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1. INTRODUCTION

This manual provides a comprehensive guide for the installation and verification of hub motor systems in electric bikes and scooters. It includes mechanical and electrical checkpoints, diagnostic procedures, and wiring standards.

2. TOOLS & MATERIALS REQUIRED

Tools:

- Torque wrench
- Allen key set
- Socket wrench set
- Screwdrivers (Phillips & flat)
- Cable ties
- Wire strippers
- Crimping tool
- Multi-meter (Digital/Analog)
- Continuity tester (optional)

3. PRE-INSTALLATION INSPECTION CHECKLIST

Mechanical:

- Rim free from cracks or warping
- Axle threads clean and intact
- Torque arms compatible and undamaged
- Frame slots aligned and free from damage
- Frame has enough clearance, for motor and cables.

Electrical:

- Phase wires are clean and undamaged.
- Hall sensor wires undamaged
- Connectors clean and fit securely
- Battery fully charged and within system specs
- Controller voltage and current ratings match motor

4. WINDING CONTINUITY AND IR CHECK SOP

Purpose:

To confirm motor windings are not shorted or open before installation.

Tools Needed:

Digital multi-meter (with continuity modes)

Pin Reference: Refer GAD

Step-by-Step SOP

Step 1: Safety

- Ensure the motor is **not connected** to the controller or battery.
- Turn your multi-meter to continuity mode.

Step 2: Check Phase-to-Phase Continuity

Use multi-meter probes on:

- $\bullet \quad U \longleftrightarrow V$
- \bullet U \leftrightarrow W
- $\bullet \quad V \longleftrightarrow W$

Expected Result:

• Continuity present

Step 3: Test for insulation breakdown b/w motor winding and metal casing.

- Put one probe on each phase wire.
- Touch the other probe to the motor casing (metal).

Expected Result:

No continuity

Here continuity means winding short to ground — motor is faulty.

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Common Fault Symptoms & Fixes

Symptom	Likely Cause	Solution			
No continuity phase-to-phase	Broken coil or wire	Replace or repair motor			
Continuity to motor shell	Ground fault	Replace or repair motor			

5. MECHANICAL INSTALLATION

Step 1: Install Hub Motor Wheel

- Insert motor axle into frame slots.
- Ensure cables aren't pinched.
- Use torque arms to both sides.
- Use washers, then torque axle nuts as per specified values in GAD.

Step 2: Wheel & Brake Alignment

- Spin wheel freely.
- Ensure axle aligns correctly.

6. ELECTRICAL INSTALLATION

Controller Wiring

- Connect **phase wires** (U/V/W) to motor as par color coding given in GAD.
- Connect 6-pin hall sensor as par color coding given in GAD.

Cable Management

- Use cable sleeves and zip ties.
- Avoid sharp bends and contact with sharp edges and moving parts.

7. HALL SENSOR 6-PIN CONNECTION SOP

Purpose:

To establish proper signal and power connections between motor and controller for smooth operation.

Refer GAD for pin-out table.

SOP Steps:

- 1. Turn off all power.
- 2. **Inspect connectors.** Ensure no bent or corroded pins.
- 3. Align key notch and connect securely. Do not force.
- 4. Reconnect battery, power on system, and test rotation.
- 5. Common Issues & Fixes:

Issue	Cause	Solution
Motor jerks/stutters	Hall wires mismatched	Verify and realign wire colors
No motor response	Sensor or connector	Check for continuity & reinsert
	fault	connector

8. MAINTENANCE SCHEDULE

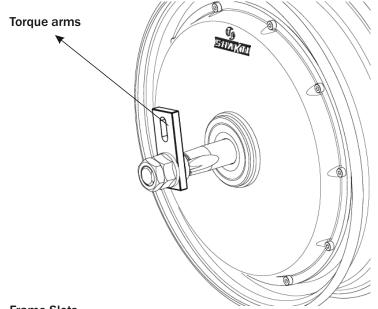
MAINTENANCE SCHEDULE												
	ŀ	Repeat the Instructions After Distance Covered in Kilometres / Month Time Period in Service (Whichever is Earlier)								ier)		
COMPONENT /PART	1000 Km/1 Month	2000 Km/2 Months	3000 Km/3 Months	4000 Km/4 Months	5000 Km/5 Months	6000 Km/6 Months	7000 Km/7 Months	8000 Km/8 Months	9000 Km/9 Months	10000 Km/10 Months	11000 Km/11 Months	12000 km/12 Months
1) OIL SEAL												$\sqrt{}$



9. TECHNICAL SPECIFICATION

Refer GAD for Technical specification as per motor rating.

10. SINGLE LINE DIAGRAM



Frame Slots

