135-TRC-08-005

SAFETY COMPLIANCE TESTING FOR FMVSS 135
Passenger Car Brake Systems

Nissan Motor Company, Limited
2008 Nissan Altima 2.5S, 4-door Sedan
NHTSA No. C85200

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

Final Report Completed: January 24, 2008

FINAL REPORT

Prepared Under Contract No.: DTNH22-06-C-00033

U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
1200 New Jersey Avenue S.E.
West Building 4th Floor
OVSC (NVS-221)
Washington, DC 20590

Prepared for the Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-06-C-00033.

Prepared By _____

Approved By _____

Approval Date: 1/24/08

Final Report Acceptance By OVSC:

_____
Contract Technical Manager, Office of Vehicle Safety Compliance

2/4/08
Acceptance Date

1. REPORT NUMBER: 135-TRC-08-005	2. GOVERNMENT ACCESSION NO.:	3. RECIPIENTS CATALOG NO.:	
4. TITLE AND SUBTITLE: Final report of FMVSS 135 Compliance Testing of a 2008 Nissan Altima 2.5S, 4-Door Sedan, NHTSA No. C85200		5. REPORT DATE: January 24, 2008 6. PERFORMING ORGANIZATION CODE: TRC 20060110/8354	
7. AUTHOR(S): Project Manager: ALAN IDA Project Engineer: RANDALL A. LANDES		8. PERFORMING ORGANIZATION REPORT NO.: TRC-DOT-135-079	
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.: DTNH22-06-C-00033	
12. SPONSORING AGENCY NAME AND ADDRESS: U.S. Department of Transportation National Highway Traffic Safety Administration Enforcement Office of Vehicle Safety Compliance (NVS-221) 1200 New Jersey Avenue S.E. West Wing 4th Floor Washington, DC 20590		13. TYPE OF REPORT AND PERIOD COVERED: Final test report Tested: 11/29/07 to 01/24/08 14. SPONSORING AGENCY CODE: NVS-221	
15. SUPPLEMENTARY NOTES:			
16. ABSTRACT: Compliance tests were conducted on the subject 2008 Nissan Altima 2.5S, 4-Door Sedan, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-135-01 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 Information Services NPO-411 1200 New Jersey Ave, S.E. Washington, DC 20590 Email: tis@nhtsa.dot.gov FAX: 202-493-2833	
19. SECURITY CLASSIF. (OF THIS REPORT): Unclassified	20. SECURITY CLASSIF. (OF THIS PAGE). Unclassified	21. NO. OF PAGES: 69	22. PRICE:

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1.0 INTRODUCTION

Tests were conducted on a 2008 Nissan Altima 2.5S, 4-door Sedan, manufactured by Nissan Motor Company, Limited, 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 135-01 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 ABS
Failed Variable Proportioning Valve (if applicable)
Failed Hydraulic Circuits
Brake Power Assist Unit Failures
RBS Failure (if applicable)
EMF (Battery) Failure (if applicable)

Brake Slope
Parking Brake

Average PFC during the test period was 1.04 (Skid Pad) and 1.02 (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: 2008
Mfr: NISSAN MOTOR CO.,LTD.
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Mfr. Date: 08/07
VIN: 1N4AL21E98C116413

NHTSA No: C85200
GVWR (Kg): 1941
GAWR Front(Kg): 1017
GAWR Rear(Kg): 993
Wheelbase (mm): 2768.6
Odometer: Start:135 MI. End:577 MI.

BUSES ONLY

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

Engine Type: GASOLINE,TBI I-4 CYL.,DOHC,16 VALVE,PISTON.
Displacement: 2.5 LITER
Engine Hspwr: N/A
Idle Speed(rpm): 72.2568
Transmission Type: CVT W/ MANUAL SHIFT MODE.
No. of Axles: 2

Tire Size: P215/60R16
Tire Type: CONTIPROCONTACT,94T,M&S,RADIAL
Tire Mfr.: CONTINENTAL
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: BOSCH
Parking Mechanism: YES
Type of Parking Unit: AUTOMATIC TRANSMISSION WITH PARK DETENT.
Mstr Cylinder Dia(mm): Not Available - M/C sealed.

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: 3.1 : 1

FRONT SYSTEM BRAKE COMPONENT MATERIALS AND CONSTRUCTION:

BRAKE TYPE: DISC
Drum Construction: N/A
Disc Construction: INTEGRAL CAST,VENTED
Front Brake Dia.(mm): 295.94
Fr Disc Thickness(mm): 26.09
Lining Construction: Bonded

Material: CAST
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)	45.92	45.92
Length(mm)	126.11	126.06
Thickness(mm)	10.97	10.95
Lining Code/Color	HP66H GG	HP66H GG

Hyd. Piston Dia.(mm): 57.15

DATA SHEET 1 - (CONTINUED)

REAR SYSTEM BRAKE COMPONENT MATERIALS AND CONSTRUCTION:

BRAKE TYPE: DISC
Drum Construction: N/A
Disc Construction: INTGRL CAST UNV
Lining Construction: BONDED
Rear Brake Dia.(mm): 291.41
Rr Disc Thickness(mm): 9.14
Lining Construction: Bonded

Material: CAST IRON
LR Drum Shoe Cage Dia.(mm): 0.00
RR Drum Shoe Cage Dia.(mm): 0.00
LR Drum Dia. RESET(mm): 0.00
RR Drum Dia. RESET(mm): 0.00

REAR BRAKE COMPONENT DIMENSIONS AND CODES:

Inboard (Leading)		Outboard (Trailing)	
Width(mm):	31.93	Width (mm):	31.85
Length(mm):	83.03	Length (mm):	83.08
Thickness(mm):	8.08	Thickness (mm):	7.98
Lining Code/Color:	AK AP59H-FF	Lining Code/Color:	AK AP59H-FF
Hyd Piston Dia (mm):	34.87		

OTHER COMPONENT INFORMATION:

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

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: 1-25-08

Quality Assurance: Randy Landes RANDY LANDES

VEHICLE: 2008 Nissan Altima 2.5S NHTSA NO.: C85200 DATE: 01/22/08

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				182.8 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 – not required.			NA
Wheel Lockup Sequence w/o ABS	LLVW					ABS equipped – not required.			NA
Adhesion Utilization w/o ABS	LLVW				Rear axle adhesion utilization curve below specified value	ABS equipped – not required.			NA
Adhesion Utilization w/o ABS	GVWR					ABS equipped – not required.			NA
Cold Effectiveness	GVWR	100	65	500	70	5	485.6	50.4	Pass
High Speed Effectiveness	GVWR	146.2	65	500	spd. depend. – 157.9	5	460.4	101.5	Pass
Stops with Engine Off	GVWR	100	65	500	70	5	454.8	47.5	Pass
Cold Effectiveness	LLVW	100	65	500	70	5	468.7	45.7	Pass
High Speed Effectiveness	LLVW	146.2	65	500	spd. depend. – 157.9	5	483.1	87.2	Pass
Failed Antilock	LLVW	100	65	500	85	5	148.4	48.7	Pass
Failed Proportioning Valve	LLVW	100	65	500	110	5	NA	NA	NA
Failed Hydraulic Circuit #1	LLVW	100	65	500	168	5	490.5	92.2	Pass
Failed Hydraulic Circuit #2	LLVW	100	65	500	168	5	491.1	90.8	Pass
Failed Hydraulic Circuit #1	GVWR	100	65	500	168	5	469.9	101.1	Pass
Failed Hydraulic Circuit #2	GVWR	100	65	500	168	5	471.6	101.9	Pass
Failed Antilock	GVWR	100	65	500	85	5	84.5	60.7	Pass
Failed Proportioning Valve	GVWR	100	65	500	110	5	NA	NA	NA
Regenerative Brake System (RBS) Failure	GVWR	100	65	500	168	5	NA	NA	NA
Electromotive Force (EMF) – Battery Failure	GVWR	100	65	500	70	5	NA	NA	NA
Power Brake Unit Failure	GVWR	100	65	500	168	5	491.4	150.1	Pass
Parking Brake - Uphill	GVWR	-	-	500	Hold for 5 min.?	NA	374.5 {Prk Br]	Yes-Holds	Pass
Parking Brake - Downhill	GVWR	-	-	500	Hold for 5 min.?	NA	399.3 [Prk Br]	Yes-Holds	Pass
Heating Snubs	GVWR	120-	NA	NA	15 Snubs- 3.0 mpsps	5	26 Vis. Avg.	NA	NA
Hot Performance Stop #1	GVWR	100	65	367 **avg**	77.0	5	402.4 (254.2)	47.6	Pass
Hot Performance Stop #2	GVWR	100	65	500	89	5	458.8 (285.7)	48.4	Pass
Brake Cooling	GVWR	50	NA	NA	4 Stops - 3.0 mpsps	5	29 Vis. Avg.	NA	NA
Recovery Performance Stop #1	GVWR	100	65	367 **avg**	One of the two stops between 36.8 and 67.4 meters.	5	292.4 (175.4)	50.0	Pass
Recovery Performance Stop #2	GVWR	100	65	367 **avg**		5	470.3 (317.8)	47.6	
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.

DATA SHEET 3 - VEHICLE WEIGHT

VEHICLE: 2008 NISSAN ALTIMA 2.5S NHTSA No. C85200 Date: 12/13/07

Tire Pressure(cold): Front (kpa) 221 Rear (kpa) 221
Odometer: Start 135 MI. End 577 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): 1941
GAWR Front(Kg): 1017
GAWR Rear(Kg): 993

UNLOADED VEHICLE WEIGHT(UVW)

L Front(Kg):	435	L Rear(Kg):	294
R Front(Kg):	431	R Rear(Kg):	281
T Front(Kg):	866	T Rear(Kg):	575

Total UVW(Kg): 1441

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):	482	L Rear(Kg):	336
R Front(Kg):	480	R Rear(Kg):	326
T Front(Kg):	962	T Rear(Kg):	662

Total LLVW(Kg): 1624

ACTUAL LIGHT LOADED WEIGHT(LLVW):

L Front(Kg):	486	L Rear(Kg):	337
R Front(Kg):	476	R Rear(Kg):	325
T Front(Kg):	962	T Rear(Kg):	662

Total Actual Test LLVW(Kg): 1624

Load: Driver/Observer 73(Kg) + Instru.41(Kg) + Ballast 67(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):	492	L Rear(Kg):	485
R Front(Kg):	490	R Rear(Kg):	474
T Front(Kg):	982	T Rear(Kg):	959

Total Fully Loaded GVWR(Kg): 1941

Load: Driver/Observer 73(Kg) + Instru. 41(Kg) + Ballast 386(Kg)= 500(kg)

Technician: Karen Easterday KAREN EASTERDAY Date: 1-25-08

Quality Assurance: Randy Landes RANDY LANDES

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 KAREN EASTERDAY Date: 1-25-08

Quality Assurance: Randy Landes RANDY LANDES

DATA SHEET 5 - VEHICLE MAX SPEED

VEHICLE: 2008 NISSAN ALTIMA 2.5S NHTSA No. C85200 Date: 12/31/07

Ambient Temperature: 31°F Wind Velocity: 3(MPH)
Road PFC: 1.03 Wind Direction: 135°
Odometer: Start 142(mi) End 157(mi)

