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SERVICE INSTRUCTION

DATE: November 10, 2015 Service Instruction No. 1458G
(Supersedes Service Instruction No. 1458F and
Obsoletes Service Instruction Nos. 1106D, 1311A, and 1318)
Engineering Aspects are
FAA Approved

SUBJECT: Connecting Rod Bolts (Identification and Installation)
MODELS AFFECTED: All supported Lycoming reciprocating aircraft engines
TIME OF COMPLIANCE: Whenever new connecting rods and/or new connecting rod bolts are being installed
REASON FOR REVISION: Clarified connecting rod bolt selection and installation instructions, added new Figure 1, revised part numbers in Table 1, and added information from obsolete Service Instructions

NOTICE: Incomplete review of all the information in this document can cause errors. Read the entire Service Instruction to make sure you have a complete understanding of the requirements.

This Service Instruction identifies currently available connecting rod assemblies, the applicable connecting rod bolt part numbers (P/Ns), specific requirements, and installation instructions for the various connecting rod bolts. Table 1 includes connecting rod bolt P/N LW-12596 which can be used as either a stretch bolt or torque bolt (indicated by the green or blue shading). Table 2 includes connecting rod assemblies no longer available from Lycoming Engines.

Connecting Rod Bolt Selection & Installation Guidelines

⚠ CAUTION: CONNECTING ROD ASSEMBLIES IN TABLE 1 HAVE A CORRESPONDING “SERVICE USE ONLY” CONNECTING ROD BOLT P/N. FOR CORRECT ENGINE OPERATION, ONLY INSTALL THE DESIGNATED “SERVICE USE ONLY” CONNECTING ROD BOLT ON THE APPLICABLE CONNECTING ROD. DO NOT INSTALL ANY OTHER CONNECTING ROD BOLT.

NOTICE: All current connecting rod bolts are installed with connecting rod nut P/N LW-12186 as a matched set.

- Any time connecting rod bolts and nuts are removed, discard both of the connecting rod bolts and nuts (Figure 1) and replace them with “Service Use Only” connecting rod bolts and nuts for the corresponding connecting rod assembly in Table 1 or Table 2.
- To select the correct connecting rod bolt, identify the connecting rod assembly P/N in Table 1 and select the corresponding replacement “Service Use Only” connecting rod bolt P/N.

NOTICE: Connecting rod bolts identified as “Service Use Only” in Tables 1 and 2 are for installation in the field. Connecting rod bolts identified as “Lycoming Use Only” in Table 1 are only installed at the factory and are not for field installation.



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⚠ CAUTION: LYCOMING DOES NOT GIVE APPROVAL FOR USE OF PMA PARTS ON ITS ENGINES. LYCOMING INSTALLATION INSTRUCTIONS DO NOT APPLY TO PMA PARTS. EQUIPMENT FAILURE COULD OCCUR IF LYCOMING INSTRUCTIONS ARE USED TO INSTALL PMA PARTS.

