

# Airworthiness Directive Schedule

## Engines

### Continental 520 Series

23 February 2023

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**Notes:** 1. This AD schedule is applicable to the following Continental engine series:

Engine Series:	FAA Type Certificate:
GTSIO-520 Series	E7CE
IO-520-B; IO-520-BA; IO-520-BB; IO-520-BE; IO-520-C; IO-520-D and IO-520-F	E5CE
TSIO-520 Series	E8CE

2. The Federal Aviation Administration (FAA) is the National Airworthiness Authority (NAA) responsible for the issue of State of Design Airworthiness Directives (ADs) for these engines. State of Design ADs can be obtained directly from the FAA website at: [Dynamic Regulatory System \(faa.gov\)](https://www.faa.gov/dynamic-regulatory-system)
3. The date above indicates the amendment date of this schedule.
4. New or amended ADs are shown with an asterisk \*

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<p>State of Design ADs listed below are available directly from the National Airworthiness Authority (NAA) websites. Links to NAA websites are available on the CAA website at <a href="https://www.aviation.govt.nz/aircraft/airworthiness/airworthiness-directives/links-to-state-of-design-airworthiness-directives/">https://www.aviation.govt.nz/aircraft/airworthiness/airworthiness-directives/links-to-state-of-design-airworthiness-directives/</a> If additional NZ ADs need to be issued when an unsafe condition is found to exist in an aircraft or aeronautical product in NZ, they will be added to the list below.</p>		
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**DCA/CON/129A Throttle Body Support Structure - Inspection**

- Applicability:** Model IO-520-D engines.
- Note:** This AD re-instated with no change to the AD requirements, or the compliance.
- Requirement:** The throttle body assembly is to be inspected for cracks in the attachment lugs and around the air induction manifold.
- Compliance:** At every periodic inspection.
- Background:** This AD is prompted by reports of finding cracks in the induction manifold and the attachment lugs of the throttle body assembly.
- Effective Date:** DCA/CON/129 - 30 November 1971  
DCA/CON/129A - 31 August 2017

**DCA/CON/131 Oil Filter Adapter - Replacement**

- Applicability:** IO-346-A; IO-520-B, -C; TSIO-520-B, -E, and -J engines having Teledyne Continental P/N 631645 oil filter adapter installed, used with AC OF-9-A oil filter assembly.
- Background:** To prevent loss of oil in the above model engines the FAA has issued AD 72-24-03.
- Requirement:** Compliance is required with FAA AD 72-24-03, except that the effective date shall be read as 1 March 1973.
- Compliance:** At next overhaul.
- Effective Date:** 31 January 1973

**DCA/CON/133 Oil Filter Adapter - Inspection**

- Applicability:** IO-346-A; IO-520-B, -C; TSIO-520-B, -E, and -J engines having Teledyne Continental P/N 631645 oil filter adapter installed, used with AC OF-9-A oil filter assembly.
- Background:** To prevent loss of oil in the above model engines the FAA has issued AD 72-24-03.
- Requirement:** Compliance is required with FAA AD 72-24-03, except that the effective date shall be read as 1 March 1973.
- Compliance:** At each oil filter element change until DCA/CON/131 is accomplished.
- Effective Date:** 31 January 1973

**DCA/CON/140B Exhaust Valves – Inspection**

- Applicability:** All model IO-520-D and –F series engines fitted with exhaust valves P/N 635720, 637781, 646286 or 655771, or their equivalent PMA P/Ns.
- Note:** The applicability of this AD revised to include exhaust valve P/N 655771 and equivalent replacement parts manufactured under Parts Manufacturing Approval (PMA) authorization.
- Requirement:** To prevent possible failure, inspect the heads and stems of all exhaust valves. Replace valves found with severe erosion pitting, before further flight.
- Compliance:** Within the next 100 hours TIS, unless already accomplished within the last 300 hours TIS, and thereafter at intervals not exceeding 300 hours TIS. (NZ occurrence 09/3196 refers)
- Effective Date:** DCA/CON/140 - 30 September 1974  
DCA/CON/140A - 27 January 2000  
DCA/CON/140B - 28 January 2010

**DCA/CON/142 Cylinder Assemblies - Inspection**

**Applicability:** All model IO-520-D and -F engines with cylinders P/N 631397 and 635448.

**Requirement:** Inspect cylinder head assemblies at junction of aluminium head and steel barrel for cracks, as indicated by oil leaks or combustion product stains

*Notes: 1. Remove engine cowls or access doors as necessary to permit inspection of cylinder assemblies with mirrors or other visual aids.*

*2. If engine is generally clean and free from oil in area to be inspected, no further cleaning is required prior to inspection.*

*3. If engine is not clean enough to satisfactorily allow inspection, it should be washed down and ground run until normal operating conditions are achieved, and then inspected.*

*4. It may be helpful to rotate propeller to detect significant compression differences between cylinders or audible leakage through cylinder barrel cracks.*

**Compliance:** At intervals not exceeding 100 hours TIS.

**Effective Date:** 16 December 1974

**DCA/CON/143 Turbocharger Oil Inlet Adapter - Inspection**

**Applicability:** Models TSIO-470-B, -C, -D; TSIO-520-B, -D, -E; GTSIO-520-C, -D, -F, -H, -J, and -K engines as listed in FAA AD 75-09-13.

**Requirement:** FAA AD 75-09-13.

(Rolls Royce SB T-302 and TCM M75-8 also refer)

**Compliance:** 1. Inspect within the next 25 hours TIS and at intervals not exceeding 25 hours TIS until aluminium adapter is replaced with a steel adapter.

2. Replace by 1 May 1976.

**Effective Date:** 2 May 1975

**DCA/CON/147A Induction System - Inspection**

**Applicability:** All TSIO-520-J and -N engines fitted with flexible elbows TCM P/N 635930.

**Requirement:** 1. Inspect per Rolls Royce SB T-375.

2. Replace induction system intake tube TCM P/N 629138 with new intake tube TCM P/N 642590.

(FAA AD 78-06-01 refers)

**Compliance:** 1. Inspection - At intervals not exceeding 100 hours TIS until replacement per Part 2 accomplished

2. Replacement - By 29 February 1980

**Effective Date:** DCA/CON/147 - 12 May 1978  
DCA/CON/147A - 23 February 1979

**DCA/CON/148 Oil Pressure Relief Valve - Inspection**

**Applicability:** New O-470, IO-470, IO-520, TSIO-520, GTSIO-520 series engines, and Rebuilt IO-346, 6-285, O-470, IO-470, IO-520, TSIO-520, GTSIO-520 series engines with S/N detailed in Rolls Royce SB T-386.

Also all listed model engines regardless of S/N which have had oil pump assembly oil pressure relief valve screw and/or plunger changed in service during period 1 April 1978 through 5 January 1979.

**Note:** TCM SB M79-2 pertains to the subject of this AD.

**Requirement:** Inspect oil pressure relief valve housing per Rolls Royce SB T-386 and replace any components not conforming with required design. (FAA AD 79-05-09 refers)

**Compliance:** Within the next 50 hours TIS.

**Effective Date:** 6 April 1979

**DCA/CON/149 Bendix Fuel Injection Regulator - Inspection**

**Applicability:** Bendix fuel injection systems models RSA-5AB1, RSA-5AD1, RSA-7AA1, RSA-7DA1, RSA-10AD1, RSA-10DB1, RSA-10DB2, RSA-10ED1 and RSA-10ED2 with parts list numbers detailed in Bendix SB's RS-68, RS-69 and RS-70 installed on, but not limited to TSIO-520 series engines

**Requirement:** Inspect and modify affected regulators per Bendix fuel systems SB's RS-68, RS-69 or RS-70 as applicable. (FAA Emergency AD dated 28 August 1979 refers)

**Compliance:** Within the next 25 hours TIS or by 18 October 1979 whichever is the sooner

**Effective Date:** 18 September 1979

**DCA/CON/150 Cylinder Assemblies - Removal**

**Applicability:** All IO-520 and TSIO-520 series with Airmotive Engineering Corporation rebarrelled cylinders P/N AE-C-631397 TT AE-C-639272 TT and AE-C-639274 TT

**Requirement:** Inspect affected cylinders for 0.050 inch minimum corner radius in area spot faced for installation of hold down nuts. Renew all cylinders found without proper radius

**Note:** Cylinder P/Ns are marked on flat area of hold down flanges on intake valve side. (FAA AD 80-01-04 refers)

**Compliance:** Within the next 50 hours TIS

**Effective Date:** 8 February 1980

**DCA/CON/152 Crankshaft Front Seal - Inspection**

**Applicability:** All TSIO-520-M engines with S/N prior to 520188 TSIO-520-P engines with S/N prior to 513621 and TSIO-520-R engines with S/N prior to 517962. Also any TSIO-520-M, -P, and -R engine remanufactured prior to 9 May 1980. Engines are installed in but not limited to, certain Cessna Models TU206G, T207A, P210N, T210M and T210N.

**Requirement:**

1. Inspect crankshaft front oil seal (located where crankshaft passes through front engine case). If seal is displaced or there is evidence of oil leakage renew oil seal per appropriate maintenance manual.
2. Install nose seal retainer plates per Rolls Royce SB T-420.
3. Run engine until normal operating temperatures achieved and inspect oil seal for leaks.  
(FAA AD 80-22-05 refers)

**Compliance:** Within the next 25 hours TIS.

**Effective Date:** 14 November 1980

**DCA/CON/153 Lubrication System/Propeller Shaft - Inspection**

**Applicability:** GTSIO-520-L S/N 608324 through 608627; GTSIO-520-M S/N 606619 through 606890 and GTSIO-520-N S/N 610001 through 610107 installed in but not limited to certain Cessna models 404 and 421C.

**Requirement:** To prevent engine failure due to loss of oil pressure, damage due to contaminated oil and propeller shaft damage resulting from thrust washer malfunction accomplish inspections detailed in FAA AD 80-25-06R1.

