94-30-N01-020

The Goodyear Tire & Rubber Company

NHTSA-97-1733-021

Akron, Ohio 44316-0001

VICE PRESIDENT

ORIGINAL

June 22, 1994

Docket Section
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Room 5109
Washington, DC 20590

RECEIVED
NHTSA DOCKET
94 JUN 23 A 9:50

Subject: 49CFR575 (Docket No. 94-30; Notice 01)
Uniform Tire Quality Grading Standards
Request for Comments

13 pgs

Sir:

The Goodyear Tire & Rubber Company welcomes the opportunity to respond to the subject request for comments. Goodyear believes that the UTQGS is in need of revision because it is not well understood by consumers and the information it contains is of limited value and accuracy. Therefore, we agree with NHTSA that the UTQGS could be made more meaningful to the tire-buying public.

It is Goodyear's opinion that treadwear grading should be eliminated from the quality grading standards. Most tires are now covered by treadwear warranties that are much better indicators for making purchasing decisions than treadwear grades. If treadwear grading is not eliminated, we believe that changes should be made to prevent the rating creep and that the treadwear test procedure should be replaced with a yet undefined laboratory test. The current testing system is unreliable, inaccurate, cumbersome, costly, environmentally unfriendly, and generally misleading.

We believe that the current method of determining traction grades is generally acceptable. However, it is unacceptable that changing traction pads has the potential to produce different traction grades than those obtained from identical tires tested prior to the change. If revisions in traction testing are necessary, we favor the addition of a new category, such as "AA", for higher traction coefficient tires.

It is our belief that there is no need for a rolling resistance grade. Lower rolling resistance tires may not necessarily produce the desired improvement in the environment. They may even be detrimental to environmental protection and other Administration goals because of the following.

QA 16865

1) Other factors being equal, a tire designed to maximize low rolling resistance may have a shorter tread life than an otherwise comparable tire thus creating the need for an increased number of tires with associated additional energy consumption. Increasing the number of tires required would also increase the environmental problems from scrap tire disposal.

2) No studies have been performed indicating how low rolling resistance tires, which often substitute a specialized silica compound for carbon black, would affect scrap tire disposal strategies including tire-derived-fuel (TDF) and other disposal and recycling options.

3) Low rolling resistance tires are, other criteria equal, more expensive than other high quality tires.

4) Low rolling resistance tires have already been produced and marketed by Goodyear which introduced the Invicta GFE. However, consumers have shown little inclination to buy these tires.

5) It could be very difficult for smaller tire manufacturers to effectively compete in the low rolling resistance market segment.

If a rolling resistance grade is added, we believe it should replace the current temperature resistance grade. However, in place of adding a rolling resistance grade, Goodyear feels that the most efficient and effective way to improve fuel economy and thus reduce CO2 emissions is through a cooperative effort in initiating an education and awareness program to promote proper tire inflation.

Attached are the thirty (30) specific questions asked by NHTSA, each question being followed by our response.

Very truly yours,

J. C. Whiteley
pjs

Att

NHTSA-QGL Questions

TREADWEAR QUESTIONS

Q1. Does the existing system for measuring treadwear result in misleading grades? Why?

A1. Yes, because: 1) there is little evidence that most of the general public understands or makes effective use of the current grading system; and 2) as noted by NHTSA (Fed.Reg.Vol.59,No.79,p 19687), the current system can and does produce results which appear to be significantly misleading estimates of relative tread life. This is particularly true when comparing the grades of current tires with the grades of tires that are worn out and need to be replaced, or when the grades are used to project expected mileage.

Q2. Should a new system be developed for establishing treadwear grades? What system?

A2. No. Treadwear grading should be eliminated from the quality grading system. It is not necessary. Nearly all passenger vehicle tires are now covered by treadwear warranties which are much better indicators for making purchasing decisions than treadwear grades, particularly since the warranties, unlike the UTQGS treadwear grade ratings, also provide a mechanism for satisfying customer complaints on treadwear.

