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REPORT NO. 124-KAR-03-03

SAFETY COMPLIANCE TESTING FOR FMVSS 124

ACCELERATOR CONTROL SYSTEMS

2003 CHRYSLER PT CRUISER

NHTSA NO. C30304

PREPARED BY:
KARCO ENGINEERING
9270 HOLLY ROAD
ADELANTO, CALIFORNIA 92301

July 28, 2003

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
ROOM 6115 (NVS-221)
400 SEVENTH STREET, SW
WASHINGTON, D.C. 20590

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract DTNH22-01-C-31025.

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Technical Report Documentation Page

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15. *Supplementary Notes*

16. *Abstract*

Compliance tests were conducted on the subject 2003 Chrysler PT Cruiser in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP124V06 for the determination of FMVSS 124 compliance. There were no apparent test failures.

17. *Key Words* Compliance Testing Safety Engineering FMVSS 124		18. *Distribution Statement* Copies of this report are available from: National Highway Traffic Safety Admin. Technical Information Services (TIS) Room 5108 (NAD-40) 400 Seventh St., SW Washington, DC 20590	
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1. PURPOSE OF COMPLIANCE TEST

Tests were conducted on a 2003 Chrysler PT Cruiser, manufactured by Daimler Chrysler Corporation, to determine compliance with FMVSS 124, "Accelerator Control Systems". FMVSS 124 establishes 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 this standard is to reduce the number of deaths and injuries resulting from engine over-speed caused by malfunctions in the accelerator control system.

All tests were conducted based on the current National Highway Traffic Safety Administration (NHTSA), Office of Vehicle Safety Compliance (OVSC) Laboratory Procedures, TP-124V-06, dated April 20, 2000, and corresponding KARCO Engineering test procedure KTP-124, dated June 13, 2003, except for engine off testing which was authorized by the OVSC to provide additional data. Detailed procedures for receiving, inspecting, testing and reporting of test results are described in the test procedures and are not repeated in this report.

This report is organized in sections containing pertinent test information and data tables as follows:

Section 2	-	Compliance Test Procedure and Data Summary
Section 3	-	Test Results
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Appendix C	-	Test Equipment List and Calibration Information

SECTION 2

COMPLIANCE TEST PROCEDURE and DATA SUMMARY

2. COMPLIANCE TEST PROCEDURE AND DATA SUMMARY

A 2003 Chrysler PT Cruiser was subjected to FMVSS 124 compliance testing. The tests were conducted at KARCO Engineering in Adelanto, California on July 28, 2003. The following tests were performed:

- Inspection
- Time to Return to Idle Position (Complete Normal Operation)
- Time to Return to Idle Position (1st Energy Source Removed)
- Time to Return to Idle Position (2nd Energy Source Removed)
- Time to Return to Idle Position (Severance)

The tests were conducted per the FMVSS 124 test procedure. The significant aspects of the test procedure are described in the following paragraphs.

A. INSPECTION

The operation of all adjustable accelerator control systems shall be checked to ascertain that the systems operate correctly. The accelerator control systems shall have at least two sources of energy capable of returning the throttle to the idle.

B. COMPLIANCE TEST EXECUTION (STATIC TESTING OF ACCELERATOR CONTROL SYSTEMS)

B.1 FULLY OPERATIONAL SYSTEM

Continuously record ambient temperature, engine coolant temperature, throttle position versus time and engine RPM versus time for the duration of each test. The accelerator may be depressed by hand or foot pressure or by any other mechanical means. Conduct the tests for 25% WOT, 50% WOT, 75% WOT and 100% WOT. Conduct the test a second time with the engine off.

B.2 DISCONNECTION OF THE FIRST SOURCE OF THROTTLE RETURN ENERGY

Remove one of the throttle return springs. Continuously record ambient temperature, engine coolant temperature, throttle position versus time, and engine RPM versus time for the duration of each test. The accelerator may be depressed by hand or foot pressure or by any other mechanical means. Conduct the tests for 25% WOT, 50% WOT, 75% WOT and 100% WOT. Conduct the test a second time with the engine off. Return the system to original condition.

B.3 DISCONNECTION OF THE SECOND SOURCE OF THROTTLE RETURN ENERGY

Remove the second throttle return spring. Continuously record ambient temperature, engine coolant temperature, throttle position versus time, and engine RPM versus time for the duration of each test. The accelerator may be depressed by hand or foot pressure or by any other mechanical means. Conduct the tests for 25% WOT, 50% WOT, 75% WOT and 100% WOT. Conduct the test a second time with the engine off. Return the system to original condition.

B.4 SEVERANCE

Identify the points determined in Section 11.3.4 of the test procedure to be the most critical in the accelerator control system. Induce severance or disconnection in the throttle return linkage. Continuously record ambient temperature, engine coolant temperature, and throttle position versus time and engine RPM versus time for the duration of each test. The accelerator may be depressed by hand or foot pressure or by any other mechanical means. Conduct the tests for 25% WOT, 50% WOT, 75% WOT and 100% WOT. Conduct the test a second time with the engine off. Return the system to original condition.

B.5 TEST SET-UP

Each series of tests were conducted in the same manner. Throttle plate position was determined by measuring voltage output directly from the throttle position sensor. Engine RPM was obtained with an optical fifth wheel recording speed on an engine belt. The Chrysler PT Cruiser was rpm limited and the RPM of the engine remained relatively constant for throttle plate positions beyond a certain point. On data traces,

time of release of accelerator pedal and time of severance is time zero, (%) on data trace is percent of throttle maximum rotation where zero is the idle state position. On data traces, RPM time is for RPM to return to approximate steady state idle. Worst-case severance was accomplished by disconnecting the accelerator cable from the throttle body and actuating the throttle position with a piece of string. Time zero on the data plots equates to release of string simulating failure.

SECTION 3
TEST DATA

3. TEST DATA

The results of FMVSS 124 compliance tests that were conducted on the 2003 Chrysler PT Cruiser on July 28, 2003, to determine compliance with FMVSS 124, "Accelerator Control Systems" is presented in this section.

DATA SHEET NO. 1

VEHICLE INSPECTION AND IDENTIFICATION

TEST VEHICLE INFORMATION			
Manufacturer	Daimler Chrysler Corp.	VIN	3C4FY48B33T545410
Manufacturing Date	09/02	Delivery Date	03/19/03
Dealer	Victor Valley Chrysler	NHTSA No.	C30304
Odometer Reading (mi.)	21	Fuel Type	Gas
Engine Displacement	2.4	Cylinders	4
Transmission	Manual	Final Drive	Front
Engine Placement	Transverse	Color	Black
Tire Press. /Max. Cap. Front	34 psi	Cold Tire Press. Front	34 psi
Tire Press. /Max. Cap. Rear	34 psi	Cold Tire Press. Rear	34 psi
Recommend Tire Size	P195/65R15	Type of Spare	T125/70D15
Tire Size on Vehicle	P195/65R15	Manufacturer	Good Year
GVWR	4225	Cargo Capacity	865
GAWR Front	2298	GVWR Rear	2075
Air Conditioning	YES	Power Steering	YES
Power Brakes	YES	AM/FM/Cassette	YES
Disc Brakes (Front)	YES	Disc Brakes (Rear)	NO
Power Windows	YES	Tilt Steering	YES
Anti-lock Brakes (ABS)	NO	Power Seats	NO
Driver Airbag	YES	Passenger Airbag	YES

DATA SHEET NO. 2

VEHICLE THROTTLE CONTROL INSPECTION

VEHICLE			
YEAR	**2003**	MAKE	**Chrysler**
MODEL	**PT Cruiser**	BODY STYLE	**4 – door**
NHTSA NO.	**C30304**	VIN	**3C4FY48B33T545410**
TEST DATE:	**07/28/03**	TEMPERATURE:	**N/A**

Determine how many forms of energy are present on the vehicle to return throttle to idle. If more than two, describe the third in the comments below.	2
Describe the first energy source.	Torsion spring mounted on throttle shaft.
Describe the second energy source.	Torsion spring mounted on throttle shaft.
Describe the third energy source.	N/A
Does vehicle have a return spring on the accelerator pedal?	NO
Describe point of severance.	Throttle cable was disconnected from the throttle shaft.

Comments:

TEST STATUS:	PASSED —	x	FAILED —	

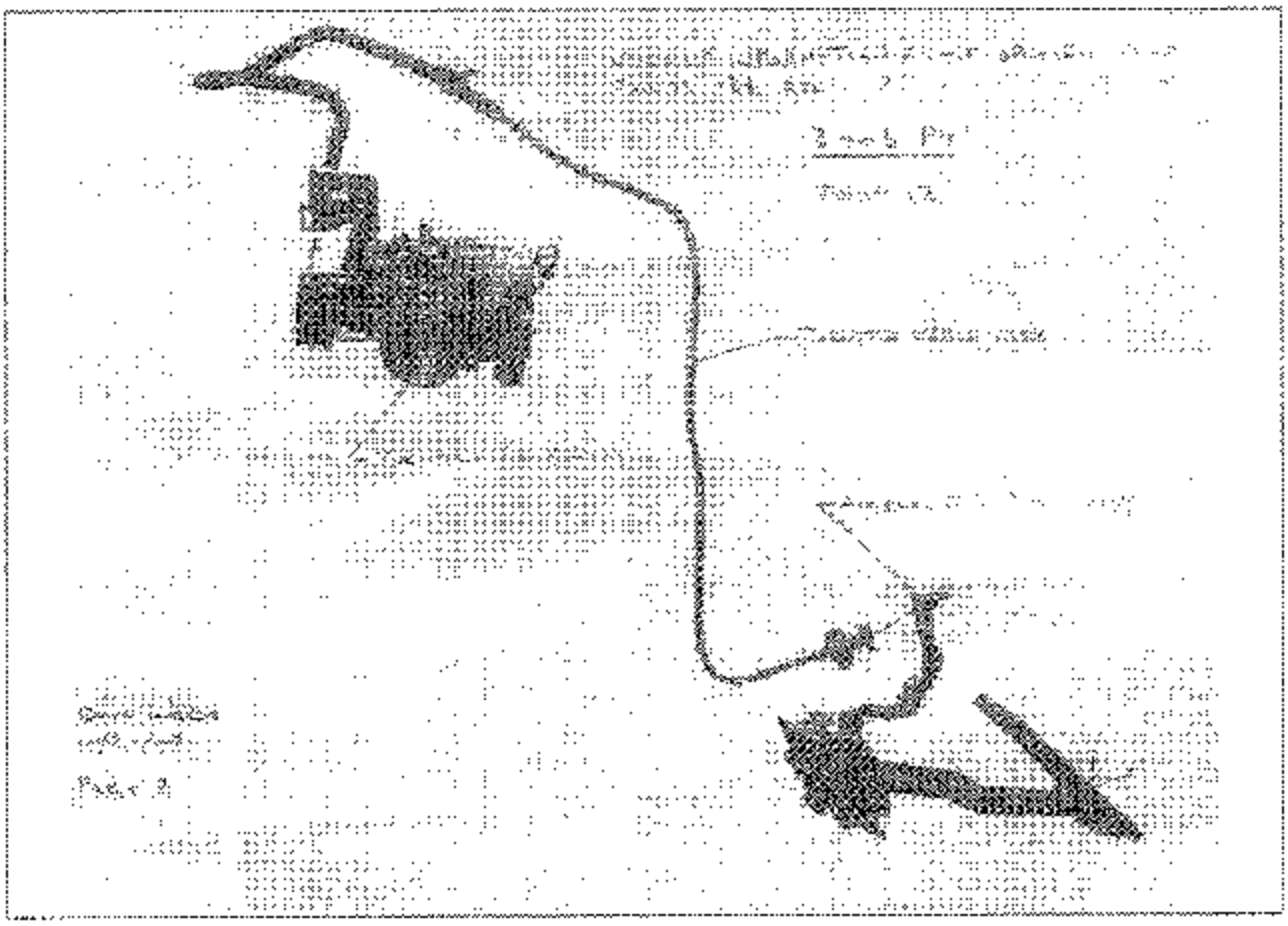
RECORDED BY: **JESSE FUENTES** DATE: **07/28/03**

APPROVED BY: **MATTHEW A. IVORY** DATE: **07/28/03**

DATA SHEET NO. 3

MANUFACTURER'S DRAWINGS

VEHICLE			
YEAR	2003	MAKE	Chrysler
MODEL	PT Cruiser	BODY STYLE	4 door
NHTSA NO.	C30204	VIN	3C4FY48B33T545410
TEST DATE:	07/28/03	TEMPERATURE:	N/A



DATA SHEET NO. 4

TEST EXECUTION

VEHICLE			
YEAR	2003	MAKE	Chrysler
MODEL	PT Cruiser	BODY STYLE	4 door
NHTSA NO.	C30204	VIN	3C4FY48B33T545410
TEST DATE:	07/28/03	TEMPERATURE:	29°C

THROTTLE CONTROL SYSTEM CONDITION:				ACCELERATOR CONTROL SYSTEM INTACT, AMBIENT TEMPERATURE, ENGINE ON			
TEST NO.	NOMINAL THROTTLE POSITION	ACTUAL THROTTLE POSITION	ENGINE RPM	ENGINE COOLANT TEMPERATURE	THROTTLE POSITION SENSOR READING AT IDLE	TIME TO RETURN TO IDLE	PASS /FAIL
1	25%	34.3%	4622.9	81°C	0.0%	110 msec	Pass
2	50%	50.4%	6017.0	81°C	0.0%	150 msec	Pass
3	75%	72.2%	6000.1	81°C	0.0%	130 msec	Pass
4	100%	100.1%	6001.3	81°C	0.0%	170 msec	Pass

THROTTLE CONTROL SYSTEM CONDITION:				ACCELERATOR CONTROL SYSTEM INTACT, AMBIENT TEMPERATURE, ENGINE OFF			
TEST NO.	NOMINAL THROTTLE POSITION	ACTUAL THROTTLE POSITION	ENGINE RPM	ENGINE COOLANT TEMPERATURE	THROTTLE POSITION SENSOR READING AT IDLE	TIME TO RETURN TO IDLE	PASS /FAIL
1	25%	26.8%	N/A	N/A	0.0%	120 msec	Pass
2	50%	49.1%	N/A	N/A	0.0%	140 msec	Pass
3	75%	75.2%	N/A	N/A	0.0%	150 msec	Pass
4	100%	99.8%	N/A	N/A	0.0%	160 msec	Pass

RETURN TIME REQUIREMENTS:
1 second (1000 msec) for vehicles less than 4536 kg.
2 seconds (2000 msec) for vehicles more than 4536 kg.
3 seconds (3000 msec) for vehicle exposed to -18°C or less.

TEST STATUS:	PASSED —	x	FAILED —	

RECORDED BY: JESSE FUENTES DATE: 07/28/03

APPROVED BY: MATTHEW A. IVORY DATE: 07/28/03

DATA SHEET NO. 4...(CONTINUED)

TEST EXECUTION

VEHICLE			
YEAR	2003	MAKE	Chrysler
MODEL	PT Cruiser	BODY STYLE	4 door
NHTSA NO.	C30204	VIN	3C4FY48B33T545410
TEST DATE:	07/28/03	TEMPERATURE:	31°C

THROTTLE CONTROL SYSTEM CONDITION:				1ST RETURN SPRING REMOVED, AMBIENT TEMPERATURE, ENGINE ON			
TEST NO.	NOMINAL THROTTLE POSITION	ACTUAL THROTTLE POSITION	ENGINE RPM	ENGINE COOLANT TEMPERATURE	THROTTLE POSITION SENSOR READING AT IDLE	TIME TO RETURN TO IDLE	PASS /FAIL
1	25%	25.3%	4483.2	81°C	0.0%	100 msec	Pass
2	50%	52.6%	6062.6	81°C	0.0%	110 msec	Pass
3	75%	74.4%	6059.8	81°C	0.0%	140 msec	Pass
4	100%	101.8%	6028.7	81°C	0.0%	190 msec	Pass

THROTTLE CONTROL SYSTEM CONDITION:				1ST RETURN SPRING REMOVED, AMBIENT TEMPERATURE, ENGINE OFF			
TEST NO.	NOMINAL THROTTLE POSITION	ACTUAL THROTTLE POSITION	ENGINE RPM	ENGINE COOLANT TEMPERATURE	THROTTLE POSITION SENSOR READING AT IDLE	TIME TO RETURN TO IDLE	PASS /FAIL
1	25%	27.3%	N/A	N/A	0.0%	110 msec	Pass
2	50%	50.2%	N/A	N/A	0.0%	120 msec	Pass
3	75%	75.9%	N/A	N/A	0.0%	170 msec	Pass
4	100%	100.2%	N/A	N/A	0.0%	170 msec	Pass

RETURN TIME REQUIREMENTS:
1 second (1000 msec) for vehicles less than 4536 kg.
2 seconds (2000 msec) for vehicles more than 4536 kg.
3 seconds (3000 msec) for vehicle exposed to -18°C or less.

TEST STATUS:	PASSED —		x	FAILED —

RECORDED BY: JESSE FUENTES DATE: 07/28/03

APPROVED BY: MATTHEW A. IVORY DATE: 07/28/03

DATA SHEET NO. 4...(CONTINUED)

TEST EXECUTION

VEHICLE			
YEAR	**2003**	MAKE	**Chrysler**
MODEL	**PT Cruiser**	BODY STYLE	**4 door**
NHTSA NO.	**C30204**	VIN	**3C4FY48B33T545410**
TEST DATE:	**07/28/03**	TEMPERATURE:	**32°C**

THROTTLE CONTROL SYSTEM CONDITION:				2ND RETURN SPRING REMOVED, AMBIENT TEMPERATURE, ENGINE ON			
TEST NO.	NOMINAL THROTTLE POSITION	ACTUAL THROTTLE POSITION	ENGINE RPM	ENGINE COOLANT TEMPERATURE	THROTTLE POSITION SENSOR READING AT IDLE	TIME TO RETURN TO IDLE	PASS /FAIL
1	25%	**28.3%**	**4513.8**	**81°C**	**0.0%**	**120 msec**	**Pass**
2	50%	**51.4%**	**6079.7**	**81°C**	**0.0%**	**110 msec**	**Pass**
3	75%	**79.2%**	**6021.9**	**81°C**	**0.0%**	**130 msec**	**Pass**
4	100%	**100.5%**	**6026.4**	**81°C**	**0.0%**	**140 msec**	**Pass**

THROTTLE CONTROL SYSTEM CONDITION:				2ND RETURN SPRING REMOVED, AMBIENT TEMPERATURE, ENGINE OFF			
TEST NO.	NOMINAL THROTTLE POSITION	ACTUAL THROTTLE POSITION	ENGINE RPM	ENGINE COOLANT TEMPERATURE	THROTTLE POSITION SENSOR READING AT IDLE	TIME TO RETURN TO IDLE	PASS /FAIL
1	25%	**27.5%**	**N/A**	**N/A**	**0.0%**	**130 msec**	**Pass**
2	50%	**49.1%**	**N/A**	**N/A**	**0.0%**	**150 msec**	**Pass**
3	75%	**74.4%**	**N/A**	**N/A**	**0.0%**	**130 msec**	**Pass**
4	100%	**103.6%**	**N/A**	**N/A**	**0.0%**	**190 msec**	**Pass**

RETURN TIME REQUIREMENTS:
1 second (1000 msec) for vehicles less than 4536 kg.
2 seconds (2000 msec) for vehicles more than 4536 kg.
3 seconds (3000 msec) for vehicle exposed to -18°C or less.

TEST STATUS:	PASSED —	x	FAILED —

RECORDED BY: **JESSE FUENTES** DATE: **07/28/03**

APPROVED BY: **MATTHEW A. IVORY** DATE: **07/28/03**

DATA SHEET NO. 4...(CONTINUED)

TEST EXECUTION

VEHICLE			
YEAR	2003	MAKE	CHRYSLER
MODEL	PT CRUISER	BODY STYLE	4 door
NHTSA NO.	C30204	VIN	3C4FY48B33T545410
TEST DATE:	07/28/03	TEMPERATURE:	32°C

THROTTLE CONTROL SYSTEM CONDITION:				SEVERANCE			
TEST NO.	NOMINAL THROTTLE POSITION	ACTUAL THROTTLE POSITION	ENGINE RPM	ENGINE COOLANT TEMPERATURE	THROTTLE POSITION SENSOR READING AT IDLE	TIME TO RETURN TO IDLE	PASS /FAIL
1	25%	24.7%	0.0	81°C	0.0%	170 msec	Pass
2	50%	48.8%	5996.3	81°C	0.0%	130 msec	Pass
3	75%	77.6%	6022.7	81°C	0.0%	140 msec	Pass
4	100%	100.9%	6016.5	81°C	0.0%	140 msec	Pass

THROTTLE CONTROL SYSTEM CONDITION:				SEVERANCE			
TEST NO.	NOMINAL THROTTLE POSITION	ACTUAL THROTTLE POSITION	ENGINE RPM	ENGINE COOLANT TEMPERATURE	THROTTLE POSITION SENSOR READING AT IDLE	TIME TO RETURN TO IDLE	PASS /FAIL
1	25%	27.1%	N/A	N/A	0.0%	100 msec	Pass
2	50%	54.3%	N/A	N/A	0.0%	140 msec	Pass
3	75%	80.2%	N/A	N/A	0.0%	120 msec	Pass
4	100%	103.7 %	N/A	N/A	0.0%	140 msec	Pass

RETURN TIME REQUIREMENTS:
1 second (1000 msec) for vehicles less than 4536 kg.
2 seconds (2000 msec) for vehicles more than 4536 kg.
3 seconds (3000 msec) for vehicle exposed to -18°C or less.

