The Steelebrook Aviation Group

Steelebrook Oil Filter Change & Inspection Kit For GA Aircraft

Safe Use & Procedure Guide

Steelebrook Oil Filter Change & Inspection Kit For General Aviation Aircraft

Thank you for purchasing the **Steelebrook Oil Filter Change & Inspection Kit**. We're confident you will find this a very useful addition to your aircraft maintenance toolbox.

We know it's important to inspect aviation oil filters for wear particulates and other foreign material but this can be a messy job. Cutting the filter open, removing and spreading out the filter pleats with residue oil flying in all directions – no wonder we sometimes neglect this important maintenance chore. Is there an easier and less messy way? You bet there is!

Introducing the **Steelebrook Oil Filter Change & Inspection Kit**. This innovative system consists of a handy oil filter drain pan/hose assembly that hangs under the oil filter, an oil filter inspection tray with an integrated filter holder, an easy to use oil filter cutting tool and a solvent spray bottle to remove particulates from the filter element.

The oil filter drain pan is equipped with a chain that slips over the oil filter to position the pan below the filter and allows the filter/flange joint to drain as the filter is removed. A 4-foot drain hose is attached to the rear of the drain pan to direct oil into a container below the engine or aircraft.

The round 16-inch aluminum filter inspection tray integrates a combination bench vice hex on the bottom of the pan and a spin on filter holder with adaptors that will fit all common aviation oil filters. The inspection pan is simply clamped in a vice and the filter is screwed into the holder, ready to cut.

The filter-cutting tool uses seven cutting blades to assure quick and easy filter can cutting.

When the filter can is cut and the inner element lifted out , the remnants of the filter can are removed from the holder and the element is slid over the center post for the spraying procedure.

The spray bottle is used to spray a non-flammable solvent forcefully into the filter element pleats to dislodge any particulates and other foreign material from the pleats and into the inspection tray.

Note: Some mechanics prefer to physically remove the filter element pleats from the metal frame and open the pleats for inspection. Of course, this can be done with the pleats spread out around the inspection pan but we don't recommend it. The pleats are difficult to remove and the metal pleat frame has sharp edges that invite injury. The solvent spray procedure outlined above is very effective and is recommended by several oil filter manufacturers. The spray procedure is the one we recommend and use ourselves.

The Steelebrook Oil Filter Change and Inspection Kit makes a tough and messy job much more manageable and much less messy.

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Study and save this manual

Read this entire manual before using the Steelebrook Oil Filter Change & Inspection Kit. Make sure you understand the instructions and safety precautions in this manual. Keep this manual and your invoice in a safe place for future reference. If you have questions regarding the use of this kit, or just need another manual, please call or write the Steelebrook Group using our contact numbers or e-mail address at the bottom of the last page. Manuals are also available on our web site in PDF format.

Steelebrook Oil Filter Change & Inspection Kit Safety Warnings and Precautions

Warning: always adhere to the following safety precautions when using this product

- Engine, filter and oil will be very hot if oil is changed soon after engine shutdown. Use caution working around these hot components to prevent burns.
- Use caution when handling the oil filter-cutting tool. The oil filter cutter blades are sharp and can cause cuts.
- Never use gasoline or other flammable solvent to spray filter elements.
- Always keep the work area clean. Cluttered areas invite accidents and possible injuries.
- Stay alert and concentrate on safety.
- Never perform maintenance if under the influence of alcohol or drugs. Read warning labels on prescriptions you are taking to determine if your judgment or reflexes will be impaired while taking these drugs.
- Always wear ANSI approved safety goggles when working with tools and equipment.
- Keep this product away from children. Do not use as a toy.

Warning: The warnings, precautions and instructions discussed in this manual cannot cover all possible conditions and situations that may occur. It must be understood by the user of this product that common sense and caution are factors that cannot be built into this product and must be supplied by the person or persons using this product.

Other Legal Notices

The Steelebrook Group make no representations or warranties regarding any damages, injuries or benefit expected by using this unit lawfully, or any request from a third person, which are caused by the inappropriate use of this product.

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Disclaimer of Warranty

The Steelebrook Group makes no representations of warranties, either expressed or implied, by or concerning any content of these written materials and in no event shall be liable for any implied warranty for any consequential, incidental or indirect damages (including but not limited to damages for loss of business profits or business interruption) arising from the use or inability to use these written materials or equipment. No liability is assumed with respect to the use of the information contained in these written materials, or for damages resulting from the use of the information contained therein.

The Steelebrook Oil Filter Change & Inspection Kit
For Grumman AA5 series Aircraft

2 year Limited Warranty

The Steelebrook Group makes every effort to provide high quality and durable products to the aviation community and warrants to the original purchaser that this product is free from defects in materials and workmanship for the period of 2 years from the date of purchase. This warranty does not apply to damage due directly or indirectly to misuse, abuse, negligence or accidents; repairs or alterations outside our facilities; or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the defect or problem must be included with the product. If our inspection verifies the defect, we will either repair or replace the product at our discretion or may elect to refund the purchase price price if we cannot readily and quickly provide you with a replacement. We will return the repaired or replaced product at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then the purchaser must bear the cost of returning the product.