**Compliance:** As detailed up to satisfactory completion of 100 hours TTIS.

**Effective Date:** 26 June 1981

**DCA/CON/156 Fuel Pump - Inspection**

**Applicability:** All IO-520, TSIO-520 and GTSIO-520 engines with engine driven fuel pumps S/N I0178 through A0280.

**Requirement:** Visually inspect for leaks and accomplish corrective retorquing, resafety and leakage check per TCM SB M80-26 Rev.1. If fuel leaks present before retorquing bolts, repeat leakage check during next five pre-flight inspections. If evidence of fuel leakage exists, overhaul or renew fuel pump as appropriate.  
(FAA AD 81-24-06 refers)

**Compliance:** Within the next 50 hours TIS unless already accomplished.

**Effective Date:** 29 January 1982

**DCA/CON/157D Cylinder Barrel - Inspection**

**Applicability:** Models IO-520, TSIO-520, GTSIO-520 and IO-550 series engines with cylinder P/Ns detailed in TCM SB M91-6 and manufactured by Teledyne Continental Motors on or after January 1, 1981. Cylinders inspected by ultrasonic method per SB M91-7 do not have to comply with the requirement of this airworthiness directive.

**Requirement:** Inspect per part II of TCM SB M91-6. Remove cracked cylinders from service before further flight.  
(FAA AD 86-13-04 R3 refers)

**Compliance:** At intervals not exceeding 50 hours TIS until 450 hours TTIS accumulated, and thereafter at intervals not exceeding 100 hours TIS, except that cylinders with the new P/N piston installed per page 2 of the SB, are to be inspected at intervals not exceeding 50 hours TIS, until 300 hours TTIS accumulated.

**Effective Date:** DCA/CON/157C - 22 February 1991  
DCA/CON/157D - 24 May 1991

**DCA/CON/158 Oil Filter - Removal**

**Applicability:** All model IO-360, TSIO-360, O-470, IO-470, TSIO-470, IO-520, TSIO-520, GTSIO-520 and IO-550 series engines with TCM P/N 649309 or 649310 (Pro-Tech) oil filters.

**Requirement:** To prevent possible loss of oil and subsequent engine failure, remove affected oil filters from service per TCM SB M88-4.  
(FAA AD 88-03-06 refers)

**Compliance:** Within the next 25 hours TIS, unless already accomplished.

**Effective Date:** 8 April 1988

**DCA/CON/161 Oil Filter - Removal**

**Applicability:** Models IO-360, L/TSIO-360, IO-346, L/O-470, TSIO-470, IO-520, L/TSIO-520, 6-285, IO-550, and GTSIO-520 series engines, which are installed on, but not limited to the following aircraft: Beech models C33, E33, F33, S35, V35, A36, 36, A36TC, A23, C55, D55, E55, 58, and 58TC; Cessna models R172K, 180 (S/N 53087 and up), 182 (S/N 67042 and up), F182 (S/N 00130 and up), 185 (S/N 03852 and up), 188 (S/N 03474 and up), T188 (S/N 03474 and up), 206 (S/N 05030 and up), 207 (S/N 05227 and up), T207 (S/N 05227 and up), 210 (S/N 63363-63375 and up), T210 (S/N 63373-63375 and up), P210 (S/N 278 and up), T303, 310, 320, P337, T337, 340, 401, 402, 414 series; Mooney Aircraft Corp models M20K and M20K-252TSE series; and Piper models PA-36, PA-28R-201T, PA-28-201T, PA-46-310P, PA-34-200T and PA-34-220T aircraft fitted with Champion P/N CH48108 or CH48109.

**Requirement:** To prevent operation with collapsed oil filter elements which may result in loss of oil pressure and engine failure accomplish the following:

Inspect the engine oil filter, Champion P/N CH48108 or CH48109, and determine the date code of the filter printed on the side of the exterior. Remove from service any filter bearing any of the following date codes prior to further flight: All three digit date codes with "9" as the third digit, or date codes 3J8, 4J8, 1K8, 2K8, 3K8, 4K8, 2L8, 1M8, 1AO, or 2AO.  
(FAA AD 91-19-03 refers)

**Compliance:** By 29 December 1991

**Effective Date:** 29 November 1991

**DCA/CON/163 Valve Retainer Key Installation - Inspection**

**Applicability:** Continental O-200, O-300, IO/TSIO/LTSIO-360, O/O/TSIO-470, IO/TSIO/LTSIO/GTSIO-520, and IO/TSIO/TSIOL-550 series engines listed by S/N in TCM Mandatory Service Bulletin (MSB) 93-12 that have less than 25 hours TIS.

Also engines that contain cylinder assemblies purchased from TCM between 29 July 1992 and 30 March 1993 and have less than 25 hours TIS since cylinder installation.

**Requirement:** To prevent engine failure due to a missing cylinder valve retainer key accomplish the following:-

Visually inspect each cylinder per TCM MSB 93-12. If a valve retainer is missing, or if a rotocoil, if applicable, is improperly installed, repair or replace the cylinder per the applicable TCM overhaul manual before further flight.  
(FAA AD 93-10-02 refers)

**Compliance:** Before further flight.

**Effective Date:** 28 May 1993

**DCA/CON/165 Oil Pick-Up Installation - Inspection**

**Applicability:** Teledyne Continental Motors (TCM) rebuilt and overhauled Model O-470, IO-470, IO-520, TSIO-520 and IO-550 series engines listed by S/N in TCM SB M91-10, Revision 1.

**Requirement:** To prevent engine failure inspect engines for an incorrect oil pick-up tube per TCM SB M91-10, Revision 1. If an incorrect oil pick-up tube is installed, prior to further flight remove the oil pick-up tube and oil sump, and replace with serviceable parts. (FAA AD 93-08-17 refers)

**Compliance:** Within next 50 hours TIS.

**Effective Date:** 3 September 1993

**DCA/CON/166 Fuel Pump Drive Coupling - Inspection**

**Applicability:** Models IO-520B, BA, BB, C, CB, M, MB, IO-550A, B, C, G, TSIO-520B, BB, D, DB, E, EB, J, JB, K, KB, L, LB, N, NB, UB, VB, WB, TSIO-550B, TSIOL-550A and B, which utilise the fuel pumps listed in Teledyne Continental Mandatory (TCM) SB M93-9 Rev. 1.

**Requirement:** To prevent possible fuel pump drive shaft disengagement and loss of engine power, inspect per TCM SB M93-9 Rev. 1 to determine which combination of fuel drive shaft and fuel pump drive coupling is installed. Reinstall fuel pump with the proper coupling per SB M93-9 Rev. 1. (FAA AD 93-16-15 refers)

**Compliance:** Within next 30 hours TIS.

**Effective Date:** 4 October 1993

**DCA/CON/169A Engine Mount Bracket - Inspection**

**Applicability:** All IO-346, IO-520C, CB and IO-550C engines and all rebuilt or factory overhauled engines listed in TCM MSB94-9. This requirement is not applicable to engines fitted with improved design engine mount brackets, P/N 653306 and 653305.

**Requirement:** To prevent engine separation from the aircraft due to failure of the engine mount brackets, accomplish the following:-

1. Inspect lower left hand engine mount bracket P/N 630695 per TCM MSB94-9. If a crack is detected, before further flight replace both the lower left engine mount bracket, P/N 630695, and lower right engine mount bracket, P/N 630694, with improved design engine mount brackets, P/N 653306 and 653305 respectively.

2. Replace both the lower left engine mount bracket, P/N 630695, and lower right engine mount bracket, P/N 630694, with improved design engine mount brackets, P/N 653306 and 653305 respectively.

(FAA AD 95-03-14 refers)

**Compliance:** 1. Within next 50 hours TIS for engines with engine mount brackets that have completed at least one engine overhaul cycle, or have accumulated 2,500 hours TIS, and thereafter at intervals not to exceed 500 hours TIS.

2. At the next engine removal.

**Note 1:** TCM MSB94-9 differs from TCM MSB92-13, which was referenced in DCA/CON/169, only in clarification of part identification by utilizing a cross reference table for P/N and casting number.

**Note 2:** The P/N is ink stamped on the part and may not be visible. The engine mount bracket can be identified by the casting number which is cast in the engine mount bracket.

**Effective Date:** DCA/CON/169 - 8 July 1994  
DCA/CON/169A - 12 May 1995



**DCA/CON/171 Inclined Valve Cylinder Rocker Shaft Retention - Modification**

- Applicability:** Models o-470, IO-470, IO-520, IO-550, TSIO-520 AND TSIOL-550 series, except; O-470-A, -E and -J, IO-550-G, L/TSIO-520-BE.
- Requirement:** To improve rocker shaft retention on engines with inclined valve cylinders and prevent engine failure, modify per Teledyne Continental SB M92-6.
- Compliance:** At next complete top or engine overhaul.
- Effective Date:** 19 January 1996

**DCA/CON/174 Oil Filter Adapter Assemblies - Inspection**

- Applicability:** Cessna engine oil filter adapter assemblies, P/N 0450404-(all dash numbers), 0556004-(all dash numbers), 0556010-(all dash numbers), 0756023-(all dash numbers), 0756024-(all dash numbers), 1250403-(all dash numbers), 1250417 -(all dash numbers), 1250418-(all dash numbers), 1250921-(all dash numbers) and 1250922-(all dash numbers).

