Research & Vehicle Technology
"Infotainment Systems Product Development"

Feature – Automatic Engine Shutdown

Infotainment Subsystem Part Specific Specification (SPSS)

Version 1.2

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Version Date: Feb 16, 2023

FORD CONFIDENTIAL

Revision History

Date	Version	Notes	
Jun 26, 2020	**1.0**	**Initial Release**	
Jan 9, 2023	**1.1**	Update SPSS structure Add LidleRq_Cfg Add Received LidleRq_Cfg value from Client 2 Add Feature Configuration Update Feature State Logic Update Default State	**Yzhan482**
Feb 16, 2023	**1.2**	LidleRq CAN signal name update	**Yzhan482**

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1 Overview

Some vehicles have a feature that shuts off the engine if the vehicle sits idle with no inputs from the driver for a certain period of time in order to improve fuel economy.

This feature documented in this SPSS gives the user the ability to override the automatic engine shut down, thus preventing the engine from turning off.

2 Architectural Design

2.1 REQ-391577/A-Client 1

Automatic Engine Shutdown Client 1 is the client interface to the user located in centerstack. This documentation provides requirements for this module. Interface method descriptions could be provided for Client 2 if it interfaces directly with Client 1.

2.2 REQ-391578/A-Client 2

Automatic Engine Shutdown Client 2 is the client interface to the user located in front of the driver.

2.3 REQ-391579/A-Server

Automatic Engine Shutdown Server is the module or modules that provide additional feature operation, such as various can signals or data that is used by the feature.

2.4 Logical Signal Mapping

The logical methods mentioned below shall refer to Can signal names. The logical names shall be mapped to their actual CAN signal names. Please use the table below to perform the mapping. The InfoCAN database file is the master file for the actual CAN signal names.

Logical Name	CAN Signal Name
LidleRq	EngIdlShutDown_B_RqDrv
LignSt	Ignition_Status
LidleRq_Cfg	

The logical methods mentioned below shall refer to new interface between client 1 and client 2 names(**Non CDC**). The logical names shall be mapped to their actual signal names. Please use the table below to perform the mapping.

Logical Name	New Signal Name
LEngSt(FBMP)	Feature Number: 0xD03

2.5 REQ-391580/A-Client 1 Tx

2.5.1 REQ-391984/A-LidleRq *CDC*

LidleRq: This signal is sent from Client 1 to the server to request feature state change.

Detail	State Encoded
No Inhibit	0 (0x0)
Inhibit	1 (0x1)

2.6 REQ-391581/A-Client 1 Rx

2.6.1 REQ-391583/A-LEngSt *Non CDC*

LengSt: this method is sent from Client 2 to client 1 and describes the state of the feature.

FID:0xD03
Parameters:
No Inhibit: The Engine will shut off.
Inhibit: Engine will Not shut off.

2.6.2 REQ-391588/A-LignSt

LignSt: This signal is received by the client. It provides vehicle power state.

Signal Parameter	Parameter Description
0x0	Unknown
0x1	Off
0x2	Accessory
0x4	Run
0x8	Start
0xF	Invalid

2.7 REQ-391582/A-Client 2 Tx

2.7.1 REQ-391583/A-LEngSt *Non CDC*

LengSt: this method is sent from Client 2 to client 1 and describes the state of the feature.

FID:0xD03
Parameters:
No Inhibit: The Engine will shut off.
Inhibit: Engine will Not shut off.

2.7.2 LidleRq_Cfg

LidleRq_Cfg: This signal is a internal variable sent by Client 2 to tell the Client 1 will change the signal value of LidleRq, when user pressed ‘OK’ hard button in steering wheel after the Client 2 pops up the prompt box "Whether need to extend the engine idle time".

3 Functional Requirements

3.1 Requirements

3.1.1 REQ-391585/A-System Accuracy

Within a 100 msec of receiving data that results in a change of state the client will update the display to the proper status.

3.1.2 REQ-391586/A-Power Mode Operation

The feature should be accessible for interaction to the user while signal IgnSt is 0x4 (Run) or 0x8 (Start).

3.1.3 REQ-391587/A-Send User Requested Option

3.1.3.1 User trigger Automatic Engine Shutdown button

The user should be able to request feature state change.
To disable the engine shutdown, the signal LidleRq, should be sent with parameter 0x1 (Inhibit).
To enable the engine shut down again, the signal LidleRq needs to be sent with parameter 0x0 (No Inhibit).

3.1.3.2 Received LidleRq_Cfg value from Client 2

When received the LidleRq_Cfg=0x0 from Client 2, the signal LidleRq, needs to be sent with parameter 0x0 (No Inhibit).
When received the LidleRq_Cfg=0x1 from Client 2, the signal LidleRq, should be sent with parameter 0x1 (Inhibit).
In Client 2, the LidleRq_Cfg value is set to 0x2 by default.
Client 1 should not care the LidleRq_Cfg=0x2 from Client 2.

Variable Parameter	Parameter Description	LidleRq	Client 1 Button State
0x0	OFF	No Inhibit(0x0)	ON
0x1	ON	Inhibit(0x1)	OFF
0x2	Default		

3.1.4 REQ-391588/A-Feature Configuration

If AEIS Without Override Config Bit = Disabled AND AEIS With Override Config Bit = Enabled, Client 1 will show a Automatic Engine Max 30min Shutdown ON/OFF button.

3.1.5 REQ-392879/A-Update Feature State

3.1.5.1 Non CDC

Feature state is indicated by the parameters of LEngSt.
When LEngSt = No Inhibit, the Engine will shut off.
When LEngSt = Inhibit, the engine will shut off.

Any item indicator in Client 1 HMi should be updated accordingly.

3.1.5.2 CDC

Automatic Engine Shutdown button in Client 1 is indicated by the parameters of LIdleRq.
When LIdleRq = No Inhibit, Automatic Engine Shutdown button will show ON.
When LIdleRq = Inhibit, Automatic Engine Shutdown button will show OFF.

3.1.6 REQ-392880/A-Default State

Default status of LIdleRq EngIdlShutDown_B_RqDrvshould be No Inhibit.
Default state of indicator associated with LEngSt Ignition_Status should be No inhibit.

Parameter Name	Description	Value at Battery Connect	Value at Module Wake-up	Value upon Entering Ignition Run/ Start from Ignition Off
LIdleRq	This signal is sent from Client 1 to the server to request feature state change.	No Inhibit (0x0)	No Inhibit (0x0)	No Inhibit (0x0)

3.2 Use Cases

3.2.1 UC-REQ-391590/A-Time Extension Confirm

Actors	User
Pre-conditions	Auto Engine shutdown feature is in **No Inhibit** state.
Scenario Description	User requests feature Inhibit option to the client.
Post-conditions	Client sends user's request to the server. LidleRq = 0x1
List of Exception Use Cases	
Interfaces	Client 1 HMI

3.2.2 UC-REQ-391591/A-Feature Inhibit State Update

Actors	User
Pre-conditions	Vehicle is on, engine is running.
Scenario Description	Server sends notification to the user through Client 2 that Engine will shut down. User choses in the menu of Client 2 to inhibit the shutdown (thus keeping the engine on). Client 2 sends the users request to client 1.
Post-conditions	Client 1 updates the state of the feature in its HMI screen.
List of Exception Use Cases	
Interfaces	Client 1 HMI, Client 2 HMI

4 Appendix: Reference Documents

1	Automatic Engine Shutdown Control Function Waning Messages - CGEA1.3
	CDC: Center Display Controller

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