

Installation and Operation Manual

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Bergmen Engineering, Inc. Spin-On Oil Filter Adaptor Kit
Model 410-010, Patent No. 7,524,416

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For the Kawasaki Concours (all years)
(and other Qualified Kawasaki Motorcycle Models)

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Dan Bergmen, December 26, 2009

1.0 Introduction

The Bergmen Engineering, Inc. Spin-On Oil Filter Adaptor Kit, Model 410-010 is the result of several months of engineering design work and thousands of miles of field testing (including racing). This Adaptor Kit is designed to directly replace the standard factory oil filter assembly without modification of any kind to the motorcycle engine. The Adaptor Kit is designed to be installed in a very simple step-by-step process with a minimum of tools. The main parts of this Adaptor Kit are custom machined from the finest and highest strength materials available and are fabricated using modern Computerized Numerical Control (CNC) machine tools at a state-of-the-art machining facility. Once the Adaptor Kit is properly installed, there is no maintenance or service required, it is designed to last the life of your motorcycle without attention.

Please read and become familiar with the entire content of this **Installation and Operation Manual** prior to installing your Model 410-010 Spin-On Oil Filter Adaptor Kit.

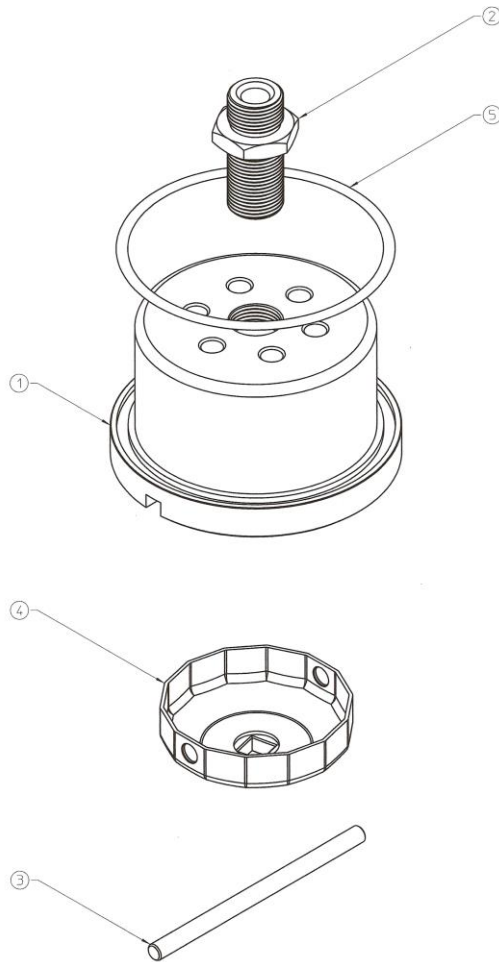
2.0 Kawasaki Motorcycle Models Qualified to use this Kit

This Kit was originally designed for use on the ZG1000 Concours but can be used without modification on several Kawasaki motorcycle models.

Please consult www.bergmenengineering.com, select **Products & Services**, select **Spin-On Oil Filter Adaptor Kit** and find the current **Kawasaki Motorcycle Model Qualification List** to see if your Kawasaki model is listed.

3.0 The Following Parts are Included in this Adaptor Kit:

- > Item 1, PN 410-001, **Housing-Filter Adaptor**
- > Item 2, PN 410-002, **Mount-Filter Adaptor**
- > Item 3, PN 410-003, **Tool, Installation**
- > Item 4, PN 410-004, **Wrench-Cup-Filter**
- > Item 5, **O-Ring** to seal the **Housing** to the engine cavity (Kawasaki #671 for stock filter)
- > Item 6, Ultra Black/sealant for the **O-Ring**
- > Item 7, Thread locking compound for **Mount-Filter Adaptor** to engine installation



4.0 Tools Required:

- > 17mm Socket (for removal of factory oil filter apparatus).
- > 3/8" or 1/2" Drive Ratchet (for removal of factory oil filter apparatus).
- > 27mm (or 1 1/16") Deep Socket (3/8" or 1/2" drive).
- > 3/8" or 1/2" Drive properly calibrated click-type, or beam type Torque Wrench.

