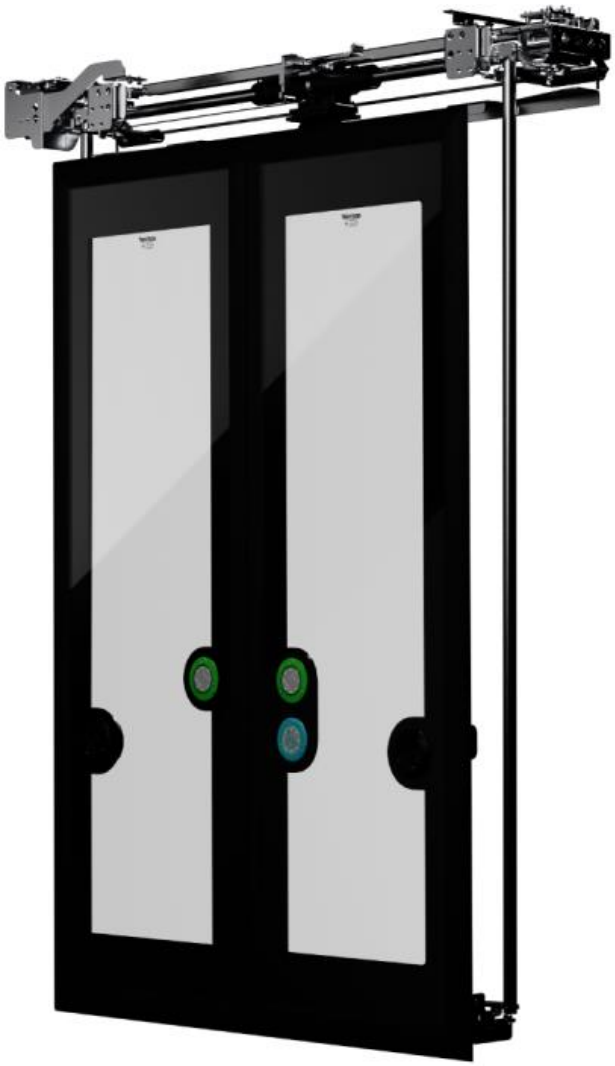

CM

PS2 Electric Ventura DCU

Commissioning Manual

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Release date	2024-07-17
Document ID	PS2200006
Project name	Plug Sliding Door System 2
Project ID	PS2

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Revision history

Revision	Date	By	Description
2.1	2024-07-17	Prepared: *O. Post*	Updated 'Purpose', 'Scope' and 'References' § Connect the buttons: added 'cut the tubes straight' Updated contact page
2.0	2022-05-03	Prepared: *M.Stoelinga*	Updated preface Added latest reg 107 reference and deleted older versions Minor text changes Added 'remove blue foam' subchapter Added 'first installation kit' subchapter Moved 'overcenter functionality' subchapter Added 'final commissioning checks' subchapter
1.0	2019-05-27	Prepared: *M.Sandtmann*	Initial release

Preface

The Quality System of Ventura Systems is accredited to *IATF 16949:2016* and *ISO 14001:2015*.

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1 Introduction

1.1 Purpose

This commissioning manual is provided to guide trained service mechanics through the commissioning steps of the Ventura door system.

1.2 Scope

This manual is intended for the Ventura electrically driven plug slide door system PS2 with DCU.

1.3 Definitions

1.4 Acronyms and Abbreviations

Abbreviation	Description
ISO	International Standardization Organization
DCU	Door Control Unit
HQ	Headquarters

Table 1: Acronyms and abbreviations

1.5 References

1.5.1 External documents

#	Reference	Description	Date
1	IATF 16949:2016	Automotive quality management system standard	2016-10-01
2	ISO 14001:2015	Environmental management systems – Requirements with guidance for use	2015-10-01
3	ISO 9001:2015	ISO Standard for Quality Management Systems – Requirements.	2015-10-01
4	REG 107 Rev 08	Uniform provisions concerning the approval of category M2 or M3 vehicles with regard to their general construction (Incorporating all valid text up to: Supplement 1 to 08 series of amendments)	2020-11-02
5	TS 160	Bus door safety systems	2021-12-01

Table 2: External documents

1.5.2 Ventura Systems documents

#	Reference	Type	Description	Revision	Date
1	QM000001	DG	Documentation Guideline	6.0	2024-04-18

Table 3: Ventura Systems documents

1.6 Overview

The list below shows a brief overview of the contents of each chapter:

1. gives an introduction, definitions and overview of this document.
2. contains the general door system safety instructions, safety symbols and disclaimer.
3. contains information about the general lay-out of the door mechanism.
4. contains general checks before commissioning the mechanism.
5. contains instructions for commissioning the mechanism.

2 Safety of the door system

2.1 General

Safety of the operator and bystanders is one of the main concerns in designing and developing a new piece of equipment. Ventura's door systems have the proper safety features for common use of the system. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. As you install, operate, or maintain the door system, you must be alert to potential hazards. Make sure you have the necessary training, skills and tools to perform any assembly, or maintenance procedures. Improper operation and maintenance of this door system may result in a dangerous situation that may cause injury or death.

Ventura Systems cannot anticipate every possible circumstance that may involve a potential hazard. The warnings in this document and on the product are not all-inclusive. If a method of installation or operation is used, which is not specifically recommended by Ventura Systems, you must satisfy yourself that it is safe for you and for others. You should also ensure that the door system will not be damaged or be made unsafe by the installation and/or operational methods you choose. The information, specifications and illustrations in this document are based on the information that was available at the time this document was written and can change at any time without notice.

2.2 Disclaimer

The information contained in this document is based upon reliable technical data at the time the document was published. These instructions are intended for use by persons having the technical knowledge to install, maintain or repair this door system. The instructions are to be used at the mechanic’s own discretion and risk. Ventura Systems assumes no responsibility for results obtained or damage incurred from the use of this material either in whole or in part by the installer. This document provides basic instructions for handlings of the door system in a step-by-step sequence that will work in most situations. While effort has been made to ensure the information in this document is correct and complete, we would appreciate it if you would contact us in case of errors.