TEST WEIGHT: Total (Kg): 1624 Front (Kg): 962 Rear (Kg): 662

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	183 kph	182.6	9.41
Run No. 2	North	184 kph	183.0	9.16

AVERAGE = 182.8 km/h

COMMENTS: INV DATA, Section 0001, 12/31/07, 09:26:45

Tester/Technician: KAREN EASTERDAY Date: 1-25-08

Quality Assurance: RANDY LANDES

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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10820 State Route 347
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Date Tested: 12/31/07

DATA SHEET 6 - BURNISH AT GVWR

Testing Conditions: INV DATA, Section 0002, 12/31/07, 13:19:17

Weather Conditions: 32°F Wind:16 mph 181° Start Odo.: 164 End Odo.: 431

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/s^2
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/sec^2)
1	80.28	179	186	111	113	81.22	44.21	3.59
10	77.43	112	131	111	113	75.51	41.40	3.64
20	82.26	109	118	115	115	63.83	39.32	3.56
30	80.63	107	117	114	113	69.39	41.63	3.32
40	81.39	116	129	108	102	82.58	43.83	3.52
50	81.57	114	117	104	110	67.57	42.64	3.38
60	80.77	112	114	109	112	56.63	42.30	3.17
70	80.13	95	103	92	93	60.68	35.12	3.55
80	81.51	92	95	96	96	76.50	32.17	3.31
90	81.19	97	112	90	81	69.12	32.05	3.24
100	82.13	93	108	89	82	81.52	31.43	3.45
110	80.08	106	115	90	89	71.20	31.51	3.13
120	79.13	90	110	80	77	51.92	31.98	3.36
130	79.33	118	135	87	84	77.86	30.64	3.35
140	81.64	104	114	74	78	64.87	28.11	3.14
150	80.92	98	118	72	75	62.52	33.29	3.34
160	79.27	109	126	68	76	72.17	41.36	3.16
170	80.48	102	118	62	69	73.78	37.32	3.14
180	81.57	95	123	70	77	78.85	36.33	3.30
190	80.59	99	133	79	83	67.51	38.63	3.38
200	80.95	96	129	77	82	74.86	37.79	3.30

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: CHUCK JENKINS Date: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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Date Tested: 01/08/08

DATA SHEET 11 - COLD EFFECTIVENESS AT GVWR

Testing Conditions: INV DATA, Section 0015, 01/08/08, 10:05:12

Weather Conditions: 60°F Wind: 30 mph 191° Start Odo.: 442 End Odo.: 447

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 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	100.92	76	82	53	57	52.5	51.5	479.48	384.43	11.70	7.58
2	99.33	84	90	59	56	51.7	52.4	468.25	380.47	11.98	7.49
3	99.32	86	92	62	57	51.3	52.0	475.45	393.50	13.17	7.07
4	100.22	84	92	64	57	51.0	50.7	479.95	407.57	13.67	7.75
5	99.61	71	78	54	47	51.1	51.5	491.97	386.82	12.93	6.81
6	99.84	89	96	69	62	50.2	50.4	485.64	366.84	12.84	6.94

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

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: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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Date Tested: 01/08/08

DATA SHEET 12 - HIGH SPEED EFFECTIVENESS AT GVWR

Testing Conditions: INV DATA, Section 0020, 01/08/08, 10:42:09

Weather Conditions: 62°F Wind: 27 mph 188° Start Odo: 448 End Odo: 458

Schedule:
Initial Brake Temperature: 65-100°C
Initial Speed: 80% max km/h, not greater than 160km/h
6 stops with transmission in gear
Target Initial Speed: 146.23 kph

Performance Requirements:
One Stop with:
Stopping Distance less than: 157.9 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 IBT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)	ACTUAL DISTANCE (meter)	CORRECTED DISTANCE (SAE 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec^2)	AVG. DECEL (m/sec^2)
1	147.77	70	78	56	47	106.4	104.2	491.55	428.02	13.52	8.07
2	144.04	79	85	62	49	98.6	101.7	488.46	397.11	12.48	7.45
3	145.55	74	78	54	44	100.3	101.2	507.08	377.80	13.60	7.23
4	145.08	79	87	59	49	99.9	101.5	460.37	379.92	13.36	7.67
5	145.00	82	89	61	49	100.1	101.8	501.32	365.88	12.75	7.22
6	145.77	82	87	62	49	101.3	101.9	467.49	387.74	12.61	7.57

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: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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Date Tested: 01/08/08

DATA SHEET 13 - STOPS WITH ENGINE OFF AT GVWR

Testing Conditions: INV DATA, Section 0025, 01/08/08, 11:50:48

Weather Conditions: 62°F Wind: 24 mph 200° Start Odo.: 459 End Odo.: 468

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 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec^2)	AVG. DECEL (m/sec^2)
1	100.73	82	90	69	63	48.2	47.5	454.78	322.83	12.49	7.20
2	99.57	69	76	63	59	48.6	49.0	464.57	338.88	12.96	7.48
3	100.34	91	92	76	70	48.0	47.7	466.42	338.68	13.18	7.19
4	99.21	90	92	72	65	47.6	48.4	456.21	360.49	13.69	7.30
5	99.64	91	96	74	66	47.3	47.7	469.17	372.26	12.82	7.11
6	100.70	79	83	64	52	48.2	47.5	451.32	356.41	11.99	7.06

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: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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Date Tested: 01/09/08

DATA SHEET 14 - COLD EFFECTIVENESS AT LLVW

Testing Conditions: INV DATA, Section 0030, 01/09/08, 08:59:21

Weather Conditions: 39°F Wind: 17 mph 260° Start Odo.: 476 End Odo.: 481

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 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	99.58	82	87	59	66	45.6	46.0	450.55	336.23	14.17	8.99
2	100.43	78	78	41	47	46.2	45.8	432.94	307.59	14.48	7.29
3	99.23	93	93	46	54	45.0	45.7	468.65	378.17	15.19	8.00
4	99.46	89	86	42	49	45.5	46.0	467.12	355.96	15.95	7.66
5	100.04	90	85	40	46	45.1	45.0	507.40	366.92	16.50	7.67
6	100.25	88	84	37	42	47.3	47.1	470.88	220.38	14.86	4.72

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: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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Date Tested: 01/09/08

DATA SHEET 15 - HIGH SPEED EFFECTIVENESS AT LLVW

Testing Conditions: INV DATA, Section 0035, 01/09/08, 09:48:33

Weather Conditions: 40°F Wind: 10 mph 235° Start Odo.: 482 End Odo.: 493

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 157.9m
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 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec^2)	AVG. DECEL (m/sec^2)
1	146.29	82	78	38	40	93.2	93.2	478.71	367.71	15.64	8.19
2	146.14	86	81	40	34	94.7	94.9	479.11	388.16	13.72	8.37
3	146.75	77	83	41	46	97.6	96.9	483.98	382.05	14.07	8.17
4	146.54	79	87	33	40	91.1	90.7	465.66	381.56	13.96	8.13
5	147.01	74	84	31	36	88.1	87.2	483.14	370.97	14.26	8.39
6	145.95	84	89	29	34	94.0	94.3	469.86	387.54	15.20	8.12

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: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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Date Tested: 01/09/08

DATA SHEET 16 - ANTILOCK FUNCTIONAL FAILURE AT LLVW

Testing Conditions: INV DATA, Section 0040, 01/09/08, 11:18:31

Weather Conditions: 41°F Wind: 12 mph 261° Start Odo.: 493 End Odo.: 493

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 ($AE 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	99.71	88	92	42	43	55.3	55.6	90.75	70.23	9.40	6.34
2	100.08	77	77	32	36	51.0	51.0	135.56	47.23	10.86	6.99
3	99.39	89	90	38	40	62.9	63.6	97.90	68.82	8.69	5.88
4	99.12	91	92	38	40	51.7	52.7	120.30	48.39	9.83	6.71
5	99.72	86	83	36	38	60.7	61.1	101.81	75.15	9.21	6.26
6	100.08	86	83	37	38	48.7	48.7	148.42	48.59	10.90	7.05

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 10 AMP FUSE FROM FUSEBOX UNDER LEFT SIDE OF HOOD.

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

Vehicle equipped with an ABS integral 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: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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Date Tested: 01/09/08

DATA SHEET 18 - HYDRAULIC CIRCUIT FAILURE #1 AT LLVW

Testing Conditions: INV DATA, Section 0050, 01/09/08, 14:17:37

Weather Conditions: 44°F Wind: 11 mph 240° Start Odo.: 496 End Odo.: 499

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

System Portion Failed: RF & LR

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 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	99.71	78	25	20	49	93.0	93.5	474.61	368.75	9.49	3.92
2	100.12	97	19	17	49	94.2	94.0	488.95	399.14	9.66	3.94
3	99.57	92	17	15	47	91.4	92.2	490.48	386.08	8.90	4.04
4	99.13	77	16	14	36	92.9	94.5	496.02	381.33	8.84	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: 69

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: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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Date Tested: 01/10/08

DATA SHEET 19 - HYDRAULIC CIRCUIT FAILURE #2 AT LLVW

Testing Conditions: INV DATA, Section 0055, 01/10/08, 08:47:41

Weather Conditions: 36°F Wind: 7 mph 92° Start Odo.: 508 End Odo.: 511

Method of simulating failure: Disconnected Brake Line @ M/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 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 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	99.88	18	84	49	22	94.7	95.0	467.41	323.79	8.69	3.84
2	99.93	15	85	46	18	93.8	93.9	466.23	373.94	9.10	3.98
3	99.26	12	91	47	15	92.4	93.8	469.05	395.87	9.15	3.90
4	99.49	11	91	43	12	89.8	90.8	491.05	398.94	8.58	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: 69

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: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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Date Tested: 01/10/08

DATA SHEET 20 - HYDRAULIC CIRCUIT FAILURE #1 AT GVWR

Testing Conditions: INV DATA, Section 0060, 01/10/08, 13:16:23

Weather Conditions: 45°F Wind: 10 mph 106° Start Odo.: 521 End Odo.: 524

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

System Portion Failed: RF & LR

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 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	99.41	92	26	21	60	108.9	110.2	487.91	396.91	7.88	3.45
2	100.06	82	18	16	51	104.1	104.0	470.48	380.67	8.07	3.50
3	99.73	91	17	16	65	102.0	102.6	485.54	365.78	9.19	3.54
4	99.51	87	15	13	62	100.2	101.1	469.89	370.38	9.12	3.60

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: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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Date Tested: 01/10/08

DATA SHEET 21 - HYDRAULIC CIRCUIT FAILURE #2 AT GVWR

Testing Conditions: INV DATA, Section 0065, 01/10/08, 10:21:00

Weather Conditions: 41°F Wind: 11 mph 109° Start Odo.: 514 End Odo.: 518

Method of simulating failure: Disconnected Brake Line @ M/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 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 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	99.69	13	78	41	16	107.4	108.1	490.66	379.18	7.39	3.55
2	98.82	12	90	49	15	103.1	105.6	496.22	420.36	9.03	3.60
3	99.80	12	85	44	12	102.9	103.3	512.37	403.76	7.47	3.58
4	100.00	13	84	43	11	101.9	101.9	471.57	393.10	8.45	3.51

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: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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Date Tested: 01/10/08

DATA SHEET 22 - ANTILOCK FUNCTIONAL FAILURE AT GVWR

Testing Conditions: INV DATA, Section 0070, 01/10/08, 14:54:39

Weather Conditions: 44°F Wind: 14 mph 129° Start Odo.: 526 End Odo.: 526

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 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	100.17	84	61	38	59	64.5	64.3	228.64	61.60	8.87	5.97
2	100.57	79	58	37	55	67.7	66.9	213.38	64.22	9.04	5.88
3	99.49	96	77	48	66	72.1	72.8	100.57	77.30	8.31	5.41
4	99.32	98	78	49	67	63.4	64.3	87.88	50.62	8.70	6.02
5	99.76	94	78	48	61	60.4	60.7	84.52	50.89	9.32	6.22
6	100.54	95	81	46	58	67.0	66.3	113.97	86.47	8.48	5.75

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 10 AMP FUSE FROM FUSEBOX UNDER LEFT SIDE OF HOOD.