This warranty gives you specific rights and you may also have other rights which vary from state to state.

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Oil & Filter Change Procedure using the Steelebrook Oil Filter Drain Pan

Read and understand all the proceeding safety precautions and warnings before using the Steelebrook Oil Filter Change & Inspection Kit.

Note: This is the procedure we use for Grumman aircraft but most of the information can be used for other aircraft, especially Lycoming powered aircraft. Use of the filter drain pan and hose may not be applicable to some non-Lycoming powered aircraft or aircraft with vertically mounted oil filters and filters mounted on the firewall.

Materials Needed

Newspaper, shop towels, nitril or latex gloves, plastic oil drain tubing (for "quick drain" valve), 2 gallon or larger container, oil sample container (if taking sample), 1 inch socket with ratchet torque wrench, filter drain pan & hose, large pan for oily parts, Dow Corning #4 lubricant or equivalent, safety wire & pliers, proper oil filter & aviation oil and "Sharpie" pen.

1. Preparation

1.1 Fly plane for at least ½ hour to warm engine oil & suspend contaminants.

1.2 Shut engine down and chock aircraft tires properly to prevent movement.

1.3 Spread newspaper on floor below engine and over front wheel pant. Open engine compartment and stuff newspaper into engine compartment below oil filter to catch stray oil. Don't be stingy with paper.

Warning: Engine will be hot from running. Use caution not to come in contact with hot parts of engine. Serious burns are possible.

2. Draining Oil

Note: If your engine does not have a "quick drain" oil drain valve, we strongly recommend that you purchase and properly install one on your engine. These valves are real time and mess savers. Just attach the drain hose and open the valve -- this makes the oil drain procedure considerably easier. The following procedure is written for aircraft equipped with these valves.

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2. Draining Oil -- Continued

2.1 Attach hose that came with "quick drain" oil valve (or equivalent hose) to valve at the right bottom of oil sump and route hose through opening in lower cowling. Place the other end of hose into at least a 2-gallon container (use larger container if engine holds more than 8 quarts of oil). An old gasoline container with a screw-on lid works well. Be sure that hose is securely captured by drain valve and container and that container is resting on newspaper.

2.2 Open "quick drain" valve to allow oil to flow from engine into container.

2.3 If taking an oil sample, allow about 1 pint of oil to drain into container, then lift tube and take sample (this can be messy).

2.4 Close quick drain when all oil is drained and remove drain tubing.

3. Removing the Oil Filter

3.1 Cut and remove safety wire from oil filter.

Warning: Cut safety wire is sharp and can cause puncture wounds. Use caution.

3.2 Push filter drain pan hose onto the hose fitting at the bottom of the drain pan if not attached. Remove the cap plug from other end of hose.

Note: Support the hose fitting nut inside the drain pan with your other hand when pushing the hose onto the fitting to prevent fracturing the drain pan. Do this whenever attaching the hose to the fitting.

3.3 Position the oil filter drain pan below filter with drain hose at the rear. Fit the front edge of pan below the filter/flange joint. Wrap chain loosely around filter and hook the loose end of chain on the "S" hook on opposite side of the pan. Adjust the chain to position the pan slightly lower at the rear to facilitate draining. Route the drain hose down and through the lower cowling and into the drain container located on the floor below the engine. Confirm that drain pan is in proper positioned under the oil filter.

3.4 Loosen the filter with a 1-inch socket and ratchet handle on the hex at rear of filter by turning counterclockwise (looking at the rear of the filter). The drain pan should stay stationary as the filter is loosened and catch the spilled oil from the filter/flange joint.

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3. Removing Oil Filter -- Continued

3.5 Allow time for the oil to flow into drain pan and down the hose and push cap plug back on hose below engine. Cap oil container and dispose of oil properly.

3.6 Remove drain pan and hose using care not to spill any oil left in the pan or hose.

Note: All oil in the pan will not drain through the hose so use extra care to keep the pan level as you remove the pan up and out of the engine compartment.

3.7 Continue turning the filter counterclockwise and remove, using care to keep open end up to minimize spillage. Place filter, drain pan and other oily parts in a larger pan to contain the oil until cleanup and disposal time.

4. Installing the New Filter

4.1 Wipe the engine filter flange with a clean fabric cloth. Lubricate new filter rubber gasket with Dow Corning #4 or equivalent lubricant and install new filter, turning clockwise. Torque to the specifications listed on the new filter.

4.2 Using a "Sharpie" type permanent marker, write date and engine (tach) hours on the filter.

4.3 Safety wire the oil filter using approved procedure.

4.4 Confirm that the oil sump drain valve is closed and add the required amount of the proper specification aviation oil to the engine.

4.5 Start the engine using normal procedures. Run engine briefly then shut down and check for oil leaks. Repair any leaks before flying aircraft.

4.6 Make proper entry in the engine logbook.

4.7 Clean and store all tools and parts properly. Keep out of the reach of children.

4.8 If an oil sample was taken, be sure to send the sample to the analysis lab.

The next section outlines the procedure for inspecting the removed oil filter using the Steelebrook Cutting Tool, Inspection Tray and spray solvent.

