

IVISTA

China Intelligent Vehicle Index

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Intelligent Parking Index Parking Assist System Test Protocol

(Version 2023)

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Parking Assist System Test Protocol

1 Scope

This document specifies the test methods of IVISTA China Intelligent Vehicle Index - Intelligent Parking Index - Parking Assist System.

2 Normative References

The following normative documents contain provisions which, through reference in this text, constitute indispensable provisions of this document. For dated references, only the dated edition applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB 34660 Road Vehicles - Requirements and Test Methods of Electromagnetic Compatibility

GB 5768.3 Road Traffic Signs and Markings - Part 3: Road Traffic Markings

GB/T 18385-2005 Electric Vehicles - Power Performance - Test Method

GB/T 34590 Road Vehicles - Functional Safety (All Parts)

GB/T 39263-2020 Road Vehicles - Advanced Driver Assistance Systems - Terms and Definitions

GB/T 40429-2021 Taxonomy of Driving Automation for Vehicles

GB/T 41630-2022 Performance Requirements and Test Methods for Intelligent Parking Assist System

JGJ 100 Code for Design of Parking Garage Building

ISO 16787 Intelligent Transport Systems-Assisted Parking Systems (APS)-Performance Requirements and Test Procedures

3 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

3.1

parking assist system; PAS

a system that can automatically detect the parking space and provide the driver with assist functions such as parking indication and/or direction control during vehicle parking

Note 1: Direction control includes lateral control or lateral and longitudinal control.

Note 2: Parking space can also be called "parking slot".

Note 3: The parking assist system is hereinafter referred to as the "system".

[Source: GB/T 41630-2022, 3.1, modified]

3.2

vehicle under test; VUT

a vehicle equipped with a PAS for testing

[Source: GB/T 41630-2022, 3.2, modified]

3.3

target parking space

a parking space used for parking-in and parking-out tests on the PAS of the VUT

3.4

slot search status

working status of the PAS searching for a parking slot

[Source: GB/T 41630-2022, 3.3]

3.5

assisted parking status

working status of the PAS assisting the driver in parking in or out by lateral control or lateral and longitudinal control

[Source: GB/T 41630-2022, 3.4, modified]

3.6

bordering vehicle; BV

a vehicle used to limit the parking slot boundary

[Source: GB/T 41630-2022, 3.5, modified]

3.7

number of kneading

during parking of the VUT, gear shifting to R and vehicle movement starting counted as the first kneading, and gear shifting from R to D or from D to R during kneading counted as one time of kneading respectively

[Source: GB/T 41630-2022, 3.8, modified]

3.8

adult pedestrian target; APT

an adult pedestrian test device for testing the active safety system

3.9

child pedestrian target; CPT

a child pedestrian test device for testing the active safety system

3.10

remote parking assist; RPA

intelligent parking function that the driver outside the VUT near the target parking space can park the VUT near the target parking space into the target parking space or park the VUT in the target parking space out of the target parking space through the one-button operation of a mobile phone or remote controller

4 Test Requirements

4.1 Proving ground and test environment

4.1.1 Requirements for test site

- a) The proving ground shall be flat and dry pavement, without visible moisture, obvious pits, cracks and other defects, and its slope shall be less than 1%;
- b) The proving ground shall be concrete or asphalt pavement;
- c) There shall be no barriers affecting the operation of the sensor on the proving ground;
- d) If the parking slot is marked, the marking shall be undamaged and clearly visible. The parking line shall be a white solid line with a width of 15 cm, and the size of the parking slot shall be subject to the distance measured from the inner side of the marking.

4.1.2 Requirements for test environment

- a) The wind speed shall not exceed 5 m/s, and there shall be no rain, snow, fog, dust, etc.;
- b) The temperature shall be 0 °C-45 °C;
- c) The environmental illuminance of the target parking space shall not be less than 2000 lux.

4.2 Test equipment

4.2.1 Target

The APT and CPT shall be swingable flexible target objects whose surface characteristic parameters can stand for the adult and child pedestrians above and adapt to the sensor system. Refer to ISO 19206-2 for specific requirements.



Fig. 1 Appearance of APT (Left) and CPT (Right)

Note 1: For flexible targets, after relevant national standards are published, the requirements of those national standards will prevail.

Note 2: If the manufacturer of the VUT believes that the flexible target does not meet the requirements of the VUT sensor for the target, please contact the IVISTA Management Center.

4.2.2 Requirements for data acquisition equipment and accuracy

- a) The sampling and storage frequency for dynamic data shall not be less than 100 Hz, and DGPS time shall be used for data synchronization between the VUT and the target object;
- b) All the equipment used during the test shall meet the requirements of dynamic data sampling and storage, and the sampling and storage frequency shall at least be 100 Hz;
- c) The position accuracy of the VUT and the target object shall be ± 0.02 m;
- d) The speed accuracy of the VUT and the target object shall be ± 0.1 km/h;

- e) The acceleration accuracy of the VUT shall be $\pm 0.01 \text{ m/s}^2$.

4.2.3 Bordering vehicle

M1 passenger cars can be used as bordering vehicles, or dummy vehicles with the same reflection characteristics as M1 passenger cars can be used as bordering vehicles.

Note: If the VUT's manufacturer considers that the bordering vehicle cannot meet the requirements of the VUT PAS sensor for the target, please contact the IVISTA Management Center directly.

