

**2009-26-12 Engine Components, Inc. (ECi):** Amendment 39-16151. Docket No. FAA-2008-0052; Directorate Identifier 2008-NE-01-AD.

**Effective Date**

(a) This airworthiness directive (AD) becomes effective February 4, 2010.

**Affected ADs**

(b) This AD supersedes AD 2008-19-05, Amendment 39-15672.

**Applicability**

(c) If your engine has not been overhauled, or not had any cylinder assemblies replaced since new, no further action is required.

(d) This AD applies to the Lycoming Engines (formerly Textron Lycoming) models 320, 360, and 540 series, "Parallel Valve," reciprocating engines listed in Table 1 of this AD, with ECi cylinder assembly, part number (P/N) AEL65102 series "Titan," and with cylinder head, P/N AEL85099, installed.

(1) The applicable cylinder assembly serial numbers (S/Ns) are S/N 1138-02 through S/N 35171-22 (referred to in this AD as Group "A" cylinder assemblies); and

(2) S/N 35239-01 through S/N 42179-30 (referred to in this AD as Group "B" cylinder assemblies).

(3) The cylinder assembly P/N is at the crankcase end of the cylinder assembly, and might be difficult to see. As a guide in determining if your cylinder assemblies are affected, all affected cylinder assemblies have cylinder head P/N AEL85099. The cylinder head P/N is at the top of the cylinder head, near the intake and exhaust valve springs, and is easier to locate than the cylinder assembly P/N.

(4) The set of numbers appearing on the cylinder, above and to the left of the S/N, in the form of "123456" is not used for determining this AD's applicability.

**Table 1--Engine Models**

<b>Cylinder Assembly Part Number:</b>	<b>Installed on Engine Models:</b>
AEL65102-NST04	<p><b>O-320</b>-A1B, A2B, A2C, A2D, A3A, A3B, B2B, B2C, B2D, B2E, B3B, B3C, C2B, C2C, C3B, C3C, D1A, D1AD, D1B, D1C, D1D, D1F, D2A, D2B, D2C, D2F, D2G, D2H, D2J, D3G, E1A, E1B, E1C, E1F, E1J, E2A, E2B, E2C, E2D, E2E, E2F, E2G, E2H, E3D, E3H</p> <p><b>IO-320</b>-A1A, A2A, B1A, B1B, B1C, B1D, B1E, B2A, D1A, D1AD, D1B, D1C, E1A, E1B, E2A, E2B</p>

	<p><b>AEIO-320-D1B, D2B, E1A, E1B, E2A, E2B</b></p> <p><b>AIO-320-A1A, A1B, A2A, A2B, B1B, C1B</b></p> <p><b>LIO-320-B1A</b></p>
AEL65102-NST05	<p><b>IO-320-C1A, C1B, C1F, F1A</b></p> <p><b>LIO-320-C1A</b></p>
AEL65102-NST06	<p><b>O-320-A1A, A2A, A2B, A2C, A3A, A3B, A3C, E1A, E1B, E2A, E2C, (also, an O-320 model with no suffix)</b></p> <p><b>IO-320-A1A, A2A</b></p>
AEL65102-NST07	<p><b>IO-320- B1A, B1B</b></p> <p><b>LIO-320- B1A</b></p>
AEL65102-NST08	<p><b>O-320-B1A, B1B, B2A, B2B, B3A, B3B, B3C, C1A, C1B, C2A, C2B, C3A, C3B, C3C, D1A, D1B, D2A, D2B, D2C</b></p>
AEL65102-NST10	<p><b>O-360-A1A, A1C, A1D, A2A, A2E, A3A, A3D, A4A, B1A, B1B, B2A, B2B, C1A, C1C, C1G, C2A, C2B, C2C, C2D, D1A, D2A, D2B</b></p> <p><b>IO-360-B1A, B1B, B1C</b></p> <p><b>HO-360-A1A, B1A, B1B</b></p> <p><b>HIO-360-B1A, B1B</b></p> <p><b>AEIO-360-B1B</b></p> <p><b>O-540-A1A, A1A5, A1B5, A1C5, A1D, A1D5, A2B, A3D5, A4A5, A4B5, A4C5, A4D5, B1A5, B1B5, B1D5, B2A5, B2B5, B2C5, B4A5, B4B5, D1A5, E1A, E4A5, E4B5, E4C5, F1A5, F1B5, G1A5, G2A5</b></p> <p><b>IO-540-C1B5, C1C5, C2C, C4B5, C4B5D, C4C5, D4A5, D4B5, N1A5</b></p>
AEL65102-NST12	<p><b>O-360- A1A, A1AD, A1D, A1F, A1F6, A1F6D, A1G, A1G6, A1G6D, A1H, A1H6, A1J, A1LD, A1P, A2A, A2D, A2F, A2G, A2H, A3A, A3AD, A3D, A4A, A4AD, A4D, A4G, A4J, A4JD, A4K, A4M, A4N, A4P, A5AD, B1A, B2C, C1A, C1C, C1E, C1F, C1G, C2A, C2B, C2C, C2D, C2E, C4F, C4P, D2A, F1A6, G1A6</b></p> <p><b>HO-360 –C1A</b></p> <p><b>LO-360-A1G6D, A1H6</b></p>

