

#36

FACTORY REPLACEMENT RAPTOR PUMP FRRP-100 & FRRP 150 FOR 1998.5-2002 24V CUMMINS INSTALLATION MANUAL

**PLEASE READ THIS MANUAL AND CHECK
CONTENTS OF THE KIT BEFORE
BEGINNING THE INSTALLATION**



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RAPTOR **Fuel Pumps**



**MOUNTS IN THE SAME LOCATION AS THE FACTORY
BLOCK MOUNTED FUEL PUMP**

OVERVIEW

Please read these instructions before the installation of this product! Observe and practice the recommended safety precautions mentioned in this manual.

The FRRP-100 and FRRP-150 fuel pump is a replacement to the factory block mounted carter fuel pump. **If your truck has been retrofitted with the in-tank pump, this pump will not work properly!** If you have an intake pump and would like to use this FRRP, call AirDog at 317-421-3180 to order the extra parts needed to complete the installation.

The FRRP-100 is for a mostly stock truck and the FRRP-150 is for a mildly modified truck. The pressure is set from the factory to 15-17 psi. If the fuel pressure is too low or too high, the regulator can be adjusted to fit your fuel consumption needs.

This fuel system mounts to the factory block bracket and uses the factory suction line and banjo bolt to pull fuel from the frame. For the FRRP-100, a section of 1/2" hose and fittings are provided to supply fuel to your factory fuel filter head. For the FRRP-150, another section of 1/2" hose and fittings is provided to provide fuel from the fuel filter head to the VP44 injection pump.

QUICK CONNECT COMPONENT OVERVIEW

Provided in this kit is an OE style Quick Connect System. This system works to allow for a quick, clean, and professional install.

SAE J2044 Quick Connect System

The SAE J2044 quick connect system is the most commonly used system in the automotive industry. The images below show the formation of SAE J2044 connection. To connect the assemblies, simply insert the male end form into the mating female connector. Push firmly until you hear it “click” into place. To disconnect the fittings, press down and hold the blue tabs on the female connector while you firmly pull the assembly apart.



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SAFETY INSTRUCTIONS

LEARN TO RECOGNIZE SAFETY INFORMATION

This is the safety alert symbol. When you see this symbol in this manual, **BE ALERT TO THE POTENTIAL FOR PERSONAL INJURY!**

Follow recommended precautions and safe operating practices.



UNDERSTANDING SIGNAL WORDS

A signal word-**DANGER**, **WARNING**, or **CAUTION** is used with the safety alert symbol.

DANGER indicates a hazardous situation which, if not avoided, **WILL** result in death or serious injury.



WARNING indicates a hazardous situation which, if not avoided, **COULD** result in death or serious injury.



CAUTION indicates a hazardous situation which, if not avoided, **COULD** result in minor or moderate injury.



PRE-INSTALLATION CHECKS



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

1. Inventory the package components completely. Notify *PUREFLOW[®] AIRDOG* immediately of any parts missing or damaged.
2. Read the installation manual completely. Understand how the system operates and installation recommendations before beginning installation.
3. The installation recommendations contained herein are suggested installation guidelines only. Individual installations may vary.
4. If any installation procedure is uncertain, contact *PUREFLOW[®] AIRDOG* for technical assistance.
5. [When installing the AirDog[®] fuel lines be sure to keep the ORIGINAL ENGINE RETURN LINE connected as it is from the factory!](#)

SAFETY GUIDELINES!



WARNING

Please be sure to chock the vehicle's tires to prevent rolling.



WARNING

Please use proper supports when working beneath an elevated vehicle.



CAUTION

Most diesel pickups have two (2) 12volt batteries. Disconnect the battery cables to both batteries before proceeding with the AirDog[®] installation.



WARNING

Vehicle frame rails should not be drilled into or welded upon.



CAUTION

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



CAUTION

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear suitable hearing protective devices such as ear muffs or earplugs to protect against objectionable or uncomfortable loud noises.



