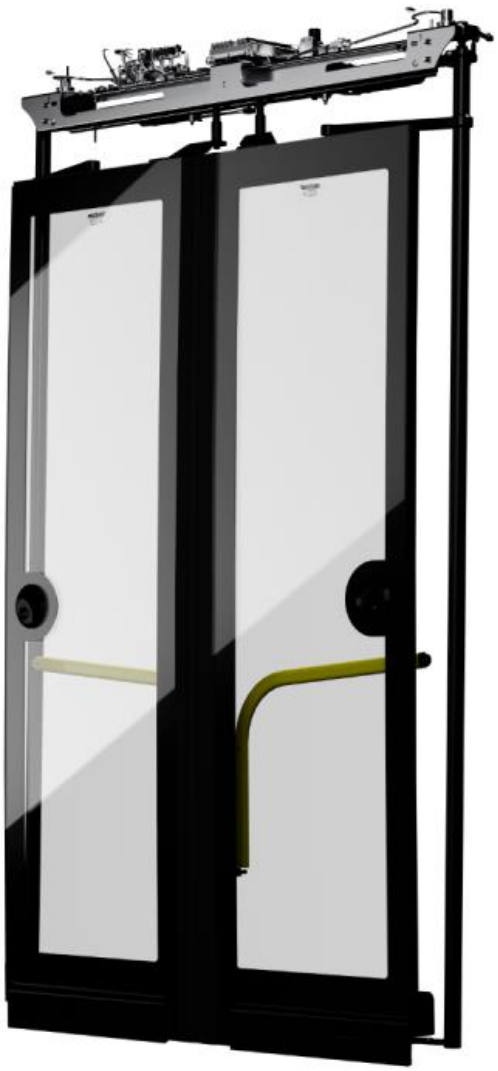

MM

# Inward Gliding Door System 4

## Maintenance Manual

| | |
|---|---|
| Version | 4.0 |
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# Revision history

| Revision | Date | By | Description |
|---|---|---|---|
| 4.0 | 2025-03-27 | Prepared:<br>*O. Post*<br>Verified:<br>*M. Rewti* | Minor updates of texts, images, lay-out<br>Renamed a few chapters<br>Updated 'Purpose' and 'Scope'<br>Added 'Required tools'<br>Updated 'Maintenance' introductory text and 'Maintenance frequencies' table<br>Updated 'Sensitive edge'<br>Shifted 'Air leakage test' to the Appendices<br>Removed 'Clamping force test'<br>Updated 'Torque settings'<br>Updated 'Contact' |
| 3.1 | 2022-05-11 | Prepared:<br>*M. Stoelinga* | Updated references.<br>Minor update in table of contents. |
| 3.0 | 2021-12-20 | Prepared:<br>*M. Stoelinga* | Adjusted preface.<br>Added references<br>Added notice to apply commissioning settings.<br>Minor text adjustments. |
| 2.2 | 2021-03-26 | Prepared:<br>*M. Stoelinga* | Added torque marking check in chapter Torque settings. |
| 2.1 | 2020-12-21 | Prepared:<br>*M. Stoelinga* | Minor text changes<br>Adjusted images for clear understanding |
| 2.0 | 2020-10-01 | Prepared:<br>*M. Stoelinga* | Adjusted torque setting of the Nordlock Ring.<br>Added repair option to sensitive edge chapter.<br>Adjusted contact email from service to support@venturasystems.com.<br>Adjusted leakage test to test the full system |
| 1.3 | 2020-04-30 | Prepared:<br>*M. Stoelinga* | Added check for the Clevis Pin and lever bush.<br>Removed torque setting check of the secure nut from wear parts.<br>Added warnings at the sensitive edge check.<br>Textual improvements.<br>Added torque settings to this manual. |
| 1.2 | 2019-12-06 | Prepared:<br>*M.Delorme*<br>*M.Stoelinga* | Added check for the clevis pin<br>Minor text improvements.<br>Updated references |
| 1.1 | 2019-07-24 | Prepared:<br>*M. Stoelinga* | - Adjusted the air leakage test to an acceptable air leakage of 0.2 and 2 bar |
| 1.0 | 2019-07-18 | Prepared:<br>*M. Stoelinga* | Added air leakage chapter<br>Adjusted minor lay-out and textual issues<br>Changed grease from "Arcanol MULTITOP" to "Kroon Multi Purpose Lithep EP2" exept the grease inside the bearing house.<br>Updated references. |
| 0.4 | 2018-12-04 | Prepared:<br>*M. Stoelinga* | Frequency changed. |
| 0.3 | 2018-11-30 | Prepared:<br>*M. Stoelinga* | Frequency changed.<br>Moved "Clamping force test" from "Safety parts" to "Part inspections".<br>Added the sentence: "Contact your local Agent for parts."<br>Adjusted filter regulator check for electric systems with non-Ventura DCU. |
| 0.2 | 2018-11-15 | Prepared:<br>*M. Stoelinga* | Rephrased safety checks.<br>Changed reference from appendix to installation manual.<br>Adjusted contact information. |
| 0.1 | 2018-11-13 | Prepared:<br>*M. Stoelinga* | Initial version. |

# Preface

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



Printed documents are uncontrolled. Documents are subject to change therefore verify correct revision before use.

