

SERVICE BULLETIN

SB07-9

Compliance Will Enhance Safety

**Technical Portions FAA
Approved**

SUBJECT: IO240B Inline Fuel Filter Reorientation

PURPOSE: To provide instructions for the reorientation of the P/N 656859 fuel filter assembly in the Diamond DA20C1 aircraft. Instructions for Continued Airworthiness (ICA) for the P/N 656859 fuel filter assembly are also provided in this Service Bulletin.

COMPLIANCE: Comply at next maintenance event or in conjunction with performance of SIL07-10.

MODELS

AFFECTED: IO240B13B, 17B, 20B, 21B engines equipped with Altitude Compensating Fuel Systems and IO240 engines modified per SIL05-4A to incorporate a 656859 inline fuel filter

FILTER REORIENTATION INSTRUCTIONS

This section contains instructions for the removal of the currently installed P/N 656859A1 fuel filter assembly with mounting bracket and installation of the replacement P/N 656859A6 fuel filter and vertical mounting bracket configuration utilizing EQ7496 Fuel Filter and Hose Kit. This kit provides a new fuel filter with bracket assembly which allows reorientation of the filter utilizing original Camloc locations on the forward apron. New inlet/outlet hoses are furnished installed to assure cleanliness of the replacement filter assembly at installation. Fuel line fittings may be loosened to allow alignment during hose attachment, but are NOT to be disconnected.

Caution


All fuel system components must be handled with care with any openings sealed with appropriate clean caps and plugs prior to installation or immediately upon removal. The engine, tools and environment must be clean to minimize any potential for fuel system contamination. Fuel system purging instructions must be performed in the sequence provided in this SID.

WARNING

Magnetos must be verified to be in the off position and grounded, and fuel must be selected to the off position when moving the propeller by hand, or personal injury may result.

Referring to the airframe manufacturers maintenance instructions:

- (a) Remove upper and lower engine cowlings from the aircraft
 - (b) Remove electrical power from the aircraft.
 - (c) Shutoff the fuel supply to the engine by closing the fuel shutoff valve.
1. Disconnect the fuel line from the engine driven fuel pump outlet fitting. The fuel outlet fitting B nut may be loosened to assist in hose removal and alignment for installation of the new pump to filter hose. (Reference Figure 1) Install a cap on the fuel pump outlet fitting to prevent contamination.
 2. Disconnect the induction air hose from the throttle body. Install cap plugs or tape on both the throttle body inlet and the induction air hose openings. Disconnect the fuel line from the fuel metering unit inlet fitting. (Reference Figure 2) Install a cap on the fuel metering inlet fitting.

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MO	DAY	YEAR	MO	DAY	YEAR		1 of 8	
12	14	2007				SB07-9		

- Disengage the camlocs that secure the fuel filter mounting bracket to the forward apron assembly. With fuel lines attached, lift the fuel filter assembly vertically removing the fuel filter assembly with hoses, from the aircraft. (Figure 3)

