Test Report

# Ex-Guard

## XG-150G3 & XG-125G3

EX-GUARD®

| XG-150G3 | XG-125G3 |
|---|---|
| **-0.40** gal/1000 miles | **-0.31** gal/1000 miles |
| -0.04 MPG | -0.03 MPG |
| -0.41% Percent | -0.32% Percent |

MESILLA VALLEY TRANSPORTATION SOLUTIONS
CERTIFIED
*Fuel Economy Experts*

**MVT SOLUTIONS CERTIFIED™ FUEL ECONOMY TEST**

August 2024

## 1.0 INTRODUCTION

Mesilla Valley Transportation Solutions ("MVTS" or "MVT Solutions") certifies the fuel savings described in this report. **Note:** this report was designed for carriers and providing information relevant to their needs. Therefore, the format varies from traditional fuel economy and technical reports. The Report Summary provides the reader a quick synopsis of the fuel savings. Following the Summary is the body of the report and further details on the subjects. This fuel economy test was performed using MVTS proprietary fuel economy test methods. These test methods were developed from race car engineering and advanced vehicle test methods, which the Mesilla Valley Transportation ("fleet" or "MVT") has relied on since 2012 to identify substantial fuel savings. The MVTS methods provide highly accurate and reliable answers on real-world fuel savings in comparison to other test methods, which enables carriers to make the best decisions for their company. Contact MVTS with any questions regarding the product or test. As part of an MVTS Certified™ test, MVTS supports product inquiries, which we encourage carriers to utilize.

Contact MVTS with any questions regarding the test.

**Note:** blue text indicates a link to the topic. Click to follow. Alt + □ returns the reader to the initial location.

## 2.0 TEST SUMMARY

Expecting a robust grille guard to result in a loss in fuel economy, the purpose of the Ex-Guard test was to quantify that loss and therefore enable fleets to make informed investment decisions with respect to fuel consumption versus vehicle front end damage.

The **Ex-Guard XG-150G3** showed a loss of **-0.40 gal/1000 miles (-0.41%)**, which can be considered very low when considering the magnitude of the system on the front of the vehicle. The **Ex-Guard XG-125G3** showed a loss of -**0.31 gal/1000 miles (-0.32%)**, which can also be considered very low when considering the magnitude of the system on the front of the vehicle. These values are similar to previous testing of Ex-Guard grill guards and MVTS is very confident in the values.

Testing for both vehicles was conducted on a 9-mile test track at 65 mph and 46,400 lbs. Gross Vehicle Weight (GVW). Test results can be found below in Table 1.

Table 1: Results Summary

| Ex-Guard Fuel Economy Test | Fuel Economy Improvement | | |
|---|---|---|---|
| | Gal/1000 miles | MPG | Percent |
| Ex-Guard XG-150G3 | -0.40 | -0.04 | -0.41% |
| Ex-Guard XG-125G3 | -0.31 | -0.03 | -0.32% |

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## 3.0: TEST PROCEDURE

The two (2) vehicles ran simultaneously at 65 mph on the 9-mile circle track near Pecos, Texas. The vehicles were 1-minute apart, avoiding any aerodynamic influence on either vehicle during testing. The vehicles were termed “Compare Vehicle” and “Test Vehicle”. The Compare Vehicle remained unchanged throughout testing; it was used solely for comparison. The Test Vehicle had modifications made during the test (*i.e.* Ex-Guard XG-150G3 & Ex-Guard XG-125G3 installed).

The test procedure may appear similar to the SAE J1321 method traditionally used in the trucking industry; however, the MVTS methods are a much more advanced and precise form of on-road and track testing. The vehicles are equipped with sensors and data recording systems that collect data on fuel consumption, aerodynamics, rolling resistance, driver behavior and many other variables that affect fuel consumption. The data is analyzed using MVTS proprietary methods, which provide very accurate answers on fuel savings. Additionally, the test results can be scientifically translated to a carrier’s real-world daily operations and long-term savings, which is a feature unique to these methods. Overall, the MVTS test methods are a much more advanced and reliable tool for predicting fuel savings than the trucking industry has used previously.

### 3.1: TEST VEHICLES

Test vehicles were 2024 Freightliner Cascadia Sleeper Cabs with Detroit Diesel DD15 15-Liter engines. Trailers were 53-ft refrigerated trailers. Gross Vehicle Weight (GVW) was approximately 46,400 lbs. GVW does not affect the fuel savings in units of gal/1000 miles. The Compare vehicle remained unchanged throughout all tests. The Test vehicle configuration was changed between test runs. Trucks and trailers used dual tires. Tire pressures were set at 100 psi in the morning, prior to incurring any effect of daytime heat. Vehicle info can be found in the Appendix.

