

REPORT NO. 118-KAR-04-002

**SAFETY COMPLIANCE TESTING
FOR FMVSS 118**

**Power-Operated Window, Partition,
And Roof Panel Systems**

2004 MAZDA RX 8
4 DOOR SPORTS COUPE

NHTSA NO. C45407

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



June 18, 2004

FINAL REPORT

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

Tests were conducted on a 2004 Mazda RX 8, manufactured by Mazda Motor Corporation to determine compliance with FMVSS 118 "Power-Operated Window, Partition, and Roof Panel Systems". FMVSS 118 specifies requirements for power operated window, partition and roof panel systems to minimize the likelihood of death or injury from their accidental operation.

All tests were conducted based on the current National Highway Traffic Safety Administration (NHTSA), Office of Vehicle Safety Compliance (OVSC) Laboratory Procedures, TP-118-03, dated April 8, 1994, and corresponding KARCO Engineering test procedure KTP-118, dated March 16, 2004. Detailed procedures for receiving, inspecting, testing and reporting of test results are described in the test procedures and are not repeated in this report.

2. TEST PROCEDURE AND DATA SUMMARY

A 2004 Mazda RX 8 was subjected to FMVSS 118 compliance testing. The tests were conducted at KARCO Engineering in Adelanto, California on March 31, 2004. FMVSS 118 Compliance testing was performed in the following sequence:

- Vehicle Receiving Photographs
- Test Vehicle Check-in
- Power Window, Partitions and Roof Panel Identification/Documentation
- Interior, Exterior and Remote Control Switch Identification/Documentation
- Pre-Test Operation of all Power Windows, Partitions and Roof Panels
- Photograph Vehicle Ignition Switch and Master and Individual Power Window, Partition and Roof Panel Switches
- Perform Ignition Switch Off Test
- Perform Ignition Key Removed Test
- Perform Exterior Key Locking System Test
- Perform Remote Control System Test
- Perform Reversal System Test

DATA SUMMARY

VEHICLE			
YEAR	2004	MAKE	Mazda
MODEL	RX 8	BODY STYLE	4 Door Sports Coupe
NHTSA NO.	C45407	VIN	JM1FE17N940131257
TEST DATE:	03/31/04		

SWITCH ACTUATION

WINDOWS, PARTITIONS, ROOF PANEL SWITCHES	INTERIOR KEY LOCKING SYSTEM		EXTERIOR LOCKING SYSTEM (PASS / FAIL)
	IGNITION KEY OFF (PASS/FAIL)	IGNITION KEY REMOVED (PASS/FAIL)	
MASTER SWITCH PANEL			
Left Front (LF)	PASS	PASS	N/A
Right Front (RF)	PASS	PASS	N/A
Left Rear (LR)	N/A	N/A	N/A
Right Rear (RR)	N/A	N/A	N/A
Tail Gate (TG)	N/A	N/A	N/A
Partition	N/A	N/A	N/A
Roof Panel (RP)	N/A	N/A	N/A
INDIVIDUAL SWITCHES			
Left Front (LF)	N/A	N/A	N/A
Right Front (RF)	PASS	PASS	N/A
Left Rear (LR)	N/A	N/A	N/A
Right Rear (RR)	N/A	N/A	N/A
Right Rear (RR)	N/A	N/A	N/A
Tail Gate (TG)	N/A	N/A	N/A
Partition (P)	N/A	N/A	N/A
Roof Panel (RP)	N/A	N/A	N/A

REMARKS: The master switch control panel is located on the driver's side door panel and includes the individual left front window switch.

DATA SUMMARY (CONTINUED)**REMOTE ACTUATION DEVICE**

VEHICLE ORIENTATION REMOTE ACTUATION DEVICE	NON-LINE OF SIGHT REMOTE (METERS)	LINE OF SIGHT REMOTE (METERS)
FRONT	N/A	N/A
DRIVER SIDE	N/A	N/A
PASSENGER SIDE	N/A	N/A
REAR	N/A	N/A

WPRP OBSTRUCTION FORCE REVERSAL

WINDOW, PARTITION, ROOF PANEL	FORCE TO REVERSE (NEWTONS)	DISTANCE WINDOW, PARTITION, OR ROOF PANEL OPENED ON REVERSAL (mm)
LEFT FRONT (LF)	N/A	N/A
RIGHT FRONT (RF)	N/A	N/A
LEFT REAR (LR)	N/A	N/A
RIGHT REAR (RR)	N/A	N/A
PARTITION (P)	N/A	N/A
ROOF PANEL (RP)	N/A	N/A
TAIL GATE (TG)	N/A	N/A

REMARKS: This vehicle is not equipped with a remote actuation device or automatic reversal system.

The subject 2004 Mazda RX 8 appeared to meet the requirements of FMVSS 118.

3. **TEST DATA**

**DATA SHEET NO. 1
VEHICLE IDENTIFICATION**

VEHICLE			
YEAR	2004	MAKE	Mazda
MODEL	RX 8	BODY STYLE	4 Door Sports Coupe
NHTSA NO.	C45407	VIN	JM1FE17N940131257
TEST DATE:	03/31/04		

Identify Vehicle equipped WPRP and WPRP controls

	LEFT FRONT	LEFT REAR	RIGHT FRONT	RIGHT REAR	TAIL GATE	PARTITION	ROOF PANEL
Power Windows	X	N/A	X	N/A	N/A	N/A	N/A
Interior Switches	X	N/A	X	N/A	N/A	N/A	N/A
Master Control Panel	X	N/A	N/A	N/A	N/A	N/A	N/A
Exterior Switches	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Remote Controller	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Auto-Reverse	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Master Control Panel Location: Driver Side Door Panel

Remote Control: None.

Window Switch Design: Master Control Switches – Flush Mounted Lever Switch push down to open, pull up to close.
Individual Window Switches – Flush Mounted Lever Switch push down to open, pull up to close.

Exterior Control Switch: None.

Sunroof: N/A

REMARKS: Master window switch is located in the driver side door panel. Individual switches are located in each respective door panel.