CAUTION

Use common sense when routing fuel lines and electrical harnesses. Keep them away from hot exhaust components and/or moving parts. Properly secure lines to prevent chaffing

PARTS LIST








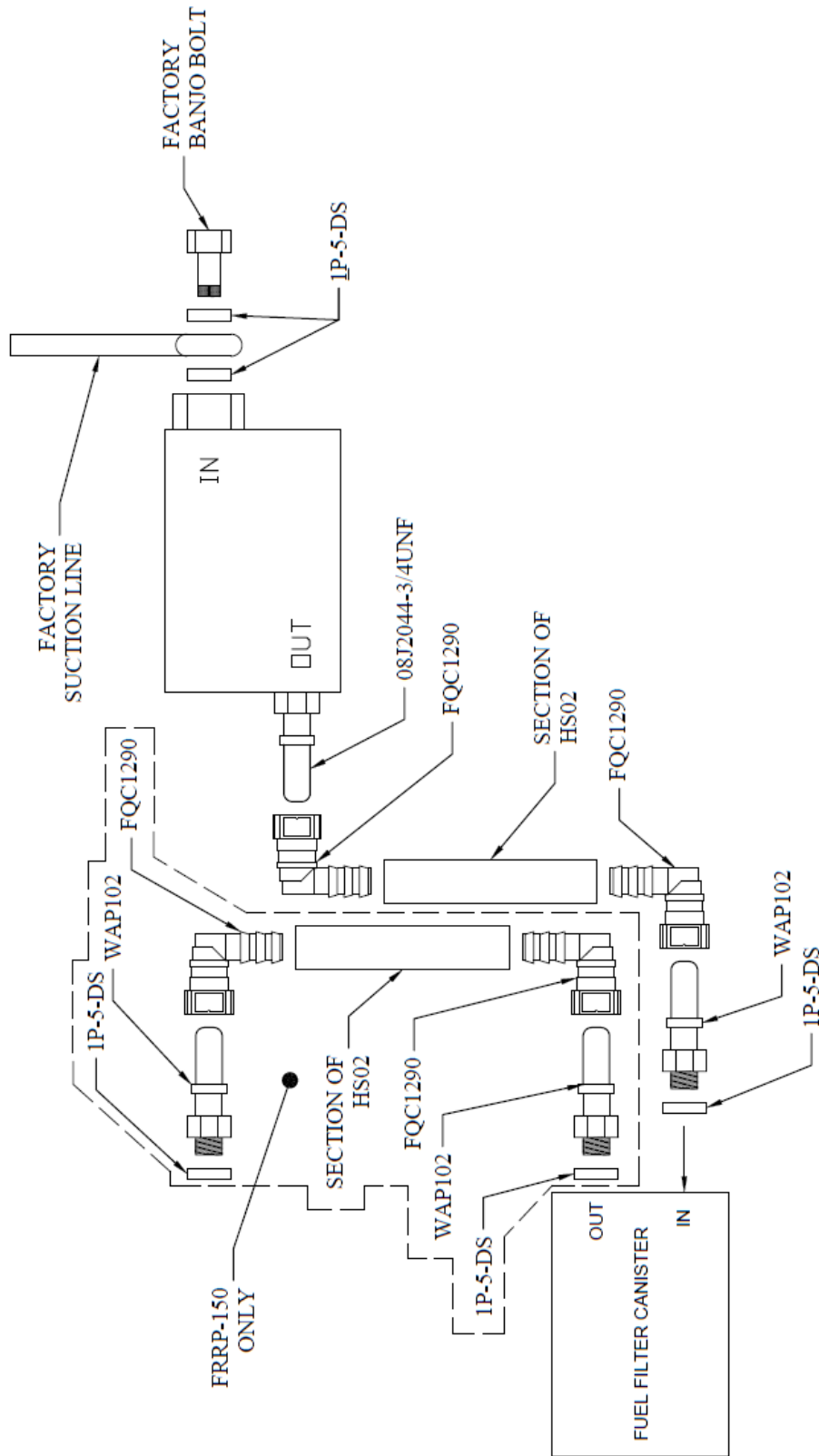
QTY	DESCRIPTION	PART NUMBER	IMAGE
1	Factory Replacement Raptor™ Pump (FRRP)	FRRP-100 Or FRRP-150	
1	Mounting Hardware Kit	901-61-0102-FRRP	
1	Customer Service Oring Replacement Kit	906-05-0100	N/A
1	1/2" Male QC x 3/4-16 ORB	08J2044-3/4UNF	
1 Or 2	2ft of 1/2" Fuel Line (1 for FRRP-100)(2 for FRRP-150)	HS02	
2 Or 4	1/2" 90° Hose Quick Connect Fitting (2 for FRRP-100) (4 for FRRP-150)	FQC1290	
1 Or 3	12mm X 1/2" Male SAE J2044 Quick Connect Fitting (1 for FRRP-100) (3 for FRRP-150)	WAP 102	
3 Or 5	Sealing Washer (installs on WAP102 fitting and factory inlet banjo) (3 for FRRP-100) (5 for FRRP-150)	1P-5-DS	

