REPORT NO. 124-KAR-06-001

SAFETY COMPLIANCE TESTING FOR FMVSS NO. 124

ACCELERATOR CONTROL SYSTEMS

DAIMLERCHRYSLER CORPORATION
2006 JEEP WRANGLER SE
2-DOOR MPV

NHTSA NO. C60303

PREPARED BY:
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9270 HOLLY ROAD
ADELANTO, CALIFORNIA 92301

JULY 10, 2006

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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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

1. *Report No.* 124-KAR-06-001	2. *Government Accession No.* N/A	3. *Recipient's Catalog No.* N/A	
4. *Title and Subtitle* Final Report of FMVSS 124 Compliance Testing of 2006 Jeep Wrangler SE 2 Door MPV NHTSA NO.: C60303		5. *Report Date* July 10, 2006 6. *Performing Organization Code* KAR	
7. *Author(s)* Mr. Rupesh B. Patel, Project Engineer, KARCO Mr. Frank D. Richardson, Program Manager, KARCO		8. *Performing Organization Report No.* KAR-DOT-06-124-001	
9. *Performing Organization Name and Address* KARCO Engineering 9270 Holly Road Adelanto, California 92301		10. *Work unit No.* N/A 11. *Contract or Grant No.* DTNH22-01-C-31025	
12. *Sponsoring Agency Name and Address* U.S. Department of Transportation National Highway Traffic Safety Administration Enforcement Office of Vehicle Safety Compliance (NVS-220) 400 Seventh Street, SW, Room 6115 Washington, D.C. 20590		13. *Type of report and Period Covered* Final Report- July 10, 2006 14. *Sponsoring Agency Code* NVS-220	
15. *Supplementary Notes*			
16. *Abstract* Compliance tests were conducted on the subject 2006 Jeep Wrangler SE 2-Door MPV on July 10, 2006 in accordance with the specifications of the Office of Vehicle Safety Compliance Laboratory Test Procedure No. TP-124-06 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 (NPO-405) 400 Seventh St., SW Washington, DC 20590	
19. *Security Classification (of this report)* UNCLASSIFIED	20. *Security Classification (of this page)* UNCLASSIFIED	21. *No. of Pages* 71	22. *Price*

Form DOT F1700.7 (8-72)

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PURPOSE OF COMPLIANCE TEST

1. PURPOSE OF COMPLIANCE TEST

Tests were conducted on a 2006 Jeep Wrangler SE 2-Door MPV, manufactured by DaimlerChrysler 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 Test Procedures, TP-124-06, dated April 20, 2000, and corresponding KARCO Engineering test procedure KTP-124A, dated May 24, 2006. As per directions of NHTSA, testing was not performed on a dynamometer or at high or low ambient temperature conditions. 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
Appendix A	-	Photographs
Appendix B	-	Data Plots
Appendix C	-	Test Equipment List

SECTION 2

COMPLIANCE TEST PROCEDURE AND DATA SUMMARY

2. COMPLIANCE TEST PROCEDURE AND DATA SUMMARY

A 2006 Jeep Wrangler SE 2-Door MPV was subjected to FMVSS 124 compliance testing. The tests were conducted at KARCO Engineering in Adelanto, California on July 10, 2006. 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 and reconnect the first 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 KTP-124A 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, throttle position versus time 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 measured using the vehicle's throttle plate position sensor. Engine RPM was obtained with an optical fifth wheel recording speed on the vehicle's engine belt. The Jeep Wrangler SE had an engine governor and the RPM of the engine remained relatively constant for throttle plate positions once the limit of the engine governor was reached. Release of the accelerator pedal and severance is time zero (0) on the data traces. The data trace for throttle plate is measured as a percentage rotation where 0% is idle and 100% is wide open throttle. Time is for the engine RPM to return to approximate steady state idle on the Data sheet No.4. Severance was accomplished by disconnecting the accelerator cable from the throttle body and actuating the throttle plate with a piece of string. Time zero on the data plots equates to release of string simulating failure.

B.6 ENGINE SPEED FOR THE FOLLOWING THROTTLE PLATE POSITIONS :

Curb Idle Position	800 RPM
100% Wide Open Throttle (WOT)	5800 RPM
Throttle Position When Engine Limits	5800 RPM
75% WOT	5800 RPM
50% WOT	5800 RPM
25% WOT	5400 RPM

SECTION 3
TEST DATA

3. TEST DATA

The results of FMVSS 124 compliance tests that were conducted on the 2006 Jeep Wrangler SE 2-Door MPV on July 10, 2006 to determine compliance with FMVSS 124, “Accelerator Control Systems” are presented in this section.

DATA SHEET NO. 1

VEHICLE INSPECTION AND IDENTIFICATION

TEST VEHICLE INFORMATION			
Manufacturer	DaimlerChrysler Corporation	VIN	1J4FA29106P741046
Manufacturing Date	01/2006	Delivery Date	06/09/2006
Dealer	Victorville Motors Inc	NHTSA No.	C60303
Odometer Reading (mi.)	63	Fuel Type	Gas
Engine Displacement (lit.)	2.4	Cylinders	Inline-4
Transmission	Manual	Final Drive	4wd
Engine Placement	Longitudinal	Color	Light Khaki
Tire Press./Max. Cap. Front	304 kpa (44 psi)	Cold Tire Press. Front	228 kpa (33 psi)
Tire Press./Max. Cap. Rear	304 kpa (44 psi)	Cold Tire Press. Rear	228 kpa (33 psi)
Recommend Tire Size	P215/75R15	Type of Spare	P215/75R15
Tire Size on Vehicle	P215/75R15	Manufacturer	GoodYear
GVWR	2019 kg (4450 lb)	Cargo Capacity	318 kg (700 lb)
GAWR Front	998 kg (2200 lb)	GAWR Rear	1203 kg (2650 lb)
Air Conditioning	No	Power Steering	Yes
Power Brakes	Yes	AM/FM/Cassette	No
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
Control System	Fuel Injected		
Comments:	None		

DATA SHEET NO. 2

VEHICLE THROTLE CONTROL INSPECTION

VEHICLE			
YEAR	**2006**	MAKE	**DaimlerChrysler Corporation**
MODEL	**Jeep Wrangler SE**	BODY STYLE	**2-Door MPV**
NHTSA NO.	**C60303**	VIN	**1J4FA29106P741046**
TEST DATE:	**07/10/2006**	TEMPERATURE	**30.0° C**

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.
Does vehicle have a return spring on the accelerator pedal?	No
Describe point of severance.	Throttle cable was disconnected from the throttle shaft.

Comments: None

TEST STATUS:	PASSED —	**x**	FAILED —	

RECORDED BY: **RUPESH B. PATEL** DATE: **07/10/06**

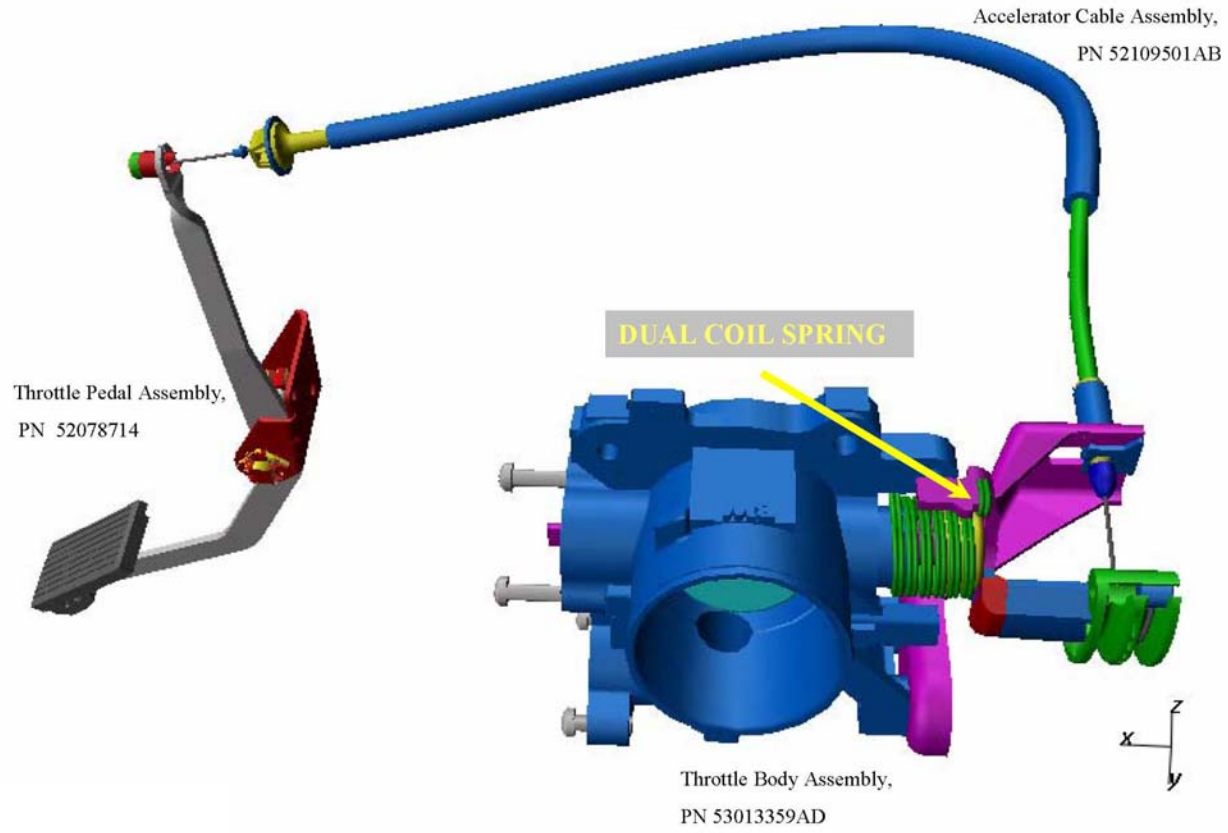
APPROVED BY: **MICHAEL L. DUNLAP** DATE: **07/10/06**

DATA SHEET NO. 3

MANUFACTURER'S DRAWINGS

VEHICLE			
YEAR	**2006**	MAKE	**DaimlerChrysler Corporation**
MODEL	**Jeep Wrangler SE**	BODY STYLE	**2-Door MPV**
NHTSA NO.	**C60303**	VIN	**1J4FA29106P741046**
TEST DATE:	**07/10/2006**	TEMPERATURE	**30.0° C**

2.4L Accelerator Control System



DATA SHEET NO. 4

TEST EXECUTION

VEHICLE			
YEAR	**2006**	MAKE	**DaimlerChrysler Corporation**
MODEL	**Jeep Wrangler SE**	BODY STYLE	**2-Door MPV**
NHTSA NO.	**C60303**	VIN	**1J4FA29106P741046**
TEST DATE:	**07/10/2006**	TEMPERATURE	**29.9° 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%	**25.2%**	**5486.3**	**32.2°C**	**0.0%**	**130 msec**	**Pass**
2	50%	**50.0%**	**5837.4**	**32.2°C**	**0.0%**	**170 msec**	**Pass**
3	75%	**75.0%**	**5822.5**	**32.2°C**	**0.0%**	**150 msec**	**Pass**
4	100%	**100.0%**	**5778.1**	**32.2°C**	**0.0%**	**150 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%	**25.0 %**				**130 msec**	**Pass**
2	50%	**50.0%**				**130 msec**	**Pass**
3	75%	**75.1%**				**140 msec**	**Pass**
4	100%	**99.9%**				**150 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: **RUPESH B. PATEL** DATE: **07/10/06**

APPROVED BY: **MICHAEL L. DUNLAP** DATE: **07/10/06**

DATA SHEET NO. 4…(CONTINUED)

TEST EXECUTION

VEHICLE			
YEAR	**2006**	MAKE	**DaimlerChrysler Corporation**
MODEL	**Jeep Wrangler SE**	BODY STYLE	**2-Door MPV**
NHTSA NO.	**C60303**	VIN	**1J4FA29106P741046**
TEST DATE:	**07/10/06**	TEMPERATURE	**29.9° 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%	**25.2%**	**5484.6**	**62.7°C**	**0.0%**	**160 msec**	**Pass**
2	50%	**50.3%**	**5753.3**	**62.7°C**	**0.0%**	**150 msec**	**Pass**
3	75%	**75.1%**	**5812.3**	**62.7°C**	**0.0%**	**140 msec**	**Pass**
4	100%	**100.2%**	**5771.5**	**62.7°C**	**0.0%**	**150 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%	**25.2%**				**110 msec**	**Pass**
2	50%	**50.2%**				**140 msec**	**Pass**
3	75%	**75.2%**				**140 msec**	**Pass**
4	100%	**100.3%**				**150 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: **RUPESH B. PATEL** DATE: **07/10/06**

APPROVED BY: **MICHAEL L. DUNLAP** DATE: **07/10/06**

DATA SHEET NO. 4…(CONTINUED)

TEST EXECUTION

VEHICLE			
YEAR	**2006**	MAKE	**DaimlerChrysler Corporation**
MODEL	**Jeep Wrangler SE**	BODY STYLE	**2-Door MPV**
NHTSA NO.	**C60303**	VIN	**1J4FA29106P741046**
TEST DATE:	**07/10/06**	TEMPERATURE	**30.2° 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%	**25.1%**	**5580.7**	**85.2°C**	**0.0%**	**140 msec**	**Pass**
2	50%	**50.2%**	**5961.6**	**85.2°C**	**0.0%**	**140 msec**	**Pass**
3	75%	**75.0%**	**5880.7**	**85.2°C**	**0.0%**	**160 msec**	**Pass**
4	100%	**100.0%**	**5876.3**	**85.2°C**	**0.0%**	**150 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%	**25.1%**				**170 msec**	**Pass**
2	50%	**50.2%**				**140 msec**	**Pass**
3	75%	**75.1%**				**140 msec**	**Pass**
4	100%	**100.6 %**				**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: **RUPESH B. PATEL** DATE: **07/10/06**

APPROVED BY: **MICHAEL L. DUNLAP** DATE: **07/10/06**

DATA SHEET NO. 4…(CONTINUED)

TEST EXECUTION

VEHICLE			
YEAR	**2006**	MAKE	**DaimlerChrysler Corporation**
MODEL	**Jeep Wrangler SE**	BODY STYLE	**2-Door MPV**
NHTSA NO.	**C60303**	VIN	**1J4FA29106P741046**
TEST DATE:	**07/10/06**	TEMPERATURE	**29.9° C**

THROTTLE CONTROL SYSTEM CONDITION:				SEVERANCE, 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%	**25.0%**	**5492.1**	**78.6°C**	**0.0%**	**150 msec**	**Pass**
2	50%	**50.9 %**	**5848.4**	**78.6°C**	**0.0%**	**160 msec**	**Pass**
3	75%	**75.3%**	**5793.6**	**78.6°C**	**0.0%**	**150 msec**	**Pass**
4	100%	**100.5%**	**5784.8**	**78.6°C**	**0.0%**	**140 msec**	**Pass**

THROTTLE CONTROL SYSTEM CONDITION:				SEVERANCE, 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%	**25.2%**				**130 msec**	**Pass**
2	50%	**50.2%**				**130 msec**	**Pass**
3	75%	**74.9%**				**140 msec**	**Pass**
4	100%	**100.0 %**				**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: **RUPESH B. PATEL** DATE: **07/10/06**

APPROVED BY: **MICHAEL L. DUNLAP** DATE: **07/10/06**

APPENDIX A
PHOTOGRAPHS

2006 JEEP WRANGLER
NHTSA NO. C60303
FMVSS NO. 124

Figure A-1: Front View of Vehicle

2006 JEEP WRANGLER
NHTSA NO. C60303
FMVSS NO. 124

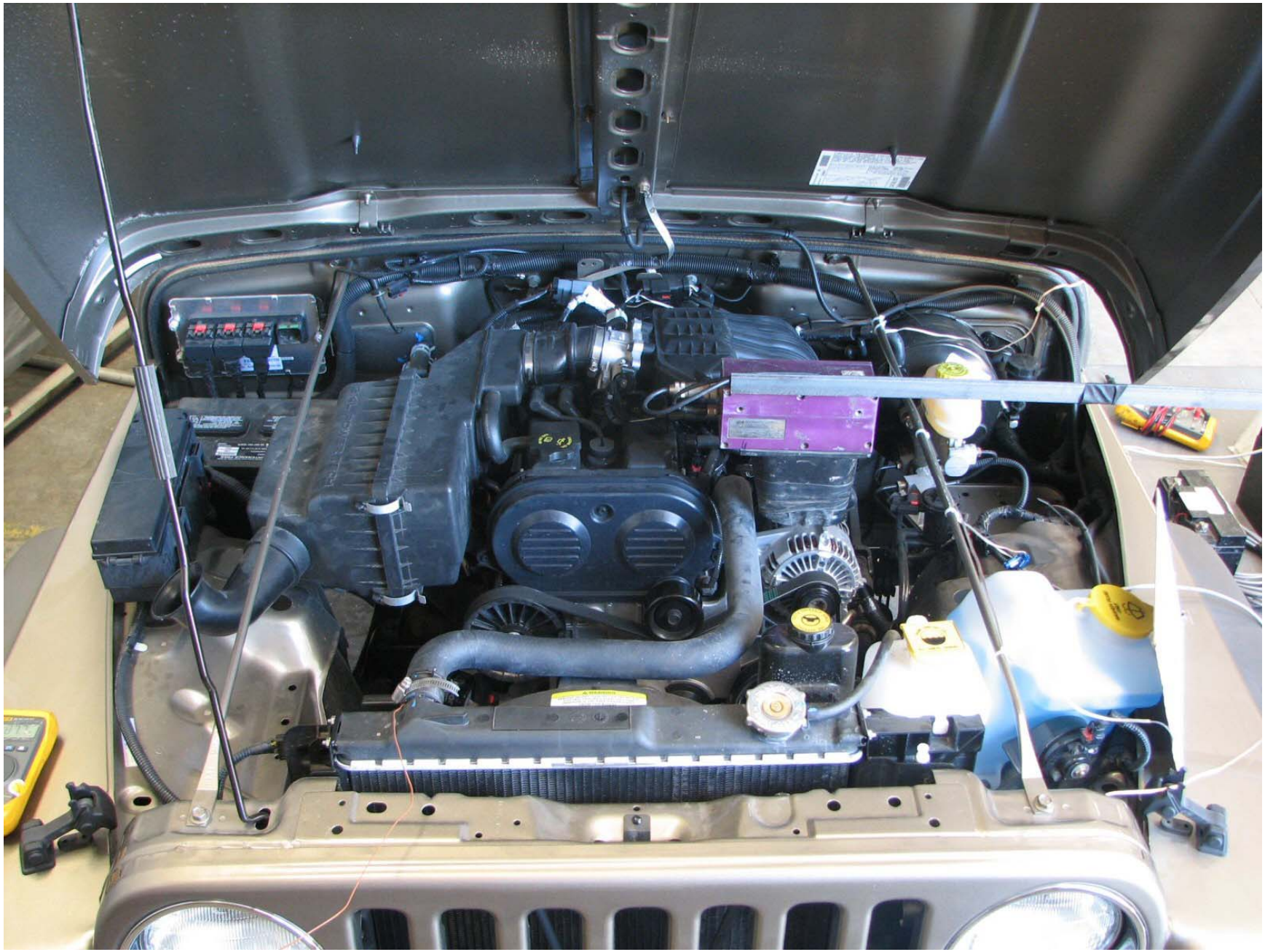
Figure A-2: Left Side View of Vehicle

2006 JEEP WRANGLER
NHTSA NO. C60303
FMVSS NO. 124

Figure A-3: Right Side View of Vehicle

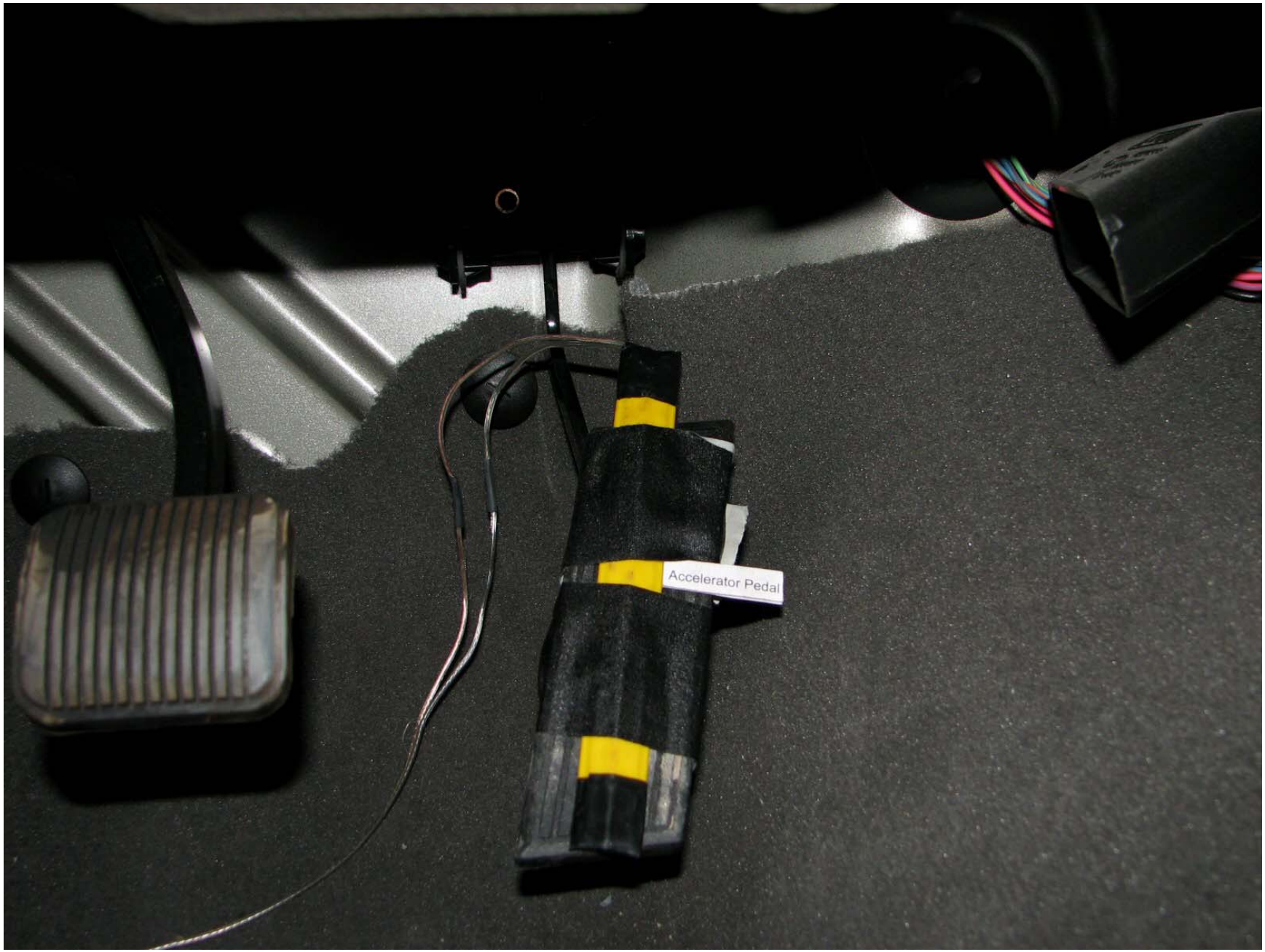
2006 JEEP WRANGLER
NHTSA NO. C60303
FMVSS NO. 124

Figure A-4: Vehicle's Certification and Tire Information Label



2006 JEEP WRANGLER
NHTSA NO. C60303
FMVSS NO. 124

Figure A-5: Vehicle's Engine Compartment



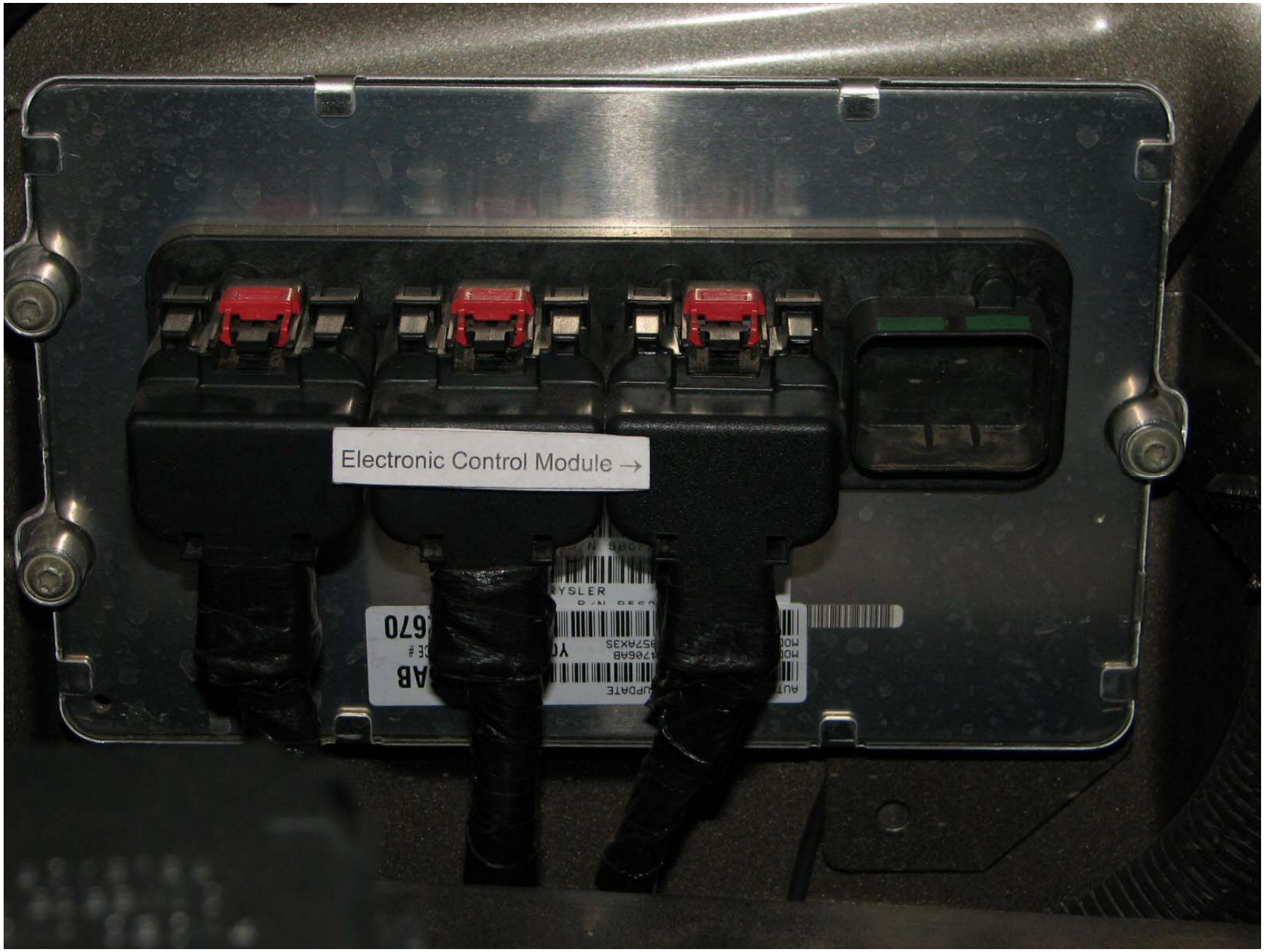
2006 JEEP WRANGLER
NHTSA NO. C60303
FMVSS NO. 124

Figure A-6: Vehicle's Accelerator Pedal Assembly

2006 JEEP WRANGLER Figure A-7: Spring 1and 2 Located on Vehicle's Accelerator Control System (Throttle Body)
NHTSA NO. C60303
FMVSS NO. 124

2006 JEEP WRANGLER
NHTSA NO. C60303
FMVSS NO. 124

Figure A-8: Throttle Plate Sensor Located on Vehicle's Accelerator Control System



2006 JEEP WRANGLER
NHTSA NO. C60303
FMVSS NO. 124

Figure A-9: Electronic Control Module

2006 JEEP WRANGLER
NHTSA NO. C60303
FMVSS NO. 124

Figure A-10: Vehicle Test Setup

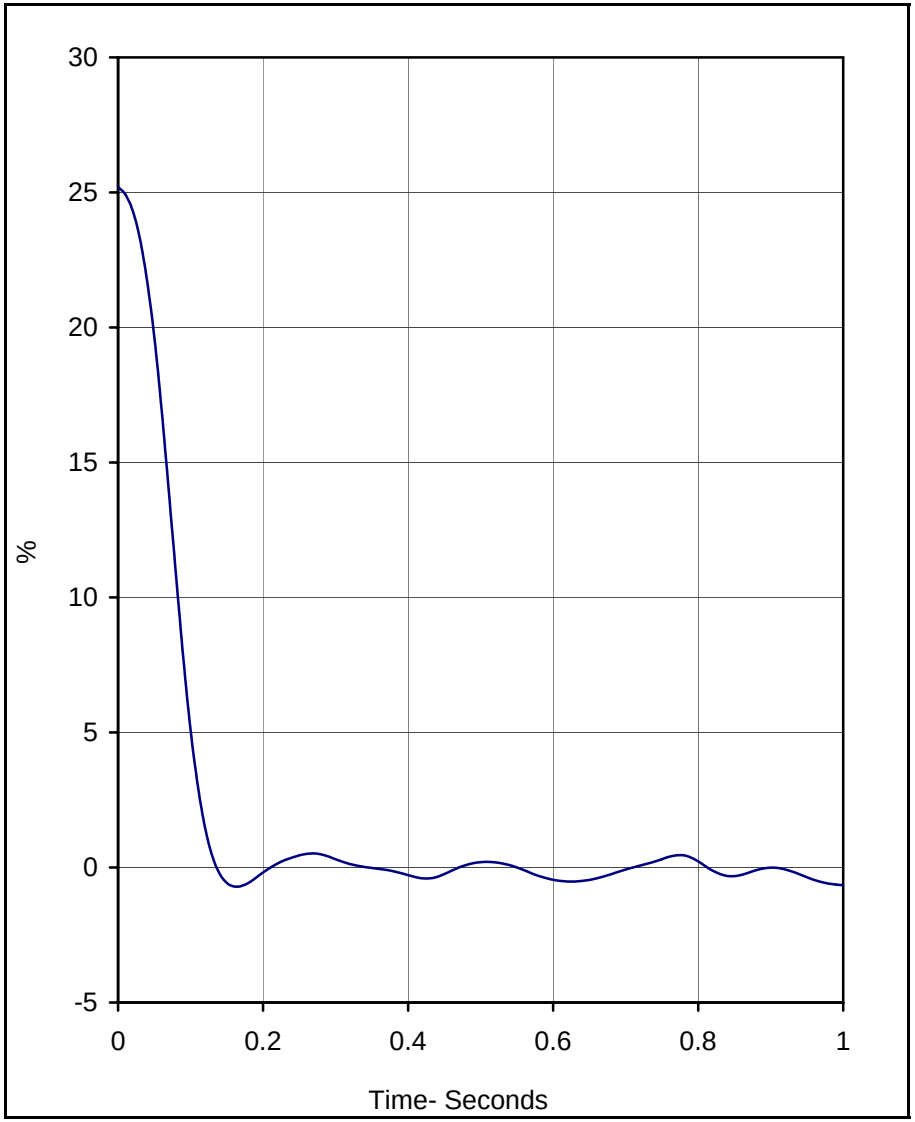
2006 JEEP WRANGLER
NHTSA NO. C60303
FMVSS NO. 124

