Engineering Specification

PART NAME: SPEC - ELECTRICAL & ELECTRONIC SYSTEM	PART NUMBER
Blue Oval DNA Welcome Farewell	ES-DS7T-1A278-CB

LET	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
FR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
LET	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
FR	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35			

	LET	FR	REVISIONS	DR	CK	REFERENCE
	A	1-31	Release ES-DS7T-1A278-CA	DV	DV	
20110307			AE00-E-12394067-156			PREPARED/APPROVED BY
		3	Section 2.1: removed reference to white backlighting			David VanAmberg
		5	Added Backlit_LED_Status signal to Table 1			CHECKED BY: David VanAmberg / DETAILED BY: David VanAmberg
		5-7	Sections 3.1 – 3.3: added reference to Backlit_LED_Status			
		8-9	Sections 4.1 & 4.4: added reference to Backlit_LED_Status			CONCURRENCE/APPROVAL SIGNATURES
		11	Section 5.4: added reference to Backlit_LED_Status			
		12	Section 5.7: added reference to Appendix IV			EESE Interior Harmony Supervisor
		13	Section 5.9: added reference to Backlit_LED_Status			Sherri Bettendorf
		19	Updated Stage 3, Step H in Appendix II			EESE Cockpit Controls Core Manager
		27-28	Added Appendix III for Centerstack Controls			Parrish Hanna
		29-33	Updated Appendix IV for Centerstack Display			Manufacturing Engrg.
	B	1-35	Release ES-DS7T-1A278-CB	DV	DV	
20140428			AE00-E-12818413-000			Quality Control
						Purchasing Supervisor
						Supplier Quality Assistance

FRAME 1 OF 35	REV B	

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1.0 INTRODUCTION

1.1 Purpose and Scope

This specification is for those 2013 MY and beyond Ford vehicle programs with the Common Global Electrical Architecture (CGEA) version 1.2 and 1.3.

1.2 Document Intent

This specification is intended as a guideline of the elements required for Ford vehicle programs to meet the Blue Oval DNA Welcome Farewell Strategy.

2.0 WELCOME FAREWELL STRATEGY OVERVIEW

The Welcome Farewell strategy is a sequence of illumination events that occur as the customer approaches, enters, starts and then exits the vehicle. The globally agreed upon state matrix for the Blue Oval DNA Welcome Farewell strategy is detailed in Appendix I. The Instrument Cluster specific Welcome Farewell strategy is summarized in Appendix II. The Centerstack Controls specific Welcome Farewell strategy is summarized in Appendix III. The Centerstack Display specific Welcome Farewell strategy is summarized in Appendix IV. The Welcome Farewell Assessment criteria are summarized in Appendix V.

2.1 Welcome

The vision statement for Welcome is: "As you approach your Ford vehicle, you are welcomed by the lights. Opening the door reinforces the invitation. As the vehicle wakes up, the displays and switches illuminate with crisp, clear Ice Blue™ backlighting hinting at the exciting driving experience."

2.2 Farewell

The vision statement for Farewell is: "As you exit your Ford vehicle, interior lighting is turned on to aid in exiting. Exterior lighting remains on for a period of time to enable you to see obstacles and your pathway when leaving your vehicle."

2.3 Welcome Farewell Components

For the most part, the master control for the Welcome Farewell strategy resides in the Body Control Module (BCM). The BCM directly controls all exterior and interior lighting. The Ambient Lighting Module (ALM) controls a major portion of interior lighting via a Local Interconnect Network (LIN) and resides within the BCM. The BCM also controls interior illumination, also called dimmable backlighting, via a hardwired signal and Controller Area Network (CAN) message.

Exterior lighting components include turn indicators and/or side markers, Parklamps or position lamps and puddle lamps. Puddle lamps include the rear license plate and may also be located on the inside of the door or on the underside of the exterior mirror or in the cargo

bed of pickup trucks. Headlamps, front and rear fog lamps, although a major portion of exterior lighting, are to remain OFF during Welcome and Farewell.

The BCM controlled interior lighting components include all the courtesy lamps which consist of the dome lamp and/or map lamps and others such as footwell lamps, if not controlled by the ALM. ALM interior lighting components can be located in the cupholders, center console, footwells, doors, overhead or in the scuff plates. These components can be illuminated in groups or individually.

Interior illumination components are all of the illuminated/dimmable components that are controlled by the BCM dimming subsystem. These components include but are not limited to; Electronic Control Panel (ECP), Electronic Finish Panel (EFP), Automatic or Manual Temperature Controller, Instrument Cluster and switches or bezels located on the Instrument Panel, Door Trim, Steering Wheel, Floor Console or Overhead Console. Electronic Display devices like the Multi-Function Displays (MFD), Display Modules (DM8) and information displays in the Instrument Cluster are also included in Interior Illumination.

2.4 Network Signals

The BCM will send various CAN signals to communicate the status of various features or events used to control the Welcome/Farewell strategy. Details of the CAN signals are shown in Table 1 below and will be discussed in more detail in Sections 3 and 4.

Table 1. Network Signals for Welcome/Farewell

Description	Length	Detailed Meaning	State Encoded	Min	Max	Comment
DrStatPsngr_B_Actl	1			0 (0x0)	1 (0x1)	Indicates status of the Passenger Door
		Closed	0x0			
		Ajar	0x1			
DrStatDrv_B_Actl	1			0 (0x0)	1 (0x1)	Indicates status of Driver's Door
		Closed	0x0			
		Ajar	0x1			
Parklamp_Status	2			0 (0x0)	3 (0x3)	Indicates status of the Parklamps relay
		Off	0x0			
		On	0x1			
		Unknown	0x2			
		Invalid	0x3			
Dimming_Lvl	8			0 (0x0)	253 (0xFD)	Intensity level of interior illumination
		Off	0x0			
		Night_1	0x1			
		Night_2	0x2			
		Night_3	0x3			
		Night_4	0x4			
		Night_5	0x5			
		Night_6	0x6			
		Night_7	0x7			
		Night_8	0x8			
		Night_9	0x9			
		Night_10	0xA			
		Night_11	0xB			
		Night_12	0xC			

Table 1. Network Signals for Welcome/Farewell *(con't)*

Description	Length	Detailed Meaning	State Encoded	Min	Max	Comment
		Day_1	0xD			
		Day_2	0xE			
		Day_3	0xF			
		Day_4	0x10			
		Day_5	0x11			
		Day_6	0x12			
		Unknown	0xFE			
		Invalid	0xFF			
Backlit_LED_Status	4			0 (0x0)	253 (0xFD)	
		Off	0x0			
		Night_1	0x1			
		Night_2	0x2			
		Night_3	0x3			
		Night_4	0x4			
		Night_5	0x5			Intensity level of interior illumination
		Night_6	0x6			
		Night_7	0x7			
		Night_8	0x8			
		Night_9	0x9			
		Night_10	0xA			
		Night_11	0xB			
		Night_12	0xC			

3.0 WELCOME STRATEGY OPERATIONAL DESCRIPTION

The Welcome Strategy is divided into a sequence of five events as the customer approaches/enters the vehicle including; Approaching Vehicle, Vehicle Ingress, Settled in Seat, Start Engine and Engine Running. Within each event, the Welcome Strategy controls elements of exterior and interior lighting as well as interior illumination. Transition between events is triggered by a customer action; i.e. unlocking a door, opening or closing a door or starting the vehicle.

3.1 Approaching Vehicle Event

Approaching Vehicle is similar to the BCM feature called Illuminated Entry. Illuminated Entry is active when the ignition is in the OFF position and one of the following occurs:

- the vehicle is electrically unlocked (a new unlock event) from the keyfob, or keypad, or a key cylinder (if electrical lock and unlock activation are both provided) regardless of door state (does *not* include unlocking from the switch inside the vehicle)
- or a closed power sliding door or closed power liftgate or (open or closed) liftgate glass is activated from the keyfob or the keypad.

The Illuminated Entry feature is exited when one of the following occurs:

- the Illuminated Entry timer expires after 25 seconds
- or when the ignition transitions from OFF
- or the vehicle is electrically locked from the keyfob or the keypad or a key cylinder (if electrical lock and unlock activation are both provided) (does *not* include locking from the switch inside the vehicle)
- or any door, liftgate or liftgate glass becomes ajar.

During this event, the exterior turn indicators and the turn signal telltales in the instrument cluster will activate for 1 second then extinguish. Parklamps, Puddle lamps and Courtesy Lamps will Theatre Dim up (see Section 5.6) and then remain ON for the duration of the event. All Ambient Lighting, interior illumination, electronic displays, Headlamps and Foglamps will be OFF for the duration of the event.
When Illuminated Entry feature is active, the Parklamps_Status signal will be ON while the Dimming_Lvl and Backlit_LED_Status signals will be OFF. When the Illuminated Entry feature is exited, the Parklamps_Status signal will transition to OFF.

Illuminated Entry is a local sleep inhibitor for the BCM; however, it is NOT a network sleep inhibitor. The BCM will allow the network(s) to sleep while Illuminated Entry is active. Local sleep is allowed when Illuminated Entry is inactive.

3.2 Vehicle Ingress Event

Vehicle Ingress is similar to the BCM feature called Courtesy Lighting. Courtesy Lighting is active when:
- the ignition is in the OFF position
- and any door or liftgate or liftgate glass is open.

The Courtesy Lighting feature is exited when one of the following occurs:
- all doors and liftgate and liftgate glass are closed
- or the Courtesy Lamps Battery Saver timer expires after 10 minutes
- or the ignition transitions to RUN or START.

During this event, Parklamps, Puddle lamps, and interior illumination will remain ON for 25 seconds at which point will transition to OFF. Courtesy Lamps and all Ambient Lighting features in their Signature Color will remain ON for the duration of the event. The current Signature Color is Ice Blue™ for Ford vehicles. The electronic display(s) in the instrument cluster will display a predetermined Welcome Screen while interior illumination is active. The Centerstack display will illuminate only if the driver's door or passenger's front door is opened. It will display a predetermined Welcome Screen while interior illumination is active. Headlamps and Foglamps will be OFF for the duration of the event.

Since interior illumination is ON, the instrument cluster gauge halo rings or decorative rings (including raised acrylic chaplets) will ramp ON to a predetermined intensity within 2 seconds and remain on until Dimming_Lvl = OFF. If the instrument cluster does not have gauge halo rings or decorative rings, then the cluster backlit graphics will ramp ON to a predetermined intensity within 2 seconds and remain on until Dimming_Lvl = OFF. The electronic display(s) in the instrument cluster will display a predetermined Welcome Screen until Dimming_Lvl = OFF. If the key is inserted in the ignition or the ignition is in ACC, the gauge pointers will ramp ON to a predetermined intensity within 2 seconds, otherwise, they will be OFF.

When the Courtesy Lighting feature is ON, the Parklamps_Status signal will be ON while the Dimming_Lvl and Backlit_LED_Status signals will be > OFF. When the Courtesy Lighting feature is exited, the Parklamps_Status, Dimming_Lvl and Backlit_LED_Status signals will transition to OFF.

