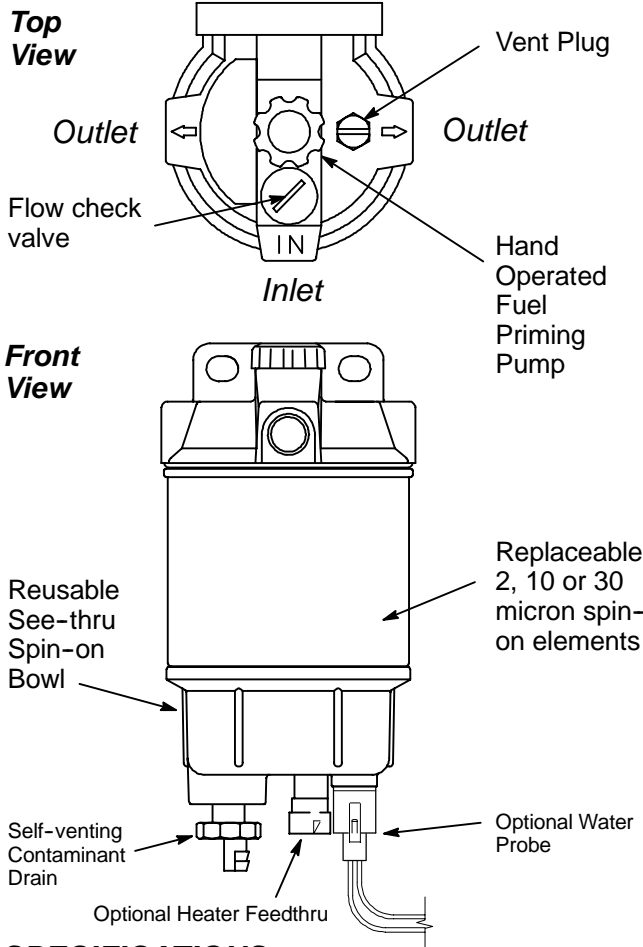


200R Spin-on Series Fuel Filter/Water Separators for Diesel Engines



Parker Hannifin Corporation
Racor Division
P.O. Box 3208, 3400 Finch Road
Modesto, CA 95353 USA
(209) 521-7860 / (800) 344-3286
www.parker.com/racor



Racor's 215R, 230R, and 245R Fuel Filter/Water Separators are specifically designed to handle today's tough diesel filtration problems. These units feature a standard in-head fuel priming pump and are different from one another only in flow capacity and element size.

These units may be used on the suction (vacuum) side or pressure side (up to 30 PSI) of the fuel transfer pump. The die-cast aluminum mounting head features two outlets and one inlet for installation to most fuel systems. The fuel ports are standard SAEJ476 1/4" NPTF (tapered dryseal pipe thread). Many varieties of fittings are available from Racor or hardware dealers. (Fittings may not be supplied with this unit).

A vent plug is fitted to easily evacuate trapped air, making fuel priming an easy, no-mess experience.

Engines will benefit from near 100% water separation and fuel filtration with Racor's proprietary *Aquabloc™* water repelling media. The replaceable spin-on filter elements are available in 2, 10, and 30 micron ratings.

The reusable see-through contaminant collection bowl allows the operator to check contamination build-up at a glance. The contaminant drain is opened by rotating the knob counterclockwise (if facing the bowl's bottom side).

OPTIONAL FEATURES:

An available option is a water probe which alerts the operator when it's time to drain the bowl. (The probe must be used with a 12 or 24 vdc powered Water Detection Kit. See Accessories for available models). For use with diesel fuel systems, only.