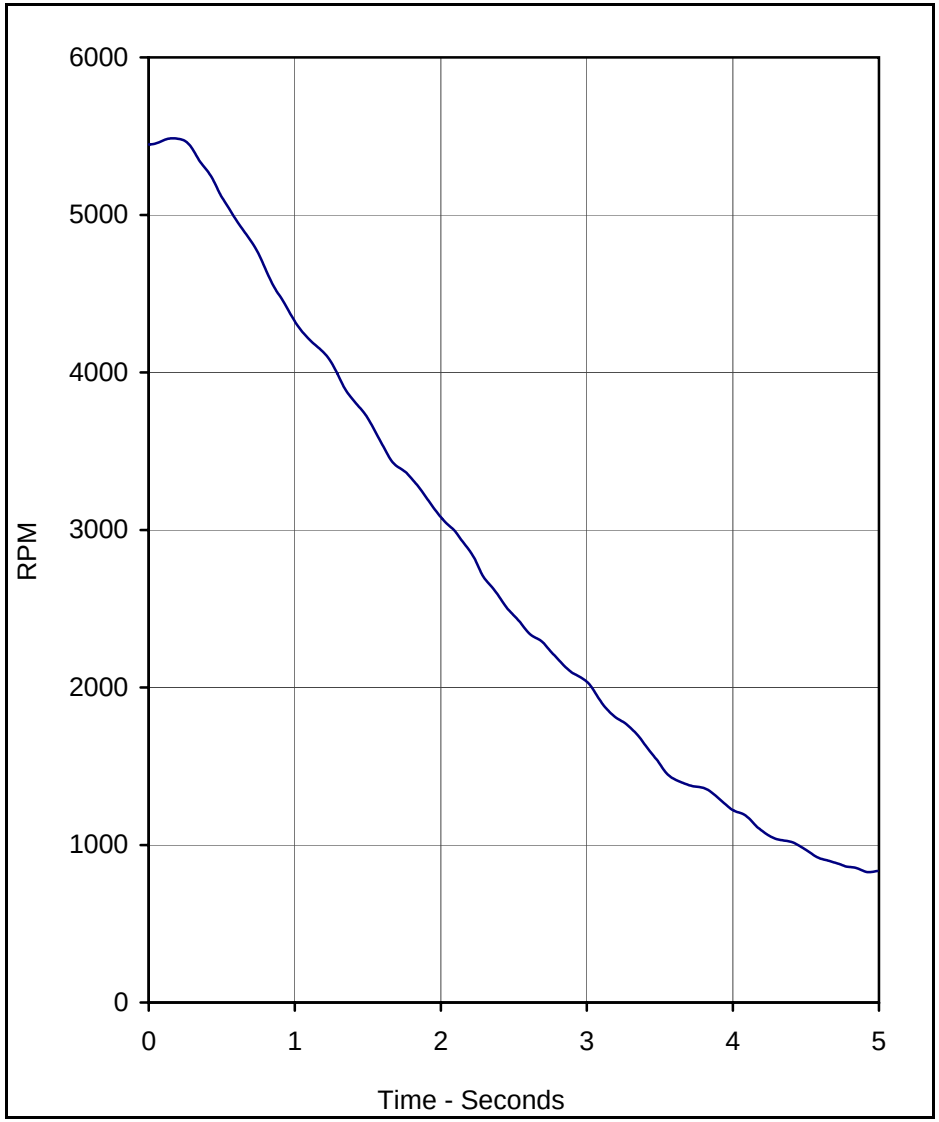
Figure A-11: Instrumentation

2006 JEEP WRANGLER
NHTSA NO. C60303
FMVSS NO. 124

Figure A-12: 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)
%	25.2	0.0	130.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	5486.3	0.2	827.4	4.9	5

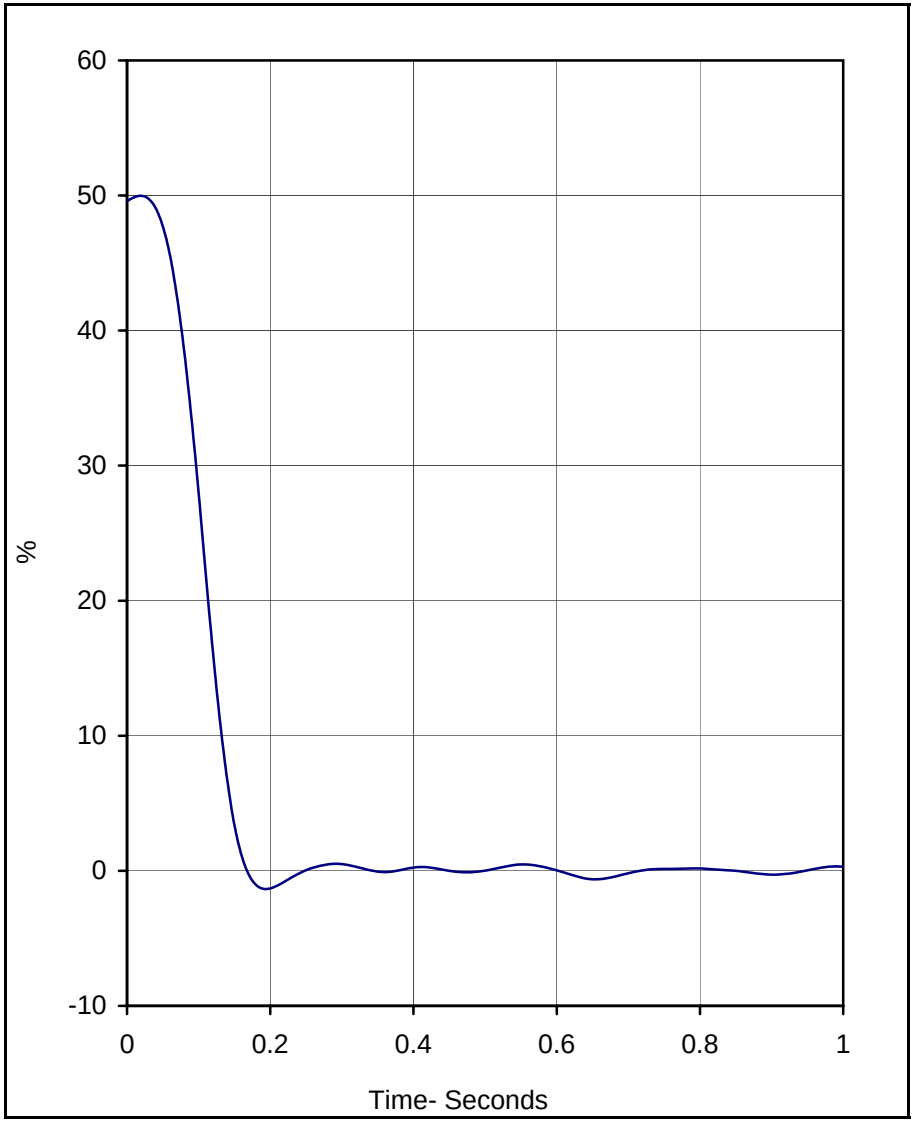
Test Program: FMVSS 124 (Normal Operation)

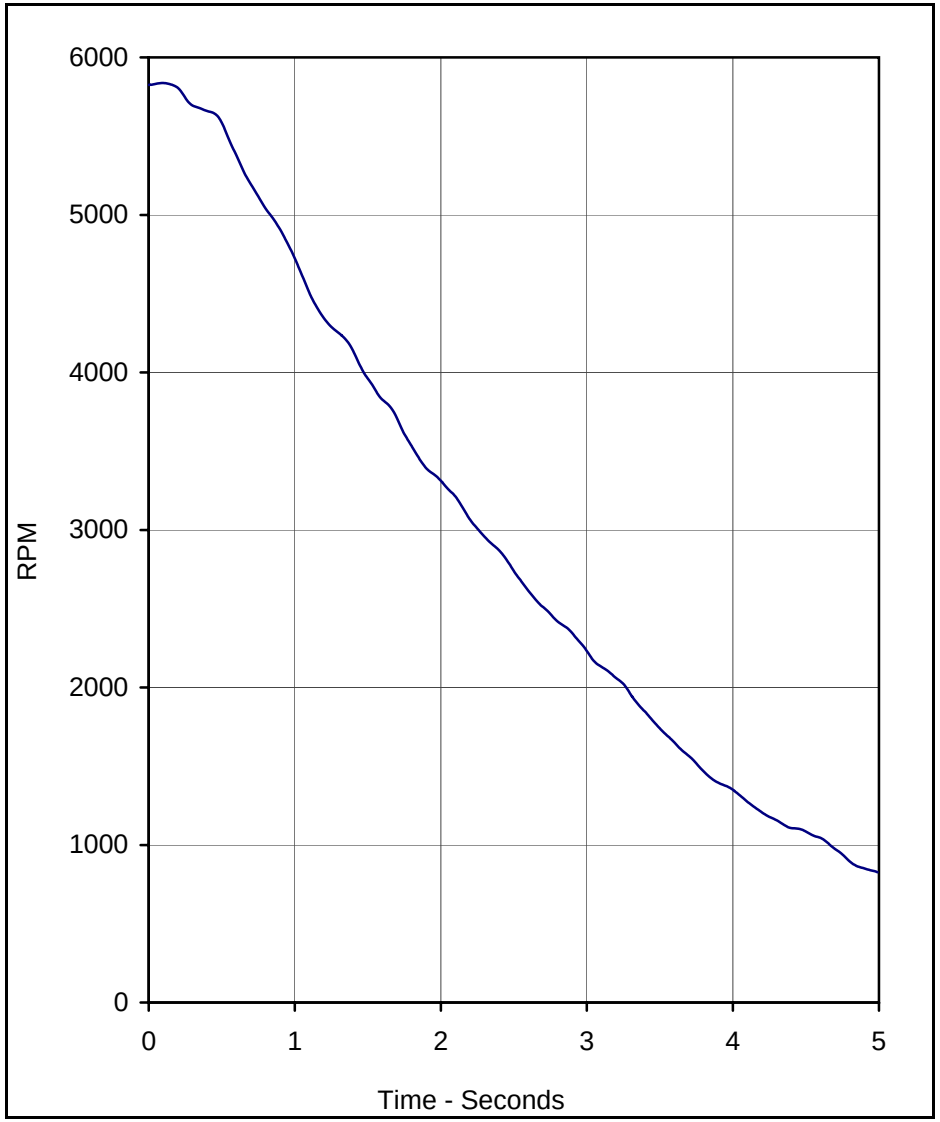
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	50.0	0.0	170.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	5837.4	0.1	827.2	5.0	5

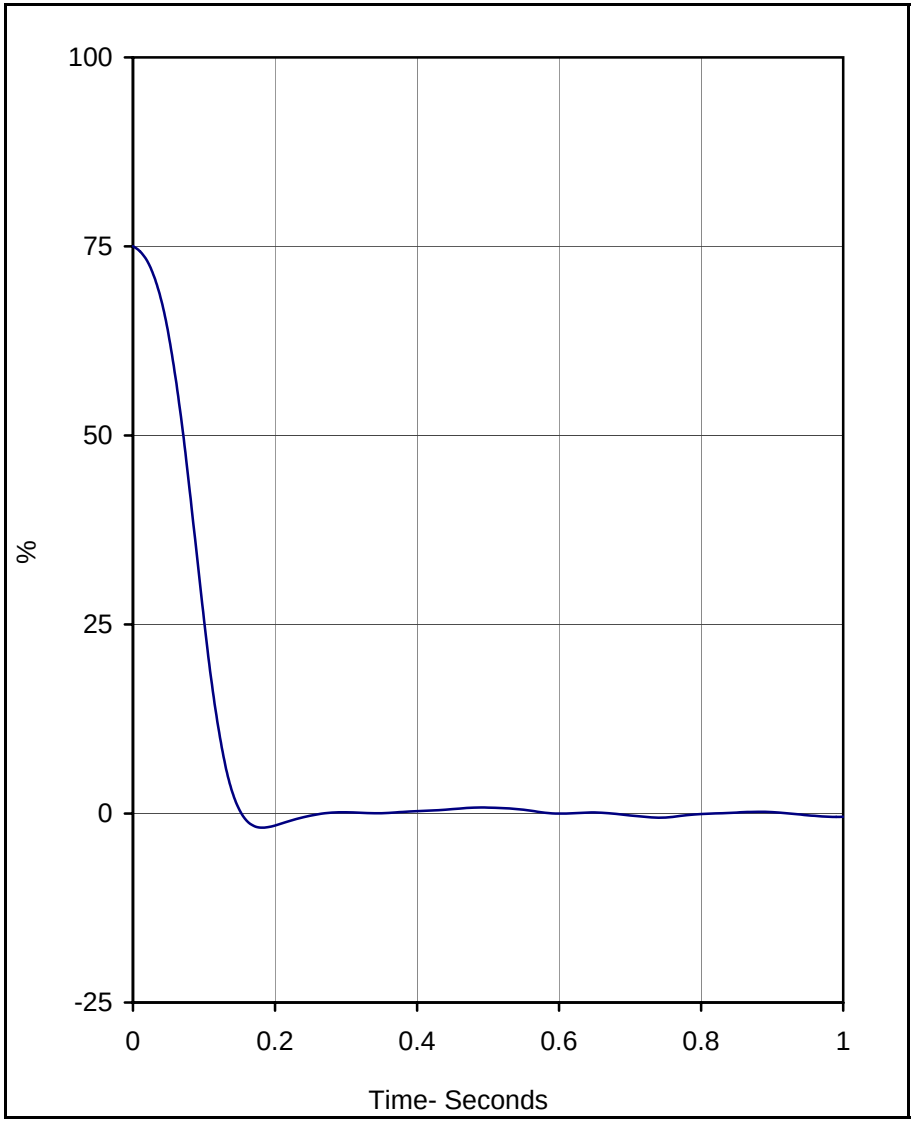
Test Program: FMVSS 124 (Normal Operation)

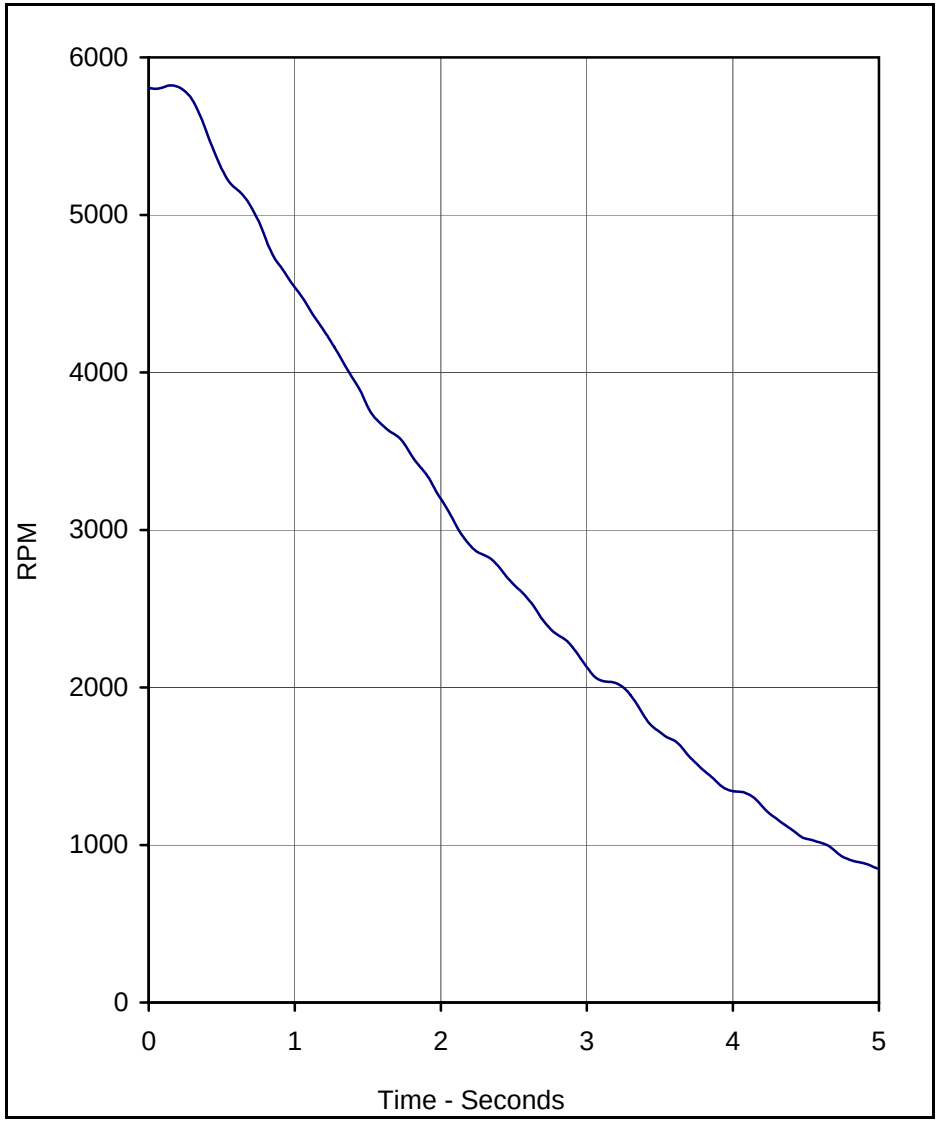
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	75.0	0.0	150.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	5822.5	0.2	850.6	5.0	5

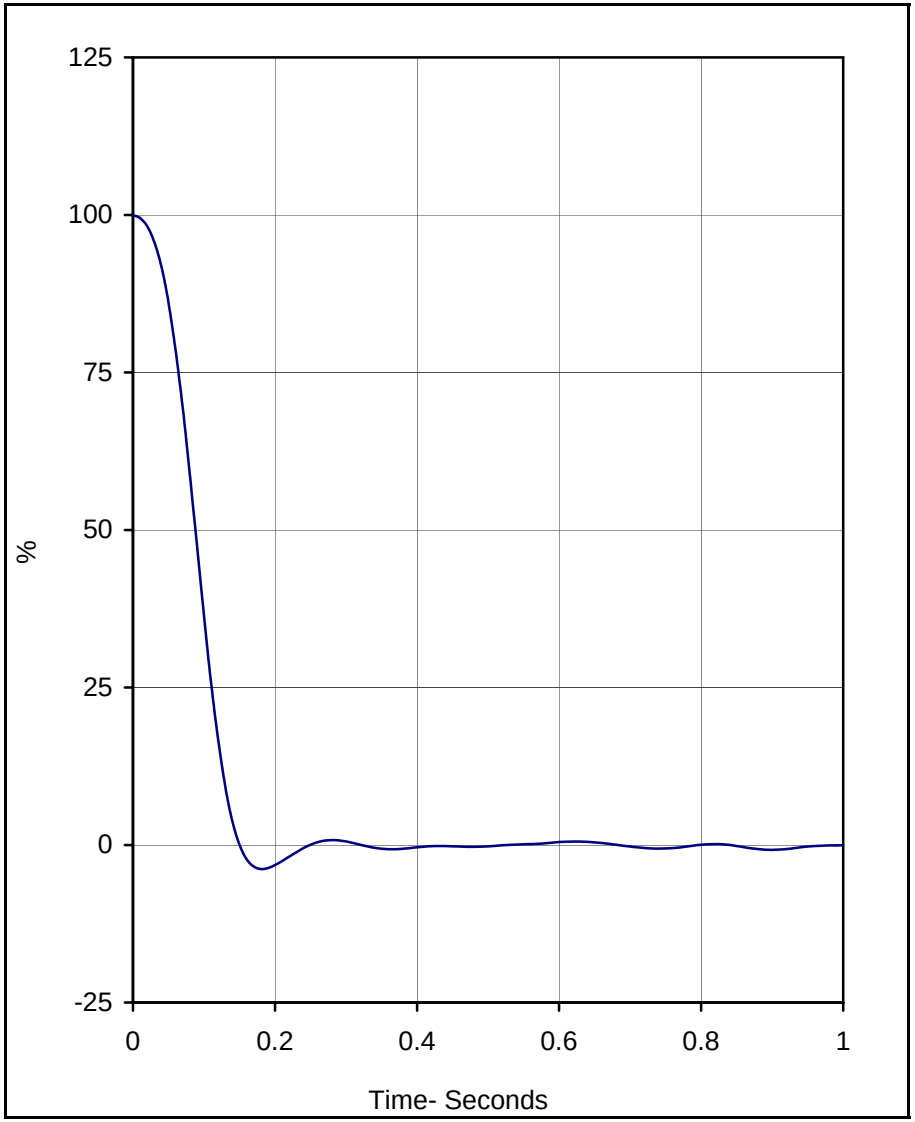
Test Program: FMVSS 124 (Normal Operation)

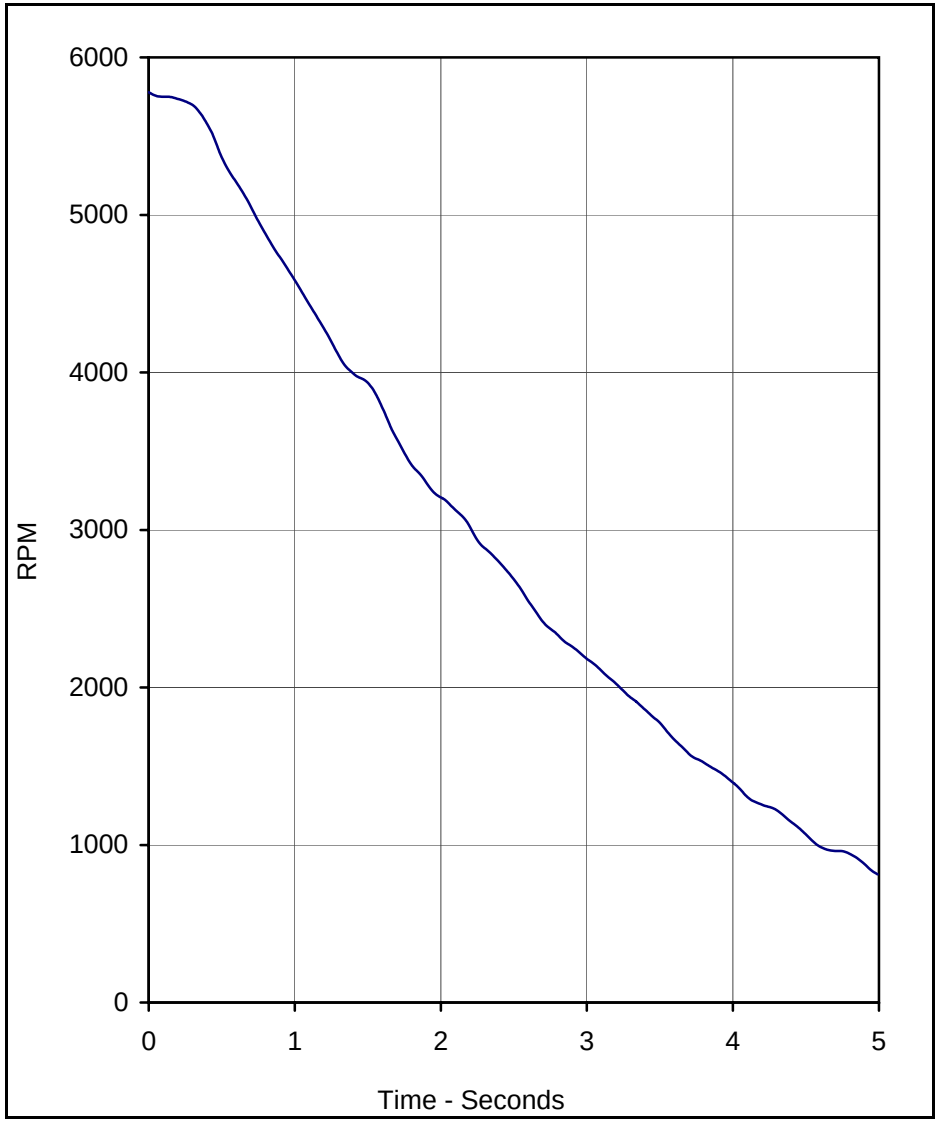
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	100.0	0.0	150.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	5778.1	0.0	813.3	5.0	5

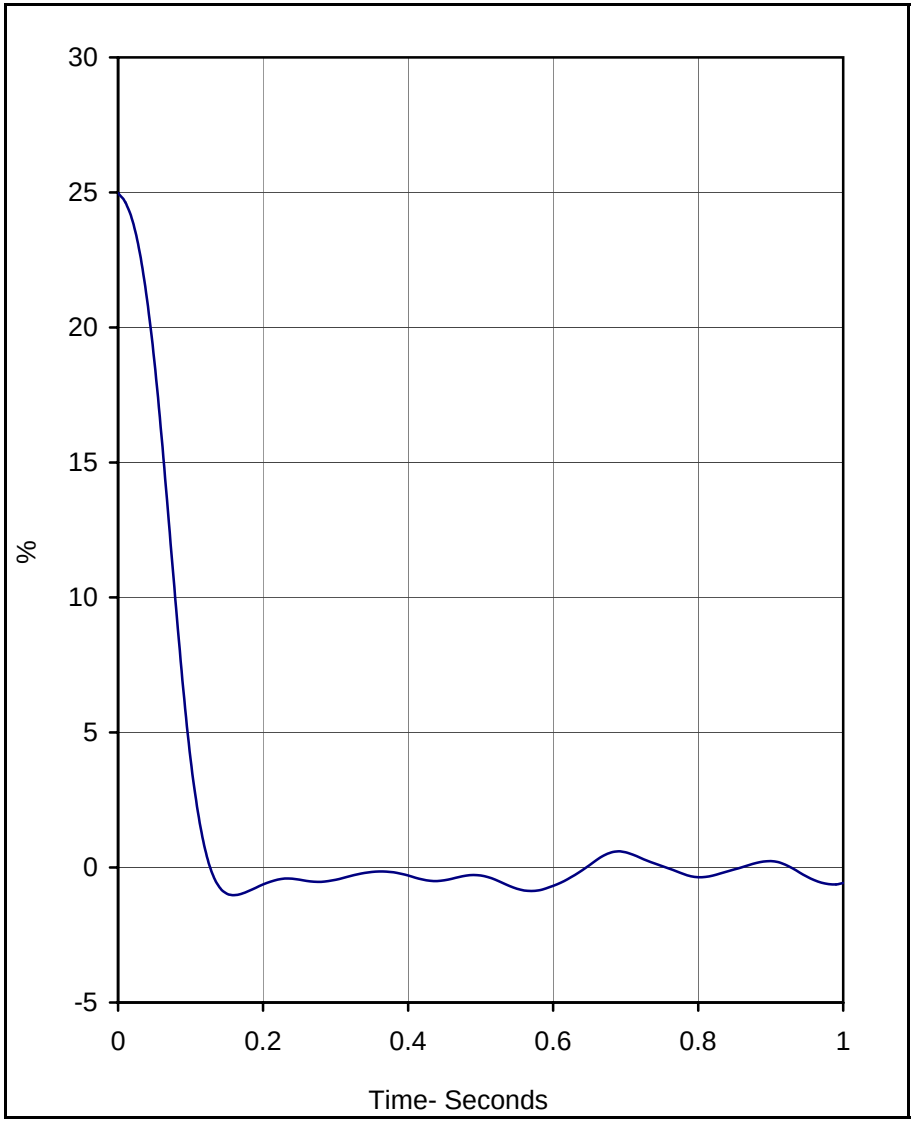
Test Program: FMVSS 124 (Normal Operation)

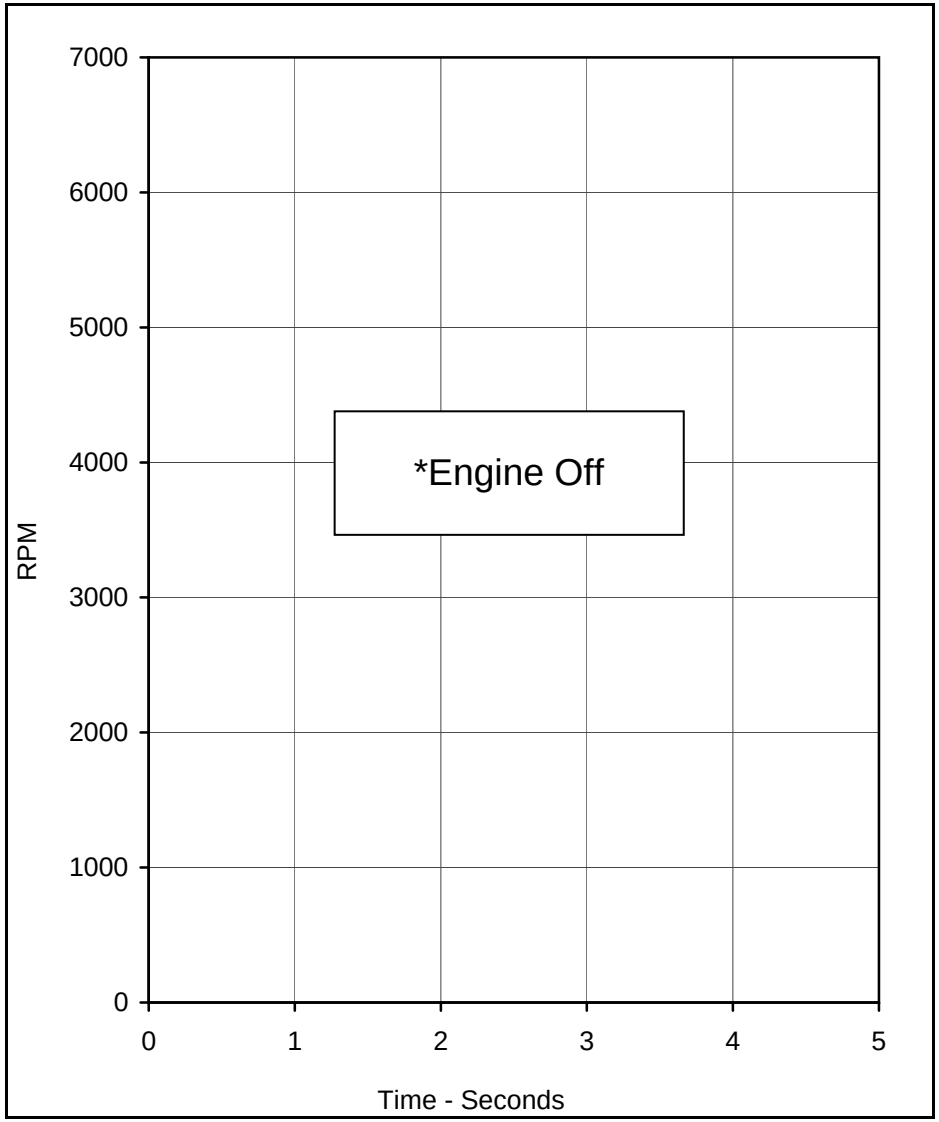
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	25.0	0.0	130.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM					