2.3 Safety alert symbols

This document contains safety messages which alert you to potential personal injury hazards. Obey all safety messages in this document to avoid possible injury or death. The following keywords and layouts call for your attention: DANGER, WARNING, CAUTION and NOTICE. Below are examples of these safety messages. The NOTE message is used for additional information not threatening the mechanic, bystanders, nor the door system.

DANGER!

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations.

WARNING!

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION!

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE

Indicates that equipment or property damage can result if instructions are not followed.

NOTE

Additional information important but not threatening to people or the system.

2.4 Safety instructions

WARNING!

This door system is designed for a specific application; **DO NOT modify or use this unit for any application other than for which it was designed.**

A door system operated improperly or by untrained personnel is dangerous. Lack of operation knowledge may cause high risk.

Do not install, maintain or operate this door system if it is damaged. If you are in doubt if the door system has a defect, immediately stop your work and contact Ventura Systems.

Do not connect the door system to air or electric supply during the maintenance process. If the manual states otherwise, follow the manual.

Do not attempt to install, maintain or operate the door system under influence of drugs or alcohol.

NOTICE

Do not modify the door system or safety devices. Unauthorized modifications may impair its function and safety.

If equipment has been altered in any way from the original design, Ventura Systems does not accept any liability for injury or warranty.

If replacement of parts is necessary, genuine factory replacement parts must be used to restore the door system to its original specifications.

*Always disconnect the air and/or electric power while replacing parts. Safety features may not be active while replacing parts.

Ventura Systems will not accept responsibility for damages as a result of the use of unapproved parts.

While working on the Ventura door systems wear appropriate personal protective equipment.
This list may include but is not limited to:

- Protective shoes with slip resistant soles
- Protective goggles, glasses or face shield
- A hard hat

Follow the regional and country laws and safety precautions.

3 Door mechanism description

3.1 Standard mechanism lay-out

The mechanism layout given here is standard for an electric mechanism with a Ventura DCU. It is not a representation of a specific mechanism but a general, indicative image.

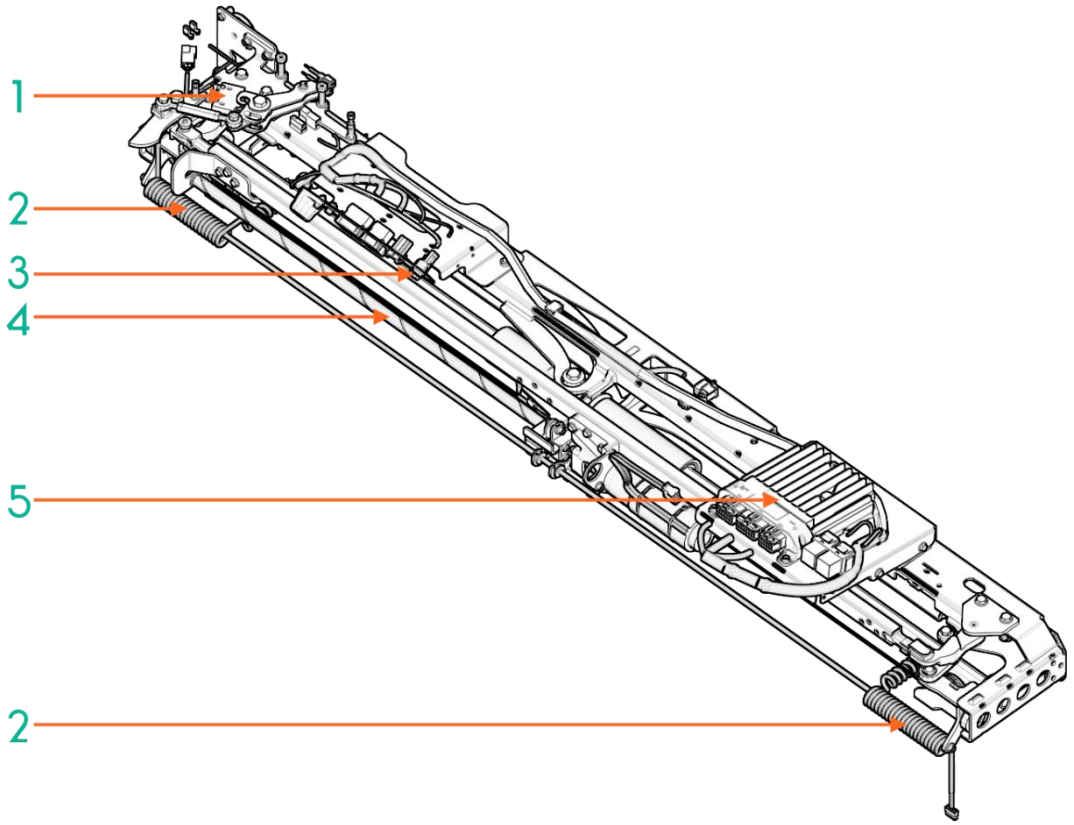

Figure 1: Indication of parts

1. Cams & switches
2. Spiral cable
3. Workshop button
4. Actuator
5. Ventura DCU

NOTES

The mechanism is one of Ventura's most comprehensive models. Possibly one or more options are not present on the mechanism actually ordered.

Left and right are defined looking from the inside of the vehicle.

Illustrations in the manual may differ from actual supplies.

4 Commissioning checks

Before the final adjustments are made for commissioning the door system, some safety checks are to be done.

4.1 Check torque settings

Check if all door system torque settings have been applied according to specification as given in the Installation Manual. This can be done by checking the torque markers, if present.