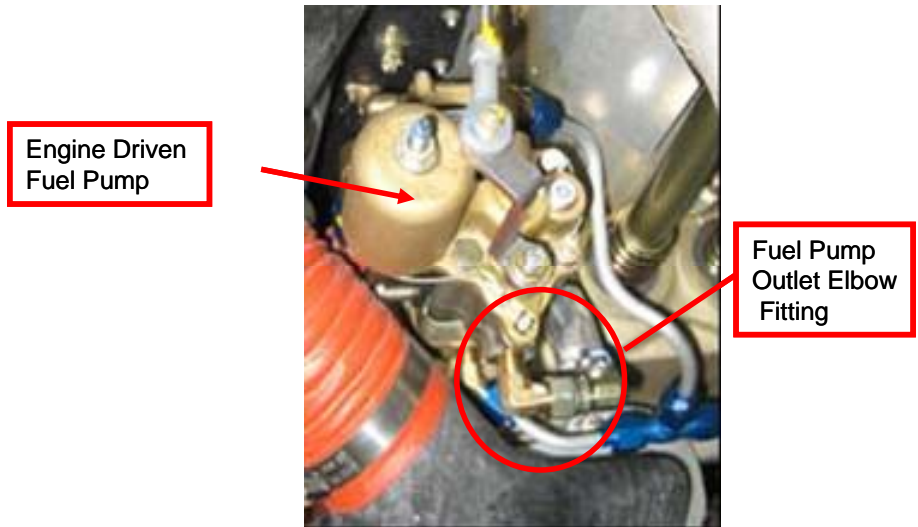


FIGURE 1

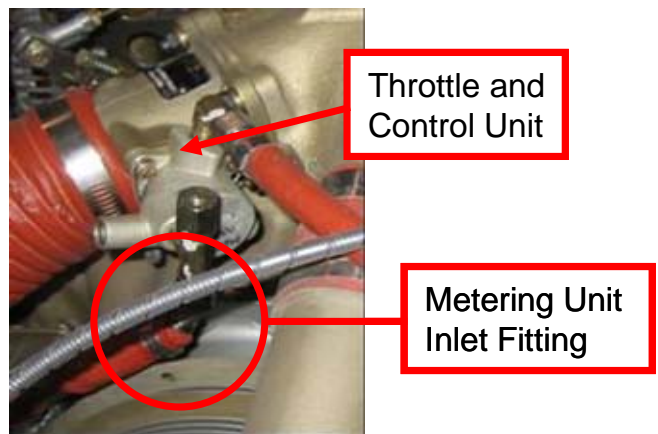



Figure 2

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MO	DAY	YEAR	MO	DAY	YEAR		2 of 8	
12	14	2007				SB07-9		

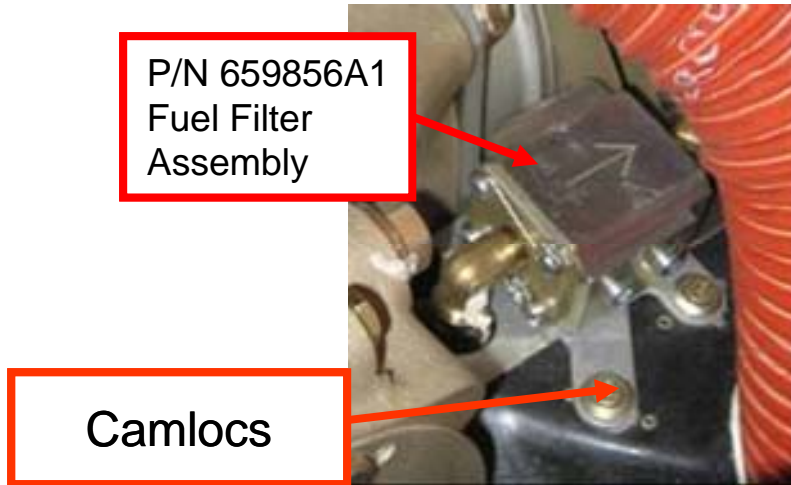


Figure 3

- Modify the existing opening in the forward baffle assembly as referenced in Figure 4. All dimensions in mm's. See Diamond Service Bulletin DAC1-73-05

NOTE: A rotary tool with a sanding drum is recommended for the baffle modification. Insure that all fuel and air openings are sealed before starting. Carefully clean all surfaces after rework to avoid contamination.