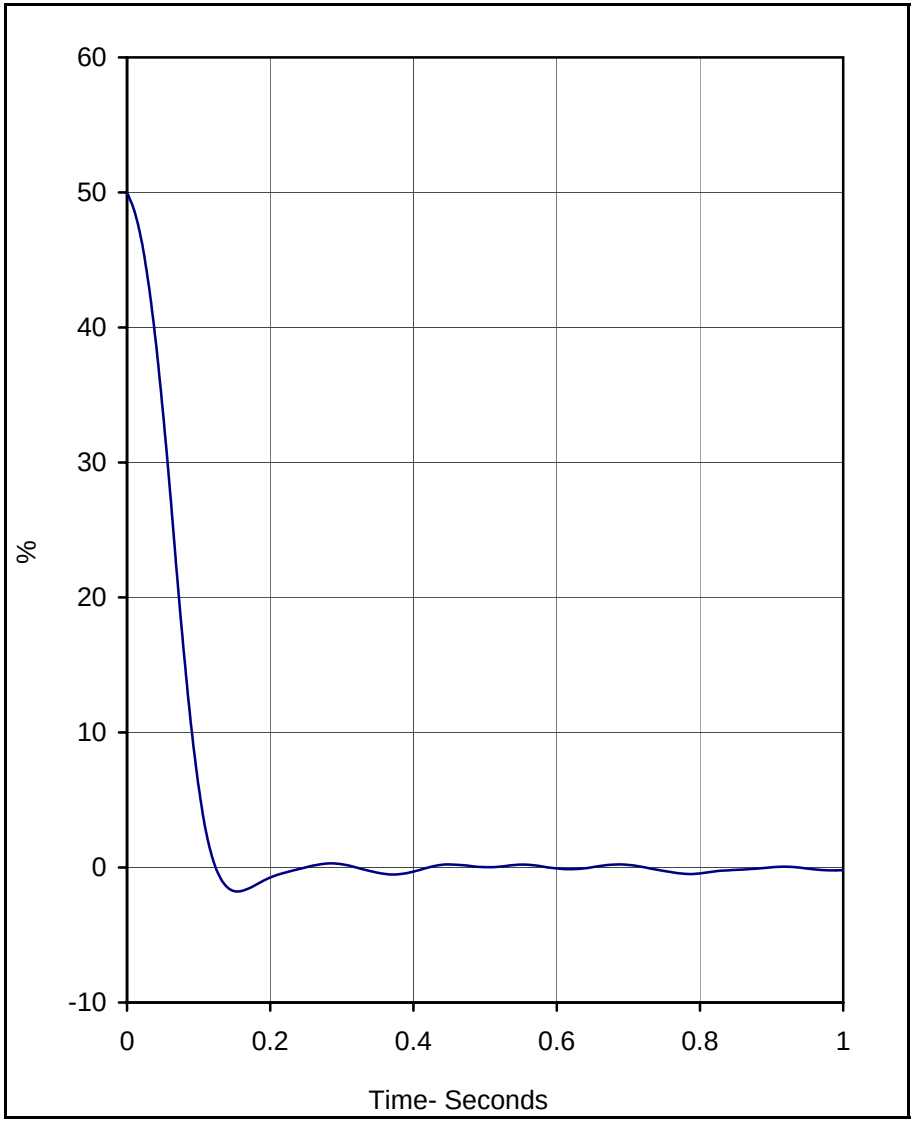
Test Program: FMVSS 124 (Normal Operation)

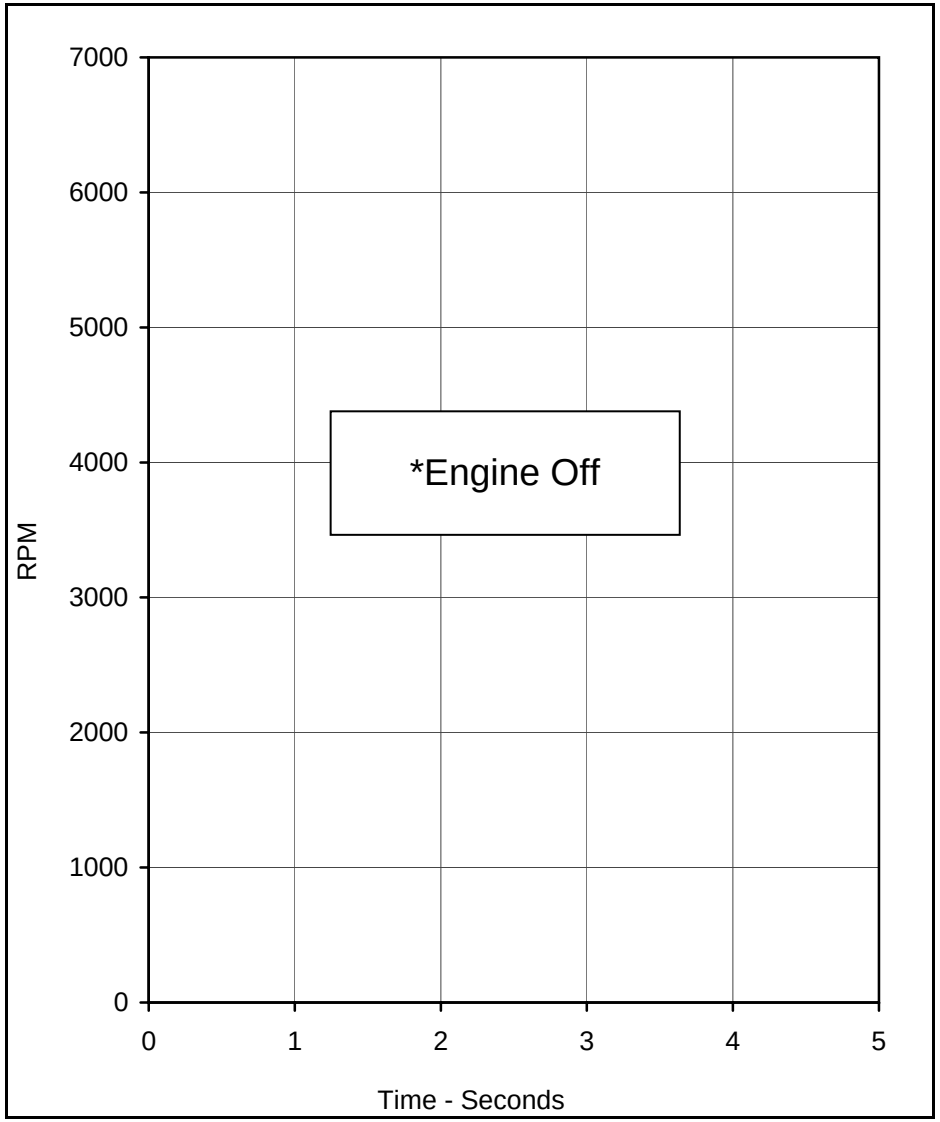
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	50.0	0.0	130.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM					

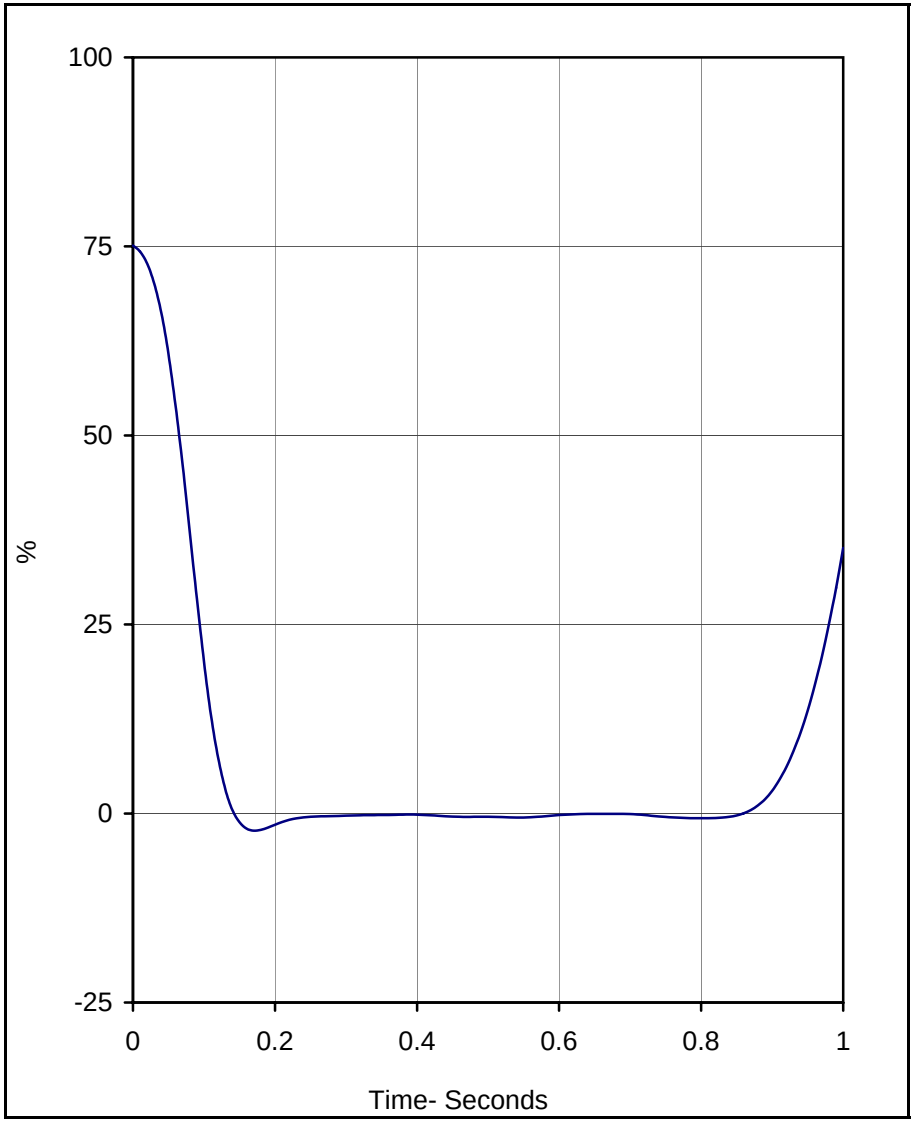
Test Program: FMVSS 124 (Normal Operation)

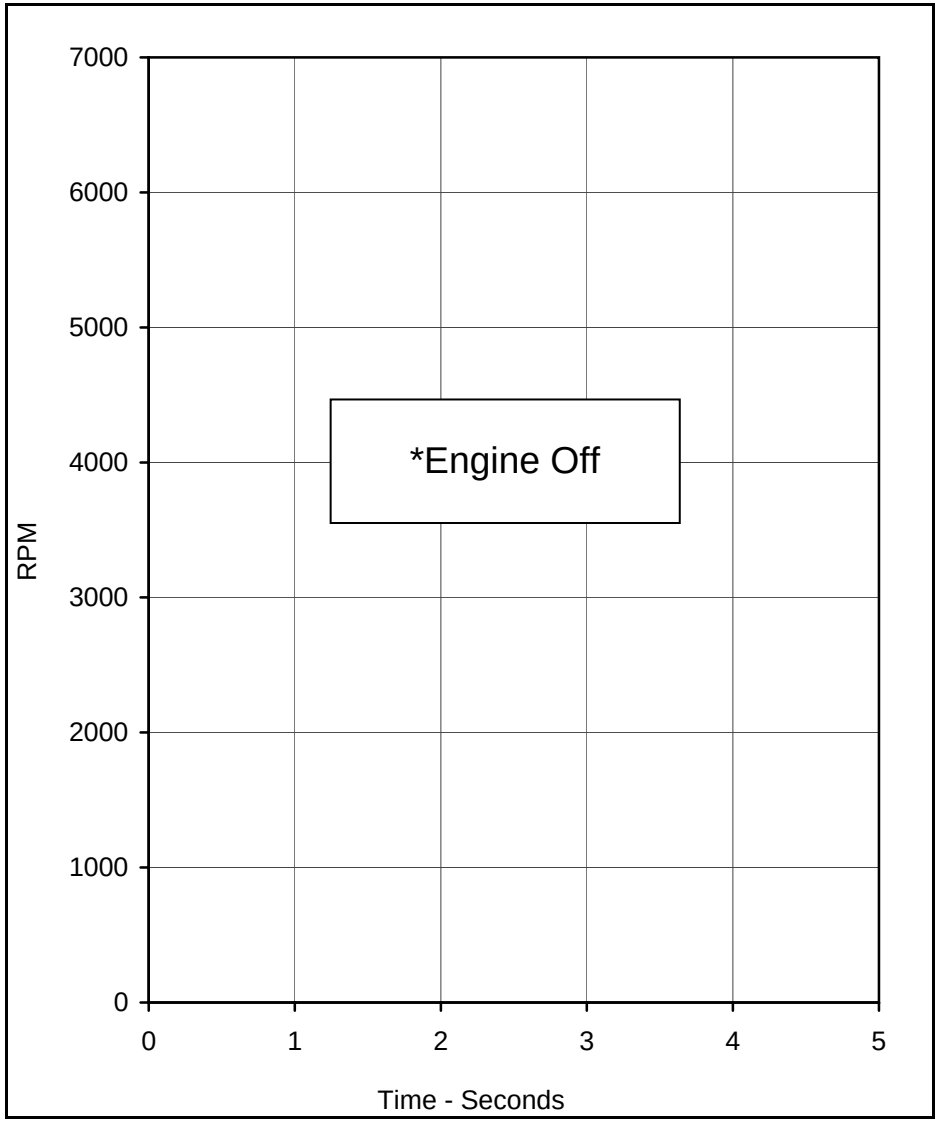
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	75.1	0.0	140.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM					

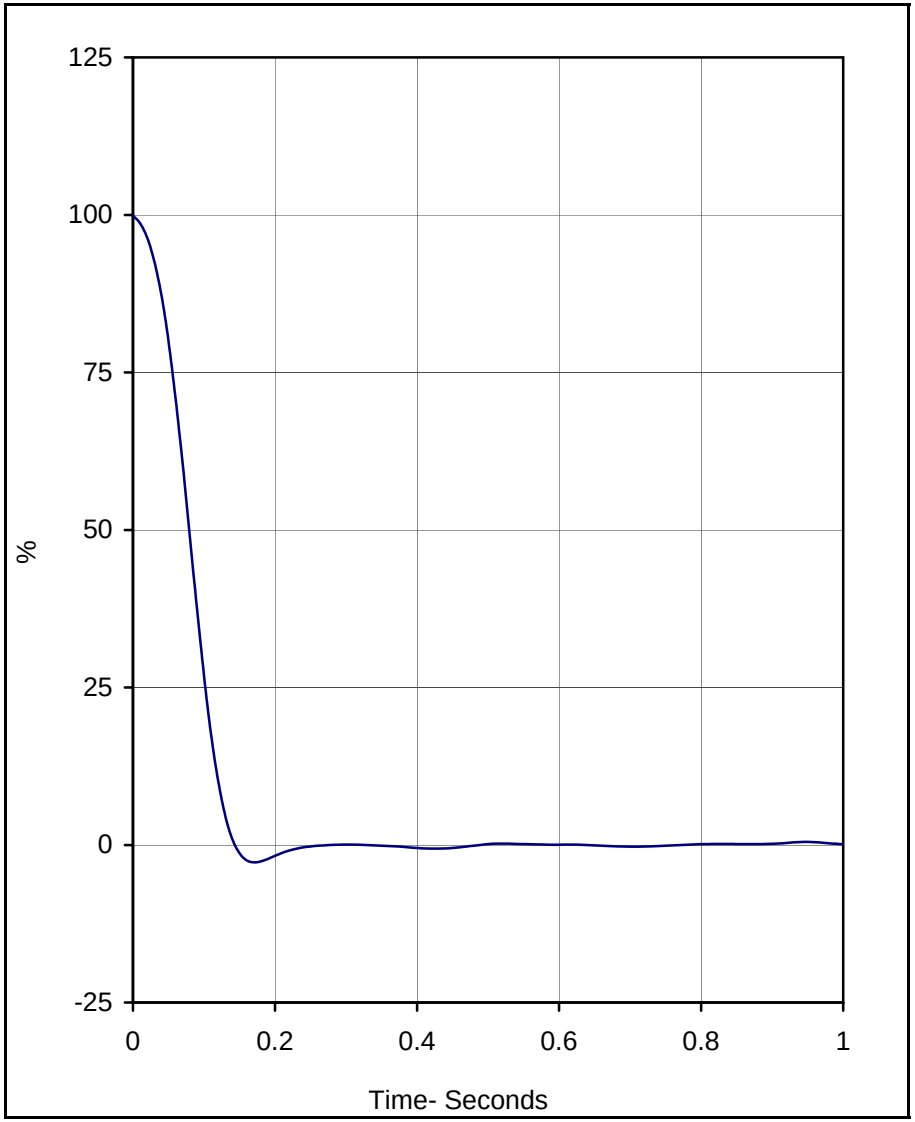
Test Program: FMVSS 124 (Normal Operation)

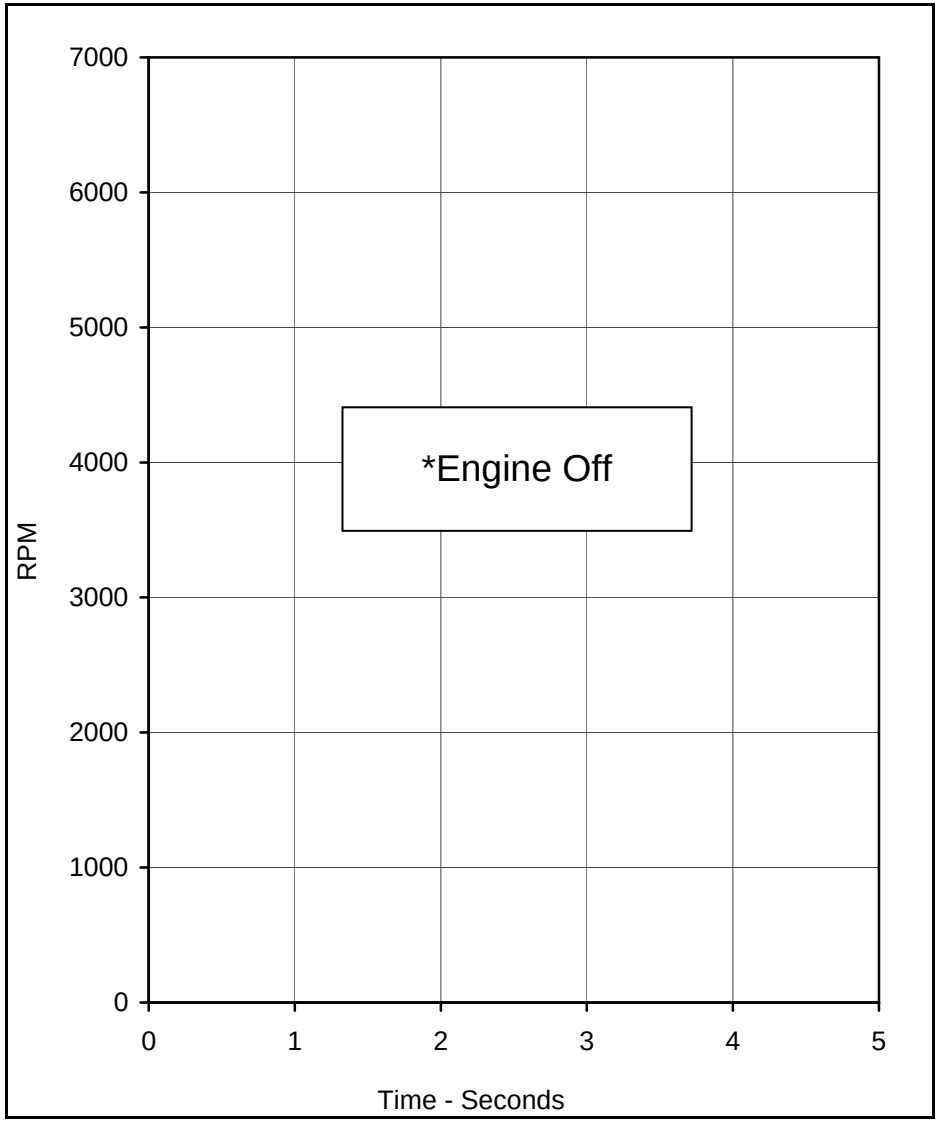
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	99.9	0.0	150.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM					

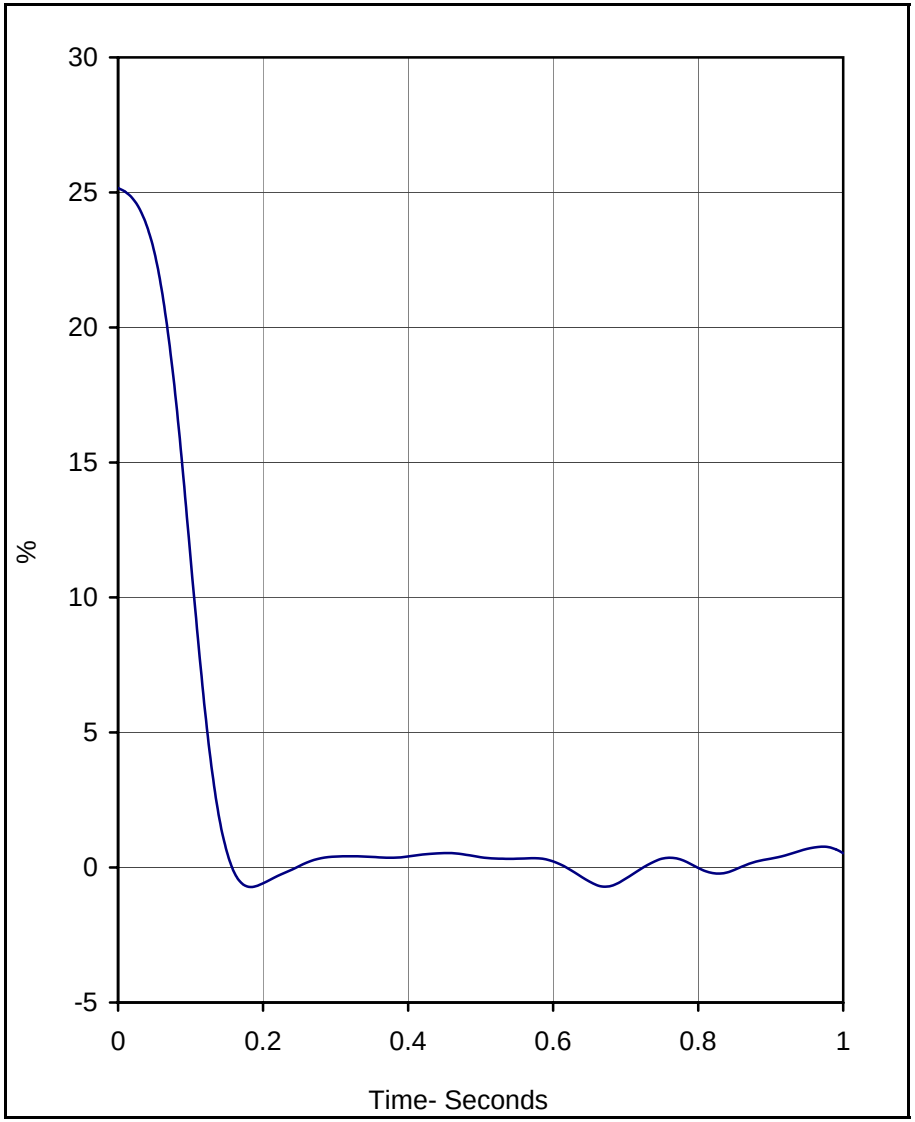
Test Program: FMVSS 124 (Normal Operation)

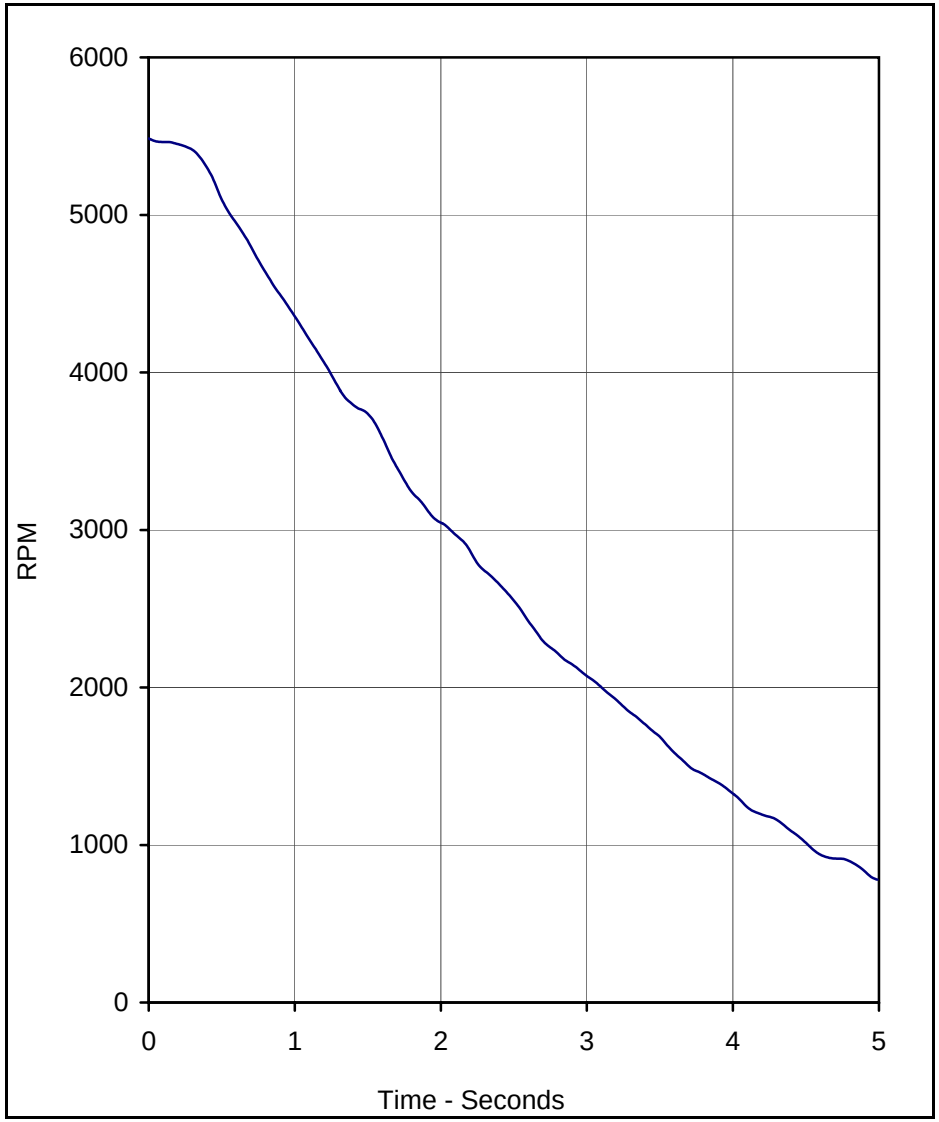
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	25.2	0.0	160.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	5484.6	0.0	780.0	5.0	5

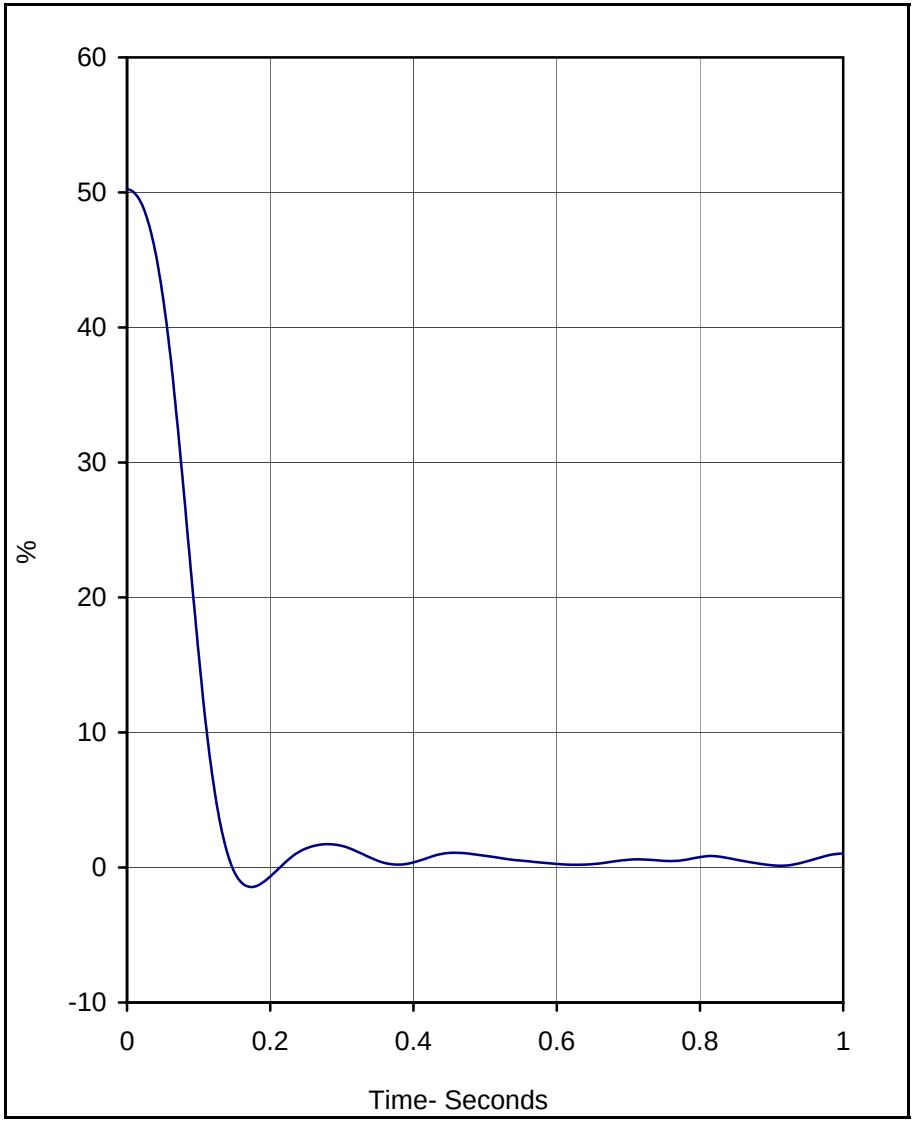
Test Program: FMVSS 124 (Spring #1 Disconnected)