TEST STATUS:	PASSED —	x	FAILED —	

RECORDED BY: **JESSE FUENTES** DATE: **07/28/03**

APPROVED BY: **MATTHEW A. IVORY** DATE: **07/28/03**

APPENDIX A
PHOTOGRAPHS

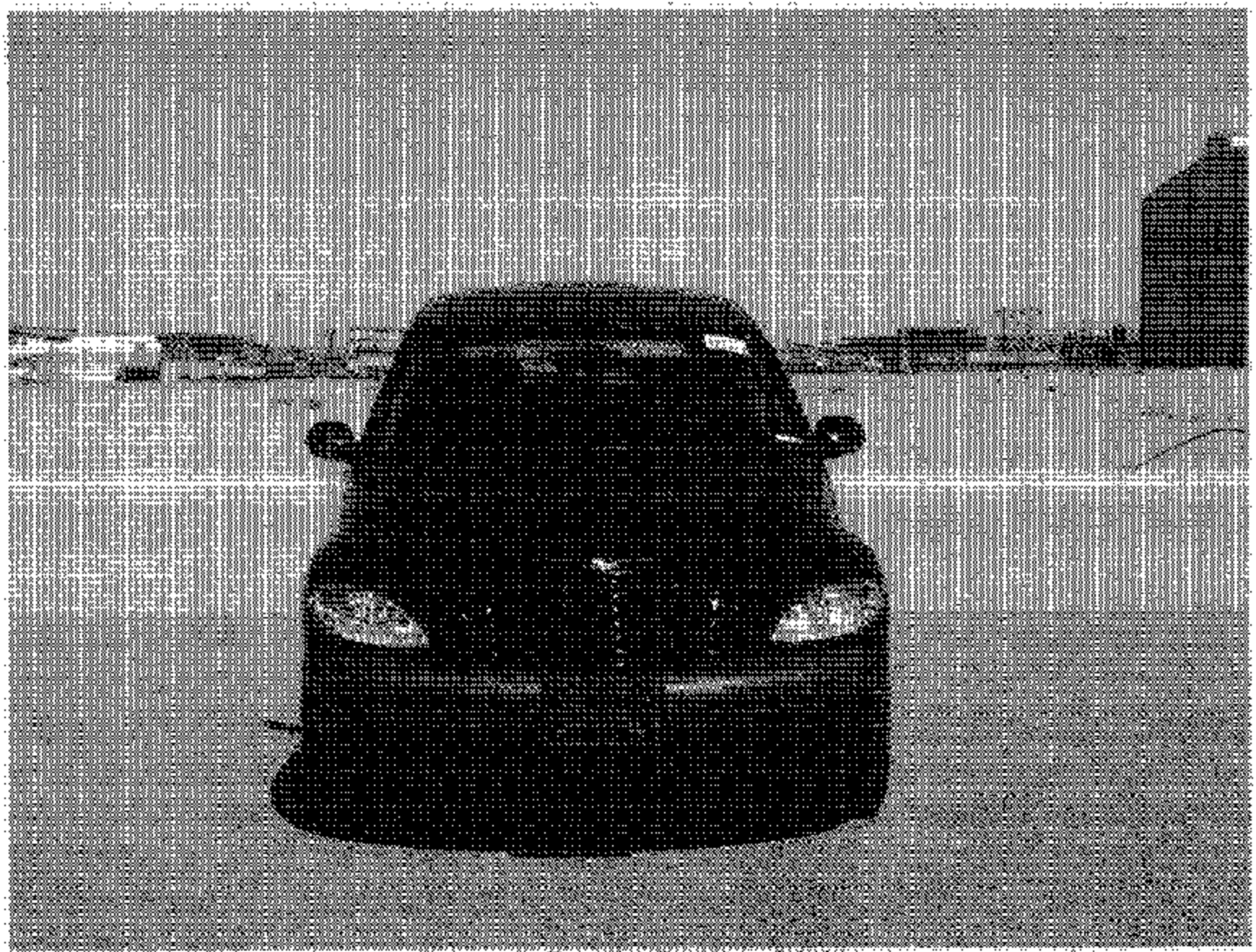


Figure A-1: Front View of Vehicle

Figure A-2. Left Side View of Vehicle

2008 CHRYSLER PT CRUISER
NHTSA NO. C30504
FMVSS NO. 124

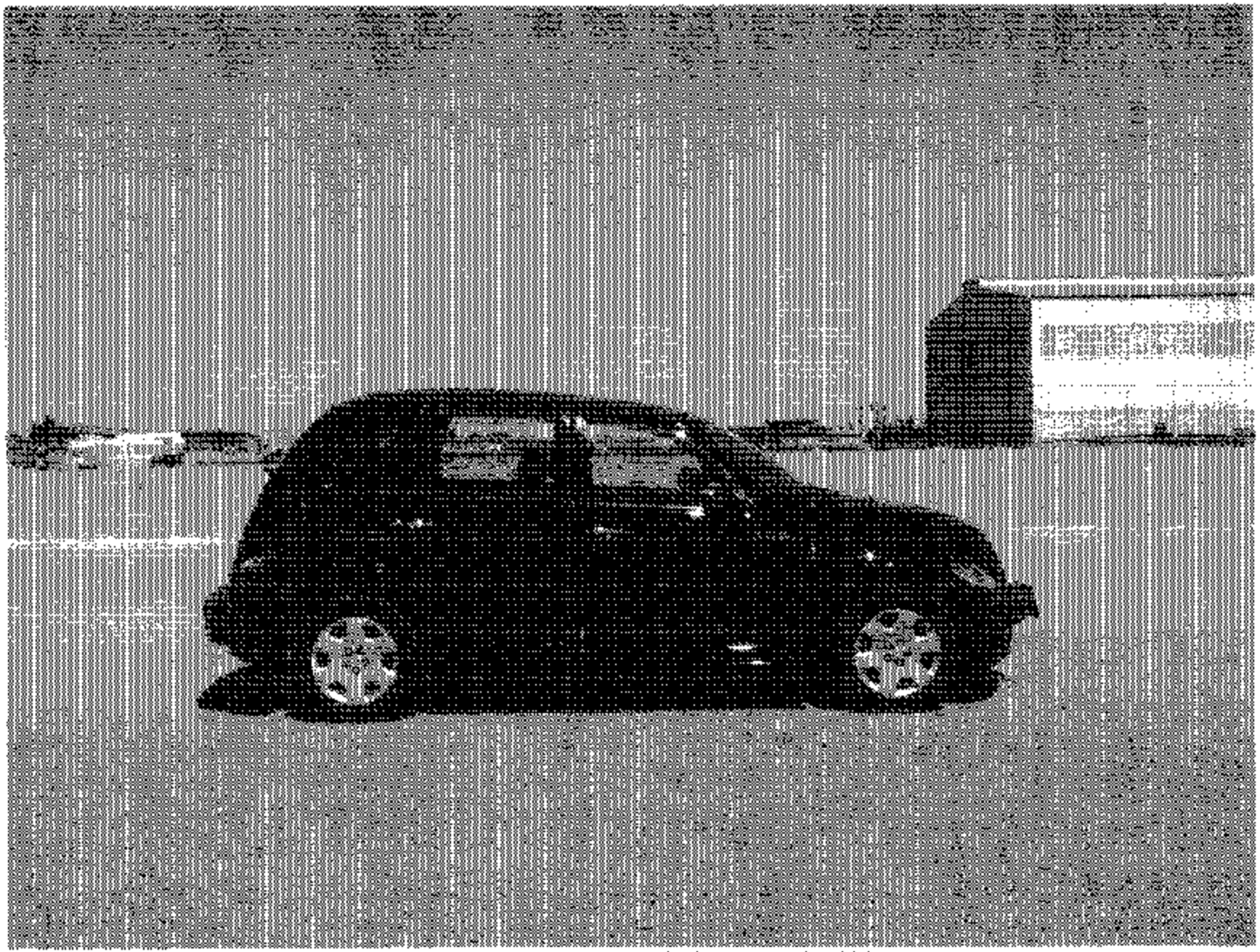


Figure A-3: Right Side View of Vehicle

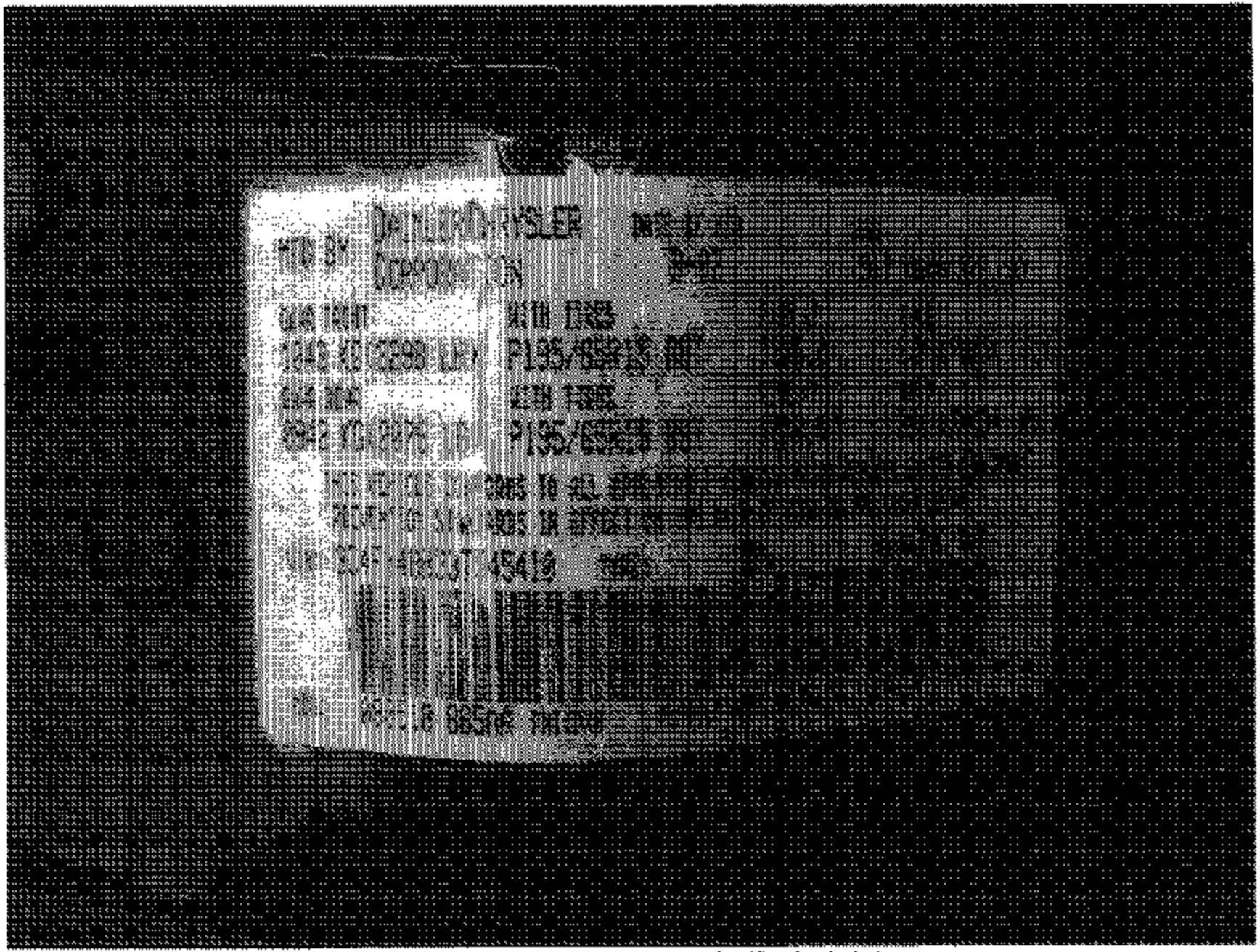


Figure A-4: Vehicle Certification Label

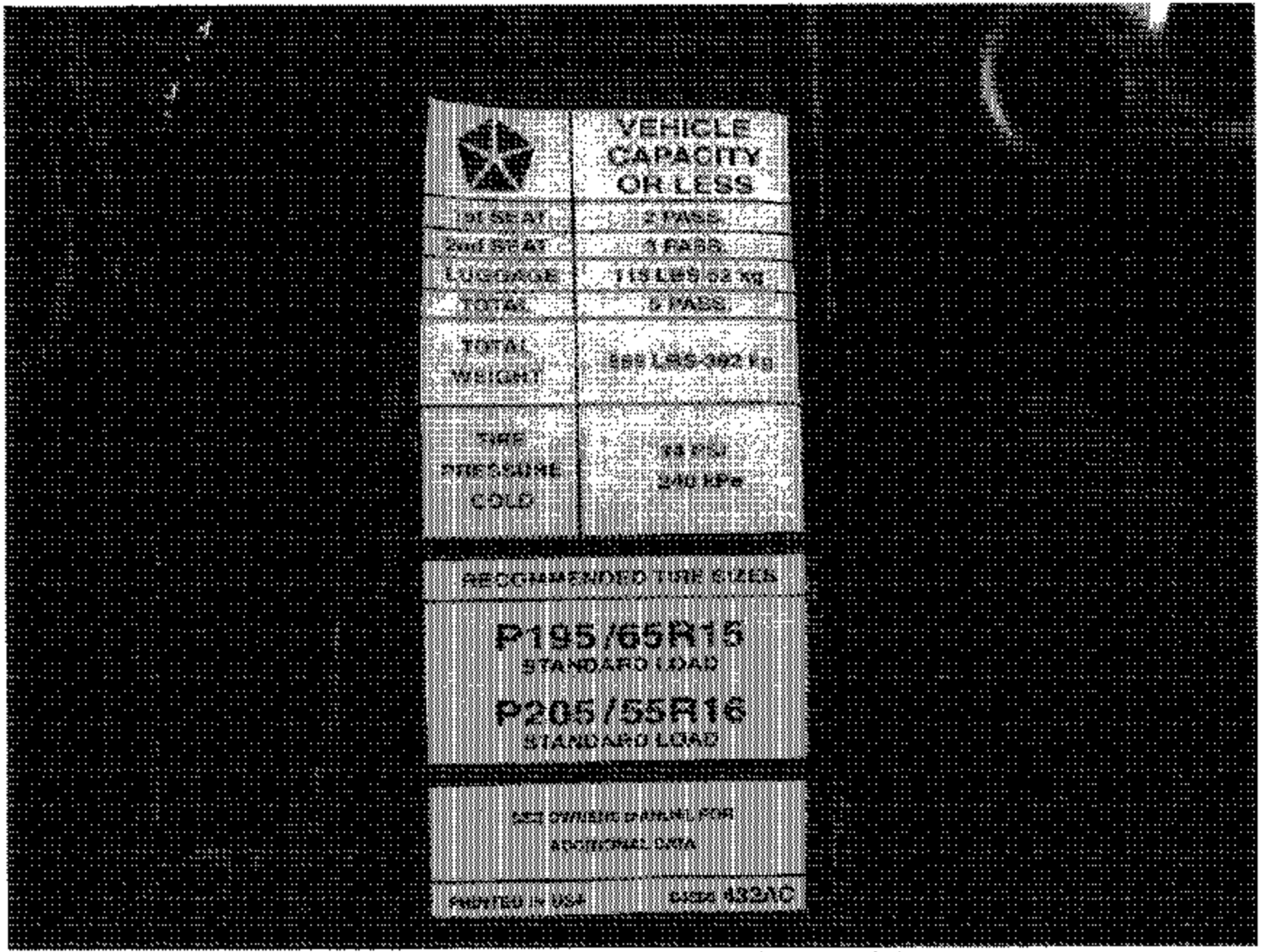


Figure A-5: Vehicle Tire Information Label

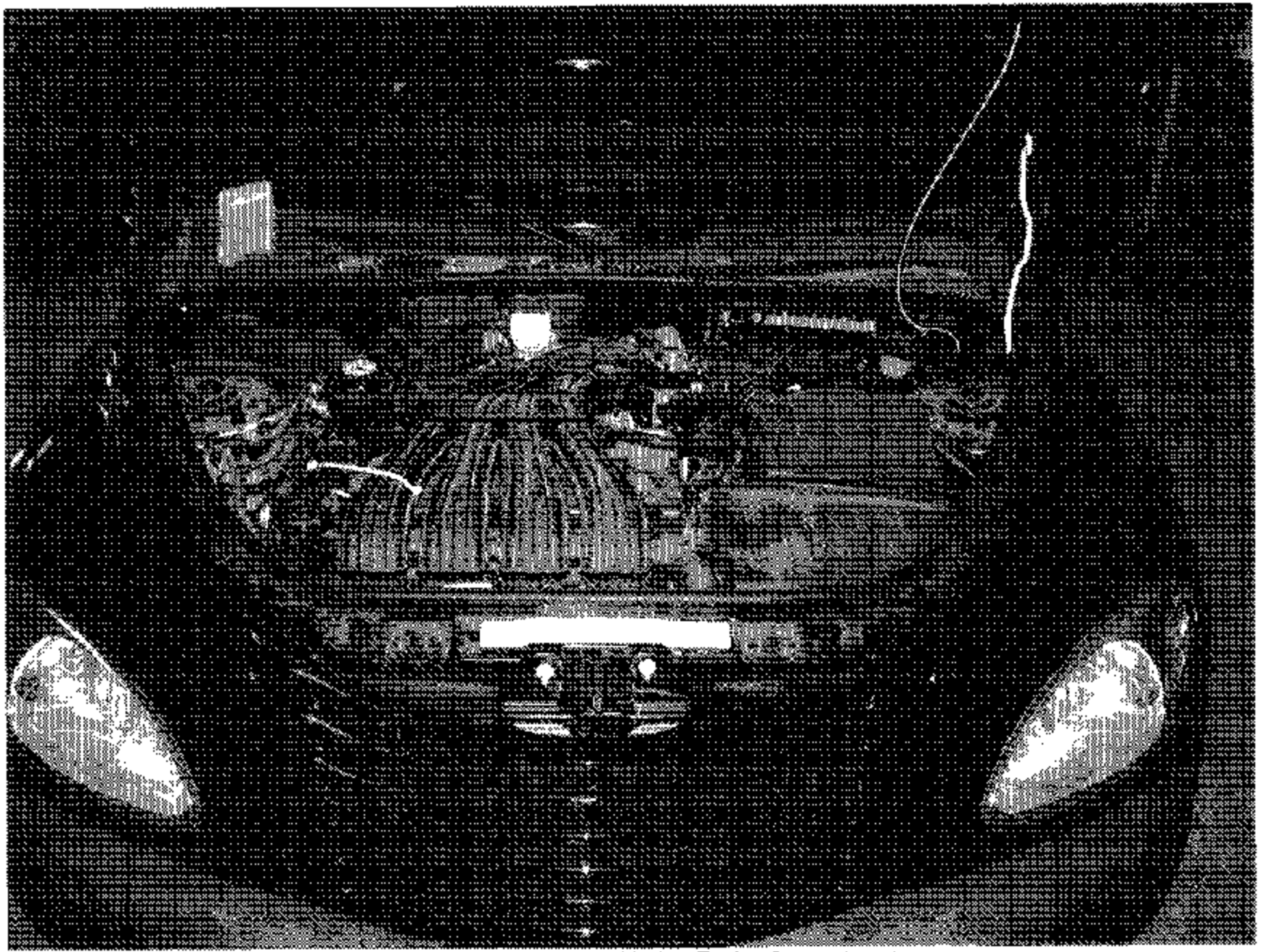


Figure A-6: Vehicle Engine Compartment

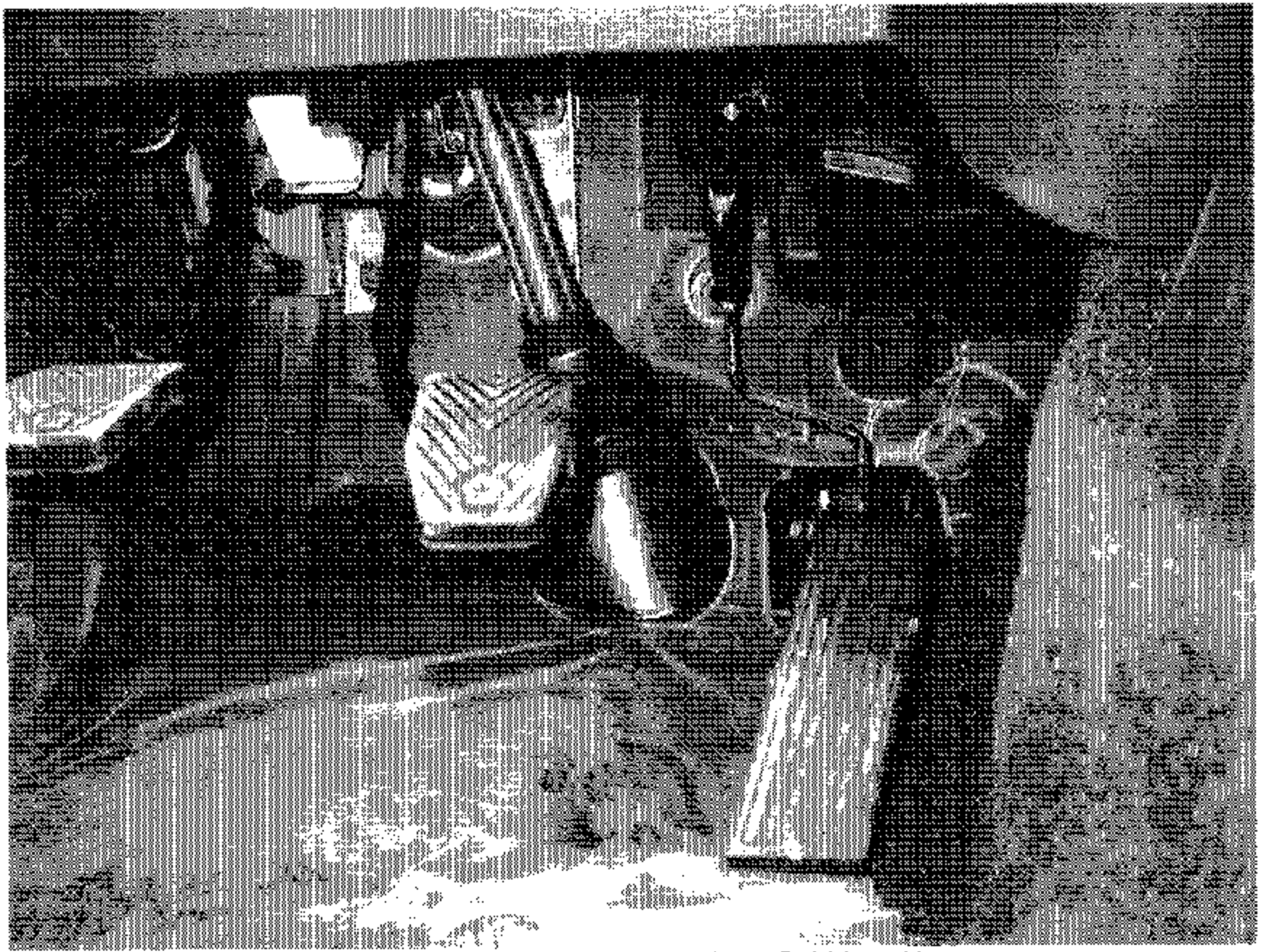


Figure A-7: Vehicle Accelerator Pedal Assembly

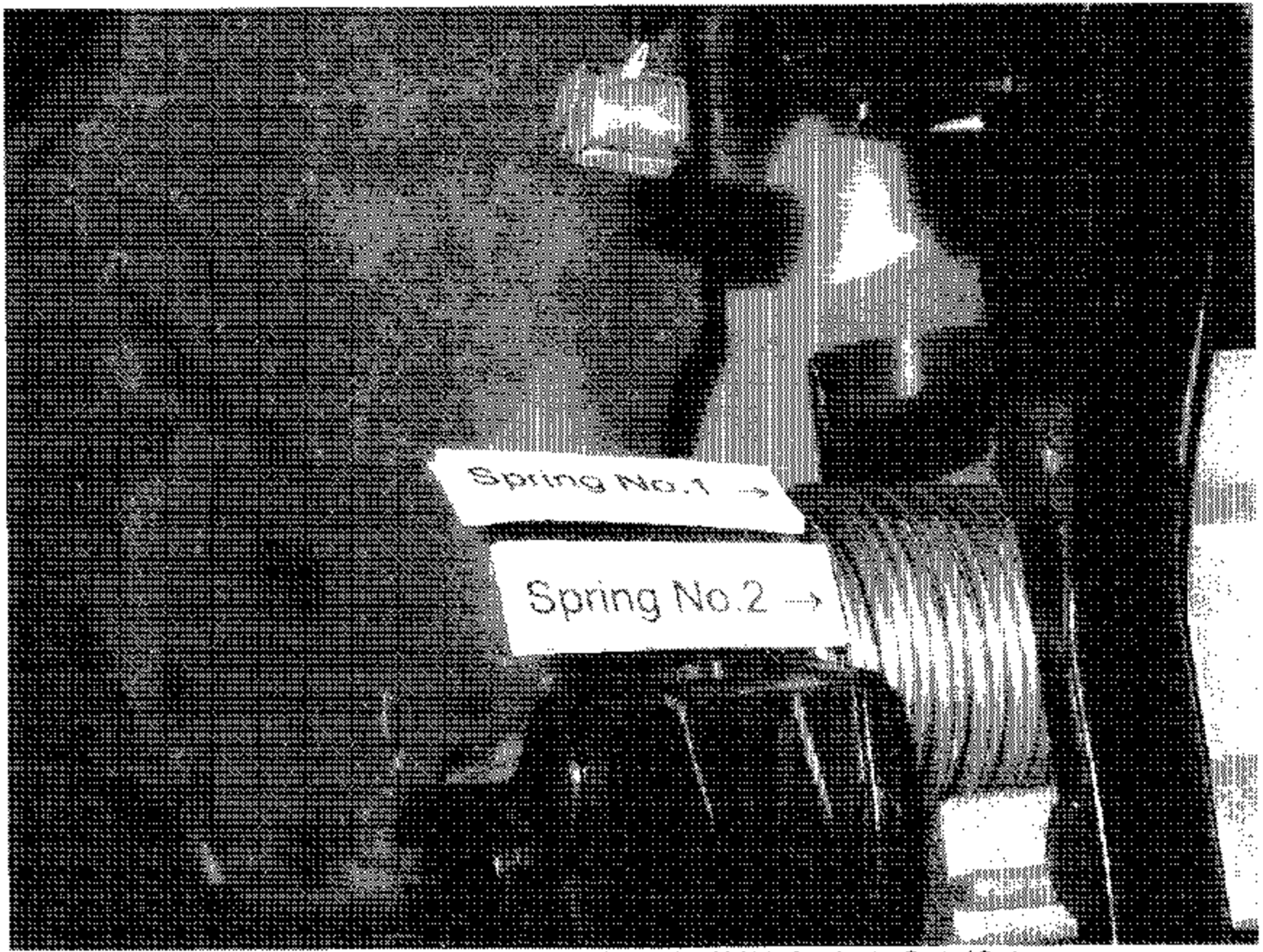


Figure A-8: Spring 1 and 2 Located on Vehicle Accelerator Control System

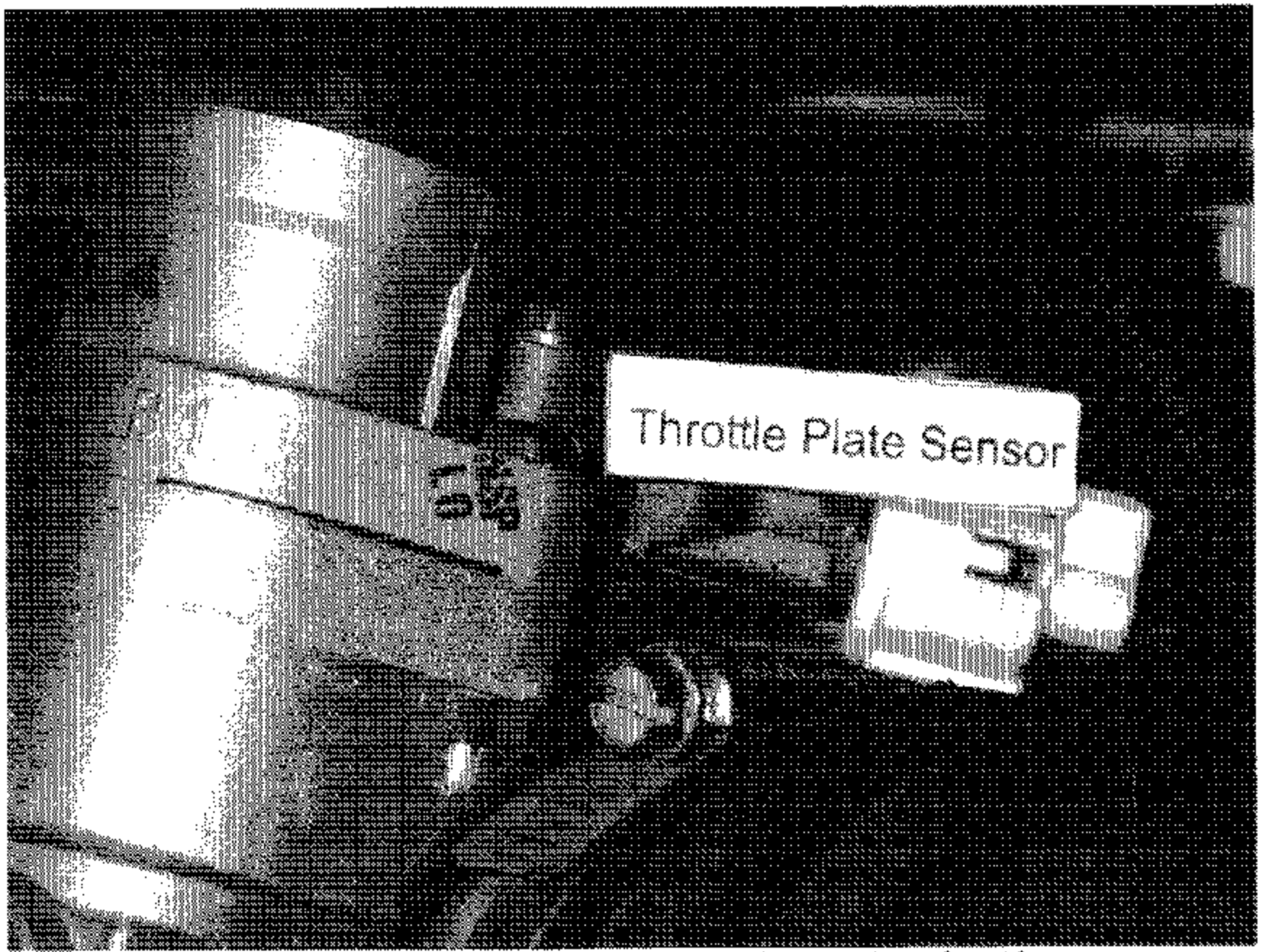


Figure A-9: Throttle Plate Sensor Located on Vehicle Accelerator Control System

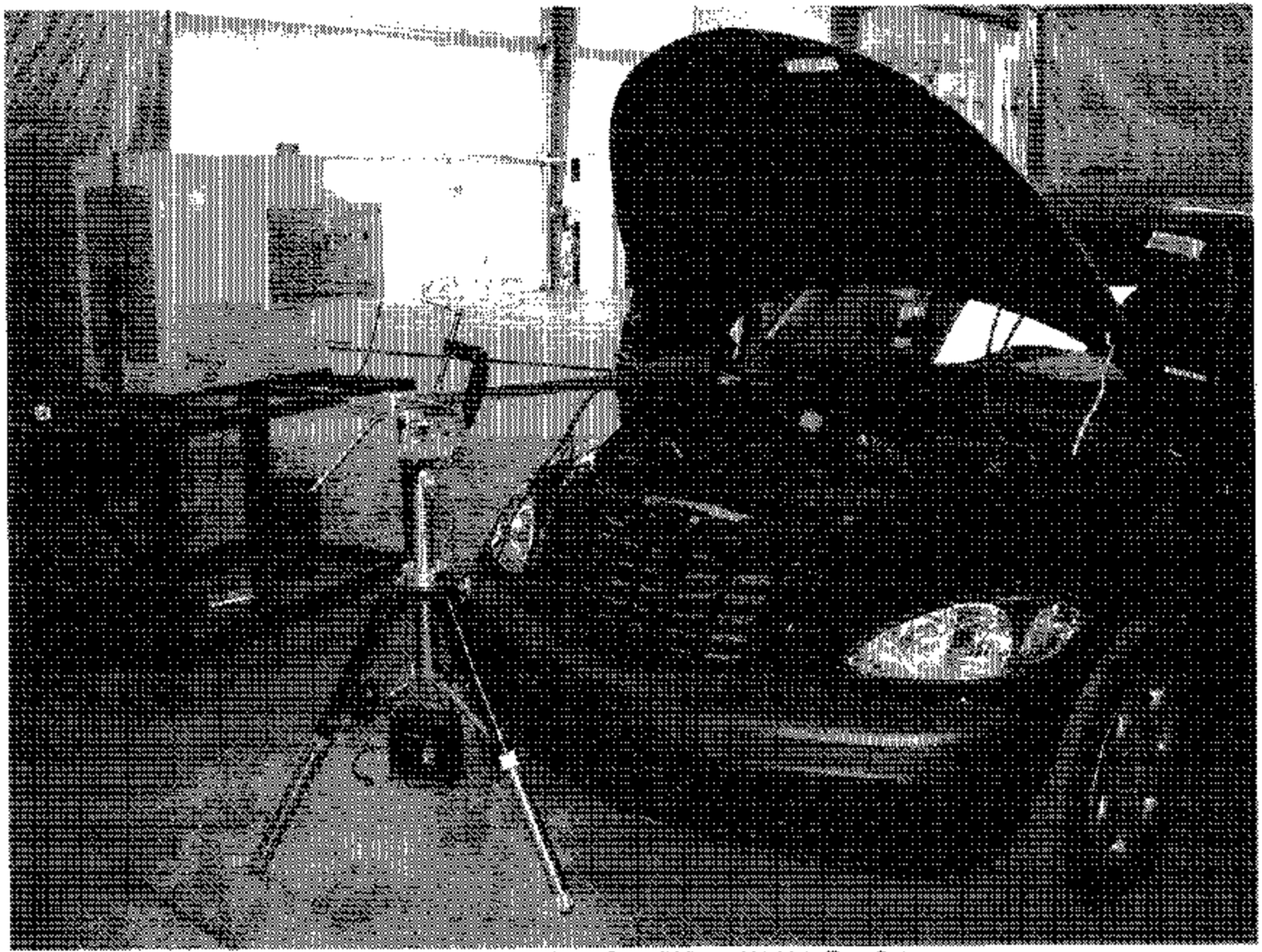


Figure A-10: Overall View of Vehicle Test Setup

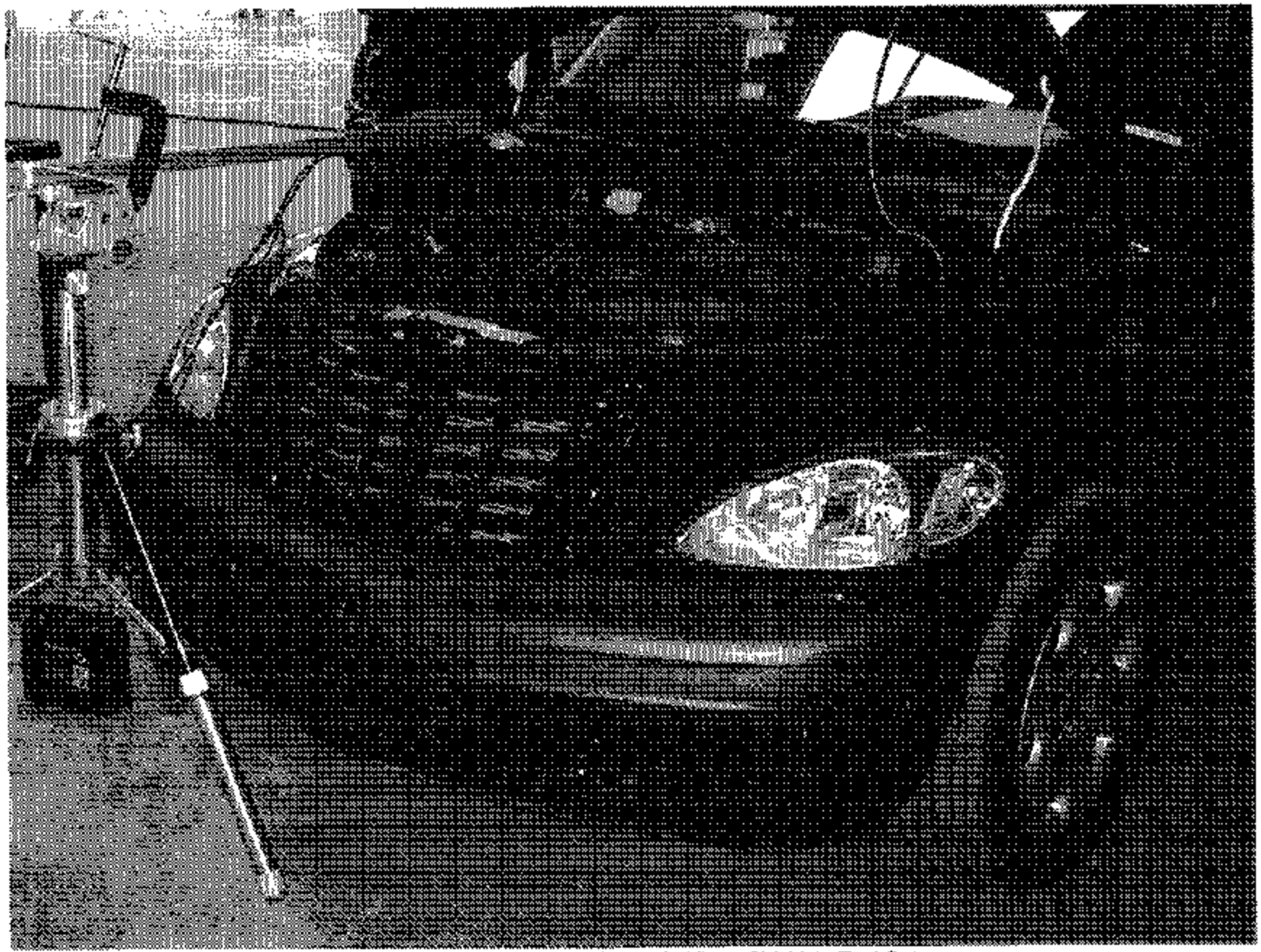


Figure A-11: Close-Up View of Vehicle Test Setup

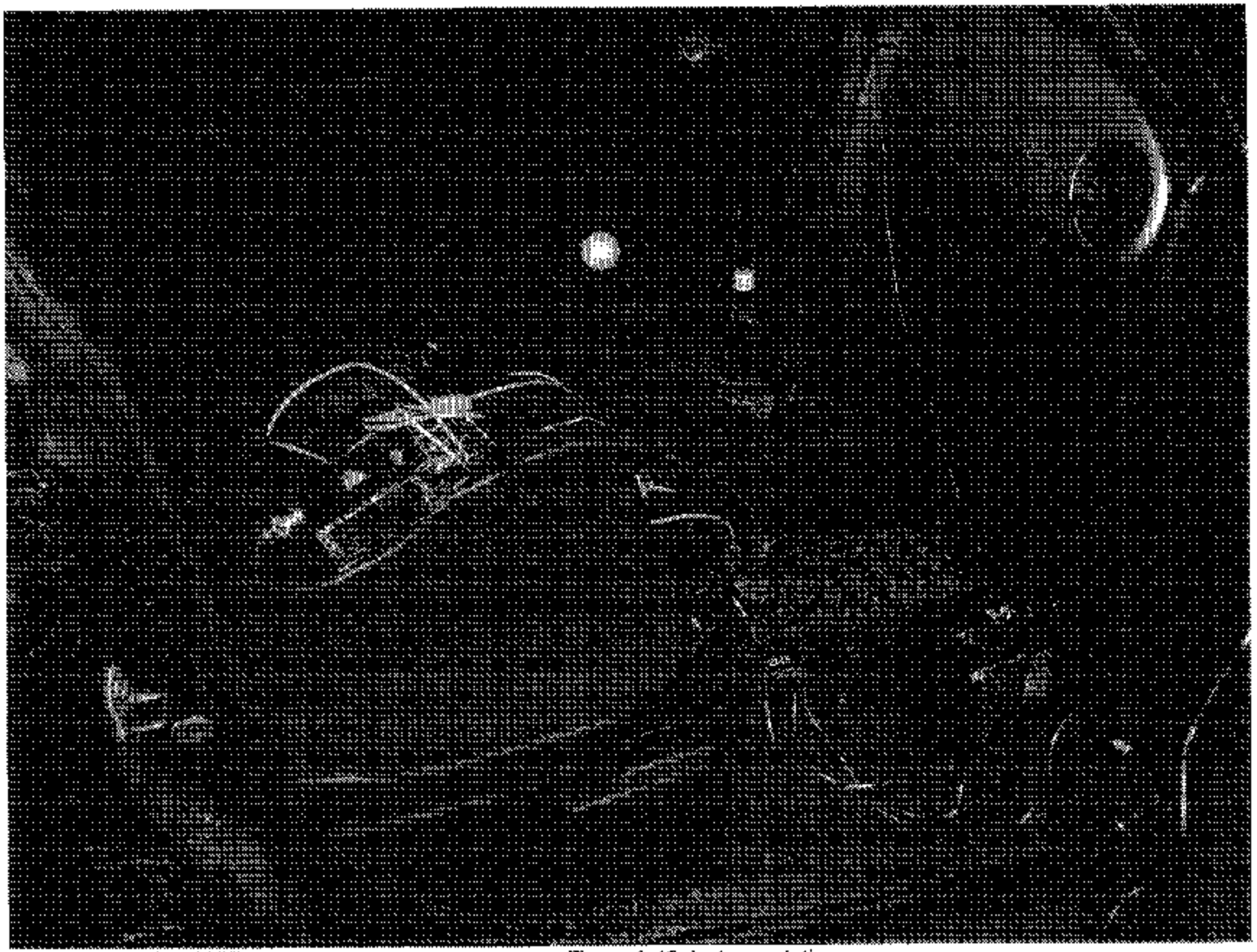


Figure A-12: Instrumentation

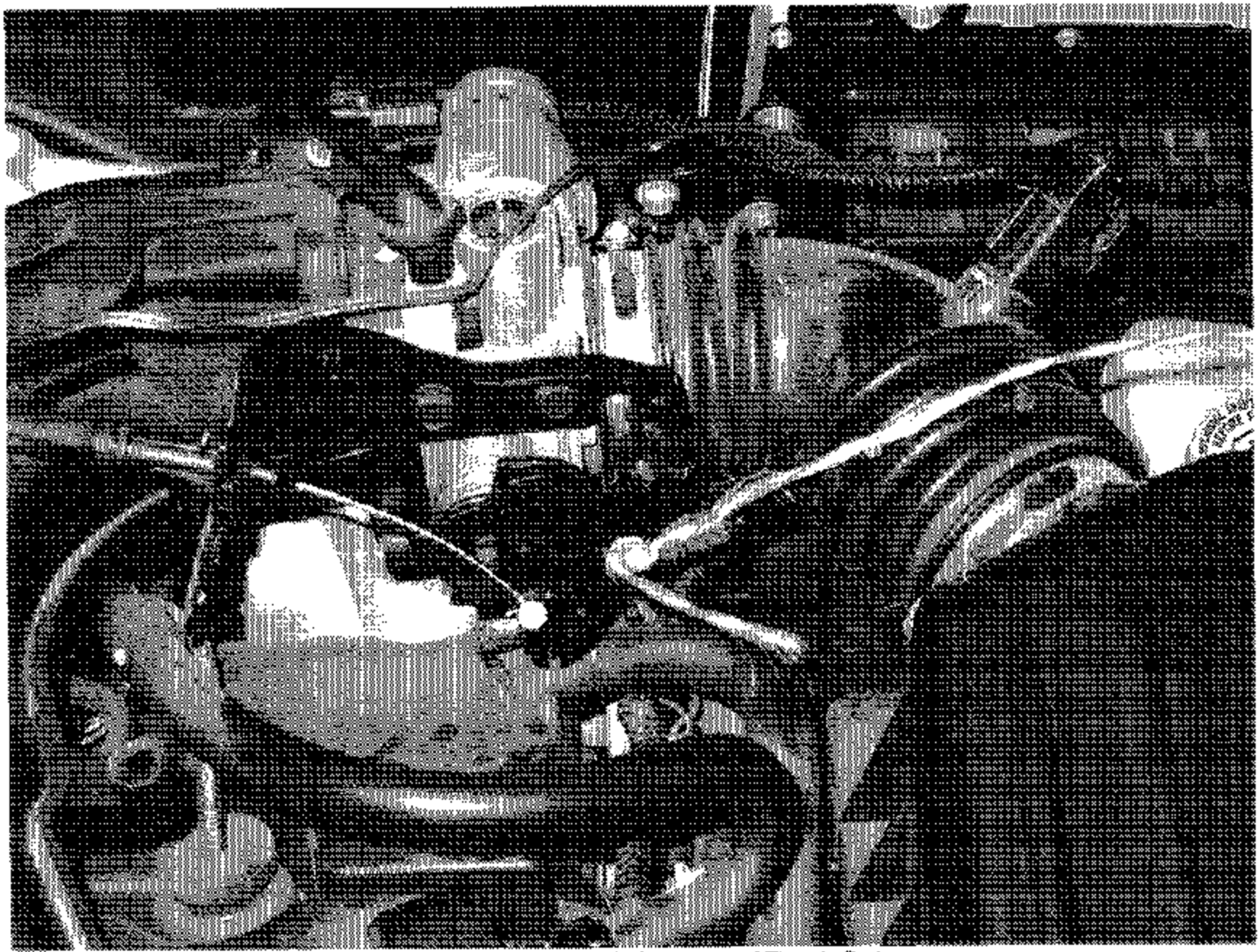
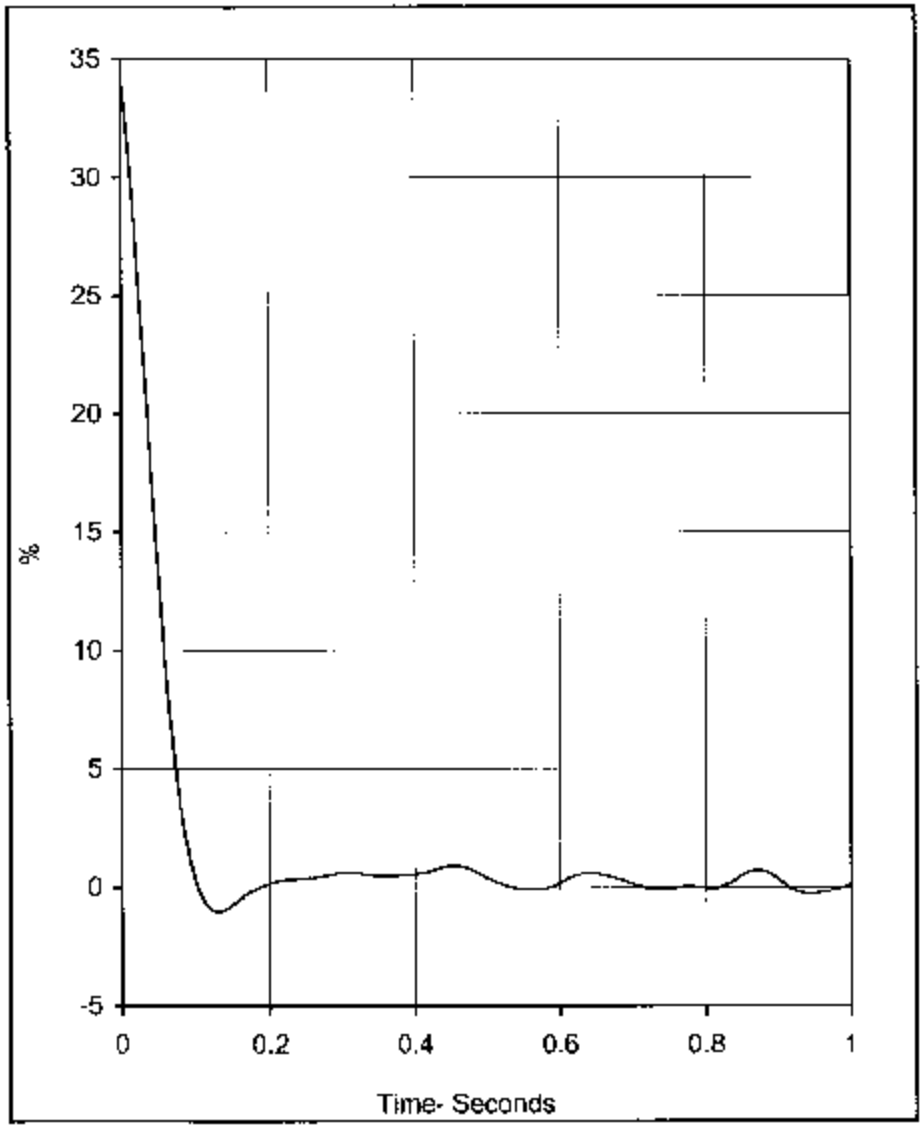
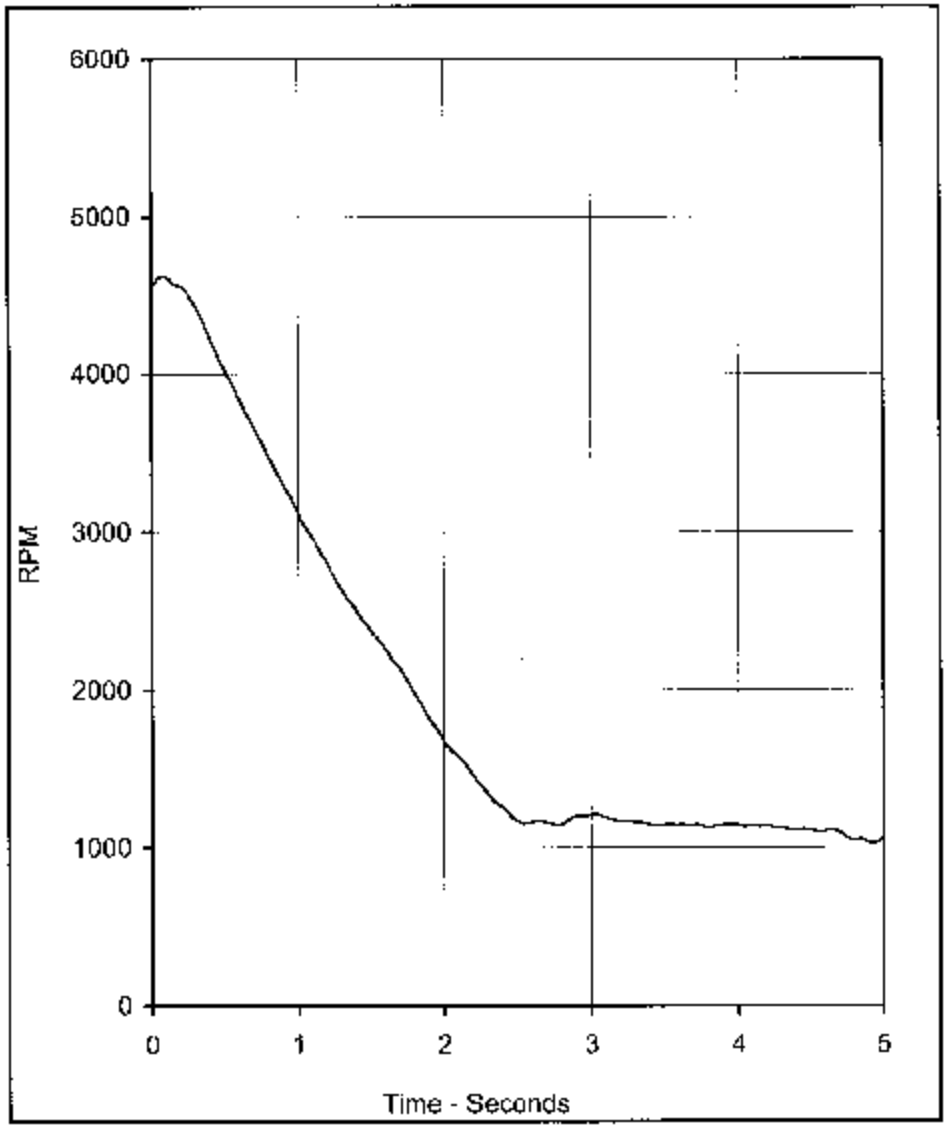


