

## Environment Assumptions Elicited (473 in total)

1. There are no obstructions or obstacles (for the vehicle) to collide with.
2. The vehicle sensors are accurate and in working conditions.
3. The vehicle is traveling in ideal weather (e.g., no ice or rain).
4. Speed (of the vehicle) is within the speed limits to avoid accidents due to travel speed.
5. The surface is flat (exp: quick angle changes, change speed without changing energy consumption).
6. A button that gives the user the ability to set the vehicle's cruise speed
7. A fully functioning cruise speed manager (csm) for the control system
8. A fully functioning actuation system for the cruise speed control system
9. A defined user interface to increase and decrease the cruise speed
10. A button to reset the vehicle's cruise control speed system on click
11. The vehicle is powered on and is moving.
12. The csm (cruise speed manager) has some way of reading the current speed of the vehicle.
13. The increase/decrease buttons move the speed (at) a constant value.
14. The csm remembers the previous speed when it gets paused.
15. When reset, the csm forgets the previous speed and clears the data.
16. The assumption that the slope is not changing is problematic because the force needed to travel uphill differs greatly from the force needed to travel downhill.
17. There seems to be an assumption that outside variables will not come into play. I see this as problematic because where other cars and drivers are involved there is always room for error.
18. It is also assumed that the car is being taken care of (e.g., gas, windshield wipers, windshield fluid, oil, etc.)
19. I also find the assumption that the weather is unchanging to be problematic as ice can cause sliding, rain can cause hydroplaning, wind can increase drag, and snow can reduce visibility.
20. It is also presumed that the terrain is the same, not accounting for conditions like off-roading.
21. The mechanical/real parts of the cruise control system's machine are functioning properly (i.e., the break pedals, the speedometer, etc.). All of these pieces are functioning and are able to work as intended.
22. The road that is being driven on contains no water or other weather-related hazards that would cause the vehicle to speed up or slow down.
23. The road contains no incline or declines that would cause the vehicle to speed up or slow down.
24. The road being test on is smooth and contains no road hazards that would affect the speed of the vehicle.
25. The vehicle does not have any external weight changing during the drive that would affect the speeding up and slowing down of the vehicle.

26. The weather is stagnant. This is very important because of hydroplaning and ice. Wind also is a big factor. To move at a slower speed is important during this for safety.
27. The slope you are on is not changing, which is problematic because the force needed to go up hill is much greater than the downhill.
28. The assumption of the terrain that is being driven on is the same so going on a dirt or rocky road would have a different affect/effect than a normal asphalt road.
29. The outside world will not be problematic. This includes other cars are maintaining a safe distance and wildlife is not jumping out causing a hindrance.
30. We also assume that the car is maintained (oil, gas level, etc.)
31. The hardware and signals are ideal and functioning properly.
32. The brake pedal is not pressed when the cruise speed is detected.
33. The minimum value that the cruise speed can be decremented to is 0.
34. The cruise control detection of speed is instantaneous to ensure that the initial value is set to the correct value.
35. The car is not in neutral.
36. Assume that the car has min value checking for decCS (could decrease and go negative).
37. Assume "setCS" assigns non-negative value to CS (cannot assign reverse value).
38. Assume that car has max value checking for incCS (could overflow and error).
39. Assume changing actuation value does not change or delete CS.
40. Assume speedometer is always connected.
41. Assume the ground level remains constant.
42. Assume the road quality remains constant.
43. Assume the road is clear.
44. Assume the wind speed remains constant.
45. Assume the temperature remains constant.
46. The initial speed at which the cruise control is set to when engaged is the same as the current speed of the car right before the system is activated.
47. The display for the speed of the car and how fast the car is traveling are the same.
48. The pedals respond quickly and accurately to input.
49. Increasing and decreasing the speed of the cruise control system is done at consistent intervals.
50. Hitting the brakes disengages the cruise control system.
51. Road condition could be wet or snowy causing tires to slip, causes a misread in data (e.g., tire slippage).
52. An incline on the road to increase the speed of the car or a decline (on the road) to decrease the speed of the car.
53. A sudden increase of speed or decrease of speed should turn the cruise control off.
54. An impact of the car should also turn the car off. If the engine light turns on, then the cruise control should turn off.
55. The environment of driving: You should be on the highway to activate the cruise control.
56. The engine, pedals, and other essential machinery for the vehicle are operational.

