FHA, FOIL 2010, REAR IMPACT TEST, 10008,

Report

Vehicle Specifications

Jeep Autocheck

Jeep CVS PG 8

Jeep Motoverse PG 10

Taurus Autocheck PG 12

Taurus CVS PG 18

Taurus Motoverse PG 20

Report PG 22

Impact test 1 report PG 35

Impact test 1 final report PG 69

FHA, FOIL 2010, REAR IMPACT TEST, 10008,

Report

Vehicle Specifications

Jeep Autocheck

AutoCheck
A part of Experian

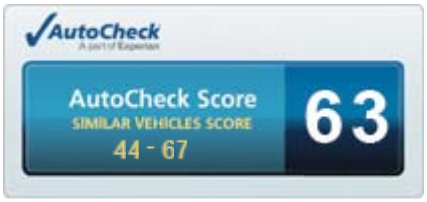
AutoCheck Vehicle History Report

1995 Jeep Grand Cherokee Limited / Orvis

Report Run Date: 2010-09-25 16:43:13.943 EDT

VIN:	1J4GZ78Y7SC[redacted]
Year :	1995
Make :	Jeep
Model:	Grand Cherokee Limited / Orvis
Style/Body:	SUV 4D
Class:	SUV - Lower Mid Range
Engine:	5.2L V8 MPI
Country of Assembly:	United States
Vehicle Age:	15 year(s)
Calculated Owners:	N/A
Calculated Accidents:	0
Last Reported Odometer Reading:	202,243

This AutoCheck Score



The AutoCheck Score is a summary of your vehicle's history, letting you compare vehicles with ease.

This vehicle qualifies for Buyback Protection

Safeguard your investment with AutoCheck Buyback Protection, which reduces the risk in buying a used vehicle.

Section summaries

The vehicle identification number you submitted has been analyzed and summary information on your car is shown below.

Title and ProblemCheck:	✓	Your vehicle checks out!
OdometerCheck:	✓	Your vehicle checks out!
Vehicle Use and EventCheck:	ⓘ	Specific vehicle use(s) or events reported
Full History:	ⓘ	Detailed information available

Title and ProblemCheck

Your vehicle checks out! AutoCheck's database for this 1995 Jeep Grand Cherokee Limited / Orvis (1J4GZ78Y7SC687528) shows no negative titles or other problems. When reported to AutoCheck, these events can indicate serious past damage or other significant problems, and disqualifies the vehicle for AutoCheck Buyback

Protection. Check the Vehicle Use and EventCheck for reported accidents that can affect vehicle safety and value.

0 Problem(s) Reported:	15 Title/Problem areas checked:
✓	No abandoned title record
✓	No damaged title or major damage incident record
✓	No fire damaged title record
✓	No grey market title record
✓	No hail damage title record
✓	No insurance loss title or probable total loss record
✓	No junk or scrapped title record
✓	No manufacturer buyback/lemon title record
✓	No odometer problem title record
✓	No rebuilt/rebuildable title record
✓	No salvage title or salvage auction record
✓	No water damaged title record
✓	No NHTSA crash test record
✓	No frame/unibody damage record
✓	No recycling facility record

OdometerCheck

Your vehicle checks out! AutoCheck examined the reported odometer readings reported to AutoCheck for this 1995 Jeep Grand Cherokee Limited / Orvis (1J4GZ78Y7SC687528) and no indication of an odometer rollback or tampering was found. AutoCheck uses business rules to determine if reported odometer readings are significantly less than previously reported values. Not all reported odometer readings are used. Title and auction events also report odometer tampering or breakage.

0 Problem(s) Reported:	Mileage	Date Reported
✓	50,781	05/15/1998
✓	94,961	01/02/2001
✓	121,000	04/17/2002
✓	124,073	10/03/2002
✓	127,032	11/07/2002
✓	171,445	11/19/2004
✓	202,243	01/02/2007

Vehicle Use and EventCheck

Information Reported! AutoCheck shows additional vehicle uses or events reported to AutoCheck for this 1995 Jeep Grand Cherokee Limited / Orvis (1J4GZ78Y7SC[redacted] . This includes reported vehicle uses such as rental or lease, and events such as whether the vehicle has been reported to have had a loan/lien or duplicate title issued. Other events show if the vehicle has a reported accident and how many calculated accidents or if it has been reported stolen or repossessed. It is recommended to have pre-owned vehicles inspected by a third party prior to purchase.

0 Event(s) Reported:	6 Vehicle uses checked:
✓	No fleet, rental and/or lease use record
✓	No taxi use record
✓	No police use record
✓	No government use record
✓	No livery use record
✓	No driver education record

2 Event(s) Reported:	9 Vehicle events checked:
✓	No accident record reported through accident data sources
ℹ	**Corrected title record(s)**
✓	No duplicate title record
ℹ	**Emission/safety inspection record(s)**
✓	No loan/lien record
✓	No fire damage incident record
✓	No repossessed record
✓	No theft record
✓	No storm area registration/title record

Full History

Below are the historical events for this vehicle listed in chronological order. Any discrepancies will be in bold text.

Report Run Date: 2010-09-25 16:43:13.943 EDT

Vehicle: 1995 Jeep Grand Cherokee Limited / Orvis (1J4GZ78Y7SC[redacted])

Event Date	Event Location	Odometer Reading	Data Source	Event Detail
06/13/1996	HIGHLAND PARK, IL		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL

10/28/1997	HIGHLAND PARK, IL		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL
05/15/1998	SCHAUMBURG, IL	50,781	Independent Source	VEHICLE IN DEALER INVENTORY
06/24/1998	CHICAGO, IL		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL
01/10/2000	DEERFIELD, IL		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL
09/14/2000	BUFFALO GROVE, IL		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL
01/02/2001	CHICAGO, IL	94,961	Motor Vehicle Dept.	TITLE (Title #:T1002090040) CORRECTED TITLE
09/18/2001	VERNON HILLS, IL		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL
04/17/2002	LINCOLNSHIRE, IL	121,000	State Agency	PASSED EMISSION INSPECTION
10/03/2002	CENTREVILLE, VA	124,073	Motor Vehicle Dept.	TITLE REGISTRATION EVENT/RENEWAL
11/07/2002	VIENNA, VA	127,032	Independent Emission Source	PASSED EMISSION INSPECTION
12/11/2002	CENTREVILLE, VA		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL
12/02/2003	FALLS CHURCH, VA		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL
11/19/2004	SPRINGFIELD, VA	171,445	Independent Emission Source	PASSED EMISSION INSPECTION
11/23/2004	SPRINGFIELD, VA		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL
01/02/2007	LORTON, VA	202,243	Independent Emission Source	PASSED EMISSION INSPECTION
01/30/2007	MC LEAN, VA		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL

This Vehicle's Glossary

Below are the specific definitions for events that appear in this vehicle's report.
More information is available in the full AutoCheck glossary.

Term	Section Location	Definition
Corrected Title	Vehicle Use and EventCheck	The State DMV has issued a corrected title for the vehicle.

Emission/Safety Inspection	Vehicle Use and EventCheck	An approved emission testing station has inspected the vehicle to measure the amount of pollutants the vehicle emits into the environment.

AutoCheck vehicle history report Terms and Conditions

This report, and any reliance upon it, is subject to AutoCheck Terms and Conditions. If you obtained the report from a dealer, the dealer has been provided with these Terms & Conditions and can share them with you. These AutoCheck Terms and Conditions are also available at any time at www.autocheck.com/consumers/disclaimer.do or by writing to Experian: Experian Automotive C/O AutoCheck Customer Service 955 American Lane Schaumburg IL 60173

AutoCheck Buyback Protection Terms and Conditions

This vehicle (1J4GZ78Y7SC687528) qualifies for AutoCheck Buyback Protection. If you obtained the report from a dealer, the dealer has been provided with the terms and can share them with you. These Buyback Protection Terms and Conditions are also available to you at any time at www.autocheck.com/bbpterms or by writing to Experian: Experian Automotive C/O AutoCheckCustomer Service 955 American Lane Schaumburg IL 60173

About AutoCheck

AutoCheck vehicle history reports by Experian Automotive is the leading vehicle history reporting service. With expert data handling, the Experian Automotive database houses over 4 billion records on a half a billion vehicles. Every AutoCheck vehicle history report will give you confidence when buying or selling your next used vehicle, with superior customer service every step of the way.

FHA, FOIL 2010, REAR IMPACT TEST, 10008,

Report

Vehicle Specifications

Jeep CVS

1995 JEEP GRAND CHEROKEE 4DR/4WD SE/LAREDO/LTD/ORVIS 5L

A	Longitudinal distance between the center of the front bumper and the center of the base of the windshield	47.7 in
B	Passenger Car Longitudinal distance between the center of the rear bumper and the center of the base of the backlight Station Wagon and Vans Longitudinal distance between the backlight top moulding and the front door latch pillar Pick-ups Longitudinal distance between the rearmost projection and the front door latch pillar	80.0 in
C	The maximum vertical height of the side glass	17.7 in
D	Vertical distance between the base of the side glass and the lower edge of the rocker panel	29.2 in
E	Distance between side rails or maximum width of top	48.5 in
F	Front overhang	31.9 in
G	Rear overhang	39.0 in
OL	Overall length	176.9 in
OW	Overall width	69.3 in
OH	Overall height	65.0 in
WB	Wheelbase	106.0 in
TWF	Front track width	57.9 in
TWR	Rear track width	57.9 in
CW	Curb weight	3667 lb
WD	Weight distribution (Front/Rear)	N/A

Measurements obtained in year: 94

FHA, FOIL 2010, REAR IMPACT TEST, 10008,

Report

Vehicle Specifications

Jeep Motoverse

Success!

The VIN you provided belongs to a vehicle that was manufactured in the USA by the Jeep corporation.

1995 JEEP

GRAND CHEROKEE LMTD / ORVIS

VIN:	1J4GZ78Y7SC[redacted]
World region:	North America
Manufactured in:	USA
Year:	1995
Make:	Jeep
Model:	GRAND CHEROKEE LMTD/ORVIS
Body style:	Wagon 4 Door
Transmission:	4 Spd Automatic
Drive type:	4WD
Cylinders:	8 Cylinders
Safety restraints:	Driver Front Air Bag
Standard options:	Air Conditioning, Power Steering, Power Brakes, Tilt Wheel, AM/FM Stereo, Cassette, ABS (4-Wheel)

Share this report: http://www.motoverse.com/tools/vinDecoder/1J4GZ78Y7SC687528

Can Motoverse tell me if this vehicle has been in an accident?

No. Our database is for identification only. Free CARFAX Record Check: 1J4GZ78Y7SC[redacted] Go

Can Motoverse tell me if this vehicle has been stolen?

No. Our database is for identification only. The NICB has a VIN check for stolen vehicles.

Go back

FHA, FOIL 2010, REAR IMPACT TEST, 10008,

Report

Vehicle Specifications

Taurus Autocheck

AutoCheck
A part of Experian

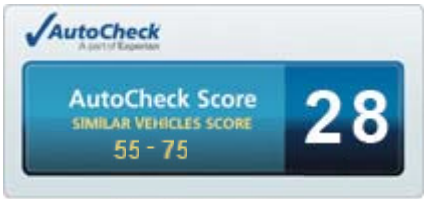
AutoCheck Vehicle History Report

2000 Ford Taurus SE

Report Run Date: 2010-09-25 16:39:10.196 EDT

VIN:	1FAFP58S0YA[redacted]
Year :	2000
Make :	Ford
Model:	Taurus SE
Style/Body:	Wagon 4D
Class:	Mid Range Car - Premium
Engine:	3.0L V6 EFI
Country of Assembly:	United States
Vehicle Age:	10 year(s)
Calculated Owners:	3
Calculated Accidents:	1
Last Reported Odometer Reading:	148,434

This AutoCheck Score



The AutoCheck Score is a summary of your vehicle's history, letting you compare vehicles with ease.

This vehicle does not qualify for Buyback Protection

Unfortunately, this vehicle does not qualify for our Buyback Protection program.

Section summaries

The vehicle identification number you submitted has been analyzed and summary information on your car is shown below.

Title and ProblemCheck:		**Major title or other problem(s) reported**
OdometerCheck:		Your vehicle checks out!
Vehicle Use and EventCheck:		Specific vehicle use(s) or events reported
Full History:		**Detailed information available**

Title and ProblemCheck

Problem Reported! AutoCheck's database for this 2000 Ford Taurus SE (1FAFP58S0YA[redacted]) shows a negative title(s) or other problems. When reported to AutoCheck, these events can indicate serious past damage or other significant problems, and disqualifies the vehicle for AutoCheck Buyback Protection. Check the Vehicle Use

and EventCheck for reported accidents.

2 Problem(s) Reported:	15 Title/Problem areas checked:
✓	No abandoned title record
✓	No damaged title or major damage incident record
✓	No fire damaged title record
✓	No grey market title record
✓	No hail damage title record
!	**Insurance loss title or probable total loss record(s)**
✓	No junk or scrapped title record
✓	No manufacturer buyback/lemon title record
✓	No odometer problem title record
✓	No rebuilt/rebuildable title record
!	**Salvage title or salvage auction record(s)**
✓	No water damaged title record
✓	No NHTSA crash test record
✓	No frame/unibody damage record
✓	No recycling facility record

OdometerCheck

Your vehicle checks out! AutoCheck examined the reported odometer readings reported to AutoCheck for this 2000 Ford Taurus SE (1FAFP58S0YA254876) and no indication of an odometer rollback or tampering was found. AutoCheck uses business rules to determine if reported odometer readings are significantly less than previously reported values. Not all reported odometer readings are used. Title and auction events also report odometer tampering or breakage.

0 Problem(s) Reported:	Mileage	Date Reported
✓	5	07/28/2000
✓	32,279	07/12/2002
✓	66,494	06/04/2004
✓	106,917	07/20/2006
✓	124,908	10/04/2007
✓	124,908	11/08/2007
✓	127,236	04/29/2008

	148,434	01/14/2010

Vehicle Use and EventCheck

Information Reported! AutoCheck shows additional vehicle uses or events reported to AutoCheck for this 2000 Ford Taurus SE (1FAFP58S0YA[redacted]). This includes reported vehicle uses such as rental or lease, and events such as whether the vehicle has been reported to have had a loan/lien or duplicate title issued. Other events show if the vehicle has a reported accident and how many calculated accidents or if it has been reported stolen or repossessed. It is recommended to have pre-owned vehicles inspected by a third party prior to purchase.

0 Event(s) Reported:	**6 Vehicle uses checked:**
	No fleet, rental and/or lease use record
	No taxi use record
	No police use record
	No government use record
	No livery use record
	No driver education record

3 Event(s) Reported:	**9 Vehicle events checked:**
	1 Accident record(s) reported through accident data sources
	No corrected title record
	Duplicate title record(s)
	Emission/safety inspection record(s)
	No loan/lien record
	No fire damage incident record
	No repossessed record
	No theft record
	No storm area registration/title record

Full History

Below are the historical events for this vehicle listed in chronological order. Any discrepancies will be in bold text.

Report Run Date: 2010-09-25 16:39:10.196 EDT

Vehicle: 2000 Ford Taurus SE (1FAFP58S0YA[redacted]

Event Date	Event Location	Odometer Reading	Data Source	Event Detail

06/05/2000			Independent Source	VEHICLE MANUFACTURED AND SHIPPED TO DEALER
07/21/2000	STERLING, VA		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL
07/28/2000	STERLING, VA	5	Motor Vehicle Dept.	TITLE
07/13/2001	STERLING, VA		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL
07/12/2002	STERLING, VA	32,279	Independent Emission Source	PASSED EMISSION INSPECTION
07/16/2002	STERLING, VA		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL
06/04/2004	STERLING, VA	66,494	Independent Emission Source	PASSED EMISSION INSPECTION
06/18/2004	STERLING, VA		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL
07/06/2005	STERLING, VA		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL
07/20/2006	STERLING, VA	106,917	Independent Emission Source	PASSED EMISSION INSPECTION
07/21/2006	STERLING, VA		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL
07/23/2007	STERLING, VA		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL
09/11/2007	VA		Accident Source	COLLISION WITH ANOTHER VEHICLE (Case #:072690634)
09/11/2007	STERLING, VA		Accident Source	ACCIDENT REPORTED
10/04/2007	**CHARLOTTESVILLE, VA**	**124,908**	**Motor Vehicle Dept.**	**TITLE INSURANCE LOSS POSSIBLE TOTAL LOSS - VEHICLE TITLED/REGISTERED TO AN INSURANCE COMPANY**
11/08/2007	**TITUSVILLE, PA**	**124,908**	**Salvage Auction**	**SOLD AT SALVAGE AUCTION / COLLISION DAMAGE REPORTED FRONT IMPACT REPORTED**
04/29/2008	UPPER MARLBORO, MD	127,236	Motor Vehicle Dept.	TITLE (Title #[redacted]) REGISTRATION EVENT/RENEWAL
10/01/2008	UPPER MARLBORO, MD		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL

07/29/2009	UPPER MARLBORO, MD		Motor Vehicle Dept.	TITLE (Title # [redacted]) DUPLICATE TITLE
01/14/2010	LANHAM, MD	148,434	Motor Vehicle Dept.	TITLE (Title # [redacted])
02/26/2010	LANHAM, MD		Motor Vehicle Dept.	REGISTRATION EVENT/RENEWAL

This Vehicle's Glossary

Below are the specific definitions for events that appear in this vehicle's report.
More information is available in the full AutoCheck glossary.

Term	Section Location	Definition
Salvage Auction	Title and ProblemCheck	An auction has reported the vehicle as a salvaged vehicle. The extent of damage is unknown, and the vehicle may or may not be severely damaged.
Insurance or Probable Total Loss	Title and ProblemCheck	This vehicle was reported an insurance or probable total loss due to an accident or theft.
Emission/Safety Inspection	Vehicle Use and EventCheck	An approved emission testing station has inspected the vehicle to measure the amount of pollutants the vehicle emits into the environment.
Accident or Vehicle Damage	Vehicle Use and EventCheck	Reported accidents or damage events are a result of vehicle collisions or other non-collision incidents such as vandalism or theft. Not all accidents or damage events are reported to AutoCheck. Certain accident or damage events are reported by the source to have resulted in minor, moderate or severe damage to the vehicle, or the events are calculated by AutoCheck to have resulted in minor, moderate or severe damage based on the information reported. It is recommended to have pre-owned vehicles inspected by a third party prior to purchase.
Duplicate Title	Vehicle Use and EventCheck	The vehicle had a duplicate title issued by the DMV.

AutoCheck vehicle history report Terms and Conditions

This report, and any reliance upon it, is subject to AutoCheck Terms and Conditions. If you obtained the report from a dealer, the dealer has been provided with these Terms & Conditions and can share them with you. These AutoCheck Terms and Conditions are also available at any time at www.autocheck.com/consumers/disclaimer.do or by writing to Experian: Experian Automotive C/O AutoCheck Customer Service 955 American Lane Schaumburg IL 60173

AutoCheck Buyback Protection Terms and Conditions

This vehicle (1FAFP58S0YA[redacted]) does not quailify for AutoCheck Buyback Protection.

About AutoCheck

AutoCheck vehicle history reports by Experian Automotive is the leading vehicle history reporting service. With expert data handling, the Experian Automotive database houses over 4 billion records on a half a billion vehicles. Every AutoCheck vehicle history report will give you confidence when buying or selling your next used vehicle, with superior customer service every step of the way.

FHA, FOIL 2010, REAR IMPACT TEST, 10008,

Report

Vehicle Specifications

Taurus CVS

2000 FORD CARS TAURUS 4DR SEDAN LX/SE/SEL

A	Longitudinal distance between the center of the front bumper and the center of the base of the windshield	48.9 in
B	Passenger Car Longitudinal distance between the center of the rear bumper and the center of the base of the backlight Station Wagon and Vans Longitudinal distance between the backlight top moulding and the front door latch pillar Pick-ups Longitudinal distance between the rearmost projection and the front door latch pillar	27.6 in
C	The maximum vertical height of the side glass	15.8 in
D	Vertical distance between the base of the side glass and the lower edge of the rocker panel	28.4 in
E	Distance between side rails or maximum width of top	46.9 in
F	Front overhang	41.8 in
G	Rear overhang	47.7 in
OL	Overall length	197.8 in
OW	Overall width	72.9 in
OH	Overall height	56.3 in
WB	Wheelbase	108.7 in
TWF	Front track width	61.9 in
TWR	Rear track width	62.3 in
CW	Curb weight	3333 lb
WD	Weight distribution (Front/Rear)	64/36

Measurements obtained in year: 00

FHA, FOIL 2010, REAR IMPACT TEST, 10008,

Report

Vehicle Specifications

Taurus Motoverse

Home :: Tools & Services :: VIN Decoder

Success!

The VIN you provided belongs to a vehicle that was manufactured in the USA by the Ford corporation.

2000 FORD

TAURUS SE

VIN:	1FAFP58S0YA[redacted]
World region:	North America
Manufactured in:	USA
Year:	2000
Make:	Ford
Model:	TAURUS SE
Body style:	Station Wagon
Transmission:	4 Spd Automatic
Drive type:	FWD
Cylinders:	6 Cylinders
Safety restraints:	Dual Front Air Bags
Standard options:	Air Conditioning, Power Steering, Power Brakes, Power Windows, Tilt Wheel, AM/FM Stereo, Cassette

Share this report: http://www.motoverse.com/tools/vinDecoder/1FAFP58S0YA254876

Can Motoverse tell me if this vehicle has been in an accident?

No. Our database is for identification only. Free CARFAX Record Check: 1FAFP58S0YA[redacted] Go

Can Motoverse tell me if this vehicle has been stolen?

No. Our database is for identification only. The NICB has a VIN check for stolen vehicles.

Go back

FHA, FOIL 2010, REAR IMPACT TEST, 10008,

Report

Rear Impact Test 1 Report

pg 14

Rear Impact Test 1 Final Report

SK pg 47

FHA, FOIL 2010, REAR IMPACT TEST, 10008, Reports

VEHICLE TEST SETUP FORM

GENERAL	
TEST NO.	10008
DATE	07/01/2010
TIME	02:00 PM
WEATHER	Sunny
TEST CONFIGURATION	Ford Tauras into Jeep Grand Cherokee with 70 Percent Engagement
SPEED (KM/H)	80 KM\H
PURPOSE	

COMMENTS

Laser Speed Trap: 80.079km\h 49.759mp\h

Speed Trap 1: Front Tire-80.264km\h 49.874mp\h Rear Tire-80.231km\h 49.854mp\h

Speed Trap 2: Front Tire- 79.252 km\h 49.245mp\h Rear Tire-79.026km\h 49.105 mp\h

VEHICLE PARAMETERS

Veh No: Bullet-Tauras **Test No:** 10008 **Date:** 07/01/10

Make:	Ford
Model:	Tauras
Year:	2000
Color:	Blue
Engine:	3
Vin No.:	1FAFP585S0YA[redacted]

Measured Curb mass (Kg)

LF:	457.50
RF:	451.50
LR:	297.50
RR:	269.50

Location of Vehicle CG (cm)

X-Axis (from LF to LR):	114.10
Y-Axis (From LF to RF):	74.80
Z-Axis (From Ground):	30.40

Measured Test Inertial Mass (Kg)

LF:	445.00
RF:	434.50
LR:	321.00
RR:	297.50

Location of CG Accelerometer (cm)

X-Axis (from LF to LR):	117.20
Y-Axis (From LF to RF):	78.30
Z-Axis (From Ground):	37.70

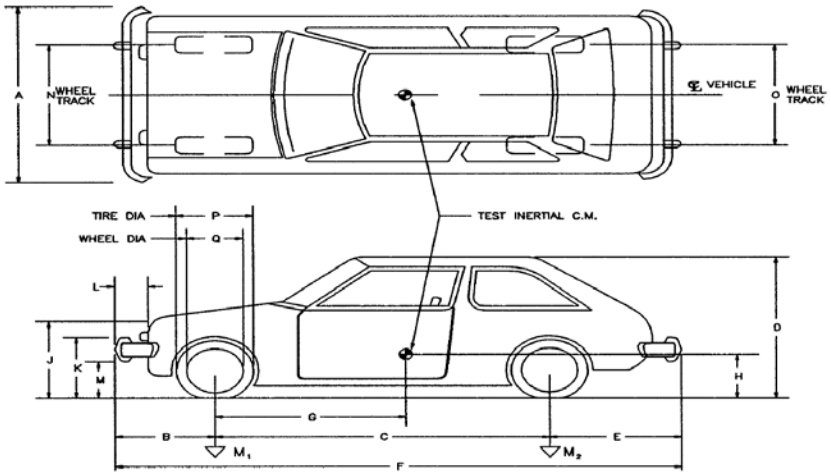
	Items Removed	Mass (Kg)	Added	Mass (Kg)
1	Oil	5.00	Data Acquisition	6.00
2	Coolant	7.50	Battery Box	6.50
3	Transmission Fluid	8.50	Instrument Tray	19.00
4	Gas	4.00	Brake System	15.50
5				
6				
7				
8				
9				
10				
11				
12				
	Total Mass Removed (Kg) =	25.00	**Total Mass Added (Kg) =**	47.00

Measured Curb Mass =	1,476.00
Removed Total =	25.00
Stripped Vehicle Mass =	1,451.00
Added Mass =	47.00
Calculated Test Inertial Mass =	1,498.00
Measured Test Inertial Mass =	1,498.00

All weights are in Kg

TEST NO.:	10008	**DATE:**	7/1/2010	**ODOMETER:**	21078
MAKE:	Jeep	**MODEL:**	Grand Cherokee	**YEAR:**	1995
VIN NO.:	1J4GZ78Y7SC[redacted]	**TIRE SIZE:**	P235 75 R15		
TIRE INFLATION PRESSURE:	40				
MASS DISTRIBUTION (KG):	**LF**	535.00	**RF**	539.50	
	LR	416.50	**RR**	365.50	

DESCRIBE ANY DAMAGE TO VEHICLE PRIOR TO TEST:



Engine Type:		**Optional Equipment:**		**Dummy Data:**	
Engine CID:				**Type:**	
Transmission Type				**Mass:**	
☐ **Auto**				**Seat Position:**	
☐ **Manual**					

GEOMETRTY - (CM)

A	168.50	**D**	162.50	**G**	124.60	**K**	74.70	**N**	147.00	**Q**	41.00
B	76.00	**E**	94.30	**H**	62.20	**L**	9.00	**O**	148.80	**R**	
C	248.00	**F**		**J**	108.00	**M**	55.70	**P**	71.00	**S**	

MASS - (KG)	**CURB**	**TEST INERTIAL**	**GROSS STATIS**
M1	1,050.00	1,075.00	
M2	713.50	782.00	
M3	1,763.50	1,857.00	

VEHICLE PARAMETERS

Veh No: Target-Jeep **Test No:** 10008 **Date:** 07/01/10

Make:	Jeep
Model:	Grand Cherokee
Year:	1995
Color:	Red
Engine:	5.2
Vin No.:	1J4GZ78Y7SC[redacted]

Measured Curb mass (Kg)

LF:	507.00
RF:	503.00
LR:	333.50
RR:	341.50

Location of Vehicle CG (cm)

X-Axis (from LF to LR):	147.00
Y-Axis (From LF to RF):	71.60
Z-Axis (From Ground):	59.30

Measured Test Inertial Mass (Kg)

LF:	535.00
RF:	539.50
LR:	416.5
RR:	368.50

Location of CG Accelerometer (cm)

X-Axis (from LF to LR):	124.60
Y-Axis (From LF to RF):	76.80
Z-Axis (From Ground):	62.20

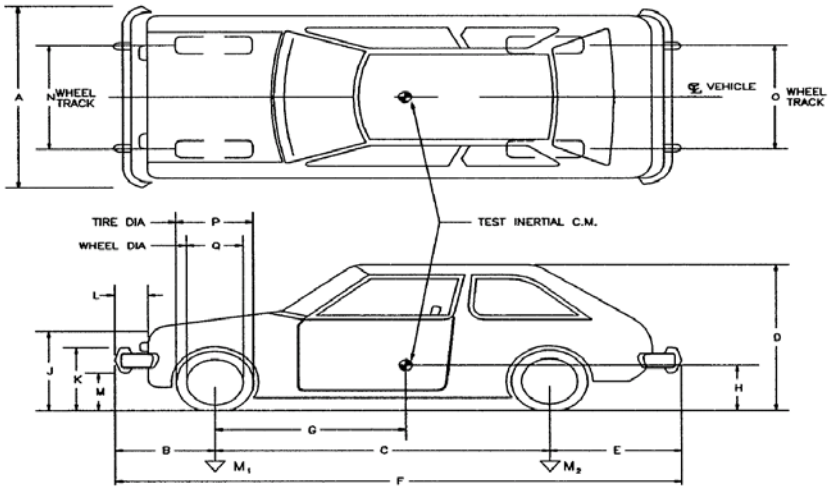
	Items Removed	Mass (Kg)	Added	Mass (Kg)
1	Oil	3.00	Battery Box	24.00
2	Trans Fluid	4.00	Data Acquisition	12.00
3	Antifreeze	7.50	Brake System	21.50
4	Fuel	7.00	Stoddard	57.00
5			Dummy	81.50
6				
7				
8				
9				
10				
11				
12				
	Total Mass Removed (Kg) =	21.50	**Total Mass Added (Kg) =**	196.00

Measured Curb Mass =	1,685.00
Removed Total =	21.50
Stripped Vehicle Mass =	1,663.50
Added Mass =	196.00
Calculated Test Inertial Mass =	1,859.50
Measured Test Inertial Mass =	1,859.50

All weights are in Kg

TEST NO.:	10008	**DATE:**	7/1/2010	**ODOMETER:**	21078
MAKE:	Jeep	**MODEL:**	Grand Cherokee	**YEAR:**	1995
VIN NO.:	1J4GZ78Y7SC[redacted]	**TIRE SIZE:**	P235 75 R15		
TIRE INFLATION PRESSURE:	40				
MASS DISTRIBUTION (KG):	**LF**	535.00	**RF**	539.50	
	LR	416.50	**RR**	365.50	

DESCRIBE ANY DAMAGE TO VEHICLE PRIOR TO TEST:



Engine Type:		**Optional Equipment:**		**Dummy Data:**	
Engine CID:				**Type:**	
Transmission Type				**Mass:**	
☐ **Auto**				**Seat Position:**	
☐ **Manual**					

GEOMETRTY - (CM)

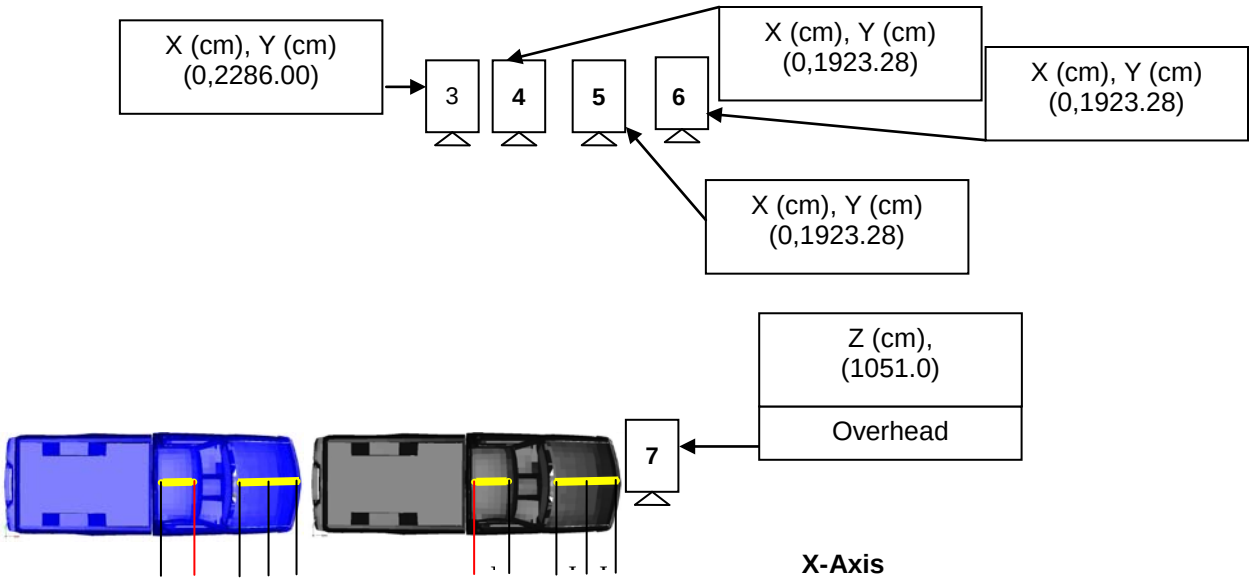
A	168.50	**D**	162.50	**G**	124.60	**K**	74.70	**N**	147.00	**Q**	41.00
B	76.00	**E**	94.30	**H**	62.20	**L**	9.00	**O**	148.80	**R**	
C	248.00	**F**		**J**	108.00	**M**	55.70	**P**	71.00	**S**	

MASS - (KG)	**CURB**	**TEST INERTIAL**	**GROSS STATIS**
M1	1,050.00	1,075.00	
M2	713.50	782.00	
M3	1,763.50	1,857.00	

CAMERA PARAMETERS

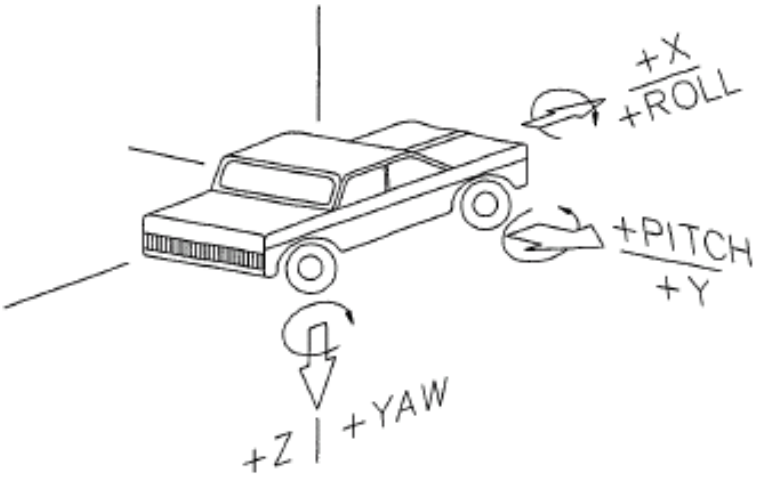
NO.	CAMERA	LENS	LENS (MM)	RESOLUTION (PIXELS)	SPEED (FPS)	LOCATION
1	K3R	Nikon	25	1280X1024	500	Right Perp
2	CI	Canon	16-100	640X480	500	Right Perp Close
3	K3	Nikon	25	1280X1024	500	Left Perp
4	K3	Nikon	50	1280X1024	500	Left Perp Close 1
5	CI	Toyo Optics	12.5-75	640X480	500	Left Perp Close 2
6	CI	Toyo Optics	12.5-75	640X480	500	Left Perp Close 3
7	K3R	Nikon	14	1280X1024	500	Overhead

CAMERA PARAMETERS



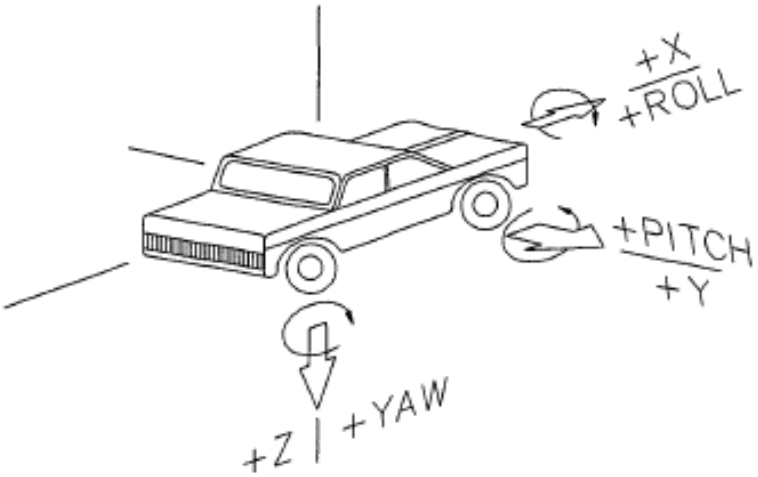
ACCELEROMETERS LOCATIONS TAURAS

CH.	LOCATION	X (cm) From frt. axle	Y (cm) From lft frt. hub	Z (cm) From ground	SERIAL NO.	AXIS
1	Center of Gravity	117.20	78.30	37.70	6DX0013 ACC1	X
2	Center of Gravity	117.20	78.30	37.70	6DX0013 ACC2	Y
3	Center of Gravity	117.20	78.30	37.70	6DX0013 ACC3	Z
4	Center of Gravity	117.20	78.30	37.70	6DX0013 ARS1	Roll
5	Center of Gravity	117.20	78.30	37.70	6DX0013 ARS2	Pitch
6	Center of Gravity	117.20	78.30	37.70	6DX0013 ARS3	Yaw
7	Center of Gravity	117.20	78.30	37.70	D12130	X
8	Center of Gravity	117.20	78.30	37.70	D12748	Y
9	Center of Gravity	117.20	78.30	37.70	D12899	Z

