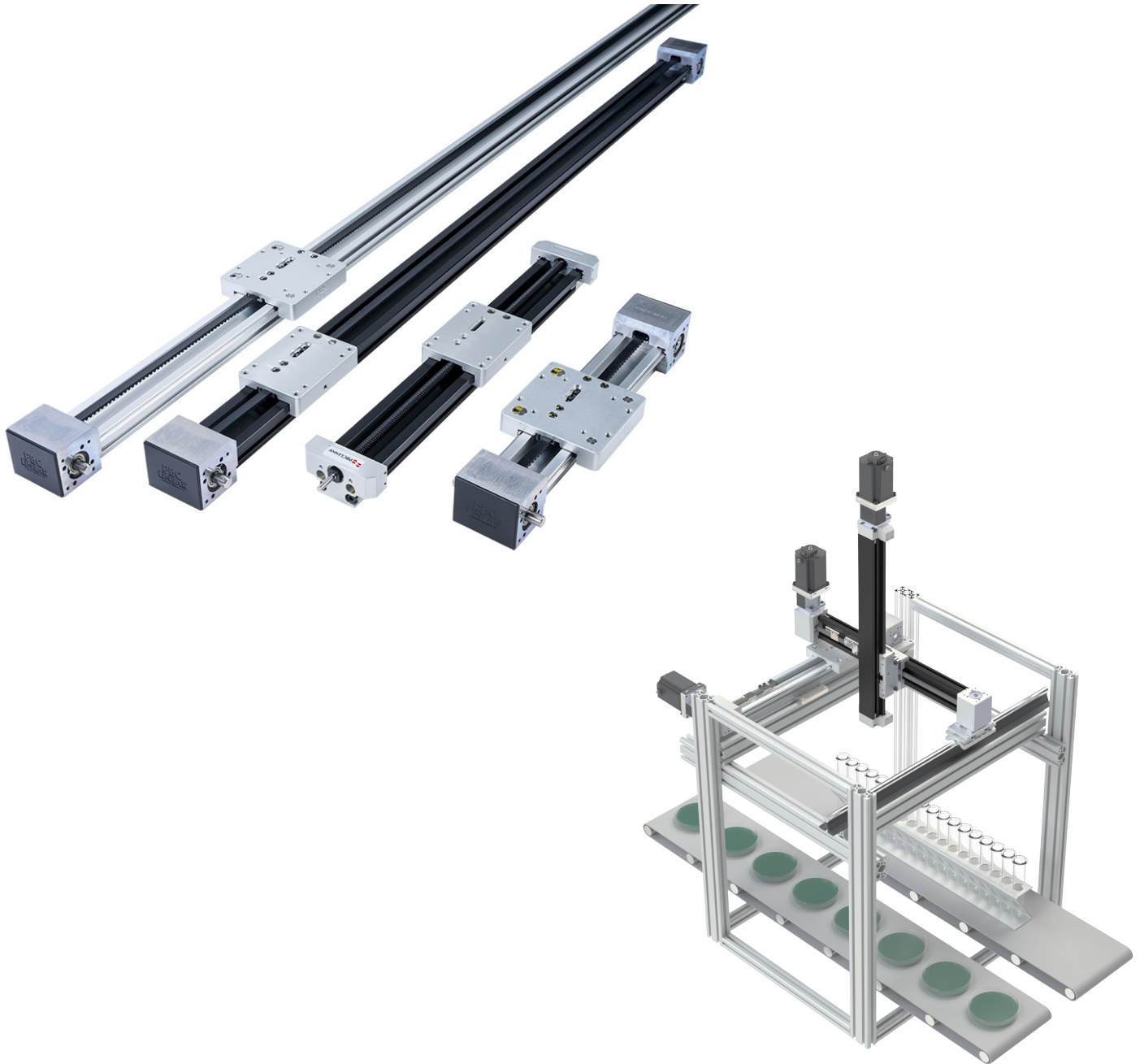




# PBC UG SERIES XYZ GANTRY USER MANUAL

---



## CONTENTS

|                                                                             |    |
|-----------------------------------------------------------------------------|----|
| Safety . . . . .                                                            | 3  |
| Getting Started . . . . .                                                   | 3  |
| What Is in the Box . . . . .                                                | 3  |
| Required for Every Driven Axis . . . . .                                    | 4  |
| Gantry Accessories . . . . .                                                | 4  |
| Kit Selection . . . . .                                                     | 4  |
| Kit Contents . . . . .                                                      | 5  |
| Mounting the Actuator . . . . .                                             | 6  |
| Carriage-to-Carriage Assembly (XY) . . . . .                                | 7  |
| LATA-KIT-038-CH: Plain Bearing Carriage to Plain Bearing Carriage . . . . . | 7  |
| LATA-KIT-039-CH: Plain Bearing Carriage to V-Guide Carriage . . . . .       | 7  |
| LATA-KIT-041-CH: V-Guide Carriage to V-Guide Carriage . . . . .             | 8  |
| Carriage-to-Rail Assembly (XY) . . . . .                                    | 9  |
| LATA-KIT-042-CH: Rail to Carriage . . . . .                                 | 9  |
| LATA-KIT-043-CH: Rail to Carriage 90 Degree Mount . . . . .                 | 9  |
| Motor Mount Assembly . . . . .                                              | 10 |
| Lead Screw Actuators (LAX, LAJ) . . . . .                                   | 10 |
| Belt Drive Actuators (B0D) . . . . .                                        | 10 |
| Motor Adapter Plate and Drive Coupling . . . . .                            | 10 |
| Sensor Bracket . . . . .                                                    | 12 |
| Maintenance . . . . .                                                       | 13 |
| Lubrication . . . . .                                                       | 13 |
| Replacing V-Guide Lubricators ( <a href="#">UGA040A-LHA-KIT</a> ) . . . . . | 13 |
| Belt Tension Check and Adjustment (B0D models) . . . . .                    | 14 |
| Belt Replacement (B0D models) . . . . .                                     | 15 |
| Troubleshooting . . . . .                                                   | 16 |

## Safety



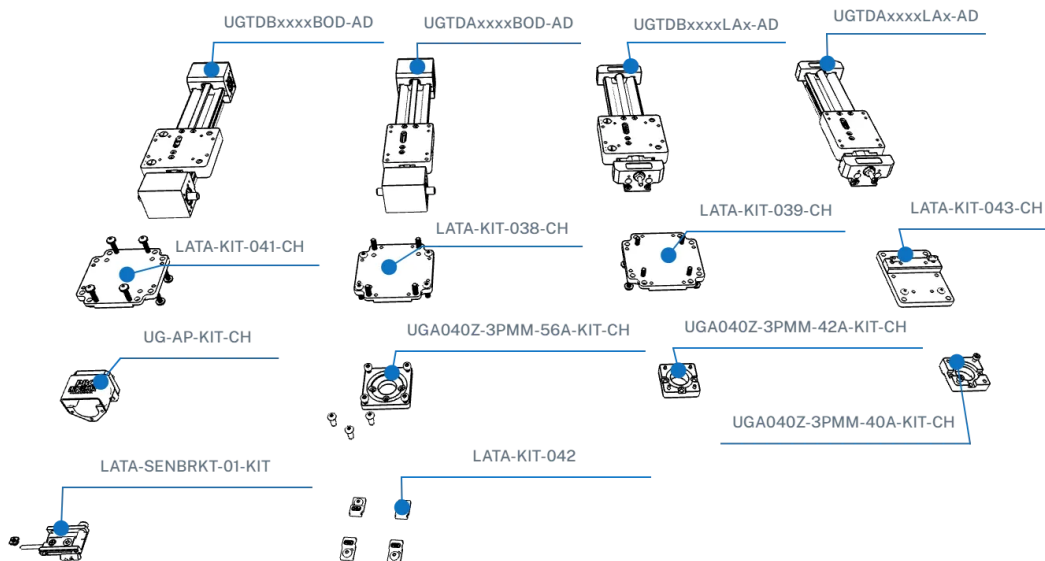
**WARNING:** Only qualified personnel must transport, assemble, operate, and maintain this equipment. Incorrect handling can result in equipment damage and personal injury.