	<p><b>HIO-360-B1A, B1B, G1A</b></p> <p><b>LTO-360-A1A6D</b></p> <p><b>TO-360-A1A6D</b></p> <p><b>IO-360-B1B, B1BD, B1D, B1E, B1F, B1F6, B1G6, B2E, B2F, B2F6, B4A, E1A, L2A, M1A, M1B</b></p> <p><b>AEIO-360-B1B, B1D, B1E, B1F, B1F6, B1G6, B1H, B2F, B2F6, B4A, H1A, H1B</b></p> <p><b>O-540-A4D5, B2B5, B2C5, B2C5D, B4B5, B4B5D, E4A5, E4B5, E4C5, G1A5, G2A5, H1A5, H1A5D, H1B5, H1B5D, H2A5, H2A5D, H2B5D</b></p> <p><b>IO-540-C4B5, C4B5D, C4D5, C4D5D, D4A5, D4B5, D4C5, N1A5, N1A5D, T4A5D, T4B5, T4B5D, T4C5D, V4A5, V4A5D</b></p> <p><b>AEIO-540-D4A5, D4B5, D4C5, D4D5</b></p>
AEL65102-NST26	<p><b>IO-540-J4A5, R1A5</b></p> <p><b>TIO-540-C1A, E1A, G1A, H1A</b></p>
AEL65102-NST38	<p><b>IO-360-F1A</b></p> <p><b>TIO-540-AA1AD, AB1AD, AB1BD, AF1A, AG1A, AK1A, C1A, C1AD, K1AD</b></p> <p><b>LTIO-540-K1AD</b></p>
AEL65102-NST43	<p><b>O-360-J2A</b></p> <p><b>O-540-F1B5, J1A5D, J1B5D, J1C5D, J1D5D, J2A5D, J2B5D, J2C5D, J2D5D, J3A5, J3A5D, J3C5D</b></p> <p><b>IO-540-AB1A5, W1A5, W1A5D, W3A5D</b></p>
AEL65102-NST44	<p><b>O-540-L3C5D</b></p>

The Lycoming Engines (formerly Textron Lycoming) models 320, 360, and 540 series, "Parallel Valve", reciprocating engines are installed on, but not limited to, the aircraft listed in the following Table 2:

**Table 2--Engines Installed on, but Not Limited To**

<b>Engine Models:</b>	<b>Installed on , But Not Limited To:</b>
-----------------------	---

O-320-A1A	<p>Piper Aircraft: Tri-Pacer (PA-22 “150”, PA-22S “150”), Apache (PA-23), Pawnee (PA-25)</p> <p>Doyn Aircraft: Doyn-Cessna (170, 170A, 170B)</p> <p>Mooney Aircraft: Mark (20A)</p> <p>Dinfia: Ranquel (1A-46)</p> <p>Simmering-Graz Pauker: Flamingo (SGP-M-222)</p> <p>Aviamilano: Scricciolo (P-19)</p> <p>Vos Helicopter Co.: Spring Bok</p>
O-320-A1B	<p>Piper Aircraft: Tri-Pacer (PA-22 “150”, PA-22S “150”), Apache (PA-23)</p> <p>Doyn Aircraft: Doyn-Cessna (170, 170A, 170B)</p> <p>S.O.C.A.T.A.: Horizon (Gardan)</p>
O-320-A2A	<p>Piper Aircraft: Tri-Pacer (PA-22 “150”, PA-22S “150”), Agriculture (PA-18A “150”), Super Cub (PA -18 “150”), Caribbean (PA-22 “150”), Pawnee (PA-25)</p> <p>Intermountain Mfg. Co.: Call Air Texas (A-5, A-5T)</p> <p>Lake Aircraft: Colonial (C-1)</p> <p>Rawdon Bros.: Rawdon (T-1, T-15, T-15D)</p> <p>Shinn Engineering: Shinn (2150-A)</p> <p>Dinfia: Ranquel (1A)46)</p> <p>Neiva: (1PD-5802)</p> <p>Sud: Gardan-Horizon (GY-80)</p> <p>LaVerda: Falco (F8L Series II, America)</p> <p>Malmo: Vipar (MF1-10)</p>
	<p>Kingsford Smith: Autocrat (SCRM-153)</p> <p>Aero Commander: 100</p>

