

REPORT NUMBER: 114-CAL-04-07

**SAFETY COMPLIANCE TESTING FOR
FMVSS No. 114
THEFT PROTECTION**

**VOLKSWAGEN AG GERMANY
2004 VOLKSWAGEN TOUAREG MPV**

NHTSA NUMBER: C45800

GENERAL DYNAMICS TEST NUMBER: 8655-P114-07

**GENERAL DYNAMICS
ADVANCED INFORMATION ENGINEERING SERVICES
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225**



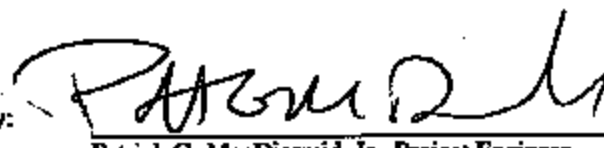
May 3, 2004

FINAL REPORT

**U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance
400 Seventh Street, SW
Room No. 6115 (NVS-220)
Washington, DC 20590**

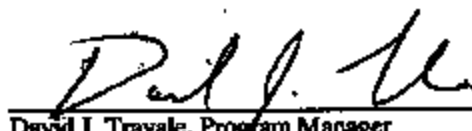
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Prepared By:



Patrick G. MacDiarmid, Jr., Project Engineer

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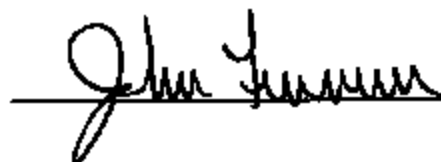
David J. Travale, Program Manager
Transportation Sciences Center

Approval Date:

May 3, 2004

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By:



Acceptance Date:

5/18/04

TECHNICAL REPORT STANDARD TITLE PAGE

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				6. Performing Organization Code CAL	
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15. Supplementary Notes					
16. Abstract Compliance tests were conducted on the subject 2004 Volkswagen Touareg MPV in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-114-01 for the determination of FMVSS 114 compliance. Test failures were identified as follows: S4.2.2(a): The vehicle was equipped with a special device that upon activation did allow the ignition key to be removed from the key locking system when the vehicle transmission shift lever was not in the "park" position. Upon device activation steering was not prevented as required by the safety standard.					
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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	Purpose of Compliance Test	1-1
2	Test Procedure and Discussion of Results	2-1
3	Test Data	3-1
	Data Sheet 1 – All Vehicles	3-2
	Data Sheet 2 – Automatic Transmission Vehicles	3-4
	Data Sheet 3 – Special Devices	3-6
4	Test Equipment List and Calibration Due Dates	4-1
5	Photographs	5-1
	Figure 1: Vehicle Left Front Three-Quarter View	5-2
	Figure 2: Vehicle Certification Placard	5-3
	Figure 3: Vehicle Tire Placard	5-4
	Figure 4: Close-Up Of Ignition Switch	5-5
	Figure 5: Close-Up Of Transmission Shift Lever Mechanism	5-6
	Figure 6: Close-Up Of Special Device Which Allows For Key Removal	5-7
6	Vehicle Owner's Manual	6-1
7	Notice of Test Failure	7-1

SECTION 1

PURPOSE OF COMPLIANCE TEST

This test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 114 Compliance Test Program conducted for the National Highway Traffic Safety Administration (NHTSA) by General Dynamics Advanced Information Engineering Services under Contract No. DTNH22-01-C-01025. The purpose of this test was to determine if the subject vehicle, a 2004 Volkswagen Touareg MPV, was in compliance with FMVSS No. 114, Theft Protection. The purpose of this standard is to reduce the incidence of crashes resulting from unauthorized operation of vehicles by specifying requirements for theft protection. Additionally, FMVSS No. 114 specifies requirements to reduce the incidents of crashes from rollaway of parked vehicles with automatic transmissions as a result of children moving the shift mechanism out of the "park" position. This standard applies to passenger cars, trucks and multipurpose passenger vehicles having a Gross Vehicle Weight Rating (GVWR) of 4536 kilograms or less. This compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No. TP-114-01, dated December 17, 1997.

SECTION 2

TEST PROCEDURE AND DISCUSSION OF RESULTS

A 2004 Volkswagen Touareg MPV with an automatic transmission was subjected to FMVSS No. 114 testing in accordance with the NHTSA Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure TP-114-01, dated December 17, 1997. This test was performed by General Dynamics Advanced Information Engineering Services on April 13, 2004.

The test equipment used for this test included a standard metric tape ruler, a digital inclinometer with digital clinometer function, weight scales and a digital manometer. Testing was performed in the following sequence:

KEY LOCKING SYSTEM REQUIREMENT (S4.2):

The key locking system with the key removed, did prevent normal activation of the vehicle's engine. Both steering and forward self mobility were prevented.

WARNING ALARM REQUIREMENT (S4.5):

With the key left in the locking system and the driver's door opened, an audible alarm was activated. This "warning to the driver" was verified in all ignition switch positions except "on" and "start".

"PARK" POSITION REQUIREMENT (S4.2.1(a)(2)):

The key locking system only permitted removal of the key when the automatic transmission shift lever was locked in "park". Key removal was attempted in all shift lever positions. On this vehicle, the transmission shift lever would not remain between detent positions without assistance.

TEN PERCENT GRADE "PARK" REQUIREMENT (S4.2.1(a)(3))

The vehicle was driven forward and stopped with the service brakes on a 10.5% grade. The parking brake was fully applied and the transmission lever was placed in "park". When the service and parking brakes were released the vehicle moved 2 mm (150 mm maximum is allowed on a 10% grade). Since the available test grade was more stringent than the specified condition, the subject vehicle appeared to perform within the safety performance requirements.

SPECIAL DEVICES REQUIREMENT (S4.2.2):

The vehicle was equipped with an ignition key emergency release, which when activated, permitted removal of the ignition key while the transmission shift lever was in a position other than "park". The special device is shown in Figure 6 and described in the vehicle owner's manual (page 3.2-4) as shown on page 6-4 of this report. The device was operable by depressing a button covered by a non-transparent surface, which, when installed, prevented sight and activation of the device. A screwdriver or similar tool was required to remove the device cover. Upon device activation, steering was not prevented.

"OUT OF PARK" POSITION REQUIREMENT (S4.3):

Starting from the condition of the engine running at idle with the transmission shift lever in the "drive" position, the steering wheel remained unlocked and the vehicle was free to roll with the transmission shift lever in each position except "park" or "reverse" when the key locking system was turned to the "3" (off) position.

SECTION 3

TEST DATA

FMVSS 114, THEFT PROTECTION

DATA SHEET 1 - ALL VEHICLES

TEST DATE: April 13, 2004 LAB: General Dynamics
 CONTRACT: DTNH22-01-C-01025 VEHICLE NHTSA NUMBER: C45800
 VIN: WVGBC67L64D003224 BUILD DATE: 05/03
 MY/MAKE/MODEL/BODY STYLE: 2004 Volkswagen Touareg MPV

LOCATION OF KEY LOCKING SYSTEM: The key locking system consisted of an ignition switch mounted on the dashboard to the right of the steering column and a transmission shift lever that was located on the center console mounted to the vehicle floor.

