



Service Instruction

ENGINE COMPONENTS, INC.

S.I. No.: 03-2

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Title: Continuing Airworthiness and Installation Eligibility of ECi Angled Oil Filter Adapters for Lycoming Engines

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Technical Portions are FAA DER Approved.

- 1.0 **APPLICABILITY:** Engine Components, Inc. (ECi®) Angled Oil Filter Adapter is applicable to Lycoming 235, 290, 320, 360, 540, and 720 engines (except 76 series engines and dual magneto accessory cases) that have sufficient clearance for installation.
- 2.0 **BACKGROUND:** ECi has completed design documentation and endurance testing according to FAR Part 33.49 for a range of engine parts including replacement oil filter adapters for Lycoming engines. This Service Instruction details some features of the ECi angled oil filter adapter and documents its installation eligibility.
- 3.0 **FEATURES:**
 - 3.1 **Increased Filtration Capacity:** The ECi angled oil filter adapter is an alternative to the Lycoming straight oil filter adapter 77852, which in most applications requires the use of a short oil filter (such as Champion CH48110 or equivalent) that has reduced filtration capacity and life. The use of the ECi angled oil filter adapter allows the use of a long oil filter (such as Champion CH48109 or equivalent), which provides additional filtration capacity because of the increased volume of oil in contact with filtration media.
 - 3.2 **Oil Drain Plug:** The ECi angled oil filter adapter has a drain plug that is located on the bottom of the filter adapter to allow draining of the oil filter prior to removal. This helps prevent oil spills onto accessories during the oil changing process.
 - 3.3 **Customized Spacers:** Each engine installation has unique components that require special spacing to avoid engine mounts, magnetos, and other accessories. ECi has made three customized lengths of adapters that space the angled oil filter adapter back from the accessory case to assist in this area. In addition to using no spacer at all, there are: 2.50 inch spacer (AEL22776-025), 1.40 inch spacer (AEL22776-014), and 0.75 inch spacer (AEL22776-008).
- 4.0 **PARTS LIST:** The ECi angled oil filter adapter is sold in kits, which include all items needed to complete the installation (oil filter must be provided by the installer). The parts required for each installation kit are listed below.

Kit No.	Components	Lycoming Equivalent	Description	QTY
AEL105-1	AEL22772-1	N/A	Adapter Assy, Oil Filter	1
	AEL22778	N/A	Gasket, Oil Filter	1
	AE8001-4-1.00 ¹	STD-1856	1/4-20 x 1 Hex Cap Screw, SAE Grade 5 Steel	4
	AN960-416	N/A	Washer, Plain, 1/4 ID	4
	MS51413-4	N/A	Washer, Internal Star, 1/4 ID	4
	AELSTD294	STD-294	Gasket, Crush Washer	1
	AEL76510	76510	Gasket, Valve Assy	1
	MS20823-8D	N/A	Elbow, 45 Degree, Aluminum	1
	CCA-1550	N/A	Valve Assembly, Oil Drain	1
AEL106-1	AEL22776-008	N/A	Extension, Oil Filter Adapter	1
	AEL12795	LW-12795	Gasket, Oil Filter	2
	AE8001-4-1.75 ²	STD-2084	1/4-20 x 1-3/4 Hex Cap Screw, SAE Grade 5 Steel	4
AEL106-2	AEL22776-014	N/A	Extension, Oil Filter Adapter	1
	AEL12795	LW-12795	Gasket, Oil Filter	2
	AE8001-4-2.50 ³	N/A	1/4-20 x 2-1/2 Hex Cap Screw, SAE Grade 5 Steel	4
AEL106-3	AEL22776-025	N/A	Extension, Oil Filter Adapter	1
	AEL12795	LW-12795	Gasket, Oil Filter	2
	AE8001-4-3.50 ⁴	LW-25-3.50	1/4-20 x 3-1/2 Hex Cap Screw, SAE Grade 5 Steel	4

¹ This bolt is fabricated and purchased as ANSI B18.2.1 standard bolt (1/4-20 x 1 Hex Cap Screw, SAE Grade 5 Steel).

² This bolt is fabricated and purchased as ANSI B18.2.1 standard bolt (1/4-20 x 1-3/4 Hex Cap Screw, SAE Grade 5 Steel).

³ This bolt is fabricated and purchased as ANSI B18.2.1 standard bolt (1/4-20 x 2-1/2 Hex Cap Screw, SAE Grade 5 Steel).

⁴ This bolt is fabricated and purchased as ANSI B18.2.1 standard bolt (1/4-20 x 3-1/2 Hex Cap Screw, SAE Grade 5 Steel).