A powerful 12 or 24 vdc 200 watt In-bowl heater option is available to quickly warm the element fuel thus providing easier starting and optimum operating efficiency in cold weather or climates. **Danger! Accessories are not intended for use with gasoline or flammable liquid applications.**

SPECIFICATIONS

MODEL		215R	230R	245R
Maximum Flow Rate	GPH	15	30	45
Replacement Element Series	LPH	57	114	170
Fuel Ports (SAEJ476)	NPT	R15	R20	R25
Clean Pressure Drop	PSI	1/4"	1/4"	1/4"
Height	kPa	0.12	0.31	0.61
Width	in.	0.82	2.14	4.21
Depth	mm	8.3	9.0	10.5
Weight, Dry	mm	211	229	267
Operating Temp.	in.	4	4	4
	mm	102	102	102
	in.	4	4	4
	mm	102	102	102
	lbs.	1.8	2	2.2
	kgs.	.80	.90	1.0
		- 40° / +255°F	- 40° / +121°C	

Additionally, a metal bowl is available for severe service, heavy duty, or marine applications. This bowl features a 3/8"NPT drain plug which may be replaced by a UL listed drain valve (refer to parts list).

For marine applications, specify Models: 215RMAM, 230RMAM or 245RMAM. *Note: Heaters may not be used with these models.*

PART NUMBER IDENTIFICATION

The example below illustrates how part numbers are constructed.

245R	M	P	12	2
215R =	Metal bowl.	In-bowl	In-bowl	Filter
15 GPH	(Omit if not desired)	Water	Fuel Heater:	Micron
230R =	Specify	Probe.	12 vdc or	Rating:
30 GPH	MAM for UL		24 vdc. Not	Specify
245R =	Marine	(Omit if not desired)	for marine use. (Omit if not desired)	one:
45 GPH	Models.			2, 10 or 30

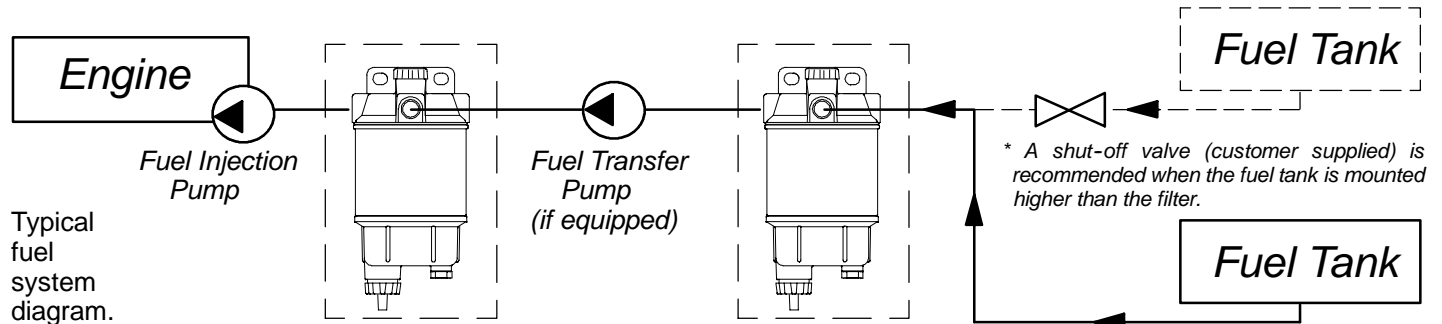
INSTALLATION INSTRUCTIONS

Determine the LOCATION: The Racor 215R, 230R, and 245R Models may be located on the suction (vacuum) side or pressure side (up to 30 PSI) of the fuel transfer pump. For optimum water separation efficiency, install the unit on the suction side.

Determine the FILTRATION: Primary (30 micron), Secondary (10 micron), or Final (2 micron) filtration. The first filter downstream from the fuel tank to the engine is a primary filter. Typically, this filter is rated for 30 microns, however, a 10 micron filter may also be used. Between this filter and the engine is a secondary filter (optional) and it should be rated for 10 micron filtration. The final filter prior to the engine injection pump should be equipped with a 2 micron filter.

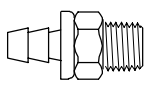
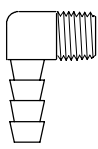
BEFORE INSTALLING THE UNIT:

1. Ensure fuel port fittings are in hand along with fuel line, hardware and all needed tools and materials.
2. Maintain a safe working environment. The engine must be off and obtain good ventilation and lighting.
Do not smoke or allow open flames near the installation. Eye protection is recommended and have fluid 'drip' pans and absorbant shop cloths available to anticipate spills.
3. The chosen mounting location should allow 2 inches below the unit for draining water and replacing elements.
4. Pipe thread paste is recommended on port fitting connections. Do not use pipe tape - a loose piece could clog the system.