57. The functions for sending/getting changes in cruise control speed are functioning as intended.
58. The buttons in the UI are functional and clearly labeled/explained to the user.
59. The vehicle is not driving in conditions that could impact its ability to maintain speed.
60. The cruise control speed is maintained when the vehicle is on surfaces with varying degrees of friction.
61. After the cruise control speed is set, you can hit the gas and when you let off the cruise control set speed will be maintained.
62. After the cruise control speed is set, you can hit the brake and the cruise control will be paused and you can resume without turning cruise control back on.
63. When the cruise control is set, downgrades and hills in the road will be dealt with accordingly by giving more or less throttle to maintain the set speed.
64. When the cruise control is set, it is assumed that there are no cars going slower than you directly in front of you.
65. When the cruise control is set, it is assumed that the physical conditions are proper for cruise control. Ex: No wheel spin (in the snow), etc.
66. Speeds shall be received from pedals
67. The car is not changing speeds when CCS is turned on
68. Driver is not pushing on pedals while engaged
69. The car is moving and has a speed
70. The driver pushes one CCS button at a time
71. Assume that cruise control can only be engaged if the car is moving
72. Assume that cruise control cannot be engaged when moving in reverse
73. Assume the acceleration pedal is the pedal used to set the cruise control
74. Assume the brake pedal is the pedal used to disengage cruise control
75. Assume that cruise control can only be engaged if the car is moving at a specific speed
76. The speed being set does not violate any traffic laws.
77. The speed being set is safe for the weather conditions of the road.
78. The speed being set does not set the car on a collision speed with any cars in front of them.
79. The speed does not exceed the ability of the engine in the car.
80. The speed being set is a viable speed for the condition of the road you are driving on, for example, things like hills, pot holes, etc.
81. All sensors, displays, and interactables are communicating and displaying information accurately.
82. The cruise speed defined and the actual cruise speed are the same.
83. The cruise speed is not negative.
84. Weather conditions are not impacting functionality.
85. The cruise control system is only able to be engaged / powered on while the car is on.
86. It is assumed that the car is mechanically working properly.
87. The speedometer is functioning correctly and measuring properly/accurately.
88. The pedal manager accurately conveys the pedal input of the user.

89. When the cruise control system is on, but not engaged, it does not affect the pedals/speed of the vehicle.
90. The increase and decrease buttons handle the input properly and do not constantly increase the speed if the button is held.
91. The vehicle does not have any mechanical or electrical issues that would inhibit its ability to set the speed.
92. The vehicle's speed will be set appropriately depending on the weather conditions.
93. If a mechanical or electrical failure were to occur the vehicle would come to a stop.
94. The vehicle will adjust its speed accordingly depending on the ground it is on. For instance, dirt, asphalt, or gravel.
95. The vehicle's speedometer is accurate.
96. Must be able to turn off in any state by user.
97. Hitting the brake should always turn off cruise control.
98. Assumes that it is safe to go into cruise control when inputted.
99. Assumes that user is following speed laws.
100. Assumes that car is in working order.
101. The car is on a relatively flat, straight, and well-maintained paved road.
102. The car is not suffering mechanical issues.
103. The weather is not rainy or snowy.
104. The car is sufficiently fueled.
105. The car is not in a wreck.
106. The car is not driving up hill or down a hill.
107. The car is driving on a flat surface. (the road is a perfectly paved road)
108. The car is not driving on a sticky surface.
109. The car is driving in a non-windy environment. (no high head wind)
110. The car is driving in a non-snowy condition.
111. The initial cruise speed is defined at the start of the routine by the speed of the car at the car when the cruise system is started.
112. The inc and dec buttons increment or decrement the cruise speed by 1mph on every press.
113. Resume sets the cruise speed to the same speed it was when it was initially paused.
114. The user interface is constantly polled while the system is engaged. This way the car can detect whether or not the status of the inc or dec buttons are pressed. This is critical because we must know if the status of these buttons has changed to increment or decrement the speed of the car.
115. This is not an adaptive cruise control (the car does not care if there is another car in front of it. It will continue to go without changing the desired cruise speed.)
116. The vehicle stays on the road and does not crash, as doing so would likely debilitate the functions of the mechanisms which this state machine is hoping to control.
117. The vehicle has enough fuel in it to attain the speed being asked for by the state machine.
118. The pedals are not sticky and are both in working order, so they do not give the system values that the user did not intend.

