APPENDIX G

Occupant Risk Assessment
Summary Report from TRAP

-Finite Element Analysis Results-
# Test Summary Report

## General Information
- **Test Agency:** WPI
- **Test Number:** A-70-05
- **Test Date:** Dec 2001
- **Test Article:** A Curb with Flat Backfill

## Test Vehicle
- **Description:** C2500
- **Test Inertial Mass:** 2000 kg
- **Gross Static Mass:** 2000 kg

## Impact Conditions
- **Speed:** 70.0 km/hr
- **Angle:** 5.0 degrees

## Occupant Risk Factors

<table>
<thead>
<tr>
<th>Impact Velocity (m/s)</th>
<th>(at 0.3927 seconds on right side of interior)</th>
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<tbody>
<tr>
<td>x-direction</td>
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<td>y-direction</td>
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<table>
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<tr>
<th>THIV (km/hr)</th>
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<tr>
<td>x-direction</td>
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<table>
<thead>
<tr>
<th>Ridedown Accelerations (g's)</th>
<th>(1.4210 - 1.4310 seconds)</th>
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<tbody>
<tr>
<td>x-direction</td>
<td>-2.9</td>
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<td>y-direction</td>
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<table>
<thead>
<tr>
<th>PHD (g's)</th>
<th>(1.4203 - 1.4303 seconds)</th>
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<tr>
<td>x-direction</td>
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<table>
<thead>
<tr>
<th>ASI</th>
<th>(0.2313 - 0.2813 seconds)</th>
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<td>x-direction</td>
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<table>
<thead>
<tr>
<th>Max 50msec Moving Avg. Accelerations (g's)</th>
<th>(0.0850 - 0.1350 seconds)</th>
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<tbody>
<tr>
<td>x-direction</td>
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</tr>
<tr>
<td>y-direction</td>
<td>-1.6</td>
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<tr>
<td>z-direction</td>
<td>-1.1</td>
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<table>
<thead>
<tr>
<th>Max Roll, Pitch, and Yaw Angles (degrees)</th>
<th>(0.9360 seconds)</th>
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<tbody>
<tr>
<td>Roll</td>
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</tr>
<tr>
<td>Pitch</td>
<td>3.0</td>
</tr>
<tr>
<td>Yaw</td>
<td>22.6</td>
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</tbody>
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## Figure G.1:
Summary report of occupant risk factors from TRAP:
- **Curb Type:** AASHTO A Curb
- **Impact Speed:** 70 km/hr
- **Impact Angle:** 5 degrees.
Test Summary Report

General Information
Test Agency: WPI
Test Number: A-70-15
Test Date: Dec 2001
Test Article: A Curb with Flat Backfill

Test Vehicle
Description: C2500
Test Inertial Mass: 2000 kg
Gross Static Mass: 2000 kg

Impact Conditions
Speed: 70.0 km/hr
Angle: 15.0 degrees

Occupant Risk Factors
Impact Velocity (m/s) at 0.6040 seconds on front of interior
x-direction 1.8
y-direction -0.9
THIV (km/hr): 6.4 at 0.6080 seconds on front of interior
THIV (m/s): 1.8
Ridedown Accelerations (g's)
x-direction -2.8 (0.6037 - 0.6137 seconds)
y-direction -3.8 (0.6037 - 0.6137 seconds)
PHD (g's): 4.4 (0.6343 - 0.6443 seconds)
ASI: 0.20 (0.5427 - 0.5927 seconds)

Max. 50msec Moving Avg. Accelerations (g's)
x-direction -1.0 (-0.0050 - 0.0450 seconds)
y-direction 1.7 (0.5390 - 0.5890 seconds)
z-direction -1.4 (0.5870 - 0.6370 seconds)

Max Roll, Pitch, and Yaw Angles (degrees)
Roll -6.5 (0.6013 seconds)
Pitch 3.1 (0.5773 seconds)
Yaw 27.4 (1.7000 seconds)

Figure G.2: Summary report of occupant risk factors from TRAP:
Curb Type -- AASHTO A Curb
Impact Speed -- 70 km/hr
Impact Angle -- 15 degrees.
## Test Summary Report

### General Information
- Test Agency: WPI
- Test Number: A-70-25
- Test Date: Dec 2001
- Test Article: A Curb with Flat Backfill

### Test Vehicle
- Description: C2500
- Test Inertial Mass: 2000 kg
- Gross Static Mass: 2000 kg

### Impact Conditions
- Speed: 70.0 km/hr
- Angle: 25.0 degrees

### Occupant Risk Factors
- Impact Velocity (m/s) at 0.5293 seconds on front of interior:
  - x-direction: 1.9
  - y-direction: -0.7
- THIV (km/hr) at 0.5393 seconds on front of interior:
  - THIV (m/s): 2.1
- Ridedown Accelerations (g's):
  - x-direction: -1.1 (0.5977 - 0.6077 seconds)
  - y-direction: 1.6 (0.5850 - 0.5950 seconds)
- PHD (g's): 2.5 (1.5970 - 1.6070 seconds)
- ASI: 0.22 (0.3147 - 0.3647 seconds)

### Max. 50msec Moving Avg. Accelerations (g's)
- x-direction: -1.5 (0.2043 - 0.2543 seconds)
- y-direction: 1.7 (0.0877 - 0.1377 seconds)
- z-direction: -1.8 (0.2343 - 0.2843 seconds)

### Max Roll, Pitch, and Yaw Angles (degrees)
- Roll: -5.4 (0.2200 seconds)
- Pitch: 2.4 (0.4893 seconds)
- Yaw: 12.0 (1.6107 seconds)

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Figure G.3: Summary report of occupant risk factors from TRAP:
- Curb Type: AASHTO A Curb
- Impact Speed: 70 km/hr
- Impact Angle: 25 degrees.
Test Summary Report

General Information
Test Agency: WPI
Test Number: B-70-05
Test Date: Dec 2001
Test Article: B Curb with Flat Backfill

Test Vehicle
Description: C2500
Test Inertial Mass: 2000 kg
Gross Static Mass: 2000 kg

Impact Conditions
Speed: 70.0 km/hr
Angle: 5.0 degrees

Occupant Risk Factors
Impact Velocity (m/s) at 0.6273 seconds on front of interior
   x-direction 1.7
   y-direction -0.8

THIV (km/hr): 6.3 at 0.6200 seconds on front of interior
THIV (m/s): 1.8

Ridedown Accelerations (g's)
   x-direction -2.2 (1.1470 - 1.1570 seconds)
   y-direction -3.1 (1.1110 - 1.1210 seconds)

PHD (g's): 3.6 (1.1103 - 1.1203 seconds)
ASI: 0.11 (1.1927 - 1.2427 seconds)

Max. 50msec Moving Avg. Accelerations (g's)
   x-direction -0.7 (1.0577 - 1.1077 seconds)
   y-direction 0.9 (0.4737 - 0.5237 seconds)
   z-direction 1.0 (1.1930 - 1.2430 seconds)

Max Roll, Pitch, and Yaw Angles (degrees)
   Roll -6.9 (0.7647 seconds)
   Pitch 2.4 (1.1113 seconds)
   Yaw 20.2 (1.7000 seconds)

Figure G.4: Summary report of occupant risk factors from TRAP:
   Curb Type -- AASHTO B Curb
   Impact Speed -- 70 km/hr
   Impact Angle -- 5 degrees.
**Test Summary Report**

