REGULATIONS AMENDING THE MOTOR VEHICLE SAFETY REGULATIONS
(STANDARD 216 — ROOF CRUSH RESISTANCE AND STANDARD 220 — ROLLOVER PROTECTION)

AMENDMENTS

1. Subsection 2(1) of the Motor Vehicle Safety Regulations (see footnote 1) is amended by adding the following in alphabetical order:

“chassis-cab” means an incomplete vehicle, other than an incomplete trailer, with a completed occupant compartment that requires only the addition of a cargo-carrying surface, work-performing equipment or a load-bearing component to perform its intended functions.

(châssis-cabine)

2. The portion of item 216 of Schedule III to the Regulations in Column II is replaced by the following:

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item (CMVSS)</td>
<td>Description</td>
</tr>
</tbody>
</table>
3. Item 220 of Schedule III to the Regulations is replaced by the following:

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
<th>Column III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Description</td>
<td>Classes of Vehicles</td>
</tr>
<tr>
<td>(CMVSS)</td>
<td></td>
<td>Motorcycle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enclosed Motorcycle</td>
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<td></td>
<td></td>
<td>Open Motorcycle</td>
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<td></td>
<td></td>
<td>Limited-speed Motorcycle</td>
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<td></td>
<td></td>
<td>Motor Tricycle</td>
</tr>
<tr>
<td>220</td>
<td>Rollover Protection</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
<th>Column III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Description</td>
<td>Classes of Vehicles</td>
</tr>
<tr>
<td>(CMVSS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rollover Protection</td>
<td>Multi-purpose</td>
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<tr>
<td></td>
<td></td>
<td>Passenger Vehicle</td>
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<td></td>
<td></td>
<td>Passenger Car</td>
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<td></td>
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<td>Snow-mobility</td>
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<td></td>
<td></td>
<td>Snow-mobile Cutter</td>
</tr>
<tr>
<td>220</td>
<td></td>
<td>X</td>
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<td></td>
<td></td>
<td>X</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
<th>Column III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Description</td>
<td>Classes of Vehicles</td>
</tr>
<tr>
<td>(CMVSS)</td>
<td></td>
<td>Trailer Converter</td>
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<tr>
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<td>Dolly</td>
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<td>Truck</td>
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<td>Importing Temporarily for Special Purposes</td>
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<td>Low-speed Vehicle</td>
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<td>Three-wheeled Vehicle</td>
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<tr>
<td>220</td>
<td>Rollover Protection</td>
<td>X</td>
</tr>
</tbody>
</table>

4. Section 216 of Schedule IV to the Regulations and the heading before it are replaced by the following:

ROOF CRUSH RESISTANCE (STANDARD 216)

216. (1) Every passenger car, multi-purpose passenger vehicle, truck or bus with a GVWR of 4 536 kg or less, except trucks built from a cutaway chassis with a GVWR greater than 2 722 kg, school buses and convertibles, shall conform to Technical Standards Document No. 216, Roof Crush Resistance (TSD 216), as amended from time to time.

(2) Every passenger car, multi-purpose passenger vehicle, truck or bus that is built in two or more stages not using a chassis-cab and with a GVWR of 4 536 kg or less and every
passenger car, multi-purpose passenger vehicle, truck or bus with a GVWR greater than 2 722 kg but not greater than 4 536 kg and with an altered roof shall conform to the requirements of TSD 216 or TSD 220, which is referred to in section 220 of this schedule.

(3) The vehicles referred to in subsections (1) and (2) may conform to the requirements of this section as it read on the day before the day on which this version of the section came into force.

(4) This section expires on January 1, 2014.

5. Section 220 of Schedule IV to the Regulations and the heading before it are replaced by the following:

ROLLOVER PROTECTION (STANDARD 220)

220. (1) Every school bus shall conform to Technical Standards Document No. 220, Rollover Protection (TSD 220), as amended from time to time.