O-320-A2B	<p>Piper Aircraft: Tri-Pacer (PA-22 “150”, PA-22S “150”), Cherokee (PA-28 “150”), Super Cub (PA -18 “150”)</p> <p>Champion Aircraft: Challenger (7GCA, 7GCB, 7KC), Citabria (7GCAA, 7GCRC), Agriculture (7GCBA)</p> <p>Beagle: Pup (150)</p> <p>Artic: Interstate S1B2</p> <p>Robinson: R-22</p> <p>Varga: Kachina 2150A</p>
O-320-A2C	<p>Robinson: R-22</p> <p>Cicare: Cicare AG</p> <p>Bellanca Aircraft: Citabria 150 (7GCAA), Citabria 150S (7GCBC)</p>
O-320-A2D	Piper Aircraft: Apache (PA-23)
O-320-A3A	<p>Doyn Aircraft: Doyn-Cessna (170, 170A, 170B)</p> <p>Corben-Fettes: Globe Special (Globe GC-1B)</p>
O-320-A3B	<p>Piper Aircraft: Apache (PA-23)</p> <p>Doyn Aircraft: Doyn-Cessna (170, 170A, 170B)</p> <p>Teal II: TSC (1A2)</p>
O-320-B1A	<p>Piper Aircraft: Apache (PA-23 “160”)</p> <p>Doyn Aircraft: Doyn-Cessna (170, 170A, 170B)</p> <p>Malmo: Vipar (MF1-10)</p>
O-320-B1B	<p>Piper Aircraft: Apache (PA-23 “160”)</p> <p>Doyn Aircraft: Doyn-Cessna (170, 170A, 170B)</p>
O-320-B2A	Piper Aircraft: Tri-Pacer (PA-22 “160”, PA-22S “160”)
O-320-B2B	<p>Piper Aircraft: Tri-Pacer (PA-22 “160”, PA-22S “160”)</p> <p>Beagle: Airedale (D5-160)</p>
	<p>Fuji-Heavy Industries: Fuji (F-200)</p> <p>Uirapuru: Aerotec 122</p>
O-320-B2C	Robinson: R-22
O-320-B2D	Maule: MX-7-160
O-320-B2E	Lycon

O-320-B3A	Piper Aircraft: Apache (PA-23 “160”) Doyn Aircraft: Doyn-Cessna (170, 170A, 170B)
O-320-B3B	Piper Aircraft: Apache (PA-23 “160”) Doyn Aircraft: Doyn-Cessna (170, 170A, 170B) Sud: Gardan (GY80-160)
O-320-C1A	Piper Aircraft: Apache (PA-23 “160”) Riley Aircraft: Rayjay (Apache)
O-320-C1B	Piper Aircraft: Apache (PA-23 “160”)
O-320-C3A	Piper Aircraft: Apache (PA-23 “160”)
O-320-C3B	Piper Aircraft: Apache (PA-23 “160”)
O-320-D1A	Sud: Gardan (GY-80) Gyroflug: Speed Cancard Grob: G115
O-320-D1F	Slingsby: T67 Firefly
O-320-D2A	Piper Aircraft: Cherokee (PA-28S “160”) Robin: Major (DR400-140B), Chevalier (DR-360), (R-3140) S.O.C.A.T.A.: Tampico TB9 Slingsby: T67C Firefly Daetwyler: MD-3-160 Nash Aircraft Ltd.: Petrel Aviolight: P66D Delta General Avia: Pinguino
O-320-D2B	Beech Aircraft: Musketeer (M-23) Piper Aircraft: Cherokee (PA-28 “160”)
O-320-D2J	Cessna Aircraft: Skyhawk 172
O-320-D3G	Piper Aircraft: Warrior II, Cadet (PA-28-161)
O-320-E1A	Grob: G115
O-320-E1C	M.B.B. (Messerschmitt-Boelkow-Blohm): Monsun (BO-209-B)
O-320-E1F	M.B.B.: Monsun (BO-209-B)