RECORDED BY: MATTHEW A. IVORY **DATE:** 03/31/04

APPROVED BY: MICHAEL L. DUNLAP **DATE:** 03/31/04

**DATA SHEET NO. 2
IGNITION KEY OFF TEST**

VEHICLE			
YEAR	2004	MAKE	Mazda
MODEL	RX 8	BODY STYLE	4 Door Sports Coupe
NHTSA NO.	C45407	VIN	JM1FE17N940131257
TEST DATE:	03/31/04		

Pre-Test Check: Window, Partition, Roof Panel Systems operate with Ignition Switch in "ON" Position	YES	X	NO	
Pre-Test Check: Window, Partition, Roof Panel Systems operate with Ignition Switch in "ACCESSORY" Position	YES		NO	X

WINDOW SWITCHES	DOORS CLOSED		LEFT DOOR OPEN		RIGHT DOOR OPEN		PASS/ FAIL
	INOP.	OPER.	INOP.	OPER.	INOP.	OPER.	
MASTER							
Left Front (LF)	N/A	X	X	N/A	X	N/A	PASS
Right Front (RF)	N/A	X	X	N/A	X	N/A	PASS
Left Rear (LR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Right Rear (RR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tail Gate (TG)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Partition (P)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roof Panel (RP)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
INDIVIDUAL							
Left Front (LF)	N/A	X	X	N/A	X	N/A	PASS
Right Front (RF)	N/A	X	X	N/A	X	N/A	PASS
Left Rear (LR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Right Rear (RR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tail Gate (TG)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Partition (P)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roof Panel (RP)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

REMARKS: The master left front switch is the same as the individual left front switch. Test was performed with key in the "Lock" position. For the pre-test check in the "Accessory" position the key was moved from the "Lock" position to the "Accessory" position without cycling through the "On" position or starting the engine.

RECORDED BY: MATTHEW A. IVORY DATE: 03/31/04

APPROVED BY: MICHAEL L. DUNLAP DATE: 03/31/04

**DATA SHEET NO. 3
IGNITION KEY REMOVED TEST**

VEHICLE			
YEAR	2004	MAKE	Mazda
MODEL	RX 8	BODY STYLE	4 Door Sports Coupe
NHTSA NO.	C45407	VIN	JM1FE17N940131257
TEST DATE:	03/31/04		

WINDOW SWITCHES	DOORS CLOSED		LEFT DOOR OPEN		RIGHT DOOR OPEN		PASS/ FAIL
	INOP.	OPER.	INOP.	OPER.	INOP.	OPER.	
MASTER							
Left Front (LF)	N/A	X	X	N/A	X	N/A	PASS
Right Front (RF)	N/A	X	X	N/A	X	N/A	PASS
Left Rear (LR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Right Rear (RR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tail Gate (TG)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Partition (P)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roof Panel (RP)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
INDIVIDUAL							
Left Front (LF)	N/A	X	X	N/A	X	N/A	PASS
Right Front (RF)	N/A	X	X	N/A	X	N/A	PASS
Left Rear (LR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Right Rear (RR)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tail Gate (TG)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Partition (P)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roof Panel (RP)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

REMARKS: The master left front switch is the same as the individual left front switch

RECORDED BY: MATTHEW A. IVORY

DATE: 03/31/04

APPROVED BY: MICHAEL L. DUNLAP

DATE: 03/31/04

**DATA SHEET NO. 4
EXTERIOR KEY LOCKING SYSTEM**

VEHICLE			
YEAR	2004	MAKE	Mazda
MODEL	RX 8	BODY STYLE	4 Door Sports Coupe
NHTSA NO.	C45407	VIN	JM1FE17N840131257
TEST DATE:	03/31/04		

EXTERIOR LOCKING CONTROL SWITCH TEST				
Can Any WPRP Be Operated by Directly Using A Key in an Exterior Locking Control Switch?	Yes		No	X
If Yes: Is Continuous Activation of the Switch Required	Yes		No	X

NOTE: Continuous activation is required for WPRP activation by exterior key locking systems.

IDENTIFY WINDOW, PARTITION AND ROOF PANEL POSITIONS WHICH ARE OPERABLE WITH EXTERIOR KEY.

LOCATION	OPERABLE W/KEY		CONTINUOUS ACTION		PASS / FAIL
	YES	NO	YES	NO	
LEFT FRONT (LF)	N/A	N/A	N/A	N/A	N/A
RIGHT FRONT (RF)	N/A	N/A	N/A	N/A	N/A
LEFT REAR (LR)	N/A	N/A	N/A	N/A	N/A
RIGHT REAR (RR)	N/A	N/A	N/A	N/A	N/A
PARTITION (P)	N/A	N/A	N/A	N/A	N/A
ROOF PANEL (RP)	N/A	N/A	N/A	N/A	N/A
TAIL GATE (TG)	N/A	N/A	N/A	N/A	N/A

REMARKS: Mazda is not equipped with an exterior key locking system that can operate the power window system

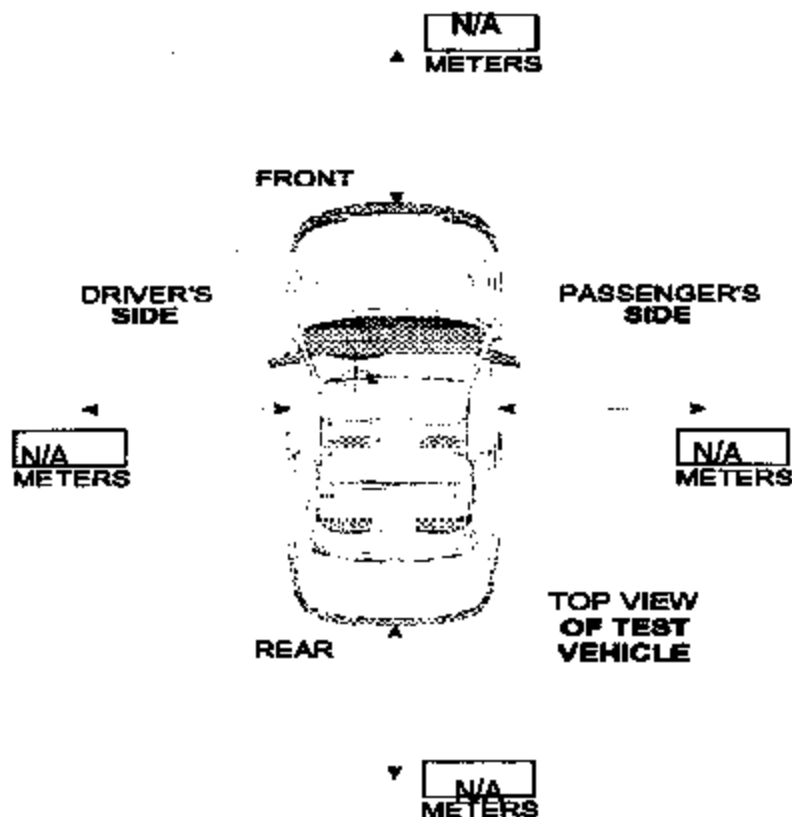
RECORDED BY: MATTHEW A. IVORY DATE: 03/31/04