TRANSMISSION TYPE:

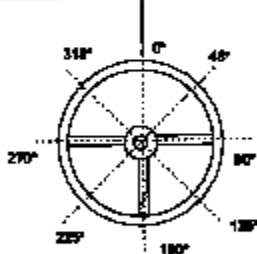
Automatic X ; Manual - ; Other -

DRIVE TRAIN TYPE:

Front Wheel - ; Rear Wheel - ; Four Wheel X

OPTIONAL RELEASE DEVICES:

Key X ; Transmission - ; None -

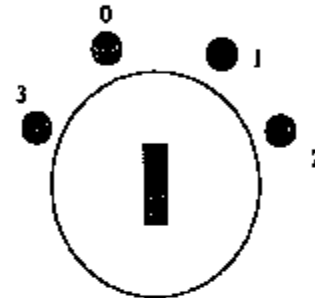
REQUIREMENT S4.2		PASS	FAIL
Engine cannot be started without utilizing the ignition key.		X	-
With key removed, steering wheel locks: Yes <u>X</u> ; No <u>-</u> Identify locking position on wheel using an arrow. <u>Clockwise - 0°</u> <u>Counterclockwise - 0°</u>			
			
Key removal prevents forward self mobility: Yes <u>X</u> ; No <u>-</u> If yes describe: <u>Automatic transmission remains in "park" position.</u>			
Locking system, with key removed prevents starting the engine and either steering or self mobility or both.		X	-

FMVSS 114, THEFT PROTECTION
DATA SHEET 1 - ALL VEHICLES (continued)

REQUIREMENT S4.5	PASS	FAIL
Warning system is activated when the ignition key is left in any switch position except "on" and "start" and the driver's door is opened.	X	-

REMARKS:

Ignition Switch Positions: (refer to page 6-3 of this report for description of the switch positions provided in the vehicle owner's manual).



RECORDED BY:

Patrick G. MacDermid, Jr.

DATE:

April 13, 2004

APPROVED BY:

James G. Kelly

FMVSS 114, THEFT PROTECTION

DATA SHEET 2 - AUTOMATIC TRANSMISSION VEHICLES ONLY

TEST DATE: April 13, 2004 LAB: General Dynamics
 CONTRACT: DTNH22-01-C-01025 VEHICLE NHTSA NUMBER: C45800
 VIN: WVGBC67L64D003224 BUILD DATE: 05/03
 MY/MAKE/MODEL/BODY STYLE: 2004 Volkswagen Touareg MPV

VEHICLE TEST WEIGHT* (kg): 2404.0 WEIGHT OF DRIVER AND BALLAST (kg): 90.5

FUEL TANK LEVEL: 100 (% OF MAX)

*with driver and ballast

TIRE PRESSURE:

Vehicle Manufacturer Recommended (kPa): Front 250 ; Rear 260

Measured (kPa): LF 250 ; LR 260 ; RF 250 ; RR 260

REQUIREMENT S4.2.1(a)(2)	PASS	FAIL
Key locking system prevents key removal from any shift mechanism detent position except "park".	X	SEE NOTE
Key locking system prevents key removal from any position between the detent positions where the shift mechanism will remain without assistance.	X	SEE NOTE
NOTE: In the event that the key can be removed at any of the transmission shift lever positions, the vehicle's transmission or transmission shift lever shall become locked in "park" as the direct result of removing the key. If such a mechanism exists, describe the mechanism and its function: <u>No such mechanism is available.</u>	N/A	N/A
System prevents movement of the shift mechanism out of "park" position after removal of key.	X	-

FMVSS 114, THEFT PROTECTION

DATA SHEET 2 – AUTOMATIC TRANSMISSION VEHICLES ONLY (continued)

REQUIREMENTS S4.2.1(a)(3)		PASS	FAIL
With the transmission in "park" measure movement of the vehicle down the slope upon releasing the service brake.			
Test grade: <u>10.5</u> % (9 to 15 %)		X	SEE NOTE
Measured movement: <u>2</u> mm (150 mm maximum)			
NOTE: Repeat procedure if vehicle fails on a grade in excess of 10%.			
Test grade: <u>-</u> % (9 to 10 %)		N/A	N/A
Measured movement: <u>-</u> mm (150 mm maximum)			

REQUIREMENT S4.3	PASS	FAIL
Transmission in any position other than "park" or "reverse" and the key locking system in the "3" (off) position. The steering wheel must remain unlocked and the vehicle must remain free to roll.	X	-

REMARKS:

None

RECORDED BY:

Patrick G. MacDiarmid, Jr.

DATE:

April 13, 2004

APPROVED BY:

James A. Gault

FMVSS 114, THEFT PROTECTION

DATA SHEET 3 - SPECIAL DEVICES

TEST DATE: April 13, 2004 LAB: General Dynamics
 CONTRACT: DTNH22-01-C-01025 VEHICLE NHTSA NUMBER: C45800
 VIN: WVGBC67L64D003224 BUILD DATE: 05/03
 MY/MAKE/MODEL/BODY STYLE: 2004 Volkswagen Touareg MPV

REQUIREMENTS S4.2.2(a)	PASS	FAIL
Electrical failure capability permits ignition key removal with transmission shift lever in other than "park" position. Yes <u>-</u> No <u>X</u> Upon key removal steering wheel locks.	N/A	-
Device permits key removal when the transmission is in other than the "park" position. Yes <u>X</u> No <u>-</u> The means for activating this device is covered by a non-transparent surface which prevents sight and activation of the device. The non-transparent surface is removable only by use of a screwdriver or other tool.	X	-
Describe the device, its cover and its location: <u>The device is located within the ignition switch lock cylinder in the key "off" position.</u> <u>The device is covered by a small, rectangular shaped non-transparent shield that is removable with a small flat-blade screwdriver or similar device. The device is shown in Figure 6 and on page 6-4 of this report (page 3,2-4 of the vehicle owner's manual).</u> Describe how the device is activated: <u>The device is activated by depressing the button with a pen or similar object and turning the ignition key counter-clockwise and removing it.</u>	-	X
Upon key removal, steering wheel locks.	-	X

REMARKS:

Upon removal of the ignition key using the ignition key emergency release the vehicle steering wheel did not lock.
Details are provided in section 7 of this report.

FMVSS 114, THEFT PROTECTION
DATA SHEET 3 - SPECIAL DEVICES (continued)

REQUIREMENTS S4.2.2(b)	PASS	FAIL
Device permits moving the transmission shift lever from "park" after key removal. Yes ☐ No ☐		
The means for activating this device is covered by a non-transparent surface which prevents sight and activation of the device. The non-transparent surface is removable only by use of a screwdriver or other tool.	N/A	N/A
Describe the device, its cover and its location: <u>Not applicable</u>		
Describe how the device is activated: <u>Not applicable</u>		
Upon device activation, the steering wheel remains locked.	N/A	N/A

REMARKS:

Test vehicle is not equipped with this special device.

RECORDED BY:

Patrick G. MacDiarmid, Jr.

DATE:

April 13, 2004

APPROVED BY:

[Signature]

SECTION 4

TEST EQUIPMENT LIST AND CALIBRATION DATES

Equipment	Manufacturer	Name	Range	Accuracy	Calibration Date	Calibration Due
Clinometer	MD	Smart Level	0-100%	0.1%	3/29/2004	3/29/2005
Steel Tape	Stanley	Stanley 3137	3 meters	0.5mm	N/A	N/A
Weight Scales	Long Acre	Computer Scales 2000	0-12,000lbs.	0.2%	11/25/2003	11/25/2004
Manometer	Meriam Instrument Co.	350 Smart Manometer	0-200 psi.	0.05%	8/3/2003	8/3/2004
Plumb Bob	Stanley	Plumb bob	N/A	N/A	N/A	N/A

SECTION 5

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

<u>Figure</u>	<u>Photograph Title</u>	<u>Page</u>
Figure 1	VEHICLE LEFT FRONT THREE-QUARTER VIEW	5- 2
Figure 2	VEHICLE CERTIFICATION PLACARD	5- 3
Figure 3	VEHICLE TIRE PLACARD	5- 4
Figure 4	CLOSE-UP OF IGNITION SWITCH	5- 5
Figure 5	CLOSE-UP OF TRANSMISSION SHIFT LEVER MECHANISM	5- 6
Figure 6	CLOSE-UP OF SPECIAL DEVICE WHICH ALLOWS FOR KEY REMOVAL	5- 7

