



**High Pressure Fuel Air Separator
with Positive Fuel Air Separation System**

INSTALLATION MANUAL

**For PACCAR MX-13
Diesel Engines**



**PLEASE READ
THESE INSTRUCTIONS
THOROUGHLY
BEFORE BEGINNING
INSTALLATION**

Part No. A6HSPA680

Revised 5/07/2024



Proudly Made in the USA

www.airdogdiesel.com

1-573-635-0555 or

1-877-463-4373

Providing "Test Cell Performance" in "Real World Conditions" Since 1993

PATENT

www.AirDogDiesel.com/patents



HEAVY DUTY & INDUSTRIAL
Fuel Systems
by **PureFlow**[™]
Technologies, Inc.

Amazingly Simple Installation

Mounts on frame and connects between the engine transfer (fuel) pump and engine. Air/vapor return line connects to engine fuel return line.

Amazingly Simple Operation

Operates in conjunction with the fuel flow and pressure created by the engine's transfer pump. Separates and removes entrained air plus vapor from fuel pump cavitation before the fuel enters the engine.

The AirDog[®] Champ is proudly made in the USA and features a 4 year limited warranty.



With PureFlow Technologies AirDog[®] Champ system installed, your diesel engine can perform as designed, even under the most extreme conditions.

877-GO-DIESEL (877-463-4373)
airdogdiesel.com

- ◆ Improves Fuel Mileage
- ◆ Lengthens Injector Life
- ◆ Smoother Idle
- ◆ Improves Throttle Response
- ◆ Maximizes Torque
- ◆ Reduces Emissions



Proudly made in the USA

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Optional Kit Available



PN FLK-CHP Champ Fuel Line Kit

This kit contains all components most commonly needed when installing the Champ frame mount air separation system using #8 fittings and Eaton Weatherhead supply lines. This kit uses #6 air and vapor return lines and includes 8' of 1/2" general purpose high pressure hose to be cut into 2 pieces for the fuel supply running from the pump or secondary filter head/housing, if equipped with one, into the Champ and for the supply running out of the Champ to the head or fuel rail. 7' of low pressure line is also included for the air and vapor return line.

INSTALLATION GUIDELINES

The installation of your AirDog® Champ can be made relatively easy by following the steps outlined in this manual, and:

1. Inventory the package components. Notify PureFlow Technologies immediately of any missing or damaged parts.
2. Read the installation manual completely. Understand how the system operates and the installation recommendations before beginning.
3. Proper location of the AirDog® Champ on the vehicle is essential. Consider hazards presented to the equipment by road debris and the elements.
4. Follow the installation recommendations and guidelines contained herein, but please note that individual installations may vary.

SAFETY GUIDELINES

CAUTION: Chock the vehicle's tires to prevent rolling.



CAUTION: Wear safety glasses when operating power tools, such as drills and grinders, or when using a punch or chisel.

CAUTION: Do not drill into or weld the top of the frame rail or within 1-½" of the frame rail flange on the side of the frame rail.



CAUTION: Route the fuel lines and electrical harnesses, keeping them away from hot exhaust components and/or moving parts. Properly secure the fuel lines and electrical harnesses to prevent chafing.

If you are uncertain of any installation procedure, please call PureFlow® Technologies, Inc. at 573-635-0555 for technical assistance.



NOTE: The pictures used in this manual are for example only and may not depict the exact components as found on your truck.

QTY	Description	Part Number	Image
1	Installation Manual	206-6-0680	
1	AirDog® Champ High Pressure Air Separator	A6HS-WIP	
1	AirDog® Fuel Filter	FF200-MG-6	








908-00-0304 Frame Mount Kit

2	Mounting Bracket	002-3C-0003 002-3C-0004	
1	901-08-0100 Hardware Kit Includes: 4 ea 3/8-16 x 1-1/4 HHCS 4 ea 3/8-16 Hex Nut 4 ea 3/8 Split Lock Washer 4 ea 1/4-20 x 2 SHCS 4 ea 1/4 Split Lock Washer 4 ea 1/4-20 Hex Nut	1J-1-C20SZ 1S-1-CSZ 1R-6-CSZ 1L-A32C 1R-6-AC 1S-1-AC	

CHPFK-680-PB Installation Kit

960-06-0560 Basic Champ Fitting Kit			
2	#8M JIC x 1/2 M ORB Straight Connector	4A-1-02-08-08-S	
1	#6M JIC x 3/8 M ORB Straight Connector	4A-1-01-06-06-S	