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

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

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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Date Tested: 01/11/08

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

Testing Conditions: INV DATA, Section 0080, 01/11/08, 09:03:08

Weather Conditions: 38°F Wind: 19 mph 244° Start Odo.: 530 End Odo.: 536

Failure Simulation: Disconnect primary source of power.

Method of rendering inoperative: Removed Engine Vacuum Hose at Booster

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 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	99.59	72	72	42	46	161.1	162.5	496.22	460.39	3.68	2.54
2	99.18	83	82	50	48	160.8	163.4	493.40	462.94	3.85	2.54
3	99.31	82	83	43	35	152.2	154.3	492.69	465.14	3.99	2.65
4	100.26	95	96	55	47	150.9	150.1	491.40	465.93	3.88	2.63
5	100.15	88	87	49	43	149.6	149.2	503.47	470.08	3.72	2.67
6	99.90	76	76	39	36	153.1	153.4	484.48	459.70	3.88	2.64

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: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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Date Tested: 01/11/08

DATA SHEET 25 - PARKING BRAKE AT GVWR

Testing Conditions: INV DATA, Section 0085, 01/11/08, 10:53:00
Parking brake: AUTOMATIC TR Non-service type: FOOT-OPERATED Service type: N/A

Weather Conditions: 36°F Wind: 13 mph 246° Start Odo.: 540 End Odo.: 541

Test Weight: Total:1941kg Front: 982kg Rear: 959kg

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	59.9	374.5	26	23	24.7	- 0 REAPPLY	UPHILL	HOLDS	20%
2	47.5	399.3	20	20	20.0	- 0 REAPPLY	DOWNHILL	HOLDS	20%

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

Comments: See Appendix C.

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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Date Tested: 01/16/08

DATA SHEET 26 - HEATING SNUBS AT GVWR

Testing Conditions: INV DATA, Section 0090, 01/16/08, 13:41:11

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 WOT to initial speed.

Performance Requirements:
Initial IBT 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 IBT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)	INIT SPD (kph)
1	3.00	--NA--	37.59	58	59	37	41	118.49
2	2.80	46	28.49	98	101	69	74	120.85
3	2.69	46	26.66	134	141	99	102	120.68
4	3.08	44	23.27	163	174	123	124	120.59
5	2.95	46	27.05	184	203	144	142	121.52
6	2.83	44	22.77	202	224	165	162	120.90
7	2.51	45	23.44	214	239	184	182	120.70
8	2.93	46	27.72	223	249	203	202	120.59
9	2.78	44	25.52	242	268	221	223	121.60
10	3.13	46	26.46	258	278	238	241	120.20
11	2.74	44	21.93	270	290	251	254	120.42
12	2.82	47	26.78	277	301	262	264	119.13
13	2.68	43	25.47	279	304	271	273	119.26
14	2.79	45	26.76	279	309	278	279	120.97
15	3.31	45	24.68	278	311	284	285	120.47

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	SOUTH	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: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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Date Tested: 01/16/08

DATA SHEET 27 - HOT PERFORMANCE AT GVWR

Testing Conditions: INV DATA, Section 0095, 01/16/08, 13:52:15

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: 6
Initial speed of stop: 99.84 (kph)
Actual distance of stop: 50.2 (meter)
Average pedal force: 366.8 (N)

Performance Requirements:
Stop Number 1 must be less than: **77.0 (meter)**
In addition the stopping distance for at least one of the of the two hot stops must be less than: **89 (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 (SAE 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	98.58	287	323	293	293	46.3	47.6	402.40	254.23	13.38	7.54
2	99.85	306	351	304	307	48.3	48.4	458.78	285.69	12.92	7.44

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 EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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Date Tested: 01/16/08

DATA SHEET 28 - BRAKE COOLING STOPS AT GVWR

Testing Conditions: INV DATA, Section 0100, 01/16/08, 13:55:36

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/sec^2)	AVG. PEDAL FORCE (N)	LEFT FRONT IBT (°C)	RIGHT FRONT IBT (°C)	LEFT REAR IBT (°C)	RIGHT REAR IBT (°C)
1	50.73	3.30	31.87	279	322	267	271
2	50.32	2.80	26.04	241	270	226	229
3	51.33	2.85	30.89	212	231	198	202
4	51.57	2.86	28.36	182	202	177	179

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

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

Vehicle: 2008 NISSAN MOTOR CO NHTSA NUMBER: C85200
Make: NISSAN
Model: ALTIMA 2.5S
Body Style: 4-DOOR SEDAN
Front Cold Tire Pressure: 221 (Kpa)
Rear Cold Tire Pressure: 221 (Kpa)

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Date Tested: 01/16/08

DATA SHEET 29 - RECOVERY PERFORMANCE AT GVWR

Testing Conditions: INV DATA, Section 0105, 01/16/08, 14:03:12

Weather Conditions: 29°F Wind: 13 mph 168° Start Odo.: 548 End Odo.: 566

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: **67.4 (meter)**
Lower limit of corrected stopping distance: **36.8 (meter)**

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:Stop6
Initial speed of stop: 99.84 (kph)
Actual distance of stop: 50.2 (meter)
Average pedal force: 366.8 (N)

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 299) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	98.25	157	184	166	165	48.2	50.0	292.41	175.42	12.75	7.25
2	99.51	178	207	188	191	47.1	47.6	470.28	317.78	13.07	7.26

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

DATA INDICATES COMPLIANCE: YES (X) NO ( )

Driver: KAREN EASTERDAY Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 01/22/08
Approving Laboratory Official: RANDY LANDES Date: 01/24/08

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

VEHICLE: 2008 Nissan Altima 2.5S NHTSA NO.: C85200 DATE: 01/18/08

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: 2008 Nissan Altima 2.5S; NHTSA NO.: C85200; GVWR: 1941 kg
MASTER CYLINDER RESERVOIR:

DATE	01/17/08	Requirements	Pass	Fail
Reservoir Compartments (S5.4.1)				
(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			
Reservoir Capacity (S5.4.2)				
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)	262 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	143.1 ml*			

Comments: None.

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

VEHICLE: 2008 Nissan Altima 2.5S; NHTSA NO.: C85200; GVWR: 1941 kg

MASTER CYLINDER RESERVOIR:

DATE	01/18/08	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 Subsystem No. 1.	23 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)	24 ml			
Fluid displaced per stroke, Subsystem No. 1.	7.7 ml			
Fluid displaced per stroke, Subsystem No. 2.	8.0 ml			
Fluid available in partial compartment Subsystem No. 1	31 ml		X	
Fluid available in partial compartment Subsystem No. 2	50 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 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 top of the filler cap 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: 2008 Nissan Altima 2.5S ; NHTSA NO.: C85200; DATE: 01/17/08

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: Lower left quadrant 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?	Yes			
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) 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. Values: **69 ml** or cc.	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			
E. *For a vehicle with electrically-actuated service brakes, failure of the source of electric power to the brakes or diminution of state of charge of the batteries.*	NA NA			
F. *For a vehicle with electric transmission of the service brake control signal, failure to a brake control circuit.*	NA			
G. *For an EV with RBS that is part of the service brake system failure of RBS.*	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. NA			

Comments: None.

Technician: K. Easterday

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

VEHICLE: 2008 Nissan Altima 2.5S; NHTSA NO.: C85200; DATE: 01/17/08

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"? (With one symbol above.)	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__Lens – Black, Letters – Yellow. Does indicator say "Antilock" or "ABS" or "Brake Proportioning"? Record wording_"ABS". 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_____ 6. *If separate indicator for RBS, the letters and background shall be of contrasting colors, one of which is yellow. The indicator shall be labeled "RBS". RBS failure in a system which is part of the service brake system may also be indicated by a yellow lamp that also indicates "ABS" failure and displays the symbol "ABS/RBS." Record wording*:_____ 7. For any other function? If yes, Record_____NA_____	NA NA Yes Yes NA NA NA		

DATA INDICATES COMPLIANCE: YES__X___ NO_____

Comments: None.
Technician: K. Easterday

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

VEHICLE: 2008 Nissan Altima 2.5S; NHTSA NO.: C85200; DATE: 01/18/08

BRAKE		LINING		
LOCATION	**TYPE**	**DESCRIPTION**	**MINIMUM THICKNESS**	**THICKNESS TO FULLY WORN (1) mm***
Left Front	Drum	Leading	Pre-test 10.97 mm	0
		Primary	Post Test 10.06 mm	
		Inboard X	Δ 0.91 mm	
	Disc X	Trailing	Pre-test 10.95 mm	0
		Secondary	Post Test 10.31 mm	
		Outboard X	Δ 0.66 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): 57.15 mm (x1 piston).		
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 8.08 mm	0
		Primary	Post Test 7.72 mm	
		Inboard X	Δ 0.36 mm	
	Disc X	Trailing	Pre-test 7.98 mm	0
		Secondary	Post Test 7.70 mm	
		Outboard X	Δ 0.28 mm	
LINING CLEARANCE:	Diametrical (2) N/A	Inboard – Approx 0 mm.	Outboard – Approx 0 mm.	
WHEEL CYLINDER DIAMETER (3): NA mm		CALIPER PISTON DIAMETER (3): 34.87 mm (x1 piston).		
SHOE CAGE DIAMETER (4): NA mm		CENTER POINT OF BRAKE ASSY TO CENTER PT. OF W.C.: NA mm		
CIRCUIT #1 CONSISTS OF:	LF	LR – X	RF – X	RR
CIRCUIT #2 CONSISTS OF:	LF – X	LR	RF	RR – X
(1) MFRS. RECOMMENDATIONS – FRONT and REAR: NA mm. (2) REAR -NA mm FRONT – NA mm				
(2) DRUM BRAKES, MEASURED AT HORIZONTAL CENTERLINE: RR drum ID: NA mm.				
(3) MFRS. DATA: FRONT – NA mm, REAR – NA mm. (4) RESET POSITION: NA mm.				