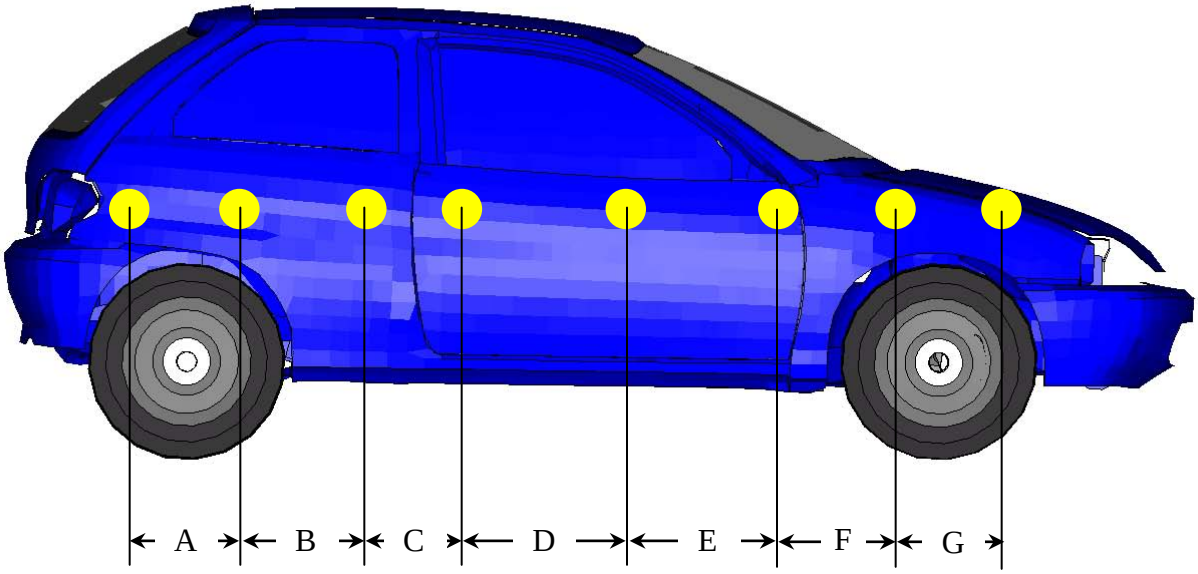


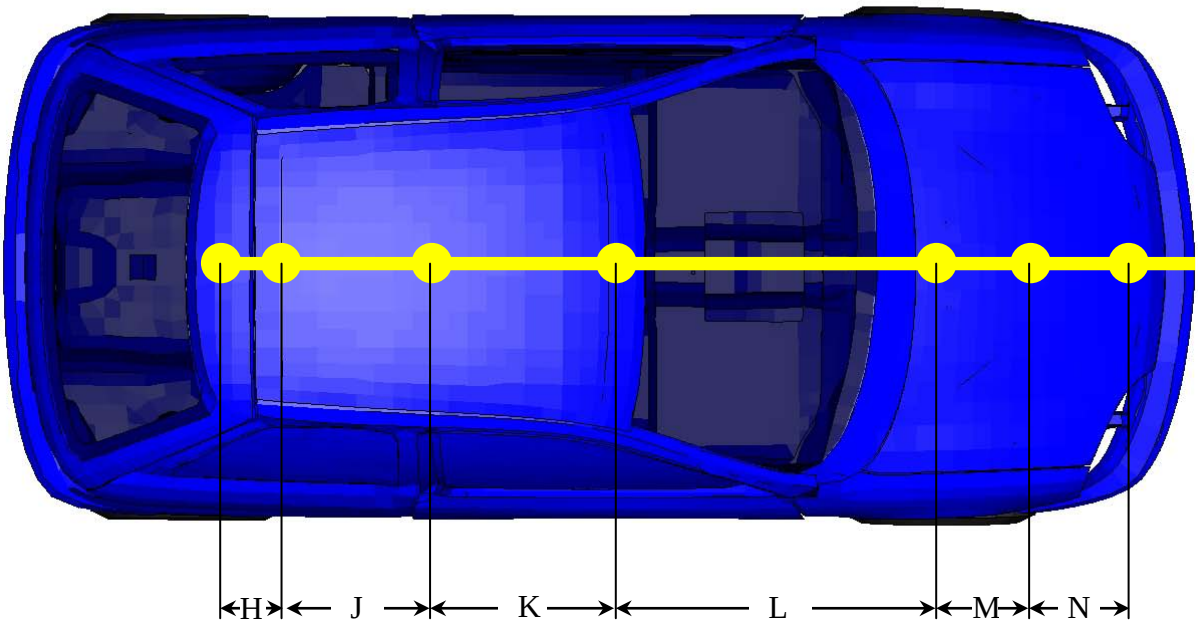
ACCELEROMETERS LOCATIONS JEEP

CH.	LOCATION	X (cm) From frt. axle	Y (cm) From lft frt. hub	Z (cm) From ground	SERIAL NO.	AXIS
1	Center of Gravity	124.60	76.80	62.20	6DX0014 ACC1	X
2	Center of Gravity	124.60	76.80	62.20	6DX0014 ACC2	Y
3	Center of Gravity	124.60	76.80	62.20	6DX0014 ACC3	Z
4	Center of Gravity	124.60	76.80	62.20	6DX0014 ARS1	Roll
5	Center of Gravity	124.60	76.80	62.20	6DX0014 ARS2	Pitch
6	Center of Gravity	124.60	76.80	62.20	6DX0014 ARS3	Yaw
7	Center of Gravity	124.60	76.80	62.20	6DX0015 ACC1	X
8	Center of Gravity	124.60	76.80	62.20	6DX0015 ACC2	Y
9	Center of Gravity	124.60	76.80	62.20	6DX0015 ACC3	Z
10	Center of Gravity	124.60	76.80	62.20	6DX0015 ARS1	Roll
11	Center of Gravity	124.60	76.80	62.20	6DX0015 ARS2	Pitch
12	Center of Gravity	124.60	76.80	62.20	6DX0015 ARS3	Yaw



Tauras



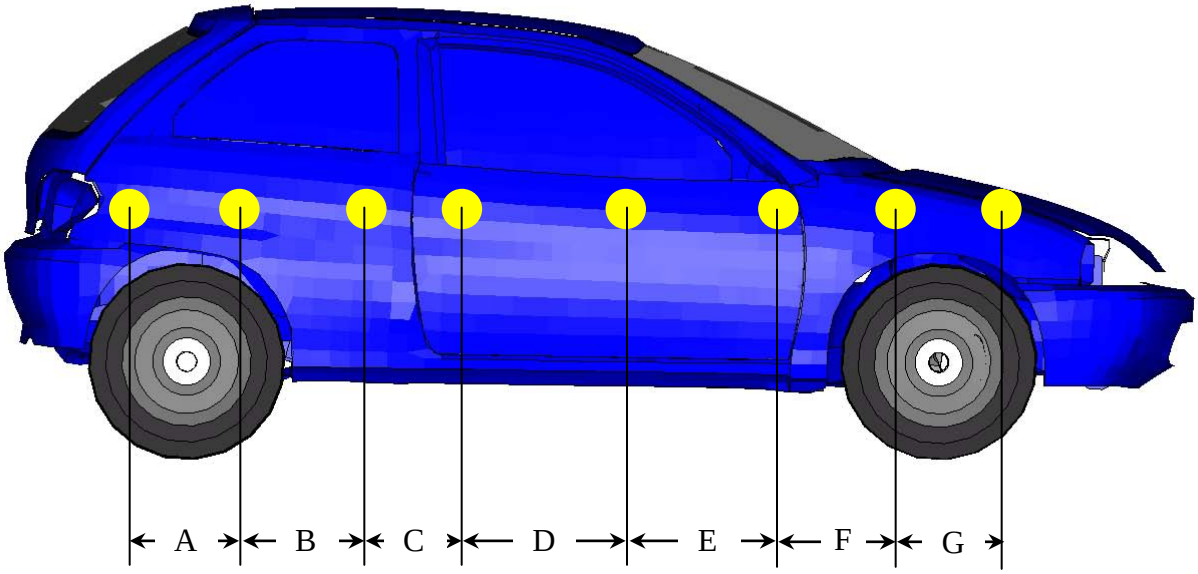


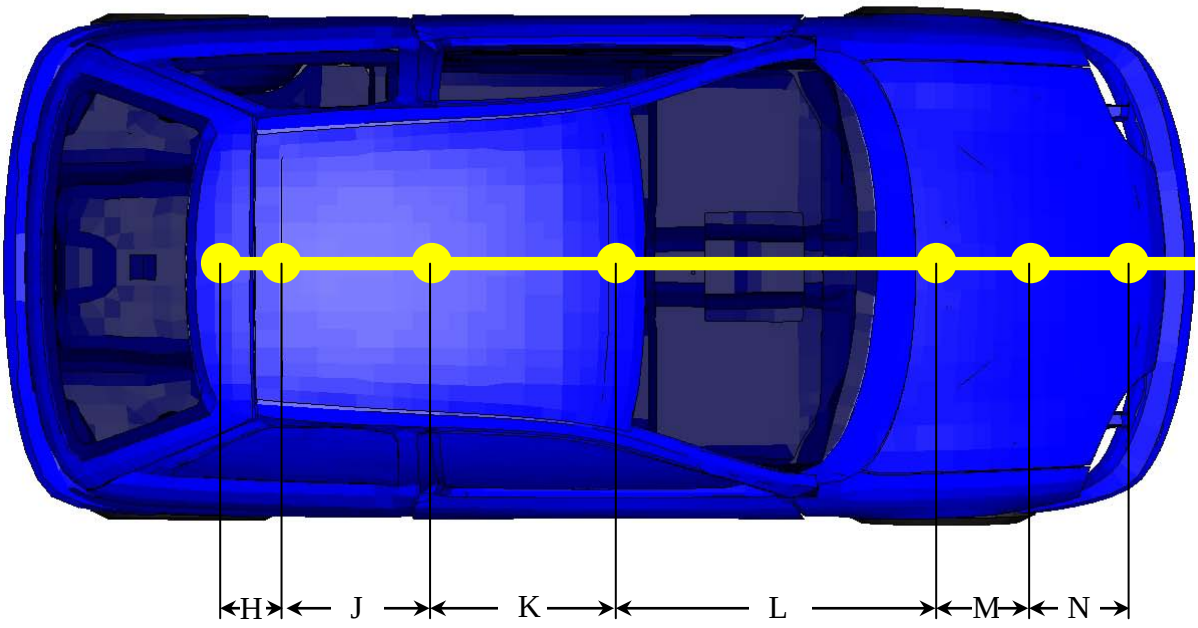
Geometry (cm)

A: 46.00	**D:** 42.70	**G:** 49.60	**K:** 44.00	**N:** 104.70	**Q:**
B: 46.00	**E:** 42.20	**H:** 49.80	**L:** 44.00	**O:** 46.70	**R:**
C: 15.50	**F:** 11.40	**J:** 10.80	**M:** 103.30	**P:** 46.60	**S:**

Geometry - (cm):

Jeep





Geometry (cm)

A: 36.00	**D:** 39.90	**G:** 48.40	**K:** 46.00	**N:** 103.20	**Q:**
B: 35.00	**E:** 40.40	**H:** 48.00	**L:** 49.50	**O:** 41.80	**R:**
C: 11.00	**F:** 11.50	**J:** 11.00	**M:** 102.80	**P:** 42.80	**S:**

FHA, FOIL 2010, REAR IMPACT TEST, 10008, Rear Impact Test 1 Report

EXPERIMENTAL TEST OF OCCUPANT ENTRAPMENT

FORD TAURUS INTO REAR OF JEEP GRAND CHEROKEE
30% OFFSET, 50 MPH

Test Date: July 1, 2010

Final Report Date: July 30, 2010

SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

The purpose of this 50 mph 30% offset rear impact test is to examine the occurrence of occupant entrapment in collisions similar in condition to that proposed for FMVSS 301.

SUMMARY

A 1995 Jeep Grand Cherokee was impacted in the rear by a 2000 Ford Taurus at a velocity of 50 mph. The Jeep and Ford were set so the right vertical edge of the front of the Ford would contact the Jeep rear 352 mm in right of the Jeep's longitudinal centerline. The test was performed at the Federal Outdoor Impact Laboratory on July 1, 2010. Pre- and Post-test photographs of the vehicle and dummy can be found in appendix A.

One real time camera and seven high-speed cameras were used to document the rear impact event. Camera locations and other pertinent camera information can be found in this report.

One 50^{th} percentile male anthropomorphic test device (ATD) was placed in the driver seating position approximately according to dummy placement instructions specified in the FMVSS 208 Laboratory Indicant Test Procedure. The ATD was not instrumented for this test.

The 21 channels of data were recorded with an on-board data acquisition system.

As a result of the impact, both driver's side doors and the passenger's side rear door of the Jeep Grand Cherokee were crush locked and could not be opened after the test. The passenger's side front door of the Jeep Grand Cherokee was fully operational after the test.

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1

BULLET VEHICLE CRASH TEST SUMMARY

Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

BULLET VEHICLE PRIMARY IMPACT DATA

Measured Parameter	**Units**	**Value**
Bullet Vehicle Velocity At Impact	kph	80
Bullet Vehicle Test Weight	kg	1,498
Bullet Vehicle Maximum Static Crush	mm	419
Impact Point	mm	NA

DOOR OPENING AND SEAT TRACK INFORMATION: BULLET VEHICLE

Description	Driver	Passenger
Front Door Opening	Functional after test	Functional after test
Rear Door Opening	Functional after test	Functional after test
Seat Track Shift (mm)	NA	NA
Seat Back Failure (deg)	NA	NA

TEST DUMMY INFORMATION: BULLET VEHICLE

Description	Driver	Passenger
Dummy Type	NA	NA
Head Contact	NA	NA
Chest Contact	NA	NA
Abdomen Contact	NA	NA
Left Knee Contact	NA	NA
Right Knee Contact	NA	NA

VIDEO COVERAGE

High Speed	7
Real Time	2
Total	9

Driver ATD Sensors	NA
Passenger ATD Sensors	NA
Bullet Vehicle Structure Accelerometers	9
Target Vehicle Structure Accelerometers	12
Total	21

DATA SHEET NO. 2

GENERAL TEST AND BULLET VEHICLE PARAMETER DATA

Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

BULLET VEHICLE INFORMATION

Manufacturer	Ford
Model	Taurus
Body Style	Wagon
Vehicle No.	1
VIN	1FAFP58S0YA254876
Color	Painted Blue
Delivery Date	June 21, 2010
Odometer Reading	150,525
Dealer	Capitol Auto Auctions
Transmission	Automatic
Final Drive	Front
Number of Cylinders	6
Engine Displacement (L)	3.0
Engine Placement	Lateral

TEST VEHICLE OPTIONS

Driver Airbag	Y
Passenger Airbag	Y
Anti-theft System	
Cruise Control	Y
Power Windows	Y
Power Steering	Y
Power Door Locks	Y
Tilt Wheel	Y
Air Conditioning	Y
Power Brakes	Y
Disc Brakes, Front	Y
Disc Brakes, Rear	Y
Anti-lock Brakes	
AM / FM / Cassette	Y

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company
Date of Manufacture	06 / 00

GVWR (kg)	2221
GAWR Front (kg)	1123
GAWR Rear (kg)	1098

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (psi)	-	-
Cold Pressure (psi)	30	30
Recommended Tire Size	P215/60TR16	P215/60TR16
Tire Size On Vehicle	P215/60R16	P215/60R16
Tire Manufacturer	Bridgestone / Goodyear	BF Goodrich

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket / Bench	Bench	Bench	
Number of Occupants	3	3	2	8
Capacity Wt. (VCW) (kg)				745
Cargo Wt. (RCLW) (kg)				201

DATA SHEET NO. 3

BULLET VEHICLE PARAMETER DATA

Bullet Vehicle: 2000 Ford Taurus
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

BULLET VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	457.5	297.5	755	445.0	321.0	766
Right	kg	451.5	269.5	721	434.5	297.5	732
Ratio	%	61.6%	38.4%	-	58.7%	41.3%	-
Totals	kg	909	567	1476	879.5	618.5	1498

BULLET VEHICLE TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight	kg	1476
Weight of 1 P572E ATD	kg	NA
Rated Cargo / Luggage Weight (RCLW)	kg	NA
Calculated Vehicle Target Weight (TVTW)	kg	1476

BULLET VEHICLE ATTITUDES

	Units	LF	RF	LR	RR
As Delivered	mm	-	-	-	-
As Tested	mm	724	740	705	718
Post Test	mm	686	762	705	724

Weight of Ballast: _____

Vehicle Components Removed: Spare tire, trunk trim removed for instrumentation

Weight Removed: 25 kg

Added: Data Acquisition, Battery Box, Instrument Tray, Brake System

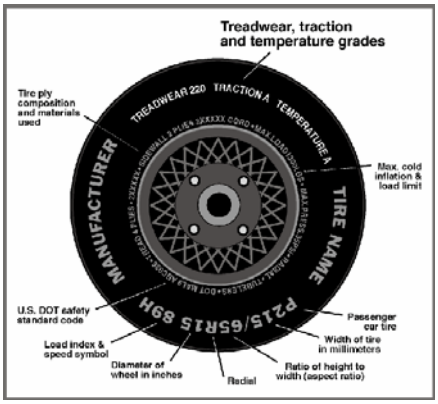
Weight Added: 47 kg

DATA SHEET NO. 4

BULLET VEHICLE TIRE INFORMATION

Bullet Vehicle: 2000 Ford Taurus
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

Vehicle Year	2000	Vehicle Make	Ford
VIN	1FAFP58S0YA[redacted]	Vehicle Model	Taurus



	Left Front	**Right Front**
Tire Manufacturer	Bridgestone	Goodyear
Tire Name	Insignia SE	Allegra
Tire Type	P	P
Tire Width (mm)	215	215
Ratio of Height to Width (aspect ratio)	60	60
Radial	R	R
Wheel Diameter	16	16
Load Index & Speed Symbol	-	-
Treadwear	380	680
Traction Grade	B	A
Temperature Grade	B	B
	Left Rear	**Right Rear**
Tire Manufacturer	BF Goodrich	BF Goodrich
Tire Name	Touring T/A	Touring T/A
Tire Type	P	P
Tire Width (mm)	215	215
Ratio of Height to Width (aspect ratio)	60	60
Radial	R	R
Wheel Diameter	16	16
Load Index & Speed Symbol	-	-
Treadwear	640	640
Traction Grade	A	A
Temperature Grade	B	B

DATA SHEET NO. 5

BULLET VEHICLE MEASUREMENTS

Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

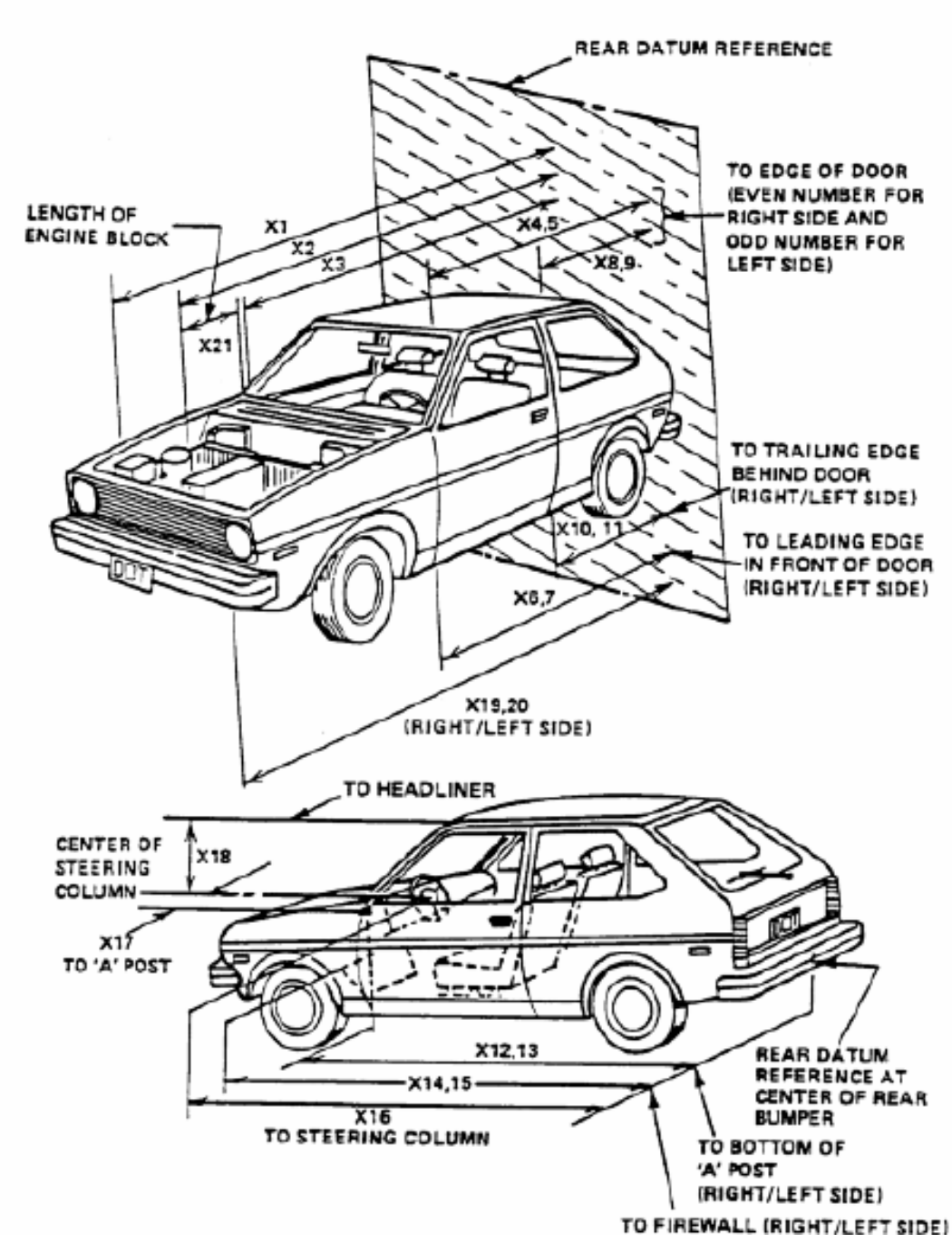
No.	Measurement	Units	Pre-Test	Post-Test	Diff
1	Total length of vehicle at centerline	mm	5029	4724.4	304.6
2	RSOV to front of engine	mm	4470	4368.8	101.2
3	RSOV to firewall centerline	mm	3916.5	3916.5	0
4	RSOV to leading edge of right door	mm	3524.3	3524.3	0
5	RSOV to leading edge of left door	mm	3524	3505.2	18.8
6	RSOV to lower leading edge of right door	mm	3435	3429	6
7	RSOV to lower leading edge of left door	mm	3435	3390.9	44.1
8	RSOV to upper leading edge of right door	mm	2886	2870.2	15.8
9	RSOV to upper leading edge of left door	mm	2908	2895.6	12.4
	RSOV to trailing edge of right door	mm	2416.4	2416.4	0
	RSOV to trailing edge of left door	mm	2413	2387.6	25.4
10	RSOV to lower trailing edge of right door	mm	2347.8	2347.8	0
11	RSOV to lower trailing edge of left door	mm	2369	2311.4	57.6
	RSOV to upper trailing edge of right door	mm	2311.6	2311.6	0
	RSOV to upper trailing edge of left door	mm	2311	2273.3	37.7
	RSOV to trailing edge of rear right door	mm	1372	1397	25
	RSOV to trailing edge of rear left door	mm	1363.6	1363.6	0
	RSOV to lower trailing edge of rear right door	mm	1670	1663.7	6.3
	RSOV to lower trailing edge of rear left door	mm	1676	1625.6	50.4
	RSOV to upper trailing edge of rear right door	mm	1568.3	1568.3	0
	RSOV to upper trailing edge of rear left door	mm	1549	1536.7	12.3
12	RSOV to bottom of right ‘A’ pillar	mm	3425.7	3425.7	0
13	RSOV to bottom of left ‘A’ pillar	mm	3428.9	3428.9	0
	RSOV to bottom of right ‘B’ pillar	mm	2385.9	2385.9	0
	RSOV to bottom of left ‘B’ pillar	mm	2387.5	2387.5	0
	RSOV to bottom of right ‘C’ pillar	mm	1657.4	1657.4	0
	RSOV to bottom of left ‘C’ pillar	mm	1657.4	1657.4	0
14	RSOV to firewall on right side	mm	3823	3581.4	241.6
15	RSOV to firewall on left side	mm	3874	3568.7	305.3
16	RSOV to steering column	mm	2985	2971.8	13.2
17	Center of steering column to left ‘A’ pillar	mm	301.4	301.4	0
18	Center of steering column to headlining	mm	432	432	0.2
19	RSOV to right side of front bumper	mm	4839	4724.4	114.6
20	RSOV to left side of front bumper	mm	4839	4826	13
21	Length of Engine Block	mm	559	559	0
RD	RSOV to right side of dash panel	mm	3108	3098.8	9.2
CD	RSOV to center of dash panel	mm	-	-	-
LD	RSOV to left side of dash panel	mm	3121	3111.5	9.5

DATA SHEET NO. 5… (continued)

BULLET VEHICLE MEASUREMENTS

Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10



DATA SHEET NO. 5… (Continued)

BULLET VEHICLE MEASUREMENTS

Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

	Elements	Measurement (mm)
1	Total Length	5029
2	Total Width	1778
3	Front Bumper Top Height	559
4	Front Bumper Bottom Height	279
5	Longitudinal Member Top Height	756
6	Distance Between Longitudinal Members	1372
7	Longitudinal Member Width	-
8	Engine Top Height	787
9	Engine Bottom Height	-
10	Engine and Gearbox Width	-
11	Front Bumper – Engine Distance	330
12	Front Shock Absorber Fixing Height	889
13	Bonnet Leading Edge Height	737
14	Front Shock Absorber Fixing Width	1137
15	Front Bumper – Front Axle distance	1035
16	Front Axle – A Pillar Distance	540
17	A-Pillar – B-Pillar Distance	1080
18	C-Pillar – Rear Axle Distance	381
19	B-Pillar – C-Pillar Distance	781
20	Roof Sill Bottom Height	1226
21	Roof Sill Top Height	1372
22	Floor Sill Bottom Height	197
23	Floor Sill Top Height	362

DATA SHEET NO. 6

BULLET VEHICLE ACCELEROMETER LOCATIONS & MEASUREMENTS

Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

Location	X (mm)	Y (mm)	Z (mm)
CG	2794	-25.4	-330.2

X Reference from the rear bumper – positive towards the front of the vehicle
Y Reference from the center line – positive towards the right side of the vehicle
Z Reference from the ground – positive down

Description of Instrumentation Included:

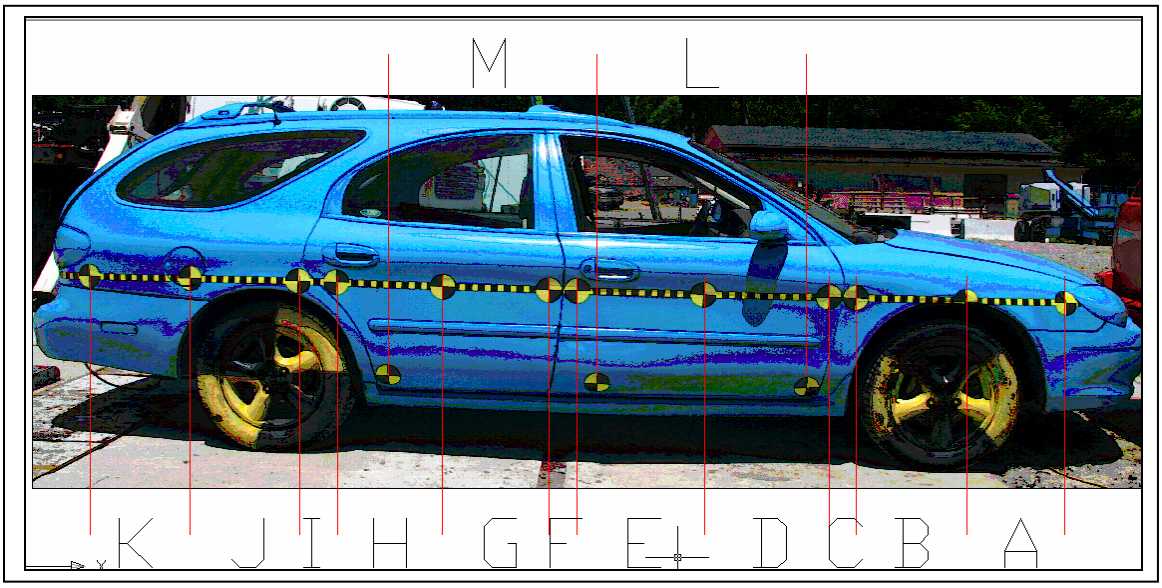
Triaxial accelerometer at cg, redundant triaxial accelerometer at cg, triaxial roll rate sensor at cg.

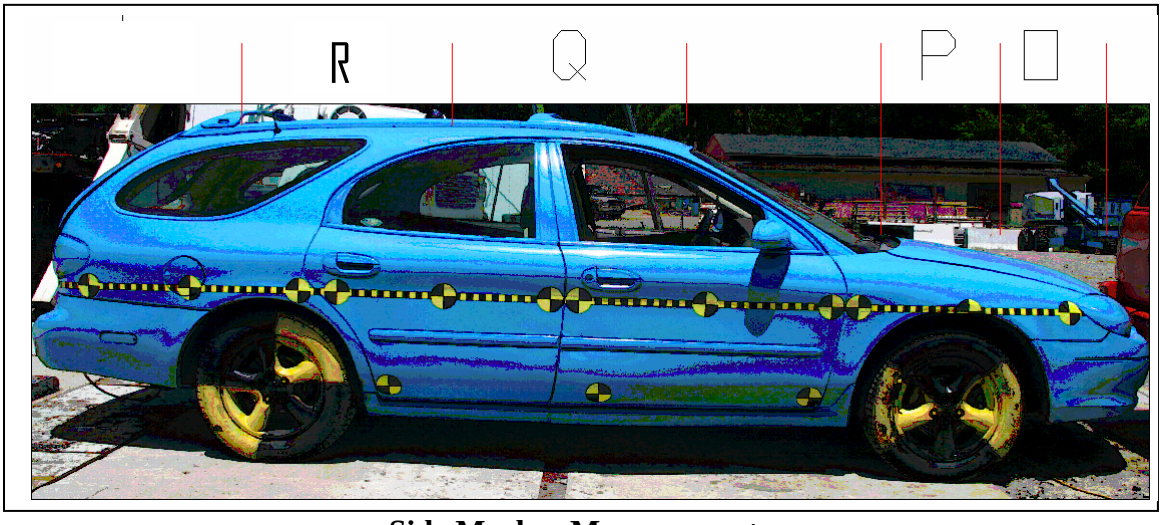
DATA SHEET NO. 7

BULLET VEHICLE PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10





Side Marker Measurements
Top Marker Measurements

DATA SHEET NO. 7

BULLET VEHICLE PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

	Driver's Side Middle		Passenger's Side Middle	
	Pre	Post	Pre	Post
A	440	440	440	440
B	438	434	437	440
C	54	112	108	108
D	497	500	502	498
E	495	498	524	496
F	102	106	105	114
G	419	434	431.8	422
H	425	433	433	427
I	156	148	146	155
J	460	451	451	460
K	457	458	457	460
	Driver's Side Low		Passenger's Side Low	
L	841	843	846	843
M	832	645	843	840
	Top			
	Pre		Post	
O	445		466	
P	-		467	
Q	1046		1047	
R	1033		1033	

DATA SHEET NO. 8

BULLET VEHICLE INTRUSION MEASUREMENTS

Bullet Vehicle: 2000 Ford Taurus

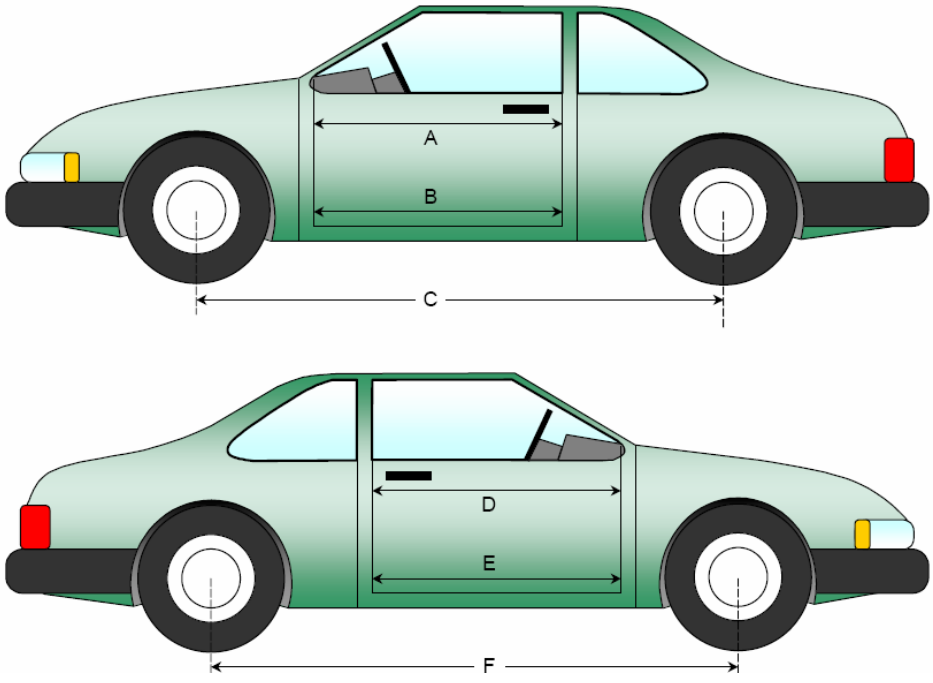
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	973	973	0
B	Left Side Lower	mm	923.5	923.5	0
D	Right Side Upper	mm	962	962	0
E	Right Side Lower	mm	927	914	920.5
	Rear Left Side Upper	mm	927	927	0
	Rear Left Side Lower	mm	682.5	682.5	0
	Rear Right Side Upper	mm	927	914	13
	Rear Right Side Lower	mm	686	679	7

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2743	2807	-64
F	Right Side Wheelbase	mm	2737	2680	57



DATA SHEET NO. 9

BULLET VEHICLE INTRUSION MEASUREMENTS

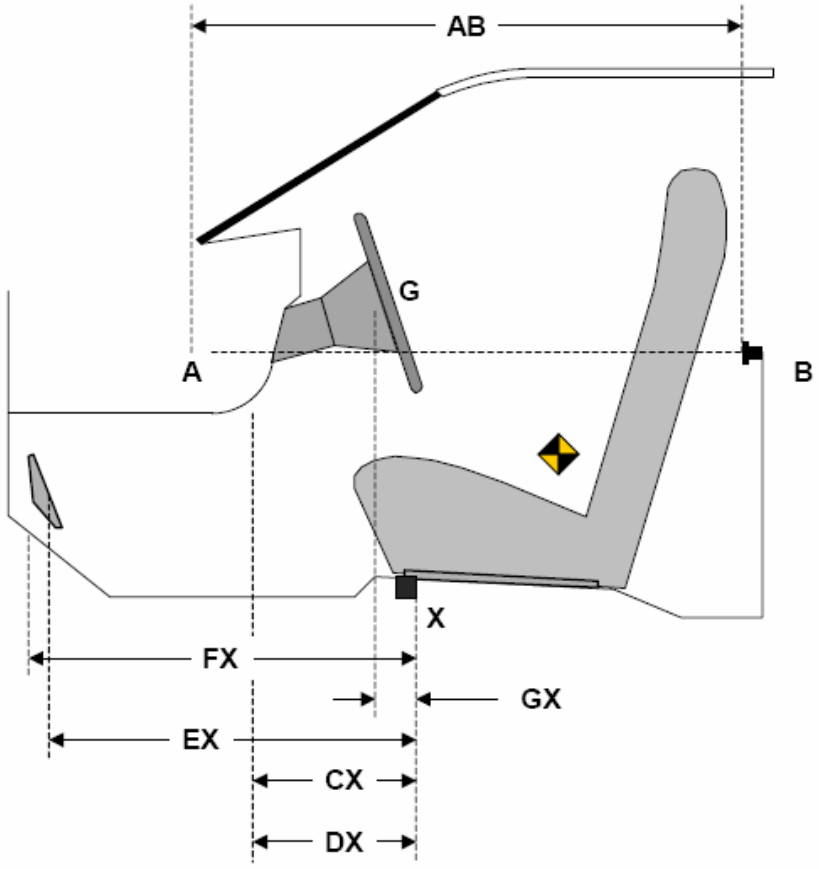
Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (inside window jam)	mm	914	889	25
CX	Left Knee Bolster to X	mm	272.5	272.5	0
DX	Right Knee Bolster to X	mm	266.5	266.5	0
EX	Brake Pedal to X	mm	533	489	44
FX	Foot Rest to X	mm	511	511	0
GX	Center of Steering Column Wheel Hub to X	mm	0	0	0