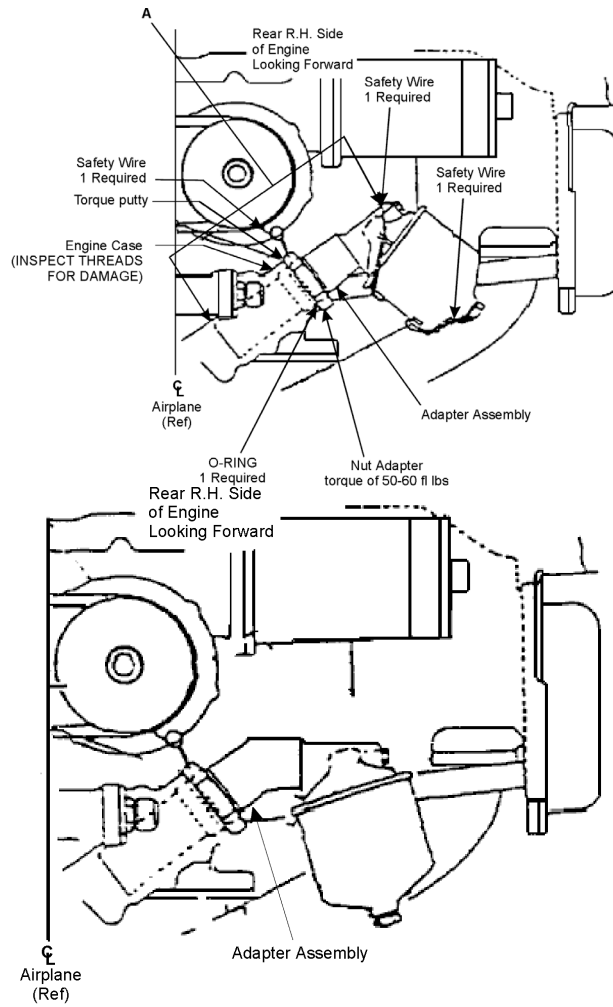
These may be installed on, but not limited to the following Teledyne Continental Motors series engines:

O-200, O-470, IO-470, TSIO-470, O-520, IO-520, TSIO-520, GTSIO-520, IO-550 and TSIO-550.

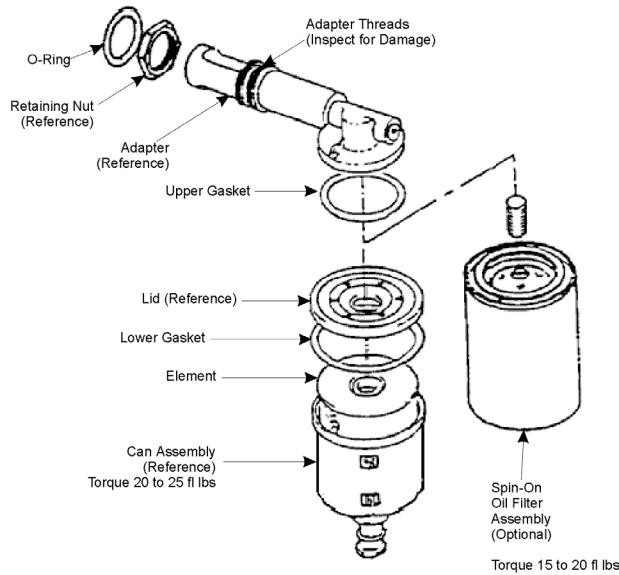
This airworthiness directive does not apply to engine oil filter adapter assemblies manufactured by Teledyne Continental Motors.

- Requirement:** To prevent loss of engine oil caused by loose or separated oil filter adapters, which could result in engine stoppage, accomplish the following:-
1. For oil filter adapter assemblies that do not have torque putty between the engine filter adapter assembly, nut, and oil pump housing, accomplish the following:
    - (a) Inspect the adapter locking nut installation for evidence of oil leakage.
    - (b) Check the torque of the adapter nut installation and ensure that the torque value is within the limits of 50 through 60 foot pounds.
    - (c) If evidence of oil leakage is found or the torque is not within the 50 through 60 foot pound limit, prior to further flight, remove the adapter and filter assembly, and:
      - (i) Inspect the threads of the adapter assembly and engine for signs of damaged or cracked threads; and
      - (ii) Replace any adapter assembly and engine oil pump housing (if necessary) that have evidence of thread damage or cracks.
    - (d) Apply torque putty between the engine filter adapter assembly, nut, and oil pump housing as specified in the diagram.
    - (e) Reassemble the engine oil filter assembly.
  2. For oil filter adapter assemblies that do have torque putty between the engine filter adapter assembly, nut, and oil pump housing, inspect the torque putty for misalignment, evidence of oil leakage, or cracks.
- If any misalignment, evidence of oil leakage, or torque putty cracks are found, prior to further flight, accomplish the requirements specified in paragraph (1) of this AD, including all subparagraphs.

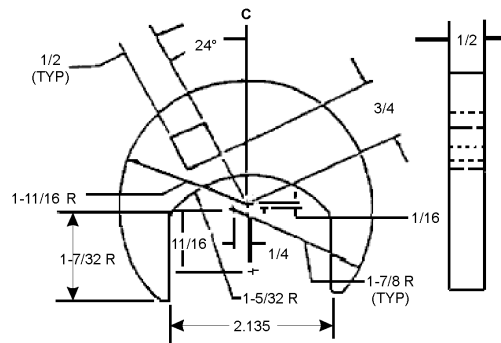
*Note: Replacing the engine oil filter adapter assembly does not eliminate the repetitive inspection requirement of this AD.*  
(FAA AD 96-12-22 refers)



Manufactured by Teledyne  
Continental Motors  
Not Applicable to This AD



DETAIL A



ALL DIMENSIONS ARE INCHES

MATERIAL: 4130 (Rc. 35-38)

TOOL NUMBER SE709 IS AVAILABLE FROM THE CESSNA SERVICE PARTS CENTER

Snap-On crows foot P/N AN8508-34A have ground down the ends for clearance

**Compliance:** Comply with requirement 1 within the next 100 hours TIS or when the engine oil filter is removed, whichever occurs first. Thereafter accomplish requirement 2 every time the oil filter is removed.

**Effective Date:** 2 August 1996

**DCA/CON/176A            Cancelled - Refer to Continental Motors Publication M-O**

**Note:** DCA/CON/176A mandated the part replacement requirements in Teledyne Continental SB97-6B. The AD and the SB identified certain parts to be replaced at the next and each subsequent engine overhaul. Continental Motors advised that SB97-6B is no longer active. The requirements in SB97-6B have now been incorporated into the Continental Aircraft Engine Maintenance Manual - Standard Practice for Spark Ignited Engines, Publication M-O.

**Effective Date:** 27 June 2019

**DCA/CON/177B            Crankshaft – Inspection**

**Applicability:** Model IO-360, LTSIO-360, TSIO-360, IO-520, LIO-520, LTSIO-520 and TSIO-520 series engines built on, or prior to 31 December 1980.

Rebuilt model TCM IO-360, LTSIO-360, TSIO-360, IO-520, LIO-520, LTSIO-520 and TSIO-520 series engines with S/Ns lower than those listed in Teledyne Continental CSB96-8, dated 25 June 1996, or later approved revision. TCM factory overhauled model IO-360, LTSIO-360, TSIO-360, IO-520, LIO-520, LTSIO-520 and TSIO-520 series engines with S/N of 901203H and lower. Rolls-Royce model IO-360 and TSIO-360 series engines with any S/N.

**Note 1:** DCA/CON/177B revised to introduce Continental Motors Mandatory Service Bulletin MSB96-10B dated 8 October 2015, align requirement 2 with FAA AD 97-26-17, and introduce Note 2.

**Requirement:** To prevent crankshaft failure and subsequent engine failure, accomplish the following:

1. Determine if the crankshaft was manufactured using the airmelt or Vacuum Arc Remelt (VAR) process per the identification procedure described in CSB 96-8. If the crankshaft was manufactured using the airmelt process or if the manufacturing process is unknown, remove the crankshaft from service and replace with a serviceable crankshaft manufactured using the VAR process.
2. For all TCM IO-360, LTSIO-360, TSIO-360, IO-520, LIO-520, LTSIO-520 and TSIO-520 and Rolls-Royce, IO-360 and TSIO-360 engine models that have VAR crankshafts installed, regardless of S/N, conduct an ultrasonic inspection of the crankshaft per the instructions in Continental Motors Mandatory Service Bulletin MSB96-10B dated 8 October 2015 or later approved revision, and if necessary, replace with a serviceable part.

**Note 2:** The ultrasonic inspection mandated by requirement 2 must be accomplished by a Level 2 NDT Inspector who is qualified under the standard adopted by CAA AC43-8 revision 2, dated 27 February 2015, or later approved revision. (FAA AD 97-26-17 refers)

**Compliance:**

1. At the next engine overhaul, or next crankshaft removal from the engine, whichever occurs first.
2. At the next and every subsequent crankshaft removal from the engine, or before the installation of a replacement crankshaft in the engine.

**Effective Date:** DCA/CON/177 - 13 February 1998  
DCA/CON/177A - 12 February 1999  
DCA/CON/177B - 25 February 2016

**DCA/CON/178 STC SE8594SW Exhaust Roller Rocker Arms - Removal**

**Applicability:** The following engine models with Performance Engineering exhaust roller rocker arms, P/N PE92E, installed per Supplemental Type Certificate (STC) SE8594SW.

Models IO-520-A, -B, -BA, -C, -CB, -D, -E, -F, -K, -L, -M, -MB, -J; TSIO-520-A, -B, -D, -E, -F, -G, -H, -J, -K, -L, -M, -N, -P, -R, -T, -U, -UB, -AF, -CE, -VB, -WB, -NB, -LB, -KB, -JB, -EB, -DB, -BB; O-470-B, -G, -K, -L, -M, -P, -R, -S, -U; IO-470-C, -D, -E, -F, -G, -H, -L, -M, -N, -P, -R, -S, -U, -V; and IO-550-B, -C, and -G series engines.

**Requirement:** To prevent exhaust roller rocker arm failure, which may result in possible engine failure, accomplish the following:-

Remove from service all Performance Engineering exhaust roller rocker arms, P/N PE92E, and replace with serviceable parts, as follows:

For IO-520, TSIO-520, O-470, IO-470, and all IO-550 series engines except the IO-550-G, replace with serviceable TCM exhaust roller rocker arms, P/N 652130.

For IO-550-G series engines, replace with serviceable TCM exhaust roller rocker arms, P/N 652966.

