MESILLA VALLEY TRANSPORTATION SOLUTIONS
CERTIFIED
Fuel Economy Experts

Test Report

TRANSTEX EDGE SKIRT™

(48-ft Dry Van)

MVT SOLUTIONS CERTIFIED™ FUEL ECONOMY TEST

June 2021

5.22 gal/1000 miles	0.55 MPG	5.22%

1.0: INTRODUCTION

Mesilla Valley Transportation Solutions (MVTS) certifies the fuel savings from this product are as 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 product's 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 Mesilla Valley Transportation (fleet) 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.

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

2.0: TEST SUMMARY

The **EDGE SKIRT™ showed a fuel savings of 5.22 gal/1000 miles (5.22%)** on a 48-ft dry van trailer. EDGE SKIRT™ model E-1932T was used for this test.

Tests were conducted on a modern Class-8 single axle day cab (SADC) tractor with a 48-ft dry van trailer. Results are shown below in Table 1.

Table 1: Fuel Economy Test Results

Product	Fuel Economy Improvement		
	Gal/1000 miles	MPG	Percent
TRANSTEX EDGE SKIRT™	5.22	0.55	5.22%

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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.* Transtex technologies 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 2018 and 2021 International LT single axle day cabs with Cummins X15 15-Liter engines. Trailers were 48-ft dry vans. Gross Vehicle Weight (GVW) was approximately 39,360 lbs. Both trucks were equipped with Ex-Guard grill guards, which were previously tested and showed no negative influence on fuel consumption. 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 110 psi in the morning, prior to incurring any effect of daytime heat. Vehicle info can be found in the Appendix.

Vehicles were thoroughly inspected and received regular maintenance prior to testing. It should also be noted, for the reader’s peace of mind, Mesilla Valley Transportation (MVT) and MVT Solutions are 100% confident in the reliable condition of the test vehicles. MVT and MVTS Elite Fleets use the same vehicle data and test procedures for their own internal purchase decisions.

Figure 1: Test Vehicle (A) and Compare Vehicle (B) with Trailers

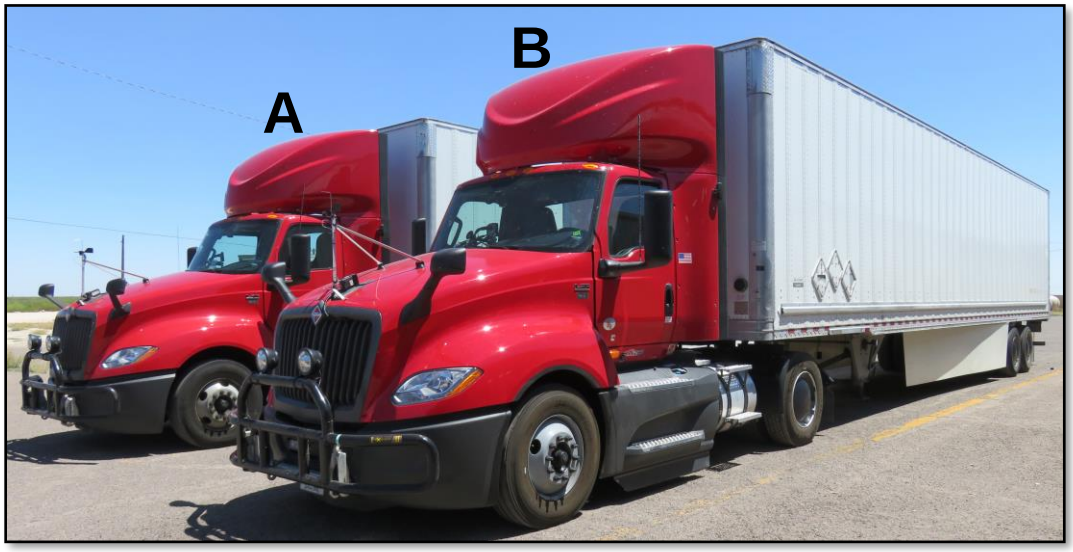


Figure 2: Test Trailer (EDGE SKIRT™ Installed)

Table 2 below shows the test run order and times. **Note:** other test runs were conducted before Run 4 which did not apply to this report and were therefore not included.