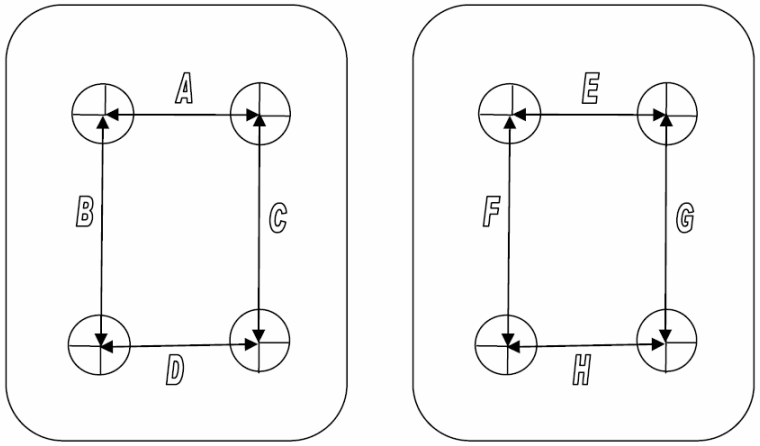
X = Front of Seat Track (stationary)



DRIVER COMPARTMENT

DATA SHEET NO. 9… (continued)
BULLETT VEHICLE INTRUSION MEASUREMENTS

Bullet Vehicle: 2000 Ford Taurus
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10



Driver Passenger

Measurement	Pre-Test	Post Test	Difference
A	-	-	-
B	-	-	-
C	-	-	-
D	-	-	-
E	-	-	-
F	-	-	-
G	-	-	-
H	-	-	-

	Pre		Post	
	D	P	D	P
From Front of Seat to Firewall	737	673	737	648

DATA SHEET NO. 9

BULLET VEHICLE ACCIDENT INVESTIGATION DIVISION DATA

Bullet Vehicle: 2000 Ford Taurus
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

VEHICLE INFORMATION

VIN: 1FAFP58S0YA[redacted] Wheelbase (mm): 2740
Vehicle Size Category: 3 Test Weight (kg): 1498

ACCELEROMETER DATA

Accelerometer Locations: at cg
Cal. Procedure / Interval: -
Integration Algorithm: - Linearity: -
Impact Velocity (kph): 80 kph
Velocity Change (kph): 52 kph Time of Separation (ms): 224

CRUSH PROFILE

Collision Deformation Classification: 12FWDE5 Midpoint of damage +267mm
Damage Region Length (mm): 1245 mm Impact Mode: Frontal Offset

At Bumper: z = 558.8 mm (y pos, x pos or crush)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at left side	mm	1612.9,191	1473.2, 190.5	+0.5
C2	Crush Zone 2 at left side	mm	1333.5,51	1219.2,215.9	-164.9
C3	Crush Zone 3 at left side	mm	1041.5,0	965.2, 304.8	-304.8
C4	Crush Zone 4 at Right Side	mm	749.3,0	711.2, 419.1	-419.1
C5	Crush Zone 5 at Right Side	mm	457.2,51	482.6, 330.2	-279.2
C6	Crush Zone 6 at Right Side	mm	165.1,191	228.6, 330.2	-139.2
L	C1 to C6	mm	1448	1244.6	-

At top of radiator (under ride): z = 762 mm (y pos, x pos or crush)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at left side	mm	-	1612.9, 495.3	-
C2	Crush Zone 2 at left side	mm	-	1333.5, 406.4	-
C3	Crush Zone 3 at left side	mm	-	1041.4, 482.6	-
C4	Crush Zone 4 at Right Side	mm	-	749.3, 546.1	-
C5	Crush Zone 5 at Right Side	mm	-	457.2, 558.8	-
C6	Crush Zone 6 at Right Side	mm	-	165.1, 673.1	-
L	C1 to C6	mm	-	1448	-

DATA SHEET NO. 10

TARGET VEHICLE CRASH TEST SUMMARY

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

TARGET VEHICLE PRIMARY IMPACT DATA

Measured Parameter	**Units**	**Value**
Target Vehicle Velocity At Impact	kph	0.0
Target Vehicle Test Weight	kg	1856.5
Target Vehicle Maximum Static Crush	mm	939.8
Impact Point	mm	NA

DOOR OPENING AND SEAT TRACK INFORMATION: TARGET VEHICLE

Description	Driver	Passenger
Front Door Opening	Crush locked	Functional After Test
Rear Door Opening	Crush Locked	Crush Locked
Seat Track Shift (mm)	TBD	NA
Seat Back Failure (deg)	Yes – 35 deg final	NA

TEST DUMMY INFORMATION: TARGET VEHICLE

Description	Driver	Passenger
Dummy Type	50^{th}	NA
Head Contact	-	NA
Chest Contact	-	NA
Abdomen Contact	-	NA
Left Knee Contact	-	NA
Right Knee Contact	-	NA

VIDEO COVERAGE

High Speed	7
Real Time	2
Total	9

Driver ATD Sensors	NA
Passenger ATD Sensors	NA
Bullet Vehicle Structure Accelerometers	9
Target Vehicle Structure Accelerometers	12
Total	21

DATA SHEET NO. 11

GENERAL TEST AND TARGET VEHICLE PARAMETER DATA

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

TARGET VEHICLE INFORMATION

Manufacturer	Chrysler / Jeep
Model	Grand Cherokee
Body Style	SUV
Vehicle No.	2
VIN	1J4GZ78Y7SC687528
Color	Painted Red
Delivery Date	June 21, 2010
Odometer Reading	221,078
Dealer	Capitol Auto Auctions
Transmission	Automatic
Final Drive	4WD
Number of Cylinders	8
Engine Displacement (L)	5.2
Engine Placement	Longitudinal

TEST VEHICLE OPTIONS

Driver Airbag	Y
Passenger Airbag	N
Anti-theft System	Y
Cruise Control	Y
Power Windows	Y
Power Steering	Y
Power Door Locks	Y
Tilt Wheel	Y
Air Conditioning	Y
Power Brakes	Y
Disc Brakes, Front	Y
Disc Brakes, Rear	Y
Anti-lock Brakes	Y
AM / FM / Cassette	Y

DATA FROM CERTIFICATION LABEL

Manufactured By	Chrysler Corp.
Date of Manufacture	3/95

GVWR (kg)	2495
GAWR Front (kg)	1248
GAWR Rear (lkg)	1339

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (psi)	-	-
Cold Pressure (psi)	33	33
Recommended Tire Size	P225/75R15	P225/75R15
Tire Size On Vehicle	LF ONLY: P245/70R15	P235/75R15
Tire Manufacturer	Goodyear Wrangler GSA	Sigma I Stampede Radial

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	NA	NA
Number of Occupants	2	3	NA	3
Capacity Wt. (VCW) (kg)	-	-	-	780.5
Cargo Wt. (RCLW) (kg)	-	-	-	440.5

DATA SHEET NO. 12

GENERAL TEST AND TARGET VEHICLE PARAMETER DATA

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

TARGET VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	519	343.5	862.5	535	416.5	951.5
Right	kg	523	329	852	539.5	365.5	905
Ratio	%	60.8	39.2	-	57.9%	42.1%	-
Totals	kg	1042	672.5	1714.5	1074.5	782	1856.5

TARGET VEHICLE TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight	kg	1714.5
Weight of 1 P572E ATD	kg	78
Rated Cargo / Luggage Weight (RCLW)	kg	136
Calculated Vehicle Target Weight (TVTW)	kg	1929

TARGET VEHICLE ATTITUDES

	Units	LF	RF	LR	RR
As Delivered	mm	848	848	883	876
As Tested	mm	841	844	865	863
Post Test	mm	845	829	857	749

Weight of Ballast: _____

Vehicle Components Removed: oil, trans fluid, antifreeze, fuel

Weight Removed: 21.5 kg

Added: battery box, data acquisition, brake system, Stoddard

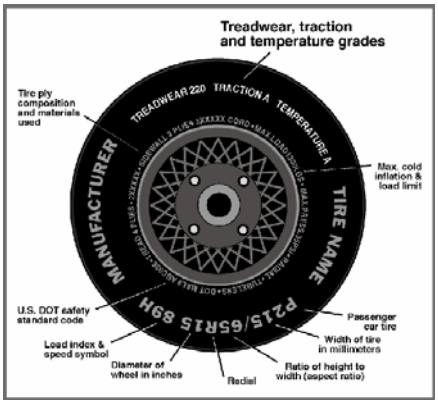
Weight Added: 114.5 kg

DATA SHEET NO. 13

TARGET VEHICLE TIRE INFORMATION

Target Vehicle: 1995 Jeep Grand Cherokee
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

Vehicle Year	1995	Vehicle Make	Jeep
VIN	1J4GZ78Y7SC687528	Vehicle Model	Grand Cherokee



	Left Front	**Right Front**
Tire Manufacturer	Goodyear	Sigma I
Tire Name	Wrangler GS-A	Stampede Radial A/T
Tire Type	P	P
Tire Width (mm)	245	235
Ratio of Height to Width (aspect ratio)	70	75
Radial	R	R
Wheel Diameter	15	15
Load Index & Speed Symbol	-	-
Treadwear	340	500
Traction Grade	A	A
Temperature Grade	B	B
	Left Rear	**Right Rear**
Tire Manufacturer	Sigma I	Sigma I
Tire Name	Stampede Radial A/T	Stampede Radial A/T
Tire Type	P	P
Tire Width (mm)	235	235
Ratio of Height to Width (aspect ratio)	75	75
Radial	R	R
Wheel Diameter	15	15
Load Index & Speed Symbol	-	-
Treadwear	500	500
Traction Grade	A	A
Temperature Grade	B	B

DATA SHEET NO. 14

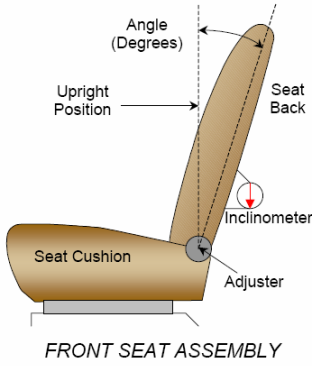
TARGET VEHICLE SEAT INFORMATION

Target Vehicle: 1995 Jeep Grand Cherokee
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

NORMAL DESIGN RIDING POSITION

Driver Seat Back Angle: 24 deg
Passenger Seat Back Angle: NA deg

(20^0 rearward of most forward locked position.)



FRONT SEAT ASSEMBLY

SEAT FORE / AFT POSITION

The driver and passenger seats are operated:
(manually / **electrically**)

Driver Seat Fore / Aft Total Travel: 195 positions / **mm**
Passenger Seat Fore / Aft Total Travel: 190 positions / **mm**

As Tested:
Driver Seat Fore / Aft Position: 97.5 mm, center of travel
Passenger Seat Fore / Aft Position: full rearward to accommodate instrumentation

SEAT BELT UPPER ANCHORAGE

The seat belt anchorages were placed in _____ position of _____ with the top position as one.

or **No Adjustment Available**

SEAT HEIGHT ADJUSTMENT

Seat is positioned at its lowest setting

NOTES: Any driver's seat motion other than seat back failure was unable to be examined due to crush locked driver's side front door

DATA SHEET NO. 14… (continued)

TARGET VEHICLE INFORMATION

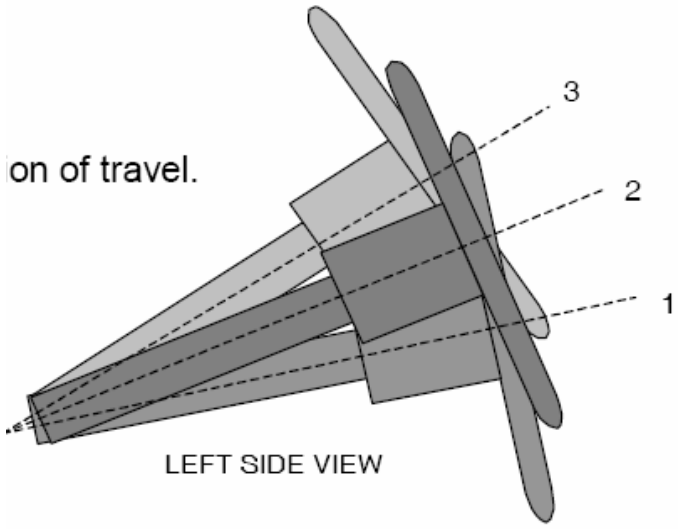
Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

STEERING COLUMN ADJUSTMENT

The steering column was placed in the mid position of travel.

Pos.	Desc	Angle
3	Full Up	50
2	Center	65
1	Full Down	80



STEERING COLUMN ASSEMBLY

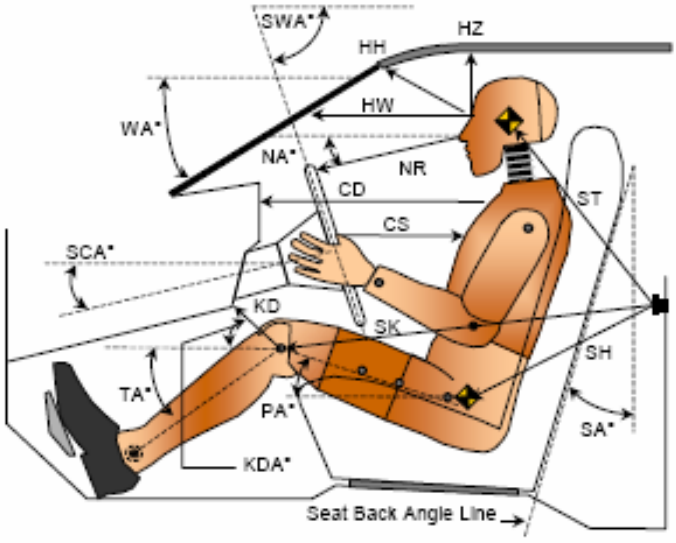
DATA SHEET NO. 15

TARGET VEHICLE DUMMY POSITIONING IN VEHICLE

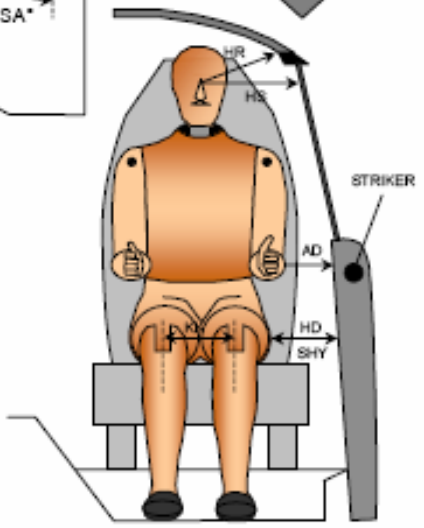
Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

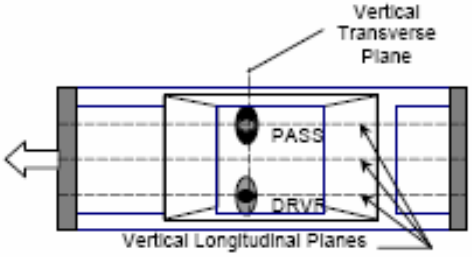
DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS



AD	Arm to Door
HD	H-Point to Door
HR	Head to Side Header
HS	Head to Side Window
KK	Knee to Knee
SHY	Striker to H-Point (Y Axis)



CD	Chest to Dash
CS	Chest to Steering Wheel Hub
HH	Head to Header
HW	Head to Windshield
HZ	Head to Roof
KDA	Knee to Dash Angle
KDL	Left Knee to Dash
KDR	Right Knee to Dash
NA	Nose to Rim Angle
NR	Nose to Rim
PA	Pelvic Angle
RA	Rim to Abdomen
SA	Seat Back Angle
SCA	Steering Column Angle
SH	Striker to H-Point
SK	Striker to Knee
ST	Striker to Head
SWA	Steering Wheel Angle
TA	Tibial Angle
WA	Windshield Angle



DATA SHEET NO. 15…(continued)

TARGET VEHICLE DUMMY POSITIONING IN VEHICLE

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

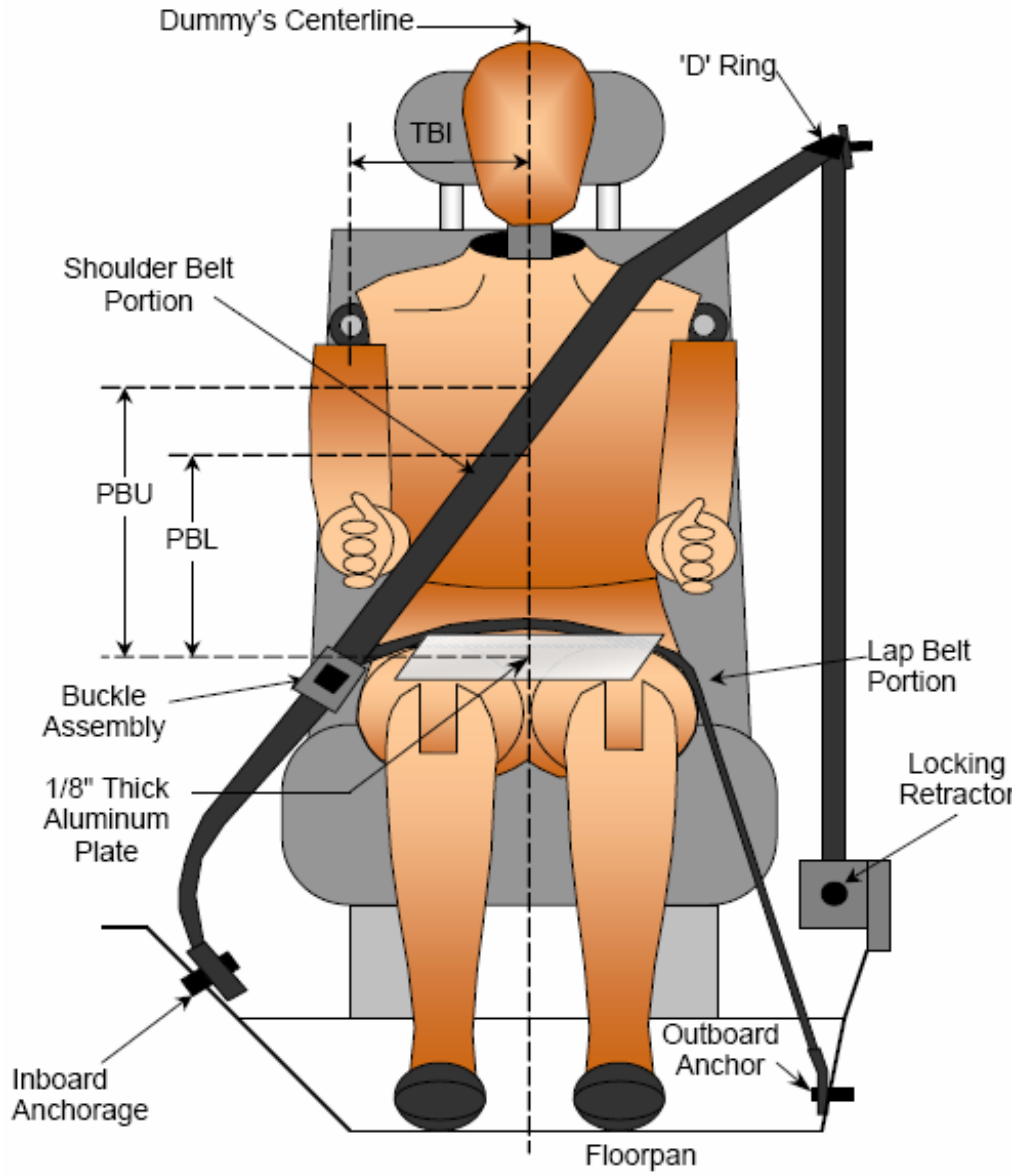
Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (^{o})	Length (mm)	Angle (^{o})
WA	Windshield Angle		35		
SWA	Steering Wheel Angle		25		
SCA	Steering Column Angle		25		
SA	Seat Back Angle (head rest post)		24		
HZ	Head to Roof (Z)	235			
HH	Head to Header	560			
HW	Head to Windshield	800			
HR	Head to Side Header (Y)	250			
NR	Nose to Rim	620			
CD	Chest to Dash	700			
CS	Chest to Steering Hub	350			
RA	Rim to Abdomen				
KDL	Left Knee to Dash	85			
KDR	Right Knee to Dash	80			
PA	Pelvic Angle		16		
TA	Tibia Angle				
KK	Knee to Knee (Y)	290			
SK	Striker to Knee	64			
ST	Striker to Head	590			
SH	Striker to H-Point	210			
SHY	Striker to H-Point (Y)	200			
HS	Head to Side Window	310			
HD	H-Point to Door	165			
AD	Arm to Door (Y)	80			
AA	Ankle to Ankle				

DATA SHEET NO. 16

TARGET VEHICLE SEAT BELT POSITIONING DATA

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU – Top surface of reference to belt upper edge	mm	370	
PBL – Top surface of reference to belt lower edge	mm	290	

DATA SHEET NO. 17

TARGET VEHICLE MEASUREMENTS

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

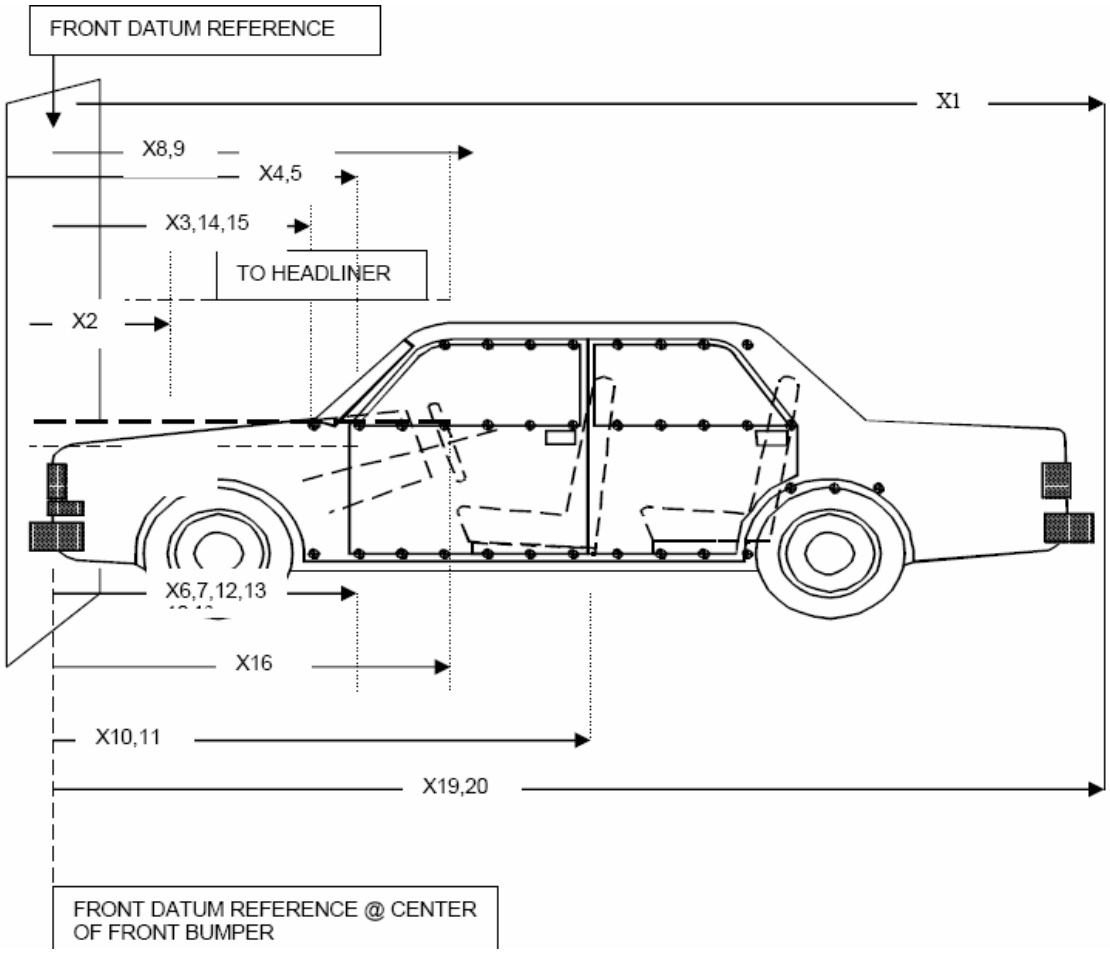
No.	Measurement	Units	Pre-Test	Post-Test	Difference
1	Total length of vehicle at centerline	Mm	4464	4127.5	336.5
4	FSOV to leading edge of right door	Mm	1359	133.5	25.5
5	FSOV to leading edge of left door	Mm	1374.7	1374.7	0
6	FSOV to lower leading edge of right door	Mm	1448	1397	51
7	FSOV to lower leading edge of left door	Mm	1461	1460.5	0.5
8	FSOV to upper leading edge of right door	Mm	1975	1397	578
9	FSOV to upper leading edge of left door	Mm	1975.1	1975.1	0
	FSOV to trailing edge of right door	Mm	2445	2413	32
	FSOV to trailing edge of left door	Mm	2445	2438.4	6.6
10	FSOV to lower trailing edge of right door	Mm	2470	2463.8	6.2
11	FSOV to lower trailing edge of left door	Mm	2477	2476.5	0.5
	FSOV to upper trailing edge of right door	Mm	2515	2501.9	13.1
	FSOV to upper trailing edge of left door	Mm	2534	2489.2	44.8
	FSOV to trailing edge of rr door	Mm	3353	3314.7	38.3
	FSOV to trailing edge of lr door	Mm	3359	3352.8	6.2
	FSOV to lower edge of rr door	Mm	3061	3009.9	51.1
	FSOV to lower edge of lr door	Mm	3061	3060.7	0.3
	FSOV to upper trailing edge of rr door	Mm	3226	3213.1	12.9
	FSOV to upper trailing edge of lr door	Mm	3226	3213.1	12.9
12	FSOV to bottom of right ‘A’ pillar	Mm	1448	1295.4	152.6
13	FSOV to bottom of left ‘A’ pillar	Mm	1448	1422.4	25.6
	FSOV to bottom of right ‘B’ pillar	Mm	2438	2413	25
	FSOV to bottom of left ‘B’ pillar	Mm	2441.5	2441.5	0
	FSOV to bottom of right ‘C’ pillar	Mm	3327	3314.7	12.3
	FSOV to bottom of left ‘C’ pillar	Mm	3333.9	3333.9	0
16	FSOV to steering column	Mm	1905	1905	0
17	Center of steering column to left ‘A’ pillar	Mm	457	292.1	164.9
18	Center of steering column to headlining	Mm	483	457.2	25.8
19	FSOV to right side of rear bumper	Mm	4407	4165.6	241.4
20	FSOV to left side of rear bumper	Mm	4420	3670.3	749.7
C1	Crush Zone 1 at right side	Mm	4432		
C2	Crush Zone 2 at right side	Mm	4445		
C3	Crush Zone 3 at right side	Mm	4458		
C4	Crush Zone 4 at left side	Mm	4458		
C5	Crush Zone 5 at left side	Mm	4445		
C6	Crush Zone 6 at left side	Mm	4432		

DATA SHEET NO. 17… (continued)

TARGET VEHICLE MEASUREMENTS

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10



DATA SHEET NO. 17… (Continued)

TARGET VEHICLE MEASUREMENTS

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

	Elements	Pre-Test (mm)
1	Total Length	4458
2	Total Width	1803
3	Rear Bumper Top Height	692
4	Rear Bumper Bottom Height	533
5	Longitudinal Member Top Height	
6	Distance Between Longitudinal Members	
7	Longitudinal Member Width	
8	Engine Top Height	NA
9	Engine Bottom Height	NA
10	Engine and Gearbox Width	NA
11	Front Bumper – Engine Distance	NA
12	Front Shock Absorber Fixing Height	NA
13	Bonnet Leading Edge Height	NA
14	Front Shock Absorber Fixing Width	NA
15	Rear Bumper – Rear Axle distance	953
16	Front Axle – A Pillar Distance	599
17	A-Pillar – B-Pillar Distance	1016
	C-Pillar – Rear Axle Distance	165
	B-Pillar – C-Pillar Distance	902
20	Roof Sill Bottom Height	1626
21	Roof Sill Top Height	1676
22	Floor Sill Bottom Height	381
23	Floor Sill Top Height	546

DATA SHEET NO. 18

TARGET VEHICLE ACCELEROMETER LOCATIONS & MEASUREMENTS

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

Location	X (mm)	Y (mm)	Z (mm)
CG	1905	-6	584.2

X Reference from the front bumper – positive towards the rear of the vehicle
Y Reference from the center line – positive towards the right side of the vehicle
Z Reference from the ground – positive up

Description of Instrumentation Included:

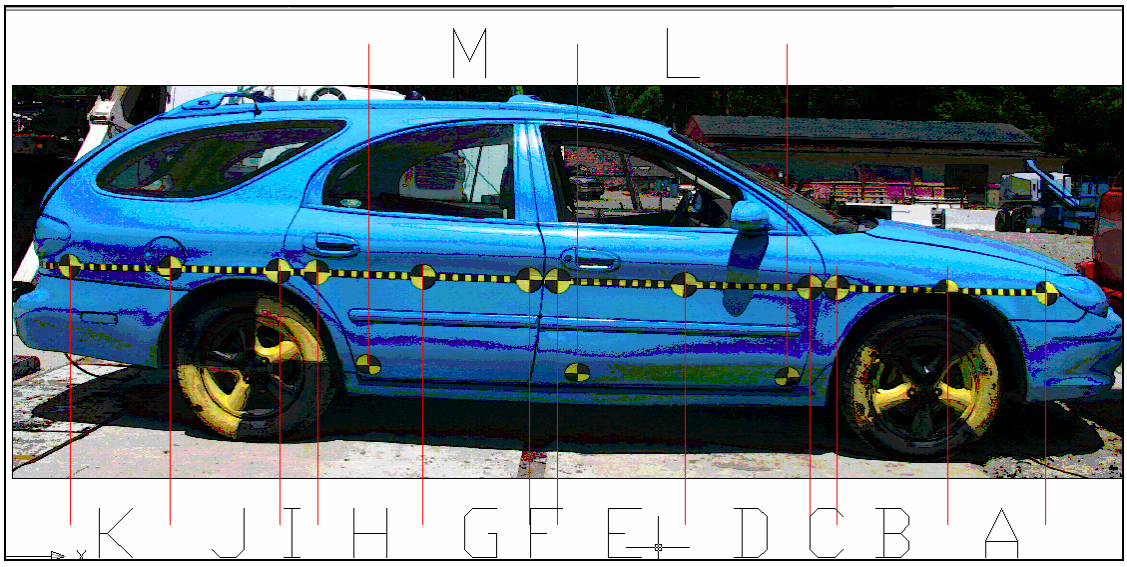
Tri-axial accelerometers and tri-axial roll rate at cg w/ full redundant

DATA SHEET NO. 19

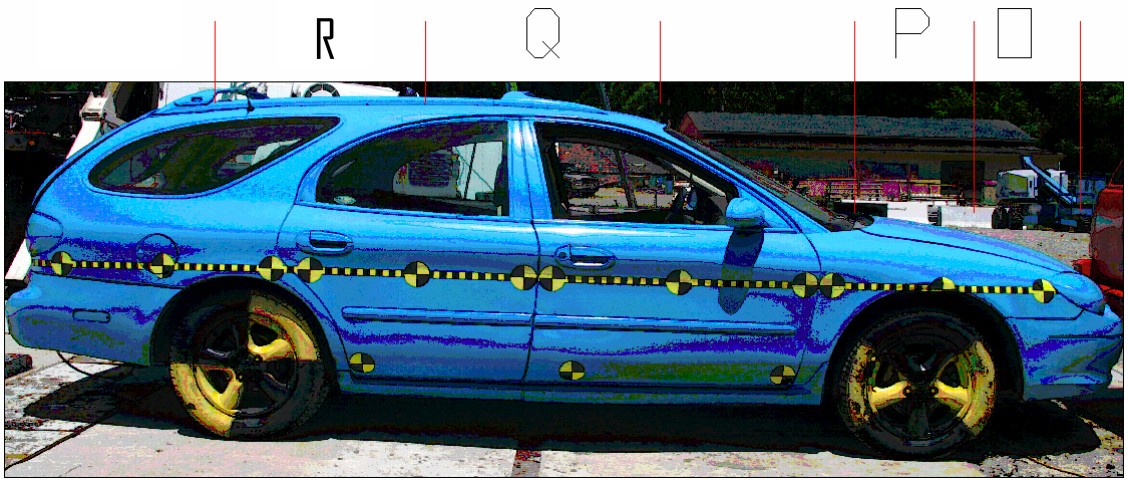
TARGET VEHICLE TARGET MEASUREMENTS

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10



Side Marker Measurements



Top Marker Measurements

DATA SHEET NO. 19…Continued

TARGET VEHICLE PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

	Driver's Side Middle		Passenger's Side Middle	
	Pre	Post	Pre	Post
A	465	465	-	464
B	462	462	460	460
C	110	106	110	108
D	485	483	480	481
E	485	484	484	483
F	109	97	115	109
G	404	397	404	403
H	400	397	399	400
I	108	78	110	95
J	353	349	350	349
K	353	178	360	352
	Driver's Side Low		Passenger's Side Low	
L	860	860	863	864
M	860	860	858	857
	Top			
	Pre		Post	
O	428		429	
P	418		406	
Q	1032		1035	
R	1028		1028	

DATA SHEET NO. 20

TARGET VEHICLE INTRUSION MEASUREMENTS

Target Vehicle: 1995 Jeep Grand Cherokee

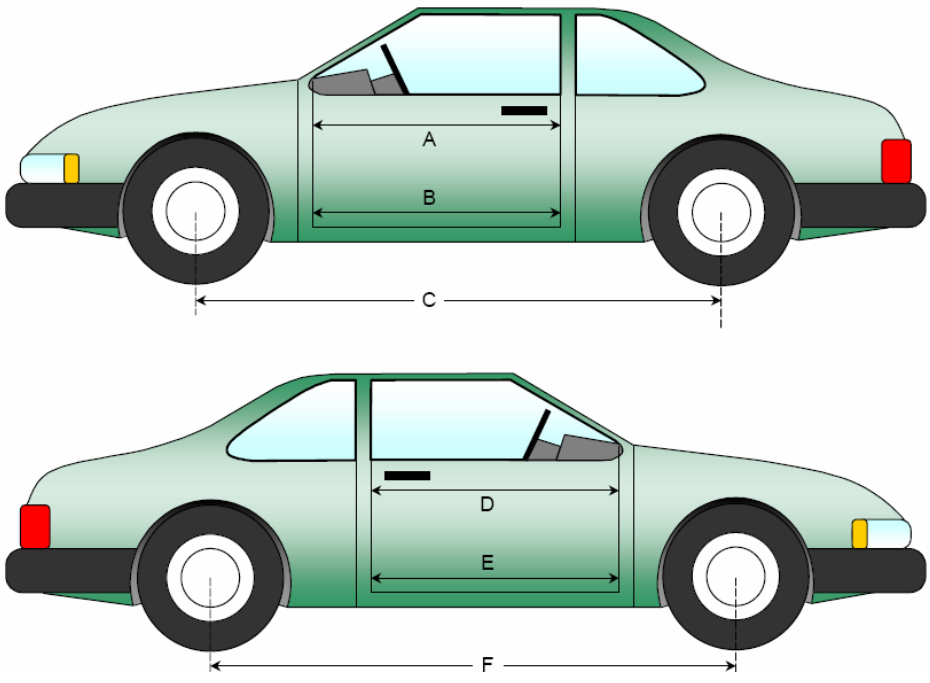
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1003	-	-
B	Left Side Lower	mm	978	-	-
D	Right Side Upper	mm	1003	999	4
E	Right Side Lower	mm	978	940	38
	Rear Left Side Upper	mm	826	-	-
	Rear Left Side Lower	mm	572	-	-
	Rear Right Side Upper	mm	826	-	-
	Rear Right Side Lower	mm	572	-	-

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2667	2518	149
F	Right Side Wheelbase	mm	2667	2670	-3



DATA SHEET NO. 21

TARGET VEHICLE ACCIDENT INVESTIGATION DIVISION DATA

Target Vehicle: 1995 Jeep Grand Cherokee
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

VEHICLE INFORMATION

VIN: 1J4GZ78Y7SC[redacted] Wheelbase (mm): 2667 mm
Vehicle Size Category: 3 Test Weight (kg): 1856.5 kg

ACCELEROMETER DATA

Accelerometer Locations: AT CG
Cal. Procedure / Interval: -
Integration Algorithm: - Linearity: -
Impact Velocity (kph): 0 kph
Velocity Change (kph): 37.0 kph Time of Separation (ms): 224

CRUSH PROFILE

Collision Deformation Classification: 06BWDA7 Midpoint of damage: -247 mm
Damage Region Length (mm): 1308 mm Impact Mode:

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at left side	mm	114, 25	343, 940	
C2	Crush Zone 2 at left side	mm	424, 13	604, 864	
C3	Crush Zone 3 at left side	mm	734, 0	866, 876	
C4	Crush Zone 4 at Right Side	mm	1044, 0	1128, 787	
C5	Crush Zone 5 at Right Side	mm	1354, 13	1389, 546	
C6	Crush Zone 6 at Right Side	mm	1664, 25	1651, 559	
L	C1 to C6	mm	1549	1308	

FHA, FOIL 2010, REAR IMPACT TEST, 10008,

Rear Impact Test 1 Final Report

SK

EXPERIMENTAL TEST OF OCCUPANT ENTRAPMENT

FORD TAURUS INTO REAR OF JEEP GRAND CHEROKEE
30% OFFSET, 50 MPH

PREPARED BY:
THE FEDERAL OUTDOOR IMPACT LABORATORY
6300 GEORGETOWN PIKE
MCLEAN, VA

Test Date: July 1, 2010

Final Report Date: July 30, 2010

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF SAFETY RESEARCH AND DEVELOPMENT
6300 GEORGETOWN PIKE
MCLEAN, VA

SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

The purpose of this 50 mph 30% offset rear impact test is to examine the occurrence of occupant entrapment in collisions similar in condition to that proposed for FMVSS 301.

