



QUALITY MANUALS | FIRST EDITION

IAF AUTHORIZED SERVICE AND MAINTENANCE MANUAL

Consistent repair quality
and accountable service release

STABLE RELEASE

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Mechanical and body repair and EV battery service
Diagnostic evidence and technician competence
Workshop control and customer handover

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Publication identity and use

IAF Authorized Service and Maintenance Standards Manual

This manual provides the requirements, operating procedures and evidence framework for the defined supplier assurance, automated inspection or automotive service activities. Apply it through a controlled site implementation plan and equipment-specific work instructions.

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Reading and applying requirements

“Shall” identifies a requirement when adopted by a site, programme or agreement. “Should” identifies a recommendation. An example is illustrative; it is not a machine setting, test acceptance limit or completed operating record. Annex worksheets may be reproduced for controlled internal use.

Controlled implementation

Stable Release identifies the completed publication text. Site approval, process validation, competence authorization and equipment release are recorded when performed. A missing safety limit, test criterion or release authority prevents activation of the affected operation. Mandatory law, product requirements and validated equipment instructions remain applicable.

Relationship to IAF recognition

Use of this manual does not by itself confer membership, Corporate Recognised status, accreditation, certification or a licence to use IAF marks. Those decisions follow the applicable IAF guides, independent evaluation and recorded scope.

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Using the annexes

Enter actual values, evidence references, names and dates in the worksheets. A blank, unsigned or illustrative record is not proof of completion. Retain the record with its governing instruction and revision.

1 Purpose and service scope

1.1 This manual defines the quality system for authorized automotive maintenance, diagnosis and repair. It covers mechanical systems, structural and cosmetic body work, refinishing, electronic systems and EV battery service. Each adopting organization shall identify its legal entity, workshops, mobile operations, vehicle families, repair categories and excluded activities.

1.2 The objective is to return the correct vehicle in a verified condition, with traceable work, competent personnel and a clear customer explanation. Completion of a work order, absence of a warning light or a successful short road test alone does not establish conformity. Release requires the checks appropriate to the actual repair and vehicle configuration.

1.3 Authorized service means work within a documented, current authorization scope. The record shall state who granted that authority, for which activity, location and vehicle family, and under what conditions. An IAF authorization does not automatically confer vehicle-manufacturer dealership status, statutory inspection powers or permission to perform every repair.

1.4 This manual establishes process and quality requirements. Vehicle-specific technical instructions, approved repair data, product limits and mandatory obligations govern actual torque values, isolation methods, test voltages, structural repair zones, adhesive conditions and other settings. Where necessary information is missing, the affected work shall be held or referred to a competent provider.

1.5 Use the IAF Quality Manual, Accreditation Scheme Guide, Aftermarket Spare Parts and Inventory Manual, relevant battery and OT manuals and the five IAF policy documents. This manual does not replace product-specific repair instructions or extend a workshop's approved technical scope by publication alone.

2 Governance and responsibilities

2.1 The Service Director owns scope, resources, customer commitments and management review. The Workshop Controller assigns work only to competent authorized personnel and suitable bays. The Technical Manager owns approved methods, complex diagnosis, repair limits and technical escalation. The Quality Manager owns audits, release controls and nonconforming work.

2.2 The Service Advisor records the customer concern, consent, estimates and communication without inventing a diagnosis. Technicians execute the approved work, record actual evidence and stop when conditions differ from the instruction. Parts personnel verify identity, compatibility, status and preservation. A commercially available part is not automatically suitable for the vehicle.

2.3 The designated high-voltage authority controls task-specific EV permissions, energy-control arrangements and specialist escalation. Body repair and diagnostic specialists hold separate authorizations appropriate to their technologies. A general workshop title shall not imply competence to open a battery pack, repair a structural member or calibrate a driver-assistance system.

2.4 An authorized release person reviews the completed job and required verification. For safety-critical work, the control plan shall require a competent independent check where appropriate. A person shall not approve evidence they are unable to interpret. Record absence cover and ensure that staffing shortages do not remove required review.

2.5 Any worker may stop unsafe or technically unsupported work. Management shall protect good-faith reporting and resolve conflicts through the IAF policies. Customer pressure, insurer cost targets, parts incentives and productivity bonuses shall not determine whether a repair meets its required technical conditions.

3 Service authorization and scope register

3.1 The workshop shall maintain a scope register covering legal entity, site, facilities, vehicle families, system types, permitted procedures, competent personnel and essential equipment. Distinguish mechanical service, structural body repair, refinishing, diagnostics, assistance-system calibration, EV isolation, pack replacement and internal battery repair.

3.2 Before accepting a new activity, demonstrate access to current technical data, trained personnel, suitable tools, safe facilities, representative practice and required verification. Complete the applicable IAF evaluation and decision process for any claimed authorization. A pending application or training booking does not permit an expanded public claim.

3.3 Scope restrictions shall be visible to booking, estimating, job allocation and release personnel. Identify unsupported vehicle architectures, materials, battery types and operations. A workshop authorized to replace a complete battery pack shall not infer authority to repair internal modules or cells.

3.4 Subcontracting requires a competent provider with the necessary scope and a written work specification. Verify the returned evidence and retain accountability for the overall customer job. Disclose subcontracting as required and prevent a provider's authorization from being represented as the workshop's own unrestricted capability.

3.5 Review scope after changes to premises, ownership, key personnel, equipment, technology or performance. Suspend affected work when an essential capability is lost. Update public claims and marks under the IAF Mark Usage Policy and the applicable authorization agreement; commercial stationery shall reflect the actual current scope.

4 Technician competence and task authorization

Competence shall be assessed for actual tasks and vehicle technologies. The following internal task bands support assignment; they are not external qualifications and do not automatically include one another.