**General Information**
- **Test Agency:** WPI
- **Test Number:** B-70-15
- **Test Date:** Dec 2001
- **Test Article:** B Curb with Flat Backfill

**Test Vehicle**
- **Description:** C2500
- **Test Inertial Mass:** 2000 kg
- **Gross Static Mass:** 2000 kg

**Impact Conditions**
- **Speed:** 70.0 km/hr
- **Angle:** 15.0 degrees

**Occupant Risk Factors**
- **Impact Velocity (m/s) at 0.5987 seconds on front of interior**
  - x-direction: 1.8
  - y-direction: -0.1

- **THIV (km/hr):** 6.4 at 0.5753 seconds on front of interior
  - THIV (m/s): 1.8

- **Ridedown Accelerations (g's)**
  - x-direction: -3.1 (0.6823 - 0.6923 seconds)
  - y-direction: -3.6 (0.6730 - 0.6830 seconds)

- **PHD (g's):** 4.2 (0.6730 - 0.6830 seconds)
- **ASI:** 0.19 (0.1947 - 0.2447 seconds)

- **Max. 50msec Moving Avg. Accelerations (g's)**
  - x-direction: -1.5 (0.1930 - 0.2430 seconds)
  - y-direction: 1.5 (0.5443 - 0.5943 seconds)
  - z-direction: 1.4 (0.3337 - 0.3837 seconds)

- **Max Roll, Pitch, and Yaw Angles (degrees)**
  - Roll: -6.6 (0.6740 seconds)
  - Pitch: 3.3 (0.6600 seconds)
  - Yaw: 25.2 (1.2280 seconds)

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**Figure G.5:** Summary report of occupant risk factors from TRAP:
- **Curb Type:** AASHTO B Curb
- **Impact Speed:** 70 km/hr
- **Impact Angle:** 15 degrees.
Test Summary Report

General Information
Test Agency: WPI
Test Number: B-70-25
Test Date: Dec 2001
Test Article: B Curb with Flat Backfill

Test Vehicle
Description: C2500
Test Inertial Mass: 2000 kg
Gross Static Mass: 2000 kg

Impact Conditions
Speed: 70.0 km/hr
Angle: 25.0 degrees

Occupant Risk Factors
Impact Velocity (m/s) at 0.5820 seconds on front of interior
x-direction 1.7
y-direction -0.8
THIV (km/hr): 6.9 at 0.5887 seconds on front of interior
THIV (m/s): 1.9

Ridedown Accelerations (g's)
x-direction -0.7 (0.7637 - 0.7737 seconds)
y-direction 1.4 (0.5817 - 0.5917 seconds)
PHD (g's): 1.6 (0.7097 - 0.7197 seconds)
ASI: 0.25 (0.1987 - 0.2487 seconds)

Max. 50msec Moving Avg. Accelerations (g's)
x-direction -1.3 (0.1617 - 0.2117 seconds)
y-direction -1.9 (0.1983 - 0.2483 seconds)
z-direction 1.9 (0.3023 - 0.3523 seconds)

Max Roll, Pitch, and Yaw Angles (degrees)
Roll -5.4 (0.2100 seconds)
Pitch 2.8 (0.4767 seconds)
Yaw 26.9 (1.7000 seconds)

Figure G.6: Summary report of occupant risk factors from TRAP:
Curb Type -- AASHTO B Curb
Impact Speed -- 70 km/hr
Impact Angle -- 25 degrees.
## Test Summary Report

### General Information
- **Test Agency:** WPI
- **Test Number:** B-100-05
- **Test Date:** Dec 2001
- **Test Article:** B Curb with Flat Backfill

### Test Vehicle
- **Description:** C2500
- **Test Inertial Mass:** 2000 kg
- **Gross Static Mass:** 2000 kg

### Impact Conditions
- **Speed:** 100.0 km/hr
- **Angle:** 5.0 degrees

### Occupant Risk Factors
- **Impact Velocity (m/s) at 0.5300 seconds on front of interior**
  - x-direction: 2.0
  - y-direction: -0.5
- **THIV (km/hr):** 7.3 at 0.5253 seconds on front of interior
- **THIV (m/s):** 2.0
- **Ridedown Accelerations (g's)**
  - x-direction: -2.0 (0.9763 - 0.9863 seconds)
  - y-direction: -3.6 (0.9403 - 0.9503 seconds)
- **PHD (g's):** 4.0 (0.9757 - 0.9857 seconds)
- **ASI:** 0.19 (0.2067 - 0.2567 seconds)

### Max. 50msec Moving Avg. Accelerations (g's)
- x-direction: -1.0 (0.2070 - 0.2570 seconds)
- y-direction: -1.5 (0.2070 - 0.2570 seconds)
- z-direction: -1.1 (0.1343 - 0.1843 seconds)

### Max Roll, Pitch, and Yaw Angles (degrees)
- **Roll:** -7.6 (0.6533 seconds)
- **Pitch:** 2.3 (0.5320 seconds)
- **Yaw:** 21.4 (1.7000 seconds)

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**Figure G.7:** Summary report of occupant risk factors from TRAP:
- **Curb Type:** -- AASHTO B Curb
- **Impact Speed:** -- 100 km/hr
- **Impact Angle:** -- 5 degrees.
Test Summary Report

General Information
Test Agency: WPI
Test Number: B-100-15
Test Date: Dec 2001
Test Article: B Curb with Flat Backfill

Test Vehicle
Description: C2500
Test Inertial Mass: 2000 kg
Gross Static Mass: 2000 kg

Impact Conditions
Speed: 100.0 km/hr
Angle: 15.0 degrees

Occupant Risk Factors
Impact Velocity (m/s) at 0.5333 seconds on front of interior
x-direction 2.0
y-direction 0.6

THIV (km/hr): 7.7 at 0.5260 seconds on front of interior
THIV (m/s): 2.1

Ridedown Accelerations (g's)
x-direction -1.2 (0.6150 - 0.6250 seconds)
y-direction 1.7 (0.5697 - 0.5797 seconds)

PHD (g's): 1.7 (0.5697 - 0.5797 seconds)
ASI: 0.22 (0.2420 - 0.2920 seconds)

Max. 50msec Moving Avg. Accelerations (g's)
x-direction -1.2 (0.1157 - 0.1657 seconds)
y-direction -1.6 (0.2417 - 0.2917 seconds)
z-direction -1.4 (0.1650 - 0.2150 seconds)

Max Roll, Pitch, and Yaw Angles (degrees)
Roll -5.0 (0.2607 seconds)
Pitch 2.6 (0.4827 seconds)
Yaw -20.0 (1.7000 seconds)

Figure G.8: Summary report of occupant risk factors from TRAP:
Curb Type -- AASHTO B Curb
Impact Speed -- 100 km/hr
Impact Angle -- 15 degrees.
### General Information
- **Test Agency:** WPI
- **Test Number:** B-100-25
- **Test Date:** Dec 2001
- **Test Article:** B Curb with Flat Backfill

### Test Vehicle
- **Description:** C2500
- **Test Inertial Mass:** 2000 kg
- **Gross Static Mass:** 2000 kg

### Impact Conditions
- **Speed:** 100.0 km/hr
- **Angle:** 25.0 degrees

### Occupant Risk Factors
- **Impact Velocity (m/s) at 0.5440 seconds on front of interior**
  - x-direction: 2.0
  - y-direction: -0.9
- **THIV (km/hr) at 0.5473 seconds on front of interior**
  - 7.8
- **THIV (m/s)**
  - 2.2
- **Ridedown Accelerations (g's)**
  - x-direction: -1.2 (1.6417 - 1.6517 seconds)
  - y-direction: 1.9 (0.5963 - 0.6063 seconds)
- **PHD (g's):**
  - 3.3 (1.6630 - 1.6730 seconds)
- **ASI:**
  - 0.29 (0.1753 - 0.2253 seconds)

