User Manual: NexBot Robotics 762-001 Joint Overhaul Kit for R-50/R-100 Series

SKU: NXB-KIT-762-001 | Version: 1.0 | Brand: NexBot Robotics

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1. Safety Information

READ ALL SAFETY INSTRUCTIONS BEFORE OPERATION. Failure to follow safety procedures may result in serious injury or equipment damage.

DANGER: HIGH VOLTAGE. Risk of electrocution or severe burns. Disconnect and Lockout/Tagout all electrical power sources before opening any robot controller or junction box. Service must be performed by qualified personnel only.

WARNING: UNEXPECTED MOVEMENT. Robot arm can move unexpectedly due to stored mechanical energy (gravity) or incorrect brake release. Always mechanically block or support the robot arm before performing maintenance on joints.

WARNING: CRUSH HAZARD. The robot arm can create powerful pinch and crush points. Maintain a safe distance and never place any part of your body within the robot's work envelope during operation or when power is applied.

> **CAUTION:** HEAVY COMPONENTS. The robot arm and joint assemblies are heavy. Use appropriate lifting equipment and follow safe lifting practices to avoid personal injury or equipment damage. The NXB-KIT-762-001 itself weighs 8.5 kg.

> **NOTICE:** COMPONENT SENSITIVITY. New bearings and seals are precision components. Do not drop or strike them. Keep components in their protective packaging until the moment of installation to prevent contamination.

2. Product Overview

The NexBot Robotics 762-001 Joint Overhaul Kit provides all essential components required to perform scheduled preventative maintenance on the high-load J2 and J3 axes of R-50 and R-100 series articulated robots. This comprehensive kit is designed for facilities technicians and certified service engineers to restore original robot performance, addressing common wear conditions such as increased backlash or positioning inaccuracies that can develop over thousands of operational hours. By bundling all necessary parts under a single SKU, this kit simplifies the procurement process, reduces the risk of ordering incorrect components, and ensures that maintenance procedures can be completed efficiently with minimal downtime. Key benefits include the restoration of motion accuracy and the extension of the robot's operational lifespan. All included components are manufactured to original equipment specifications, guaranteeing perfect fitment and function. The kit is specifically engineered for robots operating in demanding, high-cycle applications like automated welding, machine tending, and palletizing, where consistent performance is critical to production quality. The included high-strength Grade 12.9 fasteners ensure that all mechanical interfaces are secured to the correct torque specifications, maintaining structural integrity under maximum payload conditions. This kit is recommended for service at or before the 8,000 operational hour interval as part of a structured preventative maintenance program. Following the official NexBot Robotics service manual during installation is mandatory to ensure safety and proper function. The use of this kit helps maintain the robot's original repeatability and payload capacity, protecting your automation investment.

3. Getting Started

1. Kit Contents Verification

Before beginning any work, open the NXB-KIT-762-001 and compare its contents against the included packing list. Verify that all bearings, seals, O-rings, fasteners, and lubricant tubes are present and appear undamaged. Report any discrepancies to NexBot Robotics support immediately.

2. Intended Use

This kit is intended exclusively for the scheduled overhaul of the J2 (waist) and J3 (shoulder) axes on NexBot R-50 and R-100 series robots. Using these components on other axes or robot models may result in equipment failure and void the warranty. This procedure should only be performed by technicians trained in NexBot robot maintenance.

3. Storage and Handling

If the kit will not be used immediately, store it in a clean, dry location with stable temperature. Keep the box sealed to protect the precision bearings and seals from moisture and airborne contaminants. The kit dimensions are 450 x 300 x 200 mm for easy storage.

4. Operation

Component Identification and Layout

During disassembly, lay out all parts on a clean surface in the order they were removed. As you prepare to install new parts from the kit, match each new component (e.g., the large cross-roller bearing, the smaller motor bearing, specific seals) to its corresponding old part to ensure correct placement.

> **Tip:** Use a partitioned tray and label each compartment with the disassembly step number to prevent errors during reassembly.