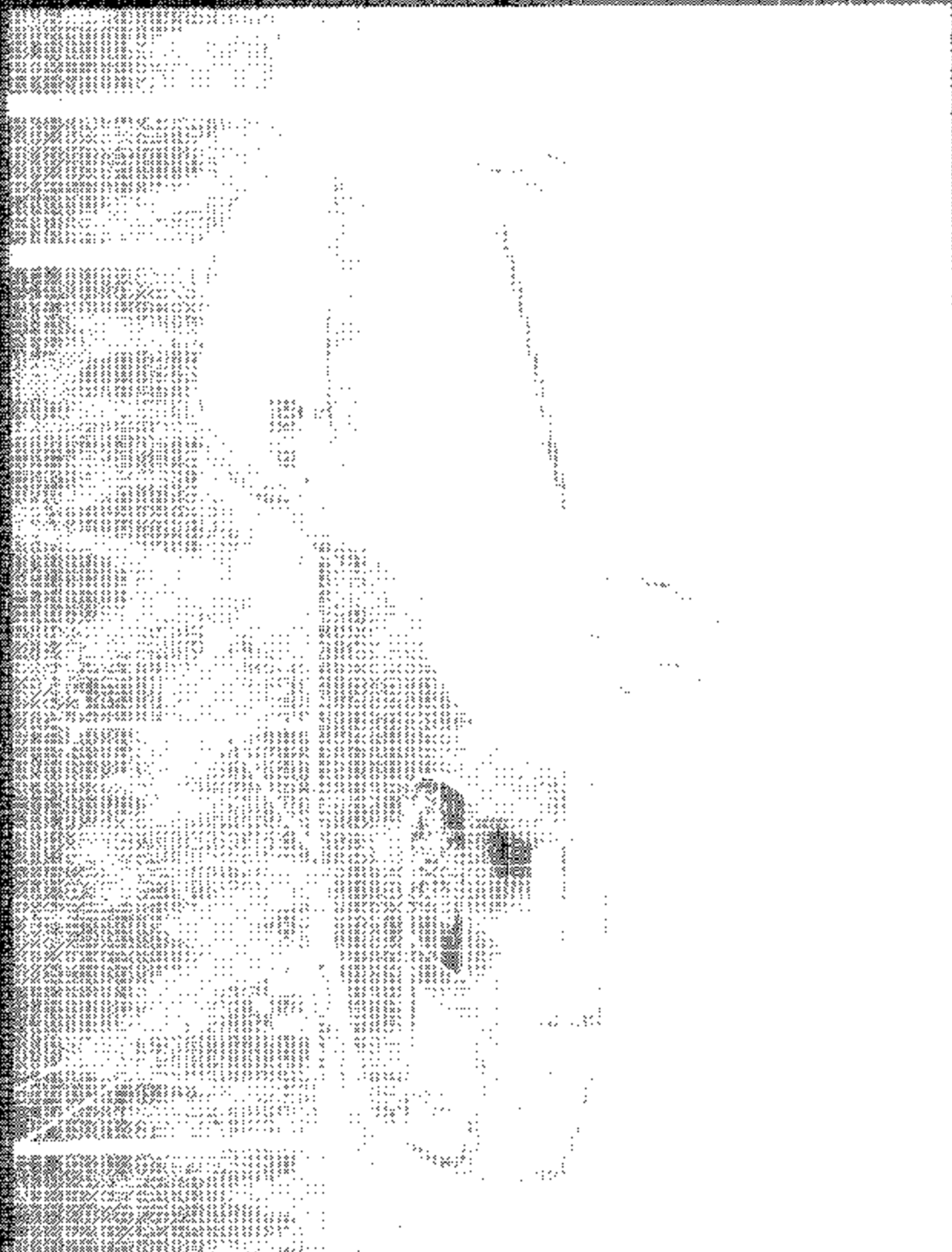


Figure 1: View of the Left Tower from the Ground Floor

John F. Kennedy Library
 1000 Massachusetts Avenue
 Cambridge, MA 02138

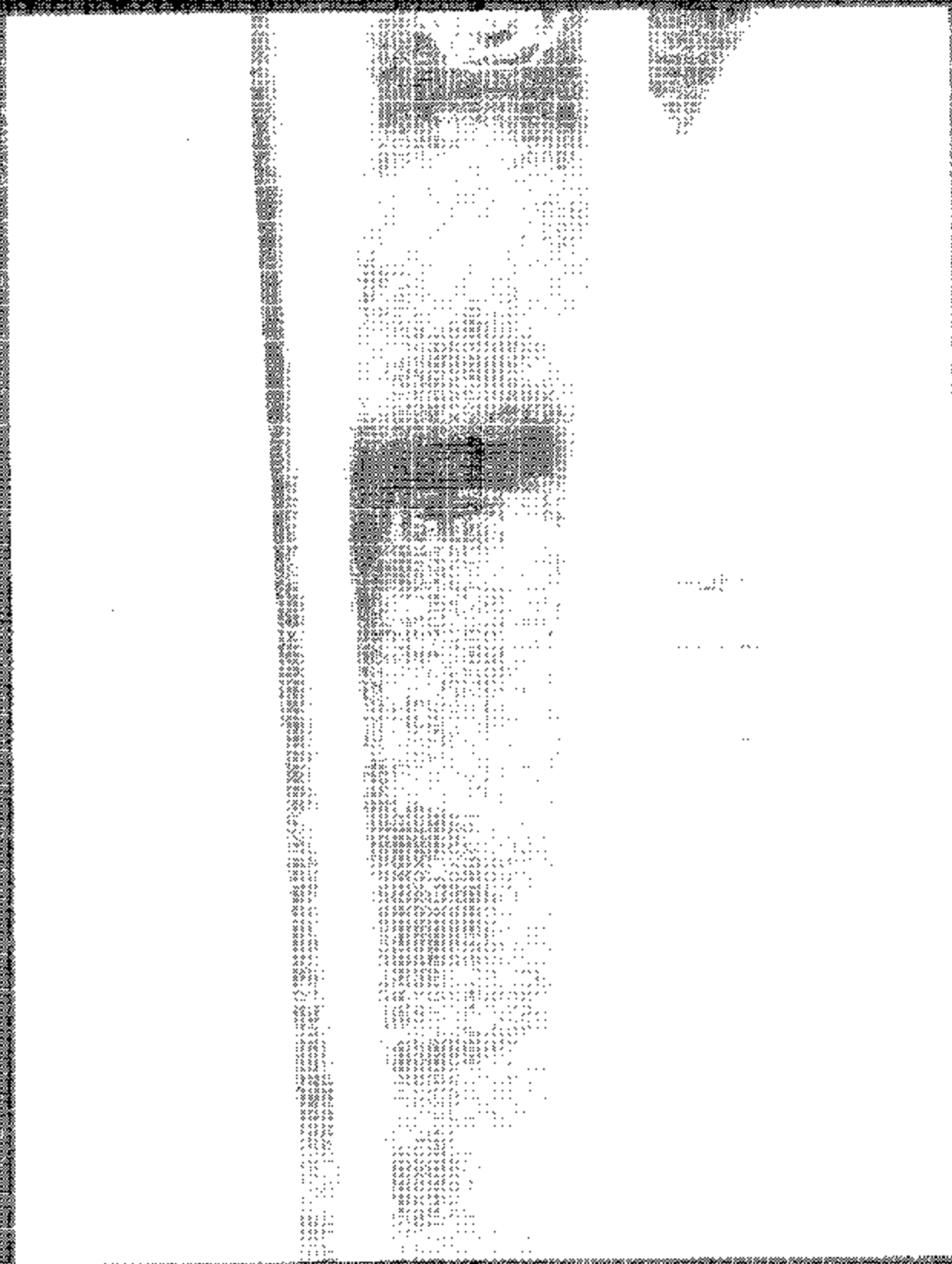


Figure 2: Volume & Credit Rating Process