Active dimming/illumination, Dimming_Lvl > OFF, is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed when Dimming_Lvl = OFF. Courtesy Lighting is a local sleep inhibitor for the BCM and Ambient Light Module; however, it is NOT a network sleep inhibitor. The BCM and Ambient Light Module will allow the network(s) to sleep while Courtesy Lighting is active. Local sleep is allowed when the Courtesy Lighting feature is OFF.

3.3 Settled In Seat Event

Settled In Seat is similar to the BCM feature called Courtesy Lighting Delay. Courtesy Lighting Delay is active when:
- the ignition is in the OFF position
- and any door, liftgate or liftgate glass is opened and then all doors and liftgate, and liftgate glass are closed.

The Courtesy Lighting Delay feature is exited when:
- the Courtesy Lighting Delay timer expires after 25 seconds
- or the ignition transitions from OFF
- or the vehicle is electrically locked from the keyfob or keypad or a key cylinder (does *not* include locking from the switch inside the vehicle).

During this event, Parklamps, Puddle lamps, Courtesy Lamps, interior illumination and all Ambient Lighting features will be ON, except Scuff Plates, for the duration of the event. All Ambient Lighting features will illuminate in their Signature Color. The Centerstack display will display a predetermined Welcome Screen for the duration of the event. Headlamps and Foglamps will be OFF.

Since interior illumination is ON, the instrument cluster gauge halo rings or decorative rings (including raised acrylic chaplets) will ramp ON to a predetermined intensity within 2 seconds and remain on for the duration of the event. If the instrument cluster does not have gauge halo rings or decorative rings, then the cluster backlit graphics will ramp ON to a predetermined intensity within 2 seconds and remain on for the duration of the event. The electronic display(s) in the instrument cluster will display a predetermined Welcome Screen for the duration of the event. If the key is inserted in the ignition or the ignition is in ACC, the gauge pointers will ramp ON to a predetermined intensity within 2 seconds, otherwise, they will be OFF.

When the Courtesy Lighting Delay feature is ON, the Parklamps_Status signal will be ON while the Dimming_Lvl and Backlit_LED_Status signals will be > OFF. When the Courtesy Lighting Delay feature is exited, the Parklamps_Status, Dimming_Lvl and Backlit_LED_Status signals will transition to OFF.

Active dimming/illumination, Dimming_Lvl > OFF, is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed when Dimming_Lvl = OFF. Courtesy Lighting Delay is a local sleep inhibitor for the BCM and Ambient Light Module; however, it is NOT a network sleep inhibitor. The BCM and Ambient Light Module will allow the network(s) to sleep while

Courtesy Lighting Delay is active. Local sleep is allowed when the Courtesy Lighting Delay feature is OFF.

3.4 Start Engine/Engine Running Events

Start Engine and Engine Running are considered active whenever the ignition transitions to RUN or START. The Start Engine and Engine Running events are exited whenever the ignition transitions from RUN or START to OFF or ACC.

During these events, all exterior lighting, Courtesy Lighting and most interior illumination features are controlled by the customer. The Centerstack display will initially display a welcome screen or welcome animation prior to transitioning to normal operation.

The instrument cluster will start prove out of the required warning lights (or telltales) and at the same time will start the "Vehicle Specific Animation" on the electronic display(s). The total duration of the animation must be ≤ 3 seconds and will transition to normal operation once the animation is complete. Coincident with the start of prove out, all of the instrument cluster backlighting will ramp ON to a known intensity within 2 seconds, while the gauge pointers will turn ON to a known intensity and move to their operating position.

4.0 FAREWELL STRATEGY OPERATIONAL DESCRIPTION

The Farewell Strategy is divided into a sequence of five events as the customer exits the vehicle including; Engine Stopped, Vehicle Egress, Leaving Vehicle, Security Locking and Locking Confirmation. Within each event, the Farewell Strategy controls elements of exterior and interior lighting as well as interior illumination. Transition between events is triggered by a customer action; i.e. removing the ignition key, opening or closing a door or locking the vehicle.

4.1 Engine Stopped

Engine Stopped is similar to the BCM feature called Illuminated Exit. Illuminated Exit is active when all doors are closed and the ignition key is removed from the ignition cylinder.

The Illuminated Exit feature is exited when:
- the ignition key is reinserted into the ignition cylinder
- or a door or liftgate (if provided) or liftgate glass (if provided) is opened
- or the Illuminated Exit timer expires after 25 seconds.

During this event, Courtesy Lamps, interior illumination and all Ambient Lighting features will be ON, except Scuff Plates, for the duration of the event. All Ambient Lighting features will illuminate in the customer selected color. The Centerstack display will display a predetermined Farewell Screen for the duration of the event. Parklamps, Headlamps and Foglamps will remain OFF.

Since interior illumination is ON, the instrument cluster gauge halo rings or decorative rings (including raised acrylic chaplets) will remain ON at a predetermined intensity for the duration of the event. If the instrument cluster does not have gauge halo rings or decorative rings, then the cluster backlit graphics will remain ON at a predetermined intensity and remain on for the duration of the event. The electronic display(s) in the instrument cluster will display a predetermined Farewell Screen for the duration of the event.

When the Illuminated Exit feature is ON, the Parklamps_Status signal will be OFF while the Dimming_Lvl and Backlit_LED_Status signals will be > OFF. When the Illuminated Exit feature is exited, the Dimming_Lvl and Backlit_LED_Status signals will transition to OFF.

Active dimming/illumination, Dimming_Lvl > OFF, is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed when Dimming_Lvl = OFF. Illuminated Exit is a local sleep inhibitor for the BCM and Ambient Light Module; however, it is NOT a network sleep inhibitor. The BCM and Ambient Light Module will allow the network(s) to sleep while Illuminated Exit is active. Local sleep is allowed when the Illuminated Exit feature is OFF.

4.2 Vehicle Egress

The operational description for the Vehicle Egress event is identical to the Vehicle Ingress event, Section 3.2, except the electronic displays in the instrument cluster and Centerstack will display a predetermined Farewell Screen for the duration of the event.

4.3 Leaving Vehicle

The operational description for the Leaving Vehicle event is identical to the Settled in Seat event, Section 3.3, except the electronic displays in the instrument cluster and Centerstack will display a predetermined Farewell Screen for the duration of the event.

4.4 Security Locking

Security Locking is similar to the BCM feature called Locking Feedback Lighting. Locking Feedback Lighting will activate the exterior turn indicators and the turn signal telltales in the instrument cluster for 400 milliseconds when:

- the ignition is OFF or ACC
- all doors have been locked by the Keypad, Key Cylinder, or Interior Central Door Lock Switch
- or all doors have been locked by single button press via keyfob
- and all doors including liftgate, liftgate glass, decklid, and hood are closed or later become closed and all doors are still locked (last command was not UNLOCK) **EXCEPT** when all passenger doors are closed and the Interior Central Door Lock Switch is pressed.

If any door including liftgate, liftgate glass, decklid, and hood is ajar, then no flashes occur with a single button press on the keyfob.

During this event, Courtesy Lamps and Puddle Lamps will Theatre Dim down (see Section 5.6). All Ambient Lighting features except Scuff Plates will remain ON for 3.7 seconds then Theatre Dim down. Parklamps, interior illumination and the electronic displays in the instrument cluster and Centerstack will immediately transition to OFF if not already OFF.

When Locking Feedback Lighting is activated, the Parklamps_Status, Dimming_Lvl and Backlit_LED_Status signals will transition to OFF if not already OFF.

4.5 Locking Confirmation

The Locking Confirmation event is similar to the BCM feature called Locking Feedback Horn. Locking Feedback Horn will flash the exterior turn indicators and the turn signal telltales in the instrument cluster twice (400 milliseconds ON, 600 milliseconds OFF, 400 milliseconds ON) and sound a single horn chirp when:

- the ignition is OFF or ACC
- and all doors have been locked by the keyfob and all doors are closed including liftgate, liftgate glass, decklid and hood and lock button on keyfob pressed twice within 3 seconds of each other.

Some Ford Motor Company regions may configure the horn chirp OFF. Ford North America will have the horn chirp configured ON while Ford of Europe will have the horn chirp configured OFF.

Locking Feedback Horn will sound a double horn chirp (40 milliseconds ON, 250 milliseconds OFF, 40 milliseconds ON) when:

- the ignition is OFF or ACC and
- and all doors have been locked by the keyfob and any door(s) are open (including decklid, liftgate, liftgate glass and hood, if equipped) and lock button on keyfob pressed twice within 3 seconds of each other.

5.0 WELCOME FAREWELL OPERATIONAL ANAMOLIES

5.1 Lincoln Experience Welcome Farewell Strategy

The Lincoln Experience Welcome Farewell strategy is a unique specification.

5.2 Passive Entry Passive Start

PEPS (Passive Entry Passive Start) replaces the normal keyed ignition with a keyfob and Push to Start button on the instrument panel. For CGEA, all of the PEPS logic resides in the BCM.

There are subtle behavioral differences in Welcome Farewell when the vehicle is equipped with PEPS. To enter the Approaching Vehicle event, the customer can just touch the door handle or release button/sensor on the door handle to unlock the vehicle as long as a valid keyfob is found by the BCM. During any of the other Welcome events, PEPS may interrupt

the Welcome screen in the instrument cluster to display ignition state-specific messages to alert the customer of the current ignition status.

The key-in ignition status influences when the instrument cluster pointers illuminate during the Welcome and Farewell. Since PEPS is a keyless system, the BCM has to logically determine key-in ignition status versus using the mechanical key cylinder switch. When the ignition position is RUN or START, by definition, the key is IN the ignition. If the ignition position is OFF and the vehicle is in PARK, the key is OUT of the ignition. If the ignition position is OFF and the vehicle is NOT in PARK, the key is IN the ignition. The instrument cluster pointers won't illuminate until the key is IN. On PEPS vehicle, the pointers will rarely illuminate during Welcome and Farewell.

5.3 Remote Start

The Remote Start feature enables the customer to start the vehicle from 100 meters of distance around the entire vehicle via the keyfob. In addition to starting the vehicle, the remote control device can also pre-condition the vehicle cabin. To activate the system, the customer must press the Lock button once followed by the Remote Start button twice to avoid inadvertent activation. Once activated, the vehicle will remain started for 10 minutes or can be cancelled by pressing the Remote Start button again.

From a Welcome perspective, if the vehicle successfully receives the request to Remote Start, the turn indicators will flash twice (400 milliseconds ON, 600 milliseconds OFF, 400 milliseconds ON). If the vehicle successfully starts, the Parklamps will remain ON for the entire Remote Start duration. If the vehicle does not successfully start, a single horn chirp is provided.

During the entire time Remote Start is active, the ignition is OFF and therefore, all features/components will behave as described Sections 3.1 – 3.3 during Welcome. For a keyed vehicle, the key must be inserted and transitioned to RUN in order enter the Start Vehicle event or to shift out of Park. For a PEPS vehicle, the keyfob must be inside the vehicle and Push to Start button pressed while the brake is depressed in order to enter the Start Vehicle event or shift out of Park.

