REPORT NUMBER 114-GTL-10-006

SAFETY COMPLIANCE TESTING FOR FMVSS NO. 114 THEFT PROTECTION

MAZDA MOTOR CORPORATION 2010 MAZDA 6, PASSENGER CAR NHTSA NO. CA5403

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



June 8, 2010

FINAL REPORT

PREPARED FOR

U. S. DEPARTMENT OF TRANSPORTATION NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION ENFORCEMENT OFFICE OF VEHICLE SAFETY COMPLIANCE 1200 NEW JERSEY AVE., SE WASHINGTON, D.C. 20590 This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

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PURPOSE OF COMPLIANCE TEST

1.0 PURPOSE OF TEST

A model year 2010 Mazda 6 Passenger Car was subjected to Federal Motor Vehicle Safety Standard (FMVSS) No. 114 testing to determine if the vehicle was in compliance with the requirements of the standard. FMVSS 114 specifies requirements to decrease the likelihood that a vehicle is stolen, or accidentally set in motion.

- 1.1 The test vehicle was a 2010 Mazda 6 Passenger Car. The vehicle was identified as follows:
 - A. Vehicle Identification Number: 1YVHZ8CH1A5M27369
 - B. NHTSA No.: CA5403
 - C. Manufacturer: MAZDA MOTOR CORPORATION
 - D. Manufacture Date: 12/09
 - E. Color: Black

1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 114 testing on March 25, 2010.

TEST PROCEDURE AND SUMMARY OF RESULTS

2.0 <u>TEST PROCEDURE</u>

All tests were conducted in accordance with NHTSA, Office of Vehicle Safety Compliance (OVSC) Laboratory Procedure TP-114-03-DRAFT-GTL-REVC and General Testing Laboratories, Inc. (GTL) Test Procedure, TP-114-03-Draft, "Theft Protection and Rollaway Prevention".

2.1 <u>SUMMARY OF RESULTS</u>

Test data indicate the FMVSS 114 requirements appear to have been satisfied. All test data resulting from the tests were recorded on test data sheets in Section 3.

TEST DATA

3.0 TEST RESULTS

The following data sheets document the results of FMVSS 114 testing on the 2010 Mazda 6.

FMVSS 114, THEFT PROTECTION DATA SHEET 1 – VEHICLE IDENTIFICATION

 TEST DATE:
 03/25/10

 CONTRACT:
 DTNH22-06-C-00032

 VIN:
 1YVHZ8CH1A5M27369

LAB.: <u>General Testing Laboratories</u> VEH. NHTSA NO.: <u>CA5403</u> BUILD DATE: 12/09

MY/MAKE/MODEL/BODY STYLE: 2010 Mazda 6

TRANSMISSION TYPE Automatic X; Man		; Other (des	cribe:)
DRIVE TRAIN TYPE: Front Wheel <u>X</u> ;	Rear	·Wheel;	4-Wheel		
FUEL TANK LEVEL:	100	(% OF max.)	MILEAGE:	86	

VEHICLE STARTING SYSTEM:

Location of the starting system:

(1) Key Cylinder located on the right side of the steering column, (2) Ignition Start/Stop button located on the center console on left side of gear selector.

Selectable settings:

Off(lock), Accessory, On(run), Start

Explain how the system is activated:

For the Automatic Transmission, the shift lever should be in "P" or "N". Insert the Physical Device into the starting system and turn it to the 'start" position. For the Electronic Code, place the advanced keyless transmitter unit in the passenger Compartment and then push the push button start while simultaneously pressing the brake pedal. The shift lever must be in "P" or "N".

<u>KEY</u>

Description of the key: Electronic Key FOB with embedded code/physical key device

STARTING SYSTEM ACTIVATION

Describe how the key is inserted into the starting system: <u>Physical Device: Insert the key into the key cylinder;</u> <u>Electronic Code: Place the advanced keyless transmitter unit in passenger compartment.</u>

FMVSS 114, THEFT PROTECTION DATA SHEET 1 continued

Describe how the key is used to activate the starting system: For the **Automatic Transmission**, the shift lever should be in "P" or "N". Insert the Physical Device into the starting system and turn it to the 'start' position. For the **Electronic Code**, place the advanced keyless transmitter unit in the passenger Compartment and then push the push button start while simultaneously pressing the brake pedal. The shift lever must be in "P" or "N".

