



# VarioStack™

**SIEMENS**

## Gripper Alignment Procedure

Document No.: 740-01385, Rev. B

Parts and Service: 1-800-938-7378

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**Important:** Prior to operating any of the equipment or performing any of the maintenance procedures described within this manual, it is strongly recommended that the operator and maintenance technician read the information provided within the applicable sections of this manual. All personnel shall pay particular attention to the notes, cautions, warnings, and dangers presented in this manual and posted on or in the area of the equipment. This equipment has been designed for use by trained and qualified operators. Every possible effort to prevent injury to the operator or maintenance personnel has been taken in the preparation of this manual. Damage to the equipment is possible when the procedures contained within this manual are not followed.

## Revisions

Revision	Date	Description
A	2019-September-04	Initial Release
B	2020-November-23	Revised for gripper upgrades and 2021 production builds. Name change to VarioStack.

# 1. Referenced Documents

Siemens Part Number	Title
740-01372	VarioStack™ Operation Manual
740-01373	VarioStack™ Service Manual
740-01432	VarioStack™ Lift Calibration Procedure

## 2. Assumption

At a minimum, the technician should be familiar with the service manual and the operation manual before executing this procedure.

## 3. Prerequisites

- 3.1. Technician should know and follow all safety precautions described in the service and operation manual. The Lockout/Tagout (LOTO) procedure will be referenced repeatedly in this document. LOTO is fully described in the service manual and should be followed to ensure safe completion of the gripper alignment procedure.
- 3.2. Lift calibration (see 740-01432 VarioStack™ Lift Calibration Procedure) should be done prior to executing this procedure.
- 3.3. Grippers should be adjusted to the extreme end of their adjustment range towards the outside of the machine (away from center of the conveyor) prior to executing this procedure.
- 3.4. Cam followers that engage the gripper cams should be adjusted to their extreme end of their adjustment range towards the outside of the machine (away from center of the conveyor) prior to executing this procedure.

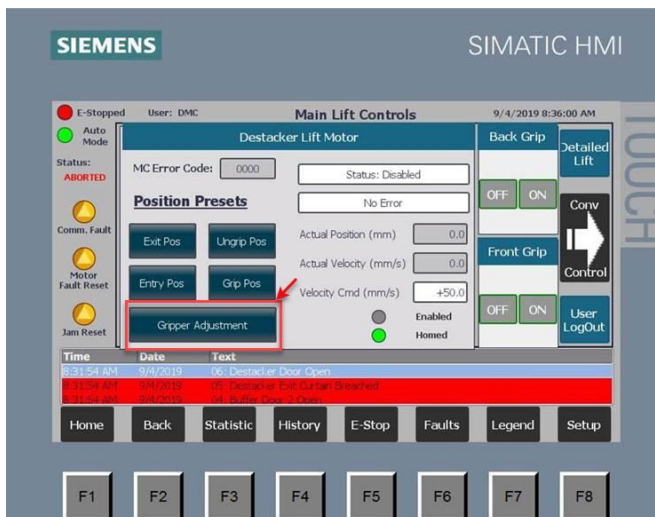


## 4. Upper Gripper Alignment Procedure

- 4.1. Use a test stack of 2 undamaged totes for the alignment process.
- 4.2. Ensure the machine is empty of totes or other objects and is ready for operation. All faults and E-Stops should be cleared.
- 4.3. Start the machine in Auto Mode.
- 4.4. Load test stack onto buffer, but do not press start on Buffer OCP.
- 4.5. Allow the stack to reach the end-stop of the lift conveyor

Note: Lift should not raise because the entry light curtain was breached.