5.4 Factory and Transport Car Modes

If the vehicle is in Factory or Transport Car Mode, certain features behave differently during Welcome/Farewell to minimize energy use from the battery. The BCM disables the Illuminated Entry, Courtesy Lighting Delay and Illuminated Exit features. Only the Courtesy Lighting feature will be active but without Parklamps or interior illumination, therefore, only Courtesy Lamps, Puddle Lamps and Ambient Lighting features will turn on when any door is left open. The Courtesy Lighting Battery Saver timer is set to 1 minute instead of 10 minutes.

While in Factory or Transport modes, during any Welcome or Farewell event, the Parklamps_Status, Dimming_Lvl and Backlit_LED_Status signals will be OFF.

5.5 Delayed Accessory

The Delayed Accessory Power feature controls power to certain accessories in the vehicle which are referred to as “delayed accessories”. For 10 minutes after the ignition has been in the OFF position and while the driver’s door and front passenger’s door remains closed, this feature allows the delayed accessories to be powered. This "delayed accessory period", controlled by the BCM, stays active until the timer expires or one of the front doors are opened. Ford of Europe (FoE) uses only the driver's front door ajar to exit Delayed Accessory while Ford North America uses either front door ajar.

With respect to Welcome Farewell, non-dimmable switches on the door trim, i.e. power door lock, window lift and mirror, are powered by Delayed Accessory Power. Therefore, during Farewell if the customer remains in the vehicle after the Engine Stopped event, the non-dimmable door trim switches will remain illuminated for 10 minutes or until a front door is opened. During Welcome, these non-dimmable door trim switches will only illuminate in the Vehicle Ingress or Settle in Seat events if ignition is in ACC and will always illuminate while in the Engine Running event. During the Start Engine event, these non-dimmable door trim switches will be turned OFF for 60 seconds to prevent excessive battery drain.

5.6 Theatre Dimming

Fade-In, described in Appendix I, is similar to the BCM feature called Theater Dimming. Theatre Dim up will ramp up Courtesy Lamps and Puddle Lamps over 0.7 seconds and Theatre Dim down will ramp them down over 1.7 seconds. If the Illuminated Entry timer expires prior to entering the Courtesy Lighting feature, Courtesy Lamps and Puddle Lamps will ramp back up instead of just turning on. The same holds true if the Courtesy Lighting timer expires prior to entering the Courtesy Lighting Delay feature.

5.7 Electronic Display Screens

The Welcome and Farewell Screens that are shown in the Centerstack display as depicted in Appendix IV are left to the discretion of the HMI Design and Design Studio teams. The Welcome and Farewell Screens that are shown in the instrument cluster display(s) must display the total odometer; all other aspects of the Screens are left to the discretion of the HMI Design and Design Studio teams. The Vehicle Specific Animation in the instrument cluster and Centerstack display that occurs during the Engine Start/Engine Running event is once again left to the discretion of the HMI Design and Design Studio teams.

5.8 Headlamp Activation During Farewell

5.8.1 Autolamps Exit Delay

The Autolamps feature provides automatic control of the headlamps and Parklamps. The lamps which makeup the headlamps consist of the low beams and high beams. The Autolamps feature is enabled and disabled by the customer (e.g. from the Autolamp position of the Headlamp Switch).

When the ignition is turned to the run or start position with the Autolamps already enabled and the ambient light level is dark, the Autolamps feature will request that the headlamps and Parklamps be turned on. When the Autolamps are enabled and the ignition is already in the run or start position and the ambient light level is dark, the Autolamps feature will request that the headlamps and Parklamps be turned on. When Autolamps are disabled, the Autolamps feature will request that the headlamps and position/Parklamps be turned off, regardless of ignition position. When the Autolamps have the headlamps and Parklamps turned on, and the ignition is turned to the OFF or ACC position, the headlamps and Parklamps will remain on for a preselected time (Autolamps Exit Delay) or until the Autolamps are disabled. The Autolamps feature allows the customer to change the length of the Autolamps Exit Delay. The exit delay can be in the range of 0 to 180 seconds with the initial default set to 20 seconds.

During the Approaching Vehicle, Vehicle Ingress, Settled in Seat, Vehicle Egress and Leaving Vehicle events, the BCM overrides the Autolamps feature keeping headlamps OFF and Parklamps ON. However, in the Engine Stopped event, prior to removing the ignition key and opening any door, Autolamps exit delay will turn headlamps and Parklamps ON for the preselected time or until the key is removed from the ignition.

5.8.2 Home Safe Light

The Home Safe Light (HSL) feature provides manual control of the headlamps and Parklamps when the ignition is OFF or ACC. HSL is independent of the Headlamp Switch position and is customer enabled by pulling the high beam stalk switch into the flash position once. When HSL is enabled, the headlamps and Parklamps will remain ON for 30 seconds. HSL is disabled by pulling the high beam stalk switch into the flash position again or when the ignition transitions to RUN or START. The HSL feature is disabled if Autolamps Exit Delay is already enabled.

When any door becomes ajar (including liftgate and decklid) and HSL is enabled, the headlamps and Parklamps will remain ON for 180 seconds. The HSL timer is reset to 30 seconds when the last door (including liftgate and decklid) is closed.

During the Approaching Vehicle, Vehicle Ingress, Settled in Seat, Vehicle Egress, Engine Stopped, Leaving Vehicle and Security Locking events, the HSL feature, if enabled, would turn headlamps ON and Parklamps ON.

5.9 Police Dark Car Mode

Police Dark Car mode is a configurable feature in the BCM, primarily for police vehicles, which disables all interior and exterior lighting as well interior illumination during Welcome and Farewell. When configured to Dark, the BCM disables the Illuminated Entry, Courtesy Lighting, Courtesy Lighting Delay and Illuminated Exit features. Therefore, all Parklamps, Puddle Lamps, Courtesy Lamps, Ambient Lighting and interior illumination will be OFF during Welcome and Farewell. This in turn means that the Parklamps_Status, Dimming_Lvl and Backlit_LED_Status signals will always be OFF.

6.0 LIST OF REFERENCES

- Body Control Module CGEA Functional Specification – FS-DG9T-14B476-A
- Driver Information STSS Welcome-Goodbye Strategy CGEA 1.3
- Operations Mode Management CGEA v1.1 System Level Functional Requirements Specification

APPENDIX I - BLUE OVAL DNA WELCOME FAREWELL STRATEGY STATE MATRIX

		Welcome				
	Body Module Feature Description	Illuminated Entry	Courtesy Lighting	Courtesy Lighting Delay		
	Event:	**Approaching Vehicle**	**Vehicle Ingress**	**Settled in Seat**	**Start Engine**	**Engine Running**
	Event Trigger:	Unlock w/ key fob, keypad or lock cylinder; or a closed power sliding door or closed power liftgate or liftgate glass is activated from key fob or keypad; Touch door handle or release button/sensor on door handle[4]	**Any Door**/Liftgate/Lift Glass **Ajar**	**All Doors**/Liftgate/Lift Glass **Closed**	Ignition transition from OFF or ACC to Run or Start	Ignition transition from **START to RUN**
	Ignition Status:	**OFF**	**OFF or ACC**	**OFF or ACC**	**RUN or START**	**RUN**
	Event Duration:	25 seconds	25 seconds and 10 minute battery saver [3]	25 seconds		
	Event Interrupt:	Lock w/ key fob, keypad or lock Ignition transitions from OFF	1) Door/Liftgate/Lift Glass Closed **OR** 2) Ignition transition to RUN or START	Ignition transition from OFF **OR** lock w/ key fob, keypad or lock cylinder	Ignition transition to OFF	Ignition transition to OFF or ACC
	Component/Feature	**Blue Oval**	**Blue Oval**	**Blue Oval**	**Blue Oval**	**Blue Oval**
EXTERIOR	Turn Signal Indicators	**FNA: Single Lock vehicles - 1 long flash (1 sec) FoE: Single Lock vehicles - 1 long flash (1 sec) FoE: Double Lock vehicles - 1 long flash (1 sec)**	**OFF**	**OFF**	**OFF**	**OFF**
EXTERIOR	Puddle area side	**ON**	**ON**	**ON**	**OFF**	**OFF**
EXTERIOR	Puddle area rear (license plate)	**ON**	**ON**	**ON**	**OFF**	**OFF**
EXTERIOR	Parklamps	**ON**	**ON**	**ON**	**OFF**	**OFF/ON** with headlamps on
EXTERIOR	Headlamps	**OFF**	**OFF**	**OFF**	**OFF**	**OFF/ON** with headlamps on
INTERIOR	Courtesy Lamps (including Footwell)	**ON** (Fade-in)	**ON**	**ON**	**OFF** (Fade-out)	**OFF**
INTERIOR	Multicolor Footwell LEDs[2]	**OFF**	**ON** (Fade-in, max intensity, signature color)	**ON** (max intensity, signature color)	**ON** (Dim to preset intensity/color) [1]	**ON** (preset intensity/color) [1]
INTERIOR	Cupholders, IP Light Bars, IP Register Lights, Trinket Trays[2]	**OFF**	**ON** (Fade-in, max intensity, signature color)	**ON** (max intensity, signature color)	**ON** (Dim to preset intensity/color) [1]	**ON** (preset intensity/color) [1]
INTERIOR	Door Pull, Map Pockets, Door Light Bars[2]	**OFF**	**ON** (Fade-in, max intensity, signature color)	**ON** (max intensity, signature color)	**ON** (Dim to preset intensity/color) [1]	**ON** (preset intensity/color) [1]
INTERIOR	Headliner[2]	**OFF**	**ON** (Fade-in, max intensity, signature color)	**ON** (max intensity, signature color)	**ON** (Dim to preset intensity/color) [1]	**ON** (preset intensity/color) [1]
INTERIOR	Scuff Plates[2]	**OFF**	**ON** (Fade-in, max intensity, signature color)	**OFF** (Fade-out)	**OFF**	**OFF**
INTERIOR	IP Switch/Button Illumination	**OFF**	**ON**	**ON**	**ON** [1]	**ON** [1]
INTERIOR	Headlamp Switch Illumination	**OFF**	**ON**	**ON**	**ON**	**ON**
INTERIOR	Non Dimmable Door Trim Switch/Button Illumination (High Current)	**OFF**	**OFF**	**OFF**	**ON** [1]	**ON** [1]
INTERIOR	Engine Start/Stop Button	**OFF**	**ON**	**ON**	**ON** [1]	**ON** [1]
CLUSTER	Instrument Cluster Backlighting / Gauges and/or Acrylic Rings	**OFF**	**ON** (intensity in harmony with display)	**ON** (intensity in harmony with display)	**ON** (Welcome Scenario), fade-in to preselected intensity	**ON** (with preselected intensity)
CLUSTER	Instrument Cluster Pointers	**OFF**	**OFF**	**OFF**	**ON** to preselected intensity (NO pointer sweep)	**ON** (with preselected intensity)
CLUSTER	Instrument Cluster Display	**OFF**	**ON** (Welcome Screen)	**ON** (Welcome Screen)	**ON**	**ON** (with preselected intensity)