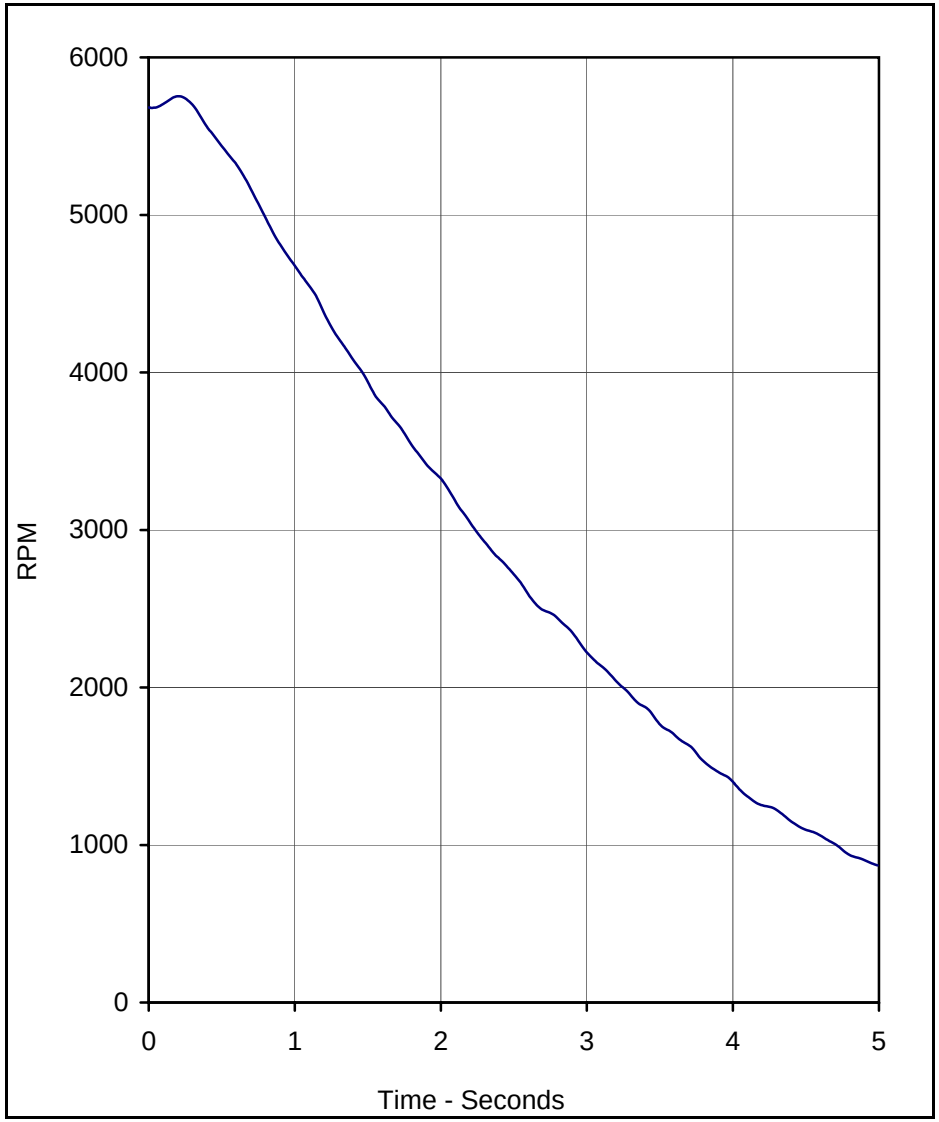
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	50.3	0.0	150.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	5753.3	0.2	870.8	5.0	5

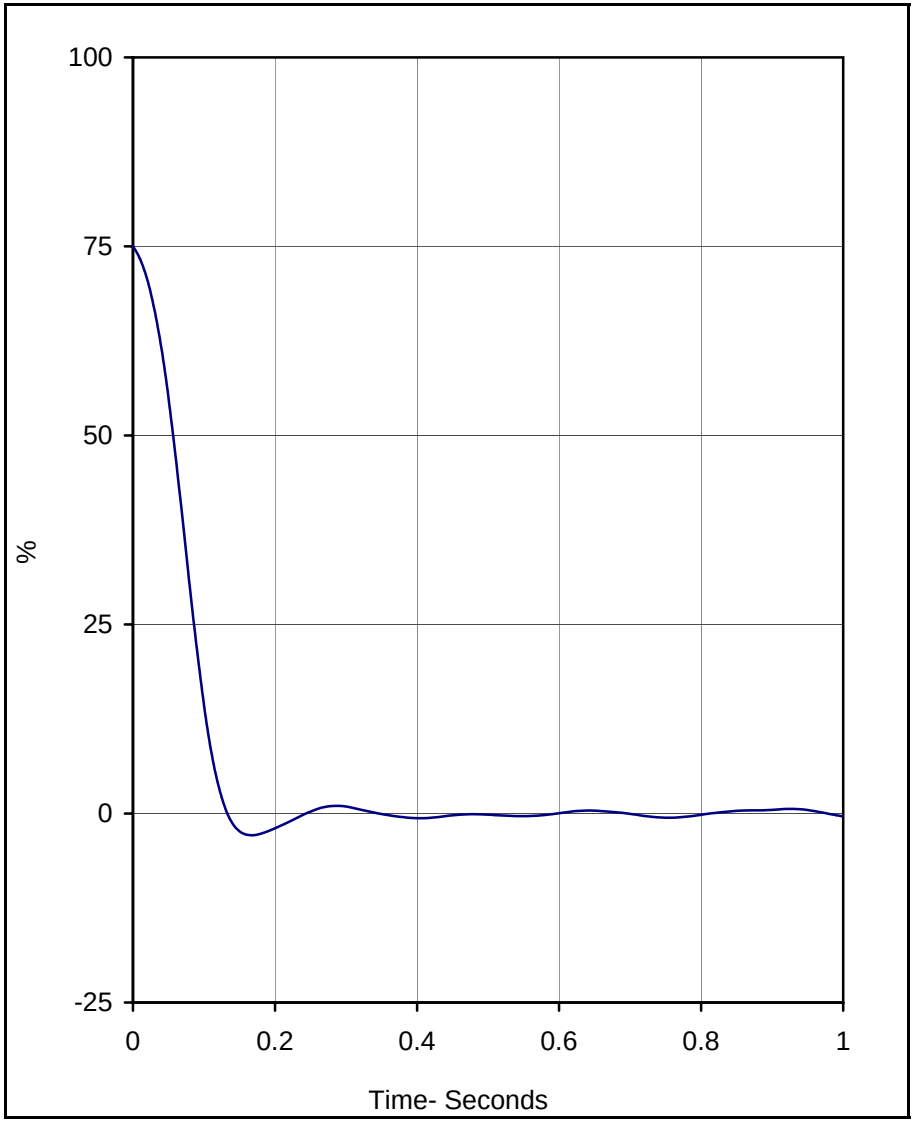
Test Program: FMVSS 124 (Spring #1 Disconnected)

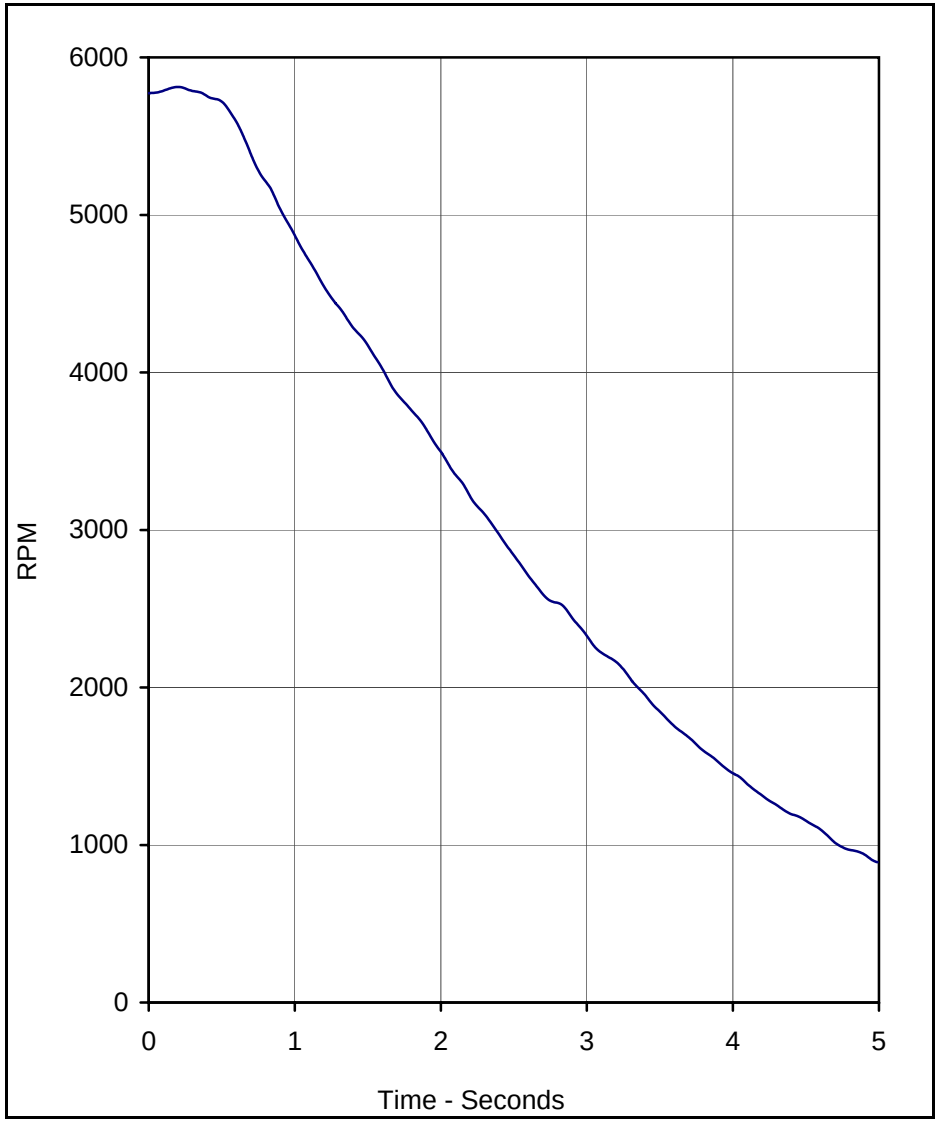
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	75.1	0.0	140.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	5812.3	0.2	890.8	5.0	5

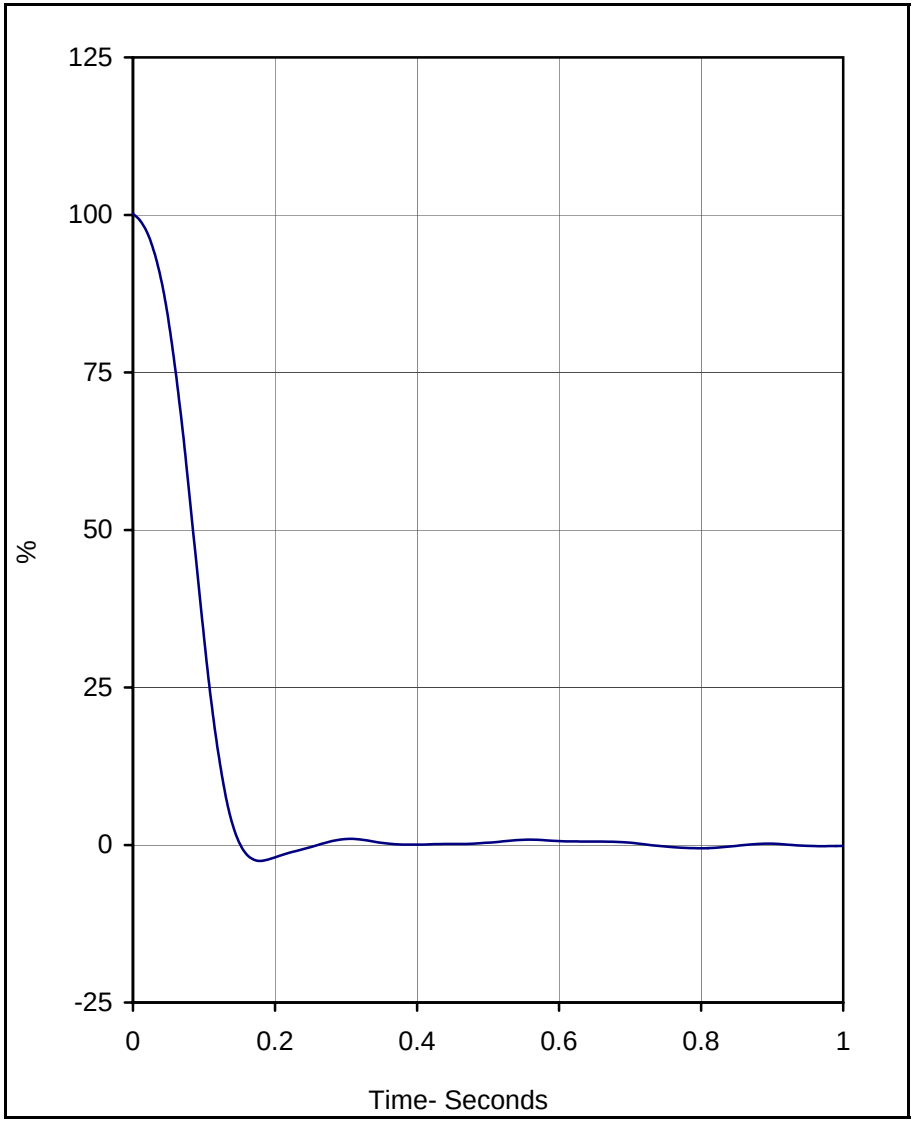
Test Program: FMVSS 124 (Spring #1 Disconnected)

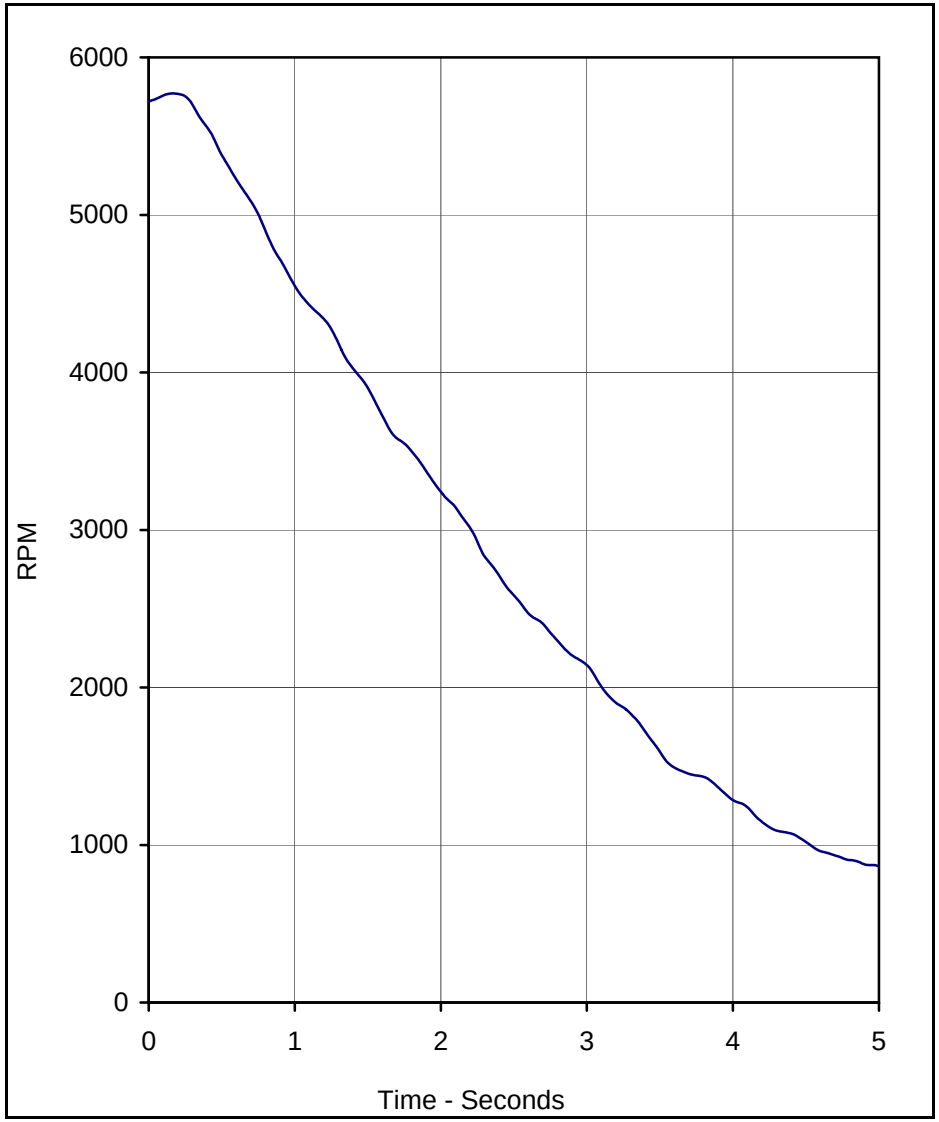
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	100.2	0.0	150.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	5771.5	0.2	867.6	5.0	5

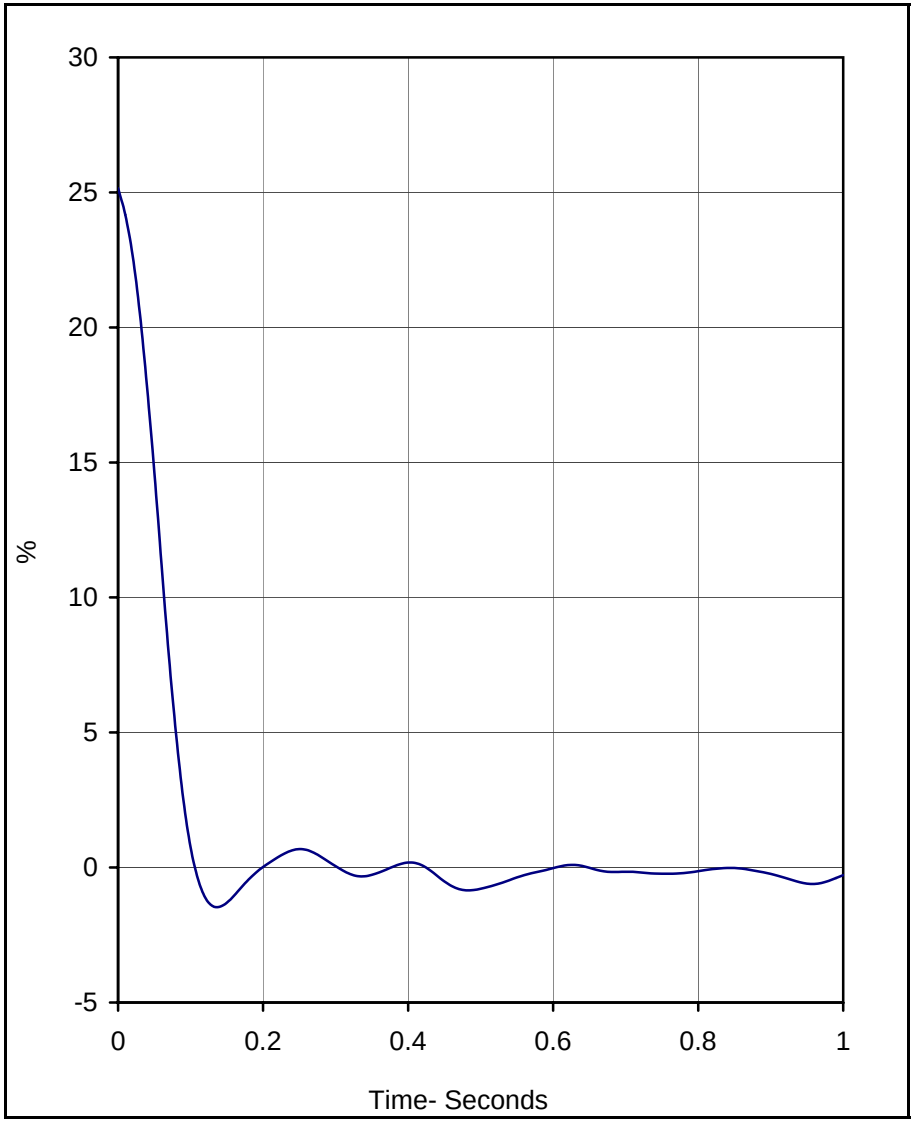
Test Program: FMVSS 124 (Spring #1 Disconnected)

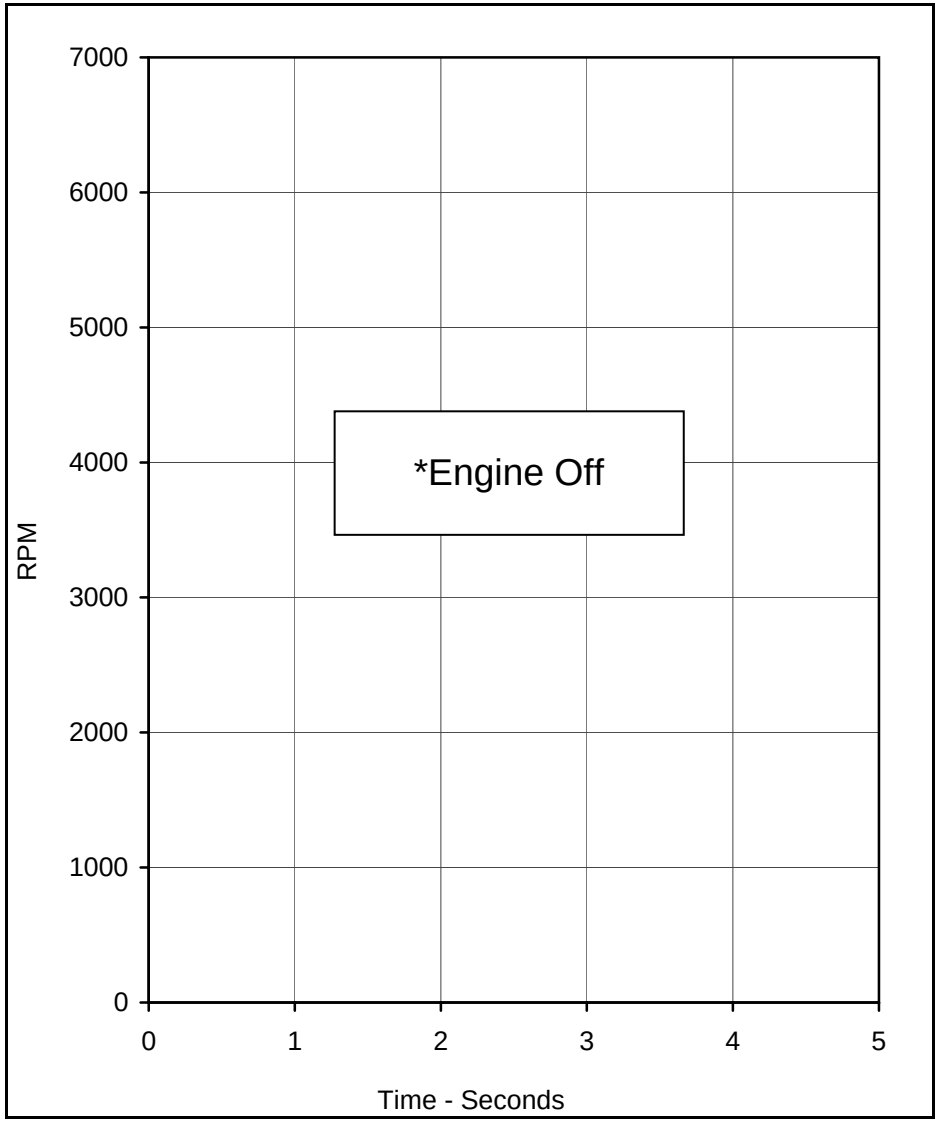
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	25.2	0.0	110.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM					

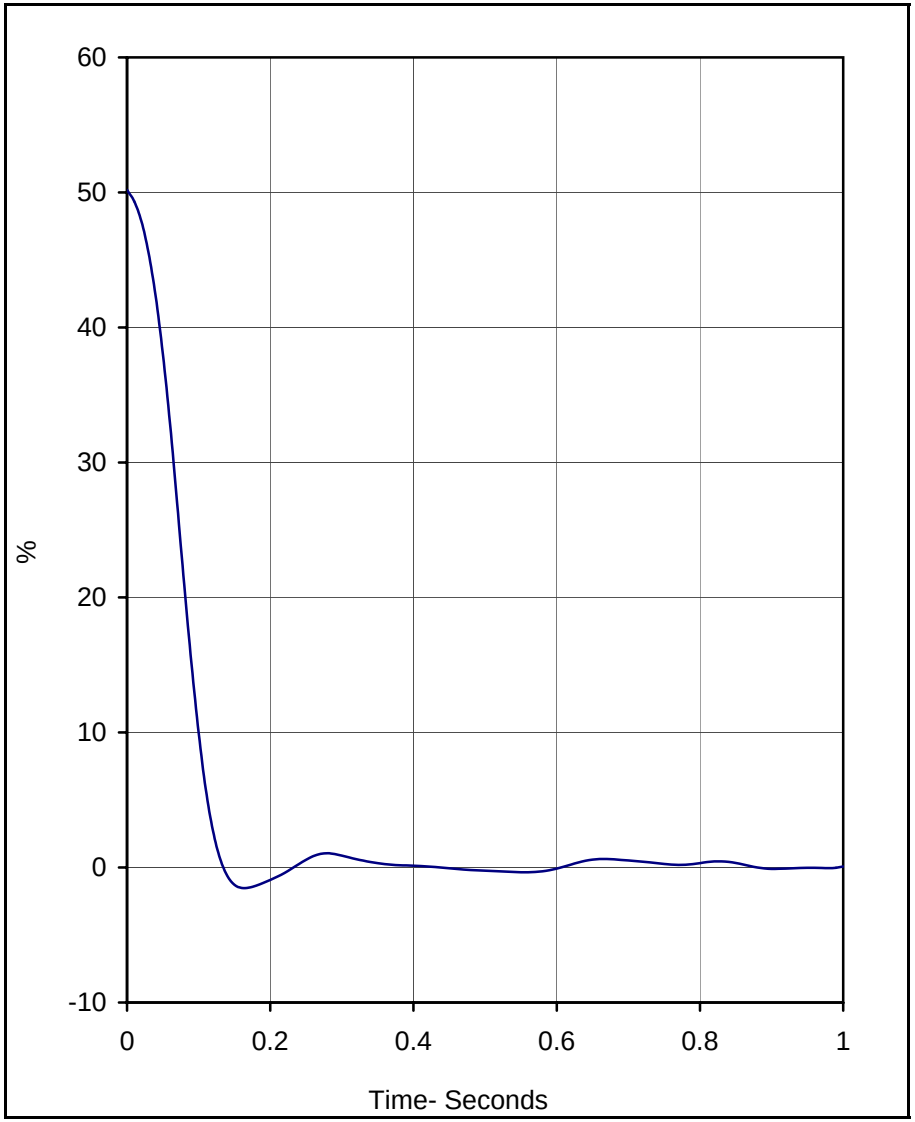
Test Program: FMVSS 124 (Spring #1 Disconnected)

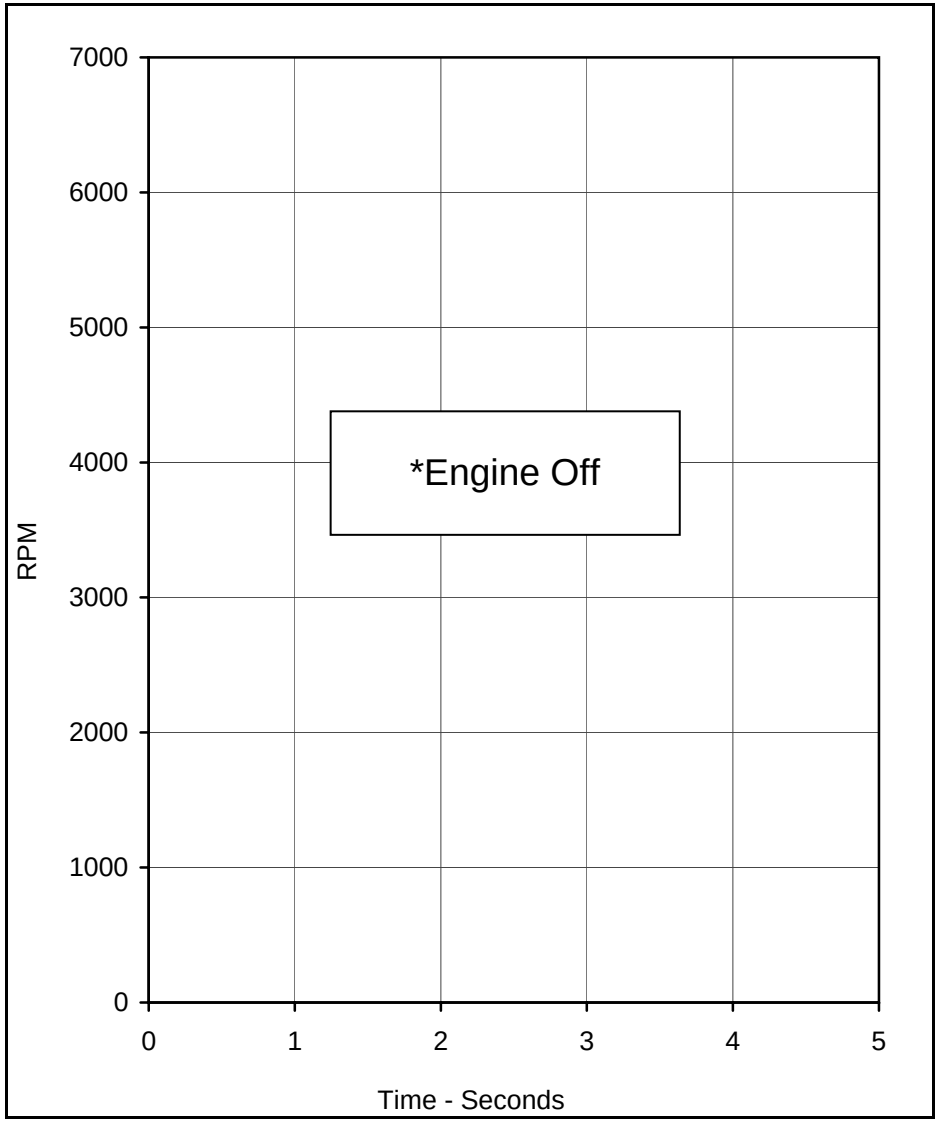
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	50.2	0.0	140.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM					

