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Effects of Tire Rolling Resistance On Class 8 Tractor-Trailer Stopping Distance

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Overview

The DOT Federal Motor Carrier Safety Administration and National Highway Traffic Safety Administration conducted a joint test program through Oak Ridge National Laboratory to explore the effects of tire rolling resistance values on Class 8 tractor-trailer stopping distance performance over a range of loading and surface conditions. The objective was to determine whether there is a relationship between tire rolling resistance and stopping distance for vehicles of this type.

Sets of 60-mph stopping distance tests were performed on four different sets of tires (on the same tractor semitrailer test vehicle) on wet and dry pavement at the Transportation Research Center in East Liberty, Ohio. For each set of tires, ten stopping distance tests were performed for each test condition. New tires of these same tire models were also laboratory-tested for rolling resistance at Smithers Rapra to facilitate comparison between the test track performance and the coefficients of rolling resistance (CRRs) for each tire set. Six new tires of each model were tested for rolling resistance.

Test Vehicle

The test vehicle was a model year 2014 Freightliner Cascadia 125 6x4 tractor that used the same Utility 2012 VS2DX 53-foot dry van trailer with air suspension for all test conditions other than Part 571 Federal Motor Vehicle Safety Standards (FMVSS) No. 121 testing, which requires a special unbraked control trailer (Figure 1). The tractor and trailer brakes were fully burnished in accordance with the FMVSS No. 121 procedures prior to testing. All tires were subjected to an on-road conditioning run of 100 miles at approximately 60 mph, loaded to 60,000 lb. gross combination vehicle weight (GCVW), prior to the start of braking tests.



Figure 1. Class 8 Tractor with 53-Foot Dry Van Trailer and FMVSS No. 121 Unbraked Control Trailer

The vehicle test weights selected for the test program are detailed in Table 1. Exact test weights for each test series are available in Appendix A, with additional details on per axle loading and vehicle configuration in Appendix C.

Description of Loading Condition	Nominal Gross Combination Vehicle Weight (GCVW)						
FMVSS No. 121 Load	57,700 lb.						
Medium Load	60,000 lb.						
Maximum FHWA Bridge Formula Load (for vehicles of	80.000 lb						
this length and number of axles) 80,000 lb.							
*A slightly higher GCVW than the standard 56,500-lb. target GCVW for FMVSS No. 121 tests							
was used to parallel other efforts where higher loads were tes	ted.						

Table 1. Nominal Vehicle Test Weights (GCVW)

Test Tires

The test tire models were selected from four manufacturers and were comprised of "all-position" (which are primarily used on tractor steer or trailer axles) and "drive" designated models (Table 1). The test design utilized the EPA SmartWay Verified designation as an indicator of low rolling resistance at the various axle positions. Detailed results of the tire rolling resistance testing are discussed later in this report and displayed in Table 8 and Appendix B. The all-position tire models ranged in average CRR from 4.6 to 6.5 N/kN. The drive tire models ranged in average CRR from 5.9 to 8.2 N/kN.

Designation	Tire Model	CRR Test Average	SmartWay ² Verified as Steer (≤6.5 CRR) ³	SmartWay Verified as Drive (≤6.6 CRR)	SmartWay Verified as Trailer (≤5.1 CRR)
	Bridgestone Ecopia R197	4.6	YES	N/A	YES
All Position	Yokohama RY617	5.7	YES	N/A	NO
	Bridgestone R280	6.3	YES	N/A	NO
	Goodyear G399A LHS	6.5	YES	N/A	NO
	Bridgestone Ecopia M710	5.9	N/A	YES	N/A
Drive	Yokohama 703ZL	6.2	N/A	YES	N/A
	Goodyear G572A LHD	6.4	N/A	YES	N/A
	Bridgestone M726 EL	8.2	N/A	NO	N/A

Table 2. Tested Tire Models

Table 3 shows how the tire models were combined into four sets of test tires. Tire Set 2 was comprised of SmartWay-verified low rolling resistance tires (LRRT) at all steer, drive, and trailer positions. Sets 1 and 3 had verified models at two of three positions (tractor steer and drive axles). Set 4 had verified tires at only one of three positions (steer) and had the highest combined rolling resistance of the four sets

Table 3. Tested Tire Sets

Tino Sot	Tir	e Model for Each Axle Gr	oup						
The Set	Steer (2 Tires)	Drive (8 Tires)	Trailer (8 Tires)						
Set 1	Goodyear G399A LHS	Goodyear G572A LHD	Goodyear G399A LHS*						
Set 2	Bridgestone Ecopia R197	Bridgestone Ecopia M710	Bridgestone Ecopia R197						
Set 3	Yokohama RY617	Yokohama 703ZL	Yokohama RY617*						
Set 4	Bridgestone R280	Bridgestone M726 EL*	Bridgestone R280*						
*Indicates a tire model that is not verified as a low rolling resistance model under EPA									
SmartWay for th	at axle position.								

Results of CRR tests for each model of tire were used to calculate an overall nominal CRR for each complete tire set for an 80,000-lb GCVW, shown in Table 4. An explanation of these calculations, along with charts showing the breakdown of actual rolling resistance by axle group using exact test weights, appear in the analysis section on rolling resistance results.

¹ See Table 7 and Appendix B for detailed tire rolling resistance results.

² Per EPA SmartWay Technology Tires Listing (Accessed 4/15/2015)

http://www.epa.gov/smartway/forpartners/technology.htm

³ Per ISO 28580 (2 meter drum) Target Values;

http://www.epa.gov/smartway/forpartners/documents/verified/420f12024.pdf

Tires	Estimated Overall GCV CRR (N/kN)
Set 1	6.48
Set 2	5.15
Set 3	5.95
Set 4	7.10

Table 4. Overall CRR Estimates Each Tire Set Loaded to 80,000-lb GCVW

Stopping Distance

The stopping distance testing was conducted on a Portland cement concrete skid pad with nominal dry peak and slide coefficients of friction of 0.94 and 0.89, respectively. Ten service brake stops for each tire set were performed on wet pavement, dry pavement, and repeated on wet pavement for two different GCVWs—60,000 lb and 80,000 lb—for a total of 60 stops per tire set. These tests were performed in a manner similar to the FMVSS No. 121 tests where the vehicle was brought up to the target speed (in this case 60-mph) and the service brakes were fully applied until the vehicle came to a stop. (Unlike the FMVSS No. 121 stops, however, the full tractor-trailer vehicle combination with a braked trailer was under test.) In addition to these stops, a set of ten 60-mph stopping tests were also performed for each set of tractor tires with an unbraked control trailer and tested in accordance with FMVSS No. 121 protocols.

A sample run is shown below in Figure 2 for reference. This plot shows the full braking pressure being applied at time zero, causing the vehicle to come to a complete stop from its 60-mph initial speed. The vehicle deceleration is fairly constant at 20 ft/s² after approximately 0.5 seconds.



Figure 2. Streaming Data from Sample Stopping Test

Stopping Distance Results Summary

The following figures show the overall stopping distance results. The values shown in Figure 3 represent the averages of the ten stopping distance tests for each scenario, and Figure 4 through Figure 7 show each individual stopping test. Note that for clarity and to better facilitate comparisons, the y axis does not begin at zero; a range of 200 ft to 300 ft is used throughout this report for 60-mph stopping distances.



Figure 3. Average Stopping Distances

Test results for each run are available in Appendix A.



Figure 4. Individual Stopping Distances for Set 1 Test Runs



Figure 5. Individual Stopping Distances for Set 2 Test Runs



Figure 6. Individual Stopping Distances for Set 3 Test Runs



Figure 7. Individual Stopping Distances for Set 4 Test Runs



Stopping distances for each run of the FMVSS No. 121-type stops are shown in Figure 8.

Figure 8. Individual Stopping Distances for FMVSS No. 121 Test Runs

Table 5 shows the average stopping distances for each set of tests. Also shown is the standard deviation for each 10-run set. The standard deviation provides a measure of how closely the individual runs are grouped around the overall average value. Table 6 displays the coefficient of variation (ratio of the standard deviation to the mean) for each set of tests. All sets of vehicle stopping distances had a coefficient of variation below 3%.

Test Set		Ave	rage		Sample Standard Deviation					
Test Set	Set 1	Set 2	Set 3	Set 4	Set 1	Set 2	Set 3	Set 4		
FMVSS No. 121	222.6	223.5	223.3	225.4	2.875	2.915	3.622	3.026		
60k Dry	219.5	211.0	223.7	214.3	4.403	4.000	4.001	2.058		
80k Dry	223.7	225.4	224.2	227.1	3.683	3.438	3.824	4.725		
60k Wet	252.7	257.7	259.5	257.5	6.360	4.715	4.994	5.563		
60k Wet Retest	260.5	258.3	261.3	250.9	4.301	8.247	4.900	4.306		
80k Wet	265.9	272.9	273.4	264.9	6.887	6.420	6.004	1.912		
80k Wet Retest	259.1	261.5	272.2	256.4	4.977	5.233	7.857	5.317		

 Table 5. Stopping Distance Averages and Standard Deviations (ft)

Table 6. Stopping Distance Coefficients of Variation

Tost Sat	Estimated Coefficient of Variation									
Test Set	Set 1	Set 2	Set 3	Set 4						
FMVSS No. 121	1.3%	1.3%	1.6%	1.3%						
60k Dry	2.0%	1.9%	1.8%	1.0%						
80k Dry	1.6%	1.5%	1.7%	2.1%						
60k Wet	2.5%	1.8%	1.9%	2.2%						
60k Wet Retest	1.7%	3.2%	1.9%	1.7%						
80k Wet	2.6%	2.4%	2.2%	0.7%						
80k Wet Retest	1.9%	2.0%	2.9%	2.1%						

Figure 9 below illustrates the confidence intervals for each series of tests based on the calculated average and standard deviation. Each marker and corresponding band represents the confidence interval for the identified set of ten runs for a given tire-load-pavement condition. The colored diamonds mark the average stopping distance for each set of ten tests, and the line on which this marker is overlaid indicates the range and limits of the 95% confidence interval (the interval in which it can be predicted with 95% confidence that the actual population average would lie given an unlimited number of repetitions).



Figure 9. Stopping Distance Confidence Intervals

Of particular interest is that in some cases the confidence interval for the wet test does not overlap with that of the wet retest as would be expected. Possible causes for this discrepancy include ambient and test track temperature changes and variations in water distribution on the test surface.

Maximum and minimum values for each set of runs are shown in Table 7 along with the range for stopping distances in each set of runs.

Tost Sat	Maximum				Minimum				Range			
Test Set	Set 1	Set 2	Set 3	Set 4	Set 1	Set 2	Set 3	Set 4	Set 1	Set 2	Set 3	Set 4
FMVSS No. 121	226	229	230	231	218	219	220	220	8	10	10	11
60k Dry	226	220	229	218	211	207	217	212	15	13	12	6
80k Dry	228	232	230	233	216	221	218	220	12	11	12	13
60k Wet	260	268	271	266	242	252	253	246	18	16	18	20
60k Wet Retest	267	273	271	257	253	244	255	244	14	29	16	13
80k Wet	277	283	282	268	252	263	265	261	25	20	17	7
80k Wet Retest	265	270	285	264	252	252	260	250	13	18	25	14

Table 7.	Stopping	Distance	Range	(ft)
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The widest stopping distance range (between maximum and minimum stopping distance for a given set of tests) was 25 feet, approximately 10% of the measured stopping distance.