(2) Every passenger car, multi-purpose passenger vehicle, truck or bus that is built in two or more stages not using a chassis-cab and with a GVWR of 4 536 kg or less and every passenger car, multi-purpose passenger vehicle, truck or bus with a GVWR greater than 2 722 kg but not greater than 4 536 kg and with an altered roof shall conform to the requirements of TSD 220 or TSD 216, which is referred to in section 216 of this schedule.

(3) This section expires on January 1, 2014.

COMING INTO FORCE

6. These Regulations come into force on the day on which they are published in the Canada Gazette, Part II.

REGULATORY IMPACT ANALYSIS STATEMENT

(This statement is not part of the Regulations.)

Issue and objectives

When a vehicle is involved in a rollover collision, the vehicle’s roof frequently crushes to the extent that injuries and fatalities result. Statistics from 1999 to 2003 show that while rollover collisions accounted for only 12% of single-vehicle crashes (see footnote 2), they resulted in 23% of all non-fatal injuries collisions and 37% of fatalities for those single-vehicle crashes.

The original Canada Motor Vehicle Safety Standard 216, “Roof Intrusion Protection” was implemented in September 1973 to reduce the number of severe injuries and deaths caused by rollovers, and to regulate the strength of vehicle roofs. While it has been amended on several occasions in the intervening period, the performance criteria for roof crush resistance above the front seats of motor vehicles remained substantially the same.

A review of Canada Motor Vehicle Safety Standards 216 and 220, hereafter referred to as Canadian safety standards 216 and 220, was required to ensure that harmonization with the United States standard would be maintained. The United States has recently updated its requirements for roof crush protection to better protect occupants of vehicles involved in a rollover. The United States published a Notice of Proposed Rulemaking (NPRM) to amend its
safety standards (Federal Motor Vehicle Safety Standards or “FMVSS”) on August 5, 2005. A supplemental notice of proposed rulemaking (SNPRM) was then published on January 30, 2008, requesting comments on various issues as well as possible variations to the requirements. The final rule was published in the Federal Register on May 12, 2009.

These amendments to Schedule IV of the Motor Vehicle Safety Regulations amend the Canadian safety standards 216 and 220 relating to vehicle roof crush and rollover protection. It improves the safety of vehicle occupants in the event of a vehicle rollover. These amendments maintain harmonization with safety standards recently amended by the United States by updating the roof crush safety standards that currently apply to both passenger vehicles and school buses. They ensure that each vehicle model may be tested to one roof crush test common to both Canada and the United States, resulting in increased safety, while ensuring there are no additional costs associated with certifying vehicles to two different North American roof crush standards.

**Description and rationale**

Following the pre-publication in the Canada Gazette, Part I, on March 22, 2008, the amendments to the Motor Vehicle Safety Regulations fully harmonize the requirements of Canadian safety standard 216 with those of the United States FMVSS 216 Final Rule. In addition to harmonizing the Canadian technical requirements with those of the “final rule” of the United States, the amendments to the Motor Vehicle Safety Regulations harmonize the title of the Canadian safety standard 216 to read “Roof Crush Resistance” (Résistance du toit à l’écrasement).

In order to maintain harmonization, changes to the Canadian safety standard 216 include provisions for compliance with the revised United States standard, which include the following requirements:

- Increasing the force applied from 1.5, to 3.0 times the gross vehicle weight rating (GVWR) for vehicles up to 2 722 kg, and requiring for the first time, vehicles with a mass greater than 2 722 kg and up to 4 536 kg, to be tested to 1.5 times the GVWR;
- Eliminating the maximum force requirement of 22 240 newtons, which was applicable only to the passenger car class of vehicle;
- Requiring all applicable vehicles to meet the specified force requirements in a two-sided test instead of a single-sided test; and
- Establishing the requirement to maintain headroom in addition to the existing roof crush limit.

