

PE16-014

FCA

4/19/2017

ENCLOSURE 8

SUBJECT

FCA Auto Park 2_9_2017 Final

PUBLIC



FIAT CHRYSLER AUTOMOBILES

FCA Vehicle Securement Strategy

09February2017 Discussion



REDACTED

8 spd Transmission

Chrysler 300 (LX)

Dodge Durango (WD)

1500 Ram (DS)

Dodge Challenger (LA)

Dodge Charger (LD)

Jeep Grand Cherokee (WK)

Alfa Giulia (GA)*

9 spd Transmission

Chrysler Pacifica (RU)

Jeep Renegade (BU)

Fiat 500X (FB)

Cherokee (KL)

Compass (MP)

Chrysler 200 (UF)

Ram ProMaster City (VM) **

REDACTED

REDACTED

REDACTED

REDACTED

REDACTED

Back Up Material

What is Electronic Park Brake (EPB) SafeHold?

The Chrysler 200 and the Chrysler Pacifica are equipped with EPB SafeHold

SafeHold is a safety feature of the Electric PARK Brake System that will engage the PARK brake automatically if the vehicle is left unsecured. If the automatic transmission is not in PARK, the seat belt is unbuckled, the driver door is open, the vehicle is at a standstill, and there is no attempt to depress the brake pedal or accelerator pedal, the park brake will automatically engage to prevent the vehicle from rolling.

SafeHold can be temporarily bypassed by pressing the Electric Park Brake Switch to the release position while the driver door is open. Once manually bypassed, SafeHold will be enabled again once the vehicle reaches 12 mph (20 km/h) or the ignition is cycled to the OFF position and back to ON again.



REDACTED

FCA US Market Rotary Shifter Applications

Chrysler:

200 (UF)

2015 - current



300 (LX)

2015 - current



Pacifica (RU)

2017 - current



02/10/2

REQUEST - VOLUNTARY SUBMISSION

INSENT ORDER MATERIALS - FCA US LLC - 000037

FCA US Market Rotary Shifter Applications

Dodge:

Durango (WD)

2014 - current



Ram:

Ram 1500 (DS)

2013 - current



FCA US Market Hybrid Shifter Applications

Jeep:

Renegade (BU)

2015 - current



Cherokee (KL)

2014 - current



Compass (MP)

2017 - current



Fiat:

500X (FB)
2014 - current



FCA US Market Monostable Shifter Applications

Alfa Romeo:

Giulia (GA) 2017 - current



FCA US Market Polystable Shifter Applications

Dodge:

Challenger (LA)

2015 - 2016



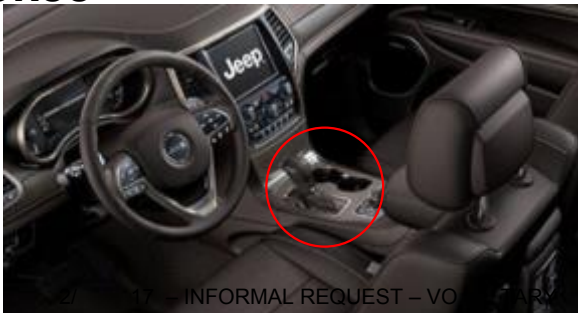
Charger (LD)

2015 - 2016



Jeep: Grand Cherokee (WK)

2016



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ESS_Block_Diagram PUBLIC

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SUBJECT Q8 - Video Guide



FIAT CHRYSLER AUTOMOBILES

Question 8, Subsection L - Video Reference Guide

3/15/2017

NAFTA
REGION



Jeep®



SRT

Question 8, Subsection L :

Describe and provide video and audio recordings of all warnings provided to the operator and all automatic control functions of the subject and electronic park brake systems (as may be equipped) for the following situations:

- i) The driver's door is opened when the engine is running and the gear selector is not in Park;*
- ii) The driver's door is opened when the engine is off and the gear selector is not in Park;*
- iii) The driver's door is opened when the engine is running and the gear selector is in Park;*
- iv) The operator attempts to operate the ignition control when the engine is running and the gear selector is not in Park;*
- v) The vehicle is moving and the operator attempts to shift to Park (include speed thresholds for the control logic related to this function);*
- vi) Any other state or circumstance FCA believes is pertinent;*

Videos were filmed with the seatbelt unbuckled to simulate the driver preparing to exit the vehicle.