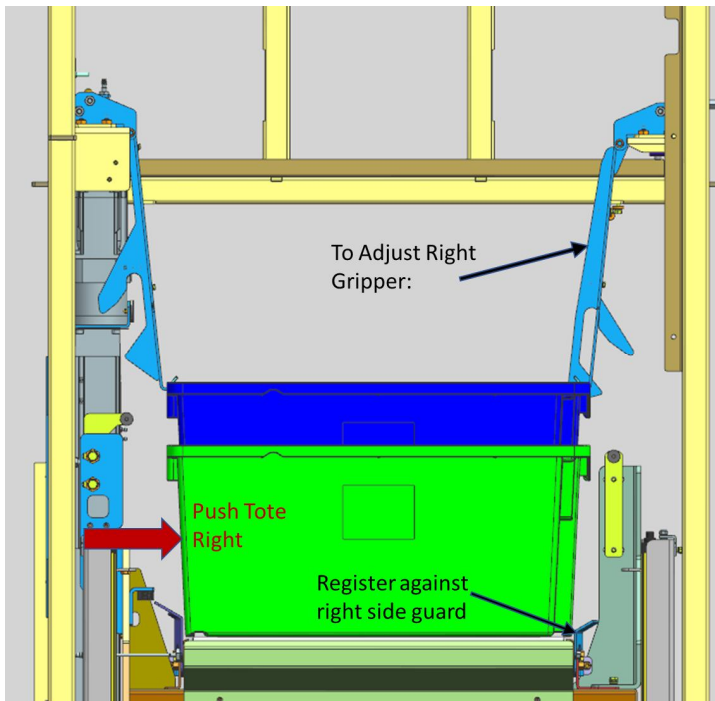
- 4.6. Switch to manual mode. Login with maintenance level privileges when prompted. Login credentials are documented in the service manual.
- 4.7. Use the Main Lift Controls screen on the HMI to drive the lift to the Gripper Adjust Position.



- 4.8. Open the Destacker door to place the machine in E-Stop state. Shutdown the machine and LOTO. Refer to service manual for shutdown and LOTO instructions.
- 4.9. Once the machine is safe to enter, enter the machine from the buffer end.

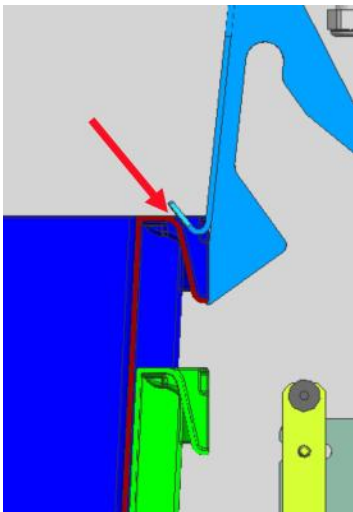
## 4.10. Adjust each extended gripper to totes

4.10.1. Push stack of totes toward the gripper being adjusted to register against conveyor side guard:

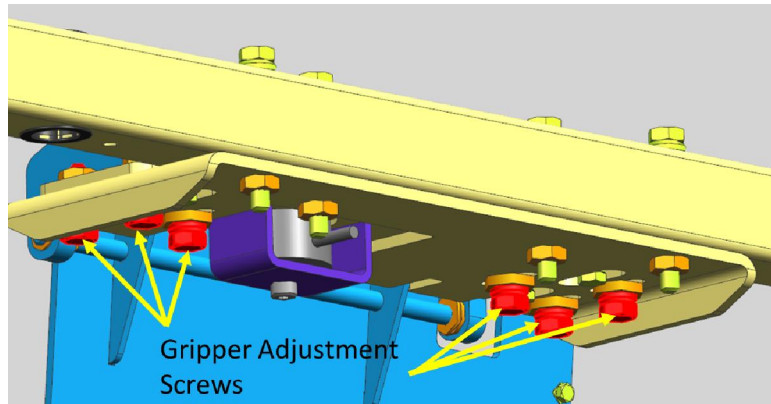


4.10.2. Manually extend each gripper to check relationship with tote. When the gripper is fully extended, the pivot end of the gripper will contact the electro-magnet. This contact should be gentle. The magnet is mounted on a spring. That spring should not be further compressed by the extending gripper.