Table 2: June 18, Test Runs

Run	Test Name/Description	Start	End
4	TRANSTEX EDGE SKIRT™	4:40 AM	6:19 AM
5	Baseline	6:32 AM	8:11 AM

3.2: RUN 4: EDGE SKIRT™

Run 4 consisted of the Test Vehicle being equipped with EDGE SKIRT™ and solid mud flaps. Run 4 was compared to Run 5 to quantify the fuel savings of EDGE SKIRT™ E-1932T trailer skirts on a 48-ft dry van trailer. **Note:** Figure 5 below was taken earlier in the day, before testing EDGE SKIRT™ on the Test Trailer.

Figure 3: EDGE SKIRT™ (Side View)

Figure 4: EDGE SKIRT™ (Rear View)

Figure 5: EDGE SKIRT™ During Daytime (Before Testing)

3.3: RUN 5: BASELINE (NO AERODYNAMIC TECHNOLOGIES)

Run 5 consisted of removing the EDGE SKIRT™ from the Test Vehicle. Solid mud flaps remained on the truck and trailer. This served as the Baseline comparison for Run 4.

Figure 6: Baseline Trailer Configuration (No Aerodynamics)

3.4: 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)

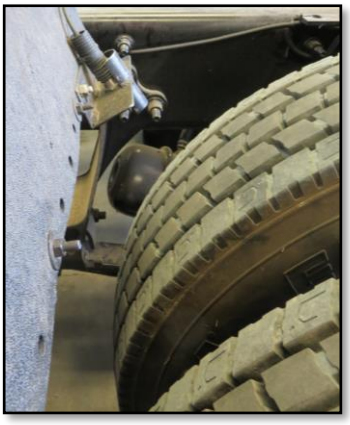
Click this link to see a video of MVTS sensors and testing: How We Test

Figure 7: Aerodynamic Sensors

Figure 8: Data Acquisition System

Figure 9: Fuel Flow Meter

Figure 10: Tire Temp. Sensor



4.0: TEST RESULTS

The EDGE SKIRT™ showed a fuel savings of **5.22 gal/1000 miles (5.22%)** on a 48-ft dry van trailer. Test results with accuracy are shown below in Table 3. Bar graphs are shown in gal/1000 miles and percent fuel savings in Figure 11 and Figure 12, respectively.

Table 3: Test Results with Accuracy

Product	Fuel Economy Improvement		
	Gal/1000 miles	MPG	Percent
TRANSTEX EDGE SKIRT™	**5.22**	0.55	5.22%
Accuracy	**+/- 0.33**	+/- 0.03	+/- 0.33%

Figure 11: Fuel Savings (gal/1000 miles)

