

*Bill Hindi of
Montgomery
Aviation inspects
a Lear Romec
pump.*

Lear Romec Fuel Pumps

Pressure to perform

By Randy Knuteson

Photos courtesy of Kelly Aerospace, 2003

AD2003-14-03 marks yet another effort by the Crane Manufacturing Corp. and the FAA to eliminate the persistent fuel leakage problem associated with the Lear Romec engine-driven fuel pump.

At first glance, this most recent AD appears to be a simple rehash of the superceded AD98-18-12. However, a more focused reading reveals some important details in this document. This AD is far from benign and could have some longstanding impact on your pocketbook unless some preventative measures are taken. Aug. 14, 2003 is the stated affectivity date of this newest Airworthiness Directive. Owners and operators have 10 hours of time in service or 30 days from this date to begin complying with the AD.

A brief history

Mechanics have been faithfully performing repetitive torque check inspections on the four cover screws (see Figure 1 on page 11) on fuel pumps since 1976, when Lycoming first released SB406. Lycoming Service Bulletins

have repeatedly addressed the importance of inspecting Titan and Lear Romec model fuel pumps for potential leaks at the parting surfaces of the relief valve housing. Typically such leaks were symptomatic of gasket material that had taken a set or shrunk with time. This ongoing inspecting and retorquing the four cover screws at scheduled intervals was an attempt to eliminate fuel seepage.

Over the past 25 years, a number of bulletins have been spawned in the wake of SB406. Many of these bulletins served to clarify fuel pump inspection criteria. AD98-18-12 came on the heels of three engine fires and six other leakage events on certain Lycoming recip engines. Yet in spite of all this additional attention, there still remains the potential for gasket compression set or gasket creep which both result in loss of clamping force. When clamping force is reduced, fuel may be allowed to escape from the parting surfaces; occasionally with catastrophic results (see Lear Romec Fuel Pump article in July 2000 *AMT*).

One successful measure taken by Crane in November of 1999 was to incorporate a new relief valve design that relied on packings held captive in O-ring grooves machined directly into the housing itself (see Figure 2). Modification kits soon became available. Replacing the old valve housing with this newer design served to enhance the pump's resistance to fuel leakage. By installing the new style housings, owners could then ignore the mandates for reoccurring inspections. Unfortunately, the additional costs associated with installing these modification kits sent overhaul prices through the roof. Modification costs were added to the cost of a normal overhaul to return the pump to an airworthy condition. An aircraft owner could expect to see list prices in the range of \$1,500 to \$2,000 to return his Lear Romec pump to service as newly overhauled and modified.

Ramifications of AD 2003-14-03

So what differentiates AD2003-14-03 from its predecessor, AD98-18-12? Also, what are some of the considerations that an owner or operator should give when attempting to comply with this directive?

The AD sets itself apart from previous documents in the following areas:

- 1.) It further defines and establishes a terminating action.
- 2.) It requires an ongoing visual inspection for the life of the pump (or until the terminating action has been satisfied).

A terminating action or options? You decide

As specified in the body of the new AD, the accepted terminating action requires the outright replacement of the relief valve housing with Lear Romec's new modified housing which may be ordered direct from the factory. All Part 135 operators who previously complied with Textron Lycoming Service Bulletin 539 have already followed this directive.

A second option that remains is to perform initial and follow-up torque checks. These recurring inspections must be performed within 10 hours time in service (TIS), or 30 days after the effective date (Aug. 14), whichever occurs first. Follow-up torque check inspections are to be performed every 50 hours thereafter. If the torque remains within the specifications found in

SB529B for an accumulated 100 hours, then a simple visual inspection is required at 50-hour intervals until the pump has been modified with Crane's kit. If the pump is simply overhauled or repaired, the entire sequence begins anew.

Buried in the text of AD2003-14-03 under the heading "Request for Additional Alternative Methods of Compliance" you'll discover yet another option to consider. The text reveals a request by a commenter for an alternate means of compliance. Specifically it reads: ". . . fuel pumps (Kelly Aerospace pumps) installed under the STC are not subject to the inspections required by this AD and may be installed without an AMOC." In 2002 Kelly Aerospace received FAA approval for two new fuel pumps designed as direct replacements for the Lear Romec RG9080 and RG17980 models. The Kelly Aerospace pumps are currently being installed on all Lycoming factory-remanufactured engines and have never had an AD issued against them. The pump is an FAA approved direct replacement to the Lear Romec pump although it uses different part numbers to help differentiate it from its Lear Romec counterpart.

Like their Romec predecessors, fuel pumps manufactured by Kelly Aerospace Power Systems Inc. are of the eccentric, sliding vane, positive displacement style. The