Comments: No manufacturer's data provided. Zero mm "fully worn thickness" utilized as a default.

Technician: K. Easterday

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

Vehicle: 2008 Nissan Altima 2.5S; NHTSA No.: C85200; Date: 01/16/08

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 = 10.97 mm
Δt_o = 10.95 mm
$t_{ic} + t_{oc}$ = 0 mm
D = 57.15 mm

$$V_r = (10.97 + 0 + 10.95 + 0) \frac{\pi (57.15)^2}{4}$$

$$= 21.92 (2565.2)$$
$$= 56229.3 \text{ mm}^3 = 56.2 \text{ ml}$$

Disc Brake: (Rear)

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

Δt_i = 8.08 mm
Δt_o = 7.98 mm
$t_{ic} + t_{oc}$ = 0 mm
D = 34.87 mm

$$V_r = (8.08 + 0 + 7.98 + 0) \frac{\pi (34.87)^2}{4}$$

$$= 16.06 (955.0)$$
$$= 15337.0 \text{ mm}^3 = 15.3 \text{ ml}$$

For System 1 (RF, LR)

$V_{r1} = 56229 \text{ mm}^3 + 15337 \text{ mm}^3 = 71566 \text{ mm}^3$
$V_{r1} = 71566 \text{ mm}^3 = (71.6 \text{ ml})$

For System 2 (LF, RR)

$V_{r2} = V_{r1}$
$V_{r2} = 71566 \text{ mm}^3 = (71.6 \text{ ml})$

TOTAL VOLUME REQUIRED = $V_t = V_{r1} + V_{r2} = 143132 \text{ mm}^3 = 143.1 \text{ ml}$*

Section 6.0

Photographs

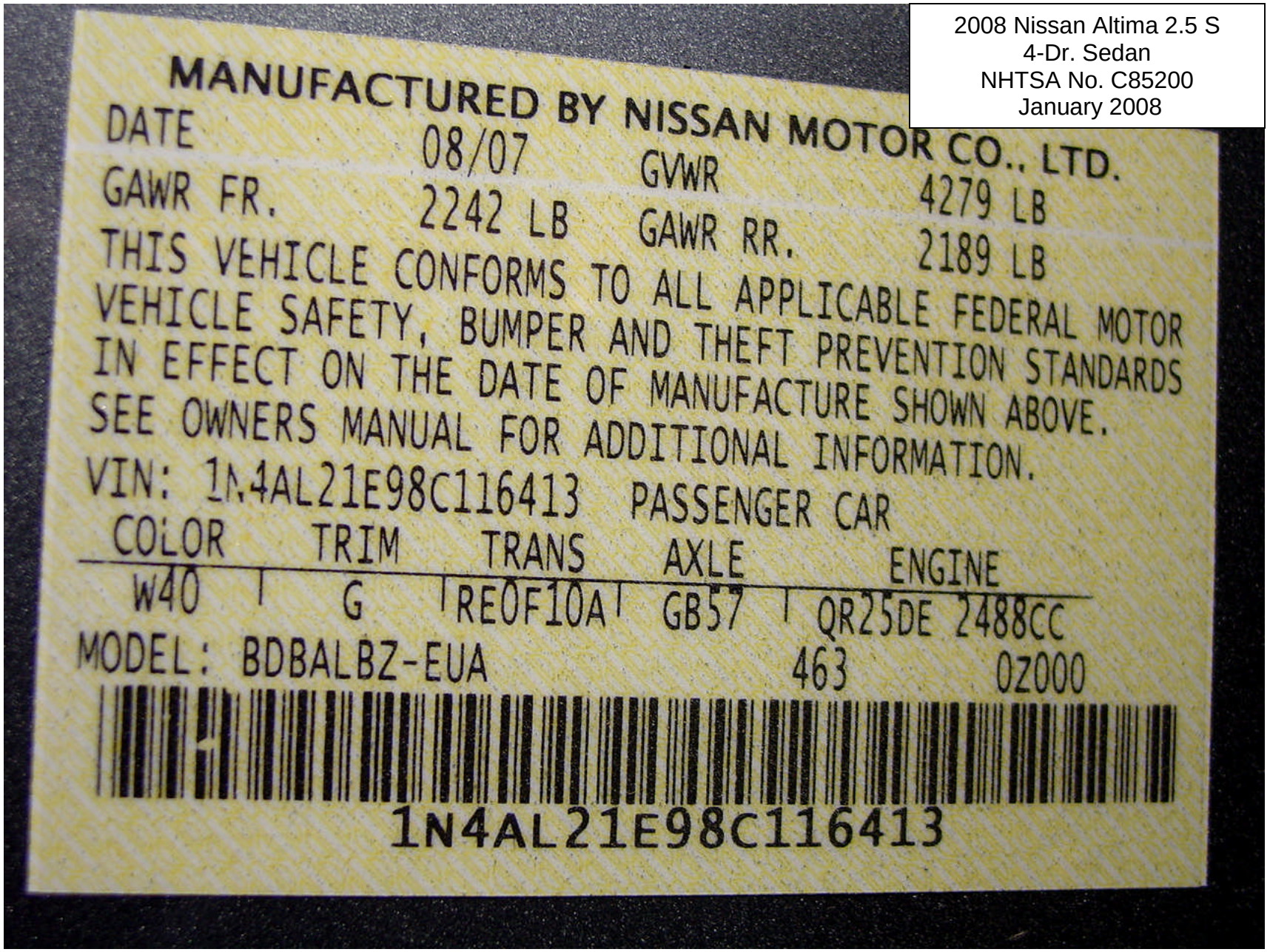
2008 Nissan Altima 2.5 S
4-Dr. Sedan
NHTSA No. C85200
January 2008

Left Front 3/4 View

2008 Nissan Altima 2.5 S
4-Dr. Sedan
NHTSA No. C85200
January 2008

Right Rear 3/4 View

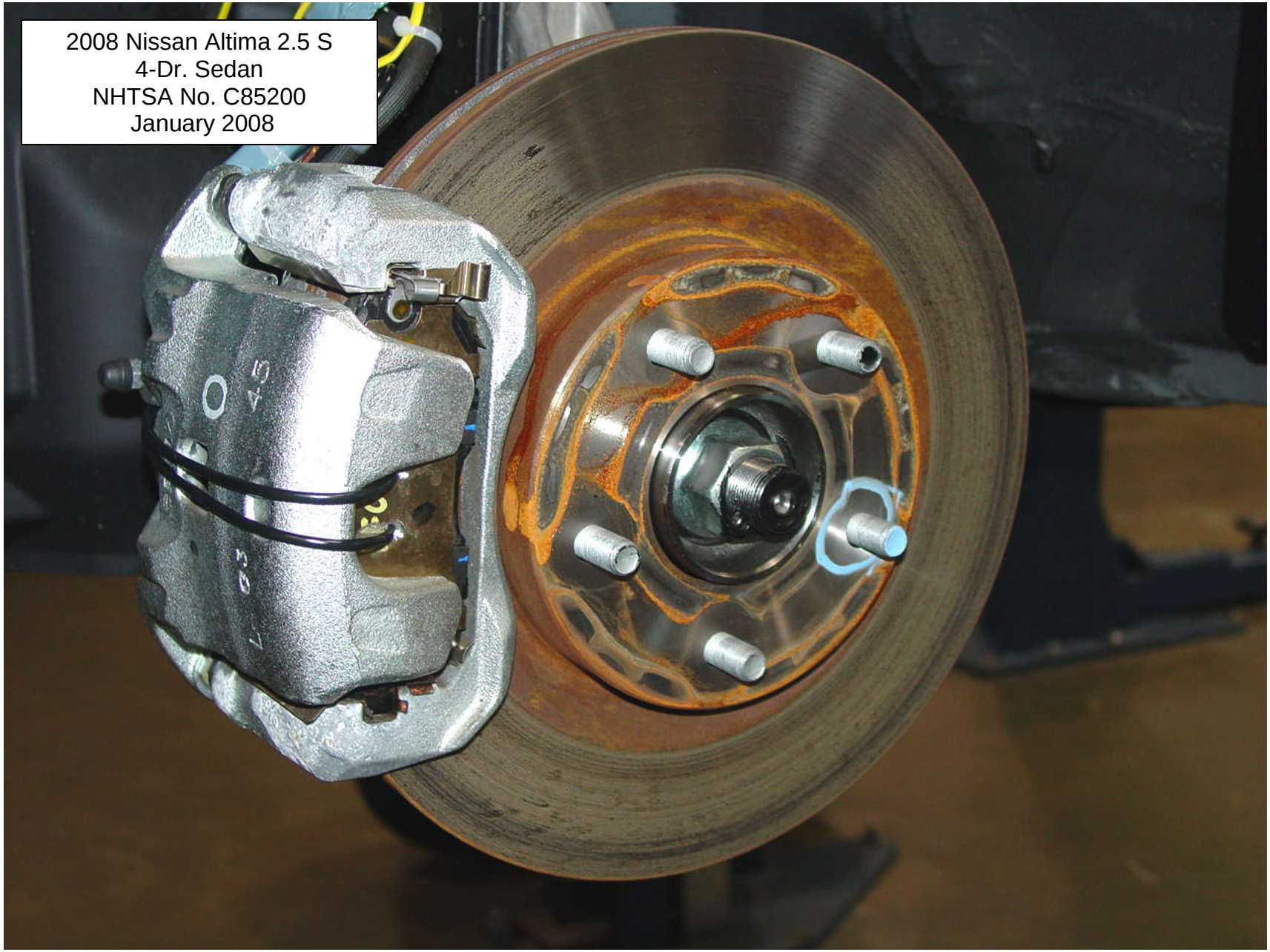
2008 Nissan Altima 2.5 S
4-Dr. Sedan
NHTSA No. C85200
January 2008



