

SAFETY TEST
VEHICLE CRASH TEST LETTER

PAGE 01

VCC05380 30 MPH REAR BARRIER, ZJJ74, 5.2L MPI ITEM ZJ8602
1996 MVSS VALIDATION - 301.
TEST DATE 02/15/95

TEST PURPOSE PRIMARY, 1996 USA 301 VALIDATION.
OBSERVE FUEL SYSTEM INTEGRITY.

IMPACT TYPE TARGET SPEED; 30.1 MPH
DAMAGE LOCATION; REAR
BARRIER TYPE; REAR TYPE IV
BARRIER SURFACE; PLYWOOD

VEHICLE BODY CLASS; ZJ
CAR LINE; J
BODY; 74
ENGINE; 5.2 LITRE
ENGINE NOTE; ELECTRONIC FUEL INJECTION.
TRANSMISSION; 4 SPEED AUTO 4x4
TRANS. NOTE;
VIN AS TESTED; 1J4GZ7856TC522282 MOD.
VIN AS BUILT; 1J4GZ7856PC522282 MOD.
1J4GZ7856PC522282

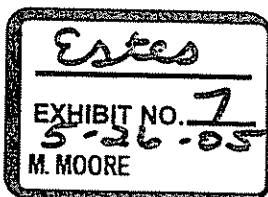
TEST SPEED 30.3 MPH BY ELECTRONIC TRAP TIMER

TEST WEIGHT (LBS) 4810 TOTAL, 2677 FRONT, 2133 REAR

OCCUPANTS LEFT FRONT, HYB II, BALLAST. AD-60
RESTRAINT-BELTS ONLY.
RIGHT FRONT, HYB II, BALLAST. AD-65
RESTRAINT-BELTS ONLY.

BUILD CONDITION 1993 PRODUCTION BUILT CANADIAN ZJ RETOFITTED
AS A 1996 DOMESTIC ZJ FOR REAR IMPACT.
5.2L ENGINE, 4 SPEED AUTO TRANS, 4X4
POWER STEERING, A/C, ABS BRAKES, ROOF RACK
P235/75R15 TIRES ON ALUMINUM WHEELS & FULL SPARE.
1996 CO-EXTRUDED FUEL TANK WITH REINFORCED
SENDING UNIT COVER.
1996 STEEL FUEL RAILS AND MATCHING LINE BUNDLE.
1996 REAR LIFT GATE WITH FIXED GLASS
1996 REINFORCED BUMPER BAR, FASCIA & BRACKETS

TARGET WEIGHT (LBS) 4163 TOTAL, 2311 FRONT, 1852 REAR REP MAX OPT. WT.
NOT INCLUDING OCCUPANTS OR LUGGAGE BALLAST.



DC 04052

SAFETY TEST
VEHICLE CRASH TEST LETTER

PAGE 02

VC05380 30 MPH REAR BARRIER, ZJJ74, 5.2L MPI ITEM ZJ8602
1996 MVSS VALIDATION - 301.
TEST DATE 02/15/95

FUEL AND BALLAST

21.8 GALLONS OF STODDARD SOLVENT.
300 LBS OF LUGGAGE BALLAST SECURED IN CARGO AREA.
200 LBS SECURED TO FRONT FOOTWELLS

POST TEST REMARKS

THERE WAS EXCESSIVE FUEL LEAKAGE DURING IMPACT AND
THE SUBSEQUENT THIRTY MINUTES, RESULTING FROM
PARTIAL SEPERATION OF THE VENT LINE FITTING FROM
THE TANK.

REPORT CODES

A = TRANSDUCER DATA	B = ALL FILM DATA
C = HIGH SPEED FILM	D = ENGINEER'S REPORT
E = DUMMY KINEMATICS	F = STEERING COLUMN
G = UNDERBODY	H = A-POST
I = DYNAMIC CRUSH	J = ENGINE COMPARTMENT
K = DOOR CRUSH	L = FORCE/CRUSH/ENERGY
M = SPECIAL	N = CATALOG EDP DATA
* = REPORT REQUESTOR	

DISTRIBUTION

W.A. BREITMOSER	422-05-01 (AB)
D.J. MCKENZIE	422-05-01 (AB)
J.B. ESTES	514-15-58 (AB)

DATE 02/16/95

TIME 08.38.02.

DC 04053

CHRYSLER MOTORS
SAFETY TEST
VEHICLE CRASH TEST REQUEST

SUPPLEMENT NO. 03

ITEM ZJ8602 CHARGE NO. MASTERCARD ISSUE DATE 01/10/95

VC 5380 30 MPH REAR BARRIER, ZJJ74, 5.2L MPI
1996 MVSS VALIDATION - 301.

TEST DATE 2/15/95 ENGINEER MANNEY
SPEED 30.3 MPH SOURCE TRAC

TEST PURPOSE PRIMARY, 1996 USA 301 VALIDATION.
OBSERVE FUEL SYSTEM INTEGRITY.

IMPACT TYPE TARGET SPEED; 30.1 MPH
DAMAGE LOCATION; REAR
BARRIER TYPE; REAR TYPE IV
BARRIER SURFACE; PLYWOOD

VEHICLE BODY CLASS; ZJ
CAR LINE; J
BODY; 74
ENGINE; 5.2 LITRE
ENGINE NOTE; ELECTRONIC FUEL INJECTION
TRANSMISSION; 4 SPEED AUTO 4x4
TRANS. NOTE;
VIN AS TESTED; 1J4GZ7856TC522282 MOD.
VIN AS BUILT; 1J4GZ7856PC522282 MOD.
1J4GZ7856PC522282

BUILD CONDITION 1993 PRODUCTION BUILT CANADIAN ZJ RETOFITTED
AS A 1996 DOMESTIC ZJ FOR REAR IMPACT.
5.2L ENGINE, 4 SPEED AUTO TRANS, 4X4
POWER STEERING, A/C, ABS BRAKES, ROOF RACK
P235/75R15 TIRES ON ALUMINUM WHEELS & FULL SPARE.
1996 CO-EXTRUDED FUEL TANK WITH REINFORCED
SENDING UNIT COVER.
1996 STEEL FUEL RAILS AND MATCHING LINE BUNDLE.
1996 REAR LIFT GATE WITH FIXED GLASS
1996 REINFORCED BUMPER BAR, FASCIA & BRACKETS

TARGET WEIGHT (LBS) 4163 TOTAL, 2311 FRONT, 1852 REAR REP MAX OPT. WT.
NOT INCLUDING OCCUPANTS OR LUGGAGE BALLAST.

TEST WEIGHT (LBS) 4810 TOTAL, 2677 FRONT, 2133 REAR

FUEL BALLAST 21.8 GALLONS OF STODDARD SOLVENT.

LUGGAGE BALLAST 300 LBS OF LUGGAGE BALLAST SECURED IN CARGO AREA.

POST TEST REMARKS _____

DC 04054

CHRYSLER MOTORS
SAFETY TEST
VEHICLE CRASH TEST REQUEST

SUPPLEMENT NO. 03

OTHER BALLAST

0.10 lbs secured to front footwell

OCCUPANTS

LEFT FRONT, HYB II, BALLAST.

AD NO 60

RESTRAINT-BELTS ONLY.

RIGHT FRONT, HYB II, BALLAST.

AD NO 61

RESTRAINT-BELTS ONLY.

MECHANICAL REQ

PLACE SEAT IN MID TRACK POSITION.

FUEL PUMP TO BE RUNNING DURING TEST.