Figure 2: Fastener marked with a torque marker

4.2 Remove blue foam

Blue padding
Check if there is blue padding on parts of the door system. If there is, remove it. The padding can prevent the door mechanism from functioning properly.

Figure 3: Blue padding

4.3 Tie wraps

Tie wraps
Check the moving parts of the door system for tie wraps. Remove the white tie wraps, they are used to secure components during transportation. Not removing these white tie wraps can prevent the door mechanism from functioning properly. Black tie wraps are used to secure parts on the mechanism and are meant for permanent application.

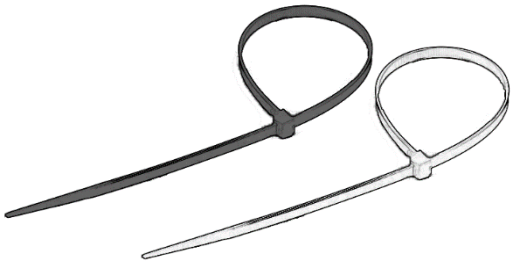

Figure 4: Black and white tie wraps

NOTICE

If present, follow the instructions written on the parts, whether or not to remove the tie wraps.

4.4 Remove red plugs

Red plugs
When the system has pneumatics, all pneumatic components need to be connected following the pneumatic scheme. Check the pneumatic components and air tubes for red plugs. When there are red plugs in the tubes, remove them and connect the loose end to the right component. When there are red plugs in components, connect the right tube to the component.

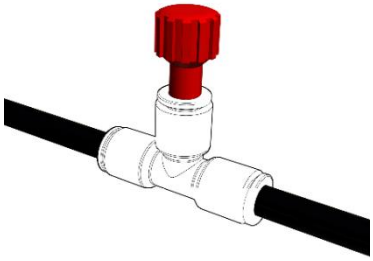

Figure 5: Red plug in pneumatic component

4.5 Door moving freely

Check manually if the door leaves are able to move freely from closed to fully open position (without pressure). The door should not collide into or slide over other surfaces while moving.

4.6 Connect buttons

- Make a cut-out in the side of the vehicle.
- (Emergency) buttons can be electric (1), pneumatic (2) or both. In case of pneumatics there is an air inlet (3) and outlet (4). Connect the pneumatics according to the pneumatic schematic.

NOTICE

It is important to cut the tubes straight. Use a tube cutter.

- Screw the button in place.
- Put the cover in place if applicable.

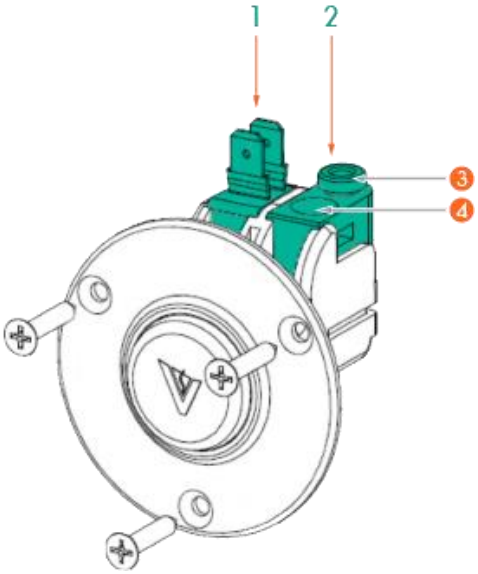

Figure 6: Connect the buttons

4.7 Connect pneumatics

WARNING!

Be sure all safety checks have been executed before applying power.

Connect the pneumatic tube from the vehicle's pneumatic system to the filter regulator to apply air pressure to the door system. Be aware to connect the pneumatic tube with air pressure to the correct side of the filter regulator.

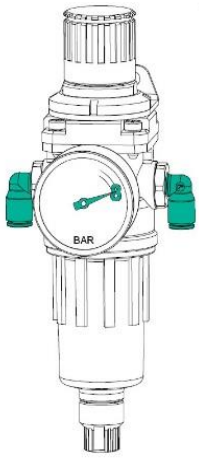

Figure 7: Filter regulator

4.8 Connect power

WARNING!

Be sure all safety checks have been executed before applying power.

Connect the cable loom of the door mechanism to the designated interface connector on the vehicle side. If necessary, look at the electrical schematic.

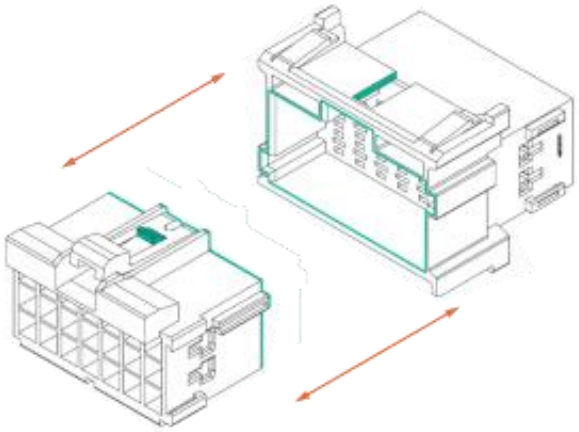

Figure 8: Connect power supply

5 Commissioning

5.1 First installation kit

After mechanical installation of the door system and in case the wiring in the vehicle is not yet completed, a “first installation kit” can be used to power up the door system. With this first installation kit you can check if the door is running properly or perform a door calibration. This “first installation kit” can be provided by Ventura.

The kit has a supply cable that needs to be connected to a power source, 24VDC for common systems. On the other side the kit connects to the Vehicle Interface (VI) connector of the mechanism. The connector that plugs into the Vehicle Interface connector also has a provision that puts the door system into “service mode” which allows it to be opened and closed via the workshop button, regardless of the state of the CAN communication (or lack of CAN communication).

There is also the possibility to reset the emergency valve of the system by using the reset button on the “first installation kit”. Contact Ventura Systems for more details on the “first installation kit”.

