

500FG Turbine Series

Fuel Filter/Water Separator

Instruction Part Number 15332 Rev H



The Racor 500FG Turbine Series fuel filter/water separator protects the precision components of your engine from dirt, rust, algae, asphaltines, varnishes and especially water, which is prevalent in low distillate fuels. Contaminants are removed from fuel using the legendary three stage process described below.

How It Works

Stage 1 - Separation

Using the fuel flow, the stationary turbine separates large solids and free water through enhanced centrifugal force.

Stage 2 - Coalescing

Smaller water droplets and solids coalesce on the conical baffle and fall into the collection bowl.

Stage 3 - Filtration

Engines will benefit from near 100% water separation and fuel filtration with Racor's proprietary Aquabloc® water repelling media. The replaceable filters are available in 2, 10, and 30 micron ratings.



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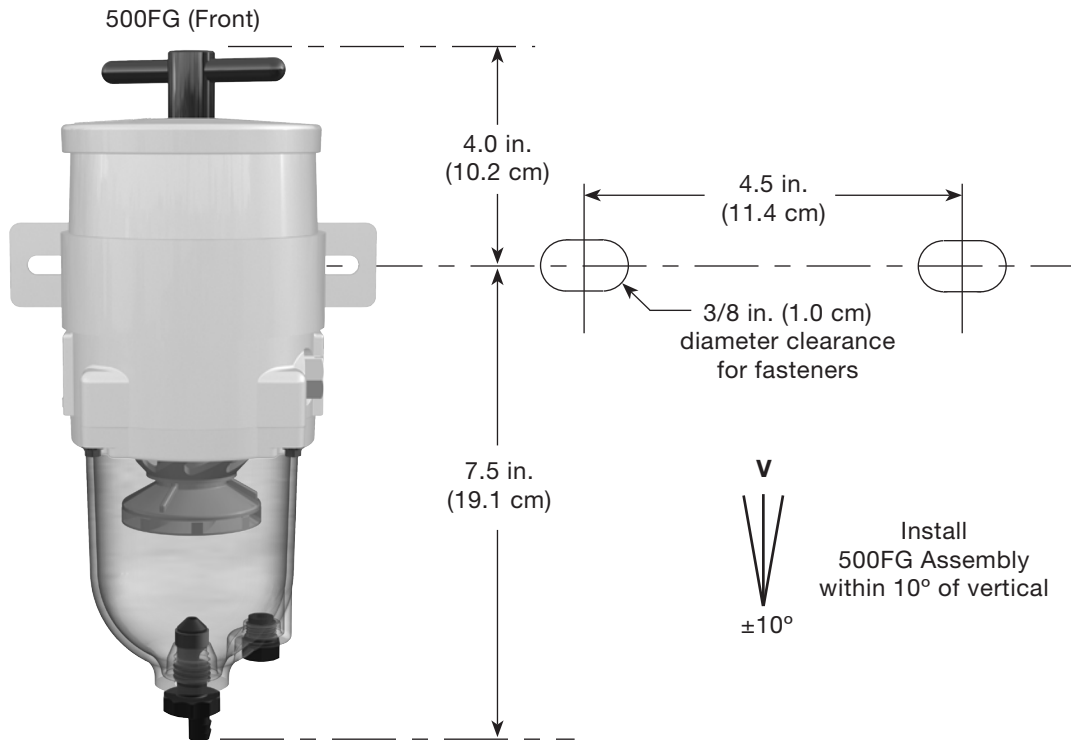
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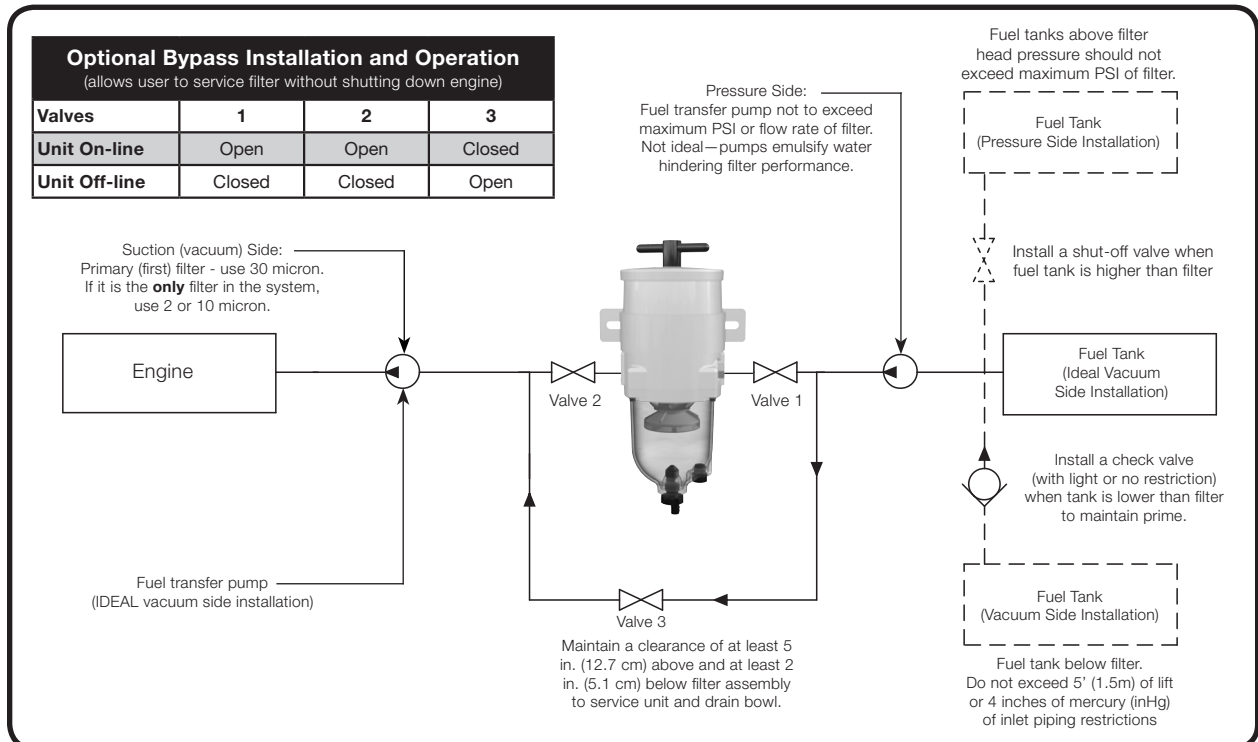
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Mounting Instructions