The variation in stopping distance test results is of particular interest for the FMVSS No. 121 stops—the standard provides a maximum stopping distance which must be met by at least one of the six runs in a standard FMVSS No. 121 test⁴. (Unlike the other stopping distance tests performed, the FMVSS No. 121 tests are performed with an unbraked control trailer and thus only provide insight into the tractor braking system.) In these tests, the tractor was loaded to 53,190 lb. (13,180 lb. on the steer axle and 40,010 lb. on the drive axles) with 4,500 lb. on the test trailer axle. For this type of tractor-trailer combination vehicle, the maximum stopping distance for a 60-mph stop is 250 feet. As apparent from Figure 10, even the longest measured stopping distances for each set of ten runs were well under this limit.



Figure 10. Range of Stopping Distances for FMVSS No. 121 Stops

⁴ http://www.nhtsa.gov/DOT/NHTSA/Rulemaking/Rules/Associated%20Files/121_Stopping_Distance_FR.pdf (Table II p. 143)

Stopping Distance and Deceleration

Following are plots of the stopping distance as a function of the average deceleration (Figure 11 to Figure 15). The upper left group of points represents the wet stopping distance tests (and retests) and the lower right group represents the dry testing resulting in higher decelerations and shorter stopping distances, as expected. This information for each tire set is shown separately to allow comparisons to be made between different test conditions. As expected, the higher test weight (dark markers in these plots) generally resulted in longer stopping distances.



Figure 11. Stopping Distance vs. Deceleration for Set 1 Tests



Figure 12. Stopping Distance vs. Deceleration for Set 2 Tests



Figure 13. Stopping Distance vs. Deceleration for Set 3 Tests



Figure 14. Stopping Distance vs. Deceleration for Set 4 Tests



Figure 15. Stopping Distance vs. Deceleration for FMVSS No. 121 Tests

Ambient Temperature

One suggested explanation for the differences between stopping distances for the initial sets of wet test runs and subsequent retests was the variation in ambient temperature. Due to the number of tests and setup required between sets of a given load and tire set, the tests were performed over a period of several days. As shown in Figure 16, there was a significant temperature variation over the course of testing.



Figure 16. Stopping Distance vs. Ambient Temperature for All Tests

Based on this scatterplot, it would be expected that some of the difference between, for example, the Set 1 (blue) and Set 3 (green) tests could be attributed to the temperature variation. Similarly, the test runs performed on Set 2 (red) were performed at a wide range of ambient temperatures, so some of the variability seen within a single tire set may also be attributable to temperature.

To explore this idea, plots were created showing for each set of tires the effect of ambient temperature on stopping distance (Figure 17 to Figure 20). It was generally observed that higher temperatures resulted in longer stopping distances for a given load and pavement condition.



Figure 17. Stopping Distance vs. Ambient Temperature for Set 1 Tests



Figure 18. Stopping Distance vs. Ambient Temperature for Set 2 Tests



Figure 19. Stopping Distance vs. Ambient Temperature for Set 3 Tests

The dry test data for Set 3 (Figure 19) is particularly interesting in that there is very little difference in stopping distance between the two weights (light and dark triangles). It would generally be expected (as has been shown earlier in this report) that heavier weights correspond to longer stopping distances. However, for this tire set, the lower-weight tests (marked by light green triangles) were performed at higher temperatures than the heavier-weight tests (marked dark green triangles) for the dry pavement condition. In this situation, the temperature effect appears to offset the weight effect completely, leading to nearly identical average corrected stopping distances of approximately 224 ft.



Figure 20. Stopping Distance vs. Ambient Temperature for Set 4 Tests

Because the FMVSS No. 121 stops were performed over a shorter period of time as a group, there was much less temperature variation between tire sets, as shown in Figure 21. This corresponds to less variability in stopping distance—all stops for all tire types are within an approximate 15-ft range.



Figure 21. Stopping Distance vs. Ambient Temperature for FMVSS No. 121 Tests

Rolling Resistance

Average CRRs

Rolling resistance tests were performed on six of each model of tire used for the stopping distance testing. There was one case where tire damage prevented testing of the sixth tire; in this case (Bridgestone R280), only five data points were used to determine the average values. A summary of the average CRRs is shown in Figure 22. The lab testing was actually performed using a 1.707-m drum, but all values presented in this report have been corrected to the equivalent 2.0-m drum, 25 °C values in conformance with ISO 28580.



Figure 22. Average CRRs by Tire Model

The numerical values are shown in Table 8, along with the standard deviation and range (difference between maximum and minimum CRR) to provide an indication of the spread of data.

Designation	Tire Model	Average	Standard Deviation	Range
	Bridgestone Ecopia R197	4.5884	0.1078	0.2857
All Position	Yokohama RY617	5.7485	0.1325	0.3077
	Bridgestone R280	6.3111	0.1452	0.3259
	Goodyear G399A LHS	6.5340	0.3676	0.9985
	Bridgestone Ecopia M710	5.9000	0.0975	0.2547
Drive	Yokohama 703ZL	6.2245	0.0980	0.2779
	Goodyear G572A LHD	6.4128	0.0962	0.2309
	Bridgestone M726 EL	8.1637	0.2597	0.5466

Table 8. Summary of CRR Statistical Values (N/kN)

The variation between tests of a same tire model was generally with in the expected range of 0.5 N/kN. However, one test within the Goodyear 399A LHS yielded CRR values approximately 1 N/kN lower than the other test runs; this is reflected in the high standard deviation for the test sample (0.3676). This tire was retested to confirm that the unexpectedly low value was valid.

Comparison of CRRs to Stopping Tests

The CRRs are dimensionless parameters which can be used to calculate estimates of rolling resistance for a given load. This was done by multiplying the weight for each axle group by the 2-m drum CRR for the tire model used in that position. This information is presented in Figure 23 (60,000-lb GCVW) and Figure 24 (80,000-lb GCVW). Although only the nominal weights appear in the plot titles for clarity, calculations were performed for each tire set using the actual test weights measured at the test track facility's certified pit scale.



Figure 23. Estimated Rolling Resistance by Axle for 60,000-lb GCVW



Figure 24. Estimated Rolling Resistance by Axle for 80,000-lb GCVW

These plots estimate the amount of rolling resistance provided by the tires at each axle. An overall vehicle CRR can be calculated by dividing the total rolling resistance forces for each axle group by the GCVW to get a dimensionless CRR for each tire set. This was done for each tire configuration and compared to the stopping distance test results for both the 60,000-lb and 80,000-lb GCVWs (Figure 25 and Figure 26, respectively).



Figure 25. Stopping Distance vs. Overall Vehicle CRR for 60,000-lb GCVW



Figure 26. Stopping Distance vs. Overall Vehicle CRR for 80,000-lb GCVW

Shown for each series of data is the R^2 value, a measure of the portion of variation in stopping distance explained by the CRR. A value close to 1 (or -1) would mean a nearly perfect correlation between the two variables—that the CRR would be an excellent indicator of stopping distance. Values close to zero would indicate that the CRR is practically unrelated to stopping distance.

As noted previously, ambient temperature variations did have a noticeable effect on stopping distance, but are not screened out in the data used for these plots. Of note is that the correlation

between CRR and stopping distance is negligible for the dry tests for both loading conditions. Although the correlation is higher for the wet testing (showing a slight trend in which lower CRRs correspond to longer stopping distances), it still does not meet the minimum threshold for statistical significance (typically 0.95, sometimes relaxed to 0.9). The strongest correlation between CRR and stopping distance was observed in the "80k Wet" data ($R^2 = 0.7588$).

The differences between relative performance of tire sets for the two loads is expected to be primarily due to the effect of load on the efficiency of the test vehicle's braking system, although further variation is introduced by ambient temperature differences for the stopping distance tests.

A similar method to that shown for the overall tractor-trailer combination can be used to estimate the CRR values for the tractor only in the FMVSS No. 121 stopping distance testing. These tests involved a tractor loaded to 53,190 lb. (13,180 lb. on the steer axle and 40,010 lb. on the drive axles) with 4,500 lb. on the test trailer axle. These tractor-only CRR estimates are shown for each tire set in Table 9.

Tires	Estimated Tractor CRR (N/kN)
Set 1	6.44
Set 2	5.57
Set 3	6.11
Set 4	7.70

Table 9. Tractor-Only CRR Estimates for FMVSS No. 121 Tests

In spite of the wide range of CRRs for the sets of tractor tires (over 2 kN/N between sets 2 and 4, or about 33% of the average tractor CRR), all FMVSS No. 121 stopping test runs for all tire sets were within the required distance.

Conclusions

While all vehicle stopping distance test sets had a coefficient of variation below 3%, ambient test temperature was observed to induce variability in the results. It was generally observed that higher ambient temperatures resulted in longer stopping distances for a given load and pavement condition. The overall results of this research suggest that tire rolling resistance is not a reliable indicator of Class 8 tractor-trailer stopping distance. The correlation coefficients (R² values) for linear regressions of wet and dry stopping distance versus overall vehicle rolling resistance values did not meet the minimum threshold for statistical significance for any of the test conditions. Correlation between CRR and stopping distance was found to be negligible for the dry tests for both loading conditions. While correlation was higher for the wet testing (showing a slight trend in which lower CRRs correspond to longer stopping distances), it still did not meet the minimum threshold for statistical significance of the vehicle with the four tire sets studied in this research (with estimated tractor CRRs which varied by 33%), were well under the FMVSS No. 121 stopping distance requirements.

Description	Tire Set	Condi tion	Run	Targ et Spee d (mph)	Target Control Pressur e (psi)	Actual Speed (mph)	Actual Stop Distanc e (ft)	Correct ed Stop Distanc e (ft)	Avg. Primar y Control Pressu re (psi)	Avg. Dece I (ft/s/ s)	Stop Time (sec)	Amb. Tem p (deg F)	Steer Axle Weight (Ib)	Drive Tande m Axles Weight (Ib)	Trailer Tande m Axles Weight (Ib)	Gross Vehicle Weight (Ib)
60k Base Wet	1	Wet	1	60	Full	60.1	243.2	242	103.6	18.6	5.18	63	11,790	24,450	23,950	60,190
60k Base Wet	1	Wet	2	60	Full	59.9	248.9	250	106.3	18.1	5.27	65	11,790	24,450	23,950	60,190
60k Base Wet	1	Wet	3	60	Full	60.1	249.9	249	103.9	18.2	5.3	67	11,790	24,450	23,950	60,190
60k Base Wet	1	Wet	4	60	Full	60.1	245.2	245	100.3	18.3	5.25	68	11,790	24,450	23,950	60,190
60k Base Wet	1	Wet	5	60	Full	60.1	255.6	254	102.1	18.1	5.35	71	11,790	24,450	23,950	60,190
60k Base Wet	1	Wet	6	60	Full	60.4	263.3	260	99	17.4	5.55	74	11,790	24,450	23,950	60,190
60k Base Wet	1	Wet	7	60	Full	60.6	256	251	102.3	18.1	5.38	73	11,790	24,450	23,950	60,190
60k Base Wet	1	Wet	8	60	Full	60.3	259.5	257	107	17.5	5.5	72	11,790	24,450	23,950	60,190
60k Base Wet	1	Wet	9	60	Full	60.2	261.1	259	99.9	17.2	5.56	74	11,790	24,450	23,950	60,190
60k Base Wet	1	Wet	10	60	Full	60.4	263.5	260	98.7	17.6	5.5	75	11,790	24,450	23,950	60,190
60k Base Dry	1	Dry	1	60	Full	60.4	218.7	216	98.3	21.3	4.64	75	11,790	24,450	23,950	60,190
60k Base Dry	1	Dry	2	60	Full	60.3	221.5	219	102.9	21.5	4.63	76	11,790	24,450	23,950	60,190
60k Base Dry	1	Dry	3	60	Full	60.3	222.6	220	107.2	21.2	4.7	76	11,790	24,450	23,950	60,190
60k Base Dry	1	Dry	4	60	Full	60.2	218.2	217	104.2	21.5	4.58	77	11,790	24,450	23,950	60,190
60k Base Dry	1	Dry	5	60	Full	60.1	226.2	226	104.3	21	4.74	77	11,790	24,450	23,950	60,190
60k Base Dry	1	Dry	6	60	Full	60.4	227.7	225	107	20.9	4.74	77	11,790	24,450	23,950	60,190
60k Base Dry	1	Dry	7	60	Full	60.2	221.9	221	107.3	21.4	4.63	78	11,790	24,450	23,950	60,190
60k Base Dry	1	Dry	8	60	Full	60.1	218.9	218	106.7	21.7	4.57	80	11,790	24,450	23,950	60,190
60k Base Dry	1	Dry	9	60	Full	60.1	222	222	107.5	21.3	4.64	80	11,790	24,450	23,950	60,190
60k Base Dry	1	Dry	10	60	Full	60.1	211.6	211	106.3	21.5	4.57	79	11,790	24,450	23,950	60,190
60k Base Wet Re-Runs	1	Wet	1	60	Full	60.2	263.7	262	104.5	17.7	5.47	79	11,790	24,450	23,950	60,190