119. The wait periods for the cruise control and pedal management systems are enacted when the machine is first starting, as having these wait times still would leave the speed undefined.
120. The cruise control system is able to identify and account for environmental factors which affect speed, such as elevation.
121. The PM (petals manager) could return an invalid value for the cruise speed causing it to be undefined while engaged.
122. When locking and unlocking it resets the CS (cruise speed) and may not get the CS when going to Pause → Engaged.
123. The incCS | decCS could go out of bounds and cause the CS to be undefined.
124. When on Pause the CS can be set and may have an undefined value before being engaged again.
125. The CSM (cruise speed manager) incorrectly thinks it needs to be reset when engaged and causes CS to be undefined.
126. Inc and Dev methods in “Pause” state will never lead to an invalid speed that the system could not acknowledge. Since “Pause” state could resume directly to “Engage” without acknowledging the speed again. Therefore, if this assumption is disregarded, “Engage” state when resumed again might have to handle an undefined speed.
127. Moving into “Lock” state would not lead to the loss of speed’s value. If this assumption is not satisfied, moving from Engaged → Lock → Pause → (resume to) Engaged would result in an undefined speed.
128. Inc and Dec speed during “Engage” state would not affect the validity of current Pedal. Since the speed could be changed during “Engaged” state without coming back to acknowledge the pedal, the new speed must work well with the current pedal.
129. Similar to the third assumption, moving from “Engaged” state to “Pause” state should not result in the loss of speed’s value.
130. Pedal manager and cruise speed manager will never make any mistake of approving an invalid request.
131. Cruise speed is determined directly from the speedometer.
132. Initial setup and equipment are expected to be damage free, and any damage sustained will inform the user of the potential for inaccurate readout.
133. The cruise control system can only be engaged after reaching 60mph. Consequently, dropping below 60mph while in cruise mode will disengage the cruise control system.
134. Hitting the brakes (regardless of speed) will disengage the cruise control system.
135. The cruise control system will maintain speed when traveling through diverse terrain.
136. The speed at which the user wants should be determined/obtained. (There exists a button to set speed.)
137. The cruise speed manager should be fully functioning.
138. The actuation should be fully functioning.
139. The PM (petals manager) should be fully functioning.
140. There exists a button that increases/decreases the cruise speed.
141. The car must be on.

142. The car must be going over 25 mph (or whatever the manufacturer set as the minimum speed allowed for cruise control).
143. The car is in the Drive mode.
144. All mechanical parts necessary for cruise control are properly working.
145. The user is not holding down the break while engaging the cruise control.
146. The control system is properly functioning and always responds to user inputs.
147. The vehicle has a properly functioning acceleration and braking system.
148. The cruise speed buttons are always completely functional for the driver.
149. The speedometer measures and displays the correct speed.
150. The speed can be interpreted and displayed in either miles per hour or kilometers per hour.
151. The cruise system can be stopped and engaged anytime if user wants to stop and engage.
152. The cruise system should be turned off when user hits the brake of the car.
153. The vehicle is working ideally and safely.
154. The driver is following a speed limit.
155. The cruise system stopped when driver accelerates. When accelerating is stopped then the system engages again.
156. The vehicle is assumed to be in a maintained condition. This includes the tires, engine, and so forth. This is because the cruise control being on when something failed is not considered in the diagram.
157. The weather is assumed to be good outside. This is because a reduction in traction due to rain or snow is not indicated in the state machine.
158. The grade of the road is assumed to be negligible. This is because the state machine diagram does not indicate any sort of increase or decrease in speed based off changes in the road's incline/decline.
159. The road is assumed to be without obstructions such as people, wildlife, big rocks, etc. The reason for this being the last assumption is roads usually do NOT have obstructions. Lastly this is an assumption because if an obstacle is hit then the state machine diagram does not indicate any sort of change when it should actually turn off.
160. Assuming that the cruise control is set to an appropriate speed for a given situation. There is nothing to restrict the driver from setting it at 1 mph on a highway. Assume speedometer is always connected.
161. The car is well maintained.
162. The weather can be driven in safely.
163. The road is flat.
164. All vehicles maintain a safe distance.
165. No obstacles in the road.
166. The car is assumed to be in working mechanical order.
167. The car can maintain speed while cruise control is on.
168. When the cruise control disengages the pedals are re-engaged to allow the user to take control.

