

JPMA/Vehicle Manufacturer LATCH WG

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Status Update

Formation of Joint Industry Initiative

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

Topics

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- 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

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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

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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

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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

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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).

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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.

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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

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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.

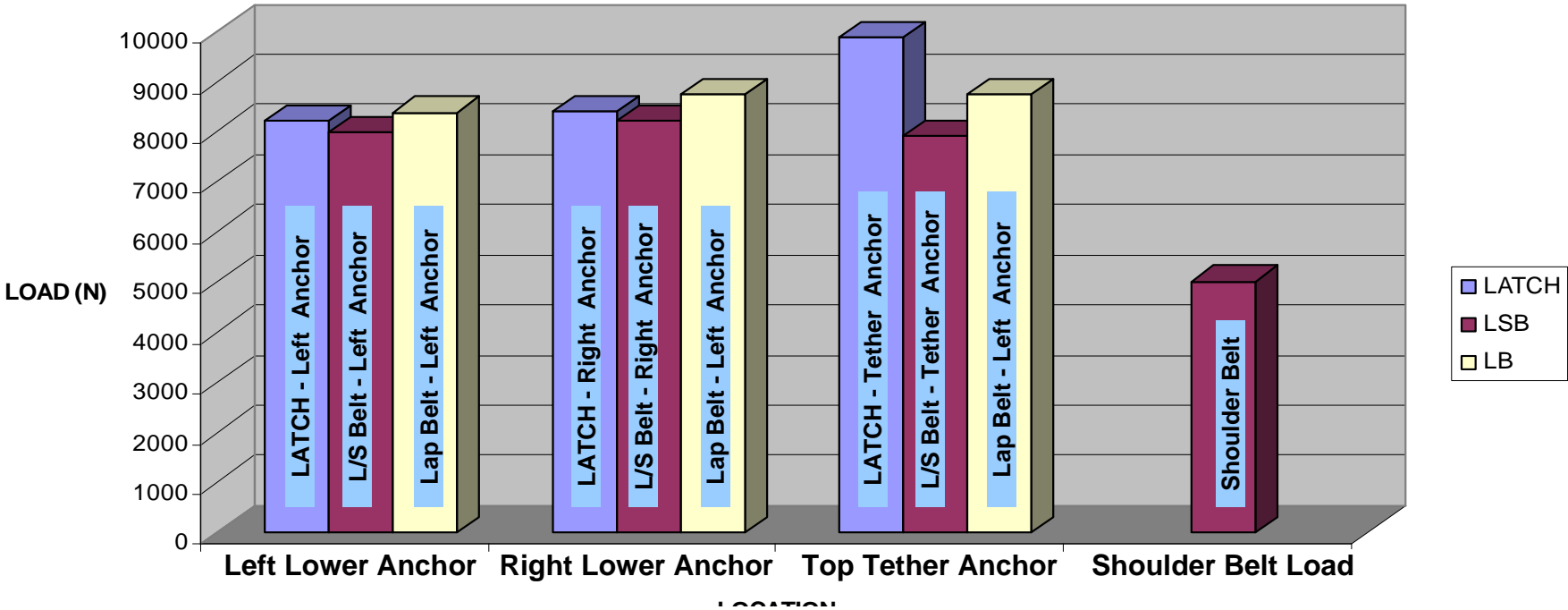
Note – “anchorage” is vehicle-related and “attachment” is CRS-related

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

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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.