In addition, the definition for “chassis-cab” is being re-introduced into the Motor Vehicle Safety Regulations as being “an incomplete vehicle, other than an incomplete trailer, with a completed occupant compartment that requires only the addition of a cargo-carrying surface, work-performing equipment, or a load-bearing component to perform its intended functions.” The amendment to Canadian safety standard 216 will allow passenger vehicles, multi-purpose passenger vehicles, trucks, or buses built in two or more stages not using a chassis-cab and with a GVWR of 4 536 kg or less, and those same vehicles with a GVWR of greater than 2 722 kg but not greater than 4 536 kg and an altered roof, to be tested using either Canadian safety standard 216 or Canadian safety standard 220, at the choice of the manufacturer.

Canadian safety standard 216 requires the application of the load at the front corner of the
vehicle roof on each side, whereas Canadian safety standard 220 requires the application of a uniform load over the centre of the vehicle roof by a large plate.

Canadian safety standard 220 is the applicable standard for rollover protection for school buses. This safety standard has been in place since September 1977, and is also harmonized with the equivalent United States safety standard. This safety standard originally applied only to school buses, whereas these amendments now add provisions to allow passenger vehicles, multi-purpose passenger vehicles, trucks, or buses, built in two or more stages not using a chassis-cab and with a GVWR of 4 536 kg or less, and those same vehicles with a GVWR of greater than 2 722 g but not greater than 4 536 kg and an altered roof, to be tested to standard 220.

To allow for future harmonization, the amendments to the Motor Vehicle Safety Regulations replace Test Methods 216 and 220 with technical standards documents incorporated by reference, as amended from time to time. Technical standards documents allow the Canadian Government to reproduce the United States FMVSS in both English and French, with Canadian-specific changes noted within. The Government publishes a notice in the Canada Gazette, Part I, each time a technical standards document is amended.

In 2005, multipurpose passenger vehicles, trucks and buses with a GVWR less than 4 536 kg accounted for 45% of vehicle sales in Canada. Since the existing Canadian safety standard 216 generally applies to vehicles weighing 2 722 kg or less, many of the vehicles noted above did not have to comply with this standard. Maintaining harmonization of the Canadian safety standard with the amended corresponding United States FMVSS 216 will result in expanding the scope of this standard to passenger cars, multi-purpose passenger vehicles, trucks or buses with a GVWR of 4 536 kg or less, except for school buses, convertibles and trucks built from a cutaway chassis with a GVWR greater than 2 722 kg. This will better protect the greater Canadian vehicle fleet by subjecting it to roof-crush resistance requirements.

As previously mentioned, the existing Canadian safety standard 216 applies to trucks, multi-purpose passenger vehicles or buses, except school buses, with a GVWR of 2 722 kg or less, and passenger cars except convertibles. To test for compliance with this safety standard, applying a force equal to 1.5 times the unloaded vehicle’s weight simulates contact with the ground during a rollover. Both the right and left front corners of the vehicle’s roof must be able to withstand this test load. For passenger cars, this force is limited to 22 240 N. The maximum permissible intrusion of the roof under this force is 127 mm. Prior to the United States issuing its final rule, the Canadian requirements were harmonized with the corresponding United States safety standard, i.e. the Federal Motor Vehicle Safety Standard (FMVSS) 216.

Harmonizing the Canadian regulatory requirements with those that the United States has updated will improve the current roof crush resistance standard for vehicles. This will result in an increased level of safety and is expected to lead to fewer injuries and deaths caused by rollover crashes. As most vehicles sold in Canada are manufactured to meet the United States requirements, harmonizing the requirements will improve safety and minimize the cost of vehicles for Canadians.

Certain passenger cars, multi-purpose passenger vehicles, trucks or buses built in two or more stages may be equipped with altered roofs. Even though the sales volume for these vehicles is low and they are intended for a limited segment of the driving public, the roofs of such vehicles have been required to meet the same performance criteria as those established for
passenger cars. During compliance testing, the test plate may produce force concentrations that excessively deform altered roofs, which is not representative of deformation observed during real-life rollovers. This issue has been addressed by allowing passenger cars, multi-purpose passenger vehicles, trucks or buses, built in two or more stages, not using a chassis-cab and with a GVWR greater than 2 722 kg but not greater than 4 536 kg, and with an altered roof to be tested to either safety standard 216 or 220, at the choice of the manufacturer.