5.0 Design Description:

One of the obvious advantages of this installation is to simplify the oil filter replacement during routine oil and filter changes by utilizing modern, disposable motorcycle and automotive type spin-on oil filters. Removal, disassembly, cleaning and proper re-assembly of the outdated stock paper cartridge oil filter apparatus will be a chore of the past once this adaptor kit is installed properly.

This Adaptor Kit is fully compatible with the oil delivery system on the Concours (and other Qualified Kawasaki Motorcycle Models) and does not restrict oil pressure or oil flow in any way. Oil filtration is enhanced by the use of modern, efficient, high flow and very effective spin-on oil filter media that has evolved steadily in technical superiority and performance while paper cartridge filter elements have not. This Adaptor Kit allows the owner to choose from a wide variety of superlative oil filters on the market today and also to take advantage of future improvements in oil filter technologies as they become available.

One very significant additional advantage of this oil filter adaptor design is the opportunity to pre-fill the spin-on oil filter with engine oil prior to filter installation. This very important step minimizes the oil pressure build-up lag that currently exists with the stock (or standard) filter design when starting the engine directly after an oil filter change. *The operational advantage of this feature alone is difficult to overstate.* This oil pressure build-up lag time is potentially very harmful to all running surfaces in the engine that depend on pressurized oil flow for hydrodynamic lubrication. The Concours engine (and other Qualified Kawasaki Motorcycle Models), when equipped with the Spin-On Oil Filter Adaptor Kit, and the filter pre-filled with oil, will achieve full operating oil pressure in the shortest possible time during the initial startup following the oil and filter change. This is simply not possible with the stock filter setup.

6.0 Engineering Specifications:

6.1 Filter Oil Pressure Design Limit (Industry Standard Specifications):

Pressure tested to 90 psi, designed to withstand upwards of 250 psi.

6.2 Oil Pressure Drop (Industry Standard Specifications):

All filter types, including stock filter (“clean” filter): < 3 psi at three gallons per minute flow when using 30wt oil at 180 degrees F (per SAE HS806 test).

7.0 Installation Instructions:

7.1 Follow these instructions exactly as stated to ensure safe, reliable operation of the Model 410-010 Spin-On Oil Filter Adaptor Kit. Contact Bergmen Engineering, Inc. during any part of the installation with any comments or questions (see **11.0** below). See Limited Warranty.

7.2 Begin by placing the Concours (or other Qualified Kawasaki Motorcycle Model) on the center stand and remove the belly pan (if applicable). The sheet metal crossbrace underneath the engine (on the Concours installation) will also need to be removed and set aside for now to allow unrestricted access to the oil filter cavity.