RUN FUEL PUMP PRE TEST TO CHECK CONNECTIONS.

PRESSURE CHECK PRE AND POST TEST.

STATIC ROLL POST TEST.

PAINT REAR DIFFERENTIAL AND GAS TANK FOR VIEWING.

INSTRUMENTATION REQ

SEE 3RD SHEET NO. 107 FOR ACCELEROMETER REQUIREMENTS AND LOCATIONS (THE 4 SILL ACCELEROMETERS ARE TO BE BI-AXIAL).

PHOTOGRAPHIC REQ

1-LEFT SIDE OVERALL CAMERA TO VIEW ENTIRE VEHICLE.
1-RIGHT SIDE OVERALL CAMERA TO VIEW ENTIRE VEHICLE
1-CATWALK CAMERA TO VIEW ENTIRE VEHICLE.
1-PIT CAMERA TO VIEW UNDERBODY, AXLE TO BUMPER.

FILM ANALYSIS

VEHICLE VELOCITY, ONLY IF REQUESTED.
DYNAMIC CRUSH.

REMARKS

MAKE 1 FILM COPY AND 1 VHS COPY, SEND TO:
J.B. ESTES 514-15-58
PLEASE RETURN VEHICLE POST TEST TO JTE.

T. E. REPORT

301 FUEL SYSTEMS REPORT REQUIRED.

REPORT CODES

A = TRANSDUCER DATA	B = ALL FILM DATA
C = HIGH SPEED FILM	D = ENGINEER'S REPORT
E = DUMMY KINEMATICS	F = STEERING COLUMN
G = UNDERBODY	H = A-POST
I = DYNAMIC CRUSH	J = ENGINE COMPARTMENT
K = DOOR CRUSH	L = FORCE/CRUSH/ENERGY
M = SPECIAL	N = CATALOG EDP DATA
* = REPORT REQUESTOR	

DISTRIBUTION

W.A. BREITMOSER	422-05-01	(AB)
D.J. MCKENZIE	422-05-01	(AB)
J.B. ESTES	514-15-58	(AB)

CHRYSLER MOTORS
SAFETY TEST
VEHICLE CRASH TEST REQUEST

SUPPLEMENT NO. 03

*****CHANGED 02/02/95 AT 10.00.08. SUPPLEMENT NO. 01

BUILD CONDITION

ADD 1996 STEEL FUEL RAILS AND MATCHING LINE BUNDLE.

TARGET WEIGHT (LBS)

MODIFY
TC READ 4163 TOTAL, 2311 FRONT, 1852 REAR REP MAX OPT. WT.

OCCUPANTS

MODIFY RESTRAINT-RESTRAINT-UNIBELT ONLY.
TO READ RESTRAINT-BELTS ONLY.
MODIFY RESTRAINT-RESTRAINT-UNIBELT ONLY.
TO READ RESTRAINT-BELTS ONLY.

*****CHANGED 02/02/95 AT 10.05.05. SUPPLEMENT NO. 02

TARGET WEIGHT (LBS)

ADD NOT INCLUDING OCCUPANTS OR LUGGAGE BALLAST.

* *****CHANGED 02/07/95 AT 13.42.32. SUPPLEMENT NO. 03

INSTRUMENTATION REQ

MODIFY
TO READ SEE 3RD SHEET NO. 107 FOR ACCELEROMETER REQUIRE-
ADD MENTS AND LOCATIONS (THE 4 SILL ACCELEROMETERS
ADD ARE TO BE BI-AXIAL).

X, Y, Z DIMENSIONS

TEST NUMBER VC5380

LOC.	X	Y	Z
LFS	59.5	-218	14.3
LMS	73.6	-218	14.9
LRA	135.6	-244	12.5
		-	
		-	
		-	

LOC.	X	Y	Z

TRAMMEL MEASUREMENTS:

LEFT SILL: PRE 24.13

TUBE COLOR BLUE

FRONT SILL

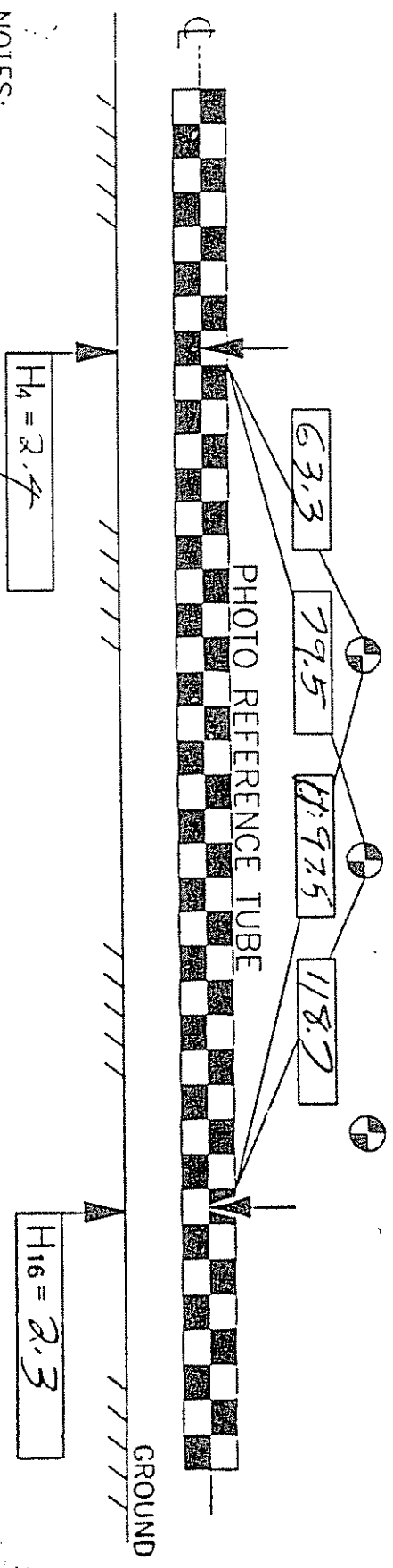
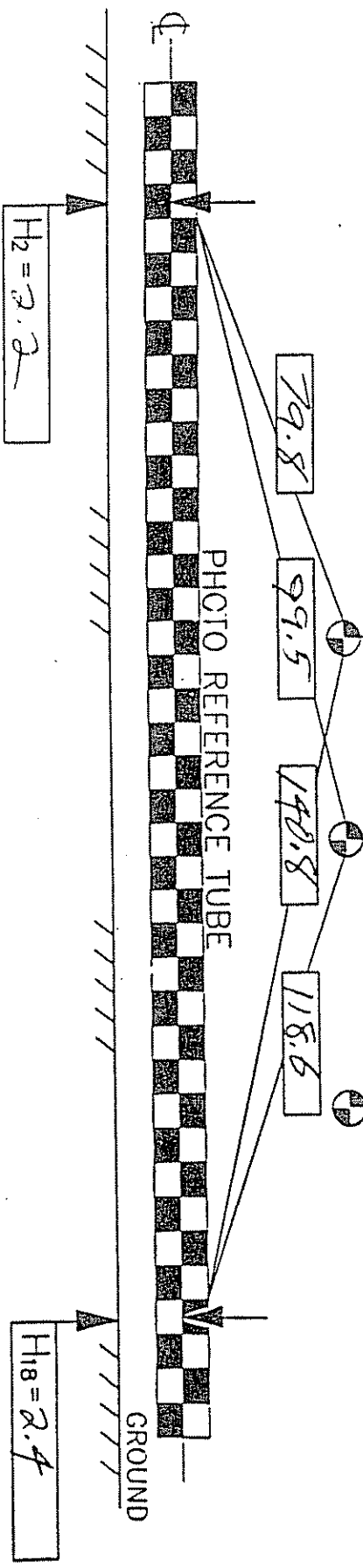
X =
Y =
Z = 15.0