During the development of these amendments, the SNPRM noted that the United States may adopt a higher or lower applied force value than the originally proposed $2.5 \times \text{GVWR}$, and that a two-sided test was being considered to replace the existing single-sided test. These considerations were based on additional tests performed by the United States since the notice of proposed rulemaking (NPRM) was published, including single-sided and two-sided testing. After final consideration of test results and stakeholder input, the United States increased the force applied from 1.5 to 3.0 times the GVWR for vehicles up to 2 722 kg. It also required vehicles with a mass greater than 2 722 kg and up to 4 536 kg to be tested to 1.5 times the GVWR. In addition, the two-sided test was selected to replace the single-sided test.

The United States has provided a phase-in schedule in order to provide the manufacturers adequate time to implement any necessary changes to meet the new requirements; however, the Department does not typically utilize phase-in schedules. As previously discussed, these amendments incorporate by reference, technical standard documents 216 and 220. In accordance with the Motor Vehicle Safety Act, regulations incorporating technical standards documents expire no later than 5 years after the day on which they come into force. This means that these amended provisions will expire no later than 2014, which is before the end of the United States phase-in period. Therefore, in order to align with the end dates of the phase-in requirements of the United States, the new requirements will be optional until made mandatory in September 1, 2016 (when the United States phase-in reaches 100%).

Based on a cost-benefit analysis that was updated since the issuance of the NPRM, the United States now estimate that adopting its proposal could prevent up to 1 065 serious injuries and 135 deaths annually once the new requirements are fully phased in. Pro-rating these figures to Canada, based on the respective populations, these amendments to the Motor Vehicle Safety Regulations could prevent as many as 13 deaths and up to 106 serious injuries per year. Estimating an average value of a life of $6.11$ million and estimating $15,960$ per serious injury, the annual savings for Canadians could reach $81$ million annually. The United States also estimates that approximately 82% of all vehicles under 2 722 kg, and 40% of all vehicles greater than 2 722 kg and up to 4 536 kg will need to be upgraded to meet the new roof crush requirements.

According to the same study, the United States estimated that the average cost of reinforcing the roof structure of a vehicle that did not meet the requirements was approximately C$65 per vehicle, for an annual cost of C$60 million for the entire Canadian vehicle fleet. (see footnote 4) As the new Canadian requirements would not become mandatory until a later date, manufacturers would not be required to immediately make the necessary investments for Canadian purposes; however, they would likely choose to do so in order to comply with the updated United States phase-in requirements. In doing so, it is anticipated that most manufacturers would certify Canadian vehicles to the new requirements, in order to avoid duplication of testing to two different sets of requirements.

The United States also noted that the changes required to reinforce the roof structure may require the installation of heavier materials or new bracing that could increase the weight of a vehicle. (see footnote 5) The United States noted that this increase in vehicle weight would
have a minor impact on vehicle fuel consumption. The Department continues to be of the opinion that vehicles will continually become more fuel efficient as a result of revised legislation such as the new corporate average fuel economy (CAFE) target of 35.5 miles per gallon (6.6 L/100 km) recently announced by the United States for vehicle model year 2016. The Canadian Government has stated its intention to harmonize with United States fuel economy standards. Hybrid vehicle technology and advanced engine technologies introduced into the marketplace will help to minimize costs in the future. Finally, the Canadian Government’s costs to conduct compliance testing to the new requirements are expected to increase. This increase is expected to be $1,200 per vehicle tested, plus a one-time, up-front test equipment upgrade cost estimated at $100,000.

