3/3

HSH
6/17/04

135-TRC-04-007

SAFETY COMPLIANCE TESTING FOR FMVSS 135
Passenger Car Brake Systems

General Motors Corporation
2004 Chevrolet Express Passenger Van, 5-Door
NHTSA No. C40111

TRANSPORTATION RESEARCH CENTER INC.
10820 State Route 347
East Liberty, Ohio 43319

Final Report Completed: May 26, 2004

FINAL REPORT

Prepared Under Contract No.: DTNH22-01-C-21025

U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
400 Seventh Street, SW
Room 6115 (NVS-220)
Washington, DC 20590

Prepared for the Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-01-C-21025.

Prepared By _____

Approved By _____

Approval Date: 5/26/04

Final Report Acceptance By OVSC:

_____

Contract Technical Manager, Office of Vehicle Safety Compliance

6/2/04

_____

Acceptance Date

1. REPORT NUMBER: 135-TRC-04-007	2. GOVERNMENT ACCESSION NO.:	3. RECIPIENTS CATALOG NO.:	
4. TITLE AND SUBTITLE: Final report of FMVSS 135 Compliance Testing of a 2004 Chevrolet Express Passenger Van, 5-Door, NHTSA No. C40111		5. REPORT DATE: May 26, 2004	
		6. PERFORMING ORGANIZATION CODE: TRC 20000113/4356	
7. AUTHOR(S): Project Manager: WALTER DUDEK Project Engineer: RANDALL A. LANDES		8. PERFORMING ORGANIZATION REPORT NO.: TRC-DOT-135-052	
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Transportation Research Center Inc. 10820 State Route 347 East Liberty, Ohio 43319		10. WORK UNIT NUMBER:	
		11. CONTRACT OR GRANT NO.: DTNH22-01-C-21025	
12. SPONSORING AGENCY NAME AND ADDRESS: U.S. Department of Transportation National Highway Traffic Safety Administration Enforcement Office of Vehicle Safety Compliance (NVS-220) 400 Seventh Street, SW, Room 6115 Washington, DC 20590		13. TYPE OF REPORT AND PERIOD COVERED: Final test report Tested: 04/20/04 to 05/06/04	
		14. SPONSORING AGENCY CODE: NVS-220	
15. SUPPLEMENTARY NOTES:			
16. ABSTRACT: Compliance tests were conducted on the subject 2004 Chevrolet Express Passenger Van, 5-Door, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-135-00 for the determination of FMVSS 135 compliance. Test failures identified were as follows: None.			
17. KEY WORDS: Compliance Testing Safety Engineering FMVSS 135		18. DISTRIBUTION STATEMENT: Copies of this report are available from: NHTSA Technical Reference Division Mail Code: NAD-40 400 Seventh Street, SW, Rm. 5108 Washington, DC 20590 Telephone No. (202) 366-4949	
19. SECURITY CLASSIF. (OF THIS REPORT): Unclassified	20. SECURITY CLASSIF. (OF THIS PAGE): Unclassified	21. NO. OF PAGES: 68	22. PRICE:

TABLE OF CONTENTS

1.0 INTRODUCTION

Tests were conducted on a 2004 Chevrolet Express Passenger Van, 5-door, manufactured by General Motors Corporation, to determine compliance with FMVSS 135 "Passenger Car Brake Systems." All tests were conducted in accordance with the U.S. D.O.T., NHTSA Laboratory Procedure TP 135-00 and/or the corresponding TRC Inc. test procedure that was submitted to NHTSA for their approval. The test procedure was clearly described in the submitted document and has not been repeated in this report.

All stops were performed manually.

All tests were conducted by TRC Inc. personnel using the following TRC facilities:

7.5-Mile Test Track
Vehicle Maximum Speed
Burnish
Heating Snubs and Hot Performance Stops
Brake Cooling and Recovery Stops

Skid Pad
Cold Effectiveness Stops
High Speed Effectiveness Stops
Stops with Engine Off
Failed Antilocks
Failed Variable Proportioning Valve (if applicable)
Failed Hydraulic Circuits
Brake Power Assist Unit Failures

Brake Slope
Parking Brake

Average PFC during the test period was 0.95 (Skid Pad) and 0.94 (Test Track) utilizing the ASTM E1337 w/E1336 tire method.

The test vehicle was ABS equipped. Therefore, the Wheel Lock Sequence and Adhesion Utilization Tests were not performed.

This vehicle met the requirements of FMVSS 135.

DATA SHEET 1 - VEHICLE INFORMATION

VEHICLE SPECS

Year:	2004	NHTSA No:	C40111
Mfr:	GENERAL MOTORS CORP.	GVWR (Kg):	3265.9
Make:	CHEVROLET	GAWR Front(Kg):	1633.0
Model:	EXPRESS PAS.VAN	GAWR Rear(Kg):	1814.4
Body Style:	MPV 5-DOOR	Wheelbase (mm):	3429.0
Mfr. Date:	08/03	Odometer: Start:	81 MI. End: 567 MI.
VIN:	1GNFG15XX41117979		

BUSES ONLY

Chassis Mfg.:	N/A
Serial No.:	N/A
No. of Seats:	N/A
Manufacture Date:	N/A

Engine Type:	GASOLINE,V6,VORTEC,FI,FEEDBACK FUEL SYSTEM,PISTON.		
Displacement:	4.3 LITER	Tire Size:	P235/75R16
Engine Hspwr:	N/A	Tire Type:	109S,LAREDO,1192MS,RADIAL,M&S
Idle Speed(rpm):	73.0946	Tire Mfr.:	UNIROYAL
Transmission Type:	AUTO.4-SPD.ELECTRONIC	GVWR Front Press.(kpa):	241.32
No. of Axles:	2	GVWR Rear Press.(kpa):	262.00

BRAKE APPLY SYSTEM

Brake Series:	Front:DISC Rear:DISC	Power Assist Unit:	YES
Brake Actuation		Pwr Unit w/Accumulator:	YES
(Hydr. Circuit Split):	FRONT/REAR	Pwr Asst./Pwr Unit w/Backup:	NO
Power Unit:	HYDRAULIC	Variable Prop. System:	NO
Anti-Skid unit Mfr:	TRW	Anti-Skid Device:	YES
Parking Mechanism:	YES		
Type of Parking Unit:	AUTOMATIC TRANSMISSION WITH PARK DETENT.		
Mstr Cylinder Dia(mm):	33.81	Pedal Ratio:	6.3:1

FRONT SYSTEM BRAKE COMPONENT MATERIALS AND CONSTRUCTION:

BRAKE TYPE:	DISC	Material:	CAST
Drum Construction:	N/A	LF Drum Shoe Cage Dia.(mm):	N/A
Disc Construction:	INTEGRAL CAST,VENTED	RF Drum Shoe Cage Dia.(mm):	N/A
Front Brake Dia.(mm):	305.18	LF Drum Dia. RESET(mm):	N/A
Fr Disc Thickness(mm):	29.08	RF Drum Dia. RESET(mm):	N/A
Lining Construction:	Bonded		

FRONT BRAKE COMPONENT DIMENSIONS AND CODES:

	Inboard (Leading)	Outboard (Trailing)
Width(mm):	43.51	43.43
Length(mm):	171.96	171.93
Thickness(mm):	12.60	12.47
Lining Code/Color:	AK NS265H FF	AK NS265H FF
Hyd. Piston Dia.(mm):	50.98 (x2 pistons)	

DATA SHEET 1 - (CONTINUED)

REAR SYSTEM BRAKE COMPONENT MATERIALS AND CONSTRUCTION:

BRAKE TYPE: DISC
Drum Construction: N/A
Disc Construction: INT.CAST,VENTED
Lining Construction: BONDED
Rear Brake Dia.(mm): 329.77
Rr Disc Thickness(mm): 30.18

Material: CAST IRON
LR Drum Shoe Cage Dia.(mm): N/A
RR Drum Shoe Cage Dia.(mm): N/A
LR Drum Dia. RESET(mm): N/A
RR Drum Dia. RESET(mm): N/A

REAR BRAKE COMPONENT DIMENSIONS AND CODES:

Inboard (Leading)		Outboard (Trailing)	
Width(mm):	43.13	Width (mm):	43.15
Length(mm):	139.32	Length (mm):	139.34
Thickness(mm):	10.77	Thickness (mm):	10.87
Lining Code/Color:	AK NS161H EF	Lining Code/Color:	AK NS161H EF
Hyd Piston Dia (mm):	44.30 (x2 pistons)		

OTHER COMPONENT INFORMATION:

Friction-type Park Brake: N/A
Non-Service Brake Type
Parking Brake: FOOT-OPERATED

Comment: Rear Calipers are aluminum.

NOTE: If at any time after the test series has begun, any brake system part requires replacement or the brake system requires adjustments other than permitted in burnish and reburnish procedures, discontinue testing and notify the COTR immediately.

Technician: KAREN EASTERDAY Date: 05-26-04

Quality Assurance: KEN WEBSTER

VEHICLE: 2004 Chevrolet Express Passenger Van NHTSA NO.: C40111 DATE: 05/06/04

3.0 SUMMARY OF TESTING

		Specification and Limit				TEST RESULTS (In compliance if one stop meets requirement)			
TEST	Loading Condition	Speed (km/h)	Min. Pedal Force (N)	Max. Pedal Force (N)	Stopping Distance Requirement (m)	Shortest Stop Min. Pedal Force (N)***	Shortest Stop Max. Pedal Force Newtons (Average – N)	Shortest Stop Stopping Distance (m) (Corrected)	PASS Fail
Equipment Requirements					Specified Equipment	Vehicle contains specified equipment			Pass
Vehicle Maximum Speed	LLVW	NA				180.7 km/h avg.			NA
Burnish	GVWR	80				200, 80 - 0 km/h stops @ 3.0 mpsps			NA
Wheel Lockup Sequence w/o ABS	GVWR				Lockup of front wheels prior to rear	ABS Equipped			NA
Wheel Lockup Sequence w/o ABS	LLVW					ABS Equipped			NA
Adhesion Utilization w/o ABS	LLVW				Rear axle adhesion utilization curve below specified value	ABS Equipped			NA
Adhesion Utilization w/o ABS	GVWR					ABS Equipped			NA
Cold Effectiveness	GVWR	100	65	500	70	5	481.9	60.9	Pass
High Speed Effectiveness	GVWR	128.6	65	500	spd. depend. – 123.6	6	469.2	81.6	Pass
Stops with Engine Off	GVWR	100	65	500	70	51	467.0	56.9	Pass
Cold Effectiveness	LLVW	100	65	500	70	5	449.0	46.5	Pass
High Speed Effectiveness	LLVW	128.6	65	500	spd. depend. – 123.6	5	438.7	75.1	Pass
Failed Antilock	LLVW	100	65	500	85	6	141.3	71.8	Pass
Failed Proportioning Valve	LLVW	100	65	500	110	5	NA	NA	NA
Failed Hydraulic Circuit #1	LLVW	100	65	500	166	6	477.5	62.2	Pass
Failed Hydraulic Circuit #2	LLVW	100	65	500	166	6	469.5	125.6	Pass
Failed Hydraulic Circuit #1	GVWR	100	65	600	166	6	425.6	79.2	Pass
Failed Hydraulic Circuit #2	GVWR	100	65	600	166	6	455.0	106.2	Pass
Failed Antilock	GVWR	100	65	500	85	6	249.4	67.1	Pass
Failed Proportioning Valve	GVWR	100	65	600	110	5	NA	NA	NA
Power Brake Unit Failure	GVWR	100	65	500	166	6	496.9	141.6	Pass
Parking Brake - Uphill	GVWR	-	-	500	Hold for 5 min.?	NA	295.1	Yes-Holds	Pass*
Parking Brake - Downhill	GVWR	-	-	500	Hold for 5 min.?	NA	267.9	Yes-Holds	Pass*
Heating Snubs	GVWR	120-60	NA	NA	16 Snubs- 3.0 mpsps	6	57 Vis. Avg.	NA	NA
Hot Performance Stop #1	GVWR	100	65	366.7 avg.	79.9	5	346.5 (267.0)	66.4	Pass
Hot Performance Stop #2	GVWR	100	65	500	89	6	370.6	54.6	Pass
Brake Cooling	GVWR	60	NA	NA	4 Stops - 3.0 mpsps	6	69 Vis. Avg.	NA	NA
Recovery Performance Stop #1	GVWR	100	65	366.7 avg.	One of the two stops between 68.6 and 97.3 meters	5	326.2 (247.8)	50.9	Pass
Recovery Performance Stop #2	GVWR	100	65	366.7 avg.		6	343.2 (250.0)	49.8	
Final Inspection-Brake Integrity	Check components for detachment, fracture or lubricants.					No detachments or fractures-normal appear. & colr.			Pass
Final Inspection-Reservoirs/Warning Indicators	Master cylinder or brake power reservoir shall meet the volume and label requirements of S5.4.2 and S5.4.3.					Brake system has sufficient capacity and indicators are in compliance.			Pass

*** Note: The Shortest Stop Minimum Pedal Force represents the minimum force value required to engage the data acquisition's recording mode. *See Appendix C.

DATA SHEET 3 - VEHICLE WEIGHT

VEHICLE: 2004 CHEVROLET EXPRESS PAS.VAN NHTSA No. C40111 Date: 04/22/04

Tire Pressure(cold): Front (kpa) 241 Rear (kpa) 262
Odometer: Start 81 MI. End 567 MI.
Scale(s) Used: TRC Scales

NOTE: GVWR, LLVW and axle weights to be measured within +0% and -1%.

GVWR/GAWR INFORMATION
(From Veh. Certification Label)

GVWR(Kg): 3266
GAWR Front(Kg): 1633
GAWR Rear(Kg): 1814

UNLOADED VEHICLE WEIGHT(UVW)

L Front(Kg):	634	L Rear(Kg):	569
R Front(Kg):	646	R Rear(Kg):	546
T Front(Kg):	1280	T Rear(Kg):	1115
Total UVW(Kg):	2395		

TARGET LIGHT LOADED WEIGHT(LLVW):

NOTE 1: LLVW = UVW+181.4Kg
NOTE 2: Weight distributed in front passenger seat area.
NOTE 3: Neither axle load at LLVW less than at UVW; ballast as required.

L Front(Kg):	694	L Rear(Kg):	597
R Front(Kg):	711	R Rear(Kg):	573
T Front(Kg):	1405	T Rear(Kg):	1171
Total LLVW(Kg):	2576		

ACTUAL LIGHT LOADED WEIGHT(LLVW):

L Front(Kg):	706	L Rear(Kg):	601
R Front(Kg):	698	R Rear(Kg):	571
T Front(Kg):	1404	T Rear(Kg):	1172
Total Actual Test LLVW(Kg):	2576		

Load: Driver/Observer 73(Kg) + Instru.41(Kg) + Ballast 68(Kg) = 181(Kg)

FULLY LOADED TEST WEIGHT (ACTUAL GVWR)

NOTE 1: Vehicle loaded so axle loads proportional to GAWR shown previously.
NOTE 2: But no axle weight to be less than at LLVW.
NOTE 3: If weight on any axle at LLVW exceeds the axle's proportional share of the GVWR, the load required to reach GVWR is placed so that the weight on that axle remains the same as at LLVW.