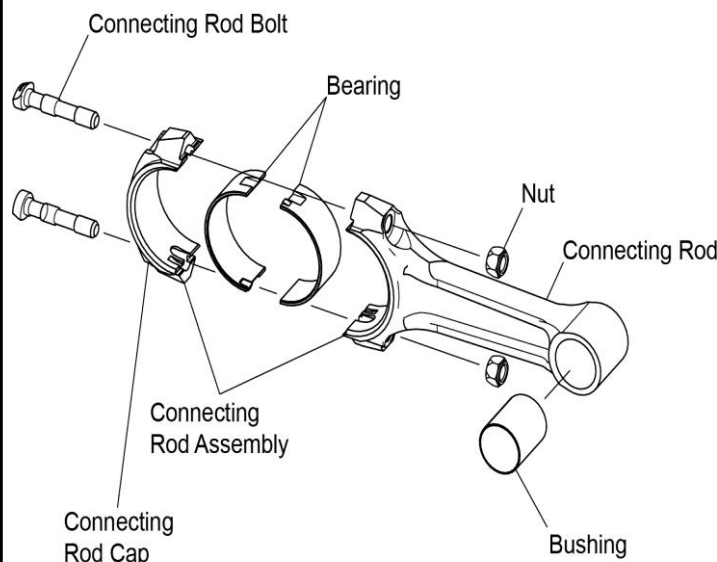


Figure 1
Connecting Rod

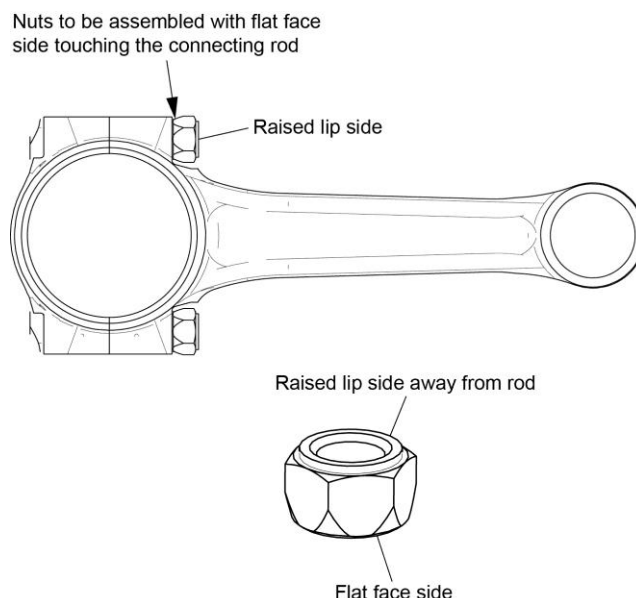


Figure 2
Connecting Rod Nut Installation

⚠ WARNING: *DO NOT ASSEMBLE STANDARD SIZE CONNECTING ROD BOLTS IN RODS THAT HAVE 0.005 IN. (0.127 MM) OVERSIZE BOLT HOLES. REFER TO THE "OVERSIZE CONNECTING ROD BOLTS" SECTION OF THIS SERVICE INSTRUCTION.*

3. Make sure the connecting rod bolt and nut are clean, free of dirt and debris, and that the threads are not damaged.
4. Apply Loctite® Food Grade Anti-Seize Lubricant to the bottom two or three threads of the connecting rod bolt. Wipe away any excess with a clean, lint-free cloth.

⚠ CAUTION: CORRECT INSTALLATION OF THE NEW NUT ON EACH NEW CONNECTING ROD BOLT IS NECESSARY FOR CORRECT CONNECTING ROD ASSEMBLY. EACH CONNECTING ROD NUT HAS TWO DIFFERENT SURFACES, ONE SURFACE IS FLAT AND THE OTHER HAS A RAISED LIP. BE SURE TO INSTALL EACH NUT ON THE CONNECTING ROD BOLT WITH THE FLAT FACE TOUCHING THE ROD AS SHOWN IN FIGURE 2. THE RAISED LIP SURFACE IS AWAY FROM THE ROD. THE CONNECTING ROD BOLT CANNOT BE TIGHTENED CORRECTLY IF THE NUT ON THE CONNECTING ROD IS INSTALLED INCORRECTLY.

5. Install the nut on the connecting rod bolt where the flat face of the nut touches the connecting rod as shown in Figure 2.
6. As shown in Table 1, some connecting rod bolts are either torqued or stretched:
 - A. **FOR TORQUE BOLTS:** Tighten the torque bolts with a calibrated torque wrench. If a torque bolt cannot be installed at the specified torque value, send the bolt to Lycoming Engines. Refer to Tables 1 and 2 in this Service Instruction for the specified torque value.

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- B. **FOR STRETCH BOLTS:** Stretch bolts require an initial torque of 35 ft.-lb. (47 Nm). If 35 ft.-lb. (47 Nm) of torque fails to give the correct stretch, between 2.255/2.256 in. (57.2770/57.3024 mm) length measured by gauge 64945 or equivalent, apply additional torque, to a maximum of 55 ft.-lb. (75 Nm), until the bolt is at the correct stretched length. Replace the bolt if the required stretch length cannot be obtained using an applied torque between the minimum and maximum amounts. If 35 ft.-lb. (47 Nm) causes an over-stretched bolt (greater than 2.256 in. (57.3024 mm) length) replace the bolt. Although variables in the joint can increase the torque for the specified stretch, a maximum torque of 55 ft.-lb. (75 Nm) is acceptable for stretch bolts.

