AirDog®
HEAVY DUTY DIESEL FUEL SYSTEMS

INDUSTRIAL
Fuel Air Separation System

INSTALLATION MANUAL

For Trucks Equipped with CATERPILLAR®

Model 3406E, C10, C11, C12, C13, C15, C16 & C18 Engines



PLEASE READ THESE INSTRUCTIONS THROUGHLY BEFORE BEGINNING INSTALLATION



Part No. A3SPBT451

Revised 11/2/2026

NOW WITH DEMAND FLOW



PROUDLY MADE IN THE USA

AirDog®
HEAVY DUTY DIESEL FUEL SYSTEMS
PureFlow® TECHNOLOGIES, INC.

www.airdogdiesel.com
1-573-635-0555 or
1-877-463-4373

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

PATENT
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AirDog® INDUSTRIAL Fuel Air Separation System

THE RIGHT CHOICE FOR YOUR DIESEL ENGINE

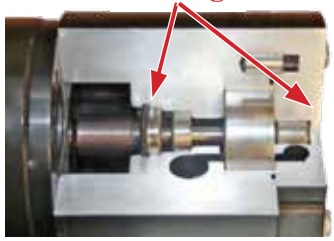
4G-HD Fuel Pump

Pump shaft, stabilized with bearings on each end, holds the gerotor in virtually perfect alignment for quiet running and extended longevity!



Low Fuel Pressure Switch and LED Indicator
Lets you know when to service the fuel filter and water separator before suffering power loss. NO MORE GUESSING!

Bearings





LoveJoy Coupler System
The LoveJoy Coupler System is self-aligning and eliminates virtually all vibrations.



Positive Air Separation
with primary air discharge port.





Dual Port Pump
Balances the gerotor for quiet operation and higher flows.



Protective Wire Screen
In water separator nipple.



Demand Flow System
Easy installation, only one small line connected to the engine return line to return air/vapor to the tank.

Drain Valve



Adjustable Regulator
For just the right fuel pressure.

Particulate Filters Featuring Long-Lasting Synthetic Media

Water Separator/Pre-Filter with Drain Valve

CARB Executive Orders D-595-5 & D-595U-6 permit the advertisement, sales and installation of PureFlow Technologies AirDog® Diesel Fuel Systems in California on 2020 and older model year on-road diesel vehicles and off-road diesel vehicles/equipment.

SYSTEM OVERVIEW

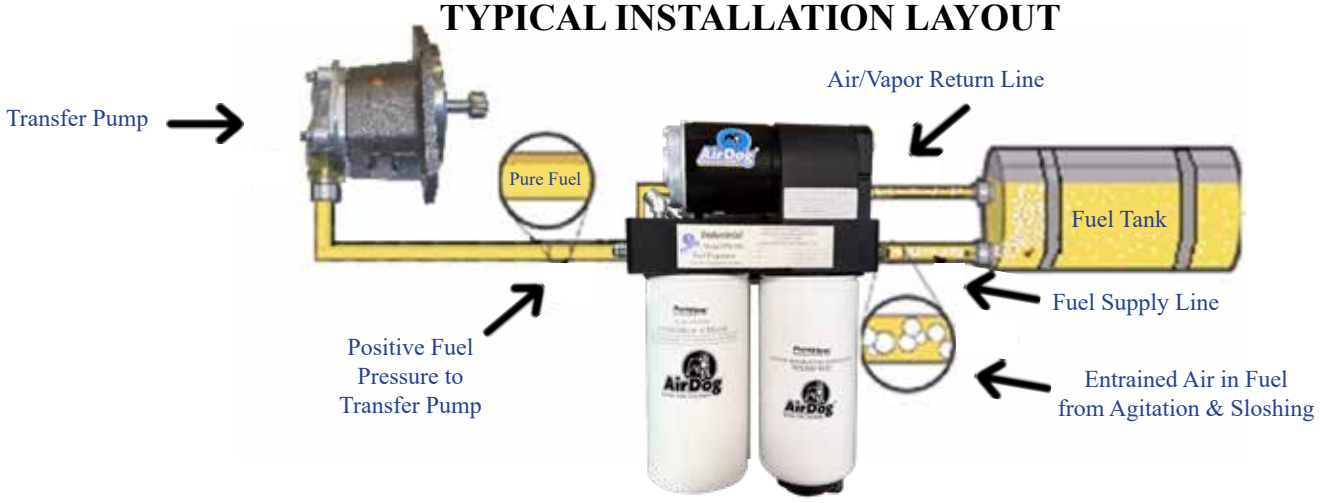
The AirDog® with advanced fuel air separation, demand flow, adjustable regulator, low pressure sensor with LED indicator, and the new 4G-HD fuel pump, is a premium fuel filtration and delivery system for the 3406E, C10, C11, C12, C13, C15, C16 & C18 model Caterpillar® engine.

Air and vapor are compressible. When air/vapor is present in a fuel injection system, the pressure buildup and injection of fuel is delayed while the air/vapor is being compressed. This delays the injection timing, causing a shorter power stroke and low power, increased fuel consumption, and increased exhaust emissions. Preventing the formation of vapor from pump cavitation and removing entrained air from the fuel flow to the injectors, restores correct injection timing. Diesel engines equipped with the AirDog® can now perform as designed, delivering "test cell" performance while in "real world" use.

The AirDog® removes water, particulates, and most importantly, the air that becomes entrained in diesel fuel, from the fuel flow to your engine. The entrained air and vapor that is separated from the fuel is returned to the fuel tank through a small return line. The fuel flow to the engine's transfer pump is at a net positive pressure, preventing cavitation and the formation of vapor, thus overcoming the performance related problems from plugged fuel filters, high altitude operation, and torque loss at higher engine RPMs.

All AirDog® products are manufactured with a personal touch, unsurpassed attention to detail, and the most stringent quality assurance.

TYPICAL INSTALLATION LAYOUT



The AirDog® requires only one small return line connected to the engine return line for quick and easy installations.

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INSTALLATION GUIDELINES

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

1. Inventory the package components. Immediately notify PureFlow® Technologies, Inc., 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® on the vehicle is essential. Consider hazards presented to the equipment by road debris and the elements.

4. The installation recommendations and guidelines contained herein are suggestions only. Individual installations may vary.

5. Use diesel compatible thread sealer when installing fittings with NPT threads. (Loctite® 545 Thread Sealer is diesel compatible.)

DO NOT REMOVE FACTORY INSTALLED SECONDARY FUEL FILTERS.REMOVAL OF A FACTORY INSTALLED SECONDARY FUEL FILTER MAY VOID YOUR ENGINE WARRANTY.

SAFETY GUIDELINES

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

CAUTION: Disconnect the battery cables before proceeding with the AirDog® installation.

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 using zip ties included in installation kit.

CAUTION: Do not subject the AirDog® system directly to high-pressure wash systems. Doing so may damage seals and electrical components, and such damage is NOT covered under warranty.

If you are uncertain of any installation procedure, contact 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.

