April 25, 2024 USG5958

Ms. Sophie Shulman
NHTSA Deputy Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

Subject: **2025 MY Parts-Marking Exemption for the Buick Electra E5**

Dear Ms. Shulman:

GM hereby petitions for a parts-marking exemption for the 2025 MY and beyond Buick Electra E5 Vehicle Line.

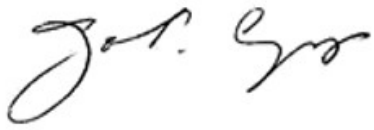
The attachment includes technical descriptions of the vehicle line's theft-deterrent system and the rationale for GM's view that this system is likely to be at least as effective in deterring motor vehicle theft as the practice of parts-marking currently required by 49 CFR Part 541.

As required by 49 CFR Part 543.5(b) (3), please be advised that GM is organized under the laws of the State of Delaware.

The information was prepared by members of my staff based on personal contact with the GM personnel who normally record such information.

Please feel free to contact me or Mr. Hoang Ngo (at huy-hoang.d.ngo@gm.com) with any questions you might have.

Sincerely,



John Capp, Director
Vehicle Safety Technology, Strategy & Regulations
Global Product Safety & Systems
General Motors LLC, North America

Attachment
cc: Office of Executive Secretariat
Jane Doherty, Director, International Policy, Fuel Economy and Consumer Programs
Carlita Ballard, Program Analyst, Office of International Policy, Fuel Economy and Consumer Programs

Attachment
USG 5958-1

# PETITION FOR EXEMPTION
# FROM THE PARTS-MARKING REQUIREMENTS OF THE MOTOR VEHICLE THEFT PREVENTION STANDARD FOR THE
# 2025 Model Year Buick Electra

(a) Required information as enumerated in 49 CFR 543.6 follows.

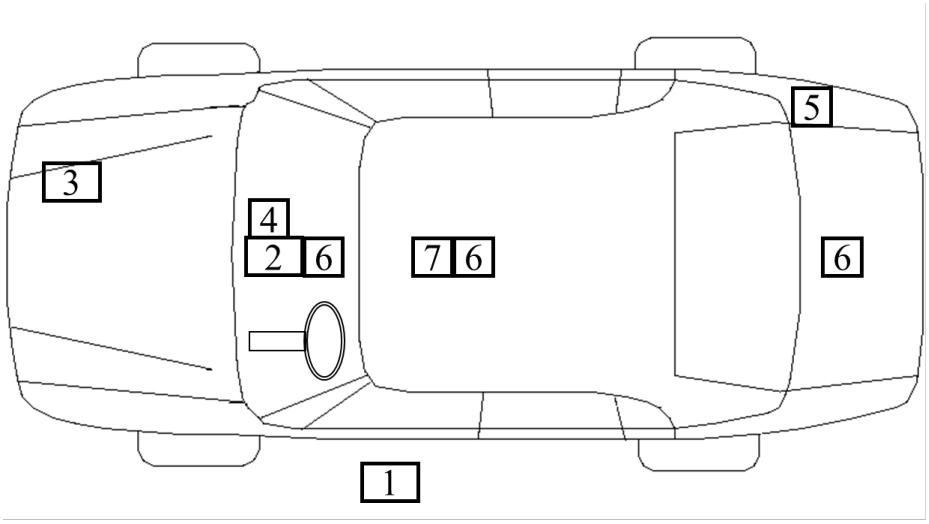
**(1) A statement that an antitheft device will be installed as standard equipment on all cars in the line for which an exemption is sought**

General Motors LLC (GM) will install a theft deterrent system, PASS-Key® III+ as standard equipment on the 2025 Buick Electra vehicle line. A keyless ignition version of PASS-Key III+ will be provided on all vehicles within the vehicle line.

