

**Ministry of Transportation and  
Communications**

**Taiwan New Car Assessment Program  
(TNCAP)**

**Second Version**

**3.13 Speed Assist Systems Testing Protocol**

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### 3.13.1 Definitions

- 3.13.1.1  $V_{\text{indicated}}$  – The speed the vehicle travels as displayed to the driver by the speedometer as in Vehicle Safety Test Direction "22-1, Speedometer".
- 3.13.1.2  $V_{\text{limit}}$  – Maximum allowed legal speed for the vehicle at the location, time and in the circumstance the vehicle is driving.
- 3.13.1.3 SLIF – Speed Limit Information Function. SLIF means a function with which the vehicle knows and communicates the speed limit.
- 3.13.1.4  $V_{\text{adj}}$  – Adjustable speed  $V_{\text{adj}}$  means the voluntarily set speed for the speed control functions, which is based on  $V_{\text{indicated}}$  and includes the offset set by the driver.
- 3.13.1.5 SLF – Speed Limitation Function. SLF means a system which allows the driver to set a vehicle speed  $V_{\text{adj}}$ , to which he wishes the speed of his car to be limited and above which he wishes to be warned.
- 3.13.1.6 ISA – Intelligent Speed Assistance. ISA is a SLF combined with SLIF, where the  $V_{\text{adj}}$  is set by the SLIF with or without driver confirmation.
- 3.13.1.7 iACC – Intelligent Adaptive Cruise Control. iACC is an ACC combined with SLIF, where the speed is set by the SLIF with or without driver confirmation.
- 3.13.1.8  $V_{\text{stab}}$  – Stabilized speed  $V_{\text{stab}}$  means the mean actual vehicle speed when operating.  $V_{\text{stab}}$  is calculated as the average actual vehicle speed over a time interval of 20 seconds beginning 10 seconds after first reaching  $V_{\text{adj}} - 10$  km/h.

### 3.13.2 Measuring Equipment

- 3.13.2.1 Instantaneous vehicle speed shall be measured using a GPS sensor with the following minimum specifications:
- (1) Accuracy: 0.1 km/h (averaged over 4 samples)
  - (2) Unit: km/h
  - (3) Update rate: minimum 10Hz
  - (4) Resolution: 0.01 km/h
- 3.13.2.2 The velocity data needs to be recorded with a minimum sampling rate of 10Hz for at least 10 seconds before and 40 seconds after reaching  $V_{\text{adj}} - 10$  km/h.

### 3.13.3 Test Conditions

- 3.13.3.1 Vehicle preparation
- 3.13.3.1.1 The tires shall be bedded and the pressure shall be as specified by the manufacturer for the vehicle.
  - 3.13.3.1.2 The vehicle mass shall be no less than the minimum kerb weight declared by the manufacturer.

### 3.13.3.2 Characteristics of the test track

3.13.3.2.1 The test surface shall be suitable for enabling stabilized speed to be maintained and shall be free from uneven patches. Gradients shall not exceed 2 percent.

3.13.3.2.2 The test surface shall be free from standing water, snow, or ice.

### 3.13.3.3 Ambient Wind Conditions

3.13.3.3.1 The mean wind speed measured at a height of at least 1m above the ground shall be less than 6 m/s with gusts not exceeding 10m/s.

## 3.13.4 Test Procedure

### 3.13.4.1 Test for the SLIF

Drive around for at least 100km on public roads, covering urban and rural roads and highways. During the drive, the reaction of the SLIF with respect to conditional speed limits needs to be verified and recorded.

The car shall be driven in both manual and cruise control mode.

Identify any major discrepancies between the signed speed limit and the speed limit indicated by the SLIF.

#### 3.13.4.1.1 Test for the SLIF Warning Function

3.13.4.1.1.1 The tests will be performed during the test drive or on a dedicated test track where speed signs are installed and shall cover at least three different speed limits.

3.13.4.1.2 The vehicle shall be accelerated up to a speed at least 10km/h greater than  $V_{\text{limit}}$ .

3.13.4.1.3 This speed shall be maintained long enough to be able to assess the complete warning sequence.

### 3.13.4.2 Test for the Speed Control Function

3.13.4.2.1 The tests will be performed at three different test speeds typical for the following road types:

- (1) City roads (e.g. 50km/h)
- (2) Inter-Urban roads (e.g. 70 km/h)
- (3) Highways (e.g. 110 km/h)

3.13.4.2.2 With the Speed Control Function activated set  $V_{\text{adj}}$ . In case of a Speed Limitation Function the vehicle shall be run at a speed of 15km/h below  $V_{\text{adj}}$ . The vehicle shall then be accelerated to engage the SLF, without applying a positive action.

3.13.4.2.3 Set  $V_{\text{adj}}$  to 110km/h and accelerate the vehicle to engage the SLF. Lower  $V_{\text{adj}}$  to a speed low enough to trigger the audiovisual warning and measure how long it takes for the vehicle to initiate this warning.

3.13.4.2.4 Set  $V_{\text{adj}}$  to 50km/h or a speed applicable at the road where the vehicle

is tested and force the vehicle into an overrun condition (e.g. pulling or downhill) where the engine braking is not able to maintain the speed of  $V_{adj}$ . Measure the speed at which the warning is initiated.