SECONDARY / FINAL FILTER LOCATION
Shown on the pressure side of the pump.
(Could also be on the suction side of the pump). Use a 2 (or 10) micron filter.

PRIMARY FILTER LOCATION AND MARINE MODEL LOCATION
Shown on the suction side of the pump. Use a 30 (or 10) micron filter.

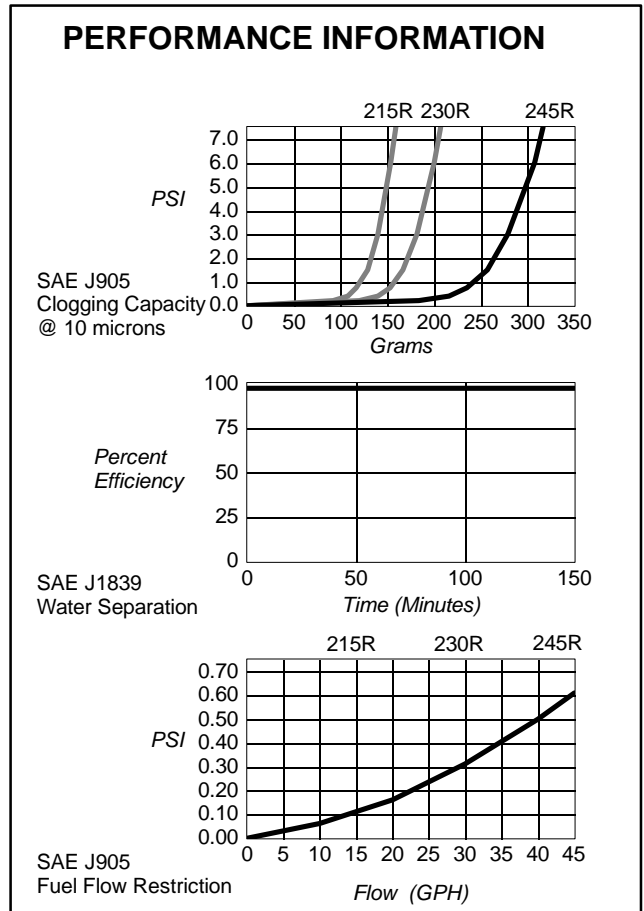
BRASS 1/4" NPT FITTINGS CHART			
Description	Hose I.D.	Part Number	Qty.
Hose Barb 	1/4"	951-N4-H4	1
	5/16"	951-N4-H5	1
	3/8"	951-N4-H6	1
Elbow Hose Barb 	5/16"	953-N4-H5	1
	3/8"	953-N4-H6	1

OPERATING INSTRUCTIONS

PRIMING. Loosen the vent plug. Operate the primer pump until fuel purges at the vent plug. Close the vent plug, start the engine and check for leaks. Follow manufacturer's priming procedures if applicable. Correct as necessary with the engine off.

TROUBLESHOOTING PROCEDURES

A major cause of power loss or hard starting is the result of an air leak. If your unit will not prime or fails to hold prime, first check that the vent plug and drain valve are properly closed and that the element and bowl are tightened. Check fitting connections and ensure the fuel lines are not pinched or clogged with contaminants. If problems persist and the element is new, call your Racor Distributor or Racor Customer Service for assistance.



INSTALLING OPTIONAL FEATURES

NOTE: RACOR ELECTRICAL OPTIONS ARE FOR USE WITH DIESEL FUEL APPLICATIONS ONLY.

WATER PROBE.

Racor 200R Series units can be specified with a water probe. The probe senses continuity values and **must** be used with a special electronic detector to function properly. Due to the various models available, these electronic detectors are sold separately. Installation instructions are supplied with each kit. See Accessories for part numbers.

IN-BOWL HEATER (NOT FOR MARINE MODELS).