4.2.4 Road curb

The road curb is arranged with reference to the size of "TF-type curb" in *Urban Road - Curb* (Atlas No. 05MR404) and the relevant construction requirements. The cross-sectional parameters of the curb are shown in Fig. 2, with a height from the ground of 12 cm ~ 20 cm, a width of 28 cm ~ 32 cm and a chamfer of $45^\circ \sim 90^\circ$.

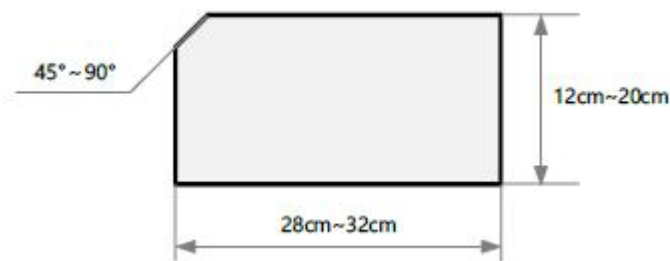


Fig. 2 Schematic Diagram of Curb Size

4.3 Vehicle under test

4.3.1 System initialization

If necessary, the PAS can be initialized before the test, including calibration of sensors such as radar and camera.

4.3.2 Vehicle condition confirmation

- a) The VUT shall be new with a traveled mileage of not more than 5000 km;
- b) The VUT shall be equipped with original new tires designated by the manufacturer. The tire pressure shall be the standard cold tire pressure recommended by the manufacturer. If more than one value is recommended for tire pressure, the tire shall be inflated to the pressure with the lightest load;
- c) The VUT shall be refueled to not less than 90% of the fuel tank capacity, with other fluids such as oil and water (e.g. coolant, brake fluid, and engine oil) added at least to the minimum indicated position. During the test, the fuel may decrease but shall not be lower than 50% of the fuel tank capacity;
- d) The mass of the VUT shall lie between the complete vehicle curb mass plus the total mass of the driver and test equipment (with the total mass of the driver and test equipment not exceeding 200 kg) and the maximum allowable total mass. No change shall be made to the conditions of the VUT after the test starts;
- e) For off-vehicle-chargeable new energy vehicles, the traction battery shall be fully charged according to 5.1 of GB/T 18385-2005. For non-off-vehicle-chargeable new energy vehicles, the test shall be prepared in their normal operation states. During the test, the power of the vehicle may decrease, but it shall not be less than 50% SOC.

4.3.3 Functional check

Before the test, it shall be checked whether the parking assist function, buttons, instruments and on-board central control panel of the VUT work properly.

4.4 Data recording and processing

4.4.1 Data record content:

- a) Software version information of the PAS of VUT;
- b) Longitudinal and lateral positions of VUT;
- c) Longitudinal and lateral speeds of VUT;
- d) Longitudinal and lateral accelerations of VUT;
- e) Position and motion data of the target.

4.4.2 Data processing requirements:

- a) For the longitudinal and lateral positions and deviation distances of the VUT, the original data shall be used, in m;
- b) The VUT speed shall be GPS speed, and the original data shall be used, in km/h;
- c) The longitudinal acceleration data of the VUT needs to be filtered by a 12-pole phaseless Butterworth filter with a cutoff frequency of 6 Hz, the average value taken every 2 s and measured in m/s^2 .

4.5 Test photos

The requirements for taking photos in the closed field test are as follows:

- a) Before installing the test equipment, take photos of the front left 45° of the VUT and the nameplate of the vehicle;
- b) After the test equipment is installed, take photos of the test equipment inside and outside the VUT.

5 Test Methods

5.1 Parking capability test

5.1.1 The parking capability test includes parallel, perpendicular and diagonal parking space test scenarios according to the type of the target parking space. Parallel parking spaces are subject to tests under parking-in and parking-out conditions; perpendicular and diagonal parking spaces are only subject to the test under the parking-in condition, and only reversing mode can be selected to enter the target parking space.

5.1.2 The VUT manufacturer may provide a pre-test report issued by a qualified third-party testing organization before the formal test. Where the VUT manufacturer does not provide a pre-test report, the test shall be conducted once under each test cycle. If the VUT manufacturer provides a pre-test result, the test shall be conducted according to the following rules:

- a) The first test:
 - The first test result is taken as the final result under the specific test cycle if it is the same as the pre-test result;
 - If the first test result deviates much from the pre-test result, the second test is conducted.
- b) The second test:

- The second test result is taken as the final result under the specific test cycle if it is the same as the pre-test result;
 - The average of the first and second test results is taken as the final result under the specific test cycle if the second test result still deviates much from the pre-test result, but it is the same as the first test result;
 - If the second test result deviates much from both the first test result and the pre-test result, the third test is conducted.
- c) The third test:
- If the third test result is the same as either the first or the second test result, the average of the two test results is taken as the final result under the specific test cycle;
 - If the third test result still deviates much from those of the previous two tests, stop the test, and conduct the test again after the reason is analyzed.

Note 1: If a sharp deviation exists between the final result of one test and the pre-test result, this one test will be recorded as invalid. After a total of 3 tests are recorded as invalid, the pre-test result will no longer be used. Only 1 test will be conducted under each follow-up test cycle.

Note 2: Whether there is a sharp deviation in the test results under the same condition is judged by whether the absolute value of the difference between the pre-test score and the formal test score under the same condition exceeds 5%.