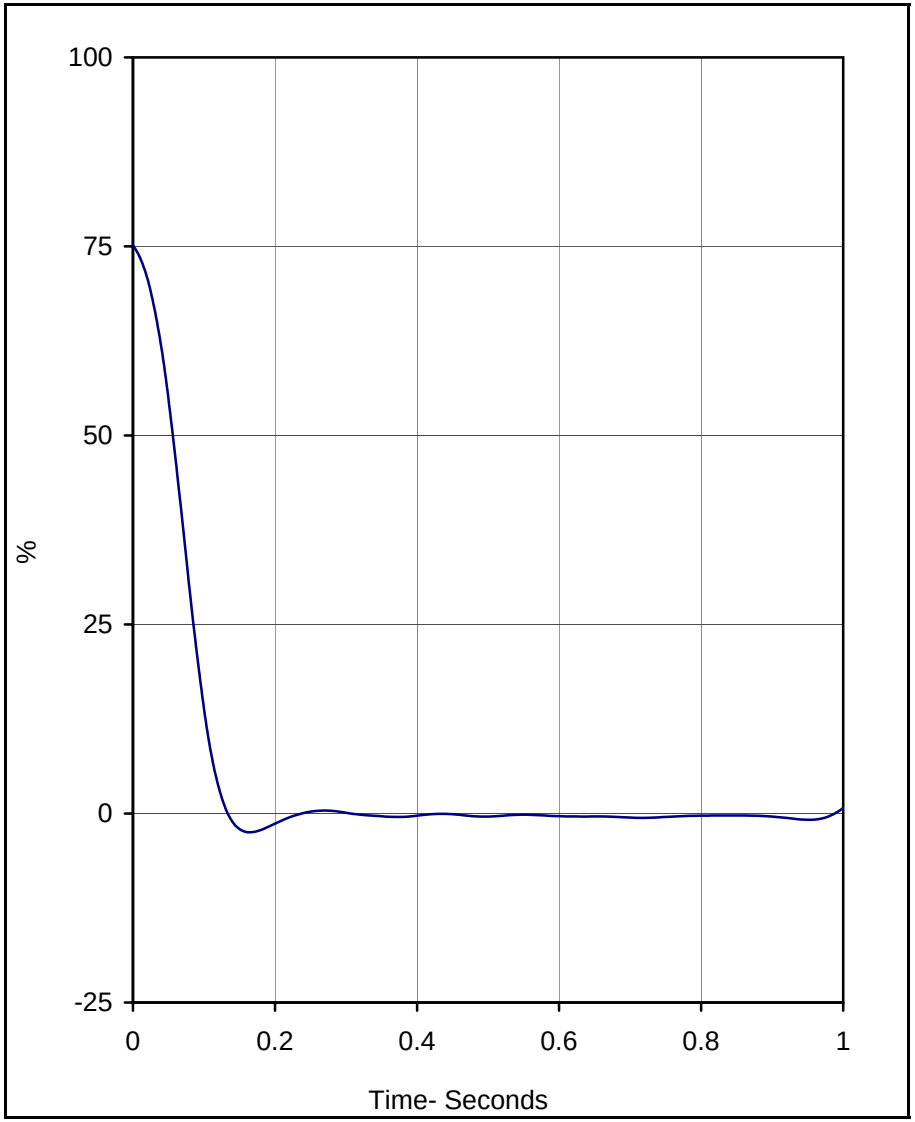
Test Program: FMVSS 124 (Spring #1 Disconnected)

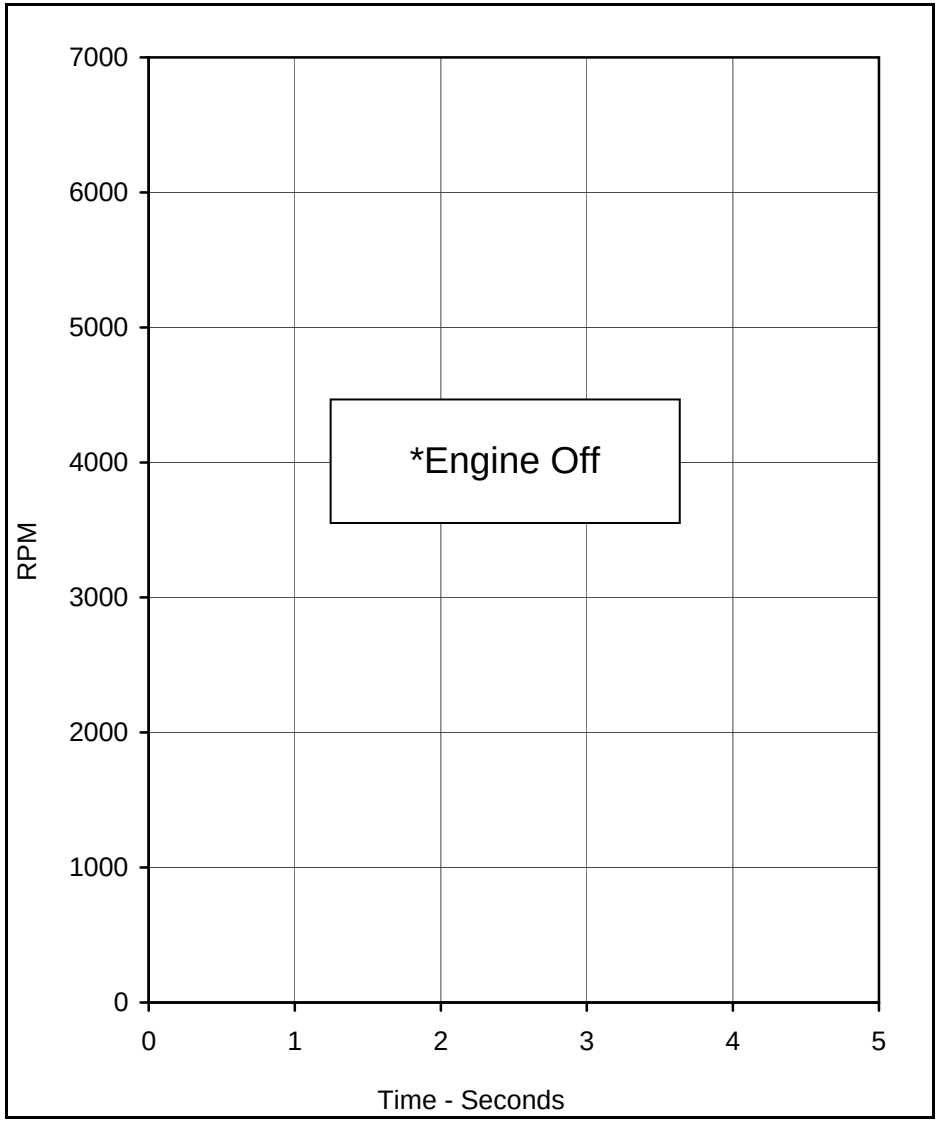
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	75.2	0.0	140.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM					

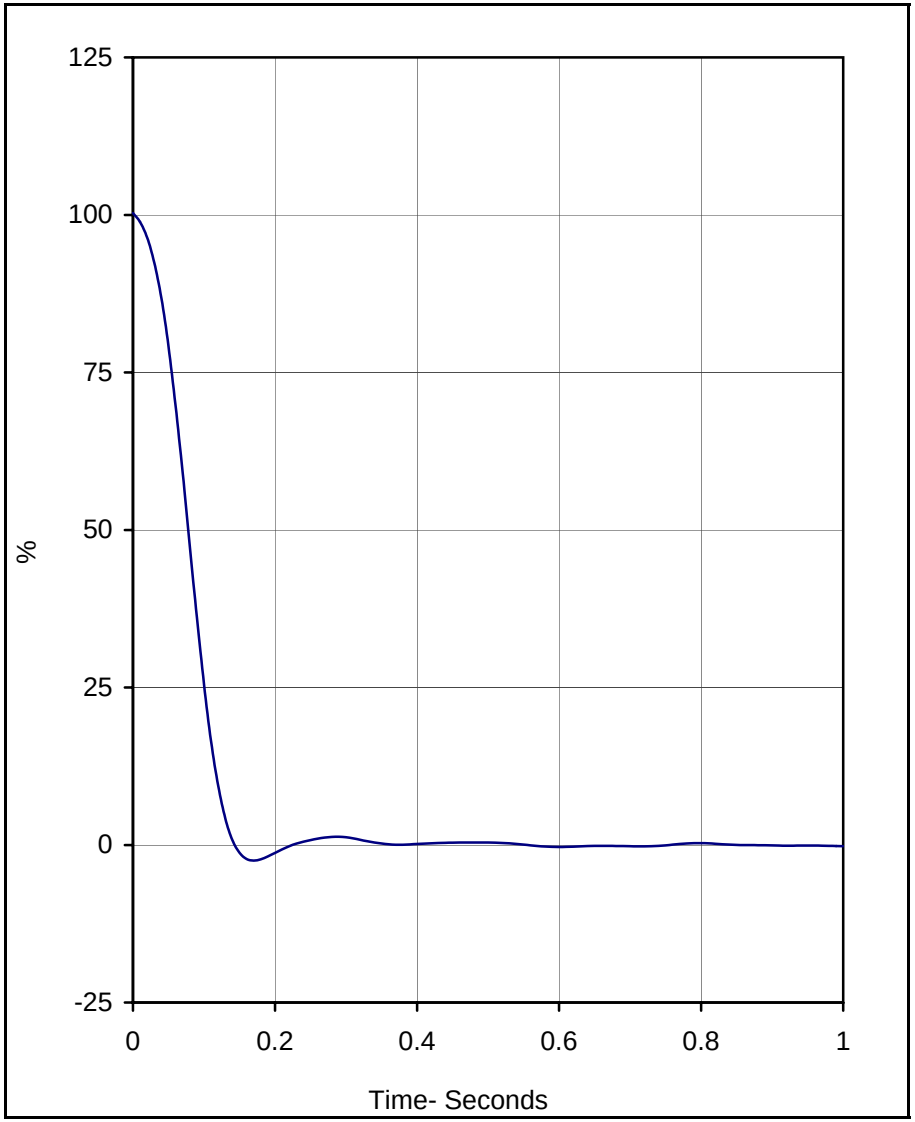
Test Program: FMVSS 124 (Spring #1 Disconnected)

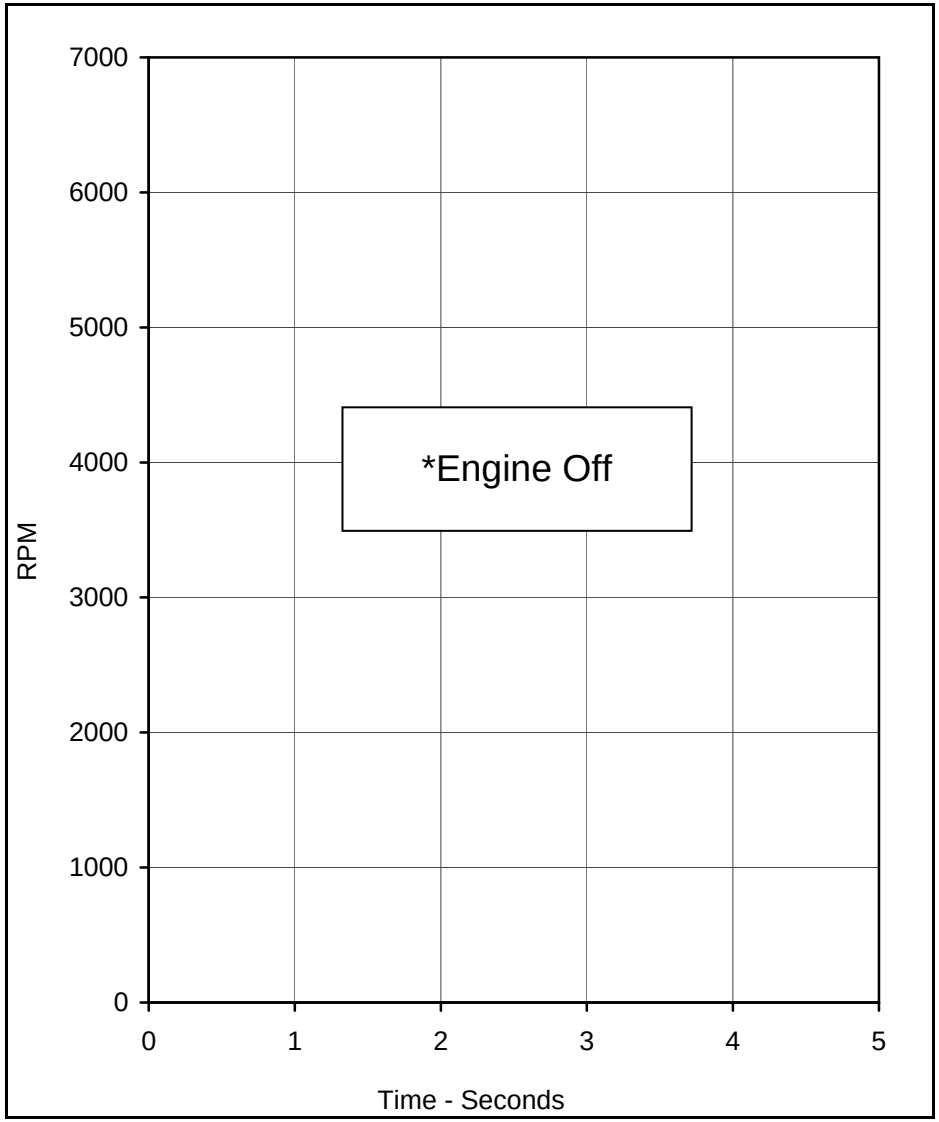
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	100.3	0.0	150.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM					

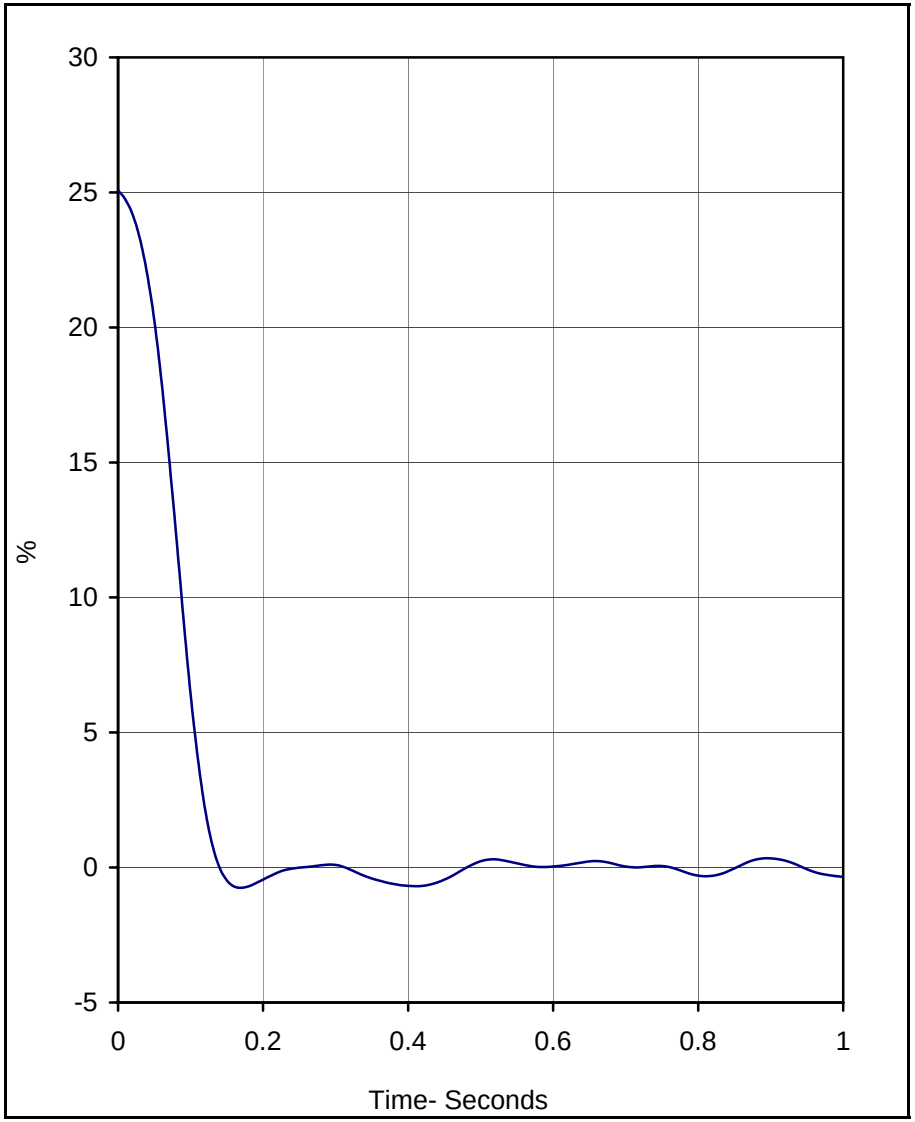
Test Program: FMVSS 124 (Spring #1 Disconnected)

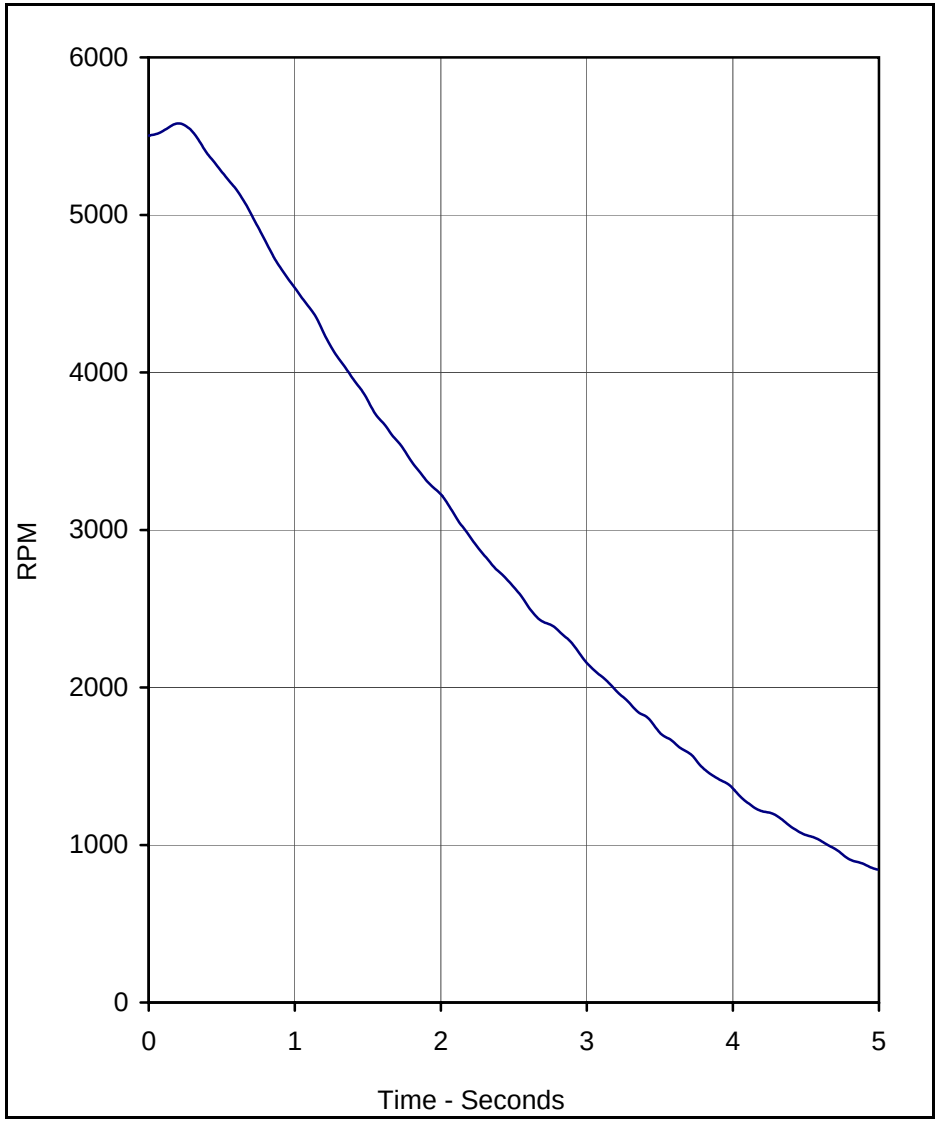
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	25.1	0.0	140.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	5580.7	0.2	843.6	5.0	5

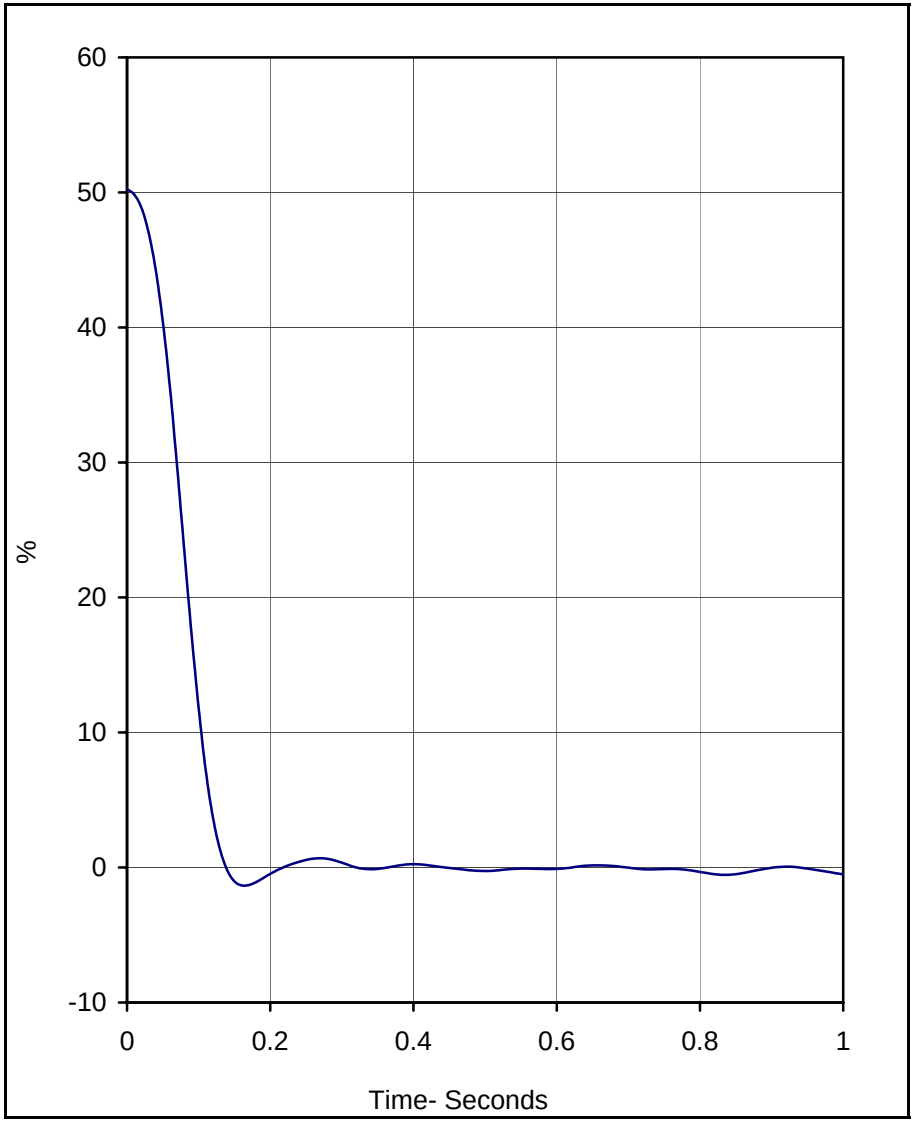
Test Program: FMVSS 124 (Spring #2 Disconnected)

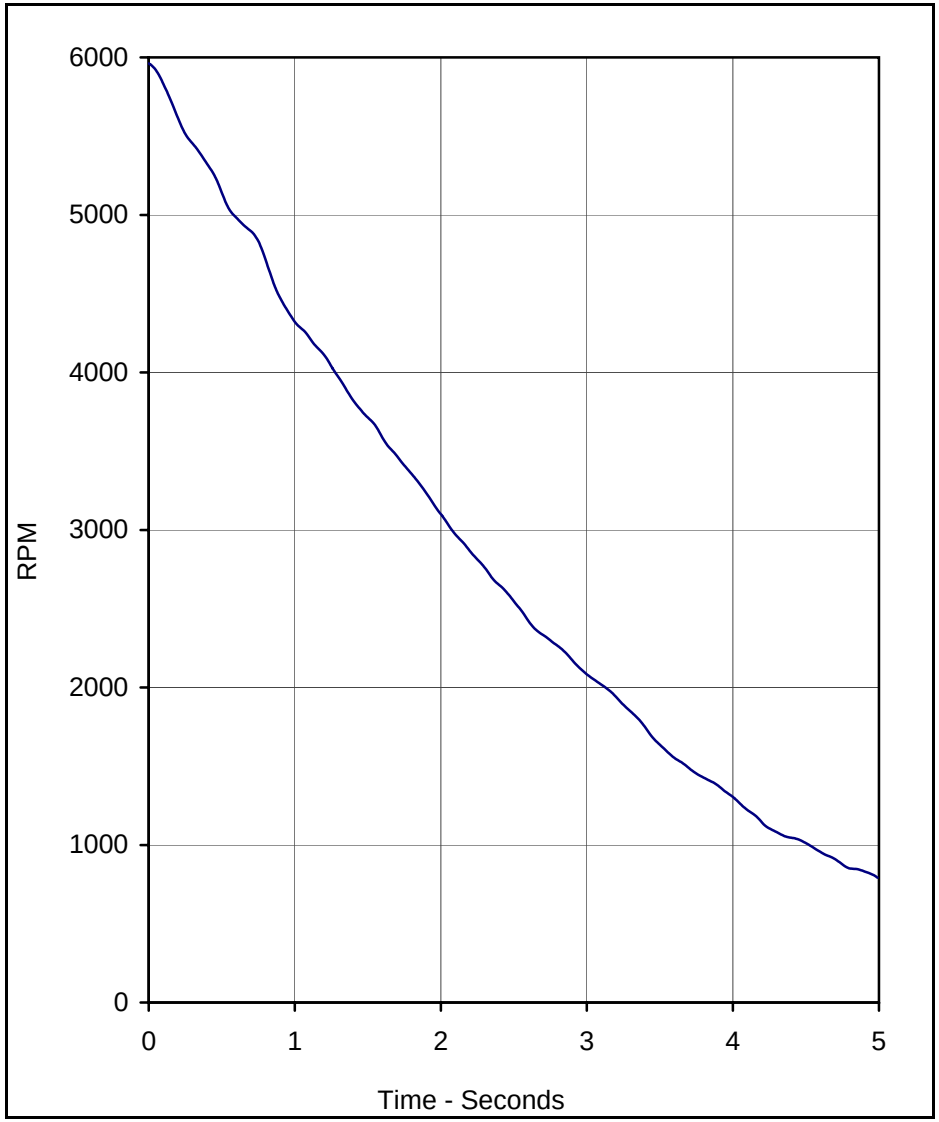
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	50.2	0.0	140.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	5961.6	0.0	792.7	5.0	5

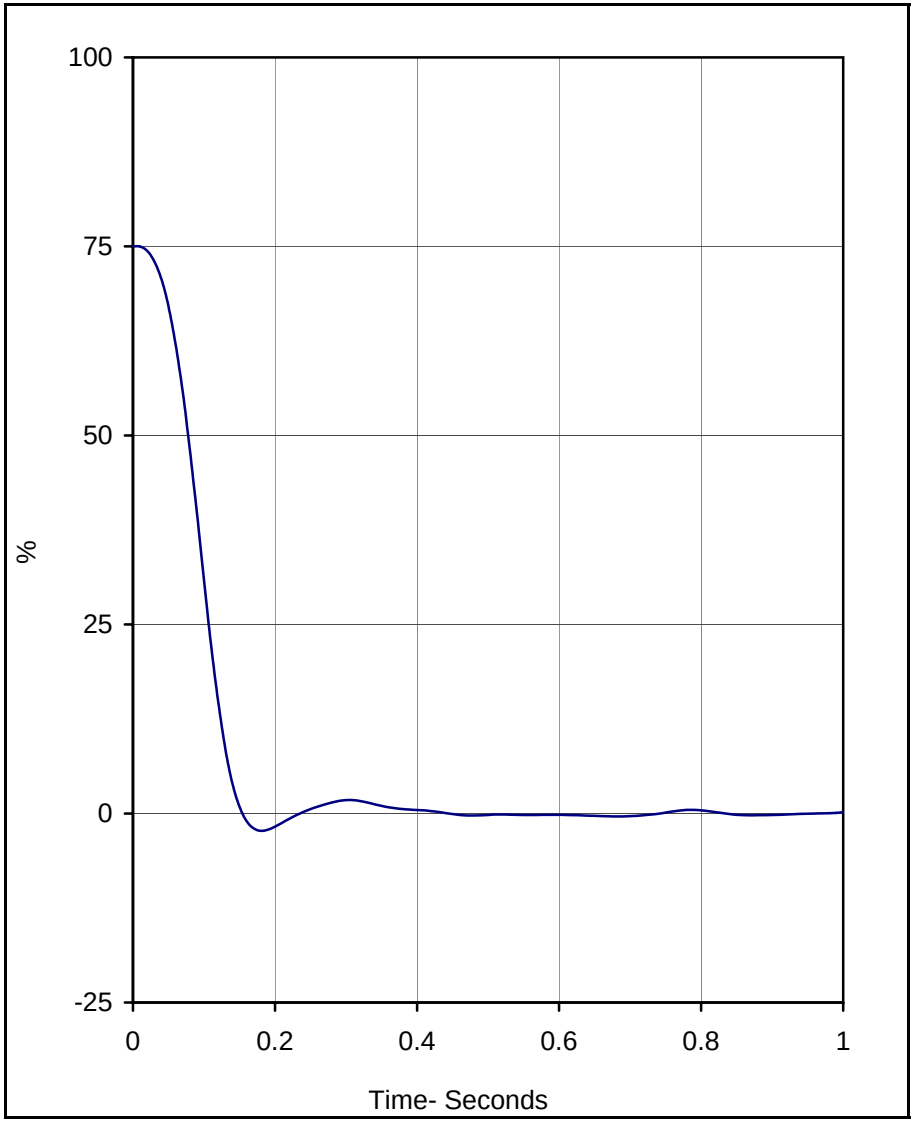
Test Program: FMVSS 124 (Spring #2 Disconnected)

