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H5#
637026

135-TRC-04-003

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

Nissan Motor Company, Limited
2004 Nissan Quest 3.5SE, 4-Door MPV
NHTSA No. C45203

TRANSPORTATION RESEARCH CENTER INC.

10820 State Route 347
East Liberty, Ohio 43319



Final Report Completed: March 9, 2004

FINAL REPORT

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

**U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Safety Assurance
Office of Vehicle Safety Compliance
400 Seventh Street, SW
Room 6115 (NVS-221)
Washington, DC 20590**

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

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Prepared By



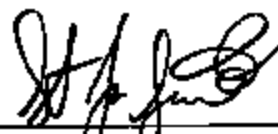
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Approval Date:

3/9/04

Final Report Acceptance By OVSC:



Contract Technical Manager, Office of
Vehicle Safety Compliance

3/12/04

Acceptance Date

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				6. PERFORMING ORGANIZATION CODE: TRC 20000113/4352	
7. AUTHOR(S): Project Manager: WALTER DUDEK Project Engineer: RANDALL A. LANDES				8. PERFORMING ORGANIZATION REPORT NO.: TRC-DOT-135-048	
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Transportation Research Center Inc. 10820 State Route 347 East Liberty, Ohio 43319				10. WORK UNIT NUMBER:	
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16. ABSTRACT: Compliance tests were conducted on the subject 2004 Nissan Quest 3.5SE, 4-Door MPV, 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.					
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1.0 INTRODUCTION

Tests were conducted on a 2004 Nissan Quest 3.5SE, 4-dr. MPV, 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 135-00 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 1.02 (Skid Pad) and 0.98 (Test Track) utilizing the ASTM E1337 w/E1336 tire method.

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

This vehicle met the requirements of FMVSS 135.

DATA SHEET 1 - VEHICLE INFORMATION

VEHICLE SPECS

Year: 2004	NHTSA No: C45203
Mfr: NISSAN MOTOR CO. LTD.	GVWR (Kg): 2600.0
Make: NISSAN	GAWR Front(Kg): 1310.0
Model: QUEST 3.5 SE	GAWR Rear(Kg): 1340.0
Body Style: MPV 4 DR.	Wheelbase (mm): 3149.6
Mfr. Date: 9-03	Odometer: Start:84 MI. End:552 MI.
VIN: 5N1BV28U94N320161	

BUSES ONLY

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

Engine Type: GASOLINE, V6, DOHC, 24-VALVE, FUEL INJECTION, PISTON.	
Displacement: 3.5 LITER	Tire Size: P225/60R17
Engine Hspwr: 240	Tire Type: 98H/EAGLE LS2, STEEL BELTED RAD
Idle Speed(rpm): 90	Tire Mfr.: GOODYEAR
Transmission Type: AUTO.5-SPD.W/DR.SEL.O/D	GVWR Front Press.(kpa): 241.00
No. of Axles: 2	GVWR Rear Press.(kpa): 241.00

BRAKE APPLY SYSTEM

Brake Series: Front:DISC Rear:DISC	Power Assist Unit: YES
Brake Actuation	Pwr Unit w/Accumulator: NO
(Hydr. Circuit Split): DIAGONAL	Pwr Asst./Pwr Unit w/Backup: NO
Power Unit: VACUUM	Variable Prop. System: NO
Anti-Skid unit Mfr: NOT MARKED ON DEVICE.	Anti-Skid Device: YES
Parking Mechanism: YES	
Type of Parking Unit: AUTOMATIC TRANSMISSION WITH PARK DETENT.	
Mstr Cylinder Dia(mm): 25.40	Pedal Ratio: 3.5 : 1

FRONT SYSTEM BRAKE COMPONENT MATERIALS AND CONSTRUCTION:

BRAKE TYPE: DISC	Material: CAST
Drum Construction: N/A	LF Drum Shoe Cage Dia.(mm): 0.00
Disc Construction: INTEGRAL CAST, VENTED	RF Drum Shoe Cage Dia.(mm): 0.00
Front Brake Dia.(mm): 289.38	LF Drum Dia. RESET(mm): 0.00
Fr Disc Thickness(mm): 28.04	RF Drum Dia. RESET(mm): 0.00
Lining Construction: Bonded	
FRONT BRAKE COMPONENT DIMENSIONS AND CODES:	
Inboard (Leading)	Outboard (Trailing)
Width(mm): 52.68	Width(mm): 52.50
Length(mm): 132.21	Length(mm): 132.44
Thickness(mm): 9.83	Thickness(mm): 9.93
Lining Code/Color: AP63H FF	Lining Code/Color: AP63H FF
Hyd. Piston Dia.(mm): 47.42 (x2)	

DATA SHEET 1 - (CONTINUED)

REAR SYSTEM BRAKE COMPONENT MATERIALS AND CONSTRUCTION:

BRAKE TYPE: DISC

Drum Construction: N/A

Disc Construction: INTEGRAL CAST

Lining Construction: BONDED

Rear Brake Dia.(mm): 307.64

Rr Disc Thickness(mm): 16.08

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)

Width(mm): 31.83

Length(mm): 82.88

Thickness(mm): 8.05

Lining Code/Color: AP59H FF

Hyd Piston Dia (mm): 42.80

Outboard (Trailing)

Width (mm): 31.75

Length (mm): 82.80

Thickness (mm): 8.15

Lining Code/Color: AP59H FF

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: 03-09-01

Quality Assurance: Ken Webster

KEN WEBSTER

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				184.3 km/h avg.			NA		
Burnish	GVWR	80				200, 50 - 0 km/h stops @ 3.0 mpsps			NA		
Wheel Lockup Sequence w/o ABS	GVWR				Lookup of front wheels prior to rear	ABS Equipped			NA		
Wheel Lockup Sequence w/o ABS	LLVW					ABS Equipped			NA		
Adhesion Utilization w/o ABS	LLVW				Rear axle adhesion utilization curve below specified value			ABS Equipped			NA
Adhesion Utilization w/o ABS	GVWR							ABS Equipped			NA
Cold Effectiveness	GVWR	100	65	600	70	5	488.0	48.5	Pass		
High Speed Effectiveness	GVWR	155.4	65	600	spd. depend.-177.4	5	483.3	111.0	Pass		
Stops with Engine Off	GVWR	100	65	600	70	5	481.5	48.2	Pass		
Cold Effectiveness	LLVW	100	66	600	70	5	441.8	44.7	Pass		
High Speed Effectiveness	LLVW	155.4	65	600	spd. depend.-177.4	5	488.1	105.6	Pass		
Failed Antilock	LLVW	100	65	600	85	5	194.3	58.8	Pass		
Failed Proportioning Valve	LLVW	100	65	600	110	5	NA	NA	NA		
Failed Hydraulic Circuit #1	LLVW	100	65	600	168	5	477.0	92.5	Pass		
Failed Hydraulic Circuit #2	LLVW	100	65	600	168	5	488.6	91.4	Pass		
Failed Hydraulic Circuit #1	GVWR	100	65	600	168	5	490.0	93.5	Pass		
Failed Hydraulic Circuit #2	GVWR	100	65	600	168	5	484.8	92.9	Pass		
Failed Antilock	GVWR	100	66	600	85	5	275.3	53.0	Pass		
Failed Proportioning Valve	GVWR	100	65	600	110	5	NA	NA	NA		
Power Brake Unit Failure	GVWR	100	65	600	168	5	490.7	130.7	Pass		
Parking Brake - Uphill	GVWR	-	-	600	Hold for 5 min.?	NA	420.3	Yes-Holds	Pass		
Parking Brake - Downhill	GVWR	-	-	600	Hold for 5 min.?	NA	471.6	Yes-Holds	Pass		
Heating Brakes	GVWR	120-60	NA	NA	15 Brakes- 3.0 mpsps	5	41 Vls. Avg.	NA	NA		
Hot Performance Stop #1	GVWR	100	65	361 avg.	75.4	5	303.9 (178.0)	48.4	Pass		
Hot Performance Stop #2	GVWR	100	65	600	89	5	418.3	47.5	Pass		
Brake Cooling	GVWR	50	NA	NA	4 Stops - 3.0 mpsps	5	42 Vls. Avg.	NA	NA		
Recovery Performance Stop #1	GVWR	100	65	361 avg.	One of the two stops between 65.0 and 36.1 meters	5	363.0 (288.3)	49.5	Pass		
Recovery Performance Stop #2	GVWR	100	65	361 avg.		5	364.2 (285.7)	48.4			
Final Inspection-Brake Integrity	Check components for detachment, injury or lubricants.					No detachments or fractures-normal appear. &			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 values required to engage the data acquisition's recording mode.

DATA SHEET 3 - VEHICLE WEIGHT

VEHICLE: 2004 NISSAN QUEST 3.5 SE

NHTSA No. C45203 Date: 12/12/03

Tire Pressure(cold): Front (kpa) 241 Rear (kpa) 241

Odometer: Start 84 MI.

End 552 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): 2600

GAWR Front(Kg): 1310

GAWR Rear(Kg): 1340

UNLOADED VEHICLE WEIGHT(UVW)

L Front(Kg): 572 L Rear(Kg): 440

R Front(Kg): 591 R Rear(Kg): 421

T Front(Kg): 1163 T Rear(Kg): 861

Total UVW(Kg): 2024

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): 630 L Rear(Kg): 474

R Front(Kg): 648 R Rear(Kg): 456

T Front(Kg): 1277 T Rear(Kg): 930

Total LLVW(Kg): 2207

L Front(Kg): 629 L Rear(Kg): 472

R Front(Kg): 646 R Rear(Kg): 458

T Front(Kg): 1275 T Rear(Kg): 929

Total Actual Test LLVW(Kg): 2205

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): 626 L Rear(Kg): 662

R Front(Kg): 658 R Rear(Kg): 651

T Front(Kg): 1283 T Rear(Kg): 1313

Total Fully Loaded GVWR(Kg): 2596

Load: Driver/Observer 73(Kg) + Instru. 41(Kg) + Ballast 458(Kg) = 572(kg)

Technician:

KAREN EASTERDAY

Date:

03-09-04

Quality Assurance:

KEN WEBSTER

DATA SHEET 4 - EQUIPMENT REQUIREMENTS (S5)

SERVICE BRAKE SYSTEM (S5.1)

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

Wear Adjustment (S5.1.1):

Service Brakes are compensated for wear by means of a system of automatic adjustment? YES

Describe: DISC-AUTOMATIC CLEARANCE TAKE-UP.

Wear Status (S5.1.2):

Wear status of service brakes is indicated by:

(A) Acoustic or optical device? YES

Describe: METAL TAB EMITS HIGH FREQUENCY SQUEAL WHEN WORN.

(B) Visual check outside or under vehicle? YES

Describe: FRONT&REAR:LOOK THROUGH CALIPER.