O-320-E2A	<p>Piper Aircraft: Cherokee (PA-28 “140”, PA-28 “150”)</p> <p>Robin: Major (DR-340), Sitar, Bagheera (GY-100-135)</p> <p>S.O.C.A.T.A.: Super Rallye (MS-886), Rallye Commodore (MS-892)</p> <p>Siai-Marchetti: (S-202)</p> <p>F.F.A.: Bravo (AS-202/15)</p> <p>Partenavia: Oscar (P66B), Bucker (131 APM)</p> <p>Aeromot: Paulistina P-56</p> <p>Pezetel: Koliber 150</p>
O-320-E2C	<p>Beech Aircraft: Musketeer III (M -23III)</p> <p>M.B.B.: Monsun (BO-209-B)</p>
O-320-E2D	Cessna Aircraft: Cardinal (172-I, 177)
O-320-E2F	M.B.B.: Monsun (BO-209-B), Wassmer Pacific (WA-51)
O-320-E2G	American Aviation Corp.: Traveler
O-320-E3D	<p>Piper Aircraft: Cherokee (140)</p> <p>Beech Aircraft: Sport</p>
IO-320-B2A	Piper Aircraft: Twin Comanche (PA-30)
IO-320-B1C	Hi. Shear: Wing
IO-320-B1D	Ted Smith Aircraft: Aerostar
IO-320-C1A	Piper Aircraft: Twin Comanche (PA-30 Turbo)
IO-320-D1A	M.B.B.: Monsun (BO-209-C)
IO-320-D1B	M.B.B.: Monsun (BO-209-C)
IO-320-E1A	M.B.B.: Monsun (BO-209-C)
IO-320-E1B	Bellanca Aircraft
IO-320-E2A	Champion Aircraft: Citabria
IO-320-E2B	Bellanca Aircraft
IO-320-F1A	CAAR Engineering: Carr Midget
LIO-320-B1A	Piper Aircraft: Twin Comanche (PA-39)
LIO-320-C1A	Piper Aircraft: Twin Comanche (PA-39)
AIO-320-B1B	M.B.B.: Monsun (BO-209-C)
AEIO-320-D1B	Slingsby: T67M Firefly
AEIO-320-D2B	Hundustan Aeronautics Ltd.: HT-2
AEIO-320-E1A	<p>Bellanca Aircraft</p> <p>Champion Aircraft</p>

AEIO-320-E1B	<p>Bellanca Aircraft</p> <p>Champion Aircraft: Decathalon (8KCAB-CS)</p>
AEIO-320-E2B	<p>Bellanca Aircraft</p> <p>Champion Aircraft: Decathalon (8KCAB)</p>
O-320-A1A	<p>Riley Aircraft: Riley Twin</p>
O-360-A1A	<p>Beech Aircraft: Travel Air (95, B-95)</p> <p>Piper Aircraft: Comanche (PA-24)</p> <p>Intermountain Mfg. Co.: Call Air (A-6)</p> <p>Lake Aircraft: Colonial (C-2, LA -4, 4A or 4P)</p> <p>Doyn Aircraft: Doyn-Cessna (170B, 172, 172A, 172B)</p> <p>Mooney Aircraft: Mark “20B” (M-20B)</p> <p>Earl Horton: Pawnee (Piper PA-25)</p> <p>Dinfia: Ranquel (1A-51)</p> <p>Neiva: (1PD-5901)</p> <p>Regente: (N-591)</p> <p>Wassmer: Super 4 (WA-50A), Sancy (WA-40), Baladou (WA-40), Pariou (WA-40)</p> <p>Sud: Gardan (GY-180)</p> <p>Bolkow: (207)</p>