### Max. 50msec Moving Avg. Accelerations (g's)
- x-direction: -1.9 (0.1170 - 0.1670 seconds)
- y-direction: 2.0 (0.0817 - 0.1317 seconds)
- z-direction: -2.8 (0.1750 - 0.2250 seconds)

### Max Roll, Pitch, and Yaw Angles (degrees)
- **Roll:** -4.2 (0.2933 seconds)
- **Pitch:** 2.4 (0.5087 seconds)
- **Yaw:** 23.1 (1.5887 seconds)

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**Figure G.9:** Summary report of occupant risk factors from TRAP:
- **Curb Type:** AASHTO B Curb
- **Impact Speed:** 100 km/hr
- **Impact Angle:** 25 degrees.
Test Summary Report

General Information
Test Agency: WPI
Test Number: C-70-05
Test Date: Dec 2001
Test Article: C Curb with Flat Backfill

Test Vehicle
Description: C2500
Test Inertial Mass: 2000 kg
Gross Static Mass: 2000 kg

Impact Conditions
Speed: 70.0 km/hr
Angle: 5.0 degrees

Occupant Risk Factors
Impact Velocity (m/s) at 0.7040 seconds on left side of interior
  x-direction  1.5
  y-direction  -1.6
THIV (km/hr): 7.2 at 0.6687 seconds on left side of interior
THIV (m/s): 2.0

Ridedown Accelerations (g's)
  x-direction  -0.6 (0.8623 - 0.8723 seconds)
  y-direction  1.3 (1.0077 - 1.0177 seconds)
PHD (g's): 1.3 (1.0077 - 1.0177 seconds)
ASI: 0.09 (0.7980 - 0.8480 seconds)

Max. 50msec Moving Avg. Accelerations (g's)
  x-direction  -0.4 (0.1163 - 0.1663 seconds)
  y-direction  0.7 (0.7977 - 0.8477 seconds)
  z-direction  0.6 (1.0550 - 1.1050 seconds)

Max Roll, Pitch, and Yaw Angles (degrees)
  Roll -6.0 (0.7027 seconds)
  Pitch 1.6 (0.2900 seconds)
  Yaw 12.6 (1.5633 seconds)

Figure G.10: Summary report of occupant risk factors from TRAP:
Curb Type – AASHTO C Curb
Impact Speed – 70 km/hr
Impact Angle – 5 degrees.
Test Summary Report

General Information

<table>
<thead>
<tr>
<th>Test Agency:</th>
<th>WPI</th>
</tr>
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<tbody>
<tr>
<td>Test Number:</td>
<td>C-70-15</td>
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<tr>
<td>Test Date:</td>
<td>Dec 2001</td>
</tr>
<tr>
<td>Test Article:</td>
<td>C Curbs with Flat Backfill</td>
</tr>
</tbody>
</table>

Test Vehicle

| Description: | C2500 |
| Test Inertial Mass: | 2000 kg |
| Gross Static Mass: | 2000 kg |

Impact Conditions

| Speed: | 70.0 km/hr |
| Angle: | 15.0 degrees |

Occupant Risk Factors

- Impact Velocity (m/s) at 0.7007 seconds on front of interior:
  - x-direction: 1.6
  - y-direction: -1.2
- THIV (km/hr): 7.0 at 0.6880 seconds on left side of interior
- THIV (m/s): 1.9

Ridedown Accelerations (g's)

| x-direction | -0.5 (0.7197 - 0.7297 seconds) |
| y-direction | 1.0 (0.7377 - 0.7477 seconds) |

PHD (g's): 1.1 (0.7370 - 0.7470 seconds)

ASI: 0.11 (0.5653 - 0.6153 seconds)

Max. 50msec Moving Avg. Accelerations (g's)

| x-direction | -0.4 (0.2070 - 0.2570 seconds) |
| y-direction | 0.8 (0.4210 - 0.4710 seconds) |
| z-direction | -1.0 (0.5643 - 0.6143 seconds) |

Max Roll, Pitch, and Yaw Angles (degrees)

| Roll | -4.2 (0.5787 seconds) |
| Pitch | 2.1 (0.5740 seconds) |
| Yaw | 11.4 (1.3147 seconds) |

Figure G.11: Summary report of occupant risk factors from TRAP:
Curb Type -- AASHTO C Curbs
Impact Speed -- 70 km/hr
Impact Angle -- 15 degrees.
## Test Summary Report

### General Information
- **Test Agency:** WPI  
- **Test Number:** C-70-25  
- **Test Date:** Dec 2001  
- **Test Article:** C Curb with Flat Backfill

### Test Vehicle
- **Description:** C2500  
- **Test Inertial Mass:** 2000 kg  
- **Gross Static Mass:** 2000 kg

### Impact Conditions
- **Speed:** 70.0 km/hr  
- **Angle:** 25.0 degrees

### Occupant Risk Factors
- **Impact Velocity (m/s) at 0.6767 seconds on front of interior**
  - x-direction: 1.6  
  - y-direction: -1.3
- **THIV (km/hr):** 7.0 at 0.6760 seconds on left side of interior  
- **THIV (m/s):** 1.9
- **Ridedown Accelerations (g's)**
  - x-direction: -0.7 (0.8823 - 0.8923 seconds)  
  - y-direction: 1.6 (0.7230 - 0.7330 seconds)
- **PHD (g's):** 1.7 (0.7243 - 0.7343 seconds)
- **ASI:** 0.16 (0.4513 - 0.5013 seconds)

### Max. 50msec Moving Avg. Accelerations (g's)
- **x-direction:** -0.7 (0.1903 - 0.2403 seconds)  
- **y-direction:** 1.2 (0.4550 - 0.5050 seconds)  
- **z-direction:** 1.2 (0.3397 - 0.3897 seconds)

### Max Roll, Pitch, and Yaw Angles (degrees)
- **Roll:** -3.9 (0.2380 seconds)  
- **Pitch:** 2.5 (0.4667 seconds)  
- **Yaw:** 23.7 (1.7000 seconds)

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**Figure G.12:** Summary report of occupant risk factors from TRAP:  
Curb Type -- AASHTO C Curb  
Impact Speed -- 70 km/hr  
Impact Angle -- 25 degrees.
Test Summary Report

**General Information**
- Test Agency: WPI
- Test Number: C-100-05
- Test Date: Dec 2001
- Test Article: C Curb with Flat Backfill

**Test Vehicle**
- Description: C2500
- Test Inertial Mass: 2000 kg
- Gross Static Mass: 2000 kg

**Impact Conditions**
- Speed: 100.0 km/hr
- Angle: 5.0 degrees

**Occupant Risk Factors**
- Impact Velocity (m/s) at 0.6200 seconds on front of interior
  - x-direction: 1.9
  - y-direction: -1.0
- THIV (km/hr): 7.5 at 0.6240 seconds on front of interior
  - THIV (m/s): 2.1
- Ridedown Accelerations (g's)
  - x-direction: -1.7 (0.6370 - 0.6470 seconds)
  - y-direction: -1.2 (0.8843 - 0.8943 seconds)
- PHD (g's): 2.2 (0.6423 - 0.6523 seconds)
- ASI: 0.09 (0.6693 - 0.7193 seconds)

