implemented. Presently, data for fuel economy labeling purposes generated by vehicles with more than 6,200 accumulated miles must be adjusted to the levels the vehicles would typically have generated at 4,000 miles. EPA has concluded that this also is an appropriate mileage limit for CAFE purposes for two reasons. First, adjustment of fuel economy data from vehicles exceeding 6,200 miles would ensure consistency with labeling practice and with the requirement that CAFE data from emission-data vehicles exceeding 6,200 miles must be adjusted to the 4,000-mile level. Second, about 90 percent of the industry's CAFE data are currently generated at less than 6,200 miles. Requiring mileage adjustment only for tests on vehicles exceeding 6,200 miles would recognize the considerable variability in the data used to generate the mileage adjustment equation and thus, the lack of precision that would otherwise be involved in adjusting the majority of the data for the relatively small fuel economy increases expected between 4,000 miles and 6,200 miles. Adjusting tests for vehicles between 6,200 and 10,000 miles would, however, compensate for the most serious cases of bias resulting from higher mileage accumulation. Thus, this change would retain the manufacturer's flexibility to test vehicles beyond 4,250 miles, but would prevent further significant inflation of CAFE estimates due to excessive mileage accumulation. There would be no test vehicle cost penalty since vehicles will still be allowed to accumulate mileage over the 6,200-mile limit, but the test data would then be adjusted to a 4,000-mile level.

The proposed fuel economy adjustment equation also received criticism. In light of the comments, EPA has performed a new analysis of the relationship between mileage and fuel economy. (See Section L and Appendix A of the Summary and Analysis of Comments to this rulemaking, contained in the docket.) An improved data base was developed from vehicle tests used for final CAFE calculations in model years 1979–1982. The analysis technique was improved by calculating the sensitivity of fuel economy changes to test mileage changes for all subconfigurations within the data set. The mean sensitivity was then used to develop an equation which adjusts fuel economy results to a 4,000-mile level. These changes, incorporated in the final rule, address the significant criticisms by commenters. The result is a reasonable estimate of the impact of mileage accumulation on fuel economy test resutls that will only be used if a manufacturer voluntarily exercises its option to test vehicles at over 6,200 miles.

EPA also had proposed that the new mileage limit on test results be effective beginning with the 1986 model year. However, since 1986 model year testing is underway and test plans may be well established, the CAFE data adjustment provision will take effect beginning with the 1987 model year for passenger cars only. (EPA also had proposed application of the 6,200-mile CAFE mileage limit to light trucks as well as passenger cars. However, as discussed below, the impact on light trucks will be addressed in a separate rulemaking.)

As noted above, the mileage adjustment equation has been updated and improved, which has resulted in a smaller adjustment. Since the equation is also used for adjusting data included in label calculations, EPA is finalizing the revised equation beginning with the 1986 model year for use in the labeling program. Any 1986 model year data already adjusted using the old equation and any 1986 model year label values already calculated at the time of this publication, may, at the maufacturer's option, be recalculated using the new equation published today.

K. CAFE Credits for Light Trucks

Light truck is a vehicle classification separate from passenger automobiles. The original NPRM did not propose any CAFE credit for light trucks. Some commenters stated that EPA should separately propose light truck CAFE adjustments to account for the same test procedure changes which affected passenger vehicles, including inertia weight simulation, distance driven measurement and laboratory humidity level. EPA agrees and is publishing elsewhere in today's **Federal Register** proposed light truck CAFE adjustments.

L. Changes for Which CAFE Credit is Denied

EPA received requests for CAFE credits for test procedure issues which were not addressed in the NPRM. EPA has determined that CAFE credits are unwarranted for the following four issues:

1. Manual Transmission Shift Speeds

In the 1975 model year, EPA regulations required that vehicles equipped with manual transmissions be shifted at minimum speeds of 15, 25, and 40 miles per hour (mph) unless the manufacturer recommended alternative shifts speeds. In 1975, the 15, 25, and 40 mph shift speeds were considered to be representative of in-use operation and nearly all manufacturers, in fact, used these shift speeds. Further, in allowing alternative shift speeds, EPA anticipated that manufacturers would only recommend shift points representative of expected in-use operation.

Subsequent to the 1975 model year, EPA revised the requirements concerning shift speeds several times. These revisions were intended to further define and provide guidance as to how to determine whether proposed shift schedules were representative of actual vehicle operation. Revisions to the procedures for determining representative shift speeds were particularly necessary to accommodate new technology such as improved transmission designs and better matching of engines and transmissions. Lower shift speeds tend to increase fuel economy measured during testing and if followed by drivers, in-use fuel economy should comparably increase. It is appropriate to allow shift schedules which result from new technology, but it is not appropriate to allow unrealistic shift schedules which optimize fuel economy during the test program but are unlikely to be followed in use and are therefore, unlikely to yield comparable fuel economy improvement expected in use. Since EPA has provided criteria for

allowing their use in CAFE testing, lower shift speeds than those used during the 1975 model year have resulted in significant improvement in manufacturers' CAFE.

GM stated that the changes EPA has made since 1975 regarding shift speeds are inconsistent with the comparability requirement of EPCA, are arbitrary, and are not within EPA's authority. Specifically, GM objected to the requirement that alternative shift speeds be demonstrated to be representative of in-use driving. GM based its claims for CAFE credits on the fuel economy difference between using the most fuel efficient shift speeds during the fuel economy test and using representative shift speeds as specified by EPA. GM contended that EPA's policies have reduced GM's ability to receive full CAFE credit for improvements in technology.