Figure 1: “Test” Vehicle with Ex-Guard (XG-125G3)

Figure 2: “Test” Vehicle with Ex-Guard (XG-150G3)

Test runs were conducted in the order as shown in Table 2 where DxRy refers to the test Day and Run numbers.

Table 2: Test Run Sequence

| Run | Test Name | Start | End |
|---|---|---|---|
| D2R4 | Ex-Guard XG-150G3 | 12:53 PM | 2:32 PM |
| D2R5 | Baseline | 2:45 PM | 4:24 PM |
| D3R1 | Ex-Guard XG-125G3 | 6:56 AM | 9:08 AM |
| D3R2 | Baseline | 9:43 AM | 11:22 AM |

## 3.2: DAY 2 RUN 4: TEST RUN WITH EX-GUARD XG-150G3

Day 2 Run 4 was the Test run where the Ex-Guard XG-150G3 was installed on the Test vehicle, as shown in (Figure 3).

Figure 3: Ex-Guard XG-150G3 Test Run

### 3.3: DAY 2 RUN 5: BASELINE WITHOUT XG-150G3

Run 5 consisted of removing the Ex-Guard XG-150G3 (Figure 4). Mounting brackets remained installed and their effect on fuel economy is considered negligible by MVTS.

Figure 4: Test Run with Ex-Guard XG-150G3 Removed

## 3.4: DAY 3 RUN 1: TEST RUN WITH EX-GUARD XG-125G3

On Day 3, the first run (Run 1) was the Test run where the Ex-Guard XG-125G3 was installed on the Test vehicle, as shown in (Figure 5).

Figure 5: Ex-Guard XG-125G3 Test Run

## 3.5: DAY 3 RUN 2: BASELINE WITHOUT XG-125G3

Run 2 consisted of removing the Ex-Guard XG-125G3 (Figure 6). Mounting brackets remained installed.

Figure 6: Test Run with Ex-Guard XG-125G3 Removed

## 4.0: VEHICLE FUEL ECONOMY TEST EQUIPMENT

MVT Solutions fuel economy testing utilizes a data acquisition system and sensors specifically for this testing. This style of testing is derived from race car engineering where reliable sensor data is critical to understanding vehicle modifications.

MVTS test sensors include:

- Data acquisition system (records sensor data)
- Fuel flow meter (accurate to 0.2%)
- Fuel temperature sensor
- Tire temperature sensor (infrared, mounted on left-front drive tire)
- Ground/road temperature sensor (infrared, mounted ahead of left-front drive tire)
- Wind speed air pressure sensor (truck hood)
- Wind direction sensor (truck hood)
- Ambient air temperature sensor (truck hood)
- Ambient air pressure sensor (truck cab)
- High Precision GPS (latitude, longitude, altitude, time)

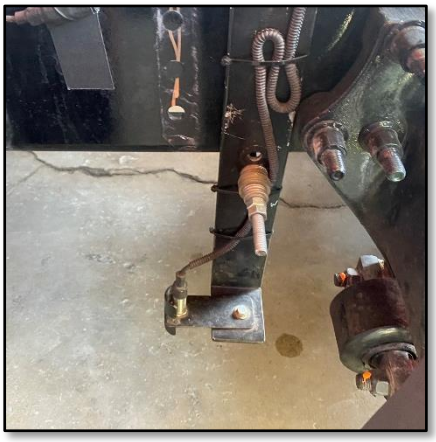
Click this link to see a video of MVTS sensors and testing: How We Test

Figure 5: Aerodynamic Sensors

Figure 6: Data Acquisition System


Figure 7: Fuel Flow Meter

Figure 8: Ground Temp. Sensor



## 5.0: TEST RESULTS

The Ex-Guard XG-150G3 showed a loss in fuel economy of -0.40 gal/1000 miles (-0.41%) and the Ex-Guard XG-125G3 showed a loss in fuel economy of -0.31 gal/1000 miles (-0.32%) when compared to a Baseline run without a grille guard. These values are both considered small in comparison to the size of the grill guards.

Table 3: Test Results with Accuracy

| Ex-Guard Fuel Economy Test | Fuel Economy Improvement | | | | | |
|---|---|---|---|---|---|---|
| | Gal/1000 miles | | MPG | | Percent | |
| | Result | Accuracy | Result | Accuracy | Result | Accuracy |
| Ex-Guard XG-150G3 | -0.40 | +/- 0.54 | -0.04 | +/- 0.06 | -0.41% | +/- 0.56% |
| Ex-Guard XG-125G3 | -0.31 | +/- 0.47 | -0.03 | +/- 0.05 | -0.32% | +/- 0.49% |

Figure 7: Test Results (gal/1000 miles)