PARKING BRAKE SYSTEM (S5.2)

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

CONTROLS (S5.3)

(A) Service brakes activated by means of a foot control? YES

(B) Parking brake control is independent of the service brake control? YES

(C) Parking brake control is hand or foot operated? YES

(D) ABS, if equipped, cannot be manually disabled? YES

DATA INDICATES COMPLIANCE:

COMMENTS: NONE.

Tester/Technician:

Karen Easterday
KAREN EASTERDAY

Date: 02-09-07

Quality Assurance:

Ron Webster
RON WEBSTER

DATA SHEET 5 - VEHICLE MAX SPEED

VEHICLE: 2004 NISSAN QUEST 3.5 SE

NHTSA No. C45203 Date: 12/12/03

Ambient Temperature: 26.00°F

Wind Velocity: 10.00(MPH)

Road PFC: 1.01

Wind Direction: 295°

Odometer: Start 109(mi) End 125(mi)

TEST WEIGHT: Total (Kg): 2205

Front (Kg): 1275

Rear (Kg): 929

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	199km/h	199.4	9.66
Run No. 2	North	189km/h	189.2	9.77

AVERAGE = 194.3 km/h

COMMENTS: INV DATA, Section 0001, 12/12/03, 15:46:12

Tester/Technician:

Karen Easterday
KAREN EASTERDAY

Date: 12-01-04

Quality Assurance:

Ken Webster
KEN WEBSTER

DATA SHEET 6 - BURNISH AT GYMR

Testing Conditions: INV DATA, Section 6002, 12/12/83, 14:30:00

Weather Conditions: 29°F Wind:14 mph 154"

Start Odu.: 110

End Odu.: 170

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 IST to 100 C° or 2 km distance, whichever occurs first.
Constant decel rate: 3.0 m/s²
Pedal force adjusted to maintain constant decel.
No lock-up allowed longer than 0.1 sec above 15 km/h
Vehicle must stay in lane of 3.5m

STOP #	INIT SPD (kph)	LEFT FRONT 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 ²)
1	79.48	93	96	78	76	55.39	47.93	2.63
10	79.32	87	100	82	86	50.87	39.99	2.69
20	79.97	109	88	88	87	55.56	40.31	2.75
30	79.81	108	95	84	80	61.98	44.82	2.70
40	80.01	100	96	96	92	60.17	43.15	2.83
50	79.44	101	86	98	94	61.04	46.34	2.56
60	80.04	100	88	96	96	63.28	46.63	2.78
70	79.80	100	100	88	87	58.88	44.86	2.77
80	80.51	89	101	94	89	61.43	43.88	2.75
90	80.33	100	101	84	81	47.53	45.68	2.78
100	79.28	100	87	92	92	55.49	44.89	2.70
110	80.37	98	88	89	92	60.23	44.38	2.89
120	81.24	84	93	76	81	61.59	52.57	2.86
130	79.96	88	90	84	85	70.05	58.19	2.88
140	80.11	83	89	81	81	71.80	47.44	2.78
150	80.33	65	92	74	48	80.33	48.34	2.77
160	79.38	86	86	82	82	62.65	46.70	2.79
170	79.25	83	93	81	58	73.45	49.26	2.90
180	80.36	80	89	78	48	69.28	51.29	2.89
190	79.89	85	88	80	54	70.14	48.46	2.89
200	79.30	81	93	78	51	66.79	43.33	2.74

COMMENTS: THIS VEHICLE WAS EQUIPPED. DATA BETWEEN 7-18 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.

Vehicle: 2004 NISSAN MOTOR CO NISSAN NUMBER: C42243

Make: NISSAN

Model: QUEST 2.5 SE

Body Style: SEDAN 4 DR.

Front Cold Tire Pressure: 241 (Kpa)

Rear Cold Tire Pressure: 241 (Kpa)

Transportation Research Center, Inc.

10810 State Route 147

East Liberty, Ohio 43319

(937)656-2011 www.trcpg.com

Date Tested: 12/12/03

DATA SHEET 11 - COLD EFFECTIVENESS AT STOP

Testing Conditions: INV DATA, Section 0015, 12/12/03, 14:47:48

Weather Conditions: 75°F Wind: 10 mph 311°

Start Sdc.: 112

End Sdc.: 390

Procedure:

Initial Brake Temperature 65 - 100 C

Initial Speed 100 km/h to zero

5 stops with transmission in neutral

Performance Requirements:

One Stop with:

Stopping Distance less than 72m

Pedal force between 65N and 500N

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

Vehicle must stay in lane of 3.5m

STOP	INIT	LEFT	RIGHT	LEFT	RIGHT	ACTUAL	CORRECTED	MAX.	AVG.	MAX.	AVG.
#	SPD	FRONT	FRONT	REAR	REAR	DISTANCE	DISTANCE	PEDAL	PEDAL	DECEL	DECEL
	(km/h)	(°C)	(°C)	(°C)	(°C)	(meter)	(meter)	(N)	(N)	(m/sec²)	(m/sec²)
1	98.30	64	73	67	57	50.3	51.1	477.15	355.89	12.76	6.76
2	99.54	74	85	68	58	50.4	50.6	474.84	355.83	12.38	6.79
3	100.12	82	90	71	71	50.1	52.0	500.86	399.41	14.57	6.87
4	100.80	88	96	70	73	50.3	49.5	468.02	368.01	12.86	6.88
5	100.57	84	91	74	74	49.8	49.3	503.98	392.92	12.56	7.18
6	99.10	87	92	74	74	49.2	50.1	495.21	361.78	12.12	7.08

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	ROUTE
2	-	NOX	ROUTE
3	-	NOX	ROUTE
4	-	NOX	ROUTE
5	-	NOX	ROUTE
6	-	NOX	ROUTE

Corrected Distances are used to determine shortest stopping distance.

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: KAREN EASTERDAY

Observer: NONE

Recorded Date Processed by: CHUCK JENKINS

Date: 02/26/04

Approving Laboratory Official: KEN WEBSTER

Date: 02/25/04

Vehicle: 2004 NISSAN MOTOR CO NHTSA NUMBER: 245283

Make: NISSAN

Model: COUNTRY 3.5 SE

Body Style: MPV 4 DR.

Front Cold Tire Pressure: 241 (Kpa)

Rear Cold Tire Pressure: 241 (Kpa)

Transportation Research Center, Inc.

10820 State Route 347

East Liberty, Ohio 43019

1937666-2811 www.trcrg.com

Date Tested: 01/21/04

DATA SHEET 12 - HIGH SPEED EFFECTIVENESS AT GVWR

Testing Conditions: IPV DATA, Section 8020, 01/21/04, 08:47:55

Weather Conditions: 25°F Wind: 9 mph 234°

Start Odo: 486

End Odo: 409

Schedule:

Initial Brake Temperature: 65-100°C

Initial Speed: 85± max km/h, not greater than 160km/h

5 stops with transmission in gear

Performance Requirements:

One Stop with:

Stopping Distance less than: 177.4 meter

Pedal force between 65N and 500N

No Look-Up allowed longer than 0.1 sec above 11 km/h

Vehicle Must stay in lane of 3.5m

STOP	INIT	LEFT	RIGHT	LEFT	RIGHT	ACTUAL	CORRECTED	MAX.	AVG.	MAX.	AVG.
#	SFD	FRONT	FRONT	REAR	REAR	DISTANCE	DISTANCE	PEDAL	PEDAL	DECEL	DECEL
#	(Kph)	(°C)	(°C)	(°C)	(°C)	(meter)	(meter)	(N)	(N)	(m/sec²)	(m/sec²)
1	159.09	78	81	64	69	122.3	116.7	487.20	380.88	12.28	8.38
2	158.58	90	88	63	59	119.0	116.3	505.62	382.39	13.84	8.54
3	158.84	82	78	58	38	114.9	111.9	486.53	370.08	13.37	8.51
4	158.86	78	47	52	33	118.8	113.8	446.31	385.84	15.34	8.38
5	158.86	77	68	49	30	116.1	111.8	493.33	374.72	14.29	8.85
5	157.86	81	71	50	31	117.3	113.6	463.20	364.26	13.08	8.86

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
5	-	NOX	SOUTH YES
5	-	NOX	SOUTH YES

DATA INDICATES COMPLIANCE: YES (2) NO ()

Driver: JAMES BARTERDAY

Observer: NONE

Recorded Data Processed by: CHUCK JENSEN

Date: 02/20/04

Approving Laboratory Official: KIM HENRY

Date: 02/25/04

Vehicle: 2004 NISSAN MOTOR CO METSA NUMBER: C4K203

Make: NISSAN

Model: QUEST 3.5 A2

Body Style: MPV 4 dr.

Front Cold Tire Pressure: 241 (Kpa)

Rear Cold Tire Pressure: 241 (Kpa)

Transportation Research Center, Inc.

10620 State Route 347

East Liberty, Ohio 43319

(614) 865-2011 www.trc.org.com

Date Tested: 01/26/04

DATA SHEET 13 - STOPS WITH ENGINE OFF AT GVWE

Testing Conditions: INV DATA, Section 0025, 01/26/04, 10:21:57

Weather Conditions: 27°F Wind: 8 mph 234°

Start Odo.: 413

End Odo.: 419

Procedure:

Initial Brake Temperature: 85-100°C

Initial Speed 100 km/h to zero

6 stops with transmission in neutral

Performance Requirements:

One Stop with:

Stopping Distance less than 10m

Pedal force between 55N and 500N

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

Vehicle must stay in lane of 3.8m

STOP #	INIT SPD (km/h)	LEFT FRONT INT (°C)	RIGHT FRONT INT (°C)	LEFT REAR INT (°C)	RIGHT REAR INT (°C)	ACTUAL DISTANCE (meters)	CORRECTED DISTANCE (NAR 200) (meters)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	100.01	82	79	71	55	48.2	48.2	377.80	289.49	11.48	6.89
2	100.33	84	81	76	54	48.3	46.3	481.48	336.17	12.18	7.31
3	100.03	72	69	54	42	52.4	52.3	451.84	379.34	10.41	5.38
4	100.03	68	84	66	84	49.8	49.8	458.80	334.08	11.40	6.79
5	100.82	95	89	67	60	49.2	48.9	455.45	341.73	10.24	6.73
6	99.86	91	86	65	55	46.2	46.3	451.28	329.83	12.77	6.62

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 BASTHEDAY

Observer: ROYCE

Remanded Data Processed by: CRUCE JENKINS

Date: 02/20/04

Approving Laboratory Official: KIM WEBSTER

Date: 02/25/04

Vehicle: 2004 NISSAN MOTOR CO NHTSA NUMBER: C46703

Make: NISSAN

Model: QUEST 3.3 SE

Body Style: MPV 4 DR.

Front Cold Tire Pressure: 241 (kpa)

Rear Cold Tire Pressure: 241 (kpa)

Transportation Research Center, Inc.