	Event Trigger:	Same as Above	**Driver's Front or Passenger's Front Door Transition from Closed to Ajar**	**Driver's Front or Passenger's Front Door Transition from Ajar to Closed**	Ignition transition from OFF or ACC to **Ignition ON**	Ignition transition from **START to RUN**
MFD CID	Centerstack Display	**OFF**	**ON** (Welcome Screen)	**ON** (Welcome Screen)	**ON**	**ON** (with preselected intensity)

1. with Headlamps ON, or Ambient Light Sensor triggered
2. Controlled by Ambient Lighting; Signature Color is Ice Blue for Ford
3. 25 second timer for Parklamps and Interior Illumination; 10 minute timer for puddle lamps, courtesy lamps and Ambient Lighting features
4. Added Touch door handle or release button/sensor on door handle for PEPS equipped vehicles

		Farewell					
	Body Module Feature Description	Illuminated Exit	Courtesy Lighting	Courtesy Lighting Delay			
	Event:	**Engine Stopped**	**Exit Vehicle/ Vehicle Egress**		**Security Locking**	**Locking Confirmation**	**Locking Confirmation**
	Event Trigger:	Ignition transition from **RUN to OFF** All **doors** are **closed**	**Any Door**/Liftgate/Lift Glass **Ajar**	**All Doors**/Liftgate/Lift Glass **Closed**	**Press lock once; Touch lock button/sensor once**	**Lock button pressed twice (within 3 seconds of each other) and all doors closed; Touch lock button/sensor twice (within 3 seconds of each other) and all doors closed**	**Lock button pressed twice (within 3 seconds of each other) and any door ajar; Touch lock button/sensor twice (within 3 seconds of each other) and any door open**
	Ignition Status:	**OFF (Key Removed)**	**OFF or ACC**	**OFF or ACC**	**OFF**	**OFF**	**OFF**
	Event Duration:	25 seconds	25 seconds and 10 minute battery saver [3]	25 seconds			
	Event Interrupt:	Key re-inserted in Ignition **OR** Door/Liftgate/Lift Glass is opened	1) Door/Liftgate/Lift Glass Closed **OR** 2) Ignition transition to RUN or START	Ignition transition from OFF **OR** lock w/ key fob, keypad or lock cylinder			
	Component/Feature	**Blue Oval**	**Blue Oval**	**Blue Oval**	**Blue Oval**	**Blue Oval**	**Blue Oval**
EXTERIOR	Indicators	**OFF**	**OFF**	**OFF**	**FNA: Single Lock vehicles - 1 short flash FoE: Single Lock vehicles - 1 short flash FoE: Double Lock vehicles - 1 short flash (short flash = 400 ms)**	**FNA: Single Lock Vehicles - 2 short flash with single horn chirp FoE: Single Lock Vehicles - 2 short flashes FoE: Double Lock Vehicles - 2 short flashes**	**FNA: Single Lock Vehicles - no flash with double horn chirp FoE: Single Lock Vehicles - no flash with double horn chirp (tbc) FoE: Double Lock Vehicles - no flash with double horn chirp (tbc)**
EXTERIOR	Puddle area side	**OFF**	**ON**	**ON**	**OFF**	**OFF**	**OFF**
EXTERIOR	Puddle area rear (license plate)	**OFF**	**ON**	**ON**	**OFF**	**OFF**	**OFF**
EXTERIOR	Parklamps	**OFF**	**ON** (to illuminate the vehicle environment)	**ON** (to illuminate the vehicle environment)	**OFF**	**OFF**	**OFF**
EXTERIOR	Headlamps	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**
INTERIOR	Courtesy Lamps	**ON** (Fade-in)	**ON**	**ON**	Fade-out 1.7 sec. / **OFF**	**OFF**	**OFF**
INTERIOR	Multicolor Footwell LEDs[3]	**ON** (preset intensity/color) [4]	**ON** (max intensity/signature color)	**ON** (max intensity/signature color)	**ON (3.7 sec.)** / Fade-out 1.7 sec.	**OFF**	**OFF**
INTERIOR	Cupholders, IP Light Bars, IP Register Lights, Trinket Trays[3]	**ON** (preset intensity/color) [4]	**ON** (max intensity, signature color)	**ON** (max intensity, signature color)	**ON (3.7 sec.)** / Fade-out 1.7 sec.	**OFF**	**OFF**
INTERIOR	Door Pull, Map Pockets, Door Light Bars[3]	**ON** (preset intensity/color) [4]	**ON** (max intensity, signature color)	**ON** (max intensity, signature color)	**ON (3.7 sec.)** / Fade-out 1.7 sec.	**OFF**	**OFF**
INTERIOR	Headliner[3]	**ON** (preset intensity/color) [4]	**ON** (max intensity, signature color)	**ON** (max intensity, signature color)	**ON (3.7 sec.)** / Fade-out 1.7 sec.	**OFF**	**OFF**
INTERIOR	Scuff Plates[3]	**OFF**	**ON** (Fade-in, max intensity, signature color)	**OFF** (Fade-out)	**OFF**	**OFF**	**OFF**
INTERIOR	IP Switch/Button Illumination	**ON**	**ON**	**ON**	**OFF**	**OFF**	**OFF**
INTERIOR	Headlamp Switch Illumination	**ON**	**ON**	**ON**	**OFF**	**OFF**	**OFF**
INTERIOR	Non Dimmable Door Trim Switch/Button Illumination	**ON**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**
INTERIOR	Engine Start/Stop Button	**ON**	**ON**	**ON**	**OFF** (Fade-out)	**OFF**	**OFF**
CLUSTER	Instrument Cluster Backlighting / Gauges and/or Acrylic Rings	**ON** (intensity in harmony with display)	**ON** (intensity in harmony with display)	**ON** (intensity in harmony with display)	**OFF** (Fade-out)	**OFF**	**OFF**
CLUSTER	Instrument Cluster Pointers	**OFF** (fade-out)	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**
CLUSTER	Instrument Cluster Display	**ON** (Farewell Screen)	**ON** (Farewell Screen)	**ON** (Farewell Screen)	**OFF** (Fade-out)	**OFF**	**OFF**

	Event Trigger:	Key Removed from Ignition Both front **doors** are **closed**	**Driver's Front or Passenger's Front Door Transition from Closed to Ajar**	**Driver's Front or Passenger's Front Door Transition from Ajar to Closed**	**All Doors**/Liftgate/Lift Glass **closed**	**All Doors**/Liftgate/Lift Glass **closed**	**All Doors**/Liftgate/Lift Glass **closed**
MFD CID	Centerstack Display	**ON** (min intensity to read infos)	**OFF**	**OFF**	**OFF** (Fade-out)	**OFF**	**OFF**

1. with Headlamps ON, or Ambient Light Sensor triggered
2. Controlled by Ambient Lighting; Signature Color is Ice Blue for Ford
3. 25 second timer for Parklamps and Interior Illumination; 10 minute timer for puddle lamps, courtesy lamps and Ambient Lighting features
4. Added Touch door handle or release button/sensor on door handle for PEPS equipped vehicles

APPENDIX II - INSTRUMENT CLUSTER WELCOME FAREWELL STRATEGY

CGEA Instrument Cluster Welcome Farewell Strategy[1]

STAGE 0 – APPROACHING VEHICLE [1,10]
Signal States: Dimming_Lvl = OFF; Ignition_Status = OFF; Key_In_Ignition_Status = Out

All Instrument Cluster Illumination must be OFF.

STAGE 1 – ENTERING VEHICLE [1,10]
Signal States: Dimming_Lvl ≠ OFF; Ignition_Status = OFF; Key_In_Ignition_Status = Out

Cluster Illumination Strategy:

A. Ramp Gauge Halo Rings or Decorative Rings (including raised acrylic chaplets), ePRNDL graphics and ePRNDL gear indicator to intensity_1[5] within 2 seconds[3,7]. All SST/grade assist displays or indicators are OFF.
B. Coincident with Step A, turn on Instrument Cluster Display to Welcome Scene[4,8].
C. All lighting should extinguish when Dimming_Lvl transitions to OFF. If Ignition transitions to Run, skip to Step G in Stage 3.

STAGE 2 – DRIVER SETTLED IN SEAT [1,10]
Signal States: Ignition_Status = OFF or ACC; Key_In_Ignition_Status = IN;

Cluster Illumination Strategy:

D. Maintain Cluster Illumination Strategy from Stage 1. If lighting is OFF, then reexecute Stage 1.
E. Coincident with Step D, ramp pointer lighting to intensity_1[5] within 2 seconds[3].
F. All lighting should extinguish 25 seconds after Key went IN Ignition or 25 seconds after Ignition transitions from OFF to ACC. If Ignition transitions to Run, skip to Step G in Stage 3.

STAGE 3 – ENGINE TO RUN [1,6,10,11]
Signal States: Ignition_Status = Run or Start

Cluster Illumination Strategy:

G. Start Prove Out of required Warning Lights and at the same time show "Vehicle Specific Introduction" on the Instrument Cluster display. Total duration of the "Vehicle Specific Introduction" must be ≤ 3 seconds. Once "Vehicle Specific Introduction" is complete transition display to normal operation.[9,12]
H. Coincident with Step G, instantly turn on pointer lighting to current dimming step[2] and move all gauge pointers to their commanded position.
I. If lighting is OFF exiting Stage 2, then coincident with Step G, ramp up Gauge Halo Rings or Decorative Rings (including raised acrylic chaplets), ePRNDL graphics, ePRNDL gear indicator and backlighting to current dimming step within 2 seconds[2,3]. All SST/grade assist displays or indicators are OFF.
J. If lighting is ON exiting Stage 2, then coincident with Step G, ramp up backlighting to current dimming step within 2 seconds[2,3]. Set Gauge Halo Rings or Decorative Rings (including raised acrylic chaplets), ePRNDL graphics and ePRNDL gear indicator to current dimming step[2]. All SST/grade assist displays or indicators are OFF.
K. Once Warning Light Prove Out is complete, Instrument cluster is in normal operating mode.

STAGE 4 – DRIVER REMAINS IN VEHICLE[1]
Signal States: Ignition_Status = ACC (Stage 4a) or OFF (Stage 4b); Key_In_Ignition_Status = IN;

Cluster Illumination Strategy:

L. If Instrument cluster is equipped with Gauge Halo Rings or Decorative Rings (including raised acrylic chaplets), turn cluster backlighting OFF. All SST/grade assist displays or indicators are OFF.
M. Set Gauge Halo Rings or Decorative Rings (including raised acrylic chaplets), ePRNDL graphics, ePRNDL gear indicator and pointer lighting to intensity_1[5,13].
N. Coincident with Step M, transition Instrument Cluster Display to Farewell Scene[4,8].
O. All lighting should extinguish 25 seconds after Ignition transitions to OFF or ACC. If Ignition transitions to Run, skip to Step G in Stage 3.

