

ADVANCED MOTOR SOLUTIONS, LLC

ELECTRIC MOTOR

PREVENTIVE MAINTENANCE, LUBRICATION & WARRANTY COMPLIANCE GUIDE

Customer Use Manual

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Applies to	Electric motors, pumps, generators and motor-driven equipment serviced by AMS

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IMPORTANT

This guide provides general maintenance and documentation requirements. The motor nameplate, manufacturer instructions, project specifications, applicable safety rules, and the written AMS estimate/invoice take priority. Work must be performed by qualified personnel. This document is not engineering or legal advice and should be reviewed for the customer's specific equipment and site conditions.

Document Control and Use

Item	Requirement
Controlled copy	The current approved electronic version maintained by Advanced Motor Solutions, LLC.
Customer responsibility	Keep this guide with the equipment records and make it available to operators and maintenance personnel.
Equipment-specific instructions	Attach the motor manufacturer manual, lubrication nameplate information, commissioning data, and service reports.
Revision control	Replace obsolete copies when AMS issues a newer revision.

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Use Sections 1-14 as the operating standard and complete the appendices at installation and during service. Retain the records for the operating life of the motor.

1. Purpose, Scope and Priority of Instructions

This guide establishes a practical preventive maintenance, lubrication, inspection, documentation, and warranty-claim framework for electric motors and motor-driven equipment repaired, rewound, rebuilt, supplied, or inspected by Advanced Motor Solutions, LLC (AMS).

It is intended to reduce avoidable failures, establish operating baselines, improve troubleshooting, and preserve the evidence required to determine whether a failure is related to AMS workmanship, a supplied component, the installation, operating conditions, maintenance, or the driven equipment.

1.1 Equipment covered

- Low- and medium-voltage AC induction motors.
- DC motors and generators, where the applicable maintenance item is relevant.
- VFD-driven, soft-starter, two-speed, brake, vertical, marine, washdown, hazardous-location, and special-duty motors.
- Motor-driven pumps, blowers, fans, compressors, winches, hoists, conveyors, hydraulic power units, and similar equipment.
- Bearings, shafts, end bells, terminal components, cooling fans, space heaters, sensors, and accessories associated with the motor.

1.2 Order of priority

1. Applicable law, site safety rules, and the facility energy-control program.
2. The specific motor manufacturer's instructions, nameplate, lubrication plate, certified drawings, and project specifications.
3. The AMS estimate, invoice, repair report, test report, and written warranty terms for the specific job.
4. This general guide.

NO UNIVERSAL INTERVAL

Do not assume that all motors use the same grease, grease quantity, lubrication interval, temperature limit, vibration limit, or insulation-resistance acceptance value. Equipment-specific information always controls.

1.3 Definitions

Term	Meaning
DE	Drive End.
NDE	Non-Drive End.
OEM	Original Equipment Manufacturer.
LOTO	Lockout/Tagout and control of hazardous energy.
VFD	Variable Frequency Drive.
Baseline	Verified readings recorded after correct installation and stable operation.
Qualified person	A person trained and authorized for the specific electrical/mechanical work and hazards.
Critical motor	A motor whose failure creates safety, environmental, production, navigation, or major financial consequences.

2. Safety and Qualified Personnel

DANGER - HAZARDOUS ENERGY

Unexpected energization, rotation, stored electrical energy, gravity, pressure, heat, or movement of the driven equipment can cause serious injury or death. Apply the site-specific energy-control procedure before inspection or maintenance.

2.1 Minimum safety requirements

- De-energize all electrical sources, including main power, control power, space heaters, brakes, auxiliary fans, anti-condensation heaters, and separately supplied sensors.
- Apply LOTO in accordance with the employer's written program and verify the zero-energy state using properly rated test equipment.
- Prevent movement from the driven equipment, stored pressure, elevated loads, rotating inertia, backspin, process flow, or gravity.
- Discharge capacitors and confirm stored voltage is removed.
- Use appropriate PPE, guards, lifting devices, test equipment, and procedures for the task.
- Do not bypass guards, overloads, temperature devices, interlocks, ground-fault protection, or emergency stops.
- Do not perform live electrical work unless specifically justified, authorized, and controlled under the applicable electrical-safety program.
- Do not open, modify, or repair explosion-proof, flameproof, dust-ignition-proof, or other listed hazardous-location motors except through qualified and authorized procedures.

2.2 Before restoring power

- Confirm all tools, rags, grease fittings, temporary jumpers, and foreign material have been removed.
- Reinstall covers, guards, terminal-box covers, grease drain plugs, fan covers, coupling guards, and inspection covers.
- Confirm personnel are clear and the driven equipment is ready.
- Follow the facility procedure for removal of locks/tags and notification of affected employees.
- Perform a controlled startup while monitoring direction, current, noise, vibration, and temperature.

3. Equipment Identification and Records

Each motor must have an individual maintenance record. Do not combine records from different motors, even when the motors are identical or serve the same system.

