

Tentative draft

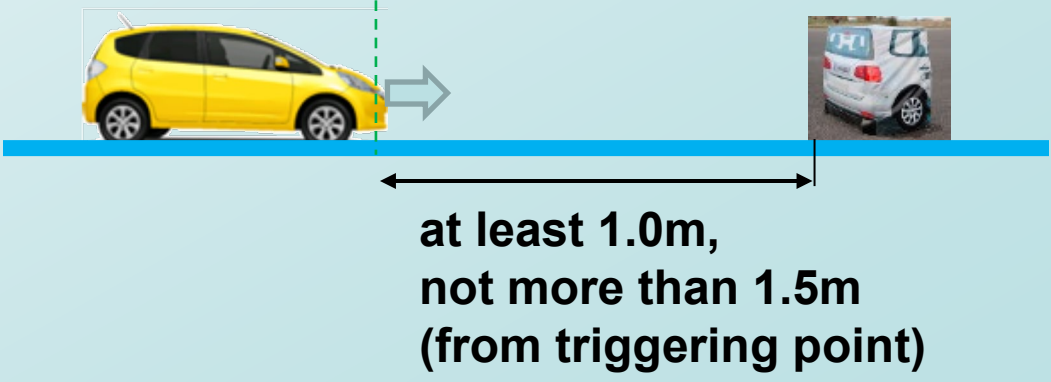
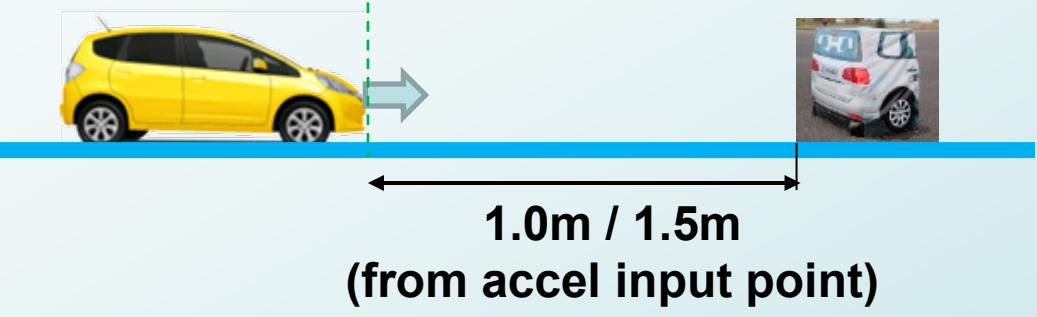
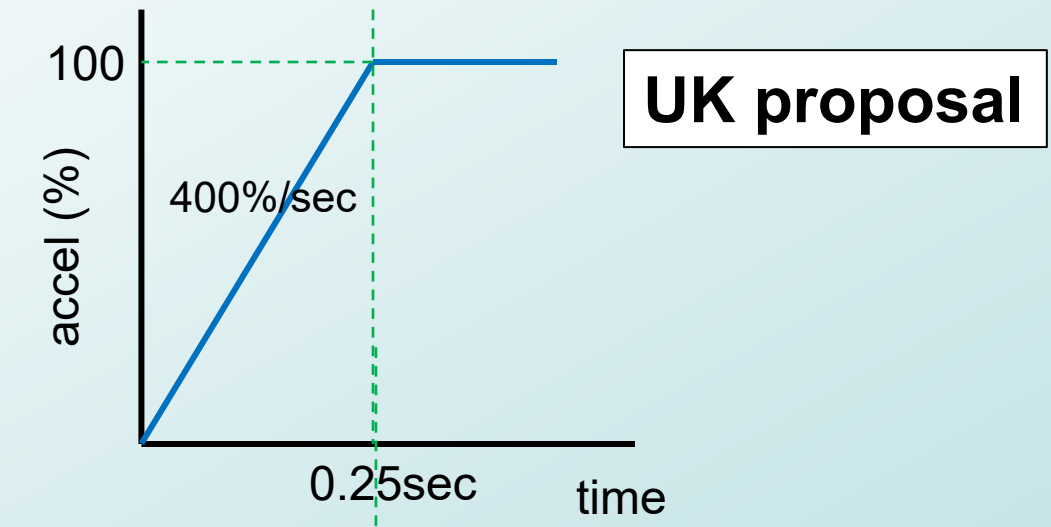
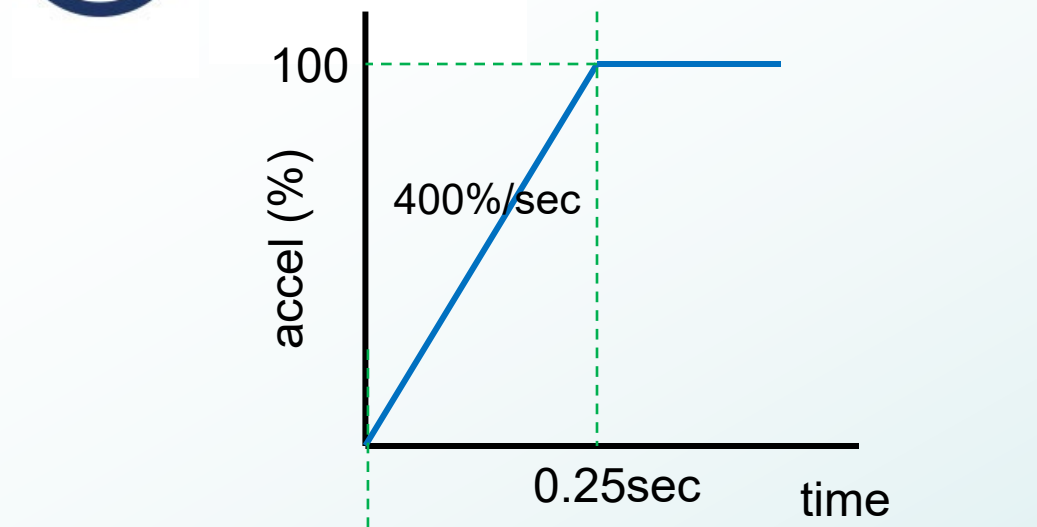
ACPE IWG #11