ILLUSTRATION OF COMPONENTS



REMOVING THE STOCK CARTER STYLE FUEL PUMP

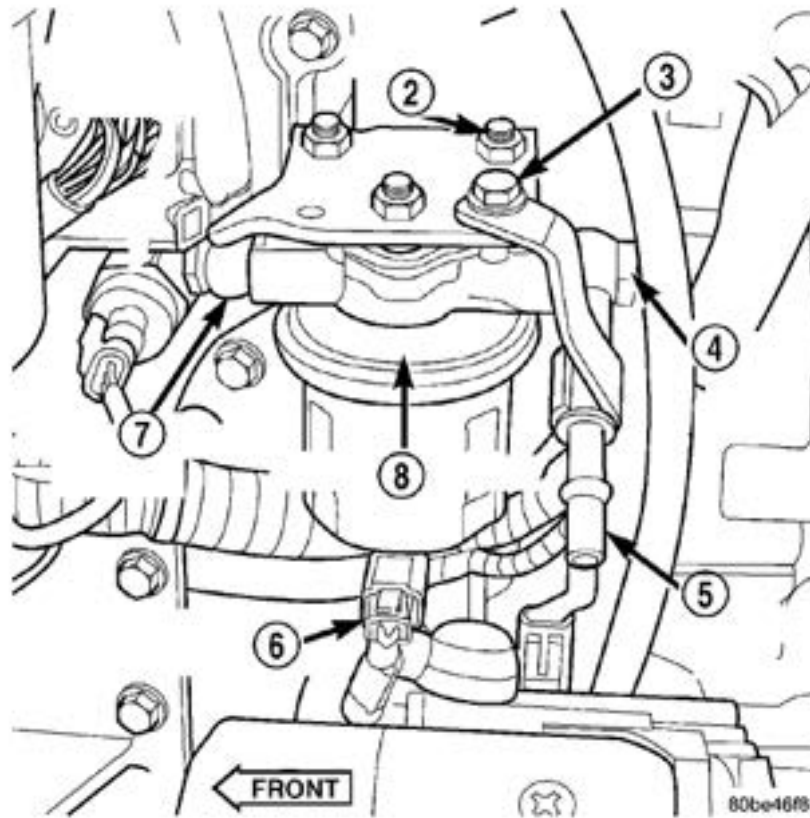
- 5.1. To ease the installation of this system, remove the intake horn and loosen the fuel filter housing from the intake and roll it out of the way. You will need a 10mm socket for the 4 intake horn bolts and the two filter housing bolts and a deep 11mm socket to remove the clamp off the intake horn.