Installation Parts List

QTY	Description	Part Number	Image
1	**Installation Manual**	206-1-0451	
1	**AirDog® Diesel Fuel System including:** Fuel Filter FF200 Water Separator WS200-WD	FPII-200	
1	**Wire Harness w/ Indicator Light & Dash Plate** 1 ea Indicator Light 5G-1-1-47674 1 ea Dash Plate 201-3-0004-S-M716	5E-2-010 908-5G-1-1-47674	
1	**3/8" Low Pressure Hose (Air/Vapor Return Line) - 7 ft Section**	4C-1-02-05-010-7FT	
1	**1- PC Mounting Bracket**	001-3C-0034	

ADFK-451 Installation Kit

1	**Fuel Pressure Sensor**	5C-9-007-SC-06	
15	**12" Zip Tie**	5H-2-1-12	
1	**908-5E-2-018/022 Add-A-Circuit Fuse Tap Adapters** 1 ea Add-A-Circuit Fuse Tap Adapter Mini 1 ea Add-A-Circuit Fuse Tap Adapter ATO	5E-2-018 5E-2-022	

1	**901-08-0100-1 Bolt Kit** 4 ea 3/8-16 x 1-1/4 HHCS 4 ea 1/4-20 x 2 SHCS **908-08-0100-N Nut Packet** 4 ea 3/8-16 Hex Nut 4 ea 1/4-20 Hex Nut **908-08-0100-1-W Washer Packet** 4 ea 3/8 Split Lock Washer 4 ea 1/4 Split Lock Washer 4 ea 3/8 Flat Washer	 1J-1-C20SZ 1L-A32C 1S-1-CSZ 1S-1-AC 1R-6-CSZ 1R-6-AC 1P-2-CSZ	

908-08-0800 AirDog® FPII Basic Fitting Kit

2	**#10M JIC x 1/2 M NPTF Straight Connector**	4A-1-01-10-08-S	
2	**#10M JIC x #10F JICX 90º Swivel Nut Elbow**	4A-2-04-10-10-S	
1	**#6M JIC x 1/4 M NPTF Straight Connector**	4A-1-01-A-C-SZ	
1	**3/8 ID, 7/8 OD Rubber Grommet**	5J-1-1-04-2758	

908-01-0451-RLFK Return Line Fitting Kit

1	**#6M JIC x 3/8 M ORB Restrictor Fitting w/ Lock Nut (w/ -906 o-ring installed)**	001-4A-1-6400-06	
1	**#8M JIC x 3/8 M ORB Restrictor Fitting w/ Lock Nut (w/ -906 o-ring installed)**	001-4A-1-6400-08	
1	**1/4 NPT with Vibraseal Pipe Plug**	4A-3-01-A-S2	
1	**#8M JIC x #8F JICX 90º Swivel Nut Elbow**	4A-2-04-08-08-S	
1	**#6M JIC x 1/4 M NPTF Straight Connector**	4A-1-01-A-C-SZ	
2	**#6F JICX x 3/8 Push-lock Hose Barb**	4A-1-09-06-06-B	
1	**#6M JIC x #6F JICX 90º Swivel Nut Elbow**	4A-2-04-06-06-S	
1	**#10M JIC x 1/2 M ORB Straight Connector - Modified**	4A-1-02-10-08-S-.5M	
1	**#10M JIC x #10F JICX 90º Swivel Nut Elbow**	4A-2-04-10-10-S	
1	**CAT Hand Primer Pump Replacement Kit** Includes: 1 Cap 002-4G-0006 & 1 Gasket 002-4G-0007	908-002-4G-0006/7	
1	**CAT Fuel Pressure Shim Kit**	SHK-CAFP	

Selecting the Best Location to Mount the AirDog®

When possible, mount the AirDog® in the same location of the original fuel filter.

Installing the AirDog® 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 transfer pump and the original primary fuel filter location.
- Protection from the elements and road debris.
- Accessibility for service.

CAUTION: Do NOT mount the AirDog® directly on the engine. Mounting the AirDog® directly on the engine will immediately void your AirDog® warranty!

The figures below show examples of different AirDog® installations. There are many variations in the arrangements of the components on the various trucks. With a little ingenuity, the AirDog® can be successfully installed on any Class 8 truck.

NOTE: When mounting the AirDog® at this location, check for clearance with the tire turned both toward and away from the frame.



This installation was on a vocational truck without much clear frame space up front. The AirDog® is mounted inside the frame, behind the cab.



AirDog® mounted on the frame under the steering column, in front of the spring hanger.



AirDog® mounted under the steering column, behind the spring hanger.

Mounting the AirDog® on the Truck's Frame

NOTE: DO NOT MOUNT THE AIRDOG® ON THE ENGINE! MOUNTING THE AIRDOG® ON THE ENGINE WILL IMMEDIATELY VOID YOUR AIRDOG® WARRANTY.

5-1. The goal is to mount the AirDog® in, or as close as possible to, the original location of the primary fuel filter. In most cases, this will allow you to use the original fuel supply lines from the tank to the engine. In many cases, the AirDog® 1-piece Mounting Bracket can be bolted into the original primary fuel filter mounting holes, requiring no drilling.

5-2. Disconnect the fuel lines and remove the original primary fuel filter.





5-3. Loosely assemble the mounting brackets and filters to the AirDog®.

5-4. Hold the AirDog®, with the bracket and filters 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 in both directions to check tire clearance.

If you are able to use the existing primary filter mounting holes, remove the AirDog® from the 1-piece Mounting Bracket and secure the 1-piece bracket to the frame with the included hardware.

If drilling mounting holes appears necessary, see Pg. 10 for the optional NDC-1000 No-Drill Mounting Kit for the AirDog® system.





Mounting the AirDog® on the Frame

5-5. While holding the AirDog® at the selected mounting location on the frame, mark and center punch each hole location.

5-6. Drill a 3/8" hole at each of the 4 previously marked locations.





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

5-7. Loosely assemble the 1-piece Mounting Bracket to the frame, then loosely assemble the AirDog® to the 1-piece Mounting Bracket.





5-8. After mounting the AirDog® on the brackets, snug the fasteners to achieve a good relaxed fit.

5-9. Properly tighten all of the fasteners.

NOTE: These steps are necessary to prevent stress cracks from forming in the mounting brackets due to road vibration and bouncing.

OPTIONAL KIT AVAILABLE (PN: NDC-1000)

NO-DRILL Frame Mount Bracket Kit

Many AirDog® Fuel System installations allow the original mounting holes in the frame to be used to mount the AirDog® 1-piece Mounting Bracket. In some instances, the original holes do not line up, or do not exist, making it necessary for new holes to be installed for mounting.

The AirDog® No-Drill Frame Mount Bracket Kit provides a Flanged Clamp Plate and Locking Clamps with hardware to enable attachment of the AirDog® 1-piece Mounting Bracket to the frame without drilling holes in the truck frame.





With the slotted holes in the 1-piece Mounting Bracket, combined with several inches of vertical hole mounting options, the No-Drill Mount Bracket Kit allows for practically unlimited positioning flexibility, ensuring clearance where it is needed.





The NDC-1000 Kit also includes 2” Spacers to step the 1-piece Mounting Bracket away from the frame, in the event that there is a bolt head, air or grease fitting, or another protrusion on the frame.



Scan here to place your order today

FUEL LINE OVERVIEW

The AirDog® has been engineered to eliminate fuel related problems. It is important that the fuel lines are assembled and installed properly, so as not to cause fuel flow restriction.