**Max. 50msec Moving Avg. Accelerations (g's)**
- x-direction: -0.6 (0.5970 - 0.6470 seconds)
- y-direction: 0.7 (0.6690 - 0.7190 seconds)
- z-direction: 0.7 (0.8877 - 0.9377 seconds)

**Max Roll, Pitch, and Yaw Angles (degrees)**
- Roll: -5.7 (0.6147 seconds)
- Pitch: 1.4 (0.4147 seconds)
- Yaw: 9.1 (1.6267 seconds)

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**Figure G.13:** Summary report of occupant risk factors from TRAP:
- Curb Type: AASHTO C Curb
- Impact Speed: 100 km/hr
- Impact Angle: 5 degrees.
Test Summary Report

General Information
Test Agency: WPI
Test Number: C-100-15
Test Date: Dec 2001
Test Article: C Curb with Flat Backfill

Test Vehicle
Description: C2500
Test Inertial Mass: 2000 kg
Gross Static Mass: 2000 kg

Impact Conditions
Speed: 100.0 km/hr
Angle: 15.0 degrees

Occupant Risk Factors
Impact Velocity (m/s) at 0.5747 seconds on front of interior
  x-direction  2.0
  y-direction  -0.9

THIV (km/hr): 7.8 at 0.5813 seconds on front of interior
THIV (m/s): 2.2

Ridedown Accelerations (g's)
  x-direction  -0.7 (0.8703 - 0.8803 seconds)
  y-direction  1.3 (0.6703 - 0.6803 seconds)

PHD (g's): 1.5 (0.6750 - 0.6850 seconds)
ASI: 0.15 (0.0947 - 0.1447 seconds)

Max. 50msec Moving Avg. Accelerations (g's)
  x-direction  -0.7 (0.1070 - 0.1570 seconds)
  y-direction  1.3 (0.0943 - 0.1443 seconds)
  z-direction  -1.0 (0.1690 - 0.2190 seconds)

Max Roll, Pitch, and Yaw Angles (degrees)
  Roll -3.8 (0.2553 seconds)
  Pitch 2.3 (0.4287 seconds)
  Yaw 22.8 (1.7000 seconds)

Figure G.14: Summary report of occupant risk factors from TRAP:
  Curb Type -- AASHTO C Curb
  Impact Speed -- 100 km/hr
  Impact Angle -- 15 degrees.
Test Summary Report

General Information
Test Agency: WPI
Test Number: C-100-25
Test Date: Dec 2001
Test Article: C Curb with Flat Backfill

Test Vehicle
Description: C2500
Test Inertial Mass: 2000 kg
Gross Static Mass: 2000 kg

Impact Conditions
Speed: 100.0 km/hr
Angle: 25.0 degrees

Occupant Risk Factors
Impact Velocity (m/s) at 0.5747 seconds on front of interior
  x-direction  1.9
  y-direction -0.9

THIV (km/hr): 7.6 at 0.5813 seconds on front of interior
THIV (m/s): 2.1

Ridedown Accelerations (g's)
  x-direction  -0.7 (0.7990 - 0.8090 seconds)
  y-direction  1.3 (0.6703 - 0.6803 seconds)

PHD (g's): 1.4 (0.6677 - 0.6777 seconds)
ASI: 0.18 (0.1793 - 0.2293 seconds)

Max. 50msec Moving Avg. Accelerations (g's)
  x-direction  -1.1 (0.1270 - 0.1770 seconds)
  y-direction  1.5 (0.0950 - 0.1450 seconds)
  z-direction  -1.7 (0.1797 - 0.2297 seconds)

Max Roll, Pitch, and Yaw Angles (degrees)
  Roll -3.4 (0.3173 seconds)
  Pitch 2.0 (0.5393 seconds)
  Yaw 23.7 (1.7000 seconds)

Figure G.15: Summary report of occupant risk factors from TRAP:
  Curb Type    -- AASHTO C Curb
  Impact Speed -- 100 km/hr
  Impact Angle -- 25 degrees.
## Test Summary Report

### General Information
- **Test Agency:** WPI  
- **Test Number:** D-70-05  
- **Test Date:** Dec 2001  
- **Test Article:** D Curb with Flat Backfill

### Test Vehicle
- **Description:** C2500  
- **Test Inertial Mass:** 2000 kg  
- **Gross Static Mass:** 2000 kg

### Impact Conditions
- **Speed:** 70.0 km/hr  
- **Angle:** 5.0 degrees

### Occupant Risk Factors
- **Impact Velocity (m/s) at 0.7067 seconds on front of interior**  
  - x-direction: 1.6  
  - y-direction: -1.4
- **THIV (km/hr):** 7.2 at 0.7080 seconds on front of interior  
  **THIV (m/s):** 2.0
- **Ridedown Accelerations (g's):**  
  - x-direction: -0.7 (1.0463 - 1.0563 seconds)  
  - y-direction: -1.3 (1.0723 - 1.0823 seconds)
- **PHD (g's):** 1.3 (1.1030 - 1.1130 seconds)  
- **ASI:** 0.10 (0.8660 - 0.9160 seconds)
- **Max. 50msec Moving Avg. Accelerations (g's):**  
  - x-direction: -0.4 (0.1063 - 0.1563 seconds)  
  - y-direction: 0.8 (0.8657 - 0.9157 seconds)  
  - z-direction: 0.9 (1.1650 - 1.2150 seconds)
- **Max Roll, Pitch, and Yaw Angles (degrees):**  
  - Roll: -7.4 (0.7453 seconds)  
  - Pitch: 2.2 (1.0800 seconds)  
  - Yaw: 11.8 (1.3427 seconds)

---

**Figure G.16:** Summary report of occupant risk factors from TRAP:
- **Curb Type:** AASHTO D Curb  
- **Impact Speed:** 70 km/hr  
- **Impact Angle:** 5 degrees.
# Test Summary Report

## General Information

<table>
<thead>
<tr>
<th>Test Agency:</th>
<th>WPI</th>
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<tbody>
<tr>
<td>Test Number:</td>
<td>D-70-15</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Dec 2001</td>
</tr>
<tr>
<td>Test Article:</td>
<td>D Curb with Flat Backfill</td>
</tr>
</tbody>
</table>

## Test Vehicle

<table>
<thead>
<tr>
<th>Description:</th>
<th>C2500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Inertial Mass:</td>
<td>2000 kg</td>
</tr>
<tr>
<td>Gross Static Mass:</td>
<td>2000 kg</td>
</tr>
</tbody>
</table>

## Impact Conditions

| Speed: | 70.0 km/hr |
| Angle: | 15.0 degrees |

## Occupant Risk Factors

<table>
<thead>
<tr>
<th>Impact Velocity (m/s) at 0.6467 seconds on front of interior</th>
</tr>
</thead>
<tbody>
<tr>
<td>x-direction</td>
</tr>
<tr>
<td>y-direction</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>THIV (km/hr): at 0.6440 seconds on front of interior</th>
</tr>
</thead>
<tbody>
<tr>
<td>THIV (m/s):</td>
</tr>
<tr>
<td>1.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ridedown Accelerations (g's)</th>
</tr>
</thead>
<tbody>
<tr>
<td>x-direction</td>
</tr>
<tr>
<td>y-direction</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PHD (g's):</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4 (0.6437 - 0.6537 seconds)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ASI:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.14 (0.5920 - 0.6420 seconds)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. 50msec Moving Avg. Accelerations (g's)</th>
</tr>
</thead>
<tbody>
<tr>
<td>x-direction</td>
</tr>
<tr>
<td>y-direction</td>
</tr>
<tr>
<td>z-direction</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max Roll, Pitch, and Yaw Angles (degrees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roll</td>
</tr>
<tr>
<td>Pitch</td>
</tr>
<tr>
<td>Yaw</td>
</tr>
</tbody>
</table>