REAR SILL

X =
Y =
Z = 15.0

REAR AXLE

X =
Y =
Z = 13.0



NOTES:

1. THE Z DIMENSION FOR THE SILL TARGETS AND REAR AXLE MUST BE RETAKEN AT THE TEST SITE
2. IF OTHER TUBE POINTS ARE USED, SO INDICATE

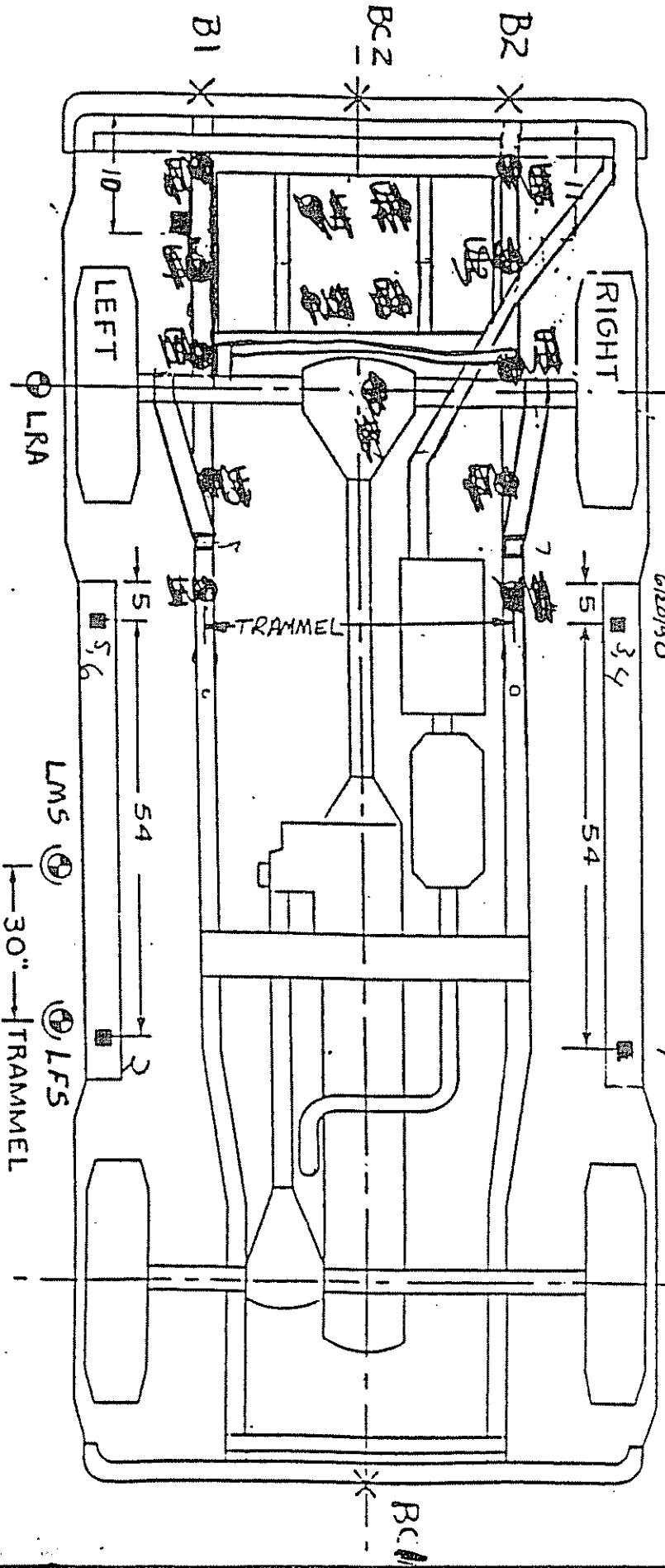
FOR REAR IMPACT TESTS - DIMENSIONING BETWEEN SILL TARGETS AND PHOTO REFERENCE TUBE TEST ENGR NAVY
VC 5380

THIRD SHEET 106, ITEM 5, VC 5380
 JEEP ZT 4x4
 TARGET AND ACCELEROMETER LOCATIONS
 FOR REAR IMPACTS

2386φ2
 VC 5380

ELEC FUEL PUMP TO BE
 RUNNING DURING IMPACT

ACCEL. LOCATIONS ARE XJ (REF. SHEET 102)
 ACTUAL LOCATIONS PER TRAMMEL

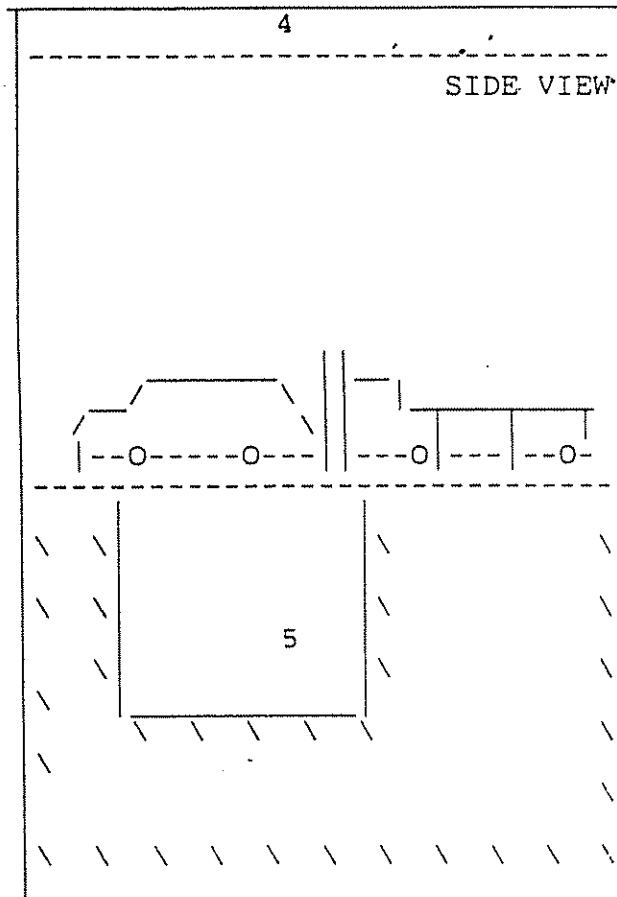
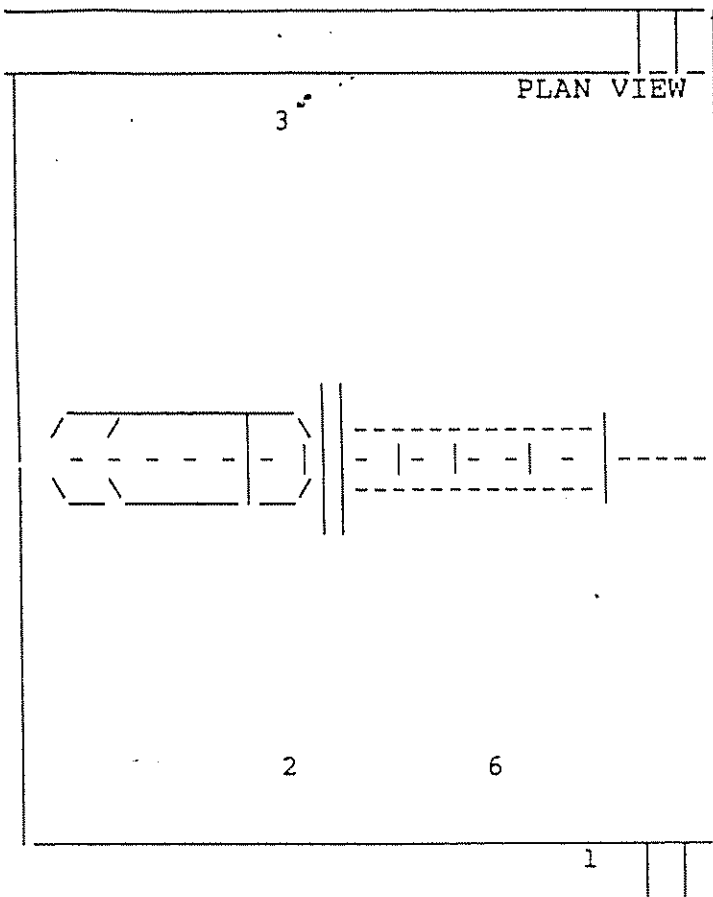