Initial Torque: 35 ft.-lb. (47 Nm)

Maximum Torque: 55 ft.-lb. (75 Nm).

NOTICE: If the correct stretched length of 2.255/2.256 in. (57.2770/57.3024 mm) is not achieved with the maximum torque of 55 ft.-lb. (75 Nm), discard and replace the bolt.

Table 1
Lycoming Connecting Rod Assemblies, Bolts, and Bolt Installation

Current Connecting Rod Assembly P/N	Service Use Only*	Bolt Type	Lycoming Use Only	Features
	Connecting Rod Bolt P/N		Connecting Rod Bolt P/N	
LW-11750-S**	75061	Torque	14S23890	Torque 40 ft.-lb (54 Nm).
LW-13865-S**	75061	Torque	14S23890	
77450-S	75060	Stretch	14S23890	Stretch length of bolt must be 2.255/2.256 in. (57.2770/57.3024 mm) measured using gage 64945 or equivalent.
78030-S	78027	Torque	-----	Torque 40 ft.-lb (54 Nm). All rod assemblies (connecting rod, bolts, and nuts) must be the same in a case where alternate rods could be approved for a particular engine.
LW-15288-S	78027	Torque	-----	
LW-13422-S**	LW-12596	Stretch	14S23889	High tensile strength bolt. Underside of bolt head must install flush against the boss on the connecting rod.
LW-19332-S**	LW-12596	Stretch	14S23889	Stretch length of bolt must be 2.255/2.256 in. (57.2770/57.3024 mm) measured using gage 64945 or equivalent.
LW-13937-S**	LW-12596	Torque	14S23889	Torque 40 ft.-lb (54 Nm)

NOTICE: Any time connecting rod bolts and nuts are removed, discard both of the connecting rod bolts and nuts (Figure 1) and replace them with "Service Use Only" connecting rod bolts and nuts for the corresponding connecting rod assembly

All current connecting rod assemblies use connecting rod nut P/N LW-12186.

Connecting rod bolt P/N LW-12595 is no longer available.

* "Service Use Only" bolts are to be used for installation of the connecting rod in the field.

** This connecting rod assembly can use connecting rod bolt P/N 75060 (stretch bolt) as an alternate to connecting rod bolt P/N 75061 (torque bolt). Either bolt must be used in pairs on the connecting rod assemblies in complete engine sets.

CAUTION: WHEN INSTALLING ANY CONNECTING ROD ASSEMBLY IN TABLE 1, USE THE SPECIFIED CONNECTING ROD BOLT FOR THAT PARTICULAR ASSEMBLY.

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Table 2
Lycoming Connecting Rod Assemblies

Connecting Rod Assembly No Longer Available at Lycoming	Service Use Only* Connecting Rod Bolt P/N	Bolt Type	Features
69483	74669**	Crimp	Torque 30 ft.-lb (41 Nm).
74502	74644	Torque	Torque 40 ft.-lb (54 Nm).
LW-11457-S	75061	Torque	Torque 40 ft.-lb (54 Nm).
LW-10776	75060	Stretch	Stretch length of bolt must be 2.255/2.256 in. (57.2770/57.3024 mm) measured using gage 64945 or equivalent.
LW-10725	78027	Torque	Torque 40 ft.-lb (54 Nm) All rod assemblies (connecting rod, bolts, and nuts) must be the same in a case where alternate rods could be approved for a particular engine.
78028-S	78027	Torque	
LW-10726	78027	Torque	
78029-S	78027	Torque	Torque 40 ft.-lb (54 Nm) All rod assemblies (connecting rod, bolts, and nuts) must be the same in a case where alternate rods could be approved for a particular engine.
LW-10718	78027	Torque	
LW-10646	75060	Stretch	Stretch length of bolt must be 2.255/2.256 in. (57.2770/57.3024 mm) measured using gage 64945 or equivalent.

NOTICE: Any time connecting rod bolts and nuts are removed, discard both of the connecting rod bolts and nuts (Figure 1) and replace them with “Service Use Only” connecting rod bolts and nuts for the corresponding connecting rod assembly.

* "Service Use Only" bolts are to be used for installation of the connecting rod in the field.