3.1 Required asset information

- Customer asset number, location, and equipment served.
- AMS reference number, estimate/invoice number, repair date, and delivery date.
- Manufacturer, model, serial number, frame, enclosure, mounting, duty, service factor, insulation class, ingress protection, and hazardous-location markings.
- Rated power, voltage, current, frequency, speed, phases, connection, and temperature-rise information.
- DE and NDE bearing numbers, lubrication type, grease type, grease quantity, and intervals shown on the nameplate or manufacturer manual.
- VFD/soft starter identification and critical settings.
- Coupling, pulley, belt, gearbox, pump, fan, or other driven-equipment information.
- Baseline voltage, current, winding resistance where applicable, insulation resistance, vibration, bearing temperature, winding temperature, and operating speed.

3.2 Record retention

Retain commissioning, inspection, lubrication, alarm, repair, alignment, vibration, electrical, and incident records for the service life of the equipment. For warranty evaluation, retain at minimum all records from the AMS repair date through the claim date.

4. Installation and Commissioning

BASELINE REQUIRED

A motor can leave the repair shop in acceptable condition and still fail after incorrect installation. Record installation and startup data before placing the unit into continuous service.

4.1 Receipt inspection

- Compare the motor, accessories, shaft extension, terminal arrangement, mounting, and bearings with the purchase order and repair documentation.
- Inspect for shipping damage, water entry, broken fans/covers, bent conduit-box parts, shaft damage, missing grease fittings or plugs, and displaced bearing locks.
- Rotate the shaft by hand when safe and permitted. Investigate binding, scraping, excessive endplay, or abnormal noise before energizing.

- Confirm temporary shipping braces or bearing locks are removed only as instructed by the manufacturer.
- Photograph the condition at receipt and before installation.

4.2 Foundation, mounting and driven equipment

- Use a rigid, flat, clean foundation capable of supporting the motor and driven load without distortion.
- Check and correct soft foot before final alignment.
- Tighten mounting hardware using the equipment manufacturer's torque requirements and locking method.
- Align shafts using an appropriate method and verify alignment after final bolt tightening and piping connection.
- For belt drives, confirm pulley condition, sheave alignment, belt type, and belt tension. Excessive belt tension overloads bearings and can deflect the shaft.
- Confirm the driven equipment turns freely and is not jammed, flooded, dry, blocked, unbalanced, or subject to abnormal thrust.
- Ensure piping does not impose unacceptable load on pump or motor housings.

4.3 Electrical connection and protection

- Confirm supply voltage, phases, frequency, connection, and rotation requirements against the motor nameplate and winding diagram.
- Inspect cable size, insulation, lugs, terminal block, phase barriers, clearances, grounding/bonding, and conduit sealing.
- Torque terminals to the component or manufacturer requirement. Mark and document completed torque checks.
- Set overload, short-circuit, ground-fault, phase-loss, phase-unbalance, temperature, and stall protection for the motor and application.
- Confirm the VFD or soft starter is compatible with the motor voltage, current, insulation system, speed range, cooling, and driven load.
- Never repeatedly reset a protection device without finding and correcting the cause.

4.4 Initial startup

1. Perform a brief uncoupled rotation check when required and safe. Confirm correct rotation before coupling or operating the process.
2. Start under controlled conditions and observe acceleration time, current, noise, vibration, shaft movement, cooling fan operation, and driven-equipment behavior.
3. After stable operation, record voltage and current on every phase, speed/frequency, load condition, ambient temperature, bearing temperatures, vibration, and alarms.
4. Recheck mounting, alignment, coupling, guards, leaks, and terminals after the initial run-in period required by the OEM or site procedure.

5. Preventive Maintenance Program

The following schedule is a general starting point for normally loaded indoor industrial motors. Shorten intervals for continuous operation, critical service, high temperature, high speed, vertical mounting, marine atmosphere, washdown, dust, chemicals, vibration, frequent starts, VFD operation, or known process instability.

Suggested frequency	Minimum activity
Each shift / before start	Check for alarms, leaks, obstructions, loose guards, abnormal noise, smell, smoke, unusual vibration, fan operation, and visible contamination.
Weekly	Review current, temperature, vibration/noise trend, housekeeping, drain condition, and operating complaints.
Monthly	Clean exterior and cooling paths; inspect terminal box, cables, grounding, fittings, seals, fan, fan cover, coupling guard, base, and fasteners.
Quarterly	Record phase voltage/current, bearing temperatures, vibration at consistent points, speed/frequency, load, and ambient temperature; inspect coupling/belts and soft-foot indicators.
Every 6 months	Review alignment, mounting torque, protection settings, VFD parameters, lubrication records, space heaters, sensors, brakes, and condition of seals/drains.
Annually	Qualified inspection including electrical trending, alignment verification, vibration review, bearing-condition evaluation, cleaning, protection-function review, and maintenance-plan update.

Suggested frequency	Minimum activity
After any abnormal event	Remove from service as needed and inspect after overload, repeated trip, phase loss, flooding, severe vibration, locked load, process upset, lightning/surge, overspeed, or accidental impact.