- Always wear appropriate personal protective equipment, such as safety glasses.
- Turn power OFF and secure the load before any assembly or maintenance.
- Provide a flat, stable mounting surface and enough space for full carriage travel. Do not use the end blocks as hard stops.
- UG Series actuators are not self-braking. A load can move if the motor, coupling, belt, or pulley is removed or power is lost, especially on a vertical axis. Fit an electromechanical power-off brake on vertical axes. PBC Linear cautions against belt drives on vertical axes.
- Do not back-drive a lead screw actuator by pushing the carriage by hand.
- Inspect the actuator regularly for worn or damaged components and replace them with parts of the same make and model.
- Always test run the actuator after maintenance.

## Getting Started

### What Is in the Box

A UG Series actuator ships as a base unit: rail, carriage, drive, end blocks, and a bare stub shaft. The motor mount, motor adapter plate, motor, coupling, and all gantry brackets are ordered separately. Handle the actuator by the end blocks to avoid damaging the rail surfaces and drive components.

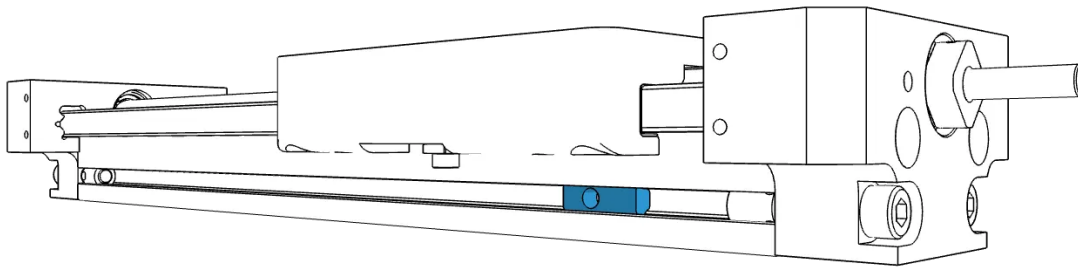


## Required for Every Driven Axis

| Item                | Part Number                     | Notes                                                                                              |
|---------------------|---------------------------------|----------------------------------------------------------------------------------------------------|
| Motor mount kit     | <a href="#">UG-AP-KIT-CH</a>    | Main frame, lead screw adapter plate, cover, (9) BHCS M4-0.7 x 12mm                                |
| Motor adapter plate | <a href="#">3PMM-40A-KIT-CH</a> | 40mm servo frame                                                                                   |
|                     | <a href="#">3PMM-42A-KIT-CH</a> | NEMA 17 (42mm) frame                                                                               |
|                     | <a href="#">3PMM-56A-KIT-CH</a> | NEMA 23 (56mm) frame                                                                               |
| Drive coupling      | See Motor Mount Assembly        | 25mm max OD, 26mm max length. 5mm stub shaft on lead screw actuators, 10mm on belt drive actuators |
| Motor               | Customer supplied               | 40mm, NEMA 17, or NEMA 23 frame                                                                    |



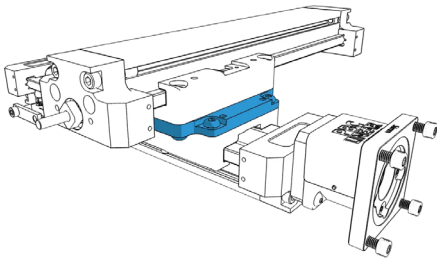
**NOTE:** All UG Series actuators sold by AutomationDirect use the UGT tall rail, which has T-slots on both sides. Use M5 T-nuts ([6100443-KIT-CH](#), package of 10) to attach brackets, sensors, and clamps anywhere along the rail.



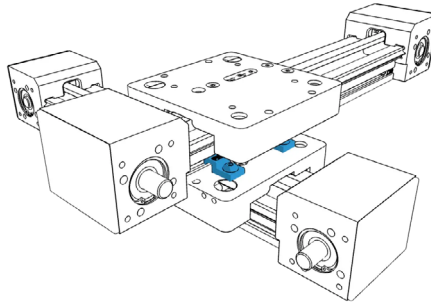
M5 T-nut ([6100443-KIT-CH](#)) rolled into a rail T-slot

## Gantry Accessories

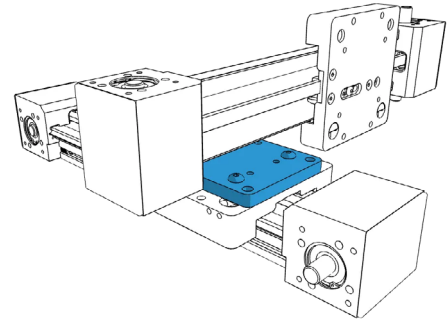
Five bracket kits join UG Series actuators into XY, XZ, and XYZ gantries. Carriage-to-carriage kits bolt one carriage on top of another, so the upper actuator's rail and motor move. Rail-to-carriage kits fasten the rail of the upper actuator onto the lower carriage, leaving the upper carriage free for a third axis.



Carriage-to-carriage  
([LATA-KIT-038/039/041-CH](#))



Rail to carriage ([LATA-KIT-042-CH](#))



Rail to carriage, 90 degree mount  
([LATA-KIT-043-CH](#))

## Kit Selection

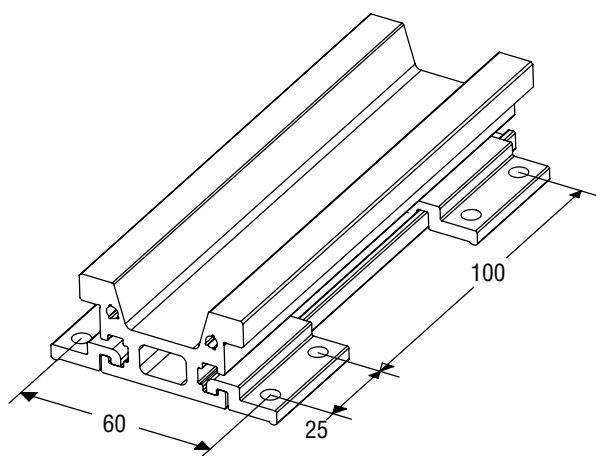
| Joint                             | Lower Actuator        | Upper Actuator        | Kit                             |
|-----------------------------------|-----------------------|-----------------------|---------------------------------|
| Carriage-to-carriage              | Plain bearing (UGTDA) | Plain bearing (UGTDA) | <a href="#">LATA-KIT-038-CH</a> |
| Carriage-to-carriage              | Plain bearing (UGTDA) | V-guide (UGTDB)       | <a href="#">LATA-KIT-039-CH</a> |
| Carriage-to-carriage              | V-guide (UGTDB)       | V-guide (UGTDB)       | <a href="#">LATA-KIT-041-CH</a> |
| Rail to carriage                  | Any                   | Any                   | <a href="#">LATA-KIT-042-CH</a> |
| Rail to carriage, 90 degree mount | Any                   | Any                   | <a href="#">LATA-KIT-043-CH</a> |