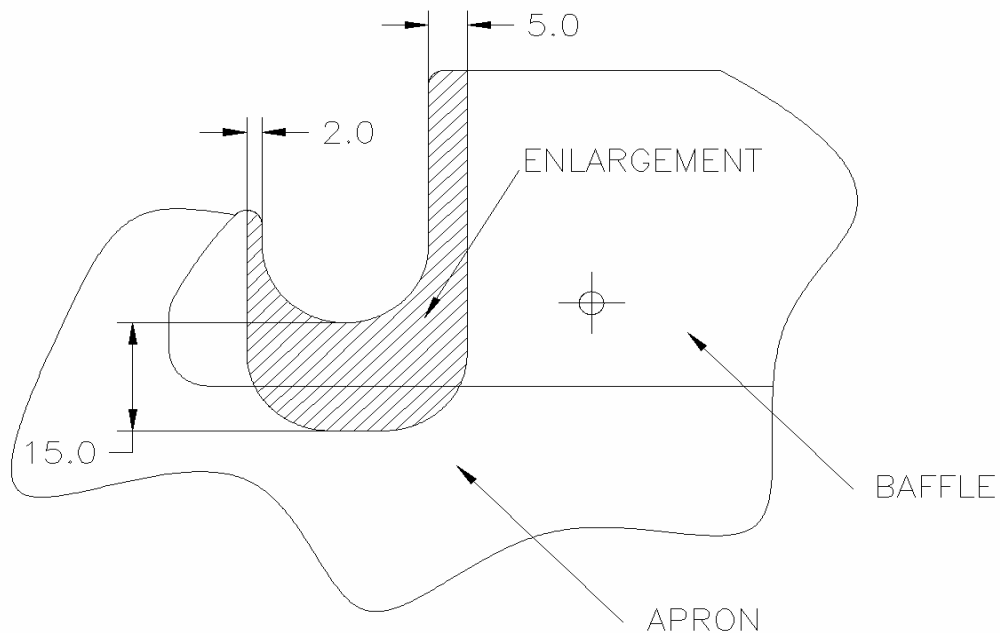



Figure 4

ISSUED			REVISED			 CONTINENTAL MOTORS <small>A Teledyne Technologies Company</small> <small>P.O. BOX 90 MOBILE ALABAMA 36601 • 251-438-3411</small>	PAGE NO	REVISION
MO	DAY	YEAR	MO	DAY	YEAR		3 of 8	
12	14	2007				SB07-9		

NOTE: All caution must be exercised during maintenance of the fuel system NOT to allow any contaminants to enter the components, lines and fittings during installation. All surfaces surrounding the area where components are to be installed must be clean and free of all forms of contaminant before and during installation. Components must be flushed and verified to be free of contamination prior to final installation.

During Installation:

- (1) Select the proper size open-end wrenches that will fit the fitting body and hose or tubing end fitting.
 - (2) Torque the hose or tubing end fitting to the specified torque using a properly certified calibrated torque wrench while maintaining sufficient force on the component fitting to prevent twisting and shear loads.
 - (3) Support the last fitting in the assembly on components that contain multiple fittings coupled in one location.
 - (4) **DO NOT over torque fittings.**
5. Confirm hose and fitting clocking of the fuel pump to inline fuel filter hose. This hose must be installed prior to filter installation as it is not accessible when the filter is attached to the forward apron. When clocking is verified, torque fitting to 135-190 inch pounds using a calibrated torque wrench. See the figure below for clocking.

