

Attachments

Attachment 1: Engine Break-In Checklist

USE OF THIS FORM				
<ul style="list-style-type: none"> • This form is used to collect information on an engine break-in sortie. • There are TWO types of engine break-in sorties: <u>INITIAL</u> sorties that are conducted when the airplane is first picked up at the maintenance facility and the <u>ONGOING</u> sorties that are conducted after the airplane has completed the initial sortie. • <u>For INITIAL Engine Break-in Sorties:</u> <ul style="list-style-type: none"> ○ The goal of the flight is to conduct a <u>one-hour</u> sortie that remains over the departure airport at altitude. ○ This flight is still considered an engine break-in sortie, however due to the increased risk following these types of maintenance events, this sortie enables the crew a designated landing location in the event of an inflight emergency or situation. ○ During this sortie, the crew must be EXTREMELY AWARE of all operations of the engine systems and the power it is producing. ○ THE FLIGHT SHOULD REMAIN WITHIN GLIDING DISTANCE AT ALL TIMES. 				
GENERAL INFORMATION				
CAP Maintenance Pilot (CMP) Name		CAPID	Date of Flight (Z)	
CMP Phone No.		CMP Email Address		
Mission No.	Sortie No.	Aircraft Tail No.		
Engine Break-In Sortie Type (select one)				
<input type="checkbox"/> INITIAL Engine Break-In Sortie		<input type="checkbox"/> ONGOING Engine Break-In Sortie		
Propeller Type (select one)				
<input type="checkbox"/> Fixed Pitch Propeller		<input type="checkbox"/> Constant Speed Propeller		
TACH TIMES		HOBBS TIMES		
Stop		Stop		
Start		Start		
Total		Total		
FLIGHT PLANNING AND PREFLIGHT				
<ul style="list-style-type: none"> • <u>For INITIAL Engine Break-in Sorties:</u> <ul style="list-style-type: none"> ○ Prior contact with the tower at controlled airfields is advisable. ○ Let ATC know your intentions and that you wish to remain within gliding distance at altitude for the flight. ○ At non-towered airfields, make traffic and position calls periodically and remain at least 1000 ft above the normal traffic pattern. • <u>For ALL Engine Break-In Sorties:</u> <ul style="list-style-type: none"> <input type="checkbox"/> Verify the condition of the airplane belly. Taking a picture would be helpful in making post-flight assessment for oil overboard determination. <input type="checkbox"/> Conduct a full preflight inspection as well as the Aircraft Maintenance Acceptance Worksheet. <input type="checkbox"/> Record cold engine oil level (oil quantity <u>before</u> adding any oil): _____ qts <input type="checkbox"/> Record amount of oil added to achieve <u>8</u> qts (172/182T/T182T), <u>9</u> qts (GA8), <u>11</u> qts (T206H), <u>12</u> qts (206H): _____ qts <input type="checkbox"/> Confirm total oil in sump is at recommended level (8 qts, 9 qts, 11 qts, or 12 qts based on A/C type) • <u>Density Altitude (DA) Planning for ALL Engine Break-In Sorties:</u> <ul style="list-style-type: none"> ○ Determine and record the expected settings you will be using at the expected cruise altitude you are planning. ○ Max 7,000 ft DA based on engines ability to produce at 75 % power (lower DA is preferred if obstacle clearance assured). <ul style="list-style-type: none"> ▪ Note: This is N/A for turbocharged aircraft, as they can maintain 75% power at higher altitudes ○ Write these figures below. Adjust as necessary once at altitude (consult POH for accuracy). 				
	Planned Density Altitude	Equivalent Indicated Altitude (from POH)	Required RPM (fixed pitch propellers)	Required MP (constant speed propellers)
75% Power Setting				
65% Power Setting				
TAXI				
<ul style="list-style-type: none"> • Limit ground time where possible. • Conduct a normal run-up in accordance with manufacturer guidance. • For Constant Speed Propellers: limit prop cycling to +/- 100 RPM. <ul style="list-style-type: none"> <input type="checkbox"/> Record oil pressure during taxi: _____ PSI <input type="checkbox"/> Record oil temperature before departure: _____ PSI <input type="checkbox"/> Record time of departure (Z): _____ (Z) 				