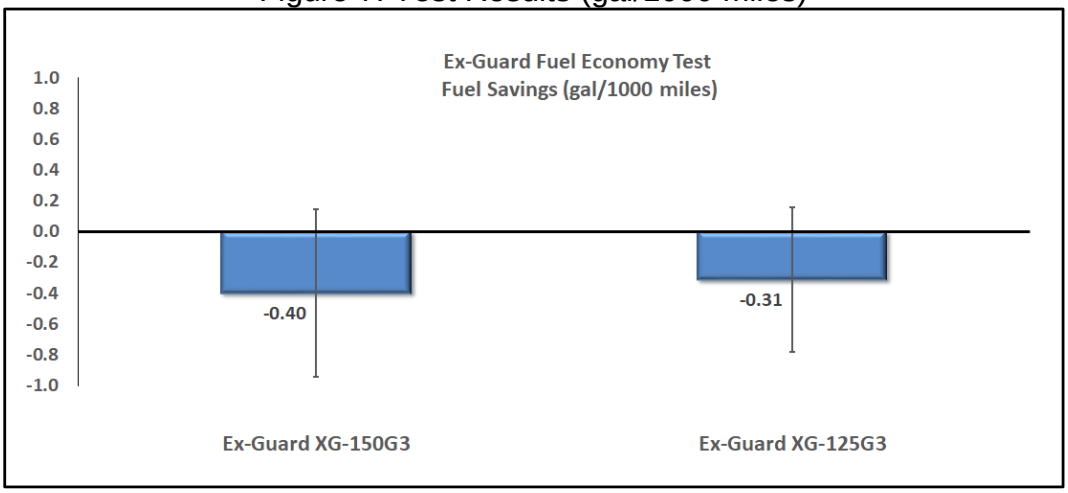
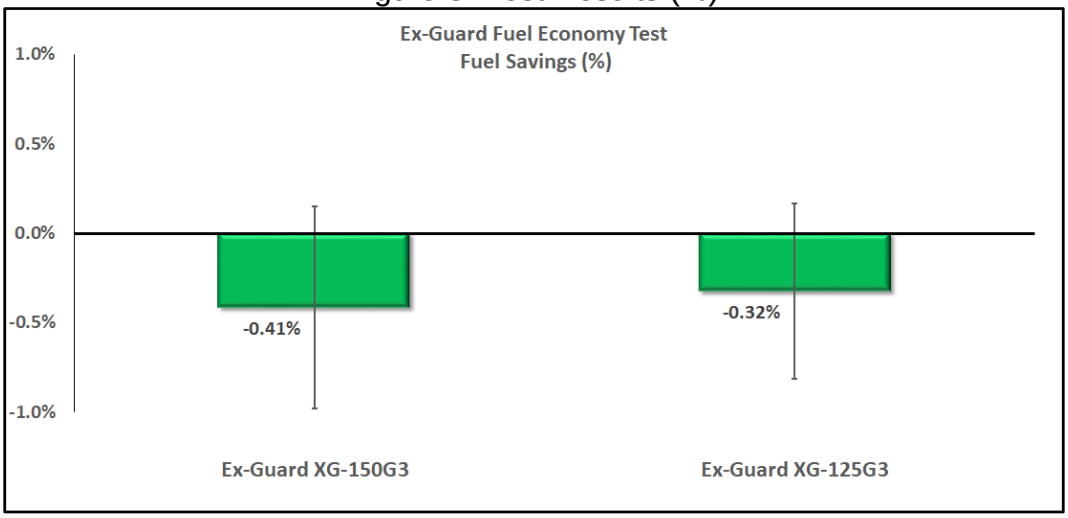



Figure 8: Test Results (%)



## 5.1: Measurement Accuracy and Margin of Error

The accuracy of fuel economy measurements is critical in determining the trustworthiness of test results. Historically, this has been a major difficulty in the trucking industry with fuel economy testing, which has led to confusion and misleading results. The MVTS test methods overcome this issue by achieving better accuracy, which is one of the ways it provides more reliable test results.

Accuracy for all the tests was calculated using a 95% confidence interval, a common standard for testing measurement. 95% confidence interval indicates that if the test were repeated 100 times, values would fall within the range in 95 out of the 100 tests (*i.e.* the reader would be 95% confident the value would be within that range).

Accuracy (*i.e.* 'margin of error') is shown in multiple locations; tables of 'Test Results with Accuracy' and also as 'error bars' in the bar graphs. The error bars are the small solid lines at the top of each bar.

Test accuracy for the Ex-Guard XG-150G3 was +/- 0.54 gal/1000 miles & Ex-Guard XG-125G3 was +/-0.47 gal/1000 miles (Table 3) and represented a large portion of the magnitude of the fuel savings/losses as shown by the Error Bar in Figure 7and Figure 8. Accuracy in percent values will not be discussed individually since it is linearly related to gal/1000 miles and follows a very similar pattern and conclusions. Although the margin of error is similar in magnitude to the test result, the result is considered reliable by MVTS due to experience with these tests and guards.

