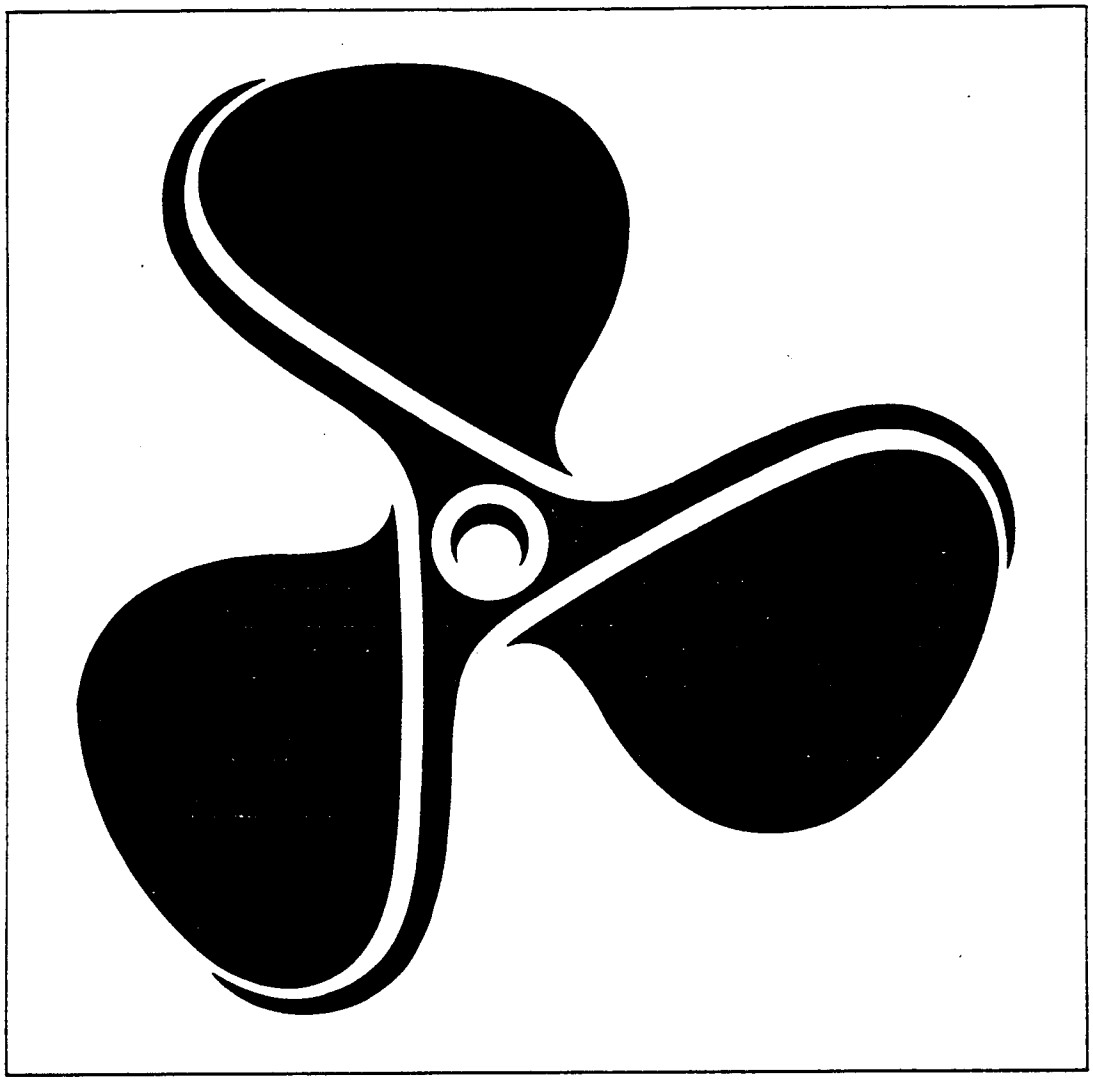
Marine diesel-fuel filter/water separators

Installation, operation, parts and service data



RACOR®

MARINE UL® LISTED

Tested to Coast Guard requirements

Racor Industries, Inc. P.O. Box 3208 Modesto, CA 95353 USA (209) 521-7860 Telex: 359-408