TARGETS

- ⊙ PUNCH POINT UNDERBODY
- ⊙ SIDE VIEW

LEGEND

- NOTES -
1. PRE AND POST DIMENSIONS ARE REQUIRED
 2. NUMBERS ASSIGNED TO EACH TARGET ARE PERMANENT
 3. TARGETS MAY BE DELETED BY NUMBER PER TR.
 4. ADDITIONAL TARGETS MAY BE REQUESTED BY TR.
 5. LOCATIONS SHOWN ARE APPROX TO ± 0.5 IN.
- ACCELEROMETERS - □ SINGLE AXIS, X
 □ BIAXIAL, X & Z



TEST NUMBER VC5380 TEST TYPE: 30 MPH TYPE IV MOVING BARRIER REAR IMPACT
 TEST ENGINEER MANNEY REQUEST DATE : 2/ 9/95 VEHICLE BODY CLASS : ZJ

#	VIEW DESCRIPTION	CAM S/N	LENS F.L.	LENS S/N	LENS MFG.	F-STOP	PNL	SKT	CBL	CAM MFG
1	PANNING									
2	LT. OVERALL	131	13mm	107230	YIN					
3	RT. OVERALL	131	13mm	107230						
4	CATWALK OVERALL	432	19mm	107230						
5	PIT AXLE TO BUMPER	282	20mm							
6	A-VELOCITY	286	100mm	52098	ELP					

FUEL SYSTEM AND STATIC ROLLOVER SUMMARY

TEST NUMBER VC5380 ITEM NUMBER ZJ8602 TEST ENGINEER MANNEY

V.I.N. 1J4GZ7856TC522282, TEST DATE 7/15/95, ROLL DATE MA / 1 / 1

TEST TYPE; 30 MPH TYPE II MOVING BARRIER REAR

FUEL; TYPE AND QUANTITY - .767 S.G. STODDARD SOLVENT, 21.8 GALLONS

TEST SPEED 30.3 MPH, TEST WEIGHT 7810 POUNDS.

POST TEST FUEL SYSTEM OBSERVATIONS THERE WAS EXCESSIVE FUEL LEAKAGE DURING IMPACT AND THE SUBSEQUENT THIRTY MINUTES, RESULTING FROM ^{PARTIAL} SEPERATION OF THE VENT LINE FITTING FROM THE TANK.

POST IMPACT LEAKAGE(OZ); AT IMPACT } EXCESSIVE
 1ST 5 MIN. }
 NEXT 25 MIN. }

POST TEST PRESSURE CHECK MA

ELECTRIC FUEL PUMP RUN MA

STATIC ROLL LEAKAGE WITH VEHICLE SIDE DOWN FIRST

		FUEL LEAKAGE LOCATIONS DURING STATIC ROLL				TOTAL	
ROLL TIME							
0-90	1ST 5 MIN	<u>NO ROLL</u>					*
	POST 5 MIN						**
90-180	1ST 5 MIN						*
	POST 5 MIN						**
180-270	1ST 5 MIN						*
	POST 5 MIN						**
270-360	1ST 5 MIN						*
	POST 5 MIN						**

* OUNCES IN 5 MINUTES, ** OUNCES PER MINUTE

LAST FORM MODIFICATION 5/27/93 - GAB

INTER COMPANY CORRESPONDENCE

FILE DCRDATA

DATE 03/01/95

TO
DISTRIBUTION

FROM
B. O. CARLISLE

DEPARTMENT
5320

PLANT/OFFICE
CTC

CIMS NUMBER
481-02-18

SUBJECT:

REAR DYNAMIC CRUSH ANALYSIS
VC05380 30 MPH REAR BARRIER. ZJJ74. 5.2L MPI ITEM ZJ8602
1996 MVSS VALIDATION - 301.
TEST DATE 02/15/95

TEST PURPOSE PRIMARY, 1996 USA 301 VALIDATION.
OBSERVE FUEL SYSTEM INTEGRITY.

IMPACT TYPE TARGET SPEED: 30.1 MPH
DAMAGE LOCATION: REAR
BARRIER TYPE: REAR TYPE IV
BARRIER SURFACE: PLYWOOD

VEHICLE BODY CLASS: ZJ
CAR LINE: J
BODY: 74
ENGINE: 5.2 LITRE
ENGINE NOTE: ELECTRONIC FUEL INJECTION
TRANSMISSION: 4 SPEED AUTO 4x4
TRANS. NOTE:
VIN AS TESTED: 1J4GZ7856TC522282 MOD.
VIN AS BUILT: 1J4GZ7856PC522282 MOD.
1J4GZ7856PC522282

TEST SPEED 30.3 MPH BY ELECTRONIC TRAP TIMER

TEST WEIGHT (LBS) 4810 TOTAL, 2677 FRONT, 2133 REAR

OCCUPANTS LEFT FRONT, HYB II, BALLAST. AD-60
RESTRAINT-BELTS ONLY.
RIGHT FRONT, HYB II, BALLAST. AD-65
RESTRAINT-BELTS ONLY.

BUILD CONDITION 1993 PRODUCTION BUILT CANADIAN ZJ RETOFITTED
AS A 1996 DOMESTIC ZJ FOR REAR IMPACT.
5.2L ENGINE, 4 SPEED AUTO TRANS, 4X4
POWER STEERING, A/C, ABS BRAKES, ROOF RACK
P235/75R15 TIRES ON ALUMINUM WHEELS & FULL SPARE.
1996 CO-EXTRUDED FUEL TANK WITH REINFORCED
SENDING UNIT COVER.
1996 STEEL FUEL RAILS AND MATCHING LINE BUNDLE.
1996 REAR LIFT GATE WITH FIXED GLASS
1996 REINFORCED BUMPER BAR, FASCIA & BRACKETS

TARGET WEIGHT (LBS) 4163 TOTAL, 2311 FRONT, 1852 REAR REP MAX OPT. WT.
NOT INCLUDING OCCUPANTS OR LUGGAGE BALLAST.

TEST VC05380 03/01/95 15.00 PAGE 1 OF 2

DC 04062

FUEL AND BALLAST

21.8 GALLONS OF STODDARD SOLVENT.
300 LBS OF LUGGAGE BALLAST SECURED IN CARGO AREA.
200 LBS SECURED TO FRONT FOOTWELLS

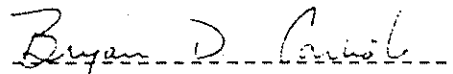
POST TEST REMARKS

THERE WAS EXCESSIVE FUEL LEAKAGE DURING IMPACT AND
THE SUBSEQUENT THIRTY MINUTES, RESULTING FROM
PARTIAL SEPERATION OF THE VENT LINE FITTING FROM
THE TANK.