Appendix A – Stopping Distance Test Results

Description	Tire Set	Condi tion	Run	Targ et Spee d (mph)	Target Control Pressur e (psi)	Actual Speed (mph)	Actual Stop Distanc e (ft)	Correct ed Stop Distanc e (ft)	Avg. Primar y Control Pressu re (psi)	Avg. Dece I (ft/s/ s)	Stop Time (sec)	Amb. Tem p (deg F)	Steer Axle Weight (Ib)	Drive Tande m Axles Weight (Ib)	Trailer Tande m Axles Weight (Ib)	Gross Vehicle Weight (Ib)
60k Base Wet Re-Runs	1	Wet	2	60	Full	60.4	269.8	267	106.4	17.1	5.62	80	11,790	24,450	23,950	60,190
60k Base Wet Re-Runs	1	Wet	3	60	Full	60.1	263.2	263	108.2	17.7	5.44	81	11,790	24,450	23,950	60,190
60k Base Wet Re-Runs	1	Wet	4	60	Full	60.1	259.8	259	107.2	17.9	5.38	80	11,790	24,450	23,950	60,190
60k Base Wet Re-Runs	1	Wet	5	60	Full	60.2	262.3	261	106.5	17.6	5.46	79	11,790	24,450	23,950	60,190
60k Base Wet Re-Runs	1	Wet	6	60	Full	60.4	267.5	264	107.2	17.5	5.56	79	11,790	24,450	23,950	60,190
60k Base Wet Re-Runs	1	Wet	7	60	Full	60.1	254.2	253	106.6	18.3	5.29	78	11,790	24,450	23,950	60,190
60k Base Wet Re-Runs	1	Wet	8	60	Full	60.4	263.7	260	104.2	17.8	5.41	77	11,790	24,450	23,950	60,190
60k Base Wet Re-Runs	1	Wet	9	60	Full	60	262	262	108.1	17.7	5.42	76	11,790	24,450	23,950	60,190
60k Base Wet Re-Runs	1	Wet	10	60	Full	60.5	258.8	254	107.5	17.8	5.38	73	11,790	24,450	23,950	60,190
80k Base Wet	1	Wet	1	60	Full	60.3	268.6	266	94	17.5	5.5	75	12,070	33,950	33,960	79,980
80k Base Wet	1	Wet	2	60	Full	60.5	268.2	264	100.1	17.6	5.48	76	12,070	33,950	33,960	79,980
80k Base Wet	1	Wet	3	60	Full	60.2	265.5	264	100.3	17.6	5.46	77	12,070	33,950	33,960	79,980
80k Base Wet	1	Wet	4	60	Full	60.5	276.3	272	95.1	17.4	5.57	76	12,070	33,950	33,960	79,980
80k Base Wet	1	Wet	5	60	Full	60.3	265.5	263	99.1	17.7	5.48	78	12,070	33,950	33,960	79,980
80k Base Wet	1	Wet	6	60	Full	60.2	278.7	277	100.6	16.8	5.73	79	12,070	33,950	33,960	79,980
80k Base Wet	1	Wet	7	60	Full	60.4	264.3	261	103.8	17.8	5.42	78	12,070	33,950	33,960	79,980
80k Base Wet	1	Wet	8	60	Full	60.3	272.6	270	103.5	17.3	5.57	79	12,070	33,950	33,960	79,980
80k Base Wet	1	Wet	9	60	Full	59.8	249.9	252	106.1	18.6	5.17	80	12,070	33,950	33,960	79,980
80k Base Wet	1	Wet	10	60	Full	60.2	271.5	270	98.1	17.4	5.53	81	12,070	33,950	33,960	79,980
80k Base Dry	1	Dry	1	60	Full	60.4	230.1	227	100.9	21.4	4.67	80	12,070	33,950	33,960	79,980
80k Base Dry	1	Dry	2	60	Full	60.3	224.2	222	105.5	20.6	4.75	80	12,070	33,950	33,960	79,980
80k Base Dry	1	Dry	3	60	Full	60.4	230.9	228	106.9	20.9	4.75	80	12,070	33,950	33,960	79,980

Description	Tire Set	Condi tion	Run	Targ et Spee d (mph)	Target Control Pressur e (psi)	Actual Speed (mph)	Actual Stop Distanc e (ft)	Correct ed Stop Distanc e (ft)	Avg. Primar y Control Pressu re (psi)	Avg. Dece I (ft/s/ s)	Stop Time (sec)	Amb. Tem p (deg F)	Steer Axle Weight (Ib)	Drive Tande m Axles Weight (Ib)	Trailer Tande m Axles Weight (Ib)	Gross Vehicle Weight (Ib)
80k Base Dry	1	Dry	4	60	Full	60.3	228.5	226	104	21.1	4.68	79	12,070	33,950	33,960	79,980
80k Base Dry	1	Dry	5	60	Full	60.5	226.8	223	101.1	20.3	4.78	77	12,070	33,950	33,960	79,980
80k Base Dry	1	Dry	6	60	Full	60.3	229.7	228	106.3	21.1	4.69	78	12,070	33,950	33,960	79,980
80k Base Dry	1	Dry	7	60	Full	60.3	225.5	223	105.7	21.2	4.66	75	12,070	33,950	33,960	79,980
80k Base Dry	1	Dry	8	60	Full	60.3	217.5	216	100.7	21.9	4.48	76	12,070	33,950	33,960	79,980
80k Base Dry	1	Dry	9	60	Full	60.5	225.5	222	100.1	20.6	4.7	73	12,070	33,950	33,960	79,980
80k Base Dry	1	Dry	10	60	Full	60.6	227	222	103.2	20.9	4.68	69	12,070	33,950	33,960	79,980
80k Base Wet Re-Runs	1	Wet	1	60	Full	60.1	254.1	253	101.8	18.3	5.22	55	12,070	33,950	33,960	79,980
80k Base Wet Re-Runs	1	Wet	2	60	Full	60	252.1	252	103.1	18.7	5.14	56	12,070	33,950	33,960	79,980
80k Base Wet Re-Runs	1	Wet	3	60	Full	59.2	245.5	252	99.2	18.2	5.16	58	12,070	33,950	33,960	79,980
80k Base Wet Re-Runs	1	Wet	4	60	Full	60.3	264.6	262	98.1	17.9	5.34	61	12,070	33,950	33,960	79,980
80k Base Wet Re-Runs	1	Wet	5	60	Full	60.6	264.3	260	97.2	18.2	5.29	62	12,070	33,950	33,960	79,980
80k Base Wet Re-Runs	1	Wet	6	60	Full	60.3	262.6	260	102.9	17.9	5.37	63	12,070	33,950	33,960	79,980
80k Base Wet Re-Runs	1	Wet	7	60	Full	60.1	264.4	263	97.9	17.9	5.39	65	12,070	33,950	33,960	79,980
80k Base Wet Re-Runs	1	Wet	8	60	Full	60.3	262.8	260	100.9	17.8	5.37	66	12,070	33,950	33,960	79,980
80k Base Wet Re-Runs	1	Wet	9	60	Full	60.3	266.7	264	101.4	18	5.38	68	12,070	33,950	33,960	79,980
80k Base Wet Re-Runs	1	Wet	10	60	Full	60.3	267.4	265	101.6	17.8	5.41	70	12,070	33,950	33,960	79,980
60k Set A Wet	2	Wet	1	60	Full	60.3	259.1	257	104.1	17.6	5.39	52	11,800	24,630	23,990	60,420
60k Set A Wet	2	Wet	2	60	Full	60.2	255.8	254	102.4	17.7	5.39	52	11,800	24,630	23,990	60,420
60k Set A Wet	2	Wet	3	60	Full	59.9	258.2	259	103.4	17.9	5.34	52	11,800	24,630	23,990	60,420

Description	Tire Set	Condi tion	Run	Targ et Spee d (mph)	Target Control Pressur e (psi)	Actual Speed (mph)	Actual Stop Distanc e (ft)	Correct ed Stop Distanc e (ft)	Avg. Primar y Control Pressu re (psi)	Avg. Dece I (ft/s/ s)	Stop Time (sec)	Amb. Tem p (deg F)	Steer Axle Weight (Ib)	Drive Tande m Axles Weight (Ib)	Trailer Tande m Axles Weight (Ib)	Gross Vehicle Weight (Ib)
60k Set A Wet	2	Wet	4	60	Full	60.3	260.4	258	104.3	17.9	5.39	53	11,800	24,630	23,990	60,420
60k Set A Wet	2	Wet	5	60	Full	60.5	263.9	260	102.6	17.3	5.54	54	11,800	24,630	23,990	60,420
60k Set A Wet	2	Wet	6	60	Full	60.2	255.1	253	103.8	18	5.34	55	11,800	24,630	23,990	60,420
60k Set A Wet	2	Wet	7	60	Full	60.3	270.7	268	104	17	5.64	57	11,800	24,630	23,990	60,420
60k Set A Wet	2	Wet	8	60	Full	60.3	254.9	252	103.8	18.6	5.24	57	11,800	24,630	23,990	60,420
60k Set A Wet	2	Wet	9	60	Full	60.3	257.8	255	99.8	18.3	5.3	59	11,800	24,630	23,990	60,420
60k Set A Wet	2	Wet	10	60	Full	60.2	262.3	261	104.6	17.5	5.48	59	11,800	24,630	23,990	60,420
60k Set A Dry	2	Dry	1	60	Full	60.3	222.2	220	99.9	20.9	4.64	61	11,800	24,630	23,990	60,420
60k Set A Dry	2	Dry	2	60	Full	60	207.2	207	105.9	22.7	4.35	59	11,800	24,630	23,990	60,420
60k Set A Dry	2	Dry	3	60	Full	60.5	214.9	212	105.9	21.9	4.51	61	11,800	24,630	23,990	60,420
60k Set A Dry	2	Dry	4	60	Full	60.2	209.9	209	105.2	22.6	4.39	60	11,800	24,630	23,990	60,420
60k Set A Dry	2	Dry	5	60	Full	60	212.5	212	101.7	21.7	4.54	62	11,800	24,630	23,990	60,420
60k Set A Dry	2	Dry	6	60	Full	60.2	208.3	207	106.4	22.4	4.39	61	11,800	24,630	23,990	60,420
60k Set A Dry	2	Dry	7	60	Full	60.1	207.9	207	107.5	22.3	4.42	63	11,800	24,630	23,990	60,420
60k Set A Dry	2	Dry	8	60	Full	60.2	214	213	100.4	22	4.48	64	11,800	24,630	23,990	60,420
60k Set A Dry	2	Dry	9	60	Full	60.4	216	213	107.2	21.8	4.54	65	11,800	24,630	23,990	60,420
60k Set A Dry	2	Dry	10	60	Full	60.2	211.5	210	105.3	22.2	4.45	66	11,800	24,630	23,990	60,420
60k Set A Wet Re-Runs	2	Wet	1	60	Full	60.4	247.6	244	105.3	18.6	5.17	53	11,800	24,630	23,990	60,420
60k Set A Wet Re-Runs	2	Wet	2	60	Full	60	253	253	105.7	18.1	5.27	53	11,800	24,630	23,990	60,420
60k Set A Wet Re-Runs	2	Wet	3	60	Full	60.1	253	252	104.1	18	5.31	54	11,800	24,630	23,990	60,420
60k Set A Wet Re-Runs	2	Wet	4	60	Full	59.9	257.6	259	100.7	17.6	5.41	55	11,800	24,630	23,990	60,420