APPROVED BY: MICHAEL L. DUNLAP DATE: 03/31/04

DATA SHEET NO. 5
MAXIMUM OPERATING RANGE FOR LINE-OF-SIGHT REMOTE

VEHICLE			
YEAR	2004	MAKE	Mazda
MODEL	RX 8	BODY STYLE	4 Door Sports Coupe
NHTSA NO.	C45407	VIN	JM1FE17N940131257
TEST DATE:	03/31/04		

If range of operation exceeds 11 meters in any of the below measured directions, the window, partition, and roof panel must meet the reversing requirements of FMVSS 118. Continuous activation of remote device is required to close windows, partition and roof panel YES () NO ().



REMARKS: The vehicle is not equipped with a remote actuation device.

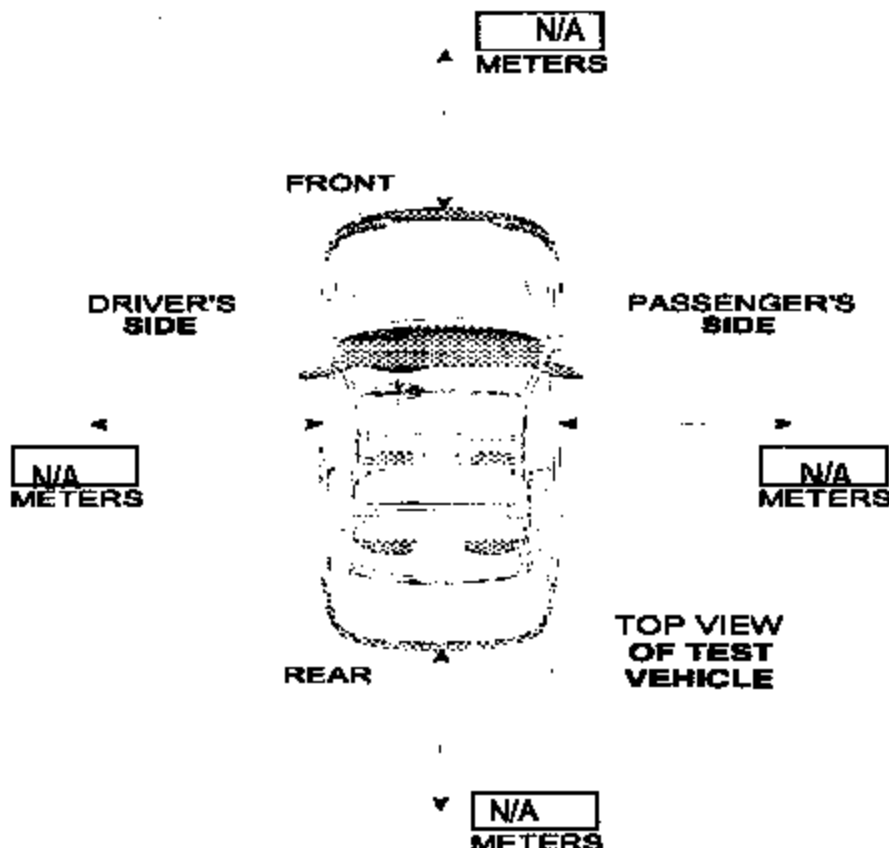
RECORDED BY: MATTHEW A. IVORY DATE: 03/31/04

APPROVED BY: MICHAEL L. DUNLAP DATE: 03/31/04

DATA SHEET NO. 8
MAXIMUM OPERATING RANGE FOR NON-LINE-OF-SIGHT REMOTE

VEHICLE			
YEAR	2004	MAKE	Mazda
MODEL	RX 8	BODY STYLE	4 Door Sports Coupe
NHTSA NO.	C45407	VIN	JM1FE17N940131257
TEST DATE:	03/31/04		

If range of operation exceeds 6 meters in any of the below measured directions, the window, partition, and roof panel must meet the reversing requirements of FMVSS 118. Continuous activation of remote device is required to close windows, partition and roof panel YES () NO ().



REMARKS: The vehicle is not equipped with a remote actuation device.