CLIMB

- Where possible, maintain a shallow climb angle until cruise (300 FPM).
- Monitor CHT, Oil Pressure, and Oil Temperature during climb.
- Climb with cowl flaps OPEN (if applicable)

CRUISE

(Max 7,000 ft DA if non-turbocharged)

- For **INITIAL Engine Break-In Sorties** and for the **First Hour of ONGOING Engine Break-In Sorties**:
 - Maintain 75% power during cruise.
 - Monitor CHTs. Maintain temperatures as low as practicable (richer mixtures).
 - Record data below every 20 minutes.
 - **Never allow any of these procedures to jeopardize safety and success of the flight. Land as soon as practicable if any issues or abnormalities present during flight.**
- For **ONGOING Engine Break-In Sorties** during the **SECOND (and subsequent) Hour(s)**:
 - **Alternate between 65% and 75% power settings every 20 minutes.** (starting at T + 80 Time Record)

Time Record (Time (Z) + X min)	Indicated Altitude	Outside Air Temperature (OAT)	Oil Temperature	Oil Pressure (PSI)	CHT (Highest Temp & Cylinder #)	EGT (Highest Temp & Cylinder #)	Fuel Flow (GPH)
<i>T + 0 starts when aircraft reaches cruise altitude and 75% power setting</i>							
T + 0							
T + 20							
T + 40							
T + 60							
<i>If INITIAL Engine Break-In Sortie: Flight complete – begin descent and preparing for landing at FBO for post-flight inspection</i> <i>If ONGOING Engine Break-In Sortie: First hour complete – begin alternating power between 65% and 75% power settings</i>							
T + 80							
T + 100							
T + 120							
<i>Second hour complete – continue alternating power between 65% and 75% power settings or begin descent for landing</i>							
T + 140							
T + 160							
T + 180							
<i>Flight complete – begin descent and preparing for landing at FBO for post-flight inspection</i>							

- **Cruise Table Notes:**
 - Some carbureted engines may only have a single cylinder monitored for CHT or EGT. In these cases, record the temperature indicated.
 - Some EGT gauges do not have numeric values shown. In those cases, the EGT recording is not required.
 - All engine parameters should be monitored and remain in the “GREEN” areas of performance.
 - Temperatures may be higher than normal during the engine break in period but must remain in the “GREEN”.
 - **If at any time you suspect something unusual - land and assess.**

DESCENT/LANDING

- Avoid large power reductions unless necessary. “Chopping” the power leads to extreme temperature changes.
- Achieve a cruise descent. Start by reducing RPM by 200 RPMs/MP by 2 inches and allow CHT to stabilize appx. 5 minutes. If additional descent is required, repeat as necessary.
- Use of flaps (high drag configuration) supports maintaining higher RPM (and thus higher CHT) at reduced speed.
- Cowl flaps CLOSED in descent
- Aim to maintain CHT between 300°F and 400°F.
- Pattern work and touch and go landings are prohibited.
- Record landing time (Z): _____ (Z)

POST FLIGHT

- Secure aircraft following the normal shutdown/secure procedures.
- Inspect the airframe for signs of oil. Consult the picture from preflight to compare.
- Inspect all openings, fasteners, and connections.
- Report any findings to Wing Maintenance Officer.
- Wait one hour after engine shutdown and record “cold” engine oil level: _____ quarts
- **Engine will still be hot! Exercise caution when checking oil level.**

RECORDKEEPING AND NOTES

- Use this link to electronically transmit information to CAP/LGM:
<https://app.smartsheetgov.com/b/form/feb530e7e064f53b9dbd990ebd705c6>
- If the link is not working, please email a copy of this completed sheet to LGPSD@capnhq.gov.
- Advise the Wing Maintenance Officer of the flight status. If any discrepancies or issues are discovered, ensure the Wing Maintenance Officer knows so that discrepancies can be recorded in the Maintenance Information System.