(FAA AD 98-01-08 refers)

**Compliance:** Within next 25 hours TIS.

**Effective Date:** 13 February 1998

**DCA/CON/179 Repaired Crankshafts - Inspection**

**Applicability:** Models A-65, A65-3, A65-8, A75, A75-8, C75-12, C85, C85-8, C85-12, C90-8FJ, C90-12, O-200, O-200-A, O-300, O-300-D, IO-360-C, E-185-4, E-225-8, O-470, O-470-K, O-470-L, O-470-R, O-470-11, IO-470, IO-470-N, IO-470-S, IO-520, IO-520-D, GTSIO-520, and TSIO-520-VB reciprocating engines, with installed crankshafts repaired by Nelson Balancing Service, Bedford, Massachusetts, USA, Repair Station Certificate No. NB7R820J, between February 1, 1995, and December 31, 1997, inclusive, as listed (by work order (W/O)) in Table 1 of this AD.

Table 1

MODEL	W/O	DATE	ENGINE S/N
A-65	1152	1/25/96	
A-65	1154	2/7/96	7187
A-65	1183	2/22/96	
A-65	1185	3/28/96	
A-65	1233	6/23/96	
A-65	1290	10/29/96	
A-65	1296	11/14/96	4933868
A-65	1299	11/19/96	
A-65	1325	3/26/97	
A-65	1326	3/26/97	
A-65	1376	4/29/97	
A-65	1438	6/17/97	5890178
A-65-3	1243	8/13/96	324993
A-65-8	1541	12/2/97	
A-65-8	1276	10/5/96	5762568
A75	1156	2/7/96	5321868
A75	1255	9/3/96	
A75	1256	9/4/96	
A75-8	1275	10/5/96	5162868
C75-12F	1293	11/4/96	3316-6-12
C85	1088	10/4/95	
C85	1092	10/18/95	
C-85	1198	4/17/96	29652-7-8

C-85	1297	11/14/96	
C-85	1352	3/10/97	
C-85	1381	4/28/97	
C-85	1391	4/19/97	
C-85	1392	4/19/97	
C-85	1484	9/4/97	28487-6-12
C-85-8FJ	1139	1/17/96	29845-7-8
C-85-8FJ	1420	5/12/97	29465-7-8
C-85-12	1031	4/6/95	
C85-12	1182	3/18/96	21596-6-12
C-85-12	1217	5/15/96	
C85-12	1265	9/12/96	14657
C-85-12	1298	11/14/96	23610-6-12
C-90-8F	1471	9/6/97	42838-1-8
C-90-12	1279	10/7/96	44747-6-12
E-185-4	1124	1/16/96	25700D-1-9
E-225-8	1505	10/28/97	35477-D-9-8-P
GTSIO-520	1208	5/7/96	210114-70H
IO-360-C	1126	12/28/95	F-51439-9-C
IO-470	1028	3/23/95	87329-R
IO-470-N	1421	5/13/97	95271-1-N
IO-470-S	1331	3/11/97	102412-2-S-I
IO-520	1174	3/4/96	
IO-520-D	1167	2/22/96	
O-200	1033	4/18/95	
O-200	1043	5/12/95	
O-200	1049	6/2/95	
O-200	1076	9/11/95	214668-27A
O-200	1104	11/21/95	213830-71A
O-200	1131	1/5/96	
O-200	1142	1/18/96	265349-R
O-200	1147	1/23/96	
O-200	1190	4/13/96	
O-200	1193	4/13/96	
O-200	1195	4/13/96	
O-200	1197	4/17/96	
O-200	1213	5/13/96	
O-200	1261	9/9/96	
O-200	1303	12/5/96	
O-200	1321	2/7/97	28115
O-200	1324	2/6/97	
O-200	1344	3/2/97	
O-200	1393	5/5/97	
O-200	1413	5/7/97	61001-5-4
O-200	1430	5/23/97	
O-200	1437	6/17/97	255759A-48
O-200	1488	9/7/97	
O-200	1506	11/18/97	
O-200	1522	11/11/97	
O-200-A	1052	6/21/95	254150-A-48
O-200-A	1085	9/29/95	
O-200-A	1120	12/29/95	253971
O-200-A	1161	2/9/96	24R-469
O-200-A	1215	5/15/96	
O-200-A	1240	8/5/96	69589-8-A
O-200-A	1254	9/3/96	6105-71-A-R
O-200-A	1264	9/12/96	
O-200-A	1356	3/10/97	
O-300	1027	3/20/95	
O-300	1042	5/12/95	34012-D-6-D
O-300	1083	9/26/95	

O-300	1096	10/23/95	464481
O-300	1137	1/17/96	
O-300	1259	9/4/96	
O-300	1387	4/22/97	
O-300	1397	4/26/97	5928-9A
O-300	1403	4/28/97	
O-300	1423	6/9/97	3834D8Z
O-300	1555	1/13/98	
O-300-A	1446	6/27/97	
O-300-D	1022	3/17/95	35110-D-6-D
O-300-D	1079	9/17/95	24276-D-0-D
O-300-D	1487	9/6/97	
O-300-D	1543	12/3/97	
O-470	1046	6/1/95	
O-470	1383	4/4/97	
O-470-11	1017	2/22/95	
O-470-11	1491	10/19/97	
O-470-11	1492	10/19/97	
O-470-11	1493	10/19/97	
O-470-11	1494	10/19/97	
O-470-F	1236	7/25/96	76956-4-F
O-470-K	1087	10/3/95	47172-6-K
O-470-L	1128	1/10/96	68681-8-L
O-470-L	1359	5/19/97	68245-8-L
O-470-L	1399	4/28/97	
O-470-R	1016	2/10/95	133087-6-R
O-470-R	1086	10/3/95	
O-470-R	1165	2/22/96	
O-470-R	1178	3/10/96	
O-470-R	1201	6/2/96	83164-1-R
O-470-R	1319	1/6/97	459408
TSIO-520-VB	1055	6/9/95	

**Requirement:** To prevent crankshaft failure due to cracking, which could result in an inflight engine failure and possible forced landing, accomplish the following:

a) Determine if this AD applies, as follows:

1. Determine if any repair was conducted on the engine that required crankshaft removal during the February 1, 1995, to December 31, 1997, time frame; if the engine was not disassembled for crankshaft removal and repair in this time frame, no further action is required.
2. If the engine and crankshaft was repaired during this time frame, determine from the maintenance records (engine log book), and Table 1 of this AD if the crankshaft was repaired by Nelson Balancing Service, Repair Station Certificate No. NB7R820J, Bedford, Massachusetts, USA. The maintenance records should contain the Return to Service (Yellow) tag for the crankshaft that will identify the company performing the repair. Also the work order number contained in Table 1 of this AD was etched on the crankshaft propeller flange, adjacent to the closest connecting rod journal. Because some etched numbers will be difficult to see, if necessary, use a 10X magnifying glass with an appropriate light source to view the work order number. In addition, the propeller spinner, if installed, will have to be removed in order to see this number.
3. If it cannot be determined who repaired the crankshaft, compliance with this AD is required.

4. If the engine and crankshaft were not repaired during the time frame specified in a) 1, or if it is determined that the crankshaft was not repaired by Nelson Balancing Service, no further action is required.

b) Accomplish the following:

1. Perform a visual inspection as defined in paragraph b) 2 of this AD, magnetic particle inspection, and a dimensional check of the crankshaft journals, or remove from service affected crankshafts and replace with serviceable parts.

2. For the purpose of this AD, a visual inspection of the crankshaft is defined as the inspection of all surfaces of the crankshaft for cracks which include heat check cracking of the nitrided bearing surfaces, cracking in the main or aft fillet of the main bearing journal and crankpin journal, including checking the bearing surfaces for scoring, galling, corrosion, or pitting.

*Note: Further guidance on all inspection and acceptance criteria is contained in applicable Overhaul or Maintenance Manuals.*

3. Replace any crankshaft that fails the visual inspection, magnetic particle inspection, or the dimensional check with a serviceable crankshaft, unless the crankshaft can be reworked to bring it in compliance with:

i) All the overhaul requirements of the appropriate Overhaul/Maintenance Manuals; or

ii) All of the approved requirements for any repair station which currently has approval for limits other than those in the appropriate Overhaul/Maintenance Manuals.

4. For the purpose of this AD, a serviceable crankshaft is one which meets the requirements of paragraph b) 3 i) or b) 3) ii) of this AD.

*Note: Crankshafts removed from engine models IO-360, IO-520, and TSIO-520 series engines are also subject to compliance with DCA/CON/177. (FAA AD 98-17-11 refers)*

**Compliance:** By 25 October 1998

**Effective Date:** 25 September 1998

#### **DCA/CON/181A          Crankshafts Manufactured During 1998 - Inspection**

**Applicability:** Model O-470, IO-470, TSIO-470, IO-520, TSIO-520, LTSIO-520, IO-550, TSIO-550, TSIOL-550, series new and rebuilt engines manufactured between January 1 1998, and December 31 1998, listed by S/N in TCM MSB 99-3C.

Also, GTSIO-520 series engines, listed by S/N in TCM CSB 99-6A.

Also any other TCM O-470, IO-470, TSIO-470, IO-520, TSIO-520, LTSIO-520, IO-550, TSIO-550, TSIOL-550, and GTSIO-520 series engines that were overhauled by facilities other than TCM, and that have had replacement crankshafts installed that were sold individually by TCM and were manufactured or rebuilt between January 1 1998, and December 31 1998. If inspections have been previously accomplished in accordance with earlier revision levels of TCM MSB 99-3 (previously CSB 99-3) or CSB 99-6, no further action is required.

*Note: The engines and crankshafts that are the subject of this AD were manufactured or rebuilt by TCM during 1998. The dates that engines and crankshafts were delivered, however, may not coincide with their dates of manufacture.*

**Requirement:** To prevent crankshaft failure due to crankshaft cheek cracks, which could result in total engine power loss, in-flight engine failure, and possible forced landing, accomplish the following:



Perform visual and ultrasonic (UT) inspections of the crankshaft for cracks per sections A and B of TCM 99-3C, or for the GTSIO-520 series engines, per sections A and B of TCM CSB 99-6A. These inspections must be performed by TCM representatives.