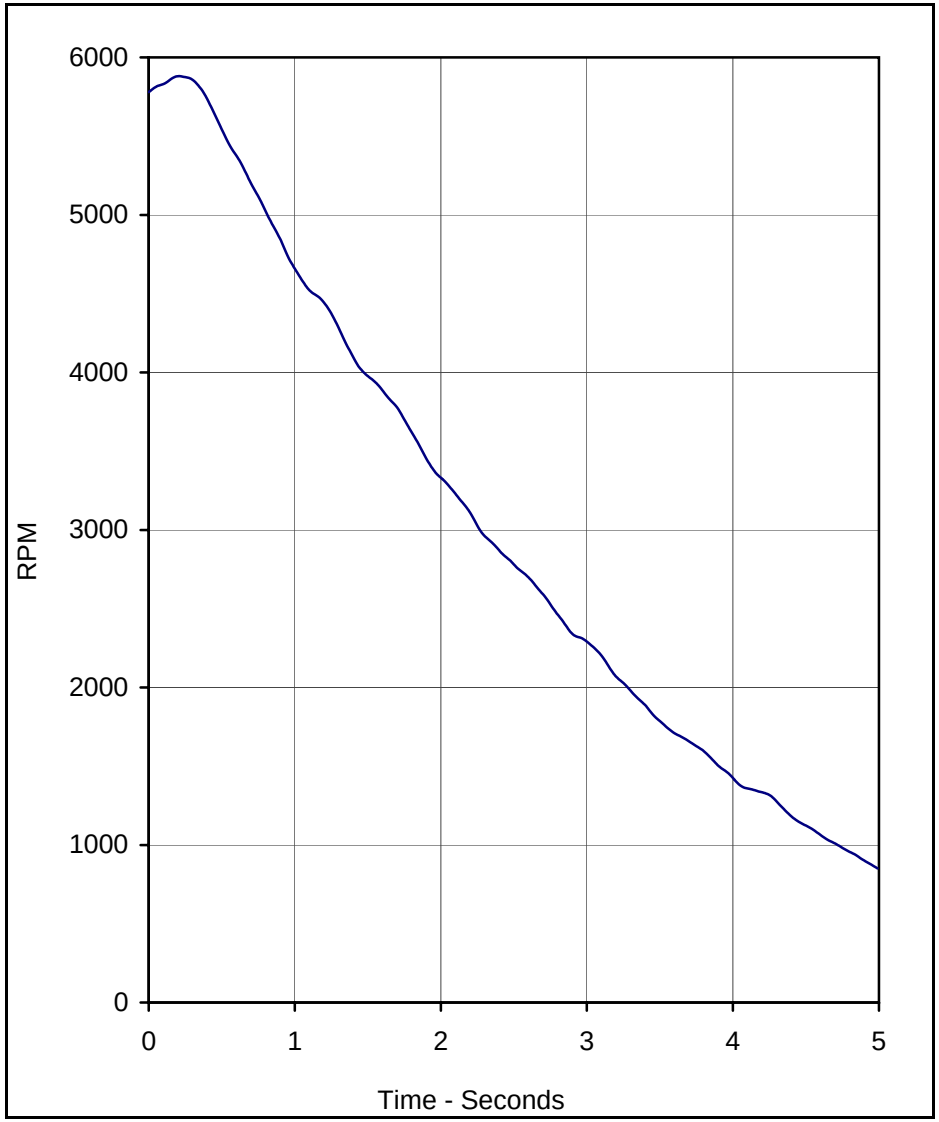
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	75.0	0.0	160.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	5880.7	0.2	851.4	5.0	5

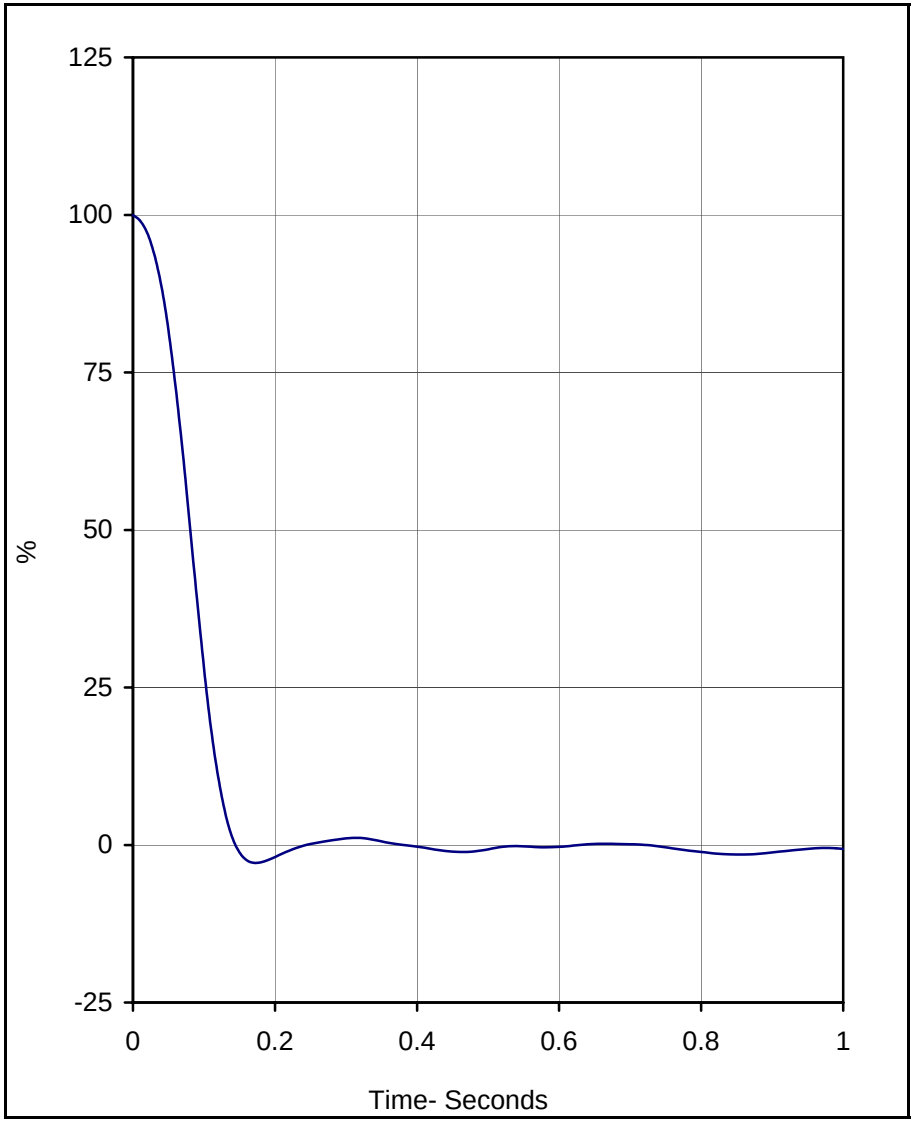
Test Program: FMVSS 124 (Spring #2 Disconnected)

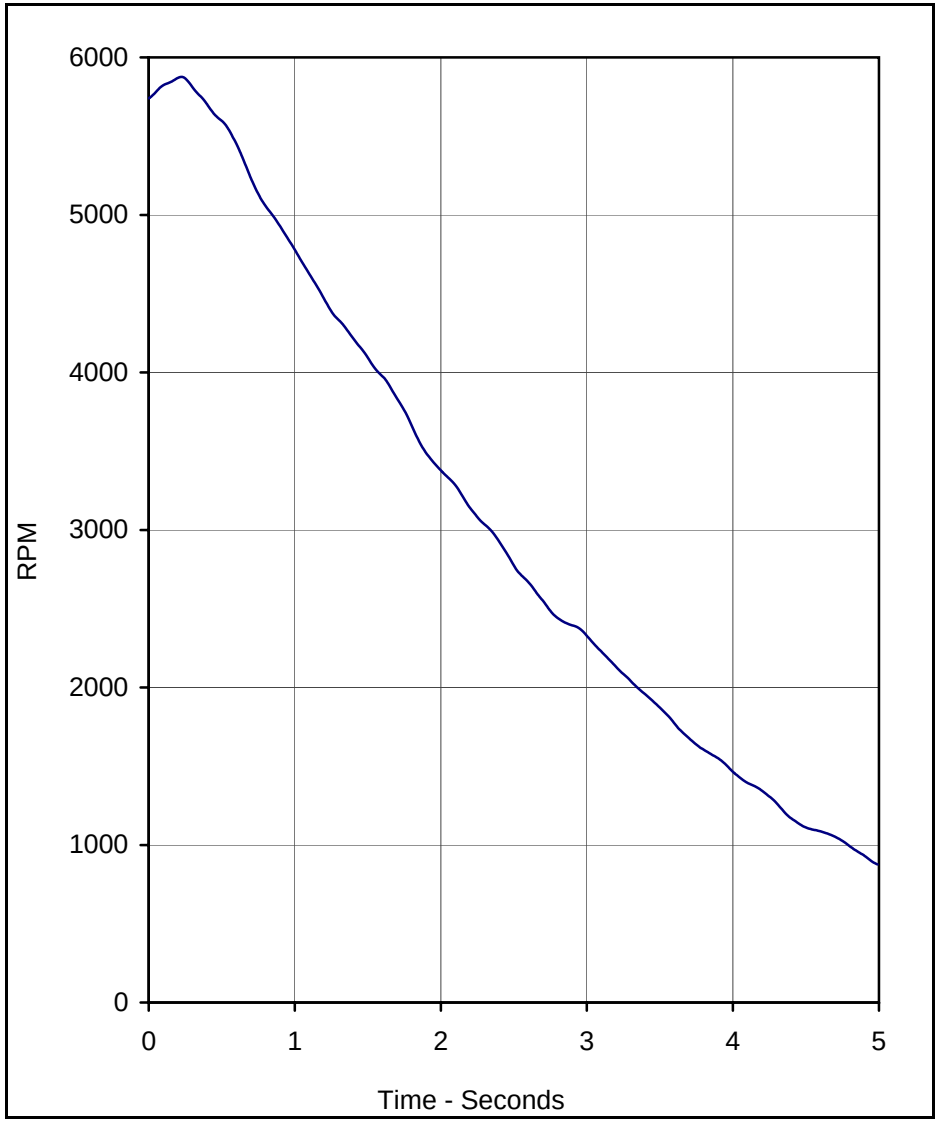
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	100.0	0.0	150.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	5876.3	0.2	876.2	5.0	5

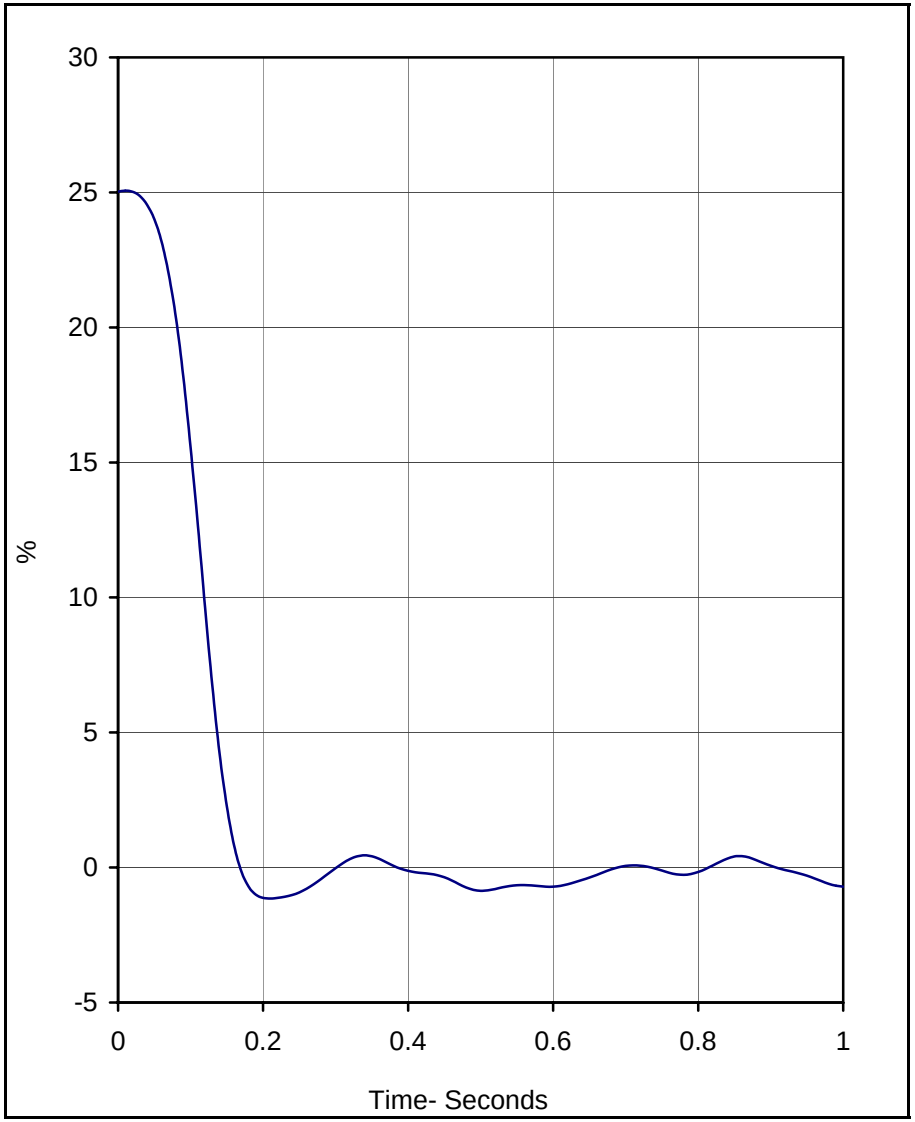
Test Program: FMVSS 124 (Spring #2 Disconnected)

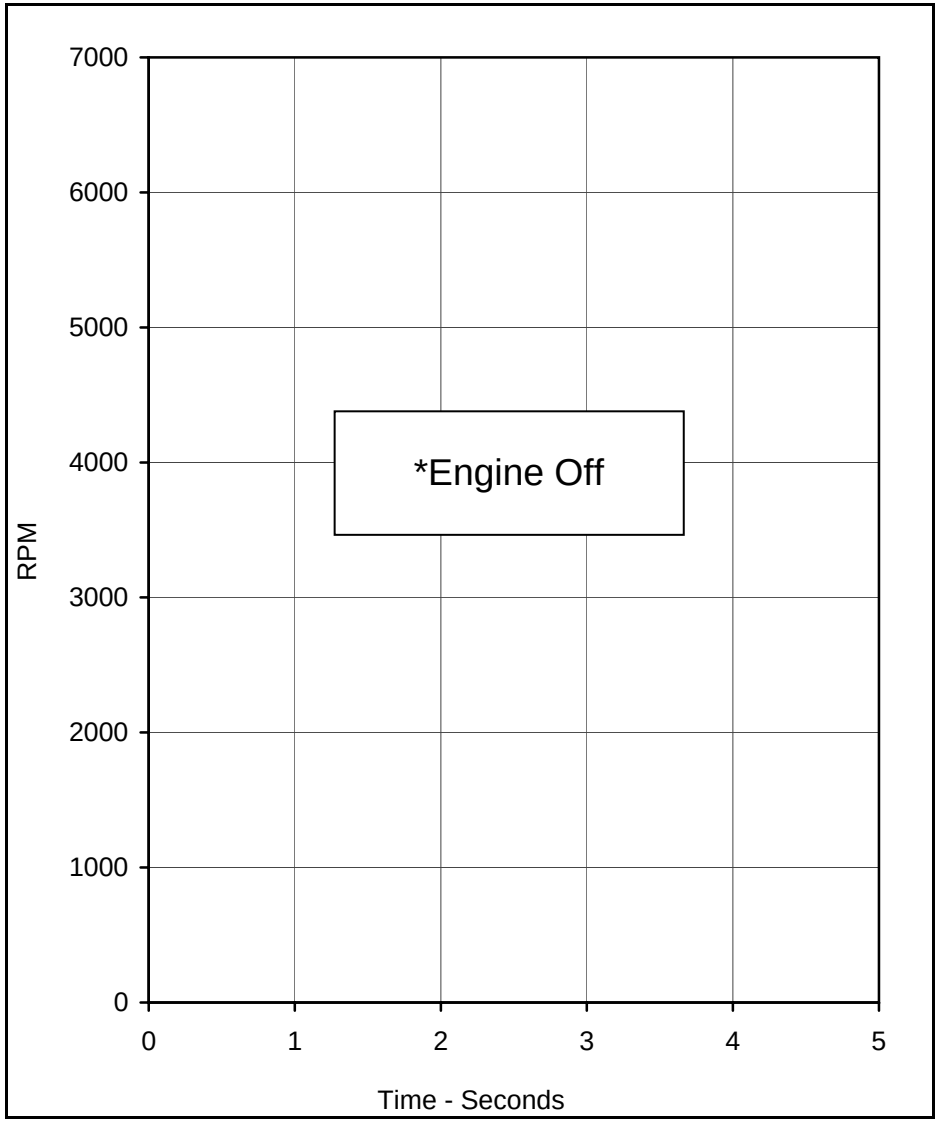
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	25.1	0.0	170.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM					

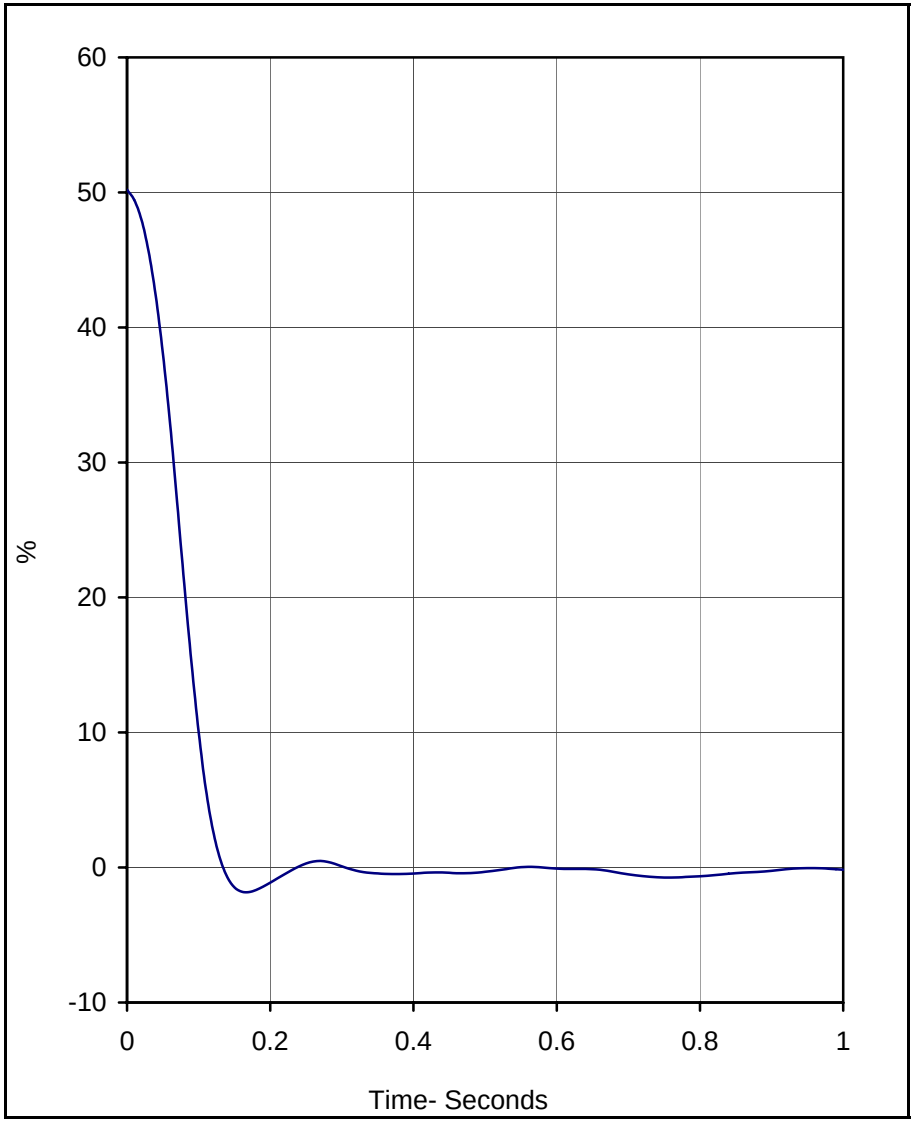
Test Program: FMVSS 124 (Spring #2 Disconnected)

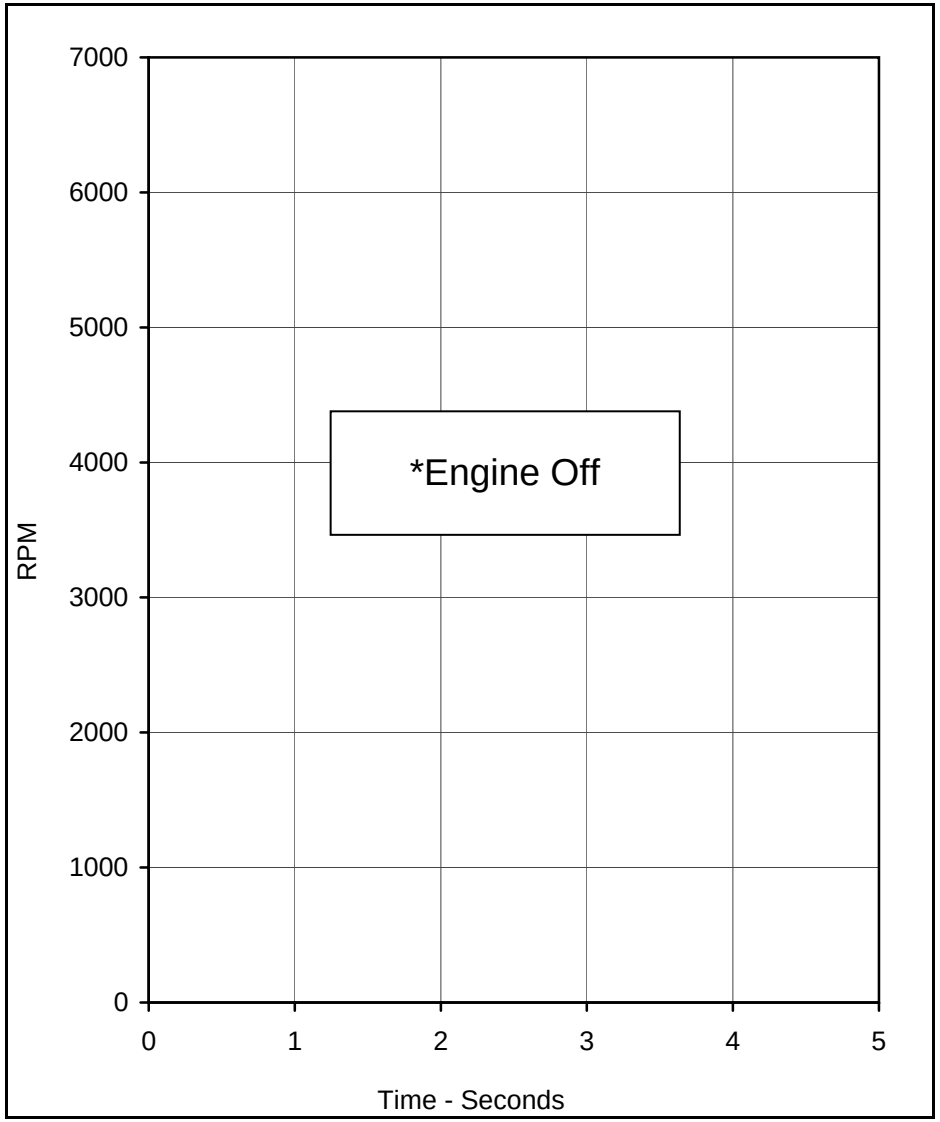
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	50.2	0.0	140.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM					

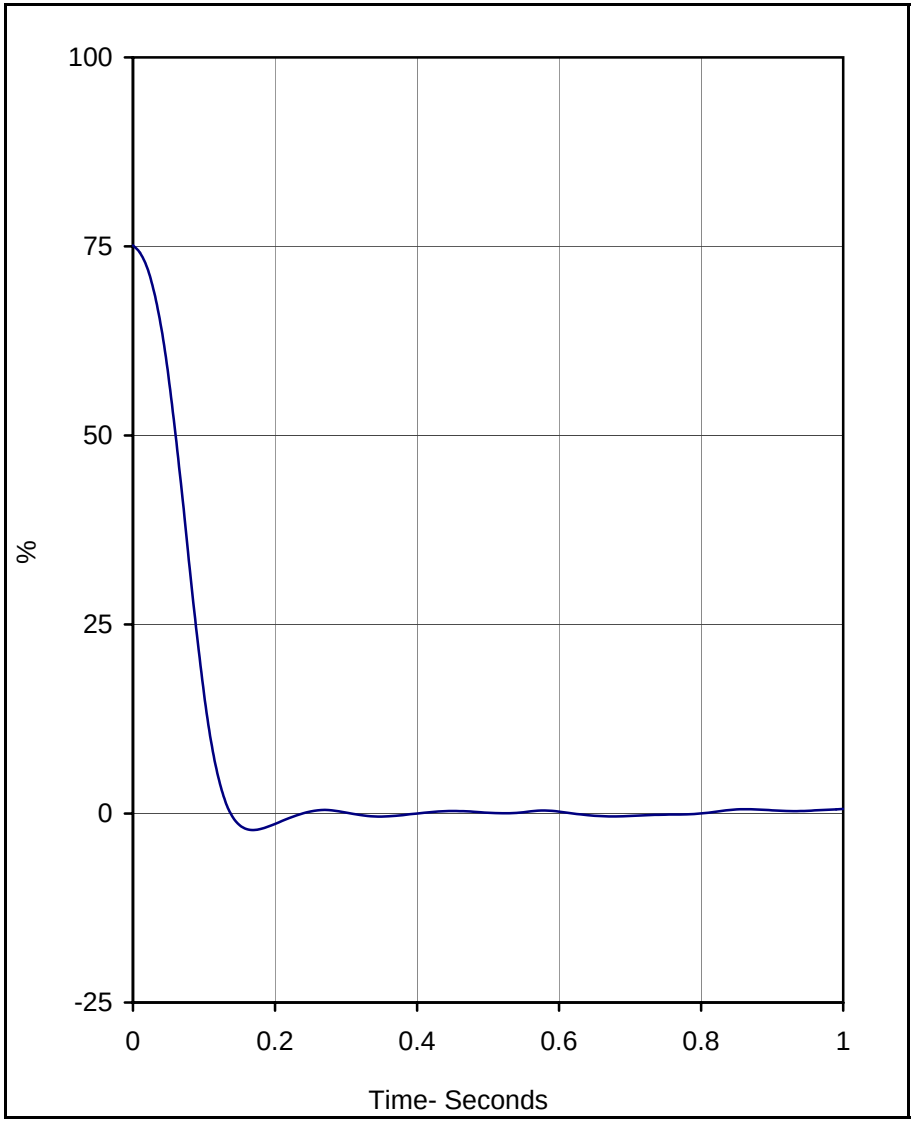
Test Program: FMVSS 124 (Spring #2 Disconnected)

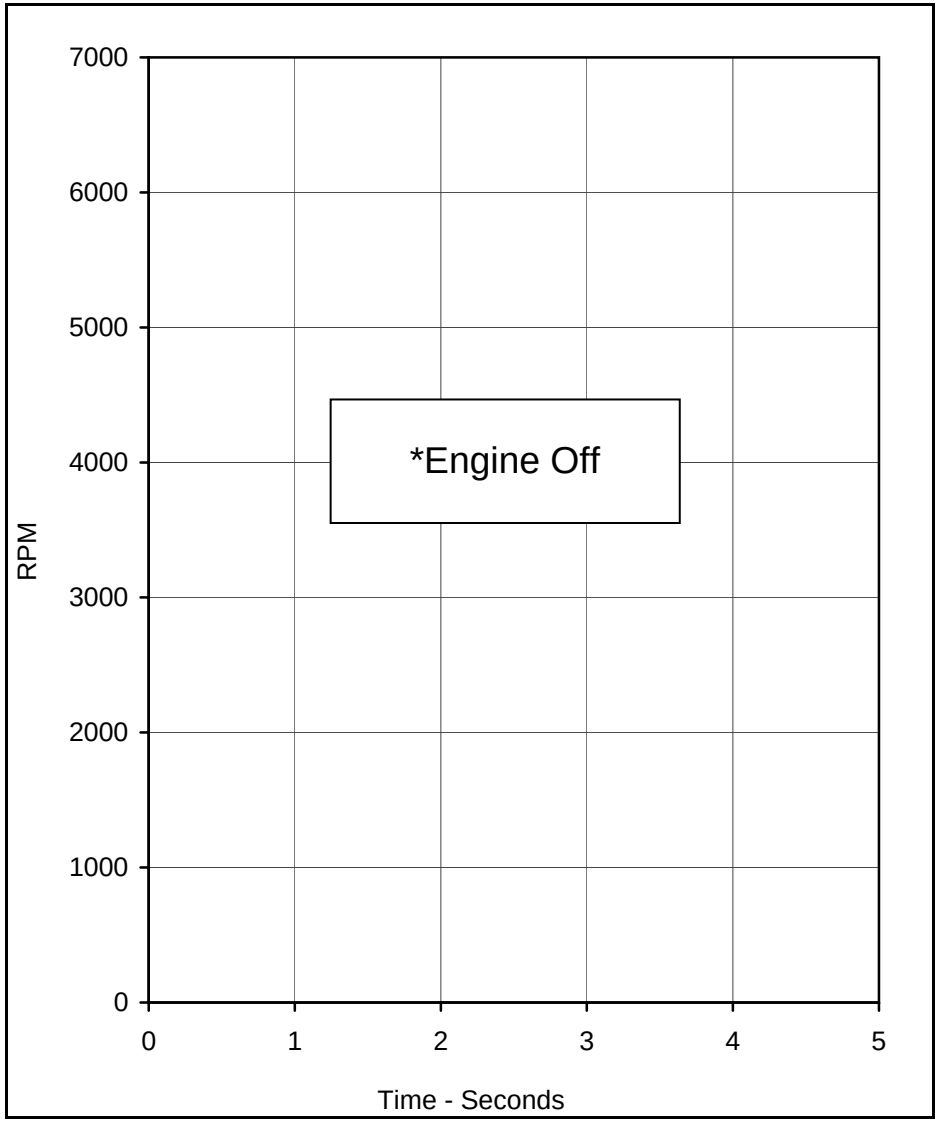
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	75.1	0.0	140.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM					

