ON THE ROAD

MARGARITELLI ROAD SAFETY

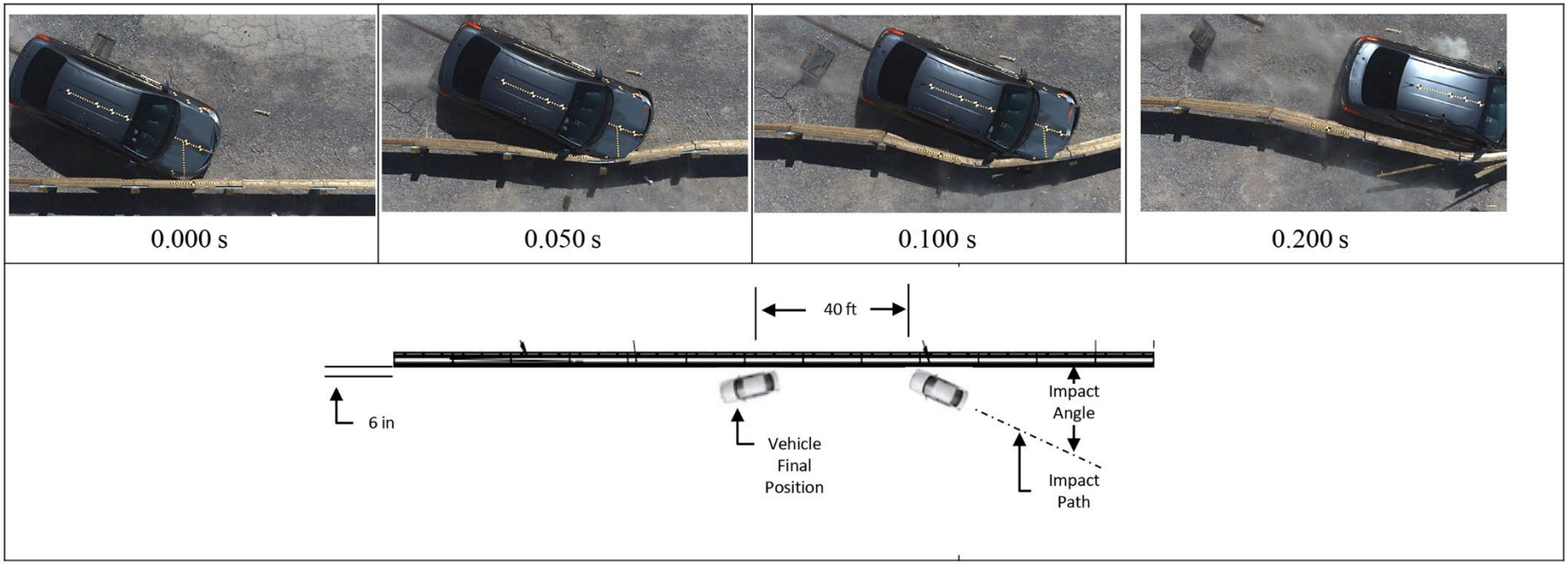
SUMMARY OF RESULTS

RANGER GUARDRAIL

RGS-01 Barrier

Tested at:

Calspan



General Information
- Test Agency ..... Calspan LLC
- Test Standard Test No. ..... MASH Test 3-10
- Calspan Test No. BR0186
- Test Date..... 04-09-2024

Test Article
- Type ..... Longitudinal Barrier
- Name..... Ranger Guardrail

Installation Length ..... 200 ft [61 m]

Material or Key Elements... Includes sections of guardrail that spanned 75" between each vertical ground post. The guardrail system contains five main pieces to make up each individual section that spanned the length of the test installation. These pieces included the vertical C-channel post which was imbedded into the ground, a corrugated splice plate, two sections of guardrail, and an optional aesthetic, non-structural component wooden cover for the posts and the back cover for the rail sections. The system was installed at it's upper tolerance so that the top of the guardrail measured 35" from the surface of the ground.