SUMMARY

A 1995 Jeep Grand Cherokee was impacted in the rear by a 2000 Ford Taurus at a velocity of 50 mph. The Jeep and Ford were set so the right vertical edge of the front of the Ford would contact the Jeep rear 352.04 mm in right of the Jeep's longitudinal centerline. The test was performed at the Federal Outdoor Impact Laboratory on July 1, 2010. Pre- and Post-test photographs of the vehicle and dummy can be found in appendix A.

One real time camera and seven high-speed cameras were used to document the rear impact event. Camera locations and other pertinent camera information can be found in this report.

One 50^{th} percentile male anthropomorphic test device (ATD) was placed in the driver seating position according to dummy placement instructions specified in the FMVSS 208 Laboratory Indicant Test Procedure.

The ATD was not instrumented for this test.

The 21 channels of data were recorded with an on-board data acquisition system. Appendix B contains the vehicle response data traces.

As a result of the impact, both driver's side doors and the passenger's side rear door of the Jeep Grand Cherokee were crush locked and could not be opened after the test. The passenger's side front door of the Jeep Grand Cherokee was fully operational after the test.

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

DATA SHEET NO. 1

BULLET VEHICLE CRASH TEST SUMMARY

Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

BULLET VEHICLE PRIMARY IMPACT DATA

Measured Parameter	**Units**	**Value**
Bullet Vehicle Velocity At Impact	kph	80
Bullet Vehicle Test Weight	kg	1,498
Bullet Vehicle Maximum Static Crush	mm	419
Impact Point	mm	NA

DOOR OPENING AND SEAT TRACK INFORMATION: BULLET VEHICLE

Description	Driver	Passenger
Front Door Opening	Functional after test	Functional after test
Rear Door Opening	Functional after test	Functional after test
Seat Track Shift (mm)	NA	NA
Seat Back Failure (deg)	NA	NA

TEST DUMMY INFORMATION: BULLET VEHICLE

Description	Driver	Passenger
Dummy Type	NA	NA
Head Contact	NA	NA
Chest Contact	NA	NA
Abdomen Contact	NA	NA
Left Knee Contact	NA	NA
Right Knee Contact	NA	NA

VIDEO COVERAGE

High Speed	7
Real Time	2
Total	9

Driver ATD Sensors	NA
Passenger ATD Sensors	NA
Bullet Vehicle Structure Accelerometers	9
Target Vehicle Structure Accelerometers	12
Total	21

DATA SHEET NO. 2

GENERAL TEST AND BULLET VEHICLE PARAMETER DATA

Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

BULLET VEHICLE INFORMATION

Manufacturer	Ford
Model	Taurus
Body Style	Wagon
Vehicle No.	1
VIN	1FAFP58S0YA254876
Color	Painted Blue
Delivery Date	June 21, 2010
Odometer Reading	150,525
Dealer	Capitol Auto Auctions
Transmission	Automatic
Final Drive	Front
Number of Cylinders	6
Engine Displacement (L)	3.0
Engine Placement	Lateral

TEST VEHICLE OPTIONS

Driver Airbag	Y
Passenger Airbag	Y
Anti-theft System	
Cruise Control	Y
Power Windows	Y
Power Steering	Y
Power Door Locks	Y
Tilt Wheel	Y
Air Conditioning	Y
Power Brakes	Y
Disc Brakes, Front	Y
Disc Brakes, Rear	Y
Anti-lock Brakes	
AM / FM / Cassette	Y

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Company
Date of Manufacture	06 / 00

GVWR (kg)	2221
GAWR Front (kg)	1123
GAWR Rear (kg)	1098

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (psi)		
Cold Pressure (psi)	30	30
Recommended Tire Size	P215/60TR16	P215/60TR16
Tire Size On Vehicle	P215/60R16	P215/60R16
Tire Manufacturer	Bridgestone / Goodyear	BF Goodrich

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket / Bench	Bench	Bench	
Number of Occupants	3	3	2	8
Capacity Wt. (VCW) (kg)				745
Cargo Wt. (RCLW) (kg)				201

DATA SHEET NO. 3

BULLET VEHICLE PARAMETER DATA

Bullet Vehicle: 2000 Ford Taurus
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

BULLET VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	457.5	297.5	755	445.0	321.0	766
Right	kg	451.5	269.5	721	434.5	297.5	732
Ratio	%	61.6%	38.4%		58.7%	41.3%	
Totals	kg	909	567	1476	879.5	618.5	1498

BULLET VEHICLE TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight	kg	1476
Weight of 1 P572E ATD	kg	NA
Rated Cargo / Luggage Weight (RCLW)	kg	NA
Calculated Vehicle Target Weight (TVTW)	kg	1476

BULLET VEHICLE ATTITUDES

	Units	LF	RF	LR	RR
As Delivered	mm				
As Tested	mm	724	740	705	718
Post Test	mm	686	762	705	724

Weight of Ballast: _____

Vehicle Components Removed: Spare tire, trunk trim removed for instrumentation

Weight Removed: 25 kg

Added: Data Acquisition, Battery Box, Instrument Tray, Brake System

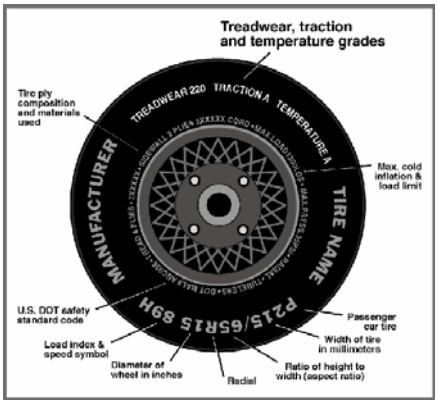
Weight Added: 47 kg

DATA SHEET NO. 4

BULLET VEHICLE TIRE INFORMATION

Bullet Vehicle: 2000 Ford Taurus
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

Vehicle Year	2000	Vehicle Make	Ford
VIN	1FAFP58S0YA[redacted]	Vehicle Model	Taurus



	Left Front	**Right Front**
Tire Manufacturer	Bridgestone	Goodyear
Tire Name	Insignia SE	Allegra
Tire Type	P	P
Tire Width (mm)	215	215
Ratio of Height to Width (aspect ratio)	60	60
Radial	R	R
Wheel Diameter	16	16
Load Index & Speed Symbol		
Treadwear	380	680
Traction Grade	B	A
Temperature Grade	B	B
	Left Rear	**Right Rear**
Tire Manufacturer	BF Goodrich	BF Goodrich
Tire Name	Touring T/A	Touring T/A
Tire Type	P	P
Tire Width (mm)	215	215
Ratio of Height to Width (aspect ratio)	60	60
Radial	R	R
Wheel Diameter	16	16
Load Index & Speed Symbol		
Treadwear	640	640
Traction Grade	A	A
Temperature Grade	B	B

DATA SHEET NO. 5

BULLET VEHICLE MEASUREMENTS

Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

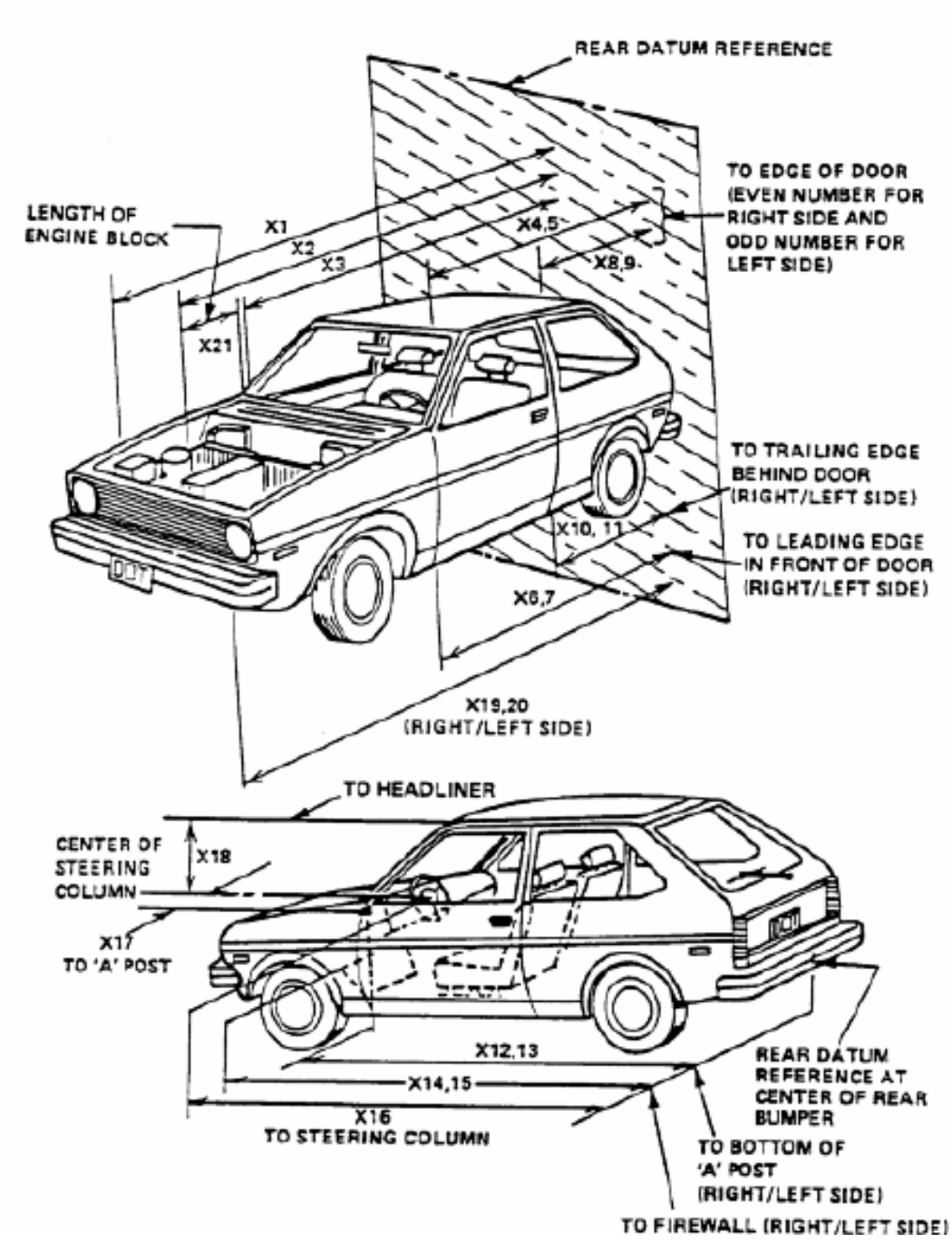
No.	Measurement	Units	Pre-Test	Post-Test	Diff
1	Total length of vehicle at centerline	mm	5029	4724.4	304.6
2	RSOV to front of engine	mm	4470	4368.8	101.2
3	RSOV to firewall centerline	mm	3916.5	3916.5	0
4	RSOV to leading edge of right door	mm	3524.3	3524.3	0
5	RSOV to leading edge of left door	mm	3524	3505.2	18.8
6	RSOV to lower leading edge of right door	mm	3435	3429	6
7	RSOV to lower leading edge of left door	mm	3435	3390.9	44.1
8	RSOV to upper leading edge of right door	mm	2886	2870.2	15.8
9	RSOV to upper leading edge of left door	mm	2908	2895.6	12.4
	RSOV to trailing edge of right door	mm	2416.4	2416.4	0
	RSOV to trailing edge of left door	mm	2413	2387.6	25.4
10	RSOV to lower trailing edge of right door	mm	2347.8	2347.8	0
11	RSOV to lower trailing edge of left door	mm	2369	2311.4	57.6
	RSOV to upper trailing edge of right door	mm	2311.6	2311.6	0
	RSOV to upper trailing edge of left door	mm	2311	2273.3	37.7
	RSOV to trailing edge of rear right door	mm	1372	1397	25
	RSOV to trailing edge of rear left door	mm	1363.6	1363.6	0
	RSOV to lower trailing edge of rear right door	mm	1670	1663.7	6.3
	RSOV to lower trailing edge of rear left door	mm	1676	1625.6	50.4
	RSOV to upper trailing edge of rear right door	mm	1568.3	1568.3	0
	RSOV to upper trailing edge of rear left door	mm	1549	1536.7	12.3
12	RSOV to bottom of right ‘A’ pillar	mm	3425.7	3425.7	0
13	RSOV to bottom of left ‘A’ pillar	mm	3428.9	3428.9	0
	RSOV to bottom of right ‘B’ pillar	mm	2385.9	2385.9	0
	RSOV to bottom of left ‘B’ pillar	mm	2387.5	2387.5	0
	RSOV to bottom of right ‘C’ pillar	mm	1657.4	1657.4	0
	RSOV to bottom of left ‘C’ pillar	mm	1657.4	1657.4	0
14	RSOV to firewall on right side	mm	3823	3581.4	241.6
15	RSOV to firewall on left side	mm	3874	3568.7	305.3
16	RSOV to steering column	mm	2985	2971.8	13.2
17	Center of steering column to left ‘A’ pillar	mm	301.4	301.4	0
18	Center of steering column to headlining	mm	432	432	0.2
19	RSOV to right side of front bumper	mm	4839	4724.4	114.6
20	RSOV to left side of front bumper	mm	4839	4826	13
21	Length of Engine Block	mm	559	559	0
RD	RSOV to right side of dash panel	mm	3108	3098.8	9.2
CD	RSOV to center of dash panel	mm			
LD	RSOV to left side of dash panel	mm	3121	3111.5	9.5

DATA SHEET NO. 5… (continued)

BULLET VEHICLE MEASUREMENTS

Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10



DATA SHEET NO. 5… (Continued)

BULLET VEHICLE MEASUREMENTS

Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

	Elements	Measurement (mm)
1	Total Length	5029
2	Total Width	1778
3	Front Bumper Top Height	559
4	Front Bumper Bottom Height	279
5	Longitudinal Member Top Height	756
6	Distance Between Longitudinal Members	1372
7	Longitudinal Member Width	
8	Engine Top Height	787
9	Engine Bottom Height	
10	Engine and Gearbox Width	
11	Front Bumper – Engine Distance	330
12	Front Shock Absorber Fixing Height	889
13	Bonnet Leading Edge Height	737
14	Front Shock Absorber Fixing Width	1137
15	Front Bumper – Front Axle distance	1035
16	Front Axle – A Pillar Distance	540
17	A-Pillar – B-Pillar Distance	1080
18	C-Pillar – Rear Axle Distance	381
19	B-Pillar – C-Pillar Distance	781
20	Roof Sill Bottom Height	1226
21	Roof Sill Top Height	1372
22	Floor Sill Bottom Height	197
23	Floor Sill Top Height	362

DATA SHEET NO. 6

BULLET VEHICLE ACCELEROMETER LOCATIONS & MEASUREMENTS

Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

Location	X (mm)	Y (mm)	Z (mm)
CG	2794	-25.4	-330.2

X Reference from the rear bumper – positive towards the front of the vehicle
Y Reference from the center line – positive towards the right side of the vehicle
Z Reference from the ground – positive down

Description of Instrumentation Included:

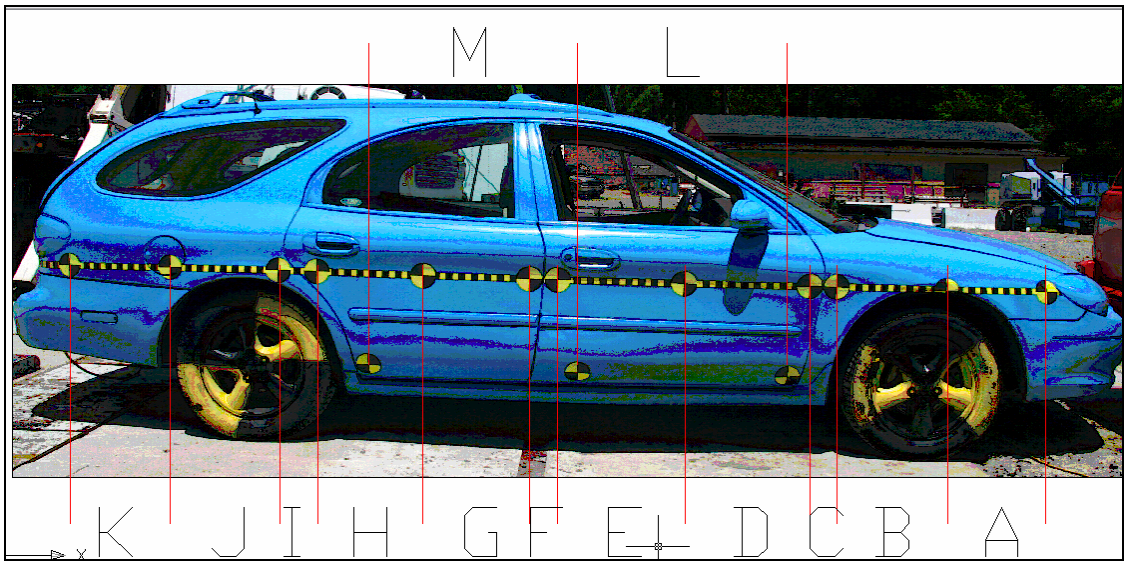
Triaxial accelerometer at cg, redundant triaxial accelerometer at cg, triaxial roll rate sensor at cg.

DATA SHEET NO. 7

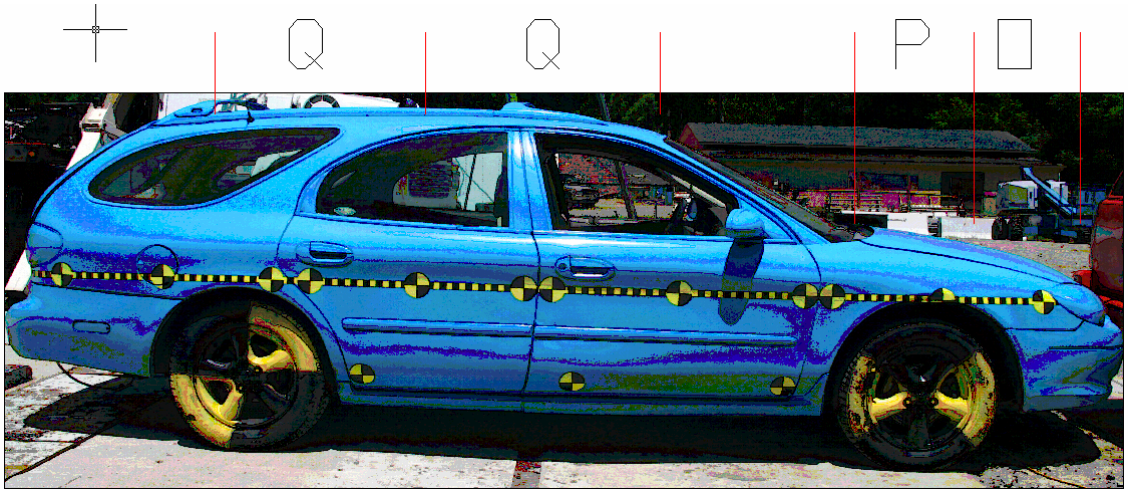
BULLET VEHICLE PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10



Side Marker Measurements



Top Marker Measurements

DATA SHEET NO. 7

BULLET VEHICLE PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

	Driver's Side Middle		Passenger's Side Middle	
	Pre	Post	Pre	Post
A	440	440	440	440
B	438	434	437	440
C	54	112	108	108
D	497	500	502	498
E	495	498	524	496
F	102	106	105	114
G	419	434	431.8	422
H	425	433	433	427
I	156	148	146	155
J	460	451	451	460
K	457	458	457	460
	Driver's Side Low		Passenger's Side Low	
L	841	843	846	843
M	832	645	843	840
	Top			
	Pre		Post	
O	445		466	
P			467	
Q	1046		1047	
R	1033		1033	

DATA SHEET NO. 8

BULLET VEHICLE INTRUSION MEASUREMENTS

Bullet Vehicle: 2000 Ford Taurus

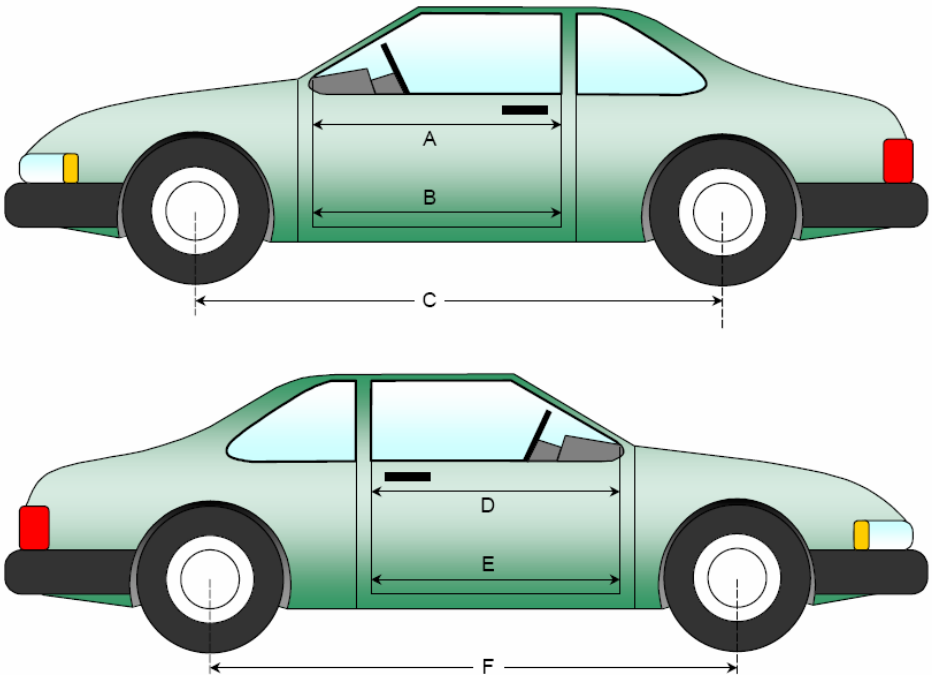
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	973	973	0
B	Left Side Lower	mm	923.5	923.5	0
D	Right Side Upper	mm	962	962	0
E	Right Side Lower	mm	927	914	920.5
	Rear Left Side Upper	mm	927	927	0
	Rear Left Side Lower	mm	682.5	682.5	0
	Rear Right Side Upper	mm	927	914	13
	Rear Right Side Lower	mm	686	679	7

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2743	2807	-64
F	Right Side Wheelbase	mm	2737	2680	57



DATA SHEET NO. 9

BULLET VEHICLE INTRUSION MEASUREMENTS

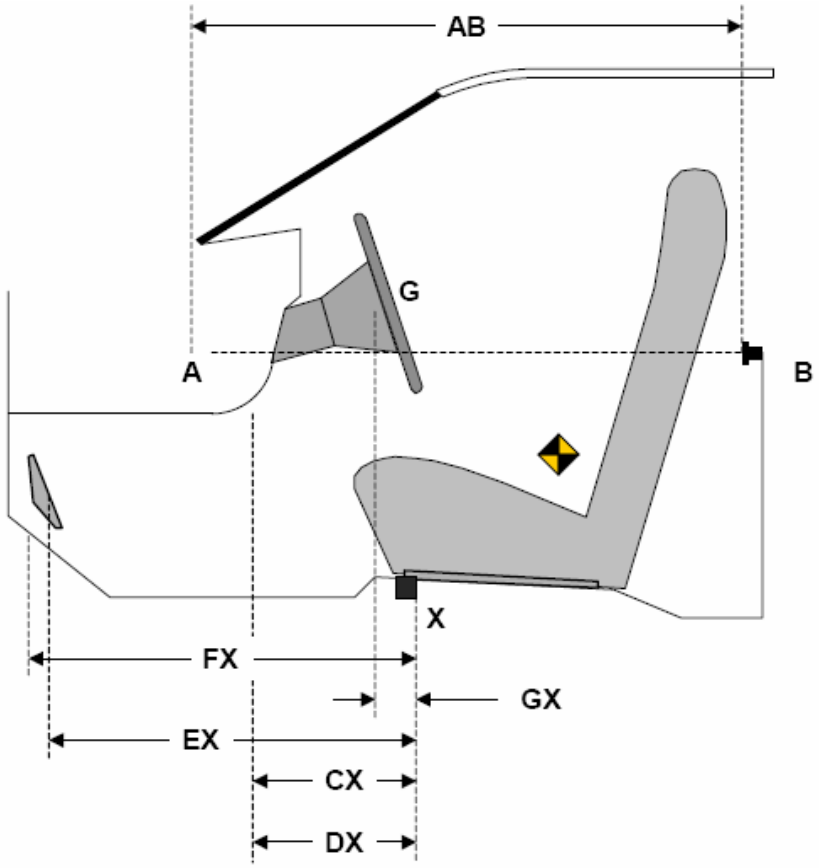
Bullet Vehicle: 2000 Ford Taurus

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (inside window jam)	mm	914	889	25
CX	Left Knee Bolster to X	mm	272.5	272.5	0
DX	Right Knee Bolster to X	mm	266.5	266.5	0
EX	Brake Pedal to X	mm	533	489	44
FX	Foot Rest to X	mm	511	511	0
GX	Center of Steering Column Wheel Hub to X	mm	0	0	0

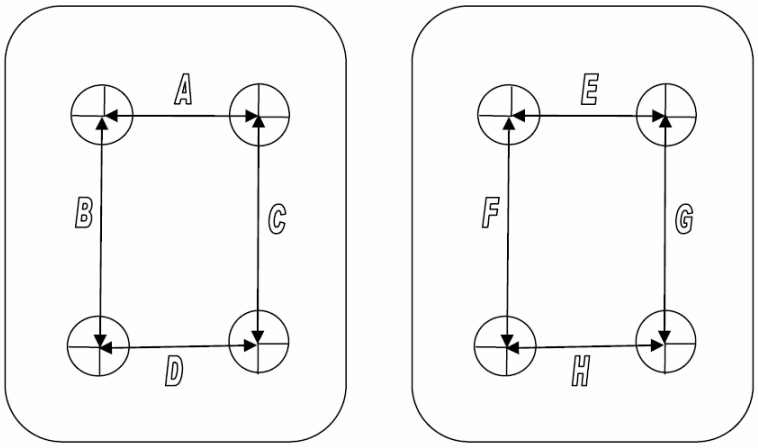
X = Front of Seat Track (stationary)



DRIVER COMPARTMENT

DATA SHEET NO. 9… (continued)
BULLETT VEHICLE INTRUSION MEASUREMENTS

Bullet Vehicle: 2000 Ford Taurus
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10



Measurement	Pre-Test	Post Test	Difference
A			
B			
C			
D			
E			
F			
G			
H			

	Pre		Post	
	D	P	D	P
From Front of Seat to Firewall	737	673	737	648

DATA SHEET NO. 9

BULLET VEHICLE ACCIDENT INVESTIGATION DIVISION DATA

Bullet Vehicle: 2000 Ford Taurus
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

VEHICLE INFORMATION

VIN: 1FAFP58S0YA[redacted] Wheelbase (mm): 2740
Vehicle Size Category: 3 Test Weight (kg): 1498

ACCELEROMETER DATA

Accelerometer Locations: at cg
Cal. Procedure / Interval:
Integration Algorithm: Linearity:
Impact Velocity (kph): 80 kph
Velocity Change (kph): 52 kph Time of Separation (ms): 224

CRUSH PROFILE

Collision Deformation Classification: 12FWDE5 Midpoint of damage +267mm
Damage Region Length (mm): 1245 mm Impact Mode:

At Bumper: z = 558.8 mm (y pos, x pos or crush)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at left side	mm	1612.9,191	1473.2, 190.5	+0.5
C2	Crush Zone 2 at left side	mm	1333.5,51	1219.2,215.9	-164.9
C3	Crush Zone 3 at left side	mm	1041.5,0	965.2, 304.8	-304.8
C4	Crush Zone 4 at Right Side	mm	749.3,0	711.2, 419.1	-419.1
C5	Crush Zone 5 at Right Side	mm	457.2,51	482.6, 330.2	-279.2
C6	Crush Zone 6 at Right Side	mm	165.1,191	228.6, 330.2	-139.2
L	C1 to C6	mm	1448	1244.6	

At top of radiator (under ride): z = 762 mm (y pos, x pos or crush)

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at left side	mm		1612.9, 495.3	
C2	Crush Zone 2 at left side	mm		1333.5, 406.4	
C3	Crush Zone 3 at left side	mm		1041.4, 482.6	
C4	Crush Zone 4 at Right Side	mm		749.3, 546.1	
C5	Crush Zone 5 at Right Side	mm		457.2, 558.8	
C6	Crush Zone 6 at Right Side	mm		165.1, 673.1	
L	C1 to C6	mm		1448	

DATA SHEET NO. 10

TARGET VEHICLE CRASH TEST SUMMARY

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

TARGET VEHICLE PRIMARY IMPACT DATA

Measured Parameter	**Units**	**Value**
Target Vehicle Velocity At Impact	kph	0.0
Target Vehicle Test Weight	kg	1856.5
Target Vehicle Maximum Static Crush	mm	939.8
Impact Point	mm	NA

DOOR OPENING AND SEAT TRACK INFORMATION: TARGET VEHICLE

Description	Driver	Passenger
Front Door Opening	Crush locked	Functional After Test
Rear Door Opening	Crush Locked	Crush Locked
Seat Track Shift (mm)	TBD	NA
Seat Back Failure (deg)	Yes – 35 deg final	NA

TEST DUMMY INFORMATION: TARGET VEHICLE

Description	Driver	Passenger
Dummy Type	50^{th}	NA
Head Contact		NA
Chest Contact		NA
Abdomen Contact		NA
Left Knee Contact		NA
Right Knee Contact		NA

VIDEO COVERAGE

High Speed	7
Real Time	2
Total	9

Driver ATD Sensors	NA
Passenger ATD Sensors	NA
Bullet Vehicle Structure Accelerometers	9
Target Vehicle Structure Accelerometers	12
Total	21

DATA SHEET NO. 11

GENERAL TEST AND TARGET VEHICLE PARAMETER DATA

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

TARGET VEHICLE INFORMATION

Manufacturer	Chrysler / Jeep
Model	Grand Cherokee
Body Style	SUV
Vehicle No.	2
VIN	1J4GZ78Y7SC687528
Color	Painted Red
Delivery Date	June 21, 2010
Odometer Reading	221,078
Dealer	Capitol Auto Auctions
Transmission	Automatic
Final Drive	4WD
Number of Cylinders	8
Engine Displacement (L)	5.2
Engine Placement	Longitudinal

TEST VEHICLE OPTIONS

Driver Airbag	Y
Passenger Airbag	N
Anti-theft System	Y
Cruise Control	Y
Power Windows	Y
Power Steering	Y
Power Door Locks	Y
Tilt Wheel	Y
Air Conditioning	Y
Power Brakes	Y
Disc Brakes, Front	Y
Disc Brakes, Rear	Y
Anti-lock Brakes	Y
AM / FM / Cassette	Y

DATA FROM CERTIFICATION LABEL

Manufactured By	Chrysler Corp.
Date of Manufacture	3/95

GVWR (kg)	2495
GAWR Front (kg)	1248
GAWR Rear (lkg)	1339

DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (psi)		
Cold Pressure (psi)	33	33
Recommended Tire Size	P225/75R15	P225/75R15
Tire Size On Vehicle	LF ONLY: P245/70R15	P235/75R15
Tire Manufacturer	Goodyear Wrangler GSA	Sigma I Stampede Radial

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	NA	NA
Number of Occupants	2	3	NA	3
Capacity Wt. (VCW) (kg)				780.5
Cargo Wt. (RCLW) (kg)				440.5

DATA SHEET NO. 12

GENERAL TEST AND TARGET VEHICLE PARAMETER DATA

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

TARGET VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	519	343.5	862.5	535	416.5	951.5
Right	kg	523	329	852	539.5	365.5	905
Ratio	%	60.8	39.2		57.9%	42.1%	
Totals	kg	1042	672.5	1714.5	1074.5	782	1856.5

TARGET VEHICLE TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight	kg	1714.5
Weight of 1 P572E ATD	kg	78
Rated Cargo / Luggage Weight (RCLW)	kg	136
Calculated Vehicle Target Weight (TVTW)	kg	1929

TARGET VEHICLE ATTITUDES

	Units	LF	RF	LR	RR
As Delivered	mm	848	848	883	876
As Tested	mm	841	844	865	863
Post Test	mm	845	829	857	749

Weight of Ballast: _____

Vehicle Components Removed: oil, trans fluid, antifreeze, fuel

Weight Removed: 21.5 kg

Added: battery box, data acquisition, brake system, Stoddard

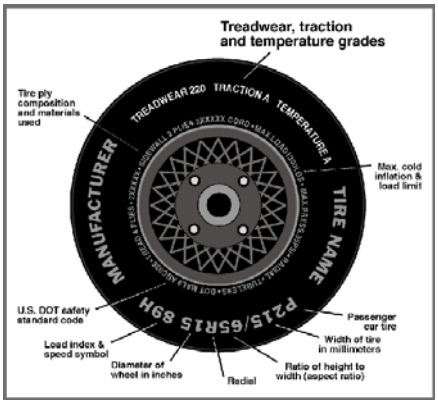
Weight Added: 114.5 kg

DATA SHEET NO. 13

TARGET VEHICLE TIRE INFORMATION

Target Vehicle: 1995 Jeep Grand Cherokee
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

Vehicle Year	1995	Vehicle Make	Jeep
VIN	1J4GZ78Y7SC[redacted]	Vehicle Model	Grand Cherokee



	Left Front	**Right Front**
Tire Manufacturer	Goodyear	Sigma I
Tire Name	Wrangler GS-A	Stampede Radial A/T
Tire Type	P	P
Tire Width (mm)	245	235
Ratio of Height to Width (aspect ratio)	70	75
Radial	R	R
Wheel Diameter	15	15
Load Index & Speed Symbol		
Treadwear	340	500
Traction Grade	A	A
Temperature Grade	B	B
	Left Rear	**Right Rear**
Tire Manufacturer	Sigma I	Sigma I
Tire Name	Stampede Radial A/T	Stampede Radial A/T
Tire Type	P	P
Tire Width (mm)	235	235
Ratio of Height to Width (aspect ratio)	75	75
Radial	R	R
Wheel Diameter	15	15
Load Index & Speed Symbol		
Treadwear	500	500
Traction Grade	A	A
Temperature Grade	B	B

DATA SHEET NO. 14

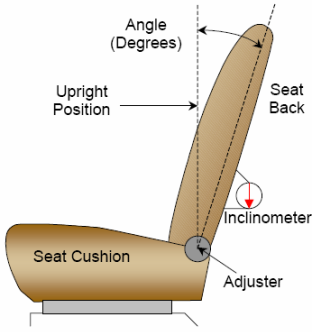
TARGET VEHICLE SEAT INFORMATION

Target Vehicle: 1995 Jeep Grand Cherokee
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

NORMAL DESIGN RIDING POSITION

Driver Seat Back Angle: 24 deg
Passenger Seat Back Angle: NA deg

(20^0 rearward of most forward locked position.)