# Table of Contents



# List of Figures

# List of Tables

# 1 Introduction

## 1.1 Purpose

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

## 1.2 Scope

This manual is intended for the Ventura inward gliding door system IG4.

## 1.3 Definitions

| Definition | Description |
|---|---|
| Wear part | Wear is progressive damage to a part caused by movement in contact with another substance or part. |
| Safety part | A safety part is a part, which is important to the overall safety of a system. |

*Table 1: Definitions*

## 1.4 Acronyms and Abbreviations

| Abbreviation | Description |
|---|---|
| DCU | Door Control Unit |
| HQ | Headquarters |
| IATF | International Automotive Task Force |
| IG | Inward Gliding door system |
| ISO | International Standardization Organization |

*Table 2: 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 |

*Table 3: External documents*

### 1.5.2 Ventura Systems documents

| # | Reference | Type | Description | Revision | Date |
|---|---|---|---|---|---|
| 1 | IG4100002 | IM | Inward Gliding Door System 4 : Installation Manual | 4.0 | 2024-04-10 |
| 2 | IG4100009 | CM | IG4 Electric Ventura DCU : Commissioning Manual | 2.2 | 2024-07-16 |
| 3 | IG4100010 | CM | IG4 Pneumatic Ventura DCU : Commissioning Manual | 2.2 | 2024-07-16 |
| 4 | IG4100011 | CM | IG4 Pneumatic : Commissioning Manual | 2.2 | 2024-07-16 |
| 5 | QM000001 | DG | Documentation Guideline | 6.0 | 2024-04-18 |

*Table 4: Ventura Systems documents*

## 1.6 Required tools

To prevent damage to the door system and personal injury, it is important to use calibrated tools of good quality.
The tools listed below are used when assembling and adjusting the Ventura door systems.
Note that all tools are metric.

| Tool | Dimensions |
|---|---|
| Wrench / socket wrench / combination ratchet wrench (metric) | Complete set (6 - 24 mm) |
| Allen key (metric) | 5 mm |
| Torx key (metric) | Set T10-T50 |
| Torque wrench | * |
| Screw driver PH2 | - |
| Side cutters | - |
| Utility knife | - |
| Vernier caliper / tape measure / laser distance meter / drawing hook | - |
| Loctite 243 | - |

*Table 5: Assembling and adjustment tools*

* For the required range, see the torque pages in this manual.

### Special tool

A special torque tool is available as an option. This tool enables the mechanic to tighten certain parts which are hard to reach by an ordinary wrench. For details, see the torque chapter in this manual.

## 1.7 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 the maintenance instructions.
4. Contains the torque settings.
5. Contains operational checks before and after applying power.

# 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 maintenance 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 maintain this door system. The instructions are to be used at the maintenance 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 the maintenance of the door system in a step-by-step sequence that will work in most types of maintenances. 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 Maintenance

Maintenance refers to the periodic check of wear parts and system settings. For the sake of completeness, this manual also covers the operational check of safety components, which is not actually maintenance, but could also lead to the need for repair or replacement.

Maintenance of a door system should be performed with the vehicle positioned on a flat surface, to prevent distortion/twisting of the vehicle body, which can lead to inaccurate measurements of the portal.

The table below shows the maintenance frequencies recommended by Ventura Systems. Whenever the amount of cycles is past, we advise to execute the applicable maintenance.

| Cycles assumption | Minimal maintenance | Applicable for |
|---|---|---|
| 300.000 | Every 12 months | Wear parts |
| 300.000 | Every 12 months | Parts inspections |

*Table 6: Maintenance frequencies*

Execute at least the minimal maintenance intervals.

**NOTICE**

After maintenance has been completed, the settings must be applied as described in the commissioning manual that came with this door system.

## 3.1 Safety parts

The checks in this chapter are safety critical. The safety parts are not in the regular schedule of *maintenance frequencies*, because it is recommended by Ventura Systems to check these parts before the first shift each day that the vehicle is operational. When the system has two door leaves, the checks must be executed for both sides.