Due to the effects of filming, in some scenarios the shift position indicator LED appears to flicker although is actually in a steady state.

Question 8, Subsection L - Video Reference

MY2013-2017 Ram 1500 (DS)



Scenario		Gear	#	Model Years	Ignition	ParkSense	ESS	Message
1	The driver's door is opened when the engine is running and the gear selector is not in Park	A. Reverse	1	All w/ParkSense	All	On	-	ParkSense Graphic with Proximity Arcs
			2	All w/ParkSense	All	Off	-	"Vehicle not in Park"
			3	All w/o ParkSense	All	-	-	"Vehicle not in Park"
		B. Drive	All	All	-	-	-	"Vehicle not in Park"
		C. Neutral	All	All	-	-	-	"Vehicle not in Park"
2	The driver's door is opened when the engine is off and the gear selector is not in Park	A. Reverse	1	All	Push Button	On	-	Scenario Not Viable (Cannot shut vehicle off)
			2	All	Push Button	Off	-	Scenario Not Viable (Cannot shut vehicle off)
			3	All w/o ParkSense	Mechanical	-	-	"Key in Ignition"
			4	All w/ParkSense	Mechanical	On	-	"Key in Ignition"
			5	All w/ParkSense	Mechanical	Off	-	"Key in Ignition"
		B. Drive	1	All	Push Button	-	-	Scenario Not Viable (Cannot shut vehicle off)
			2	All	Mechanical	-	-	"Key in Ignition"
		C. Neutral	1	All	Push Button	-	-	Scenario Not Viable (Cannot shut vehicle off)
			2	All	Mechanical	-	-	"Key in Ignition"
3	The driver's door is opened when the engine is	Park	All	All	-	-	-	Door Open Symbol
4	The operator attempts to operate the ignition control when the engine is running and the gear selector is not in Park	A. Reverse	1	All	Push Button	On	-	Cannot shut vehicle off. ParkSense Graphic with Proximity Arcs
			2	All	Push Button	Off	-	Cannot shut vehicle off. "ParkSense Off"
			3	All w/o ParkSense	Mechanical	-	-	1. "Shift to P to Start" 2. "Shifter Autocorrect Active"
			4	All w/ParkSense	Mechanical	On	-	1. "Shift to P to Start" 2. "Shifter Autocorrect Active"
			5	All w/ParkSense	Mechanical	Off	-	1. "Shift to P to Start" 2. "Shifter Autocorrect Active"
		B. Drive	1	All	Push Button	-	-	Cannot shut vehicle off. "Vehicle Not In Park"
			2	All	Mechanical	-	-	1. "Shift to P to Start" 2. "Shifter Autocorrect Active"
		C. Neutral	1	All	Push Button	-	-	Cannot shut vehicle off. "Vehicle Not In Park"
			2	All	Mechanical	-	-	1. "Shift to P to Start" 2. "Shifter Autocorrect Active"
5	The vehicle is moving and the operator attempts to shift to Park	A. Reverse	All	All	-	-	-	"Vehicle Speed is too High to Shift to P" Threshold is 2.0 km/h (1.2 MPH)
		B. Drive	All	All	-	-	-	"Vehicle Speed is too High to Shift to P" Threshold is 2.0 km/h (1.2 MPH)

"-" means the presence of the feature (ParkSense, ESS) does not change the function of the vehicle or the message displayed during the scenario.

Question 8, Subsection L - Video Reference

MY2014-2017 Dodge Durango (WD)



