



CONTINENTAL

A E R O S P A C E T E C H N O L O G I E S

STANDARD PRACTICE MAINTENANCE MANUAL

SPARK IGNITED ENGINES

Technical Portions Accepted by the Federal Aviation Administration

C-2.3. 100% Parts Replacement Requirements

“100% Replacement” parts are items that require a “new” replacement if removed during any maintenance or preventive maintenance on the engine or it’s components. You must always replace removed gaskets, seals, packings, hoses, “O” rings, cotter pins, retaining rings (snap rings), safety wires, self locking fasteners (including exhaust and connecting rod nuts) and lock washers with “new” serviceable parts.

NOTE: Service documents published or revised subsequent to the issuance of this publication may mandate the replacement of components and parts not included in these instructions. At engine overhaul, the technician must review all service bulletins to ensure compliance with the manufacturer’s requirements for continued airworthiness.

Do not re-use worn, damaged or deformed fasteners. Do not replate cadmium plated fasteners or washers. If the cadmium plating has been removed, discard the item and replace it with a new part.



Engine mounted accessories must be maintained in accordance with the manufacturer’s instructions. Additionally, accessories must be overhauled during engine overhaul, or more frequently, in accordance with the manufacturer’s instructions.

At engine overhaul the starter, starter adapter, alternator, magnetos, and engine fuel system must be replaced with New, Factory Rebuilt, or FAA approved overhauled units. On turbocharged engines, the turbocharger, wastegate, all controllers, bypass valve and exhaust system must be replaced with new, factory rebuilt or FAA approved overhauled units. All engine baffles must be repaired or replaced and all flexible baffle seals replaced.

Items such as spark plugs, alternator drive belts and air-conditioning drive belts are replaced on condition.

C-2.4. Mandatory Overhaul Replacement Parts

In addition to the items listed in Section C-2.3, mandatory replacement parts must be discarded and replaced with new parts during engine overhaul.

Table C-1. Mandatory Overhaul Replacement Parts

REPLACEMENT ITEMS	SPECIAL CONDITIONS	100% REPLACEMENT	MANDATORY REPLACEMENT AT ENGINE OVERHAUL
Accessories, Engine Mounted ¹	Replace On Condition		X
Air-conditioning Drive Belts	Replace On Condition		X
Alternators • Drive Belts • Rubber Drive Bushings	Replace On Condition		X X
Baffles (see Engine Baffles)	Repairable		X
Bearings: connecting rod, crankshaft main and thrust, needle, ball, and roller			X
Bushings: used in bearing applications (subject to wear) - reference disassembly/assembly instructions			X
Camshaft Gears: • Replace P/Ns 535934, or 535660, or 656037 (O470J, K, L, R, S; IO346A; IO470J, K) with 656913, or subsequent part number, at overhaul. • Replace P/Ns 537432 or 656038 (O470G, GCI, M; IO470C, D, E, F, H, L, M, N, S; TSIO470B, C, D; GTSIO520C, D, H, K, L, M, N, R) with 656914, or subsequent part number, at overhaul. • Replace P/Ns 631845, or 655516, or 656031 (O470U, IO470U, V; IO520A, B, BA, BB, C, CB, D, E, F, J, K, L, M, MB, N, NB, P, R; LIO520P; L/TSIO520ALL; IO550ALL; IOF550ALL; TSIO550ALL; TSIO550A, B, C), or 655430 (IO550A, B, C, D, E, F, G, L, N) with P/N 656818 or subsequent part number)	Design Change Design Change Design Change	X X X	
Camshaft Gear Bolts			X
Cold Start Primer Diverter Valves			X
Connecting Rods (must be inspected for serviceable condition during Overhaul) • Connecting Rods (P/N 626119, 646320, and 646321 must be replaced with current part number)² See Section 10-9.1 for engine applicability • Connecting Rods (with beam widths less than 0.625 inches must be replaced with current part number)² • Connecting Rod Bolts • Connecting Rod Nuts	Inspection Required Design Change Design Change Design Change	X X X	X
Cotter Pins		X	
Counterweight • Counterweights (P/N 631810 must be replaced with P/N 652833)³ • Counterweight Pins • Retainer Plates • Retaining (Snap) Rings	Design Change X	X X	X X X
Crankcase Through Bolts			X
Crankshaft Gears • Crankshaft Gear (P/Ns 536421 or 653631 must be replaced with P/N 657175, or subsequent)³ • Crankshaft Cluster Gear (P/Ns 641906 or 656272 must be replaced with P/N 656072, or subsequent)⁴ • Crankshaft Gear, large (P/N 656991 Rev B must be replaced with P/N 656991 Rev.C, or subsequent)⁵ • Crankshaft Gear Bolts	Design Change Design Change Design Change	X X X	X

