

»» **Service Letter**
Experimental

Number: L03-06 F
Replaces L03-06 E

Date: 10/11/2006

Subject: Lightweight Sump Installation Instructions

Application:

Lightweight Sump Assembly	Engine Applications
SV78901 (front mount – injected) SV78903 (rear mount – injected)	Superior XP Engine Series and other Experimental 4-cylinder Lycoming style Aircraft Engines – Except Lancair
SV78905 (front mount – injected) SV78907 (rear mount – injected) See Caution Note	Superior XP Engine Series and other Experimental 4-Cylinder Lycoming Style Aircraft Engines – Lancair Only
CAUTION NOTE: The SV78905 and SV78907 Lightweight Sump Assemblies are not to be installed in tail wheel type aircraft. See Service Letter L05-07 for Operation with Electronic Ignition System	

Compliance

These Superior Lightweight Sump Assemblies are for EXPERIMENTAL AIRCRAFT USE ONLY. They are to be installed, operated and maintained in accordance with Superior Air Parts Service Letters, Service Bulletins and Operator's manuals where appropriate. Failure to comply with these instructions may result in damage to the sump assembly and/or engine and render them unsafe.

Information:

The lightweight sump assembly is made of Ryton[®] PPS, an alternative material to aluminum providing similar strength with significantly reduced weight. The design of the intake manifold, together with the thermal insulative properties of the Ryton[®] PPS, combines to create the coldest intake air system practical. The cold air feature plus the tuned induction system provide valuable performance benefits in operation. The oil sump has been designed for a full 8-quart system and includes anti-slosh baffles for more stabilized oil pickup. Ports are provided on the side of the sump to accommodate inverted oil systems.

Note: *The lightweight nature of the sump assembly can significantly impact the weight and balance of the aircraft. As with any engine or airframe modification, the weight and balance of the aircraft must be obtained prior to flight.*

Installation:

1. Inspect Sump Assembly and kit components for general condition, handling damage, stud damage, mating surface condition and security of intake connector tubes.
2. Apply aviation grade Form-A-Gasket to the threads of the Quick-Drain Oil Plug and install as shown in Figure 1 below. Torque to 160 In-Lb as specified in the instruction card packaged with the Quick-Drain Oil Plug and install safety wire per standard aviation practices.

Important: Torque values must be strictly followed. Torque values greater than those specified can cause damage to the sump assembly resulting in improper function and/or component failure.

