REPORT NUMBER 124H-GTL-04-004

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637146

SAFETY COMPLIANCE TESTING FOR FMVSS 124H ACCELERATOR CONTROL SYSTEMS

NISSAN MOTOR CO., LTD.
2004 NISSAN QUEST, MPV
NHTSA NO. C45203

GENERAL TESTING LABORATORIES, INC.
1623 LEEDSTOWN ROAD
COLONIAL BEACH, VIRGINIA 22443

MAY 18, 2004

FINAL REPORT

PREPARED FOR

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, SW
ROOM 6115 (NVS-220)
WASHINGTON, D.C. 20590

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Approved By: [signature]

Approval Date: 5/18/04

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: [signature]

Acceptance Date: 5/21/04

Technical Report Documentation Page

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4. Title and Subtitle Final Report of FMVSS 124 Compliance Testing of 2004 NISSAN QUEST, MPV NHTSA No. C45203		5. Report Date May 18, 2004 6. Performing Organ. Code GTL
7. Author(s) Grant Farrand, Project Engineer Debbie Messick, Project Manager		8. Performing Organ. Rep# GTL-DOT-04-124-004
9. Performing Organization Name and Address General Testing Laboratories, Inc. 1623 Leedstown Road Colonial Beach, Va 22443		10. Work Unit No. (TRAIS) 11. Contract or Grant No. DTNH22-01-C-11025
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Admin. Enforcement Office of Vehicle Safety Compliance (NVS-220) 400 7th Street, S.W., Room 6115 Washington, DC 20590		13. Type of Report and Period Covered Final Test Report April 23, 2004 14. Sponsoring Agency Code NSA-30
15. Supplementary Notes		
16. Abstract Compliance tests were conducted on the subject 2004 Nissan Quest MPV in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-124-06 for the determination of FMVSS 124 compliance. Test failures identified were as follows: NONE		
17. Key Words Compliance Testing Safety Engineering FMVSS 124	18. Distribution Statement Copies of this report are available from NHTSA NHTSA Technical Reference Div., Rm. 5108 (NAD-52) 400 7th St., S.W. Washington, DC 20590 Telephone No. (202) 366-4946	
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SECTION 1
PURPOSE OF COMPLIANCE TEST

FMVSS 124 specifies requirements for the return of a vehicle's throttle to the idle position when the driver removes the actuating force from the accelerator control, or in the event of a severance or disconnection in the accelerator control system. The purpose of FMVSS 124 is to reduce deaths and injuries resulting from engine overspeed caused by malfunctions in the accelerator control system. This standard applies to passenger cars, multipurpose passenger vehicles (MPV's), trucks and buses.

SECTION 2
TEST PROCEDURES AND DISCUSSION OF RESULTS

Compliance testing was conducted on a 2004 NISSAN QUEST, MPV, NHTSA No. C45203 in accordance with the National Highway Traffic Safety Administration (NHTSA) Laboratory Procedure TP-124-06.

The drive-by wire vehicle was equipped with an Accelerator Pedal Position Sensor (APS), Throttle Plate Position Sensor (TPS), Electronic Control Module (ECM), and Air Throttle Plate Actuator Motor (TPM).

Output from the throttle position sensor on the air throttle plate shaft was used to measure throttle position and data was recorded at 1000 HZ with GTL's data acquisition system. Normal operation testing was conducted to simulate the normal removal of the driver's foot from the accelerator pedal. Return to idle times were determined for various throttle plate positions with the accelerator control system complete and with each of the wires to the TPS and TPM acutator motor independently severed and also shorted to ground. Return to idle times were also determined for severance of the connectors to the APS, and TPS/TPM actuator motor. Removal of two springs in the accelerator pedal was not performed at this time due to the APS unit being a non-serviceable unit which cannot be taken apart without physically cutting apart the sealed unit. Also a motor return spring in the TPM was not removed at this time due to inaccessibility of the unit between the engine and firewall of the vehicle. The ECM connectors were also tested for severance and affect on throttle return times.

Severance and wire shorting of TPS and actuator motor wires in some cases resulted in a Limp Home type RPM mode although the throttle plate return times were within specification. Under certain failed TPS conditions, limited or no data was available as output from the vehicle TPS was used for data recordation. The laboratory by observation did not experience any failures which resulted in a runaway engine. System failures were induced approximately simultaneously with release of pedal force. Some tests were conducted only at 100% W.O.T. as it represented the worst case return time scenario.

This testing was performed at high ambient temperature of 52° C (-5 +0) in accordance with the NHTSA Test Procedure TP-124-06.

SECTION 3
COMPLIANCE TEST DATA

Test data for this test can be found on the following pages. Photographs are found in Section 5 and Test Plots are found in Section 6.

DATA SHEET 1
VEHICLE DESCRIPTION

VEHICLE MY/MAKE/MODEL/BODY STYLE: 2004 NISSAN QUEST MPV
VEHICLE NHTSA NO.: C45203
VEHICLE VIN: 5N1BV28494N320161
DATE OF TEST: APRIL 23, 2004
TEST LAB: GENERAL TESTING LABORATORIES
VEHICLE ENGINE TYPE: V6 GVWR: 2586 KG
VEHICLE ENGINE SIZE: 3.5 L
VEHICLE ACCEL. CONTROL SYSTEM (ACS) (Air or Fuel Throttled): AIR
MAX. BHP ENGINE SPEED: UNK.
MFR. IDLE RPM: COMPUTER CONTROLLED (850)
FUEL METERING DEVICE (Carburetor, fuel injection, etc): FUEL INJECTION

REMARKS:

RECORDED BY: [signature] DATE: 04/23/04

APPROVED BY: [signature]

DATA SHEET 2
NORMAL OPERATION TEST
(fully operational system)

VEHICLE MY/MAKE/MODEL/BODY STYLE: 2004 NISSAN QUEST, MPV
VEHICLE NHTSA NO.: C45203
DATE OF TEST: APRIL 23, 2004

Check one:

Mid Temp. Test:___ Low Temp. Test:___ High Temp. Test: X

SYSTEM CONDITION: COMPLETE (no modifications) Normal Operation

ACCELERATOR POSITION % WIDE OPEN THROTTLE (WOT)	THROTTLE POSITION SENSOR READING	RPM	TEMPERATURE (°F)		THROTTLE POSITION SENSOR READING @ IDLE (BASELINE)	RETURN TIME TO IDLE (Msec)	PASS/ FAIL
			ENGINE COOLANT	AMBIENT			
25%	25	4995	121.0	120.5	3%	71	P
50%	50	4995	130	120.5	3%	72	P
75%	75	4995	135	120.5	3%	77	P
100%	100	4995	136	121.0	3%	89	P

RETURN TIME REQUIREMENTS:

1 second (1000 ms) for vehicles less than 4536 kg.
2 seconds (2000 ms) for vehicles more than 4536 kg.
3 seconds (3000 ms) for vehicles exposed to -18° C or less

PASS X FAIL ____

REMARKS:

RECORDED BY: _____ DATE: 04/23/04

APPROVED BY: _____

DATA SHEET 3 (1 of 7)
FAIL-SAFE OPERATION DISCONNECTION

VEHICLE MY/MAKE/MODEL/BODY STYLE: 2004 NISSAN QUEST, MPV
VEHICLE NHTSA NO.: C45203
DATE OF TEST: APRIL 23, 2004

Check one:

Mid Temp. Test:___ Low Temp. Test:___ High Temp. Test: X

SYSTEM CONDITION: APS CONNECTOR DISCONNECT

ACCELERATOR POSITION % WIDE OPEN THROTTLE (WOT)	THROTTLE POSITION SENSOR READING	RPM	TEMPERATURE (°F)		THROTTLE POSITION SENSOR READING @ IDLE (BASELINE)	RETURN TIME TO IDLE (Msec)	PASS/ FAIL
			ENGINE COOLANT	AMBIENT			
25%							
50%							
75%							
100%	100	4995	138	120.6	3%	438	P

RETURN TIME REQUIREMENTS:

1 second (1000 ms) for vehicles less than 4536 kg.
2 seconds (2000 ms) for vehicles more than 4536 kg.
3 seconds (3000 ms) for vehicles exposed to -18° C or less

PASS X FAIL ___

REMARKS:

RECORDED BY: _____ DATE: 04/23/04

APPROVED BY: _____

DATA SHEET 3 (2 of 7)
FAIL-SAFE OPERATION DISCONNECTION

VEHICLE MY/MAKE/MODEL/BODY STYLE: 2004 NISSAN QUEST, MPV
VEHICLE NHTSA NO.: C45203
DATE OF TEST: APRIL 23, 2004

Check one:

Mid Temp. Test:___ Low Temp. Test:___ High Temp. Test: X

SYSTEM CONDITION: TPS/TPM CONNECTOR DISCONNECT

ACCELERATOR POSITION % WIDE OPEN THROTTLE (WOT)	THROTTLE POSITION SENSOR READING	RPM	TEMPERATURE (°F)		THROTTLE POSITION SENSOR READING @ IDLE (BASELINE)	RETURN TIME TO IDLE (Msec)	PASS/ FAIL
			ENGINE COOLANT	AMBIENT			
25%							
50%							
75%							
100%	100	4995	132	120.3	3%	**	P

RETURN TIME REQUIREMENTS:

1 second (1000 ms) for vehicles less than 4536 kg.
2 seconds (2000 ms) for vehicles more than 4536 kg.
3 seconds (3000 ms) for vehicles exposed to -18° C or less

PASS X FAIL ____

REMARKS: Went into Limp Home RPM Mode at 1375 RPM.
** No throttle position data due to open circuit

RECORDED BY: _____ DATE: 04/23/04

APPROVED BY: _____

DATA SHEET 3 (3 of 7)
FAIL-SAFE OPERATION DISCONNECTION

VEHICLE MY/MAKE/MODEL/BODY STYLE: 2004 NISSAN QUEST, MPV
VEHICLE NHTSA NO.: C45203
DATE OF TEST: APRIL 23, 2004

Check one:

Mid Temp. Test:___ Low Temp. Test:___ High Temp. Test: X

SYSTEM CONDITION: TPS/TPM WIRES (INDIVIDUAL OPEN CIRCUIT)

WIRE NO.	ACCELERATOR POSITION % WIDE OPEN THROTTLE (WOT)	THROTTLE POSITION SENSOR READING	RPM	TEMPERATURE (°F)		THROTTLE POSITION SENSOR READING @ IDLE (BASELINE)	RETURN TIME TO IDLE (Msec) OR LIMP MODE	PASS/ FAIL
				ENGINE COOLANT	AMBIENT			
1	100%	100	4995	132	121.0	3%	5	P*
2	100%	100	4995	138	121.2	3%	**	P*
3	100%	100	4995	139	121.5	3%	100	P
4	100%	100	4995	143	121.7	3%	93	P*
5	100%	100	4995	147	121.8	3%	92	P*
6	100%	100	4995	148	122.0	3%	56	P

RETURN TIME REQUIREMENTS:

1 second (1000 ms) for vehicles less than 4536 kg.
2 seconds (2000 ms) for vehicles more than 4536 kg.
3 seconds (3000 ms) for vehicles exposed to -18° C or less

PASS X FAIL ___

REMARKS: * Went into Limp Home RPM Mode at 1375 RPM
** No Throttle Position Data Due to Open Circuit

RECORDED BY: T. Ferrara DATE: 04/23/04

APPROVED BY: D. Merrill

DATA SHEET 3 (4 of 7)
FAIL-SAFE OPERATION DISCONNECTION

VEHICLE MY/MAKE/MODEL/BODY STYLE: 2004 NISSAN QUEST, MPV
VEHICLE NHTSA NO.: C45203
DATE OF TEST: APRIL 23, 2004

Check one:

Mid Temp. Test:___ Low Temp. Test:___ High Temp. Test: X

SYSTEM CONDITION: TPS/TPM WIRES SHORTED TO GROUND

WIRE NO.	ACCELERATOR POSITION % WIDE OPEN THROTTLE (WOT)	THROTTLE POSITION SENSOR READING	RPM	TEMPERATURE (°F)		THROTTLE POSITION SENSOR READING @ IDLE (BASELINE)	RETURN TIME TO IDLE (Msec) OR LIMP MODE	PASS/ FAIL
				ENGINE COOLANT	AMBIENT			
1	100%	100	4995	138.5	121.0	3%	161	P*
2	100%	100	4995	140	121.2	3%	159	P
3	100%	100	4995	145	121.2	3%	85	P
4	100%	100	4995	148	121.3	3%	188	P*
5	100%	100	4995	150	121.3	3%	181	P*
6	100%	100	4995	156.6	121.3	3%	14	P

RETURN TIME REQUIREMENTS:

1 second (1000 ms) for vehicles less than 4536 kg.
2 seconds (2000 ms) for vehicles more than 4536 kg.
3 seconds (3000 ms) for vehicles exposed to -18° C or less

PASS X FAIL ___

REMARKS: * Went into Limp Home RPM Mode at 1375 RPM

RECORDED BY: [signature] DATE: 04/23/04

APPROVED BY: [signature]

DATA SHEET 3 (5 of 7)
FAIL-SAFE OPERATION DISCONNECTION

VEHICLE MY/MAKE/MODEL/BODY STYLE: 2004 NISSAN QUEST, MPV
VEHICLE NHTSA NO.: C45203
DATE OF TEST: APRIL 23, 2004

Check one:

Mid Temp. Test:___ Low Temp. Test:___ High Temp. Test: X

SYSTEM CONDITION: APS INDIVIDUAL WIRES SHORTED TO GROUND

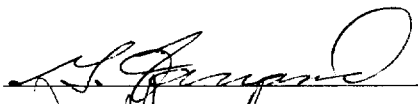
WIRE NO.	ACCELERATOR POSITION % WIDE OPEN THROTTLE (WOT)	THROTTLE POSITION SENSOR READING	RPM	TEMPERATURE (°F)		THROTTLE POSITION SENSOR READING @ IDLE (BASELINE)	RETURN TIME TO IDLE (Msec) OR LIMP MODE	PASS/ FAIL
				ENGINE COOLANT	AMBIENT			
11	100%	100	4995	152	120.0	3%	19	P*
12	100%	100	4995	151.5	121.5	3%	49	P*
13	100%	100	4995	151.4	121.7	3%	162	P
14	100%	100	4995	151.4	122.0	3%	43	P*
15	100%	100	4995	153.5	120.6	3%	82	P
16	100%	100	4995	154.8	120.0	3%	110	P

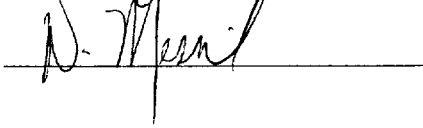
RETURN TIME REQUIREMENTS:

1 second (1000 ms) for vehicles less than 4536 kg.
2 seconds (2000 ms) for vehicles more than 4536 kg.
3 seconds (3000 ms) for vehicles exposed to -18° C or less

PASS X FAIL ___

REMARKS: * Went into Limp Home RPM Mode at 1375 RPM

RECORDED BY:  DATE: 04/23/04

APPROVED BY: 

DATA SHEET 3 (6 of 7)
FAIL-SAFE OPERATION DISCONNECTION

VEHICLE MY/MAKE/MODEL/BODY STYLE: 2004 NISSAN QUEST, MPV
VEHICLE NHTSA NO.: C45203
DATE OF TEST: APRIL 23, 2004

Check one:

Mid Temp. Test:___ Low Temp. Test:___ High Temp. Test: X

SYSTEM CONDITION: APS INDIVIDUAL WIRES OPEN

WIRE NO.	ACCELERATOR POSITION % WIDE OPEN THROTTLE (WOT)	THROTTLE POSITION SENSOR READING	RPM	TEMPERATURE (°F)		THROTTLE POSITION SENSOR READING @ IDLE (BASELINE)	RETURN TIME TO IDLE (Msec) OR LIMP MODE	PASS/ FAIL
				ENGINE COOLANT	AMBIENT			
11	100%	100	4995	167.6	120.2	3%	53	P*
12	100%	100	4995	160.3	120.4	3%	87	P*
13	100%	100	4995	164.5	120.6	3%	83	P
14	100%	100	4995	165.0	121.0	3%	70	P
15	100%	100	4995	166.5	120.9	3%	199	P
16	100%	100	4995	168.8	119.8	3%	92	P

RETURN TIME REQUIREMENTS:

1 second (1000 ms) for vehicles less than 4536 kg.
2 seconds (2000 ms) for vehicles more than 4536 kg.
3 seconds (3000 ms) for vehicles exposed to -18° C or less

PASS X FAIL ___

REMARKS: * Went into Limp Home RPM Mode at 1375 RPM

RECORDED BY: _____ DATE: 04/23/04

APPROVED BY: _____

DATA SHEET 3 (7 of 7)
FAIL-SAFE OPERATION DISCONNECTION

VEHICLE MY/MAKE/MODEL/BODY STYLE: 2004 NISSAN QUEST, MPV
VEHICLE NHTSA NO.: C45203
DATE OF TEST: APRIL 23, 2004

Check one:

Mid Temp. Test:___ Low Temp. Test:___ High Temp. Test: X

SYSTEM CONDITION: ECM CONNECTOR DISCONNECT

CONN #	ACCELERATOR POSITION % WIDE OPEN THROTTLE (WOT)	THROTTLE POSITION SENSOR READING	RPM	TEMPERATURE (°F)		THROTTLE POSITION SENSOR READING @ IDLE (BASELINE)	RETURN TIME TO IDLE (Msec) OR LIMP MODE	PASS/ FAIL
				ENGINE COOLANT	AMBIENT			
1	100%	100	4995	149.8	119.8	3%	1	P
2	100%	100	4995	151.7	119.8	3%	79	P

RETURN TIME REQUIREMENTS:

1 second (1000 ms) for vehicles less than 4536 kg.
2 seconds (2000 ms) for vehicles more than 4536 kg.
3 seconds (3000 ms) for vehicles exposed to -18° C or less

PASS X FAIL _____

REMARKS:

RECORDED BY: _____ DATE: 04/23/04

APPROVED BY: _____

SECTION 4
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

EQUIPMENT	DESCRIPTION	MODEL/ SERIAL NO.	CAL. DATE	NEXT CAL. DATE
CONTINUOUS RECORDER	OMEGA	55662	03/04	03/05
ENGINE RECORDING	FLUKE	7471026	03/04	03/05
ENGINE RECORDING	MONARCH	1444664	01/04	07/05
SOFTWARE	GTL	N/A	BEFORE USE	BEFORE USE
CHAMBER	GTL	N/A	N/A	N/A
EXHAUST DUCT	GTL	N/A	N/A	N/A

SECTION 5
PHOTOGRAPHS

2004 NISSAN QUEST
NHTSA NO. C45203
FMVSS NO. 124H

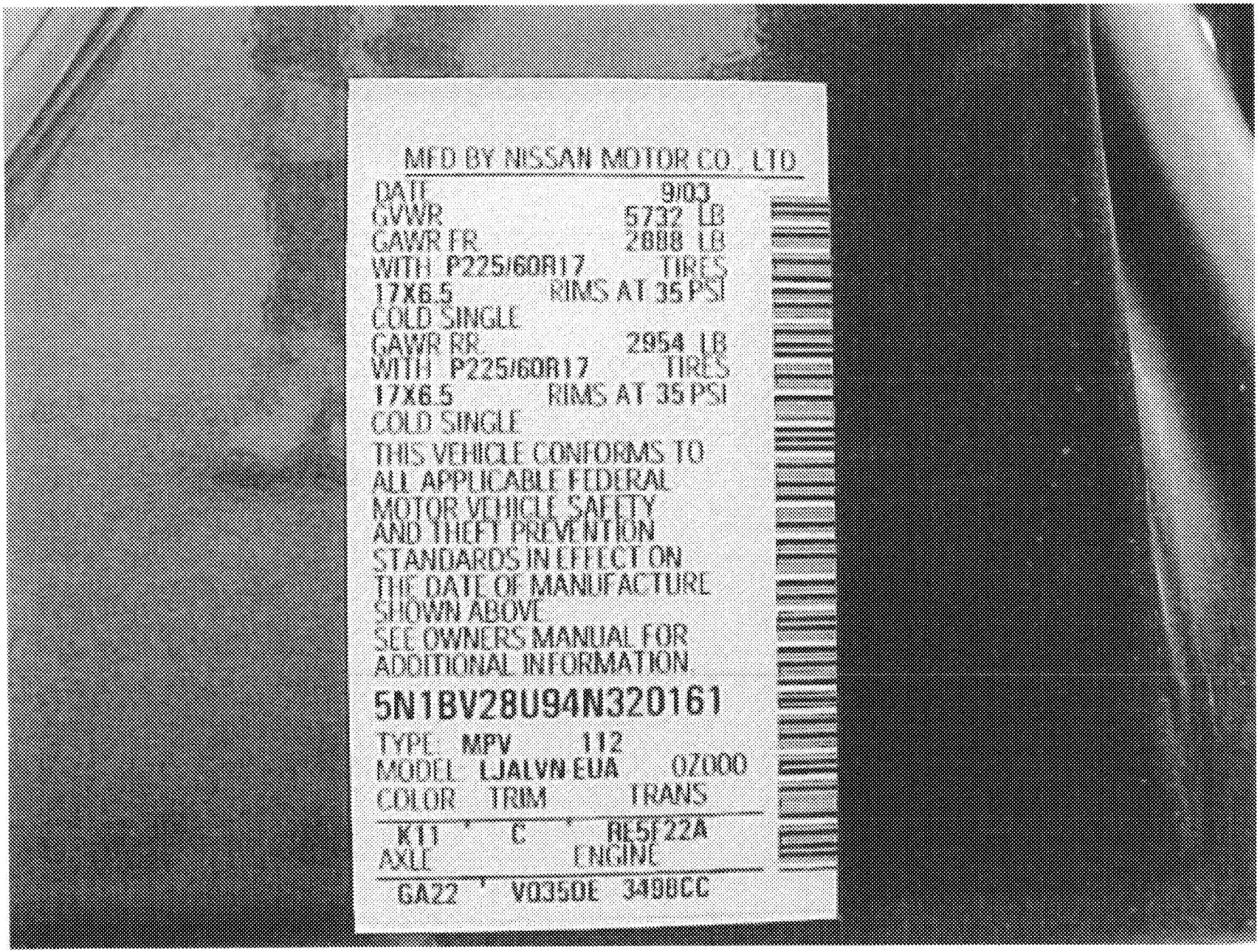
FIGURE 5.1
FRONT VIEW OF VEHICLE

2004 NISSAN QUEST
NHTSA NO. C45203
FMVSS NO. 124H

FIGURE 5.2
LEFT SIDE VIEW OF VEHICLE

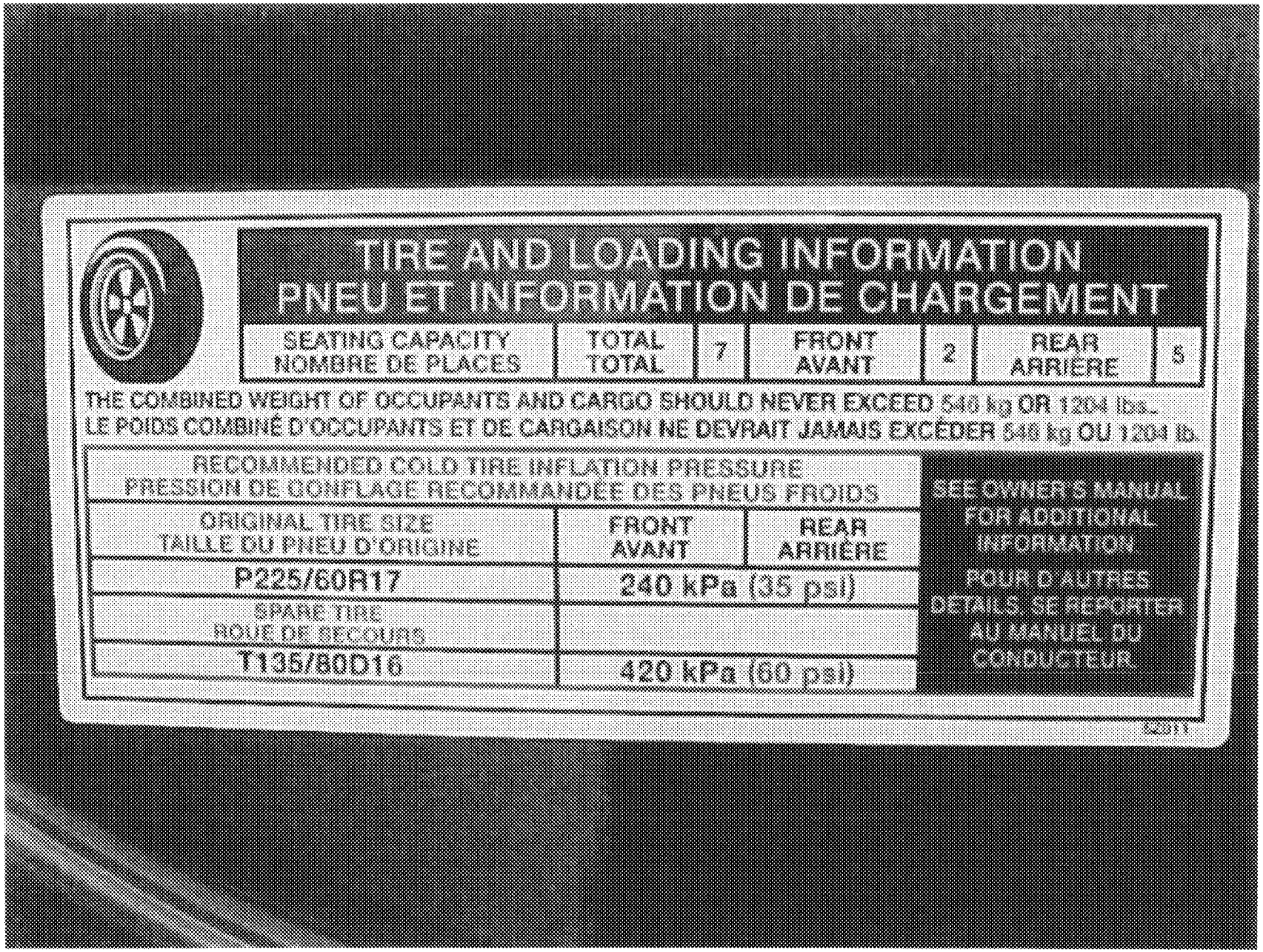
2004 NISSAN QUEST
NHTSA NO. C45203
FMVSS NO. 124H