960-06-0680-FK Paccar MX-13 Fitting Kit

1	Quick Connect Return Adapter Sub-Assy	908-VM-QCRA	
1	1-1. Quick Connect Return Adapter	001-4A-1-0051	
1	1-2. 1/4 NPT w/ Vibraseal Pipe Plug	4A-3-01-A-S2	
1	1-3. 12.5 x 2.5 mm O-Ring	1U-2-1-12.5	
1	1-4. Quick Connect Retainer Clip	4C-2-00-00	
1	1-5. #6M JIC x 1/4 M NPTF Straight Connector	4A-1-01-A-C-SZ	
1	#8M JIC x #8F JICX x 1/4 NPTF Port GagePort	4A-1-11-08-08-4P	
1	#8 JIC x 3/8 M NPTF Straight Connector	4A-1-02-08-06-SZ	
1	Champ Paccar Fitting	006-00-PA-001-R2	
1	12.5 x 2.5mm O-Ring (installed on fitting)	1U-2-1-12.5	
1	16mm M x #8 M JIC Straight Connector	4A-1-01-08-16-S	
1	16mm Sealed Washer (on fitting)	1P-5-FS	
1	Quick Connect Retainer Clip	4C-2-00-00	
1	6" Zip Tie	5H-2-1-06	

See page 3 for optional fuel line kit available.



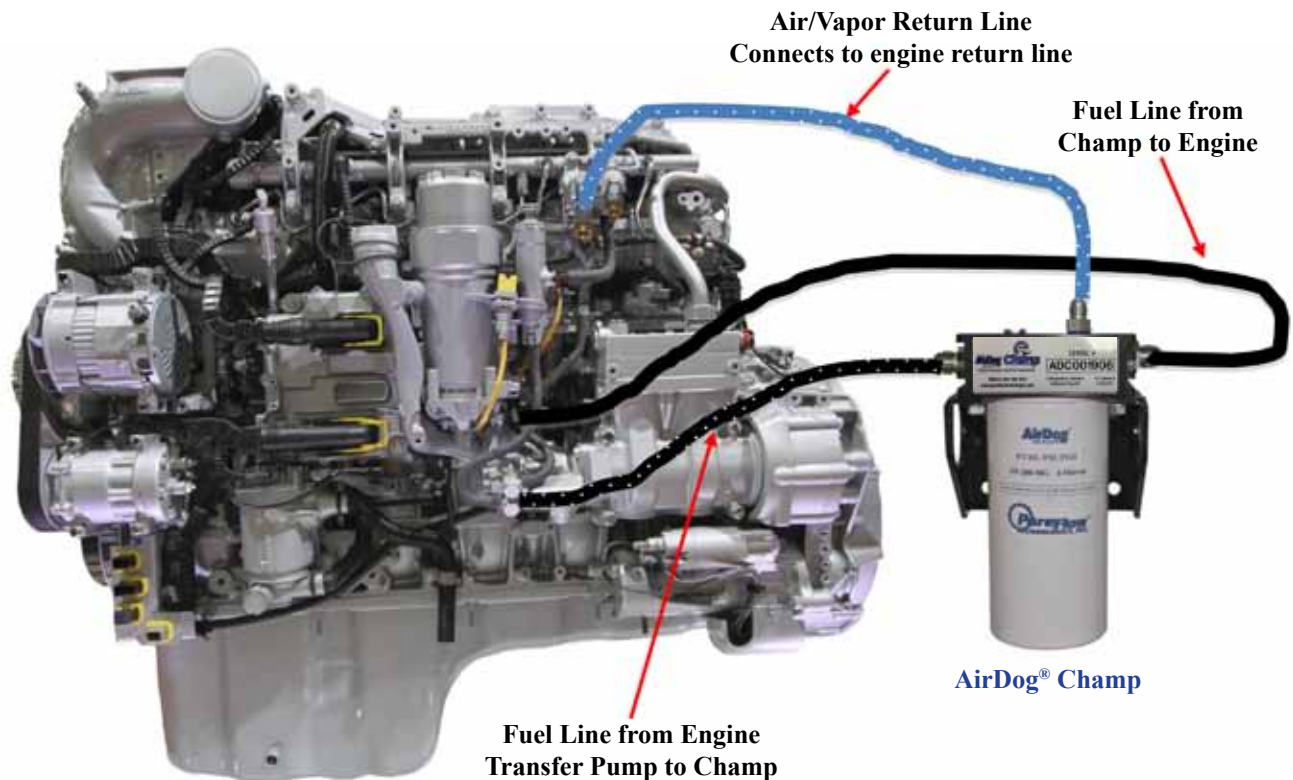
SYSTEM OVERVIEW

Welcome to the AirDog® Champ
High Pressure Fuel Air Separation System for Class 8 Trucks