EPA cannot agree with GM's contentions. The EPA shift speed policies have been implemented to ensure that the test vehicles are shifted at speeds typical of in-use operation so that any associated fuel economy improvement is likely to be realized by the customer. This is fully consistent with the policies and practices in place in the 1975 model year. Throughout the fuel economy program, EPA has not allowed use of shift speeds so low that consumers are unlikely to use them. To allow unrealistically low shift speeds without any evidence that consumers would indeed shift at those speeds would result in inappropriately high fuel economy test values and manufacturer CAFE values. Test practices which allow increases in a manufacturer's CAFE without a corresponding reduction of in-use fuel consumption erode the effectiveness of the CAFE standards in reducing the nation's fuel consumption. Similarly, giving credit for practices beyond what is representative of in-use operation reduces the stringency of the CAFE standards and does not maintain comparability with the 1975 procedures as required by EPCA. Thus, no CAFE credit is warranted for the general changes EPA has made to refine and further delineate its policies for allowing alternative shift schedules. Credit for improvements in technology that allow lower shift speeds will still be available where manufacturers can show that alternative shift schedules are representative of in-use driving.

2. Shift Indicator Light Policy

As a particular aspect of EPA's manual transmission shift speed procedures, GM criticized EPA's policy concerning shift indicator lights. Shift indicator lights are intended to signal the driver when vehicle operating conditions would allow acceptable operation at the next higher gear. These signals typically occur at speeds lower than those at which drivers have normally been accustomed to shifting.

EPA's current shift light policy allows manufacturers to gain credit for fuel economy improvements for shift lights in proportion to the frequency with which drivers shift in response to the light. EPA has allowed two options for gaining this shift light fuel economy credit. First, manufacturers may survey the shift speeds of a random cross-section of drivers operating vehicles equipped with shift lights. The resulting average in-use shift points are then used during fuel economy program testing. Alternatively, manufacturers can survey for the percentage of time drivers follow their shift light signals. Under this alternative, test vehicles are tested according to the base (non-shift light) shift points and tested again according to the shift light shift points. The fuel economy results are then combined into a weighted average according to the percentage of usage determined in the manufacturer's survey. Under either approach, the fuel economy estimate reflects average in-use shift points.

GM, in its comments, claimed EPA has arbitrarily constrained GM from gaining the full fuel economy benefits deserved for such technology improvements as shift indicator lights. GM specifically claimed that EPA policy limited its shift light credit to a 65 percent usage frequency. This is not correct. For labeling purposes EPA allows up to a 65 percent usage frequency for new designs and applications for which no factual usage data exist. However, for CAFE purposes, EPA relies on survey-determined actual usage factors. As these surveys have demonstrated, actual adherence to the shift lights varies considerably in-use (from less than 40 percent to infrequently over 65 percent) which makes it impractical for EPA to establish any fixed usage factors. Consequently, EPA will continue to rely on in-use surveys to establish the appropriate fuel economy benefit due to shift indicator lights. Not only does this EPA policy give credit based on actual in-used data, but it also creates an incentive for manufactures to adopt the most effective designs. If the manufacturers were able to gain fuel economy credit that assumed 100 percent adherence to their shift lights, they would have an incentive to calibrate their lights to come on at even lower shift speeds to gain further CAFE benefit. This might actually result in decreased in-use fuel economy if drivers learn to generally ignore the shift light as a result of the recommended shift speeds being too low to all accepatable driveability.

In conclusion, no manufacturer, including GM, has been arbitrarily constrained as to the fuel economy benefit it can derive from technology improvements such as shift indicator lights. Rather, EPA has developed and implemented procedures which provide fuel economy credit consistent with the gains expected in-use. This maintains the fuel economy test's comparability with the 1975 test procedures as required by EPCA. To provide additional credits as suggested by GM would reduce the stringency of the standard by generating CAFE gains in excess of the actual impact on vehicle fuel economy. As such, GM's recommendations for additional credits must be denied.

3. Driving Schedule Compliance

The Federal Test Procedure (FTP) requires vehicles to operate on a fixed speed time schedule on a chassis dynamometer. The 1975 model year test procedure required test vehicles to follow this driving schedule as closely as possible within the limits of the vehicles' capability.

Ford commented that CAFE credit may be due for two changes which are related to test vehicle compliance with the driving schedule. First, Ford states that a Novermber 14, 1978 technical amendment which requires vehicles to be operated at *maximum available power*, if necessary, to follow driving schedule may qualify for a CAFE adjustment. For the 1975 model year, the exact requirement was for *wide-open-throttle* operation, if necessary to follow the driving schedule. Second, Ford stated that EPA's December 27, 1982 interpretation of the speed variation tolerance has increased the stringency of the tolerance. This interpretation was intended to prohibit deliberate deviations from the driving trace in order to minimize speed variations (termed "trace smoothing") which could improve emissions and fuel economy test results.