## 5.2: Units of Measurement

The reader may not be familiar with units of gal/1000 miles (gallons per 1000 miles) since it is not traditionally used in the trucking industry. The following paragraphs briefly explain the reasons for these units and how they help carriers better calculate fuel savings.

Units of gal/1000 miles more reliably calculate fuel savings when compared to other units such as miles-per-gallon (MPG) and percent (%). Those units are prone to error from changing variables such as vehicle baseline fuel economy, load, driver behavior, and duty cycle. For example, gal/1000 miles values are not affected by load for an aerodynamic product. Any empty Class-8 unit at 34,000 lbs. will save the same fuel in gal/1000 miles as one loaded to 80,000 lbs. However, when viewed in percent (%) or MPG the values change with load. This causes a carrier to experience varied results in real-world operation and difficulty predicting the financial benefits of the product unless units of gal/1000 miles are used.

Units of gal/1000 miles are the most reliable units of measurement for aerodynamic fuel savings due to their scientific and mathematical relationship to fuel consumption. Further detail is beyond the scope of this report and the reader is encouraged to contact MVT Solutions if more information is desired.

## 5.3: WEATHER CONDITIONS SUMMARY

During testing, ambient temperatures ranged from 92°F to 100°F with winds reported at 5-13 MPH on August 14, 2024. On August 15, 2024, temperatures ranged from 80°F to 92°F, with winds reported at 12-17 MPH.

Weather data was acquired from a local Weather Underground weather station and complete data can be found in the Appendix.

The reader should be aware that MVTS methods include instantaneous and constant weather data acquisition on each vehicle, and this testing has minimal dependency on external weather data collection. MVTS test data accounts for changes in wind, temperature, and other pertinent variables instantaneously.

## 6.0: SAVINGS CALCULATIONS

Below is a brief outline of how to use the test results to calculate savings. For more detail or assistance contact MVT Solutions.

### 6.1: FUEL SAVINGS CALCULATIONS

Fuel savings resulting from this test can be calculated as follows:

$$Fuel\ Savings\ (gal/year) = (Test\ result)\ x \frac{(Thousands\ of\ miles\ travelled\ per\ year)}{1000}$$

Test result must be in units of gal/1000 miles (*i.e.* not percent or MPG)

Example: Ex-Guard XG-150G3 with fuel losses of -0.40 gal/1000 miles and 125,000 miles travelled annually:

$$Fuel\ Savings = (-0.40\ gal/1000\ miles)x \frac{(125{,}000\ miles/year)}{1000} = -50\ gal/year$$

Therefore, the Ex-Guard XG-150G3 would result in consumption loss of 50 gallons of fuel per year for this vehicle travelling 125,000 miles.

Example: Ex-Guard XG-125G3 with fuel losses of -0.31 gal/1000 miles and 125,000 miles travelled annually:

$$Fuel\ Savings = (-0.31\ gal/1000\ miles)x \frac{(125{,}000\ miles/year)}{1000} = -39\ gal/year$$

Therefore, the Ex-Guard XG-125G3 would result in consumption loss of 39 gallons of fuel per year for this vehicle travelling 125,000 miles.

## 7.0: CONCLUSION

MVTS testing proved the impact of the Ex-Guard XG-150G3 & XG-125G3 on fuel economy with answers that were clear and precise. The Ex-Guard XG-150G3 showed a fuel economy loss of -0.40 gal/1000 miles (-0.41%) and the Ex-Guard XG-125G3 showed a fuel economy loss of -0.31 gal/1000 miles (-0.32%), which can be considered minimal for this magnitude of device.

Ex-Guard is a product used to reduce front end damage and therefore reduce operational cost. Ex-Guard is not a fuel savings product; however, these tests quantified the fuel consumption impact and can be used to determine a carrier's savings/loss in real-world operations. For further questions please contact MVTS.

Overall, having only a minor effect on fuel economy, the Ex-Guard grille guards should provide fleets confidence to pursue the products based on operational costs as opposed to fuel economy losses.