Description	Tire Set	Condi tion	Run	Targ et Spee d (mph)	Target Control Pressur e (psi)	Actual Speed (mph)	Actual Stop Distanc e (ft)	Correct ed Stop Distanc e (ft)	Avg. Primar y Control Pressu re (psi)	Avg. Dece I (ft/s/ s)	Stop Time (sec)	Amb. Tem p (deg F)	Steer Axle Weight (Ib)	Drive Tande m Axles Weight (Ib)	Trailer Tande m Axles Weight (Ib)	Gross Vehicle Weight (Ib)
60k Set A Wet Re-Runs	2	Wet	5	60	Full	60.4	263.8	260	107.7	17.4	5.51	58	11,800	24,630	23,990	60,420
60k Set A Wet Re-Runs	2	Wet	6	60	Full	60.4	260.7	257	105.2	17.8	5.38	61	11,800	24,630	23,990	60,420
60k Set A Wet Re-Runs	2	Wet	7	60	Full	60.3	270.5	268	104	17.1	5.6	63	11,800	24,630	23,990	60,420
60k Set A Wet Re-Runs	2	Wet	8	60	Full	60.2	263.4	262	103.2	17.4	5.53	66	11,800	24,630	23,990	60,420
60k Set A Wet Re-Runs	2	Wet	9	60	Full	60	255.5	255	106.6	17.9	5.35	68	11,800	24,630	23,990	60,420
60k Set A Wet Re-Runs	2	Wet	10	60	Full	60.2	275.2	273	103.7	16.9	5.67	69	11,800	24,630	23,990	60,420
80k Set A Wet	2	Wet	1	60	Full	60.2	270.2	269	104.3	17	5.61	77	12,070	33,950	33,960	79,980
80k Set A Wet	2	Wet	2	60	Full	60.2	264.4	263	103.3	17.1	5.54	78	12,070	33,950	33,960	79,980
80k Set A Wet	2	Wet	3	60	Full	60.4	269.6	266	104.3	17.5	5.51	78	12,070	33,950	33,960	79,980
80k Set A Wet	2	Wet	4	60	Full	60.3	286.1	283	102.6	16.3	5.86	79	12,070	33,950	33,960	79,980
80k Set A Wet	2	Wet	5	60	Full	60.5	277	273	94.2	17	5.66	79	12,070	33,950	33,960	79,980
80k Set A Wet	2	Wet	6	60	Full	61	282.8	274	107.9	16.6	5.78	79	12,070	33,950	33,960	79,980
80k Set A Wet	2	Wet	7	60	Full	60.5	277.6	273	104.2	17	5.68	78	12,070	33,950	33,960	79,980
80k Set A Wet	2	Wet	8	60	Full	60.5	287.1	283	107.9	16.4	5.91	80	12,070	33,950	33,960	79,980
80k Set A Wet	2	Wet	9	60	Full	60.4	277.2	274	105.2	17	5.67	81	12,070	33,950	33,960	79,980
80k Set A Wet	2	Wet	10	60	Full	60.7	277.2	271	101.9	17	5.71	79	12,070	33,950	33,960	79,980
80k Set A Dry	2	Dry	1	60	Full	60.7	231.6	227	104	20.8	4.76	79	12,070	33,950	33,960	79,980
80k Set A Dry	2	Dry	2	60	Full	60.6	224.6	221	102.7	21.6	4.59	78	12,070	33,950	33,960	79,980
80k Set A Dry	2	Dry	3	60	Full	60.6	236.6	232	103.8	20.2	4.89	78	12,070	33,950	33,960	79,980
80k Set A Dry	2	Dry	4	60	Full	60.7	228.8	223	101	20.8	4.74	78	12,070	33,950	33,960	79,980

Description	Tire Set	Condi tion	Run	Targ et Spee d (mph)	Target Control Pressur e (psi)	Actual Speed (mph)	Actual Stop Distanc e (ft)	Correct ed Stop Distanc e (ft)	Avg. Primar y Control Pressu re (psi)	Avg. Dece I (ft/s/ s)	Stop Time (sec)	Amb. Tem p (deg F)	Steer Axle Weight (Ib)	Drive Tande m Axles Weight (Ib)	Trailer Tande m Axles Weight (Ib)	Gross Vehicle Weight (Ib)
80k Set A Dry	2	Dry	5	60	Full	60.5	228.2	225	102.8	20.5	4.77	78	12,070	33,950	33,960	79,980
80k Set A Dry	2	Dry	6	60	Full	60.5	228.9	225	102.9	21	4.69	77	12,070	33,950	33,960	79,980
80k Set A Dry	2	Dry	7	60	Full	60.4	233.7	230	102.6	20.6	4.76	77	12,070	33,950	33,960	79,980
80k Set A Dry	2	Dry	8	60	Full	60.1	225.7	225	102.9	20.9	4.67	76	12,070	33,950	33,960	79,980
80k Set A Dry	2	Dry	9	60	Full	60.3	226.4	224	104.5	20.6	4.69	74	12,070	33,950	33,960	79,980
80k Set A Dry	2	Dry	10	60	Full	60.4	224.7	222	103.9	20.2	4.79	72	12,070	33,950	33,960	79,980
80k Set A Wet Re-Runs	2	Wet	1	60	Full	60.1	252.8	252	104.1	18.6	5.17	59	12,070	33,950	33,960	79,980
80k Set A Wet Re-Runs	2	Wet	2	60	Full	60.2	260.9	259	102.5	17.4	5.47	59	12,070	33,950	33,960	79,980
80k Set A Wet Re-Runs	2	Wet	3	60	Full	60.1	263.5	262	102.3	17.3	5.46	60	12,070	33,950	33,960	79,980
80k Set A Wet Re-Runs	2	Wet	4	60	Full	60.4	259.8	257	104.8	18	5.33	61	12,070	33,950	33,960	79,980
80k Set A Wet Re-Runs	2	Wet	5	60	Full	60.4	269	266	101.8	17.3	5.53	61	12,070	33,950	33,960	79,980
80k Set A Wet Re-Runs	2	Wet	6	60	Full	60.5	262.5	258	100.9	17.6	5.45	62	12,070	33,950	33,960	79,980
80k Set A Wet Re-Runs	2	Wet	7	60	Full	60.2	262.5	261	103.8	17.7	5.38	61	12,070	33,950	33,960	79,980
80k Set A Wet Re-Runs	2	Wet	8	60	Full	60.1	271.5	270	102.3	17.1	5.61	61	12,070	33,950	33,960	79,980
80k Set A Wet Re-Runs	2	Wet	9	60	Full	59.8	262.8	265	103.2	17.1	5.52	61	12,070	33,950	33,960	79,980
80k Set A Wet Re-Runs	2	Wet	10	60	Full	60.1	265.8	265	103.9	17.2	5.54	60	12,070	33,950	33,960	79,980
60k Set B Wet	3	Wet	1	60	Full	60.1	258.5	257	103	17.6	5.44	47	11,800	24,630	23,990	60,420
60k Set B Wet	3	Wet	2	60	Full	60.1	262.7	262	101.5	17.3	5.52	48	11,800	24,630	23,990	60,420
60k Set B Wet	3	Wet	3	60	Full	60.3	265.3	263	104.2	17	5.65	49	11,800	24,630	23,990	60,420
60k Set B Wet	3	Wet	4	60	Full	60.3	263	260	100.6	17.6	5.52	50	11,800	24,630	23,990	60,420

Description	Tire Set	Condi tion	Run	Targ et Spee d (mph)	Target Control Pressur e (psi)	Actual Speed (mph)	Actual Stop Distanc e (ft)	Correct ed Stop Distanc e (ft)	Avg. Primar y Control Pressu re (psi)	Avg. Dece I (ft/s/ s)	Stop Time (sec)	Amb. Tem p (deg F)	Steer Axle Weight (Ib)	Drive Tande m Axles Weight (Ib)	Trailer Tande m Axles Weight (Ib)	Gross Vehicle Weight (Ib)
60k Set B Wet	3	Wet	5	60	Full	60.4	260.5	257	103.9	17.6	5.46	50	11,800	24,630	23,990	60,420
60k Set B Wet	3	Wet	6	60	Full	60	256.6	257	103.8	18	5.37	52	11,800	24,630	23,990	60,420
60k Set B Wet	3	Wet	7	60	Full	60	253.2	253	102.7	18.1	5.35	53	11,800	24,630	23,990	60,420
60k Set B Wet	3	Wet	8	60	Full	60.4	259.4	256	102.4	17.6	5.48	55	11,800	24,630	23,990	60,420
60k Set B Wet	3	Wet	9	60	Full	60.3	260.9	259	104.8	17.9	5.43	56	11,800	24,630	23,990	60,420
60k Set B Wet	3	Wet	10	60	Full	60.6	276.5	271	107.5	17.2	5.72	57	11,800	24,630	23,990	60,420
60k Set B Dry	3	Dry	1	60	Full	60.2	219.1	218	101.8	21.6	4.57	66	11,800	24,630	23,990	60,420
60k Set B Dry	3	Dry	2	60	Full	60.4	231.4	228	104.5	20.5	4.82	65	11,800	24,630	23,990	60,420
60k Set B Dry	3	Dry	3	60	Full	60.3	219.5	217	104	21.4	4.61	65	11,800	24,630	23,990	60,420
60k Set B Dry	3	Dry	4	60	Full	60.1	227.1	226	105.2	20.7	4.76	64	11,800	24,630	23,990	60,420
60k Set B Dry	3	Dry	5	60	Full	60.5	228.3	225	105.9	20.6	4.8	64	11,800	24,630	23,990	60,420
60k Set B Dry	3	Dry	6	60	Full	60.2	227.4	226	104	20.1	4.85	63	11,800	24,630	23,990	60,420
60k Set B Dry	3	Dry	7	60	Full	60.4	223.3	221	106.8	20.9	4.7	63	11,800	24,630	23,990	60,420
60k Set B Dry	3	Dry	8	60	Full	60.3	226.2	224	102.8	20.8	4.74	63	11,800	24,630	23,990	60,420
60k Set B Dry	3	Dry	9	60	Full	60.3	231.5	229	104.8	20.1	4.91	63	11,800	24,630	23,990	60,420
60k Set B Dry	3	Dry	10	60	Full	60.2	223.8	223	101.5	21.1	4.66	62	11,800	24,630	23,990	60,420
60k Set B Wet Re-Runs	3	Wet	1	60	Full	60.1	259.7	259	105.1	17.6	5.44	54	11,800	24,630	23,990	60,420
60k Set B Wet Re-Runs	3	Wet	2	60	Full	60	259.1	259	103.9	17.6	5.44	53	11,800	24,630	23,990	60,420
60k Set B Wet Re-Runs	3	Wet	3	60	Full	60	254.6	255	104	18.1	5.35	54	11,800	24,630	23,990	60,420
60k Set B Wet Re-Runs	3	Wet	4	60	Full	60.1	263.4	262	103.3	17.3	5.54	54	11,800	24,630	23,990	60,420
60k Set B Wet Re-Runs	3	Wet	5	60	Full	60.2	260.3	259	104.6	17.8	5.39	55	11,800	24,630	23,990	60,420

