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**135-TRC-04-009**

**SAFETY COMPLIANCE TESTING FOR FMVSS 135  
Passenger Car Brake Systems**

**Nissan Motors Company, LTD.  
2004 Nissan Maxima 3.5 SE, 4-Door Sedan  
NHTSA No. C45207**

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



**Final Report Completed: June 24, 2004**

**FINAL REPORT**

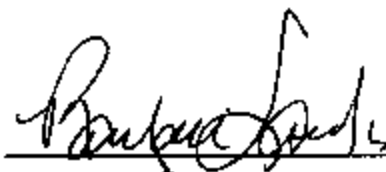
**Prepared Under Contract No.: DTNH22-01-C-21025**

**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**

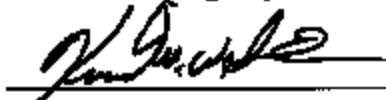
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Prepared By



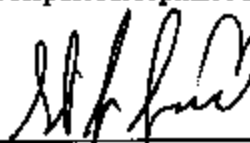
Approved By



Approval Date:

6/25/04

Final Report Acceptance By OVSC:



Contract Technical Manager, Office of  
Vehicle Safety Compliance

7/7/04

Acceptance Date

1. REPORT NUMBER: 135-TRC-04-009		2. GOVERNMENT ACCESSION NO.:		3. RECIPIENT'S CATALOG NO.:	
4. TITLE AND SUBTITLE: Final report of FMVSS 135 Compliance Testing of a 2004 Nissan Maxima 3.5 SE, 4-Door Sedan, NHTSA No. C45207				5. REPORT DATE: June 24, 2004	
7. AUTHOR(S): Project Manager: WALTER DUDEK Project Engineer: RANDALL A. LANDES				6. PERFORMING ORGANIZATION CODE: TRC 20000113/4355	
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Transportation Research Center Inc. 10820 State Route 347 East Liberty, Ohio 43319				8. PERFORMING ORGANIZATION REPORT NO.: TRC-DOT-135-064	
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				10. WORK UNIT NUMBER:	
				11. CONTRACT OR GRANT NO.: DTNH22-01-C-21025	
				13. TYPE OF REPORT AND PERIOD COVERED: Final test report Tested: 05/27/04 to 06/04/04	
15. SUPPLEMENTARY NOTES:				14. SPONSORING AGENCY CODE: NVS-220	
16. ABSTRACT: Compliance tests were conducted on the subject 2004 Nissan Maxima 3.5 SE, 4-Door Sedan, 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	
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## 1.0 INTRODUCTION

Tests were conducted on a 2004 Nissan Maxima 3.5 SE, 4-door sedan, manufactured by Nissan Motor Company, Ltd. 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 0.97 (Skid Pad) and 0.95 (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  
Mfr: NISSAN MOTOR CO. LTD.  
Make: NISSAN  
Model: MAXIMA 3.5 SE  
Body Style: 4-DR. SEDAN  
Mfr. Date: 09/03  
VIN: 1N4BA11E94CB54759

NHTSA No: C45207  
GVWR (Kg): 2062.1  
GAWR Front(Kg): 1119.9  
GAWR Rear(Kg): 951.2  
Wheelbase (mm): 2844.8  
Odometer: Start: 189 MI. End: 641 MI.

## BUSES ONLY

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

Engine Type: GASOLINE, V6, EFI, DOHC, PISTON.  
Displacement: 3.5 LITER  
Engine Hspwr: N/A  
Idle Speed(rpm): 800  
Transmission Type: MANUAL 6-SPD.  
No. of Axles: 2

Tire Size: P245/45R18  
Tire Type: 96V, EAGLE RS-A, M&S, RADIAL, TUBE  
Tire Mfr.: GODDYEAR  
GVWR Front Press. (kpa): 220.63  
GVWR Rear Press. (kpa): 220.63

## BRAKE APPLY SYSTEM

Brake Series: Front: DISC Rear: DISC  
Brake Actuation  
(Hydr. Circuit Split): DIAGONAL  
Power Unit: VACUUM  
Anti-Skid unit Mfr: MAN. RESP. UNISIA JEC5  
Parking Mechanism: NO  
Type of Parking Unit: N/A  
Mstr Cylinder Dia(mm): 23.80

Power Assist Unit: YES  
Pwr Unit w/Accumulator: NO  
Pwr Asst./Pwr Unit w/Backup: NO  
Variable Prop. System: NO  
Anti-Skid Device: YES

Pedal Ratio: 4.3 : 1

## FRONT SYSTEM BRAKE COMPONENT MATERIALS AND CONSTRUCTION:

BRAKE TYPE: DISC  
Material: CAST IRON

Drum Construction: N/A  
Disc Construction: INTEGRAL CAST, VENTED  
Front Brake Dia.(mm): 319.71  
Fr Disc Thickness(mm): 28.09  
Lining Construction: Bonded

LF Drum Shoe Cage Dia.(mm): 0.00  
RF Drum Shoe Cage Dia.(mm): 0.00  
LF Drum Dia. RESET(mm): 0.00  
RF Drum Dia. RESET(mm): 0.00

FRONT BRAKE COMPONENT DIMENSIONS AND CODES:

Inboard (Leading)	Outboard (Trailing)
Width(mm): 58.12	Width(mm): 58.06
Length(mm): 110.49	Length(mm): 110.49
Thickness(mm): 9.07	Thickness(mm): 8.86
Lining Code/Color: HITACHI HP65H FF	Lining Code/Color: HITACHI HP65H FF
Hyd. Piston Dia.(mm): 57.07	

# DATA SHEET 1 - (CONTINUED)

## REAR SYSTEM BRAKE COMPONENT MATERIALS AND CONSTRUCTION:

BRAKE TYPE: DISC	Material: CAST IRON
Drum Construction: N/A	LR Drum Shoe Cage Dia. (mm): 0.00
Disc Construction: INT. CAST, UNVENT	RR Drum Shoe Cage Dia. (mm): 0.00
Lining Construction: BONDED	LR Drum Dia. RESET (mm): 0.00
Rear Brake Dia. (mm): 291.57	RR Drum Dia. RESET (mm): 0.00
Rr Disc Thickness (mm): 8.99	

### REAR BRAKE COMPONENT DIMENSIONS AND CODES:

Inboard (Leading)	Outboard (Trailing)
Width (mm): 31.72	Width (mm): 31.72
Length (mm): 82.91	Length (mm): 82.93
Thickness (mm): 8.18	Thickness (mm): 8.08
Lining Code/Color: AK AP55-PF	Lining Code/Color: AK AP55-PF
Hyd Piston Dia (mm): 34.77	

### OTHER COMPONENT INFORMATION:

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

COMMENT: DRUM IN HAT PARK BRAKE

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*

KAREN EASTERDAY

Date: 06-25-04

Quality Assurance: *Ken Webster*

KEN WEBSTER

3.0 SUMMARY OF TESTING

TEST	Loading Condition	Specification and Limit				TEST RESULTS (In compliance if one stop meets requirement)			
		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				215.7 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	85	500	70	5	493.2	63.5	Pass
High Speed Effectiveness	GVWR	180.0	85	500	spd. depend. - 187.5	5	484.8	122.5	Pass
Stops with Engine Off	GVWR	100	85	500	70	5	499.8	52.5	Pass
Cold Effectiveness	LLVW	100	85	500	70	5	455.7	47.7	Pass
High Speed Effectiveness	LLVW	180.0	85	500	spd. depend. - 187.5	5	464.3	113.2	Pass
Failed Antilock	LLVW	100	85	500	85	5	289.2	51.3	Pass
Failed Proportioning Valve	LLVW	100	85	500	110	5	NA	NA	NA
Failed Hydraulic Circuit #1	LLVW	100	85	500	188	5	471.2	81.4	Pass
Failed Hydraulic Circuit #2	LLVW	100	85	500	188	5	486.8	83.6	Pass
Failed Hydraulic Circuit #1	GVWR	100	85	500	188	5	487.2	89.0	Pass
Failed Hydraulic Circuit #2	GVWR	100	85	500	188	5	485.4	101.8	Pass
Failed Antilock	GVWR	100	85	500	85	5	262.0	82.3	Pass
Failed Proportioning Valve	GVWR	100	85	500	110	5	NA	NA	NA
Power Brake Unit Failure	GVWR	100	85	500	188	5	485.5	154.2	Pass
Parking Brake - Uphill	GVWR	-	-	400	Hold for 5 min.?	NA	354.3	Yes-Holds	Pass
Parking Brake - Downhill	GVWR	-	-	400	Hold for 5 min.?	NA	362.9	Yes-Holds	Pass
Heating Brakes	GVWR	120-60	NA	NA	16 Stops - 3.0 mpsps	5	37 Via. Avg.	NA	NA
Hot Performance Stop #1	GVWR	100	85	381.3 avg.	82.0	5	385.0 (218.0)	47.9	Pass
Hot Performance Stop #2	GVWR	100	85	500	89	5	389.8 (237.5)	47.8	Pass
Brake Cooling	GVWR	80	NA	NA	4 Stops - 3.0 mpsps	5	35 Via. Avg.	NA	NA
Recovery Performance Stop #1	GVWR	100	85	381.3 avg.	One of the two stops between 71.7 and 36.8 meters	5	372.9 (232.5)	49.4	Pass
Recovery Performance Stop #2	GVWR	100	85	381.3 avg.		5	366.6 (287.0)	49.8	Pass
Final Inspection-Brake Integrity	Check components for detachment, fracture or lubricants.					No detachments or fractures-normal appear. & colr.			Pass
Final Inspection-Reservoir/Warning Indicators	Master cylinder or brake power reservoir shall meet the volume and label requirements of 35.4.2 and 35.4.3.					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.



# DATA SHEET 3 - VEHICLE WEIGHT

VEHICLE: 2004 NISSAN MAXIMA 3.5 SE

NHTSA No. C45207 Date: 05/27/04

Tire Pressure(cold): Front (kpa) 221 Rear (kpa) 221  
Odometer: Start 189 MI. End 641 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): 2062  
GAWR Front(Kg): 1120  
GAWR Rear(Kg): 951

UNLOADED VEHICLE WEIGHT(UVW)

L Front(Kg): 476 L Rear(Kg): 308  
R Front(Kg): 477 R Rear(Kg): 308  
T Front(Kg): 953 T Rear(Kg): 616  
Total UVW(Kg): 1569

TARGET LIGHT LOADED WEIGHT(LLVW):

ACTUAL 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): 524 L Rear(Kg): 350  
R Front(Kg): 524 R Rear(Kg): 353  
T Front(Kg): 1048 T Rear(Kg): 703  
Total LLVW(Kg): 1751

L Front(Kg): 527 L Rear(Kg): 349  
R Front(Kg): 521 R Rear(Kg): 352  
T Front(Kg): 1048 T Rear(Kg): 702  
Total Actual Test LLVW(Kg): 1750

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): 556 L Rear(Kg): 465  
R Front(Kg): 560 R Rear(Kg): 482  
T Front(Kg): 1115 T Rear(Kg): 947  
Total Fully Loaded GVWR(Kg): 2062

Load: Driver/Observer 73(Kg) + Instru. 41(Kg) + Ballast 379(Kg) = 493(kg)

Technician: Karen Easterday

KAREN EASTERDAY

Date: 06-25-04

Quality Assurance: Ken Webster

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:

06-25-04

Quality Assurance:

  
KEN WEBSTER

# DATA SHEET 5 - VEHICLE MAX SPEED

VEHICLE: 2004 NISSAN MAXIMA 3.5 SE

NHTSA No. C45207 Date: 05/27/04

Ambient Temperature: 72°F

Wind Velocity: 19(MPH)

Road PFC: 96.25

Wind Direction: 234°

Odometer: Start 205(mi) End 220(mi)

TEST WEIGHT: Total (Kg): 1750

Front (Kg): 1048

Rear (Kg): 702

**ESTABLISH VEHICLE MAXIMUM SPEED**

VEHICLE LOAD: LLWV

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 LLWV
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	216 kph	216.7	10.15
Run No. 2	North	214 kph	214.7	9.85