Task band	Typical scope	Required demonstration
Awareness	Reception, movement and nontechnical handling within defined limits.	Recognize hazards, follow restrictions and escalate abnormal conditions.
Mechanical	Approved maintenance and mechanical repairs for listed systems.	Use instructions, tools and measurements; verify repair and records.
Diagnostic	Structured fault isolation, electronic tests and approved software work.	Interpret evidence, select safe tests and verify root cause and repair.
Body specialist	Listed structural, joining, refinishing or assistance-system activities.	Demonstrate material-specific methods, equipment and acceptance checks.
EV specialist	Separately listed isolation, pack handling, testing or internal repair tasks.	Demonstrate task-specific electrical and battery competence and emergency response.

The competence matrix shall show each person against each permitted task as not authorized, supervised practice, independently authorized or authorized assessor. Identify vehicle families, equipment, limitations, assessor, evidence and review date. Authorization to isolate a vehicle is separate from permission to work inside an energized battery assembly.

Use observed practical work, diagnostic cases, measurements and understanding of abnormal conditions. Review after incidents, technology changes, prolonged inactivity or poor performance. Training attendance and years of service are supporting evidence, not a substitute for demonstrated competence. Annex C provides the matrix.

5 Workshop layout and environmental conditions

5.1 The facility shall separate vehicle reception, normal repair, hazardous or damaged-vehicle holding, clean component work, body preparation, paint operations, parts storage and customer access. Maintain clear routes, emergency access and defined vehicle movement rules. Bay capability shall match the vehicle dimensions, mass and planned operation.

5.2 EV work areas shall support the assessed electrical, fire, chemical and handling risks. Control unauthorized access, charging, keys, remote activation and exposed components. Define specialist arrangements for suspect or damaged batteries. There is no universal safe quarantine distance or observation period suitable for every battery condition and site.

5.3 Structural and refinishing areas shall provide appropriate extraction, fire prevention, contamination control and environmental conditions. Separate incompatible material work where cross-contamination can damage the repair. Adhesive application, coating and curing conditions shall follow the approved product and vehicle requirements.

5.4 Provide adequate lighting, ventilation, clean surfaces and controlled storage for sensitive components. Protect removed parts, connectors and fluids from contamination or mix-up. Battery internal repair, where expressly authorized, requires its own validated cleanliness, environmental and electrical controls; a normal mechanical bay is insufficient.

5.5 The facility owner shall inspect utilities, compressed air, electrical supplies, charging equipment, lifting systems and emergency equipment at justified intervals. Record defects and block affected use. Temporary extension leads, makeshift lifting arrangements or overcrowded holding areas shall not become routine substitutes for adequate facilities.

6 Tools lifting and measurement equipment

6.1 The equipment register shall identify tools requiring calibration, verification, maintenance or specific authorization. Include torque devices, pressure and electrical instruments, diagnostic interfaces, wheel alignment and assistance-system equipment, structural measurement, welding equipment, battery lifting tables and charging systems. Record permitted ranges and limitations.

6.2 Before lifting, verify vehicle identity, actual mass and configuration, approved lift points, equipment capacity and load stability. Removed powertrains or battery packs can change the centre of gravity. Use vehicle-specific support arrangements and competent personnel. Do not infer safe capacity from an unverified lift label or nominal vehicle mass.

6.3 Measurement equipment shall be suitable for the quantity, range, accuracy and environment. Electrical instruments and accessories require appropriate ratings and condition for the planned task. Calibration status alone does not make a damaged lead, unsuitable probe or incorrect measurement method acceptable.

6.4 Control software, targets, fixtures, adapters and consumables that affect results. Verify equipment after relocation, impact, repair or significant update. Where a calibration or verification fails, assess jobs performed since the last defensible valid state and determine whether vehicles require reinspection or customer contact.

6.5 Technicians shall report damaged, missing or unsuitable equipment and stop the affected task. Borrowed tools require the same suitability checks. The tool custodian shall retain traceable service records and ensure that obsolete, failed or unapproved devices cannot be issued inadvertently.

7 Vehicle reception and initial risk triage

Owner: Service Advisor with a competent technical assessor. Begin before placing the vehicle into an ordinary work bay or connecting diagnostic or charging equipment.

Step / owner	Required action and evidence
1 Establish identity	Record vehicle identifiers, registration where relevant, mileage, customer identity and authority to instruct work. Resolve mismatches between physical identifiers and documents.
2 Capture the concern	Record the customer's description, conditions, warnings, prior repairs, recent software changes, collision, flood, overheating or charging events. Preserve their wording separately from technical conclusions.
3 Inspect safely	Record visible condition, warning indications, leaks, damage, unusual heat, noise or odour and accessories. Do not approach a visibly unstable battery or activate a vehicle to investigate an emergency.
4 Assign the route	Classify ordinary service, restricted technical assessment or specialist incident handling. Suspected battery, fuel, structural or restraint hazards require the relevant competent assessment.
5 Control custody	Record keys, remote access, valuables, attachments, charge or fuel status and custody condition. Establish permitted movement, storage and charging instructions.
6 Open the job	Create a unique work order linking the vehicle, concern, triage outcome, authorized scope and responsible team. Communicate immediate restrictions and next steps to the customer.

Photographs shall have a justified purpose and appropriate privacy controls. Triage is a routing decision, not a full diagnosis or assurance that hidden damage is absent. Annex A captures reception and work authorization.

8 Work orders estimates and customer consent

8.1 Every job shall have a controlled work order with vehicle identity, customer concern, requested service, agreed scope, estimate, authorization method, parts strategy, subcontracting where relevant and expected communication points. Separate diagnostic investigation from repair approval. A consent to diagnose does not automatically authorize all proposed replacements.

8.2 Explain material uncertainty, inspection charges, possible dismantling, data access, software effects and vehicle downtime before the relevant commitment. Record customer approval of scope changes and additional cost. Emergency protective actions shall be documented with the reason, authority and prompt customer communication.

8.3 Confirm the vehicle configuration and current repair information before allocating work. Check applicable service actions, prior unresolved concerns and relevant maintenance history through authorized channels. Record unverified customer statements as such. Missing history shall not be replaced by invented maintenance entries.