Figure 1



Figure 2



Fuel Transfer Pump Location

- 2 - PUMP BRACKET NUTS (3)
- 3 - SUPPORT BRACKET BOLT
- 4 - BANJO BOLT (REAR)
- 5 - FUEL SUPPLY LINE
- 6 - ELECTRICAL CONNECTOR
- 7 - BANJO BOLT (FRONT)
- 8 - FUEL TRANSFER PUMP

Figure 3

- 5-2. Disconnect the electrical connector (#6 in figure 3) by depressing the clip while pulling
- 5-3. Remove the banjo bolt on the inlet side of the stock fuel pump using a 17mm wrench (#4 in figure 3). **Be sure to not damage the banjo bolt or throw it away as it is to be reused in the FRRP.**
- 5-4. Remove the banjo fitting from the inlet side of the pump by removing the 10mm support bracket bolt. (#3 in figure 3).
- 5-5. Remove the outlet banjo bolt and fitting using a 17mm wrench (#7 in figure 3). This fitting will **not** be reused.
- 5-6. Remove the factory fuel pump by removing the (3) 10mm nuts (#2 in figure 3). Leave the pump bracket in place as this is used for the FRRP.

- 5-7. Using a 17mm wrench, remove the filter housing inlet fitting and discard the factory line.



Figure 4

PREP THE FRRP FOR INSTALLATION

- 6-1. Using a 7/8" wrench, install fitting 08J2044-3/4UNF into the outlet port of the out port in the FRRP.



Figure 5



Figure 6

MOUNT THE FRRP

- 7-1. Using the supplied hardware and a 3/16" allen wrench, install the FRRP to the factory fuel pump bracket.



Figure 7



Figure 8

CONNECTING THE FACTORY LINE TO THE FRRP INLET

- 8-1. Using two of the supplied 1P-5-DS and a 17mm wrench, install the original inlet banjo bolt through the original banjo fitting into the inlet side of the FRRP. **Do not overtighten or the fitting may break!!!**



Figure 9



Figure 10



Figure 11

INSTALL THE FUEL FILTER HOUSING INLET FITTING

- 9-1. Reinstall the filter housing using a 10mm socket.



Figure 12

- 9-2. Using a 17mm wrench, install the WAP102 with a 1P-5-DS in the inlet port of the Filter Housing. They differ depending on what year truck you have. 1998.5-1999 have the fittings in the top of the housing. If you have this style, install the fitting in the right port (Figure 13). 2000-2002 have the inlet fitting in the side of the filter housing. If you have this style, install the fitting in the right side of the housing (Figure 14).



Figure 13



Figure 14

WIRING THE FRRP

- 10-1.** The FRRP has an adapter harness installed to adapt the motor connector to the factory Deutch 2 pin connector. Plug the connector into the factory wiring on the truck. Refer to #6 in Figure 3.



Figure 15

ASSEMBLING AND INSTALLING THE FEED LINE

- 11-1.** This kit comes with quick connect fittings that use push to lock barb ends to connect to the fuel line. To assemble the fuel line, use clean motor oil or ATF to lubricate the barbs and the inside of the fuel line and press the fitting into the hose. Pressing the line in one smooth motion will ease the installation. Stopping mid press will make the installation much more difficult.



Figure 16



Figure 17



Figure 18

- 11-2.** Assemble one end of the fuel line as shown in Figure 16 through 18. Press the assembled fitting into the FRRP outlet fitting as shown below.



Figure 19

- 11-3.** Next, cut the line to length and press in the other FQC1290 per steps 16 though 18. Press the assembled fitting into the Fuel Filter Housing Inlet fitting that was installed in step 9-2 (Figure 22). You may need to remove the fuel line back out of the truck to ease pressing the fitting in.