5.1 Condition-based maintenance

- Use repeatable measurement locations, instruments, units, load conditions, and operating speeds.
- Compare readings to the motor's own verified baseline and trend, not only to a generic limit.
- Investigate a meaningful change even when the reading has not crossed an alarm limit.
- For critical motors, consider continuous or route-based vibration and temperature monitoring.
- Use oil/grease analysis, thermography, electrical signature testing, or advanced vibration analysis when justified by criticality and failure history.

6. Bearing Lubrication

THE LUBRICATION PLATE CONTROLS

Use the bearing type, grease specification, quantity, interval, and procedure stated by the motor manufacturer or lubrication nameplate. Too much grease, too little grease, the wrong grease, contamination, and blocked grease outlets can all cause premature bearing failure.

6.1 Identify the bearing system before adding lubricant

Bearing/lubrication type	Required action
Sealed or shielded "lubricated-for-life" bearing	Do not add grease unless the manufacturer specifically provides a regreasing method. Do not drill the end bell or install an improvised grease fitting.
Regreasable rolling-element bearing	Use only the specified grease, quantity, interval, outlet/drain procedure, and motor-running or stopped condition required by the OEM.
Oil-lubricated sleeve or rolling bearing	Maintain the exact oil type and level; inspect rings, sight glasses, seals, coolers, and circulation system. Do not substitute grease.
Oil mist / circulating oil system	Confirm the external system is operating before and during motor operation and follows the system manufacturer's procedure.
Hazardous-location motor	Use only lubricants and procedures approved for the exact motor listing and location classification.

6.2 Information required before regreasing

- DE and NDE bearing identification.
- Exact grease manufacturer/product or approved specification.
- Compatibility with the grease already inside the bearing and housing.
- Quantity per bearing, preferably in grams or ounces from the nameplate/manual.
- Operating-hours or calendar interval and any correction for speed, temperature, vertical mounting, contamination, or duty.
- Location and condition of grease inlet, relief path, drain, plug, and purge passage.
- Whether the motor must be stopped, rotated, or running during the procedure.

6.3 General regreasing procedure

1. Review the motor manual, lubrication plate, safety requirements, and maintenance history. Confirm the bearing is regreasable.
2. Use a clean, dedicated grease gun labeled for the exact grease. Verify the gun output per stroke when quantity is controlled by strokes.
3. Clean the grease fitting and the surrounding area before connecting the grease gun. Do not force dirt through the fitting.
4. Open or remove the grease outlet/drain only when the motor design and OEM procedure require it. Confirm the discharge path is not blocked.
5. Add the specified amount slowly. Stop if pressure rises abnormally, the fitting will not accept grease, or grease exits from an unintended location.

6. Follow the OEM purge/run procedure. Monitor bearing temperature, noise, and vibration during and after lubrication.
7. Remove purged grease, clean the area, and reinstall the outlet plug at the time specified by the OEM.
8. Record date, operating hours, grease product, quantity, DE/NDE bearing, technician, and observations in Appendix C.

6.4 Grease compatibility and contamination

- Do not mix greases solely because they have the same NLGI grade or similar color.
- Confirm thickener, base oil, viscosity, additives, temperature range, and manufacturer compatibility guidance.
- When changing to an incompatible or unknown grease, the existing grease must be removed using an approved bearing/housing procedure.
- Keep grease cartridges, guns, fittings, caps, and storage cabinets clean. Moisture, metal particles, dust, fibers, and mixed lubricants shorten bearing life.
- Do not use an open, dirty, damaged, or unlabeled grease cartridge.

6.5 Common lubrication errors

Error	Likely consequence
Overgreasing	Churning, elevated temperature, seal damage, grease migration into windings, increased power loss, and early bearing failure.
Undergreasing / missed interval	Lubricant starvation, heat, wear, noise, and bearing damage.
Wrong or incompatible grease	Oil separation, hardening/softening, loss of lubrication, overheating, and failure.
Blocked outlet or old hardened grease	Pressure buildup, poor purge, seal damage, and overheating.
Dirty fitting or equipment	Contamination and abrasive bearing wear.
Lubricating a sealed bearing through an improvised fitting	Bearing damage and loss of enclosure integrity.
No written record	Loss of traceability and difficulty evaluating failure cause or warranty coverage.

7. Electrical Inspection and Testing

QUALIFIED TESTING ONLY

Insulation resistance, polarization index, winding resistance, surge comparison, high-potential testing, and energized power measurements require qualified personnel, correct instruments, safe isolation, and proper interpretation. Improper testing can damage the motor or expose personnel to hazardous voltage.