2001 Volume & Credit Rating
NHTSA No. 00500

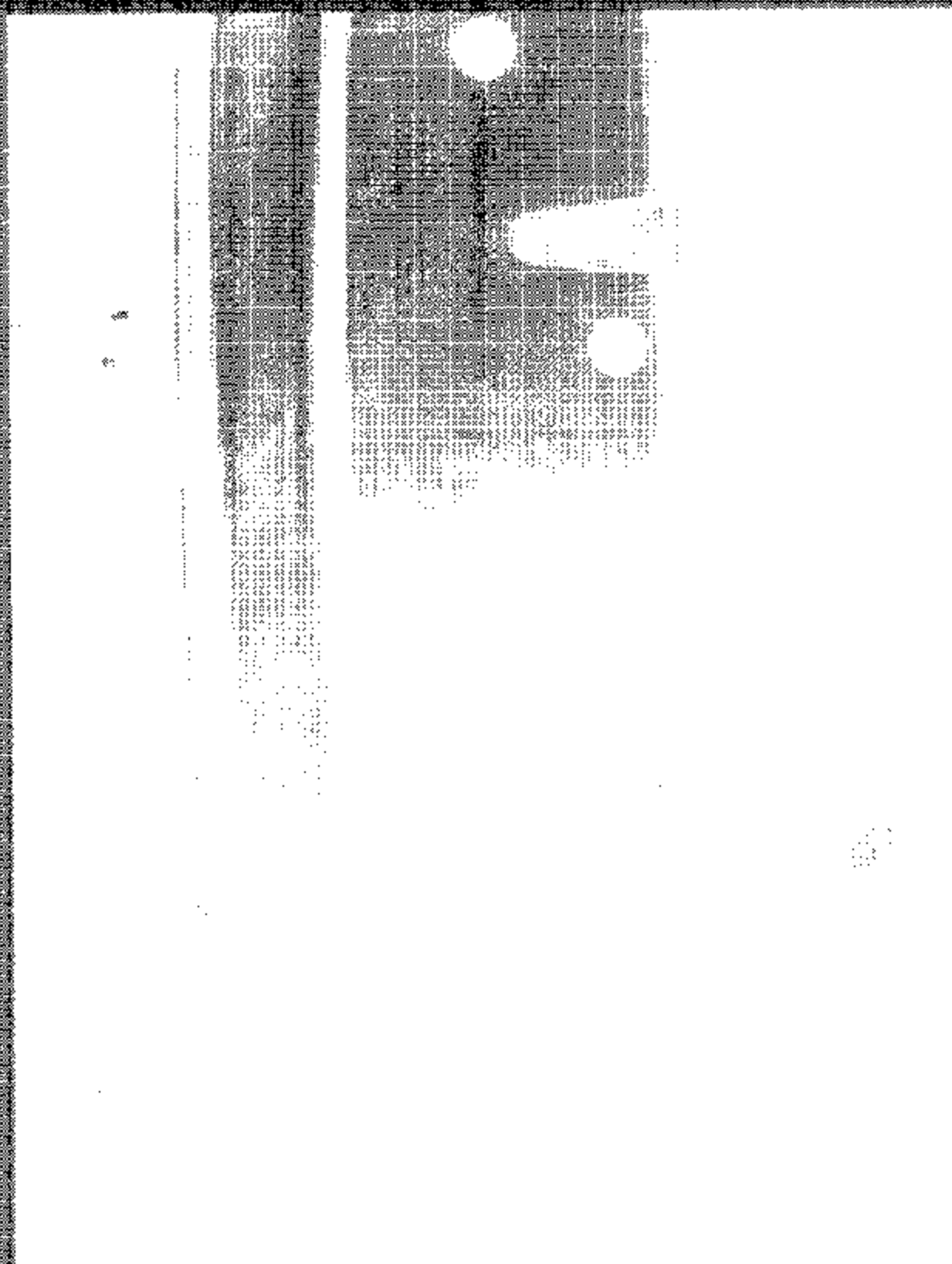


Figure 3: Vehicle Tire Print
2004 Volkswagen Journey MPV
NISTSA No. 05880

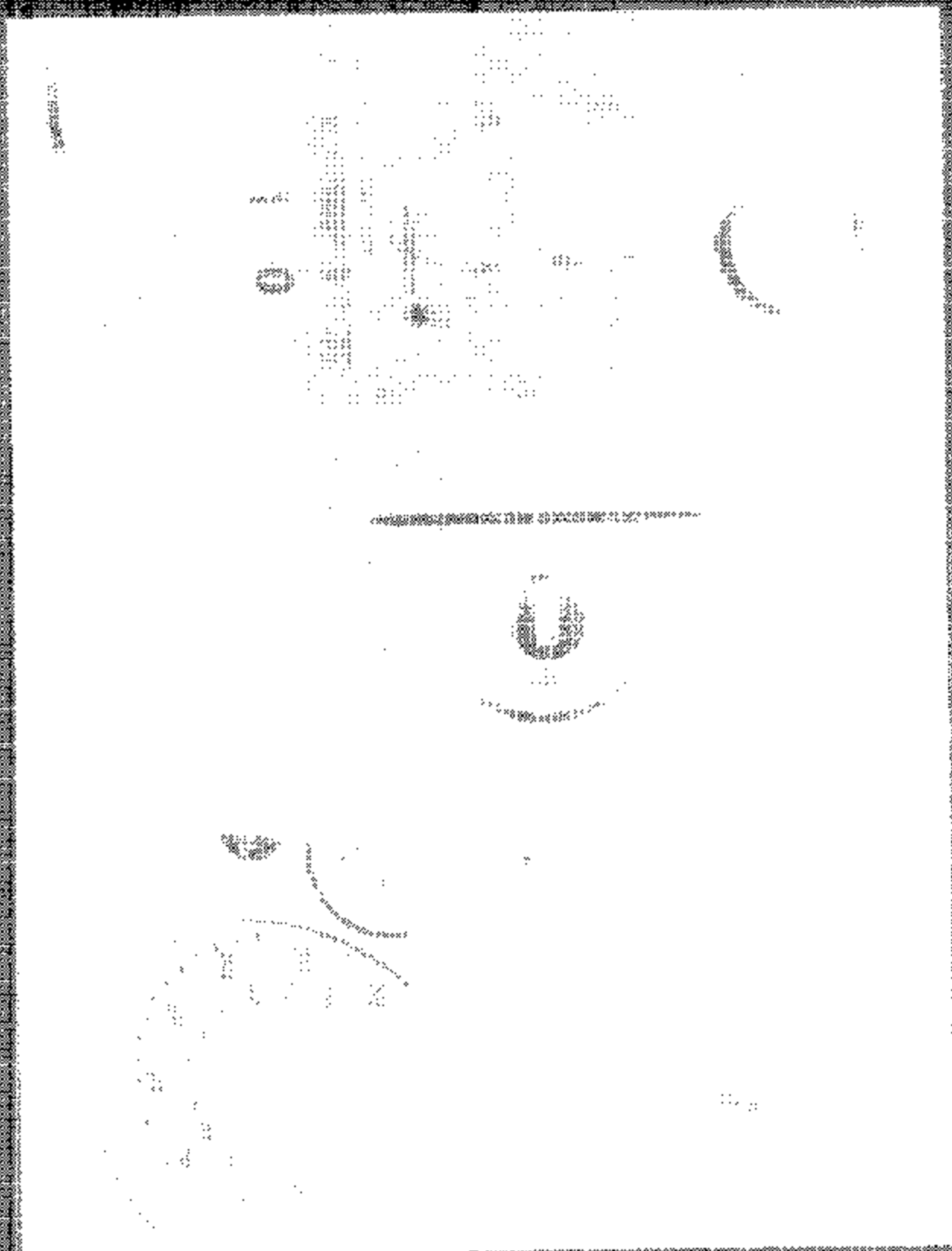


Figure 4. Growth of *Aspergillus* on paper.

