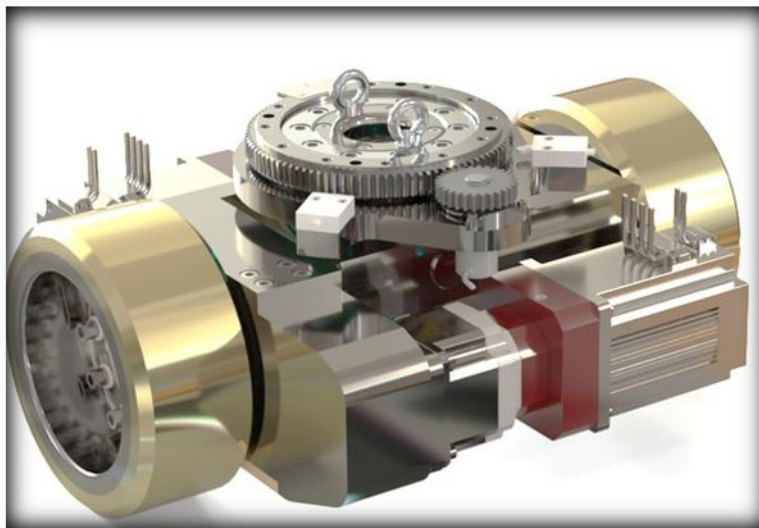




TECHNICAL SERVICE DOCUMENT

STEERING DRIVE ASSEMBLY

OPERATION &
MAINTENANCE MANUAL



English Edition

Version 2026

Nanjing JY Robot Co., Ltd.

www.jy-robots.com

JY-OM-SDA-2026-EN

DOCUMENT CONTROL

Publication information

This English edition restructures the supplied Version 2026 operation and maintenance manual into a clearer service reference for vehicle builders, integrators and maintenance personnel. The technical values, maintenance intervals and service procedures remain based on the source document.

Document title	Steering Drive Assembly - Operation & Maintenance Manual
Publishing reference	JY-OM-SDA-2026-EN
Edition	English Edition / Version 2026
Product scope	Selected JY ROBOT steering drive assemblies
Prepared for	Vehicle builders, integrators and trained maintenance personnel
Publisher	Nanjing JY Robot Co., Ltd.
Website	www.jy-robots.com

DOCUMENT PRECEDENCE

Confirm the product model and nameplate before service work. Product-specific drawings, wiring information and project documents supplied with the vehicle take precedence over general guidance in this manual.

QUALIFIED PERSONNEL ONLY

Installation, electrical work, disassembly and maintenance must be carried out by appropriately trained personnel using suitable tools and safe lifting or support equipment.

Revision record

Edition	Date	Description	Status
2026 EN	2026	Reformatted English publication based on supplied Version 2026 manual	For controlled release

NAVIGATION

Contents

1	Overview	4
2	Product identification	5
2.1	Product composition	5
2.2	Nameplate information	6
2.3	Model code structure	6
3	Safety	7
3.1	Terminology and hazard categories	7
3.2	General safety requirements	8
4	Installation	9
4.1	Mechanical installation	9
4.2	Electrical installation	10
5	Disassembly and fastener torque	11
6	Maintenance and service	12
6.1	Cleaning and electrical work	12
6.2	Tyres and wear-part service	13
7	Component replacement	14
7.1	Tyre replacement	14
7.2	Motor replacement	15
7.3	Planetary gearbox replacement	16
8	Maintenance schedule and checklist	17
9	Service records and technical support	18

HOW TO USE THIS MANUAL

Read the safety section before installation or maintenance. Use the nameplate and project information to confirm that the procedure and replacement part apply to the installed configuration.

SECTION 1

1 Overview

Purpose, scope and operating responsibility

This manual provides general guidance for identifying, installing, disassembling and maintaining selected JY ROBOT steering drive assemblies. It also describes routine inspection and the replacement of selected wear and drive components.

Read the manual before beginning work. Follow all safety instructions and do not make unauthorised modifications. Contact JY ROBOT service support when the product model, replacement specification or procedure is uncertain.

1.1 Use of spare parts

Only confirmed JY ROBOT replacement parts should be used for the procedures described in this manual. Incorrect or incompatible parts may damage the steering drive assembly and may invalidate warranty claims.