L Front(Kg):	787	L Rear(Kg):	878
R Front(Kg):	760	R Rear(Kg):	841
T Front(Kg):	1546	T Rear(Kg):	1719
Total Fully Loaded GVWR(Kg):	3265		

Load: Driver/Observer 73(Kg) + Instru. 41(Kg) + Ballast 757(Kg)= 870(kg)

Technician: Karen Easterday KAREN EASTERDAY Date: 05-26-04

Quality Assurance: KEN WEBSTER

DATA SHEET 4 - EQUIPMENT REQUIREMENTS (S5)

SERVICE BRAKE SYSTEM (S5.1)

Vehicle equipped with a service brake system acting on all wheels? YES

Wear Adjustment (S5.1.1):
Service Brakes are compensated for wear by means of a system of automatic adjustment? YES
Describe: DISC-AUTOMATIC CLEARANCE TAKE-UP.

Wear Status (S5.1.2):
Wear status of service brakes is indicated by:
(A) Acoustic or optical device? YES
Describe: METAL TAB EMITS HIGH FREQUENCY SQUEAL WHEN WORN.
(B) Visual check outside or under vehicle? YES
Describe: FRONT&REAR:LOOK THROUGH CALIPER.

PARKING BRAKE SYSTEM (S5.2)

Vehicle equipped with a parking brake system of a friction type with solely mechanical means to retain engagement: YES

CONTROLS (S5.3)

(A) Service brakes activated by means of a foot control? YES
(B) Parking brake control is independent of the service brake control? YES
(C) Parking brake control is hand or foot operated? YES
(D) ABS, if equipped, cannot be manually disabled? YES

DATA INDICATES COMPLIANCE: YES

COMMENTS: NONE.

Tester/Technician:  KAREN EASTERDAY Date: 05-26-04

Quality Assurance:  KEN WEBSTER

DATA SHEET 5 - VEHICLE MAX SPEED

VEHICLE: 2004 CHEVROLET EXPRESS PAS.VAN NHTSA No. C40111 Date: 04/22/04

Ambient Temperature: 47°F Wind Velocity: 3(MPH)
Road PFC: .94 Wind Direction: 51°
Odometer: Start 102(mi) End 118(mi)

TEST WEIGHT: Total (Kg): 2576 Front (Kg): 1404 Rear (Kg): 1172

ESTABLISH VEHICLE MAXIMUM SPEED

VEHICLE LOAD: LLVW IBT: N/A
GEAR: Drive DECEL RATE: N/A
PEDAL FORCE: N/A WHEEL LOCKUP: N/A
TEST SPEED: Maximum attainable from a standing start in 3.2 km. INTERVAL: N/A

1. Ballast Vehicle to LLVW
2. Accelerate at a maximum rate from a standing start for a distance of 3.2 km on a level surface.
3. Repeat in opposite direction.
4. Record speed attained in each direction and use the average of the two runs.

	DIRECTION	MAX SPEED (km/h)		Time 0 - 100 KPH (seconds)
		Visual	Recorded	
Run No. 1	South	161.2 kph	161.2	14.07
Run No. 2	North	160.4 kph	160.1	14.49

AVERAGE = 160.7 km/h

COMMENTS: INV DATA, Section 0001, 04/23/04, 09:30:51

Tester/Technician: Karen Easterday Date: 05-26-04
KAREN EASTERDAY

Quality Assurance: Ken Webster
KEN WEBSTER

Vehicle: 2004 GENERAL MOTORS ENTRA NUMBER: C40111
Make: CHEVROLET
Model: EXPRESS PAS.VAN
Body Style: MPV 5-DOOR
Front Cold Tire Pressure: 241 (Kpa)
Rear Cold Tire Pressure: 362 (Kpa)

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 04/23/04

DATA SHEET 6 - BURNISH AT GVWR

Testing Conditions: INV DATA, Section 0002, 04/22/04, 11:56:03

Weather Conditions: 59°F Wind: 0 mph 347° Start Odo.: 120 End Odo.: 168

Schedule:
Initial Brake Temperature Less Than 100°C
Initial Speed 80 km/h to zero
200 stops with transmission in gear

Performance Requirements:
Interval between runs: Time necessary to reduce IBT to 100 C° or 2 km distance, whichever occurs first.
Constant decel rate: 3.0 m/s²
Pedal force adjusted to maintain constant decel.
No Lock-Up allowed longer than 0.1 sec above 15 km/h
Vehicle must stay in lane of 3.5m

STOP #	INIT SPD (kph)	LEFT FRONT IBT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	AVG. DECEL (m/sec²)
1	79.91	64	49	40	37	79.48	57.89	2.60
10	79.62	118	139	130	109	62.15	54.21	2.70
20	80.31	108	133	129	108	64.28	48.68	2.72
30	79.86	112	123	119	114	62.51	48.98	2.82
40	80.26	115	129	129	121	57.98	47.16	2.78
50	80.68	113	127	129	122	66.37	46.70	2.84
60	80.03	99	108	114	109	67.89	46.68	2.90
70	79.59	103	111	117	111	62.62	52.57	2.78
80	79.84	112	120	124	121	67.41	52.54	2.77
90	80.27	109	118	125	124	66.31	51.05	2.87
100	80.53	107	114	121	122	59.26	51.20	2.65
110	80.81	99	111	108	114	67.58	54.46	2.87
120	79.77	105	119	116	125	67.13	48.37	2.63
130	80.18	102	117	118	127	62.79	49.47	2.83
140	79.90	99	113	117	127	59.90	48.92	2.78
150	80.42	98	113	113	124	62.66	47.22	2.77
160	80.95	98	109	116	124	58.77	47.67	2.58
170	79.62	99	108	115	124	60.87	49.23	2.80
180	79.52	96	113	112	121	60.41	48.28	2.73
190	80.45	96	105	112	119	60.93	49.86	2.67
200	79.26	96	105	112	121	60.48	48.34	2.83

COMMENTS: THIS VEHICLE ABS EQUIPPED. DATA SHEETS 7-10 NOT INCLUDED.

BRAKE ADJUSTMENT

Schedule:
Adjust service brakes; record procedure and amount adjusted.

Left Front: DISC DISC BRAKE NO ADJUSTMENT REQUIRED
Right Front: DISC DISC BRAKE NO ADJUSTMENT REQUIRED
Left Rear: DISC DISC BRAKE NO ADJUSTMENT REQUIRED.
Right Rear: DISC DISC BRAKE NO ADJUSTMENT REQUIRED.
DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CRUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/15/04

Vehicle: 2004 GENERAL MOTORS ENTRA NUMBER: C49111
Make: CHEVROLET
Model: EXPRESS PAS.VAN
Body Style: MPV 5-DOOR
Front Cold Tire Pressure: 241 (Kpa)
Rear Cold Tire Pressure: 262 (Kpa)

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 04/27/04

DATA SHEET 11 - COLD EFFECTIVENESS AT GVWR

Testing Conditions: INV DATA, Section 0015, 04/27/04, 09:32:00

Weather Conditions: 42°F Wind: 22 mph 329° Start Odo.: 401 End Odo.: 406

Schedule:
Initial Brake Temperature 65 - 100 C
Initial Speed 100 km/h to zero
6 stops with transmission in neutral

Performance Requirements:
One Stop with:
Stopping Distance less than 70M
Pedal force between 65N and 500N
No Lock-Up allowed longer than 0.1 sec above 15 km/h
Vehicle Must stay in lane of 3.5m

STOP #	INIT SPD (kph)	LEFT FRONT IBT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAE J299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	99.79	72	71	69	71	37.7	37.9	441.80	394.53	9.86	5.69
2	100.20	86	84	59	66	52.1	51.9	424.67	352.48	10.79	6.64
3	100.09	95	87	52	59	51.0	50.9	479.41	366.72	11.51	6.52
4	99.61	80	66	38	43	51.3	51.7	443.37	374.69	10.43	6.73
5	100.75	73	61	31	36	51.1	50.3	481.86	367.85	11.12	6.23
6	100.53	86	73	35	41	51.0	50.6	448.83	367.12	11.01	6.64

STOP #	DRIVER VEHICLE STOP COMMENTS (Wheel Lock up - Direction of Stop - Stay in Lane)		
1	-	NOT	SOUTH	YES
2	-	NOT	SOUTH	YES
3	-	NOT	SOUTH	YES
4	-	NOT	SOUTH	YES
5	-	NOT	SOUTH	YES
6	-	NOT	SOUTH	YES

Corrected Distances are used to determine shortest stopping distance.

DATA INDICATES COMPLIANCE: YES (X) NO [ ]

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/15/04

Vehicle: 2004 GENERAL MOTORS NHTSA NUMBER: C40111
Make: CHEVROLET
Model: EXPRESS PAS.VAN
Body Style: MPV 5-DOOR
Front Cold Tire Pressure: 241 [Kpa]
Rear Cold Tire Pressure: 262 [Kpa]

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 04/27/04

DATA SHEET 12 - HIGH SPEED EFFECTIVENESS AT GVWR

Testing Conditions: INV DATA, Section 0020, 04/27/04, 10:40:09

Weather Conditions: 61°F Wind: 20 mph 309° Start Odo: 407 End Odo: 415

Schedule:
Initial Brake Temperature: 65-100°C
Initial Speed: 80% max km/h, not greater than 160km/h
6 stops with transmission in gear

Performance Requirements:
One Stop with:
Stopping Distance less than: 123.6 meter
Pedal force between 65N and 500N
No Lock-up allowed longer than 0.1 sec above 15 km/h
Vehicle Must stay in lane of 3.5m

STOP #	INIT SPD (kph)	LEFT FRONT INT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAE J299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DNCR% (m/sec²)	AVG. DNCRL (m/sec²)
1	123.67	81	67	31	36	81.6	66.1	442.49	382.84	11.42	6.57
2	126.53	92	79	35	43	84.2	84.2	428.46	359.26	11.32	6.90
3	127.75	93	79	35	42	82.5	83.6	502.81	376.30	10.57	6.95
4	128.06	89	72	31	37	83.2	82.9	470.83	388.64	11.06	7.07
5	129.58	87	71	29	35	82.8	81.8	459.19	374.24	11.37	6.78
6	128.18	94	77	31	37	81.9	82.9	477.71	398.70	11.24	7.18

STOP #	DRIVER VEHICLE STOP COMMENTS (Wheel Lock up - Direction of Stop - Stay in Lane)		
1	-	NOX	SOUTH	YES
2	-	NOX	SOUTH	YES
3	-	NOX	SOUTH	YES
4	-	NOX	SOUTH	YES
5	-	NOX	SOUTH	YES
6	-	NOX	SOUTH	YES

DATA INDICATES COMPLIANCE: YES (X) NO [ ]

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/15/04

Vehicle: 2004 GENERAL MOTORS KEYSA NUMBER: Cadill
Make: CHEVROLET
Model: EXPRESS PAS.VAN
Body Style: MPV 5-DOOR
Front Cold Tire Pressure: 241 (Kpa)
Rear Cold Tire Pressure: 262 (Kpa)

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 04/27/04

DATA SHEET 13 - STOPS WITH ENGINE OFF AT GVWR

Testing Conditions: MFV DATA, Section 0035, 04/27/04, 11:36:38

Weather Conditions: 43°F Wind: 16 mph 323° Start Odo.: 416 End Odo.: 431

Schedule:
Initial Brake Temperature: 65-100°C
Initial Speed 100 km/h to zero
6 stops with transmission in neutral

Performance Requirements:
One Stop with:
Stopping Distance less than 70M
Pedal force between 65N and 500N
No Lock-Up allowed longer than 0.1 sec above 15 km/h
Vehicle Must stay in lane of 3.5m

STOP #	INIT SPD (kph)	LEFT FRONT TMP (°C)	RIGHT FRONT TMP (°C)	LEFT REAR TMP (°C)	RIGHT REAR TMP (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAE J299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	100.12	89	79	34	44	61.7	61.6	455.83	336.26	9.39	5.83
2	99.31	79	74	46	48	63.0	64.0	471.10	378.33	8.67	5.87
3	100.59	84	85	48	56	138.5	135.8	516.11	440.64	4.36	2.79
4	99.77	78	78	72	68	139.4	140.0	497.17	426.83	4.25	2.74
5	99.22	84	89	70	77	87.2	88.1	440.16	342.93	9.07	5.98
6	99.88	93	95	54	63	88.7	88.9	486.95	382.34	9.47	6.20

STOP #	DRIVER VEHICLE STOP COMMENTS (Wheel Lock-Up - Direction of Stop - Stay in Lane)		
1	-	NOX	SOUTH	YES
2	-	NOX	SOUTH	YES
3	-	NOX	SOUTH	YES
4	-	NOX	SOUTH	YES
5	-	NOX	SOUTH	YES
6	-	NOX	SOUTH	YES

Comments: For stops #3 & #4, see Appendix C.