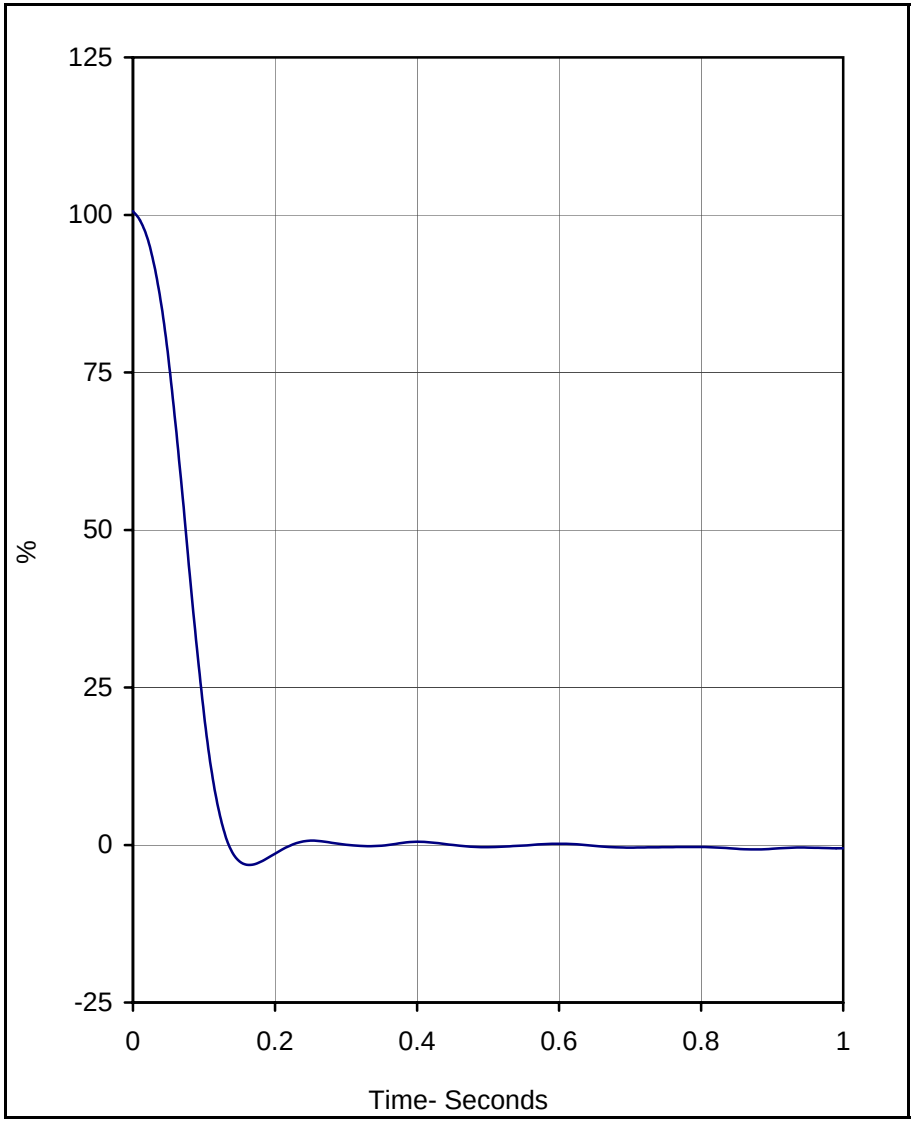
Test Program: FMVSS 124 (Spring #2 Disconnected)

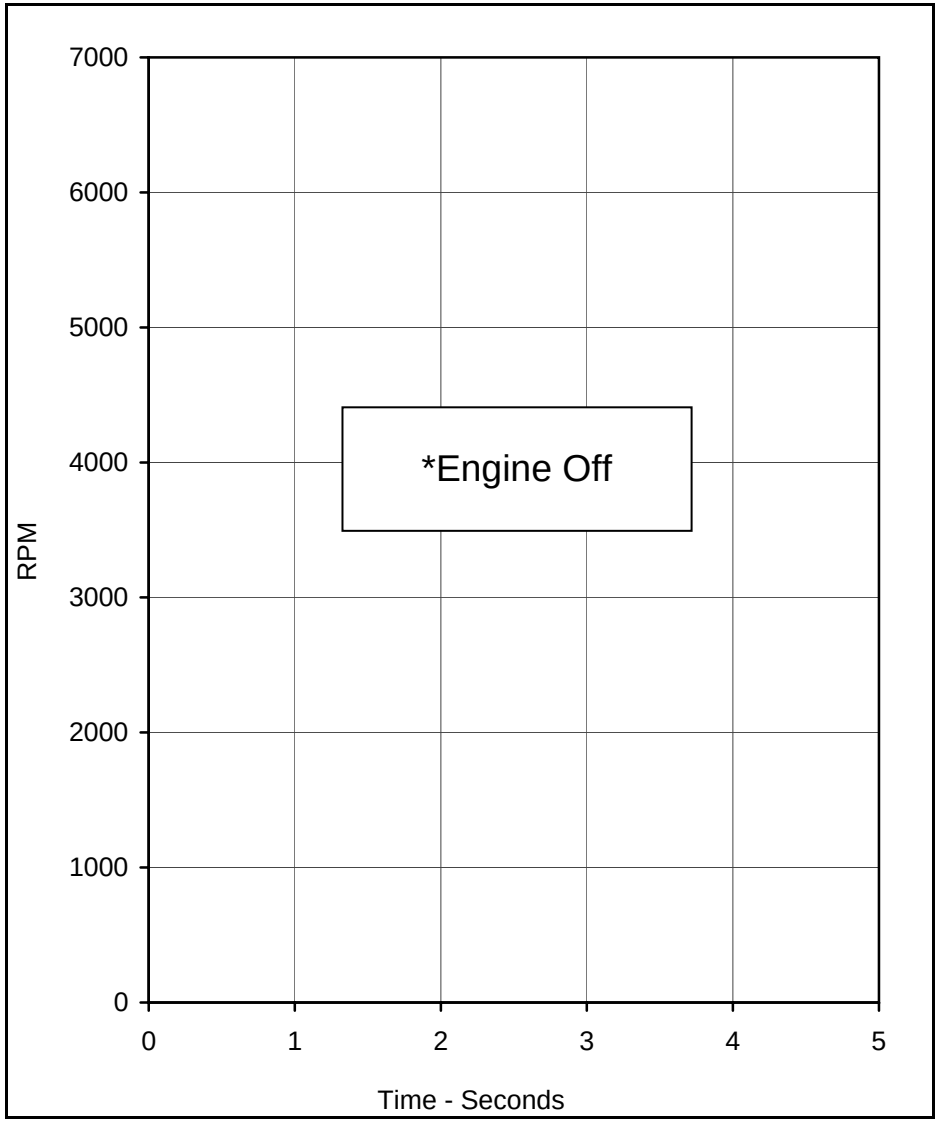
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	100.6	0.0	140.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM					

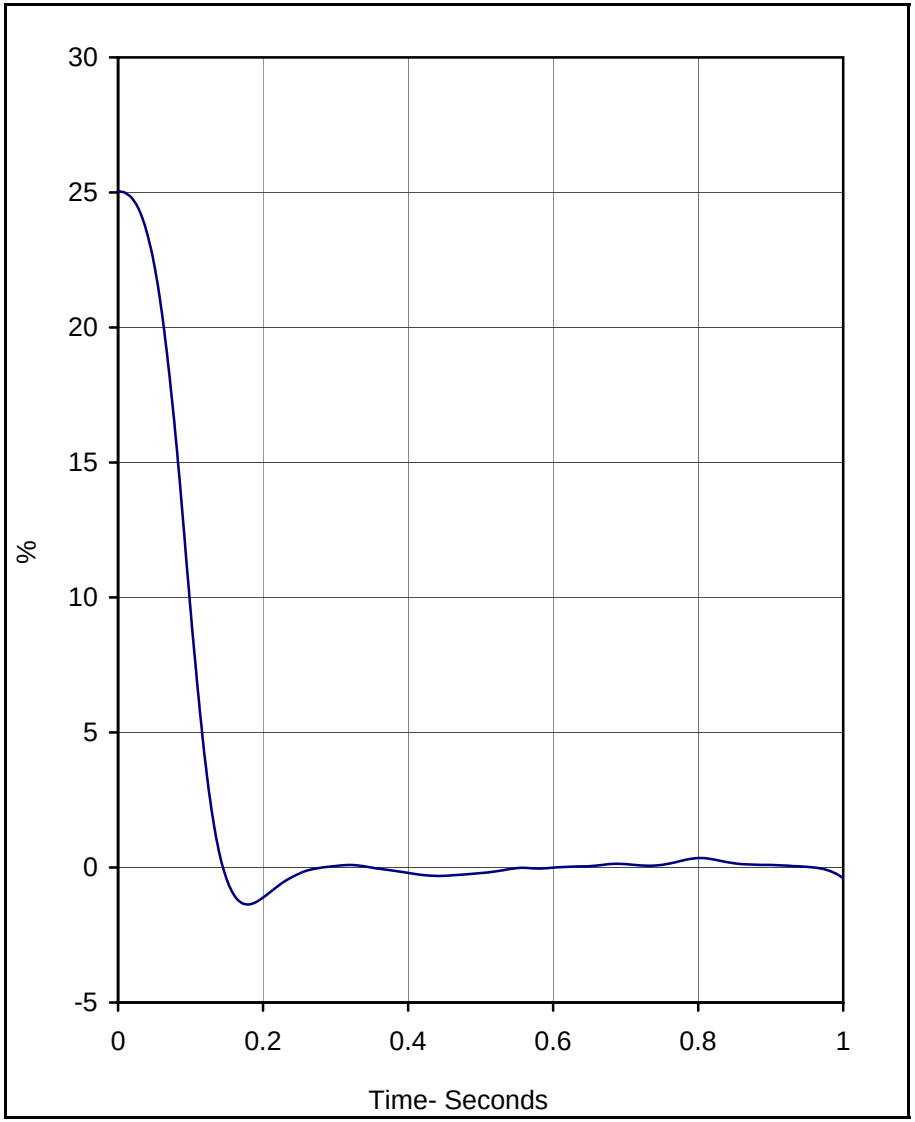
Test Program: FMVSS 124 (Spring #2 Disconnected)

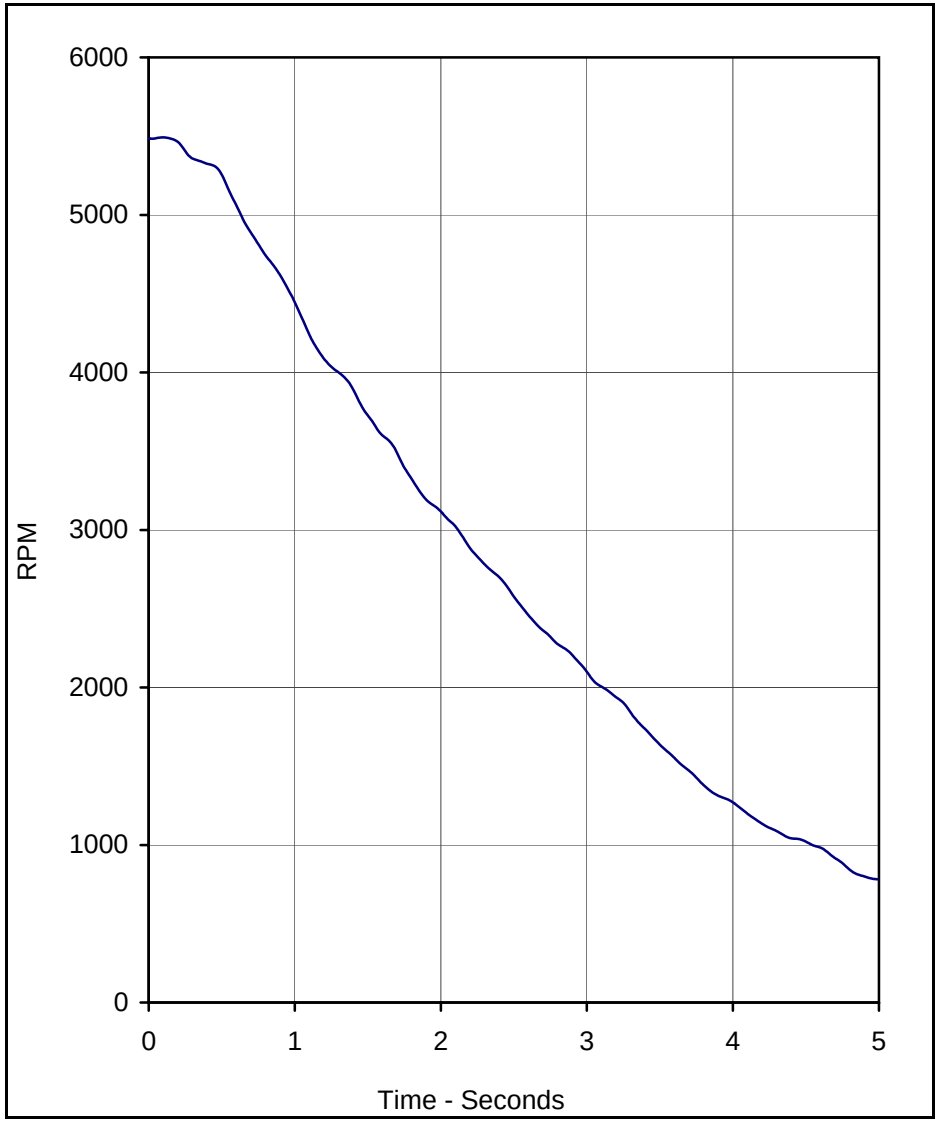
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	25.0	0.0	150.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	5492.1	0.1	782.3	5.0	5

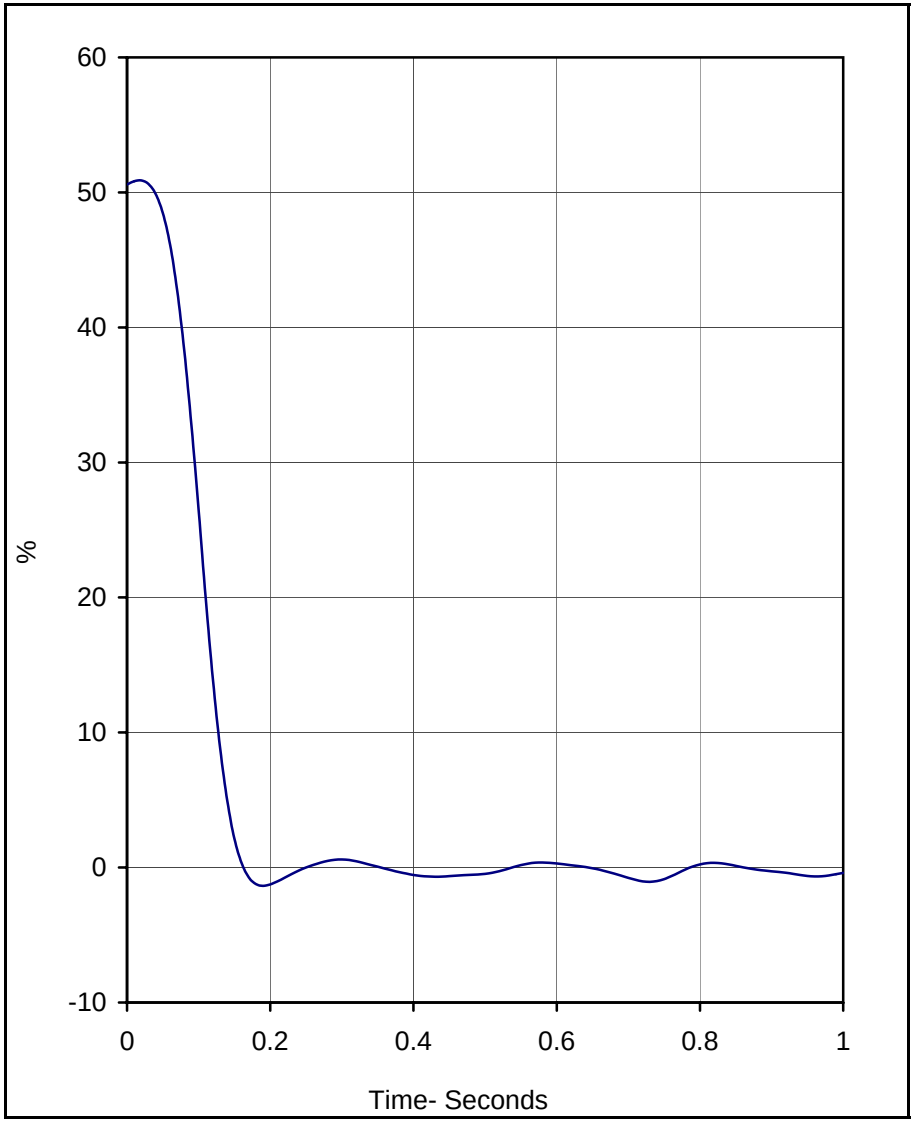
Test Program: FMVSS 124 (Severance of Throttle Cable)

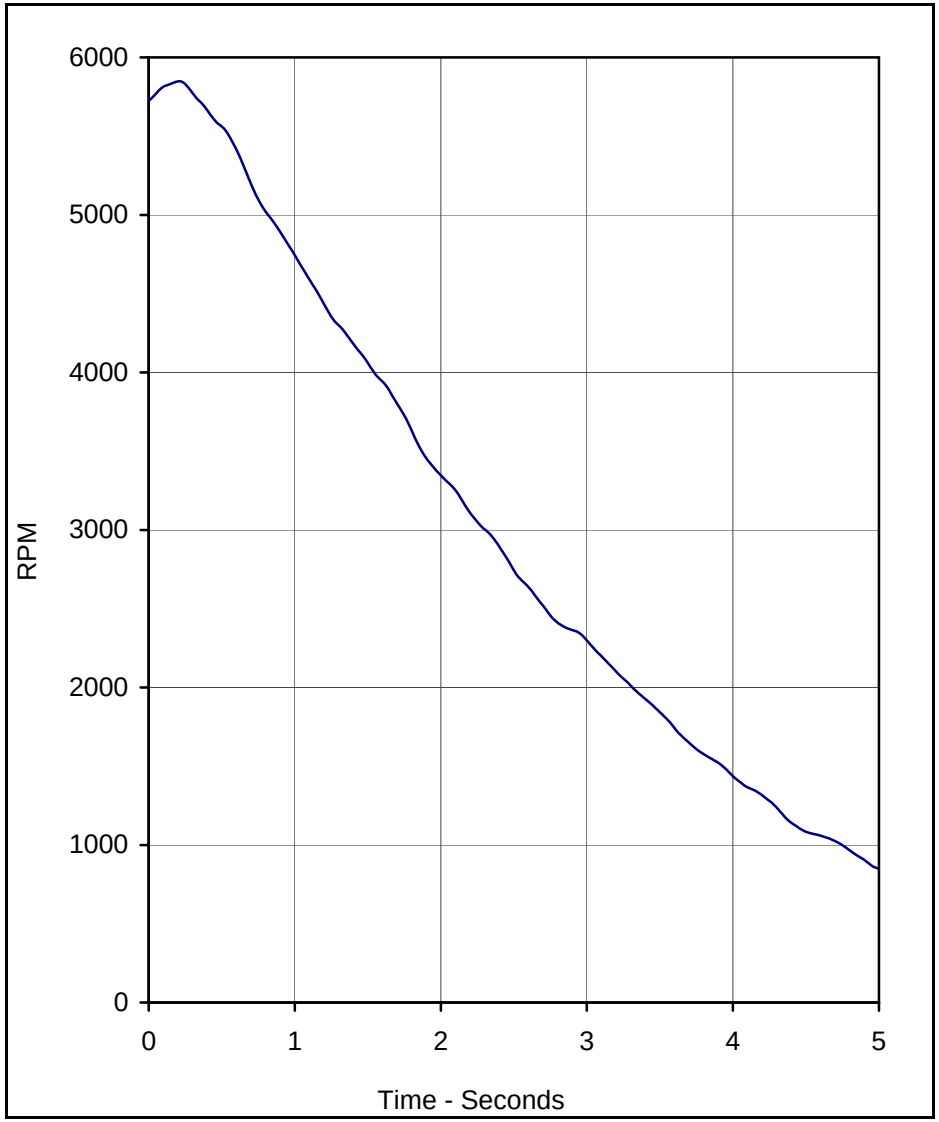
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	50.9	0.0	160.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	5848.4	0.2	851.6	5.0	5

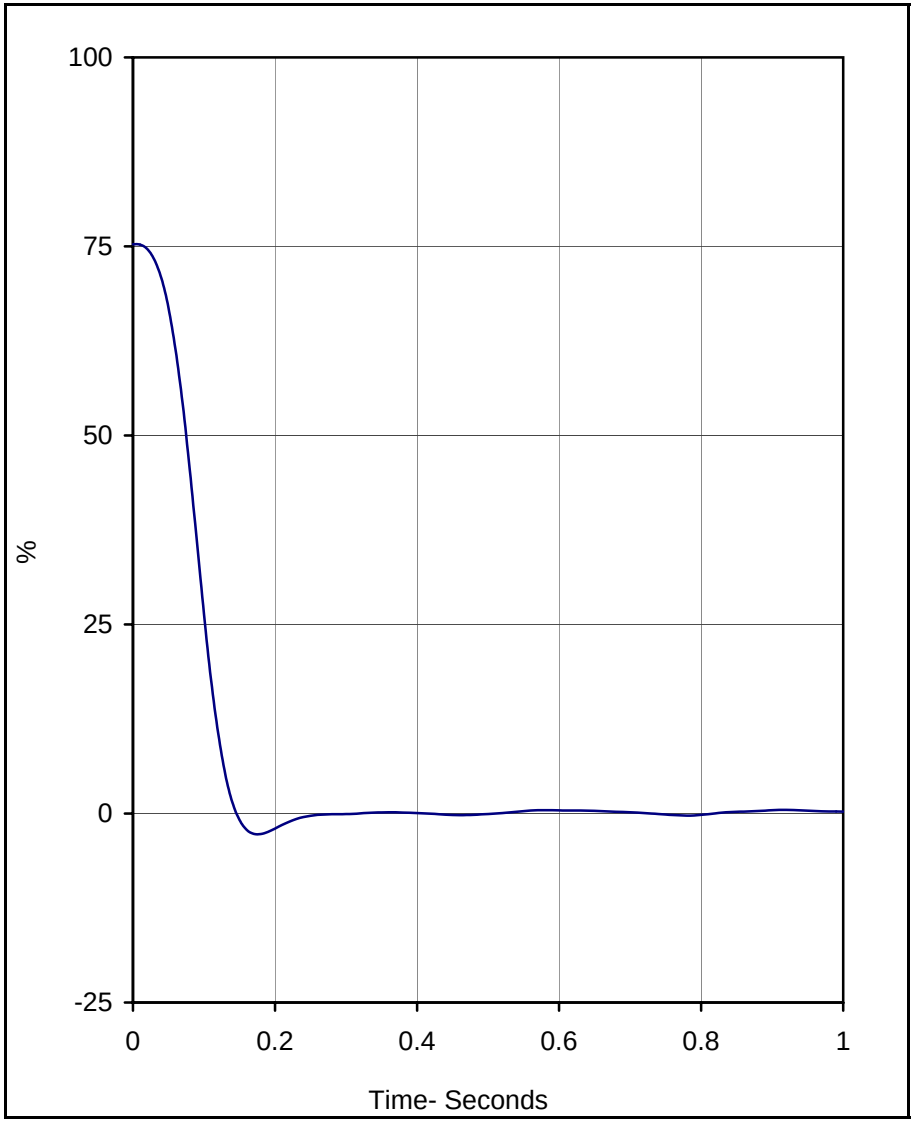
Test Program: FMVSS 124 (Severance of Throttle Cable)

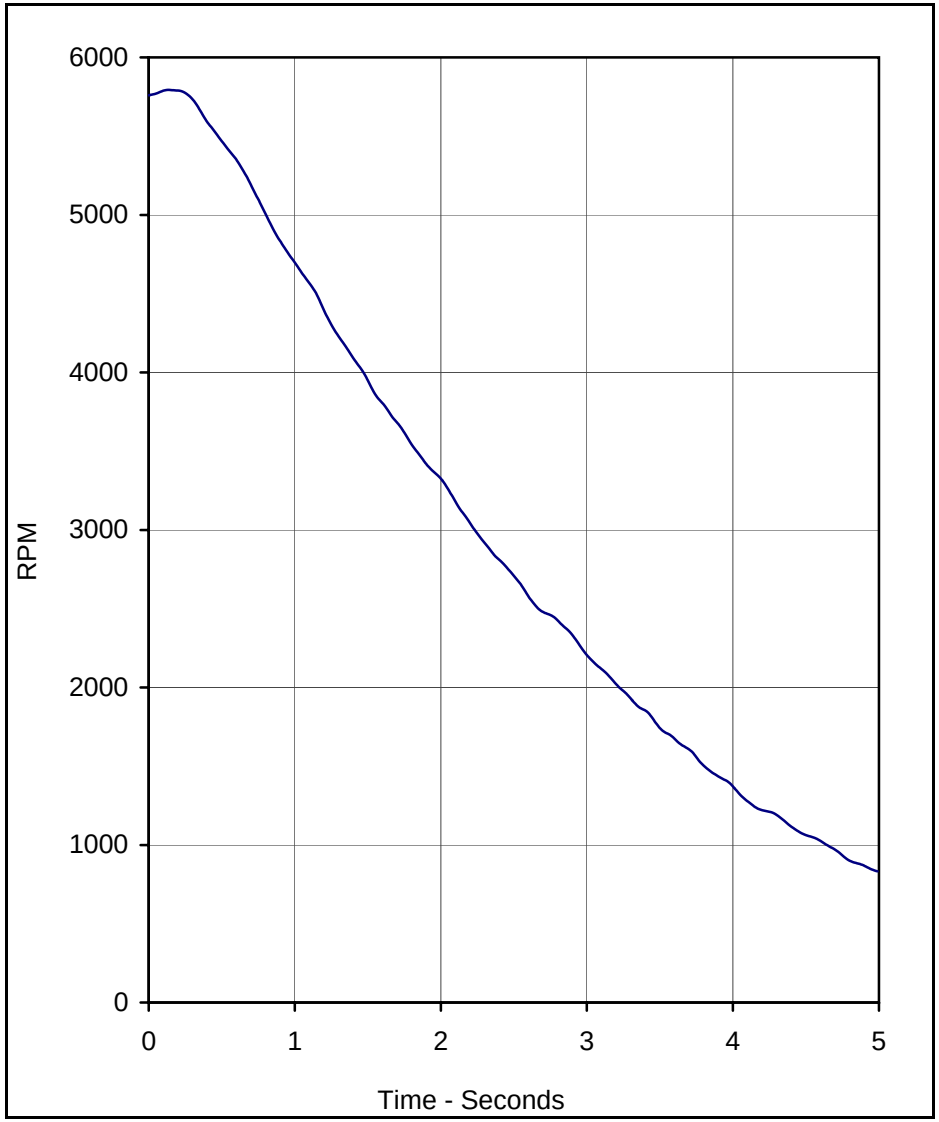
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	75.3	0.0	150.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM	5793.6	0.1	832.7	5.0	5

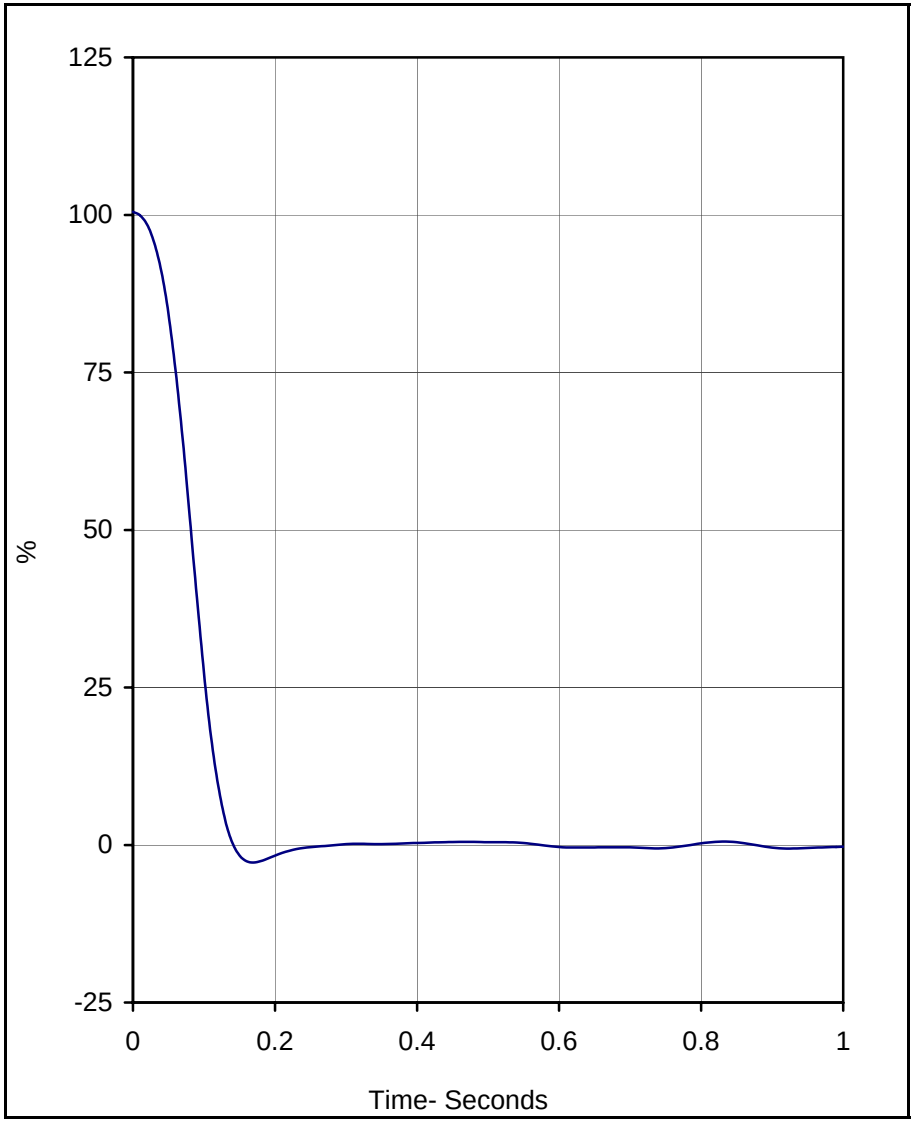
Test Program: FMVSS 124 (Severance of Throttle Cable)