7.1 Routine energized observations

- Record line-to-line voltage on all phases at the motor or drive output as appropriate.
- Record current on every phase under a known and repeatable load.
- Compare voltage, current, frequency, speed, load, and temperature to the nameplate and baseline.
- Investigate phase loss, abnormal unbalance, harmonics, repeated overload trips, unstable current, or current above the permitted operating value.
- For across-the-line motors, calculate voltage unbalance as: maximum deviation from average voltage divided by average voltage, multiplied by 100. Investigate values approaching or exceeding 1%, and follow the motor/OEM requirements for derating or correction.
- For VFD output, use instruments and methods suitable for pulse-width-modulated waveforms; ordinary meters may provide misleading values.

7.2 De-energized inspection

- Inspect cables, lugs, terminal block, jumpers, phase barriers, insulation, grounding, conduit seals, drain/breather condition, and signs of heating or tracking.
- Check terminal torque using the manufacturer requirement. Do not repeatedly retorquing without assessing joint condition and hardware suitability.
- Inspect for moisture, corrosion, conductive dust, oil, loose hardware, insect/rodent contamination, or damaged gaskets.
- Confirm RTDs, thermistors, thermostats, space heaters, brakes, encoders, and auxiliary fans are connected and functional.

7.3 Insulation and winding tests

Test	Guidance
Insulation resistance to ground	Test only after proper isolation. Record winding temperature, test voltage, duration, and result. Correct/interpret for temperature and compare with OEM criteria and prior trends.
Polarization index / dielectric absorption	Use when appropriate for the winding type and condition. Interpret with the OEM or applicable industry practice; not every small or low-voltage motor requires this test.
Winding resistance	Compare phases and prior data at a known temperature. Account for connection configuration and parallel circuits.
Surge comparison	Service-center diagnostic test for turn-to-turn weakness. Do not perform as an unsupervised routine field test.
High-potential test	Potentially destructive if incorrectly applied. Perform only under an approved test procedure and appropriate standard.
Grounding/bonding continuity	Confirm a reliable equipment-ground path and correct bonding of motor, conduit, driven equipment, and VFD system.

8. Mechanical Condition, Alignment and Vibration

8.1 Alignment and soft foot

- Correct soft foot before precision alignment.
- Align the complete train under the condition required by the equipment manufacturer, considering thermal growth, pipe strain, and final bolt torque.
- Recheck alignment after piping, coupling, belt, or base work and after significant maintenance.
- Document the method, tolerances used, final readings, shims, and technician.

8.2 Vibration monitoring

- Use the same measurement points and directions (horizontal, vertical, axial) whenever possible.
- Record machine speed, load, process condition, instrument, units, and sensor mounting method.
- Trend overall vibration and, for critical equipment, collect spectra and bearing-condition data.
- Investigate changes associated with imbalance, misalignment, looseness, resonance, bearing defects, electrical problems, cavitation, bent shafts, rubs, belt defects, or driven-equipment faults.
- Use the equipment manufacturer and applicable vibration standard for acceptance limits; do not apply one universal limit to every motor and machine.

8.3 Bearing and shaft condition

- Monitor bearing temperature and compare with ambient, load, speed, and baseline.
- Investigate new noise, roughness, impact, increasing temperature, grease leakage, metal particles, or rapid vibration change.
- Check shaft endplay, radial movement, coupling fit, key/keyway, seals, sleeves, bearing seats, and evidence of fretting or electrical fluting when indicated.
- Do not continue operating a motor with a known loose bearing fit, damaged shaft, cracked end bell, or rubbing rotor/fan.

8.4 Belt-driven equipment

- Use matched belts and correct pulley/sheave geometry.
- Align sheaves and set belt tension using the belt/equipment manufacturer method.
- Recheck tension after run-in. Excess tension can overload bearings; low tension can slip, heat, vibrate, and damage belts.
- Inspect for pulley wear, cracks, imbalance, runout, improper key fit, and belt dust.

9. Cooling, Cleaning and Environmental Protection

9.1 Cooling system

- Keep air inlets, external fins, fan, fan cover, filters, ducts, heat exchangers, and water-cooling circuits clean and unobstructed.
- Confirm separately powered blowers and cooling pumps operate before loading the motor.

- Do not operate a totally enclosed fan-cooled motor with a broken, missing, reversed, or blocked fan system.
- At low VFD speed, confirm the motor has adequate cooling or an auxiliary blower when required.
- Inspect water-cooled motors for flow, leaks, fouling, corrosion, and proper coolant quality.

9.2 Cleaning

- De-energize and protect the motor before cleaning.
- Use clean, dry methods suitable for the enclosure and contamination. Vacuuming is preferred where compressed air would drive contamination deeper.
- Do not direct high-pressure air at bearings, seals, windings, or terminal insulation.
- Do not pressure-wash a motor unless its exact enclosure and installation are designed for that cleaning method.
- Do not use solvents that attack varnish, insulation, paint, seals, cable jackets, or grease.
- After wet cleaning or water exposure, do not energize until dryness and insulation condition are verified by qualified personnel.