FIGURE 5.3
RIGHT SIDE VIEW OF VEHICLE



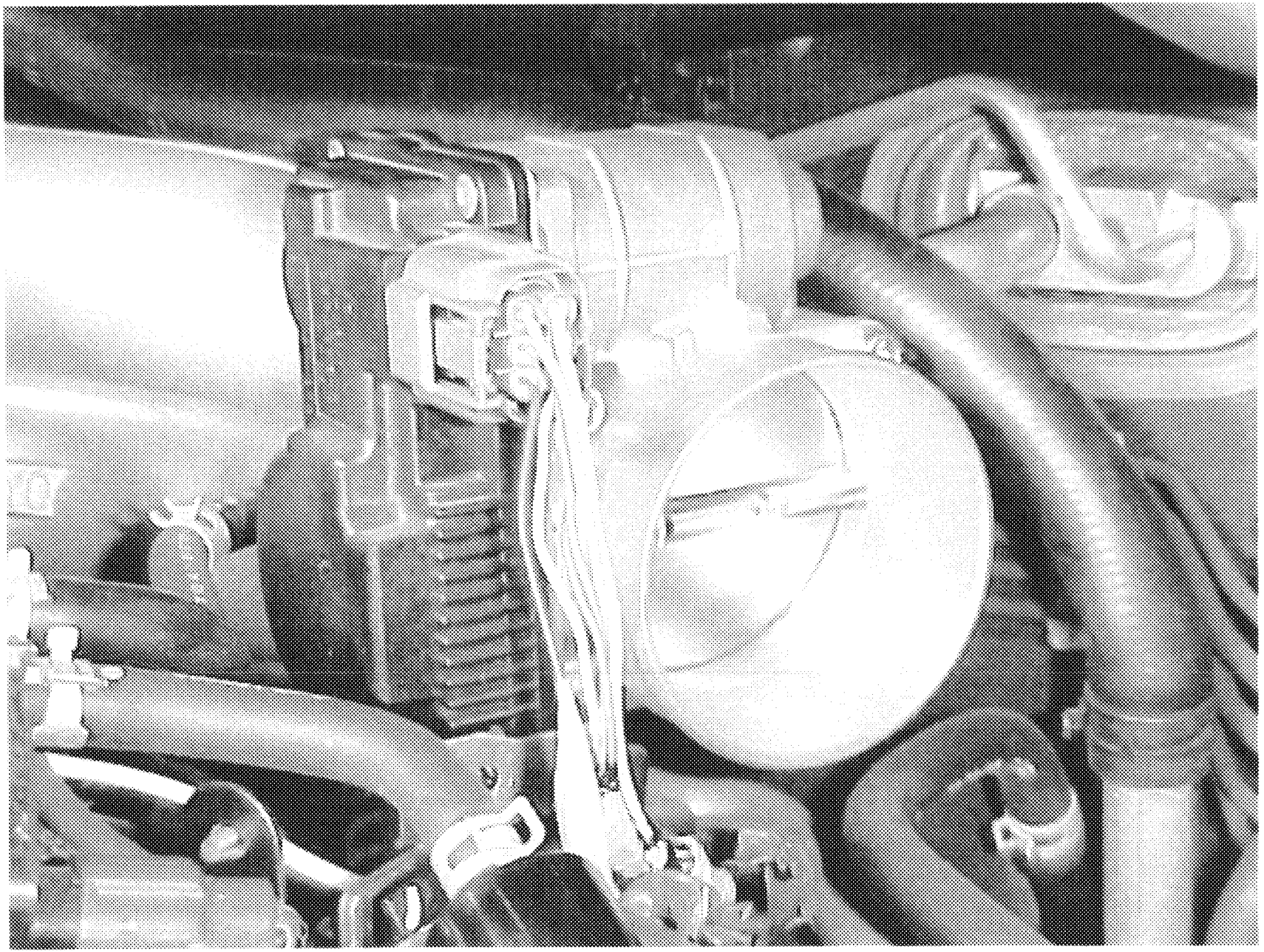
2004 NISSAN QUEST
NHTSA NO. C45203
FMVSS NO. 124H

FIGURE 5.4
CLOSE-UP VIEW OF VEHICLE'S CERTIFICATION LABEL



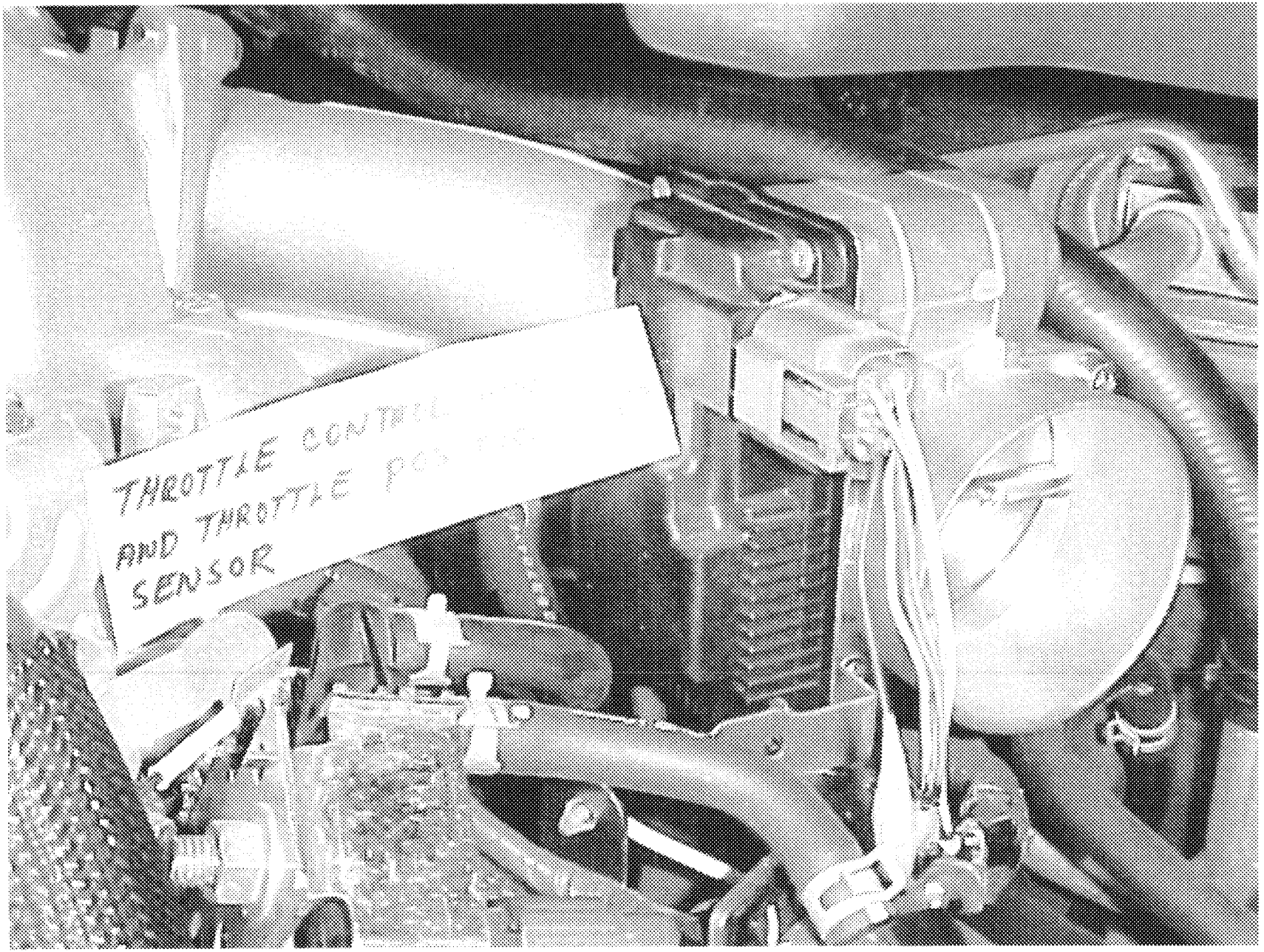
2004 NISSAN QUEST
NHTSA NO. C45203
FMVSS NO. 124H

FIGURE 5.5
CLOSE-UP VIEW OF VEHICLE'S TIRE INFORMATION LABEL



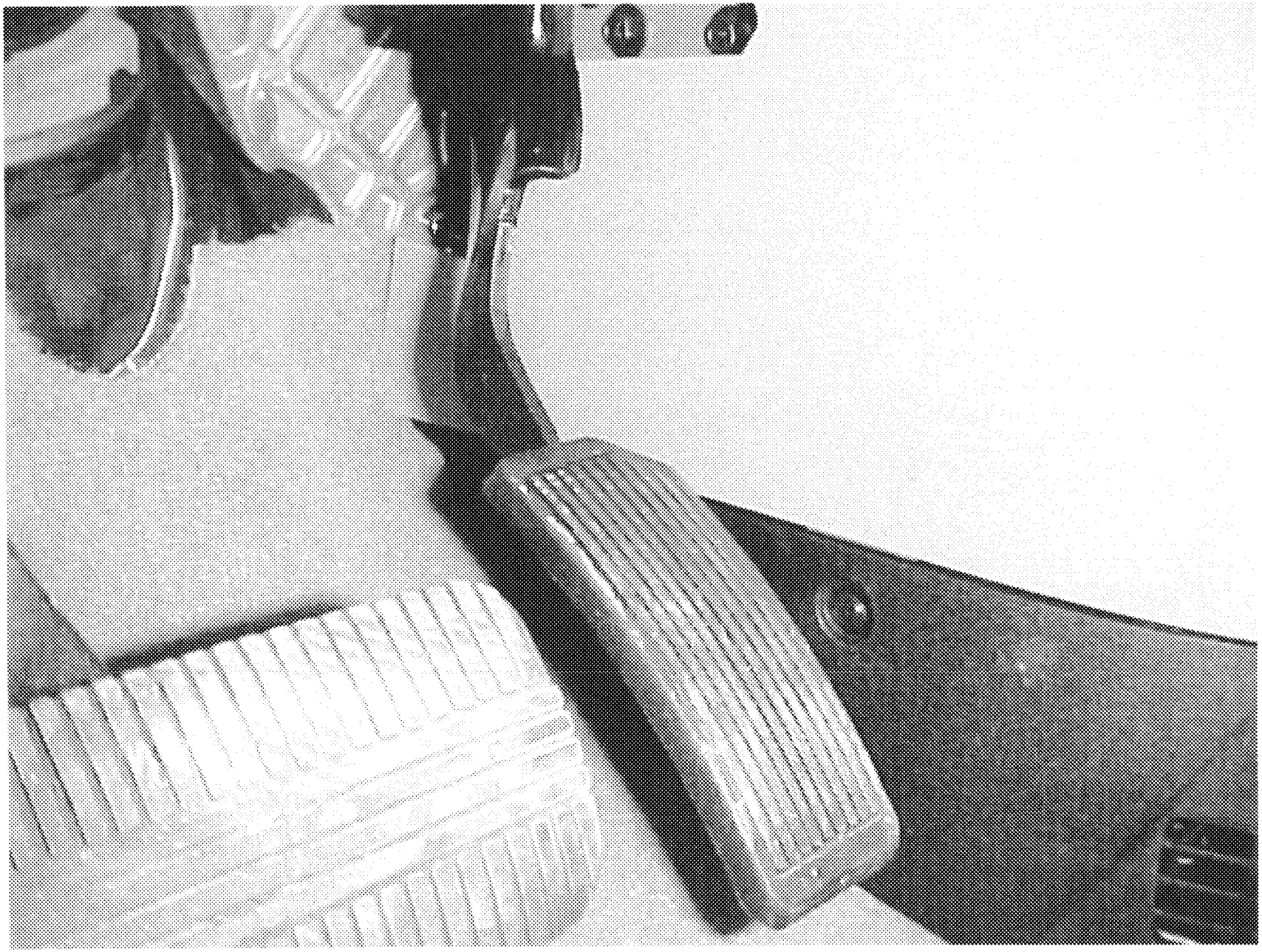
2004 NISSAN QUEST
NHTSA NO. C45203
FMVSS NO. 124H

FIGURE 5.6
VIEW OF THROTTLE BODY ON ENGINE



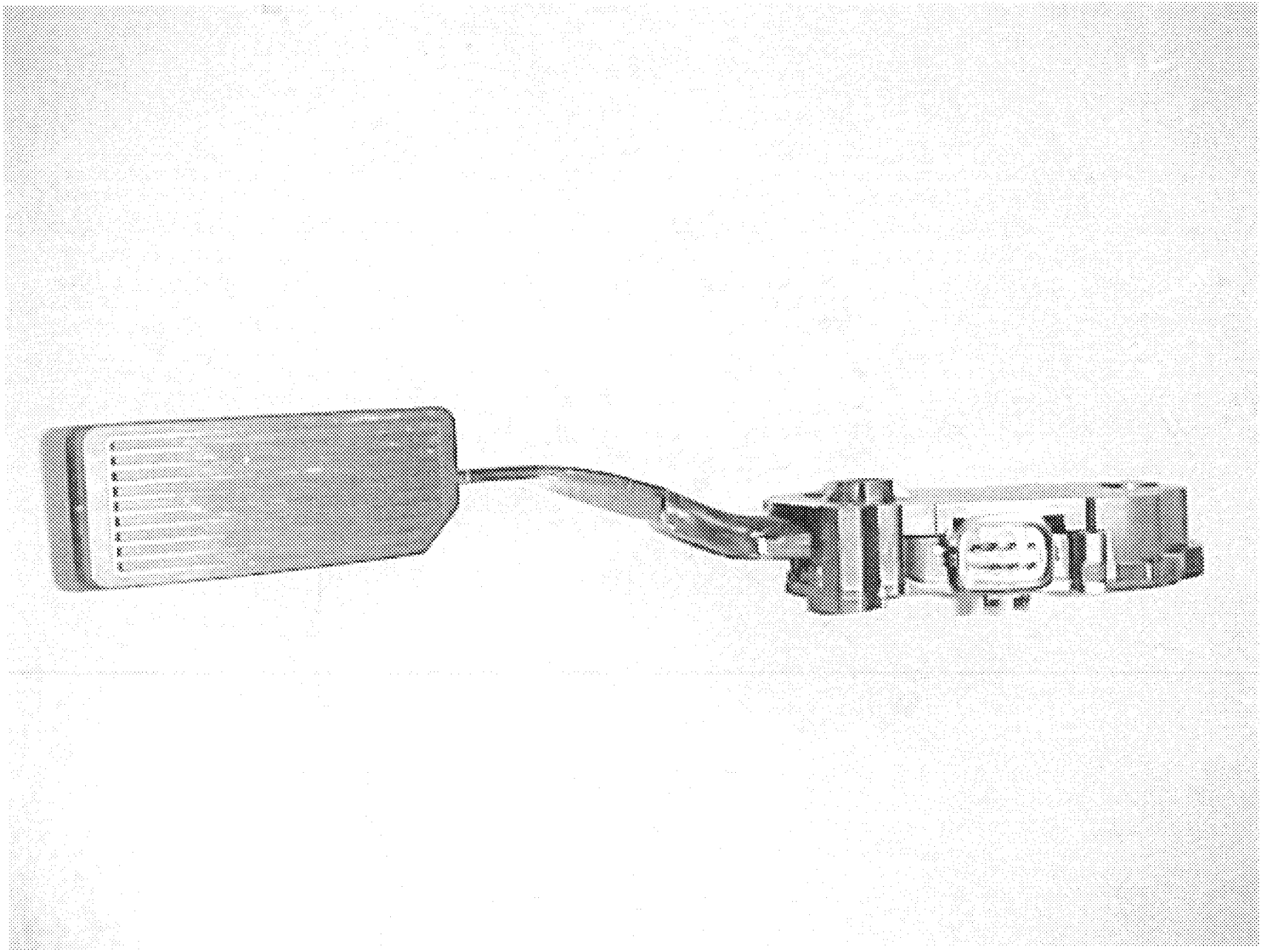
2004 NISSAN QUEST
NHTSA NO. C45203
FMVSS NO. 124H

FIGURE 5.7
LOCATION OF TPS AND TPM



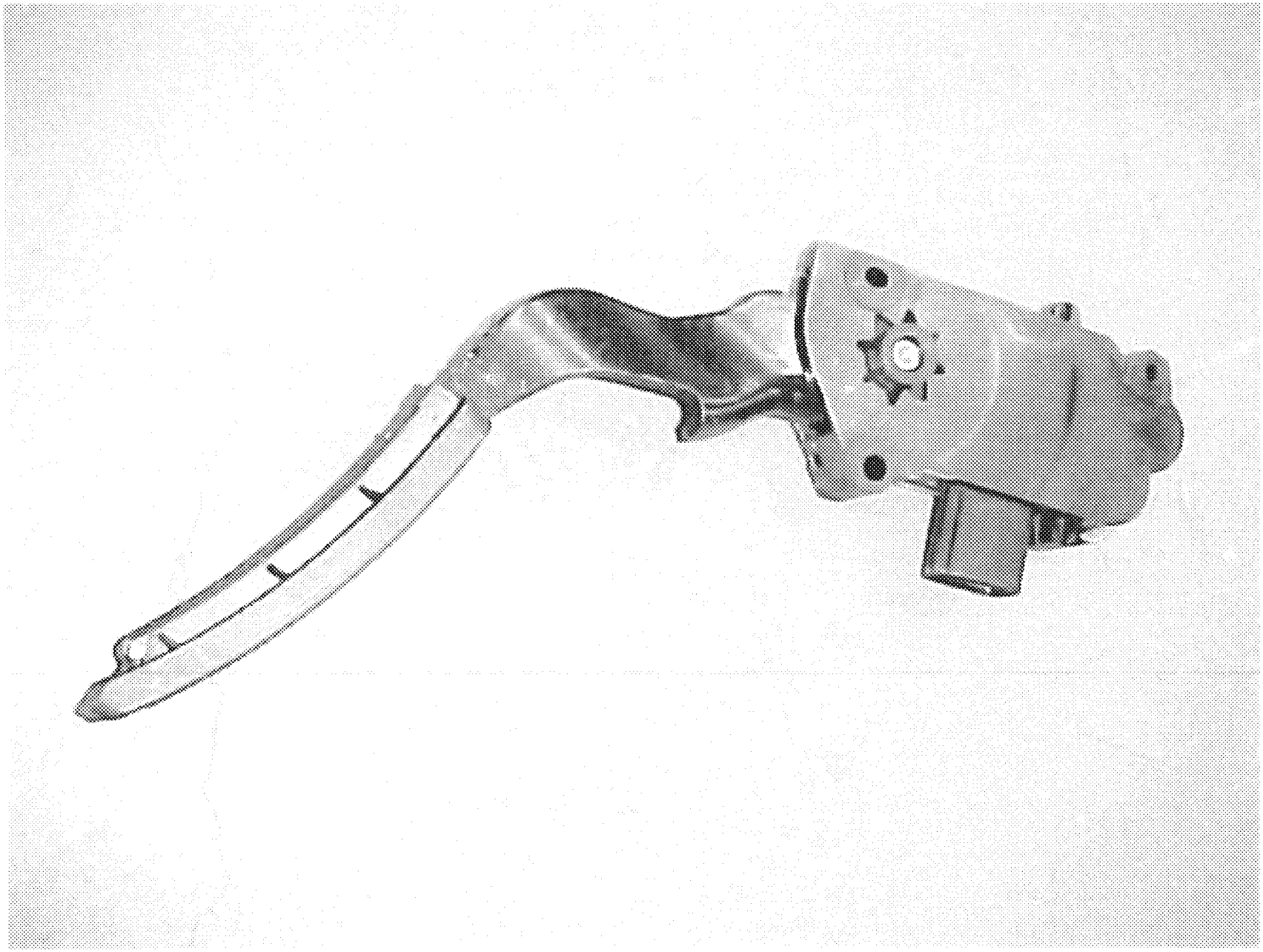
2004 NISSAN QUEST
NHTSA NO. C45203
FMVSS NO. 124H

FIGURE 5.8
ACCELERATOR PEDAL ASSEMBLY



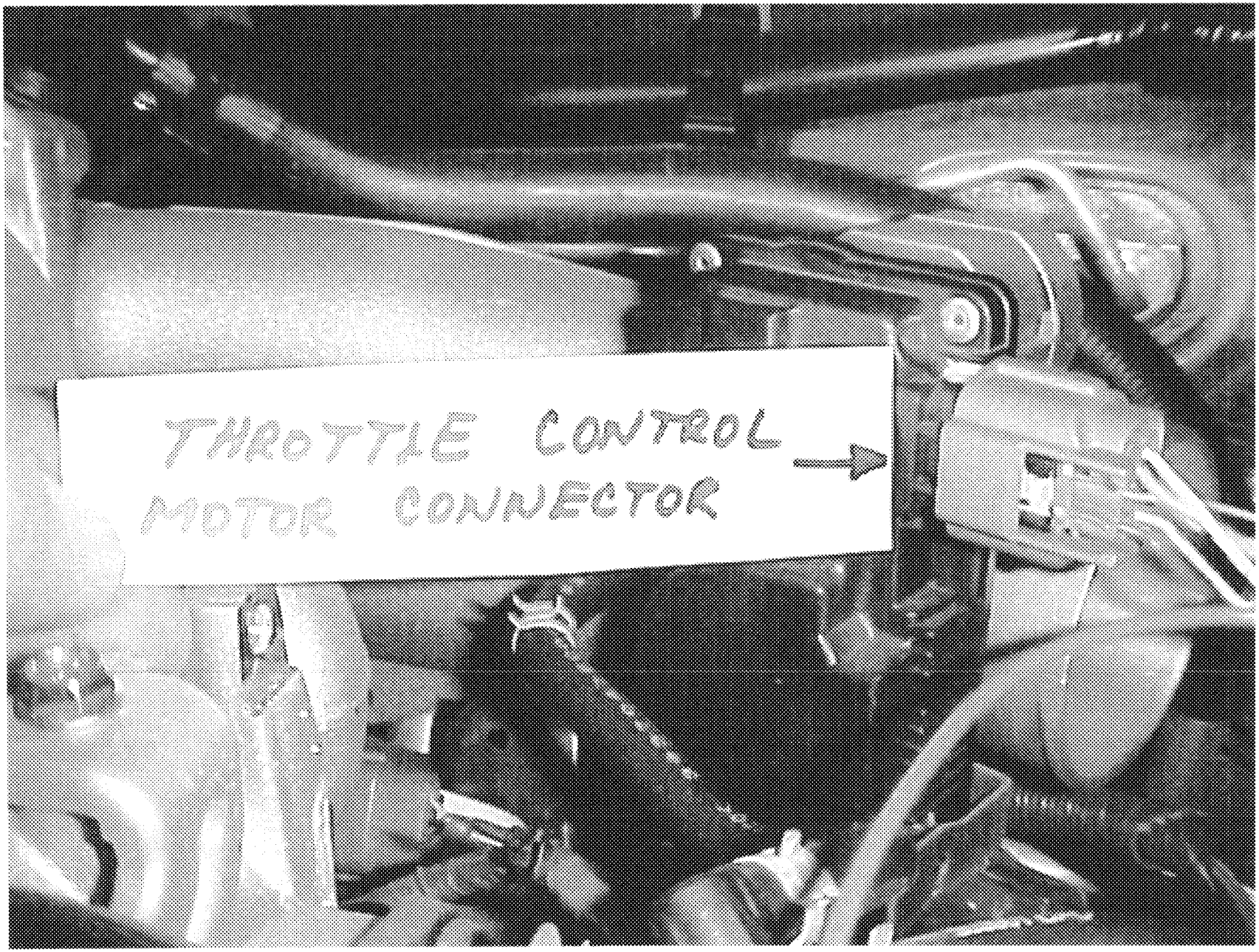
2004 NISSAN QUEST
NHTSA NO. C45203
FMVSS NO. 124H