Bearing Installation Technique

New bearings must be installed perfectly square to their housing bores. Never apply installation force to the outer race if installing on a shaft, or to the inner race if installing in a housing. Use a press or a properly sized sleeve that contacts only the race being press-fit to avoid damaging the rolling elements.

Seal Installation

When installing new oil seals, apply a thin film of the supplied grease to the seal's outer diameter and the housing bore to ease installation. Ensure the seal is driven in evenly and to the correct depth. An angled or improperly seated seal will fail prematurely.

> **Tip:** A large socket or a dedicated seal driver tool that matches the seal's outer diameter is the best tool for ensuring an even installation.

Grease Application and Purging

The grease included in the kit is specifically formulated for the high-pressure environment inside the robot's harmonic drive. When filling the joint, pump grease slowly and steadily. Watch for old, discolored grease to be purged from the relief ports, followed by clean, new grease, which indicates a complete fill.

5. Maintenance Schedule

Interval	Task	Notes
Post-Installation (First 40 hours)	Monitor the overhauled joints for any signs of weeping or grease leakage around the new seals.	A slight increase in temperature during the initial break-in period is normal.

Interval	Task	Notes
	Check the joint housing temperature to ensure it is operating within the normal range.	
Weekly	Perform a visual inspection of the J2 and J3 joint areas. Look for any new signs of grease leakage, loose fasteners, or damage to cables.	This can be done quickly during routine operator checks.
Quarterly	Listen to the J2 and J3 joints while the robot runs a test cycle at various speeds. Note any new or unusual noises such as whining, clicking, or rumbling.	Use a mechanic's stethoscope for more precise acoustic analysis.
Annually	Measure the backlash of the J2 and J3 axes using a dial indicator or the robot controller's diagnostic software. Compare the reading to the 'as-new' specification to track wear over time.	Trending this data helps predict when the next overhaul will be required.
Per Service Manual (e.g., 10,000 hours)	Perform the next complete joint overhaul using a new NXB-KIT-762-001.	Adherence to the preventative maintenance schedule is critical for maximizing robot lifespan and uptime.

6. Troubleshooting

Symptom	Possible Cause	Solution
Excessive heat at the joint after overhaul.	Too much grease was applied, or a bearing was installed improperly, causing binding.	Stop operation immediately. If recently serviced, purge excess grease via the relief valve. If the problem persists, the joint must be disassembled to inspect bearing alignment.
Persistent positioning errors or 'hunting' for position.	The robot's mastering data was not correctly reset for the overhauled axes.	Re-run the complete mastering and calibration procedure for the J2 and J3 axes according to the NexBot service manual.

Symptom	Possible Cause	Solution
Grinding or clicking noise from the joint.	Contamination entered the joint during assembly, or a bearing was damaged during installation.	The joint must be disassembled for inspection. Clean all components and replace any damaged parts. Ensure a clean work environment is used for reassembly.
Grease is leaking from a newly installed seal.	The seal was damaged during installation, installed backwards, or the sealing surface on the shaft has a scratch.	Disassemble the joint to replace the seal. Carefully inspect the shaft for imperfections and polish if necessary. Use a proper seal driver for installation.
A bolt has come loose after a few hours of operation.	The bolt was not torqued to specification, or thread-locking compound was not used.	Power down the robot (LOTO). Re-torque all fasteners on the joint housing to the correct specification using a calibrated torque wrench and appropriate thread-locker.
The robot gives an 'Excess Torque' or 'Collision' alarm on the overhauled axis at low loads.	A bearing is misaligned, or components are binding due to incorrect assembly.	Do not run the robot. Disassemble the joint and carefully re-check the seating of all bearings and the alignment of all housing components.
A new bearing from the kit feels rough or does not spin freely.	The bearing may have been dropped or contaminated prior to installation.	Do not install a suspect bearing. Use another bearing if available, or contact NexBot support to report a potentially defective component from the kit.

7. Technical Specifications

Parameter	Value	Unit
Weight	8.5	kg
Country of Origin	KR	
Dimensions	450 x 300 x 200 mm	