JPMA/Vehicle Manufacturer LATCH WG

Status Update

Abridged version of Lifesavers Conf April 08

13 May 2008
The JPMA and Vehicle Manufacturers LATCH Working Group (WG) was formed to examine LATCH related technical and communication issues.
Topics

I. LATCH Anchorage and CRS/Child Weight Limit Recommendations

II. LATCH in the Rear Center Seating Position

III. CRS Installation Using LATCH and Vehicle Belts Simultaneously

IV. Labeling of LATCH Attachments and Anchorages

V. Harmonization of CRS Top Tether Strap Lengths with Vehicle Anchorage Zones
I. LATCH CRS/Child Weight Limit Recommendations

Objective:
- Determine dynamic load capacity of vehicles.
- CRS manufactures would limit designs to these loads.
- CRS manufacturers would determine child seat weight limits.
I. LATCH CRS/Child Weight Limit Recommendations

LATCH WG Plan:

Correlate anchor loads for vehicle and CRS

- Quantify dynamic loads applied to vehicle LATCH anchorages.
  
  Total applied load = Child + CRS weight

- Define how to measure and relate CRS sled test loads to vehicle anchor loads.

- Dynamic vehicle anchorage loads in 35 mph frontal NCAP rigid barrier crash test configurations
I. LATCH CRS/Child Weight Limit Recommendations

WG Research (cont):

- **Vehicle Testing** - Define the dynamic load values applied to current vehicle anchorages when using a heavier CRS with test dummies up to 65 lbs. In-vehicle testing or simulations in 35 mph NCAP tests.

- **CRS Testing** – Test CRSs in FMVSS 213 bench environment using selected 35 mph NCAP test conditions to define anchor loads that CRSs generate under those test conditions.
I. LATCH CRS/Child Weight Limit Recommendations

Vehicle Manufacturer Test Plan:

- Conduct tests (or simulations) under 35 mph frontal NCAP conditions with a H3 6YO test dummy weighted to 65 lbs. in higher weight CRS (~21 lbs.).
- Collect anchor load data from a variety of vehicle types to obtain CRS LATCH attachment loads (lower anchor belt and top tether strap).
Initial Results:

- Vehicle and Component Dynamic Simulation Analysis.
  - From the sled testing we have developed a rough load estimate for a 65 lb child using a crash pulse from a 35 mph barrier test.
  - This was compared to an estimate of the strength of a sample of LATCH lower anchorages.
  - Preliminary analysis indicates that there appears to be some margin between the expected dynamic loads on the LATCH bars and their ultimate dynamic capacity.
CRS Manufacturer Sled Test Plan:

- **Step 1** - Conduct sled testing on an FMVSS 213 bench with a modified (65 lb) 6YO test dummy with a severe pulse (representative of conditions seen in NCAP testing) to define anchor loads in this configuration.
  - Measure lower and top tether flexible attachment and anchorage loads.
  - Use test experience to select a CRS to use for comparative testing.

- **Step 2** – Use data from CRS (bench) sled testing and full vehicle testing to make adjustments to the CRS bench test conditions to correlate to vehicle environment loads.

- **Step 3** – Test CRS under final test conditions for CRS LATCH attachment evaluation.

Note – “anchorage” is vehicle-related and “attachment” is CRS-related
I. LATCH CRS/Child Weight Limit Recommendations

Status - CRS Testing:
  - Step 1 - Testing complete [20 tests].

Initial Results:
  - Conducted tests with lap/shoulder belt- and lap belt- only installation to define belt loads before testing with lower anchor load cells.
  - Conducted tests with LATCH installation measuring lower and top tether flexible attachment and anchorage loads.
  - CRS configuration defined for comparative testing.

Note – “anchorage” is vehicle-related and “attachment” is CRS-related
I. LATCH CRS/Child Weight Limit Recommendations

LATCH, Lap, L/S Belt and Tether Loads
FMVSS 213 Bench Seat/Severe 35 mph pulse

Load Comparison for Each Anchor Point

Load by Anchor Location on FMVSS 213 Bench
I. LATCH CRS/Child Weight Limit Recommendations

Next Steps:

1. Complete data collection of vehicle and CRS tests
   a. Testing with 65 pound test dummies in harness
   b. Testing with other size test dummies
2. Analyze data and define CRS sled test conditions.
3. Test CRS under modified test conditions.
4. Define recommendations based on data.

Timing:

When recommendations are final, they will be reported.