

**Vehicle Research and Test Center  
Oblique Side Pole Impact  
SID-IIs - (Build Level D)  
2007 Subaru Impreza  
TRC Inc. Test Number: 070628**

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**Final Report  
June - July 2007**

**Prepared For  
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## Section 1.0

### Purpose and Test Procedure

### Purpose

This side impact test is part of the proposed FMVSS 214 Side Impact Protection. It was conducted for the National Highway Traffic Safety Administration (NHTSA) and Vehicle Research and Test Center (VRTC) by Transportation research Center Inc. (TRC Inc.). The purpose of this test was to evaluate side impact protection of a 2007 Subaru Impreza 4-door sedan with the rigid pole. The test was conducted in accordance with the National Highway Traffic Safety Administration's Notice of Proposed Rulemaking (Docket No. NHTSA-2004-17694, May 17, 2004).

## Section 2.0

### Side Impact Test

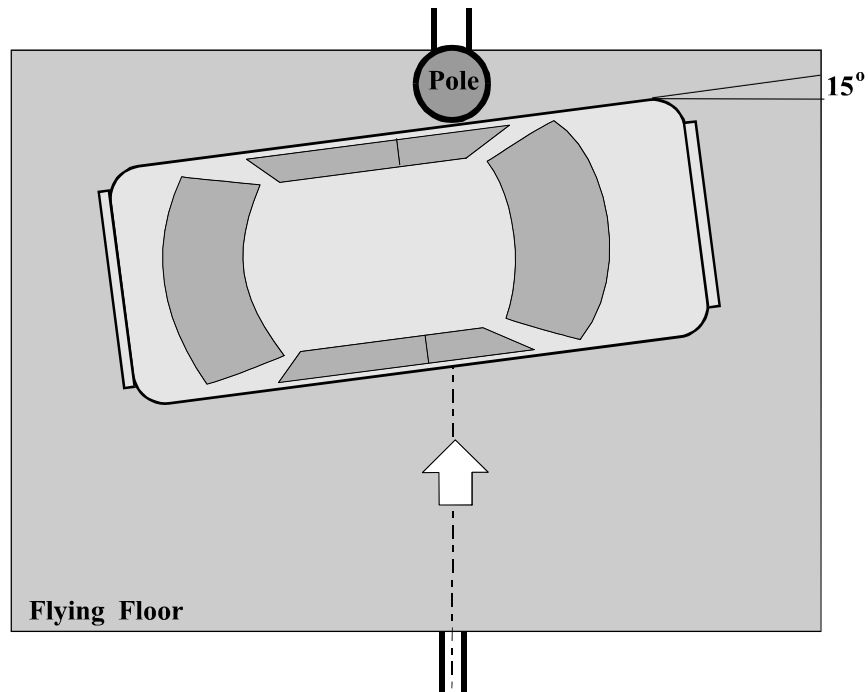
### Summary of Side Impact Test

A 2007 Subaru Impreza 4-door sedan impacted an oblique rigid pole barrier at an angle of 285°, at a velocity of 32.3 km/h (20.1 mph). The pole was aligned with the dummy's head center of gravity. The side impact test was conducted by Transportation Research Center Inc. in East Liberty, Ohio on June 28, 2007. Pre-test and post-test photographs of the test vehicle, the rigid pole barrier, and the side impact dummy (SID-IIs Build Level D) are included in Appendix A.

One restrained Side Impact Dummy (SID-IIs Build Level D) was placed in the driver (Pos. #1) designated seating position according to the instructions specified in the NHTSA Draft Side Impact Laboratory Test Procedure (TP-214P-00, dated May 2004). The side impact test was documented by one (1) real-time camera and nine (9) high-speed digital cameras. Camera locations and other pertinent camera information are included in this report.

The SID-IIs Build Level D was instrumented with triaxial head, shoulder, upper spine, lower spine and pelvis oriented to measure longitudinal, lateral, and vertical accelerations. The dummy was also instrumented with 6-axis channel upper neck moment and force load cells, shoulder, iliac, and acetabulum load cells, five rib lateral accelerometers, and rib and shoulder displacement potentiometers.

A summary of the side impact dummy (SID-IIs Build Level D) configuration and verification test data can be found in Appendix C. A total of 78 channels of data were recorded. Appendix B contains the vehicle, barrier, and dummy response data traces.



The following table summarizes the results of the test.

|                                             | Front SID-IIs (#056) |
|---------------------------------------------|----------------------|
| HIC36 (g) CFC 1000                          | 184                  |
| Upper Rib Deflection (mm) CFC 180           |                      |
| Rib 1                                       | 51 mm                |
| Rib 2                                       | 44 mm                |
| Rib 3                                       | 31 mm                |
| Lower Rib Deflection (mm) CFC 180           |                      |
| Rib 1                                       | 28 mm                |
| Rib 2                                       | 38 mm                |
| Lower Spine Resultant (g) CFC 180           | 58 g                 |
| Combined Iliac/Acetabulum Force (N) CFC 600 | 4377 N               |

|                                             | 2007 Subaru Impreza  |
|---------------------------------------------|----------------------|
| Vehicle Test Weight                         | 1485.8 kg (3276 lbs) |
| Impact Point (Horizontal - from Front Axle) | 1102 mm              |
| Maximum Crush                               | 390 mm Level 3       |
| Impact Speed                                | 20.06 mph            |

### Data Acquisition Explanations

The driver dummy's upper neck force X-axis data channel, 11NECKUP00S2FOXA, exceeded full-scale at approximately 143 milliseconds.

The driver dummy's shoulder force X- and Z-axis data channels, 11SHLDLE00S2FOXA and 11SHLDLE00S2FOZA, respectively, exceeded full-scale capacity at approximately 30 milliseconds prior to being filtered and did not return to zero.

The driver dummy's shoulder force Y-axis data channel, 11SHDLE00S2FOYA, exceeded full-scale capacity at approximately 24 milliseconds and did not return to zero.

The vehicle's rear floor pan above axle X-axis acceleration data channel, 18FORA000000ACXA, recorded questionable data throughout the event. This affected the velocity calculation.

The vehicle's left lower A-post Y-axis acceleration data channel, 11APILLO00000ACYA, exceeded full-scale capacity at approximately 32 milliseconds. This affected the velocity calculation.

The vehicle's front door mid-rear 430 above ground Y-axis acceleration data channel, 14DOOR000002ACYA, recorded questionable data after approximately 100 milliseconds and did not return to zero.

The driver dummy head, shoulder, torso, and leg contact switches failed to record any event during the crash. Dummy contact was determined using grease paint.

## Section 3

### Summary of Test Results

Table 1 General Test Vehicle Parameter Data

Test Vehicle: 2007 Subaru Impreza

Test Date: 06/28/07

**TEST VEHICLE INFORMATION**

|                     |                   |
|---------------------|-------------------|
| Make                | Subaru            |
| Model               | Impreza           |
| Body Style          | 4-door sedan      |
| VIN                 | JF1GD61627H507671 |
| Color               | Silver            |
| Odometer Reading    | 129 miles         |
| Transmission        | 4-Speed Automatic |
| Final Drive         | Four wheel drive  |
| Number of Cylinders | 4                 |
| Engine Displacement | 2.5 L             |
| Engine Placement    | Longitudinal      |
| Air Conditioning    | Yes               |
| Power Windows       | Yes               |
| Power Seats         | No                |
| Cruise Control      | Yes               |
| Tinted Glass        | Yes               |
| Keyless Entry       | Yes               |

**TEST VEHICLE OPTIONS**

|                                    |     |
|------------------------------------|-----|
| Driver Front Airbag                | Yes |
| Driver Side Curtain Airbag         | Yes |
| Driver Side Torso Airbag           | Yes |
| Rear Passenger Side/Curtain Airbag | Yes |
| Rear Passenger Side Torso Airbag   | No  |
| Power Steering                     | Yes |
| Power Door Locks                   | Yes |
| Tilt Wheel                         | Yes |
| Anti-lock Brakes                   | Yes |
| Traction Control                   | No  |
| Bucket Seats                       | Yes |
| Rear Defroster                     | Yes |
| 2-Door/4-Door                      | 4   |
| AM/FM Radio                        | Yes |
| CD Player                          | Yes |
| Sun Roof                           | No  |
| Telescoping Steering Wheel/Column  | No  |

**DATA FROM CERTIFICATION LABEL**

|                     |                      |
|---------------------|----------------------|
| Manufactured By     | Subaru Motor Company |
| Date of Manufacture | 09/06                |

|                 |      |
|-----------------|------|
| GVWR (kg)       | 1778 |
| GAWR Front (kg) | 939  |
| GAWR Rear (kg)  | 907  |

| Measured Parameter    | Front  | Mid         | Rear        | Total |
|-----------------------|--------|-------------|-------------|-------|
| Type of Seats         | Bucket | Split Bench | Split Bench |       |
| Number Of Occupants   | 2      | N/A         | 3           | 5     |
| Capacity Wt. (VCW)    |        |             |             | 375   |
| Cargo Wt. (RCLW) (kg) |        |             |             | 35    |

Table 1 General Test Vehicle Parameter Data, Continued

Test Vehicle: 2007 Subaru Impreza

Test Date 06/28/07

**TEST VEHICLE WEIGHTS**

|        | Units | As Delivered (UVW) (Axle) |       |        | As Tested (ATW) (Axle) |       |        |
|--------|-------|---------------------------|-------|--------|------------------------|-------|--------|
|        |       | Front                     | Rear  | Total  | Front                  | Rear  | Total  |
| Left   | kg    | 407.2                     | 298.0 |        | 431.4                  | 303.6 |        |
| Right  | kg    | 405.0                     | 279.6 |        | 431.8                  | 319.0 |        |
| Ratio  | %     | 58.4                      | 41.6  |        | 58.1                   | 41.9  |        |
| Totals | kg    | 812.2                     | 577.6 | 1389.8 | 863.2                  | 622.6 | 1485.8 |

**TARGET TEST WEIGHT CALCULATION**

| Measured Parameter                      | Units | Value  |
|-----------------------------------------|-------|--------|
| Total Delivered Weight (UVW)            | kg    | 1389.8 |
| Weight of SIDIIs ATD                    | kg    | 61.0   |
| Rated Cargo/Luggage Weight (RCLW)       | kg    | 35.0   |
| Calculated Vehicle Target Weight (TVTW) | kg    | 1485.8 |

**TEST VEHICLE ATTITUDES AND CG**

|              | Units | LF  | RF  | LR  | RR  | CG(aft of front axle) |
|--------------|-------|-----|-----|-----|-----|-----------------------|
| As Delivered | mm    | 700 | 704 | 670 | 674 | 1049                  |
| As Tested    | mm    | 689 | 689 | 662 | 665 | 1057                  |
| Fully Loaded | mm    | 693 | 700 | 656 | 667 |                       |

**GENERAL TEST VEHICLE DATA**

| Measurement Description                 | Units  | Value |
|-----------------------------------------|--------|-------|
| Test Vehicle Wheelbase                  | mm     | 2523  |
| Total Vehicle Length at Left Side       | mm     | 4210  |
| Total Vehicle Length at Centerline      | mm     | 4465  |
| Total Vehicle Length at Right Side      | mm     | 4210  |
| Weight of Ballast in Trunk Area         | kg     | 1.4   |
| Amount of Stoddard Solvent in Fuel Tank | liters | 56.0  |

**TEST VEHICLE VERTICAL IMPACT LINE DATA**

| Measurement Description               | Units | Value     |
|---------------------------------------|-------|-----------|
| Impact Reference Line From Front Axle | mm    | 1103      |
| Impact Point                          | mm    | 1102      |
| Impact Point Difference               | mm    | 1 mm Left |

Table 1 General Test Vehicle Parameter Data, Continued

Test Vehicle: 2007 Subaru Impreza

Test Date 06/28/07

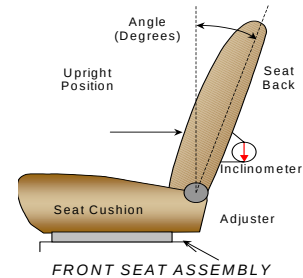
## SID II's RIDING POSITION

The driver and passenger seat back is positioned to the manufacturer's designated angle.

Driver: Total Number of detents: 17

Test detent (with the forward-most detent defined as 0): 0

Driver seat back angle: The back was adjusted to 6.6° forward of 0  
measured at the head restraint.

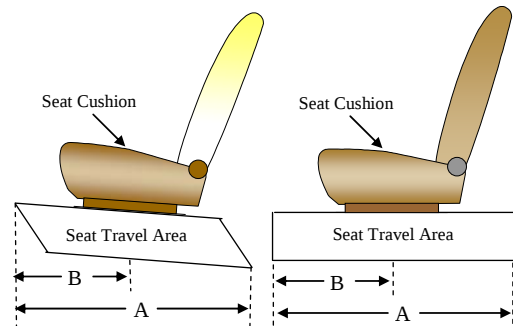


## SEAT FORE/AFT POSITIONS

The total seat travel was measured from forward most position to rearmost position, irrespective of vertical seat height in those positions. The seat was set at the longitudinal mid position with vertical adjustment at the lowest position obtainable for both the driver and passenger.

### SEAT FORE/AFT POSITIONING

|             | Total Fore/Aft Travel | Placed in Position No. |
|-------------|-----------------------|------------------------|
| Driver Seat | 215 mm                | Full forward           |
| Rear Seat   | N/A                   | N/A                    |



### SEAT BELT UPPER ANCHORAGE

|             | Total No. of Positions | Placed in Position No. |
|-------------|------------------------|------------------------|
| Driver Seat | 4                      | Full down              |
| Rear Seat   | N/A                    | N/A                    |

Position number one is the uppermost adjustment position.

Table 1 General Test Vehicle Parameter Data, Continued

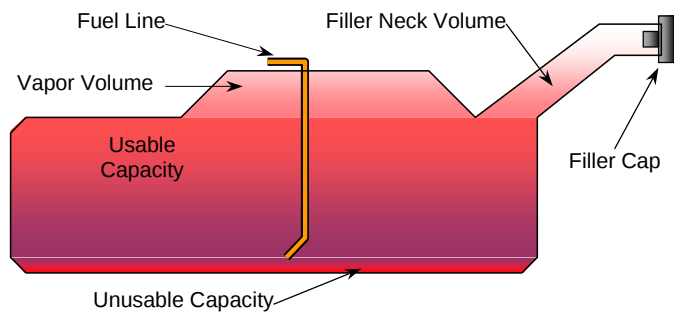
Test Vehicle: 2007 Subaru Impreza

Test Date 06/28/07

### FUEL TANK CAPACITY

|                                    | Liters |
|------------------------------------|--------|
| Usable Capacity of "Standard Tank" | 60.2   |
| Usable Capacity used for FMVSS301  | 60.2   |
| Actual Amount of Solvent used      | 56.0   |

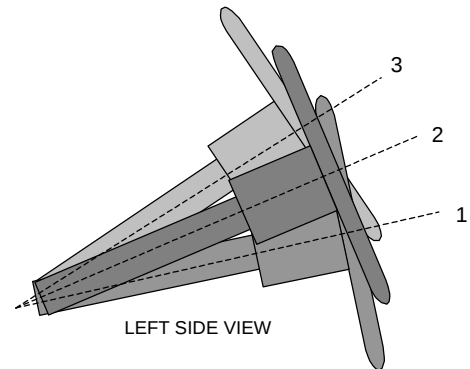
The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds after the ignition is placed in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies the area under the rear seat.



VEHICLE FUEL TANK ASSEMBLY

### STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed on the plate and the angle is measured.



STEERING COLUMN ASSEMBLY

### STEERING WHEEL/COLUMN POSITIONS

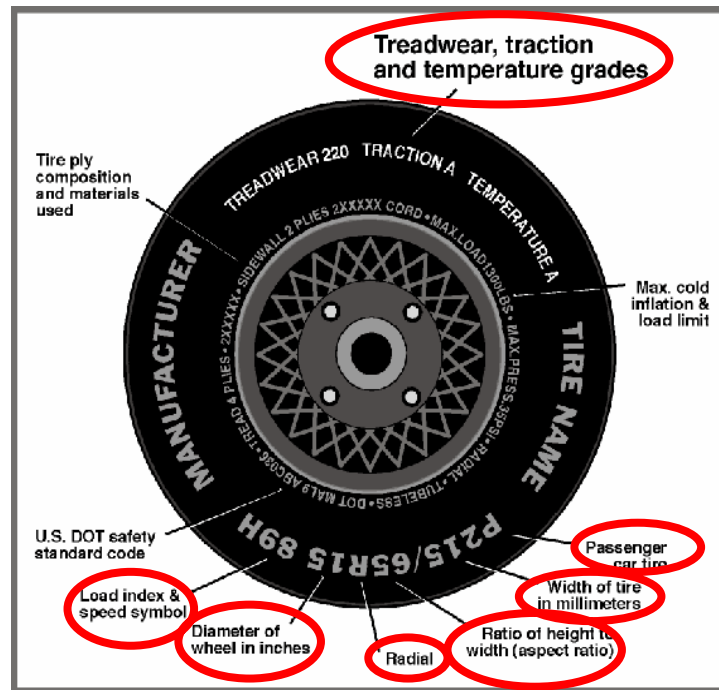
|                           | Degrees | Fore/Aft Position, mm |
|---------------------------|---------|-----------------------|
| Lowermost Position        | N/A     | N/A                   |
| Geometric Center Position | N/A     | N/A                   |
| Uppermost Position        | N/A     | N/A                   |

### Table 2 Test Vehicle Tire Information

Test Vehicle: 2007 Subaru Impreza

Test Date

06/28/07



### DATA FROM TIRE PLACARD

| Measured Parameter          | Front       | Rear        |
|-----------------------------|-------------|-------------|
| Maximum Tire Pressure (kPa) | 300         | 300         |
| Cold / Test Pressure (kPa)  | 230         | 210         |
| Recommended Tire Size       | P205/55R16  | P205/55R16  |
| Tire Size on Vehicle        | P205/55R16  | P205/55R16  |
| Tire Manufacturer           | Bridgestone | Bridgestone |
| Tire Name                   | Potenza     | Potenza     |
| Radial                      | R           | R           |
| Wheel Diameter              | 16          | 16          |
| Load Index & Speed Symbol   | 89V         | 89V         |
| Treadwear                   | 260         | 260         |
| Traction Grade              | A           | A           |
| Temperature Grade           | A           | A           |

Table 3 Post-Test Observations

Test Vehicle: 2007 Subaru Impreza

Test Date 06/28/07

**TEST DUMMY INFORMATION AND CONTACT POINTS**

| Description             | Front Seat SID IIs                  |
|-------------------------|-------------------------------------|
| Dummy Type / Serial No. | SID IIs / 056                       |
| Head Contact            | Side curtain airbag, head restraint |
| Upper Torso Contact     | Torso airbag                        |
| Lower Torso Contact     | Torso airbag                        |
| Left Knee Contact       | Door panel                          |
| Right Knee Contact      | None                                |

**POST TEST DOOR OPENING AND SEAT TRACK INFORMATION**

| Description             | Front            | Rear             |
|-------------------------|------------------|------------------|
| Locked/Unlocked Doors   | Unlocked         | Unlocked         |
| Left Side Door Opening  | Jammed & Latched | Jammed & Latched |
| Right Side Door Opening | Close & Latched  | Closed & Latched |
| Seat Movement           | None             | None             |
| Seat Back Failure       | None             | None             |

**POST TEST STRUCTURAL OBSERVATIONS**

| Critical Areas of Performance | Observations and Conclusions  |
|-------------------------------|-------------------------------|
| Pillar Performance            | Did not separate from vehicle |
| Sill Separation               | Did not separate from vehicle |
| Windshield Damage             | Broken                        |
| Window Damage                 | Left front window shattered   |
| Other Notable Effects         | None                          |

**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

| Restraint Type         | Left Front (Driver) Occupant<br>Location 01 |           |
|------------------------|---------------------------------------------|-----------|
|                        | Installed                                   | Operation |
| Front Airbag           | Yes                                         | No        |
| Head/Torso Side Airbag | Yes                                         | Yes       |
| Head Airbag            | No                                          | N/A       |
| Curtain Airbag         | No                                          | N/A       |

## Section 4

### Occupant and Vehicle Information

Table 4 SID-II's Instrumentation Data

Vehicle: 2007 Subaru Impreza 4-door sedan

Test Number: 070628

Driver Dummy Serial Number: 056

|                                 |   | Positive Direction |       | Negative Direction |       |
|---------------------------------|---|--------------------|-------|--------------------|-------|
|                                 |   | Max.               | Time  | Max.               | Time  |
| Location                        |   | (g)                | (ms)  | (g)                | (ms)  |
| Head Acceleration               | X | 28.6               | 55.8  | 2.9                | 40.5  |
|                                 | Y | 38.6               | 51.6  | 7.2                | 179.2 |
|                                 | Z | 7.0                | 82.0  | 21.4               | 32.0  |
|                                 | R | 47.0               | 52.9  |                    |       |
| Neck Force <sup>1</sup>         | X | ----               | ----  | ----               | ----  |
|                                 | Y | 439.6              | 33.0  | 1828.2             | 125.6 |
|                                 | Z | 706.3              | 32.1  | 261.3              | 82.2  |
| Neck Moment                     | X | 29.9               | 42.8  | 39.8               | 32.7  |
|                                 | Y | 32.7               | 101.0 | 34.5               | 58.2  |
|                                 | Z | 20.5               | 68.3  | 9.7                | 183.9 |
| Shoulder Acceleration           | X | 498.6              | 30.8  | 678.7              | 22.2  |
|                                 | Y | 1115.2             | 22.5  | 1826.2             | 30.6  |
|                                 | Z | 545.6              | 30.6  | 185.3              | 31.4  |
|                                 | R | 1908.4             | 30.6  |                    |       |
| Shoulder Force <sup>1</sup>     | X | ----               | ----  | ----               | ----  |
|                                 | Y | ----               | ----  | ----               | ----  |
|                                 | Z | ----               | ----  | ----               | ----  |
| Shoulder Displacement           | Y | 58.4               | 31.8  | 0.1                | 21.4  |
| Upper Spine Acceleration        | X | 12.2               | 84.2  | 14.2               | 51.9  |
|                                 | Y | 14.2               | 105.7 | 86.6               | 30.5  |
|                                 | Z | 7.7                | 105.6 | 9.3                | 30.6  |
|                                 | R | 88.1               | 30.5  |                    |       |
| Left Thorax Rib 1 Displacement  | Y | 50.9               | 32.5  | 0.0                | 21.0  |
| Left Thorax Rib 2 Displacement  | Y | 44.3               | 32.9  | 0.0                | 5.9   |
| Left Thorax Rib 3 Displacement  | Y | 31.4               | 34.0  | 0.6                | 285.5 |
| Left Abdomen Rib 1 Displacement | Y | 28.1               | 48.4  | 1.8                | 137.7 |

<sup>1</sup> See Data Acquisition Explanations.

Table 4 SID-II's Instrumentation Data, Continued

Vehicle: 2007 Subaru Impreza 4-door sedan

Test Number: 070628

Driver Dummy Serial Number: 056

|                                 |   | Positive Direction |      | Negative Direction |      |
|---------------------------------|---|--------------------|------|--------------------|------|
|                                 |   | Max.               | Time | Max.               | Time |
| Location                        |   | (g)                | (ms) | (g)                | (ms) |
| Left Abdomen Rib 2 Displacement | Y | 38.1               | 62.6 | 0.0                | 3.0  |
| Left Thorax Rib 1 Acceleration  | Y | 388.2              | 41.6 | 705.3              | 48.6 |
| Left Thorax Rib 2 Acceleration  | Y | 371.4              | 22.4 | 202.4              | 31.5 |
| Left Thorax Rib 3 Acceleration  | Y | 614.3              | 22.6 | 222.6              | 24.2 |
| Left Abdomen Rib 1 Acceleration | Y | 320.7              | 23.2 | 165.7              | 24.9 |
| Left Abdomen Rib 2 Acceleration | Y | 212.2              | 31.8 | 78.9               | 36.8 |
| Lower Spine Acceleration        | X | 23.4               | 54.7 | 13.7               | 34.1 |
|                                 | Y | 54.6               | 46.7 | 24.8               | 88.6 |
|                                 | Z | 26.2               | 30.6 | 21.8               | 39.7 |
|                                 | R | 57.5               | 47.0 |                    |      |
| Left Iliac Wing Force           | Y | 1298.9             | 41.2 | 117.2              | 65.0 |
| Left Acetabulum Force           | Y | 3121.1             | 39.7 | 75.5               | 66.2 |
| Pelvis Acceleration             | X | 14.1               | 77.0 | 9.0                | 41.8 |
|                                 | Y | 78.4               | 41.4 | 36.3               | 79.0 |
|                                 | Z | 11.7               | 75.9 | 7.0                | 39.7 |
|                                 | R | 79.0               | 41.4 |                    |      |

Positive Direction

Longitudinal: Forward

Lateral: Rightward

Vertical: Downward

Negative Direction

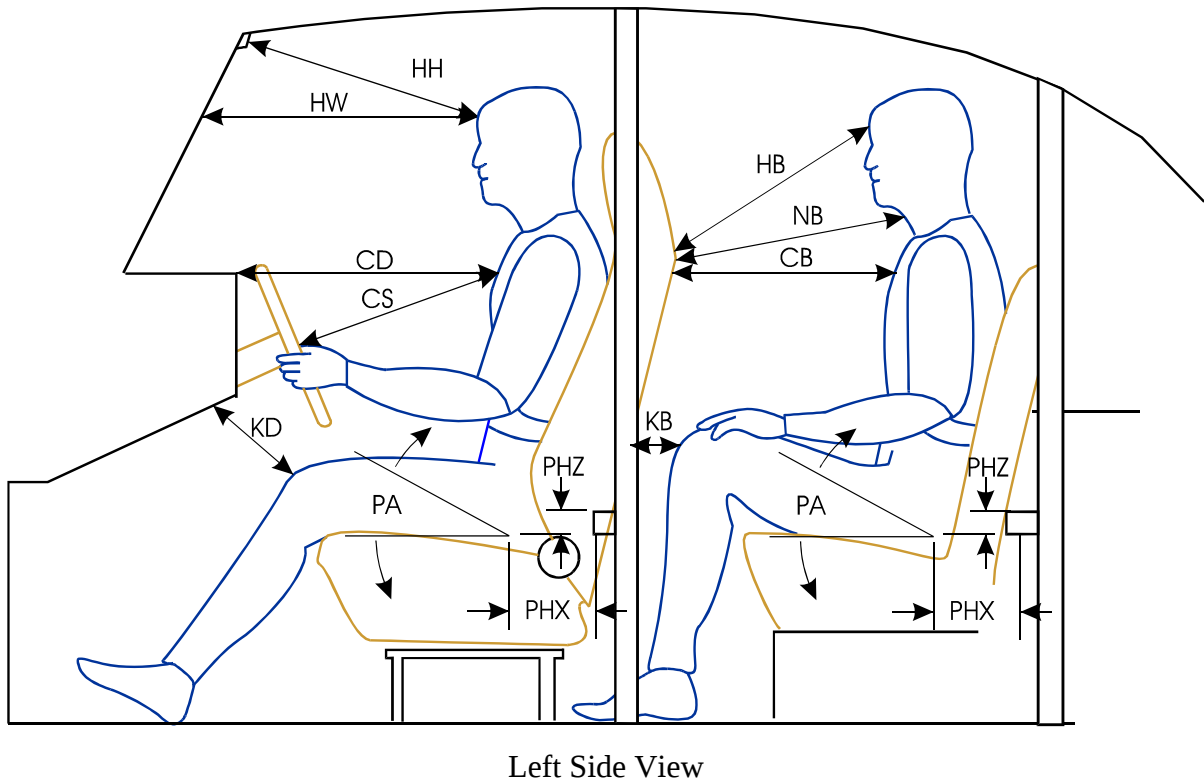
Longitudinal: Rearward

Lateral: Leftward

Vertical: Upward

Figure 1 SID-IIs Longitudinal Clearance Dimensions

Vehicle: 2007 Subaru Impreza 4-door sedan



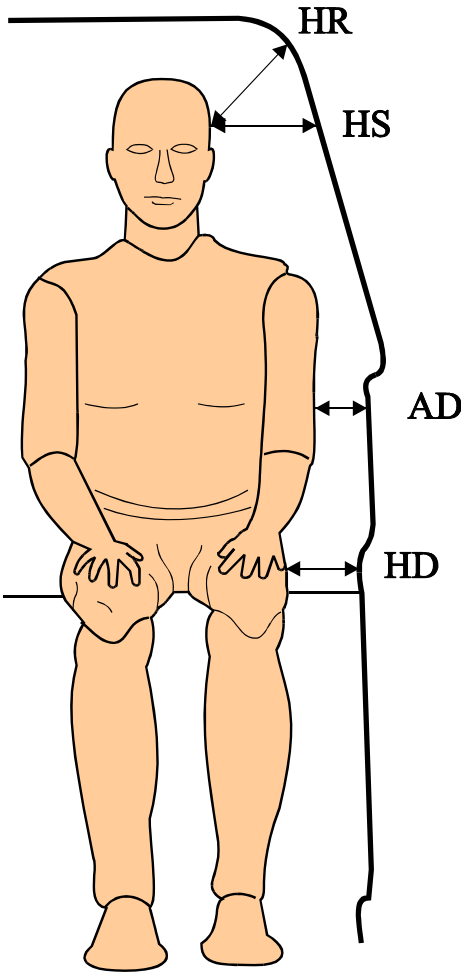
Note: All measurements are in millimeters with tolerance of  $\pm 0.1$  mm

| Measurement | Driver SID-IIs # 056 |
|-------------|----------------------|
| HH          | 259                  |
| HW          | 544                  |
| HZ          | 215                  |
| NR          | 225                  |
| CD          | 385                  |
| CS          | 167                  |
| KDL(KDA°)   | 131/(27.7°)          |
| KDR(KDA°)   | 126/(24.9°)          |
| PA°         | 18.6°                |
| PHX         | 258                  |
| PHZ         | 112                  |

Note: 2-door vehicle shown. Rear dummy PHX and PHZ measurements for 4-door vehicle would use the C-post striker as a reference point.

Figure 2 SID-IIs Lateral Clearance Dimensions

Vehicle: 2007 Subaru Impreza 4-door sedan

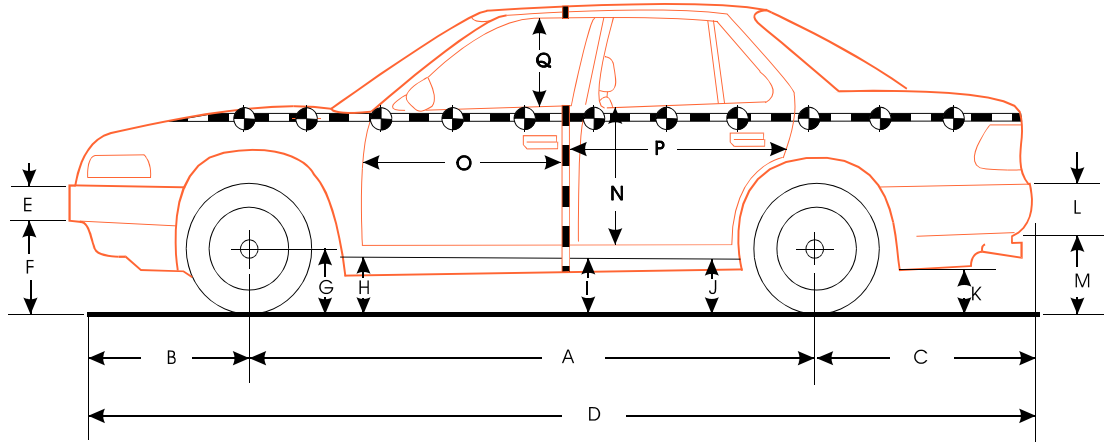


Note: All measurements are in millimeters with tolerance of  $\pm 0.1$  mm

| Measurement | Driver SID-IIs # 056 |            |
|-------------|----------------------|------------|
| HR          | 256                  |            |
| HS          | 340                  |            |
| AD          | Lower: 136           | Upper: 113 |
| HD          | 30                   |            |

**Figure 3 Vehicle Pre-Test And Post-Test Measurements**

Vehicle: 2007 Subaru Impreza 4-door sedan



Left Side View

Note: All dimensions are in millimeters with tolerance of  $\pm 0.1$  mm

|    | Pre-Test<br>(as delivered) | Pre-Test<br>(as tested) | Post-Test<br>(as tested) | Change |
|----|----------------------------|-------------------------|--------------------------|--------|
| A  | 2523                       | 2523                    | 2375                     | 148    |
| B  | 988                        | 988                     | 984                      | 4      |
| C  | 955                        | 955                     | 955                      | 0      |
| D  | 4465                       | 4465                    | 4379                     | 86     |
| E  | 115                        | 115                     | 115                      | 0      |
| F  | 428                        | 414                     | 452                      | -38    |
| G  | 295                        | 297                     | 295                      | 2      |
| H  | 300                        | 293                     | 286                      | 7      |
| I  | 240                        | 237                     | 255                      | -18    |
| J1 | 178                        | 172                     | 165                      | 7      |
| J2 | 240                        | 230                     | 266                      | -36    |
| K  | 243                        | 243                     | 243                      | 0      |
| L  | 186                        | 186                     | 186                      | 0      |
| M  | 413                        | 413                     | 402                      | 11     |
| N  | 730                        | 730                     | 695                      | 35     |
| O  | 582                        | 582                     | 453                      | 129    |
| P  | 1241                       | 1241                    | 1133                     | 108    |
| Q  | 388                        | 388                     | 359                      | 29     |
| R  | 4210                       | 4210                    | 4210                     | 0      |
| S  | 4210                       | 4210                    | 4083                     | 127    |
| T  | 1268                       | 1268                    | 1131                     | 137    |

D = Length at centerline

E and L = Bumper Thickness

R = Right Side Length

S = Left Side Length

T = Width at B-pillar

J1 = To Pinch Weld

J2 = To Sill

Table 5 Vehicle Structural Measurements<sup>1,2</sup>

|    | Elements                              | Pre-Test |
|----|---------------------------------------|----------|
| 1  | Total Length                          | 4465     |
| 2  | Total Width                           | 1692     |
| 3  | Bumper Top Height                     | 543      |
| 4  | Bumper Bottom Height                  | 430      |
| 5  | Longitudinal Member Top Height        | 523      |
| 6  | Longitudinal Member Bottom Height     | 280      |
| 7  | Distance Between Longitudinal Members | 1030     |
| 7' | Longitudinal Member Width             | 110      |
| 8  | Engine Top Height                     | 844      |
| 9  | Engine Bottom Height                  | 208      |
| 10 | Engine and Gearbox Width              | 750      |
| 11 | Front Bumper - Engine Distance        | 476      |
| 12 | Front Shock Absorber Fixing Height    | 863      |
| 13 | Bonnet Leading Edge Height            | 725      |
| 14 | Front Shock Absorber Fixing Width     | 1072     |
| 15 | Front Bumper - Front Axle Distance    | 988      |
| 16 | Front Axle - A Pillar Distance        | 525      |
| 17 | A Pillar - B Pillar Distance          | 990      |
| 18 | B Pillar - Rear Axle Distance         | 1024     |
| 19 | B Pillar - C Pillar Distance          | 891      |
| 20 | Roof Sill Bottom Height               | 1281     |
| 21 | Roof Sill Top Height                  | 1306     |
| 22 | Floor Sill Bottom Height              | 296      |
| 23 | Floor Sill Top Height                 | 324      |

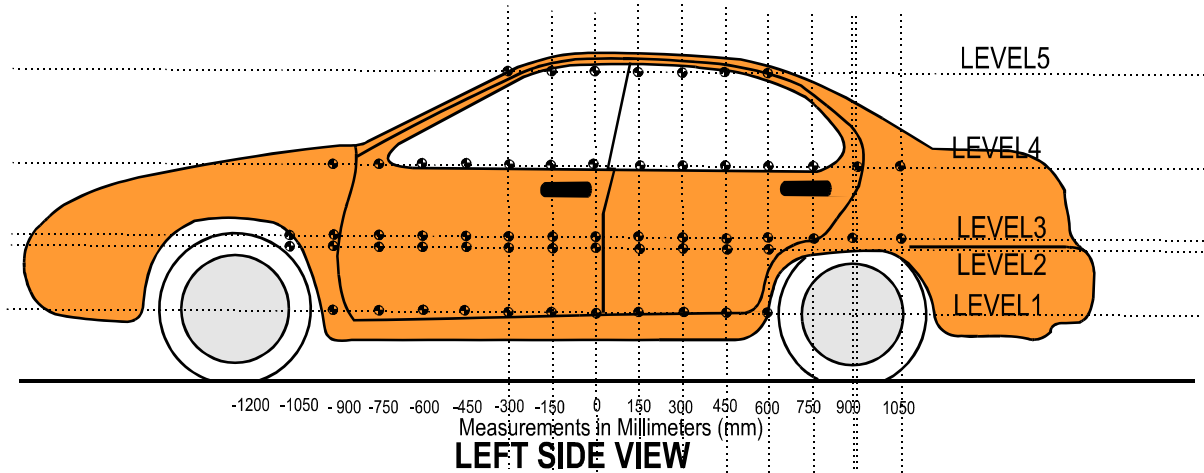
All distance measurements are in millimeters.

<sup>1</sup> Taken from INSIA report, “Structural Survey of Cars, Methodology of the Main Resistant Elements in the Car Body”, March 1999. This report is included in Appendix E.

<sup>2</sup> The vertical measurements from the ground are adjusted based on the test vehicle’s pre-test attitude measurements.

Figure 4 Vehicle Side Measurements

Vehicle: 2007 Subaru Impreza 4-door sedan



Measurements are taken when the vehicle is in the “As Tested” configuration.

Measurements along the vertical 750 mm line shown above.

Measurements vehicle forward of the impact line are negative.

All measurements below in mm.

| Level | Measurement Description | Height Above Ground |
|-------|-------------------------|---------------------|
| 5     | Window                  | 1305                |
| 4     | Window Sill             | 890                 |
| 3     | Mid Door                | 605                 |
| 2     | Occupant H-Point        | 480                 |
| 1     | Sill Top                | 250                 |

Table 6 Vehicle Exterior Crush Profiles - All Levels

Vehicle: 2007 Subaru Impreza 4-door sedan

| Location                  | Height |       | (mm) From Impact Point |       |      |      |      |      |      |      |     |     |     |     |     |     |
|---------------------------|--------|-------|------------------------|-------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|
|                           |        |       | -1245                  | -1095 | -945 | -795 | -645 | -495 | -345 | -195 | -45 | 105 | 255 | 405 | 555 | 705 |
| Level 1<br>Side Sill      | 250    | Pre   |                        |       |      |      | 799  | 789  | 789  | 789  | 789 | 789 | 789 | 789 | 789 | 790 |
|                           |        | Post  |                        |       |      |      | 831  | 756  | 685  | 600  | 496 | 462 | 552 | 639 | 700 | 751 |
|                           |        | Crush |                        |       |      |      | -32  | 33   | 104  | 189  | 293 | 327 | 237 | 150 | 89  | 39  |
| Level 2<br>H-Point        | 480    | Pre   |                        |       |      |      | 844  | 839  | 840  | 842  | 843 | 843 | 843 | 843 | 842 | 843 |
|                           |        | Post  |                        |       |      |      | 873  | 786  | 700  | 602  | 496 | 459 | 556 | 690 | 736 | 779 |
|                           |        | Crush |                        |       |      |      | -29  | 53   | 140  | 240  | 347 | 384 | 287 | 153 | 106 | 64  |
| Level 3<br>Mid-Door       | 605    | Pre   |                        |       |      | 872  | 847  | 842  | 844  | 845  | 845 | 846 | 845 | 845 | 845 | 846 |
|                           |        | Post  |                        |       |      | 913  | 880  | 790  | 696  | 608  | 497 | 456 | 547 | 688 | 714 | 760 |
|                           |        | Crush |                        |       |      | -41  | -33  | 52   | 148  | 237  | 348 | 390 | 298 | 157 | 131 | 86  |
| Level 4<br>Window<br>Sill | 890    | Pre   |                        |       | 771  | 780  | 788  | 791  | 797  | 802  | 805 | 808 | 815 | 813 | 814 | 816 |
|                           |        | Post  |                        |       | 861  | 852  | 831  | 793  | 702  | 606  | 494 | 437 | 534 | 641 | 698 | 726 |
|                           |        | Crush |                        |       | -90  | -72  | -43  | -2   | 95   | 196  | 311 | 371 | 281 | 172 | 116 | 90  |
| Level 5<br>Window<br>Top  | 1305   | Pre   |                        |       |      |      | 769  | 734  | 693  | 653  | 604 | 581 | 571 | 566 | 563 | 563 |
|                           |        | Post  |                        |       |      |      | 819  | 743  | 653  | 562  | 467 | 406 | 441 | 490 | 532 | 549 |
|                           |        | Crush |                        |       |      |      | -50  | -9   | 40   | 91   | 137 | 175 | 130 | 76  | 31  | 14  |

All measurements were recorded using TRC Inc.'s FARO Arm with a tolerance of  $\pm 0.1$  mm.

Note: Negative measurements are vehicle forward of the impact point.

The crush profile grid is established prior to test day based on an estimated impact point. The final distance to impact is determined after final dummy positioning. The pole is aligned with the center of gravity of the head.

Table 6 Vehicle Exterior Crush Profiles - All Levels, Continued

Vehicle: 2007 Subaru Impreza 4-door sedan

|                           |        |       | (mm) From Impact Point |      |      |      |      |      |      |      |      |      |      |      |      |
|---------------------------|--------|-------|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
|                           |        |       | 855                    | 1005 | 1155 | 1305 | 1455 | 1605 | 1755 | 1905 | 2055 | 2205 | 2355 | 2505 | 2655 |
| Location                  | Height |       |                        |      |      |      |      |      |      |      |      |      |      |      |      |
| Level 1<br>Side Sill      | 250    | Pre   | 790                    | 792  |      |      |      |      |      |      |      |      |      |      |      |
|                           |        | Post  | 799                    | 824  |      |      |      |      |      |      |      |      |      |      |      |
|                           |        | Crush | -9                     | -32  |      |      |      |      |      |      |      |      |      |      |      |
| Level 2<br>H-Point        | 480    | Pre   | 846                    | 851  |      |      |      |      |      |      |      |      |      |      |      |
|                           |        | Post  | 819                    | 854  |      |      |      |      |      |      |      |      |      |      |      |
|                           |        | Crush | 27                     | -3   |      |      |      |      |      |      |      |      |      |      |      |
| Level 3<br>Mid-Door       | 605    | Pre   | 851                    | 857  | 863  |      |      |      |      |      |      |      |      |      |      |
|                           |        | Post  | 807                    | 850  | 882  |      |      |      |      |      |      |      |      |      |      |
|                           |        | Crush | 44                     | 7    | -19  |      |      |      |      |      |      |      |      |      |      |
| Level 4<br>Window<br>Sill | 890    | Pre   | 816                    | 816  | 793  |      |      |      |      |      |      |      |      |      |      |
|                           |        | Post  | 752                    | 777  | 780  |      |      |      |      |      |      |      |      |      |      |
|                           |        | Crush | 64                     | 39   | 13   |      |      |      |      |      |      |      |      |      |      |
| Level 5<br>Window<br>Top  | 1305   | Pre   | 565                    | 574  | 612  |      |      |      |      |      |      |      |      |      |      |
|                           |        | Post  | 555                    | 568  | 608  |      |      |      |      |      |      |      |      |      |      |
|                           |        | Crush | 10                     | 6    | 4    |      |      |      |      |      |      |      |      |      |      |

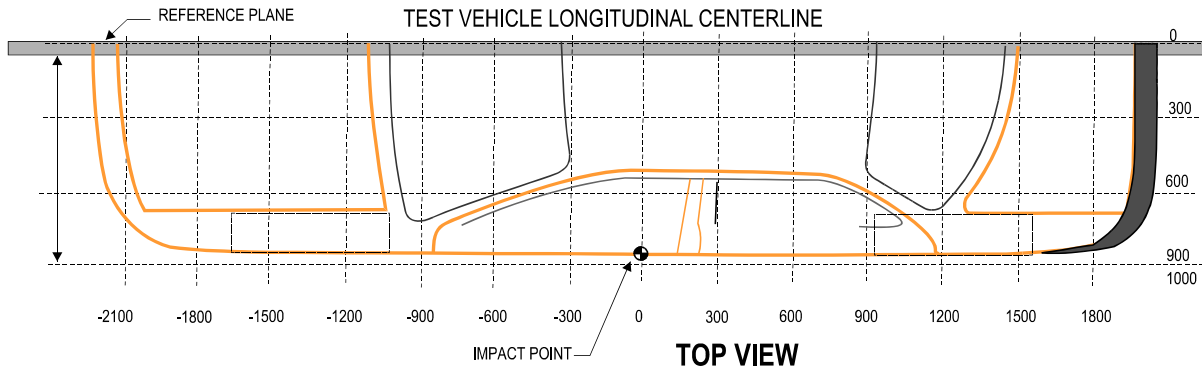
All measurements were recorded using TRC Inc.'s FARO Arm with a tolerance of  $\pm 0.1$  mm.

**Figure 5 Vehicle Damage Profile Distances**

Test Vehicle: **2007 Subaru Impreza**

Test Date: **06/28/07**

NOTE: All measurements were recorded using TRC Inc.'s FARO Arm with a tolerance of plus or minus 0.1 mm.



**MEASUREMENT CONVENTIONS:**

Forward of the impact point (towards front of vehicle) is considered negative (-)

Rearward of the impact point (towards rear end of vehicle) is considered positive (+)

**DAMAGE PROFILE DISTANCES**

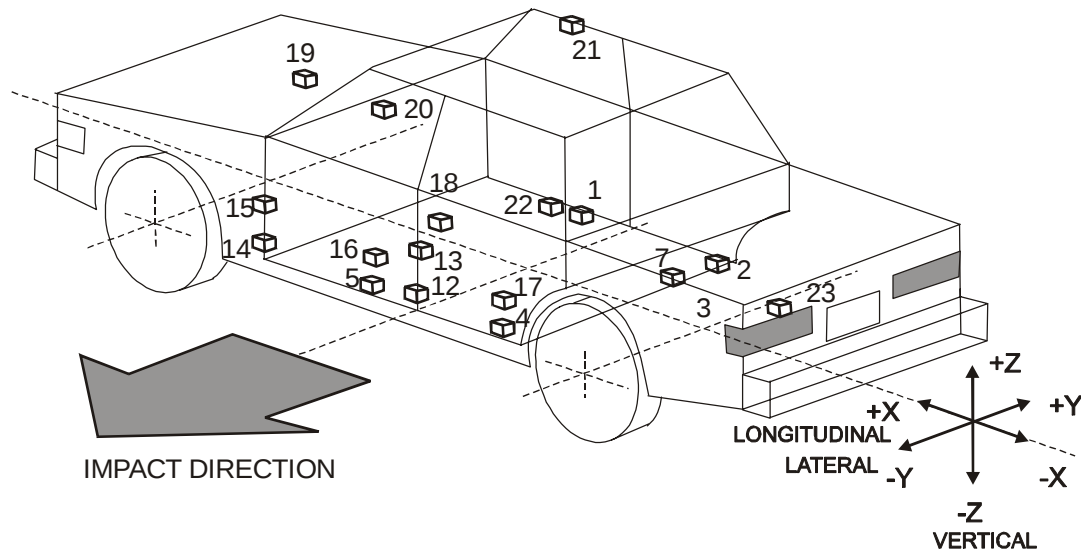
| DPD | Distance from Impact Point in mm | Level | Pre-Test (mm) | Post-Test (mm) | Max. Static Crush (mm) |
|-----|----------------------------------|-------|---------------|----------------|------------------------|
| 1   | 1155 mm                          | 3     | 863           | 882            | -19                    |
| 2   | 705 mm                           | 4     | 816           | 726            | 90                     |
| 3   | 405 mm                           | 4     | 813           | 641            | 172                    |
| 4   | 105 mm                           | 3     | 846           | 456            | 390                    |
| 5   | -195 mm                          | 2     | 842           | 602            | 240                    |
| 6   | -495 mm                          | 5     | 769           | 819            | -50                    |

Reference plane is parallel to test vehicle longitudinal centerline.

Given dimensions = Reference plane to car body.

Figure 6 Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2007 Subaru Impreza 4-door sedan



- 1-Right Front Side Sill
- 2-Right Side Sill at Rear Seat
- 3-Rear Floorpan above Axle
- 4-Left Side Sill at Rear Seat
- 5-Left Side Sill at Front Seat
- 6-Left Front Door on Centerline
- 7-Right Rear Occupant Compartment
- 8-Left Front Door Mid Rear
- 9-Left Front Door Upper Centerline
- 10-Left Rear Door Mid Rear
- 11-Left Rear Door Upper Centerline
- 12-Left Side Lower B-pillar

- 13-Left Side Middle B-pillar
- 14-Left Side Lower A-pillar
- 15-Left Side Middle A-pillar
- 16-Left Side Front Seat Track at H-point
- 17-Left Rear Seat Track at H-point
- 18-Vehicle Center of Gravity
- 19-Top of Engine
- 20-Firewall
- 21-Right Side Roof Rail
- 22-Right Side Sill In-Line with Impact Location
- 23-Rear Deck Behind Rear Axle

Table 7 Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2007 Subaru Impreza 4-door sedan

| Location                           | Coordinates<br>(millimeters) |     |     | Positive Direction<br>Max.      Time<br>(g)        (ms) |      | Negative Direction<br>Max.      Time<br>(g)        (ms) |       |
|------------------------------------|------------------------------|-----|-----|---------------------------------------------------------|------|---------------------------------------------------------|-------|
|                                    | X                            | Y   | Z   |                                                         |      |                                                         |       |
| 1 Right Side Sill<br>at Front Seat | 2885                         | 643 | 247 |                                                         |      |                                                         |       |
| Longitudinal                       |                              |     |     | 3.9                                                     | 38.1 | 0.7                                                     | 141.3 |
| Lateral                            |                              |     |     | 17.0                                                    | 35.3 | 0.9                                                     | 181.8 |
| Vertical                           |                              |     |     | 4.4                                                     | 13.2 | 3.2                                                     | 43.2  |
| Resultant                          |                              |     |     | 17.6                                                    | 35.4 |                                                         |       |
| 2 Right Side Sill<br>at Rear Seat  | 2080                         | 646 | 270 |                                                         |      |                                                         |       |
| Longitudinal                       |                              |     |     | 2.6                                                     | 27.4 | 0.7                                                     | 141.6 |
| Lateral                            |                              |     |     | 17.2                                                    | 38.1 | 0.8                                                     | 182.0 |
| Vertical                           |                              |     |     | 4.9                                                     | 36.4 | 2.2                                                     | 54.8  |
| Resultant                          |                              |     |     | 17.7                                                    | 38.0 |                                                         |       |
| 3 Rear Floorpan<br>Above Axle      | 1333                         | 0   | 526 |                                                         |      |                                                         |       |
| Longitudinal <sup>1</sup>          |                              |     |     | 2.6                                                     | 80.8 | 85.8                                                    | 302.7 |
| Lateral                            |                              |     |     | 13.1                                                    | 32.5 | 1.0                                                     | 205.0 |
| Vertical                           |                              |     |     | 4.6                                                     | 41.9 | 2.7                                                     | 105.0 |
| 4 Left Side Sill at<br>Rear Seat   | 2100                         | 646 | 264 |                                                         |      |                                                         |       |
| Longitudinal                       |                              |     |     |                                                         |      |                                                         |       |
| Lateral                            |                              |     |     | 23.8                                                    | 23.4 | 5.5                                                     | 39.4  |
| Vertical                           |                              |     |     |                                                         |      |                                                         |       |
| Resultant                          |                              |     |     |                                                         |      |                                                         |       |
| 5 Left Side Sill at<br>Front Seat  | 2950                         | 643 | 270 |                                                         |      |                                                         |       |
| Longitudinal                       |                              |     |     |                                                         |      |                                                         |       |
| Lateral                            |                              |     |     | 32.2                                                    | 23.4 | 7.9                                                     | 29.7  |
| Vertical                           |                              |     |     |                                                         |      |                                                         |       |
| Resultant                          |                              |     |     |                                                         |      |                                                         |       |

Table 7 Test Vehicle Accelerometer Locations and Data Summary, Continued

Vehicle: 2007 Subaru Impreza 4-door sedan

| Location                                | Coordinates<br>(millimeters) |     |     | Positive Direction |              | Negative Direction |              |
|-----------------------------------------|------------------------------|-----|-----|--------------------|--------------|--------------------|--------------|
|                                         | X                            | Y   | Z   | Max.<br>(g)        | Time<br>(ms) | Max.<br>(g)        | Time<br>(ms) |
| 6 Left Front Door<br>on Centerline      | 2700                         | 705 | 626 |                    |              |                    |              |
| Longitudinal                            |                              |     |     |                    |              |                    |              |
| Lateral                                 |                              |     |     | 110.7              | 8.8          | 36.8               | 25.7         |
| Vertical                                |                              |     |     |                    |              |                    |              |
| Resultant                               |                              |     |     |                    |              |                    |              |
| 7 Right Rear<br>Occupant<br>Compartment | 1980                         | 575 | 323 |                    |              |                    |              |
| Longitudinal                            |                              |     |     |                    |              |                    |              |
| Lateral                                 |                              |     |     | 13.7               | 38.3         | 0.7                | 181.3        |
| Vertical                                |                              |     |     |                    |              |                    |              |
| Resultant                               |                              |     |     |                    |              |                    |              |
| 8 Left Front Door<br>Mid-Rear           | 2391                         | 712 | 626 |                    |              |                    |              |
| Longitudinal                            |                              |     |     |                    |              |                    |              |
| Lateral <sup>1</sup>                    |                              |     |     | 149.4              | 40.8         | 128.9              | 146.3        |
| Vertical                                |                              |     |     |                    |              |                    |              |
| Resultant                               |                              |     |     |                    |              |                    |              |
| 9 Left Front Door<br>Upper Centerline   | 2700                         | 725 | 880 |                    |              |                    |              |
| Longitudinal                            |                              |     |     |                    |              |                    |              |
| Lateral                                 |                              |     |     | 118.8              | 7.3          | 36.9               | 15.2         |
| Vertical                                |                              |     |     |                    |              |                    |              |
| Resultant                               |                              |     |     |                    |              |                    |              |
| 10 Left Rear Door<br>Mid Rear           | 1760                         | 725 | 647 |                    |              |                    |              |
| Longitudinal                            |                              |     |     |                    |              |                    |              |
| Lateral                                 |                              |     |     | 33.3               | 17.4         | 17.5               | 24.5         |
| Vertical                                |                              |     |     |                    |              |                    |              |
| Resultant                               |                              |     |     |                    |              |                    |              |

Table 7 Test Vehicle Accelerometer Locations and Data Summary, Continued

Vehicle: 2007 Subaru Impreza 4-door sedan

| Location                              | Coordinates<br>(millimeters) |      |     | Positive Direction |              | Negative Direction |              |
|---------------------------------------|------------------------------|------|-----|--------------------|--------------|--------------------|--------------|
|                                       | X                            | Y    | Z   | Max.<br>(g)        | Time<br>(ms) | Max.<br>(g)        | Time<br>(ms) |
| 11 Left Rear Door<br>Upper Centerline | 1760                         | 7235 | 905 |                    |              |                    |              |
| Longitudinal                          |                              |      |     |                    |              |                    |              |
| Lateral                               |                              |      |     | 42.5               | 87.9         | 31.1               | 83.0         |
| Vertical                              |                              |      |     |                    |              |                    |              |
| Resultant                             |                              |      |     |                    |              |                    |              |
| 12 Left Lower<br>B-Pillar             | 2247                         | 790  | 500 |                    |              |                    |              |
| Longitudinal                          |                              |      |     |                    |              |                    |              |
| Lateral                               |                              |      |     | 41.5               | 13.9         | 7.5                | 41.8         |
| Vertical                              |                              |      |     |                    |              |                    |              |
| Resultant                             |                              |      |     |                    |              |                    |              |
| 13 Left Middle<br>B-Pillar            | 2222                         | 775  | 796 |                    |              |                    |              |
| Longitudinal                          |                              |      |     |                    |              |                    |              |
| Lateral                               |                              |      |     | 31.3               | 27.9         | 7.7                | 41.8         |
| Vertical                              |                              |      |     |                    |              |                    |              |
| Resultant                             |                              |      |     |                    |              |                    |              |
| 14 Left Lower<br>A-Pillar             | 3265                         | 780  | 465 |                    |              |                    |              |
| Longitudinal                          |                              |      |     |                    |              |                    |              |
| Lateral <sup>1</sup>                  |                              |      |     | ----               | ----         | ----               | ----         |
| Vertical                              |                              |      |     |                    |              |                    |              |
| Resultant                             |                              |      |     |                    |              |                    |              |
| 15 Left Middle<br>A-Pillar            | 3242                         | 775  | 810 |                    |              |                    |              |
| Longitudinal                          |                              |      |     |                    |              |                    |              |
| Lateral                               |                              |      |     | 33.8               | 32.0         | 9.9                | 26.5         |
| Vertical                              |                              |      |     |                    |              |                    |              |
| Resultant                             |                              |      |     |                    |              |                    |              |

Table 7 Test Vehicle Accelerometer Locations and Data Summary, Continued

Vehicle: 2007 Subaru Impreza 4-door sedan

| Location                                         | Coordinates<br>(millimeters) |     |     | Positive Direction |              | Negative Direction |              |
|--------------------------------------------------|------------------------------|-----|-----|--------------------|--------------|--------------------|--------------|
|                                                  | X                            | Y   | Z   | Max.<br>(g)        | Time<br>(ms) | Max.<br>(g)        | Time<br>(ms) |
| 16 Left Front Seat Track                         | 2505                         | 576 | 290 |                    |              |                    |              |
| Longitudinal<br>Lateral<br>Vertical<br>Resultant |                              |     |     |                    |              |                    |              |
|                                                  |                              |     |     | 61.1               | 22.0         | 20.6               | 39.6         |
|                                                  |                              |     |     |                    |              |                    |              |
|                                                  |                              |     |     |                    |              |                    |              |
| 17 Left Rear Seat Track                          | 1722                         | 530 | 410 |                    |              |                    |              |
| Longitudinal<br>Lateral<br>Vertical<br>Resultant |                              |     |     |                    |              |                    |              |
|                                                  |                              |     |     | 0.5                | 179.4        | 19.9               | 31.8         |
|                                                  |                              |     |     |                    |              |                    |              |
|                                                  |                              |     |     |                    |              |                    |              |
| 18 Vehicle CG                                    | 2586                         | 0   | 529 |                    |              |                    |              |
| Longitudinal<br>Lateral<br>Vertical<br>Resultant |                              |     |     | 21.1               | 39.8         | 13.5               | 35.0         |
|                                                  |                              |     |     | 47.6               | 31.6         | 13.8               | 84.6         |
|                                                  |                              |     |     | 13.6               | 27.3         | 22.9               | 47.8         |
|                                                  |                              |     |     | 48.5               | 31.6         |                    |              |
| 19 Top of Engine                                 | 3900                         | 0   | 839 |                    |              |                    |              |
| Longitudinal<br>Lateral<br>Vertical<br>Resultant |                              |     |     | 12.6               | 45.8         | 1.1                | 252.3        |
|                                                  |                              |     |     | 14.1               | 57.0         | 4.1                | 218.9        |
|                                                  |                              |     |     |                    |              |                    |              |
|                                                  |                              |     |     |                    |              |                    |              |
| 20 Firewall                                      | 3540                         | 35  | 857 |                    |              |                    |              |
| Longitudinal<br>Lateral<br>Vertical<br>Resultant |                              |     |     | 10.0               | 43.2         | 1.6                | 37.6         |
|                                                  |                              |     |     | 17.2               | 34.2         | 1.1                | 279.4        |
|                                                  |                              |     |     |                    |              |                    |              |
|                                                  |                              |     |     |                    |              |                    |              |

Table 7 Test Vehicle Accelerometer Locations and Data Summary, Continued

Vehicle: 2007 Subaru Impreza 4-door sedan

| Location                                        | Coordinates<br>(millimeters) |     |      | Positive Direction |              | Negative Direction |              |
|-------------------------------------------------|------------------------------|-----|------|--------------------|--------------|--------------------|--------------|
|                                                 | X                            | Y   | Z    | Max.<br>(g)        | Time<br>(ms) | Max.<br>(g)        | Time<br>(ms) |
| 21 Right Side Roof Rail                         | 2525                         | 540 | 1324 |                    |              |                    |              |
| Longitudinal                                    |                              |     |      | 7.3                | 30.2         | 5.9                | 35.4         |
| Lateral                                         |                              |     |      | 29.0               | 31.8         | 1.3                | 25.1         |
| Vertical                                        |                              |     |      |                    |              |                    |              |
| Resultant                                       |                              |     |      |                    |              |                    |              |
| 22 Right Side Sill In-Line with Impact Location | 3140                         | 702 | 191  |                    |              |                    |              |
| Longitudinal                                    |                              |     |      |                    |              |                    |              |
| Lateral                                         |                              |     |      | 18.8               | 35.0         | 0.8                | 259.4        |
| Vertical                                        |                              |     |      |                    |              |                    |              |
| 23 Rear Deck Behind Rear Axle                   | 460                          | 0   | 538  |                    |              |                    |              |
| Longitudinal                                    |                              |     |      | 8.9                | 84.9         | 5.3                | 53.9         |
| Lateral                                         |                              |     |      | 16.1               | 92.1         | 2.5                | 202.7        |
| Vertical                                        |                              |     |      | 5.7                | 80.3         | 5.5                | 48.6         |

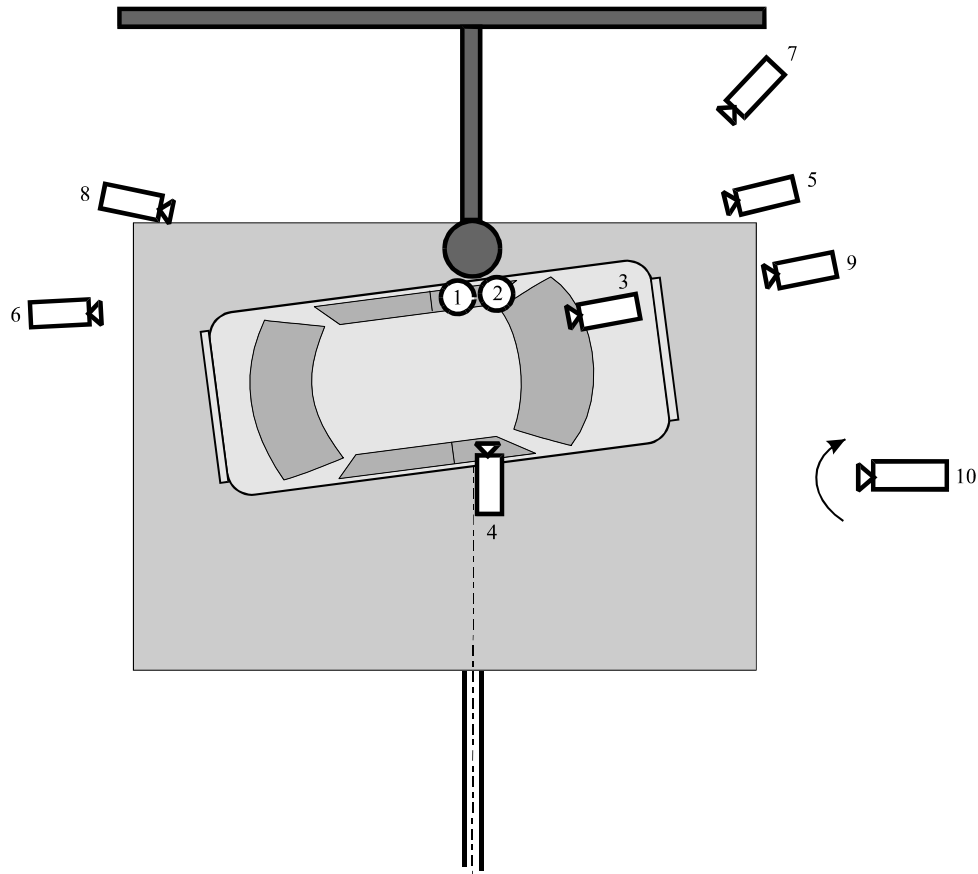
Reference:      X: + Forward from rear bumper  
                      Y: + Rightward from vehicle centerline  
                      Z: + Downward from ground level

For acceleration data sign convention see Report Sign Convention in Appendix D.

<sup>1</sup> See Data Acquisition Explanations

Figure 7 High-Speed Camera Locations and Data Summary

Vehicle: 2007 Subaru Impreza 4-door sedan



| No. | Camera View             | Location (mm) |      |       | Angle (deg.) | Lens (mm) | Speed (fps) |
|-----|-------------------------|---------------|------|-------|--------------|-----------|-------------|
|     |                         | X             | Y    | Z     |              |           |             |
| 1   | Overhead Wide           | 350           | 0    | -5350 | 90.0         | 12.5      | 1000        |
| 2   | Overhead Tight          | 0             | 0    | -5350 | 90.0         | 25        | 1000        |
| 3   | Onboard Front - Driver  | 4690          | 1180 | -1140 | 1.9          | 12.5      | 1000        |
| 4   | Onboard Side Front      | 1610          | 0    | -1090 | 5.9          | 6.5       | 1000        |
| 5   | Front Vehicle to Pole   | -1380         | 5510 | -1310 | 4.0          | 12.5      | 1000        |
| 6   | Rear Vehicle to Pole    | 2050          | 5880 | -1310 | 2.1          | 12.5      | 1000        |
| 7   | Left Front Angled       | -2370         | 4720 | -1330 | 3.3          | 25        | 1000        |
| 8   | Left Rear Angled        | 1350          | 4610 | -1320 | 2.7          | 25        | 1000        |
| 9   | Vehicle Front on Driver | 680           | 4300 | -2290 | 11.9         | 50        | 1000        |
| 10  | Panning                 |               |      |       |              | Zoom      | 30          |

+X: Forward (referenced to Pole) from impact point  
+Y: Rightward (referenced to Pole) from impact point  
+Z: Downward from ground level  
Vehicle was at a 15° angle to the rigid pole.