RECORDED BY: MATTHEW A. IVORY DATE: 03/31/04

APPROVED BY: MICHAEL L. DUNLAP DATE: 03/31/04

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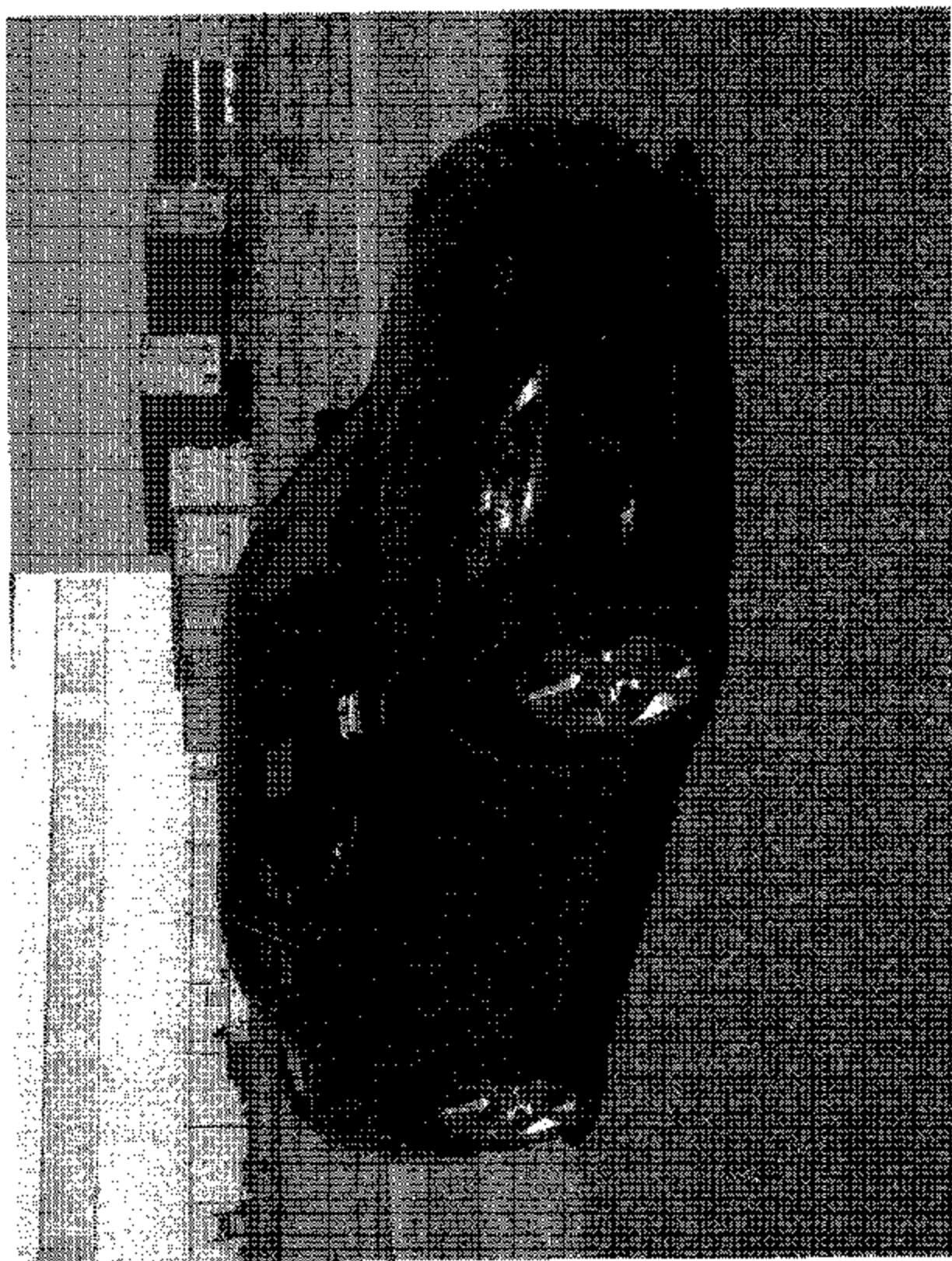


Figure 1: ¾ Frontal View From Right Side of Vehicle

2004 MAZDA RX-8
NHTSA NO. C45407
FMVSS NO. 118

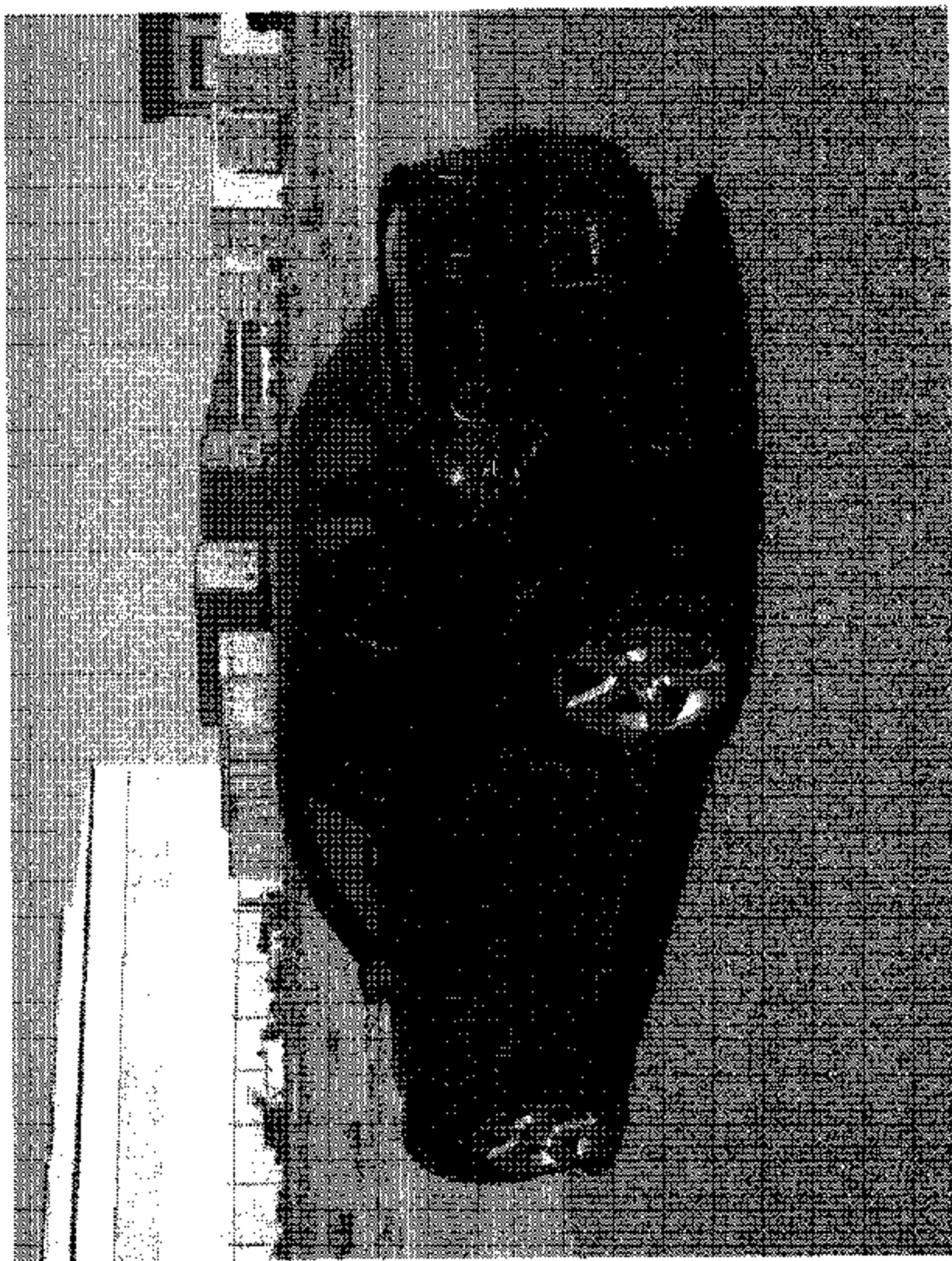


Figure 2: ¾ Rear View From Left Side of Vehicle

2004 MAZDA RX-8
NHTSA NO. C45407
FMVSS NO. 118

VEHICLE CAPACITY WEIGHT (FE02)
CAPACITÉ PORTEUSE DU VÉHICULE 308kg (680lb)