If a fault is detected, it is necessary to reset, repair or replace the affected component until the defect is resolved.

### 3.1.1 Emergency release

If the door system is equipped with an emergency release, execute the following check.

Apply power and/or pressure to the system and put the door(s) in closed position.

**CAUTION!**

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

When the system is active, activate the emergency release.

The following events should occur.

1. The power/pressure is released from the system.
2. The door(s) can be opened manually.

3. Reset the emergency release.
4. Open and close the door(s) using the power source.

### 3.1.2 Sensitive edge

Apply power and/or pressure to the system and put the door(s) in closed position.

**CAUTION!**

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

Do not apply an obstruction with body parts.
When the safety parts do not function, this could result in serious injury.

Put the doors in open position to execute the next steps.

- Use the power to close the doors.
- While closing, press against the right mid seal at a height of 1 meter or less.
- The doors go to open position.
- Repeat this for the left door leaf.

**When the door leaves do not open when pressing the mid seals as described, perform the following checks. When the door leaves do open, continue to the next step, without executing the following checks.**

**WARNING!**

Remove the power and/or pressure from the system before you continue.

- Pull out the cap (1) at the top of the vertical profile. Be careful not to damage the cable, cap or seal.
- Disconnect the sensitive edge from the spiral cable (2).
- Set the multimeter to continuity mode and connect the multimeter to the connector of the sensitive edge.

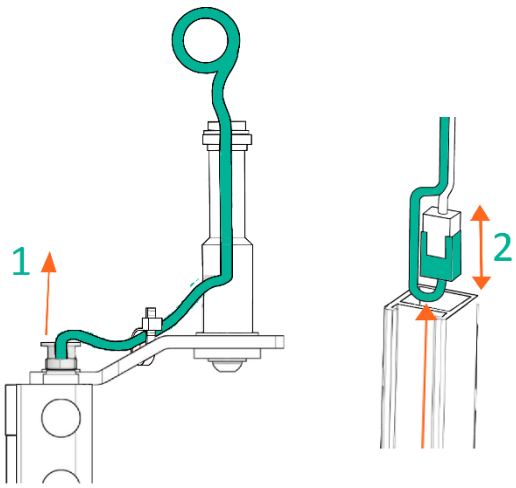



*Figure 1: Spiral cable runs smooth and has no overlength*

1. Be sure there is no force pressing the mid seal which can activate the sensitive edge. Resistance is 8200 Ω or 1200 Ω for the resistor of the sensitive edge.
2. Apply force to the mid seal of the door leaf. Resistance is approximately zero: R ≈ 0 Ω.

Reconnect the sensitive edge to the spiral cable and perform the following checks.

1. Check if spiral cable moves free on the shaft.
2. Check if all the excess length from the spiral cable is fitted inside the door profile. The spiral cable should be fixed to the guiding shaft bracket with a tie wrap. Be sure there is a little play.
3. When the guiding shaft has no grease on it, and the spiral cable does not run smoothly over the guiding shaft, apply some multipurpose grease on the guiding shaft so the cable moves smoothly. Use "Kroon Multi Purpose Lithep EP2" or a grease with similar specifications.

When the sensitive edge is not working properly, replace it.

**NOTE**

The sensitive edge is malfunctioning when, if activated, the resistance is infinite: R = ∞ .

## 3.2 Wear parts

These parts wear out and must be replaced when damaged or worn, after the prescribed cycles or after the prescribed time the parts are in use. When a part has a maximum amount of cycles, it will be mentioned.

### 3.2.1 Lever bush and clevis pin

- Check if the lever bush is not damaged.
- Check if there are no excessive wear marks on the lever bush.
- Check if there is grease between the clevis pin and the lever bush.

If the bush is damaged or worn, replace the bush.

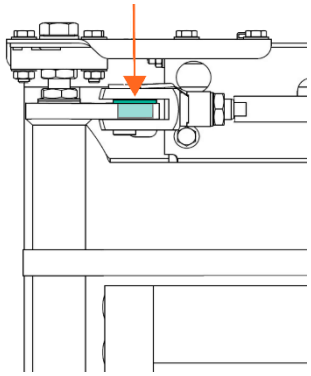


*Figure 2: Lever bush*

- Check if the clevis pin is not damaged.
- The clevis pin has to connect the fork joint to the upper lever of the door shaft.

If the clevis pin is damaged, replace the clevis pin.