## Appendix A

### Photographs



**Figure A-1 Pre-Test Front View**



**Figure A-2 Post-Test Front View**



**Figure A-3 Pre-Test Left Front View**



**Figure A-4 Post-Test Left Front View**



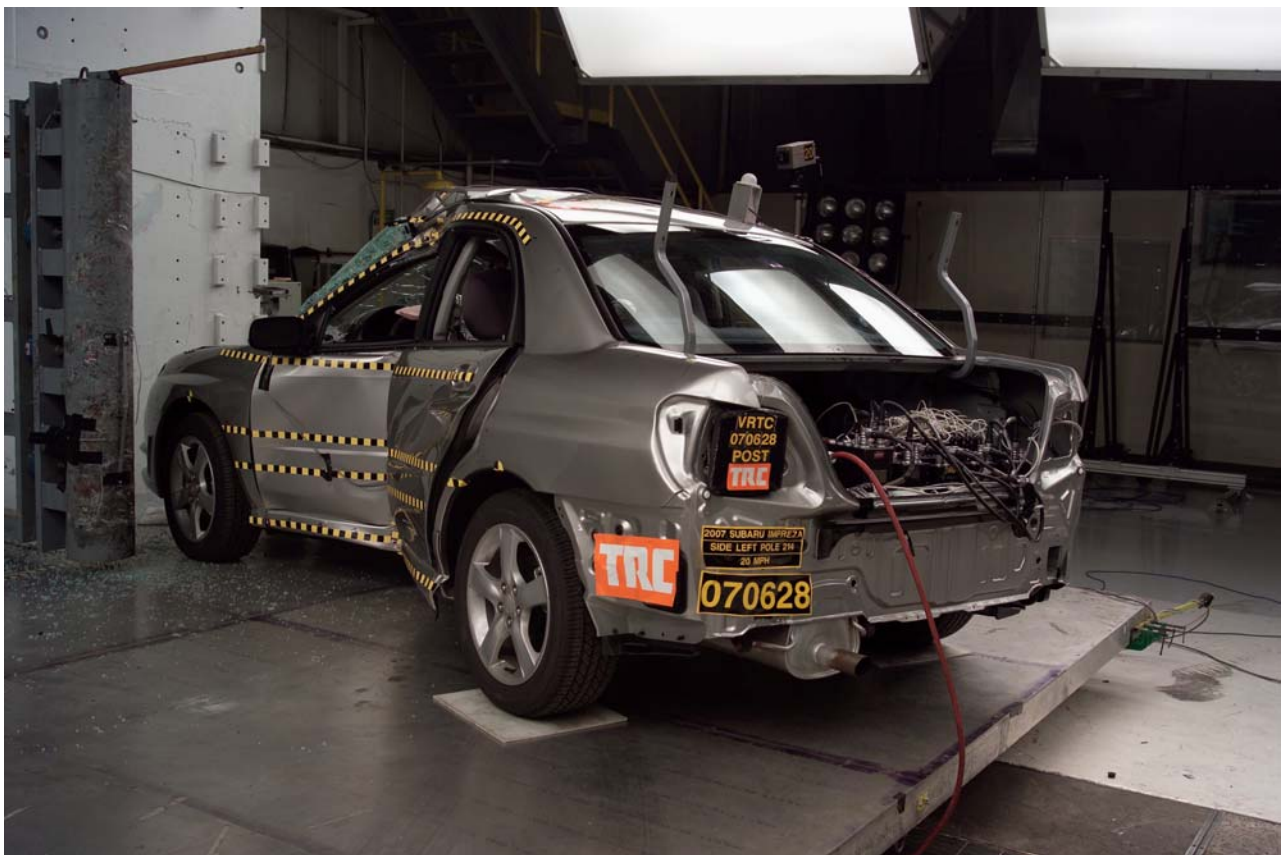
**Figure A-5 Pre-Test Left Side View**



**Figure A-6 Post-Test Left Side View**



**Figure A-7 Pre-Test Left Rear View**



**Figure A-8 Post-Test Left Rear View**



**Figure A-9 Pre-Test Rear View**



**Figure A-10 Post-Test Rear View**



**Figure A-11 Pre-Test Right Rear View**



**Figure A-12 Post-Test Right Rear View**



**Figure A-13 Pre-Test Right Side View**



**Figure A-14 Post-Test Right Side View**



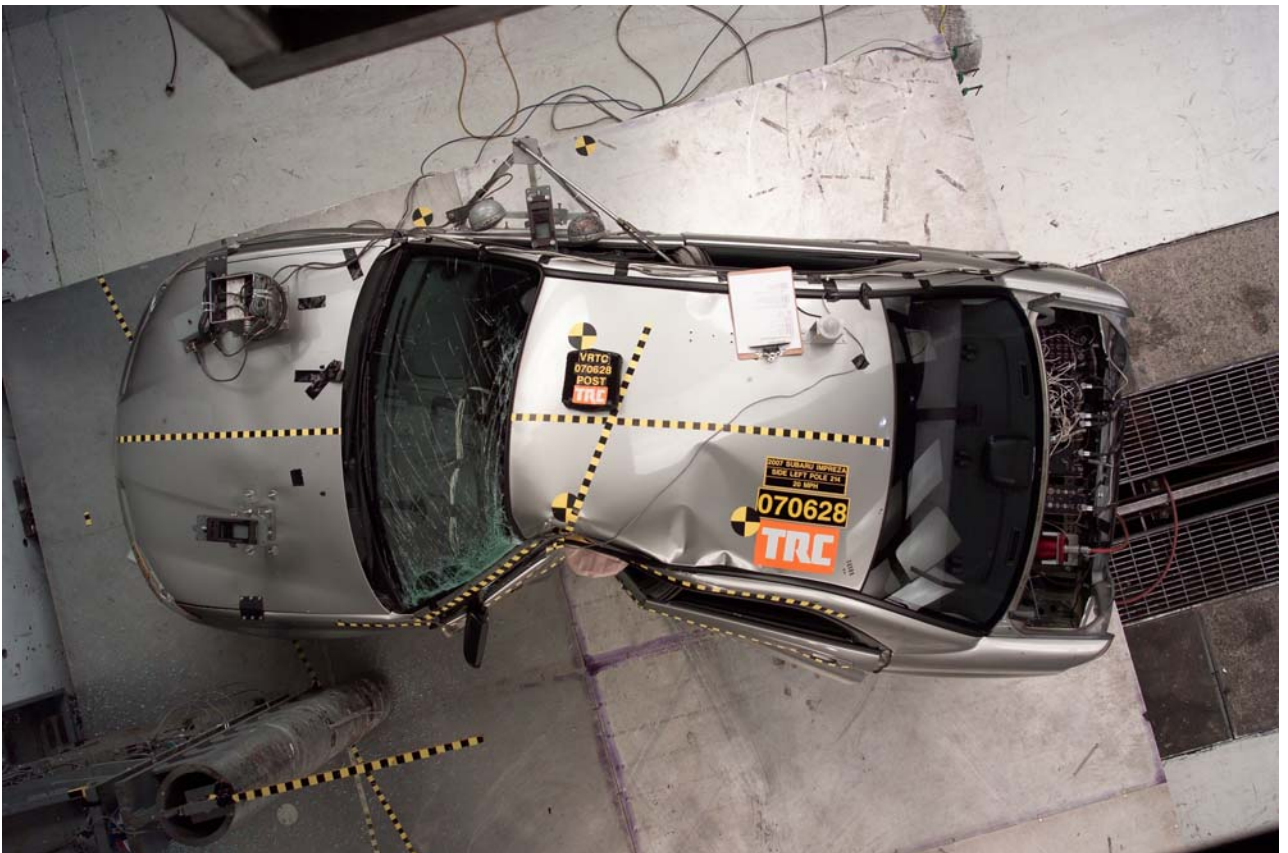
**Figure A-15 Pre-Test Right Front View**



**Figure A-16 Post-Test Right Front View**



**Figure A-17 Pre-Test Overhead View**



**Figure A-18 Post-Test Overhead View**



**Figure A-19 Pre-Test Impact Point View**



**Figure A-20 Post-Test Impact Point View**



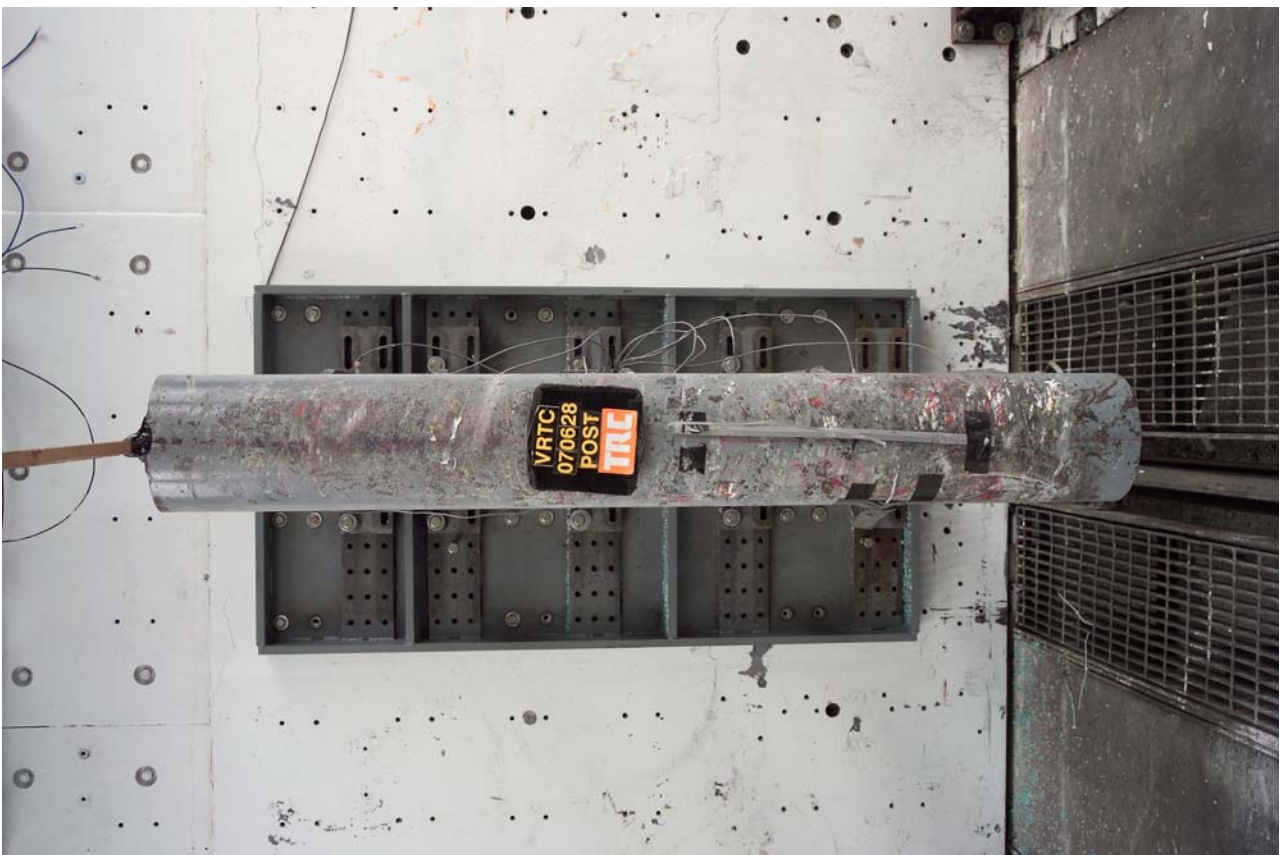
**Figure A-21 Pre-Test Fuel Filler Cap View**



**Figure A-22 Post-Test Fuel Filler Cap View**



**Figure A-23 Pre-Test Pole Barrier Front View**



**Figure A-24 Post-Test Pole Barrier Front View**



**Figure A-25 Pre-Test Pole Barrier Side View**

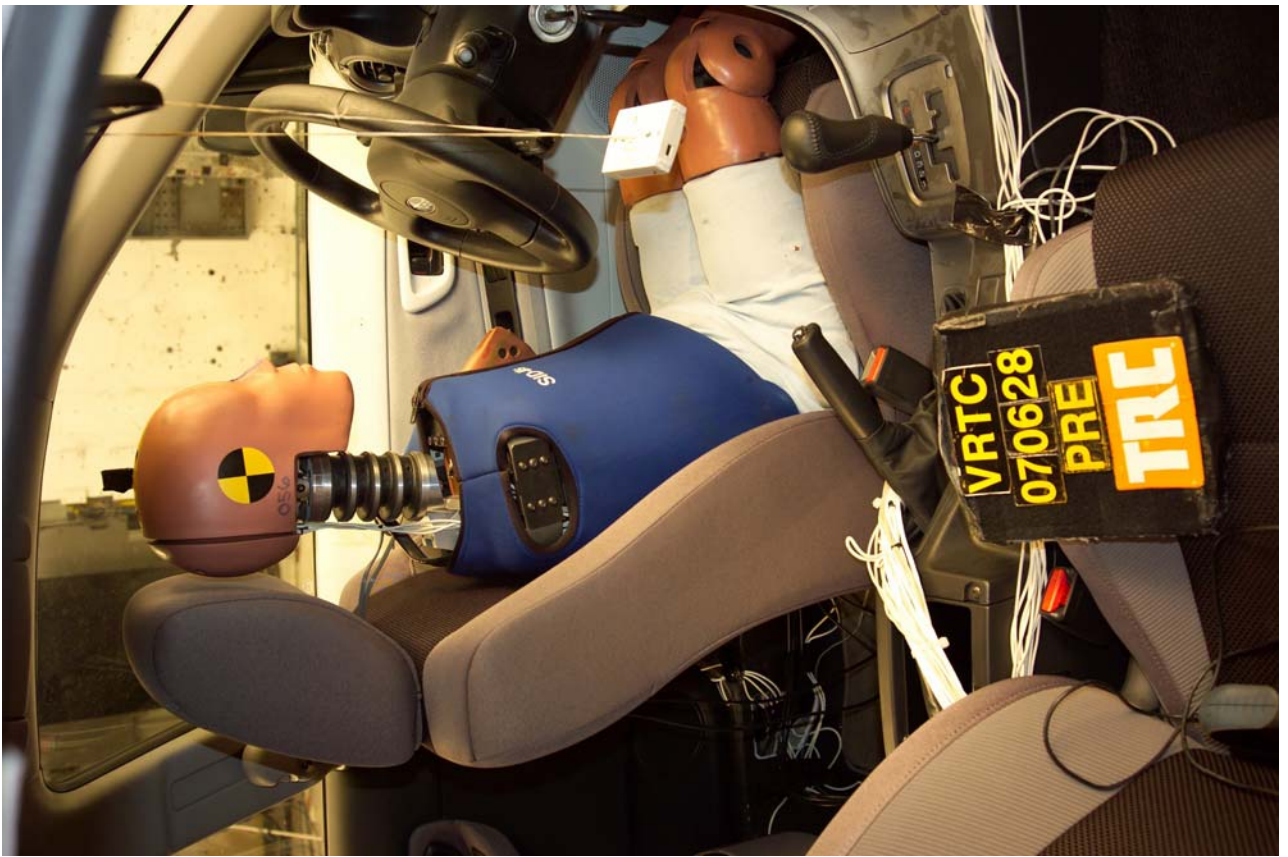
**Intentionally Left Blank**



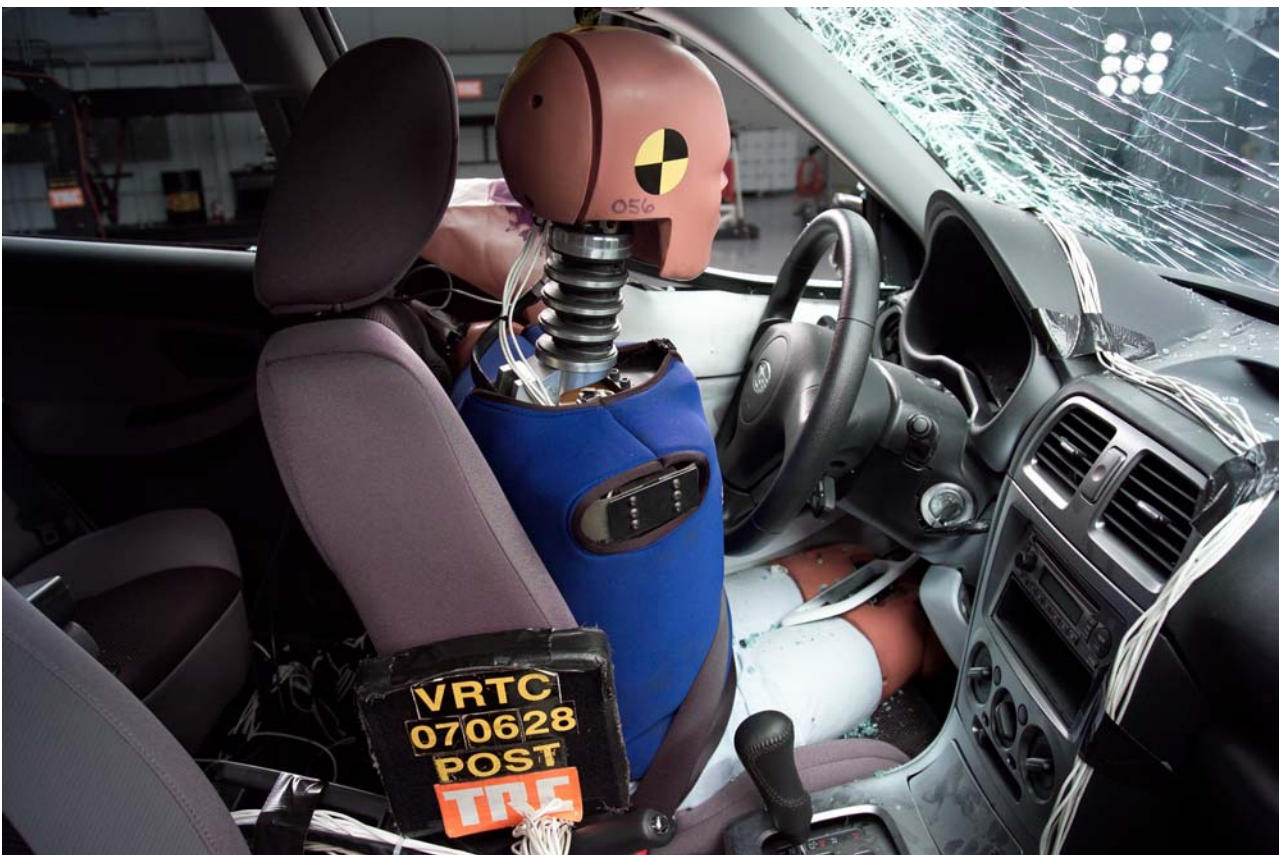
**Figure A-26 Pre-Test Driver Dummy Side View**



**Figure A-27 Post-Test Driver Dummy Side View**



**Figure A-28 Pre-Test Right Side Dummy Occupant Compartment View**



**Figure A-29 Post-Test Right Side Dummy Occupant Compartment View**



Figure A-30 Pre-Test Driver Dummy and Door Clearance View



Figure A-31 Post-Test Driver Dummy and Door Clearance View

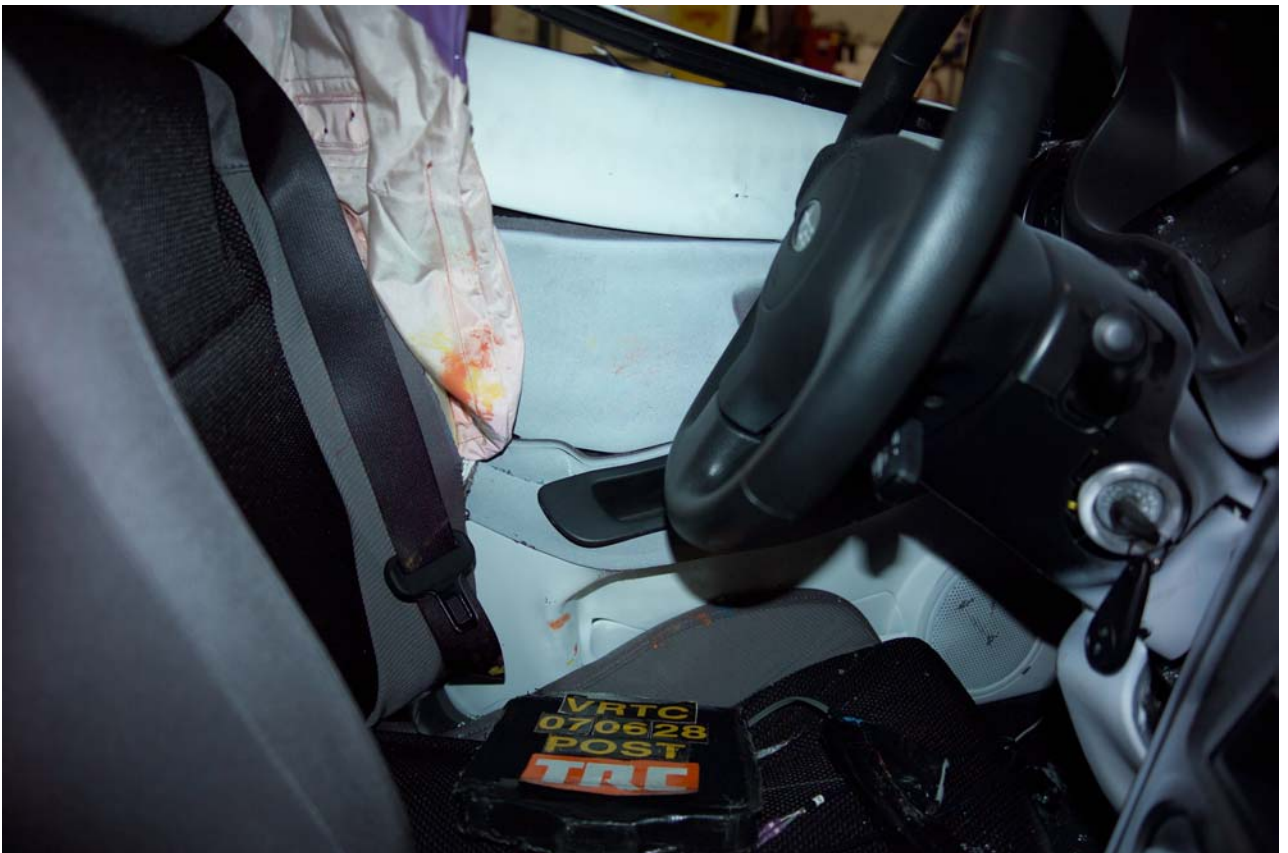


**Figure A-32 Pre-Test Driver Dummy Showing Belts, Chalking, and Contact Switches**

**Intentionally Left Blank**



**Figure A-33 Pre-Test Driver Door Panel View**



**Figure A-34 Post-Test Driver Door Panel View**



**Figure A-35 Post-Test Driver Dummy Head Contact View**



**Figure A-36 Post-Test Driver Dummy Door Contact View**



Figure A-37 Certification Label View



Figure A-38 Recommended Tire Pressure Label View



**Figure A-39 Pre-Test Ballast View**

**Intentionally Left Blank**

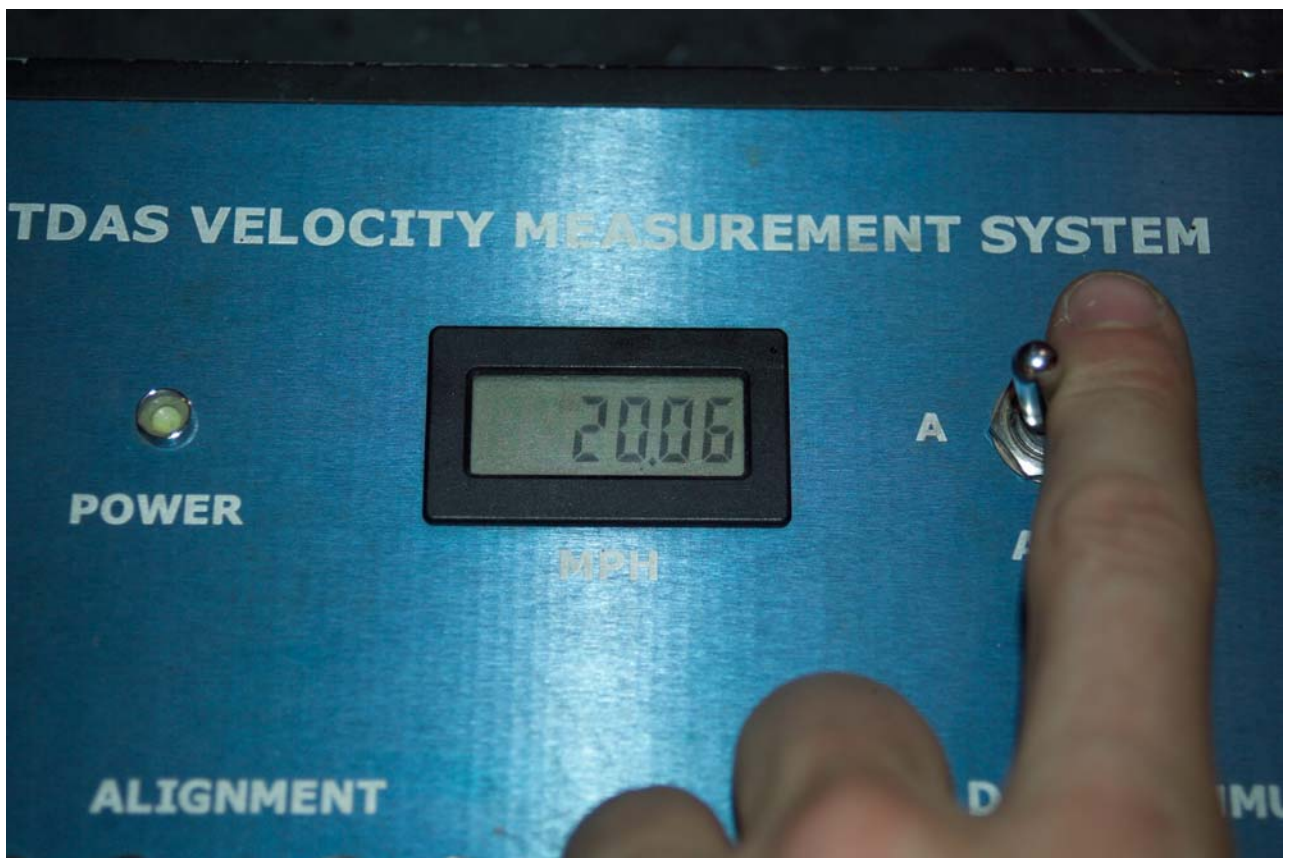


Figure A-40 Post-Test Digital Light Trap Read-Out - View 1

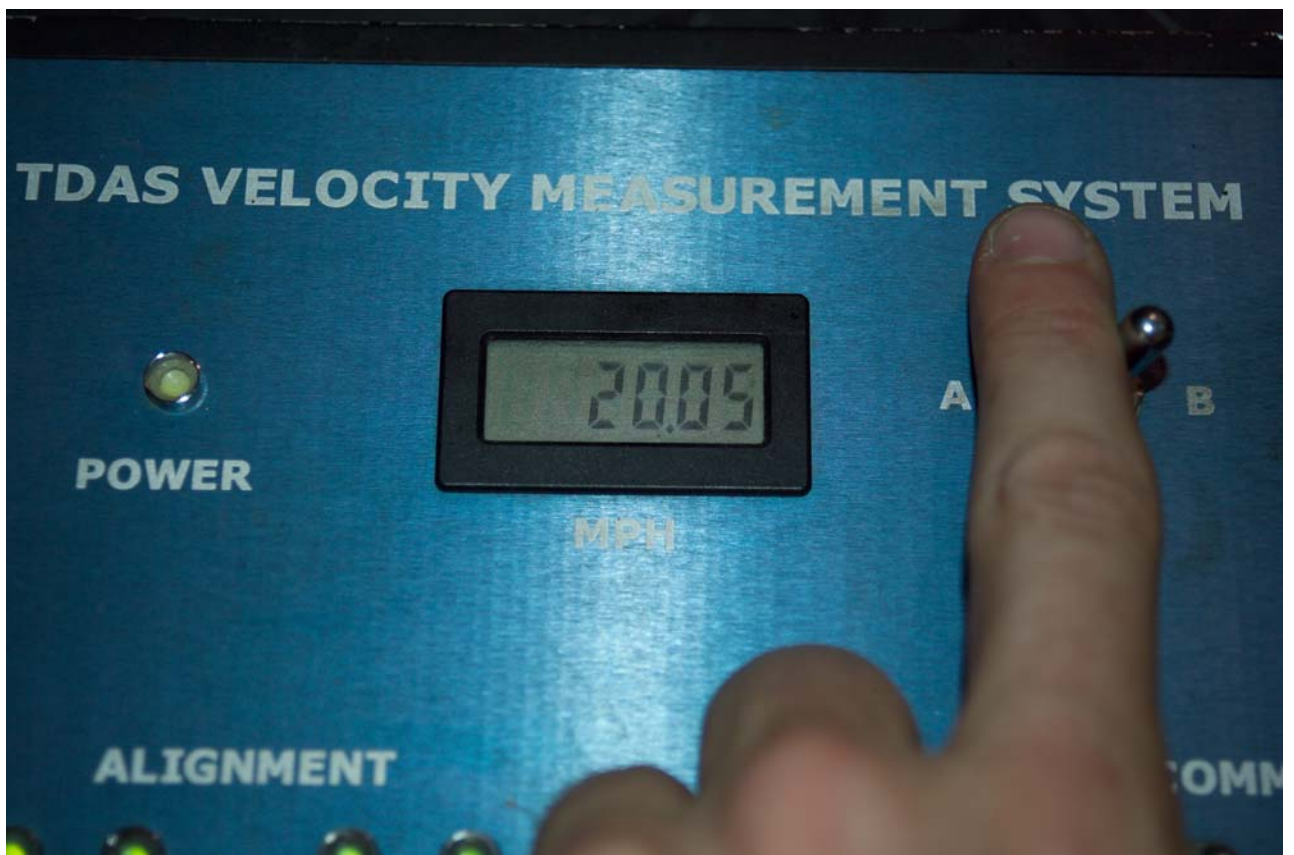


Figure A-41 Post-Test Digital Light Trap Read-Out - View 2

## Appendix B

### Data Plots



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

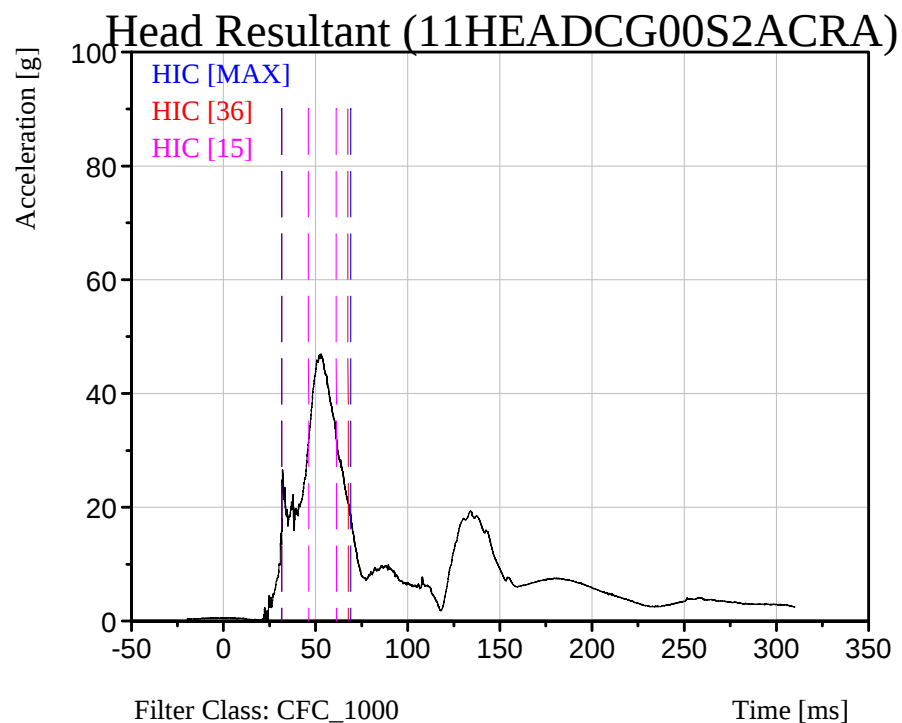
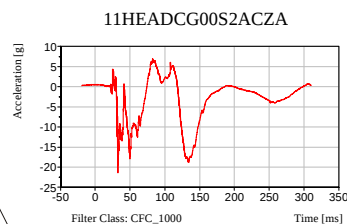
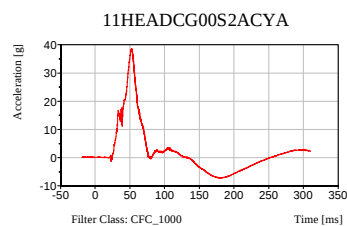
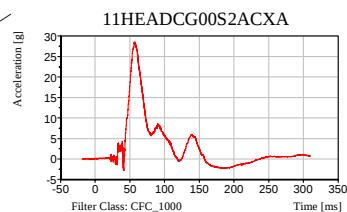
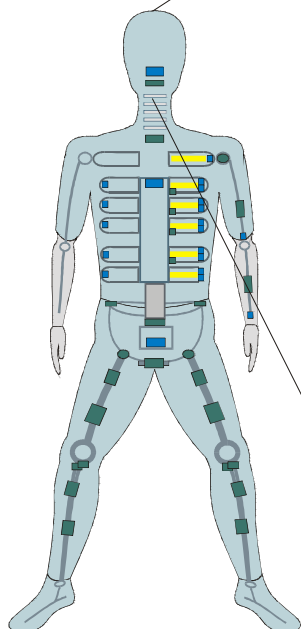
Date: 06/28/2007  
Time: 14:43

## Head Injury Criterion (HIC)

Customer: VRTC

TRC Inc. Test Lab: CTF

Test Number: 070628



|                     | <u>T1</u> (Begin) | <u>T2</u> (End) | <u>Avg. g T1 to T2</u> |
|---------------------|-------------------|-----------------|------------------------|
| HIC [Max.] = 184.35 | 31.60 ms          | 69.12 ms        | 29.93 g                |
| HIC [36] = 183.62   | 31.68 ms          | 67.68 ms        | 30.39 g                |
| HIC [15] = 160.91   | 46.24 ms          | 61.28 ms        | 40.85 g                |

Dummy:SID II  
Seating Position:  
Driver

HIC Source Code: SAE J2052 ISO/TC22/SC12/WG3 N 282 (Issued 1990-03-16)

B-2

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

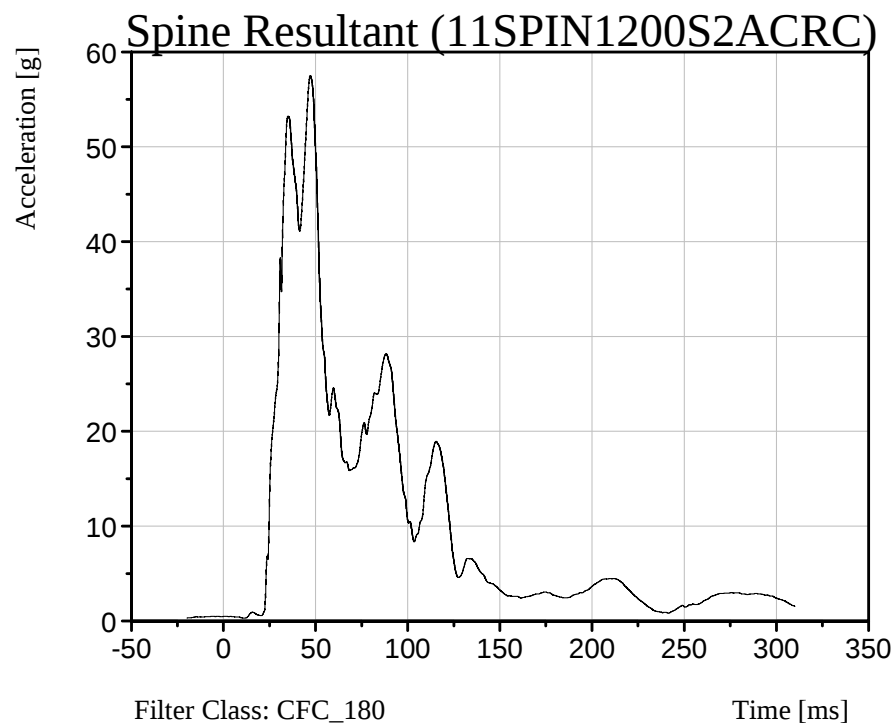
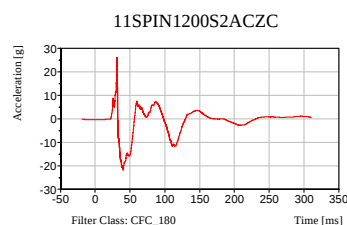
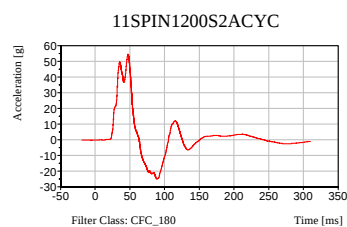
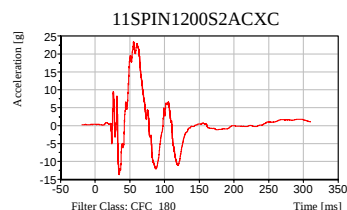
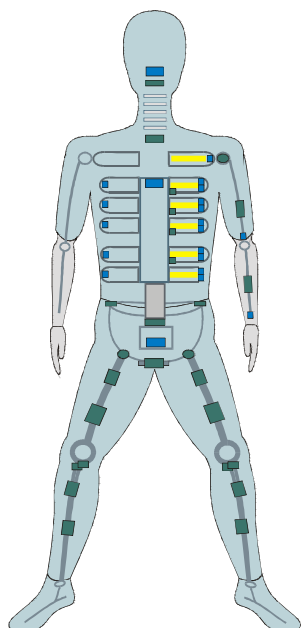
Date: 06/28/2007  
Time: 14:43

## Resultant (Spine)

Customer: VRTC

TRC Inc. Test Lab: CTF

Test Number: 070628



Dummy:SID IIs  
Seating Position:  
Driver

[Max.] 57.53 g at 47.04 ms

[Min.] 0.31 g at 11.12 ms

Resultant Source Code :  $\text{Sqrt}(11\text{SPIN1200S2ACXC}^2 + 11\text{SPIN1200S2ACYC}^2 + 11\text{SPIN1200S2ACZC}^2)$

B-3

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

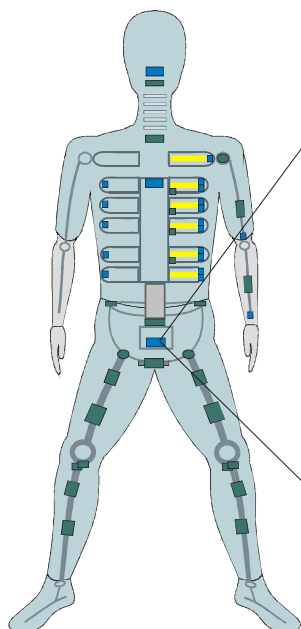
## Pelvis(LE) Summation

Customer: VRTC

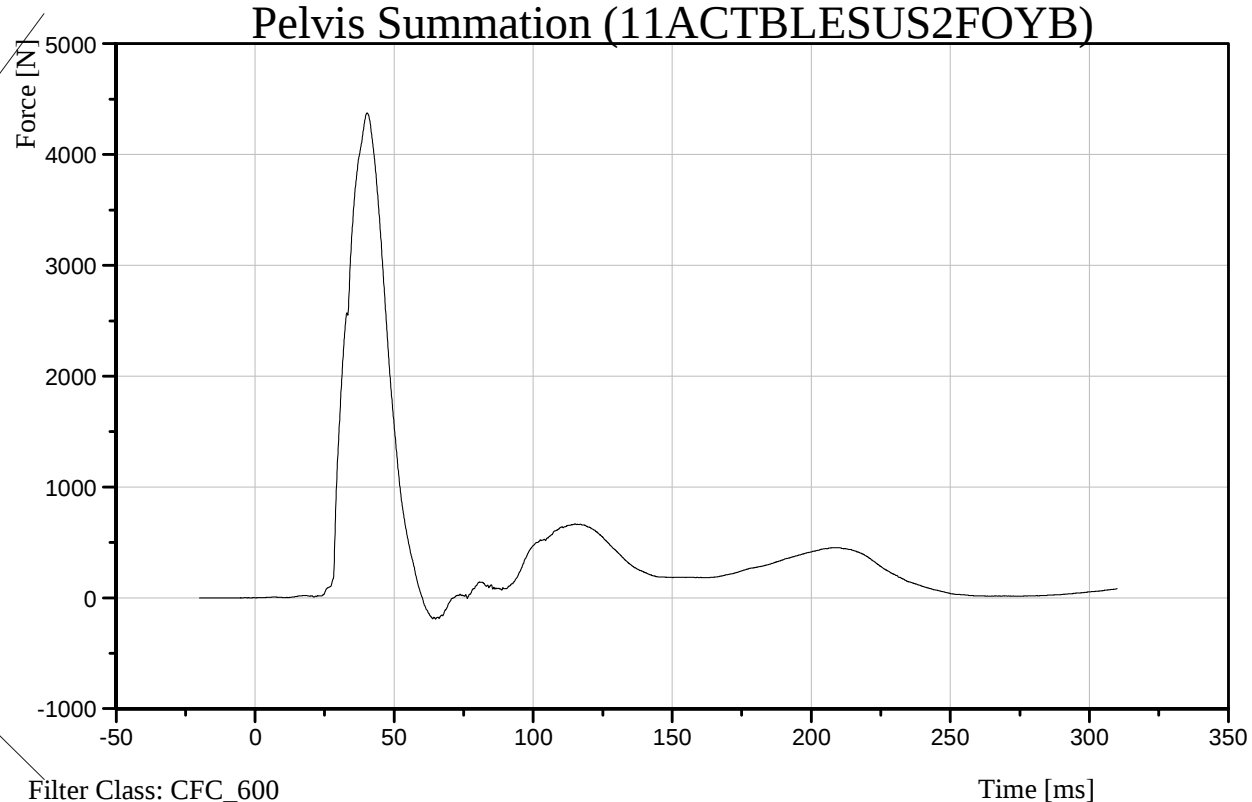
TRC Inc. Test Lab: CTF

Test Number: 070628

Test Orientation = Side



## Pelvis Summation (11ACTBLESUS2FOYB)



Dummy:SID IIs  
Seating Position:  
Driver

[Max.] 4,376.76 N at 40.24 ms

[Min.] -190.43 N at 64.88 ms

Pelvis Summation Source Code : Summation of Channels 11ILACLE00S2FOYB,11ACTBLE00S2FOYB

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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