FIGURE 5.9
ACCELERATOR PEDAL ASSEMBLY FRONT VIEW



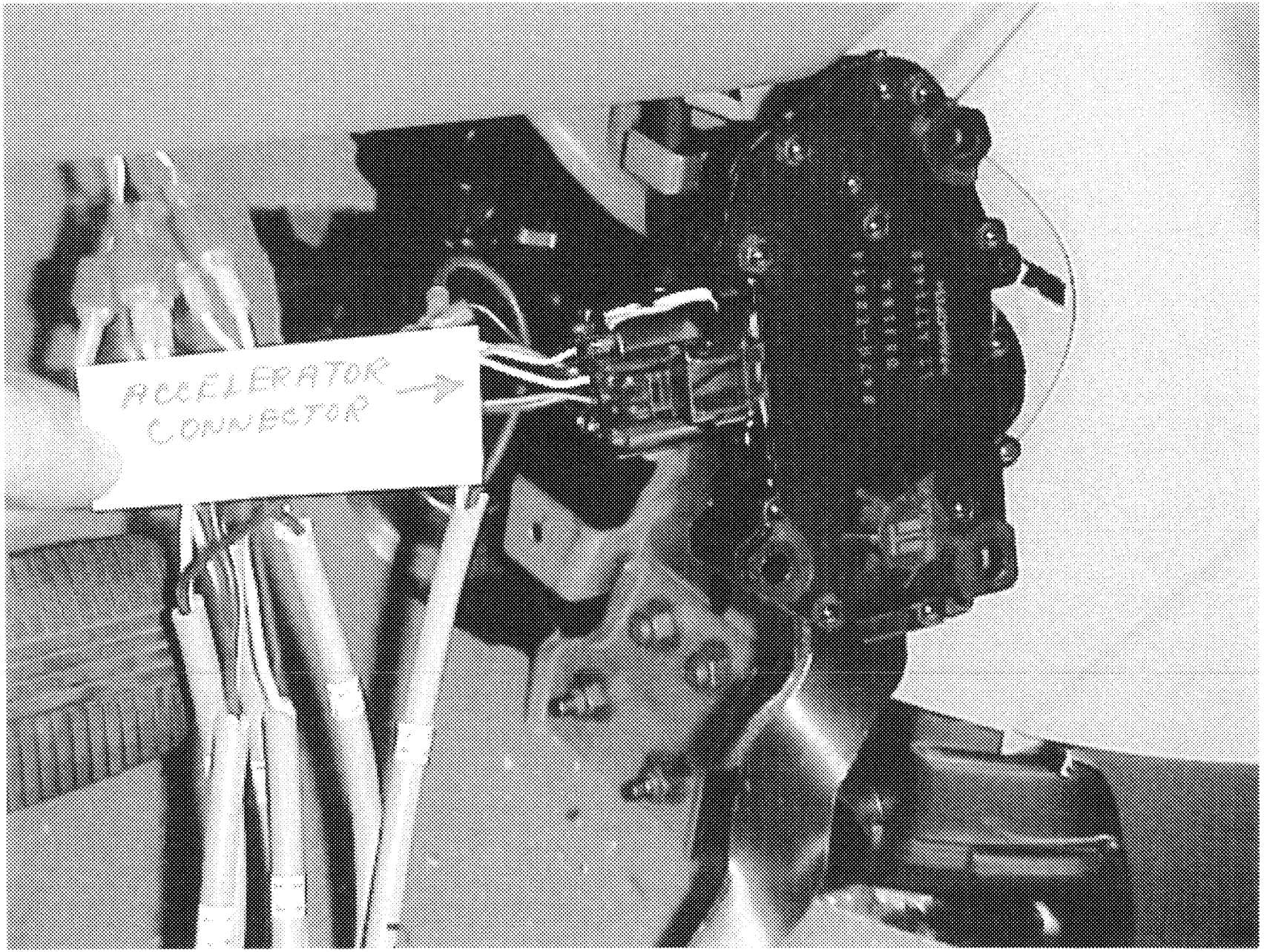
2004 NISSAN QUEST
NHTSA NO. C45203
FMVSS NO. 124H

FIGURE 5.10
ACCELERATOR PEDAL ASSEMBLY SIDE VIEW



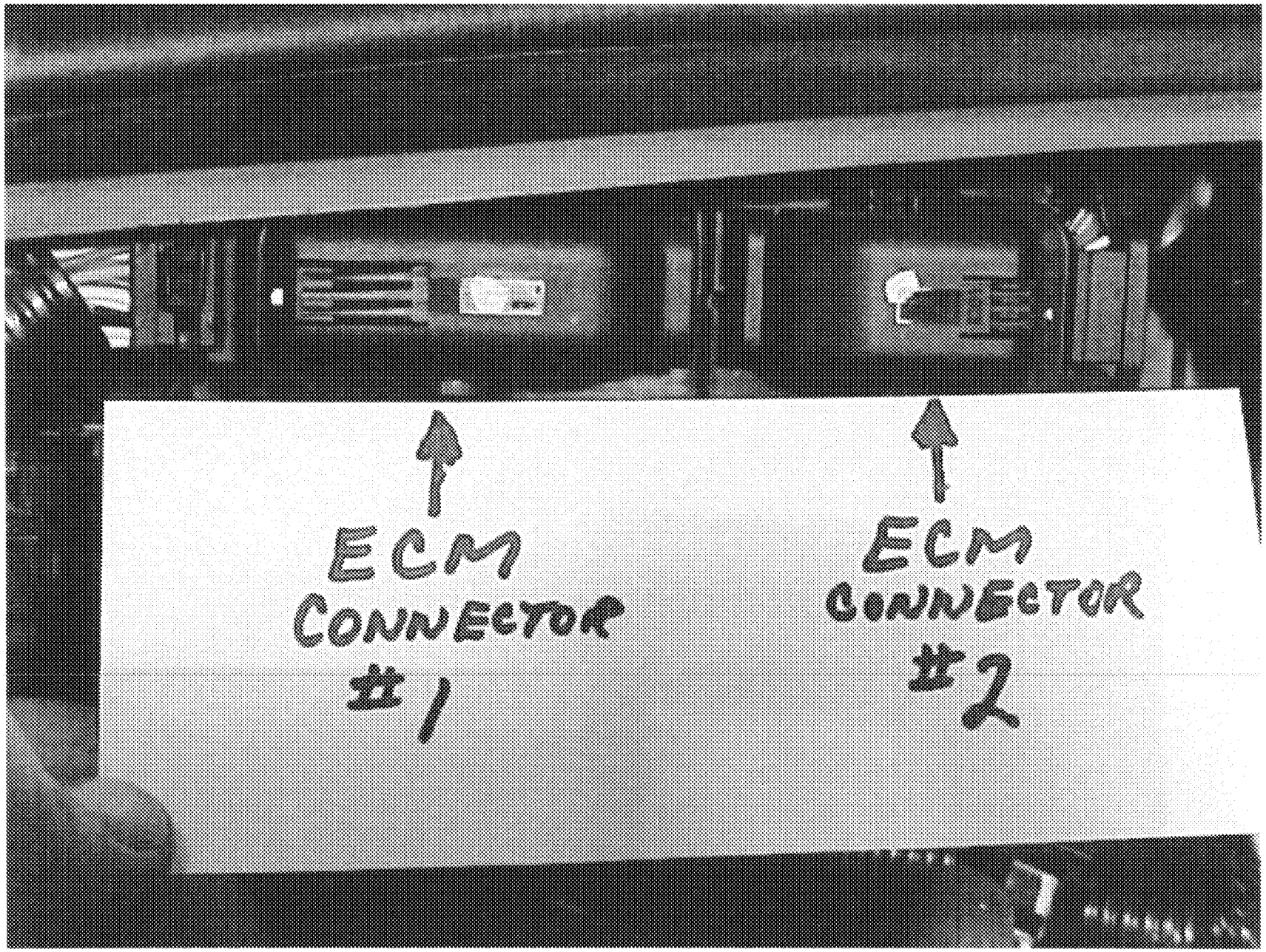
2004 NISSAN QUEST
NHTSA NO. C45203
FMVSS NO. 124H

FIGURE 5.11
TPS AND TPM CONNECTOR



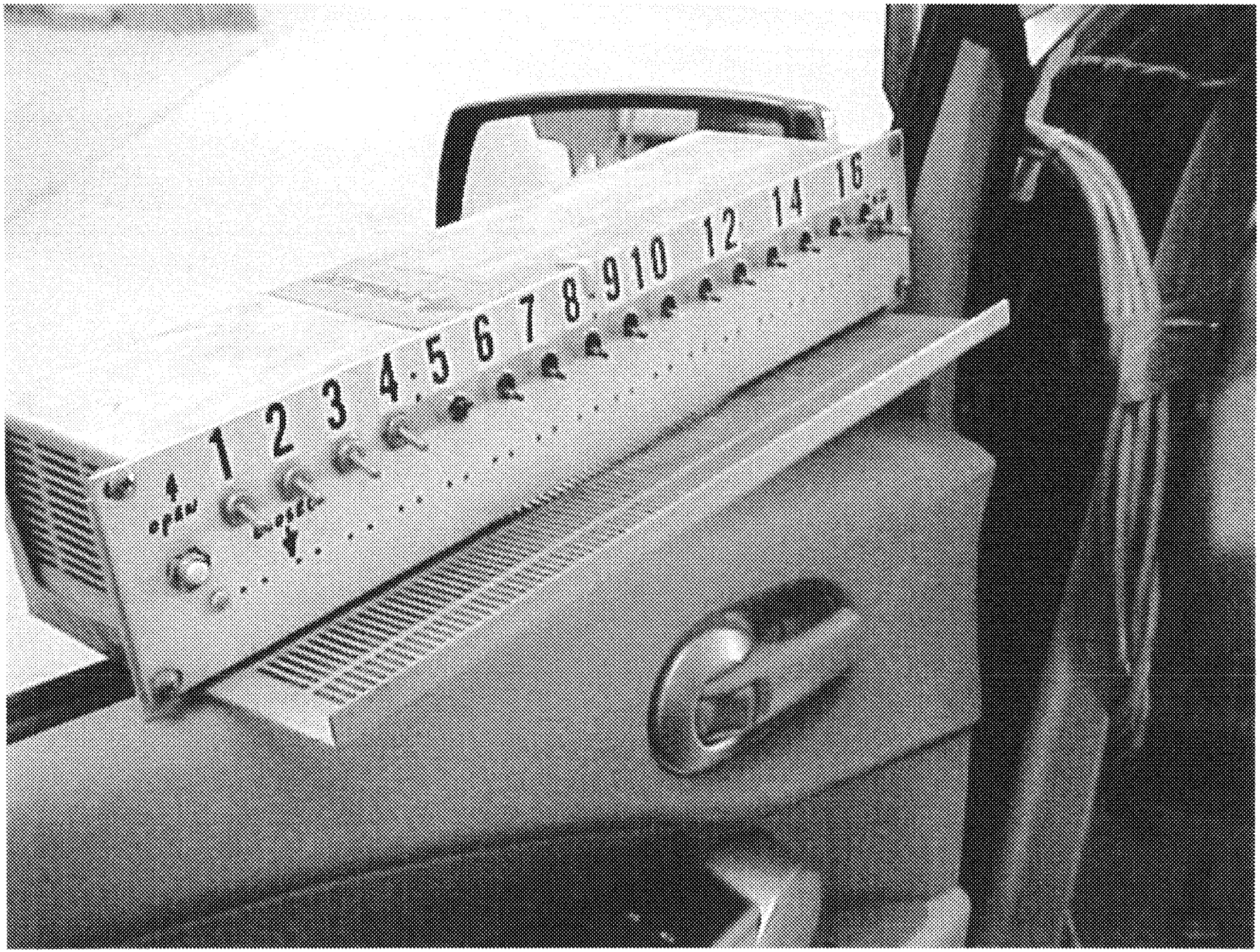
2004 NISSAN QUEST
NHTSA NO. C45203
FMVSS NO. 124H

FIGURE 5.12
ACCELERATOR PEDAL CONNECTOR



2004 NISSAN QUEST
NHTSA NO. C45203
FMVSS NO. 124H

FIGURE 5.13
ECM CONNECTORS #1 AND #2

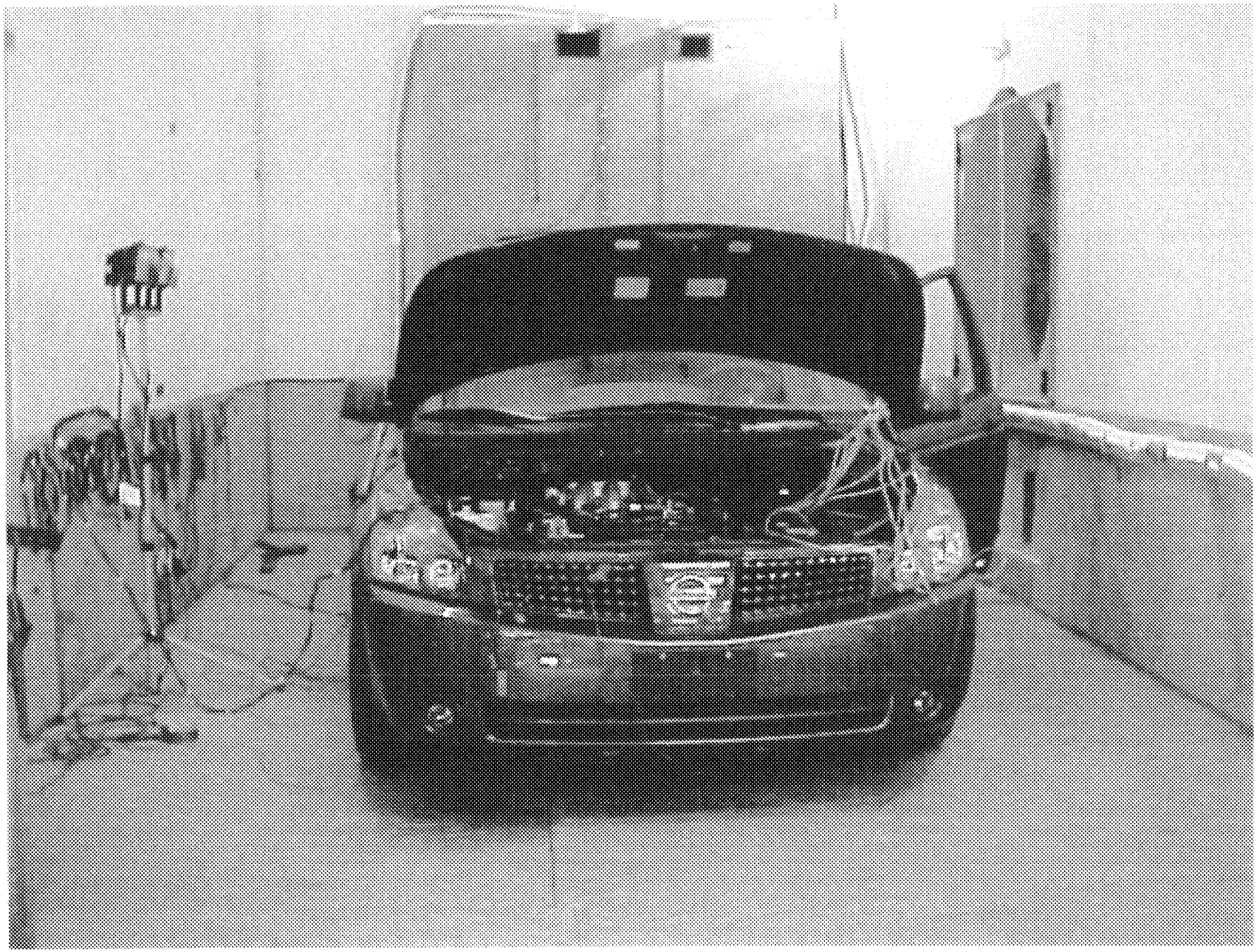


2004 NISSAN QUEST
NHTSA NO. C45203
FMVSS NO. 124H

FIGURE 5.14
TEST SET-UP TO PROVIDE OPEN AND GROUND WIRES

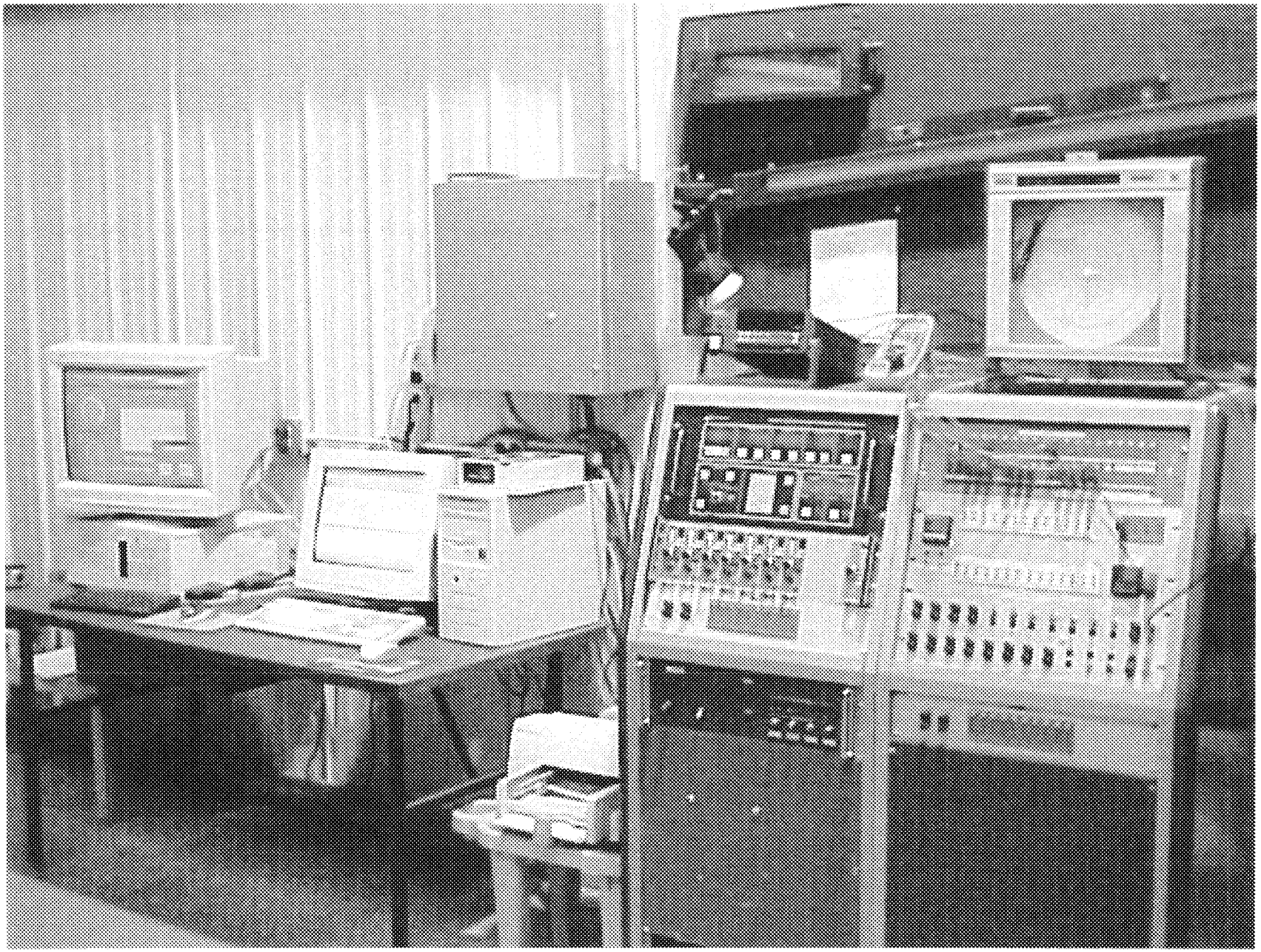
2004 NISSAN QUEST
NHTSA NO. C45203
FMVSS NO. 124H

FIGURE 5.15
OVERALL TEST SET-UP WIRING
VEHICLE IN TEST CHAMBER



2004 NISSAN QUEST
NHTSA NO. C45203
FMVSS NO. 124H

FIGURE 5.16
VEHICLE IN TEST CHAMBER



2004 NISSAN QUEST
NHTSA NO. C45203
FMVSS NO. 124H

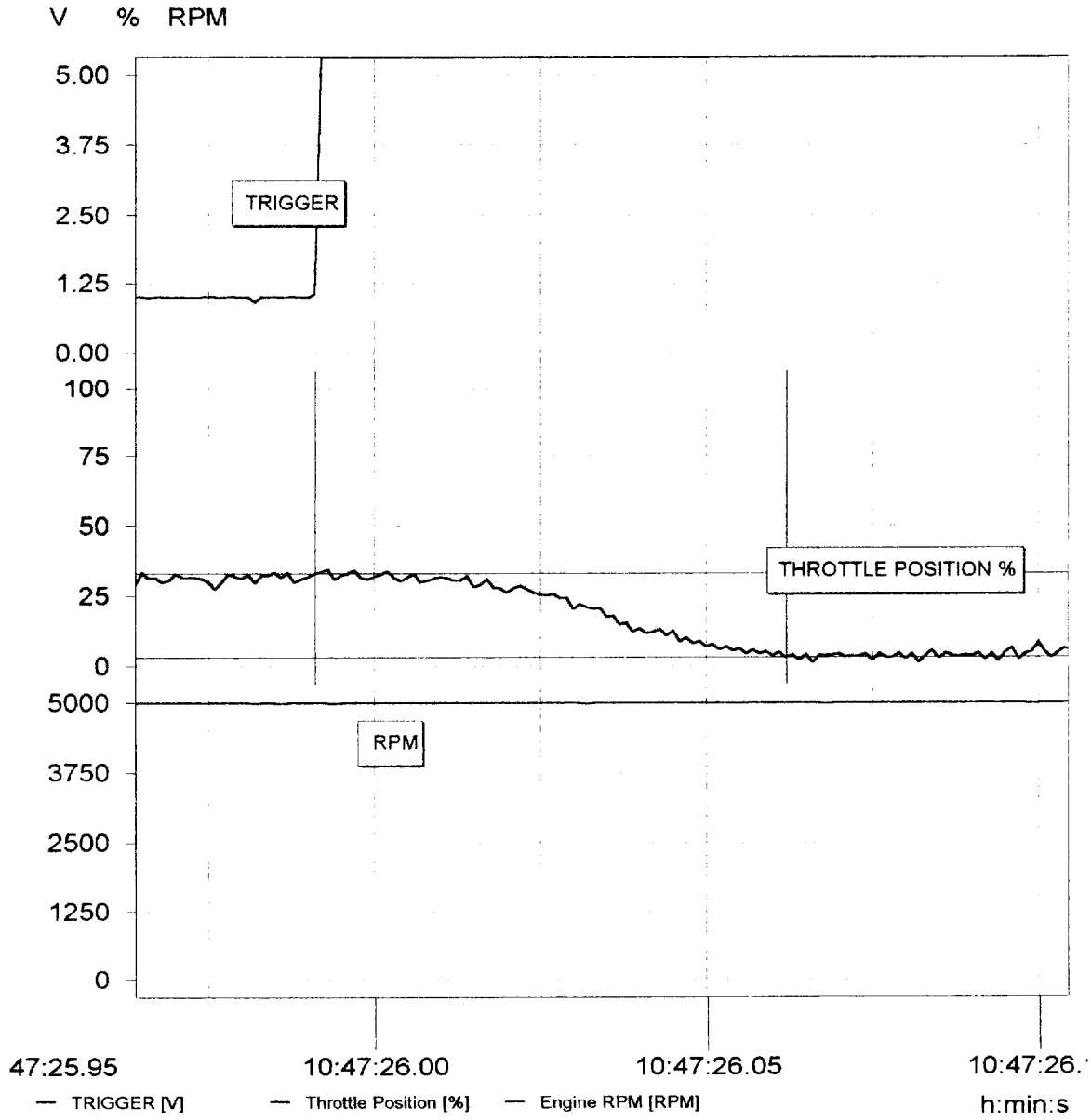
FIGURE 5.17
124 TEST INSTRUMENTATION SET-UP

SECTION 6
PLOTS

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ NORMAL/ 25 % WOT 10:53:51 AM 4/23/04