When possible, use the fuel lines that are on the vehicle. This will reduce your installation costs and make the installation go much more quickly.

NOTE: On various Class 8 trucks, the manufacturer may use other than traditional steel braid fuel lines. These lines require special fittings. The fittings used with the original primary fuel filter are specific to the fuel lines used on the truck. When possible, mount the AirDog® in the location that will allow the use of the original fuel lines and fittings.

Inspect the original fuel lines for size, length, and condition. If the fuel lines are in good condition and the correct size and length to adequately reach the AirDog®, you may want to go ahead and use them. If any of the fuel lines need to be replaced, it is recommended that the fuel lines selected meet or exceed DOT requirements.

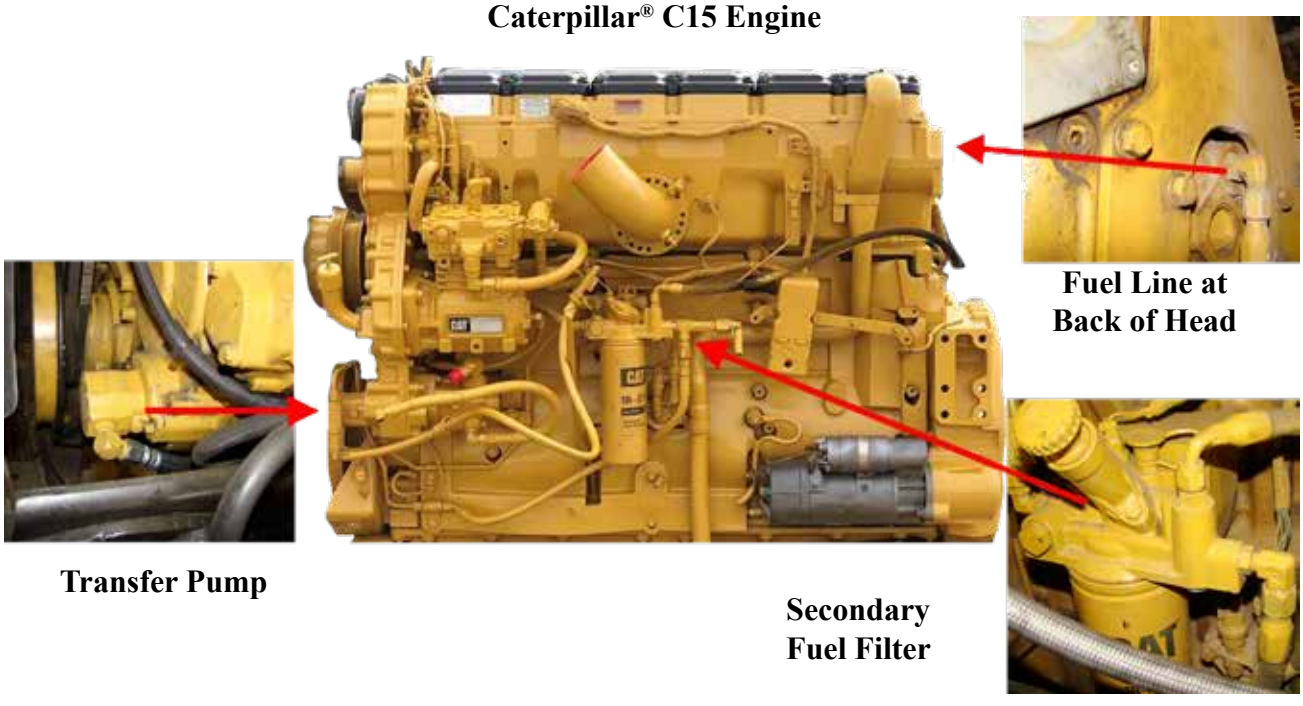
Fuel Supply Line: The fuel supply lines from the tank to the AirDog® and to the engine should be size 10 or, at the absolute minimum, size 8 (1/2" ID).

Air/Vapor Return Line: The AirDog® air/vapor return line can be connected to the engine's return line. A size 6 is adequate for the air/vapor return line.

Primary Fuel Filters: It is most important that there are no fuel filters between the fuel tank and the AirDog® or between the AirDog® and the engine's transfer pump to plug and cause restriction. These filters should be removed from the system as part of the AirDog® installation.

Secondary Fuel Filters: DO NOT REMOVE SECONDARY FUEL FILTERS. This is the filter between the transfer pump and the engine.

Caterpillar® C15 Engine



Fuel Line at Back of Head

Transfer Pump

Secondary Fuel Filter

Installing the Fuel Fittings and Low Fuel Pressure Sensor

IMPORTANT: Use diesel compatible thread sealer when installing NPT fittings.

NOTE: The figures below illustrate the installation of straight fittings. However, in some instances, 90º fittings may be required to connect the fuel lines to the AirDog®. Two 90º fittings have been included in the kit for this purpose.

6A-1. Install a straight #10 M JIC x ½ M NPT fuel fitting in the AirDog® fuel port marked **"ENGINE".**





6A-2. Install a straight #10 M JIC x ½" M NPT fuel fitting into the fuel inlet port next to the regulator marked **"FUEL IN"**.

6A-3. Install the ¼" NPT x #6 M JIC return fitting into the air/vapor return port marked **"TANK"**.





6A-4. Remove the 1/8" NPT plug from the end of the pre-installed 45° fitting in the AirDog® base. Install the fuel pressure sensor into the 45° fitting.