1.2 Conditions outside the stated responsibility

- Consequential damage or liability not directly related to the supplied product.
- Unauthorised modification of the steering drive assembly or associated components.
- Use outside the intended operating scope, or improper use and the resulting consequences.
- Continued operation with a known fault or failure to perform scheduled maintenance.

SOURCE-MANUAL LIMITATION

The supplied manual describes general service work and simple fault-related maintenance. It does not provide full diagnostic logic, drive commissioning parameters or project-specific electrical schematics.

1.3 Before starting work

- Identify the product model, serial number and installed vehicle.
- Review the vehicle manufacturer instructions and the project documentation.
- Isolate all power sources and prevent unintended vehicle movement.
- Prepare suitable metric tools, lifting support, cleaning equipment and approved lubricants or sealing materials.
- Record the work performed and any abnormal wear, leakage, noise or damage.

SECTION 2

2 Product identification

Confirm the assembly and configuration before service work

2.1 Product composition

The source manual identifies the principal components shown below. The exact arrangement can vary with the product model and project configuration.

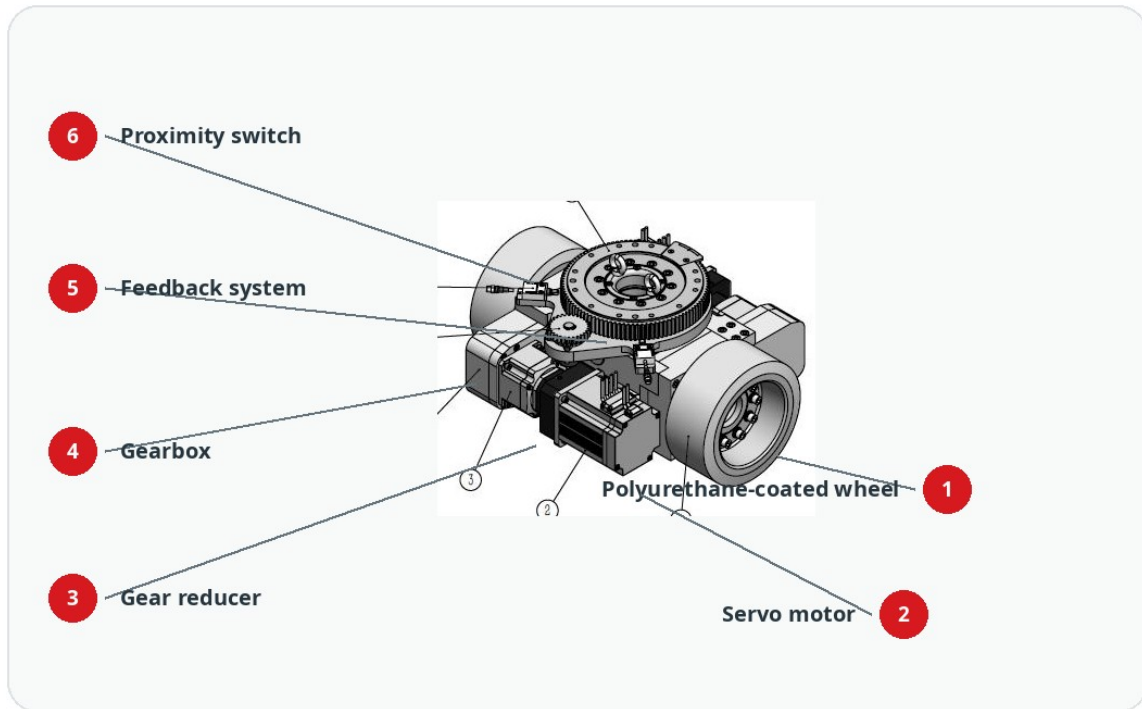


Figure 1. Principal components identified in the supplied manual.

1	Polyurethane-coated wheel	2	Servo motor
3	Gear reducer	4	Gearbox
5	Feedback system	6	Proximity switch

CONFIGURATION VARIATION

Motors, reducers, feedback devices, brakes, wheel materials and interfaces may differ. Always match replacement parts to the complete model and project specification.