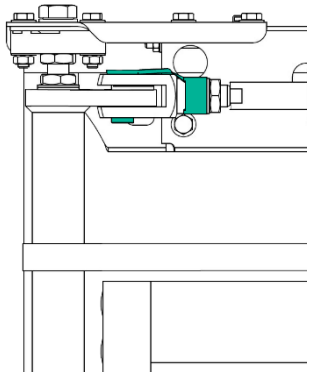


*Figure 3: Clevis pin*

### 3.2.2 Guide rollers

- The guide rollers on top of the guiding shafts are not worn or damaged in any way. Check for damage visually and feel if there are no worn places on the guide rollers.
- The guide rollers do not press against the guide rail while the doors are opening or closing.

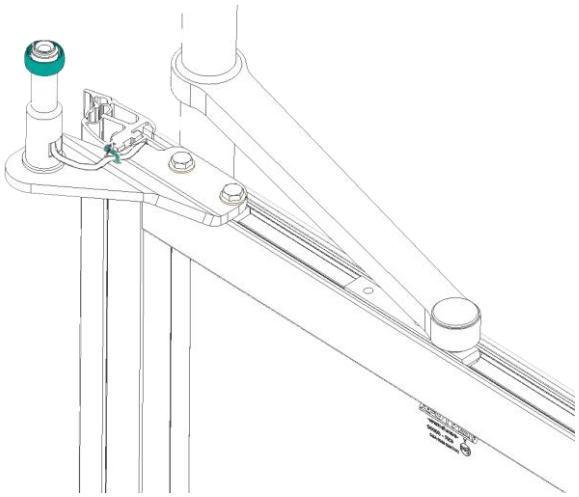


*Figure 4: Guide roller*

### 3.2.3 Shaft's bottom bearing bush

- Check if the door shaft is free from vertical play (up and downward movement).
- Check if the door does not squeak. If it does, apply some grease between the bearing and pivot bolt.

If the door shaft is free from vertical play, continue without executing this step. If there is play, execute the following check.

1. Check if the bearing bush is not broken.

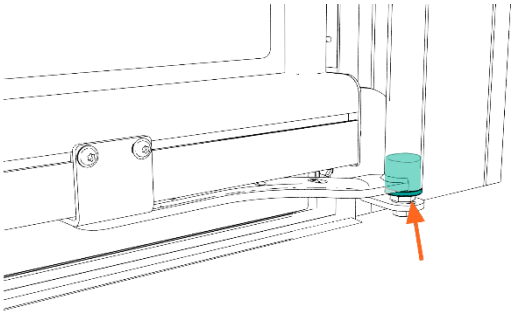


*Figure 5: Bottom bearing bush*

### 3.2.4 Lever bearing bush

**Check if the bearing is broken**

- Check if the bearing bush on the lever is not broken.
- Check if the bearing bush on the lever is not blocked by dust and dirt.

When the bearing does not function properly, clean the bush.
When the bush is broken, replace it.

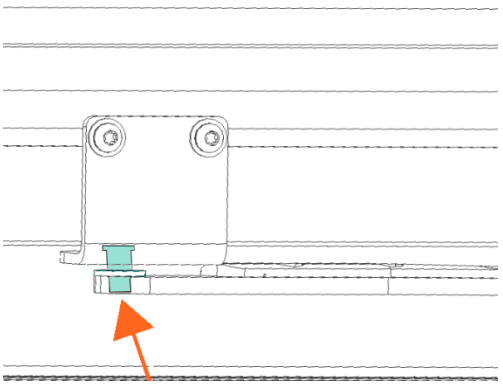


*Figure 6: Lever bearing bush*

### 3.2.5 Sliding plate

**Check sliding plate**

- When the sliding plate is heavily worn, replace the part. when the sliding plate is not worn, continue to the next step.

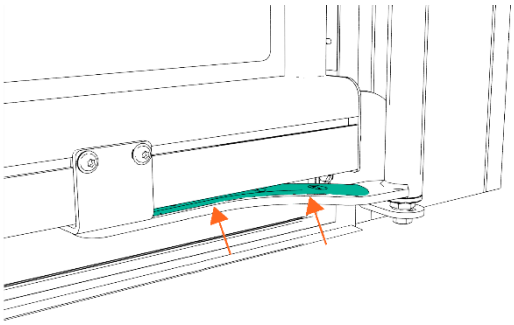


*Figure 7: Sliding plate*

## 3.3 Parts inspections

These parts can get affected by use and must be readjusted or cleaned when needed. Check the distance settings of the door system in open and closed position following the installation manual.

### 3.3.1 Filter regulator

Check if the system is equipped with a regulator or a filter regulator. If there is no regulator or a filter regulator, skip this step.