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/15/04

Vehicle: 2004 GENERAL MOTORS NHTSA NUMBER: C40111
Make: CHEVROLET
Model: EXPRESS PAS.VAN
Body Style: MPV 5-DOOR
Front Cold Tire Pressure: 241 (Kpa)
Rear Cold Tire Pressure: 262 (Kpa)

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 04/28/04

DATA SHEET 14 - COLD EFFECTIVENESS AT LLVW

Testing Conditions: INV DATA, Section 0030, 04/26/04, 09:28:20

Weather Conditions: 47°F Wind: 16 mph 171° Start Odo.: 440 End Odo.: 446

Schedule:
Initial Brake Temperature: 65-100°C
Initial Speed 100 km/h to zero
5 stops with transmission in neutral

Performance Requirements:
One Stop with:
Stopping Distance less than 72m
Pedal force between 65N and 500N
No Lock-Up allowed longer than 0.1 sec above 15 km/h
Vehicle Must stay in lane of 3.5m

STOP #	INIT SPD (kph)	LEFT FRONT IBT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAE J299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	99.20	68	97	60	58	46.5	46.2	371.75	278.69	12.30	7.32
2	99.56	89	86	53	51	47.5	46.0	523.27	353.38	13.11	7.22
3	98.59	77	83	43	36	46.4	47.7	479.72	327.22	11.82	7.38
4	99.92	67	72	36	28	46.4	46.5	448.96	355.11	11.99	7.31
5	99.34	71	67	36	28	45.9	44.8	487.48	324.83	12.64	6.89
6	99.39	78	75	40	31	48.0	48.6	497.61	353.47	12.40	7.09

STOP #	DRIVER VEHICLE STOP COMMENTS (Wheel Lock-Up - Direction of Stop - Stay in Lane)			
1	-	NOX	SOUTH	YES
2	-	NOX	SOUTH	YES
3	-	NOX	SOUTH	YES
4	-	NOX	SOUTH	YES
5	-	NOX	SOUTH	YES
6	-	NOX	SOUTH	YES

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/15/04

Vehicle: 2004 GENERAL MOTORS NHTSA NUMBER: C4111
Make: CHEVROLET
Model: EXPRESS PAS.VAN
Body Style: MPV 5-DOOR
Front Cold Tire Pressure: 241 (Kpa)
Rear Cold Tire Pressure: 362 (Kpa)

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 04/28/04

DATA SHEET 15 - HIGH SPEED EFFECTIVENESS AT LLVW

Testing Conditions: INV DATA, Section 0035, 04/28/04, 10:13:11

Weather Conditions: 52°F Wind: 12 mph 166° Start Odo.: 447 End Odo.: 454

Schedule:
Initial Brake Temperature: 65-100°C
Initial Speed: 80% max km/h
6 stops with transmission in gear

Performance Requirements:
One Stop with:
Stopping Distance less than 123.4m
Pedal force between 65N and 500N
No Lock-Up allowed longer than 0.1 sec above 15 km/h
Vehicle Must stay in lane of 3.5m

STOP #	INIT SPD (kph)	LEFT FRONT IBT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAE J299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	127.38	83	88	38	32	75.9	77.3	428.76	337.40	12.21	7.51
2	130.23	81	83	36	29	77.1	75.1	438.69	372.08	12.63	7.89
3	129.34	87	86	38	32	78.8	77.7	485.98	389.77	11.83	7.26
4	128.73	79	79	38	31	76.0	75.8	484.86	383.14	11.82	7.71
5	131.32	79	87	44	34	78.5	80.0	493.42	384.41	11.85	7.28
6	129.03	69	74	38	31	74.9	76.3	467.27	356.08	11.70	6.85

STOP #	DRIVER VEHICLE STOP COMMENTS (Wheel Lock-Up - Direction of Stop - Stay in Lane)		
1	-	NOX	SOUTH	YES
2	-	NOX	SOUTH	YES
3	-	NOX	SOUTH	YES
4	-	NOX	SOUTH	YES
5	-	NOX	SOUTH	YES
6	-	NOX	SOUTH	YES

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN KASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/15/04

Vehicle: 2004 GENERAL MOTORS NHTSA NUMBER: C48111
Make: CHEVROLET
Model: EXPRESS PAS.VAN
Body Style: RPV 5-DOOR
Front Cold Tire Pressure: 241 (Kpa)
Rear Cold Tire Pressure: 262 (Kpa)

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 04/28/04

DATA SHEET 16 - ANTILOCK FUNCTIONAL FAILURE AT LLVW

Testing Conditions: IRV DATA, Section 0040, 04/28/04, 11:25:24

Weather Conditions: 56°F Wind: 19 mph 191° Start Odo.: 457 End Odo.: 462

Schedule:
Initial Brake Temperature: 65-100°C
Initial Speed 100 km/h to zero
6 stops with transmission in neutral

Performance Requirements:
One Stop with:
Stopping Distance less than 85m
Pedal force between 65N and 500N
No Lock-Up allowed longer than 0.1 sec above 15 km/h
Vehicle Must stay in lane of 3.5m

STOP #	INIT SPD (kph)	LEFT FRONT IBT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAE J299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	98.99	70	77	54	46	76.7	76.2	212.65	105.81	7.91	5.02
2	99.75	85	93	64	59	71.4	71.8	141.29	116.05	7.16	5.11
3	99.61	69	78	64	54	73.5	74.1	226.39	101.66	8.27	5.03
4	98.80	78	81	77	67	77.1	78.9	134.24	98.15	7.10	4.77
5	99.41	75	90	68	57	72.6	73.5	208.14	93.21	7.19	5.07
6	98.95	81	87	76	68	75.1	76.6	201.79	90.39	7.55	4.66

STOP #	DRIVER VEHICLE STOP COMMENTS (Wheel Lock-Up - Direction of Stop - Stay in Lane)			
1	-	NOT	SOUTH	YES
2	-	NOT	SOUTH	YES
3	-	NOT	SOUTH	YES
4	-	NOT	SOUTH	YES
5	-	NOT	SOUTH	YES
6	-	NOT	SOUTH	YES

How was the ABS failure induced: REMOVED 60 AMP FUSE FROM BOX IN ENGINE COMPARTMENT.

Is brake system indicator lamp activated: YES (X) NO ( )

Vehicle not equipped with variable proportioning valve, Data Sheet 17 not included.

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/15/04

Vehicle: 2004 GENERAL MOTORS VEHICLE NUMBER: C48111
Make: CHEVROLET
Model: EXPRESS RAB.VAN
Body Style: MPV 5-DOOR
Front Cold Tire Pressure: 241 (Kpa)
Rear Cold Tire Pressure: 262 (Kpa)

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 04/28/04

DATA SHEET 18 - HYDRAULIC CIRCUIT FAILURE #1 AT LLVW

Testing Conditions: IMV DATA, Section 0050, 04/28/04, 13:55:23

Weather Conditions: 62°F Wind: 26 mph 200° Start Odo.: 465 End Odo.: 469

Method of simulating failure: Disconnected Brake Line @ M/C Front Port

System Portion Failed: LR & RR

Schedule:
Initial Brake Temperature: 65-150°C
Initial Speed 100 km/h to zero
4 stops with transmission in neutral

Performance Requirements:
One Stop with:
Stopping Distance less than 168m
Pedal force between 65N and 500N
No Lock-Up allowed longer than 0.1 sec above 15 km/h
Vehicle Must stay in lane of 3.5m

STOP #	INIT SPD (kph)	LEFT FRONT IBT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAE J299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	98.48	76	80	27	24	64.9	56.9	434.01	326.31	8.43	5.50
2	99.99	79	83	26	23	64.5	54.5	441.45	346.72	8.28	5.53
3	99.59	69	72	23	21	64.5	55.0	421.44	321.69	8.78	5.48
4	99.71	75	82	23	21	61.8	52.2	477.53	366.59	8.89	5.58

STOP #	DRIVER VEHICLE STOP COMMENTS (Wheel Lock-Up - Direction of Stop - Stay in Lane)		
1	-	NOX	SOUTH	YES
2	-	NOX	SOUTH	YES
3	-	NOX	SOUTH	YES
4	-	NOX	SOUTH	YES

Force Needed to Activate Brake Failure Lamp (N): 44
Fluid Removed (mL) to Activate Brake Failure Lamp:

Is brake system indicator lamp activated: YES (X) NO ( )

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/15/04

Vehicle: 2004 GENERAL MOTORS NHTSA NUMBER: C40111
Make: CHEVROLET
Model: EXPRESS PAS.VAN
Body Style: MPV 8-DOOR
Front Cold Tire Pressure: 241 [Kpa]
Rear Cold Tire Pressure: 262 [Kpa]

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 04/28/04

DATA SHEET 19 - HYDRAULIC CIRCUIT FAILURE #2 AT LLVW

Testing Conditions: IWV DATA, Session 0055, 04/28/04, 15:04:02

Weather Conditions: 65°F Wind: 25 mph 206° Start Odo.: 472 End Odo.: 477

Method of simulating failure: Disconnected Brake Line @ M/C Rear Port

System Portion Failed: LF & RF

Schedule:
Initial Brake Temperature 65-100°C
Initial Speed 100 km/h to zero
4 stops with transmission in neutral

Performance Requirements:
One Stop with:
Stopping Distance less than 168m
Pedal force between 65N and 500N
No Lock-Up allowed longer than 0.1 sec above 15 km/h
Vehicle must stay in lane of 3.7m

STOP #	INIT SPD (kph)	LEFT FRONT IBT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAE J299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	99.72	41	43	78	73	123.7	124.4	501.89	386.23	8.31	3.10
2	99.43	37	38	93	88	125.4	126.9	481.30	352.95	7.78	3.02
3	100.24	31	32	75	64	126.2	128.6	489.45	368.26	9.27	3.94
4	100.40	26	27	88	72	123.4	122.5	501.71	369.44	7.30	2.93

STOP #	DRIVER VEHICLE STOP COMMENTS (Wheel Lock-Up - Direction of Stop - Stay in Lane)		
1	-	NOE	SOUTH	YES
2	-	NOE	SOUTH	YES
3	-	NOE	SOUTH	YES
4	-	NOE	SOUTH	YES

Force Needed to Activate Brake Failure Lamp (N): 44
Fluid Removed (mL) to Activate Brake Failure Lamp:

Is brake system indicator lamp activated: YES (X) NO ( )

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/15/04

Vehicle: 2004 GENERAL MOTORS NHTSA NUMBER: C60111
Make: CHEVROLET
Model: EXPRESS PAS.VAN
Body Style: MPV 5-DOOR
Front Cold Tire Pressure: 241 (Kpa)
Rear Cold Tire Pressure: 262 [Kpa]

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 04/29/04

DATA SHEET 20 - HYDRAULIC CIRCUIT FAILURE #1 AT GVWR

Testing Conditions: INV DATA, Section 3068, 04/29/04, 10:34:50

Weather Conditions: 68°F Wind: 21 mph 229° Start Odo.: 485 End Odo.: 500

Method of simulating Failure: Disconnected Brake Line @ M/C Front Port

System Portion Failed: LR & RR

Schedule:
Initial Brake Temperature 65-100°C
Initial Speed 100 Km/h to zero
6 stops with transmission in neutral

Performance Requirements:
One Stop with:
Stopping Distance less than 168m
Pedal force between 65N and 500N
No Lock-Up allowed longer than 0.1 sec above 15 Km/h
Vehicle Must stay in lane of 3.5m

STOP #	INIT AVG (kph)	LEFT FRONT IBT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAE J299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	Max. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	99.25	87	92	35	33	81.4	82.8	288.43	238.29	7.72	4.33
2	99.73	70	69	31	29	77.2	77.7	285.65	303.65	7.39	4.90
3	99.88	94	89	29	28	78.6	78.8	334.87	300.89	7.43	4.80
4	100.23	94	86	28	27	73.5	73.2	425.82	346.07	7.52	4.78

STOP #	DRIVER VEHICLE STOP COMMENTS [Wheel Lock-Up - Direction of Stop - Stay in Lane]		
1	-	NOX	SOUTH	YES
2	-	NOX	SOUTH	YES
3	-	NOX	SOUTH	YES
4	-	NOX	SOUTH	YES

Is Brake system indicator lamp activated: YES (X) NO ( )

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN MASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/13/04

Vehicle: 2004 GENERAL MOTORS TRTA NUMBER: C46111
Make: CHEVROLET
Model: EXPRESS PAS.VAN
Body Style: REV 5-DOOR
Front Cold Tire Pressure: 241 (Kpa)
Rear Cold Tire Pressure: 262 (Kpa)

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 04/29/04

DATA SHEET 21 - HYDRAULIC CIRCUIT FAILURE #2 AT GVWR

Testing Conditions: IBV DATA, Section 0865, 04/29/04, 09:02:44

Weather Conditions: 64°F Wind: 12 mph 220° Start Odo.: 486 End Odo.: 489

Method of simulating failure: Disconnected Brake Line @ M/C Rear Port

System Portion Failed: LF & RF

Schedule:
Initial Brake Temperature 65-100°C
Initial Speed 100 km/h to zero
4 stops with transmission in neutral

Performance Requirements:
One Stop with:
Stopping Distance less than 168m
Pedal force between 65N and 500N
No Lock-Up allowed longer than 0.1 sec above 15 km/h
Vehicle Must stay in lane of 3.5m

STOP #	INIT SPD (kph)	LEFT FRONT IBT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAE J299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	99.86	26	24	76	74	108.1	108.6	416.07	351.66	8.98	3.56
2	99.95	27	26	83	85	108.8	109.6	462.27	334.65	8.02	3.22
3	100.11	27	27	85	84	106.4	106.2	454.98	334.41	7.95	3.38
4	99.78	27	26	83	81	107.8	108.0	417.01	295.88	7.74	2.96

STOP #	DRIVER VEHICLE STOP COMMENTS (Wheel Lock-Up - Direction of Stop - Stay in Lane)		
1	NOX	SOUTH	YES
2	NOX	SOUTH	YES
3	NOX	SOUTH	YES
4	NOX	SOUTH	YES

Is brake system indicator lamp activated: YES (X) NO ( )

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/15/04

Vehicle: 2004 GENERAL MOTORS NHTSA NUMBER: C40111
Make: CHEVROLET
Model: EXPRESS PAS.VAN
Body Style: MPV 3-DOOR
Front Cold Tire Pressure: 241 [Kpa]
Rear Cold Tire Pressure: 262 [Kpa]

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 04/29/04

DATA SHEET 22 - ANTILOCK FUNCTIONAL FAILURE AT GVWR

Testing Conditions: INV DATA, Section 0070, 04/29/04, 11:37:14

Weather Conditions: 71°F Wind: 22 mph 234° Start Odo.: 583 End Odo.: 589

Schedule:
Initial Brake Temperature 65-100°C
Initial Speed 100 km/h to zero
6 stops with transmission in neutral

Performance Requirements:
One Stop with:
Stopping Distance less than 65m
Pedal force between 68N and 500N
No Lock-Up allowed longer than 0.1 sec above 15 km/h
Vehicle Must stay in lane of 3.5m

STOP #	INIT SPD (kph)	LEFT FRONT IBT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAE J299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	99.65	73	75	54	52	63.1	63.7	220.72	152.36	7.07	4.67
2	100.04	92	94	62	61	68.6	68.8	230.38	172.63	7.82	5.28
3	99.73	89	90	57	55	56.8	57.1	249.43	195.44	9.63	6.09
4	98.82	92	92	58	56	58.8	61.5	243.47	177.91	8.56	5.80
5	99.73	91	89	58	58	60.8	61.1	244.96	186.82	8.83	5.70
6	100.49	88	84	56	52	60.0	59.4	267.93	195.59	8.88	5.74

STOP #	DRIVER VEHICLE STOP COMMENTS (Wheel Lock-Up - Direction of Stop - Stay in Lane)		
1	- NOX	SOUTH	YES
2	- NOX	SOUTH	YES
3	- NOX	SOUTH	YES
4	- NOX	SOUTH	YES
5	- NOX	SOUTH	YES
6	- NOX	SOUTH	YES

How was the ABS failure induced: REMOVED 60 AMP FUSE FROM BOX IN ENGINE COMPARTMENT.

Is brake system indicator lamp activated: YES (X) NO ( )

Vehicle not equipped with variable proportioning valve. Data Sheet 23 not included.

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN KASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/15/04

Vehicle: 2004 GENERAL MOTORS NHTSA NUMBER: C40111
Make: CHEVROLET
Model: EXPRESS PAS.VAN
Body Style: MPV 5-DOOR
Front Cold Tire Pressure: 241 (Kpa)
Rear Cold Tire Pressure: 262 (Kpa)

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 05/03/04

DATA SHEET 24 - BRAKE POWER UNIT OR PWR ASSIST UNIT IN/OP AT GVWR

Testing Conditions: INV DATA, Section 0080, 05/03/04, 11:44:09

Weather Conditions: 44°F Wind: 11 mph 328° Start Odo.: 520 End Odo.: 527

Failure Simulation: Disconnect primary source of power.