SEATING CAPACITY
NOMBRE DE PLACES

FRONT SEAT	...	2
SIÈGE AVANT		
REAR SEAT	..	2
SIÈGE ARRIÈRE		
TOTAL	...	4

TIRE INFLATION PRESSURE	FRONT/AV.	REAR/AR.
PRESSION DE GONFLEMENT DES	220	220
PNEUS kPa(kgf/cm ²)(p.s.i., lb/po ²)	(2.2)(32)	(2.2)(32)

TIRE SIZE
TAILLE DES PNEUS

225/45R18 91W

2004 MAZDA RX-8
NHTSA NO. C45407
FMVSS NO. 118

Figure 4: Tire Information Placard

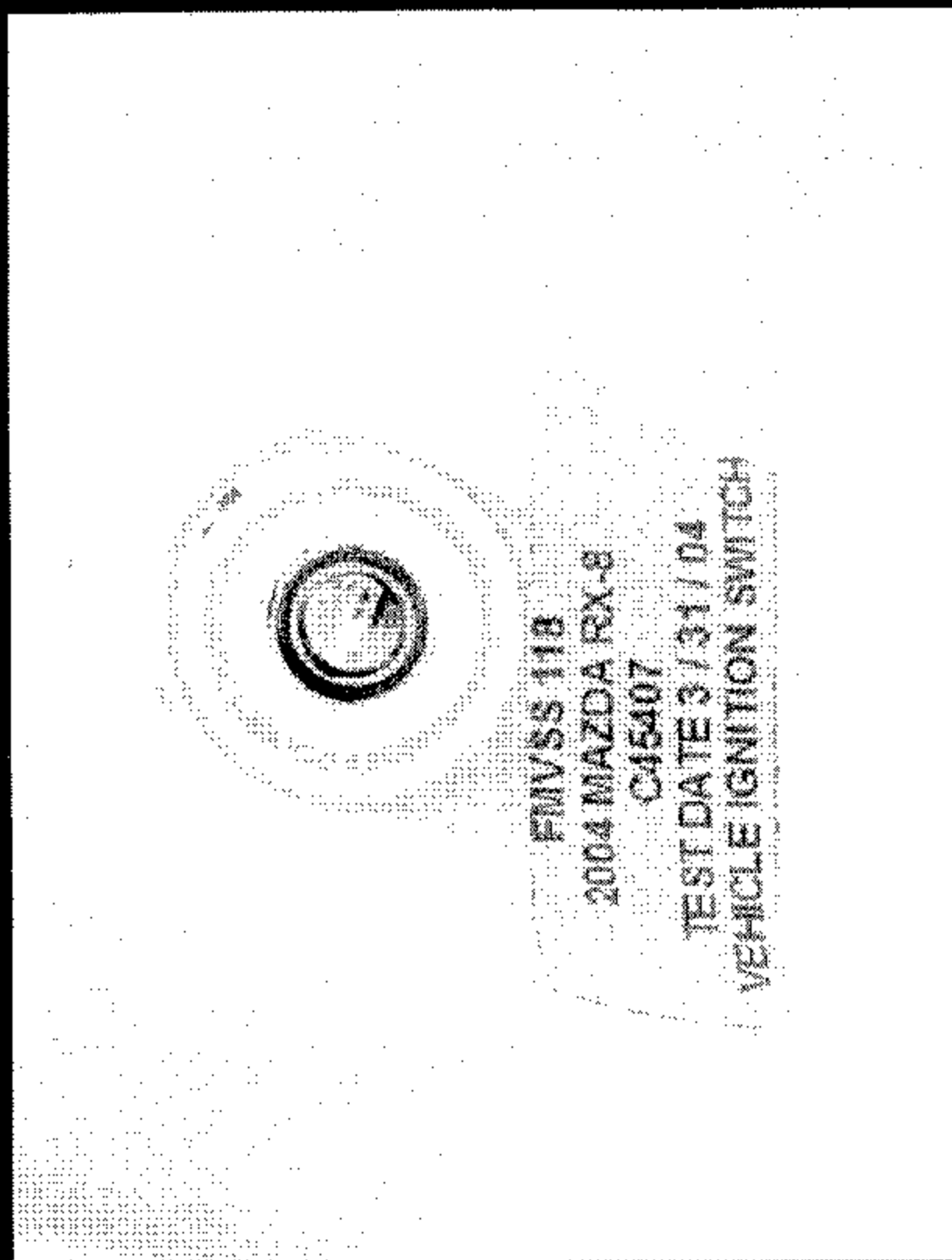


Figure 5: Ignition Switch

2004 MAZDA RX-8
NHTSA NO. C45407
FMVSS NO. 118

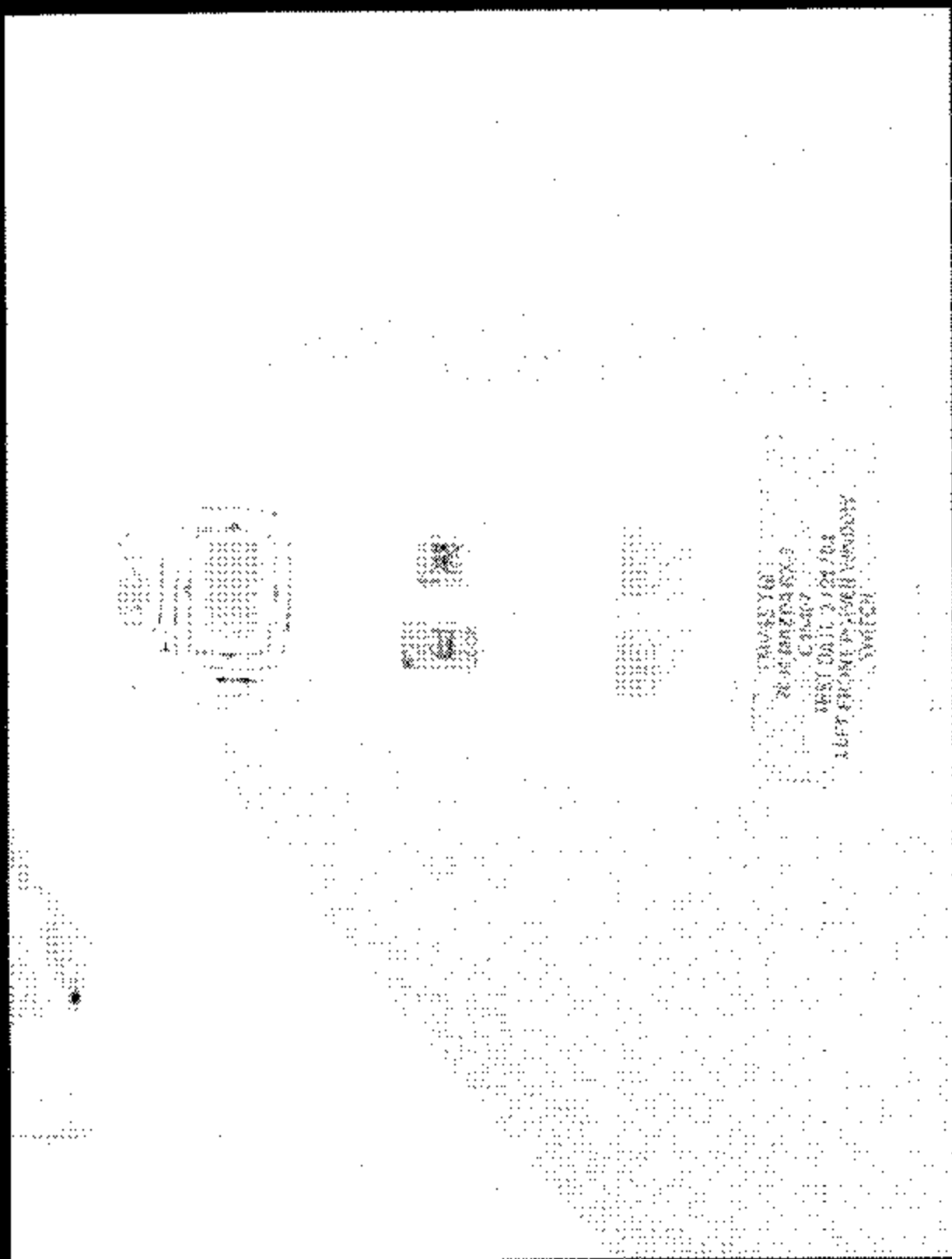


Figure 6: Left Front Master Power Window Switch

2004 MAZDA RX-8
NHTSA NO. C45407
FMVSS NO. 118

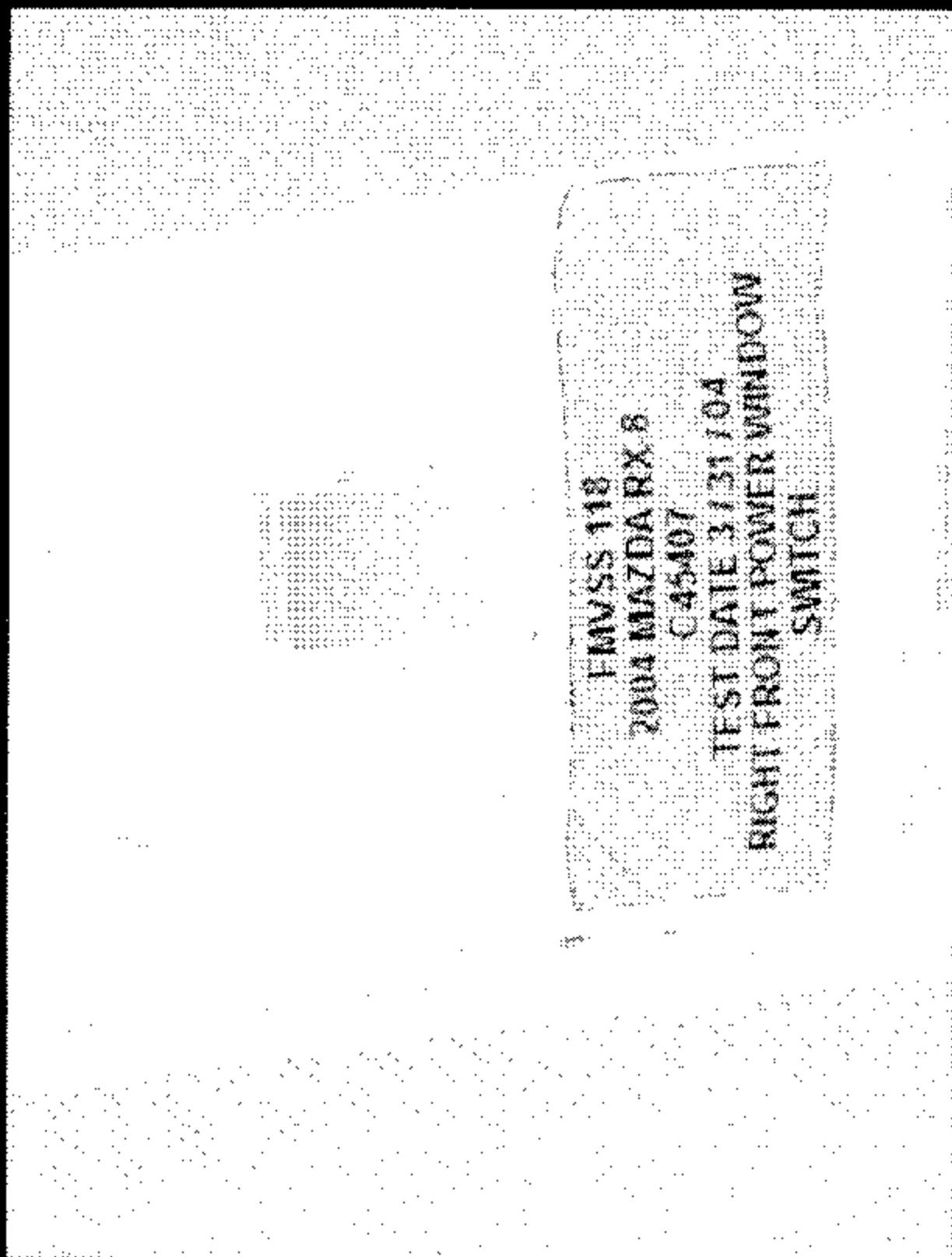


Figure 7: Right Front Power Window Switch

2004 MAZDA RX-8
NHTSA NO. C45407
FMVSS NO. 118

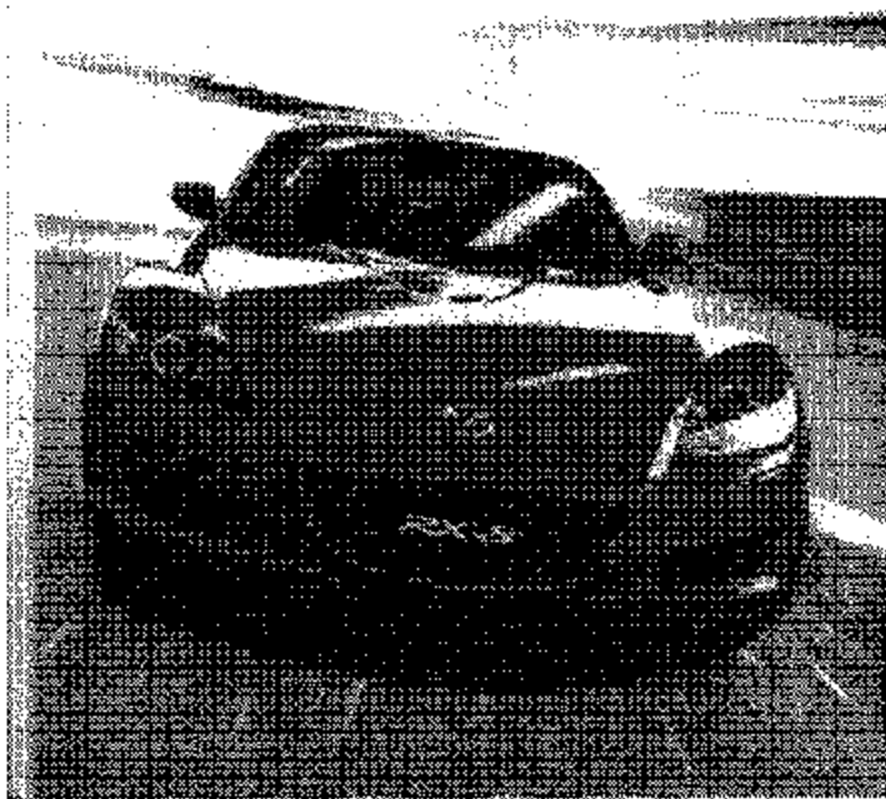
5. **COPY OF OWNER'S MANUAL INSTRUCTION FOR USE OF POWER WINDOWS**

COPY OF OWNER'S MANUAL INSTRUCTIONS FOR USE OF POWER WINDOWS

VEHICLE			
YEAR	2004	MAKE	Mazda
MODEL	RX 8	BODY STYLE	4 Door Sports Coupe
NHTSA NO.	C45407	VIN	JM1FE17N940131257
TEST DATE:	03/31/04		



2004 Mazda RX-8 Owner's Manual



COPY OF OWNER'S MANUAL INSTRUCTIONS FOR USE OF POWER WINDOWS

VEHICLE			
YEAR	2004	MAKE	Mazda
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TEST DATE:	03/31/04		

Always Use Seats

Doors and Locks

Power Windows

The ignition switch must be in the ON position for the power windows to operate.