2004 Yellowstone Journal
 NHTSA No. 04-000

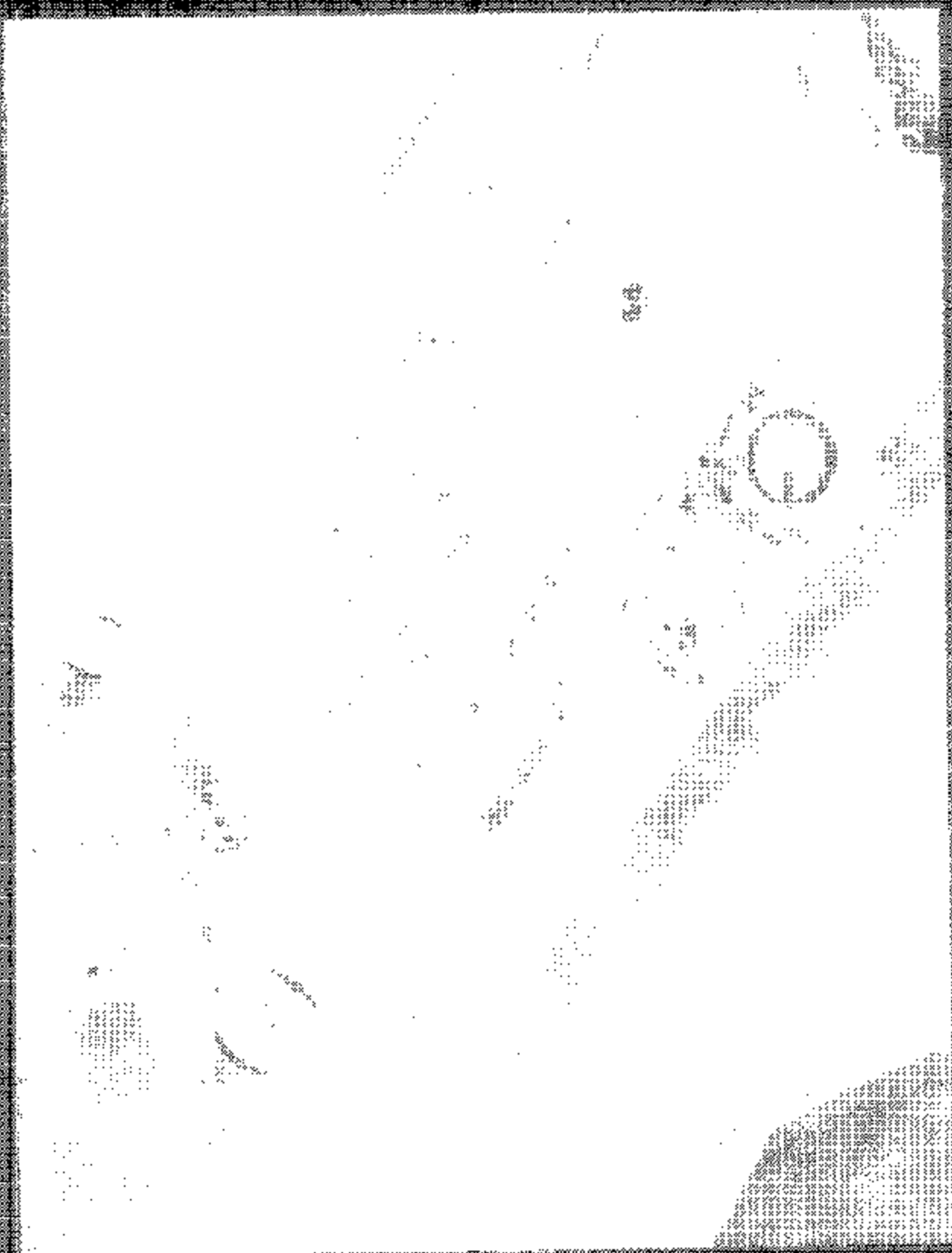


Figure 5. Chemically Crystallized Salt Lake Water

100% Polypropylene Tissue Paper
JELFA No. C-3300