The AirDog® Champ with *ADVANCED FUEL AIR SEPARATION* is a premium fuel air separator for Paccar MX-13 Engines.

The AirDog® Champ is installed between the engine transfer pump or secondary fuel filter housing, removing virtually all entrained air and vapor from the fuel flow to the engine.

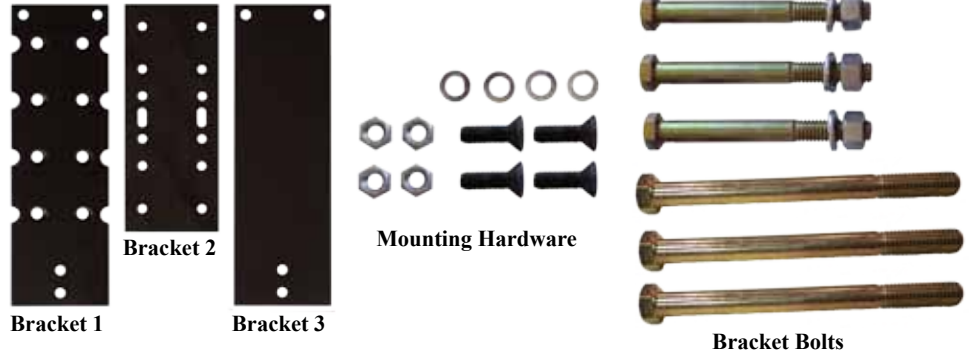
TYPICAL INSTALLATION LAYOUT



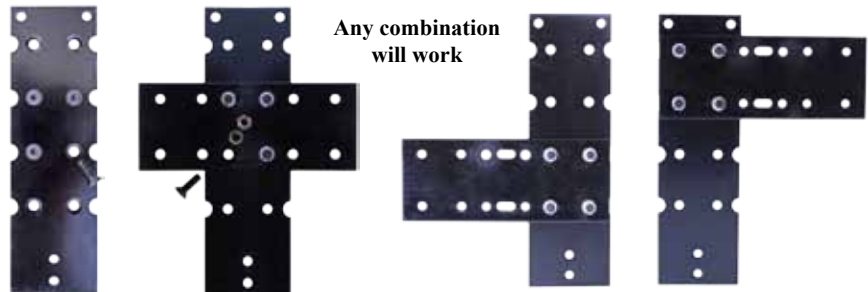
OPTIONAL KIT AVAILABLE (PN: SBK-1000)

Mounting the Champ to the Frame without Drilling

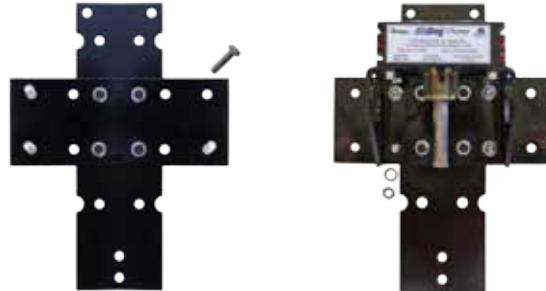
Determine which holes in bracket 1 that you are going to need by holding it up to the frame of your vehicle.



Use mounting hardware to mount bracket 1 to bracket 2. The position of bracket 2 can be adjusted vertically and horizontally to suit your particular needs.

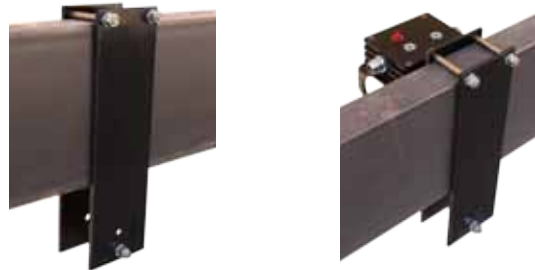


Using product mounting hardware, mount product to brackets.