Describe how the key is removed from the starting system: <u>Physical Device: Remove the key from the key cylinder.</u> <u>Electronic Code: The following procedure must be followed: 1)Shift shift lever to the "P"</u> <u>position, 2)Stop the engine, 3)Open the driver's side door, 4)remove the advanced</u> <u>Keyless transmitter from the passenger compartment.</u>

GEAR SELECTION CONTROL

Describe the gear selection control: Traditional center console mounted gear shift selector.

Describe how the gear selection control is activated: Depress the brake pedal then move gear selector to desired position.

Describe all of the selectable settings: Park, Reverse, Neutral, Drive with ±

IMMOBILIZER

Is the vehicle equipped with an immobilizer YES X NO_____

Describe the immobilizer device and how it prevents vehicle theft (if equipped): <u>The immobilizer is designed to prevent the engine from being started unless a coded</u> <u>key programmed to the vehicle is used.</u>

OPTIONAL RELEASE DEVICES

Describe if the vehicle is equipped with optional release devices:

Yes

OPTIONAL RELEASE DEVICES:

Key Removal	Gear Selection Control	Х

Other____

None_____

VEHICLE FLUIDS

Check all vehicle fluids and adjust to the proper levels for operation: Full

FMVSS 114, THEFT PROTECTION DATA SHEET 1 continued

VEHICLE TIRE PLACARD INFORMATION

 Vehicle Mfg. Recommended Tire Inflation Pressure (kPa): Front 220
 Rear 220

 TIRE INFLATION PRESSURES:

 Measured (kPa): LF 220
 LR 220
 RF 220
 RR 220

 WEIGHT

 Vehicle Curb Weight(kg):
 1516.5
 Weight of Driver (kg):
 91
 (target = 91kg)

FMVSS 114, THEFT PROTECTION DATA SHEET 2

REQUIREMENT S5.1.1	PASS	FAIL			
Engine cannot be started without using the key <u>X</u> Yes <u>No</u>	Х				
With key removed, steering wheel locks: Yes: <u>X</u> No:					
Note: After opening driver door	/1	0°			
Identify locking position(s) on wheel using arrow(s) Clockwise: <u>10</u> (degrees) Counterclockwise: <u>0</u> (degrees)		, Inn			
Key removal prevents forward self-mobility: Yes: X No	•	_			
If yes describe: Vehicle will not start without the coded advanced keyless transmitter unit in the passenger compartment.					
When key is removed from the starting system, starting of the engine or motor and either steering or self mobility is prevented. YES	x				

FMVSS 114, THEFT PROTECTION DATA SHEET 2 continued

REQUIREMENT S5.1.3	PASS	FAIL
An audible warning is activated whenever the key is in any starting system position with the exception of "on" and "start" and the door closest to the driver's designated seating position is opened. Yes X No	x	
Identify ALL key/starting system position setting: OFF, ACCESSORY, ON, START		

REQUIREMENT S5.1.4	PASS	FAIL
With the vehicle engine or motor shut down and the transmission gear selection control in any position other than "park";	x	
The steering wheel can rotate without locking? Yes X No		
NOTE: Engine cannot be turned off by push button if gear selector is not in the park position.		
The vehicle is free to roll forward? Yes X No	x	

REMARKS:

 RECORDED BY:
 G. Farrand
 DATE:
 03/25/10

 APPROVED BY:
 D. Messick
 DATE:
 03/25/10

FMVSS 114, ROLLAWAY PREVENTION DATA SHEET 3 (for vehicles equipped with transmission with a "park" position)

VEH. NHTSA NO.: CA5403 TEST DATE:

TEST DATE: 03/25/10

REQUIREMENT S5.2.1		FAIL
The starting system prevents key removal in ALL gear selection control positions except "park". Yes <u>X</u> No		
Can the gear selection control be placed between each gear selection position and will it remain there without assistance? Yes No <u>X</u>	х	
If yes, can the key be removed from the starting system? Yes No		
If the key can be removed from the vehicle starting system when the gear selection control is not locked in "park", a mechanism shall exist which, upon key removal, the vehicle transmission or gear selection control shall become locked in "park" as the direct result of removing the key. If such a mechanism exists, describe the mechanism and its function:		