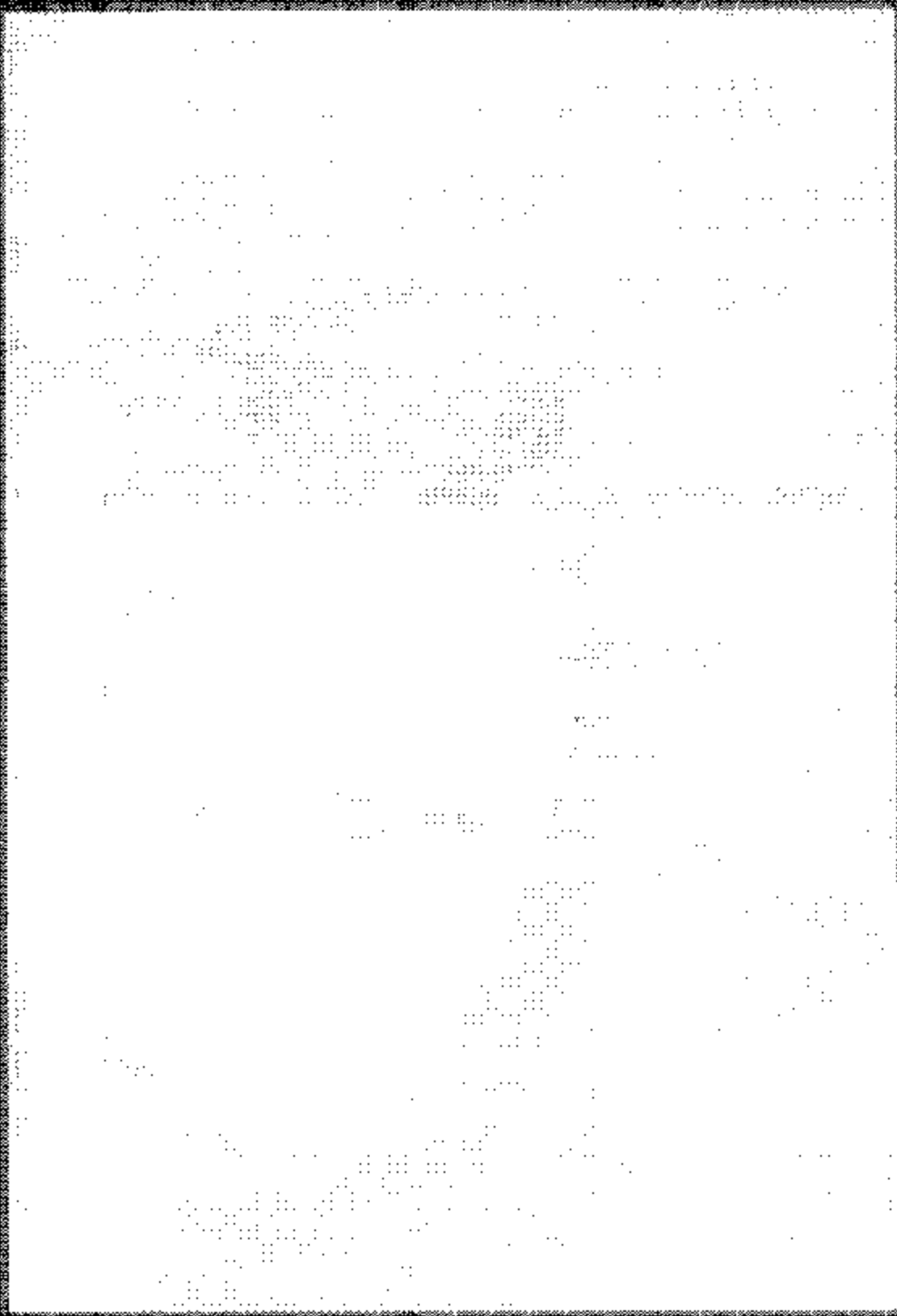


Page 6 of 6

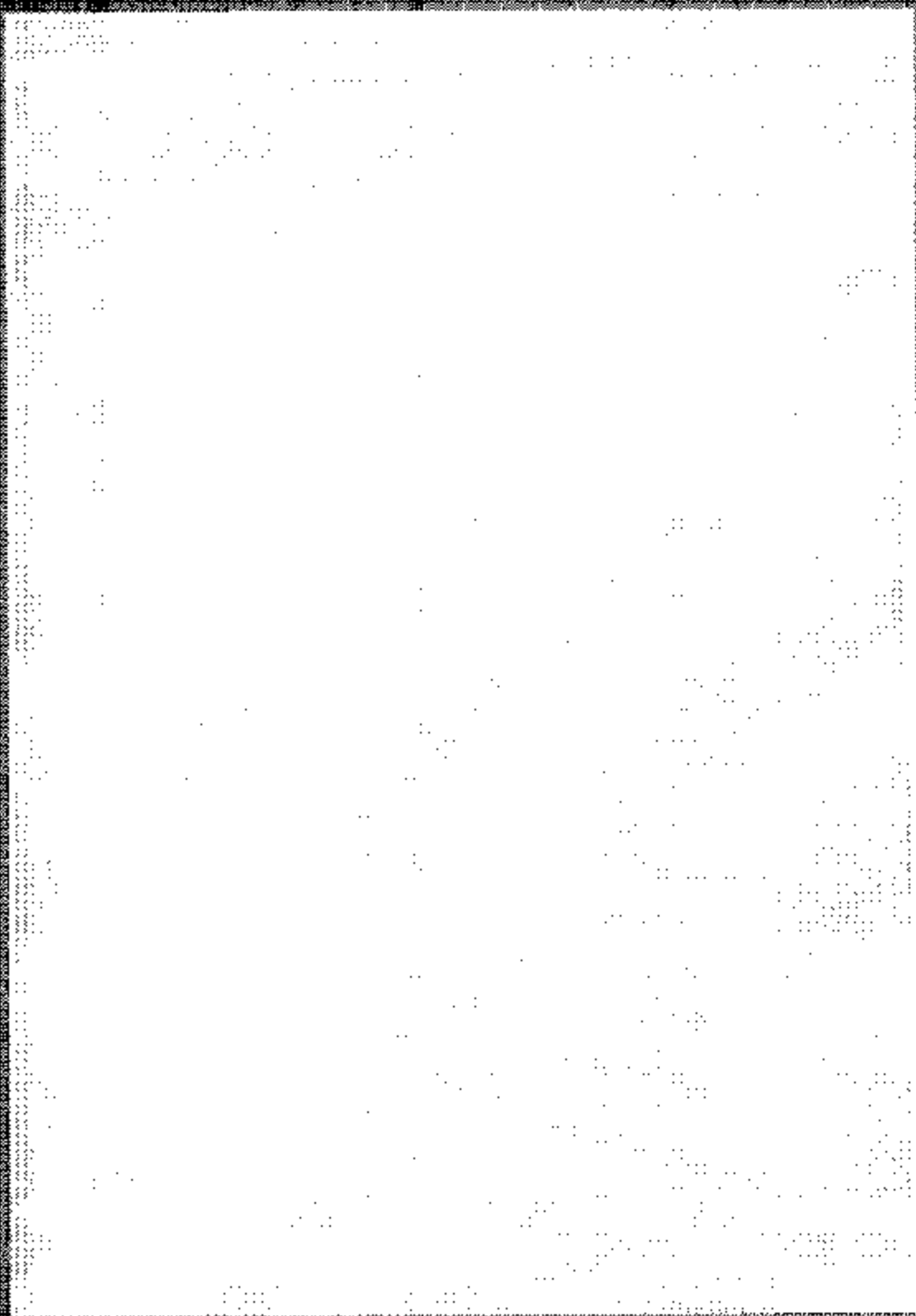
1001 Vandewater Young Rd
MESA, AZ 85205

SECTION 6

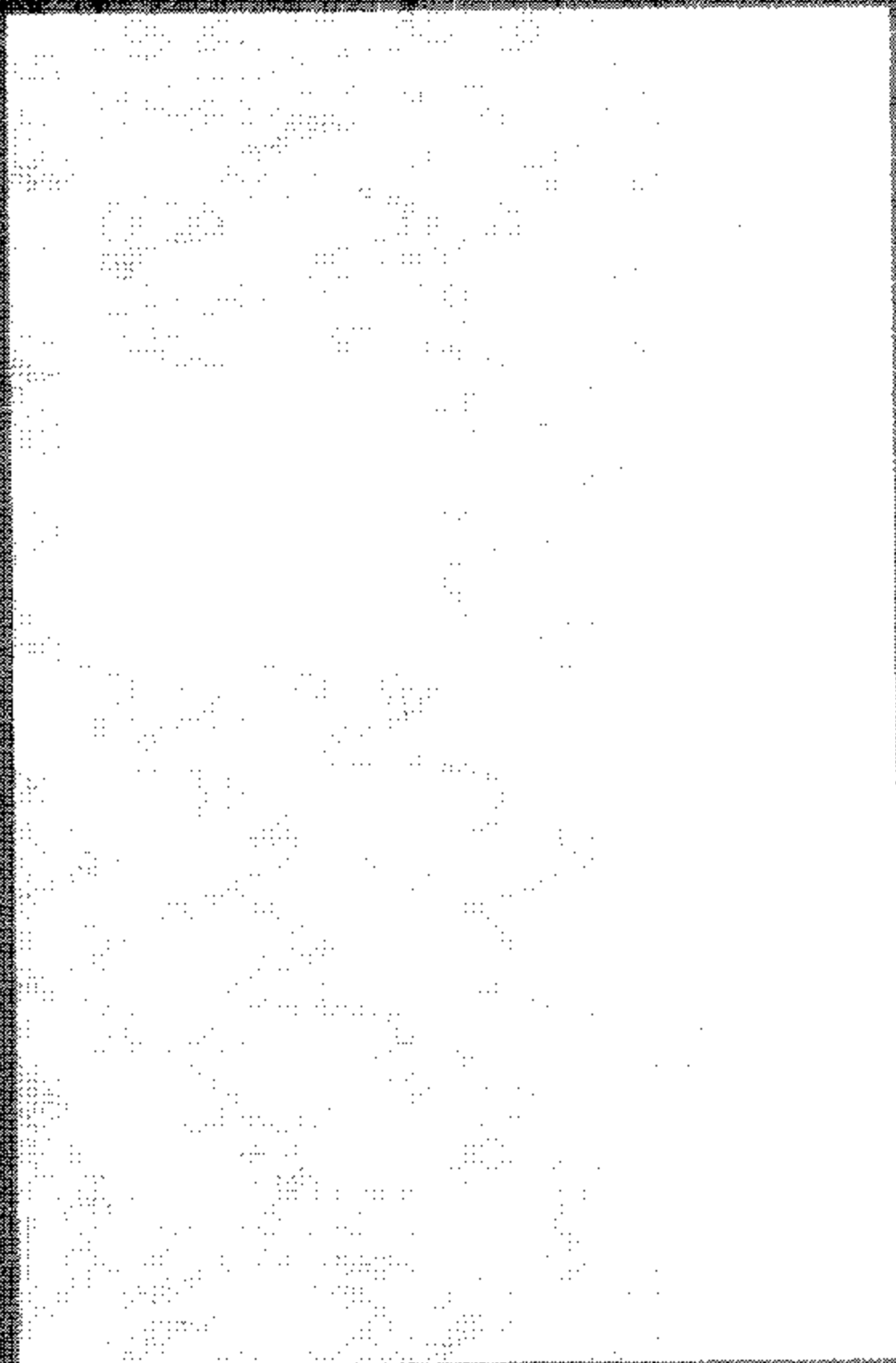