Scenario	Gear	#	Model Years	ParkSense	ESS	Message
1 The driver's door is opened when the engine is running and the gear selector is not in Park	A. Reverse	1	All w/ParkSense	On	-	ParkSense Graphic with Proximity Arcs
		2	All w/ParkSense	Off	-	"ParkSense Off"
		3	2014 w/ParkSense	Off	-	"Vehicle Not In Park"
		4	All w/o ParkSense	-	-	"Vehicle Not In Park"
	B. Drive	1	2016-17	-	Active	"Shift to P When Exiting Shift to D to Restart"
		2	All	-	Not Equipped / Not Active	"Vehicle Not In Park"
	C. Neutral	All		-	-	"Vehicle Not In Park"
2 The driver's door is opened when the engine is off and the gear selector is not in Park	A. Reverse	1	All	On	-	Scenario Not Viable (Cannot shut vehicle off)
		2	All	Off	-	Scenario Not Viable (Cannot shut vehicle off)
	B. Drive	All		-	-	Scenario Not Viable (Cannot shut vehicle off)
	C. Neutral	1	2016 v1 - 2016 v2	-	-	"Vehicle Not In Park"
		2	2016v2 - 2017	-	-	"Vehicle Not In Park" "Shifter Autocorrect Active" "Ignition or Accessory On"
		3	2014-15	-	-	Scenario Not Viable (Cannot shut vehicle off)
3 The driver's door is opened when the engine is running and the gear selector is in Park	Park	All		-	-	Door Open Symbol
4 The operator attempts to operate the ignition control when the engine is running and the gear selector is not in Park	A. Reverse	1	All w/ParkSense	-	-	Cannot shut vehicle off. ParkSense Graphic with Proximity Arcs
		2	All w/o ParkSense	-	-	Cannot shut vehicle off. "Vehicle Not In Park"
	B. Drive	All		-	-	Cannot shut vehicle off. "Vehicle Not In Park"
	C. Neutral	1	2016 v1 - 2016 v2	-	-	"Vehicle Not In Park"
		2	2016v2 - 2017			"Vehicle Not In Park" "Shifter Autocorrect Active"
		3	2014-15	-	-	Cannot shut vehicle off. "Vehicle Not In Park"
5 The vehicle is moving and the operator attempts to shift to Park	A. Reverse	All		-	-	"Vehicle Speed is too High to Shift to P" Threshold is 2.0 km/h (1.2 MPH)
	B. Drive	All		-	-	"Vehicle Speed is too High to Shift to P" Threshold is 2.0 km/h (1.2 MPH)

“-” means the presence of the feature (ParkSense, ESS) does not change the function of the vehicle or the message displayed during the scenario.

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ENCLOSURE 8

SUBJECT

SUBJECT Q8b PUBLIC

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ENCLOSURE 8

SUBJECT Q8c PUBLIC

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ENCLOSURE 8

SUBJECT Q8d

Q8d. Describe, and provide copies of all documents related to, all design failure mode and effects analyses (DFMEA) and fault tree analyses (FTA) of the subject system that relate in any way to unintended vehicle movement as the driver is exiting or after the driver has exited the vehicle;

A8d. The subject systems are designed and developed by FCA US' external suppliers. While FCA US reviews DFMEAs with its suppliers, the suppliers are responsible for maintaining the DFMEAs. These DFMEAs are not supplied to FCA US in the normal course of business. Table 1 indicates the subject systems which are supplier produced.

Component	Vehicle	Purchased/Licensed
8-Speed Transmission	Ram 1500, Dodge Durango	Purchased and Licensed
Rotary Shifter	Ram 1500, Dodge Durango	Purchased
Keyless-go Ignition (Push Button Start)	Ram 1500	Purchased
Fobik and Hard-key Ignition (Fob Insert and Mechanical Ignition Key)	Ram 1500	Purchased
Keyless-go Ignition	Dodge Durango	Purchased
RF Hub	Ram 1500	Purchased
RF Hub	Dodge Durango	Purchased
Instrument Panel Cluster	Ram 1500	Purchased
Instrument Panel Cluster	Dodge Durango	Purchased

Table 1: FCA US Purchased and Licensed Subject Components

Though FCA US does not create vehicle-level DFMEAs, the FMEA process is followed through the design and development of the subject vehicles' transmission shift strategy. Extensive testing is completed for each vehicle designed by FCA US. For example, proving ground durability testing relating to the subject vehicles evaluates system shift performance. These materials are included in ENCLOSURE 06.

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ENCLOSURE 8

SUBJECT Q8e PUBLIC

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ENCLOSURE 8

SUBJECT Q8g

Q8g. Describe any or all conditions under which the subject system will automatically shift the transmission to Park;

A8g. Unless indicated otherwise, the below design attributes apply to all model years of the 8-speed transmission in the subject vehicles. Some examples of when the subject system(s) automatically shift the transmission to Park include:

- If the operator moves the ignition position from RUN to ACC, the transmission will automatically go to Park at speeds below 1.2 mph (2 kph).
- In the event of a hardware failure in the transmission controller while in steady-state Reverse or Neutral, the transmission will default to Park at speeds below 1.2 mph (2 kph).
- The ESS system on the subject vehicles will automatically shift the transmission to Park in certain situations. For further detail on the ESS system, refer to FCA US' response to Q8i.
- In 2016 MY vehicles equipped with certain engines, if the operator's request to shift to Park is not honored, a message "Service Trans Press Brake When Stopped Key Off Engine to Engage Park" is displayed along with an audible chime to inform the operator that the engine shut off will lead to AutoPark. If at this time, the operator removes their foot from the brake, the engine will automatically shut off to achieve AutoPark.
- In certain situations, the vehicle will shift into Neutral and then Park. Details on situations where the vehicle will automatically shift the transmission to Neutral are contained in response to Q8h.