REQUIREMENT S5.2.2		FAIL
The gear selection control is locked in the "park" position when the key is removed from the starting system. Yes <u>X</u> No	х	

REQUIREMENT S5.2.3	PASS	FAIL
ELECTRICAL FAILURE (Battery Discharge)		
In the event of an electrical failure, key removal from the starting system when the transmission or gear selection control is not locked in "park" is permitted". Yes X No		
The vehicle is equipped with an override device that permits key removal from the starting system when the transmission or gear selection control is not locked in "park". Yes No \underline{X}		
If yes, select the type of override device equipped: Opaque Cover No Cover Describe the override device design and mode of activation (if equipped):	N/A	
FILL IN THE SECTION BELOW THAT APPLIES:		
OVERRIDE WITH AN OPAQUE COVER:		
The opaque surface cover prevents sight of and use of override device. Yes No		
The opaque surface cover can only be removed by using a screwdriver or other tool. Yes No	N/A	
As a direct result of removing the key from starting system, the following is prevented: Steering or Self-Mobility		
OVERRIDE WITH NO COVER		
The override device requires the use of a tool to activate. Yes No		
Simultaneous activation of the override device and removal of key from starting system is required. YesNo	N/A	
As a direct result of removing the key from the starting system, the following is prevented: Steering or Self-Mobility		

REQUIREMENT S5.2.4	PASS	FAIL
GEAR SELECTION CONTROL OVERRIDE DEVICE		
The vehicle is equipped with an override device that allows the user to move the gear selection control from "park" after the key has been removed from the starting system. Yes X No		
If yes, select the type of override device that is equipped: Override operated with a: Key Opaque CoverX No Cover	Х	
Describe the override device design and mode of activation (if equipped):		
FILL IN THE SECTION BELOW THAT APPLIES:		
OVERRIDE OPERATED WITH KEY:		
The key is required to operate the override device that allows the user to move the gear selection control from "park" after the key has been removed from the starting system.	N/A	
OVERRIDE WITH AN OPAQUE COVER		
The opaque surface cover prevents sight of and use of override device. Yes <u>X</u> No		
The opaque surface cover can only be removed by using a screwdriver or other tool. Yes <u>X</u> No	Х	
As a direct result of removing the key from the starting system, the following is prevented: Steering X or Self-Mobility X		
OVERRIDE WITH NO COVER		
The override device requires the use of a tool to operate. Yes No		
Simultaneous activation of the override device and removal of key from starting system is required. Yes No	N/A	
As a direct result of removing the key from the starting system, the following is prevented: Steering or Self-Mobility		

PASS	FAIL
	see note
Х	
Х	
	X

REQUIREMENTS S5.3	PASS	FAIL
VEHICLE FACING UPHILL ON 10% GRADE		
With the key in the "off" position, the transmission will shift out of "park" without the service brake being applied. Yes No \underline{X}	<u> </u>	
With the key in the "acc" position, the transmission will shift out of "park" without the service brake being applied. Yes No \underline{X}	<u> </u>	
With the key in the "on" position (engine off), the transmission will shift out of "park" without the service brake being applied. Yes No \underline{X}	<u> </u>	
With the key in the "start" position, the transmission will shift out of "park" without the service brake being applied. Yes No \underline{X}	<u> X </u>	
With the key in the "other" position (please specify), the transmission will shift out of "park" without the service brake being applied. Yes No	<u>N/A</u>	
Does the key stay between starting system positions without being held by operator? Yes NoX If so, please describe.	<u>x</u>	
Brake force readings (force required to allow the transmission to shift out of "park"):		
The vehicle is equipped with adjustable pedals: Yes No_X		
Fore Position: Aft Position (if applicable)		
Reading 1 5.4 N Reading 1 Reading 2 4.3 N Reading 2 Reading 3 4.5 N Reading 3 Reading 4 4.4 N Reading 4 Reading 5 4.4 N Reading 5 Avg. 4.6 N Avg.	_ <u>x</u>	

