

July 19th, 2023

Sophie Shulman  
Deputy Administrator  
National Highway Traffic Safety Administration  
1200 New Jersey Avenue, S.E.  
Washington, D.C. 20590

**Side Underride Guards on Trailers and Semitrailers**  
**Docket Number: NHTSA-2023-0022**

Dear Ms. Shulman,

Les Entreprises PHSS Fortier Inc is a side underride manufacturer and is pleased to share its data with the National Highway Traffic Safety Administration Committee.

First, let me mention that at the start, PHSS Fortier's side guard was intended for pedestrians, cyclists & motorcycles to prevent them from going under the semi-trailer. However, we pushed our research further to include vehicles.

Currently available and in circulation in the province of Quebec, PHSS Fortier's side guard are installed on 102 Manac semi-trailers & 15 others are on Hyundai semi-trailers.

PHSS Fortier's side guard differs from other manufacturers.

Here are our characteristics:

- Flexible – provides sufficient ground clearance for bumps, railroad crossings & negative dock deliveries.
- Universal kit for 2 axles and 3 axles (can be mounted on MANAC, Utility, Wabash, Hyundai, Great Dane & Stoughton semi-trailers)
- Integrated with a fuel economy system (tested with PIT Innovation in Blainville, Québec, Canada) registered a 4% fuel economy under the new regulation for qualifications.
- Return on investment with the fuel economy system.
- Curtain is flexible which allows a quick access underneath the trailer for maintenance and go round inspections.
- Galvanized steel structure – longevity estimated of 20-years.
- No alteration to the semi-trailers
- Weight at approximately 540 lbs.
- Installation time 3 hours \* 2 employees. (NOTE: once experienced, 7 trailers were equipped in 1 work shift (10 hours) by 4 employees.
- Only specialized tool required for installation, 1 torque wrench for the straps (400 lbs. torque), remaining tools 1 key 9/16 with a box & 1 key 3/4 with a box. **No welding.**

## Crash Data:

2017, in collaboration with MANAC Inc, a semi-trailer manufacturer, we underwent with our 1<sup>st</sup> round of testing. **Please refer to Manac's results in 2023 final report.**

**Note: Report is in French.** I've translated portions of the report.

In 2019, during the installation of our sideguard on the Hyundai, we realized that our kits were not manufactured for universal trailers. We were required to slightly modify our front brace.

2022, again with MANAC Inc., and in collaboration with the Canadian National Research Center of Ottawa, the CNRC conducted a series of static and dynamic computer simulations to assess how the "Side Underride Protection device" performed when impacted by a vehicle at various speeds and locations. The CNRC built numerical models with implicit (static, small deformation) and explicit (dynamic, high deformation) FEA tools.

At our 2022 quasi-static test, we took a drop in our results.

Following the CNRC's 2022 recommendations to strengthen our front brace, July 6<sup>th</sup>, 2023, the models were validated against quasi-static test at Manac's research facility in Saint Georges, QC.

**For the results, please refer to Manac's final test results dated July 7<sup>th</sup>, 2023.**

**Note: Report is in French.** I've translated portions of the report.

**Also attached, CNRC's final report on their study. Report is in English.**

## Summary to our final test results.

The semi-trailer has now become the failure point and not PHSS Fortier's side guard.



**It is to be noted that this picture was for testing purposes. We have an insertion on the skirt for the side light which is not shown on this picture.**

## Side Underride Guard Effectiveness:

Following comments have been shared and translated from our customer Robert Transport who have over 100 PHSS Fortier side guards in circulation in the province of Québec.

Transport Robert installed over 100 units with PHSS Fortier's side guard.

1. Our first reason why we choose to install PHSS Fortier's lateral protection on our trailers were for the security of cyclist, pedestrians & automobiles.
2. In addition to the security of the side protection, PHSS gives us the advantage of having an aerodynamic trailer for fuel economy.
3. The fact that it is a vinyl skirt gives us an advantage when we go to sloping docks, even if the skirt touches the ground, it bends and resumes its place once we've pulled away.
4. When the drivers lean the vinyl skirt on a snowbank, it does not bend or break because it is made of vinyl. It obeys up to a certain point and returns to its place.
5. When the drivers collide with a fixed object, (pole, concrete block, etc.), the canvas will tear if it goes too far. However, the vinyl skirt can easily be repaired and if it is not repairable, the various fixations and the skirt can easily be changed.

## Benefits:

PHSS Fortier's side guard has more than 1 benefit. You have the safety aspect for pedestrians, cyclists, motorcycles & vehicles but we have a fuel economy system integrated which gives you a return on your investment.

### Below is the estimated fuel consumption - return on your investment.

In collaboration with the University of Sherbrooke, they performed a wind tunnel test on a scale of 1/28 with their supercomputer named "mamouth". The most powerful and environmentally supercomputer in Canada. Their study revealed that the PHSS Fortier's side guard channels the airflow below the trailer and induces a reduction in the drag force, the value of which is quantified between 4.5 and 7% for travel speeds of a truck-trailer ranging from 60 to 100 km/h.

**Note that below gains are in Canadian funds, the speed is in KM and the consumption is in liters vs gallons.**

Speed (km/h)	Consumption gain (L/100 km)	Annual consumption gain (L / 13000 km)	Annual consumption price gain (\$ / 13000 km)
10,8	-0,7504	-975,50	-1121,83
21,6	-0,5954	-773,97	-890,06
32,4	-0,7231	-940,03	-1081,03
43,2	-1,1100	-1443,01	-1659,46
54	-1,2713	-1652,72	-1900,63
64,8	-1,3532	-1759,15	-2023,02
75,6	-1,7240	-2241,26	-2577,45
86,4	-2,2942	-2982,47	-3429,84
97,2	-2,9528	-3838,62	-4414,41

In 2017, our first prototype was installed on a customer's semi-trailer. As of today, this semi-trailer is still in circulation. With 117 units in circulation, the only parts that have been required for replacement by our customers have been the vinyl skirt and the aluminum fender.

The structural portion of the side guard itself has had no replacements and it is important to note that our first 15 units have been in circulation since April 2019 and that the other remaining side guards since middle of 2020.

## **Other products available in our line:**

PHSS Fortier Inc also developed a side guard for pedestrians, cyclists and motorcycles which 1 unit (prototype) is in circulation in the greater Montreal area. This product was installed on 4 axles dumper trailer.



It is important to note that our product can be installed on gravel trucks, waste management trucks, delivery trucks, city trucks.

However, with the differences in these vehicles, standardizing will be more difficult but doable on a custom order.

## **Costs:**

PHSS Fortier's side guard is currently available in Canada as an option at Manac Inc. PHSS Fortier is currently working on establishing a distribution circuit within the United States. More information will be available in the upcoming months.

Note that shipping fees and installation fees are excluded in the following costing. These prices are based on current exchange rates (July 19<sup>th</sup>, 2023) and are subject to changes (supplier price fluctuation & volume). Prices are based on standard white vinyl skirts with no inscription.

2 axles - 3095,00\$ USD

3 axles - 3135,00\$ USD

Costing for a 4 axles dumper truck, still requires to be established as only a prototype was developed.

## **Conclusion:**

Based on the experience of Robert Transport, there are no significant operational limitations to using PHSS Fortier's under ride protection devices, only road safety and aerodynamic benefits.

We hope that our information will share another view of the side guard.

On behalf of Les Entreprises PHSS Fortier Inc, we would like to thank the NHTSA for allowing a Canadian based company to share its comments and our products information with your organization.

Sincerely,

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