** No longer available, no replacement available.

⚠ CAUTION: WHEN INSTALLING ANY CONNECTING ROD ASSEMBLY IN TABLE 2, USE THE SPECIFIED CONNECTING ROD BOLT FOR THAT PARTICULAR ASSEMBLY.

Oversize Connecting Rod Bolts

Connecting rods with 0.005 in. (0.127 mm) oversize bolt holes, use connecting rod bolts with 0.005 in. (0.127 mm) oversize body diameter are identified as shown in Figures 3 and 4. The oversize connecting rod bolts are identified by the black oxide coating and the characters, "H5" on the truncated surface of the bolt head; connecting rods with 0.005 in. (0.127 mm) oversize bolt holes are stamped with "H5" on both sides of the rod and cap. Also, the part number on the side of connecting rod has the suffix "H5" indicative of the oversize bolt holes. If any doubt exists as to the size of any bolt or bolt hole, measure the diameter with the dimensions shown in Figures 3 and 4.

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WARNING DO NOT, UNDER ANY CIRCUMSTANCE, ASSEMBLE STANDARD SIZE CONNECTING ROD BOLTS IN CONNECTING RODS THAT HAVE .005 O/S HOLES; TO DO SO COULD CAUSE ABRUPT ENGINE FAILURE. USED CONNECTING RODS WITH STANDARD SIZE BOLT HOLES CANNOT BE REWORKED TO ACCOMMODATE OVERSIZE BOLTS.

Table 3 identifies the part numbers of connecting rods and corresponding attaching bolts that are currently available with 0.005 in. (0.127 mm) oversize bolt holes and 0.005 in. (0.127 mm) oversize body diameters, respectively. During manufacture, connecting rods with 0.005 in. (0.127 mm) oversize bolts and connecting rods with standard size bolts are not intermixed in the same engine. However, during overhaul it is permissible to intermix connecting rod assemblies with oversize bolts and connecting rod assemblies with standard size bolts.

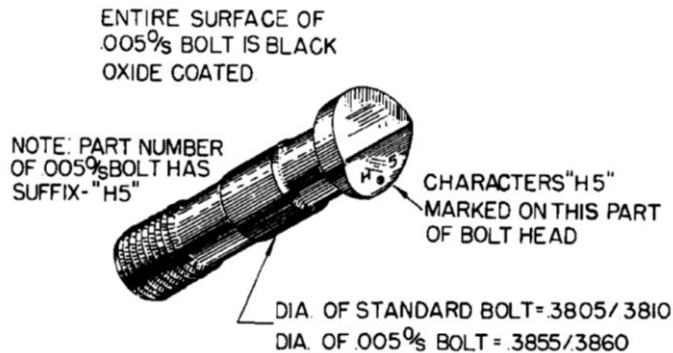


Figure 3

Typical Connecting Rod Bolt Showing Identification Marks on the Head

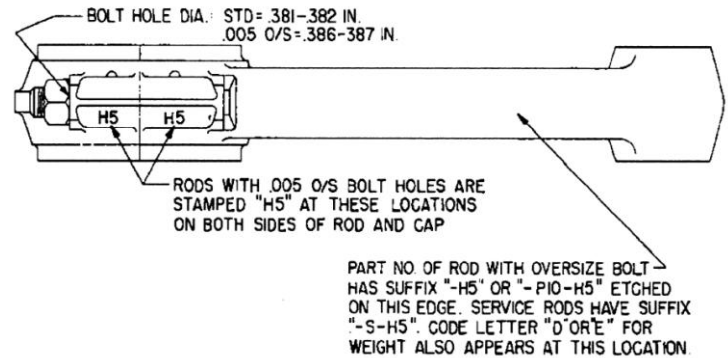


Figure 4

Typical Connecting Rod Assembly Showing Location of Oversize Identification Markings

Table 3

Connecting Rod and Oversize Connecting Rod Bolt Part Numbers

Basic Connecting Rod P/N	Basic Connecting Rod Bolt P/N
77450	75060
78030	78027
LW- 11750	75061
LW-13422*	LW-12596*
LW-13937*	LW-12596*

* Refer to Table 1 for connecting rod assembly and stretch or torque bolt application.

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