AVERAGE = 215.7 km/h

COMMENTS: INV DATA, Section 0001, 05/27/04, 13:46:53

Tester/Technician:

*Karen Easterday*  
KAREN EASTERDAY

Date:

*06-25-04*

Quality Assurance:

*Ken Webster*  
KEN WEBSTER

Vehicle: 2004 NISSAN MOTOR CO NHTSA NUMBER: C4E287

Make: NISSAN

Model: MAXIMA 3.5 SE

Body Style: 4-DR. SEDAN

Front Cold Tire Pressure: 330 (kpa)

Rear Cold Tire Pressure: 223 (kpa)

Transportation Research Center, Inc.  
10820 State Route 347  
West Liberty, Ohio 43219  
(614) 686-3013 www.tropg.com

Date Tested: 06/28/04

### DATA SHEET 6 - BURNISH AT GVWR

Testing Conditions: INV DATA, Section 0003, 06/28/04, 10:10:03

Weather Conditions: 82°F Wind: 7 mph 31°

Start Cdb.: 227 End Cdb.: 484

#### Schedule:

Initial Brake Temperature Less Than 100°C  
Initial Speed 90 km/h to zero  
200 stops with transmission in gear

#### Performance Requirements:

Interval between runs: Time necessary to reduce IRT to 100 °C or 2 km distance, whichever occurs first.  
Constant Decel rate: 3.0 m/s<sup>2</sup>  
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 INT (°C)	RIGHT FRONT INT (°C)	LEFT REAR INT (°C)	RIGHT REAR INT (°C)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	AVG. DECEL (m/sec <sup>2</sup> )
1	79.82	88	88	51	49	57.88	42.97	2.73
10	79.28	98	93	83	98	64.54	44.71	2.83
20	79.87	96	98	88	101	62.74	43.49	2.80
30	80.02	101	100	103	108	57.19	40.43	2.98
40	80.83	98	96	102	108	67.22	36.32	2.98
50	79.42	97	87	100	107	62.69	37.92	2.84
60	80.25	99	103	103	111	55.73	38.48	2.78
70	80.95	90	97	94	99	89.65	36.24	2.67
80	81.02	98	103	103	104	81.70	48.44	2.85
90	79.78	100	103	103	106	68.24	38.72	2.89
100	79.91	92	102	101	104	67.32	40.89	2.77
110	79.08	98	103	88	87	65.83	37.88	2.88
120	80.56	101	104	102	104	53.78	49.02	2.88
130	79.60	97	101	92	94	85.06	49.84	2.71
140	80.57	96	104	99	103	62.38	41.85	2.77
150	81.00	104	108	102	107	84.91	48.23	2.95
160	80.27	98	101	98	105	52.47	46.75	2.74
170	81.38	86	102	101	108	49.64	41.84	2.82
180	80.27	87	102	95	99	57.59	39.74	2.90
190	80.32	101	104	98	103	47.81	37.67	2.85
200	80.74	96	101	96	101	52.44	43.64	2.72

COMMENTS: THIS VEHICLE WAS 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 EASTREDAY

Observer: ROWE

Recorded Data Processed by: CHUCK JENKINS

Date: 06/10/04

Approving Laboratory Official: IEN WEBSTER

Date: 06/18/04

Vehicle: 2004 NISSAN ROTOR CO NHTSA NUMBER: C48207

Make: NISSAN

Model: MAXIMA 3.5 SE

Body Style: 4-DR. SEDAN

Front Cold Tire Pressure: 221 (Kpa)

Rear Cold Tire Pressure: 221 (Kpa)

Transportation Research Center, Inc.

10620 State Route 347

East Liberty, Ohio 43318

(937)665-2011 www.trcrg.com

Date Tested: 06/01/04

### DATA SHEET 11 - COLD EFFECTIVENESS AT GVWR

Testing Conditions: INV DATA, Section 0015, 06/01/04, 10:28:46

Weather Conditions: 66°F Wind: 13 mph 237°

Start Od.: 498

End Od.: 502

#### 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 70m

Pedal Force between 80N and 800N

No Lock-Up allowed longer than 0.1 sec above 13 km/h

Vehicle Must stay in lane of 3.5m

STOP #	INIT SPD (mph)	LEFT FRONT Tmp (°C)	RIGHT FRONT Tmp (°C)	LEFT REAR Tmp (°C)	RIGHT REAR Tmp (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAS 255) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec <sup>2</sup> )	AVG. DECEL (m/sec <sup>2</sup> )
1	88.86	85	87	94	83	53.5	54.8	348.88	344.39	19.29	8.76
2	89.91	83	81	64	83	56.0	58.1	468.13	378.98	11.41	7.08
3	89.72	98	81	76	74	53.2	53.5	492.20	381.29	11.08	7.08
4	89.35	87	89	71	71	54.8	54.7	495.85	382.26	10.83	6.87
5	101.81	86	88	71	69	55.7	54.6	459.66	364.80	11.46	6.81
6	89.51	82	85	88	66	53.7	54.3	517.33	283.26	11.14	6.97

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

Corrected Distances are used to determine shortest stopping distance.

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN RASTERDAY

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 06/10/04

Approving Laboratory Official: INV 888888

Date: 06/15/04

Vehicle: 2004 NISSAN MOTOR CO NHTSA NUMBER: 048297

Make: NISSAN

Model: MAXIMA 3.5 SE

Body Style: 4-DR. SEDAN

Front Cold Tire Pressure: 321 (Kpa)

Rear Cold Tire Pressure: 321 (Kpa)

Transportation Research Center, Inc.

10920 State Route 347

East Liberty, Ohio 43129

(614) 666-2811 www.trcrg.com

Date Tested: 06/01/04

**DATA SHEET 12 - HIGH SPEED EFFECTIVENESS AT GVWR**

Testing Conditions: INV DATA, Section 0020, 06/01/04, 11:35:04

Weather Conditions: 70°F Wind: 19 mph 273°

Start Odo: 503

End Odo: 513

**Schedule:**

Initial Brake Temperature: 65-100°C

Initial Speed: 90± max km/h, not greater than 160km/h

6 stops with transmission in gear

**Performance Requirements:**

One Stop with:

Stopping Distance less than: 137.5 METERS

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	RIGHT FRONT	LEFT REAR	RIGHT REAR	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAM 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec <sup>2</sup> )	AVG. DECEL (m/sec <sup>2</sup> )
		INT (°C)	INT (°C)	INT (°C)	INT (°C)						
1	159.28	84	72	56	43	124.8	124.0	489.38	359.69	14.31	7.77
2	159.48	82	84	56	63	121.5	122.3	494.78	377.18	14.85	7.87
3	160.84	81	83	48	54	123.8	123.8	507.88	389.64	14.31	7.80
4	189.03	86	88	62	71	124.2	125.8	501.34	385.89	13.18	7.61
5	188.25	79	87	47	54	128.8	123.1	472.51	398.27	13.68	8.10
6	188.16	91	92	54	73	121.8	124.1	473.85	366.47	13.68	7.76

STOP #	DRIVER VEHICLE STOP COMMENTS (wheel lock up - Direction of Stop - Stay in Lane)		
	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 ( ) NO ( )

Driver: LAREN EASTKEDAY

Observer: NONE

Recorded Data Processed by: CRUCE JENKINS

Date: 06/10/04

Approving Laboratory Official: LEN WEBSTER

Date: 06/18/04

Vehicle: 2004 NISSAN MOTOR CO NHTSA NUMBER: CA8207

Name: NISSAN

Model: MAXIMA 3.5 SE

Body Style: 4-DR. SEDAN

Front Cold Tire Pressure: 221 (Kpa)

Rear Cold Tire Pressure: 221 (Kpa)

Transportation Research Center, Inc.

18828 State Route 147

East Liberty, Ohio 43118

(614) 666-2011 www.trcpgg.com

Date Tested: 06/01/04

DATA SHEET 13 - STOPS WITH ENGINE OFF AT GVWR

Testing Conditions: JTV DATA, Section 0625, 06/01/04, 13:27:42

Weather Conditions: 74°F Wind: 18 mph 260°

Start Odn.: 518

End Odn.: 822

Schedule:

Initial Brake Temperature: 48-100°C

Initial Speed 100 km/h to zero

5 stops with transmission in neutral

Performance Requirements:

One Stop with:

Stopping Distance less than 17m

pedal force between 85N and 200N

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

Vehicle must stay in lane of 3.5m

STOP #	LEFT SPD (Kph)	LEFT FRONT TBT (°C)	RIGHT FRONT TBT (°C)	LEFT REAR TBT (°C)	RIGHT REAR TBT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAN 250) (meter)	MAX.		AVG.	
								PEDAL FORCE (N)	PEDAL FORCE (N)	DECEL (m/sec <sup>2</sup> )	DECEL (m/sec <sup>2</sup> )
1	100.12	99	92	78	71	52.9	52.8	468.84	358.60	11.05	6.79
2	99.89	96	89	88	64	54.3	54.5	469.86	382.75	10.42	6.74
3	100.29	95	87	84	59	53.7	53.4	492.86	394.93	10.01	5.80
4	99.61	87	81	57	53	53.1	53.5	434.48	395.76	12.85	7.17
5	100.24	96	89	84	63	52.8	52.5	489.58	397.68	10.97	6.94
6	99.91	92	88	61	58	52.4	52.5	481.18	383.83	11.73	6.42

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 WASTERDAY

Observer: NCHS

Recorded Data Processed by: CHUCK JENKINS

Date: 06/10/04

Approving Laboratory Official: XNW WEDSTER

Date: 06/18/04

Vehicle: 2004 NISSAN MOTOR CO VEHICLE NUMBER: C65207

Make: NISSAN

Model: MAXIMA 3.5 SE

Body Style: 4-DR. SEDAN

Front Cold Tire Pressure: 221 (Kpa)

Rear Cold Tire Pressure: 221 (Kpa)

Transportation Research Center, Inc.

10620 State Route 147

West Liberty, Ohio 43219

(937)666-2811 www.trcprg.com

Date Tested: 06/01/04

### DATA SHEET 14 - COLD EFFECTIVENESS AT LLVM

Testing Conditions: INV DATA, Section 8838, 06/01/04, 14:38:04

Weather Conditions: 74°F Wind: 18 mph 160°

Start Cdn.: 828

End Cdn.: 822

#### Schedule:

Initial Brake Temperature: 58-100°C

Initial Speed 100 km/h to zero

6 stops with transmission in neutral

#### Performance Requirements:

One Stop with:

Stopping Distance less than 17m

Pedal force between 45N 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 INT (°C)	LEFT REAR INT (°C)	RIGHT REAR INT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SEE 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec <sup>2</sup> )	AVG. DECEL (m/sec <sup>2</sup> )
1	99.66	75	78	57	52	48.8	48.2	452.84	323.01	25.64	7.27
2	88.91	89	84	63	58	48.1	48.2	483.83	387.92	15.23	7.58
3	108.41	98	92	62	63	48.1	47.7	486.65	368.86	15.89	7.82
4	99.02	97	90	59	58	47.8	47.9	472.39	372.46	15.79	7.79
5	98.84	94	89	59	59	47.5	48.9	473.43	382.81	15.68	7.86
6	100.85	98	90	59	56	48.1	48.2	492.96	327.83	15.72	7.34

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: IAN M BASTENAY

Observer: FOWE

Recorded Data Processed by: CHUCK JENKINS

Date: 06/10/04

Approving Laboratory Official: IAN WEBSTER

Date: 06/18/04



Vehicle: 2004 NISSAN MOTOR CO NISSAN NUMBER: C45207

Make: NISSAN

Model: MAXIMA 3.5 SE

Body Style: 4-DR. SEDAN

Front Cold Tire Pressure: 221 (Kpa)

Rear Cold Tire Pressure: 221 (Kpa)

Transportation Research Center, Inc.