These two issues do not represent changes from the 1975 model year test procedures and, therefore, do not warrant a CAFE adjustment. The technical amendment which addressed using maximum available power only clarified the requirement that a vehicle should follow the driving schedule even if it requires operating at wide-open-throttle and selecting the proper

transmission gear for maximum available power. This requirement to follow the driving trace to the best capability of the car has existed throughout the fuel economy program. Likewise, EPA's interpretation of the speed variation tolerance clarified that the intended purpose of this tolerance has always been to permit reasonable speed deviations from the driving schedule, but not to allow purposeful deviations such as might occur if the driver were to try to bias fuel economy or emission test results. It should further be noted that these tolerances have a two-sided effect in that they limit biasing which could either increase or decrease fuel economy. Thus, the intent and effect of EPA's interpretation of the speed variation tolerance is to minimize the test-to-test variation in fuel economy test results. Therefore, no CAFE adjustment is warranted.

4. Vehicle Preconditioning

A vehicle's emissions and fuel economy can be influenced by the preconditioning received by the vehicle before testing. The EPA test procedure includes a vehicle preconditioning sequence to ensure that vehicles are tested in a manner and condition representative of typical operation and consistent across all vehicles. In 1976, EPA published, regulations (41 FR 35627, August 23, 1976) which deleted, as unnecessary, one hour of vehicle preconditioning driving which had been part of the test sequence. Ford commented that the deletion of one hour of the preconditioning driving schedule may affect fuel economy but provided no data or technical rationale which substantiated its claim.

Coupled with deletion of this one-hour drive from the preconditioning schedule, EPA issued Advisory Circular No. 50A which stated that manufacturers should deliver their vehicles to EPA test facilities in a condition which is representative of typical operation. Since the requirement that vehicles should be delivered for testing in a condition representative of typical operation involves use of a driving cycle identical to the deleted preconditioning driving cycle, the change in preconditioning procedure has no effect on CAFE, and no CAFE adjustment is warranted.

M. Future CAFE Adjustmemts

The NPRM proposed to provide CAFE adjustment for future test procedure changes which had, individually or as a group, a quantifiable impact of 0.10 mpg or more for any manufacturer. Consistent with the philosphy followed in determining adjustment for past test procedure changes, EPA proposed to consider the CAFE impact of procedure changes which require revision of the regulatory requirements as well as those which do not. Further, test procedure changes whose effect was to close loopholes or provide manufacturers with an improved ability to receive CAFE credit for real fuel economy improvements would not warrant CAFE adjustment. Finally, largely to allow timely implementation of certain test procedure changes that do not require revision of regulatory requirements, EPA stated its intent not to delay adoption of such changes pending rulemaking proceedings to determine their CAFE impact. Rather these test procedure changes could be adopted and any CAFE impact and resultant CAFE adjustment subsequently determined.

In commenting on the proposal, several manufacturers pointed out that the proposed regulations needed to be clarified to conform to the intent stated in the preamble. Specifically, the aggregate effect of several procedure changes with, for example, individually small CAFE impacts should be considered when determining if CAFE has been significantly impacted and an adjustment therefore warranted. The regulations have been revised to clarify the intent to consider the aggregate effect of procedure changes where individually they do not result in a significant CAFE impact.

GM also commented that 0.10 mpg should not define the threshold for providing CAFE adjustment. Rather, GM recommended that CAFE adjustments be provided if any manufacturer's CAFE would be affected by a test procedure change. Manufacturer CAFE's are determined by rounding off the calculated value to the nearest 0.1 mpg and CAFE adjustments of less than 0.10 mpg could affect this rounding off. This potential impact of more precise calculation of CAFE adjustment is evident in EPA's determination of adjustments for past test procedure changes. In several instances, CAFE adjustments have been provided for test procedure changes which have less than a 0.1 mpg impact. EPA concurs with the point brought out by GM. Therefore, EPA is not establishing a minimum threshold for consideration of whether future test procedure changes warrant a CAFE adjustment. All future changes will be addressed through rulemaking procedures to determine if their effect on CAFE are significant and if they appropriately warrant a CAFE adjustment.

Finally, Ford recommended that EPA consider the alternative of first considering via rulemaking the need for and likely CAFE impact of any test procedure change prior to implementing the change. For the same reasons stated in the proposal, EPA finds it unnecessary and disruptive to precede the implementation of a test procedure change with a rulemaking unless the nature of the change requires revision of the regulations.

EPA will continue its present methods of providing notification to industry of any changes in laboratory equipment and practices and any changes in certification and fuel economy program policies or practices which may be of interest to or have an impact on the manufacturers but which do not require modifications to the regulations. Routine equipment changes are announced to the industry through "Equipment-Procedure Change Notices." Depending on the type of equipment change, these notices request comment and submission of data on any effect on test results. Industry notice of any significant change in program or laboratory practice is provided by the EPA system of advisory circulars. Advisory circulars provide guidance to manufacturers on the acceptability of certain laboratory practices and test procedures. In issuing these Equipment-Procedure Notices and advisory circulars, EPA will assess the expected fuel economy impact. The industry will be notified of EPA's interim determination and provide the opportunity to comment at the time the revised procedure documentation is distributed. If EPA's assessment or industry's comments regarding advisory circulars or Equipment Change Notices, indicate that a manufacturer's CAFE will likely be affected EPA will initiate rulemaking to determine if a CAFE credit is appropriate and if it is, the level of that credit.