If elimination of treadwear grades is not acceptable to NHTSA, we propose discarding the current system and replacing it with a standardized, repeatable laboratory test that will assess treadwear potential.

Q3. Should the treadwear procedure be changed? What specific changes should be made? Why? What data are available to support such changes? How should such changes be implemented?

A3. As noted in Answer 2, we believe the treadwear procedure should be eliminated, since tread life warranties provide a superior mechanism for accurately conveying expected treadwear information to consumers. If NHTSA is to require a treadwear grade, it should be based on a standardized, repeatable laboratory test. The current system is unreliable, inaccurate, cumbersome, costly, environmentally unfriendly, and does not provide consumers with accurate and useful information. Also, recent requirements that all tires must rotate through all vehicles during the QGL treadwear test has limited the range of candidate tires that can be tested, and has introduced variables into the test that did not previously exist. There is no easy fix, and we feel the system is beyond repair.

Q4. Should the test course calibration procedures be changed? What changes should be made?

A4. We assume that "test course calibration procedure" refers to establishing a new Base Course Wear Rate (BCWR) for each batch of CMTs. If that assumption is correct, we believe this test course calibration procedure should be eliminated because it fails to achieve the most basic goal of any calibration procedure, i.e., producing accurate, consistent, repeatable results over time. The inaccuracies of the procedure provide one of the reasons why this system should be abolished in favor of warranties or a new laboratory-based testing system.

As noted by NHTSA, the Base Course Wear Rate has gone down with each new batch of CMTs. The reason for this is that every time a CMT from a recently manufactured new batch of CMTs (New CMT) is tested against a CMT from an old batch of CMTs manufactured a year or more ago (Old CMT), the fresh New CMT has invariably had a lower wear rate than the aged Old CMT when the Old and New CMTS are tested together. This result has been obtained nine times out of nine chances, and strains credibility that it is just a random result. Yet nobody has been able, to date, to explain this phenomenon, which has led to so-called treadwear rating creep -- continuously increasing treadwear grade ratings over a period of years. This fact provides additional support for our position that, as previously stated in Answer 3, the system as a whole appears to be flawed beyond repair.

However, as regards the specific problem of treadwear rating creep, there are several ways this phenomenon can be eliminated or ameliorated. For example, establish the BCWR: 1) at some fixed, unchanging number such as the current 1.47; 2) as a running average of actual CMT wear rates; or 3) by some method that slowly brings it more in line with actual wear rates of the CMTs.

Fixing the BCWR at the current 1.47 has the great advantage of keeping treadwear ratings at their current levels. Existing grades will not have to be revised, and treadwear grades on future lines of tires would remain at or near current levels. The CMTs would then be used essentially as control tires in each treadwear test to adjust for changes in current test conditions.

TRACTION QUESTIONS

Q5. How should traction grades be determined or improved? Does traction change significantly with wear for any tire lines?

A5. The current method of determining traction grades is generally acceptable. However, it is unacceptable that new traction pads have the potential to produce different traction grades than those obtained from identical tires tested on the old traction pads.

It may be possible to improve traction grading by adjusting the traction coefficients for the two surfaces rather than having fixed values. Also, as mentioned later in the response to question 7, it may be useful to include the peak traction value in addition to the slide value, to determine traction grades. Still another possibility is to increase the water depth and test speed used in the traction test, to better differentiate between tires of different tread designs. However, the effectiveness of any of these possibilites is not clear at this time.

Traction does change as a tire wears. Generally, dry traction gets higher and wet traction gets lower with wear. The reduction in wet traction is not considered to be significant until there is less than 2/32" of tread depth remaining in the worn tire. That is the basis for treadwear indicators required by the tire safety standards being set at 2/32".

Q6. Should the traction grades be upgraded? By raising the minimum values for each category (A, B, C), or by creating a new category such as AA? By other means?

A6. As noted by NHTSA, over 67% of new tires are graded 'A' for traction, the highest available grade. To provide greater product differentiation, revisions may be beneficial.