8.4 The Workshop Controller shall assign technicians and equipment within their authorization scopes. Define hold points for diagnosis, parts confirmation, safety-critical checks and final release. The job shall remain identifiable when moved between bays, subcontractors or shifts; handover shall include hazards and incomplete operations.

8.5 Customer refusal of a recommended repair shall be recorded accurately with its technical consequence and lawful next steps. A signed waiver does not make an unsafe repair acceptable or erase mandatory duties. The service organization shall not describe a partly completed or restricted vehicle as fully repaired.

9 Structured diagnostic investigation

Owner: authorized diagnostic technician. The method shall test hypotheses and preserve evidence before resets, software changes or component replacement.

Step / owner	Required action and evidence
1 Verify the complaint	Review history and reproduce the symptom only where safe and authorized. Record operating conditions, frequency, warning state and the exact behaviour; distinguish confirmed symptoms from reported ones.
2 Establish the baseline	Confirm configuration, power supply condition, relevant technical information and initial fault records. Save codes, status, freeze-frame or event data and software identities before clearing anything.
3 Build hypotheses	Use system architecture and observed evidence to identify plausible causes. A diagnostic trouble code identifies a monitored condition, not necessarily the failed component.
4 Plan discriminating tests	Choose safe tests that distinguish causes, with approved connection points, methods, expected values and stop conditions. Do not bypass safeguards or probe restricted circuits without the required competence.
5 Evaluate and repair	Record actual measurements, instrument identity and interpretation. Confirm the cause sufficiently to justify the proposed work; obtain consent and execute the approved repair.
6 Verify the outcome	Repeat relevant tests and the original safe operating condition. Confirm required adaptations, calibrations and system checks. Record unresolved concerns and final disposition.

If the symptom cannot be reproduced, report the evidence and limitations honestly. Do not claim that a code reset proves the fault is repaired. Annex B provides the diagnostic evidence and hypothesis record.

10 Diagnostic data and software control

10.1 Use approved diagnostic interfaces, current vehicle-specific procedures and controlled software. Verify the vehicle, module hardware, software version and intended package before programming. Protect credentials, secure functions and customer information. A downloaded file with a plausible name is not evidence of a valid update.

10.2 Before programming, establish the required power support, communication stability, configuration backup where permitted, recovery method and customer authorization. Check dependencies among modules and required post-update procedures. An update shall not be used to conceal an unresolved physical fault or erase evidence needed for an investigation.

10.3 Record package identity, source verification, start and completion, module identifiers, result, interruptions and recovery. Confirm successful installation and the required functional checks. A progress bar reaching completion shall not be the sole release evidence. Failed or interrupted programming requires a controlled technical decision.

10.4 Keep security access task-specific and attributable. Do not bypass immobilizers, safety interlocks, emissions controls or protected functions through unauthorized methods. For legitimate replacement and recovery, use the authorized vehicle procedure and verify the requester's entitlement where required.

10.5 Apply data minimization to diagnostic logs, customer settings, location history and personal devices. Obtain the necessary permission for access and disclosure. Preserve relevant evidence under controlled retention, separate from unnecessary personal content. Follow the IAF privacy and OT requirements for remote support, transfer and disposal.

11 Maintenance planning and scheduled work

11.1 The maintenance plan shall use the vehicle's actual configuration, age, distance, operating hours where relevant, duty cycle, environment and current technical instructions. Severe-use conditions may change required work. This manual establishes no universal service interval or fluid-change schedule for every vehicle.

11.2 Confirm which tasks are due, completed previously, conditional on inspection or required after a specific event. Distinguish scheduled replacement from a condition-based recommendation. Record the applicable criterion and actual evidence. A generic sales package shall not replace the vehicle-specific service requirement.

11.3 Before work, verify parts, fluids, consumables, tools and technician scope. Confirm fluid specification, compatibility and contamination controls; colour or container appearance alone is insufficient. Record quantities and batch information where necessary for traceability. Prevent cross-filling and mixing of incompatible products.

11.4 Execute maintenance with controlled task completion and measurements, including inspected conditions that require no replacement. Reset service indicators only after the corresponding work and checks are completed. The record shall not imply a full service when only selected tasks were authorized or performed.

11.5 Review findings with the customer using clear urgency and evidence. Separate immediate safety restrictions, required maintenance and optional improvements. Provide the next due criteria and preserve unresolved recommendations. Do not create unnecessary replacement recommendations solely to meet parts or labour targets.

12 Mechanical repair and controlled assembly

12.1 The technician shall confirm the defect, approved repair method, compatible parts and required tools before dismantling. Protect vehicle identity, customer property and removed components. Record relevant initial positions, settings, damage and measurements where needed for diagnosis or correct reassembly.

12.2 Control contamination in lubrication, fuel, cooling, braking, air-conditioning and intake systems. Cap openings with suitable clean protection and segregate components. Follow the required depressurization, temperature and stored-energy precautions. Do not disconnect a pressurized or hazardous system merely because the engine is stopped.

12.3 Inspect mating surfaces, fasteners, seals, threads and related components against the repair criteria. Replace single-use or damaged items where specified. Apply only the approved lubricant, sealant or locking product and required preparation. A similar-looking fastener or gasket shall not be substituted without verified suitability.

12.4 Assembly shall follow the correct sequence, alignment, tightening method and vehicle-specific values. Record safety-critical measurements and fastening evidence. For torque-and-angle or tension-sensitive joints, a final torque value alone may not demonstrate correct execution. Repeated tightening can alter the joint and shall follow the approved procedure.

12.5 After repair, perform required filling, bleeding, adaptation, leak checks, functional tests and independent verification. Confirm that tools, temporary restraints and protective caps are removed as appropriate. Preserve replaced parts and failed components according to the agreed investigation, warranty, return or disposal route.

13 Braking steering suspension and restraint checks

13.1 Safety-critical systems shall have explicit verification points in the work order. For braking, confirm correct components, friction surfaces, routing, fasteners, fluid and approved bleeding or electronic service functions. Evaluate leaks, pedal behaviour and required performance using the vehicle-specific method. A warning lamp going out is insufficient.