10820 State Route 347

East Liberty, Ohio 43319

(937)466-2011 www.trcnp.org

Date Tested: 06/02/04

**DATA SHEET 15 - HIGH SPEED EFFECTIVENESS AT LLVM**

Testing Conditions: INV DATA, Section 0935, 06/02/04, 09:34:09

Weather Conditions: 62°F Wind: 11 mph 238°

Start Odb.: 545

End Odb.: 554

**Schedule:**

Initial Brake Temperature: 65-100°C

Initial Speed: 60% max km/h

6 stops with transmission in gear

**Performance Requirements:**

One Stop with:

Stopping Distance less than 127.5m

Pedal force between 55N and 500N

No Look-Up allowed longer than 0.1 sec above 10 km/h

Vehicle Must stay in lane of 3.5m

STOP #	IBT SPD (kph)	LEFT FRONT IBT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAE 291) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec <sup>2</sup> )	AVG. DECEL (m/sec <sup>2</sup> )
1	189.02	93	92	47	48	113.9	118.3	455.94	348.90	15.73	8.42
2	187.70	93	92	48	42	113.2	118.5	465.36	344.74	15.92	8.34
3	189.34	91	73	43	33	113.7	114.5	527.46	388.06	15.51	8.35
4	189.19	77	84	39	21	114.4	115.5	491.80	355.86	15.18	8.07
5	160.49	93	79	44	38	119.1	118.4	486.80	343.76	15.38	8.08
6	158.92	90	79	47	37	111.7	113.2	494.25	348.21	15.60	8.23

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: JAREN HASTEDAY

Observer: NONE

Recorded Data Processed by: CRUCE JEWELING

Date: 06/16/04

Approving Laboratory Official: RAY WEBSTER

Date: 06/16/04

Vehicle: 2004 NISSAN MOTOR CO NHTSA NUMBER: C45307

Make: NISSAN

Model: MAXIMA 3.5 SE

Body Style: 4-DR. SEDAN

Front Cold Tire Pressure: 221 (Kpa)

Rear Cold Tire Pressure: 221 (Kpa)

Transportation Research Center, Inc.

10930 State Route 347

East Liberty, Ohio 43328

(637)466-2011 www.trcpg.com

Date Tested: 06/02/04

### DATA SHEET 16 - ANTILOCK FUNCTIONAL FAILURE AT LLVN

Testing Conditions: INV DATA, Section 0940, 06/02/04, 11:07:03

Weather Conditions: 66°F Wind: 11 mph SW

Start Odo.: 897

End Odo.: 893

#### Schedule:

Initial Brake Temperature: 53-100°C

Initial Speed 100 km/h to zero

6 stops with transmission in neutral

#### Performance Requirements:

One Stop with:

Stopping Distance less than 23m

Fedal force between 85N and 500N

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

Vehicle must stay in lane of 2.8m

STOP #	INIT SPD (kph)	LEFT		RIGHT		ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (NHTSA 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec <sup>2</sup> )	AVG. DECEL (m/sec <sup>2</sup> )
		FRONT INT (°C)	FRONT EXT (°C)	REAR INT (°C)	REAR EXT (°C)						
1	100.02	72	69	48	42	54.4	54.4	146.60	188.31	9.79	6.18
2	99.86	89	87	59	54	54.0	54.4	341.23	125.70	13.45	6.83
3	99.66	84	91	50	57	58.3	59.3	198.67	109.71	9.85	6.51
4	99.84	89	92	58	59	56.3	56.4	224.97	109.35	9.71	6.67
5	99.89	88	84	51	50	57.3	57.8	233.60	117.60	9.61	6.26
6	99.88	87	92	57	57	50.9	51.3	289.17	117.30	10.55	7.28

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

How was the ABS failure induced: REMOVED IS ANY PEGS FROM BLOCK UNDER HOOD, LEFT SIDE.

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

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

Comments: See Appendix C.

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN BASTREDAY      Observer: BOFF  
 Recorded Data Processed by: CHUCK JENKINS      Date: 06/10/04  
 Approving Laboratory Official: KIM WEBSTER      Date: 06/18/04

Vehicle: 2004 NISSAN ROTOR CO NHTSA NUMBER: C48207

Make: NISSAN

Model: MAXIMA 3.5 SE

Body Style: 4-DR. SEDAN

Front Cold Tire Pressure: 321 (kpa)

Rear Cold Tire Pressure: 321 (kpa)

Transportation Research Center, Inc.

10820 State Route 347

West Liberty, Ohio 43319

(937) 466-2011 www.trc.org.com

Date Tested: 06/02/04

**DATA SHEET 18 - HYDRAULIC CIRCUIT FAILURE #1 AT LLYW**

Testing Conditions: INV DATA, Section 0880, 06/02/04, 13:43:09

Weather Conditions: 71°F Wind: 17 mph 260° Start Odo.: 366 End Odo.: 569

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

System Portion Failed: RF & LR

Procedure:

Initial Brake Temperature: 85-100°C  
Initial Speed 100 km/h to zero  
4 stops with transmission in neutral

Performance Requirements:

One Stop with:  
Stopping Distance less than 1.5M  
Pedal force between 50N and 500N  
No Lock-Up allowed longer than 0.1 sec above 15 km/h  
Vehicle must stay in lane of 1.5M

STOP #	INIT SPD (kph)	LEFT FRONT	RIGHT FRONT	LEFT REAR	RIGHT REAR	ACTUAL DISTANCE (meters)	CORRECTED DISTANCE (SAE 299) (meters)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec <sup>2</sup> )	AVG. DECEL (m/sec <sup>2</sup> )
		INT (°C)	INT (°C)	INT (°C)	INT (°C)						
1	99.46	84	37	29	54	91.7	92.7	438.40	369.78	8.06	4.18
2	100.30	101	34	31	42	90.7	98.4	606.60	406.60	7.67	4.08
3	100.30	83	37	29	49	93.0	91.4	471.23	366.88	7.46	3.85
4	100.10	96	39	31	47	94.1	92.9	485.82	389.84	7.86	3.82

DRIVER VEHICLE STOP COMMENTS  
(Wheel Lock-Up - Direction of Stop - Stay in Lane)

STOP #	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): N/A  
Fluid Removed (mL) to Activate Brake Failure Lamp: 104

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

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: JAMES HASTEDAY Observer: NONE

Recorded Data Processed by: CHUCK JENKINS Date: 06/18/04

Approving Laboratory Official: IAN WEBSTER Date: 06/15/04

Vehicle: 2804 NISSAN MOTOR CO VIN# NUMBER: C63307

Make: NISSAN

Model: MAXIMA 3.0 SE

Body Style: 4-DR. SEDAN

Front Cold Tire Pressure: 221 (Kpa)

Rear Cold Tire Pressure: 221 (Kpa)

Transportation Research Center, Inc.

18028 State Route 147

West Liberty, Ohio 43119

(937) 666-2011 www.trcprb.com

Date Tested: 06/02/04

### DATA SHEET 19 - HYDRAULIC CIRCUIT FAILURE #2 AT LIVE

Testing Conditions: TRV DATA, Section 0056, 06/02/04, 14:33:14

Weather Conditions: 71°F Wind: 13 mph 219°

Start Odo.: 373

End Odo.: 376

Method of simulating failure: Disconnected Brake Line @ W/C rear Port

System Portion Failed: LF & RR

#### 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 16m

Pedal force between 65N and 600N

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

Vehicle must stay in lane of 3.5m

STOP #	SPD (Kph)	LEFT FRONT	RIGHT FRONT	LEFT REAR	RIGHT REAR	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAME 189) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DRCEL (m/sec <sup>2</sup> )	AVG. DRCEL (m/sec <sup>2</sup> )
		TEMP (°C)	TEMP (°C)	TEMP (°C)	TEMP (°C)						
1	100.49	42	74	58	32	95.0	94.1	466.67	392.46	8.20	4.12
2	100.65	40	96	77	31	94.8	93.6	486.56	421.45	7.34	4.19
3	98.48	41	94	68	31	93.9	94.9	492.85	418.78	7.73	3.87
4	98.75	39	96	68	30	93.3	93.8	498.19	417.98	7.89	3.86

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): N/A  
Fluid Removed (mL) to Activate Brake Failure Lamp: 104

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

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN BASTEDAY

Observer: SUNE

Recorded Data Processed by: CRUCE JENKINS

Date: 06/10/04

Approving Laboratory Official: KEN WEBSTER

Date: 06/15/04

Vehicle: 2004 NISSAN MOTOR CO NHTSA NUMBER: C45287

Make: NISSAN

Model: MAXIMA 3.5 SE

Body Style: 4-DR. SEDAN

Front Cold Tire Pressure: 321 (Kpa)

Rear Cold Tire Pressure: 321 (Kpa)

Transportation Research Center, Inc.

10820 State Route 147

East Liberty, Ohio 43319

(614) 666-2011 www.trcopp.com

Date Tested: 06/02/04

### DATA SHEET 20 - HYDRAULIC CIRCUIT FAILURE #1 AT GVWR

Testing Conditions: LNY DATA, Section 0060, 06/02/04, 09:07:38

Weather Conditions: 54°F Wind: 6 mph 350° Start Odo.: 554 End Odo.: 598

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

System Portion Failed: RF & LR

#### Schedule:

Initial Brake Temperature 85-100°C  
Initial Speed 100 km/h to zero  
4 stops with transmission in neutral

#### Performance Requirements:

One Stop with:  
Stopping distance less than 1.6m  
Pedal force between 400N and 500N  
No Lock-Up allowed longer than 0.1 sec above 35 km/h  
Vehicle must stay in lane of 3.5m

STOP #	INIT SPD (kph)	LEFT FRONT TBT (°C)	RIGHT FRONT TBT (°C)	LEFT REAR TBT (°C)	RIGHT REAR TBT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SEE APP)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec <sup>2</sup> )	AVG. DECEL (m/sec <sup>2</sup> )
1	99.83	72	28	26	59	104.2	105.2	455.50	395.85	7.35	3.72
2	100.68	85	28	25	52	104.2	104.8	439.82	409.01	7.82	3.68
3	100.10	89	28	28	75	99.2	99.0	497.37	439.98	5.83	3.75
4	99.68	86	32	24	66	104.4	104.2	490.33	429.64	5.83	3.87

STOP # DRIVER VEHICLE STOP COMMENTS (Wheel Lock-Up - Direction of Stop - Stay in Lane)

STOP #	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 KATHEDAY Observer: NONE

Recorded Data Processed by: CRUCK JEWELINE Date: 06/10/04

Approving Laboratory Official: FYS WENSTEN Date: 06/15/04

Vehicle: 2004 NISSAN MOTOR CO NHTSA NUMBER: C49207

Make: NISSAN

Model: MAXIMA 2.5 SE

Body Style: 4-DR. SEDAN

Front Cold Tire Pressure: 221 (Kpa)

Rear Cold Tire Pressure: 221 (Kpa)

Transportation Research Center, Inc.

10420 State Route 347

East Liberty, Ohio 43319

(937)666-2611 www.trcpsy.com

Date Tested: 06/02/04

### DATA SHEET 21 - HYDRAULIC CIRCUIT FAILURE #2 AT GVWR

Testing Conditions: INV DATA, Section 0065, 06/02/04, 15:14:50

Weather Conditions: 73°F Wind: 17 mph 280° Start Odc.: 579 End Odc.: 584

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

System Portion Failed: LV & RV

#### Schedule:

Initial Brake Temperature 85-100°C

Initial Speed 100 km/h to zero

4 stops with transmission in neutral

#### Performance Requirements:

One Stop with:

Stopping Distance less than 150M

Pedal force between 45N and 509N

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

Vehicle Must stay in lane of 3.5m

STOP #	INIT SPD (km/h)	LEFT FRONT	RIGHT FRONT	LEFT REAR	RIGHT REAR	ACTUAL DISTANCE (meters)	CORRECTED DISTANCE (MAX 399) (meters)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec <sup>2</sup> )	AVG. DECEL (m/sec <sup>2</sup> )
		INT (°C)	INT (°C)	INT (°C)	INT (°C)						
1	98.86	36	74	85	38	103.1	103.1	477.63	421.32	6.16	3.72
2	89.84	39	94	85	32	103.7	104.1	478.21	425.49	6.78	3.76
3	100.19	37	98	77	32	102.3	101.9	486.37	413.97	6.26	3.60
4	89.59	37	94	78	33	101.9	102.8	491.95	416.86	6.96	3.72

#### DRIVER VEHICLE STOP COMMENTS

STOP #	(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 BASTREDAY

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 06/18/04

Approving Laboratory Official: KEV WEBSTER

Date: 06/18/04

Vehicle: 2004 NISSAN MOTOR CO NHTSA NUMBER: C45287

Make: NISSAN

Model: MAXIMA 3.5 SE

Body Style: 4-DR. SEDAN

Front Cold Tire Pressure: 221 (Kpa)

Rear Cold Tire Pressure: 221 (Kpa)

Transportation Research Center, Inc.