The in-bowl heater is a cold weather starting aid with an internal automatic thermostat that turns the heater on if the fuel temperature drops below 45°F (7°C). Heat is supplied just below the replacement element to melt the wax crystals and allow fuel to efficiently pass through the element. The heater will automatically turn off at about 75°F (24°C). The 200 watt heater is available in 12 or 24 vdc (volts, direct current).

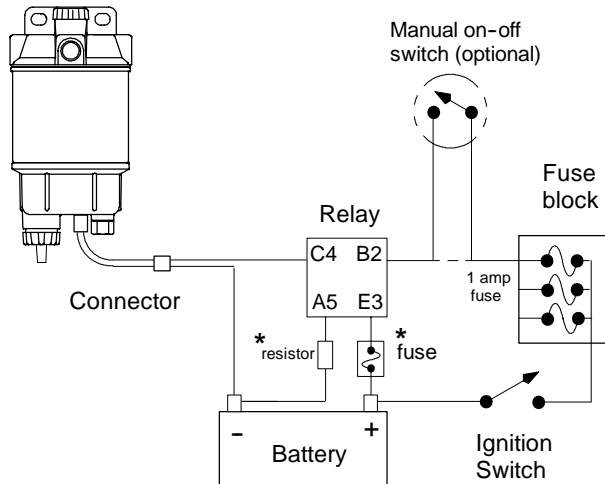
The heater is operated by turning on the ignition switch for a minimum of five minutes prior to starting the engine.

CUSTOMER SUPPLIED ITEMS.

1. Because of the heater power demand: 20 amps for 12 vdc and 10 amps for 24 vdc, an additional relay is recommended for the safest method of installation. Racor offers two relay kits, available from your dealer: RK11861 for 12 vdc systems or RK11862 for 24 vdc systems. These kits include an in-line fuse holder (and fuse) and the RK11862 kit also includes a resistor. Use the 25 amp fuse with 12 vdc and the 15 amp fuse (and resistor) with 24 vdc systems.
2. An on-off toggle switch may be used to control power to the heater relay. This allows the operator to cut power to the heater relay during summer use.
3. All wires should be 14 AWG (American Wire Gauge), minimum.

INSTALLATION.

1. Either heater wire may be used for Hot (+) or Ground (-).
2. Wire / terminal connections should be soldered and crimped.
3. Run wires in protected locations. Avoid hot surfaces and places that could pinch or rub on the wires.



*For 24 vdc systems install the resistor and use the 15 amp fuse.

SERVICE

Frequency of water draining or element replacement is determined by the contamination levels present in diesel fuel. If the fuel tank is located higher than the Racor, close the fuel tank outlet valve prior to servicing.

DRAINING THE COLLECTION BOWL.

Water is heavier than diesel fuel and will settle to the bottom of the bowl and appear different in color. The bowl must be drained before contaminants reach the bottom of the element or when the Water Detector (if equipped) indicates it's time to 'drain water'. Inspect or drain the collection bowl of water daily.

1. Open the drain and operate the pump to drain off contaminants. Close the drain.

MARINE MODELS: Remove the drain plug to drain off contaminants. Replace drain plug to bowl snugly.

ELEMENT REPLACEMENT.

Element replacement frequency is determined by the contamination level in diesel fuels. Fuel flow to the engine becomes restricted as the element slowly plugs with contaminants, resulting in noticeable power loss and/or hard starting.