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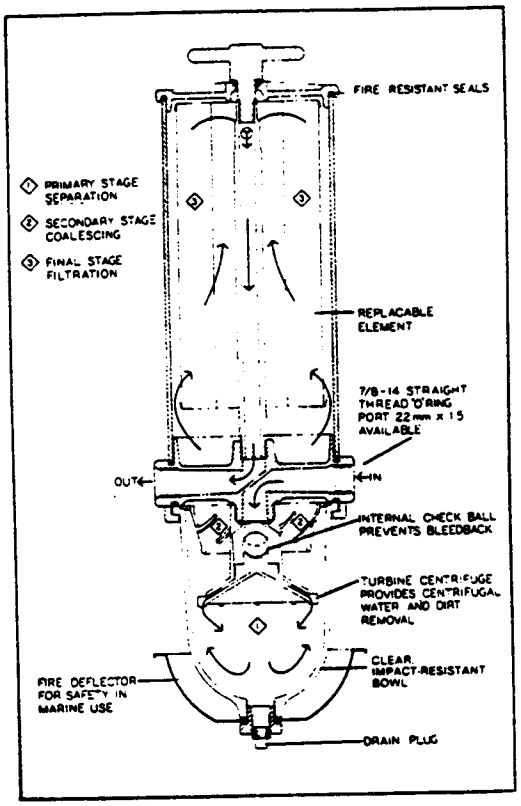
Marine U.L. listed/U.S. Coast Guard accepted.

Racor units have passed rugged U.L. Fire and Thermal shock tests, and Racor has the only Marine UL Listed and U.S. Coast Guard accepted Fuel Filter/Water Separators with a see-thru bowl or metal bowl option.

There is a Racor Fuel/Filter Water Separator for every marine diesel engine application, including multiple units that can be serviced during continuous operation.

8 features to save you time and money

1. Single Unit Tri-functional Design
2. Internal Check Valve System
3. Turbine Centrifuge
4. See-Through Bowl
5. Coalescing
6. Long Life Replaceable Element
7. High Quality Construction
8. Spin-on Handle and Easily Removable Cartridge
9. Exclusive Flame Guard (Pat. Pending)



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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 DISAVOWS 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 OF TRADE USAGE.

The policy of Racor is one of continual improvement in design and manufacturing to insure still finer products; therefore, specifications and equipment are subject to change without notice. Product information published herein, while correct at the time of publication, is subject to change.

Installation

Below Filter Fuel Storage Application

1. Remove vacuum side filters in fuel line between fuel tank and fuel pump. Cast-in head or non-removable housing should be adapted with the Racor Spin-On By-Pass Cap (Part No. 11548). Otherwise, service and leave in place. All secondary or pressure side filters located between the pump and engine should be serviced and left in place.
2. Mount Racor Filter/Separator vertically on the vacuum side of the fuel pump or transfer pump, whichever comes first, in a convenient location for servicing and monitoring contaminants. Maintain vertical clearance above filter housing for removal of element or elements. (See 500MA, 900MA, or 1000 MA Parts Diagram.)
3. Position unit between the horizontal planes of the bottom of the fuel tank or day tank and pump inlet for minimum restriction to the pump. (See Figure 1.)
4. Install fuel line from tank to inlet side of the Racor unit using plated steel fittings and maximum fuel line size available in order to reduce restriction. Any fuel by-pass or return lines returning to suction side of filter which are removed must be routed into inlet side of the Racor unit using plated steel fittings. These fittings are available from your dealer or Racor Industries. Lubricate the O-ring of each fitting before installation. (Use clean diesel fuel or a light oil.)
5. Install fuel line from the outlet of the Racor unit to the inlet of the transfer or fuel pump, again using plated steel fittings.
6. Remove lid and prime the system by pouring clean fuel into filter cylinder until full. Replace lid and hand-tighten the T-handle. Carefully clean any accumulation of diesel fuel from the metal deflector bowl.
7. Start engine and test system. (See Troubleshooting Section.)

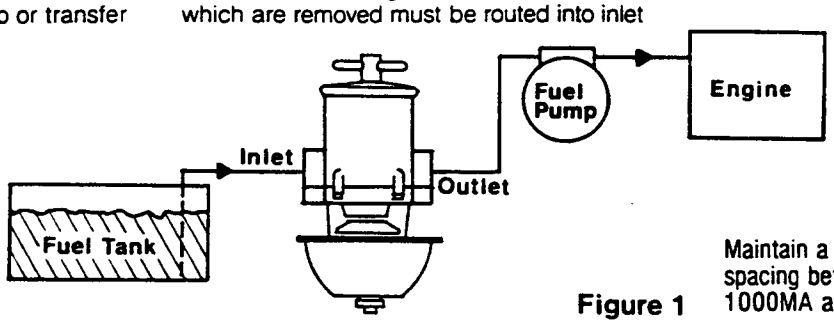

Figure 1

Maintain a minimum of 5-1/8" vertical spacing between mounting clamps on 1000MA and 1000MAM.

Installation

Above Filter Fuel Storage Application

1. Follow Steps 1 and 2 for Below Filter Fuel Storage Application.
2. Position unit between fuel tank and fuel pump inlet for minimum restriction to the pump. (See Figure 2.)
3. Follow Steps 4 and 5 for Below Filter Fuel Storage Application.
4. On a 500MA, 900MA, 1000MA, 73/1000 MA or 77/1000MA unit, a valve must be installed on the *inlet* side of the filter system. This valve is necessary when changing elements. (See Figure 2 and Accessories Section.)
5. On a 75/900MA, 75/1000MA, or 79/1000 MA unit, a pipe tee with a compound vacuum/pressure gauge must be installed on the *outlet* side of the filter system. A valve must also be installed on the *inlet* side of the filter system. (See Figure 3 and Accessories Section.)
6. Follow Steps 6 and 7 for Below Filter Fuel Storage Application.