Installation Diagram



Installation Guidelines

These customer supplied materials should be on hand before beginning installation.

- Shop Towels
- Mounting Hardware
- Inlet/Outlet Fittings
- Fuel Hose
- Clean Diesel Fuel
- Parker Super O-lube or Clean Motor Oil
- Thread Sealant (no thread tapes)

Positioning The Assembly

Filter assemblies should be installed on vacuum side of fuel transfer pump for optimum water separating efficiency. See Installation Diagram.

Keep fuel line restrictions to a minimum. Locate the 500FG filter assembly between horizontal planes of bottom of fuel tank and inlet of fuel pump, if possible. If 500FG filter assembly is installed in an application where the fuel tank is higher than the filter, a shut-off valve must be installed between the tank and 500FG filter assembly INLET. This will be used when servicing the replacement filter.

Before Installing The Assembly

- Obtain good ventilation and lighting.
- Maintain a safe working environment.
- Engine must be off for installation.
- DO NOT smoke or allow open flames near installation.

Installing The Filter

Completely remove any vacuum side filters in fuel line between fuel tank and fuel pump. This is where the Racor filter will mount. Leaving these filters in place will add to fuel line restriction. Filter heads cast into engine or that are non-removable or hard piped should be serviced with a new filter and left in place.

Keep fuel flow restriction to a minimum. Always use the maximum size fuel hose possible. Do not make sharp bends with flexible hose as kinks may occur. Avoid use of two 45° elbow fittings where one 90° elbow will work.

When routing hose, avoid surfaces that move, have sharp edges, or get hot (such as exhaust piping).

Priming The Unit

1. Remove T-handle and lid from top of filter assembly.
2. Fill filter assembly with clean fuel.
3. Lubricate lid gasket and T-handle O-ring with clean fuel or motor oil.
4. Replace lid and T-handle, tighten snugly by hand only—do not use tools.
5. If applicable, refer to equipment operator's manual to complete fuel priming procedure.
6. Start engine, check for fuel system leaks. Correct as necessary with engine off and pressure relieved from filter assembly.

Service

Draining Water

Frequency of water draining is determined by the contamination level of the fuel. Inspect or drain collection bowl of water daily or as necessary. Collection bowl must be drained before contaminants reach top of turbine or when Water Detection Module (optional) indicates it's time to drain water.

Vacuum Applications/ Installations

1. Close inlet valve (or valve #1) and open drain on bottom of bowl with a suitable container in place.
2. Close drain after all water and contaminants have been evacuated—DO NOT leave drain open too long as it will eventually completely drain entire filter assembly of water AND fuel.
3. Follow Priming Instructions.