5.1.3 The parking capability test cycles are shown in Table 1, and the detailed test rules are described in Annex A.

Table 1 List of Parking Capability Test Cycles

S/N	Type of Parking Space	Test Scenarios	Test Cycle
1	Parallel parking space	Scenario of parallel parking space with two bordering vehicles	Parking-in
2			Parking-out
3		Scenario of APT walking through parallel parking space with two bordering vehicles at a constant speed along the road edge	Parking-in
4			Parking-out
5	Perpendicular parking space	Scenario of perpendicular parking space with a pillar and bordering vehicle	Parking-in
6		Scenario of perpendicular parking space with markings	Parking-in
7		Scenario of CPT walking into the center of perpendicular parking space with two bordering vehicles	Parking-in
8	Diagonal parking space	Scenario of diagonal parking space with two bordering vehicles	Parking-in

5.1.4 Parking-in test: In order to ensure the consistency and validity of the test, the PAS shall be turned on when the VUT is stationary, and then the VUT shall enter the assisted parking status. When the VUT is 5 m away from the target parking space, the speed of the VUT in the slot search status shall be controlled within (10 ± 2) km/h, and the error of the distance between the outermost grounding points of the front and rear tires on the side of the VUT close to the parking space and the outer boundary of the parking space (excluding two vehicle rearview mirrors) shall be controlled within (1.2 ± 0.2) m. The test shall start with the idle parking space on the right side in the driving direction as the target parking space of the VUT. The schematic diagrams (see Fig. 3, Fig. 4, and Fig.5) are as follows:

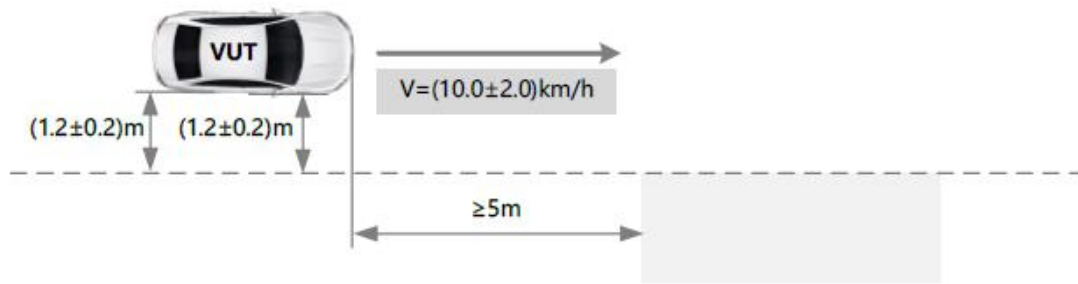


Fig. 3 Starting Status of VUT Parking-in Test for Parking Capability Test in Parallel Parking Space

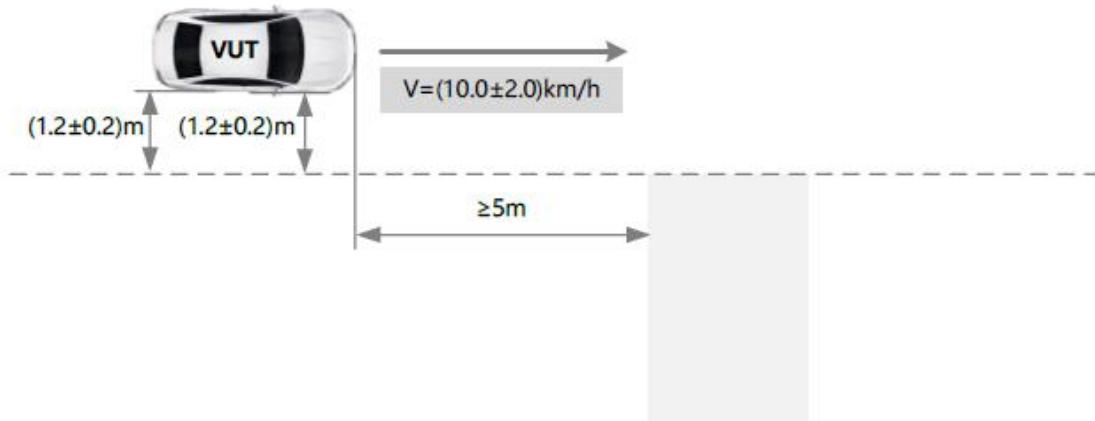


Fig. 4 Starting Status of VUT Parking-in Test for Parking Capability Test in Perpendicular Parking Space

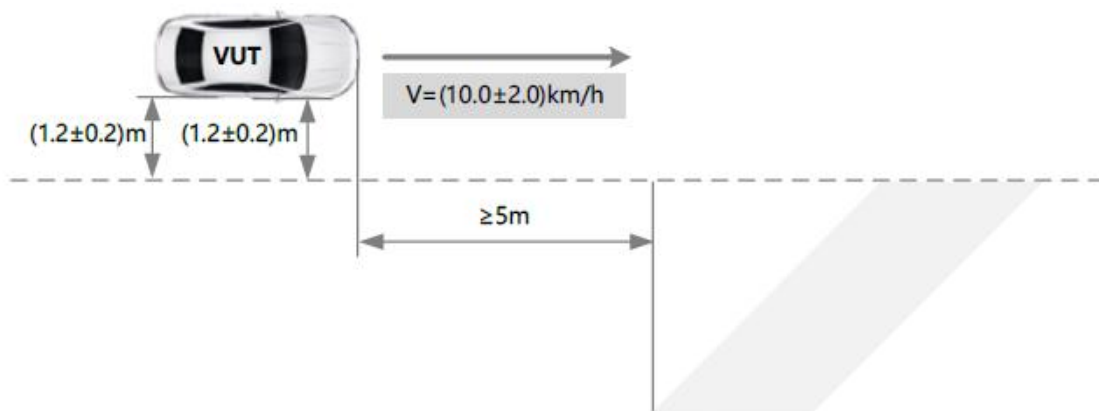


Fig. 5 Starting Status of VUT Parking-in Test for Parking Capability Test in Diagonal Parking Space