13.2 For steering and suspension, verify component identity, mounting, orientation, joints, clearances, wheel and tyre suitability and required alignment. Account for ride-height systems and stored spring or pneumatic energy. Use the approved restraint and support methods before releasing stored force.

13.3 Wheel installation shall verify compatible wheels and fasteners, seating condition, tightening sequence and specified values. Record required tyre pressures and any monitoring-system procedures. Do not use an impact tool as the sole evidence of final tightening where controlled torque is required.

13.4 Restraint systems and pyrotechnic devices require specifically competent personnel, current instructions and controlled handling. Avoid unapproved electrical tests, probing or repairs to these circuits. After replacement or relevant collision work, perform the required configuration, inspection and diagnostic checks and preserve component traceability.

13.5 A competent release reviewer shall confirm the required evidence and unresolved issues. Road testing may supplement checks only under safe, lawful conditions and with suitable authorization. It shall not be used to discover whether an unverified brake, steering or restraint repair is safe enough to operate.

14 Collision assessment and structural repair planning

14.1 The body specialist shall identify vehicle structure, materials, joining methods, safety systems and hidden components before planning repair. Obtain current repair data for the specific variant. Visual exterior damage alone cannot establish the condition of structural members, battery enclosure, restraint systems or hidden electrical routing.

14.2 Prepare a damage map using suitable measurements, photographs and diagnostic evidence. Distinguish repairable, replaceable and prohibited repair areas. Structural sectioning, straightening, heating or component reuse shall occur only where an approved method supports it. A repair technique suitable for mild steel may be unsuitable for another material or casting.

14.3 The repair plan shall identify structural dimensions, datum systems, replacement parts, joining methods, corrosion protection, restraint work, battery precautions and final calibration or roadworthiness checks. Review interactions among tasks before dismantling. Insurer approval of cost does not establish technical permission for a repair method.

14.4 Before cutting, drilling, pulling, welding or heating, locate wiring, high-voltage components, fuels, pyrotechnics and other hazards. Apply the vehicle-specific protections and energy controls. Record the condition and safe status of systems affected by the proposed work.

14.5 When required data, equipment or competence is unavailable, stop the affected operation and obtain an approved solution or refer the vehicle. Preserve evidence of the limitation and customer communication. The final record shall identify structural repairs actually performed, not merely list replacement panels.

15 Joining bonding and corrosion protection

15.1 For each joint, specify the approved process, material stack, geometry, preparation, consumables, equipment and acceptance evidence. This includes welding, brazing, riveting, adhesive bonding and combined joints where permitted. Do not substitute one joining method for another based only on access or workshop preference.

15.2 Qualify the equipment setup and operator for the actual materials and joint requirements. Use representative test coupons and the required verification before work where specified. Preserve settings and test evidence. A visually neat joint is not proof of adequate internal integrity or mechanical performance.

15.3 Adhesive and sealant control shall cover product identity, batch, shelf life, storage, surface preparation, application, joint gap, clamping and cure conditions. Record actual conditions and release time where they determine strength. A surface that feels dry is not evidence that a structural adhesive has reached the required state.

15.4 Restore corrosion protection, seam sealing, cavity protection, drainage and isolation between incompatible materials according to the repair plan. Consider inaccessible surfaces before assembly. Document hidden work before closure where later verification would be impossible. Cosmetic refinishing shall not conceal an unverified structural joint.

15.5 Inspect and measure repaired geometry and joints using the required method. Nonconforming work shall be assessed before additional heat, grinding or repeated joining is applied. Rework requires an approved method and verification; uncontrolled repeated attempts can damage the material and shall not be treated as routine correction.

16 Refinishing surface preparation and cure control

16.1 The refinishing plan shall identify substrate, coating system, preparation, permitted repair boundaries, colour or appearance target and environmental requirements. Verify compatibility with prior coatings, plastic parts, sensors, adhesives and vehicle technology. A visually acceptable colour match does not establish durability or functional compatibility.

16.2 Control cleaning, sanding, masking, mixing, application and cure according to the approved products and vehicle limitations. Record batch and mix information when relevant, equipment settings and actual cure conditions. Do not infer part temperature from booth-air temperature without an appropriate method.

16.3 Assess battery, electronics, fuel and adhesive temperature limitations before heated curing. Follow the vehicle-specific decision about protection or component removal. This manual does not prescribe one safe booth temperature for all EVs. A nominally isolated battery can still be damaged by an unsuitable thermal process.

16.4 Provide suitable extraction, exposure controls, ignition prevention and competent handling of coating materials. Apply the site's assessed respiratory, skin and environmental protections. Do not use the quality inspection area as an uncontrolled spraying or solvent-cleaning space.

16.5 Final inspection shall verify surface defects, colour and appearance under controlled conditions, relevant thickness or other required properties, sensor areas, trim, drainage and cleanliness. Confirm removal of masking and temporary protection. Record remaining limitations and approved rework; repeated polishing or repainting shall stay within the permitted repair method.

17 Driver assistance systems and post repair calibration

17.1 The repair planner shall identify cameras, radar, ultrasonic sensors and related systems affected by damage, component replacement, alignment, ride height, glass, bumpers, structural work or software changes. Determine required inspections, aiming, calibration and functional checks from the specific vehicle procedure.

17.2 Before calibration, verify prerequisites such as correct parts, mounting geometry, tyre condition and pressure, loading, ride height, alignment, power state and environmental conditions. Use the specified targets, fixtures, distances and approved equipment. This manual does not define universal target positions or calibration dimensions.

17.3 For static procedures, confirm floor, lighting, space and target placement meet the method. For dynamic procedures, assess route suitability, legal conditions, weather, traffic and technician responsibilities. A required calibration shall not be replaced by an improvised road drive that merely produces no warning.

17.4 Record vehicle and module identity, preconditions, equipment status, procedure revision, software, results and required post-checks. A tool message reporting completion shall be reviewed with the full procedure outcome. Failed or incomplete calibration requires correction or restricted disposition and shall not be hidden by clearing codes.