The minimum values of current categories should not change. Otherwise, all but a few high traction coefficient tires would need to be regraded, with the attendant costs of welding and restamping thousands of existing molds. Furthermore, the traction grades for existing tires could not be grandfathered. Otherwise, two tires with apparently identical traction grades might actually have different grades. That would be very difficult to explain to a consumer.

If it is concluded that revisions are necessary, we favor the addition of a new category, such as 'AA', to the traction grades for higher traction coefficient tires. However, we will further review this issue if such a proposal is made.

Q7. Should the UTQGS include peak tire traction ratings? Does peak tire traction correlate with stopping distance on ABS-equipped vehicles? Can the peak tire traction coefficient be measured reliably? How could/should it be expressed?

A7. It is not clear whether peak traction values should be used to determine traction grades. Potentially, they could be rated separately from, jointly with, or in place of slide traction values which are currently the basis for traction grades.

Peak traction values do correlate with stopping distances on ABS-equipped vehicles, but the results are dependent upon the differences among the various ABS systems.

Peak traction measurements are repeatable enough to be reliable.

If in the first instance it is concluded that peak traction values should be included in traction quality grading, the question of how peak traction values could or should be expressed as a potential quality grade will require more time for evaluation.

Q8. What would be the cost of measuring peak traction? In addition to sliding traction? Instead of sliding traction?

A8. Both peak and slide values are presently measured/captured during the QGL traction test. The only additional cost would be to modify the data reduction program to work with the peak value in place of or in addition to the slide value.

TEMPERATURE RESISTANCE/ROLLING RESISTANCE QUESTIONS

Q9. Are the characteristics related to a tire's ability to dissipate heat and to withstand higher operating temperatures that affect a tire's temperature resistance rating directly related to a tire's rolling resistance?

A9. No. A tire's rolling resistance and the tire's ability to operate at higher temperatures are separate characteristics of the tire. Measurement of one of these characteristics cannot be a direct substitute for measurement of the other.

Q10. Should the temperature resistance grade be deleted from UTQGS? Is it adequately represented by the voluntary tire industry speed ratings?

A10. The temperature resistance grade should be deleted from the quality grading system, for reasons noted by NHTSA.

While the measurement of rolling resistance would not "provide equivalent safety information to the temperature resistance grade" (as noted in Answer 9), the voluntary tire industry speed ratings and/or the "DOT" certification required by FMVSS109 do provide such information.

Tires which do not have a voluntary speed rating would, at the least, be equivalent to a temperature resistance grade of "C", because "the grade C corresponds to a level of performance which all passenger tires must meet under the Federal Motor Vehicle Safety Standard No. 109". Passenger tires that are speed rated are generally rated "S", or higher. Speed rating "S" could be considered equivalent to Temperature Resistance "B". Speed ratings above "S" could be considered equivalent or superior to Temperature Resistance "A".

Q11. Should a rolling resistance grade replace temperature resistance? How would such a grade be expressed? How would it be labeled on the tire?

All. No. We believe that there is no need for a rolling resistance grade. (See Answers 13 and 30). However, if such a grade is added, we believe that it should replace the temperature resistance grade. (See Answer 10).

There are several possibilities as to how a tire's rolling resistance grade might be expressed. We are not yet prepared to suggest how it should be expressed or labeled.

Q12. Should a rolling resistance grade be added to the UTQGS as a fourth grade?

A12. No. (See Answers 10, 11, 13, and 30).

Q13. How would the agency explain to consumers the correlation between rolling resistance and fuel economy?

A13. We do not believe that NHTSA will be able to accurately or effectively explain to the public the relationship between rolling resistance and fuel economy. This is because there is no fixed correlation between these two variables. Rather, the relationship between tire rolling resistance and overall vehicle fuel economy depends on a variety of factors, some of which include:

SPEED - The fuel requirements for any given vehicle are greater the faster that vehicle is driven. For every five miles per hour above 55, for example, there is a measurable loss in overall vehicle fuel economy. Also, harsh acceleration and frequent start-and-stop driving can seriously increase fuel usage.