Pressure Applications/ Installations

1. Open drain on bottom of bowl to evacuate water and contaminants with a suitable collection container in place. Head pressure will push any water and contaminants out of drain while keeping filter primed.
2. Close drain after all water and contaminants have been evacuated—DO NOT leave drain open too long as it will eventually completely drain entire filter assembly of water AND fuel, and possibly drain entire tank.

Filter Replacement

Filter replacement frequency is determined by the contamination level of the fuel. Replace filter every 10,000 miles (16,000 km), every 500 hours, every other oil change, when vacuum gauge (optional) reads between 7 to 10 inches of mercury (inHg), if power loss is noticed, or annually, whichever occurs first.

Note—always carry extra replacement filters as one tankful of excessively dirty fuel can plug a filter.

Use only genuine Racor Aquabloc® replacement filters—see Part List.

All Applications

1. Bypass filter assembly with bypass valves, if applicable.
2. Remove T-handle and lid.
3. Remove filters by holding bail handles and slowly pulling upward with a twisting motion. Dispose properly according to local regulations.
4. Remove and discard old lid gasket and T-handle O-ring and clean seal glands of any dirt or debris. Lubricate new gasket and seal (supplied with new filter) with motor oil or diesel fuel before installation.

5. Refer to Priming Instructions, otherwise, fill unit with clean fuel, replace lid and T-handle and tighten snugly by hand only—do not use tools.

Note—above ground tanks or transfer pump applications may use head pressure to prime filter assembly.

Specifications	500FG
Maximum Flow Rate:	60 GPH (227 LPH)
Port Size	3/4"-16 UNF (SAE J1926)
Service Clearance Above Assembly Below Assembly	5.0 in. (12.7 cm) 2.0 in. (5.1 cm)
Replacement Filters 2 micron 10 micron 30 micron	2010SM-OR 2010TM-OR 2010PM-OR
Water In Bowl Capacity	3.7 oz. (109 ml)
Height	11.5 in. (29.2 cm)
Width	5.8 in. (14.7 cm)
Depth	4.8 in. (12.2 cm)
Weight (dry)	4.0 lb (1.8 kg)
Max. Working Pressure	25 PSI (1.7 bar)
Clean Pressure Drop	0.25 PSI (1.7 kPa)
Water Removal Efficiency	99%
Ambient Temperature Range (when fuel temp is)	-40° to +255°F (-40° to +121°C) 80° to 190°F (27° to 88°C)

Troubleshooting

A major cause of power loss or hard starting is result of an air leak (or clogged filter). If your unit will not prime or fails to hold prime, check that drain, bowl and lid are properly tightened. Next, check all fitting connections and ensure fuel lines are not pinched or clogged with contaminants. If problems persist (and filter is new) call Racor Technical Support: (800) 344-3286 ext. 7555 or (209) 575-7555.

Installing Optional In-Filter Heater

Please read and understand all instructions prior to installation.

The in-filter heater option is a cold weather starting aid with an internal automatic thermostat that turns the heater ON when the fuel temperature drops below 50°F (10°C) and turns OFF when the fuel reaches 80°F (27°C). Heat is supplied in the filter assembly just below the replacement filter to melt wax crystals and allow fuel to pass through the filter for quick, easy starting. The 100 watt heater is operated by turning the ignition switch ON for a minimum of five minutes prior to starting the engine.

HEATER WIRING INSTALLATION

Caution! Please read carefully before beginning installation. See schematic on next page.

1. Never power up the heater if there is no fuel in the Racor filter, **severe damage** may

result to the heater and filter assembly.

2. During equipment or vehicle servicing, always ensure power to the Racor heater is turned off. We recommend the installation of a customer-supplied power control switch (see electrical schematic).
3. Check contaminant collection bowl daily for accumulated water. Water is heavier than diesel fuel and will fall to the bottom of the bowl. Drain water before the level reaches the bottom of the turbine centrifuge. Do not allow water to rise to the level of the heater.
4. Ensure wiring installation diagram is closely followed and the proper safety fuse is used. If a fuse should fail, determine the cause and correct it before installing a new fuse and using the heater again.
5. Exterior wiring connections should be soldered, crimped and sealed for protection against shorting.

6. Route wires in protected locations, away from hot or moving surfaces and places that could expose them to chemical contact or environmental debris.