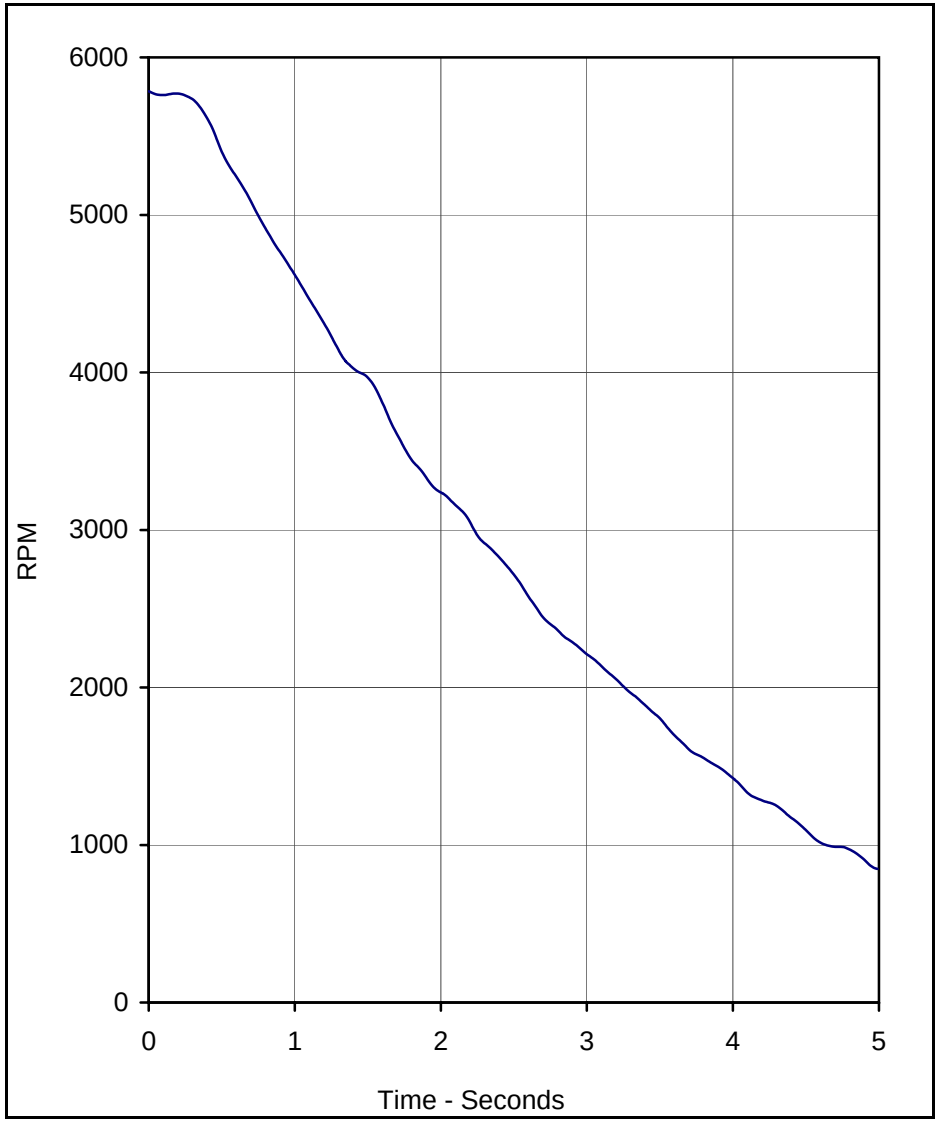
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

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	5784.8	0.0	847.7	5.0	5

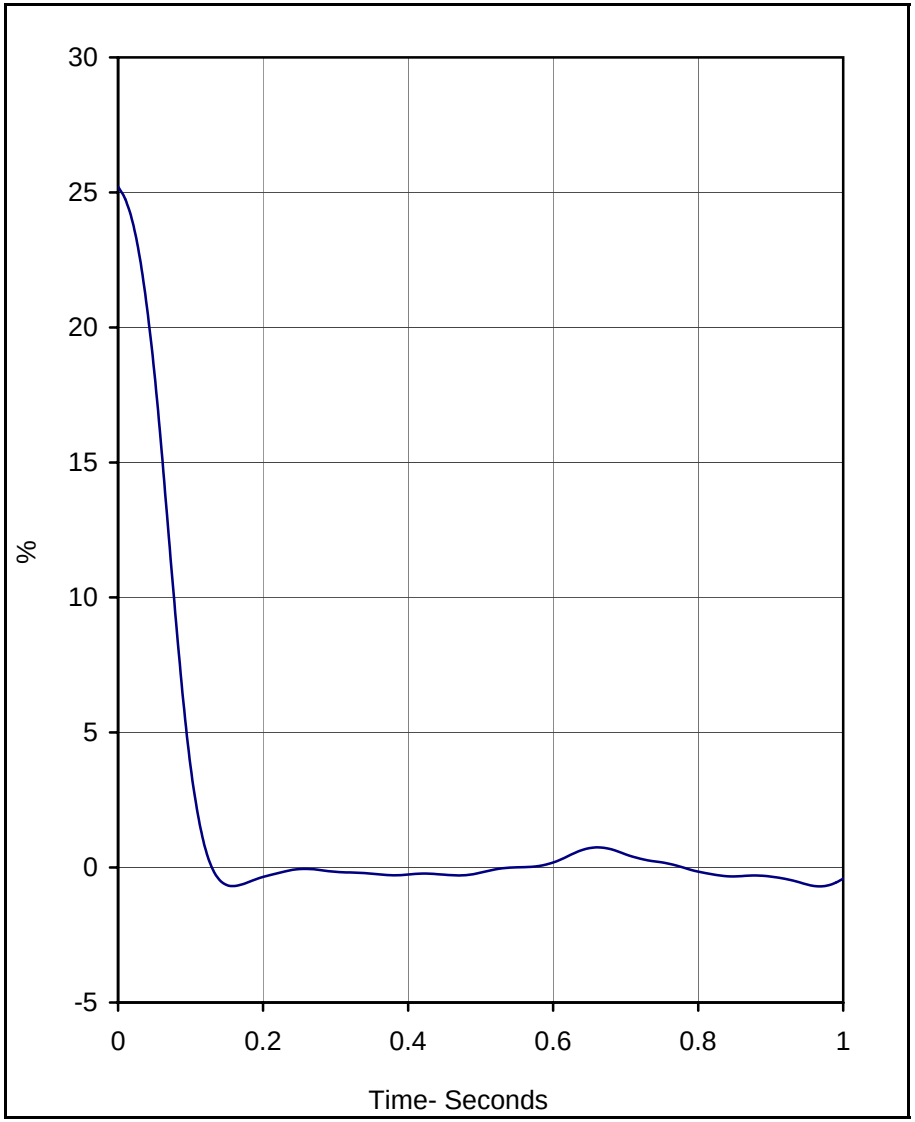
Test Program: FMVSS 124 (Severance of Throttle Cable)

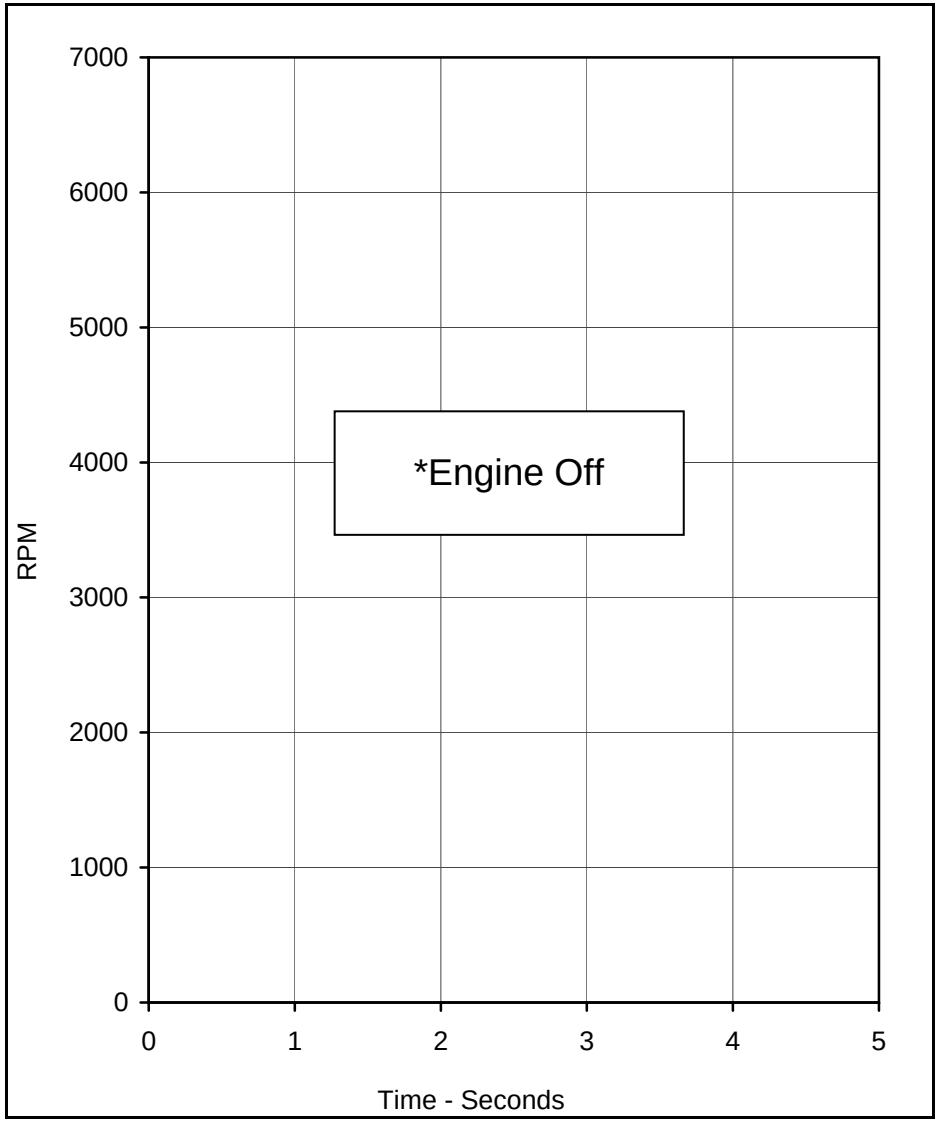
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	25.2	0.0	130.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM					

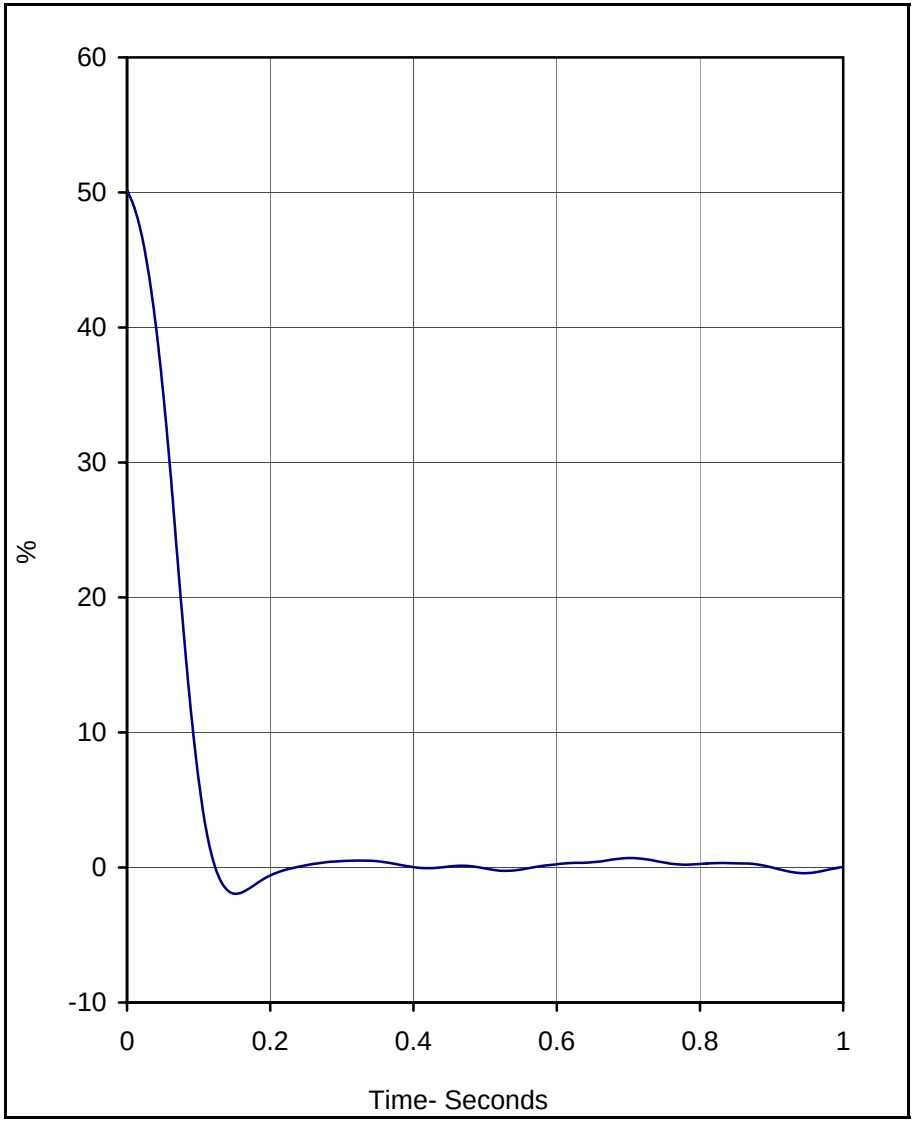
Test Program: FMVSS 124 (Severance of Throttle Cable)

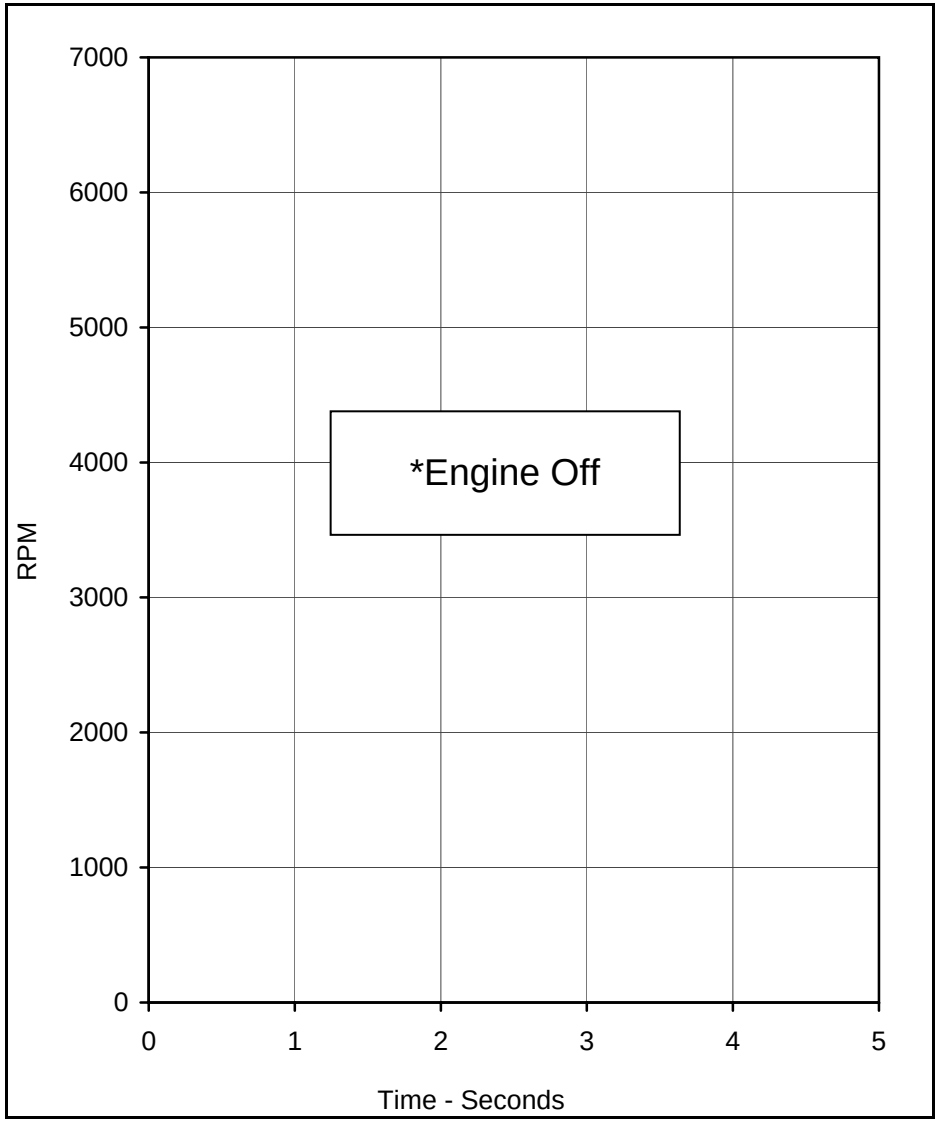
Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering





Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	50.2	0.0	130.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM					

Test Program: FMVSS 124 (Severance of Throttle Cable)

Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

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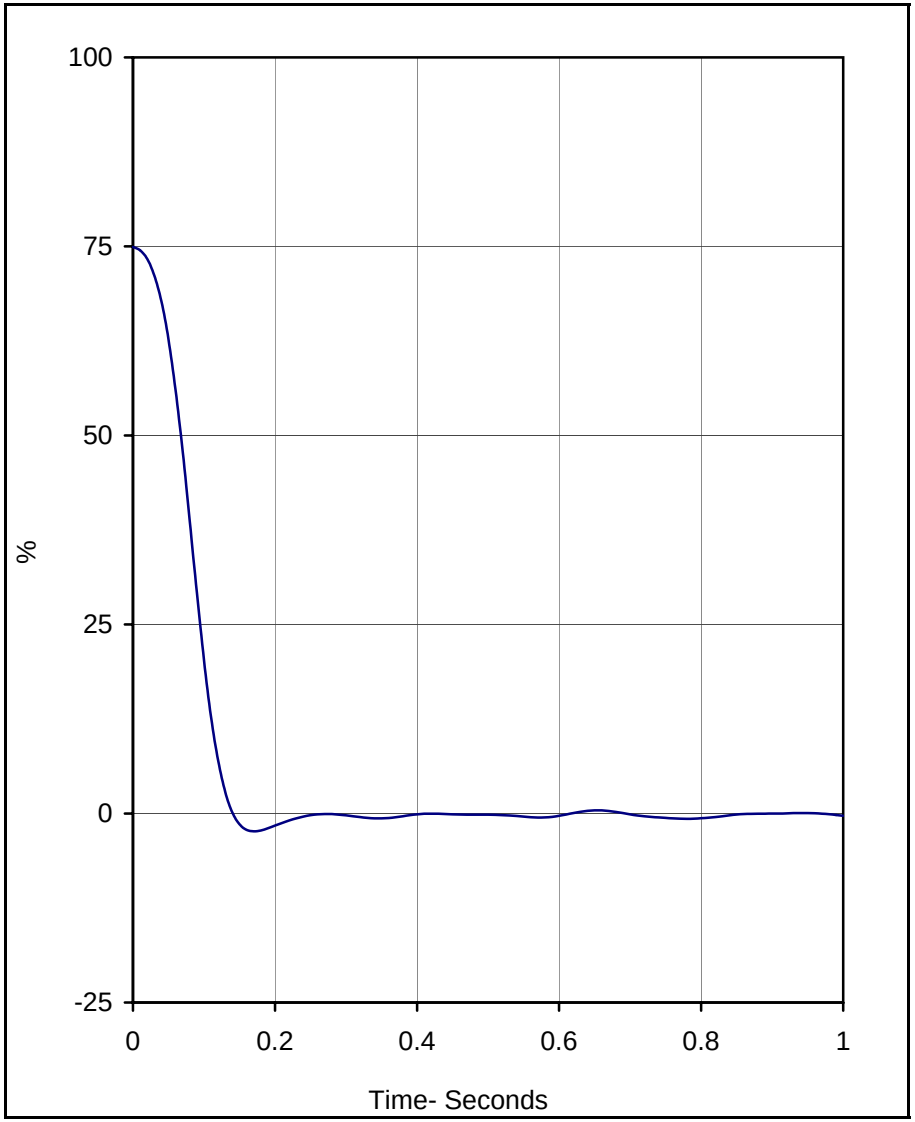

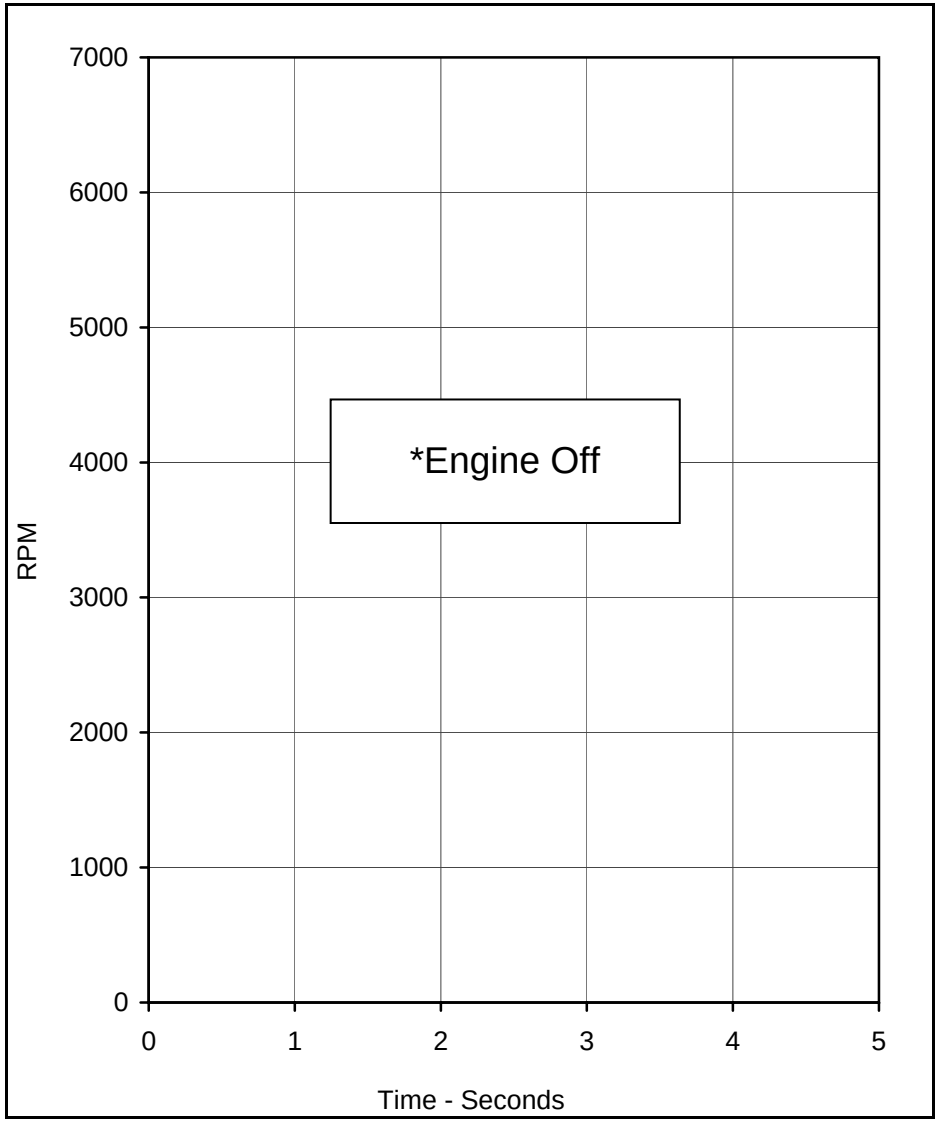

Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	74.9	0.0	140.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM					

Test Program: FMVSS 124 (Severance of Throttle Cable)

Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

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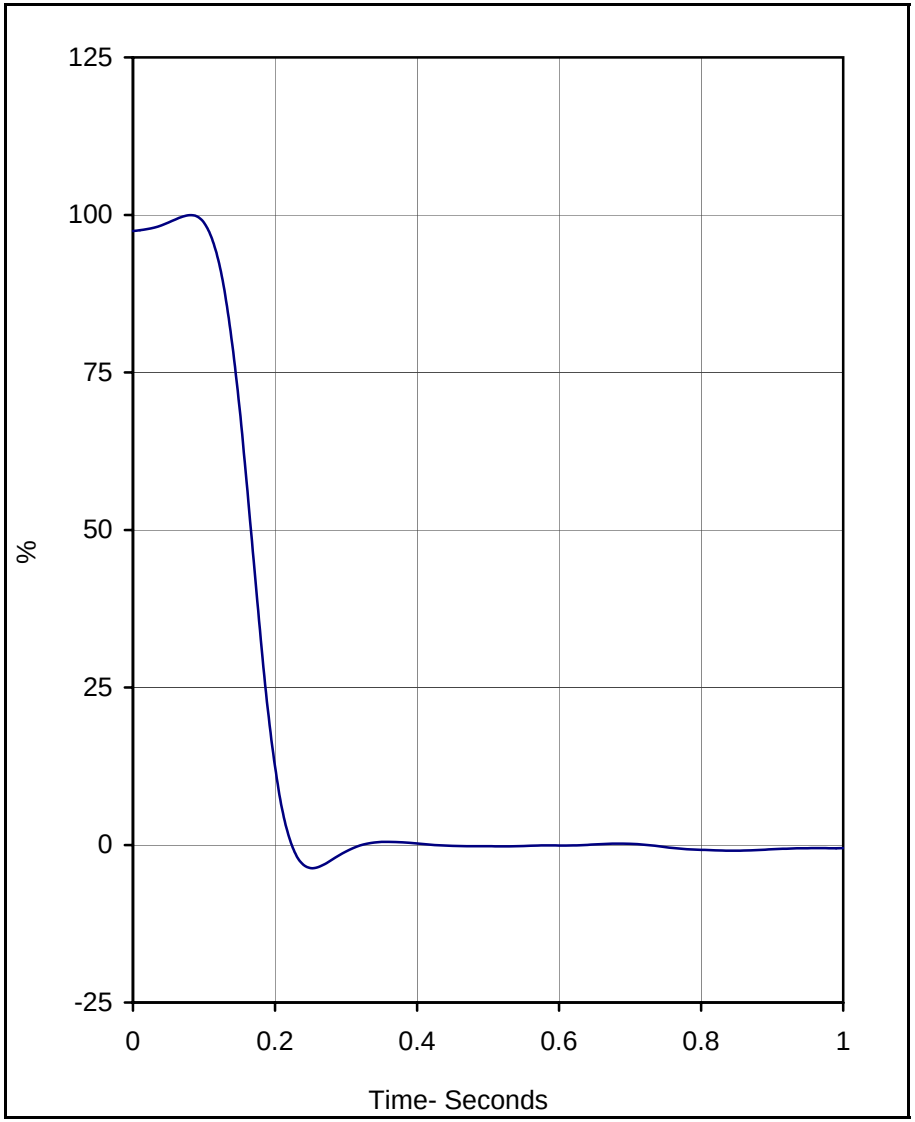

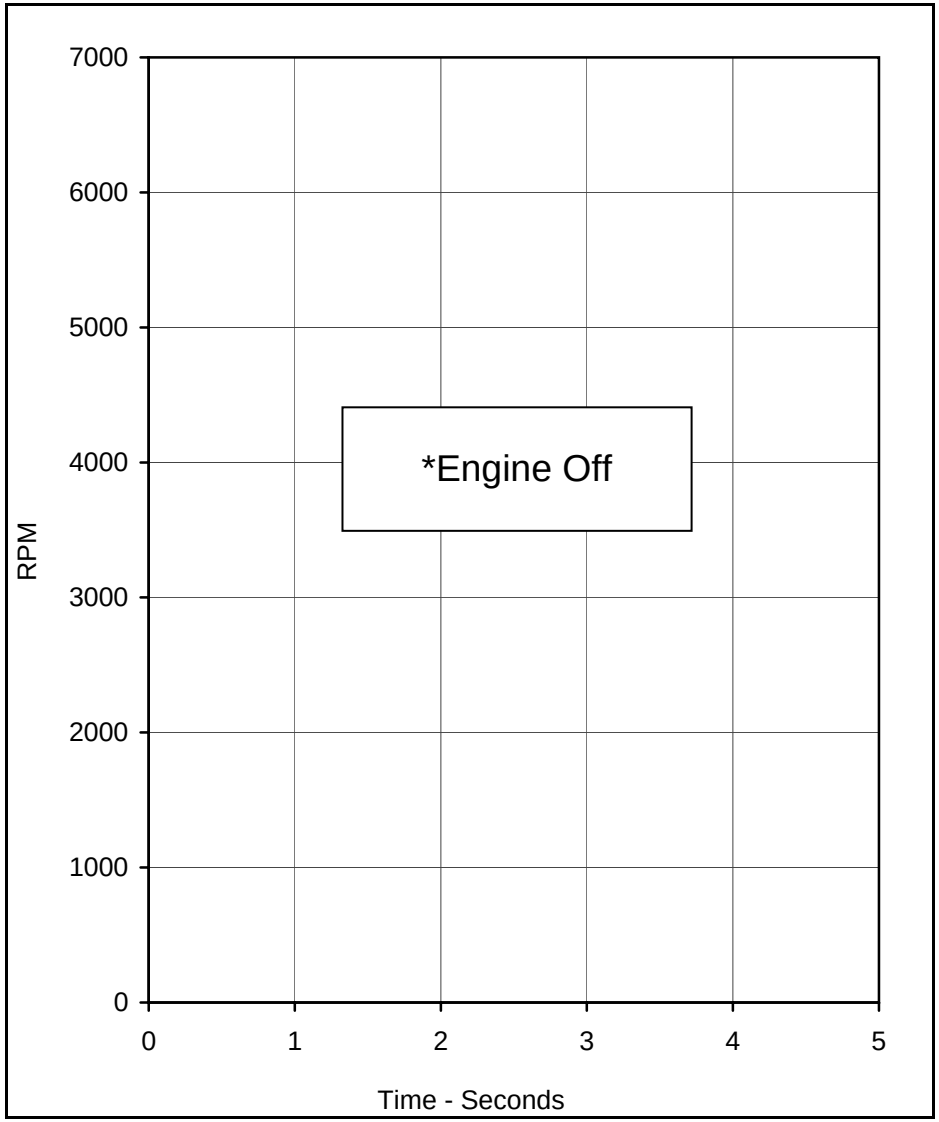

Curve Description	CURNO	Type
Throttle Position vs. Time	001	FIL

Units	Max	Time	Return Time (msec)	Filter (Hz)
%	100.0	0.1	140.0	5

Curve Description	CURNO	Type
Engine RPM vs. Time	002	FIL

Units	Max	Time	Min	Time	Filter (Hz)
RPM					

Test Program: FMVSS 124 (Severance of Throttle Cable)

Test Vehicle: 2006 Jeep Wrangler 2-Door MPV

Test Date: 07/10/06

NHTSA No.: C60303

KARCO Engineering

APPENDIX C
TEST EQUIPMENT LIST

FMVSS 124 Accelerator Control Systems

Test Equipment List and Calibration Information

07/10/06

2006 Jeep Wrangler 2-Door MPV

Description	Manufacturer	Model No.	Serial No.	Limit	Accuracy	Cal. Date	Due Cal.
TDAS	DTS	TDAS	DM0101	N/A	SAE J211	11/14/05	11/14/06
Computer	Toshiba	PAS4014	X8065355A	N/A	N/A	N/A	N/A
Optical 5th Wheel	Datron	DLS-2	06-262	150 MPH	± 1.0%	06/05/06	06/05/07