- Open drain by turning clockwise
- Close drain by turning counter clockwise

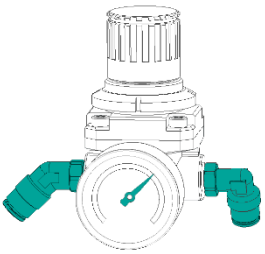


*Figure 8: Regulator*

**NOTICE**

Depending on the filter regulator's location, it is advised to keep the drain closed so it will not spill dirt over vital parts of the vehicle.

1. Check if the pressure of the pneumatic system is 8 bar / 116 PSI.
2. The filter regulator is semi-automatic, meaning the filter will drain itself when the pneumatic pressure drops below 0.3 bar / 4.3 PSI and the drain is open. Manually drain the regulator every two months.
3. Replace the filter when it is not clear white or at least once a year.

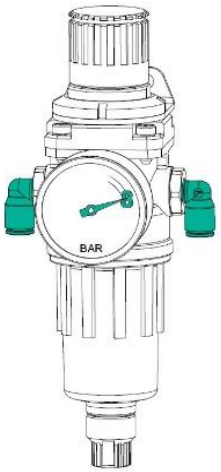



*Figure 9: Filter regulator*

### 3.3.2 Air leakage

Only check the leakage on door systems when the door is not functioning correctly or air leakage is hearable.
Check for damaged air tubes or connectors. Try to find where the leakage is coming from. Is there any air leak noise? Can you feel air coming from the connectors or tubes?
To reduce air leakage, manually drain the bowl following this maintenance manual's relevant chapter. Change the filter element inside the bowl at least every year.

In Appendix B, a comprehensive air leakage test is described.

### 3.3.3 grease spiral cable shaft

Put the doors in open position.

1. The shaft is clean of dirt.
2. There is a layer of grease on the guiding shaft which helps the spiral cable run smoothly over the shaft.

Apply grease when needed. Use "Kroon Multi Purpose Lithep EP2" or a grease with similar specifications.

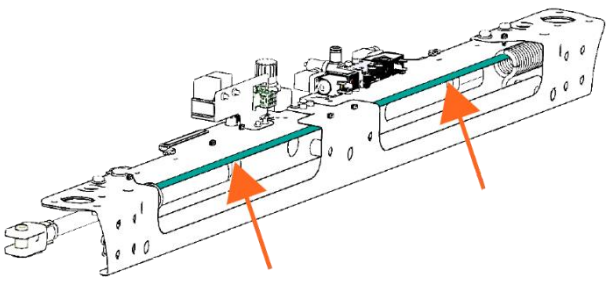


*Figure 10: Spiral cable guiding shaft*

# 4 Torque Settings

All door system settings that require torque tightening are given in this chapter. During maintenance, only fasteners mentioned below that have been loosened need to be tightened to torque. The torques of marked fasteners may be verified by checking if the marking is intact.
The fasteners which connect Ventura parts to the vehicle are, in most cases, not supplied by Ventura. Therefore the torque of these fasteners is not defined by Ventura.

After setting a part to torque specification, mark the connection with a torque marker.

*Figure 11: Torque marker*

In case the secure nut is hard to reach due to construction limitations, a specially developed tool can be purchased at Ventura's (No. VA3860). This tool ensures far better reachability and much smaller needed torque, therefore this tool can enhance quality of the final product and reduce lead time.

**CAUTION!**

The torque with the tool differs from the torque mentioned below. The correct torque for the tool is mentioned in the instruction of the tool.

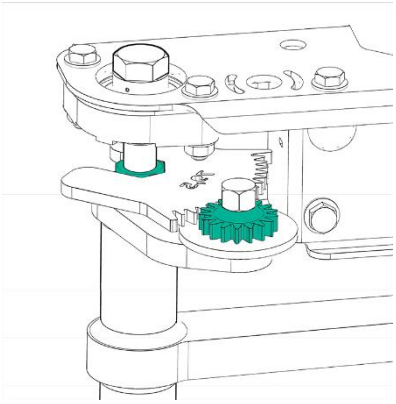


*Figure 12: Torque tool VA3860*

The position numbers in the image below correspond to the detailed drawings following, in which the required torque values are given.