WARNING

Closing Power Windows:
Closing power windows are dangerous. A person's hands, head, or even neck could be caught by the window and result in serious injury or even death.

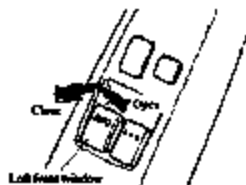
This warning applies especially to children. Always take the opening to close before closing a window.

Children and Power Windows:
Leaving the power window switches unattended while children are in the vehicle is dangerous. Power window switches that are not locked with the power window lock switch could allow children to operate power windows unintentionally which could result in serious injury if a child's hands, head or neck becomes caught by the window. Always lock all passenger power windows with the power window lock switch on the driver's side while children are in the vehicle, and never allow children to play with power window switches.

▼ Operating the Driver's Side Power Window

Manual operation:

To open the window to the desired position, lightly hold down the switch.
To close the window to the desired position, lightly pull up the switch.



Autosensing

To fully open the window automatically, press the switch completely down.

To keep the window partially open, lightly pull up the switch and then release it.

COPY OF OWNER'S MANUAL INSTRUCTIONS FOR USE OF POWER WINDOWS

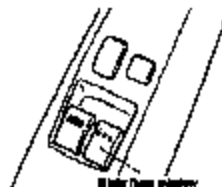
VEHICLE			
YEAR	2004	MAKE	Mazda