# 8.0: APPENDIX

## 8.1: TEST VEHICLE DETAILS

Figure 9: Vehicle Info, (Test) Vehicle

| | | | |
|---|---|---|---|
| Test Date | August 13, 2024 | | |
| Vehicle Provider | Fleet | | |
| Test Location | Pecos, TX | | |
| Test Route | 9-mile track | | |
| **TRUCK ID:** | **Veh. B** | | |
| Brand | Freightliner | | |
| Date of Manufacture (MY) | 2024 | | |
| Model | Cascadia (Sleeper Cab) | | |
| Engine | DD15 Gen 5 IDP (455 HP) | | |
| VIN | 3AKJHHDR7RSUU3968 | | |
| Mileage (miles): | 8,428 | | |
| Transmission | DT12-1750-DHE Efficient On-Highway 12 Speed | | |
| Front Drive Axle | DA-RT-40.0-4T HH ALM 40,000# R-Series | | |
| Rear Drive Axle | DA-RT-40.0-4T HH ALM 40,000# R-Series | | |
| Rear Gear | 2.16:1 | | |
| Wheelbase (inches) | 227 | | |
| Fifth Wheel Location | 8.13 / 4.13 | | |
| Fuel Load | Full | | |
| Fuel Type & Batch | No. 2 diesel | | |
| Axle Weights (S,D,T) (lbs) | 10,780 | 17,920 | 17,700 |
| Total weight | 46,400 | | |
| **TRAILER ID:** | **Trailer B** | | |
| Brand | Utility | | |
| VIN | 1UYVS2534P6954614 | | |
| Date of Manufacture (MY) | 2023 | | |
| Type | Reefer | | |
| Size | 53-foot | | |
| King Pin Location | 36 inches | | |
| Tandem Setting | 40-feet California spec | | |
| Cab to Trailer Gap (inches) | 54.00 inches | | |
| Aero Trailer Gap (inches) | 29.75 inches | | |
| Add-ons | Trailer skirts | | |

Figure 10: Trailer Info, (Test) Vehicle

**Truck** **Veh. B**

| LF | | Front Axle | | RF |
|---|---|---|---|---|
| Bridgestone R213 Ecopia | | Type | | Bridgestone R213 Ecopia |
| 295/75R22.5 | | Size | | 295/75R22.5 |
| 17 | | Tread Depth (32nds) | | 17 |
| 100 | | Pressure (psi) | | 100 |
| Aluminum | | Wheel Type | | Aluminum |

| LF-Outer Drive | LF-Inner Drive | Drive Axle | RF-Inner Drive | RF-Outer Drive |
|---|---|---|---|---|
| Bridgestone M713 Ecopia | Bridgestone M713 Ecopia | Type | Bridgestone M713 Ecopia | Bridgestone M713 Ecopia |
| 295/75R22.5 | 295/75R22.5 | Size | 295/75R22.5 | 295/75R22.5 |
| 24 | 24 | Tread Depth (32nds) | 24 | 24 |
| 100 | 100 | Pressure (psi) | 100 | 100 |
| Aluminum | Aluminum | Wheel Type | Aluminum | Aluminum |

| LR-Outer Drive | LR-Inner Drive | Drive Axle | RR-Inner Drive | RR-Outer Drive |
|---|---|---|---|---|
| Bridgestone M713 Ecopia | Bridgestone M713 Ecopia | Type | Bridgestone M713 Ecopia | Bridgestone M713 Ecopia |
| 295/75R22.5 | 295/75R22.5 | Size | 295/75R22.5 | 295/75R22.5 |
| 24 | 24 | Tread Depth (32nds) | 24 | 24 |
| 100 | 100 | Pressure (psi) | 100 | 100 |
| Aluminum | Aluminum | Wheel Type | Aluminum | Aluminum |

**Trailer** **Trailer B**

| LF-Outer Trailer | LF-Inner Trailer | Tandem Front | RF-Inner Trailer | RF-Outer Trailer |
|---|---|---|---|---|
| Yokohama BluEarth 109L UWB | Michelin X Line Energy Z | Type | Michelin X Line Energy T2 | Michelin X Line Energy T |
| 295/75R22.5 | 275/80R22.5 | Size | 295/75R22.5 | 295/75R22.5 |
| 11 | 11 | Tread Depth (32nds) | 11 | 11 |
| 100 | 100 | Pressure (psi) | 100 | 100 |
| Steel | Steel | Wheel Type | Steel | Steel |

| LR-Outer Trailer | LR-Inner Trailer | Tandem Rear | RR-Inner Trailer | RR-Outer Trailer |
|---|---|---|---|---|
| Michelin X Line Energy T2 | Michelin X Line Energy T2 | Type | Michelin X Line Energy T2 | Michelin X Line Energy T2 |
| 295/75R22.5 | 295/75R22.5 | Size | 295/75R22.5 | 295/75R22.5 |
| 11 | 11 | Tread Depth (32nds) | 11 | 11 |
| 100 | 100 | Pressure (psi) | 100 | 100 |
| Steel | Steel | Wheel Type | Steel | Steel |