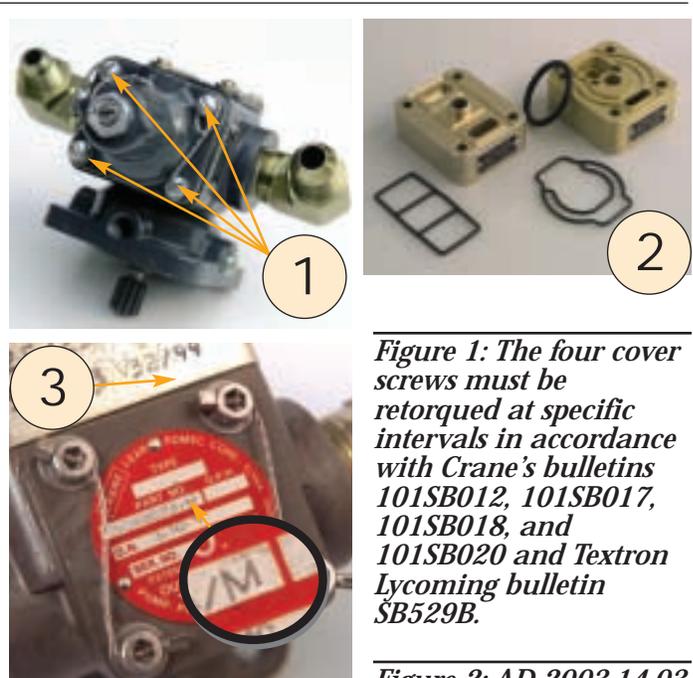


Figure 1: The four cover screws must be retorqued at specific intervals in accordance with Crane's bulletins 101SB012, 101SB017, 101SB018, and 101SB020 and Textron Lycoming bulletin SB529B.

Figure 2: AD 2003-14-03 (7/14/03) and Crane's bulletin RG9080-73-001 (7/28/03) address the possibility of replacing the relief valve housing as an alternate means of compliance and as a terminating action to the AD. Relief valves for the RG17980 style of pump sell for \$315. Valve housings for the RG9080 sell for \$285.

Figure 3: If the P/N on the Lear Romec data tag ends with the suffix "M," the pump has already been modified and no further action is required. Note: The new style relief valve body is silver or gold anodized.

pumps provide an uninterrupted flow of fuel to the fuel injection servo or carburetor and are capable of producing pressures well in excess of engine demands, thus fulfilling the directives of FAR23.955(c). Though similar in design and function, each Kelly pump in the 200F and 201F Series is tailored to meet the exacting requirements and demands for their specific applications. The Kelly designed pump utilizes fewer parts while incorporating carbon/graphite vanes and bearings, an improved shaft seal, and a proprietary relief valve body seal that will not creep or leak.

Careful consideration should be given to the value of buying a new direct replacement pump over dealing with as many as 30 to 40 inspections of the existing pump to TBO. The new Kelly Aerospace 200F and 201F Series of fuel pumps could be an attractive alternative to repetitively inspecting the unit for leakage since they are priced significantly less than the Lear Romec pumps (see application chart on page 12).

Ultimately, your decision may be determined by simple economics or by the hassles associated with redundant inspections. Do you wish to repeatedly inspect the pump through TBO, replace the relief valve housing, or replace the entire pump and eliminate the need for recurring inspections? In some cases, pumps may be buried deep within the confines of the engine compartment and may have a difficult cowling configuration to remove. On average, most cowlings can easily be removed and reinstalled with the pump fully inspected within an hour's time. There are however a few notable exceptions. The Malibu with the TIO-540-AE2A is one such installation — where pump inspections could take several hours. Some pumps incorporate a blast shroud that may hide residual fuel stains. With shrouded pumps, it may be difficult to discern if there is a problem short of removing the pump.

Don't get torqued off!

Make certain that the required torquing or 50-hour visual inspection is performed in conjunction with other routine maintenance and oil changes. Inspect the pumps every other oil change if oil and filters are replenished at 25 hours in turbocharged engines. A simple visual inspection of the pump could cost the owner anywhere from \$65 to \$130 if the inspection does not coincide with regularly scheduled maintenance. This figure will vary depending upon how difficult the cowling is to remove in order to gain access to the pump. Cowling configurations and variations in hourly shop rates could conceivably drive the price of inspections higher still.

Bottom line, if your pump has already been modified, disregard the AD. However, it is always a good practice to visually inspect your pump and all your fuel componentry including the hoses for evidence of fuel leaks. Any time fuel system parts are installed or reinstalled, the hoses must be flushed and the entire fuel system pressurized for leaks.

It would be wise for every airplane owner to stay current with any service publications directly impacting the safe operation of his or her aircraft. Often, the burden of keeping current on such bulletins falls directly on the shoulders of the technician who is tasked with keeping the owner's aircraft flight-worthy. This is a shortsighted and irresponsible approach to maintaining "ownership" of an aircraft. All owners and operators should have slightly more than a vested interest in knowing whether their plane is ship-shape!

AMT

Randy Knuteson is the director of product support for Kelly Aerospace Power Systems.

Kelly Aerospace Part No.	Current Lycoming Part No. (/M)	Lear Romec Equivalent	Obsolete Lycoming Part No.
200F-5001	62E22580	RG9080F2/M	68262
200F-5002	62E22581	RG9080J4A/M	LW-13909
200F-5003	62E22583	RG9080J6A/M	LW-14444
200F-5004	62E22582	RG9080J7A/M	LW-13920
200F-5005	62E22584	RG9080J8A/M	LW-15740
201F-5001	62D22565	RG17980/M	74547
201F-5002	62D22566	RG17980A/M	76188
201F-5003	62D22567	RG17980D/M	76486
201F-5004	62D22568	RG17980E/M	77443
201F-5005	62D22569	RG17980J/M	78993
201F-5006	62D22570	RG17980K/M	LW-11166
201F-5007	62D22562	RG17980P/M	LW-12534
201F-5008	62D22563	RG17980U/M	62D21153