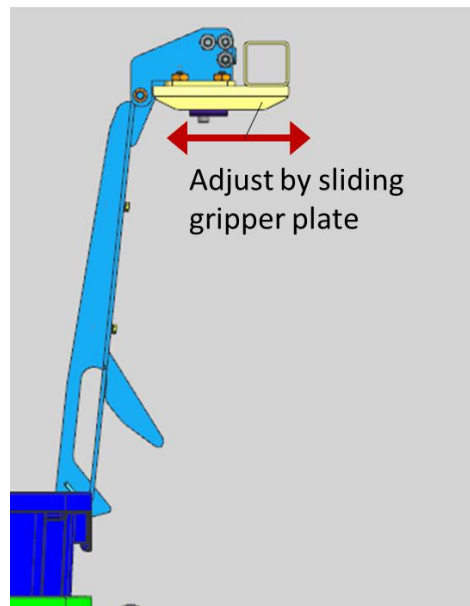
4.10.3. Check gripper alignment to tote. When the gripper is properly aligned, the end of the gripper will be just touching the tote or have a minimal gap (up to 2mm).



- 4.10.4. If gripper is not properly aligned, slightly loosen Gripper Adjustment Screws (6 screws per gripper). Loosen only enough to allow gripper assembly to move relative to the frame.



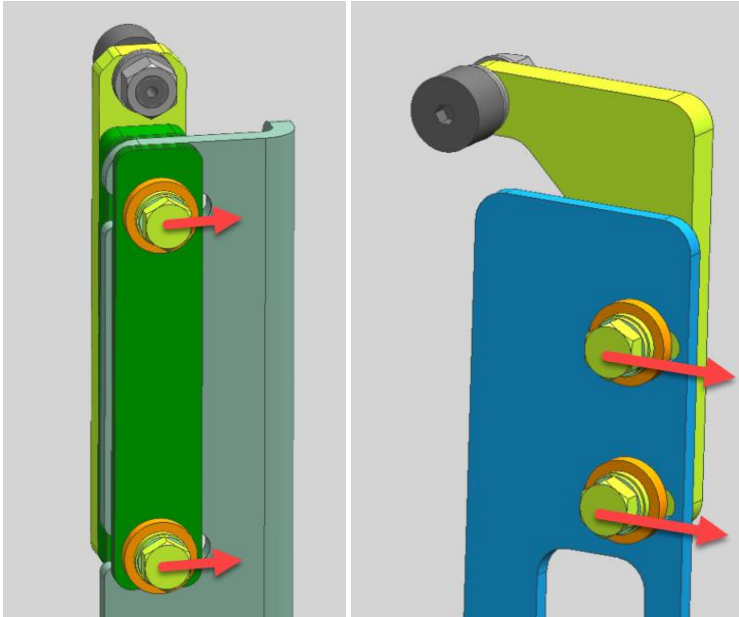
- 4.10.5. Adjust gripper laterally (as shown below) until gripper is properly aligned (as defined above in Section 4.10.3).



- 4.10.6. Re-tighten Gripper Adjustment Screws. Be careful not to move gripper while tightening screws.
- 4.10.7. Repeat for opposite gripper.

## 4.11. Adjust Cam Positions

- 4.11.1. Slightly loosen Cam Adjustment Screws (2 screws per side) on the operator side of the machine. Loosen only enough to enable movement between the brackets. Temporarily register roller bracket at the back of both slots (furthest away from gripper cams). Repeat for opposite side gripper.