169. The buttons on the user interface accurately carry the information from the driver to the car's system saying when to increase, decrease, and disengage cruise control.
170. When the cruise control is paused and resumed the cruise control is assumed to remember the previous speed the vehicle was traveling at.
171. Assume that the driver is in good health and is in an ideal position to drive without compromising their safety.
172. Assume that the driver is properly educated on driving laws/techniques.
173. Assume that the driver has experience driving in a range of different speeds.
174. Assume that the weather conditions that are present are feasible conditions for safe driving.
175. Assume that the vehicle is functioning correctly and there are no internal issues.
176. The most important assumption is that all the electrical components are functioning properly (i.e., speedometer, Inc speed, Dec speed, speed controller).
177. Secondly, all other aspects of the car are functioning correctly (i.e., engine, wheels, steering wheels, safety measures).
178. Another important assumption is that a person will be operating the vehicle for the entirety of the trip.
179. An assumption would be everyone else on the road is following appropriate driving laws (speed, direction of travel, lanes, and distance between cars).
180. The vehicle is operating on drivable roads and safe road conditions (i.e., weather, infrastructure, line of sight).
181. When the system is engaged on it takes a record of its current speed.
182. The car is able to measure its speed in some way.
183. The speed is stored in the CSM until it is reset.
184. When the system is engaged the vehicle is already in motion.
185. External objects do not affect the CS.
186. The car is mechanically working properly.
187. The speedometer is giving the correct value.
188. The brake correctly disengages the cruise control.
189. The cruise control buttons properly start and cancel the cruise control.
190. The cars gas pedal works properly to manage the speed.
191. It is assumed that the car is moving at a speed above 0 mph.
192. It is assumed that there are no other mechanical issues with the car.
193. It is assumed that nothing is blocking the car from traveling forward at speed.
194. It is assumed that electricity will be reliably supplied to the car's cruise control computer.
195. It is assumed that the readings from the speed sensors are accurate.
196. The cruise control shall disengage upon pressing the brake pedal at any time.
197. The cruise speed shall be defined to be the current speed upon pressing the cruise control button (engaging the cruise control system).
198. The speed limit shall be tracked using available speed zones.
199. The cruise control shall not engage at values higher than +5 the tracked speed limit.

200. Weather conditions shall be considered to ensure that the speed of the vehicle is safe in all conditions.
201. Speedometer and speedometer data is functioning properly.
202. All physical aspects of the PM work properly (such as locking and unlocking).
203. Brake sensor properly disengages.
204. Pedals do not fail
205. All other major aspects of the vehicle work.
206. The vehicle's cruise speed prior to turning cruise control on is calculated and then defined without explicitly being engaged.
207. The cruise speed is still defined when the Lock block is executed.
208. When WaitPM is being executed the cruise control system is both on and engaged at the same time.
209. While engaged, when either incCS or decCS are executed, an appropriate cruise speed acceleration is applied until the target cruise speed is reached.
210. If the vehicle driver puts their foot on either the brake or gas while the system is both on and engaged, then the driver input overrides the set cruise speed.
211. The brakes can quickly disengage the cruise control without fail. This is the most important assumption because if the cruise control does not become disengaged on command, there is a high probability that severe damage will occur to the environment, vehicle and/or the driver and their passengers.
212. There are no obstacles on the road, such as people or dangerous pavement conditions. I believe this is another important assumption because it can cause someone to seriously get hurt if this assumption is not made.
213. The weather is nice enough to drive at a constant speed. This is important so no dangerous conditions are encountered while driving. If the weather is not nice, it is not a good idea to engage cruise control as it may cause an accident.
214. The car is up to all standards and does not need any pre-trip checks (has enough fuel, will not break down, etc.). This is important so the car does not break down mid-journey and cause problems on the road.
215. The car will be driving on a straight path that will not require many turns. This is the least important, as it will not cause damage to the environment if it is not correct. However, it is still an important assumption to make because if there are several turns throughout the car's journey, it is not a good idea to have cruise control engaged because the car's speed will need to vary as it goes into these turns.
216. The cruise control buttons and the car pedals work and allow the system to be set.
217. The car is moving while cruise control is on.
218. The cruise speed is defined by the speed the car is moving when it is set.
219. The car will not crash while cruise control is engaged.
220. The user understands how to set the cruise speed for cruise control.
221. The off/on is for the cruise control and not for the overall vehicle.
222. The rest of the vehicle parts involved (for example the pedals) are working correctly.
223. The cruise control does not adjust automatically to terrain conditions, i.e., for a vehicle slowing in front of it.