VEHICLE AERODYNAMICS - The resistance a vehicle generates when moving through the air (a measureable character-istic known as coefficient of drag) significantly affects vehicle fuel economy.

VEHICLE ALIGNMENT - A vehicle which is out of alignment is literally being dragged forward rather than rolling, and this added resistance to motion requires more energy, reducing overall fuel economy.

LOAD - The greater the load on the tire, the higher its resistance to rolling. Likewise, the more heavily loaded the vehicle, the more fuel will be required to move it. Thus, higher loads can cause substantial reductions in overall vehicle fuel economy.

ROAD SURFACE - Overall vehicle fuel economy can vary from region to region and road to road, due to the differences in road-building materials and surfaces around the country. The most tractive road surfaces typically cause the greatest reduction in fuel economy.

TIRE INFLATION PRESSURE - Tires which are underinflated can cause a significant loss of overall vehicle fuel economy. By the Department of Energy's own estimates, up to four million gallons of gasoline could be saved in the United States every day if the driving public simply followed the recommendations of their vehicle manufacturers for proper tire inflation.

The fact that overall vehicle fuel economy is dependent upon so many and such varied factors highlights a key problem with the concept of purchasing tires solely on the basis of fuel economy or rolling resistance: tire differences contribute relatively little to the picture of overall fuel economy.

Q14. Can rolling resistance be improved without detracting from the other graded characteristics? What is the additional cost per tire? Do you agree with the costs projected in "The Climate Change Action Plan"?

A14. Generally, no. However, on a few tires, it may be possible to make a very limited amount of improvement in rolling resistance without sacrificing the other graded characteristics of treadwear and traction. But such a limited improvement in rolling resistance would result in a lesser, even more limited improvement in fuel economy.

We have not, and probably cannot, reduce our data to a simple equation relating a unit of rolling resistance reduction to a unit of cost. Many variables are involved. Whatever the increased costs (mainly for processing and materials) turn out to be, they will require a substantial increase in the price of the tires. In various consumer surveys, the end users have demonstrated that they will not pay a premium for a low rolling resistance tire.

We have not completed our evaluation of the cost figures in "The Climate Change Action Plan".

Q15. Can tires of the same size, construction, and load carrying capacity which have the same rolling resistance, exhibit significantly different temperature resistance performance?

A15. Yes, because, as was discussed in Answer 9, rolling resistance and temperature resistance are only indirectly related and may vary significantly, even if other factors such as size and construction are held constant.

Q16. Would any safety values be affected if rolling resistance replaced temperature resistance (in UTQGS)?

A16. No. (See Answer 10.)

Q17. How should data based on the test procedures of SAE-J1269 and SAE-J1270 be utilized to compare the rolling resistance performance of different tires?

Al7 The data generated by 51269 are reduced to RR coefficients, which can be used for direct comparisons.

Q18. What data regarding rolling resistance of different tire designs currently exists?

A18. Within our company, a great deal of rolling resistance data exists but the large majority of it relates to OEM tires.

Q19. What is the range of rolling resistance performance available both to OEM and aftermarket passenger car tires today? What is the potential for further reductions in rolling resistance for tires of various types, such as all-season, mud/snow, rain, and conventional?

A19. Pure mud/snow tires, defined as deep tread, winter-type snow tires, are specifically excluded from UTQGS. This exclusion should also extend to rolling resistance for those tires.

For other types of tires, rolling resistance may be expressed as a coefficient. For tires that we have tested, the range of rolling resistance coefficients, multiplied by a factor of 10,000, are as follows:

For OEM tires: Range = 152 to 67. These tires are also available in the replacement market.

For replacement tires: Range = 131 to 83. It is noted that the tires in this group are exclusively replacement market tires.