5.1.5 Parking-out test: In order to ensure the consistency and validity of the test, for test scenarios applicable to parking-out test cycles, the parking-in test of the corresponding test scenario shall be carried out first, and then the parking-out test of the corresponding scenario. It shall be ensured that the VUT shuts down and powers off at least once between the parking-out test and the parking-in test with a time interval of greater than 5 minutes. The starting status of the VUT in the parking-out test shall be subject to the final status of the VUT successfully completing the parking-in test. If the VUT fails to complete the parking-in test in the corresponding test scenario, the VUT shall be parked in the middle of the target parking space (see Fig. 6) as the starting status of the VUT in the parking-out test. No requirement is made for the parking direction of the VUT in the parking-out test.



Fig. 6 Parking-out Starting Status of VUT in Parking Capability Test

5.1.6 If the VUT PAS cannot control the longitudinal vehicle speed, the driver is required to control the speed within 5 km/h during kneading in the parking-in and parking-out tests.

5.1.7 After the start of the test, if the following conditions happen to the VUT before the successful completion of the parking-in or parking-out task, the test will be terminated in advance:

- a) The function of PAS is disabled in advance;
- b) The PAS sends a takeover request, indicating that it is unable to continue to complete the task;
- c) The VUT collides with the bordering vehicle, target object, curb, pillar, or wall.

5.2 Remote parking assist test

The test scenarios for the remote parking assist function include two types: parallel parking space with two bordering vehicles and perpendicular parking space with a pillar and bordering vehicle. It is required that the VUT should be subject to parking-in and parking-out tests in the two types of parking spaces, with one test under each test cycle. For the parking-in condition in the scenario of perpendicular parking space, the VUT is required to enter the target parking space by reversing mode. See Table 2 for the contents of remote parking assist function test, and see Annex B for detailed test rules.

Table 2 Contents of Remote Parking Assist Test

S/N	Test Object	Type of Parking Space	Test Cycle
1	Remote parking assist	Parallel parking space	Parking-in
2			Parking-out
3		Perpendicular parking space	Parking-in
4			Parking-out

5.3 Safety tip review

The objects of safety tip review include the user manual (publicly released document, not limited to paper version or electronic version) and function prompt. The review contents are shown in Table 3.

Table 3 Contents of Safety Tip Review

S/N	Review Contents	Review Items
1	Review of user manual	Definition of assist functions
2		Driver responsibility
3		Use conditions of parking function
4		Limitations of parking function
5	Review of function prompt	Prompt for opening and closing
6		Prompt for system failure and functional insufficiency

5.3.1 Review of user manual

The form of the user manual is not limited to textual content, but may also include the human-machine interaction learning process, safety education video or animation before the user uses the vehicle, and other forms that are easy for the driver to understand the use method and functional boundary of the intelligent parking function. The review items are shown in Table 4.

Table 4 Review Items of User Manual

S/N	Scoring Term
1	Definition of assist functions
2	Driver responsibility
3	Use conditions of parking function
4	Limitations of parking function

5.3.2 Review of function prompt

The review of function prompt includes "prompt for opening and closing" and "prompt for system failure and functional insufficiency". The specific contents are as follows:

- a) Enable the parking-in and parking-out functions of the VUT, and observe whether there are sound and image prompts when the relevant functions are enabled and disabled.
- b) During parking-in and parking-out of the VUT, set functional insufficiency and fault problems by means such as blocking the sensor or powering off, and observe whether there are prompts for system failure and functional insufficiency.

Annex A
Detailed Rules for Parking Capability Test

A.1 Parallel parking space

A.1.1 Scenario of parallel parking space with two bordering vehicles

A.1.1.1 Scenario description

As shown in Fig. A.1, the target parking space is a parallel parking space with two bordering vehicles, and the long side is composed of the curb and the extension line of the outer edge of the bordering vehicle. No parking space marking is drawn on the ground. In the figure, L is the parking space length and W is the parking space width. See Table A.1 for parking space dimensions, where X is the VUT length and Y is the VUT width (excluding exterior rearview mirrors).



Fig. A.1 Schematic Diagram of Parallel Parking Space with Two Bordering Vehicles

Table A.1 Dimensions of Parallel Parking Space with Two Bordering Vehicles

VUT Length	Parking Space Length, L	Parking Space Width, W
$X \leq 2.8\text{m}$	$L = X + 0.7\text{m}$	$Y + 0.2\text{m}$
$X > 2.8\text{m}$	$L = X + 0.5 \times (\max\{0.7\text{m}, 0.15 \times X\} + \min\{1.5\text{m}, 0.25 \times X\})$	$Y + 0.2\text{m}$

A.1.1.2 Test method

A.1.1.2.1 Parking-in test: The parking assist function is enabled when the VUT is in the test starting status specified in 5.1.4 and then the VUT parks in the target parking space. After the VUT parks in the target parking space, the parking-in test is completed and the test ends.

A.1.1.2.2 Parking-out test: The parking assist function is enabled when the VUT is in the test starting status specified in 5.1.5 and then the VUT parks out of the target parking space. After the VUT parks out of the target parking space, the parking-out test is completed and the test ends.