Method of rendering inoperative: Removed power steering pump drive belt.

Schedule:
Initial Brake Temperature 65-100°C
Initial Speed 100 km/h to zero
6 stops with transmission in neutral

Performance Requirements:
One Stop with:
Stopping Distance less than 168M
Pedal force between 65N and 500N
No Lock-Up allowed longer than 0.1 sec above 15 km/h
Vehicle Must stay in lane of 3.5m

STOP #	INIT SPD (kph)	LEFT FRONT IBT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAE J299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	99.25	74	83	78	81	134.8	136.4	495.24	458.52	4.89	2.59
2	99.19	78	89	85	86	146.5	150.9	493.39	460.65	4.49	2.66
3	101.02	82	91	88	91	145.4	142.4	491.69	457.25	4.53	2.75
4	99.80	86	96	91	93	141.2	141.6	498.97	462.71	4.45	2.84
5	100.78	82	92	89	91	143.0	141.6	496.89	457.73	4.42	2.82
6	99.58	84	94	88	89	136.2	137.3	503.49	466.38	4.71	2.90

STOP #	DRIVER VEHICLE STOP COMMENTS (Wheel Lock-Up - Direction of Stop - Stay in Lane)		
1	-	NOX SOUTH	YES
2	-	NOX SOUTH	YES
3	-	NOX SOUTH	YES
4	-	NOX SOUTH	YES
5	-	NOX SOUTH	YES
6	-	NOX SOUTH	YES

Is the brake system indicator lamp activated: YES ( ) NO (X)

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/15/04

Vehicle: 2004 GENERAL MOTORS NHTSA NUMBER: C60111
Make: CHEVROLET
Model: EXPRESS PAS.VAN
Body Style: MPV 5-DOOR
Front Cold Tire Pressure: 241 (Kpa)
Rear Cold Tire Pressure: 262 (Kpa)

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 05/03/04

DATA SHEET 25 - PARKING BRAKE AT GVWR

Testing Conditions: IBT DATA, Section 0005, 05/03/04, 14:49:12
Parking brake: AUTOMATIC TR Non-service type: FOOT-OPERATED Service type: N/A

Weather Conditions: 47°F Wind: 20 mph 337° Start Odo.: 530 End Odo.: 539

Test Weight: Total:3265kg Front:1546kg Rear:1719kg

Schedule:
Initial Brake Temperature <100°C or (Ambient temp. if non-service brake type materials)
Loaded to GVWR with transmission in neutral
Drive onto 20% slope in forward and reverse directions.

Performance Requirements:
Up to Three Applies in each direction:
Parking brake must hold the vehicle stationary in both directions for 5 minutes each.
Pedal force: Hand control: <400 N
Foot control: <500 N

NOTE: For vehicles with parking brake systems not utilizing the service brake friction elements, the friction elements of such systems are to be burnished prior to parking brake tests according to the manufacturer's published recommendation as furnished to the purchaser. If no recommendations are furnished, test the system in an unburnished condition. If recommendations are furnished, record method used.

APPLY #	MAX SERVICE FORCE (N)	MAX P-BRAKE FORCE (N)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)	AVG REAR IBT (°C)	DRIVER VEHICLE STOP COMMENTS (Direction of Stop (Up/Down) - Brake Holds/Fails)			
1	145.8	296.1	27	27	26.9	-	ONEAPPLY	UPHILL	HOLDS	20%
2	117.1	287.9	26	25	25.3	-	ONEAPPLY	DOWNHILL	HOLDS	20%

Is brake system indicator lamp activated: YES (X) NO ( )

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/15/04

Vehicle: 2004 GENERAL MOTORS NHTSA NUMBER: C48111
Make: CHEVROLET
Model: EXPRESS PAS.VAN
Body Style: MPV 5-DOOR
Front Cold Tire Pressure: 241 (Kpa)
Rear Cold Tire Pressure: 262 (Kpa)

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 05/04/04

DATA SHEET 26 - HEATING SNUBS AT GVWR

Testing Conditions: INV DATA, Section 0090, 05/04/04, 09:15:26

Schedule:
Conduct 15 snubs from 120 Km/h or 80% Vmax, whichever is slower, to 1/2 of initial speed.
Attain required decel in 1 second and maintain that decel.
Interval between snubs is 45 seconds and NOT to initial speed.

Performance Requirements:
Initial INT for first snub is 55-65°C
Maintain 3.0 m/s/s deceleration
Vehicle Must stay in lane of 3.5m

SNUB #	AVG. DECEL (m/sec²)	Time Between Snubs (second)	AVG. PEDAL FORCE (N)	LEFT FRONT IRT (°C)	RIGHT FRONT IRT (°C)	LEFT REAR IRT (°C)	RIGHT REAR IRT (°C)	LIMIT SPD (kph)
1	2.63	--NA--	51.86	53	58	53	58	119.16
2	2.73	46	48.83	94	106	103	116	119.74
3	2.73	45	49.71	134	151	153	165	120.33
4	2.75	47	56.00	171	191	192	195	119.21
5	2.64	44	55.27	205	227	224	223	119.22
6	2.61	44	57.42	224	257	248	248	121.68
7	2.63	47	56.85	256	276	264	260	120.18
8	2.70	43	58.46	272	293	282	276	120.27
9	2.90	45	66.81	291	309	294	292	119.63
10	2.80	45	58.31	304	315	301	312	119.78
11	2.69	45	58.61	316	326	304	327	120.80
12	2.66	45	56.39	325	336	323	337	122.94
13	2.80	45	63.90	331	344	336	339	119.53
14	2.77	45	62.71	338	351	347	342	119.48
15	2.71	45	58.70	342	358	355	342	119.99

STOP #	DRIVER VEHICLE SNUB COMMENTS (Wheel Lock-Up - Direction of Stop - Stay in Lane)		
1	-	NOX	NORTH	YES
2	-	NOX	EAST	YES
3	-	NOX	SOUTH	YES
4	-	NOX	SOUTH	YES
5	-	NOX	SOUTH	YES
6	-	NOX	WEST	YES
7	-	NOX	WEST	YES
8	-	NOX	NORTH	YES
9	-	NOX	NORTH	YES
10	-	NOX	NORTH	YES
11	-	NOX	EAST	YES
12	-	NOX	EAST	YES
13	-	NOX	SOUTH	YES
14	-	NOX	SOUTH	YES
15	-	NOX	SOUTH	YES

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/15/04

Vehicle: 2004 GENERAL MOTORS NHTSA NUMBER: C&S111
Make: CHEVROLET
Model: EXPRESS PAS.VAN
Body Style: MPV 5-DOOR
Front Cold Tire Pressure: 241 (Kpa)
Rear Cold Tire Pressure: 262 (Kpa)

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 05/04/04

DATA SHEET 27 - HOT PERFORMANCE AT GVWR

Testing Conditions: INV DATA, Section 0095, 05/04/04, 09:26:21

Schedule:

Make 2 stops from 100 kph
Pedal Force: 1st stop is done with an average force less than the average recorded in the shortest GVWR Cold Effectiveness stop.
2nd stop is done with a force less than 500 N.
No Lock-Up allowed longer than 0.1 sec above 15 km/h.

Distance Requirements are based on the following:

shortest stop in Data Sheet 11 is: 3
Initial speed of stop: 100.08 (kph)
Actual distance of stop: 51.0 (meter)
Average pedal force: 366.7 (N)

Performance Requirements:

Stop Number 1 must be less than: 78.3 (meter)
In addition the stopping distance for at least one of the of the two hot stops must be less than: 88 (meter)

STOP #	INIT SPD (kph)	LEFT FRONT IBT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (RAW 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	100.16	361	379	370	359	58.5	58.4	348.50	267.00	9.85	8.79
2	99.10	375	392	369	358	53.6	54.6	370.68	301.83	11.14	8.83

STOP #	DRIVER VEHICLE STOP COMMENTS (Wheel Lock-Up - Direction of Stop - Stay in Lane)		
1	-	NOX	SOUTH	YES
2	-	NOX	WEST	YES

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/15/04

Vehicle: 2004 GENERAL MOTORS METER NUMBER: C40111
Make: CHEVROLET
Model: EXPRESS PAS.VAN
Body Style: MPV 5-DOOR
Front Cold Tire Pressure: 241 (Kpa)
Rear Cold Tire Pressure: 262 (Kpa)

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 05/04/04

DATA SHEET 28 - BRAKE COOLING STOPS AT GVWR

Testing Conditions: INT DATA, Section D100, 05/04/04, 09:28:08

Schedule:
Initial Brake Temperature:
Achieved on completing Hot Performance
Initial Speed 50 km/h to zero
4 stops with transmission in gear

Performance Requirements:
Constant Decel rate: 3.0 m/s/s
Pedal force adjusted as necessary
No Lock-Up allowed longer than 0.1 sec above 15 km/h
Vehicle Must stay in lane of 3.5m

STOP #	INIT SPD (kph)	AVG. DECEL (m/sec²)	AVG. PEDAL FORCE (N)	LEFT FRONT IBT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)
1	51.23	2.76	71.22	335	354	318	303
2	50.48	2.48	58.46	274	287	270	259
3	50.39	2.57	54.48	226	230	220	230
4	49.18	2.54	51.69	190	195	183	206

STOP #	DRIVER VEHICLE STOP COMMENTS (Wheel Lock up -	Direction of Stop -	Stay in Lane)
1	-	NOX	WEST	YES
2	-	NOX	NORTH	YES
3	-	NOX	NORTH	YES
4	-	NOX	NORTH	YES

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/15/04

Vehicle: 2004 GENERAL MOTORS METER NUMBER: C40111
Make: CHEVROLET
Model: EXPRESS PAS.VAN
Body Style: MPV 5-DOOR
Front Cold Tire Pressure: 241 (Kpa)
Rear Cold Tire Pressure: 262 (Kpa)

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319
(937)666-2011 www.trcpg.com

Date Tested: 05/04/04

DATA SHEET 29 - RECOVERY PERFORMANCE AT GVWR

Testing Conditions: IMV DATA, Section 0105, 05/04/04, 08:36:23

Weather Conditions: 45°F Wind: 12 mph 247° Start Odo.: 541 End Odo.: 559

Schedule:
Make 2 stops from 100 kph
Pedal Force: Both stops are performed with an average force less than the average recorded in the shortest GVWR Cold Effectiveness stop.

Performance Requirements:
One of the two stops must be within the following limits:
Upper limit of corrected stopping distance: 58.6 (meter)
Lower limit of corrected stopping distance: 37.3 (meter)

No Look-Up allowed longer than 0.1 sec above 15 km/h.

Distance Requirements are based on the following:
Shortest stop Data Sheet 11 is:Stop 3
Initial speed of stop: 100.08 (kph)
Actual distance of stop: 51.0 (meter)
Average pedal force: 366.7 (N)

STOP #	INIT SPD (kph)	LEFT FRONT TMP (°C)	RIGHT FRONT TMP (°C)	LEFT REAR TMP (°C)	RIGHT REAR TMP (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAE J299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	100.78	170	158	173	192	51.5	50.6	328.23	247.81	10.66	6.80
2	99.55	204	205	183	201	48.4	49.6	341.19	250.00	11.29	6.20

STOP #	DRIVER VEHICLE STOP COMMENTS (Wheel Lock-Up - Direction of Stop - Stay in Lane)		
1	-	WEST	YES
2	-	WEST	SOUTH	YES

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN KASTNERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 5/10/04
Approving Laboratory Official: KEN WEBSTER Date: 5/15/04

DATA SHEET 30 (Part 1 of 5)
6.0 Test Completion Inspection (7.17)

VEHICLE: 2004 Chevrolet Express Passenger Van NHTSA NO.: C40111 DATE: 05/06/04

System Integrity (S5.6)

Each vehicle shall meet the complete performance requirements of this standard without:
(a) Detachment or fracture of any component of the braking system such as brake springs and brake shoes or disc pad facings, other than minor cracks, that do not impair attachment of the friction facings. All mechanical components of the braking system shall be intact and functional. Friction facing tearout (complete detachment of lining) shall not exceed 10 percent of the lining on any single frictional element.
(b) Any visible brake fluid or lubricant on the friction surface of the brake or leakage at the master cylinder or brake power unit reservoir cover, seal, and filler openings.

Friction Material Condition: Primary/Inner		**Friction Material Condition: Secondary/Outer**	
LF	Normal Appearance & Color	LF	Normal Appearance & Color
RF	Normal Appearance & Color	RF	Normal Appearance & Color
LR	Normal Appearance & Color	LF	Normal Appearance & Color
RR	Normal Appearance & Color	RR	Normal Appearance & Color
Drum (or Rotor) Condition:		**Brake Fluid/Lubricant Inside Brakes:**	
LF	Normal Appearance & Color	LF	None
RF	Normal Appearance & Color	RF	None
LR	Normal Appearance & Color	LR	None
RR	Normal Appearance & Color	RR	None
Hydraulic Component Condition:		**Mechanical Component Condition:**	
LF	Good	Brk/Pedal	Good
RF	Good	Power Brk	Good
LR	Good	Stop/Lamp	Good
RR	Good	Linkage	Good
M/Cyl	Good	Other	NA

COMPLIANCE: Yes X No___
Comments: None.