10120 State Route 247

East Liberty, Ohio 43329

(937)866-2013 www.trcogg.com

Date Tested: 05/03/04

### DATA SHEET 22 - ANTILOCK FUNCTIONAL FAILURE AT GVWR

Testing Conditions: INV DATA, Section 0070, 06/03/04, 10:23:47

Weather Conditions: 61°F Wind: 4 mph 7° Start Cdb.: 601 End Cdb.: 606

#### 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 18m  
Pedal force between 45N and 800N  
No look-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	RIGHT FRONT	LEFT REAR	RIGHT REAR	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (MAX 295) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec <sup>2</sup> )	AVG. DECEL (m/sec <sup>2</sup> )
		IN7 (°C)	IN7 (°C)	IN7 (°C)	IN7 (°C)						
1	100.16	79	71	63	60	62.7	62.5	284.66	123.91	8.80	6.01
2	100.21	84	80	62	60	64.2	64.0	234.37	106.44	8.48	5.91
3	99.81	83	89	67	60	63.8	63.7	204.74	101.47	8.00	5.82
4	99.24	83	93	67	60	61.6	62.4	148.87	115.52	8.83	6.00
5	86.37	82	94	69	61	62.9	64.1	219.67	109.73	8.34	6.19
6	99.59	89	91	67	62	62.8	62.3	261.98	123.93	8.83	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

How was the ABS failure induced: REMOVED 30 AMP FUSES FROM BLOCK UNDER HOOD, LEFT SIDE.

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

Vehicle was equipped with variable proportioning valve. Data Sheet 22 not included.

Comments: See Appendix C.

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: FAREN KATHADAY

Observer: TONS

Recorded Data Processed by: CHUCK JENKINS

Date: 06/10/04

Approving Laboratory Official: EMM WESSTER

Date: 06/15/04

Vehicle: 2004 NISSAN MURANO CO NISSAN NUMBER: C48207

Make: NISSAN

Model: MAXIMA 3.5 SE

Body Style: 4-DR. SEDAN

Front Cold Tire Pressure: 321 (Kpa)

Rear Cold Tire Pressure: 321 (Kpa)

Transportation Research Center, Inc.

19870 State Route 347

East Liberty, Ohio 43319

(614) 466-2011 www.trcpcg.com

Date Tested: 06/03/04

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

Testing Conditions: LEV DATA, Section 6080, 06/03/04, 11:55:24

Weather Conditions: 64°F Wind: 5 mph 17° Start Odo.: 507 End Odo.: 619

Failure Simulation: Disconnect primary source of power.

Method of rendering inoperative: Removed Engine Vacuum Hose at Hoostax

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 150m  
Pedal force between 40N and 500N  
No lock-up allowed longer than 0.1 sec and above 15 km/h  
Vehicle must stay in lane of 3.5m

STOP	INIT SPD (kph)	LEFT	RIGHT	LEFT	RIGHT	ACTUAL DISTANCE (meter)	CORRECTED	MAX.	AVG.	MAX.	AVG.
		FRONT INT (°C)	FRONT INT (°C)	REAR INT (°C)	REAR INT (°C)		DISTANCE (mm 299)	PEDAL FORCE (N)	PEDAL FORCE (N)	DECEL (m/sec²)	DECEL (m/sec²)
1	99.72	81	81	47	46	163.7	164.4	503.45	474.25	3.36	2.43
2	100.48	85	81	59	55	160.4	159.8	501.62	472.75	3.80	2.47
3	100.44	84	92	56	55	159.6	158.2	486.11	467.33	3.46	2.48
4	99.08	86	92	59	54	156.8	159.8	500.43	467.33	3.59	2.59
5	99.88	87	94	63	57	153.8	154.2	488.51	471.38	3.86	2.68
6	98.63	88	96	67	61	154.8	156.0	481.74	469.21	4.06	2.62

STOP DRIVER VEHICLE STOP COMMENTS  
6 (Wheel Lock-Up - Direction of Stop - Stay in Lane)

1					
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 EASTRDAY

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 06/10/04

Approving Laboratory Official: RAY WEBSTER

Date: 06/15/04



Vehicle: 2004 NISSAN MOTOR CO METRA NUMBER: C65287

Make: NISSAN

Model: MAXIMA 3.5 SE

Body Style: 4-DR. SEDAN

Front Cold Tire Pressure: 221 (Kpa)

Rear Cold Tire Pressure: 221 (Kpa)

Transportation Research Center, Inc.

10820 State Route 347

West Liberty, Ohio 43319

(637)866-2011 www.trcpg.com

Date Tested: 06/03/04

### DATA SHEET 25 - PARKING BRAKE AT GVWR

Testing Conditions: TRV DATA, Section D085, 06/03/04, 13:15:18

Parking brake: N/A

Non-service type: HAND-OPERATED

Service type: N/A

Weather Conditions: 66°F

Wind: 4 mph 31°

Start Odn.: 615

End Odn.: 615

Test Weight: Total:2062kg

Front:1115kg

Rear: 947kg

Schedule:

Initial Brake Temperature <100°C or (Ambient temp. if non-service brake type materials)  
Loaded to GVWR with transmission in neutral  
Drive onto 2% 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 furnished 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 unbraked condition. If recommendations are furnished, record method used.

APPLY	RFR SERVICE FORCE (N)	RLR P-BRAKE FORCE (N)	LEFT REAR TST (°C)	RIGHT REAR TST (°C)	AVG REAR TST (°C)	DRIVER VEHICLE STOP COMMENTS (Direction of Stop (Up/Down) - Brake Holds/Fails)				
						0	1	2	3	
1	101.3	164.3	19	35	16.9	0	REAPPLY	UPHILL	HOLDS	20%
2	74.3	152.3	37	32	34.4	0	REAPPLY	DOWNHILL	HOLDS	20%

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

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN HASTEDAY

Observer: NONE

Recorded Data Processed by: CHUCK JERKINS

Date: 06/10/04

Approving Laboratory Official: KIM WENDTNER

Date: 06/15/04

Vehicle: 2004 NISSAN MOTOR CO NHTSA NUMBER: C42827

Make: NISSAN

Model: MAXIMA 2.5 SE

Body Style: 4-DR. SEDAN

Front Cold Tire Pressure: 221 (Kpa)

Rear Cold Tire Pressure: 221 (Kpa)

Transportation Research Center, Inc.

10620 State Route 347

East Liberty, Ohio 43029

(937)466-2011 www.trcorg.com

Date Tested: 06/03/04

### DATA SHEET 26 - HEATING SNUBS AT GVWR

Testing Conditions: INV DATA, Section 0090, 06/03/04, 13:33:58

#### Schedule:

Conduct 15 snubs from 120 Km/h or 80t Wms, whichever is slower, to 1/3 of initial speed.

Attain required decel in 1 second and maintain that decel.

Interval between snubs is 45 seconds and WOT to initial speed.

#### Performance Requirements:

Initial IFT for first snub is 55-65°C

Maintain 3.0 w/m/s deceleration

Vehicle must stay in lane of 3.5m

SNUB #	AVG. DECEL (m/sec <sup>2</sup> )	Time Between Snubs (seconds)	AVG. PEDAL FORCE (N)	LEFT	RIGHT	LEFT	RIGHT	INIT SPD (kph)
				FRONT IFT (°C)	FRONT IFT (°C)	REAR IFT (°C)	REAR IFT (°C)	
1	2.80	--NA--	47.85	38	41	48	46	126.11
2	3.31	47	41.24	85	94	79	77	118.51
3	3.07	45	30.84	129	128	184	182	119.78
4	2.76	43	30.30	286	151	124	123	119.42
5	2.78	45	28.73	175	189	140	139	120.89
6	2.49	48	22.88	193	184	186	156	120.38
7	2.72	45	26.76	197	298	179	169	120.21
8	2.53	44	28.44	211	208	193	182	120.18
9	2.80	45	28.07	218	214	195	193	119.88
10	2.68	44	42.22	224	224	286	282	120.60
11	2.91	45	38.87	227	228	215	212	122.88
12	2.83	48	41.77	221	231	222	218	120.84
13	2.88	44	37.74	224	235	231	224	120.38
14	3.02	48	33.41	238	237	228	231	120.27
15	2.75	46	36.16	245	239	242	236	118.93

#### STOP

#### DRIVER VEHICLE SNUB COMMENTS

(Wheel Lock-Up - Direction of Stop - Stay in Lane)

STOP #	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 (2) NO (1)

Driver: KAREN HASTERDAY

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 06/10/04

Approving Laboratory Official: KEV HASTER

Date: 06/15/04

Vehicle: 2004 NISSAN MOTOR CO ENTER NUMBER: C05207

Make: NISSAN

Model: MAXIMA 3.5 SE

Body style: 4-DR. SEDAN

Front Cold Tire Pressure: 221 (Kpa)

Rear Cold Tire Pressure: 221 (Kpa)

Transportation Research Center, Inc.  
10820 State Route 247  
East Liberty, Ohio 43319  
(937) 666-2011 www.trcpg.com

Date Tested: 06/03/04

### DATA SHEET 27 - HOT PERFORMANCE AT GVWR

Testing Conditions: INV DATA, Section 0095, 06/03/04, 13:44:59

#### 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: 99.72 (kph)

Actual distance of stop: 53.2 (meter)

Average pedal force: 381.3 (N)

#### Performance Requirements:

Stop Number 1 must be less than: 53.8 (meter)

In addition the stopping distance for at least one of the of the two hot stops must be less than: 69 (meter)

STOP #	INIT SPD (kph)	LEFT FRONT	RIGHT FRONT	LEFT REAR	RIGHT REAR	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAE 259) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec <sup>2</sup> )	AVG. DECEL (m/sec <sup>2</sup> )
		IN (°C)	IN (°C)	IN (°C)	IN (°C)						
1	97.87	267	256	282	254	45.6	47.8	388.00	216.00	13.39	7.43
2	99.69	264	264	271	265	47.3	47.6	389.79	237.51	12.34	7.23

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

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN BASTHEDAY

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 06/10/04

Approving Laboratory Official: KEV WEBSTER

Date: 06/15/04

Vehicle: 2004 NISSAN MOTOR CO NHTSA NUMBER: C45287

Make: NISSAN

Model: MAXIMA 3.5 SE

Body Style: 4-DR. SEDAN

Front Cold Tire Pressure: 221 (Kpa)

Rear Cold Tire Pressure: 221 (Kpa)

Transportation Research Center, Inc.

10820 State Route 347

West Liberty, Ohio 43081

(607)686-2811 www.trcpg.com

Date Tested: 06/03/04

### DATA SHEET 28 - BRAKE COOLING STOPS AT GVWR

Testing Conditions: INV DATA, Section 0100, 06/03/04, 13:47:57

#### 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 0.3 sec above 15 km/h

Vehicle must stay in lane of 3.5m

STOP #	INIT SPD (kph)	AVG. DECEL (m/sec <sup>2</sup> )	AVG.	LEFT	RIGHT	LEFT	RIGHT
			PEDAL FORCE (N)	FRONT INT (°C)	FRONT INT (°C)	REAR INT (°C)	REAR INT (°C)
1	50.20	2.07	33.74	235	238	223	221
2	49.27	2.43	38.77	186	204	192	186
3	49.88	2.76	32.18	149	178	164	185
4	49.86	2.73	32.92	172	149	141	132

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

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN KASTERDAY

Observer: NONE

Recorded Date Processed by: CHUCK JENKINS

Date: 06/18/04

Approving Laboratory Official: KIM WENSTER

Date: 06/15/04

Vehicle: 2004 NISSAN MOTOR CO NISSAN NUMBER: C42287

Make: NISSAN

Model: MAXIMA 3.5 SE

Body Style: 4-DR. SEDAN

Front Cold Tire Pressure: 221 (Kpa)

Rear Cold Tire Pressure: 221 (Kpa)

Transportation Research Center, Inc.