**(2) A list naming each component in the antitheft system, and a diagram showing the location of each of those components within the vehicle**

Components of the PASS-Key III+ system include:

1. Electronically coded ignition key – Customer Carried Component in the form of a key fob
2. PASS-Key III+ Controller, integrated within Body Control Module (BCM) – Located under the center of the instrument panel, on floor, near bulkhead.
3. Engine Control Module (ECM) – Located in underhood compartment
4. Passive Entry Passive Start (PEPS) Module – Located below instrument panel
5. RF Receiver – In the passenger rear headliner area
6. Passive Low-frequency antennas – Located along centerline of vehicle: in front of center console, in Center Console, in floor of cargo compartment
7. Active low-frequency antenna – Located under side pocket in center console



**(3) A discussion that explains the means and process by which the device is activated and functions, including any aspect of the device designed to-**

**(i) Facilitate or encourage its activation by motorists,**

PASS-Key III+ is designed to be active at all times without direct intervention by the vehicle operator. No intentionally specific or discrete security system action is necessary to achieve protection. The system is fully functional (armed) after the ignition has been turned off. No operator action is required other than removing the key.

**(ii) Attract attention to the efforts of an unauthorized person to enter or move a vehicle by means other than a key,**

The PASS-Key III+ theft deterrent system will provide protection against unauthorized starting and fueling of the vehicle engine. PASS-Key III+ does not provide any visible or audible indication of unauthorized entry, by means of flashing vehicle lights or blowing of the horn, as part of its system. Since PASS-Key III+ is fully operational once the ignition has been turned off and the key removed, specific visible or audible reminders beyond the key warning buzzer have not been provided.

Based on a comparison of the reduction in theft rates of Chevrolet Corvettes using a passive theft deterrent system ("VATS®") along with an audible/visible alarm system to the reduction in theft rates for Chevrolet Camaro and Pontiac Firebird models equipped with a passive theft-deterrent system ("PASS-Key") without an alarm, GM finds that the lack of an alarm or attention attracting device does not compromise the theft deterrent performance of a system such as PASS-Key III+. The agency has previously agreed with this finding (Reference: Federal Register / Vol. 62, No. 80 / April 25, 1997 / p. 20241).

**(iii) Prevent defeating or circumventing the device by an unauthorized person attempting to enter a vehicle by means other than a key,**

The PASS-Key III+ system will provide protection against unauthorized use but does not provide protection against unauthorized vehicle entry.

**(iv) Prevent the operation of a vehicle which an unauthorized person has entered using means other than a key, and**

The PASS-Key III+ system utilizes a special ignition key and decoder module. Before the vehicle can be operated, the key's electrical code must be sensed and properly decoded by the BCM.

For the Buick Electra, the electronic key resides in the form of a remote key fob The key fob contains buttons to perform normal remote keyless entry functions and contains special electronics to communicate with the vehicle without direct customer intervention. When the customer requests vehicle operation (by pressing the Engine Start/Stop switch), the vehicle transmits a randomly generated 32-bit challenge and a vehicle identifier within the passenger compartment of the vehicle via the three low-frequency antennas, controlled by the Pasive Entry Passive Start module. The electronic key receives the data and, if the vehicle identifier matches that of the vehicle for which the key is programmed, the electronic key will calculate a response to the vehicle using the challenge and secret information shared between the key and the vehicle. The electronic key then transmits the response via a Radio Frequency (RF) channel to a vehicle mounted receiver, which conveys the information to the PASS-Key III+ control module. The PASS-Key III+ control module compares the received response with an internally calculated response. If the values match, the system will allow the vehicle to enter functional modes and transmit a fixed-code Pre-Release Password to the Engine controller over the serial data bus and enable computation and communication of a Response to any valid Challenge received from the Engine controller. If a valid Key is not detected, the system will not transmit a fixed code Pre-Release Password to the Engine controller so that fuel will not be delivered to the engine and the starter will not be enabled and will respond to any Challenge received from the Engine controller with a "negative".

Also, if an invalid electronic key code is received, the vehicle will not be allowed to transition from the Off mode to the Accessory, On, or Start mode.