NHTSA C45203 NISSAN QUEST



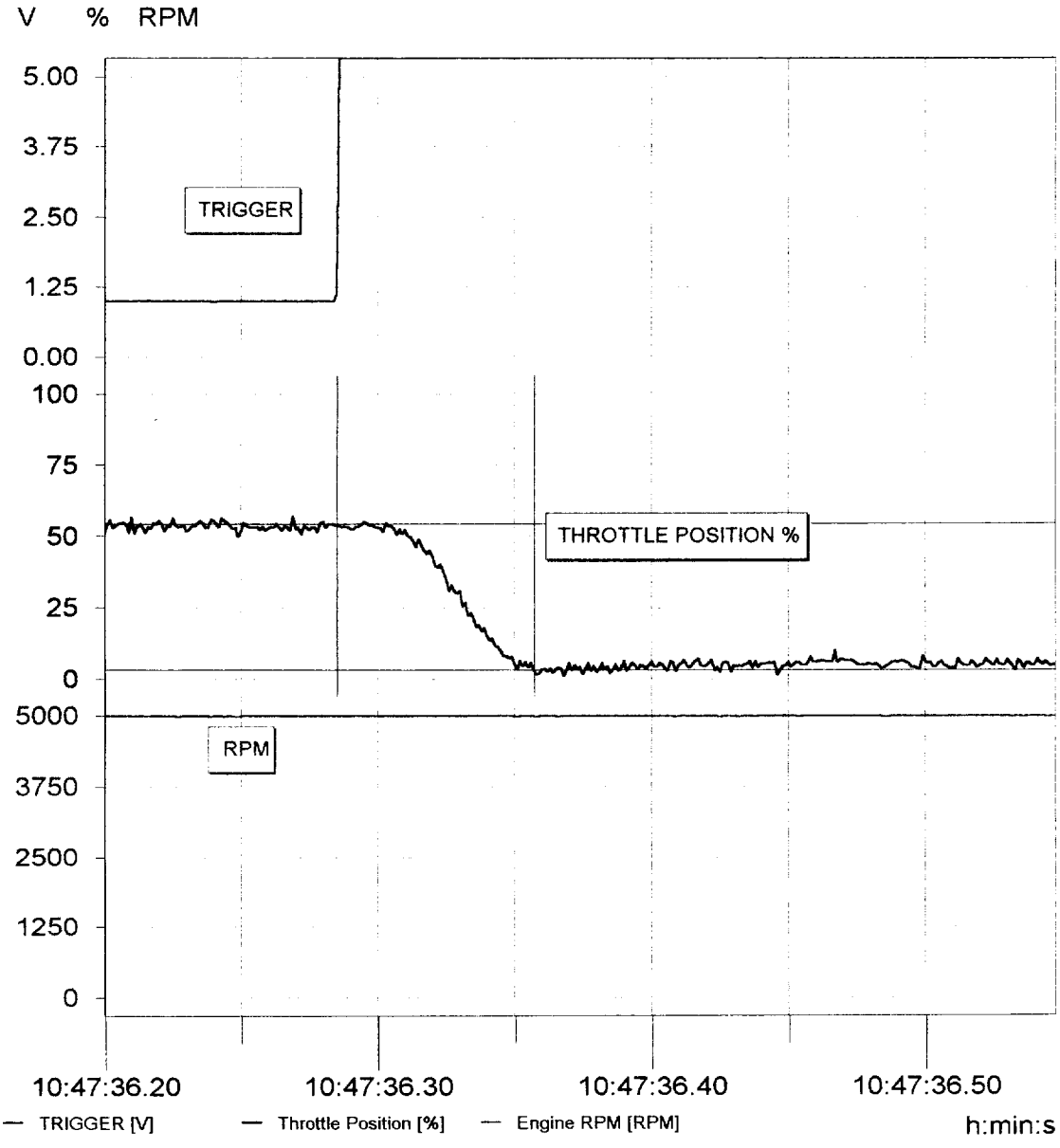
Channel:Throttle Position

Y1:	32.994 %	Y2:	2.961 %
t1:	-34449.559 ms	t2:	-34378.559 ms
dt:	0.071 s	f:	14.085 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ NORMAL/ 50% WOT 11:04:21 AM 4/23/04

NHTSA C45203 NISSAN QUEST



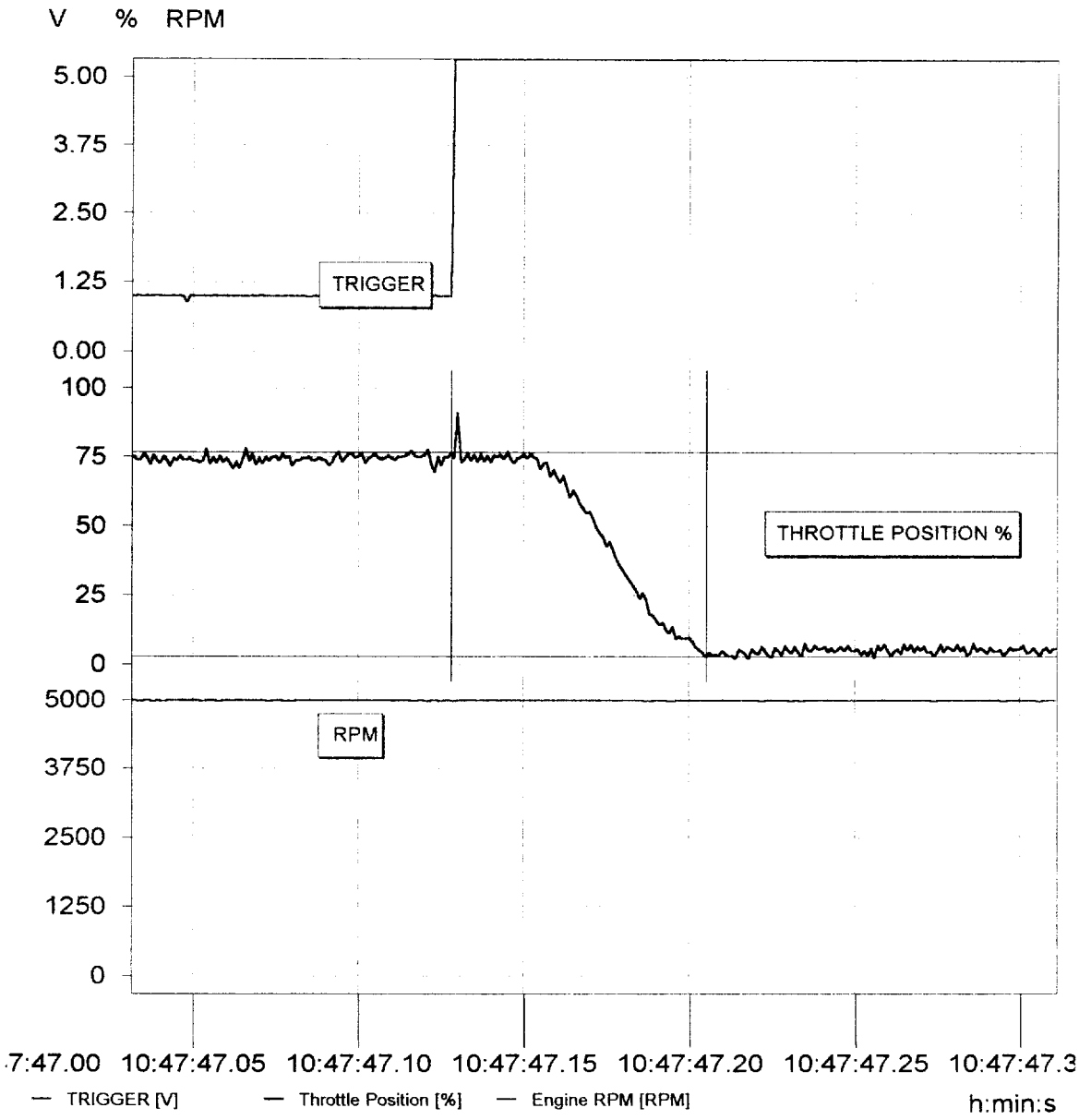
Channel: Throttle Position

Y1:	54.208 %	Y2:	3.171 %
t1:	-24155.559 ms	t2:	-24083.559 ms
dt:	0.072 s	f:	13.889 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ NORMAL/ 75% WOT 11:00:14 AM 4/23/04

NHTSA C45203 NISSAN QUEST



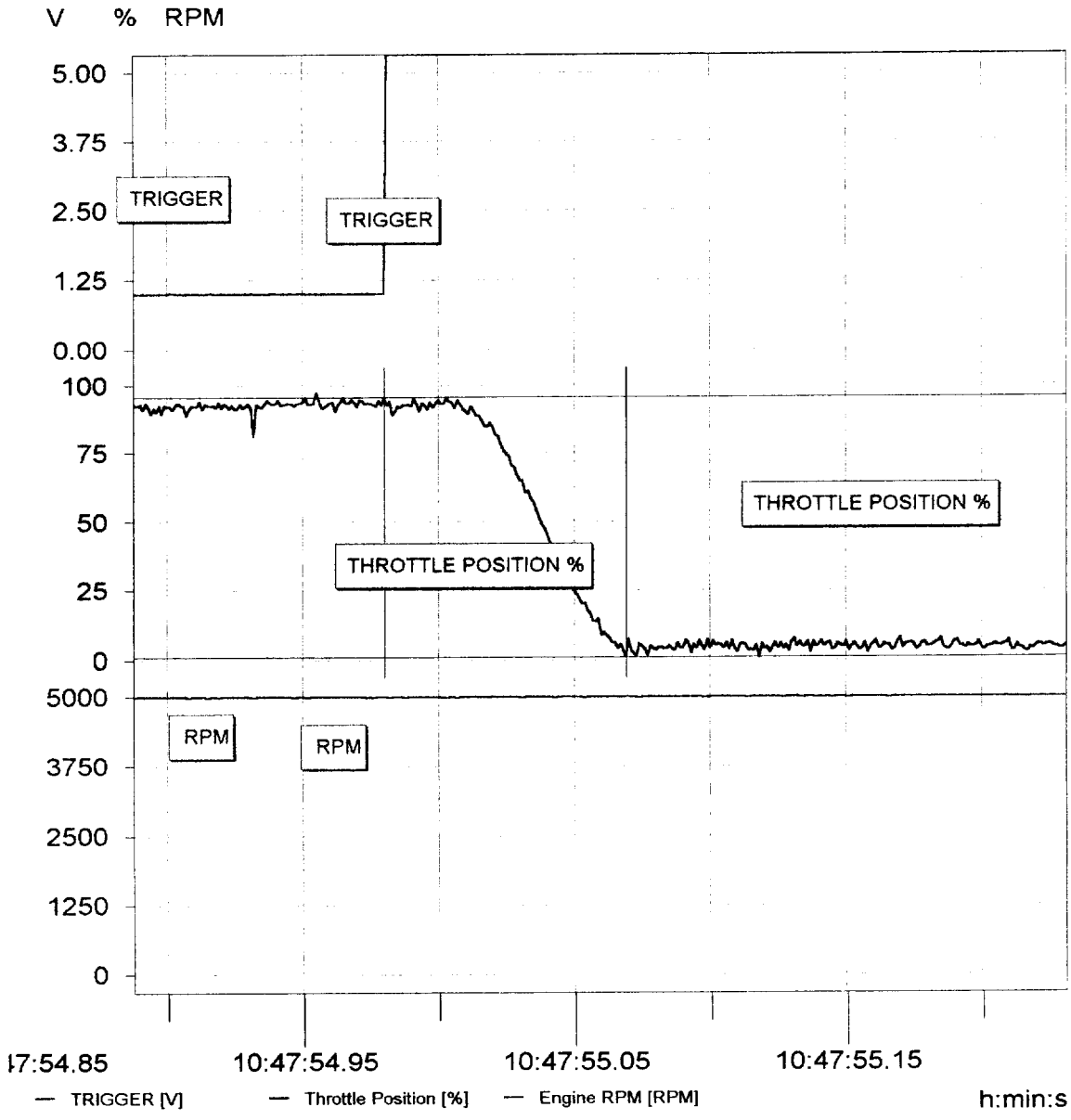
Channel:Throttle Position

Y1:	76.496 %	Y2:	2.780 %
t1:	-13312.559 ms	t2:	-13235.559 ms
dt:	0.077 s	f:	12.987 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ NORMAL/ 100% WOT 11:07:46 AM 4/23/04

NHTSA C45203 NISSAN QUEST



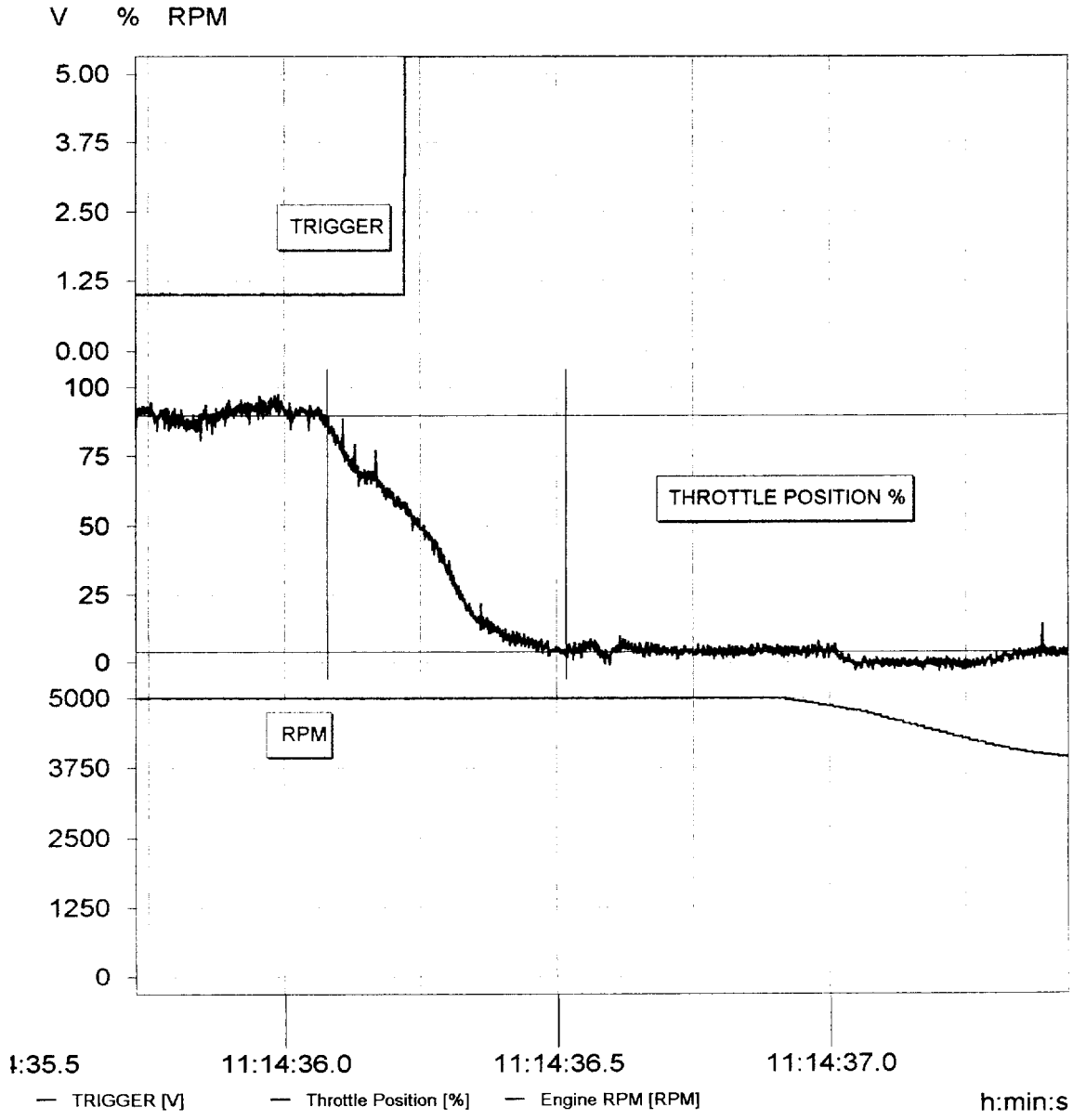
Channel:Throttle Position

Y1:	95.476 %	Y2:	1.032 %
t1:	-5460.559 ms	t2:	-5371.559 ms
dt:	0.089 s	f:	11.236 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ APS DISCONNECT/ 100% WOT 11:19:32 AM 4/23/04

NHTSA C45203 NISSAN QUEST



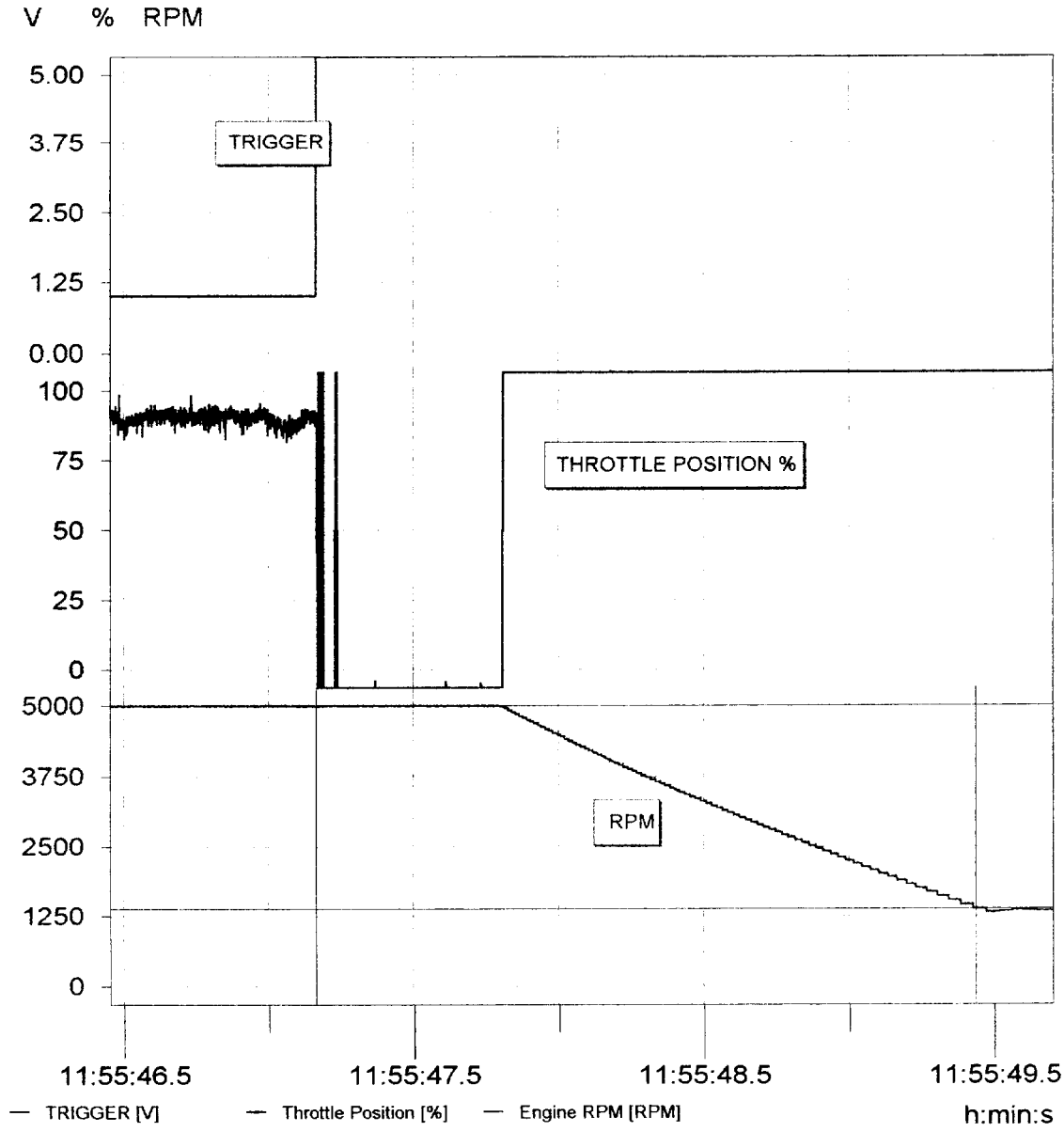
Channel:Throttle Position

Y1:	89.332 %	Y2:	3.772 %
t1:	-5250.622 ms	t2:	-4812.622 ms
dt:	0.438 s	f:	2.283 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ TPS,TPM DISCONNECT/ 100% WOT 12:07:34 PM 4/23/04

NHTSA C45203 NISSAN QUEST



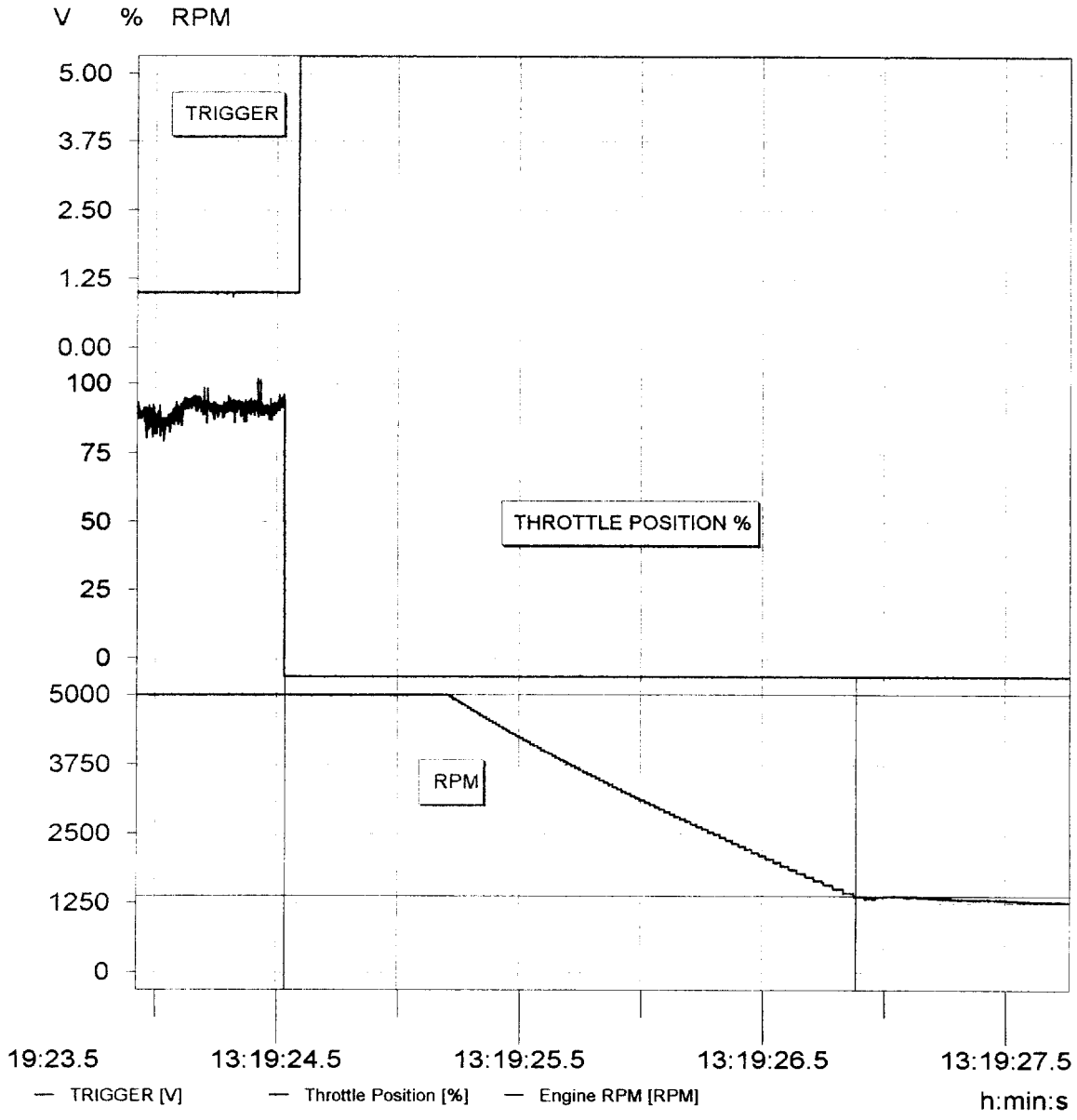
Channel:Engine RPM

Y1:	4996.796 RPM	Y2:	1372.986 RPM
t1:	-3838.066 ms	t2:	-1565.066 ms
dt:	2.273 s	f:	0.440 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ TPS,TPM OPEN WIRE 1 1:31:47 PM 4/23/04

