



## Chapter 03: Maintenance Operations

# 03. 100-Hour and Annual Inspection Execution

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Execute regulatory inspections in compliance with FAA requirements to maintain aircraft airworthiness certification.

## Purpose

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Establish systematic procedures for conducting 100-hour and annual inspections in accordance with 14 CFR Part 91.409 requirements. These inspections ensure continued airworthiness, regulatory compliance, and safe aircraft operation while maintaining detailed documentation for certification purposes.

## Roles and Responsibilities

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### A&P Mechanic:

- Execute assigned maintenance tasks per specifications
- Review work order technical requirements
- Provide technical input for work scope estimates
- Document completion status and discrepancies
- Ensure regulatory compliance in all maintenance work

### Client Service Representative:

- Manage client communications and service requests
- Process documentation and billing
- Obtain client authorizations and approvals
- Coordinate scheduling and aircraft availability
- Maintain professional client relationships

## Process Steps

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### Pre-Inspection Planning

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- **Verify inspection requirements** - Confirm 100-hour or annual inspection due date and review aircraft operating time since last inspection
- **Review maintenance records** - Examine logbooks for compliance with airworthiness directives, service

bulletins, and previous inspection findings

- **Prepare inspection workspace** - Set up adequate lighting, tools, and documentation materials in appropriate hangar or maintenance area
- **Gather technical references** - Collect current manufacturer maintenance manuals, inspection checklists, and regulatory guidance materials

## Engine and Propeller Inspection

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- **Remove engine cowling** - Carefully remove and inspect cowling components while checking for cracks, security, and proper fit
- **Inspect engine external components** - Examine engine mounts, accessories, hoses, and wiring for security, wear, leaks, or damage
- **Check propeller and spinner** - Inspect propeller blades, hub, and spinner for cracks, nicks, security, and proper track and balance
- **Examine engine controls** - Test throttle, mixture, propeller, and carburetor heat controls for proper operation and security

## Airframe Structural Inspection

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- **Inspect fuselage structure** - Examine skin, frames, bulkheads, and attachment points for cracks, corrosion, or structural damage
- **Check wing and control surfaces** - Inspect wings, ailerons, elevator, rudder, and trim tabs for structural integrity and proper rigging
- **Examine landing gear system** - Inspect struts, wheels, brakes, tires, and retraction systems for wear, damage, or operational deficiencies
- **Review flight control systems** - Check control cables, pulleys, bellcranks, and connections for proper tension, wear, and security

## Systems and Equipment Inspection

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- **Test avionics and electrical systems** - Verify operation of all navigation, communication, and electrical systems while checking for proper installation
- **Inspect cabin and cockpit** - Check seats, belts, controls, instruments, and placards for security, condition, and regulatory compliance
- **Examine fuel and oil systems** - Inspect tanks, lines, filters, and pumps for leaks, security, and proper operation
- **Review emergency equipment** - Verify presence, condition, and currency of required emergency and safety equipment

## Airworthiness Directive Compliance

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- **Review applicable ADs** - Check current airworthiness directive status and compliance for aircraft, engine, and propeller
- **Perform required AD actions** - Execute any recurring airworthiness directive requirements due at inspection interval
- **Document AD compliance** - Record completion of all airworthiness directive actions in aircraft maintenance records
- **Update AD tracking system** - Enter next compliance dates for recurring airworthiness directives in tracking database

## Final Documentation and Certification

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- **Complete inspection checklist** - Verify all required inspection items have been completed and documented according to regulatory requirements
- **Document discrepancies and actions** - Record all findings, corrective actions, and deferred maintenance items in aircraft logbooks
- **Prepare return to service entry** - Complete required logbook entries certifying inspection completion and aircraft airworthiness
- **Coordinate client delivery** - Schedule aircraft return with client and provide inspection summary and any recommended future maintenance

## Process Mapping

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Flowchart to show sequential steps

## Tools and Resources

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- 14 CFR Part 91 Appendix D inspection checklist
- Manufacturer maintenance manuals and service bulletins
- Current airworthiness directive database and tracking system
- Inspection tools, mirrors, and measurement equipment
- Aircraft maintenance logbooks and record forms
- Parts catalogs and technical service information
- Digital camera for discrepancy documentation
- Client communication and authorization forms

## Success Metrics

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- **Completion Time:** 100-hour inspection completed within 16 hours; annual inspection within 24 hours.
- **Quality Standard:** 100% compliance with regulatory inspection requirements and airworthiness directive actions.
- **Safety Standard:** Zero missed inspection items or airworthiness deficiencies at aircraft delivery.
- **Client Satisfaction:** 95% client approval rating for inspection quality and communication throughout process.

## Common Issues and Solutions

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- **Issue:** Discovery of airworthiness directives not previously complied with during inspection
- **Solution:** Maintain current AD database subscriptions, implement systematic AD tracking procedures, and budget time for unexpected compliance actions

**Issue:** Parts availability delays for discrepancies discovered during inspection


**Solution:** Maintain inventory of common inspection-related parts, establish expedited parts ordering procedures, and communicate delays immediately to clients


**Issue:** Inspection timeline extensions due to additional maintenance requirements


**Solution:** Conduct thorough pre-inspection assessment, maintain realistic time estimates, and establish clear client communication protocols for scope changes


## Safety Considerations

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 **WARNING:** Never return aircraft to service with unresolved airworthiness discrepancies or incomplete inspection requirements

 **CAUTION:** Ensure proper documentation of all inspection findings and corrective actions before aircraft release

 **NOTE:** All inspection work must be performed by appropriately certified personnel with current qualifications

 **BEST PRACTICE:** Use standardized inspection checklists and maintain current technical references for consistent inspection quality

# Regulatory References

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- **14 CFR Part 91.409** - Inspections
- **14 CFR Part 91 Appendix D** - Airports/Locations: Special Operating Restrictions
- **14 CFR Part 43.15** - Additional Performance Rules for Inspections
- **14 CFR Part 43.11** - Content, Form, and Disposition of Records for Inspections
- **AC 43-9C** - Maintenance Records
- **AC 20-62E** - Eligibility, Quality, and Identification of Aeronautical Replacement Parts