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SUBJECT Q8h PUBLIC

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ENCLOSURE 8

SUBJECT Q8i

Q8i. Describe any "start-stop" technology for the engine, which may be actuated for fuel efficiency and/or safety reasons and how it interacts with the transmission control system;

A8i. A description of the Engine Start-Stop ("ESS") systems' operation in situations where a driver attempts to turn the engine off or exit the vehicle while in an ESS situation is provided below in Table 1 in relation to the subject vehicles.

Note: All Ram 1500 ("DS") vehicles offered with the ESS option are equipped with either a Hard-key Ignition (Mechanical Ignition Key).

Model	Model Year(s)	Ignition Type	Situation	Outcome
Ram 1500	2013-2016	Hard-key Ignition	While in an ESS situation, the driver attempts to turn the vehicle off	The vehicle is secured from motion by the transmission shifting to park ("AutoPark").
Ram 1500	2013-2016	Hard-key Ignition	While in an ESS situation, the Driver attempts to exit the vehicle	The vehicles will AutoPark. Triggers for AutoPark are the door opening with either the brake released or the seatbelt is unbuckled in any order. 1. Auto start capability of ESS is inhibited; and 2. The shifter does not autocorrect resulting in a mismatch between the rotary shifter state & the transmission gear state. The mismatch requires correction by the driver. An instructional message is displayed in the instrument cluster. The ignition is still in the RUN position.
Dodge Durango	2016-current	Keyless-go	While in an ESS situation, the driver pushes the STOP/START button	Causes the engine to start automatically while in Autostop mode, a temporary off state, the ignition is still in the RUN position.
Dodge Durango	2016-current	Keyless-go	While in an ESS situation, the Driver attempts to exit the vehicle	The vehicle is secured from motion by the transmission shifting to park (AutoPark). Triggers for AutoPark are the door opening with either the brake released or the seatbelt is unbuckled in any order.

-
1. Auto start capability of ESS is inhibited; and
 2. The shifter does not autocorrect resulting in a mismatch between the rotary shifter state & the transmission gear state. The mismatch requires correction by the driver. An instructional message is displayed in the instrument cluster.

Table 1: ESS Operation when Occupant Attempts to Turn off the Vehicle when in an ESS Situation

Messages specific to vehicles equipped with ESS are included below:

- If equipped with Engine Stop/Start: display “Stop/Start Autostop Active” on the Stop/Start menu page and a telltale in the cluster when the engine is in a temporary off state and the ignition is still in the RUN state.
- If equipped with Engine Stop/Start: display “Shift to P When Exiting Shift to D to Restart” in the cluster with a chime when in an Autostop and the driver door is opened and driver seatbelt is unbuckled or driver door is opened and brake pedal is released.

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ENCLOSURE 8

SUBJECT Q8j

Mr. Scott Yon

Reference: NEF-102jao; PE16-014

March 15, 2017

ENCLOSURE

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Q8j. Describe any override control logic and timing relative to transmission gear position, engine status, vehicle speed, service brake switch status, and driver's door switch status which may be entered into via a sequence of driver operations (e.g. "car wash mode");

A8j. FCA US does not currently employ a driver-operated override feature relative to transmission gear position, engine status, vehicle speed, service brake switch status or driver's door switch status which may be entered into via a sequence of driver operations.

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ENCLOSURE 8

SUBJECT Q8k

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ENCLOSURE

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Q8k. Describe any fault remediation strategies for instances where a disagreement exists between the position of the shifter and the actual gear status of the transmission;

A8k. FCA US has provided details related to mismatches between the Rotary Gear Shifter Module and the transmission in response to Q8b.

