

POWER BEAM

INSTALLATION AND MAINTENANCE INSTRUCTIONS

Special Model
IM800D015x17593 & 17594
IM800 and IM900
BALL SCREW
VERSION "D"
FORM # 106854-1

A. DESCRIPTION:

Model 800 and 900 POWER BEAMS, are fully enclosed rodless cylinder style, linear actuators driven by ball bearing screw drive. IM800 and 900 series are the choice for high precision, repeatable positioning application.. POWER BEAM is available in stroke lengths of up to 20' (max. stroke is limited by ball screw critical speed) and capable of handling loads up to 1,000 pounds. The unique guided carriage absorbs yaw, pitch, and roll forces without requiring separate external guide rods or additional load supports.

B. OPERATION:

Power Beam "IM800" and "IM900" series feature enclosed, guided carriage driven by a precision rolled ball screw. Two heavy-duty, multi-row linear guides support the carriage. The enclosure consists of an aluminum housing with re-circulating dust belt. Power Beam IM800 and IM900 series are designed to operate over an ambient temperature range from -10° to 40 degrees "C", provided that condensation does not occur, either internally or externally.

C. CONSTRUCTION: (refer to Fig. 1)

A high strength aluminum "H" section beam supports one linear guide rail and carries the load over the full stroke length without requiring extra supports. The combination of "H" section beam, linear rail, and linear guides provide a near frictionless system for heavy load handling. All loads are carried by the beam and carriage. The linear rail, linear guides, and ball screw, are protected from workplace contamination by the unit's sealed aluminum enclosure and dust belt system. The enclosure ensures that the designed service life will routinely be achieved; free from accidental damage to the working parts, and premature wear due to contaminants. A standard "purge port" is provided on enclosure, to allow application of low-pressure (1-3 psig) compressed air to reduce contaminants and provide some "cooling" effect.

Special Features of IM800D015x17593 & 17594:

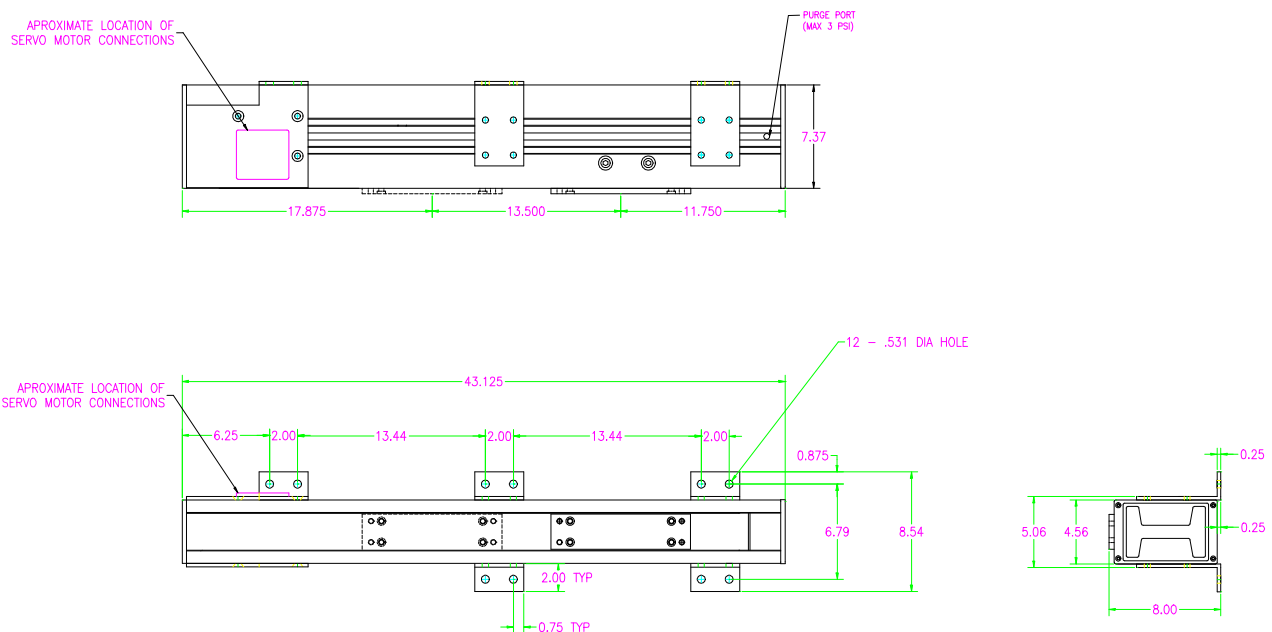
- Integral servomotor mounted inside enclosure
- 15.0" gross travel available with 0.5" urethane end of travel bumpers
- Special mounting brackets for mounting 17593 & 17594
- Wipers installed on ball screw

D. INSTALLATION:

Each unit is prepared at the factory and is ready for installation when received. Mounting brackets and fasteners are included with unit.