To summarize EPA's plans for determining future CAFE adjustments: (1) The CAFE impacts of only test procedure changes initiated subsequent to this rulemaking will be considered; (2) no adjustments will be provided for changes which close loopholes which permit manufacturers to gain measured improvements to fuel economy that are not the result of real improvement to actual vehicle fuel economy; (3) no debits will be assessed for test procedure changes which provide manufacturers with improved ability to receive credit for real fuel economy improvements; (4) adjustments will be based on changes initiated by EPA; no adjustment will be made for changes independently adopted by manufacturers; (5) changes will be assessed either individually or

collectively for their impact on manufacturers' CAFE; (6) the impact of the changes on CAFE will be determined via rulemaking; (7) for changes which involve specific changes to the regulations, the CAFE impact will be determined as part of the rulemaking implementing such changes; (8) for changes not requiring revised regulations, EPA may choose to implement the test procedure change prior to determining and providing any appropriate CAFE adjustment via rulemaking.

IV. Regulatory Analysis

Under Executive Order 12291, EPA must judge whether a regulation is "major" and, therefore, subject to the requirement of a Regulatory Impact Analysis. This regulation is not major because it will result in an annual effect on the economy of less than $100 million. Also, this regulation should not result in increased costs or prices for consumers, industries, or others, nor should it have adverse effects on competition, employment, investment, or productivity. In fact, the CAFE adjustments granted by this rulemaking will reduce the burden, including the costs of compliance with fuel economy requirements, for the industry as a whole. The results of EPA's calculation of the CAFE adjustments provided by this rule, shown in Appendix A, indicate that the position of all manufacturers' CAFE compliance is enhanced.

This action was submitted to the Office of Management and Budget (OMB) for review as required by Executive Order 12291. Any comments from OMB to EPA and any EPA responses to those comments are available for public inspection in the docket for this rulemaking; Docket No. A-83-44. The EPA's Central Docket Section (A-130) is located at 401 M Street, S.W., Washington, D.C. 20460.

V. Reporting and Recordkeeping Requirements

This rule does not contain any information collection requirements subject to OMB review under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

VI. Regulatory Flexibility Act

Under the Regulatory Flexibility Act, 5 U.S.C. 601 et seq., EPA is required to determine whether a regulation will have a significant economic impact on a substantial number of small entities so as to require a regulatory flexibility analysis. This rulemaking will not affect any small entities. Therefore, pursuant to 5 U.S.C. 605(b), I hereby certify that this rule will not have a significant economic impact on a substantial number of small entities.

VII. List of Subjects in 40 CFR Part 600

Electric power, Energy conservation, Gasoline, Labeling, Motor vehicles, Reporting and recordkeeping requirements, Adminstrative practice and procedure, Fuel economy.

Dated: June 22, 1985.

Lee M. Thomas,

Administrator.

Appendix A

Note.—The following appendix will not appear in the Code of Federal Regulations.

1980 Model Year

Manufacturer	Compliance category	Unadjusted CAFE	Adjusted CAFE
American Motors.	Domestic—PA	21.5	22.3
Chrysler	Domestic—PA	21.7	22.3
Ford	Domestic—PA	22.1	22.9
General Motors.	Domestic—PA	21.9	22.6
Avanti	Domestic—PA	15.8	16.3
Checker	Domestic—PA	18.5	19.1
Chrysler	Import—PA	32.5	33.6
Ford	Import—PA	29.8	30.7
Alfa Romeo	Import—PA	21.7	22.4
BMW	Import—PA	25.9	26.7
Mercedes-Benz.	Import—PA	23.9	24.6
Fiat	Import—PA	26.6	27.4
Honda	Import—PA	29.2	30.1
Jaguar Cars Inc..	Import—PA	21.6	22.2
Nissan	Import—PA	31.2	32.2
Peugeot	Import—PA	27.2	28.1
Renault	Import—PA	33.3	34.3
Rolls-Royce	Import—PA	11.1	11.4
Saab	Import—PA	23.4	24.3
Toyo Kogyo	Import—PA	26.0	26.8
Toyota	Import—PA	27.4	28.3
Volkswagen	Import—PA	31.3	32.3
Volvo	Import—PA	21.6	22.3
Fuji Heavy Ind.	Import—PA	27.9	28.7

1981 Model Year

Manufacturer	Compliance category	Unadjusted CAFE	Adjusted CAFE
American Motors.	Domestic—PA	22.4	23.1
Chrysler	Domestic—PA	26.1	26.8
Ford	Domestic—PA	23.4	24.1
General Motors.	Domestic—PA	23.2	23.8
Checker	Domestic—PA	18.6	19.1
Alfa Romeo	Import—PA	22.5	23.1
Chrysler	Import—PA	32.0	32.9
Ford	Import—PA	34.3	35.2
BMW	Import—PA	26.6	27.3
DeLorean	Import—PA	24.0	24.8
Mercedes-Benz.	Import—PA	25.6	26.3
Fiat	Import—PA	27.6	28.4
Honda	Import—PA	30.8	31.6
Isuzu	Import—PA	34.7	35.6
Jaguar Cars Inc..	Import—PA	18.5	19.0
Maserati	Import—PA	10.2	10.5
Nissan	Import—PA	30.5	31.4
Peugeot	Import—PA	27.9	28.7
Renault	Import—PA	29.4	30.2
Rolls-Royce	Import—PA	10.9	11.2
Saab	Import—PA	23.3	24.1
Toyo Kogyo	Import—PA	31.1	31.9
Toyota	Import—PA	30.9	31.8
Volkswagen	Import—PA	34.2	35.2
Volvo	Import—PA	22.3	22.9

1981 Model Year—Continued

Manufacturer	Compliance category	Unadjusted CAFE	Adjusted CAFE
Fuji Heavy Ind.	Import—PA	31.2	32.0