10620 State Route 147

East Liberty, Ohio 43318

(614) 666-2013 www.trc.org

Date Tested: 06/03/04

### DATA SHEET 29 - RECOVERY PERFORMANCE AT GVWR

Testing Conditions: INV DATA, Section 0185, 06/03/04, 13:55:18

Weather Conditions: 69°F Wind: 6 mph 80°

Start Odo.: 617

End Odo.: 624

#### Procedure:

Make 2 stops from 100 mph

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: 71.7 (meter)

Lower limit of corrected stopping distance: 36.8 (meter)

No Lock-Up allowed longer than 0.1 sec above 18 km/h.

Distance Requirements are based on the following:

Shortest stop Data Sheet 11 is: Stop 3

Initial speed of stop: 99.72 (mph)

Actual distance of stop: 43.2 (meter)

Average pedal force: 361.2 (N)

STOP #	INIT SPD (kph)	LEFT FRONT TBT (°C)	RIGHT FRONT TBT (°C)	LEFT REAR TBT (°C)	RIGHT REAR TBT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SEE 29B) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec <sup>2</sup> )	AVG. DECEL (m/sec <sup>2</sup> )
1	99.26	111	130	151	123	48.7	49.4	273.90	232.81	1.4.22	7.03
2	99.55	120	154	154	149	49.2	49.8	288.57	286.98	13.30	6.99

STOP # DRIVER VEHICLE STOP COMMENTS (Wheel Lock-Up - Direction of Stop - Stay in Lane)

STOP #	DRIVER	VEHICLE	STOP COMMENTS
1	-	NOX	SCUTE YES
2	-	NOX	SCUTE YES

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: IAREN HASTERDAY

Observer: NONE

Recorded Data Processed By: CHUCK JENKINS

Date: 06/10/04

Approving Laboratory Official: KEN WEBSTER

Date: 06/15/04

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

VEHICLE: 2004 Nissan Maxima 3.5 SE NHTSA NO.: C45207 DATE: 06/04/04

**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 Nissan Maxima 3.5 SE; NHTSA NO.: C45207; GVWR: 2062 kg  
**MASTER CYLINDER RESERVOIR:**

DATE	06/04/04	Requirements	Pass	Fail
<b>Reservoir Compartments (S5.4.1)</b>				
(1) Does master cylinder have a reservoir compartment for each brake subsystem?	Yes	Master cylinder shall have a reservoir compartment for each subsystem.	X	
	No			
(2) Does loss of fluid in one compartment result in complete loss from another compartment?	Yes	Loss of fluid from one compartment shall not cause complete loss from another compartment.	X	
	No			
<b>Reservoir Capacity (S5.4.2)</b>				
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)	185 ml	Shall have total minimum capacity for entire reservoir for displacement resulting from all subsystem wheel cylinders or caliper pistons 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	67.2 ml*			

Comments: None

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

VEHICLE: 2004 Nissan Maxima 3.5 SE; NHTSA NO.: C45207; GVWR: 2082 kg

**MASTER CYLINDER RESERVOIR:**

DATE	08/04/04	Requirements	Pass	Fail		
Master Cylinder Piston Displacement(85.4.2) [If Common Reservoir Supply - continued from previous page]						
Fluid displaced by three strokes of master cylinder piston for Primary (Subsystem No. 1)	21.5 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 <u>full stroke</u> 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)	20.5 ml					
Fluid displaced per stroke, Primary	7.2 ml					
Fluid displaced per stroke, Secondary	6.8 ml					
Fluid available in partial compartment Subsystem No. 1	31 ml				X	
Fluid available in partial compartment Subsystem No. 2	31 ml				X	
Brake Power Unit Reservoir (85.4.2)						
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 or accumulators to normal operating pressure <u>plus</u> displacement when wheel cylinders or caliper pistons move from new lining to full worn condition as above.	NA			
Reservoir Labeling (85.4.3)						
Exact copy of reservoir label: On master cylinder reservoir cap: <b>WARNING, CLEAN FILLER CAP BEFORE REMOVING, USE ONLY DOT 3 BRAKE FLUID FROM A SEALED CONTAINER.</b>		Label shall read: "Warning, clean filler cap before removing; use only * fluid from a sealed container". * Fluid type specified in 49 CFR 571.110	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. <u>Embossed on the top of the master cylinder reservoir.</u>		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	If label is not engraved or embossed, letters shall be of a color that contrasts with the background	X			
	<u>Yes</u>					

Comments: None

Technician: K. Easterday



**DATA SHEET 30 (Part 4 of 5)**  
**TEST COMPLETION INSPECTION (\$7.18)**

VEHICLE: 2004 Nissan Maxima 3.5 SE; NHTSA NO.: C45207; DATE: 06/04/04  
**BRAKE SYSTEM WARNING INDICATOR (\$5.5)**

CONDITION	ANSWER	REQUIREMENTS	PASS	FAIL
<b>Brake Systems Indicator Lamp Function Check (\$5.5.2) (Bulb and systems check)</b>				
Describe location of brake indicator lamp: <u>In lower right quadrant of instrument cluster within the tachometer dial.</u>	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 manufacturer check position- OR -single manual action by driver	X	
Does lamp light with ignition between ON and Start?	Yes			
Brake check description in owner's manual?	Yes	Manufacturer shall explain the brake check function test procedure in the owner's manual.	X	
<b>Brake System Warning Indicator ACTIVATION (\$5.5.1) DURATION (\$5.5.3) FUNCTION (\$5.5.4)</b>				
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) occurs. 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 <u>not split system</u> 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? (\$5.4.4)	NA			
Indicator lamps remain activated as long as condition exists - ignition "on", and engine on or off? _____ (\$5.5.3 DURATION))	Yes			
Visual warning - continuous or flashing?	Yes-Cont.			
Audible warning -continuous or flashing?	NA			

Comments: None.

Technician: K. Easterday

**DATA SHEET 30 (Part 5 of 5)  
TEST COMPLETION INSPECTION (\$7.18)**

VEHICLE: 2004 Nissan Maxima 3.5 SE; NHTSA NO.: C45207; DATE: 06/04/04

**BRAKE SYSTEM WARNING INDICATOR LABELING (\$5.5.5)**

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" - <u>3.8 mm</u> ; "ABS" - <u>3.2 mm</u> .	Yes	X	
Visual indicator words and background contrasting colors, one of which is red. Record colors <u>Letters - Red, Lens - Black</u>	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: 1. Low brake fluid per S5.5.1(a)(1), does indicator say "Brake Fluid"? NOTE: not required for mineral oil system Record wording _____ 2. Gross pressure loss per S5.5.1(a)(2), does indicator say "Brake Pressure"? Record wording _____ 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 <u>Lens - Black, Letters - Amber or yellow</u> Does indicator say "Antilock" or "ABS" or "Brake Proportioning"? Record wording <u>"ABS"</u> . 4. Parking brake per S5.5.1(c), does indicator say "Park" or "Parking Brake"? Record wording _____ 5. Brake lining wear-out per S5.5.1(d), does indicator say "Brake Wear"? Record wording <u>NA</u> 6. For any other function? If yes, Record <u>NA</u>	NA NA Yes Yes NA NA NA	X	

Comments: None.

Technician: K. Easterday

**DATA SHEET 31 (Part 1 of 2)**  
**CALCULATION OF MINIMUM RESERVOIR VOLUME REQUIREMENTS**  
**VEHICLE: 2004 Nissan Maxima 3.5 SE; NHTSA NO.: C45207; DATE: 08/04/04**

BRAKE		LINING		
LOCATION	TYPE	DESCRIPTION	MINIMUM THICKNESS	THICKNESS TO FULLY WORN (1) mm*
Left Front	Drum	Leading	Pre-test 9.07 mm	2 mm
		Primary	Post Test 8.41 mm	
		Inboard X	Δ 0.66 mm	
	Disc X	Trailing	Pre-test 8.66 mm	2 mm
		Secondary	Post Test 7.70 mm	
		Outboard X	Δ 1.17 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): 67.07 mm (x1 piston)		
SHOE CAGE DIAMETER (4) <u>N/A</u> ; CENTER POINT OF BRAKE ASSY TO CENTER POINT OF W.C. <u>N/A</u>				
Right Rear	Drum	Leading	Pre-test 8.34 mm	2 mm
		Primary	Post Test 7.80 mm	
		Inboard X	Δ 0.64 mm	
	Disc X	Trailing	Pre-test 8.06 mm	2 mm
		Secondary	Post Test 6.71 mm	
		Outboard X	Δ 1.37 mm	
LINING CLEARANCE:	Diametrical (2) -	Inboard - Approx. 0 mm	Outboard - Approx. 0 mm.	
WHEEL CYLINDER DIAMETER (3): N/A		CALIPER PISTON DIAMETER (3): 34.77 mm (x1 piston)		
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 - X	RR
CIRCUIT #2 CONSISTS OF:	LF - X	LR	RF	RR - X
(1) MFRS. RECOMMENDATIONS - 2 mm front & rear.				
(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: Front: 67.2 mm; Rear 34.83 mm.				
(4) RESET POSITION: N/A				

Comments: Manufacturer's stated new lining thickness: Frt.: 9 mm; Rear 8.5 mm.  
 Technician: K. Easterday

**DATA SHEET 31 – SECTION CONTINUED (Part 2 of 2)**Vehicle: 2004 Nissan Maxima 3.5 SE;NHTSA No.: C45207;Date: 06/18/04**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,  $V_r = (\Delta t_i + t_o + \Delta t_o + t_{oc}) \times [\pi (D^2)]/4$ , where –

- $V_r$  = Volume required per wheel
- $\Delta t$  = 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)

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

$$\Delta t_i = 7.07 \text{ mm}$$

$$\Delta t_o = 7 \text{ mm}$$

$$t_o + t_{oc} = 0 \text{ mm}$$

$$D = 57.2 \text{ mm}$$

$$V_r = (7.07 + 0 + 7 + 0) \frac{\pi (57.2)^2}{4}$$

$$= 14.07(2569.7)$$

$$= 36156 \text{ mm}^3 \text{ (x one piston)} = 36156 \text{ mm}^3 = 36.16 \text{ ml}$$

Disc Brake:  
(Rear)

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

$$\Delta t_i = 6.5 \text{ mm}$$

$$\Delta t_o = 6.5 \text{ mm}$$

$$t_o + t_{oc} = 0 \text{ mm}$$

$$D = 34.93 \text{ mm}$$

$$V_r = (6.5 + 0 + 6.5 + 0) \frac{\pi (34.93)^2}{4}$$

$$= 13(958.3)$$

$$= 12457 \text{ mm}^3 \text{ (x one pistons)} = 12457 \text{ mm}^3 = 12.46 \text{ ml}$$

For System 1 (RF, LR)

$$V_{r1} = 36156 \text{ mm}^3 + 12,457 \text{ mm}^3 = 48,613 \text{ mm}^3$$

$$V_{r1} = 48,613 \text{ mm}^3 = (48.61 \text{ ml})$$

For System 2 (LF, RR)

