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airbus a318 engine run procedures

Published: September 19, 2026 | Index ID: #-

Airbus A318 Engine Run Procedures: A Complete Guide for Pilots and Engineers

The Airbus A318, the smallest member of the A320neo family, is powered by two CFM International CFM56 5B4 engines. Whether you are a first time pilot, a seasoned captain, or an aviation maintenance technician, understanding the engine run procedures is essential for safe and efficient operation. This article walks through every step of the engine run process, from pre flight preparation to post run monitoring, and provides practical tips that align with airline operating manuals and regulatory requirements.

Why Engine Run Procedures Matter

Engine run procedures are more than a routine checklist; they are the bridge between a theoretical start and a real flight. Proper execution ensures:

- Optimal engine performance and fuel efficiency.
- Early detection of mechanical or operational anomalies.
- Compliance with airline and regulatory safety standards.
- Reduced wear and tear, extending engine life.

In the high stakes environment of commercial aviation, a single oversight can compromise safety. That's why the Airbus A318's design incorporates a comprehensive engine run protocol that is both rigorous and user friendly.

Pre Flight Engine Checks: Setting the Stage for a Smooth Run

Before the engines can be started, the flight crew must complete a series of pre flight checks that confirm the aircraft is ready for power. These checks are grouped into the following categories:

1. External Inspection

Conduct a visual walk around of the engines and nacelles, looking for:

- Oil leaks or foreign object damage.
- Loose or damaged bolts, brackets, or seals.
- Any visible signs of wear or corrosion.

2. Engine Specific Parameters

Verify the following engine data from the Flight Management System (FMS) or Engine Data Display:

- Fuel quantity and distribution.
- Oil pressure, temperature, and filter status.
- Engine control settings (e.g., idle thrust, propeller pitch).

3. Electrical and Avionics Checks

Ensure that the aircraft's electrical system is stable and that all engine related avionics are operational. This includes:

- Engine Control Unit (ECU) status.

- Engine monitoring displays.
- Redundant power supplies.

4. Environmental Conditions

Record current weather data, including temperature, pressure, wind, and any known turbulence. These factors influence the engine start sequence and the required thrust settings during the run up.

5. Documentation Verification

Confirm that all required documents, such as the Engine Run Up Checklist and the Aircraft Maintenance Record, are up to date and accessible to the crew.

Engine Start Sequence: Step by Step

The Airbus A318's engine start procedure is designed for reliability and safety. The following steps outline the standard sequence, but always refer to the aircraft's specific operating manual for any airline specific variations.

1. Engine Start Switch Activation

In the cockpit, the pilot selects the "Engine Start" button on the Engine Control Panel. This action initiates the following:

- Engagement of the starter motor.
- Automatic opening of the fuel valve.
- Activation of the ignition system.

2. Starter Motor Engagement

The starter motor spins the turbine to a speed that allows the combustion chamber to ignite. A typical starter spin up time is 2–3 seconds. During this time, the pilot monitors:

- Starter current draw.
- Engine RPM (revolutions per minute).
- Oil pressure and temperature gauges.

3. Ignition and Fuel Flow

Once the starter reaches the desired RPM, the ignition system fires the spark plugs, and fuel flow is initiated. Key parameters to monitor include:

- Fuel flow rate (usually 10–15 kg/hr per engine at idle).
- Engine temperature rise.
- Oil pressure stabilization.

4. Engine Stabilization at Idle

When the engine reaches a stable idle speed (typically 1400–1500 RPM), the pilot confirms that:

- All engine instruments are within normal limits.
- There are no abnormal vibrations or noises.
- Engine control displays show the correct thrust setting.

5. Final Engine Start Check

After the engine stabilizes, the pilot completes the following actions:

- Closes the engine start switch.
- Verifies that the engine status lights (red, amber, green) indicate normal operation.

- Logs the engine start time and any anomalies in the Flight Data Recorder (FDR).

Engine Run Up: The Critical Phase Before Takeoff

Engine run up is the phase where the aircraft's engines operate at increased power to verify performance and detect potential issues. This phase is crucial for the Airbus A318, as it confirms that the engines can safely provide the required thrust for departure.