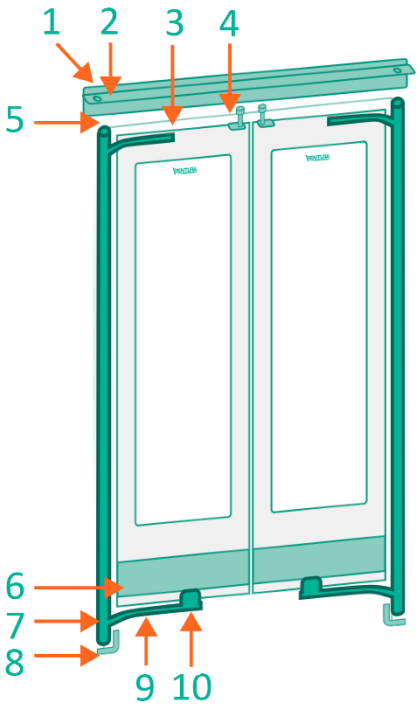
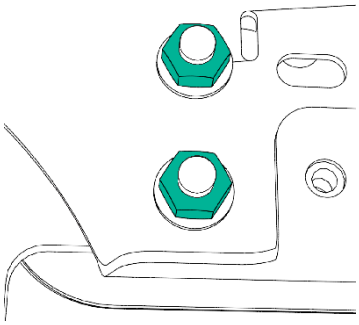


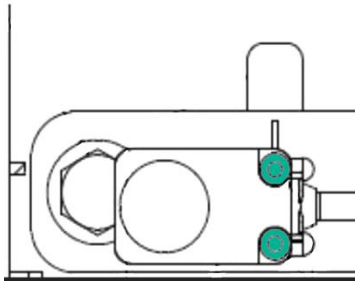

*Figure 13: Torque setting overview (both doors apply)*

Position 1
If fasteners are supplied by Ventura



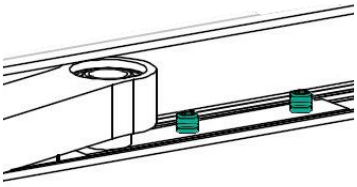
45±4 Nm, 2 per side

Position 2
If fasteners are supplied by Ventura



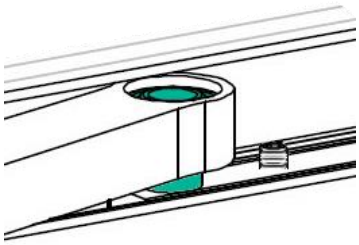
1±0.5 Nm, 2 per side

Position 3



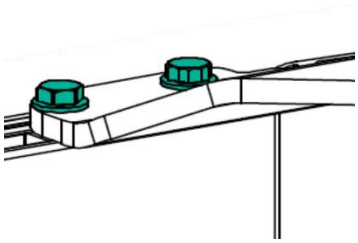
Socket 4 mm = 9±1 Nm,
Socket 5 mm = 15±1 Nm, 2 per side

Position 3



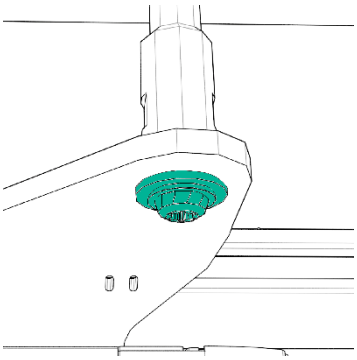
35±3 Nm, 1 per side

Position 4



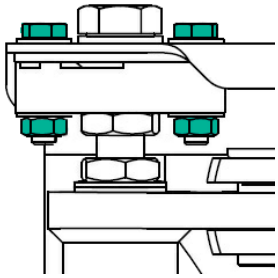
22±2 Nm, 2 per side

Position 4



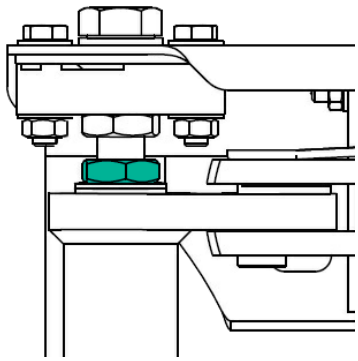
Socket M8 = 22±2 Nm,
Torx M10 = 60±5 Nm, 1 per side