Install 2 of the frame bracket bolts on top of bracket 1 and bracket 3. Slide over frame and install bottom bolt.

Note: 3.5" and 4.5" bolts are included. Use the length best suited to your vehicle's frame width.



Tighten bolts as needed.
Install filter.



Mounting the Champ to the Frame by Drilling

Selecting the best location to mount the AirDog® Champ.

Installing the AirDog® Champ at the proper location on the vehicle is most important. When deciding where to locate the AirDog®, the following points should be considered:

- Best relationship to the secondary fuel filter and back of engine head.
- Protection from the elements and road debris.
- Accessibility for service.

Figures 2 and 3 depict the AirDog® Champ mounted on the frame. There are many variations in the arrangements of the components on the various trucks. With a little ingenuity, the AirDog® Champ can be easily installed on any Class 8 truck.



Figure 2



Figure 3

5-1. Hold the AirDog® Champ, with the brackets and filter attached, next to the frame at the selected mounting location. Check for clearance. If mounted between the frame and steer tire, turn the steering wheel fully to the left and right to check for tire clearance.



Figure 4



Figure 5



5-2. Mark and center punch the hole locations. Drill a 3/8" hole at each of the 4 locations and attach the AirDog® Champ brackets.

WARNING! DO NOT DRILL INTO OR DAMAGE ANY WIRING, AIR LINES, OR OTHER COMPONENTS LOCATED BEHIND THE FRAME RAIL.

**FUEL LINE NOT INCLUDED - SEE PAGE 3 FOR AVAILABLE FUEL LINE KIT
- USING THIS OPTIONAL COST EFFECTIVE KIT WILL MAKE
INSTALLATION EASIER AND MORE EFFICIENT.**

Section 6A: Fuel Lines from Transfer Pump to AirDog® Champ

- 6A-1. Install fittings in the AirDog® Champ as follows (Figure 6):
A #8 M JIC x 1/2" M ORB (PN 4A-1-02-08-08-S) "FUEL IN"
B #6 M JIC x 3/8" M ORB (PN 4A-1-01-06-06-S) "AIR RETURN"
C #8 M JIC x 1/2" M ORB (PN 4A-1-02-08-08-S) "FUEL OUT"



Figure 6

- 6A-2. Remove 16mm banjo bolt and fuel line from the fuel inlet port on the side of the transfer pump.



Figure 7

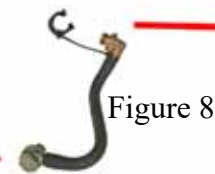


Figure 8



Figure 9

- 6A-3. Follow the fuel line to the secondary fuel filter housing above the transfer pump. Remove the retainer clip holding the fuel line "quick connect fitting", then remove the molded fuel line (Fig. 9) from the secondary fuel filter housing.

Fuel Lines from Transfer Pump to AirDog® Champ (cont'd)

6A-4. Assemble the 3/8" M NPT x #8 JIC fitting (PN 4A-1-02-08-06-SZ) into the AirDog® Paccar quick connect fitting (PN 006-00-PA-001-R2 & PN 1U-1-1-12.5). Use diesel compatible thread sealer. Attach the Paccar retainer clip (PN 4C-2-00-00) to the quick connect fitting assembly using a plastic zip tie (PN 5H-2-1-06) (Figure 10).