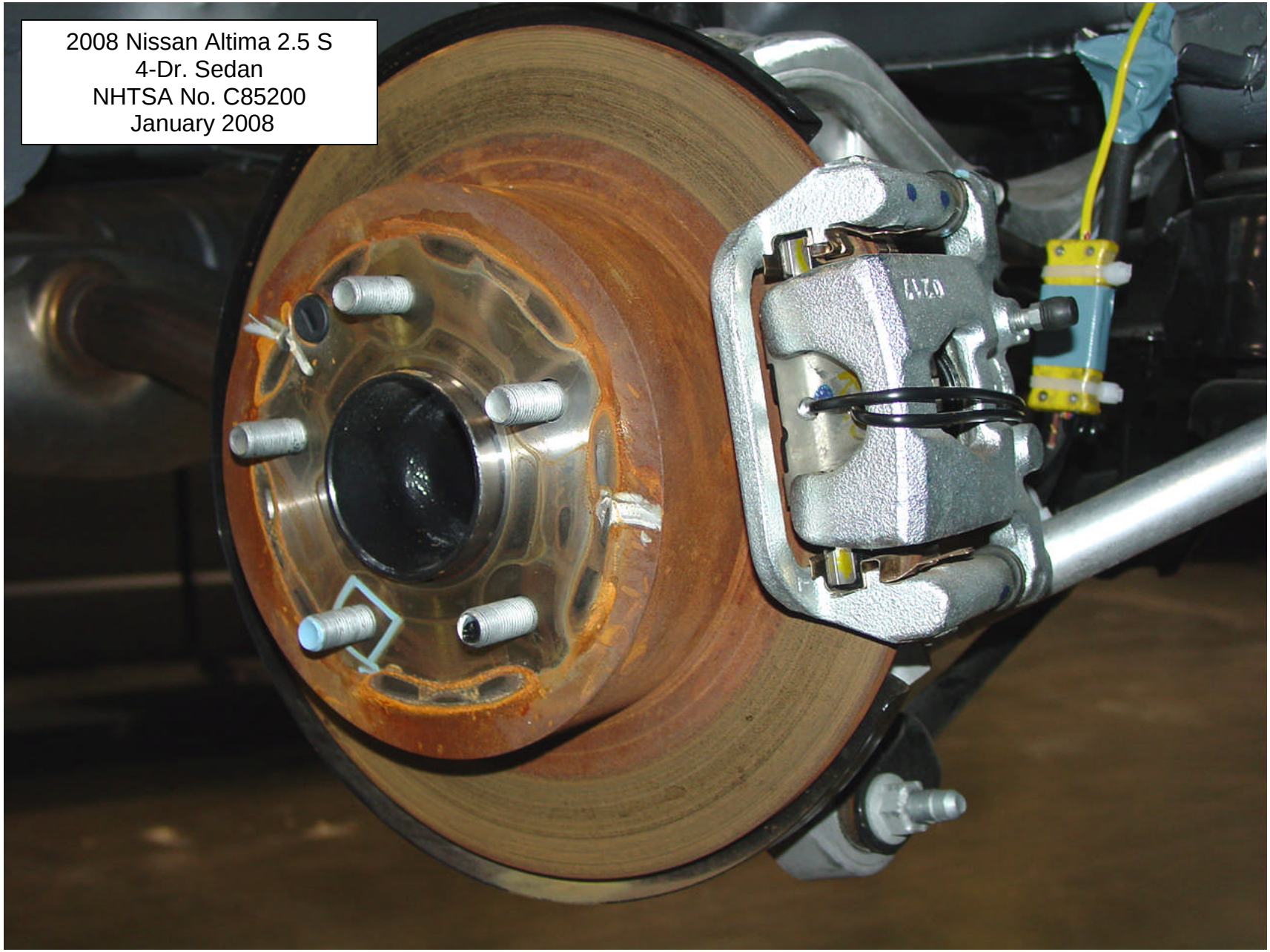
Vehicle Certification Placard

2008 Nissan Altima 2.5 S
4-Dr. Sedan
NHTSA No. C85200
January 2008

Vehicle Tire Information Label



Left Front Thermocouple Installation



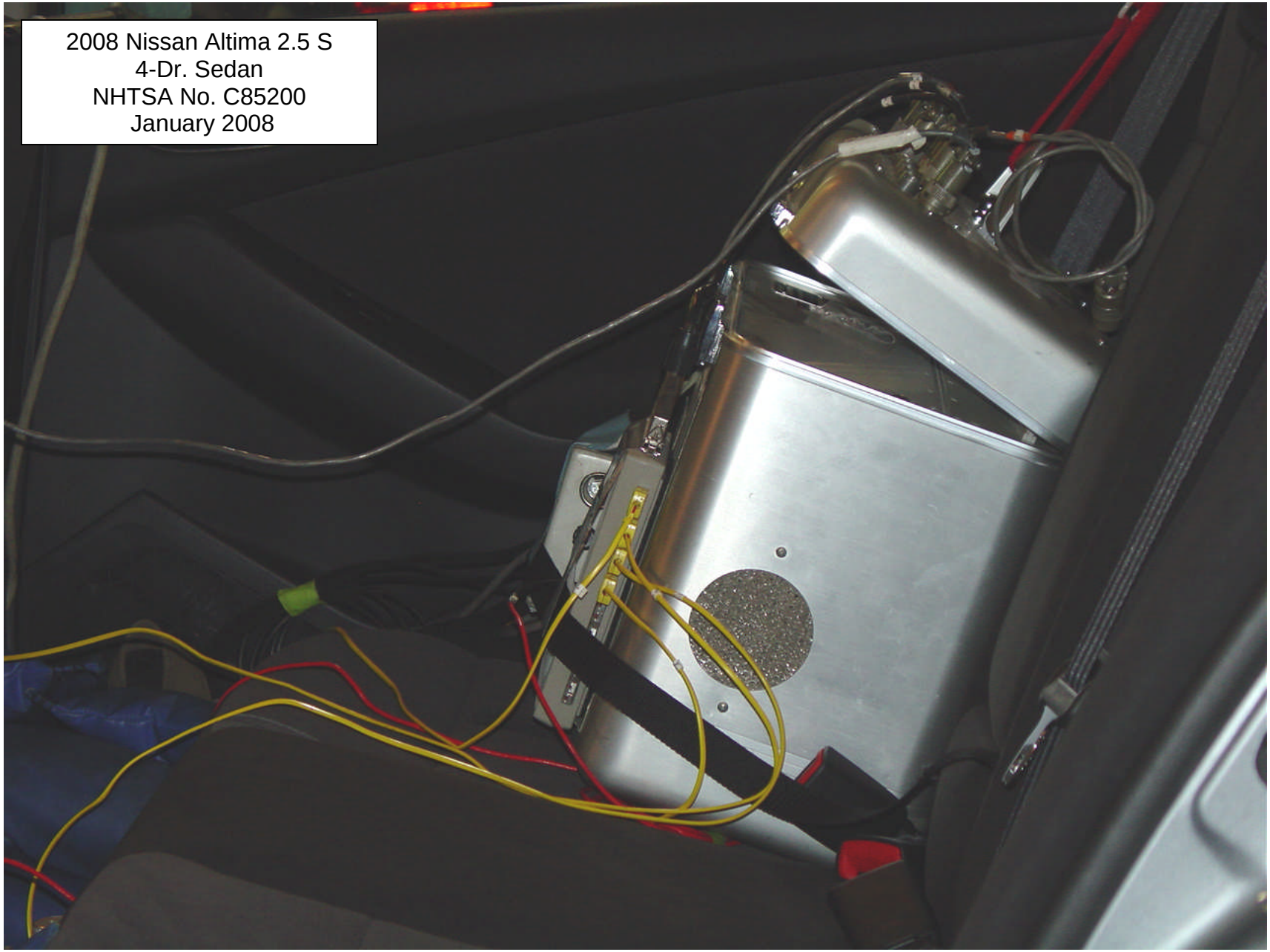
Right Rear Thermocouple Installation

2008 Nissan Altima 2.5 S
4-Dr. Sedan
NHTSA No. C85200
January 2008

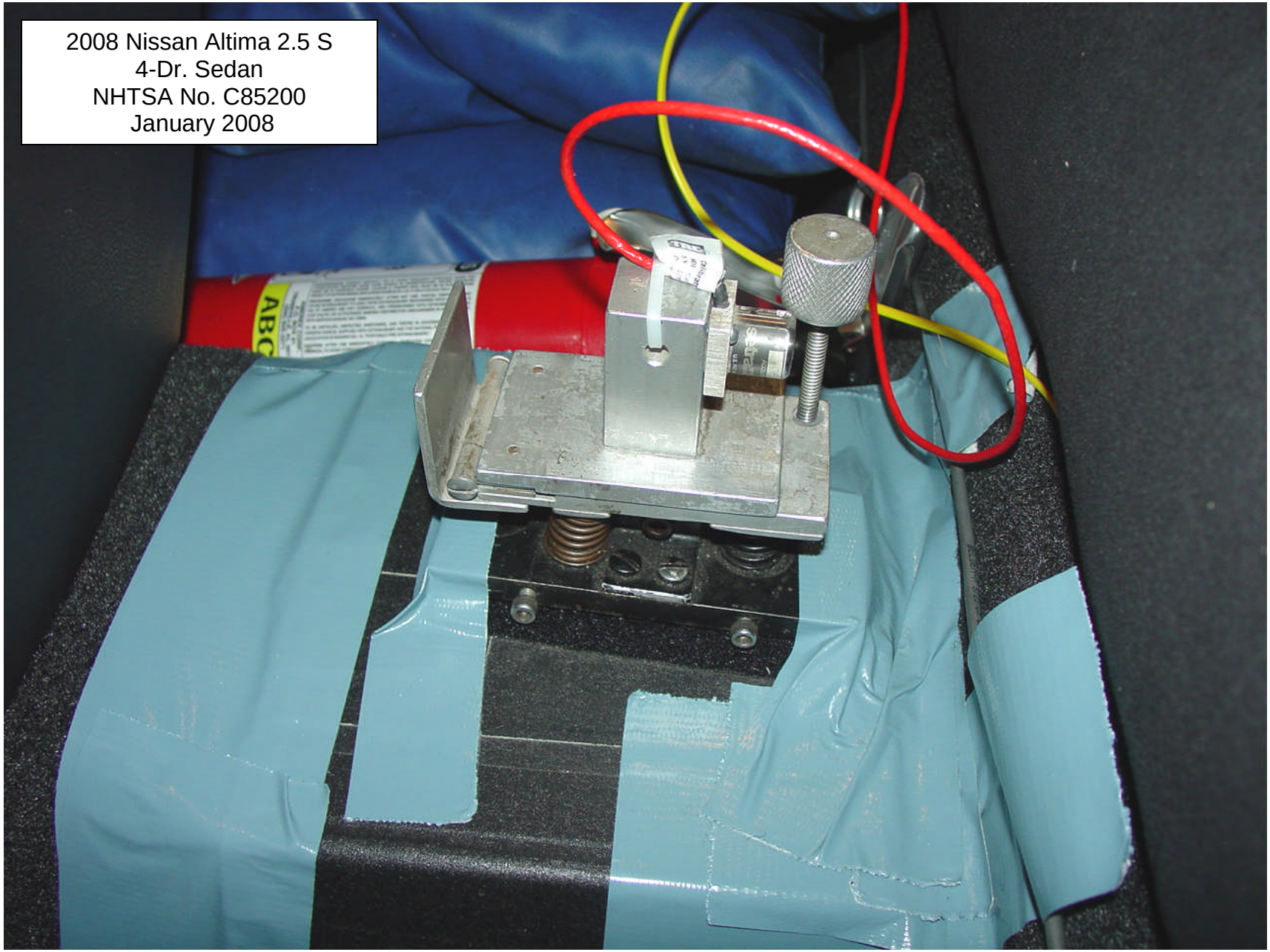
Test Instrumentation in Vehicle

2008 Nissan Altima 2.5 S
4-Dr. Sedan
NHTSA No. C85200
January 2008

Test Instrumentation in Vehicle



Test Instrumentation in Vehicle



Test Instrumentation in Vehicle

Test Instrumentation in Vehicle

Vehicle Being Weighed

Ballast in Vehicle

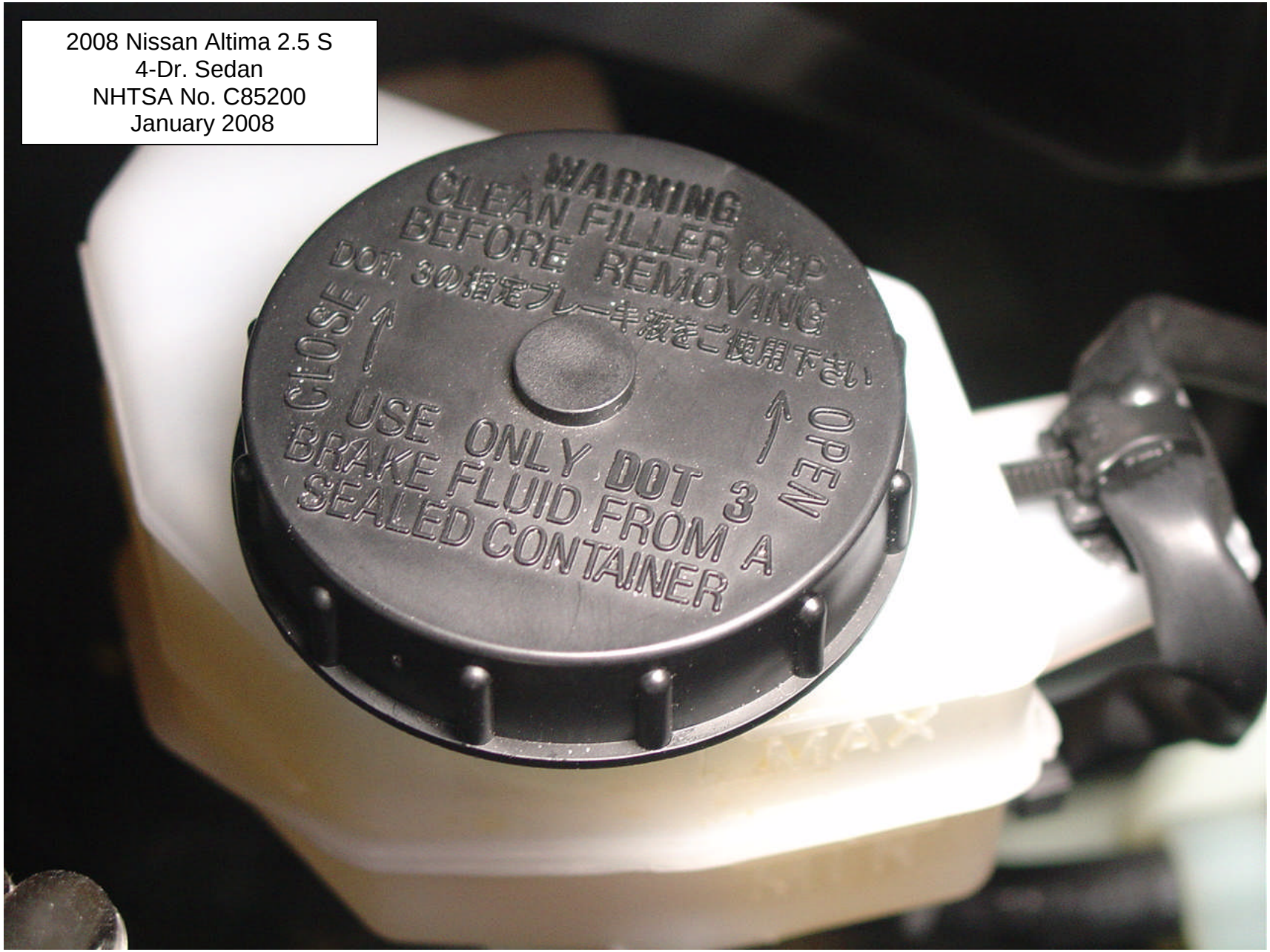
Ballast in Vehicle

Ballast in Vehicle

Ballast in Vehicle

Brake System Indicators (Warning) and (ABS) Lamps

2008 Nissan Altima 2.5 S
4-Dr. Sedan
NHTSA No. C85200
January 2008

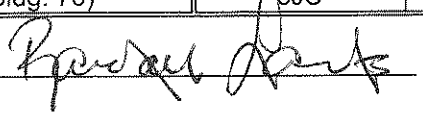


Brake Fluid (Master Cylinder) Reservoir Warning Label

7.0 INSTRUMENT CALIBRATION (12 MONTH MAXIMUM INTERVAL)

VEHICLE: 2008 Nissan Altima 2.5S ; NHTSA NO.: C85200; DATE: 01/18/08

INSTRUMENT	SERIAL NUMBER	CALIBRATION DATE	NEXT CALIBRATION
Data Acquisition System - Link DAS 2082	975016	07/17/07	07/17/08
Computer – Dell/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 – Fisher Scientific (Heating Snubs)	SN-97216633	08/21/07	08/21/08
Stopwatch – Accusplit (Daily Cals)	SW ST03	08/21/07	08/21/08
Tire Pressure Gauge – WIKA	AG-101	12/11/07	03/11/08
Pedal Force Transducer – Sensor Devel	169755	Each Test	Each Test
Asst. Pipe-Handle Steel Weights - Ohaus	LB-0001	05/05/07	05/05/08
Park Brake Force Transducer – Lebow	LC-42631	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	140.0229	Each Test	Each Test
Wind Velocity/Direct. – Davis Model 6410	070321N03	03/21/07	03/21/08
Ambient Temp. Gage–Davis Mod. 6150C	070321N01	03/21/07	03/21/08
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	11/09/07	02/09/08

QUALITY ASSURANCE 

DAILY CALIBRATIONS (1 of 3)

Vehicle: 2008 Nissan Altima 2.5S NHTSA No.: C85200

Deceleration Calibration Data for Unit 8354
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	12/13/2007	11:50:06	9.76	0.00	PRE-TEST CAL.
		12/31/2007	9:11:21	9.80	0.02	
		1/4/2008	8:25:04	9.77	0.01	
		1/4/2008	14:18:29	9.74	-0.01	
		1/8/2008	9:52:19	9.73	0.07	
		1/9/2008	8:31:21	9.81	0.01	
		1/9/2008	15:01:01	9.96	-0.01	
		1/10/2008	8:34:34	9.82	0.01	
		1/10/2008	15:34:22	9.88	0.00	
		1/11/2008	8:45:40	9.74	0.08	
		1/16/2008	13:22:25	9.76	0.09	
		1/16/2008	14:15:33	9.68	0.02	
		1/17/2008	8:59:26	9.82	-0.04	POST-TEST CAL.

Pre-Test Linearity Check 12/13/2007

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 01/16/2008

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 8354
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	12/31/2007	9:03:44	1000.2
		1/4/2008	14:20:41	1000.0
		1/8/2008	10:00:27	999.9
		1/9/2008	8:55:03	999.7
		1/9/2008	15:07:53	999.3