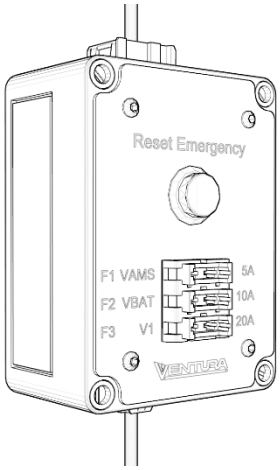

Figure 9: First installation kit

WARNING!

Be aware the door can move as soon as the 24 Volt is connected!

5.2 Calibrating the door system (Ventura DCU)

The calibration process is essential for the DCU to be able to control the door system. The calibration process is to define the positions of the door leaves in open and closed position.
These steps must be performed after:

- New installation of the door system.
- Configuration of the door control movement (Reed switches, potentiometer or cams + sensors, whichever is applicable).
- Re-adjustment of door system parts (door leaves, door shafts, guiding brackets or bottom supports).

CAUTION!

Be aware the system could move when applying power and/or pressure to it.

1. Push and hold the workshop button (1) regardless of the position of the door leaves. The Ventura DCU will now move the door to closed position.
2. If the door is already in closed position or has moved into closed position, a green light will flash once on the Ventura DCU. Hold the workshop button.
3. The Ventura DCU will now move the door slowly into open position. If the open position is reached, a green light will flash twice on the Ventura DCU.
4. Release the workshop button. The open and closed positions have been set.

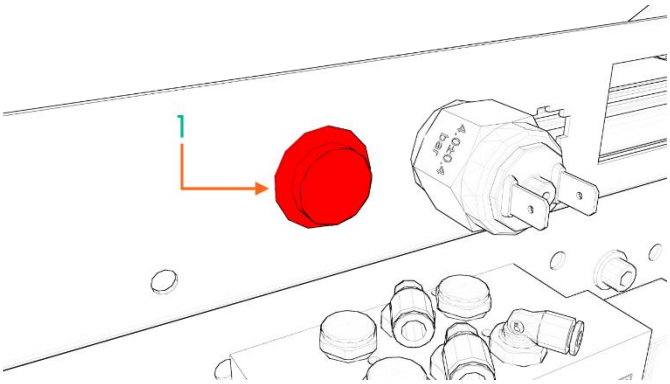

Figure 10: Workshop button

5.3 Over center functionality

The over center functionality is a locking mechanism that prevents the door leaves from opening at low or medium force.

An easy way to see if the system has an over center position, is to check if the door mechanism has an unlock cylinder (1), otherwise known as a press-out device. This device is used in emergency situations to open the door system by pressing the door mechanism out of the over center position.

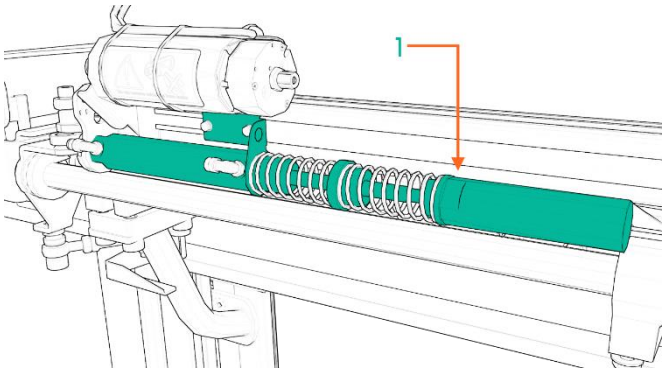

Figure 11: Emergency press-out device

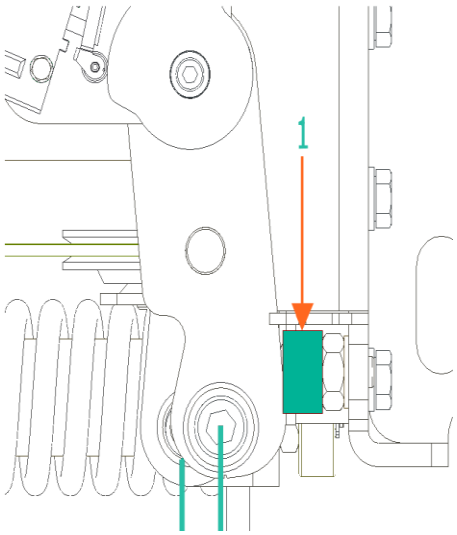

Figure 12: Over center electric PS with unlock cylinder

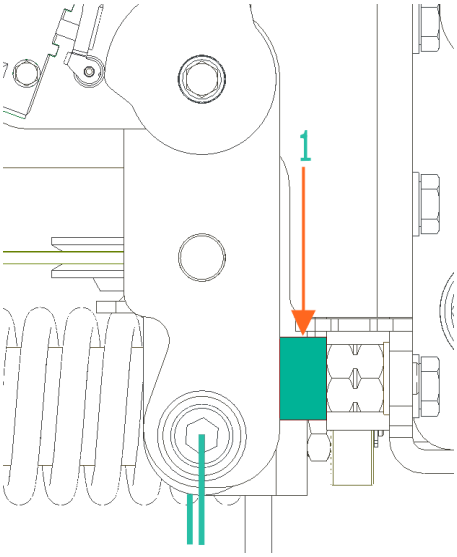

Figure 13: Over center pneumatic with unlock cylinder

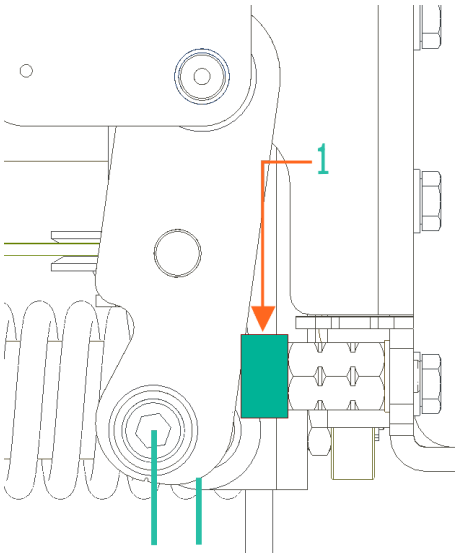

Figure 14: No over center function

- Check if the length of the soft stopper (1) is one or two units. If the soft stopper length is three units, it means there is no over center functionality.
- With over center functionality:
    1. Put the door in fully closed position.
    2. Check if the lever touches the end stop.
    3. If the lever does not touch the end stop or the markings are incorrect, check adjustments. If adjustments are incorrect, contact Ventura Systems.