**(v) Ensure the reliability and durability of the device;**

The design and assembly processes of the PASS-Key III+ subsystem and components are validated for a vehicle life of 10 years and 150,000 miles of performance. Following is a list of specific tests used to validate PASS-Key® III integrity, durability and reliability. After each test, PASS-Key III+ components must operate as designed.

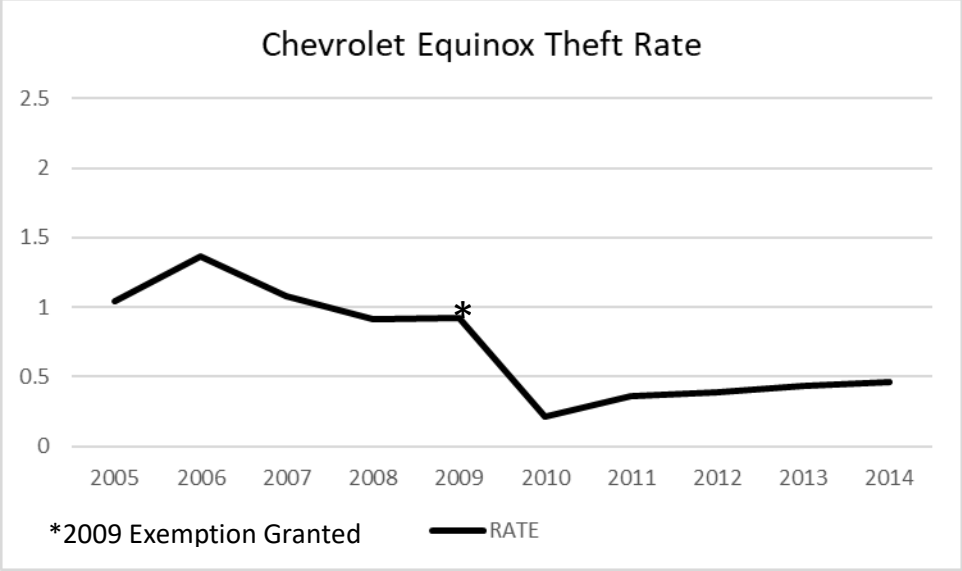
- High Temperature Storage
- Low Temperature Storage
- Thermal Shock
- Humidity
- Frost
- Salt Fog
- Flammability
- Altitude
- Drop
- Shock
- Random Vibration
- Dust
- Potential Contaminants
- Connector Retention/Strain Relief
- Terminal Retention
- Connector Insertion
- Crush
- Ice
- Immersion
- Tumbling
- Environmental Test Induced by Overmold Process for Key Head

**(4) The reasons for the petitioner's belief that the antitheft device will be effective in reducing and deterring motor vehicle theft, including any theft data and other data that are available to the petitioner and form a basis for that belief;**

Variants of the PASS-Key III+ system have been in production since the 2003 Model Year. It is designed to enhance the functionality and theft protection provided by GM's first, second, and third generation PASS-Key, PASS-Key II, and PASS-Key III systems.

Data which provide the basis for GM's confidence that the PASS-Key III+ system will be effective in reducing and deterring motor vehicle theft are contained in the response of the American Automobile Manufacturers Association to Docket 97-042; Notice 1 (NHTSA Request for Comments on its preliminary report to Congress on the effects of the Anti Car Theft Act of 1992 and the Motor Vehicle Theft Law Enforcement Act of 1984).

Theft Rate data from Vehicle Theft Rates Search | NHTSA were used to plot the Chevrolet Equinox theft rate for the available years 2005 - 2014. The Equinox is an similarly constructed crossover vehicle which is equipped with the PASS-Key III+ system. Of note is the theft rate dropped after the parts marking exemption was granted in 2009.




GM reviewed the theft rate data available and was not able to find comparison vehicles with parts marking labels and without immobilizer equipment.