		1/10/2008	8:42:18	999.0
		1/10/2008	15:39:15	999.3
		1/11/2008	8:53:51	999.8
		1/16/2008	13:28:24	1000.0
		1/16/2008	14:22:07	1000.4

DAILY CALIBRATIONS CONTINUED (2 of 3)

Vehicle: 2008 Nissan Altima 2.5S NHTSA No.: C85200

Wheel Tachometer Calibrations for Unit 8354

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	1/8/2008	9:55:20	0.0	14.8	0.0	15.8	0.0	16.3	0.0	16.2	PRE-TEST CAL
		1/9/2008	8:35:18	0.0	14.8	0.0	15.9	0.0	16.1	0.0	16.3	
		1/9/2008	15:03:47	0.0	15.0	0.0	15.9	0.0	16.3	0.0	16.2	
		1/10/2008	8:37:34	0.0	14.9	0.0	15.8	0.0	16.1	0.0	16.2	
		1/10/2008	15:36:37	0.0	14.8	0.0	15.6	0.0	16.3	0.0	16.1	
		1/11/2008	8:49:32	0.0	15.8	0.0	16.7	0.0	17.3	0.0	17.3	
		1/16/2008	13:24:17	0.0	14.9	0.0	15.9	0.0	16.4	0.0	16.4	
		1/16/2008	14:17:56	0.0	14.8	0.0	15.7	0.0	16.2	0.0	16.2	POST-TEST CAL

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

Pedal Force Meter Calibration for Unit 8354

Target shunt calibration is 389 N

Desired recorded value is: 389 N

Desired recorded actual force calibration check 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.	12/13/2007	11:40:51	0.0	498.5	PRE-TEST CAL.
		12/31/2007	9:09:30	-0.4	389.6	
		1/4/2008	8:23:32	-0.3	389.5	
		1/4/2008	14:17:26	-0.2	389.5	
		1/8/2008	9:50:37	-0.4	389.1	
		1/9/2008	8:32:03	-0.2	389.4	
		1/9/2008	15:02:19	-0.1	389.5	
		1/10/2008	8:33:31	-0.2	389.2	
		1/10/2008	15:35:26	-0.1	389.3	
		1/11/2008	8:46:04	-0.2	389.4	
		1/16/2008	13:21:42	-0.3	389.2	
		1/16/2008	14:14:19	0.0	389.5	
		1/17/2008	10:12:17	-4.5	502.7	PST-TEST CAL.

Pre-Test Linearity Check - 12/13/07

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

Post-Test Linearity Check - 01/16/08

Actual Force (N)	Recrdd Frc(N)
0	0
222	223
445	446
498	499

DAILY CALIBRATIONS CONTINUED (3 of 3)

Vehicle: 2008 Nissan Altima 2.5S NHTSA No.: C85200

Dynamic Speed Calibration for Unit 8354

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.	12/31/2007	9:14:17	101.0	35.93	PRE-TEST CAL
		1/4/2008	NA	NA	35.96	
		1/8/2008	9:58:16	99.9	36.25	
		1/9/2008	8:53:23	98.6	36.25	
		1/9/2008	15:05:57	100.4	36.06	
		1/10/2008	8:39:50	100.0	36.37	
		1/10/2008	15:38:06	100.6	36.40	
		1/11/2008	8:51:56	100.1	36.18	
		1/16/2008	13:26:27	100.7	36.12	
		1/16/2008	14:19:56	100.3	36.03	POST-TEST CAL

APPENDIX A

Copy of Manufacturer's Sticker

2008 ALTIMA 2.5 S

AUTOMATIC TRANSMISSION
Color: PRECISION GREY
CHARCOAL

Standard Equipment Included at No Extra Charge

MECHANICAL & PERFORMANCE
2.5-Liter DOHC 16-Valve 4-Cylinder Engine
175 Horsepower and 180 lb-ft Torque
Xtronic™ CVT (Continuously Variable Transmission)
Sequential Multi-Point Fuel Injection System
Front and Rear Stabilizer Bars
Independent Multi-Link Rear Suspension
Power Rack-and-Pinion Steering
Anti-Lock Braking System (ABS)

EXTERIOR
Dual Exhaust w/Chrome-Tipped Finishers
Dual Power Sideview Mirrors
16" Steel Wheels w/Full Wheel Covers
P215/60R16 All-Season Tires
Halogen Headlights
Body-Color Fascias & Sideview Mirrors
Body-Color Side Moldings