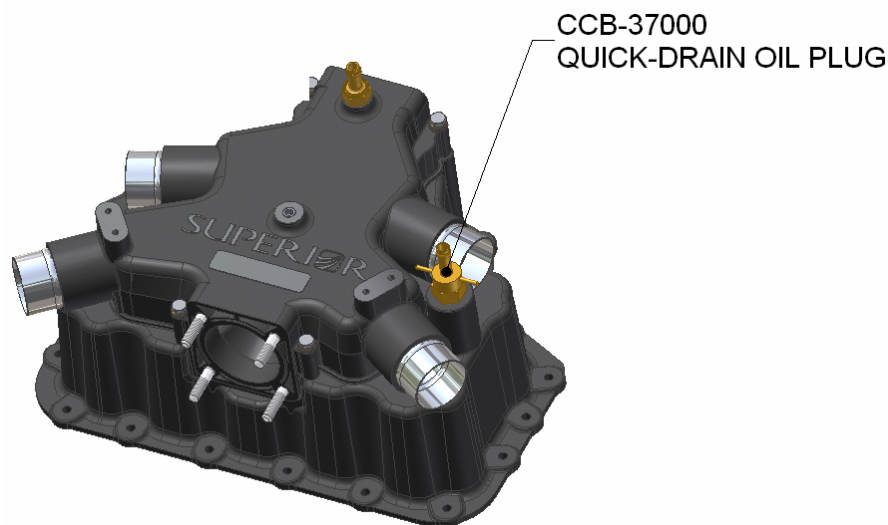


Figure 1
QUICK-DRAIN OIL PLUG INSTALLATION

3. Apply aviation grade Form-A-Gasket to the threads of the Fuel Drain and 1/8-NPT Plug and install as shown in Figure 2 below. Torque to 40 In-Lb as specified in the instruction card packaged with the Fuel Drain. **NOTE:** The location of the Fuel Drain valve and 1/8-NPT Plug are interchangeable. Location should be chosen such that sufficient clearance exists between the Fuel Drain and exhaust pipes or other components. **NOTE:** Installations on aircraft with tail wheel configurations require the use of a Fuel Drain installed in the rear boss location as illustrated in Figure 2 of this Service Letter. In this configuration, the Fuel Drain Ports in the forward boss of the manifold should be plugged with a 1/8-NPT fitting. **NOTE:** Lightweight sumps provided for Lancair installations have only one drain boss near the center of the intake manifold (See Figure 3). The Fuel Drain valve is installed in this 1/8-NPT threaded hole. A 1/8-NPT plug is not required for this application. Lightweight Sumps with only one fuel drain boss can not be used in tail wheel installations.

Important: Torque values must be strictly followed. Torque values greater than those specified can cause damage to the sump assembly resulting in improper function and/or component failure.