If a crack is found, replace the crankshaft with a serviceable crankshaft of the same P/N prior to further flight.

If no crack is found, reassemble the engine and return it to service.  
(FAA AD 99-19-01 refers)

**Compliance:** Inspect within 10 hours TIS;

- Those engines listed by S/N on pages 3 through 12 of MSB 99-3C, or on pages 2 and 3 of TCM CSB 99-6A, with 500 hours or less TIS.
- Any other engine that was overhauled at a facility other than TCM and that has a crankshaft installed that was manufactured or rebuilt between January 1 1998 and December 31 1998, with 500 hours or less TIS.

Inspect at the next maintenance event, or within 50 hours TIS, whichever occurs first.

- Those engines listed by S/N on pages 3 through 12 of MSB 99-3C, or on pages 2 and 3 of TCM CSB 99-6A, with more than 500 hours TIS.
- Any other engine that was overhauled at a facility other than TCM and that has a crankshaft installed that was manufactured or rebuilt between January 1 1998 and December 31 1998, with more than 500 hours TIS.

After the effective date of this AD, installation of a crankshaft that was manufactured or rebuilt between January 1, 1998, and December 31, 1998, is prohibited, unless it has been inspected and reidentified per section C of TCM MSB 99-3C, or for the GTSIO-520 series engines, per section C of TCM CSB 99-6A. These inspections must be performed by TCM.

**Effective Date:** DCA/CON/181 - 29 April 1999  
DCA/CON/181A - 30 September 1999

#### **DCA/CON/182B            Crankshaft Material - Inspection**

**Applicability:** TCM IO-360, TSIO-360, LTSIO-360, O-470, IO-470, TSIO-470, IO-520, TSIO-520, LTSIO-520, IO-550, TSIO-550 and TSIOL-550 series engines incorporating a crankshaft listed by S/N in TCM MSB 00-5D.

**Note:** Applicable crankshafts are some of the crankshafts that were manufactured in the period 1 April 1998 through 31 March 2000. These may have been installed in new or rebuilt engines by TCM or installed by an organisation other than TCM during a bulk strip or field overhaul.

**Requirement:** To prevent failure of the crankshaft, accomplish the following:-

Remove a core sample of the crankshaft material for the purpose of metallurgical evaluation per TCM MSB 00-5D. Core removal must be accomplished using the specialised tools and equipment provided by TCM as listed in TCM MSB 00-5D. Engines may only be returned to service following receipt of TCM documented evidence that confirms the material sample was found not to exhibit any metallurgical anomalies. The TCM notification of result, is to be retained in the engine log book as an engine record.

(FAA AD 2000-23-21 refers)

**Compliance:** Within next 10 hours TIS, unless already accomplished.

**Note:** Crankshaft propeller flange core samples that were done per TCM MSB 00-5, MSB 00-5A, MSB 00-5B, or MSB 00-5C comply with this AD and must not be repeated.

**Effective Date:** DCA/CON/182A - 7 December 2000  
DCA/CON/182B - 20 December 2001

**DCA/CON/186 ECI Cylinders - Replacement**

**Applicability:** Model 520 and 550 series fitted with ECI cylinders, P/N AEC631397, and TSIO-520-NB, -VB, and -WB engines that are modified by STC SE4327SW, STC SE09104SC, or STC SE09261SC for operation at 325 HP or greater. (RAM TSIO-520-NB, -VB, or -WB Series III, IV, and VII.)

**Requirement:** To prevent incorrectly heat-treated cylinders from cracking in service, causing sudden power loss and engine failure, identify and if necessary replace cylinders, ECI P/N AEC631397 as follows:

1. Determine the S/N of the cylinder by looking in the engine records or by inspecting the cylinder for a S/N on the intake port boss, or on the flat area next to the head to barrel junction. Disregard any dash numbers that might follow the four digit S/N. If the S/N is 1043 or lower, or if it is 7709 or higher, no further action is required. If the cylinder S/N is 1044 through 7708, do the following:
  - a. Remove the rocker box cover from the cylinder.
  - b. Locate the ECI logo and casting P/N.
  - c. If the casting has AEC65385, and an "O" under the ECI logo, the cylinder is P/N AEC631397, proceed to part 2. If the cylinder is not ECI P/N AEC631397, no further action is required.
2. If the cylinder is ECI P/N AEC631397, do the following:
  - a. Look at the flange of the rocker box above the casting P/N.
  - b. If there is a letter "A," "B," or "X" stamped on the flange of the rocker box, no further action is required. If there is no letter "A," "B," or "X" stamped on the flange of the rocker box, replace the cylinder before further flight.

**Note:** ECI Mandatory SB S.I. No. 04-1, revision 1, relates to this AD and provides illustrations of the P/N locations. (FAA AD 2004-08-10 refers)

**Compliance:** Within 50 hours TIS

**Effective Date:** 29 April 2004

**DCA/CON/188A Superior Air Parts Cylinders – Replacement**

**Applicability:** Superior Air Parts (SAP) cast cylinder assemblies P/Ns SA47000L-A1, SA47000L-A20P, SA47000S-A1, SA47000S-A20P, SA47000S-A21P, SA52000-A1, SA52000-A20P, SA52000-A21P, SA52000-A22P, SA52000-A23P, SA55000-A1, SA55000-A20P.

These SAP cast cylinder assemblies may be fitted to the following Teledyne Continental Motors (TCM) engines:

O-470 -G, -K, -L, -M, -P, -R, -S, -U
IO-470 -C, -D, -E, -F, -G, -H, -L, -M, -N, -P, -R, -S, -U, -V
IO-520 -A, B, BA, C, CB, D, E, F, J, K, L, M, BB, MB
TSIO-520 -AF, B, BB, C, CE, D, DB, E, EB, G, H, J, JB, K, KB, L, LB, M, N, NB, P, -R, T, UB, VB, WB
IO-550 -A, B, C, D, E, F, L

- Note 1:** The affected cylinder assembly S/N range in this AD has been revised to narrow the applicability even further. Accomplishment of DCA/CON/188 satisfies the requirements of this AD.
- Requirement:** To prevent cylinder head fatigue failure and separation at the head-to-barrel threaded interface that could lead to engine failure, accomplish the following:
1. Inspect the aircraft log books to determine which cast cylinder assemblies are fitted.
- If the aircraft log books do not list the P/Ns of the cylinders fitted to the engine, then visually inspect the engine to determine which cylinders are fitted.
- Replace cylinder assemblies S/N 47LE053559 through to 47LF053643, and 47SE054212 through to 47SF054251, and 52D0531708 through to 52H0532197, and 55E05223 through to 55G05289, and 32WE059006 through to 32WF059067, and 32WHE05379 through to 32WHE05392, and 326WF055517 through to 326WF055532, and 36TWF05430 through to 36TWG05453, and 36WF058058 through to 36WG058124, and 366WE056944 through to 366WF057061, and 366WF057150 through to 366WF057232, and 366WF057259 through to 366WG057534, and 366WG057556, 366WG057569, 366WG057598, 366WG057616, 366WG057621, 366WG057624, and 366WJ057770 through to 366WJ057776, and 366WL058131, per Superior Air Parts Mandatory SB B06-01, revision E, dated 24 January 2007.
- Note 2:** These affected S/Ns were manufactured between April 2005 and November 2005.
- Note 3:** The affected SAP cylinder head flanges are marked: SA47000L-A1, SA47000L-A20P, SA47000S-A1, SA47000S-A20P, SA47000S-A21P, SA52000- A1, SA52000-A20P, SA52000-A21P, SA52000-A22P, SA52000-A23P, SA55000-A1, SA55000-A20P, SL32000W-A1, SL32000W-A20P, SL32000W-A21P, SL32000WH-A1, SL32000WHA20P, SL32006W-A1, SL32006W-A20P, SL32006W-A21P, SL36000TW-A1, SL36000TW-A20P, SL36000TW-A21P, SL36000TW-A22P, SL36000W-A1, SL36000W-A20P, SL36000W-A21P, SL36006W-A1, SL36006W-A20P or SL36006W-A21P.
2. Affected Superior Air Parts cast cylinder assemblies listed in Requirement 1 of this AD may not be installed on any engine.  
(FAA AD 2007-04-19R1 refers)
- Compliance:**
1. At 150 hours TTIS (on affected SAP cylinders), or within the next 10 hours TIS, whichever is the later.
  2. From the effective date of this AD.
- Effective Date:** DCA/CON/188 - 12 March 2007  
DCA/CON/188A - 26 April 2007

### DCA/CON/189 Starter Adapter and Crankshaft Gears – Inspection

- Applicability:** All model GTSIO-520 series engines.
- These engines may be installed on but not limited to Twin Commander 685 and Cessna 404, 411 and 421 aircraft.
- Requirement:** To prevent failure of the starter adapter assembly and/or the crankshaft gear, resulting in failure of the engine, accomplish the following:
1. Inspect the starter adapter viscous damper and shaftgear backlash per Part 2 of TCM MSB No. MSB94-4G. Replace components as required.
- If needle bearing P/N 537721 is fitted to the crankcase, replace with a bush P/N 654472 or a manufacturer approved bearing, per Part 4 of MSB94-4G before reassembling components.

2. Inspect starter adapter shaft gear and crankshaft gear teeth per Part 3 of MSB94-4G. Replace components as required.

If needle bearing P/N 537721 is fitted to the crankcase, replace with a bush P/N 654472 or a manufacturer approved bearing, per Part 4 of MSB94-4G before reassembling components.

3. Install TCM service kit P/N EQ6642 (new) or EQ6642R (rebuilt) per the service kit installation procedures specified in Part 5 of MSB94-4G.

**Note 1:** The installation of TCM service kit, P/N EQ6642 or EQ6642R is not a terminating action to the requirements of this AD. Repetitive inspections per Requirements 1 and 2 of this AD are to be continued.  
(FAA AD 2007-05-15 refers)

**Note 2:** For engines that experience rough running, perform the inspection specified in Part 1 and Part 3 of MSB94-4G, before further flight. For the purposes of this AD rough running refers to a sudden increase in perceived engine vibration level that cannot be cleared by adjustment of the engine controls, particularly the mixture adjustment.