9.3 Moisture, drains and space heaters

- Keep drains/breathers in the correct position for the motor mounting orientation.
- Inspect drain paths for blockage and evidence of internal water or oil.
- Use anti-condensation space heaters when provided and when the motor is idle, according to the wiring design.
- Prevent simultaneous heater and winding energization unless the design specifically permits it.
- Investigate repeated condensation rather than relying only on drainage.

10. VFD and Soft Starter Applications

Drive-related failures can resemble winding or bearing defects. Preserve the drive setup, fault history, operating speed, and cable information for troubleshooting and warranty evaluation.

10.1 Required configuration record

- Drive manufacturer, model, serial number, firmware, input/output voltage class, and rated current.
- Motor nameplate data entered into the drive and motor autotune/identification results.
- Minimum/maximum frequency and speed, acceleration/deceleration time, current limit, overload class, torque boost, control mode, switching/carrier frequency, and braking settings.
- Motor lead length, cable type, grounding method, output reactor, dv/dt filter, sine-wave filter, common-mode choke, and shaft-grounding or insulated-bearing provisions.
- External cooling fan control, motor thermal sensor input, brake control, encoder feedback, bypass arrangement, and multi-motor operation.
- Complete fault/alarm history and changes made after commissioning.

10.2 Operating precautions

- Do not exceed the motor's approved speed, frequency, voltage, current, torque, bearing speed, or mechanical limits.
- Confirm continuous low-speed operation does not cause inadequate cooling.
- Long motor cables and fast voltage rise can stress winding insulation; use the motor/drive manufacturer's cable and filter recommendations.
- VFD common-mode voltage can contribute to bearing currents; apply grounding, insulated bearings, shaft-grounding devices, filters, and installation practices as specified.
- Do not increase carrier frequency or disable protective functions without checking motor heating and drive derating.
- For a two-speed motor with separate or reconnectable windings, verify the exact winding connection and drive compatibility before energizing.

10.3 Soft starter precautions

- Set starting current, ramp time, kick start, stall, overload class, and bypass operation for the actual motor and load.
- Excessively long acceleration can overheat the motor even when current is below locked-rotor current.
- Confirm the bypass contactor closes and all phases carry current correctly.
- Investigate repeated start failures or protection trips; do not repeatedly attempt starts against a jammed or overloaded machine.

11. Storage and Standby Motors

11.1 Storage conditions

- Store indoors in a clean, dry, vibration-free area with stable temperature whenever possible.

- Keep the motor off the floor and protect it from flooding, salt spray, condensation, construction dust, welding/grinding debris, chemicals, and pests.
- Keep terminal boxes closed and openings sealed while allowing the ventilation/space-heater arrangement required by the OEM.
- Use space heaters or controlled storage heating when supplied or required.
- Do not use plastic wrapping that traps moisture without an approved preservation method.

11.2 Periodic storage maintenance

- Inspect the motor and preservation condition at a documented interval based on environment and criticality.
- Rotate the shaft periodically according to the OEM instructions to redistribute lubricant and reduce false brinelling risk. Many manufacturers use intervals between one and three months; use the specific motor requirement.
- For regreasable bearings, follow the OEM storage lubrication schedule. Do not add grease to sealed bearings.
- For sleeve bearings, maintain preservation and oil requirements; some motors ship without operating oil.
- Record insulation resistance and winding temperature at the interval required by the OEM or site program.
- Before commissioning after long-term storage, inspect bearings, lubricant, insulation, heaters, drains, shaft rotation, and shipping restraints.

11.3 Installed standby motors

- Exercise or test-run only under an approved procedure that confirms the driven equipment is ready.
- Monitor condensation, space heaters, drains, corrosion, vibration from adjacent machinery, and readiness of auxiliary systems.
- After long inactivity, do not assume the original grease condition, insulation condition, or alignment remains acceptable.

12. Special Applications

Application	Additional requirements
Vertical motors	Confirm thrust-bearing arrangement, shaft endplay, lubricant distribution, direction, pump thrust, non-reverse ratchet, and manufacturer-specific lubrication interval.
Pumps	Prevent dry running, cavitation, blocked suction/discharge, seal leakage into the motor, pipe strain, and operation outside the pump's permitted range.
Marine / offshore	Shorten inspection intervals for salt, humidity, vibration, corrosion, washdown, and standby service. Maintain drains, heaters, coatings, cable glands, and enclosure integrity.
Washdown / food / chemical	Use only cleaning methods, seals, coatings, lubricants, and cable entries approved for the environment. Repair coating damage promptly.
Brake motors / hoists / winches	Inspect brake wear, air gap, rectifier/control, manual release, torque, load holding, limit switches, and overspeed/load protection. Motor operation does not prove the brake is safe.
Hazardous locations	Maintain listing, flame paths, fasteners, cable entries, seals, temperature code, bearings, and repair traceability. Do not make unauthorized modifications.
High-speed / special bearings	Use the specified bearing clearance, cage, lubrication, balance, and speed limits. Generic replacement bearings may be unsuitable.
Insulated bearings / shaft grounding	Do not substitute a standard bearing or remove grounding devices without engineering approval. Inspect for electrical discharge damage.
Motors with RTDs/thermistors	Verify sensor type, alarm/trip settings, wiring, and calibration. Never bypass sensors to keep the motor running.
Two-speed motors	Identify each winding/connection and test configuration. Incorrect external connections can create abnormal resistance readings, overheating, or winding damage.