Description	Tire Set	Condi tion	Run	Targ et Spee d (mph)	Target Control Pressur e (psi)	Actual Speed (mph)	Actual Stop Distanc e (ft)	Correct ed Stop Distanc e (ft)	Avg. Primar y Control Pressu re (psi)	Avg. Dece I (ft/s/ s)	Stop Time (sec)	Amb. Tem p (deg F)	Steer Axle Weight (Ib)	Drive Tande m Axles Weight (Ib)	Trailer Tande m Axles Weight (Ib)	Gross Vehicle Weight (Ib)
60k Set B Wet Re-Runs	3	Wet	6	60	Full	60	266.1	266	101.5	17.1	5.6	56	11,800	24,630	23,990	60,420
60k Set B Wet Re-Runs	3	Wet	7	60	Full	60.2	267.2	266	105.4	17.2	5.61	55	11,800	24,630	23,990	60,420
60k Set B Wet Re-Runs	3	Wet	8	60	Full	60	258.1	258	102.8	17.5	5.45	55	11,800	24,630	23,990	60,420
60k Set B Wet Re-Runs	3	Wet	9	60	Full	60.1	271.9	271	103	17	5.64	56	11,800	24,630	23,990	60,420
60k Set B Wet Re-Runs	3	Wet	10	60	Full	59.8	255.7	258	103	17.7	5.38	56	11,800	24,630	23,990	60,420
80k Set B Wet	3	Wet	1	60	Full	60.3	267.5	265	104	17.5	5.51	56	12,050	34,040	33,920	80,010
80k Set B Wet	3	Wet	2	60	Full	60.4	276.1	272	102.1	16.9	5.7	56	12,050	34,040	33,920	80,010
80k Set B Wet	3	Wet	3	60	Full	60.3	285.2	282	101.4	16.1	5.9	56	12,050	34,040	33,920	80,010
80k Set B Wet	3	Wet	4	60	Full	60.3	272.2	270	103.1	17.2	5.58	56	12,050	34,040	33,920	80,010
80k Set B Wet	3	Wet	5	60	Full	60	282.1	282	101.9	16.1	5.84	57	12,050	34,040	33,920	80,010
80k Set B Wet	3	Wet	6	60	Full	60.2	272.9	271	96.7	17	5.6	56	12,050	34,040	33,920	80,010
80k Set B Wet	3	Wet	7	60	Full	60.3	275.5	273	102.5	16.9	5.7	56	12,050	34,040	33,920	80,010
80k Set B Wet	3	Wet	8	60	Full	60.3	269.5	267	102.6	17	5.6	57	12,050	34,040	33,920	80,010
80k Set B Wet	3	Wet	9	60	Full	60.1	273	272	100.5	16.9	5.64	57	12,050	34,040	33,920	80,010
80k Set B Wet	3	Wet	10	60	Full	60.2	282	280	100.1	16.3	5.85	57	12,050	34,040	33,920	80,010
80k Set B Dry	3	Dry	1	60	Full	60.4	225.1	222	104.4	20.9	4.67	43	12,050	34,040	33,920	80,010
80k Set B Dry	3	Dry	2	60	Full	60.6	221.8	218	104	21.3	4.59	44	12,050	34,040	33,920	80,010
80k Set B Dry	3	Dry	3	60	Full	60.4	230.2	227	104.3	20.5	4.76	45	12,050	34,040	33,920	80,010
80k Set B Dry	3	Dry	4	60	Full	60.3	232.1	230	102.4	20.1	4.82	46	12,050	34,040	33,920	80,010
80k Set B Dry	3	Dry	5	60	Full	60.4	226.2	223	101.7	21	4.67	48	12,050	34,040	33,920	80,010

Description	Tire Set	Condi tion	Run	Targ et Spee d (mph)	Target Control Pressur e (psi)	Actual Speed (mph)	Actual Stop Distanc e (ft)	Correct ed Stop Distanc e (ft)	Avg. Primar y Control Pressu re (psi)	Avg. Dece I (ft/s/ s)	Stop Time (sec)	Amb. Tem p (deg F)	Steer Axle Weight (Ib)	Drive Tande m Axles Weight (Ib)	Trailer Tande m Axles Weight (Ib)	Gross Vehicle Weight (Ib)
80k Set B Dry	3	Dry	6	60	Full	60.4	227.5	224	101.9	21.2	4.65	50	12,050	34,040	33,920	80,010
80k Set B Dry	3	Dry	7	60	Full	60.1	224	223	99.8	21	4.66	52	12,050	34,040	33,920	80,010
80k Set B Dry	3	Dry	8	60	Full	60.1	220.5	220	103.8	20.9	4.67	53	12,050	34,040	33,920	80,010
80k Set B Dry	3	Dry	9	60	Full	60.1	226.6	226	105.8	20.3	4.77	54	12,050	34,040	33,920	80,010
80k Set B Dry	3	Dry	10	60	Full	60.4	232.6	229	102.6	20.3	4.8	55	12,050	34,040	33,920	80,010
80k Set B Wet Re-Runs	3	Wet	1	60	Full	60.1	263	262	100.3	17.7	5.47	58	12,050	34,040	33,920	80,010
80k Set B Wet Re-Runs	3	Wet	2	60	Full	60.3	269.7	267	102	17.5	5.54	58	12,050	34,040	33,920	80,010
80k Set B Wet Re-Runs	3	Wet	3	60	Full	60.3	280.5	278	103	16.7	5.75	57	12,050	34,040	33,920	80,010
80k Set B Wet Re-Runs	3	Wet	4	60	Full	60.3	279.3	276	101.8	17	5.69	57	12,050	34,040	33,920	80,010
80k Set B Wet Re-Runs	3	Wet	5	60	Full	60.4	280.7	277	102.9	16.9	5.73	56	12,050	34,040	33,920	80,010
80k Set B Wet Re-Runs	3	Wet	6	60	Full	60.1	261.3	260	102	17.8	5.39	57	12,050	34,040	33,920	80,010
80k Set B Wet Re-Runs	3	Wet	7	60	Full	60.1	269.3	268	102.3	17.7	5.49	57	12,050	34,040	33,920	80,010
80k Set B Wet Re-Runs	3	Wet	8	60	Full	60.5	281.3	277	103.1	17.2	5.68	57	12,050	34,040	33,920	80,010
80k Set B Wet Re-Runs	3	Wet	9	60	Full	60.6	291	285	100.8	16.3	5.93	57	12,050	34,040	33,920	80,010
80k Set B Wet Re-Runs	3	Wet	10	60	Full	60	272.7	272	101.1	17.2	5.59	58	12,050	34,040	33,920	80,010
60k Set C Wet	4	Wet	1	60	Full	60.2	258.9	257	106.5	18	5.36	54	11,840	24,710	24,090	60,640
60k Set C Wet	4	Wet	2	60	Full	60	266.1	266	104.3	17.3	5.55	54	11,840	24,710	24,090	60,640
60k Set C Wet	4	Wet	3	60	Full	60.4	258.5	255	105.8	17.8	5.45	56	11,840	24,710	24,090	60,640
60k Set C Wet	4	Wet	4	60	Full	60.2	259.8	258	106.7	18.1	5.39	58	11,840	24,710	24,090	60,640
60k Set C Wet	4	Wet	5	60	Full	60.4	261.7	259	106.6	18.1	5.38	59	11,840	24,710	24,090	60,640

Description	Tire Set	Condi tion	Run	Targ et Spee d (mph)	Target Control Pressur e (psi)	Actual Speed (mph)	Actual Stop Distanc e (ft)	Correct ed Stop Distanc e (ft)	Avg. Primar y Control Pressu re (psi)	Avg. Dece I (ft/s/ s)	Stop Time (sec)	Amb. Tem p (deg F)	Steer Axle Weight (Ib)	Drive Tande m Axles Weight (Ib)	Trailer Tande m Axles Weight (Ib)	Gross Vehicle Weight (Ib)
60k Set C Wet	4	Wet	6	60	Full	60.3	261.3	259	100	17.9	5.43	60	11,840	24,710	24,090	60,640
60k Set C Wet	4	Wet	7	60	Full	60.2	263.2	261	106	17.5	5.51	60	11,840	24,710	24,090	60,640
60k Set C Wet	4	Wet	8	60	Full	61.3	262.6	252	106.1	18.3	5.37	60	11,840	24,710	24,090	60,640
60k Set C Wet	4	Wet	9	60	Full	60.3	264.7	262	109	17.4	5.55	60	11,840	24,710	24,090	60,640
60k Set C Wet	4	Wet	10	60	Full	60	245.6	246	105	18.7	5.18	61	11,840	24,710	24,090	60,640
60k Set C Dry	4	Dry	1	60	Full	60.1	216.8	216	104.3	21.6	4.54	52	11,840	24,710	24,090	60,640
60k Set C Dry	4	Dry	2	60	Full	60	212.3	212	104.8	22.2	4.44	52	11,840	24,710	24,090	60,640
60k Set C Dry	4	Dry	3	60	Full	60.1	213.5	213	104.1	21.9	4.51	52	11,840	24,710	24,090	60,640
60k Set C Dry	4	Dry	4	60	Full	60.1	213	212	105.7	22.2	4.45	53	11,840	24,710	24,090	60,640
60k Set C Dry	4	Dry	5	60	Full	60.1	214.7	214	106.3	21.9	4.5	52	11,840	24,710	24,090	60,640
60k Set C Dry	4	Dry	6	60	Full	60.2	214.7	213	104	22	4.5	54	11,840	24,710	24,090	60,640
60k Set C Dry	4	Dry	7	60	Full	60.2	214.7	213	105.9	21.9	4.51	54	11,840	24,710	24,090	60,640
60k Set C Dry	4	Dry	8	60	Full	60	216	216	105.4	21.9	4.51	54	11,840	24,710	24,090	60,640
60k Set C Dry	4	Dry	9	60	Full	60.3	217.7	216	102.2	21.7	4.55	55	11,840	24,710	24,090	60,640
60k Set C Dry	4	Dry	10	60	Full	60.1	218.7	218	106.1	21.6	4.58	56	11,840	24,710	24,090	60,640
60k Set C Wet Re-Runs	4	Wet	1	60	Full	60	253.8	254	108.1	18.2	5.31	63	11,840	24,710	24,090	60,640
60k Set C Wet Re-Runs	4	Wet	2	60	Full	60.3	252.1	250	103.2	18.7	5.22	64	11,840	24,710	24,090	60,640
60k Set C Wet Re-Runs	4	Wet	3	60	Full	60	248.8	249	102.8	19	5.12	64	11,840	24,710	24,090	60,640
60k Set C Wet Re-Runs	4	Wet	4	60	Full	60.3	254	251	107.3	18.2	5.33	64	11,840	24,710	24,090	60,640
60k Set C Wet Re-Runs	4	Wet	5	60	Full	60.1	253	252	103.9	18.4	5.28	65	11,840	24,710	24,090	60,640
60k Set C Wet Re-Runs	4	Wet	6	60	Full	59.9	243.5	244	105	18.9	5.14	65	11,840	24,710	24,090	60,640