224. This vehicle has only two pedals (at least only two that would affect its starting and stopping).
225. The vehicle is taken out of park or handbrake is turned off when it is turned on.
226. The cruise control works.
227. The speedometer works.
228. Braking disables cruise control in all states.
229. User can disable cruise control with button at all states.
230. The cruise speed will not result in a crash.
231. Assumes that the weather conditions are ideal (no wet/slippery roads).
232. Assumes that there are and will not be any roadblocks/obstacles that will be encountered.
233. Assumes the vehicle is in ideal working condition.
234. Assumes the vehicle is traveling ideal speed limit otherwise will either get flagged down or run into other cars.
235. Assumes the driver is in good condition (not sleeping, not inebriated, not under the influence, etc.) to brake to stop cruise control or control the steering wheel if needed.
236. There should be no hazardous weather conditions.
237. The user should be able to set the desired cruising speed.
238. There is enough fuel in the car.
239. The speedometer must be intact and working.
240. There must be limited obstacles (lights, other cars, etc.).
241. When turning on cruise control, the csm has a value to set as the cs.
242. The csm's values for speed are being adjusted when increasing and decreasing.
243. When pausing cruise control, the set cs is saved.
244. A speed of 0 still counts as a set cruise speed.
245. Weather Hazards, may slow/accelerate speeds
246. Amount of Gas in the tank, may stop car
247. Up-hill/Down-hill Terrain, may slow/accelerate speeds
248. Tolls, may have to stop car to pay toll
249. Potholes, may damage car and affect speed
250. All user buttons and car parts function correctly.
251. Cruise speed always follows speed limits and safe speeds.
252. When cruise speed is first turned on it is safe to turn on cruise control and the speed is set to that of a safe and legal speed limit.
253. Everytime incCS and decCS is called then setCS is called to set the new speed.
254. resetCS always resets to a safe speed based on where the car is located.
255. Assume the car's ignition has been started and the car is driving.
256. Assume the car is in good enough condition to drive, therefore maintaining cruise control speed (e.g., enough oil, air in tires, gas, etc.)
257. Assume if a collision occurs, the cruise speed is set to 0 mph/kmph
258. The cruise speed is consistent despite road conditions (incline/decline road, wet, icy, etc.)
259. Cruise control speed cannot be manipulated by outside forces such as hackers.

260. Assume the car is not turned off
261. Assume the car has no electrical issues or the speed sensor preventing cruise control from getting a reading of the current speed
262. Assuming the car is going at the minimum speed required for cruise control to activate
263. Assume the driver knows the basics of how to operate cruise control
264. Assume there are no conditions (weather, terrain, etc.) that are hindering the car's ability to operate properly.
265. All the other functions of the cruise work properly.
266. Restricting deviations from the desired speed and/or the desired distance to a predecessor.
267. Initial speed is risk free.
268. Detailed planning for fuel consumption and emissions.
269. The travel should be smooth and comfortable.
270. The machine is able to accurately receive the current speed.
271. resetCS turns off cruise control.
272. Pressing the brake stops the cruise control.
273. incCS and decCS change the cruise speed by reasonable increments (1 mph).
274. All other sensors and machine functions are working correctly.
275. Whether the gas and brake pedal are properly working
276. In the case of a fuel burning vehicle that when the internal combustion engine may fail or be off while the electronic system stays active
277. Whether the actuator is properly connected to the engine; if it is not, then there can be no changes of the vehicle's actual speed by the CCS
278. When the car is fully on and the car is not moving
279. The vehicle is not running out of fuel
280. The car has the computational capability to remember the desired cruise control speed while cruise control is engaged.
281. The car has the computational capability to change the desired cruise control speed within its memory while cruise control is engaged.
282. The "inc" and "dec" buttons increase the current cruise speed by 1 and decrease the current cruise speed by 1 within the car's memory respectively.
283. The cruise speed manager provides a user interface capability to start cruise control with the cruise speed currently selected.
284. The car contains technology, like a speed sensor, that can determine the actual speed of the car when the car is on.
285. The csm has the ability to recall the speed that is set.
286. When resume is called, the csm can get the old speed.
287. The car's engine is able to maintain the cruise speed.
288. The car has buttons that can trigger the functions.
289. The car is able to measure its speed (i.e., odometer).
290. There are no outside forces that might change the speed, such as wind and terrain.

