



Research & Vehicle Technology
“Infotainment Systems Product Development”

Feature – Grade Assist Control

**Infotainment Subsystem Part Specific
Specification (SPSS)**

Version 1.0

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Version Date: February 4, 2020

FORD CONFIDENTIAL



Revision History

Date	Version	Notes	
February 4, 2020	1.0	Initial Release	



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1 Overview

The Grade Assist feature attempts to maintain the speed of a vehicle on a significant (greater than 3%) downhill grade.



2 Architectural Design

2.1 GAC-CLD-REQ-369620/A-Grade Assist Control Client

Grade Assist Control Client provides the user input to request feature change.

2.2 GAC-CLD-REQ-369621/A-Grade Assist Control Server

Grade Assist Control Server controls the feature state. It receives user's input through Client and decides on enabling/disabling the feature.

2.3 Logical Signal Mapping

The CAN signals mentioned throughout this document shall refer to the CAN signal's logical name. 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. Note: some CAN signals referenced throughout this document may use the logical name while some may use the actual CAN signal name.

Logical Name	CAN Signal Name
LGrdSt	GrdAsstAllw_D_DsplyPt
LGrdRq	GrdAsstAllw_D_RqMnu
IgnSt	Ignition_Status

2.4 GAC-IIR-REQ-369622/A-Grade Assist Control Client Rx

2.4.1 MD-REQ-369629/A-LGrdSt

This signal provides the current status of the grade assist mode.

State Encoded	Description
0x0	No mode selected
0x1	Off
0x2	On
0x3	Not Used

2.4.2 MD-REQ-371290/A-IgnSt

IgnSt: 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



2.5 GAC-IIR-REQ-369623/A-Grade Assist Control Client Tx

2.5.1 MD-REQ-369630/A-LGrdRq

This signal communicates the status of the Grade Assist menu pick.

State Encoded	Description
0x0	No mode selected
0x1	Off
0x2	On
0x3	Not Used



3 Functional Requirements

3.1 GAC-FUN-REQ-369624/A-Grade Assist Control

3.1.1 GAC-REQ-369625/A-Value Queries

Due to Client booting time and the signal transit time and type (only on data change), there could be cases where the received values could be missed. The client should request data from the transmitting server whenever the client wakes up due to ignition cycle.

3.1.2 GAC-REQ-369626/A-System Accuracy

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

3.1.3 GAC-REQ-369627/A-Power Mode Operation

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

3.1.4 GAC-REQ-371293/A-Feature Rq Upon Client Restart

Upon client restart due to ignition cycle or other reason, it should transmit the signal LGrdRq with a value of 0 .

3.1.5 GAC-REQ-371294/A-Feature Unselectable

If the client receives the signal LGrdSt with value 0x0, the client should display the feature as inactive.

3.1.6 GAC-REQ-372719/A-Status Update

The client shall update the status of the data displayed to the user provided from LGrdSt at any time new signal parameter is delivered. (The signal LGrdSt is periodic, hence client shall reflect any changes that happen to the data provided through that signal.)

3.2 Use Cases

3.2.1 GAC-UC-REQ-369631/A-Grade Assist Control Enable

Actors	Vehicle User
Pre-conditions	Grade Assist is disabled.
Scenario Description	User enabled Grade Assist through client interface.
Post-conditions	Grade Assist feature gets enabled.
List of Exception Use Cases	
Interfaces	Vehicle HMI Interface.

3.2.2 GAC-UC-REQ-369632/A-Grade Assist Control Disable

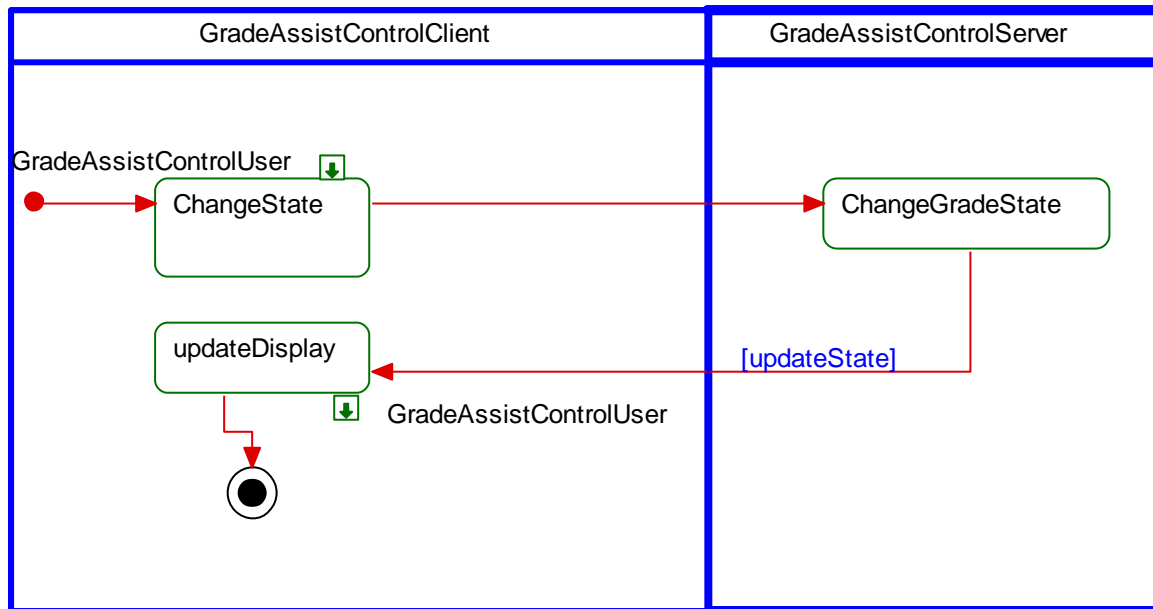
Actors	Vehicle User
Pre-conditions	Grade Assist feature is enabled.
Scenario Description	User disabled Grade Assist feature through client interface.
Post-conditions	Grade Assist feature gets disabled.
List of Exception Use Cases	
Interfaces	Vehicle HMI interface.