(day3)

- **UK proposal test procedure**
 - **Confirmation**
 - **Concern**



Confirmation of UK proposal test procedure

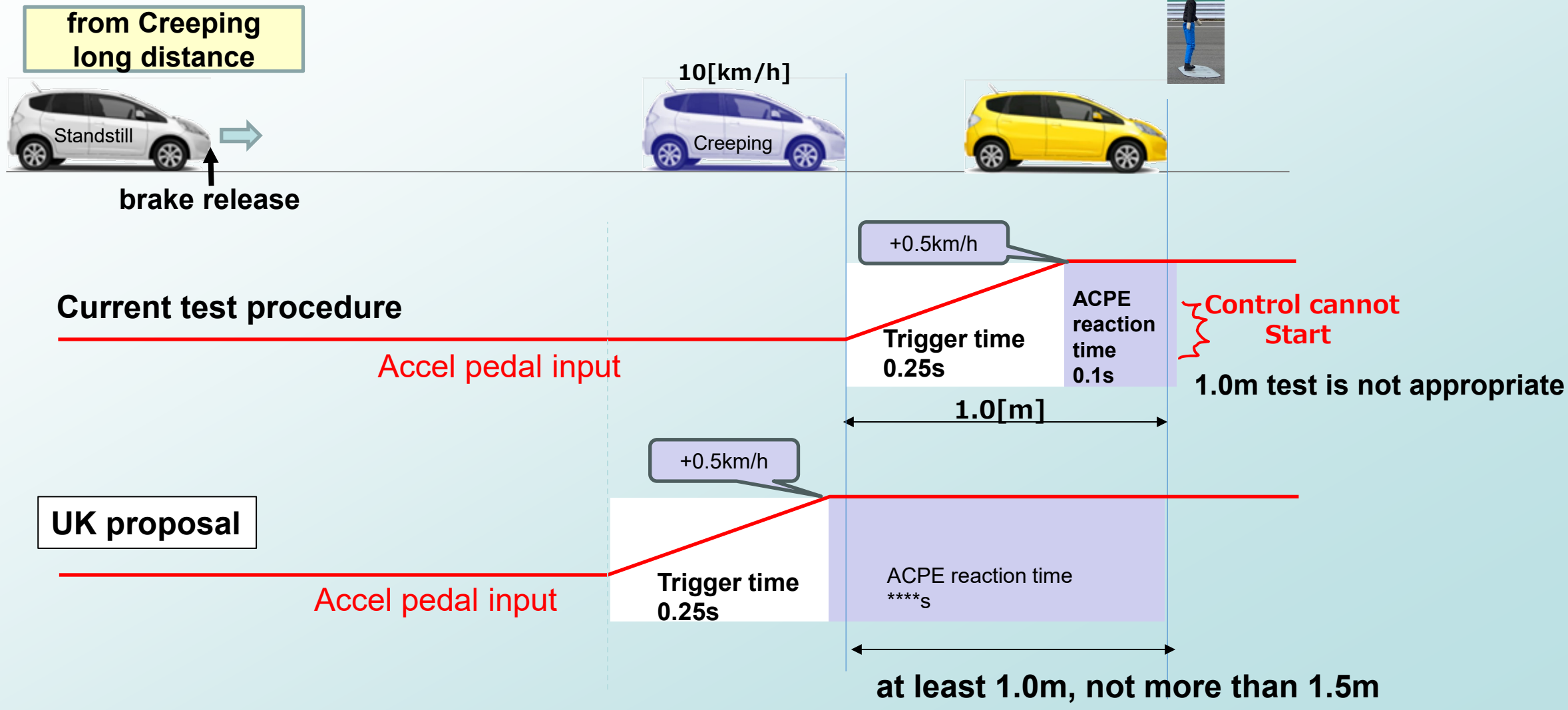


00 series test procedure

Compare "From Standstill test"



Compare test procedure





Rearward operation concern

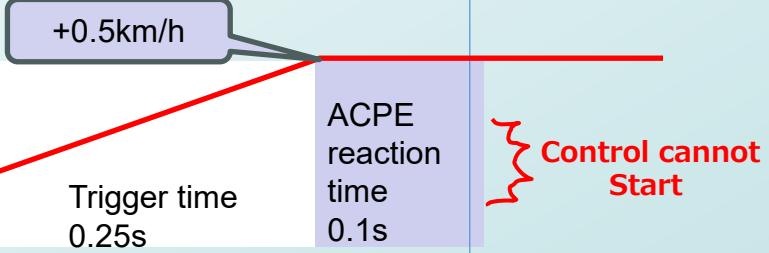
- **System configuration ; most of system is using only “Ultrasonic sensors”**
- **Sensor characteristics ; When the speed increases, it is more difficult to detect obstacles than when the vehicle is stationary.**



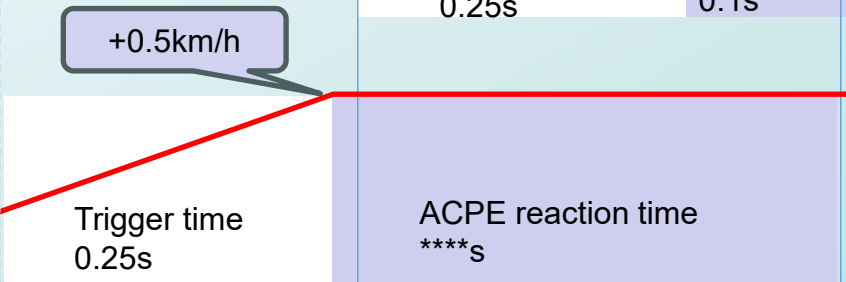
Concern of Ultrasonic sensors detection performance



Current test procedure



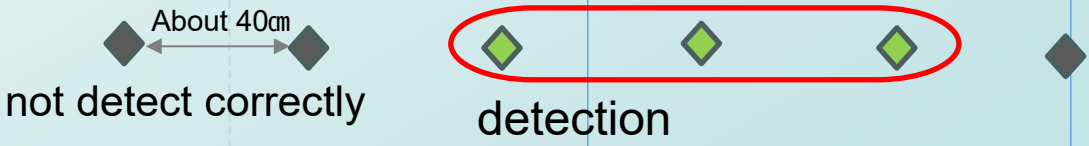
UK proposal



Ultrasonic Sensors

0.15s (calculation cycle)

detection interval



The problem remains the same even if B=1.5m

<Lack of robustness and detection reliability>
 Sonar reflection is weak and unstable
 → ACPE can only get weak reflection 2 or 3 times



Proposal



■ Proposal for Creeping “Rearward” test

- Creeping test will be conducted at **speed less than 4km/h**

■ Justification

➤ Considering technical feasibility

There is no experience for industry such creeping test. There is no system exist in the market.