5.4 Configuring door leaf positions: cams + switches (if needed)

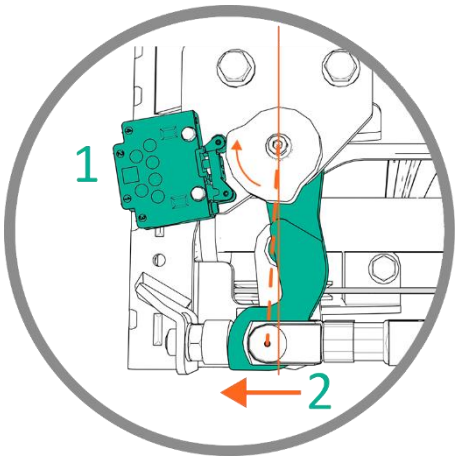

Figure 15: Closed switch and over center lever, top view

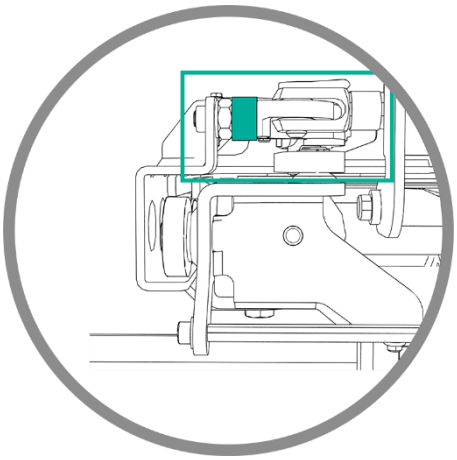

Figure 16: Over center soft stopper, side view

The closed switch (1) is located in the left part of the door mechanism and is activated/released by the over center lever. When the doors close, the rod (2) is pushing the lever over center, shown by the dashed orange line making an angle with the center line. In this process, the closed switch is activated. When the doors open again, the switch is released. See left image. The over center soft stopper is shown in the image to the right. Below a magnification of the marked area from the above image is shown:

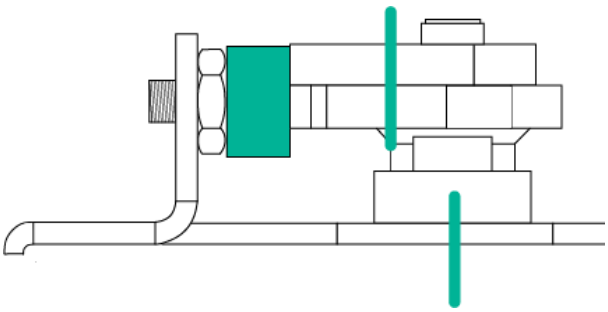

Figure 17: Over center mechanism

The green marks in the image indicate the positions of the rotation centers of the lever, the upper in front (on the rod), the lower in the back (on the mechanism frame).

The closed switch needs to be adjusted. This could be done using the Ventura adjustment tool 6–8 mm P/N VB8538, or else a similar tool.

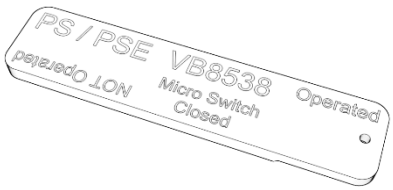

Figure 18: Adjustment tool VB8538

WARNING!

Pinch-point hazard!
The following steps have to be performed while parts of the door system are moving.

When the doors are in closed position, the closed switch (2) has to be activated. If the closed switch is not activated, follow the next steps to adjust it.

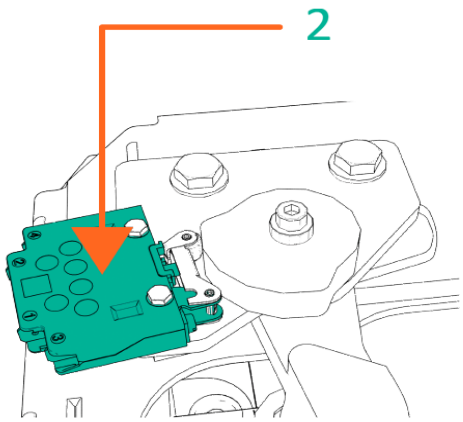

Figure 19: Closed switch

- Place the door in an open position.
- Place the 6 mm side of the adjustment tool between the door mechanism and the end stopper (see image).
- Close the door and move on to the next steps.
  Be aware of pinch point hazard.

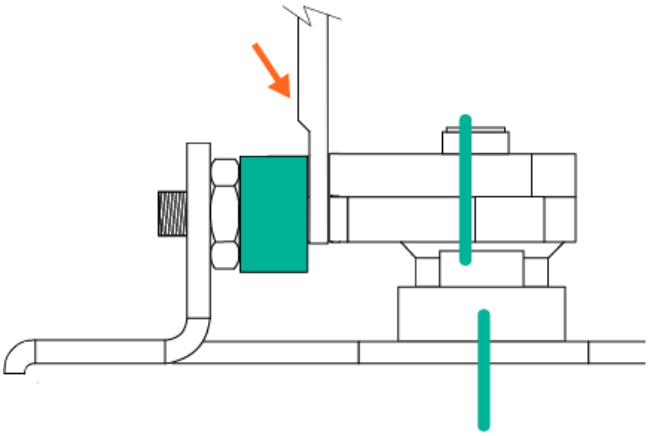

Figure 20: Position the 6 mm adjustment tool

- Unscrew the cam with an Allen key.
- Turn the cam to a position where the microswitch activates (see image).
- Fasten the cam.
- Place the door in an open position and move on to the next steps.

