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.
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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
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15. Supplementary Notes

16. Abstract

Compliance tests were conducted on the subject 2010 Mazda 6 4-door Passenger Car in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-114-03-DRAFT-GTL-REVC for the determination of FMVSS 114 compliance.

Test failures identified were as follows:
None

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SECTION 1

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.

SECTION 2

TEST PROCEDURE AND SUMMARY OF RESULTS

2.0 TEST PROCEDURE

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 SUMMARY OF RESULTS

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.

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 LAB.: General Testing Laboratories
CONTRACT: DTNH22-06-C-00032 VEH. NHTSA NO.: CA5403
VIN: 1YVHZ8CH1A5M27369 BUILD DATE: 12/09

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

TRANSMISSION TYPE:
Automatic X; Manual ____; Other ____ (describe: _____)

DRIVE TRAIN TYPE:
Front Wheel X; 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".

KEY

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:
Physical Device: Insert the key into the key cylinder;
Electronic Code: Place the advanced keyless transmitter unit in passenger compartment.

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

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):
The immobilizer is designed to prevent the engine from being started unless a coded key programmed to the vehicle is used.

OPTIONAL RELEASE DEVICES

Describe if the vehicle is equipped with optional release devices:
Yes

OPTIONAL RELEASE DEVICES:
Key Removal Gear Selection Control X None Other

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

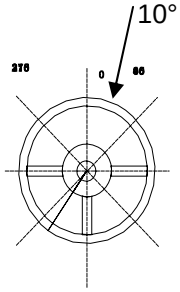
TIRE INFLATION PRESSURES:

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 _X_ Yes ____ No	X	
With key removed, steering wheel locks: Yes: _X_ No: _____ Note: After opening driver door Identify locking position(s) on wheel using arrow(s) Clockwise: _____10___ (degrees) Counterclockwise:___0___ (degrees) 		
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	

REMARKS:

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 ____ Identify ALL key/starting system position setting: OFF, ACCESSORY, ON, START	X	

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"; 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.	X	
The vehicle is free to roll forward? Yes__X__ No_____	X	

REMARKS:

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

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

VEH. NHTSA NO.: CA5403 TEST DATE: 03/25/10

REQUIREMENT S5.2.1	PASS	FAIL
The starting system prevents key removal in ALL gear selection control positions except “park”. Yes X No Can the gear selection control be placed between each gear selection position and will it remain there without assistance? Yes No X 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:	X	

REQUIREMENT S5.2.2	PASS	FAIL
The gear selection control is locked in the “park” position when the key is removed from the starting system. Yes X No	X	

REMARKS:

DATA SHEET 3 continued

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 __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_____ 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. Yes_____ No_____ As a direct result of removing the key from the starting system, the following is prevented: Steering_____ or Self-Mobility_____	N/A N/A	

REMARKS:

DATA SHEET 3 continued

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 Cover __X__ No Cover_____ 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. Yes _____ No_____ OVERRIDE WITH AN OPAQUE COVER The opaque surface cover prevents sight of and use of override device. Yes__X___ No____ The opaque surface cover can only be removed by using a screwdriver or other tool. Yes__X__ No____ 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_____ As a direct result of removing the key from the starting system, the following is prevented: Steering_____ or Self-Mobility_____	X N/A X N/A	

REMARKS:

DATA SHEET 3 continued

REQUIREMENTS S5.2.5	PASS	FAIL
VEHICLE FACING UPHILL ON 10% GRADE With the gear selection control in “park” measure movement of the vehicle down the slope upon releasing the service brake. Test grade: 15 % (9% to 15%) Measured movement: 54 mm (150mm maximum) **NOTE:** Repeat procedure if vehicle fails on grade in excess of 10%. Test grade: _____ % (9% to 10%) Measured movement: _____ mm (150 mm maximum)	X	see note
VEHICLE FACING DOWNHILL ON 10% GRADE With the gear selection control in “park” measure movement of the vehicle down the slope upon releasing the service brake. Test grade: 15 % (9% to 15%) Measured movement: 24 mm (150mm maximum) **NOTE:** Repeat procedure if vehicle fails on grade in excess of 10%. Test grade: _____ % (9% to 10%) Measured movement: _____ mm (150 mm maximum)	X	