17.5 Explain system limitations and relevant changes to the customer without overstating capability. Release requires the applicable calibration and verification, including systems affected indirectly by the repair. If a function remains unavailable, its condition and lawful vehicle disposition shall be explicitly determined and communicated.

18 EV intake and damaged battery assessment

18.1 An EV or hybrid intake shall consider collision, underbody impact, flooding, overheating, charging faults, unusual odour, leakage, deformation and warning history. Perform observations from a safe position and route abnormal conditions to the designated specialist. Absence of visible damage or warning codes does not prove that a battery is undamaged.

18.2 Suspected unstable or damaged batteries require the site's specialist incident procedure. Control access and involve emergency responders when conditions indicate an immediate threat. Do not charge, energize, open, move or connect test equipment to a suspect battery unless a competent assessment and approved procedure permit the specific action.

18.3 Record vehicle and pack identity where safely obtainable, event history, observed condition, temperature evidence where appropriate and the limitations of the assessment. A single surface-temperature reading cannot establish internal stability. Continued observation, location and escalation arrangements shall follow the assessed condition and specialist instructions.

18.4 Charging and storage permissions shall be explicit. Verify charger compatibility, connection condition, location and monitoring appropriate to the vehicle state. A vehicle accepted for diagnosis is not automatically approved for unattended charging. Quarantine arrangements shall account for site layout, fire response, exposure and possible re-ignition.

18.5 Transfer or return of a damaged or suspect pack shall involve competent dangerous-goods and recovery arrangements. Ordinary parcel packaging or a routine warranty-return label is insufficient. Preserve custody and condition records and coordinate with the IAF packaging and logistics controls without treating those records as transport authorization.

19 High voltage task authorization and energy control

Owner: designated high-voltage authority and specifically authorized technician. This is a control procedure; the exact switching, waiting, test points and acceptance values shall come from the current vehicle-specific safe-work instruction.

Step / owner	Required action and evidence
1 Authorize the task	Confirm vehicle architecture, repair scope, competence, suitable bay, tools, protective equipment, emergency arrangements and the permitted work method. Stop if essential information is missing.
2 Identify all energy	Account for traction and auxiliary supplies, charging, remote activation, stored electrical energy and possible mechanical generation or movement. Define the boundary of the intended safe state.
3 Establish controlled isolation	Execute the approved vehicle-specific procedure and secure against unintended reactivation. Control keys, remote access and connected equipment. Record the responsible person and isolation identifiers.
4 Verify the work boundary	A competent person uses suitable verified test equipment and the prescribed method to establish the required state at the relevant points. Record results and instrument checks; failed or ambiguous evidence means stop.
5 Maintain control	Protect the work zone and preserve isolation through task changes and handovers. Battery internals may remain energized despite vehicle isolation. Do not extend the permitted work boundary without reassessment.
6 Restore with authority	Verify completed work, covers, connections, personnel clearance and required tests. Restore energy only under the approved sequence and authority, then complete the prescribed functional checks.

Routine live work is not authorized by this manual. Any necessary energized diagnostic task requires a separate competent assessment, specific authorization and suitable controls. Annex E records the task permit without substituting for the vehicle procedure.

20 Battery pack removal and installation

20.1 Pack replacement requires a validated handling and installation method for the actual vehicle and battery. Verify pack mass, centre of gravity, lifting points, support equipment, attachment method and vehicle stability. Control personnel positions and crush hazards throughout transfer; an improvised platform is not an acceptable substitute for suitable equipment.

20.2 Before removal, establish the required electrical and other energy controls and verify the condition of the pack. Follow the approved method for coolant, refrigerant or other connections, fasteners, seals and protective components. Record the removed pack identity and preserve connector and opening protection.

20.3 Check the replacement pack's identity, compatibility, revision, condition, storage history and authorized status. Confirm hardware and software dependencies and any restrictions on reused or remanufactured assemblies. A physically fitting pack or matching nominal voltage does not establish compatibility.

20.4 Installation shall use the specified fasteners, tightening sequence, seals, connection methods and thermal-system procedures. Record safety-critical work and required independent checks. Do not use an electrical test or a final road test to compensate for an unverified mechanical attachment or seal.

20.5 Complete the required configuration, leak checks, electrical checks, thermal-system checks and controlled functional verification before release. Handle the removed pack through its approved return, investigation, repair or disposal route. The vehicle record shall link both pack identities and the actual replacement authorization.

21 Internal battery repair and component replacement

21.1 Internal battery work shall occur only where the service organization, personnel, facility and method are expressly authorized for the specific battery architecture and operation. Vehicle isolation does not remove the energy stored within cells or modules. General EV awareness or pack-replacement competence does not authorize internal repair.

21.2 The technical assessment shall determine whether the pack is eligible for the proposed repair. Consider incident history, mechanical damage, contamination, corrosion, electrical condition, thermal events and the availability of an approved method. Where repair is unsupported, maintain controlled status and select an authorized alternative; do not improvise cell-level work.

21.3 An approved repair plan shall specify permitted components, compatibility, matching requirements, handling, cleanliness, connection methods, testing and traceability. Preserve cell or module identities where required and link removed and installed items. Nominal voltage, appearance or a short capacity reading alone is insufficient to establish interchangeable components.

21.4 Access, disassembly and joining require task-specific control of remaining electrical energy, short-circuit risk, chemicals and mechanical hazards. Work instructions shall define boundaries, protected areas, tools, stop conditions and emergency response. Unapproved soldering, bypassing protective devices or bridging failed cells shall not be used to restore an apparently functional pack.

21.5 Reassembly shall restore seals, insulation, thermal interfaces, cooling paths, protective devices and enclosure integrity using the approved method. Verify all required properties through controlled testing. The repair record shall identify the actual work and residual limitations; it shall not describe a repaired pack as new unless that claim is independently justified and permitted.