## Kit Contents

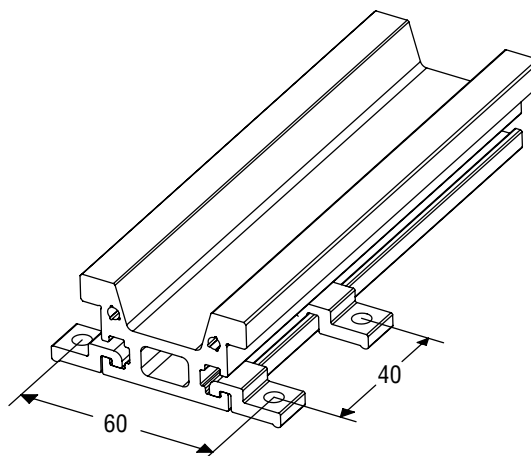
| Kit                                 | Includes                                                                                                                                |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">LATA-KIT-038-CH</a>     | (1) plate, 100 x 100 x 8mm; (8) BHCS M6-1.0 x 20mm                                                                                      |
| <a href="#">LATA-KIT-039-CH</a>     | (1) plate; (4) BHCS M5-0.8 x 16mm; (4) BHCS M5-0.8 x 30mm; (4) custom washers, M5 x 2mm thick                                           |
| <a href="#">LATA-KIT-041-CH</a>     | (1) plate; (8) BHCS M5-0.8 x 30mm; (8) custom washers, M5 x 2mm thick                                                                   |
| <a href="#">LATA-KIT-042-CH</a>     | (4) small toe clamps; (4) BHCS M5-0.8 x 12mm                                                                                            |
| <a href="#">LATA-KIT-043-CH</a>     | (1) large plate, 100 x 73 x 8mm; (1) small plate; (4) BHCS M6-1.0 x 16mm; (4) BHCS M5-0.8 x 12mm; (4) BHCS M5-0.8 x 16mm; (2) M5 T-nuts |
| <a href="#">LATA-SENBRKT-01-KIT</a> | (1) sensor bracket; (1) M5 T-nut; (1) SHCS M5-0.8 x 35mm; (2) SHCS M3-0.5 x 6mm; (1) square spacer                                      |
| <a href="#">6100443-KIT-CH</a>      | (10) M5-0.8 T-nuts, zinc-plated steel                                                                                                   |
| <a href="#">UGA040A-LHA-KIT</a>     | (2) replacement lubricators for V-guide carriages; (4) BHCS M3-0.5 x 8mm                                                                |
| <a href="#">UG-AP-KIT-CH</a>        | (1) main frame; (1) lead screw adapter plate; (1) cover; (9) BHCS M4-0.7 x 12mm                                                         |
| <a href="#">3PMM-40A-KIT-CH</a>     | (1) 40mm motor plate; (2) SHCS M4-0.7 x 10mm                                                                                            |
| <a href="#">3PMM-42A-KIT-CH</a>     | (1) NEMA 17 motor plate; (2) SHCS M3-0.5 x 14mm; (2) SHCS M3-0.5 x 16mm                                                                 |
| <a href="#">3PMM-56A-KIT-CH</a>     | (1) NEMA 23 motor plate; (4) SHCS M5-0.8 x 12mm                                                                                         |

## Mounting the Actuator

UGT rails have no through holes. Fasten the rail to the machine base with toe clamps from [LATA-KIT-042-CH](#), or [UGT040A-TC-1](#), or UGT040A-TC-2. Use at least four toe clamps per rail, spaced as indicated in the illustration. Tall UGT rails can also be end-supported.



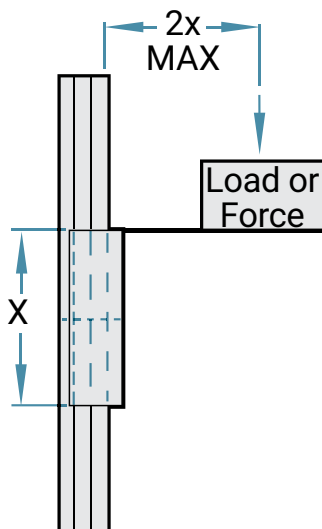
Double toe clamp [UGT040A-TC-2](#) (dimensions in mm)



Single toe clamp [UGT040A-TC-1](#) (dimensions in mm)



**NOTE:** Plain bearing (UGTDA) carriages must obey the 2:1 rule. A cantilevered load or drive force must act no farther than two times the 100mm carriage length (200mm) from the carriage, or the carriage will bind regardless of how light the load is. V-guide (UGTDB) carriages are exempt.



## Carriage-to-Carriage Assembly (XY)

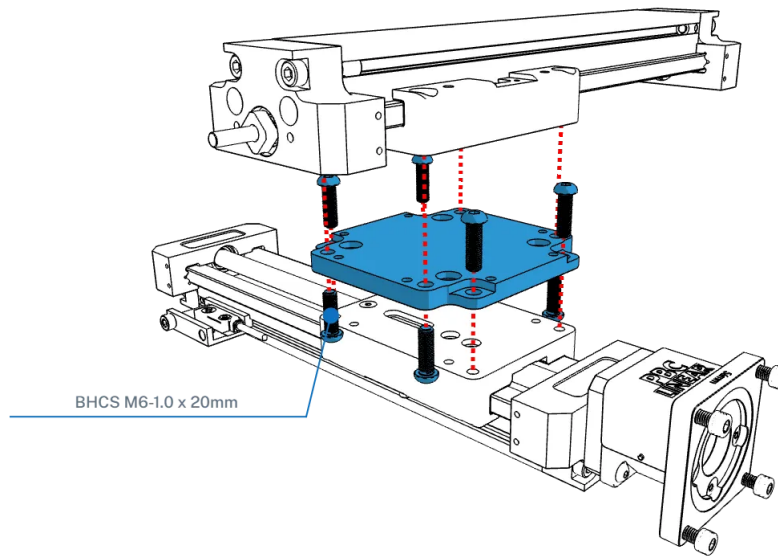
The plate joins two carriages at 90°. The lower carriage moves the upper linear actuator. Users can typically add tooling to the end of the upper linear actuator.



NOTE: Apply low-strength threadlocker to all bracket fasteners.

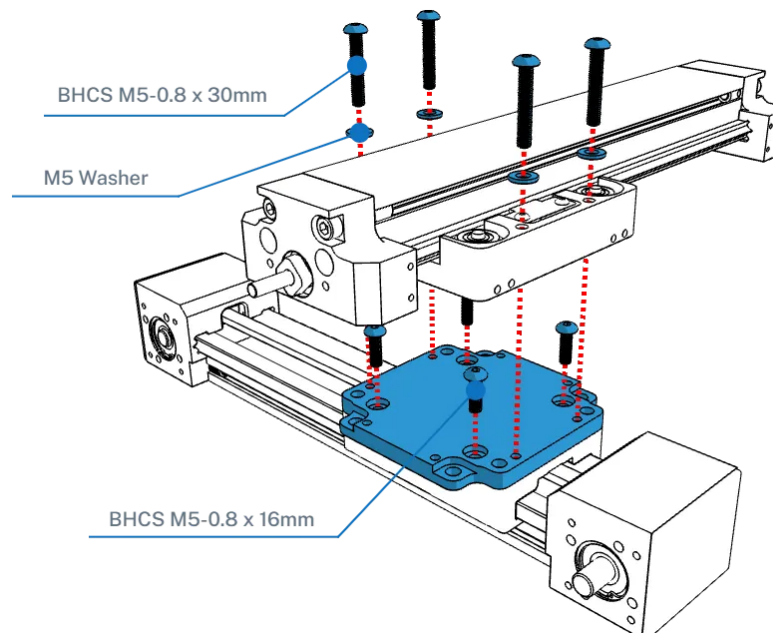
### **LATA-KIT-038-CH: Plain Bearing Carriage to Plain Bearing Carriage**

1. Orient the plate with the counterbores facing up and attach it to the lower carriage with (4) BHCS M6-1.0 x 20mm.
2. Set the upper actuator carriage-down on the plate, at 90° to the lower rail. Install (4) BHCS M6-1.0 x 20mm through the plate into the upper carriage.