The potential for further reductions in rolling resistance for the various types of tires listed are not great without affecting the other graded characteristics of the tires. (See Answer 14.)

Q20. Are there improvements that should be made in the current procedures for measuring rolling resistance? If so, please describe how those measures could be improved, and at what additional cost?

A20. No. SAE-J1269 has essentially become the industry standard.

COMMERCIAL QGL QUESTIONS

Q21. What should be done about tires already graded?

A21. They should be grandfathered and excluded from any changes. Any changes in the QGL standard should apply only to new lines of tires introduced after the effective date of the revised regulation.

Q22. What would be the most effective campaign to publicize the low rolling resistance/fuel efficiency program?

A22. Goodyear does not believe that any campaign to publicize low tire rolling resistance would achieve beneficial results. We have attempted to market low rolling resistance/fuel efficient passenger tires in the past, without sufficient success to sustain the product. Most notably, the Invicta GFE was specifically marketed as a fuel efficient tire. Consumers were unwilling to pay even a small premium for that benefit. (But see Answer 30.)

Rather than promoting a policy which is likely to meet with minimal success, and which further risks damage to other environmental goals (such as reducing the quantity of scrap tires, and improving the environment for all citizens including the economically disadvantaged), Goodyear suggests that any public promotion campaign focus on urging consumers to maintain manufacturer-recommended tire pressures. This would likely be far more successful at reducing greenhouse gases, and would produce multiple broad-based environmental gains. (See Answer 30.)

Q23. What procedures would be the most effective in monitoring the low rolling resistance/fuel efficiency program to assure maximum results?

A23. We do not know,

Q24. what is the estimated incremental consumer cost increase for low rolling resistance tires of various types?

A24. The incremental consumer cost increase for low rolling resistance tires is unknown at this time, and would depend on a variety of factors including, as was explained in Answers 14 and 19, the extent and nature of any performance trade-offs which might be made to optimize tires for rolling resistance.

Q25. What is the estimated cost effectiveness for low rolling resistance tires of various types? How cost effective would low rolling resistance tires have to be to motivate consumers to buy them?

A25. Cost effectiveness is not associated with low tire rolling resistance, particularly at the consumer level, due not only to the increased cost of the tire, but also to the performance trade-offs involved, including tread life. Other factors are the driving forces behind low rolling resistance in tires.

Our experience is that low rolling resistance will not motivate a consumer to spend more money for tires. (See Answer 22.)

Q26. What is the current cost of tire labeling for treadwear, traction, and temperature resistance combined on a per-tire basis assuming a high volume production line? How would this cost change if rolling resistance replaced temperature resistance? If it were added, without replacing any of the existing UTQGS requirements?

A26. The actual cost per tire for quality grading is a proprietary figure that is likely different for each manufacturer, and is essentially irrelevant in the context of this question.

The cost per test for rolling resistance is less than the cost per test for temperature resistance. However, it is likely that more tests will be required to grade rolling resistance than are necessary to grade temperature resistance. Therefore, costs associated with tire labeling are expected to increase if rolling resistance is graded instead of or in addition to temperature resistance.

Q27. What are current equipment and per-test costs to measure temperature resistance according to UTQGS? Rolling resistance according to SAE guidelines?

A27.

TEST	MACHINE COST	TEST COST
QGL Temperature Resistance	$750,000	$250
SAE Rolling Resistance	$1,500,000	$175

Q28. Is it necessary to replace all four (4) tires to achieve the benefits of lower rolling resistance? What are the fuel savings if fewer than four (4) tires are replaced?

A28. In order to get the maximum benefit, low rolling resistance tires should be used on all four wheel positions.

The fuel savings provided by less than four tires is a direct mathematical relationship. Thus, 3 tire = 3/4 fuel savings; 2 tires = 1/2 fuel savings; 1 tire = 1/4 fuel savings.

It should be noted that the maximum fuel efficiency benefit promised by low rolling resistance tires occurs, as with all tires, only when proper tire inflation is maintained.