REMARKS:

DATA SHEET 3 continued

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 X	X	
With the key in the "acc" position, the transmission will shift out of "park" without the service brake being applied. Yes_____ No X	X	
With the key in the "on" position (engine off), the transmission will shift out of "park" without the service brake being applied. Yes____ No X	X	
With the key in the "start" position, the transmission will shift out of "park" without the service brake being applied. Yes_____ No X	X	
With the key in the "other" position (please specify), the transmission will shift out of "park" without the service brake being applied. Yes_____ No_____	N/A	
Does the key stay between starting system positions without being held by operator? Yes_____ No X If so, please describe.	X	
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. _____	X	

REMARKS:

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

APPROVED BY: D. Messick

SECTION 4
TEST EQUIPMENT LIST

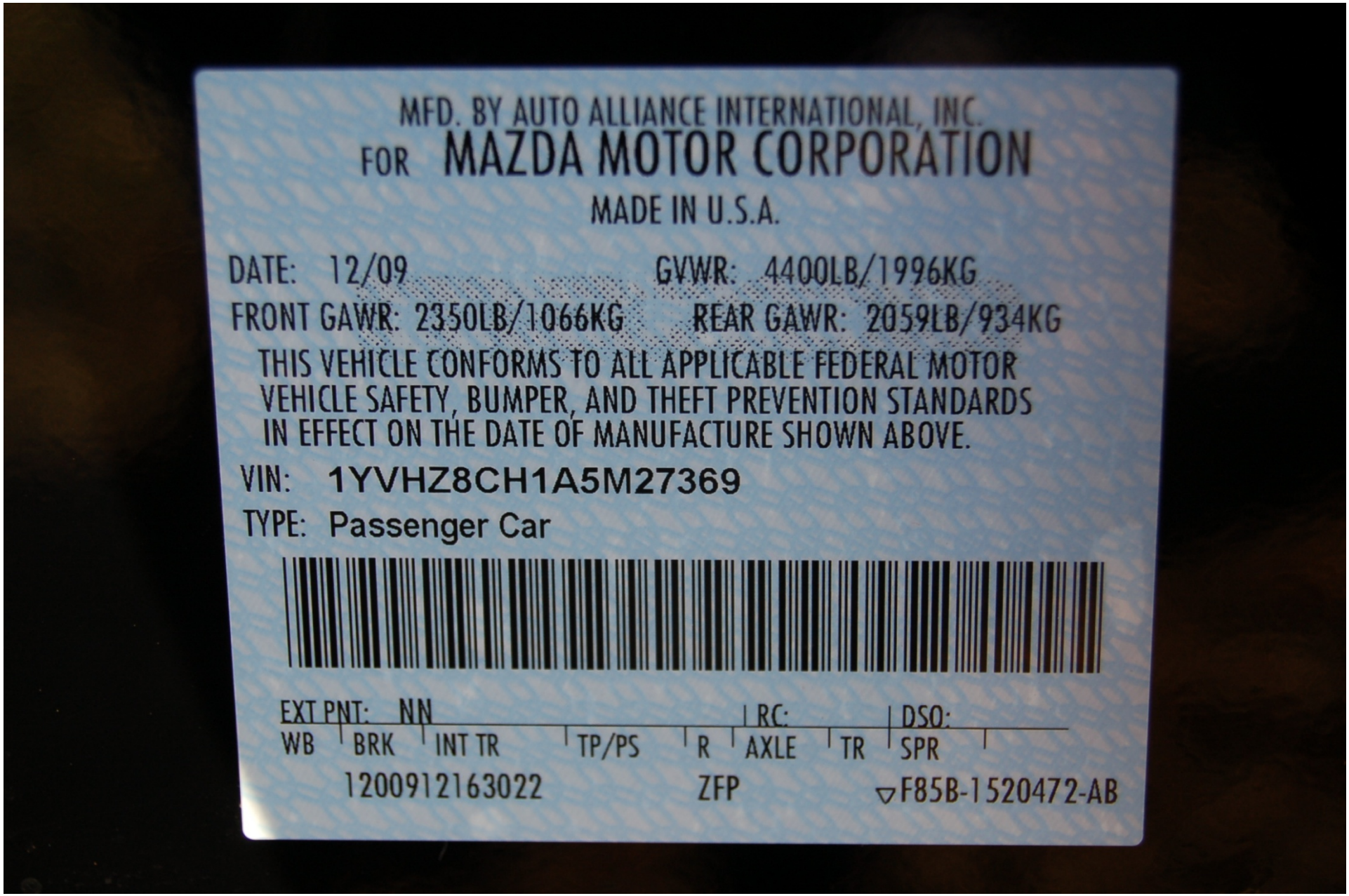
ITEM	MFR	MODEL	S/N	CAL. PERIOD	DATE OF NEXT CALIB.	REMARKS
SLR DIGITAL CAMERA	NIKON	D50	N/A	N/A	N/A	
TIRE PRESSURE GAUGE	WESKLER	45-0/100	107	12 MO.	04/03/10	
INCLINOMETER	MITUTOYO	PRO 360	950-315	N/A	BEFORE USE	
STEEL TAPE	STANLEY	FAT MAX	33-890	12 MO.	03/29/10	
WHEEL SCALES	INTERCOMP	SERIES 94	199744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