13. Stop-Work and Immediate Shutdown Conditions

STOP THE MOTOR

Shut down safely and investigate when any condition below is observed. Continued operation can convert a minor problem into a winding, bearing, shaft, end-bell, rotor, coupling, or driven-equipment failure.

- Smoke, sparks, burning odor, arcing, or visible insulation damage.
- Rapidly increasing or abnormal bearing/winding temperature.
- New severe noise, scraping, knocking, rubbing, or vibration.
- Current above the permitted value, phase loss, severe unbalance, or repeated overload/ground-fault trips.
- Locked or overloaded driven equipment, failed acceleration, or repeated stall.
- Broken cooling fan, blocked cooling path, failed auxiliary blower, or loss of cooling water/oil system.
- Water, oil, chemicals, or conductive contamination entering the motor or terminal box.
- Loose coupling, cracked base, broken fastener, excessive shaft movement, or known bearing fit/end-bell damage.
- Unexpected overspeed, reverse rotation, backspin, abnormal thrust, or brake failure.
- VFD/soft starter fault indicating output phase loss, overcurrent, ground fault, overvoltage, overheating, or motor thermal trip.

13.1 After shutdown

1. Apply LOTO and protect the equipment from further damage.
2. Do not repeatedly reset and restart the motor.
3. Record operating conditions, alarms, current, voltage, speed, temperature, vibration, and the sequence of events.
4. Take clear photos and videos before disturbing the installation.
5. Contact AMS before disassembly when a warranty claim may be involved.

14. Warranty Compliance and Claim Procedure

WARRANTY NOTICE

The specific estimate, invoice, written warranty, and approved scope of work control. This guide supports proper care and failure analysis but does not expand the warranty or guarantee uninterrupted operation.

14.1 General AMS warranty framework

Unless the applicable AMS estimate or invoice states otherwise, AMS's standard warranty period is one year from delivery or completion of the repaired work. Coverage applies to defects determined by AMS to be directly attributable to AMS workmanship or a part specifically supplied by AMS within the approved scope.

Warranty acceptance is not automatic. Submission of a form, return of equipment, or preliminary communication does not constitute approval. AMS must inspect the equipment and evaluate the root cause, operating conditions, maintenance, installation, and scope of work.

14.2 Conditions generally outside the repaired-work warranty

- Lack of lubrication, incorrect grease/oil, overgreasing, contamination, blocked grease passages, or maintenance outside the OEM requirement.
- Bearing, shaft, end-bell, seal, coupling, fan, brake, terminal, cable, or driven-equipment damage not included in the approved repair scope.
- Misalignment, soft foot, pipe strain, excessive belt tension, imbalance, resonance, improper mounting, abnormal axial/radial load, or damaged driven equipment.
- Incorrect voltage, frequency, connection, rotation, overload setting, single phasing, phase/voltage unbalance, power-quality issue, repeated starts, locked rotor, or operation above rating.
- Incorrect VFD/soft starter selection, settings, cable/filter/grounding arrangement, low-speed cooling, overspeed, bearing-current control, or repeated fault resets.
- Water, flooding, condensation, salt, chemicals, conductive dust, oil, pressure washing, corrosion, blocked ventilation, excessive ambient temperature, or other environmental exposure beyond the equipment rating.
- Unauthorized disassembly, alteration, machining, welding, rewinding, bearing replacement, field repair, or removal of evidence before AMS inspection.
- Normal wear, consumables, accidental damage, abuse, transportation/handling damage after delivery, or force-majeure events.
- Damage consequential to a separate failure in the pump, gearbox, fan, compressor, load, control system, or facility power system.

14.3 Customer responsibilities for a claim

- Stop operation promptly when an abnormal condition occurs and prevent additional damage.
- Do not disassemble, clean, rewind, machine, replace bearings, or discard parts without written AMS authorization when warranty evaluation is requested.
- Complete the online Warranty Claim Request & Failure Checklist.
- Provide the AMS reference/estimate/invoice number, motor nameplate, installation date, operating hours, application, and detailed failure description.
- Provide commissioning, maintenance, lubrication, vibration, temperature, electrical, alignment, VFD/soft-starter, alarm, and incident records relevant to the failure.
- Provide clear photos/video of the installation, motor, coupling, nameplate, terminal connection, driven equipment, and observed damage.
- Obtain return/shipping instructions. Unless specifically approved in writing, removal, installation, freight, travel, onboard labor, crane service, downtime, and consequential costs are not included.

14.4 Evidence and claim determination

Failure to provide records does not by itself prove misuse; however, missing or incomplete records may prevent AMS from establishing the failure cause. A claim may be denied when the available inspection and evidence reasonably show that an excluded installation, operating, maintenance, environmental, or external condition caused or materially contributed to the failure.