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ENCLOSURE 8

SUBJECT Q81

Mr. Scott Yon
Reference: NEF-102jao; PE16-014
March 15, 2017

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Q8I. Describe and provide video and audio recordings of all warnings provided to the operator and all automatic control functions of the subject and electronic park brake systems (as may be equipped) for the following situations:

- i) The driver's door is opened when the engine is running and the gear selector is not in Park;**
- ii) The driver's door is opened when the engine is off and the gear selector is not in Park;**
- iii) The driver's door is opened when the engine is running and the gear selector is in Park;**
- iv) The operator attempts to operate the ignition control when the engine is running and the gear selector is not in Park;**
- v) The vehicle is moving and the operator attempts to shift to Park (include speed thresholds for the control logic related to this function);**
- vi) Any other state or circumstance FCA believes is pertinent;**

A8I. Documents responsive to subpart (I), relative to the subject vehicles, are located in ENCLOSURE 08 and titled Ram 1500 Video.mpg and Dodge Durango Video.mpg. A viewing guide for the videos is also located in ENCLOSURE 08 and titled Q8 - Video Guide.pdf.

Note: Due to the effects of filming, the shift position indicator LED appears to flicker while actually in a steady-state.

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ENCLOSURE 8

SUBJECT Q8m

Q8m. State whether any of the subject or peer vehicles have a hill-assist function or other system which may act to hold the vehicle at a standstill, even if the brake pedal is released, and if so identify the make, model and model year for each; and

A8m. The Hill Start Assist function is standard equipment on all subject vehicles and can be disabled by the operator.

The Owner's Manual for the 2016 MY Ram 1500 ("DS"):

STARTING AND OPERATING 619

unless braking is no longer desired. Once the brake pedal is released, the BAS is deactivated.

WARNING!

The Brake Assist System (BAS) cannot prevent the natural laws of physics from acting on the vehicle, nor can it increase the traction afforded by prevailing road conditions. BAS cannot prevent collisions, including those resulting from excessive speed in turns, driving on very slippery surfaces, or hydroplaning. The capabilities of a BAS-equipped vehicle must never be exploited in a reckless or dangerous manner, which could jeopardize the user's safety or the safety of others.

Hill Start Assist (HSA)

The HSA system is designed to mitigate roll back from a complete stop while on an incline. If the driver releases

the brake while stopped on an incline, HSA will continue to hold the brake pressure for a short period. If the driver does not apply the throttle before this time expires, the system will release brake pressure and the vehicle will roll down the hill as normal.

The following conditions must be met in order for HSA to activate:

- The feature must be enabled.
- The vehicle must be stopped.
- Park brake must be off.
- Driver door must be closed.
- The vehicle must be on a sufficient grade.
- The gear selection must match vehicle uphill direction (i.e., vehicle facing uphill is in forward gear; vehicle backing uphill is in REVERSE gear).

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- HSA will work in REVERSE gear and all forward gears. The system will not activate if the transmission is in PARK or NEUTRAL. For vehicles equipped with a manual transmission if the clutch is pressed HSA will remain active.

WARNING!

There may be situations where the Hill Start Assist (HSA) will not activate and slight rolling may occur, such as on minor hills or with a loaded vehicle, or while pulling a trailer. HSA is not a substitute for active driving involvement. It is always the driver's responsibility to be attentive to distance to other vehicles, people, and objects, and most importantly brake operation to ensure safe operation of the vehicle under all road conditions. Your complete attention is always required while driving to maintain

(Continued)

WARNING! (Continued)

safe control of your vehicle. Failure to follow these warnings can result in a collision or serious personal injury.

Towing With HSA

HSA will also provide assistance to mitigate roll back while towing a trailer.

WARNING!

- If you use a trailer brake controller with your trailer, the trailer brakes may be activated and deactivated with the brake switch. If so, there may not be enough brake pressure to hold both the vehicle and the trailer on a hill when the brake pedal is released. In order to avoid rolling down an

(Continued)

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ENCLOSURE 8

SUBJECT Q8n

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Q8n. State whether FCA has ever considered adopting control logic for the subject systems that automatically shift to Park if the system detects signals (e.g., driver's door opens) indicating that the driver may be exiting the vehicle when the gear selector is not in Park and, if so, the reasons why such control logic either was or was not adopted.

A8n. FCA US refers the Agency to the securement strategy presented to NHTSA on February 9, 2017. A representative copy of the document, as submitted in relation to the February 9, 2017, meeting, can be found in ENCLOSURE 08 and titled FCA Auto Park 2_9_2017 Final CONF BUS INFO.pdf.