SECTION 5

PHOTOGRAPHS

2010 MAZDA 6
NHTSA NO. CA5403
FMVSS NO. 114

FIGURE 5.1
¾ FRONTAL VIEW FROM LEFT SIDE OF VEHICLE



2010 MAZDA 6
NHTSA NO. CA5403
FMVSS NO. 114

FIGURE 5.2
VEHICLE CERTIFICATION LABEL

2010 MAZDA 6
NHTSA NO. CA5403
FMVSS NO. 114

FIGURE 5.3
VEHICLE TIRE INFORMATION LABEL

2010 MAZDA 6
NHTSA NO. CA5403
FMVSS NO. 114

FIGURE 5.4
CLOSE-UP VIEW OF IGNITION KEY

2010 MAZDA 6
NHTSA NO. CA5403
FMVSS NO. 114

FIGURE 5.5
PUSH BUTTON START/STOP SWITCH

2010 MAZDA 6
NHTSA NO. CA5403
FMVSS NO. 114

FIGURE 5.6
EMERGENCY KEY INSERTED IN AUXILIARY SWITCH

2010 MAZDA 6
NHTSA NO. CA5403
FMVSS NO. 114

FIGURE 5.7
AUXILIARY SWITCH WITH COVER

2010 MAZDA 6
NHTSA NO. CA5403
FMVSS NO. 114

FIGURE 5.8
AUXILIARY SWITCH WITH COVER REMOVED

2010 MAZDA 6
NHTSA NO. CA5403
FMVSS NO. 114

FIGURE 5.9
TRANSMISSION GEAR SELECTION CONTROL

2010 MAZDA 6
NHTSA NO. CA5403
FMVSS NO. 114

FIGURE 5.10
GEAR SELECTOR RELEASE COVER

2010 MAZDA 6
NHTSA NO. CA5403
FMVSS NO. 114

FIGURE 5.11
GEAR SELECTOR RELEASE WITH KEY

2010 MAZDA 6
NHTSA NO. CA5403
FMVSS NO. 114

FIGURE 5.12
KEY LOADED IN SYSTEM SYMBOL

2010 MAZDA 6
NHTSA NO. CA5403
FMVSS NO. 114

FIGURE 5.13
KEY NOT LOADED IN SYSTEM SYMBOL