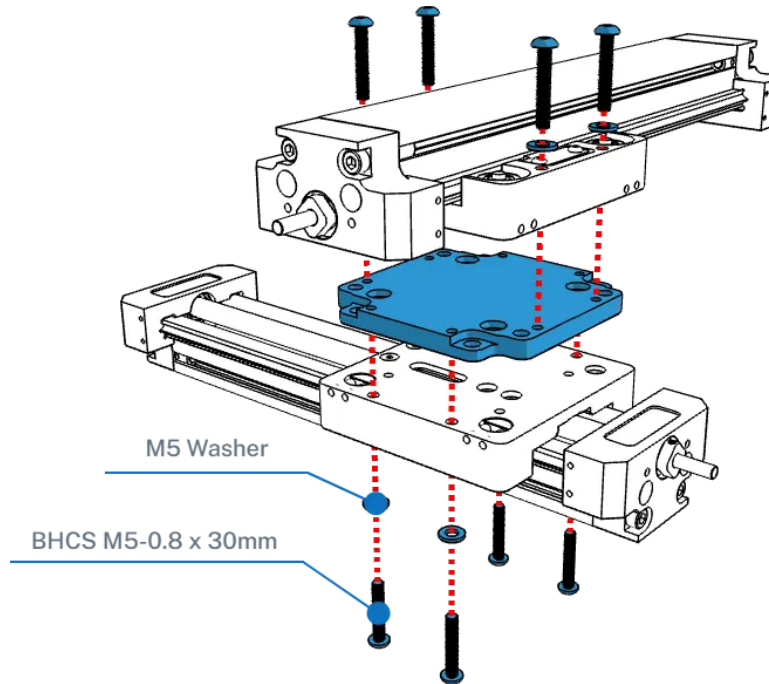
### **LATA-KIT-039-CH: Plain Bearing Carriage to V-Guide Carriage**

1. Set the plate on the plain bearing carriage with the counterbores facing up. Install (4) BHCS M5-0.8 x 16mm.
2. Set the V-guide actuator carriage-down on the plate. Install (4) BHCS M5-0.8 x 30mm with (4) custom washers, M5 x 2mm thick, through the V-guide carriage and into the plate.



**LATA-KIT-041-CH: V-Guide Carriage to V-Guide Carriage**

1. Set the plate on the lower carriage with the counterbores facing up. Install (4) BHCS M5-0.8 x 30mm with (4) custom washers, M5 x 2mm thick.
2. Set the upper actuator carriage-down on the plate. Install (4) BHCS M5-0.8 x 30mm with (4) custom washers, M5 x 2mm thick, through the upper carriage and into the plate.

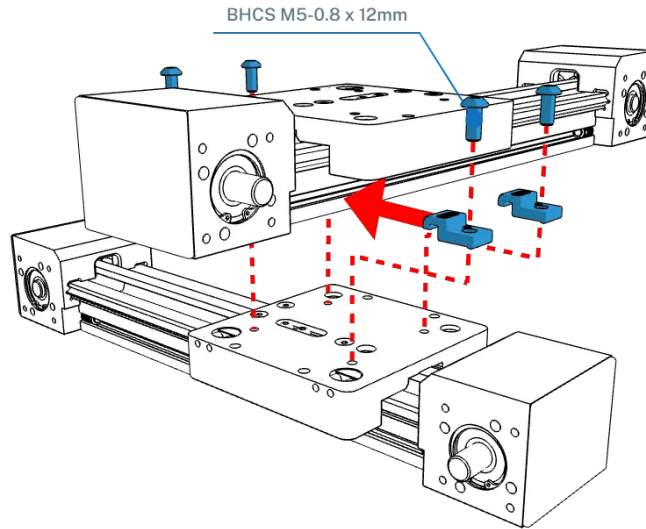


## Carriage-to-Rail Assembly (XY)

The following kits fasten the rail of an upper actuator onto a lower carriage, so the upper carriage stays free to carry a third axis.

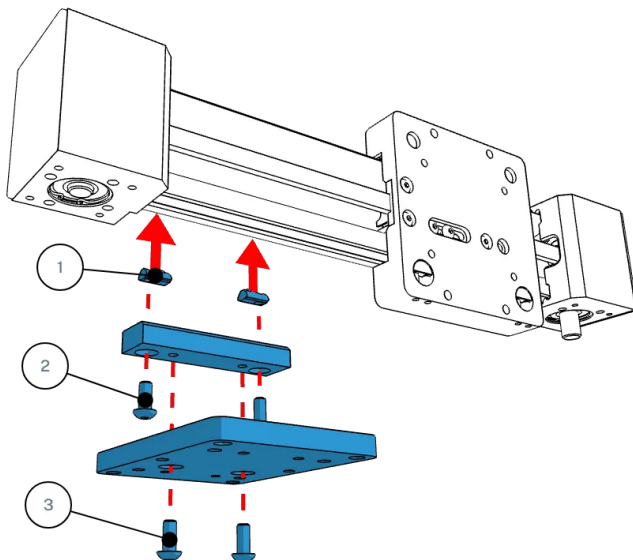
### LATA-KIT-042-CH: Rail to Carriage

1. Set the upper rail across the lower carriage at 90°.
2. Slide the four toe clamps into the lower T-slots of the upper rail, two per side, over the carriage mounting holes.
3. Install (4) BHCS M5-0.8 x 12mm with low-strength threadlocker and tighten evenly.

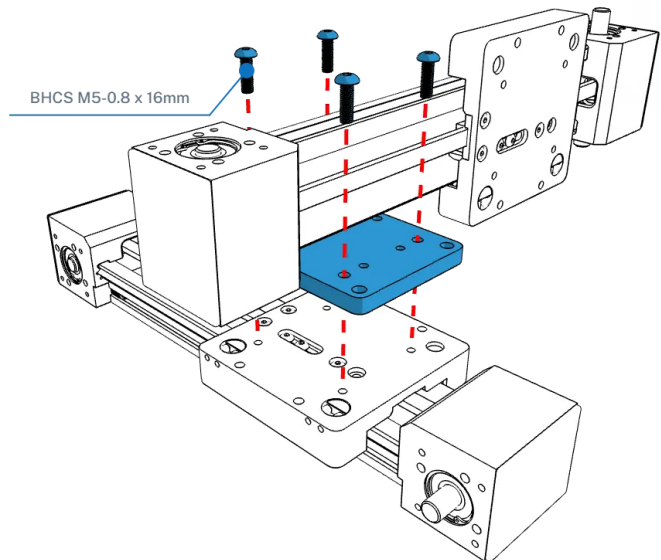


### LATA-KIT-043-CH: Rail to Carriage 90 Degree Mount

1. Insert (2) M5-0.8 T-nuts into the rail of the upper linear actuator. Attach the small plate to the rail with (2) BHCS M5-0.8 x 12mm. Note the orientation of the chamfer on the small plate.
2. Attach the large plate to the small plate with (2) BHCS M5-0.8 x 12mm.
3. Set the upper linear actuator assembly onto the lower carriage and secure it. Plain bearing (UGTDA) carriage: (4) BHCS M6-1.0 x 16mm. V-guide (UGTDB) carriage: (4) BHCS M5-0.8 x 16mm.