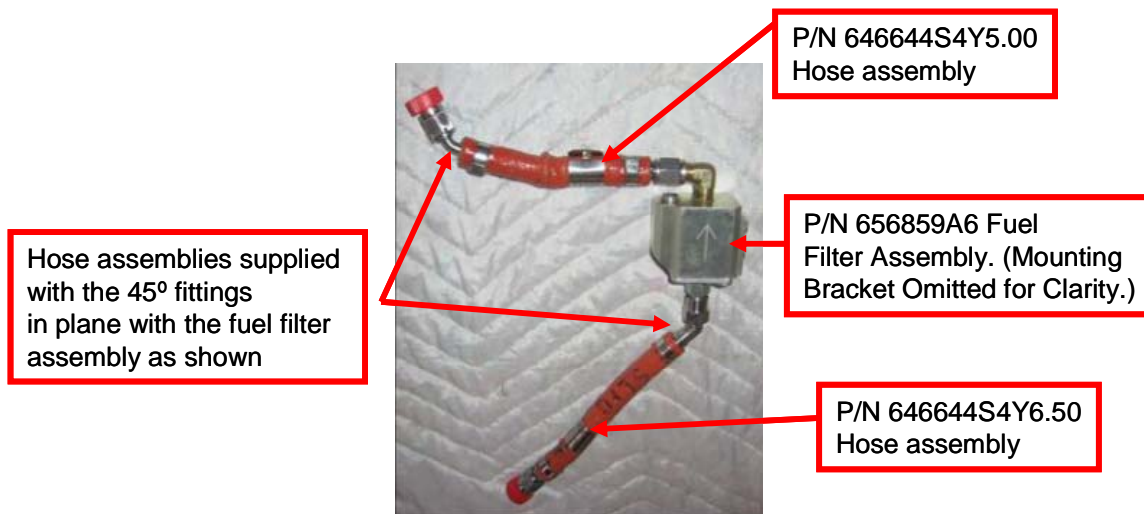



FIGURE 5

6. Leaving the inlet and outlet hose attached to the filter, route the new fuel pump to fuel filter line through the forward apron. It will be necessary to guide the fuel line around the back side of the engine driven fuel pump and into the correct position for installation. Assure that that the four lockwired screws are on the

ISSUED			REVISED			 CONTINENTAL MOTORS <small>A Teledyne Technologies Company</small> <small>P.O. BOX 90 MOBILE ALABAMA 36601 • 251-438-3411</small>	PAGE NO	REVISION
MO	DAY	YEAR	MO	DAY	YEAR		4 of 8	
12	14	2007				SB07-9		

lower side of the filter installation. Attach the fuel filter to the forward apron by engaging the existing Camloc fasteners on bracket. (Reference Figure 6)

7. Restore electrical power to the aircraft. Select the fuel "ON".
8. Remove the fuel pump outlet fitting protective cap. Utilizing the airframe boost pump, flush a minimum of 1 quart of fuel through the fuel pump outlet fitting through a coffee filter into a clean, dry container. If contamination is found, continue to flush until no contaminant is evident. If no contamination is found, remove protective plug from the fuel pump to filter hose and attach hose to the fuel pump outlet fitting.
9. Torque the fuel pump outlet fitting elbow B nut and the fuel pump outlet hose "B" nut to 135-190 Inch-Lbs.
10. Remove the plug from the fuel filter to fuel metering unit inlet hose. Utilizing the airframe boost pump, flush a minimum of 1 quart of fuel into a clean, dry container. Inspect the flushed fuel. If contamination is found, locate the source and correct the issue before proceeding further. If no contamination is present, proceed to the next step.
11. Connect the fuel filter outlet line to the metering unit inlet fitting. Torque to 135-190 Inch-Lbs. (Reference Figure 6)