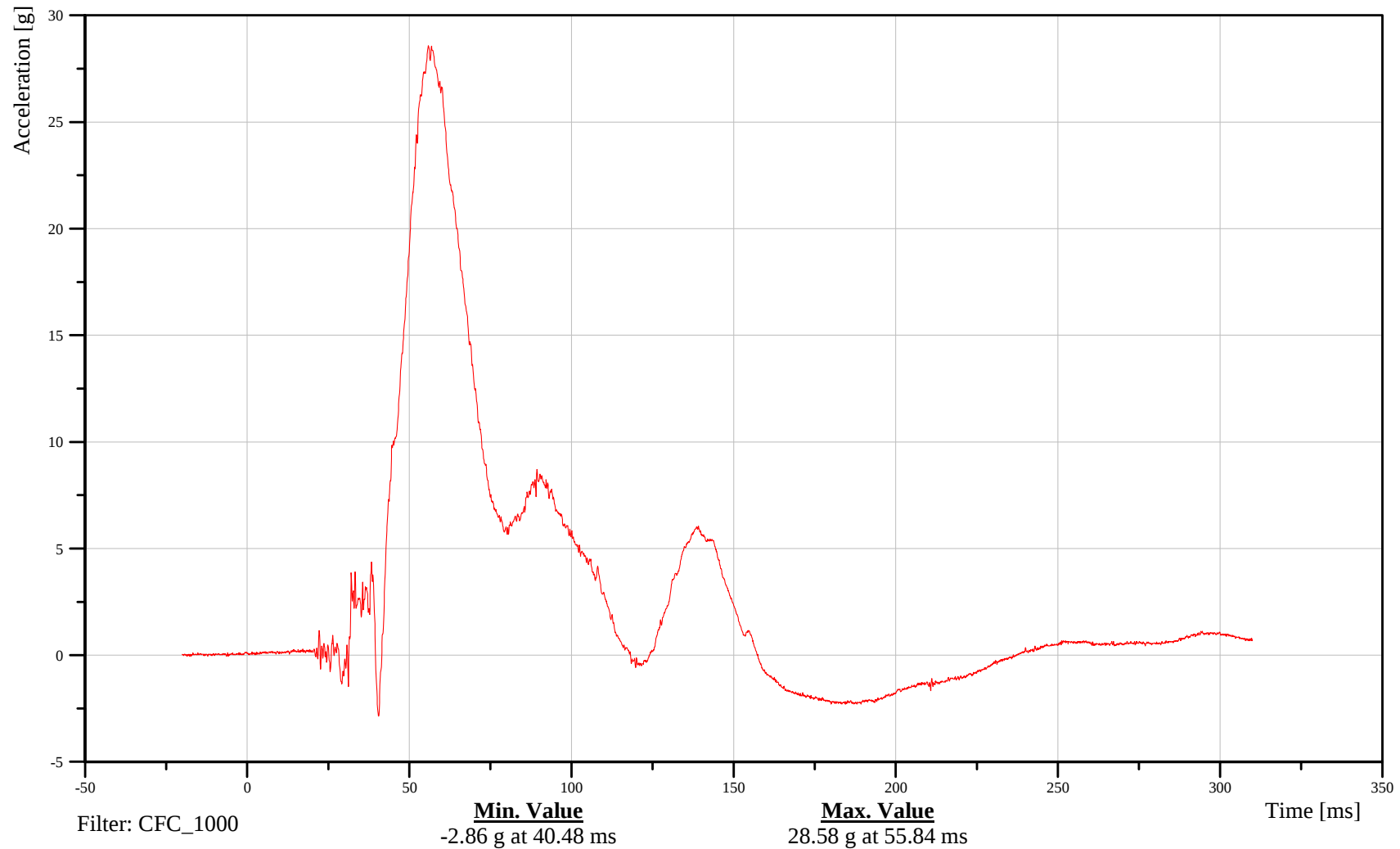
## Head X-Axis Acceleration

Customer: VRTC

### 11HEADCG00S2ACXA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-5

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

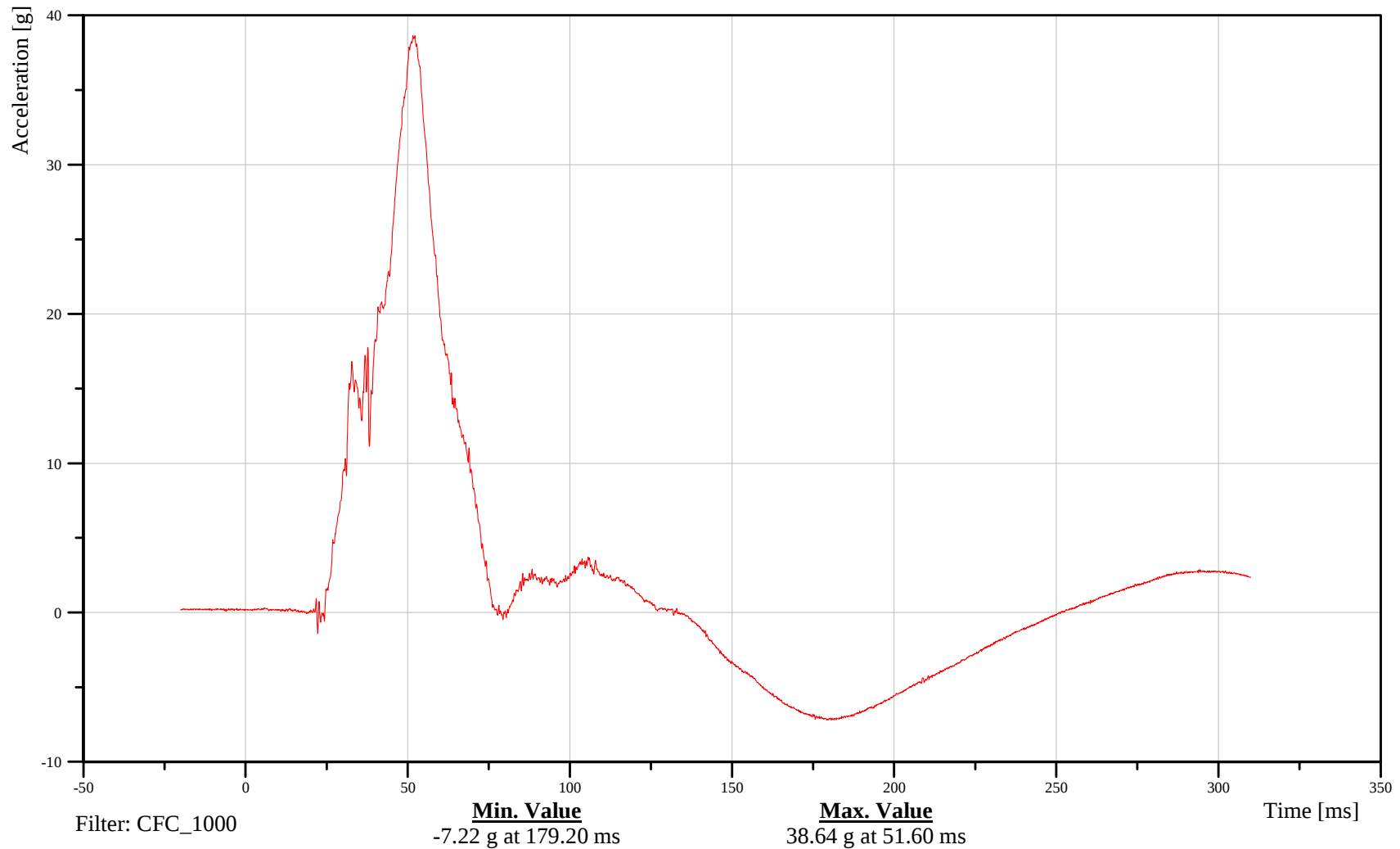
## Head Y-Axis Acceleration

Customer: VRTC

### 11HEADCG00S2ACYA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-6

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

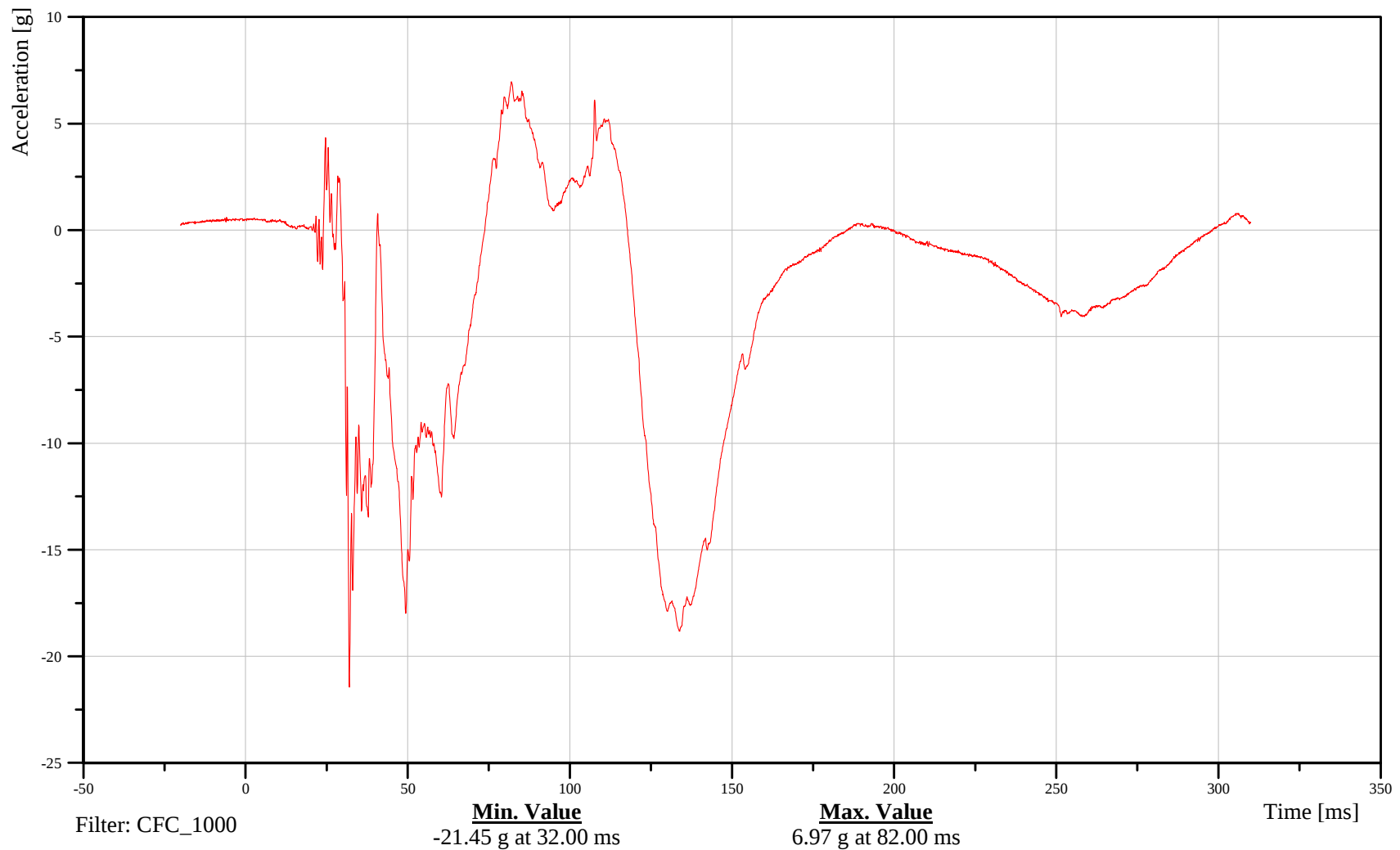
## Head Z-Axis Acceleration

Customer: VRTC

### 11HEADCG00S2ACZA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-7

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

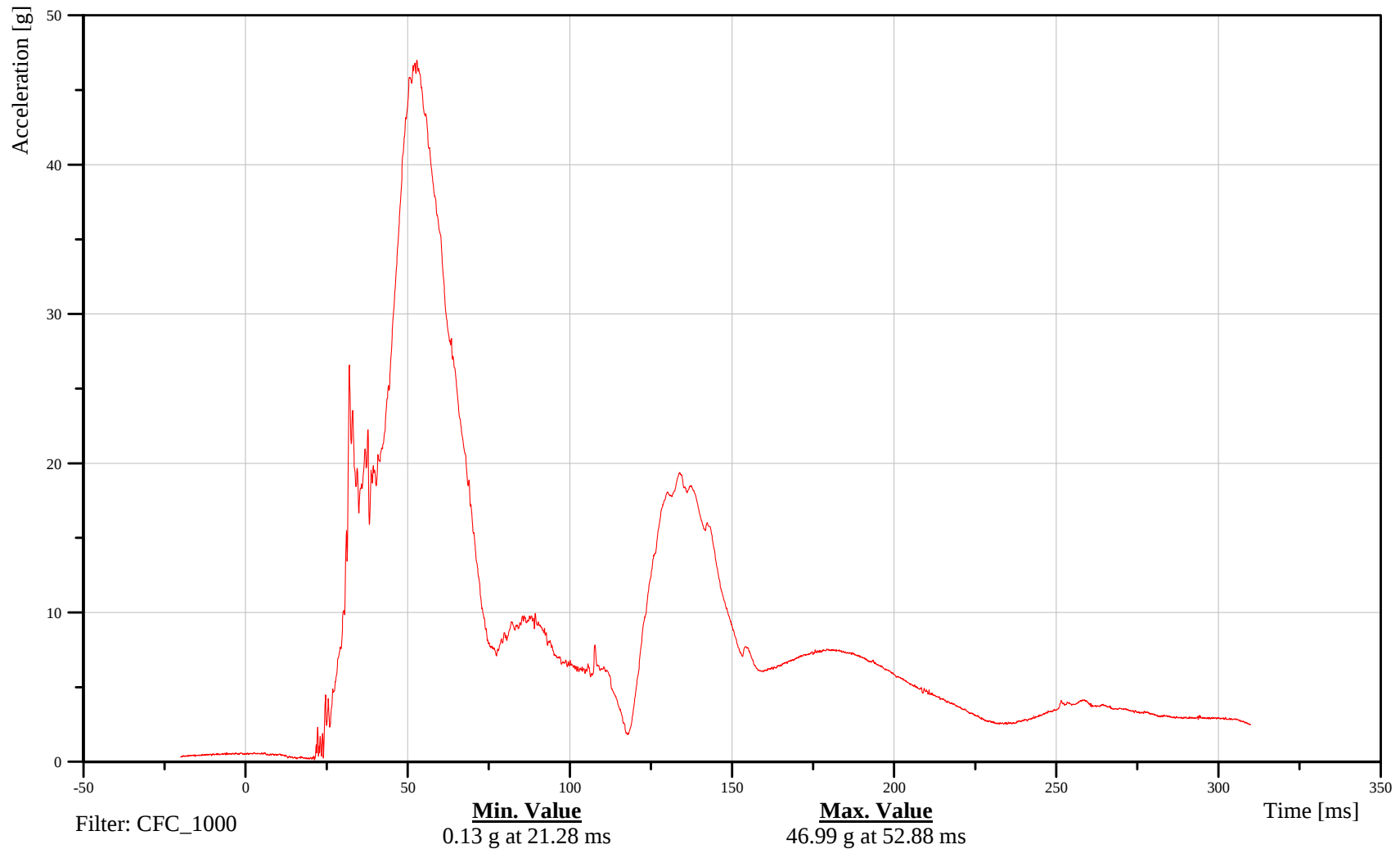
## Head Resultant Acceleration

Customer: VRTC

### 11HEADCG00S2ACRA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-8

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

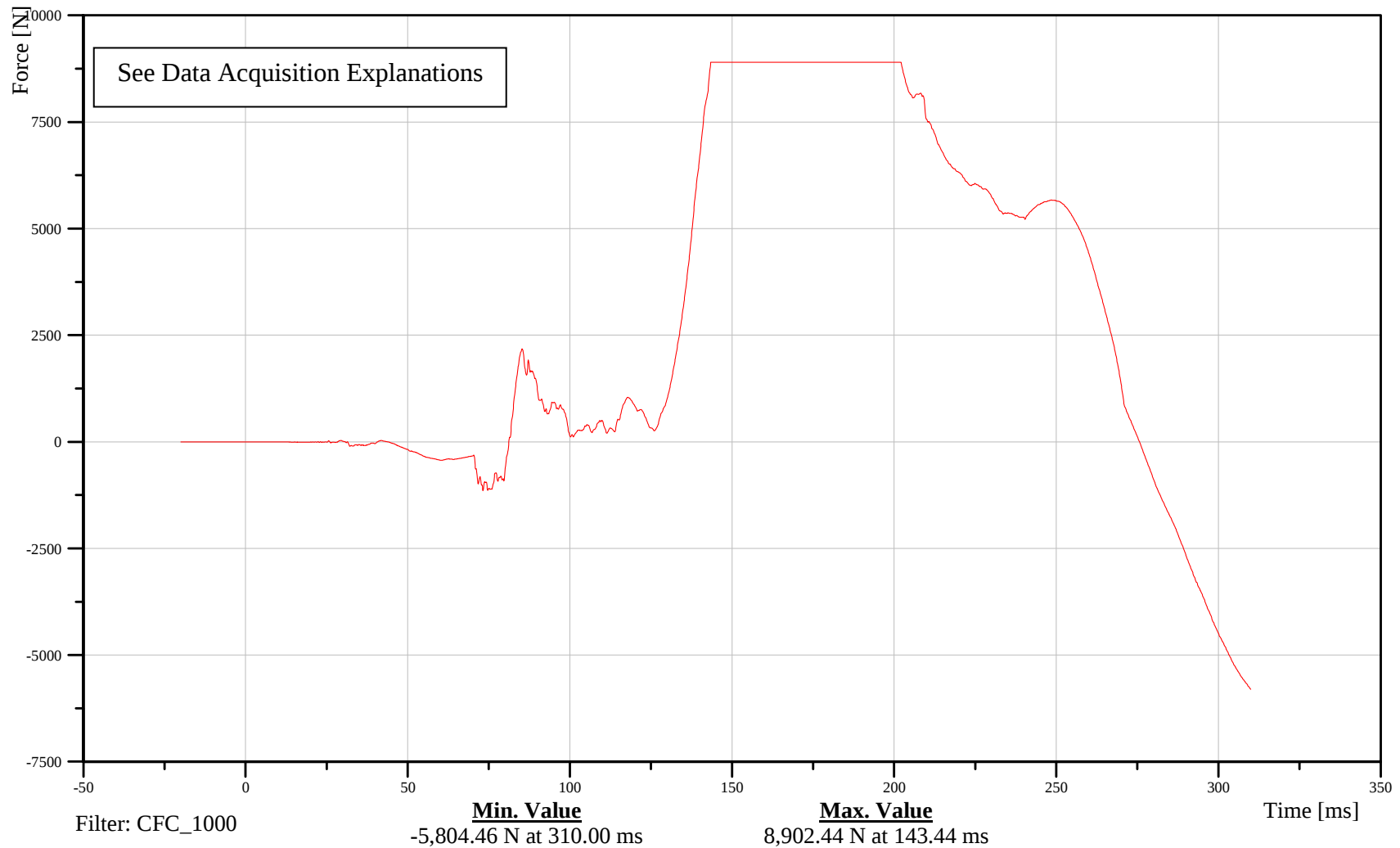
## Upper Neck X-Axis Force

Customer: VRTC

### 11NECKUP00S2FOXA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-9

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

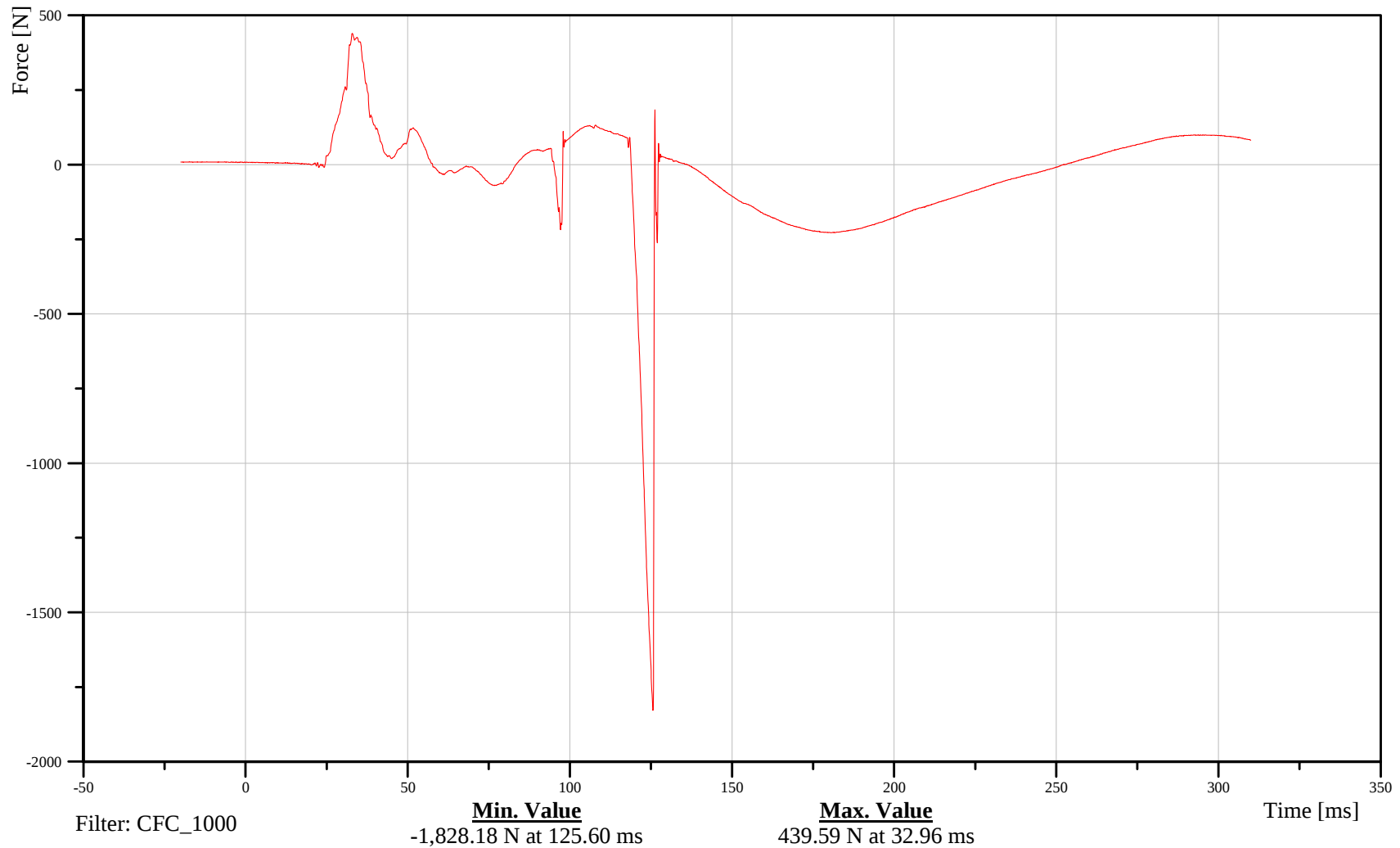
## Upper Neck Y-Axis Force

Customer: VRTC

### 11NECKUP00S2FOYA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-10

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

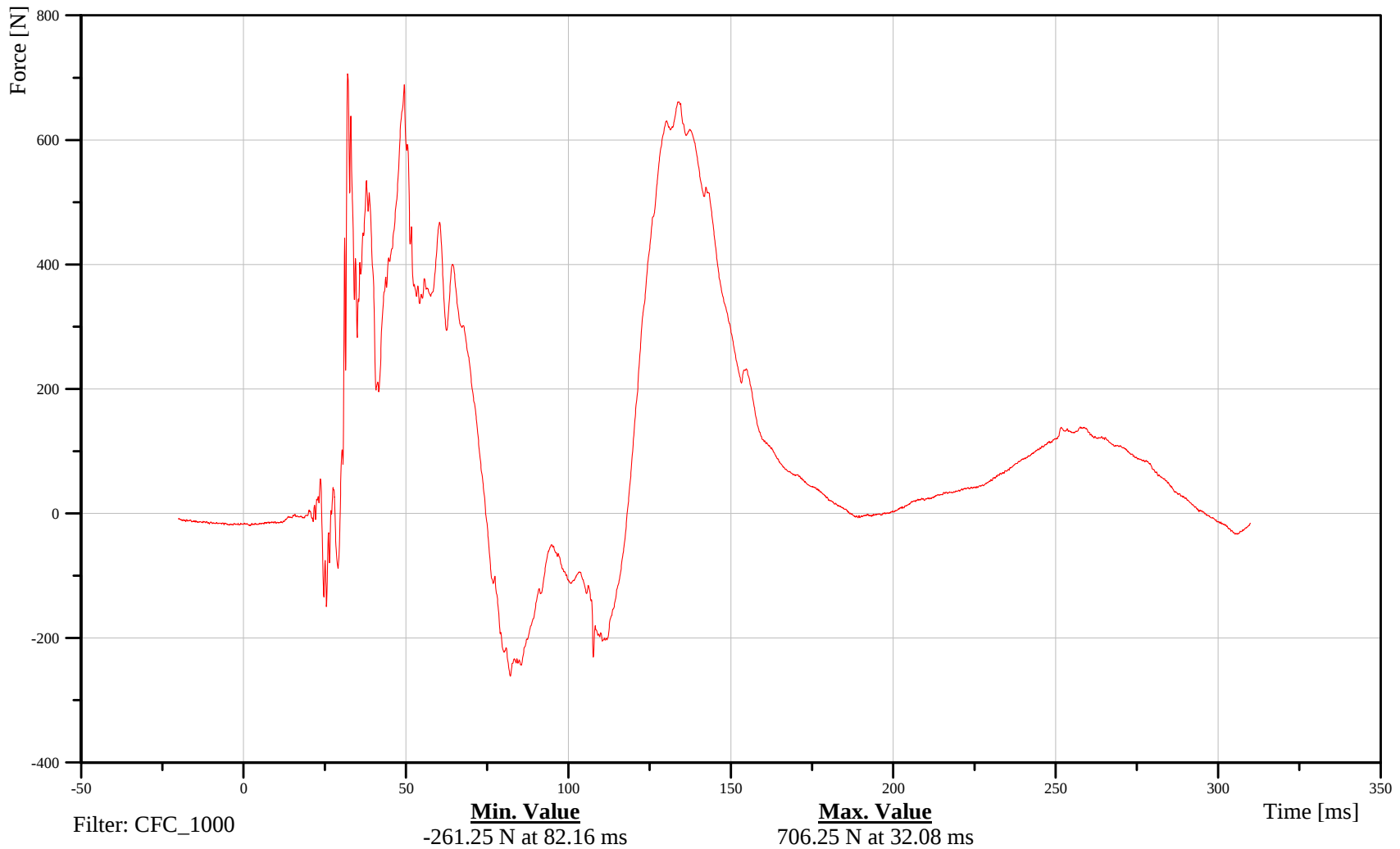
## Upper Neck Z-Axis Force

Customer: VRTC

### 11NECKUP00S2FOZA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-11

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

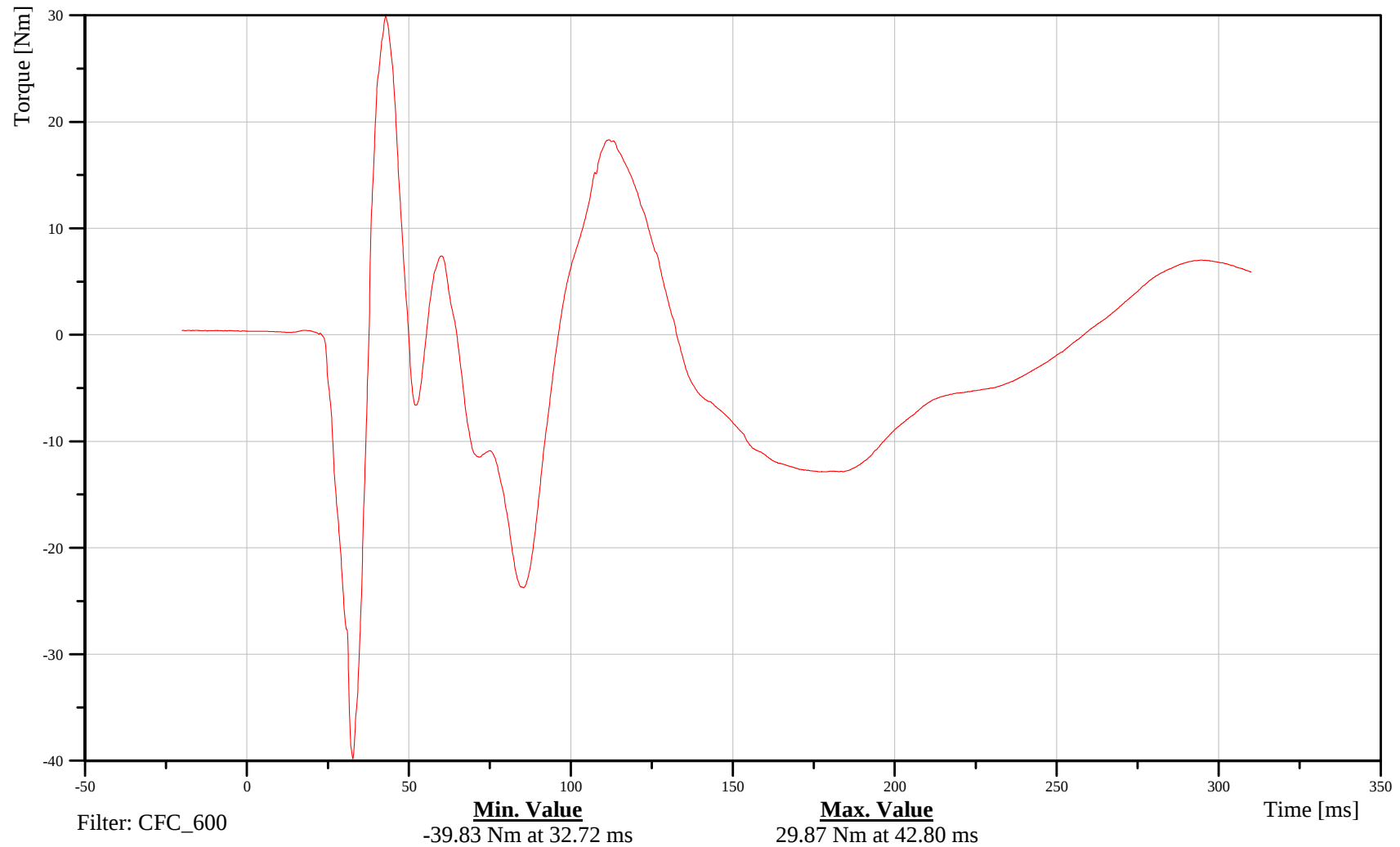
## Upper Neck Moment About X Axis

Customer: VRTC

### 11NECKUP00S2MOXB

TRC Inc. Test Lab: CTF

Test Number: 070628



B-12

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

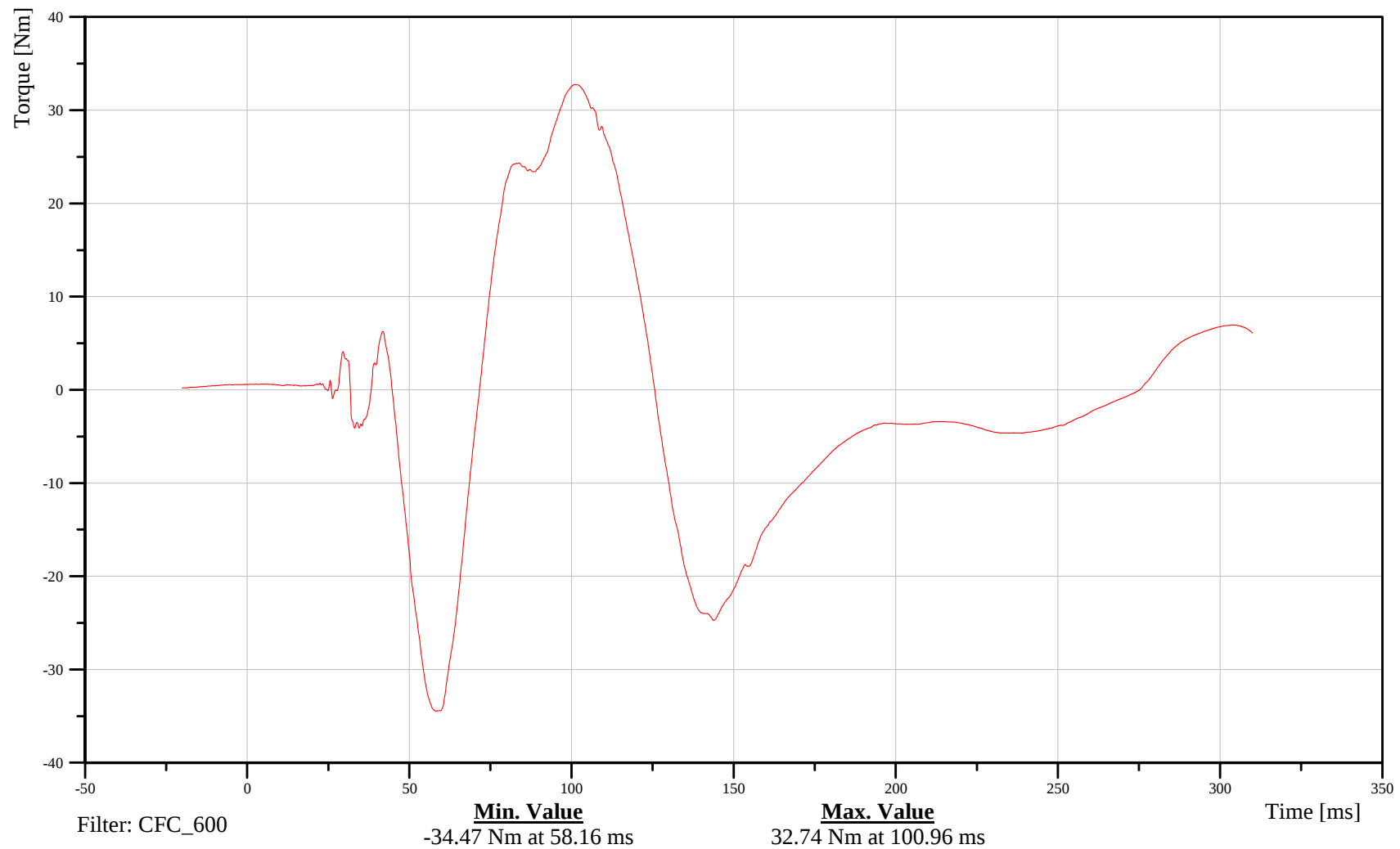
## Upper Neck Moment About Y Axis

Customer: VRTC

### 11NECKUP00S2MOYB

TRC Inc. Test Lab: CTF

Test Number: 070628



B-13

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

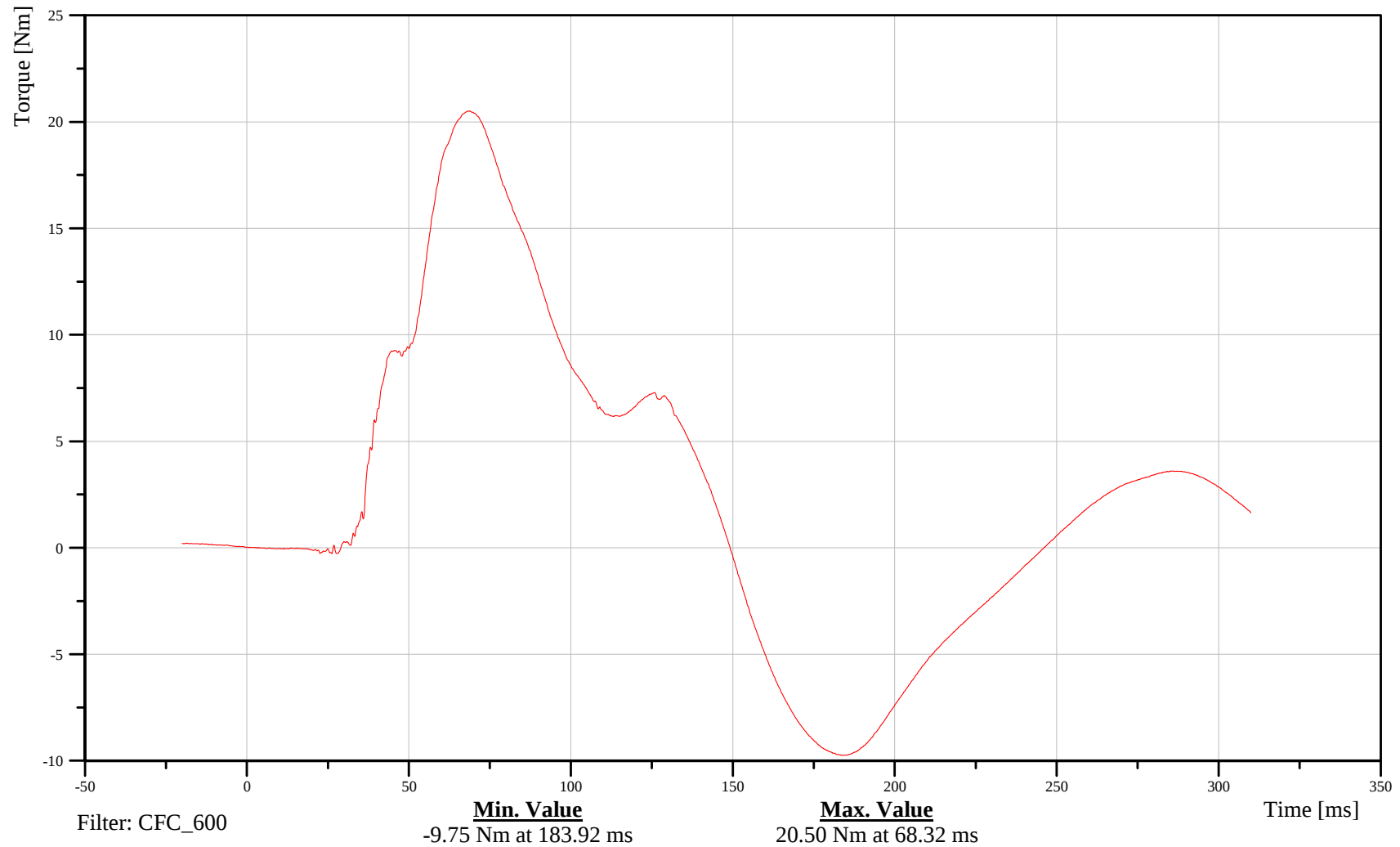
## Upper Neck Moment About Z Axis

Customer: VRTC

### 11NECKUP00S2MOZB

TRC Inc. Test Lab: CTF

Test Number: 070628



B-14

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

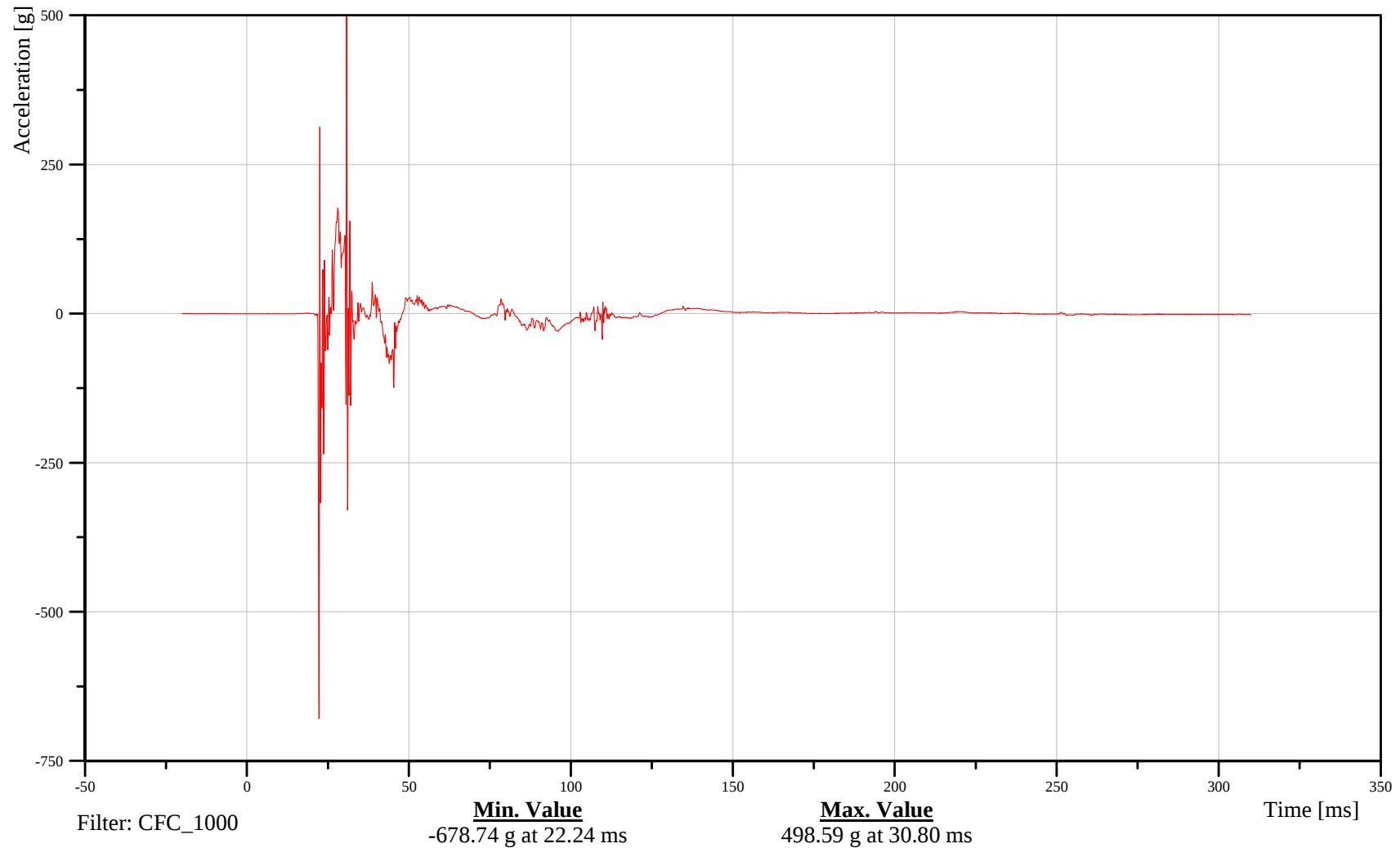
## Shoulder X-Axis Acceleration

Customer: VRTC

### 11SHLDLE00S2ACXA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-15

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

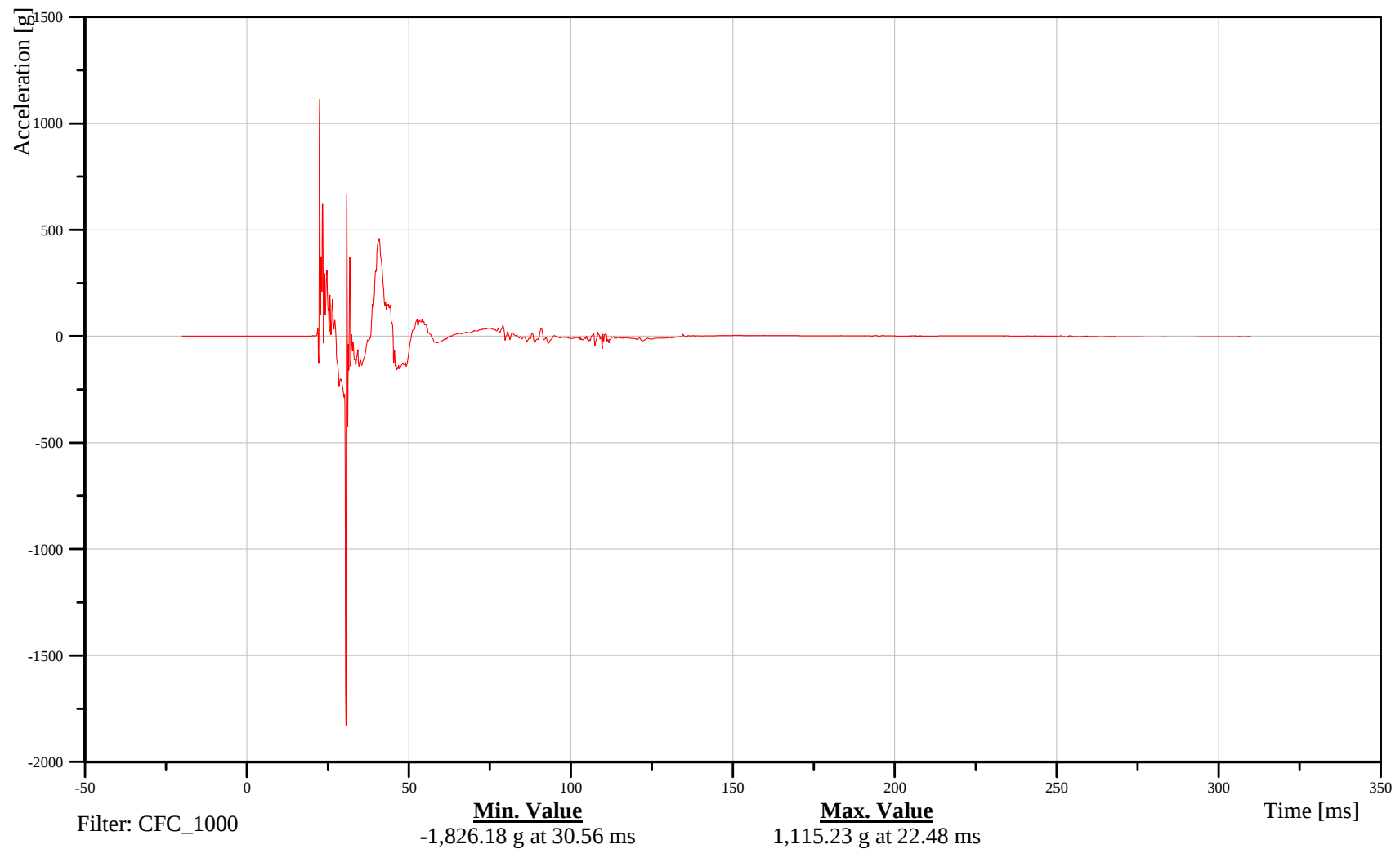
## Shoulder Y-Axis Acceleration

Customer: VRTC

### 11SHLDLE00S2ACYA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-16

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

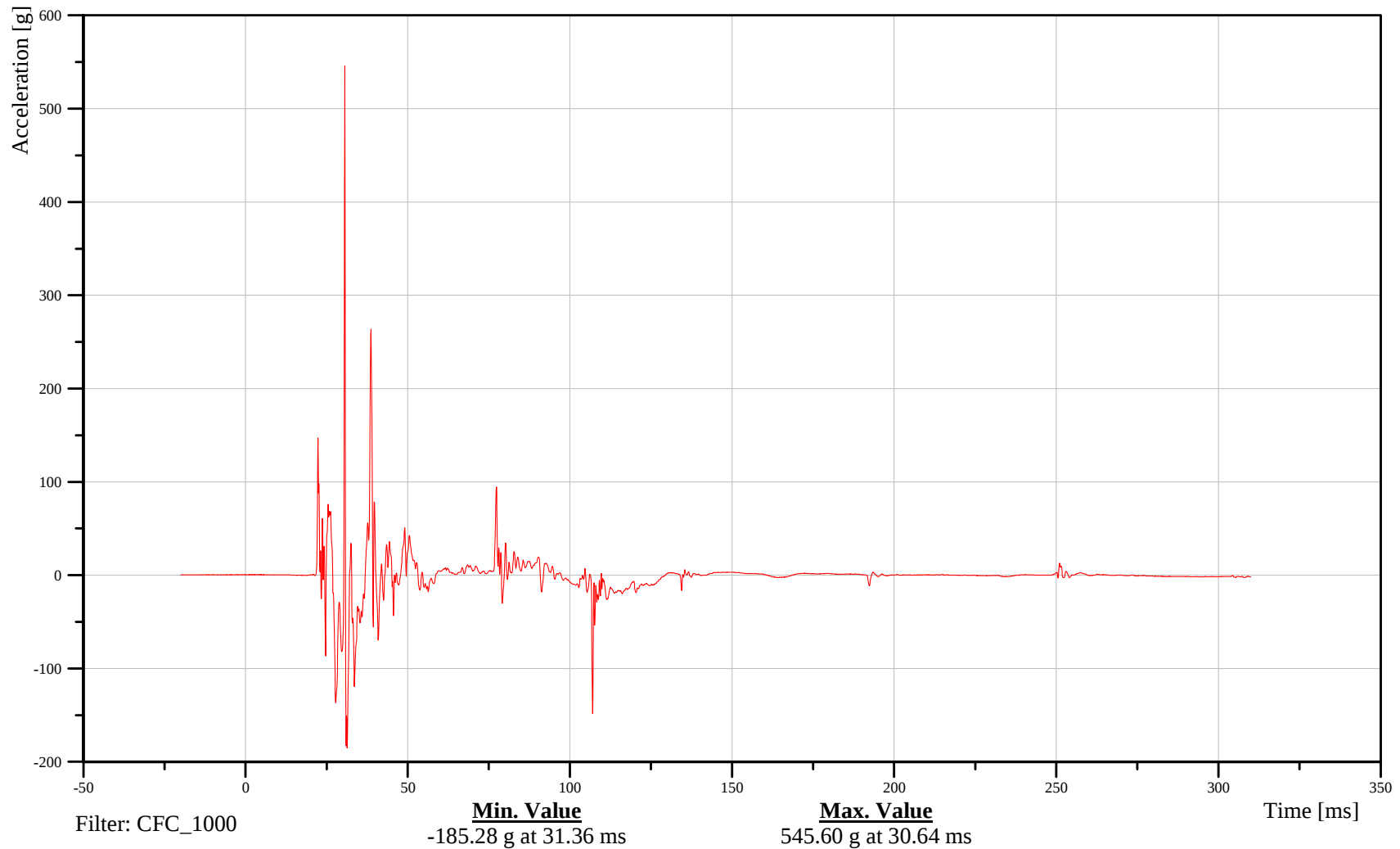
## Shoulder Z-Axis Acceleration

Customer: VRTC

11SHLDLE00S2ACZA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-17

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

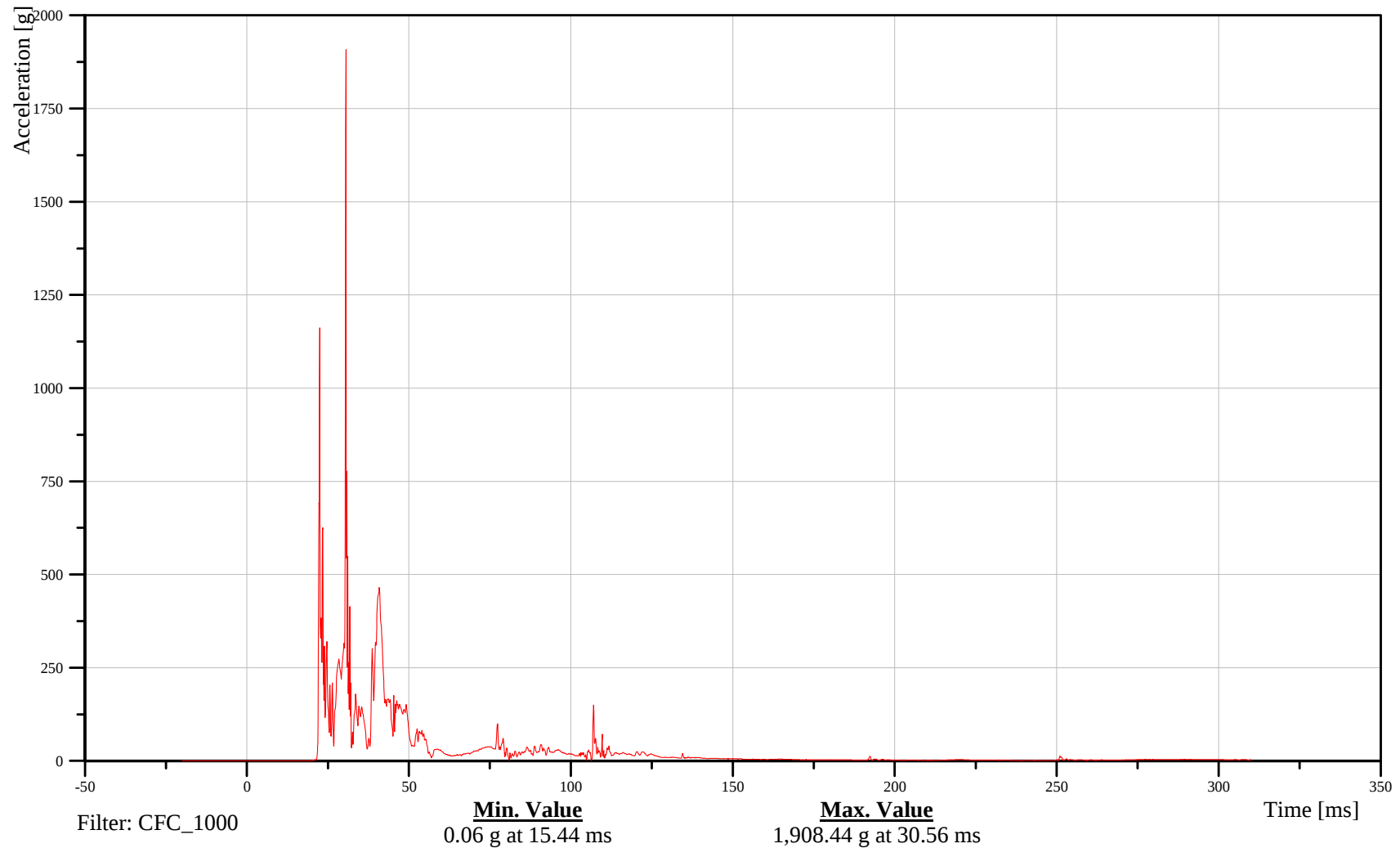
## Shoulder Resultant Acceleration

Customer: VRTC

11SHLDLE00S2ACRA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-18

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

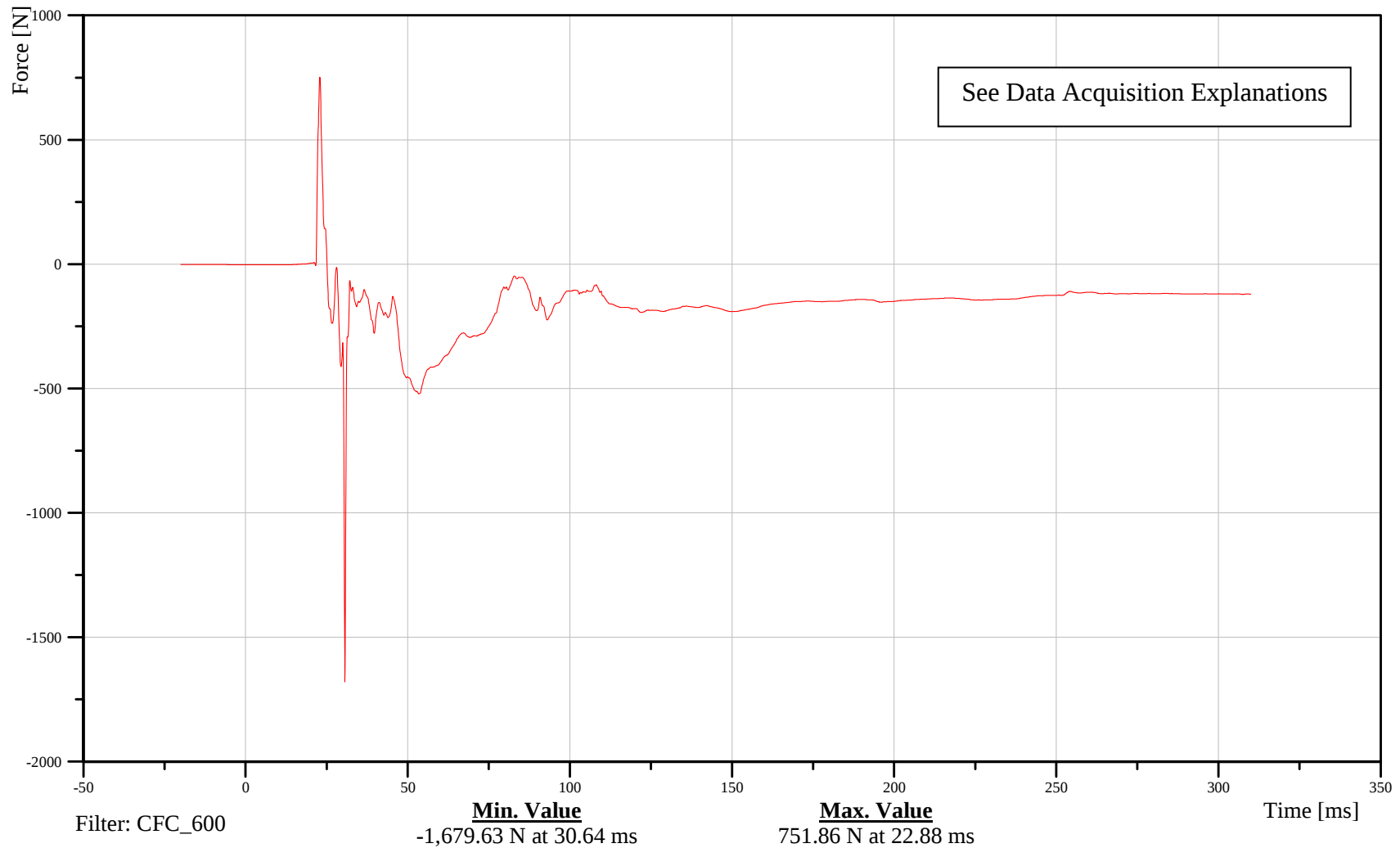
## Shoulder X-Axis Force

Customer: VRTC

11SHLDLE00S2FOXB

TRC Inc. Test Lab: CTF

Test Number: 070628



B-19

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

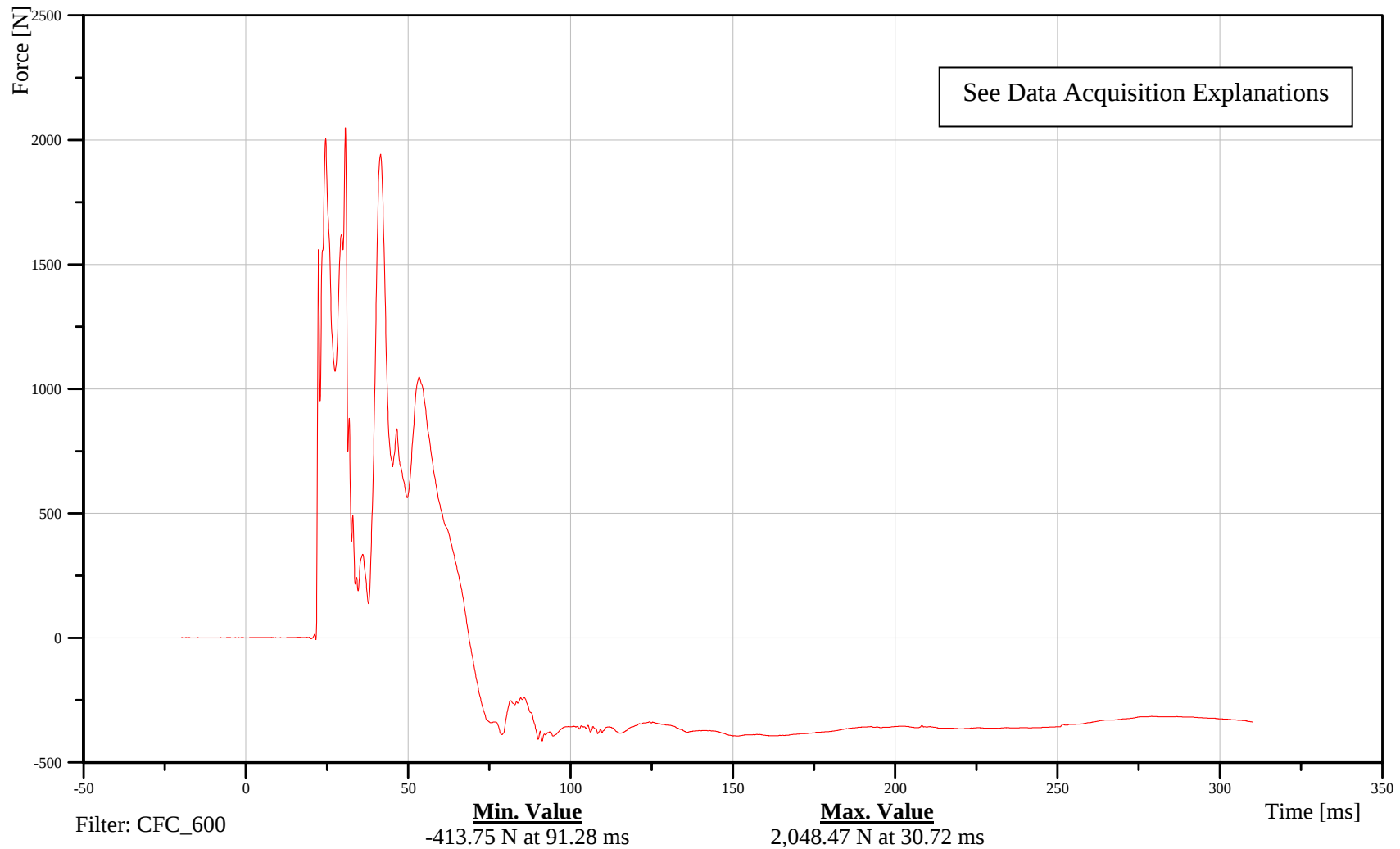
## Shoulder Y-Axis Force

Customer: VRTC

11SHLDLE00S2FOYB

TRC Inc. Test Lab: CTF

Test Number: 070628



B-20

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

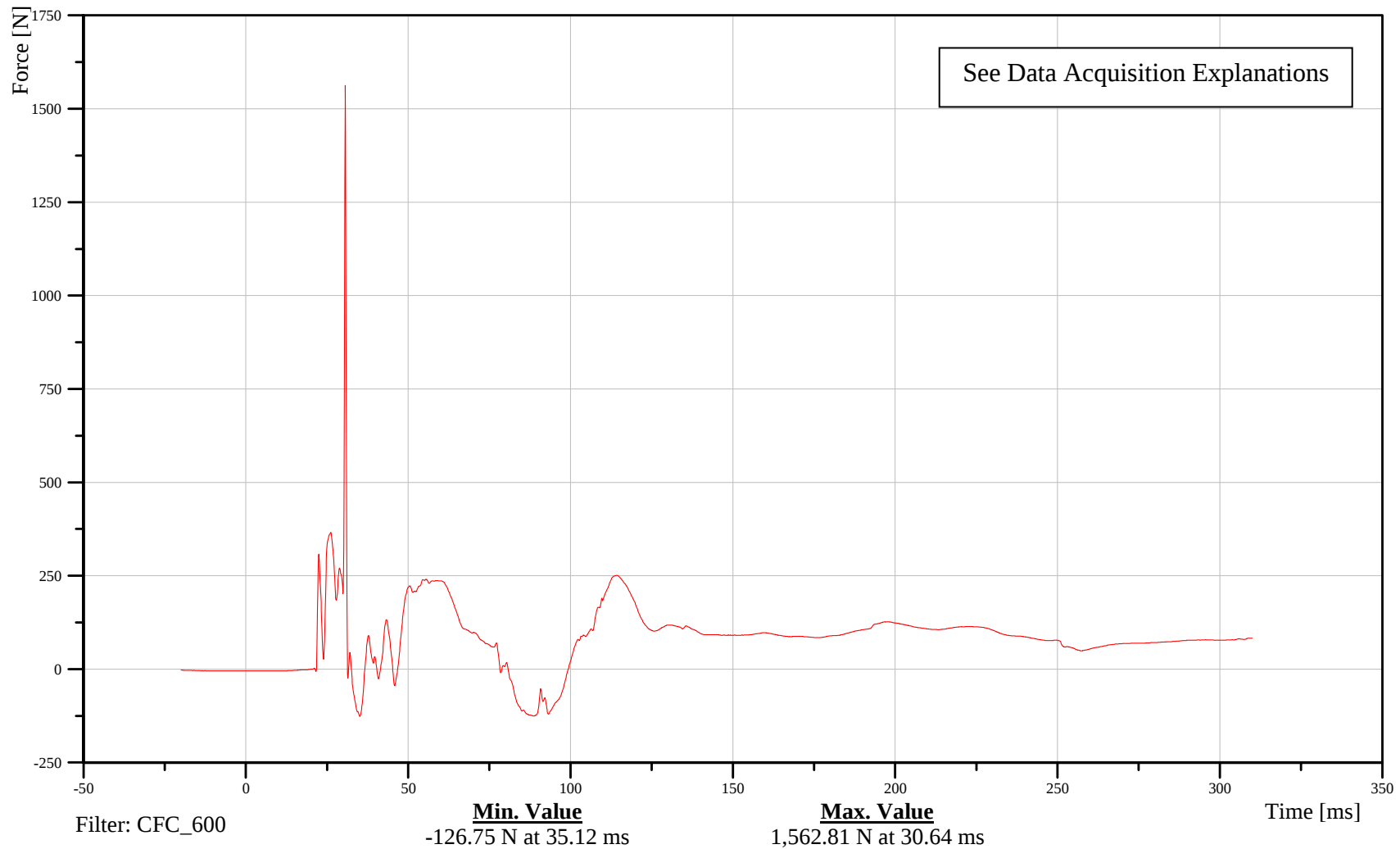
## Shoulder Z-Axis Force

Customer: VRTC

### 11SHLDLE00S2FOZB

TRC Inc. Test Lab: CTF

Test Number: 070628



B-21

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

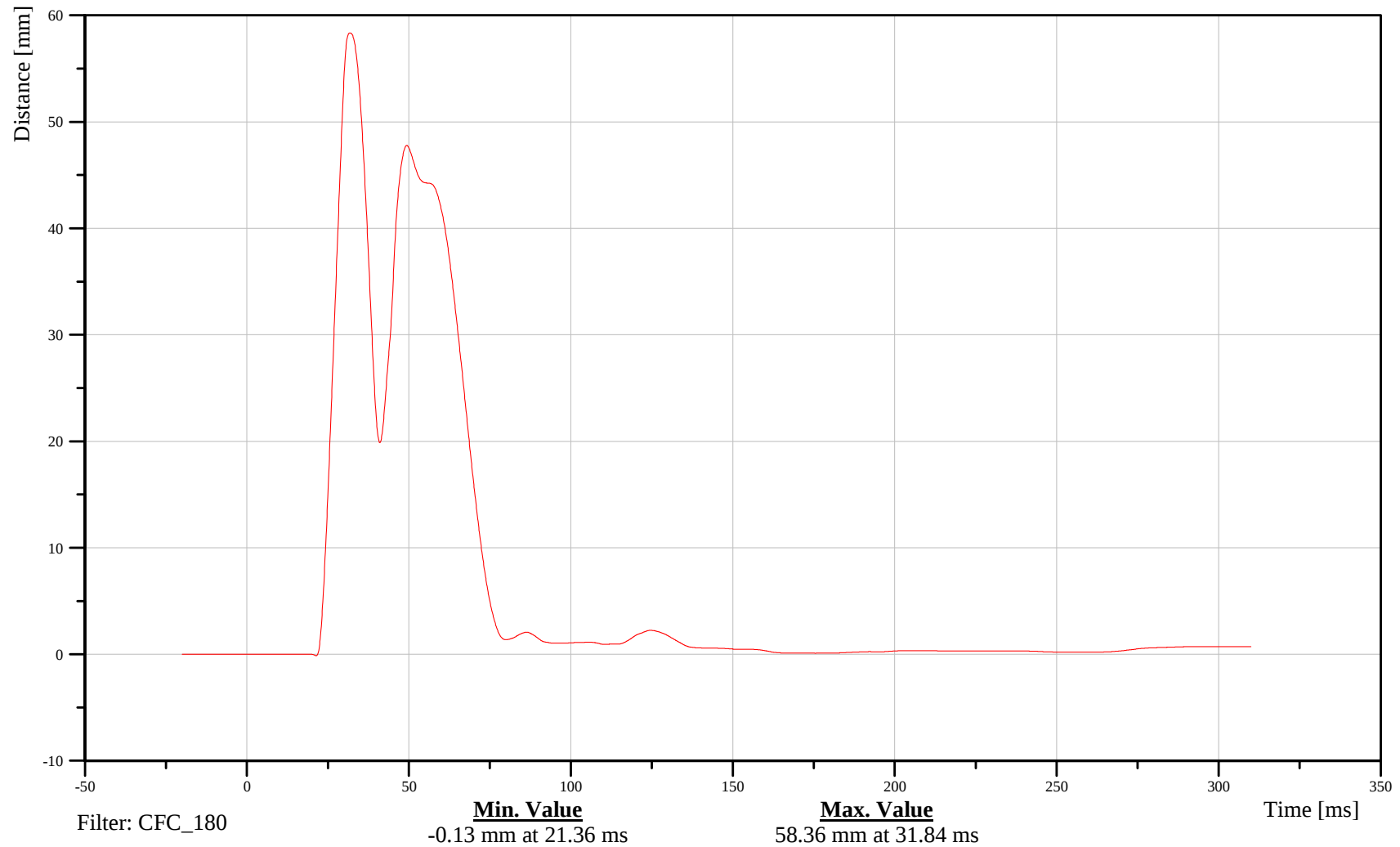
## Shoulder Y-Axis Displacement

Customer: VRTC

### 11SHRILE00S2DSYC

TRC Inc. Test Lab: CTF

Test Number: 070628



B-22

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

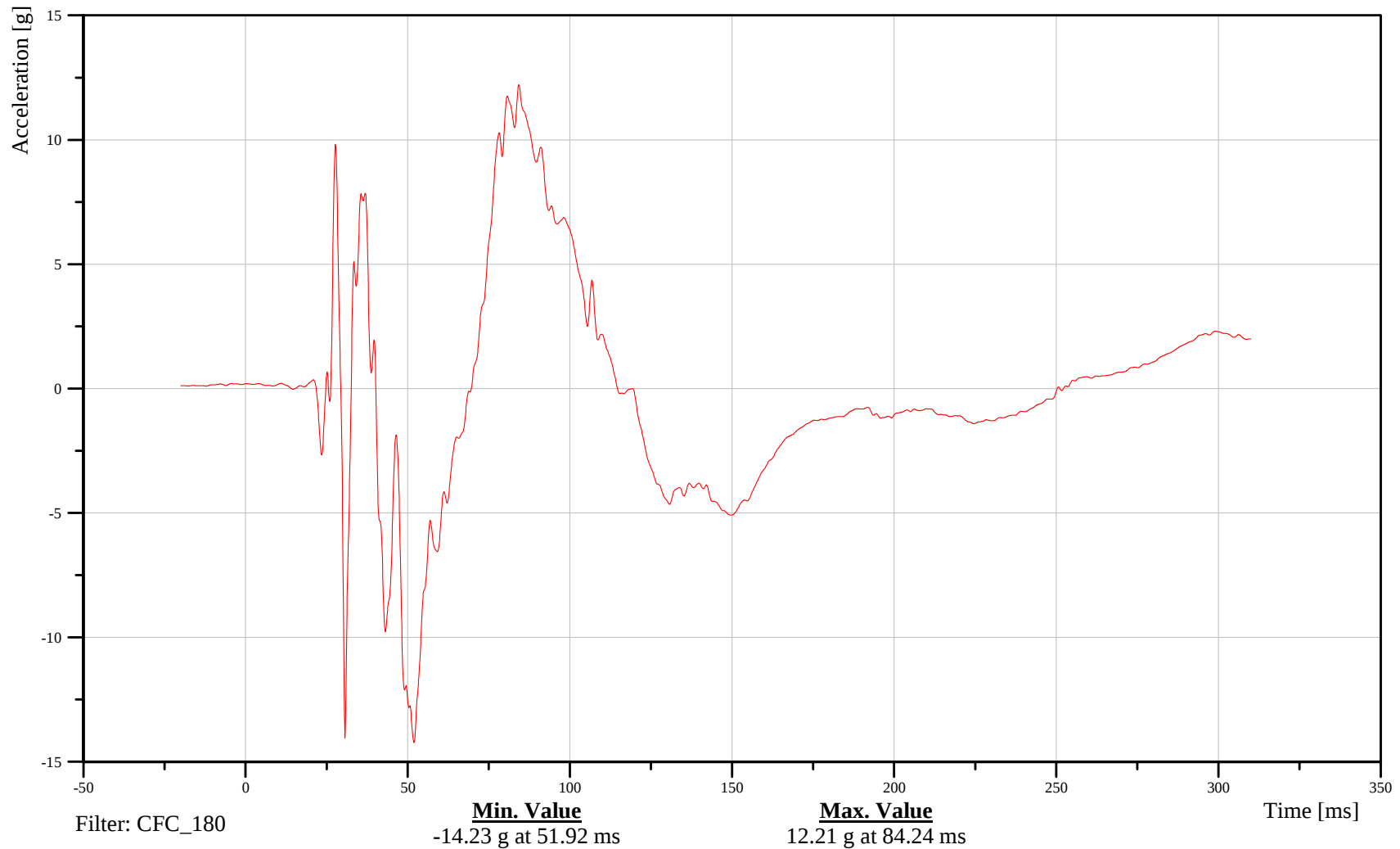
## Upper Spine X-Axis Acceleration

Customer: VRTC

### 11SPIN0100S2ACXC

TRC Inc. Test Lab: CTF

Test Number: 070628



B-23

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

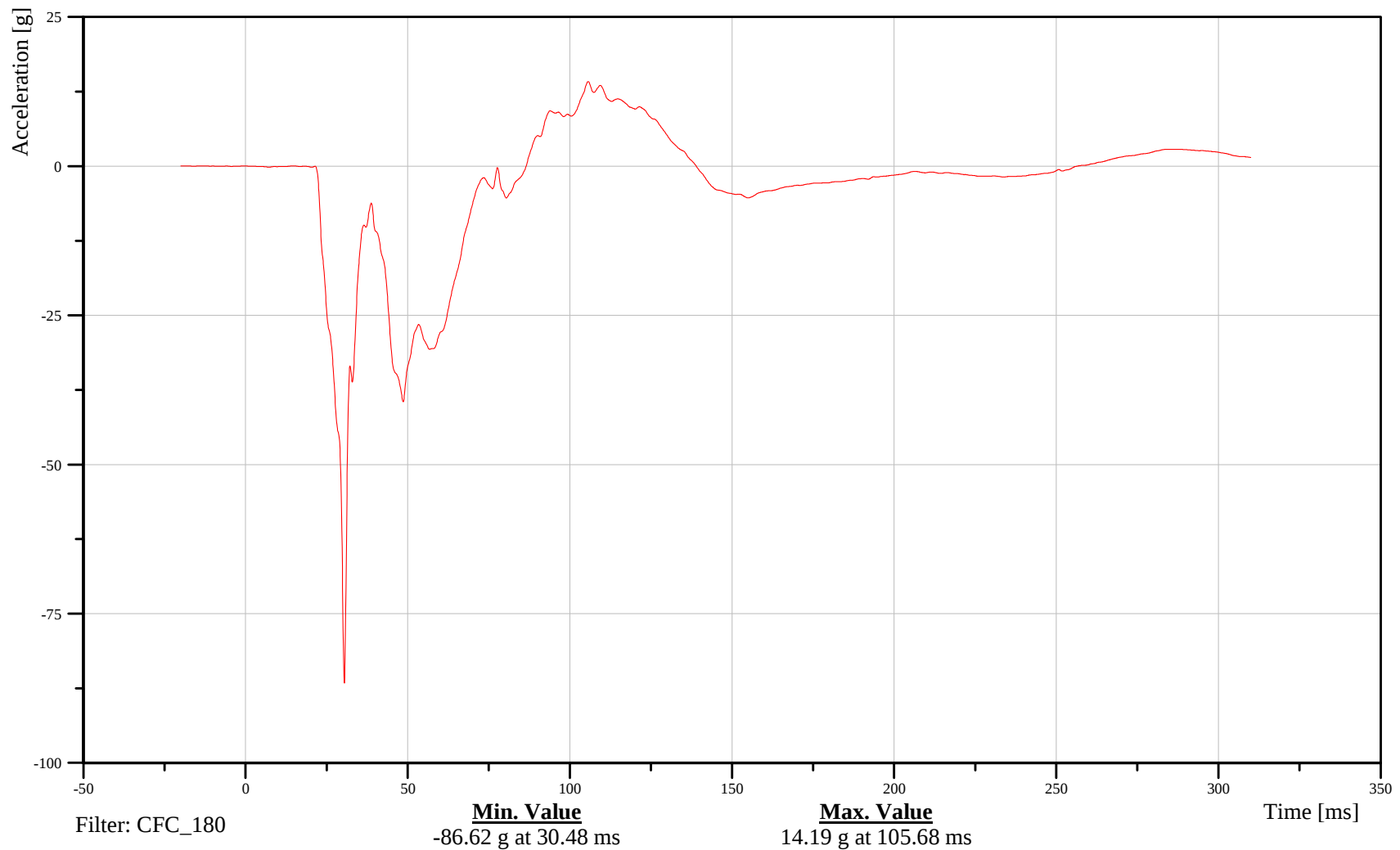
## Upper Spine Y-Axis Acceleration

Customer: VRTC

11SPIN0100S2ACYC

TRC Inc. Test Lab: CTF

Test Number: 070628



B-24

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

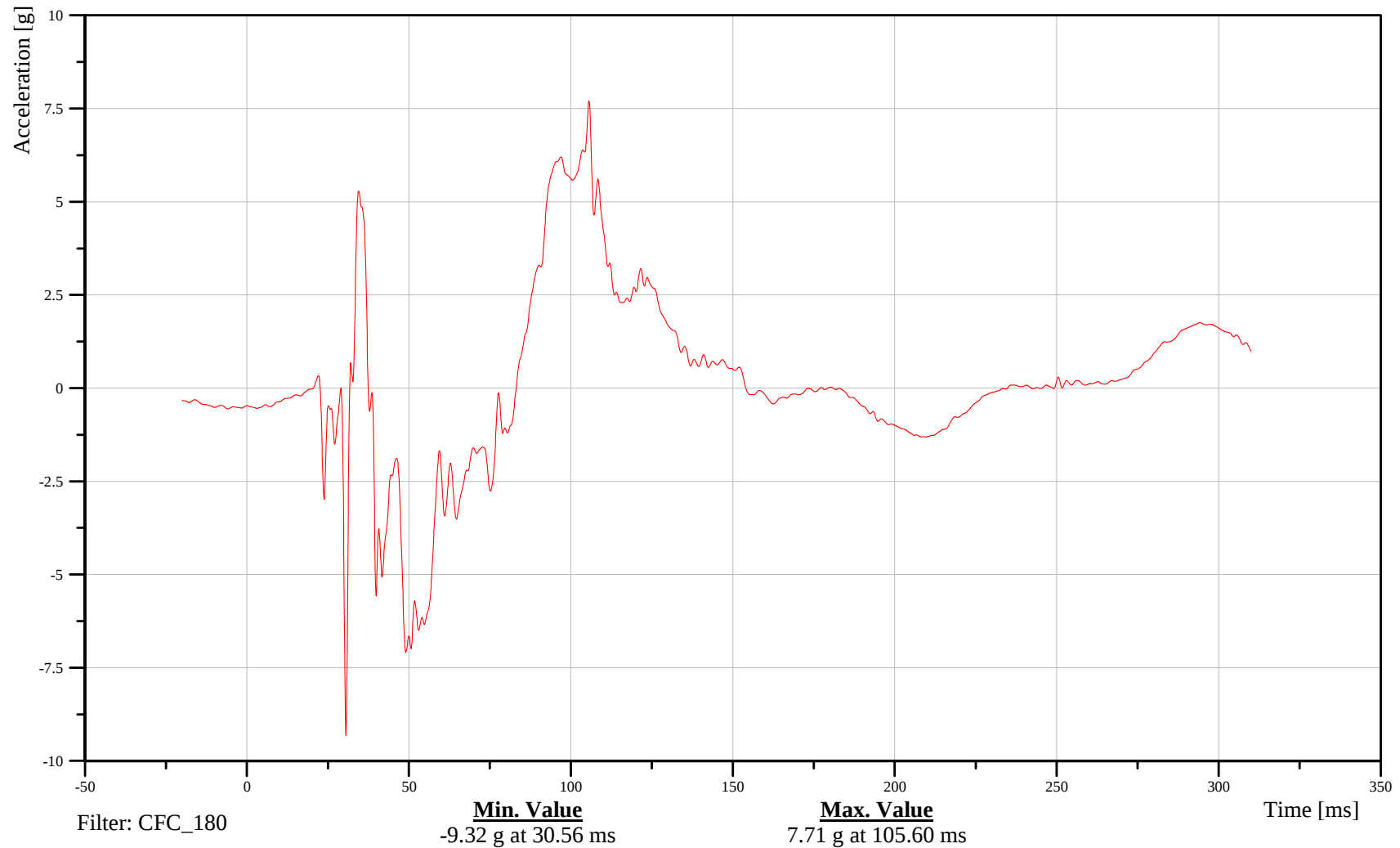
## Upper Spine Z-Axis Acceleration

Customer: VRTC

### 11SPIN0100S2ACZC

TRC Inc. Test Lab: CTF

Test Number: 070628



B-25

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

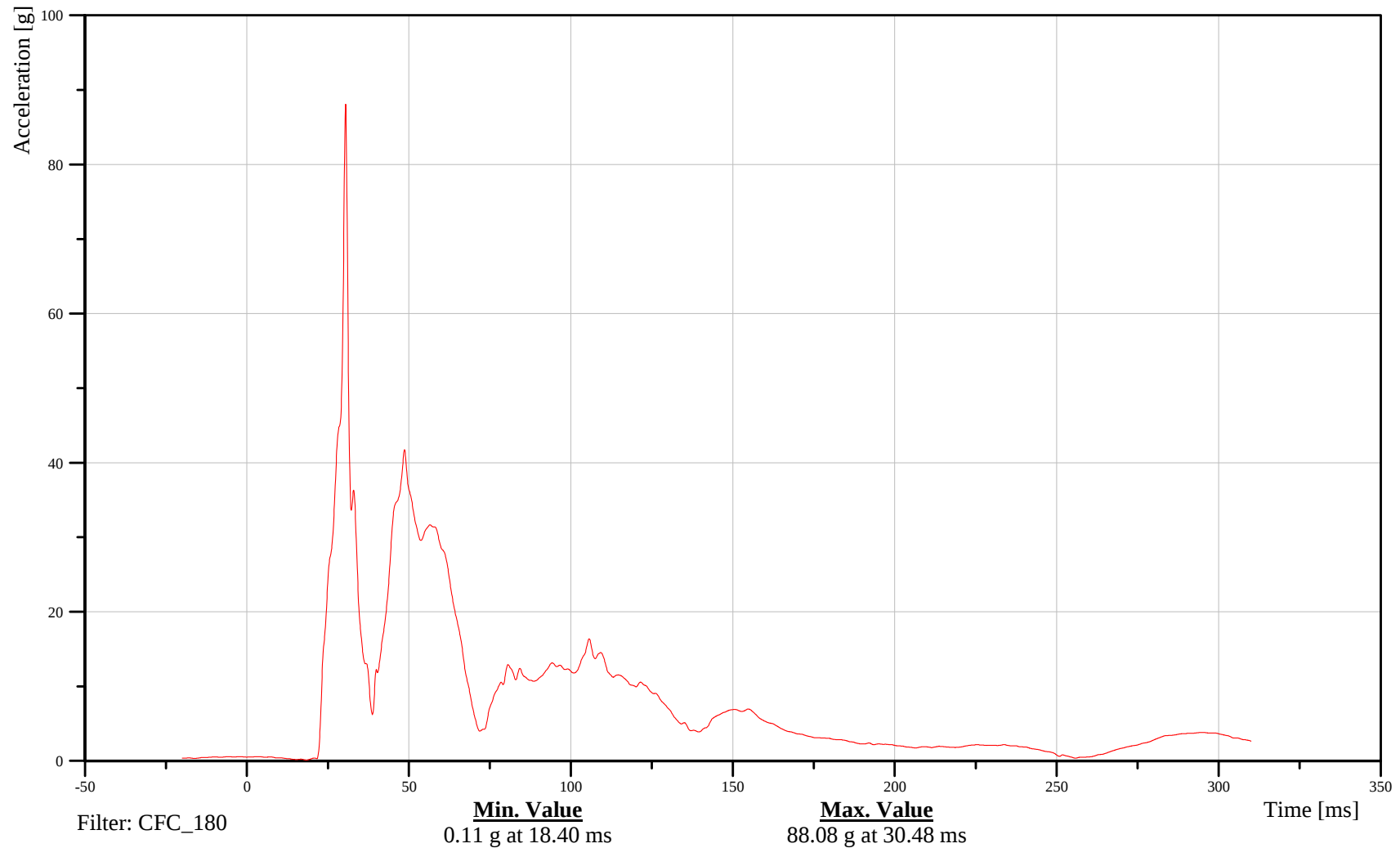
## Upper Spine Resultant Acceleration

Customer: VRTC

11SPIN0100S2ACRC

TRC Inc. Test Lab: CTF

Test Number: 070628



B-26

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

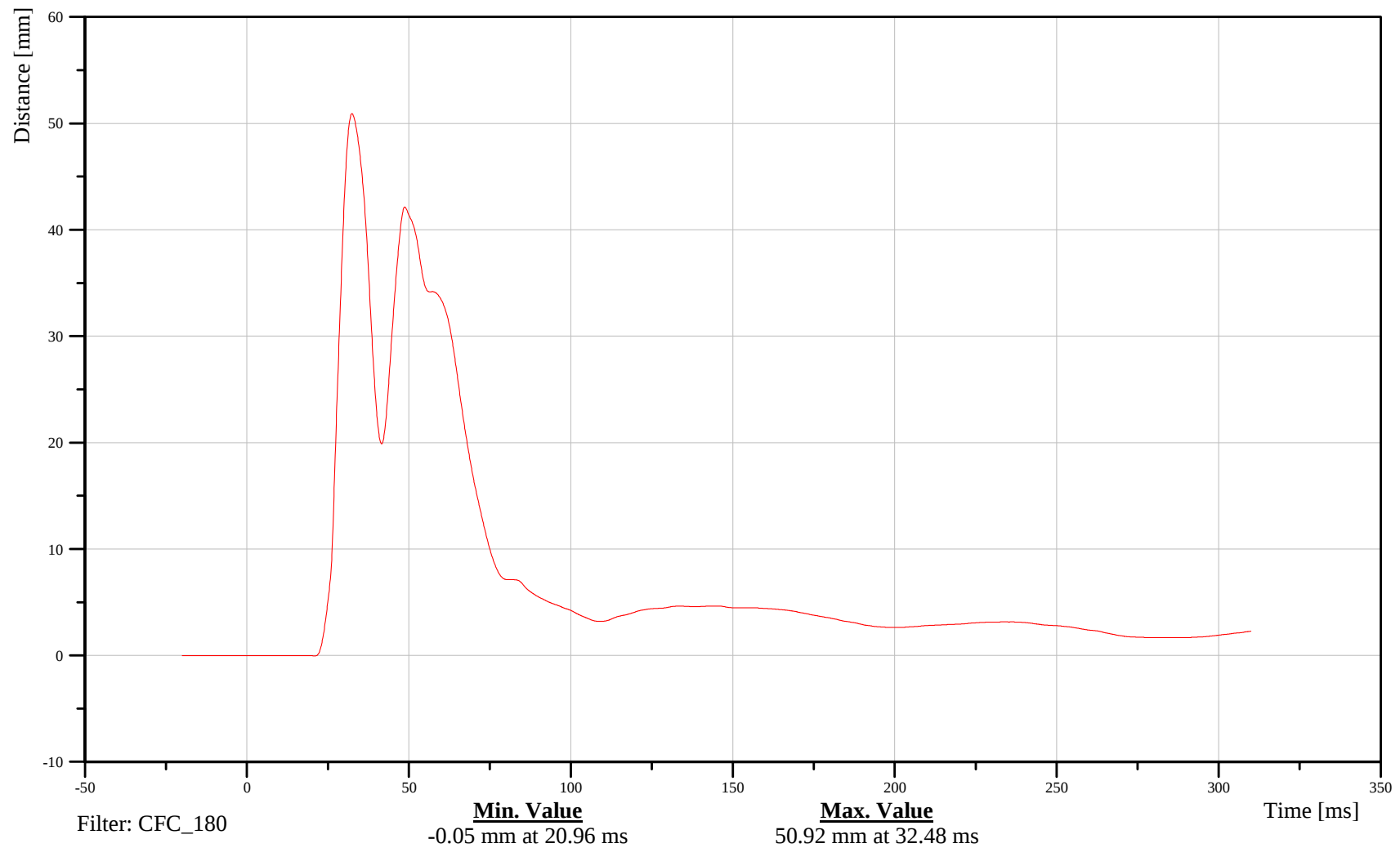
## Left Thorax Rib 1 Y-Axis Displacement

Customer: VRTC

### 11TRRI01LES2DSYC

TRC Inc. Test Lab: CTF

Test Number: 070628



B-27

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

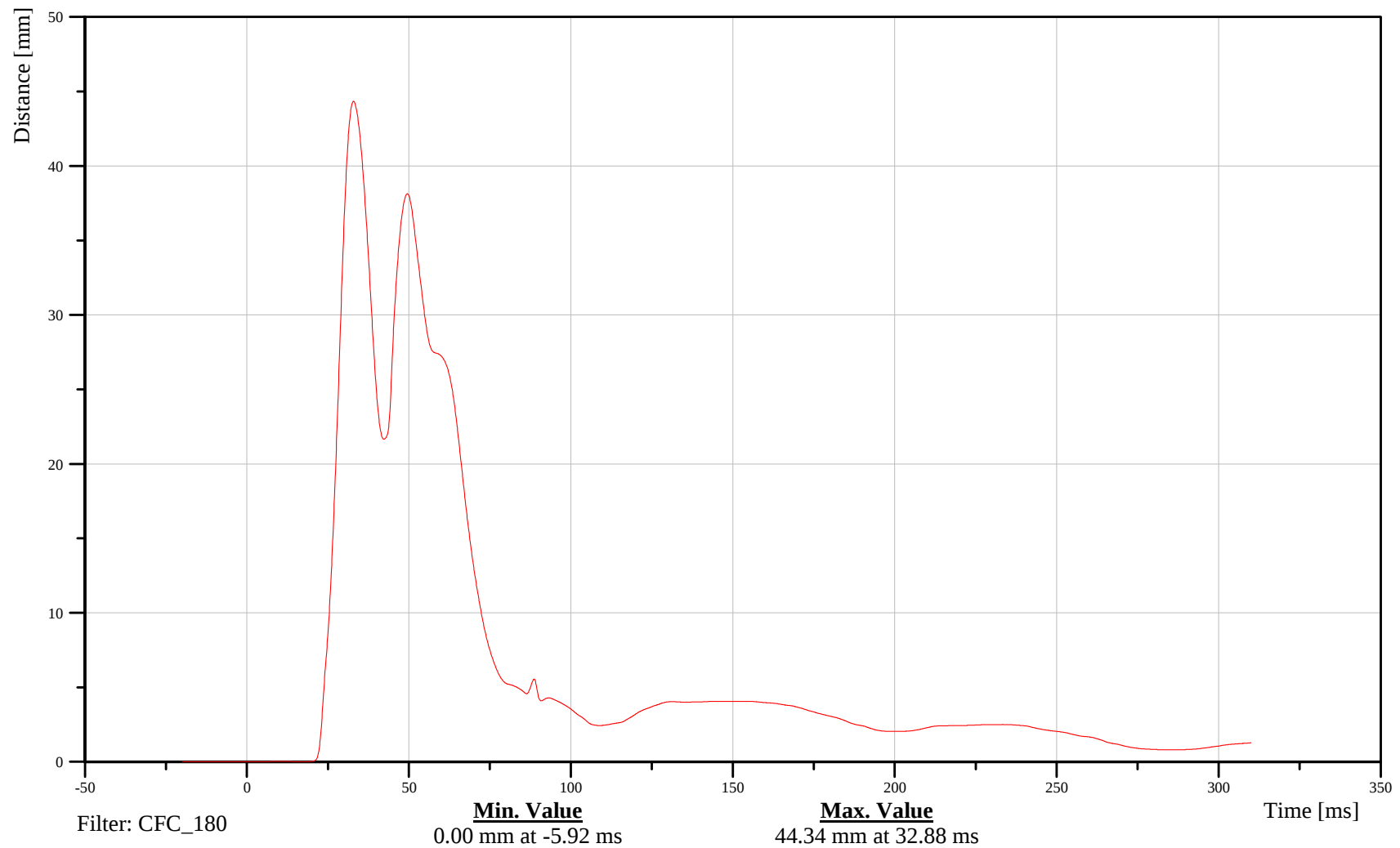
## Left Thorax Rib 2 Y-Axis Displacement

Customer: VRTC

### 11TRRI02LES2DSYC

TRC Inc. Test Lab: CTF

Test Number: 070628



B-28

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

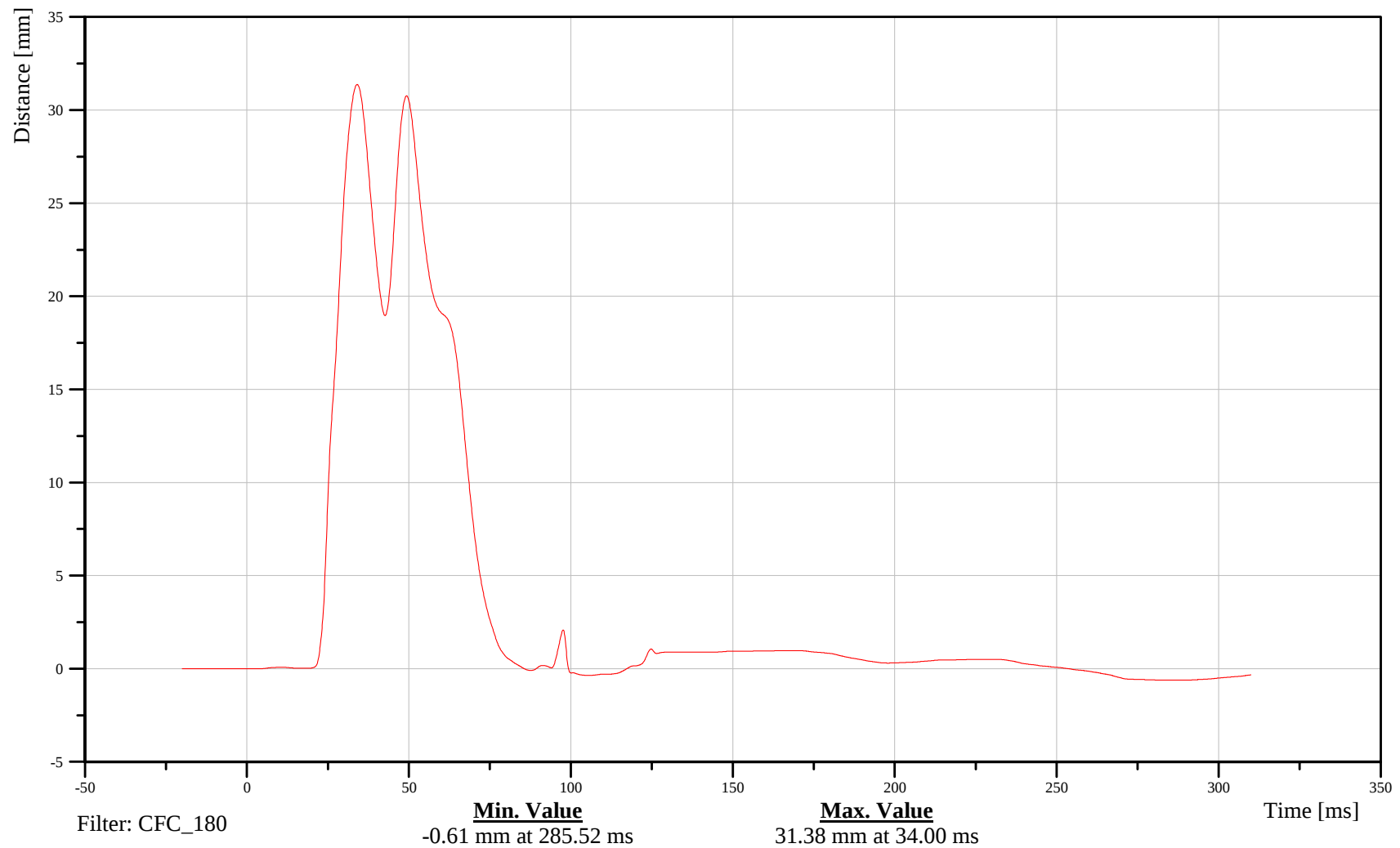
## Left Thorax Rib 3 Y-Axis Displacement

Customer: VRTC

### 11TRRI03LES2DSYC

TRC Inc. Test Lab: CTF

Test Number: 070628



B-29

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

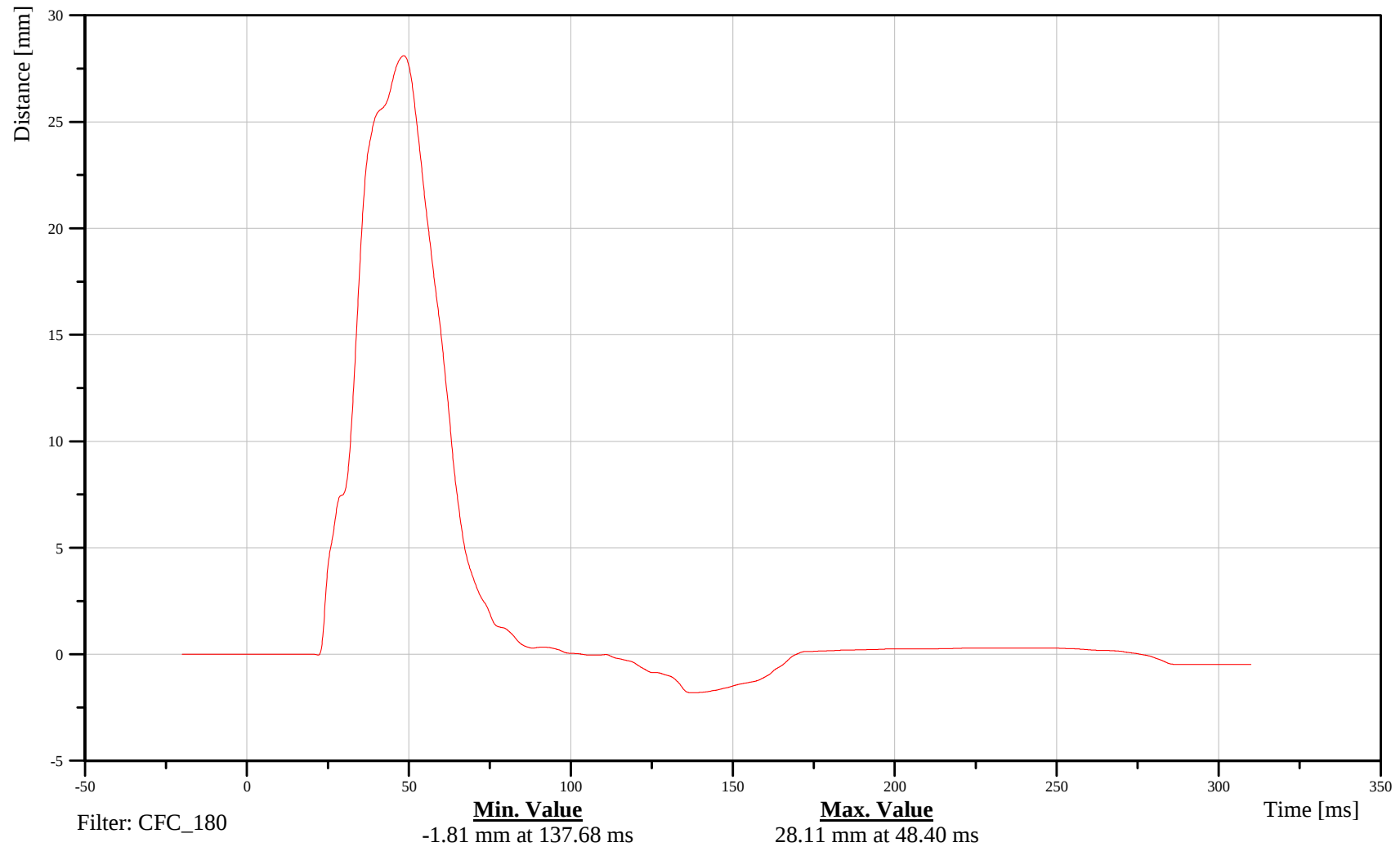
## Left Abdomen Rib 1 Y-Axis Displacement

Customer: VRTC

### 11ABRI01LES2DSYC

TRC Inc. Test Lab: CTF

Test Number: 070628



B-30

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

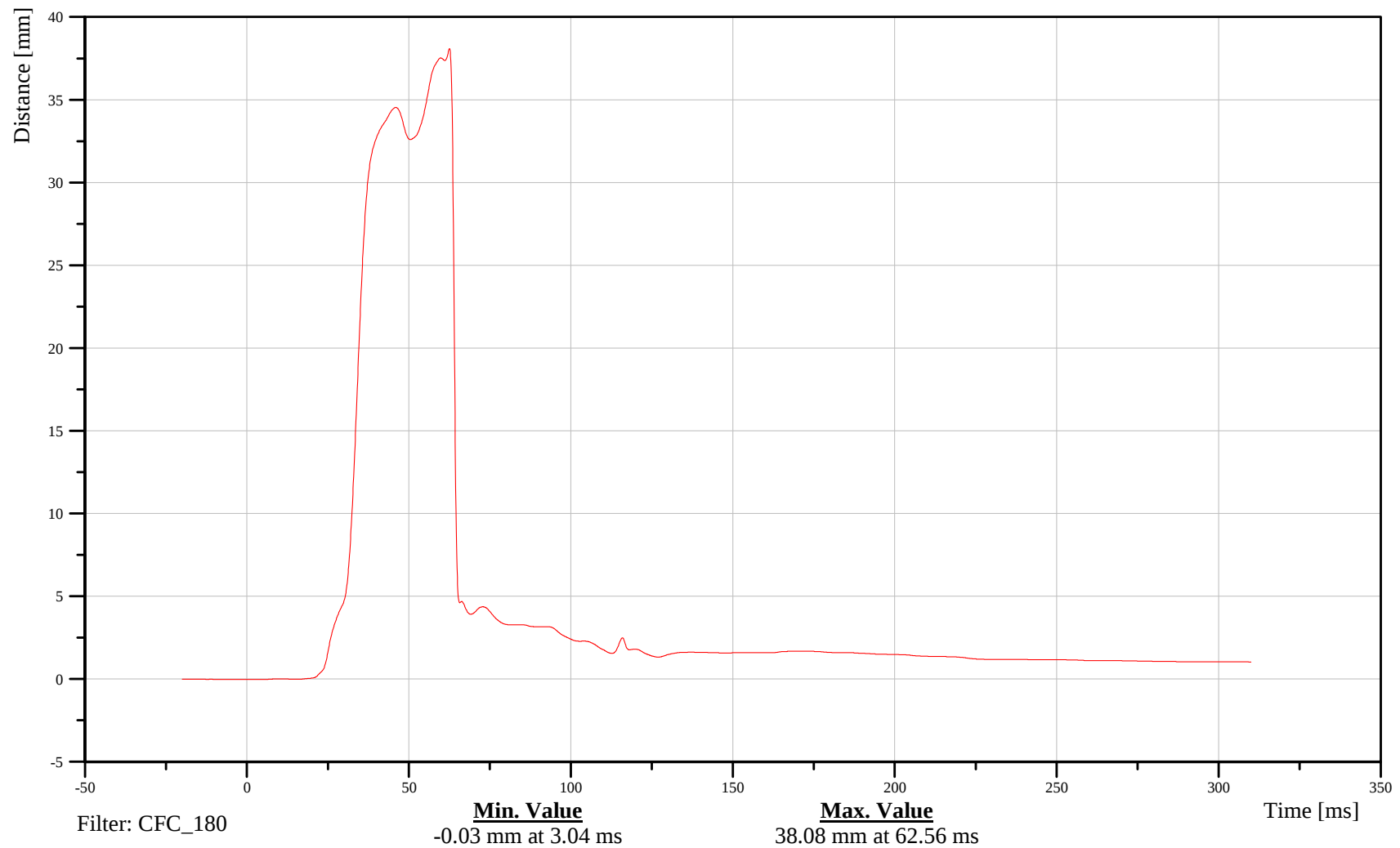
## Left Abdomen Rib 2 Y-Axis Displacement

Customer: VRTC

### 11ABRI02LES2DSYC

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

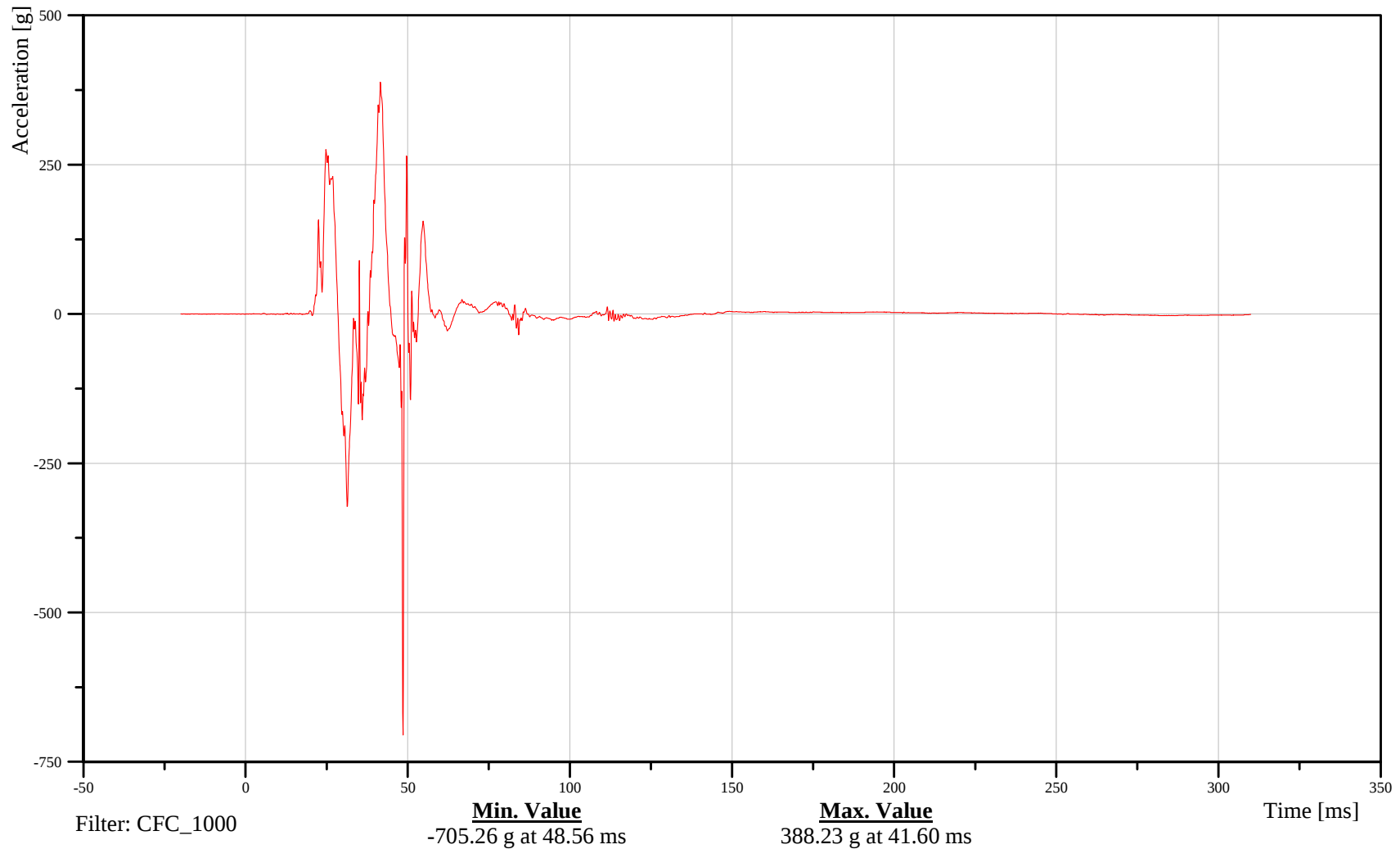
## Left Thorax Rib 1 Y-Axis Acceleration

