APTIV Vehicle Drive Report

Vehicle Integration and Controls Team Testing

Vehicle: BMW-17

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Chapter 1. Adaptive Cruise Control(ACC) Feature

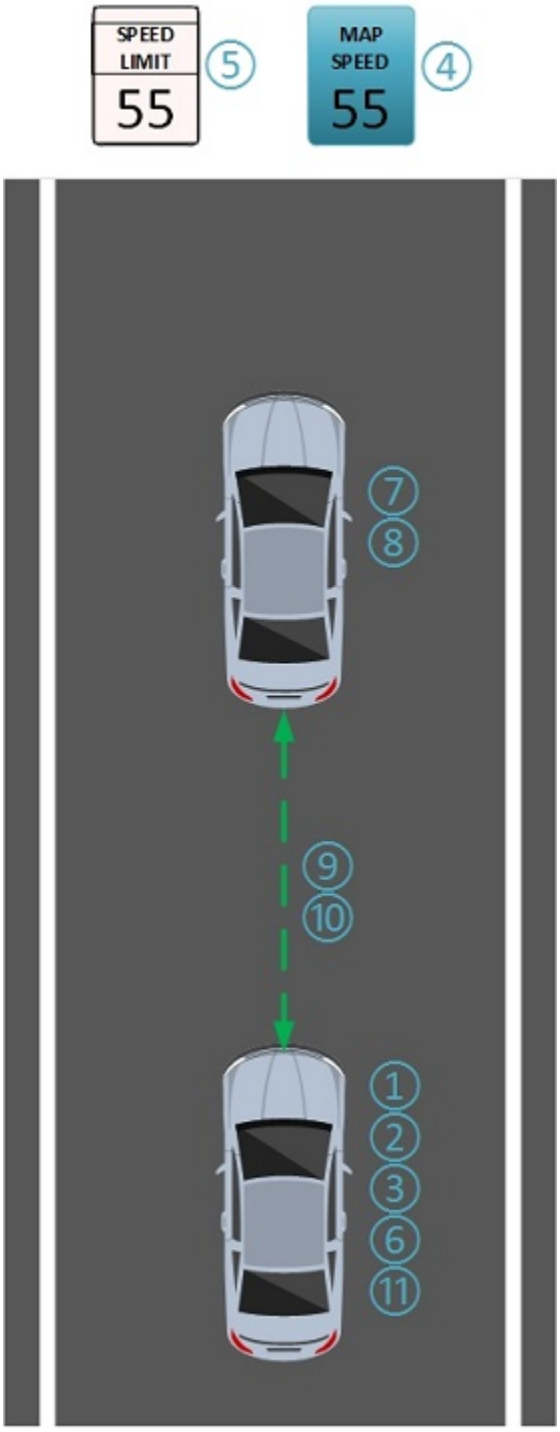
1.1. ACC Related Algorithm Variables

The following are variables that can be used to indicate ACC performance.

1. ACC_VarHost_Long_Accel_mpss
2. Host_Speed_mps
3. ACCDrvrSeltedSpd_mps
4. Map_Speed
5. TSR_Speed
6. Allowed_Speed
7. ACC_Target_Present
8. ACC_Target_Speed_mps
9. ACCRange
10. ACCRangeRate
11. ACCA_State

1.2. ACC Scenario

The meanings of the above variables are shown in the schematic below.



1.3. ACC Related plots

All of these ACC related variables are from Simulink model. We can envaluate the ACC feature‘s performance based on variables logging.I will display the list of variables and show the plots as below. Sheets and Tables also can be shown here if necessary.