STAGE 4D – EXITING VEHICLE [1,10]

Signal States: Dimming_Lvl ≠ OFF; Ignition_Status = OFF; Key_In_Ignition_Status = Out

Cluster Illumination Strategy:

P. Maintain Cluster Illumination Strategy from Stage 4 except turn pointer lighting OFF.

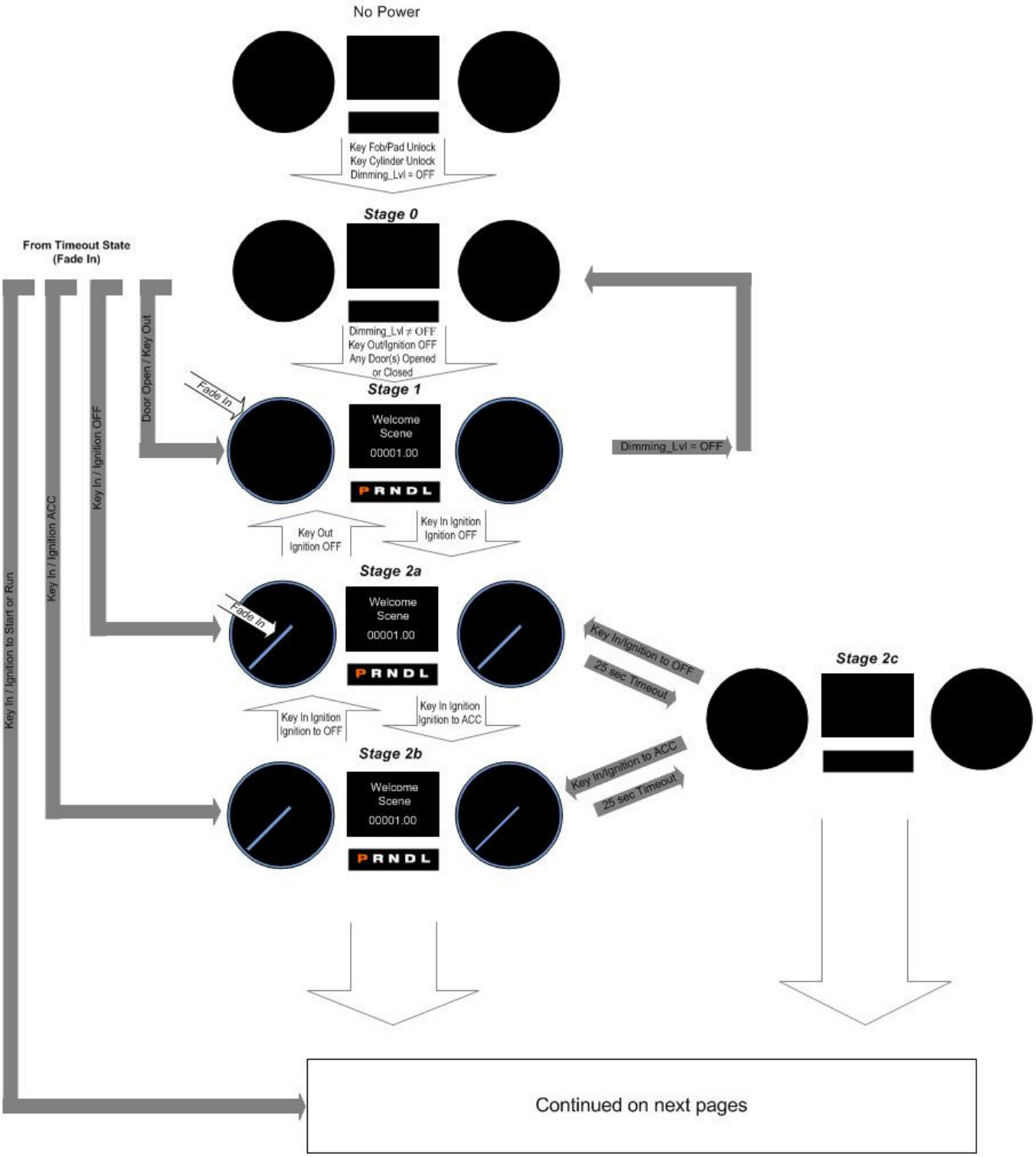
Q. If lighting is OFF, then ramp Gauge Halo Rings or Decorative Rings (including raised acrylic chaplets), ePRNDL graphics and ePRNDL gear indicator to intensity_1[5] within 2 seconds[3,13]. Turn on Instrument Cluster Display to Farewell Scene[4,8]. All SST/grade assist displays or indicators are OFF.

R. All lighting should extinguish when Dimming_Lvl transitions to OFF. If Ignition transitions to Run, skip to Step G in Stage 3.

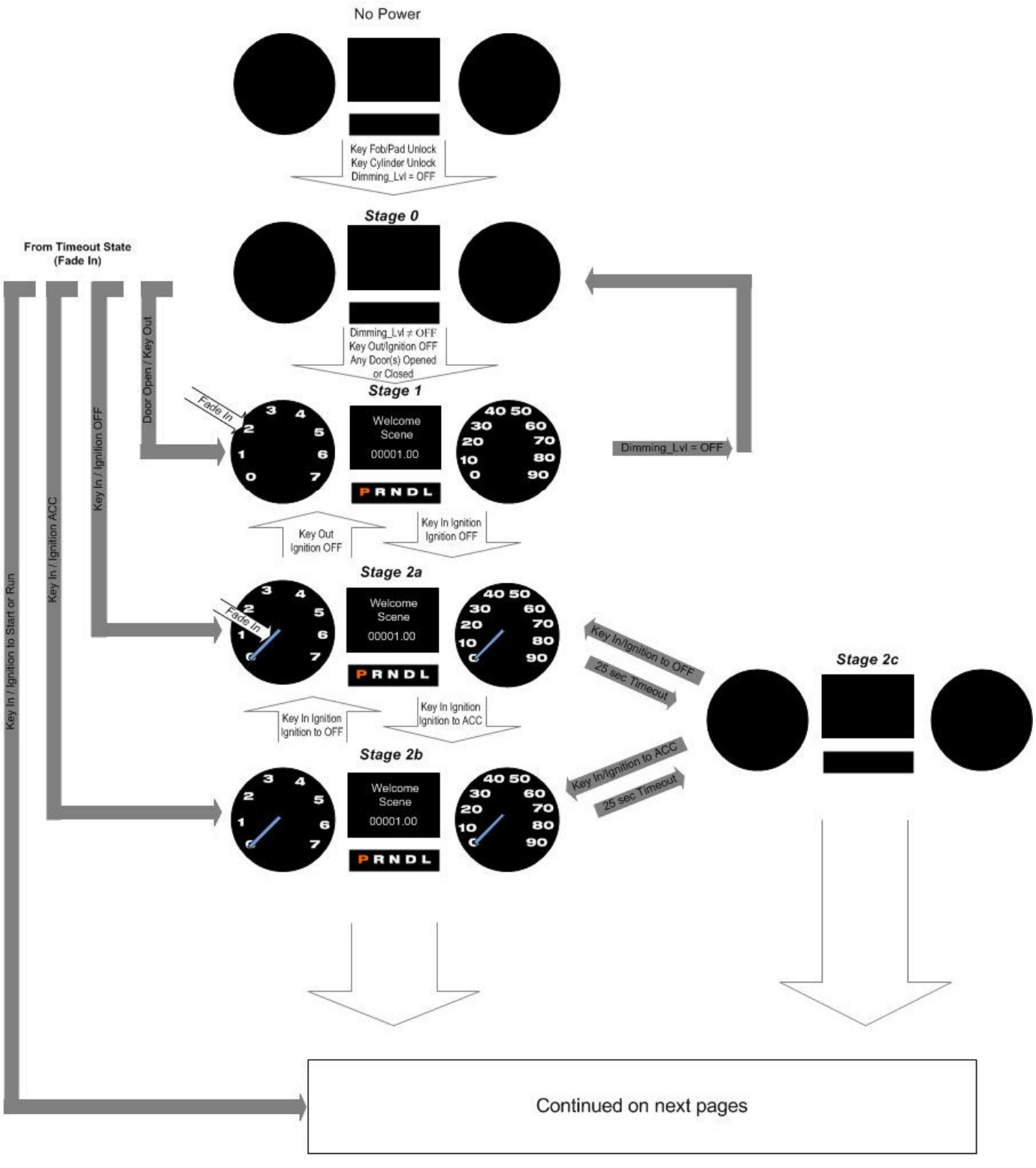
Notes:

1. The Welcome Strategy must be configurable On or Off by the Vehicle Assembly Plant *and/or dealer.*
2. If Message 0x3B3 or Dimming_Lvl is Missing, Invalid or Unknown, use last known, valid dimming step. If last known valid = 0, use Night_12.
3. The ramp times and durations for all backlighting features must be cluster configurable *including the ability to completely disable the feature/step*.
4. Because this is an aesthetic feature only, all normal cluster features (e.g. Engineering Test mode, PEPS warnings, mileage indication via MC button press) shall supersede control of the display.
5. Intensity_1 = Day_3 (must be easily configurable).
6. During Start (or Engine Crank), all Instrument Cluster Welcome/Farewell features will either be identical to Stage 2a or 2b (Stage 3a) or be similar to Stage 2a or 2b with exception that the display will be OFF (Stage 3b). Stage 3a is for Instrument Clusters with a TFT Display(s) and Stage 3b is for Instrument clusters with a VF Display. Stage 3a or 3b could be cluster configurable.
7. For Stages 1, 2 and 4, if the Instrument Cluster is not equipped with Gauge Halo Rings or Decorative Rings (including raised acrylic chaplets) then substitute with cluster backlighting.
8. For Instrument Clusters with a VF Display, the Welcome and Farewell Scenes will be the total odometer display. For Instrument Clusters with a TFT Display(s), the Welcome and Farewell Scenes must include total odometer display; all other aspects of the Welcome and Farewell scenes are left to the discretion of the SigHMI team.
9. For Instrument Clusters with a VF display, the "Vehicle Specific Introduction" is the total odometer display for 3 seconds.
10. Treat Key_In_Ignition_Status = Unknown the same as Key_In_Ignition_Status = OUT. Treat Ignition_Status = Unkown or Invalid the same as Ignition_Status = OFF.
11. To prevent restarting Stage 3 when Ignition transitions from OFF or ACC to RUN then START then back to RUN, the Instrument Cluster should wait 800 milliseconds before initiating Stage 3 to allow the Ignition_Status to stabilize.
12. Vehicle Specific Introduction must only be executed the first time the ignition transitions to RUN or START during an ignition cycle. For any further transitions from RUN to START or START to RUN, the Instrument Cluster Display should remain in its "normal operation" state. An ignition cycle is when the Ignition_Status transitions from OFF or ACC to RUN or START then back to ACC or OFF.
13. For Stages 4 and 4D, if Instrument Cluster is not equipped with Gauge Halo Rings or Decorative Rings (including raised acrylic chaplets) then do NOT substitute cluster backlighting, in other words, for Stages 4 and 4D cluster backlighting is always OFF.