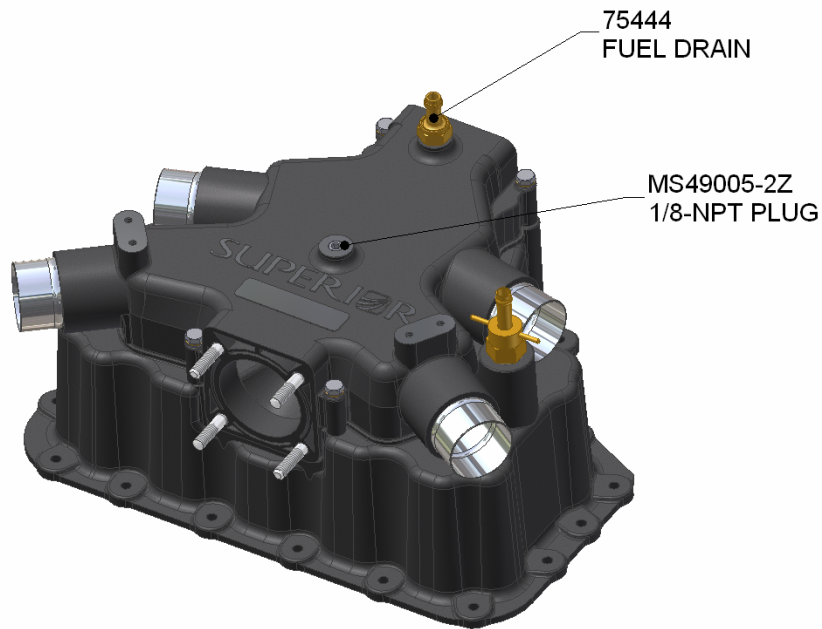


Figure 2
FUEL DRAIN (INSTALLED IN REAR BOSS) AND 1/8-NPT PLUG

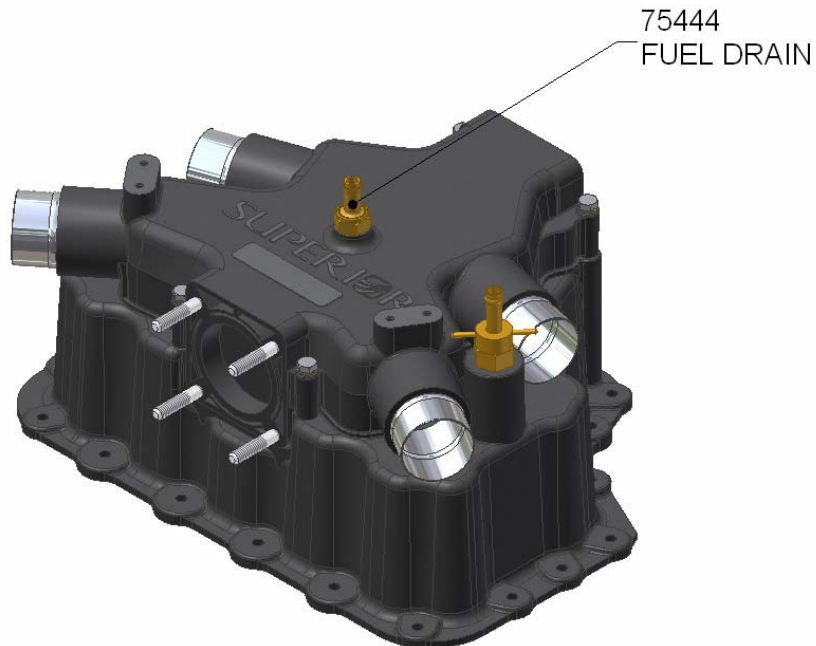


Figure 3
SINGLE FUEL DRAIN VERSION

4. Insert Oil Suction Screen fully into Sump Assembly as shown in Figure 4 below. Insert the crush gasket onto the Oil Suction Screen Plug and install as shown in Figure 4 below. Apply a drop of oil to the threads of the plug and tighten until "finger tight" against the gasket and oil sump wall and then turn an additional 135°. Install safety wire per standard aviation practices.

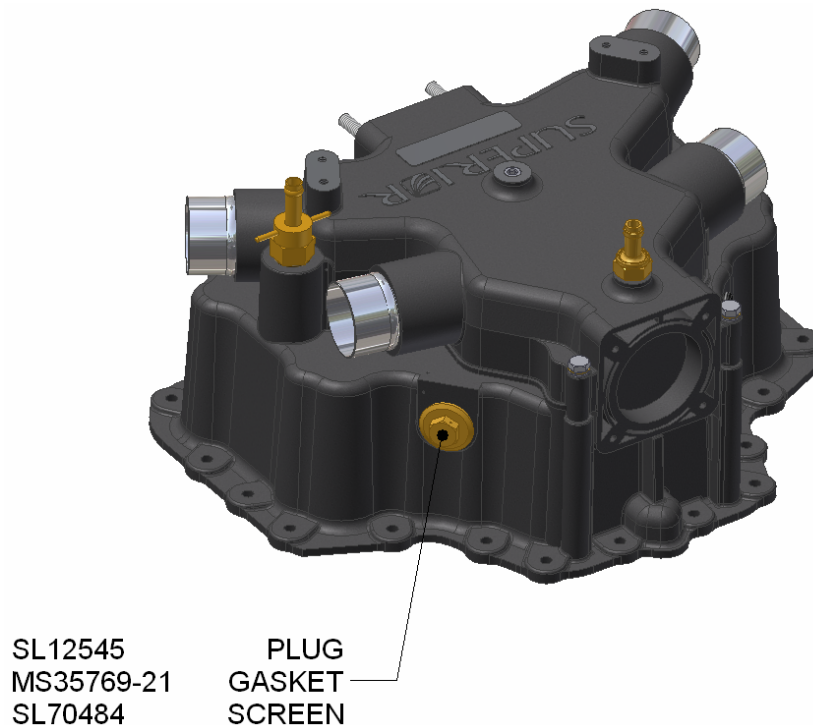


Figure 4
OIL SUCTION SCREEN INSTALLATION

5. Inspect data plate part number and serial number. Clean data plate and sump assembly with acetone prior to data plate assembly as shown in Figure 5. Apply a thin film of DP-190 Gray 2-part epoxy by 3M Corp. to the data plate and assemble to the sump assembly as shown in Figure 5. Allow curing for 24 hours at room temperature or 3 hours at 180°-200° F. **Note:** Use of Data Plate is optional for Experimental Aircraft engine.