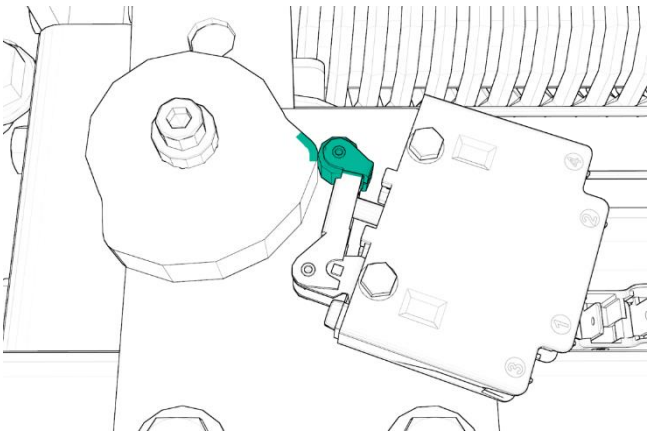

Figure 21: Adjusting cam position

- Place the 8 mm side of the adjustment tool between the door mechanism and the end stopper (see image). Be aware of pinch point hazard.
- Close the door.
- Check if the closed switch activates. The switch should NOT be activated.
- If the switch activates, redo the previous steps.

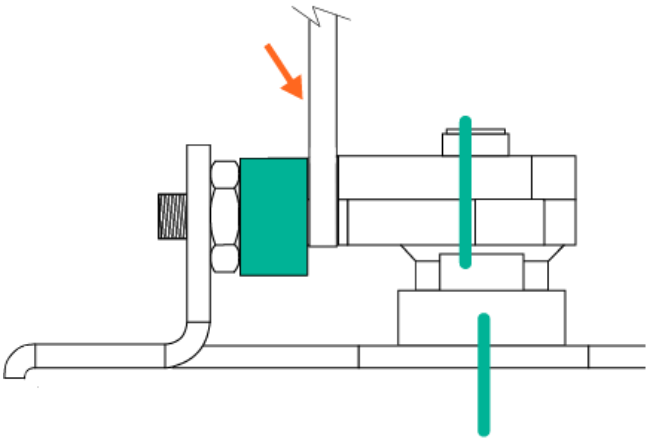

Figure 22: Position the 8 mm adjustment tool

WARNING!

Remove the power and/or pressure from the system after executing these steps and before you continue.

5.5 Sensitive edge

Sensitive edges are installed inside the seal of the leading edge of the door leaves. They provide line of touch sensing along surfaces when the doors are in operation. The activation of the sensitive edge results in a signal being send to the control system. The control then stops and reverses the door movement. When one of the sensitive edges is not working correctly, the following steps need to be checked.

CAUTION!

Malfunctioning sensitive edges have to be replaced immediately.

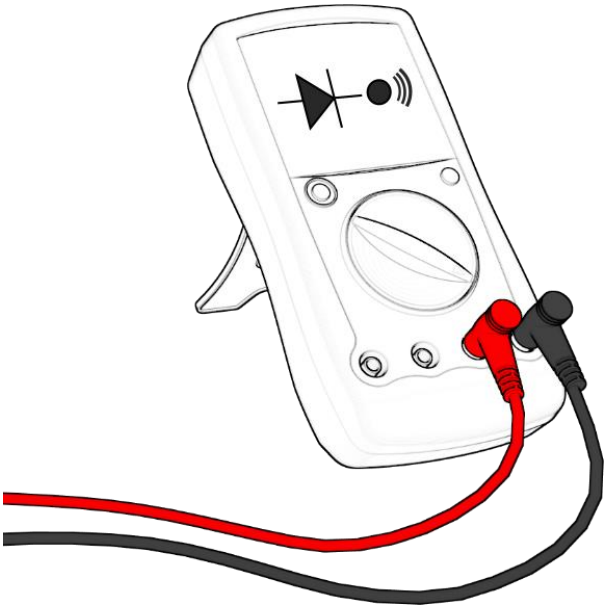

Figure 23: Multimeter in continuity mode

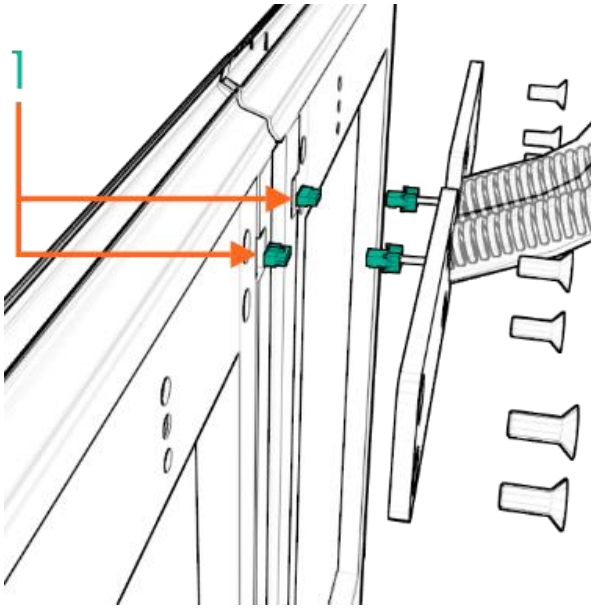

Figure 24: Sensitive edge connector

- Consult the electrical drawing to see which type of sensitive edge is used (with or without resistor).
- Remove the door leaf from the door arm and disconnect the sensitive edge from the spiral cable.
- Connect a multimeter in continuity mode to the connector of the sensitive edge (1).
    - Sensitive edge without resistor:
        - Sensitive edge not pressed = resistance infinite (R = ∞)
        - Sensitive edge pressed R ≈ 0 Ω
    - Sensitive edge with resistor:
        - Sensitive edge not pressed R = 1200 or 8200 Ω
        - Sensitive edge pressed R ≈ 0 Ω
        - Sensitive edge malfunctioning = resistance infinite (R = ∞)