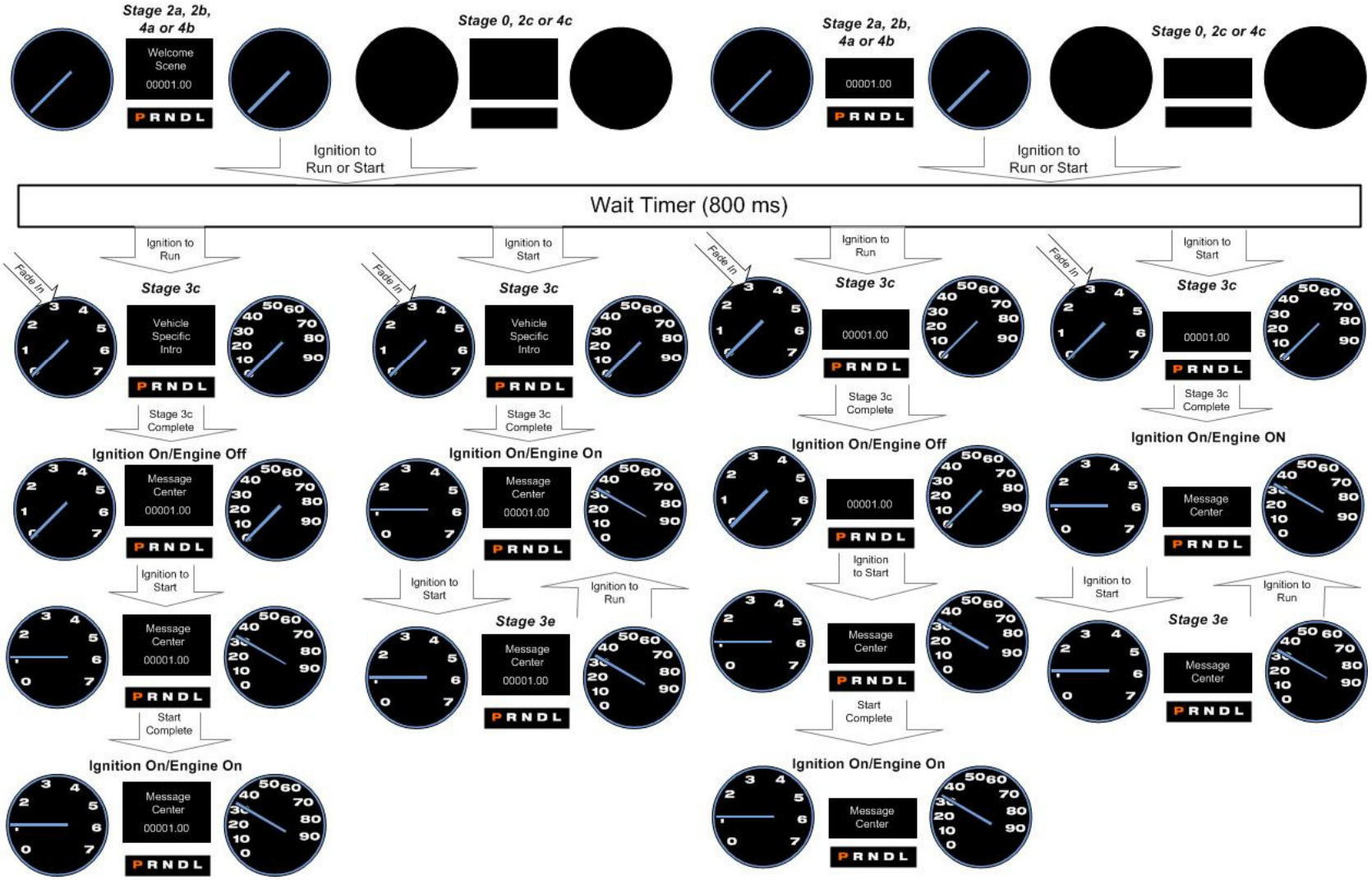
Ford CGEA Instrument Cluster *(with acrylic rings or chaplets)*
Global Welcome Strategy State Diagram



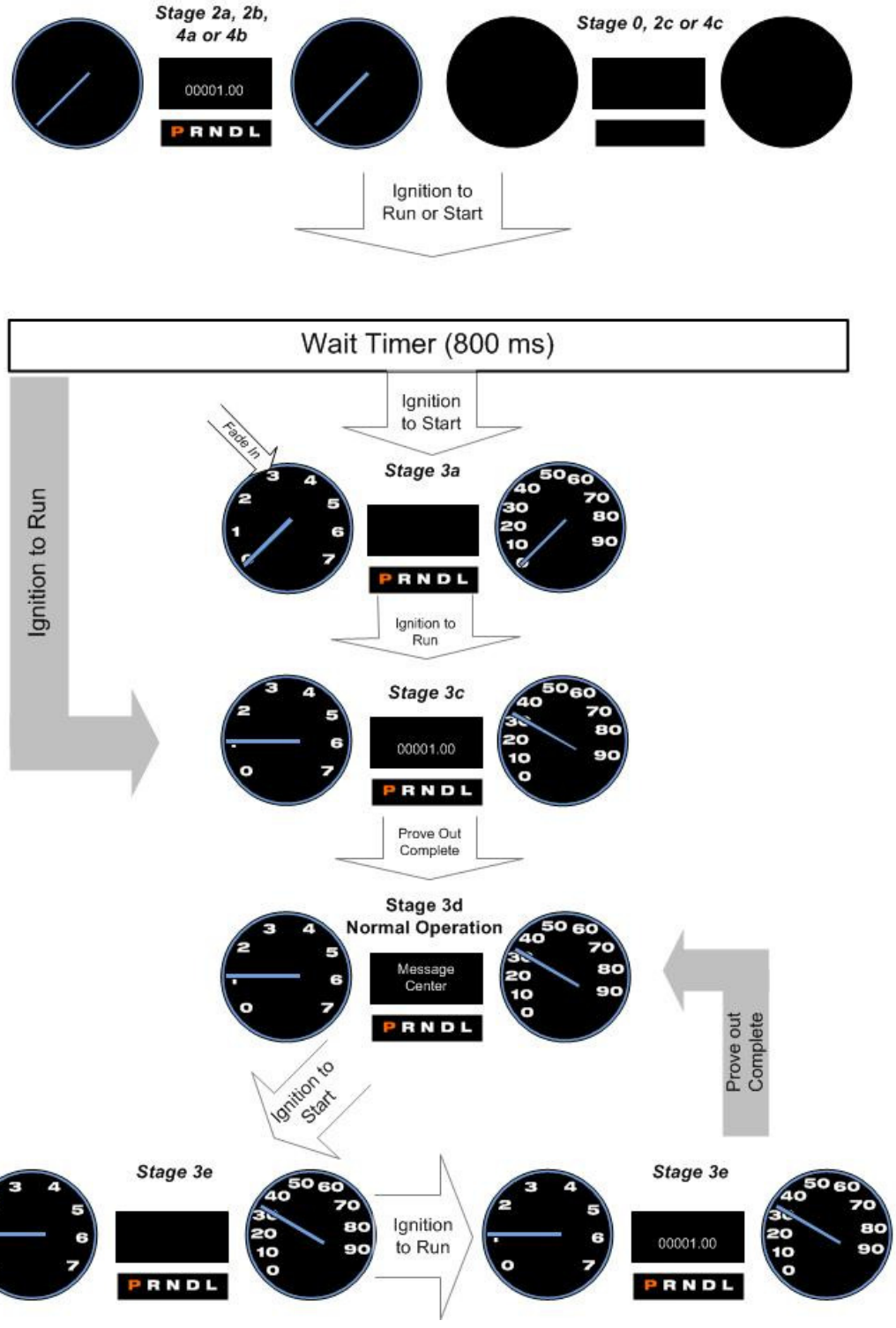
Ford CGEA Instrument Cluster *(without acrylic rings or chaplets)*
Global Welcome Strategy State Diagram



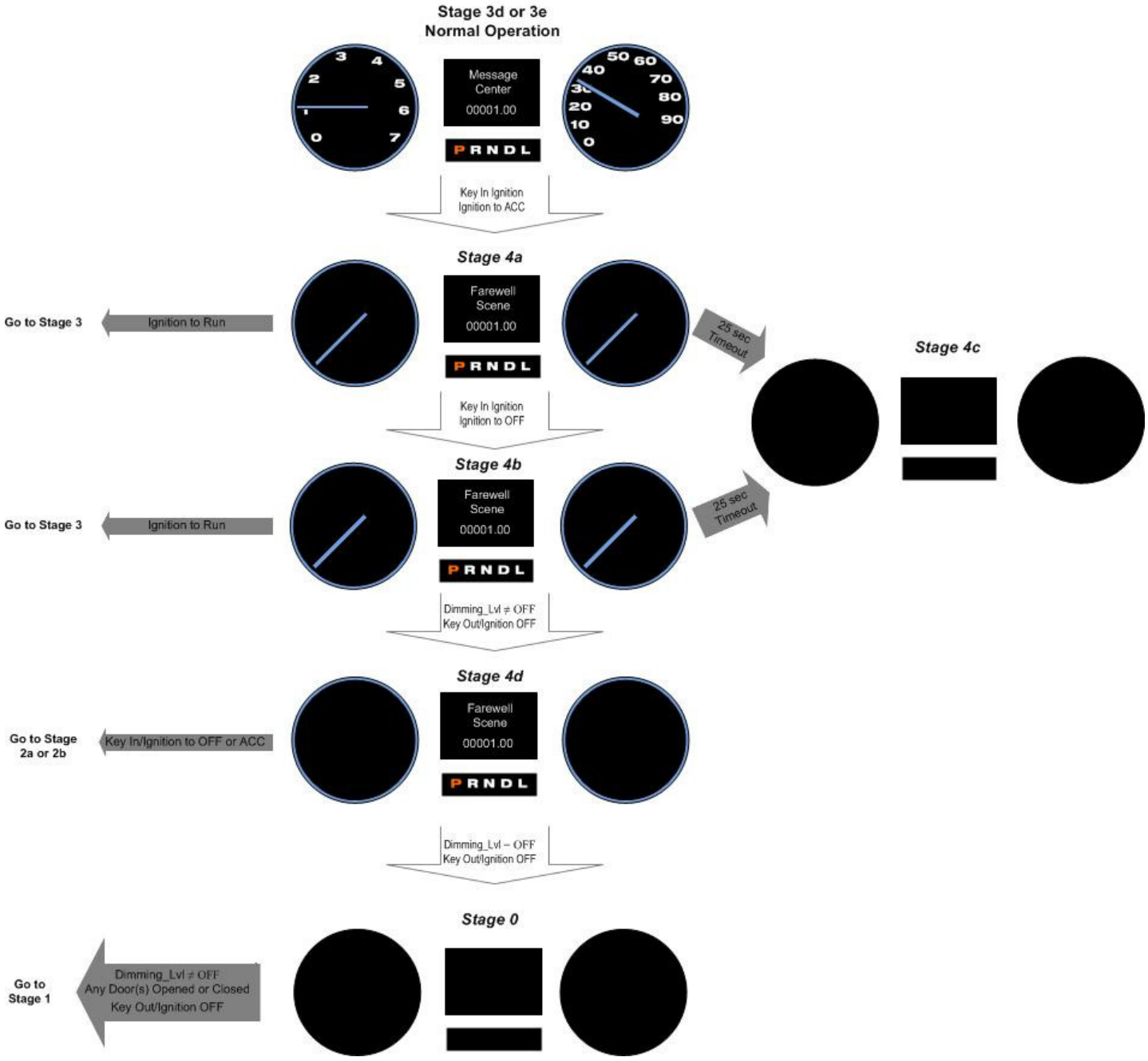
Ford CGEA Instrument Cluster *(w/ TFT or LCD display)*
Global Welcome Strategy State Diagram *(con't)*