VEHICLE OWNER'S MANUAL



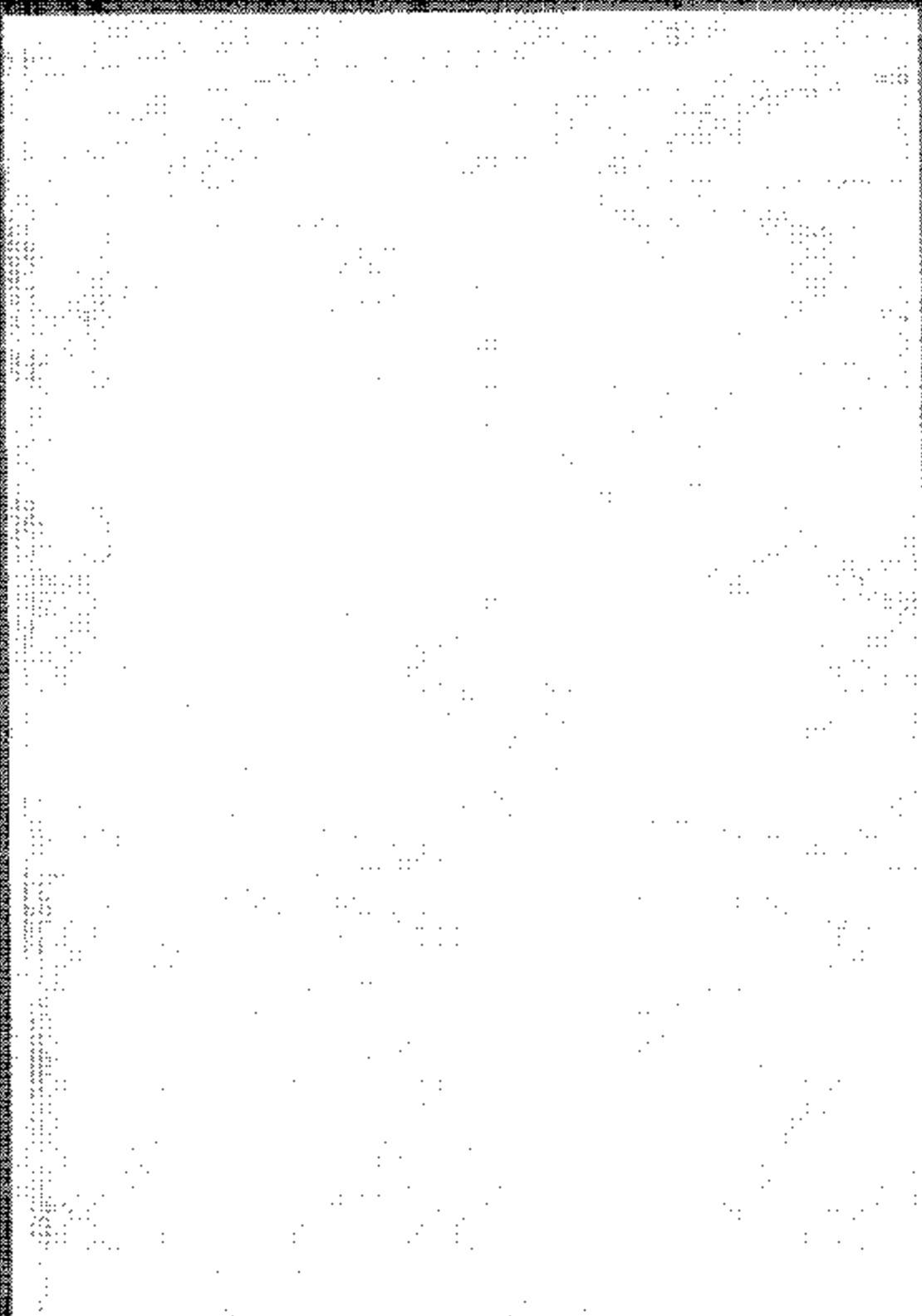
2004 Volkswagen Touareg MPV
NHTSA No. C43890



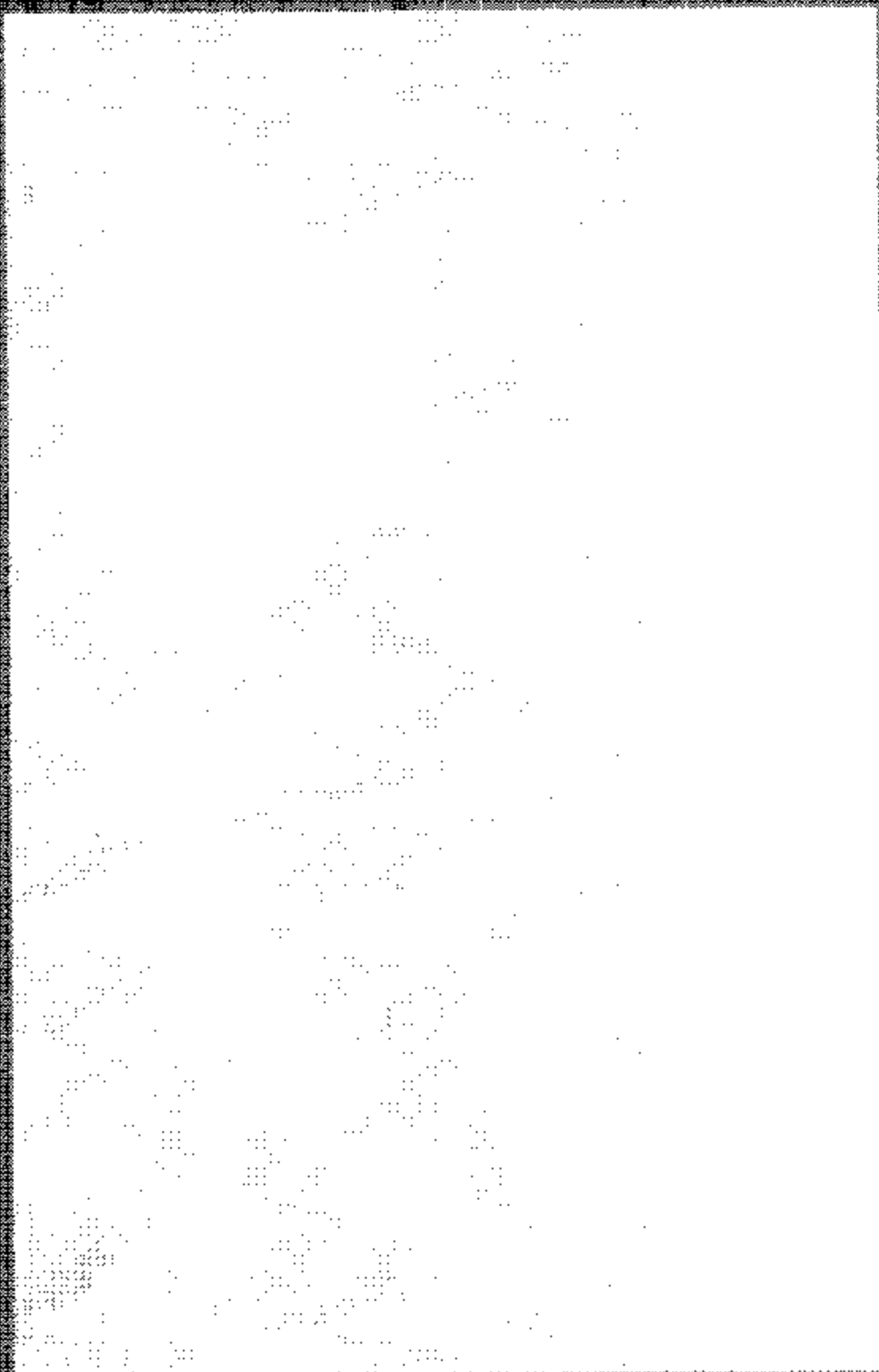
2004 Volkswagen Touareg MPV
NHTSA No. C15800