291. The buttons on the interface are working properly.
292. There is no other way to control the speed cruise than through the buttons.
293. The user has a way to turn on and off the system abruptly.
294. The speed is always greater than 0.
295. The cruise speed is within the threshold of the vehicle, between 30 mph and the max speed of the vehicle.
296. The current speed of the vehicle is 30 mph or higher.
297. The inc and dec buttons are working properly and sending correct information.
298. The manual way to stop cruise control (the pedals) are properly working.
299. The cruise control system sent the correct speed to the 'Engaged' function.
300. There is space for the vehicle to continue the speed.
301. The vehicle is able to get to the speed specified by CSM.
302. The vehicle is in drive.
303. The driver is not manipulating the pedals.
304. The engine is running (not just the vehicle electric turned on).
305. The diagram assumes the driver is safely seated inside the car and in control of the vehicle. This may occur during the pedal manager acknowledgement. However, this must be assumed so the car doesn't drive away with nobody in control. Additionally, this assumes the driver is not impaired in any way, such as being under the influence of alcohol.
306. The diagram assumes the car has an automatic transmission to start. Additionally, the transmission must be in one of the drive gears, preferably the highest gear, instead of park, neutral, or reverse.
307. The diagram assumes the tires are making a consistent connection with the road. If the car tires are slipping on the road in snow or ice for example, the cruise speed manager will not get accurate feedback from the speedometer to adjust the speed.
308. The diagram assumes the emergency brake is not engaged on the car. While the car may still move forward with the E-brake engaged, this can damage the brake and severely hinder the engine.
309. The diagram assumes there is not a loss of power to the engine because the car is out of gas. Additionally, the diagram assumes there will not be some other mechanical failure with the engine or power train.
310. The function whose purpose it is to define the cruise speed is successful and works as intended.
311. The cruise speed becomes defined either at the moment that the cruise control is engaged or it has a default value that is defined when the car is turned on the first time.
312. The cruise control system has a way to read the current speed to define the cruise speed when the system gets engaged.
313. The increase and decrease buttons are working as expected -- they increase or decrease the cruise speed.
314. The cruise speed stays defined when the increase or decrease buttons are engaged.
315. User will operate cruise control according to the state machine and not do anything to break it.

316. The vehicle is traveling on a flat surface so no bumps or hills will affect the speed.
317. The weather won't affect the speed of the vehicle.
318. The cruise speed can't be set above the max speed the vehicle can travel.
319. If the car hits an object that would cause it to stop then the cruise speed will be set to 0.
320. When a driver presses csInc or csDec the set speed increases or decreases by a uniform, predictable amount.
321. Current speed as set by the cruise control is accurately displayed on the speedometer.
322. We assume that the cruise control system has access to the vehicle's current speed and when it is engaged that information is shared. //multiple SMDs involved.
323. When cruise control is paused it stores the value and it can be referenced when the cruise control resumed.
324. csInc may not be used to set the vehicle at a speed higher than it is capable of operating at.
325. There is a minimum speed that the cruise control can operate it.
326. You cannot begin the cruise control below at or below the minimum speed.
327. You cannot decrease the speed to or below the minimum cruise control operating speed.
328. You cannot increase the speed above the car's maximum operating speed.
329. There is a CSM defined in the system, and it's able to be engaged.
330. The CSM has a default cruise speed value.
331. The CSS is able to communicate with the CSM.
332. CSM can accept and process an increment or decrement speed command.
333. There is a way for the CSM to read the car's current speed.
334. The alternator is working correctly (constant current).
335. The operating vehicle has no engine or mechanical issues causing speed to be misread.
336. The driver of the vehicle sets the speed before attempting to engage.
337. The cruise control speed won't be set below 0 or there is exception handling for this case.
338. The cruise speed shouldn't go higher than the car's capability. This means it needs a cap in case someone presses accelerate too many times.
339. The vehicle operator is paying attention to the road.
340. The car is able to match the speed on the cruise control.
341. The car is driving on a decently maintained road, so the terrain isn't slowing the car down requiring it to constantly try to speed up.
342. The weather isn't affecting the speed of the car.
343. The car's tires are fully inflated.
344. Driver should have appropriate training/familiarity with engaging/disengaging CCS.
345. Adverse weather conditions that impact traction such as ice or snow.
346. Unexpected road hazards, such as a stopped vehicle or debris in the travel lane, and any resulting hard braking or emergency stop maneuvers.