22 Battery testing and technical release

22.1 The test plan shall be specific to battery architecture, condition and repair scope. It may require electrical integrity, insulation, protective functions, enclosure or cooling-system integrity, thermal response, communication, configuration and controlled charge or discharge checks. Test order and prerequisites shall be approved; testing a suspect pack can itself create risk.

22.2 Use suitable equipment, accessories, fixtures and protective arrangements. Test voltage, pressure, duration, current and acceptance values shall come from the approved method. An unsuitable insulation or high-voltage test can damage electronics or expose personnel; no universal test setting is established by this manual.

22.3 Record actual measurements, conditions, instrument identities, software and the battery state needed to interpret results. Distinguish measured capacity, estimated state of health and other indicators. A single diagnostic estimate shall not support an unrestricted claim about remaining life or all aspects of battery safety.

22.4 Investigate failed, unstable or inconsistent results before repeating tests. Preserve the original outcome and reason for retest. Do not repeatedly charge, cycle or reset a pack until it produces a favourable reading. Where the evidence is inadequate, maintain hold and obtain specialist disposition.

22.5 A competent independent reviewer shall confirm the applicable repair and test evidence before battery or vehicle release. Record permitted use, restrictions, monitoring or customer instructions where justified. The release shall not imply that hidden defects are impossible or that the battery's original warranty has automatically been restored.

23 Parts consumables and subcontracted work

23.1 Apply the IAF Aftermarket Spare Parts and Inventory Manual to part identity, fitment, authenticity, condition, storage, warranty and lifecycle. Distinguish original, alternative, remanufactured, refurbished and used parts accurately. Obtain the required customer agreement and technical acceptance; price or packaging shall not establish suitability.

23.2 Trace safety-critical components, batteries, electronic modules and controlled consumables to the vehicle and work order. Record part number, revision, serial or batch where relevant, source and installation date. Preserve old-to-new relationships for replacements and verify any required software or calibration dependencies.

23.3 Subcontracted machining, testing, structural work, calibration, battery services or refinishing shall have an approved scope, method, acceptance criteria and evidence requirement. Verify provider competence, equipment and current authorization. A supplier invoice alone is insufficient evidence that the required technical checks were completed.

23.4 On return, inspect identity, condition and documentation before installation or release. Resolve mismatches and missing results. The contracting workshop shall integrate subcontracted work into the final vehicle verification and customer record rather than simply attach a provider's certificate without review.

23.5 Control warranty cores, removed parts and hazardous returns under agreed ownership, evidence and transport requirements. Prevent reuse of condemned or unidentified parts. Disposal shall make inappropriate re-entry to service unlikely while meeting the applicable waste and data-protection obligations.

24 Final quality inspection and vehicle release

Owner: authorized release person, with independent technical checks where the repair risk requires. Release begins only after the work scope and all outstanding items are known.

Step / owner	Required action and evidence
1 Reconcile the job	Compare authorized work with tasks performed, parts installed, subcontracted services and unresolved recommendations. Confirm vehicle identity and the relevant repair-data revisions.
2 Review critical evidence	Verify fastening, fluid, structural, battery, calibration and other required records. Check technician authorization, instrument status and approval of any deviations.
3 Inspect the vehicle	Confirm assembly, covers, connections, leaks, cleanliness, removed tools and the required static or functional checks. Address new damage or faults arising during the job.
4 Verify the concern	Repeat the appropriate diagnostic and functional conditions. Perform road or dynamic tests only where safe, lawful and required. Preserve results and any remaining limitations.
5 Decide disposition	Record released, released with an explicitly permitted limitation, or held. Unresolved safety-critical evidence shall prevent an unrestricted release; customer consent does not replace the required checks.
6 Close and communicate	Approve the final record, prepare the customer explanation, update service history and hand over keys, documents and permitted-use instructions. Confirm the recipient's authority.

The release record shall identify the real reviewer and actual date. A pre-signed checklist or automatic system closure at invoicing is unacceptable. Annex G provides the final verification and customer handover form.

25 Customer handover warranty and complaints

25.1 Explain the confirmed concern, work completed, parts used, relevant software changes, verification performed and remaining recommendations in plain language. Identify any limitations or follow-up requirements and provide the applicable service and warranty terms. Do not imply that a replaced component proves every reported symptom was caused by that component.

25.2 Provide a traceable invoice or service record consistent with the work order. Record mileage or other relevant exposure at release and the next service criteria. Return or dispose of replaced parts according to the agreement and applicable requirements. Protect the customer's personal information and restore settings only as authorized.

25.3 A repeat concern shall trigger review of the original diagnosis, repair method, parts, verification and operating conditions. Preserve evidence before repeating resets or replacing further components. Distinguish recurrence, a related consequence and an unrelated new issue using evidence rather than assigning blame to the customer.

25.4 Warranty decisions shall be made within the applicable agreement and mandatory obligations. Technical findings, commercial goodwill and legal entitlement shall be recorded distinctly. The workshop shall not invent a universal warranty period or deny a claim solely because an unrelated service was performed elsewhere.

25.5 Use the IAF Appeals and Complaints Policy for concerns within its scope and maintain the workshop's customer complaint route. Acknowledge and investigate through the applicable deadlines, protect impartial review and record corrective action. Do not condition access to essential safety information on withdrawal of a complaint.

26 Emergency readiness and environmental control

26.1 The site emergency plan shall address fire, electrical incident, unstable batteries, hazardous release, vehicle movement, lifting failure and medical response. Assign roles, access arrangements, communication and evacuation. Coordinate specialist battery and fire response with competent responders according to the actual facility and work scope.

26.2 Personnel shall understand alarms, stop conditions and the limits of their response competence. A person shall not enter an electrical or chemical danger zone to recover tools or move a vehicle without appropriate authorization and controls. Emergency equipment and drills shall match the assessed hazards; a generic extinguisher location is not a complete plan.

26.3 Control fuel, refrigerants, oils, solvents, coatings, contaminated absorbents and batteries through suitable storage, handling and disposal arrangements. Segregate incompatible materials and protect drains and the environment. Recovered fluids shall not be reused without the necessary quality and technical justification.