NHTSA C45203 NISSAN QUEST



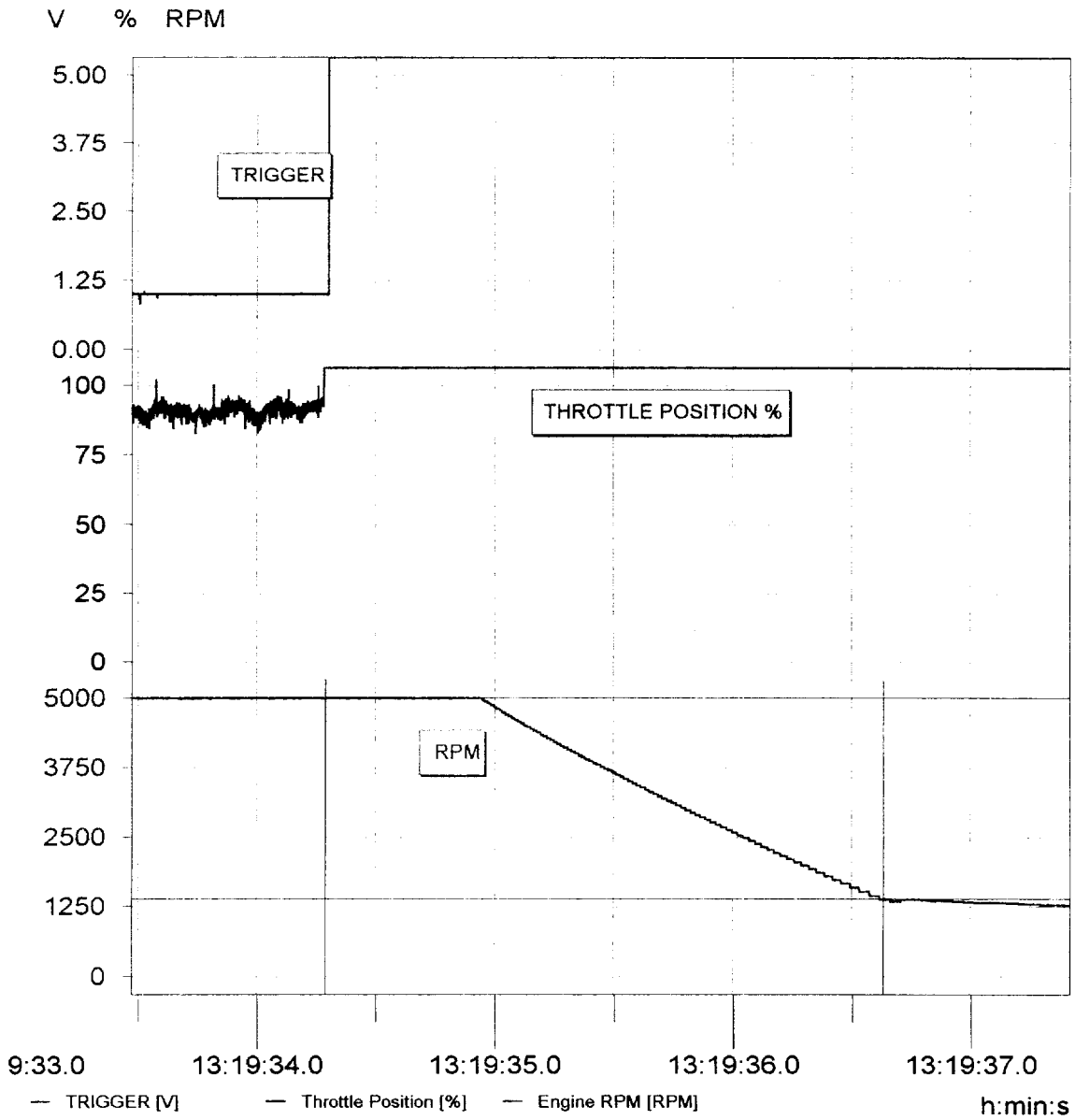
Channel:Engine RPM

Y1:	4997.406 RPM	Y2:	1359.558 RPM
t1:	-54831.958 ms	t2:	-52478.958 ms
dt:	2.353 s	f:	0.425 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ TPS,TPM OPEN WIRE 2 1:46:45 PM 4/23/04

NHTSA C45203 NISSAN QUEST



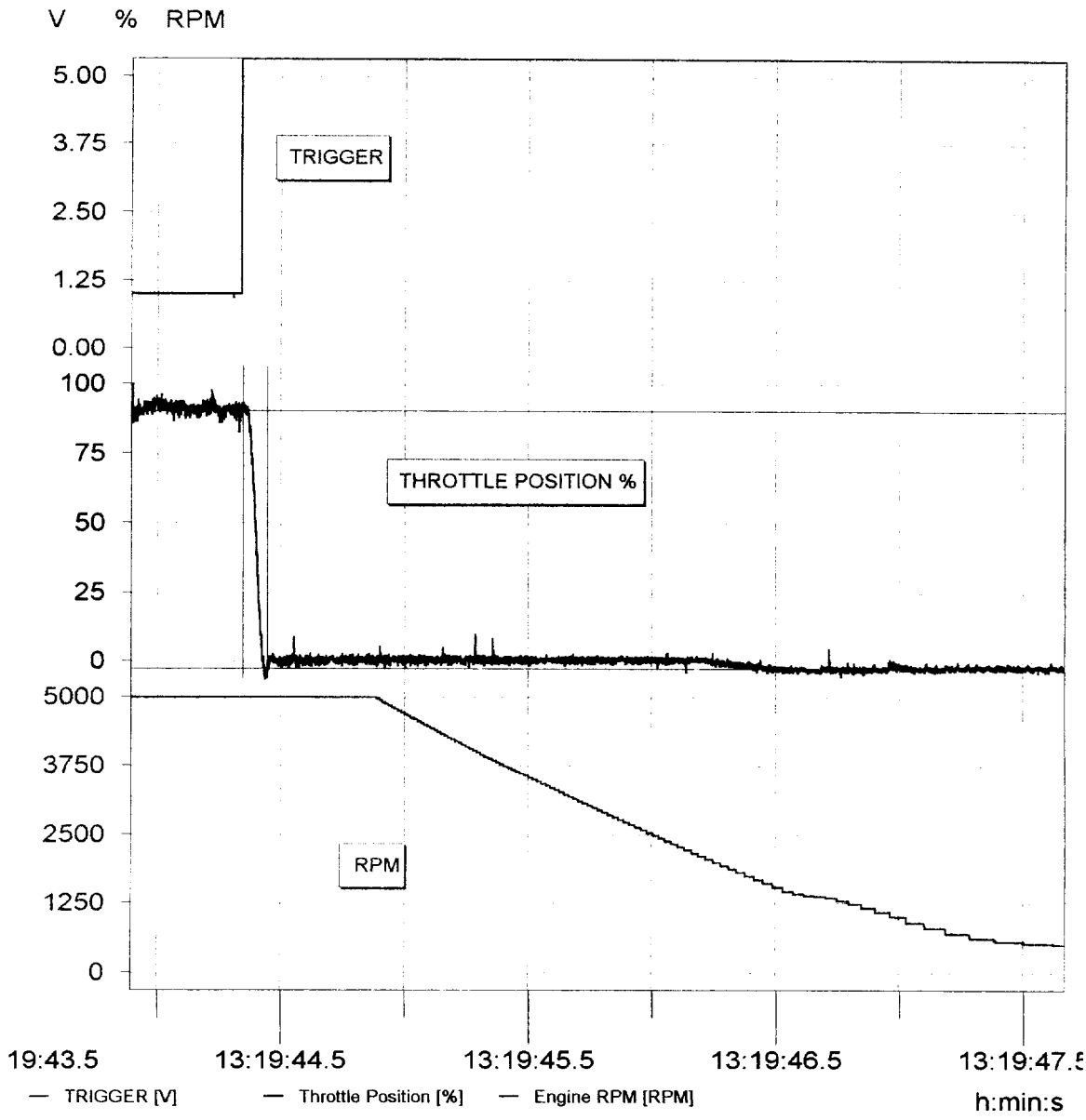
Channel:Engine RPM

Y1:	4995.728 RPM	Y2:	1371.002 RPM
t1:	-45077.958 ms	t2:	-42731.958 ms
dt:	2.346 s	f:	0.426 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ TPS,TPM OPEN WIRE 3 1:50:21 PM 4/23/04

NHTSA C45203 NISSAN QUEST



Channel: Throttle Position

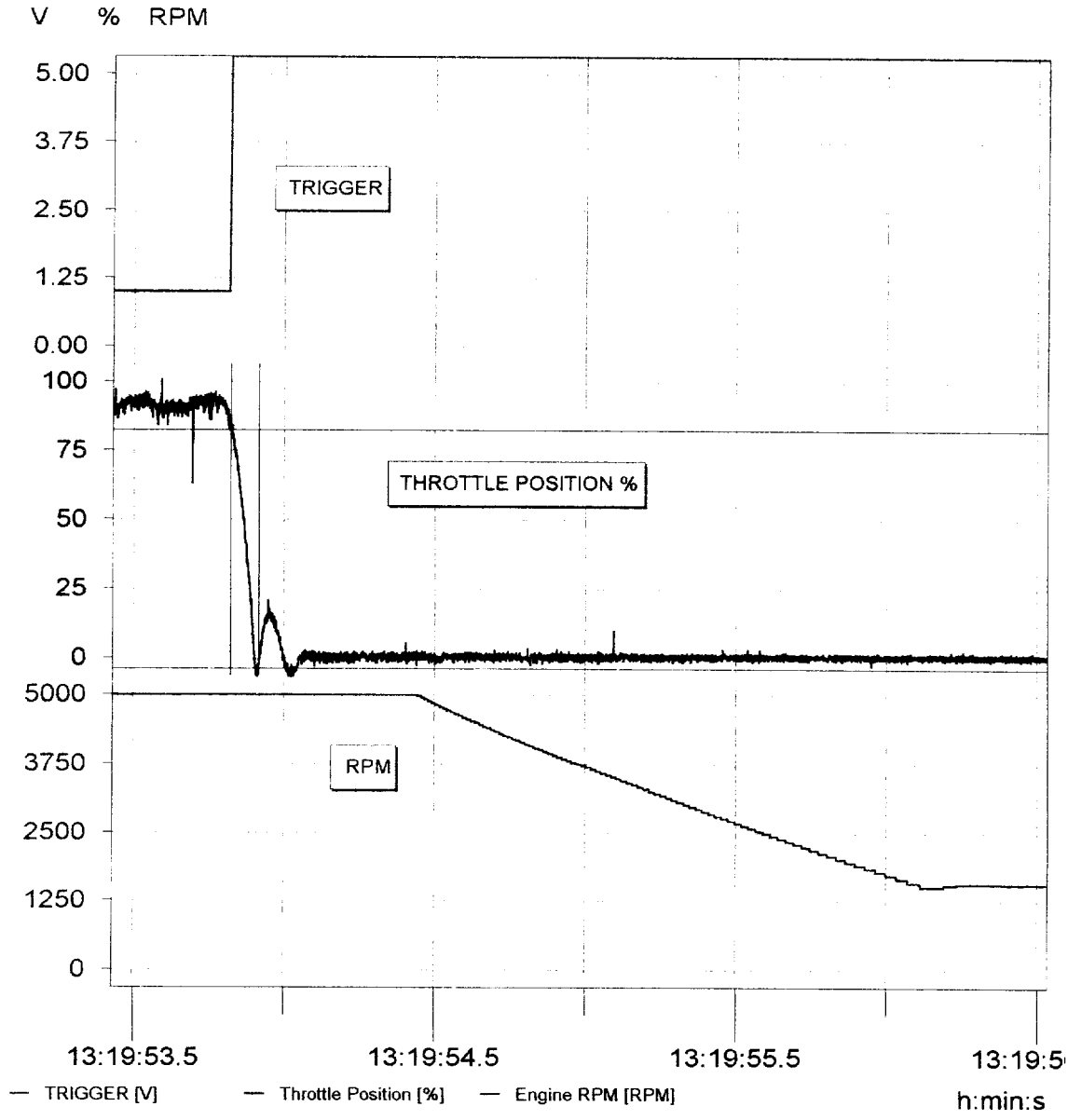
Y1:	90.097 %	Y2:	-2.871 %
t1:	-35020.958 ms	t2:	-34920.958 ms
dt:	0.100 s	f:	10.000 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ TPS,TPM OPEN WIRE 4

1:53:15 PM 4/23/04

NHTSA C45203 NISSAN QUEST



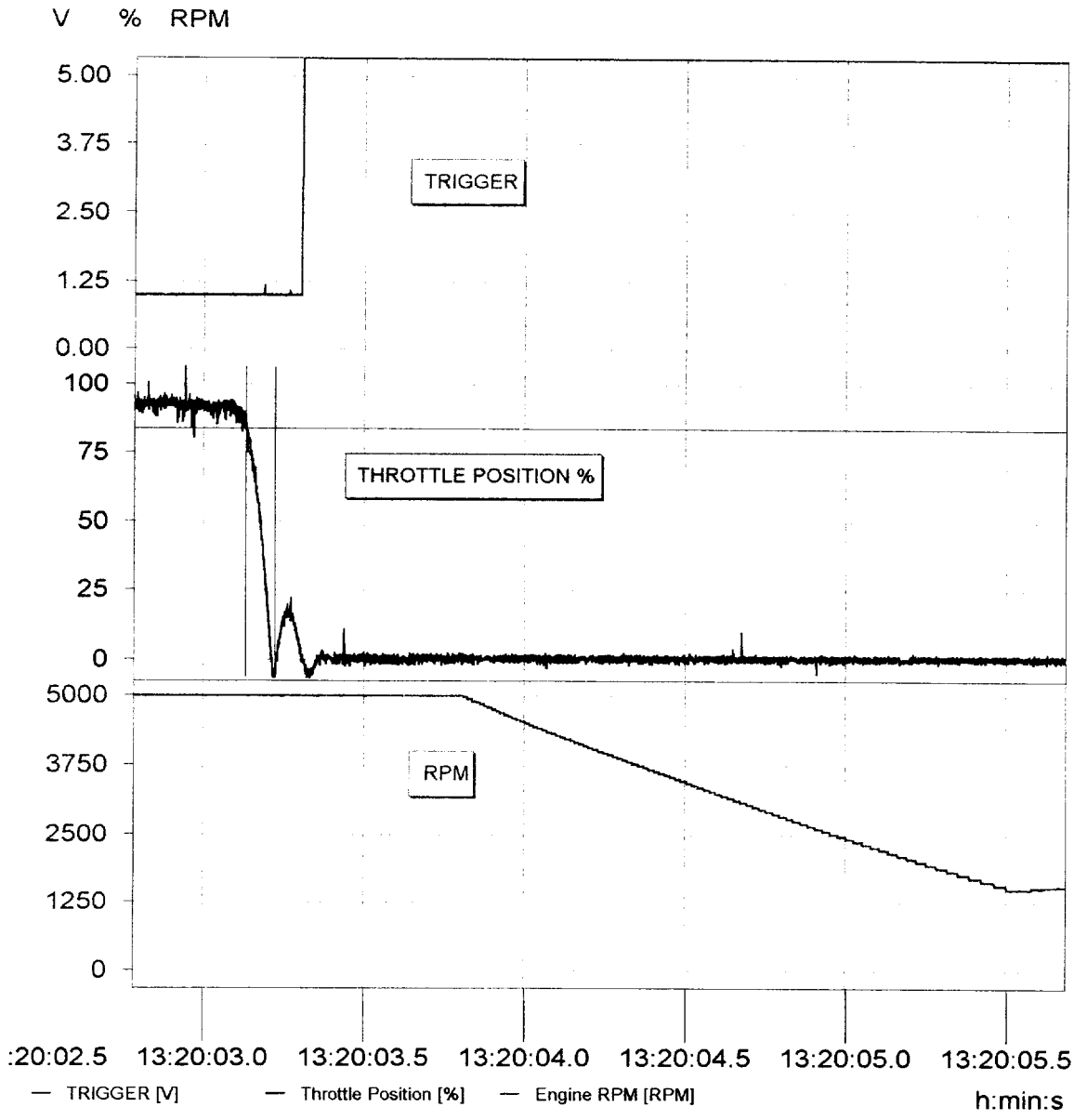
Channel:Throttle Position

Y1:	82.328 %	Y2:	-3.924 %
t1:	-25541.958 ms	t2:	-25448.958 ms
dt:	0.093 s	f:	10.753 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ TPS,TPM OPEN WIRE 5 1:55:10 PM 4/23/04

NHTSA C45203 NISSAN QUEST



Channel:Throttle Position

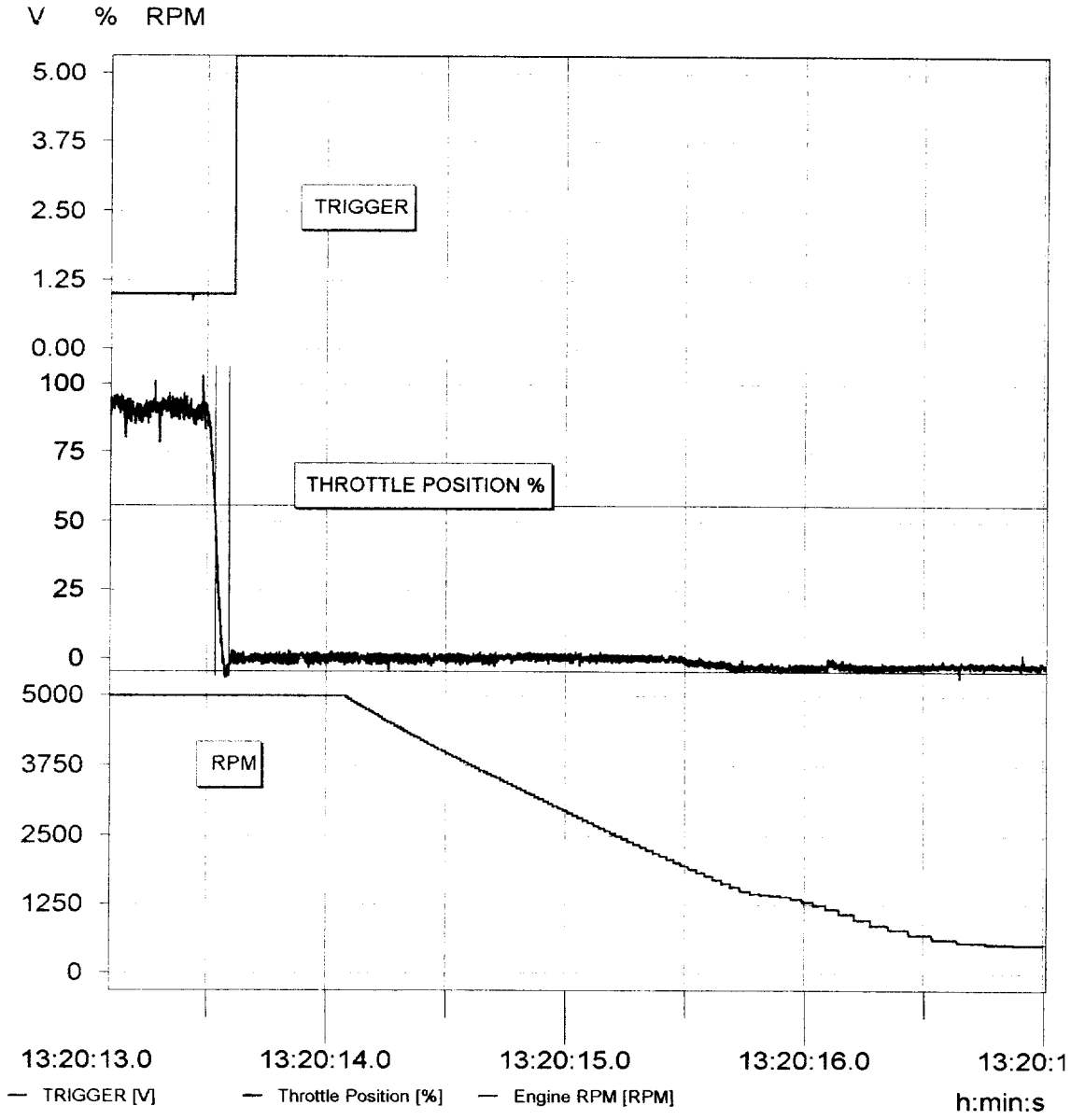
Y1:	83.607 %	Y2:	-7.884 %
t1:	-16234.958 ms	t2:	-16142.958 ms
dt:	0.092 s	f:	10.870 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ TPS,TPM OPEN WIRE 6

1:57:28 PM 4/23/04

NHTSA C45203 NISSAN QUEST



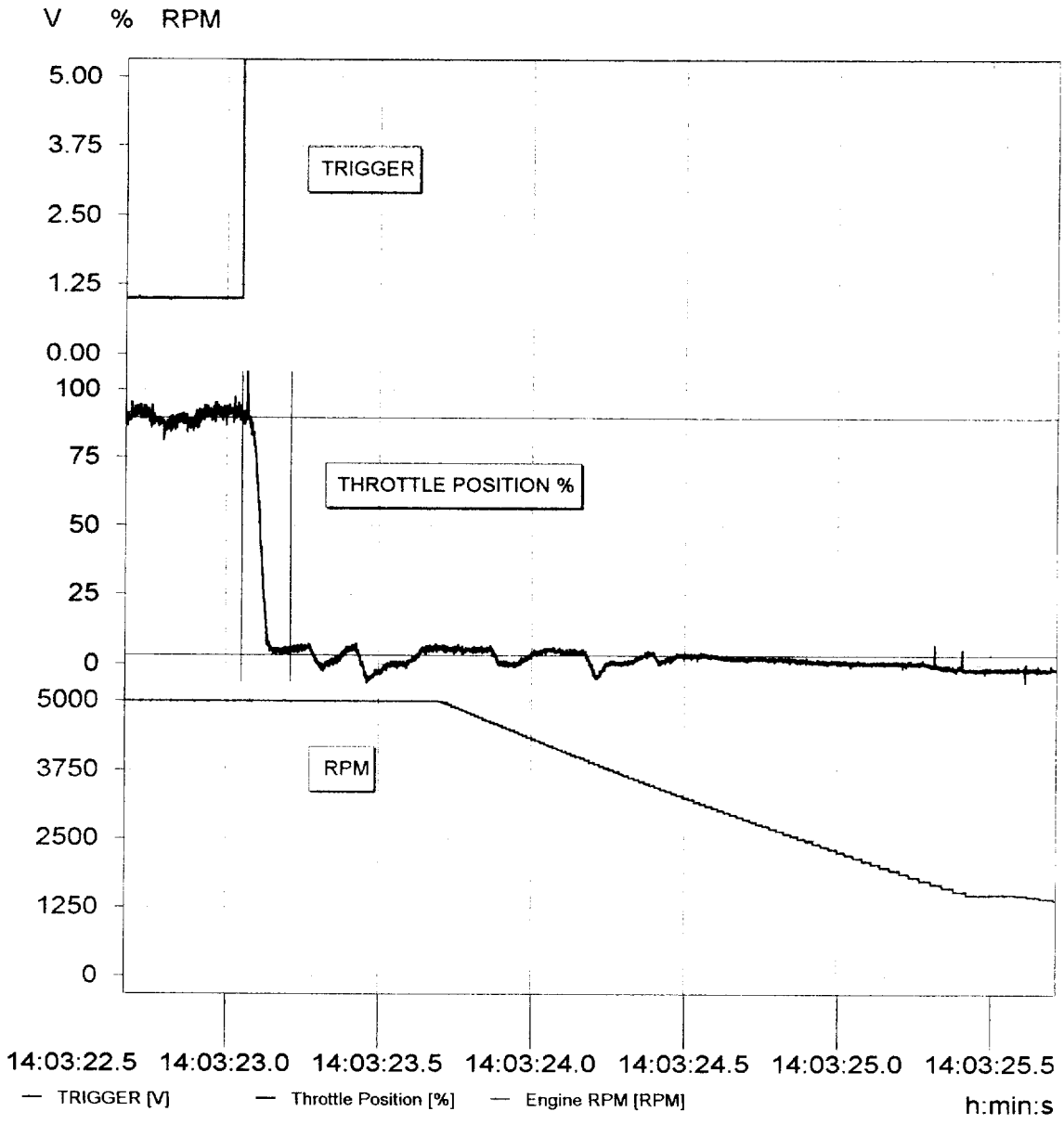
Channel:Throttle Position

Y1:	55.730 %	Y2:	-4.606 %
t1:	-5830.958 ms	t2:	-5774.958 ms
dt:	0.056 s	f:	17.857 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ TPS,TPM SHORT WIRE 1 2:14:53 PM 4/23/04

NHTSA C45203 NISSAN QUEST



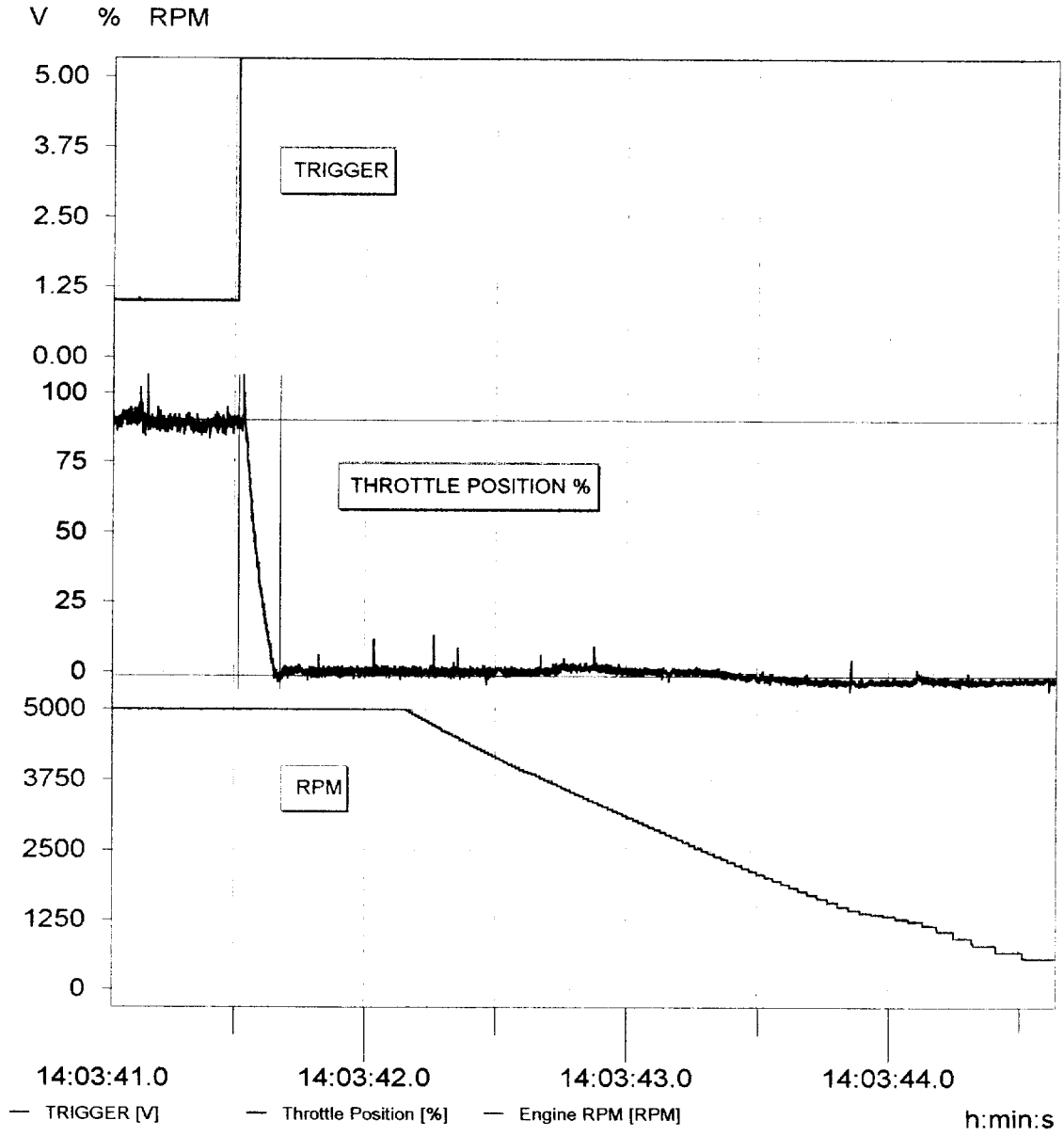
Channel:Throttle Position

Y1:	89.348 %	Y2:	3.208 %
t1:	-53669.314 ms	t2:	-53508.314 ms
dt:	0.161 s	f:	6.211 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ TPS,TPM SHORT WIRE 2 2:17:28 PM 4/23/04