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Inspecting the Oil Filter Element Using the Steelebrook Cutting Tool, Inspection Tray & Spray Solvent

Engine, filter and oil will be very hot if oil is changed soon after engine shutdown. Use caution working around these hot components to prevent burns.

Use caution when handling the oil filter-cutting tool. The oil filter cutter blades are sharp and can cause cuts.

Never use gasoline or other flammable solvent to spray filter elements.

1. Mounting the Inspection Tray in a Vise

1.1 Clamp the inspection tray in a sturdy vise by opening the vise jaws to at least one inch and placing the tray on the jaws with the hex at the bottom of the tray between the jaws.

1.2 Align the flats on the hex with vise jaws and tighten the jaws to clamp the hex securely.

2. Mounting the Oil filter on the Inspection Tray

Note: The inspection tray is available in two configurations; one, to accommodate 5/8-inch internal and external thread oil filters and the other for ¾ inch internal and external thread filters. Be sure you are using the correct pan for the filter you are inspecting.

2.1. Drain as much oil as possible from the filter before mounting.

Note: If filter has internal threads, screw the thread adaptor supplied with kit into top of filter mounting post at center of pan before mounting filter.

2.2 Screw filter into threads on mounting post by hand until snug

3. Using the Filter Cutting Tool

3.1 Turn the knurled handle of the filter-cutting tool supplied with kit counterclockwise (when looking at the end of handle) until it stops turning. This will open the cutter loop to its maximum position.

3.2 Hook the end of the cutter loop in the hook slots on the tool and with the hook on the left side, slip the cutter loop over the mounted filter.

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3. Using the Filter Cutting Tool -- Continued

3.3 Position cutter blades approximately 3/4 inch above the bottom of the filter and turn the knurled handle clockwise until resistance is felt and all cutter blades are contacting the wall of the filter.

3.4 Begin turning the entire cutting tool clockwise around the filter, using the knurled handle as a lever. As you turn the tool around the filter, a groove will begin to develop where the cutter blades are working their way into the wall of the filter.

3.5 When the groove is established, slightly turn the knurled handle clockwise to maintain a steady cutter blade pressure on the filter while turning the cutter blades into the groove.

Note: only gentle pressure is required on the cutter blades. Do not turn the knurled handle excessively. This will only deform the filter and cause the tool to bind. Make sure the cutting wheels are rolling freely and let the wheels do the work. Swing the handle in the longest possible arc. Experience is the best teacher here. A good rule of thumb is to turn the knurled handle ½ turn for every full revolution of the cutting tool around the filter.

Also, the cutter blades need to stay in a single groove to complete the cut. If the cutter blades stray either up or down, apply slight pressure to the chain in the opposite direction to maintain alignment while turning. Again, experience will develop this skill very quickly.

3.6 Continue turning cutting tool around the filter while maintaining gentle pressure on the cutter blades until the filter can separates, exposing the filter element.

Note: the cutter blades may break though in one area first. If this happens, you can bend the top of the filter can towards the uncut side and use a “back and forth” motion to fatigue the metal and break the filter can free. Discard the top portion of the filter housing properly.

Warning: the cut edges of the filter will be very sharp. Use caution when handling these parts.

4. Inspecting the Filter Element

Note: You should now be looking at the outside of the filter element media that captures particulates and other contaminants in the oil.

4.1 The element should now slip off the retaining base at the bottom of the filter. Use leather or rubber gloves to remove the element and set it in the tray.

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4. Inspecting the Filter Element -- continued

4.2 Use heavy leather gloves to remove the bottom portion of the filter from the inspection tray by turning the filter counterclockwise and off the mounting post. Discard filter parts properly.

Warning: Never attempt to remove the filter without heavy leather gloves or proper tools. Cut edges of filter are very sharp and can cause lacerations and other injury.

4.3 Clean any shavings, oil or other material from the floor of the inspection tray. The cleaner this surface is, the more accurate your inspection will be as you want to be looking at only contaminants from the filter element that fall into the tray when spraying the element with solvent.

4.4 Position the element by sliding it over the mounting post. If the element does not fit on the post (this is rare), just set it upright near the center of the tray.

4.5 Fill the spray bottle included in inspection kit with a non-flammable, non-toxic solvent. We use a 1:3 mixture of grease cutting dishwashing liquid and water with good results, but other safe solvents should work equally well.

4.6 Adjust the spray nozzle to spray a forceful stream and begin spraying the filter element, wetting the entire surface. Start at the top and work your way down and all the way around the element. Use a forceful stream to dislodge contaminants from the element and down into the tray.

4.7 Spray until you are certain all particles have dislodged from the element and flowed into the tray.

4.8 Inspect the particles and other contaminants at the bottom of the tray for foreign material (aluminum, steel, etc) that may indicate abnormal wear, as you would with a traditional filter inspection. If you are not an A&P mechanic, you may want to consult one to interpret the findings.

4.9 Clean the inspection tray and cutting tool thoroughly. Lubricate cutting tool wheels with a general purpose lubricant to insure easy cutting and long life of the tool. Store all components in a safe place. Keep out of the reach of children.

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