Any courtesy repair, commercial accommodation, or one-time exception is limited to that specific case and does not modify future warranty coverage unless AMS confirms the change in writing.

SUBMIT A WARRANTY CLAIM

Use the QR code or the secure online form:

www.advancemotorsolutions.com/warranty-claim

Phone: 786-720-9161 / 786-843-9627

Email: contact@advancemotorsolutions.com



15. Quick Reference Checklists

15.1 Before each start

- ☐ No active unresolved alarm or trip
- ☐ Area and cooling paths clear
- ☐ Guards and fan cover installed
- ☐ No visible water/oil/chemical leak
- ☐ No loose cable, terminal-box, base, coupling, or belt condition
- ☐ Driven equipment ready and free to operate
- ☐ Correct valve/damper/load condition
- ☐ Space heater/auxiliary systems in correct state

15.2 During operation

- ☐ Current and speed/frequency normal for the load
- ☐ No abnormal noise, smell, smoke, or vibration
- ☐ Bearing and winding temperatures stable
- ☐ Cooling fan/blower/water/oil system operating
- ☐ No repeated overload, VFD, or soft-starter faults
- ☐ No abnormal leakage, shaft movement, or coupling/belt behavior

15.3 Before lubrication

- ☐ Bearing is regreasable
- ☐ Correct DE/NDE bearing identified
- ☐ Correct grease and compatibility confirmed
- ☐ Correct quantity and interval confirmed
- ☐ Clean grease gun and fitting
- ☐ Outlet/drain procedure confirmed
- ☐ Motor running/stopped condition confirmed
- ☐ Log available for immediate entry

15.4 When a failure occurs

- ☐ Stop safely and apply LOTO
- ☐ Do not repeatedly reset/restart
- ☐ Preserve alarms and drive history
- ☐ Record readings and operating condition
- ☐ Take photos/video before disassembly
- ☐ Keep all failed parts/evidence
- ☐ Contact AMS and submit online form
- ☐ Obtain written authorization before repair or shipment

Appendix A - Motor Installation and Commissioning Record

Customer / Vessel / Facility	Location / Equipment Served
Customer Asset No.	AMS Reference No.
Estimate / Invoice No.	Installation Date
Motor Manufacturer	Model / Serial No.
Frame / Enclosure / Mounting	Power / Voltage / Current
Frequency / Speed / Phases	Connection / Rotation
DE Bearing / NDE Bearing	Grease or Oil Specification
VFD / Soft Starter ID	Driven Equipment / Coupling

Installation verification

Item	Status	Remarks
Foundation/base clean, rigid and undamaged	☐ Yes ☐ No ☐ N/A	
Soft foot checked/corrected	☐ Yes ☐ No ☐ N/A	
Shaft/coupling alignment completed	☐ Yes ☐ No ☐ N/A	
Belt/sheave alignment and tension verified	☐ Yes ☐ No ☐ N/A	
Driven equipment rotates freely	☐ Yes ☐ No ☐ N/A	
Electrical connection matches diagram/nameplate	☐ Yes ☐ No ☐ N/A	
Grounding/bonding verified	☐ Yes ☐ No ☐ N/A	
Terminal torque completed/documentated	☐ Yes ☐ No ☐ N/A	
Protection settings verified	☐ Yes ☐ No ☐ N/A	
Cooling, drains, heaters and sensors verified	☐ Yes ☐ No ☐ N/A	
Correct rotation verified	☐ Yes ☐ No ☐ N/A	
Guards installed before service	☐ Yes ☐ No ☐ N/A	

Appendix A (continued) - Baseline Readings and Signoff

Record readings at a known operating condition. Use one row for no-load or initial operation and one row for stable loaded operation when applicable.

Date / Time	Load / Process	V L1-L2	V L2-L3	V L3-L1	A L1	A L2	A L3	Hz/RPM
Ambient °F/°C	DE Temp	NDE Temp	Winding Temp	Vib H	Vib V	Vib A	Units / Instrument	
Alignment method / final readings				VFD/soft starter settings attached?				
Startup observations / alarms				Corrective work completed				
Commissioned by / Company				Signature / Date				

Appendix B - Routine Motor Maintenance Log

Customer / Facility				Motor Asset No.			
AMS Reference No.				Motor Location / Service			
Date / Hours	Operating condition	Voltage / Current	DE/NDE Temp	Vibration / Units	Inspection or work performed	Findings / Action	Technician

Attach detailed electrical, alignment, vibration, thermography, oil/grease, or protection-test reports when performed.

[illegible]

Do not write only "greased." Record the exact grease, quantity, bearing end, motor hours, procedure, and observations. If grease type or compatibility is unknown, stop and obtain technical guidance before adding grease.