PRODUCT IDENTIFICATION

2.2 Nameplate information

Use the product nameplate as the primary identification source. The sample nameplate in the supplied manual includes the following fields:

Product name	<i>Record from actual nameplate</i>	Model	<i>Record from actual nameplate</i>
Travel motor	<i>Record from actual nameplate</i>	Rated speed	<i>Record from actual nameplate</i>
Travel ratio	<i>Record from actual nameplate</i>	Rated load	<i>Record from actual nameplate</i>
Steering motor	<i>Record from actual nameplate</i>	Installation height	<i>Record from actual nameplate</i>
Steering ratio	<i>Record from actual nameplate</i>	Steering diameter	<i>Record from actual nameplate</i>

DO NOT USE SAMPLE VALUES

Any values shown on an example image are illustrative. Service decisions must be based on the nameplate fitted to the actual assembly.

2.3 Model code structure

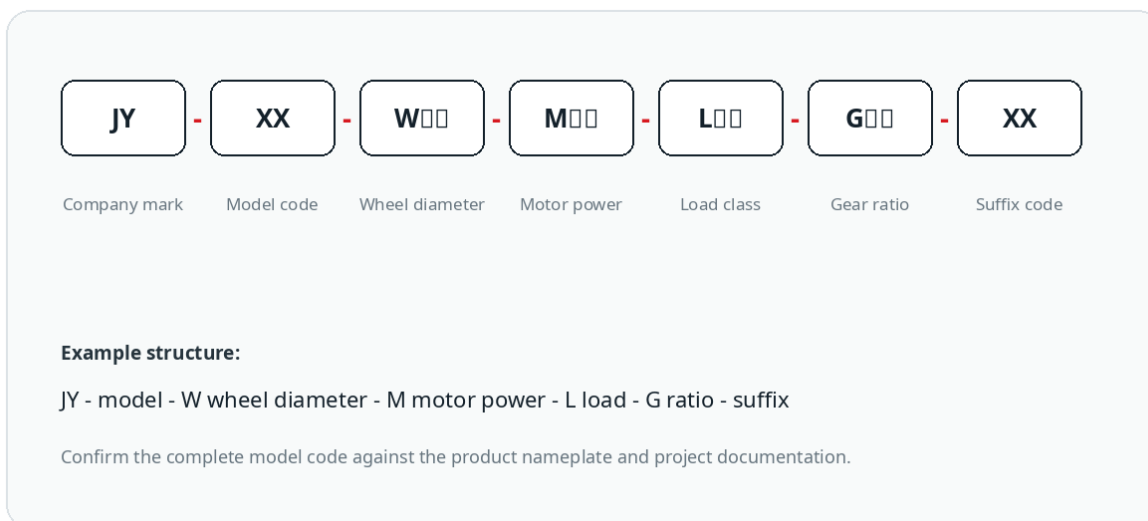


Figure 2. Model-code structure reproduced from the supplied manual.

The model code identifies the company mark, model series, wheel diameter, motor power, load class, gear ratio and suffix configuration. Confirm the complete code before ordering parts or requesting technical documentation.

SECTION 3

3 Safety

Read this section before installation, testing or maintenance

3.1 Terminology and hazard categories

DANGER

Indicates a situation that may result in serious injury or death if the required precautions are not followed.

CAUTION / MATERIAL DAMAGE

Indicates a situation that may damage the product, associated equipment or materials.

3.2 Product safety and hazardous areas

The product is manufactured in accordance with its technical design and recognised safety principles. Residual hazards can nevertheless remain during installation, operation and maintenance.

- Mechanical hazards from transmission mechanisms, rotating components and unintended vehicle movement.
- Thermal hazards associated with gearbox oil and components that may become hot during operation.
- Chemical hazards from cleaning agents, adhesives, lubricants and sealing compounds.
- Electrical hazards from batteries, motor power circuits, control circuits and stored energy.
- Crushing or tipping hazards when the vehicle or assembly is not securely supported.

RECOGNISED WORKING PRACTICES

Observe applicable industrial safety rules, accident-prevention requirements, environmental rules and the vehicle manufacturer instructions.

3.3 Unauthorised changes

Do not modify the gearbox, steering drive assembly or safety-related parts without written approval. Unauthorised changes may create hazards, damage the assembly and affect the validity of the warranty.

SAFETY REQUIREMENTS

3.4 General safety instructions

UNEXPECTED START-UP

Disconnect the motor power supply before installation, testing, disassembly or maintenance. Prevent the drive system from being energised by another person.