Figure 20



Figure 21

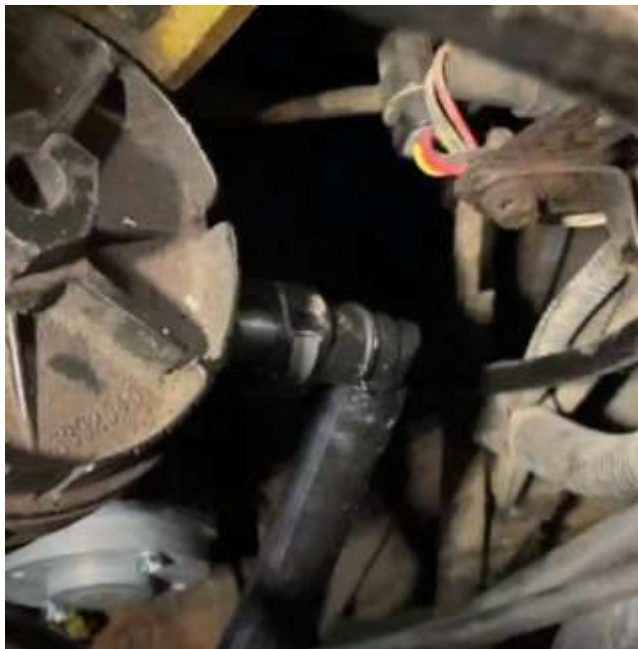


Figure 22

- 11-4.** Reinstall the intake horn using a 10mm. **This concludes the installation for the FRRP-100. Refer to section 13 for the initial startup procedure.** For the FRRP-150, continue on to the next step.

BIG LINE KIT INSTALLATION

- 12-1.** Remove the factory banjo bolt (Figure 23) and discard the fuel hard line that runs between the filter canister and the injection pump. Install the seal washer “1P-5-DS” and “WAP 102” male quick connect to the inlet port of the injection pump. (Figure 24)

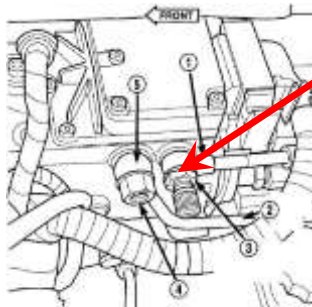


Figure 23

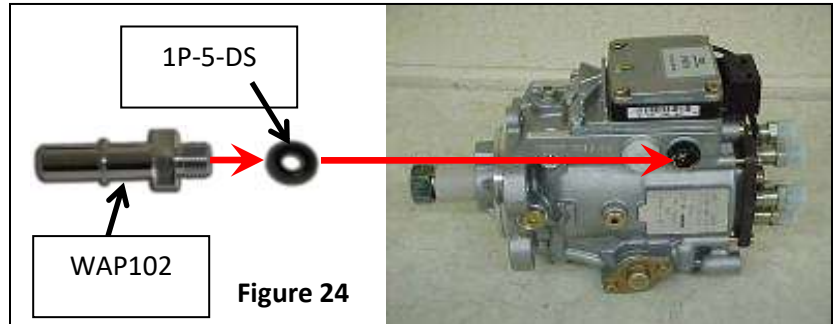


Figure 24

- 12-2.** Install the male quick connect fitting “WAP 102” with seal washer “1P-5-DS” into the outlet port of the fuel filter canister.



Figure 25



Outlet Port



Figure 26

Note: Figures 25 & 26 depict a JIC connection. This kit is supplied with quick connects as shown in the parts list.

- 12-3.** Assemble one end of the hose (Reference step 11-1) using fuel line end FQC1290 and plug it into the WAP102 fitting installed in the filter canister “outlet” port in the previous step. A “click” will be heard once the fitting is properly connected.