Customer: VRTC

11TRRI01LES2ACYA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-32

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

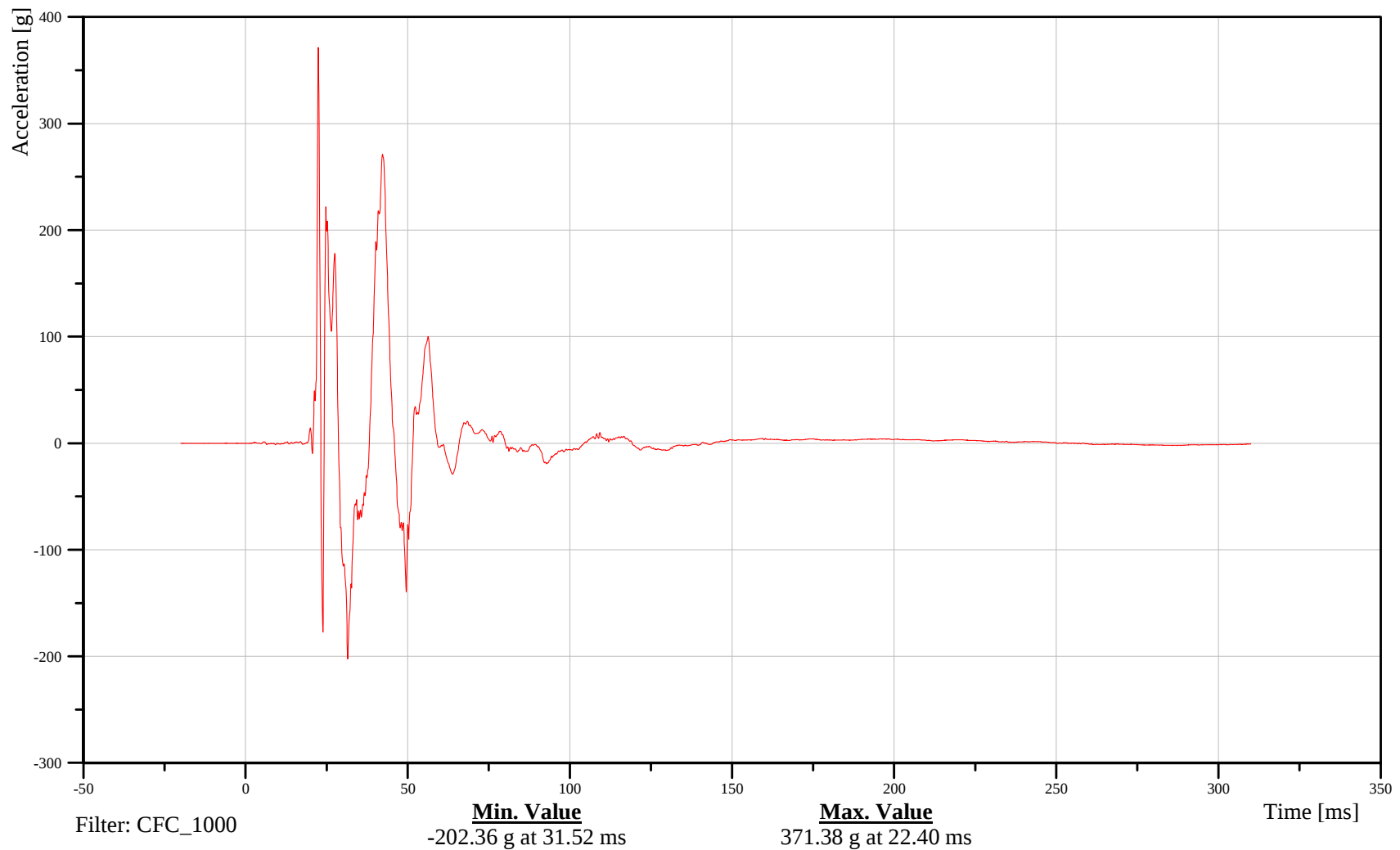
## Left Thorax Rib 2 Y-Axis Acceleration

Customer: VRTC

11TRRI02LES2ACYA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-33

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

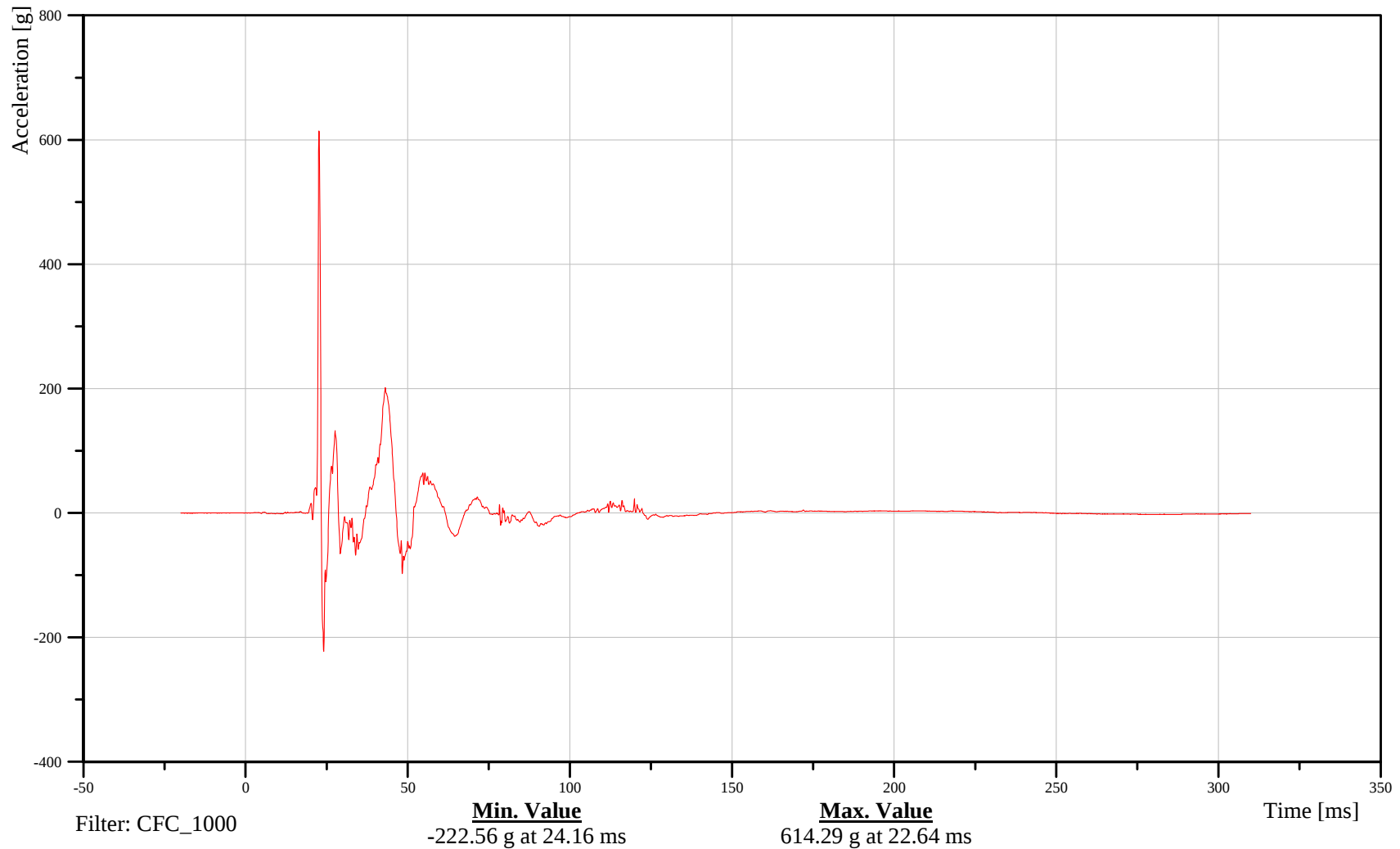
## Left Thorax Rib 3 Y-Axis Acceleration

Customer: VRTC

11TRRI03LES2ACYA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-34

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

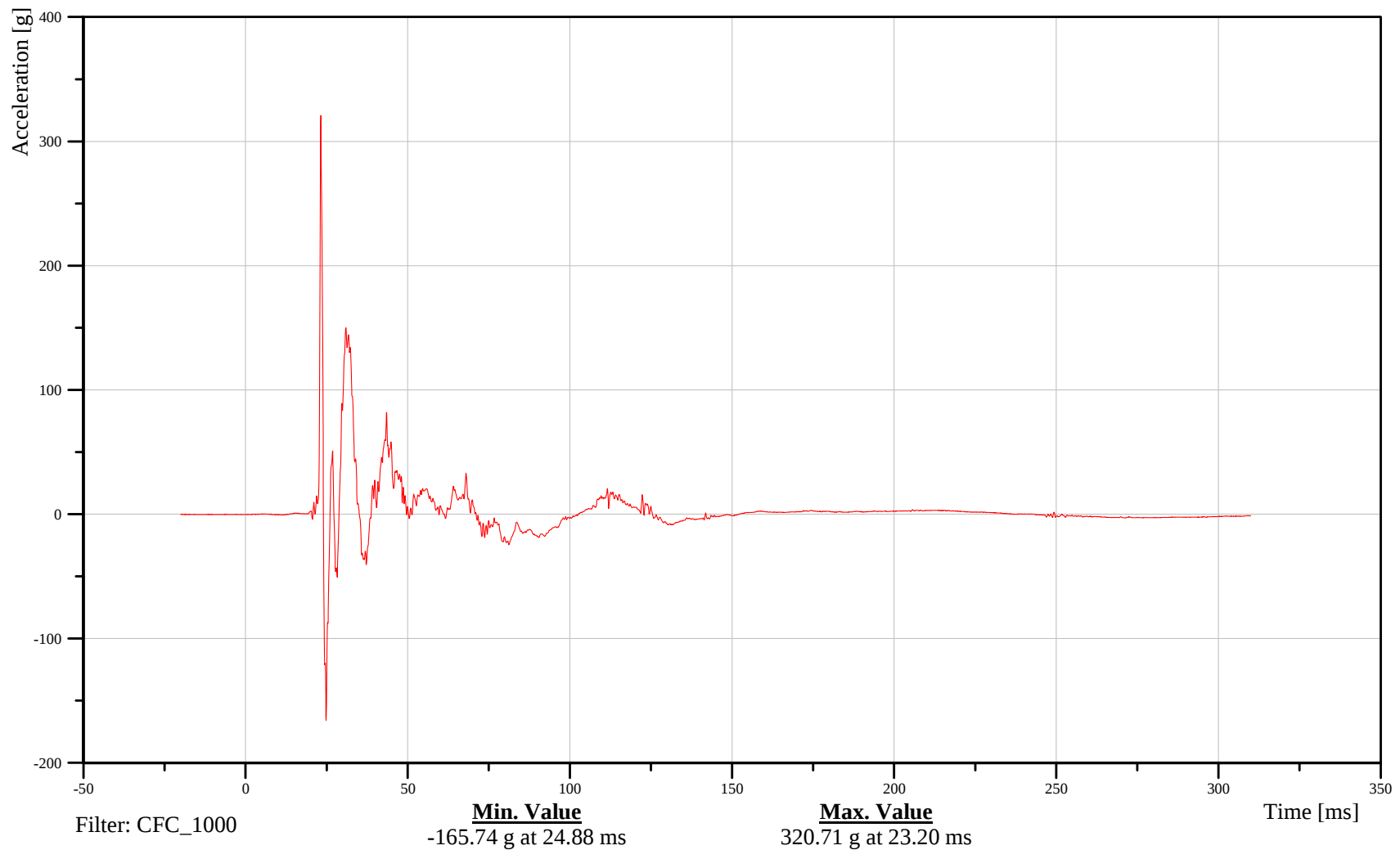
## Left Abdomen Rib 1 Y-Axis Acceleration

Customer: VRTC

11ABRI01LES2ACYA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-35

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

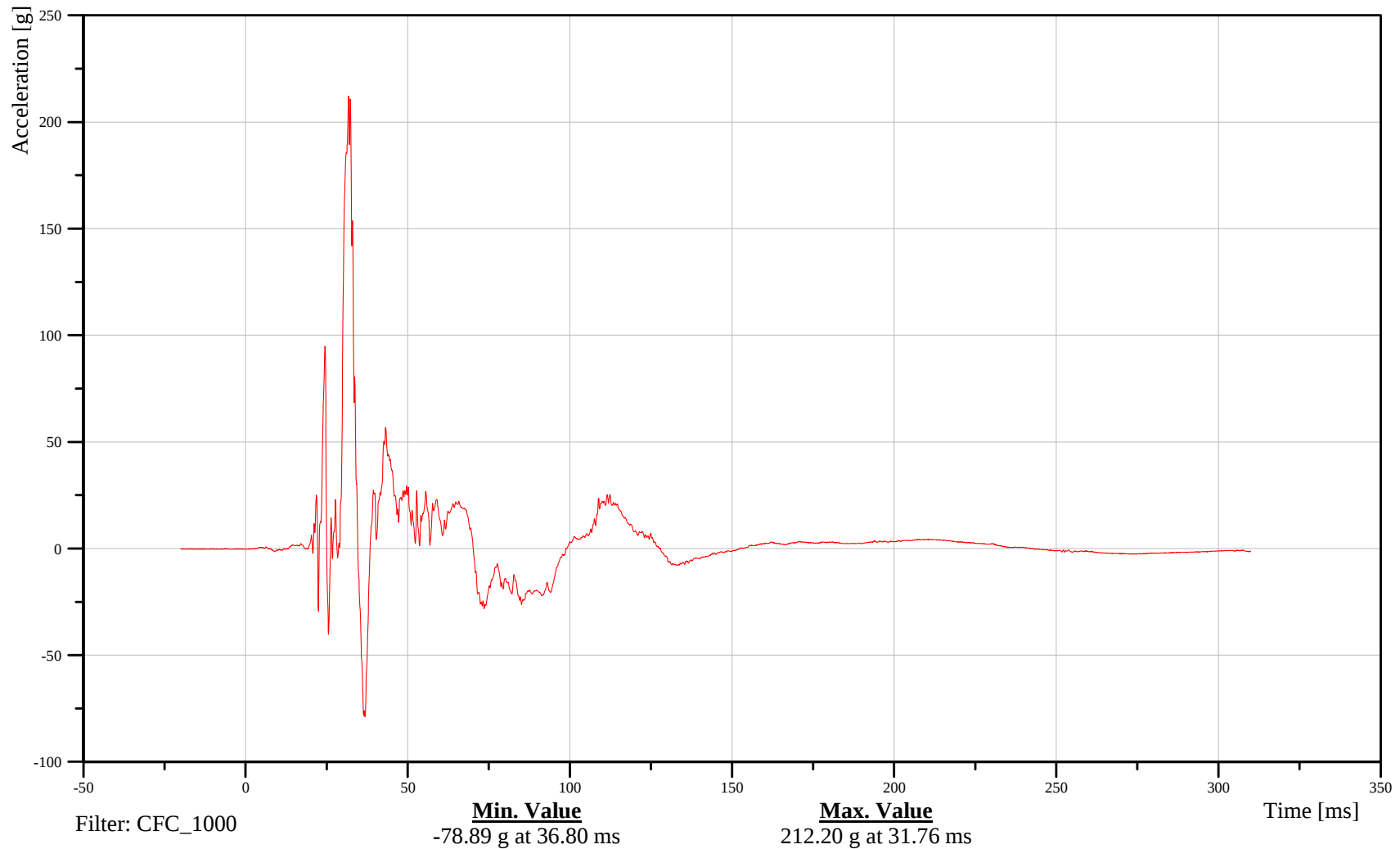
## Left Abdomen Rib 2 Y-Axis Acceleration

Customer: VRTC

11ABRI02LES2ACYA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-36

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

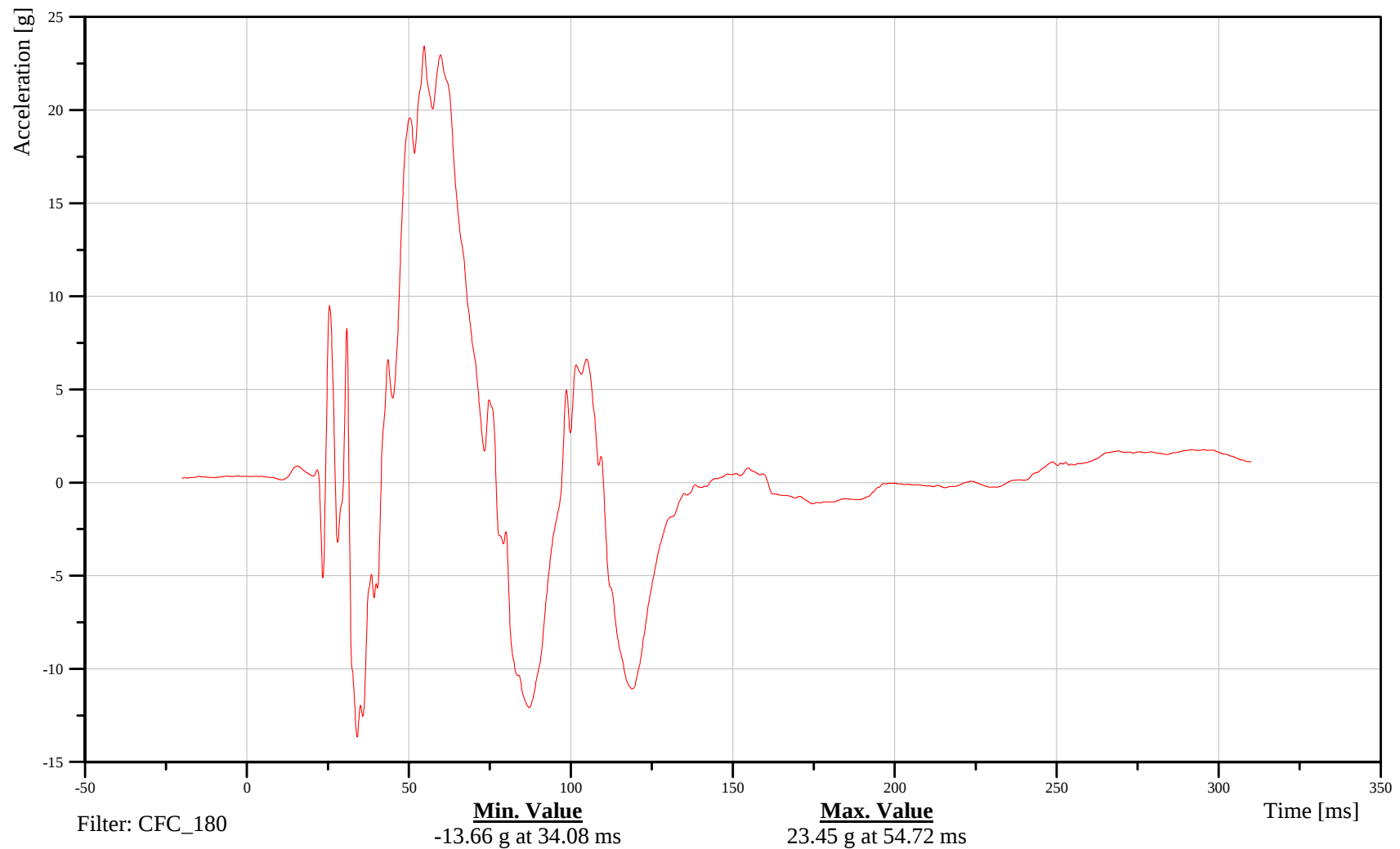
## Lower Spine X-Axis Acceleration

Customer: VRTC

11SPIN1200S2ACXC

TRC Inc. Test Lab: CTF

Test Number: 070628



B-37

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

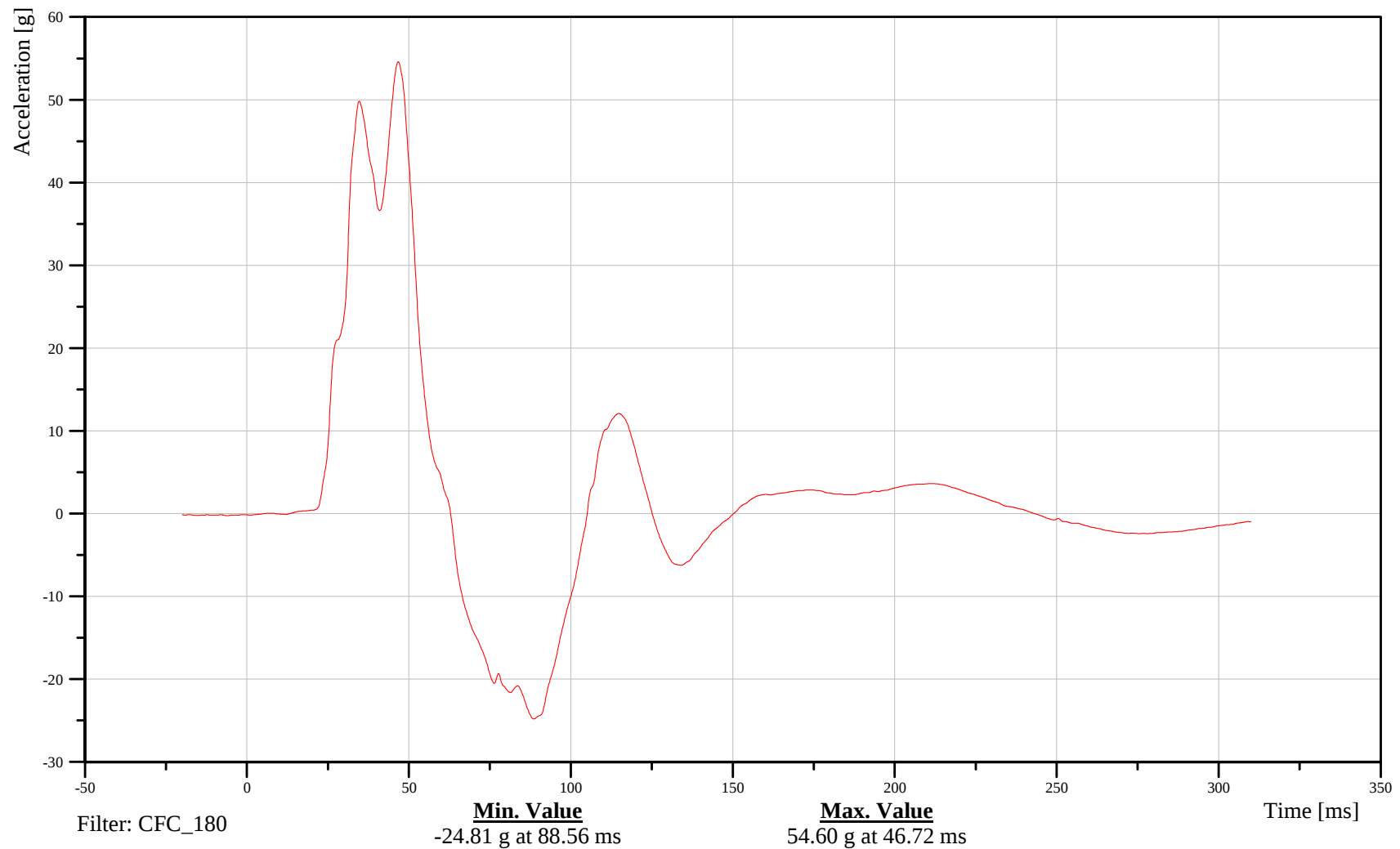
## Lower Spine Y-Axis Acceleration

Customer: VRTC

11SPIN1200S2ACYC

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

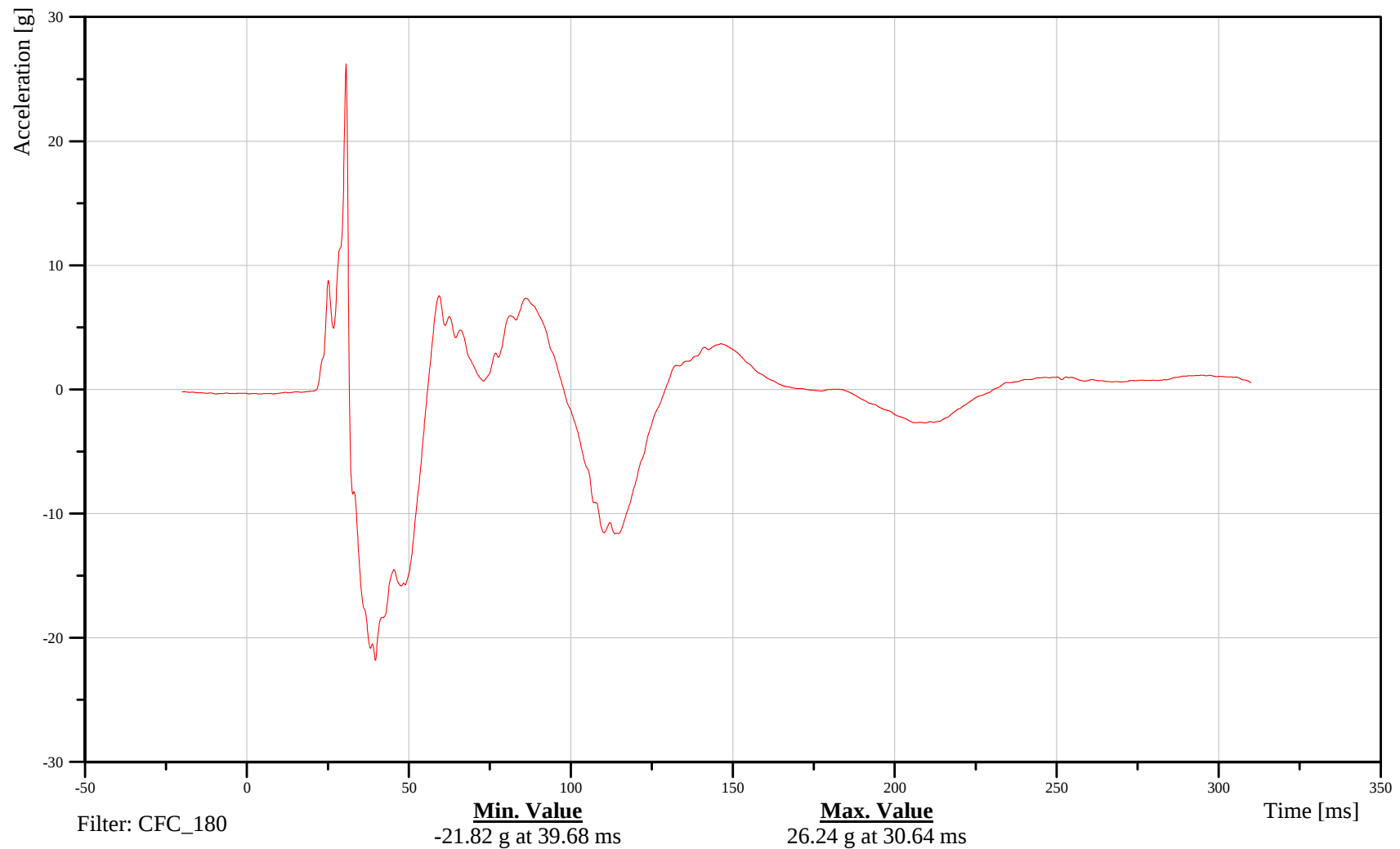
## Lower Spine Z-Axis Acceleration

Customer: VRTC

### 11SPIN1200S2ACZC

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

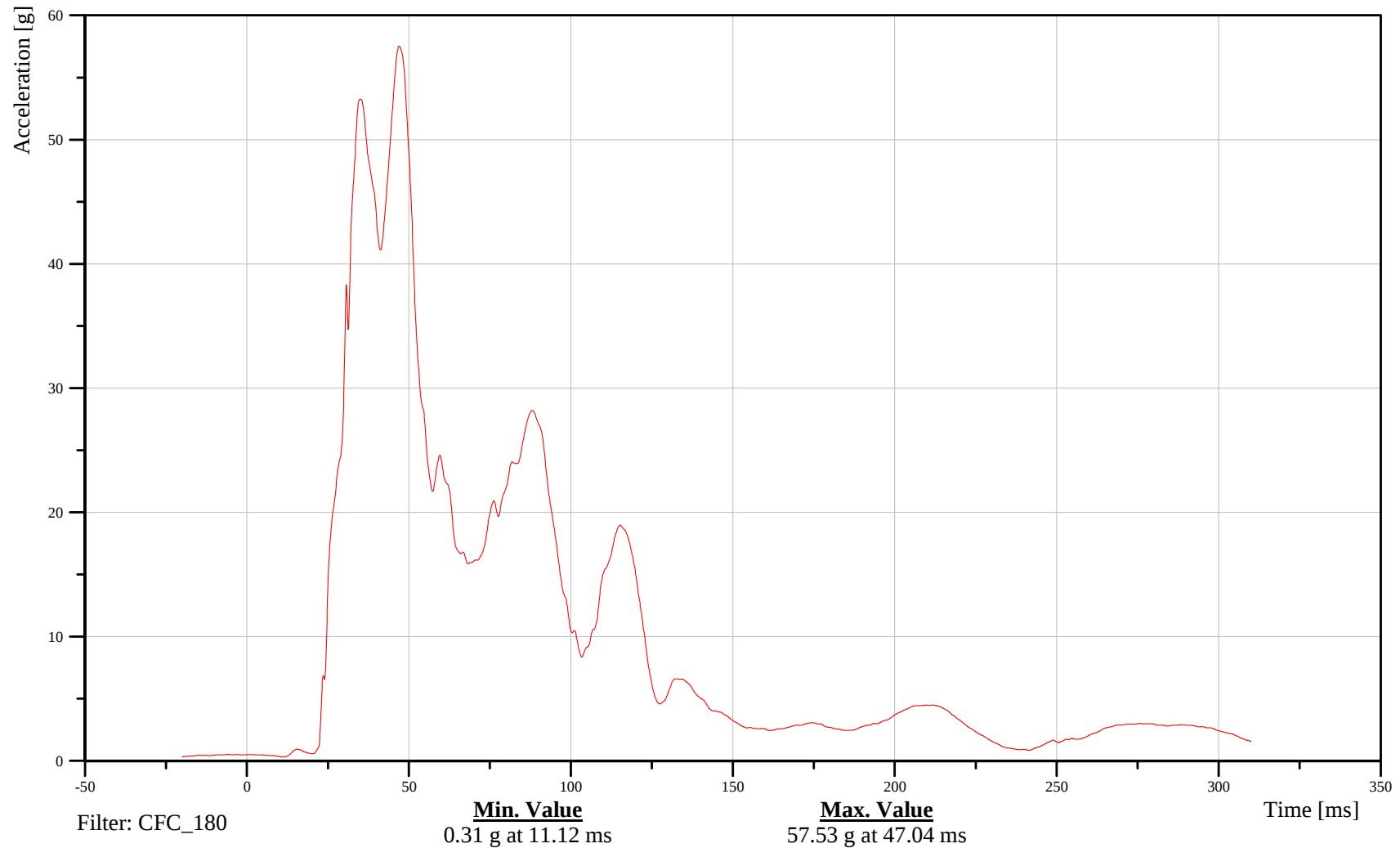
## Lower Spine Resultant Acceleration

Customer: VRTC

11SPIN1200S2ACRC

TRC Inc. Test Lab: CTF

Test Number: 070628



B-40

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

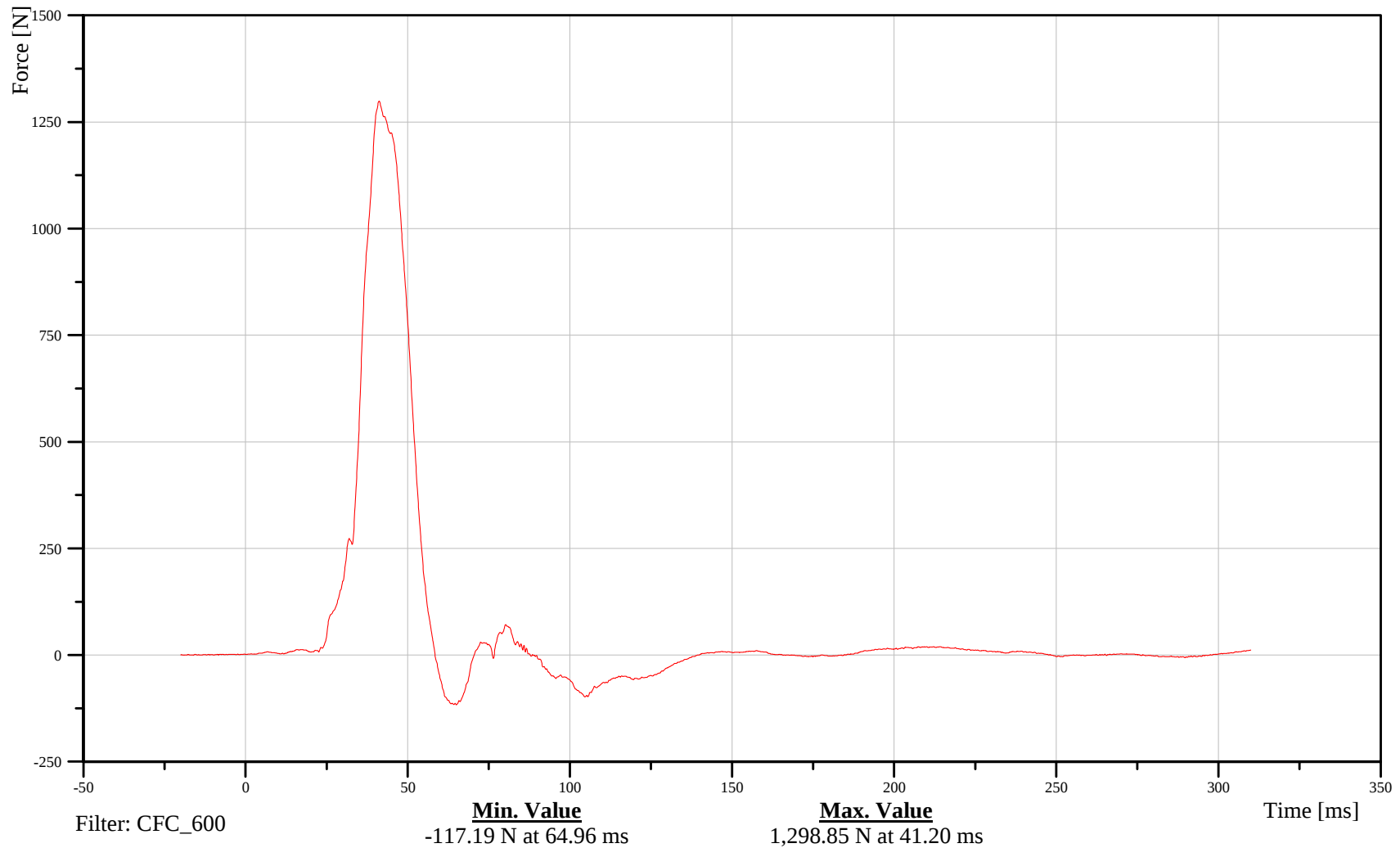
## Left Iliac Wing Y-Axis Force

Customer: VRTC

11ILACLE00S2FOYB

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

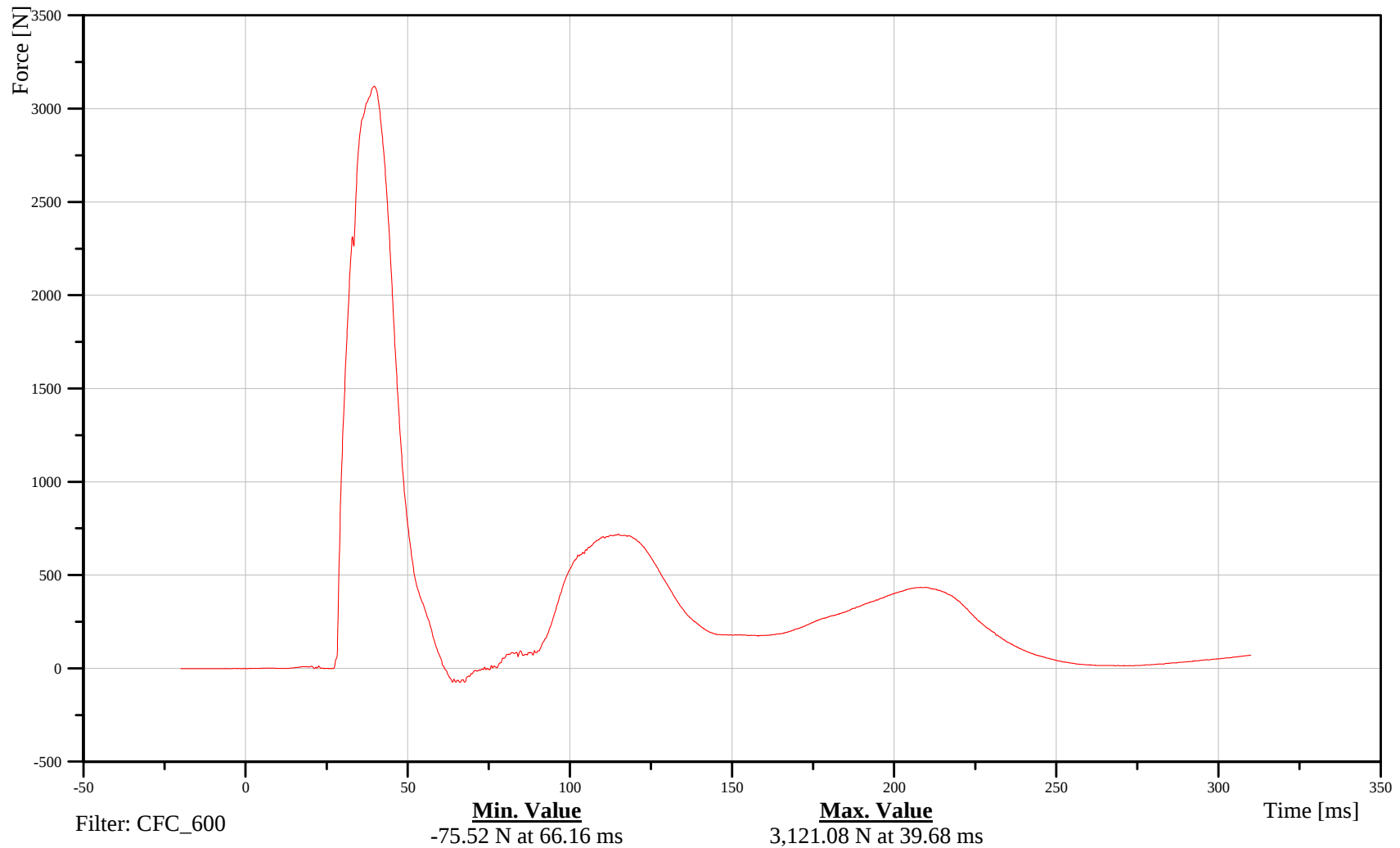
## Left Acetabulum Y-Axis Force

Customer: VRTC

### 11ACTBLE00S2FOYB

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

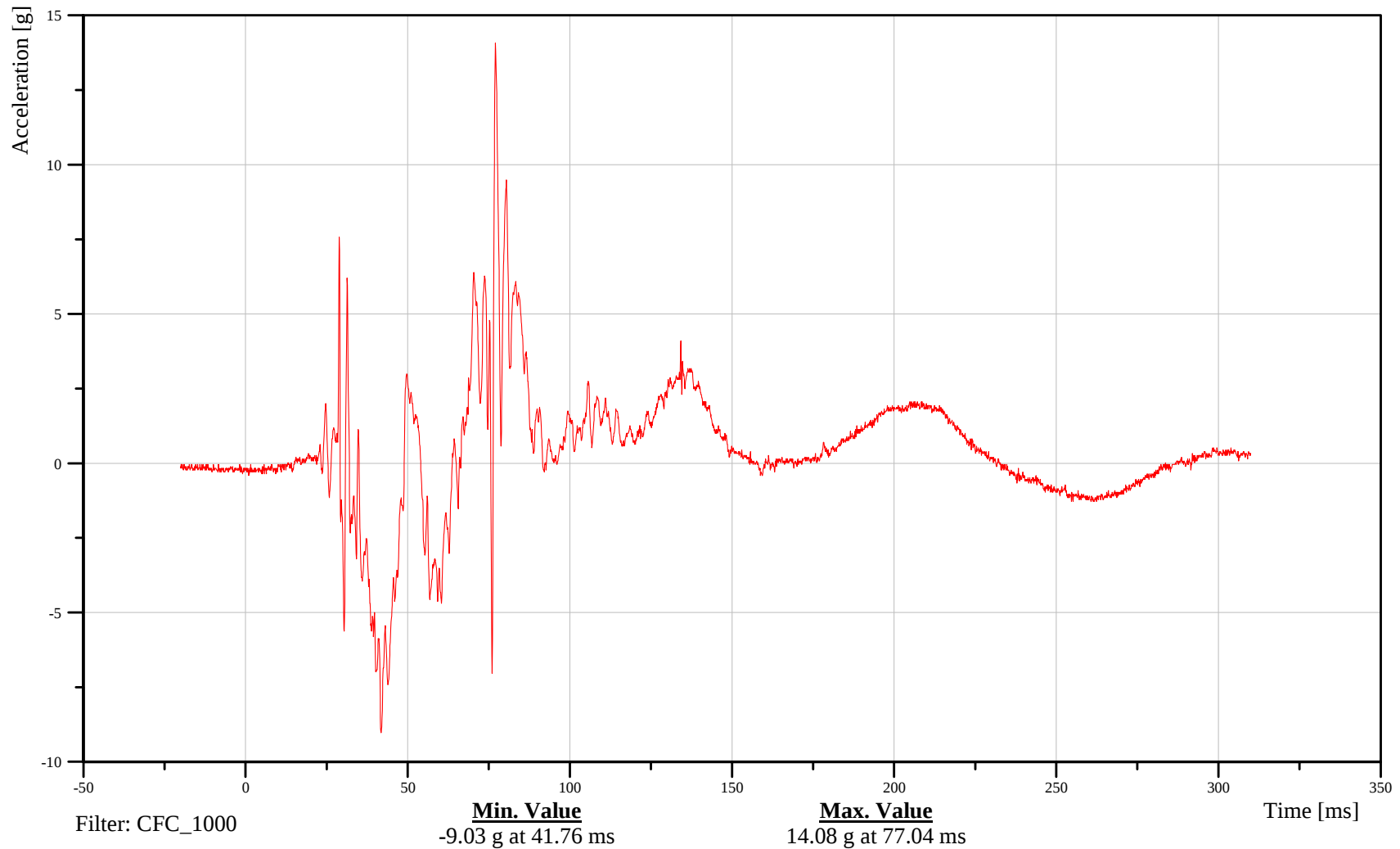
## Pelvis X-Axis Acceleration

Customer: VRTC

### 11PELVCG00S2ACXA

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

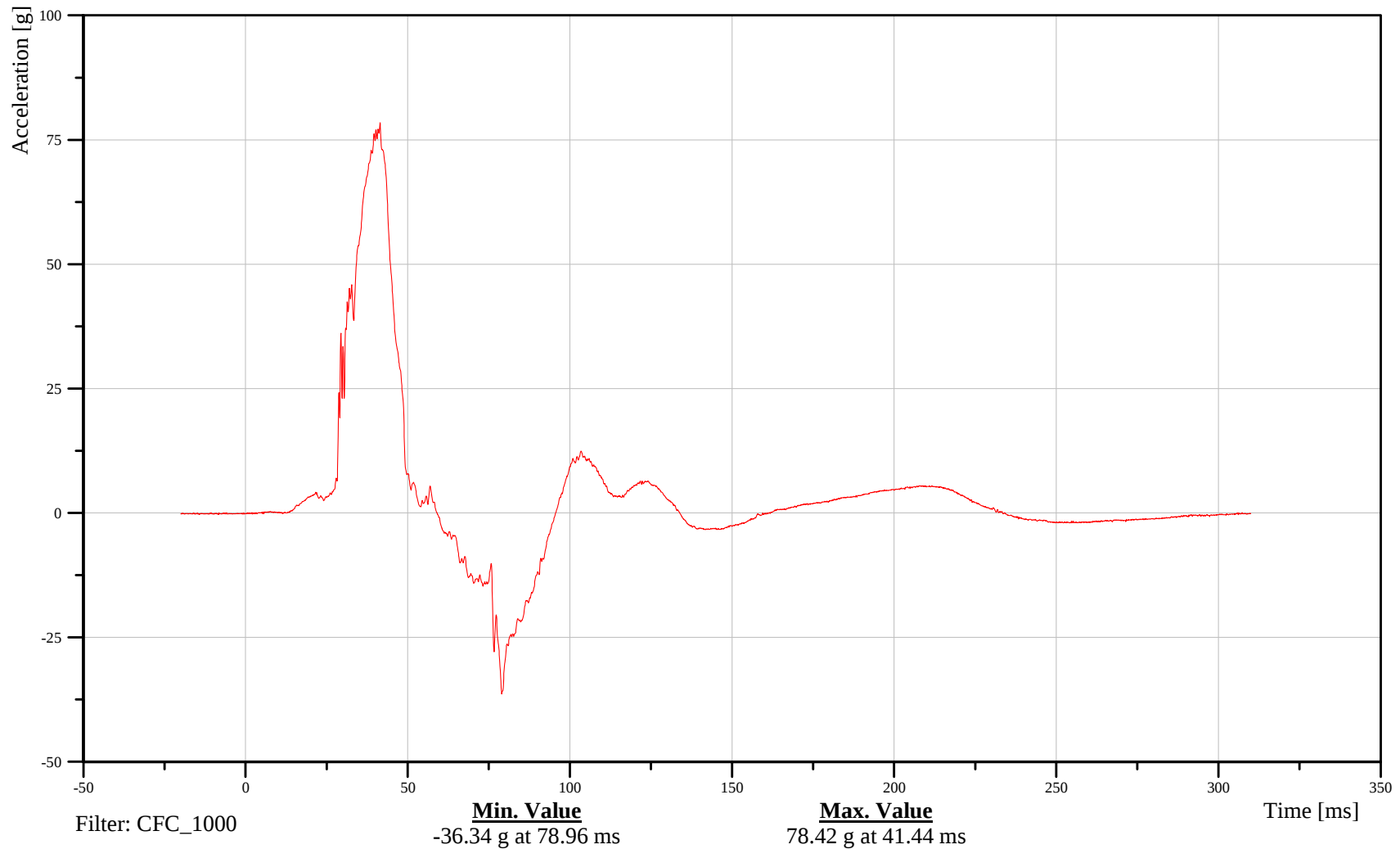
## Pelvis Y-Axis Acceleration

Customer: VRTC

### 11PELVCG00S2ACYA

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

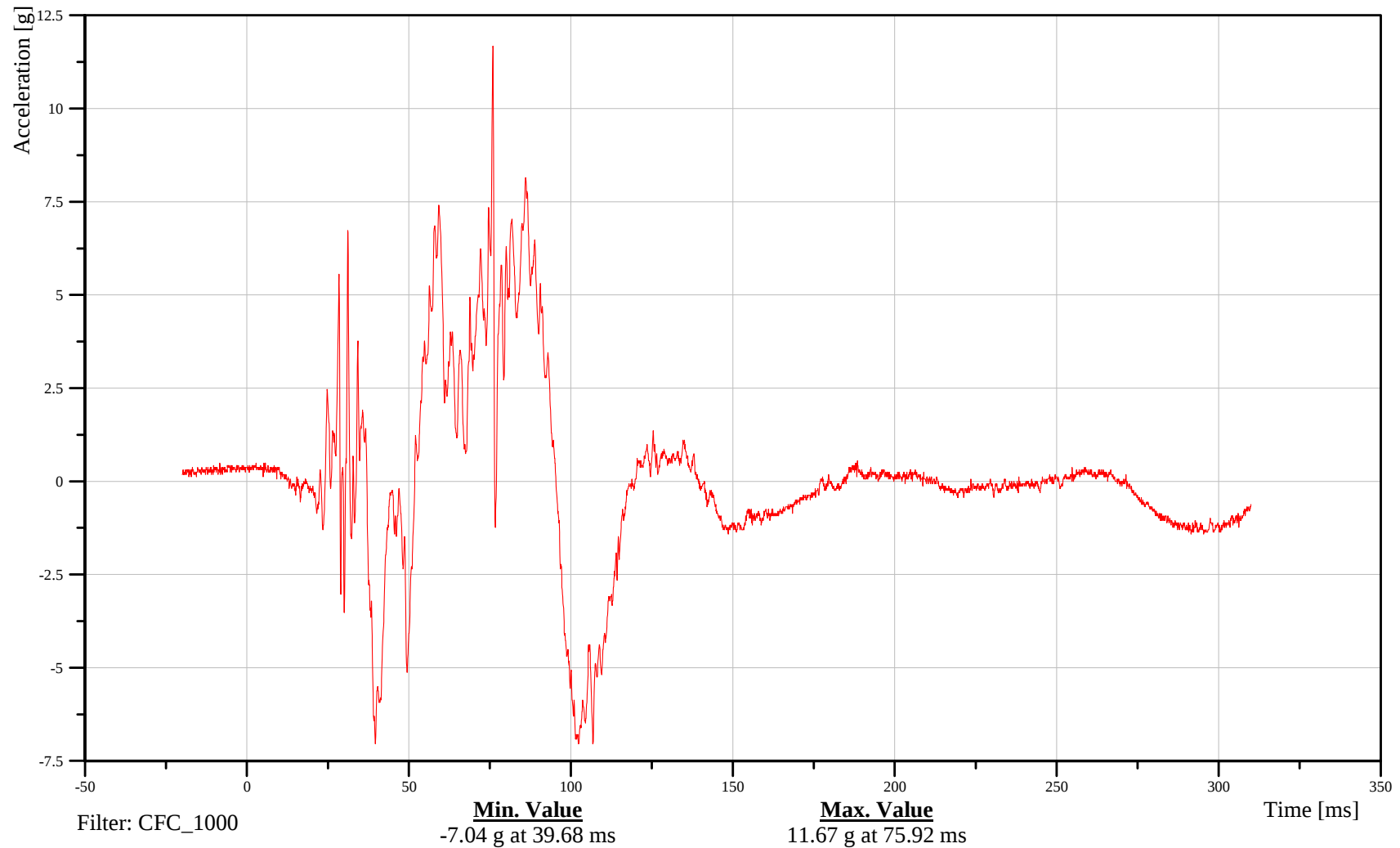
## Pelvis Z-Axis Acceleration

Customer: VRTC

### 11PELVCG00S2ACZA

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

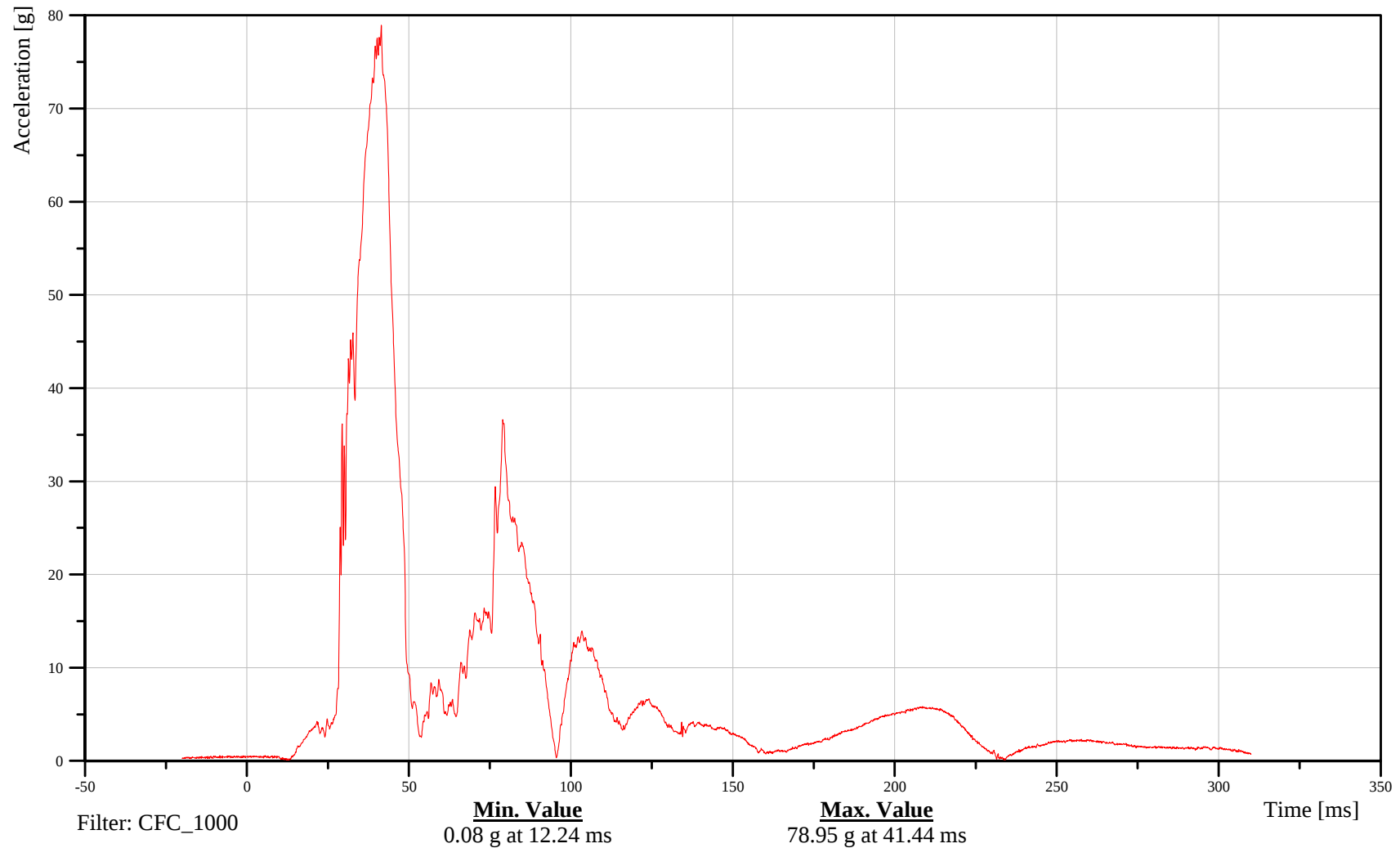
## Pelvis Resultant Acceleration

Customer: VRTC

### 11PELVCG00S2ACRA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-46

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

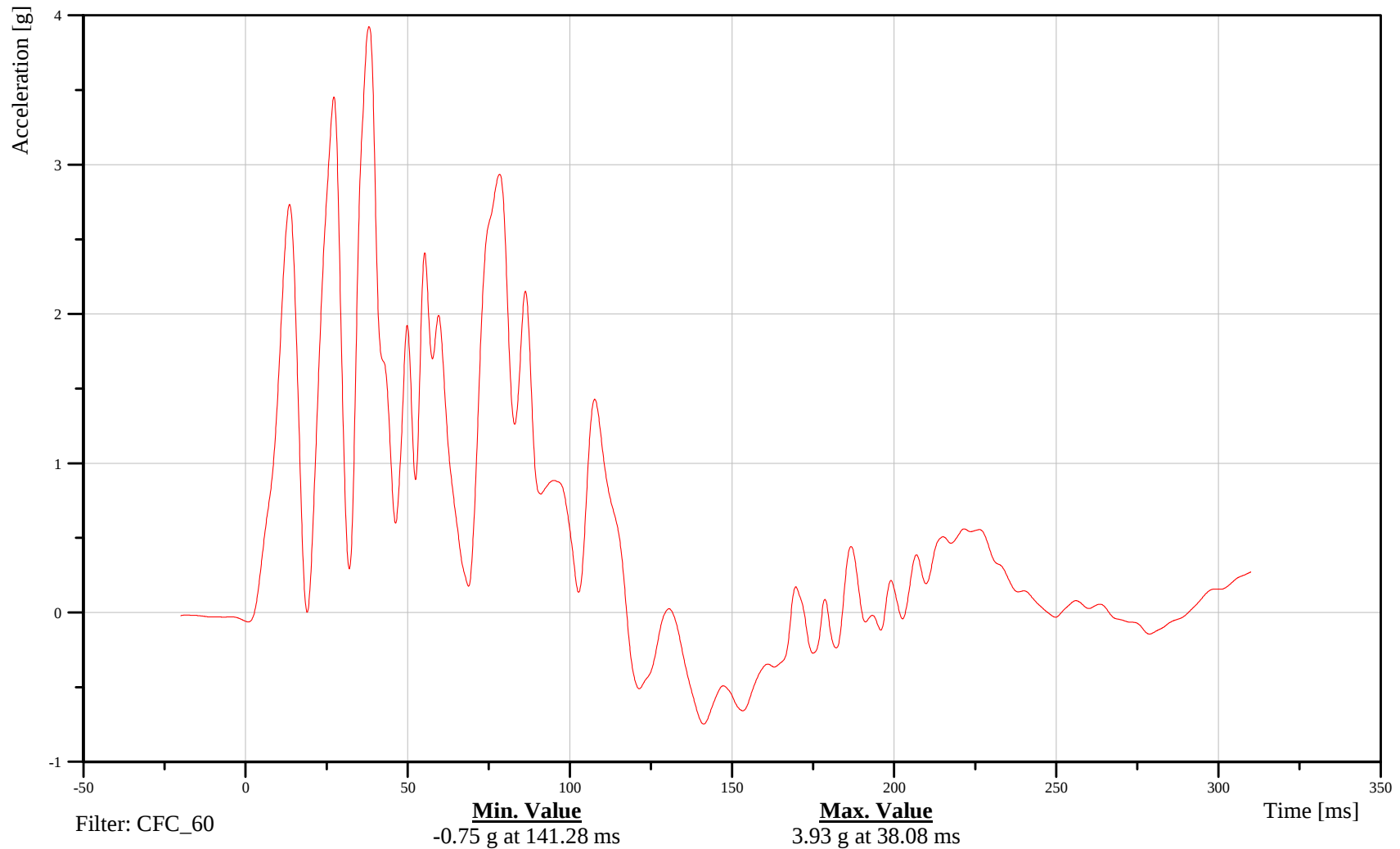
## Right Side Sill at Front Seat X-Axis Acceleration

Customer: VRTC

16SILBFR0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007

Time: 14:43

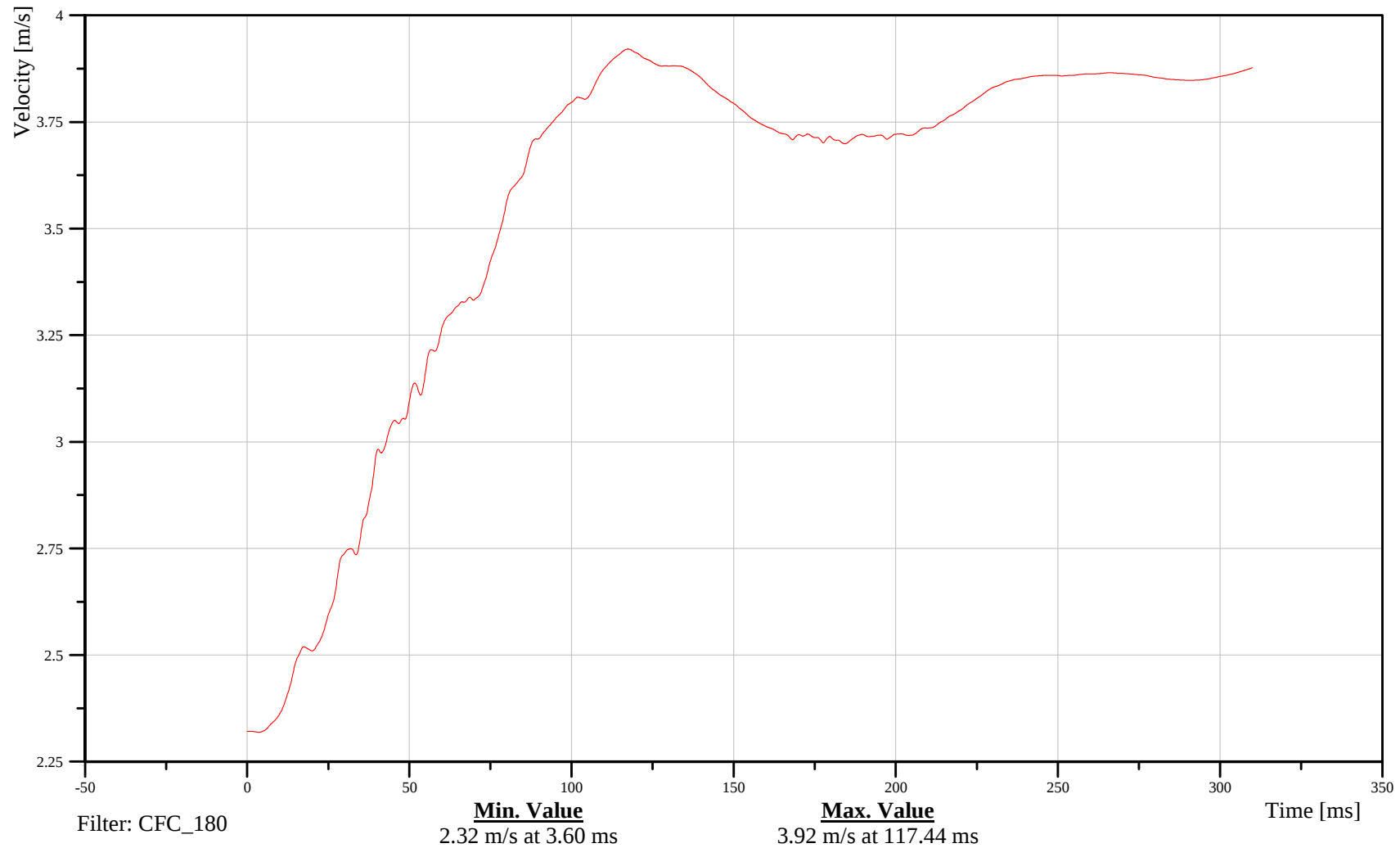
## Right Side Sill at Front Seat X-Axis Velocity

Customer: VRTC

### 16SILBFR0000VEXC

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007

Right Side Sill at Front Seat X-Axis Displacement

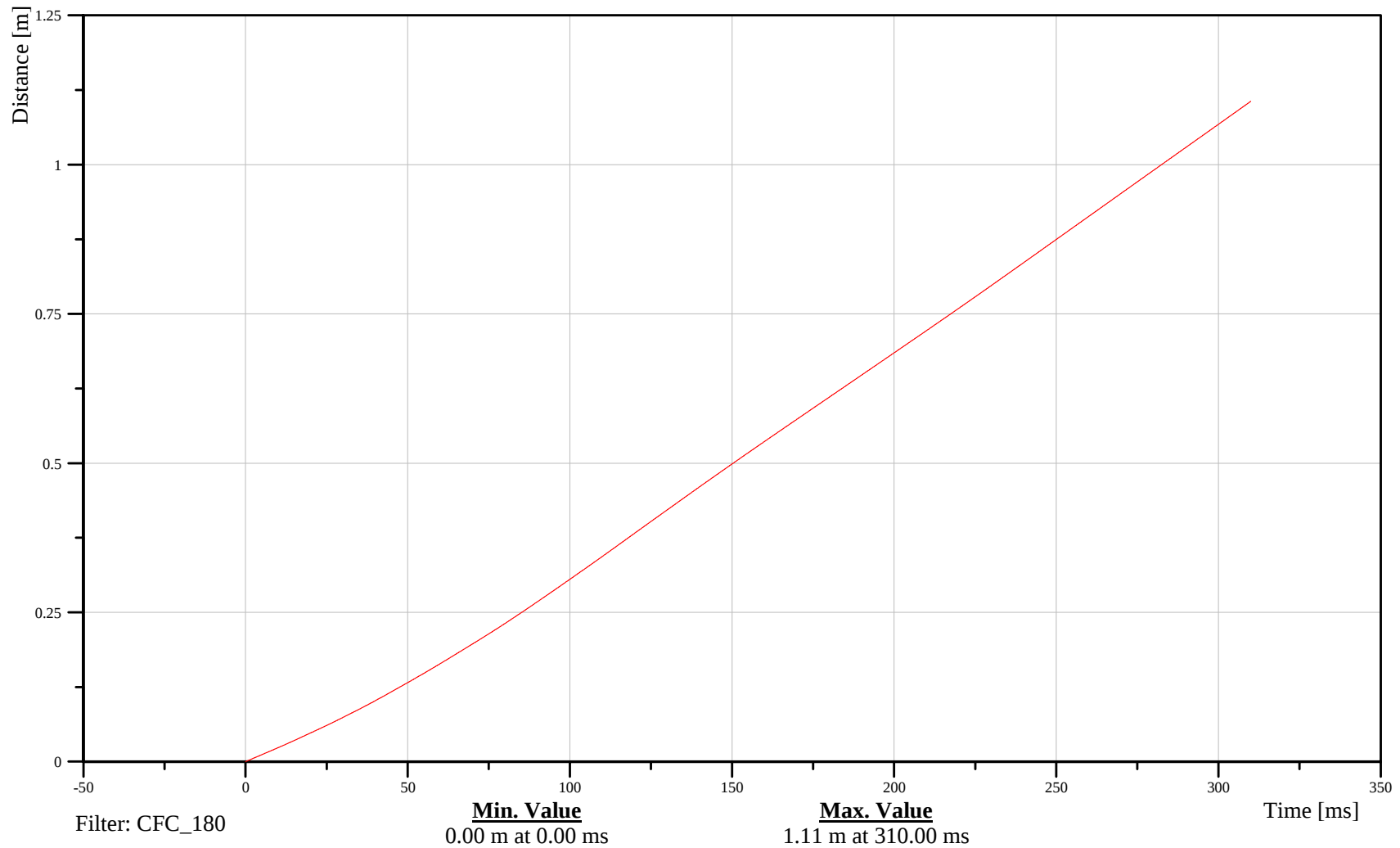
Time: 14:43

Customer: VRTC

## 16SILBFR0000DCXC

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

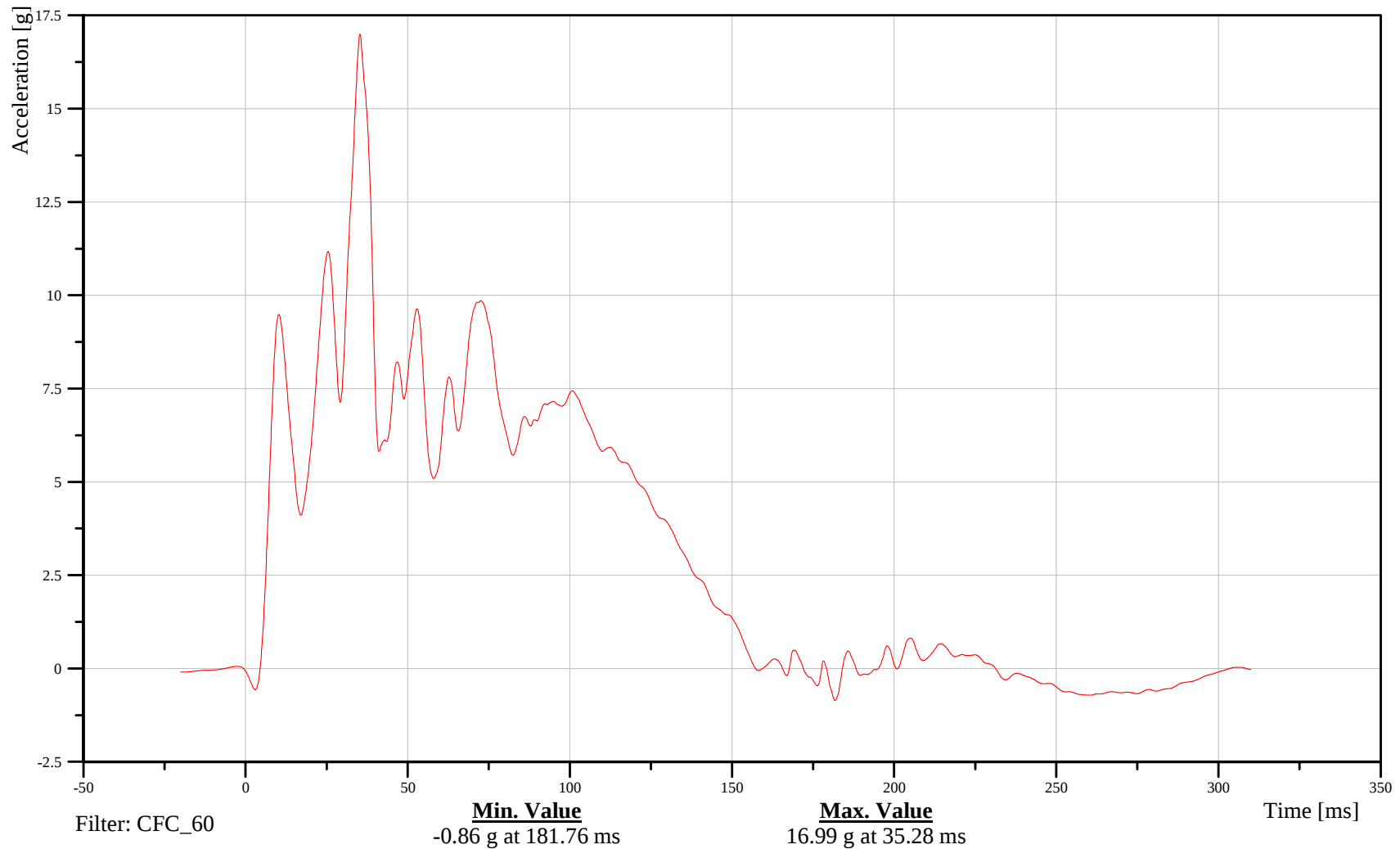
Right Side Sill at Front Seat Y-Axis Acceleration