**(5) The reasons for the petitioner's belief that the agency should determine that the antitheft device is likely to be as effective as compliance with the parts-marking requirements of Part 541 in reducing and deterring motor vehicle theft, including any statistical data that are available to the petitioner and form a basis for petitioner's belief that a line of passenger motor vehicle equipped with the antitheft device is likely to have a theft rate equal to or less than that of passenger motor vehicles of the same, or a similar, line which have parts marked in compliance with Part 541.**

The theft rates, as reported by the Federal Bureau of Investigation's National Crime Information Center, are lower for GM models equipped with "PASS-Key"-like systems which have exemptions from the parts-marking requirements of 49 CFR Part 541, than the theft rates for earlier models with similar appearance and construction which were parts-marked. GM has concluded, therefore, that "PASS-Key"-like systems are more effective in deterring theft than are the parts-marking requirements of 49 CFR Part 541.

Based on the performance of PASS-Key, PASS-Key II, and PASS-Key III systems on other GM models, and the advanced technology utilized in PASS-Key III+, GM believes that PASS-Key III+ will be more effective in deterring theft than the parts-marking requirements of 49 CFR Part 541.

GM believes that the agency should find that inclusion of PASS-Key III+ as standard equipment on the 2025 Buick Electra vehicle line is sufficient to qualify this vehicle line for full exemption from 49 CFR Part 541 requirements. This belief is supported not only by GM's proven success in reducing the theft rates of its carlines, but also by the high value the agency itself places on "passive activation" as a functional dimension of theft deterrent systems.

**(b) Any petitioner submitting data under paragraph (a) (4) or (5) of this section shall submit an explanation of its belief that the data are sufficiently representative and reliable to warrant NHTSA's reliance upon them.**

Theft data referred to in paragraph (a) (4) are those reported by the Federal Bureau of Investigation's National Crime Information Center and obtained from the NHTSA, and are therefore considered by GM to be sufficiently credible as to warrant the NHTSA's reliance upon them.

# PASS-Key III+ System Overview

**System Overview**
The immobilization system is automatically armed after the vehicle is put into the Off mode; no additional operator action is required to protect the vehicle. The system is comprised of the following components:

a) User Identification Device (UID) in the form of a key fob
b) Three interior-mounted passive low-frequency antennas
c) Interior-mounted active low-frequency antenna
d) Passive Entry Passive Start (PEPS) Module
e) Radio Frequency Receiver
f) Body Control Module (BCM), and
g) Engine Control Module (ECM).

The PEPS Module and the BCM jointly communicate with the UID to perform driver authentication prior to allowing vehicle operation. Verification of the electronic code is also required to allow the transmission shift lever to unlock.

The User Identification Device contains buttons to perform normal remote keyless entry functions, and also contains special electronics to communicate with the vehicle without direct customer intervention. When the customer requests vehicle operation (by pressing the Engine Start/Stop button on the instrument panel), the vehicle transmits a randomly generated 32-bit challenge and a vehicle identifier within the passenger compartment of the vehicle via three low-frequency antennas.

The UID receives the data and, if the vehicle identifier matches that of the vehicle for which the key is programmed, will calculate a response to the vehicle using the challenge and secret information shared between the UID and the vehicle. The UID then transmits the response via a Ultra-High Frequency (UHF) radio waves to the RF receiver mounted at the windshield near the inside rearview mirror.

The RF Receiver demodulates the received signal and transmits the data to the BCM for continued processing. The BCM decrypts the received data, and compares the received response with an internally stored value. If the decrypted data matches the expected command and response values, authorization is conveyed within the BCM to allow the vehicle to enter operating modes.

When the BCM commands the vehicle into an Accessory, On, or Start mode for which it has been authorized, the BCM will also transmit a coded signal to the Engine Control Module to enable fuel initiation, ignition control, and starter motor operation.

Upon detection of a vehicle operating mode, the Engine Control Module will transmit a challenge signal to the BCM to further authenticate proper vehicle components are present. The BCM calculates the appropriate response based upon the challenge, algorithm, and secret key information shared with the ECM. The BCM also verifies confirmation from additional vehicle modules that the proper vehicle components are present prior to transmitting the final authorizing response to the ECM.

If incorrect responses are received at any point in this process, or if there is a failure to receive any response, the system will inhibit operation of the engine.