	Partenavia: Oscar (P-66) Siai-Marchetti: (S-205) Procaer: Picchio (F-15-A) S.A.A.B.: Safir (91-D) Malmo: Vipar (MF-10B) Aero Boero: AB-180 Beagle: Airedale (A-109) DeHavilland: Drover (DHA-3MK3) Kingsford-Smith: Bushmaster (J5-6) Aero Engine Service Ltd.: Victa (R-2)
O-360-A1AD	S.O.C.A.T.A.: Tabago TB-10
O-360-A1D	Piper Aircraft: Comanche (PA-24) Lake Aircraft: Colonial (LA -4, 4A or 4P) Doyn Aircraft: Doyn-Beech (Beech 95) Mooney Aircraft: Master "21" (M-20E), Mark "20B", "20D", (M20B, M20C), Mooney Statesman (M-20G) Dinfia: Querandi (1A-45) Wassmer: (WA-50) Malmo: Vipar (MF1-10) Cessna Aircraft: Skyhawk Doyn Aircraft: Doyn-Piper (PA-23 "160")
O-360-A1F6	Cessna Aircraft: Cardinal
O-360-A1F6D	Cessna Aircraft: Cardinal 177 Teal III: TSC (1A3)
O-360-A1G6	Aero Commander
O-360-A1G6D	Beech Aircraft: Duchess 76
O-360-A1H6	Piper Aircraft: Seminole (PA-44)
O-360-A1LD	Wassmer: Europa WA-52
O-360-A1P	Aviat: Husky

O-360-A2A	Center Est Aeronautique: Regente (DR-253) S.O.C.A.T.A.: Rallye Commodore (MS-893) Societe Aeronautique Normande: Mousquetaire (D-140) Bolkow: Klemm (K1-107C) Partenavia: Oscar (P-66) Beagle: Husky (D5-180) (J1-U)
O-360-A2D	Piper Aircraft: Comanche (PA-24), Cherokee "C" (PA-28 "180") Mooney Aircraft: Master "21" (M-20D), Mark "21" (M-20E)
O-360-A2E	Std. Helicopter
O-360-A2F	Aero Commander: Lark (100) Cessna Aircraft: Cardinal
O-360-A2G	Beech Aircraft: Sport
O-360-A3A	C.A.A.R.P.S.A.N.: (M-23III) Societe Aeronautique Normande: Jodel (D-140C) Robin: Regent (DR400/180), Remorqueur (DR400/180R), R-3170 S.O.C.A.T.A.: Rallye 180GT, Sportavia Sportsman (RS-180) Norman Aeroplance Co.: NAC-1 Freelance Nash Aircraft Ltd.: Petrel
O-360-A3AD	S.O.C.A.T.A.: TB-10 Robin: Aiglon (R-1180T)
O-360-A4A	Piper Aircraft: Cherokee "D" (PA-28 "180")
O-360-A4D	Varga: Kachina
O-360-A4G	Beech Aircraft: Musketeer Custom III
O-360-A4K	Grumman American: Tiger Beech Aircraft: Sundowner 180
O-360-A4M	Piper Aircraft: Archer II (PA-28 "18") Valmet: PIK-23
O-360-A4N	Cessna Aircraft: 172 (Optional)
O-360-A4P	Penn Yan: Super Cub Conversion
O-360-A5AD	C. Itoh and Co.: Fuji FA-200

O-360-B2C	Seabird Aviation: SB7L
O-360-C1A	Intermountain Mfg. Co.: Call Air (A-6)
O-360-C1E	Bellanca Aircraft: Scout (8GCBC-CS)
O-360-C1F	Maule: Star Rocket MX-7-180
O-360-C1G	Christen: Husky (A-1)
O-360-C2B	Hughes Tool Co.: (269A)
O-360-C2D	Hughes Tool Co.: (269A)
O-360-C2E	Hughes Tool Co.: (YHO-2HU) Military  Bellanca Aircraft: Scout (8GCBC FP)
O-360-C4F	Maule: MX-7-180A
O-360-C4P	Penn Yan: Super Cub Conversion
O-360-F1A6	Cessna Aircraft: Cutlass RG
O-360-J2A	Robinson: R22
IO-360-B1A	Beech Aircraft: Travel-Air (B-95A)  Doyn Aircraft: Doyn-Piper (PA-23 “200”)
IO-360-B1B	Beech Aircraft: Travel-Air (B-95B)  Doyn Aircraft: Doyn-Piper (PA-23 “200”)  Fuji: (FA-200)
IO-360-B1D	United Consultants: See-Bee
IO-360-B1E	Piper Aircraft: Arrow (PA-28 “180R”)
IO-360-B1F	Utva: 75
IO-360-B2E	C.A.A.R.P. C.A.P. (10)
IO-360-B1F6	Great Lakes: Trainer
IO-360-B1G6	American Blimp: Spector 42
IO-360-B2F6	Great Lakes: Trainer
LO-360-A1G6D	Beech Aircraft: Duchess
LO-360-A1H6	Piper Aircraft: Seminole (PA-44)
IO-360-E1A	T.R. Smith Aircraft: Aerostar
IO-360-L2A	Cessna Aircraft: Skyhawk C-172
IO-360-M1A	Diamond Aircraft: DA-40
IO-360-M1B	Vans Aircraft: RV6, RV7, RV8  Lancair: 360
AEIO-360-B1F	F.F.A.: Bravo (200)  Grob: G115/Sport-Acro
AEIO-360-B1G6	Great Lakes
AEIO-360-B2F	Mundry: CAP-10