Position 5



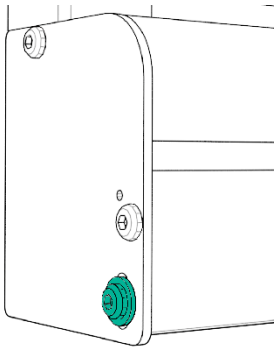
22±2 Nm, 2 per side

Position 5



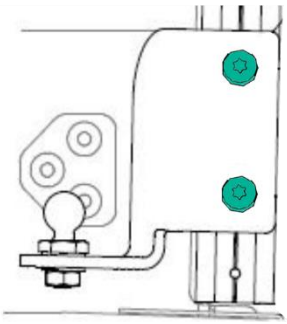
126 +0/-5 Nm, 1 per side

Position 6



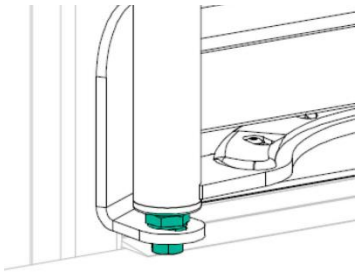
12±1 Nm, 2 per side

Position 7
If fasteners are supplied by Ventura



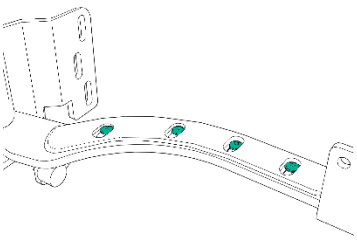
22±2 Nm, 2 per side

Position 8



45±4 Nm, 1 per side

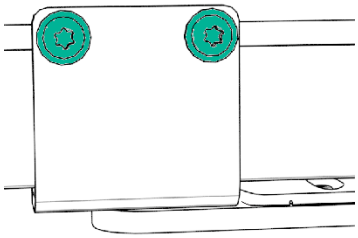
Position 9



9±1 Nm, 4 or 5 per side

Continue on the next page.

Position 10



Torx M8 = 22±2 Nm,
Socket 5 mm = 15±1 Nm, 2 per side

# 5 Operational checks

## 5.1 General checks before power

Execute these checks before applying power.

**WARNING!**

Applying power to an unchecked system may result in a hazardous situation causing death or serious injury.

| No. | Check | Verified by | Approved |
|---|---|---|---|
| 1. | Be assured all fasteners are on torque where required according to the installation manual. If not, tighten them to torque. | | |
| 2. | Check if all cables and tubes on the system are connected. | | |
| 3. | Manually check if the door leaf/leaves open and close without obstruction. | | |

After these checks, the power may be applied.

## 5.2 Operation and controls

These checks are all with power and pressure.

| No. | Check | Verified by | Approved |
|---|---|---|---|
| 1. | There is no leakage in the pneumatic system, in closed and open position of the doors. | | |
| 2. | Check if the electric parts and wires, as well as the pneumatic tubes and components, are not damaged, possibly risking short circuiting or air leakage. | | |
| 3. | Check if all door system settings, in closed and open position and while closing and opening, match the installation manual's requirements. | | |

## 5.3 Safety checks

These checks are all with power and pressure.

| No. | Check | Verified by | Approved |
|---|---|---|---|
| 1. | All emergency buttons function as specified. | | |
| 2. | Apply an obstruction while closing. Doors open again. Test left and right separately. *CAUTION! | | |
| 3. | Apply an obstruction while opening. Doors go to half open position. Test left and right separately. *CAUTION! | | |

**CAUTION!**

Do not use body parts to apply an obstruction.