Assembly Instruction for Hose Barb

1. Cut hose line to length.
2. Apply oil to fitting.
3. Push fitting into line until seated.

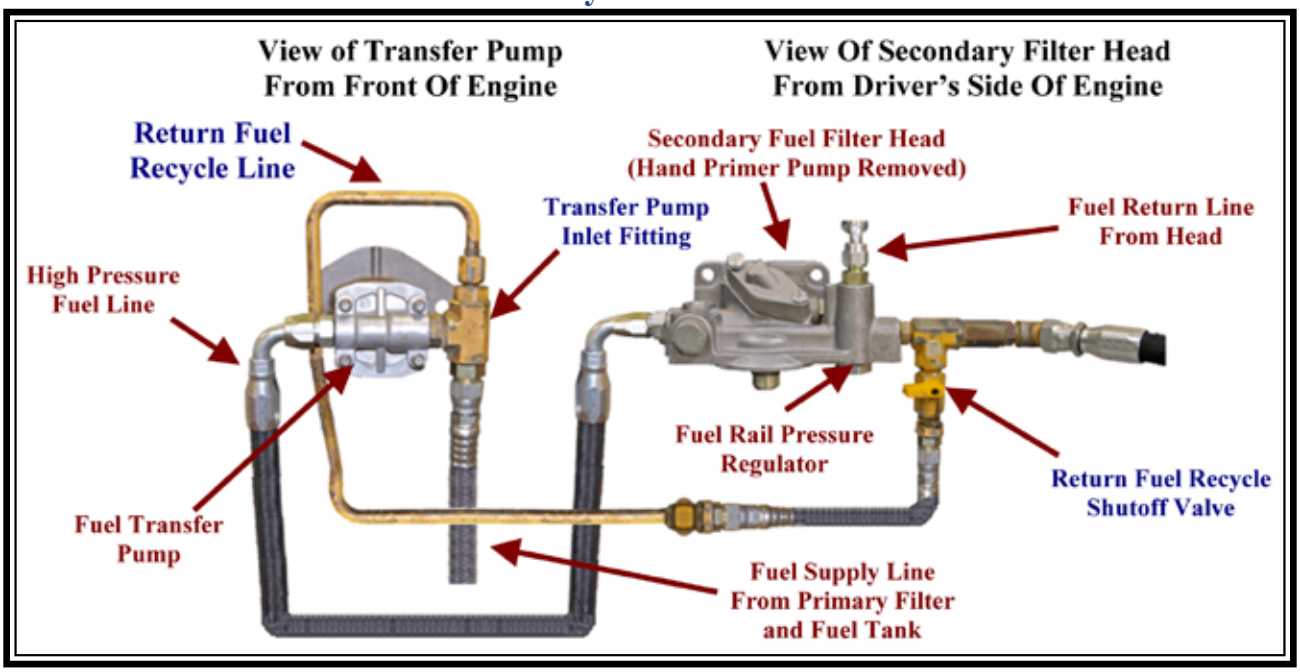


Caterpillar® ACERT Fuel Recycle Line (CAT ACERT Engines)

For Non ACERT engines, see Section 6C

Caterpillar® ACERT engines have a return fuel recycle line. This fuel line recycles "HOT" fuel, coming directly from the engine head, back to the fuel inlet port of the transfer pump.

For BEST FUEL ECONOMY and MAXIMUM ENGINE EFFICIENCY, the return fuel recycle line must be removed.



6B-1. Disconnect the return fuel recycle line from the top of the inlet fitting at the transfer pump.

6B-2. Disconnect the return fuel recycle line from the bottom of the return line shutoff valve.

6B-3. There is a bracket on the return fuel recycle line that secures the line to the block. Remove the bolt holding the bracket. Remove the return fuel recycle line from the engine.

6B-4. Disconnect the fuel supply line from the bottom of the inlet fitting at the transfer pump.

6B-5. Remove the transfer pump inlet fitting.



Note: Use the #10 F JIC swivel x #10 M JIC 90° elbow, as needed.



6B-6. Install the #10 M JIC x 1/2" M ORB fitting in the transfer pump inlet port.

6B-7. Reconnect and tighten the fuel supply line removed earlier.

Replacing the Transfer Pump Fuel Inlet Fitting (Non ACERT Engines)

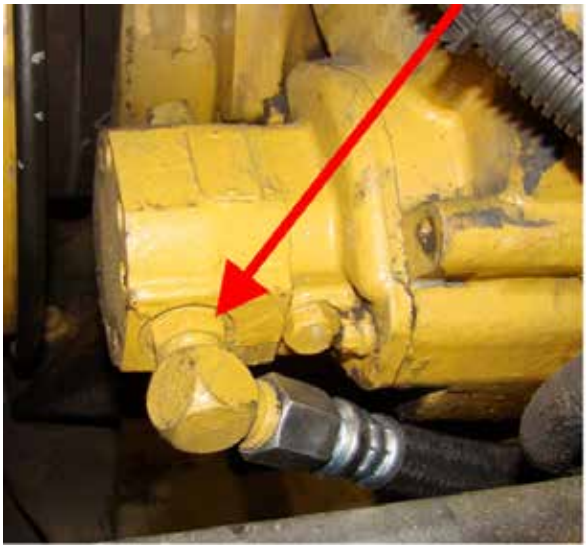
(For ACERT engines, see Section 6B)

NOTE: The small hole in the ORB side of the fitting, opening into the larger-volume section of the inlet to the transfer pump creates a vacuum, therefore a pressure drop, which can cause vapor to form. The remedy for this is porting the fuel inlet fitting.

6C-1. Disconnect the fuel line from the fitting and remove the fuel fitting from the transfer pump.



6C-2. Replace the fuel inlet fitting with the #10 M JIC x 1/2" M ORB modified fitting. If needed, attach the 90° #10 F JIC swivel x #10 M JIC fitting.



6C-3. Connect the fuel line originally connecting the primary fuel filter to the transfer pump to the AirDog® "Out to Engine" port. If the fuel line is in poor condition or too short to make the connection, replace it with a new fuel line.

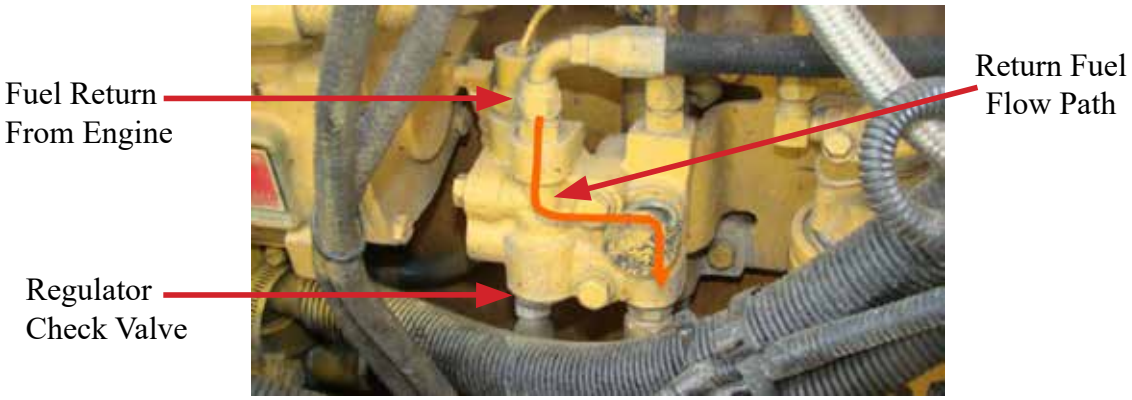
6C-4. Reconnect the fuel line to the transfer pump.



Installing the AirDog® Air/Vapor Return Line

Early Model 3406E CAT Secondary Fuel Filter Head

The early model CAT 3406E engines have a fuel distribution casting mounted on the driver's side, upper front of the engine.



6D-1. Disconnect the fuel return line and remove the fuel return fitting from the fuel distribution casting. Note whether you have a -6 or -8 return line size. Install the appropriately sized special AirDog® O-Ring Boss restrictor fitting in the fuel return port of the casting (Figure 2). Hand tighten for the moment.



Figure 2

001-4A-1-6400-06 (Silver) for a -6 return line
– or –
001-4A-1-6400-08 (Black) for a -8 return line



6D-2. There are two ¼" NPT female ports in the special return fitting installed in Step 6D-1. Install one ¼" NPT x -6 JIC male fitting into the port which best aligns with a direct line from the AirDog® fuel pump.



Installing the AirDog® Air/Vapor Return Line

Early Model 3406E CAT Secondary Fuel Filter Head

6D-3. Install one ¼" NPT with Vibraseal Pipe Plug into the opposite port of the restrictor fitting installed in Step 6D-1.

6D-4. Securely tighten the jam nut on the special restrictor fitting, locking the fitting into position and seating the o-ring.