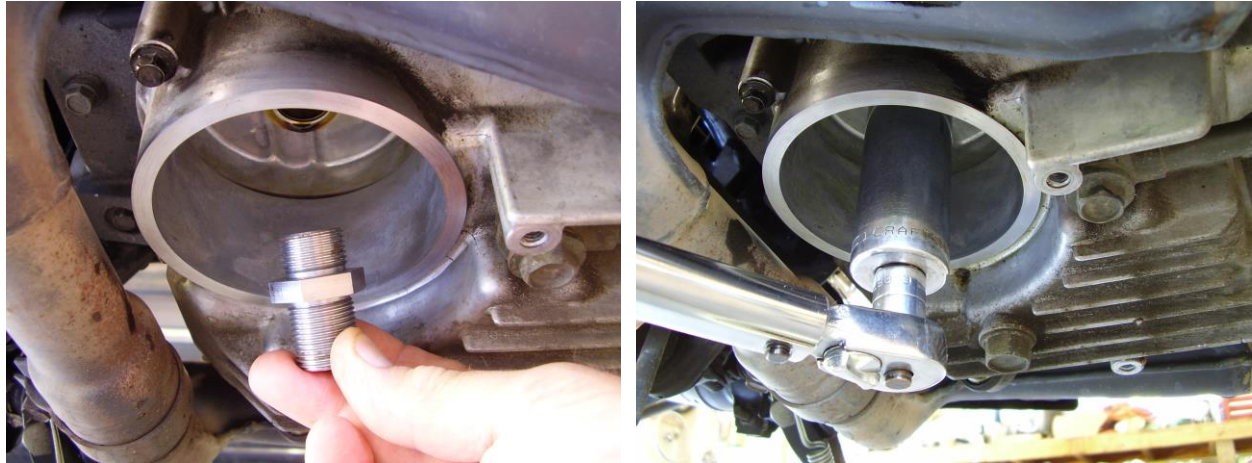
7.3 Next remove the factory oil filter plate and oil filter assembly. None of these parts will be used in the new assembly, so they can be cleaned and set aside for storage. There is no need to drain the engine oil for this installation, but if it is time to do so, this can be accomplished now as well (see **9.0** below for specific recommendations regarding oil and filter changes).

7.4 Using a mild solvent (such as alcohol or carburetor cleaner) and a small brush such as an old toothbrush, clean the threads in the threaded boss in the engine cavity to remove as much oil residue as possible. Allow solvent to dry before the next step.

7.5 Find in the kit the **Mount-Filter Adaptor (Item 2)**. Place a small amount of thread locking compound (**Item 7**) on the full length of threads on the **short threaded end** of the **Mount**. Use thread locking compound sparingly to prevent excess from being forced into main oil galley upon startup.

7.6 Install this part with the short end up as shown in the following illustration . **This is critical.** If this part is installed upside down it will block oil flow to the engine.

7.7 Using the torque wrench and a 27mm (or 1 1/16") deep socket, **Torque the Mount into place to 50 ft. lbs.:**



7.8 Find in the kit the **Housing-Filter Adaptor** (Item 1) and the **O-Ring** (Item 5):

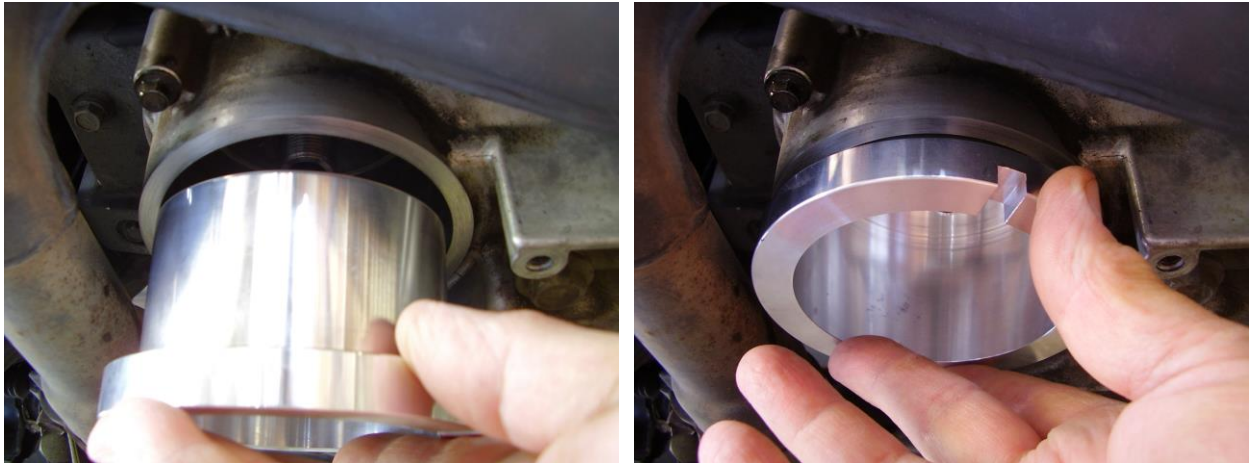
7.9 Place the **O-Ring** in the groove on the flange of the **Housing**:



7.10 With the adhesive/sealant supplied in the kit (Item 6), evenly coat the **O-Ring** and flange surface. An even, thin coating is better than an uneven, thick coating.