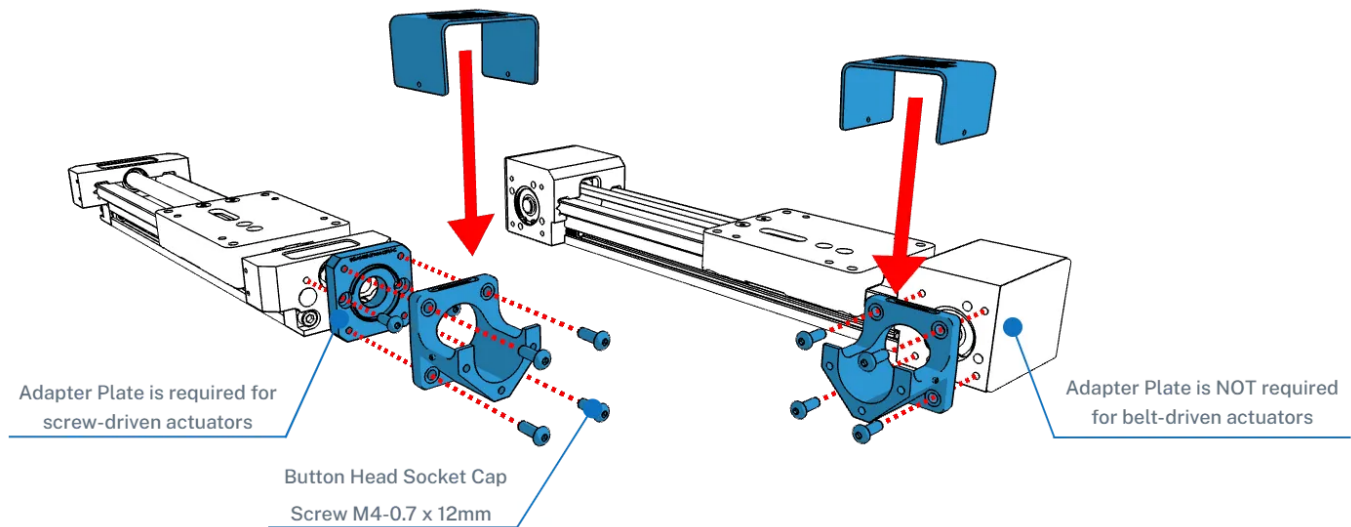
Steps 1 and 2



Step 3: V-guide (UGTDB) carriage shown

## Motor Mount Assembly

Every driven axis needs one [UG-AP-KIT-CH](#) motor mount and one 3PMM motor adapter plate matched to the motor frame.



Lead screw actuator (left) needs the adapter plate; belt drive actuator (right) does not

### Lead Screw Actuators (LAX, LAJ)

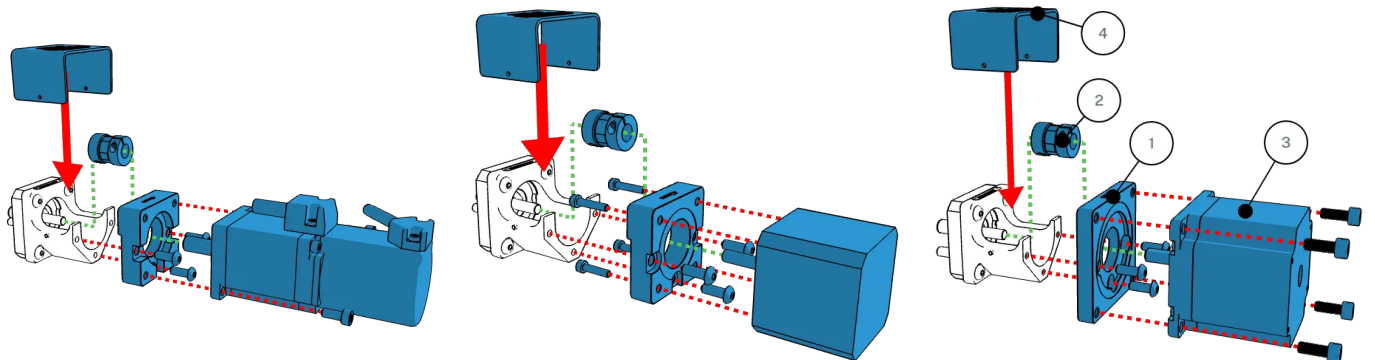
1. Attach the adapter plate to the lead screw actuator end block with (2) BHCS M4-0.7 x 12mm.
2. Attach the main frame to the adapter plate with (4) BHCS M4-0.7 x 12mm.
3. After the drive coupling and motor are installed, snap the plastic cover onto the main frame.

### Belt Drive Actuators (B0D)

1. Attach the main frame directly to the belt drive actuator with (4) BHCS M4-0.7 x 12mm. The lead screw adapter plate is not used.
2. After the drive coupling and motor are installed, snap the plastic cover onto the main frame.

### Motor Adapter Plate and Drive Coupling

1. Slide the coupling onto the actuator stub shaft and tighten the actuator-side clamp screw.
2. Attach the motor adapter plate to the main frame with (3) BHCS M4-0.7 x 12mm.
3. Attach the motor to the adapter plate with the plate fasteners and engage the motor shaft in the coupling. Check shaft engagement on both sides, then tighten the motor-side clamp screw.



40mm servo frame ([3PMM-40A-KIT-CH](#))

NEMA 17 (42mm) frame ([3PMM-42A-KIT-CH](#))

NEMA 23 (56mm) frame ([3PMM-56A-KIT-CH](#))

| RECOMMENDED AUTOMATIONDIRECT MOTOR ADAPTER PLATES AND DRIVE COUPLINGS |                                                                                                                            |                                                                                                    |                                                                                                                                  |
|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
|                                                                       | 40mm frame<br>(8mm motor shaft)                                                                                            | 42mm frame, NEMA 17<br>(5mm motor shaft)                                                           | 56mm frame, NEMA 23<br>(6.35mm motor shaft)                                                                                      |
| Motor adapter plate                                                   | <a href="#">3PMM-40A-KIT-CH</a>                                                                                            | <a href="#">3PMM-42A-KIT-CH</a>                                                                    | <a href="#">3PMM-56A-KIT-CH</a>                                                                                                  |
| Drive coupling                                                        | <a href="#">SRB-19C-5-8</a>                                                                                                | <a href="#">SRB-19C-5-5</a>                                                                        | <a href="#">SRB-19C-5-6.35</a>                                                                                                   |
| Lead screw actuators UGTDx-xx<br>(5mm stub shaft)                     | <a href="#">SHR-18C-5-8</a><br><a href="#">SJC-20C-5</a> + <a href="#">SJC-20C-8</a><br>+ <a href="#">SJC-20-xx-SLEEVE</a> | <a href="#">SHR-18C-5-5</a><br>(2) <a href="#">SJC-20C-5</a><br>+ <a href="#">SJC-20-xx-SLEEVE</a> | <a href="#">SHR-18C-5-6.35</a><br><a href="#">SJC-20C-5</a> + <a href="#">SJC-20C-6.35</a><br>+ <a href="#">SJC-20-xx-SLEEVE</a> |
| Drive coupling                                                        | <a href="#">SRB-22C-8-10</a>                                                                                               | <a href="#">SRB-22C-5-10</a>                                                                       | <a href="#">SRB-22C-6.35-10</a>                                                                                                  |
| Belt drive actuators UGTDx-xx-<br>B0D<br>(10mm stub shaft)            | <a href="#">SJC-20C-8</a> + <a href="#">SJC-20C-10</a><br>+ <a href="#">SJC-20-xx-SLEEVE</a>                               | <a href="#">SJC-20C-5</a> + <a href="#">SJC-20C-10</a><br>+ <a href="#">SJC-20-xx-SLEEVE</a>       | <a href="#">SJC-20C-6.35</a> + <a href="#">SJC-20C-10</a><br>+ <a href="#">SJC-20-xx-SLEEVE</a>                                  |

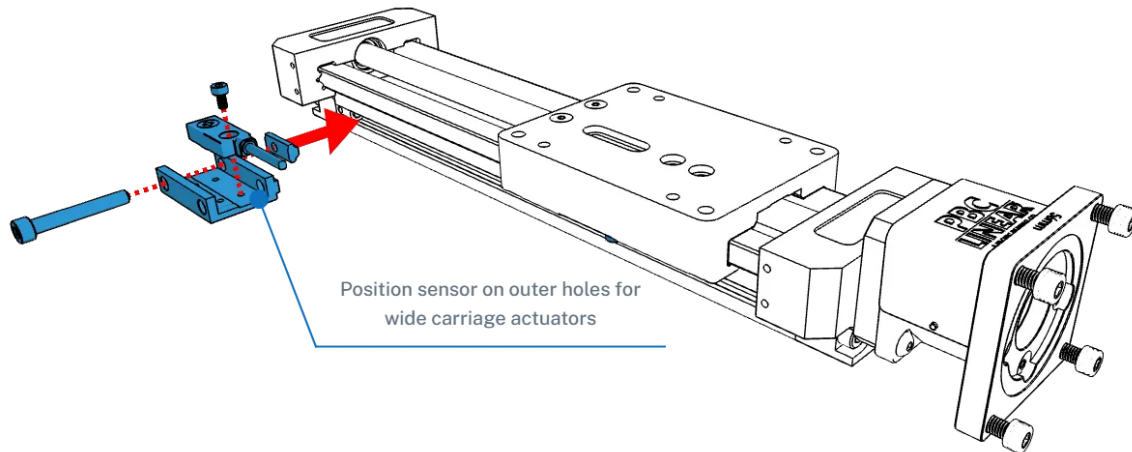
SRB servo-beam and SHR servo high-gain couplings are one piece. SJC jaw couplings need one hub for each shaft plus one SJC-20 spider (GR, BL, or RD durometer). Every coupling listed fits inside the [UG-AP-KIT-CH](#) main frame (25mm maximum OD, 26mm maximum length).