26.4 Alternative-fuel vehicles and unusual architectures require additional scope-specific assessment. High-pressure gas, hydrogen systems and legacy hazardous materials shall be handled only by competent authorized personnel using suitable methods. General mechanical or EV authorization does not automatically cover these activities.

26.5 After an incident, preserve evidence, assess affected vehicles and equipment, communicate required information and verify safe recovery. Review training, facilities and work instructions for systemic causes. Quality closure shall include the technical condition of customer vehicles, not only restoration of workshop operations.

27 Service performance audits and improvement

27.1 The Quality Manager shall audit the complete job path from booking and consent through diagnosis, repair, parts, testing and handover. Sample routine work, complex faults, safety-critical repairs, EV jobs, subcontracting, repeat concerns and declined recommendations. Trace evidence to the actual vehicle and technician.

27.2 Use defined measures such as first-time repair success, repeat visits, confirmed repair-induced faults, overdue calibration, missing critical evidence, customer complaints and release delays. State the time window, denominator and attribution rules. A customer returning for unrelated work shall not automatically count as a failed repair.

27.3 For first-time repair analysis, identify eligible completed jobs and verified same-concern returns within the defined observation window. Distinguish incomplete follow-up from confirmed success. Review severity as well as rate; one serious safety escape may require more action than many cosmetic rework events.

27.4 Investigate patterns of parts replacement without diagnosis, repeated code clearing, missing battery test records, unusually fast structural repairs or excessive overrides. Audit technician competence and workload, not only signatures. Favourable productivity shall not offset unsupported release evidence.

27.5 Corrective action shall identify occurrence, detection and management causes, assign owners and verify effectiveness. Management review shall address resources, scope, training, customer outcomes and new technologies. Share lessons across the service network while protecting customer data and confidential technical information.

28 Records implementation and revision control

28.1 Apply the IAF Documents and Records Guide to work orders, consent, technical instructions, diagnostic data, measurements, parts genealogy, photographs, permits, tests and release records. Keep actual dates, identities and attributable corrections. An amended diagnosis or report shall preserve the original and explain the change.

28.2 The retention schedule shall consider mandatory, contractual, product-life and IAF scheme requirements. Apply the Accreditation Scheme Guide's minimum periods where work falls within that scheme. Retain longer where a recall, investigation, legal hold or unresolved claim requires. Minimize personal data and securely dispose of records when justified retention ends.

28.3 Before adopting this manual, map the workshop scope, competence, equipment, facilities and existing procedures. Complete a gap plan with owners and evidence. Pilot representative mechanical, body, diagnostic and EV jobs only within the intended authorization; missing competence shall not be disguised through retrospective paperwork.

28.4 Validate digital work-order and approval systems so that incomplete critical tasks block release, signatures are attributable and attachments remain accessible. Test backup and recovery. A restored database shall preserve vehicle-to-part relationships, technical revisions and outstanding safety restrictions.

28.5 Record the actual site adoption date and competent approval. Review after significant incidents, scope changes and scheduled management review. Process manual revisions through the appropriate IAF authority, communicate changes and retrain affected roles. Annex H provides implementation checks and internal document connections.

Annex A Vehicle reception and work authorization

Form ASM F01. Work order _____. Site _____. Reception date and advisor _____. Customer or authorized representative _____. Contact and consent record _____.

Vehicle and scope	Actual record
Vehicle identifiers and configuration	_____
Mileage or hours and service history	_____
Customer concern and occurrence conditions	_____
Visible condition and prior incident history	_____
EV fuel or other hazard triage	_____
Keys remote access and custody restrictions	_____
Diagnostic and repair scope authorized	_____
Estimate parts strategy and subcontracting	_____
Movement storage and charging permission	_____

Triage result: ordinary service / restricted assessment / specialist incident route. Responsible technical assessor _____. Immediate restrictions _____. Do not connect or charge a suspect battery solely to complete reception data.

Customer authorization and date _____. Scope changes require a new recorded approval. Assigned technician and permitted task scope _____. Required hold points _____. Planned customer update _____.

Annex B Diagnostic evidence and hypothesis worksheet

Form ASM F02. Work order and vehicle _____. Technician and authorization _____. System _____. Technical method revision _____. Initial software configuration _____.

Investigation record	Evidence
Reported symptom	Customer statement and operating conditions: _____
Confirmed baseline	Observed symptom, initial codes, status, event data and preserved files: _____
Hypothesis one	Proposed mechanism, discriminating test and expected result: _____
Hypothesis two	Alternative mechanism, test and expected result: _____
Actual test results	Values, units, conditions, instrument identity and evidence files: _____
Technical conclusion	Supported cause, rejected explanations and remaining uncertainty: _____
Repair verification	Approved work, repeat test, outcome and unresolved concerns: _____

Safety prerequisites and stop conditions _____. Customer approval for additional work _____. Data cleared or software changed only after evidence preservation: action and authority _____.

If no fault is found, record what was tested and under which conditions. Result: concern verified and repaired / further investigation required / not reproduced with stated limitations. Reviewer _____. Date _____. Do not use a code reset as the sole proof of repair.

Annex C Technician competence and authorization matrix

Form ASM F03. Workshop _____. Matrix owner _____. Review date _____. Use N = not authorized, S = supervised practice, A = independently authorized and R = authorized assessor. These are internal status codes.

Person or role	Mechanical	Diagnostic	Body work	EV tasks
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Each broad entry shall link to a detailed task authorization. For EV work, list separately vehicle isolation, pack removal and installation, electrical testing, internal repair and any energized diagnostic task. For body work, separate structural joining, refinishing and assistance-system calibration.

Individual task record	Evidence and scope
Person task and vehicle families	_____
Training and technical experience	_____
Observed practical demonstration	_____
Assessor competence and decision	_____
Limitations supervision and equipment	_____
Authorization and review triggers	_____

Reassessment after incident, prolonged inactivity or new technology _____. Temporary restriction _____. Workshop Controller notified _____. A broad matrix cell shall not expand the detailed task authorization.