7.11 Using a mild solvent (such as alcohol or carburetor cleaner) wipe clean the bottom, machined edge of the oil filter cavity on the engine. This is the surface that the new **Housing-Filter Adaptor** (Item 1) will seal against.

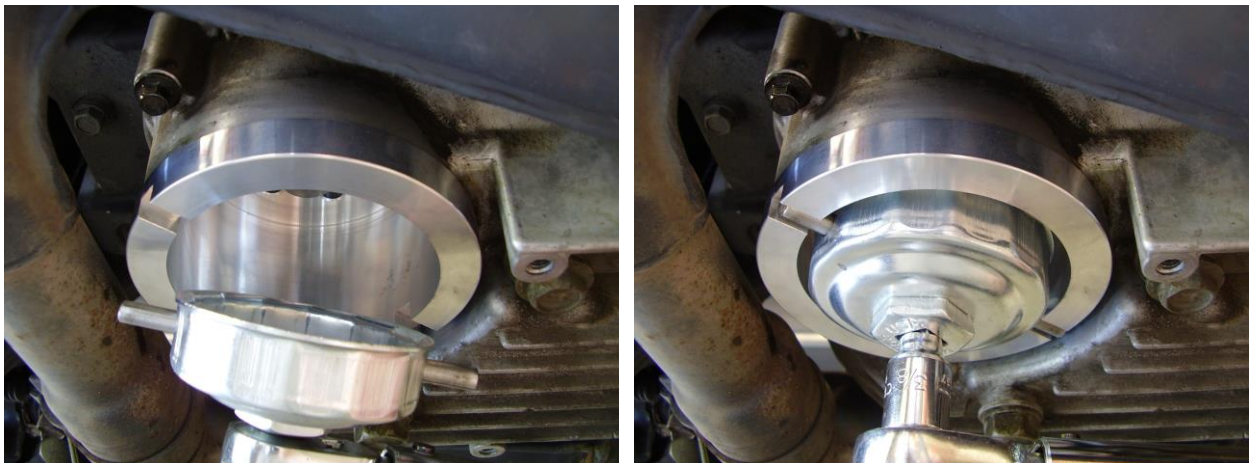
7.12 Insert the **Housing** into the oil filter cavity of the engine being careful not to contaminate the mating surfaces of either the **Housing** or the flange of the engine oil filter cavity. It is imperative that both of these surfaces be contaminate-free in order to produce a leak-free, reliable seal:



7.13 Thread the **Housing** *up to but not quite touching* the engine oil cavity flange. The adhesive/sealant being used is of an anaerobic type and will not cure until it is in the absence of air. Bringing the flange into contact with the engine oil cavity flange may start the curing process and this should start only when you are in position to tighten and torque the **Housing** into place. Be sure the O-Ring stays properly inserted in the groove while tightening.

7.14 Find in the kit the **Wrench-Cup-Filter** (Item 4) and assemble to the torque wrench.

7.15 Find in the kit the **Tool, Installation** (Item 3) and slide the **Tool** through the holes in the **Wrench-Cup-Filter** as shown below (a small piece of adhesive tape can be used to hold the **Tool, Installation**, centered in place for convenience during this step):