UNEXPECTED VEHICLE MOVEMENT

Secure the vehicle against movement. Chock or block the wheels where appropriate, park on firm level ground and do not perform service work on a slope.

CLEANING PRODUCTS

Do not use benzene or other flammable cleaning agents on the gearbox. Follow the cleaning-product manufacturer instructions and applicable accident-prevention rules.

3.5 Environmental protection

- Do not discharge cleaning agents, oil or other service fluids into drains, soil or the environment.
- Collect used fluids, cleaning materials and replaced parts, and dispose of them according to the applicable environmental procedures.
- Prevent contamination of the gearbox and internal transmission components during disassembly.

3.6 Personnel and tools

- Maintenance and repair work must be performed by trained technical personnel.
- Electrical work must be performed by personnel with appropriate electrical training.
- Use metric tools for all screws and threads in the assembly.
- Use suitable lifting and support equipment; never rely only on a vehicle lifting mechanism.
- Use approved replacement parts, lubricants, sealing compounds and tightening values.

LIVE WORK PROHIBITED

All switches must be in the OFF position. Live electrical work is strictly prohibited.

SECTION 4

4 Installation

Mechanical mounting, cable movement and electrical integration

4.1 Mechanical installation requirements

- Mount the steering drive assembly to a clean, flat and sufficiently rigid metal plate.
- Confirm the complete steering envelope and ensure that the assembly cannot interfere with surrounding structures throughout its rotation.
- Tighten the mounting bolts to the required torque and apply an appropriate anti-loosening method.
- Provide sufficient ventilation and heat dissipation around the assembly.
- Allow at least 0.5 m of free cable movement so that steering rotation does not pull, twist or damage the cables.

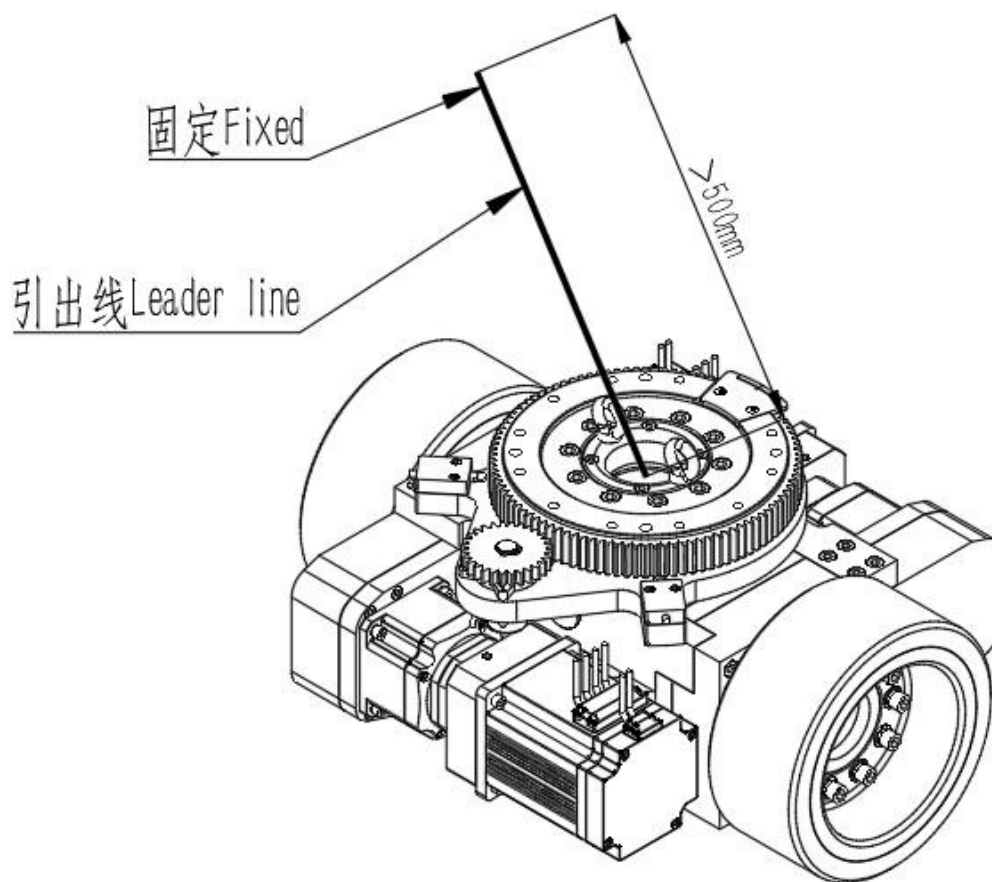


Figure 3. Cable-routing principle from the supplied manual: fixed point and more than 0.5 m of free lead length.