NHTSA C45203 NISSAN QUEST



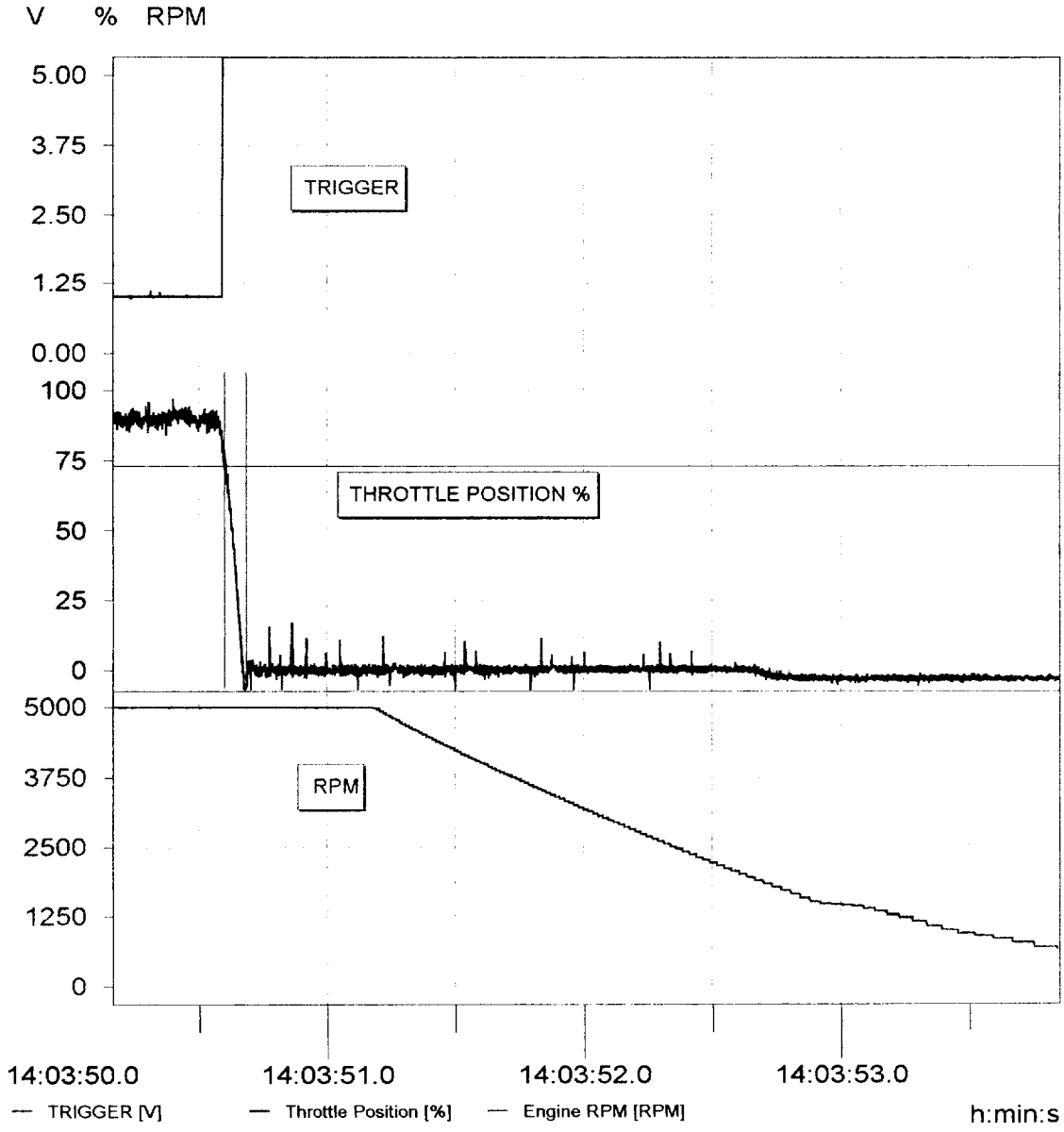
Channel:Throttle Position

Y1:	89.982 %	Y2:	-1.423 %
t1:	-35201.314 ms	t2:	-35042.314 ms
dt:	0.159 s	f:	6.289 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ TPS,TPM SHORT WIRE 3 2:20:13 PM 4/23/04

NHTSA C45203 NISSAN QUEST



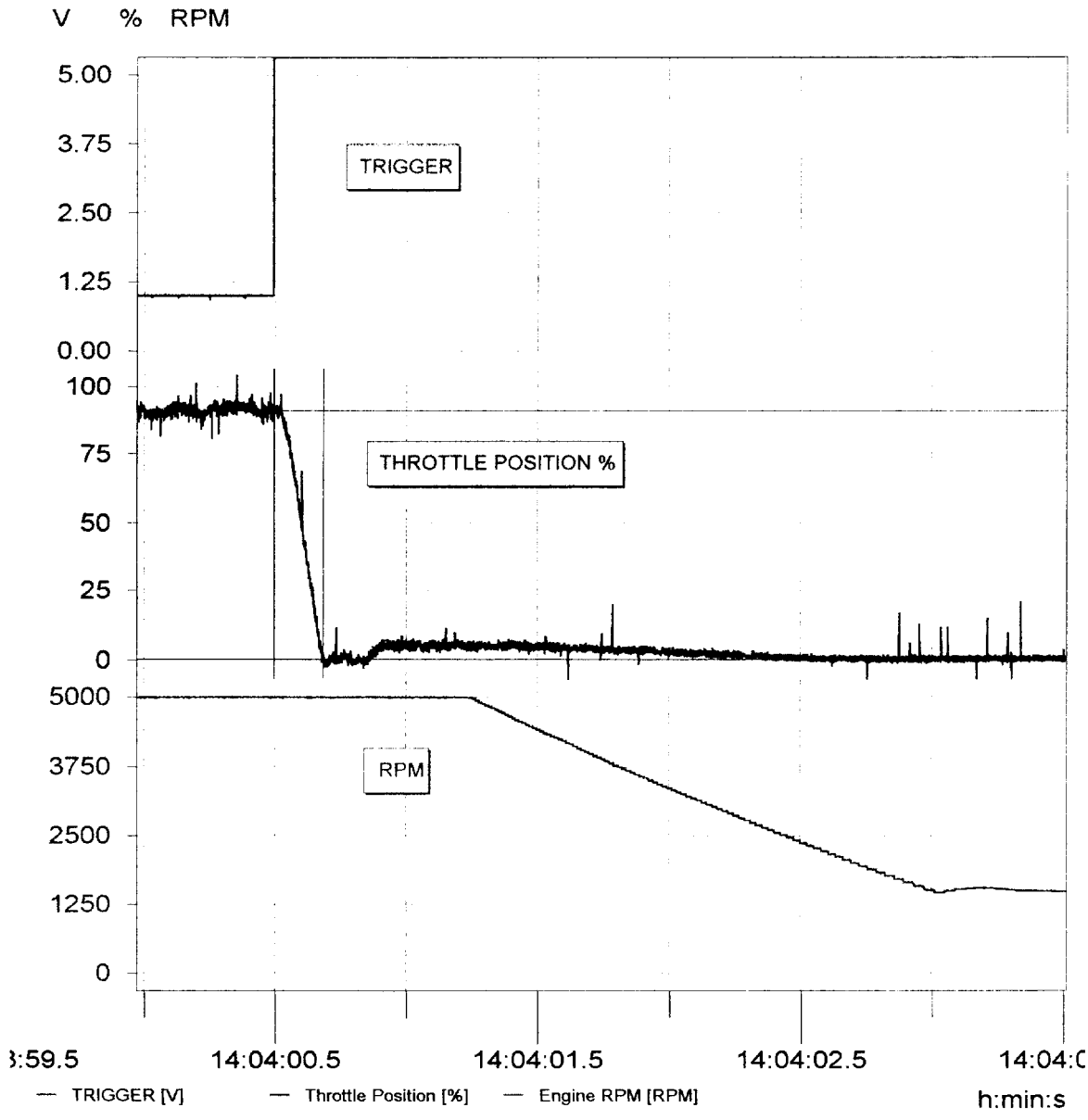
Channel:Throttle Position

Y1:	73.000 %	Y2:	-7.592 %
t1:	-26120.314 ms	t2:	-26035.314 ms
dt:	0.085 s	f:	11.765 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ TPS,TPM SHORT WIRE 4 2:22:09 PM 4/23/04

NHTSA C45203 NISSAN QUEST



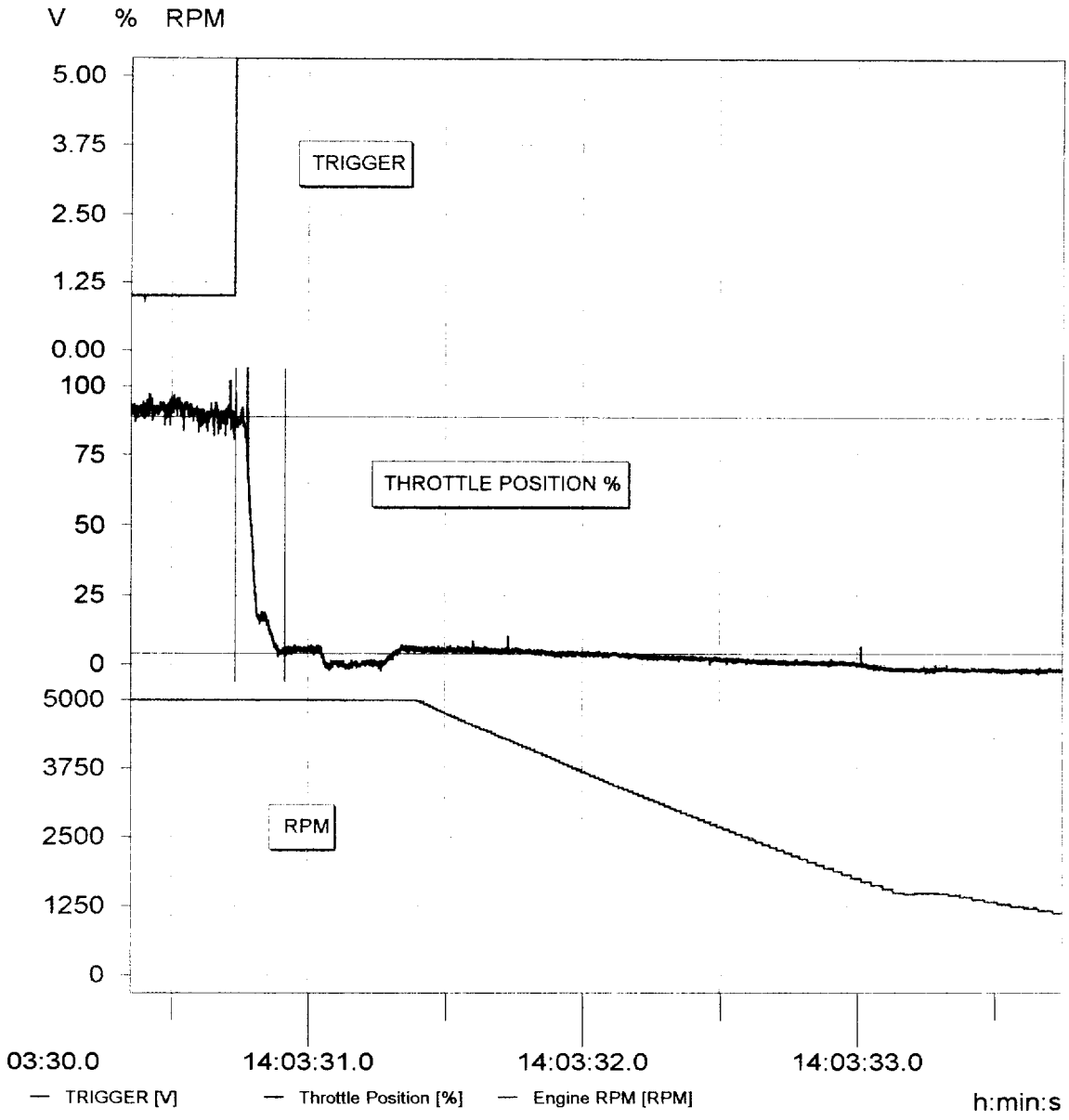
Channel:Throttle Position

Y1:	91.059 %	Y2:	0.411 %
t1:	-16223.314 ms	t2:	-16035.314 ms
dt:	0.188 s	f:	5.319 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ TPS,TPM SHORT WIRE 5 2:29:02 PM 4/23/04

NHTSA C45203 NISSAN QUEST



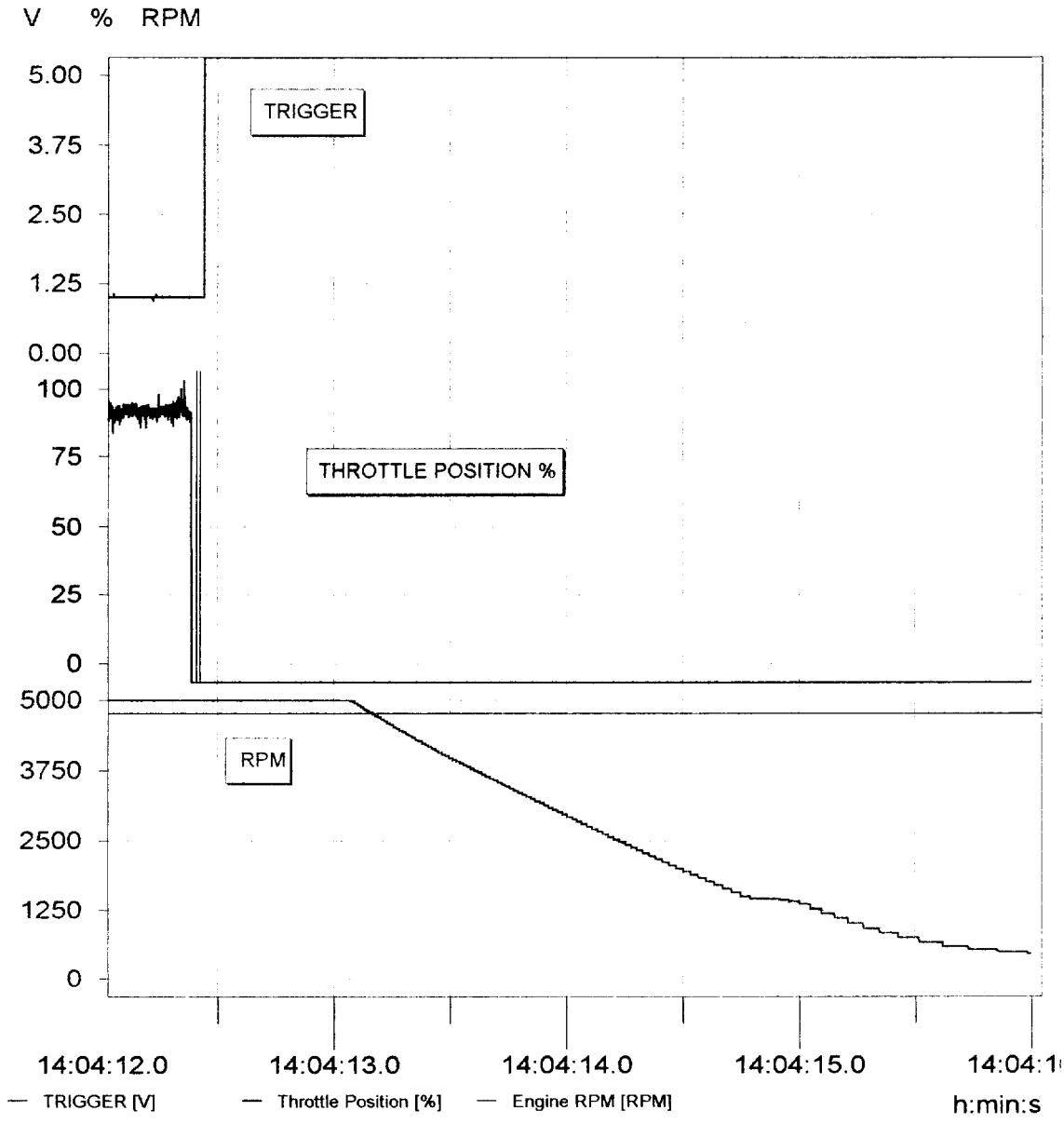
Channel:Throttle Position

Y1:	88.592 %	Y2:	3.776 %
t1:	-45985.314 ms	t2:	-45804.314 ms
dt:	0.181 s	f:	5.525 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ TPS,TPM SHORT WIRE 6 2:26:19 PM 4/23/04

NHTSA C45203 NISSAN QUEST



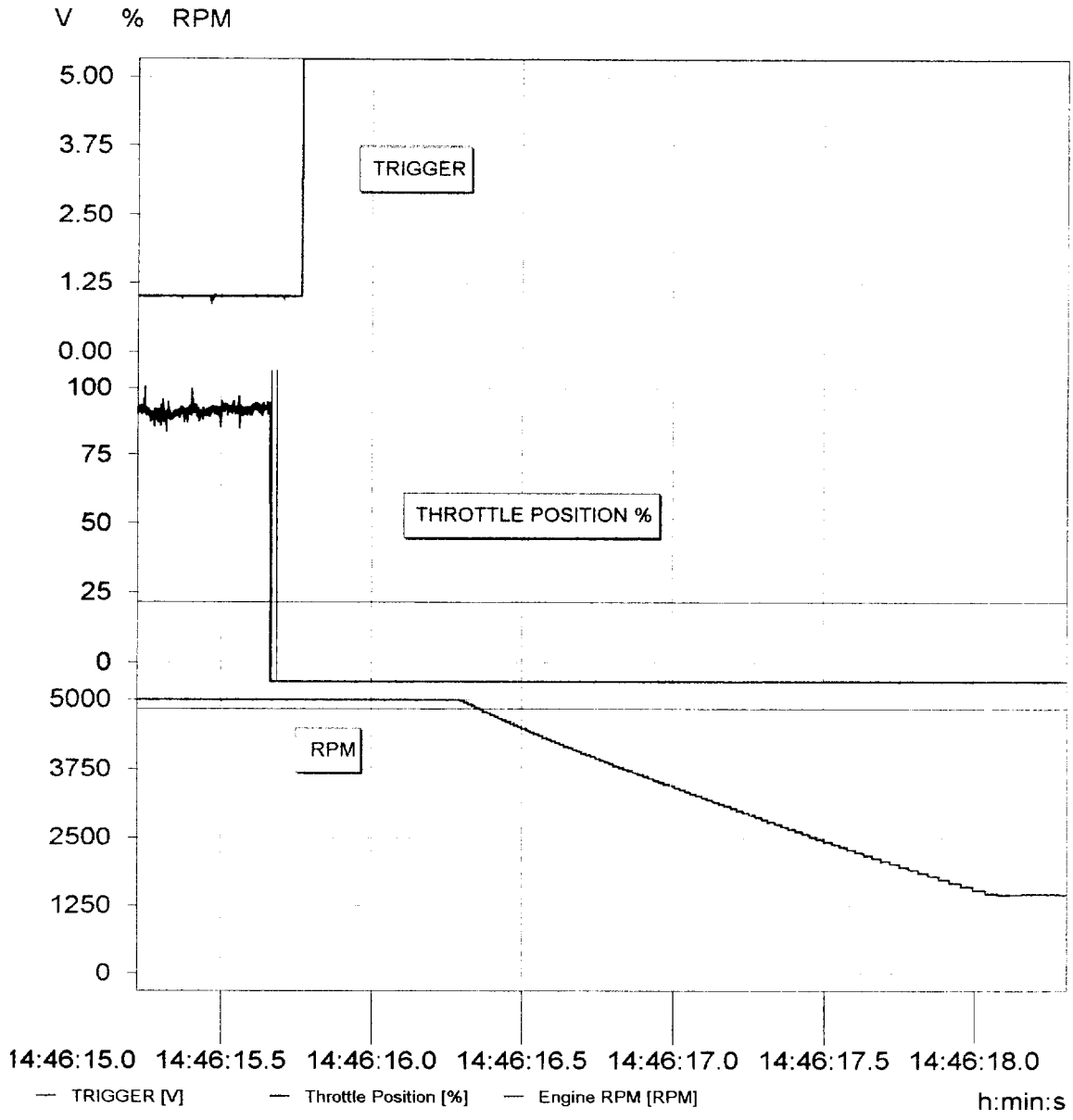
Channel:Throttle Position

Y1:	-17.817 %	Y2:	-17.998 %
t1:	-4309.314 ms	t2:	-4295.314 ms
dt:	0.014 s	f:	71.429 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ APS SHORT WIRE 11 2:52:11 PM 4/23/04

NHTSA C45203 NISSAN QUEST



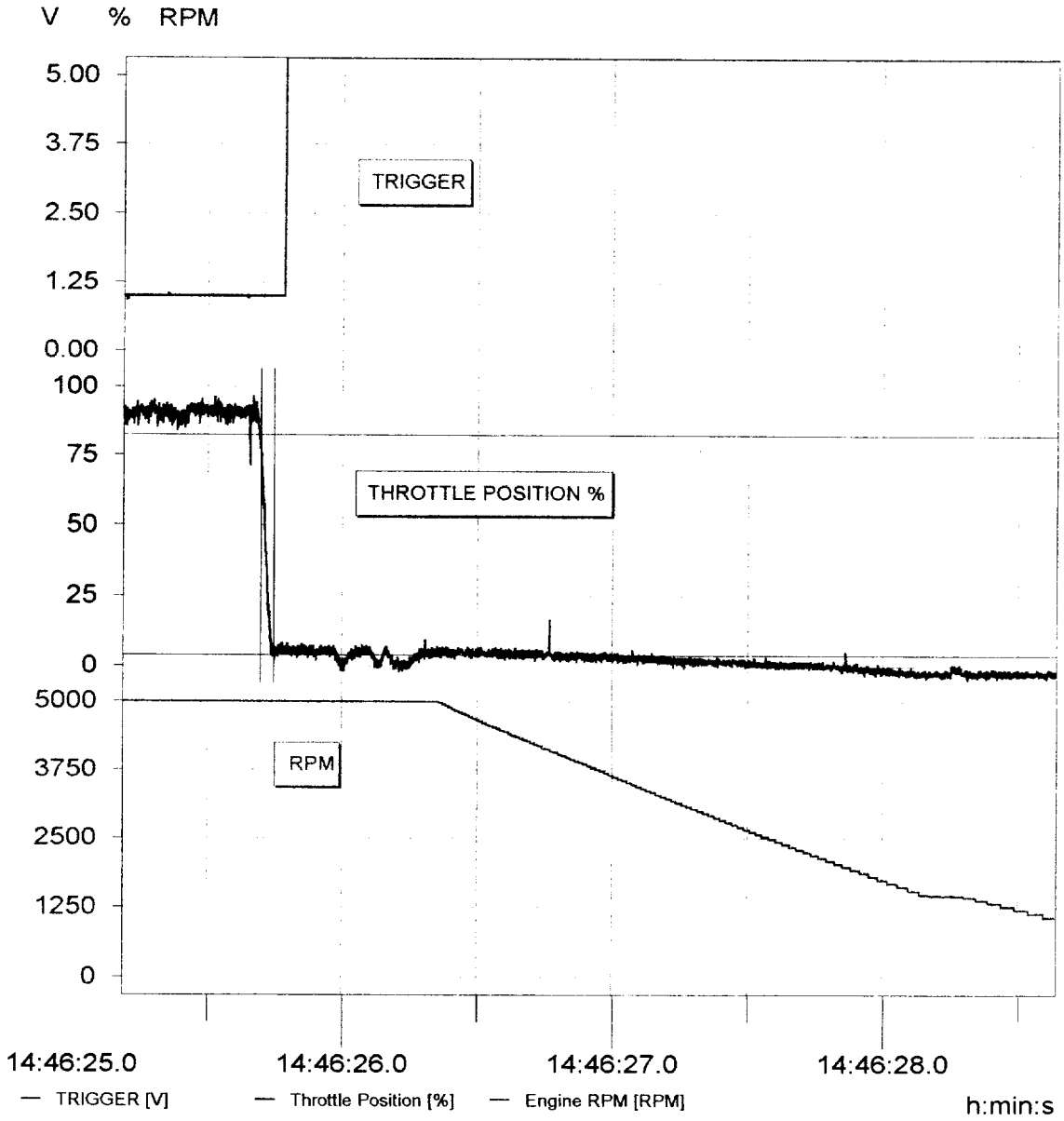
Channel: Throttle Position

Y1:	21.354 %	Y2:	-16.521 %
t1:	-54857.052 ms	t2:	-54838.052 ms
dt:	0.019 s	f:	52.632 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ APS SHORT WIRE 12 2:53:55 PM 4/23/04