10820 State Route 247

West Liberty, Ohio 43318

(937)466-2811 www.tropg.com

Date Tested: 01/08/04

DATA SHEET 14 - COLD EFFECTIVENESS AT LHM

Testing Conditions: INV DATA, Section 0030, 01/08/04, 13:07:58

Weather Conditions: 37°F Wind: 11 mph 225°

Start Qdr: 422

End Qdr: 437

Schedule:

Initial Brake Temperature: 45-100°C

Initial Speed 100 km/h to zero

8 stops with transmission in neutral

Performance Requirements:

One Stop with:

Stopping Distance less than 70m

Pedal force between 450 and 500N

No Lock-Up allowed longer than 0.1 sec above 11 km/h

Vehicle must stay in lane of 3.0m

STOP	INIT	LEFT	RIGHT	LEFT	RIGHT	ACTUAL	CORRECTED	MAX.	AVG.	MAX.	AVG.
#	SPD	FRONT	FRONT	REAR	REAR	DISTANCE	DISTANCE	PEDAL	PEDAL	DECEL	DECEL
	(km/h)	(°C)	(°C)	(°C)	(°C)	(meters)	(meters)	(N)	(N)	(m/sec²)	(m/sec²)
1	99.17	54	59	73	58	45.2	45.9	412.25	256.75	18.83	7.52
2	100.83	84	81	50	41	46.9	46.2	516.93	369.12	14.15	7.84
3	99.40	91	87	51	42	45.3	45.9	421.87	311.64	14.88	7.51
4	100.85	88	82	49	41	44.8	44.7	441.77	319.93	14.68	7.46
5	99.84	86	84	47	39	45.6	44.8	472.93	341.27	14.07	7.68
6	99.20	92	86	49	41	45.3	44.2	479.86	350.81	14.44	7.17

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
5	NOX	SOUTH	YES
6	NOX	SOUTH	YES

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: KAREN MASTERDAY

Observer: MONT

Recorded Data Processed by: CHUCK JEFFERS

Date: 02/20/04

Approving Laboratory Official: KIM WENSTEN

Date: 02/25/04

Vehicle: 2004 NISSAN MOTOR CO NHTSA NUMBER: 245203

Make: NISSAN

Model: QUEST 2.5 SE

Body Style: MPV 4 DR.

Front Cold Tire Pressure: 341 (Kpa)

Rear Cold Tire Pressure: 341 (Kpa)

Transportation Research Center, Inc.

10820 State Route 347

East Liberty, Ohio 43319

(614)466-2011 www.trcrg.com

Date Tested: 01/28/04

DATA SHEET 15 - HIGH SPEED EFFECTIVENESS AT LLYN

Testing Conditions: INV DATA, Section 0035, 01/28/04, 14:04:24

Weather Conditions: 37°F Wind: 4 mph 212°

Start Odo.: 428

End Odo.: 437

Schedule:

Initial Brake Temperature: 65-100°C

Initial Speed: 88+ max km/h

6 stops with transmission in gear

Performance Requirements:

One Stop with:

Stopping Distance less than 177.4m

Pedal force between 65N and 500N

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

Vehicle must stay in lane of 3.8m

STOP #	INIT SPD (km/h)	LEFT FRONT	RIGHT FRONT	LEFT REAR	RIGHT REAR	ACTUAL DISTANCE (meters)	CORRECTED DISTANCE (SEE 2PP)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
		(°C)	(°C)	(°C)	(°C)						
1	159.42	82	82	49	40	112.7	107.1	469.98	331.29	15.61	8.11
2	157.75	86	79	39	28	110.5	107.2	424.99	348.24	14.80	8.34
3	156.81	77	64	32	19	111.4	108.6	468.97	355.54	14.37	8.28
4	159.50	75	71	34	24	118.2	109.4	484.89	375.69	14.00	8.38
5	159.37	81	68	33	16	121.8	108.6	489.04	385.32	15.37	8.13
6	158.76	82	77	39	24	111.2	106.6	454.48	386.63	14.10	8.19

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 BARTHOLOMEW

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 02/20/04

Approving Laboratory Official: BEN WEINSTEIN

Date: 02/25/04

Vehicle: 2004 NISSAN MOTOR CO NHTSA NUMBER: C45203

Make: NISSAN

Model: QUEST 3.5 SE

Body Style: MPV 4 DR.

Front Cold Tire Pressure: 341 (Kpa)

Rear Cold Tire Pressure: 341 (Kpa)

Transportation Research Center, Inc.

16820 State Route 347

East Liberty, Ohio 43319

(937)644-2811 www.trc.org

Date Tested: 01/09/04

DATA SHEET 16 - ANTILOCK FUNCTIONAL FAILURE AT LLYW

Testing Conditions: INV DATA, Section 8040, 01/09/04, 13:03:00

Weather Conditions: 23°F Wind: 7 mph 27"

Start Odo.: 447

End Odo.: 453

Schedule:

Initial Brake Temperature: 58-100°C

Initial Speed 100 km/h to zero

4 stops with transmission in neutral

Performance Requirements:

One Stop with:

Stopping Distance less than 11m

Pedal force between 65N and 800N

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

Vehicle Must stay in lane of 3.5m

STOP #	INIT SPD (kph)	LEFT FRONT (°C)	RIGHT FRONT (°C)	LEFT REAR (°C)	RIGHT REAR (°C)	ACTUAL DISTANCE (meters)	CONNECTED DISTANCE (meters)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	99.82	63	78	61	51	52.9	53.1	146.49	118.38	10.32	5.88
2	99.89	78	81	47	43	59.1	59.3	127.82	98.62	8.47	5.17
3	100.36	82	87	51	48	62.1	61.4	126.31	100.78	8.45	5.14
4	99.11	86	93	51	48	56.7	57.4	159.58	104.75	9.75	6.38
5	98.84	85	91	51	47	57.7	57.7	127.68	103.49	9.39	6.26
6	99.68	82	88	49	44	56.5	56.8	194.25	111.85	9.61	5.48

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	-	LEFT-REAR	SOUTH
2	-	NOX	SOUTH
3	-	NOX	SOUTH
4	-	NOX	SOUTH
5	-	NOX	SOUTH
6	-	NOX	SOUTH

How was the ABS failure induced: DISCONNECTED LEFT REAR WHEEL SPEED SENSOR.

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

Vehicle equipped: ABS/Varic-Stop Ignored w/ABS Can't Tell Separately. Data Sheet 17 not included.

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: KAREN EASTREDAY

Observer: NONE

Recorded Data Processed by: CHUCK JENNINS

Date: 02/20/04

Approving Laboratory Official: KEN WEBSTER

Date: 02/21/04

Vehicle: 2004 NISSAN MOTOR CO NISSAN NUMBER: E45293

Make: NISSAN

Model: QUEST 1.8 4X

Body Style: MPV 4 DR.

Front Cold Tire Pressure: 241 (Kpa)

Rear Cold Tire Pressure: 241 (Kpa)

Transportation Research Center, Inc.

10620 State Route 347

East Liberty, Ohio 43019

(614) 866-2013 www.trcps.com

Date Tested: 01/14/04

DATA SHEET 18 - HYDRAULIC CIRCUIT FAILURE #1 AT LLVM

Testing Conditions: INV DATA, Section 0050, 01/14/04, 08:45:41

Weather Conditions: 23°F Wind: 11 mph 155°

Start Odo.: 468

End Odo.: 471

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

System Portion Failed: 2F & 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 18m

Pedal force between 45N and 800N

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 INT [°C]	RIGHT FRONT INT [°C]	LEFT REAR INT [°C]	RIGHT REAR INT [°C]	ACTUAL DISTANCE [meters]	CORRECTED DISTANCE [MAX 255] [meters]	MAX. PEDAL FORCE [N]	AVG. PEDAL FORCE [N]	MAX. DECEL [m/sec²]	AVG. DECEL [m/sec²]
1	99.97	54	5	5	69	93.9	93.9	484.22	192.36	7.11	3.81
2	99.71	55	5	5	60	91.9	91.9	477.02	189.10	8.04	3.80
3	99.68	56	6	7	52	91.4	91.4	456.18	155.84	8.28	3.68
4	98.88	71	4	4	35	91.2	91.3	484.82	193.78	8.53	3.81

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

Force Needed to Activate Brake Failure Lamp (N): N/A
Fluid Removed (mL) to Activate Brake Failure Lamp: 125

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

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: HARRY HASTEDAY

Observer: NONE

Recorded Data Processed by: CHUCK JENNINGS

Date: 02/20/04

Approving Laboratory Official: TIM WEBSTER

Date: 02/25/04

Vehicle: 2004 NISSAN MOTOR CO NHTSA NUMBER: 245301

Make: NISSAN

Model: QUEST 3.5 SE

Body Style: MPV 4 DR.

Front Cold Tire Pressure: 341 (Kpa)

Rear Cold Tire Pressure: 341 (Kpa)

Transportation Research Center, Inc.

10820 State Route 247

East Liberty, Ohio 43319

(937)666-2811 www.trcpg.com

Date Tested: 01/14/04

DATA SHEET 19 - HYDRAULIC CIRCUIT FAILURE #2 AT LLYN

Testing Conditions: INV DATA, Section 0055, 01/14/04, 11:00:33

Weather Conditions: 28°F Wind: 19 mph 181° Start Odo.: 474 End Odo.: 477

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

System Portion Failed: LF & RR

Schedule:

Initial Brake Temperature 65-130°C

Initial Speed 100 km/h to zero

4 stops with transmission in neutral

Performance Requirements:

One Stop with:

Stopping Distance less than 165m

Pedal force between 65N and 300N

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 (meters)	CONNECTED DISTANCE (EAR 200) (meters)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	99.85	16	83	63	11	83.1	93.4	484.95	371.44	7.08	3.64
2	100.13	18	89	61	6	94.3	94.9	487.72	382.31	7.18	3.74
3	100.26	7	88	88	3	92.4	92.8	524.85	389.13	7.67	3.81
4	100.19	4	94	55	3	91.7	91.4	466.59	369.23	7.89	3.79

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: 125

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

Comments: Stop#2 - DAS continued to log - Low averages.

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: SALEM EASTERDAY

Observer: NONE

Recorded Data Processed by: CRUCE JENKINS

Date: 02/20/04

Approving Laboratory Official: IAN WEBSTER

Date: 02/25/04

Vehicle: 2004 NISSAN MOTOC CO NHTSA NUMBER: C4E203

Make: NISSAN

Model: QUEST 2.5 SE

Body Style: SUV 4 DR.

Front Cold Tire Pressure: 241 (Kpa)

Rear Cold Tire Pressure: 241 (Kpa)

Transportation Research Center, Inc.