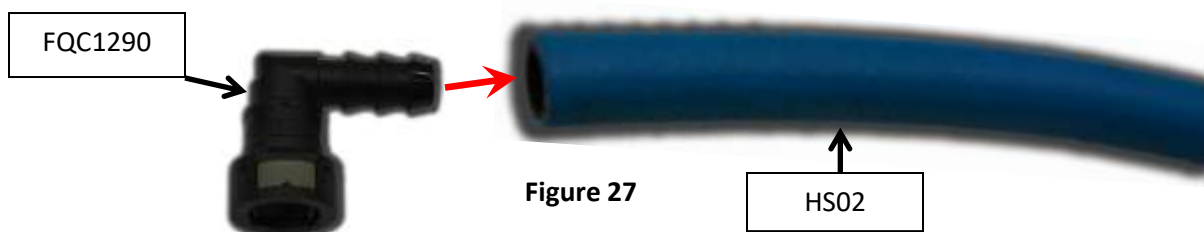
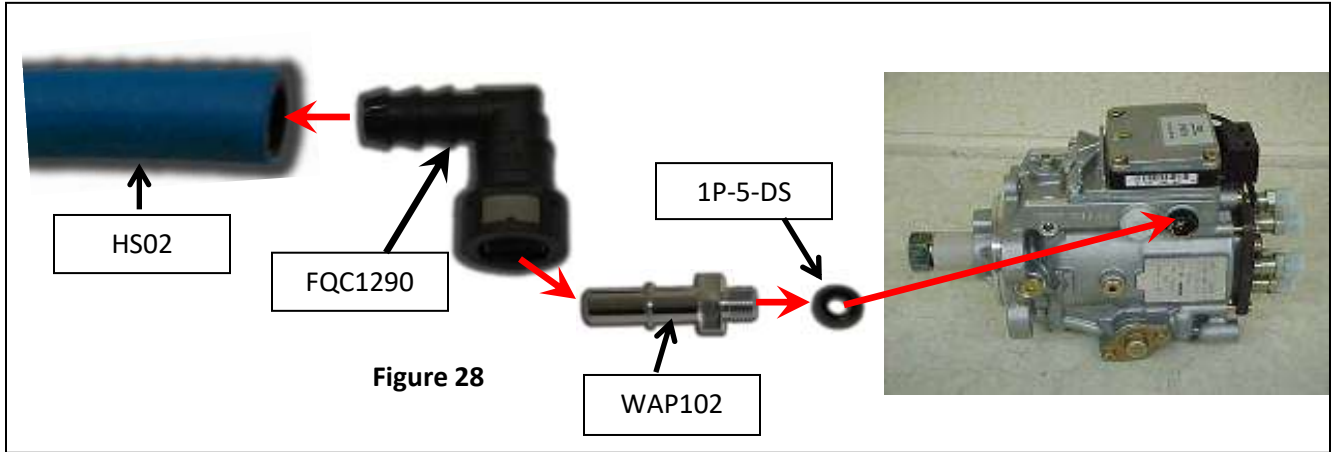


Figure 27

HS02

- 12-4.** Run the fuel line to VP44 injection to where the fitting was previously installed and cut the fuel line to length. Press in fuel line end FQC1290 per the fuel line assembly section and install it on the previously installed WAP102 fitting. A “click” will be heard when properly installed.



INITIAL START PROCEDURE

- 13-1.** Bump the starter for the ECM to send power to the FRRP. You may need to bump the starter several times for the pump to prime. You will hear a tone change once the pump is pressurized. Try and start the truck. If the truck does not want to start move on to the next step.
- 13-2.** It may be necessary to bleed the injection lines in order to get the truck to start. Loosen injection lines 1, 3, and 4 at the cylinder head and crank the engine over until fuel starts squirting out of the lines. When this happens, tighten the lines back up and start the engine.

ADJUSTING THE FUEL PRESSURE

Every FRRP is tested for pressure and vacuum before it packed out and leaves our facility. That being said, not all trucks consume the same amount of fuel. It is recommended to check fuel pressure after installation to be sure it is in the range of 15-17psi.

To adjust the fuel pressure, loosen the lock nut on the regulator adjustment screw with a 9/16 wrench. Using a flat blade screw driver, rotate the adjustment screw clockwise to increase pressure or counter clockwise to decrease pressure. Be careful not to loosen the regulator assembly base. If you do, tighten it immediately. When finished, properly torque the regulator adjustment screw lock nut!