While the projected benefits (estimated at $81 million) exceed the costs (estimated at $60 million), the more important consideration is that these amendments to the Motor Vehicle Safety Regulations will maintain harmonization between the United States and the Canadian safety standards. Not harmonizing them could mean that some vehicle models might not be available in Canada, as a different test procedure would have been required. Furthermore, each model would then have required two separate roof crush tests, one for Canada and one for the United States, resulting in increased costs to the manufacturer and ultimately the consumer.

Strategic Environmental Assessment

Under the Government’s Strategic Environmental Assessment policy, a preliminary evaluation of the possible effects of the regulations was carried out. It was determined that the amendments to the regulations would have no significant net impact on the environment.

Consultation

Discussions regarding these specific amendments to the Motor Vehicle Safety Regulations have taken place during meetings with the vehicle manufacturers (both the Canadian Vehicle Manufacturers Association [CVMA] and the Association of International Automobile Manufacturers of Canada [AIAMC]) throughout the years 2006 to 2009. The vehicle manufacturers were concerned that if the Government did not harmonize the roof crush testing requirements with those of the United States, there would be extra Canadian-unique testing required to meet the two different requirements. The vehicle manufacturers’ associations were informed of the Government’s intention to proceed with amendments to the Motor Vehicle Safety Regulations relating to roof crush resistance in a timely fashion that aimed at maintaining harmonization.

During the 75-day pre-publication period, which began after March 22, 2008, the Government received jointly submitted written comments from the CVMA and AIAMC, as well as comments from Mercedes-Benz Canada Inc., one consulting company, and a member of the public.

Commenters were very supportive of Transport Canada’s efforts to harmonize requirements with those of the proposed United States FMVSS 216 update. They requested that despite an extended review period for FMVSS 216, in order to ensure harmonization with the United States, the Department not publish its final amendment until the final United States rule had been published.

Commenters also requested that in order to alleviate the potential for phase-in complications related to model-mix differences during the United States phase-in period, that Canada
require compliance only after the United States phase-in reached 100% in 2016. The Government has granted this request, and notes that in doing so, Canadians will still be able to derive safety benefits from improved roof strength due to the substantial number of vehicles that are common to the Canadian and United States fleets.

The CVMA/AIAMC requested that the Government consider the extensive comments submitted by the Association of International Automobile Manufacturers (AIAM) to the United States. Mercedes-Benz Canada Inc. also pointed out concerns with the United States NPRM. The Government notes that the subject issues have been considered by the United States during its rulemaking process, and has decided to harmonize with the United States final rule. In addition, the Government notes that by setting compliance to the new requirements only at the end of the United States phase-in period, the manufacturers are provided with sufficient time to carry out any necessary design work on future vehicles.

One commenter was concerned about issues raised by the National Mobility Equipment Dealers Association (NMEDA) to the United States, specifically concerns related to the applicability of FMVSS 220. The Government notes that it is allowing vehicles with a GVWR greater than 2 722 kg and up to 4 536 kg and with an altered roof, the option of conforming to either TSD 216 or TSD 220, at the choice of the manufacturer.

**Implementation, enforcement and service standards**

Motor vehicle manufacturers and importers are responsible for ensuring that their products conform to the requirements of the *Motor Vehicle Safety Regulations*. The Department of Transport monitors self-certification programs of manufacturers and importers by reviewing their test documentation, inspecting vehicles, and testing vehicles obtained in the open market. In addition, when a defect in a vehicle or equipment is identified, the manufacturer or importer must issue a Notice of Defect to the owners and to the Minister of Transport, Infrastructure and Communities. If a vehicle does not comply with a Canadian safety standard, the manufacturer or importer is liable to prosecution and, if found guilty, may be fined as prescribed in the *Motor Vehicle Safety Act*.

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Footnote a  
S.C. 1993, c. 16

Footnote b  
S.C. 1999, c. 33, s. 351

Footnote c  
S.C. 1993, c. 16
Footnote 1
C.R.C., c. 1038

Footnote 2

Footnote 3
Source: Automotive News Data Center and Association of International Automobile Manufacturers of Canada.

Footnote 4

Footnote 5