10820 State Route 347

East Liberty, Ohio 43319

(614) 644-2811 www.trcrg.com

Date Tested: 01/14/04

DATA SHEET 20 - HYDRAULIC CIRCUIT FAILURE #1 AT GYRE

Testing Conditions: SUV DATA, Section 2040. 01/14/04, 14:52:57

Weather Conditions: 34°F Wind: 23 mph 109° Start Odo.: 490 End Odo.: 491

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

System Portion Failed: RF & LR

Schedule:

Initial Brake Temperature 65-100°C

Initial Speed 100 km/h to zero

3 stops with transmission in neutral

Performance Requirements:

One Stop with:

Stopping Distance less than 1.8m

Pedal force between 80N and 800N

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 (meters)	CORRECTED DISTANCE (RAN 2SP) (meters)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	100.62	85	70	15	59	97.8	96.6	484.92	387.12	5.92	3.73
2	99.66	84	15	16	59	93.9	94.6	472.73	368.12	6.45	3.78
3	99.75	85	13	14	74	93.8	92.5	478.98	408.58	7.92	3.94
4	100.02	84	13	13	73	93.8	92.6	492.87	436.57	7.49	3.80

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 KASTNERDAY

Observer: KORE

Recorded Data Processed by: CHUCK JENNINGS

Date: 01/20/04

Approving Laboratory Official: KEN WEBSTER

Date: 01/25/04

Vehicle: 2004 NISSAN MOTO CC NHTSA NUMBER: E46203

Make: NISSAN

Model: QUEST 2.5 SE

Body Style: MPV 4 DR.

Front Cold Tire Pressure: 241 (Kpa)

Rear Cold Tire Pressure: 241 (Kpa)

Transportation Research Center, Inc.

10825 State Route 247

East Liberty, Ohio 43019

(614) 666-2811 www.trcprg.com

Date Tested: 01/14/04

DATA SHEET 21 - HYDRAULIC CIRCUIT FAILURE #2 AT GVWR

Testing Conditions: INV DATA, Section 0065, 01/14/04, 11:23:00

Weather Conditions: 12°F Wind: 20 mph 175° Start Odo.: 482 End Odo.: 488

Method of simulating failure: disconnected Brake Line @ R/C Rear Port

System Portion Failed: LF & RF

Schedule:

Initial Brake Temperature 83-100°C
Initial Speed 100 km/h to zero
4 stops with transmission in neutral

Performance Requirements:

One Stop with:
Stopping distance less than 165M
Pedal force between 45N and 300N
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 INT (°C)	RIGHT FRONT INT (°C)	LEFT REAR INT (°C)	RIGHT REAR INT (°C)	ACTUAL DISTANCE (meters)	CORRECTED DISTANCE (NAN 200) (meters)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	94.91	8	81	58	7	98.9	98.8	481.27	384.42	6.70	3.67
2	108.93	8	92	71	7	94.7	92.3	484.77	361.46	6.95	3.50
3	99.47	7	87	78	8	93.7	94.7	486.55	390.80	9.00	3.74
4	97.87	8	69	65	4	91.4	94.2	481.35	371.19	8.20	3.89

STOP #	DRIVER VEHICLE STOP COMMENTS
1	(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 HASTEDAY

Observer: NOX

Recorded Data Processed by: CHUCK JEWELLS

Date: 02/20/04

Approving Laboratory Official: KEN HEDSTER

Date: 02/25/04

Vehicle: 1994 NISSAN MOTOR CO. NHTSA NUMBER: C45203

Make: NISSAN

Model: QUEST 2.5 SE

Body Style: MPV 4 DR.

Front Cold Tire Pressure: 341 (Kpa)

Rear Cold Tire Pressure: 241 (Kpa)

Transportation Research Center, Inc.

10820 State Route 247

West Liberty, Ohio 43319

(617) 646-1011 www.trcpcg.com

Date Tested: 02/12/04

DATA SHEET 22 - ANTILOCK FUNCTIONAL FAILURE AT OVER

Testing Conditions: INV DATA, Section 0070, 02/12/04, 10:02:24

Weather Conditions: 33°F Wind: 12 mph 264°

Start Odo.: 881

End Odo.: 507

Schedule:

Initial Brake Temperature 48-100°C

Initial Speed 100 km/h to zero

6 stops with transmission in neutral

Performance Requirements:

One stop with:

Stopping Distance less than 12m

Pedal force between 61N and 800N

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

Vehicle must stay in lane at 1.5m

STOP #	INIT SPD (km/h)	LEFT		RIGHT		ACTUAL DISTANCE (meters)	CONNECTED DISTANCE (meters)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
		FRONT INT (°C)	FRONT EXT (°C)	REAR INT (°C)	REAR EXT (°C)						
1	100.39	81	80	59	59	57.2	56.8	226.75	150.49	0.87	6.23
2	88.77	89	87	62	61	58.3	59.6	128.08	122.74	0.41	6.80
3	100.21	92	93	68	64	53.2	53.0	278.26	144.77	0.42	6.17
4	100.14	93	90	61	61	59.9	59.7	141.18	127.78	0.89	6.21
5	100.18	88	85	54	57	61.6	61.3	228.18	125.79	0.15	6.80
6	99.69	94	88	58	59	61.3	61.7				

DRIVER VEHICLE STOP COMMENTS

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

STOP #	WHEEL LOCK-UP	DIRECTION OF STOP	STAY IN LANE
1	-	NOX	SOUTH
2	-	NOX	SOUTH
3	-	NOX	SOUTH
4	-	NOX	SOUTH
5	-	NOX	SOUTH
6	-	NOX	SOUTH

How was the ABS failure induced: DISCONNECTED LEFT REAR WHEEL SPEED SENSOR.

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

Vehicle equipped: ABS/ESP-EXPERIMENTAL W/ABS CAN'S fail SEPARATELY. Data Sheet 21 not included.

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: KAREN EASTHARDY

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

DRIVE: 02/26/04

Approving Laboratory Official: KEN WEBSTER

Date: 02/26/04

Vehicle: 2004 NISSAN ROTEX CD METRA NUMBER: C45293

Make: NISSAN

Model: QUEST 3.5 SE

Body Style: MPV 4 DR.

Front Cold Tire Pressure: 341 (Kpa)

Rear Cold Tire Pressure: 341 (Kpa)

Transportation Research Center, Inc.

10670 State Route 347

East Liberty, Ohio 42319

(513)666-2011 www.tropg.com

Date Tested: 02/12/04

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

Testing Conditions: INV DATA, Section 0090, 02/12/04, 10:55:35

Weather Conditions: 23°F Wind: 15 mph 280°

Start Odo.: 510

End Odo.: 516

Failure Simulation: Disconnect primary source of power.

Method of rendering inoperative: Removed Engine Vacuum Hose at Booster

Scenario:

Initial Brake Temperature 52-100°C

Initial Speed 100 km/h to zero

4 stops with transmission in neutral

Performance Requirements:

One Stop with:

Stopping Distance less than 115m

Pedal force between 50N and 100N

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 (SAS 250) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	99.44	59	71	43	47	150.2	151.8	491.40	460.85	3.68	2.78
2	100.00	68	83	54	57	132.8	131.8	491.83	462.62	4.09	2.99
3	99.80	63	84	51	57	138.8	135.1	503.60	463.73	3.72	2.80
4	99.77	67	91	59	61	130.1	130.7	490.70	453.74	3.98	3.01
5	99.48	68	84	56	58	134.8	136.2	500.22	457.95	4.11	3.50
6	99.12	68	82	56	54	134.3	136.7	489.48	461.23	3.87	2.98

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 HASTENBAY

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 02/20/04

Approving Laboratory Official: KEN WEBSTER

Date: 02/25/04

Vehicle: 2004 NISSAN MOTOC CO METRA NUMBER: 045203

Make: NISSAN

Model: QUEST 3.5 SE

Body Style: SUV 4 DR.

Front Cold Tire Pressure: 241 (Kpa)

Rear Cold Tire Pressure: 241 (Kpa)

Transportation Research Center, Inc.

10820 State Route 347

Near Liberty, Ohio 43219

(937) 655-2011 www.trcprg.com

Date Tested: 02/13/04

DATA SHEET 25 - PARKING BRAKE AT GVWR

Testing Conditions: INT DATA, Section 0085, 02/13/04, 12:06:43
Parking brake: AUTOMATIC TR Non-service type: FOOT OPERATED

Service type: N/A

Weather Conditions: 33°F Wind: 9 mph 26°

Start Odo.: 515

End Odo.: 519

Test Weight: Total: 12994kg

Front: 1203kg

Rear: 1313kg

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: <800 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 unburnished condition. If recommendations are furnished, record method used.

APPLY	MAX SERVICE FORCE (N)	MAX P-BRAKE FORCE (N)	LEFT TEST (°C)	RIGHT TEST (°C)	AVG TEST (°C)	DRIVER VEHICLE STOP COMMENTS (Direction of stop (Up/Down) - Brake holds/fails)			
1	102.8	428.3	28	31	30.3	0 REAPPLY	UPHILL	HOLDS	20%
2	92.4	471.8	27	26	26.1	0 REAPPLY	DOWNHILL	HOLDS	20%

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

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: KAREN EASTERDAY

Observer: HOWE

Recorded Data Processed by: CHUCK JEWINS

Date: 02/20/04

Approving Laboratory Official: KEN WEBSTER

Date: 02/15/04

Vehicle: 2004 NISSAN MOTOR CO HTS2A NUMBER: C06203

Make: NISSAN

Model: QUINT 3.0 SE

Body Style: MPV 4 DR.

Front Cold Tire Pressure: 241 (Kpa)

Rear Cold Tire Pressure: 241 (Kpa)

Transportation Research Center, Inc.

10520 State Route 347

East Liberty, Ohio 43019

(614) 655-2011 www.tropg.com

Date Tested: 02/12/04

DATA SHEET 26 - HEATING SNUBS AT QUINT

Testing Conditions: INV DATA, Section 0990, 02/12/04, 12:41:49

Schedule:

Conduct 15 snubs from 120 Km/h or 80% Vmax, whichever is slower, to 1/2 of initial speed.

Attain required decel in 1 second and maintain that decel.

Interval between snubs is 45 seconds and NOT to initial speed.