DYNAMIC CRUSH, PITCH, AND REAR WHEEL MOTION RELATIVE TO THE FRONT
SILL HAVE BEEN DETERMINED BY FILM ANALYSIS. TIME WAS BASED ON
CAMERA TIMING DATA.

DYNAMIC CRUSH 22.3 +OR- 1 INCH AT 86. +OR- 5 MSEC.


C. M. ANDERSON


B. D. CARLISLE

GRAPHS - 4

G L O S S A R Y O F T E R M S

U S E D I N S T A N D A R D R E P O R T S

AD	ANTHROPOMORPHIC DEVICE
ADT	ANTHROPOMORPHIC TEST DEVICE
BASE COORD	BASE COORDINATE SYSTEM
C/L	CENTERLINE
CAR COORD	CAR COORDINATE SYSTEM
CCW	COUNTER CLOCKWISE
CORR-IN	SEPARATION IN INCHES (MINUS INITIAL LENGTH)
CORR-MM	SEPARATION IN MM (MINUS INITIAL LENGTH)
CORR-P	CORRECTED (ZEROED) PITCH
CORR-R	CORRECTED (ZEROED) ROLL
CORR-Y	CORRECTED (ZEROED) YAW
CW	CLOCKWISE
EFI	ELECTRONIC FUEL INJECTOR
ENG	ENGINE
ENGPY	ENGINE PITCH AND YAW
FESH	FRONT END SHEET METAL
FIDUCIAL	REFERENCE POINT OR TARGET
FS	FRONT SILL TARGET
FWD	FORWARD
IP	INSTRUMENT PANEL TARGET
LBS	POUNDS
LCP,LQP	LEFT C-POST & QUARTER PANEL TARGETS
LFS,LMS,LRS	LEFT FRONT SILL, MID SILL, & REAR SILL TARGETS
LT	LEFT
MS	MID SILL TARGET
NORMALIZE	PUT ON A COMMON BASIS
NOSE-DOWN	LEADING END BELOW TRAILING
NOSE-UP	LEADING END ABOVE TRAILING
PERF	PERFORMANCE
REF	REFERENCE
REL	RELATIVE TO (ONE-DIMENSIONAL)
RCP,RQP	RIGHT C-POST & QUARTER PANEL TARGETS
RFS,RMS,RRS	RIGHT FRONT, MID, & REAR SILL TARGETS
ROLL-LEFT	LEFT SIDE LOWER THAN RIGHT
ROLL-RIGHT	RIGHT SIDE LOWER THAN LEFT
RS	REAR SILL TARGET
RT	RIGHT
SEP	SEPARATION OF (THREE-DIMENSIONAL)
SYS	SYSTEM
TBI	THROTTLE BODY INJECTOR
TIME.MS	TIME IN MILLISECOND
U/B	UNDERBODY
VS	VERSUS
X	LONGITUDINAL AXIS (INCREASING TOWARD TRAILING EDGE)
XF	X-FILTERED
Y	LATERAL AXIS (INCREASING TO THE RIGHT)
YAW-LEFT	LEADING EDGE TO LEFT
YAW-RIGHT	LEADING EDGE TO RIGHT
Z	VERTICAL AXIS (INCREASING UPWARD)
ZEROED	SHIFTED TO START AT ZERO
ZERO-IN	ZEROED INCHES
ZERO-MM	ZEROED MILLIMETERS

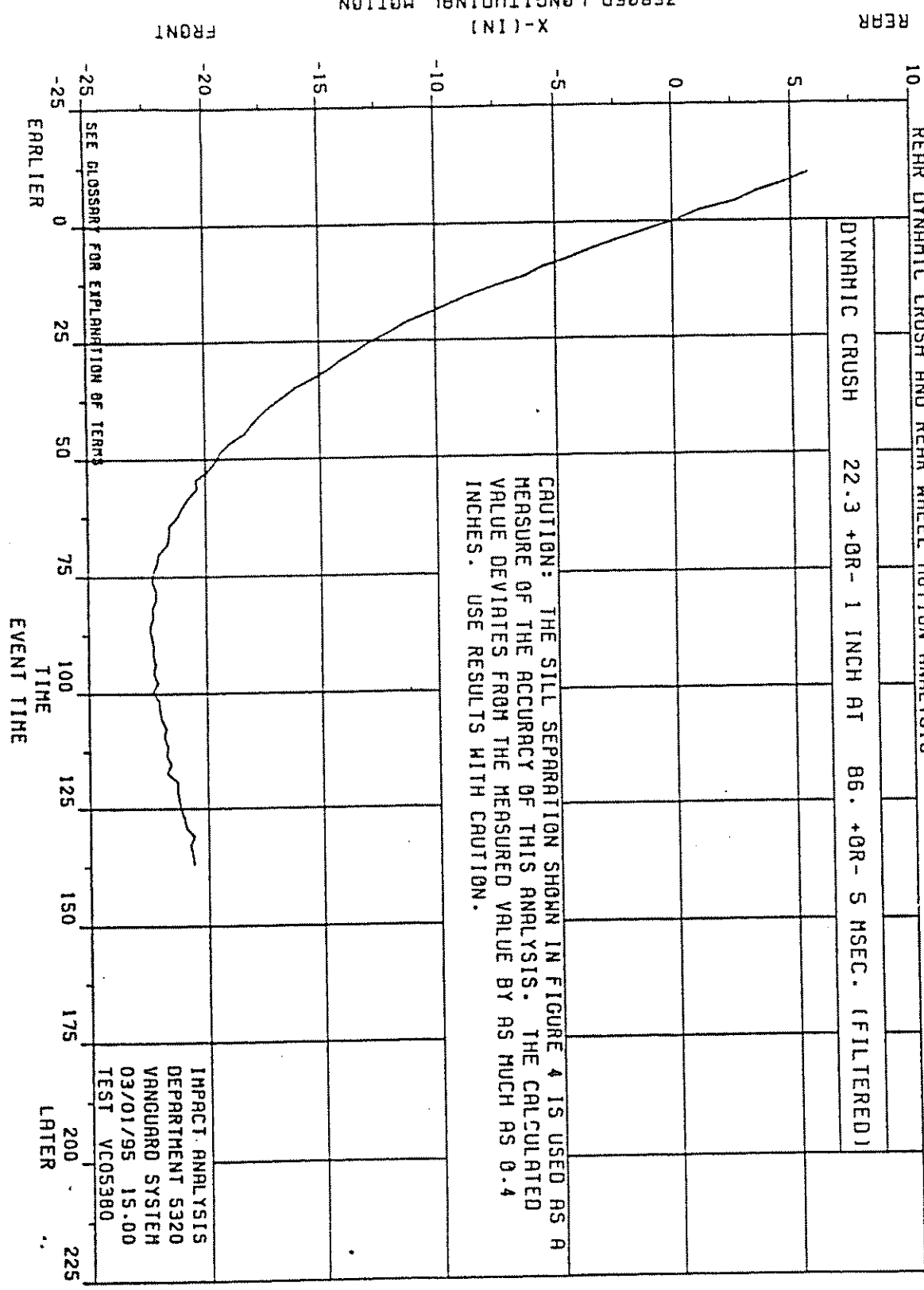
IMPACT ANALYSIS
DEPARTMENT 5320
03/01/95 15.00
TEST VC05380

DC 04064

VC05380 30 MPH REAR BARRIER, 2J74, S-2L MPI ITEM 2J8602
 1996 HVSS VALIDATION - 301.