Description	Tire Set	Condi tion	Run	Targ et Spee d (mph)	Target Control Pressur e (psi)	Actual Speed (mph)	Actual Stop Distanc e (ft)	Correct ed Stop Distanc e (ft)	Avg. Primar y Control Pressu re (psi)	Avg. Dece I (ft/s/ s)	Stop Time (sec)	Amb. Tem p (deg F)	Steer Axle Weight (Ib)	Drive Tande m Axles Weight (Ib)	Trailer Tande m Axles Weight (Ib)	Gross Vehicle Weight (Ib)
60k Set C Wet Re-Runs	4	Wet	7	60	Full	60.2	258.8	257	104.4	17.9	5.43	65	11,840	24,710	24,090	60,640
60k Set C Wet Re-Runs	4	Wet	8	60	Full	60.3	256	254	107.2	18.4	5.31	65	11,840	24,710	24,090	60,640
60k Set C Wet Re-Runs	4	Wet	9	60	Full	60	254	254	107.7	18.3	5.31	65	11,840	24,710	24,090	60,640
60k Set C Wet Re-Runs	4	Wet	10	60	Full	59.9	243.5	244	103.2	19.2	5.1	66	11,840	24,710	24,090	60,640
80k Set C Wet	4	Wet	1	60	Full	60.3	267.1	264	105.3	17.1	5.62	60	12,050	34,040	33,920	80,010
80k Set C Wet	4	Wet	2	60	Full	60.2	263.1	261	102.8	17.3	5.51	59	12,050	34,040	33,920	80,010
80k Set C Wet	4	Wet	3	60	Full	60.2	267.1	265	104.6	17.1	5.6	61	12,050	34,040	33,920	80,010
80k Set C Wet	4	Wet	4	60	Full	60.2	266.7	265	104.5	17.4	5.52	61	12,050	34,040	33,920	80,010
80k Set C Wet	4	Wet	5	60	Full	60.2	265.9	264	102.9	17.4	5.52	63	12,050	34,040	33,920	80,010
80k Set C Wet	4	Wet	6	60	Full	60.3	266.7	264	105.5	17.3	5.57	63	12,050	34,040	33,920	80,010
80k Set C Wet	4	Wet	7	60	Full	60.3	270.6	268	104.2	17.1	5.6	62	12,050	34,040	33,920	80,010
80k Set C Wet	4	Wet	8	60	Full	60.3	268.2	265	102	17.5	5.52	63	12,050	34,040	33,920	80,010
80k Set C Wet	4	Wet	9	60	Full	60.4	271.1	267	103.7	17.3	5.57	64	12,050	34,040	33,920	80,010
80k Set C Wet	4	Wet	10	60	Full	60.4	269.2	266	102.3	16.9	5.63	65	12,050	34,040	33,920	80,010
80k Set C Dry	4	Dry	1	60	Full	60.4	236.2	233	108.7	19.7	4.94	75	12,050	34,040	33,920	80,010
80k Set C Dry	4	Dry	2	60	Full	60.3	233.1	231	107	20.3	4.85	74	12,050	34,040	33,920	80,010
80k Set C Dry	4	Dry	3	60	Full	60.2	228.2	227	105.3	20	4.86	75	12,050	34,040	33,920	80,010
80k Set C Dry	4	Dry	4	60	Full	60.1	231.2	230	105.2	19.9	4.91	74	12,050	34,040	33,920	80,010
80k Set C Dry	4	Dry	5	60	Full	60.1	226.5	225	106.1	20.4	4.75	73	12,050	34,040	33,920	80,010
80k Set C Dry	4	Dry	6	60	Full	60.1	221	220	106	21	4.64	73	12,050	34,040	33,920	80,010

Description	Tire Set	Condi tion	Run	Targ et Spee d (mph)	Target Control Pressur e (psi)	Actual Speed (mph)	Actual Stop Distanc e (ft)	Correct ed Stop Distanc e (ft)	Avg. Primar y Control Pressu re (psi)	Avg. Dece I (ft/s/ s)	Stop Time (sec)	Amb. Tem p (deg F)	Steer Axle Weight (Ib)	Drive Tande m Axles Weight (Ib)	Trailer Tande m Axles Weight (Ib)	Gross Vehicle Weight (Ib)
80k Set C Dry	4	Dry	7	60	Full	60.3	231.4	229	105.9	20.4	4.8	72	12,050	34,040	33,920	80,010
80k Set C Dry	4	Dry	8	60	Full	60	220.6	220	107.3	21	4.64	74	12,050	34,040	33,920	80,010
80k Set C Dry	4	Dry	9	60	Full	60.2	224.9	224	104.8	21	4.65	74	12,050	34,040	33,920	80,010
80k Set C Dry	4	Dry	10	60	Full	60.2	234.1	232	104.3	20	4.86	74	12,050	34,040	33,920	80,010
80k Set C Wet Re-Runs	4	Wet	1	60	Full	60.2	257.5	256	108.1		5.36	53	12,050	34,040	33,920	80,010
80k Set C Wet Re-Runs	4	Wet	2	60	Full	60.4	266.8	264	103.7	17.4	5.52	53	12,050	34,040	33,920	80,010
80k Set C Wet Re-Runs	4	Wet	3	60	Full	60.1	263.6	263	101.2	17.7	5.45	53	12,050	34,040	33,920	80,010
80k Set C Wet Re-Runs	4	Wet	4	60	Full	60.3	265.4	263	102.4	17.6	5.47	54	12,050	34,040	33,920	80,010
80k Set C Wet Re-Runs	4	Wet	5	60	Full	60.1	254.2	253	100.8	18.3	5.28	55	12,050	34,040	33,920	80,010
80k Set C Wet Re-Runs	4	Wet	6	60	Full	60.1	258.9	258	101.6	17.6	5.42	56	12,050	34,040	33,920	80,010
80k Set C Wet Re-Runs	4	Wet	7	60	Full	60	253.9	254	105.1	18	5.31	55	12,050	34,040	33,920	80,010
80k Set C Wet Re-Runs	4	Wet	8	60	Full	60.1	252.9	252	104.6	18.4	5.25	56	12,050	34,040	33,920	80,010
80k Set C Wet Re-Runs	4	Wet	9	60	Full	60.1	251.6	251	104.3	18.1	5.26	56	12,050	34,040	33,920	80,010
80k Set C Wet Re-Runs	4	Wet	10	60	Full	60.2	251	250	105.1	18	5.28	57	12,050	34,040	33,920	80,010
121 BASELINE	1	FMVS S No. 121	1	60	Full	60.6	230.6	226	106	19.8	4.9	44	13,180	40,010	4,500	57,690
121 BASELINE	1	FMVS S No. 121	2	60	Full	60.2	226.1	225	102.5	20.3	4.78	45	13,180	40,010	4,500	57,690
121 BASELINE	1	FMVS S No. 121	3	60	Full	60.5	226.1	223	102	20.5	4.76	47	13,180	40,010	4,500	57,690
121 BASELINE	1	FMVS S No. 121	4	60	Full	60.4	228.3	226	105.4	20.3	4.77	48	13,180	40,010	4,500	57,690

Description	Tire Set	Condi tion	Run	Targ et Spee d (mph)	Target Control Pressur e (psi)	Actual Speed (mph)	Actual Stop Distanc e (ft)	Correct ed Stop Distanc e (ft)	Avg. Primar y Control Pressu re (psi)	Avg. Dece I (ft/s/ s)	Stop Time (sec)	Amb. Tem p (deg F)	Steer Axle Weight (Ib)	Drive Tande m Axles Weight (Ib)	Trailer Tande m Axles Weight (Ib)	Gross Vehicle Weight (Ib)
121 BASELINE	1	FMVS S No. 121	5	60	Full	60.3	224.2	222	105.1	20.7	4.73	49	13,180	40,010	4,500	57,690
121 BASELINE	1	FMVS S No. 121	6	60	Full	60.1	219	218	106.1	20.8	4.66	50	13,180	40,010	4,500	57,690
121 BASELINE	1	FMVS S No. 121	7	60	Full	60.3	224.5	222	105.1	20.7	4.74	50	13,180	40,010	4,500	57,690
121 BASELINE	1	FMVS S No. 121	8	60	Full	60.4	220.8	218	110	21.3	4.62	50	13,180	40,010	4,500	57,690
121 BASELINE	1	FMVS S No. 121	9	60	Full	60.3	225.9	224	102.8	20.5	4.76	52	13,180	40,010	4,500	57,690
121 BASELINE	1	FMVS S No. 121	10	60	Full	60.1	222.5	222	105.2	20.7	4.7	52	13,180	40,010	4,500	57,690
121 SET A	2	FMVS S No. 121	1	60	Full	60.4	231.9	229	103.4	19.6	4.91	43	13,180	40,010	4,500	57,690
121 SET A	2	FMVS S No. 121	2	60	Full	60.6	224.6	221	104.1	20.6	4.72	44	13,180	40,010	4,500	57,690
121 SET A	2	FMVS S No. 121	3	60	Full	60.3	221.4	219	106.2	20.9	4.66	45	13,180	40,010	4,500	57,690
121 SET A	2	FMVS S No. 121	4	60	Full	60.5	228.3	225	106.1	20.2	4.8	45	13,180	40,010	4,500	57,690
121 SET A	2	FMVS S No. 121	5	60	Full	60.6	229.1	225	104.7	20.3	4.81	45	13,180	40,010	4,500	57,690
121 SET A	2	FMVS S No. 121	6	60	Full	60.4	223.3	221	106.2	20.6	4.72	46	13,180	40,010	4,500	57,690

Description	Tire Set	Condi tion	Run	Targ et Spee d (mph)	Target Control Pressur e (psi)	Actual Speed (mph)	Actual Stop Distanc e (ft)	Correct ed Stop Distanc e (ft)	Avg. Primar y Control Pressu re (psi)	Avg. Dece I (ft/s/ s)	Stop Time (sec)	Amb. Tem p (deg F)	Steer Axle Weight (Ib)	Drive Tande m Axles Weight (Ib)	Trailer Tande m Axles Weight (Ib)	Gross Vehicle Weight (Ib)
121 SET A	2	FMVS S No. 121	7	60	Full	60.3	228.3	226	104.7	20.2	4.81	46	13,180	40,010	4,500	57,690
121 SET A	2	FMVS S No. 121	8	60	Full	60.4	225.1	222	106.8	20.6	4.72	46	13,180	40,010	4,500	57,690
121 SET A	2	FMVS S No. 121	9	60	Full	60.4	226.4	223	106.8	20.4	4.77	48	13,180	40,010	4,500	57,690
121 SET A	2	FMVS S No. 121	10	60	Full	60.6	227.7	224	105.9	20.6	4.77	47	13,180	40,010	4,500	57,690
121 SET B	3	FMVS S No. 121	1	60	Full	60.4	232.9	230	105.8	19.5	4.94	53	13,180	40,010	4,500	57,690
121 SET B	3	FMVS S No. 121	2	60	Full	60.3	230	228	102.9	20	4.85	54	13,180	40,010	4,500	57,690
121 SET B	3	FMVS S No. 121	3	60	Full	60.3	223.5	221	106.6	20.8	4.7	53	13,180	40,010	4,500	57,690
121 SET B	3	FMVS S No. 121	4	60	Full	60.3	223.1	221	106.7	20.6	4.72	54	13,180	40,010	4,500	57,690
121 SET B	3	FMVS S No. 121	5	60	Full	60.4	222.9	220	106.3	20.8	4.69	54	13,180	40,010	4,500	57,690
121 SET B	3	FMVS S No. 121	6	60	Full	60.2	222.9	221	104.6	20.9	4.69	56	13,180	40,010	4,500	57,690
121 SET B	3	FMVS S No. 121	7	60	Full	60.3	223	221	106.3	20.8	4.69	57	13,180	40,010	4,500	57,690
121 SET B	3	FMVS S No. 121	8	60	Full	60.3	229.7	227	105.9	20.7	4.77	58	13,180	40,010	4,500	57,690