FRONT SEAT ASSEMBLY

SEAT FORE / AFT POSITION

The driver and passenger seats are operated:
(manually / **electrically**)

Driver Seat Fore / Aft Total Travel: 195 positions / **mm**
Passenger Seat Fore / Aft Total Travel: 190 positions / **mm**

As Tested:
Driver Seat Fore / Aft Position: 97.5 mm, center of travel
Passenger Seat Fore / Aft Position: full rearward to accommodate instrumentation

SEAT BELT UPPER ANCHORAGE

The seat belt anchorages were placed in _____ position of _____ with the top position as one.

or **No Adjustment Available**

SEAT HEIGHT ADJUSTMENT

Seat is positioned at its lowest setting

NOTES: Any driver's seat motion other than seat back failure was unable to be examined due to crush locked driver's side front door

DATA SHEET NO. 14… (continued)

TARGET VEHICLE INFORMATION

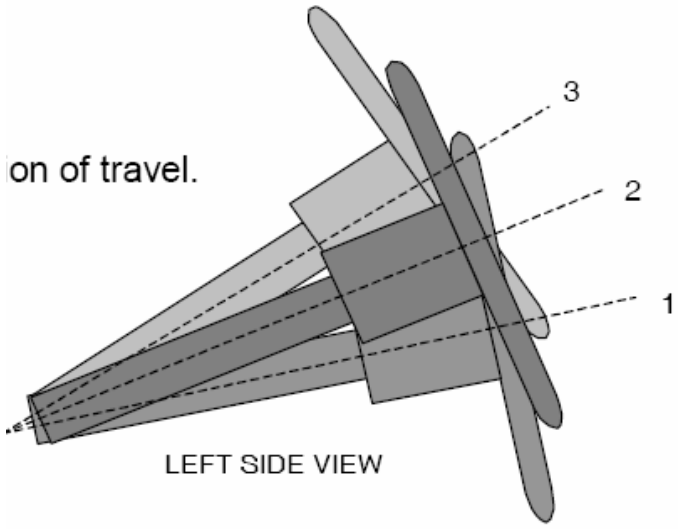
Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

STEERING COLUMN ADJUSTMENT

The steering column was placed in the mid position of travel.

Pos.	Desc	Angle
3	Full Up	50
2	Center	65
1	Full Down	80



STEERING COLUMN ASSEMBLY

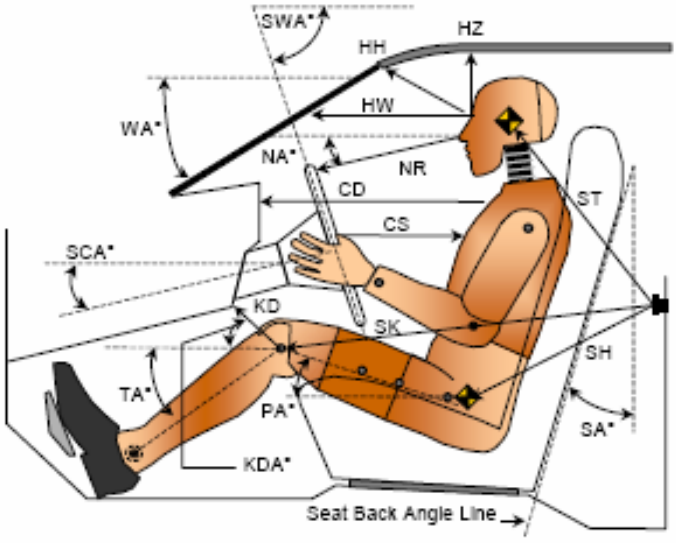
DATA SHEET NO. 15

TARGET VEHICLE DUMMY POSITIONING IN VEHICLE

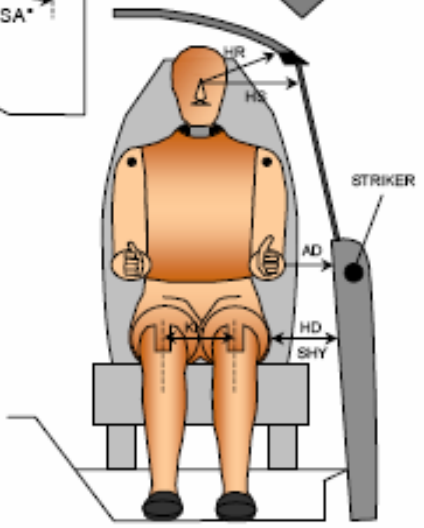
Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

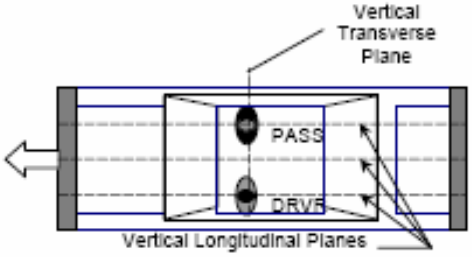
DUMMY MEASUREMENTS FOR FRONT SEAT OCCUPANTS



AD	Arm to Door
HD	H-Point to Door
HR	Head to Side Header
HS	Head to Side Window
KK	Knee to Knee
SHY	Striker to H-Point (Y Axis)



CD	Chest to Dash
CS	Chest to Steering Wheel Hub
HH	Head to Header
HW	Head to Windshield
HZ	Head to Roof
KDA	Knee to Dash Angle
KDL	Left Knee to Dash
KDR	Right Knee to Dash
NA	Nose to Rim Angle
NR	Nose to Rim
PA	Pelvic Angle
RA	Rim to Abdomen
SA	Seat Back Angle
SCA	Steering Column Angle
SH	Striker to H-Point
SK	Striker to Knee
ST	Striker to Head
SWA	Steering Wheel Angle
TA	Tibial Angle
WA	Windshield Angle



DATA SHEET NO. 15…(continued)

TARGET VEHICLE DUMMY POSITIONING IN VEHICLE

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

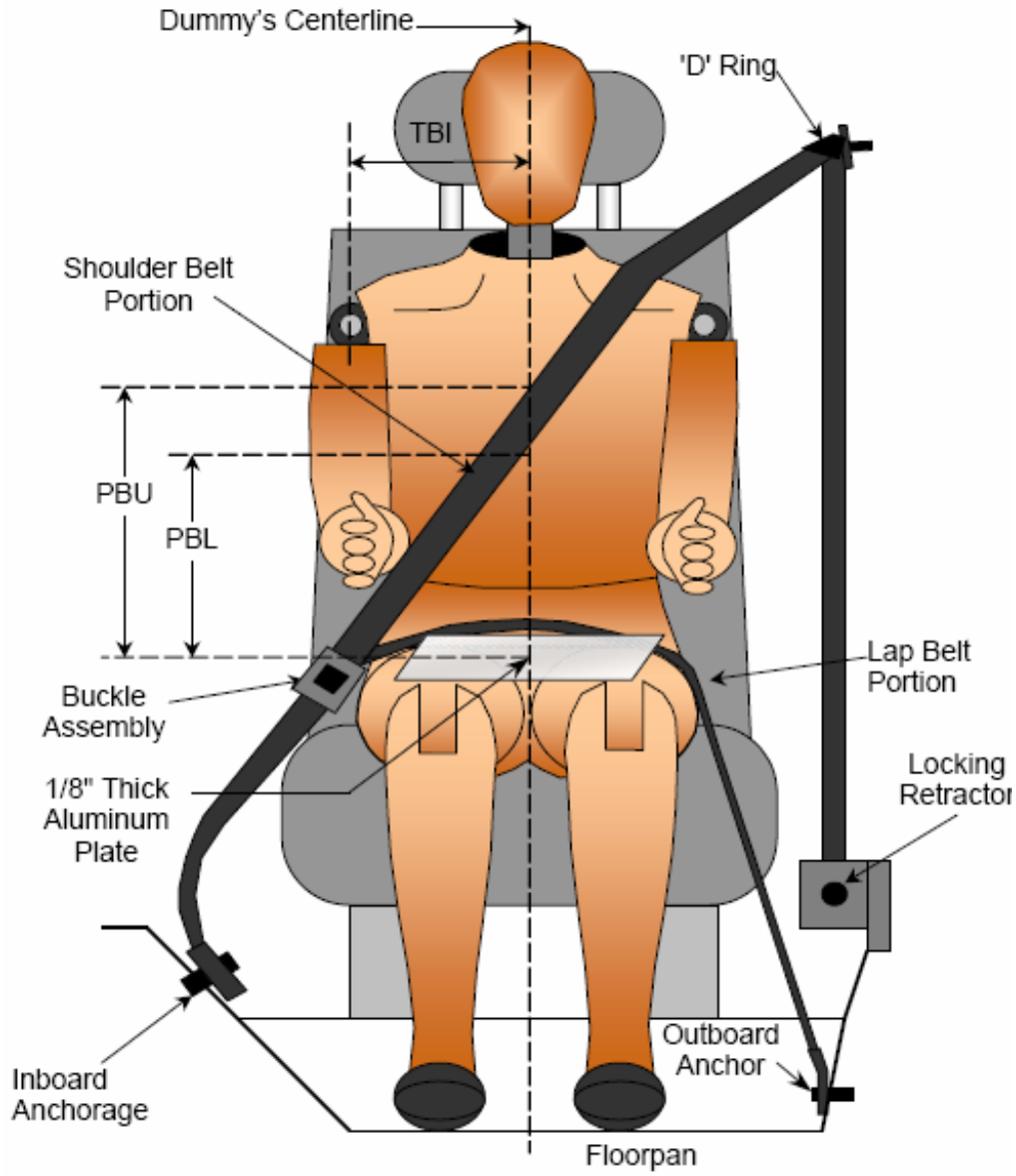
Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle (^{o})	Length (mm)	Angle (^{o})
WA	Windshield Angle		35		
SWA	Steering Wheel Angle		25		
SCA	Steering Column Angle		25		
SA	Seat Back Angle (head rest post)		24		
HZ	Head to Roof (Z)	235			
HH	Head to Header	560			
HW	Head to Windshield	800			
HR	Head to Side Header (Y)	250			
NR	Nose to Rim	620			
CD	Chest to Dash	700			
CS	Chest to Steering Hub	350			
RA	Rim to Abdomen				
KDL	Left Knee to Dash	85			
KDR	Right Knee to Dash	80			
PA	Pelvic Angle		16		
TA	Tibia Angle				
KK	Knee to Knee (Y)	290			
SK	Striker to Knee	64			
ST	Striker to Head	590			
SH	Striker to H-Point	210			
SHY	Striker to H-Point (Y)	200			
HS	Head to Side Window	310			
HD	H-Point to Door	165			
AD	Arm to Door (Y)	80			
AA	Ankle to Ankle				

DATA SHEET NO. 16

TARGET VEHICLE SEAT BELT POSITIONING DATA

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU – Top surface of reference to belt upper edge	mm	370	
PBL – Top surface of reference to belt lower edge	mm	290	

DATA SHEET NO. 17

TARGET VEHICLE MEASUREMENTS

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

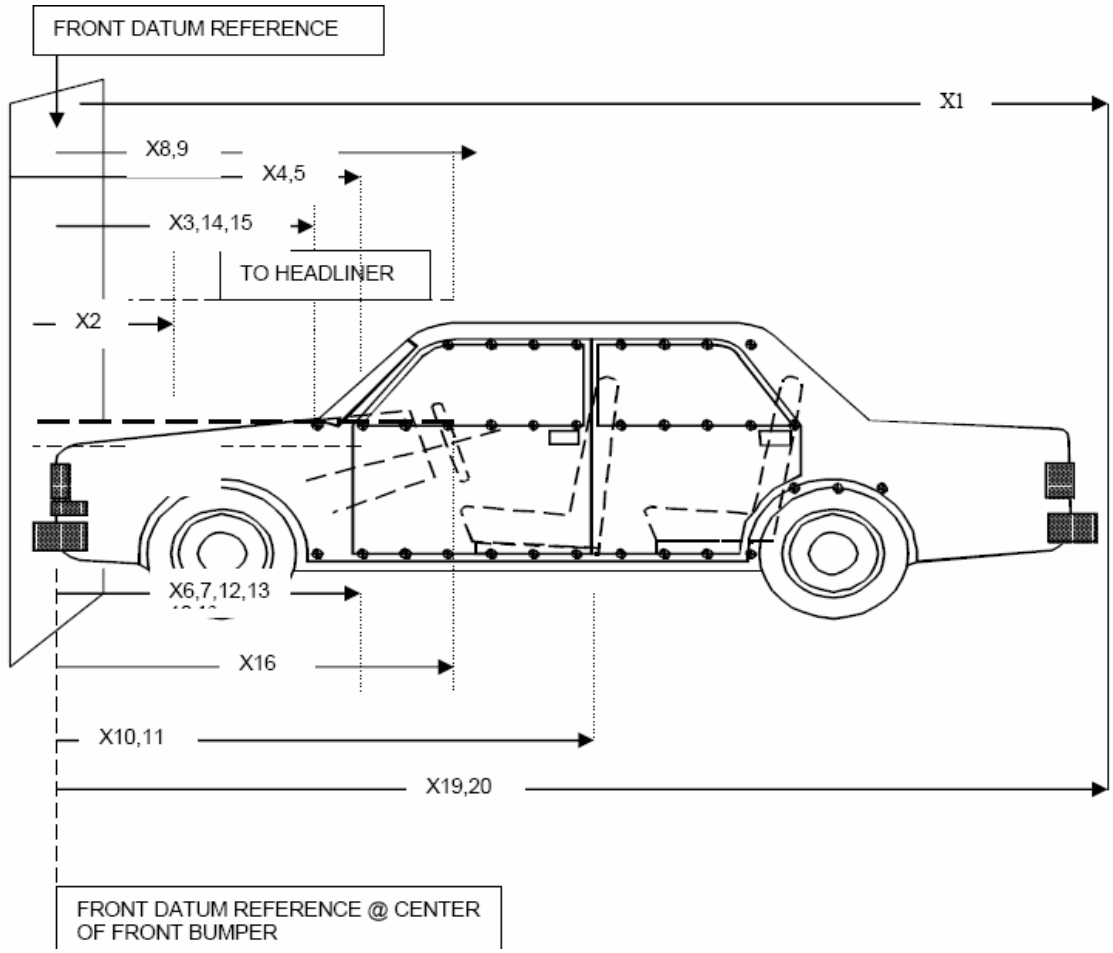
No.	Measurement	Units	Pre-Test	Post-Test	Difference
1	Total length of vehicle at centerline	Mm	4464	4127.5	336.5
4	FSOV to leading edge of right door	Mm	1359	133.5	25.5
5	FSOV to leading edge of left door	Mm	1374.7	1374.7	0
6	FSOV to lower leading edge of right door	Mm	1448	1397	51
7	FSOV to lower leading edge of left door	Mm	1461	1460.5	0.5
8	FSOV to upper leading edge of right door	Mm	1975	1397	578
9	FSOV to upper leading edge of left door	Mm	1975.1	1975.1	0
	FSOV to trailing edge of right door	Mm	2445	2413	32
	FSOV to trailing edge of left door	Mm	2445	2438.4	6.6
10	FSOV to lower trailing edge of right door	Mm	2470	2463.8	6.2
11	FSOV to lower trailing edge of left door	Mm	2477	2476.5	0.5
	FSOV to upper trailing edge of right door	Mm	2515	2501.9	13.1
	FSOV to upper trailing edge of left door	Mm	2534	2489.2	44.8
	FSOV to trailing edge of rr door	Mm	3353	3314.7	38.3
	FSOV to trailing edge of lr door	Mm	3359	3352.8	6.2
	FSOV to lower edge of rr door	Mm	3061	3009.9	51.1
	FSOV to lower edge of lr door	Mm	3061	3060.7	0.3
	FSOV to upper trailing edge of rr door	Mm	3226	3213.1	12.9
	FSOV to upper trailing edge of lr door	Mm	3226	3213.1	12.9
12	FSOV to bottom of right ‘A’ pillar	Mm	1448	1295.4	152.6
13	FSOV to bottom of left ‘A’ pillar	Mm	1448	1422.4	25.6
	FSOV to bottom of right ‘B’ pillar	Mm	2438	2413	25
	FSOV to bottom of left ‘B’ pillar	Mm	2441.5	2441.5	0
	FSOV to bottom of right ‘C’ pillar	Mm	3327	3314.7	12.3
	FSOV to bottom of left ‘C’ pillar	Mm	3333.9	3333.9	0
16	FSOV to steering column	Mm	1905	1905	0
17	Center of steering column to left ‘A’ pillar	Mm	457	292.1	164.9
18	Center of steering column to headlining	Mm	483	457.2	25.8
19	FSOV to right side of rear bumper	Mm	4407	4165.6	241.4
20	FSOV to left side of rear bumper	Mm	4420	3670.3	749.7
C1	Crush Zone 1 at right side	Mm	4432		
C2	Crush Zone 2 at right side	Mm	4445		
C3	Crush Zone 3 at right side	Mm	4458		
C4	Crush Zone 4 at left side	Mm	4458		
C5	Crush Zone 5 at left side	Mm	4445		
C6	Crush Zone 6 at left side	Mm	4432		

DATA SHEET NO. 17… (continued)

TARGET VEHICLE MEASUREMENTS

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10



DATA SHEET NO. 17… (Continued)

TARGET VEHICLE MEASUREMENTS

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

	Elements	Pre-Test (mm)
1	Total Length	4458
2	Total Width	1803
3	Rear Bumper Top Height	692
4	Rear Bumper Bottom Height	533
5	Longitudinal Member Top Height	
6	Distance Between Longitudinal Members	
7	Longitudinal Member Width	
8	Engine Top Height	NA
9	Engine Bottom Height	NA
10	Engine and Gearbox Width	NA
11	Front Bumper – Engine Distance	NA
12	Front Shock Absorber Fixing Height	NA
13	Bonnet Leading Edge Height	NA
14	Front Shock Absorber Fixing Width	NA
15	Rear Bumper – Rear Axle distance	953
16	Front Axle – A Pillar Distance	599
17	A-Pillar – B-Pillar Distance	1016
	C-Pillar – Rear Axle Distance	165
	B-Pillar – C-Pillar Distance	902
20	Roof Sill Bottom Height	1626
21	Roof Sill Top Height	1676
22	Floor Sill Bottom Height	381
23	Floor Sill Top Height	546

DATA SHEET NO. 18

TARGET VEHICLE ACCELEROMETER LOCATIONS & MEASUREMENTS

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

Location	X (mm)	Y (mm)	Z (mm)
CG	1905	-6	584.2

X Reference from the front bumper – positive towards the rear of the vehicle
Y Reference from the center line – positive towards the right side of the vehicle
Z Reference from the ground – positive up

Description of Instrumentation Included:

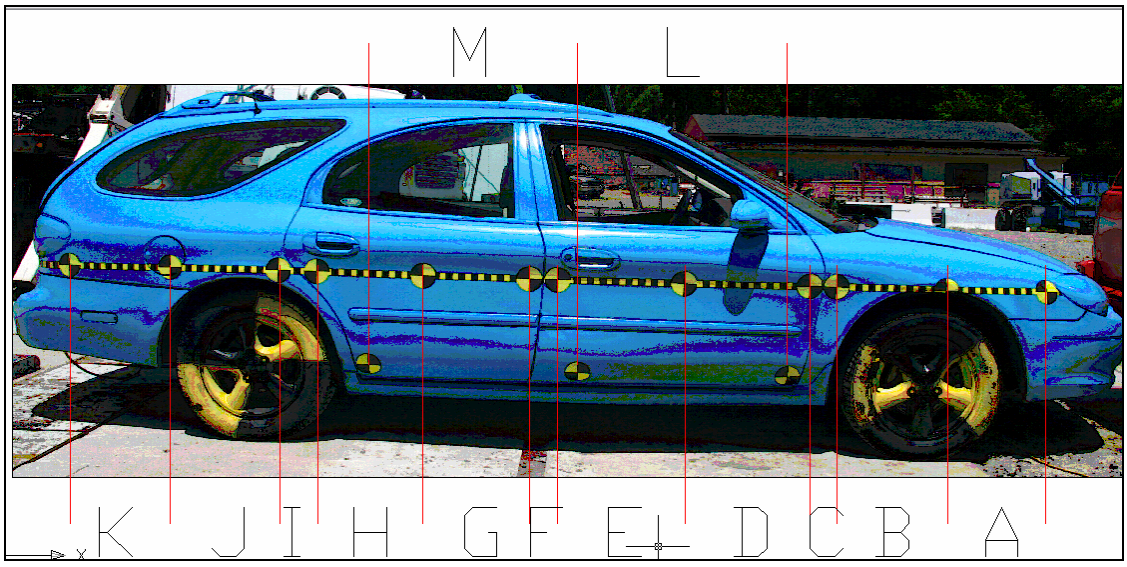
Tri-axial accelerometers and tri-axial roll rate at cg w/ full redundant

DATA SHEET NO. 19

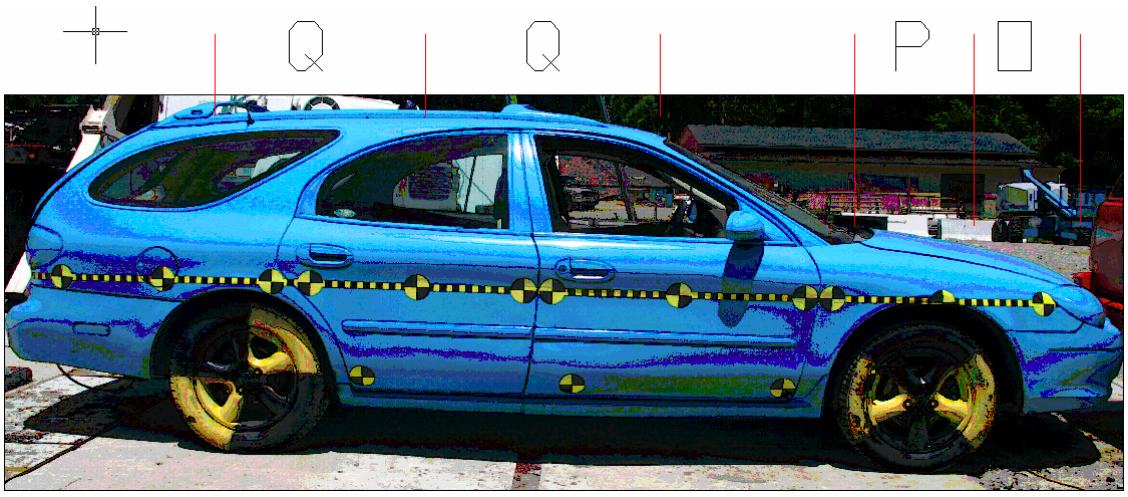
TARGET VEHICLE TARGET MEASUREMENTS

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10



Side Marker Measurements



Top Marker Measurements

DATA SHEET NO. 19…Continued

TARGET VEHICLE PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

	Driver's Side Middle		Passenger's Side Middle	
	Pre	Post	Pre	Post
A	465	465	-	464
B	462	462	460	460
C	110	106	110	108
D	485	483	480	481
E	485	484	484	483
F	109	97	115	109
G	404	397	404	403
H	400	397	399	400
I	108	78	110	95
J	353	349	350	349
K	353	178	360	352
	Driver's Side Low		Passenger's Side Low	
L	860	860	863	864
M	860	860	858	857
	Top			
	Pre		Post	
O	428		429	
P	418		406	
Q	1032		1035	
R	1028		1028	

DATA SHEET NO. 20

TARGET VEHICLE INTRUSION MEASUREMENTS

Target Vehicle: 1995 Jeep Grand Cherokee

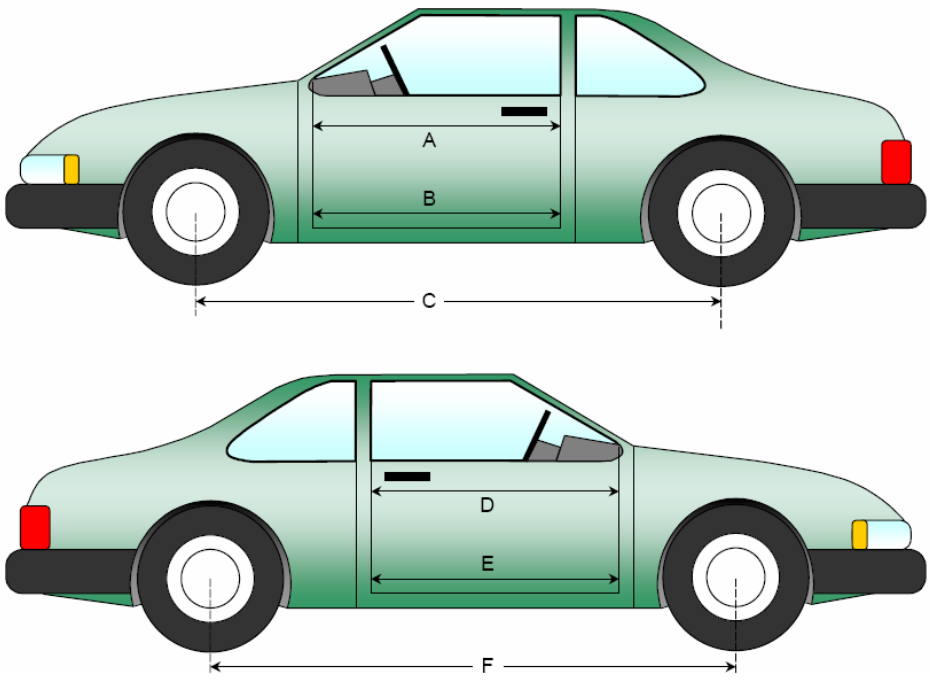
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1003		
B	Left Side Lower	mm	978		
D	Right Side Upper	mm	1003	999	
E	Right Side Lower	mm	978	940	
	Rear Left Side Upper	mm	826		
	Rear Left Side Lower	mm	572		
	Rear Right Side Upper	mm	826		
	Rear Right Side Lower	mm	572		

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2667	2518	
F	Right Side Wheelbase	mm	2667	2670	



DATA SHEET NO. 21

TARGET VEHICLE ACCIDENT INVESTIGATION DIVISION DATA

Target Vehicle: 1995 Jeep Grand Cherokee
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

VEHICLE INFORMATION

VIN: 1J4GZ78Y7SC[redacted] Wheelbase (mm): 2667 mm
Vehicle Size Category: 3 Test Weight (kg): 1856.5 kg

ACCELEROMETER DATA

Accelerometer Locations: AT CG
Cal. Procedure / Interval:
Integration Algorithm: Linearity:
Impact Velocity (kph): 0 kph
Velocity Change (kph): 37.0 mph Time of Separation (ms): 224

CRUSH PROFILE

Collision Deformation Classification: 06BWDA7 Midpoint of damage: -247 mm
Damage Region Length (mm): 1308 mm Impact Mode:

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at left side	mm	114, 25	343, 940	
C2	Crush Zone 2 at left side	mm	424, 13	604, 864	
C3	Crush Zone 3 at left side	mm	734, 0	866, 876	
C4	Crush Zone 4 at Right Side	mm	1044, 0	1128, 787	
C5	Crush Zone 5 at Right Side	mm	1354, 13	1389, 546	
C6	Crush Zone 6 at Right Side	mm	1664, 25	1651, 559	
L	C1 to C6	mm	1549	1308	

DATA SHEET NO. 22

CAMERA LOCATIONS

Bullet Vehicle: 2000 Ford Taurus
Target Vehicle: 1995 Jeep Grand Cherokee
Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real Time					
2	Overall Target Vehicle Driver's Side					
3	Target Vehicle Driver's Side					
4	Target Vehicle Driver's Closeup					
5	Bullet Vehicle Driver's Side					
6	Overall Target Vehicle Passenger's Side					
7	Target Vehicle Passenger's Side					
8	Overhead Wide (not shown)					
9						
10						
11						

Coordinates

+X = film plane forward of impact point
+Y = film plane to right of monorail centerline
+Z = film plane above ground level

Camera	Coverage Description
2	Entire bullet and target vehicle
3	Entire target vehicle
4	Driver's Area (just behind B pillar to just in front of A pillar)
5	Entire bullet vehicle
6	Entire bullet and target vehicle
7	Entire target vehicle

NOTE: all cameras should cover the specified object from the point of impact through the first 15 ft of motion.

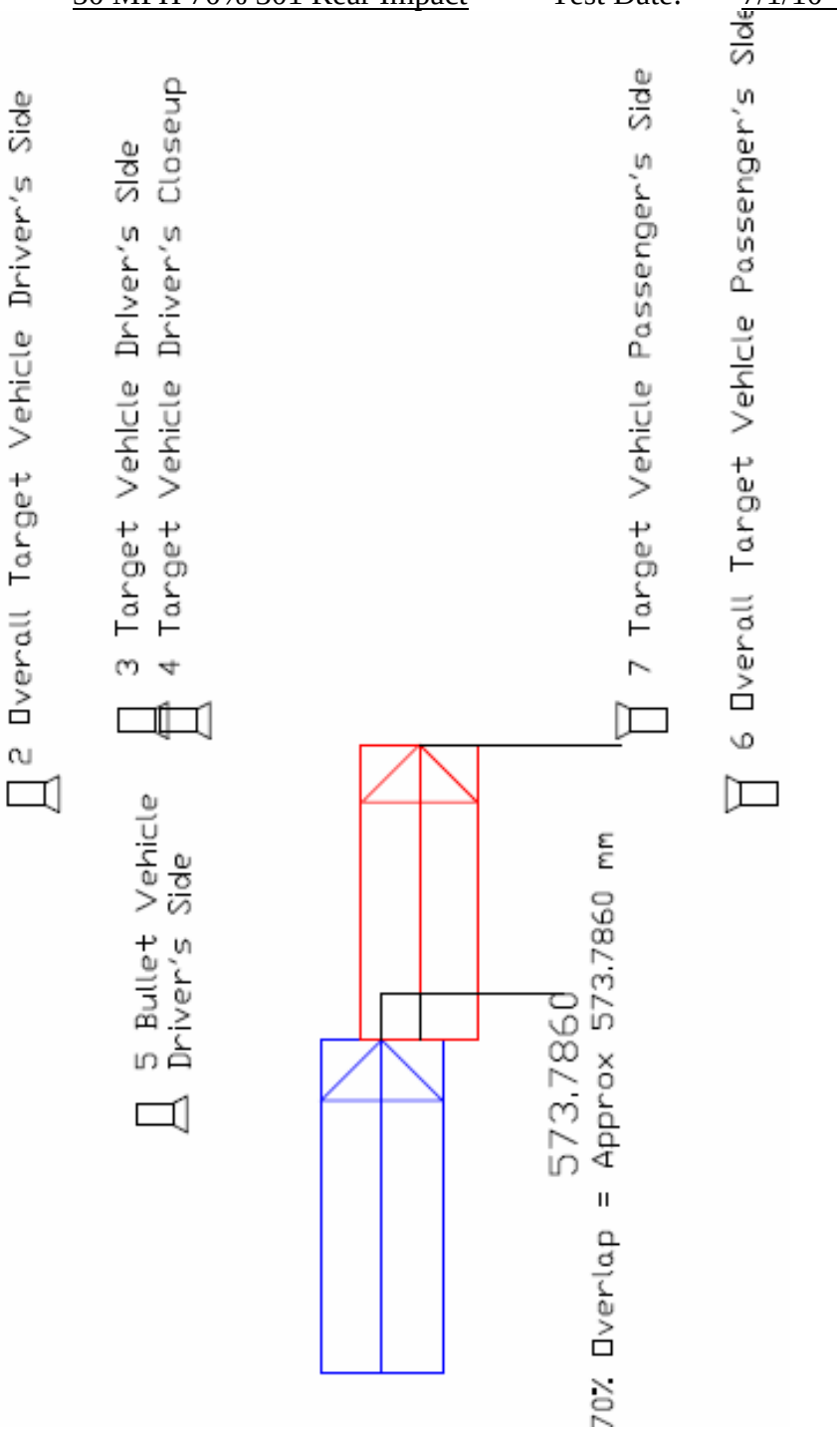
DATA SHEET NO. 27… (continued)

CAMERA LOCATIONS

Bullet Vehicle: 2000 Ford Taurus

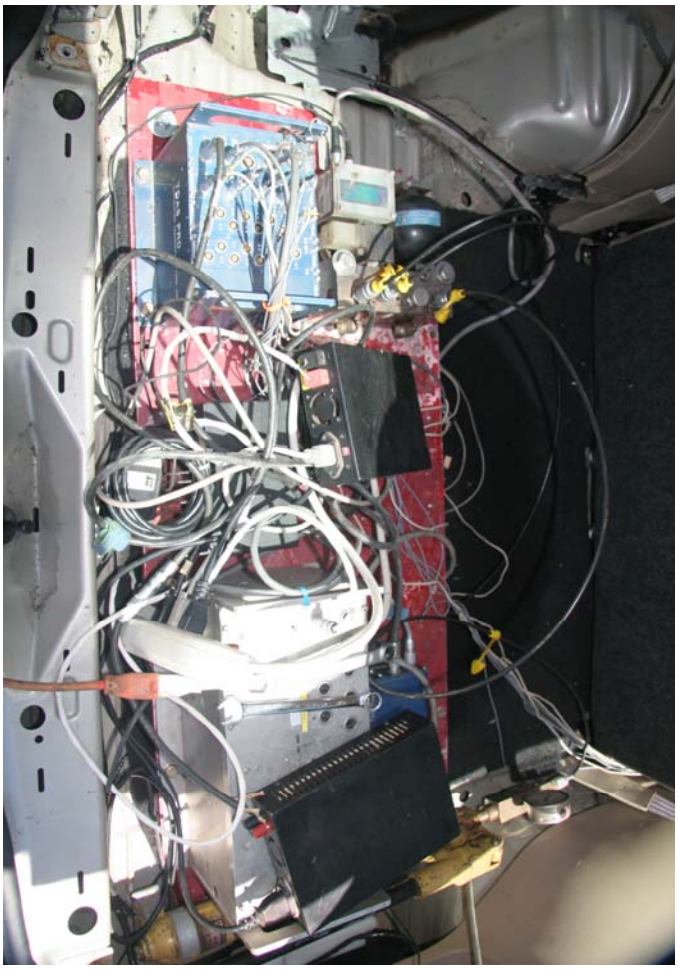
Target Vehicle: 1995 Jeep Grand Cherokee