ZEROED X MOTION OF F3 REL TO LFS IN BASE COORD SYS
 VERSUS TIME IN MILLISECONDS

REAR DYNAMIC CRUSH AND REAR WHEEL MOTION ANALYSIS



CAUTION: THE SILL SEPARATION SHOWN IN FIGURE 4 IS USED AS A
 MEASURE OF THE ACCURACY OF THIS ANALYSIS. THE CALCULATED
 VALUE DEVIATES FROM THE MEASURED VALUE BY AS MUCH AS 0.4
 INCHES. USE RESULTS WITH CAUTION.

IMPACT ANALYSIS
 DEPARTMENT 5320
 VANGUARD SYSTEM
 03/01/95 15.00
 TEST VC05380

FIGURE 1
 ZEROED LONGITUDINAL MOTION

VC05380 30 MPH REAR BARRIER, ZJ74, S-2L HPI ITEM ZJ8602
 1996 HVSS VALIDATION - 301.

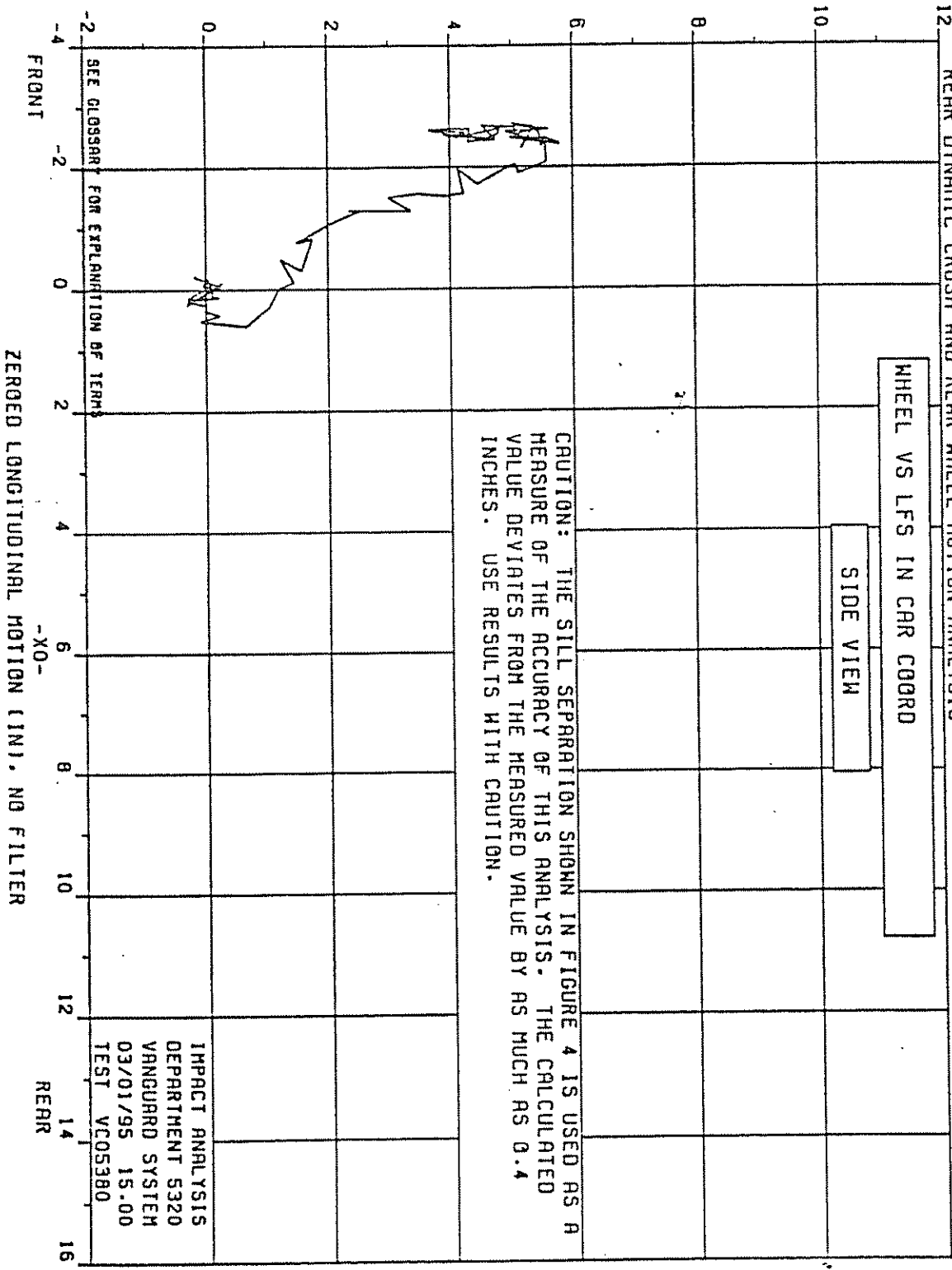
ZERGED Z OF WHEEL RELATIVE TO LFS IN CAR COORD
 VERSUS ZERGED X OF WHEEL RELATIVE TO LFS IN CAR COORD
 REAR DYNAMIC CRUSH AND REAR WHEEL MOTION ANALYSIS

WHEEL VS LFS IN CAR COORD

SIDE VIEW

CAUTION: THE SILL SEPARATION SHOWN IN FIGURE 4 IS USED AS A
 MEASURE OF THE ACCURACY OF THIS ANALYSIS. THE CALCULATED
 VALUE DEVIATES FROM THE MEASURED VALUE BY AS MUCH AS 0.4
 INCHES. USE RESULTS WITH CAUTION.