---

**Figure G.17:** Summary report of occupant risk factors from TRAP:

- Curb Type: AASHTO D Curb
- Impact Speed: 70 km/hr
- Impact Angle: 15 degrees.
# Test Summary Report

## General Information

<table>
<thead>
<tr>
<th>Test Agency</th>
<th>WPI</th>
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</thead>
<tbody>
<tr>
<td>Test Number</td>
<td>D-70-25</td>
</tr>
<tr>
<td>Test Date</td>
<td>Dec 2001</td>
</tr>
<tr>
<td>Test Article</td>
<td>D Curb with Flat Backfill</td>
</tr>
</tbody>
</table>

## Test Vehicle

<table>
<thead>
<tr>
<th>Description</th>
<th>C2500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Inertial Mass</td>
<td>2000 kg</td>
</tr>
<tr>
<td>Gross Static Mass</td>
<td>2000 kg</td>
</tr>
</tbody>
</table>

## Impact Conditions

| Speed | 70.0 km/hr |
| Angle | 25.0 degrees |

## Occupant Risk Factors

<table>
<thead>
<tr>
<th>Impact Velocity (m/s)</th>
<th>at 0.5640 seconds on front of interior</th>
</tr>
</thead>
<tbody>
<tr>
<td>x-direction</td>
<td>1.9</td>
</tr>
<tr>
<td>y-direction</td>
<td>-0.7</td>
</tr>
</tbody>
</table>

| THIV (km/hr): | 6.8 at 0.5727 seconds on front of interior |
| THIV (m/s):   | 1.9                                      |

<table>
<thead>
<tr>
<th>Ridedown Accelerations (g's)</th>
<th>(0.5743 - 0.5843 seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>x-direction</td>
<td>-1.2</td>
</tr>
<tr>
<td>y-direction</td>
<td>1.6</td>
</tr>
</tbody>
</table>

| PHD (g's): | 1.7 (0.7330 - 0.7430 seconds) |
| ASI:       | 0.21 (0.0980 - 0.1480 seconds) |

<table>
<thead>
<tr>
<th>Max. 50msec Moving Avg. Accelerations (g's)</th>
<th>(0.0517 - 0.1017 seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>x-direction</td>
<td>-1.1</td>
</tr>
<tr>
<td>y-direction</td>
<td>1.8</td>
</tr>
<tr>
<td>z-direction</td>
<td>-1.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max Roll, Pitch, and Yaw Angles (degrees)</th>
<th>(0.2320 seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roll</td>
<td>-5.2</td>
</tr>
<tr>
<td>Pitch</td>
<td>2.7</td>
</tr>
<tr>
<td>Yaw</td>
<td>28.1</td>
</tr>
</tbody>
</table>

---

**Figure G.18:** Summary report of occupant risk factors from TRAP:

- **Curb Type:** AASHTO D Curb
- **Impact Speed:** 70 km/hr
- **Impact Angle:** 25 degrees.

---

**G-19**
Test Summary Report

General Information
Test Agency: WPI
Test Number: D-100-05
Test Date: Dec 2001
Test Article: D Curb with Flat Backfill

Test Vehicle
Description: C2500
Test Inertial Mass: 2000 kg
Gross Static Mass: 2000 kg

Impact Conditions
Speed: 100.0 km/hr
Angle: 5.0 degrees

Occupant Risk Factors
Impact Velocity (m/s) at 0.6227 seconds on front of interior
  x-direction 1.9
  y-direction -0.8

THIV (km/hr): 7.1 at 0.6173 seconds on front of interior
THIV (m/s): 2.0

Ridedown Accelerations (g's)
  x-direction -0.9 (0.6970 - 0.7070 seconds)
  y-direction -1.3 (0.8830 - 0.8930 seconds)

PHD (g's): 1.5 (0.9117 - 0.9217 seconds)
ASI: 0.14 (0.1680 - 0.2180 seconds)

Max. 50msec Moving Avg. Accelerations (g's)
  x-direction -0.6 (0.1670 - 0.2170 seconds)
  y-direction -1.1 (0.1683 - 0.2183 seconds)
  z-direction 0.9 (0.9603 - 1.0103 seconds)

Max Roll, Pitch, and Yaw Angles (degrees)
  Roll -7.1 (0.6380 seconds)
  Pitch 1.8 (0.4520 seconds)
  Yaw 7.8 (1.1807 seconds)

Figure G.19: Summary report of occupant risk factors from TRAP:
Curb Type -- AASHTO D Curb
Impact Speed -- 100 km/hr
Impact Angle -- 5 degrees.
## General Information
- **Test Agency:** WPI
- **Test Number:** D-100-15
- **Test Date:** Dec 2001
- **Test Article:** D Curb with Flat Backfill

## Test Vehicle
- **Description:** C2500
- **Test Inertial Mass:** 2000 kg
- **Gross Static Mass:** 2000 kg

## Impact Conditions
- **Speed:** 100.0 km/hr
- **Angle:** 15.0 degrees

## Occupant Risk Factors
- **Impact Velocity (m/s) at 0.5720 seconds on front of interior**
  - x-direction: 2.0
  - y-direction: -0.3
- **THIV (km/hr):** 7.2 at 0.5680 seconds on front of interior
- **THIV (m/s):** 2.0

### Ridedown Accelerations (g's)
- x-direction: -1.0 (0.5910 - 0.6010 seconds)
- y-direction: 1.3 (0.7183 - 0.7283 seconds)

- **PHD (g's):** 2.0 (0.5677 - 0.5777 seconds)
- **ASI:** 0.19 (0.0847 - 0.1347 seconds)

### Max. 50msec Moving Avg. Accelerations (g's)
- x-direction: -1.0 (0.0757 - 0.1257 seconds)
- y-direction: 1.6 (0.0843 - 0.1343 seconds)
- z-direction: -1.2 (0.1683 - 0.2183 seconds)

### Max Roll, Pitch, and Yaw Angles (degrees)
- Roll: -5.3 (0.2600 seconds)
- Pitch: 2.8 (0.4587 seconds)
- Yaw: 24.6 (1.7000 seconds)

---

**Figure G.20:** Summary report of occupant risk factors from TRAP:
- **Curb Type:** AASHTO D Curb
- **Impact Speed:** 100 km/hr
- **Impact Angle:** 15 degrees.