## 8.2: COMPARE VEHICLE DETAILS

Figure 11: Vehicle Info, Compare Vehicle

| | | | |
|---|---|---|---|
| Test Date | August 13, 2024 | | |
| Vehicle Provider | Fleet | | |
| Test Location | Pecos, TX | | |
| Test Venue/Route | 9-mile track | | |
| **TRUCK ID:** | **Veh. A** | | |
| Brand | Freightliner | | |
| Date of Manufacture (MY) | 2024 | | |
| Model | Cascadia (Sleeper Cab) | | |
| Engine | DD15 Gen 5 IDP (455 HP) | | |
| VIN | 3AKJHHDR0RSUU4007 | | |
| Mileage (miles): | 2,511 | | |
| Transmission | DT12-1750-DHE Efficient On-Highway 12 Speed | | |
| Front Drive Axle | DA-RT-40.0-4T HH ALM 40,000# R-Series | | |
| Rear Drive Axle | DA-RT-40.0-4T HH ALM 40,000# R-Series | | |
| Rear Gear | 2.16:1 | | |
| Wheelbase (inches) | 227 | | |
| Fifth Wheel Location | 8.13 / 4.13 | | |
| Fuel Load | Full | | |
| Fuel Type & Batch | No. 2 diesel | | |
| Axle Weights (S,D,T) (lbs) | 10,760 | 17,780 | 17,440 |
| Total weight | 45,980 | | |
| **TRAILER ID:** | **Trailer A** | | |
| Brand | Utility | | |
| VIN | 1UYVS2531R2102117 | | |
| Date of Manufacture (MY) | 2024 | | |
| Type | Reefer | | |
| Size | 53-foot | | |
| King Pin Location | 36 inches | | |
| Tandem Setting | 40-feet California spec | | |
| Cab to Trailer Gap (inches) | 54.00 inches | | |
| Aero Trailer Gap (inches) | 29.75 inches | | |
| Add-ons | Trailer skirts, side fairings | | |

Figure 12: Trailer Info, Compare Vehicle

**Truck** **Veh. A**

| LF |
|---|
| Bridgestone R213 Ecopia |
| 295/75R22.5 |
| 17 |
| 100 |
| Aluminum |

| **Front Axle** |
|---|
| Type |
| Size |
| Tread Depth (32nds) |
| Pressure (psi) |
| Wheel Type |

| RF |
|---|
| Bridgestone R213 Ecopia |
| 295/75R22.5 |
| 17 |
| 100 |
| Aluminum |

| LF-Outer Drive | LF-Inner Drive |
|---|---|
| Bridgestone M713 Ecopia | Bridgestone M713 Ecopia |
| 295/75R22.5 | 295/75R22.5 |
| 24 | 24 |
| 100 | 100 |
| Aluminum | Aluminum |

| **Drive Axle** |
|---|
| Type |
| Size |
| Tread Depth (32nds) |
| Pressure (psi) |
| Wheel Type |

| RF-Inner Drive | RF-Outer Drive |
|---|---|
| Bridgestone M713 Ecopia | Bridgestone M713 Ecopia |
| 295/75R22.5 | 295/75R22.5 |
| 24 | 24 |
| 100 | 100 |
| Aluminum | Aluminum |

| LR-Outer Drive | LR-Inner Drive |
|---|---|
| Bridgestone M713 Ecopia | Bridgestone M713 Ecopia |
| 295/75R22.5 | 295/75R22.5 |
| 24 | 24 |
| 100 | 100 |
| Aluminum | Aluminum |

| **Drive Axle** |
|---|
| Type |
| Size |
| Tread Depth (32nds) |
| Pressure (psi) |
| Wheel Type |

| RR-Inner Drive | RR-Outer Drive |
|---|---|
| Bridgestone M713 Ecopia | Bridgestone M713 Ecopia |
| 295/75R22.5 | 295/75R22.5 |
| 24 | 24 |
| 100 | 100 |
| Aluminum | Aluminum |

**Trailer** **Trailer A**

| LF-Outer Trailer | LF-Inner Trailer |
|---|---|
| Michelin X Line Energy T2 | Michelin X Line Energy T2 |
| 295/75R22.5 | 295/75R22.5 |
| 11 | 11 |
| 100 | 100 |
| Steel | Steel |

| **Tandem Front** |
|---|
| Type |
| Size |
| Tread Depth (32nds) |
| Pressure (psi) |
| Wheel Type |

| RF-Inner Trailer | RF-Outer Trailer |
|---|---|
| Michelin X Line Energy T2 | Michelin X Line Energy T2 |
| 295/75R22.5 | 295/75R22.5 |
| 11 | 11 |
| 100 | 100 |
| Steel | Steel |

| LR-Outer Trailer | LR-Inner Trailer |
|---|---|
| Michelin X Line Energy T2 | Michelin X Line Energy T2 |
| 295/75R22.5 | 295/75R22.5 |
| 11 | 11 |
| 100 | 100 |
| Steel | Steel |

| **Tandem Rear** |
|---|
| Type |
| Size |
| Tread Depth (32nds) |
| Pressure (psi) |
| Wheel Type |

| RR-Inner Trailer | RR-Outer Trailer |
|---|---|
| Michelin X Line Energy T2 | Michelin X Line Energy T2 |
| 295/75R22.5 | 295/75R22.5 |
| 11 | 11 |
| 100 | 100 |
| Steel | Steel |

## 8.3: TEST ROUTE

Pecos, Texas 9-mile circle track. Clockwise direction, middle lane (of 3).