Description	Tire Set	Condi tion	Run	Targ et Spee d (mph)	Target Control Pressur e (psi)	Actual Speed (mph)	Actual Stop Distanc e (ft)	Correct ed Stop Distanc e (ft)	Avg. Primar y Control Pressu re (psi)	Avg. Dece I (ft/s/ s)	Stop Time (sec)	Amb. Tem p (deg F)	Steer Axle Weight (Ib)	Drive Tande m Axles Weight (Ib)	Trailer Tande m Axles Weight (Ib)	Gross Vehicle Weight (Ib)
121 SET B	3	FMVS S No. 121	9	60	Full	60.3	223.6	221	105.2	20.8	4.7	59	13,180	40,010	4,500	57,690
121 SET B	3	FMVS S No. 121	10	60	Full	60.3	225.6	223	106.4	20.5	4.74	61	13,180	40,010	4,500	57,690
121 SET C	4	FMVS S No. 121	1	60	Full	60.2	226.4	225	105.1	20	4.83	42	13,180	40,010	4,500	57,690
121 SET C	4	FMVS S No. 121	2	60	Full	60.3	232.6	231	106.7	19.3	4.96	43	13,180	40,010	4,500	57,690
121 SET C	4	FMVS S No. 121	3	60	Full	60.3	230.4	228	102.3	19.8	4.89	44	13,180	40,010	4,500	57,690
121 SET C	4	FMVS S No. 121	4	60	Full	60.3	227.7	225	105.2	20.2	4.81	46	13,180	40,010	4,500	57,690
121 SET C	4	FMVS S No. 121	5	60	Full	60.4	228.7	226	104.5	20	4.83	45	13,180	40,010	4,500	57,690
121 SET C	4	FMVS S No. 121	6	60	Full	60.2	226.7	225	104.7	20.2	4.8	46	13,180	40,010	4,500	57,690
121 SET C	4	FMVS S No. 121	7	60	Full	60.3	227.4	225	104.4	20.2	4.81	48	13,180	40,010	4,500	57,690
121 SET C	4	FMVS S No. 121	8	60	Full	60.3	229.4	227	106.7	20.1	4.84	48	13,180	40,010	4,500	57,690
121 SET C	4	FMVS S No. 121	9	60	Full	60.3	222.3	220	105.4	20.5	4.73	48	13,180	40,010	4,500	57,690
121 SET C	4	FMVS S No. 121	10	60	Full	60.3	224.2	222	106.3	20.6	4.73	49	13,180	40,010	4,500	57,690

Tire Size	Test Rim Size	Design OD (mm)	Test Method	Test Drum Diameter (m)	MaxLoad (kg)	Max Inflation (kPa)	Req. Test Load (kN)	Req. Test Inflation (kPa)	Req. Test Speed (km/h)
			ISO 28580 -						
295/75R22.5	9.00x22.5	1014	Force	1.7	2800	760	23.34	760	80

Appendix B – Rolling Resistance Test Results

SR Tracking No.	Manufacturer	Tire Name	USDOT Tire ID No.	Tire Size	Test Rim	Test Order	Data File	Test Date	Test Machine
Control	Control	Control	Control	255/80R22.5	8.25x22.5	C1	R2152708	27-Jan-15	R2
1500388	Yokohama	RY617	6B371UA0614	295/75R22.5	9.00x22.5 Al	1	R2152803	28-Jan-15	R2
1500380	Goodyear	G572A LHD	MC37VFBW1614	295/75R22.5	9.00x22.5 Al	2	R2152804	28-Jan-15	R2
1500359	Bridgestone	M726 EL	32BT3DE0314	295/75R22.5	9.00x22.5 Al	3	R2152906	29-Jan-15	R2
1500397	Yokohama	703ZL	FBBTVJK4412	295/75R22.5	9.00x22.5 Al	4	R2152907	29-Jan-15	R2
1500356	Bridgestone	M726 EL	2CBT3CW0414	295/75R22.5	9.00x22.5 Al	5	R2152908	30-Jan-15	R2
1500391	Yokohama	RY617	6B371UA1114	295/75R22.5	9.00x22.5 Al	6	R2153001	30-Jan-15	R2
1500365	Bridgestone	R280	2CBT6K22813	295/75R22.5	9.00x22.5 Al	7	R2153002	30-Jan-15	R2
1500384	Goodyear	G572A LHD	MC37VFBW1614	295/75R22.5	9.00x22.5 Al	8	R2153003	30-Jan-15	R2
1500378	Goodyear	G399A LHS	MC37HRBW3214	295/75R22.5	9.00x22.5 Al	9	R2153005	30-Jan-15	R2
Control	Control	Control	Control	255/80R22.5	8.25x22.5	C2	R2153006	31-Jan-15	R2
1500355	Bridgestone	Ecopia R197	2CBT3A61714	295/75R22.5	9.00x22.5 Al	10	R2153102	31-Jan-15	R2
1500368	Bridgestone	Ecopia M710	32BT3JN2114	295/75R22.5	9.00x22.5 Al	11	R2153105	31-Jan-15	R2
1500386	Yokohama	RY617	6B371UA2913	295/75R22.5	9.00x22.5 Al	12	R2153106	31-Jan-15	R2
1500382	Goodyear	G572A LHD	MC37VFBW1614	295/75R22.5	9.00x22.5 Al	13	R2153202	1-Feb-15	R2

SR Tracking No.	Manufacturer	Tire Name	USDOT Tire ID No.	Tire Size	Test Rim	Test Order	Data File	Test Date	Test Machine
1500352	Bridgestone	Ecopia R197	2CBT3A61214	295/75R22.5	9.00x22.5 Al	14	R2153203	1-Feb-15	R2
1500377	Goodyear	G399A LHS	MC37HRBW3214	295/75R22.5	9.00x22.5 Al	15	R2153305	2-Feb-15	R2
1500367	Bridgestone	R280	2CBT6K24313	295/75R22.5	9.00x22.5 Al	16	R2153306	2-Feb-15	R2
1500376	Goodyear	G399A LHS	MC37HRBW3214	295/75R22.5	9.00x22.5 Al	17	R2153307	3-Feb-15	R2
1500381	Goodyear	G572A LHD	MC37VFBW1614	295/75R22.5	9.00x22.5 Al	18	R2153408	3-Feb-15	R2
1500371	Bridgestone	Ecopia M710	32BT3JN2114	295/75R22.5	9.00x22.5 Al	19	R2153409	3-Feb-15	R2
1500358	Bridgestone	M726 EL	32BT3DE1314	295/75R22.5	9.00x22.5 Al	20	R2153410	3-Feb-15	R2
1500350	Bridgestone	Ecopia R197	2CBT3A61314	295/75R22.5	9.00x22.5 Al	21	R2153411	3-Feb-15	R2
Control	Control	Control	Control	255/80R22.5	8.25x22.5	C3	R2153515	4-Feb-15	R2
1500354	Bridgestone	Ecopia R197	2CBT3A61714	295/75R22.5	9.00x22.5 Al	22	R2153516	4-Feb-15	R2
1500362	Bridgestone	R280	2CBT6K22313	295/75R22.5	9.00x22.5 Al	23	R2153517	4-Feb-15	R2
1500360	Bridgestone	M726 EL	2CBT3DE1314	295/75R22.5	9.00x22.5 Al	24	R2153518	5-Feb-15	R2
1500389	Yokohama	RY617	6B371UA1414	295/75R22.5	9.00x22.5 Al	25	R2153619	5-Feb-15	R2
1500375	Goodyear	G399A LHS	MC37HRBW3214	295/75R22.5	9.00x22.5 Al	26	R2153620	5-Feb-15	R2
1500387	Yokohama	RY617	6B371UA1414	295/75R22.5	9.00x22.5 Al	27	R2153621	5-Feb-15	R2
1500379	Goodyear	G399A LHS	MC37HRBW3214	295/75R22.5	9.00x22.5 Al	28	R2153624	6-Feb-15	R2
1500390	Yokohama	RY617	6B371UA1414	295/75R22.5	9.00x22.5 Al	29	R2153725	6-Feb-15	R2
1500370	Bridgestone	Ecopia M710	32BT3JN2114	295/75R22.5	9.00x22.5 Al	30	R2153726	6-Feb-15	R2
1500357	Bridgestone	M726 EL	2CBT3CW0414	295/75R22.5	9.00x22.5 Al	31	R2153727	6-Feb-15	R2
1500394	Yokohama	703ZL	FBBTVJK2513	295/75R22.5	9.00x22.5 Al	32	R2153728	6-Feb-15	R2
1500364	Bridgestone	R280	2CBT6K22813	295/75R22.5	9.00x22.5 Al	33	R2153801	7-Feb-15	R2
1500395	Yokohama	703ZL	FBBTVJK2513	295/75R22.5	9.00x22.5 Al	34	R2153802	7-Feb-15	R2
1500383	Goodyear	G572A LHD	MC37VFBW1614	295/75R22.5	9.00x22.5 Al	35	R2153803	7-Feb-15	R2
1500351	Bridgestone	Ecopia R197	2CBT3A62314	295/75R22.5	9.00x22.5 Al	36	R2153901	8-Feb-15	R2
1500363	Bridgestone	R280	2CBT6K22813	295/75R22.5	9.00x22.5 Al	37	R2153902	8-Feb-15	R2
Control	Control	Control	Control	255/80R22.5	8.25x22.5	C4	R2153903	8-Feb-15	R2
1500361	Bridgestone	M726 EL	2CBT3DE4913	295/75R22.5	9.00x22.5 Al	38	R2153904	9-Feb-15	R2

SR Tracking No.	Manufacturer	Tire Name	USDOT Tire ID No.	Tire Size	Test Rim	Test Order	Data File	Test Date	Test Machine
1500396	Yokohama	703ZL	FBBTVJK1813	295/75R22.5	9.00x22.5 Al	39	R2154001	9-Feb-15	R2
1500369	Bridgestone	Ecopia M710	32BT3JN2114	295/75R22.5	9.00x22.5 Al	40	R2154002	9-Feb-15	R2
1500372	Bridgestone	Ecopia M710	32BT3JN2114	295/75R22.5	9.00x22.5 Al	41	R2154003	9-Feb-15	R2
1500385	Goodyear	G572A LHD	MC37VFBW1614	295/75R22.5	9.00x22.5 Al	42	R2154004	9-Feb-15	R2
1500374	Goodyear	G399A LHS	MC37HRBW3214	295/75R22.5	9.00x22.5 Al	43	R2154005	10-Feb-15	R2
1500373	Bridgestone	Ecopia M710	32BT3JN2114	295/75R22.5	9.00x22.5 Al	44	R2154101	10-Feb-15	R2
1500392	Yokohama	703ZL	FBBTVJK1813	295/75R22.5	9.00x22.5 Al	45	R2154102	10-Feb-15	R2
1500353	Bridgestone	Ecopia R197	2CBT3A61414	295/75R22.5	9.00x22.5 Al	46	R2154103	10-Feb-15	R2
1500393	Yokohama	703ZL	FBBTVJK2613	295/75R22.5	9.00x22.5 Al	47	R2154202	11-Feb-15	R2
1500366	Bridgestone	R280	2CBT6K22213	295/75R22.5	9.00x22.5 Al	48	NA	11-Feb-15	R2
Control	Control	Control	Control	255/80R22.5	8.25x22.5	C6	R2154306	12-Feb-15	R2