Customer: VRTC

16SILBFR0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-50

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007

Right Side Sill at Front Seat Y-Axis Velocity

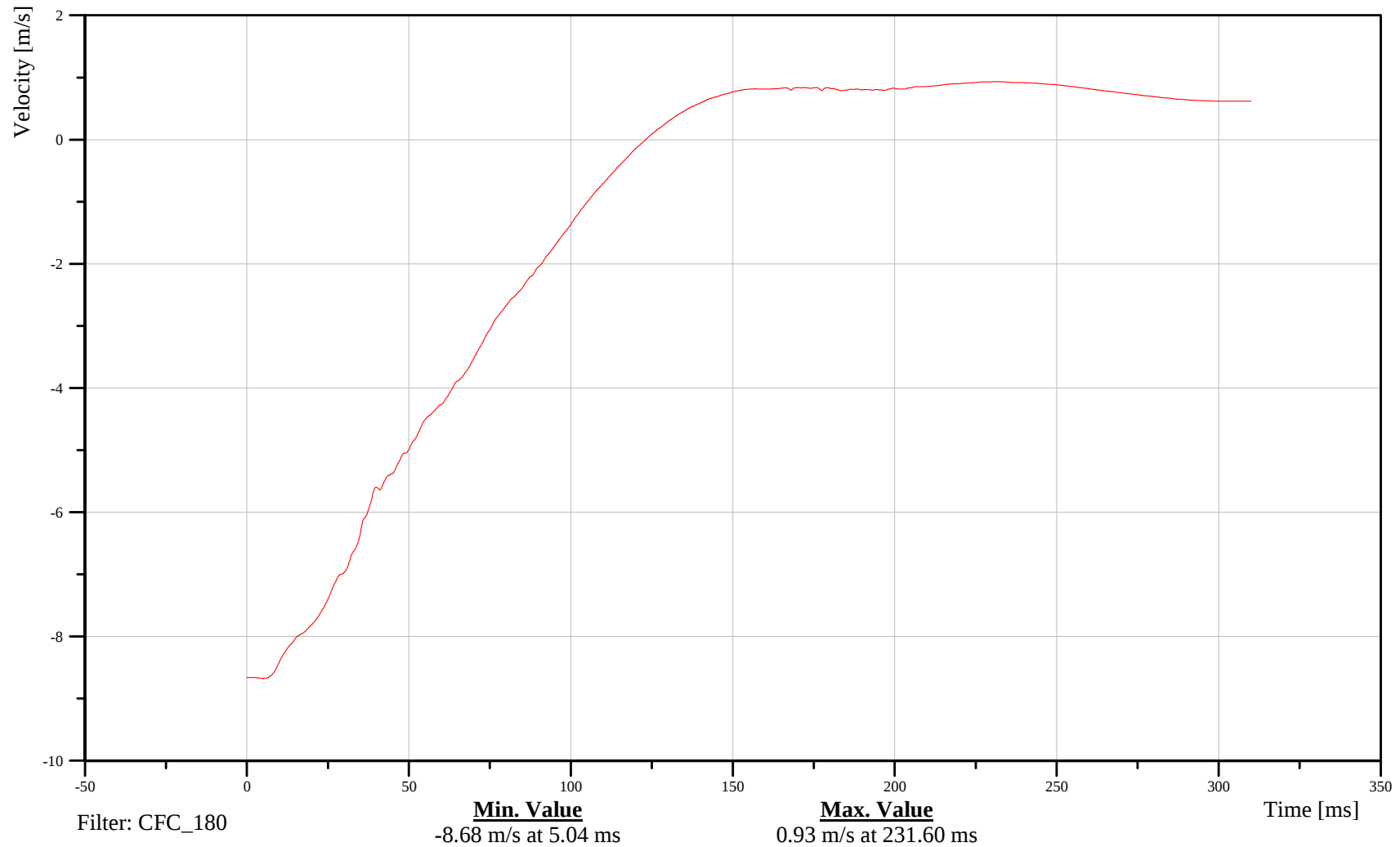
Time: 14:43

Customer: VRTC

16SILBFR0000VEYC

TRC Inc. Test Lab: CTF

Test Number: 070628



B-51

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007

Right Side Sill at Front Seat Y-Axis Displacement

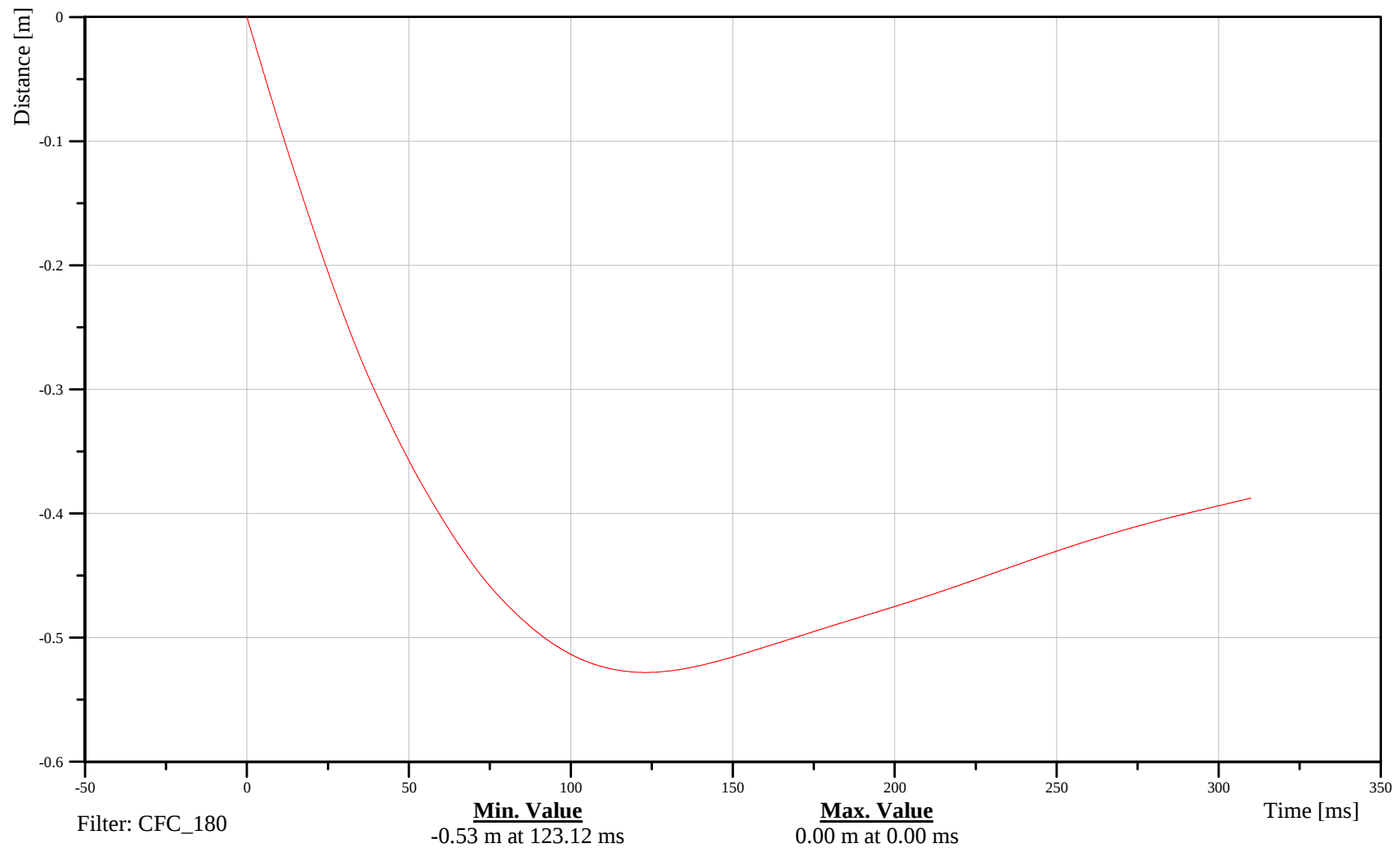
Time: 14:43

Customer: VRTC

## 16SILBFR0000DCYC

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007

Time: 14:43

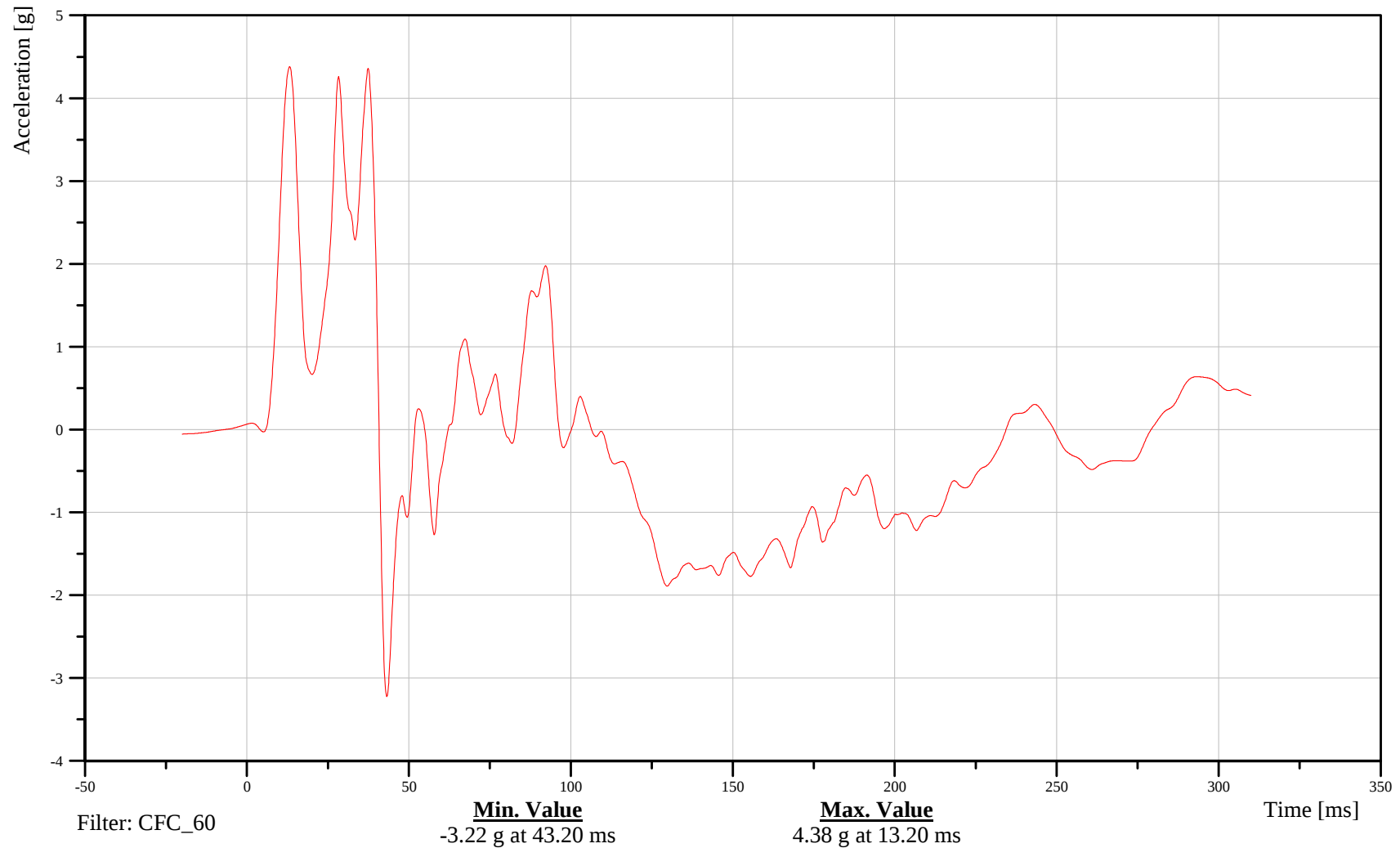
Right Side Sill at Front Seat Z-Axis Acceleration

Customer: VRTC

## 16SILBFR0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-53

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

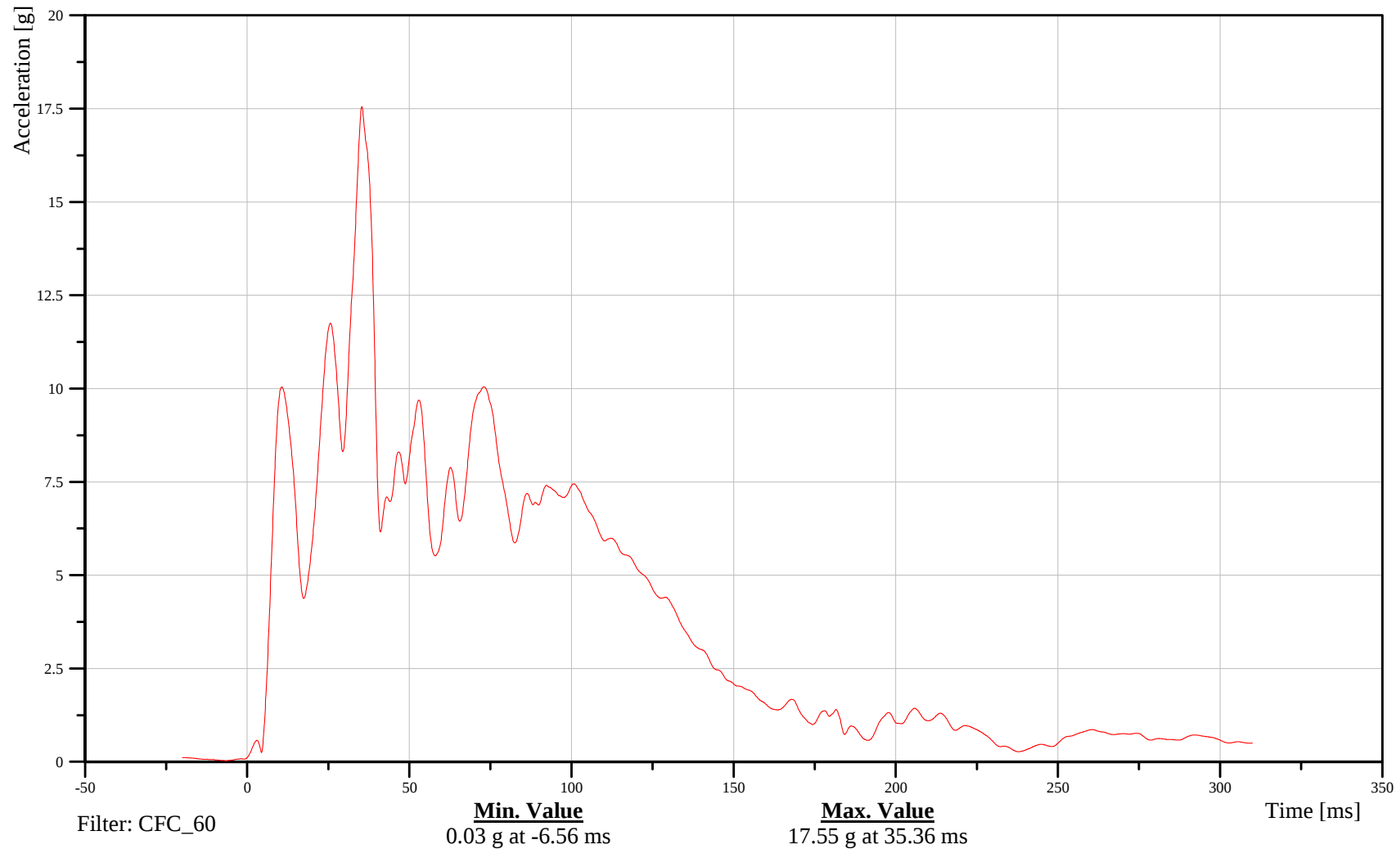
## Right Side Sill at Front Seat Resultant Acceleration

Customer: VRTC

16SILBFR0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

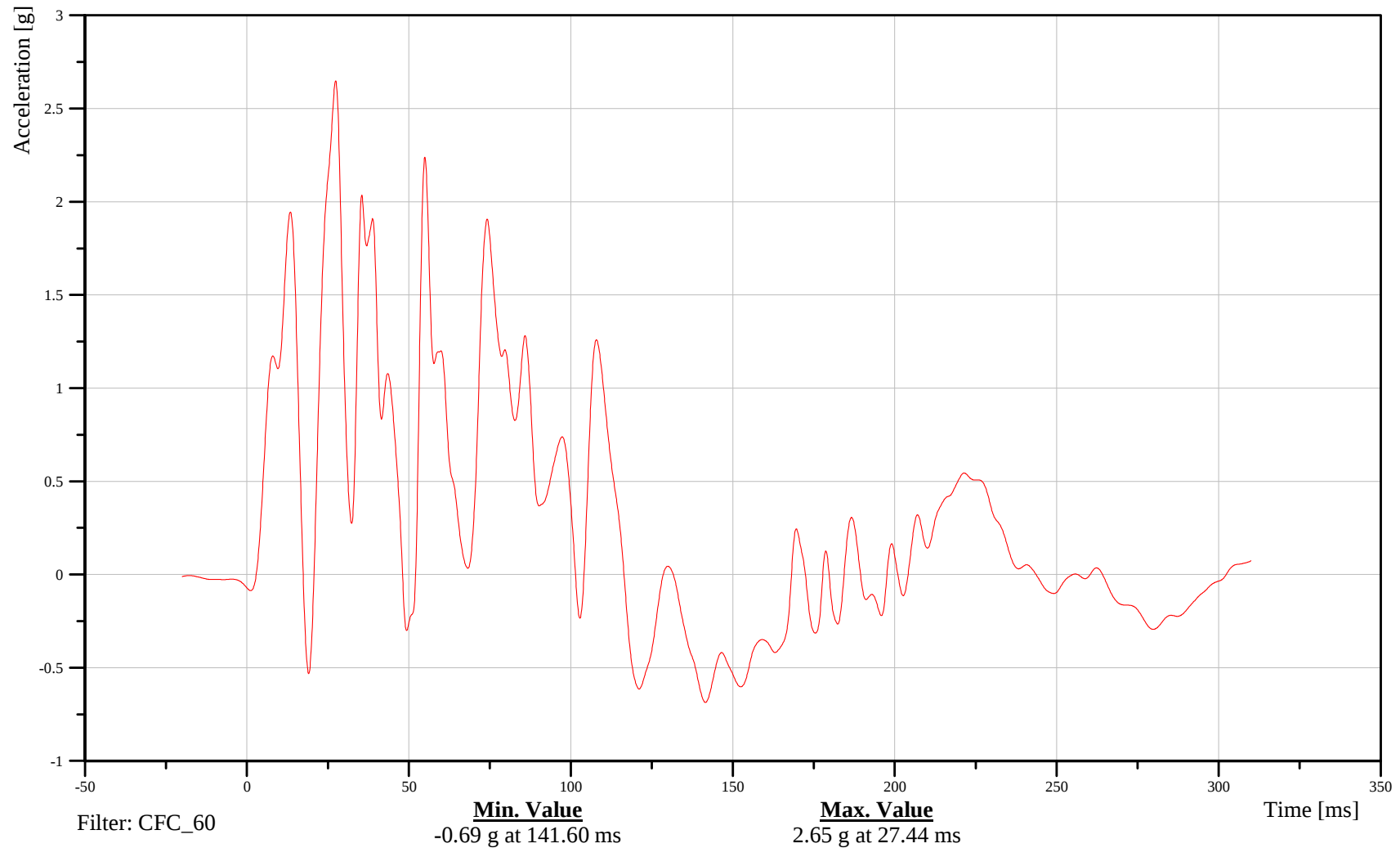
Right Side Sill at Rear Seat X-Axis Acceleration

Customer: VRTC

16SILBRE0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-55

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007

Right Side Sill at Rear Seat X-Axis Velocity

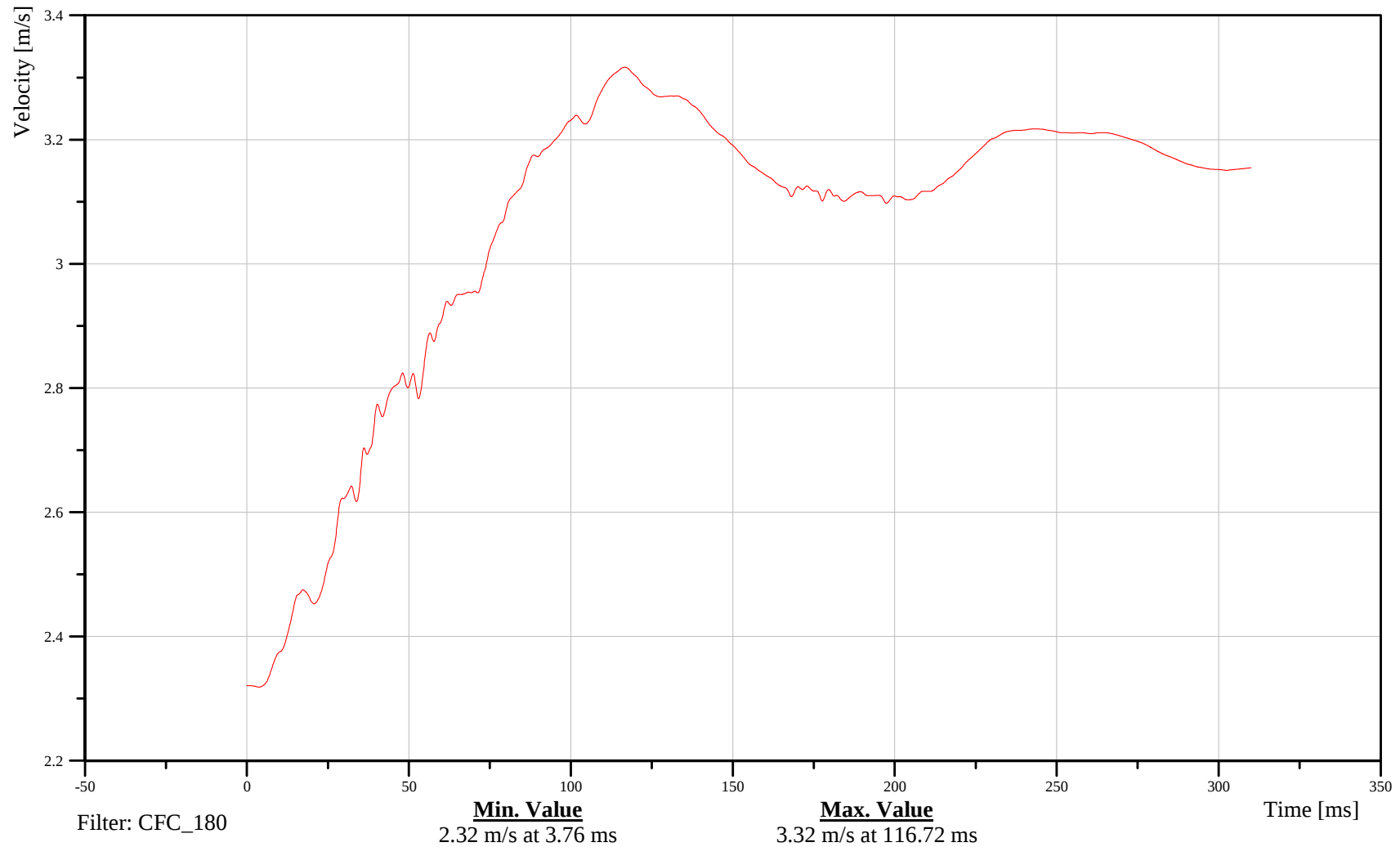
Time: 14:43

Customer: VRTC

16SILBRE0000VEXC

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007

Right Side Sill at Rear Seat X-Axis Displacement

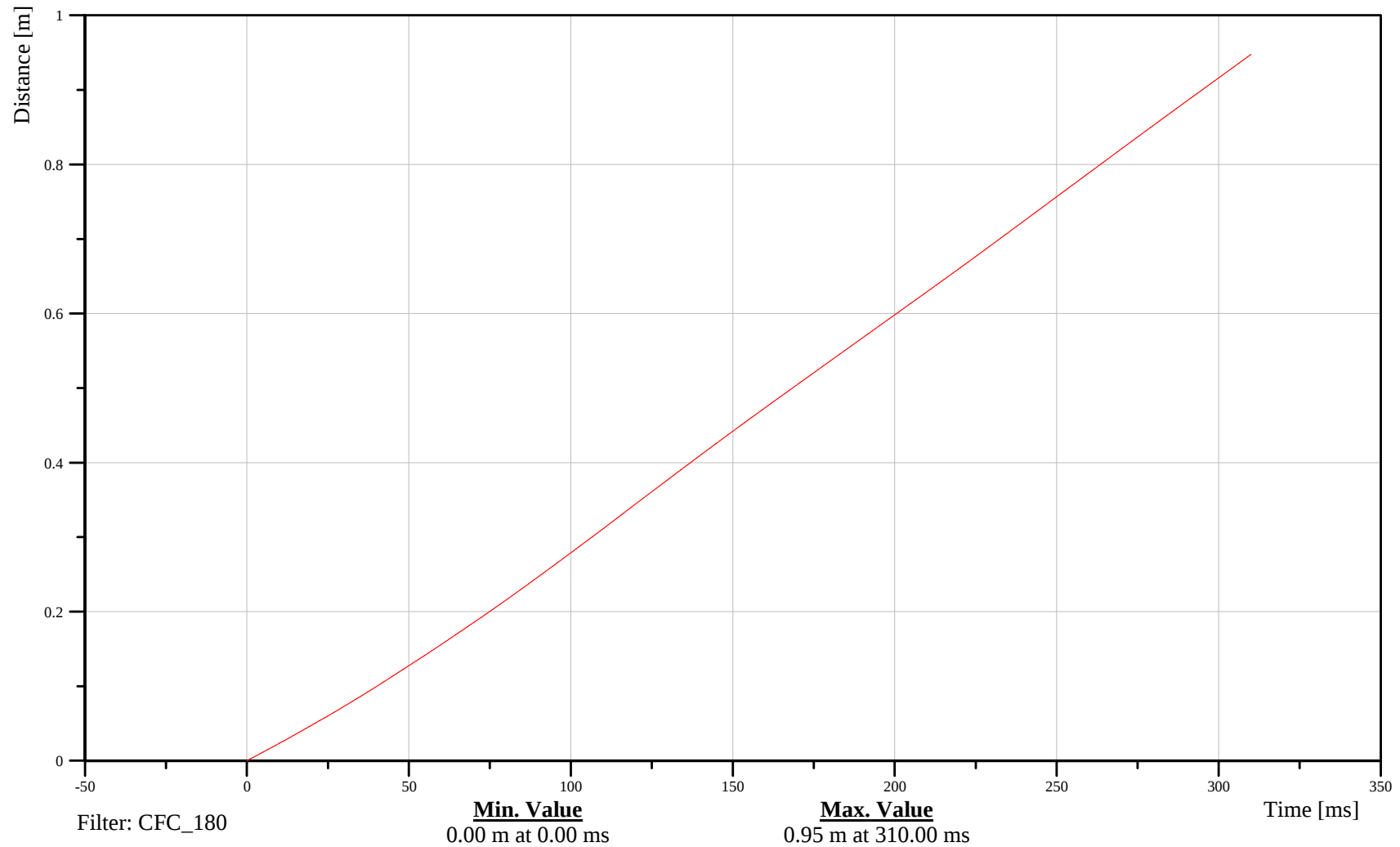
Time: 14:43

Customer: VRTC

## 16SILBRE0000DCXC

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

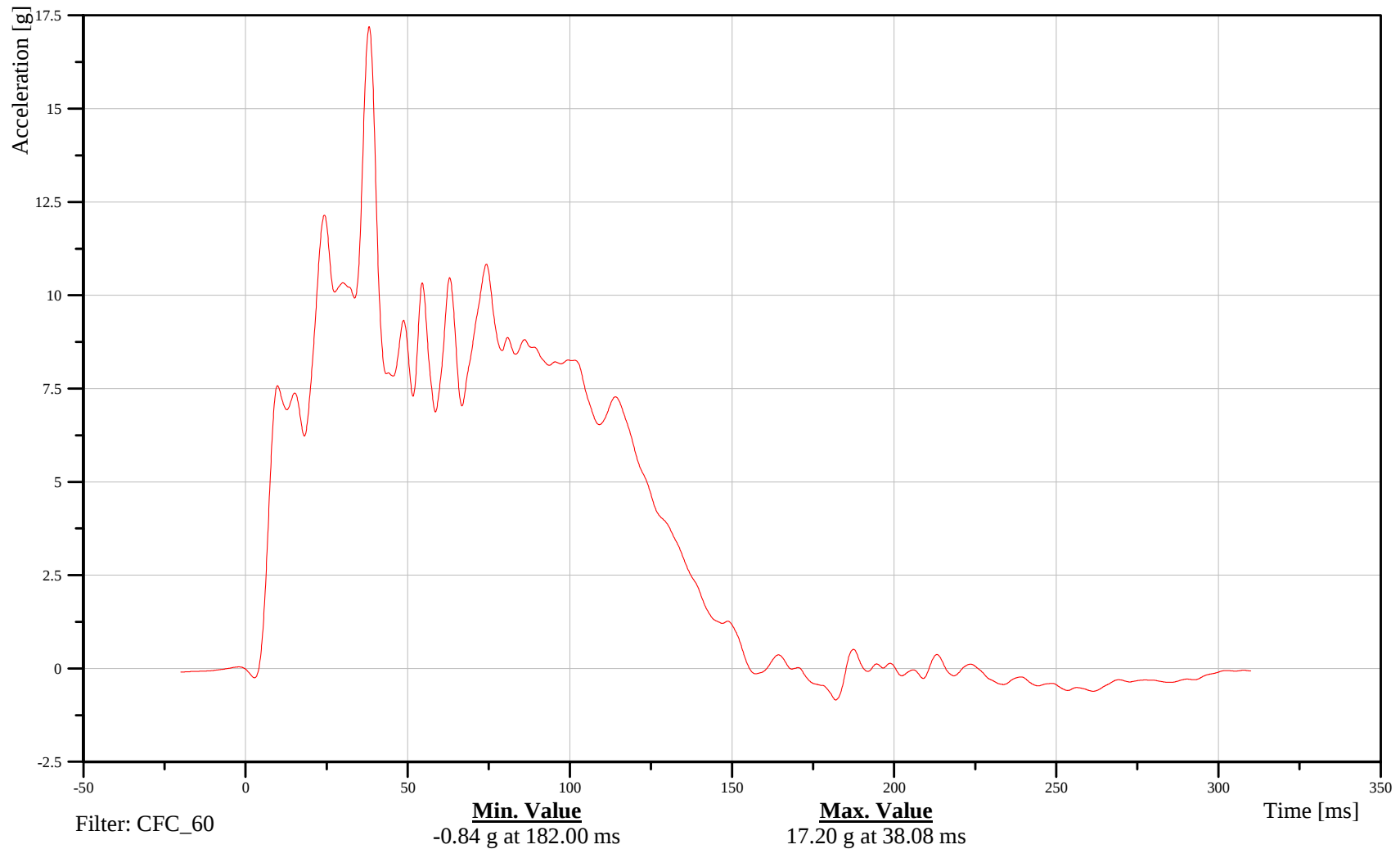
Right Side Sill at Rear Seat Y-Axis Acceleration

Customer: VRTC

16SILBRE0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

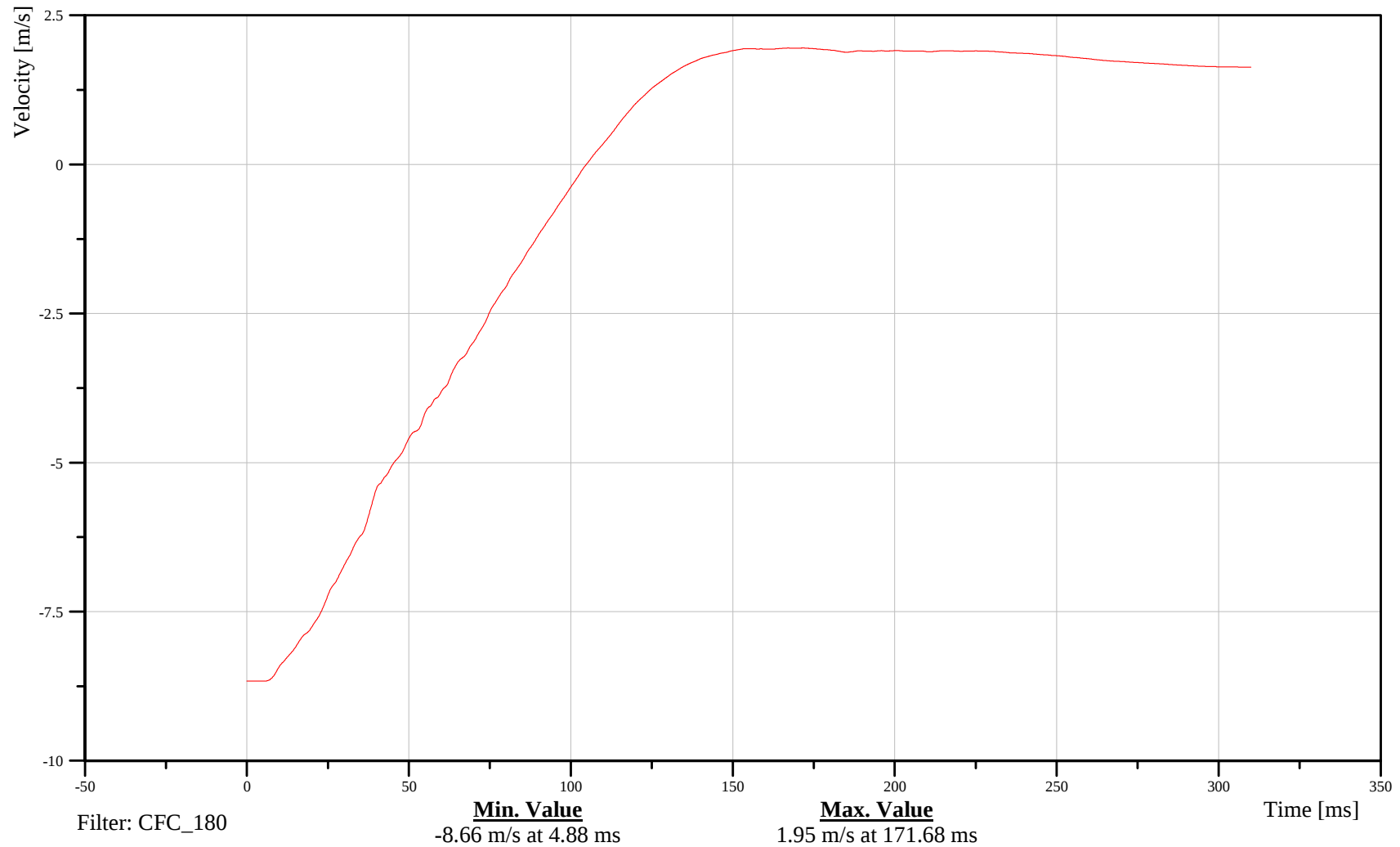
Right Side Sill at Rear Seat Y-Axis Velocity

Customer: VRTC

16SILBRE0000VEYC

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

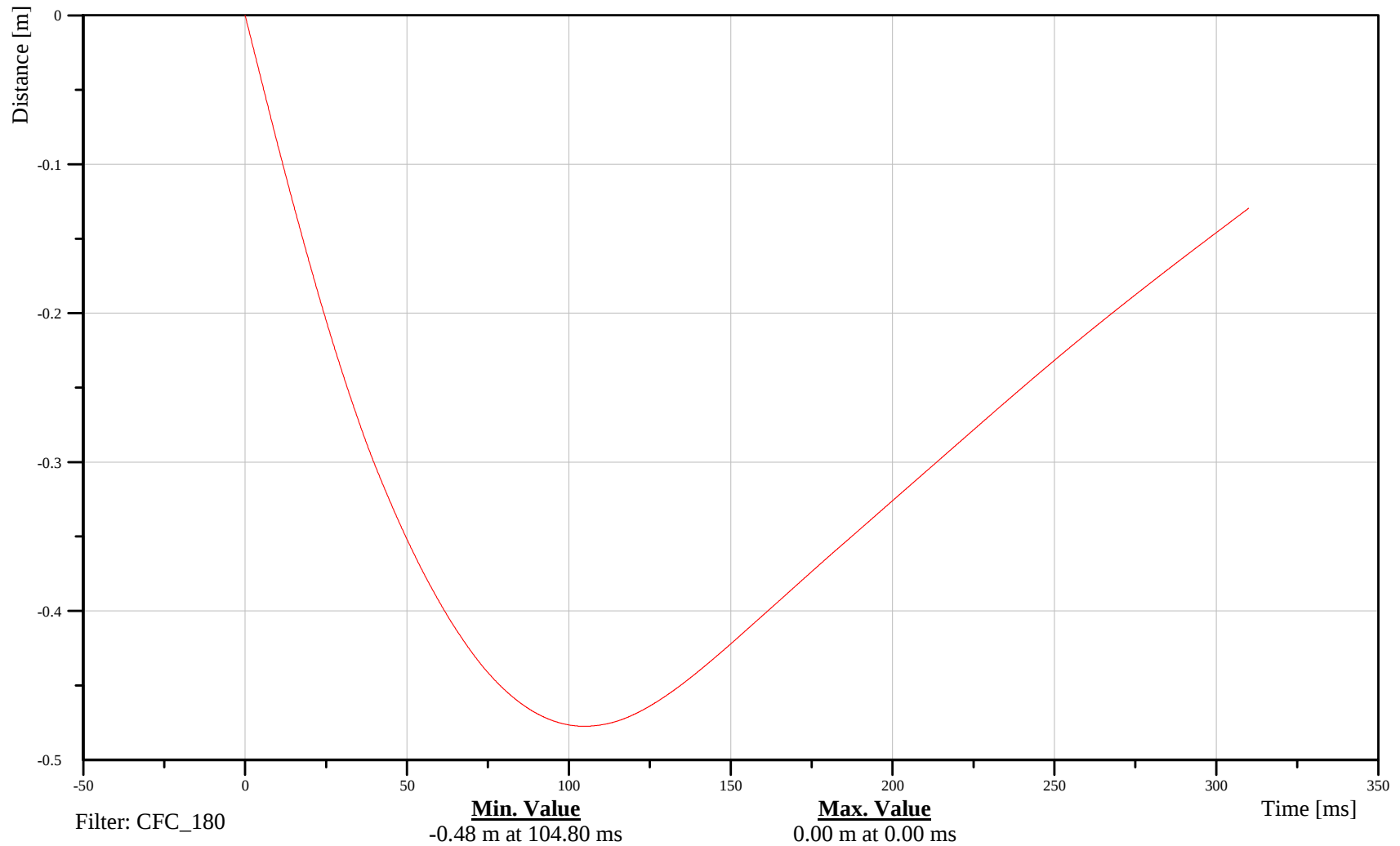
Right Side Sill at Rear Seat Y-Axis Displacement

Customer: VRTC

## 16SILBRE0000DCYC

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

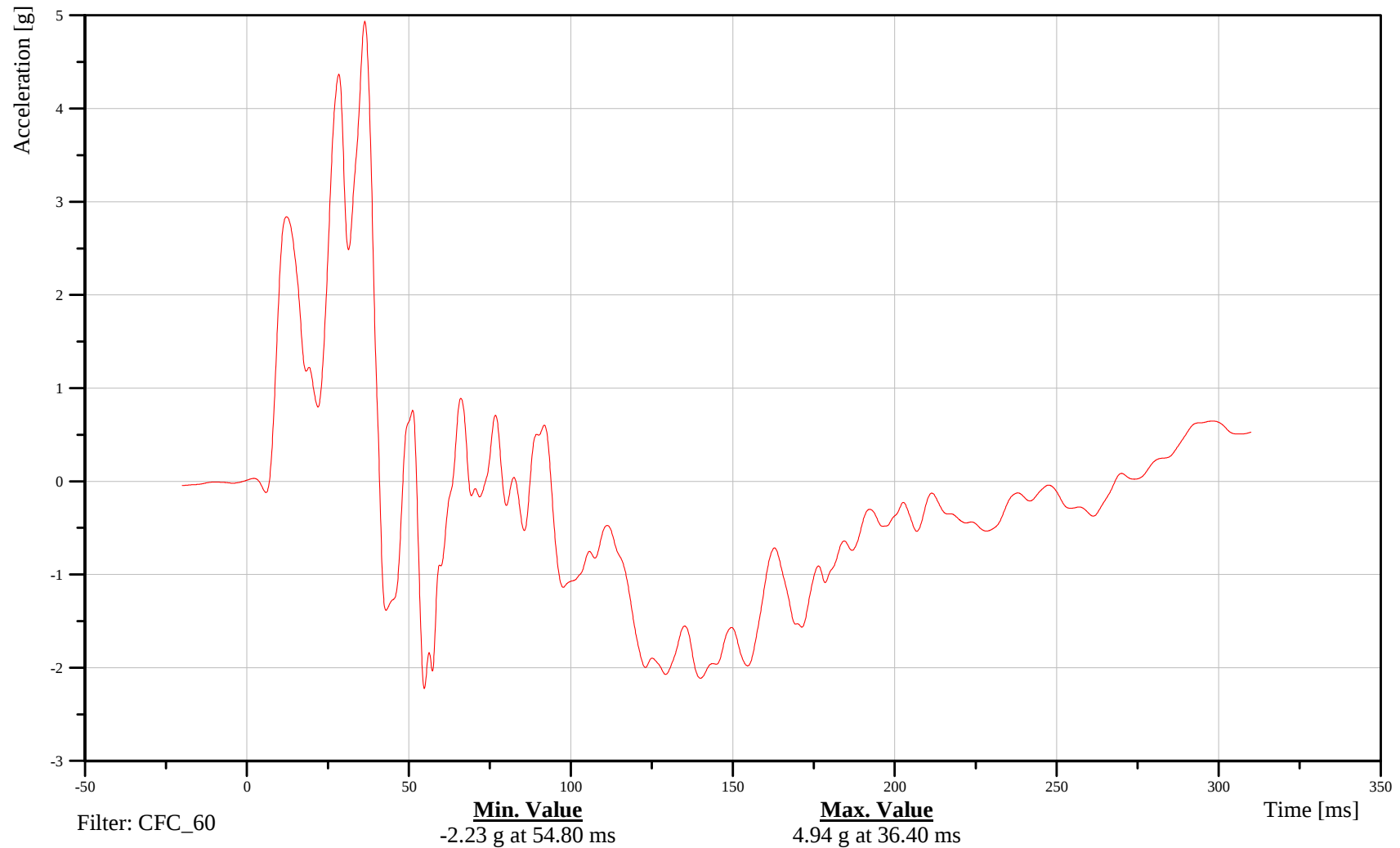
## Right Side Sill at Rear Seat Z-Axis Acceleration

Customer: VRTC

16SILBRE0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

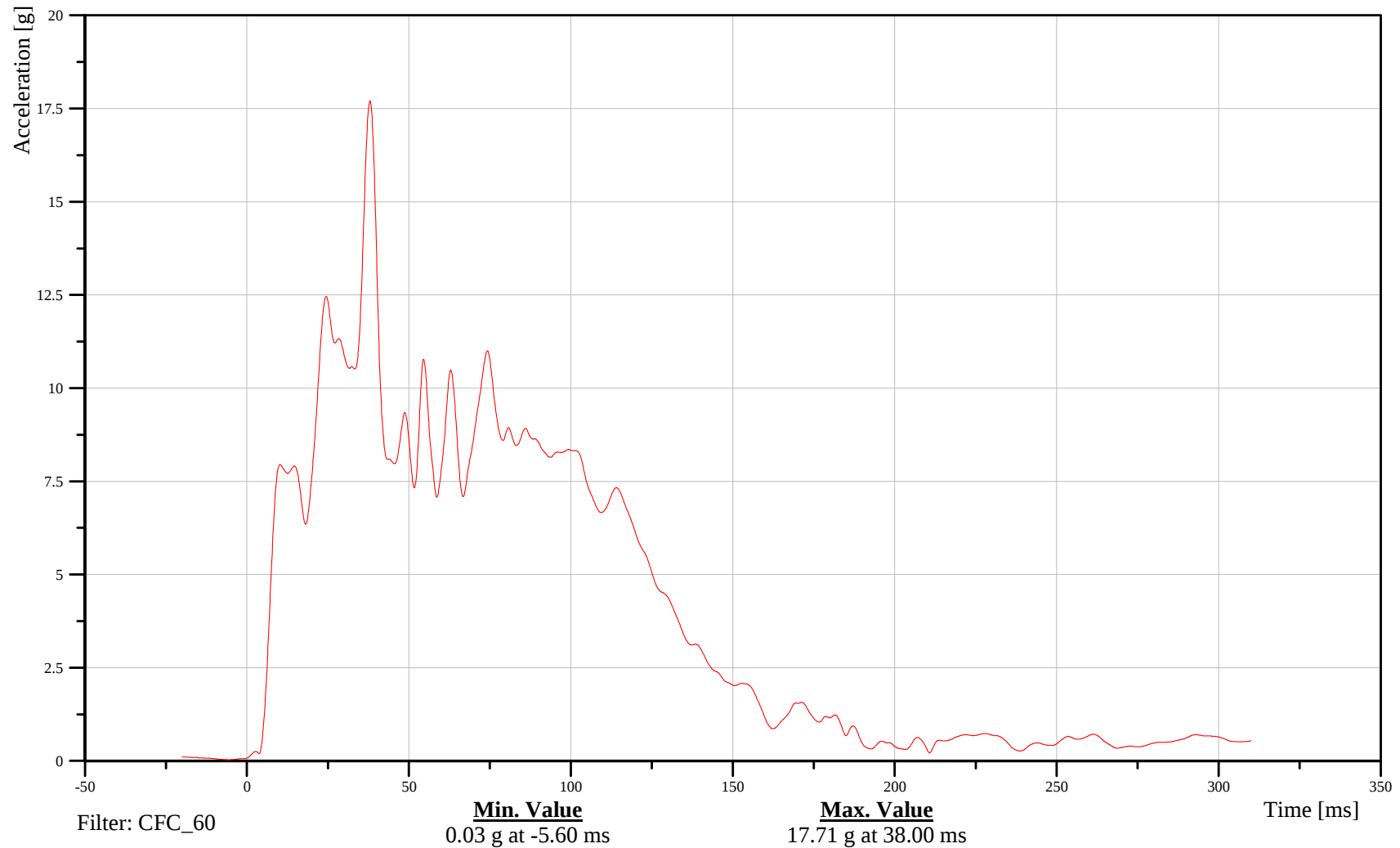
## Right Side Sill at Rear Seat Resultant Acceleration

Customer: VRTC

16SILBRE0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

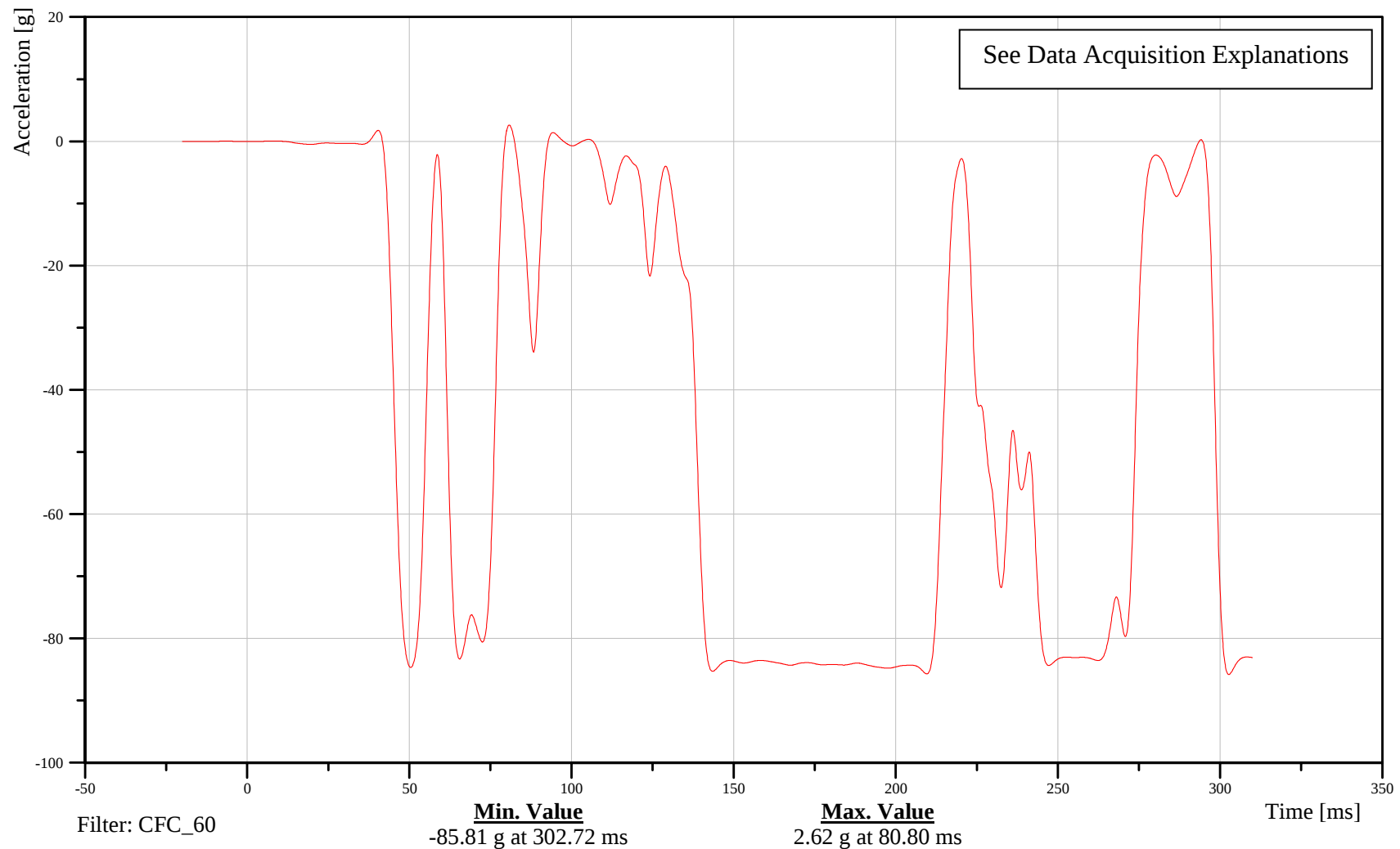
Rear Floorpan Above Axle X-Axis Acceleration

Customer: VRTC

18FORA000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

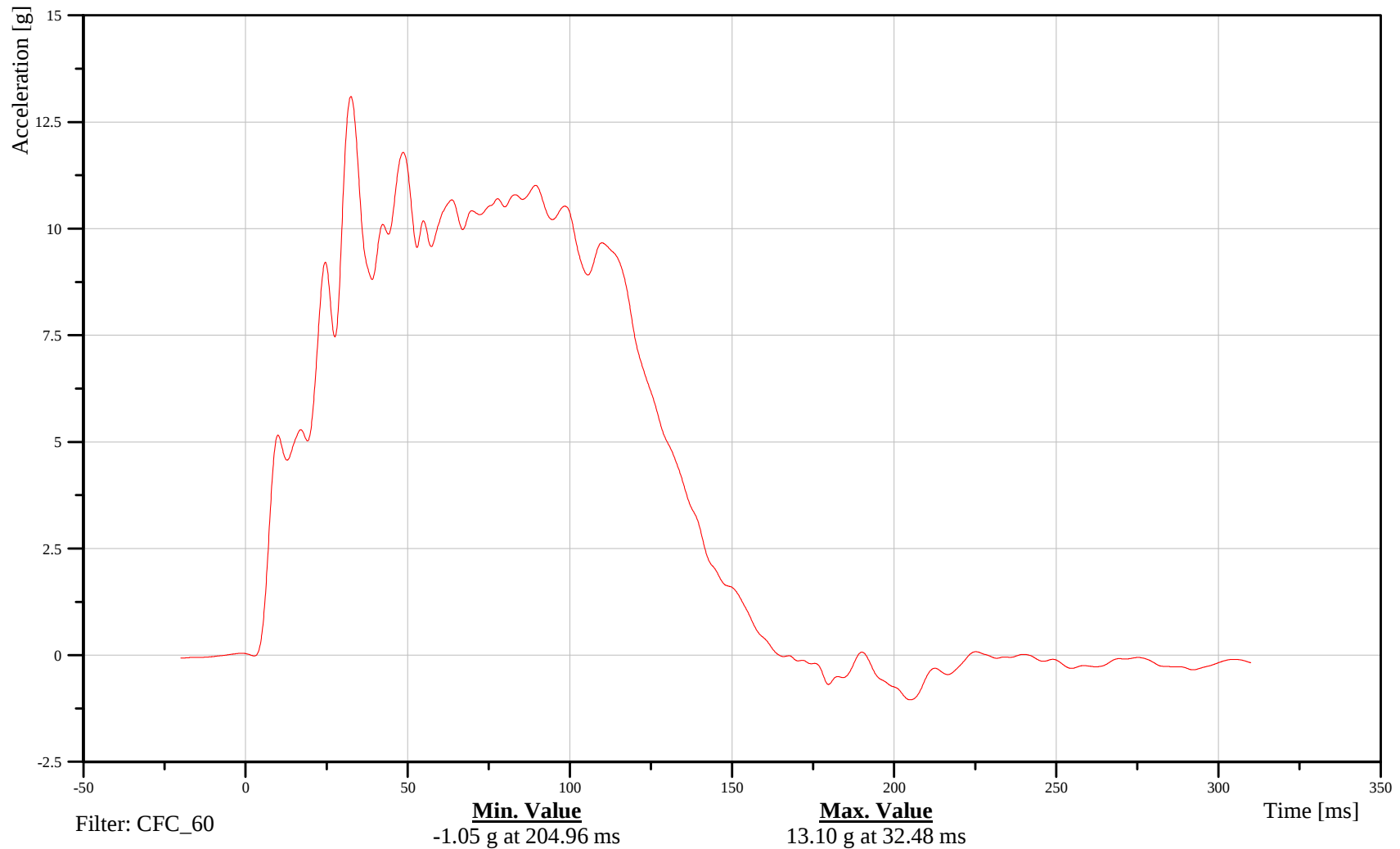
Rear Floorpan Above Axle Y-Axis Acceleration

Customer: VRTC

18FORA000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

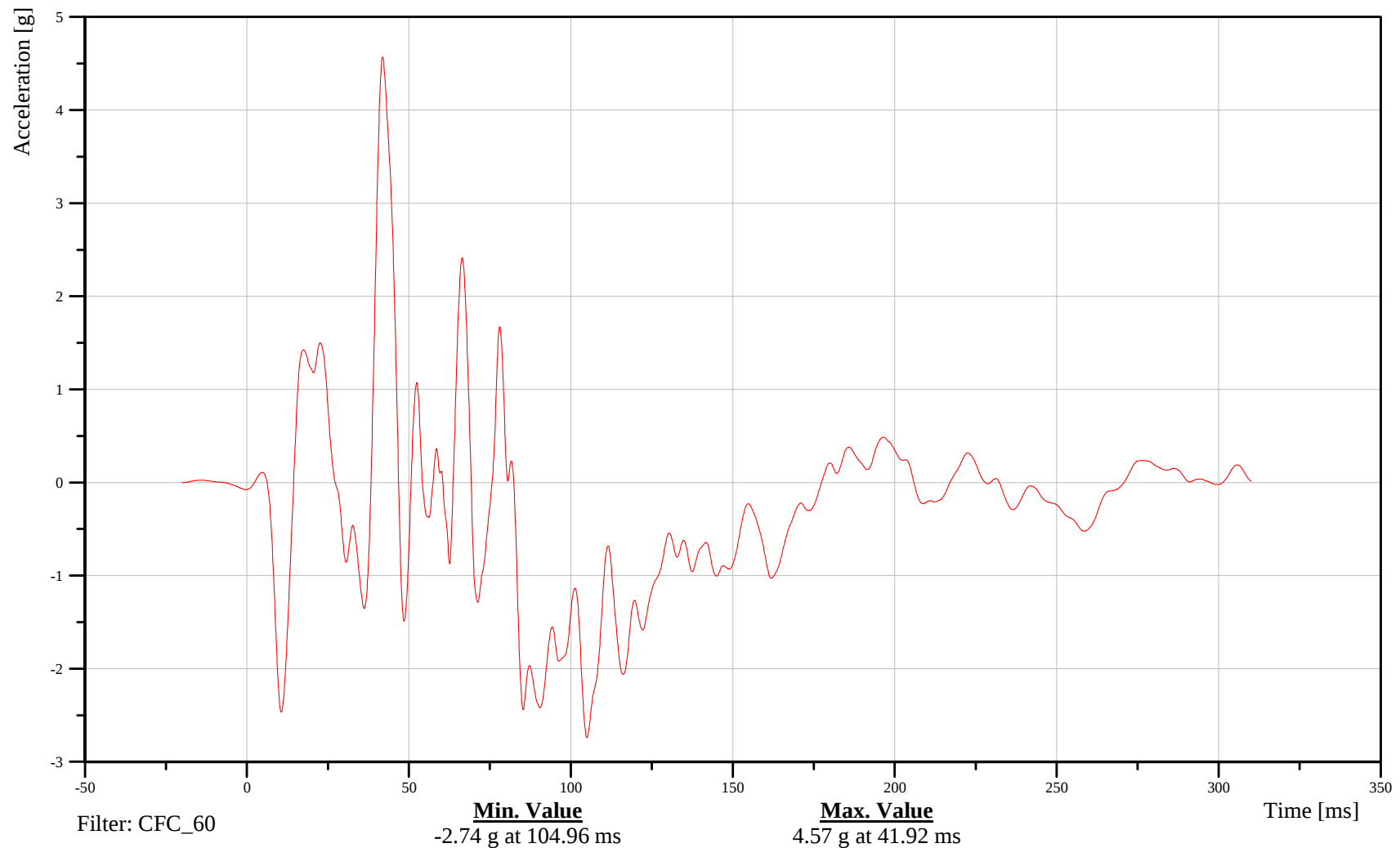
Rear Floorpan Above Axle Z-Axis Acceleration

Customer: VRTC

18FORA000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-65

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007

Time: 14:43

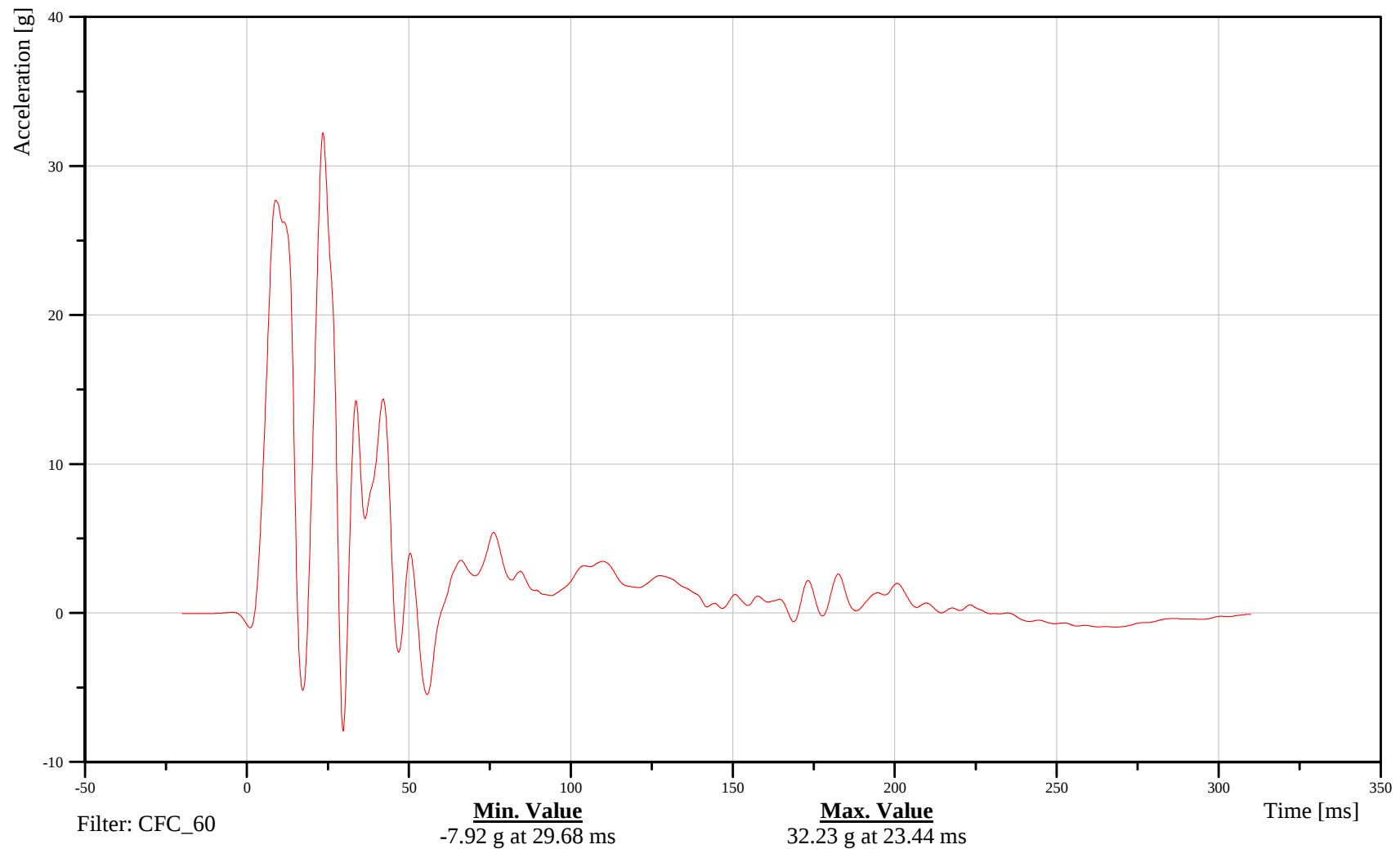
## Left Side Sill at Front Seat Y-Axis Acceleration

Customer: VRTC

### 14SILBFR0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-66

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007

Time: 14:43

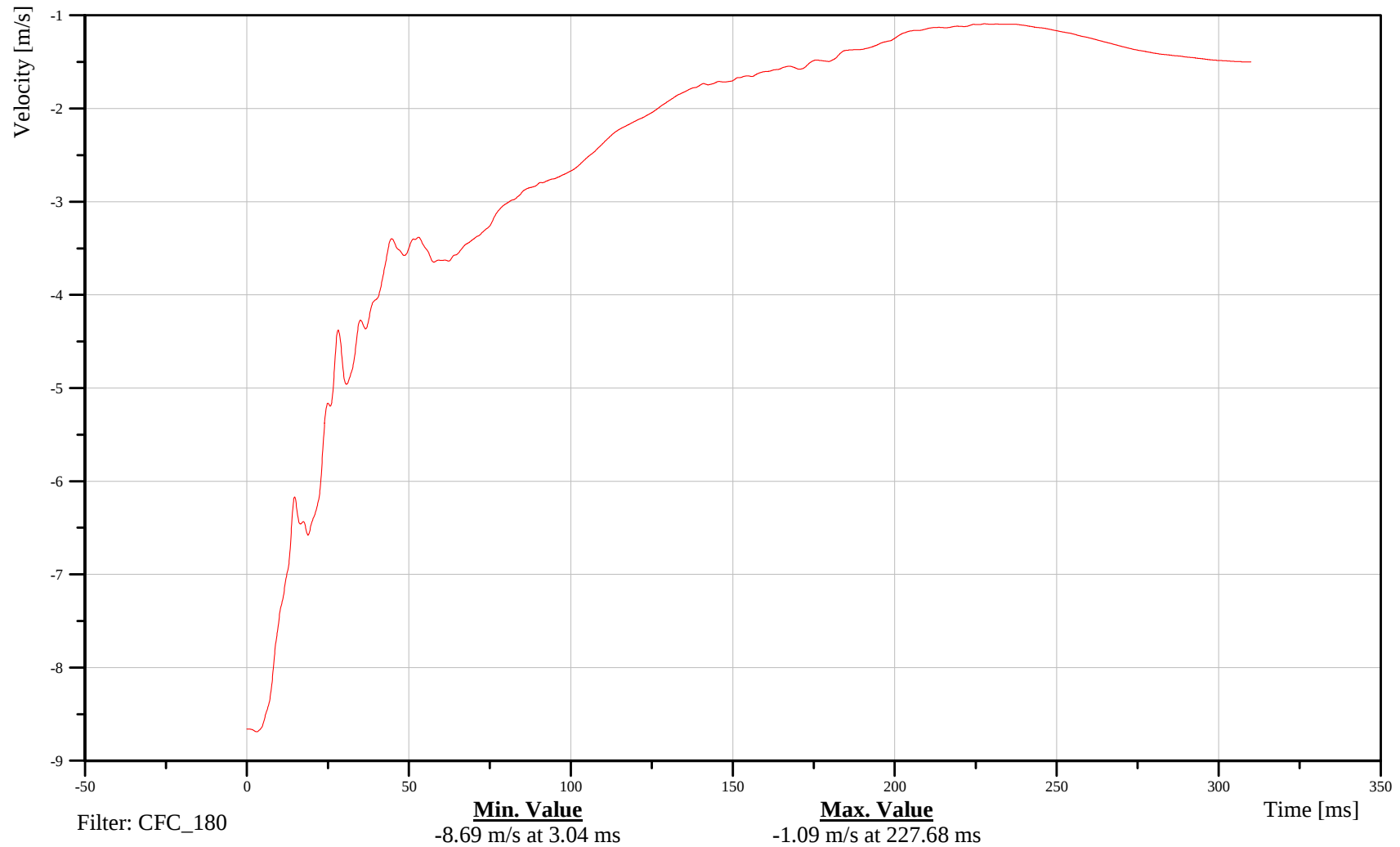
## Left Side Sill at Front Seat Y-Axis Velocity

Customer: VRTC

14SILBFR0000VEYC

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007

Time: 14:43

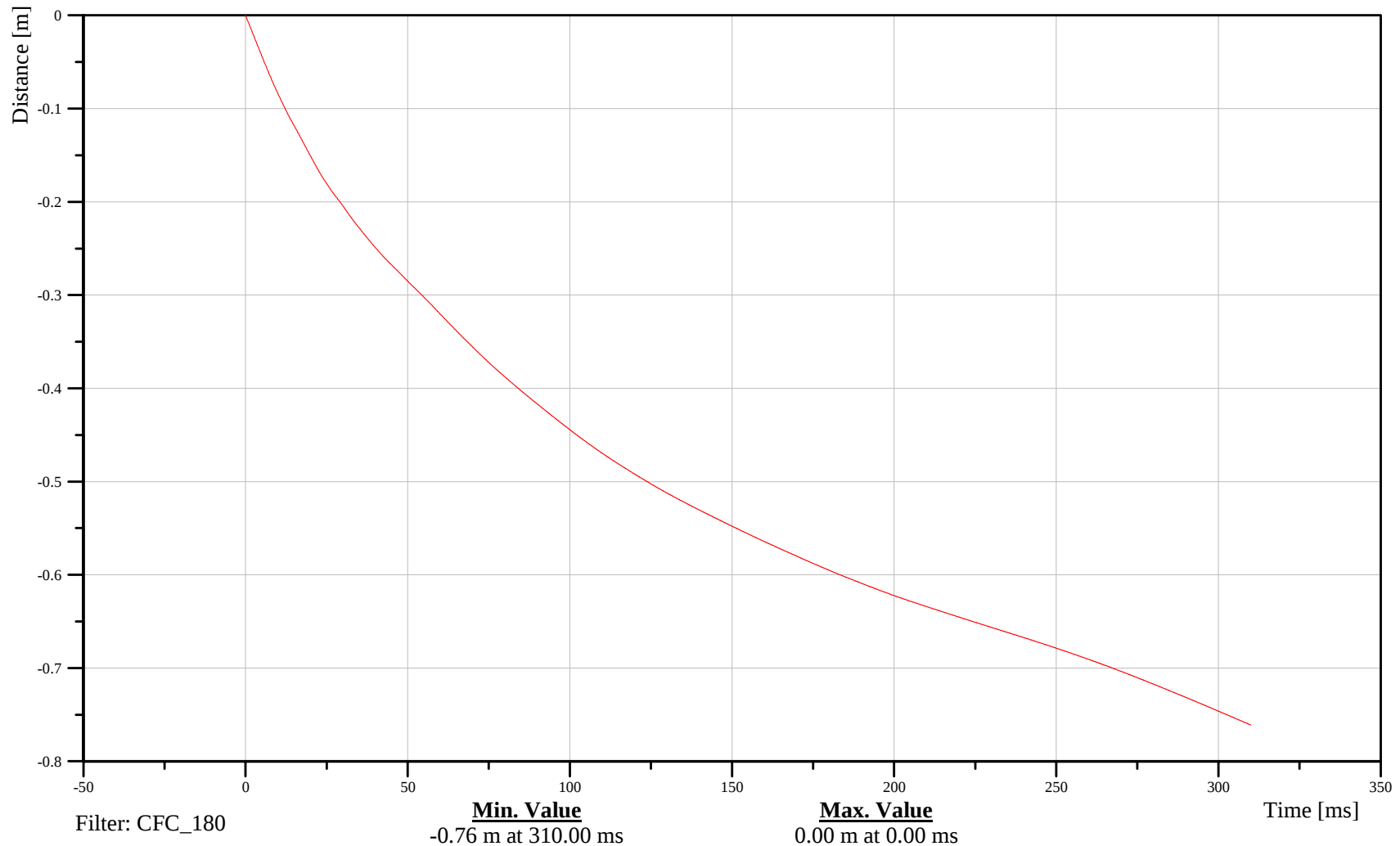
## Left Side Sill at Front Seat Y-Axis Displacement

Customer: VRTC

# 14SILBFR0000DCYC

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

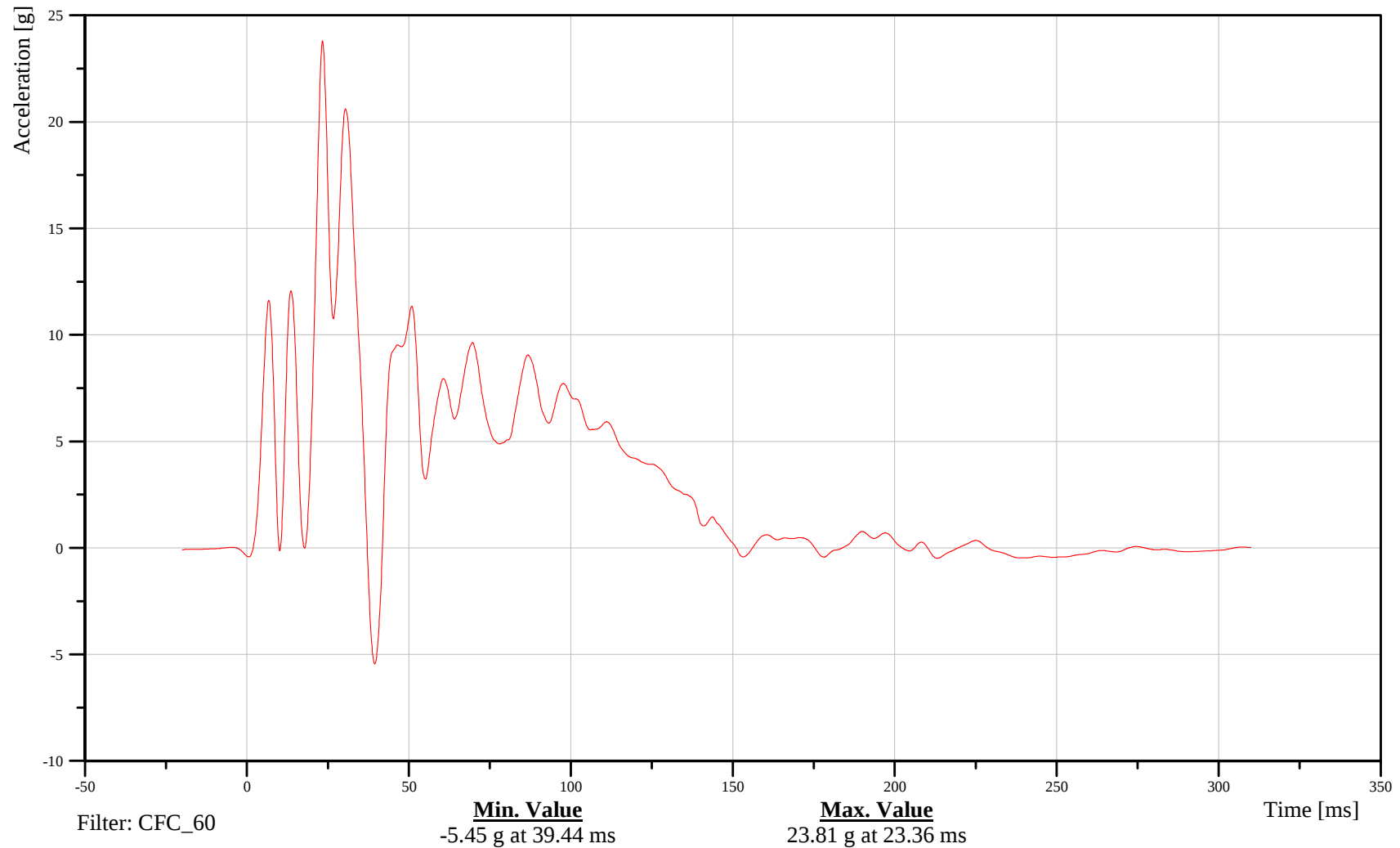
## Left Side Sill at Rear Seat Y-Axis Acceleration

Customer: VRTC

14SILBRE0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-69

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

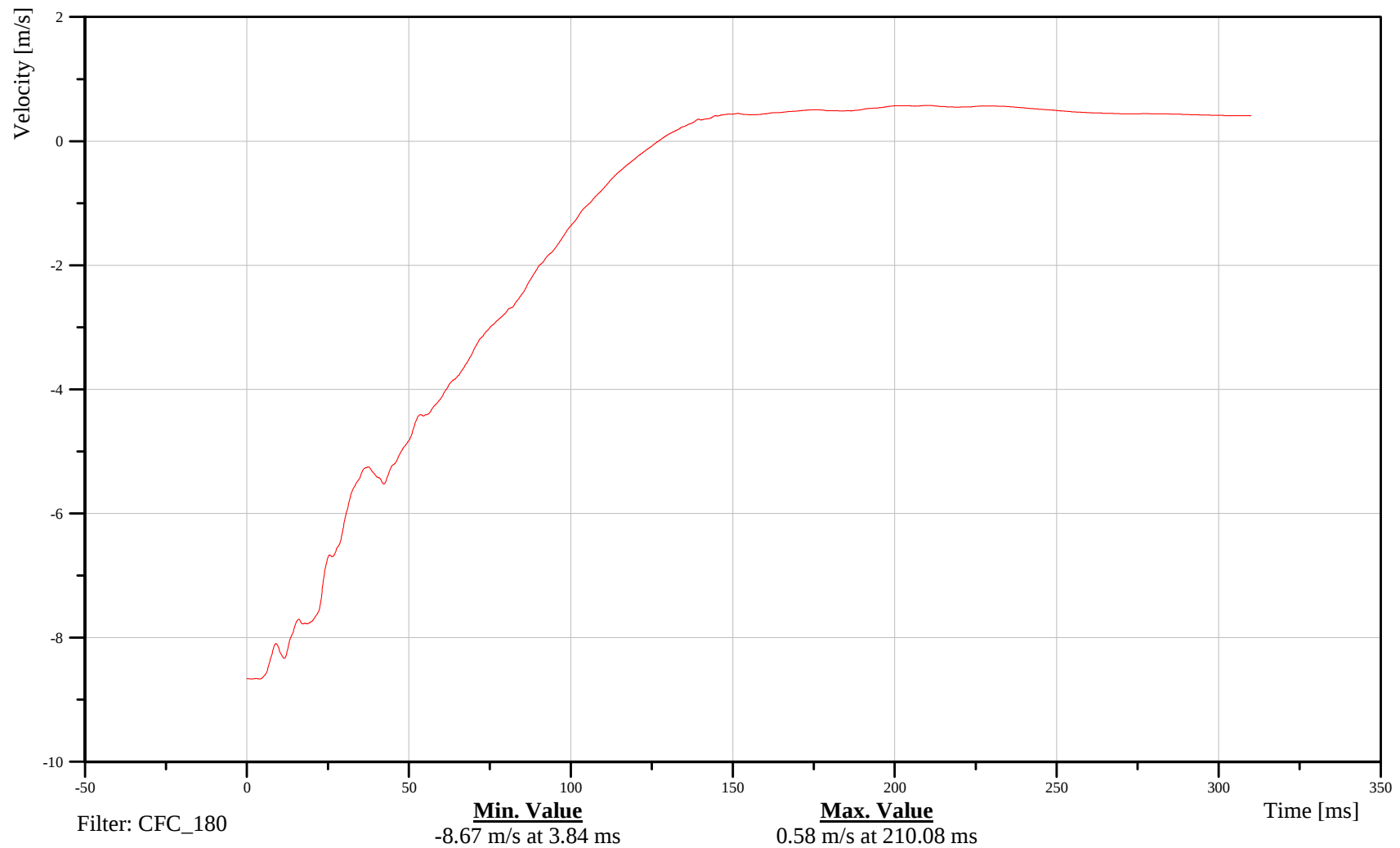
Left Side Sill at Rear Seat Y-Axis Velocity