1982 Model Year

Manufacturer	Compliance category	Unadjusted CAFE	Adjusted CAFE
American Motors.	Domestic—PA	23.9	24.3
Chrysler	Domestic—PA	27.2	27.6
Ford	Domestic—PA	24.6	25.0
General Motors.	Domestic—PA	24.2	24.6
Checker	Domestic—PA	18.4	18.7
Ford	Import—PA	34.4	34.9
Alfa Romeo	Import—PA	24.6	25.0
BMW	Import—PA	26.4	26.9
Mercedes-Benz.	Import—PA	26.3	26.6
Fiat	Import—PA	25.7	26.1
Honda	Import—PA	33.4	33.9
Isuzu	Import—PA	37.6	38.1
Jaguar Cars Inc.	Import—PA	18.8	19.0
Maserati	Import—PA	10.1	10.2
Nissan	Import—PA	30.7	31.2
Peugeot	Import—PA	27.6	28.0
Renault	Import—PA	32.4	32.9
Rolls-Royce	Import—PA	10.8	11.0
Saab	Import—PA	24.1	24.6
Mitsubishi	Import—PA	33.1	33.6
Toyo Kogyo	Import—PA	29.4	29.8
Toyota	Import—PA	30.5	30.9
Volkswagen	Import—PA	32.9	33.4
Volvo	Import—PA	25.1	25.5
Fuji Heavy Ind.	Import—PA	31.6	32.0

1983 Model Year

Manufacturer[1]	Compliance category	Unadjusted CAFE	Adjusted CAFE
American Motors.	Domestic—PA	33.5	34.2
Ford	Domestic—PA	23.8	24.3
General Motors.	Domestic—PA	23.5	24.0
Chrysler	Import—PA	33.8	34.5
Alfa Romeo	Import—PA	25.2	25.8
BMW	Import—PA	25.6	26.2
Bertone	Import—PA	29.1	29.7
Mercedes-Benz.	Import—PA	26.6	27.2
Ferrari	Import—PA	13.2	13.5
Honda	Import—PA	35.3	36.0
Isuzu	Import—PA	30.7	31.4
Jaguar Cars Inc.	Import—PA	18.8	19.2
Maserati	Import—PA	10.0	10.2
Nissan	Import—PA	32.7	33.4
Peugeot	Import—PA	25.1	25.6
Pininfarina	Import—PA	28.9	29.5
Renault	Import—PA	31.4	32.0
Rolls-Royce	Import—PA	11.0	11.2
Saab	Import—PA	25.8	26.6
Mitsubishi	Import—PA	30.2	30.8
Toyo Kogyo	Import—PA	28.9	29.4
Toyota	Import—PA	32.6	33.3
Volkswagen	Import—PA	30.0	30.7
Volvo	Import—PA	25.8	26.5
Fuji Heavy Ind.	Import—PA	32.4	33.0

[1] Does not include manufacturers whose CAFE's have not yet been confirmed.

1984 Model Year

Manufacturer[1]	Compliance category	Unadjusted CAFE	Adjusted CAFE
General Motors.	Domestic—PA	24.4	24.9
BMW	Import—PA	27.4	28.0

1984 MODEL YEAR—Continued

Manufacturer [1]	Compliance category	Unadjusted CAFE	Adjusted CAFE
Bertone	Import—PA	29.2	29.8
Mercedes-Benz.	Import—PA	25.7	26.2
Ferrari	Import—PA	14.1	14.4
Isuzu	Import—PA	28.4	29.2
Jaguar Cars Inc.	Import—PA	19.0	19.4
Peugeot	Import—PA	24.5	25.0
Pininfarina	Import—PA	28.5	29.0
Saab	Import—PA	25.3	26.0
Mitsubishi	Import—PA	30.9	31.6
Mazda Motor Corp.	Import—PA	30.0	30.6
Toyota	Import—PA	32.9	33.5
Volvo	Import—PA	26.4	27.0

[1] Does not include manufacturers whose CAFE's have not yet been confirmed.

PART 600—[AMENDED]

For the reasons set forth in the preamble, EPA amends 40 CFR Part 600 as follows:

1. The authority citation for Part 600 continues to read as follows:

Authority: Title III of the Energy Policy and Conservation Act of 1975, Pub. L. 94-163, 89 Stat. 871, Title IV of the National Energy Conservation Policy Act of 1978, Pub. L. 95-619, 92 Stat. 3295.

2. Section 600.006-86 is amended by revising paragraph (g)(1) to read as follows:

§ 600.006-86 Data and information requirements for fuel economy vehicles.

* * * * *

(g)(1) The manufacturer shall adjust all test data used for fuel economy label calculations generated by vehicles with engine-drive system combinations with more than 6,200 miles by using the following equation:

$$FE_{4,000_{mi}} = FE_T\,[0.979 + 5.25 \times 10^{-6}(mi)]^{-1}$$

Where:

$FE_{4,000_{mi}}$ = Fuel economy data adjusted to 4,000-mile test point rounded to the nearest 0.1 mpg.

FE_T = Tested fuel economy value rounded to the nearest 0.1 mpg.

mi = System miles accumulated at the start of the test rounded to the nearest whole mile.

* * * * *

3. A new § 600.006-87 is added to read as follows:

§ 600.006-87 Data and information requirements for fuel economy vehicles.

(a) For certification vehicles with less than 10,000 miles, the requirements of this section are considered to have been met except as noted in paragraph (c) of this section.