INTERIOR
Cloth Seat Trim
Contoured Reclining Front Bucket Seats
Trip Computer w/Outside Temperature Gauge
Vehicle Information Display
Front Console w/ sliding Armrest & Storage

COMFORT & CONVENIENCE
Intelligent Key with Push Button Ignition
Power Door Locks
Power Windows w/One-Touch Driver Auto Up/Down w/Auto Reverse Feature
AM/FM/CD Audio System w/6 Speakers
Auxiliary Audio Input Jack
Air Conditioning w/ In-Cabin Microfilter
Cruise Control w/Steering Wheel-Mounted Controls
60/40 Split Fold-Down Rear Seat w/Lock
Tilt/Telescopic Steering Column
Flat-Blade Speed-Sensitive Variable Intermittent Windshield Wipers
Front Map Lights and Sunglass Storage
Remote Trunk, Hood & Fuel Door Releases
Rear Window Defroster/Side Window Defoggers
Dual 12-Volt DC Power Outlets
Three Cup Holders in Center Console
Rear Center Armrest w/Dual Cup Holders
Driver & Passenger Seatback Pockets
Front and Rear Door Map Pockets w/ Bottle Holders
Dual Visor Vanity Mirrors

SAFETY & SECURITY
Nissan Advanced Air Bag System (AABS)
Driver & Front-Passenger Side-Impact Suppl. Air Bags
Roof-Mounted Curtain Side-Impact Suppl. Air Bags
Front Seat Belts w/Pretensioners, Load Limiters & Adjustable Upper Anchors
3-Point ALR/ELR Seat Belts for All Seating Positions (Driver ELR Only)
Child Safety Rear Door Locks
Lower Anchors & Tethers for CHildren (LATCH)
Front-Seat Active Head Restraints
Tire Pressure Monitoring System (TPMS)
Vehicle Security System
Nissan Vehicle Immobilizer System

Compare this vehicle to others in the FREE FUEL ECONOMY GUIDE available at the dealer.

These estimates reflect new EPA methods beginning with 2008 models

CITY MPG

23

Fuel Economy Information

HIGHWAY MPG

31

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

19 and 27 mpg in the city and between

26 and 36 mpg on the highway.

2008 NISSAN ALTIMA
2.5 LITERS,
4 CYLINDERS,
FUEL INJECTION,
FEEDBACK FUEL SYSTEM,
CONTINUOUSLY VARIABLE TRANSMISSION,
CATALYTIC CONVERTER,
50 STATE EMISSIONS CONTROL SYSTEM.

Estimated Annual Fuel Cost:
$1617

For Comparison Shopping,
all vehicles classified as
MIDSIZE
CARS

NOT AVAILABLE
have been issued mileage ratings
ranging from to mpg city
and to mpg hwy

see www.fueleconomy.gov

Dealer: KINGS NISSAN
9819 KINGS AUTO MALL RD
CINCINNATI OH 45249

Transport Method: TRUCK
Final Assembly Point: SMYRNA

This vehicle qualifies for Nissan's
Security+Plus Vehicle Protection Plan
The only service agreement backed by Nissan!
Ask your dealer for details, or call
1-800-NISSAN-6 for information.

2008 ALTIMA 2.5 S
VIN: 1N4AL21E98C116413
05718-116413 W40G

THE NEW BENCHMARK

Manufacturer's Suggested Retail Base Price	$20,580.00
Options Included by Manufacturer	
SPLASH GUARDS	135.00
Destination Charges	625.00
Total*	**$21,340.00**

* Does not include dealer installed options & accessories, local taxes or license fees. This label has been applied pursuant to federal law. Do not remove prior to delivery to the ultimate purchaser.

57

3673 24 DAS PB00 394978 065 000000 1

BIP20070802134259FI3673 AB10C83

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 C85200.

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.

The manufacture of the master cylinder did not allow a safe disassembly and reassembly. Additionally, manufacturer's data was unavailable. Therefore, the laboratory was unable to acquire the master cylinder piston diameter measurement. Master cylinder part numbers: bottom – 2C2554; on end – A2735, 72093, 07205, 17:26. BQM.

There was a compartment within the master cylinder reservoir of 30 ml capacity, located on the driver's side that did not deplete fluid when the front, rear and/or common compartments were evacuated. This fluid was *not* included in the reservoir's total fluid capacity.

For Date Sheet 25 – Parking Brake @ GVWR, the driver utilized all the parking brake control "travel" at or near the maximum forces stated in the report, though the maximum allowable is 500N.

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.

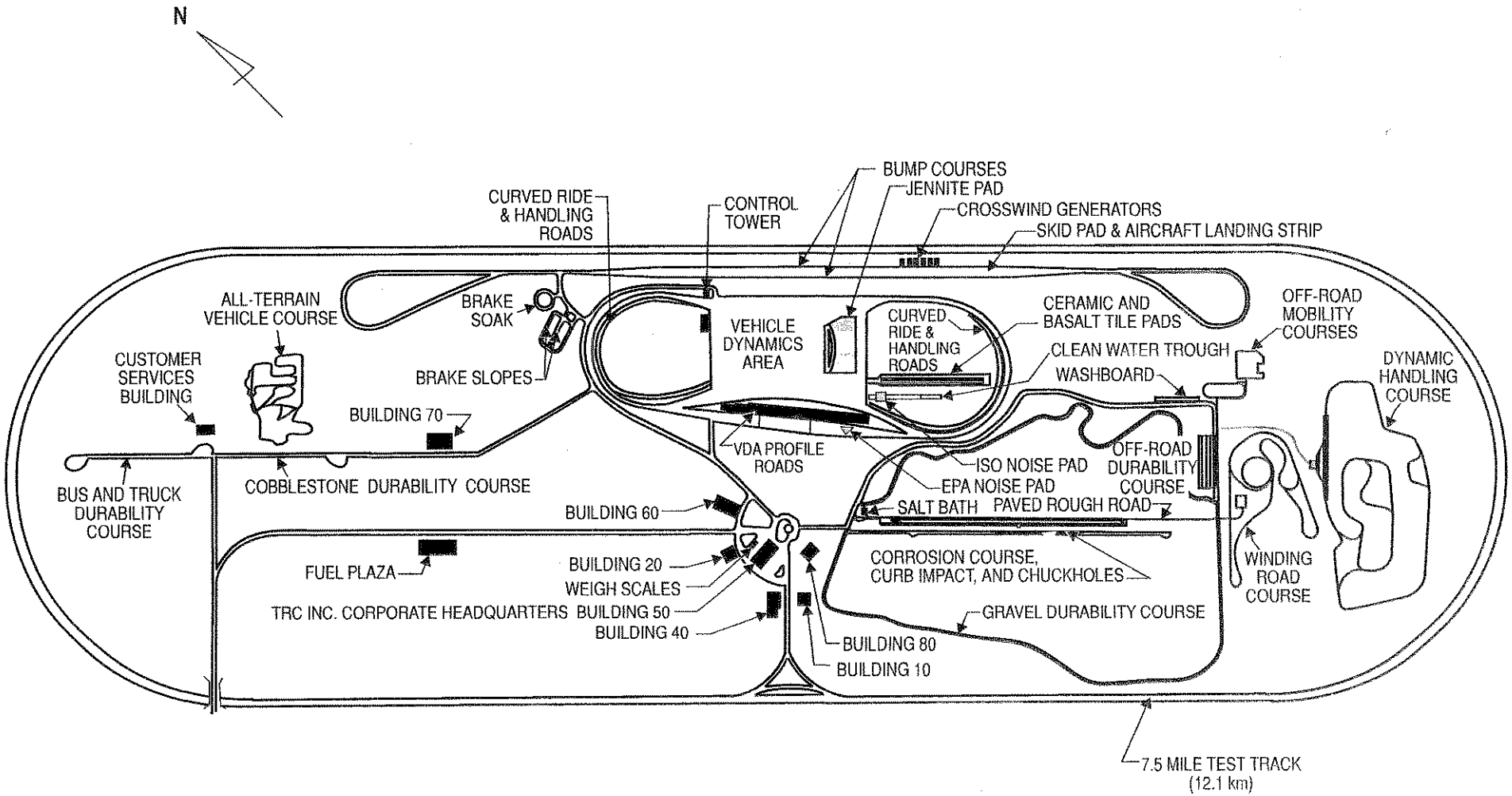
The overall dimensions of the pad are 9,000 feet by 84 feet with loops on the north and south ends. Both turnaround loops have a 309-foot radius and are 16 feet wide with a 25 percent super elevation. They will accommodate speeds of 45 mph with zero side force and 60 mph with .5 g's lateral acceleration.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

The subject test vehicle was rear wheel anti lock equipped. Rather than rapidly and fully applying the service brake control, the driver modulated the service brake control as necessary to control/prevent front wheel lock.