Test Program: 50 MPH 70% 301 Rear Impact Test Date: 7/1/10

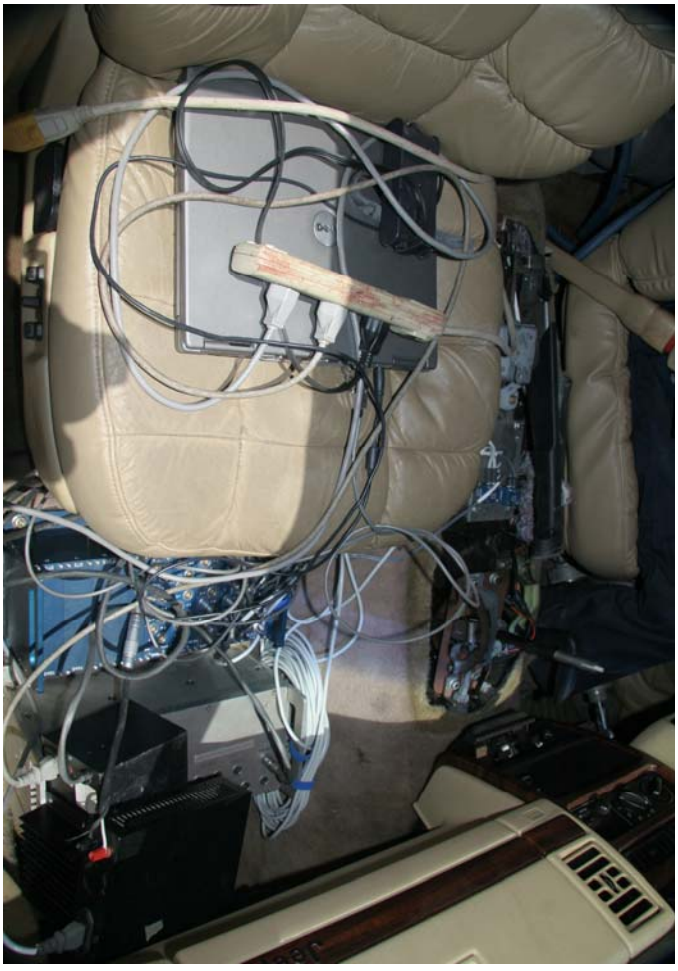


APPENDIX A

PHOTOGRAPHS PRE-TEST

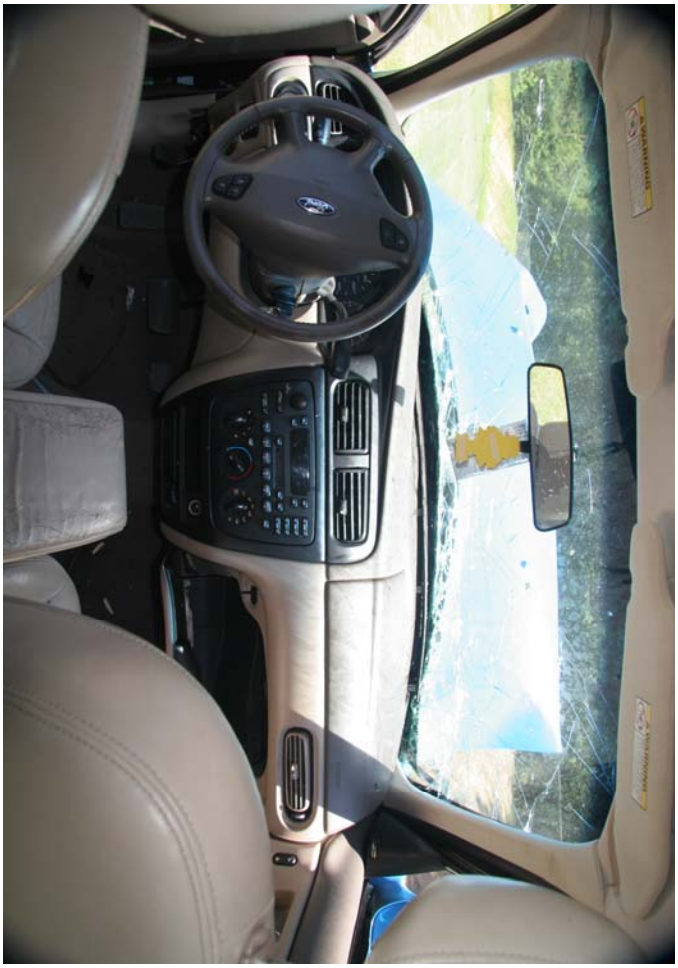


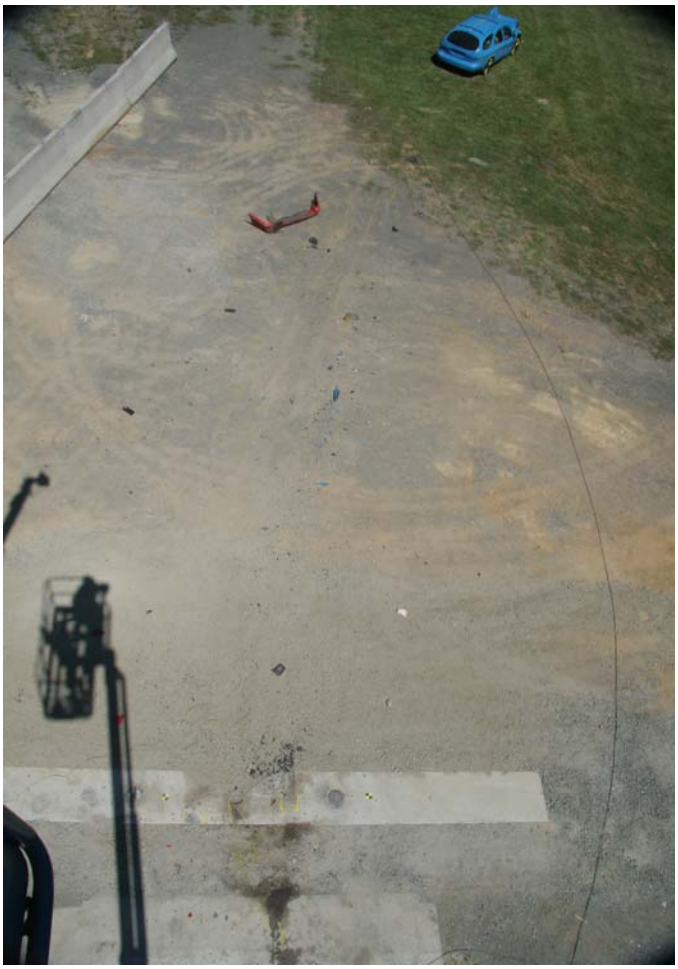
DTS
BOX

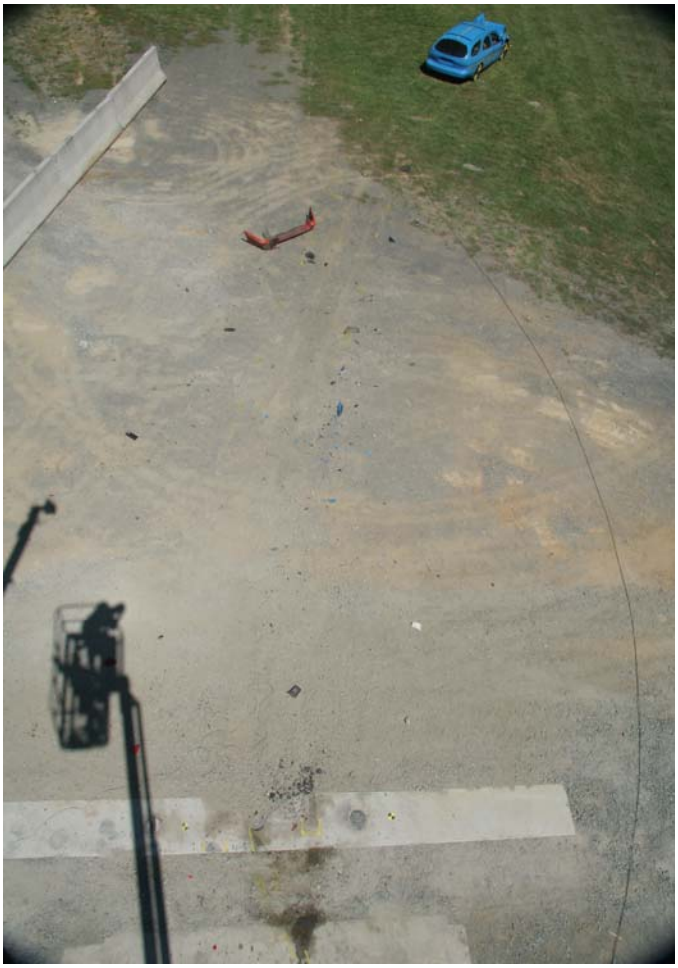


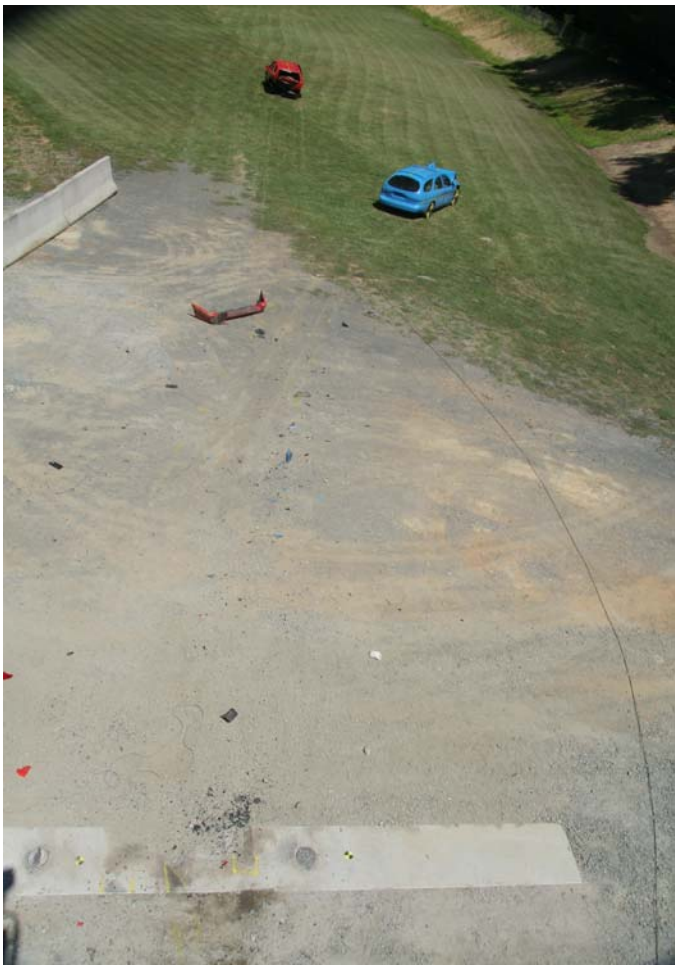
PHOTOGRAPHS POST-TEST

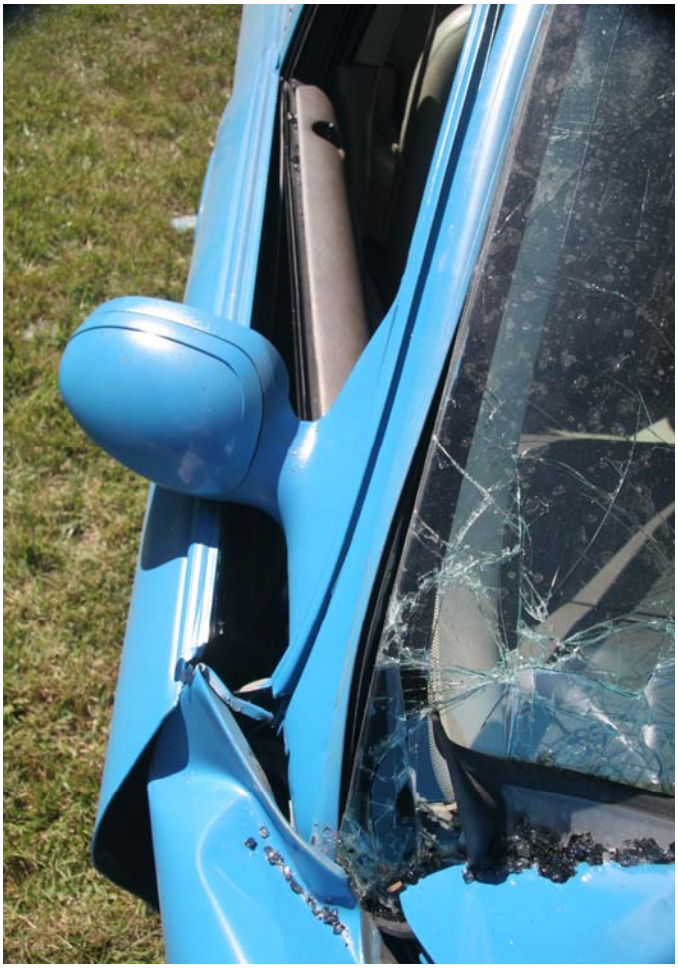

ARTHU











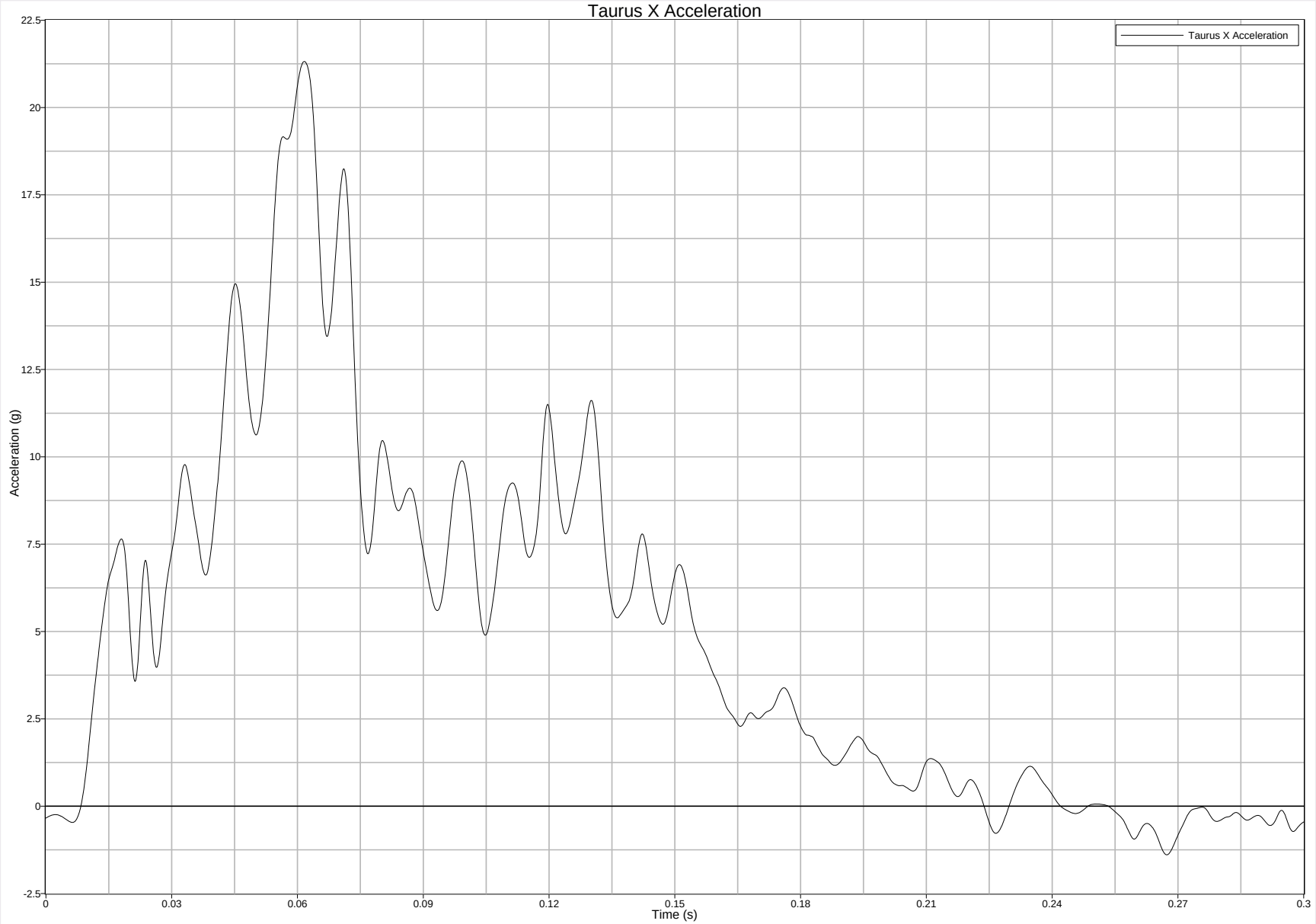

AMPEDE


AMPEDE

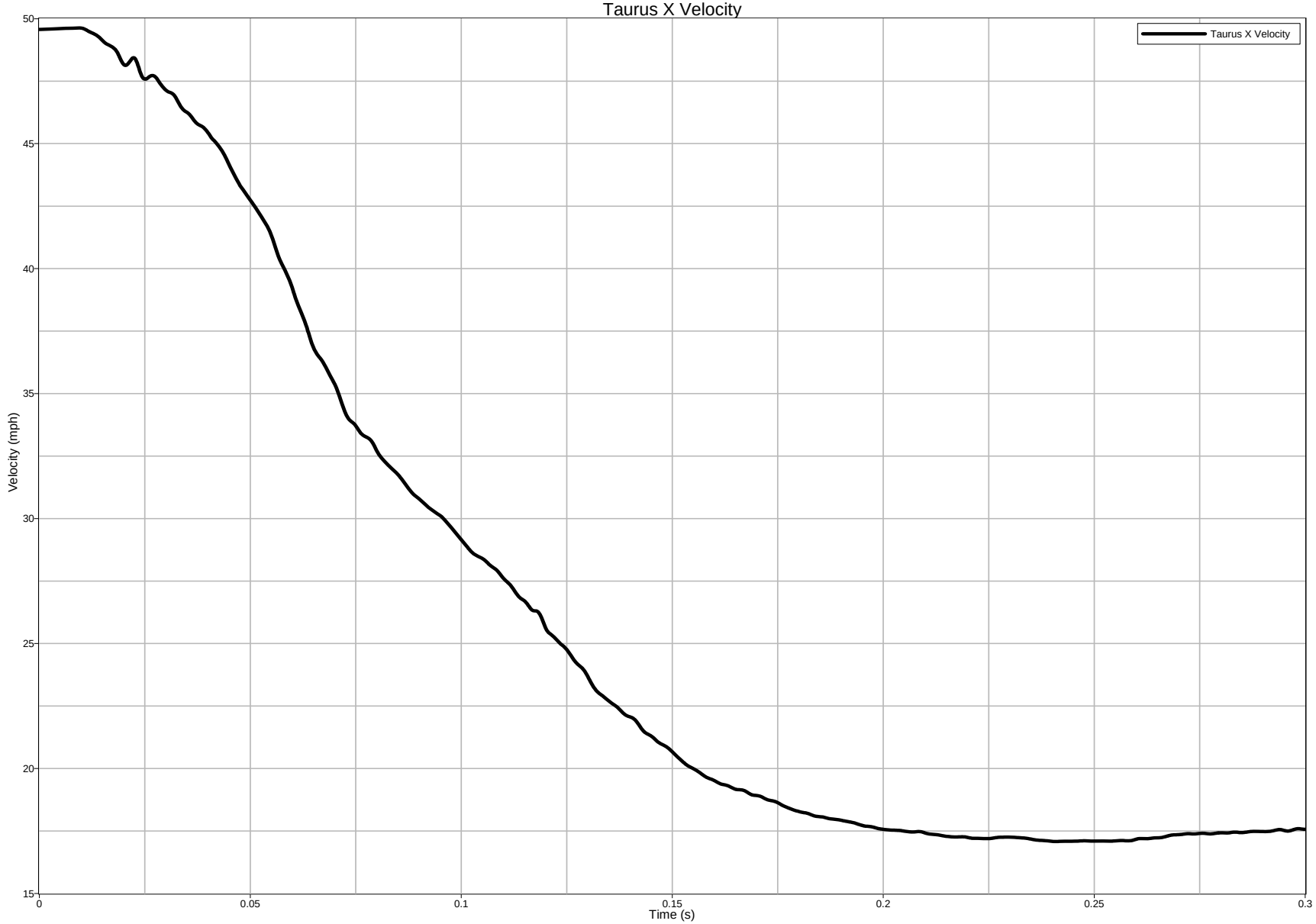
APPENDIX B

ACCELEROMETER DATA TRACES

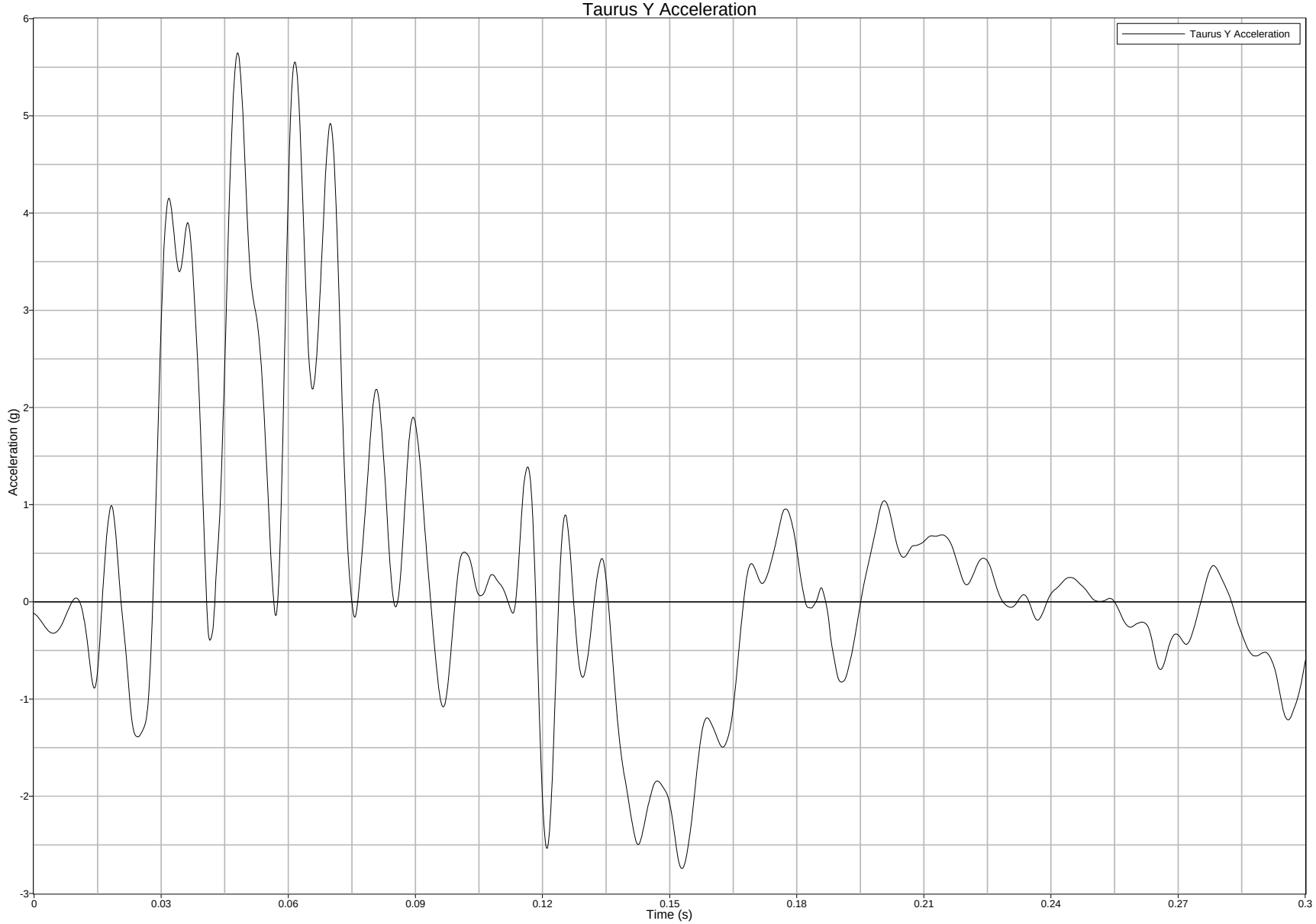
s X Acceleration



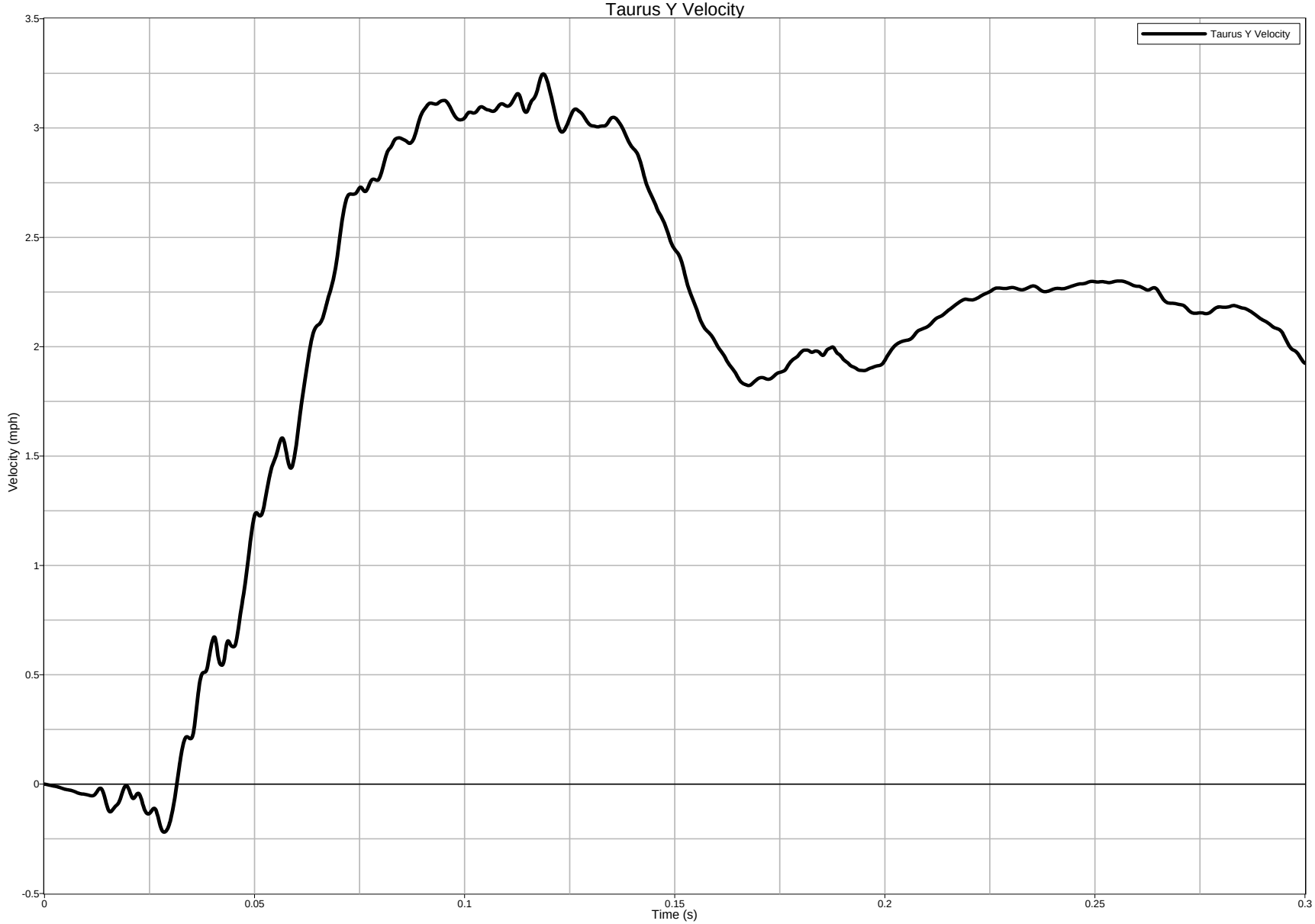
Taurus X Velocity



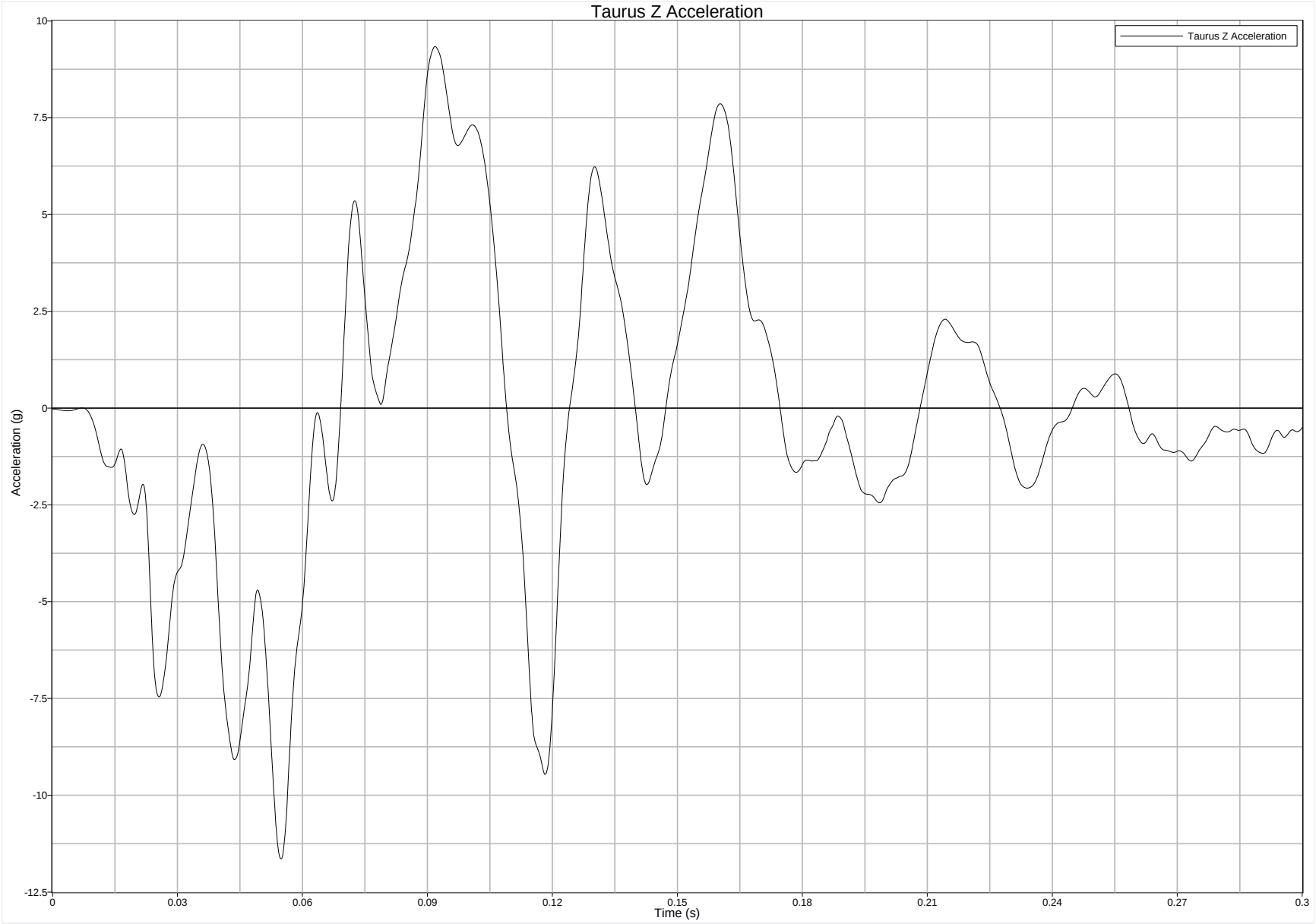
Taurus Y Acceleration



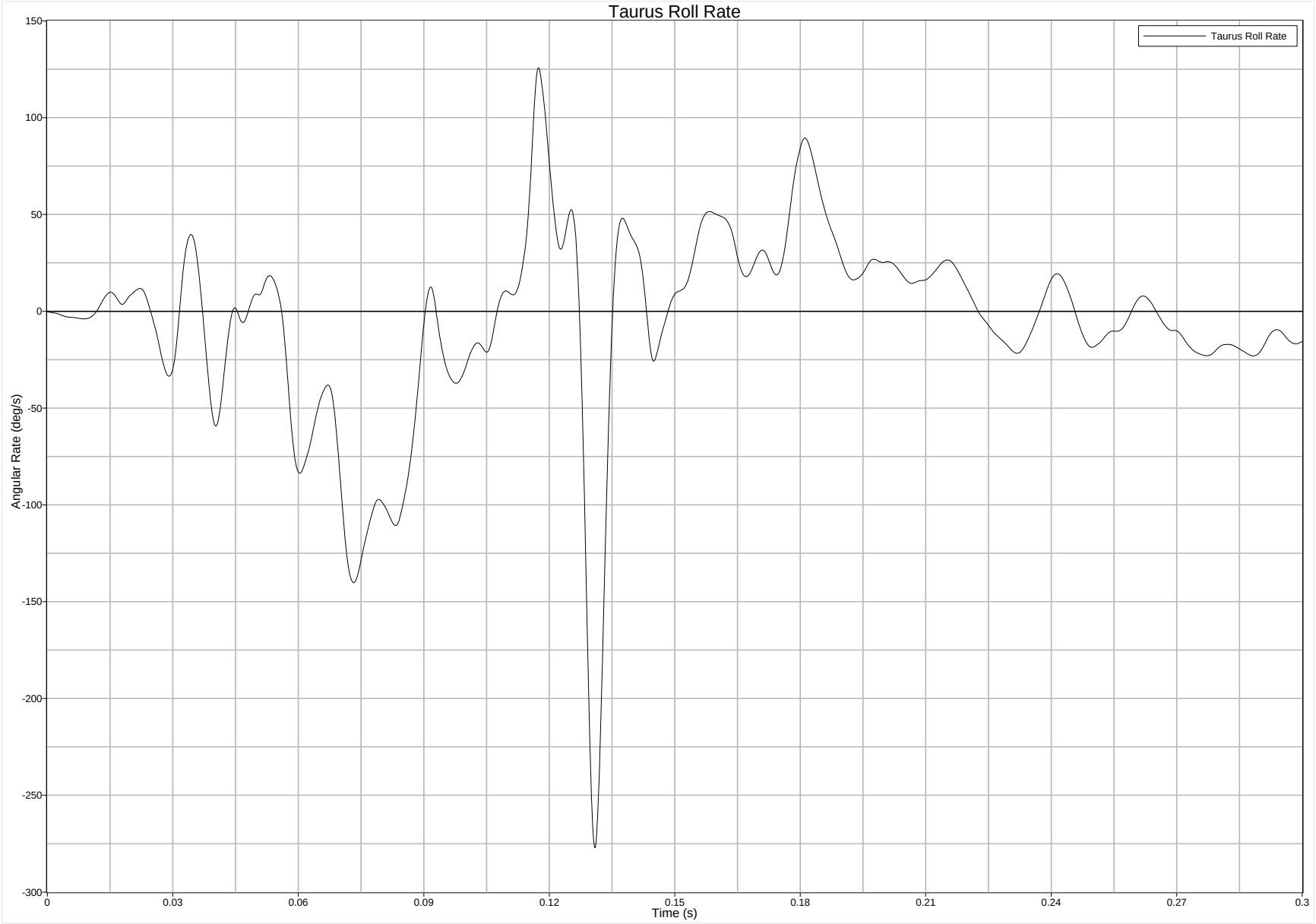