6D-5. Measure and cut the length of 3/8" fuel line required (included in your kit), when properly routed, to connect the AirDog® air/vapor return port to the new return fitting installed on the secondary fuel filter head.



6D-6. Reconnect the engine fuel return line at the newly-installed restrictor fitting.



Installing the AirDog® Air/Vapor Return Line

Later Model 3406E CAT Secondary Fuel Filter Head

The AirDog® returns entrained air & vapor to the fuel tank. The AirDog® air/vapor return line may be connected directly to the engine fuel return line "Low Pressure" side after the regulator.

Connecting the AirDog® Air/Vapor Return to the Engine Fuel Return Line

6E-1. Disconnect the fuel return line connected to the fuel return fitting on the secondary filter housing and remove the ORB fitting. Note whether you have a -6 or -8 return line size. Install the appropriately sized special AirDog® O-Ring Boss restrictor fitting in the "To Tank" port in the secondary filter head. Hand tighten for the moment.

001-4A-1-6400-06 (Silver) for a -6 return line

– or –

001-4A-1-6400-08 (Black) for a -8 return line



6E-2. There are two ¼" NPT female ports in the special return fitting installed in Step 6E-1. Install one ¼" NPT x -6 JIC male fitting into the port which best aligns with a direct line from the AirDog® fuel pump.

- Install one ¼" NPT with Vibraseal Pipe Plug into the opposite port of the restrictor fitting.
- Securely tighten the jam nut on the special restrictor fitting, locking the fitting into position and seating the o-ring.



6E-3. Measure and cut the length of 3/8" fuel line required (included in your kit), when properly routed, to connect the AirDog® air/vapor return port to the new return fitting installed on the secondary fuel filter head.



Installing the AirDog® Air/Vapor Return Line

Later Model 3406E CAT Secondary Fuel Filter Head

6E-4. Connect the new return line to the AirDog® "TANK" air/vapor return port.

6E-5. Route and connect the other end of the air/vapor return line to the newly installed return fitting at the secondary fuel filter housing. Use the included 90° elbow, if required.





6E-6. Connect the factory return fuel line to the end of the AirDog® special return fitting installed in step 6E-1. Use the included 90° elbow, if required.





Connecting the AirDog® Fuel Supply Line to the Fuel Tank

6F-1. Inspect the fuel supply lines that connect the fuel tank(s) to the primary fuel filter for size, length, and condition. If a fuel line has deteriorated or if it is too short to connect to the AirDog®, replace it or make an extension as necessary.

6F-2. If it is necessary to replace the fuel line, measure and cut the length of fuel line required when properly routed and secured to make the connection from the fuel tank to the AirDog®. Assemble the fuel line per standard procedures.

6F-3. Route the fuel supply line from the fuel tank to the fitting on the AirDog® fuel inlet port marked **"FUEL IN"**. Use an included 90° elbow, if required.

6F-4. Connect the fuel supply line from the fuel tank to the fitting. Secure the line with zip ties to prevent chafing and abrasion.





READY TO FULLY OPTIMIZE YOUR CAT™ ENGINE?



Champ™ II

Add the Champ™ II High-Pressure Air Separation System to maximize your CAT engine's potential!

UPS-CAFS

Our Secondary Fuel System Upgrade Kit is the perfect complement to the Champ™ II and AirDog® - maximize fuel flow for supreme efficiency and performance!





SCAN FOR INFO

Contact us at
www.airdogdiesel.com
1-877-463-4273

Porting the Secondary Fuel Filter Head

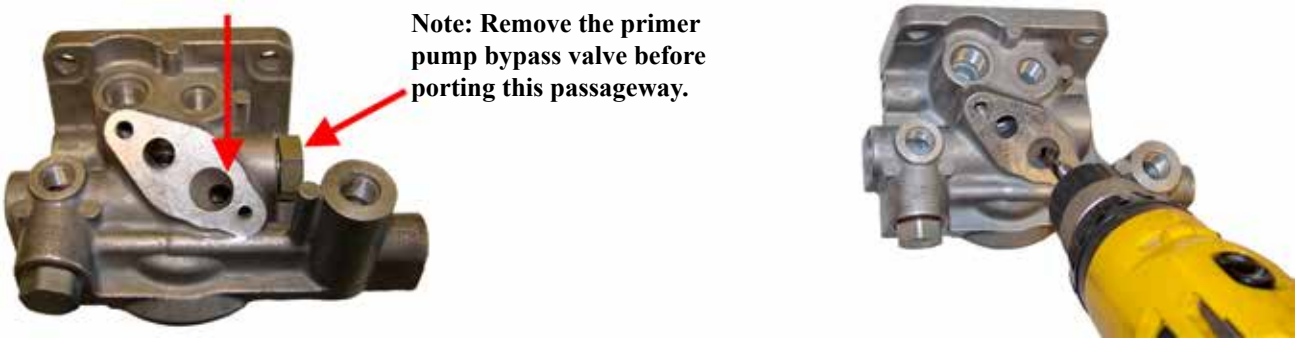
All Caterpillar® diesel engines are equipped with a secondary fuel filter mounted on the engine. The filter head usually includes an attached hand primer pump, to make it easier to prime and start the engine after filter changes. However, the fuel passages in the filter head, and the valves in the hand primer pump, are restrictive to the flow of fuel through the system, and the restriction negatively affects engine performance. The passages should be enlarged to improve fuel flow through the filter head (see below).



NOTE: Perform the following steps to improve fuel flow and engine performance. In most cases, the filter head can be drilled out without removing it from the engine.

7-1. Remove the hand primer  pump and  fuel filter from the filter head.

7-2. Using a 3/8” bit, carefully drill out the passageway that carries the fuel from the primer pump into the fuel filter.



NOTE: Be careful not to drill into the fuel filter gasket seat in the underside of the filter head.

Porting the Secondary Fuel Filter Head

7-3. Remove all burrs and shavings from the filter head.

7-4. Install the hand primer pump ported replacement cap and gasket on the filter head in place of the hand primer pump. Re-install the fuel filter.

NOTE: The primer pump replacement cap (included in the kit) cross passage has been ported to 3/8" to increase fuel flow for better engine performance.





IMPORTANT: It is recommended that you keep the hand primer pump on board, in the event it is needed to prime the system.

AirDog® Wire Harness

NOTE: The AirDog® wire harness includes a 15-amp fuse.

The AirDog® wire harness has a low pressure sensor and an amber LED indicator light as standard equipment. The indicator light will illuminate at start-up, remain on for a few seconds, then go off and should remain off unless pressure flow to the engine drops below minimum requirements.