RECORDED BY:	G. Farrand	DATE:	03/25/10
APPROVED BY:	D. Messick		

SECTION 4 TEST EQUIPMENT LIST

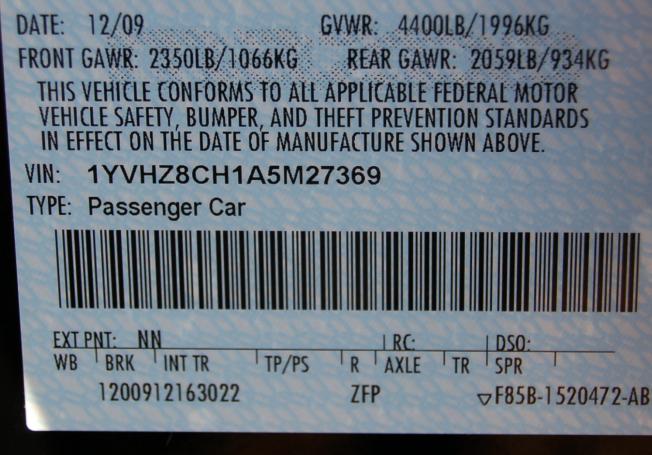
ITEM	MFR	MODEL	S/N	CAL. PERIOD	DATE OF NEXT CALIB.	REMARKS
SLR DIGITAL CAMERA	NIKON	D50	N/A	N/A	N/A	
TIRE PRESSURE GAUGE	WESKLER	45-0/100	107	12 MO.	04/03/10	
INCLINOMETER	MITUTOYO	PRO 360	950-315	N/A	BEFORE USE	
STEEL TAPE	STANLEY	FAT MAX	33-890	12 MO.	03/29/10	
WHEEL SCALES	INTERCOMP	SERIES 94	199744	12 MO.	03/02/11	
WHEEL SCALES	INTERCOMP	SERIES 94	199744	12 MO.	03/02/11	
WHEEL SCALES	INTERCOMP	SERIES 94	199744	12 MO.	03/02/11	
WHEEL SCALES	INTERCOMP	SERIES 94	199744	12 MO.	03/02/11	
SPRING SCALE	CHATILLON	DPP-10	4729	12 MO.	BEFORE USE	

PHOTOGRAPHS



FIGURE 5.1 ¾ FRONTAL VIEW FROM LEFT SIDE OF VEHICLE

MFD. BY AUTO ALLIANCE INTERNATIONAL, INC. FOR MAZDA MOTOR CORPORATION MADE IN U.S.A.



2010 MAZDA 6 NHTSA NO. CA5403 FMVSS NO. 114 FIGURE 5.2 VEHICLE CERTIFICATION LABEL

	TIRE RENSEIGNE SEATING C NOMBRE DE	AND LOADING INFORMATION EMENTS SUR LES PNEUS ET LE CHARGEMENT
The combine Le poids total	NOMBRE DE ed weight of occupa des occupants et du	AFACITY I TOTAL 5 FRONT 2 REAR AVANT 2 ARRIÈRE 3 ants and cargo should never exceed 385 kg or 850 lbs.* chargement ne doit jamais dépasser 385 kg ou 850 lb.*
TIRE PNEU	SIZE DIMENSIONS	COLD TIRE PRESSURE SEE OWNER'S
FRONT AVANT	P215/55R17	220 kPa, 32 psi INFORMATION
REAR ARRIÈRE	P215/55R17	220 kPa, 32 psiVOIR LE MANUEL DE L'USAGER POUR PLUS DE RENSEIGNIEMENTS420 kPa, 60 psi
SPARE DE SECOURS	T115/70D16	420 kPa, 60 psi POUR PLUS DE BOUR PLUS PLUS PLUS PLUS PLUS PLUS PLUS PLUS

FIGURE 5.3 VEHICLE TIRE INFORMATION LABEL



FIGURE 5.4 CLOSE-UP VIEW OF IGNITION KEY



FIGURE 5.5 PUSH BUTTON START/STOP SWITCH



FIGURE 5.6 EMERGENCY KEY INSERTED IN AUXILIARY SWITCH



FIGURE 5.7 AUXILIARY SWITCH WITH COVER



FIGURE 5.8 AUXILIARY SWITCH WITH COVER REMOVED



FIGURE 5.9 TRANSMISSION GEAR SELECTION CONTROL



FIGURE 5.10 GEAR SELECTOR RELEASE COVER



FIGURE 5.11 GEAR SELECTOR RELEASE WITH KEY



FIGURE 5.12 KEY LOADED IN SYSTEM SYMBOL



FIGURE 5.13 KEY NOT LOADED IN SYSTEM SYMBOL