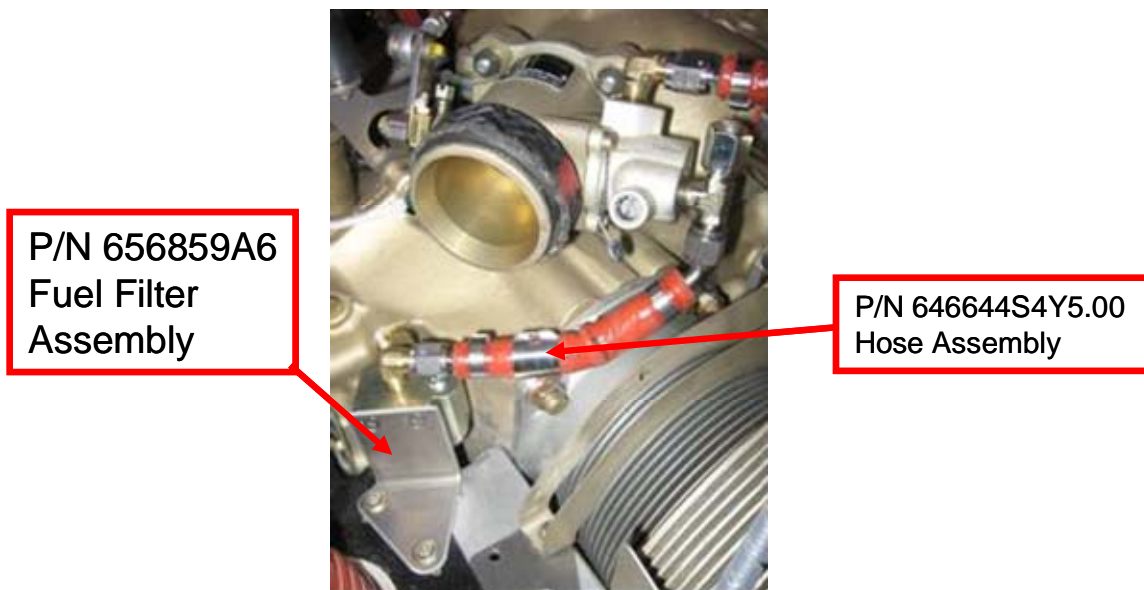



FIGURE 6

12. Using the fuel boost pump, leak check the complete engine fuel system. Correct any defects noted before proceeding to the next step.
13. Perform the fuel system setup and operation verification in accordance with the instructions and specifications contained in TCM bulletin SID07-3, revision A or later and the instructions contained in the latest revision of the IO-240 Maintenance Manual TCM Form X30621A. Assure that 639464 caps are installed on the fuel metering tee and the manifold tee pressure checking points. Make an engine logbook entry that SB07-9 has been complied with.

ISSUED			REVISED			 CONTINENTAL MOTORS <small>A Teledyne Technologies Company</small> <small>P.O. BOX 90 MOBILE ALABAMA 36601 • 251-438-3411</small>	PAGE NO	REVISION
MO	DAY	YEAR	MO	DAY	YEAR		5 of 8	
12	14	2007				SB07-9		

WARNING

Over priming can cause a flooded intake resulting in a hydraulic lock condition and subsequent engine damage or failure. If the engine is over primed, or flooded, make sure that all fuel has drained from the intake and cylinders prior to attempting engine start.

NOTE

Pressure altitude must be used when determining fuel system set-up values. To determine pressure altitude prior to take-off, set your altimeter to 29.92 in hg, and the altimeter will indicate your pressure altitude.

14. Using the airframe manufacturers instructions, return the aircraft to its normal configuration.

WARRANTY

Contact Teledyne Continental Motors Customer Service at 1-888-826-5465 for part kit availability and labor claim filing instructions to allow completion of the modification section of this Service Bulletin.

Please provide the following information to TCM representative at time of contact;

1. Model and Serial number of the affected aircraft
2. Registration number
3. Engine Serial Number
4. Total time on engine
5. Owner's Name, Address and Telephone Contact info
6. FBO Name, Address and Telephone Contact info

PARTS REQUIRED

P/N EQ7496 Fuel Filter assembly with hoses 1 EA


INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

Teledyne Continental Motors requires the P/N 656859A6 filter assembly to be inspected after each 200 hours in service using the following instructions and referencing photo 1.

WARNING

Magnetos must be verified to be in the off position and grounded, and fuel must be selected to the off position when moving the propeller by hand, or personal injury may result.


NOTE: All caution must be exercised during maintenance of the fuel system NOT to allow any contaminants to enter the components, lines and fittings during installation. All surfaces surrounding the area where components are to be installed must be clean and free of all forms of contaminant before and during installation. Components must be flushed and verified to be free of contamination prior to final installation.