**Compliance:** 1. For engines that have not been inspected per requirement 1 of DCA/CON/187:  
Within the next 50 hours TIS or annual inspection, whichever occurs sooner, and thereafter at intervals not to exceed 100 hours TIS.

For engines that have been inspected per requirement 1 of DCA/CON/187 within the last 100 hours TIS or annual inspection:

Within the next 100 hours TIS, and thereafter at intervals not to exceed 100 hours TIS.

2. At 400 hours TTIS (for starter adaptors), or within 25 hours TIS for starter adaptors with more than 400 hours TIS or unknown TIS, (unless already accomplished per requirement 2 of DCA/CON/187), and thereafter at intervals not to exceed 400 hours TIS.

3. At the next engine overhaul or starter adapter replacement, whichever occurs sooner, and thereafter accomplish the inspections per requirements 1 and 2.

**Effective Date:** 29 March 2007

### **DCA/CON/190 Turbochargers - Replacement**

**Applicability:** Models TSIO-520-BE, TSIO- 550-A, TSIO-550-B, TSIO-550-C, TSIO-550-E and TSIO-550-G engines fitted with a Kelly Aerospace Power Systems turbocharger, TCM P/N 646677, with certain S/Ns, installed on, or after 20 March 2007.

These engines are installed on, but not limited to, Adam Aircraft A500 aircraft, Columbia Aircraft Manufacturing LC41-550FG aircraft, Mooney Airplane Company M20TN (Acclaim) aircraft and Piper Aircraft Incorporated PA-46-310P (Malibu) aircraft.

Model TCM IO-550-N engines embodied with Engine Technologies Incorporated supplemental type certificate (STC) SE10589SC to install a turbocharger P/N 466304-0003, with certain S/Ns, installed on, or after 20 March 2007.

These engines are installed on, but not limited to, Cirrus Design Corporation Aircraft model SR22 embodied with Engine Technologies Incorporated STC SA10588SC.

**Note 1:** Refer to Kelly Aerospace Power Systems Service Bulletins No. 026, revision B, dated 27 July 2007 and SB No. 027, dated 25 July 2007 for the list of S/N of affected turbochargers.

**Requirement:** To prevent the turbine rotor separating from the shaft of the turbocharger due to the possibility of a compressor machining defect which could result in loss of full engine power, loss of engine lubricant and smoke in the aircraft cabin, replace affected turbochargers.

For engines embodied with Engine Technologies Incorporated STC SE10589SC refer to SB No. 026 for the list of S/N of affected turbochargers.

For engines fitted with a Kelly Aerospace Power Systems turbocharger, TCM P/N 646677 refer to SB No. 027 for the list of S/N of affected turbochargers.

**Note 2:** If the engine turbocharger was installed before 20 March 2007, no further action is required.

**Note 3:** Teledyne Continental Aircraft Engine Mandatory Service Bulletin (MSB) MSB07-4, dated 30 July 2007 contains additional information on replacing turbochargers on TCM engines and Cirrus Service Advisory SA 07-14 revision 1, dated 24 July 2007, contains additional information on replacing turbochargers on Cirrus Design Corporation Aircraft Model SR22 embodied with Engine Technologies Incorporated STC SA10588SC.  
(FAA AD 2007-16-10 refers)

**Compliance:** Before further flight unless already accomplished.

**Effective Date:** 30 August 2007

### **DCA/CON/191 Turbochargers – Inspection**

**Applicability:** KAPS turbochargers P/N 465930-0003 (Teledyne Continental Motors (TCM) P/N 641672-3) fitted to model TCM GTSIO-520-L and GTSIO-520-N engines, with a turbocharger S/N listed in KAPS MSB No. 030, revision A, dated 1 April 2008, and  
KAPS turbochargers P/N 466412-0003 (TCM P/N 652964) fitted to model TCM TSIOL-550-A and TSIOL-550-C engines with a the turbocharger S/N listed in KAPS MSB No. 030, and  
KAPS turbochargers P/N 466412-0004 fitted to RAM modifications only, with a turbocharger S/N listed in KAPS MSB No. 030, and  
KAPS turbochargers P/N 466412-0003 (TCM P/N 652964) fitted to Cessna 414 aircraft with a model TCM TSIOL-550-A or TSIOL-550-C engine (Supplemental Type Certificate (STC) SA7633SW) with a turbocharger S/N listed in KAPS MSB No. 030, and  
KAPS turbochargers P/N 465930-0003 (TCM P/N 641672-3) fitted to Cessna 421 Golden Eagle aircraft with a TCM GTSIO-520-L or GTSIO-520-N engine with a turbocharger S/N listed in KAPS MSB No. 030, and  
KAPS turbochargers P/N 465680-0004 (Cessna P/N C295001-0202) fitted to TCM TSIO-520-AF or TSIO-520-P engines with a turbocharger S/N listed in KAPS MSB No. 030, and  
KAPS turbochargers P/N 465930-0002 (TCM P/N 641672-2) fitted to TCM GTSIO-520-M engines with a turbocharger S/N listed in KAPS MSB No. 030, and  
KAPS turbochargers P/N 465680-0004 (Cessna P/N C295001-0202) fitted to Cessna P210 Pressurized Centurion aircraft with a TCM TSIO-520-AF or TSIO-520-P engine, with a turbocharger S/N listed in KAPS MSB No. 030, and  
KAPS turbochargers P/N 465930-0002 (TCM P/N 641672-2) fitted to Cessna 404 Titan aircraft with a TCM GTSIO-520-M engine with a turbocharger S/N listed in KAPS MSB No. 030, and  
KAPS overhauled turbochargers P/N 465930-9003 fitted to TCM GTSIO-520-L or GTSIO-520-N engines with a turbocharger S/N listed in KAPS MSB No. 031, dated February 28, 2008, and  
KAPS overhauled turbochargers P/N 465930-9002 fitted to TCM GTSIO-520-M engines, with a turbocharger S/N listed in KAPS MSB No. 031, and  
KAPS turbochargers that might have been overhauled or repaired by anyone other than KAPS, that used a P/N 441977-0023S or P/N 441977-0025S turbine housing sold as a spare part through the Aviall Company. These turbine housings have the

date code of 1006 and might have been installed between October 2006 and January 25, 2008. The turbocharger data plates might include manufacturer's information other than KAPS information, such as:

Garrett P/N 465680-0004 fitted to TCM TSIO-520-AF and TSIO-520P engines.

Garrett P/N 465930-0002 fitted to TCM GTSIO-520-M engines.

Garrett P/N 465930-0003 fitted to TCM GTSIO-520-L and GTSIO-520-N engines.

Garrett P/N 465448-0004 fitted to TCM TSIO-520-CE engines.

Garrett P/N 466412-0003 fitted to TCM TSIOL-550-A and TSIOL-550-C engines.

Garrett P/N 466412-0004 fitted to engines modified by RAM.

**Requirement:** To prevent hazardous amounts of carbon monoxide entering the cabin, an increase in under-cowl temperatures and loss of tailpipe retention which could result in an inflight fire and loss of aircraft control, accomplish the following inspection of the turbocharger:

a) Carefully remove the "V" band clamp around the turbocharger turbine housing at the turbocharger exhaust outlet. Take care not to move the exhaust tube and tailpipe assembly.

b) Visually inspect the area that is captured by the "V" band clamp. Use a feeler gauge at the split line between the turbine housing flange and the exhaust tube flange all around the circumference. The maximum gap must not exceed 0.005 inch.

c) Replace the turbocharger with a serviceable turbocharger before further flight, if the gap exceeds 0.005 inch.

d) If the maximum gap is not exceeded, metal stamp a 1/8" upper case "I" on the side of the turbocharger discharge flange. Information on the stamping location can be found in the MSBs referenced in this AD.

**Note:** A serviceable turbocharger is considered to be a unit that either passes the visual inspection in this AD, or is a unit with a S/N not listed in any of the referenced KAPS MSBs.  
(FAA AD 2008-08-17 refers)

**Compliance:** Within the next 10 hours TIS or at the next maintenance inspection, whichever occurs sooner, unless already accomplished.

**Effective Date:** 6 May 2008

### DCA/CON/192 TCM EQ3 Cylinders – Inspection

**Applicability:** Model O-470-G, K, L, R, S, M and U engines, and  
Model IO-470-C, D, E, F, H, L, M, N, S, U, V and VO engines, and  
Model TSIO-470-B, C and D engines, and  
Model IO-520-A, B, BA, BB, C, CB, D, E, F, J, K, L, M and MB engines, and  
Model TSIO-520-AF, B, BB, C, CE, D, DB, E, EB, G, H, J, JB, K, KB, L, LB, M, N, NB, P, R, T, UB, VB and WB engines, and  
Model IO-550-A, B, C, D, E, F and L engines, and  
Model IOF-550-B, C, D, E, F and L engines, and

Fitted with one or more EQ3 TCM cylinders. To identify affected cylinders refer to tables 1, 1A, 2 and 2A of TCM MSB No. MSB09-1B, dated 14 July 2009.

**Note 1:** The tables in MSB No. MSB09-1B can also be used to identify spare EQ3 cylinders by cylinder P/N and S/N that may have been fitted on affected engines.

These engines are installed on, but not limited to, Alexandria Aircraft LLC (formerly Bellanca) model 300 Super Viking aircraft; Beech Bonanza 33, 35 and 36 series

aircraft, Beech Baron 56 and 58 series aircraft, Cessna 180, 182, 188, 205, 206, 207, 210, 303, 310, 320, 402, and 414 model series aircraft; Aero Commander 200 and 500 aircraft; certain Rockwell (formerly Meyers) Windecker Eagle 200 aircraft, and Navion aircraft.