7. Inspect all wiring and connections for unsafe conditions annually or every 12,000 miles, whichever occurs first.

8. Study the wiring schematic before starting. Due to the power consumption of the heater (12 vdc = 8.3 amps, 24 vdc = 4.2 amps) an external relay is required. Racor offers relay kits for this application; refer to the Heater Relay Kit Selection Guide, below. Racor Relay kits include instructions on how to attach them to the Racor heater.

See schematic on next page.

Racor Heater Relay Kit Information

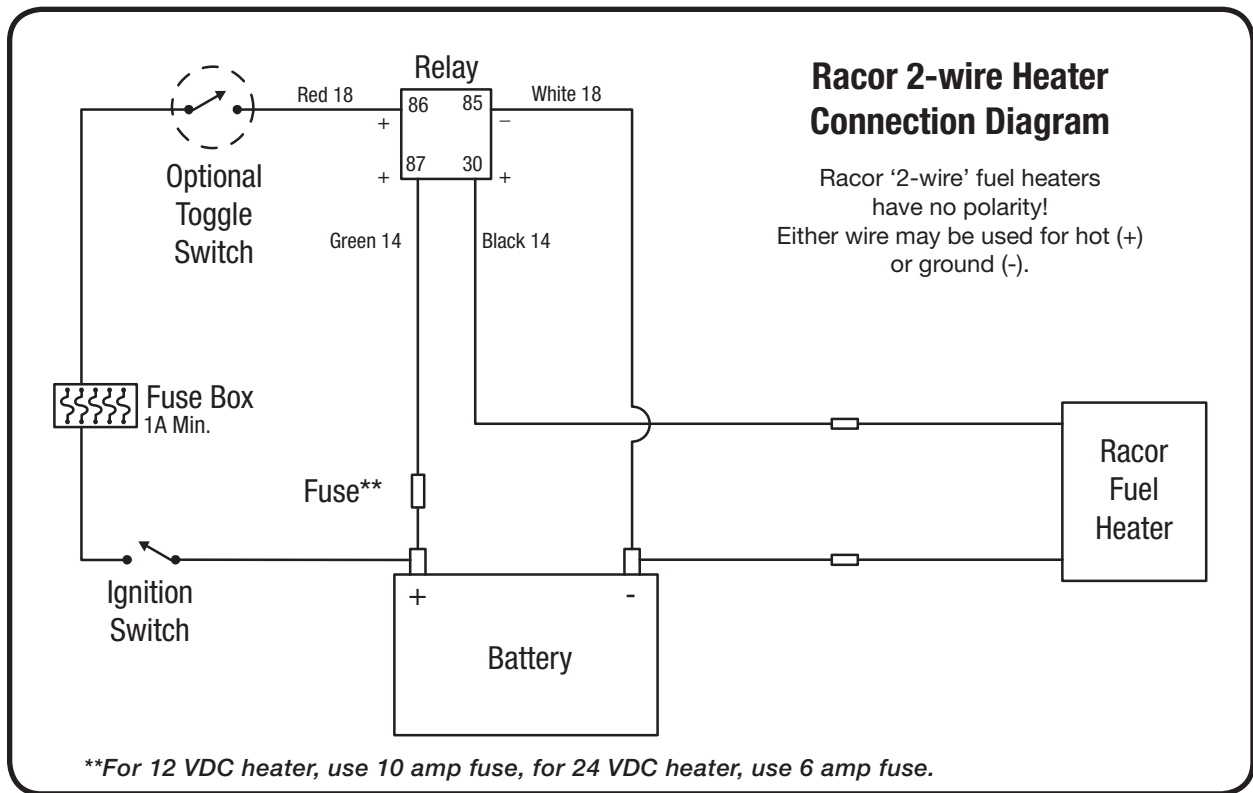
Recommended Racor Heater Relay Kit		
Heater Kits	Heater In Use	Use Kit Number
RK15438-01 12 VDC 100 Watts 8.3 Amps	Single (1)	RK 11861
	Dual (2)	RK 11861
RK15438-02 24 VDC 100 Watts 4.2 Amps	Single (1)	RK 11862
	Dual (2)	RK 11862



RK 11861 or RK 11862 Relay Kits

Note - Racor heater relay kits are ordered separately.

Schematic - For Light-Duty Power Relay Kits: RK 11861 and RK 11862



T-handle Vacuum Gauge

The T-handle vacuum gauge monitors your filters condition. As your filter slowly becomes clogged with contaminants, restriction (resistance to flow) increases. Because of this restriction, more air is mixed with fuel and less fuel is delivered to the engine (fuel degassing). This will result in loss of power and eventually stall the engine.

Installing a T-handle vacuum gauge in your fuel system gives you a visual monitor of your filter condition. Excessive resistance on the gauge means it's time to change the filter.