---

G-21
Test Summary Report

General Information
Test Agency: WPI
Test Number: D-100-25
Test Date: Dec 2001
Test Article: D Curb with Flat Backfill

Test Vehicle
Description: C2500
Test Inertial Mass: 2000 kg
Gross Static Mass: 2000 kg

Impact Conditions
Speed: 100.0 km/hr
Angle: 25.0 degrees

Occupant Risk Factors
Impact Velocity (m/s) at 0.5133 seconds on front of interior
x-direction 2.0
y-direction -0.7

THIV (km/hr): 7.5 at 0.5173 seconds on front of interior
THIV (m/s): 2.1

Ridedown Accelerations (g's)
x-direction -1.4 (0.5223 - 0.5323 seconds)
y-direction 2.4 (0.6097 - 0.6197 seconds)

PHD (g's): 2.5 (0.6097 - 0.6197 seconds)
ASI: 0.26 (0.1807 - 0.2307 seconds)

Max. 50msec Moving Avg. Accelerations (g's)
x-direction -1.6 (0.1203 - 0.1703 seconds)
y-direction 2.2 (0.0850 - 0.1350 seconds)
z-direction -2.5 (0.1803 - 0.2303 seconds)

Max Roll, Pitch, and Yaw Angles (degrees)
Roll 4.2 (0.2980 seconds)
Pitch 2.4 (0.5120 seconds)
Yaw 23.8 (1.6773 seconds)

---

Figure G.21: Summary report of occupant risk factors from TRAP:
Curb Type -- AASHTO D Curb
Impact Speed -- 100 km/hr
Impact Angle -- 25 degrees.
Test Summary Report

General Information
Test Agency: WPI
Test Number: G-70-05
Test Date: Dec 2001
Test Article: G Curb with Flat Backfill

Test Vehicle
Description: C2500
Test Inertial Mass: 2000 kg
Gross Static Mass: 2000 kg

Impact Conditions
Speed: 70.0 km/hr
Angle: 5.0 degrees

Occupant Risk Factors
Impact Velocity (m/s) at 0.7293 seconds on front of interior
  x-direction 1.6
  y-direction -1.2

THIV (km/hr): 7.0 at 0.7367 seconds on front of interior
THIV (m/s): 1.9

Ridedown Accelerations (g's)
  x-direction -0.5 (0.8263 - 0.8363 seconds)
  y-direction 0.5 (0.8723 - 0.8823 seconds)

PHD (g's): 0.7 (0.8463 - 0.8563 seconds)
ASI: 0.07 (0.3840 - 0.4340 seconds)

Max. 50msec Moving Avg. Accelerations (g's)
  x-direction -0.4 (0.1097 - 0.1597 seconds)
  y-direction 0.5 (0.4577 - 0.5077 seconds)
  z-direction 0.6 (0.3830 - 0.4330 seconds)

Max Roll, Pitch, and Yaw Angles (degrees)
  Roll -5.9 (0.6787 seconds)
  Pitch 1.6 (0.3107 seconds)
  Yaw 6.4 (1.4113 seconds)

Figure G.22: Summary report of occupant risk factors from TRAP:
Curb Type -- AASHTO G Curb
Impact Speed -- 70 km/hr
Impact Angle -- 5 degrees.
Test Summary Report

General Information
Test Agency: WPI
Test Number: G-70-15
Test Date: Dec 2001
Test Article: G Curb with Flat Backfill

Test Vehicle
Description: C2500
Test Inertial Mass: 2000 kg
Gross Static Mass: 2000 kg

Impact Conditions
Speed: 70.0 km/hr
Angle: 15.0 degrees

Occupant Risk Factors
Impact Velocity (m/s) at 0.6947 seconds on front of interior
x-direction 1.6
y-direction -0.8

THIV (km/hr): 6.3 at 0.7007 seconds on front of interior
THIV (m/s): 1.8

Ridedown Accelerations (g's)
x-direction -0.5 (0.7197 - 0.7297 seconds)
y-direction 0.8 (0.7083 - 0.7183 seconds)

PHD (g's): 0.9 (0.7083 - 0.7183 seconds)
ASI: 0.09 (0.2920 - 0.3420 seconds)

Max. 50msec Moving Avg. Accelerations (g's)
x-direction -0.5 (0.0217 - 0.0717 seconds)
y-direction 0.7 (0.4143 - 0.4643 seconds)
z-direction 0.9 (0.2917 - 0.3417 seconds)

Max Roll, Pitch, and Yaw Angles (degrees)
Roll -4.0 (0.2147 seconds)
Pitch 2.2 (0.5587 seconds)
Yaw 4.1 (0.8347 seconds)

Figure G.23: Summary report of occupant risk factors from TRAP:
Curb Type -- AASHTO G Curb
Impact Speed -- 70 km/hr
Impact Angle -- 15 degrees.
General Information
Test Agency: WPI
Test Number: G-70-25
Test Date: Dec 2001
Test Article: G Curb with Flat Backfill

Test Vehicle
Description: C2500
Test Inertial Mass: 2000 kg
Gross Static Mass: 2000 kg

Impact Conditions
Speed: 70.0 km/hr
Angle: 25.0 degrees

Occupant Risk Factors
Impact Velocity (m/s) at 0.7060 seconds on front of interior
x-direction 1.6
y-direction -1.2
THIV (km/hr): 6.9 at 0.6993 seconds on left side of interior
THIV (m/s): 1.9

Ridedown Accelerations (g's)
x-direction -0.4 (0.7410 - 0.7510 seconds)
y-direction 1.1 (0.7063 - 0.7163 seconds)

PHD (g's): 1.1 (0.7037 - 0.7137 seconds)
ASI: 0.14 (0.4440 - 0.4940 seconds)

Max. 50msec Moving Avg. Accelerations (g's)
x-direction -0.6 (0.1830 - 0.2330 seconds)
y-direction 1.1 (0.4437 - 0.4937 seconds)
z-direction 1.1 (0.3237 - 0.3737 seconds)

Max Roll, Pitch, and Yaw Angles (degrees)
Roll -4.1 (0.2260 seconds)
Pitch 2.7 (0.4500 seconds)
Yaw 9.8 (1.1580 seconds)

Figure G.24: Summary report of occupant risk factors from TRAP:
Curb Type AASHTO G Curb
Impact Speed 70 km/hr
Impact Angle 25 degrees.
**Test Summary Report**

**General Information**

- **Test Agency:** WPI
- **Test Number:** G-100-05
- **Test Date:** Dec 2001
- **Test Article:** G Curb with Flat Backfill

**Test Vehicle**

- **Description:** C2500
- **Test Inertial Mass:** 2000 kg
- **Gross Static Mass:** 2000 kg

**Impact Conditions**

- **Speed:** 100.0 km/hr
- **Angle:** 5.0 degrees

**Occupant Risk Factors**

- **Impact Velocity (m/s) at 0.6207 seconds on front of interior**
  - x-direction: 1.8
  - y-direction: -0.6

- **THIV (km/hr):** 6.8 at 0.6213 seconds on front of interior
  - **THIV (m/s):** 1.9

- **Ridedown Accelerations (g's)**
  - x-direction: -0.6 (0.7157 - 0.7257 seconds)
  - y-direction: 0.6 (0.7843 - 0.7943 seconds)

- **PHD (g's):** 0.8 (0.7683 - 0.7783 seconds)

- **ASI:** 0.08 (0.2947 - 0.3447 seconds)

- **Max. 50msec Moving Avg. Accelerations (g's)**
  - x-direction: -0.4 (0.1790 - 0.2290 seconds)
  - y-direction: 0.4 (0.7483 - 0.7983 seconds)
  - z-direction: 0.7 (0.2943 - 0.3443 seconds)

- **Max Roll, Pitch, and Yaw Angles (degrees)**
  - Roll: -5.4 (0.6267 seconds)
  - Pitch: 1.3 (0.4260 seconds)
  - Yaw: 3.3 (0.6247 seconds)