Technician: K. Easterday

DATA SHEET 30 (Part 2 of 5)
TEST COMPLETION INSPECTION (S7.17)

VEHICLE: 2004 Chevrolet Express Pass. Van; NHTSA NO.: C40111; GVWR: 3266 kg

MASTER CYLINDER RESERVOIR:

DATE	05/05/04	Requirements	Pass	Fail
Reservoir Compartments (S6.4.1)				
(1) Does master cylinder have a reservoir compartment for each brake subsystem?	***Yes*** / No	Master cylinder shall have a reservoir compartment for each subsystem.	X	
(2) Does loss of fluid in one compartment result in complete loss from another compartment?	Yes / ***No***	Loss of fluid from one compartment shall not cause complete loss from another compartment.	X	
Reservoir Capacity (S6.4.2)				
Shall conform to requirements (1) or (2), state units:				
(1) For reservoirs having completely separate compartments for each subsystem (two separate, independent reservoirs):				
Subsystem 1 Subsystem reservoir capacity		Each compartment (reservoir) shall have a minimum capacity equivalent to the fluid displacement resulting when all wheel cylinders or caliper pistons serviced by that independent compartment/reservoir moves from a new lining, fully retracted position to a fully worn, properly adjusted, fully applied position. **(Use Data Sheet 31 and Appendix 1A)**	NA	NA
Subsystem 1 Fluid displaced from new to worn lining				
Subsystem 2 Subsystem reservoir capacity			NA	NA
Subsystem 2 Fluid displaced from new to worn lining				
2) For reservoirs utilizing a portion of the reservoir for a common supply to two or more subsystems:				
Total minimum capacity for the entire master cylinder reservoir (includes individual compartment reservoirs)	918 ml	Shall have total minimum capacity for entire reservoir for displacement resulting from all subsystem wheel cylinders or caliper positions moving from new lining to full worn condition as above.	X	
Fluid displaced from new to worn linings (ALL linings) *Value calculated from Data Sheet 31	330.4 ml*			

Comments: None

DATA SHEET 30 (Part 3 of 5)
TEST COMPLETION INSPECTION (S7.18)

VEHICLE: 2004 Chevrolet Express Pass. Van; NHTSA NO.: C40111; GVWR: 3266 kg

MASTER CYLINDER RESERVOIR:

DATE	05/05/04	Requirements	Pass	Fail
Master Cylinder Piston Displacement(S5.4.2) [If Common Reservoir Supply - continued from previous page]				
Fluid displaced by three strokes of master cylinder piston for Primary (Subsystem No. 1)	46 ml	Individual partial compartments of reservoir shall each have a minimum of fluid equal to at least the volume displaced by the master cylinder piston servicing the subsystem during a full stroke of the piston. NOTE: Procedure uses three strokes to ensure an accurate measurement.		
Fluid displaced by three strokes of master cylinder piston for Secondary (Subsystem No. 2)	18 ml			
Fluid displaced per stroke, Primary	15.3 ml			
Fluid displaced per stroke, Secondary	6 ml			
Fluid available in partial compartment Subsystem No. 1	142 ml		X	
Fluid available in partial compartment Subsystem No. 2	108 ml		X	
Brake Power Unit Reservoir (S5.4.2)				
Volume displaced in charging system piston or accumulator to normal operating pressure plus wheel cylinder or caliper piston displacement.		Shall have a capacity at least equal to fluid displacement required to charge the system pistons on accumulators to normal operating pressure plus displacement when wheel cylinders or caliper pistons move from new lining to full worn condition as above.	NA	
Reservoir Labeling (S5.4.3)				
Exact copy of reservoir label: On master cylinder reservoir cap: WARNING. CLEAN FILLER CAP BEFORE REMOVING. USE ONLY DOT 3 BRAKE FLUID FROM A SEALED CONTAINER.		Label shall read: "Warning, clean filler cap before removing; use only * fluid from a sealed container". * Fluid type specified in 49 CFR 571.116	X	
Measure letter height	3.2 mm	Letters shall be at least 3.2 mm/ 0.125" high	X	
Describe label attachment method and location. Embossed on the top of the master cylinder reservoir.		Lettering shall be permanently affixed, engraved or embossed and located so as to be visible by direct view either on or within 100 mm/3.94 inches of the brake fluid reservoir filler plug or cap.	X	
Does the lettering contrast with the background?	Yes No	If label is not engraved or embossed, letters shall be of a color that contrasts with the background	NA	

Comments: None

Technician: K. Easterday

DATA SHEET 30 (Part 4 of 5)
TEST COMPLETION INSPECTION (S7.18)

VEHICLE: 2004 ;Chevrolet Express Pass. Van NHTSA NO.: C40111; DATE: 05/05/04

BRAKE SYSTEM WARNING INDICATOR (S5.5)

CONDITION	ANSWER	REQUIREMENTS	PASS	FAIL
Brake Systems Indicator Lamp Function Check (S5.5.2) (Bulb and systems check)				
Describe location of brake indicator lamp: Left side of the instrument cluster.	NA	Shall be in front, and in clear view, of driver.	X	
Does lamp light with ignition (start) switch at ON/RUN?	Yes	Automatic activation when ignition switch is "on" when engine not running, or ignition between "on" and "start" if is manufacturer check position- OR -single manual action by driver	X	
Does lamp light with ignition between ON and Start?	No			
Brake check description in owner's manual?	Yes	Manufacturer shall explain the brake check function test procedure in the owner's manual.	X	
Brake System Warning Indicator ACTIVATION (S5.5.1) DURATION (S5.5.3) FUNCTION (S5.5.4)				
CONDITION	**Light ON?**	**REQUIREMENT**	**PASS**	**FAIL**
A. In event of hydraulic leak (1) On or before appearance of pressure differential of 218 psi (split system)	NA	When ignition (Start) switch is ON, lamp must light whenever (A), (B), (C), or (D) occure. In addition, if service brake system is not a split system, audible warning must be activated when any condition in (A) exists. Visual warning indicator for non-split systems must be flashing.	X	
(2) If any reservoir falls below either "safe" level or 25% of capacity, whichever is greater.	Yes			
(3) On or before supply pressure to brake power unit falls to 50%	NA			
B. Electrical functional failure in an antilock or variable brake proportioning system.	Yes		X	
C. Application of the parking brake.	Yes			
D. Brake lining wear-out if optical warning	NA			
Must have Audible alarm if not split system and a condition in (a) above exists?	NA			
If condition (A) (2) above does not exist, then fluid reservoir must be transparent for fluid check without the need for reservoir to be opened? (S5.4.4)	NA			
Indicator lamps remain activated as long as condition exists - ignition "on", and engine on or off? _____ (S5.5.3 DURATION))	Yes			
Visual warning – continuous or flashing? Audible warning –continuous or flashing?	Yes-Cont. Yes-Flash.*			

Comments: *Audible chime sounds six times.

Technician: K. Easterday

DATA SHEET 30 (Part 5 of 5)
TEST COMPLETION INSPECTION (S7.18)

VEHICLE: 2004 Chevrolet Express Pass. Van0; NHTSA NO.: C40111; DATE: 05/05/04

BRAKE SYSTEM WARNING INDICATOR LABELING (S5.5.5)

CONDITION AND REQUIREMENT	ANSWER NOTE: Standard requires that the answer to questions be YES	PASS	FAIL
Are visual indicators legible to driver in daylight and nighttime conditions when activated?	Yes	X	
Are visual indicator words 3.2 mm (.125") high minimum? Record Height: "Brake" - 3.2 mm; "ABS" – 3.2 mm.	Yes	X	
Visual indicator words and background contrasting colors, one of which is red. Record colors Letters –red, Lens - Black	Yes	X	
If split system, is there one brake indicator? If yes, does it say the word "Brake"?	Yes	X	
If not split system; is there a separate indicator for loss of fluid or fluid pressure? Does this indicator say "Stop-Brake Failure"? Are the letters block and not less than 6.4 mm (.25") in height? Record letter height	NA		
If separate indicator for:		X	
1. Low brake fluid per S5.5.1(a)(1), does indicator say "Brake Fluid"? NOTE: not required for mineral oil system Record wording	NA		
2. Gross pressure loss per S5.5.1(a)(2), does indicator say "Brake Pressure"? Record wording	NA		
3. Electrical functional failure in antilock or variable proportioning system per S5.5.1(b), letters and background contrasting colors one of which is yellow? Record colors Lens – Black, Letters – Amber or yellow	Yes		
Does indicator say "Antilock" or "ABS" or "Brake Proportioning"? Record wording "ABS" within symbol.	Yes		
4. Parking brake per S5.5.1(c), does indicator say "Park" or "Parking Brake"? Record wording	NA		
5. Brake lining wear-out per S5.5.1(d), does indicator say "Brake Wear"? Record wording	NA		
6. For any other function? If yes, Record	NA		

Comments: None.

Technician: K. Easterday

DATA SHEET 31 (Part 1 of 2)
CALCULATION OF MINIMUM RESERVOIR VOLUME REQUIREMENTS

VEHICLE: 2004 Chevrolet Express Pass Van; NHTSA NO.: C40111; DATE: 05/05/04

BRAKE		LINING		
LOCATION	TYPE	DESCRIPTION	MINIMUM THICKNESS	THICKNESS TO FULLY WORN (1) mm*
Left Front	Drum	Leading	Pre-test 12.60 mm	0
		Primary	Post Test 11.84 mm	
		Inboard X	Δ 0.76 mm	
	Disc X	Trailing	Pre-test 12.49 mm	0
		Secondary	Post Test 11.89 mm	
		Outboard X	Δ 0.68 mm	
LINING CLEARANCE:	Diametrical (2): N/A	Inboard – Approx. 0 mm.	Outboard – Approx. 0 mm.	
WHEEL CYLINDER DIAMETER (3) N/A		CALIPER PISTON DIAMETER (3): 50.96 mm (x2 pistons)		
SHOE CAGE DIAMETER (4) N/A ; CENTER POINT OF BRAKE ASSY TO CENTER POINT OF W.C. N/A				
Right Rear	Drum	Leading	Pre-test 10.77 mm	0
		Primary	Post Test 10.46 mm	
		Inboard X	Δ 0.30 mm	
	Disc X	Trailing	Pre-test 10.87 mm	0
		Secondary	Post Test 10.49 mm	
		Outboard X	Δ 0.38 mm	
LINING CLEARANCE:	Diametrical (2) – N/A	Inboard – Approx. 0 mm	Outboard – Approx. 0 mm.	
WHEEL CYLINDER DIAMETER (3): N/A		CALIPER PISTON DIAMETER (3): 44.30 mm (x2 pistons)		
SHOE CAGE DIAMETER (4): N/A		CENTER POINT OF BRAKE ASSY TO CENTER PT. OF W.C.: N/A		
CIRCUIT #1 CONSISTS OF:	LF	LR - X	RF	RR - X
CIRCUIT #2 CONSISTS OF:	LF - X	LR	RF - X	RR
(1) MFRS. RECOMMENDATIONS – N/A. (2) REAR - TOP OF RIVET HEADS – N/A. FRONT - 1/32 INCH – N/A. MFRS. DATA – N/A.				
(2) DRUM BRAKES, MEASURED AT HORIZONTAL CENTERLINE: N/A				
(3) MFRS. DATA: N/A. (4) RESET POSITION: N/A				

Comments: Manufacturer's provided data with a GVWR greater than the vehicle tested – data provided is, therefore, Not Applicable. For Fully Worn Thickness and Lining Clearances, zero was used as the default.

Technician: K. Easterday

DATA SHEET 31 – SECTION CONTINUED (Part 2 of 2)

Vehicle: 2004 Chevrolet Express Passenger Van; NHTSA No.: C40111; Date: 05/05/04

Procedure and Example for Determining Master Cylinder Volume Requirement

The procedure followed for determining the minimum volume requirements is outlined in the example shown below. The required data is taken from the previous page.

DISC BRAKES

Volume Required, $V_r = (\Delta t_i + t_{ic} + \Delta t_o + t_{oc}) \times [\pi (D^2)]/4$, where –

: V_r = Volume required per wheel
Δt = Change in thickness (average)
i = Inboard
o = Outboard
D = Caliper cylinder diameter
c = Average clearance

Using the above equations, the volume requirements for Subsystem No. 1 (LR, RR) and Subsystem No. 2 (RF, LR) were calculated utilizing measured and manufacturer's provided data to create the greatest displacement, as shown below:

Disc Brake: (Front)

$$V_r = (\Delta t_i + t_{ic} + \Delta t_o + t_{oc}) \times \frac{\pi D^2}{4}$$

Δt_i = 12.60 mm
Δt_o = 11.84 mm
$t_{ic} + t_{oc}$ = 0 mm
D = 50.98 mm

$$V_r = (12.6 + 0 + 11.84 + 0) \frac{\pi (50.98)^2}{4}$$

= 24.44 (2041.2)
= 49887.39 mm^3 (x two pistons) = 99774.8 mm^3 = 99.8 ml

Disc Brake: (Rear)

$$V_r = (\Delta t_i + t_{ic} + \Delta t_o + t_{oc}) \times \frac{\pi D^2}{4}$$

Δt_i = 10.77 mm
Δt_o = 10.48 mm
$t_{ic} + t_{oc}$ = 0 mm
D = 44.3 mm

$$V_r = (10.77 + 0 + 10.46 + 0) \frac{\pi (44.3)^2}{4}$$

= 21.23 (1541.34)
= 32722.56 mm^3 (x two pistons) = 65445.13 mm^3 = 65.4 ml

For System 1 (LR, RR)
V_{r1} = 65445.13 mm^3 + 65445.13 mm^3 = 130890.3 mm^3
V_{r1} = 130890.3 mm^3 = (130.9 ml)
For System 2 (RF, LF)
V_{r2} = 99774.8 mm^3 + 99774.8 mm^3 = 199549.6 mm^3
V_{r2} = 199549.6 mm^3 = (199.5 ml)

TOTAL VOLUME REQUIRED = $V_t = V_{r1} + V_{r2}$ = 330439.9 mm^3 = 330.4 ml*

SECTION 6.0

Photographs

34 3/4 Left Frontal

35 3/4 Right Rear

2004 CHEVROLET EXPRESS 2WD NHTSA NO. C40111 APRIL 2004

GM

MFD BY GENERAL MOTORS CORP 08/03

GVWR 3266KG(7200LB) GAWR FRT 1633KG(3600LB) GAWR RR 1814KG(4000LB)

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

1GNFG15XX4[redacted] TYPE: M.P.V.

MODEL: G13406

GPAN	TIRE SIZE	SPEED RTG	RIM	COLD TIRE PRESSURE
FRT	P235/75R16XL	S	16X6.5J	240KPA(35PSI)
RR	P235/75R16XL	S	16X6.5J	260KPA(38PSI)
SPA	P235/75R16XL	S	16X6.5J	280KPA(41PSI)

SEE OWNER'S MANUAL [II] FOR MORE INFORMATION.