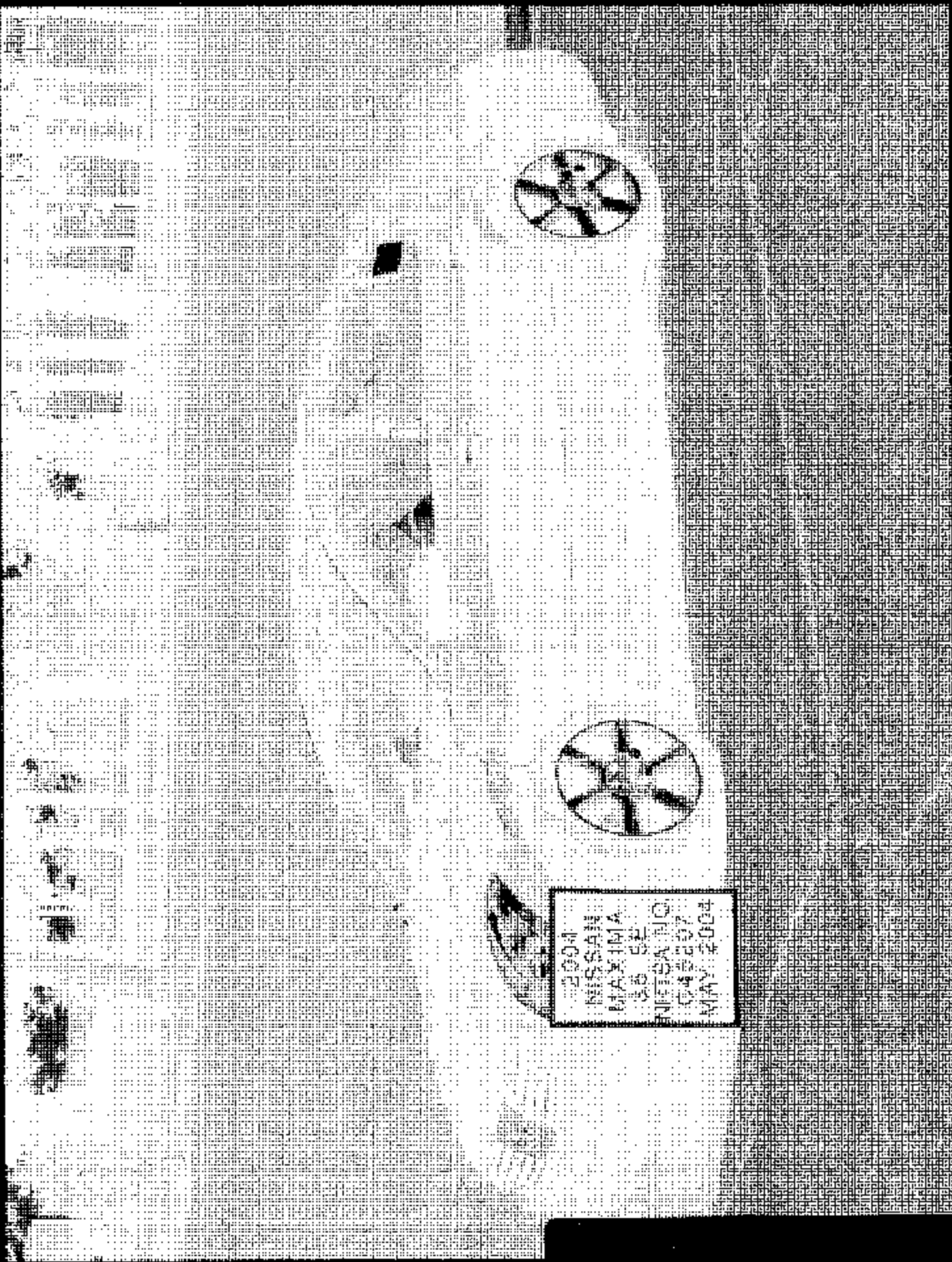
$$V_{r2} = V_{r1}$$

$$V_{r2} = 48,613 \text{ mm}^3 = (48.61 \text{ ml})$$

$$\text{TOTAL VOLUME REQUIRED} = V_t = V_{r1} + V_{r2} = 97,226 \text{ mm}^3 = 97.23 \text{ ml}^*$$

**SECTION 6.0**

**Photographs**



MISSISSAUGA  
MAY 2004



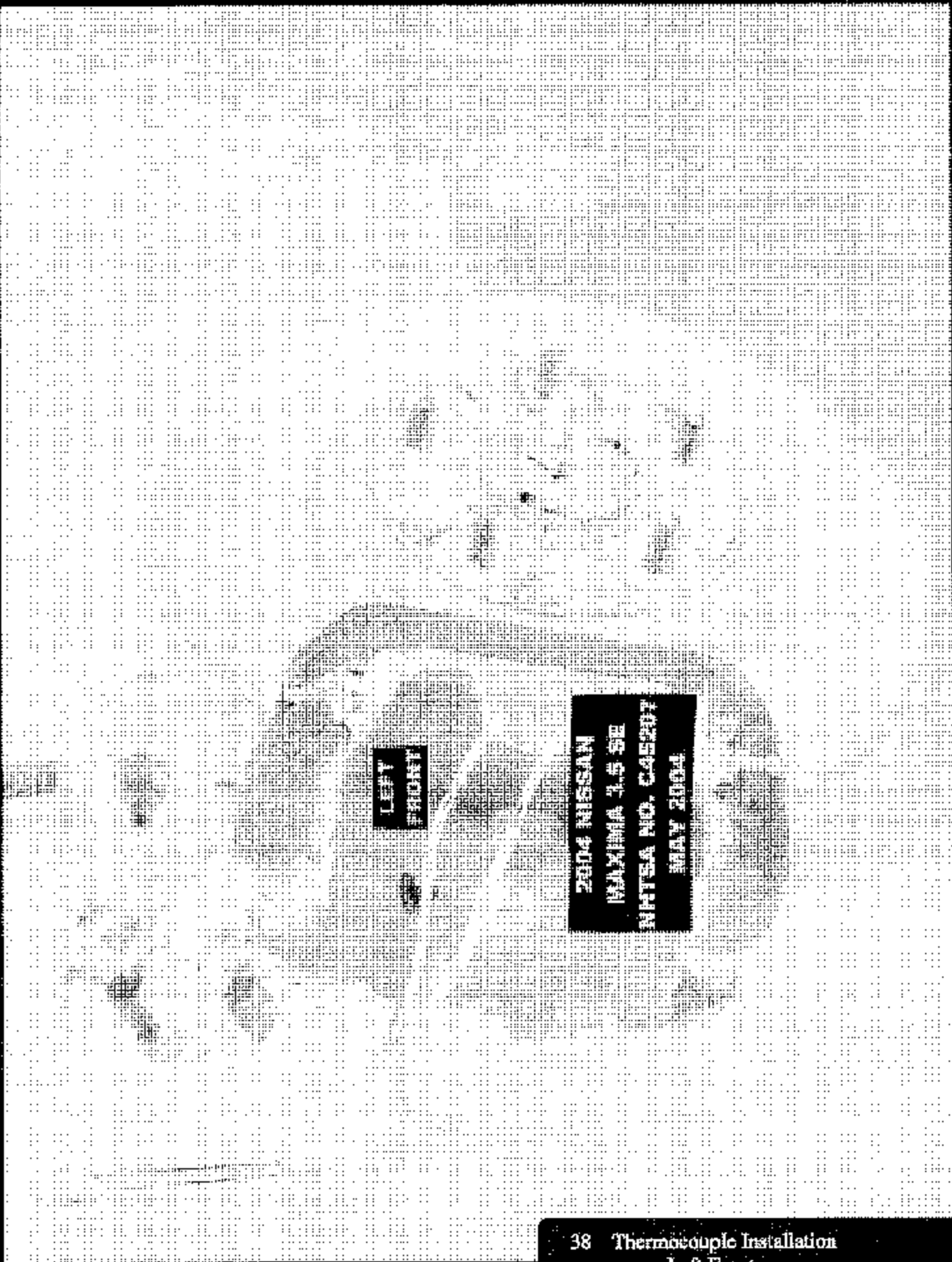
2004  
NISSAN  
MAXIMA  
3.5 SE  
HTON MO  
G45207  
MAY 2004





2004 NISSAN  
 MAXIMA 3.5 SE  
 NHTSA NO. G45207  
 MAY 2004

GROSS WEIGHT POIDS BRUT 3200 LBS 1450 KG	SEATING CAPACITY NOMBRE DE PLACES 5	FRONT AVANT REAR ARRIERE 2 3 TOTAL TOTAL 5	SCARF ROULEE SCARF 1	2
PLEASE WEAR YOUR SEATBELT AND THE NHTSA RECALL PRESSURE. VÉRIFIEZ VOTRE CEINTURE DE SÉCURITÉ ET LA RECALL NHTSA.				
GROSS FRONT WEIGHT POIDS BRUT AVANT 1600 LBS 725 KG	FRONT AVANT REAR ARRIERE 2 3 TOTAL TOTAL 5	SEATING CAPACITY NOMBRE DE PLACES 5	SCARF ROULEE SCARF 1	2
PLEASE WEAR YOUR SEATBELT AND THE NHTSA RECALL PRESSURE. VÉRIFIEZ VOTRE CEINTURE DE SÉCURITÉ ET LA RECALL NHTSA.				
GROSS REAR WEIGHT POIDS BRUT ARRIERE 1600 LBS 725 KG	FRONT AVANT REAR ARRIERE 2 3 TOTAL TOTAL 5	SEATING CAPACITY NOMBRE DE PLACES 5	SCARF ROULEE SCARF 1	2
PLEASE WEAR YOUR SEATBELT AND THE NHTSA RECALL PRESSURE. VÉRIFIEZ VOTRE CEINTURE DE SÉCURITÉ ET LA RECALL NHTSA.				
GROSS WEIGHT POIDS BRUT 3200 LBS 1450 KG	SEATING CAPACITY NOMBRE DE PLACES 5	FRONT AVANT REAR ARRIERE 2 3 TOTAL TOTAL 5	SCARF ROULEE SCARF 1	2
PLEASE WEAR YOUR SEATBELT AND THE NHTSA RECALL PRESSURE. VÉRIFIEZ VOTRE CEINTURE DE SÉCURITÉ ET LA RECALL NHTSA.				



LEFT  
FRONT

2004 NISSAN  
MAXIMA 3.5 SE  
INTSA NO. C45207  
MAY 2004

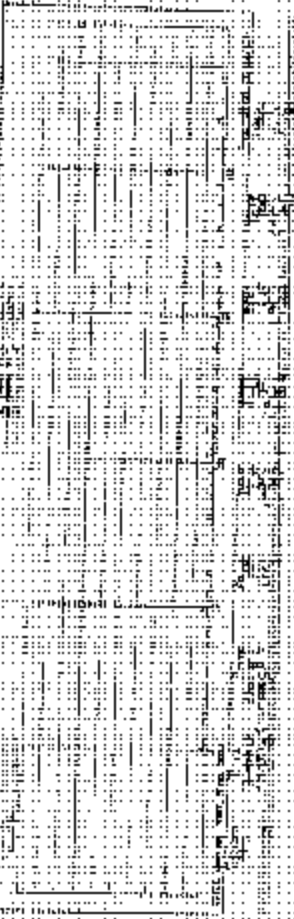
THERMOCOUPLE

RIGHT  
REAR

2004 NISSAN  
MAXIMA 3.5 SE  
NHTSA NO. C45207  
MAY 2004

LF Brake 22 C  
 RF Brake 22 C  
 LR Brake 23 C  
 RR Brake 24 C  
 Front XI 25 C  
 Rear XI 23 C