A.1.2 Scenario of APT walking through parallel parking space with two bordering vehicles at a constant speed along the road edge

A.1.2.1 Scenario description

As shown in Fig. A.2, based on the scenario of a parallel parking space with two bordering vehicles described in A.1.1.1, an APT walking across at a constant speed along the road edge, as a moving obstacle, is added to interfere with the parking-in and parking-out processes of the VUT.

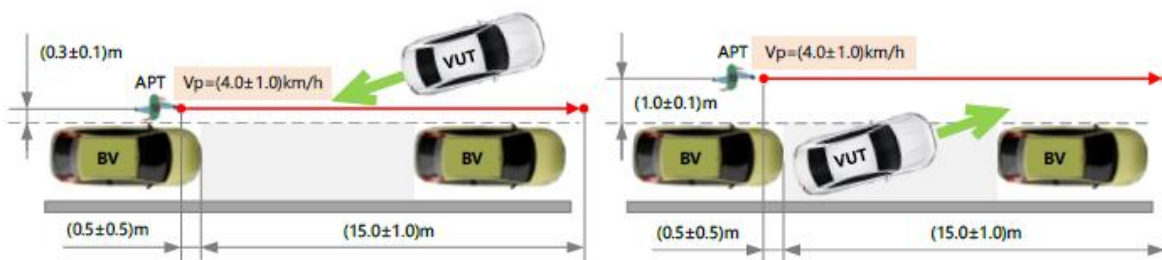


Fig. A.2 Parking-in (Left) and Parking-out (Right) Scenarios

A.1.2.2 Test method

A.1.2.2.1 Parking-in test: The parking assist function is enabled when the VUT is in the test starting status specified in 5.1.4 and then the VUT parks in the target parking space. The APT walks forward at a constant speed along the road edge before the VUT is about to enter the parking space after kneading. If the VUT does not take any avoidance measures, it shall be ensured that the APT collides with the rear or right side of the VUT (as shown in Fig. A.3). If the VUT stops and does not collide with the APT, it shall continue to complete the parking-in after the APT leaves the parking area. The test ends when one of the following conditions occurs:

- The VUT PAS detects an APT during kneading for parking-in and the VUT stops without colliding with the APT and can continue to successfully park in the target parking space after the APT leaves;
- The VUT PAS detects an APT during kneading for parking-in and the VUT stops without colliding with the APT and cannot continue to park in the target parking space as the parking function is disabled;
- The VUT collides with an APT or bordering vehicle.

A.1.2.2.2 Parking-out test: The parking assist function is enabled when the VUT is in the test starting status specified in 5.1.5 and then the VUT parks out of the target parking space. The APT walks forward at a constant speed along the road edge before the VUT is about to exit the parking space after kneading. If the VUT does not take any avoidance measures, it shall be ensured that the APT collides with the front or left side of the VUT (as shown in Fig. A.3). If the VUT stops and does not collide with the APT, it shall continue to complete the parking-out after the APT leaves the parking area. The test ends when one of the following conditions occurs:

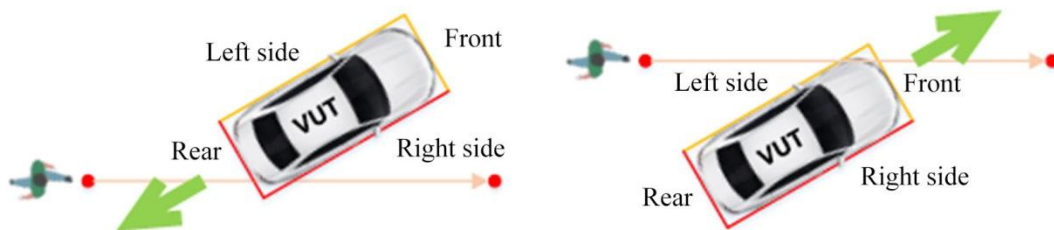


Fig. A.3 Effective Collision Between APT and VUT During Parking-in (Left)/Parking-out (Right)

- The VUT PAS detects an APT during kneading for parking-out and the VUT stops without actively colliding with the APT and can continue to successfully park out of the target parking space after the APT leaves;
- The VUT PAS detects an APT during kneading for parking-out and the VUT stops without actively colliding with the APT and cannot continue to park out of the target parking space as the parking function is disabled;
- The VUT collides with an APT or bordering vehicle.

A.2 Perpendicular parking space

A.2.1 Scenario of perpendicular parking space with a pillar and bordering vehicle

A.2.1.1 Scenario description

As shown in Fig. A.4, the target parking space is a perpendicular parking space with a pillar and bordering vehicle. The pillar is located on the left side of the bordering vehicle, the parking space is marked and fixed in size, and the side of the bordering vehicle body is parallel to the long

side of the target parking space. There is a wall with a length of 4 m ~ 5 m and a height of 1.5 m ~ 1.8 m in front of the parking space, and the distance between the wall and the target parking space is 5.5 m. The lateral offset between the bordering vehicle and the pillar is W . See Table A.2 for the calculation method of W , where Y is the width of the VUT (excluding exterior rearview mirrors). Two wheel stop blocks are placed 0.6 m from the bottom of the target parking space and 0.1 m from the left and right edges of the parking space. The stop block is 50 cm ~ 60 cm long, 12 cm ~ 16 cm wide, and 10 cm ~ 12 cm high.