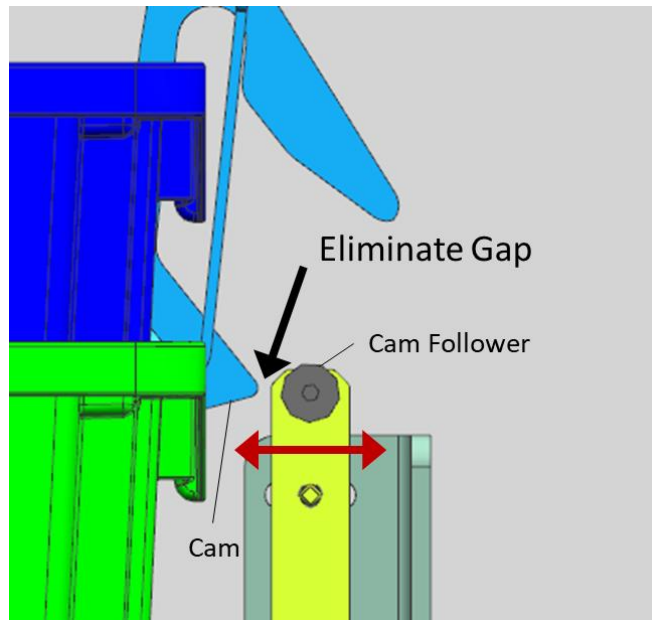


- 4.11.2. Ensure all moving components are clear of tools, etc and the tote stack is aligned properly on the conveyor. Check service manual for full list of safety measures required before operating the machine.
- 4.11.3. Repower and reboot machine.
- 4.11.4. Clear and reset safety system (doors closed, light curtains cleared, E-Stops cleared).
- 4.11.5. Use the HMI to drive the lift to the Grip Position.

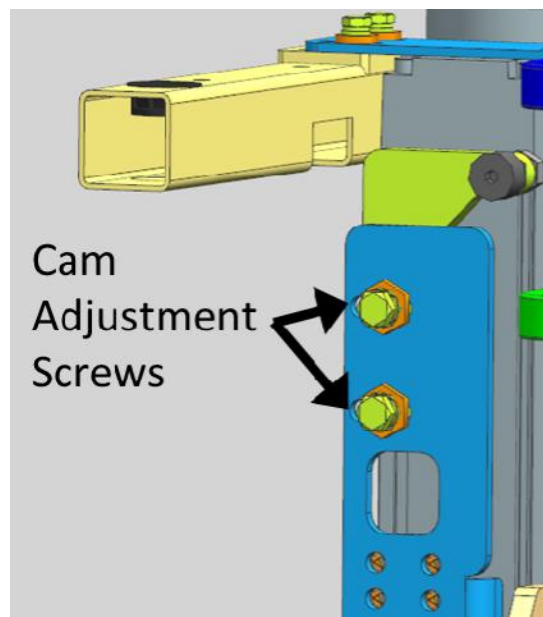




- 4.11.6. Open the Destacker door to place the machine in E-Stop state. Shutdown the machine and LOTO. Refer to service manual for shutdown and LOTO instructions.
- 4.11.7. Manually extend one gripper and adjust cam follower position so that it just touches the cam.  
*As before, be careful not to over-extend the gripper against the electro-magnet. The spring mounted to the electro-magnet should not be further compressed by the manual actuation of the grippers.*

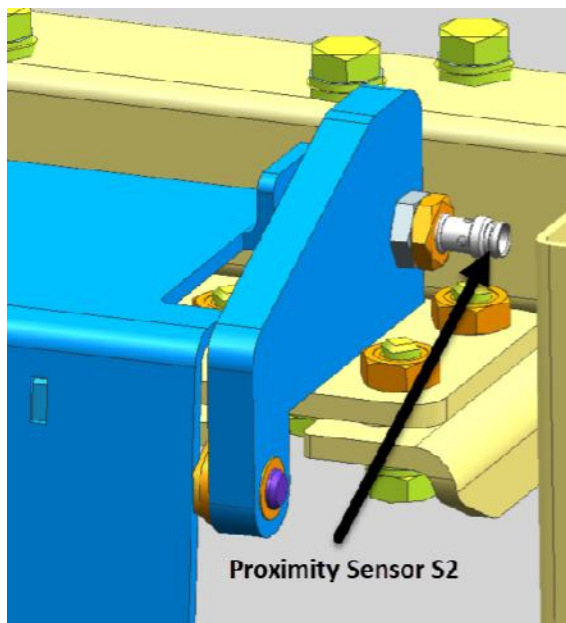


- 4.11.8. Retighten Cam Adjustment Screws.
- 4.11.9. Repeat for opposite (motor side) cam.



