Security and Theft Deterrent Systems

The information presented here is simply designed to provide an overview of security and theft deterrent systems to provide quick-start information on programming vehicle keys and remote controls.

The theft deterrent system generally focuses on monitoring entry to the vehicle and sounding an alarm or flashing lights when the hood, trunk lid, lift gate or passenger doors are opened without using the proper key or transmitter. Once activated, the alarm can be cancelled by inserting and turning the proper key in the lock or by pressing the un-lock button on the remote transmitter.

Mazda lock systems provide a variety of options for locking or unlocking their vehicle by using a key or the keyless entry system. The keyless system allows the owner to lock or unlock the vehicle from a distance without having to physically insert a key in the lock, while also having the option of sounding a panic alarm.

These systems also provide features such as command verification, accidental lock activation, and system self diagnostic functions.

Vehicle theft is further deterred by immobilizing the ignition, fuel delivery, and starter or a combination of these systems if any thing other than a valid key is used. There are several immobilizer system variations, depending on the vehicle year or model.

The system and key validity status is communicated to the operator by flashing a security light on the instrument cluster. If a non-valid key is used to try starting the vehicle, a DTC will be set and engine will not run continuously, although it may start and immediately stall.

The most immediate task for a technician is to know the system variations, understand the requirements for routine system programming, and how to find the supporting service information, either on MS3 or in printed manuals.

Keyless Entry Systems

Every keyless entry system requires specific procedures to program remotes.   The programming procedures have varied throughout the years.   MS3 should be consulted for model specific information on programming and inspection because there are some time constraints that have to be observed.

Immobilizer and Passive Anti-Theft System Security Systems

Passive security systems use coded ignition keys. When the ignition key is turned, a code number from a microchip inside the base of the key is read by a radio antenna around the ignition cylinder.   The code number is sent to a to a control unit then to the PCM or directly to the PCM depending on the system. If the key code is recognized, the engine will start and run. If the key code is not recognized, then the vehicle will either start then stall or will not start at all.

Mazda has used several different systems to provide customers with anti-theft security. There are unique differences among these systems, which require very specific procedures to be followed by the technician.
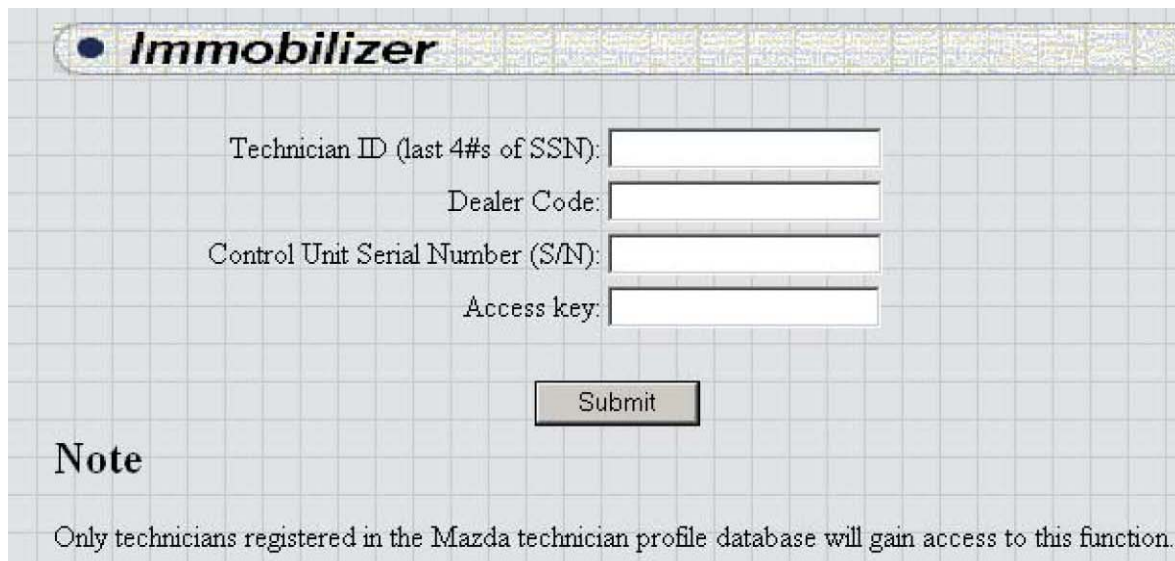
The three system types are;

- Immobilizer
- PATS
- Advanced Keyless Entry/Starting System

Immobilizer (Key Cycle) Programming

626 1998-2002
Miata 2001-2005
MPV 2000-2003

- This is an early key/transponder style security system.

- What makes this system different than others is the key programming requirements.

- Keys are coded by ignition key cycles and counting security light flashes.

- There are different procedures depending on how many blank keys and programmed keys exist.

- There is a job aid on MS3 to assist programming these types of keys.

- The immobilizer code identifies the number of security light flashes you count between ignition key cycles during key programming.

- You obtain the code from MS3 using the immobilizer control module serial #.

- The code word is required when there is only one valid key, no valid keys and when the PCM is replaced.