## Sensor Bracket

The [LATA-SENBRKT-01-KIT](#) holds an inductive proximity sensor in the rail T-slot beneath the carriage. A flag screw and square spacer installed in the underside of the carriage trip the sensor.

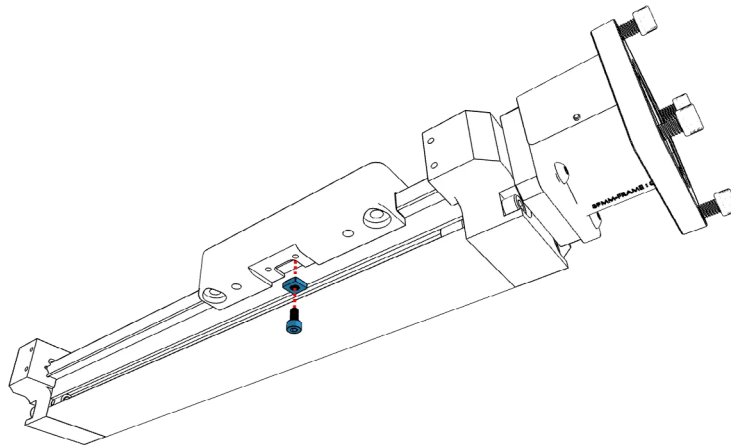


**WARNING:** End blocks are not rated as hard stops.



Steps 1 and 3: sensor bracket, T-nut, and sensor

1. Roll the M5 T-nut into the rail T-slot and attach the sensor bracket with the SHCS M5-0.8 x 35mm.
2. Attach the sensor flag components, (1) SHCS M3-0.5 x 6mm and (1) square spacer, in any one of the four locations on the underside of the plain bearing carriage. For a V-guide carriage, remove any one of the four wiper retaining screws and install the flag components in that hole.
3. Install the sensor with (1) SHCS M3-0.5 x 6mm. Note the location depending on the carriage type.
4. Power up the sensor and move the carriage to ensure it triggers as desired and that the flag does not hit the sensor housing. Adjust the sensor bracket along the T-slot to the desired location.



Step 2: flag screw and square spacer, carriage underside

### RECOMMENDED AUTOMATIONDIRECT INDUCTIVE PROXIMITY SENSORS

| Sensor PN                      | Output | Normal State | Sensing Distance | Connection |
|--------------------------------|--------|--------------|------------------|------------|
| <a href="#">DW-AD-611-C12P</a> | NPN    | N.O.         | 4mm              | 2m pigtail |
| <a href="#">DW-AD-612-C12P</a> | NPN    | N.C.         | 4mm              | 2m pigtail |
| <a href="#">DW-AD-613-C12P</a> | PNP    | N.O.         | 4mm              | 2m pigtail |

## Maintenance

### Lubrication

Plain bearing (UGTDA) carriages use self-lubricating FrelonGOLD liners and need no lubrication. The PTFE-coated lead screw and polymer nut also need no lubrication. V-guide (UGTDB) carriages carry oil-filled polymer lubricators that wipe the stainless raceways. Replace worn lubricators with the UGA040A-LHA-KIT.

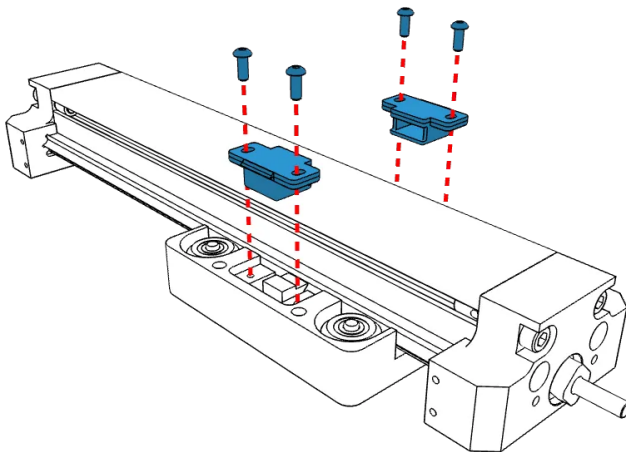
- Relubricate V-guide raceways every 1,000km, 50,000 cycles, or six months, whichever comes first. Demanding conditions (high speed, temperature extremes, contamination) need shorter intervals.
- Use a synthetic lithium-soap grease or oil with ISO VG 32–100 viscosity, or a way lube or lightweight oil. Brush a thin layer along the raceways and stroke the carriage at least four times.
- Squealing or chirping from a V-guide carriage means the lubricators need replacement.
- Wipe the actuator down occasionally. Use fluids sparingly and keep them out of the drive.



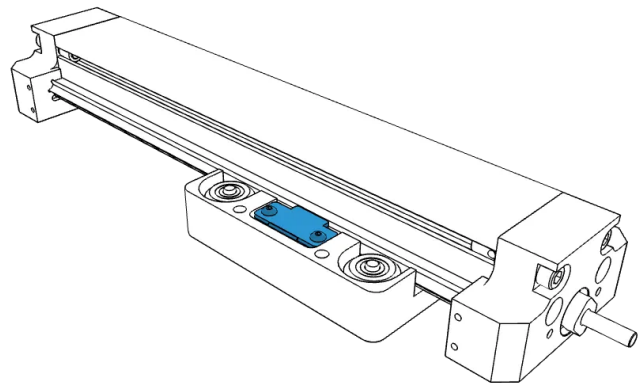
**WARNING:** Do not use WD-40, motor oil, oils with additives, moly or other filled greases, PTFE sprays, or products containing silicone on any UG Series actuator.

#### **Replacing V-Guide Lubricators (UGA040A-LHA-KIT)**

1. Turn power OFF and secure the load.
2. Remove the (2) BHCS M3-0.5 x 8mm holding each worn lubricator on the underside of the carriage and remove the lubricator.
3. Install the new lubricators with the supplied BHCS M3-0.5 x 8mm.
4. Apply lubricant to the raceways and stroke the carriage at least four times.