INTEGRATION CHECK

After mounting, rotate the steering mechanism through its intended range by hand where safe to do so. Verify mechanical clearance, cable movement and connector strain before applying power.

INSTALLATION

4.2 Electrical installation requirements

- Install a main fuse and a control-circuit fuse. Select fuse ratings to match the maximum current of the applicable drive controller.
- Keep the motor, battery and controller power cables as short as practical and route related conductors in a controlled, parallel arrangement.
- Keep low-current signal cables away from high-current power cables.
- Where power and signal cables must cross, cross them at approximately 90 degrees.
- Use shielded twisted-pair cable for communication buses where required.
- Protect cables from sharp edges, hot surfaces, moving parts and repeated bending below the cable minimum bend radius.
- Confirm the wiring against the project electrical documentation before energising the system.

POWER ISOLATION

All switches must be in the OFF position and the battery or other supply must be isolated before wiring work begins.

4.3 Pre-commissioning checks

Check	Requirement
☐	Mounting bolts tightened and secured
☐	Steering clearance verified
☐	Cables have adequate free movement
☐	Connectors fully engaged and strain relieved
☐	Fuses installed with the correct ratings
☐	Power and signal cables routed separately
☐	No tools, loose fasteners or foreign objects remain
☐	Assembly can be tested with the drive wheels safely raised from the floor

SECTION 5

5 Disassembly and fastener torque

Clean working practice and reference tightening values

5.1 Precautions for disassembly

Clean the steering drive assembly before opening it. Small particles, incorrect assembly or contamination inside the transmission mechanism can cause accelerated wear or severe damage.

- Clean and inspect all components before reassembly; check for wear and other defects.
- Do not reinstall damaged or worn components. Replace them with confirmed new parts.
- Use the specified sealing compound on oil-tight housing and cover joints unless the product documentation states otherwise.
- Use the required special tools, fixtures and support equipment in addition to standard metric tools.
- Observe test data, setting values and tightening torques during reassembly.
- Refill with the specified lubricant after repair.

5.2 Bolt torque reference

The following tightening torques are reproduced from the supplied manual. Values are in N·m and are grouped by metric thread and bolt property class.

Thread	8.8	10.9	12.9	Thread	8.8	10.9	12.9
M4	2.8	4.1	4.8	M8x1	24	36	43
M5	5.5	8.1	9.5	M10x1	52	76	89
M6	9.5	14	16.5	M10x1.25	49	72	84
M8	23	34	40	M12x1.25	87	125	150
M10	46	68	79	M12x1.5	83	120	145
M12	79	115	135	M14x1.5	135	200	235
M14	125	185	215	M16x1.5	205	300	360
M16	195	280	330	M18x1.5	310	440	520
M18	280	390	460	M20x1.5	430	620	720
M20	390	560	650				

REFERENCE VALUES ONLY

Use product-specific drawings or confirmed assembly instructions where they specify a different fastener, lubrication condition or tightening value.

SECTION 6

6 Maintenance and service

Operating safety, environmental protection and cleaning

6.1 Maintenance responsibility

- Perform inspections and maintenance within the intervals stated in the maintenance checklist.
- Do not modify the steering drive assembly or its safety-related components.
- Use confirmed original replacement parts to maintain stable and reliable operation.
- Dispose of aged components, replaced lubricants and other service materials in accordance with applicable environmental rules.
- Complete maintenance with suitable professional tools and trained personnel.

6.2 Cleaning

- Do not use flammable liquids for cleaning.
- Before cleaning, isolate the battery or other power source and prevent sparks or short circuits.
- For electrical and electronic components, use low-pressure extraction or controlled compressed air together with a non-conductive anti-static brush.
- If water or high-pressure cleaning equipment is used on surrounding vehicle areas, carefully protect all electrical and electronic components from moisture.
- Do not use steam-jet cleaning equipment on the steering drive assembly.

MOISTURE PROTECTION

Water ingress can cause electrical or electronic malfunction. Do not direct high-pressure water at connectors, motors, feedback devices or control components.