(b)(1) The manufacturer shall submit the following information for each fuel economy data vehicle:

(i) A description of the vehicle, exhaust emission test results, applicable deterioration factors, and adjusted exhaust emission levels.

(ii) A statement of the origin of the vehicle including total mileage accumulation, and modifications (if any) from the vehicle configuration in which the mileage was accumulated. (For modifications requiring advance approval by the Administrator, the name of the Administrator's representative approving the modification and date of approval are required.) If the vehicle was previously used for testing for compliance with Part 86 of this chapter or previously accepted by the Administrator as a fuel economy data vehicle in a different configuration, the requirements of this paragraph may be satisfied by reference to the vehicle number and previous configuration.

(iii) A statement that the fuel economy data vehicle, with respect to which data are submitted:

(A) Has been tested in accordance with applicable test procedures,

(B) Is, to the best of the manufacturer's knowledge, representative of the vehicle configuration listed, and

(C) Is in compliance with applicable exhaust emission standards.

(2) The manufacturer shall retain the following information for each fuel economy data vehicle, and make it available to the Administrator upon request:

(i) A description of all maintenance to engine, emission control system, or fuel system components performed within 2,000 miles prior to fuel economy testing.

(ii) In the case of electric vehicles, a description of all maintenance to electric motor, motor controller, battery configuration, or other components performed within 2,000 miles prior to fuel economy testing.

(iii) A copy of calibrations for engine, fuel system, and emission control devices, showing the calibration of the actual components on the test vehicle as well as the design tolerances.

(iv) In the case of electric vehicles, a copy of calibrations for the electric motor, motor controller, battery configuration, or other components on the test vehicle as well as the design tolerances.

(v) If calibrations for components specified in paragraph (b)(2) (iii) or (iv) of this section were submitted previously as part of the description of another vehicle or configuration, the original submittal may be referenced.

(c) The manufacturer shall submit the following fuel economy data:

(1) For vehicles tested to meet the requirements of Part 86 (other than those chosen in accordance with § 86.085-24 (c) and (h)), the city and highway fuel economy results from all tests on that vehicle, and the test results adjusted in accordance with paragraph (g) of this section.

(2) For each fuel economy data vehicle, all individual test results (excluding results of invalid and zero mile tests) and these test results adjusted in accordance with paragraph (g) of this section.

(d) The manufacturer shall submit an indication of the intended purpose of the data (e.g., data required by the general labeling program or voluntarily submitted for specific labeling).

(e) In lieu of submitting actual data from a test vehicle, a manufacturer may provide fuel economy values derived from an analytical expression, e.g., regression analysis. In order for fuel economy values derived from analytical methods to be accepted, the expression (form and coefficients) must have been approved by the Administrator.

(f) If, in conducting tests required or authorized by this part, the manufacturer utilizes procedures, equipment, or facilities not described in the Application for Certification required in § 86.087-21, the manufacturer shall submit to the Administrator a description of such procedures, equipment, and facilities.

(g)(1) The manufacturer shall adjust all test data used for fuel economy label calculations in Subpart D and average fuel economy calculations in Subpart F for passenger automobiles within the categories identified in paragraphs (a)(1) and (a)(2) of § 600.510. The test data shall be adjusted in accordance with (g)(3) or (g)(4) as applicable.

(2) The manufacturer shall only adjust the test data used for fuel economy label calculations, in Subpart D for light trucks within the categories identified in paragraphs (a)(3) through (a)(6) of § 600.510. The test data shall be adjusted in accordance with (g)(3) or (g)(4) as applicable.

(3) The manufacturer shall adjust all test data generated by vehicles with engine-drive system combinations with more than 6,200 miles by using the following equation:

$$FE_{4,000_{mi}} = FE_T[0.979 + 5.25 \times 10^{-6}(mi)]^{-1}$$

Where:

$FE_{4,000_{mi}}$ = Fuel economy data adjusted to 4,000-mile test point rounded to the nearest 0.1 mpg.

FE_T = Tested fuel economy value rounded to the nearest 0.1 mpg.

mi = System miles accumulated at the start of the test rounded to the nearest whole mile.

(4) For vehicles with 6,200 miles or less accumulated, the manufacturer is not required to adjust the data.

4. Section 600.510–80 is amended by adding and reserving paragraph (d), and adding paragraphs (e), and (f) to read as follows:

§ 600.510–80 Calculation of average fuel economy.

* * * * *

(d) [Reserved].

(e) For passenger automobile categories identified in paragraphs (a)(1) and (a)(2) of this section, the average fuel economy calculated in accordance with paragraph (c) of this section shall be adjusted using the following equation:

$$AFE_{adj} = AFE\ [((0.55 \times a \times c) + (0.45 \times c) + (0.5556 \times a) + 0.4487) / ((0.55 \times a) + 0.45)] + IW$$

Where:

AFE_{adj} = Adjusted average combined fuel economy, rounded to the nearest 0.1 mpg.

AFE = Average combined fuel economy as calculated in paragraph (c) of this section, rounded to the nearest 0.0001 mpg.

a = Sales-weighted average (rounded to the nearest 0.0001 mpg) of all model types highway fuel economy values (rounded to the nearest 0.1 mpg) divided by the sales-weighted average (rounded to the nearest 0.0001 mpg) of all model types city fuel economy values (rounded to the nearest 0.1 mpg). The quotient shall be rounded to 4 decimal places. These average fuel economies shall be determining using the methodology of paragraph (c) of this section.