5.6 Emergency inhibit/reset valve

Depending on the applicable requirements, the emergency inhibit/reset valve prevents operation of the emergency triggers while the vehicle is at speed.
This safety feature must be tested before delivery of the vehicle and during maintenance. The emergency inhibit/reset valve is not adjustable.

If the safety feature is not working:

- Test if the control signal (1) is active when required.
- Test incoming pneumatic pressure (see pneumatic schematic).
- Test outgoing pneumatic pressure when the valve receives a control signal (1) and check the incoming pneumatic pressure. If the valve is not switching, replace the emergency inhibit/reset valve. See pneumatic schematic for the correct pressure.

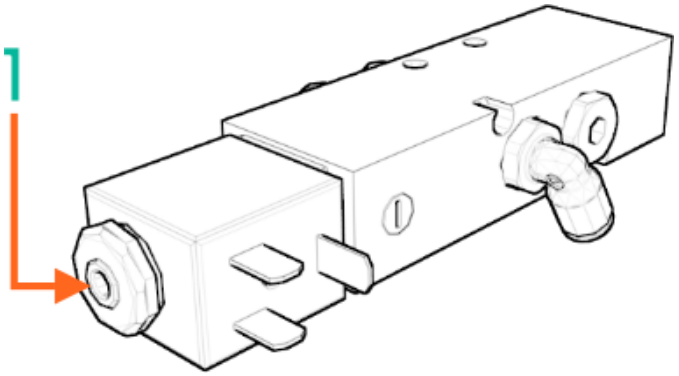

Figure 25: Emergency inhibit/reset valve

5.7 Detection beam

This paragraph explains how to test the detection beams. All types of detection beams have a LED indication light or emit light that should be visible when closely inspected.

NOTE

Infrared light is not visible to the naked eye. Use a camera or a smartphone camera to see if the light is emitting.

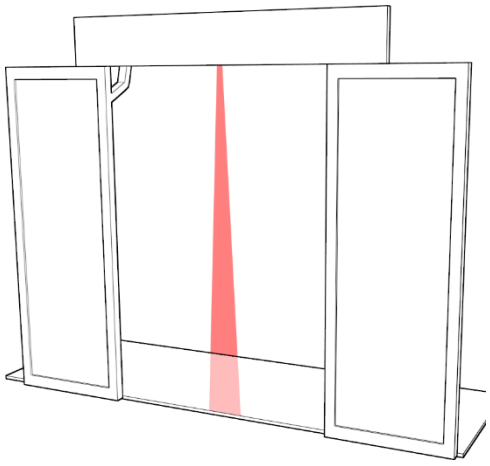

Figure 26: Cone beam top sensor

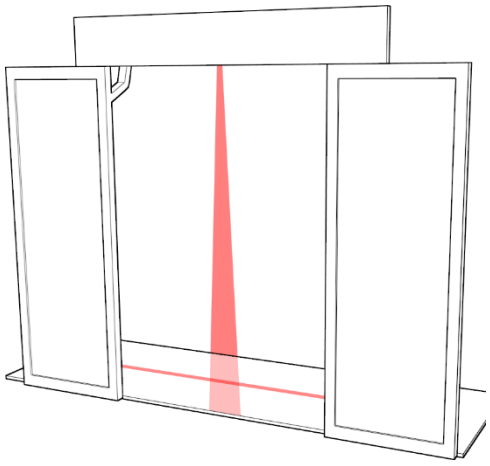

Figure 27: Cone beam top sensor and horizontal beam

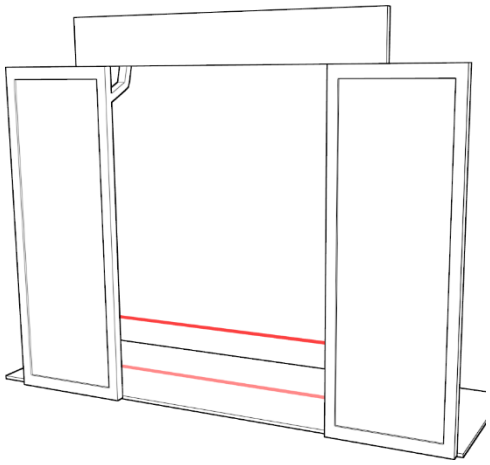

Figure 28: Double horizontal beam

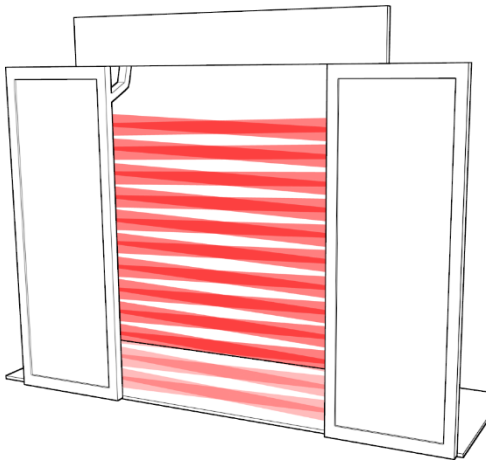

Figure 29: Light curtain

WARNING!

Do not place a person between the door leaves to test the detection beams while operating the door system.