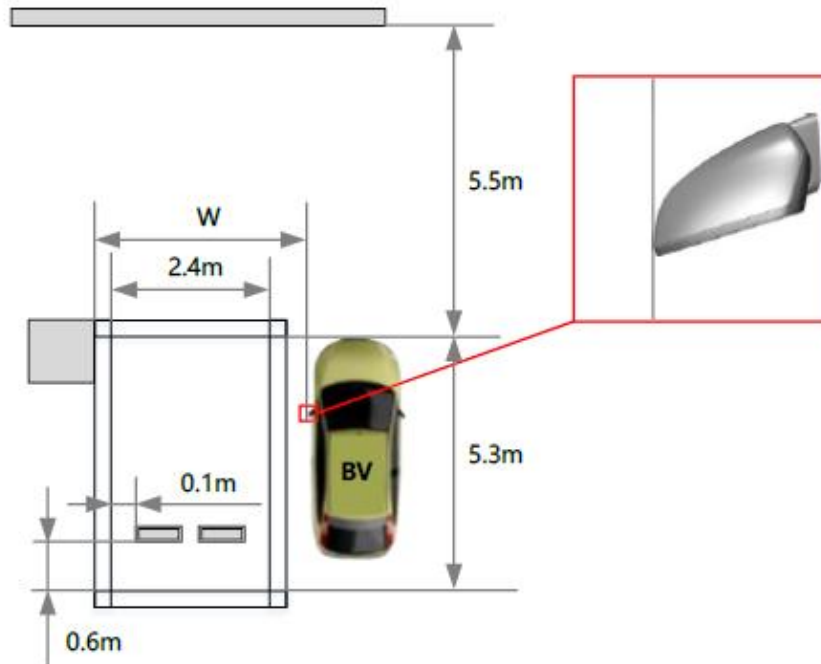


Fig. A.4 Schematic Diagram of Perpendicular Parking Space with a Pillar

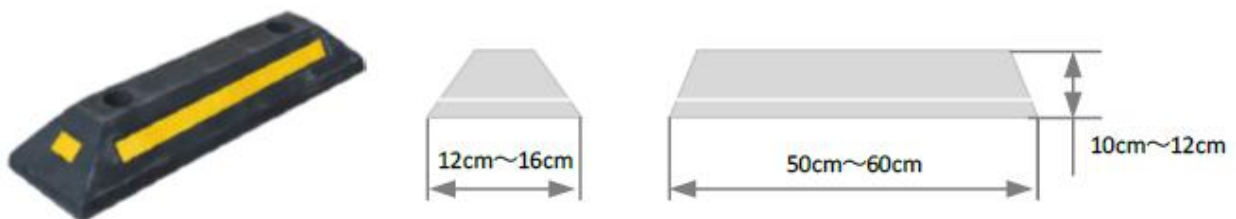


Fig. A.5 Dimension of Wheel Stop Block

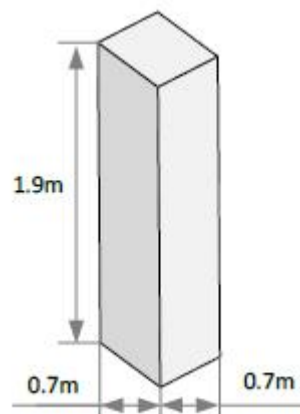


Fig. A.6 Dimension of Pillar

Table A.2 Value of Scenario Parameter W

Width Y of VUT (excluding exterior rearview mirrors)	Scenario Parameter W
$Y \leq 1.9\text{m}$	2.7m
$Y > 1.9\text{m}$	$Y + 0.8\text{m}$

A.2.1.2 Test method

In this scenario, only the parking-in test is carried out. The parking assist function is enabled when the VUT is in the test starting status specified in 5.1.4 and then the VUT parks in the target parking space. After the VUT parks in the target parking space, the parking-in test is completed and the test ends.

A.2.2 Scenario of perpendicular parking space with markings

A.2.2.1 Scenario description

As shown in Fig. A.7, this scenario consists of three consecutive perpendicular parking spaces with markings. The parking space in the middle is the target parking space.

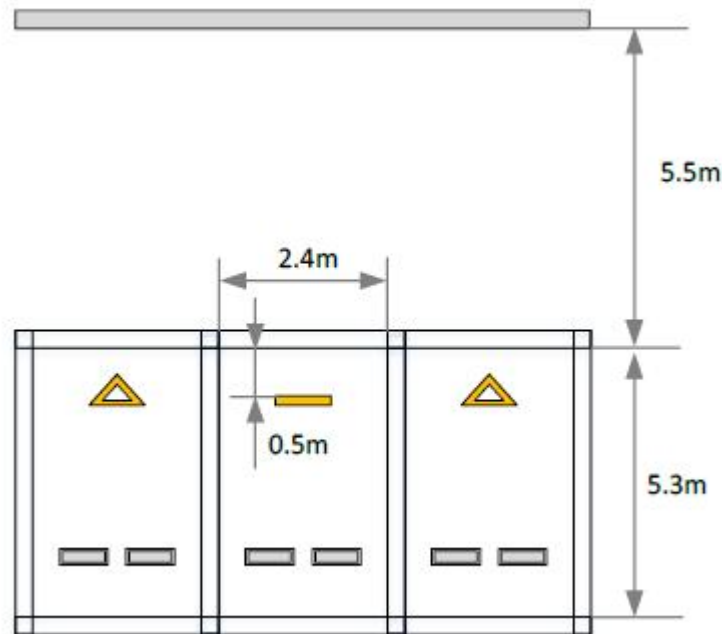


Fig. A.7 Schematic Diagram of Perpendicular Parking Spaces with Markings

An "A" type parking lock with a dimension of 0.48 m × 0.16 m × 0.30 m is placed 0.5 m from the inside the front-end markings of the three parking spaces. During the test, the parking lock of the target parking space is retracted to the ground, and the parking locks of the parking spaces on both sides are unfolded and erected. There is a wall with a length of 4 m ~ 5 m and a height of 1.5 m ~ 1.8 m in front of the parking space, and the distance between the wall and the target parking space is 5.5 m.