IMPACT ANALYSIS
 DEPARTMENT 5320
 VANGUARD SYSTEM
 03/01/95 15.00
 TEST VC05380

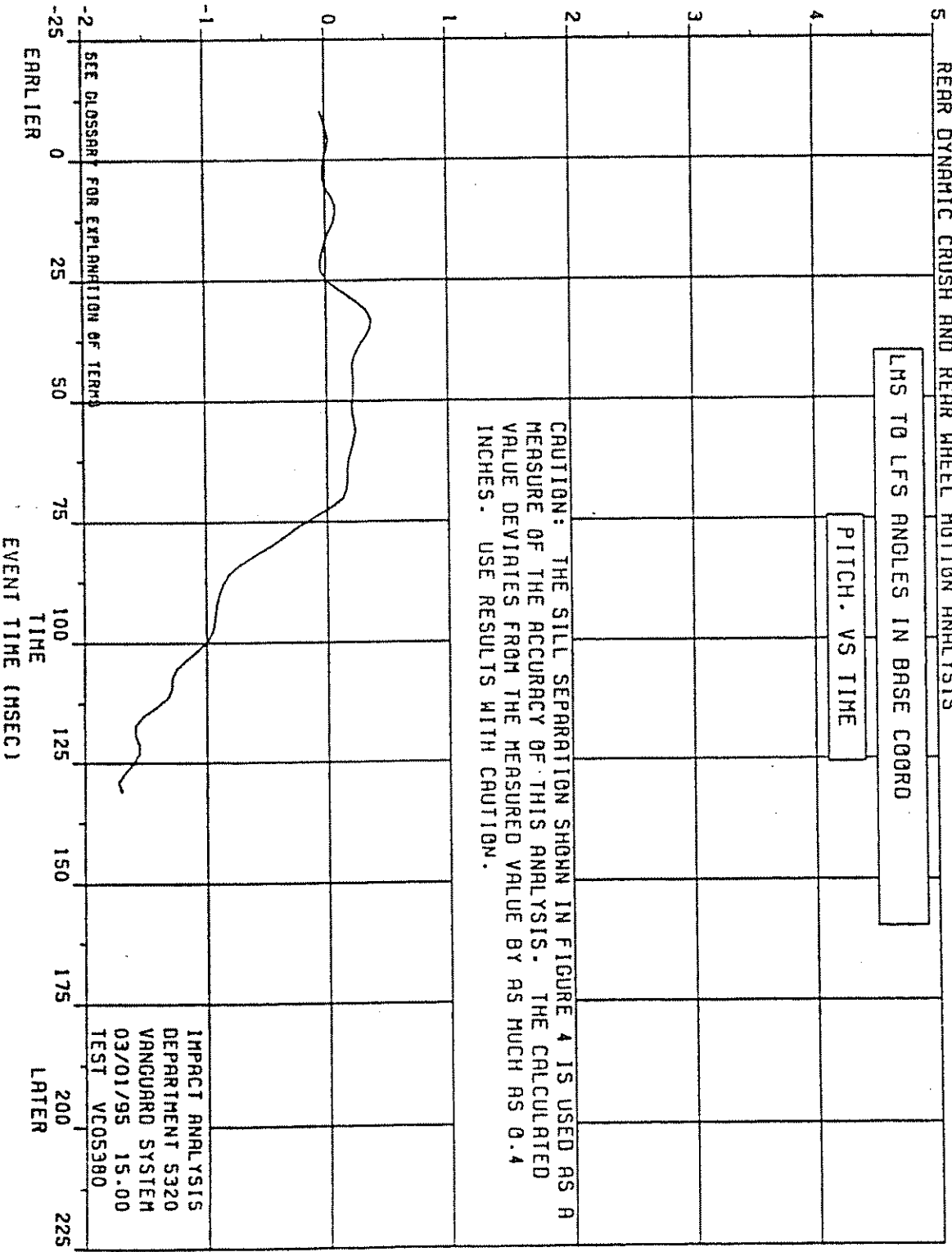


ZERGED VERTICAL MOTION (IN), NO FILTER
 -20-
 DGMH

FIGURE 2

VC05380 30 MPH REAR BARRIER, ZJ74, 5.2L MPI ITEM ZJ8602
 1996 HVSS VALIDATION - 301.

ZERGED PITCH OF LHS TO LFS IN BASE COORD SYSTEM
 VERSUS TIME IN HILLISECONDS
 REAR DYNAMIC CRUSH AND REAR WHEEL MOTION ANALYSIS



NOSE-UP
 CORR-P
 DEGREES CCM AROUND Y RELATIVE TO X (RT SIDE VIEW) 50HZ FILTER

FIGURE 3

VC05380 30 MPH REAR BARRIER, ZJJ74, 5.2L HPI ITEM ZJ8602
 1996 HVSS VALIDATION - 301.