AEIO-360-B4A	Pitts: S-1S
AEIO-360-H1A	Bellanca Aircraft: Super Decathlon (8KCAB-180)
AEIO-360-H1B	American Champion: Super Decathlon
VO-360-A1A	Brantly Hynes Helicopter: (B-2)
VO-360-A1B	Brantly Hynes Helicopter: (B-2, B2-A). Military (YHO-3BR)
VO-360-B1A	Brantly Hynes Helicopter: (B-2, B2-A)
IVO-360-A1A	Brantly Hynes Helicopter: (B2-B)
HO-360-B1A	Hughes Tool Co.: (269A)
HO-360-B1B	Hughes Tool Co.: (269A)
HO-360-C1A	Schweizer: (300C)
HIO-360-B1A	Hughes Tool Co.: Military (269-A-1), (TH-55A)
HIO-360-B1B	Hughes Tool Co.: (269A)
HIO-360-G1A	Schweizer: (CB)
O-540-A1A	Rhein-Flugzeugbau: (RF-1)
O-540-A1A5	Piper Aircraft: Comanche (PA-24 "180")  Helio: Military (H-250)  Yoeman Aviation: (YA-1)
O-540-A1B5	Piper Aircraft: Aztec (PA-23 "250"), Comanche (PA-24 "250")
O-540-A1C5	Piper Aircraft: Comanche (PA-24 "250")
O-540-A1D	Found Bros.: (FBA-2C)  Dornier: (DO-28-B1)
O-540-A1D5	Piper Aircraft: Aztec (PA-23 "250"), Comanche (PA-24 "250"), Military Aztec (U-11A)  Dornier: (DO-28)
O-540-A2B	Aero Commander: (500)  Mid-States Mfg. Co.: Twin Courier (H-500), (U-5)
O-540-A3D5	Piper Aircraft: Navy Aztec (PA-23 "250")
O-540-B1A5	Piper Aircraft: Apache (PA-23 "235")
O-540-B1B5	Piper Aircraft: Comanche (PA-24 "250")  Doyn Aircraft: Doyn-Piper (PA-24 "250")
O-540-B1D5	Wassmer: (WA-421)

O-540-B2B5	<p>Piper Aircraft: Pawnee (PA-25 “235”), Cherokee (PA-28 “235”), Aztec (PA-23 “235”)</p> <p>Intermountain Mfg. Co.: Call Air (A-9)</p> <p>Rawdon Bros.: Rawdon (T-1)</p> <p>S.O.C.A.T.A.: Rallye 235CA</p>
O-540-B2C5	Piper Aircraft: Pawnee (PA-25 “235”)
O-540-B4B5	<p>Piper Aircraft: Cherokee (PA-28 “235”)</p> <p>Embraer: Corioca (EMB-710)</p> <p>S.O.C.A.T.A.: Rallye 235GT, Rallye 235C</p> <p>Maule: Star Rocket (MX-7-235), Super Rocket (M-6-235), Super Std. Rocket (M-7-235)</p>
O-540-E4A5	<p>Piper Aircraft: Comanche (PA-24 “260”)</p> <p>Aviamilano: Flamingo (F-250)</p> <p>Siai-Marchetti: (SF-260), (SF-208)</p>
O-540-E4B5	<p>Britten-Norman: (BN-2)</p> <p>Piper Aircraft: Cherokee Six (PA-32 “260”)</p>
O-540-E4C5	Pilatus Britten-Norman: Islander (BN-2A-26), Islander (BN-2A-27), Islander II (BN-2B-26), Islander (BN-2A-21), Trislander (BN-2A-Mark III-2)
O-540-F1B5	<p>Omega Aircraft: (BS-12D1)</p> <p>Robinson: (R-44)</p>
O-540-G1A5	Piper Aircraft: Pawnee (PA-25 “260”)
O-540-H1B5D	Aero Boero: 260
O-540-H2A5	<p>Embraer: Impanema “AG”</p> <p>Gippsland: GA-200</p>
O-540-H2B5D	Aero Boero: 260
O-540-J1A5D	Maule: Star Rocket (MX-7-235), Super Rocket (M-6-235), Super Std. Rocket (M-7-235)
O-540-J3A5	Robin: R-3000/235
O-540-J3A5D	Piper Aircraft: Dakota (PA-28-236)
O-540-J3C5D	Cessna Aircraft: Skylane RG
O-540-L3C5D	Cessna Aircraft: TR-182, Turbo Skylane RG
IO-540-C1B5	Piper Aircraft: Aztec B (PA-23 “250”), Comanche (PA-24 “250”)
IO-540-C1C5	Riley Aircraft: Turbo-Rocket