- Check if the sensor is working by checking if the LED light is active, or by trying to operate the door while blocking the beam with an object.
- If the sensor is not working but the LED light is active, check the DCU settings with the DCU diagnostics software.
- If the sensor is not working and the LED light is not active, check the wiring (see electrical scheme for the correct connecting of the sensor(s) to the cable loom).

5.8 Final checks

To check if the door system works correctly after commissioning, the following checks can be done.

CAUTION!

Be aware the system could move when applying power and/or pressure to it.

- Check fuse rating according to the system layout drawing.
- Check CAN termination.
  - Turn off the vehicle.
  - Connect a multimeter set to resistance on CAN H and CAN L.
  - The measured resistance should be 60 Ω ± 10%.
- Check network configuration on door 1 (only necessary if the DCU is type 1, 3 or 6). This can be checked after calibrating door 1. If the number of detected DCUs does not correspond to the number of doors, check if all DCUs are connected and powered and recalibrate door 1.
- Check parameter and software configurations.
  - Is the current software version of the DCU the latest accepted.
  - Are customer specific settings, including but not limited to buzzer or button settings, set to the requirements of the end user?
  - Check if DTC174 is not active. If this DTC is active, consult DTC info in v-diag manual.
- Check v-diag for other DTCs. If there are any active DTCs, consult DTC info in v-diag manual.

The following checks are not obligatory but useful to find problems early on.

- Check if the door movement timing is correct. If the door movement is too fast or too slow, first try recalibrating the door system. If you still encounter problems, check the following parts.
  - Is the potentiometer or encoder calibrated correctly?
  - Is the sensitive edge connected and working correctly?
  - Check v-diag if there are any DTCs. If there are active DTCs, consult DTC info in v-diag manual.
- Check if sensitive edge and speed obstruction are working correctly.
- Check interlock systems, bus stop brake and standstill if necessary.
- Check emergency reporting to dashboard.
- Check emergency blocking while driving.

Appendix A - Contact

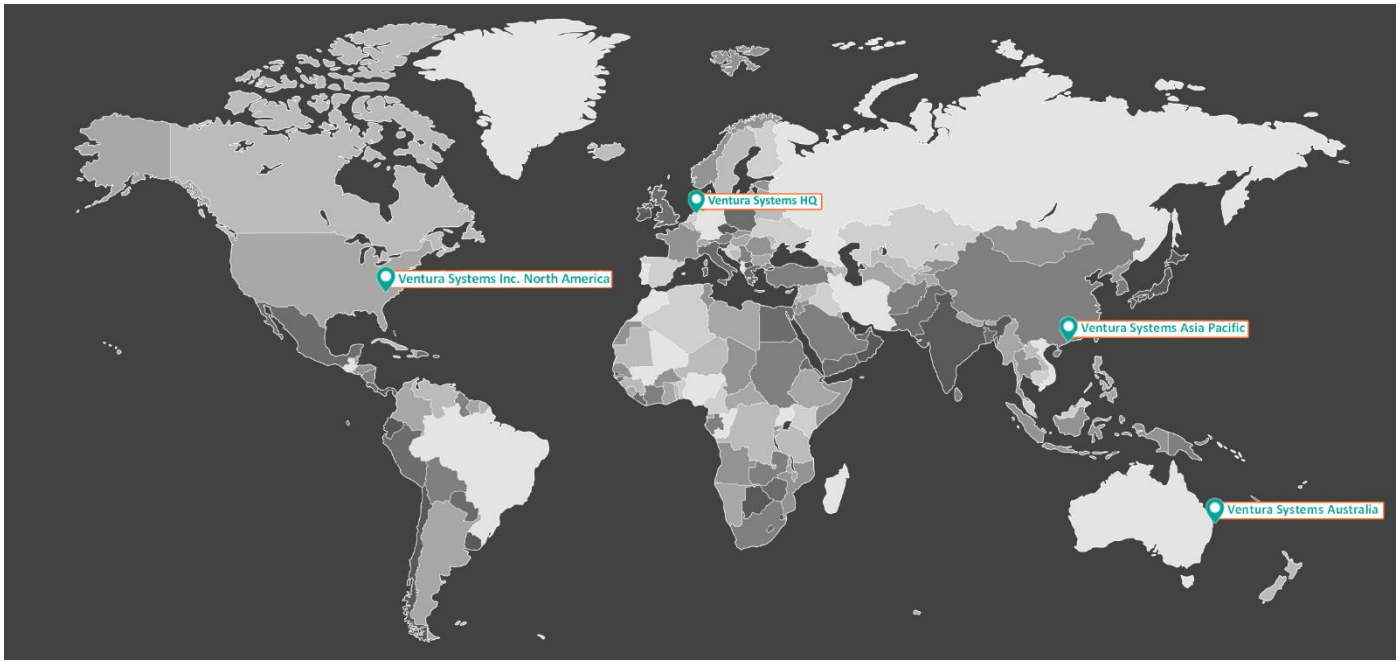

Figure 30: World map Ventura locations

	Ventura Systems HQ	Ventura Systems Asia Pacific
	De Marne 216 8701 MH Bolsward The Netherlands	Unit 10 on the 13/F Fotan Industrial Centre 26-28 Au Pui Wan Street Hong Kong
	+31 515 577750	+852 2712 6001
	support@venturasystems.com parts@venturasystems.com	support.ap@venturasystems.com
	www.venturasystems.com	www.venturasystems.com

Table 4: General contact and parts information HQ and Asia Pacific

	Ventura Systems Australia	Ventura Systems Inc North America
	PO Box 284 Sanctuary Cove QLD 4212 Australia	160 Gibson Ct NC 28034 Dallas
	+61 474 031074	+1 704-691-0311
	AUSSupport@venturasystems.com.au	support.inc@venturasystems.com
	www.venturasystems.com	www.venturasystems.com

Table 5: General contact and parts information Australia and North America

Contact your local agent for parts.