Remove POWER BEAM from the carton, and check the nameplate for correct catalogue number, and accessories.

POWER BEAM may be mounted in any position. (Mounting with carriage plate facing up, down, or vertical, is preferred for greatest dust belt life.) Maximum load forces should not exceed the specifications for each model type. The high efficiency of the ball screw may require a brake motor or spring set brake may be used to hold the load.



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F. MAINTENANCE: (GENERAL)

POWER BEAM units are designed to be relatively maintenance free. The following items should however be considered.

- 1.0 A film of lubricant should be maintained on ball screw surface. The longevity of the lubricant film is determined by travel distance, load and cycle frequency. Recommended lubricant is Nook part # E-900 available in spray or liquid.
- 2.0 For detailed maintenance schedule, refer to document "Maintenance & Guidelines" # 125853-3
- 3.0 Carriage bearings can be lubricated, without dis-assembly, through external grease ports. Remove (2) plugs and lubricate 2 linear bearings with grease gun using recommended lubricant (Dow Corning Br-2-Plus or Equivalent)
- 4.0 While in service, the unit should be operated at least for a short time once per month.
- 5.0 Periodically inspect the service conditions, and check operation of the unit.
- 6.0 Environmental conditions may require occasional cleaning of exposed surfaces.
- 7.0 Cleaning should consist of wiping down the unit with a compatible solvent if required. Medium grit "Scotchbrite" pad will brighten aluminum sources. All cleaning solvents should be compatible with nylon, polyethylene and their compounds.
- 8.0 PURGE PORT: Very low pressure, low flow, clean only, air supply at the standard purge port (1-3 PSI max.) to ensure a positive pressure within the enclosure, will greatly reduce the accumulation of fine dust & cool the unit in hot environments.
- 9.0 Replacement of dust belt at the first sign of wear or damage extends the life of POWER BEAM.
- 10.0 Over travel switches and sufficient programming should be utilized to eliminate repeated dead stopping beam at end-of-stroke.

WARNING:

Turn off all electrical and air supplies to the POWER BEAM and ensure all pressure has been vented from the unit prior to performing service work.

G. REPAIR KITS:

Parts subject to wear are available as replacement kits, as follows:

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|------------------------|---|
| BALL SCREW ASSEMBLY | # 128700 (includes ball screw, ball nut, support bearings, wiper kit) |
| LINEAR GUIDE KIT | # 125060 – Consists of linear guides, washers and hardware. |
| POLY BELT KIT | #125473S-length – Consists of poly belt, edge seals, belt scrapers and belt splice. |
| 180 DEGREE DRIVE PLATE | #106698-consists of a wrap-around drive plate to allow inversion mounting of Power Beam |

ORDERING INFORMATION – When ordering repair kits for the POWER BEAM, specify the catalogue and serial numbers from the nameplate. (Serial number is also stamped in behind end plate, and on cover near label)

H. BELT KIT # 125473S-Lgth

- 1.0 Remove (4) self-tapping screws from each end plate. This will allow removal of enclosure end plates and gaskets.
- 2.0 Remove belt scraper from each end.
- 3.0 Remove carriage drive plate by unfastening (4) drive plate bolts.
- 4.0 Slide belt from joint through edge seal and out the end-removing belt. (For ease of new belt installation, attach (tape) new belt to old belt end, and pull new belt through enclosure.)
- 5.0 Remove belt splice by sliding through edge seal and out the end.
- 6.0 Remove old edge seal from each enclosure extrusion groove.
- 7.0 Install new belt edge seals into grooves of enclosure extrusions with cutout on bottom surface to allow belt to form around guide at each end. (Loctite # 770 primer and Loctite 404 adhesive achieve best adhesion)
- 8.0 Insert the belt splice into the edge seals and position it over the carriage.
- 9.0 Insert the belt into the edge seals. The belt must wrap around the guides. Both ends of the belt must meet on top of the center of the slice. (Ensure belt is installed between plastic belt guides at each end of beam)
- 10.0 Secure the drive plate to the carriage through the belt using (4) bolts. (If possible, cycle beam to ensure belt is centered during travel, re-adjust at carriage plate if necessary.)
- 11.0 Insert the scrapers into the edge seals at each end of the beam.
- 12.0 Attach the gasket and end plate to each end of the beam using self-tapping screws.
- 13.0 Cycle unit over full travel and observe belt for uniform smooth motion to confirm proper assembly.