Appendix D - VFD / Soft Starter Configuration Record

Customer / Facility		Motor Asset No.	
AMS Reference No.		Drive / Starter Manufacturer	
Model / Serial No. / Firmware		Input / Output Voltage Class	
Rated Current		Motor Lead Length / Cable Type	
Grounding / Bonding Method		Output Reactor / Filter	
Insulated Bearing / Shaft Grounding		Date Settings Verified	
Parameter	Setting	Parameter	Setting
Motor rated voltage		Motor rated current	
Motor rated frequency		Motor rated speed	
Minimum frequency/speed		Maximum frequency/speed	
Acceleration time		Deceleration time	
Current limit		Overload class / thermal model	
Control mode		Autotune / ID result	
Carrier/switching frequency		Torque boost / flux setting	
Brake settings		External blower control	
Motor thermal input		Encoder/feedback setup	
Bypass / contactor setup		Multi-motor configuration	
Complete parameter backup file location		Active alarms / fault history	
Changes from commissioning settings		Verified by / Signature / Date	

Appendix E - Failure / Incident Record

Customer / Facility	Motor Asset No.
AMS Reference No.	Date / Time of Event
Operating Hours Since AMS Service	Person Reporting
Motor Application / Driven Equipment	Load / Process Condition
Describe exactly what happened and the sequence of events	
Alarms, trips, fault codes and timestamps	
Voltage, current, speed/frequency, temperature and vibration at event	
Noise, smell, smoke, leak, water, contamination or physical damage observed	
Recent maintenance, lubrication, alignment, VFD, process or electrical changes	
Actions taken after event, including restart attempts	
Photos / videos / files attached	
Parts preserved and equipment current condition	

Claim evidence checklist

- | | |
|---|--|
| ☐ Motor nameplate photo | ☐ Installation/coupling photos |
| ☐ Terminal connection photos | ☐ VFD/starter backup and faults |
| ☐ Commissioning record | ☐ Maintenance log |
| ☐ Lubrication log | ☐ Alignment report |
| ☐ Vibration/temperature trends | ☐ Electrical test records |
| ☐ Shipping/handling condition | ☐ All failed parts preserved |

Submitted online: www.advancemotorsolutions.com/warranty-claim Date: _____

Appendix F - Customer Acknowledgment

The undersigned confirms receipt of this Electric Motor Preventive Maintenance, Lubrication & Warranty Compliance Guide and understands the following:

- ☐ The motor nameplate and manufacturer instructions take priority over this general guide.
- ☐ Qualified personnel must perform installation, energized measurements, electrical tests, lubrication, alignment, and maintenance.
- ☐ The customer is responsible for installation, operation, protection settings, lubrication, environmental control, maintenance, and recordkeeping unless AMS has separately agreed in writing to perform those services.
- ☐ A warranty claim is not approved until AMS completes its inspection and written determination.
- ☐ Failure caused or materially contributed to by excluded installation, operation, maintenance, environmental, or external conditions may not be covered.
- ☐ Equipment must not be disassembled or altered before AMS authorization when warranty evaluation is requested.

Customer Company	Name / Title
Signature	Date
Motor / AMS Reference	Comments or equipment-specific exceptions
ADVANCED MOTOR SOLUTIONS, LLC 175 SW 20th Way, Suite N6 Dania Beach, FL 33004, USA 786-720-9161 / 786-843-9627 contact@advancemotorsolutions.com www.advancemotorsolutions.com	 Warranty Claim Form

References and Technical Basis

This AMS guide is an original customer-maintenance document informed by the following safety standards, industry practices, and manufacturer publications. The referenced documents remain subject to their own terms, revisions, and equipment applicability.

1. **Occupational Safety and Health Administration (OSHA):** 29 CFR 1910.147 - The Control of Hazardous Energy (Lockout/Tagout). [Official source](#)
2. **Electrical Apparatus Service Association (EASA):** ANSI/EASA AR100-2025 - Recommended Practice for the Repair of Rotating Electrical Apparatus. [Official source](#)
3. **National Electrical Manufacturers Association (NEMA):** NEMA MG 1 - Motors and Generators; use the current applicable edition and motor manufacturer requirements. [Official source](#)
4. **WEG:** WMO/W20 Introduction and Instruction Manual - shipment, storage, installation, operation and maintenance of electric motors. [Official source](#)
5. **WEG:** Electric Motors Installation, Operation and Maintenance Manual, document 50033244, Rev. 43, April 2026. [Official source](#)
6. **ABB / Baldor-Reliance:** AC & DC Motor Installation & Maintenance, MN416. [Official source](#)
7. **ABB:** Operating Instructions Manual - NEMA Motors, A5E52711437A. [Official source](#)
8. **SKF:** SKF Bearing Maintenance Handbook and lubrication guidance. [Official source](#)

FINAL IMPLEMENTATION NOTE

Before publishing this document as binding warranty terms, have the warranty language reviewed by a Florida commercial attorney and confirm it matches AMS estimates, invoices, insurance requirements, customer contracts, and any RCG or vessel-specific agreements. The maintenance procedures should also be supplemented with the exact OEM manual for each motor.