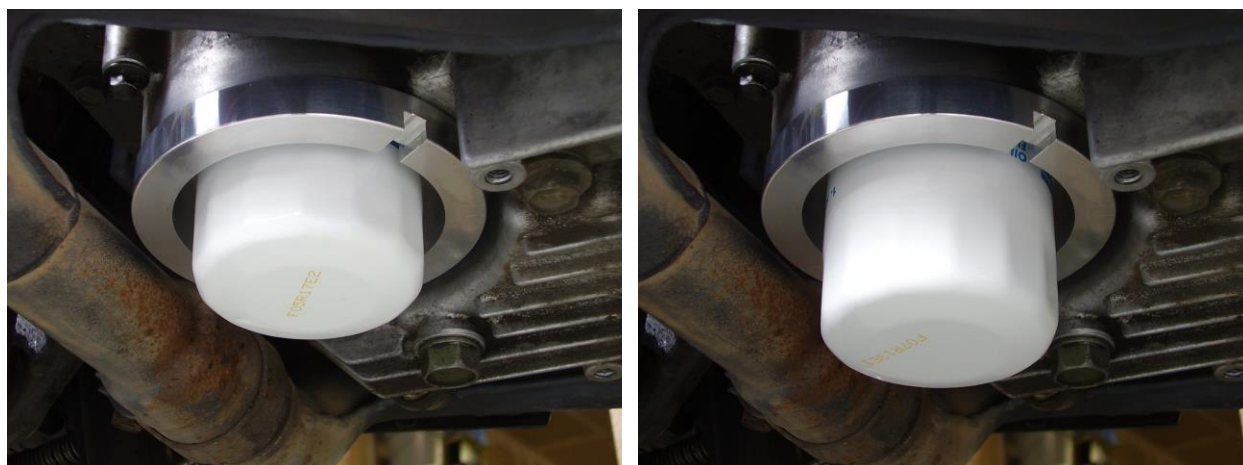
7.16 Carefully engage the **Tool, Installation** in the slots in the **Housing** making sure all parts are centered and aligned. Tighten and **Torque the Housing into place to 50 ft. lbs.**

8.0 Spin-On Oil Filter Installation

There is a short series and a long series of spin-on oil filters that are compatible with this kit. If the short filter is installed, there will be no need to modify the belly pan (on the Concours installation). If the long filter is installed, some modification of the belly pan will be required to clear the filter (see section **8.3**).

8.1 Pre-fill the oil filter with the same type of motor oil that is being used in the engine. Tilt the filter side to side several times to remove air bubbles and continue filling only up to the bottom edge of the threaded mounting hole. This will prevent oil overflow when installing the filter.

8.2 Place a small amount of engine oil on the gasket of the oil filter and evenly spread it around the surface. Insert the filter up into the Housing and thread into place until the gasket comes into contact with the inside surface of the housing. Using the **Wrench-Cup-Filter** again, tighten the filter 3/4-1 turn. Tightening the filter more than 1 turn may make the filter difficult to remove when it comes time to remove the filter during the next oil/filter change:



8.3 If the long filter is installed, the belly pan of the Concours will have to be modified in order to clear the filter. There are two ways to accomplish this modification. One method is to completely remove the rear cross brace on the belly pan so as to clear the extended filter. The second method is to cut a circular relief opening in the cross brace of the belly pan for filter access. A template for cutting the cross brace in this manner is available at www.bergmenengineering.com. There is no compromise to the function of the belly pan when this is done, it basically allows the filter to protrude below the surface of the belly pan slightly. It also allows removal of the oil filter without having to remove the belly pan.

Congratulations! You have now completed the installation of the Bergmen Engineering Spin-On Oil Filter Adaptor Kit. If the engine oil is not being changed as a part of this kit installation, start the engine and run at idle to quickly establish proper oil pressure. Run the engine for several minutes and check for any signs of oil leaks at the oil filter or Adaptor Housing. Correct any leaks before operating the motorcycle even if it requires the removal of all of the Adaptor parts and starting over.

If the engine oil is being changed, refill the crankcase with **3 quarts** of the motor oil of choice.