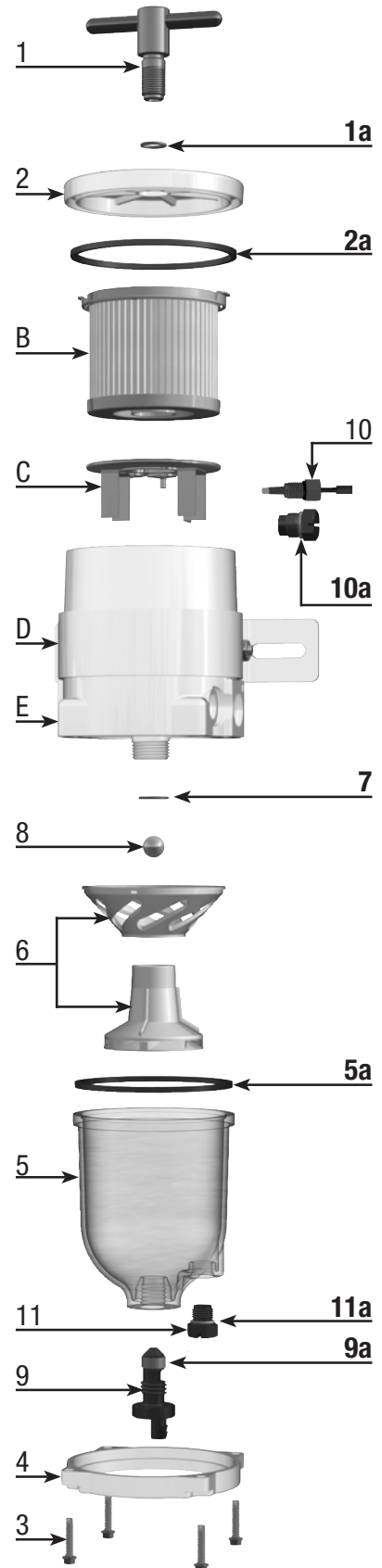
Specifications

RK 11-1969

Application	For 500 Filter Assemblies
Thread Size	1/4" NPT bottom boss mount
Fitting Thread	9/16"-18 UNF
Dimensions	2.0" Diameter x 1.1" Depth
Weight (dry)	0.3 lb (0.1 kg)
Ambient Temperature Range	-40° to +250°F (-40° to +121°C)

Special Notes: For severe vibration applications, mount gauge on a stable, remote location and connect to the source using flexible tubing. After September 1999, Racor converted many liquid-filled gauges to new silicone dampened movement. This new (dry) technology provides a vibration resistant design that never leaks fluid or requires adjustments due to temperature or altitude variations.

Part Number		Description
1	RK 11888	T-handle and O-ring Kit (9/16"-18 UNF Threads) Hand Tighten
1a	RK11350	T-handle O-ring
2	RK 15078	Lid Kit
2a	15005	Lid Seal
B	2010SM-OR (2 micron), 2010TM-OR (10 micron), or 2010PM-OR (30 micron)	Replacement Filter (All Models)
C	RK 15438-01	Heater Kit (12 vdc, 100 watt with TCO)
	RK 15438-02	Heater Kit (24 vdc, 100 watt with TCO)
3	RK 15081	Bowl Fasteners (4) Tighten to 60 in. lbs (6.78 Nm)
4	RK 15035	Bowl Ring Kit
5	RK15437	Clear Bowl Kit (includes 5, 5a, 9, 9a, 11, & 11a)
5a	RK15374	Bowl Seal
6	RK 15013D	Turbine Centrifuge and Conical Baffle Kit Hand Tighten
7	(not sold separately)	Check Ball Seal
8	RK 15010B	Check Ball Kit (includes 7)
9	RK 30476 (>2002)	Self-venting Drain Kit Tighten to 30 in. lbs (3.39 Nm)
9a	(not sold separately)	Drain Gasket
10	RK 21067	Heater Feedthru Kit Tighten to 15 in. lbs (1.69 Nm)
	RK 11-1679	Feed-thru Plug Kit Tighten to 15 in. lbs (1.69 Nm)
10a	43506	Feedthru or plug O-ring
11	RK 21069	Water Probe Kit Tighten to 15 in. lbs (1.69 Nm)
	RK 20126	Bowl Plug Kit Tighten to 15 in. lbs (1.69 Nm)
11a	(not sold separately)	Water Probe or Plug O-ring
D	RK 15378	Clamp Bracket Kit
	RK 11838	Carriage Bolt Kit
E	(not sold separately)	500 Body/Housing



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