- Requirement:** To prevent loss of engine power due to possible cracks in the cylinder head, accomplish the following:
1. Identify EQ3 cylinders in accordance with step 1 of TCM MSB No. MSB09-1B, dated July 14, 2009.
  2. Accomplish a visual inspection of the cylinder for cracks per step 2, paragraph B, of TCM MSB No. MSB09-1B.
  3. Replace all EQ3 cylinders per TCM MSB No. MSB09-1B.
  4. An EQ3 cylinder shall not be fitted to any engine, and an engine already fitted with an EQ3 cylinder shall not be fitted to any aircraft.

**Note 2:** Initial visual inspections accomplished before the effective date of this AD per TCM MSB No. MSB09-1A dated 11 March 2009 complies with the initial inspection requirements of this AD.  
(FAA AD 2009-19-07 refers)

- Compliance:**
1. Within the next 20 hours TIS unless previously accomplished.
  2. Before accumulating 400 hours TTIS on EQ3 cylinders, or within 20 hours TIS whichever occurs later unless previously accomplished, and thereafter at intervals not to exceed 50 hours TIS.
  3. By 1300 hours TTIS.
  4. From 7 October 2009.

**Effective Date:** 7 October 2009

#### **DCA/CON/195 Hydraulic Valve Lifters – Inspection**

**Applicability:** Model TCM 240, 346, 360, 470, 520 and 550 series engines, and Rolls-Royce Motors, Ltd. (R-RM) IO-240-A engines, and Fitted with hydraulic lifters P/N 657913, 657915 or 657916.

**Note 1:** These engines are installed on, but not limited to general aviation aircraft.

**Note 2:** This AD supersedes DCA/CON/194A. The applicability of this AD revised to include TCM 346 series engines and R-RM IO-240-A engines. No action required if already in compliance with DCA/CON/194A.

**Requirement:** To prevent excess hydraulic valve lifter wear possibly resulting in loss of engine power and aircraft control, accomplish the following:

1. Review the aircraft logbooks and determine the manufacture date or the rebuild date of the engine, and determine if the hydraulic valve lifters have been replaced after 19 June 2009.

If the engine was manufactured or rebuilt before 19 June 2009 and if none of the hydraulic lifters have been replaced after 19 June 2009 no further AD action is required.

If the engine was manufactured or rebuilt after 19 June 2009, or if any of the hydraulic lifters have been replaced after 19 June 2009 accomplish requirement 2 of this AD.

2. If the engine was manufactured or rebuilt after 19 June 2009, or if any of the hydraulic lifters have been replaced after 19 June 2009 and the P/N of the hydraulic lifters cannot be determined from the engine records refer to the list of affected engine S/N in section A of TCM MSB No. MSB09-8A dated 4 December 2009.

For engines listed in section A of MSB No. MSB09-8A inspect the hydraulic lifters fitted to each cylinder and determine the P/N of the hydraulic lifters per paragraphs 1

through to 3 in Section I. Action Required of MSB No. MSB09-8A, dated 4 December 2009.

If an affected hydraulic valve lifter is found fitted, replace all affected hydraulic lifters per paragraphs 2.a.1) through to 2.b.4) in Step 2 of MSB No. MSB09-8A before further flight.

3. Affected hydraulic lifters P/N 657913, 657915 or 657916 shall not be fitted to any TCM 240, 346, 360, 470, 520 or 550 series engines or any R-RM IO-240-A engines.

**Note 3:** Accomplish the requirements of this AD per the instructions in Teledyne Continental Motors MSB No. MSB09-8A dated 4 December 2009.  
(FAA AD 2010-11-04 refers)

**Compliance:**

1. Before further flight unless previously accomplished.
2. Before further flight unless previously accomplished.
3. From 24 June 2010.

**Effective Date:** 24 June 2010

### **DCA/CON/197 Slick Magnetos – Inspection**

**Applicability:** Continental and Rolls-Royce C-125, C-145, O300, IO-360, TSIO-360 and LTSIO-520-AE series engines fitted with Champion Aerospace (formerly Unison Industries) Slick magnetos 6314, 6324 and 6364, S/N 99110001 through to 99129999.

**Note 1:** This AD retains the requirements in superseded DCA/CON/183A. No AD action required for affected TCM engines which are in compliance with DCA/CON/183A. The applicability revised to include certain engines manufactured under license by Rolls-Royce.

**Requirement:** To prevent engine failure due to possible migration of the magneto impulse coupling stop pin, accomplish the following:

1. Inspect the aircraft records or inspect the aircraft and determine the P/N and the S/N of the magnetos. If an affected magneto is not fitted, then no further AD action is required.

If an affected magneto is found fitted, replace the magneto with a S/N not affected by this AD. Inspect removed magnetos and determine if the impulse coupling stop pin is present. If the pin is missing, accomplish the inspections and corrective actions specified in paragraph (g) of FAA AD 2011-26-07 before further flight.  
(FAA AD 2011-26-07 refers).

2. A Champion Aerospace (formerly Unison Industries) Slick magneto model 6314, 6324 or 6364 with a S/N affected by this AD shall not be fitted to any engine.

**Note 2:** A P/N cross-reference for Slick magneto model 6314 (TCM P/N 653271), model 6324 (TCM P/N 653292) and model 6364 (TCM P/N 649696) can be found in TCM MSB No. MSB00-6D dated 19 November 2010.

**Compliance:**

1. Within the next 10 hours TIS unless previously accomplished.
2. From 26 January 2012.

**Effective Date:** 26 January 2012



**DCA/CON/198 AVStar Fuel Servos – Inspection**

**Applicability:** All Teledyne Continental Motors (TCM) fuel injected engines fitted with a AVStar Fuel Systems, Inc. (AFS) fuel servo diaphragm P/N AV2541801 or P/N AV2541803.

**Requirement:** To prevent fuel servo failure which could result in loss of engine power and aircraft control, accomplish the following:

1. Review the aircraft records and determine if an AFS fuel servo diaphragm P/N AV2541801 or P/N AV2541803 from an affected production lot listed in AFS MSB No. AFS-SB6 revision 2, dated 6 April 2011 was installed in the fuel servo any time after 20 May 2010. If the fuel servo is found fitted with an affected diaphragm, replace the fuel servo before further flight.
2. Fuel servos with an affected AFS fuel servo diaphragm P/N AV2541801 or P/N AV2541803 from the production lots listed in AFS MSB No. AFS-SB6 revision 2 shall not be fitted to any aircraft. (FAA AD 2012-03-06 refers)

**Compliance:**

1. Within the next 5 hours TIS unless previously accomplished.
2. From 24 February 2012.

**Effective Date:** 24 February 2012

**DCA/CON/199 Turbocharger – Replacement**

**Applicability:** Model TSIO-520 series engines fitted with Hartzell Engine Technologies (HET) turbochargers P/N 406610-0005 or 406610-9005 with S/N listed in table 1 of HET ASB No. 047, dated 8 May 2012, and Model TSIO-520 series engines fitted with HET turbochargers with P/N 406610-0005 or 406610-9005 overhauled or repaired on or after 1 January 2012 with the same turbocharger center housing P/N and date code H-0112, and Hartzell Engine Technologies (HET) turbocharger center housings P/N 409836-0005 sold as parts with date code H-0112.

These turbochargers are installed on, but not limited to Cessna 206, 207 and 210 aircraft fitted with Continental Motors, Inc TSIO-520-C, -G, -H, -M and -R reciprocating engines.

**Requirement:** To prevent turbocharger bearing failure which could result in loss of engine power, replace turbochargers listed in the applicability section of this AD before further flight. (FAA AD 2012-10-52 refers)

**Compliance:** Before further flight unless previously accomplished.

**Effective Date:** 22 May 2012

**DCA/CON/200 Starter Adaptors – Inspection**

**Applicability:** Model TSIO-520-B, BB, D, DB, E, EB, J, JB, K, KB, N, NB, UB, VB, and model TSIO-550-K, and model TSIOF-550-K, and model IO-550-N (Turbo-normalized only - STC SE10589SC), and fitted with a starter adapter P/N 642085A17, 642085A18, 642085A19, 642085A20, 642085A22, 642085-1A1, R-642085A17, R-642085A18, R-642085A19 or R-642085A22 and the engine was manufactured before 20 November 2011, or a new or rebuilt starter adapter was fitted to the engine before 20 November 2011.

**Note:** This AD supersedes DCA/CON/196 to expand the AD applicability.

**Requirement:** To prevent failure of the starter adapter gear shaft which could result in loss of the oil scavenge pump drive and an in-flight engine shutdown, accomplish the inspections and corrective actions specified in FAA AD 2012-10-13. (FAA AD 2012-10-13 refers)

**Compliance:** At the compliance times specified in FAA AD 2012-10-13.

**Effective Date:** 8 June 2012

State of Design ADs listed below are available directly from the National Airworthiness Authority (NAA) websites. Links to NAA websites are available on the CAA website at <https://www.aviation.govt.nz/aircraft/airworthiness/airworthiness-directives/links-to-state-of-design-airworthiness-directives/>

If additional NZ ADs need to be issued when an unsafe condition is found to exist in an aircraft or aeronautical product in NZ, they will be added to the list below.

#### 2014-05-29 Superior Air Parts (SAP) Investment Cast Cylinder Assemblies – Inspection

**Applicability:** Models IO-520, TSIO-520, and IO-550 series reciprocating engines fitted with replacement Superior Air Parts, Inc. (SAP) parts manufacturer approval (PMA) investment cast cylinder assemblies, P/Ns SA52000-A1, SA52000-A20P, SA52000-A21P, SA52000-A22P, SA52000-A23P, SA55000-A1, or SA55000-A20P.

All other engine models approved for the use of CMI 520 and 550 cylinder assemblies such as the CMI 470 series engines when modified by Supplemental Type Certificate (STC), fitted with SAP investment cast cylinder assemblies, P/Ns SA52000-A1, SA52000-A20P, SA52000-A21P, SA52000-A22P, SA52000-A23P, SA55000-A1, or SA55000-A20P.