If there are any oil leaks between the Housing and the engine, there is a problem with the seal integrity at this interface. It will be necessary to remove all parts and carefully examine this area for any contamination or defects. Be certain that all parts are in good condition and free of any obstructions that could compromise the seal integrity. Reseal, reassemble and re-torque into place according to steps **7.9** to **7.16** detailed in these instructions. Continue with steps **8.1** and **8.2**, restart and recheck for leaks.

9.0 Oil and Filter Changes with your new Adaptor Kit Installed:

Oil changes are best made after the motorcycle has been brought to full operating temperature. Allow the engine to cool sufficiently to be able to handle parts such as drain plugs and oil filters comfortably.

9.1 Using the supplied oil filter cup wrench, loosen the oil filter until it can be turned by hand. Slowly continue loosening the filter until oil begins to flow down the sides of the oil filter. Let this flow continue until the oil filter cavity is drained completely. This is a good time to remove both drain plugs and allow the oil pan to drain completely as well.

9.2 After the filter is removed, wipe the inside of the **Housing** clean with a rag or paper towels. It is especially necessary to assure that the surface that the filter gasket contacts be free of any dirt or contamination that would adversely affect the seal of a new oil filter when installed.

9.3 Install the new oil filter as described in sections **8.1** and **8.2** above.

9.4 Fill the crankcase with the engine oil of choice and start the engine as described in section **9.5** and **9.6** below.

Use of a spin-on type oil filter in the Concours (or other Qualified Kawasaki Motorcycle Models) will require slightly different oil quantities when re-filling after an oil change. Studies have shown that when one of the longer filters is used, approximately **1/4 quarts** (7 ounces) of additional oil is required for re-filling (including the amount of oil used in pre-filling the filter). Slightly less oil is required if one of the shorter filters is used.

When restarting after an oil and filter change, the recommended method is to start the engine while the motorcycle is on the center stand and in the following prescribed manner:

9.5 Turn ignition **ON** and **leaving the enricher lever in the full OFF position**, push the starter button for several seconds.

9.6 While holding the starter button down and watching the oil pressure light on the dash, **SLOWLY** begin to pull the enricher lever rearward to allow the engine to begin starting. The oil pressure light should go off during this process as oil pressure begins to build. Once the lever is advanced enough to allow the engine to start, release the starter button and allow the engine to come up to speed smoothly at (or just above) idle speed (1,000-1,500 rpm). **DO NOT** advance the throttle to raise rpm during this initial process in order for the oil pressure to build and oil flow to begin circulating throughout the entire engine lubrication system.

Since all of the moving parts in the engine are vulnerable to damage (especially those parts, such as camshafts, which are farthest from the oil pump) by any operation without proper oil pressure and oil flow, this procedure represents the quickest way to achieve proper oil pressure and oil flow. This procedure (as outlined in steps **9.5** and **9.6** above) is highly recommended for the stock (or standard) oil filter apparatus as well for the same reasons as stated above.

Once the engine is running smoothly, allow the engine to run in this state for a few minutes (at steady speeds up to about 1,500 rpm or so). Shut the engine off and allow to sit for several minutes before checking the oil level. Once the engine is shut off, make a careful inspection of the oil filter and drain plugs for any signs of oil leaks.

Check the oil level and adjust as required to bring the oil level between the marks on the sight glass.

10.0 Spin-On Oil Filter Choices:

A preliminary oil filter reference list is included with this Installation Manual for use as a reference guide only. This list is also placed on www.murphskits.com and www.bergmenengineering.com and will be updated on a regular basis for use only as a reference source.

The www.bergmenengineering.com website also lists several links to independent oil filter studies that may be of some use in making oil filter choices as well. If at any time there are questions as to the proper applicability of any desired oil filter, contact Bergmen Engineering, Inc. or www.murphskits.com for specific advice on compatibility with the Model 410-010 Adaptor Kit.

11.0 Bergmen Engineering, Inc. Contact Information:

If at any time there are any questions, comments or problems with any part of the Adaptor Kit or suggestions for improvement of the product, please do not hesitate to write or call Bergmen Engineering, Inc. using the following contact information:

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