



MEMORANDUM

Date: March 16, 2023

Re: Testing Costs and Obstacles for Transit Bus Rollover Protection

From: Kirk Burcar, M. Eng., P.Eng., Vice President, Engineering Services, New Flyer of America Inc. (New Flyer)

This memorandum has been prepared to present information about the testing costs and engineering challenges that New Flyer estimates would be incurred in order to apply the NHTSA Bus Rollover Rule, 49 C.F.R. Section 571.227, FMVSS No. 227, to transit buses sold to private parties and to the federal government.

As explained in New Flyer's February 11, 2022, petition for reconsideration (Petition), the language used in the rule to exempt transit buses from the Bus Rollover Rule apparently covers only buses sold to state and municipal transit agencies and not those sold to the federal government or to private parties such as private universities. New Flyer's petition estimates that this omission will affect 80 to 120 transit buses a year in the industry, and 25 to 35 of these buses that would otherwise be sold by New Flyer, at an average price New Flyer estimates to be over \$600,000 per vehicle.

The information presented here was not reasonably available to New Flyer at the time it prepared its reconsideration petition submitted February 11, 2022. Rather, this information is based on the experience of New Flyer's sister company, Motor Coach Industries, Inc. (MCI), since the petition was filed, and the MCI estimate of costs in testing and engineering needed to bring its future over-the-road buses (OTRBs), which New Flyer refers to as motor coaches, into compliance with the Bus Rollover Rule. That rule will come into force on December 31, 2024. This information is then used to estimate the compliance and testing costs for transit buses in the event the petition is denied.

I. MCI's Compliance and Testing Efforts for Motor Coaches (ORTBs): There Are Large Non-Recurring Engineering Costs to Certify Each Model's Compliance.

The Bus Rollover Rule requires manufacturers such as New Flyer's sister company, MCI, which makes motor coaches, to certify compliance with the Bus Rollover Rule. That certification assures that in the event of a rollover accident the motor coach body does not intrude into the portion of the interior defined as the "survival space." The rule also essentially requires that no large objects – such as entire windows or luggage racks – be thrown into that survival space. Under this rule, emergency exits must stay latched during a rollover accident.

NHTSA's rule states that for government compliance tests, NHTSA will use a version of the European Union's (EU's) test standard, ECE R.66. Briefly stated, in that test, the bus is tilted on its side until it falls over nearly upside down onto a hard surface. The resulting deformation of the bus body, the dislodging (if any) of windows and interior fittings, and the integrity of emergency exits, are all checked.

NHTSA's testing regime is more rigorous than the EU version of ECE R.66 in at least one important respect: the NHTSA requirement that the bus be at its gross vehicle weight when tested and not just at



its “curb weight,” the weight of the vehicle fully fueled, but without passengers. While the NHTSA approach may better simulate the worst case potential rollover accident, the increased stringency means that past EU test results are NOT readily transferrable to new buses made for sale in the United States.

In its testing and compliance efforts for motor coaches, MCI has closely consulted with its sister company in Europe, Alexander Dennis Limited (ADL), because ADL is experienced with ECE R.66 testing.

MCI has now performed repeated ECE R.66 tests (using the heavier vehicle weight) on “coupons” -- prototype sections of motor coach buses.

MCI has determined from these tests that costly changes will be needed in the materials it uses. The change to heavier, thicker stainless steel in turn requires substantial existing factory tooling to be discarded and new tooling built to handle the different welding requirements, at an additional cost MCI estimate at around \$2.5 million.

MCI also estimates the costs to redesign the motor coach for compliance, to test the redesigned motor coach, and to build the mockup or prototype, to total about \$3.1 million. The estimated total cumulative non-recurring engineering, testing, and tooling costs so far for all motor coach models is thus over \$5.6 million.

Based on its testing experience from this past year, MCI believes that virtually every major bus manufacturer will need to re-design and re-engineer the bus structure in order to make the required certification, and will face similar large non-recurring engineering, testing, and tooling costs to be spread over hundreds of motor coach (ORTBs) sold per year.

II. Transit Bus Rollover Testing and Compliance Costs Are Prohibitive for the Small Number of Transit Buses Sold to Private Parties and Federal Agencies.

As stated in New Flyer’s Petition, about 80 to 120 transit buses are sold each year to U.S. government agencies and to private parties, such as private universities. New Flyer estimates that it sells between 25 and 35 such transit buses a year to parties other than state and municipal transit agencies. While these transit buses are virtually identical to those sold to state and municipal agencies, the transit bus definition used in the final Bus Rollover Rule does NOT exempt these federal agency and private party purchases from compliance with the rule.

Based on MCI’s testing work to date, and New Flyer’s knowledge of the physical differences between the ORTBs that MCI makes, and the transit buses New Flyer makes, New Flyer’s engineers are convinced that the ORTB rollover test results are NOT a valid basis on which to certify the Bus Rollover Rule compliance for transit buses. In particular, transit buses are now often equipped with substantial roof-mounted equipment for electric, fuel cell, or CNG operation, equipment that is NOT roof-mounted on ORTBs. In addition, some models are 60 feet long, rather than the shorter 40-foot-long models, with substantial differences because of the accordion-like structure joining the portions of the 60 foot model. Because there are material differences in the location, weight, and density of such roof-mounted equipment between different models of transit buses, each transit bus model is likely to need its own



testing, redesign and tooling to comply with the Bus Rollover Rule and for New Flyer to certify compliance.

New Flyer's engineers also forecast, based on MCI's design, testing, and tooling experience over the last year, that the costs of certifying transit bus compliance with the Bus Rollover Rule for each of the transit bus models are likely to exceed the estimated \$5.6 million that MCI estimates it will have to spend for all of its combined ORTB models.

As New Flyer sells only 25 to 35 transit buses of various models each year to federal agencies and private parties, these estimated non-recurring engineering costs of over \$5.6 million per model will make the resulting transit bus models so expensive that no one will buy them. Consequently, if the Petition is not granted, New Flyer will simply refuse to sell transit buses to private parties and federal agencies, rather than incur such large and useless engineering and tooling costs. There is no reason to believe that other manufacturers will reach a different conclusion.

As explained in the Petition, the exemption of most transit buses from the Bus Rollover Rule, based on their slow-speed and frequent stop operating cycles, and by the very small number of transit bus rollover accidents, is amply justified by the rulemaking record.

New Flyer asks that this new information, unavailable at the time the petition was filed over a year ago, be considered and that the pending petition be granted without further delay.

Respectfully submitted,

NEW FLYER OF AMERICA INC.

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