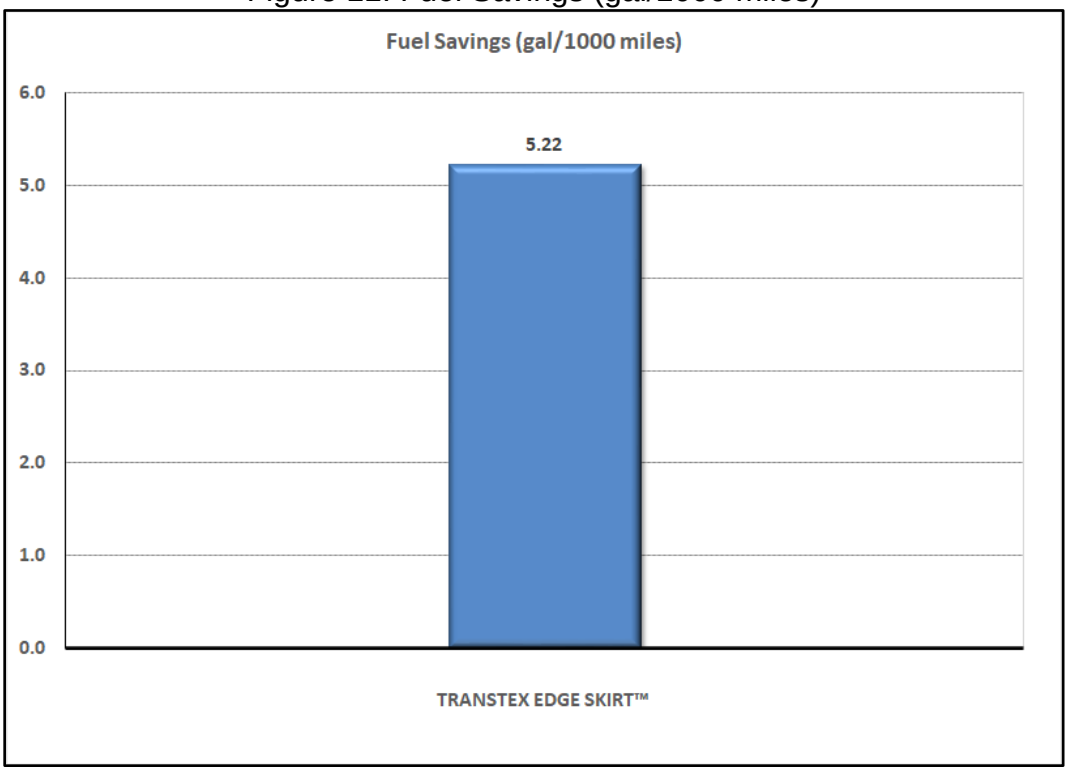
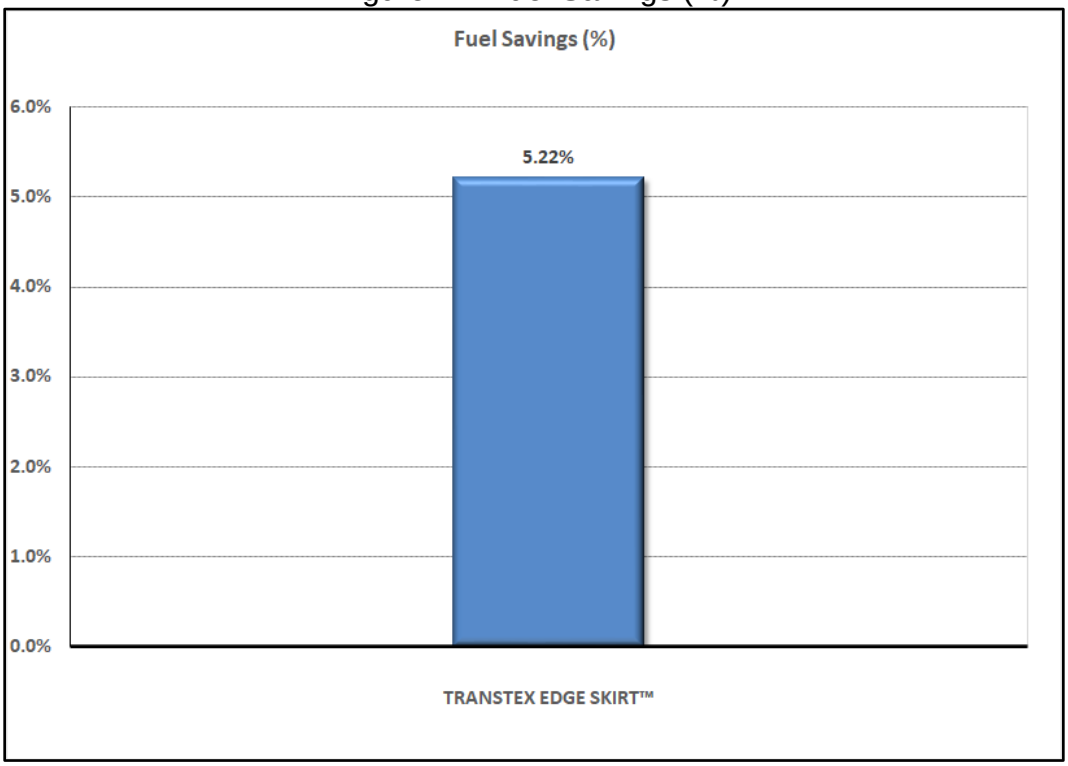


Figure 12: Fuel Savings (%)



4.1: 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.

4.2: WEATHER CONDITIONS SUMMARY

Ambient temperature during testing ranged from 67°F to 71°F with winds ranging from 0-9 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.