Steps 2 and 3: lubricators and BHCS M3-0.5 x 8mm,  
carriage underside

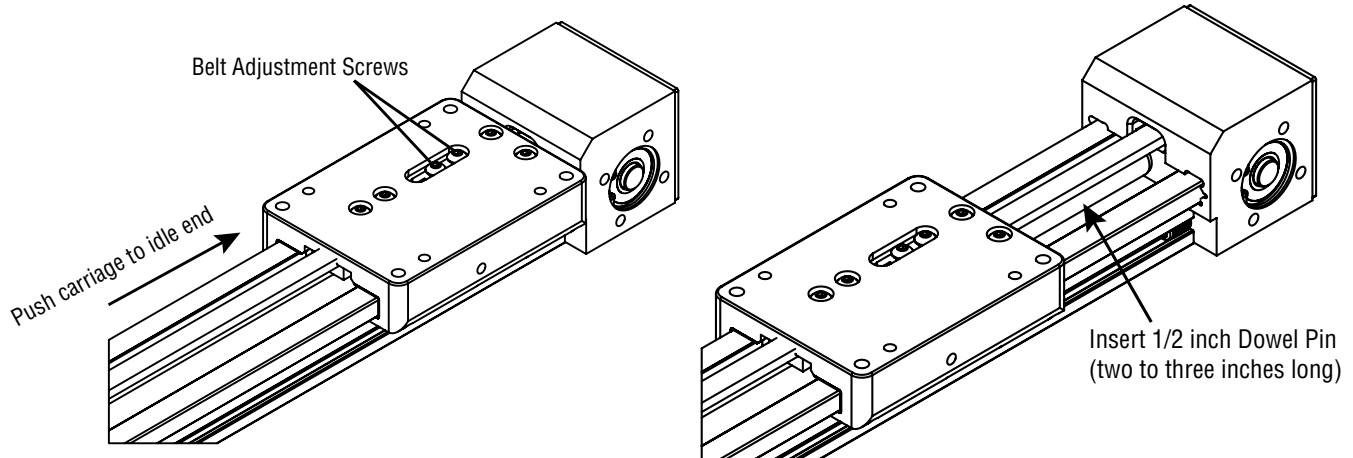


Lubricator installed

## Belt Tension Check and Adjustment (B0D models)

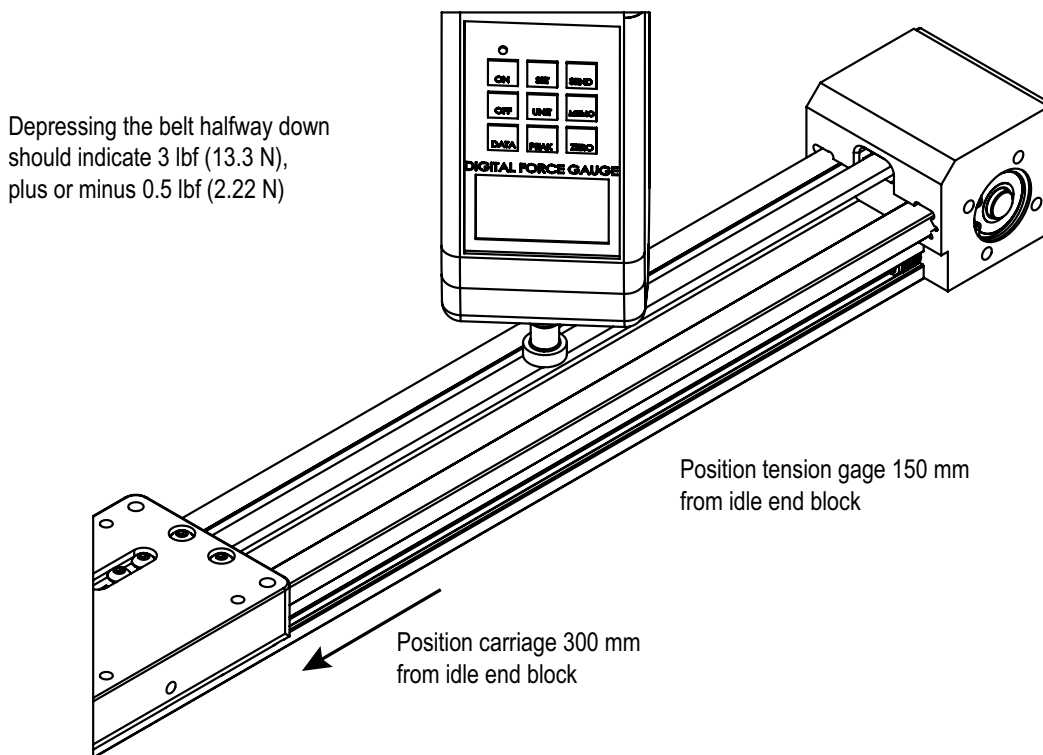
Tools: 2.5mm hex key, belt tension gauge, and a 1/2in diameter dowel pin 2–3in long. Turn power OFF before starting.

1. Push the carriage to the idle end of the actuator.
2. Loosen both belt adjustment screws slightly with the 2.5mm hex key. Keep some tension so the belt does not detach.
3. Place the dowel pin between the carriage and the idle end block. Push the carriage against the pin to keep the belt taut and tighten both adjustment screws.
4. Move the carriage 300mm away from the idle end block.
5. Press the belt down halfway with the tension gauge positioned 150mm from the idle end block. Correct tension reads  $3 \pm 0.5$  lbf [ $13.3 \pm 2.2$  N].
6. If the tension is wrong, repeat the procedure, increasing or decreasing tension as required.



Steps 1–2: push the carriage to the idle end and loosen the adjustment screws

Step 3: dowel pin between the carriage and the end block



Steps 4–5: gauge 150mm from the idle end block, carriage 300mm back

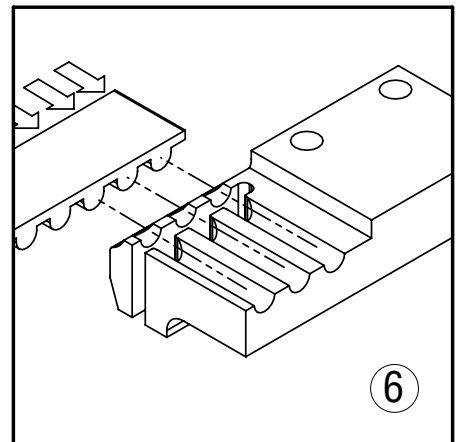
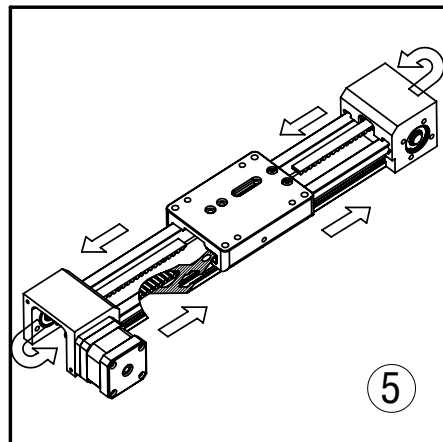
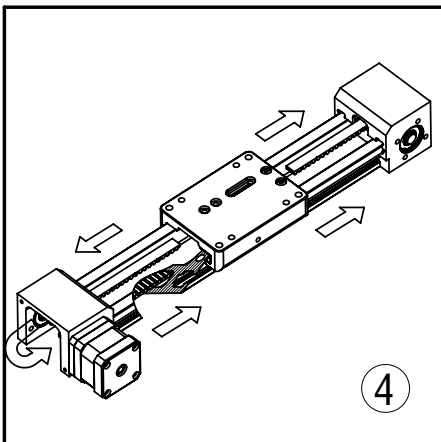
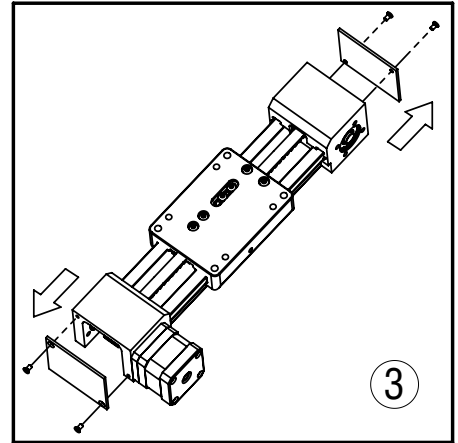
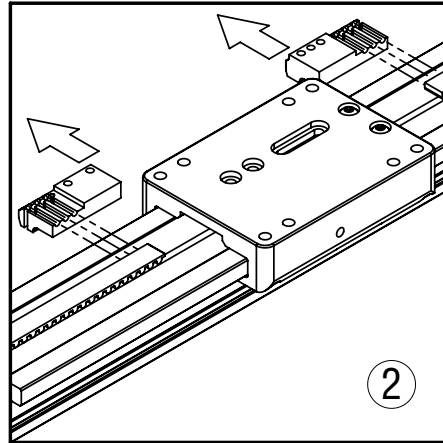
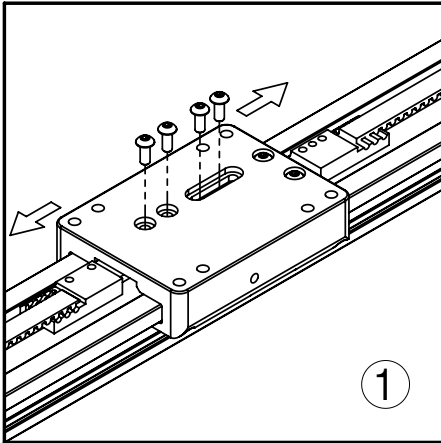
## Belt Replacement (B0D models)