Figure A-13: Severance of Throttle Body

APPENDIX B
DATA PLOTS





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	34.3	0.0	110.0	5

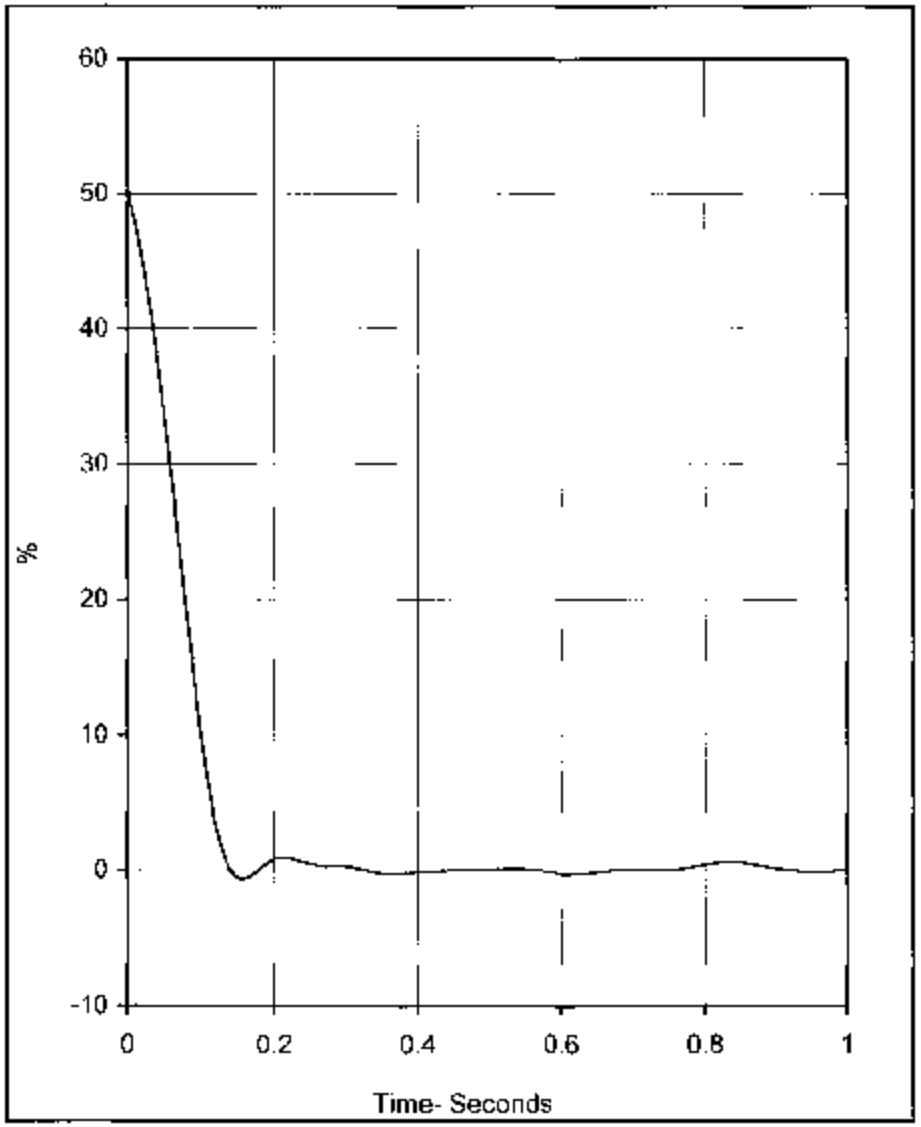
Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

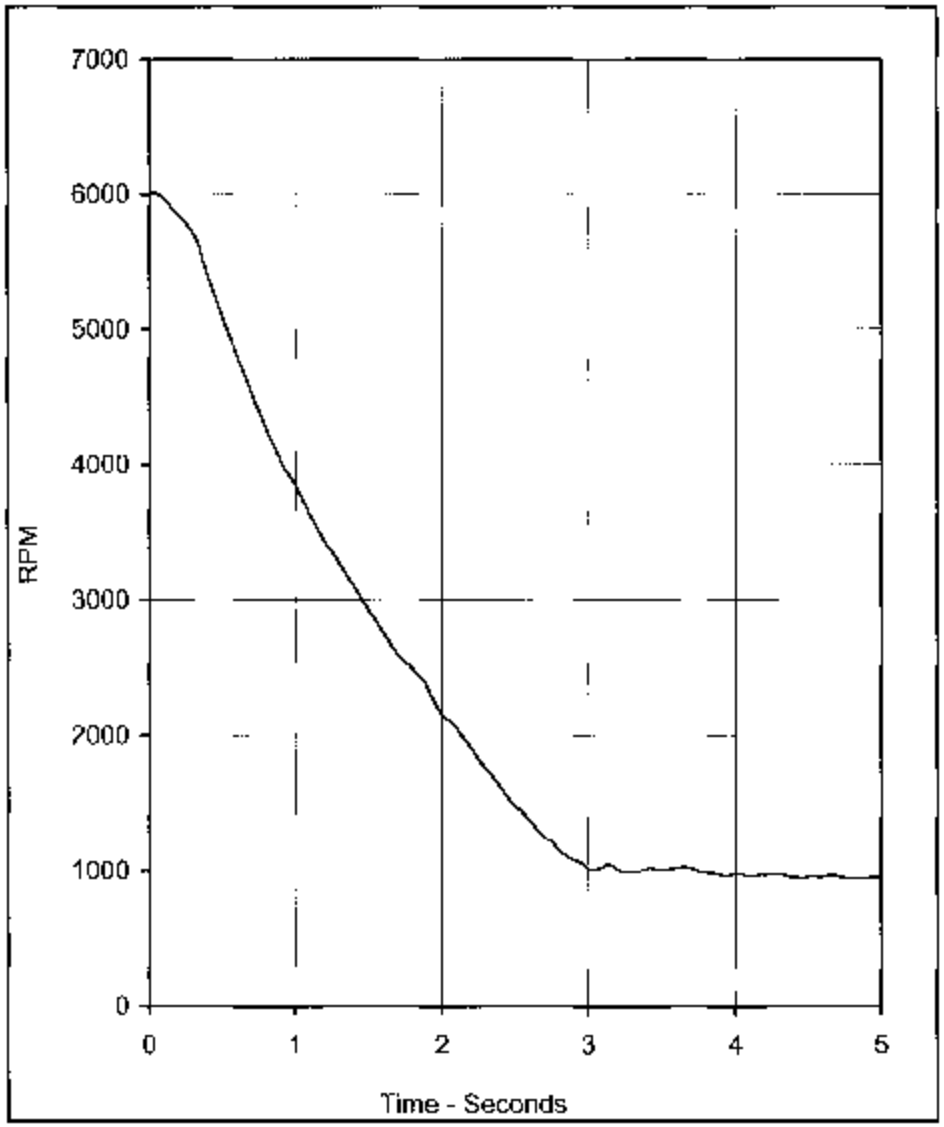
Units	Max	Time	Min	Time	Filter (Hz)
RPM	4622.9	0.1	1028.1	4.9	5

Test Program: FMVSS 124 (Normal Operation)
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03
NHTSA No.: C30304

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	50.4	0.0	150.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	6017.0	0.0	944.8	4.9	5

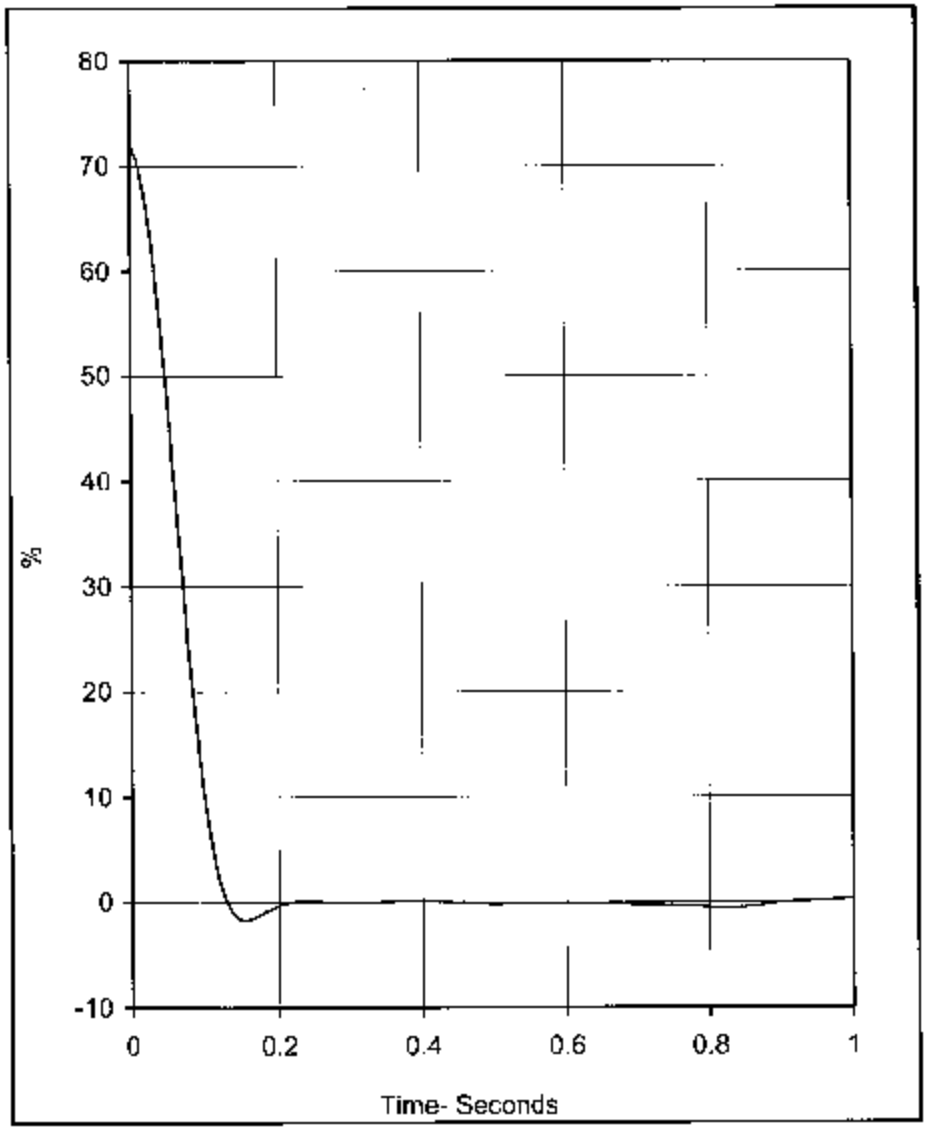
Test Program: FMVSS 124 (Normal Operation)

Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

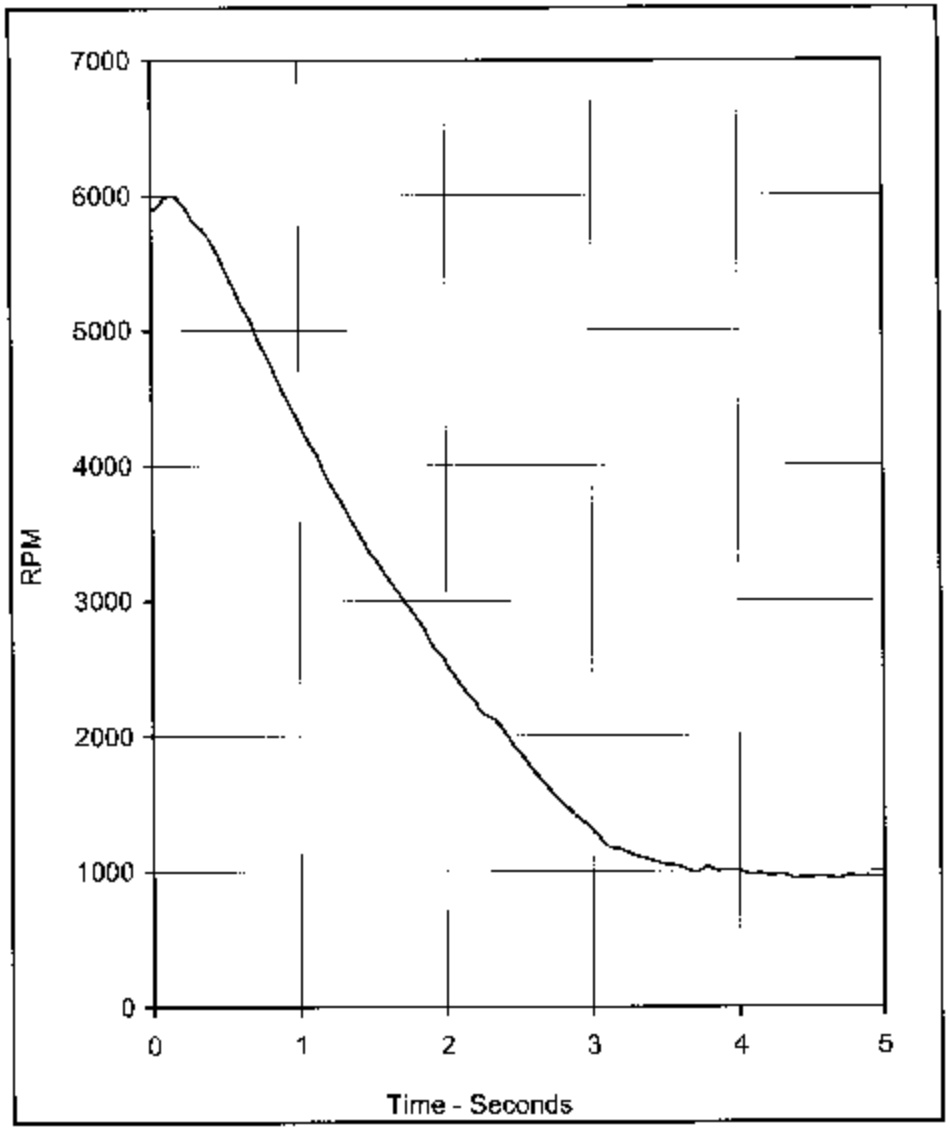
NHTSA No.: C30304

KARCO Engineering



Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	72.2	0.0	130.0	5



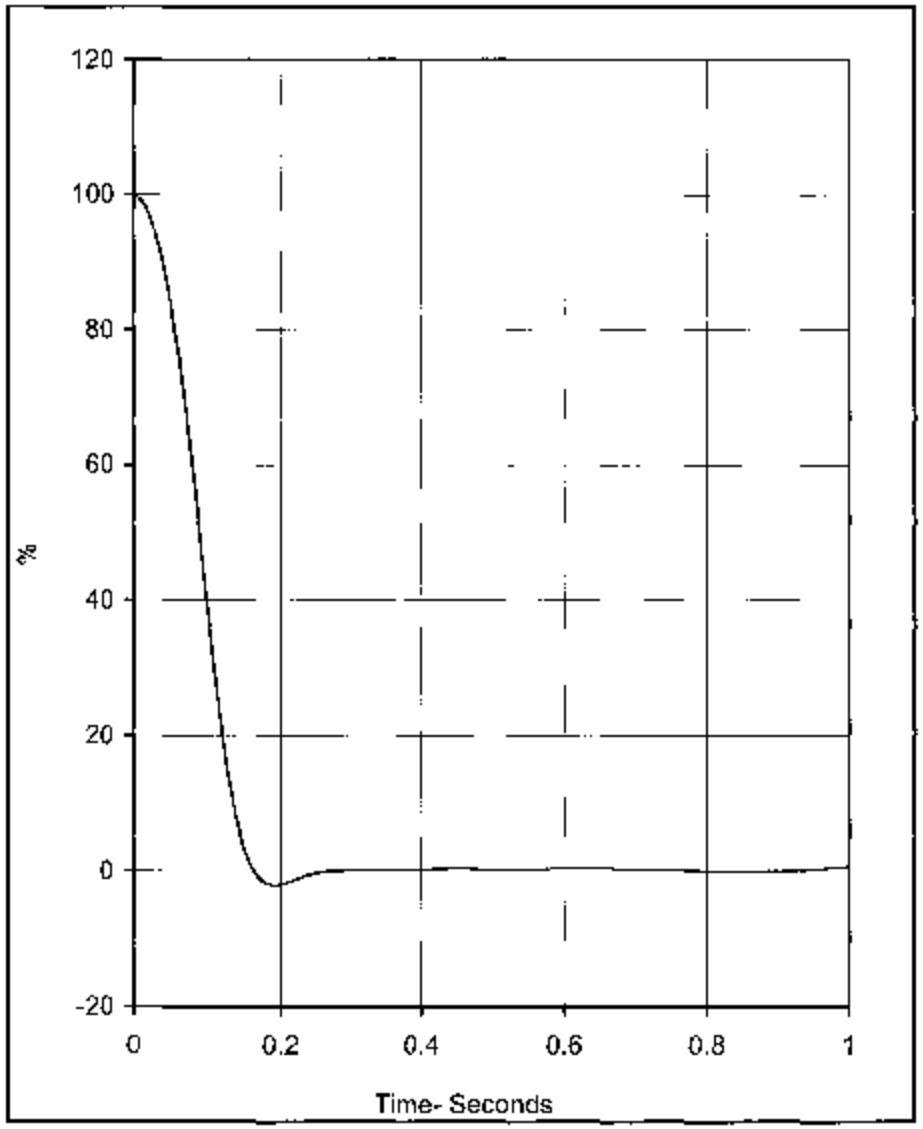
Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	6000.1	0.1	946.7	4.7	5

Test Program: FMVSS 124 (Normal Operation)
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

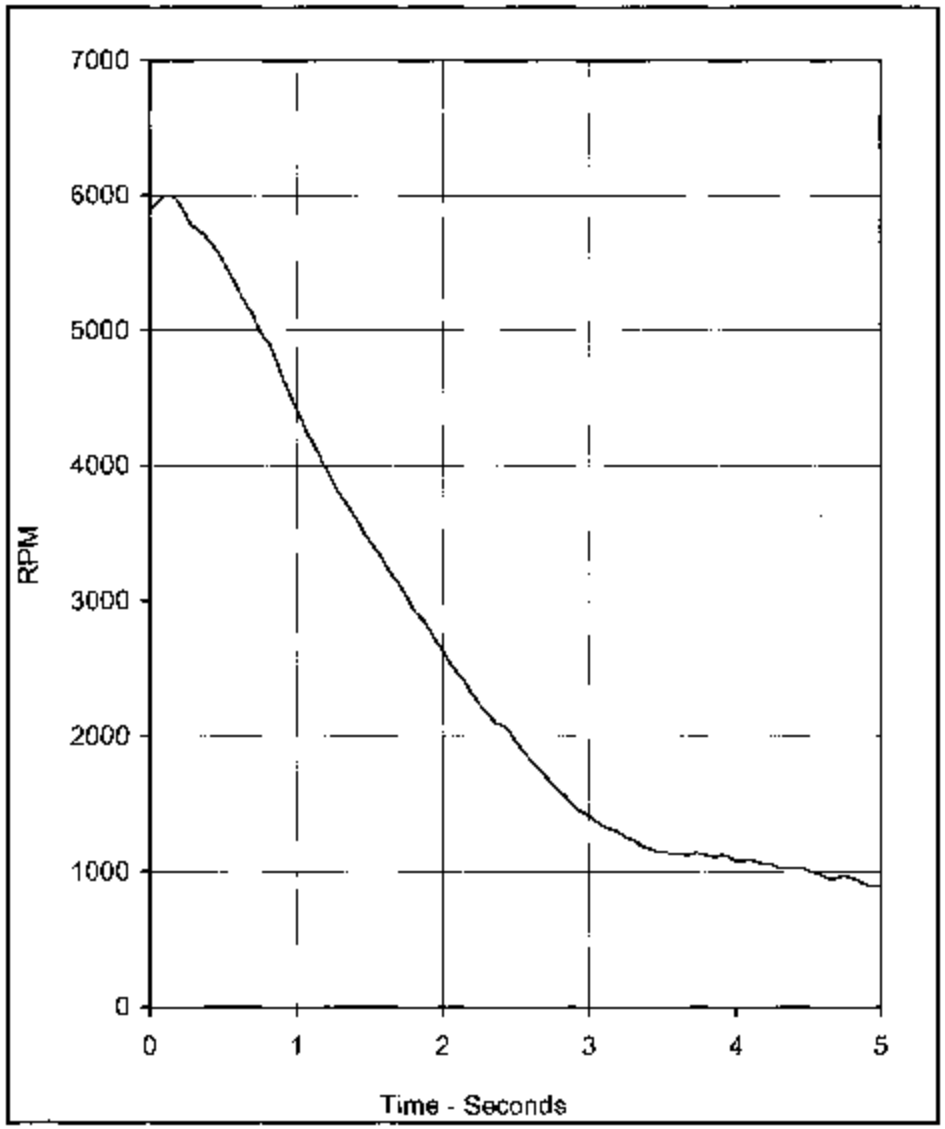
Test Date: 7/28/03
NHTSA No.: C30304

KARCO Engineering



Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	100.1	0.0	170.0	5

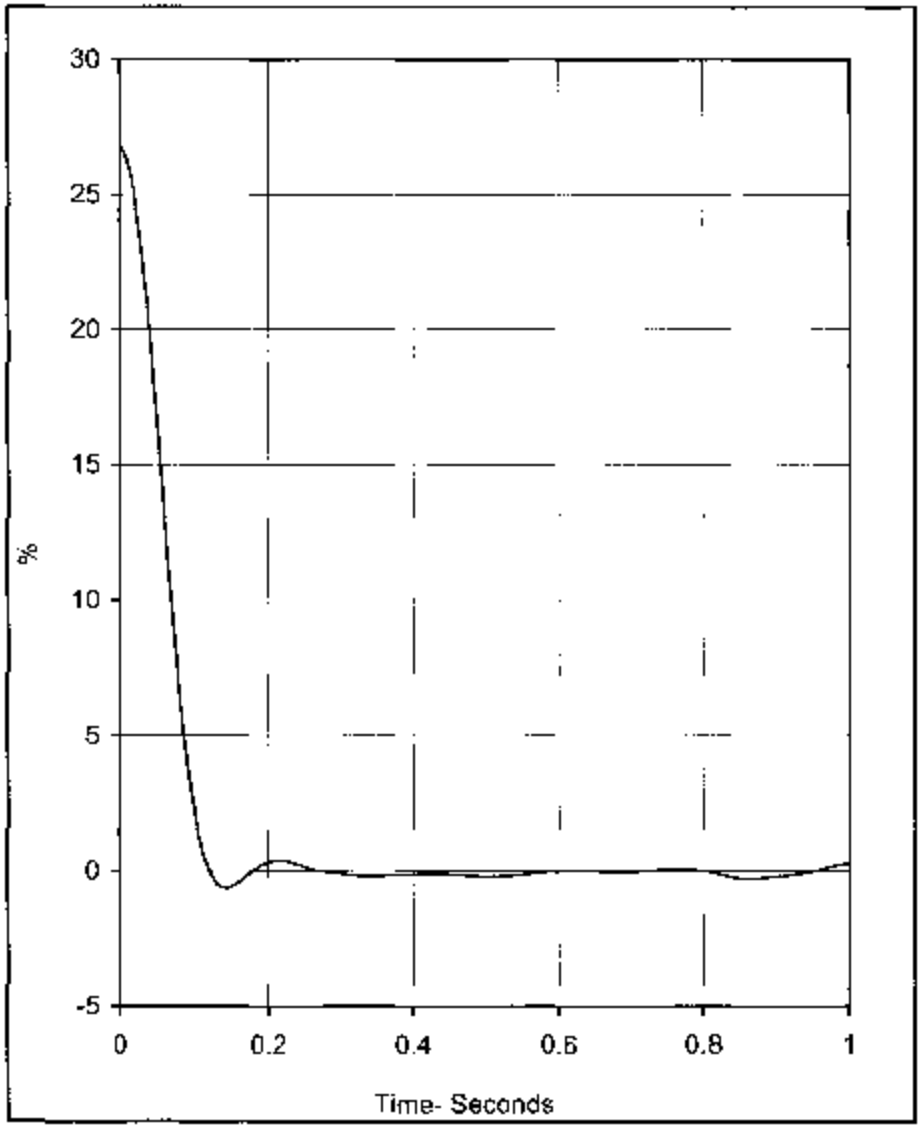


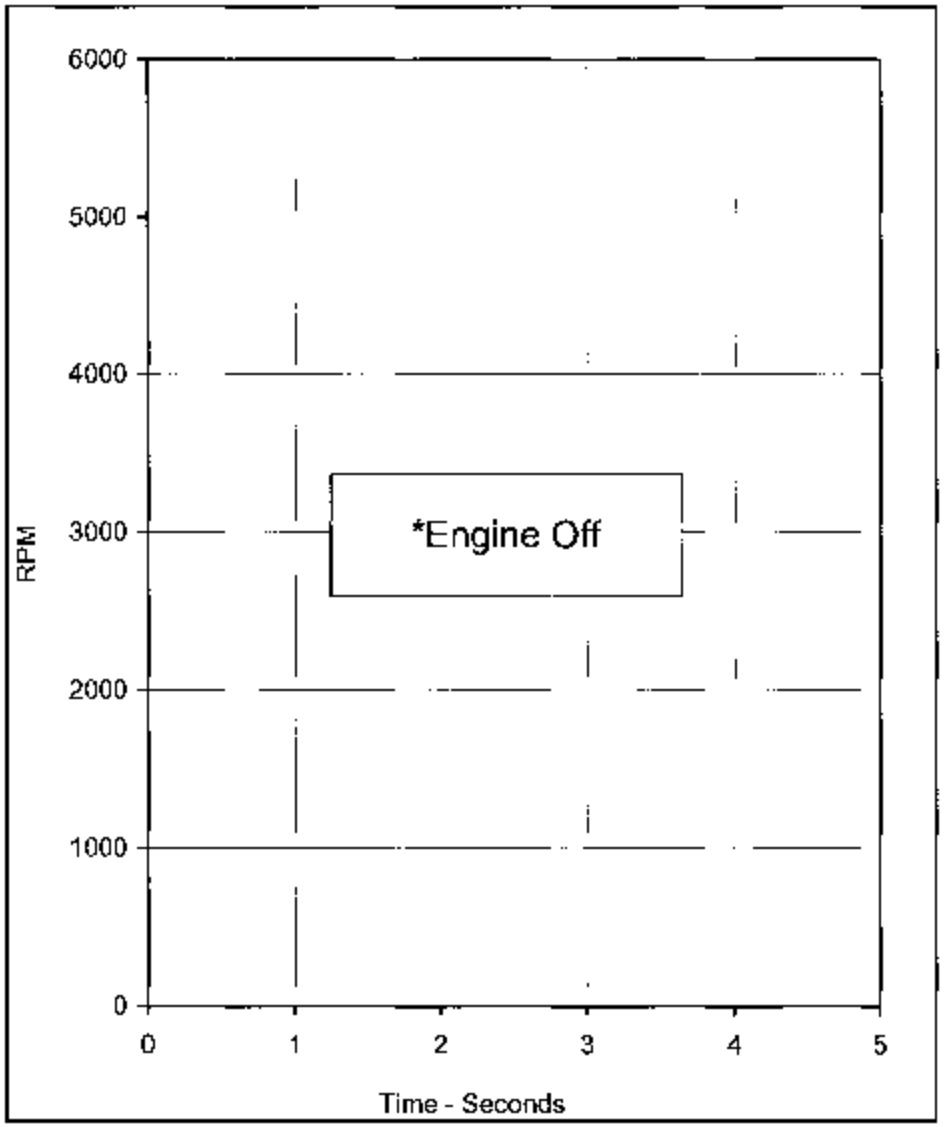
Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	6001.3	0.1	890.0	5.0	5

Test Program: FMVSS 124 (Normal Operation)
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03
NHTSA No.: C30304





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	26.8	0.0	120.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	0.0	0.0	0.0	0.0	5

*Engine Off

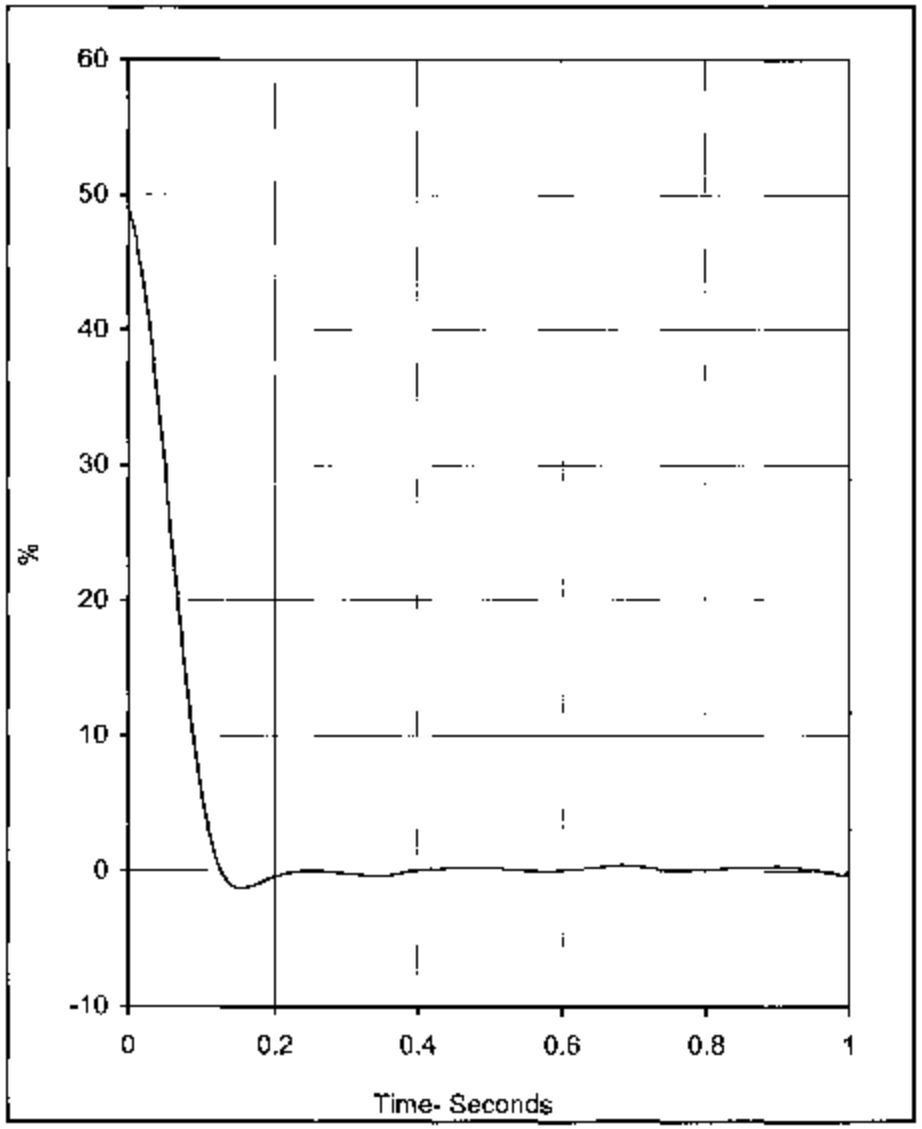
Test Program: FMVSS 124 (Normal Operation)

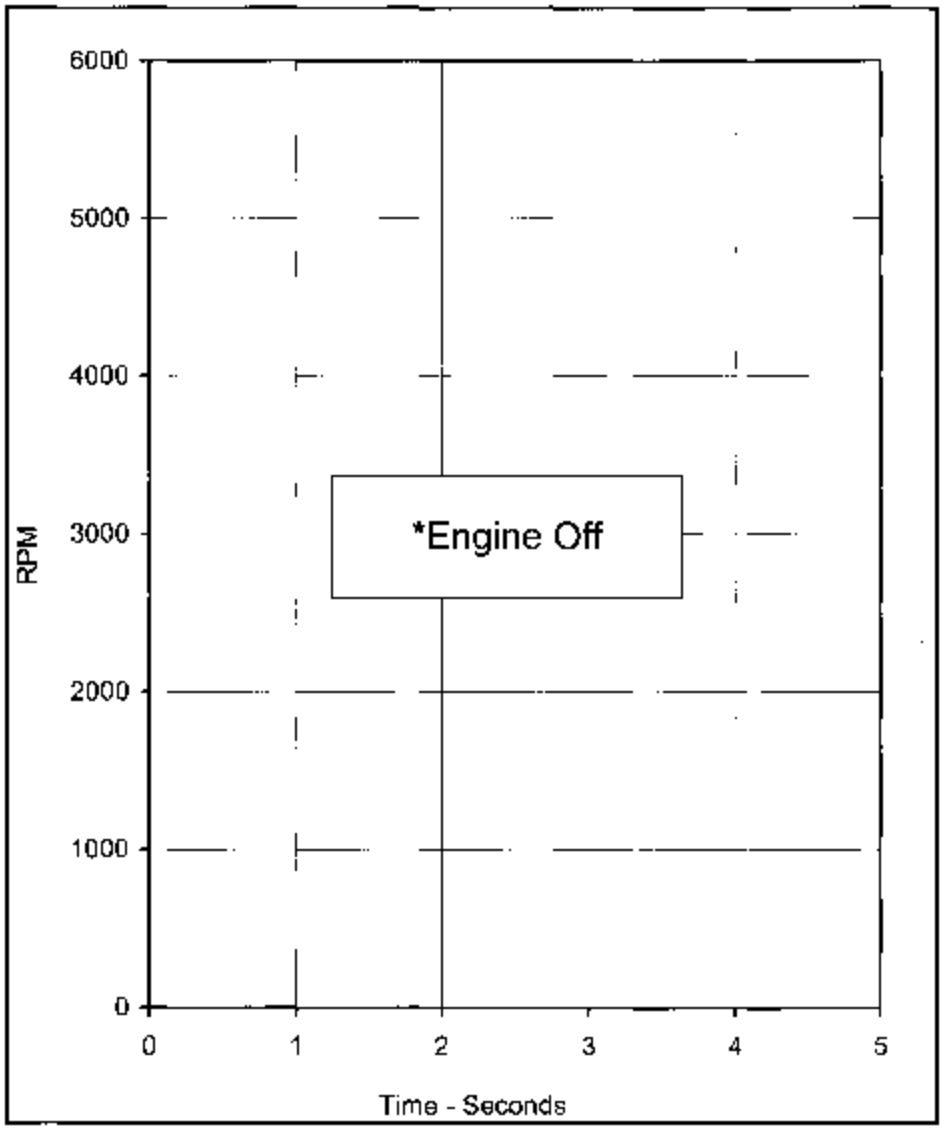
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