5.0 INSTALLATION ELIGIBILITY:

- 5.1 The ECi angled oil filter adapter is sold as a kit AEL105-1, which includes all components needed to complete installation of the basic oil filter adapter without extension spacers. However, depending upon the installation, the ECi angled oil filter adapter may need one or none of the customized spacer kits (AEL106-x) listed above. It is the responsibility of the installer to determine which extension best fits the particular engine installation.
- 5.2 The ECi angled oil filter adapter is eligible for installation on all Lycoming 235, 290, 320, 360, 540, and 720 series engines except 76 series engines (O-320-H2AD, O-360-E1A6D, etc.) and dual magneto engines (O-360-A1AD, A1F6D, A1LD, etc.).
- 5.3 The ECi angled oil filter adapter requires the use of a filter with an internal bypass valve, which ensures oil flow in the event the filter media is completely filled to capacity. Therefore, filters such as CH48109 (long) or CH48108 (short) having an internal bypass valve must be used. These filters have $\frac{3}{4}$ inch internal thread attachment.

6.0 INSTALLATION INSTRUCTIONS: Installation should be accomplished in accordance with the Lycoming Overhaul Manual and Advisory Circular 43.13-1 requirements. The following steps are helpful in adhering to these requirements.

- 6.1 If replacing an existing oil filter or screen adapter, remove all attaching components such as temperature probes and control valves (Vernatherm). Remove the old oil filter adapter or oil screen adapter and thoroughly clean the surface of gasket material. The surface must be clean and smooth to install the ECi angled oil filter adapter.
- 6.2 Visually inspect the oil filter mounting pad to confirm that the profile is the same as depicted in Figure 1. If your mounting pad does not conform to this figure, the ECi angled oil filter adapter may not be used.
 - 6.2.1 ECi angled oil filter adapters are not eligible for 76 series (O-320-H2AD, O-360-E1A6D, etc.) or dual magneto accessory cases (see Lycoming Overhaul Manuals for an explanation of the dual magneto designation).
 - 6.2.2 ECi extensions (AEL22776-xxx) are not valid for 235 series engines because of the unique oil supply issues in that engine series.
 - 6.2.3 Installation of the ECi angled oil filter adapter on IO-720 series engines requires the use of a special spacer (Lycoming part LW-12775), which should already be installed on the engine if a straight oil filter adapter was previously installed.

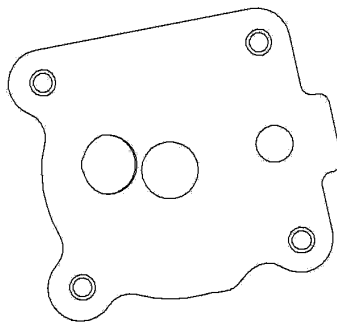


Figure 1: Accessory Case Oil Filter Pad



- 6.3 To ensure that you have the correct kit, temporarily assemble an oil filter and all adapters together and fit the assembly on your accessory case (see Figure 2). At least ½ inch clearance should be maintained from the firewall or any other structure on the aircraft or engine.

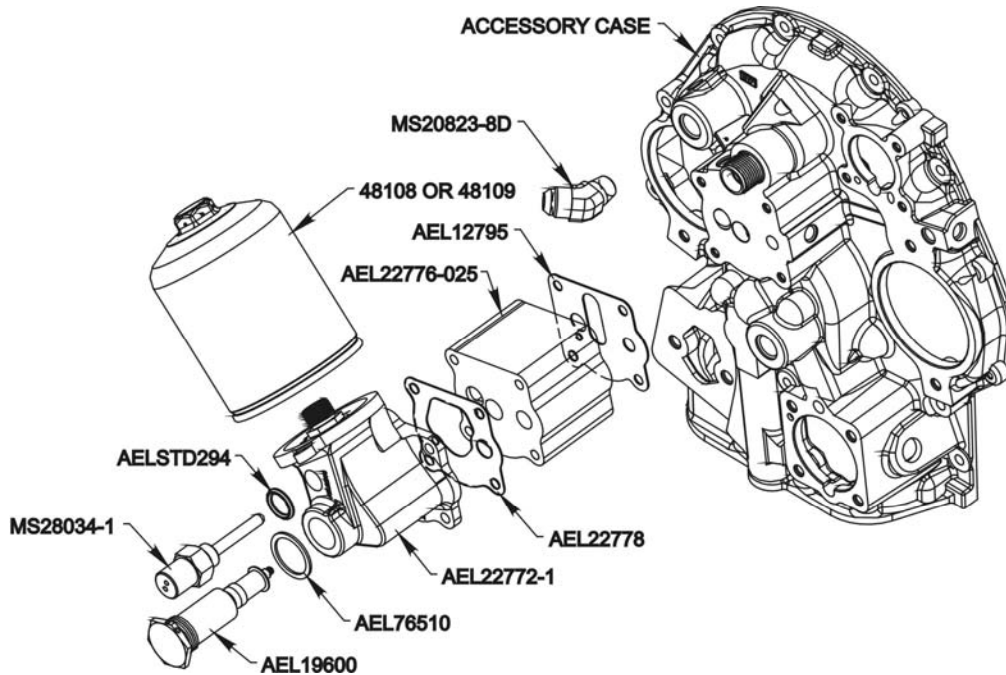


Figure 2: Assembly of ECi Angled Oil Filter Adapter and Components

WARNING: The AEL22778 gasket MUST be used between the AEL22772-1 adapter and the accessory case or the extension. Only the AEL22778 gasket has clearance for the AEL19600 temperature control valve to seat properly and perform satisfactorily.