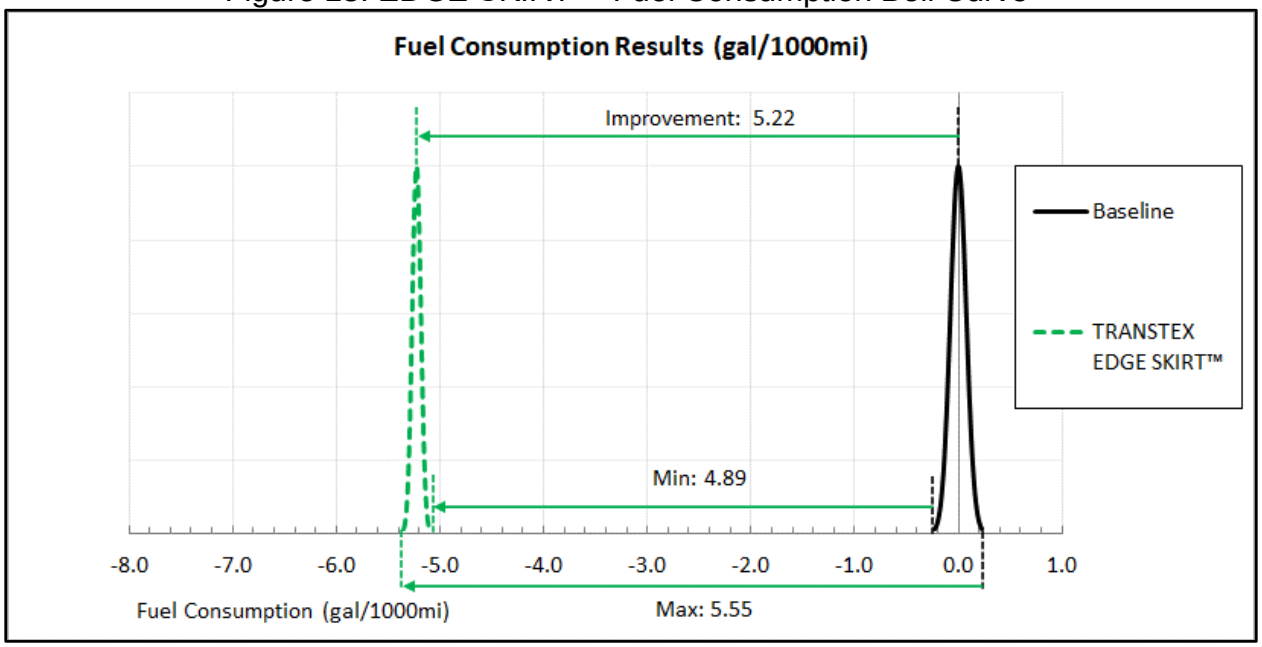
4.3: MEASUREMENT ACCURACY

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).

Figure 13 below shows the statistical bell curves of EDGE SKIRT™ on a 48-ft dry van trailer. The Baseline run and EDGE SKIRT™ run clearly show two separate bell curves, indicating the test had valid accuracy and results were reliable. The graph shows the arrow pointing to the left, illustrating less fuel used (*i.e.* fuel savings). The distance between the peaks of the bell curves is the test result average, which was a fuel savings of 5.22 gal/1000 miles. Minimum and maximum values were calculated as the test result plus or minus the accuracy values (5.22 +/- 0.33), which were 4.89 and 5.55 gal/1000 miles, respectively.

Figure 13: EDGE SKIRT™ Fuel Consumption Bell Curve



5.0: 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.

5.1: FUEL SAVINGS CALCULATIONS, EDGE SKIRT™ (48-FT DRY VAN TRAILER)

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: EDGE SKIRT™ fuel savings of 5.22 gal/1000 miles and 125,000 miles travelled annually:

$$Fuel\ Savings = (5.22\ gal/1000\ miles)x\ \frac{(125{,}000\ miles/year)}{1000} = 653\ gal/year$$

Therefore, EDGE SKIRT™ on a 48-ft dry van would save 653 gallons of fuel per year for this vehicle travelling 125,000 miles.

5.2: FINANCIAL SAVINGS CALCULATIONS, EDGE SKIRT™ (48-FT DRY VAN TRAILER)

Financial calculations can be made by multiplying the fuel saved by the fuel price:

$$Savings\ (\$/year) = (Fuel\ Savings)\ x\ (Price\ of\ fuel)$$

Example: Using the example above and U.S. average retail price of diesel fuel in 2020, $2.551[1] /gal.