Figure 10

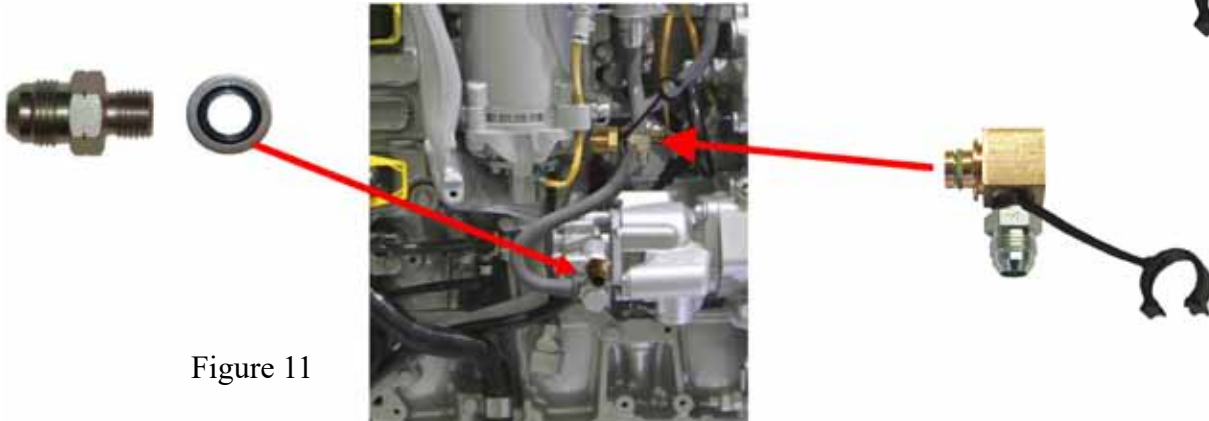


Figure 11

6A-5. Install the 16mm ORB x #8 JIC fitting (PN 4A-1-01-08-16-S) with steel retainer o-ring (PN 1P-5-FS) in the "Fuel Out" port on the transfer pump just vacated by the banjo bolt.

6A-6. Install the AirDog® Champ quick connect fitting assembly into the secondary filter housing.

6A-7. Measure, cut, and assemble a #8 fuel line to connect the Champ "Fuel Out" fitting to the quick connect fitting assembly into the secondary filter housing.

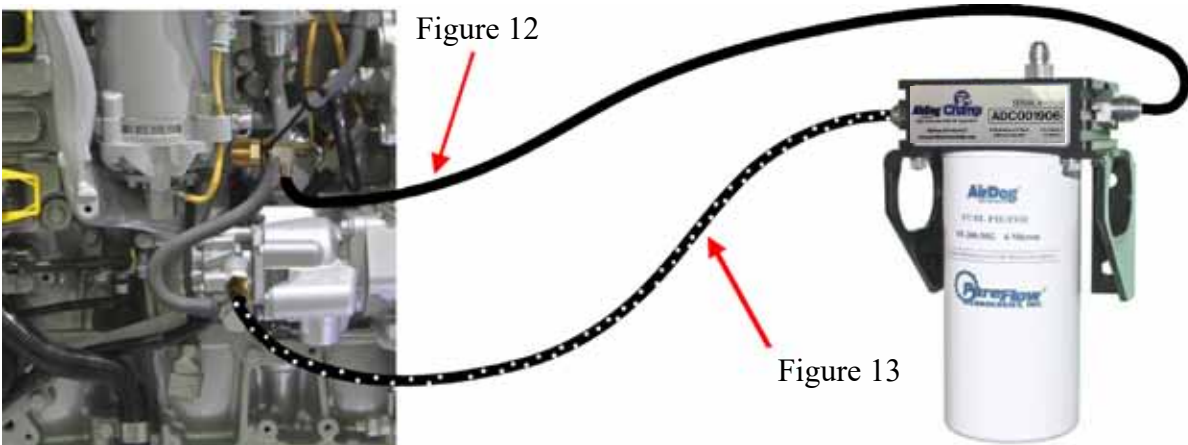


Figure 12

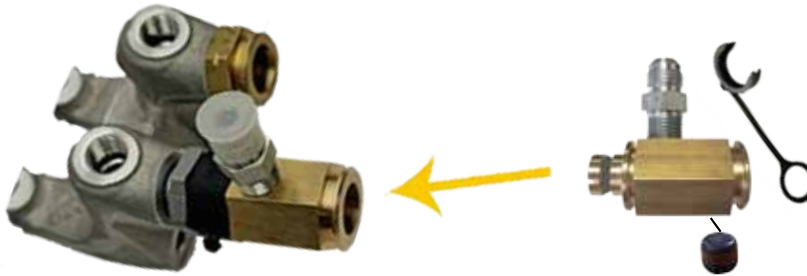
Figure 13

6A-8. Route and connect the new fuel line (shown in solid black) to the #8 "Fuel Out" fitting in the Champ to the new quick connect fitting in the secondary filter head. Properly secure. (Figure 12)

6A-9. Measure, cut, and assemble a #8 fuel line to connect the fuel pump fuel out fitting to the fuel in fitting on the Champ. (Figure 13)

6A-10. Route and connect the new fuel line (shown in black with white dots) to the #8 fuel out fitting in the fuel pump and then to the fuel in fitting on the Champ. Properly secure. (Figure 13)

Section 6B: Air/Vapor Return to Tank



VERY IMPORTANT: The AirDog® Air/Vapor return line is connected directly to the engine fuel return line.