GENERAL MAINTENANCE

These pumps have an inlet screen to keep large debris from jamming the Gerotor. It is recommended to clean this screen every oil change. Failure to clean the screen may result in premature pump wear and failures. How will the pump fail if the screen isn't cleaned? If the screen is plugged and the suction side of the pump can't keep up with the demand of fuel needed to be pumped, the pump will cavitate. Cavitation damage is the number 1 killer of fuel pumps. If the pump is allowed to cavitate for an extended period of time, it will struggle to prime and make pressure. **Cavitation damage is a lack of maintenance and is not a warrantable failure.**

SYMPTOMS OF A PLUGGING SCREEN

1. Loud pump. If the pump is louder than normal, this indicates there is an inlet restriction and the pump is cavitating. This will most likely be caused by debris plugging the inlet screen.
2. Larger than normal pressure drops under load. This again indicates an inlet restriction due, most likely, to a plugged inlet screen.

HOW TO CLEAN THE SCREEN

1. Remove the inlet banjo bolt with a 17mm wrench.
2. Remove the adapter fitting out of the FRRP with a 7/8 wrench.



3. Using a screwdriver or pick, carefully clean the screen down in the inlet port.
4. Once the screen is clean, reinstall the adapter fitting and banjo bolt.

4 YEAR LIMITED EXPRESS WARRANTY

FOR Raptor™ FRRP100 and FRRP-150

IMPORTANT NOTICE

TO ACTIVATE YOUR PUREFLOW AIRDOG WARRANTY, YOU MUST COMPLETE AND MAIL YOUR WARRANTY CARD TO PUREFLOW AIRDOG WITH A COPY OF YOUR ORIGINAL SALES RECEIPT WITHIN 30 DAYS OF PURCHASE. FAILURE TO COMPLETE AND SUBMIT YOUR WARRANTY CARD WILL RESULT IN A WARRANTY PERIOD OF THE COVERED PRODUCT TO ONE (1) YEAR FROM THE DATE OF PURCHASE.

PureFlow AirDog (hereafter collectively, "SELLER") warrants and guarantees only to the Original Purchaser (hereafter collectively, BUYER) that All PureFlow AirDog Systems (hereafter collectively, PRODUCT) shall be free from defects of materials and workmanship in the manufacturing process for as long as the BUYER owns the PRODUCT.

The 4 Year Limited Express Warranty is limited to the PRODUCT purchased by the original BUYER of the PRODUCT and limited solely to the parts contained within the PRODUCT and EXCLUDES ALL ELSE. The BUYER must follow the Warranty Procedure for any PRODUCT that is in question of Warranty. All Warranty claims are subject to the approval of PureFlow AirDog. If it is determined that a Warranty claim exists, PureFlow AirDog will, at its sole discretion, replace the defective PRODUCT with a comparable PRODUCT, repair the defective PRODUCT, or refund the BUYER'S purchase price in exchange for the PRODUCT. Repairs or replacements are warranted for only the remainder of the original warranty period and only to the original BUYER.

Under no circumstances shall the SELLER be liable for any labor charged or travel time incurred in the diagnosis for defects, removal, or reinstallation of the PRODUCT, or any contingent expense.

Under no circumstances will the SELLER be liable for any damage or expense incurred by reason of the use or sale of the PRODUCT.

Other than expressly set forth herein, the SELLER shall in no way be responsible for the proper or improper use and service of the PRODUCT. In no event shall the SELLER be liable for any special, incidental, indirect or consequential damages of any kind or nature, whether or not the BUYER of the PRODUCT was advised of the possibility of damage or harm, arising or resulting from the use or performance of the PRODUCT and BUYER hereby waives the right to any and all such claims.

BUYER, acknowledges that he/she is not relying on SELLER'S skill or judgment to select or furnish goods suitable for any particular purpose and that SELLER has no liability that will extend beyond the scope of the LIMITED EXPRESS WARRANTY contained herein, and BUYER hereby waives all remedies or liabilities, expressed or implied, arising by operation of law or otherwise. (including, without limitation, any obligation of SELLER with respect to fitness for any particular purpose; merchantability; and special, incidental, indirect or consequential damages) or whether or not occasioned by SELLER'S negligence.