Relay
(8-1)





AirDog® Pump Motor Lead (8-2)

Fuel Pressure Sensor Lead (8-3)

Indicator Light & Dash Plate (8-5 & 8-9)

Battery Positive Lead - Red (8-12)

Battery Negative Lead - Green (8-11)

Indicator Light Lead (8-5 & 8-9)

Relay Trigger Lead (No Connector/Plug) (8-5 & 8-6)

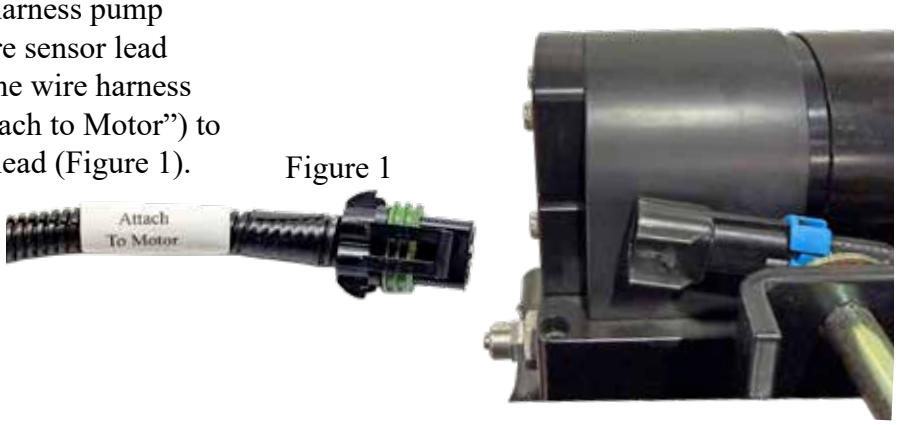
Securing the AirDog® Wire Harness Relay to the Vehicle

8-1. Secure the AirDog® wire harness relay to the vehicle. This picture shows the relay mounted on the firewall.



8-2. Route the AirDog® wire harness pump motor lead and the fuel pressure sensor lead to the AirDog® unit. Connect the wire harness pump motor lead (labeled “Attach to Motor”) to the AirDog® unit pump motor lead (Figure 1).

Figure 1



Securing the AirDog® Wire Harness Relay to the Vehicle

8-3. Connect the AirDog® wire harness fuel pressure sensor lead to the AirDog® unit fuel pressure sensor.



Relay Trigger Lead and Indicator Light Lead

The AirDog® Wire Harness Indicator Light lead must be routed through the firewall and to the dashboard. The Relay Trigger lead must be connected to a contact point that is electrically "HOT" when the key is in the "RUN" position. This could be either in a spare fuse holder in the fuse panel, using an Add-A-Fuse (included) to add the relay trigger lead to an existing circuit, or on the ignition switch itself.

Note: DO NOT connect the AirDog® wire harness relay trigger lead to a point that is "HOT" when the key is in the ACCESSORY position.

Routing the Indicator Light and Relay Trigger Lead through the firewall:

8-4. Many trucks have access holes through the firewall, located below or near the steering column. Remove the plug from one of those access holes, and route the wire leads through the hole. For trucks that do not have an existing hole in the firewall, you will need to drill a 5/8" hole in the firewall for entry of the leads into the cab. Use the provided grommet to seal around the wire loom.



Relay Trigger Lead and Indicator Light Lead

8-5. Route the AirDog® wire harness trigger lead (red wire with no connector/plug) and indicator light lead through the firewall.

By the Steering Column



Under the Dash



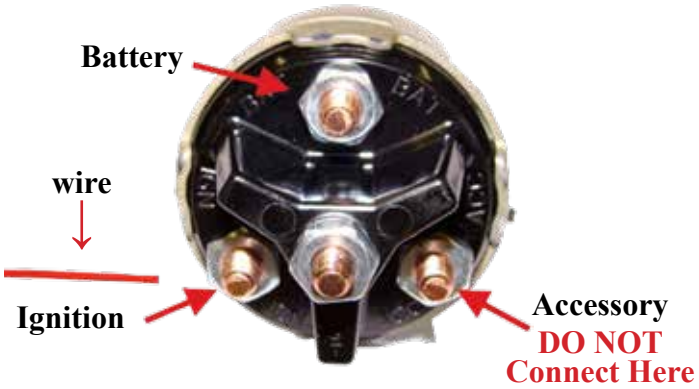
NOTE: Be sure to seal the opening or install a grommet around the wire loom to prevent water leakage and protection from chafing.

Relay Trigger Lead

This

There are several options for attaching the relay trigger wire:

8-6A. Connect the relay trigger lead to a terminal on the ignition switch that is "HOT" when the key is in the "RUN" position, as detailed in this picture:



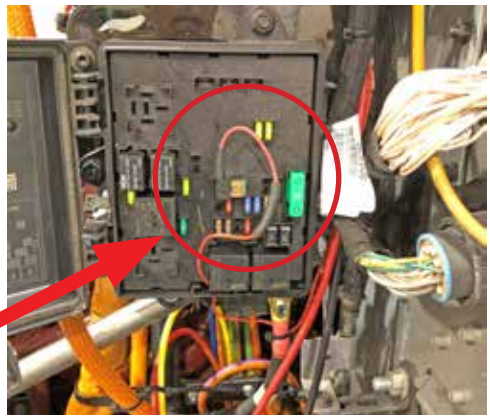
OR

Add-a-Fuse



That

8-6B. Using the appropriately sized Add-a-Fuse (included in your AirDog® installation kit), connect the relay trigger lead to a fuse holder in the fuse panel that is "HOT" when the key is in the "Run" position. An example is pictured here:



Installing the AirDog® Wire Harness Indicator Light

LED Indicator Light

8-7. Select a location on the dash that is easily visible to the driver. Remove the dash components as necessary to access the area behind the selected location.







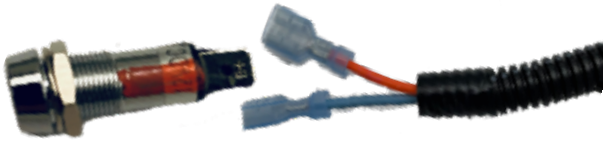
8-8. Drill a 7/16” hole in the dash at the selected location. Be very careful when drilling. Do not damage components located behind the dash.

8-9. Remove the nut from the indicator light and insert the indicator light through the dash plate. To adhere the dash plate to the dashboard, peel off the paper backing from the back side of the plate to expose the adhesive. Install the dash plate with indicator light into the hole in the dash. Reinstall the nut to the indicator light at the back side of the dash, and tighten the nut until snug.

Connect the positive (orange wire) lead of the wire harness to the positive quick-connect terminal (marked orange) on the indicator light (see image below).

Then connect the negative (blue wire) lead on the wire harness to the negative (unmarked) quick connect terminal on the indicator light.





8-10. Re-assemble the dash components back to their original position.

Connecting the Power Supply Leads

The power supply leads can be easily connected to the appropriate contacts on the battery. Another alternative option would be to connect the power supply leads to the appropriate contacts on the alternator. Any high amperage terminal that is always "HOT" is OK for the Positive + (RED) lead. Be sure the NEGATIVE - (GREEN) lead is connected to a reliable chassis ground.

IMPORTANT: On 24V systems, the power supply leads can be easily connected to the appropriate contacts on the ALTERNATOR. DO NOT connect directly to the 24V batteries.

8-11. Route the red & green power leads to the battery or an alternator. Connect the green (-) ground lead to the negative battery terminal post.

8-12. Connect the red (+) positive lead to the positive battery/alternator terminal post.



NOTE: Secure wire harness with zip ties included in installation kit.



Installing your filter restriction gauge into the AirDog® Gerotor Cap Sensor Port

Does your HD truck have a filter restriction gauge that you would like to continue using with the AirDog®?