6.3 Electrical systems

- Electrical work must be performed by trained electrical personnel.
- Take all necessary precautions to prevent electric shock, short circuit and unintended energisation.
- Restore covers, cable protection and grounding or shielding provisions before testing.

WEAR-PART MAINTENANCE

6.4 Tyres and service preparation

Tyre condition directly affects vehicle stability, traction and travel performance. Replacement tyres must match the confirmed product model and specification.

6.4.1 Tyre replacement criteria

- For patterned tyres, replace the tyre when the central tread approaches the bottom of the groove.
- For smooth tyres, replace the tyre when wear exceeds one third of the original tread thickness.
- Replace the tyre if cracking, tearing, separation or material loss is visible.
- Replace the tyre whenever its condition may affect safe operation.

6.4.2 Tyre storage and pairing

- Replace paired left and right wheels together where uneven diameter could cause the vehicle to tilt or track incorrectly.
- Protect solid tyres from direct sunlight, heat, oil, grease, acids, alkalis and other chemicals that accelerate ageing.
- Store replacement tyres in a clean, dry environment and confirm the part number before installation.

6.5 Safe preparation for wear-part replacement

COMPLETE POWER ISOLATION

Disconnect the complete vehicle power supply before replacing tyres, motors or gearboxes. Energised work can cause injury or component damage.

- Place the vehicle on a hard, level and clean surface free from oil, water and other slippery or flammable materials.
- Support the vehicle securely to prevent tipping or collapse.
- Clean the assembly and surrounding area before opening or removing components.
- After maintenance, inspect the completed work before applying power.
- For the first functional test, raise the drive wheels clear of the floor where the vehicle design permits.

SECTION 7

7 Component replacement

Procedures reproduced and clarified from the supplied manual

7.1 Tyre replacement

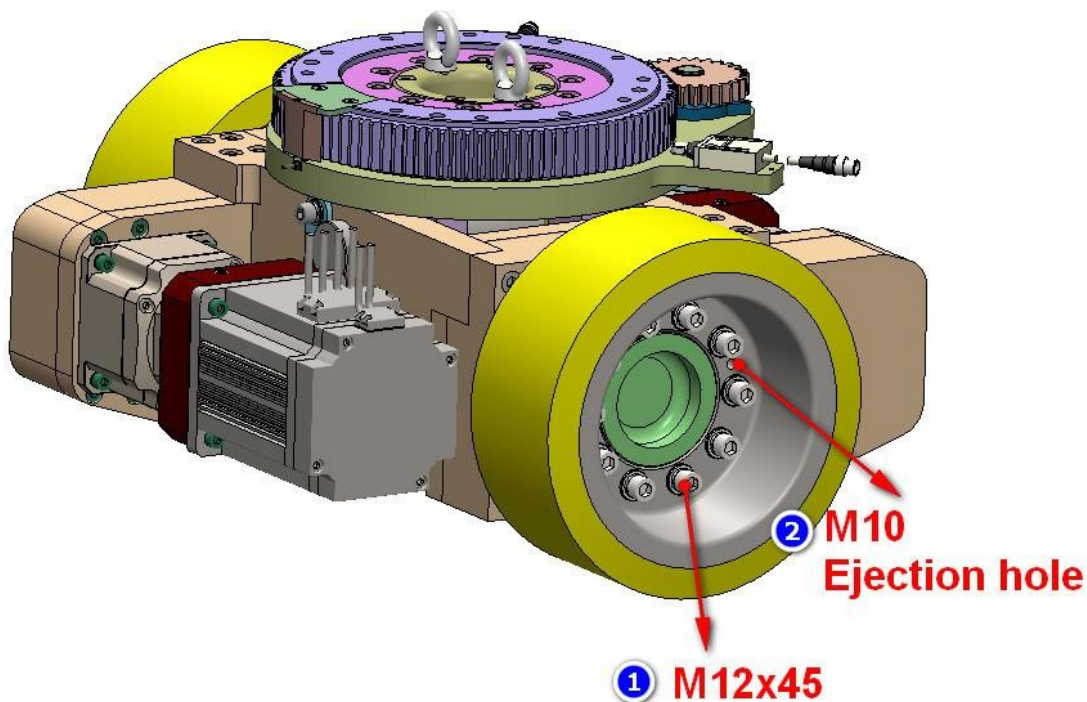


Figure 4. Tyre removal points: M12x45 wheel fastener and M10 extraction hole.