ISSUED			REVISED			 CONTINENTAL MOTORS <small>A Teledyne Technologies Company</small> <small>P.O. BOX 90 MOBILE ALABAMA 36601 • 251-438-3411</small>	PAGE NO	REVISION
MO	DAY	YEAR	MO	DAY	YEAR		6 of 8	
12	14	2007				SB07-9		

Referring to the airframe manufacturer’s maintenance instructions:

- (a) Remove electrical power from the aircraft.
 - (b) Remove the upper engine cowling from the aircraft
 - (c) Shutoff the fuel supply to the engine by closing the fuel shutoff valve.
1. Disconnect the fuel line from the engine driven fuel pump outlet fitting. The fuel outlet fitting B nut may be loosened but not removed to assist in hose removal and alignment for installation of the new pump to filter hose. (Reference Figure 1) Install a cap on the fuel pump outlet fitting to prevent contamination.
 2. Disconnect the induction air hose from the throttle body. Install cap plugs or tape on both the throttle body inlet and the induction air hose openings.
 3. Disconnect the fuel line from the fuel metering unit inlet fitting. (Reference Figure 2) Install a cap on the fuel metering inlet fitting.
 4. Disengage the camlocs that secure the fuel filter mounting bracket to the forward apron assembly. With fuel lines attached, lift the fuel filter assembly vertically removing the fuel filter assembly with hoses, from the aircraft. (Figure 3)
 5. Remove the P/N 656859A6 filter assembly. Cut the safety wire on the four screws holding the P/N 656855 cover on the inlet side of the fuel filter assembly. Remove the four screws and remove the cover. Remove the P/N MS9021-020 o-ring from the cover and discard.
 6. Remove the P/N 656858 filter spring from the filter housing, then remove the P/N 656856 filter disc from the housing.
 7. Clean the filter disc, cover and housing ultrasonically or by soaking in lacquer thinner or acetone for several hours. Clean the housing and spring prior to reassembly. Blow the filter disc, housing and spring dry with clean, filtered dry compressed air. If any physical damage is noted to the filter disc, it must be replaced.
 8. Install the filter disc and then the spring into the filter housing assembly. Install a new P/N MS9021-020 o-ring onto the cover. Lubricate the o-ring with clean engine oil and install the cover onto the filter housing assembly. Secure the cover using the four P/N AN500-A8-7 screws and AN960-8 washers. Torque the cover retaining screws to 17.5 to 22.5 In-Lbs. Lockwire the screws in pairs using 0.032” stainless steel lockwire conforming to MS20995 Condition A
 9. Reinstall the hoses to filter 656859A6 (Reference Figure 5). Route the fuel pump to fuel filter line through the forward apron. It will be necessary to guide the fuel line around the back side of the engine driven fuel pump and into the correct position for installation. Assure that that the four lockwired screws are on the lower side of the filter installation. Attach the fuel filter to the forward apron by engaging the existing camloc fasteners on bracket. (Reference Figure 6)
 10. Restore electrical power to the aircraft. Select the fuel “ON”.
 11. Remove the fuel pump outlet fitting protective cap. Utilizing the airframe boost pump, flush a minimum of 1 quart of fuel through the fuel pump outlet fitting through a coffee filter into a clean, dry container. If contamination is found, continue to flush until no contaminant is evident. If no contamination is found, remove protective plug from the fuel pump to filter hose and attach hose to the fuel pump outlet fitting.
 12. Torque the fuel pump outlet fitting elbow B nut and the fuel pump outlet hose “B” nut to 135-190 inch-lbs.
 13. Remove the plug from the fuel filter to fuel metering unit inlet hose. Utilizing the airframe boost pump, flush a minimum of 1 quart of fuel into a clean, dry container. Inspect the flushed fuel. If contamination is found, locate the source and correct the issue before proceeding further. If no contamination is present, proceed to the next step.
 14. Connect the fuel filter outlet line to the metering unit inlet fitting. Torque to 135-190 Inch-Lbs. (Reference Figure5)

Using the fuel boost pump, leak check the complete engine fuel system. Correct any defects noted before proceeding to the next step.