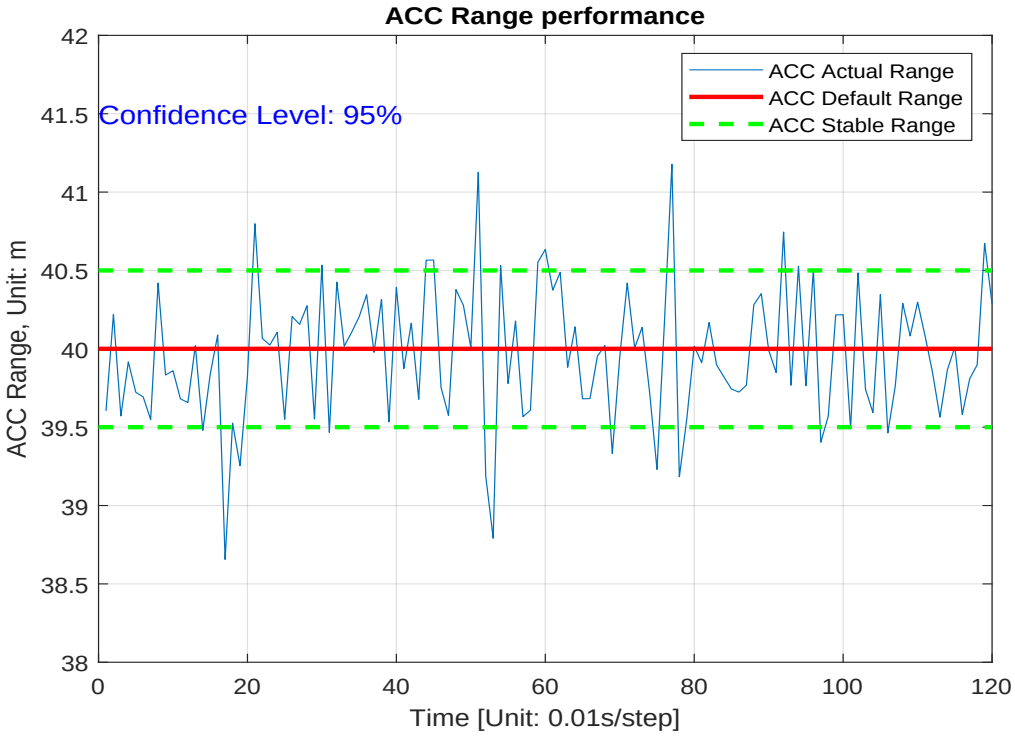


Figure 1.1. ACC Range Performance

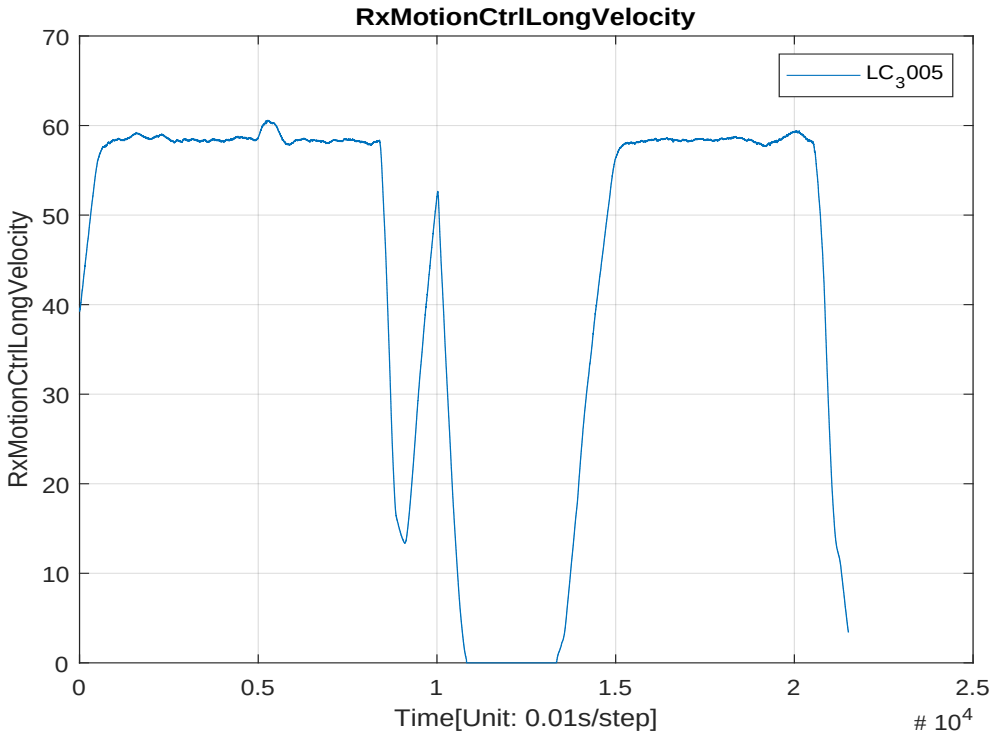


Figure 1.2. Vehicle Longtinual Speed

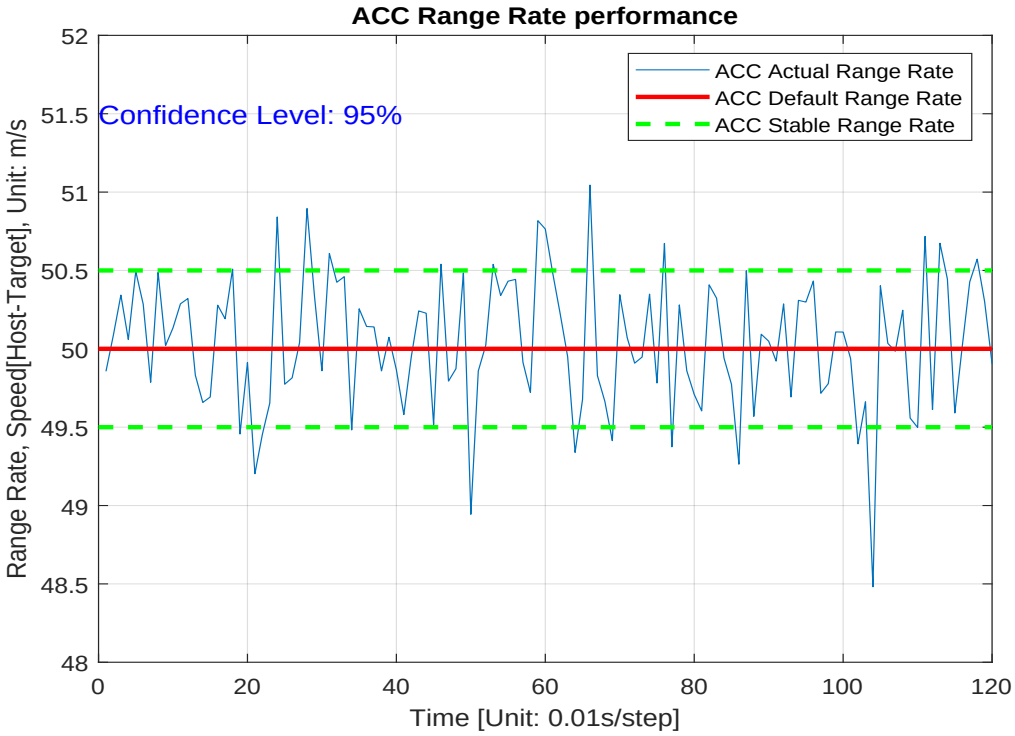


Figure 1.3. ACC Range Rate Performance

1.4. ACC Related Table

Vehicle Longtinual Speed table [m/s]

MIN	MAX	MEAN	STD
0	60.579500000000003	44.225499999999997	21.988499999999998

ACC Range Rate Table [m/s]