MODEL	RX 8	BODY STYLE	4 Door Sports Coupe
NHTSA NO.	C45407	VIN	JM1FE17N940131257
TEST DATE:	03/31/04		

Knowing Your Vehicle Doors and Locks

Operating the Passenger Power Windows

The power window may be opened when the power window lock switch on the driver's door is in the unlocked position.

The passenger window may be opened or closed by the power window master control switches on the driver's door.



To open the window to the desired position, hold down the switch. To close the window to the desired position, pull up the switch.



Power Window Lock Switch

With the lock switch in the unlocked position, all power windows on each door can be opened.

With the lock switch in the locked position, only the driver's side power window can be opened.



WARNING

Unintentional Window Operation: Unintentional window operation is dangerous. A person's hands, head, or neck could be caught by the window and result in serious injury. Unless a passenger needs to operate a window, keep the power window lock switch in the locked position.

COPY OF OWNER'S MANUAL INSTRUCTIONS FOR USE OF POWER WINDOWS

VEHICLE			
YEAR	2004	MAKE	Mazda
MODEL	RX 8	BODY STYLE	4 Door Sports Coupe
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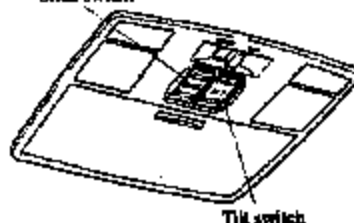
Knowing Your Vehicle

Doors and Locks

Moonroof™

The moonroof can be opened or closed electrically only when the ignition switch is in the ON position.