347. Dense traffic
348. Increase/decrease of CS based on the relative speed and distance of the vehicle ahead
349. The system is able to receive data about the current speed of the car.
350. The pedal manager is able to control the pedals to maintain a constant speed.
351. The cruise speed is stored when the system is paused (so it can be set again when resumed).
352. Inc and Dec buttons affect the cruise speed as designed (i.e., they don't do something weird like set the cruise speed to null).
353. There are no electronic malfunctions with the cruise control system.
354. The car is able to safely maintain this speed in the current weather conditions, i.e., without spinning the tires or hydroplaning.
355. The environment isn't so rough that it could damage the car at the speed set.
356. The car isn't experiencing engine troubles which could be amplified by the speed set.
357. The driver is still paying attention to the road.
358. The driver isn't breaking the law.
359. Assume gas tank is not empty.
360. Assume cruise speed cannot be greater than maxSpeed or less than zero.
361. Assume car is in Drive, D2, or D3.
362. Assume external environment does not prevent car from moving forwards.
363. Assume speedometer is properly calibrated.
364. When paused, the cruise speed will stay defined.
365. When the inc button is pressed, the cruise speed will update and stay defined.
366. When the dec button is pressed, the cruise speed will update and stay defined.
367. When a pedal is pushed during cruise, the cruise speed will stay defined.
368. External factors (road conditions, grade of the road, weather) will not affect the cruise speed.
369. The pedals take priority over the inc/dec buttons in defining the speed.
370. Inc/dec buttons can only be used when pedals are not engaged.
371. There is a minimum speed defined for the machine to use cruise control.
372. The inc/dec buttons can only be used after an initial speed is defined by the pedals.
373. The speed cannot be defined until cruise control is turned on.
374. The sensor that reads the speed is functioning properly.
375. The car is moving.
376. The driver has interacted with the system properly.
377. The car can reach the cruise speed.
378. The cruise speed manager properly handles user input/changes in the car's speed.
379. The driver sets any speed changes; the cruise control system is responsible for maintaining the set speed.
380. It is assumed that the vehicle has some kind of speed-sensing mechanism, whether that is speedometer or other method of speed detection.
381. The speed of the vehicle is greater than zero when the cruise control system is engaged.

382. It is assumed that the driver is in control of steering the vehicle, not the cruise control system.
383. The system won't have to apply both brakes and accelerator.
384. When cruise control is engaged, the speed gets logged/defined.
385. When the inc/dec buttons are used the speed definition gets updated within CSM.
386. When setCS/resetCS is used, the speed is immediately logged/defined.
387. If the brakes are used, the speed definition should be wiped and cruise control turned off.
388. If car is sped up, the speed definition will not be redefined and cruise control will remain on.
389. The car is running.
390. Cruise speed manager is able to set speed.
391. Speed detector in the vehicle is functioning.
392. The pedal sensors are functioning.
393. The car is moving.
394. A speedometer is present to supply the current speed.
395. Cruise speed is not changed by another system outside of this state machine.
396. Cruise speed is defined/input before the cruise control system is turned on.
397. The increase/decrease buttons present usable values to the state machine.
398. The cruise control's set speed is presented to the user.
399. The driver of the vehicle that is using cruise control knows how to use cruise control.
400. The car is in suitable condition to drive and use cruise control.
401. The driver is going the necessary speed to activate cruise control.
402. In the event of a collision the cruise control speed is set to 0.
403. The road conditions (incline, decline, rain, snow, ice, etc.) doesn't or won't affect speed.
404. The car is actively moving, or else cruise control would not be able to be engaged.
405. The vehicle is traveling on a flat road.
406. There are no defects in the actual car.
407. The speed of the car is accurately being measured.
408. Pedals send a signal when the driver triggers them.
409. Cruise speed must be remembered when you resume cruise control.
410. The car must be able to tell how fast it is going.
411. The cruise speed is still set when its inc or dec.
412. When the cruise speed is undefined, cruise is turned off.
413. When cruise is turned off, the cruise speed is either saved or discarded.
414. Ability for the CSM to accurately read the current speed of the vehicle.
415. When paused, the speed is saved so that cruise control may properly resume.
416. The buttons properly increment and decrement the speed by a set amount upon each use.
417. The car has the ability to properly accelerate and brake.
418. The speedometer functions correctly for the driver.
419. The CCS can read the current speed of the car.