Customer: VRTC

14SILBRE0000VEYC

TRC Inc. Test Lab: CTF

Test Number: 070628



B-70

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

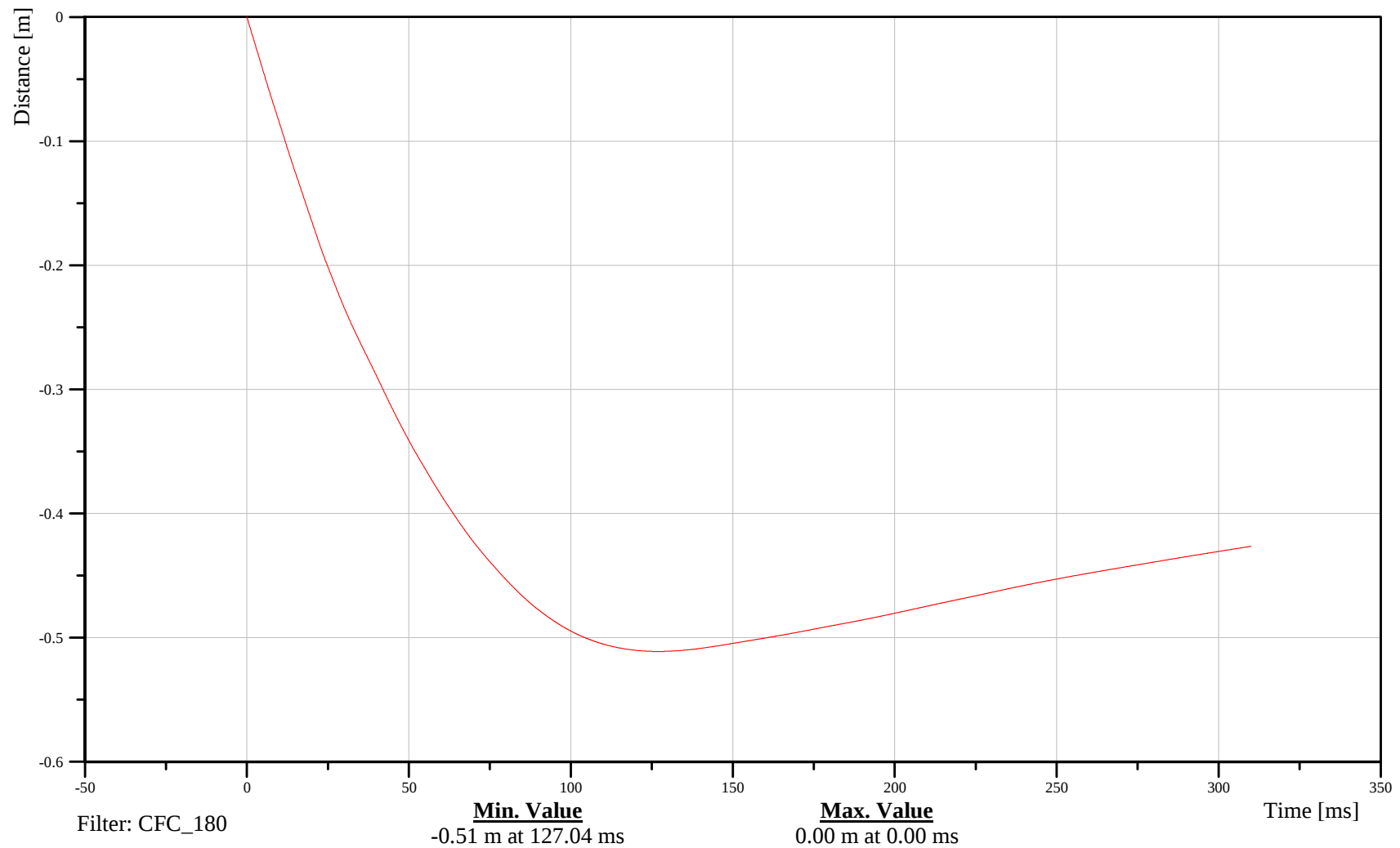
## Left Side Sill at Rear Seat Y-Axis Displacement

Customer: VRTC

### 14SILBRE0000DCYC

TRC Inc. Test Lab: CTF

Test Number: 070628



B-71

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007

Time: 14:43

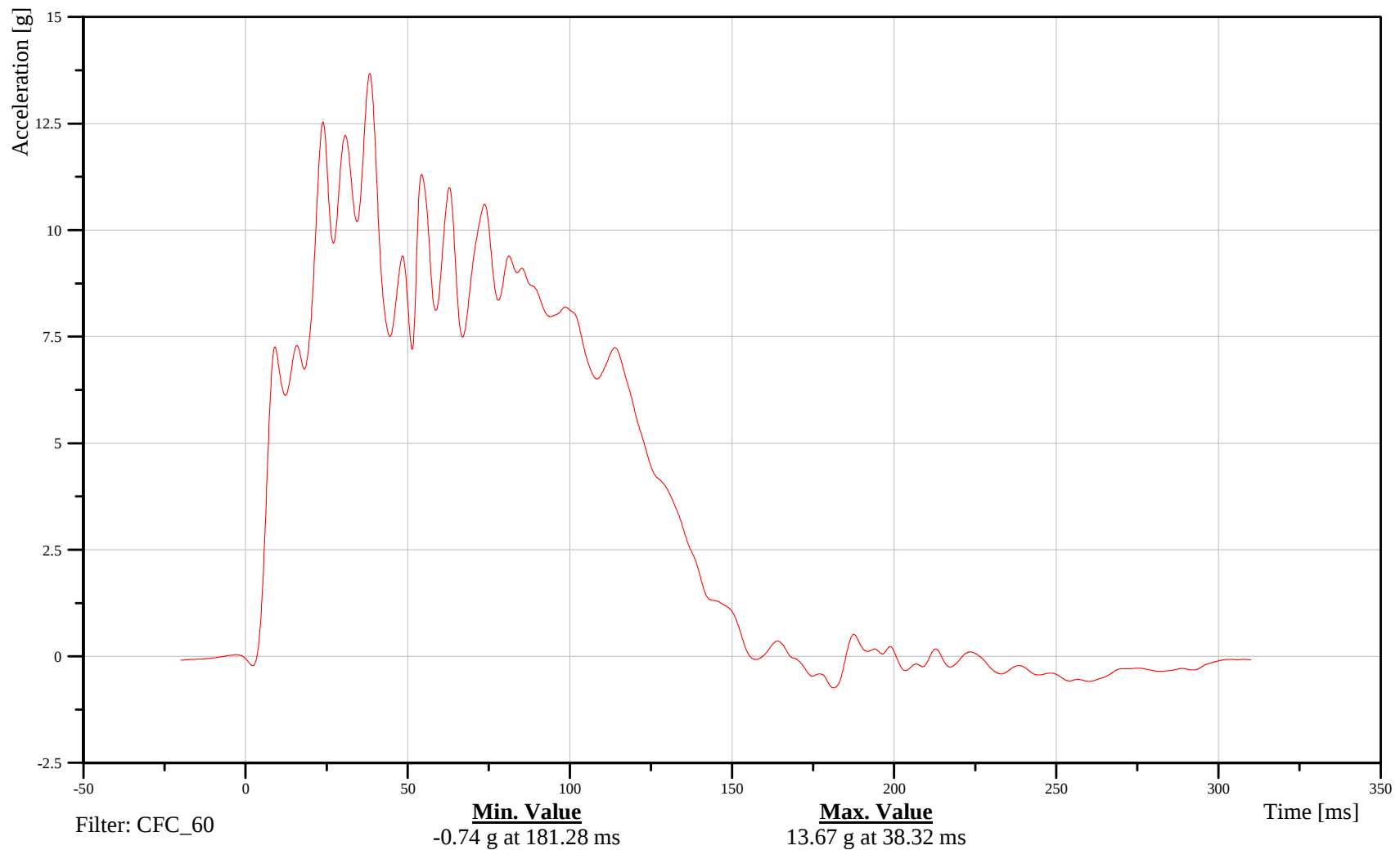
## Right Rear Occupant Compartment Y-Axis Acceleration

Customer: VRTC

16VEHCRE0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-72

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

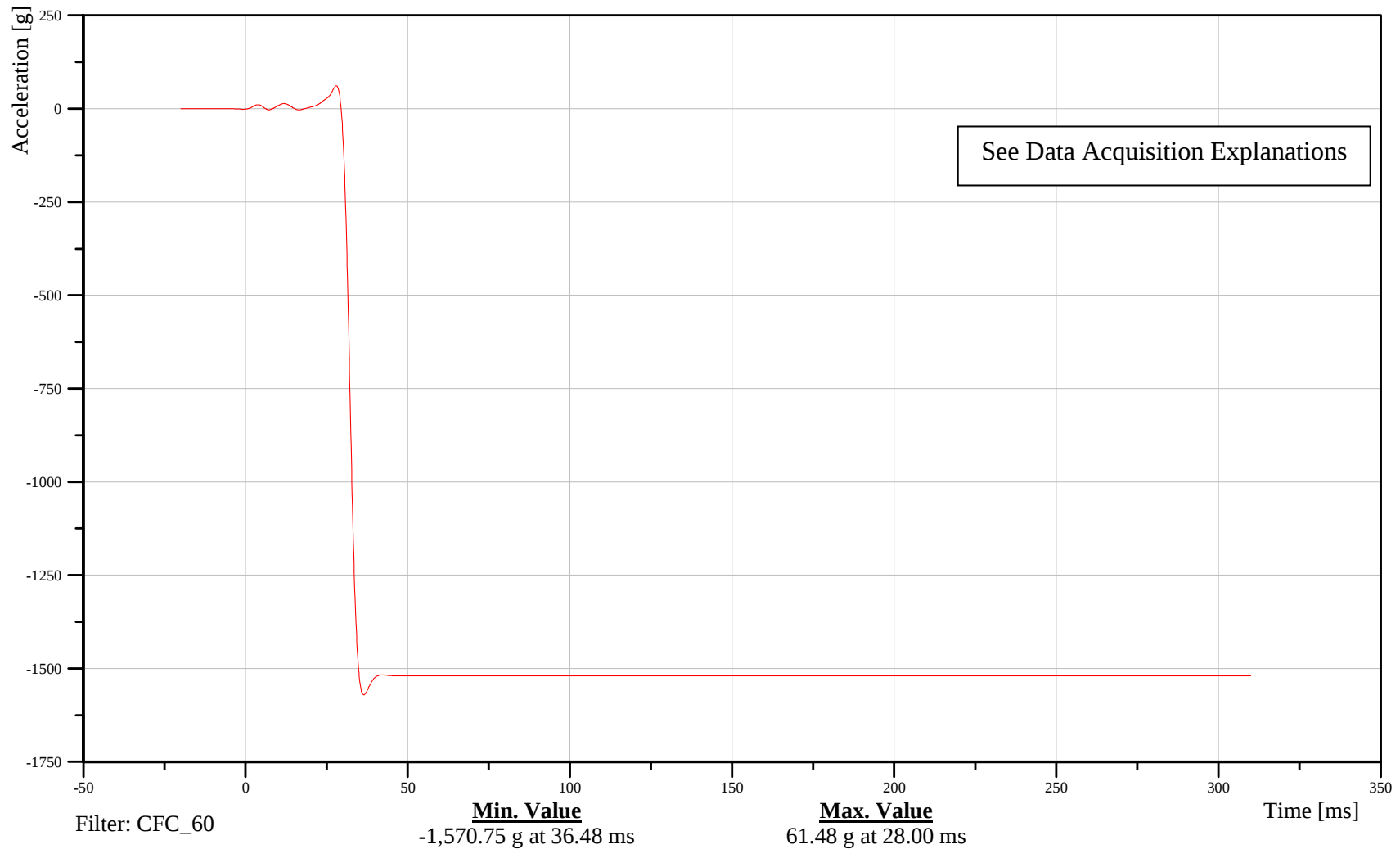
## Left Lower A-Pillar Y-Axis Acceleration

Customer: VRTC

11APILLO0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-73

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

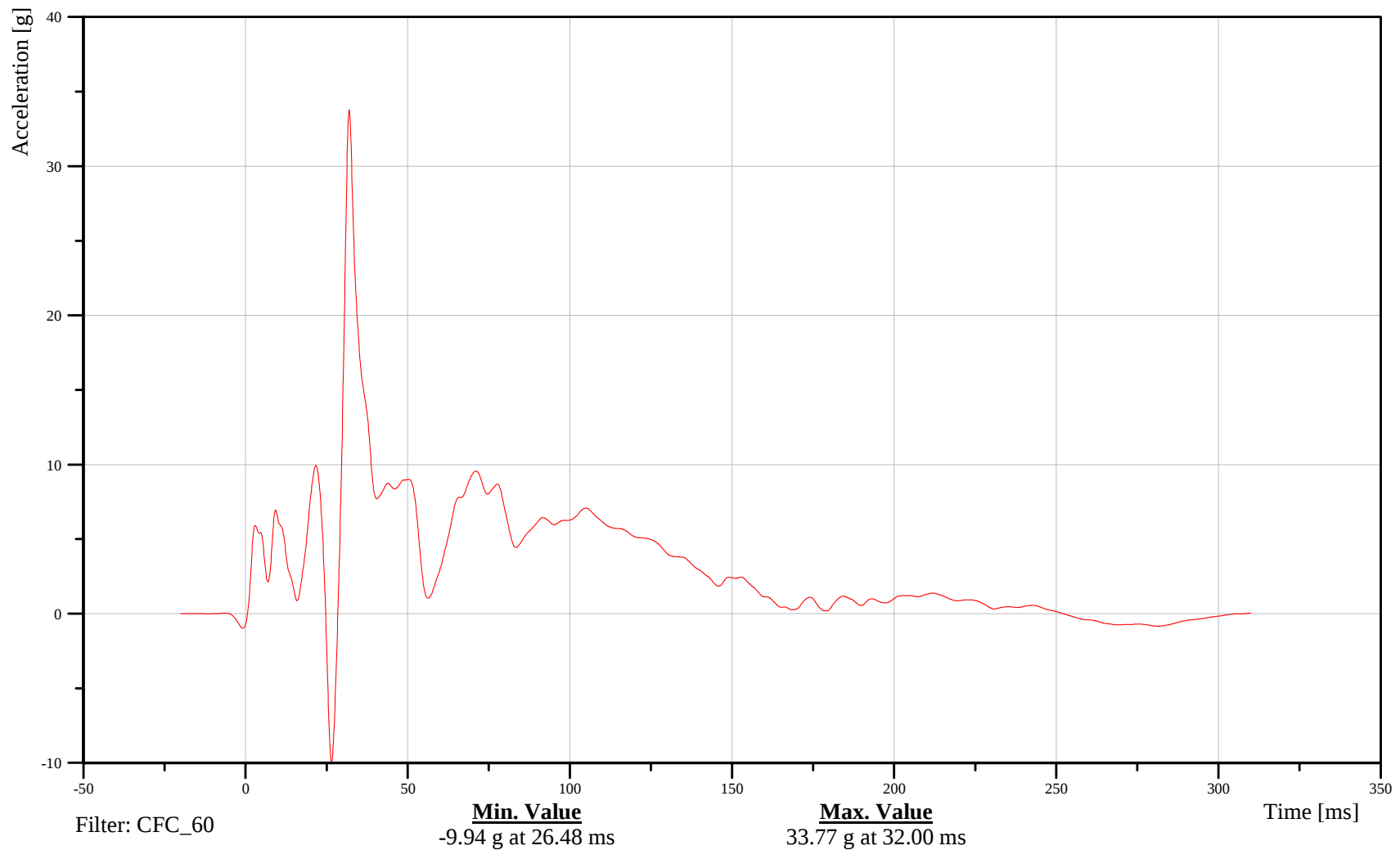
## Left Mid A-Pillar Y-Axis Acceleration

Customer: VRTC

### 11APILMI0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-74

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

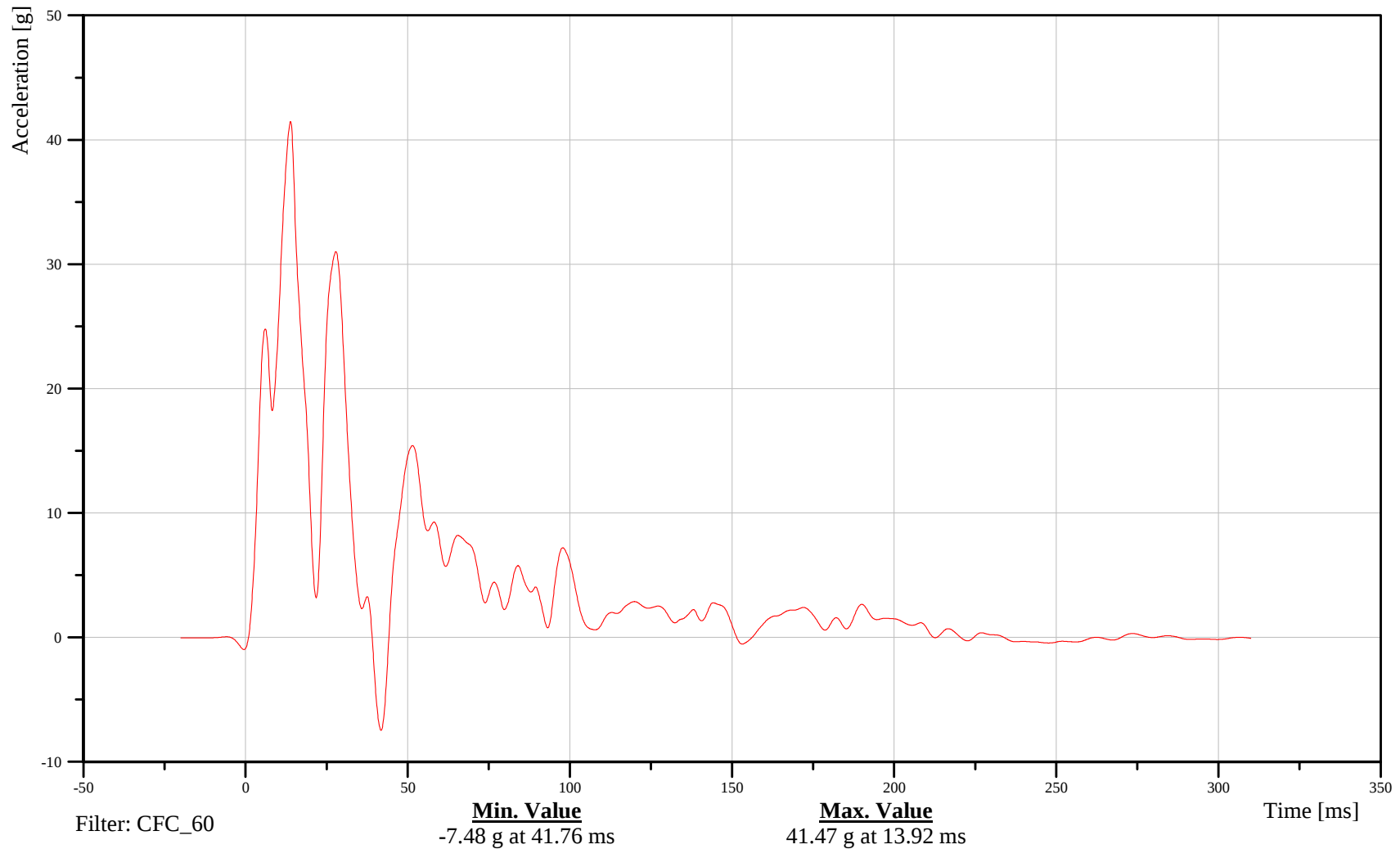
## Left Lower B-Pillar Y-Axis Acceleration

Customer: VRTC

14BPILLO0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-75

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

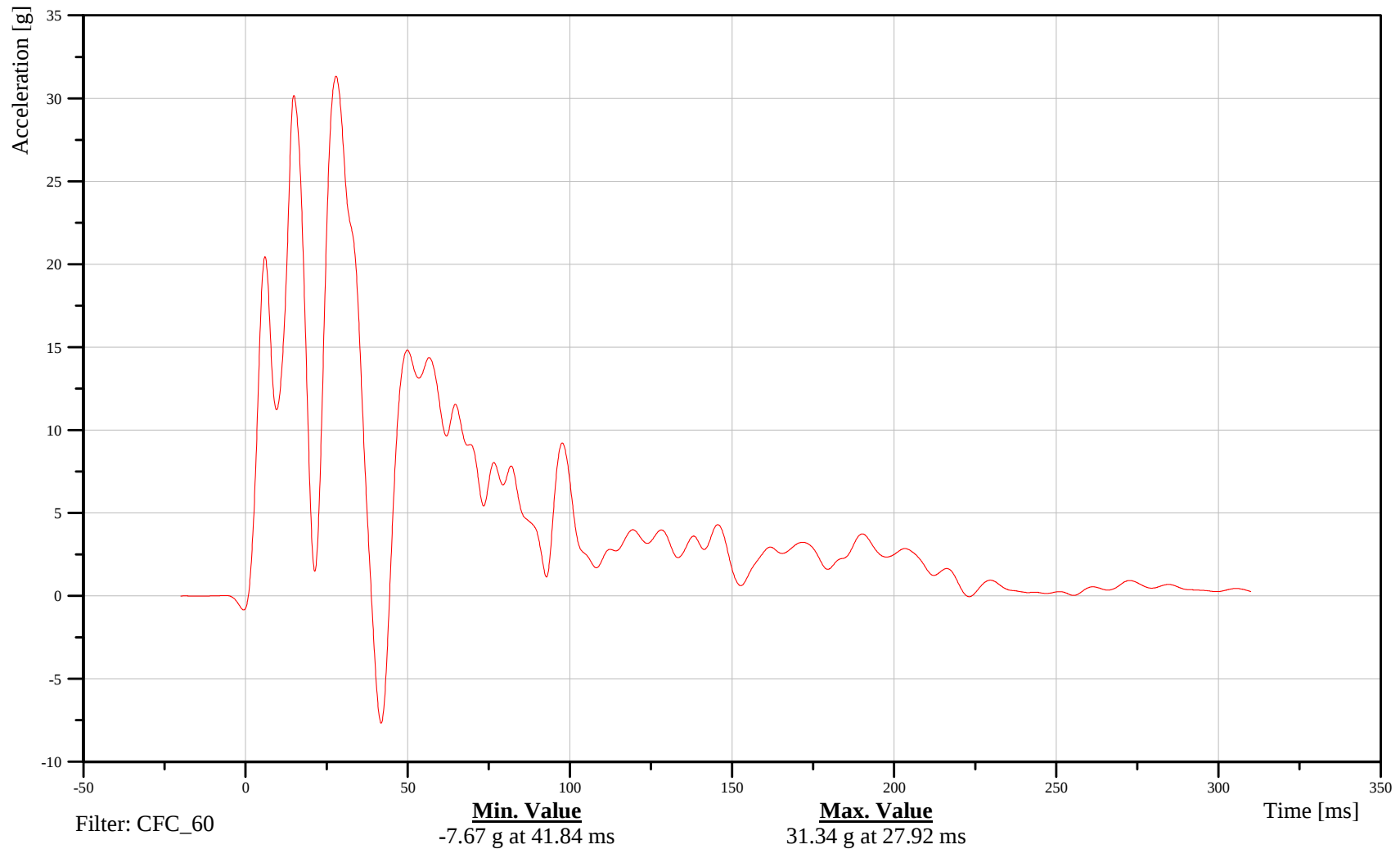
## Left Mid B-Pillar Y-Axis Acceleration

Customer: VRTC

### 14BPILMI0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-76

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

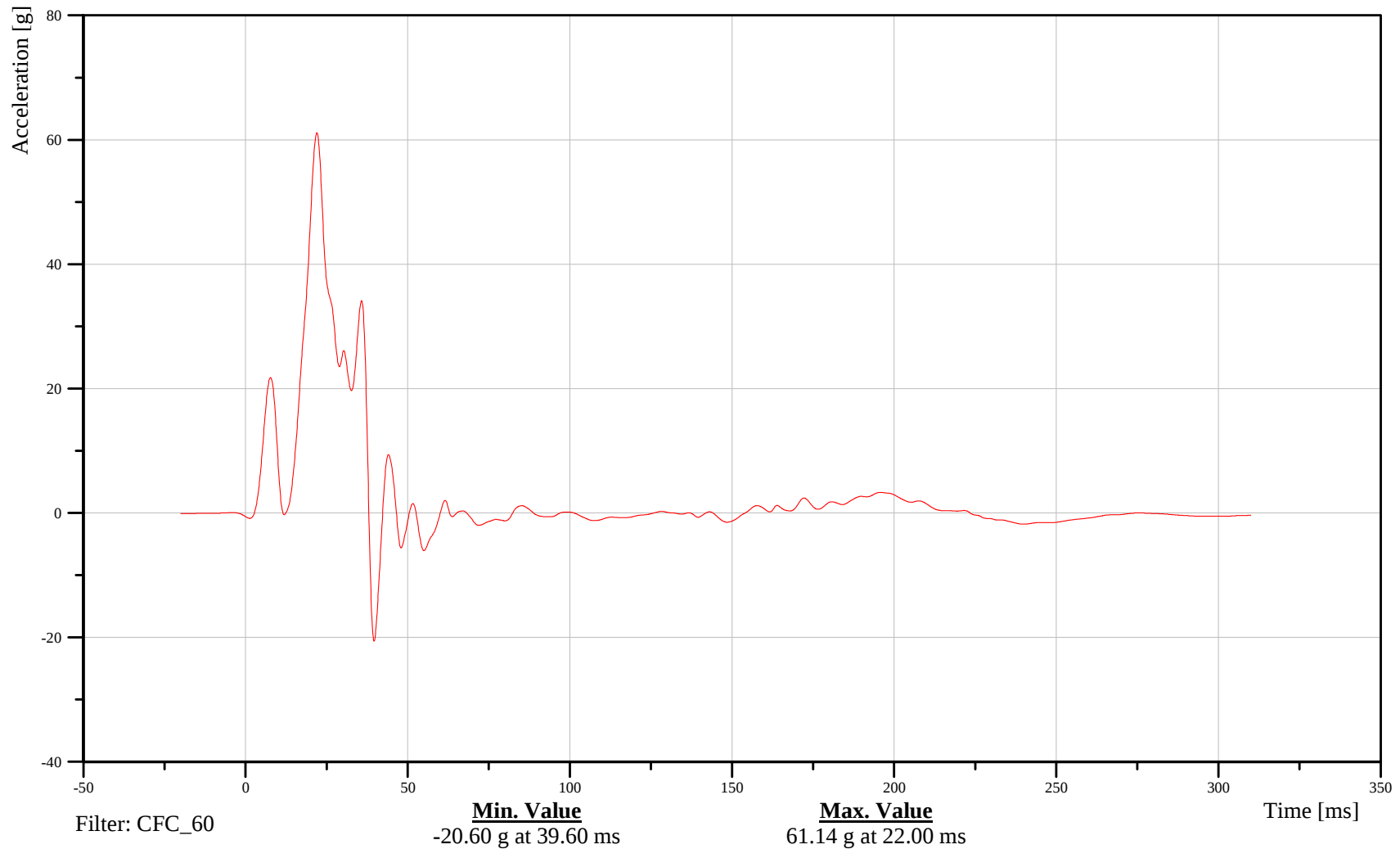
## Left Front Seat Track Y-Axis Acceleration

Customer: VRTC

11SETRFR0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-77

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

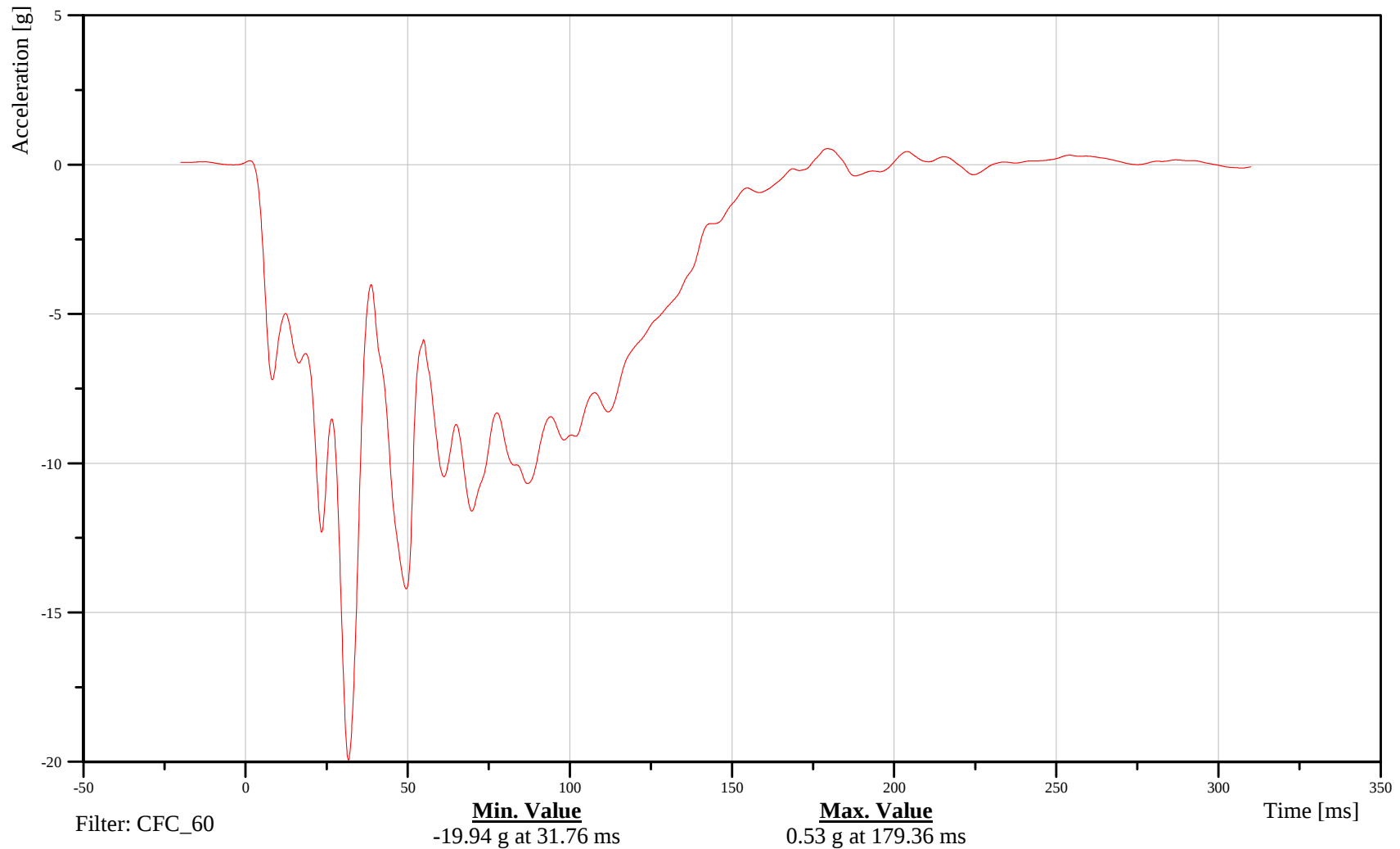
## Left Rear Seat Track Y-Axis Acceleration

Customer: VRTC

14SETRLERE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-78

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

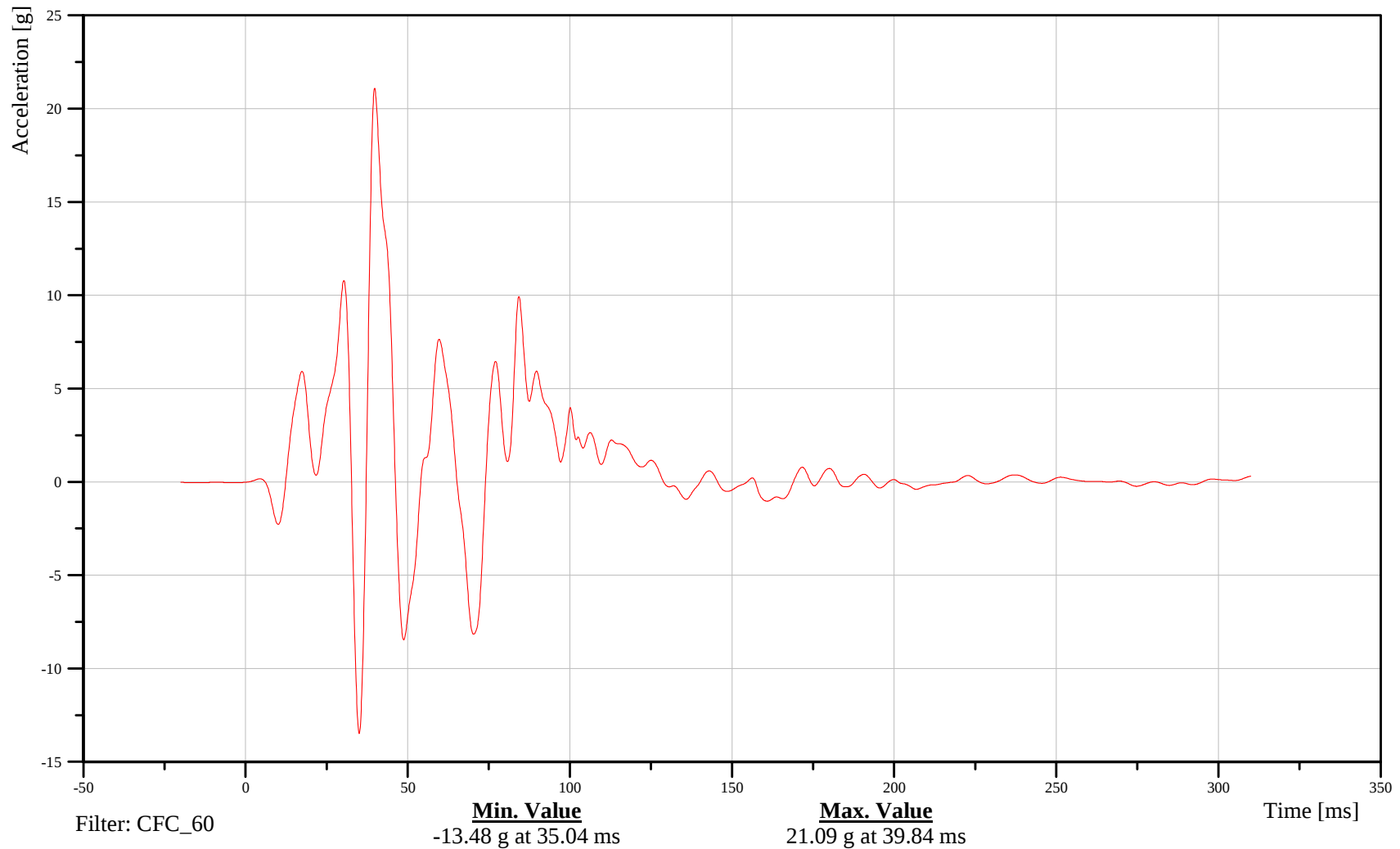
## Vehicle Center of Gravity X-Axis Acceleration

Customer: VRTC

10VEHCCG0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-79

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

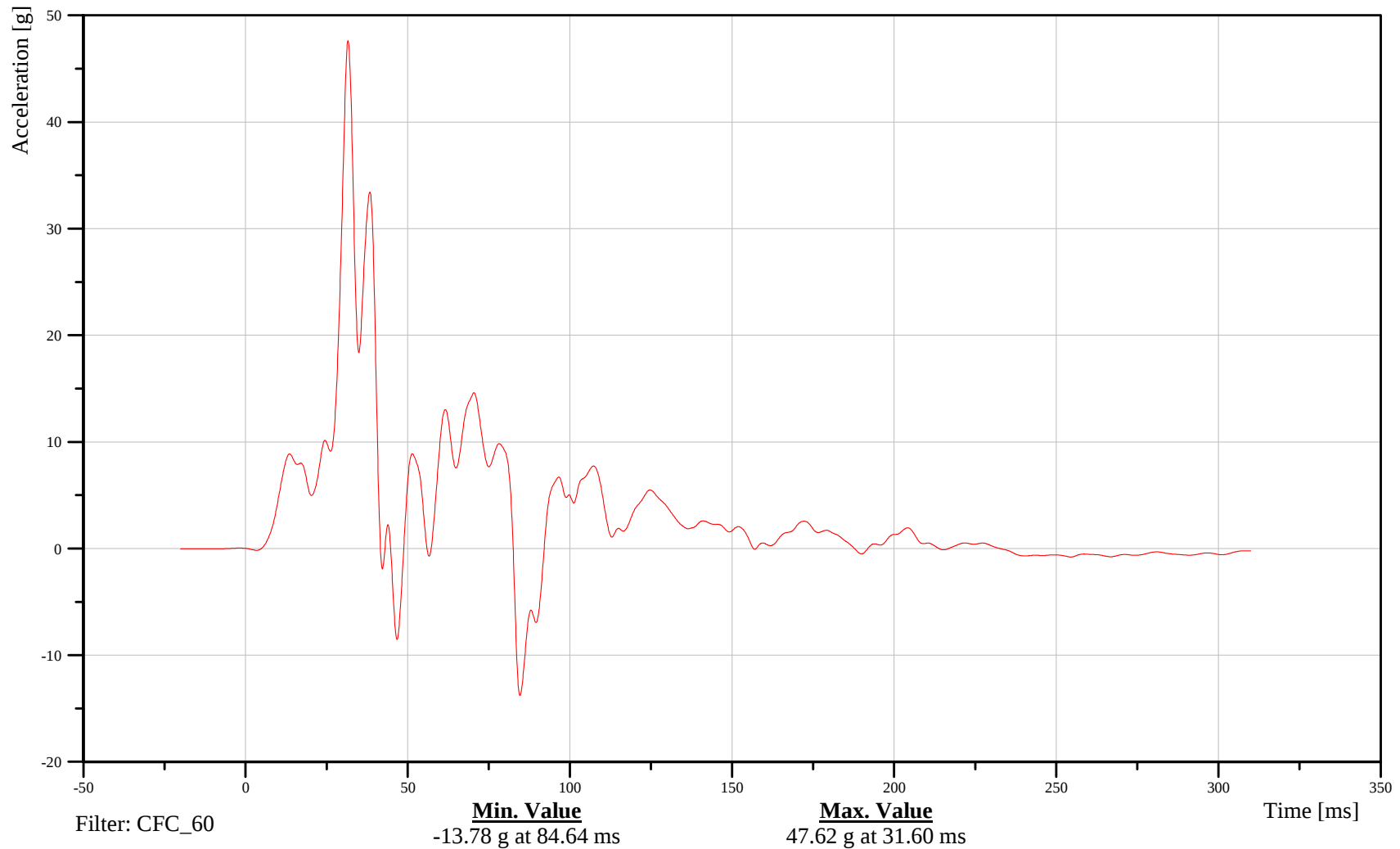
## Vehicle Center of Gravity Y-Axis Acceleration

Customer: VRTC

10VEHCCG0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-80

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

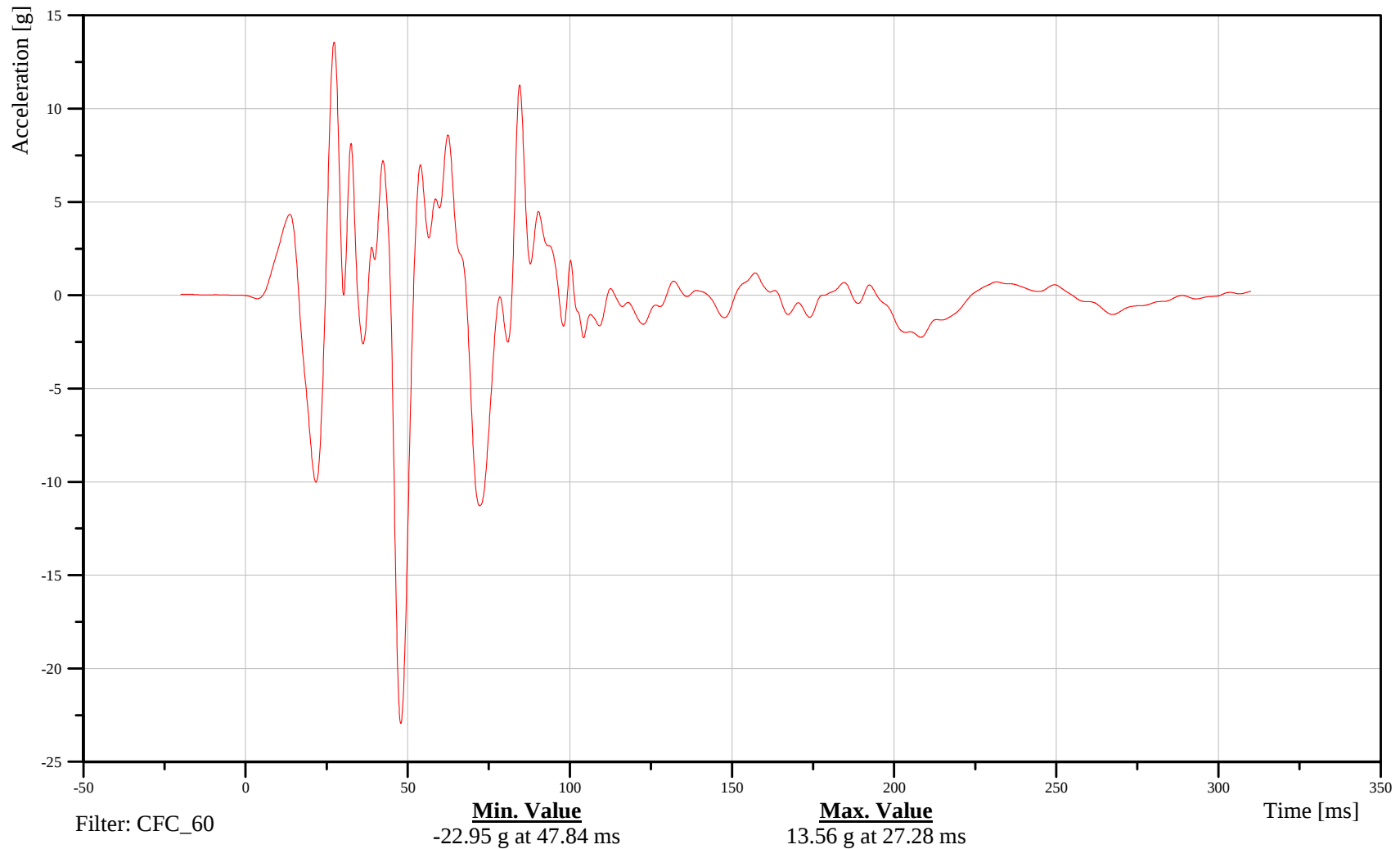
## Vehicle Center of Gravity Z-Axis Acceleration

Customer: VRTC

10VEHCCG0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-81

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

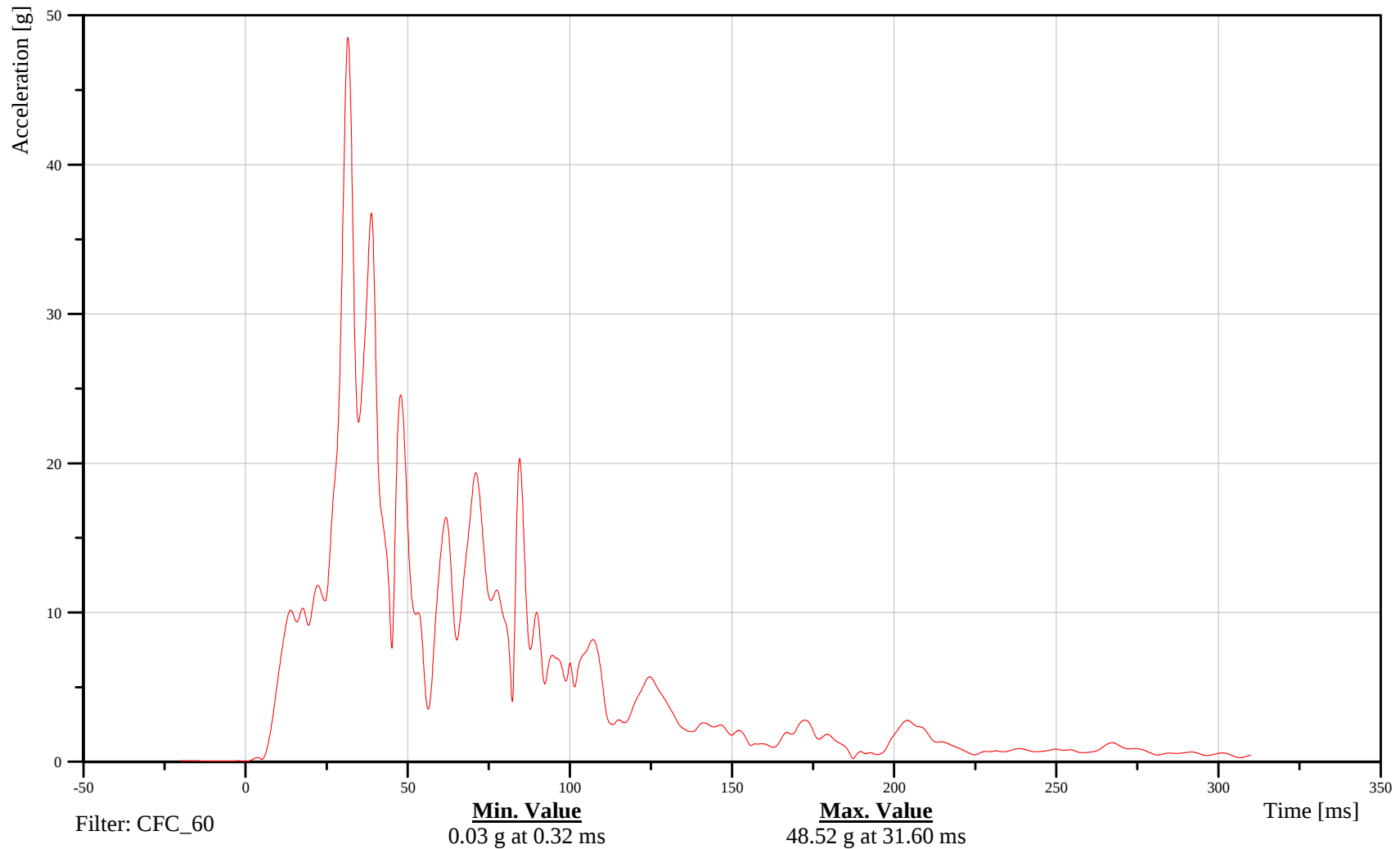
## Vehicle Center of Gravity Resultant Acceleration

Customer: VRTC

10VEHCCG0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-82

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

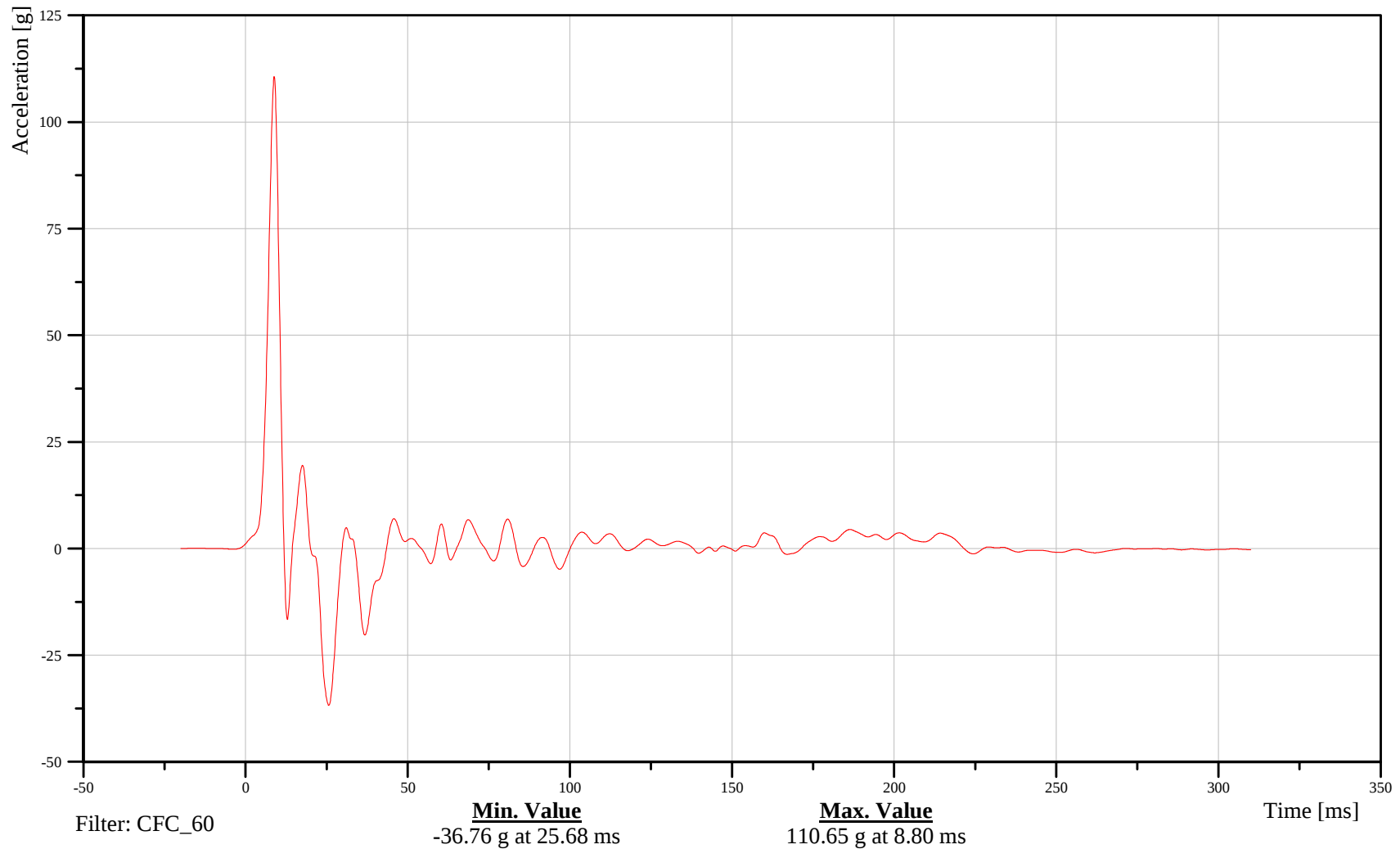
## Vehicle Front Door Centerline Y-Axis Acceleration

Customer: VRTC

14DOOR000001ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-83

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

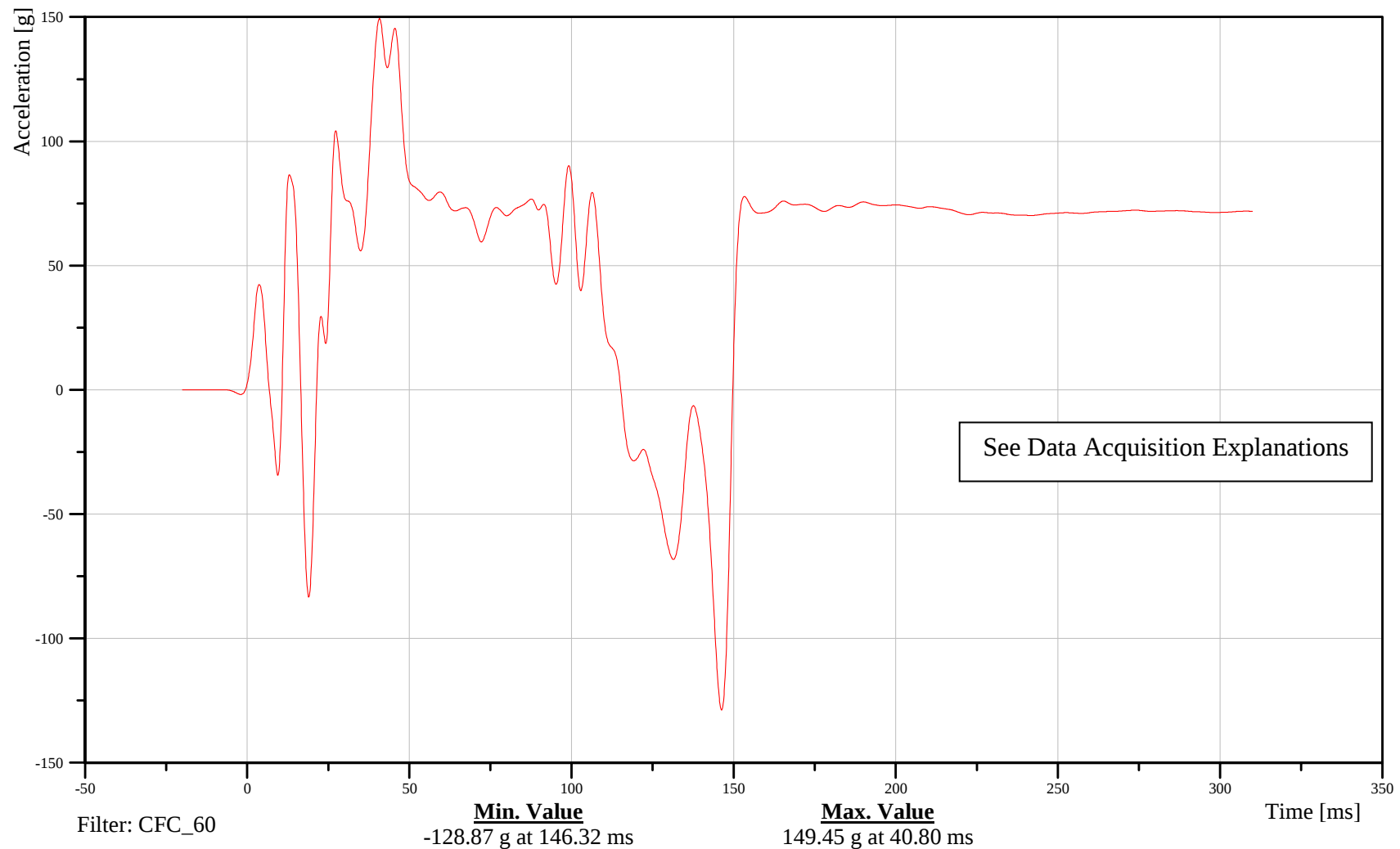
## Vehicle Front Door Mid-Rear Y-Axis Acceleration

Customer: VRTC

### 14DOOR000002ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-84

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007

Time: 14:43

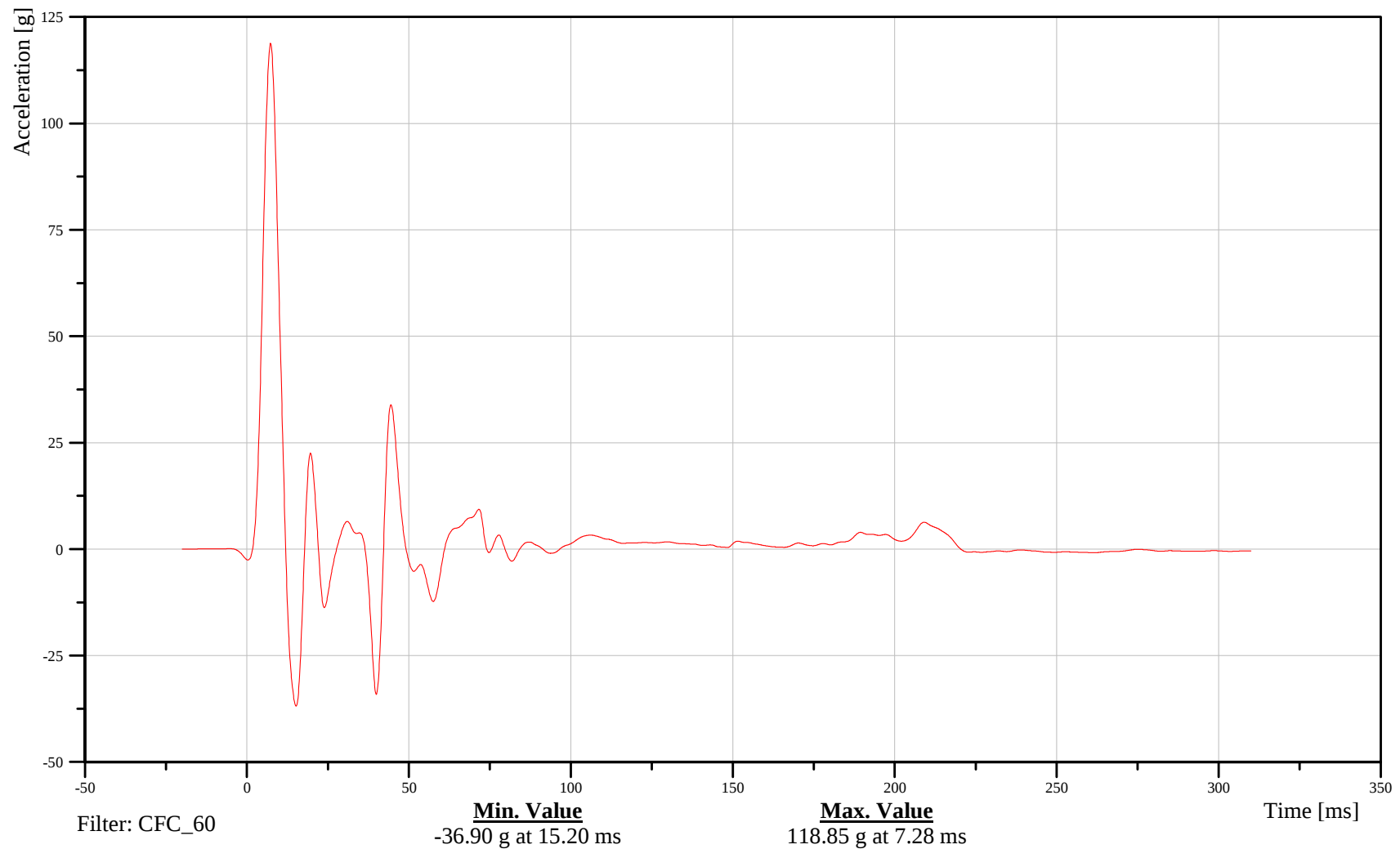
## Vehicle Front Door Upper Centerline Y-Axis Acceleration

Customer: VRTC

14DOOR000003ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-85

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007

Time: 14:43

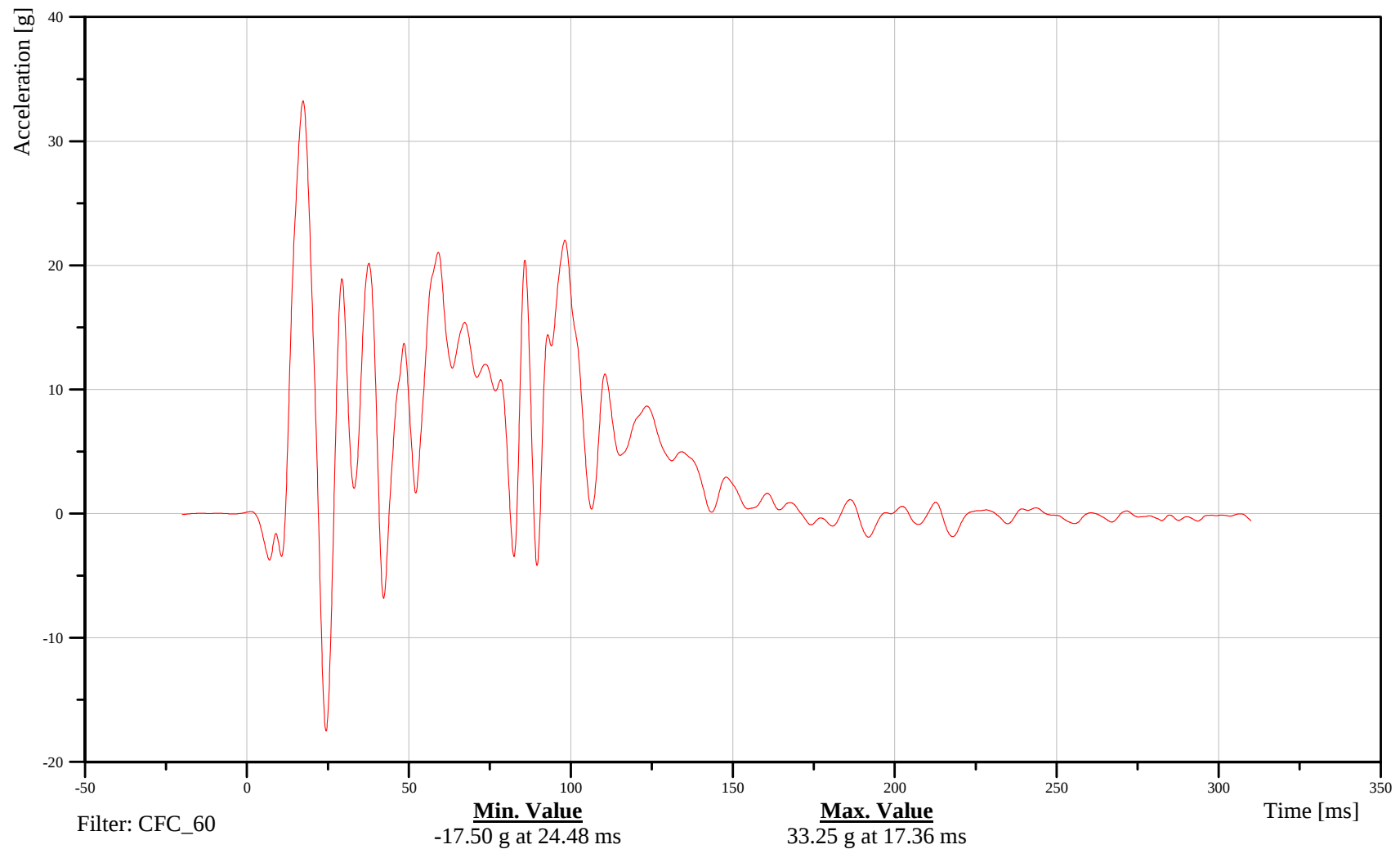
## Vehicle Rear Door Mid-Rear Y-Axis Acceleration

Customer: VRTC

16DOOR000002ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-86

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007

Time: 14:43

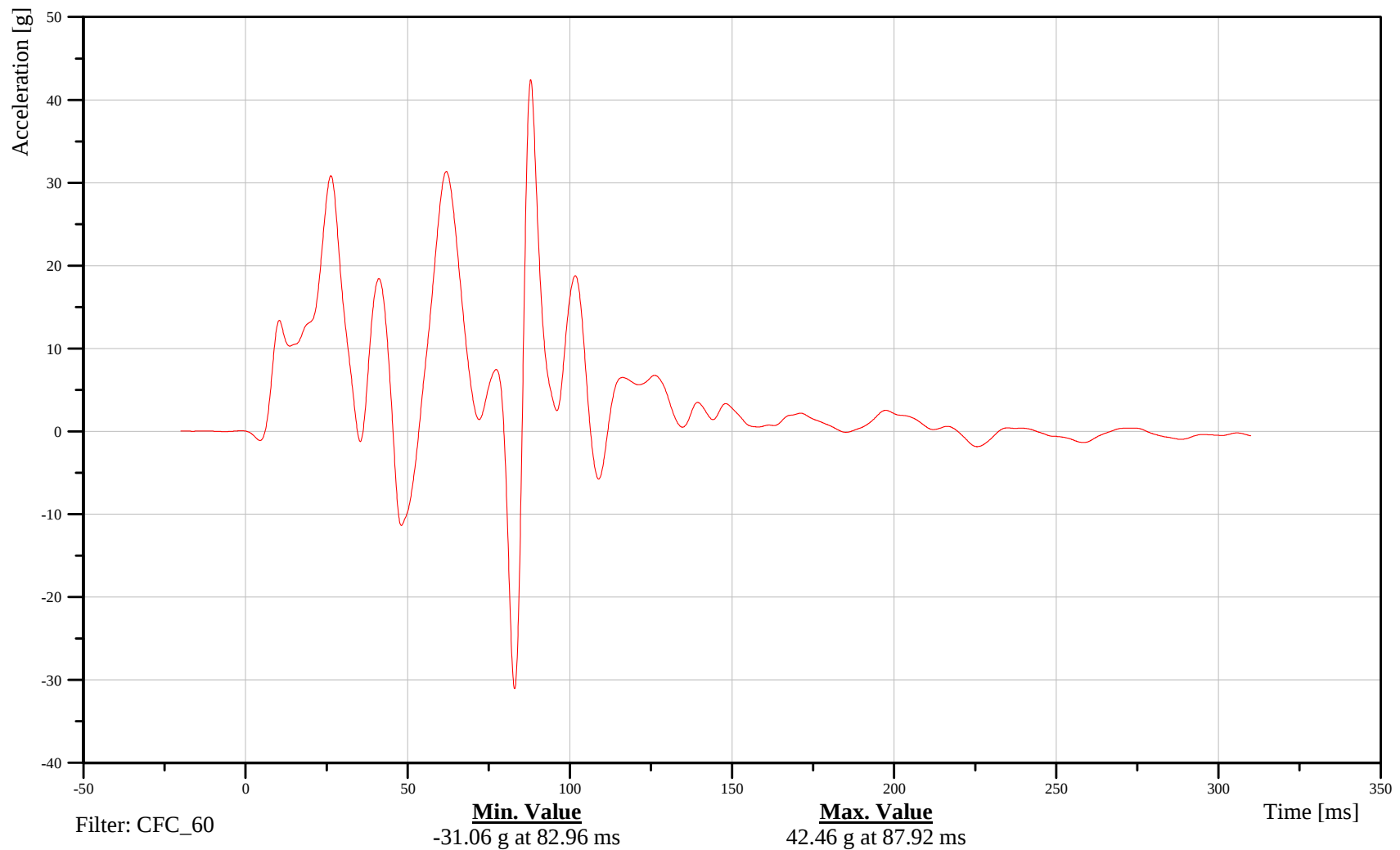
## Vehicle Rear Door Upper Centerline Y-Axis Acceleration