MIN	MAX	MEAN	STD
0	121.15900000000001	88.450999999999993	43.976999999999997

Chapter 2. Lane Centering(LC) Feature

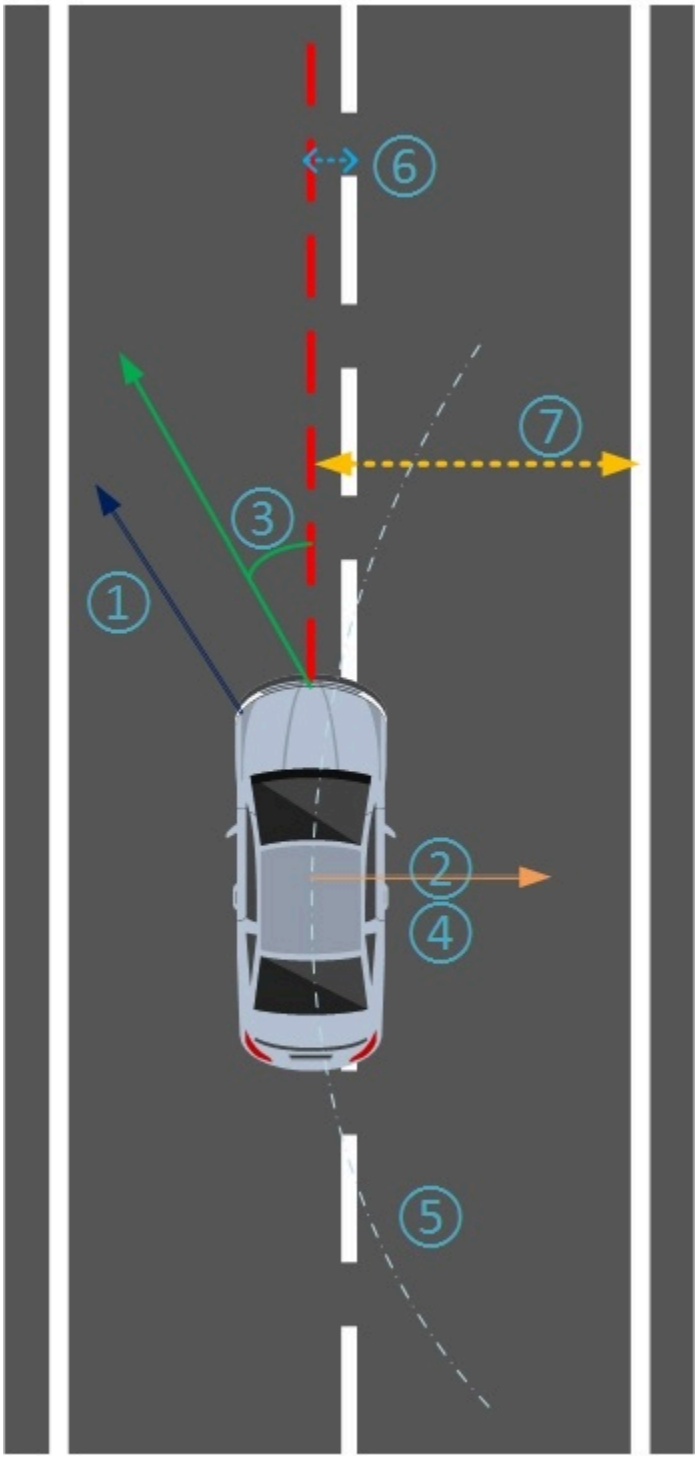
2.1. LC Related Algorithm Variables

All of these LC related variables are from Simulink model. We can envaluate the LC feature's performance based on variables logging.I will display the list of variables and show the plots as below. Sheets and Tables also can be shown here if necessary.

1. LV_Steer_angle_final
2. RxMotionCtrlLatAccel
3. IMUYawRtPri
4. Host_Speed_mps
5. A[2]
6. Larteral Error
7. A[0]

2.2. LC Scenario

Based on the variables listed above, We depict the scenarios as below.



2.3. LC Related plots

All of these LC related variables are from Simulink model. We can envaluate the LC feature‘s performance based on variables logging.I will display the list of variables and show the plots as below. Sheets and Tables also can be shown here if necessary.