$Savings\ (\$/year) = \left(653\ \frac{gal}{year}\right)\ x\ \left(\frac{\$2.551}{gal}\right) = \$1{,}665\ /year$ in fuel savings

Therefore, EDGE SKIRT™ would save $1,665 per year in fuel for the vehicle travelling 125,000 miles.

[1] Source: https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMD_EPD2DXL0_PTE_NUS_DPG&f=W

5.3: PAYBACK AND ROI, EDGE SKIRT™ (48-FT DRY VAN TRAILER)

Buyers of fuel economy technologies are highly interested in saving money. For a technology supplier to be successful, their technology must save their potential customers money and many fleets consider the number of months required for the technology to pay for itself as a buying qualification, which is referred to as 'payback' in trucking or sometimes ROI.

$$Payback\ (months) = \frac{(Product\ Cost)}{(Savings\ (\$/year)}\ x\ (12\ months/year)$$

Example @$750 product cost, 2:1 trailer to tractor ratio: **Note**: The product cost is an example value only. Contact a Transtex sales representative or trailer OEM for pricing.

$$Payback\ (months) = \frac{2x\ (\$750)}{(\$1{,}665\ /year)}\ x\ \left(12\frac{months}{year}\right) = 10.8\ months$$

Note: '2x' is used in the product cost to account for a 2:1 trailer ratio.

Therefore, with a product cost of $750 and 2:1 trailer ratio, EDGE SKIRT™ would pay for itself (*i.e.* payback or ROI) in 10.8 months.

5.4: TECHNOLOGY PROFIT, EDGE SKIRT™ (48-FT DRY VAN TRAILER)

Since saving money is the end goal, calculating profit is another important factor. **Note**: these calculations will consider fuel and purchase price only and not maintenance.

$$Profit\ (\$) = (Savings) - (Cost)$$

Example @$750 Product cost, 2:1 trailer ratio: Using annual values from above and a 5-year trailer life.

$Profit\ (\$) = (\$1{,}665) - \frac{2x\ (\$750)}{5\ year} = \$1{,}365$ saved per year, per power unit.

If this were translated to a 1000-truck fleet, the profits would be $1.365M annually.

Therefore, the EDGE SKIRT™ on a 48-ft dry van trailer would add $1,365 in profit per vehicle with 125,000 miles in travel. For a fleet of 1000 vehicles, this would equate to $1.365M.

6.0: CONCLUSION

MVTS testing proved the fuel savings of the EDGE SKIRT™ on a 48-ft dry van trailer with results that were clear and precise.

EDGE SKIRT™ showed a fuel economy improvement of **5.22 gal/1000 miles (5.22%)**. These are substantial fuel savings that would interest any fleet concerned with fuel economy improvements and profit.

Financially, the EDGE SKIRT™ on a 48-ft dry van trailer would equate to a savings of $1,365 per power unit per year. For a 1000-truck fleet, this would equate to $1.365M in annual profit. These are substantial savings. **Note:** values will depend on product cost, trailer ratio, price of fuel, and many other variables. Contact MVTS for questions or assistance in calculating.

The test values shown can be used to estimate a carrier's savings in real-world operations. More precision can be obtained by using a carrier's vehicle and duty cycle information. Contact MVT Solutions for assistance or more information.

7.0: APPENDIX

7.1: MODIFIED (*I.E.* TEST) TRUCK/TRAILER VEHICLE DETAILS

Figure 14: Vehicle Info, Test Vehicle

Date	June 15, 2021					
Company	Saia LTL					
Location	Pecos, Texas					
Test Route	Pecos 9-mile Test Track					
TRUCK ID:	**Veh. B**					
Brand	International					
Date of Manufacture	12/2018					
Model	LT Day Cab SA					
Engine	Cummins X15					
VIN	3HSDYAPN7LN806843					
Mileage (miles):	284,576					
Transmission	N/A					
Rear Gear	N/A					
Fuel Load	Full					
Fuel Type & Batch	No. 2 Diesel					
Axle Weights	9,820		13,840		15,700	
Total weight	39,360					
TRAILER ID:	**D, 487200**					
Model	Hyundai Translead					
VIN	3H3V482C2KT200001					
Year	01/2018					
Model	VC2480152-JRS Dry Van					
Size	48-ft					
Trailer Gap (inches)	21 inches from cab extender to trailer					
Add-ons	TRANSTEX EDGE SKIRT™					