Figure 13: Pecos Test Track

## 8.4: WEATHER CONDITIONS

The weather during testing was fair, with winds ranging from 5-13 MPH on August 14, 2024 (Day 2, as referenced in Table 4) and 12-17 MPH on August 15, 2024 (Day 3, as referenced in Table 5Table 5). Weather data was obtained from a local Weather Underground station, with the source provided below.

The reader should be aware that MVTS methods include instantaneous and constant weather data acquisition on each vehicle, and this testing has minimal dependency on external weather data collection. MVTS test data accounts for changes in wind, temperature, and other pertinent variables instantaneously. **Note:** darkened rows pertain to test times.

Table 4: Weather Data, August 14, 2024

| Time | Temperature | Dew Point | Humidity | Wind | Wind Speed | Wind Gust | Pressure | Precip. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| 12:53 AM | 84.0 | 58 °F | 41 % | S | 15.0 | 0 mph | 27.05 in | 0.0 in | Fair |
| 1:53 AM | 82.0 | 59 °F | 45 % | SSE | 10.0 | 0 mph | 27.05 in | 0.0 in | Fair |
| 2:53 AM | 80.0 | 59 °F | 48 % | SSE | 9.0 | 0 mph | 27.06 in | 0.0 in | Fair |
| 3:53 AM | 79.0 | 59 °F | 50 % | SSE | 8.0 | 0 mph | 27.06 in | 0.0 in | Fair |
| 4:53 AM | 78.0 | 60 °F | 54 % | S | 9.0 | 0 mph | 27.05 in | 0.0 in | Fair |
| 5:53 AM | 78.0 | 62 °F | 58 % | S | 8.0 | 0 mph | 27.06 in | 0.0 in | Fair |
| 6:53 AM | 77.0 | 63 °F | 62 % | S | 9.0 | 0 mph | 27.06 in | 0.0 in | Fair |
| 7:53 AM | 78.0 | 64 °F | 62 % | S | 14.0 | 0 mph | 27.06 in | 0.0 in | Fair |
| 8:53 AM | 80.0 | 66 °F | 62 % | S | 17.0 | 0 mph | 27.08 in | 0.0 in | Fair |
| 9:53 AM | 83.0 | 67 °F | 58 % | S | 17.0 | 0 mph | 27.08 in | 0.0 in | Fair |
| 10:53 AM | 86.0 | 66 °F | 51 % | S | 18.0 | 25 mph | 27.07 in | 0.0 in | Fair |
| 11:53 AM | 90.0 | 64 °F | 42 % | SSW | 13.0 | 23 mph | 27.07 in | 0.0 in | Fair |
| 12:53 PM | 92.0 | 63 °F | 38 % | S | 8.0 | 0 mph | 27.05 in | 0.0 in | Fair |
| 1:53 PM | 94.0 | 63 °F | 36 % | SSW | 13.0 | 23 mph | 27.03 in | 0.0 in | Fair |
| 2:53 PM | 96.0 | 62 °F | 32 % | VAR | 5.0 | 0 mph | 27.01 in | 0.0 in | Fair |
| 3:53 PM | 99.0 | 60 °F | 28 % | S | 9.0 | 17 mph | 26.99 in | 0.0 in | Fair |
| 4:53 PM | 100.0 | 58 °F | 25 % | SSE | 10.0 | 0 mph | 26.97 in | 0.0 in | Partly Cloudy |
| 5:53 PM | 99.0 | 58 °F | 25 % | SSW | 8.0 | 0 mph | 26.96 in | 0.0 in | Fair |
| 6:53 PM | 98.0 | 59 °F | 27 % | S | 16.0 | 21 mph | 26.94 in | 0.0 in | Fair |
| 7:46 PM | 93.0 | 57 °F | 30 % | SW | 20.0 | 36 mph | 26.96 in | 0.0 in | Haze |
| 7:53 PM | 92.0 | 57 °F | 31 % | SW | 23.0 | 30 mph | 26.96 in | 0.0 in | Haze / Windy |
| 8:53 PM | 90.0 | 58 °F | 34 % | SW | 17.0 | 0 mph | 26.99 in | 0.0 in | Fair |
| 9:53 PM | 89.0 | 58 °F | 35 % | SW | 12.0 | 0 mph | 27.01 in | 0.0 in | Fair |
| 10:53 PM | 87.0 | 59 °F | 39 % | S | 7.0 | 0 mph | 27.01 in | 0.0 in | Partly Cloudy |
| 11:53 PM | 87.0 | 60 °F | 40 % | S | 9.0 | 0 mph | 27.01 in | 0.0 in | Fair |

Source: https://www.wunderground.com/history/daily/us/tx/midland/KMAF/date/2024-8-14