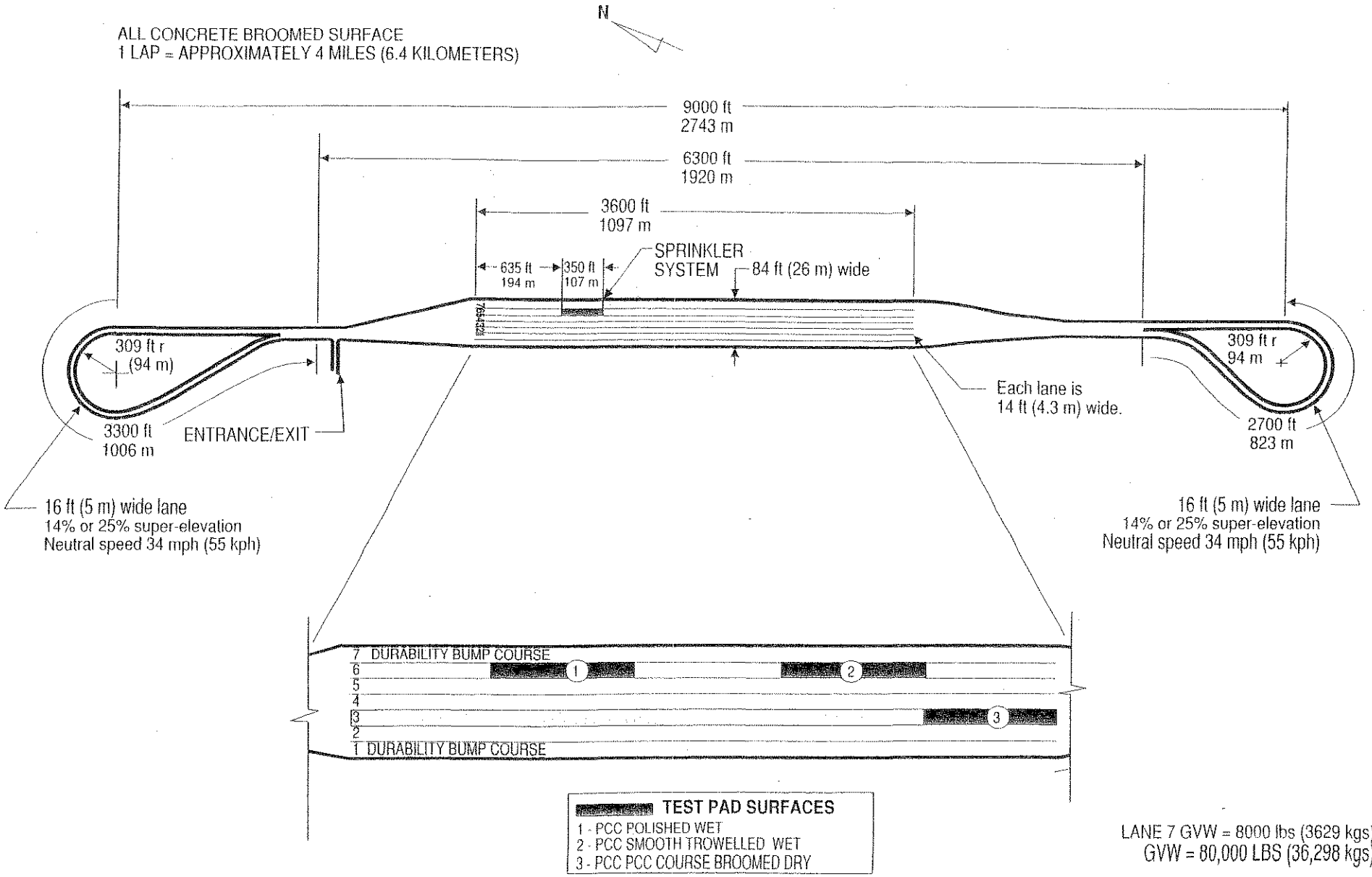


NOT TO SCALE

TEST FACILITY DETAIL

TRC®
TRANSPORTATION RESEARCH CENTER INC.
EAST LIBERTY, OHIO 43319-0367
F-15 0605

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



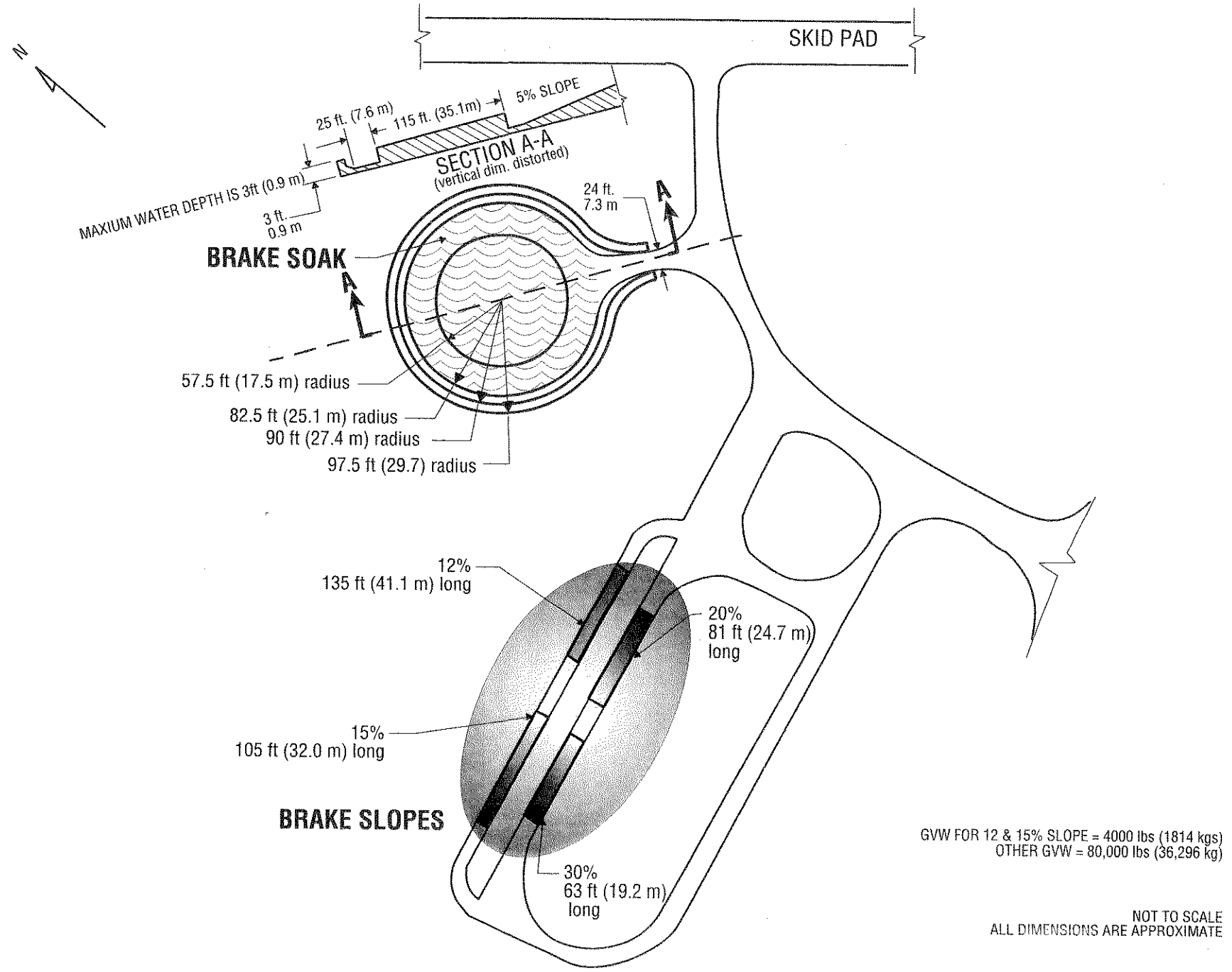
LANE 7 GVW = 8000 lbs (3629 kgs)
GVW = 80,000 LBS (36,298 kgs)

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

Not to scale
All dimensions are approximate

SKID PAD

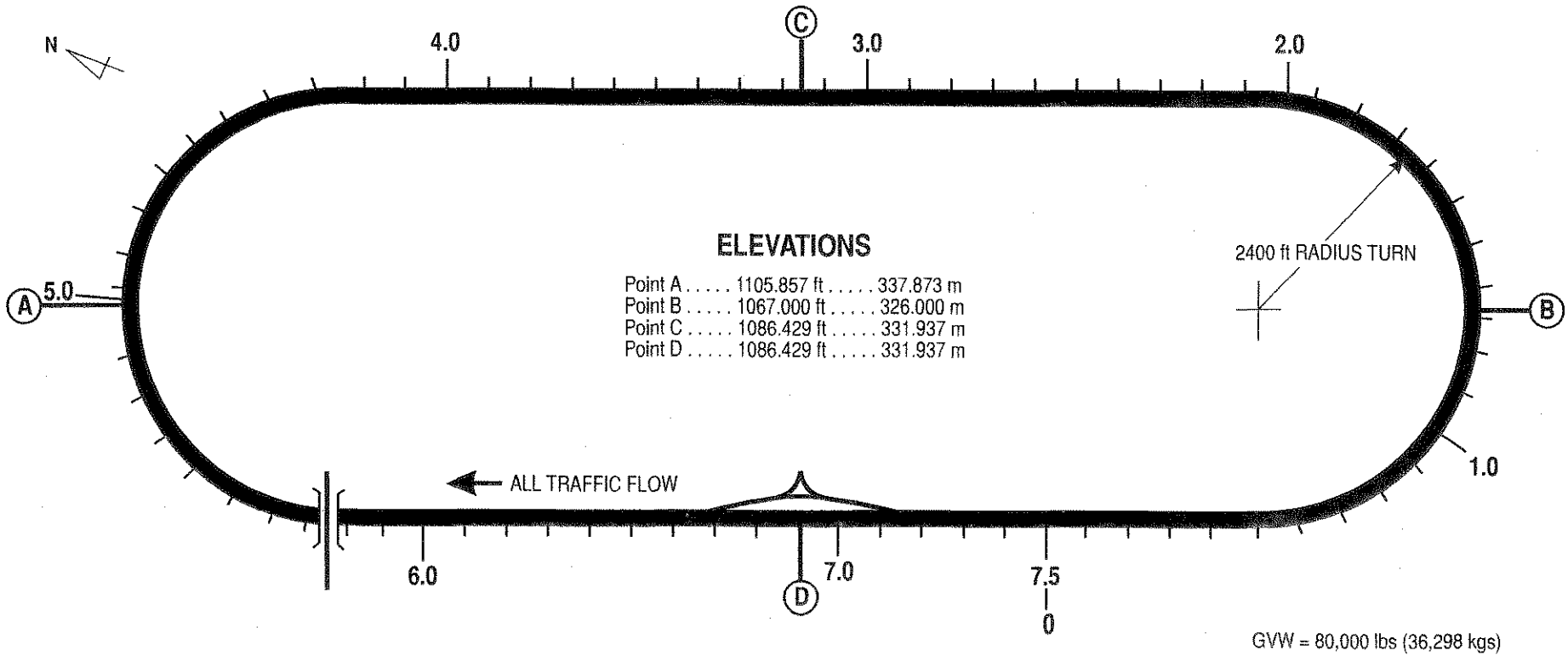
TRC®
TRANSPORTATION RESEARCH CENTER INC.
EAST LIBERTY, OHIO 43319-0367



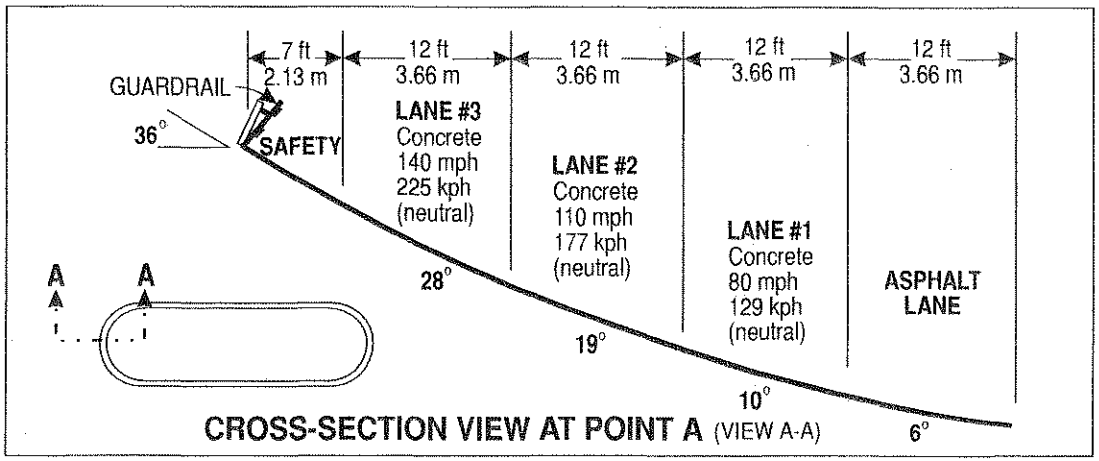
BRAKE SOAK and BRAKE SLOPES

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

F-3 0500



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

TRANSPORTATION RESEARCH CENTER INC.
EAST LIBERTY, OHIO 43319-0367
F-10 0605

APPENDIX D

Notice of Possible Non-Compliance

This vehicle (C85200) met the requirements of the FMVSS 135 standard.