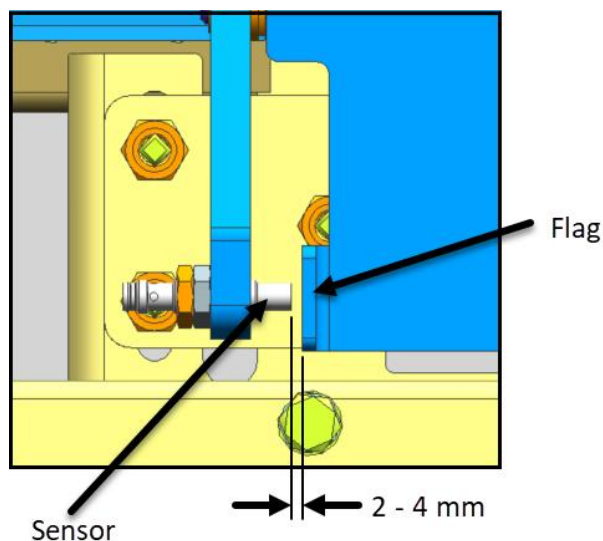
#### 4.12. Adjust Gripper Sensors

Check proximity sensor S2 and S4 to ensure each is on when the corresponding gripper is extended. These sensors are located on the gripper plate of each gripper (S2 is on operator side and S4 is on motor side).



4.12.1. If adjustment is needed, follow the following steps.

- 4.12.1.1. Loosen both jam nuts on the sensor
- 4.12.1.2. Disconnect cable connector (not shown in picture above)
- 4.12.1.3. Twist sensor body until sensor is reliably detecting the flag on the gripper. The distance from the end of the sensor to the gripper flag should be approximately 2-4mm (0.08" to 0.16").



4.12.1.4. Tighten jam nuts

4.12.1.5. Reconnect cable. A lamp on the body of the sensor should illuminate to indicate the sensor is "on". If the lamp is not on, the sensor needs to be adjusted closer to the gripper flag.

4.12.2. Repeat for opposite side

#### 4.13. Adjust Gripper Backstops

4.13.1. Ensure all moving components are clear of tools, etc and the tote stack is aligned properly on the conveyor. Check service manual for full list of safety measures required before operating the machine.