SR Tracking No.	Tire Orientation	Measured OD (mm)	Tire Weight (kg)	Act. Test Load (kN)	Act. Test Inflation (kPa)	Act. Test Speed (km/h)	Ambient Temperature (C)	Test Lr (mm)	RRF - 25 C, 1.7 m drum (N)	RRF - 25 C, 2 m drum (N)	CRR - 25 C, 1.7 m drum (N/kN)	CRR - 25 C, 2 m drum (N/kN)
Control	RF	973	NA	23.15	828	79.9	23.6	461	131	127	5.7	5.5
1500388	RF	1019	49.71	23.34	862	79.8	23.7	486	138	134	5.9	5.7
1500380	RF	1041	59.06	23.34	867	79.8	24.2	498	152	148	6.5	6.3
1500359	RF	1040	59.62	23.34	865	79.9	25.2	496	189	184	8.1	7.9
1500397	RF	1040	57.04	23.34	848	79.8	23.9	495	145	141	6.2	6.0
1500356	RF	1040	55.59	23.34	862	79.8	25.3	495	189	184	8.1	7.9
1500391	RF	1018	49.71	23.34	871	79.8	24.3	486	140	137	6.0	5.9
1500365	RF	1025	50.01	23.34	862	79.9	23.5	488	147	143	6.3	6.1
1500384	RF	1040	58.67	23.34	863	79.8	23.8	498	154	149	6.6	6.4
1500378	RF	1020	48.72	23.34	860	79.8	23.3	486	139	135	6.0	5.8

SR Tracking No.	Tire Orientation	Measured OD (mm)	Tire Weight (kg)	Act. Test Load (kN)	Act. Test Inflation (kPa)	Act. Test Speed (km/h)	Ambient Temperature (C)	Test Lr (mm)	RRF - 25 C, 1.7 m drum	RRF - 25 C, 2 m drum	CRR - 25 C, 1.7 m drum	CRR - 25 C, 2 m drum
Control	RE	073	ΝΔ	23.15	827	70.8	22.9	461	(N) 131	(IN) 128	(IN/KIN) 5.7	
1500355	RF	1010	45.81	23.13	845	79.8	22.5	480	109	106	4.7	4.5
1500368	RF	1030	NA	23.34	862	79.8	23.7	490	138	134	5.9	5.7
1500386	RF	1018	50.17	23.34	863	79.8	22.9	485	134	130	5.7	5.6
1500382	RF	1042	58.51	23.34	866	79.9	23.4	498	156	152	6.7	6.5
1500352	RF	1010	46.29	23.34	842	79.8	22.5	480	108	105	4.6	4.5
1500377	RF	1019	49.46	23.34	877	79.8	24.4	486	159	154	6.8	6.6
1500367	RF	1025	49.74	23.34	847	79.8	23.4	487	148	144	6.3	6.2
1500376	RF	1021	49.92	23.34	875	79.8	23.8	487	162	157	6.9	6.7
1500381	RF	1041	58.97	23.34	864	79.8	23.6	498	152	148	6.5	6.4
1500371	RF	1030	55.81	23.34	852	79.8	23.9	490	142	138	6.1	5.9
1500358	RF	1039	60.40	23.34	862	79.8	24.5	496	202	196	8.7	8.4
1500350	RF	1010	45.50	23.34	842	79.8	22.8	480	111	108	4.8	4.6
Control	RF	973	NA	23.15	831	79.8	23.9	461	131	127	5.7	5.5
1500354	RF	1009	45.81	23.34	838	79.8	22.7	480	108	105	4.6	4.5
1500362	RF	1024	49.90	23.34	865	79.7	23.1	488	153	149	6.6	6.4
1500360	RF	1039	60.31	23.34	868	79.8	24.9	496	200	195	8.6	8.3
1500389	RF	1018	50.26	23.34	859	79.9	24.2	485	135	131	5.8	5.6
1500375	RF	1019	48.87	23.34	873	79.8	24.6	486	160	155	6.8	6.7
1500387	RF	1018	50.89	23.34	862	79.9	24.0	485	141	137	6.0	5.9
1500379	RF	1020	49.03	23.34	873	79.7	23.8	486	163	159	7.0	6.8
1500390	RF	1018	50.64	23.34	874	79.9	22.8	486	140	136	6.0	5.8
1500370	RF	1030	55.43	23.34	852	79.8	23.9	490	143	139	6.1	6.0
1500357	RF	1041	55.54	23.34	859	79.8	24.7	495	202	196	8.7	8.4
1500394	RF	1040	57.40	23.34	846	79.8	24.4	495	150	146	6.4	6.2

SR Tracking No.	Tire Orientation	Measured OD (mm)	Tire Weight (kg)	Act. Test Load (kN)	Act. Test Inflation (kPa)	Act. Test Speed (km/h)	Ambient Temperature (C)	Test Lr (mm)	RRF - 25 C, 1.7 m drum (N)	RRF - 25 C, 2 m drum (N)	CRR - 25 C, 1.7 m drum (N/kN)	CRR - 25 C, 2 m drum (N/kN)
1500364	RF	1024	57.40	23.34	868	79.8	23.4	488	155	151	6.7	6.5
1500395	RF	1040	57.72	23.34	856	79.9	23.7	495	151	147	6.5	6.3
1500383	RF	1041	58.81	23.34	864	79.8	22.9	498	152	148	6.5	6.3
1500351	RF	1010	46.40	23.34	852	79.8	22.3	480	115	112	4.9	4.8
1500363	RF	1025	49.92	23.34	869	79.8	22.7	488	153	149	6.6	6.4
Control	RF	973	NA	23.15	829	79.8	23.1	461	134	130	5.8	5.6
1500361	RF	1040	59.26	23.34	859	79.9	24.2	495	193	188	8.3	8.0
1500396	RF	1040	57.33	23.34	847	79.8	23.8	495	150	146	6.4	6.3
1500369	RF	1030	56.11	23.34	854	79.8	24.3	490	144	140	6.2	6.0
1500372	RF	1031	56.02	23.34	851	79.8	23.4	491	141	137	6.0	5.9
1500385	RF	1042	58.47	23.34	864	79.8	23.6	498	158	153	6.8	6.6
1500374	RF	1021	48.74	23.34	872	79.8	23.2	486	158	154	6.8	6.6
1500373	RF	1031	55.84	23.34	858	80.0	23.9	490	143	139	6.1	6.0
1500392	RF	1040	57.29	23.34	843	79.8	23.8	495	150	146	6.4	6.3
1500353	RF	1009	46.06	23.34	842	79.8	22.9	480	109	106	4.7	4.5
1500393	RF	1040	57.15	23.34	864	79.8	25.2	495	150	146	6.4	6.3
1500366	RF	1024	50.22	NA	NA	NA	NA	NA	NA	NA	NA	NA
Control	RF	973	NA	23.15	830	79.8	23.5	461	134	130	5.8	5.6

Appendix C – Test Vehicle Configuration

ORNL-03 Weight Log

Test Type	Steer	Drive Tandem	Trailer Tandem	Total Test	
	Axle	Total	Total	Weight	
	(lbs)	(lbs)	(lbs)	(lbs)	
Burnish	13,240	40,340	40,020	93,600	
60k Baseline Tires	11,790	24,450	23,950	60,190	
80k Baseline and Set A					
Tires	12,070	33,950	33,960	79,980	
60k Set A and Set B Tires	11,800	24,630	23,990	60,420	
80k Set B and Set C	12,050	34,040	33,920	80,010	
60k Set C	11,840	24,710	24,090	60,640	
FMVSS 121 Control Trailer	13,180	40,010	4,500 (Single Axle)	57,690	



Document Number:	5.10-L4-703-00
Document Name:	Vehicle Specification Sheet

Record

Test Vehicle Specifications and Information Ryder Rental Tractor/Trailer - Unit Number 303

Manufacturer	Trac.: FREIGHTLINER	Trail.: UTILITY
	TRAILER	
Туре	Trac.: 6x4 Tractor	Trail.: 53' Van
Model Number	Trac.: Cascadia	Trail.: 4000D-X
Date of Manufacture	Trac.: 05/2013	Trail.: 01/2012
VIN	Trac.: 3AKJGLBG2ESFS8303 Trail.: 1UYVS2531DG503503	VS2DX
GVWR	Trac.: 52,000 LBS	Trail.: 65,000 LBS
No. of Axles	Trac.: 3	Trail.: 2
Wheelbase Whole combination	Axle 1-2= 206" Axle 2-3= 5=	52" Axle 3-4= 435" Axle 4- 50"

Axles	Axle 1	Axle 2	Axle 3	
Manufacturer				
Model Number				
Serial Number				
GAWR	12,000 lbs	20,000 lbs	20,000 lbs	
Suspension Type	Leaf Spring	AirLiner	AirLiner	
Brakes				
Manufacturer	Meritor	Meritor	Meritor	
Туре	Drum	Drum	Drum	
Size	16.5"x5	16.5"x7	16.5"x7	
Lining Code	MA1201	MA2001	MA2001	
Chamber Make / Size	MGM 24L3	MGM 3030L	MGM 3030L	
Slack Make / Size	Meritor 5.5"	Meritor 5.5"	Meritor 5.5"	
Rotor or Drum Make /	Gunite	Gunite	Gunite	
Part #	3758X	3600AX	3600AX	
Rotor or Drum Size				
ABS	Wabco 4s4m			
Valve Type/Mfgr.				
Burnish Tires				
Manufacturer	Bridgestone	Bridgestone	Bridgestone	
Tread Name	R280	M726EL		
Size	295/75R22.5	295/75R22.5	295/75R22.5	
Pressure	110	110	110	



Document Number: Document Name:

: 5.10-L4-729-00 Vehicle 7 Axle Specification Sheet

Record

Test Vehicle Specifications and Information Ryder Rental Tractor/Trailer - Unit Number 303

Axles	Axle 4	Axle 5	
Manufacturer	Hendrickson	Hendrickson	
GAWR	20,000 lbs	20,000 lbs	
Suspension Type	Air	Air	
Brakes			
Manufacturer	Meritor	Meritor	
Туре	Drum	Drum	
Size	16.5" x 7"	16.5" x 7"	
Lining Code	MA212A	MA212A	
Chamber Make / Size	Haldex 30/30 L	Haldex 30/30 L	
Slack Make / Size	Haldex 5.5" ASA	Haldex 5.5" ASA	
Rotor or Drum Make / Part #	Meritor 123207	Meritor 123207	
Rotor or Drum Size	16.5" x 7"	16.5" x 7"	
ABS	Bendix 2s1m		
Valve Type/Mfgr.	Bendix		
Burnish Tires			
Manufacturer	Bridgestone	Bridgestone	
Tread Name	R280	R280	
Size	295/75R22.5	295/75R22.5	
Pressure	110	110	

DOT HS 812 176 June 2015



U.S. Department of Transportation National Highway Traffic Safety Administration



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