$c = 2.501 \times 10^{-2}$ for the 1980 model year

$c = 2.184 \times 10^{-2}$ for the 1981 model year

$c = 9.260 \times 10^{-3}$ for the 1982 model year

$c = 1.435 \times 10^{-2}$ for the 1983 model year

$c = 1.420 \times 10^{-2}$ for the 1984 model year

$c = 1.490 \times 10^{-2}$ for the 1985 model year

$$IW = (9.2917 \times 10^{-3} \times SF_{3IWC} \times FE_{3IWC}) - (3.5123 \times 10^{-3} \times SF_{4ETW} \times FE_{4IWC})$$

Note.—Any calculated value of IW less than zero shall be set equal to zero.

SF_{3IWC} = The 3000 lb. inertia weight class sales divided by total sales. The quotient shall be rounded to 4 decimal places.

SF_{4ETW} = The 4000 lb. equivalent test weight category sales divided by total sales. The quotient shall be rounded to 4 decimal places.

FE_{3IWC} = The sales-weighted average combined fuel economy of all 3000 lb. inertia weight class base levels in the compliance category. Round the result to the nearest 0.0001 mpg.

FE_{4IWC} = The sales-weighted average combined fuel economy of all 4000 lb. inertia weight class base levels in the compliance category. Round the result to the nearest 0.0001 mpg.

(f) The Administrator shall calculate and apply additional average fuel economy adjustments if, after notice and opportunity for comment, the Administrator determines that as a result of test procedure changes not previously considered, such correction is necessary to yield fuel economy test results that are comparable to those obtained under the 1975 test procedures. In making such determination, the Administrator must find that:

(1) A directional change in measured fuel economy of an average vehicle can be predicted from a revision to the test procedures;

(2) The magnitude of the change in measured fuel economy for any vehicle or fleet of vehicles caused by a revision to the test procedures is quantifiable from theoretical calculations or best available test data;

(3) The impact of a change on average fuel economy is not due to eliminating the ability of manufacturers to take advantage of flexibilities within the existing test procedures to gain measured improvements in fuel economy which are not the result of actual improvements in the fuel economy of production vehicles.

(4) The impact of a change on average fuel economy is not due to a greater ability of manufacturers to reflect in average fuel economy those design changes expected to have comparable effect on in-use fuel economy.

(5) The test procedure change is required by EPA or is a change initiated by EPA in its laboratory and is not a change implemented solely by a manufacturer in its own laboratory.

5. Section 600.510–86 is amended by adding paragraphs (e) and (f) to read as follows:

§ 600.510–86 Calculation of average fuel economy.

* * * * *

(e) For passenger categories identified in paragraphs (a)(1) and (a)(2) of this section, the average fuel economy calculated in accordance with paragraph (c) of this section shall be adjusted using the following equation:

$$AFE_{adj} = AFE[((0.55 \times a \times c) + (0.45 \times c) + (0.5556 \times a) + 0.4487) / ((0.55 \times a) + 0.45)] + IW$$

Where:

AFE_{adj} = Adjusted average combined fuel economy, rounded to the nearest 0.1 mpg.

AFE = Average combined fuel economy as calculated in paragraph (c) of this section, rounded to the nearest 0.0001 mpg.

a = Sales-weighted average (rounded to the nearest 0.0001 mpg) of all model types highway fuel economy values (rounded to the nearest 0.1 mpg) divided by the sales-weighted average (rounded to the nearest 0.0001 mpg) of all model types city fuel economy values (rounded to the nearest 0.1 mpg). The quotient shall be rounded to 4 decimal places. These average fuel economies shall be determined using the methodology of paragraph (c) of this section.

c = A constant value, fixed by model year. For 1986 and later model years, the Administrator will specify the c values after the necessary laboratory humidity and test fuel data become available.

$$IW = (9.2917 \times 10^{-3} \times SF_{3IWC} \times FE_{3IWC}) - (3.5123 \times 10^{-3} \times SF_{4ETW} \times FE_{4IWC})$$

Note.—Any calculated value of IW less than zero shall be set equal to zero.

SF_{3IWC} = The 3000 lb. inertia weight class sales divided by total sales. The quotient shall be rounded to 4 decimal places.

SF_{4ETW} = The 4000 lb. equivalent test weight category sales divided by total sales. The quotient shall be rounded to 4 decimal places.

FE_{3IWC} = The sales-weighted average combined fuel economy all 3000 lb. inertia weight class base levels in the compliance category. Round the result to the nearest 0.0001 mpg.

FE_{4IWC} = The sales-weighed average combined fuel economy of all 4000 lb. inertia weight class base levels in the compliance category. Round the result to the nearest 0.0001 mpg.

(f) The Administration shall calculate and apply additional average fuel ecomony adjustments if, after notice and opportunity for comment, the Administrator determines that, as a result of test procedure changes not previously considered, such correction is necessary to yield fuel economy test results that are comparable to those obtained under the 1975 test procedures. In making such determinations, the Administrator must find that:

(1) A directional change in measured fuel economy of an average vehicle can be predicted from a revision to the test procedures;

(2) The magnitude of the change in measured fuel economy for any vehicle or fleet of vehicles caused by a revision to the test procedures is quantifiable from theoretical calculations or best available test data;

(3) The impact of a change on average fuel economy is not due to eliminating the ability of manufacturers to take advantage of flexibilities within the existing test procedures to gain measured improvements in fuel economy which are not the result of actual improvements in the fuel economy of production vehicles.