Table 5: Weather Data, August 15, 2024

| Time | Temperature | Dew Point | Humidity | Wind | Wind Speed | Wind Gust | Pressure | Precip. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| 12:53 AM | 86.0 °F | 58 °F | 38 % | S | 10.0 mph | 0 mph | 27.02 in | 0.0 in | Fair |
| 1:53 AM | 84.0 °F | 58 °F | 41 % | S | 12.0 mph | 0 mph | 27.02 in | 0.0 in | Fair |
| 2:53 AM | 83.0 °F | 59 °F | 44 % | S | 12.0 mph | 0 mph | 27.02 in | 0.0 in | Fair |
| 3:53 AM | 83.0 °F | 61 °F | 47 % | S | 16.0 mph | 0 mph | 27.01 in | 0.0 in | Fair |
| 4:53 AM | 82.0 °F | 61 °F | 49 % | SSW | 16.0 mph | 0 mph | 27.01 in | 0.0 in | Fair |
| 5:53 AM | 81.0 °F | 61 °F | 50 % | SSW | 13.0 mph | 21 mph | 27.01 in | 0.0 in | Fair |
| 6:53 AM | 80.0 °F | 60 °F | 50 % | S | 12.0 mph | 0 mph | 27.02 in | 0.0 in | Fair |
| 7:53 AM | 80.0 °F | 60 °F | 50 % | S | 15.0 mph | 0 mph | 27.04 in | 0.0 in | Fair |
| 8:53 AM | 81.0 °F | 62 °F | 52 % | S | 17.0 mph | 0 mph | 27.04 in | 0.0 in | Fair |
| 9:53 AM | 83.0 °F | 63 °F | 51 % | SSW | 13.0 mph | 0 mph | 27.05 in | 0.0 in | Fair |
| 10:53 AM | 88.0 °F | 63 °F | 43 % | S | 13.0 mph | 0 mph | 27.05 in | 0.0 in | Mostly Cloudy |
| 11:53 AM | 92.0 °F | 63 °F | 38 % | S | 13.0 mph | 0 mph | 27.04 in | 0.0 in | Fair |
| 12:53 PM | 95.0 °F | 61 °F | 32 % | S | 9.0 mph | 0 mph | 27.03 in | 0.0 in | Fair |
| 1:53 PM | 98.0 °F | 60 °F | 28 % | 0 | 0.0 mph | 0 mph | 27.02 in | 0.0 in | Fair |
| 2:53 PM | 98.0 °F | 58 °F | 26 % | VAR | 3.0 mph | 0 mph | 27.01 in | 0.0 in | Fair |
| 3:53 PM | 100.0 °F | 57 °F | 24 % | ESE | 12.0 mph | 18 mph | 26.99 in | 0.0 in | Fair |
| 4:53 PM | 99.0 °F | 57 °F | 25 % | SE | 12.0 mph | 23 mph | 26.97 in | 0.0 in | Fair |
| 5:53 PM | 98.0 °F | 57 °F | 25 % | VAR | 6.0 mph | 0 mph | 26.96 in | 0.0 in | Fair |
| 6:53 PM | 99.0 °F | 56 °F | 24 % | SSE | 17.0 mph | 21 mph | 26.96 in | 0.0 in | Fair |
| 7:53 PM | 96.0 °F | 57 °F | 27 % | SSE | 13.0 mph | 22 mph | 26.96 in | 0.0 in | Fair |
| 8:53 PM | 94.0 °F | 56 °F | 28 % | SSE | 14.0 mph | 0 mph | 26.98 in | 0.0 in | Fair |
| 9:53 PM | 93.0 °F | 55 °F | 28 % | S | 13.0 mph | 0 mph | 27.01 in | 0.0 in | Fair |
| 10:53 PM | 90.0 °F | 54 °F | 29 % | S | 15.0 mph | 0 mph | 27.01 in | 0.0 in | Fair |
| 11:53 PM | 89.0 °F | 54 °F | 30 % | S | 15.0 mph | 0 mph | 27.03 in | 0.0 in | Fair |

Source: https://www.wunderground.com/history/daily/us/tx/midland/KMAF/date/2024-8-15

## 8.5: PRODUCT DETAILS

- Ex-Guard XG-150G3
- Ex-Guard XG-125G3

## 8.6: TEST PERSONNEL (ON-SITE)

8.6a: MVT SOLUTIONS ENGINEERING

- Daryl Bear, Lead Engineer & COO
- Danny Ortiz, Test Engineer

8.6b: MVT SOLUTIONS DRIVERS & TECHNICIANS

- John Rintelen, Driver and Shop Technician
- Gene McGarey

8.6c: EX-GUARD INDUSTRIES

- Daryl Hughes, Key Account Manager

## 8.7: MVT SOLUTIONS CONTACT INFO

Daryl Bear, Lead Engineer & COO
Daryl.Bear@m-v-t-s.com
317-603-9325

MVT Solutions Website
www.m-v-t-s.com