# Appendix A - Contact

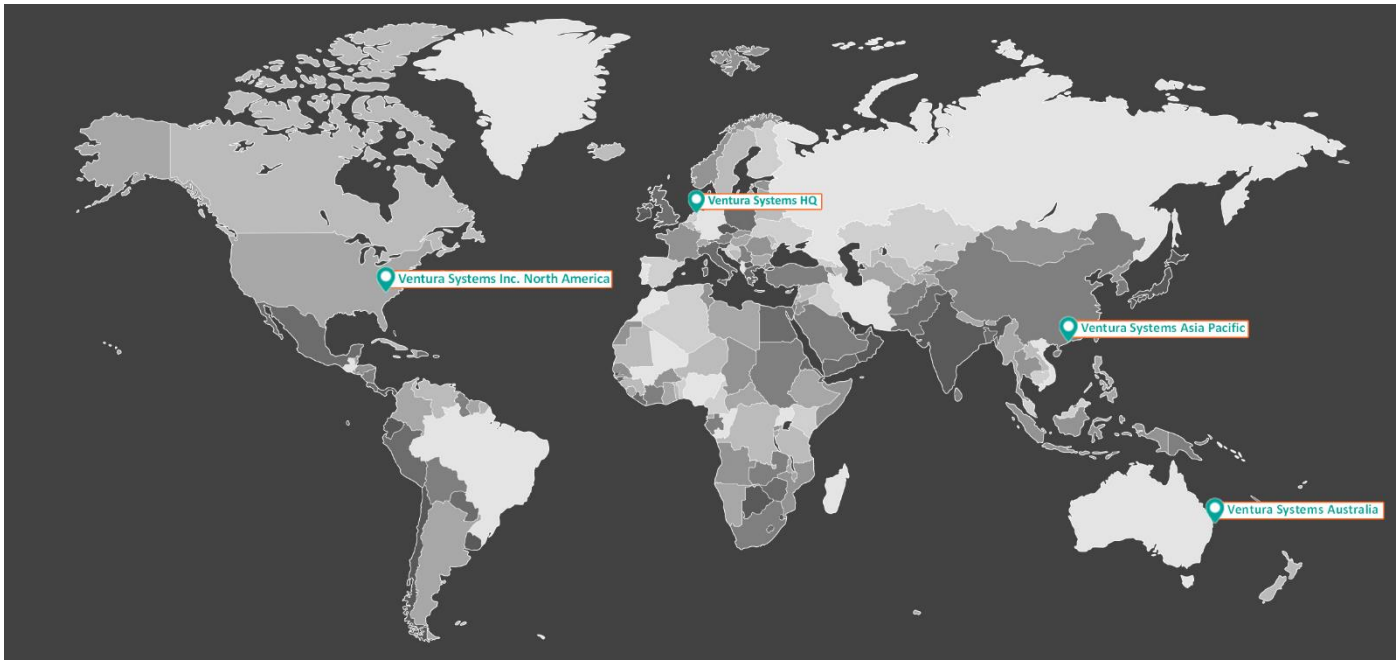



*Figure 14: World map Ventura locations*

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

*Table 7: General contact and parts information HQ and Asia Pacific*

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

*Table 8: General contact and parts information Australia and North America*

Contact your local agent for parts.

# Appendix B - Air leakage test

All stated air leakage test values are applicable solely on one door system. Starting pressure of the test is 8 bars. Test time is one minute.
The leakage value is a constant indicator in testing supplied pneumatic parts.
The system may leak a maximum of 1 bar per minute.

The following explanation uses icons how to connect the manometer. The icons used are displayed in the legend.

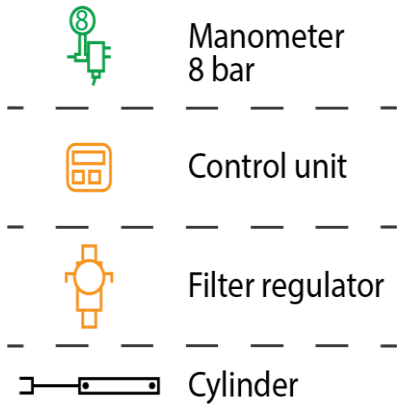



*Figure 15: Legend for air leakage images*

The testing device can be ordered with number U994. This is a manometer combined with manual valve.

**Testing the complete door system**

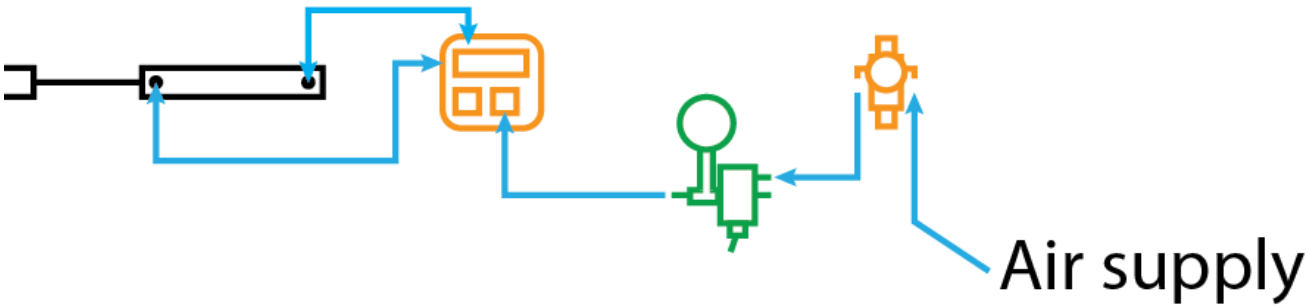



*Figure 16: Testing complete door system*

1. Connect the testing device between the filter regulator and the rest of the door system as shown in the image above.
2. Start the engine of the bus, air pressure should be 8 bar.
3. Put the doors in open position.
4. Remove the air pressure at the filter regulator.
5. Set the test device on "open".
6. Turn up the air pressure at the filter regulator till 8 bar.
7. Turn on the manometer at the testing device by pressing the left button and check the pressure.
8. Set the test device on "testing".
9. Measure the pressure drop for 1 minute in open position, the value from 8 bar should not drop more than 1 bar.
   **Execute the same test but in closed position.**
10. Set the test device on "open".
11. Let go of the air pressure at the filter regulator.
12. Remove the testing device and fit the air tubes in their original state.
13. Turn up the air pressure at the filter regulator till 8 bar.
14. If the value drops more than 1 bar in one minute, contact Ventura Support.