Performance Requirements:

Initial INT for first snub is 38-65°C

Maintain 3.0 m/s/s deceleration

Vehicle must stay in lane of 2.5m

SNUB	AVG.	time	AVG.	LEFT	RIGHT	LEFT	RIGHT	INIT
#	DECEL	Between	PEAK	FRONT	FRONT	REAR	REAR	TEMP
#	(m/sec ²)	(seconds)	FORCE	INT	INT	INT	INT	(Kpa)
1	2.74	47	47.83	58	60	38	40	120.56
2	2.77	47	44.73	96	103	78	72	120.08
3	2.83	48	38.84	134	141	98	97	120.43
4	2.99	48	41.14	164	172	119	121	120.33
5	2.96	44	48.46	187	200	142	142	120.73
6	3.71	48	38.05	203	214	161	159	120.72
7	2.91	49	39.17	217	238	180	177	120.81
8	3.02	46	42.12	232	242	193	189	121.16
9	2.85	44	41.39	230	242	209	203	121.10
10	2.82	45	35.89	232	240	229	212	119.85
11	3.00	47	35.81	232	234	227	222	118.82
12	2.63	48	27.64	238	242	234	233	120.68
13	2.85	44	41.39	241	251	248	243	120.67
14	2.83	46	40.39	244	259	252	249	120.44
15	2.88	44	40.74	247	267	256	254	121.00

DRIVER VEHICLE SNUB COMMENTS

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 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: LARRY EASTERNAY

Observer: MOSE

Recorded Data Processed by: CRUCE JENKINS

Date: 02/20/04

Approving Laboratory Official: KEN WHESTER

Date: 02/25/04

Vehicle: 2004 NISSAN MOTOR CO VIN: CA2103

Make: NISSAN

Model: QUEST 2.5 SE

Body Style: SUV 4 DR.

Front Cold Tire Pressure: 241 (kpa)

Rear Cold Tire Pressure: 241 (kpa)

Transportation Research Center, Inc.

10820 State Route 347

East Liberty, Ohio 43119

(937) 566-2611 www.trcys.com

Date Tested: 02/12/04

DATA SHEET 27 - HOT PERFORMANCE AT GVWR

Testing Conditions: INV DATA, Section 0058, 02/12/04, 13:52:45

Schedule:

Make 2 stops from 100 kph

Pedal Force: 1st stop is done with an average force not greater than the average recorded in the shortest GVWR Cold Effectiveness stop.

2nd stop is done with a force not greater 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: 5

Initial speed of stop: 99.10 (kph)

Actual distance of stop: 49.2 (meter)

Average pedal force: 361.8 (N)

Performance Requirements:

Stop Number 1 must be equal or less than: 75.4 (meter)

In addition the stopping distance for at least one of the of the two hot stops must be equal or less than: 89 (meter)

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 28F) (meter)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. SWCEL (m/sec²)	AVG. SWCEL (m/sec²)
1	99.63	162	183	172	171	48.1	48.4	263.81	177.99	14.20	6.90
2	100.55	277	304	284	283	48.0	47.5	416.28	247.76	17.30	6.88

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

DATE INDICATES COMPLIANCE: YES (X) NO ()

Driver: TAREN BARTHOLOMEW

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 02/26/04

Approving Laboratory Official: KEN WENSTER

Date: 02/26/04

Vehicle: 1994 NISSAN MOTOR CO METSA NUMBER: C43202

Make: NISSAN

Model: QUEST 3.5 SE

Body Style: WGV 4 DR.

Front Cold Tire Pressure: 261 (Kpa)

Rear Cold Tire Pressure: 261 (Kpa)

Transportation Research Center, INC.

16820 State Route 147

West Liberty, Ohio 43319

(937)666-2011 www.trcpg.com

Date Tested: 02/12/04

DATA SHEET 28 - BRAKE COOLING STOPS AT GYRE

Testing Conditions: INV DATA, Section 0100, 02/12/04, 13:55:39

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 11 km/h

Vehicle must stay in lane of 3.5m

STOP	INIT	AVG.	AVG.	LEFT	RIGHT	LEFT	RIGHT
#	SPD	DECEL	PEDAL	FRONT	FRONT	REAR	REAR
	(kph)	(m/sec ²)	(N)	(°C)	(°C)	(°C)	(°C)
1	50.70	2.25	42.84	212	268	238	229
2	50.25	2.58	39.67	181	293	194	188
3	50.87	2.74	40.48	146	192	192	197
4	50.11	2.86	43.97	119	118	125	136

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

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: KAREN EASTHEDAY

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 02/18/04

Approving Laboratory Official: KEN WENSTER

Date: 02/23/04

Vehicle: 2004 FORD MOTOR CO NHTSA NUMBER: C42203

Make: FORD

Model: QUEST 3.0 2D

Body Style: MPV 4 DR.

Front Cold Tire Pressure: 241 (kpa)

Rear Cold Tire Pressure: 241 (kpa)

Transportation Research Center, Inc.

10820 State Route 347

East Liberty, Ohio 43019

(614) 566-2011 www.trcpg.com

Date Tested: 02/12/04

DATA SHEET 29 - RECOVERY PERFORMANCE AT GVWR

Testing Conditions: INV DATA, Section D105, 02/12/04, 14:02:54

Weather Conditions: 32°F Wind: 17 mph 285°

Start Odo.: 520

End Odo.: 137

Schedule:

Make 2 stops from 100 kph

Pedal Force: Both stops are performed with an average force not greater 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: 55.0 (meters)

Lower limit of corrected stopping distance: 36.1 (meters)

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: Stop 6

Initial speed of stop: 99.10 (kph)

Actual distance of stop: 49.1 (meters)

Average pedal force: 361.6 (N)

STOP	INIT SPD (kph)	LEFT FRONT TIR (°C)	RIGHT FRONT TIR (°C)	LEFT REAR TIR (°C)	RIGHT REAR TIR (°C)	ACTUAL DISTANCE (meters)	CORRECTED DISTANCE (SEE 299) (meters)	MAX. PEDAL FORCE (N)	AVG. PEDAL FORCE (N)	MAX. DECEL (m/sec²)	AVG. DECEL (m/sec²)
1	100.11	104	106	114	122	49.6	49.6	282.85	218.33	13.05	6.91
2	99.48	127	128	138	146	49.8	49.4	364.24	205.70	13.47	6.91

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

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: KAREN HARTERDAY

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 02/20/04

Approving Laboratory Official: KEN WEDOTER

Date: 02/23/04

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

VEHICLE: 2004 Nissan Quest 3.5SE NHTSA NO.: C45203 DATE: 02/19/04

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 1 of 5)
6.0 Test Completion Inspection (7.17)

VEHICLE: 2004 Nissan Quest 3.5SE NHTSA NO.: C45203 DATE: 02/19/04

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 (\$7.17)

VEHICLE: 2004 Nissan Quest 3.5SE: NHTSA NO.: C45203; GVWR: 2600 kg
MASTER CYLINDER RESERVOIR:

DATE	02/17/04	Requirements	Pass	Fail
Reservoir Compartments (85.4.1)				
(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 (85.4.2)				
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)	234 mi	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	151.5 mi*			

Comments: None

DATA SHEET 30 (Part 3 of 5)
TEST COMPLETION INSPECTION (\$7.18)

VEHICLE: 2004 Nissan Quest 3.5SE; NHTSA NO.: C45203; GVWR: 2600 kg

MASTER CYLINDER RESERVOIR:

DATE	12/05/03	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)	23ml	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)	23 ml			
Fluid displaced per stroke, Primary	7.7 ml			
Fluid displaced per stroke, Secondary	7.7 ml			
Fluid available in partial compartment Subsystem No. 1	21 ml		X	
Fluid available in partial compartment Subsystem No. 2	24 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: <u>WARNING. CLEAN FILLER CAP BEFORE REMOVING. USE ONLY DOT 3 BRAKE FLUID FROM A SEALED CONTAINER.</u>		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. <u>Embossed on the top of the master cylinder reservoir filler cap.</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	NA	
	No			

Comments: None

Technician: K. Easterday

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

VEHICLE: 2004 Nissan Quest 3.5SE; NHTSA NO.: C45203; DATE: 02/17/04
BRAKE SYSTEM WARNING INDICATOR (\$5.5)

CONDITION	ANSWER	REQUIREMENTS	PASS	FAIL
Brake Systems Indicator Lamp Function Check (\$5.6.2) (Bulb and systems check)				
Describe location of brake indicator lamp: <u>Center of the instrument cluster.</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 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 (\$5.5.1) DURATION (\$5.5.3) FUNCTION (\$5.5.4)				
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.	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? Audible warning - continuous or flashing?	Yes-Cont. NA			

Comments: None.

Technician: K. Easterday

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

VEHICLE: 2004 Nissan Quest 3.5SE; NHTSA NO.: C45203; DATE: 02/17/04

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 (.126") high minimum? Record Height <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"? <u>"BRAKE", w/one symbol.</u>	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 black and not less than 8.4 mm (.25") in height? Record letter height <u>NA</u>	NA		
If separate indicator for: 1. Low brake fluid per S6.5.1(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 S6.5.1(b), letters and background contrasting colors one of which is yellow? Record colors <u>Lens - Black, Letters - Yellow (or Amber).</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 _____ 6. For any other function? If yes, Record _____	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 Quest 3.5SE; NHTSA NO.: C45203; DATE: 02/17/04

BRAKE		LINING		
LOCATION	TYPE	DESCRIPTION	MINIMUM THICKNESS	THICKNESS TO FULLY WORN (1) mm*
Left Front	Drum	Leading	Pre-test 8.83 mm	2.0
		Primary	Post Test 9.07 mm	
		Inboard X	Δ 0.76 mm	
	Disc X	Trailing	Pre-test 9.93 mm	2.0
		Secondary	Post Test 9.25 mm	
		Outboard X	Δ 0.68 mm	
LINING CLEARANCE:	Diametrical (2): N/A	Inboard - Approx 0 mm	Outboard - Approx. 0 mm	
WHEEL CYLINDER DIAMETER (3): N/A		CALIPER PISTON DIAMETER (3): 47.42 mm (x2 pistons)		
SHOE CAGE DIAMETER (4): N/A; CENTER POINT OF BRAKE ASSY TO CENTER POINT OF W.C.: N/A				
Right Rear	Drum	Leading	Pre-test 8.06 mm	2.0
		Primary	Post Test 7.70 mm	
		Inboard X	Δ 0.36 mm	
	Disc X	Trailing	Pre-test 8.15 mm	2.0
		Secondary	Post Test 7.67 mm	
		Outboard X	Δ 0.28 mm	
LINING CLEARANCE:	Diametrical (2) - N/A	Inboard - Approx. 0 mm	Outboard - Approx. 0	
WHEEL CYLINDER DIAMETER (3): N/A		CALIPER PISTON DIAMETER (3): 42.60 mm		
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 - 2.0 mm.				
(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: Frt.: 47.82 mm (x2 pistons); Rear: 42.88 mm.				
(4) RESET POSITION: N/A				

Comments: Manufacturer's new lining thickness: Frt. - 10 mm; Rears - 8.5 mm.
Technician: K. Easterday

DATA SHEET 31 – SECTION CONTINUED (Part 2 of 2)Vehicle: 2004 Nissan Quest 3.5SENHTSA No.: C45203Date: 03/08/04**Procedure and Example for Determining Master Cylinder Volume Requirement**

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

DISC BRAKES

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

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

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

Disc Brake: $V_r = (\Delta t_i + t_{ic} + \Delta t_o + t_{oc}) \times \frac{\pi d^2}{4}$
(Front)