37 Thermocouple Installation
Left Front

38 Thermocouple Installation
Right Rear

39 Instrumentation Installed
In Vehicle

2004 CHEVROLET
EXPRESS 2WD
NHTSA NO. C40111
APRIL 2004

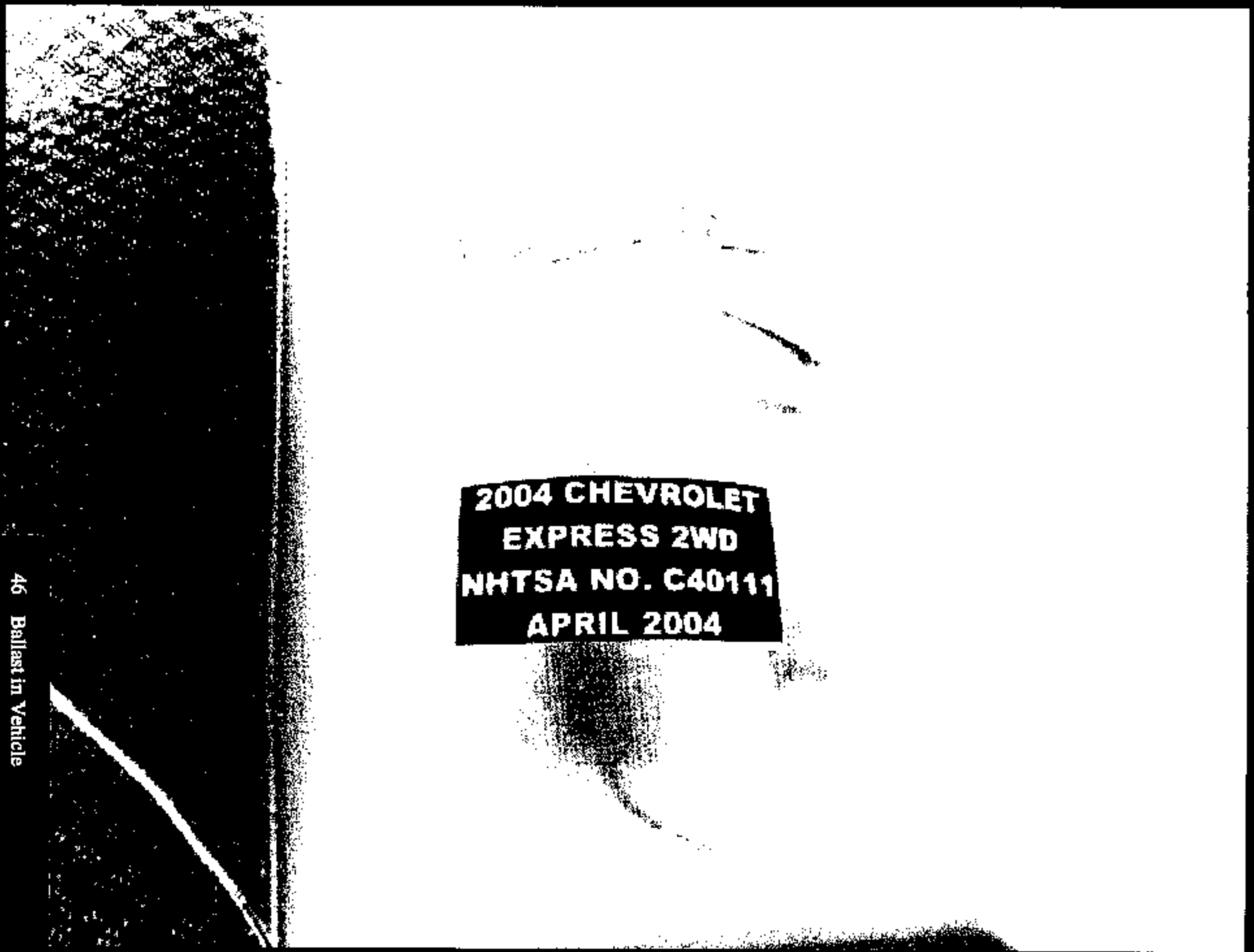
41 Instrumentation Installed in Vehicle

2004 CHEVROLET
EXPRESS 2WD
NHTSA NO. C40111
APRIL 2004

43 Vehicle Being Weighed

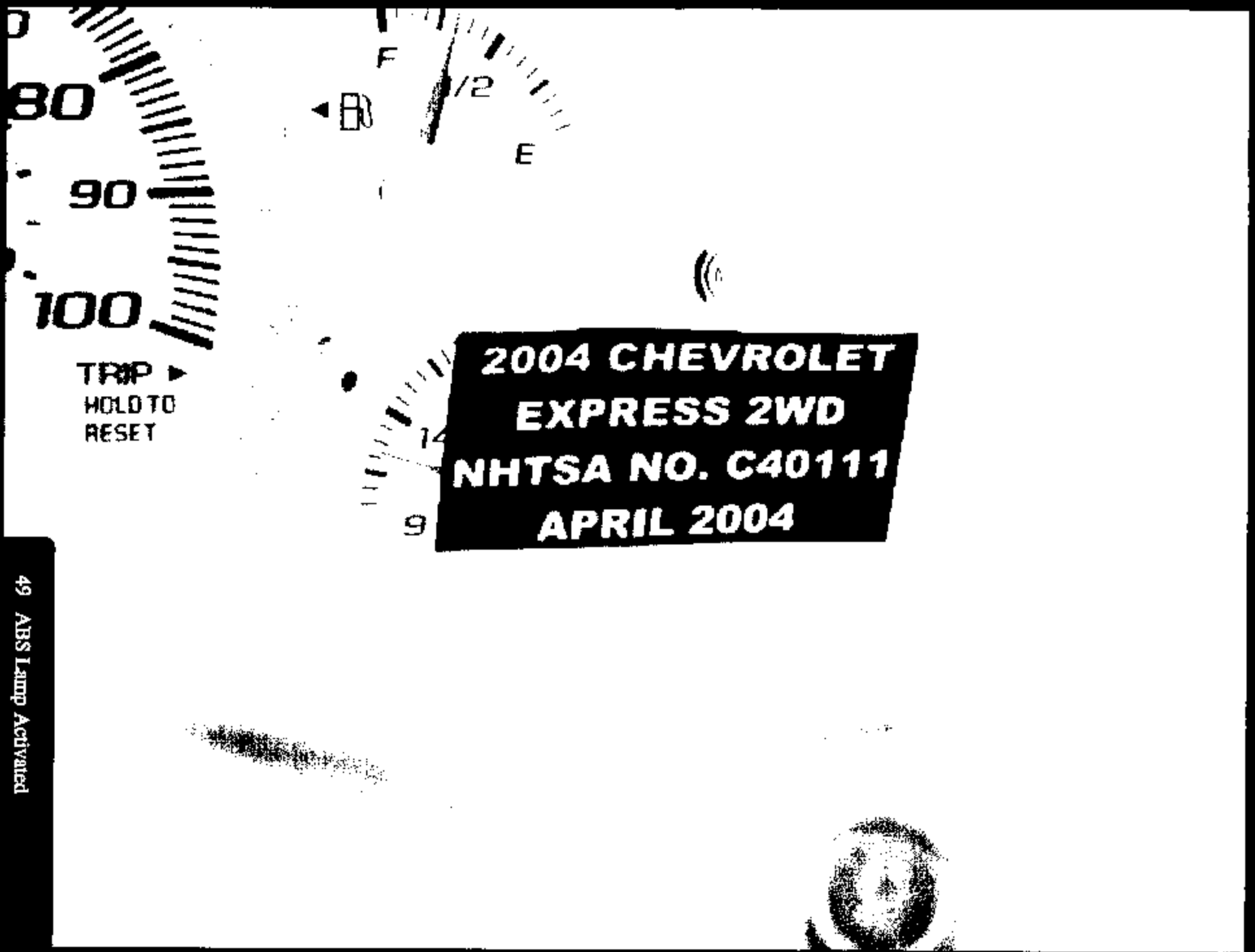
2004 CHEVROLET
EXPRESS 2WD
NHTSA NO. C40111
APRIL 2004

45 Ballast in Vehicle


2004 CHEVROLET
EXPRESS 2WD
NHTSA NO. C40111
APRIL 2004

47 Ballast in Vehicle

48 Brake Lamp Activated


80
90
100
TRIP ▶
HOLD TO
RESET
F
1/2
E
14
9
2004 CHEVROLET
EXPRESS 2WD
NHTSA NO. C40111
APRIL 2004

50 Brake Fluid Reservoir Label

7.0 INSTRUMENT CALIBRATION (12 MONTH MAXIMUM INTERVAL)

VEHICLE: 2004 Chevrolet Express Pass.Van; NHTSA NO.: C40111; DATE: 05/06/04

INSTRUMENT	SERIAL NUMBER	CALIBRATION DATE	NEXT CALIBRATION
Data Acquisition System - Link DAS 2030	975016	10/23/03	10/23/04
Computer – Dell Latitude/Link Engrg.	TRC-43207	Not Applicable	Not Applicable
Software - Link Engrg. Rev Data	TRC Propr.	NA	NA
LF Torque Wheel	Not Utilized		
RF Torque Wheel	Not Utilized		
LR Torque Wheel	Not Utilized		
RR Torque Wheel	Not Utilized		
Stopwatch – Accusplit	SW ST03	04/08/03	04/08/04
Tire Pressure Gauge – Ashcroft	AG-05	11/25/03	11/25/04
Voltage Multimeter – Dana 4300	M-108639	11/25/03	11/25/04
Pedal Force Transducer – Sensor Devel.	LC-169755	Each Test	Each Test
Asst. Pipe-Handle Steel Weights - Ohaus	LB-0002	05/12/03	05/12/04
Park Brake Force Transducer – Interface	41721	Each Test	Each Test
LF Hydraulic Pressure Transducer	Not Utilized		
RF Hydraulic Pressure Transducer	Not Utilized		
LR Hydraulic Pressure Transducer	Not Utilized		
RR Hydraulic Pressure Transducer	Not Utilized		
Accelerometer - Setra (+ or – 15 g) 141A	A-1055763	Each Test	Each Test
Fifth Wheel – ADAT DSR-06 Radar	140.0119	Each Test	Each Test
Wind Velocity/Direct. – Davis Model 6410	WXB308193A	09/15/03	09/15/04
Ambient Temp. Gage – Davis Model 6320	WXB308193A	09/15/03	09/15/04
LF Brake Thermocouple - Temprel/Link	T52-0B-24K	Ea. Test w/Link	Ea. Test w/Link
RF Brake Thermocouple - Temprel/Link	T52-0B-24K	Ea. Test w/Link	Ea. Test w/Link
LR Brake Thermocouple - Temprel/Link	T52-0B-24K	Ea. Test w/Link	Ea. Test w/Link
RR Brake Thermocouple - Temprel/Link	T52-0B-24K	Ea. Test w/Link	Ea. Test w/Link
Lock-up Detection System	TRC Propr.	Each Test	Each Test
Vehicle Weight – Toledo/Mettler Scales JAGXTREME 3000000, (Bldg. 70)	SN 5318823-5KD	02/12/04	05/12/04

QUALITY ASSURANCE_____

DAILY CALIBRATIONS (1 of 3)

Vehicle: 2004 Chevrolet Express Passenger Var NHTSA No.: C40111

Deceleration Calibration Data for Unit 4356
Desired full scale value is: 9.81 m/s/s
Allowed deviation is: + or - 0.15 m/s/s

		"Date"	"Time"	Zero	Cal	
		"stp"	"stp"	"Decel"	"Decel"	
Accelerometer	Level to zero, then tilt to full scale	04/22/2004	11:13:13	0.00	9.82	PRE-TEST CAL.
		04/23/2004	8:37:57	0.01	9.82	
		04/27/2004	9:29:05	0.03	9.80	
		04/27/2004	15:17:48	-0.01	9.88	
		04/28/2004	9:16:04	-0.02	9.84	
		04/28/2004	15:46:17	0.08	9.86	
		04/29/2004	8:47:39	-0.01	9.82	
		04/29/2004	13:56:06	0.00	9.78	
		05/03/2004	11:22:40	0.07	9.73	
		05/03/2004	15:17:51	-0.14	9.88	
		05/04/2004	8:47:08	0.00	9.74	
		05/04/2004	8:47:49	0.02	9.78	
		05/04/2004	10:25:34	0.00	9.76	POST-TEST CAL.

Pre-Test Linearity Check 04/22/04

Actual (m/s/s)	Rec. (m/s/s)
0.0	0.0
3.0	3.0
6.1	6.1
9.8	9.8

Post-Test Linearity Check 05/04/04

Actual (m/s/s)	Rec. (m/s/s)
0.0	0.0
3.0	3.0
6.1	6.1
9.8	9.8

Distance Calibration Data for Unit 4356
Desired full scale value is: 1000 m
Allowed deviation is: 3 m

		"Date"	"Time"	Distance for	
		"stp"	"stp"	1000 meters	
Light beam distance sensor	Drive from 0 to 100 to 0 km/h on a measured kilometer	04/22/2004	14:25:41	1000.0	PRE-TEST CAL.
		04/23/2004	8:43:49	1000.0	
		04/27/2004	9:34:04	1000.0	
		04/27/2004	15:27:02	999.9	
		04/28/2004	9:20:50	999.9	
		04/28/2004	15:52:14	999.5	
		04/29/2004	8:54:08	998.9	
		04/29/2004	14:07:21	998.9	
		05/03/2004	11:30:14	999.7	
		05/03/2004	15:24:55	998.0	
		05/04/2004	8:52:19	999.5	
		05/04/2004	9:53:04	999.6	POST-TEST CAL.

DAILY CALIBRATIONS CONTINUED (2 of 3)

VEHICLE: 2004 Chevrolet Express Passenger Van NHTSA No.: C40111

Wheel Tachometer Calibrations for Unit 4356
Wheel tachometer calibrations: all wheel speeds should be 15 km/h

		"Date"	"Time"	Zero	@15km/h	Zero	@15km/h	Zero	@15km/h	Zero	@15km/h	
		stp	stp	LF	LF	RF	RF	LR	LR	RR	RR	
Wheel lock detector	While at a standstill, check zeros. Drive vehicle at approx. 15 km/h and engage zero speed switch for each wheel	04/27/2004	9:44:42	10.2	22.9	0.0	15.1	0.0	15.6	0.0	16.3	PRE-TEST CAL.
		04/27/2004	15:22:02	0.0	20.0	-0.1	14.9	-0.1	15.3	-0.1	16.2	
		04/28/2004	9:19:43	0.0	17.4	0.0	15.0	0.0	15.6	-2.0	14.1	
		04/28/2004	15:47:26	0.0	16.4	-0.1	14.4	0.0	15.2	0.0	15.8	
		04/29/2004	8:53:06	0.0	17.3	0.0	15.1	0.0	15.9	-1.1	15.3	
		04/29/2004	14:03:20	0.0	17.9	0.0	14.9	0.0	15.1	0.0	16.6	
		05/03/2004	11:24:19	-0.1	18.3	0.0	16.2	-0.1	15.6	0.0	20.4	
		05/03/2004	15:23:15	0.0	16.6	0.0	14.5	0.0	16.8	-0.1	18.6	
		05/04/2004	8:54:20	0.0	16.7	0.0	14.4	-0.1	15.8	0.0	19.0	
		05/04/2004	9:52:04	-0.1	16.1	0.0	14.3	0.0	15.5	0.0	17.9	POST-TEST CAL.

When driven over 15 km/hr and the wheel tach generators are shunted to zero volts, does the graphical screen indicate wheel lock at each wheel position?: __X__ Yes, _____ No.

Pedal Force Meter Calibration for Unit 4356
Target shunt calibration is 390 N

Desired recorded value is: 390 N
Desired recorded calibration value is: 500 N
Allowed deviation is: 6.5 N

		"Date"	"Time"	Zero	Cal Val		
		stp	stp	Force	Force lb		
Service brk. pedal effort	Driver engages a fixed shunt cal switch.	04/22/2004	13:13:34	-994.2	499.5	PRE-TEST CAL.	Equipment Malfunction: Cal. value corrected to 389 N.
		04/23/2004	9:06:30	-0.5	389.9		
		04/27/2004	9:28:10	-0.1	392.0		
		04/27/2004	15:19:07	-0.3	394.0		
		04/28/2004	9:15:42	-0.1	389.4		
		04/28/2004	15:45:48	-0.2	389.7		
		04/29/2004	8:46:16	-0.1	389.5		
		04/29/2004	13:56:29	0.1	389.8		
		05/03/2004	11:22:05	0.0	391.9		
		05/03/2004	15:19:43	-0.1	393.6		
		05/04/2004	8:48:46	-0.3	389.7		
		05/04/2004	9:48:59	-0.2	389.6		
		05/05/2004	9:08:28	-0.3	498.7	POST-TEST CAL.	