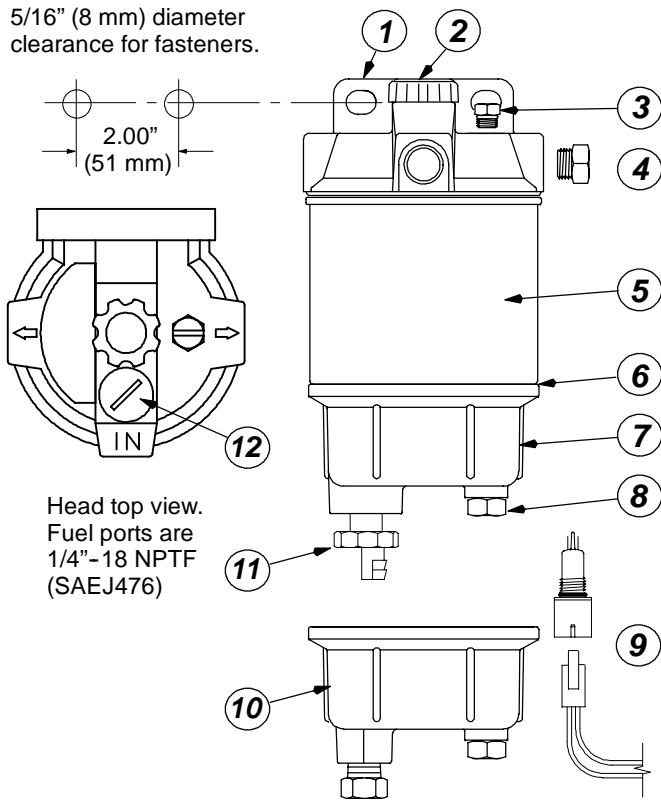
Replace the element every 10,000 miles, every 500 hours of operation, every other oil change, annually or if a power loss is noticed, whichever ever comes first. If a vacuum gauge has been installed on the outlet side of the filter, change the element between 6 to 10 inches of mercury (restriction). The actual measurement varies in different fuel systems.

Note: Always carry an extra element as one tankful of excessively contaminated fuel can plug a filter.

1. Drain off some fuel by loosening the vent plug and opening the drain valve. (Marine models: remove the drain plug).
2. Disconnect the water sensor and heater connectors, if equipped.
3. Spin the element and bowl off together. Remove the bowl and clean the O-ring gland.
4. Apply a coating of clean fuel or motor oil to the new O-ring and element seal.
5. Spin the bowl onto the new element and then spin them both onto the filter head snugly by hand only. **DO NOT USE TOOLS.**
6. Close the bowl drain. (Marine models: replace the drain plug. Apply thread sealant to threads, if needed).
7. Connect the water sensor and heater connectors, if equipped.
8. With the vent plug still loosened, operate the primer pump until fuel purges at the vent plug. Close the vent plug, start the engine and check for leaks. Correct as necessary with the engine off.
9. Follow manufacturer's priming procedures, if applicable.

REPLACEMENT PARTS LIST

5/16" (8 mm) diameter clearance for fasteners.



Item/Part No.	Description	Qty.
1 RK20046	Head, 1/4"-18 NPTF Ports	1
2 RK20025	Primer Pump Assembly	1
3 RK20179	Plastic Vent Plug, 3/8"-16 UNF	1
4 RK12041	Metal Plug, 1/4"-18 NPTF	1
5 R15S	215R, 2 mic. Replacement Element	1
R15T	215R, 10 mic. Replacement Element	1
R15P	215R, 30 mic. Replacement Element	1
R20S	230R, 2 mic. Replacement Element	1
R20T	230R, 10 mic. Replacement Element	1
R20P	230R, 30 mic. Replacement Element	1
R25S	245R, 2 mic. Replacement Element	1
R25T	245R, 10 mic. Replacement Element	1
R25P	245R, 30 mic. Replacement Element	1
6 RK22244	Bowl O-ring	1
7 RK22350-02	See-thru Bowl Assembly	1
RK22354-01	12vdc Heater and See-thru Bowl	1
RK22354-02	24vdc Heater and See-thru Bowl	1
8 RK20022	Metal Plug, 1/2"-20 UNF	1
9 RK30964**	Water Probe and Connector Kit	1
10 RK22368	Marine Metal Bowl, NPT drain & 1/2"port	1
11 RK30476	Self-Venting Drain Knob	1
12 RK20011	Check Ball and Plastic Cap	1
RK20742	Marine Metal Check Ball Cap	1
RK20075	Complete Gasket/O-ring Kit	1

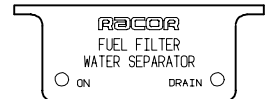
**Must be used with a Water Detection Kit. See Accessories below.