$\Delta t_i = 8.00 \text{ mm}$
 $\Delta t_o = 8.00 \text{ mm}$
 $t_{ic} + t_{oc} = 0 \text{ mm}$
 $d = 47.62 \text{ mm}$
 $V_r = (8.00 + 0 + 8.00 + 0) \frac{\pi (47.62)^2}{4}$
 $= 16.00 (1781.02)$
 $= 28496.3 \text{ mm}^3 = 28.5 \text{ ml (x2 pistons)} = 57.0 \text{ ml}$

Disc Brake: $V_r = (\Delta t_i + t_{ic} + \Delta t_o + t_{oc}) \times \frac{\pi d^2}{4}$
(Rear)

$\Delta t_i = 6.50 \text{ mm}$
 $\Delta t_o = 6.50 \text{ mm}$
 $t_{ic} + t_{oc} = 0 \text{ mm}$
 $d = 42.86 \text{ mm}$
 $V_r = (6.50 + 0 + 6.50 + 0) \frac{\pi (42.86)^2}{4}$
 $= 13.00 (1442.8)$
 $= 18755.9 \text{ mm}^3 = 18.8 \text{ ml}$

For System 1 (RF, LR)

$$V_{r1} = 56992.6 \text{ mm}^3 + 18755.9 \text{ mm}^3$$

$$V_{r1} = 75748.5 \text{ mm}^3 = (75.7 \text{ ml})$$

For System 2 (LF, RR)

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

$$V_{r2} = 75748.5 \text{ mm}^3 = (75.7 \text{ ml})$$

$$\text{TOTAL VOLUME REQUIRED} = V_t = V_{r1} + V_{r2} = 151497.0 \text{ mm}^3 = 151.5 \text{ ml}^*$$

SECTION 6.0

Photographs



2004 NISSAN QUEST
3.5 SE
NHTSA NO. C45203
DECEMBER 2003

MFU BY NISSAN AMERICA, INC.

DATE 12/03/03
CAMP FR. 2003 FR.
WITH P225MMR17 RIMS AT 33 PSI
17X8.5
COLD SINGLE
CAMP FR. 2003 FR.
WITH P225MMR17 RIMS AT 33 PSI
17X8.5
COLD SINGLE

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL SAFETY STANDARDS AND REGULATIONS.



**LEFT
FRONT**

**2004 NISSAN QUEST
3.5 SE
NHTSA NO. C45203
DECEMBER 2003**

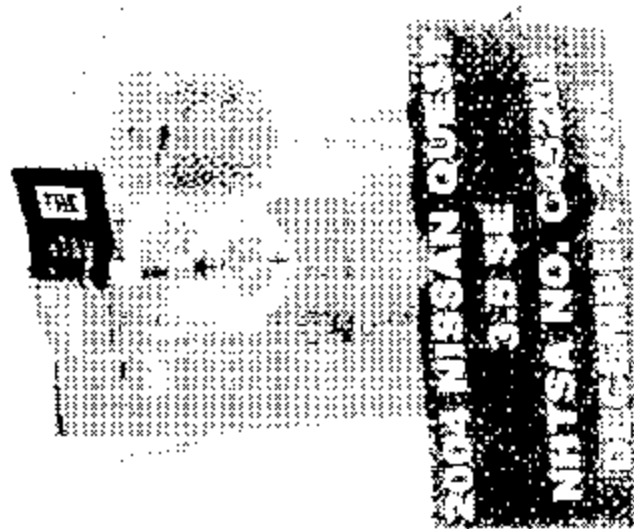
**RIGHT
REAR**

**2004 NISSAN QUEST
3.5 SE
NHTSA NO. C45203
DECEMBER 2003**



2004 NISSAN
3.3
NHTSA NISSAN
DECEMBER

2004 NISSAN QUEST
3.5 SE
NHTSA NO. C45203
DECEMBER 2003



2004 NISSAN QUEST

3.5 SE

NHTSA NO. 04520

DECEMBER 2004

QUEST 3.5 SE

INTSA NO. C4520

DECEMBER 2003

2004
NISSAN
QUEST SE35
NHTSA NO.
C45203
DECEMBER
2003

2004 NISSAN
QUEST 3.5 SE
NHTSA NO. C45903
DECEMBER 2003



2004 JISSM QUEST
3-5 SE
INVEST NO. C45203
DECEMBER 2003

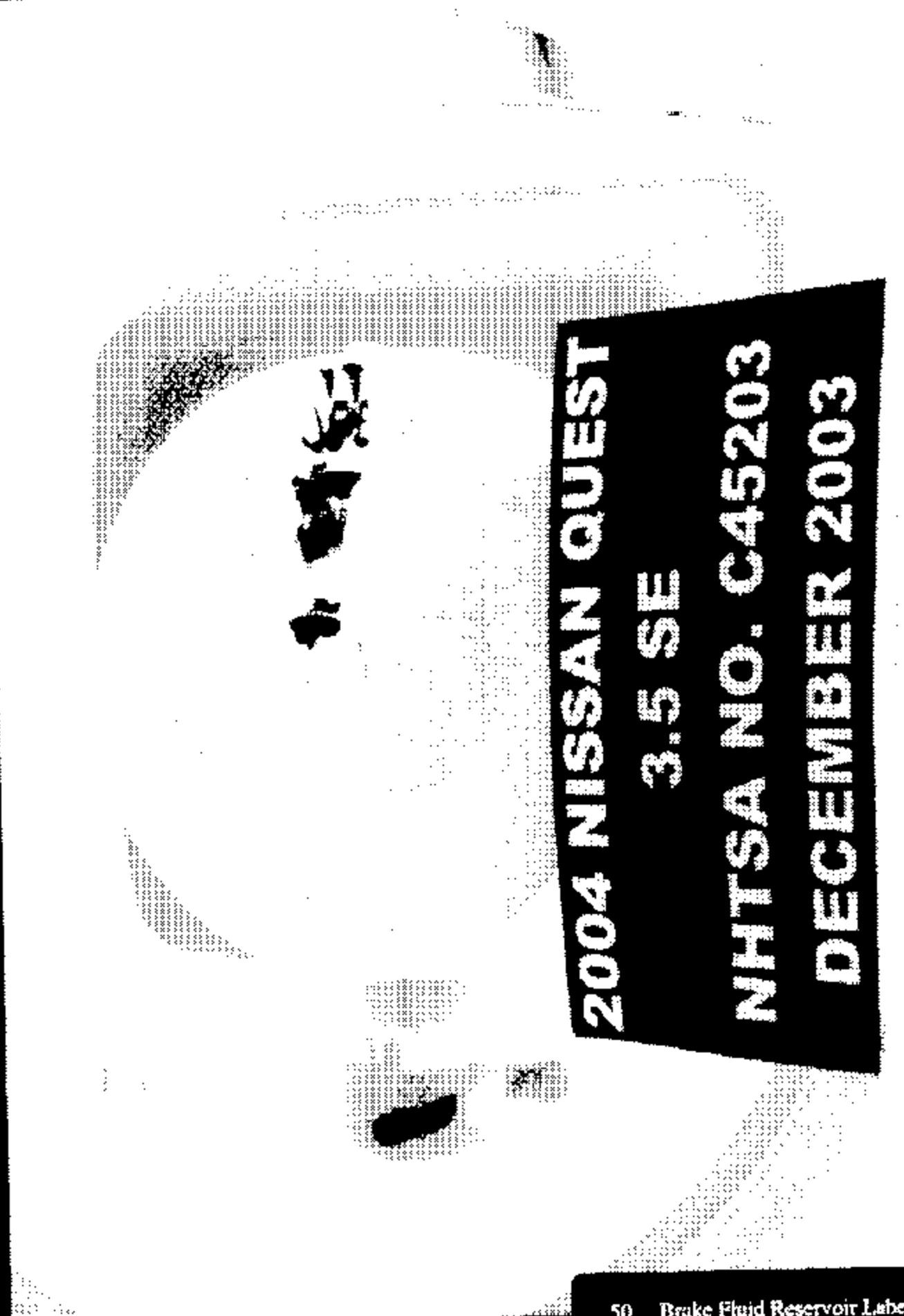
SOON

ABS

BRAKE



F



2004 NISSAN QUEST

3.5 SE

NHTSA NO. C45203

DECEMBER 2003

7.0 INSTRUMENT CALIBRATION (12 MONTH MAXIMUM INTERVAL)
VEHICLE: 2004 Nissan Quest 3.5SE; NHTSA NO.: C45203; DATE: 02/20/04

INSTRUMENT	SERIAL NUMBER	CALIBRATION DATE	NEXT CALIBRATION
Data Acquisition System - Link DAS 2030	975016	10/23/03	10/23/04
Computer - Dell Latitude/Link Engr.	TRC-43207	Not Applicable	Not Applicable
Software - Link Engr. 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	7561RD4011 SN 5225831- JIC	10/28/03	01/28/04

QUALITY ASSURANCE

DAILY CALIBRATIONS (1 of 3)

Vehicle: 2004 Nissan Quest 3.5SE

NHTSA No.: C45203

Deceleration Calibration Data for Unit 4352

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"
12/12/2003	11:32:36	0.00	9.80
12/15/2003	12:51:40	0.01	9.79
12/18/2003	14:38:01	0.02	9.82
12/18/2003	15:14:15	-0.01	9.81
1/8/2004	8:29:31	0.06	9.75
1/8/2004	15:13:55	0.04	9.81
1/8/2004	12:51:28	-0.03	9.78
1/13/2004	8:19:24	0.03	9.72
1/14/2004	8:26:57	0.03	9.79
1/14/2004	15:15:14	0.03	9.81
2/12/2004	9:01:44	-0.01	9.81
2/12/2004	14:20:57	0.00	9.81
2/16/2004	8:38:04	0.01	9.82

PRE-TEST CAL.

POST-TEST CAL.

Pre-Test Linearity Check 12/12/03

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 02/16/04

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 4352

Desired full scale value is: 1000 m

Allowed deviation is: 3 m

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

"Date"	"Time"	Distance for
"stp"	"stp"	1000 meters
12/12/2003	15:30:44	1000.5
12/18/2003	14:30:20	1000.7
12/18/2003	15:24:48	1000.7
1/8/2004	8:42:37	1001.5
1/8/2004	15:22:00	1000.2
1/8/2004	12:57:59	1001.0
1/13/2004	8:28:35	1001.3
1/14/2004	8:39:15	1000.8
1/14/2004	15:23:39	1000.6
2/12/2004	9:49:44	1000.8
2/12/2004	14:28:15	1000.6

PRE-TEST CAL.

POST-TEST CAL.