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BALL SCREW KIT #128700

LINEAR GUIDE KIT # 125060

- 1.0 Remove belt as per Belt I & M on page 4.
- 2.0 Lay the POWER BEAM on its side.
- 3.0 Remove trim strip from front enclosure extrusion, unfasten self-tapping screws and remove front extrusion.
- 4.0 Remove enclosure joining strip from rear enclosure extrusion.
- 5.0 Repeat for the rear extrusion.
- 6.0 Move the carriage to the center of its stroke. Mark location of screw support blocks.
- 7.0 Remove fasteners holding the carriage to the bearing blocks. Remove left end (free end) ball screw support blocks upper and lower, right end upper mount only, and loosen the motor coupler. Remove carriage. Remove ball screw assembly.
- 8.0 Install new ball screw assembly in reverse order from above. Ensure ball screw is aligned with rail and screw end aligned with motor (+/- .005") Apply Loctite 242 to fasteners and torque M8 screws to 209 in. lbs.

REPLACING LINEAR GUIDE BLOCKS ONLY (RE-USING LINEAR GUIDE RAIL):

- 9.0 Slide guide blocks from rail. (Note orientation of grease fittings on guide blocks) Clean linear rail surfaces and inspect for excess wear or damage. If the rail is worn or damaged, continue to step 9.0. If rail is satisfactory, skip to step

REPLACING BOTTOM MOUNT LINEAR RAIL:

- 10.0 Remove bearing blocks from rail. Store bearings on retainers in they are to be reused. Remove the bottom mount screws and place the rail aside. Clean the H section of the beam, the screw holes and the screws. Use the polishing pad to be sure that the surface is clean and free of debris. Lay the new Bottom Mount Rail on the beam and align it with the holes. Install a low head screw in every fifth hole finger tight, and be sure to mark the hole position. Align the rail parallel to the beam, 2.40" from the outside of the channel to inside of the rail and hand tighten the screws. Apply 242 loctite to the remaining screws and install them in the empty holes and tighten them to 150 in/lbs. Once the rail is aligned and the screws are tightened, remove the dry screws apply loctite to them and reinstall them.(torque to 150 in/lbs). (Note: When using stainless screws, clean them with solvent, apply loctite primer #7649 to the screw holes and screws. Then use the 242 loctite on them and install and torque them to 150 in/lbs.)
- 11.0 Line up new bearing retainer with end of linear rail and, noting orientation of grease nipple, slide new bearing on rail. (Grease nipples should face center to line up with grease access holes in "H" channel.)
- 12.0 Using grease gun (with B22 grease) apply grease to each bearing. Manually cycle bearing back and forth a minimum distance of four times the length of the bearing block for four to six times. Repeat until grease appears at both ends of bearing.
- 13.0 Reassemble carriage to bearings, Torque bolts to 209 inch pounds.
- 14.0 Apply Loctite 242 to (8) flat head bolt threads. Reassemble "H" section beam, linear rail, and carriage assembly to end caps. Torque bolts to 25 foot-pounds.
- 15.0 Reassemble ball screw assembly to beam (see 8.0) Reassemble enclosure extrusion, front and rear, bottoming extrusion on top of "H" beam and center extrusion on end cap mounting holes.
- 16.0 Install belt as per I&M on page 4.

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<u>FEATURE</u>	<u>FREQUENCY</u>	<u>VISUAL INSPECTION / REPLACEMENT OR END OF SERVICE LIFE INDICATED</u>
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NOTE: Remove/disconnect all power sources and support load before performing any service operations on Power Beam

Belt	2000 HRS / OPERATION	Remove enclosure end plates/gasket and visually inspect belt for dents and/or cracks along edges. Cycle unit with end plate/gasket off observing any grinding sounds. Install belt kit #128473S-LGTH, if one or more of the above faults are observed.
Ball Screw Ass'y	2000 HRS / OPERATION	Remove end plates/gaskets & belt, rotate ball screw coupling, checking for bearing roughness, binding and noise. Visually inspect screw for wear or contamination. Install new ball screw assembly if one of the above conditions are observed. If satisfactory, apply Nook E-900 Ball Screw Lubricant to all screw surfaces.
Carriage Bearings	*PERIODIC *2000 HRS/ OPERATION	Relubricate the linear guides through the external grease Ports with recommended grease (Dow Corning Br2 or equivalent.) Remove end plates/gaskets & belt, cycle unit and observe carriage for smoothness of motion and bearings for grinding noise. Install bearing kit # 125060 if one or more of the above faults are observed.

NOTE: SEE INSTALLATION AND MAINTENANCE INST.(#106854) FOR REPLACEMENT KITS