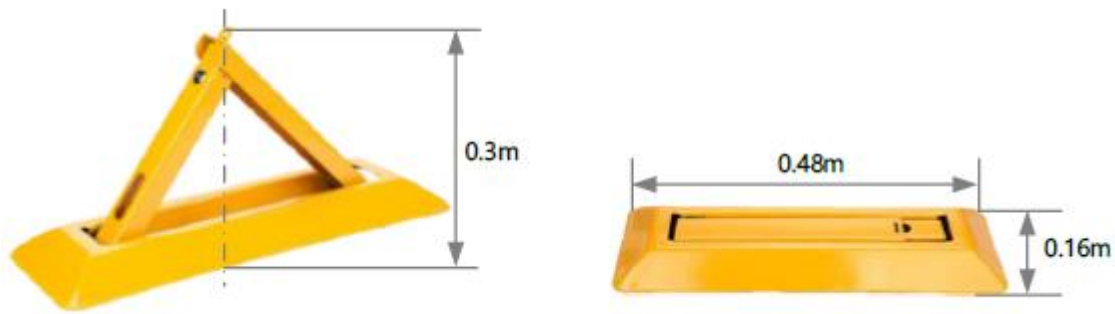


Fig. A.8 Dimension of "A" Type Parking Lock

A.2.2.2 Test method

Same as A.2.1.2.

A.2.3 Scenario of CPT walking into the center of perpendicular parking space with a pillar and bordering vehicle

A.2.3.1 Scenario description

As shown in Fig. A.9, based on the scenario of a perpendicular parking space with a pillar and bordering vehicle described in A.2.1.1, a CPT walking into the center of the target parking space, as a moving obstacle, is added to occupy the target parking space, so that the target parking space is insufficient to park the VUT.

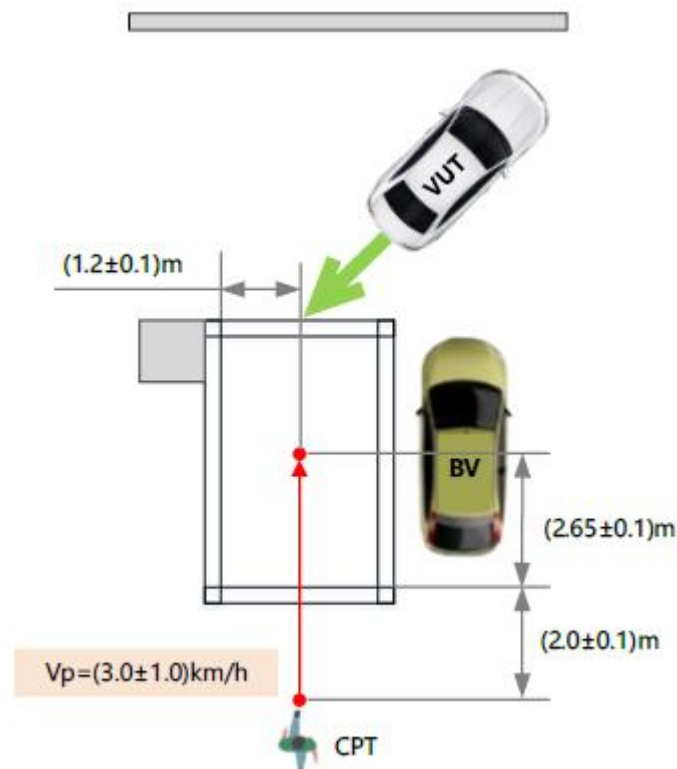


Fig. A.9 CPT Walking into the Center of Parking Space with a Pillar and Bordering Vehicle

A.2.3.2 Test method

In this scenario, only the parking-in test is carried out. The parking assist function is enabled when the VUT is in the test starting status specified in 5.1.4 and then the VUT parks in the target parking space. When the rear of the VUT passes by the front edge of the target parking space, the

CPT begins to walk toward the target parking space. If the VUT detects that the CPT occupies the target parking space and stops, the test under this condition ends.

A.3 Diagonal parking space

A.3.1 Scenario of diagonal parking space with two bordering vehicles

A.3.1.1 Scenario description

As shown in Fig. A.10, the target parking space is a diagonal parking space with two bordering vehicles, which are parallel to each other and form an inclination angle of 45° with the curb. The parking space length $L=X+Y$ and the width $W=Y+1.0\text{m}$, where X and Y are the length and width of the VUT respectively (excluding exterior rearview mirrors).