You will use one of these options based on your engine setup:

- The Quick Connect Return Adapter Sub-Assy (PN 908-VM-QCRA) accomodates the AirDog® air/vapor return line on trucks **equipped with plastic fuel lines.**



- The #8M JIC x #8F JICX x 1/4 NPTF Port GagePort (PN 4A-1-11-08-08-4P) and the #6M JIC x 1/4 M NPTF Straight Connector (PN 4A-1-01-A-C-SZ) accomodate the AirDog® air/vapor return line on trucks **equipped with steel braided reinforced fuel lines.**



Trucks Equipped with Quick Connect Plastic Fuel Lines

6B-1A. Remove the factory quick connect fuel line, and install the provided quick connect return adapter (PN 908-VM-QCRA) into the factory fitting. **Be sure to lubricate the o-ring on the adapter and ensure the fitting is fully seated.** Then secure the fitting with the provided retainer clip.



6B-1B. Install factory fuel return line into the female side of quick connect return fitting. Once line is fully seated, secure with factory retainer clip.

PROCEED TO 6B-3.

Section 6B: Air/Vapor Return to Tank (cont'd)

Trucks Equipped with Steel Braided Reinforced Lines

6B-2A. Disconnect the engine fuel return line from the #8 JIC flare fitting located on the side of the engine and remove the original fuel return fitting.



6B-2B. Install #6M JIC x 1/4 M NPTF Straight Connector (PN 4A-1-01-A-C-SZ) into #8M JIC x #8F JICX x 1/4 NPTF Port GagePort (PN 4A-1-11-08-08-4P). Then install this Gageport Fitting Assembly onto the engine fuel return fitting.



6B-2C. Connect the factory fuel return line onto the GagePort Assembly.

PROCEED TO 6B-3.

6B-3. Measure, cut, and assemble a #6 air/vapor return line to connect the Champ air/vapor return port to the air/vapor return fitting.



6B-4. Install the new #6 air/vapor return line shown in blue with white dots. (Figure 14)

Note: Secure all fuel lines to prevent damage from abrasion.

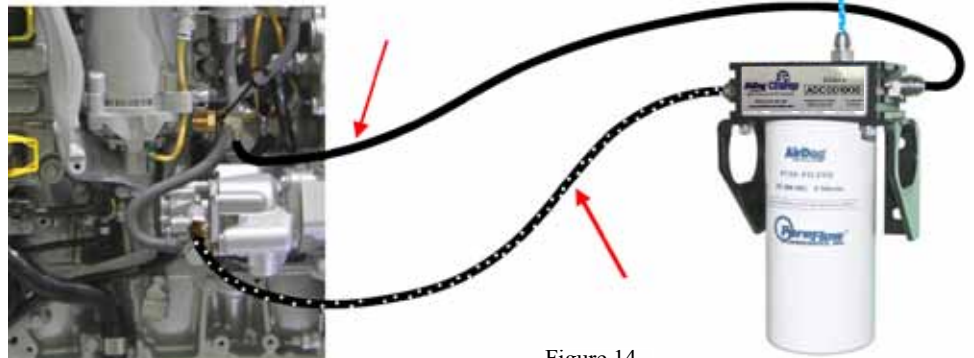


Figure 14

NOTE: Secure all fuel lines to prevent damage from abrasion.

Servicing the AirDog® Champ Fuel Filter

The AirDog® fuel filters have a typical lifespan of 25,000+ miles, and up to 40,000 miles, as they are made with a high-quality and high-capacity Micro-Glass media, as opposed to a paper element, and filter life is affected by many variables. In any case, we do not recommend exceeding 40,000 miles of service with a fuel filter. It is recommended that you keep a replacement AirDog® fuel filter on hand, ready for replacement. When replacing the fuel filter, be sure to clean the under side of the Champ base. Rub clean diesel fuel or oil on filter seal before installing to ensure a proper seal. Follow the instructions on the filter for proper tightening procedures.



**Built in check valve
Prevents fuel from
draining from the engine
head during filter changes**

**AirDog® Champ
Fuel Filter
6 Micron Micro-Glass**

NOTE: Due to the fact that fuel filters are often OVER TIGHTENED and difficult to remove, it is suggested to carry a second filter wrench to use as a backup wrench when changing the fuel filter.

Dispose of waste fuel and used filters properly to protect our environment.



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