LMS TO LFS DISTANCE - 24.03 INCHES (INITIAL DIST) (IN)
 VERSUS TIME IN MILLISEC

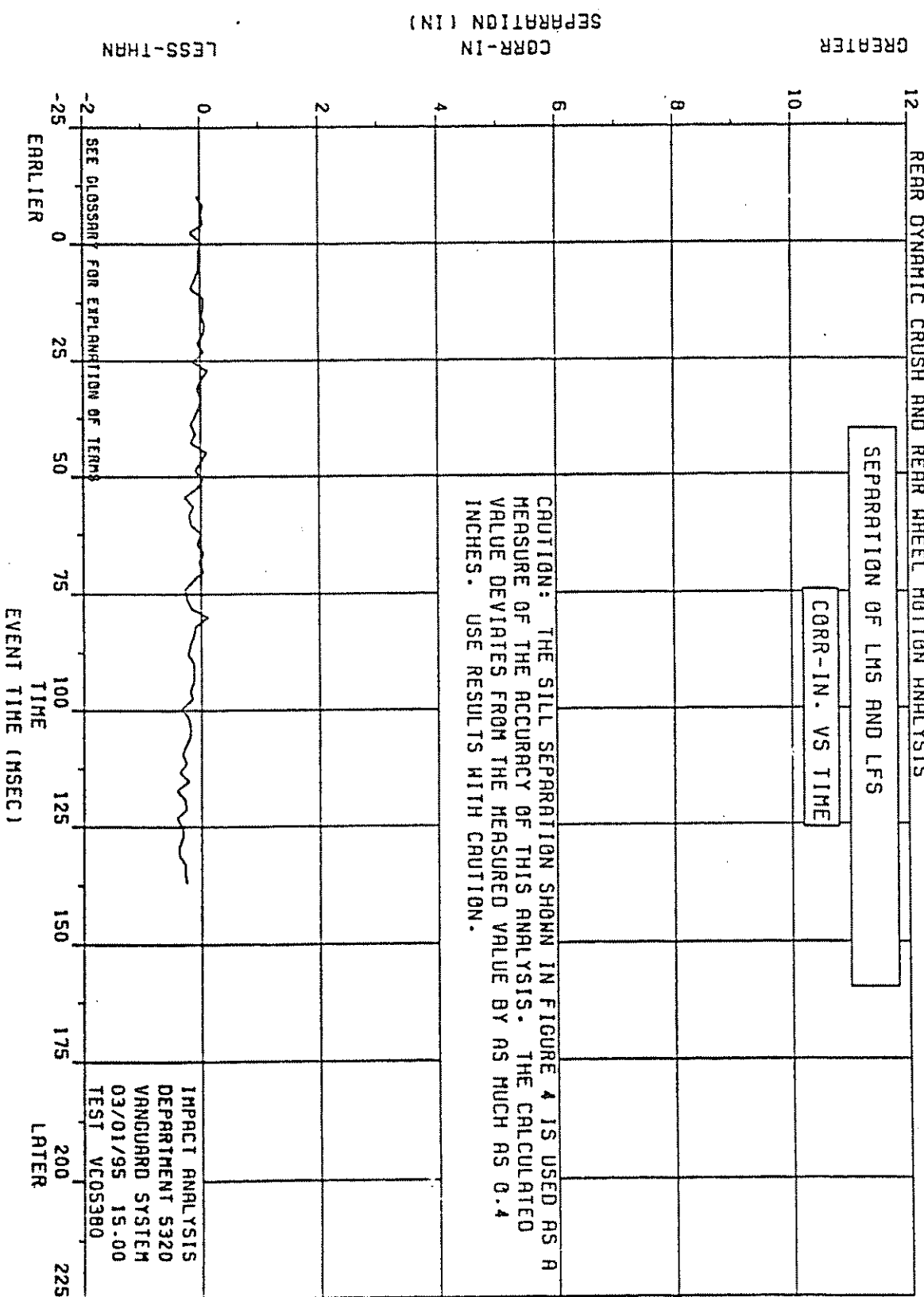
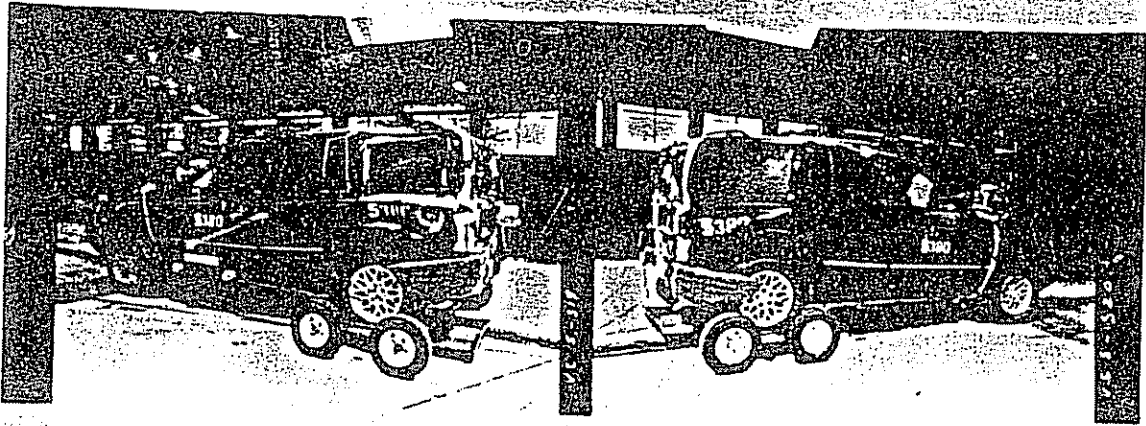
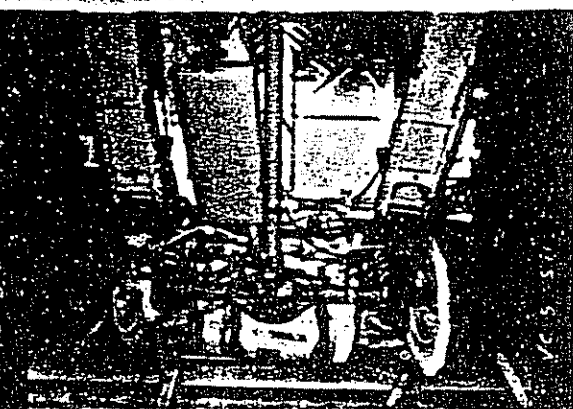
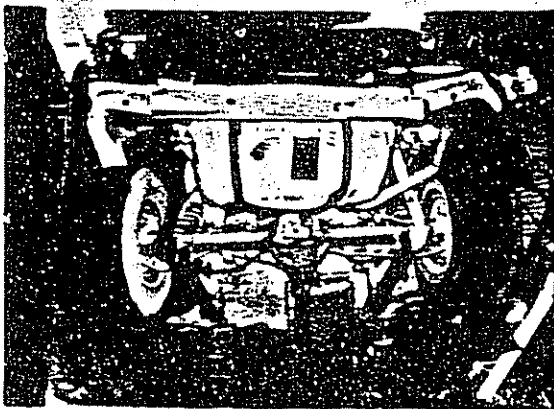
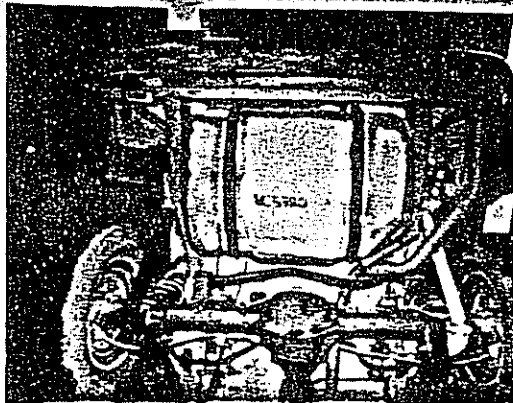
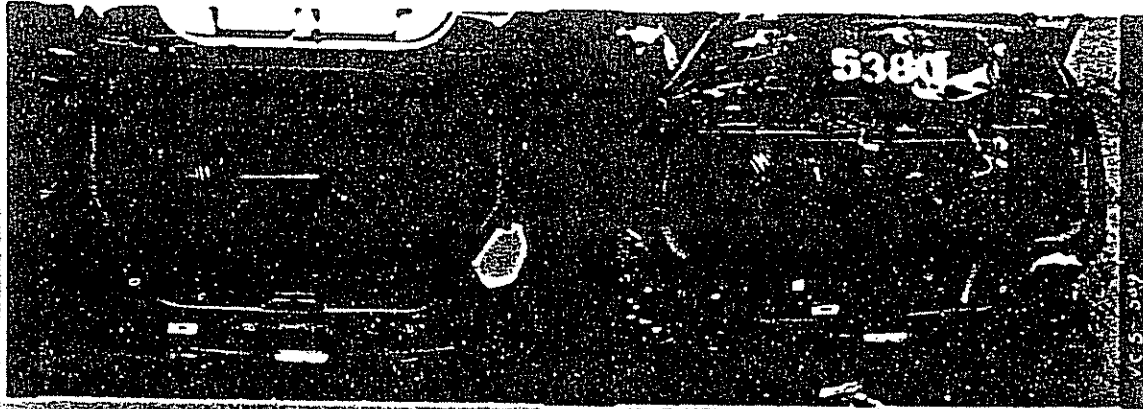
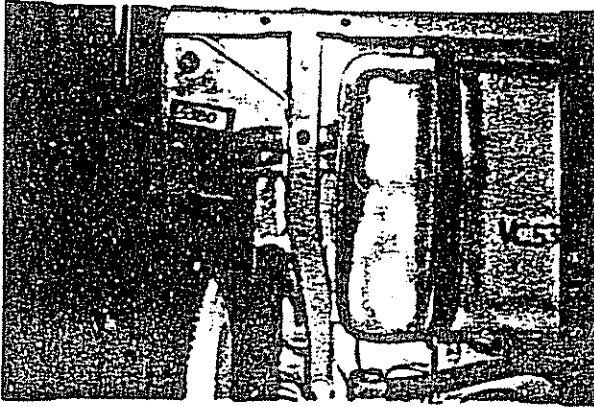
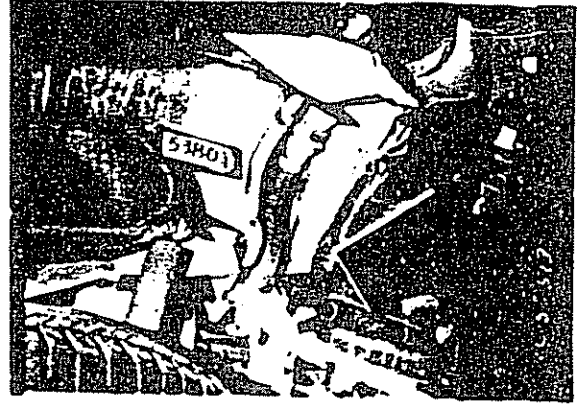
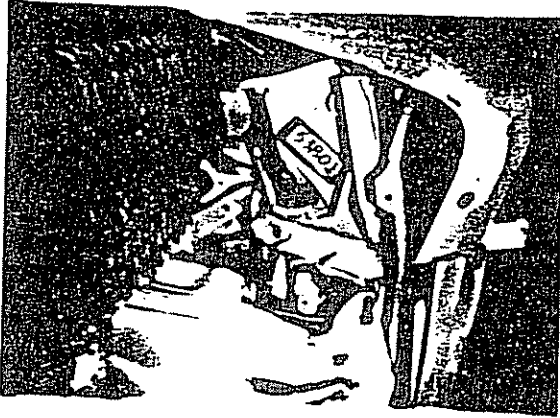


FIGURE 4



DC 04069





DC 04071