- 6.3.1 If the assembly does not have sufficient clearance, contact ECi customer service for assistance in ordering the correct kit (see Figure 3 and Figure 4).
- 6.3.2 In order to accommodate the oil filter adapter, a 45° elbow must be installed in the oil cooler return (located above the left magneto). This elbow MS20823-8D is provided with each kit.
- 6.4 Remove the oil filter from the adapter, and install the ECi angled oil filter adapter and spacers using the enclosed gaskets, bolts, and washers. The installation should be accomplished according to the following.
- 6.4.1 Take care to ensure that the gasket is aligned precisely as indicated on its surface to ensure that no oil passages are obstructed.
- 6.4.2 Inspect the depth of the bolt holes thoroughly to ensure that they are clean, damage-free, and deep enough to fully seat the bolt on the adapter flange by hand. If the accessory case oil filter pad contains one or more studs, as is sometimes the case when the straight oil filter adapter is used, these may need to be removed prior to installation of the ECi oil filter adapter extensions. Great care should be exercised when performing this task in order to prevent breaking the stud or damaging threads on the oil filter pad. ECi recommends repairs be accomplished only by FAA-certified repair stations.

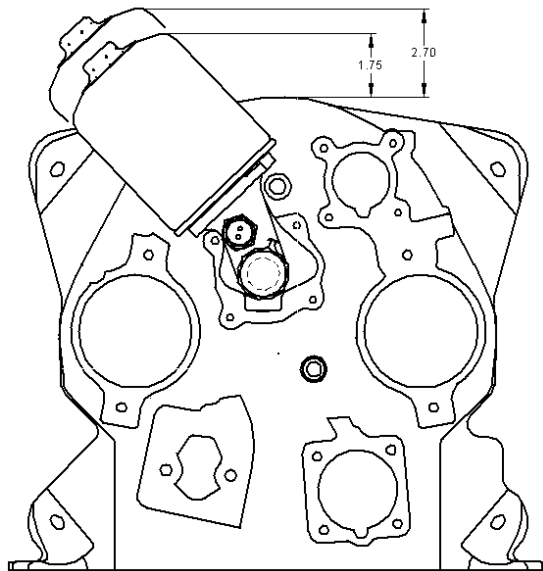


Figure 3: Filter Vertical Clearance Requirement

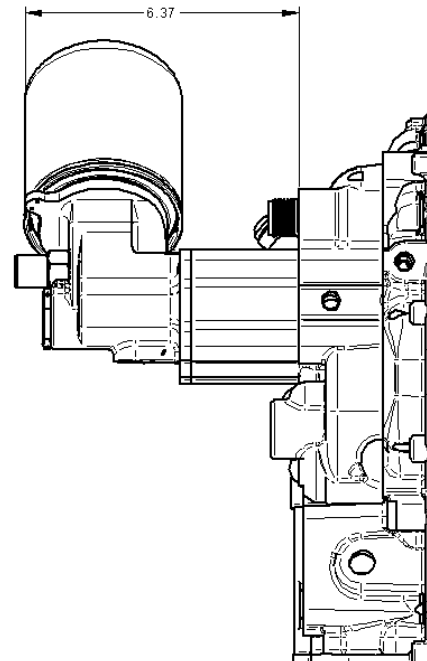


Figure 4: Filter Horizontal Clearance Requirement

6.5 Install the temperature control valve (ECi part number AEL19600) and the temperature probe (MS28034-1 or equivalent) using the gaskets provided and according to Lycoming Overhaul Manual torque requirements. Be certain to safety wire all components as required in the Lycoming Overhaul Manual and AC 43.13-1.

6.6 Lubricate the oil filter seal with clean engine oil or equivalent, install, and torque to 16–18 ft-lbs. DO NOT use dirty engine oil since this will make removal more difficult in the future.

NOTE: The ECi angled oil filter adapter does not have an internal bypass valve, so filter CH48109 (or CH48108) must be used! The eligible filters have $\frac{3}{4}$ inch diameter internal thread attachment.

6.7 Run the engine and confirm correct operation in accordance with Lycoming Overhaul Manual requirements. Be certain to safety wire oil filter according to the Lycoming Overhaul Manual and AC 43.13-1.

7.0 FILTER REMOVAL INSTRUCTIONS: When an oil change is required, the procedure below should be followed.

7.1 Remove the oil plug installed in the ECi angled oil filter adapter to drain the oil remaining in the filter and drain the sump. Using a screw driver or awl to punch a hole in the filter may help drain the filter.

7.2 After waiting for all oil to be removed from the system (approximately 1 hour), the oil filter should be removed and replaced in accordance with engine manufacturer recommendations. For a tidier oil change, a plastic bag may be placed tightly around the oil filter and ECi angled oil filter adapter before the filter is completely removed.