Taurus Y Velocity



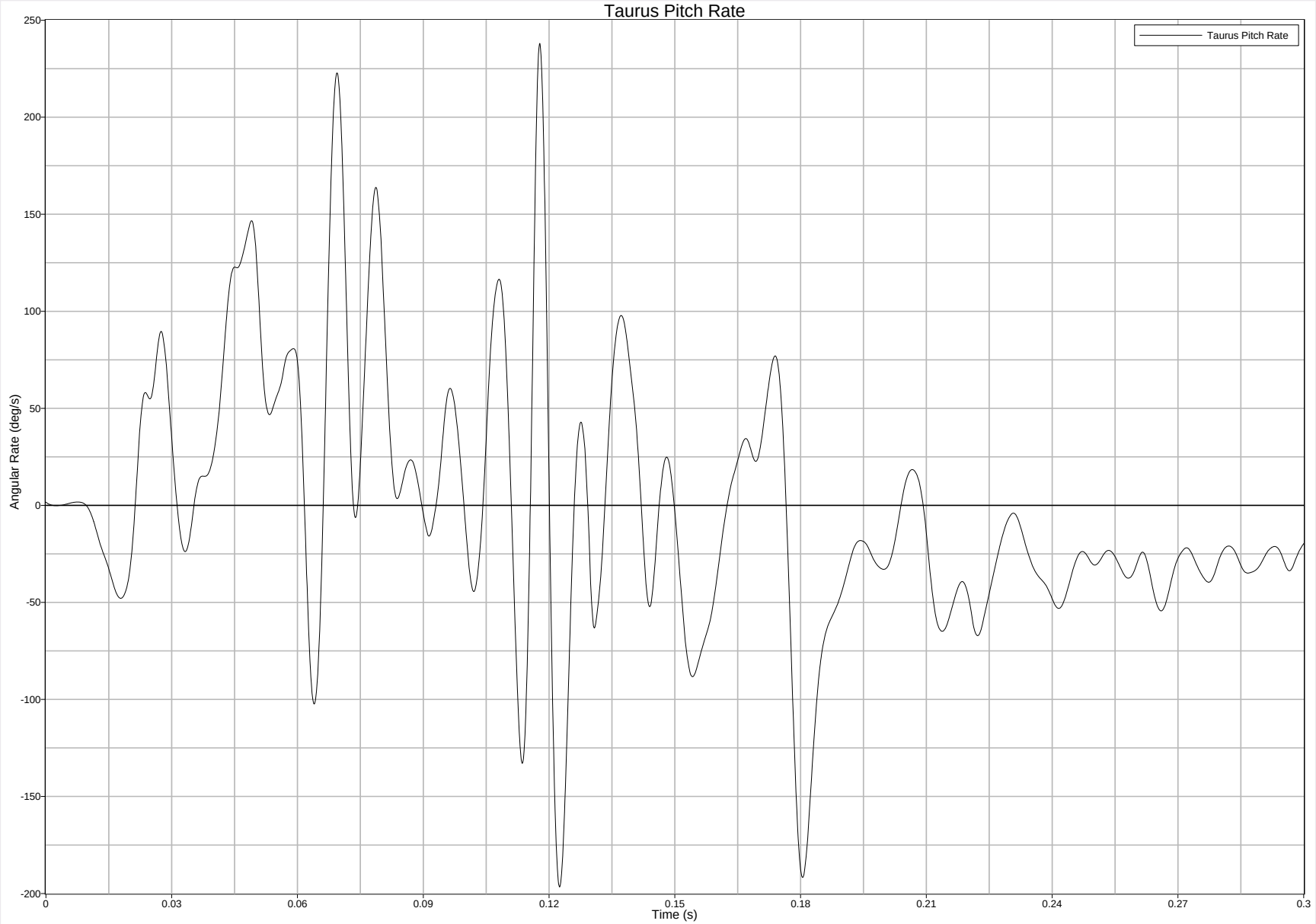
Taurus Z Acceleration



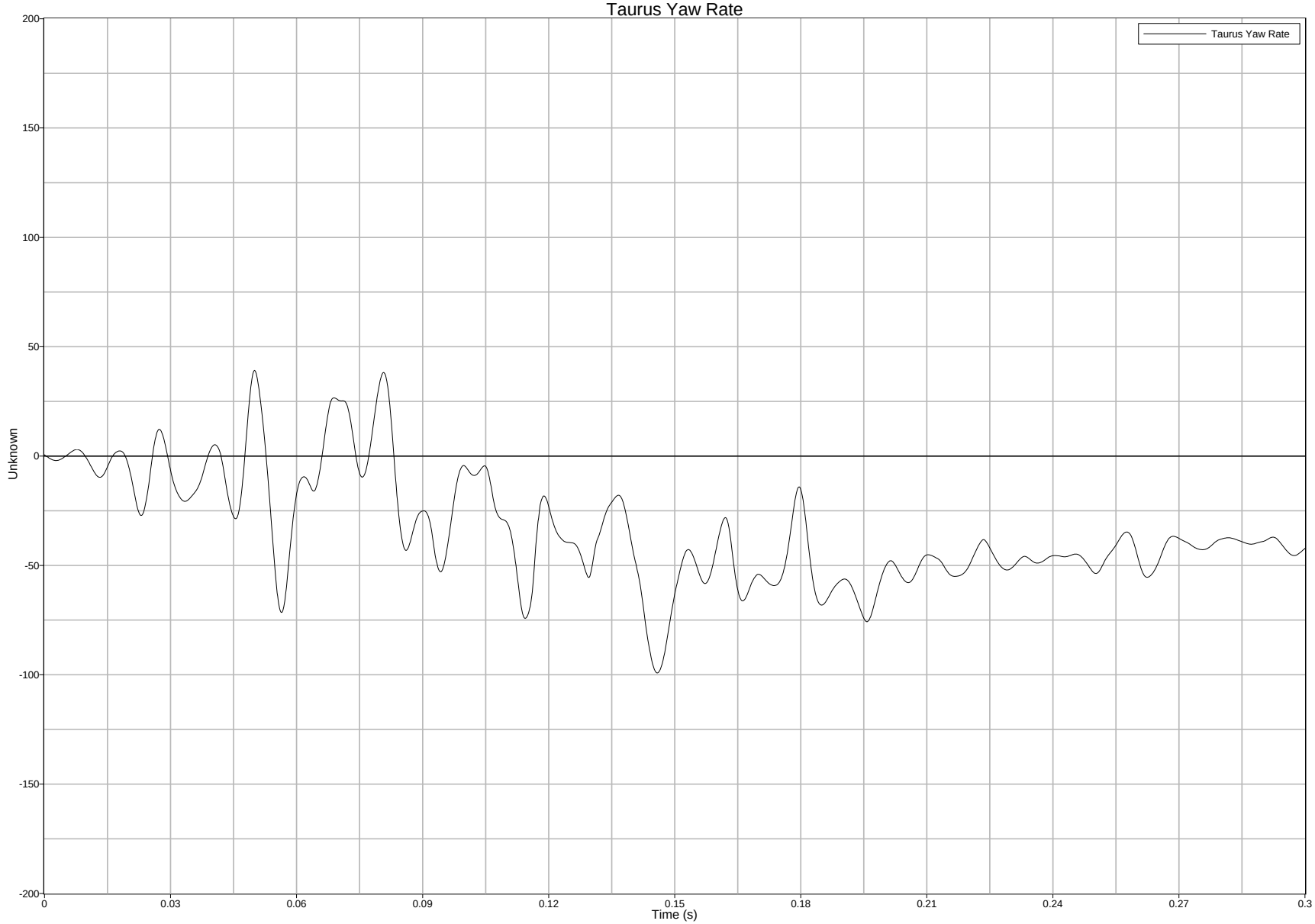
Taurus Roll Rate



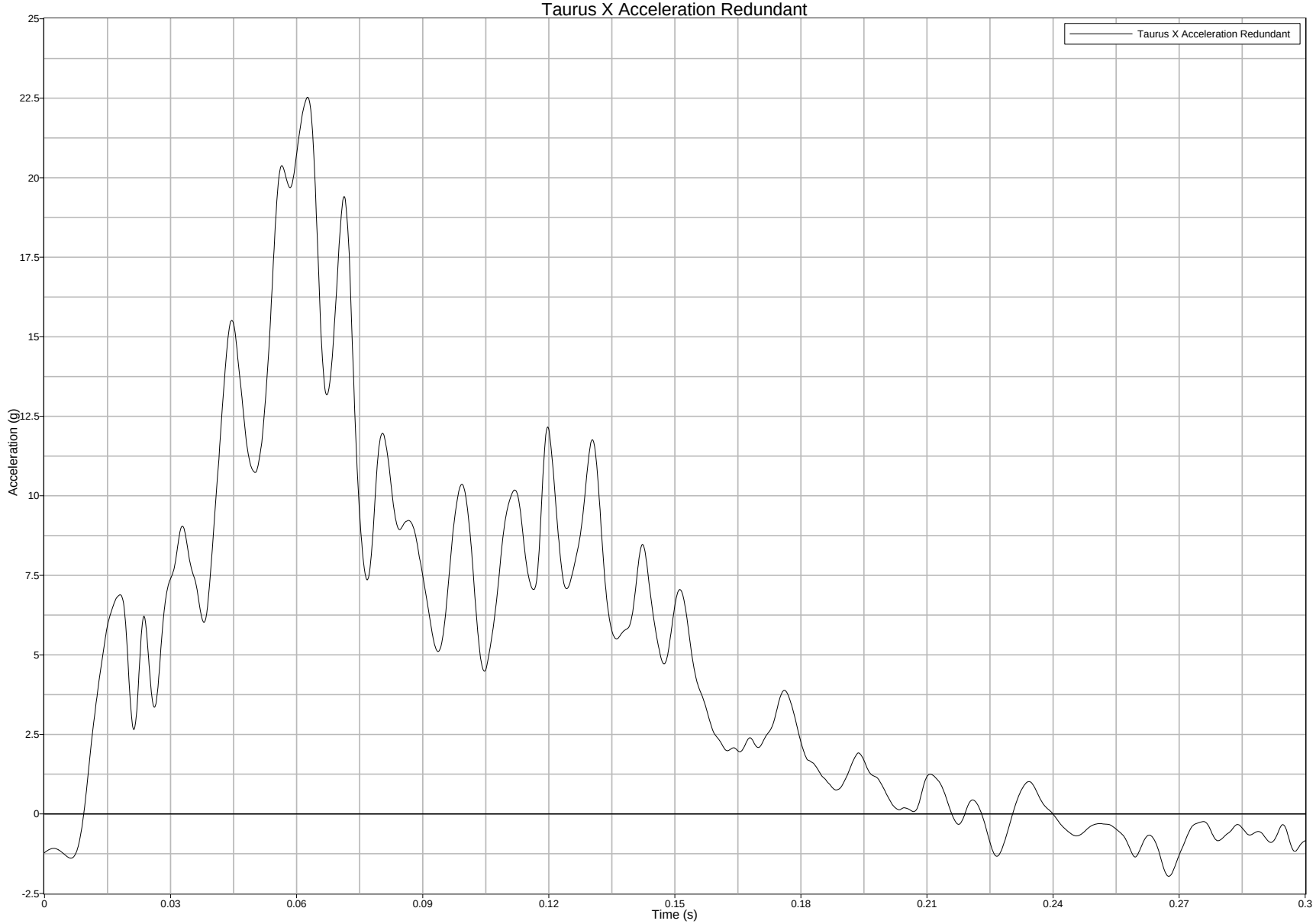
Taurus Pitch Rate



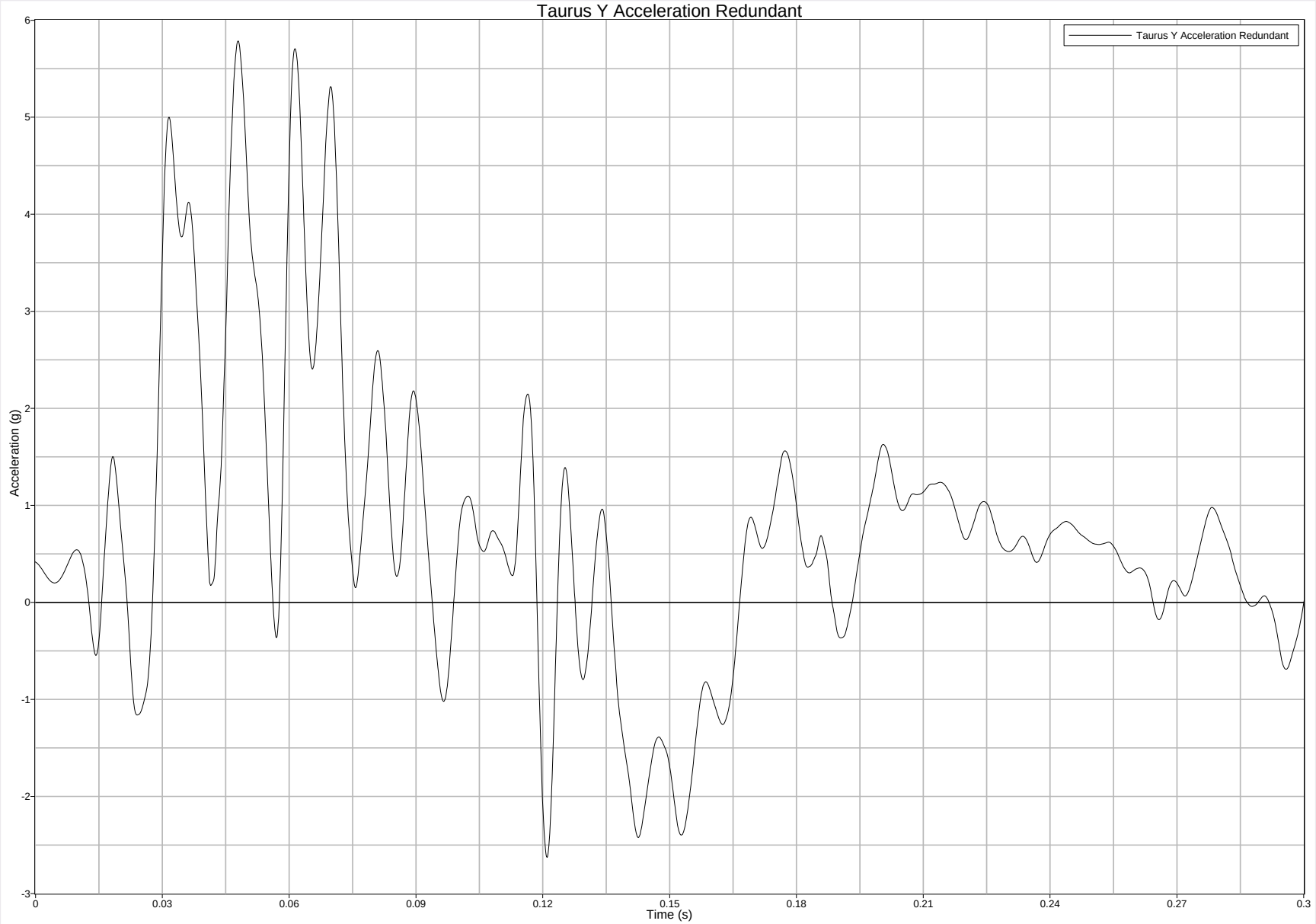
Taurus Yaw Rate



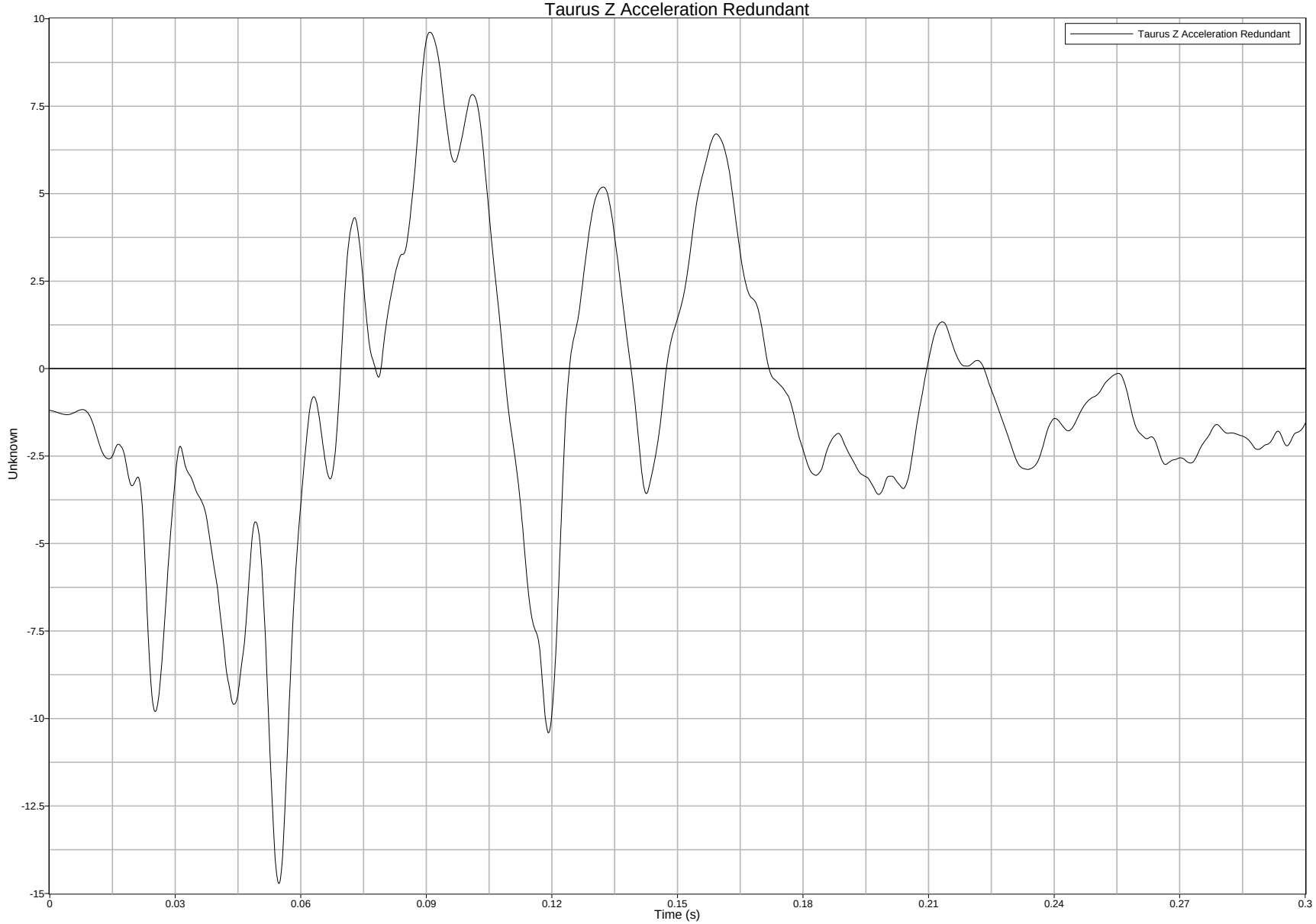
Taurus X Acceleration Redundant



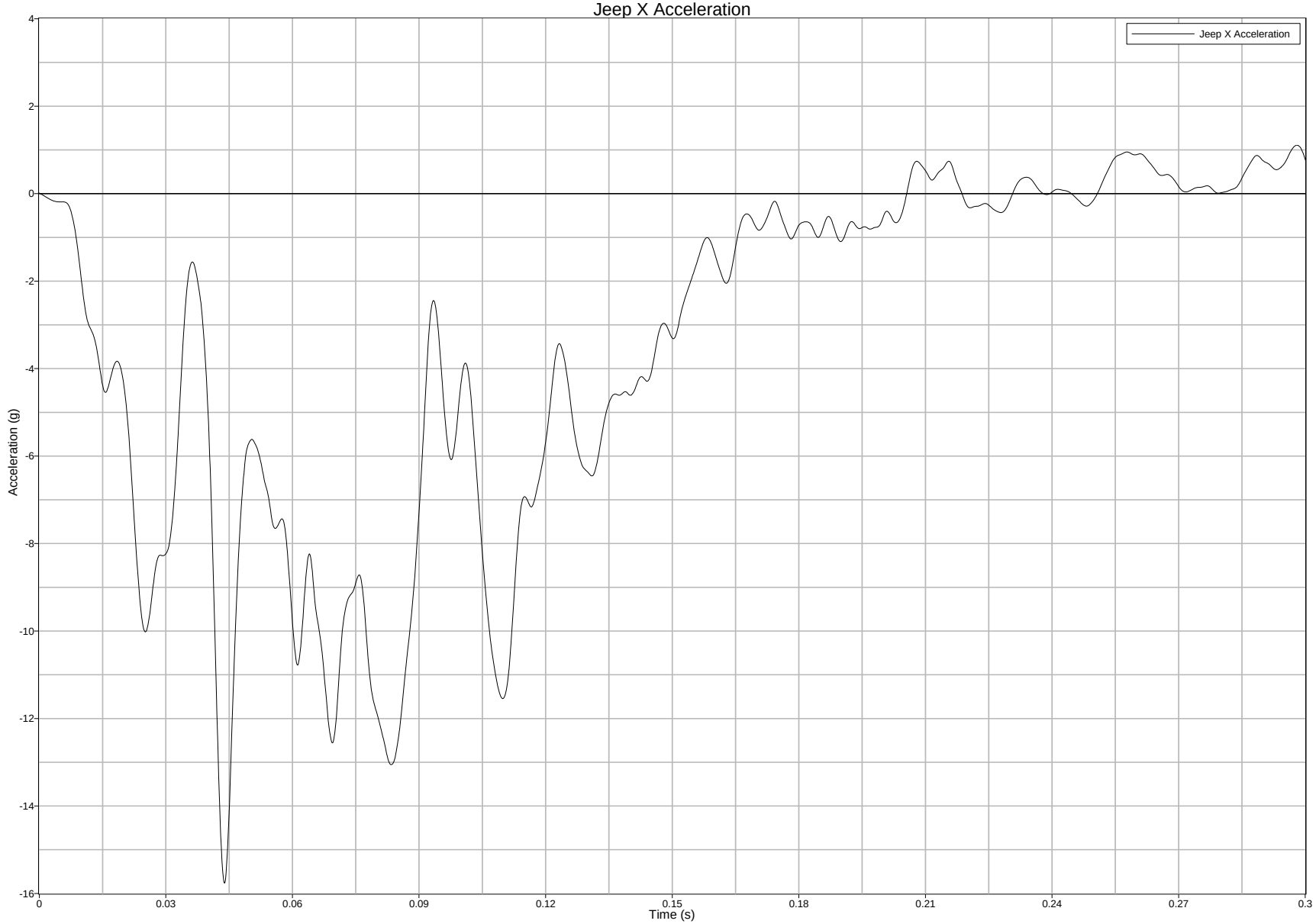
Taurus Y Acceleration Redundant

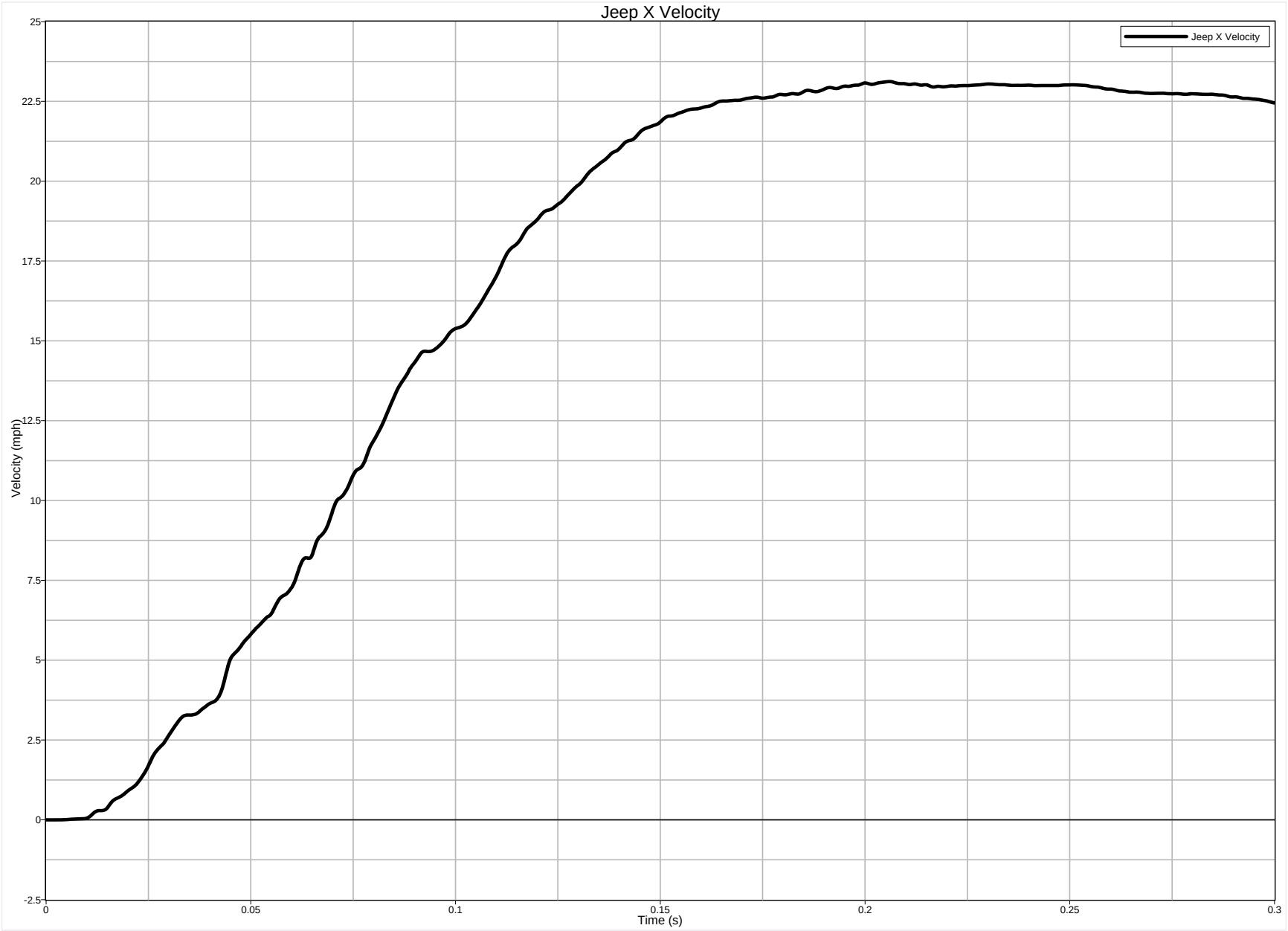


Taurus Z Acceleration Redundant

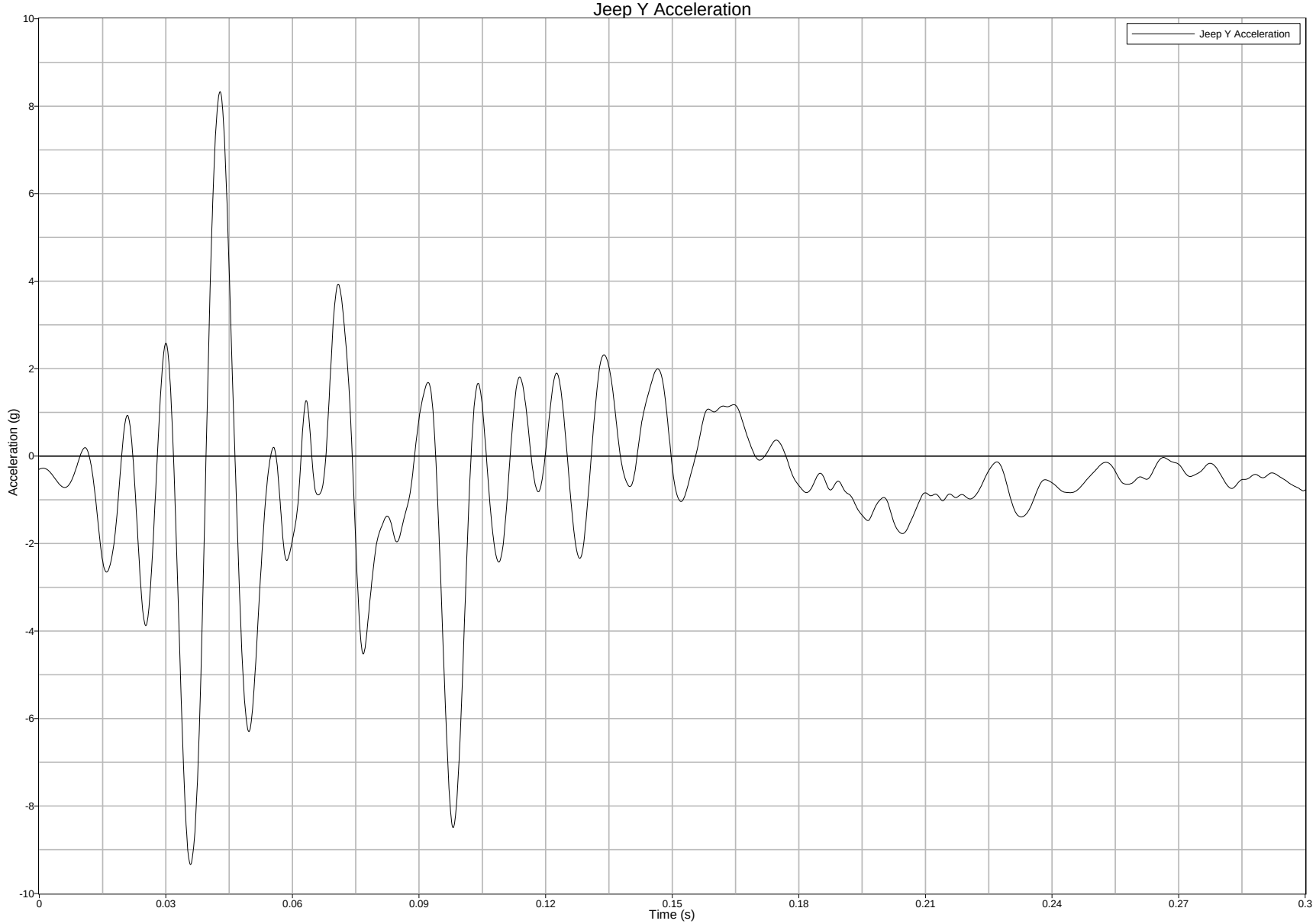


Jeep X Acceleration

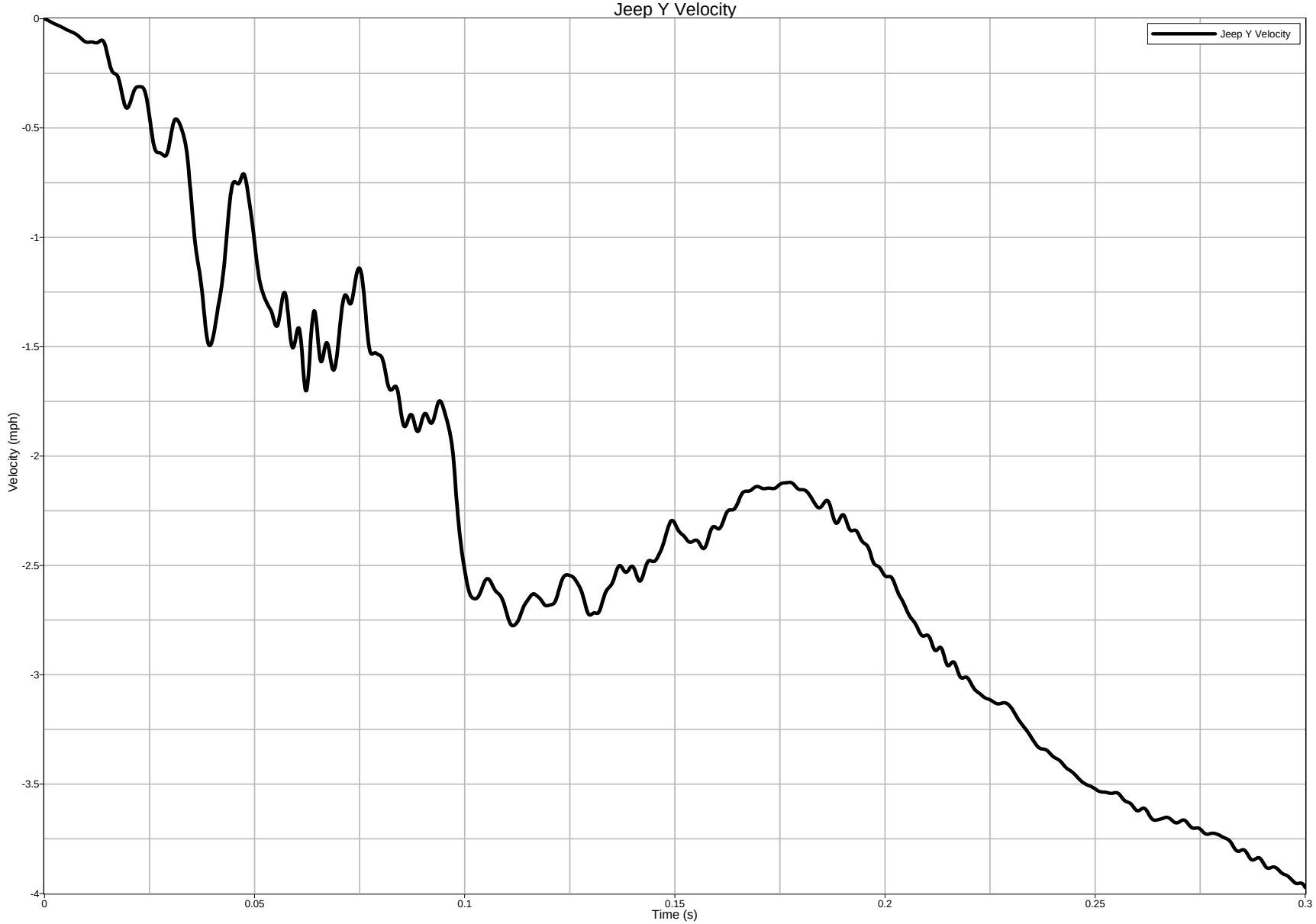



Jeep X Velocity
Jeep X Velocity
Velocity (mph)
25
22.5
20
17.5
15
12.5
10
7.5
5
2.5
0
-2.5
0
0.05
0.1
0.15
0.2
0.25
0.3
Time (s)