3.3 Activity Views

3.3.1 Activity Diagram

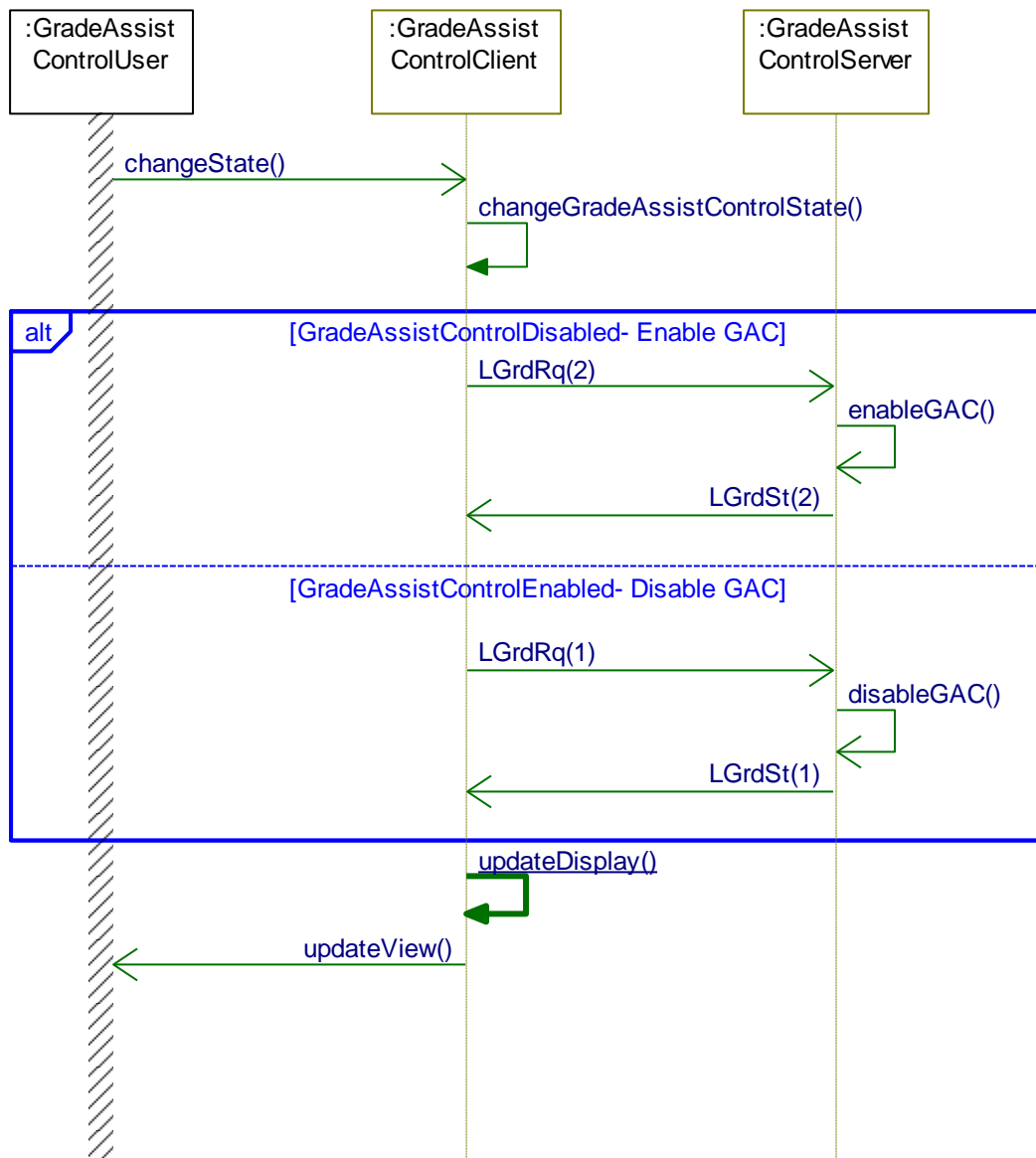
3.3.1.1 GAC-ACT-REQ-371291/A-Grade Assist Control





3.3.2 Sequence Diagram

3.3.2.1 GAC-SD-REQ-371292/A-Grade Assist Control





4 Appendix: Reference Documents

1	543240_A_001_Grade Assist Control Function - PHEV_FHEV - CGEA1.3_v1.1 (STSS)