7.1.1 Removal

- Clean the tyre, hub and surrounding area.
- Support the vehicle securely and verify that the wheel is unloaded.
- Loosen and remove the M12x45 wheel connecting bolt or bolts shown for the applicable assembly.
- Use the M10 threaded extraction hole to push the wheel from its fitted position.
- Remove the wheel carefully and prevent dirt from entering the hub or transmission area.

7.1.2 Installation

- Confirm that the replacement tyre and wheel match the original model and specification.
- Clean the mounting surfaces and inspect the fastener and locating features.
- Install the wheel by reversing the removal sequence.
- Tighten bolts and pins according to the applicable product instruction and torque reference.
- Check free rotation, clearance and security before returning the vehicle to service.

PROCEDURE APPLICABILITY

The number and position of fasteners may vary between models. Use the applicable assembly drawing when the installed unit differs from Figure 4.

COMPONENT REPLACEMENT

7.2 Motor replacement

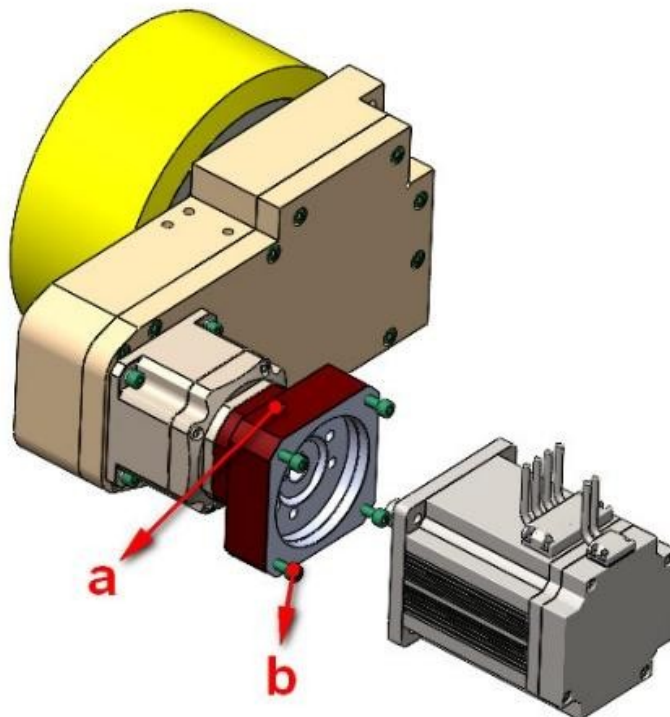


Figure 5. Motor removal: shaft locking screw at a and four motor fixing screws at b.

7.2.1 Removal

- Disconnect the motor cables and mark each connection for correct reassembly.
- Remove the four motor fixing screws identified as b.
- At position a, use a 4 mm hex key to loosen the motor-shaft locking screw by approximately two to three counter-clockwise turns. Rotate the motor slightly if necessary to align the tool with the locking screw.
- Pull the steering motor out with light, controlled axial force.

7.2.2 Installation

- Confirm the motor part number, shaft interface and electrical specification before installation.
- Install the motor by reversing the removal sequence.
- Reconnect the marked cables and restore cable protection and strain relief.
- Check the locking screw and fixing screws, then perform a controlled test with the wheel clear of the floor.

SEPARATE MOTOR DOCUMENTATION

The source manual states that motor fault diagnosis and routine motor maintenance are covered by separate documentation. Request the applicable motor information for the installed configuration.