➤ Traffic accidents result (in JAPAN OEM internal data)

- Japanese market data shows that 10km/h or more **reversing speed** are observed only 2%.
 - It is rare to drive at high speeds. (long creeping reversing run seemed to be rare)
- 57 accident data shows that Accidents at speeds below 4 km/h account for over 91% of incidents while reversing.
 - **The top priority is to establish technology that covers low vehicle speeds of 4 km/h or less.**



Concern : performance requirement

ACPE-11-10

Revising performance requirements to account for creeping

Performance Requirements:

The ACPE shall limit vehicle acceleration in order to prevent or mitigate a collision with an obstacle located **between not more than [1.0 m and 1.5 m]** in front of or behind the vehicle, in the vehicle path, at the time the **accelerator control is applied triggering conditions (as outlined in paragraph 5.1.2.) are reached**, provided:

(d) The situation is unambiguous, i.e.:

... (vii) **The obstacle is located at least 1.0m from the vehicle at the time the triggering conditions (as outlined in paragraph 5.1.2.) are reached;**

(viii) **The vehicle is travelling at or below its maximum creeping speed.**

- UK mentioned 5.1.5 but not mentioned 5.1.6, 5.1.6.1



Is it intended to evaluate same requirement for “Creeping test” ?

Refer ; Creeping Test result



2. Test Conditions

The magnitude of ΔV at Distance B

✗ The red arrow indicates $\Delta V < 3\text{km/h}$.

✗ Results of Vehicle1

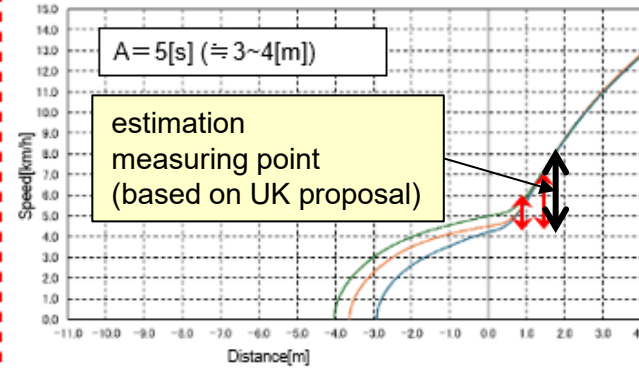
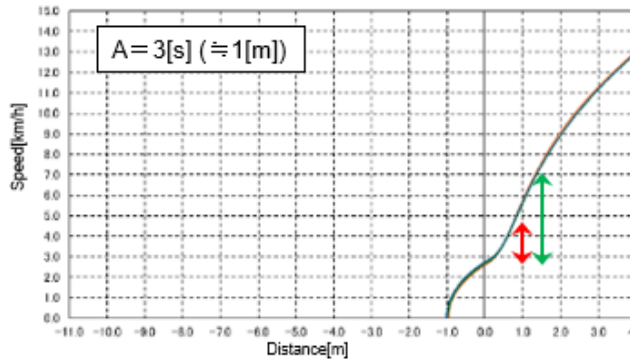