9-1. Every AirDog® Heavy Duty Diesel Fuel System is now equipped with a port for your restriction sensor. On the inside surface of the gerotor pump cap, you will find a 1/8" NPT plug.



9-2. Remove that plug (3/16" Allen), and install your restriction sensor with the same 1/8" NPT thread, using an elbow if necessary, and you can now connect and use your original filter restriction gauge with the AirDog® system.



Initial Start Up Procedure

The AirDog® is a self priming system. However, to prevent damage to a dry seal and reduce the life expectancy of the system, it is suggested to pre-fill the water separator/pre-filter with diesel fuel to the bottom of the "NUT PLATE".

- ❒ 10-1. Rub CLEAN diesel fuel or oil on filter seals before installing to ensure a proper seal.
- ❒ 10-2. Pre-fill the water separator/pre-filter with diesel fuel up to the bottom of the nut plate.
- ❒ 10-3. Turn the starter key to the on/run position.
- ❒ 10-4. The AirDog® should now be running and pumping fuel, bleed the fuel line to the engine by loosening the fuel line connection at the engine fitting. As soon as the line is purged of air and pure fuel is observed, properly tighten the fuel fitting.

  NOTE: Put a rag or shop towel over and around the fitting to prevent fuel splatter or spray. Catch all spilled fuel and dispose of properly. Wear safety glasses.

- ❒ 10-5. Start the engine.

  Recheck all fuel fittings for leakage and proper torque. Be sure all fuel lines are properly routed to protect from excessive heat and secured to protect from chafing and abrasion. Recheck all electrical lines and secure as necessary.

Adjusting the Fuel Rail Pressure

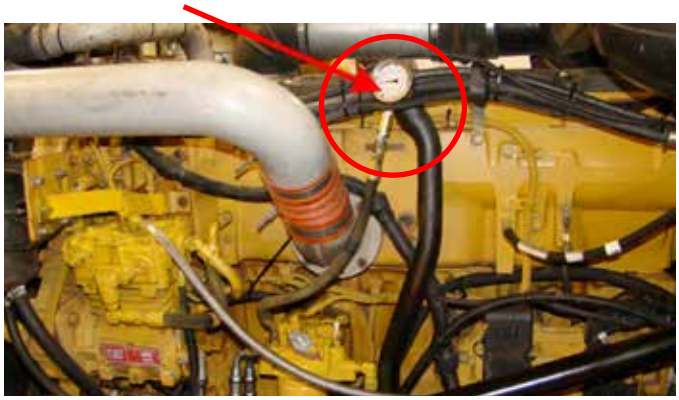
For the CAT engine to perform at peak efficiency, the fuel rail pressure must be adequate to completely fill the fuel injectors during the upstroke of the plunger. A minimum of 115 PSI to an absolute maximum of no more than 120 PSI at “high idle” is required.

There are three models of the Caterpillar® fuel transfer pump. The early model 1st generation with a small diameter spring and hex head plug and the 2nd generation and 3rd generation with a larger diameter spring and socket head plug.

Temporarily Install a 150 PSI Fuel Pressure Gauge



Connect the Pressure Gauge Here



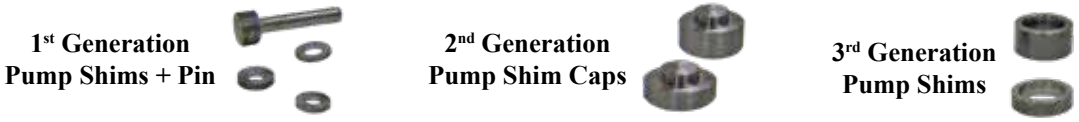
It is important to know the original fuel pressure before you start.

NOTE: The first step to resetting the “Fuel Rail Pressure” has already been performed when the AirDog® special restrictor return fitting was installed in step 6D-1 or 6E-1. If your transfer pump is in good condition and not worn out, with the engine running, the fuel rail pressure should be at approximately 118 PSI at high idle (1,900 to 2,100 RPM). If the fuel rail pressure is still low, follow the steps below.

To adjust the rail pressure after the AirDog® restrictor fitting has been installed (Section 6D or 6E), reset the spring tension on the high pressure bypass regulator.

Adjusting the Fuel Rail Pressure

Note: The shim kit includes shims for each of the three generation pumps.



Adjusting the Rail Pressure for the 1st Generation CAT® Fuel Transfer Pump

11-1. Remove hex plug “A” on the side of the transfer pump. (Figure 1)

11-2. Take out spring “C” and the stiffener pin “B”.

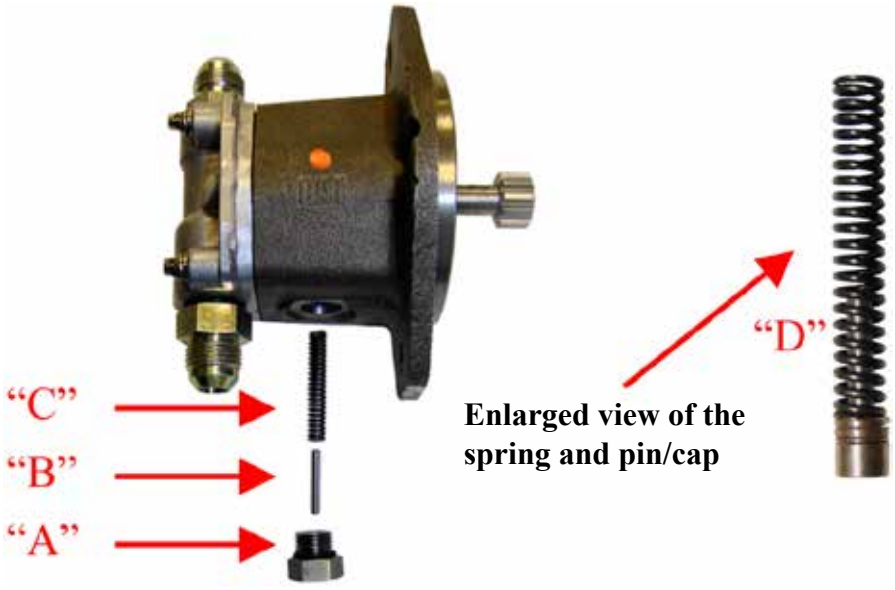
NOTE: The shim kit includes new stiffener pin with cap and three shims for the 1st generation transfer pump.

11-3. Put the new stiffener pin with cap ”D” into the spring and re-install in transfer pump.

11-4. Start the engine. Run the RPM up slowly until high idle is reached. High idle is 1,900 to 2,100 RPM. Read the fuel rail pressure. If the rail pressure does not reach 118 PSI, add a shim and repeat until at least 118 PSI, but not more than 120 PSI, is reached. All three shims may be required to reach 118 PSI.

WARNING: Do NOT exceed 120 PSI fuel rail pressure. High rail pressure (130 PSI and above) will void your factory engine warranty and may cause engine damage.

Figure 1



Adjusting the Fuel Rail Pressure

Adjusting Rail Pressure for the 2nd & 3rd Generation CAT® Fuel Transfer Pump

11-5. Remove hex plug "A" on the side of the transfer pump. (Figures 2 & 3)

NOTE: The Shim Kit includes:

- **Two shim caps, one 0.25" thick and one 0.125" thick, for the 2nd generation pump.**
- **Two shims, one 0.25" thick and one 0.125" thick, for the 3rd generation pump.**



11-6. Hold the 0.125" shim cap "C" (2nd Generation) or 0.125" shim "D" (3rd Generation) on the end of the plug "A" and re-install the spring, shim cap or shim, and plug into the transfer pump.

