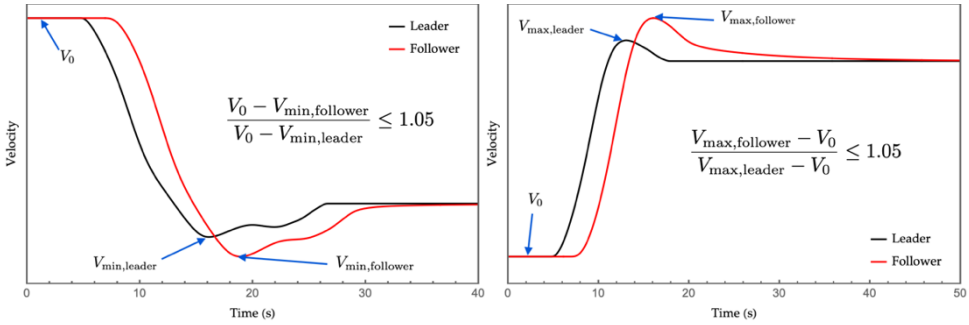
String stability requirement

y.y **While following another vehicle the activated DCAS system shall aim to be string stable and shall aim to avoid further amplifying the perturbation caused by the lead vehicle from one vehicle to the next.**

OR

y.y **A DCAS vehicle following another vehicle at constant speed and at a distance such that the speed profile of the DCAS system is influenced by the speed profile of the vehicle in front, the activated DCAS system shall aim to respond to a perturbation in the speed of the vehicle in front with a perturbation in its speed profile by at most a [5%] increase in the maximum difference in speed compared to the vehicle in front before reaching a new equilibrium velocity following the visual examples reported in the following figures.**



The provisions included in this paragraph shall be demonstrated in xxx of ANNEX X.

ANNEX X

x.x. **String stability base testx.x.1. The tests shall demonstrate that the activated DCAS system is able to achieve string stable operations when following a car target proceeding with a speed lower than the speed the DCAS would maintain in the same situation in the absence of the same target.**

x.x.2. **The tests can be executed with one or more DCAS equipped vehicles proceeding in platoon formation.**

x.x.3. **The following conditions shall be ensured for the correct execution of each test:**

x.x.3.1. **The initial speed of the car target shall be lower than the speed limit or of the speed the DCAS set speed, whatever is the minimum.**

x.x.3.1. **If the DCAS systems include different settings for the headway distance to the preceding vehicle, the shortest setting has to be chosen.**

x.x.3.2. **The car target shall keep the constant initial speed for a time sufficient to ensure that all the DCAS equipped vehicles are able to maintain the same constant speed. A fluctuation of the speed of the vehicles within a range of ± [1] m/s from the speed of the car target is allowed. When these conditions are achieved the platoon is in steady state formation and the test can be considered as started.**

x.x.3.4. **Each test shall comprise the deceleration of the car target from steady state platoon formation to achieve a speed reduction of at least [3] m/s. The speed of the car target at the end of the deceleration shall not be lower than [5] m/s.**

x.x.3.4. **At the end of the deceleration, the car target shall maintain the new speed for a time sufficient to bring the platoon again in steady state formation**

according to the previsions of paragraph x.x.3.2. When this is achieved the test can be considered as concluded.

x.x.3.5. **At the end of the test the following quantities have to be computed.**

(a) The difference between the maximum and the minimum speed achieved by the car target during the test (L_{target})

(b) The difference between the maximum and the minimum speed achieved by the last DCAS vehicle in the platoon during the test (L_{DCAS})

(c) The ratio between the two differences $L = \frac{L_{DCAS}}{L_{target}}$

x.x.3.6. **The speed of all vehicles shall be measured with a frequency of at least 5 Hz. If deemed necessary to remove measurement errors, the resulting speed profile of each vehicle can be subject to filtering. Any filtering process on the signal shall not have a range of more than 0.2 seconds. Moreover, the measurement error shall be limited to 5% of the fluctuation of the speed of the controlled vehicle.**

x.x.. **String stability extended tests: The test shall the executed with**

- **different combinations of initial speed,**
- **final speed and deceleration adopted by the car target.**
- **different roads**
- **different targets (i.e. motorcycle)**