DAILY CALIBRATIONS CONTINUED (2 of 3)

VEHICLE: 2004 Nissan Quest 3.5SE

NHTSA No.: C45203

Wheel Tachometer Calibrations for Unit 4362

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
			LF	LF	RF	RF	LR	LR	RR	RR
Wheel lock detector	12/18/2003	14:36:01	0.0	18.8	0.0	18.1	0.0	18.2	-0.2	17.1
	12/18/2003	15:19:20	-0.1	15.3	0.0	15.5	0.0	18.0	-0.2	18.2
	01/08/2004	8:36:22	0.0	17.7	-0.1	18.5	0.0	16.9	-1.5	21.2
	01/08/2004	15:18:04	0.0	16.7	0.0	17.6	-2.5	35.9	-1.5	16.0
	01/09/2004	12:56:58	0.0	17.0	0.0	18.8	0.0	19.8	-2.9	14.8
	01/13/2004	8:28:10	13.3	17.4	0.0	17.3	0.0	16.8	0.0	17.9
	01/14/2004	8:33:44	0.0	16.9	0.0	21.2	0.0	16.9	0.0	22.3
	1/14/2004	16:19:12	-0.1	17.4	0.0	16.2	0.0	17.3	-0.1	18.9
	2/12/2004	8:48:31	0.0	15.6	0.0	16.2	-0.1	34.4	-0.1	23.4
	2/12/2004	14:26:42	0.0	16.3	0.0	16.1	0.0	34.1	0.0	24.1
POST-TEST CAL										

When driven over 15 km/hr and the wheel tech generators are shunted to zero volts, do all four wheel lock indicators align?: ☒ Yes, ☐ No.

Pedal Force Meter Calibration for Unit 4352

Target shunt calibration is 367 N

Desired recorded value is: 366 N

Desired recorded calibration value is: 500 N

Allowed deviation is: 0.5 N

Service brk. pedal effort	Driver engages a fixed shunt cal switch.	"Date"	"Time"	Zero	Cal Val	PRE-TEST CAL
		stp	stp	Force	Force lb	
		12/12/2003	12:05:08	-1.8	499.1	
		12/15/2003	8:10:36	-0.3	502.9	
		12/15/2003	12:56:48	-0.6	389.8	
		12/18/2003	14:26:27	-0.6	389.3	
		12/18/2003	15:17:28	-0.7	389.3	
		1/8/2004	8:26:36	-0.3	389.8	
		1/8/2004	15:16:57	-0.4	389.8	
		1/9/2004	12:53:17	-0.8	389.6	
		1/13/2004	8:21:02	-0.2	390.0	
		1/14/2004	8:31:50	-0.4	390.3	
		1/14/2004	16:17:38	-0.5	389.5	
		2/12/2004	8:42:28	-0.5	389.8	
		2/12/2004	14:23:48	-0.5	389.7	
2/16/2004	10:06:49	-0.2	499.9	POST-TEST CAL		

Pre-Test Linearity Check - 12/12/03

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

Post-Test Linearity Check - 02/16/04

Actual	Recorded
Force (N)	Force (N)
0	0
222	223
445	444
498	497

DAILY CALIBRATIONS CONTINUED (3 of 3)

VEHICLE: 2004 Nissan Quest 3.5SE

NHTSA No. C45203

Dynamic Speed Calibration for Unit 4352

Desired speed value is: 100 km/h

Allowed deviation is: 1.8 km/h

Desired time value is: 36 seconds

Allowed deviation is: + or - 0.6 seconds

Light beam
speed sensor

Drive vehicle
at a steady
100 km/h
through a
kilometer.

"Date"	"Time"	"Speed"	"Time"
stp	stp	km/h	sec
12/12/2003	15:35:21	99.8	36.31
12/18/2003	14:28:22	100.1	36.12
12/18/2003	15:23:10	100.2	36.40
1/8/2004	8:40:27	100.2	35.56
1/8/2004	15:19:59	100.4	36.09
1/9/2004	12:55:26	99.9	36.37
1/13/2004	8:24:29	100.1	36.15
1/14/2004	8:37:00	100.3	36.00
1/14/2004	15:21:46	100.0	36.12
2/12/2004	9:47:04	100.5	36.09
2/12/2004	14:25:13	100.0	36.25

PRE-TEST

POST-TEST

APPENDIX A

Copy of Manufacturer's Sticker

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 C45203.

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 slightly less than the required/target deceleration values.

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

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

For Data Sheet 31 – Calculation of Minimum Reservoir Volume Requirements:

Only the amount of brake fluid that could be available from the upper master cylinder reservoir to the smaller reservoir (mounted on the master cylinder) was measured. Please note the following photograph. The test vehicle is at the GVWR condition. The supply tube from the upper/larger reservoir was disconnected and allowed to drain until no more flow was observed from the tube. The photograph displays the unmeasured and non-usable brake fluid remaining in the upper reservoir. The amount of the non-usable brake fluid did not affect test compliance.

2004 NISSAN 3.5 L
NHTSA NC 10000
DECEMBER 2004



61 Brake Fluid Reservoir

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

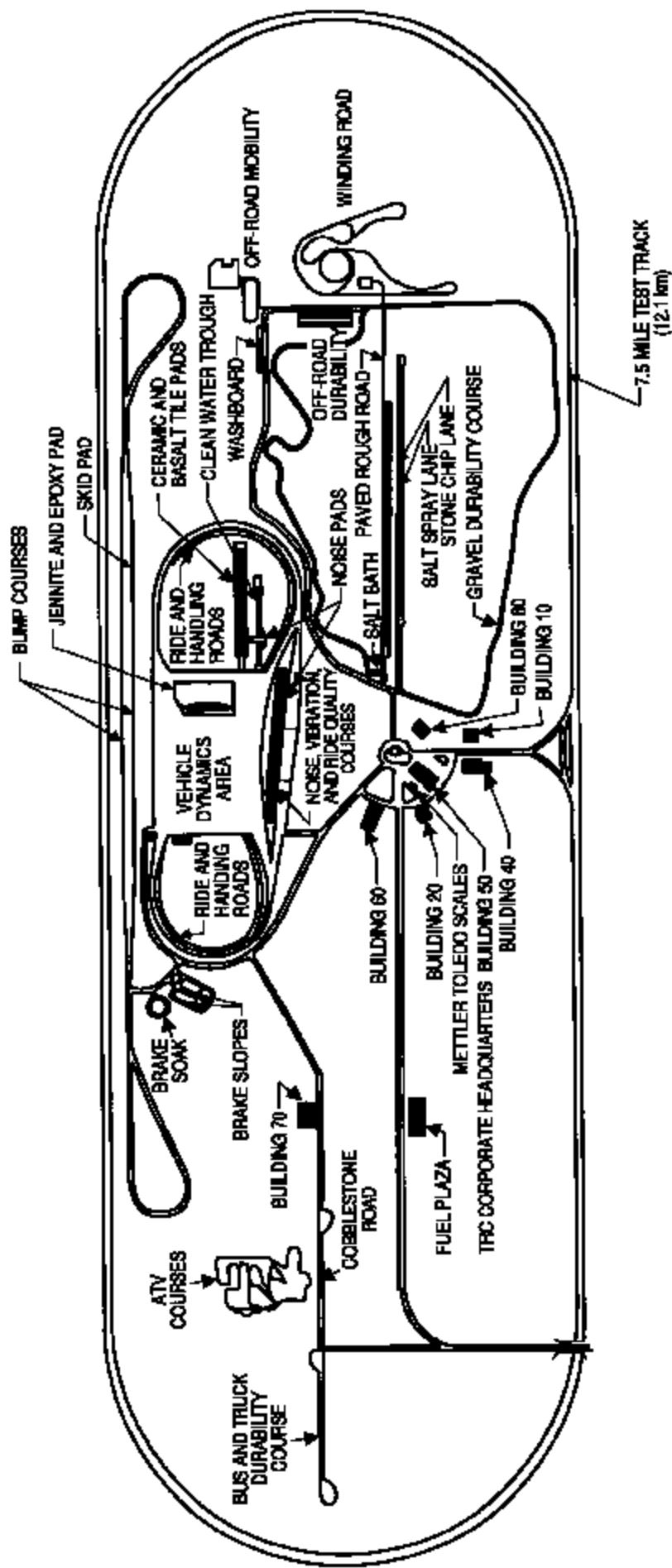
The Skid Pad is a test facility which is utilized primarily for the evaluation of tire and brake systems.

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

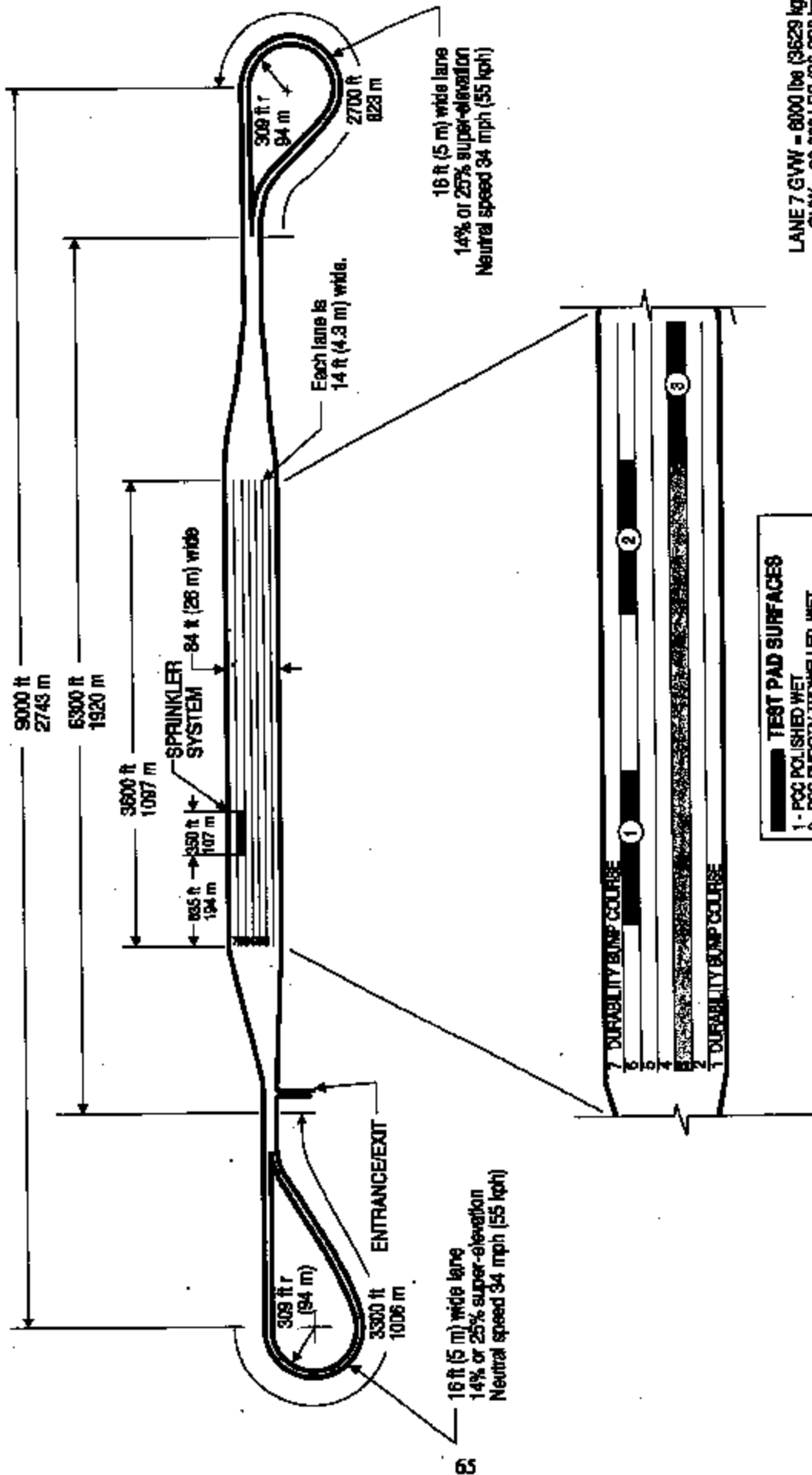


TRANSPORTATION RESEARCH CENTER INC.