Figure 15: Tire Info, Test Vehicle

					Truck	Veh. B			
LF:					**Front Axle Tires**				RF: Same
Bridgestone R284					Type				Bridgestone R284
295/75R22.5					Size				295/75R22.5
17/32					Tread Depth (inches)				18/32
110					Pressure (psi)				110
LF-Outer Drive:		LF-Inner Drive:			**Drive Axle Tires**		RF-Inner Drive:		RF-Outer Drive
Michelin X Line XDA Energy +		Michelin X Line XDA Energy +			Type		Michelin X Line XDA Energy +		Michelin X Line XDA Energy +
275/80R22.5		275/80R22.5			Size		275/80R22.5		275/80R22.5
19/32		19/32			Tread Depth (inches)		19/32		19/32
110		110			Pressure (psi)		110		110
					Trailer	D, 487200			
LF-Outer Trailer:		LF-Inner Trailer:			**Tandem Front**		RF-Inner Trailer		RF-Outer Trailer
Continental Eco Plus HT3		Continental Eco Plus HT3			Type		Continental Eco Plus HT3		Continental Eco Plus HT3
295/75R22.5		295/75R22.5			Size		295/75R22.5		295/75R22.5
10/32		10/32			Tread Depth (inches)		10/32		10/32
110		110			Pressure (psi)		110		110
LR-Outer Trailer:		LR-Inner Trailer:			**Tandem Rear**		RR-Inner Trailer		RR-Outer Trailer
Continental Eco Plus HT3		Continental Eco Plus HT3			Type		Continental Eco Plus HT3		Continental Eco Plus HT3
295/75R22.5		295/75R22.5			Size		295/75R22.5		295/75R22.5
9/32		9/32			Tread Depth (inches)		9/32		9/32
110		110			Pressure (psi)		110		110

7.2: COMPARE TRUCK/TRAILER VEHICLE DETAILS

Figure 16: Vehicle Info, Compare Vehicle

Date	June 15, 2021				
Company	Saia LTL				
Location	Pecos, Texas				
Test Route	Pecos 9-mile Test Track				
TRUCK ID:	**VEH. A**				
Brand	International				
Date of Manufacture	02/2021				
Model	LT Day Cab SA				
Engine	Cummins X15				
VIN	3HSDYAPN9NN154620				
Mileage (miles):	2,321				
Transmission	N/A				
Rear Gear	N/A				
Fuel Load	Full				
Fuel Type & Batch	No. 2 Diesel				
Axle Weights	9,820		13,840		15,700
Total weight	39,360				
TRAILER ID:	**C, 487344**				
Model	Hyundai Translead				
VIN	3H3V482C2KT219144				
Year	03/2018				
Model	VC2480152-JRS Dry Van				
Size	48-ft				
Trailer Gap (inches)	21 inches from cab extender to trailer				
Add-ons	Michelin Trailer Skirts				

Figure 17: Tire Info, Compare Vehicle

				Truck	VEH. A			
LF:				**Front Axle Tires**			RF: Same	
Bridgestone R284				Type			Bridgestone R284	
295/75R22.5				Size			295/75R22.5	
17/32				Tread Depth (inches)			18/32	
110				Pressure (psi)			110	
LF-Outer Drive:	LF-Inner Drive:			**Drive Axle Tires**		RF-Inner Drive:	RF-Outer Drive	
Michelin X Line XDA Energy +	Michelin X Line XDA Energy +			Type		Michelin X Line XDA Energy +	Michelin X Line XDA Energy +	
275/80R22.5	275/80R22.5			Size		275/80R22.5	275/80R22.5	
19/32	19/32			Tread Depth (inches)		19/32	19/32	
110	110			Pressure (psi)		110	110	
				Trailer	C, 487344			
LF-Outer Trailer:	LF-Inner Trailer:			**Tandem Front**		RF-Inner Trailer	RF-Outer Trailer	
Continental Eco Plus HT3	Continental Eco Plus HT3			Type		Continental Eco Plus HT3	Continental Eco Plus HT3	
295/75R22.5	295/75R22.5			Size		295/75R22.5	295/75R22.5	
10/32	10/32			Tread Depth (inches)		10/32	10/32	
110	110			Pressure (psi)		110	110	
LR-Outer Trailer:	LR-Inner Trailer:			**Tandem Rear**		RR-Inner Trailer	RR-Outer Trailer	
Bridgestone R197	Continental Eco Plus HT3			Type		Continental Eco Plus HT3	Continental Eco Plus HT3	
295/75R22.5	295/75R22.5			Size		295/75R22.5	295/75R22.5	
7/32	9/32			Tread Depth (inches)		10/32	9/32	
110	110			Pressure (psi)		110	110	