IO-540-C4B5	Piper Aircraft: Aztec C (PA-23 “250”), Aztec F  Wassmer: (WA4-21)  Avions Pierre Robin: (HR100/250)  Bellanca Aircraft: Aries T-250  Aerofab: Renegade 250
IO-540-C4D5	S.O.C.A.T.A.: TB-20
IO-540-C4D5D	S.O.C.A.T.A.: Trinidad TB-20
IO-540-D4A5	Piper Aircraft: Comanche (PA-24 “260”)  Siai-Marchetti: (SF-260)
IO-540-D4B5	Cerva: (CE-43 Guepard)
IO-540-J4A5	Piper Aircraft: Aztec (PA-23 “250”)
IO-540-R1A5	Piper Aircraft: Comanche (PA-24)
IO-540-T4A5D	General Aviation: Model 114
IO-540-T4B5	Commander: 114B
IO-540-T4B5D	Rockwell: 114
IO-540-T4C5D	Lake Aircraft: Seawolf
IO-540-V4A5	Maule: MT-7-260, M -7-260  Aircraft Manufacturing Factory
IO-540-V4A5D	Brooklands: Scoutmaster
IO-540-W1A5	Maule: MX-7-235, MT-7-235, M7-235
IO-540-W1A5D	Maule: Star Rocket (MX-7-235), Super Rocket (M-6-235), Super Std. Rocket (M-7-235)
IO-540-W3A5D	Schweizer: Power Glider
AEIO-540-D4A5	Christen: Pitts (S-2S), S-2B)  Siai-Marchetti: SF-260  H.A.L.: HPT-32  Slingsby: Firefly T3A
AEIO-540-D4B5	Moravan: Zlin-50L  H.A.L.: HPT-32
AEIO-540-D4D5	Burkhart Grob: Grob G, 115T Aero
TIO-540-C1A	Piper Aircraft: Turbo Aztec (PA-23-250)
TIO-540-K1AD	Piper Aircraft
TIO-540-AA1AD	Aerofab Inc.: Turbo Renegade (270)
TIO-540-AB1AD	S.O.C.A.T.A.: Trinidad TC TB-21

TIO-540-AB1BD	Schweizer
TIO-540-AF1A	Mooney Aircraft: "TLS" M20M
TIO-540-AG1A	Commander Aircraft: 114TC
TIO-540-AK1A	Cessna Aircraft: Turbo Skylane T182T
LTIO-540-K1AD	Piper Aircraft

### **Unsafe Condition**

(e) This AD results from reports of 10 additional cylinder head separations since issuing AD 2008-19-05, on cylinder S/Ns not listed in that AD. We are issuing this AD to prevent loss of engine power due to cracks at the head-to-barrel interface in the cylinder assemblies and possible engine failure caused by separation of a cylinder head, which could result in loss of control of the aircraft.

### **Compliance**

(f) You are responsible for having the actions required by this AD performed within the compliance times specified unless the actions have already been done.

### **Engines Overhauled or Cylinder Assemblies Replaced Since New**

(g) If your engine was overhauled or had a cylinder assembly replaced since new, do the following:

(1) Before further flight, inspect the maintenance records and engine logbook to determine if the overhaul or repair facility installed ECi cylinder assemblies, P/N AEL65102, with cylinder head, PN AEL85099, S/N 1138-02 through S/N 35171-22, or S/N 35239-01 through S/N 42179-30, in your engine.

(2) If your cylinder assemblies are not ECi, P/N AEL65102, no further action is required.

(3) If your cylinder assemblies are ECi, P/N AEL65102, but the S/N is not listed in this AD, no further action is required.