Distance A is short

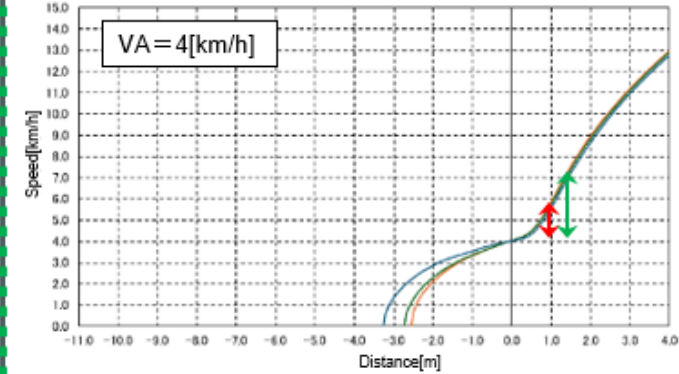
Distance A is long

Distance A is short

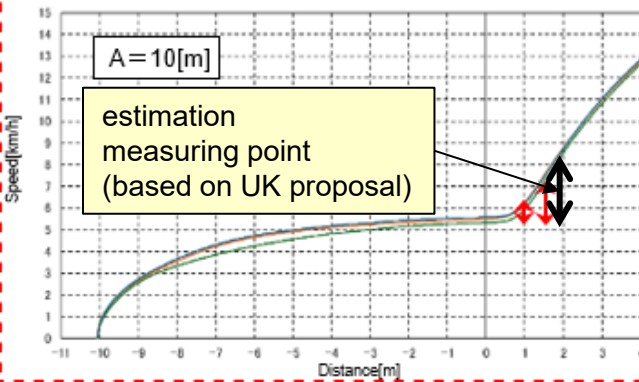
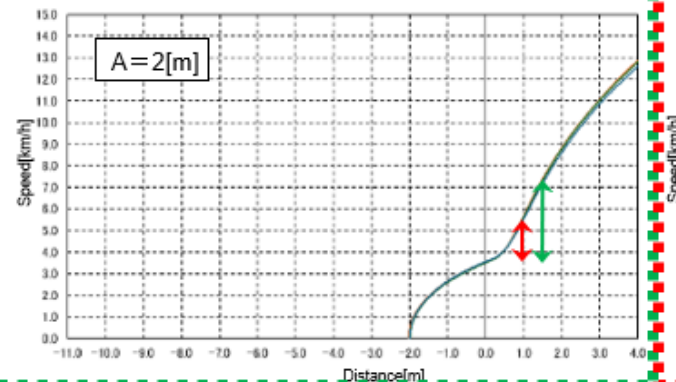
Distance A is defined by time



Fix VA



Distance A is defined by distance



To increase ΔV , it is better to shorten distance A and lower VA. And Distance B=1.0m is not suitable for evaluation.

without ACPE operation

Speed increase without ACPE operation is small at long distance creeping run

Confirmation

Table 1, 2nd column heading:

ACPE-11-10

- *Distance to target at the point triggering conditions reached / Distance to speed measuring point.*

Justification:

- *For creeping test procedure, the distance to target at the point of acceleration will not be equal to distance to target for a stationary test procedure, therefore we suggest changing the column heading to accommodate for both test procedures*

Driving direction	Distance to target at the point triggering conditions reached / Distance to speed measuring point (m)	Tolerance on the longitudinal distance (m)	Presence of target
Forward	1.0	+ 0.1	Yes
Forward	1.0	+ 0.1	No *
Forward	1.5	-0.1	Yes
Forward	1.5	-0.1	No *
Rearward	1.0	+ 0.1	Yes
Rearward	1.0	+ 0.1	No **
Rearward	1.5	-0.1	Yes
Rearward	1.5	-0.1	No **

Conduct all test ? ; Standstill test 1.0/1.5m and Creeping test 1.0/1.5m ?

Proposal summary

■ Performance requirement

To modify test procedure based on UK proposal, speed increase without ACPE operation is small. It is not appropriate to quantify performance requirements.

→ “ACPE Suppression control function confirmation (check)” is appropriate

■ Proposal Summary

Direction	Test procedure	Creeping speed	Requirement	Remarks
Forward	based on UK proposal	based on 6.6.2	Confirm “ACPE suppression function”	<ul style="list-style-type: none"> Consider creeping speed, relationship between ACPE and AEB
Rearward		less than 4km/h		<ul style="list-style-type: none"> Consider <ul style="list-style-type: none"> technical feasibility Traffic accidents results

<Text amendment>

5.1.6.2. In case of acceleration while creeping

In case the distance between the creeping vehicle and the object does not allow for a fulfilment of the requirements of paragraph 5.1.6. (e.g. due to a considerable creeping speed) the manufacturer shall demonstrate to the satisfaction of the technical service that an ACPE intervention is triggered.



Thank you