7.3: TEST ROUTE

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

Figure 18: Pecos Test Track

7.4: WEATHER CONDITIONS

Weather during testing was fair with winds from 0-9 mph. Weather data was acquired from a local Weather Underground weather station. Source shown 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, June 18, 2021

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
12:15 AM	81 °F	49 °F	33%	SE	7 mph	0 mph	27.30 in	0.0 in	Fair
1:15 AM	77 °F	49 °F	37%	SE	6 mph	0 mph	27.30 in	0.0 in	Fair
2:15 AM	74 °F	49 °F	40%	SE	5 mph	0 mph	27.29 in	0.0 in	Fair
3:15 AM	72 °F	48 °F	43%	ESE	5 mph	0 mph	27.27 in	0.0 in	Fair
4:15 AM	71 °F	49 °F	46%	E	6 mph	0 mph	27.26 in	0.0 in	Fair
5:15 AM	70 °F	50 °F	50%	E	9 mph	0 mph	27.26 in	0.0 in	Fair
6:15 AM	69 °F	51 °F	52%	E	8 mph	0 mph	27.27 in	0.0 in	Fair
7:15 AM	67 °F	50 °F	55%	CALM	0 mph	0 mph	27.28 in	0.0 in	Fair
8:15 AM	71 °F	51 °F	49%	CALM	0 mph	0 mph	27.29 in	0.0 in	Fair
9:15 AM	76 °F	51 °F	41%	ESE	3 mph	0 mph	27.30 in	0.0 in	Fair
10:15 AM	81 °F	49 °F	33%	CALM	0 mph	0 mph	27.30 in	0.0 in	Fair
11:15 AM	85 °F	49 °F	29%	S	3 mph	0 mph	27.27 in	0.0 in	Fair
12:15 PM	90 °F	49 °F	24%	SSE	3 mph	0 mph	27.26 in	0.0 in	Fair
1:15 PM	94 °F	43 °F	17%	E	9 mph	0 mph	27.25 in	0.0 in	Fair
2:15 PM	95 °F	42 °F	16%	SSE	3 mph	0 mph	27.22 in	0.0 in	Fair
3:15 PM	98 °F	39 °F	13%	NNE	5 mph	9 mph	27.19 in	0.0 in	Fair
4:15 PM	98 °F	36 °F	12%	ESE	7 mph	0 mph	27.16 in	0.0 in	Fair
5:15 PM	100 °F	36 °F	11%	E	10 mph	0 mph	27.15 in	0.0 in	Fair
6:15 PM	100 °F	35 °F	11%	E	9 mph	0 mph	27.13 in	0.0 in	Fair
7:15 PM	98 °F	42 °F	15%	ESE	17 mph	23 mph	27.13 in	0.0 in	Fair
8:15 PM	95 °F	43 °F	16%	E	20 mph	0 mph	27.13 in	0.0 in	Fair
9:15 PM	91 °F	43 °F	19%	ESE	16 mph	0 mph	27.15 in	0.0 in	Fair
10:15 PM	87 °F	44 °F	22%	ESE	15 mph	0 mph	27.17 in	0.0 in	Fair
11:15 PM	85 °F	47 °F	26%	ESE	15 mph	0 mph	27.19 in	0.0 in	Fair

Source: https://www.wunderground.com/history/daily/us/tx/pecos/KPEQ/date/2021-6-18

7.5: PRODUCT DETAILS

- EDGE SKIRT™
  https://transtex-llc.com/

7.6: TEST PERSONNEL

7.6a: MVT SOLUTIONS

- Daryl Bear, Lead Engineer & COO
- Jacob Schwartz, Test Engineer
- Jonathan Ruppert, Test Engineer

7.6b: DRIVERS

- Allan Dahringer
- Seth Knight
- Carlos Aragon
- Jack Burchell

7.6c: TRANSTEX LLC

- Mathieu Boivin, Founder & CEO
- Pierre-Yves Lacroix, Engineering Director

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