Surface Type and Condition ..... Barrier was installed on a flat MASH compatible soil of coarse crushed limestone

Test Vehicle
- Type/Designation 1100C
- Make and Model..... 2017 Nissan Versa
- Curb ..... 2,330 lb [1,056.9 kg]
- Test Inertial ..... 2,405 lb [1,090.9 kg]
- Dummy..... 165 lb (75 kg)
- Gross Static..... 2,470 lb [1,165.9 kg]

Impact Conditions
- Speed .....61.1 mph [98.3 km/h]
- Angle.....24.5°
- Location/Orientation.....41.3 in [1,0504 mm] Upstream of Post 11

Impact Severity ..... 55.1 kip-ft (74.7 kJ)

Exit Conditions
- Speed .....15.6 mph [25.5 km/h]
- Trajectory/Heading Angle ... 18.2°

Occupant Risk Values
- Longitudinal OIV .....10.6 ft/s [3.2 m/s]
- Lateral OIV.....11.8 ft/s [3.6 m/s]
- Longitudinal Ridedown ..... 8.7 g
- Lateral Ridedown..... 7.2 g
- THIV.....5.2 m/s
- ASI.....0.53

Max. 0.050-s Average
- Longitudinal .....4.1 g
- Lateral.....4.6 g
- Vertical..... 3.5 g

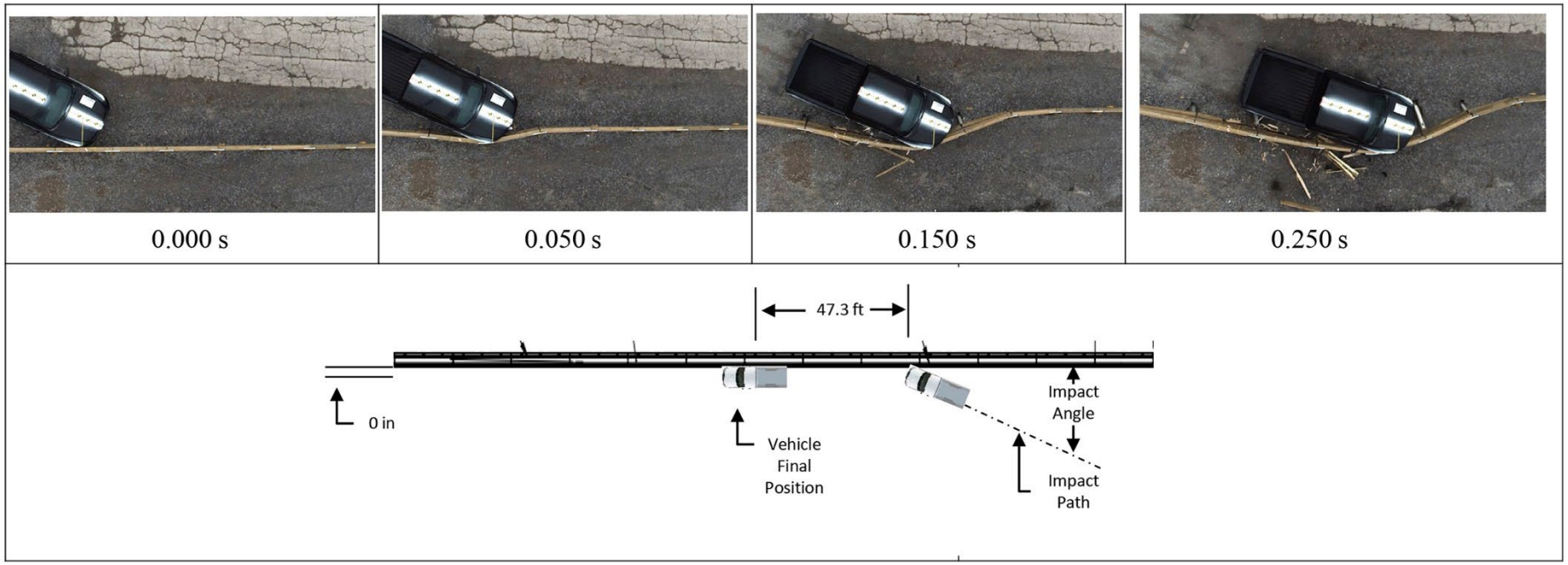
Post-Impact Trajectory
- Stopping Distance..... 40 ft [12.2 m] downstream 6 in [152 mm] left of barrier