---

**Figure G.25:** Summary report of occupant risk factors from TRAP:

Curb Type -- AASHTO G Curb
Impact Speed -- 100 km/hr
Impact Angle -- 5 degrees.
Test Summary Report

General Information
Test Agency: WPI
Test Number: G-100-15
Test Date: Dec 2001
Test Article: G Curb with Flat Backfill

Test Vehicle
Description: C2500
Test Inertial Mass: 2000 kg
Gross Static Mass: 2000 kg

Impact Conditions
Speed: 100.0 km/hr
Angle: 15.0 degrees

Occupant Risk Factors
Impact Velocity (m/s) at 0.5713 seconds on front of interior
x-direction 1.9
y-direction -0.5
THIV (km/hr): 7.1 at 0.5720 seconds on front of interior
THIV (m/s): 2.0

Ridedown Accelerations (g's)
  x-direction -0.6 (0.6710 - 0.6810 seconds)
  y-direction 1.2 (0.6703 - 0.6803 seconds)

PHD (g's): 1.3 (0.6703 - 0.6803 seconds)
ASI: 0.12 (0.0900 - 0.1400 seconds)

Max. 50msec Moving Avg. Accelerations (g's)
  x-direction -0.7 (0.0350 - 0.0850 seconds)
  y-direction 1.1 (0.0897 - 0.1397 seconds)
  z-direction -1.1 (0.1590 - 0.2090 seconds)

Max Roll, Pitch, and Yaw Angles (degrees)
  Roll -4.0 (0.2560 seconds)
  Pitch 2.4 (0.4307 seconds)
  Yaw 6.7 (1.6547 seconds)

Figure G.26: Summary report of occupant risk factors from TRAP:
  Curb Type -- AASHTO G Curb
  Impact Speed -- 100 km/hr
  Impact Angle -- 15 degrees.
### Test Summary Report

#### General Information
- **Test Agency:** WPI
- **Test Number:** G-100-25
- **Test Date:** Dec 2001
- **Test Article:** G Curb with Flat Backfill

#### Test Vehicle
- **Description:** C2500
- **Test Inertial Mass:** 2000 kg
- **Gross Static Mass:** 2000 kg

#### Impact Conditions
- **Speed:** 100.0 km/hr
- **Angle:** 25.0 degrees

#### Occupant Risk Factors
- **Impact Velocity (m/s) at 0.5760 seconds on front of interior**
  - x-direction: 1.9
  - y-direction: -1.0
- **THIV (km/hr):** 7.6 at 0.5853 seconds on front of interior
- **THIV (m/s):** 2.1
- **Ridedown Accelerations (g's)**
  - x-direction: -0.7 (0.6163 - 0.6263 seconds)
  - y-direction: 1.6 (0.5930 - 0.6030 seconds)
- **PHD (g's):** 1.7 (0.5930 - 0.6030 seconds)
- **ASI:** 0.19 (0.0880 - 0.1380 seconds)

#### Max. 50msec Moving Avg. Accelerations (g's)
- **x-direction:** -1.0 (0.0350 - 0.0850 seconds)
- **y-direction:** 1.7 (0.0877 - 0.1377 seconds)
- **z-direction:** -1.8 (0.1557 - 0.2057 seconds)

#### Max Roll, Pitch, and Yaw Angles (degrees)
- **Roll:** -3.6 (0.3140 seconds)
- **Pitch:** 2.2 (0.5333 seconds)
- **Yaw:** 21.7 (1.7000 seconds)

---

**Figure G.27:** Summary report of occupant risk factors from TRAP:
- **Curb Type:** AASHTO G Curb
- **Impact Speed:** 100 km/hr
- **Impact Angle:** 25 degrees.

---

G-28
Test Summary Report

General Information
Test Agency: WPI
Test Number: NY-70-05
Test Date: Dec 2001
Test Article: NY Curb with Flat Backfill

Test Vehicle
Description: C2500
Test Inertial Mass: 2000 kg
Gross Static Mass: 2000 kg

Impact Conditions
Speed: 70.0 km/hr
Angle: 5.0 degrees

Occupant Risk Factors
Impact Velocity (m/s) at 0.7753 seconds on front of interior
  x-direction  1.5
  y-direction  -0.8
THIV (km/hr): 6.2 at 0.7753 seconds on front of interior
THIV (m/s): 1.7
Ridedown Accelerations (g's)
  x-direction  -0.3 (1.4290 - 1.4390 seconds)
  y-direction  -0.5 (1.0477 - 1.0577 seconds)
PHD (g's): 0.5 (1.0470 - 1.0570 seconds)
ASI: 0.05 (0.6120 - 0.6620 seconds)
Max. 50msec Moving Avg. Accelerations (g's)
  x-direction  -0.3 (0.3017 - 0.3517 seconds)
  y-direction  0.4 (0.6157 - 0.6657 seconds)
  z-direction  0.3 (0.4170 - 0.4670 seconds)
Max Roll, Pitch, and Yaw Angles (degrees)
  Roll  -4.9 (0.7760 seconds)
  Pitch  1.2 (1.3327 seconds)
  Yaw  4.0 (0.8313 seconds)

Figure G.28: Summary report of occupant risk factors from TRAP:
Curb Type -- New York Curb (100 mm)
Impact Speed -- 70 km/hr
Impact Angle -- 5 degrees.

G-29
Test Summary Report

General Information
- Test Agency: WPI
- Test Number: NY-70-15
- Test Date: Dec 2001
- Test Article: NY Curb with Flat Backfill

Test Vehicle
- Description: C2500
- Test Inertial Mass: 2000 kg
- Gross Static Mass: 2000 kg

Impact Conditions
- Speed: 70.0 km/hr
- Angle: 15.0 degrees

Occupant Risk Factors
- Impact Velocity (m/s) at 0.7747 seconds on front of interior
  - x-direction: 1.5
  - y-direction: -0.8
- THIV (km/hr): 6.1 at 0.7800 seconds on front of interior
- THIV (m/s): 1.7
- Ridedown Accelerations (g's)
  - x-direction: -0.4 (0.8837 - 0.8937 seconds)
  - y-direction: -0.2 (0.8670 - 0.8770 seconds)
- PHD (g's): 0.4 (0.8857 - 0.8957 seconds)
- ASI: 0.07 (0.5580 - 0.6080 seconds)

Max. 50msec Moving Avg. Accelerations (g's)
- x-direction: -0.4 (0.3577 - 0.4077 seconds)
- y-direction: 0.6 (0.4143 - 0.4643 seconds)
- z-direction: -0.6 (0.5590 - 0.6090 seconds)

Max Roll, Pitch, and Yaw Angles (degrees)
- Roll: -3.8 (0.3580 seconds)
- Pitch: 2.1 (0.5747 seconds)
- Yaw: 3.0 (0.8300 seconds)

Figure G.29: Summary report of occupant risk factors from TRAP:
- Curb Type: New York Curb (100 mm)
- Impact Speed: 70 km/hr
- Impact Angle: 15 degrees.