NHTSA C45203 NISSAN QUEST



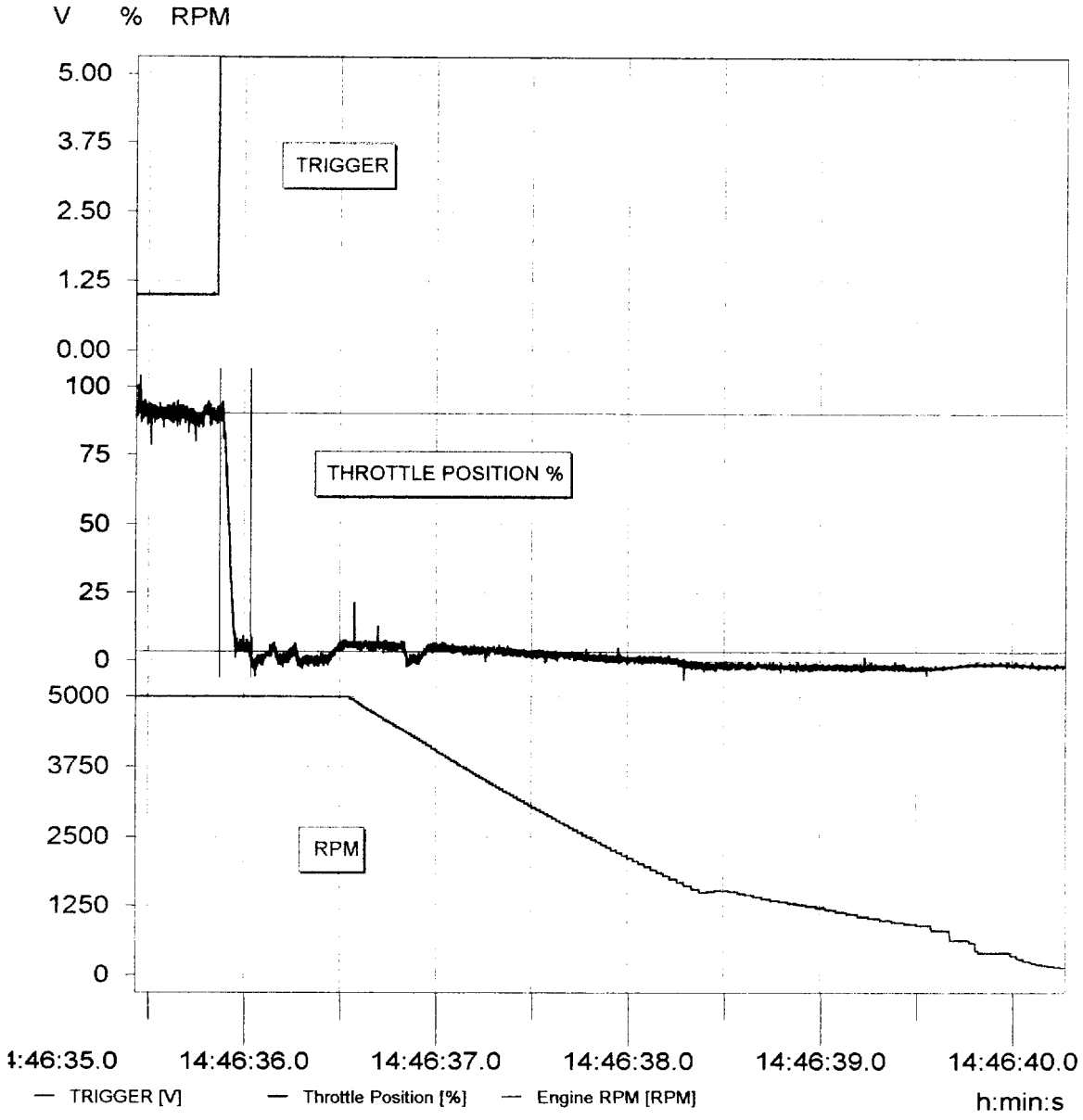
Channel: Throttle Position

Y1:	82.155 %	Y2:	3.854 %
t1:	-44828.052 ms	t2:	-44779.052 ms
dt:	0.049 s	f:	20.408 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ APS SHORT WIRE 13 2:56:09 PM 4/23/04

NHTSA C45203 NISSAN QUEST



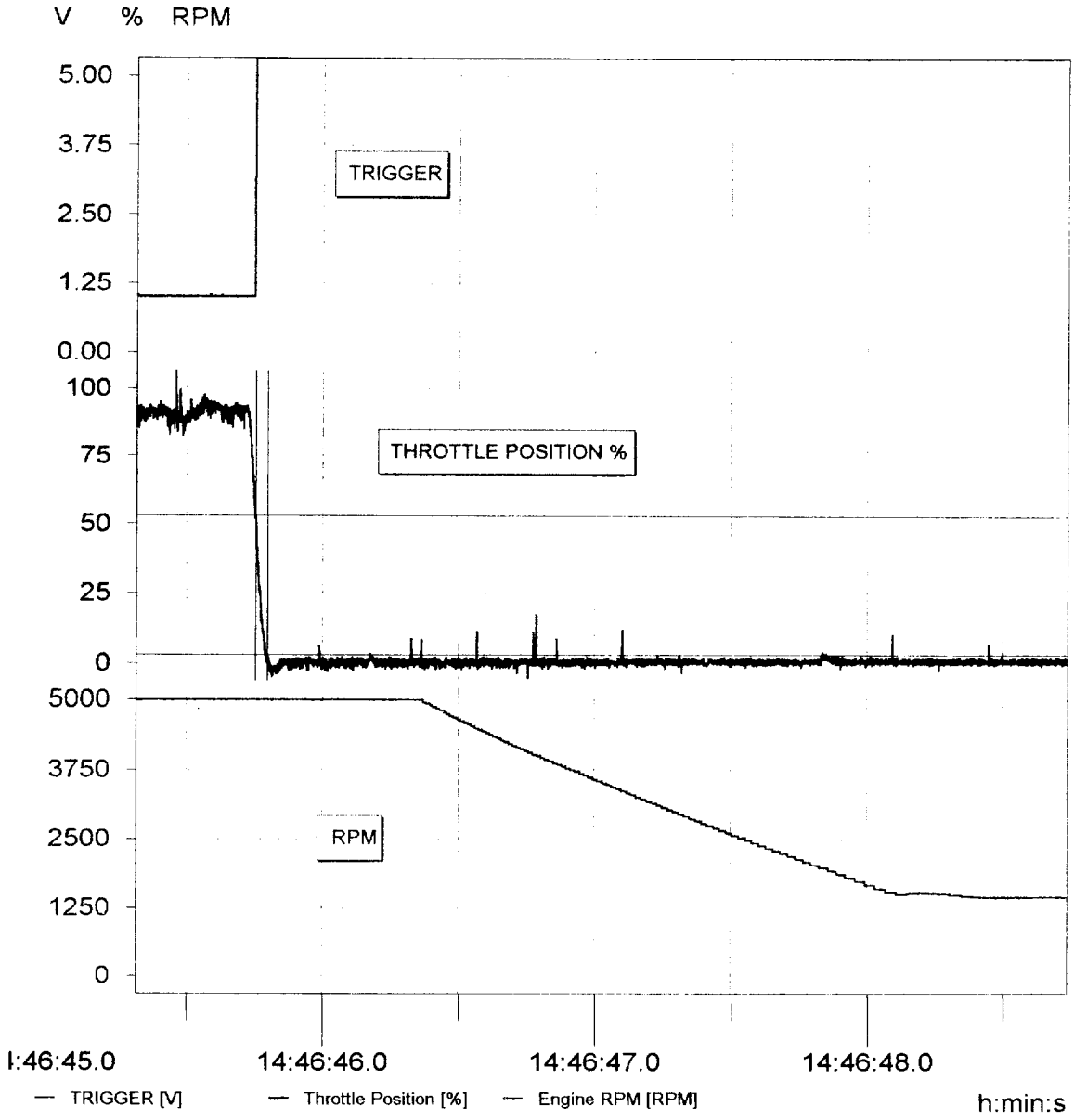
Channel:Throttle Position

Y1:	90.072 %	Y2:	3.146 %
t1:	-34655.052 ms	t2:	-34493.052 ms
dt:	0.162 s	f:	6.173 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ APS SHORT WIRE 14 2:59:04 PM 4/23/04

NHTSA C45203 NISSAN QUEST



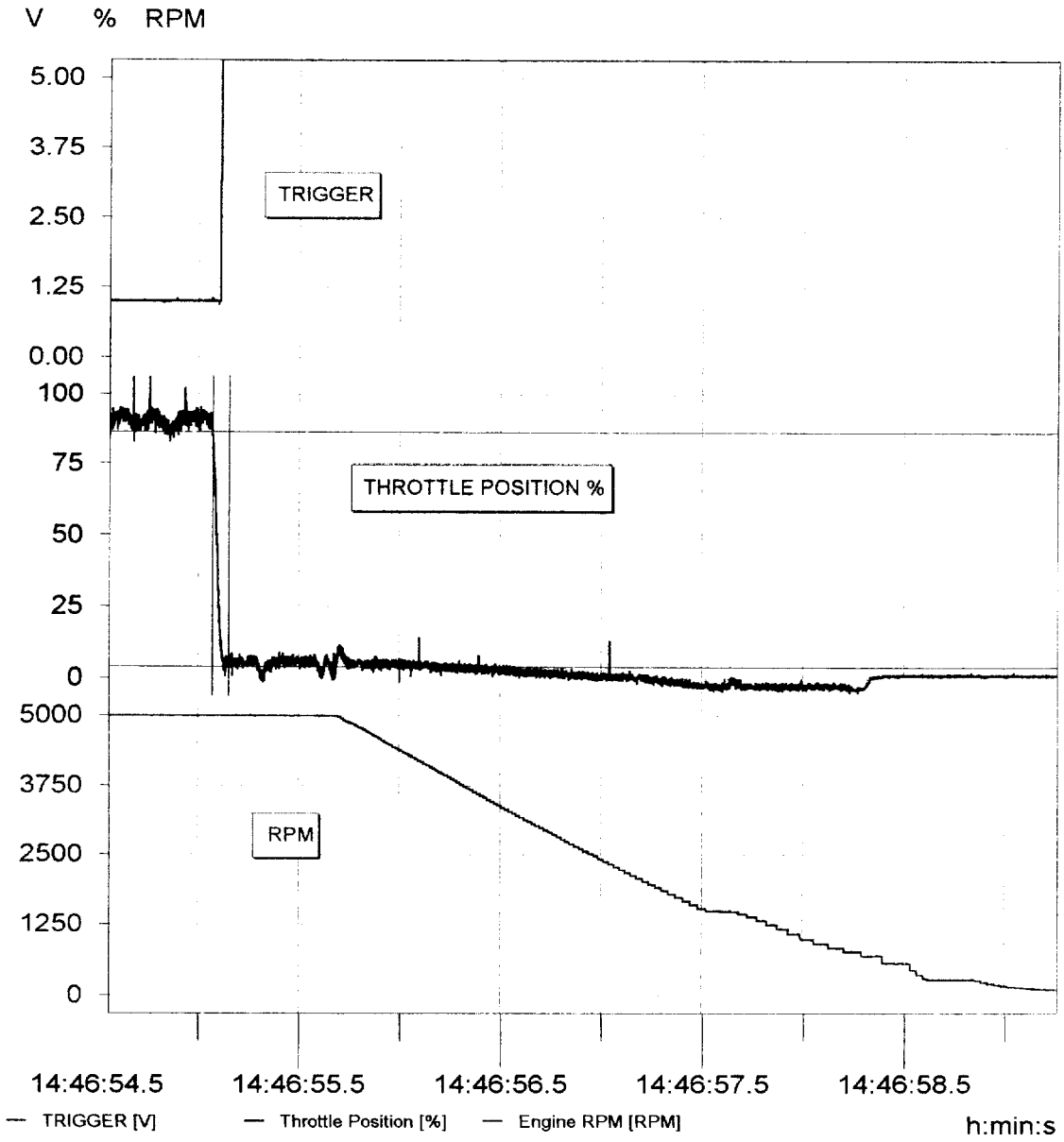
Channel:Throttle Position

Y1:	52.731 %	Y2:	2.957 %
t1:	-24771.052 ms	t2:	-24728.052 ms
dt:	0.043 s	f:	23.256 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ APS SHORT WIRE 15 3:02:04 PM 4/23/04

NHTSA C45203 NISSAN QUEST



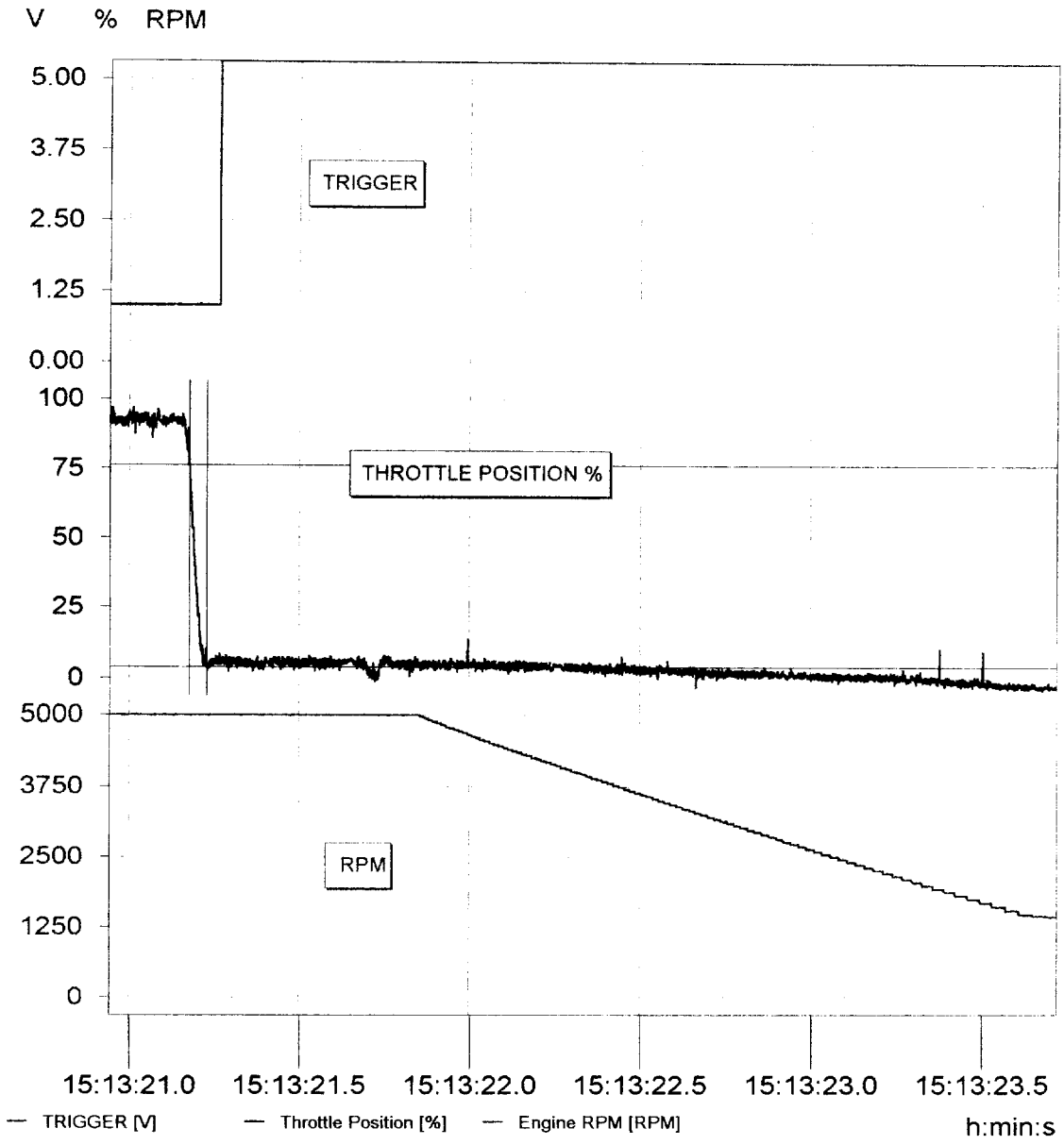
Channel:Throttle Position

Y1:	86.157 %	Y2:	3.751 %
t1:	-15453.052 ms	t2:	-15371.052 ms
dt:	0.082 s	f:	12.195 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ APS OPEN WIRE 11 3:18:24 PM 4/23/04

NHTSA C45203 NISSAN QUEST



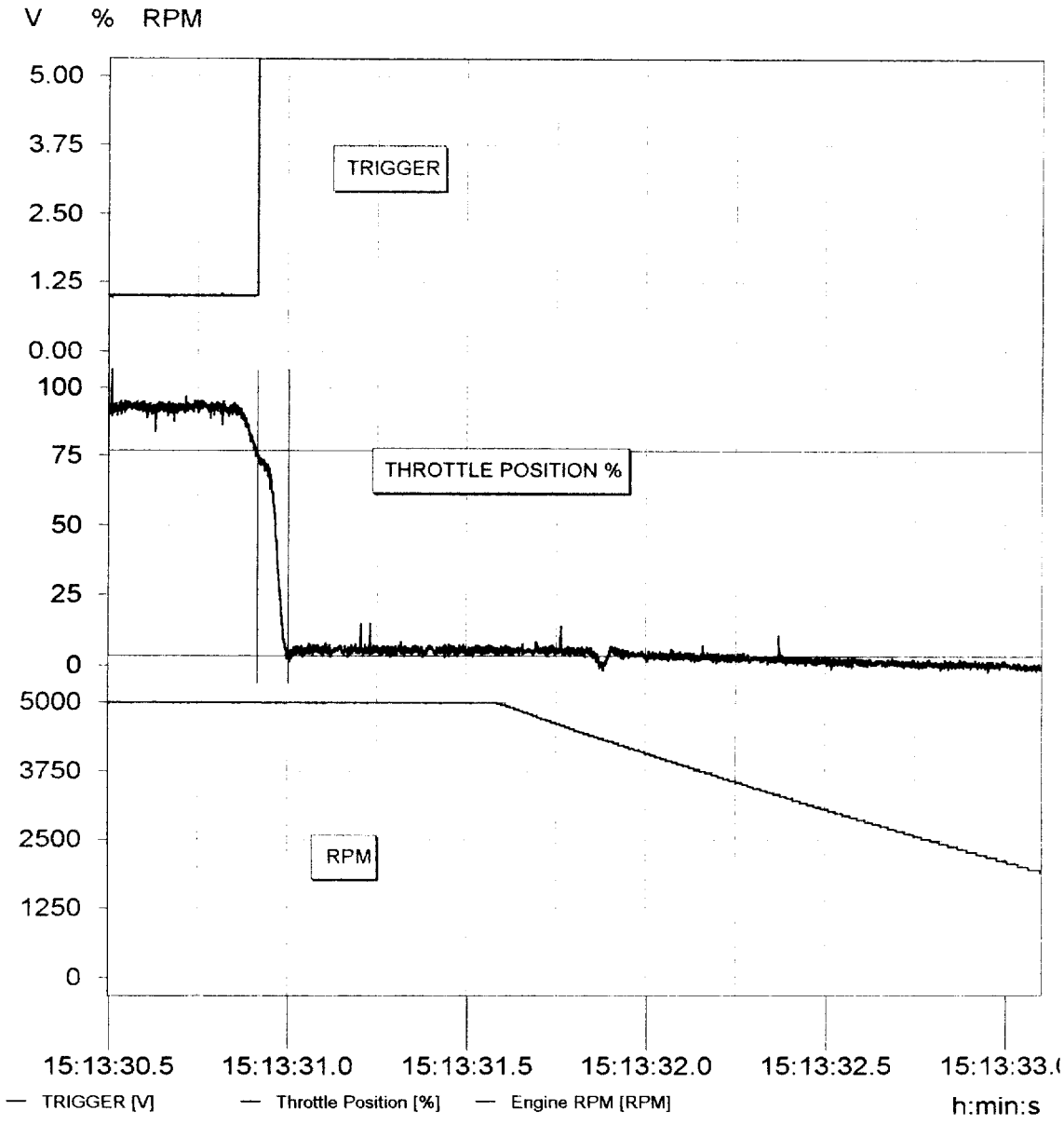
Channel:Throttle Position

Y1:	76.199 %	Y2:	3.829 %
t1:	-54866.563 ms	t2:	-54813.563 ms
dt:	0.053 s	f:	18.868 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ APS OPEN WIRE 12 3:20:25 PM 4/23/04

NHTSA C45203 NISSAN QUEST



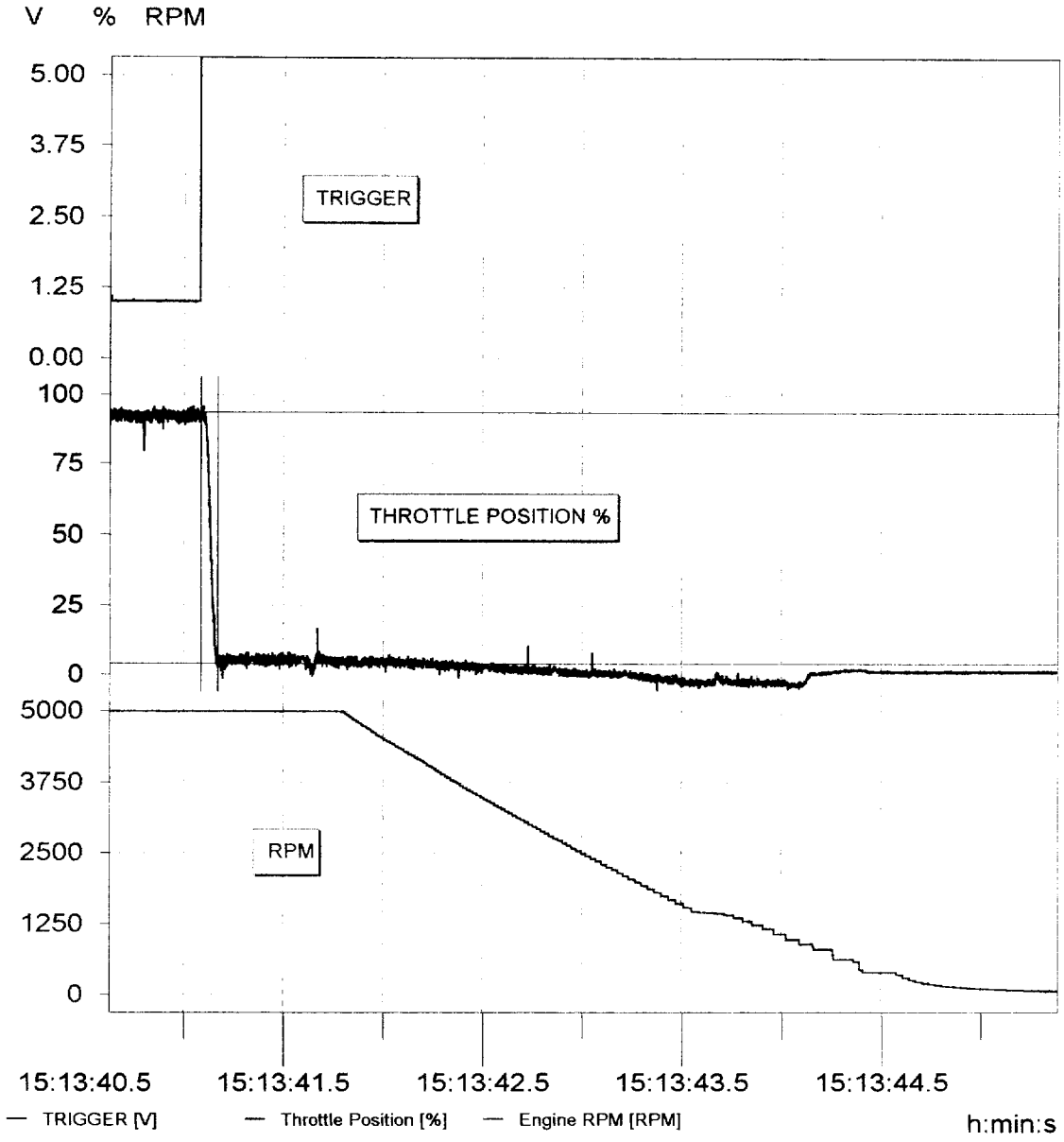
Channel:Throttle Position

Y1:	76.816 %	Y2:	3.459 %
t1:	-45127.563 ms	t2:	-45040.563 ms
dt:	0.087 s	f:	11.494 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ APS OPEN WIRE 13 3:22:21 PM 4/23/04