NHTSA No.: C30304

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	49.1	0.0	140.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	0.0	0.0	0.0	0.0	5

*Engine Off

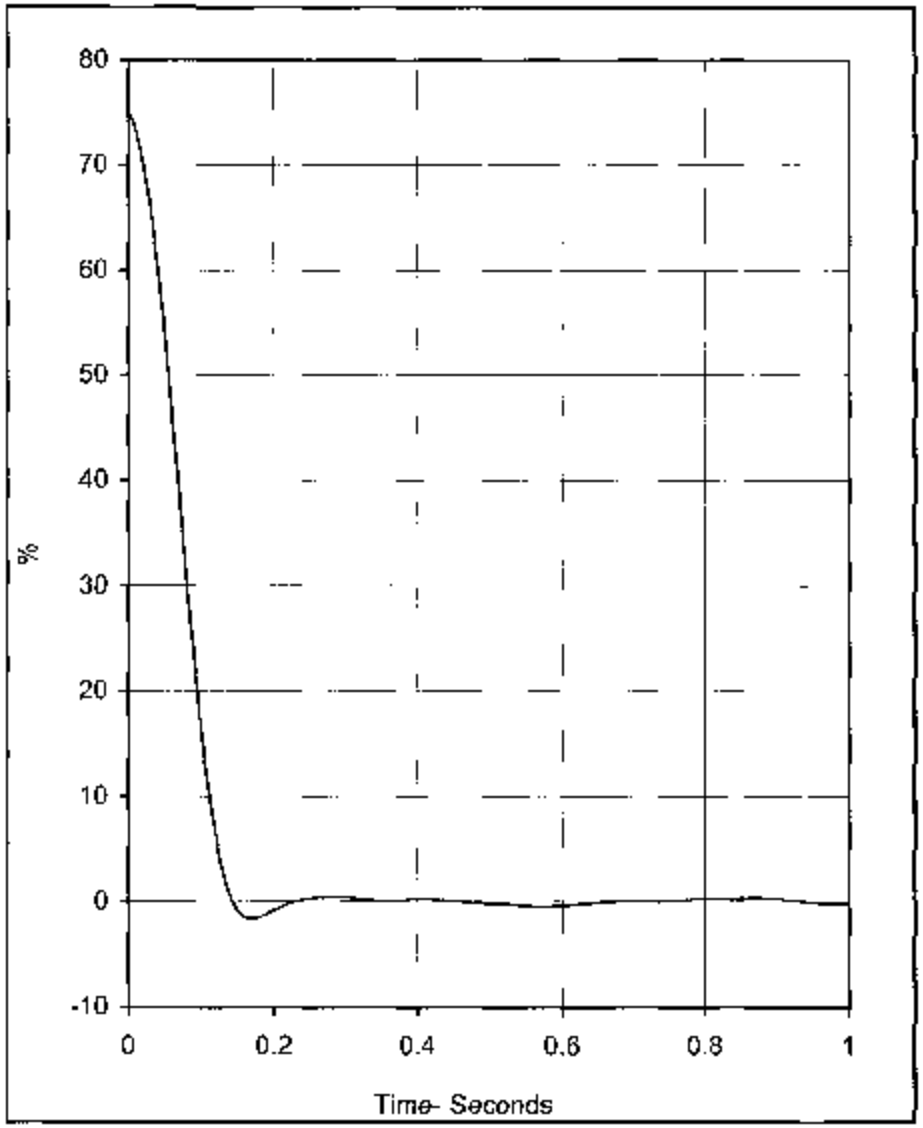
Test Program: FMVSS 124 (Normal Operation)

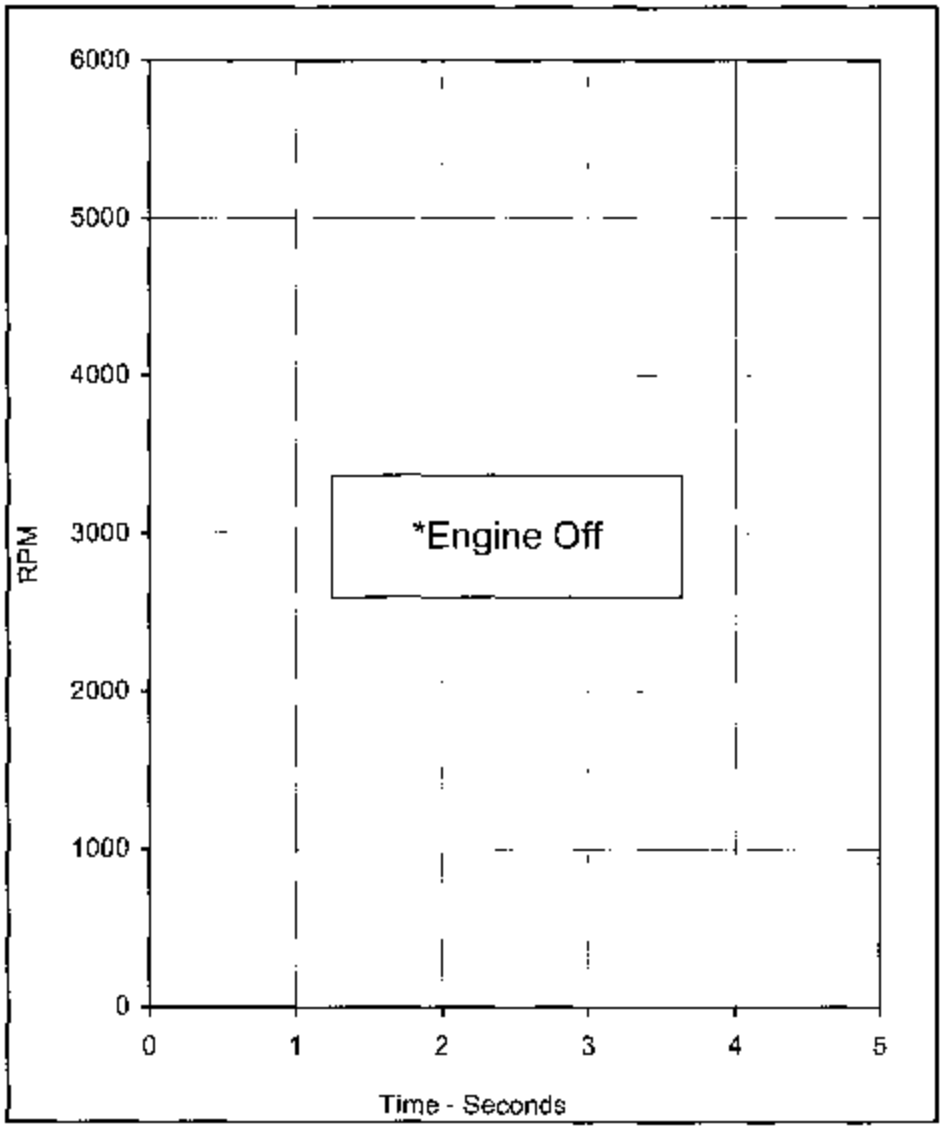
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

NHTSA No.: C30304

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	75.2	0.0	150.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	0.0	0.0	0.0	0.0	5

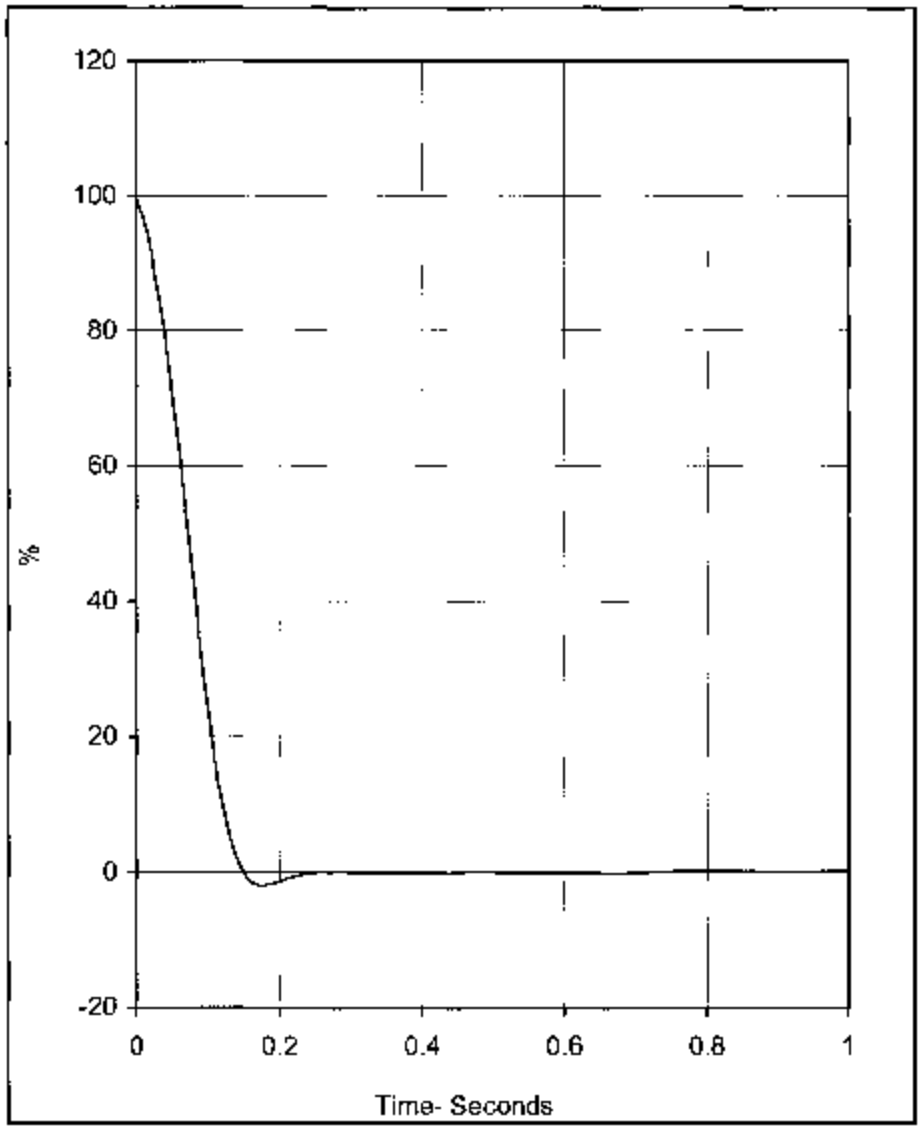
*Engine Off

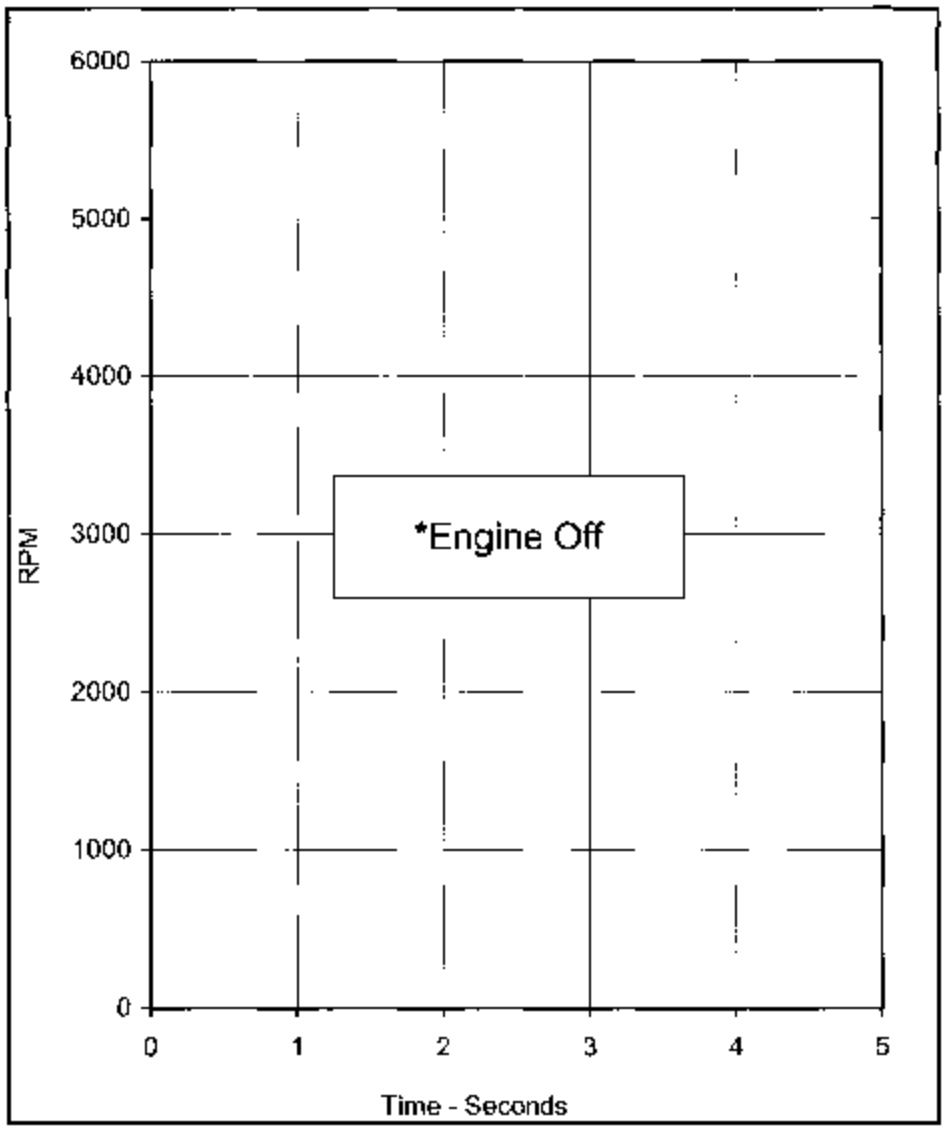
Test Program: FMVSS 124 (Normal Operation)

Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

NHTSA No.: C30304





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	99.8	0.0	160.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	0.0	0.0	0.0	0.0	5

*Engine Off

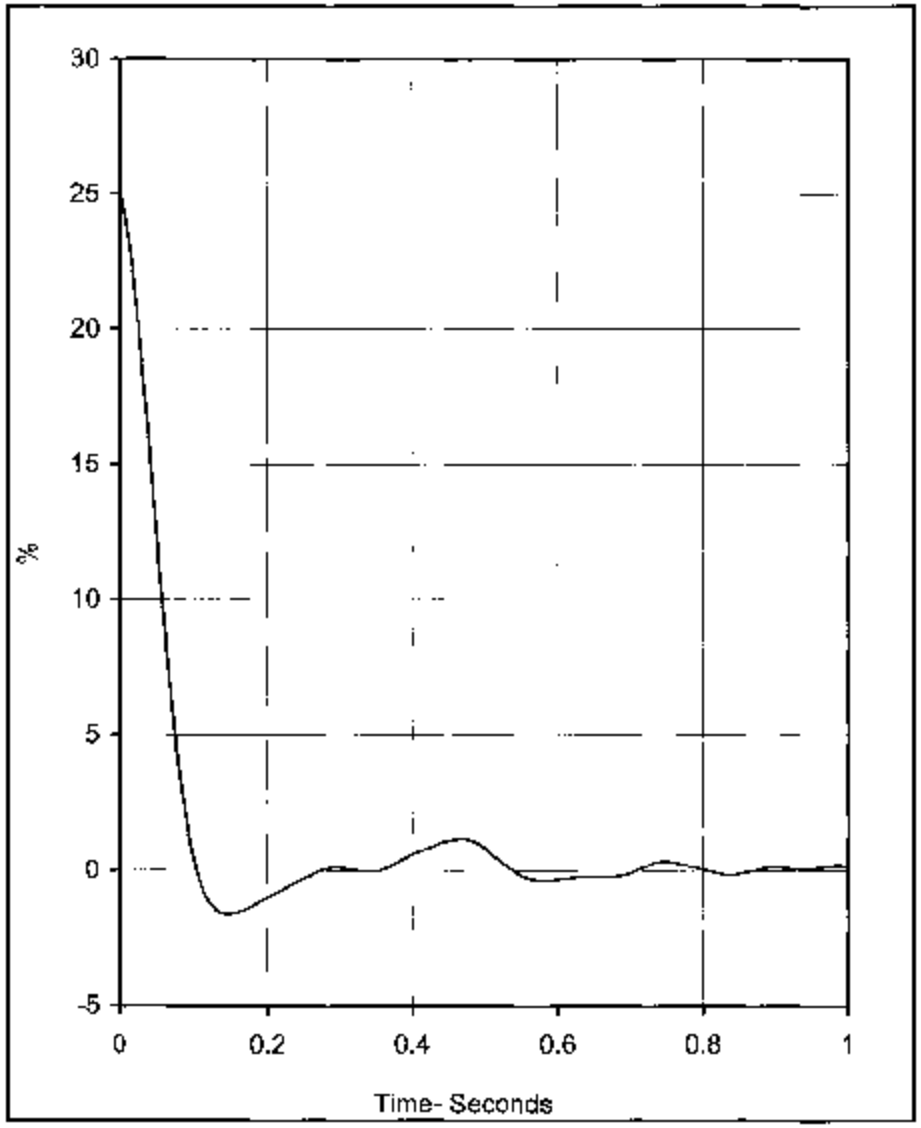
Test Program: FMVSS 124 (Normal Operation)

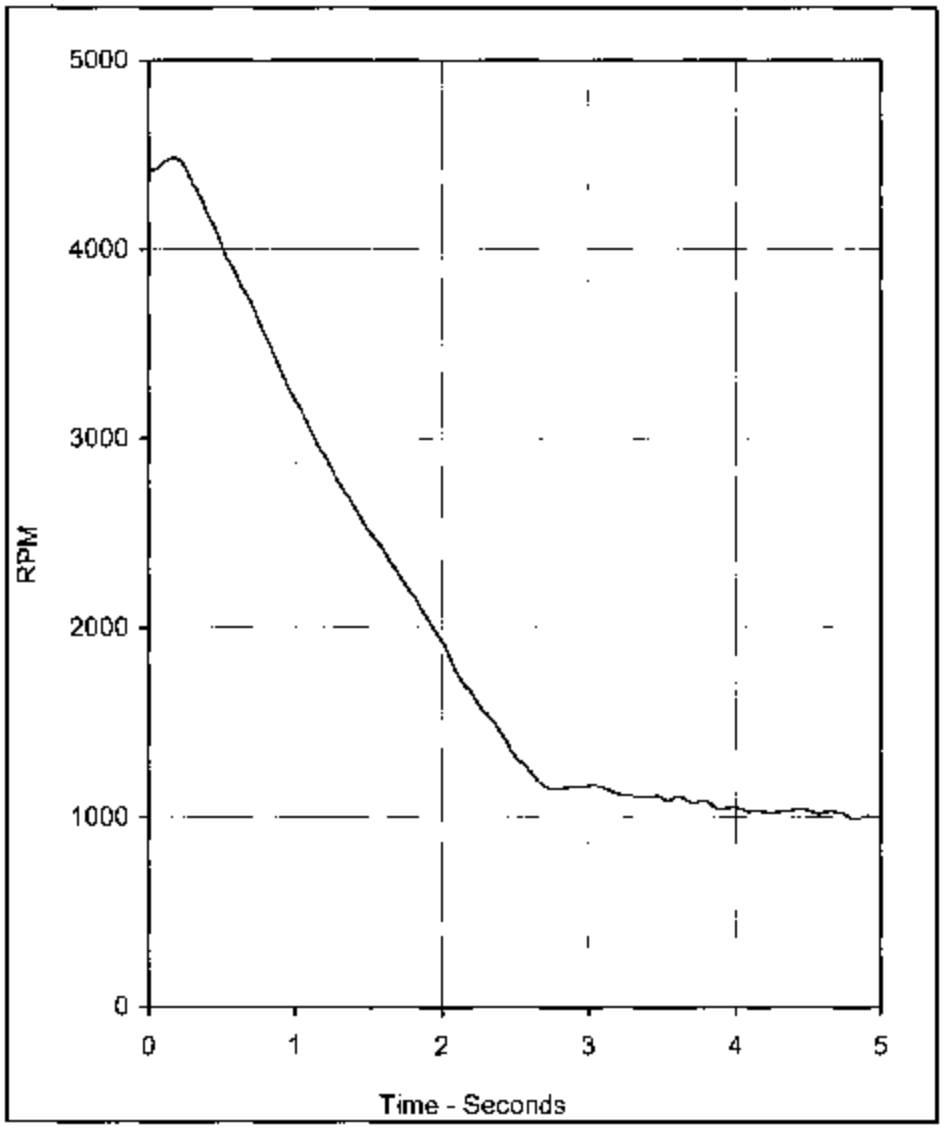
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

NHTSA No.: C30304

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

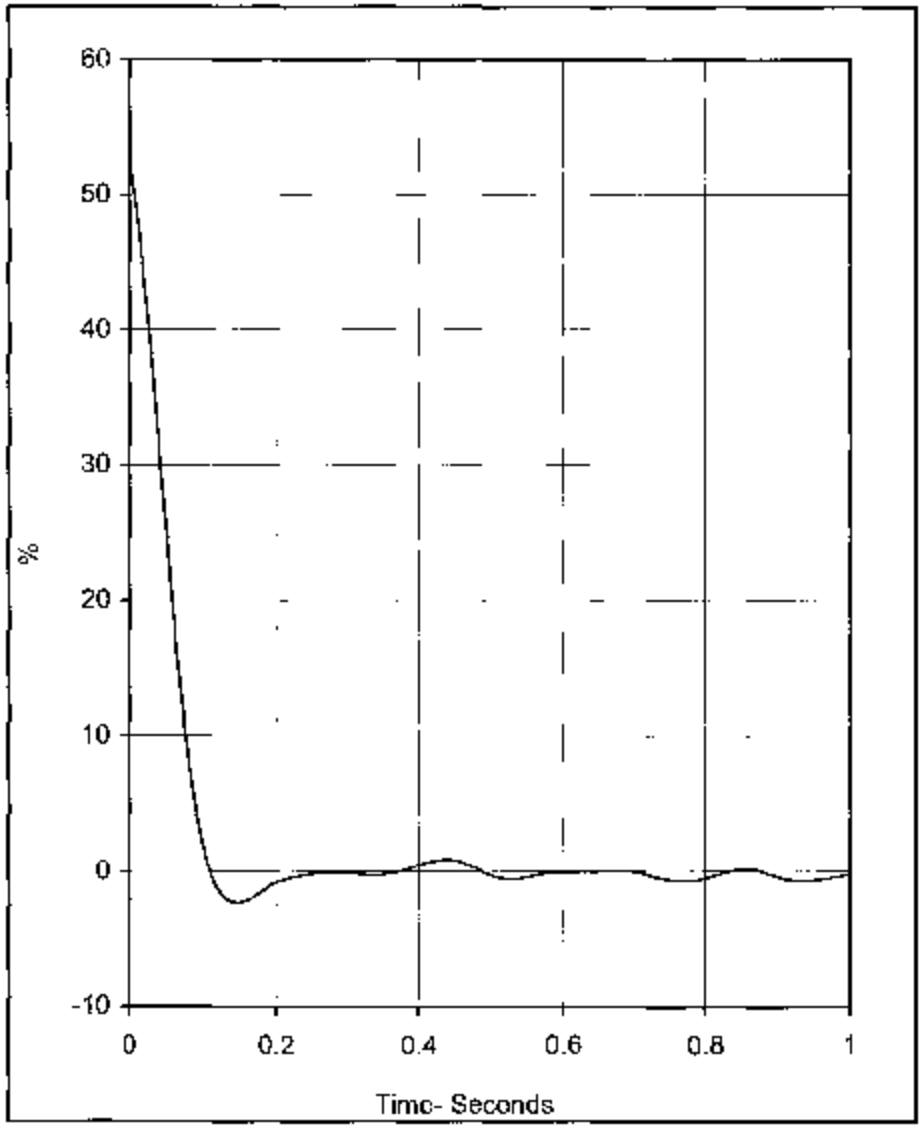
Units	Max	Time	Return Time (msec)	Filter (Hz)
%	25.3	0.0	100.0	5

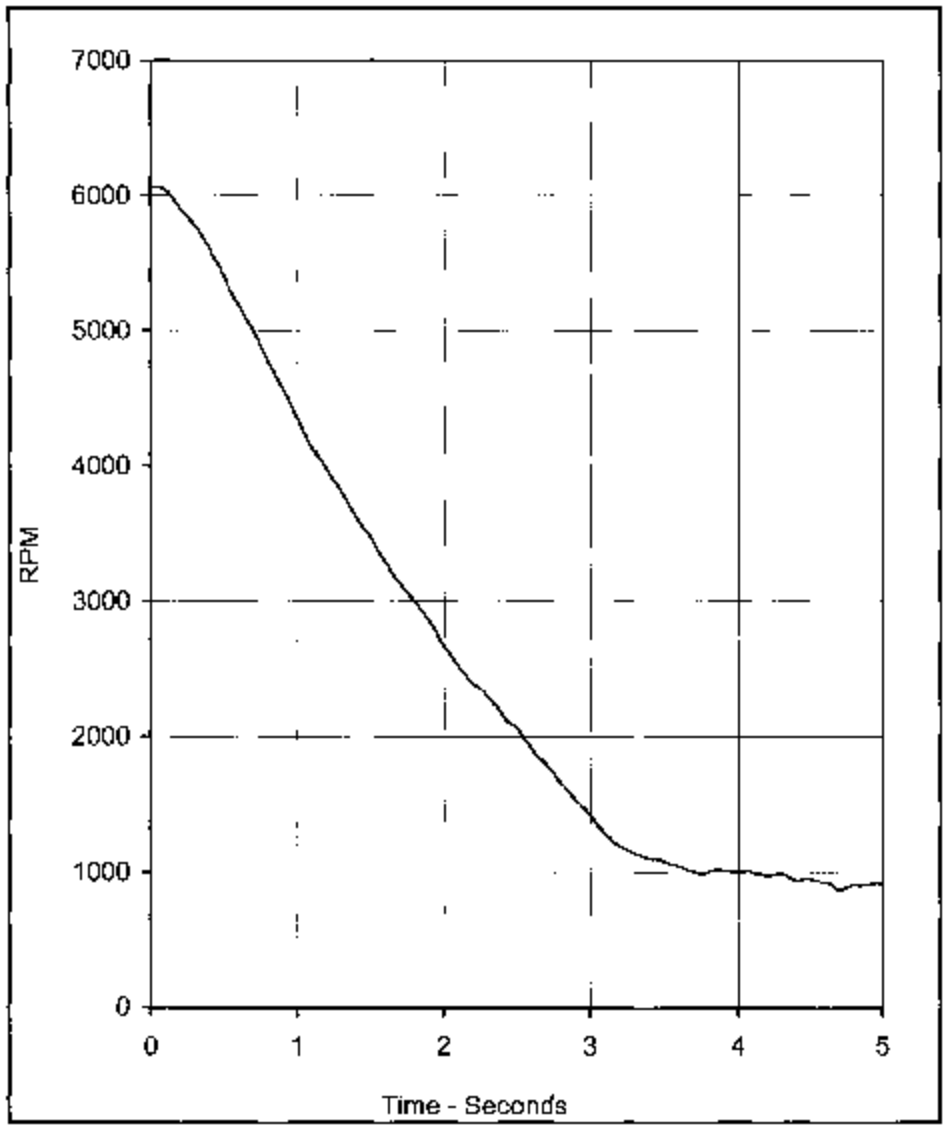
Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	4483.2	0.2	991.0	4.8	5

Test Program: FMVSS 124 (#1 Spring Disconnected)
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03
NHTSA No.: C30304





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	52.6	0.0	110.0	5

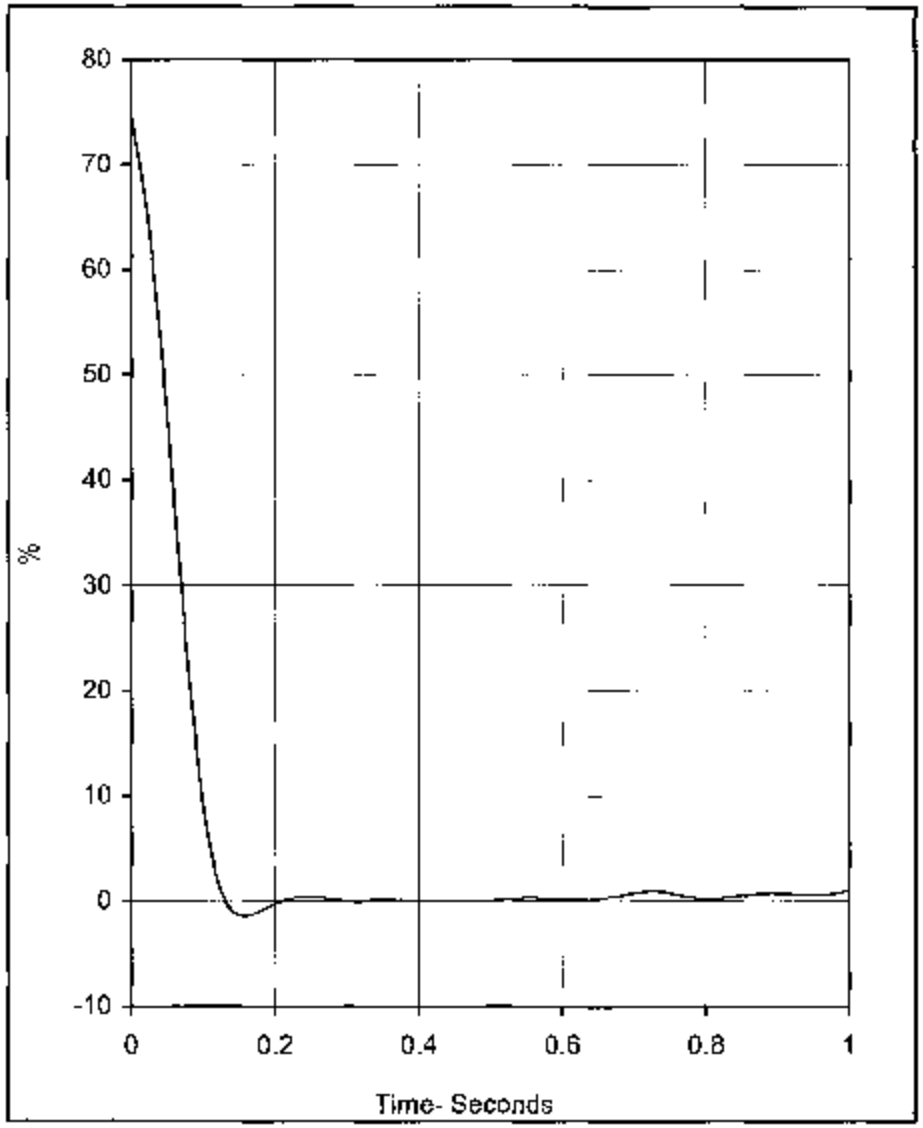
Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

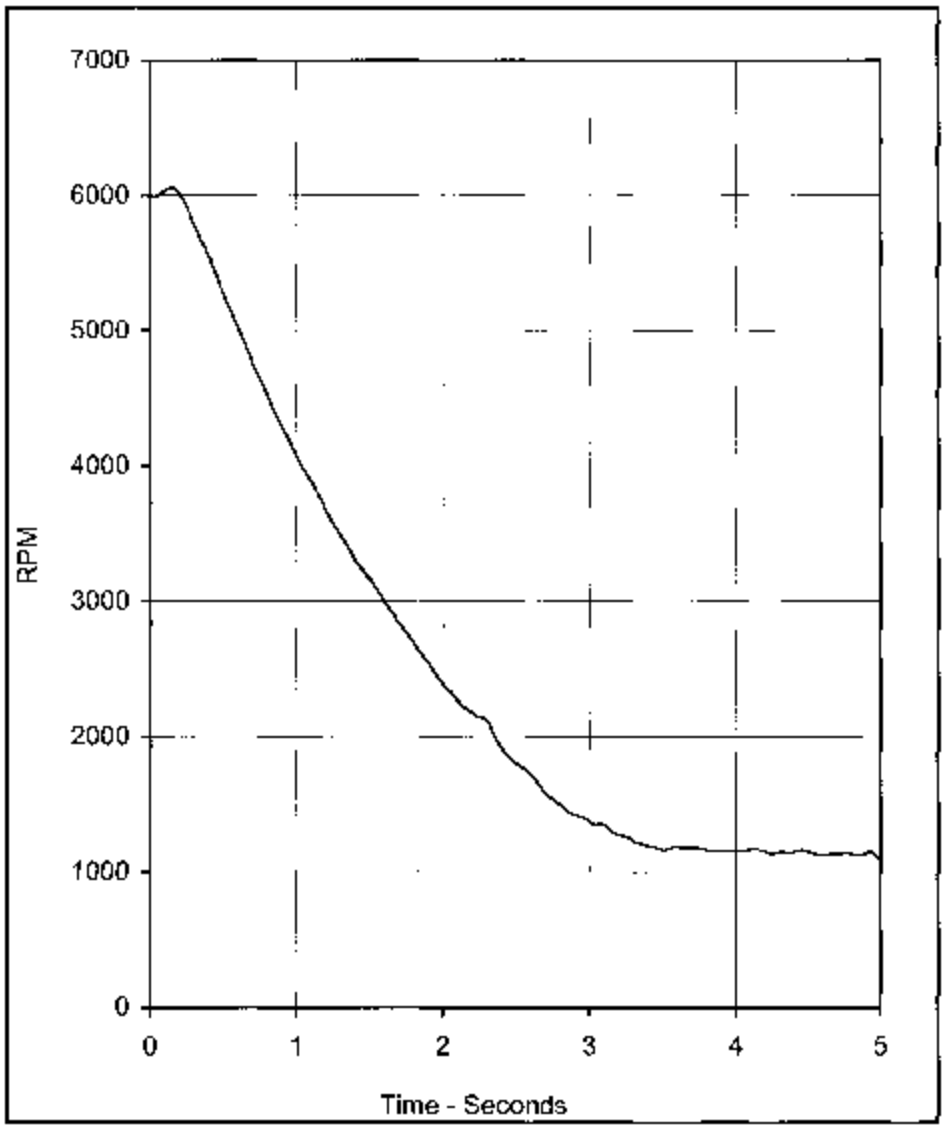
Units	Max	Time	Min	Time	Filter (Hz)
RPM	6062.6	0.0	867.2	4.7	5

Test Program: FMVSS 124 (#1 Spring Disconnected)
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03
NHTSA No.: C30304