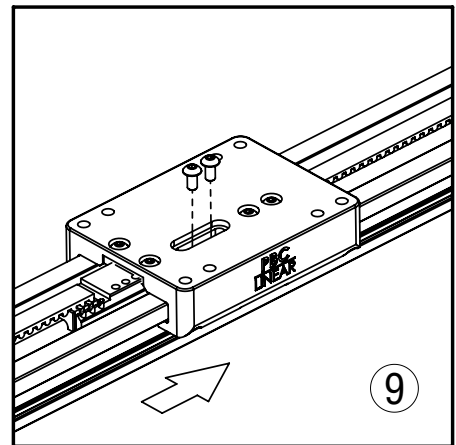
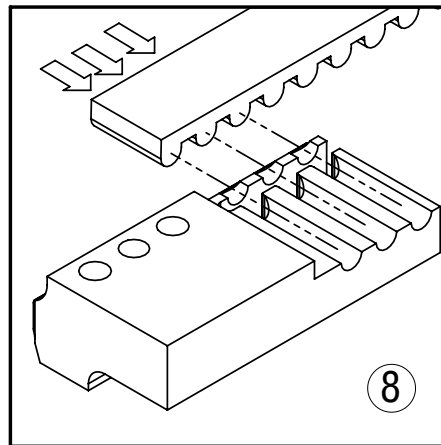
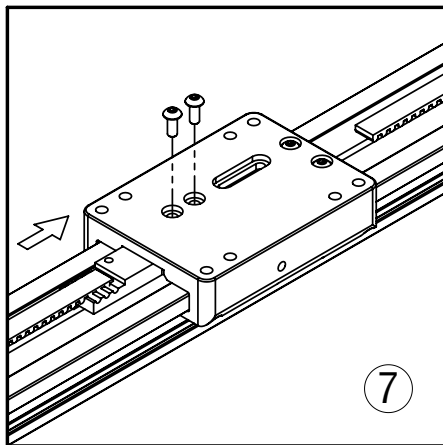
Tools: 2.5mm hex key. Parts: replacement pulley belt (order from PBC Linear; see the Replacement Belt Lengths table), (4) BHCS M4-0.7. Turn power OFF before starting. The numbered figures below match the steps.



**WARNING:** The carriage is free to move once the belt is removed. Secure the carriage and any load before starting.

1. Remove the (4) M4 BHCS securing the two pulley clamps under the carriage, then pull both clamps out from under the carriage.
2. Remove both pulley clamps from the belt.
3. Remove the actuator end plates (the covers on the end blocks), if fitted.
4. Pull the belt around the pulley in the drive end block, then around the pulley in the idle end block, and out of the actuator.
5. Feed the new belt through the actuator around both pulleys. Do not skip a tooth.
6. Insert one belt end into the fixed pulley clamp with all teeth engaged.
7. Slide the fixed pulley clamp under the carriage and fully tighten its (2) BHCS M4-0.7.
8. Insert the other belt end into the adjustable pulley clamp with all teeth engaged.
9. Slide the adjustable pulley clamp under the carriage and install its (2) BHCS M4-0.7 loosely. Set the tension as described in Belt Tension Check and Adjustment, then tighten the screws.





### REPLACEMENT BELT LENGTHS (5M GT2 X 9MM WIDE)

| Plain Bearing Actuator           | V-Guide Actuator                 | Rail Length | Travel | Replacement Belt   |
|----------------------------------|----------------------------------|-------------|--------|--------------------|
| <a href="#">UGTDA0250B0D-AD</a>  | <a href="#">UGTDB0250B0D-AD</a>  | 250mm       | 150mm  | Consult PBC Linear |
| <a href="#">UGTDA0400B0D-AD</a>  | <a href="#">UGTDB0400B0D-AD</a>  | 400mm       | 300mm  | Consult PBC Linear |
| <a href="#">UGTDA0550B0D-AD</a>  | <a href="#">UGTDB0550B0D-AD</a>  | 550mm       | 450mm  | Consult PBC Linear |
| <a href="#">UGTDA0700B0D-AD</a>  | <a href="#">UGTDB0700B0D-AD</a>  | 700mm       | 600mm  | Consult PBC Linear |
| <a href="#">UGTDA0850B0D-AD</a>  | <a href="#">UGTDB0850B0D-AD</a>  | 850mm       | 750mm  | Consult PBC Linear |
| <a href="#">UGTDA01100B0D-AD</a> | <a href="#">UGTDB01100B0D-AD</a> | 1100mm      | 1000mm | Consult PBC Linear |
| <a href="#">UGTDA01350B0D-AD</a> | <a href="#">UGTDB01350B0D-AD</a> | 1350mm      | 1250mm | Consult PBC Linear |
| <a href="#">UGTDA01600B0D-AD</a> | <a href="#">UGTDB01600B0D-AD</a> | 1600mm      | 1500mm | Consult PBC Linear |
| <a href="#">UGTDA01850B0D-AD</a> | <a href="#">UGTDB01850B0D-AD</a> | 1850mm      | 1750mm | Consult PBC Linear |

## Troubleshooting

| Symptom                                                      | Possible Cause                                                               | Corrective Action                                                                                       |
|--------------------------------------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Carriage binds or stalls (plain bearing)                     | Load or drive force applied beyond the 2:1 cantilever limit                  | Move the load closer to the carriage or add a second carriage or support                                |
| Carriage binds or stalls (all types)                         | Rail twisted or bowed by an uneven mounting surface or over-tightened clamps | Loosen the clamps, check mounting surface flatness, retighten evenly                                    |
| Squealing or chirping from a V-guide carriage                | Lubricators worn out or raceways dry                                         | Replace lubricators ( <a href="#">UGA040A-LHA-KIT</a> ) and relubricate raceways                        |
| Belt slips or skips teeth                                    | Belt tension low or pulley clamp loose                                       | Set belt tension to 3 lbf [13.3N] (see Belt Tension Check and Adjustment) and tighten the pulley clamps |
| Motor runs but carriage does not move, or moves erratically  | Coupling clamp loose, coupling misaligned, or insufficient shaft engagement  | Check both coupling clamps and shaft engagement; verify the coupling fits the stub shaft                |
| Load drifts when power is removed                            | Actuator is not self-braking                                                 | Add a power-off brake on the motor; secure the load before service                                      |
| Position lost at end of travel or carriage strikes end block | No limit sensors, or sensor not tripping                                     | Fit sensors at both ends of travel; check the flag screw, sensor location, and sensing distance         |
| Rough or noisy travel                                        | Contamination on the rail, or a prohibited lubricant was used                | Clean the rail and relubricate with an approved lubricant (see Lubrication)                             |
| Excessive backlash or poor repeatability (lead screw)        | Worn nut or loose coupling                                                   | Check the coupling; contact PBC Linear for nut replacement                                              |