1. Run Up Checklist Overview

The Run Up Checklist is divided into three main sections:

1. Pre Run Up Checks.
2. Run Up Execution.
3. Post Run Up Review.

2. Pre Run Up Checks

Before initiating the run up, the crew must confirm:

- All engines are at idle and stable.
- Fuel quantity is sufficient for the planned flight and additional run up fuel.
- Environmental conditions are within operational limits.
- All required personnel (pilot, co pilot, and ground crew) are in position.

3. Run Up Execution Steps

The run up procedure involves gradually increasing thrust to a specified percentage of the maximum takeoff thrust (MTOT). For the Airbus A318, the typical run up thrust setting is 85% MTOT.

1. Thrust Increase: Using the thrust levers, the pilot increases power to 85% MTOT while monitoring engine parameters.
2. Monitoring: Continuously check engine RPM, oil pressure, temperature, and fuel flow. Look for any irregularities such as:
3. Sudden drops in RPM.
4. Oil pressure fluctuations.
5. Unusual noises or vibrations.

4. Post Run Up Review

After completing the run up, the crew should perform the following checks:

- Verify that engine parameters returned to normal ranges.
- Ensure no alarms or warnings are displayed.
- Confirm that the Run Up Checklist is fully completed.
- Update the Aircraft Maintenance Record with any observations.

Common Engine Run Up Anomalies and Troubleshooting

While most run ups proceed without incident, certain anomalies can occur. Below are common issues and recommended troubleshooting steps.

1. Engine Vibration

Excessive vibration may indicate a balance issue or a foreign object in the engine. Steps to address:

- Check engine balance status in the FMS.

- Inspect the engine nacelle for debris.
- Consult the maintenance manual for vibration thresholds.

2. Oil Pressure Drops

Low oil pressure can be caused by leaks, filter blockage, or a failing pump. Troubleshooting includes:

- Checking oil level and filter condition.
- Inspecting oil lines for blockages.
- Verifying the oil pump's operation.

3. Fuel Flow Irregularities

Unexpected changes in fuel flow may signal a fuel system fault. Actions to take:

- Verify fuel valve operation.
- Check for fuel line leaks or blockages.
- Consult the fuel system schematic for potential issues.

4. Engine Temperature Surges

Rapid temperature increases can indicate combustion problems or cooling system failure. Mitigation steps:

- Check the engine cooling fan operation.
- Inspect the air intake for obstructions.
- Confirm the temperature sensor is functioning correctly.

Integration with Flight Management Systems (FMS)

The Airbus A318's FMS plays a pivotal role in engine run procedures. It provides real time data, alerts, and automated logging. Key FMS functions include:

- Displaying engine health metrics.
- Automating the Run Up Checklist.
- Generating post run reports for maintenance.
- Alerting the crew to any deviations from normal parameters.

Pilots should become familiar with the FMS interface to efficiently manage engine data during the run up.

Safety Culture: The Human Factor in Engine Run Procedures

Technology and procedures are only part of the equation. A strong safety culture ensures that pilots and maintenance personnel remain vigilant. Essential practices include:

- Adhering strictly to checklists.
- Maintaining open communication between cockpit and ground crew.
- Continuously updating knowledge through recurrent training.
- Encouraging a proactive approach to anomaly reporting.

Regulatory Framework and Compliance

The Airbus A318's engine run procedures must align with various regulatory bodies, including:

- Federal Aviation Administration (FAA) – Advisory Circular 120-63.
- European Aviation Safety Agency (EASA) – Part 1/2 of the EC 200/2004 regulation.
- International Civil Aviation Organization (ICAO) – Annex 6.

Compliance ensures that airlines meet global safety standards and maintain operational certifications.

Maintenance Perspective: Post Run Up Inspection

Engine run up data is invaluable for maintenance teams. After each run up, technicians should review logs for:

- Unusual temperature or pressure spikes.
- Fuel consumption patterns.
- Vibration trends.
- Any recorded anomalies in the FDR.

These insights help predict component wear, schedule preventive maintenance, and avoid unscheduled downtime.

Best Practices for Pilots and Engineers

1. Always Follow the Checklist: Even if the engine seems to be running smoothly, complete every step.
2. Monitor Multiple Data Points: Cross verify engine RPM, oil pressure, temperature, and fuel flow.
3. Communicate Effectively: Keep the cabin crew and ground support informed of any anomalies.
4. Keep Records Current: Update the Aircraft Maintenance Record after every run up.
5. Train Regularly: Participate in recurrent training modules focused on engine run procedures.

Conclusion

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