EAST LIBERTY, OHIO 43928-0287

F-16-0001

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



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

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

Not to scale
All dimensions are approximate

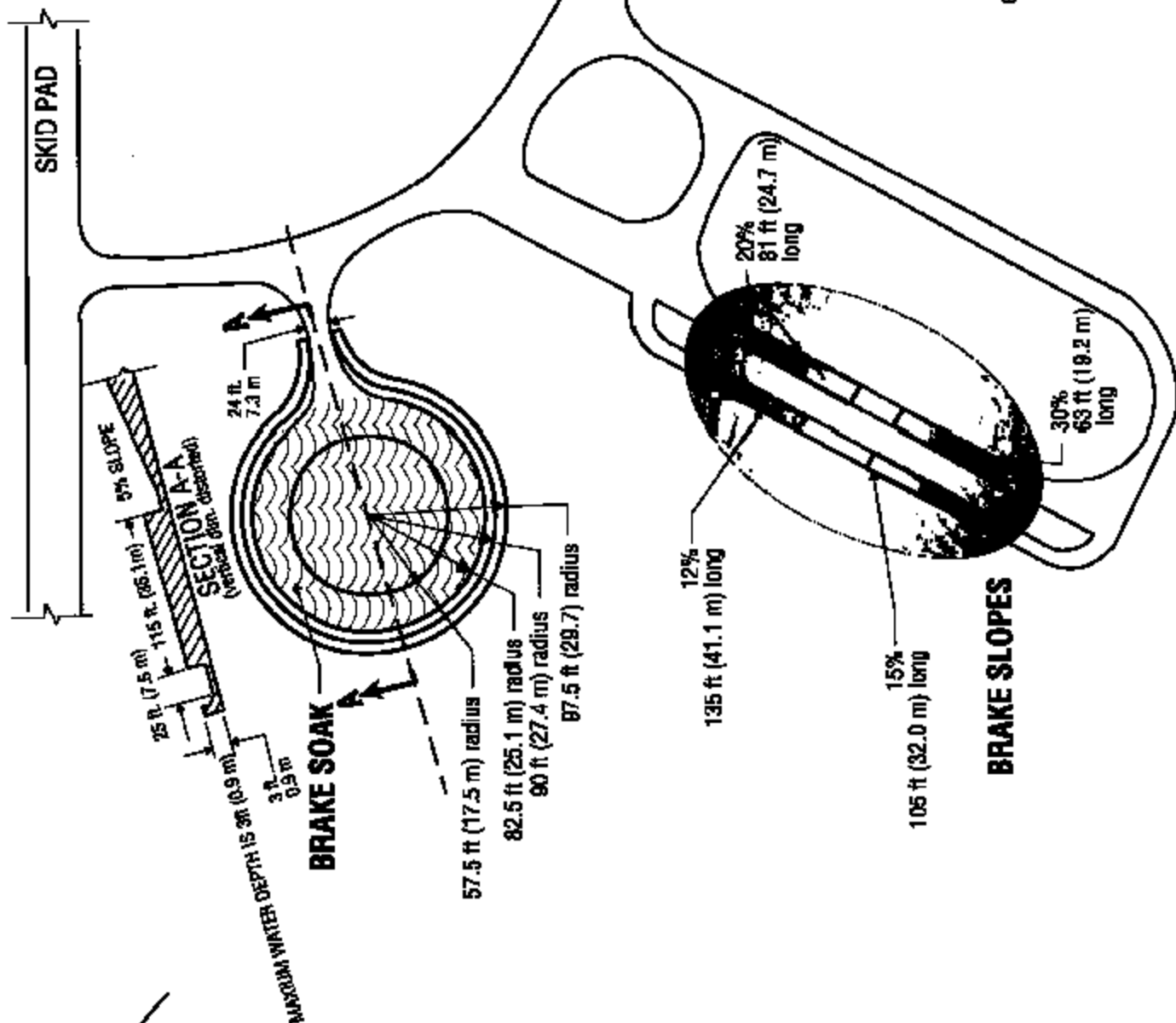
TRC

SKID PAD

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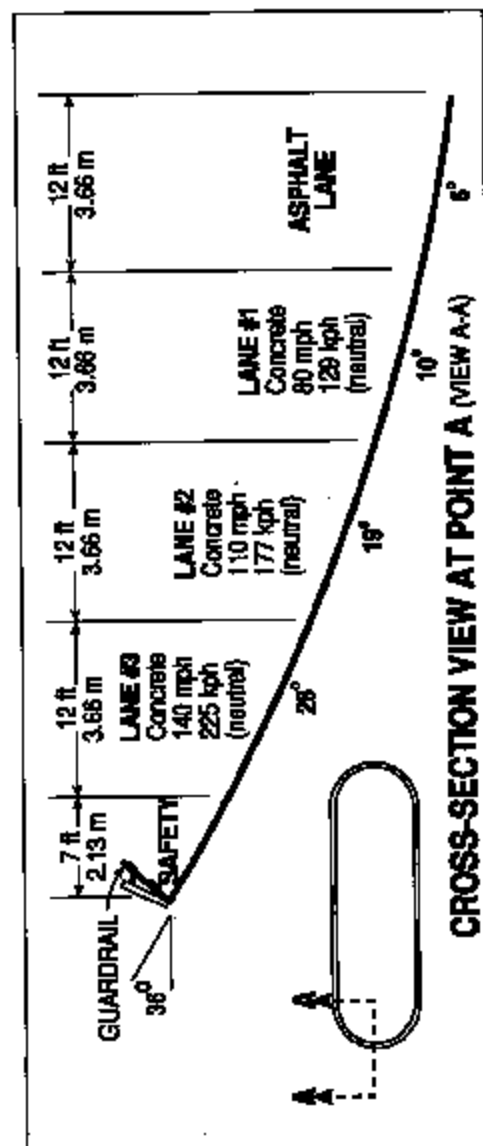
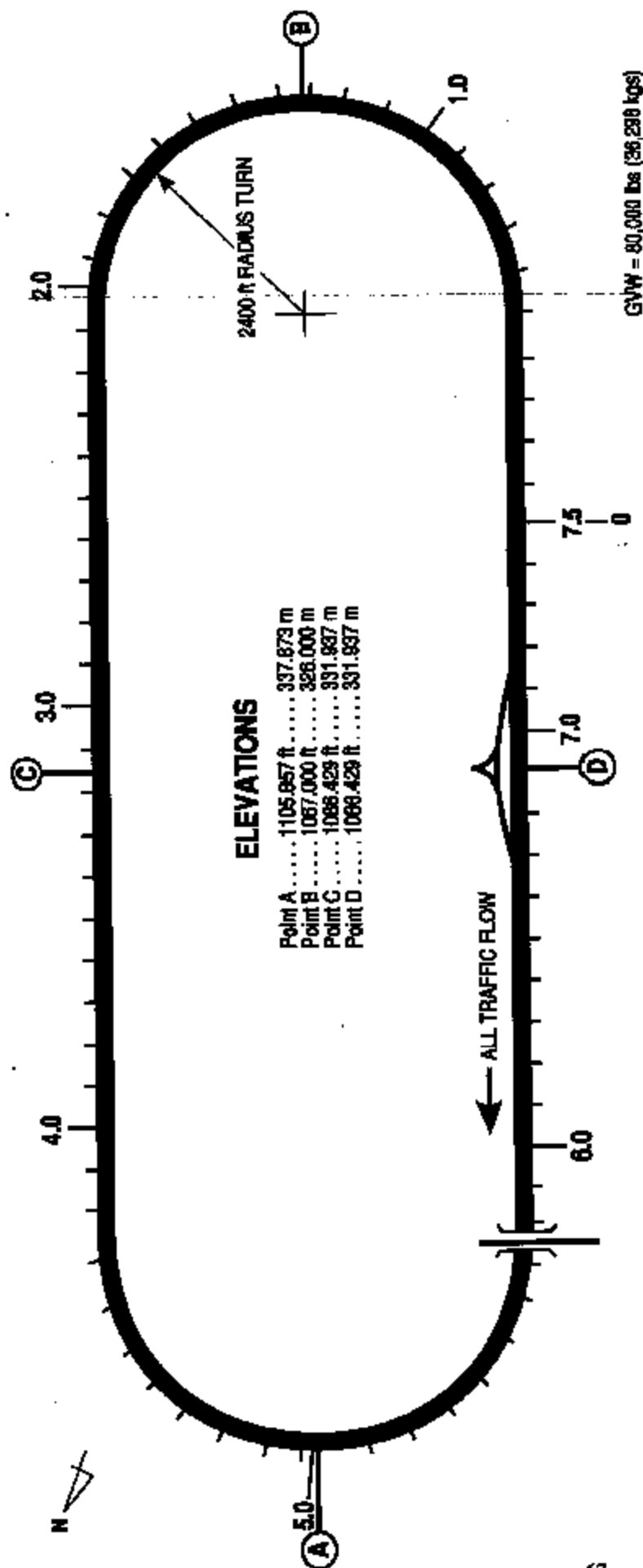
10

1-8 0000



GWW FOR 12 & 15% SLOPE = 4000 lbs (1814 kg)
OTHER GWW = 30,000 lbs (13,608 kg)

NOT TO SCALE
ALL DIMENSIONS ARE APPROXIMATE



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

TRC

(B)

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EAST LEBERT, OHIO 43018-0287
P-10-008

7.5-MILE TEST TRACK

APPENDIX D
Notice of Possible Non-Compliance

This vehicle (C45203) met the requirements of the FMVSS 135 standard.