MARC Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	74.4	0.0	140.0	5

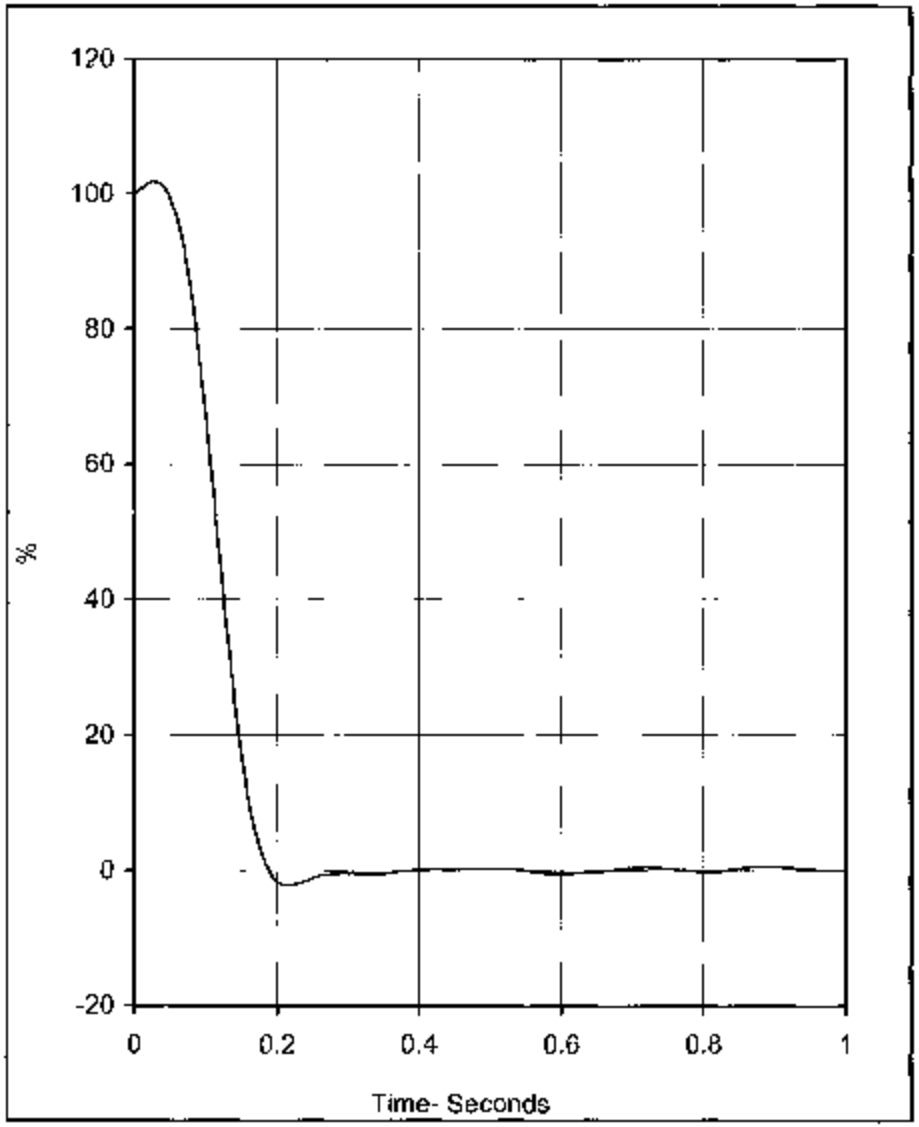
Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

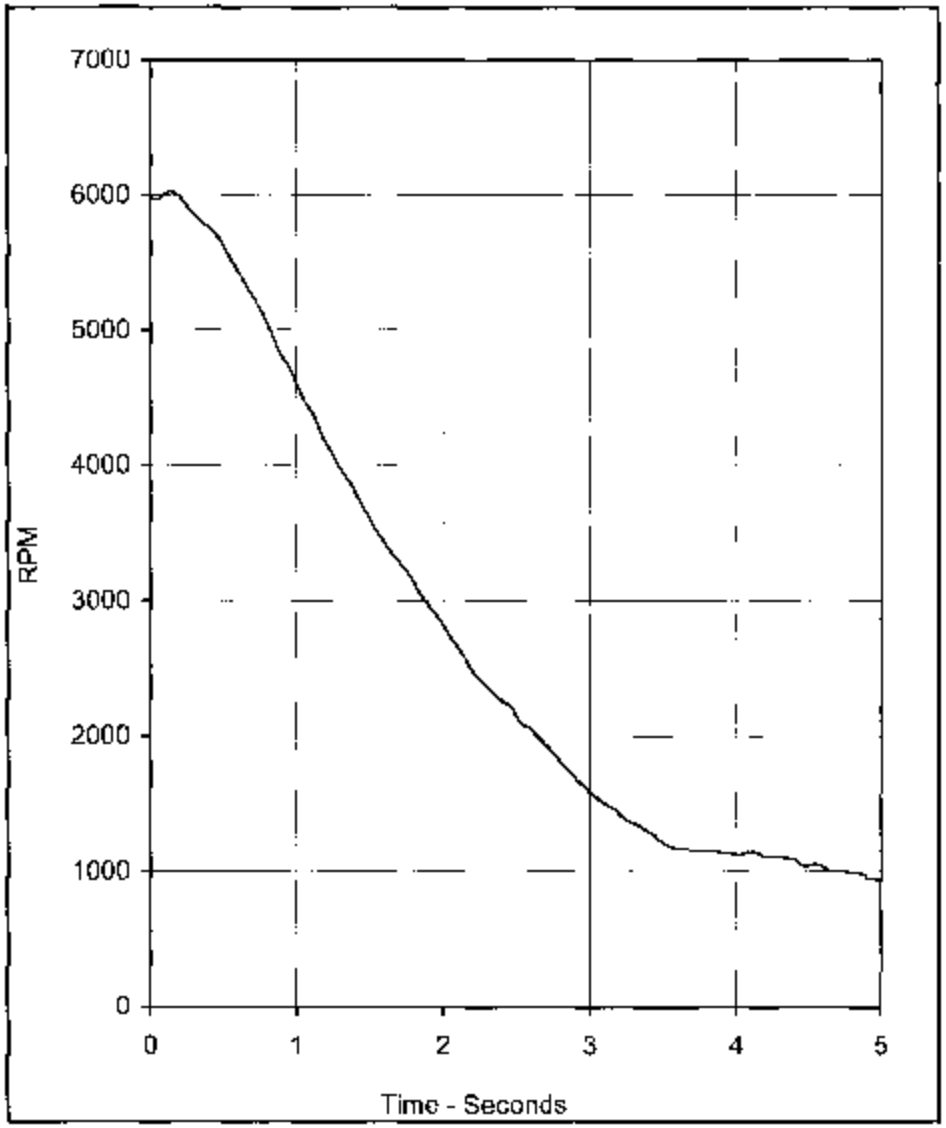
Units	Max	Time	Min	Time	Filter (Hz)
RPM	6059.8	0.2	1100.7	5.0	5

Test Program: FMVSS 124 (#1 Spring Disconnected)
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03
NHTSA No.: C30304

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	101.8	0.0	190.0	5

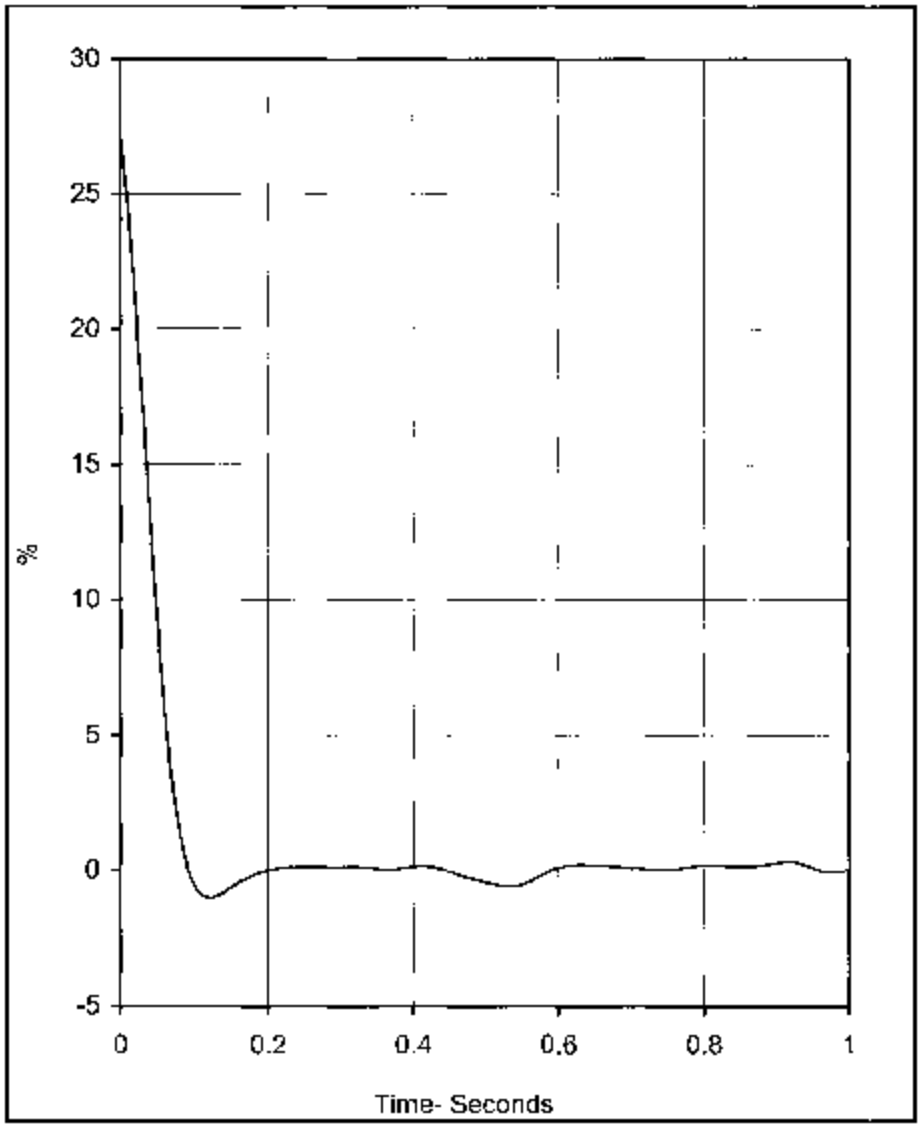
Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

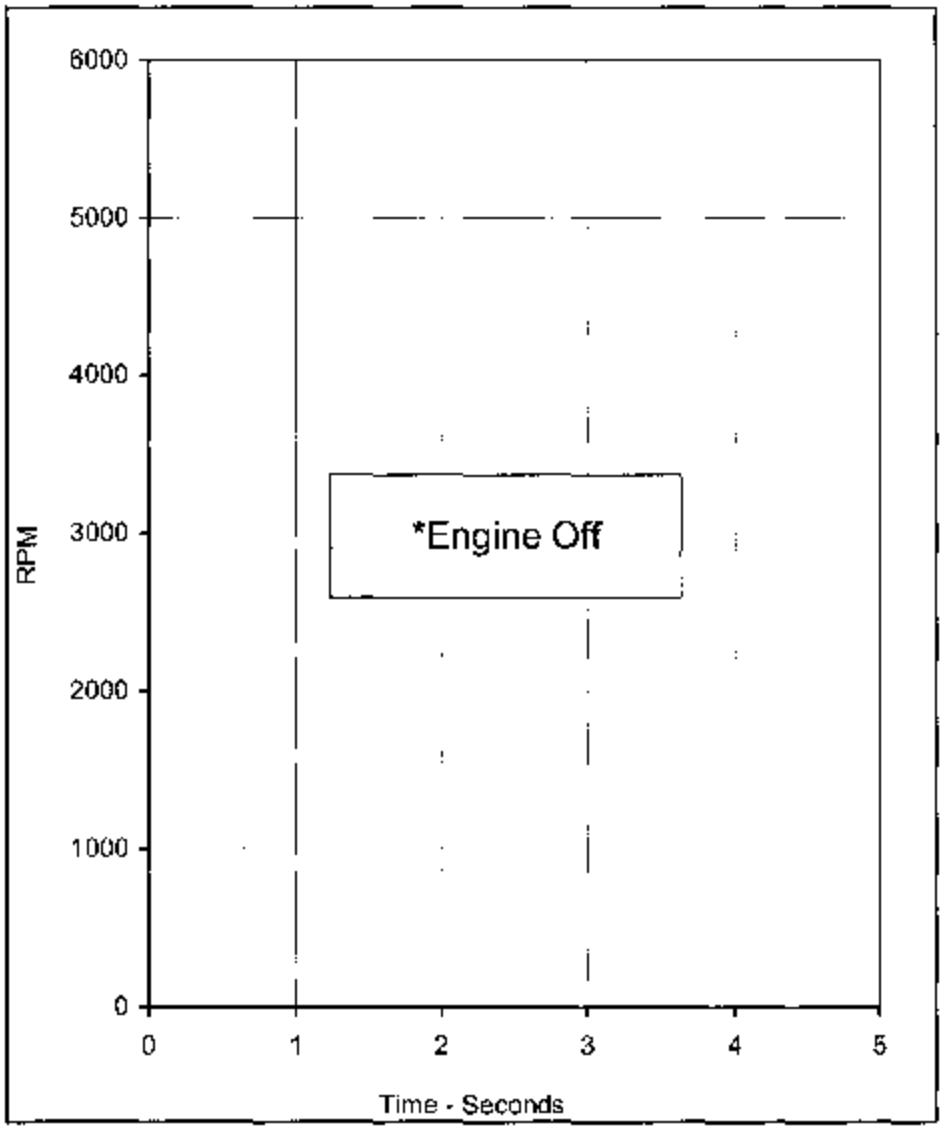
Units	Max	Time	Min	Time	Filter (Hz)
RPM	6028.7	0.1	936.3	5.0	5

Test Program: FMVSS 124 (#1 Spring Disconnected)
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03
NHTSA No.: C30304

MARC Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	27.3	0.0	110.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	0.0	0.0	0.0	0.0	5

*Engine Off

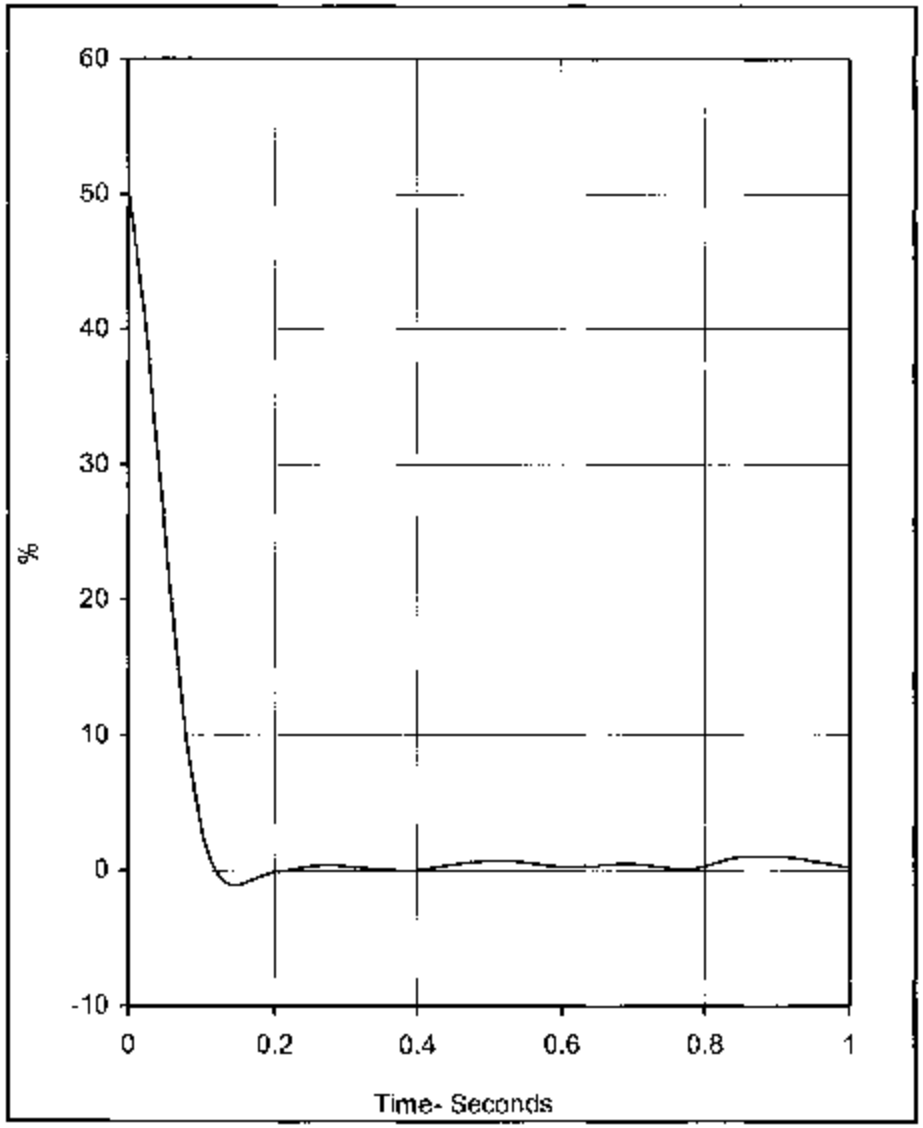
Test Program: FMVSS 124 (#1 Spring Disconnected)

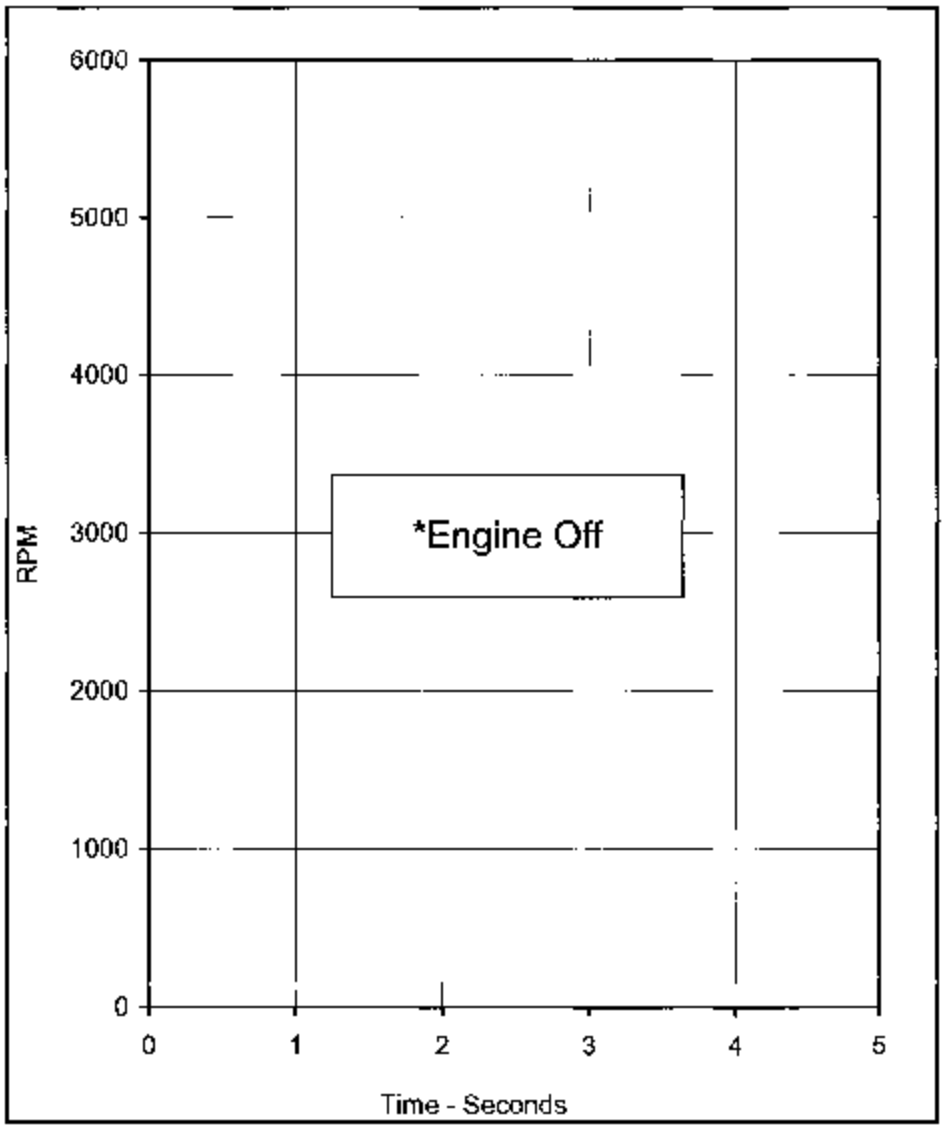
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

NHTSA No.: C30304

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	50.2	0.0	120.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	0.0	0.0	0.0	0.0	5

*Engine Off

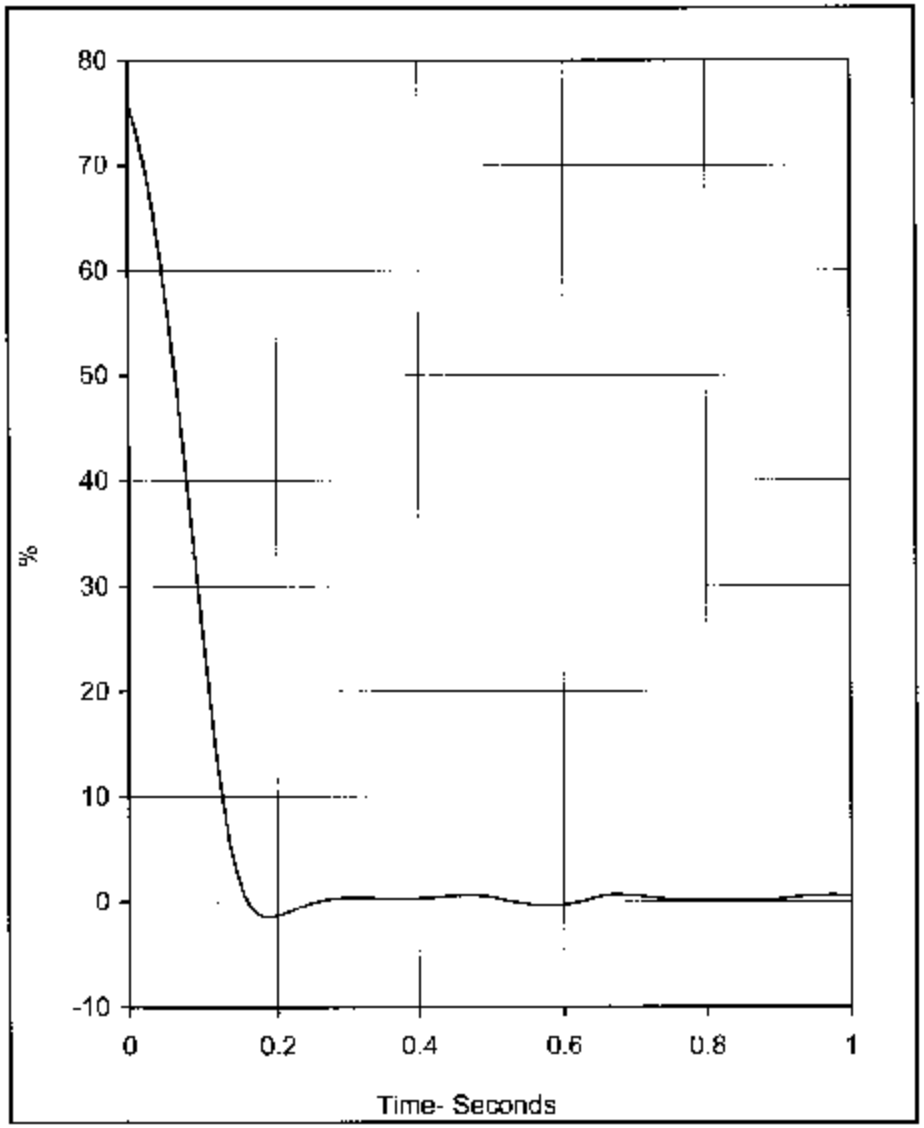
Test Program: FMVSS 124 (#1 Spring Disconnected)

Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

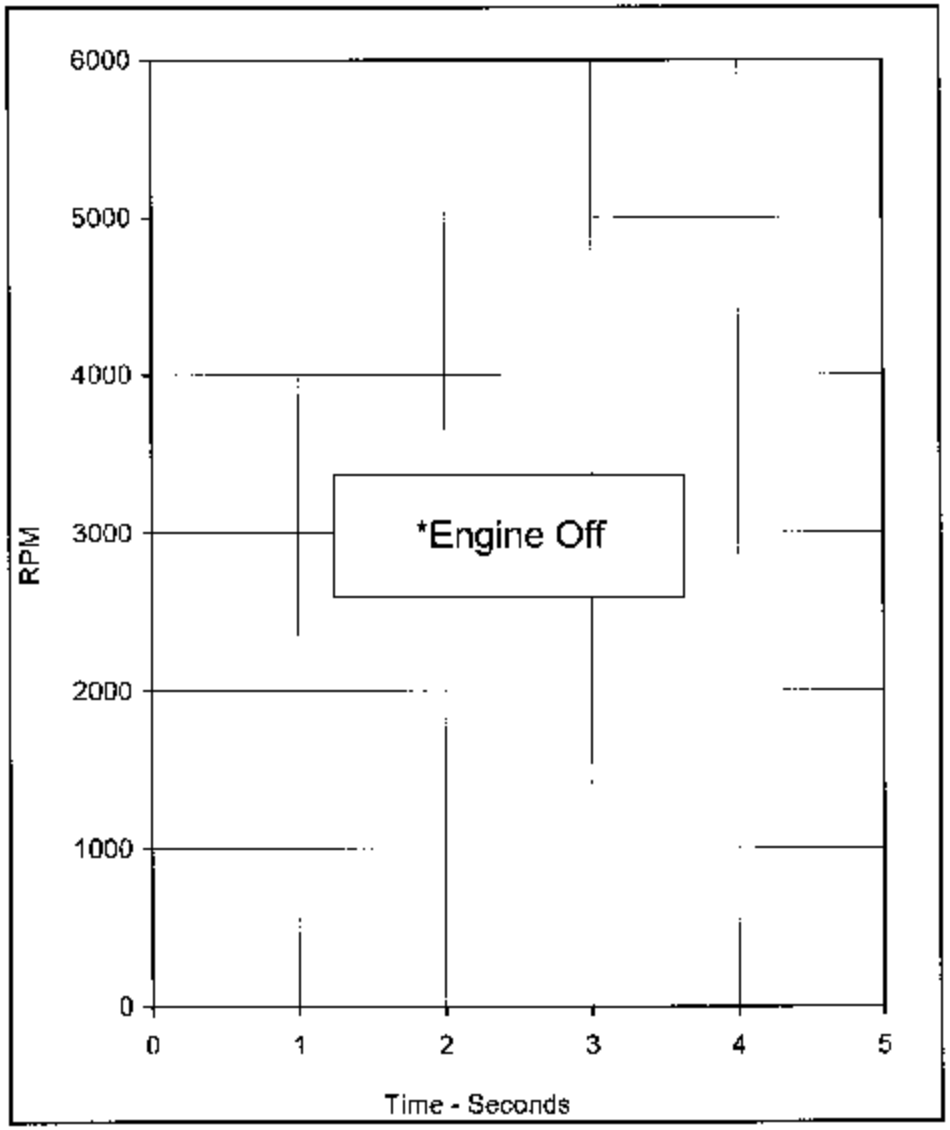
NHTSA No.: C30304

KARCO Engineering



Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	75.9	0.0	170.0	5



Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	0.0	0.0	0.0	0.0	5

*Engine Off

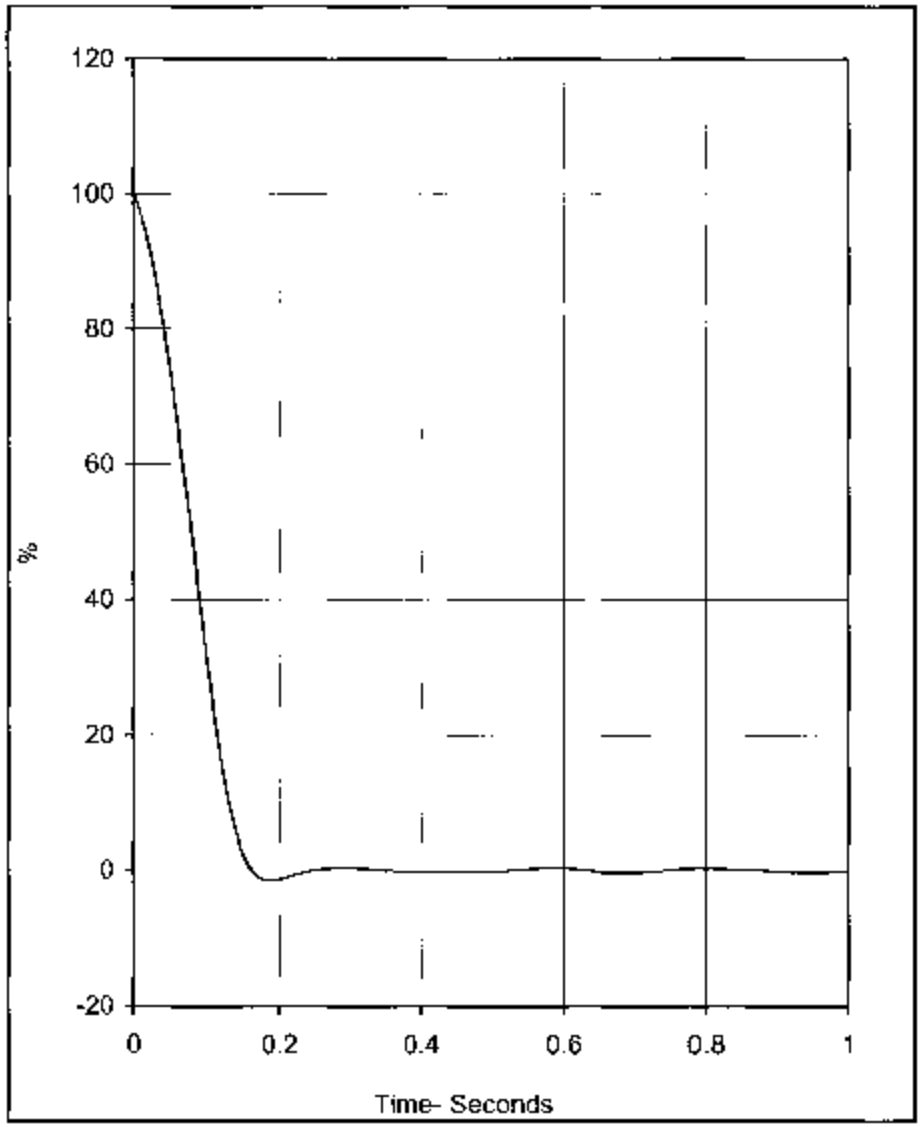
Test Program: FMVSS 124 (#1 Spring Disconnected)

Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

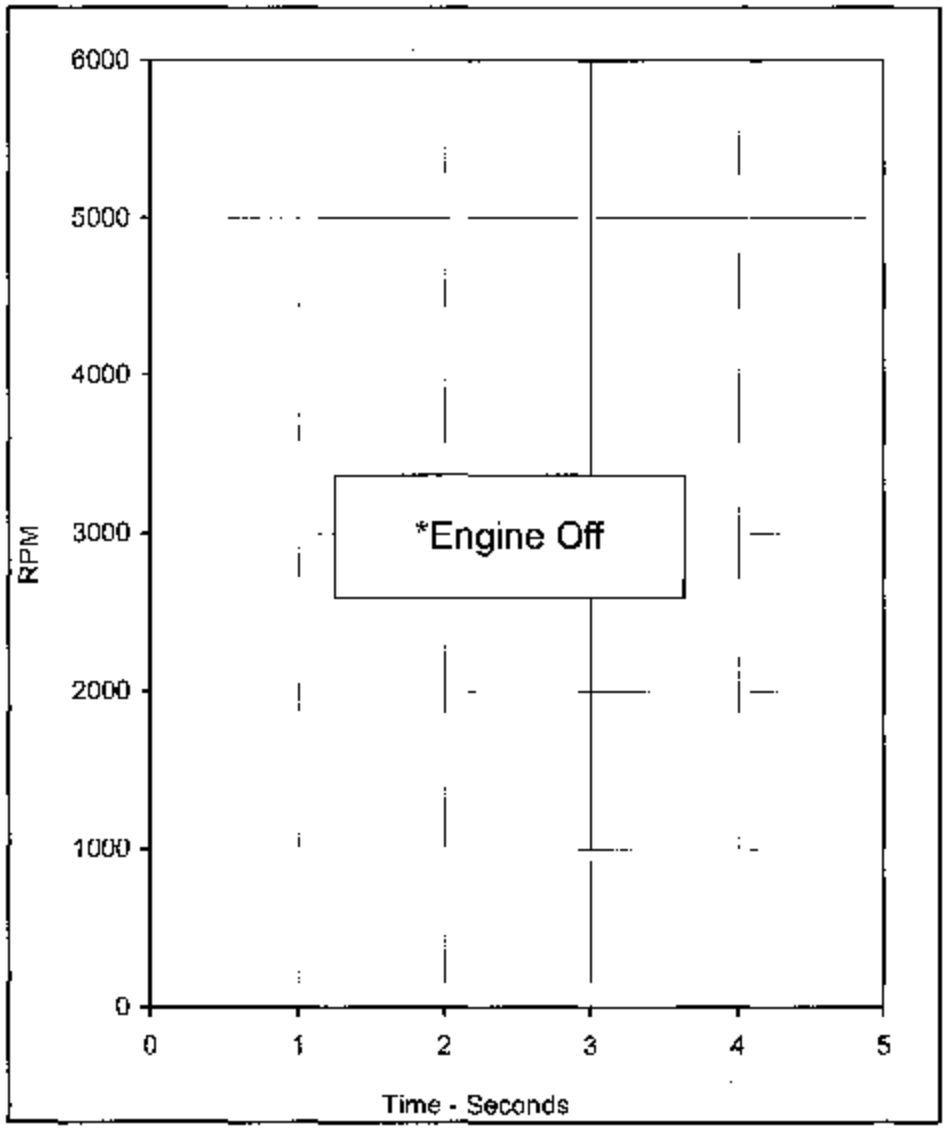
NHTSA No.: C30304

MARC Engineering



Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	100.2	0.0	170.0	5



Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	0.0	0.0	0.0	0.0	5

*Engine Off

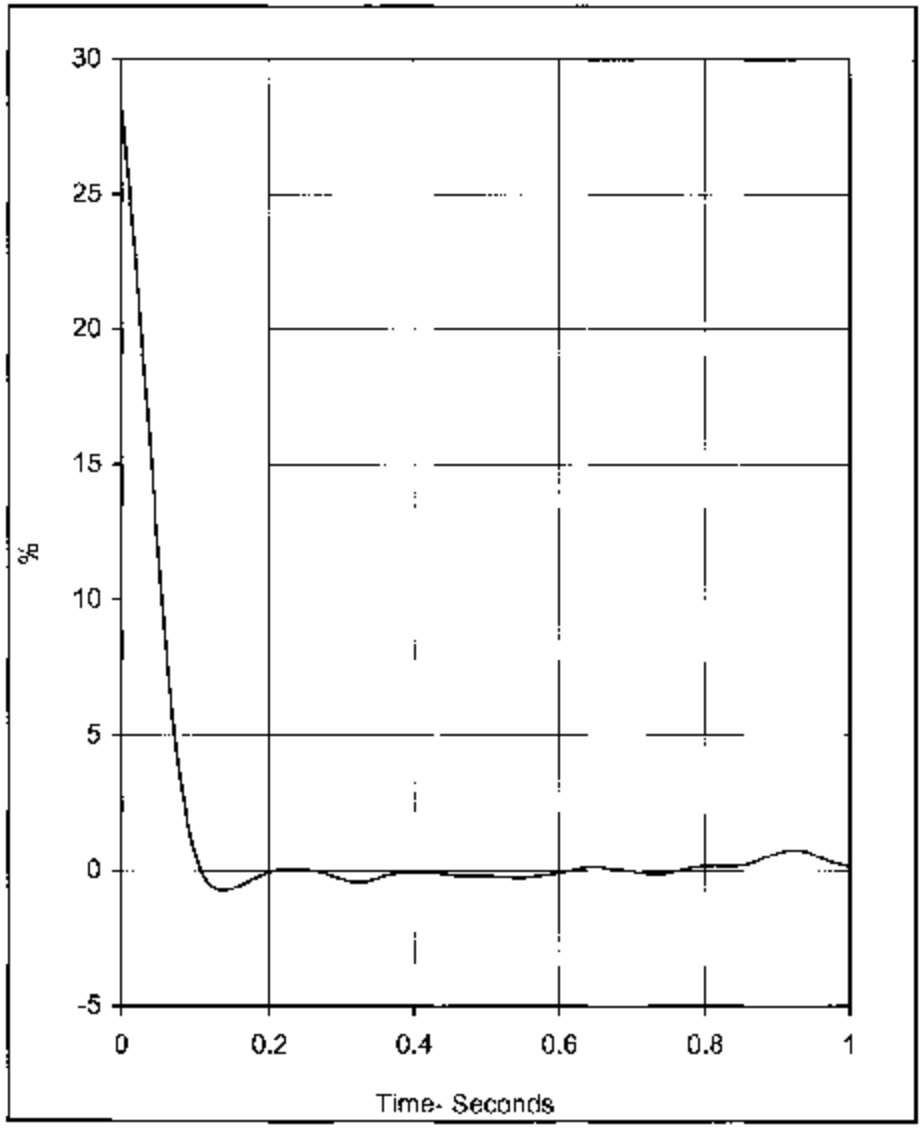
Test Program: FMVSS 124 (#1 Spring Disconnected)