Q29. What is the frequency with which consumers replace four (4) tires at once? Three tires? Two tires?

A29.

Tires	% Purchases	% Tires sold
4	42%	62%
3	2%	2%
2	41%	30%
1	15%	6%

Q30. Are there other or additional measures NHTSA should consider to aid in reducing greenhouse gases? What are the costs and benefits of these measures?

A30. "Goodyear continues to recommend a cooperative effort among tire manufacturers, DOT, DOE, and EPA to initiate a consumer education and awareness program to promote proper tire inflation. Such a program might be similar in practice and effectiveness to the educational effort by DOT which increased seat belt usage from less than 5% just a few years ago to an impressive 62% by the end of 1992. Goodyear believes that such an effort could make a substantial and immediate impact in fuel savings, with attendant reductions in CO2 emissions. The time and cost involved in implementing a new regulation would be eliminated. Most importantly, while there is no cost to the consumer for keeping tires properly inflated, there are obvious savings through improved tire wear and fuel efficiency, as well as safety benefits." (Excerpt from letter to Federico F Pena, December 13, 1993)

The White House Conference on Global Warming was told that the use of reduced rolling resistance tires could reduce CO2 emissions from passenger cars by 16 million metric tons (MMT) per year. We believe it is possible that this figure was based on older industry estimates that 20% of vehicle energy was lost through tires. Current estimates are that tire-related energy losses are now closer to 10%, due in part to improved tire technologies. Even if the higher estimate is used, it still accounts for no more than 1% of US CO2 output from burning fossil fuels.

In contrast, as mentioned in Answer 13, it has been estimated by the Department of Energy that 4 million gallons of gasoline could be saved every day in the United States if all tires were maintained at proper inflation. Annualized, this savings translates to over 13 MMT of reduced CO2 emissions.

Therefore, the tire-related portion of the Administration's policy goal of reducing greenhouse gases can be achieved most quickly and efficiently through a concerted government/industry initiative to encourage consumers to maintain proper tire inflation. This is a far superior method of achieving greenhouse gas reductions since:

* An informational tire inflation campaign can be instituted very quickly and acted upon by virtually all car and truck owners. This strategy is superior to quality grade ratings for rolling resistance in virtually every regard because:

>> it allows broad-based participation by all vehicle owners immediately rather than effectively requiring a long phase-in period which would primarily involve only car owners purchasing premium-priced tires;

>> it does not require any additional expense on the part of consumers: and

>> it saves consumers money not only through improved fuel efficiency but also through longer tread life. Extending tread life will create a ripple effect of environmental improvements, including but not limited to greenhouse gas reductions, by improving fuel efficiency and reducing the disposal rate of tires.

* Rolling resistance ratings are a poor method of achieving greenhouse gas reductions because:

>> there is little evidence consumers understand and make decisions based on UTQGS;

>> consumers have shown little inclination to purchase the low rolling resistance tires already on the market; and

>> potential benefits would involve only those consumers buying new premium-priced passenger car tires and, at best, a substantial phase-in period would be required before any significant greenhouse gas reductions occurred.

* The purchase of low rolling resistance tires, which necessarily are a premium-priced product, would be closely linked to socio-economic status and disposable income. Therefore, the plan's environmental effects could vary by location. Thus, to the extent that the proposed rating system was successful in encouraging the purchase of low rolling resistance tires, the reduction in greenhouse gases and other tailpipe emissions would be greatest in more affluent areas. This plan would, to the extent it was successful, increase the disparity in environmental quality between richer and poorer locations -- a problem which the Administration has pledged to rectify.

* Lower rolling resistance tires are not necessarily an environmental improvement and may even be detrimental to environmental protection and other Administration policy goals. Tires designed to maximize fuel efficiency are likely to have a lower tread life than otherwise comparable tires. This creates the need for increased tire consumption with the associated additional increase in the use of fossil fuels. This situation would also increase the environmental problems associated with tire disposal.