Side switch



Tilt switch

⚠ WARNING

Extending the Head or Arms Through the Moonroof:
Extending the head, arms, or other parts of the body through the moonroof is dangerous. The head or arms could hit something while the vehicle is moving. This could cause death or serious injury. Don't let passengers stand up or extend anything through the open moonroof while the vehicle is moving.

Closing the Moonroof:
A closing moonroof is dangerous. The hands, head, or even neck of a person—especially a child—could be caught in it as it closes, causing serious injury or even death. Make sure the opening is clear before closing the moonroof.

NOTE

After washing your Mazda or after a rain, wipe the water off the moonroof before operating it to avoid water penetration which could cause rust and water damage to your headliner.

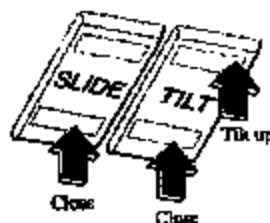
▼ Tilt Operation

The rear of the moonroof can be tilted open to provide more ventilation.

To fully tilt automatically, push the rear of the tilt switch.

To stop tilting partway, push any part of the tilt or slide switch.

To close to the desired position, push the front of the tilt or slide switch.



COPY OF OWNER'S MANUAL INSTRUCTIONS FOR USE OF POWER WINDOWS

VEHICLE			
YEAR	2004	MAKE	Mazda
MODEL	RX 8	BODY STYLE	4 Door Sports Coupe
NHTSA NO.	C45407	VIN	JM1FE17N940131257
TEST DATE:	03/31/04		

Knowing Your Mazda

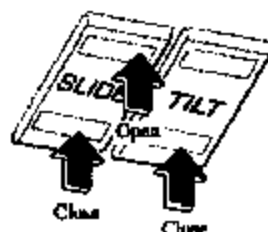
Doors and Locks

▼ Slide Operation

To fully open automatically, push the rear of the slide switch.

To stop sliding partway, push any part of the tilt or slide switch.

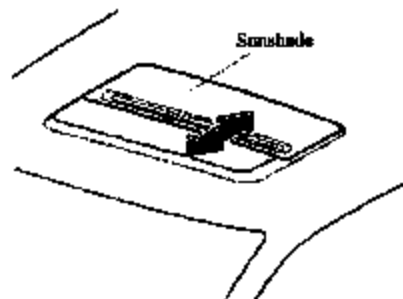
To close to the desired position, push the front of the tilt or slide switch.



▼ Sunshade

The sunshade can be opened and closed by hand.

The sunshade opens automatically when the moonroof is opened, but must be closed by hand.



⚠ CAUTION

The sunshade doesn't tilt. To avoid damaging the sunshade, don't push up on it.

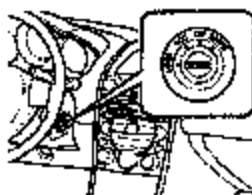
COPY OF OWNER'S MANUAL INSTRUCTIONS FOR USE OF POWER WINDOWS

VEHICLE			
YEAR	2004	MAKE	Mazda
MODEL	RX 8	BODY STYLE	4 Door Sports Coupe
NHTSA NO.	C45407	VIN	JM1FE17N940131257
TEST DATE:	03/31/04		

Starting and Driving

Ignition Switch

Ignition Switch Positions

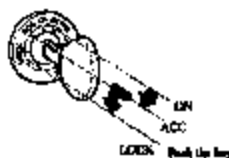


LOCK

The steering wheel locks in place against theft. Only in this position can the key be removed.

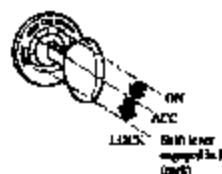
Manual Transmission

To turn the key from the ACC in the LOCK position, push the key in the ACC position, then turn it to the LOCK position.



Automatic Transmission

To turn the key from the ACC in the LOCK position, the shift lever must be in the P position.



WARNING

Remember the Key

It's dangerous to remove the key from the ignition while the vehicle is moving. Removing the key allows the steering wheel to lock. This will lose steering control and a serious accident could occur. Remove the key only when the vehicle is parked.

Not Leaving the Parking Brake

Leaving the driver's seat without setting the parking brake is dangerous. Unparked vehicles unexpectedly could move if the parking brake is not set. This could cause an accident. Before leaving the driver's seat, always set the parking brake and make sure the shift lever is in P with an automatic transmission or in 1 or R with a manual transmission.

COPY OF OWNER'S MANUAL INSTRUCTIONS FOR USE OF POWER WINDOWS

VEHICLE			
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Driving Your Mazda

Starting and Driving

NOTE

If turning the key is difficult, jiggle the steering wheel from side to side.

ACC (Accessory)

The steering wheel unlocks and some electrical accessories will operate.

ON

This is the normal running position after the engine is started. The warning lights (except brakes) should be inspected before the engine is started (page 5-35).

NOTE

(With headlight auto-leveling)
When the ignition switch is turned to the ON position, the sound of the headlight leveling motors operating at the front of the engine compartment can be heard. This does not indicate an abnormality.

START

The engine is started in this position. It will crank until you release the key; then it returns to the ON position. The brake warning light can be checked after the engine is started (page 5-35).

▼ Ignition Key Reminder

If the ignition switch is in the LOCK or ACC position, a beep sound will be heard when the driver's door is opened.

Starting the Engine

NOTE

Engine-starting is controlled by the spark ignition system. This system meets all Canadian Interference-Causing Equipment Standard requirements regulating the impulse electrical field strength of radio noise.

1. Occupants should fasten their seat belts.
2. Make sure the parking brake is on.
3. Depress the brake pedal.
4. (Manual transmission)
Depress the clutch pedal all the way and shift into neutral.
Keep the pedal depressed while cranking the engine.

NOTE

The starter will not operate if the clutch pedal is not pushed down all the way.

(Automatic transmission)

Put the vehicle in park (P). If you must restart the engine while the vehicle is moving, shift into neutral (N).

NOTE

The starter will not operate if the shift lever is not in P or N.