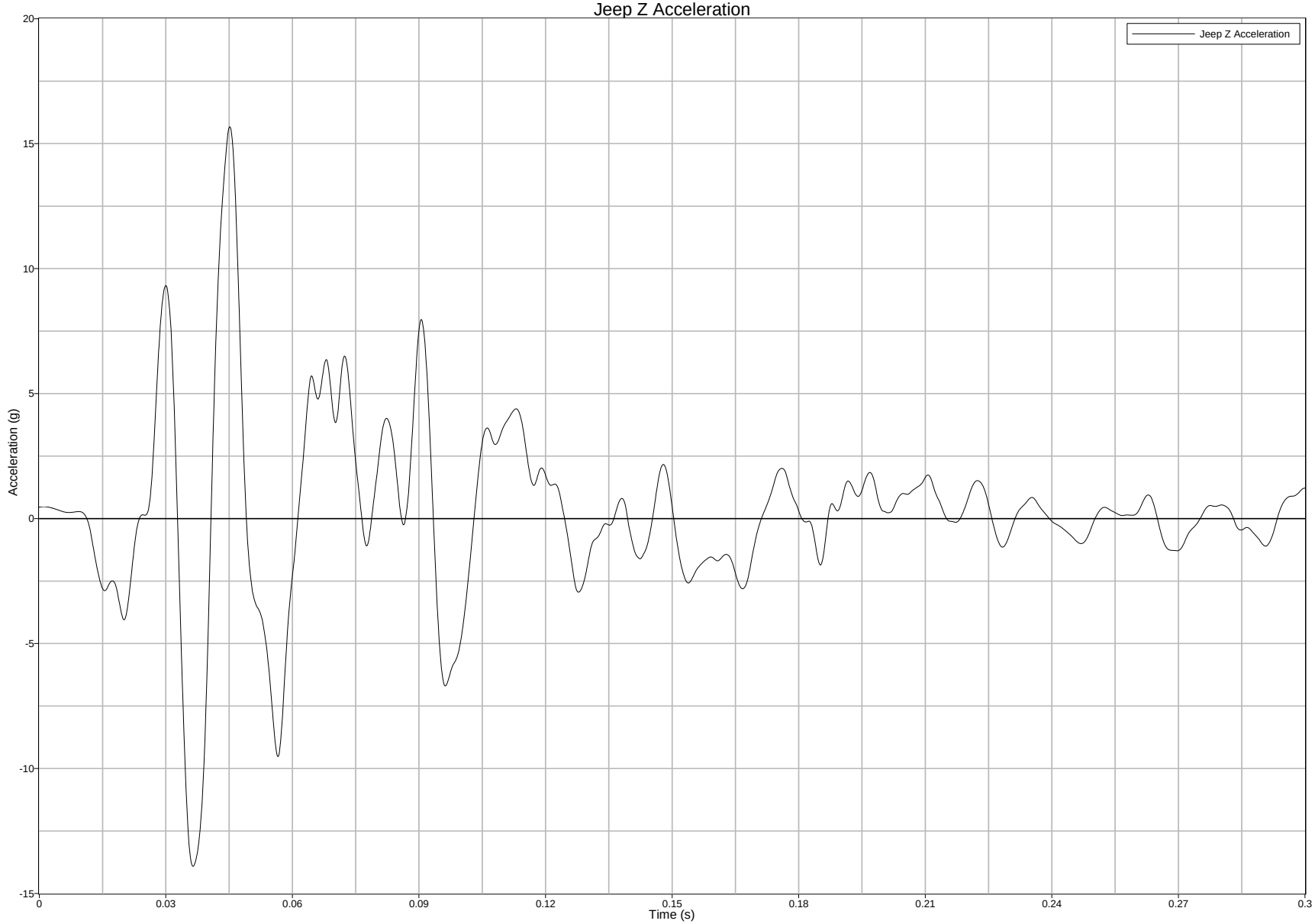
Jeep Y Acceleration



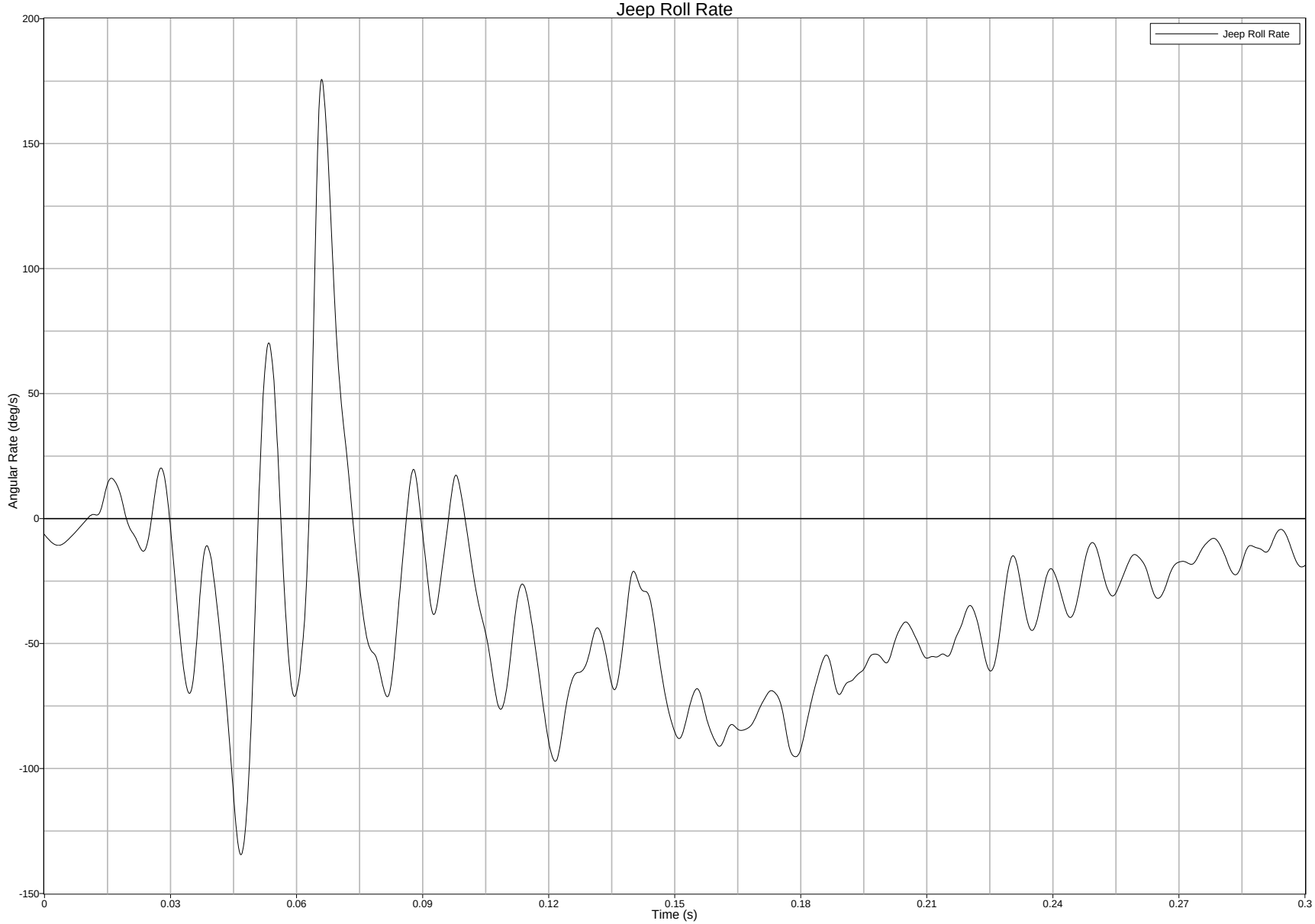
Jeep Y Velocity



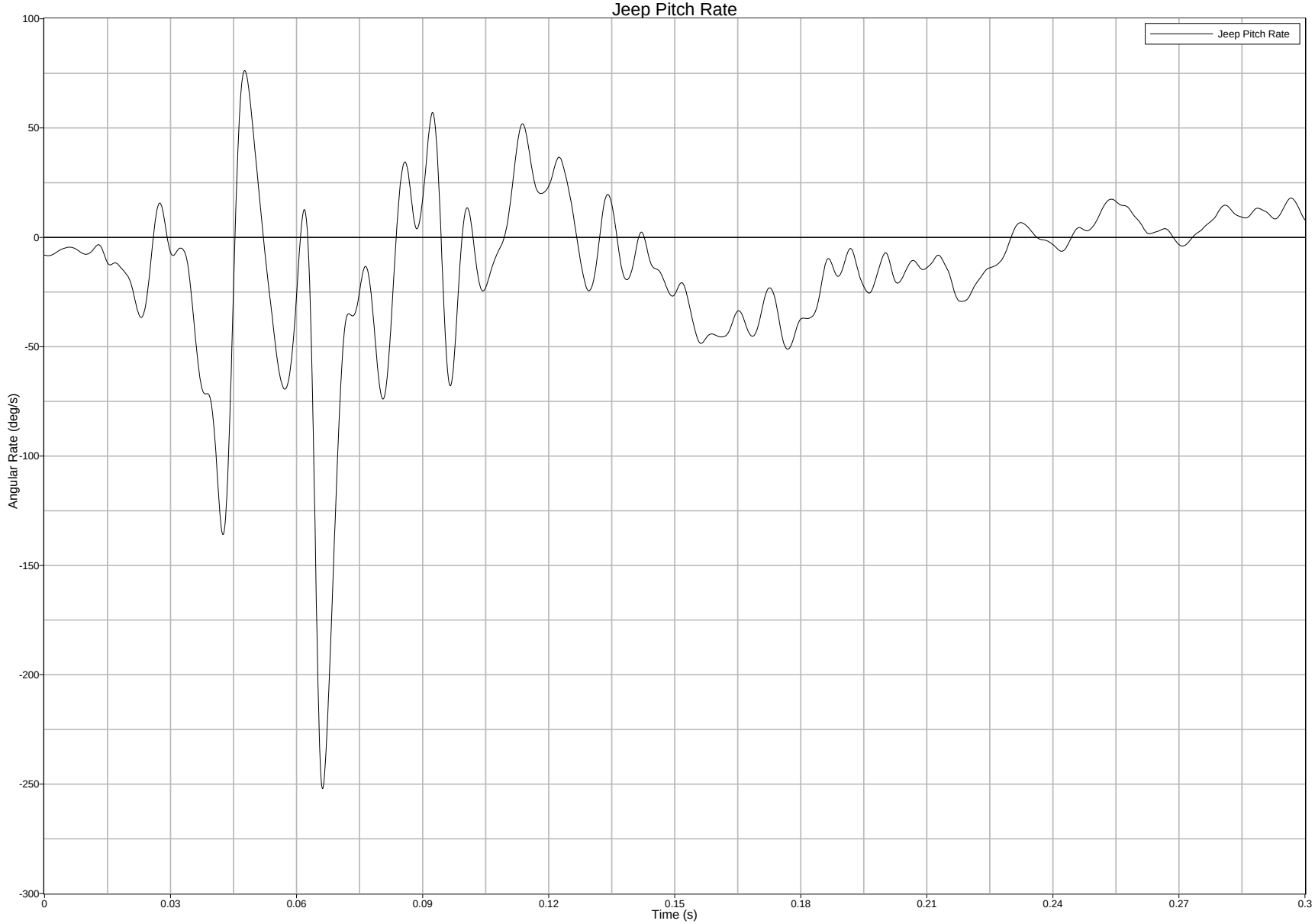
Jeep Z Acceleration



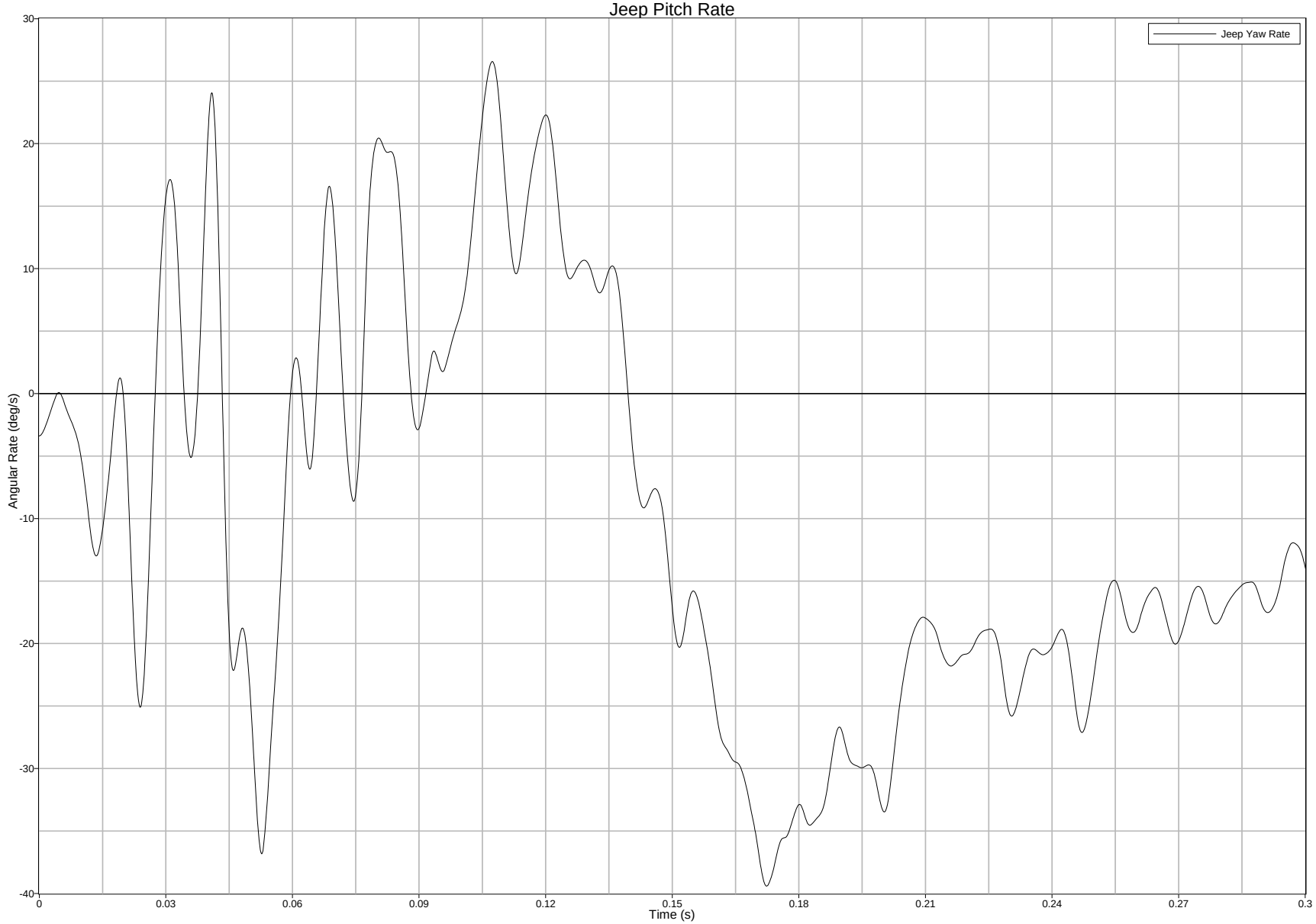
Jeep Roll Rate



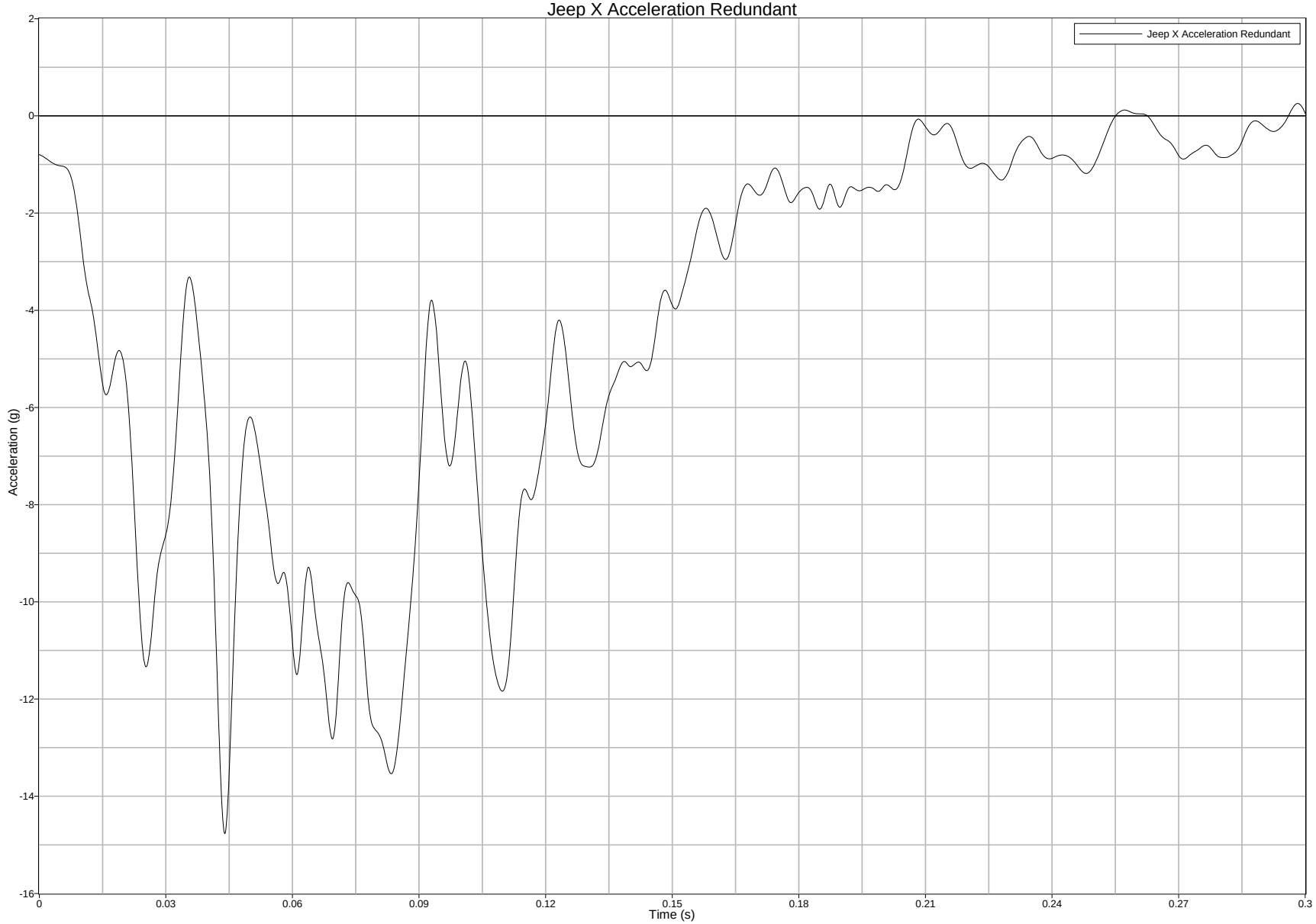
Jeep Pitch Rate



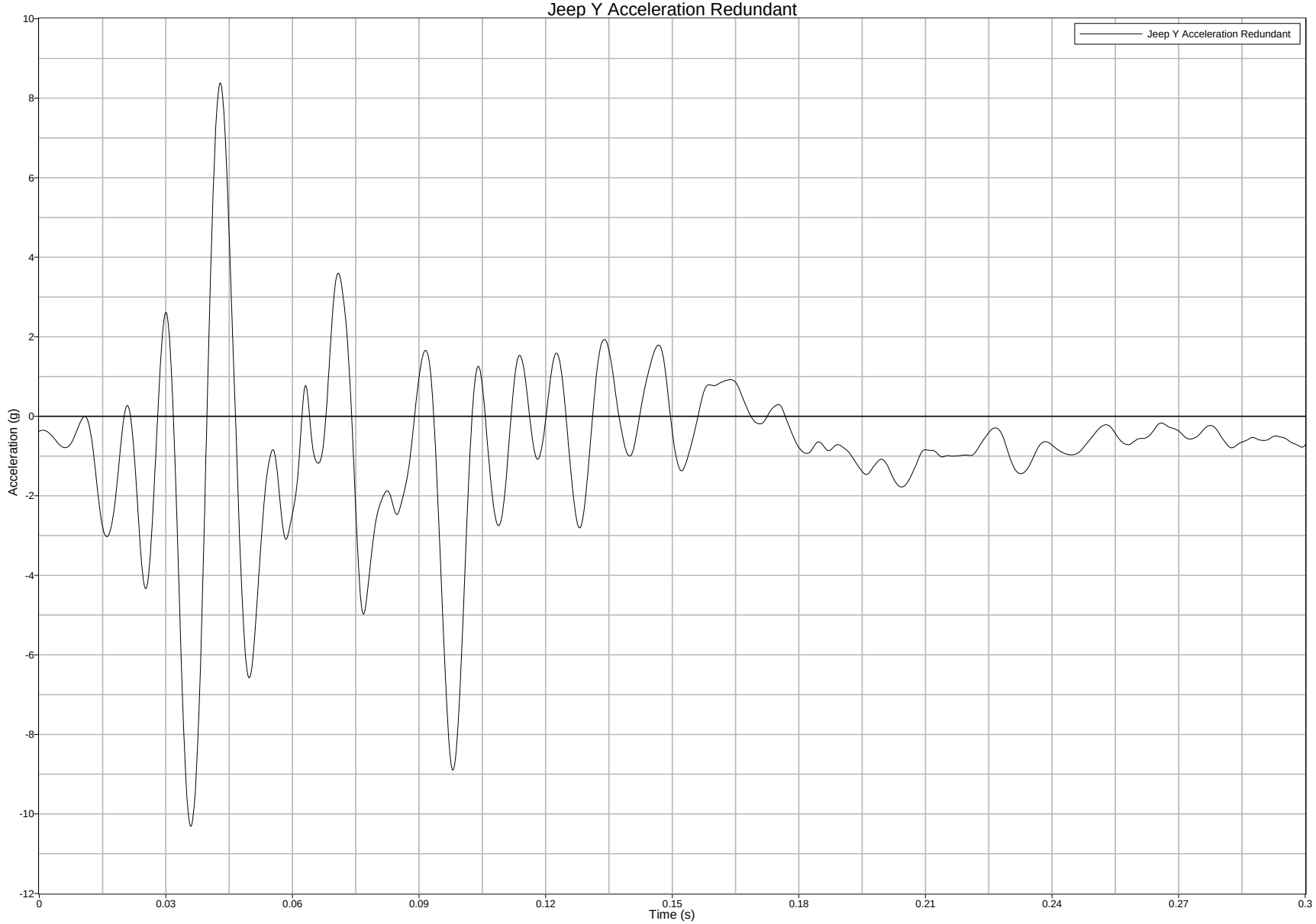
Jeep Pitch Rate



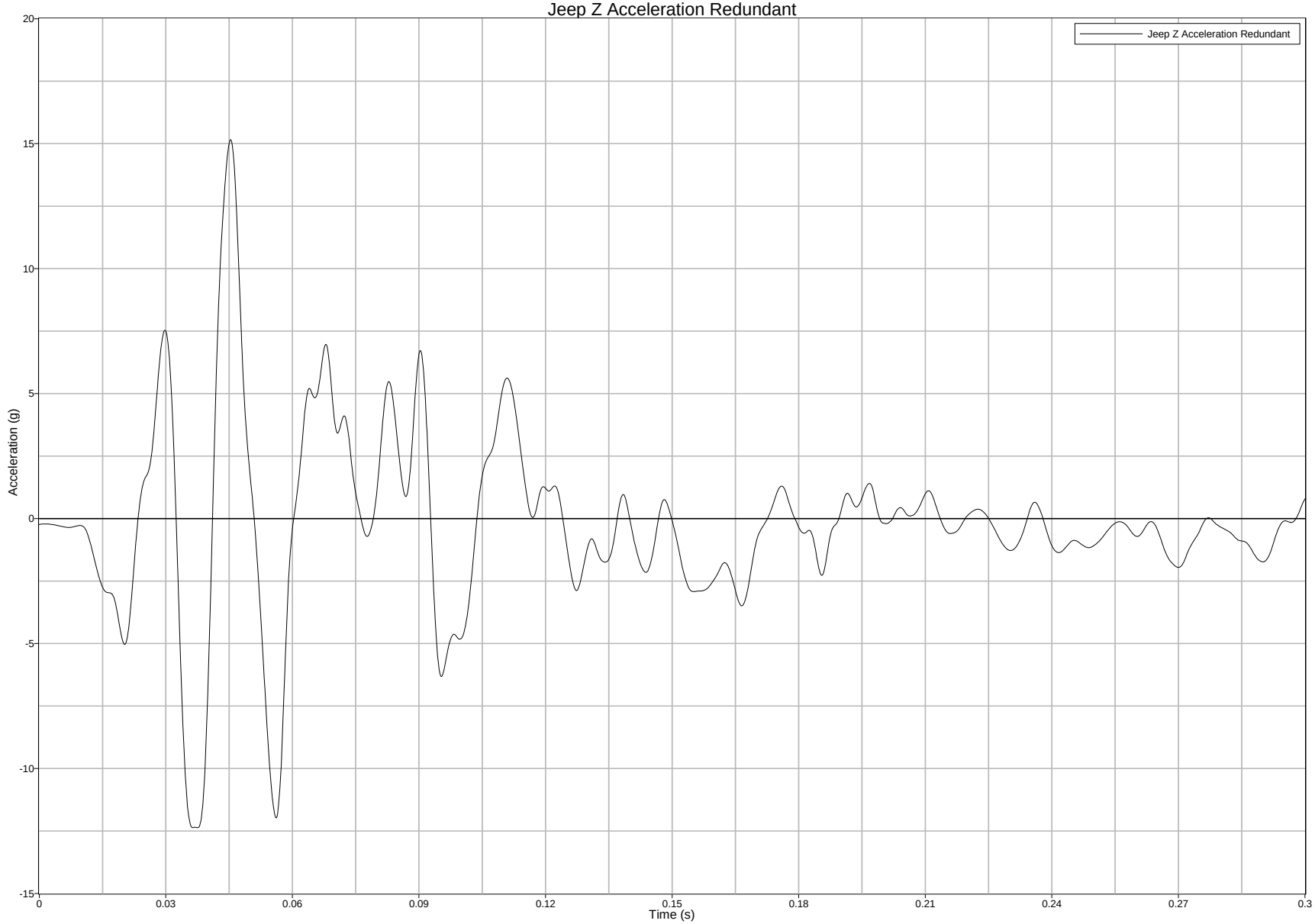
Jeep X Acceleration Redundant



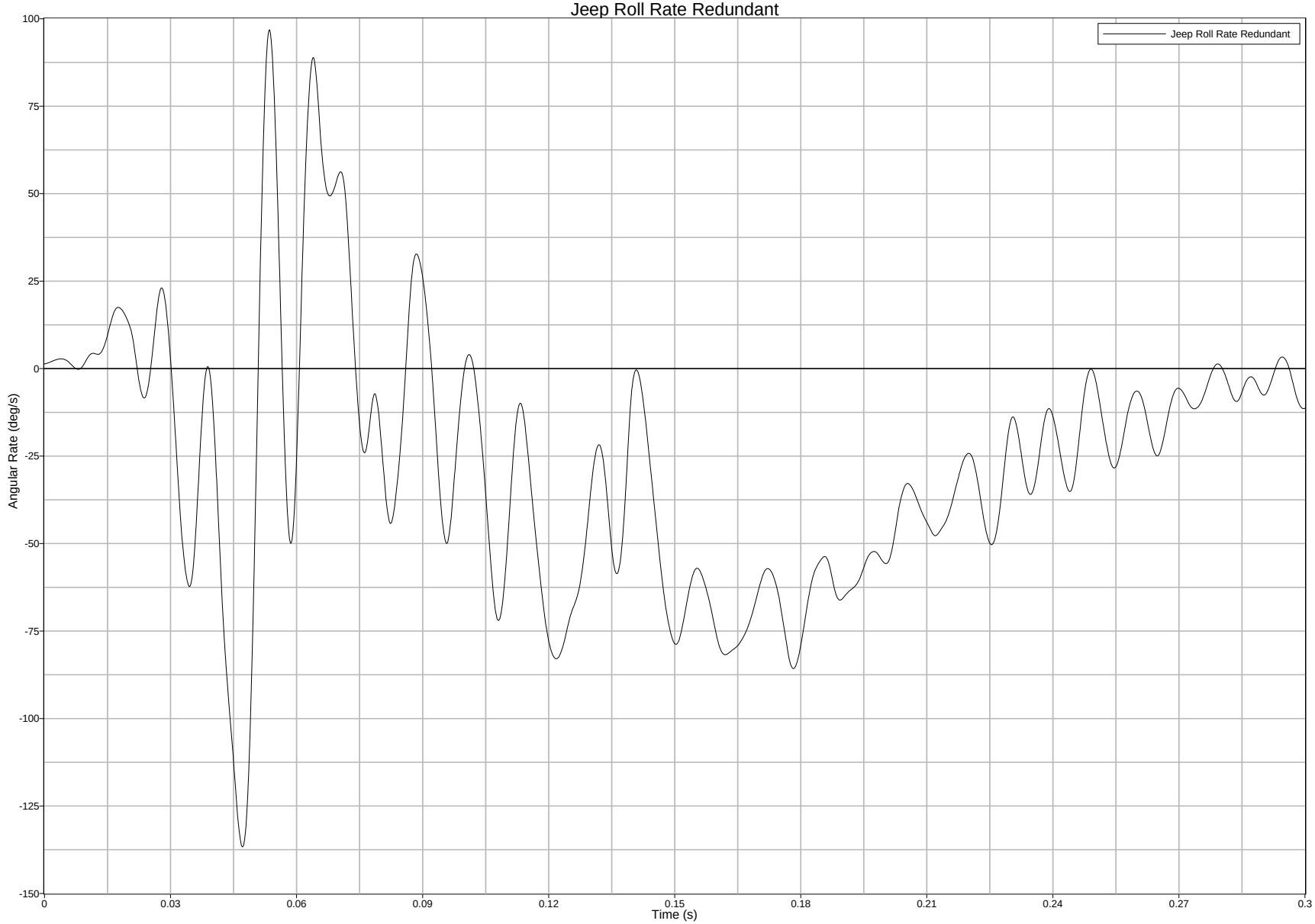
Jeep Y Acceleration Redundant



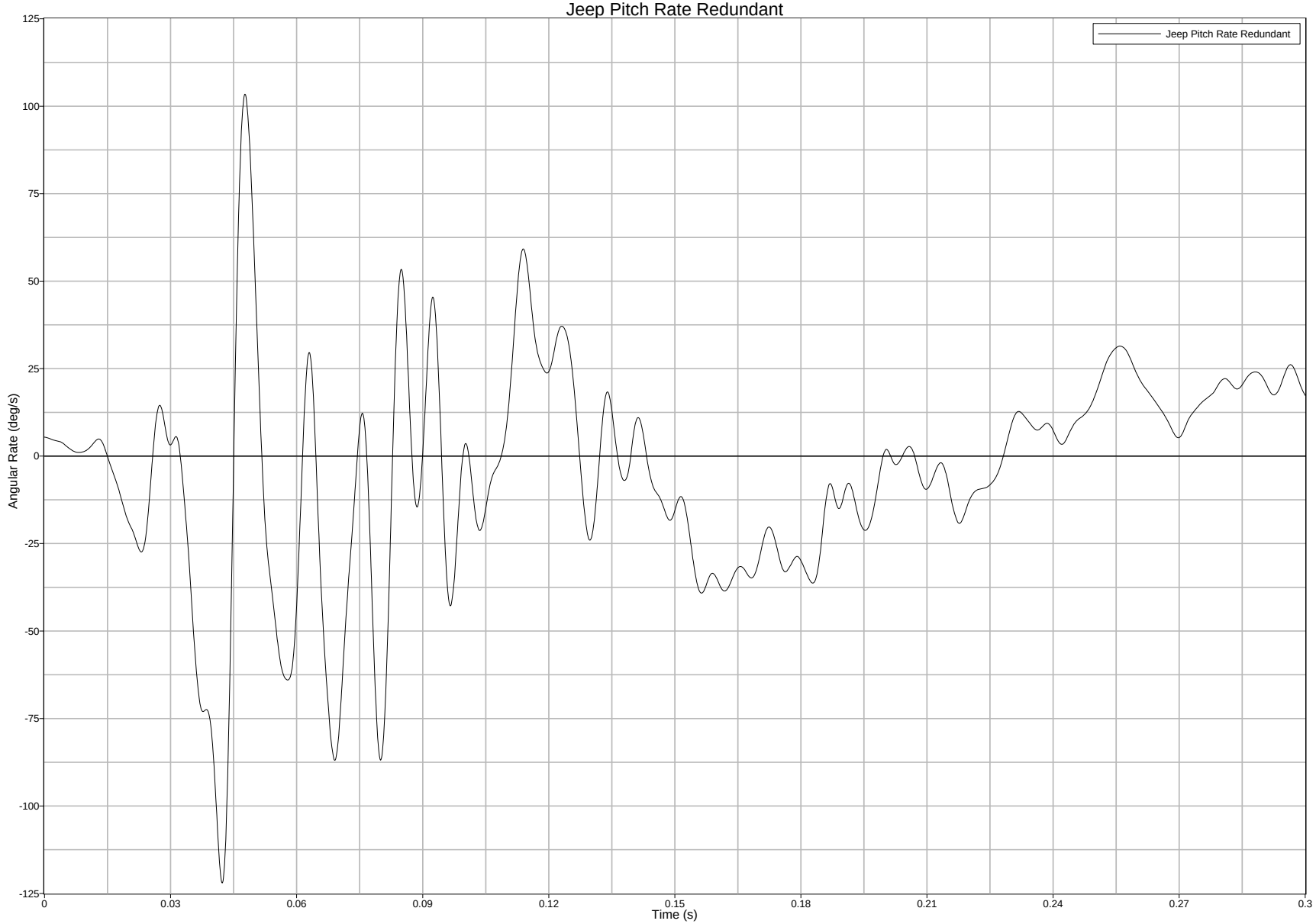
Jeep Z Acceleration Redundant



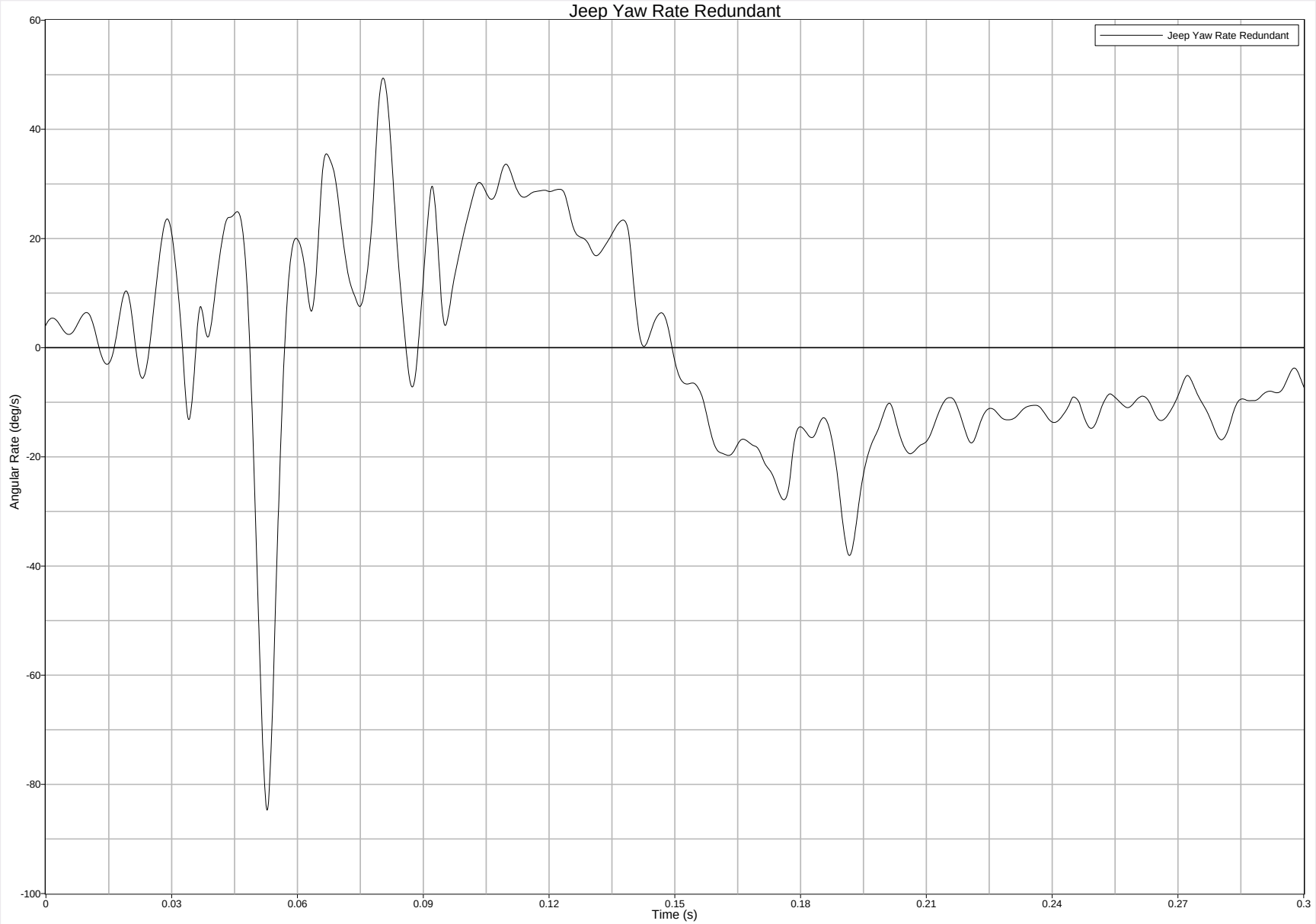
Jeep Roll Rate Redundant



Jeep Pitch Rate Redundant



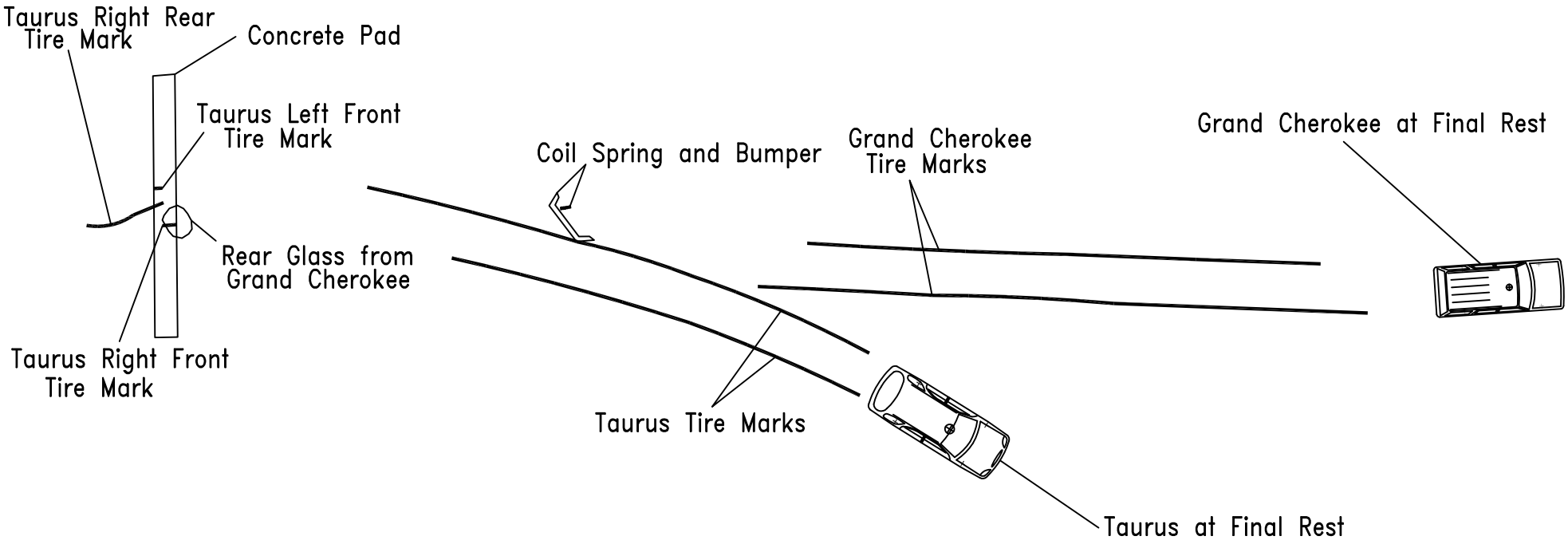
Jeep Yaw Rate Redundant



Scale in Feet:

10 0 10 20 30 40 50

Accident Scene Evidence



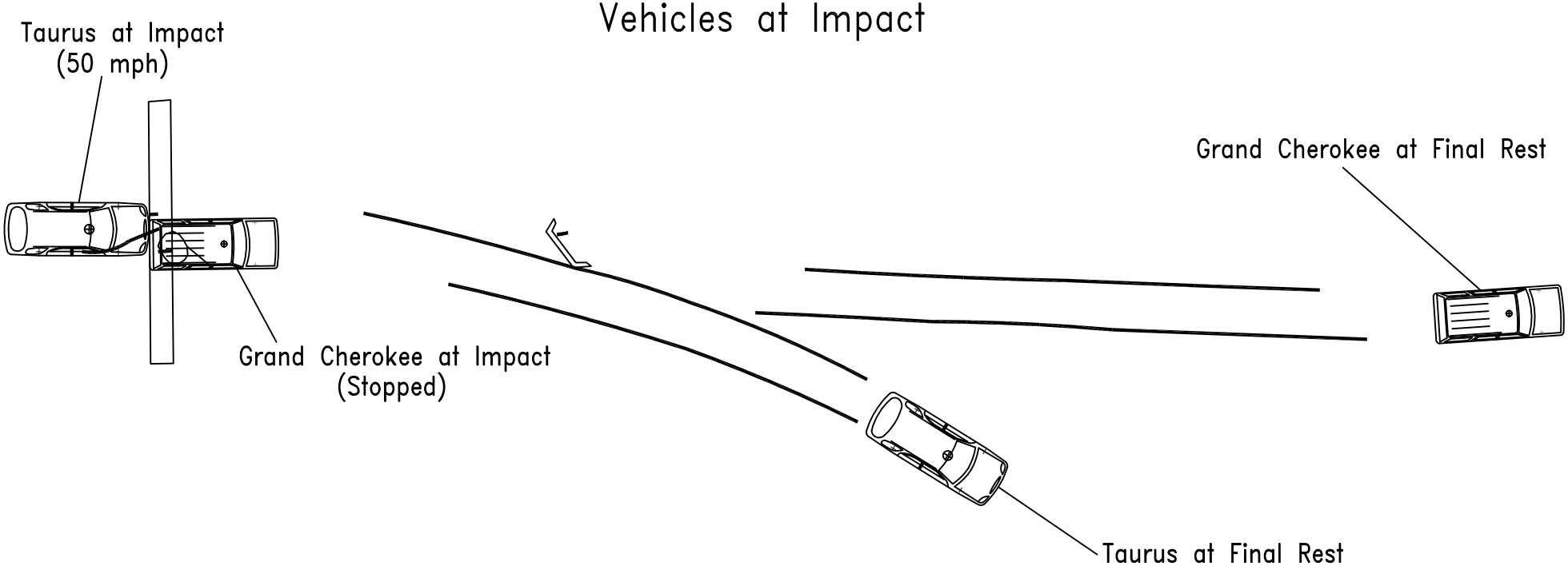
Taurus–Grand Cherokee Rear Impact
50 mph, 70% Overlap

North

Scale in Feet:

10 0 10 20 30 40 50

Vehicles at Impact



Taurus–Grand Cherokee Rear Impact
50 mph, 70% Overlap

North