ACCESSORIES

Accessory kits are intended for use with diesel fuel only. Order kits from your Racor dealer.

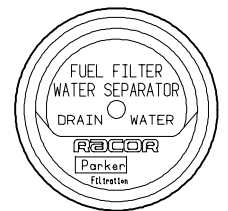
Water Detection Kit # RK 20725

This 12 vdc under dash module illuminates an LED when power is on and then when water is detected. The 'DRAIN' LED will remain illuminated until the water is drained below the probe tips. The unit automatically resets. Hardware and instructions included. Wire/terminals are customer supplied. Measures 2 3/4" by 1" by 1 1/2" deep.



Water Detection Kit # RK 20726

This 2" diameter gauge type module is ideal for in-dash applications. The corrosion resistant body is waterproof from the face side and may be used with 12 or 24 vdc electrical systems. The unit illuminates an LED and sounds a momentary buzzer at every 'power-up' and then when water is detected. The unit automatically resets. Hardware and instructions are included however, wire and terminals are customer supplied. Fits standard 2 1/16" diameter panel openings. Measures 2 1/4" (major) diameter by 3 1/8" deep (to end of threaded connector studs).

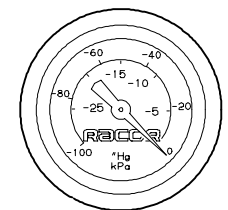


Water Detection and Element Restriction Kit # RK 11-1570 (not shown)

Similar to RK 20726 above except the unit features two LEDs. Illuminates and sounds a momentary buzzer at every 'power-up' and then when water or filter restriction is detected (vacuum switch set at factory for 7 inHg). Automatically resets. Hardware and instructions are included. Wire and terminals are customer supplied.

Gauge-Type Element Restriction Monitor Kit #1606B

This 2" diameter gauge is also ideal for in-dash applications. Fuel flow to the engine becomes restricted as the element slowly plugs with contaminants. The gauge monitors the filter restriction and informs the operator of filter condition anytime the engine is running. Hardware and instructions included however, plated steel 'Tee' and vacuum tubing not supplied. These items may be ordered from your Racor dealer.



WARNING The following statement is required pursuant to Proposition 65 applicable in the State of California: "This product may contain a chemical known to the State of California to cause cancer".
WARNING Failure or improper selection or improper use of the products and/or systems described herein or related items can cause death, personal injury and property damage. This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operation conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the applications are met. The products described herein, including with limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

RACOR LIMITED WARRANTIES STATEMENT
 All products manufactured or distributed by Racor are subject to the following, and only the following, LIMITED EXPRESS WARRANTIES, and no others: For a period of one (1) year from and after the date of purchase of a new Racor product, Racor warrants and guarantees only to the original purchaser-user that such a product shall be free from defects of materials and workmanship in the manufacturing process. The warranty period for pumps and motors is specifically limited to ninety (90) days from date of purchase. A product claimed to be defective must be returned to the place of purchase. Racor, at its sole option, shall replace the defective product with a comparable new product or repair the defective product. This express warranty shall be inapplicable to any product not properly installed and properly used by the purchaser-user or to any product damaged or impaired by external forces. THIS IS THE EXTENT OF WARRANTIES AVAILABLE ON THIS PRODUCT. RACOR SHALL HAVE NO LIABILITY WHATSOEVER FOR CONSEQUENTIAL DAMAGES FLOWING FROM THE USE OF ANY DEFECTIVE PRODUCT OR BY REASON OF THE FAILURE OF ANY PRODUCT. RACOR SPECIFICALLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED INCLUDING, WITHOUT LIMITATION, ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE (EXCEPT FOR THOSE WHICH APPLY TO PRODUCT OR PART THEREOF THAT IS USED OR BOUGHT FOR USE PRIMARILY FOR PERSONAL, FAMILY, OR HOUSEHOLD PURPOSES), WARRANTIES OF DESCRIPTION, WARRANTIES OF MERCHANTABILITY, TRADE USAGE OR WARRANTIES OR TRADE USAGE.