(4) The impact of a change on average fuel economy is not solely due to a greater ability of manufacturers to reflect in average fuel economy those design changes expected to have comparable effect on in-use fuel economy.

(5) The test procedure change is required by EPA or is a change initiated by EPA in its laboratory and is not a change implemented solely by a manufacturer in its own laboratory.

6. Section 600.513–81 is amended by adding paragraph (a)(3), redesignating paragraphs (c) through (f) as paragraphs (d) through (g) and redesignating the paragraph following (b)(2)(vi) as paragraph (c), and revising paragraphs (b)(1), (c)(1), (d)(1), (e)(1), (f)(1), and (g)(1) to read as follows:

§ 600.513–81 Gas Guzzler Tax.

(a)* * *

(2)* * *

(3) For 1980 and later model year passenger automobiles, the combined general label model type fuel economy value used for Gas Guzzler Tax assessments shall be calculated in accordance with the following equation, rounded to the nearest 0.1 mpg:

$$FE_{adj} = Fe\ [((0.55 \times a_g \times c) + (0.45 \times c) + (0.5556 \times a_g) + 0.4487) / ((0.55 \times a_g) + 0.45)] + IW_g$$

Where:

FE_{adj} = Fuel economy value to be used for determination of gas guzzler tax assessment rounded to the nearest 0.1 mpg.

FE = Combined model type fuel economy calculated in accordance with § 600.207, rounded to the nearest 0.0001 mpg.

a_g = Model type highway fuel economy, calculated in accordance with § 600.207, rounded to the nearest 0.0001 mpg divided by the model type city fuel economy calculated in accordance with § 600.207, rounded to the nearest 0.0001 mpg. The quotient shall be rounded to 4 decimal places.

$c = 2.501 \times 10^{-2}$ for the 1980 model year
$c = 2.184 \times 10^{-2}$ for the 1981 model year
$c = 9.260 \times 10^{-3}$ for the 1982 model year
$c = 1.435 \times 10^{-2}$ for the 1983 model year
$c = 1.420 \times 10^{-2}$ for the 1984 model year
$c = 1.490 \times 10^{-2}$ for the 1985 model year
$c = 1.300 \times 10^{-3}$ for the 1986 and later model years

$$IW_g = (9.2917 \times 10^{-3} \times SF_{3IWCG} \times FE_{3IWCG}) - (3.5123 \times 10^{-3} \times SF_{4ETWG} \times FE_{4IWCG})$$

Note.—Any calculated value of IW less than zero shall be set equal to zero.

SF_{3IWCG} = The 3000 lb. inertia weight class sales in the model type divided by the total model type sales. The quotient shall be rounded to 4 decimal places.

SF_{4ETWG} = The 4000 lb. equivalent test weight sales in the model type divided by the total model type sales, the quotient shall be rounded to 4 decimal places.

FE_{3IWCG} = The 3000 lb. inertia weight class base level combined fuel economy used to calculate the model type fuel economy rounded to the nearest 0.0001 mpg.

FE_{4IWCG} = The 4000 lb. inertia weight class base level combined fuel economy used to calculate the model type fuel economy rounded to the nearest 0.0001 mpg.

(b) * * *

(1) Passenger automobiles with a combined general label model type fuel economy value of less than 17.0 mpg, calculated in accordance with paragraph (a)(3) of this section and rounded to the nearest 0.1 mpg, shall carry a Gas Guzzler Tax statement pursuant to section 403 of the National Energy Conservation Policy Act.

* * * * *

(c) This paragraph applies to 1982 model year vehicles.

(1) Passenger automobiles with a combined general label model type fuel economy value of less than 18.5 mpg, calculated in accordance with paragraph (a)(3) of this section and rounded to the nearest 0.1 mpg, shall carry a Gas Guzzler Tax statement pursuant to section 403 of the National Energy Conservation Policy Act.

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(d) This paragraph applies to 1983 model year vehicles.

(1) Passenger automobiles with a combined general label model type fuel economy value of less than 19.0 mpg, calculated in accordance with paragraph (a)(3) of this section and rounded to the nearest 0.1 mpg, shall carry a Gas Guzzler Tax statement pursuant to section 403 of the National Energy Conservation Policy Act.

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(e) This paragraph applies to 1984 model year vehicles.

(1) Passengers automobiles with a combined general label model type fuel economy value of less than 19.5 mpg, calculated in accordance with paragraph (a)(3) of this section and rounded to the nearest 0.1 mpg, shall carry a Gas Guzzler Tax statement pursuant to section 403 of the National Energy Conservation Policy Act.

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(f) This paragraph applies to 1985 model year vehicles.

(1) Passengers automobiles with a combined general label model type fuel economy value of less than 21.0 mpg, calculated in accordance with paragraph (a)(3) of this section and rounded to the nearest 0.1 mpg, shall carry a Gas Guzzler Tax statement pursuant to section 403 of the National Energy Conservation Policy Act.

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(g) This paragraph applies to 1986 and later model year vehicles.

(1) Passenger automobiles with a combined general label model type fuel economy value of less than 22.5 mpg, calculated in accordance with paragraph (a)(3) of this section and rounded to the nearest 0.1 mpg, shall carry a Gas Guzzler Tax statement pursuant to section 403 of the National Energy Conservation Policy Act.

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FR Doc. 85–15711 Filed 6–28–85; 8:45 am]
BILLING CODE 6560–50–M