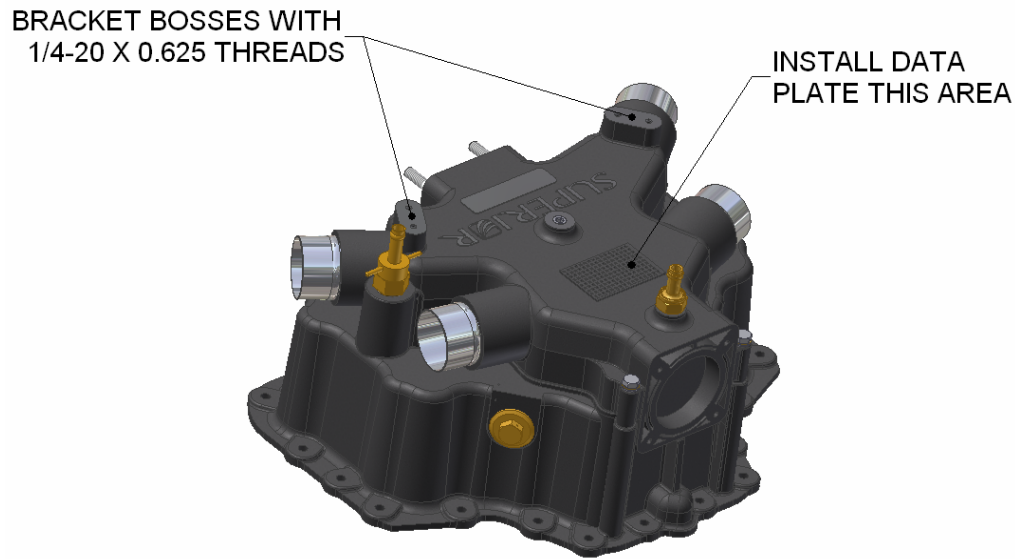


Figure 5
DATA PLATE INSTALLATION AND BRACKET BOSSES

6. Two (2) bosses with 1/4-20 x .625 deep threads are provided for the mounting of installation brackets such as throttle and mixture cable supports. This is illustrated in Figure 5. It is recommended that the thread engagement used in these bosses be no longer than 0.500". The use of longer bolts may "bottom out" in the hole resulting in induction leaks.
7. Align sump gasket on sump assembly flange and install to engine crankcase with appropriate hardware. Torque sump flange bolts to 96-108 in-lb. **NOTE:** Although it is not required, a thin film of aviation grade Form-A-Gasket may be used on both sides of the sump gasket if desired.
8. Install induction system per Service Letter L03-004, "Induction Kit Installation for Lightweight Sumps".

Maintenance:

The Superior Lightweight Sump Assembly requires little routine maintenance. It is recommended that after the first five (5) hours of operation the oil drain plug, filter plug and fasteners be checked for proper torque. If the torque does not meet the specifications above, tighten to the required torque as described in steps 2, 3, 4 and 7 above (as appropriate).

Operation:

A small number of engines utilizing this lightweight sump have experienced failure of the intake manifold portion of the assembly resulting from a significant induction backfire. In all cases, this condition has occurred on engine start-up and often accompanies ignition systems with wasted spark technology as used on some electronic ignition systems. This is not a safety of flight issue, as it has only occurred during engine start-up. The condition can be identified by a strong audible backfire sound followed by significant engine roughness and/or change in RPM. In the event of this condition, follow engine shutdown procedures immediately per the engine operation manual or aircraft flight manual including

turning the fuel selector valve off and turning off the ignition switch(es). Contact Superior Air Parts Technical Support Department for replacement.

This condition can most effectively be avoided by practicing starting procedures that minimize the risk and severity of engine induction backfire including proper priming techniques. Refer to the engine operation manual or aircraft flight manual for the recommended starting procedures.

Reference Documents:

The following documents may provide additional information related to this service letter.

L03-04	Induction Kit Installation for Lightweight Sumps
L05-07	Engine Starting Instructions for Installations with Electronic Ignitions and Lightweight Sumps