Annex D Mechanical and body repair verification

Form ASM F04. Work order _____. Vehicle _____. Repair scope _____. Technician _____.
 Technical instruction and revision _____. Repeat the checklist for each relevant system.

Control point	Evidence and result
Correct parts and consumables	Identity, fitment, source, condition and required serial or batch: _____
Fastening and assembly	Required values, sequence, single-use items and actual evidence: _____
Fluids and sealed systems	Correct product, fill or bleed, leak and functional results: _____
Structural dimensions	Approved repair zones, measured geometry and acceptance: _____
Joining and bonding	Method, material, setup, test evidence and cure conditions: _____
Hidden protection	Corrosion, sealant, insulation and photographs before closure: _____
Refinishing and thermal limits	Product, actual cure conditions, vehicle limits and appearance: _____
Affected electronic systems	Diagnostics, calibrations, restraints and functional checks: _____

Not applicable entries require a reason. Unresolved item and vehicle restriction _____. Rework instruction and authorization _____. Independent safety-critical check _____. Reviewer and date _____.

Final disposition remains subject to the complete vehicle release in Annex G. A completed body repair checklist alone does not establish electrical, restraint or roadworthiness readiness.

Annex E High voltage task permit and handover

Form ASM F05. This permit records authorization and evidence; the current vehicle-specific procedure supplies the actual sequence, points and values. It does not authorize work outside the named boundary.

Permit element	Required entry
Vehicle and battery identity	_____
Task and exact work boundary	_____
Procedure revision and technical authority	_____
Authorized personnel and task competence	_____
Energy sources and remote activation controls	_____
Bay tools protective and emergency arrangements	_____
Isolation and responsible-person controls	_____
Verification method instruments and results	_____
Remaining energized areas and restrictions	_____
Handover and temporary interruption controls	_____

Permit issued by _____. Technician acceptance _____. Date and time _____. Any change to scope or conditions requires reassessment; vehicle isolation does not establish that battery internals are de-energized.

Restoration checks and evidence _____. Personnel clearance and control release _____. Authorized restoration person _____. Date and time _____. Post-restoration tests _____. Unresolved restrictions _____.

Annex F Battery repair and test record

Form ASM F06. Work order _____. Vehicle _____. Pack identity _____. Condition and incident history _____. Approved repair scope _____. Specialist authorization _____.

Battery work element	Evidence and outcome
Eligibility and condition	Assessment, limitations and approved method: _____
Removed and installed items	Part, revision, serial or batch, compatibility and source: _____
Handling and internal controls	Equipment, remaining energy, cleanliness and protected boundaries: _____
Mechanical and thermal assembly	Fasteners, seals, interfaces, coolant and actual checks: _____
Electrical and functional tests	Method, limits, actual values, units, instruments and configuration: _____
Enclosure or cooling integrity	Approved test conditions, results and acceptance: _____
Configuration and controlled operation	Software, protective functions and required operating tests: _____

Retest reason and original failed evidence _____. The approved procedure determines whether a test is safe and appropriate for the pack condition. Do not apply an invented universal voltage, pressure or cycling sequence.

Technical reviewer and date _____. Decision: accepted within stated scope / restricted / held. Restrictions and customer information _____. Removed-pack or component custody and destination _____. Final vehicle release reference _____.

Annex G Final release and customer handover

Form ASM F07. Work order _____. Vehicle identifiers _____. Completion mileage or hours _____. Release reviewer _____. Date _____.

Release check	Evidence and decision
Authorized scope reconciled	Work performed, deferred items and customer approvals: _____
Critical work verified	Fastening, brakes, steering, structure, restraints or EV evidence as applicable: _____
Diagnostics and software	Initial and final results, adaptations and unresolved faults: _____
Calibrations and functional checks	Required systems, equipment, method and outcome: _____
Vehicle condition	Leaks, covers, tools, cleanliness, damage and static checks: _____
Dynamic test where required	Safe prerequisites, route or conditions, result and tester: _____
Parts and subcontracted work	Traceability, competence, reports and final review: _____
Customer information	Work, limitations, follow-up, warranty terms and next service criteria: _____

Disposition: released / released with specifically permitted limitation / held. Technical basis and restrictions _____. Missing safety-critical evidence prevents unrestricted release.

Accountable approval _____. Customer or authorized recipient _____. Handover date and time _____. Keys and records transferred _____. Unresolved recommendations acknowledged _____. A customer signature records receipt; it does not replace the technical release decision.

Annex H Implementation and IAF document interfaces

Form ASM F08. Legal entity and site _____. Adopted service scope _____. Accountable owner _____. Actual effective date _____. Gap review _____.

IAF document	Service interface
Quality Manual and Constitution	Authority, quality responsibility, management review and impartial decisions.
Accreditation Scheme Guide	Repair scope, evaluation, activation, surveillance and status restrictions.
Membership Guide and Memorandum	Membership and contractual duties; separate from task-specific service authority.
Aftermarket Spare Parts and Inventory Manual	Part identity, compatibility, stock condition, warranty cores and lifecycle.
Gigafactory and Advanced Assembly Manual	Relevant battery technology and technical interfaces; service-specific instructions still govern repair.
OT and Documents and Records guides	Diagnostic access, software integrity, evidence, retention and recovery.
Five IAF policy documents	Complaints, disclosures, mark use, privacy and conflicts of interest.

Activation evidence: scope register ____; technician matrix ____; equipment suitability ____; facilities and emergency arrangements ____; current repair data ____; trial jobs and release checks ____; customer and subcontractor controls ____.

Audit sample and findings _____. Critical gaps closed before activation _____. Management review _____. Remaining actions, owners and dates _____.

This manual supports consistent service quality. It does not confer vehicle-manufacturer authorization, statutory inspection powers or an unrestricted right to use IAF marks. Public claims shall match the current recorded authorization.