COMPONENT REPLACEMENT

7.3 Planetary gearbox replacement

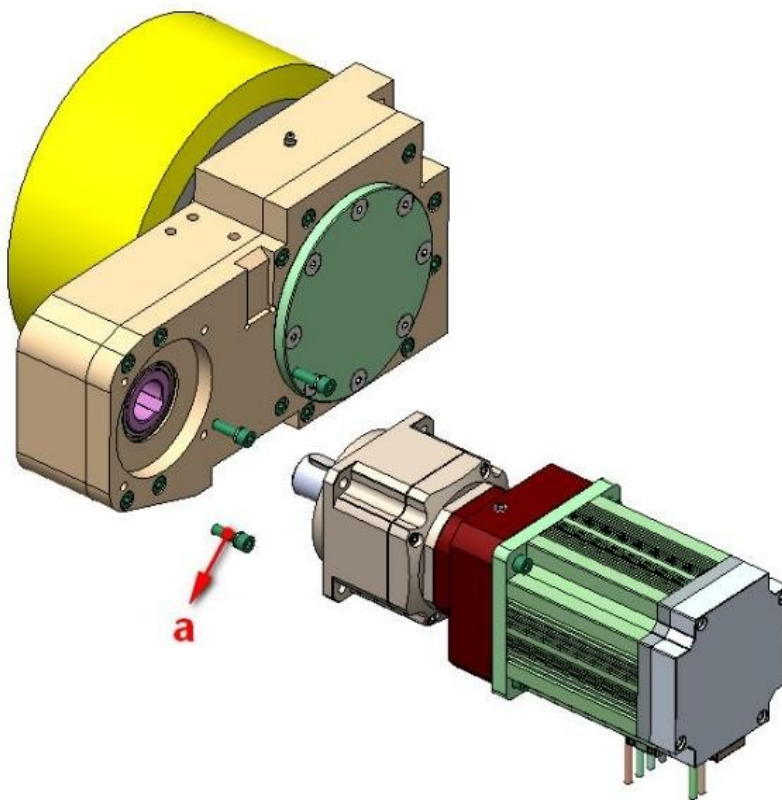


Figure 6. Planetary gearbox removal arrangement from the supplied manual.

7.3.1 Removal

- Remove the four gearbox or associated motor fixing screws identified as a in the source figure.
- Use a 4 mm hex key to loosen the gearbox-shaft locking screw by approximately two to three counter-clockwise turns. Rotate the gearbox slightly if necessary to align the tool with the locking screw.
- Pull the gearbox out with light, controlled axial force.
- Protect exposed interfaces from dirt and impact.

7.3.2 Installation

- Confirm the gearbox part number, ratio, shaft interface and mounting arrangement.
- Inspect the coupling and mating surfaces before assembly.
- Install the gearbox by reversing the removal sequence.
- Tighten the locking and fixing screws to the applicable values.
- Check alignment, rotation, noise and leakage during a controlled test.

PART MATCHING

Use only a gearbox confirmed for the complete steering drive model. An incorrect ratio or interface can cause control errors, mechanical damage or unsafe vehicle behaviour.

SECTION 8

8 Maintenance schedule and checklist

Intervals from the supplied Version 2026 manual

W	A	B	C
Every 50 operating hours At least once per week	Every 500 operating hours Condition-based periodic service	Every 1,000 operating hours At least once per year	Every 3,000 operating hours At least once every two years
RUNNING-IN CHECK After approximately 100 operating hours, check the wheel nuts and bolts and retighten them where necessary. Severe dust, temperature variation, intensive shift operation or other demanding conditions require shorter intervals.			

Assembly	Inspection / maintenance item	W	A	B	C	Record
Limit switch	Inspect cable for damage and verify terminal security		•			
Limit switch	Check microswitch or proximity-switch function			•		
Gearbox	Check for abnormal noise or leakage			•		
Wheel	Inspect wear and damage in accordance with Section 7.1	•				
Wheel	Check wheel bearings and fastener security			•		
Gearbox	Replenish grease			•		
Gearbox	Change lubricating oil				•	
Slewing mechanism	Check for abnormal wear		•			
Slewing mechanism	Replenish grease			•		
External surfaces	Remove foreign material and inspect for visible damage	•				

SECTION 9

9 Service records and technical support

Record the work and request product-specific information where needed

9.1 Recommended maintenance record

Product model	
Serial / nameplate reference	
Vehicle / project	
Operating hours	
Date of service	
Work completed	
Parts replaced	

9.2 Information to include with a support request

- Complete product model and a clear photograph of the nameplate.
- Vehicle or project reference and operating environment.
- Description of the required manual, drawing, replacement part or service procedure.
- Photographs or video of the installed assembly and the observed condition.
- Operating hours, maintenance history and any abnormal noise, leakage, heat, wear or fault message.

TECHNICAL SUPPORT

Where the public manual does not cover the installed configuration, request the applicable project documentation before disassembly or part replacement.

JY ROBOT

Steering, drive, lifting and load-bearing components for AGV / AMR applications

www.jy-robots.com