Customer: VRTC

16DOOR000003ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-87

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

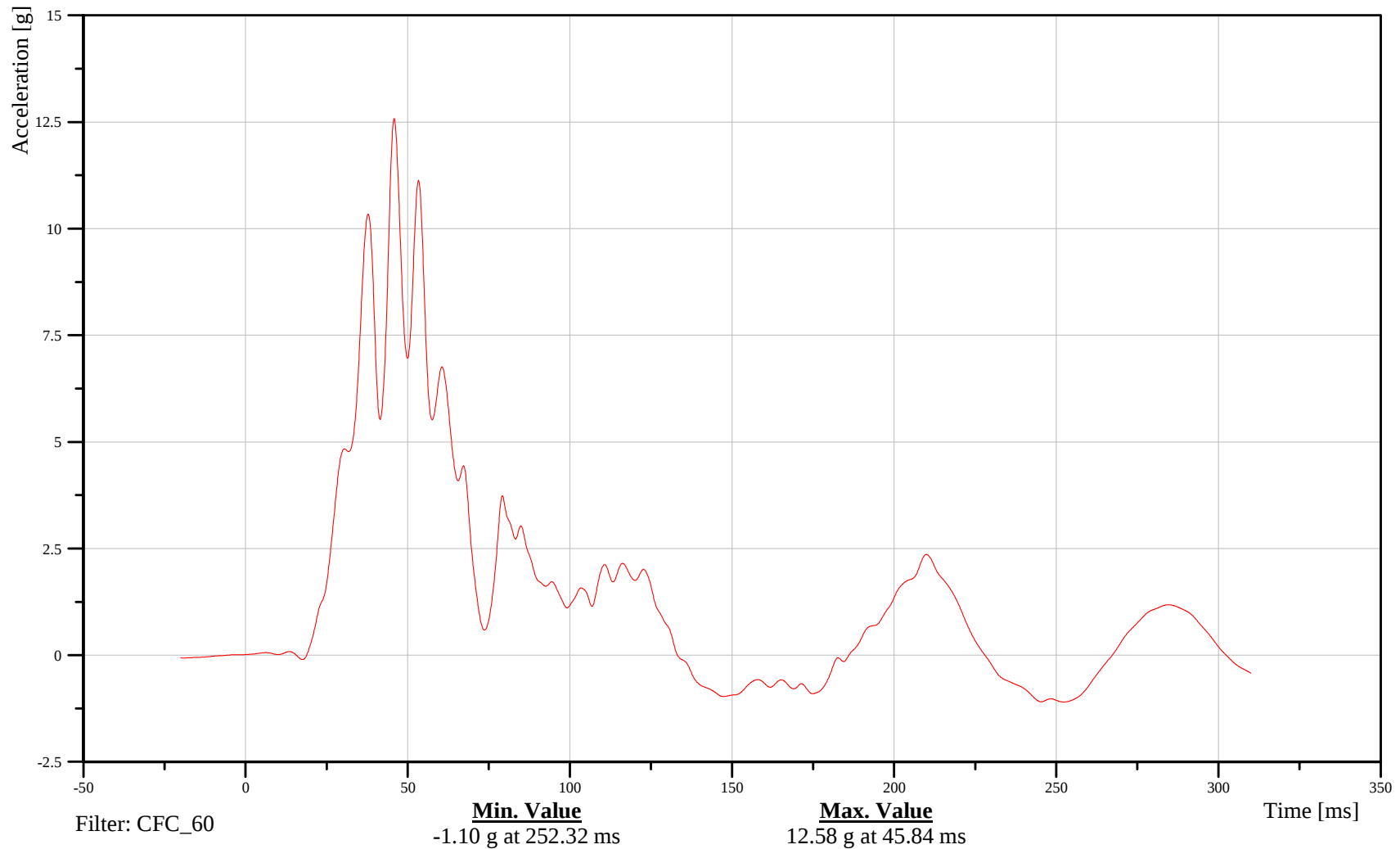
Top of Engine X-Axis Acceleration

Customer: VRTC

12ENGNTTP0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-88

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

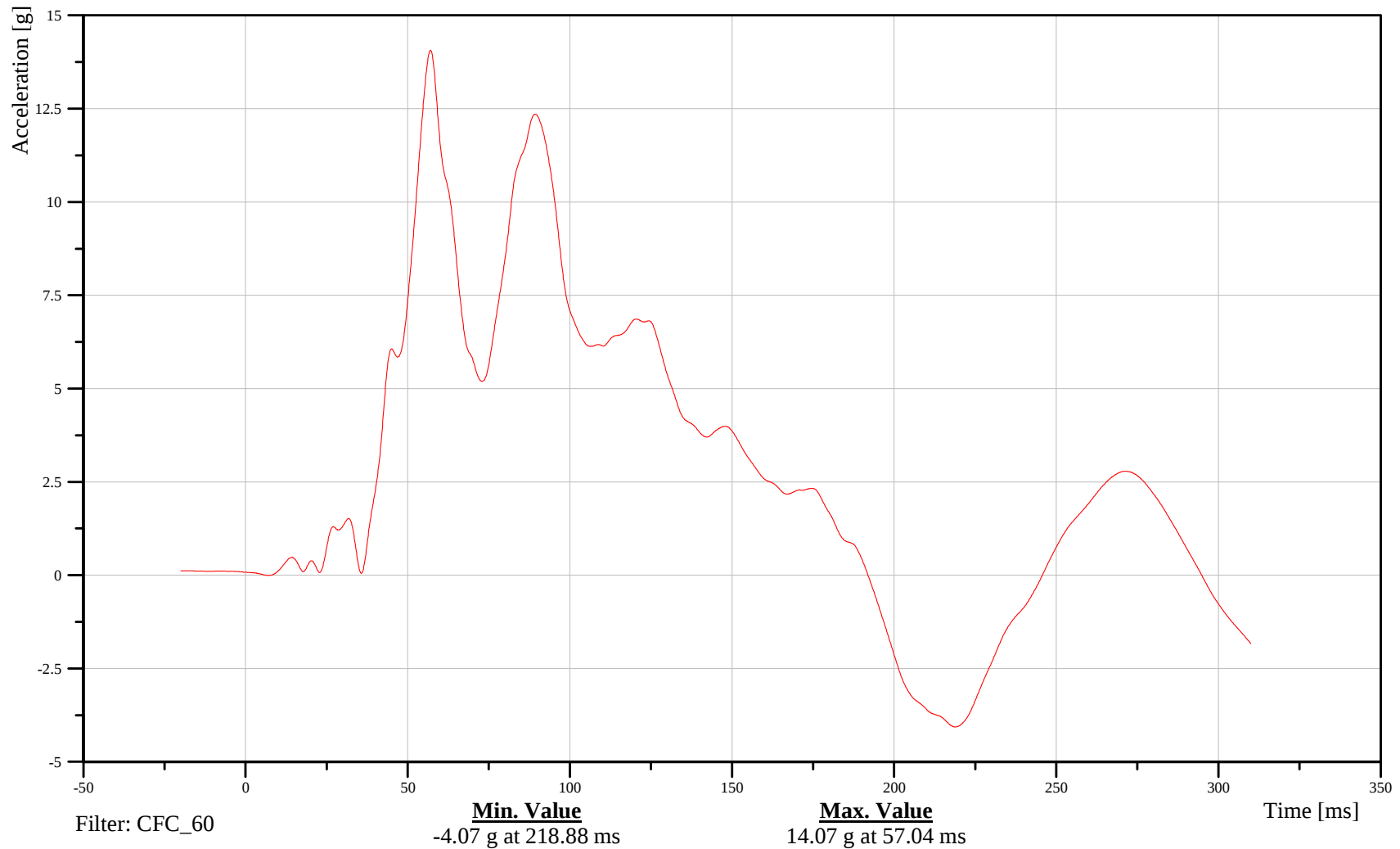
## Top of Engine Y-Axis Acceleration

Customer: VRTC

12ENGNTTP0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-89

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

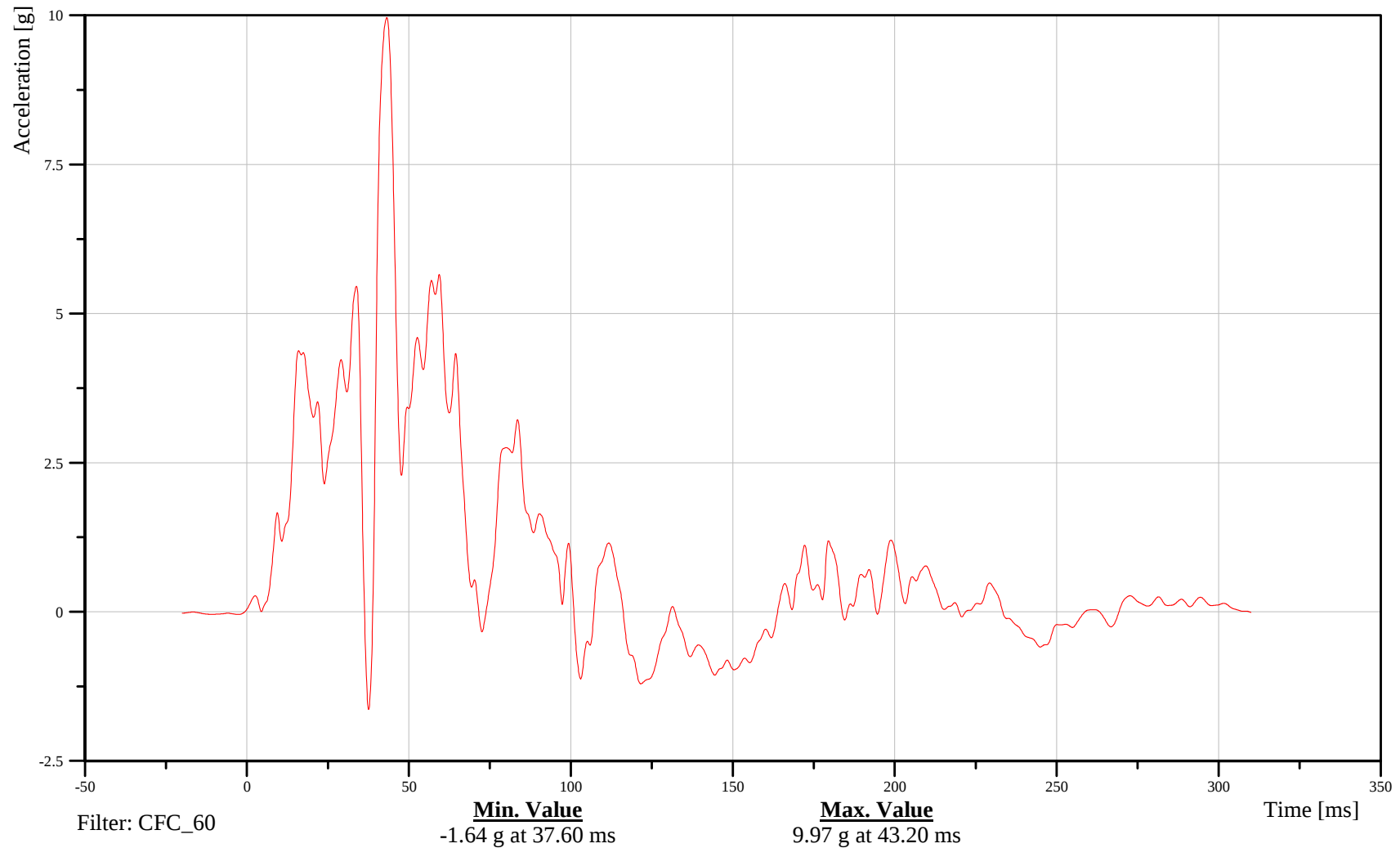
## Firewall X-Axis Acceleration

Customer: VRTC

12VEHC000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-90

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

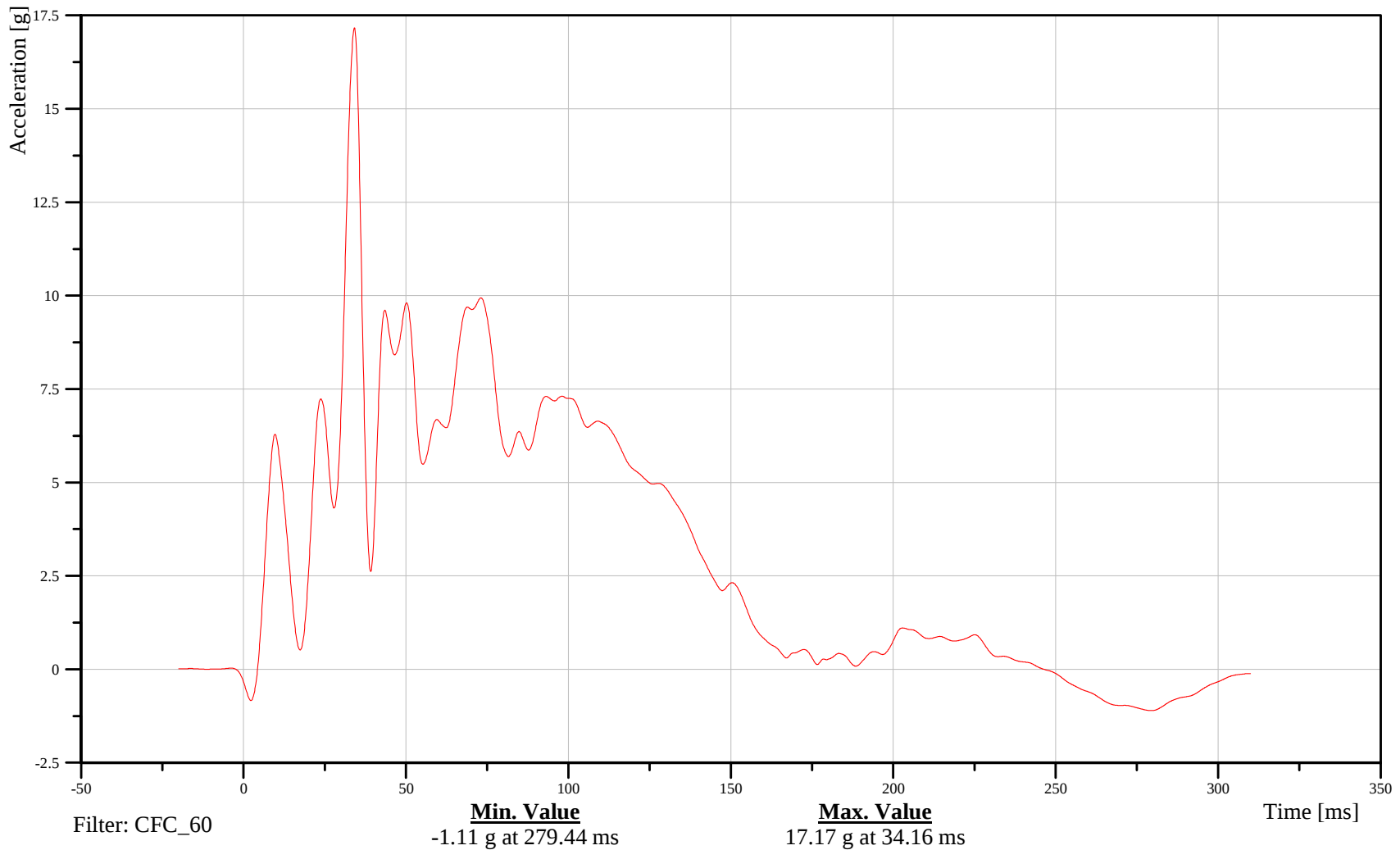
## Firewall Y-Axis Acceleration

Customer: VRTC

12VEHC000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-91

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

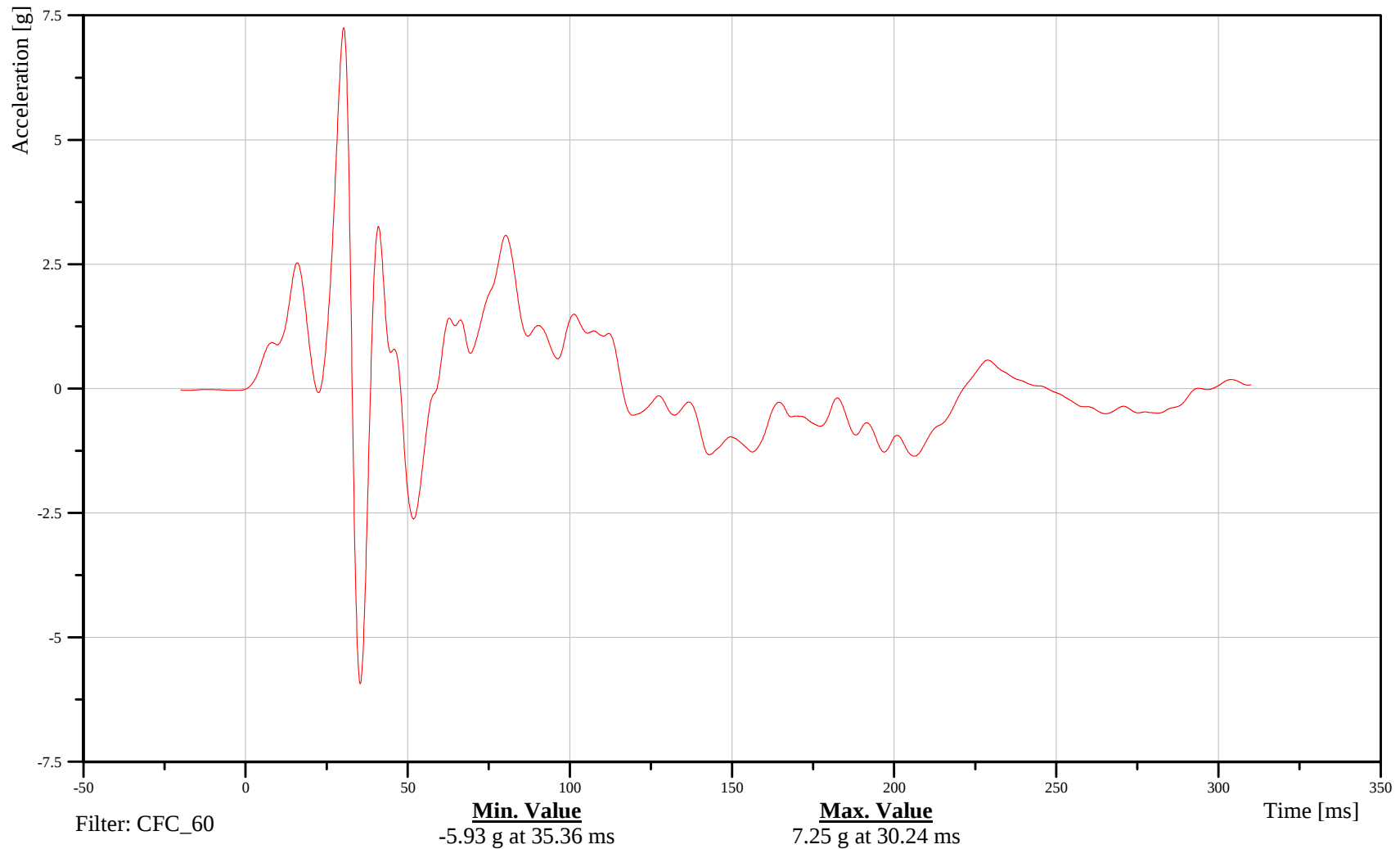
## Right Side Roof Rail X-Axis Acceleration

Customer: VRTC

13ROOF000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-92

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

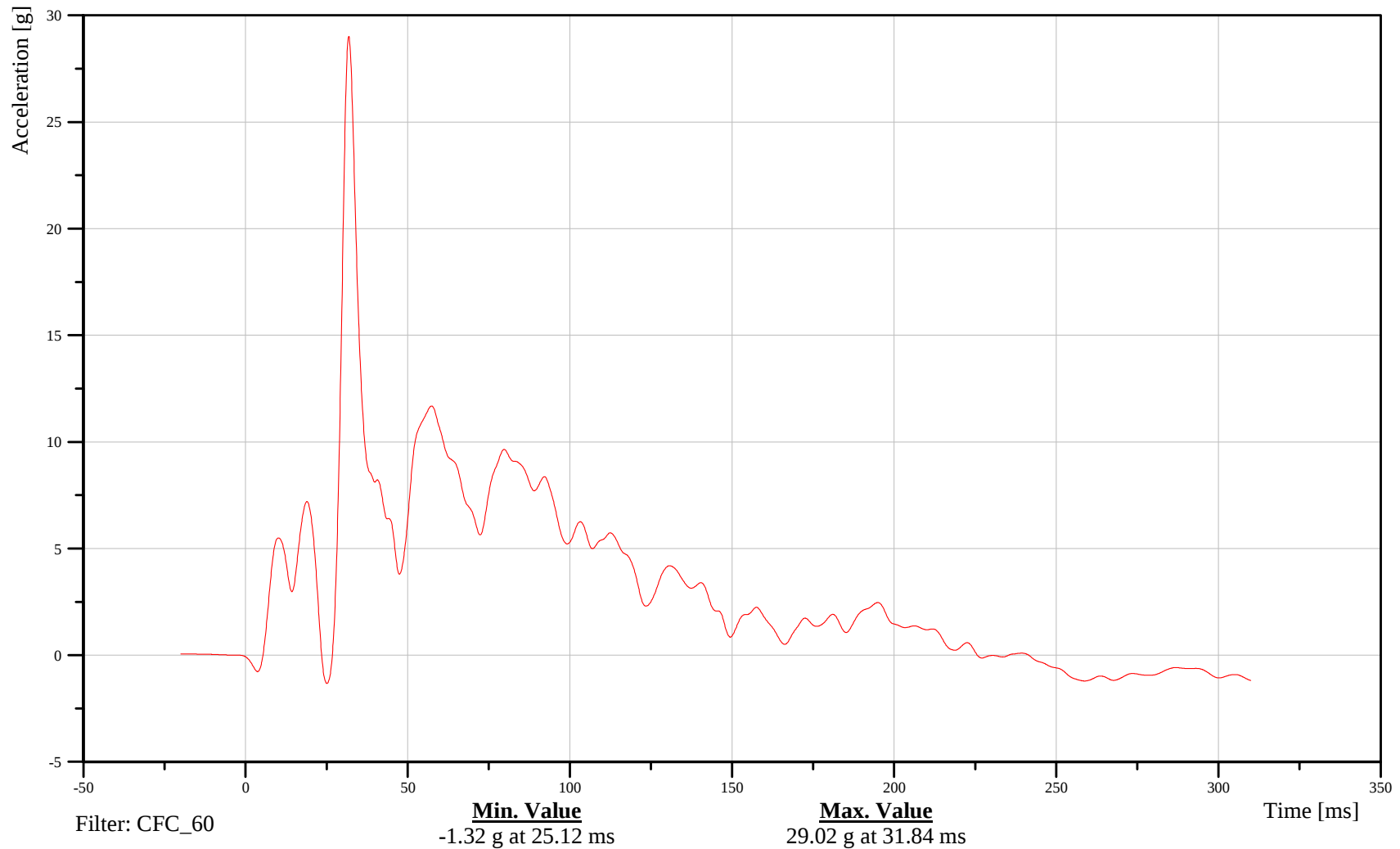
## Right Side Roof Rail Y-Axis Acceleration

Customer: VRTC

13ROOF000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-93

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007

Right Side Sill In-Line With Impact Location Y-Axis Acceleration

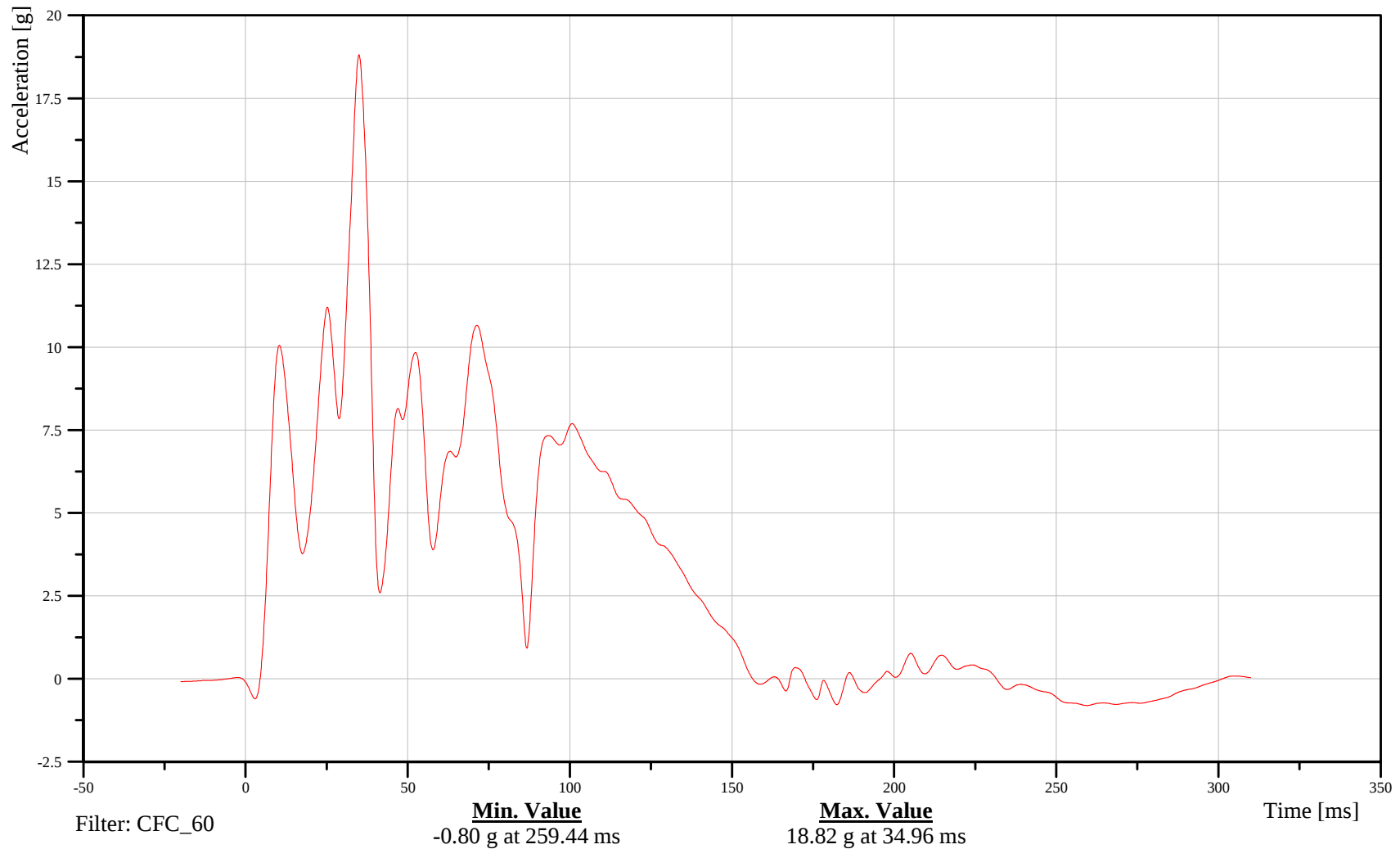
Time: 14:43

Customer: VRTC

## 13SILBFR0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 070628



B-94

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007

Time: 14:43

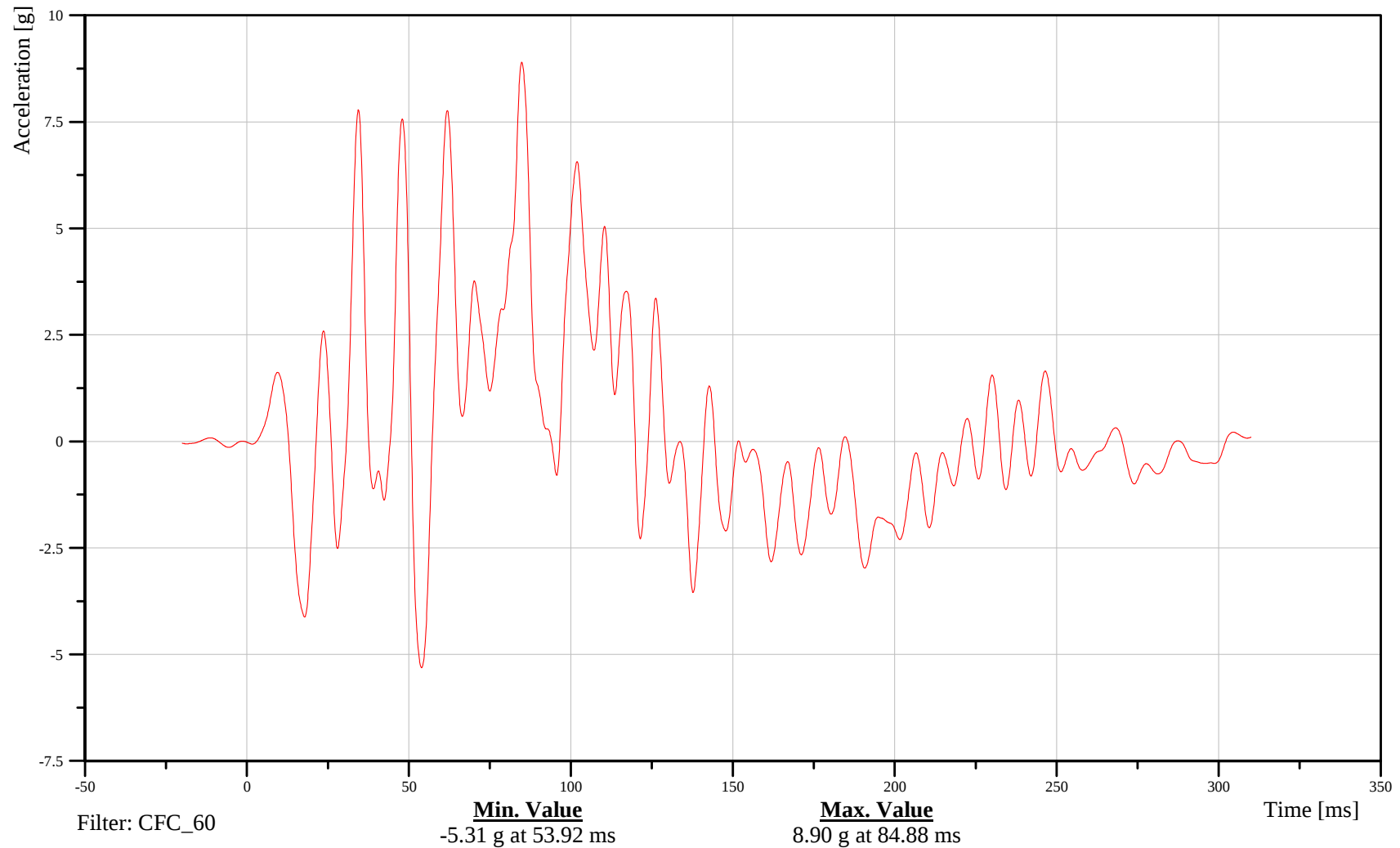
## Rear Deck Behind Rear Axle X-Axis Acceleration

Customer: VRTC

### 18DECK000000ACXA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-95

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

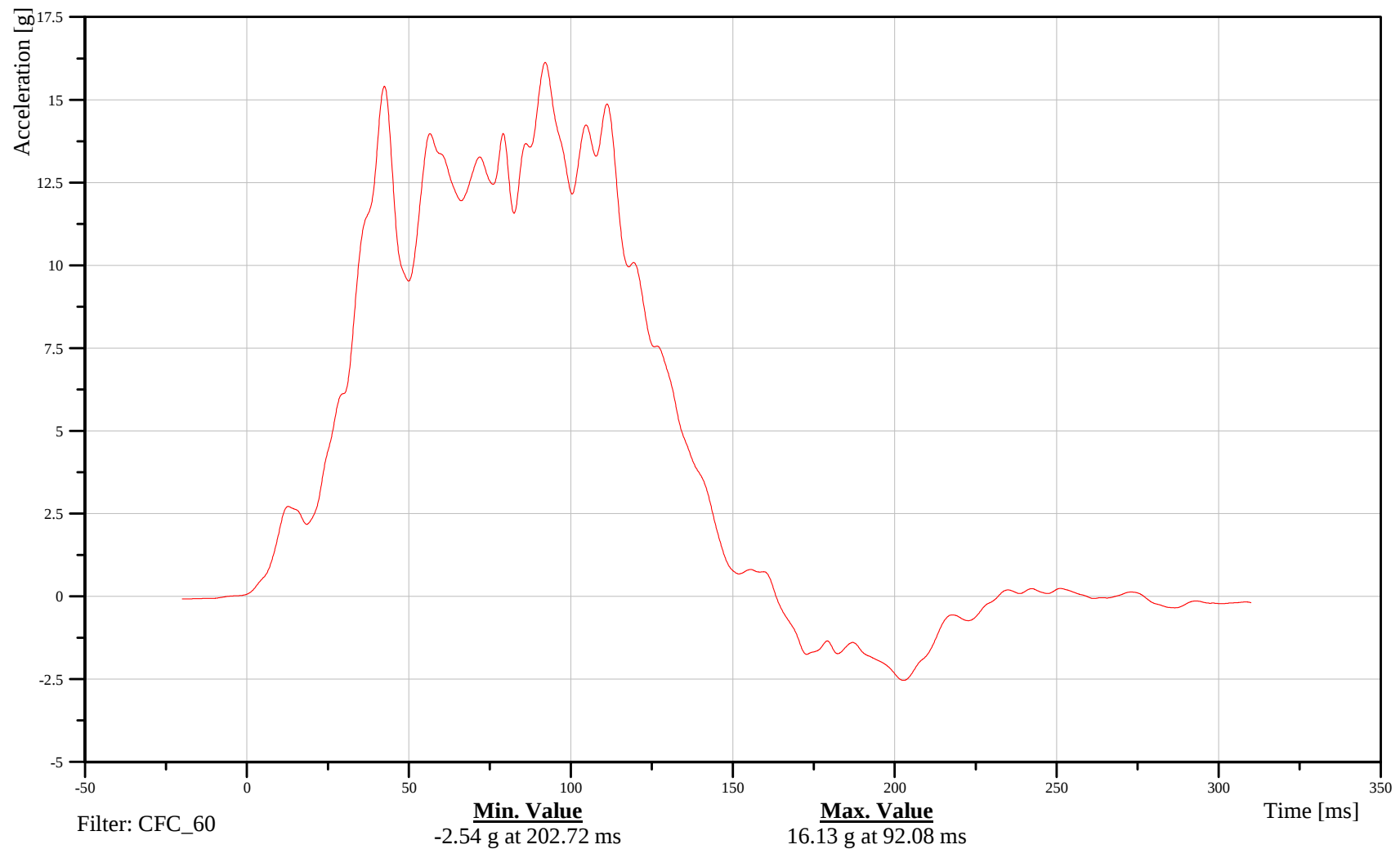
Rear Deck Behind Rear Axle Y-Axis Acceleration

Customer: VRTC

18DECK000000ACYA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-96

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

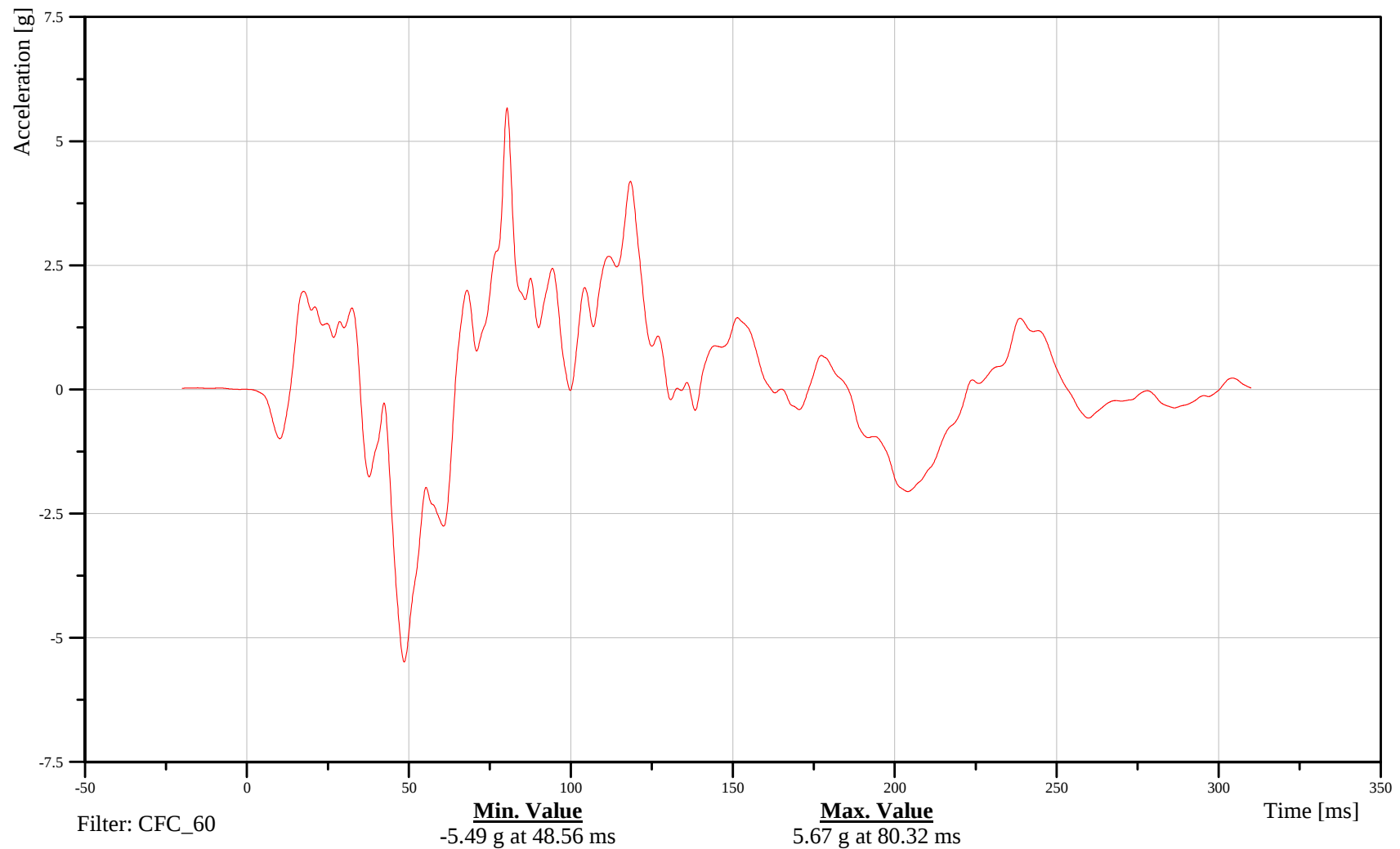
Rear Deck Behind Rear Axle Z-Axis Acceleration

Customer: VRTC

## 18DECK000000ACZA

TRC Inc. Test Lab: CTF

Test Number: 070628



B-97

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

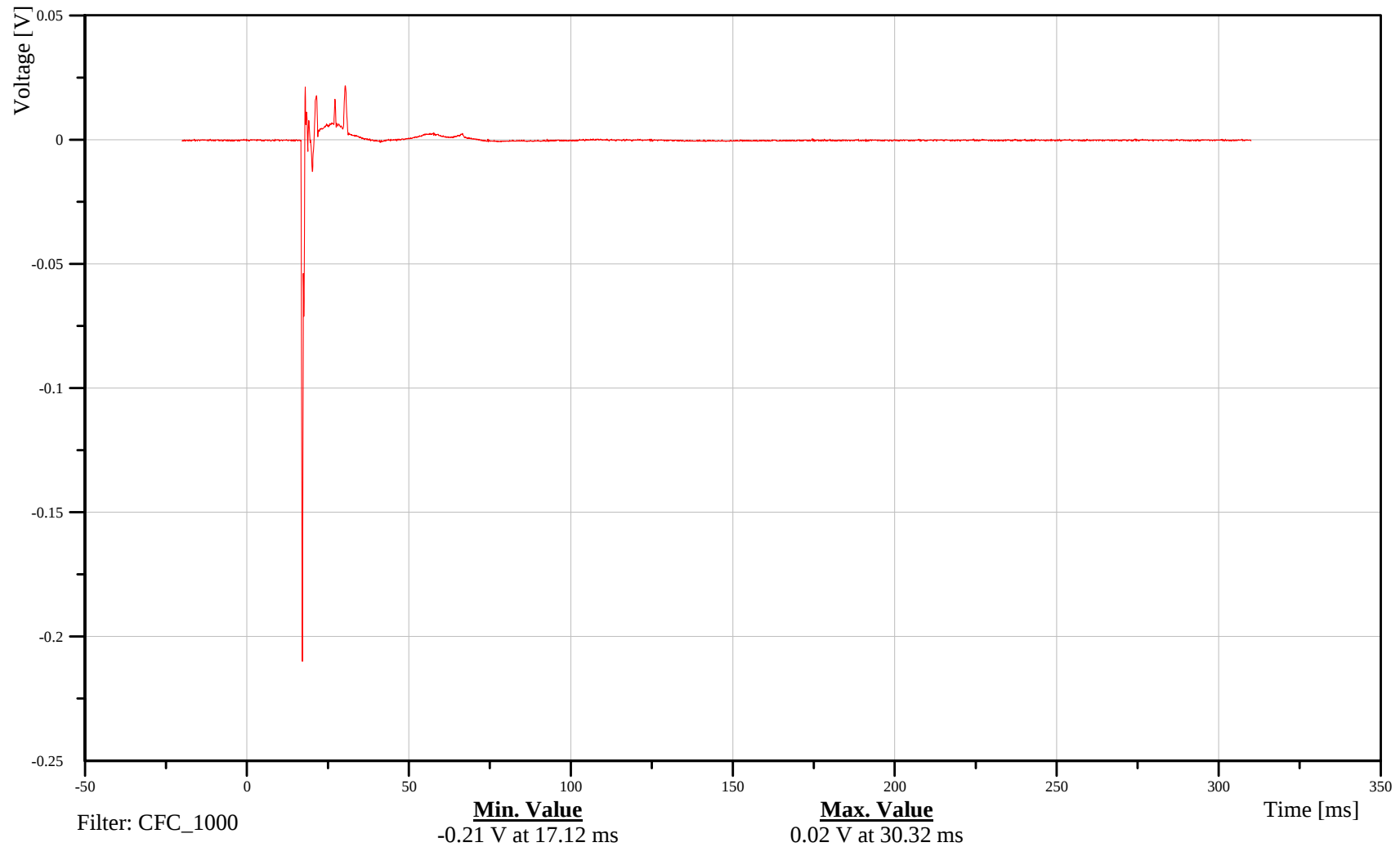
## Driver Side Airbag

Customer: VRTC

# 11AIRBMILE00EV0A

TRC Inc. Test Lab: CTF

Test Number: 070628



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070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

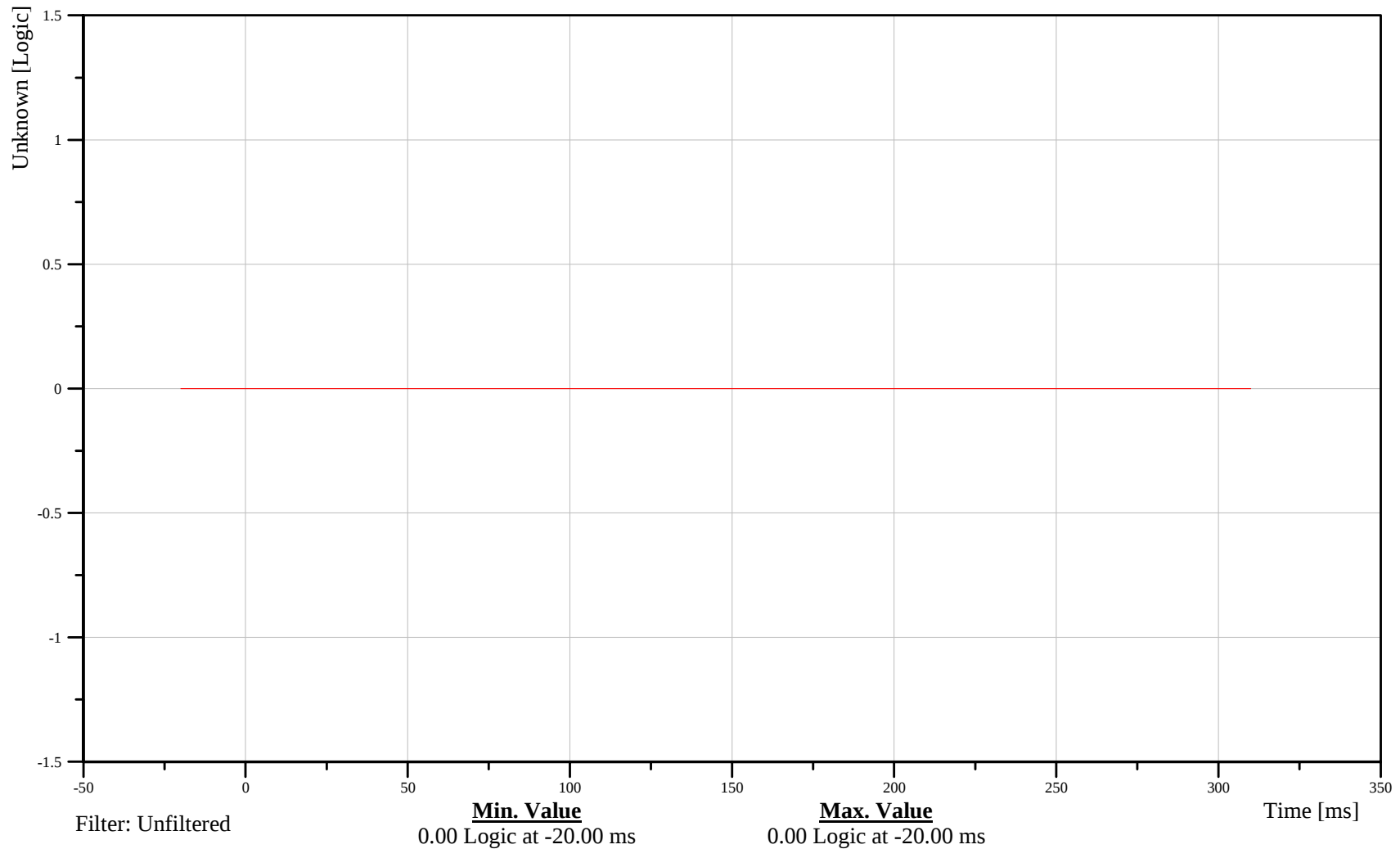
## Head Contact Switch

Customer: VRTC

11CONT000001VO00

TRC Inc. Test Lab: CTF

Test Number: 070628



B-99

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

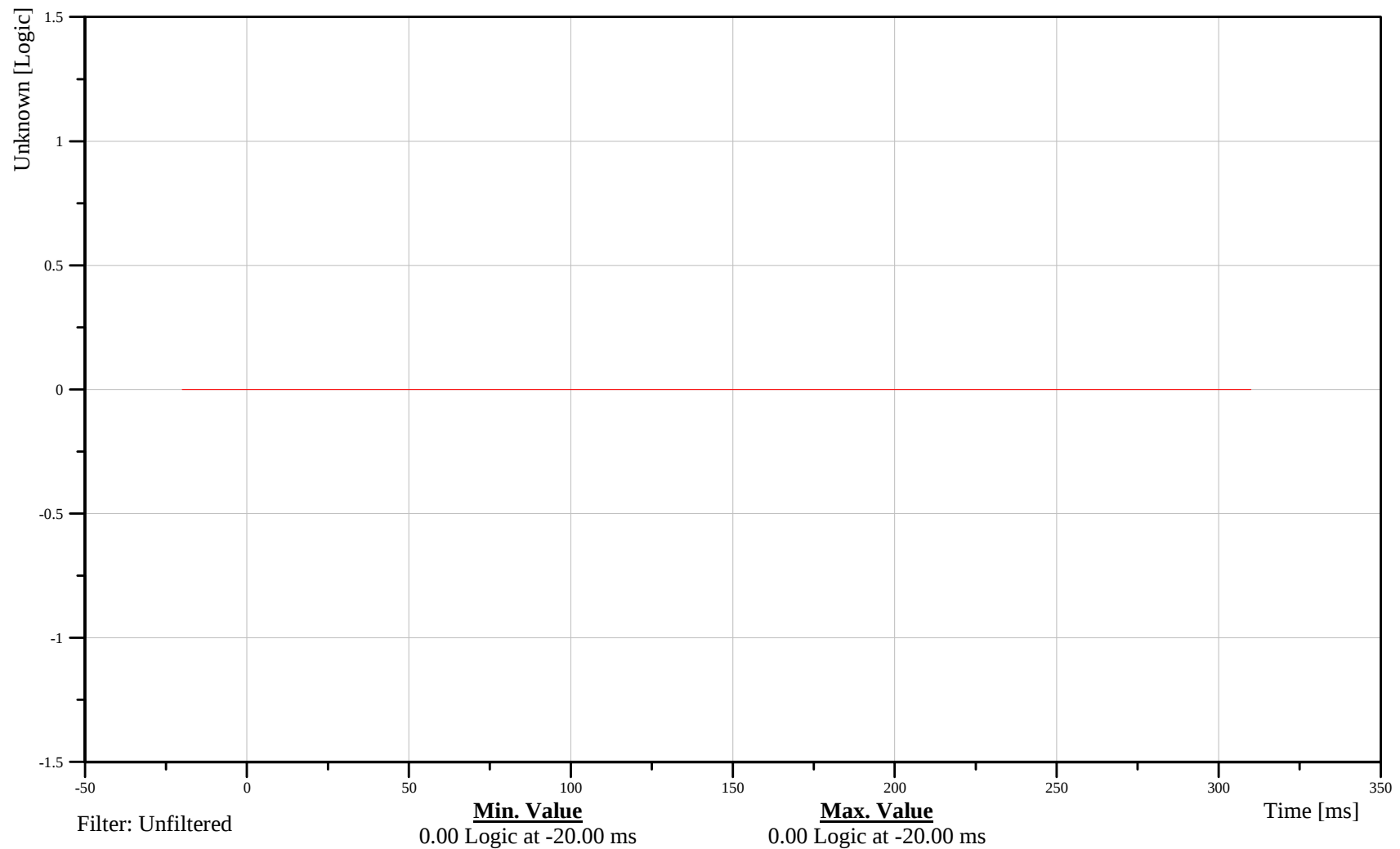
## Shoulder Contact Switch

Customer: VRTC

### 11CONT000002VO00

TRC Inc. Test Lab: CTF

Test Number: 070628



B-100

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

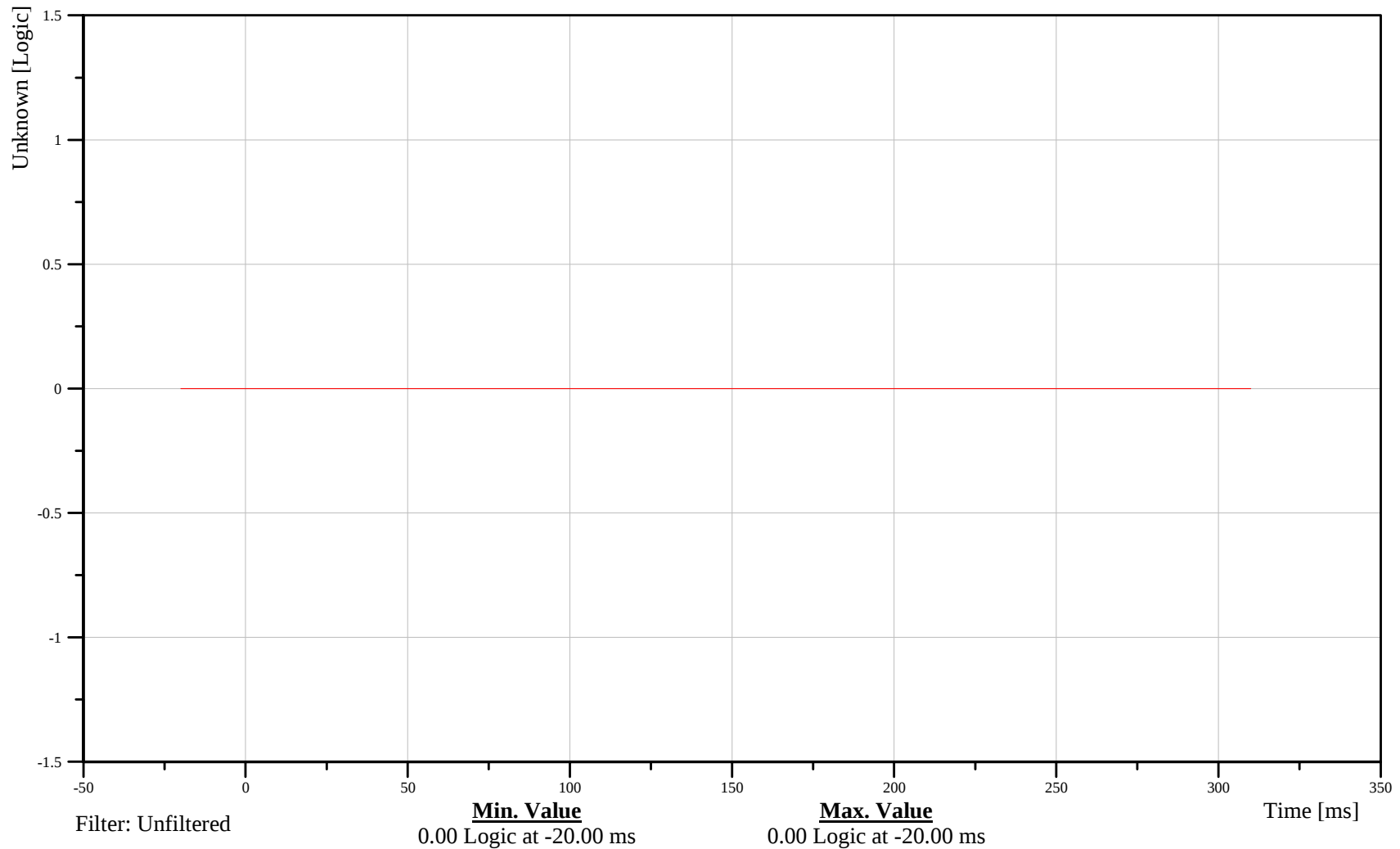
## Torso Contact Switch

Customer: VRTC

### 11CONT000003VO00

TRC Inc. Test Lab: CTF

Test Number: 070628



B-101

070628



# 2007 Subaru Impreza Left Side FMVSS 214 Pole Impact at 32 kph

Date: 06/28/2007  
Time: 14:43

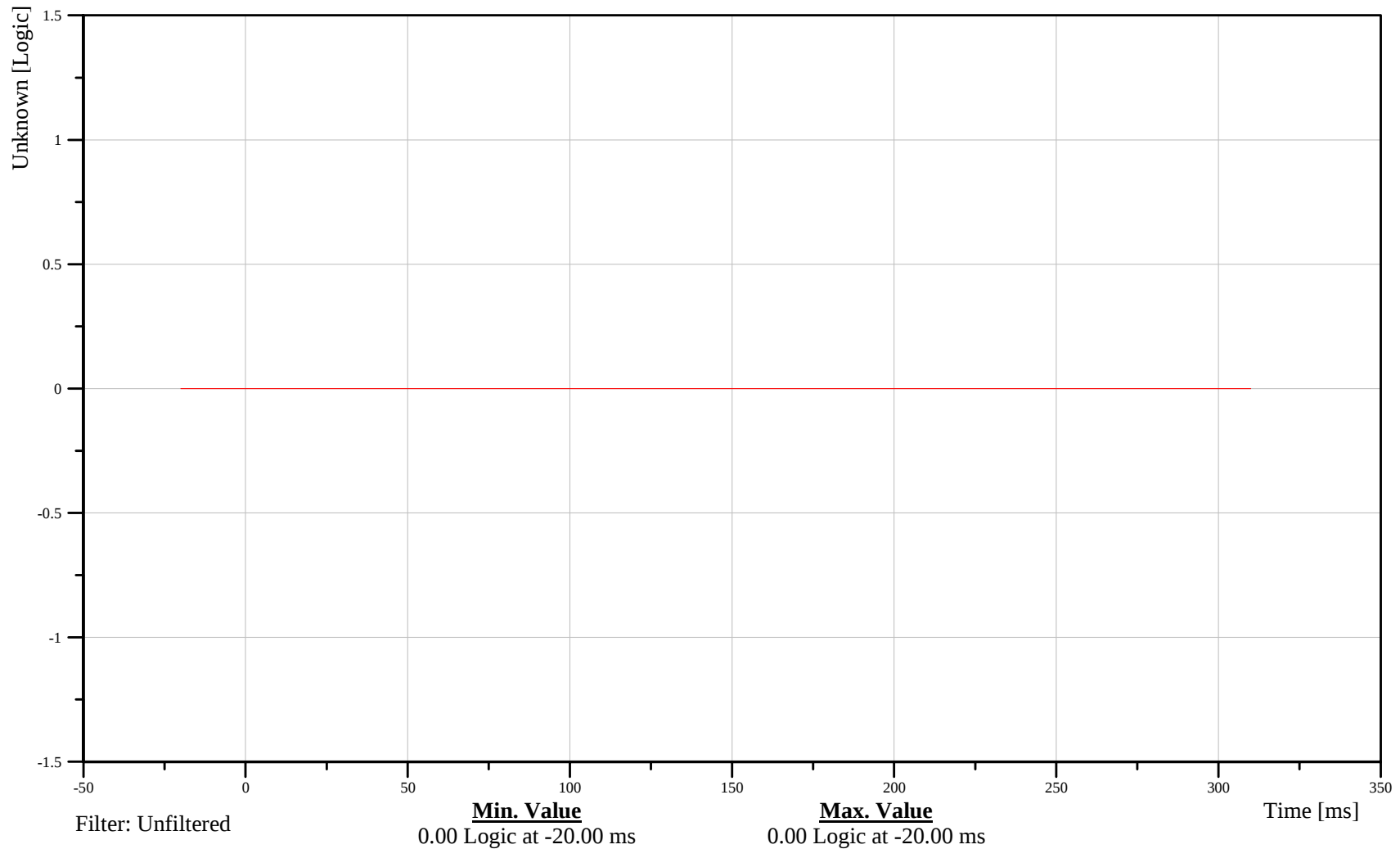
## Leg Contact Switch

Customer: VRTC

11CONT000004VO00

TRC Inc. Test Lab: CTF

Test Number: 070628



B-102

070628

## Appendix C

### SID-IIs Configuration and Performance Verification Data

Calibration Test Results

Pre-Test

SID-IIs: 056

Configured for Left Side Impact

**Transportation Research Center Inc.**  
**SIDIIs Dummy - Level D**  
**External Dimensions**  
**Serial No. 056 Calibration N0.\_05\_**  
**Date: \_06/14/07\_\_**

| Symbol | Description                     | Specification | Results | Pass |
|--------|---------------------------------|---------------|---------|------|
|        |                                 | mm            | mm      |      |
| A      | Sitting Height                  | 772.0 - 788.0 | 783     | Yes  |
| B      | Shoulder Pivot Height           | 437.0 - 453.0 | 444     | Yes  |
| C      | H-Point Height                  | 79.0 - 89.0   | 88      | Yes  |
| D      | H-Point from Backline           | 141.0 - 151.0 | 143     | Yes  |
| E      | Shoulder Pivot from Backline    | 97.0 - 107.0  | 105     | Yes  |
| F      | Thigh Clearance                 | 119.0 - 135.0 | 125     | Yes  |
| G      | Head Breadth                    | 140.0 - 148.0 | 142     | Yes  |
| H      | Head Back from Backline         | 40.0 - 46.0   | 45      | Yes  |
| I      | Head Depth                      | 178.0 - 188.0 | 183     | Yes  |
| J      | Head Circumference              | 541.0 - 551.0 | 542     | Yes  |
| K      | Buttock to Knee Length          | 514.0 - 540.0 | 532     | Yes  |
| L      | Popliteal Height                | 343.0 - 369.0 | 348     | Yes  |
| M      | Knee to Floor Height            | 393.0 - 409.0 | 397     | Yes  |
| N      | Buttock Popliteal Length        | 416.0 - 442.0 | 430     | Yes  |
| O      | Chest Depth without Jacket      | 195.0 - 211.0 | 204     | Yes  |
| P      | Foot Length                     | 216.0 - 232.0 | 220     | Yes  |
| Q      | Hip Breadth                     | 313.0 - 323.0 | 318     | Yes  |
| R      | Arm Length                      | 249.0 - 259.0 | 250     | Yes  |
| S      | Knee Joint to Seat Back         | 478.0 - 493.0 | 487     | Yes  |
| V      | Shoulder Width                  | 341.0 - 357.0 | 350     | Yes  |
| W      | Foot Width                      | 78.0 - 94.0   | 85      | Yes  |
| Y      | Chest Circumference with Jacket | 851.0 - 881.0 | 872     | Yes  |
| Z      | Waist Circumference             | 761.0 - 791.0 | 769     | Yes  |

**Dummy meets all specifications.**

Technician

Charles W. Bell

Approved

Ron Stover

Revised 9/29/2005



# Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs SBLD Serial No. 056 Certification No. 5-1

Test Date: 6/12/2007

| Test Parameter                                                       | Specification  | Test Results | Pass |
|----------------------------------------------------------------------|----------------|--------------|------|
| Temperature                                                          | 18.9 - 25.6 °C | 21.4 °C      | Yes  |
| Relative Humidity                                                    | 10 - 70 %      | 51 %         | Yes  |
| Peak Head Resultant Acceleration                                     | 115 - 137 g    | 123.1 g      | Yes  |
| Peak Head Longitudinal Acceleration                                  | (-15) - 15 g   | 2.5 g        | Yes  |
| Is Head Resultant Acceleration Curve<br>Unimodal within 15% of Peak? | Yes            | Yes          | Yes  |

**Test meets specifications.**

**Comments:**

Technician

Charles W. Bell

Approved

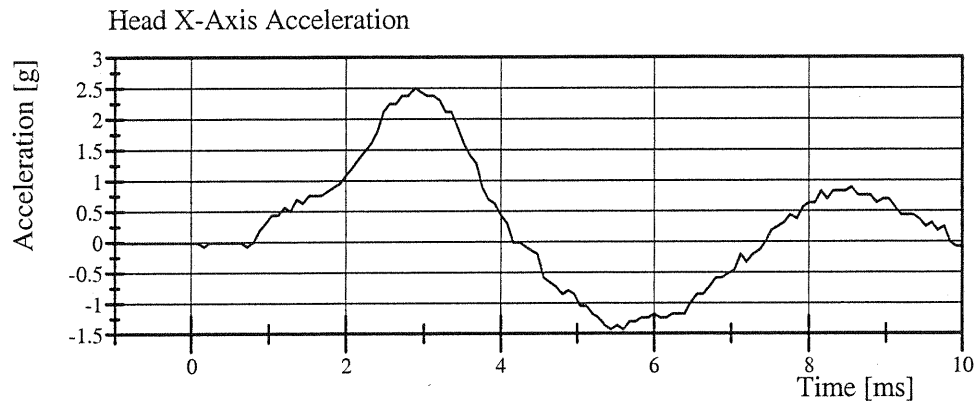
Ron Stoner

# Transportation Research Center Inc.

Left Lateral Head Drop

SID IIs SBLD Serial No. 056 Certification No. 5-1

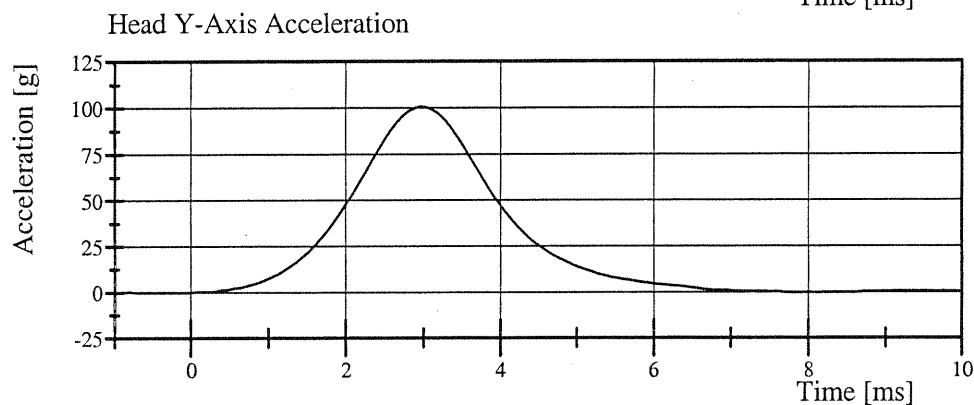
Test Date: 6/12/2007



Filter Class: CFC\_1000

Max: 2.5 g at 2.9 ms

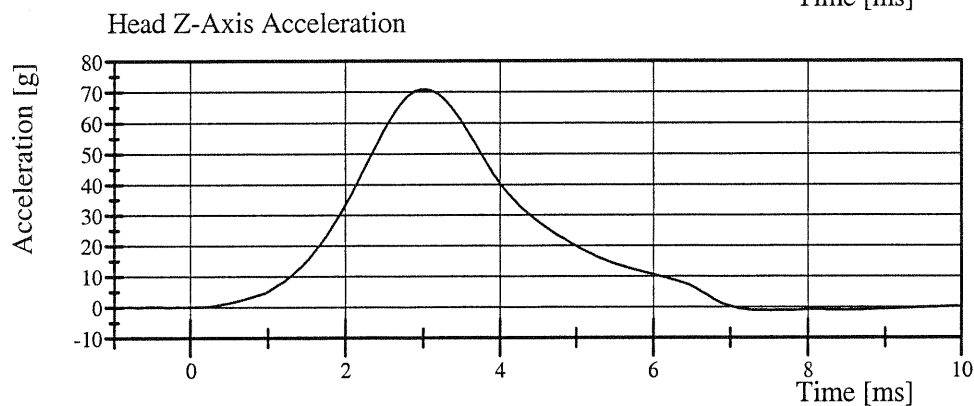
Min: -1.4 g at 5.4 ms



Filter Class: CFC\_1000

Max: 100.6 g at 3.0 ms

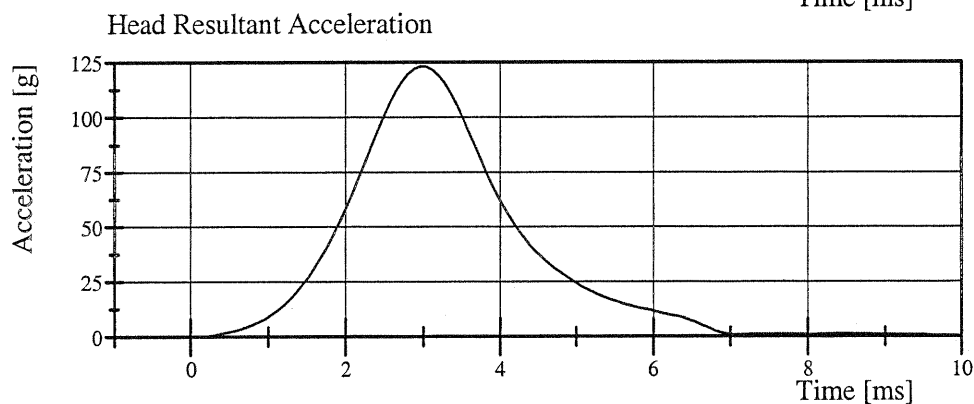
Min: -0.3 g at 8.2 ms



Filter Class: CFC\_1000

Max: 70.9 g at 3.0 ms

Min: -1.1 g at 7.5 ms



Filter Class: CFC\_1000

Max: 123.1 g at 3.0 ms

Min: 0.0 g at -0.9 ms

# Transportation Research Center Inc.

Left Lateral Neck

SID IIs SBLD Serial No. 056 Certification No. 5-1

Test Date: 6/13/2007

| Test Parameter                                               | Specification         | Test Results | Pass |
|--------------------------------------------------------------|-----------------------|--------------|------|
| Temperature                                                  | 20.6 - 22.2 °C        | 21.1 °C      | Yes  |
| Relative Humidity                                            | 10 - 70 %             | 56 %         | Yes  |
| Pendulum Velocity                                            | (-5.51) - (-5.63) m/s | -5.592 m/s   | Yes  |
| Pendulum Integrated Velocity                                 |                       |              |      |
| Change at 10 ms                                              | 2.20 - 2.80 m/s       | 2.739 m/s    | Yes  |
| Change at 15 ms                                              | 3.30 - 4.10 m/s       | 3.886 m/s    | Yes  |
| Change at 20 ms                                              | 4.40 - 5.40 m/s       | 5.193 m/s    | Yes  |
| Change at 25 ms                                              | 5.40 - 6.10 m/s       | 5.946 m/s    | Yes  |
| Change at 25 to 100 ms                                       | 5.50 - 6.20 m/s       | 5.948 m/s    | Yes  |
| Maximum Headform Flexion<br>occurring between 50ms and 70ms. |                       |              |      |
| Peak                                                         | (-71) - (-81) deg     | -74.3 deg    | Yes  |
| Time of Peak                                                 | 50 - 70 ms            | 57.6 ms      | Yes  |
| Total Neck Occipital Condyles Moment                         | 36 - 44 N·m           | 42.6 N·m     | Yes  |
| Total Neck Occipital Condyles Moment<br>Decay Time to 0 N·m  | 102 - 126 ms          | 103.6 ms     | Yes  |

**Test meets specifications.**

**Comments:**

Technician

Charles W. Hall

Approved

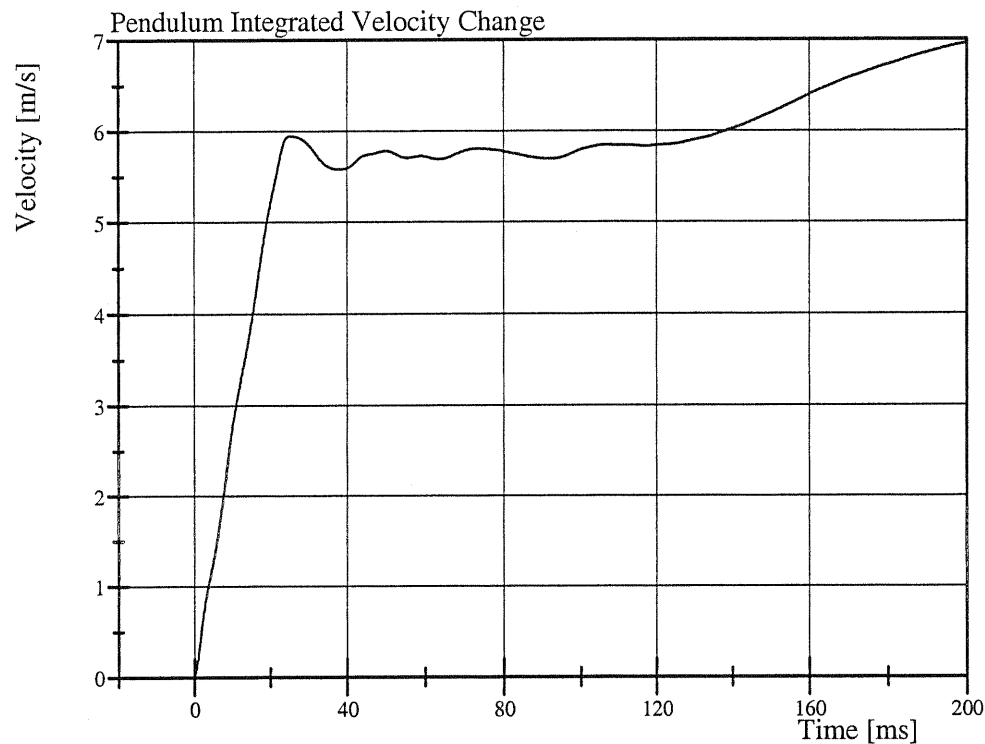
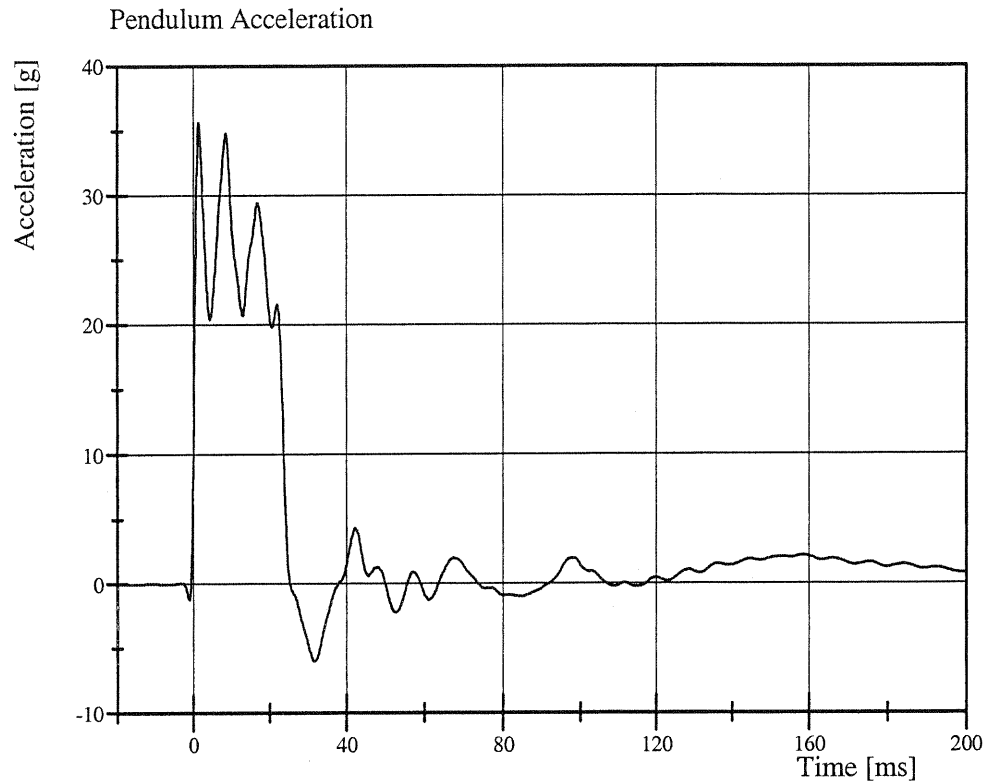
Ron Storer

# Transportation Research Center Inc.

Left Lateral Neck

SID IIs SBLD Serial No. 056 Certification No. 5-1

Test Date: 6/13/2007



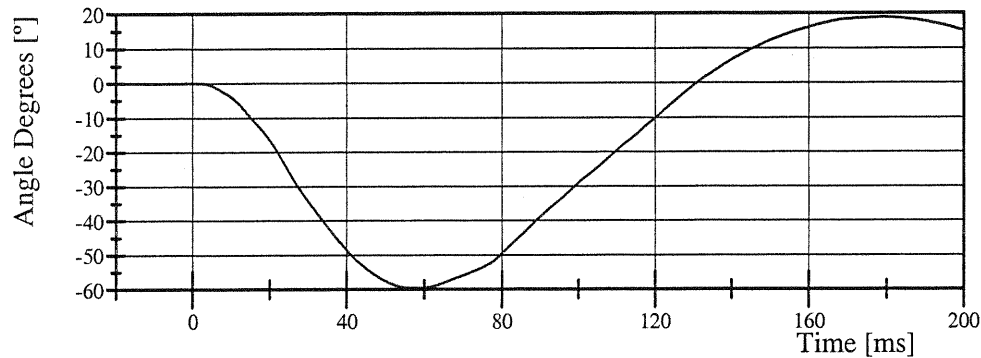
# Transportation Research Center Inc.