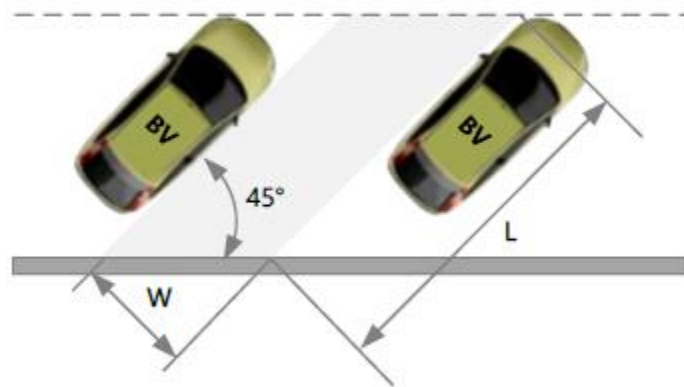


Fig. A.10 Schematic Diagram of Diagonal Parking Space with Two Bordering Vehicles

A.3.1.2 Test method

In this scenario, only the parking-in test is carried out. The parking assist function is enabled when the VUT is in the test starting status specified in 5.1.4 and then the VUT parks in the target parking space. After the VUT parks in the target parking space, the parking-in test is completed and the test ends.

Annex B Detailed Rules for Remote Parking Assist Test

B.1 Scenario of parallel parking space

B.1.1 Scenario description

As shown in Fig. B.1, the scenario setting is the same as described in A.1.1.1.



Fig. B.1 Schematic Diagram of Parallel Parking Space with Two Bordering Vehicles

B.1.2 Test method

B.1.2.1 Parking-in test: After the VUT correctly identifies the target parking space near the target parking space, the tester sends an instruction to activate the remote parking assist function at a distance of not more than 6 m from the VUT. The VUT parks in the target parking space. After the VUT parks in the target parking space and stops, the parking-in test is completed and the test ends.

B.1.2.2 Parking-out test: The initial status of the VUT for parking-out test is determined according to the method in 5.1.5. The tester sends an instruction to activate the remote parking assist function at a distance of not more than 6 m from the VUT. The VUT parks out of the target parking space. After the VUT parks out of the target parking space and stops, the parking-out test is completed and the test ends.

B.2 Scenario of perpendicular parking space

B.2.1 Scenario description

As shown in Fig. B.2, the target parking space is a perpendicular parking space with a pillar and bordering vehicle. The pillar is located on the left side of the bordering vehicle, the parking space is marked and fixed in size, and the bordering vehicle body is parallel to the edge line on one side of the target parking space. There is a wall with a length of 4 m ~ 5 m and a height of 1.5 m ~ 1.8 m in front of the parking space. The distance between the wall and the target parking space is 5.5 m, and the lateral offset between the bordering vehicle and the pillar is 2.7 m. Two wheel stop blocks are placed 0.6 m from the bottom of the target parking space and 0.1 m from the left and right edges of the parking space. The stop block is 50 cm ~ 60 cm long, 12 cm ~ 16 cm wide, and 10 cm ~ 12 cm high.

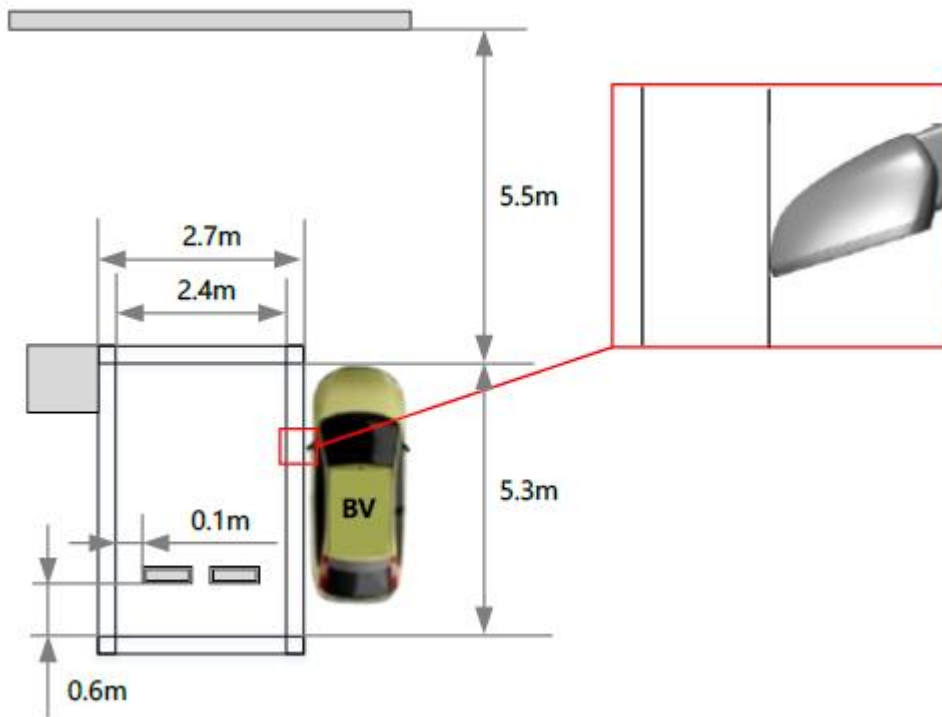


Fig. B.2 Schematic Diagram of Perpendicular Parking Space with a Pillar and Bordering Vehicle

B.2.2 Test method

B.2.2.1 Parking-in test: After the VUT, which is perpendicular to the target parking space, correctly identifies the target parking space near the target parking space, the tester sends an instruction to activate the remote parking assist function at a distance of not more than 6 m from the VUT. The VUT parks in the target parking space. After the VUT parks in the target parking space and stops, the parking-in test is completed and the test ends.

B.2.2.2 Parking-out test: The initial status of the VUT for parking-out test is determined according to the method in 5.1.5. The tester sends an instruction to activate the remote parking assist function at a distance of not more than 6 m from the VUT. The VUT parks out of the target parking space. After the VUT parks out of the target parking space and stops, the parking-out test is completed and the test ends.