Vehicle Stability
- Maximum Yaw Angle ..... 59.5°
- Maximum Pitch Angle ..... 30.6°
- Maximum Roll Angle..... 50.0°
- Vehicle Snagging..... None
- Vehicle Pocketing ..... No

Test Article Deflections
- Dynamic..... 48.5 in [1,233 mm]
- Static..... 38.1 in [967 mm]
- Working Width..... 58.5 in [1,489 mm]

Vehicle Damage
- VDS 01RFQ4
- CDC 01RFEW4
- Max. Occupant Comp. Deformation..... 0.0 in [0.0 mm]

Summary of Results for *MASH* Test 3-10 on Longitudinal Barrier



General Information
- Test Agency ..... Calspan LLC
- Test Standard Test No. ..... MASH Test 3-11
- Calspan Test No. BR0238
- Test Date..... 04-04-2024

Test Article
- Type ..... Longitudinal Barrier
- Name..... Ranger Guardrail

Installation Length ..... 200 ft [61 m]

Material or Key Elements... Includes sections of guardrail that spanned 75" between each vertical ground post. The guardrail system contains five main pieces to make up each individual section that spanned the length of the test installation. These pieces included the vertical C-channel post which was imbedded into the ground, a corrugated splice plate, two sections of guardrail, and an optional aesthetic, non-structural component wooden cover for the posts and the back cover for the rail sections. The system was installed at it's upper tolerance so that the top of the guardrail measured 35" from the surface of the ground.

Surface Type and Condition ..... Barrier was installed on a flat MASH compatible soil of coarse crushed limestone

Test Vehicle
- Type/Designation 2270P
- Make and Model..... 2017 Dodge Ram 1500
- Curb ..... 4,875 lb [2,211.3 kg]
- Test Inertial ..... 4,970 lb [2,254.4 kg]
- Dummy..... N/A
- Gross Static..... 4,970 lb [2,254.4 kg]

Impact Conditions
- Speed .....61.9 mph [99.6 km/h]
- Angle.....25.2°
- Location/Orientation.....41.3 in [1,0504 mm] Upstream of Post 11

Impact Severity ..... 115.4 kip-ft (156.5 kJ)

Exit Conditions
- Speed .....18.4 mph [29.6 km/h]
- Trajectory/Heading Angle ...0°

Occupant Risk Values
- Longitudinal OIV .....19.9 ft/s [6.1 m/s]
- Lateral OIV.....9.7 ft/s [3.0 m/s]
- Longitudinal Ridedown ..... 6.9 g
- Lateral Ridedown..... 5.9 g
- THIV.....6.8 m/s
- ASI.....0.57

Max. 0.050-s Average
- Longitudinal .....4.8 g
- Lateral.....4.0 g
- Vertical..... 3.5 g

Post-Impact Trajectory
- Stopping Distance..... 47.3 ft [14.4 m] downstream
  0 in [0 mm] left of barrier

Vehicle Stability
- Maximum Yaw Angle..... 59.3°
- Maximum Pitch Angle..... 30.6°
- Maximum Roll Angle..... 34.5°
- Vehicle Snagging..... None
- Vehicle Pocketing ..... No

Test Article Deflections
- Dynamic..... 78.0 in [1,981 mm]
- Static..... 52.2 in [1,327 mm]
- Working Width..... 88.0 in [2,237.3 mm]

Vehicle Damage
- VDS 01RFQ3
- CDC 01RFEW3
- Max. Occupant Comp. Deformation..... 0.0 in [0.0 mm]

Summary of Results for *MASH* Test 3-11 on Longitudinal Barrier