Docket No. NHTSA-2020-0109 / RIN 2127-AM04

Magna Mirrors of America, Inc. ("Magna Mirrors") would like to propose revisiting the FMVSS 111 Breakaway test procedure solely relative to verifying compliance with paragraph S5.1.2 (Mounting), the second sentence, of FMVSS 111, which is reproduced below for convenience of reference, and revising NHTSA's related Laboratory Test Procedure for FMVSS 111, No. TP-111V-01, Section 13.1 (Rearview Mirror Testing), Subsection F (Break-Away Test) ("TP-111V-01 13.1 F").

- The FMVSS 111, S5.1.2 400N "Breakaway Test" procedure described in TP-111V-01 13.1 F) no longer accurately reflects relevant real-world scenarios.
    - The test is a slow motion (up to 2 inches per minute) push watching for a reduction in force (which is how TP-111V-01 defines a deflection), which does not, in Magna Mirrors' view, reflect the vast majority of real-world high crash scenarios that impact the interior of a vehicle equipped with this type of rearview mirror include the vehicle occupant(s).

- Magna Mirrors believes that ECE R46 (unofficial copy attached for reference), , paragraph 6.3.2 (Impact Test) dynamic pendulum impact tests more accurately reflect real-world crash events. Its method is closer than the one in TP-111V-01 13.1 F to a dynamic crash event with an unbelted occupant. In particular:
    - The pendulum consists of a simulated head-form with 5mm thick 50 shore A simulated skin with 6.8kg mass
    - The 1m long pendulum is dropped from 60° and makes contact with the mirror at the bottom of its swing, imparting all of the energy into the mirror. See attached for specific test requirements.
    - Globally, many countries have adopted or are in the process of adopting ECE R46; for example (and without limitation), Japan recently adopted it in place of "Article 44", China has adopted it as part of its GB-15084 regulation.

- If ECE R46, para. 6.3.2 test procedure is adopted:
    - In general, no additional material cost is likely to be incurred as many mirror manufacturers such as Magna Mirrors can be expected already to operate or to have access to requisite ECE R46 pendulum test equipment.
    - Products made for USA only will be safer due to closer correlation with a dynamic vehicle event.
    - Products made for a global market will be equally safe but will be more readily developed and optimized.
        - Below is but one example of a recent development and optimizing problem due to FMVSS 111 regulation vs ECE R46 mismatch:
          A mirror windshield mounting system was developed that easily met ECE R46, para. 6.3.2 due to a spring attachment mechanism and other details. During the ECE R46 impact tests, the pendulum would hit the mirror and it would detach without glass breakage and leave less than 10mm remaining from the base. However, in order to meet the requirement of FMVSS 111, para. S5.1.2 (second sentence), the mounting spring details had to be revised such that it would deflect, collapse, or breakaway at a lower force. Initially the design gave a force of more than 1000N.

After revising the spring to meet the 400N deflection threshold, the vehicle OEM could experience detachment from the vehicle in the production line, which could be an indicator of possible field detachment issues. Development would need to resume to improve retention without affecting FMVSS 111 test performance, which due to layout geometry, tends to prove difficult.

- Magna Mirrors has also consulted with outside contractor laboratories that perform this FMVSS 111, S5.1.2 "breakaway" test, and understands that the they share our view that this existing method has become obsolete and could benefit from an update.

Proposal: Adopt ECE R46, para. 6.3.2 test and requirements in place of the FMVSS 111, S5.1.2 (Mounting), second sentence test.

Alternate Proposal: Optionally allow ECE R46, para. 6.3.2 and requirements in place of, and as a valid alternative to, the FMVSS 111, S5.1.2 (Mounting), second sentence test (so that a mirror manufacturer could choose either method to verify compliance with this specified FMVSS 111 requirement).

Alternate Proposal 2: Adopt ECE R46 in its entirety

FROM FMVSS 111:
S5.1.2 Mounting. The mirror mounting shall provide a stable support for the mirror, and shall provide for mirror adjustment by tilting in both the horizontal and vertical directions. If the mirror is in the head impact area, the mounting shall deflect, collapse or break away without leaving sharp edges when the reflective surface of the mirror is subjected to a force of 400 N in any forward direction that is not more than 45° from the forward longitudinal direction.