G-30
## Test Summary Report

### General Information
- **Test Agency:** WPI
- **Test Number:** NY-70-25
- **Test Date:** Dec 2001
- **Test Article:** NY Curb with Flat Backfill

### Test Vehicle
- **Description:** C2500
- **Test Inertial Mass:** 2000 kg
- **Gross Static Mass:** 2000 kg

### Impact Conditions
- **Speed:** 70.0 km/hr
- **Angle:** 25.0 degrees

### Occupant Risk Factors
- **Impact Velocity (m/s) at 0.7053 seconds on left side of interior**
  - x-direction: 1.5
  - y-direction: -1.3
- **THIV (km/hr):** 7.7 at 0.7173 seconds on front of interior
- **THIV (m/s):** 2.1
- **Ridedown Accelerations (g's)**
  - x-direction: -0.5 (0.8690 - 0.8790 seconds)
  - y-direction: 0.7 (0.7077 - 0.7177 seconds)
- **PHD (g's):** 0.6 (0.9197 - 0.9297 seconds)
- **ASI:** 0.14 (0.4267 - 0.4767 seconds)
- **Max. 50msec Moving Avg. Accelerations (g's)**
  - x-direction: -0.5 (0.1963 - 0.2463 seconds)
  - y-direction: 1.1 (0.4270 - 0.4770 seconds)
  - z-direction: -1.1 (0.2217 - 0.2717 seconds)
- **Max Roll, Pitch, and Yaw Angles (degrees)**
  - Roll: -3.7 (0.2207 seconds)
  - Pitch: 2.3 (0.4447 seconds)
  - Yaw: -7.8 (1.1280 seconds)

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**Figure G.30:** Summary report of occupant risk factors from TRAP:
- **Curb Type:** -- New York Curb (100 mm)
- **Impact Speed:** -- 70 km/hr
- **Impact Angle:** -- 25 degrees.
## Test Summary Report

### General Information
- **Test Agency:** WPI
- **Test Number:** NY-100-05
- **Test Date:** Dec 2001
- **Test Article:** NY Curb with Flat Backfill

### Test Vehicle
- **Description:** C2500
- **Test Inertial Mass:** 2000 kg
- **Gross Static Mass:** 2000 kg

### Impact Conditions
- **Speed:** 100.0 km/hr
- **Angle:** 5.0 degrees

### Occupant Risk Factors

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Time Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact Velocity (m/s)</td>
<td>1.8</td>
<td>at 0.6367 seconds on front of interior</td>
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<td></td>
<td>-0.5</td>
<td></td>
</tr>
<tr>
<td>THIV (km/hr)</td>
<td>6.8</td>
<td>at 0.6373 seconds on front of interior</td>
</tr>
<tr>
<td>THIV (m/s)</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>Ridedown Accelerations (g's)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>x-direction</td>
<td>-1.7</td>
<td>(0.6910 - 0.7010 seconds)</td>
</tr>
<tr>
<td>y-direction</td>
<td>0.6</td>
<td>(0.8197 - 0.8297 seconds)</td>
</tr>
<tr>
<td>PHD (g's)</td>
<td>2.3</td>
<td>(0.6950 - 0.7050 seconds)</td>
</tr>
<tr>
<td>ASI</td>
<td>0.08</td>
<td>(0.3353 - 0.3853 seconds)</td>
</tr>
<tr>
<td>Max. 50msec Moving Avg. Accelerations (g's)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>x-direction</td>
<td>-0.6</td>
<td>(0.6510 - 0.7010 seconds)</td>
</tr>
<tr>
<td>y-direction</td>
<td>0.3</td>
<td>(0.7970 - 0.8470 seconds)</td>
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<td>z-direction</td>
<td>0.7</td>
<td>(0.3350 - 0.3850 seconds)</td>
</tr>
<tr>
<td>Max Roll, Pitch, and Yaw Angles (degrees)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roll</td>
<td>-5.5</td>
<td>(0.6600 seconds)</td>
</tr>
<tr>
<td>Pitch</td>
<td>1.2</td>
<td>(0.4553 seconds)</td>
</tr>
<tr>
<td>Yaw</td>
<td>4.1</td>
<td>(1.7000 seconds)</td>
</tr>
</tbody>
</table>

### Figure G.31
Summary report of occupant risk factors from TRAP:
- **Curb Type:** New York Curb (100 mm)
- **Impact Speed:** 100 km/hr
- **Impact Angle:** 5 degrees.
## General Information

- **Test Agency:** WPI  
- **Test Number:** NY-100-15  
- **Test Date:** Dec 2001  
- **Test Article:** NY Curb with Flat Backfill

## Test Vehicle

- **Description:** C2500  
- **Test Inertial Mass:** 2000 kg  
- **Gross Static Mass:** 2000 kg

## Impact Conditions

- **Speed:** 100.0 km/hr  
- **Angle:** 15.0 degrees

## Occupant Risk Factors

- **Impact Velocity (m/s) at 0.6813 seconds on front of interior:**
  - x-direction: 1.8
  - y-direction: -0.3
- **THIV (km/hr):** 6.5 at 0.6787 seconds on front of interior
- **THIV (m/s):** 1.8
- **Ridedown Accelerations (g's):**
  - x-direction: -0.6 (0.8783 - 0.8883 seconds)
  - y-direction: 0.6 (0.6923 - 0.7023 seconds)
- **PHD (g's):** 0.8 (0.6883 - 0.6983 seconds)
- **ASI:** 0.10 (0.1713 - 0.2213 seconds)

## Max. 50msec Moving Avg. Accelerations (g's)

- **x-direction:** -0.5 (0.1223 - 0.1723 seconds)
- **y-direction:** -0.8 (0.1297 - 0.1797 seconds)
- **z-direction:** -1.0 (0.1710 - 0.2210 seconds)

## Max Roll, Pitch, and Yaw Angles (degrees)

- **Roll:** -3.7 (0.2707 seconds)
- **Pitch:** 2.0 (0.4300 seconds)
- **Yaw:** 5.9 (1.3200 seconds)

## Summary

- **Curb Type:** New York Curb (100 mm)
- **Impact Speed:** 100 km/hr
- **Impact Angle:** 15 degrees

Figure G.32: Summary report of occupant risk factors from TRAP:
Test Summary Report

General Information
Test Agency: WPI
Test Number: NY-100-25
Test Date: Dec 2001
Test Article: NY Curb with Flat Backfill

Test Vehicle
Description: C2500
Test Inertial Mass: 2000 kg
Gross Static Mass: 2000 kg

Impact Conditions
Speed: 100.0 km/hr
Angle: 25.0 degrees

Occupant Risk Factors
Impact Velocity (m/s) at 0.5953 seconds on front of interior
  x-direction  1.9
  y-direction -1.3

THIV (km/hr): 7.7 at 0.5820 seconds on left side of interior
THIV (m/s): 2.1

Ridedown Accelerations (g's)
  x-direction  -0.6
  y-direction  1.0

PHD (g's): 1.3 (0.6637 - 0.6737 seconds)

ASI: 0.17 (0.0853 - 0.1353 seconds)

Max. 50msec Moving Avg. Accelerations (g's)
  x-direction -0.8 (0.1170 - 0.1670 seconds)
  y-direction  1.5 (0.0850 - 0.1350 seconds)
  z-direction -1.6 (0.1690 - 0.2190 seconds)

Max Roll, Pitch, and Yaw Angles (degrees)
Roll -3.4 (0.3093 seconds)
Pitch 2.1 (0.5093 seconds)
Yaw 18.4 (1.7000 seconds)

Figure G.33: Summary report of occupant risk factors from TRAP:
Curb Type -- New York Curb (100 mm)
Impact Speed -- 100 km/hr
Impact Angle -- 25 degrees.