SELLER disclaims any warranty and expressly disclaims any liability for personal injury or damages related to BUYER'S use of the PRODUCT. BUYER acknowledges and agrees that the disclaimer of any liability for personal injury is a material term for this agreement and BUYER agrees to indemnify SELLER and hold SELLER harmless from any claim related to the PRODUCT and its use or performance. Under no circumstances will SELLER be liable for any damages, liabilities, costs or expenses incurred as a result of or by reason of use, performance or sale of the PRODUCT, including without limitation, any damages, liabilities, costs or expenses incurred by reason of BUYER'S negligence related to those uses of the PRODUCT.

The proper installation of the PRODUCT is the sole responsibility of the BUYER. The SELLER assumes no liability regarding improper installation or misapplication of the PRODUCT.

SELLER hereby provides the following limited warranty as to description, quality, merchantability, fitness for the PRODUCT'S purpose, productiveness, or any other matter of SELLER'S PRODUCT sold herewith. The SELLER shall be in no way responsible for the open use and service of the PRODUCT and the BUYER hereby waives all rights other than those expressly written herein. This Warranty shall not be extended or varied except by a written instrument signed by SELLER and BUYER.

IN THE EVENT THAT THE BUYER DOES NOT AGREE WITH THIS AGREEMENT, THE BUYER MAY PROMPTLY RETURN THE PRODUCT, IN A NEW AND UNUSED CONDITION, WITH A DATED PROOF OF PURCHASE, TO THE PLACE OF PURCHASE WITHIN THIRTY (30) DAYS FROM THE DATE OF PURCHASE FOR A FULL REFUND. THE BUYER AGREES THAT THE INSTALLATION OF THIS PRODUCT CONFIRMS THE BUYER HAS READ AND UNDERSTANDS THIS AGREEMENT AND ACCEPTS THE TERMS AND CONDITIONS OF THIS AGREEMENT.

Warranty Procedure

In the unlikely event a warranty appears as if it may be warranted, the following steps are taken:

- 1 The customer discussed the symptoms of the problem with a PureFlow AirDog Technician. The customer is to have the system Serial Number and Model Number available for the Technician when the call is made. This will expedite all steps of the process.
- 2 The customer performs any and all tests requested by the PureFlow AirDog Technician. This is done to isolate the potential problem while eliminating potential installation or maintenance related issues,
- 3 If the PureFlow AirDog Technician determines based on the customer feedback concerning the requested testing that system may be at fault, the customer is advised that all returned pumps are tested upon arrival and should this returned pump perform at design criteria upon arrival, the customer will be charged a \$50.00 fee.
- 4 The PureFlow AirDog Technician will first request the customer's phone number in the event the phone call is accidentally disconnected and then transfer the customer to a PureFlow AirDog Customer Service Representative. Should a Customer Service Representative not be available, the Technician will offer the Customer the option to hold, call back, or receive a return call.
- 5 The PureFlow AirDog Customer Service Representative will check to determine if the customer's Warranty Registration Card is on file.
 - a. If no Warranty Registration is found, the customer will be required to supply the original purchase receipt showing the purchase date.
 - b. If no Warranty Registration is found, the customer will be advised of the options should the system in question is out of the default warranty period (1 year).
- 6 The PureFlow AirDog Customer Service Representative will request the customer information, including: Name, Address, Phone Number, Model Number, Serial Number, Year / Make / Model of vehicle, Name of Dealer purchased from, Purchase Date, Description of Problem, Customers' understanding of the resolution, and customer credit card information.
- 7 PureFlow AirDog will cover Ground Shipping charges to ship the replacement unit and will include a prepaid shipping label for the return of the defective unit. Any additional items ordered at the time of the replacement shipment will include their portion of the shipping cost.
- 8 A period of 15 Calendar Days from the time of shipment is provided for the receipt of the defective unit at the PureFlow AirDog facility. Failure to return ship the defective unit to arrive within the defined time period will result in a charge of \$250.00 against the customer's credit card as the purchase cost of the defective unit.

Revised April 11, 2022