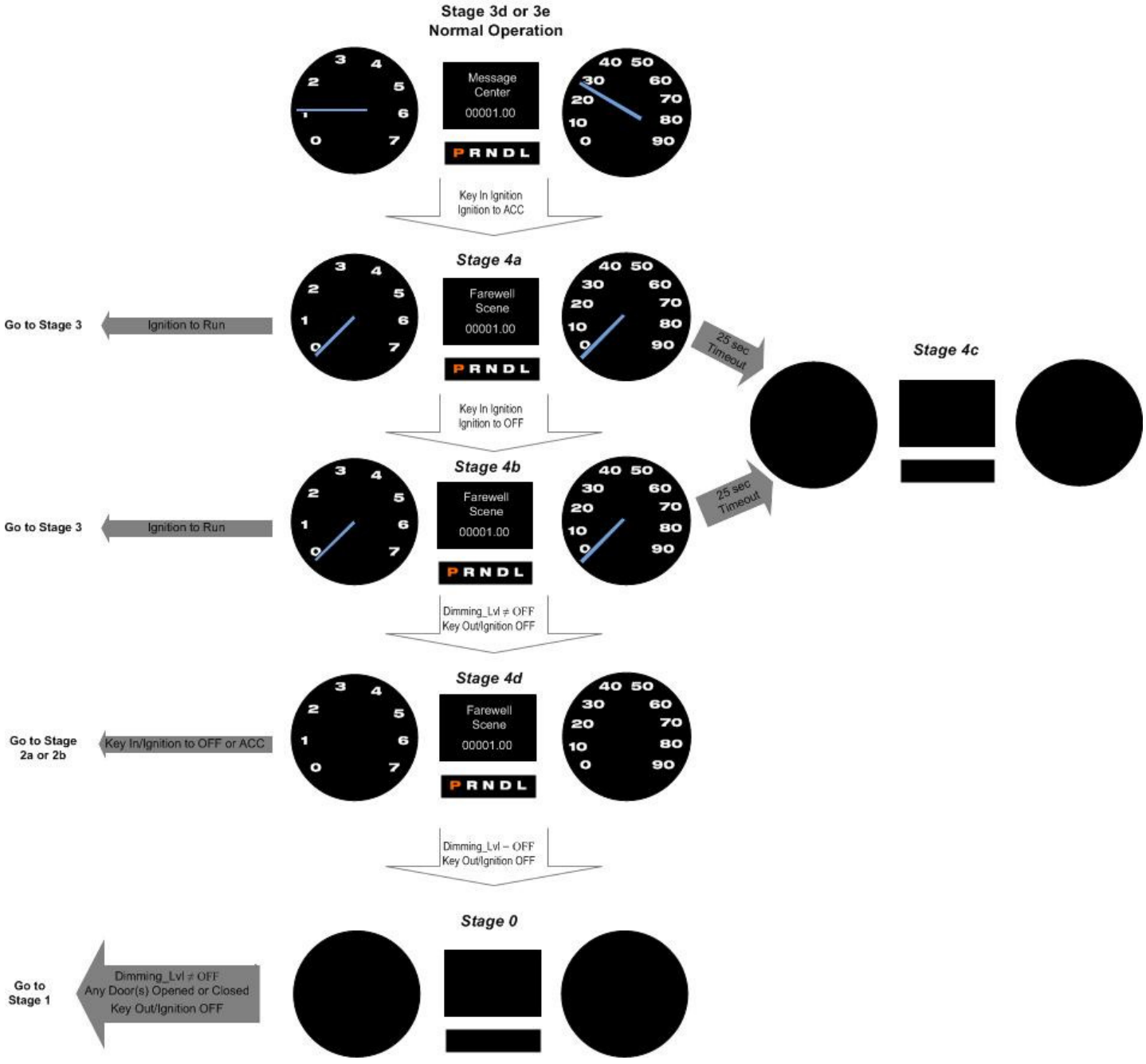
Ford CGEA Instrument Cluster *(w/ VF Display)*
Global Welcome Strategy State Diagram *(con't)*



Ford CGEA Instrument Cluster *(with acrylic rings or chaplets)* Global Farewell Strategy State Diagram



Ford CGEA Instrument Cluster *(without acrylic rings or chaplets)*
Global Farewell Strategy State Diagram



APPENDIX III - CENTERSTACK CONTROLS WELCOME FAREWELL STRATEGY

CGEA Centerstack Controls[1] Welcome Farewell Strategy

STAGE 0 – APPROACHING VEHICLE
Signal States: Dimming_Lvl = OFF; Ignition_Status = OFF[2]; HMI_HMIMode_St or Multimedia_System = OFF

Centerstack Control Illumination must be OFF.

STAGE 1 – ENTERING/EXITING VEHICLE
Signal States: Dimming_Lvl ≠ OFF; Ignition_Status = OFF or ACC[2], HMI_HMIMode_St or Multimedia_System = OFF

Centerstack Control Illumination Strategy:
A. Illuminate Centerstack Controls to Intensity_1[3].
B. If HMI_HMIMode_St or Multimedia_System transitions to ON, maintain illumination of Centerstack Controls at Intensity_1[3].
C. If Dimming_Lvl transitions to OFF AND HMI_HMIMode_St or Multimedia_System = OFF, Centerstack Control illumination should extinguish.
D. If Dimming_Lvl transitions to OFF AND HMI_HMIMode_St or Multimedia_System = ON, maintain illumination at Intensity_1[3].
E. If Ignition transitions to RUN or START, skip to Step H in Stage 3.

STAGE 2 – DRIVER SETTLED IN SEAT
Signal States: Dimming_Lvl ≠ OFF; Ignition_Status = OFF or ACC[2]; HMI_HMIMode_St or Multimedia_System = OFF

Centerstack Control Illumination Strategy:
F. Maintain Illumination Strategy from Stage 1. If Centerstack Control illumination is OFF, then reexecute Stage 1.
G. If Ignition transitions to RUN or START, skip to Step H in Stage 3.

STAGE 3 – ENGINE TO RUN or START
Signal States: Ignition_Status = RUN or START[2]

Centerstack Control Illumination Strategy:
H. Whenever Ignition_Status transitions from OFF or ACC to RUN OR from OFF or ACC to START, the Centerstack Controls should maintain Intensity_1[3] for 800 ms then transition to current dimming step.[4]
I. If Ignition_Status transitions from RUN to START, the Centerstack Controls should maintain last known valid dimming step until Ignition_Status transitions back to RUN, then return to normal operation at current dimming step.[4]

STAGE 4 – DRIVER REMAINS IN VEHICLE
Signal States: Ignition_Status transitions from RUN or START to OFF or ACC[2]; Dimming_Lvl ≠ OFF; HMI_HMIMode_St or Multimedia_System = ON

Centerstack Control Illumination Strategy:
J. Transition Centerstack Controls to Intensity_1[3].
K. If HMI_HMIMode_St or Multimedia_System transitions to OFF AND Dimming_Lvl ≠ OFF, maintain illumination at Intensity_1[3].
L. If Dimming_Lvl transitions to OFF AND HMI_HMIMode_St or Multimedia_System = OFF, Centerstack Control illumination should extinguish.
M. If Dimimng_Lvl transitions to OFF AND HMI_HMIMode_St or Multimedia_System = ON, maintain illumination at Intensity_1[3].
N. If Ignition transitions to RUN or START, skip to Step H in Stage 3

Notes:
1. Centerstack Controls can include Centerstack Control, EFP, Climate Controls and Audio controls that are on CAN
2. Treat Ignition_Status = Unknown or Invalid the same as Ignition_Status = OFF.
3. Intensity_1 = Night_12 (must be easily configurable).
4. If Dimming_Lvl is Missing, Invalid or Unknown, use last known, valid dimming step. If last known valid = 0, use Night_12.

APPENDIX IV - CENTERSTACK DISPLAY WELCOME FAREWELL STRATEGY

CGEA Centerstack Display[1] Welcome Farewell Strategy

STAGE 0 – APPROACHING VEHICLE [5]
Signal States: Dimming_Lvl = OFF; HMI_HMIMode_St or Multimedia_System = OFF

Centerstack Display Illumination must be OFF.

STAGE 1 – ENTERING VEHICLE
Signal States: Dimming_Lvl ≠ OFF; DrStatDrv_B_Actl or DrStatPsngr_B_Actl transitions from Closed to Ajar; HMI_HMIMode_St or Multimedia_System = OFF

Centerstack Display Illumination Strategy:

D. Turn on Centerstack Display to Welcome Scene[1] at Intensity_1[2].
E. If Driver or Passenger door remains ajar then Centerstack Display should extinguish when Dimming_Lvl transitions to OFF or 25 seconds after last front door went ajar. If HMI_HMIMode_St or Multimedia_System transitions from OFF to ON, go to Step E in Stage 3 or skip to Step G in Stage 4. [5]

STAGE 2 – DRIVER SETTLED IN SEAT
Signal States: Dimming_Lvl ≠ OFF; DrStatDrv_B_Actl **and** DrStatPsngr_B_Actl transitions from Ajar to Closed; HMI_HMIMode_St or Multimedia_System = OFF

Centerstack Display Illumination Strategy:

F. Maintain Illumination Strategy from Stage 1. If Centerstack Display is OFF, then reexecute Stage 1.
G. Centerstack Display should extinguish when Dimming_Lvl transitions to OFF or 25 seconds after last front door transitions to Closed. If HMI_HMIMode_St or Multimedia_System transitions from OFF to ON, go to Step E in Stage 3 or to Step G in Stage 4. [5]

STAGE 3 – MULTIMEDIA SYSTEM TRANSITIONS FROM OFF TO ON [5]
Signal States: HMI_HMIMode_St or Multimedia_System transitions from OFF to ON

Centerstack Display Illumination Strategy:

H. Centerstack Display should transition to "Vehicle Specific Animation". Total duration of the "Vehicle Specific Animation" must be ≤ 3 seconds.
I. If Dimming_Lvl = OFF, once "Vehicle Specific Animation" is complete transition display to normal operation at Intensity_1[2]. If Dimming_Lvl ≠ OFF, once "Vehicle Specific Animation" is complete transition display to normal operation at current dimming step.