(4) If the cylinder assemblies are ECi, P/N AEL65102, and if the S/N is listed in this AD, do the following:

### **Group "A" Cylinder Assemblies; S/N 1138-02 Through S/N 35171-22**

(i) For Group "A" cylinder assemblies:

(A) Perform an initial visual inspection as specified in paragraphs (h) through (i) of this AD, and an initial compression test as specified in paragraphs (j) through (m) of this AD, within the next 10 operating hours time-in-service (TIS), if the cylinder assembly has 350 or more operating hours TIS on the effective date of this AD, but fewer than 2,000 operating hours TIS.

(B) Perform an initial visual inspection as specified in paragraphs (h) through (i) of this AD, and an initial compression test as specified in paragraphs (j) through (m) of this AD, within the next 10 operating hours TIS, or before exceeding 350 operating hours TIS, whichever occurs later, if the cylinder assembly has fewer than 350 operating hours TIS on the effective date of this AD.

(C) Replace cylinder assemblies installed in helicopter engines within the next 25 operating hours TIS after the effective date of this AD if the cylinder assembly has 1,500 operating hours TIS or more on

the effective date of this AD.

(D) Replace cylinder assemblies installed in airplane engines within the next 25 operating hours TIS after the effective date of this AD if the cylinder assembly has 2,000 operating hours TIS or more on the effective date of this AD.

(E) Perform repetitive visual inspections as specified in paragraphs (h) through (i) of this AD, and repetitive compression tests as specified in paragraphs (j) through (m) of this AD, within every 50 operating hours TIS.

(F) Replace cylinder assemblies installed in helicopter engines that pass the visual inspections and compression tests, no later than 1,500 operating hours TIS after the effective date of this AD.

(G) Replace cylinder assemblies installed in airplane engines that pass the visual inspections and compression tests, no later than 2,000 operating hours TIS after the effective date of this AD.

### **Group "B" Cylinder Assemblies; S/N 35239-01 through S/N 42179-30**

(ii) For Group "B" cylinder assemblies:

(A) Perform an initial visual inspection as specified in paragraphs (h) through (i) of this AD, and initial compression test as specified in paragraphs (j) through (l) of this AD, within the next 10 operating hours TIS.

(B) Replace the cylinder assembly within the next 25 operating hours TIS after the effective date of this AD if the cylinder assembly has 350 or more operating hours TIS on the effective date of this AD.

(C) Replace cylinder assemblies that pass the initial visual inspections and compression tests, before exceeding 350 operating hours TIS after the effective date of this AD.

### **Visual Inspection**

(h) Visually inspect each cylinder head around the exhaust valve side for cracks or any signs of black or white residue of combustion leakage from cracks.

(i) Replace cracked cylinder assemblies before further flight.

### **Cylinder Assembly Compression Test**

(j) Perform a standard cylinder differential compression test.

(k) During the compression test, if the cylinder pressure gauge reads below 70 pounds-per-square-inch, apply a water and soap solution to the side of the leaking cylinder, near the head-to-barrel interface.

(l) Replace the cylinder assembly before further flight if air leakage and bubbles are observed on the side of the cylinder assembly, near the head-to-barrel interface.

(m) For Group "A" cylinder assemblies only, repair or replace the engine cylinder assembly before further flight if the cause of the low gauge reading in paragraph (k) of this AD is from leaking intake or exhaust valves, or from leaking piston rings.



## **Prohibition of Group "B" ECi Cylinder Assemblies Affected by This AD**

(n) After the effective date of this AD, do not install any Group "B" ECi cylinder assembly, P/N AEL65102, onto any engine and do not attempt to repair or reuse Group "B" cylinder assemblies.

## **Alternative Methods of Compliance**

(o) The Manager, Special Certification Office, has the authority to approve alternative methods of compliance for this AD if requested using the procedures found in 14 CFR 39.19.

## **Special Flight Permits**

(p) Under 14 CFR 39.23, we will not approve special flight permits for this AD for engines that have failed the visual inspection or the cylinder assembly compression test required by this AD.

## **Related Information**

(q) Contact Peter W. Hakala, Aerospace Engineer, Special Certification Office, FAA, Rotorcraft Directorate, 2601 Meacham Blvd., Fort Worth, TX 76193; e-mail: [peter.w.hakala@faa.gov](mailto:peter.w.hakala@faa.gov); telephone (817) 222-5145; fax (817) 222-5785, for more information about this AD.

PREAMBLE