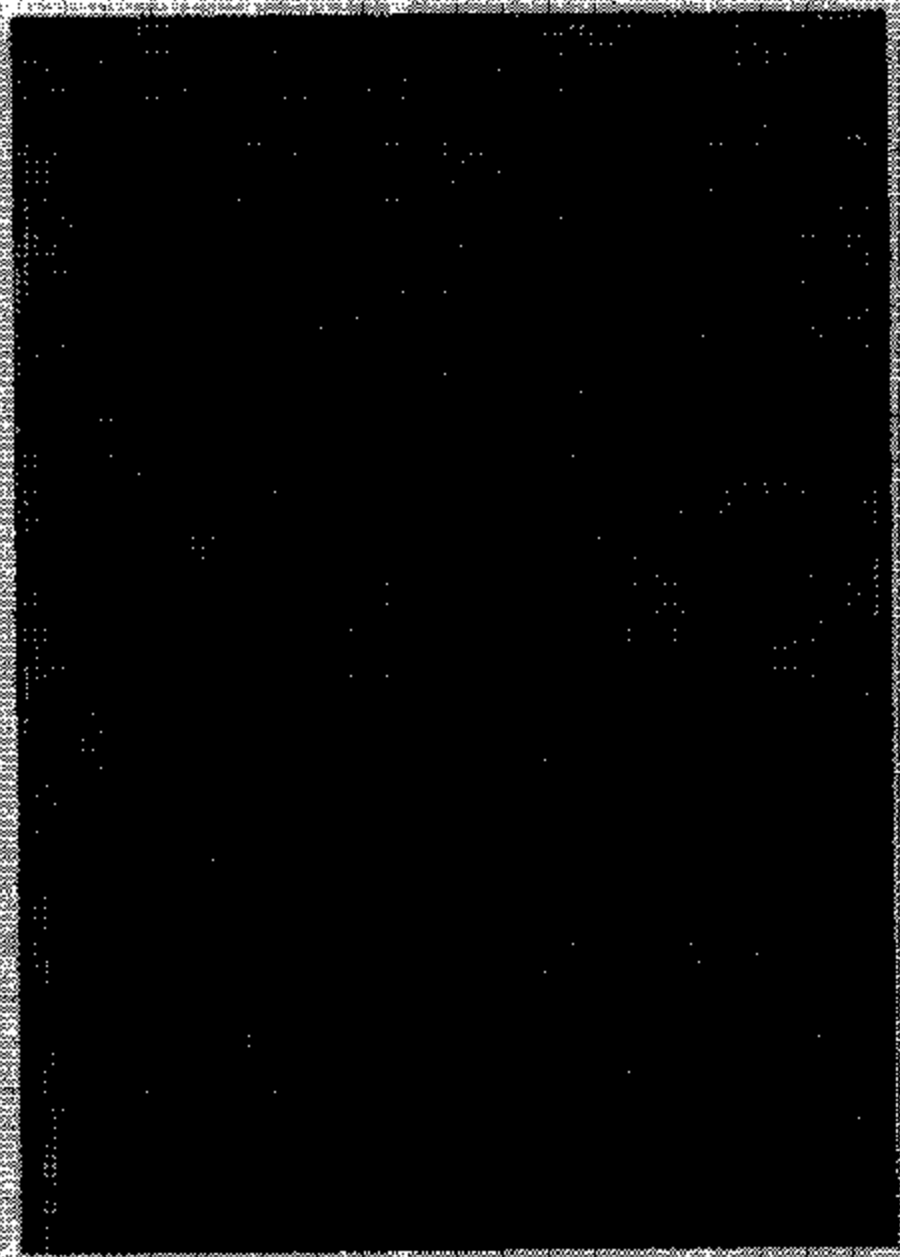
2004 Volkswagen Touran MPV
NHTSA No. C45560



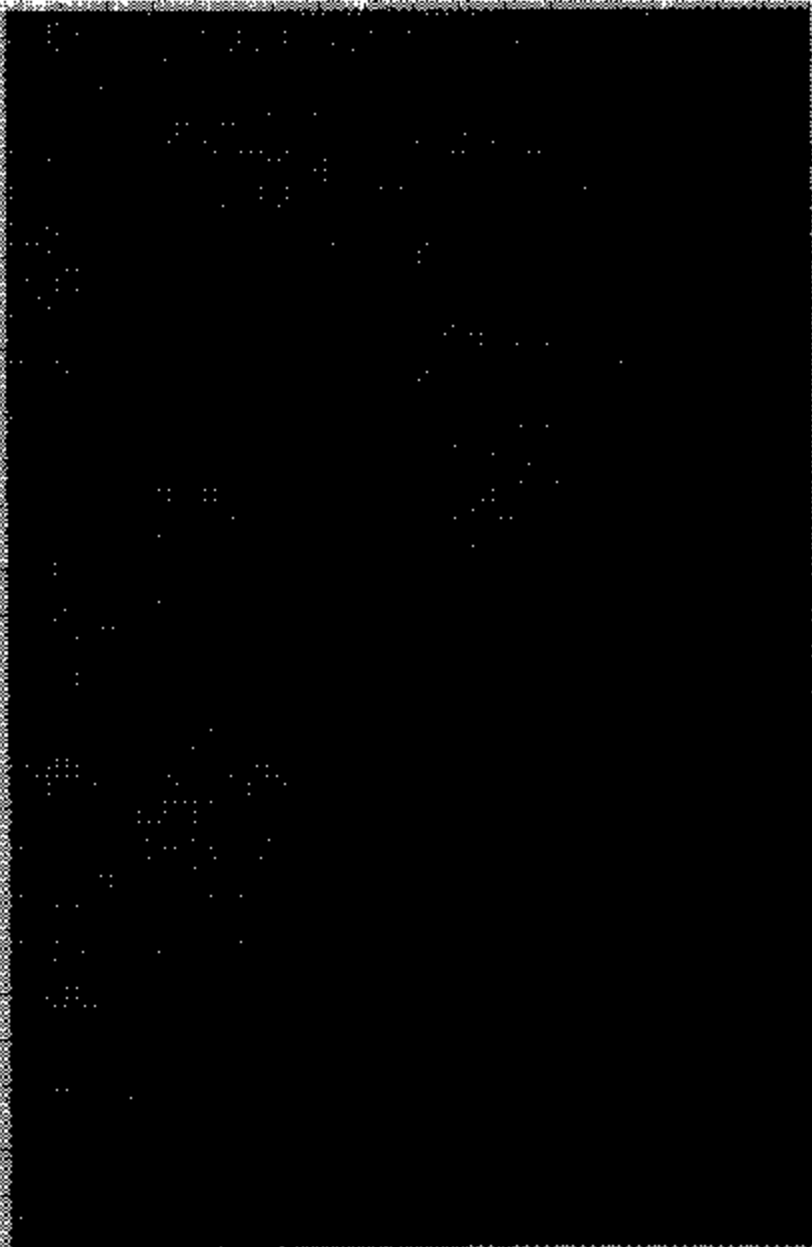
2004 Volkswagen Training MPV
NHTSA No. C45509



2004 Volkswagen Touareg MPV
NHTSA No. 140866



2004 Volkswagen Touareg MPV
14TTSA No. 040401



2004 Volkswagen Touareg MPV
NHTSA No. C45800

SECTION 7

NOTICE OF TEST FAILURE

LABORATORY NOTICE OF FAILURE TO OVSC

FMVSS NO.: 114 TEST DATE: April 13, 2004
LABORATORY: General Dynamics Advanced Information Engineering Services
CONTRACT NO.: DTNH22-01-C-01025; DELIVERY ORDER NO.: _____
LAB PROJECT ENGINEER'S NAME: Patrick G. MacDiarmid, Jr.
TEST SPECIMEN DESCRIPTION: 2004 Volkswagen Touareg Multipurpose Passenger Vehicle Ignition
Key Emergency Release

VEHICLE NHTSA NO.: C45800 VIN: WVGHC67L64D003224
PART NO.: Unknown MFR: Volkswagen AG Germany
TEST FAILURE DESCRIPTION: The VW Touareg is equipped with a special device that upon activation allows for the ignition key to be removed from the key locking system when the transmission shift lever is not in the park position. This device is operable when the vehicle has full power (battery connected) and during a simulated electrical failure condition (battery disconnected). Under both the full power and electrical failure conditions, upon key removal, steering **IS NOT** prevented as required by FMVSS No. 114, paragraph S4.2.2(a).

FMVSS REQUIREMENT, PARAGRAPH S4.2.2 (a): "Notwithstanding S4.2.1, provided that steering is prevented upon key's removal, each vehicle specified therein may permit key removal when electrical failure of this system (including battery discharge) occurs or may have a device which, when activated, permits key removal. This means for activating any such device shall be covered by a non-transparent surface which, when installed, prevents sight of and activation of the device. The covering shall be removable only by use of a screwdriver or other tool."

NOTIFICATION TO NHTSA (COTR): John Finnegan
DATE: April 13, 2004 BY: Patrick G. MacDiarmid, Jr.

REMARKS: The device is described in Touareg's Owner's manual booklet 3.2 page 4. However, the Owner's manual does not describe the opaque covering that prevents sight of and activation of the device. The covering is only removable with a screwdriver or similar tool.