Sample Immobilizer Code Word: **88 36 72 44**
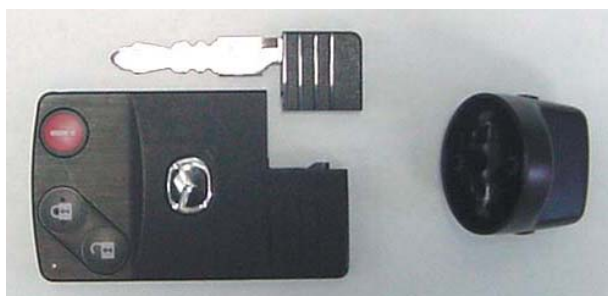
Advanced Keyless: Reception Range
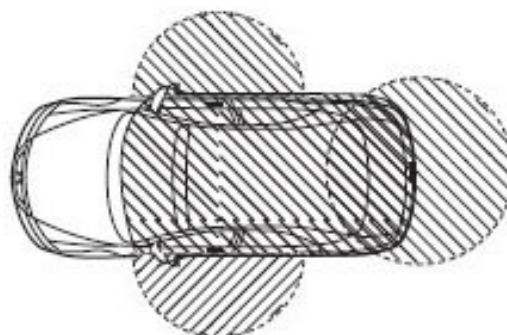
(EXTERIOR) RADIUS:
APPROX. 80 cm {315 in}

Advanced Keyless Precaution

If you exit the vehicle and remove the keycard from the reception range before closing the door, the system will not automatically lock the doors.

Advanced Keyless: Transmitters

2009 Mazda6

Advanced Keyless: Backup

- If the transmitter battery fails, the advanced keyless system fails or the battery dies, you can still access the vehicle and start the vehicle.

- There is an auxiliary key hidden inside the advanced keyless transmitter.

- This key will unlock the mechanical key cylinders/locks on the driver door, trunk, and glove box.

- This vehicle is also equipped with an auxiliary ignition cylinder.

- Remove the start knob by pressing the release buttons on each side of the start knob while pulling. Insert the key and turn.

2009 Mazda6 and 2010 Mazda3 Advanced Keyless

All Advanced Keyless functions must be customized using M-MDS Programmable Parameters. There are four different choices for the vehicle functions. There is an Engine Start/Stop button instead of an ignition switch. There is a capacitive touch sensor on the front door handles, allowing unlocking by grasping the door handle.

Advanced Keyless: Automatic Relocking	
• If the keyless transmitter moves outside the reception zone before a door is opened, all doors lock after 2-seconds.	
• If no doors are opened (even if the transmitter is in the reception zone), the doors will re-lock after 30-seconds.	

IC Green Key and Red Key Indicator Lights	
Green Key light is on for up to 3 seconds ignition pressed	Advanced keycard is recognized and vehicle will start.
Green Key light flashes for 30 seconds after ignition is off	Advanced keycard battery is weak (if function is turned on using M-MDS).
Red key light flashes when ignition knob is pressed	Keycard is not recognized.

Buzzer	
Buzzer sounds 1-time	Advanced keycard is recognized during unlock.
Buzzer sounds 2-times	Advanced keycard is recognized during lock.
Buzzer sounds 6-times	Request switch was pressed while a door is open.
Buzzer sounds for 10-seconds	A keycard in inside the vehicle or the trunk is open during locking.
Buzzer sounds 20 times	A keycard is inside the vehicle while the remote lock button is pressed.

IC Red Key Indicator Light and Buzzer	
IC Red key light flashes and buzzer sounds 6-times	No recognized keycards in the vehicle, all doors closed, and the start knob is not in the LOCK position. Request switch pressed while a door is open or while the ignition is not in the LOCK position.
IC Red key light flashes and buzzer sounds continuously	Driver door is open with the start knob in ACC.
IC Red key light flashes and buzzer sounds continuously	No recognized keycards in the vehicles, driver door is open and the start knob is not in the LOCK position.

Transmitter Recognized
• When the start knob is pressed and held, the IC green key light illuminates for up to 3 seconds.
• If the IC green key indicator light flashes, replace the keycard battery.
• When door is opened and the keycard is inside, the red LED on the keycard flashes every 2.5 seconds. (this will eventually drain the keycard battery).
Transmitter NOT Recognized
• When the start knob is pressed, the IC red key light flashes.
• Keycard red LED does not light.
Keycard Left Inside Vehicle
• Power door locks do not lock from the power door lock switch or lock knob.
Ignition Left ON and Keycard is Removed from Vehicle
• Buzzer sounds 3-times and the IC red key light flashes 3-times.

Advanced Keyless Diagnosis, Keycard and Key Programming
All diagnosis and programming of up to six transmitters for the advanced keyless system is done with M-MDS and MS3. Key programming and keycard programming are different procedures.

Advanced Keyless: Beeps
The vehicle will beep/answer back chirp (if turned on with M-MDS, factory default is on) when a request switch is pressed in the presence of a programmed transmitter. If you leave an advanced keyless transmitter inside the vehicle and attempt to lock the vehicle, it will beep at you. If you attempt to lock the vehicle with the transmitter in the trunk, or with the lights or ignition on, the keyless buzzer will beep to alert you.

Advanced Keyless Automatic Locking
This feature causes the doors to lock when the doors close and the keycard leaves the reception range.   The door must close before the keycard leaves the reception zone or the doors will not lock.