

Mechanical Assembly Checklist

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Overview

The mechanical assembly checklist should be used as a final check once the system is assembled.

Use the following checks to ensure that your system is assembled correctly.

General assembly

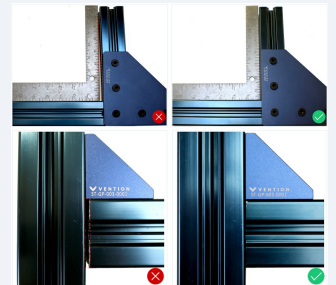
- 1. Extrusions** Extrusions are assembled according to CAD design.
- Check that the right profile type and length are used in each location.

- 2. Gussets** High-precision (HP) and general-precision (GP) gussets are installed in correct locations.

- 3. Plates** Assembly plates are properly mounted; no fasteners are missing.

- 4. Frame** Base frame can support more than enough weight.
- Inspect entire assembly, starting from the bottom and moving up.
 - Use a framing square if necessary to attain the correct perpendicularity.

For details, see the [assembly guide](#).



- 5. Screws** Screws are securely tightened.
- Torque all fasteners to 13–16 Nm.
 - For systems exposed to vibrations, consider applying Loctite 2760 to critical screws.

For details, see the [anti-vibration products guide](#).

- 6. Level** System is leveled.
- Check using a level.
 - Adjust feet as needed to obtain desired results.

- Cables and tubes are sufficiently long and run along clear paths.
- 7. Cables and tubes**
- If you have any moving parts or are using drag chains, check that cables are long enough to move from one end to another.
 - Cables and tubes should be easy to identify and to access.
- For details, see the [cable management guide](#).

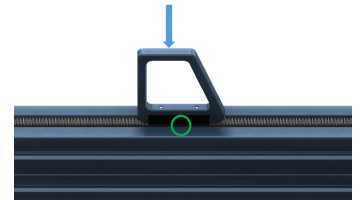
8. Hinges Hinges move smoothly.

9. Safety interlock Safety interlocks are adjusted and fully engaged.

10. Custom parts Custom parts are deburred and have no sharp edges.

Rack and pinion

- Gear rack sections are properly joined.
- 11. Rack spacing**
- Place the rack installation tool over the joint of two rack segments to check that teeth are spaced correctly.
- For details, see the [rack and pinion actuator guide](#).



12. End-stop brackets End sensor brackets are tightened on rack.

13. Housing Bearings and/or rollers are securely mounted on housing.

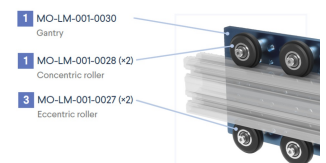
Alignment

- Linear rails are levelled and parallel.
- Rail brackets are securely tightened on extrusions.
- Gantry moves fluidly on the rails, traveling from end to end without any resistance. For details, see the [linear axis alignment guide](#).

15. Shaft If system has butt-jointed rails: Butt-joints have no chamfer, gaps, or misalignment.

- After alignment, double-check that shaft brackets are securely tightened.

16. Roller wheels Eccentric rollers are all on one side and properly adjusted; concentric rollers are all on the opposite side. For details, see the [linear guides datasheet](#).



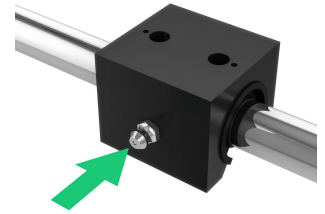
Lubrication and maintenance

Find step-by-step instructions for these components in the [maintenance guide](#).

17. Linear ball bearings

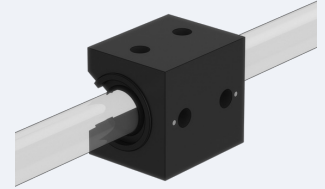
Installation: Ball bearings lubricated.

Maintenance plan: Linear ball bearings lubricated once a year or after every 100 km of travel, whichever comes first.



18. Plain bearings

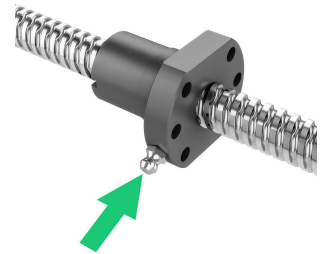
Installation (recommended): Shaft cleaned with 3-in-1 oil.
No lubrication required for installation or maintenance.



19. Ball screws

Installation: Ball screws lubricated.

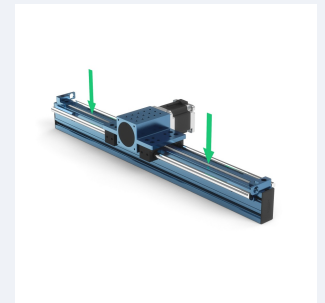
Maintenance plan: Ball screws lubricated every six months or after 500,000 revolutions, whichever comes first.



20. Rack and pinion

Installation: Gear racks lubricated.

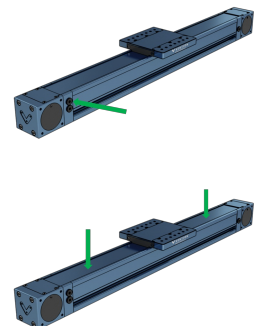
Maintenance plan: Gear racks lubricated every six months or after 500,000 revolutions, whichever comes first.



21. Enclosed timing belt actuator

Installation: N/A (ships pre-lubricated).

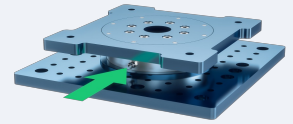
Maintenance plan: Bearings and cover strips lubricated once a year or after every 100 km of travel, whichever comes first.



22. Rotary actuator

Installation: N/A (ships pre-lubricated).

Maintenance plan: Gears lubricated every six months or after 10,000 revolutions, whichever comes first.



Sensors

23. End-stop sensor

If using an actuator: End-stop sensors are functioning (to detect when gantry reaches end of travel).

24. End-stop bumper

Sensor has sufficient clearance from plate at end-stop position.

- Use jam nuts to adjust sensor position.
- Leave 2-3 mm of clearance between sensor and plate at end-stop position, to ensure gantry hits the bumper and not the end-stop sensor.

25. Sensor mounting

Sensors have enough clearance and are not intercepted by the movement of other components.

Motors

26. Motor

Before installation: Shaft has key installed on it.

27. Power transmission devices

Before installation: Design follows proper order of motor, gearbox, and brake.

If using a gearbox: The input clamping mechanism is properly secured through ports on the gearbox's side.