George W. K...  
 DISTANCE 7.0 M  
 Figure 10 M  
 CRASH TEST IN B



LASER WINDSHIELD UNIT 2052  
 FRONT WINDSHIELD UNIT 2053  
 REAR WINDSHIELD UNIT 2054







330

2001 NISSAN  
MAXIMA 3.5 SE  
WVISA NO. C45207  
MAY 2002

1103  
1104  
1105

2004 NISSAN  
MAXIMA 3.5 SE  
NHTSA NO. C45207  
MAY 2004



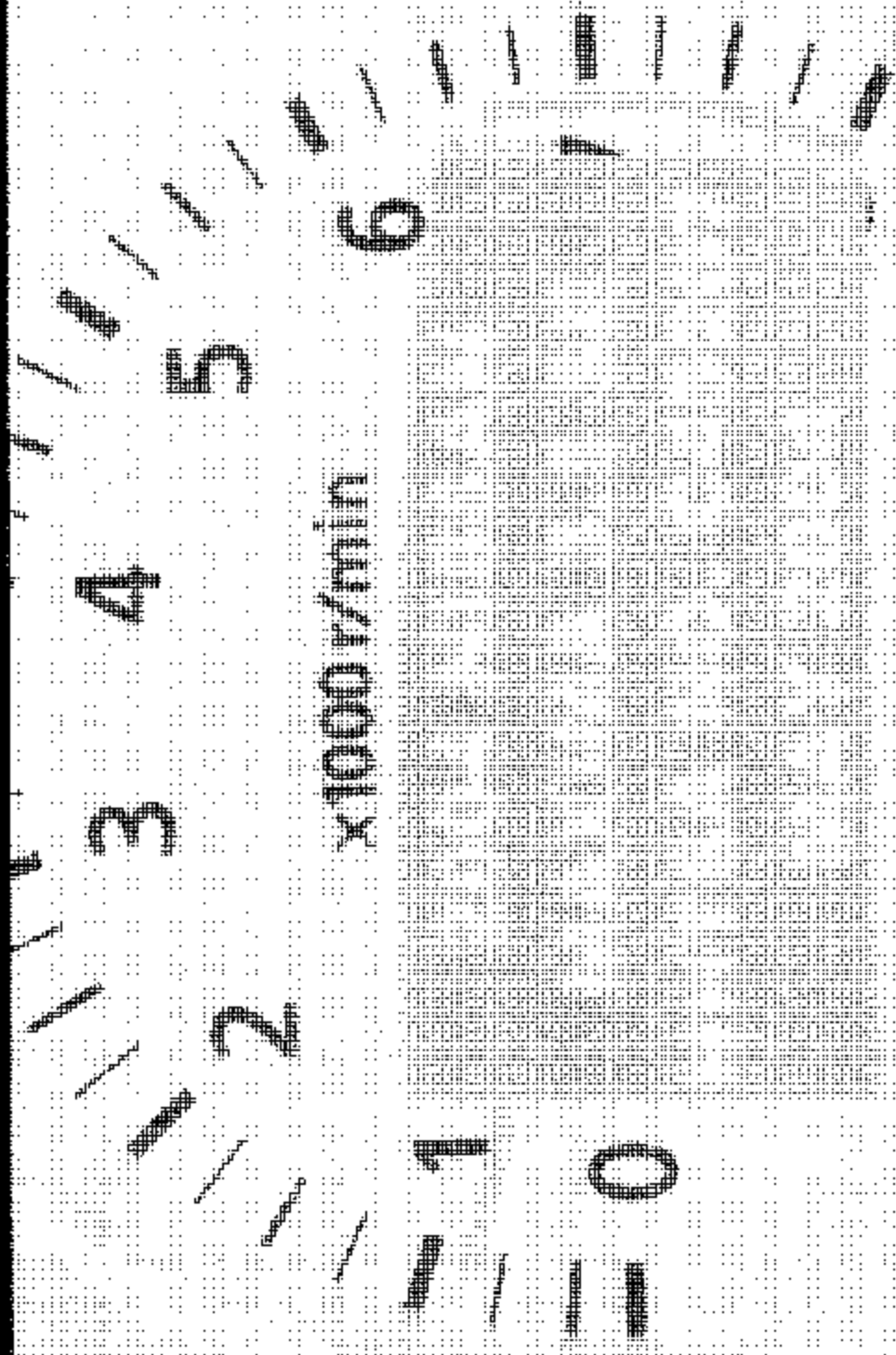
2004  
NISSAN  
MAXIMA  
3.5 SE  
NHTSA NO  
C45207  
MAY 2004



2004 NISSAN  
MAXIMA 3.5 SE  
NISSA NO. C45207  
MAY 2004

2004 NISSAN  
MAXIMA 3.5 SE  
NHTSA NO. C45207  
MAY 2004

2004 NISSAN  
MAXIMA 3.5 SE  
NHTSA NO. C4520T  
MAY 2004



10V

ABS



2004 NISSAN  
MAXIMA 3.5 SE  
NHTSA NO. CA5207  
MAY 2004

**7.0 INSTRUMENT CALIBRATION (12 MONTH MAXIMUM INTERVAL)**  
**VEHICLE: 2004 Nissan Maxima Pass. Car; NHTSA NO.: C45207; DATE: 05/24/04**

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 STD3	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 5225831- 5JC	05/06/04	08/06/04

QUALITY ASSURANCE *[Signature]*



DAILY CALIBRATIONS (1 of 3)

Vehicle: 2004 Nissan Maxima 3.5

NHTSA No.: C45207

Deceleration Calibration Data for Unit 4355

Desired full scale value is: 9.81 m/s/s

Allowed deviation is: + or - 0.15 m/s/s

Accelerometer Level to zero, then tilt to full scale

"Date"	"Time"	Zero	Cal
"stp"	"stp"	"Decel"	"Decel"
5/27/2004	11:43:06	9.80	-0.02
5/27/2004	13:35:29	9.78	0.00
5/28/2004	9:56:10	9.78	0.01
6/1/2004	10:09:27	9.79	-0.02
6/1/2004	15:30:21	9.81	-0.06
6/2/2004	8:28:11	9.75	0.05
6/2/2004	15:40:31	9.77	0.01
6/3/2004	8:55:42	9.75	0.00
6/3/2004	14:07:52	9.79	0.05
6/4/2004	17:06:09	9.79	-0.03

PRE-TEST CAL

POST-TEST CAL

Pre-Test Linearity Check 05/27/04

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 06/03/04

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 4355

Desired full scale value is: 1000 m

Allowed deviation is: 3 m

Light beam distance sensor Drive from 0 to 100 to 0 km/h on a measured kilometer

"Date"	"Time"	Distance for
"stp"	"stp"	1000 meters
5/27/2004	13:23:02	999.8
5/28/2004	10:01:30	999.8
6/1/2004	10:19:15	1000.2
6/1/2004	15:36:01	1000.0
6/2/2004	8:52:21	1000.2
6/2/2004	15:46:15	1000.0
6/3/2004	9:02:35	1000.2
6/3/2004	14:13:53	1000.3

PRE-TEST CAL

POST-TEST CAL

DAILY CALIBRATIONS CONTINUED (2 of 3)

VEHICLE: 2004 Nissan Maxima 3.5

NHTSA No.: C45207

Wheel Tachometer Calibrations for Unit 4955

Wheel tachometer calibrations: all wheel speeds should be 15 km/h

Wheel lock detector

While at a standstill, check zeros. Drive vehicle at approx. 15 km/h and engage zero speed switch for each wheel

"Date"	"Time"	Zero	@15km/h	Zero	@15km/h	Zero	@15km/h	Zero	@15km/h
stp	stp	LF	LF	RF	RF	LR	LR	RR	RR
8/1/2004	10:15:48	-0.1	16.5	-0.1	18.2	0.0	16.6	-0.1	17.4
8/1/2004	15:31:32	-0.2	15.3	-0.3	17.8	-0.2	16.0	-10.2	3.6
8/2/2004	8:47:55	-0.1	17.5	0.0	18.3	-0.1	16.1	-0.1	16.7
8/2/2004	15:42:18	0.0	15.8	-0.1	18.8	-0.1	17.3	0.0	23.4
8/3/2004	8:57:29	-0.1	16.3	-0.1	18.2	0.0	17.4	-0.1	21.4
8/3/2004	14:12:25	-0.1	16.4	-0.1	17.7	0.0	18.3	-0.1	21.4

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?  Yes,  No.

Note: The wheel tach calibrations did not occur until after the Burnish was complete.

Pedal Force Meter Calibration for Unit 4955

Target shunt calibration is 390 N

Desired recorded value is: 390 N

Desired recorded calibration value is: 500 N

Allowed deviation is: 8.5 N

Service brk. pedal effort

Driver engages a fixed shunt coil switch.

"Date"	"Time"	Zero	Cal Val
stp	stp	Force	Force lb
5/27/2004	11:47:40	-0.7	500.0
5/27/2004	13:38:36	-5.8	390.5
5/28/2004	9:55:40	-0.3	390.5
6/1/2004	10:10:08	-0.4	390.5
6/1/2004	15:28:41	-0.5	390.4
6/2/2004	8:26:27	-0.6	390.3
6/2/2004	16:38:13	-0.7	390.5
8/3/2004	8:55:00	-0.4	390.8
8/3/2004	14:07:07	-1.7	390.8
8/4/2004	17:12:28	-0.4	502.0

PRE-TEST CAL.

POST-TEST CAL.

Pre-Test Linearity Check - 05/27/04

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

Post-Test Linearity Check - 08/03/04

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

**DAILY CALIBRATIONS CONTINUED (3 of 3)**

VEHICLE: 2004 Nissan Maxima 3.5 SE

NHTSA No. C45207

Dynamic Speed Calibration for Unit 4355

Desired speed value is: 100 km/h

Allowed deviation is: 1.6 km/h

Desired time value is: 36 seconds

Allowed deviation is: + or - 0.8 seconds

Light beam  
speed sensor Drive vehicle  
at a steady  
100 km/h  
through a  
kilometer.

"Date" stp	"Time" stp	"Speed" km/h	"Time" sec
5/27/2004	13:28:46	100.5	36.09
5/28/2004	9:59:53	100.1	35.90
6/1/2004	10:17:25	100.7	35.86
6/1/2004	15:33:54	99.9	36.06
6/2/2004	8:50:14	100.0	36.28
6/2/2004	15:44:08	100.4	36.31
6/3/2004	9:00:31	100.9	36.00
6/3/2004	14:10:11	100.4	36.03

POST-TEST CAL.

APPENDIX A

Copy of Manufacturer's Sticker

No manufacturer's sticker was provided.

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 INT	-	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 C45207.

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 Sheets 16 & 22 – Antilock Functional Failure at LLVW and GVWR, respectively, the ABS and the Electronic Brake Distribution (EBD) - Variable Proportioning - are integral. Failing the ABS also fails the EBD. The EBD cannot be failed separately. Therefore, Data Sheets 17 and 23 are not included.

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.

## 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

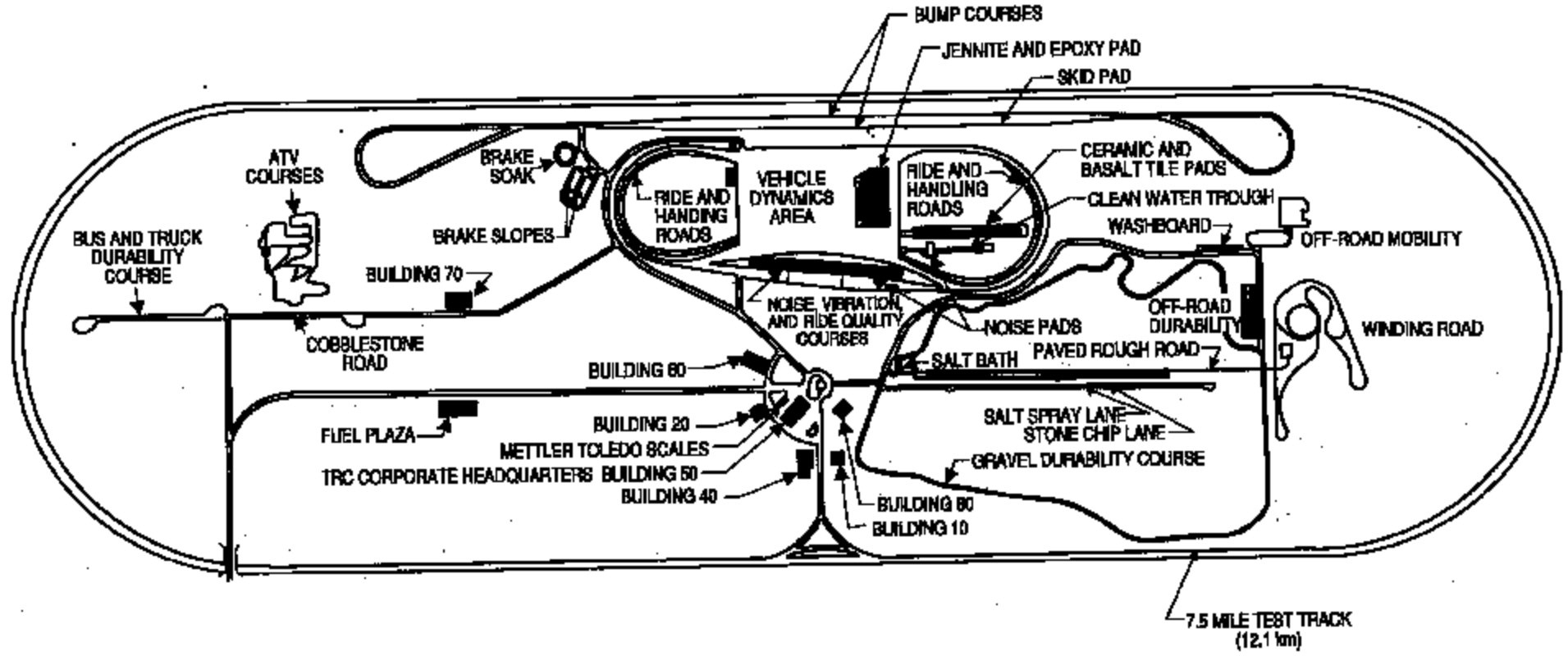
The Skid Pad is a test facility which is utilized primarily for the evaluation of tire and brake systems.