STAGE 4 – MULTIMEDIA SYSTEM REMAINS ON [5]
Signal States: HMI_HMIMode_St or Multimedia_System transitions = ON

Centerstack Display Illumination Strategy:

J. If Dimming_Lvl = OFF, transition display to normal operation at Intensity_1[2]. If Dimming_Lvl ≠ OFF, transition display to normal operation at current dimming step.

STAGE 5 – ENGINE TO START [5]
Signal States: Ignition_Status transitions to START

Centerstack Display Illumination Strategy:

K. Once Ignition_Status transitions to START, the Centerstack Display should maintain last used dimming step for 800 ms, independent of any Ignition_Status state changes, then transition to current dimming step [4,5].

STAGE 6 – DRIVER REMAINS IN VEHICLE OR EXITS VEHICLE
Signal States: Dimming_Lvl ≠ OFF; HMI_HMIMode_St or Multimedia_System transitions from ON to OFF

Centerstack Display Illumination Strategy:

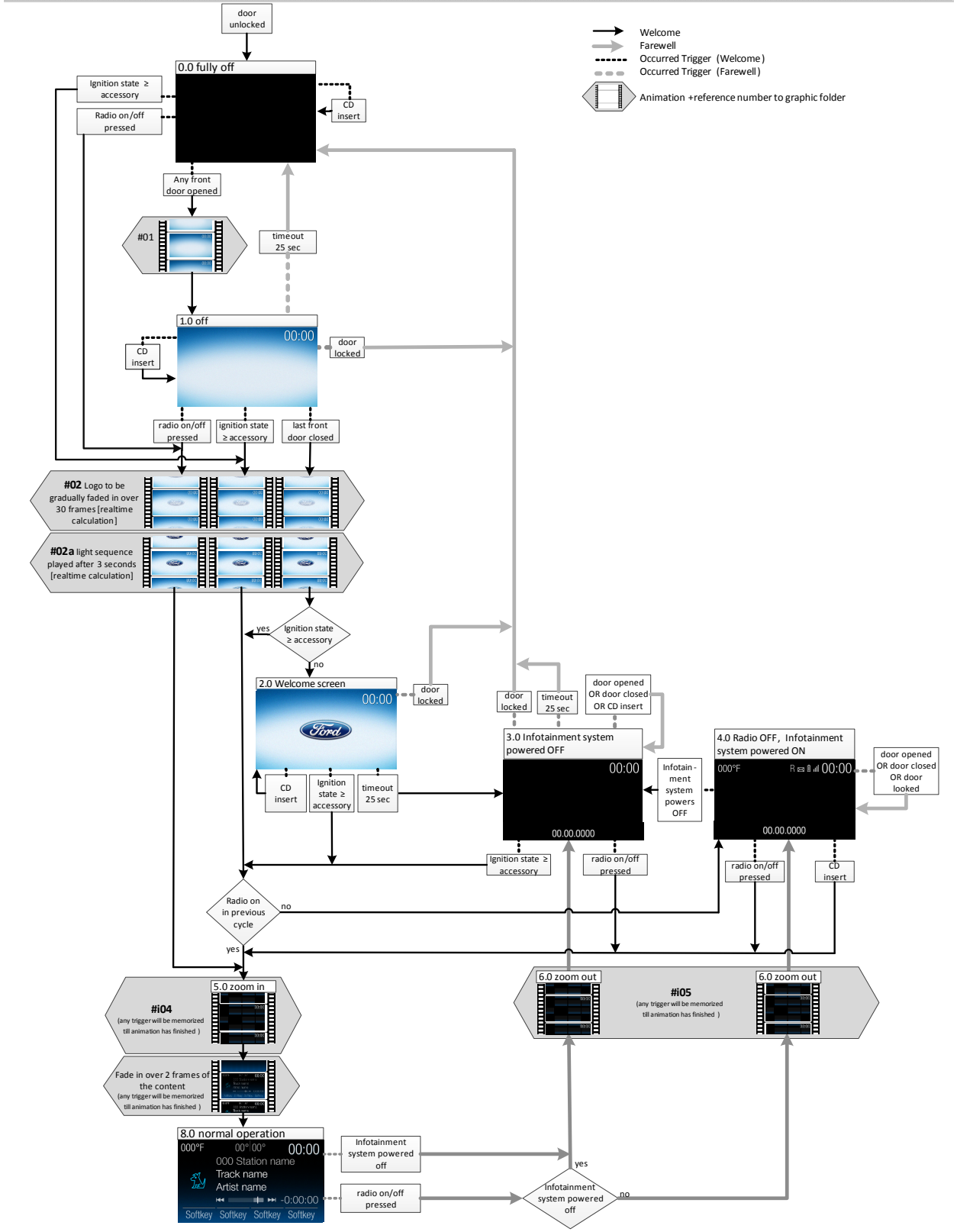
L. Transition Centerstack Display to Farewell Scene[1] at Intensity_1[2].
M. Centerstack Display should extinguish when Dimming_Lvl transitions to OFF or Veh_Lock_Status transitions to Lock. If HMI_HMIMode_St or Multimedia_System transitions from OFF to ON, go to Step E in Stage 3 or to Step G in Stage 4. [5]

Notes:

1. The Welcome and Farewell Scenes are left to the discretion of the SigHMI team. The "Vehicle Specific Animation" is also left to the discretion of the SigHMI team. For low level displays, the Welcome and Farewell Scenes are generally the clock screen.
2. Intensity_1 = Night_12
3. The "Vehicle Specific Animation" must only be executed the first time the Multimedia_System OR HMI_HMIMode_St transitions to ON. For any further transitions from ON to OFF or OFF to ON, the Centerstack Display should remain in its "normal operation" state.
4. If Dimming_Lvl is Missing, Invalid or Unknown, use last known, valid dimming step. If last known valid = 0, use Night_12.
5. For CGEA 1.3; when Multimedia_System OR HMI_HMIMode_St = ON AND last state of Dimming_Lvl = OFF, the Centerstack Display should transition to Night_12 intensity.

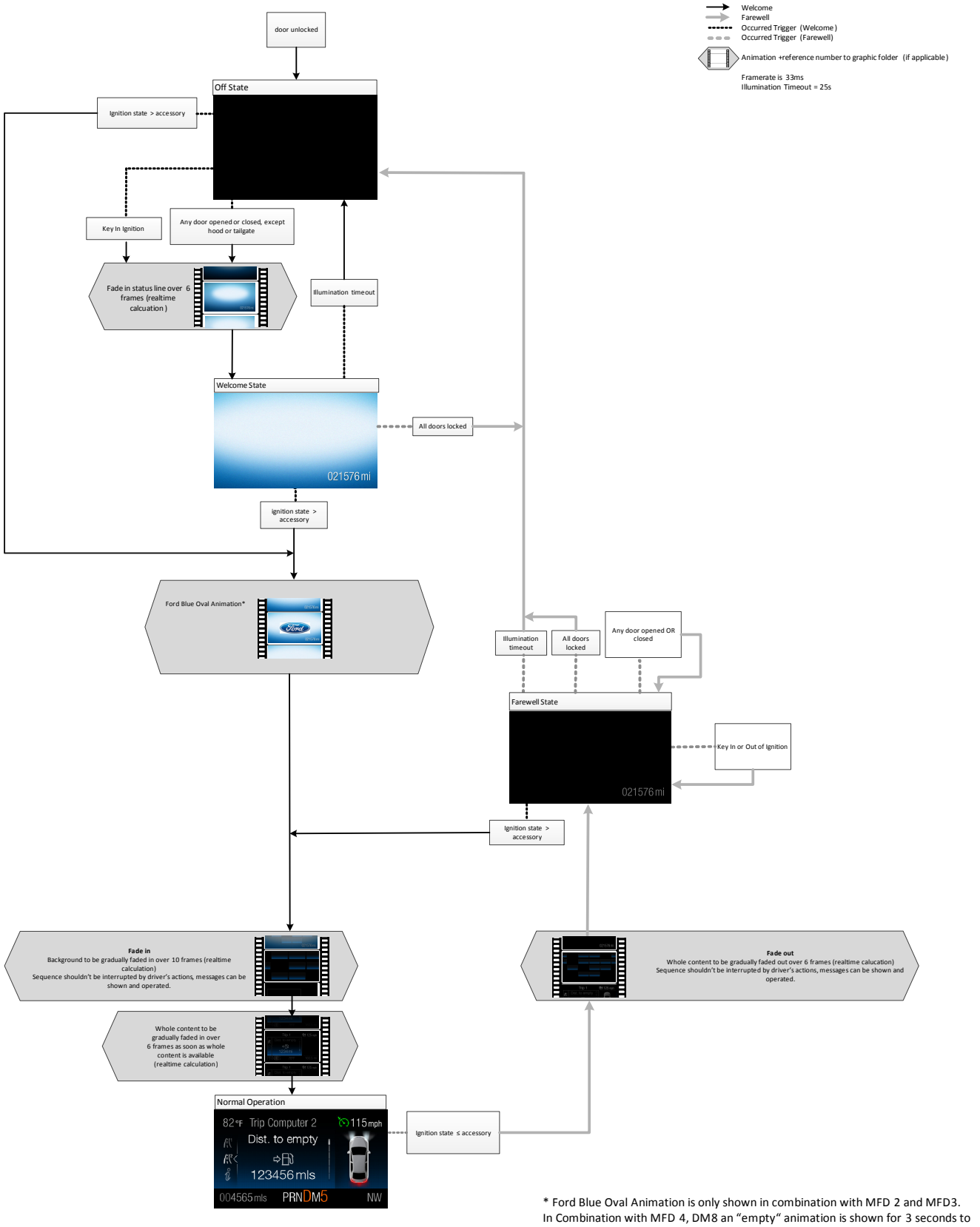
Welcome/Farewell Strategy
MFD4 CD4.2
Black color scheme

Ford confidential
v2.1
19.12.2013



Welcome Strategy For CD 4.2 IPC with 4.2" Display
Ford Blue Oval will NOT be shown in combination with MFD4 and DM8

Ford Confidential v1.3 09.01.2014



* Ford Blue Oval Animation is only shown in combination with MFD 2 and MFD3.
In Combination with MFD 4, DM8 an "empty" animation is shown for 3 seconds to make sure that "Fade In" sequences of Cluster and MFD start at the same time .

APPENDIX V - BLUE OVAL DNA WELCOME FAREWELL ASSESSMENT CRITERIA

Interior Harmony DNA Assessment Criteria

Welcome/Farewell

Green – Fully Meets DNA
Vehicle Exterior, Interior Courtesy, and Backlighting illumination modes are fully aligned with Welcome Farewell state matrix. Utilizes approved Welcome/Farewell display screens.

Green – Meets DNA Character for all of above except for display screens - < 3 minor discrepancies

Red – Does not meet DNA Character – > 4 minor or >1 major discrepancies

Methods to Assess and Data Needed

Objective data – Verify lighting on/off sequences are compliant to Welcome/Farewell state matrix.

Subjective data – Does the vehicle properly anticipate the customer's ingress and egress lighting needs?