Pre-Test Linearity Check - 05/03/04

Actual Force (N)	Recorded Force (N)
0	0
222	223
445	445
498	498

Post-Test Linearity Check - 05/04/04

Actual Force (N)	Recrdd Frc(N)
0	0
222	227
445	450
498	503

DAILY CALIBRATIONS CONTINUED (3 of 3)

VEHICLE: 2004 Chevrolet Express Passenger Van NHTSA No. C40111

Dynamic Speed Calibration for Unit 4356

Desired speed value is: 100 km/h
Allowed deviation is: 1.6 km/h
Desired time value is: 36 seconds
Allowed deviation is: + or - 0.6 seconds

		"Date"	"Time"	"Speed"	Time"	
		stp	stp	km/h	sec	
Light beam speed sensor	Drive vehicle at a steady 100 km/h through a kilometer.	04/22/2004	14:29:11	100.4	36.15	PRE-TEST CAL.
		04/23/2004	8:42:04	100.7	36.12	
		04/27/2004	9:31:46	100.0	36.00	
		04/27/2004	15:25:03	99.8	36.21	
		04/28/2004	9:18:06	100.4	36.12	
		04/28/2004	15:50:12	100.2	36.03	
		04/29/2004	8:51:02	100.6	36.00	
		04/29/2004	14:05:16	100.5	36.00	
		05/03/2004	11:27:33	100.4	36.25	
		05/03/2004	15:22:09	100.0	36.18	
		05/04/2004	8:50:19	100.6	36.2	
		05/04/2004	9:49:57	100.5	35.93	POST-TEST CAL.

APPENDIX A

Copy of Manufacturer's Sticker

2004 EXPRESS PASSENGER VAN

4.3L V8 ENGINE

4 SPEED AUTO TRANSMISSION

EXTERIOR SUMMIT WHITE

INTERIOR MED. DARK PEWTER INTERIOR TRIM

The Most Dependable, Longest Lasting Trucks on the Road

CHEVY TRUCKS

GM

STANDARD EQUIPMENT

Items Featured Below are included at NO EXTRA CHARGE in the Standard Vehicle Price Shown at Right

- *** MECHANICAL ***
- FRONT DISC/REAR DISC BRAKES W/FRNT DISC BRAKE WEAR SENSORS
- INDEPENDENT FRONT SUSPENSION
- 2 STAGE MULTI-LEAF RR SPRING
- FRONT STABILIZER BAR
- APPROX 31 GALLON FUEL TANK
- *** SAFETY & SECURITY ***
- DUAL FRONTAL AIR BAGS
- DAYTIME RUNNING LAMPS
- REAR CHILD SECURITY LOCKS
- FOUR WHEEL ANTI-LOCK BRAKES
- PASSLOCK THEFT DETERRENT
- CHILD SEAT LATCH SYSTEM
- *** EXTERIOR ***
- FOLD AWAY EXTERIOR MIRRORS
- HALOGEN HEADLAMPS
- SIDE DOORS (PASS. SIDE)
- FRONT/REAR PAINTED BUMPERS
- PAINTED STEEL WHEELS W/GREY CENTER CAPS
- STAINLESS STEEL EXHAUST
- TWO-SIDED GALVANIZED BODY PANELS (EXCEPT ROOF)
- *** INTERIOR ***
- FRONT AIR CONDITIONING
- AM/FM STEREO,SK&SC AND CLOCK
- INTERMITTENT WIPER SYSTEM
- INTERIOR DOME LAMPS
- *** OTHER ***
- COURTESY TRANSPORTATION
- 24 HR ROADSIDE ASSISTANCE
- CUSTOMER ASSISTANCE

MANUFACTURER'S SUGGESTED RETAIL PRICE

STANDARD VEHICLE PRICE	$25,045.00
Options Installed by Manufacturer	
TILT WHEEL AND SPEED CONTROL	385.00
HD REAR LOCKING DIFFERENTIAL	255.00
AM/FM STEREO W/CD REPLACES STANDARD/OPTIONAL PACKAGE RADIO	205.00
AUXILIARY LIGHTING	75.00
ILLUMINATED VISOR MIRRORS	75.00
FRONT BUCKET SEAT - CLOTH	25.00
7,200 LB GVW	NO CHARGE
FRONT LICENSE PLATE MOUNT	NO CHARGE
P235/75R-16EL ALS BW	NO CHARGE
DOOR, SLIDING PASSENGER DOOR	NO CHARGE
P235/75R-16EL ALS BW	NO CHARGE
P235/75R16EL ALS BW	NO CHARGE
EIGHT PASSENGER SEATING	NO CHARGE
1SA PACKAGE	NO CHARGE
TOTAL OPTIONS	1,020.00

FREE FUEL ECONOMY GUIDE

CITY MPG

15

HIGHWAY MPG

20

Actual mileage will vary with options, driving conditions, driving habits and vehicle condition. Results reported to EPA indicate that the majority of vehicles with these estimates will achieve between

12 and 16 mpg in the city and between

17 and 23 mpg on the highway.

2004 G15/G25 CHEVY EXPRESS 2WD
4.3 LITER V8 ENGINE
FUEL INJECTION, AUTOMATIC
4 SPD ELECTRONIC TRANS
CATALYST, FEEDBACK FUEL SYSTEM

ESTIMATED ANNUAL FUEL COST: $1238

For comparison shopping, all vehicles classified as VAN have been issued mileage ratings ranging from to mpg city and to mpg highway.

GXB

TOTAL VEHICLE & OPTIONS	$26,065.00
DESTINATION CHARGE	740.00
TOTAL VEHICLE PRICE*	$26,805.00

DEALER TO WHOM DELIVERED HOLIDAY CHEVROLET INC
[illegible] GRAND RIVER
FARMINGTON HILLS MI 48336

FINAL ASSEMBLY WENTZVILLE, MO USA

ORDER NO 0M7170
MODEL NO G01340
SALES CODE R
DEALER NO 44-884

*This label has been applied pursuant to Federal law—Do not remove prior to delivery to the ultimate purchaser. *Excludes Manufacturer's Recommended Pre-Delivery Service. Does not include dealer installed options or accessories not listed above, local taxes or license fees. [illegible] General Motors Corporation.

NZ

VIN 1GNFG15XX41117979

1GA1074666

APPENDIX B

Discussion on Data

DISCUSSION ON DATA

Symbols for Brake Components

4	-	4 Wheel	G	-	Groan	DL	-	Deceleration (State FPSPS)
X	-	Skid	SQ	-	Squeal	PF	-	Pedal on Floor
L	-	Left	SQK	-	Squeak	SCP	-	Shoe Scrape
R	-	Right	PO	-	Pinchout	RB	-	Rubber Banding
R	-	Rear	P	-	Pull	O	-	Odor
F	-	Front	R	-	Shudder	NOX	-	No Skid
B	-	Both	M	-	Momentary			

INT or INIT	-	Initial Part of Stop
MID	-	Middle of Stop
END	-	End of Stop

All stops were made manually.

APPENDIX C

Contractor's Comments
Procedure Modifications
and
Test Facility

Comments for vehicle C40111.

For all recorded decelerations:

The recorded *average* deceleration values for the tests are slightly lower than that which is required or targeted for certain test sections. However, in all cases and in reality, the driver maintained the correct required/target deceleration values for the majority of time for each of those stops. The recorded deceleration is acquired from the moment the service brake pedal is moved until the vehicle reaches zero speed. Therefore, the time needed to achieve the target deceleration (rise time) and the time the vehicle goes from the target deceleration to zero (fall time) is included in the average deceleration calculation. The rise and fall times were added to the entire length of the stops. Hence the recorded average deceleration values were generally and slightly less than the required/target deceleration values.

For Data Sheet 13 – Stops With Engine Off at GVWR

During stops 3 and 4 the Hydro-Boost accumulator had failed to fully recharge resulting in much longer stopping distances than the first two stops. The third stop was not recorded and the next stop was recorded as stop 3 when stop 3 was repeated. Instructions from General Motors Corp., through OVSC's Standards Engineer on how to recharge the accumulator where followed to perform stops 5 and 6. The Hydro-Boost accumulator recharging procedures are not in the Owner's Manual.

For Data Sheet 19 – Hydraulic Circuit Failure #2 At LLVW:

The pedal forces for stops 1 and 4 slightly exceeded 500 N when the ABS was activated during the stops.

For Data Sheets 20 & 21 – Hydraulic Circuit Failure #1 and #2 at GVWR:

Due to the difficult accessibility and resultant complexity of accessing the master cylinder output ports, these two test sequences were performed in reverse order; #21 first, #20 second.

For Data Sheet 25 – Parking Brake at GVWR:

The foot operated parking brake was allowed a maximum application force of 500 N. However, the pedal "bottomed" or ran out of travel at the forces recorded on the data sheet. The forces were well below 500 N.

7.5-MILE TEST TRACK

The 7.5-mile test track encloses a 1,600-acre area, one mile wide and 3.5 miles long.

The track has a downward grade, north to south, of 0.228 percent and a cross slope in the straightaways of 3/16 inch per foot. The 1.88 mile long straightaways flow into transition areas 2,300 feet in length and then into 5,275-foot long curves with a constant radius of 2,400 feet. The 36-foot wide straightaways and the 42-foot wide curves provide three test lanes. Paved berms, 12 feet in width, border the straightaways and the inside of the curves.

As a vehicle moves toward the outside of the track in the curves, it encounters a progressively steeper bank. The inside lane (or "slow" lane) has a bank of 10 degrees allowing a neutral speed of 80 mph with no side forces. In the center lane, the slope increases to 19 degrees resulting in a neutral speed of 110 mph. The outside lane's 28-degree bank allows a 140 mph neutral speed. Rimming the outer lane is a seven-foot safety lane culminating in a 36-degree slope at the guardrail.

The facility is paved with Portland cement concrete. It carries a maximum single axle load of 36,000 pounds and a maximum tandem axle load weight of 48,000 pounds. Special provisions can be made for heavier weight loads.

With 22.5 lane miles, our track will accommodate many vehicles simultaneously. Research which utilizes the track includes component performance and durability studies, brake tests, aerodynamic studies, fuel economy studies, drive line efficiency tests, and the determination of vehicular acceleration and cruise characteristics. In addition, it supports maximum speed determination, road load power, noise and emission measurements and tire durability test programs.

The 7.5-mile test track can be used in conjunction with other facilities at TRC. It provides an excellent area for pre-test conditioning of equipment such as brake burnishing, tire break-in, and vehicle warm-up.

TRC SKID PAD

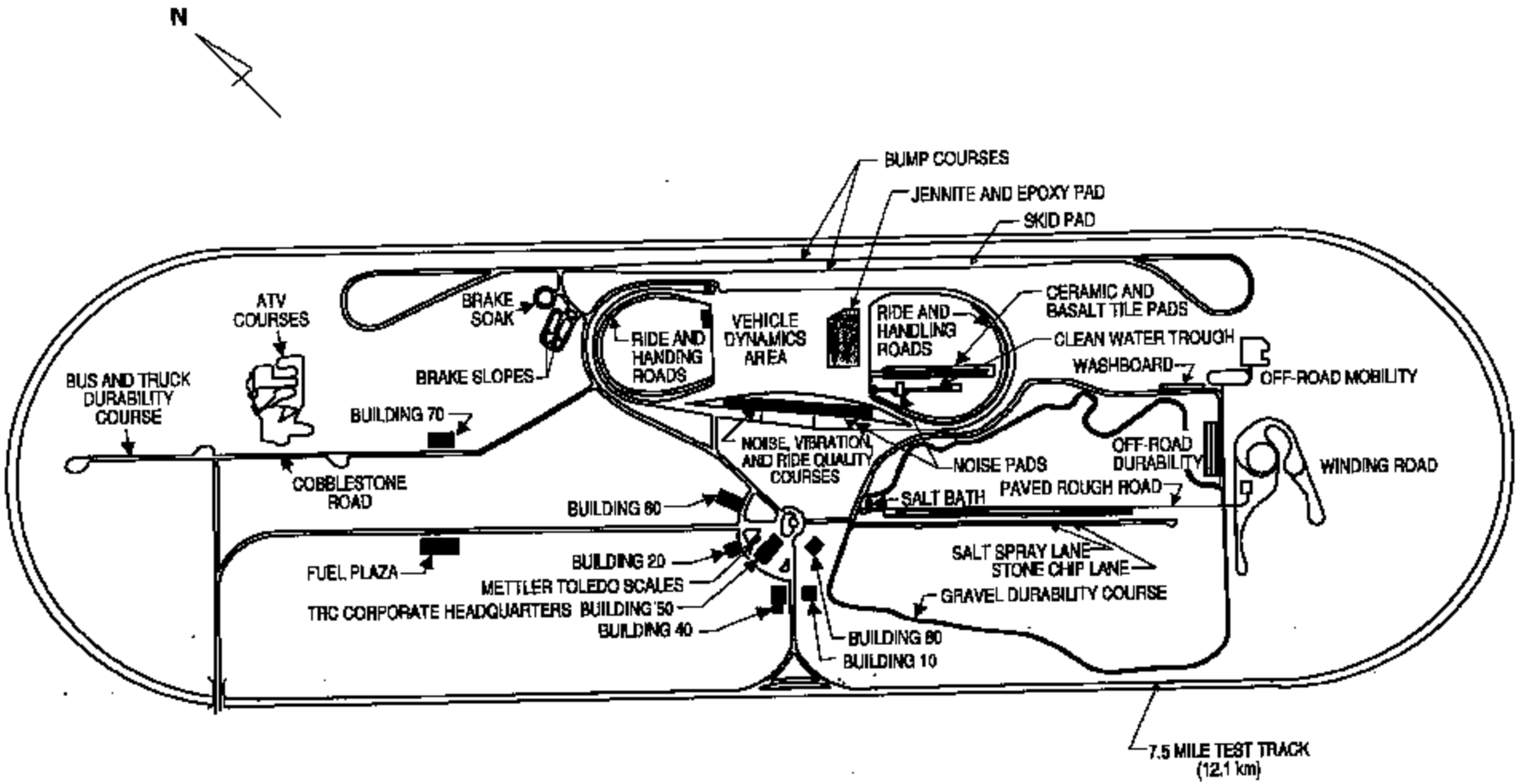
The Skid Pad is a test facility which is utilized primarily for the evaluation of tire and brake systems.

The overall dimensions of the pad are 9,000 feet by 84 feet with loops on the north and south ends. Both turnaround loops have a 309-foot radius and are 16 feet wide with a 25 percent super elevation. They will accommodate speeds of 45 mph with zero side force and 60 mph with .5 g's lateral acceleration. The acceleration/deceleration lanes at each end are 3,280 feet in length.

A test area of 210,000 square feet is situated in the center of the skid pad containing several test pads with varying surface textures. Skid numbers in this area range from 30 (wet) to 80 (dry).