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

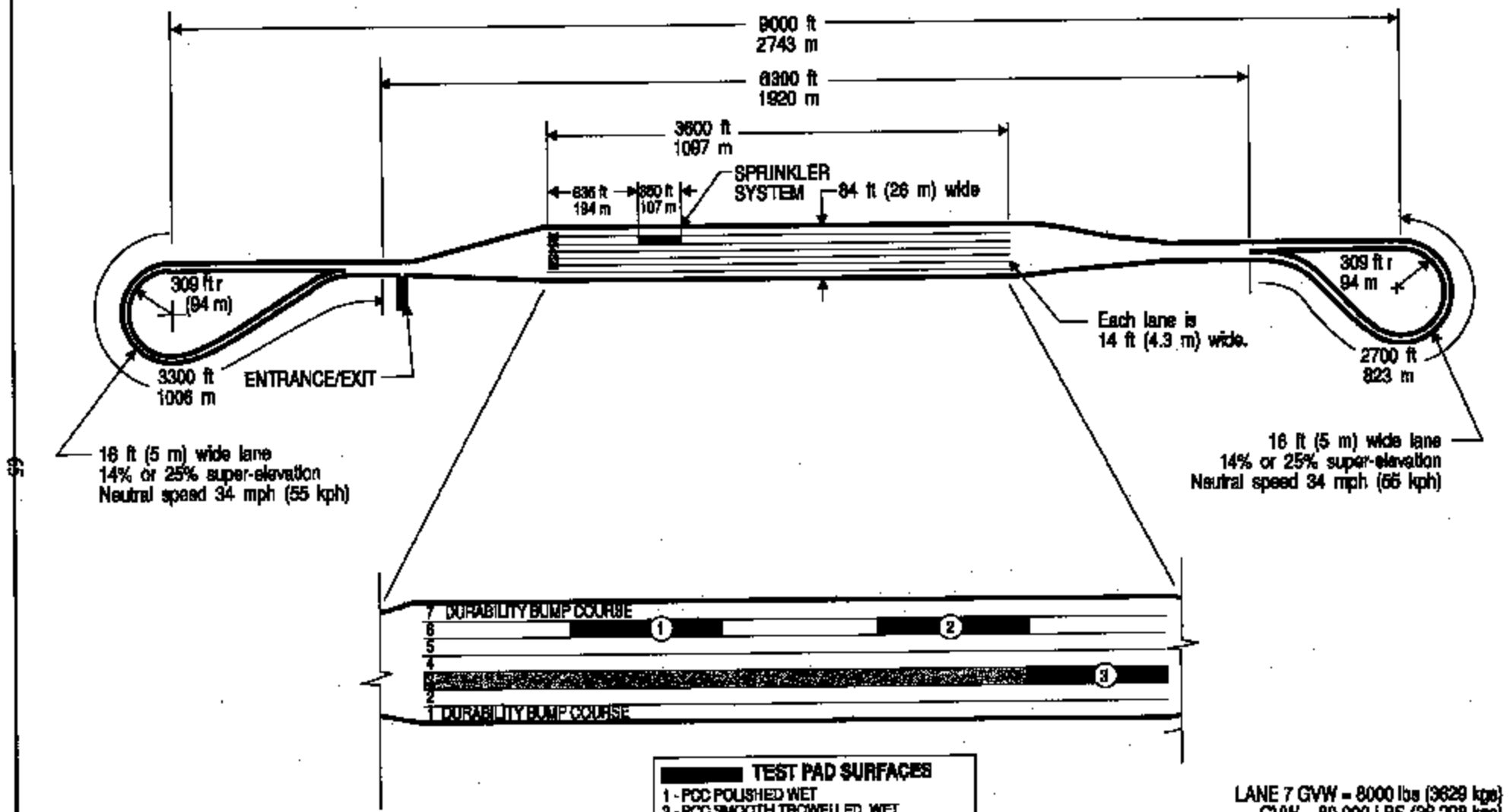


TRANSPORTATION RESEARCH CENTER INC.

EAST LIBERTY, OHIO 43849-0067

F-15 0901

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

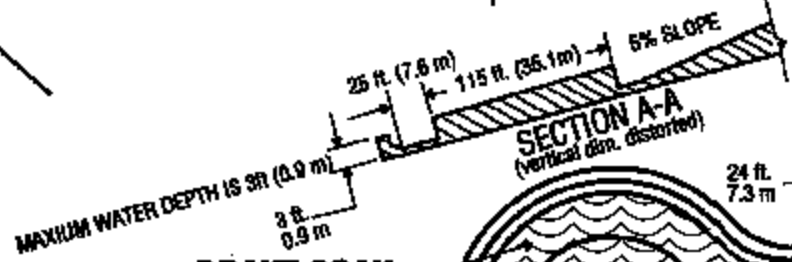


TRANSPORTATION RESEARCH CENTER INC.  
EAST LIBERTY, OHIO 43319-0367

F-19 0280



SKID PAD



**BRAKE SOAK**

- 57.5 ft (17.5 m) radius
- 82.5 ft (25.1 m) radius
- 90 ft (27.4 m) radius
- 97.5 ft (29.7) radius

12%  
135 ft (41.1 m) long

20%  
81 ft (24.7 m) long

15%  
105 ft (32.0 m) long

**BRAKE SLOPES**

30%  
63 ft (19.2 m) long

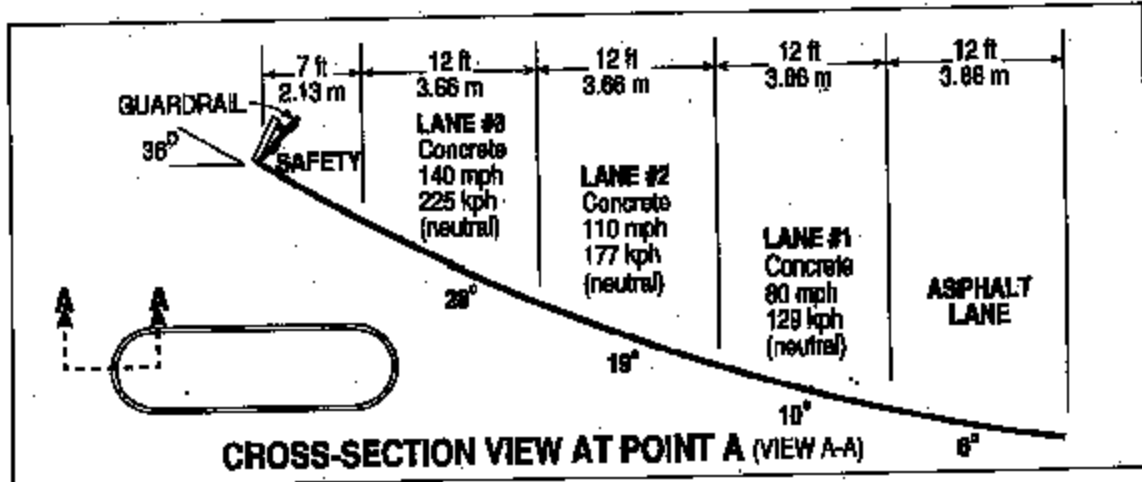
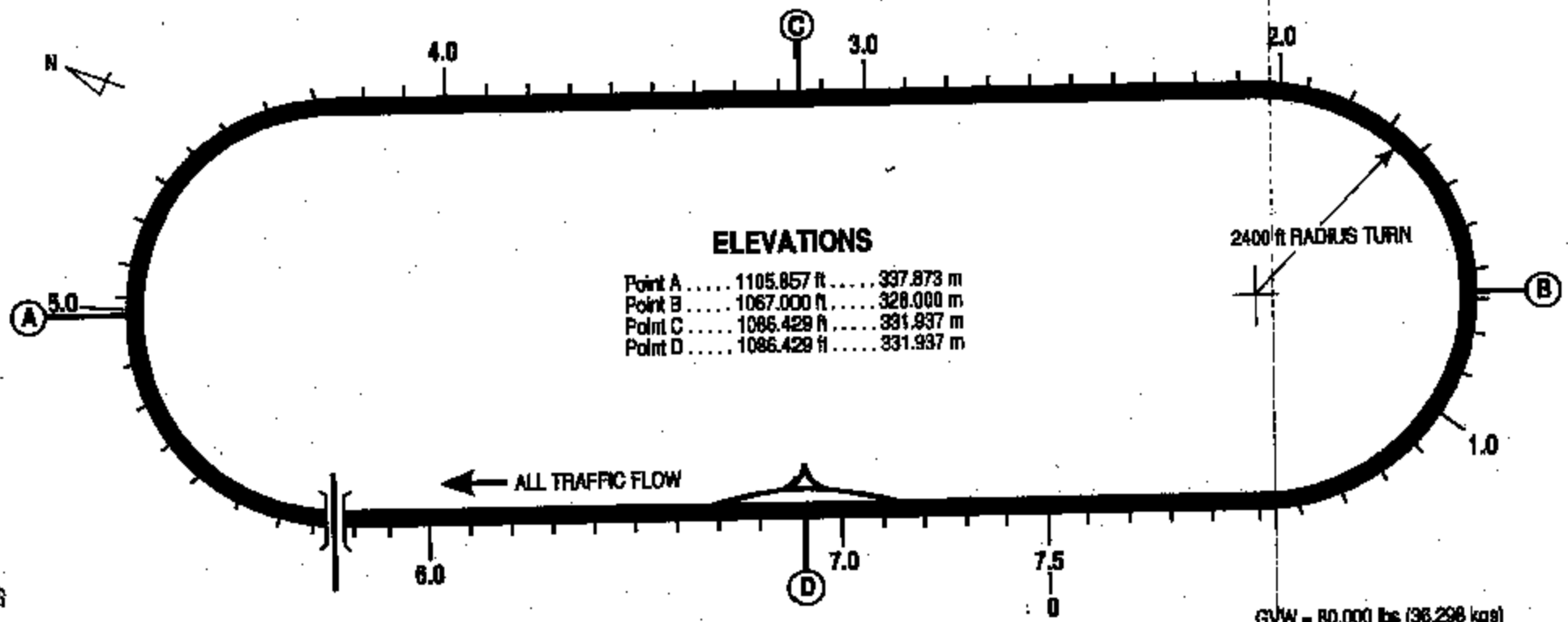
GVW FOR 12 & 15% SLOPE = 4000 lbs (1814 kgs)  
OTHER GVW = 80,000 lbs (36,288 kg)

NOT TO SCALE  
ALL DIMENSIONS ARE APPROXIMATE

**BRAKE SOAK and BRAKE SLOPES**



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**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	..... 3.533 mi	..... 5.684 km
Point C to Point D	..... .947 mi	..... 1.524 km

NOT TO SCALE

**7.5-MILE TEST TRACK**



**TRANSPORTATION RESEARCH CENTER INC.**  
 EAST LIBERTY, OHIO 43019-0987  
 F-10 0985

**APPENDIX D**  
**Notice of Possible Non-Compliance**



This vehicle (C45207) met the requirements of the FMVSS 135 standard.