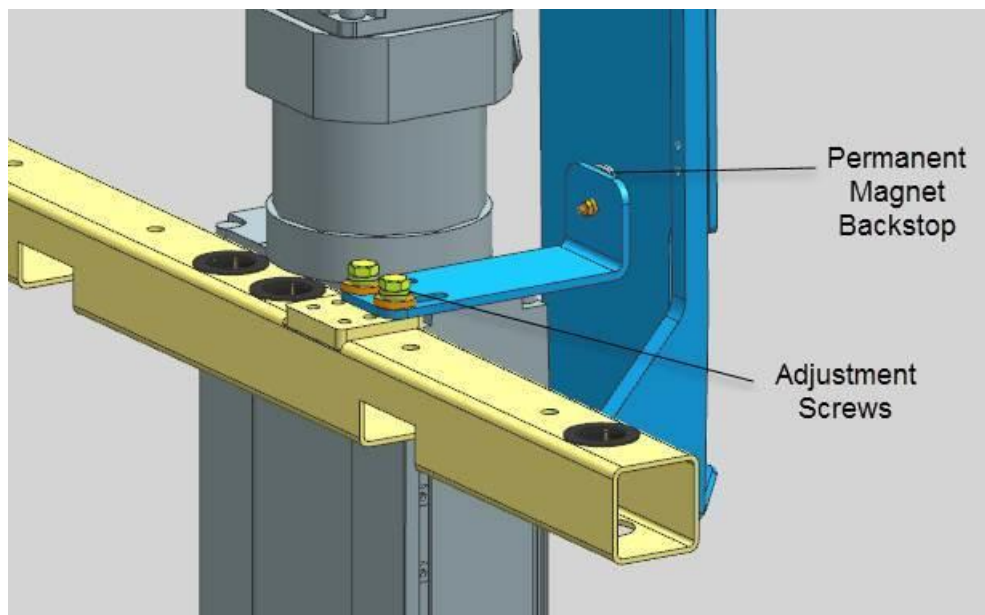
4.13.2. Repower and reboot machine

4.13.3. If necessary, clear and reset safety system (doors closed, light curtains cleared, E-Stops cleared).

4.13.4. Use the HMI to drive the lift to the Ungrip Position. Both grippers should be retracted and not engaging the totes.

4.13.5. Open the Destacker door to place the machine in E-Stop state. Shutdown the machine and LOTO. Refer to service manual for shutdown and LOTO instructions.

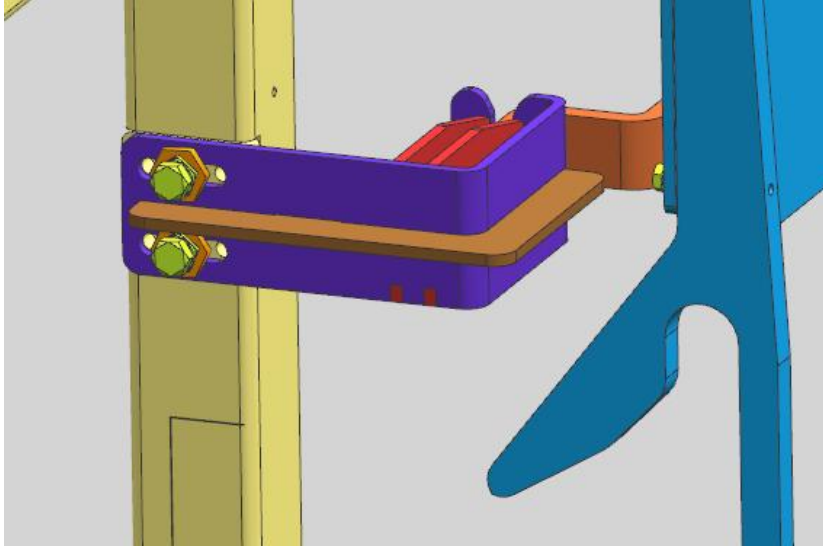
4.13.6. Slightly loosen the two Adjustment Screws for the motor side backstop as shown below. Loosen only enough to allow bracket to move relative to the frame



4.13.7. Adjust backstop to touch backside of gripper. Then move the backstop 1mm further towards the gripper. This will slightly move the gripper.

4.13.8. Retighten adjustment screws.

4.13.9. Repeat adjustment procedure for operator side backstop:



- 4.14. Ensure all moving components are clear of tools, etc and the tote stack is aligned properly on the conveyor.
- 4.15. Repower and reboot machine.
- 4.16. If necessary, clear and reset safety system (doors closed, light curtains cleared, E-Stops cleared).
- 4.17. Use the HMI energize both gripper magnets.
- 4.18. Use the HMI to drive the lift to the Exit Position. The bottom tote should be “destacked” and the top tote should remain suspended by the two grippers. This is the first test of the gripper alignment. If this destack fails, repeat as needed.
- 4.19. Turn key switch on front of main electrical enclosure back to auto mode.
- 4.20. Test gripper alignment by operating in auto mode with at least two full stacks of twelve totes.