The skid pad is paved with Portland cement. The load capacity of the skid pad is 36,000 pounds maximum single axle weight and 48,000 pounds maximum tandem axle weight.

Varying surface textures in the main test area are ideal for testing tire and/or brake system performance on different surfaces as characterized by "skid numbers." The skid pad is also used for acceleration studies, aerodynamics, rolling resistance, noise testing, and vehicle top speed determination.



NOT TO SCALE

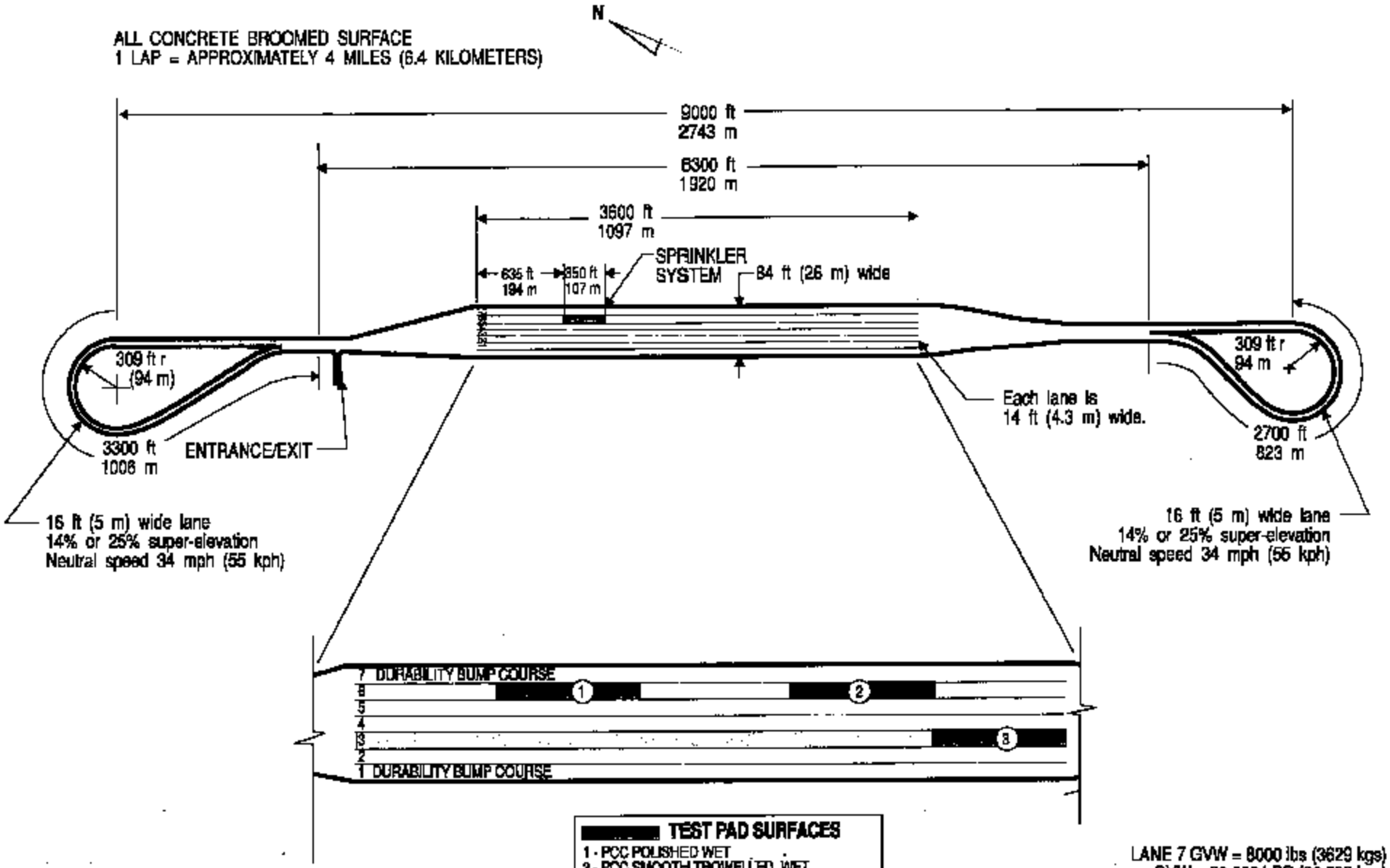
TEST FACILITY DETAIL

TRC®

TRANSPORTATION RESEARCH CENTER INC.
EAST LIBERTY, OHIO 43319-0357

F-15 0501

ALL CONCRETE BROOMED SURFACE
1 LAP = APPROXIMATELY 4 MILES (6.4 KILOMETERS)

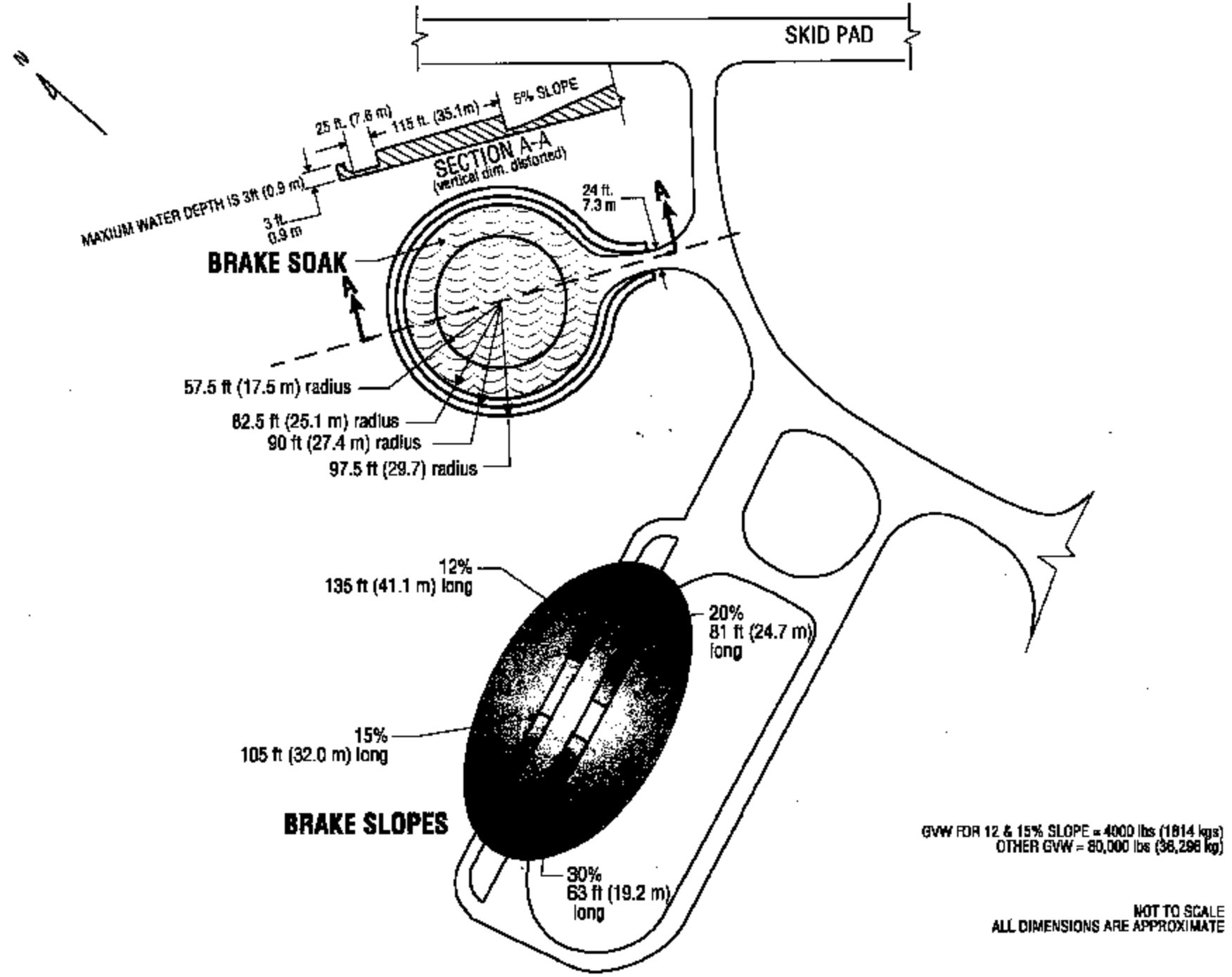


NOTE: BUMP COURSES PARALLEL THE PERIMETERS OF LANES 1 AND 7.

Not to scale
All dimensions are approximate

SKID PAD

TRC®
TRANSPORTATION RESEARCH CENTER INC.
EAST LIBERTY, OHIO 43319-0867

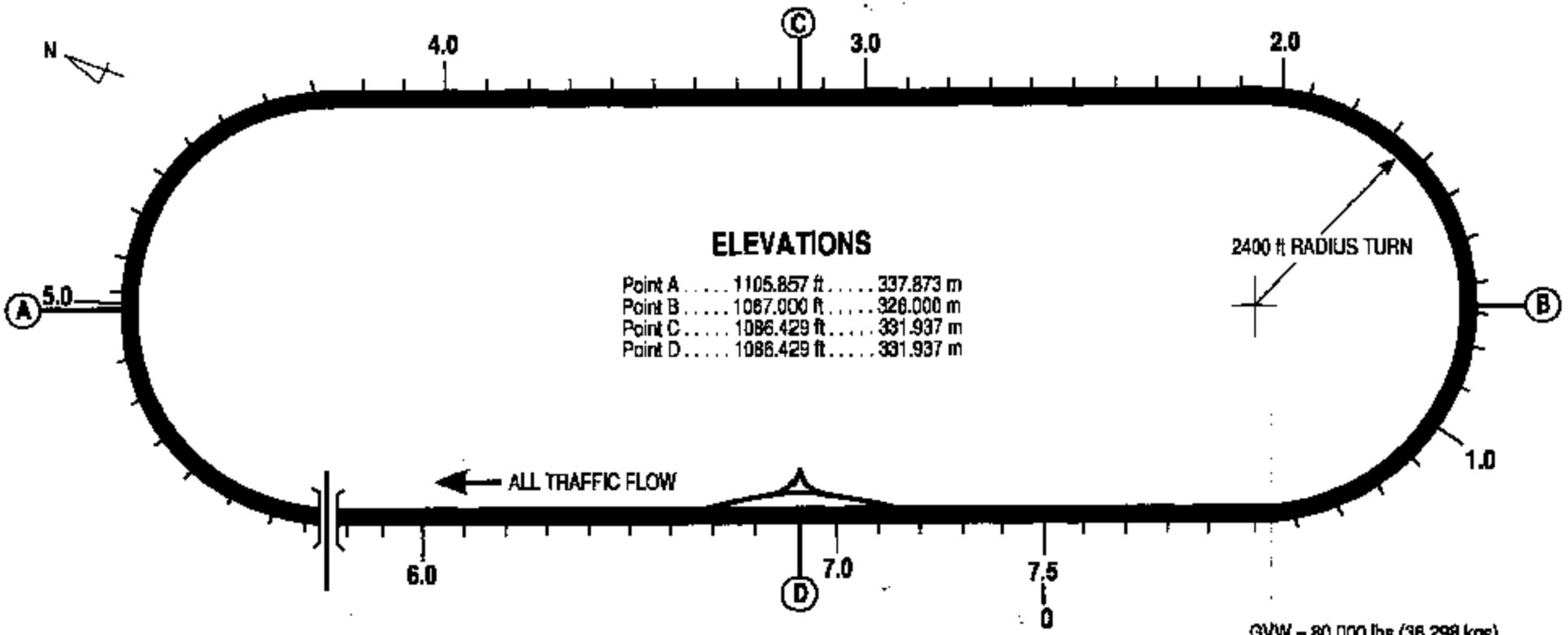


BRAKE SOAK and BRAKE SLOPES

TRC®

TRANSPORTATION RESEARCH CENTER INC.
EAST LIBERTY, OHIO 43319-0357

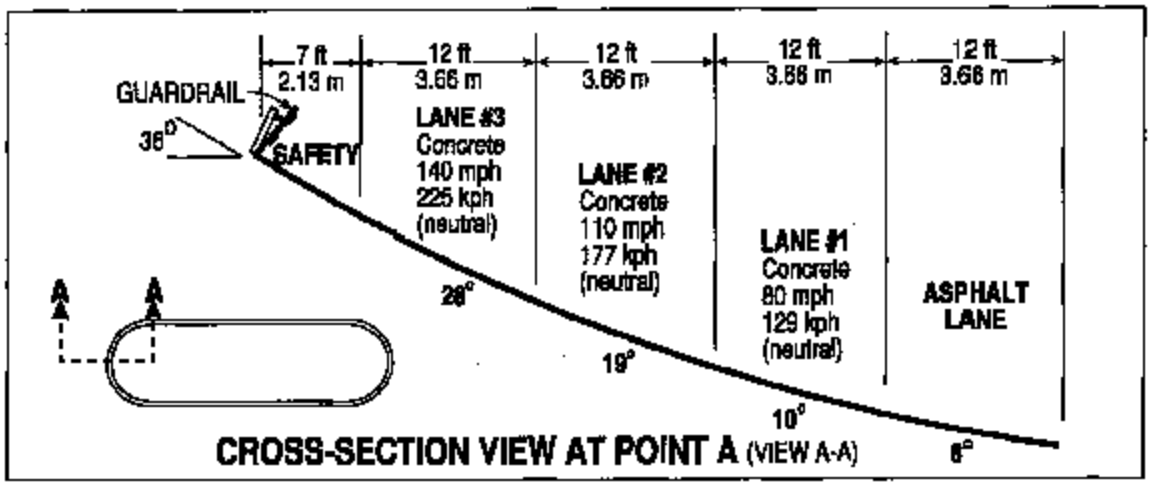
T-3-0500



ELEVATIONS

Point A . . . . . 1105.857 ft . . . . . 337.873 m
Point B . . . . . 1067.000 ft . . . . . 326.000 m
Point C . . . . . 1086.429 ft . . . . . 331.937 m
Point D . . . . . 1086.429 ft . . . . . 331.937 m

GVW = 80,000 lbs (36,298 kgs)



CROSS-SECTION VIEW AT POINT A (VIEW A-A)

DISTANCES

Lane 3 . . . . . 7.539 mi . . . . . 12.133 km
Lane 2 . . . . . 7.521 mi . . . . . 12.104 km
Lane 1 . . . . . 7.507 mi . . . . . 12.081 km

Point A to Point B . . . . . 3.333 mi . . . . . 5.364 km
Point C to Point D . . . . . .947 mi . . . . . 1.524 km

NOT TO SCALE

7.5-MILE TEST TRACK

TRC®
TRANSPORTATION RESEARCH CENTER INC.
EAST LIBERTY, OHIO 43319-0367
F-10 0498

99

APPENDIX D

Notice of Possible Non-Compliance

This vehicle (C40111) met the requirements of the FMVSS 135 standard.