NHTSA C45203 NISSAN QUEST



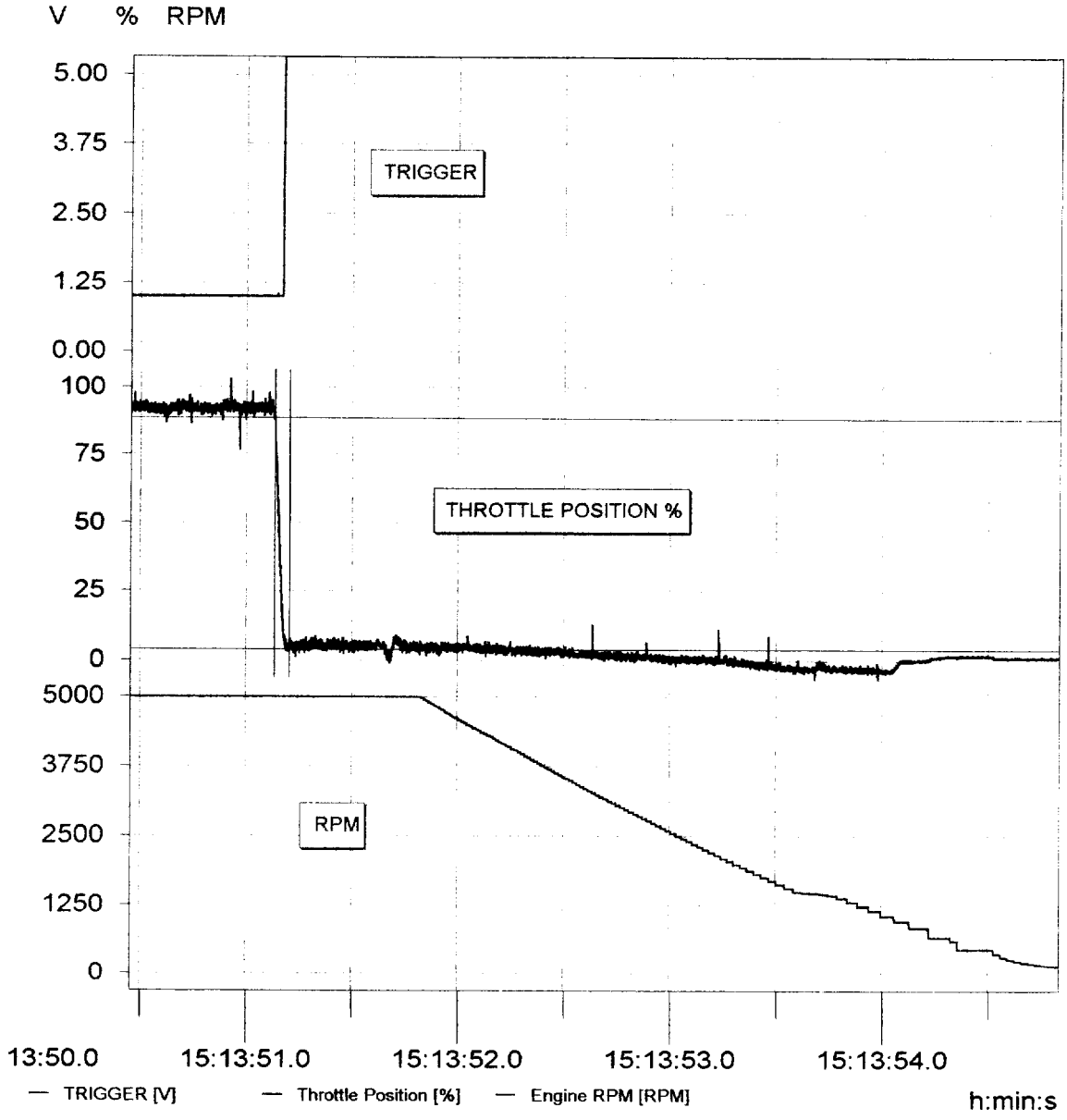
Channel:Throttle Position

Y1:	93.523 %	Y2:	3.730 %
t1:	-34958.563 ms	t2:	-34875.563 ms
dt:	0.083 s	f:	12.048 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ APS OPEN WIRE 14 3:24:05 PM 4/23/04

NHTSA C45203 NISSAN QUEST



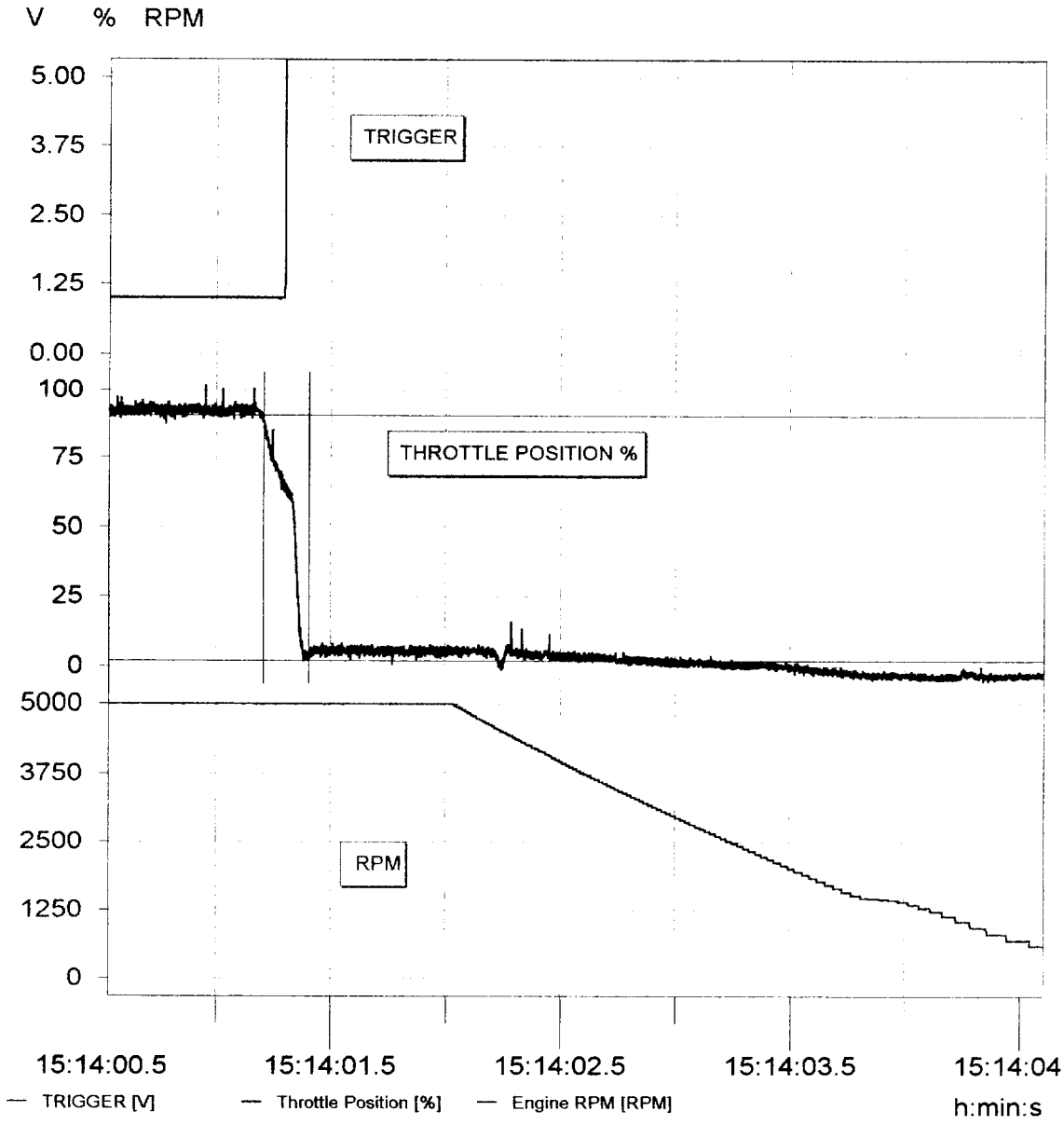
Channel:Throttle Position

Y1:	88.304 %	Y2:	3.813 %
t1:	-24908.563 ms	t2:	-24838.563 ms
dt:	0.070 s	f:	14.286 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ APS OPEN WIRE 15 3:30:09 PM 4/23/04

NHTSA C45203 NISSAN QUEST



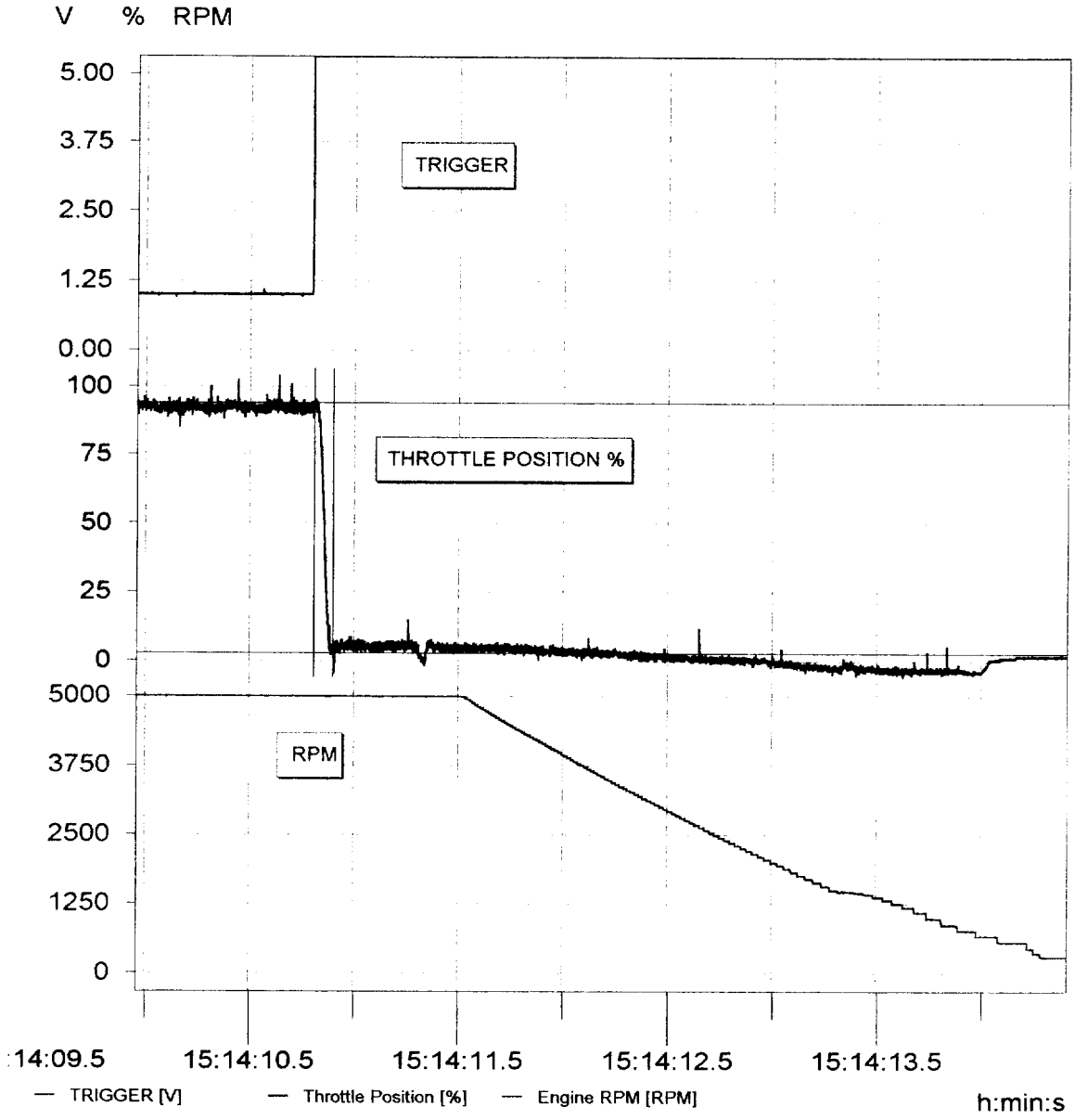
Channel:Throttle Position

Y1:	90.418 %	Y2:	1.937 %
t1:	-14838.563 ms	t2:	-14639.563 ms
dt:	0.199 s	f:	5.025 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ APS OPEN WIRE 16 3:31:52 PM 4/23/04

NHTSA C45203 NISSAN QUEST



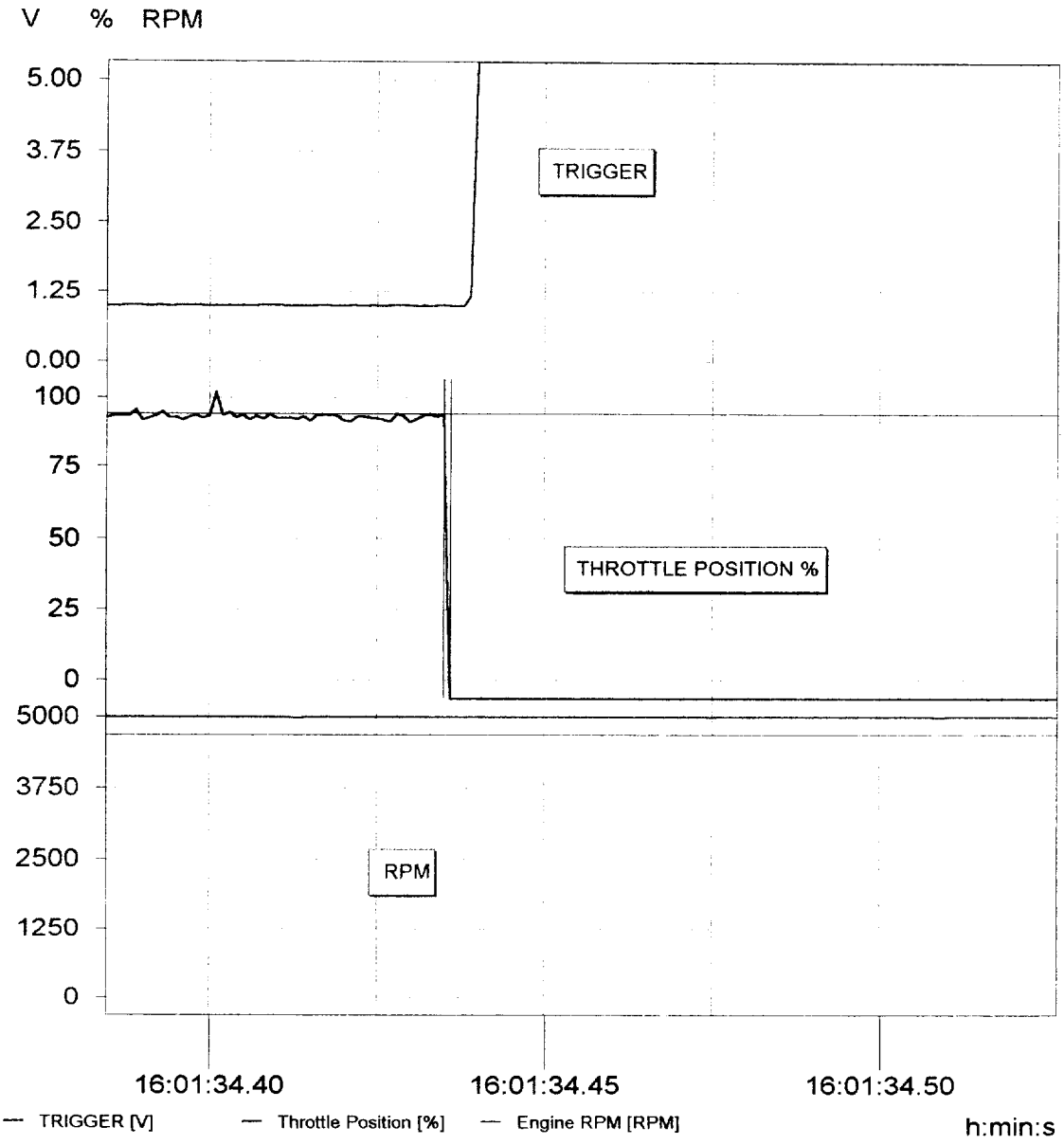
Channel:Throttle Position

Y1:	94.099 %	Y2:	2.817 %
t1:	-5236.563 ms	t2:	-5144.563 ms
dt:	0.092 s	f:	10.870 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ ECM CONNECTOR 1 4:08:13 PM 4/23/04

NHTSA C45203 NISSAN QUEST



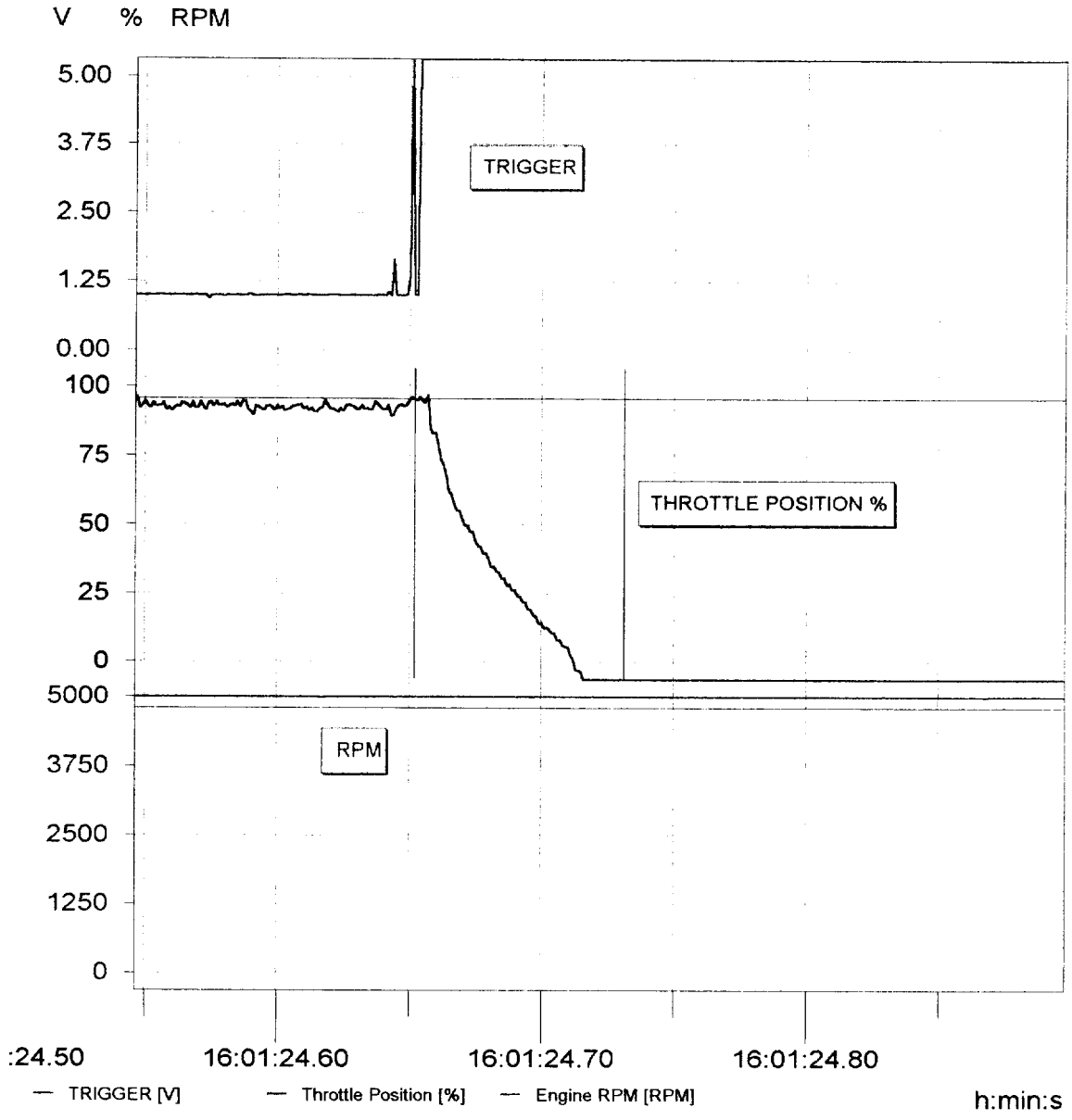
Channel: Throttle Position

Y1:	93.909 %	Y2:	-19.417 %
t1:	-6586.536 ms	t2:	-6585.536 ms
dt:	0.001 s	f:	1000.000 Hz

FMVSS 124 THROTTLE RETURN TEST

124 HOT/ ECM CONNECTOR 2 4:06:03 PM 4/23/04

NHTSA C45203 NISSAN QUEST



Channel:Throttle Position

Y1:	95.715 %	Y2:	-17.426 %
t1:	-16369.536 ms	t2:	-16290.536 ms
dt:	0.079 s	f:	12.658 Hz

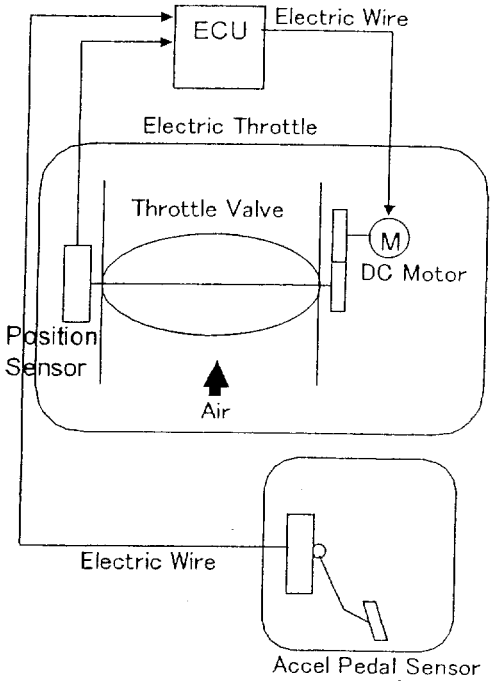
SECTION 7
MANUFACTURER'S DRAWINGS

VEHICLE INFORMATION/TEST SPECIFICATIONS
FMVSS 124 - Accelerator Control Systems

Requested Information:

1.) A sketch of the driver operated accelerator control system (ACS) starting from the accelerator pedal up to and including the fuel metering device (carburetor, fuel injectors, fuel distributor, or fuel injection pump).

Ans.



2.) For Normal ACS operation, the method utilized to determine the engine idle state (air throttle plate position, fuel delivery rate, other).

Ans. Air throttle plate position

3.) For Fail-Safe operation of the ACS (disconnection or severance), the method utilized to determine return of engine power to the idle state (air throttle plate position, fuel delivery rate, air intake, engine rpm, other)

Ans. Air throttle plate position

4.) Is the vehicle ACS equipped with any of the following:

A. Accelerator Pedal Position Sensor (APS)
B. Throttle Plate Position Sensor (TPS)
C. Electronic Control Module (ECM)
D. Air throttle plate actuator motor

Ans. A-D all.

5.) If air throttle plate equipped, is there a procedure which can be utilized by the test laboratory to measure the position of the throttle plate by tapping into the TPS or ECM? If so, please describe.

Ans. Throttle plate position can be utilized by measuring the voltage of TPS output.

6.) Point(s) chosen to demonstrate compliance with FMVSS 124 for single point disconnect and severance.

Ans.
For severances: (each tested separately)

1. Accel Pedal Inner Spring
2. Accel Pedal Outer Spring
3. Throttle Motor Return Spring (motor power off)
4. Throttle Motor only (return spring removed)

For Disconnections (each tested separately - wiring disconected)

1. Throttle Control Motor Asy
    a. Monitor Sensor 1
    b. Disconnect Sensor 2
2. Throttle Position Sensor Asy
    a. Monitor Sensor 1
    b. Disconnect Sensor 2
3. Accelerator Pedal Position Sensor Asy
    a. Monitor Sensor 1
    b. Disconnect Sensor 2

7.) Where applicable, were connections in the ACS beyond the ECM such as the fuel injectors tested for disconnection and severance. If yes, provide details.

Ans. No.

8.) Where applicable, were idle return times tested for electrical severance accompanied by shorting to ground? If yes, please provide details.

Ans. No.

9.) All sources of return energy (springs) for the accelerator pedal and if applicable, the air throttle plate.

Ans. The accelerator Pedal has 2 (redundant) return springs.

10.) If fuel delivery rate is used to demonstrate return to idle state, provide:
    A. The method used to measure this signal i.e. connection to standard SAE J1587 data bus.
    B. Equipment required to measure signal.
    C. Fuel rate signal output range at the idle state.

Ans. Not applicable.

11.) Is the ACS equipped with a limp home mode? If yes, provide operation description.

Ans. ACS has a limp home mode.
If ACS detects the failure, the system turns throttle motor off and return throttle plate to default position.

12.) Please describe a method by which the test laboratory can measure the engine RPM by tapping into the ECM, OBD connector, etc.

Ans. We could take a signal from the ECM via a CONSULT (Nissan's diagnostic system), or from the meter signal.