420. The CCS knows whether or not the car speed is in km/hr or mph.
421. The inc and dec buttons increase and decrease the cruise control speed respectively.
422. The CCS saves speed when cruise control is exited.
423. Cruise control speed cannot be set to zero.
424. The vehicle is moving when the cruise control is engaged by the user.
425. The cruise control activation button sets the initial cruise speed to the current speed of the vehicle.
426. The exact speed of the vehicle is always known by the csm..
427. There are buttons in the vehicle for the user to operate the cruise control system.
428. The vehicle is started and properly functioning.
429. Assume the csm has a maximum and a minimum speed it can operate at.
430. Assume that the car is at a suitable speed within the operating range of the csm when it is engaged.
431. Assume there will be no race conditions between the WaitPM, inc Engaged, and dec Engaged.
432. Assume that the csm correctly reads the speed of the car.
433. Assume there is negligible margin of error on the inc and dec and that there is negligible error in the exact speed it changes the speed of the car.
434. The user cannot press both inc and dec buttons at the same time.
435. No other system can engage the cruise control system.
436. No other system can reset the CS.
437. The cruise control system disengages if the power goes out then back on.
438. No other system can control the csm.
439. The control system can accurately read the speed at which the car is moving.
440. The control system has a means to display the speed to the user, i.e., a speedometer.
441. The control system is able to display the speed in both kmph and mph.
442. When changing the cruise speed while the control system is activated, the speed updates in real time.
443. If the car cannot meet the cruise speed that is set for whatever reason (i.e., flat tire, rough terrain, etc.) it will display the current speed, rather than the set cruise speed that it is trying to achieve.
444. There is an initial speed defined by the car or driver; this number can be 0.
445. The car is able to abide by the defined cruise speed, i.e., it is physically possible.
446. Pedals are not needed to define the speed while the system is engaged.
447. The Decrease & Increase functions should accurately change the definition of the cruise speed.
448. The speed doesn't have to be defined while the system is not engaged.
449. The cruise speed should adjust for cars that are in front of the vehicle.
450. The cruise control should respond to stop lights and stop signs appropriately (by coming to a stop).

451. The cruise control should be responsive to unpredictable situations (objects in the road, pedestrians crossing the street, etc.).
452. The cruise speed should be at or under the speed limit of the street.
453. The cruise speed should adjust for adverse weather conditions.
454. WaitCS and WaitPM sleep the program for an amount of time before checking and switching state (otherwise the system will drown itself in an infinite loop).
455. The cruise control system should be able to be turned off from any state.
456. The value of cruise speed does not need to remain constant while cruise control is engaged.
457. When the cruise control is turned off, we do not care about preserving the value of cruise speed.
458. When the cruise control is paused or locked, we do not care about preserving the value of cruise speed.
459. There is a button to effectively engage the CCS.
460. If the control system is unable to be engaged, the cruise speed will not be asked to be defined.
461. There is a number pad for the user to input the speed for the CCS.
462. The cruise speed will be defined in one measurement, mph.
463. There is a limit to how fast the CCS can go.
464. The cruise speed readings are accurate and constantly monitored.
465. The vehicle's path is free of any obstacles that would alter its speed.
466. There is a set (relatively small) range of how much a vehicle's speed can change while it is in the "Lock" state.
467. The vehicle's speed will not change beyond the range while it is in the "Lock" state.
468. Incrementing and decrementing the cruise speed is done in specific and defined intervals.
469. The engine is turned on and the vehicle is moving forward.
470. The user has access to controls inside the vehicle that allow operation of the CCS.
471. The current driving speed of the vehicle is always known (odometer is working properly).
472. When the user activates the CCS, the cruise speed is set to the current driving speed of the vehicle.
473. The vehicle is mechanically sound and has sufficient fuel.