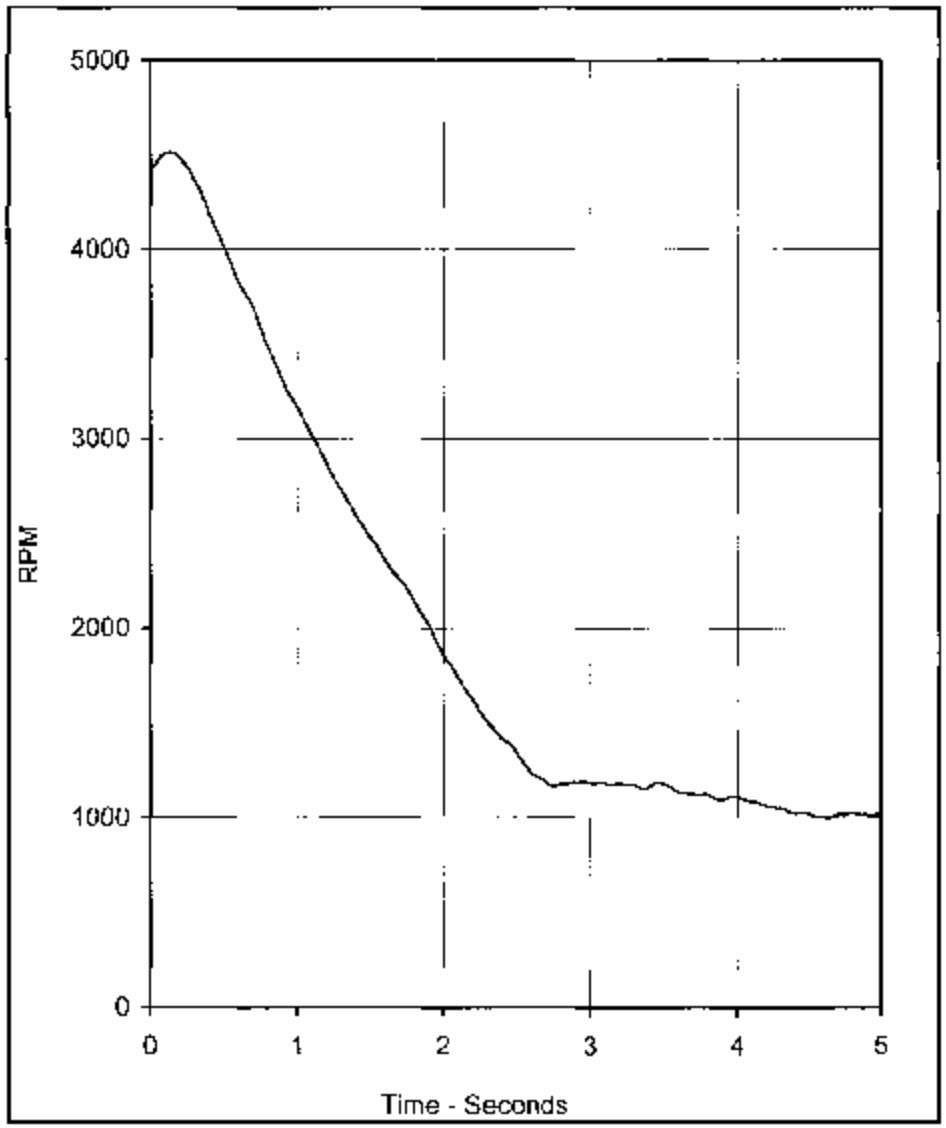
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

NHTSA No.: C30304

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	28.3	0.0	120.0	5

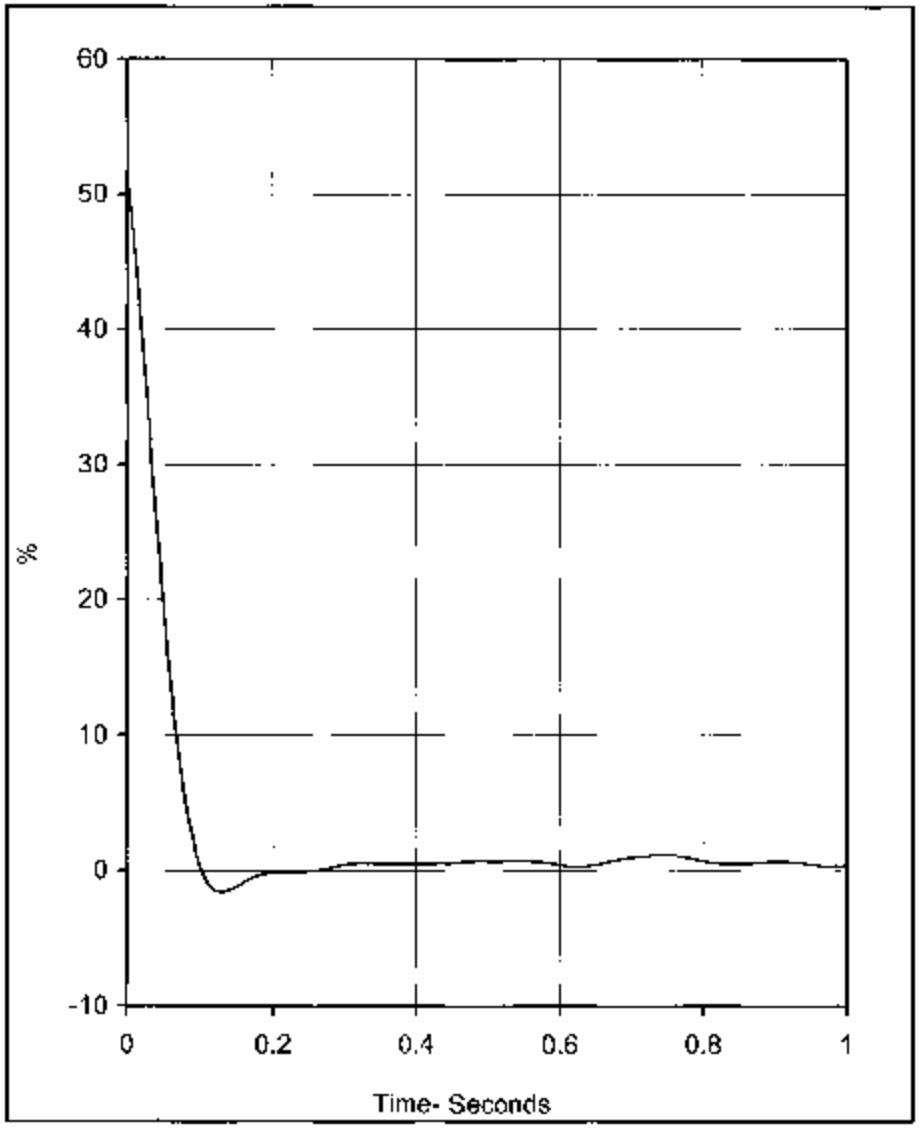
Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

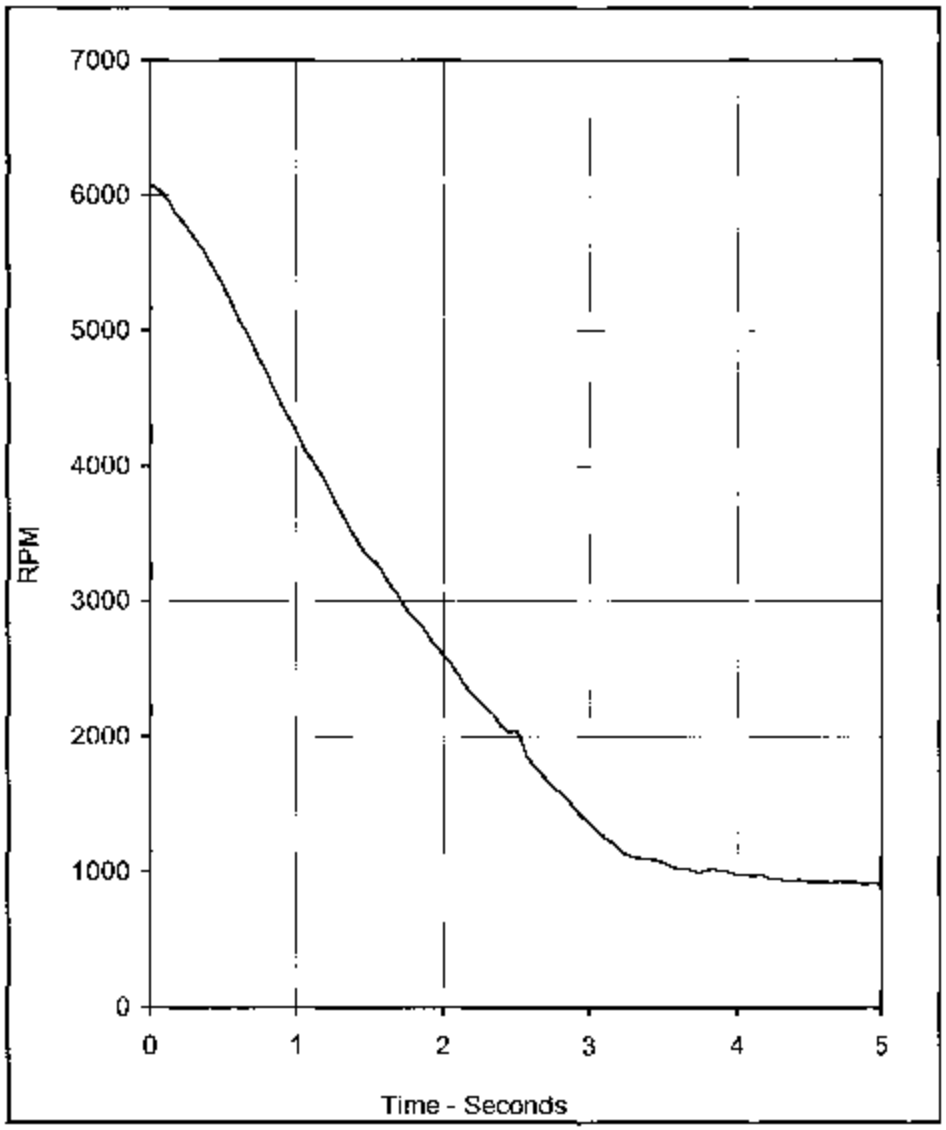
Units	Max	Time	Min	Time	Filter (Hz)
RPM	4513.8	0.1	999.2	4.7	5

Test Program: FMVSS 124 (#2 Spring Disconnected)
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03
NHTSA No.: C30304

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	51.4	0.0	110.0	5

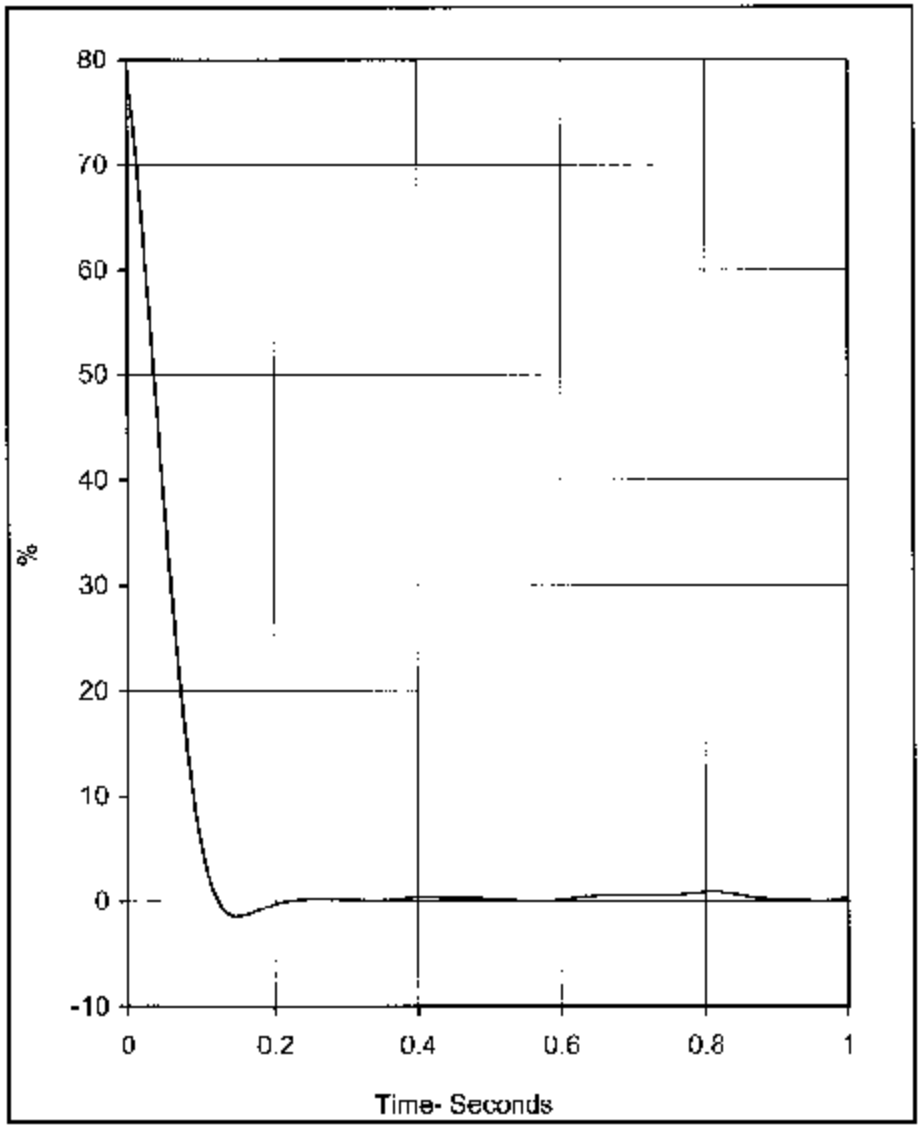
Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

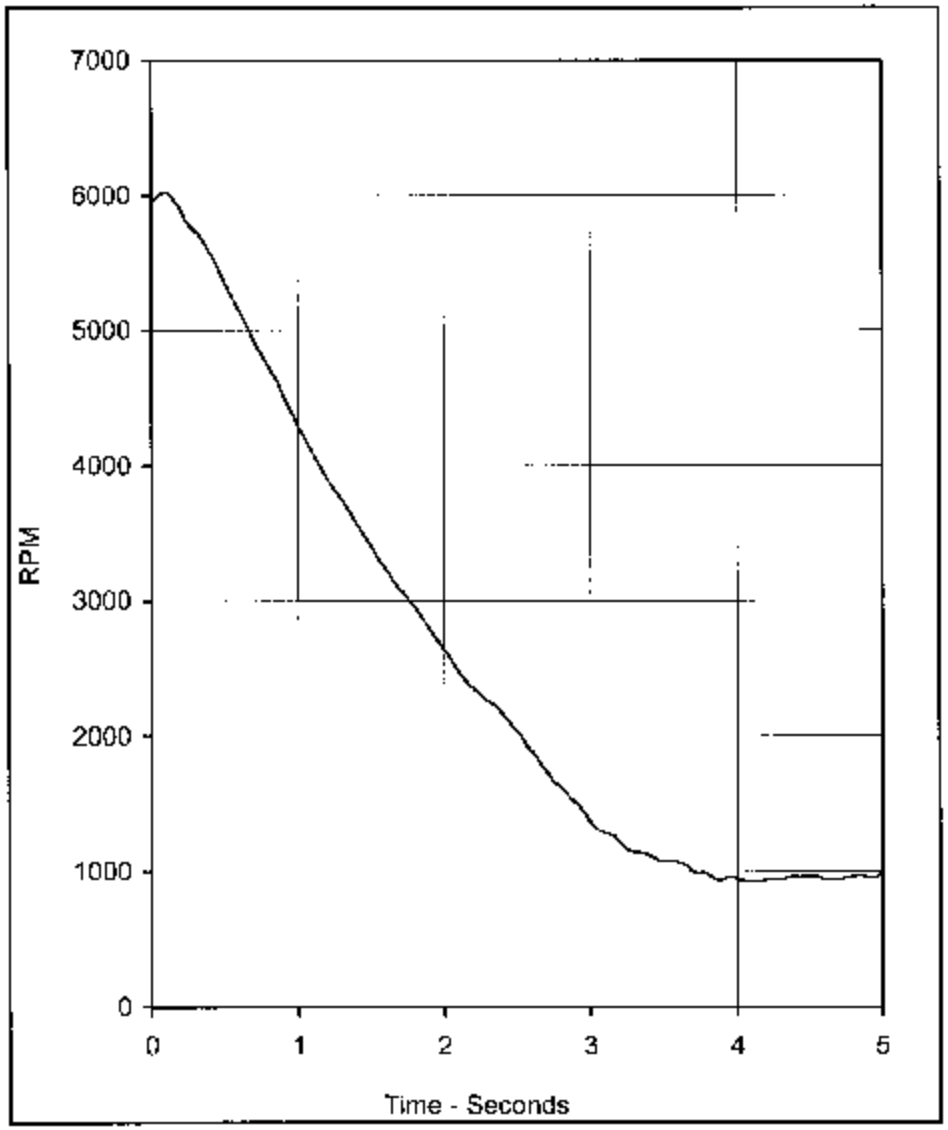
Units	Max	Time	Min	Time	Filter (Hz)
RPM	6079.7	0.0	907.9	5.0	5

Test Program: FMVSS 124 (#2 Spring Disconnected)
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03
NHTSA No.: C30304

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	79.2	0.0	130.0	5

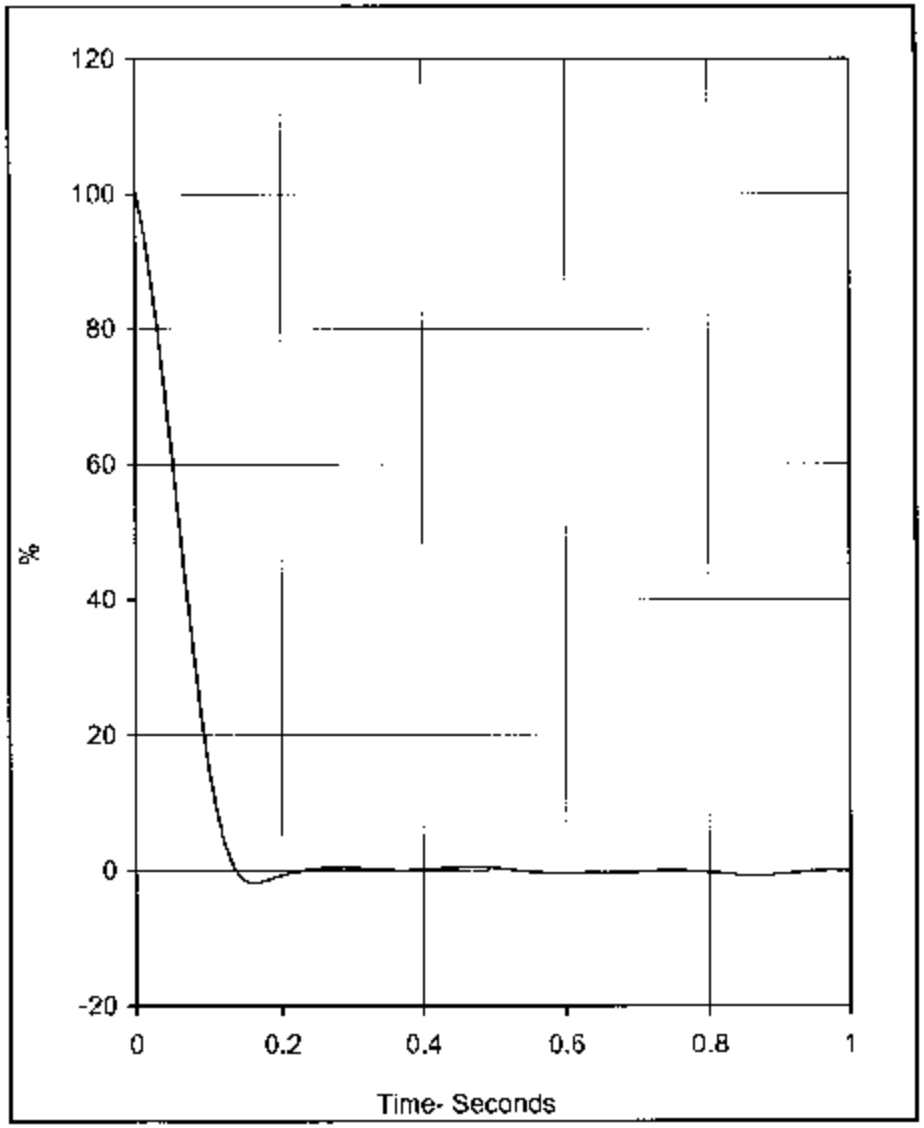
Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

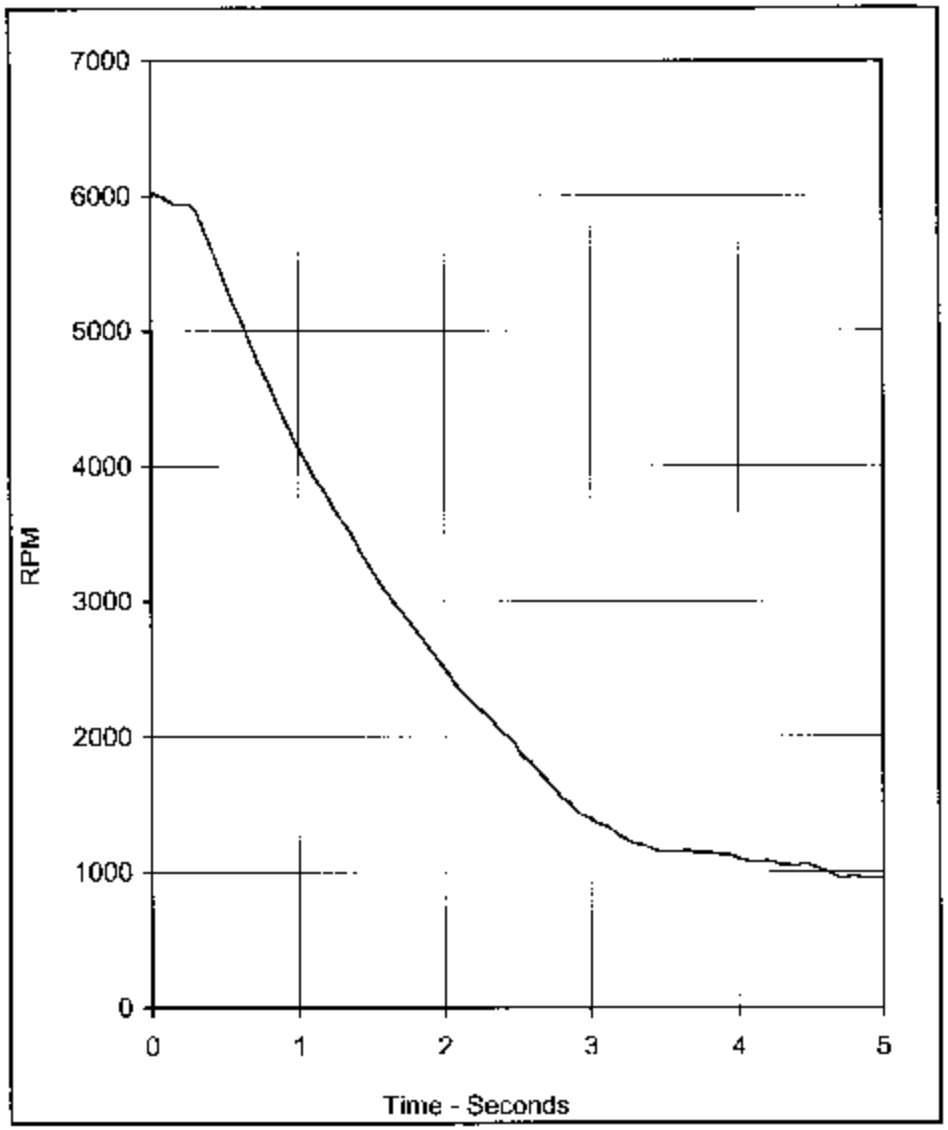
Units	Max	Time	Min	Time	Filter (Hz)
RPM	6021.9	0.1	925.2	4.1	5

Test Program: FMVSS 124 (#2 Spring Disconnected)
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03
NHTSA No.: C30304

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	100.5	0.0	140.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	6026.4	0.0	951.2	4.9	5

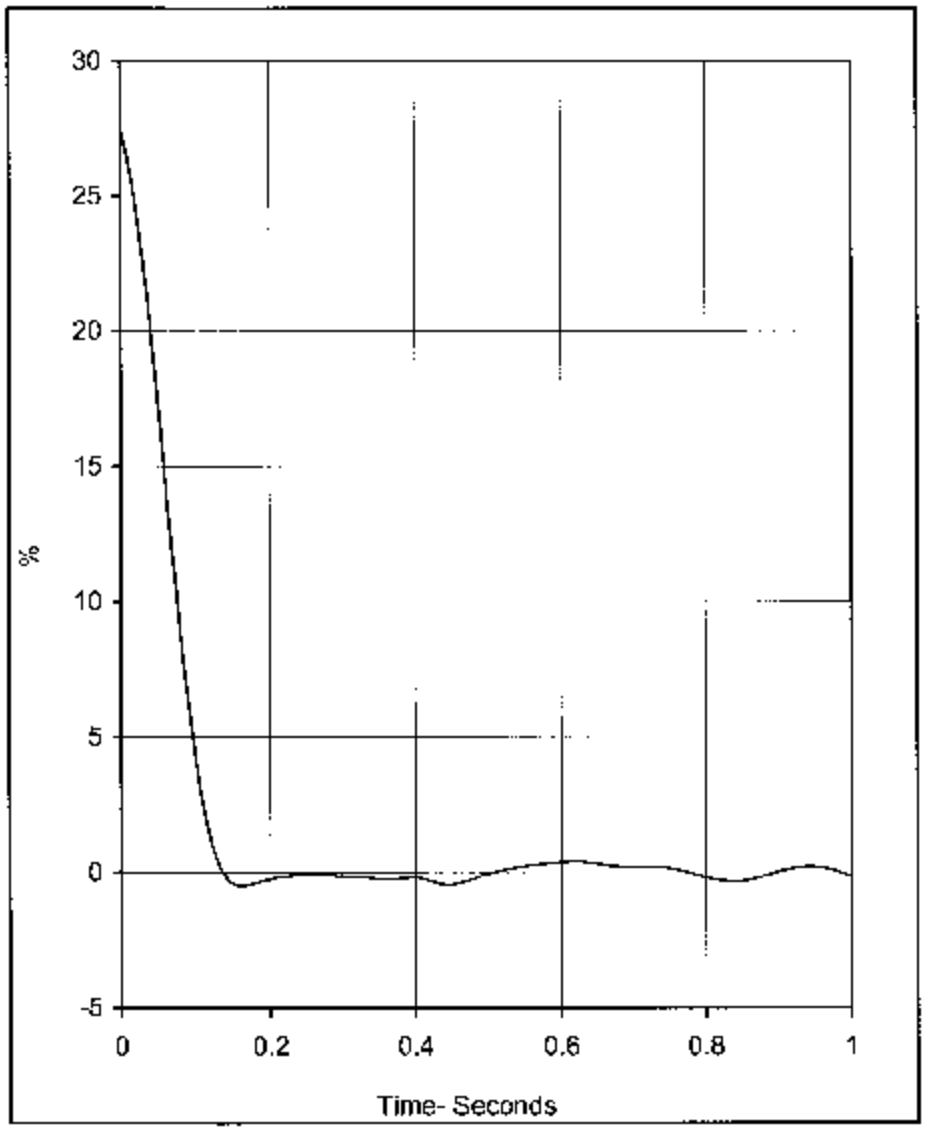
Test Program: FMVSS 124 (#2 Spring Disconnected)

Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

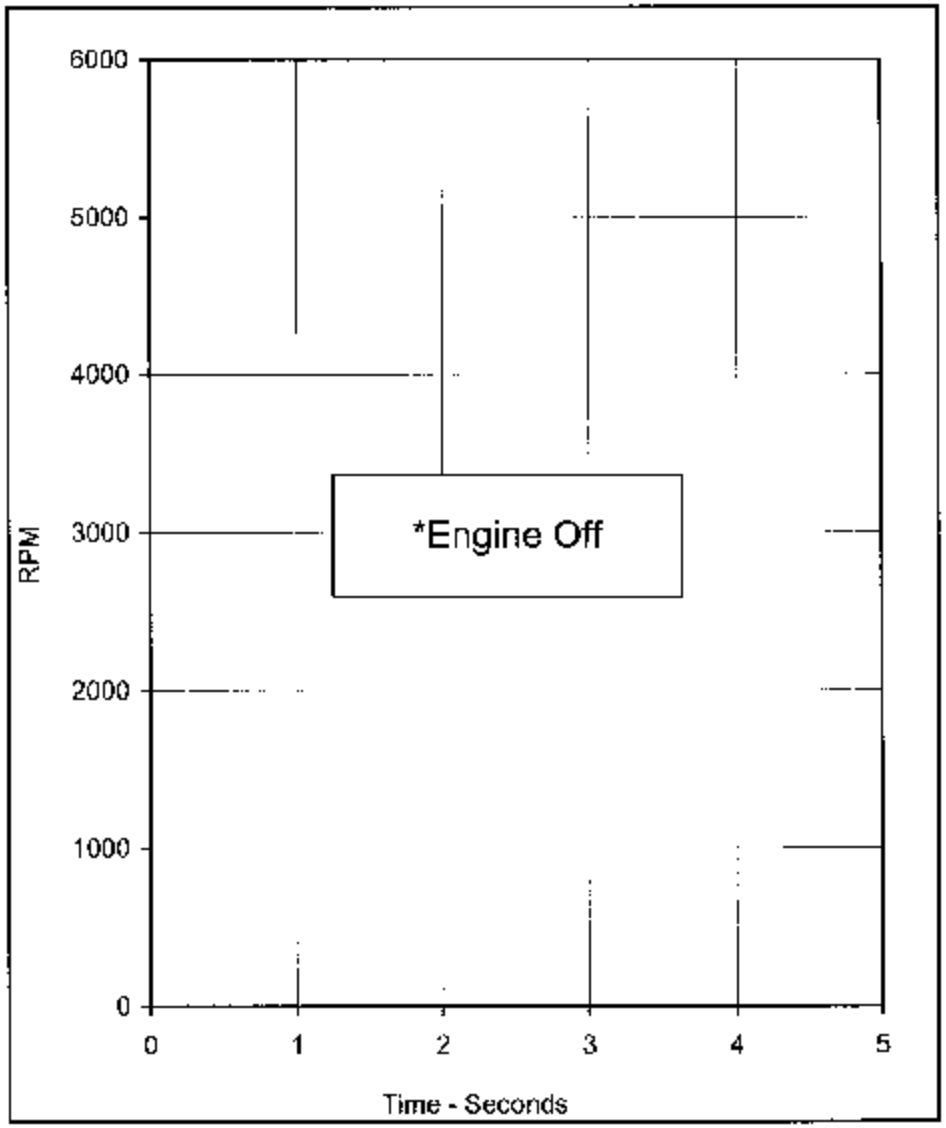
NHTSA No.: C30304

MARC Engineering



Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	27.5	0.0	130.0	5



Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	0.0	0.0	0.0	0.0	5

*Engine Off

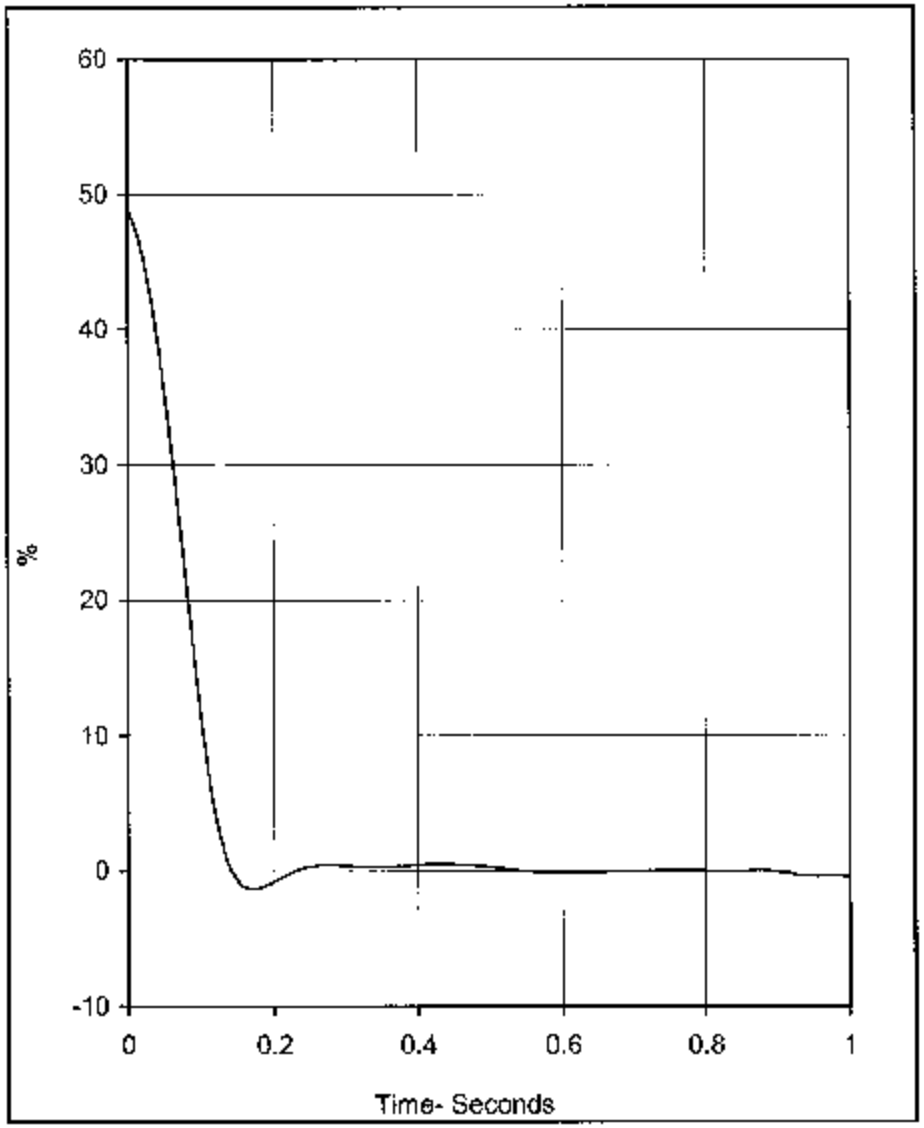
Test Program: FMVSS 124 (#2 Spring Disconnected)

Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

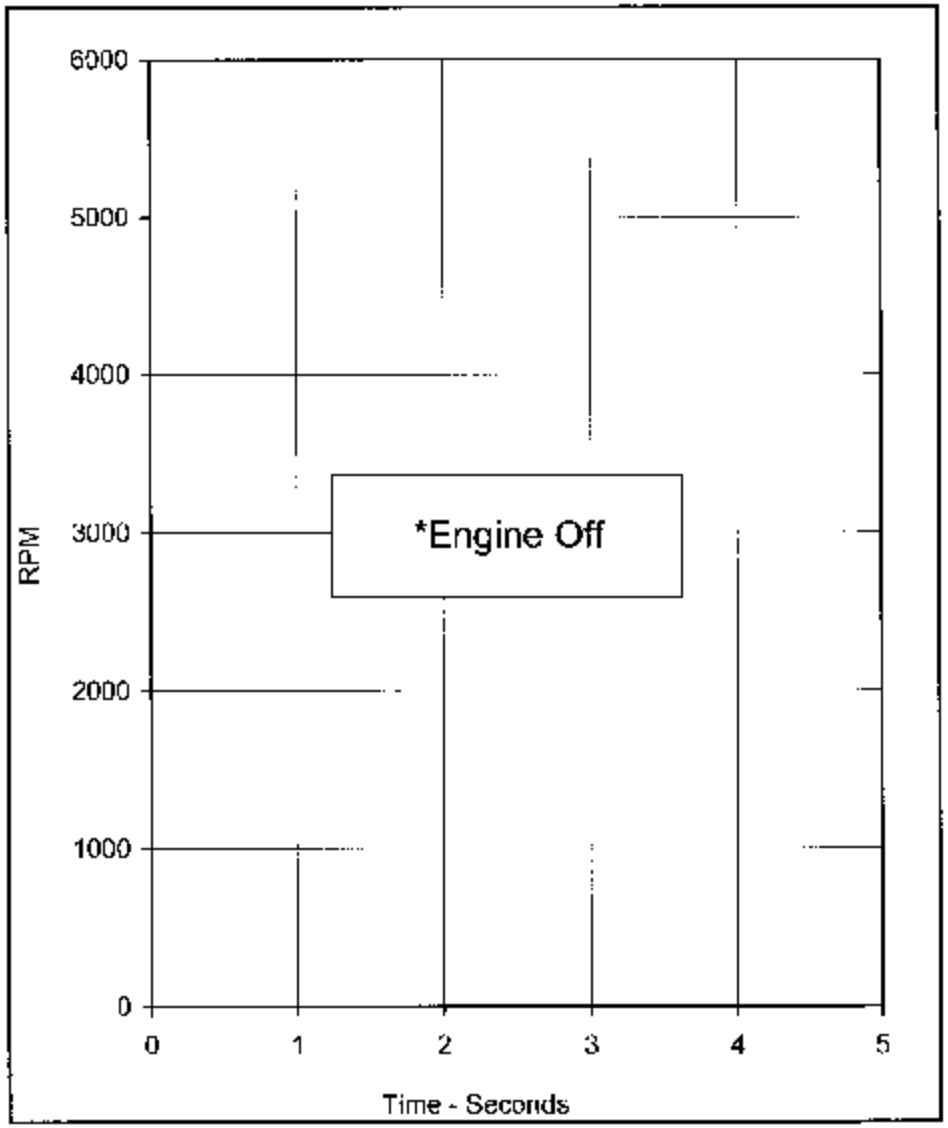
NHTSA No.: C30304

KARCO Engineering



Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	49.1	0.0	150.0	5



Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	0.0	0.0	0.0	0.0	5

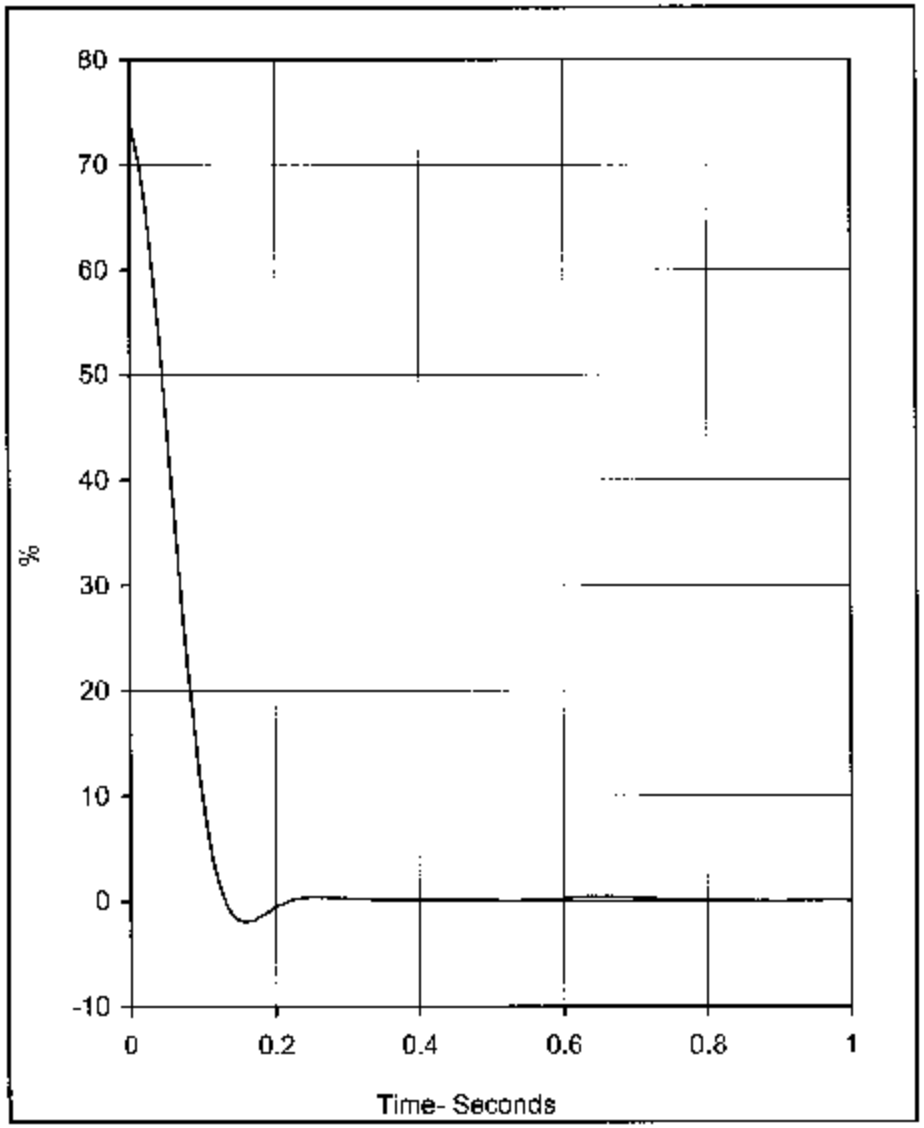
*Engine Off

Test Program: FMVSS 124 (#2 Spring Disconnected)

Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

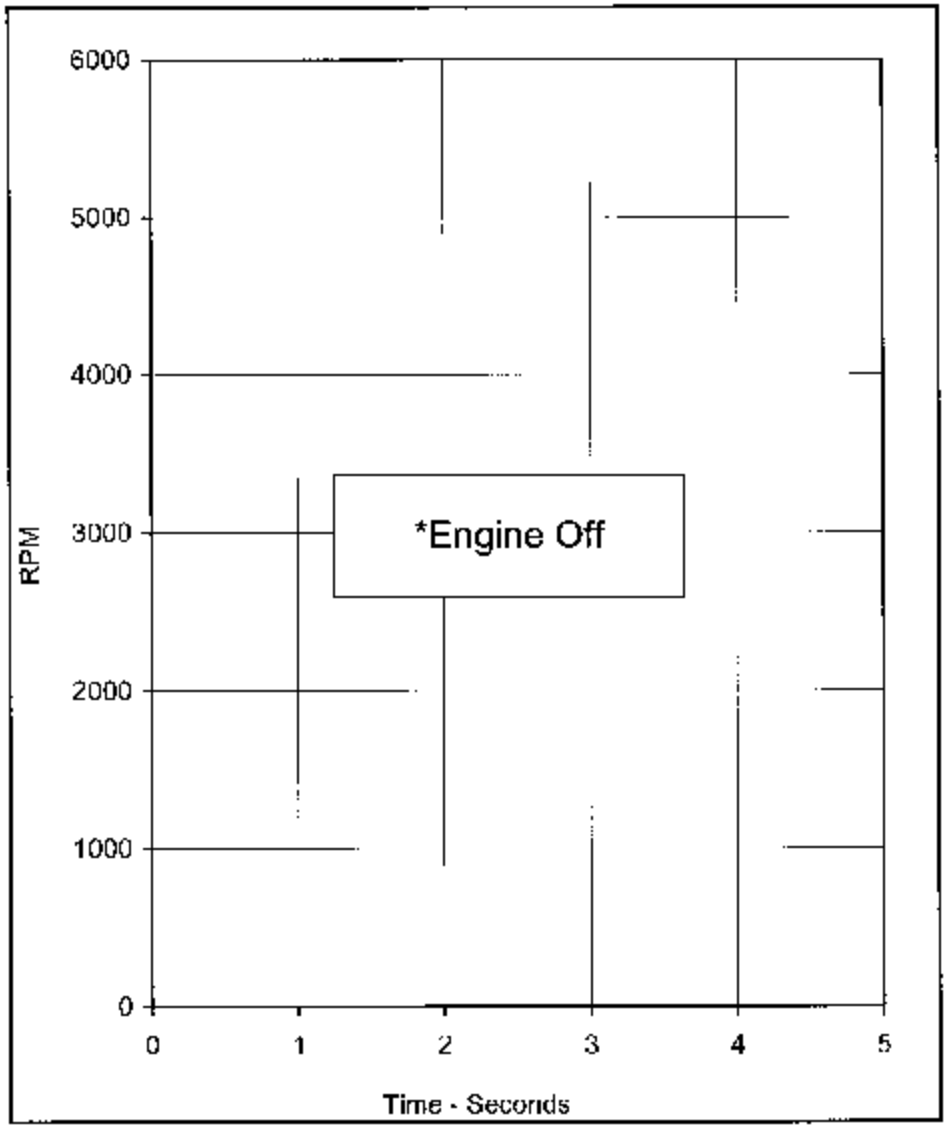
Test Date: 7/28/03

NHTSA No.: C30304



Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	74.4	0.0	130.0	5



Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	0.0	0.0	0.0	0.0	5

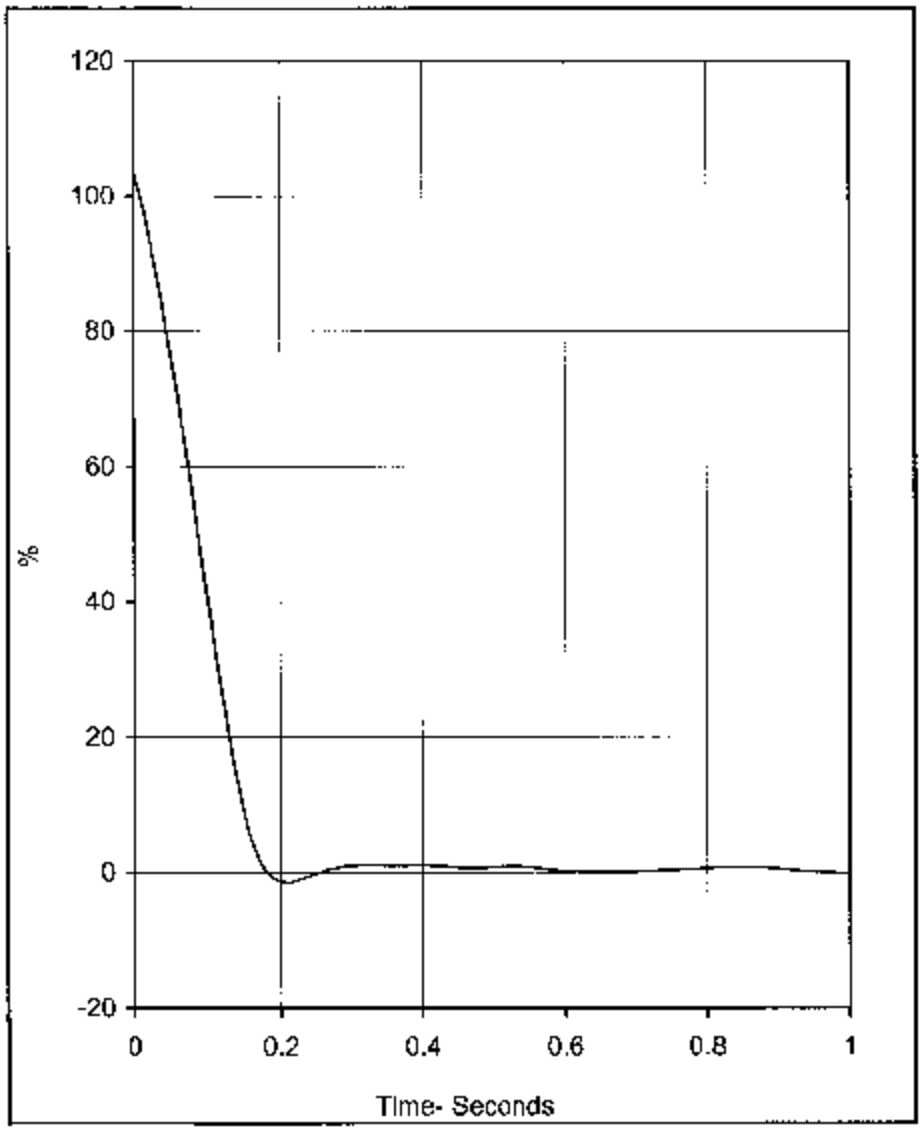
*Engine Off

Test Program: FMVSS 124 (#2 Spring Disconnected)

Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

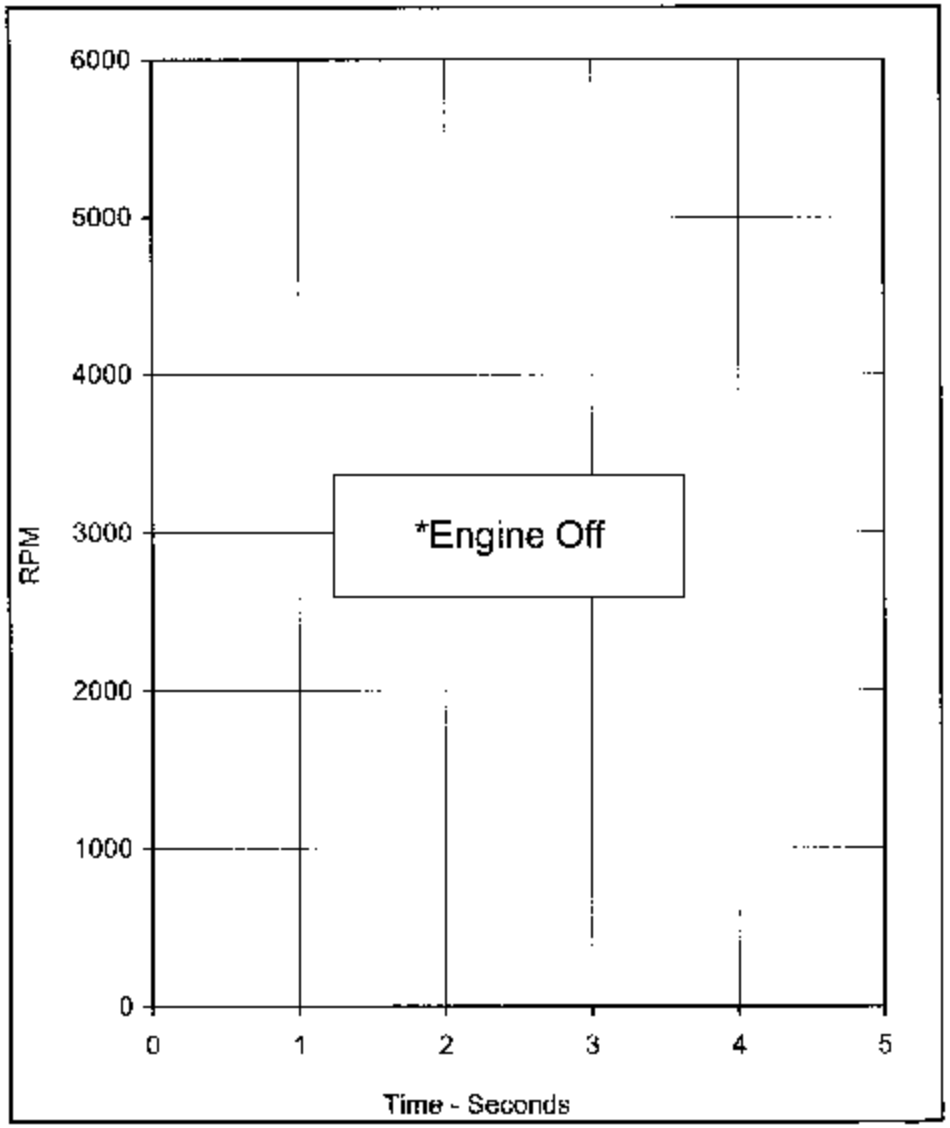
Test Date: 7/28/03

NHTSA No.: C30304



Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	103.6	0.0	190.0	5



Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	0.0	0.0	0.0	0.0	5

*Engine Off

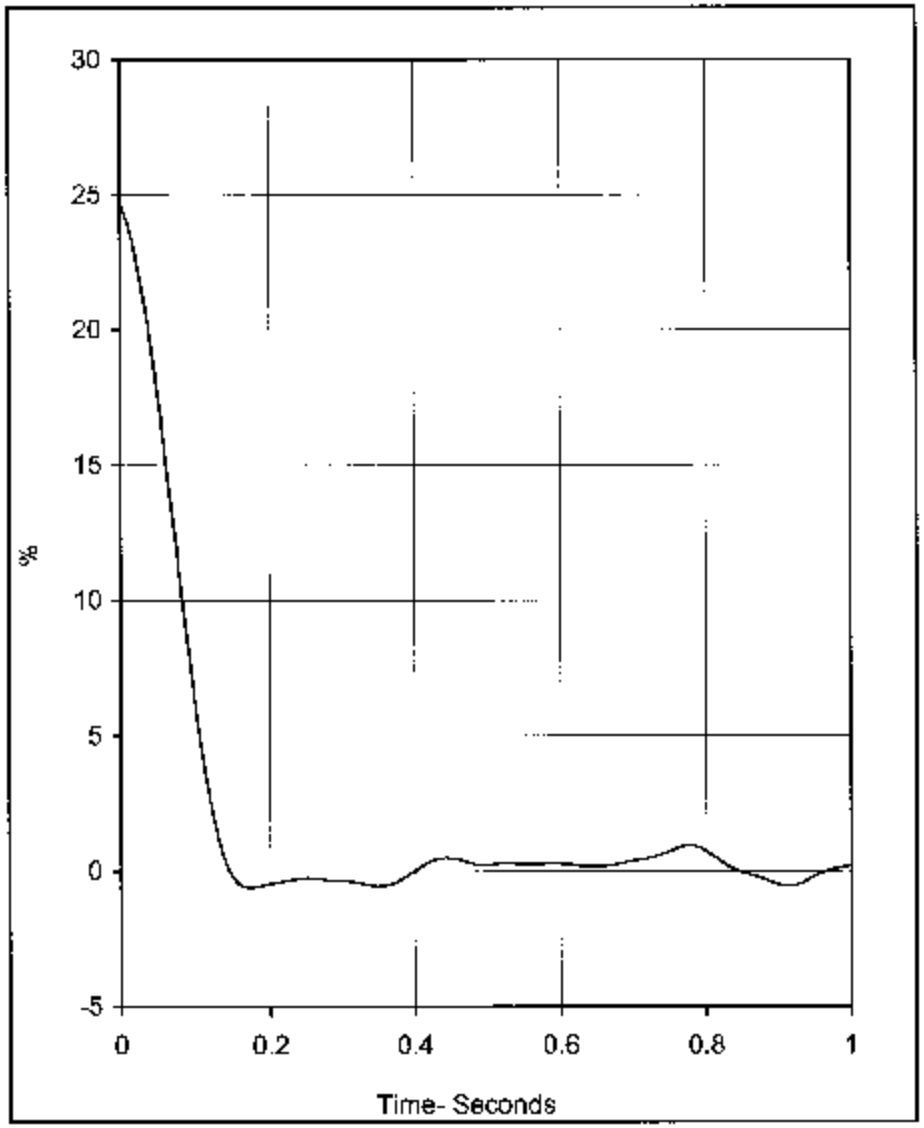
Test Program: FMVSS 124 (#2 Spring Disconnected)

Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

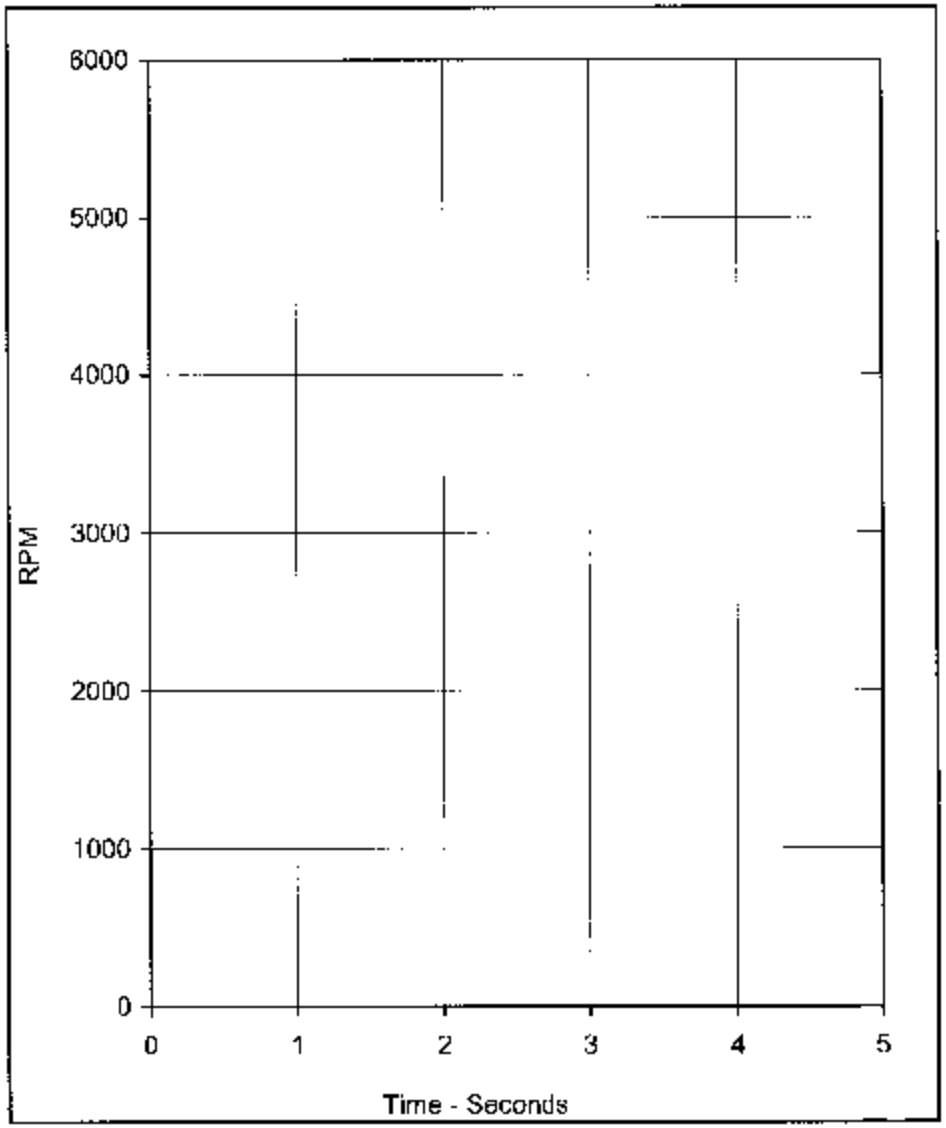
NHTSA No.: C30304

KARCO Engineering



Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	24.7	0.0	170.0	5



Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	0.0	0.0	0.0	0.0	5

* No data

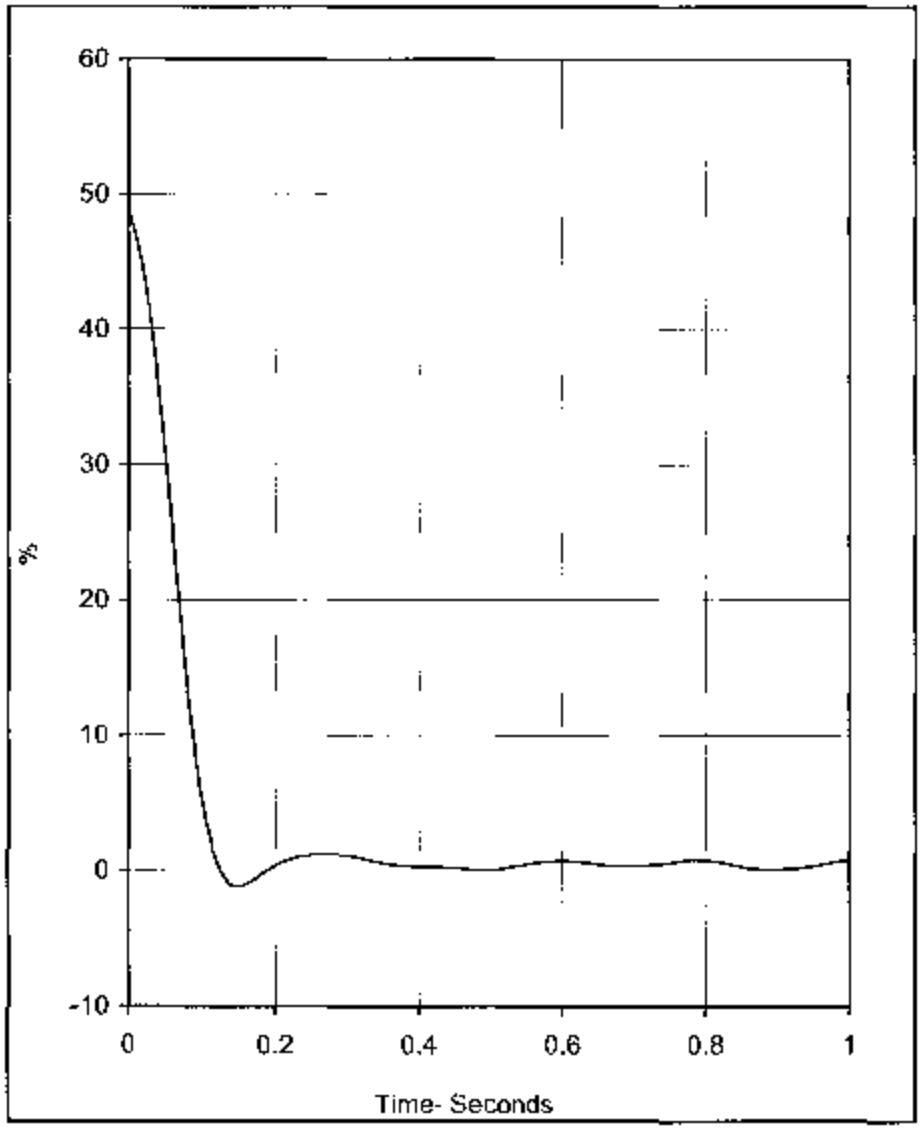
Test Program: FMVSS 124 (Severance Of Throttle Cable)

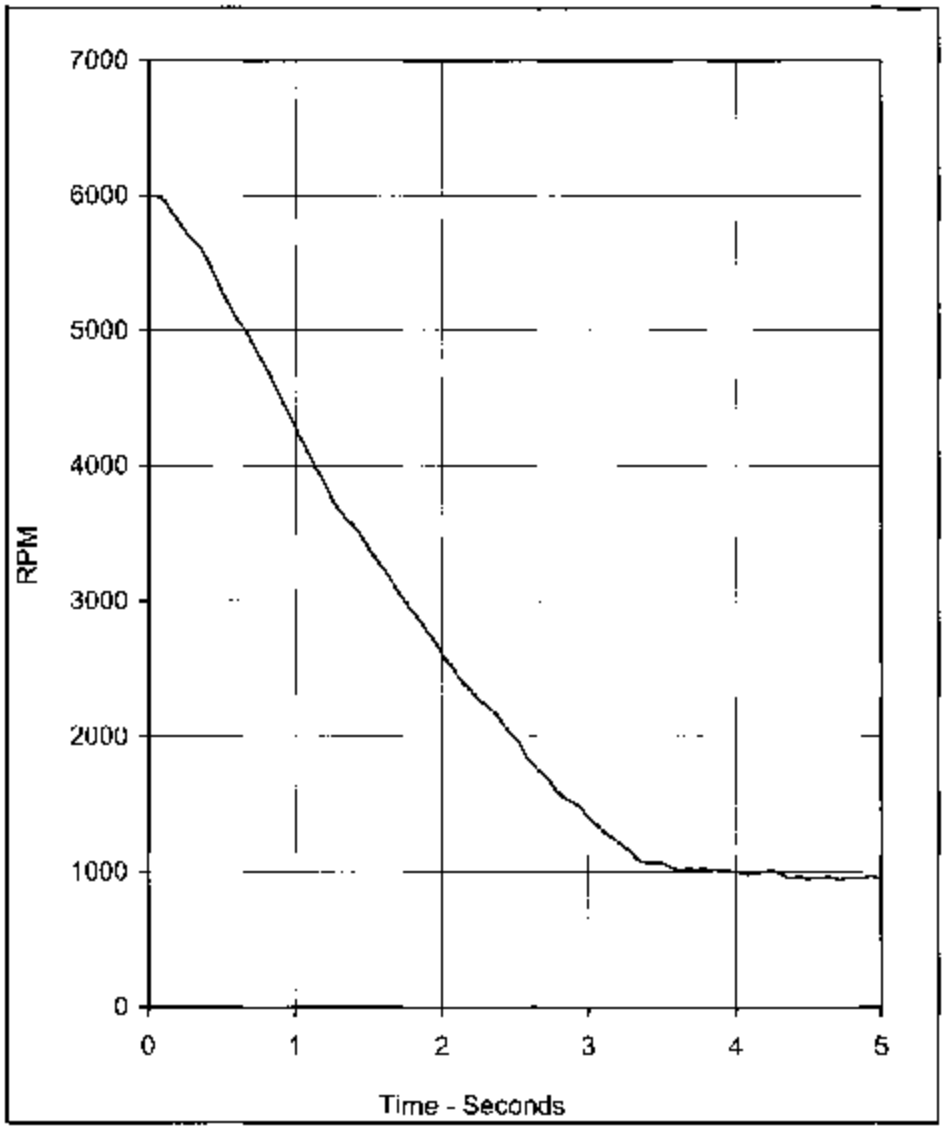
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

NHTSA No.: C30304

MARC Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	48.8	0.0	130.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

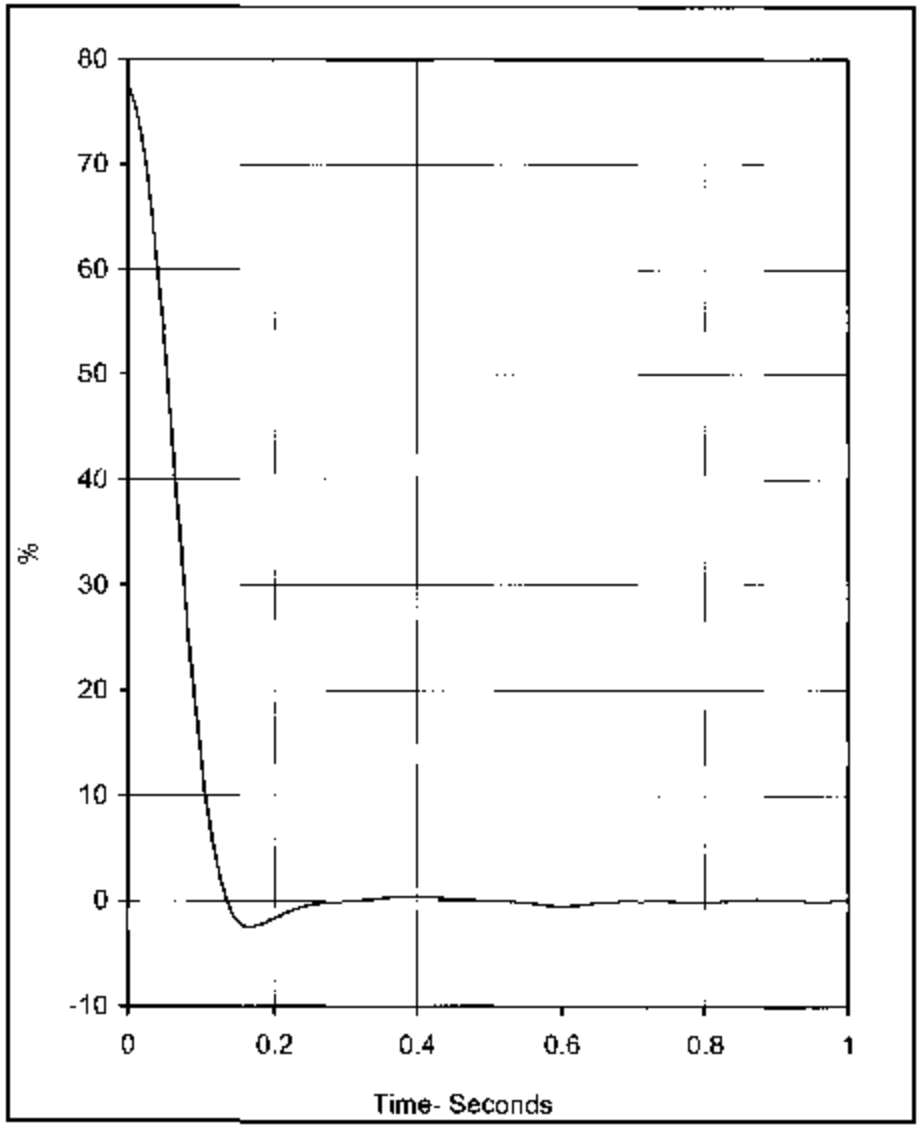
Units	Max	Time	Min	Time	Filter (Hz)
RPM	5996.3	0.0	945.8	4.7	5

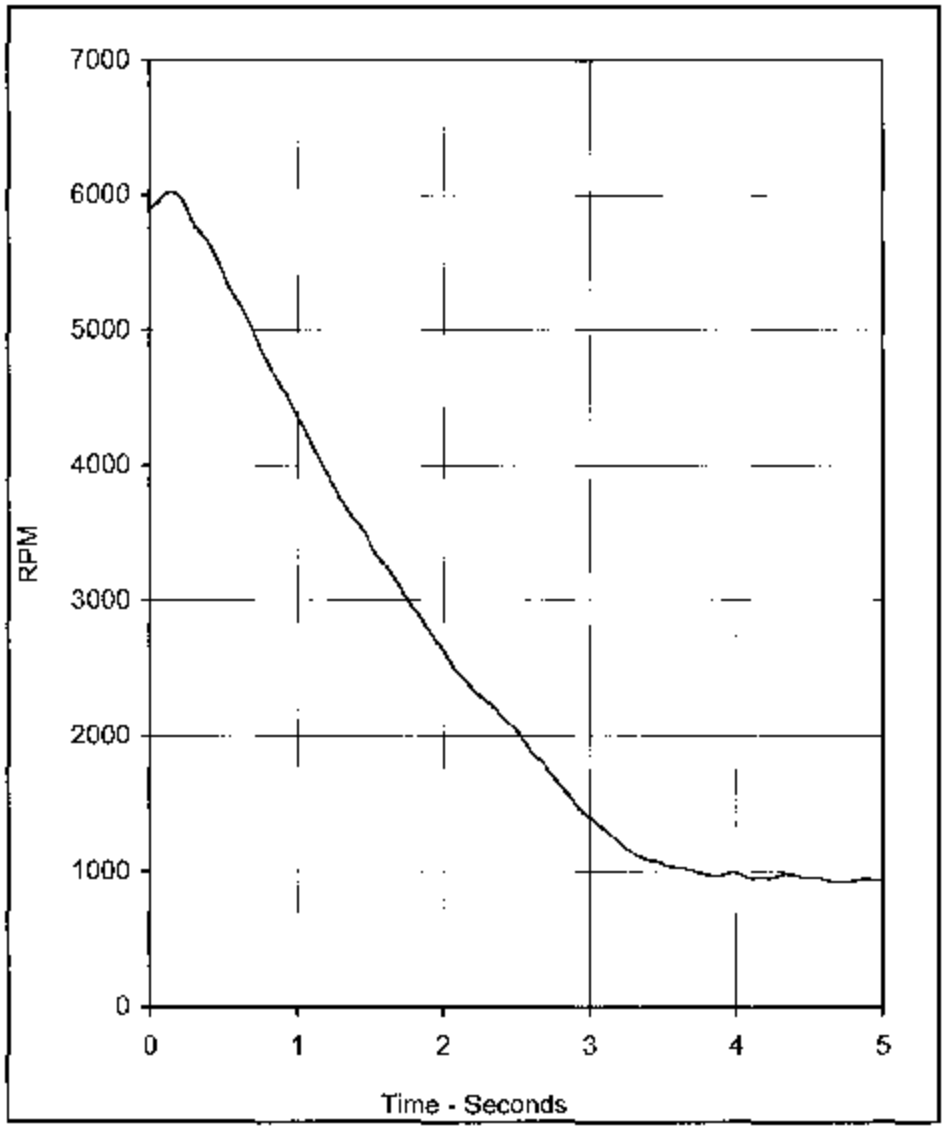
Test Program: FMVSS 124 (Severance Of Throttle Cable)

Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

NHTSA No.: C30304





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	77.6	0.0	140.0	5

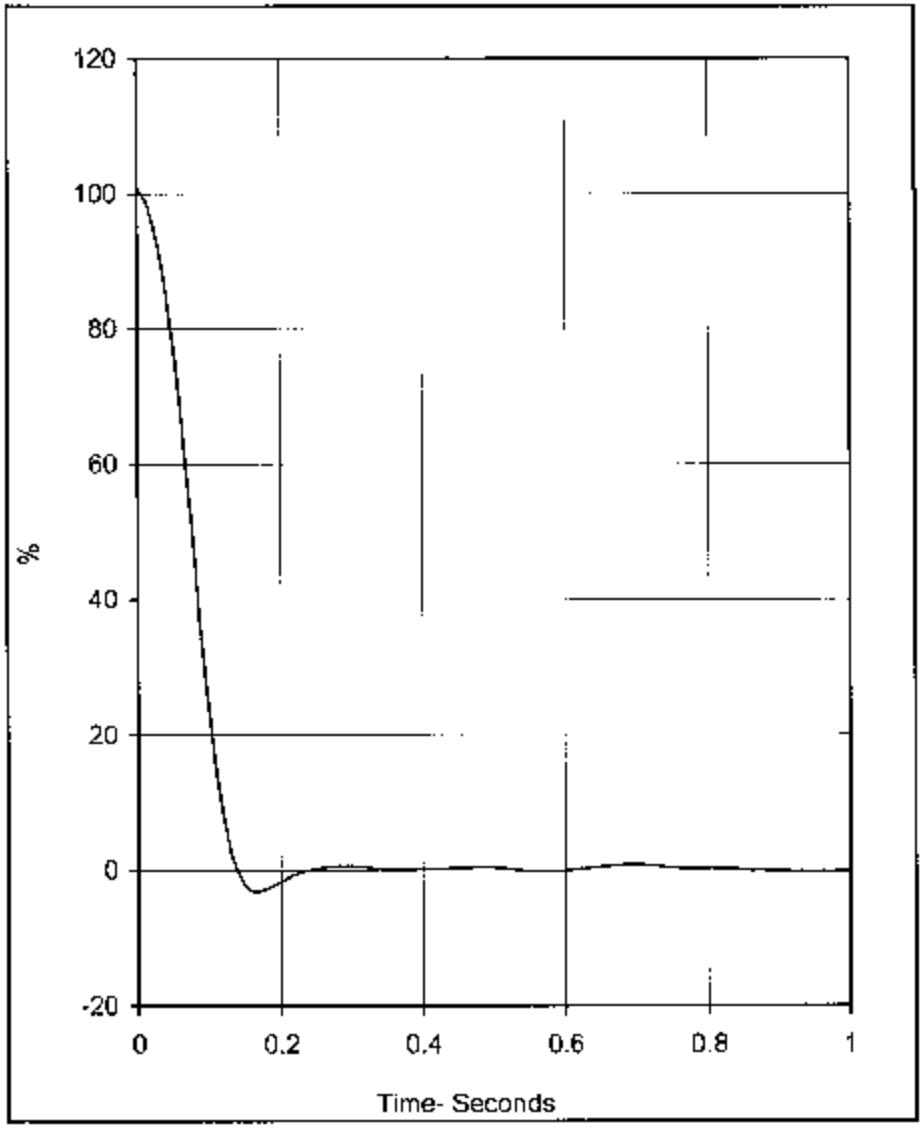
Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

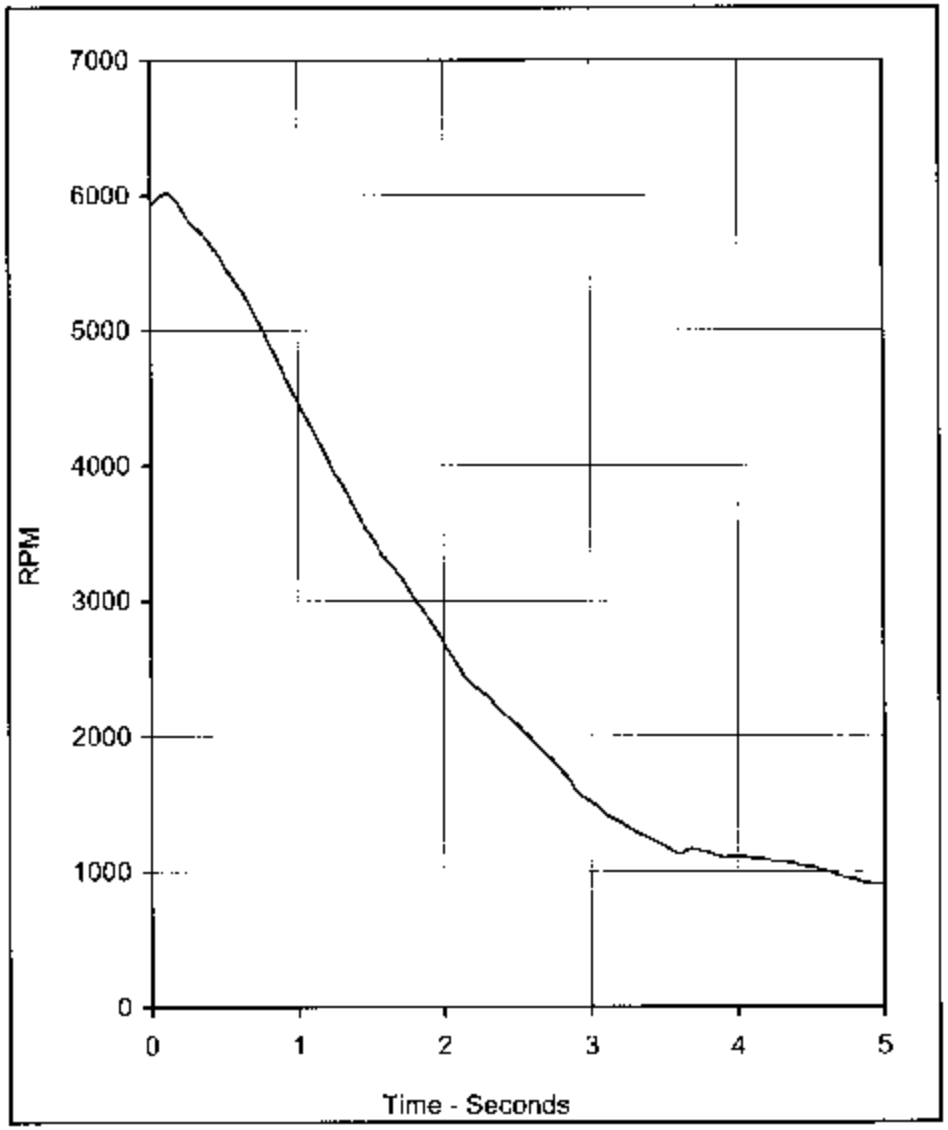
Units	Max	Time	Min	Time	Filter (Hz)
RPM	6022.7	0.1	924.3	4.7	5

Test Program: FMVSS 124 (Severance Of Throttle Cable)
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03
NHTSA No.: C30304

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	100.9	0.0	140.0	5

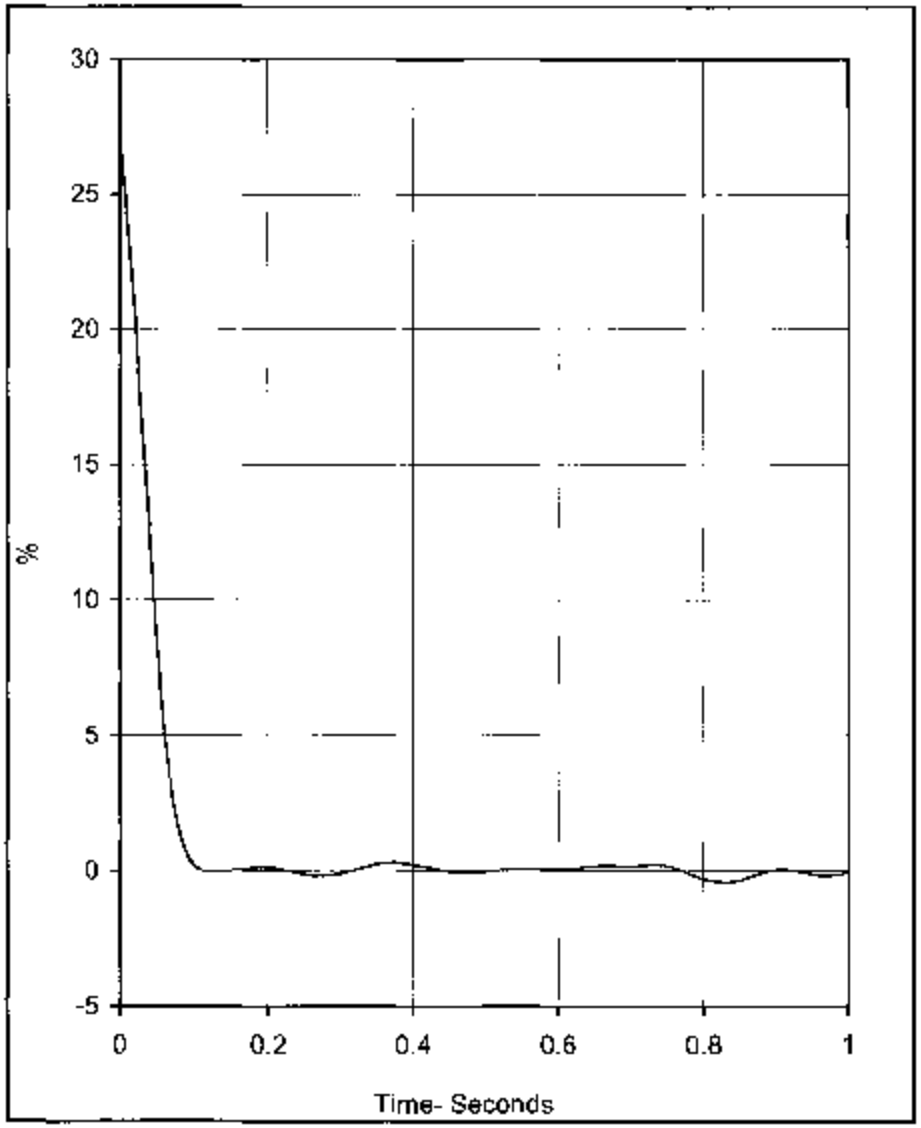
Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

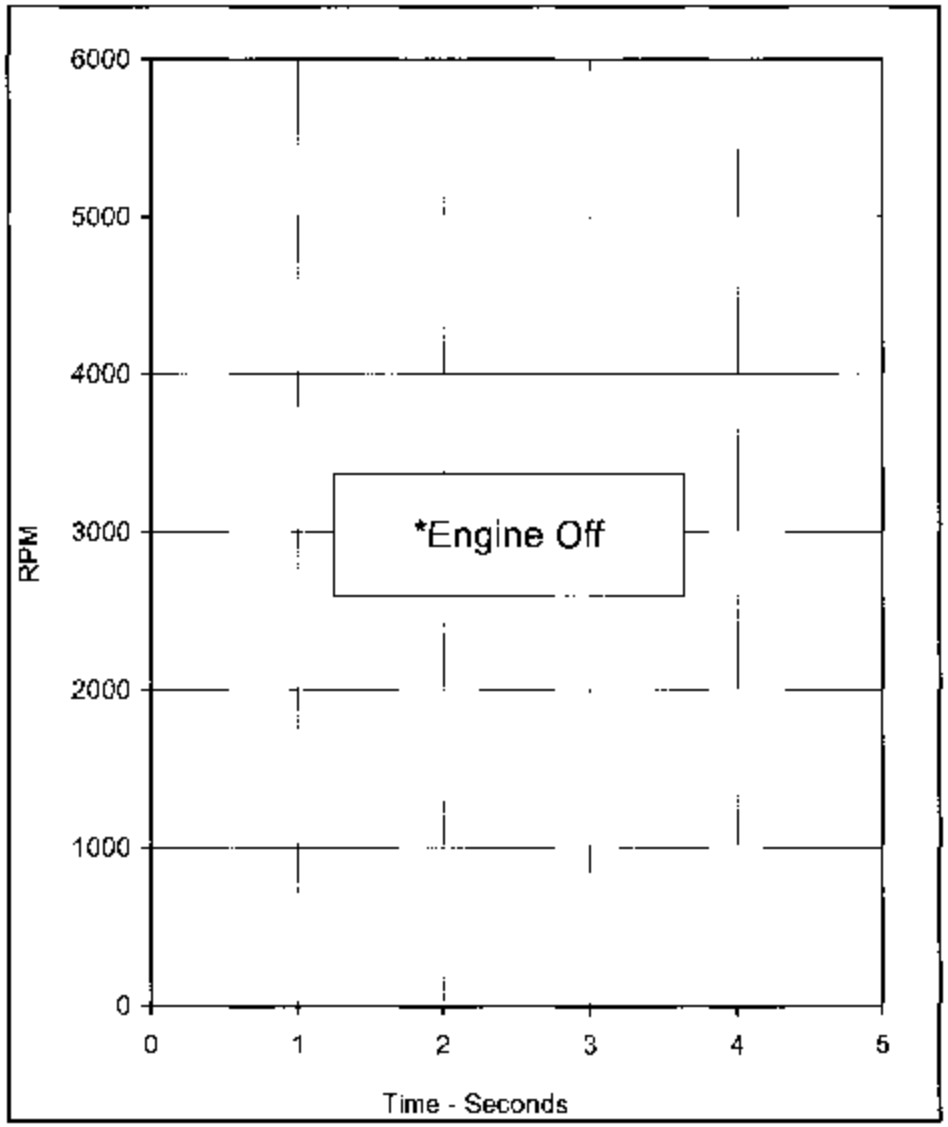
Units	Max	Time	Min	Time	Filter (Hz)
RPM	6016.5	0.1	903.9	5.0	5

Test Program: FMVSS 124 (Severance Of Throttle Cable)
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03
NHTSA No.: C30304

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	27.1	0.0	100.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	0.0	0.0	0.0	0.0	5

*Engine Off

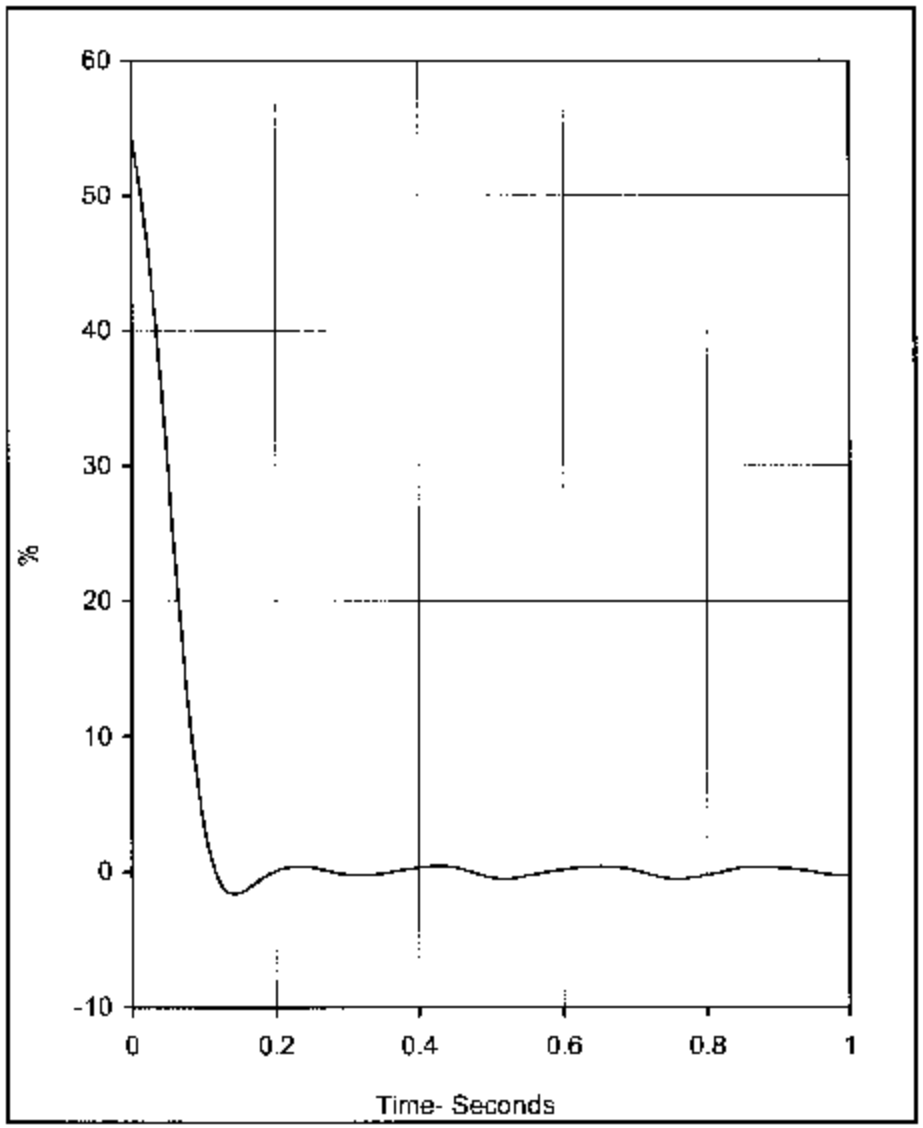
Test Program: FMVSS 124 (Severance Of Throttle Cable)

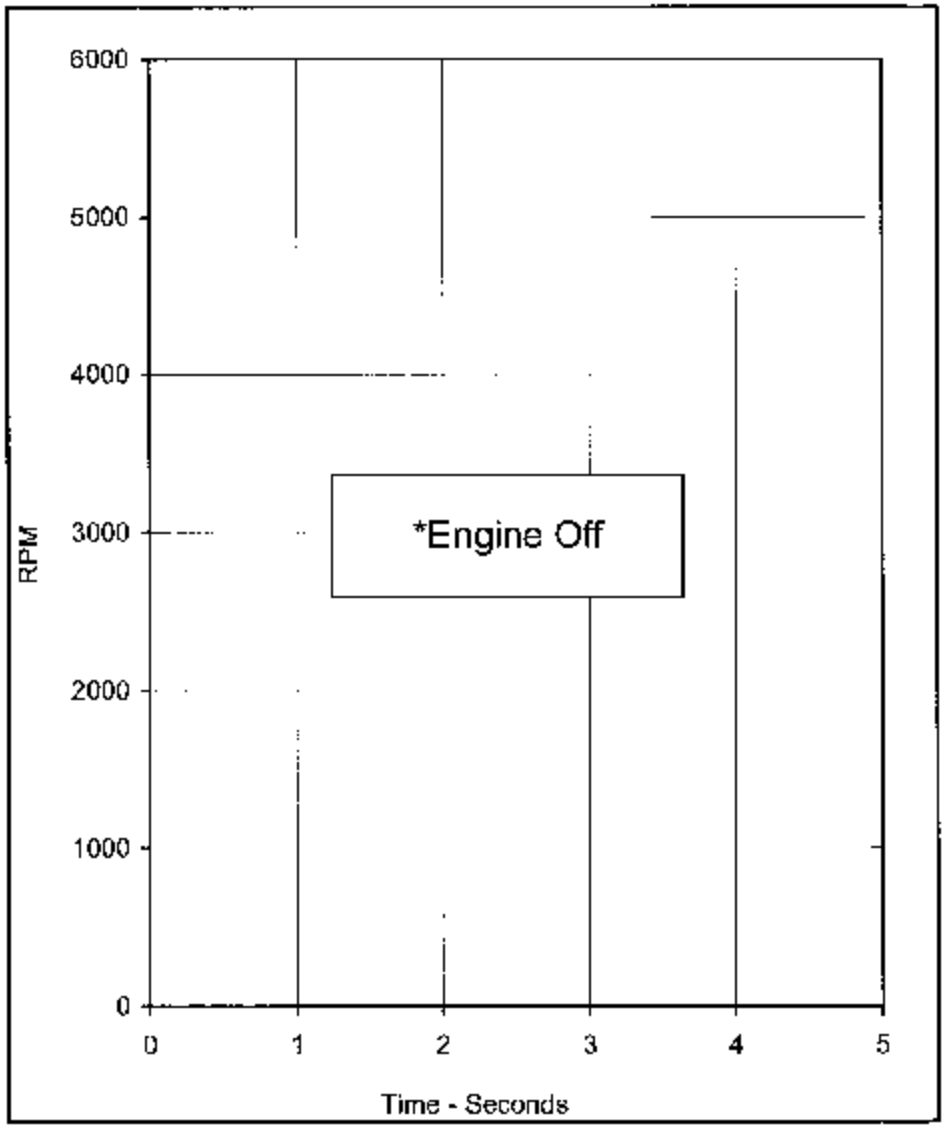
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

NHTSA No.: C30304

CARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	54.3	0.0	140.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	0.0	0.0	0.0	0.0	5

*Engine Off

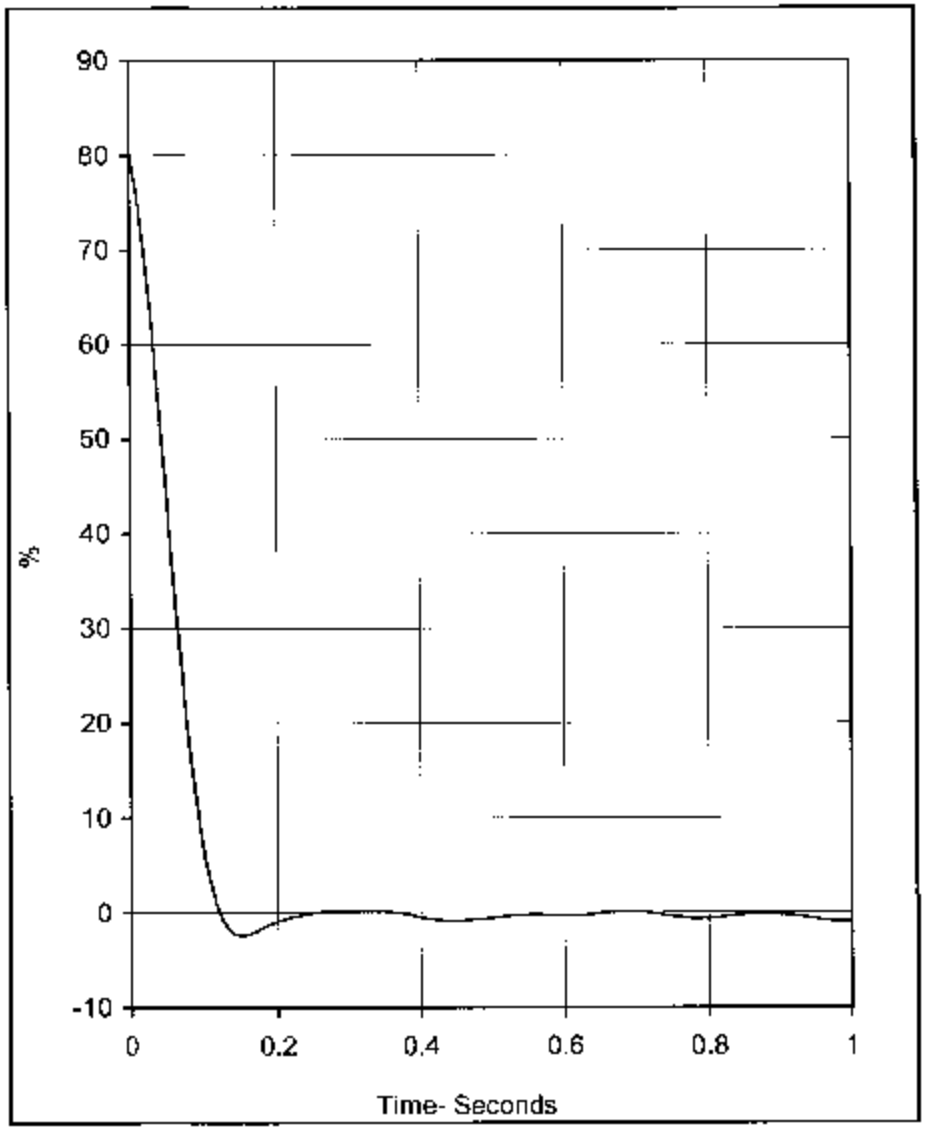
Test Program: FMVSS 124 (Severance Of Throttle Cable)

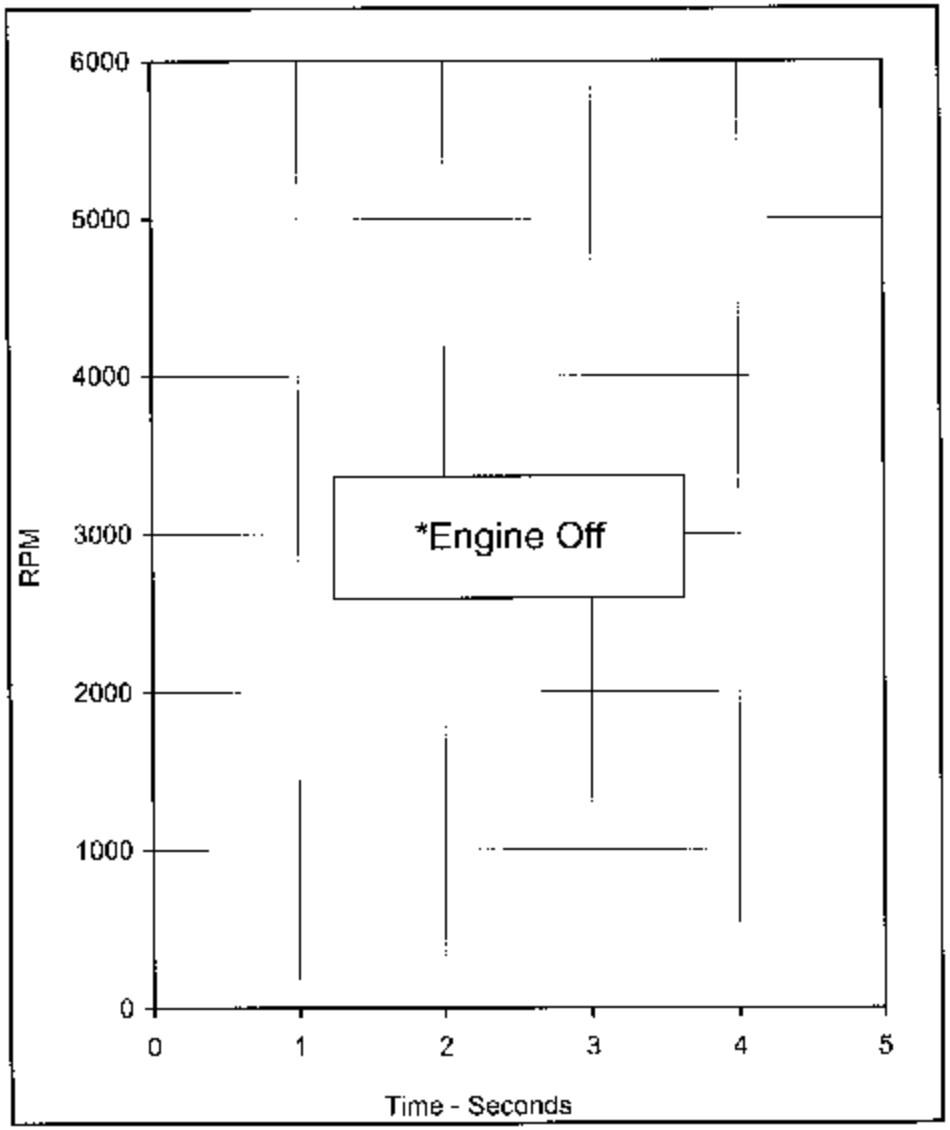
Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

NHTSA No.: C30304

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	80.2	0.0	120.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	0.0	0.0	0.0	0.0	5

*Engine Off

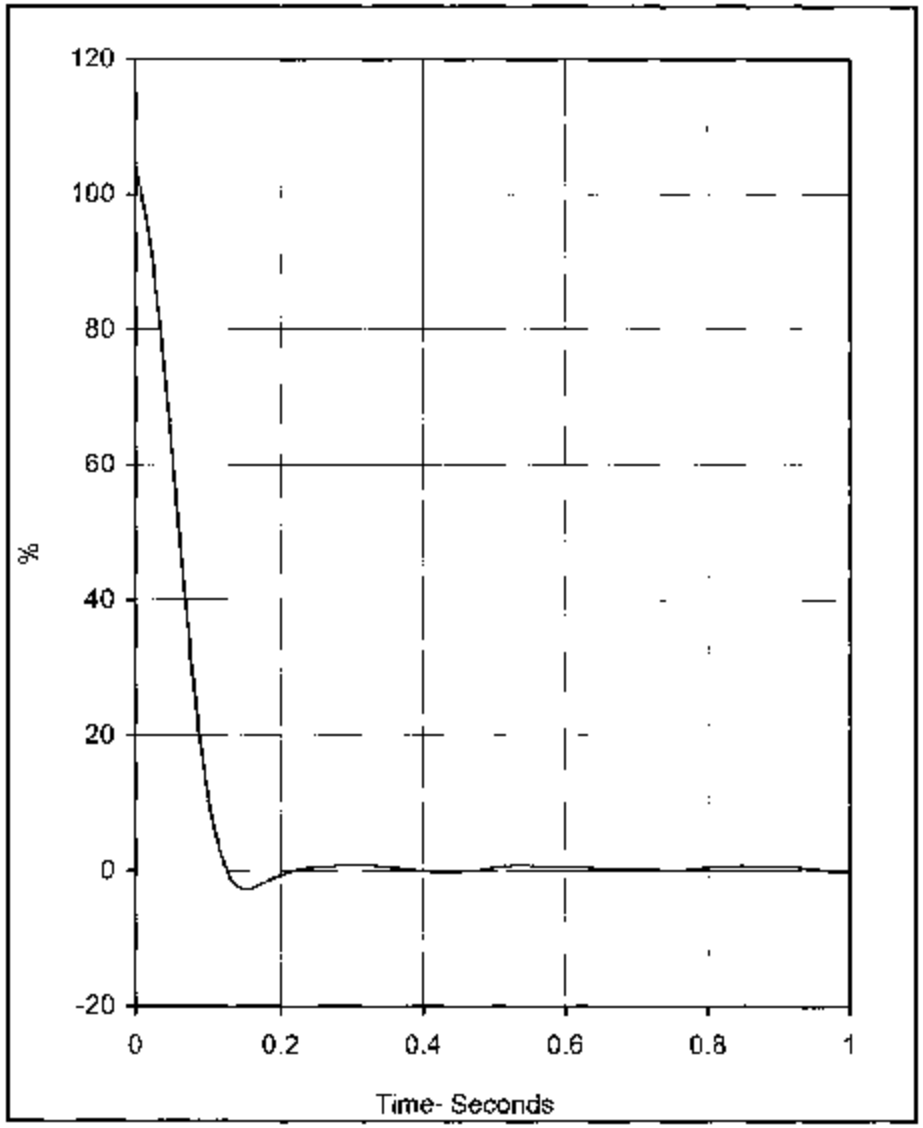
Test Program: FMVSS 124 (Severance Of Throttle Cable)

Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

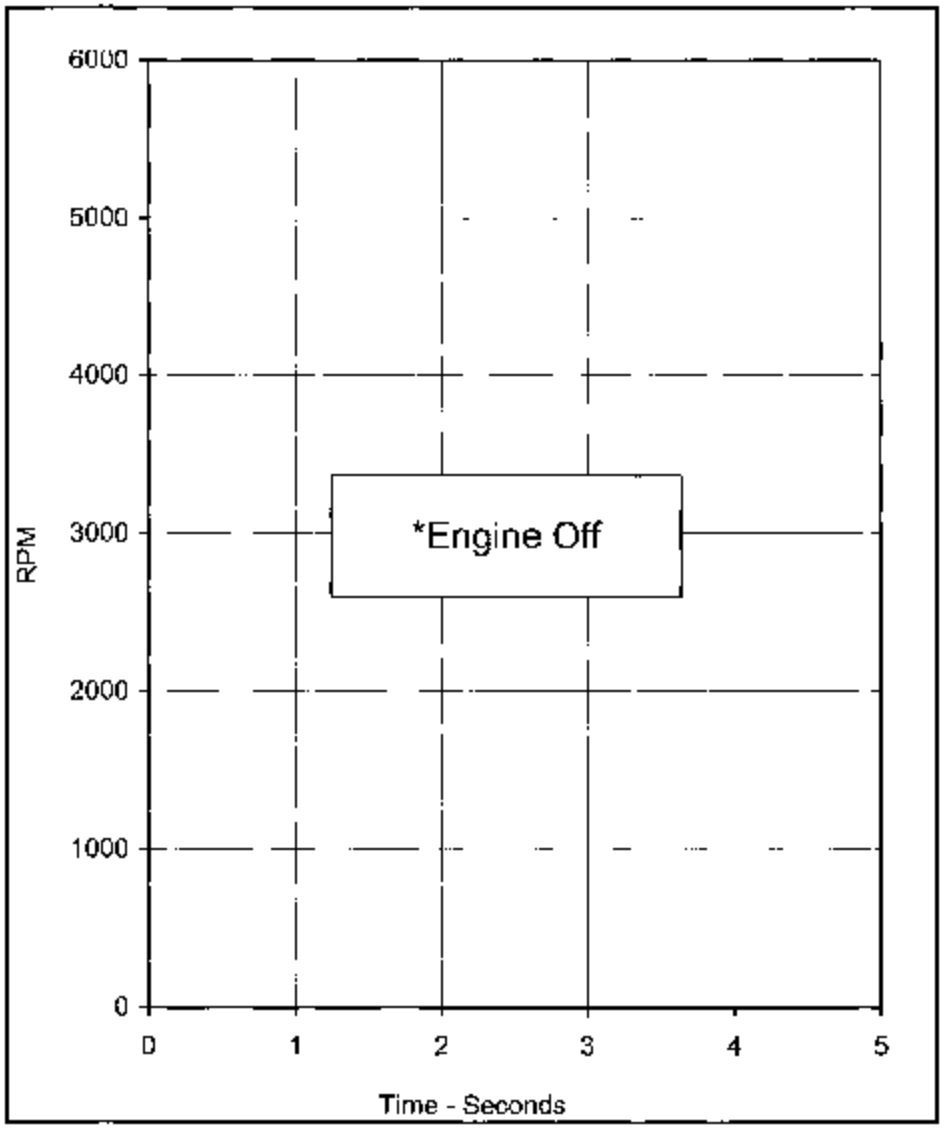
NHTSA No.: C30304

KARCO Engineering



Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	103.7	0.0	140.0	5



Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	0.0	0.0	0.0	0.0	5

*Engine Off

Test Program: FMVSS 124 (Severance Of Throttle Cable)

Test Vehicle: 2003 Chrysler PT Cruiser 4 Door Hatchback

Test Date: 7/28/03

NHTSA No.: C30304

MARCO Engineering

APPENDIX C

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

FMVSS 124 Accelerator Control Systems

Test Equipment List

7/28/03

2003 Chrysler PT Cruiser 4 Door Hatchback

Description	Manufacturer	Model No.	Serial No.	Limit	Accuracy	Cal. Date	Due Cal.
TDAS	DTS	TDAS	DM0101	N/A	SAE J211	11/28/02	11/28/03
Computer	Panasonic	CF-71	8IMAA01852	N/A	N/A	N/A	N/A
Optical 5th Wheel	Datron	DLS-2	06-262	150 MPH	± 1.0%	4/9/03	4/8/04