Table C-1. Mandatory Overhaul Replacement Parts

REPLACEMENT ITEMS	SPECIAL CONDITIONS	100% REPLACEMENT	MANDATORY REPLACEMENT AT ENGINE OVERHAUL
Crankshaft Gears, continued			
• Crankshaft Alternator Face Gear Bolts			X
• Crankshaft Alternator Face Gear Lock Plates		X	
Cylinder Deck Stud Nuts and Through Bolt Nuts			X
Engine Baffles (see Baffles)	Repairable		X
Engine Mounted Accessories ¹	Replace On Condition		X
Exhaust Nuts		X	
Exhaust Valves and Rotocoils			X
FADEC			X
• Electronic Control Units			X
• Engine Low Voltage Harness (including EGT and CHT sensors)			X
• Fuel Filter			X
• Fuel Injectors			X
• Fuel Pressure Sensors			X
• Manifold Air Pressure Sensors			X
• Oil Pressure Sensor, if equipped			X
• Oil Temperature Sensor, if equipped			X
• Signal Conditioner, if equipped			X
• Speed Sensor			X
• Turbine Inlet Temperature Sensor(s), if equipped			X
Filters, replaceable (air, oil, fuel, magneto), if equipped	Replace On Condition		X
Flexible Baffle Seal		X	
Fuel Systems			X
Fuel Pump Drive Coupling (P/N 631263 must be replaced with P/N 653359, or subsequent part number) ⁶ on all IO520B, BA, BB, C, CB, M, MB, N, NB; TSIO520B, BB, BE, D, DB, E, EB, J, JB, K, KB, L, LB, N, NB, UB, VB, WB; IO550A, B, C, G, N, P, R; TSIO550A, B, C, E; TSIO550A, B, C	Design Change	X	
Gaskets		X	
Hoses	Replace On Condition		X
Hydraulic Lifters (tappets)			X
Ignition System Harness			X
Intake Valves	Replace On Condition		
Lock Washers		X	
Magnetos			X
• Magneto Rubber Drive Bushings			X
"O" Rings		X	
Oil Pump Gears (O-300, IO-360, TSIO-360 and LTSIO-360 Series) ⁷	Design Change	X	
Oil Suction Screens (360 series P/Ns 649470, 649471, 652669, 652670 must be replaced with current part number) ⁷	Design Change	X	
Oil Suction Screens (C-125, C-145 and O-300 series P/N 633272 must be replaced with current part number) ⁷	Design Change	X	
Packings		X	
Pistons			X
• Pins			X
• Rings			X

Table C-1. Mandatory Overhaul Replacement Parts

REPLACEMENT ITEMS	SPECIAL CONDITIONS	100% REPLACEMENT	MANDATORY REPLACEMENT AT ENGINE OVERHAUL
Intake Valve Rotocoils (except all E-series, O-470, IO-470, IO-520 / 550, TSIO-520 / 550 TSIOL-550 and GTSIO-520 engines) ⁸	Design Change	X	
Rocker Shafts			X
Rocker Shaft Thrust Washers			X
Rotocoils, Exhaust			X
Safety Wire		X	
Seals		X	
Self Locking Nuts		X	
Snap Rings		X	
Solid Valve Spring Retainers			X
Spark Plugs	Replace On Condition		X
Starter ⁴			X
• Starter Adapter Assemblies (replace all GTSIO520 with EQ6642) ⁹	Design Change	X	
Turbochargers			X
• All Controllers			X
• Bypass Valve			X
• Exhaust Clamps			X
• Exhaust System			X
• Oil Supply Valves			X
• Return Check Valves			X
• Snap Rings			X
• Wastegate			X
Valve Keepers (intake/exhaust)			X
Valve Springs (inner/outer)			X
Woodruff Keys ¹⁰		X	

- ✱ 1. Engine mounted accessories must be maintained and overhauled at engine overhaul, or more frequently, in accordance with the manufacturer's instructions.
2. Reference Critical Service Bulletin CSB96-13 (or latest revision)
3. Reference Section 10-9.1 (was SB00-3) for Permold engine models. For Sandcast engines, replace crankshaft gear according to instructions in SB08-12.
4. Reference Service Bulletin SB14-2 (or latest revision)
5. Reference Service Bulletin SB13-6 (or latest revision)
6. Reference Mandatory Service Bulletin MSB 95-6 (or latest revision)
7. Reference Service Bulletin SB96-4 (or latest revision)
8. Replace intake valve rotocoils with solid valve spring retainers on all E-series O-470, IO-470, IO-520/550, IOF550, TSIO-520/550, TSIOL-550, TSIOF550, and GTSIO-520 engines.
9. Reference Service Bulletin MSB94-4 (or latest revision). Overhaul is prohibited on starter adapters with scavenge pump, P/N 658440. On GTSIO-520; all EQ6642 starter adapter assemblies (both new and factory rebuilt) include new torsional damper, starter adapter shaftgear, and crankshaft gear.
10. Reference the manufacturer's primary ICAs for all alternators.