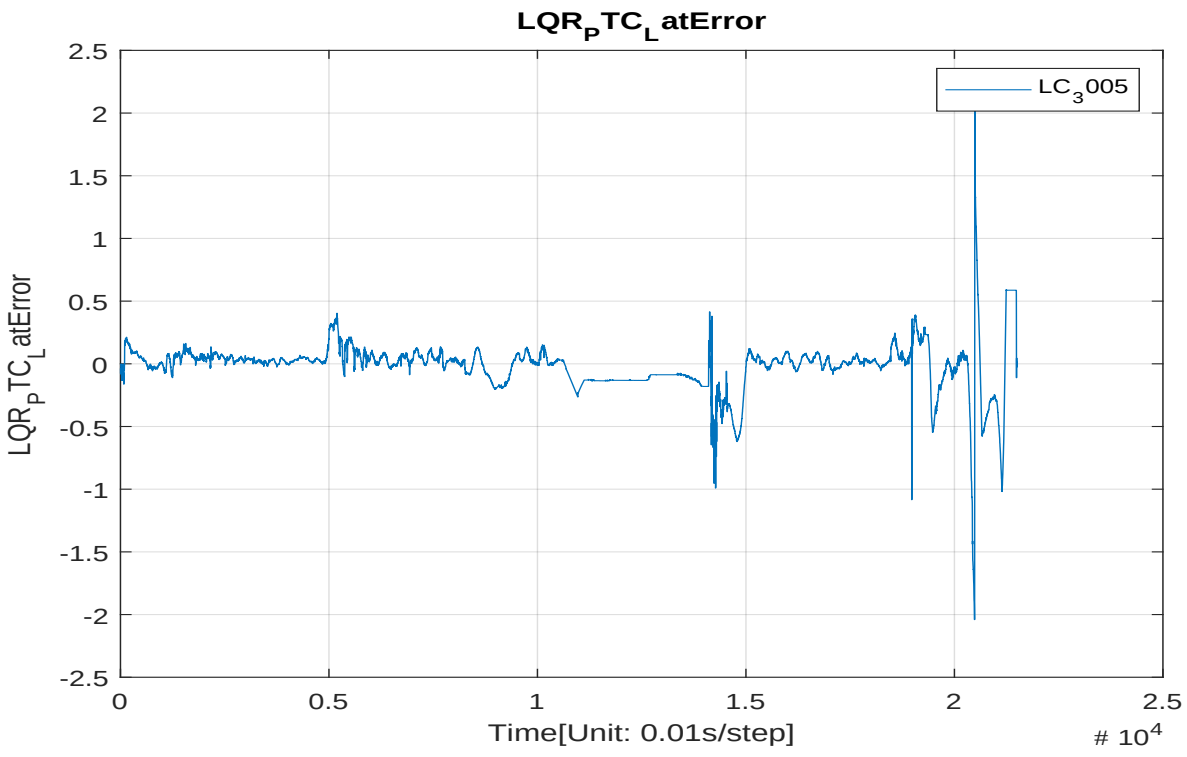


Figure 2.1. LQR_PTC_LatError

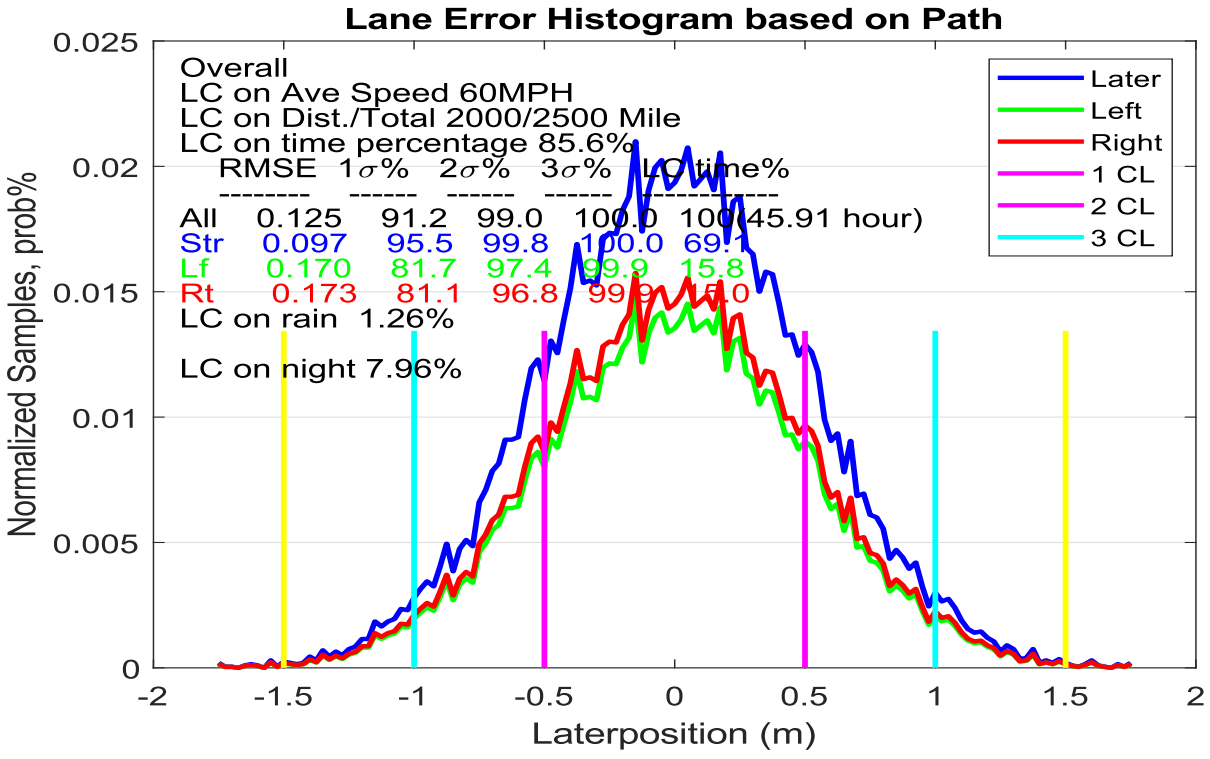


Figure 2.2. Lane Centering Performance

2.4. LC Related Table

Some statics can be shown in the table based on the plots. And also need to improve this part in code

MIN	MAX	MEAN	STD
-2.0406	2.1962999999999999	-0.0218	0.2051999999999999

Chapter 3. System Degradation Manager(SDM) Feature

3.1. SDM Related Algorithm Variables

All of these SDM related variables are from Simulink model. We can envaluate the SDM feature's performance based on variables logging from ControlDesk.I will display the list of variables and show the plots as below. Sheets and Tables also can be shown here if necessary.

1. battery voltage status
2. vehicle health status
3. Current vehicle location
4. Current vehicle velocity
5. Current navigation route status
6. Driver buckle state
7. Occupied passenger seat buckled
8. Ignition status
9. Trailer not connected
10. Doors closed
11. Hood closed
12. Trunk/liftgate closed
13. Drive or low gear selected in PRNDL
14. Manual shift mode not engaged
15. Spare tire not in use
16. Electric park brake not engaged
17. Auto load leveling not engaged
18. 4WD/Transfer case position
19. Suspension height not manually altered
20. Vehicle braking system event status
21. Hood closed
22. Braking system fault status
23. Steering system fault status
24. Engine control system fault status
25. Body control system fault status
26. Tire pressure faults
27. Safe stop not activated previously
28. Lane lines present
29. Trailer not connected

Chapter 4. Operation Design Domain(ODD) Feature

4.1. ODD Related Algorithm Variables

All of these ODD related variables are from Simulink model. We can envaluate the ODD feature's performance based on variables logging from ControlDesk.I will display the list of variables and show the plots as below. Sheets and Tables also can be shown here if necessary.

1. Outside ambient air temperature
2. Severe Weather is not present
3. ADS_TOLL_DIST
4. Supported road type