Figure 2

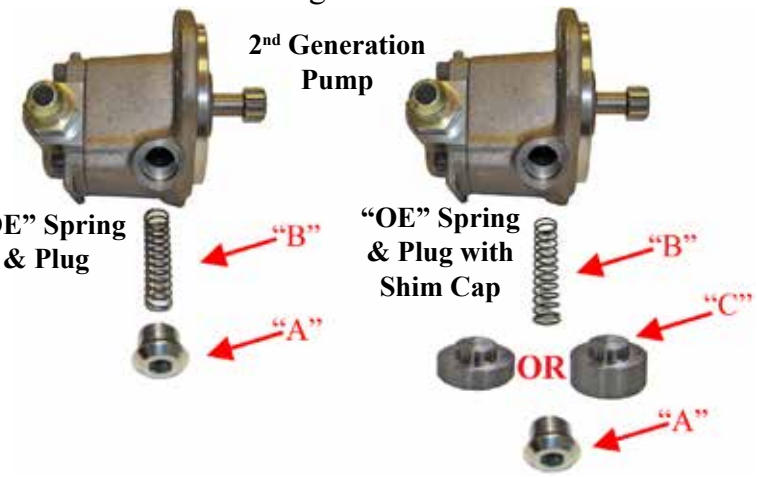
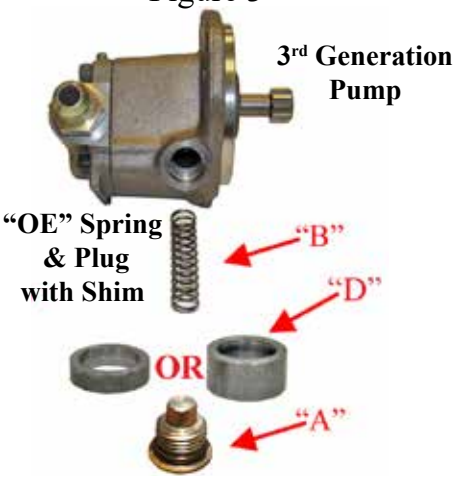


Figure 3



11-7. Start the engine. Run the RPM up slowly until high idle is reached. High idle is 1,900 to 2,100 RPM. Read the fuel rail pressure. If the rail pressure does not reach 118 PSI, remove the .125 shim and replace with the .250 shim and repeat until at least 118 PSI is achieved, but not more than 120 PSI.

11-8. When you have completed adjusting the fuel rail pressure, remove the pressure gauge from the secondary fuel filter head and replace the plug.

VERY IMPORTANT: After the adjustments have been performed and the rail pressure does not reach 118 PSI ±3, it would be wise to have the fuel pump checked for excessive wear. Your fuel pump may be worn out and need replacing.

Servicing the AirDog® Fuel Filter and Water Separator/Pre-Filter

It is highly recommended that you keep a replacement AirDog® fuel filter and water separator on-hand, ready for replacement when the AirDog® Indicator Light illuminates.

When the particulate fuel filter, water separator, mesh screen in the water separator nipple, or a combination of these, become plugged, the restriction will cause a loss in pressure and flow through the AirDog® system, which will cause the AirDog® Indicator Light to illuminate, and stay on. When the Indicator Light comes on, this indicates it is time for a filter change. It is strongly recommended that BOTH filters be changed at the same time. After changing filters, if the Indicator Light remains on, please check that the AirDog® fuel pump is running, with the key in the "RUN" position. If the pump is not running, check the fuse in the wire harness, located near the AirDog® wire harness terminals connected to the battery or alternator for power. It is possible for a restriction in flow to cause the pump to draw high amps for a short period of time, which could pop the 15A fuse in the harness. Replace the fuse, if blown. After replacing the fuse, if the Indicator Light remains on, please use the following procedure to check for debris in the water separator nipple:

- Remove the water separator from the AirDog® filter base.
- Using a 1-1/8" (29mm) deep-well socket, loosen and remove the threaded nipple that the water separator was installed on.
- Inspect the wire mesh screen inside the nipple, blow any debris out of the screen with compressed air.
- Reinstall the threaded nipple into the AirDog® filter base.
- Tighten the nipple securely with the socket and ratchet. Torque spec for the nipple installation is 35 FT-LBS.



FUEL FILTER: The AirDog® fuel filters have a typical lifespan of 25,000+ miles, and up to 40,000 miles, as they are manufactured with a high-quality and high-capacity synthetic media, as opposed to a paper element. Fuel filter life is affected by many variables. In any case, we do not recommend exceeding 40,000 miles of service with a fuel filter. When replacing the fuel filter, be sure to clean the underside of the AirDog® filter base. Rub clean diesel fuel or oil on filter seals before installing, to ensure a proper seal. It is not necessary to pre-fill the fuel filter with fuel; the AirDog® integrated fuel pump will fill the filter and prime the system automatically. Follow the instructions on the filter for proper tightening procedures.

WATER SEPARATOR: The AirDog® water separator/pre-filters have a typical lifespan of up to 40,000 miles. Servicing of the water separator simply requires draining at regular intervals. It is suggested to check/drain the water separator weekly or as needed should you experience excessive 'water in fuel' conditions. Replace the water separator when the AirDog® Indicator Light illuminates, if it becomes damaged or permanently plugged, and when changing the AirDog® fuel filter. Before installing a new water separator, be sure to clean the underside of the AirDog® filter base. Rub clean diesel fuel or oil on filter seals, to ensure a proper seal. It is suggested that you pre-fill the water separator (only) with clean diesel fuel when changing filters, to assist the system with priming. Follow the instructions printed on the water separator/pre-filter for proper tightening procedures.

When tightening filters with a filter wrench, DO NOT overtighten, as doing so may damage the filters.

Caution: Be careful to prevent any contaminants from entering the water separator when replacing. Although the water separator pre-filter has a protective wire screen, any debris passing through the system could cause the Gerotor fuel pump to lock up, which can cause the in-line fuse to blow. Such a pump lock-up is not covered under warranty.

DISPOSE OF WASTE FUEL AND USED FILTERS PROPERLY TO PROTECT OUR ENVIRONMENT!

NOTES

NOTES

AirDog®

HEAVY DUTY DIESEL FUEL SYSTEMS



DON'T FORGET...



Heating Kit

The AirDog® Heater Kit provides additional thermal protection for the AirDog® FPII-150 and FPII-200 4G fuel air separation systems, preventing fuel gelling in cold climates.



Replacement Filters

PureFlow Technologies, Inc. offters AirDog® replacement filters and water separators to maintain the efficiency and longevity of AirDog® and Champ™ diesel fuel systems.



Apparel

Get your AirDog® apparel today! Rep your favorite brand and unleash the power of the AirDog!

SHOP NOW

877-463-4373

PureFlow TECHNOLOGIES, INC.

Check us out @ airdogdiesel.com



AirDog®
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