**Note:** This AD applies to all serial numbers for the P/Ns listed in paragraphs (c)(1) and (c)(2) of this AD. If no SAP replacement cylinders were installed during engine maintenance since the CMI engines were new, then this AD does not apply.

**Effective Date:** 25 April 2014

#### 70-14-07 Fuel Injection Pump – Inspection

**Applicability:** Models IO-360-A, -C and -D engines.  
Models IO-520-A, -B, -C, -D, -E, -F, -J and -K engines.  
Models IO-470-C, -D, -E, -F, -H, -K, -L, -M, -N, -S, -J, -U, -V and -VO engines.  
Models TSIO-470-B, -C and -D engines.

**Note:** This AD supersedes DCA/CON/128 due to that AD not being applicable to all affected engines.

**Compliance:** Before the issue of a New Zealand Certificate of Airworthiness, or at the next Review of Airworthiness (RA), whichever is the sooner, unless previously accomplished. Repetitive inspections, if required, to be accomplished at intervals not to exceed the times specified in the FAA AD.

**Effective Date:** 25 August 2016

#### 72-24-03 Oil Filter Adapter – Inspection

**Applicability:** Model IO-346-A, IO-520-B and -C and TSIO 520-B, -E, and -J engines having Teledyne Continental Part Number 631645 oil filter adapter installed, used with AC OF-9-A oil filter assembly.

**Compliance:** Before the issue of a New Zealand Certificate of Airworthiness, or at the next Review of Airworthiness (RA), whichever is the sooner, unless previously accomplished. Repetitive inspections, if required, to be accomplished at intervals not to exceed the times specified in the FAA AD.

**Effective Date:** 25 August 2016

**77-13-22 Crankcase Cracks – Inspection**

**Applicability:** Model IO-520-A, -B, -BA, -C, -D, -E, -F, -J, -K, -L, and -M which do not incorporate the identification markings in Table 1 of the AD.

Model TSIO-520-B, -C, -D, -E, -G, -H, -J, -K, -L, and -N which do not incorporate the identification markings in Table 1 of the AD.

Model GTSIO-520-C, -D, -F, and -H which do not incorporate the identification markings in Table 1 of the AD.

**Compliance:** Before the issue of a New Zealand Certificate of Airworthiness, or at the next Review of Airworthiness (RA), whichever is the sooner, unless previously accomplished. Repetitive inspections, if required, to be accomplished at intervals not to exceed the times specified in the FAA AD.

**Effective Date:** 25 August 2016

**80-06-05 Magnetos – Inspection**

**Applicability:** Model A-65-8, A-75-8, C-85-8, C-90-8, O-200-A, O-300-A, -B, -C, -D; O-470-U, IO-360-KB, IO-470, IO-520-A, -B, -F; TSIO-470 and TSIO-520-T engines.

**Compliance:** Before the issue of a New Zealand Certificate of Airworthiness, or at the next Review of Airworthiness (RA), whichever is the sooner, unless previously accomplished. Repetitive inspections, if required, to be accomplished at intervals not to exceed the times specified in the FAA AD.

**Effective Date:** 25 August 2016

**87-14-02 Starter Adaptor Shaft Gear – Inspection**

**Applicability:** Model IO-520, IO-550, and TSIO-520 series engines with starter adapter shaftgear P/N 649343, a freon compressor, and 25 hours or less time in service installed on engines listed in the AD.

**Compliance:** Before the issue of a New Zealand Certificate of Airworthiness, or at the next Review of Airworthiness (RA), whichever is the sooner, unless previously accomplished. Repetitive inspections, if required, to be accomplished at intervals not to exceed the times specified in the FAA AD.

**Effective Date:** 25 August 2016

**88-17-03 Starter Adaptor Shaft Gear Assembly – Inspection**

**Applicability:** Model IO-520- BA, BB, IO-550-B, and TSIO-520-BE, LB, UB, and WB series engines equipped with air conditioners listed in the AD.

**Compliance:** Before the issue of a New Zealand Certificate of Airworthiness, or at the next Review of Airworthiness (RA), whichever is the sooner, unless previously accomplished. Repetitive inspections, if required, to be accomplished at intervals not to exceed the times specified in the FAA AD.

**Effective Date:** 25 August 2016

**2016-16-12 ECi Cylinder Assemblies – Inspection**

**Applicability:** Model -520 and -550 reciprocating engines, and all other CMI engine models approved to use model -520 and -550 cylinder assemblies such as the CMI model -470 when modified by supplemental type certificate (STC),

Fitted with Continental Motors Inc., San Antonio (formerly Airmotive Engineering Corp.), replacement parts manufacturer approval (PMA) cylinder assemblies, marketed by Engine Components International Division (hereinafter referred to as ECi), P/N AEC 631397, with ECi Class 71 or Class 76, S/N 1 through to S/N 61176.

**Effective Date:** 15 September 2016

**77-05-04 Crankshaft – Inspection**

**Applicability:** IO-520-D installed on Cessna 185 and 188 aircraft serial numbers 18502839 through 18503234, 18503236 through 18503284, 18503287, 18503291, 18503293, 18802349 through 18802887, and 18802893.

IO-520-F, TSIO-520-C, TSIO-520-G, TSIO-520-M and TSIO-520-R installed on Cessna U-206, T-206, and T-207 aircraft serial numbers U20603021 through U20603693, U20603695, U20603696, U20603699, U20603712, 20700315 through 20700378.

IO-520-L, TSIO-520-H, TSIO-520-R, installed on Cessna 210 and T-210 aircraft serial numbers 21061040 through 21061736, 21061738 through 21061763, 21061766, 21061771, 21061773, 21061775 through 21061777, 21061789.

**Compliance:** Initial compliance required before the issue of a New Zealand Certificate of Airworthiness, or at the next Review of Airworthiness (RA), whichever is the sooner, unless previously accomplished. Repetitive inspections, if required, are to be accomplished at intervals not to exceed the times specified in the FAA AD.

**Effective Date:** 25 June 2020

**2010-11-04 Hydraulic Lifters – Inspection**

**Applicability:** Continental 520 series engines fitted with hydraulic lifters P/N 657913, 657915, or 657916.

**Compliance:** Initial compliance required before the issue of a New Zealand Certificate of Airworthiness, or at the next Review of Airworthiness (RA), whichever is the sooner, unless previously accomplished. Repetitive inspections, if required, are to be accomplished at intervals not to exceed the times specified in the FAA AD.

**Effective Date:** 25 June 2020

**2020-16-11 Crossflow Cylinder Assemblies – Inspection**

**Applicability:** Continental GTSIO-520-C, GTSIO-520-D, GTSIO-520-H, GTSIO-520-K, GTSIO-520-L, GTSIO-520-M, GTSIO-520-N and TSIO-520-BE engines, originally manufactured, rebuilt, or modified with a crossflow cylinder assembly replacement, on or after 1 November 2014, and fitted with a cross-flow cylinder assembly P/N 658538, 658540, 658542, 658591, 658595, 658613, 658624, 658539, 658541, 658590, 658594, 658603, 658623, or 658630.

**Effective Date:** 21 September 2020

**89-14-01 Crankshaft – Inspection**

**Applicability:** TSIO-520BE engines, S/N 528001 through to 528337.

**Compliance:** Initial compliance required before the issue of a New Zealand Certificate of Airworthiness, or at the next Review of Airworthiness (RA), or at the next annual inspection, whichever is the sooner, unless previously accomplished. Repetitive inspections, if required, are to be accomplished at intervals not to exceed the times specified in the FAA AD.

**Effective Date:** 26 August 2021

**2022-04-04 Oil Filter Adapter – Inspection**

**Applicability:** Continental Aerospace Technologies, Inc. (Type Certificate previously held by Continental Motors, Inc., and Teledyne Continental Motors) engine models C-125-1, C-125-2, C145-2, C145-2H, IO-360-C, IO-360-D, IO-360-DB, IO-360-H, IO-360-HB, IO-360-K, IO-360-KB, IO-470-E, IO-470-S, IO-550-B, IO-550-G, O-300-B, O-300-C, O-300-D, O-300-E, O-470-A, O-470-B, O-470-G, O-470-J, O-470-K, O-470-L, O-470-M, O-470-N, O-470-R, O-470-S, O-470-U, O-470-11, O-470-15, TSIO-360-E, TSIO-360-EB, TSIO-360-F, TSIO-360-FB, TSIO-360-GB, TSIO-360-LB, TSIO-360-MB, TSIO-360-SB, TSIO-520-C, TSIO-520-CE, TSIO-520-E, and TSIO-520-UB, embodied with F&M Enterprises, Inc. (F&M) or Stratus Tool Technologies, LLC (Stratus) oil filter adapter installed per Supplemental Type Certificate SE8409SW, SE09356SC, or SE10348SC.

Continental Motors (Type Certificate previously held by Teledyne Continental Motors) engine models IO-520-A, IO-520-B, IO-520-BA, IO-520-BB, IO-520-C, IO-520-D, IO-520-J, and IO-520-L, embodied with F&M Enterprises, Inc. (F&M) or Stratus Tool Technologies, LLC (Stratus) oil filter adapter installed per Supplemental Type Certificate SE8409SW, SE09356SC, or SE10348SC.

**Effective Date:** 29 March 2022

**\* 2023-02-12 Superior Air Parts Cylinder Assemblies – Inspection**

**Applicability:** Continental GTSIO-520, IO-520, LIO-520, LTSIO-520 and TSIO-520 reciprocating engines listed in the Application Table, page 1, of Superior Air Parts, Inc. (SAP) Mandatory Service Bulletin MSB22-01 A, dated December 16, 2022 (SAP MSB22-01 A) with an installed:

(1) SAP cylinder assembly having a P/N and S/N listed in Table 1 of SAP MSB22-01 A, installed on, or after January 20, 2022; or

(2) A cylinder assembly that was repaired and installed on, or after January 20, 2022, with a SAP intake valve having P/N SA539988 and lot number 19077 O; or

(3) SAP intake valve with P/N SA539988 and lot number 19077 O.

**Effective Date:** 23 February 2023