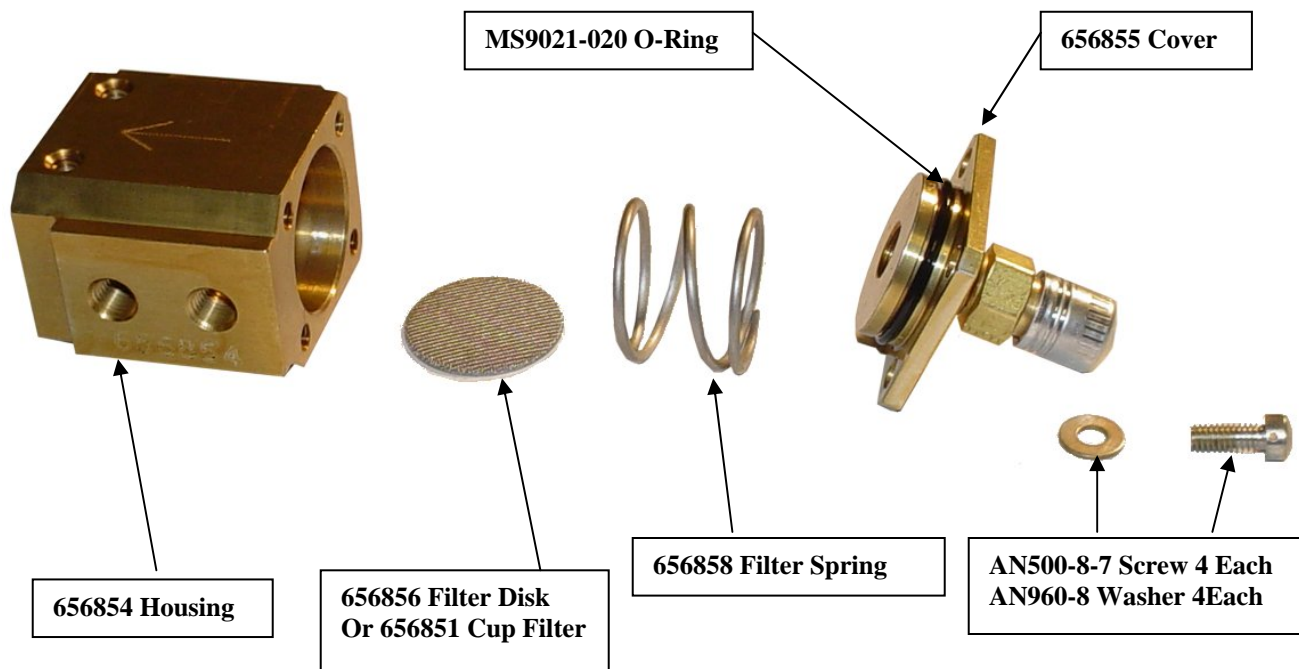
ISSUED			REVISED			 CONTINENTAL MOTORS <small>A Teledyne Technologies Company</small> <small>P.O. BOX 90 MOBILE ALABAMA 36601 • 251-438-3411</small>	PAGE NO	REVISION
MO	DAY	YEAR	MO	DAY	YEAR		7 of 8	
12	14	2007				SB07-9		

WARNING


Over priming can cause a flooded intake resulting in a hydraulic lock condition and subsequent engine damage or failure. If the engine is over primed, or flooded, make sure that all fuel has drained from the intake and cylinders prior to attempting engine start.

Perform the fuel system verification in accordance with the procedures contained in the latest revision of TCM bulletin SID07-3 and the procedures contained in the latest revision of the IO-240 Maintenance Manual TCM Form X30621A. Assure that all connections are correct and properly torqued.

Reinstall the cowlings in accordance with the airframe manufacturer's maintenance instructions.



**PHOTO 1
FUEL FILTER ASSEMBLY**

ISSUED			REVISED			 CONTINENTAL MOTORS <small>A Teledyne Technologies Company</small> <small>P.O. BOX 90 MOBILE ALABAMA 36601 • 251-438-3411</small>	PAGE NO	REVISION
MO	DAY	YEAR	MO	DAY	YEAR		8 of 8	
12	14	2007				SB07-9		