Left Lateral Neck

SID IIs SBLD Serial No. 056 Certification No. 5-1

Test Date: 6/13/2007

Forward Pot Rotation at Base of Pendulum

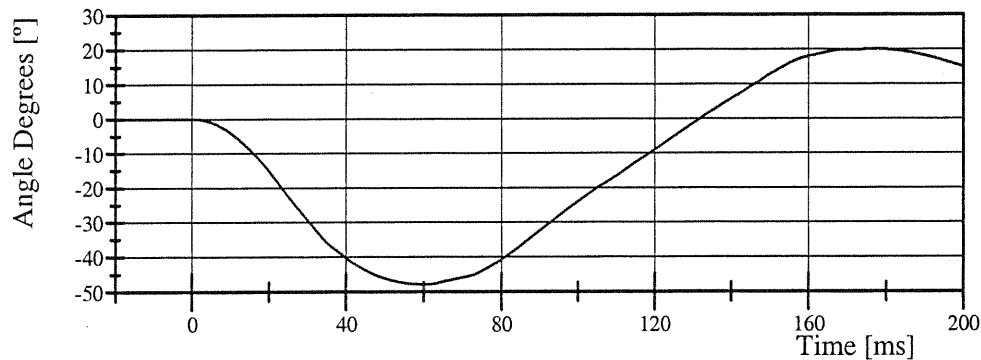


Filter Class: CFC\_60

Max: 18.9 ° at 179.0 ms

Min: -59.7 ° at 57.8 ms

Rear Pot Rotation at Base of Pendulum

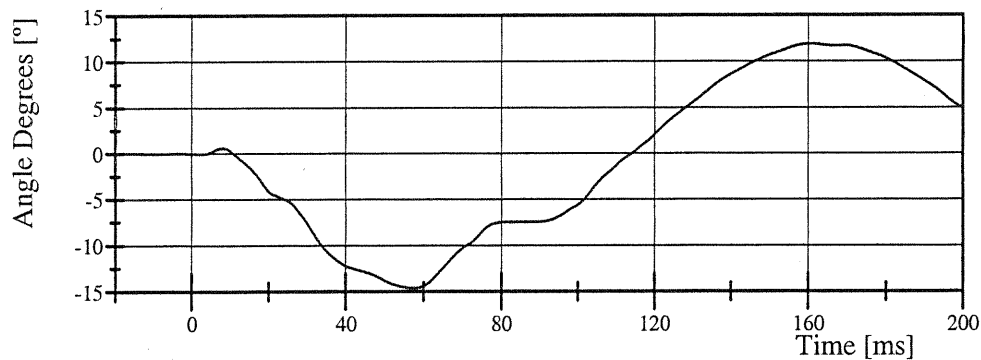


Filter Class: CFC\_60

Max: 20.1 ° at 177.7 ms

Min: -47.9 ° at 60.6 ms

Center Headform Pot Rotation at Center of Gravity

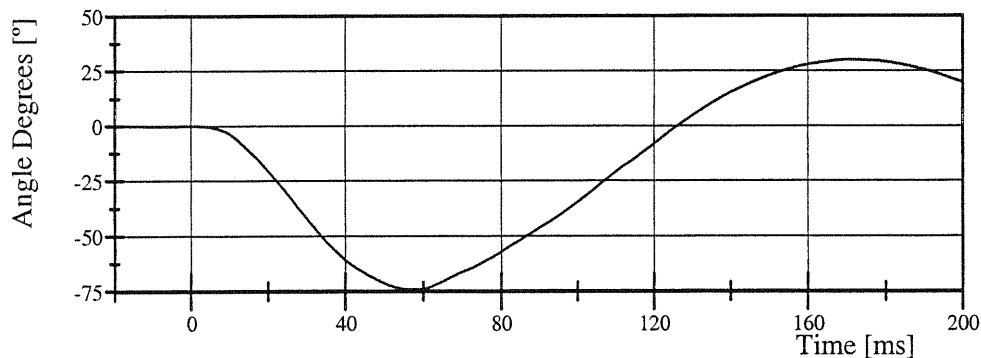


Filter Class: CFC\_60

Max: 11.9 ° at 160.6 ms

Min: -14.6 ° at 57.4 ms

Total Headform Flexion



Filter Class: CFC\_60

Max: 30.2 ° at 170.9 ms

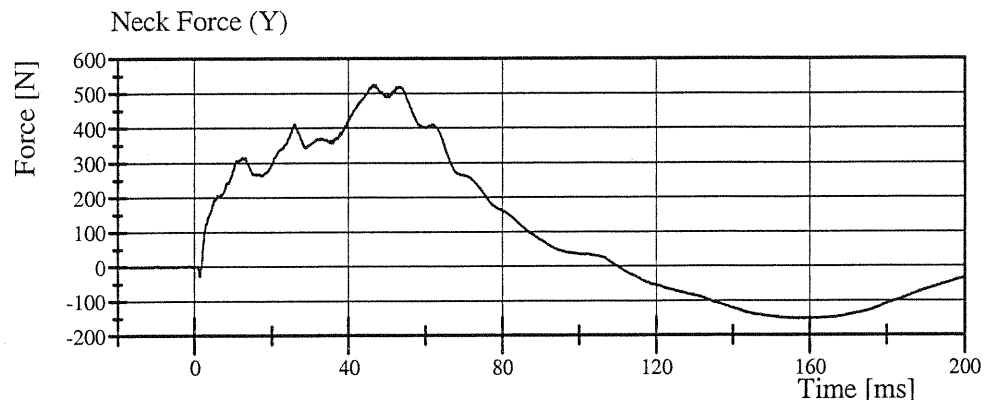
Min: -74.3 ° at 57.6 ms

# Transportation Research Center Inc.

Left Lateral Neck

SID IIs SBLD Serial No. 056 Certification No. 5-1

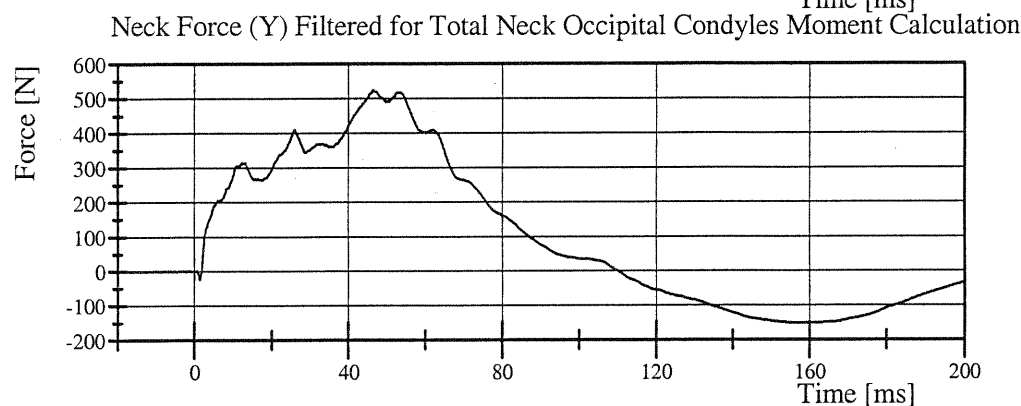
Test Date: 6/13/2007



Filter Class: CFC\_1000

Max: 524.5 N at 46.3 ms

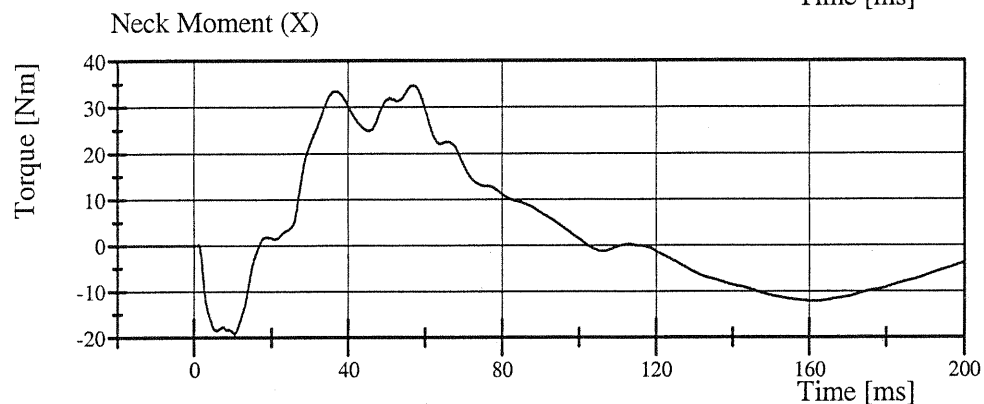
Min: -152.0 N at 157.0 ms



Filter Class: CFC\_600

Max: 523.9 N at 46.4 ms

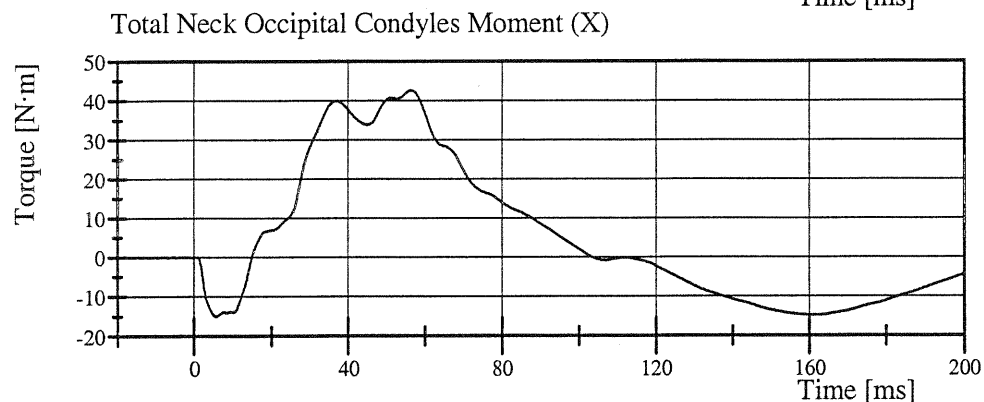
Min: -151.6 N at 158.6 ms



Filter Class: CFC\_600

Max: 34.7 Nm at 57.0 ms

Min: -19.2 Nm at 10.5 ms



Filter Class: CFC\_600

Max: 42.6 N·m at 56.2 ms

Min: -14.9 N·m at 5.7 ms

# Transportation Research Center Inc.

Left Lateral Thorax with Arm

SID IIs SBLD Serial No. 056 Certification No. 5-1

Test Date: 6/12/2007

| Test Parameter                   | Specification   | Test Results | Pass |
|----------------------------------|-----------------|--------------|------|
| Temperature                      | 20.6 - 22.2 °C  | 21.1 °C      | Yes  |
| Relative Humidity                | 10 - 70 %       | 52 %         | Yes  |
| Impactor Velocity                | 6.60 - 6.80 m/s | 6.623 m/s    | Yes  |
| Impactor Acceleration            | (-31) - (-36) g | -31.2 g      | Yes  |
| Shoulder Displacement            | 31 - 40 mm      | 36.5 mm      | Yes  |
| Upper Thorax Rib Displacement    | 26 - 32 mm      | 29.4 mm      | Yes  |
| Center Thorax Rib Displacement   | 30 - 36 mm      | 34.2 mm      | Yes  |
| Lower Thorax Rib Displacement    | 32 - 38 mm      | 36.6 mm      | Yes  |
| Upper Spine Lateral Acceleration | 34 - 43 g       | 34.4 g       | Yes  |
| Lower Spine Lateral Acceleration | 28 - 35 g       | 32.7 g       | Yes  |

**Test meets specifications.**

**Comments:**

Technician

Charles W. Bull

Approved

Ron Stoner



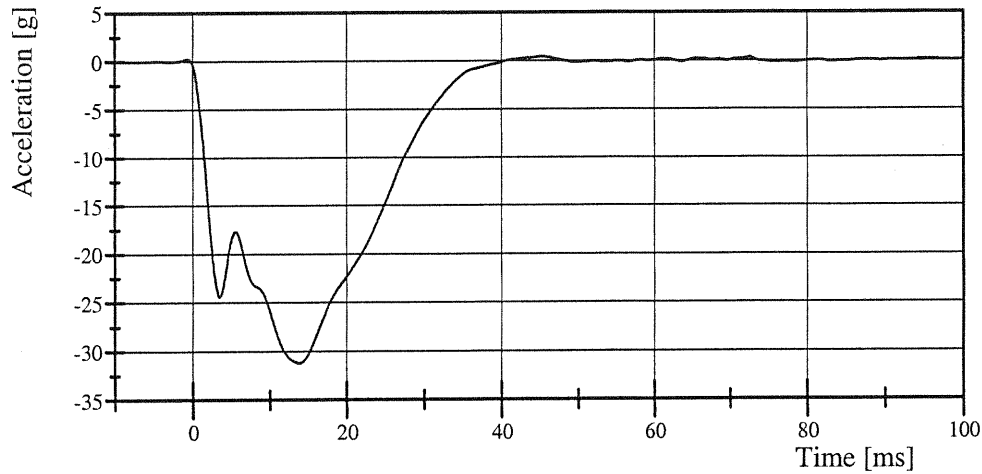
# Transportation Research Center Inc.

Left Lateral Thorax with Arm

SID IIs SBLD Serial No. 056 Certification No. 5-1

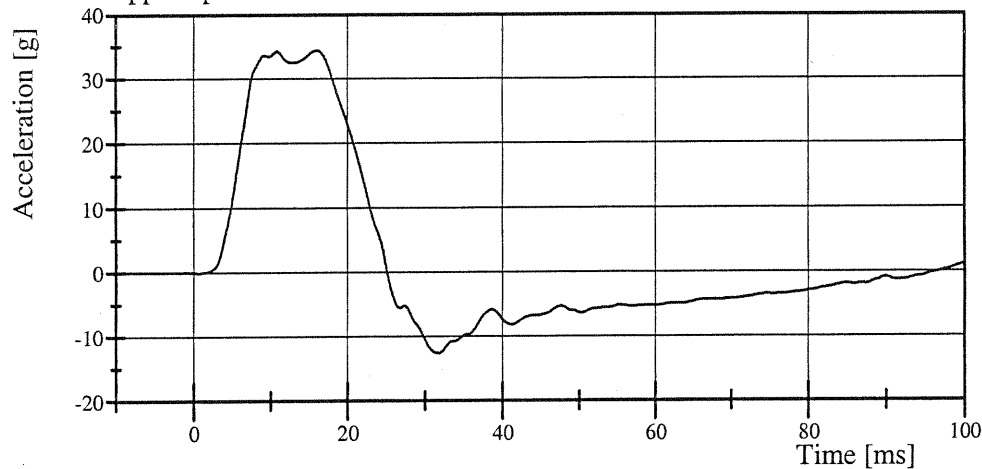
Test Date: 6/12/2007

Probe Acceleration



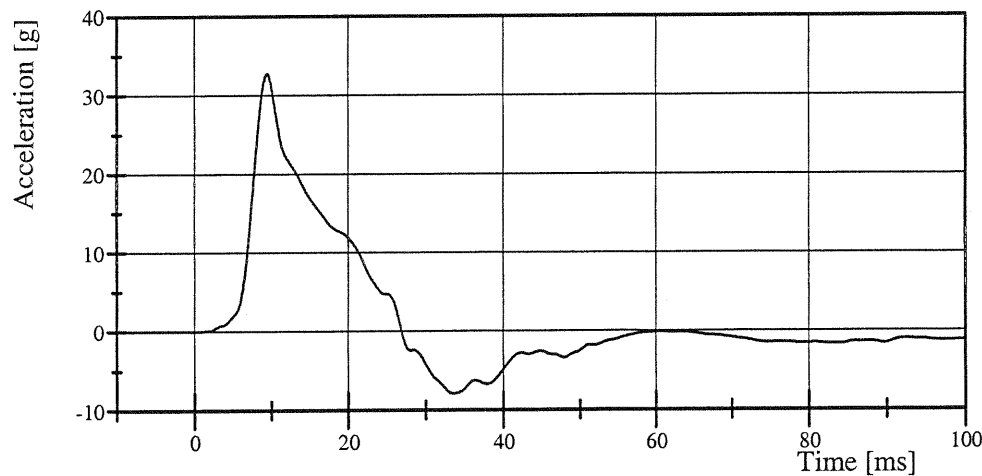
Filter Class: CFC\_180  
Max: 0.5 g at 45.4 ms  
Min: -31.2 g at 13.8 ms

Upper Spine Acceleration



Filter Class: CFC\_180  
Max: 34.4 g at 15.9 ms  
Min: -12.6 g at 31.7 ms

Lower Spine Acceleration



Filter Class: CFC\_180  
Max: 32.7 g at 9.5 ms  
Min: -7.9 g at 33.5 ms

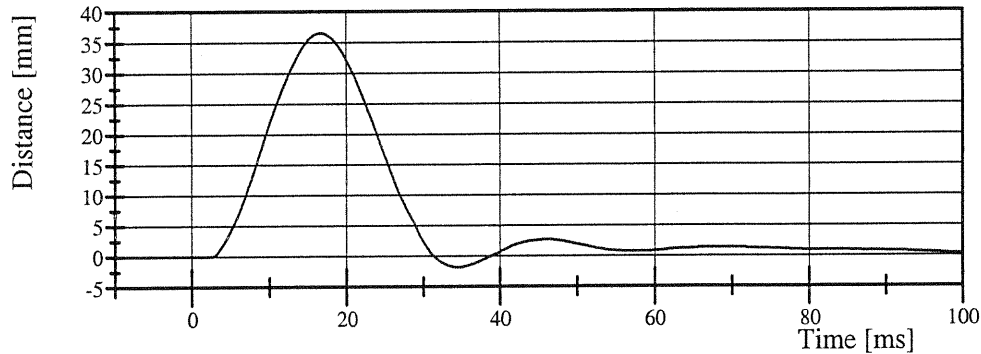
# Transportation Research Center Inc.

Left Lateral Thorax with Arm

SID II's SBLD Serial No. 056 Certification No. 5-1

Test Date: 6/12/2007

Shoulder Rib Displacement

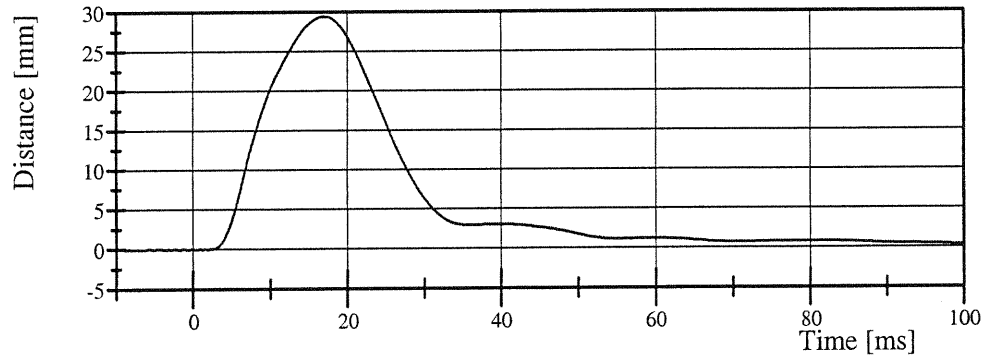


Filter Class: CFC\_600

Max: 36.5 mm at 16.7 ms

Min: -1.9 mm at 34.4 ms

Upper Thorax Rib Displacement

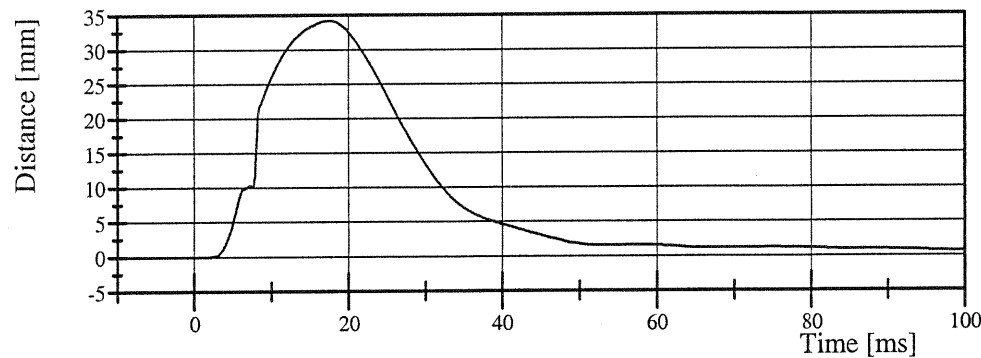


Filter Class: CFC\_600

Max: 29.4 mm at 17.0 ms

Min: -0.0 mm at -6.4 ms

Center Thorax Rib Displacement

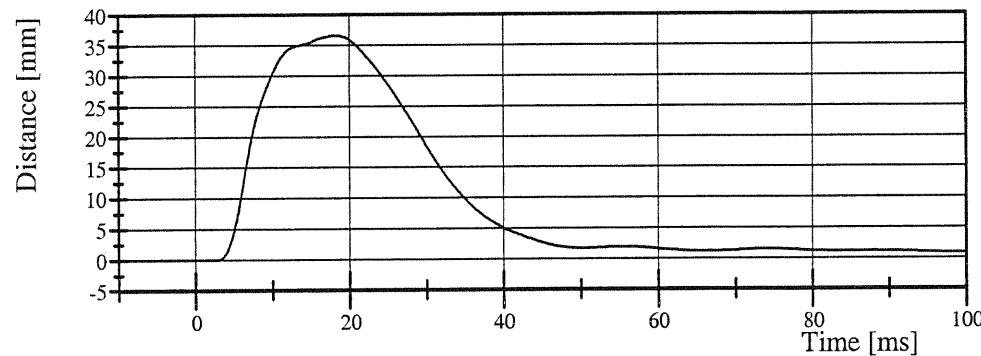


Filter Class: CFC\_600

Max: 34.2 mm at 17.5 ms

Min: -0.0 mm at -8.9 ms

Lower Thorax Rib Displacement



Filter Class: CFC\_600

Max: 36.6 mm at 18.2 ms

Min: -0.0 mm at 2.6 ms

# Transportation Research Center Inc.

Left Lateral Abdomen

SID IIs SBLD Serial No. 056 Certification No. 5-1

Test Date: 6/12/2007

| Test Parameter                   | Specification   | Test Results | Pass |
|----------------------------------|-----------------|--------------|------|
| Temperature                      | 20.6 - 22.2 °C  | 20.9 °C      | Yes  |
| Relative Humidity                | 10 - 70 %       | 47 %         | Yes  |
| Impactor Velocity                | 4.30 - 4.50 m/s | 4.482 m/s    | Yes  |
| Impactor Acceleration            | (-12) - (-16) g | -14.5 g      | Yes  |
| Upper Abdominal Rib Displacement | 39 - 47 mm      | 44.2 mm      | Yes  |
| Lower Abdominal Rib Displacement | 37 - 46 mm      | 43.2 mm      | Yes  |
| Lower Spine Lateral Acceleration | 11.0 - 14.0 g   | 11.60 g      | Yes  |

**Test meets specifications.**

**Comments:**

Technician

Charles W. Beale

Approved

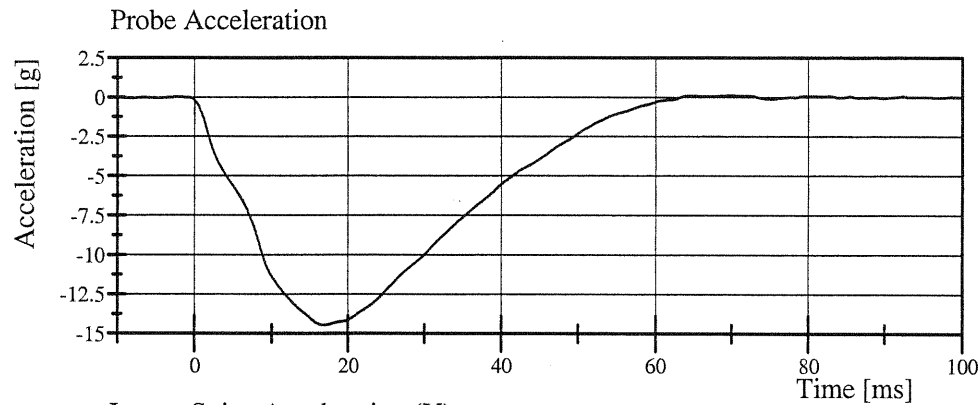
Ron Starnes

# Transportation Research Center Inc.

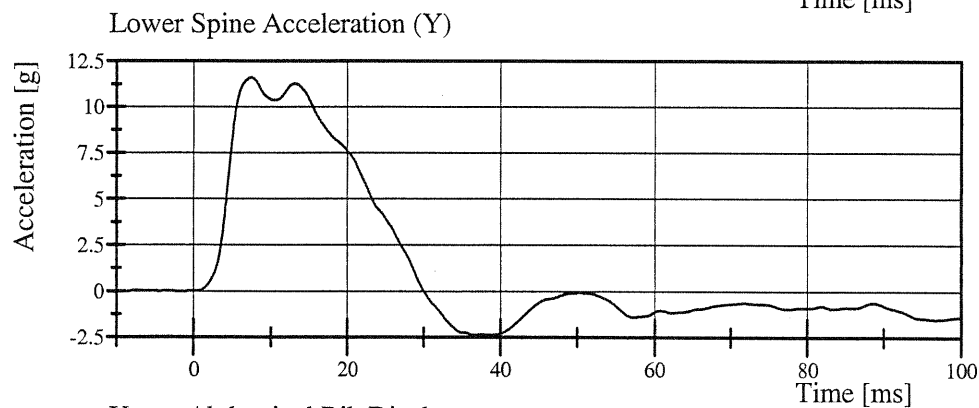
Left Lateral Abdomen

SID IIs SBLD Serial No. 056 Certification No. 5-1

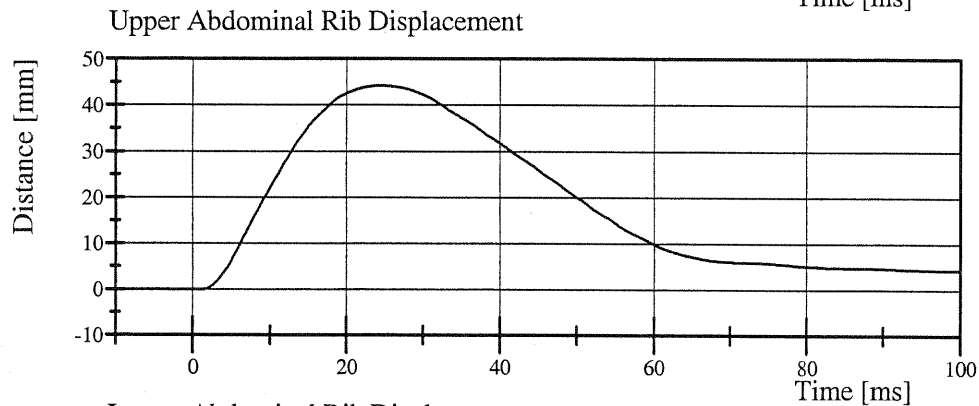
Test Date: 6/12/2007



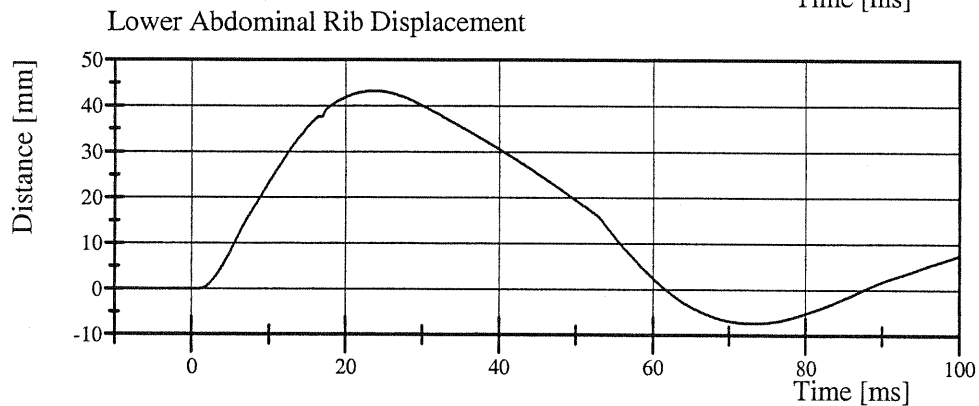
Filter Class: CFC\_180  
Max: 0.1 g at 70.1 ms  
Min: -14.5 g at 16.9 ms



Filter Class: CFC\_180  
Max: 11.6 g at 7.4 ms  
Min: -2.4 g at 36.6 ms



Filter Class: CFC\_600  
Max: 44.2 mm at 24.4 ms  
Min: -0.0 mm at 1.2 ms



Filter Class: CFC\_600  
Max: 43.2 mm at 23.6 ms  
Min: -7.3 mm at 73.3 ms

# Transportation Research Center Inc.

Left Lateral Iliac

SID IIs SBLD Serial No. 056 Certification No. 5-1

Test Date: 6/11/2007

| Test Parameter                   | Specification       | Test Results | Pass |
|----------------------------------|---------------------|--------------|------|
| Temperature                      | 20.6 - 22.2 °C      | 21.2 °C      | Yes  |
| Relative Humidity                | 10 - 70 %           | 49 %         | Yes  |
| Impactor Velocity                | 4.20 - 4.40 m/s     | 4.344 m/s    | Yes  |
| Impactor Acceleration            | (-34.0) - (-40.0) g | -39.10 g     | Yes  |
| Peak Pelvis Lateral Acceleration | 27.0 - 33.0 g       | 30.37 g      | Yes  |
| Iliac Force                      | 3,700 - 4,500 N     | 4,351.3 N    | Yes  |

**Test meets specifications.**

**Comments:**

Technician

Charles W. Bell

Approved

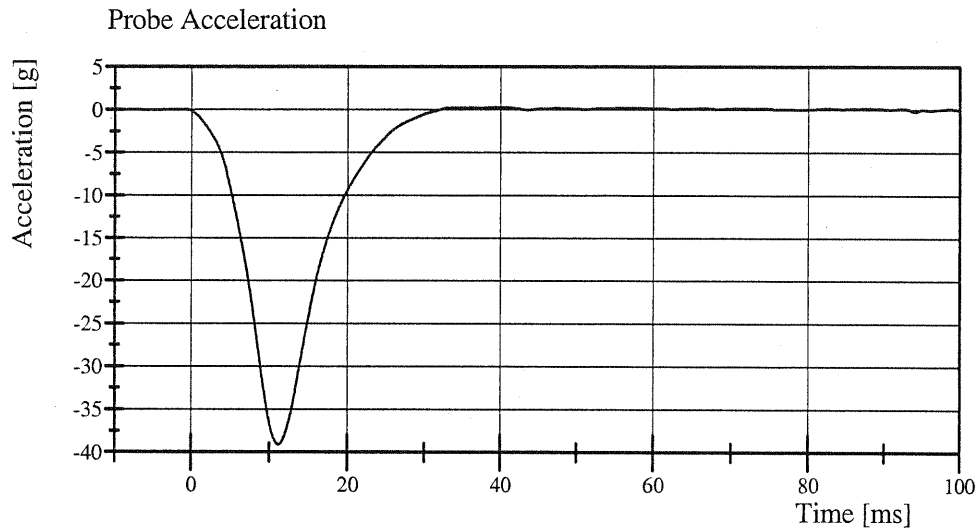
Ron Stoner

# Transportation Research Center Inc.

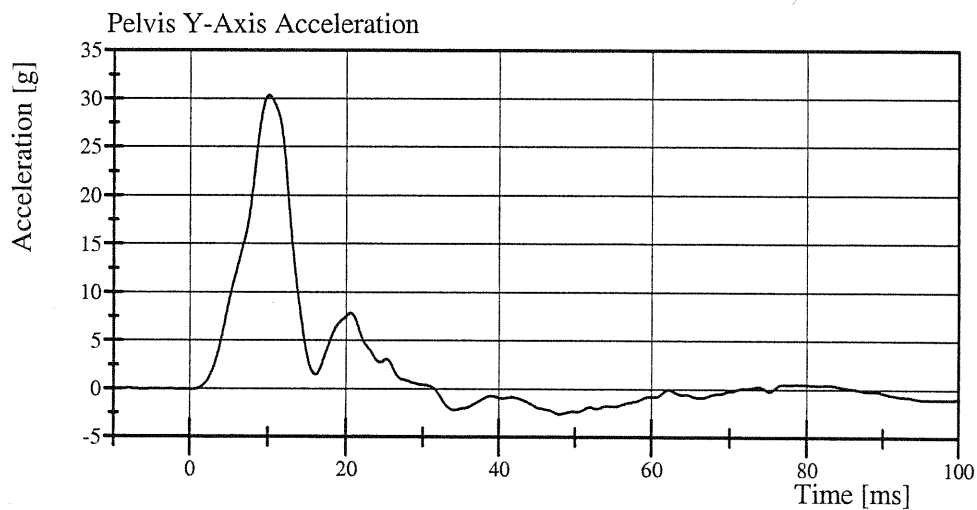
Left Lateral Iliac

SID IIs SBLD Serial No. 056 Certification No. 5-1

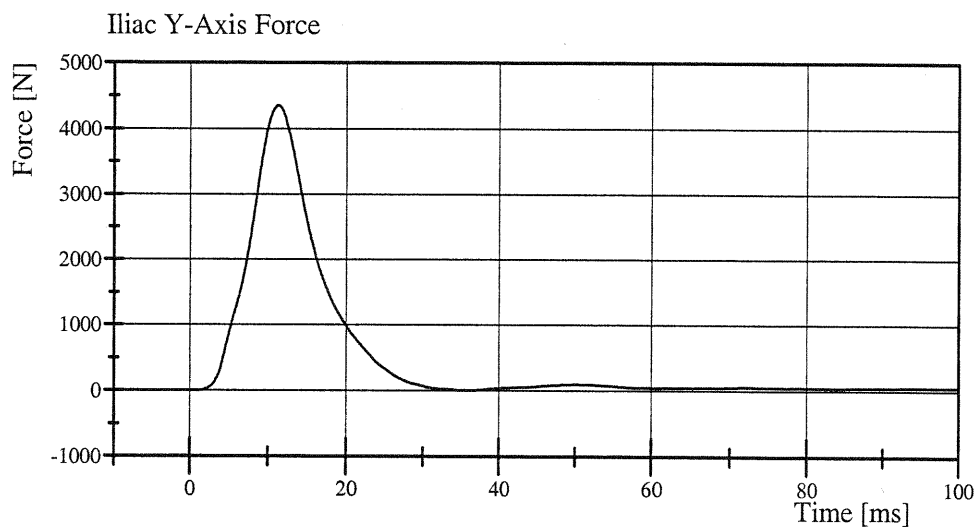
Test Date: 6/11/2007



Filter Class: CFC\_180  
Max: 0.3 g at 39.0 ms  
Min: -39.1 g at 11.2 ms



Filter Class: CFC\_180  
Max: 30.4 g at 10.1 ms  
Min: -2.6 g at 48.0 ms



Filter Class: CFC\_600  
Max: 4,351.3 N at 11.3 ms  
Min: -1.0 N at -6.1 ms

# Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs SBLD Serial No. 056 Certification No. 5-1

Test Date: 6/12/2007

| Test Parameter                   | Specification       | Test Results | Pass |
|----------------------------------|---------------------|--------------|------|
| Temperature                      | 20.6 - 22.2 °C      | 21.4 °C      | Yes  |
| Relative Humidity                | 10 - 70 %           | 54 %         | Yes  |
| Impactor Velocity                | 6.60 - 6.80 m/s     | 6.646 m/s    | Yes  |
| Impactor Acceleration            | (-38.0) - (-47.0) g | -43.18 g     | Yes  |
| Peak Pelvis Lateral Acceleration | 41.0 - 50.0 g       | 41.07 g      | Yes  |
| Acetabulum Force                 | 3,800 - 4,600 N     | 3,952.0 N    | Yes  |

Test meets specifications.

Comments:

Technician

Charles W. Hall

Approved

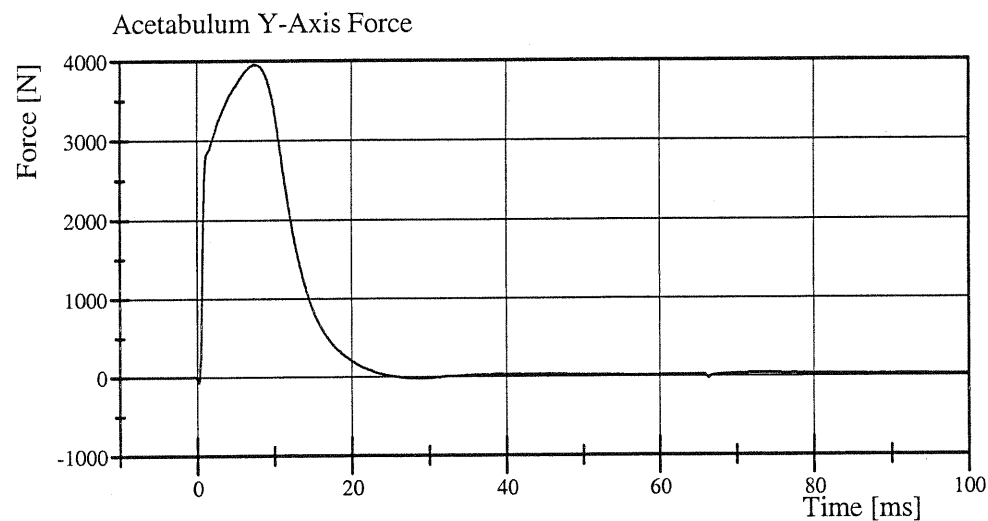
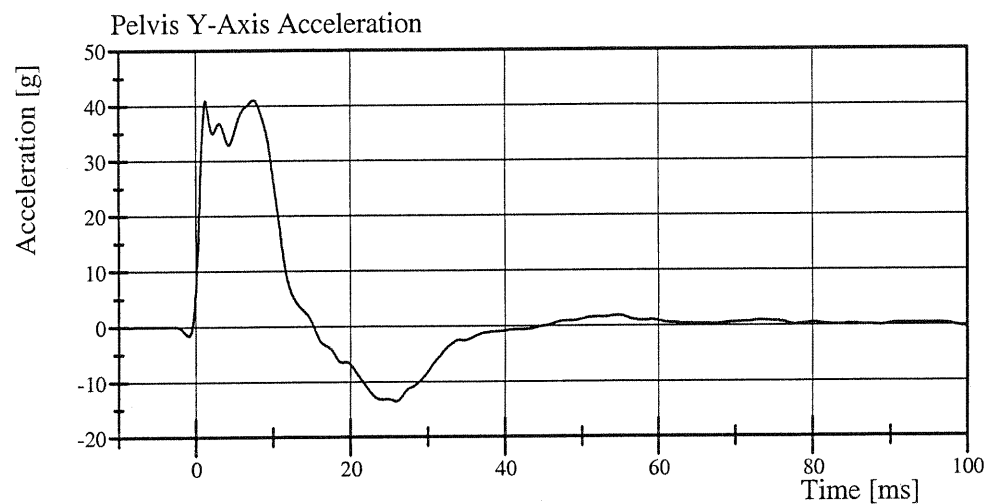
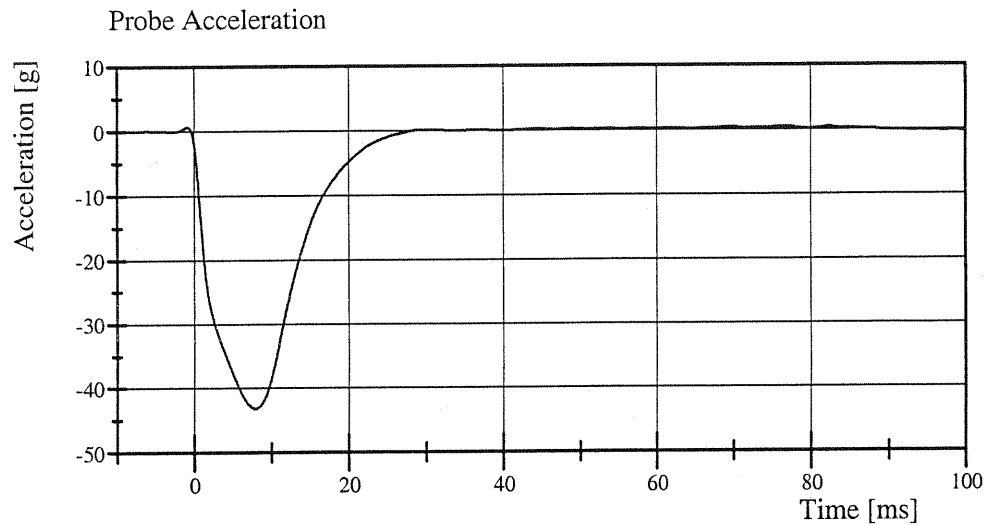
Ron Stur

# Transportation Research Center Inc.

Left Lateral Pelvis

SID IIs SBLD Serial No. 056 Certification No. 5-1

Test Date: 6/12/2007



## Appendix D

### Test Equipment List and Calibration Information

Sign Convention  
SAE J211 MAR95

Accelerometers:

+X: Forward  
+Y: Rightward  
+Z: Downward

Potentiometers:

+Chest longitudinal deflection: Outward  
+Chest lateral deflection: Rightward  
+Seat belt displacement: Outward  
+Seat belt extension: Elongation  
+Knee slider displacement: Distance between femur and tibia increased (in relation to a seated dummy)

Rotation potentiometers:

+About the X-axis: Left foot-eversion  
Right foot-inversion  
+About the Y-axis: Left/right foot-dorsiflexion  
+About the Z-axis: Left foot-internal  
Right foot-external

Load cells:

+Femur force: Tension  
+Seat belt force: Tension  
+Barrier force: Tension

Neck load cells:

+X force: Head pushed rearward  
+Y force: Head pushed leftward  
+Z force: Head pulled upward (tension on neck)  
+X moment: Left ear rotating toward left shoulder  
+Y moment: Chin rotating toward chest  
+Z moment: Chin rotating toward left shoulder

Tibia load cells:

+X force: Ankle forward, knee rearward  
+Y force: Ankle rightward, knee leftward  
+Z force: Tension  
+X moment: Bottom of tibia moving leftward  
+Y moment: Bottom of tibia moving rearward

Sign Convention (Continued)  
SAE J211 MAR95

|                           |            |                                                |
|---------------------------|------------|------------------------------------------------|
| <u>Lumbar load cells:</u> | +X force:  | Chest rearward, pelvis forward                 |
|                           | +Y force:  | Chest leftward, pelvis rightward               |
|                           | +Z force:  | Chest upward, pelvis downward                  |
|                           | +X moment: | Left shoulder toward left hip                  |
|                           | +Y moment: | Sternum toward front of legs                   |
|                           | +Z moment: | Right shoulder forward, left shoulder rearward |

Frequency Response Classes  
SAE J211 MAR95

| <u>Typical Test Measurements</u>             | <u>Channel Class</u> |
|----------------------------------------------|----------------------|
| Vehicle Structural Accelerations for use in: |                      |
| Total vehicle comparison                     | 60                   |
| Collision simulation input                   | 60                   |
| Component analysis                           | 600                  |
| Integration for velocity or displacement     | 180                  |
| Barrier Face Forces                          | 60                   |
| Belt Restraint System Loads                  | 60                   |
| Anthropomorphic Test Device                  |                      |
| Head accelerations (linear and angular)      | 1000                 |
| Neck                                         |                      |
| Forces                                       | 1000                 |
| Moments                                      | 600                  |
| Thorax                                       |                      |
| Spine accelerations                          | 180                  |
| Rib accelerations                            | 1000                 |
| Sternum accelerations                        | 1000                 |
| Deflections                                  | 600                  |
| Lumbar                                       |                      |
| Forces                                       | 1000                 |
| Moments                                      | 1000                 |
| Pelvis                                       |                      |
| Accelerations                                | 1000                 |
| Forces                                       | 1000                 |
| Moments                                      | 1000                 |
| Femur/Knee/Tibia/Ankle                       |                      |
| Forces                                       | 600                  |
| Moments                                      | 600                  |
| Displacements                                | 180                  |
| Sled Accelerations                           | 60                   |
| Steering Column Loads                        | 600                  |
| Head Form Accelerations                      | 1000                 |

The direction column on the following sheets describes the transducer output as mounted and wired in the test location. The polarity column indicates whether a polarity change occurred during data acquisition to conform to J211 MAR95. See Report Sign Convention sheet for description of data output as presented in the report: occasionally channels have been adjusted in post-acquisition processing to conform to J211 MAR95.

# Channel Report Test Number 070628

| Ref | Transducer ID    | ISO Signal Identifier | Description                        | FScale | Units   | DAS  |                                         | Assembly                       |
|-----|------------------|-----------------------|------------------------------------|--------|---------|------|-----------------------------------------|--------------------------------|
|     |                  |                       |                                    |        |         | Flip | Positive Polarity                       |                                |
| 1   | Trig D1          | 10ZERO00000VO0A       | EVENT                              |        | 1 Logic | +    | Bipolar                                 |                                |
| 2   | P54771           | 11HEADCG00S2ACXA      | Head Accel X                       | 1000   | g       | +    | Forward                                 | 1-VRTC SID IIs 056 5/03/07.001 |
| 3   | P49172           | 11HEADCG00S2ACYA      | Head Accel Y                       | 1000   | g       | -    | Leftward                                | 1-VRTC SID IIs 056 5/03/07.002 |
| 4   | P51299           | 11HEADCG00S2ACZA      | Head Accel Z                       | 1000   | g       | -    | Upward                                  | 1-VRTC SID IIs 056 5/03/07.003 |
| 5   | 1716A-1746-FX    | 11NECKUP00S2FOXA      | Upper Neck Force X                 | 8896   | N       | -    | Head forward, chest rearward            | 1-VRTC SID IIs 056 5/03/07.004 |
| 6   | 1716A-1746-FY    | 11NECKUP00S2FOYA      | Upper Neck Force Y                 | 8896   | N       | +    | Head leftward, chest rightward          | 1-VRTC SID IIs 056 5/03/07.005 |
| 7   | 1716A-1746-FZ    | 11NECKUP00S2FOZA      | Upper Neck Force Z                 | 13344  | N       | +    | Head upward, chest downward             | 1-VRTC SID IIs 056 5/03/07.006 |
| 8   | 1716A-1746-MX    | 11NECKUP00S2MOXA      | Upper Neck Moment X                | 282.5  | Nm      | -    | Right ear toward right shoulder         | 1-VRTC SID IIs 056 5/03/07.007 |
| 9   | 1716A-1746-MY    | 11NECKUP00S2MOYA      | Upper Neck Moment Y                | 282.5  | Nm      | +    | Chin toward sternum                     | 1-VRTC SID IIs 056 5/03/07.008 |
| 10  | 1716A-1746-MZ    | 11NECKUP00S2MOZA      | Upper Neck Moment Z                | 282.5  | Nm      | +    | Chin toward left shoulder               | 1-VRTC SID IIs 056 5/03/07.009 |
| 11  | 03E03E21-M01     | 11SHLDLE00S2ACXA      | Shoulder Accel X                   | 2000   | g       | +    | Forward                                 | 1-VRTC SID IIs 056 5/03/07.010 |
| 12  | 03E03E20-N08     | 11SHLDLE00S2ACYA      | Shoulder Accel Y                   | 2000   | g       | +    | Rightward                               | 1-VRTC SID IIs 056 5/03/07.011 |
| 13  | 02I02I05-F15     | 11SHLDLE00S2ACZA      | Shoulder Accel Z                   | 2000   | g       | +    | Downward                                | 1-VRTC SID IIs 056 5/03/07.012 |
| 14  | IF-344-107-FX    | 11SHLDLE00S2FOXA      | Shoulder Force X                   | 2000   | N       | -    | Left shoulder rearward, chest forward   | 1-VRTC SID IIs 056 5/03/07.013 |
| 15  | IF-344-107-FY    | 11SHLDLE00S2FOYA      | Shoulder Force Y                   | 2000   | N       | +    | Left shoulder rightward, chest leftward | 1-VRTC SID IIs 056 5/03/07.014 |
| 16  | IF-344-107-FZ    | 11SHLDLE00S2FOZA      | Shoulder Force Z                   | 2000   | N       | +    | Left shoulder downward, chest upward    | 1-VRTC SID IIs 056 5/03/07.015 |
| 17  | 180-3861-056RBSH | 11SHRILE00S2DSYA      | Shoulder Disp. Y                   | 75     | mm      | -    | Leftward                                | 1-VRTC SID IIs 056 5/03/07.016 |
| 18  | J28686           | 11SPIN0100S2ACXA      | Upper Spine Accel X (Rib1)         | 2000   | g       | -    | Rearward                                | 1-VRTC SID IIs 056 5/03/07.017 |
| 19  | J36038           | 11SPIN0100S2ACYA      | Upper Spine Accel Y (Rib1)         | 2000   | g       | -    | Leftward                                | 1-VRTC SID IIs 056 5/03/07.018 |
| 20  | ADATO            | 11SPIN0100S2ACZA      | Upper Spine Accel Z (Rib1)         | 2000   | g       | +    | Downward                                | 1-VRTC SID IIs 056 5/03/07.019 |
| 21  | 180-3862-056RB1  | 11TRRI01LES2DSYA      | Left Thorax Rib 1 Disp. Y (Rib 1)  | 75     | mm      | -    | Leftward                                | 1-VRTC SID IIs 056 5/03/07.020 |
| 22  | 180-3863-056RB2  | 11TRRI02LES2DSYA      | Left Thorax Rib 2 Disp. Y (Rib 2)  | 75     | mm      | -    | Leftward                                | 1-VRTC SID IIs 056 5/03/07.021 |
| 23  | 180-3864-056RB3  | 11TRRI03LES2DSYA      | Left Thorax Rib 3 Disp. Y (Rib 3)  | 75     | mm      | -    | Leftward                                | 1-VRTC SID IIs 056 5/03/07.022 |
| 24  | 180-3865-056RB4  | 11ABRI01LES2DSYA      | Left Abdomin Rib 1 Disp. Y (Rib 4) | 75     | mm      | -    | Leftward                                | 1-VRTC SID IIs 056 5/03/07.023 |
| 25  | 180-3866-056RB5  | 11ABRI02LES2DSYA      | Left Abdomin Rib 2 Disp. Y (Rib 5) | 75     | mm      | -    | Leftward                                | 1-VRTC SID IIs 056 5/03/07.024 |
| 26  | J28708           | 11TRRI01LES2ACYA      | Left Thorax Rib 1 Accel Y (Rib 1)  | 2000   | g       | +    | Rightward                               | 1-VRTC SID IIs 056 5/03/07.025 |
| 27  | 03E03E21-M18     | 11TRRI02LES2ACYA      | Left Thorax Rib 2 Accel Y (Rib 2)  | 2000   | g       | +    | Rightward                               | 1-VRTC SID IIs 056 5/03/07.026 |
| 28  | 03D03D16-F12     | 11TRRI03LES2ACYA      | Left Thorax Rib 3 Accel Y (Rib 3)  | 2000   | g       | +    | Rightward                               | 1-VRTC SID IIs 056 5/03/07.027 |
| 29  | ACCY3            | 11ABRI01LES2ACYA      | Left Abdomin Rib 1 Accel Y (Rib 4) | 2000   | g       | +    | Rightward                               | 1-VRTC SID IIs 056 5/03/07.028 |
| 30  | EH75J            | 11ABRI02LES2ACYA      | Left Abdomin Rib 2 Accel Y (Rib 5) | 2000   | g       | +    | Rightward                               | 1-VRTC SID IIs 056 5/03/07.029 |
| 31  | 03E03E18-F18     | 11SPIN1200S2ACXA      | Lower Spine Accel X (Rib 4)        | 2000   | g       | -    | Rearward                                | 1-VRTC SID IIs 056 5/03/07.030 |
| 32  | P54290           | 11SPIN1200S2ACYA      | Lower Spine Accel Y (Rib 4)        | 2000   | g       | -    | Leftward                                | 1-VRTC SID IIs 056 5/03/07.031 |
| 33  | J35921           | 11SPIN1200S2ACZA      | Lower Spine Accel Z (Rib 4)        | 2000   | g       | -    | Upward                                  | 1-VRTC SID IIs 056 5/03/07.032 |
| 34  | IF-507-112-FY    | 11ILACLE00S2FOYA      | Left Iliac Wing Force Y            | 13344  | N       | +    | Left iliac rightward, chest leftward    | 1-VRTC SID IIs 056 5/03/07.033 |

# Channel Report Test Number 070628

| Ref | Transducer ID | ISO Signal Identifier | Description                                                            | FScale | Units | DAS<br>Flip | Positive Polarity                               | Assembly                       |
|-----|---------------|-----------------------|------------------------------------------------------------------------|--------|-------|-------------|-------------------------------------------------|--------------------------------|
| 35  | 3249J-260-FY  | 11ACTBLE00S2FOYA      | Left Acetabulum Force Y                                                | 8896   | N     | +           | Left acetabulum<br>rightward, chest<br>leftward | 1-VRTC SID IIs 056 5/03/07.034 |
| 36  | P16493        | 11PELVCG00S2ACXA      | Pelvis Accel X                                                         | 2000   | g     | +           | Forward                                         | 1-VRTC SID IIs 056 5/03/07.035 |
| 37  | AF973         | 11PELVCG00S2ACYA      | Pelvis Accel Y                                                         | 2000   | g     | +           | Rightward                                       | 1-VRTC SID IIs 056 5/03/07.036 |
| 38  | J18736        | 11PELVCG00S2ACZA      | Pelvis Accel Z                                                         | 2000   | g     | +           | Downward                                        | 1-VRTC SID IIs 056 5/03/07.037 |
| 39  | P50953        | 16SILBFR0000ACXA      | RIGHT SIDE SILL AT FRONT SEAT (X) ACCELERATION VS TIME (#1)            | 400    | g     | +           | Forward                                         |                                |
| 40  | P54184        | 16SILBFR0000ACYA      | RIGHT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME (#1)            | 1000   | g     | -           | Leftward                                        |                                |
| 41  | P50952        | 16SILBFR0000ACZA      | RIGHT SIDE SILL AT FRONT SEAT (Z) ACCELERATION VS TIME (#1)            | 400    | g     | -           | Upward                                          |                                |
| 42  | P54560        | 16SILBRE0000ACXA      | RIGHT SIDE SILL AT REAR SEAT (X) ACCELERATION VS TIME (#2)             | 400    | g     | +           | Forward                                         |                                |
| 43  | P54680        | 16SILBRE0000ACYA      | RIGHT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME (#2)             | 1000   | g     | -           | Leftward                                        |                                |
| 44  | P54577        | 16SILBRE0000ACZA      | RIGHT SIDE SILL AT REAR SEAT (Z) ACCELERATION VS TIME (#2)             | 400    | g     | -           | Upward                                          |                                |
| 45  | P49699        | 18FORA000000ACXA      | REAR FLOOR PAN ABOVE AXLE (X) ACCELERATION VS TIME (#3)                | 1000   | g     | +           | Forward                                         |                                |
| 46  | P54815        | 18FORA000000ACYA      | REAR FLOOR PAN ABOVE AXLE (Y) ACCELERATION VS TIME (#3)                | 1000   | g     | -           | Leftward                                        |                                |
| 47  | P45626        | 18FORA000000ACZA      | REAR FLOOR PAN ABOVE AXLE (Z) ACCELERATION VS TIME (#3)                | 1000   | g     | -           | Upward                                          |                                |
| 48  | P54593        | 14SILBFR0000ACYA      | LEFT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME (#5)             | 1000   | g     | +           | Rightward                                       |                                |
| 49  | p54295        | 14SILBRE0000ACYA      | LEFT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME (#4)              | 1000   | g     | +           | Rightward                                       |                                |
| 50  | P47538        | 16VEHCRE0000ACYA      | RIGHT REAR OCCUPANT COMPARTMENT (Y) ACCELERATION VS TIME (#7)          | 1500   | g     | -           | Leftward                                        |                                |
| 51  | P54578        | 11APILLO0000ACYA      | LEFT LOWER A-POST (Y) ACCELERATION VS TIME (#14)                       | 1500   | g     | -           | Leftward                                        |                                |
| 52  | P50851        | 11APILMI0000ACYA      | LEFT MID A-POST (Y) ACCELERATION VS TIME (#15)                         | 1500   | g     | -           | Leftward                                        |                                |
| 53  | P45665        | 14BPILLO0000ACYA      | LEFT LOWER B-POST (Y) ACCELERATION VS TIME (#12)                       | 1500   | g     | -           | Leftward                                        |                                |
| 54  | P49933        | 14BPILMI0000ACYA      | LEFT MID B-POST (Y) ACCELERATION VS TIME (#13)                         | 1500   | g     | -           | Leftward                                        |                                |
| 55  | P49567        | 11SETRFR0000ACYA      | LEFT FRONT SEAT TRACK (Y) ACCELERATION VS TIME (#16)                   | 1500   | g     | +           | Rightward                                       |                                |
| 56  | P47547        | 14SETRLERE00ACYA      | LEFT REAR SEAT TRACK (Y) ACCELERATION VS TIME (#17)                    | 1500   | g     | -           | Leftward                                        |                                |
| 57  | P54196        | 10VEHCCG0000ACXA      | VEHICLE CENTER OF GRAVITY (X) ACCELERATION VS TIME (#18)               | 1000   | g     | +           | Forward                                         |                                |
| 58  | P50283        | 10VEHCCG0000ACYA      | VEHICLE CENTER OF GRAVITY (Y) ACCELERATION VS TIME (#18)               | 1000   | g     | -           | Leftward                                        |                                |
| 59  | P54288        | 10VEHCCG0000ACZA      | VEHICLE CENTER OF GRAVITY (Z) ACCELERATION VS TIME (#18)               | 1000   | g     | -           | Upward                                          |                                |
| 60  | P54548        | 14DOOR000001ACYA      | Vehicle Front Door centerline 430 mm above ground Y acceleration       | 1500   | g     | +           | Rightward                                       |                                |
| 61  | P50888        | 14DOOR000002ACYA      | Vehicle Front Door mid-rear 430 mm above ground Y acceleration         | 1500   | g     | +           | Rightward                                       |                                |
| 62  | P54542        | 14DOOR000003ACYA      | Vehicle Front Door upper centerline 685 mm above ground Y acceleration | 1500   | g     | +           | Rightward                                       |                                |
| 63  | P54844        | 16DOOR000002ACYA      | Vehicle Rear Door mid-rear 430 mm above ground Y acceleration          | 1500   | g     | +           | Rightward                                       |                                |
| 64  | P54540        | 16DOOR000003ACYA      | Vehicle Rear Door upper centerline 685 mm above ground Y acceleration  | 1500   | g     | +           | Rightward                                       |                                |
| 65  | P54547        | 12ENGNTTP0000ACXA     | Top of Engine X acceleration                                           | 1000   | g     | +           | Forward                                         |                                |
| 66  | P54832        | 12ENGNTTP0000ACYA     | Top of Engine Y acceleration                                           | 1000   | g     | -           | Leftward                                        |                                |
| 67  | P54487        | 12VEHC000000ACXA      | Firewall X acceleration                                                | 1000   | g     | +           | Forward                                         |                                |
| 68  | P48540        | 12VEHC000000ACYA      | Firewall Y acceleration                                                | 1000   | g     | -           | Leftward                                        |                                |
| 69  | P54421        | 13ROOF000000ACXA      | Right side Roof Rail (in line with impact point) X acceleration        | 1000   | g     | -           | Rearward                                        |                                |
| 70  | P54329        | 13ROOF000000ACYA      | Right side Roof Rail (in line with impact point) Y acceleration        | 1000   | g     | -           | Leftward                                        |                                |
| 71  | P54620        | 13SILBFR0000ACYA      | Right side sill in-line with impact location Y-axis acceleration       | 1000   | g     | +           | Rightward                                       |                                |
| 72  | P48537        | 18DECK000000ACXA      | Rear deck behind rear axel X-axis accel                                | 1000   | g     | +           | Forward                                         |                                |
| 73  | P54812        | 18DECK000000ACYA      | Rear deck behind rear axel Y-axis accel                                | 1000   | g     | -           | Leftward                                        |                                |
| 74  | P50895        | 18DECK000000ACZA      | Rear deck behind rear axel Z-axis accel                                | 1000   | g     | +           | Downward                                        |                                |
| 75  | ABFire1       | 11AIRBMILE00EV0A      | DRIV. SIDE AIRBAG IND (IP 08)                                          | 5      | V     | +           | Bipolar                                         |                                |
| 76  | Bit.00        | 11CONT000001VO00      | Head contact switch                                                    | 1      | Logic | +           | Bipolar                                         |                                |
| 77  | Bit.01        | 11CONT000002VO00      | Shoulder contact switch                                                | 1      | Logic | +           | Bipolar                                         |                                |
| 78  | Bit.02        | 11CONT000003VO00      | Torso contact switch                                                   | 1      | Logic | +           | Bipolar                                         |                                |
| 79  | Bit.03        | 11CONT000004VO00      | Leg contact switch                                                     | 1      | Logic | +           | Bipolar                                         |                                |

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070628

# Command File Test Number 070628

| Channel | ISO mnemonic     | Channel Title                          | Filter Class | Flip | Zero | Full Scale |
|---------|------------------|----------------------------------------|--------------|------|------|------------|
| 1       | 11HEADCG00S2ACXA | Head X-Axis Acceleration               | 1000         | -    | yes  | 1000       |
| 2       | 11HEADCG00S2ACYA | Head Y-Axis Acceleration               | 1000         | +    | yes  | 1000       |
| 3       | 11HEADCG00S2ACZA | Head Z-Axis Acceleration               | 1000         | -    | yes  | 1000       |
| 3A      | 11HEADCG00S2ACRA | Head Resultant Acceleration            | 1000         |      |      |            |
| 4       | 11NECKUP00S2FOXA | Upper Neck X-Axis Force                | 1000         | +    | yes  | 8896       |
| 5       | 11NECKUP00S2FOYA | Upper Neck Y-Axis Force                | 1000         | +    | yes  | 8896       |
| 6       | 11NECKUP00S2FOZA | Upper Neck Z-Axis Force                | 1000         | +    | yes  | 13344      |
| 7       | 11NECKUP00S2MOXA | Upper Neck Moment About X Axis         | 600          | +    | yes  | 282.5      |
| 8       | 11NECKUP00S2MOYA | Upper Neck Moment About Y Axis         | 600          | +    | yes  | 282.5      |
| 9       | 11NECKUP00S2MOZA | Upper Neck Moment About Z Axis         | 600          | +    | yes  | 282.5      |
| 10      | 11SHLDLE00S2ACXA | Shoulder X-Axis Acceleration           | 1000         | -    | yes  | 2000       |
| 11      | 11SHLDLE00S2ACYA | Shoulder Y-Axis Acceleration           | 1000         | +    | yes  | 2000       |
| 12      | 11SHLDLE00S2ACZA | Shoulder Z-Axis Acceleration           | 1000         | -    | yes  | 2000       |
| 12A     | 11SHLDLE00S2ACRA | Shoulder Resultant Acceleration        | 1000         |      |      |            |
| 13      | 11SHLDLE00S2FOXA | Shoulder X-Axis Force                  | 600          | +    | yes  | 2000       |
| 14      | 11SHLDLE00S2FOYA | Shoulder Y-Axis Force                  | 600          | +    | yes  | 2000       |
| 15      | 11SHLDLE00S2FOZA | Shoulder Z-Axis Force                  | 600          | +    | yes  | 2000       |
| 16      | 11SHRILE00S2DSYA | Shoulder Y-Axis Displacement           | 180          | +    | yes  | 75         |
| 17      | 11SPIN0100S2ACXA | Upper Spine X-Axis Acceleration        | 180          | +    | yes  | 2000       |
| 18      | 11SPIN0100S2ACYA | Upper Spine Y-Axis Acceleration        | 180          | -    | yes  | 2000       |
| 19      | 11SPIN0100S2ACZA | Upper Spine Z-Axis Acceleration        | 180          | -    | yes  | 2000       |
| 19A     | 11SPIN0100S2ACRA | Upper Spine Resultant Acceleration     | 180          |      |      |            |
| 20      | 11TRRI01LES2DSYA | Left Thorax Rib 1 Y-Axis Displacement  | 180          | +    | yes  | 75         |
| 21      | 11TRRI02LES2DSYA | Left Thorax Rib 2 Y-Axis Displacement  | 180          | +    | yes  | 75         |
| 22      | 11TRRI03LES2DSYA | Left Thorax Rib 3 Y-Axis Displacement  | 180          | +    | yes  | 75         |
| 23      | 11ABRI01LES2DSYA | Left Abdomen Rib 1 Y-Axis Displacement | 180          | +    | yes  | 75         |
| 24      | 11ABRI02LES2DSYA | Left Abdomen Rib 2 Y-Axis Displacement | 180          | +    | yes  | 75         |
| 25      | 11TRRI01LES2ACYA | Left Thorax Rib 1 Y-Axis Acceleration  | 1000         | +    | yes  | 2000       |
| 26      | 11TRRI02LES2ACYA | Left Thorax Rib 2 Y-Axis Acceleration  | 1000         | +    | yes  | 2000       |
| 27      | 11TRRI03LES2ACYA | Left Thorax Rib 3 Y-Axis Acceleration  | 1000         | +    | yes  | 2000       |
| 28      | 11ABRI01LES2ACYA | Left Abdomen Rib 1 Y-Axis Acceleration | 1000         | +    | yes  | 2000       |
| 29      | 11ABRI02LES2ACYA | Left Abdomen Rib 2 Y-Axis Acceleration | 1000         | +    | yes  | 2000       |
| 30      | 11SPIN1200S2ACXA | Lower Spine X-Axis Acceleration        | 180          | -    | yes  | 2000       |
| 31      | 11SPIN1200S2ACYA | Lower Spine Y-Axis Acceleration        | 180          | +    | yes  | 2000       |
| 32      | 11SPIN1200S2ACZA | Lower Spine Z-Axis Acceleration        | 180          | -    | yes  | 2000       |
| 32A     | 11SPIN1200S2ACRA | Lower Spine Resultant Acceleration     | 180          |      |      |            |
| 33      | 11ILACLE00S2FOYA | Left Iliac Wing Y-Axis Force           | 600          | +    | yes  | 13344      |

# Command File Test Number 070628

| Channel | ISO mnemonic     | Channel Title                                        | Filter Class | Flip | Zero | Full Scale |
|---------|------------------|------------------------------------------------------|--------------|------|------|------------|
| 34      | 11ACTBLE00S2FOYA | Left Acetabulum Y-Axis Force                         | 600          | +    | yes  | 8896       |
| 35      | 11PELVCG00S2ACXA | Pelvis X-Axis Acceleration                           | 1000         | -    | yes  | 2000       |
| 36      | 11PELVCG00S2ACYA | Pelvis Y-Axis Acceleration                           | 1000         | +    | yes  | 2000       |
| 37      | 11PELVCG00S2ACZA | Pelvis Z-Axis Acceleration                           | 1000         | -    | yes  | 2000       |
| 37A     | 11PELVCG00S2ACRA | Pelvis Resultant Acceleration                        | 1000         |      |      |            |
| 38      | 16SILBFR0000ACXA | Right Side Sill at Front Seat X-Axis Acceleration    | 60           | -    | yes  | 400        |
| 38A     | 16SILBFR0000VEXC | Right Side Sill at Front Seat X-Axis Velocity        | 180          |      |      |            |
| 38B     | 16SILBFR0000DCXC | Right Side Sill at Front Seat X-Axis Displacement    | 180          |      |      |            |
| 39      | 16SILBFR0000ACYA | Right Side Sill at Front Seat Y-Axis Acceleration    | 60           | +    | yes  | 1000       |
| 39A     | 16SILBFR0000VEYC | Right Side Sill at Front Seat Y-Axis Velocity        | 180          |      |      |            |
| 39B     | 16SILBFR0000DCYC | Right Side Sill at Front Seat Y-Axis Displacement    | 180          |      |      |            |
| 40      | 16SILBFR0000ACZA | Right Side Sill at Front Seat Z-Axis Acceleration    | 60           | -    | yes  | 400        |
| 40A     | 16SILBFR0000ACRA | Right Side Sill at Front Seat Resultant Acceleration | 60           |      |      |            |
| 41      | 16SILBRE0000ACXA | Right Side Sill at Rear Seat X-Axis Acceleration     | 60           | -    | yes  | 400        |
| 41A     | 16SILBRE0000VEXC | Right Side Sill at Rear Seat X-Axis Velocity         | 180          |      |      |            |
| 41B     | 16SILBRE0000DCXC | Right Side Sill at Rear Seat X-Axis Displacement     | 180          |      |      |            |
| 42      | 16SILBRE0000ACYA | Right Side Sill at Rear Seat Y-Axis Acceleration     | 60           | +    | yes  | 1000       |
| 42A     | 16SILBRE0000VEYC | Right Side Sill at Rear Seat Y-Axis Velocity         | 180          |      |      |            |
| 42B     | 16SILBRE0000DCYC | Right Side Sill at Rear Seat Y-Axis Displacement     | 180          |      |      |            |
| 43      | 16SILBRE0000ACZA | Right Side Sill at Rear Seat Z-Axis Acceleration     | 60           | -    | yes  | 400        |
| 43A     | 16SILBRE0000ACRA | Right Side Sill at Rear Seat Resultant Acceleration  | 60           |      |      |            |
| 44      | 18FORA000000ACXA | Rear Floorpan Above Axle X-Axis Acceleration         | 60           | -    | yes  | 1000       |
| 45      | 18FORA000000ACYA | Rear Floorpan Above Axle Y-Axis Acceleration         | 60           | +    | yes  | 1000       |
| 46      | 18FORA000000ACZA | Rear Floorpan Above Axle Z-Axis Acceleration         | 60           | -    | yes  | 1000       |
| 47      | 14SILBFR0000ACYA | Left Side Sill at Front Seat Y-Axis Acceleration     | 60           | +    | yes  | 1000       |
| 47A     | 14SILBFR0000VEYC | Left Side Sill at Front Seat Y-Axis Velocity         | 180          |      |      |            |
| 47B     | 14SILBFR0000DCYC | Left Side Sill at Front Seat Y-Axis Displacement     | 180          |      |      |            |
| 48      | 14SILBRE0000ACYA | Left Side Sill at Rear Seat Y-Axis Acceleration      | 60           | +    | yes  | 1000       |
| 48A     | 14SILBRE0000VEYC | Left Side Sill at Rear Seat Y-Axis Velocity          | 180          |      |      |            |
| 48B     | 14SILBRE0000DCYC | Left Side Sill at Rear Seat Y-Axis Displacement      | 180          |      |      |            |
| 49      | 16VEHCRE0000ACYA | Right Rear Occupant Compartment Y-Axis Acceleration  | 60           | +    | yes  | 1500       |
| 50      | 11APILLO0000ACYA | Left Lower A-Pillar Y-Axis Acceleration              | 60           | +    | yes  | 1500       |
| 51      | 11APILMI0000ACYA | Left Mid A-Pillar Y-Axis Acceleration                | 60           | +    | yes  | 1500       |
| 52      | 14BPILLO0000ACYA | Left Lower B-Pillar Y-Axis Acceleration              | 60           | +    | yes  | 1500       |
| 53      | 14BPILMI0000ACYA | Left Mid B-Pillar Y-Axis Acceleration                | 60           | +    | yes  | 1500       |
| 54      | 11SETRFR0000ACYA | Left Front Seat Track Y-Axis Acceleration            | 60           | +    | yes  | 1500       |
| 55      | 14SETRLERE00ACYA | Left Rear Seat Track Y-Axis Acceleration             | 60           | -    | yes  | 1500       |

# Command File Test Number 070628

| Channel | ISO mnemonic     | Channel Title                                                    | Filter Class | Flip | Zero | Full Scale |
|---------|------------------|------------------------------------------------------------------|--------------|------|------|------------|
| 56      | 10VEHCCG0000ACXA | Vehicle Center of Gravity X-Axis Acceleration                    | 60           | -    | yes  | 1000       |
| 57      | 10VEHCCG0000ACYA | Vehicle Center of Gravity Y-Axis Acceleration                    | 60           | +    | yes  | 1000       |
| 58      | 10VEHCCG0000ACZA | Vehicle Center of Gravity Z-Axis Acceleration                    | 60           | -    | yes  | 1000       |
| 58A     | 10VEHCCG0000ACRA | Vehicle Center of Gravity Resultant Acceleration                 | 60           |      |      |            |
| 59      | 14DOOR000001ACYA | Vehicle Front Door Centerline Y-Axis Acceleration                | 60           | +    | yes  | 1500       |
| 60      | 14DOOR000002ACYA | Vehicle Front Door Mid-Rear Y-Axis Acceleration                  | 60           | +    | yes  | 1500       |
| 61      | 14DOOR000003ACYA | Vehicle Front Door Upper Centerline Y-Axis Acceleration          | 60           | +    | yes  | 1500       |
| 62      | 16DOOR000002ACYA | Vehicle Rear Door Mid-Rear Y-Axis Acceleration                   | 60           | +    | yes  | 1500       |
| 63      | 16DOOR000003ACYA | Vehicle Rear Door Upper Centerline Y-Axis Acceleration           | 60           | +    | yes  | 1500       |
| 64      | 12ENGNT0000ACXA  | Top of Engine X-Axis Acceleration                                | 60           | -    | yes  | 1000       |
| 65      | 12ENGNT0000ACYA  | Top of Engine Y-Axis Acceleration                                | 60           | +    | yes  | 1000       |
| 66      | 12VEHC000000ACXA | Firewall X-Axis Acceleration                                     | 60           | -    | yes  | 1000       |
| 67      | 12VEHC000000ACYA | Firewall Y-Axis Acceleration                                     | 60           | +    | yes  | 1000       |
| 68      | 13ROOF000000ACXA | Right Side Roof Rail X-Axis Acceleration                         | 60           | -    | yes  | 1000       |
| 69      | 13ROOF000000ACYA | Right Side Roof Rail Y-Axis Acceleration                         | 60           | +    | yes  | 1000       |
| 70      | 13SILBFR0000ACYA | Right Side Sill In-Line With Impact Location Y-Axis Acceleration | 60           | +    | yes  | 1000       |
| 71      | 18DECK000000ACXA | Rear Deck Behind Rear Axle X-Axis Acceleration                   | 60           | -    | yes  | 1000       |
| 72      | 18DECK000000ACYA | Rear Deck Behind Rear Axle Y-Axis Acceleration                   | 60           | +    | yes  | 1000       |
| 73      | 18DECK000000ACZA | Rear Deck Behind Rear Axle Z-Axis Acceleration                   | 60           | -    | yes  | 1000       |
| 74      | 11AIRBMILE00EV0A | Driver Side Airbag                                               | 1000         | +    | no   | 5          |
| 75      | 11CONT000001VO00 | Head Contact Switch                                              | 0            | +    | no   | 1          |
| 76      | 11CONT000002VO00 | Shoulder Contact Switch                                          | 0            | +    | no   | 1          |
| 77      | 11CONT000003VO00 | Torso Contact Switch                                             | 0            | +    | no   | 1          |
| 78      | 11CONT000004VO00 | Leg Contact Switch                                               | 0            | +    | no   | 1          |

# 2007 SUBARU IMPREZA LEFT SIDE FMVSS 214 POLE IMPACT AT 32 KPH