Maintain a minimum of 5-1/8" vertical spacing between mounting clamps on 1000MA and 1000MAM.

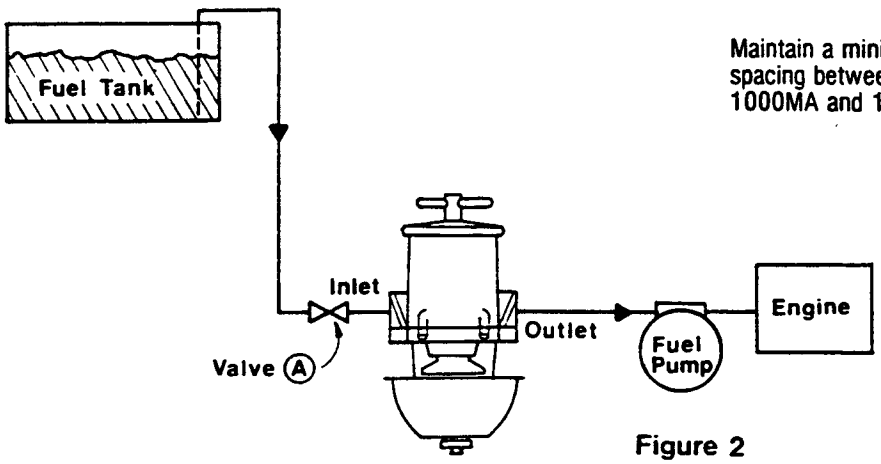

Figure 2

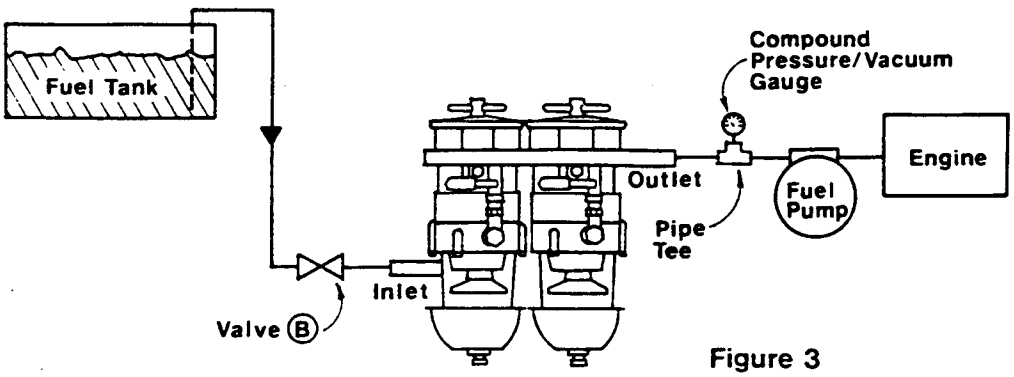

Figure 3

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Service

Elements should be changed at 8 to 15 inches of vacuum (inHg). (See Accessories Section for Gauges.) Measurement should be made between the Racor unit and the fuel pump.

On '75/ and '79/Series models with valving, all valves are in the open position for normal operation. For continuous operation, one unit may be shut down while under power to change element. During the element change, reduce fuel flow rate to 6 gpm for '79 model or to 3 gpm for 75 model.

Below Filter Fuel Storage Application

. Shut off engine. Remove lid.
2. Inspect gaskets. Replace only if necessary with Racor Marine Gaskets.
. Remove element.
. Insert Racor replacement element over enter return tube with turning motion. (See arts Diagram for correct element number.)
. Top off by pouring *clean* diesel fuel into iter cylinder until full.
. Lubricate lid gasket and T-handle O-ring. eplace lid and hand-tighten T-handle. arefully clean any accumulation of diesel uel from the metal deflector bowl. The bowl ust be drained before water or contaminnts reach the bottom of the centrifuge ssembly.

> CAUTION: To insure safety, use only plated steel fittings and genuine Racor replacement elements and parts.

bove Filter Fuel Storage pplication

hen replacing element(s) on a 500MA, 00MA, 1000MA, 73/1000MA or 77/1000MA ith the engine *not* in operation.

Turn valve "A" off. (See Figure 2.)

Remove lid and T-handle. Inspect skets. Replace only if necessary with acor Marine Gaskets.

Remove element(s) by means of bail.

Insert Racor replacement element over nter return tube with turning motion. (See rts Diagram for correct element number.)

Top off by pouring clean diesel fuel into er cylinder until full.

Lubricate lid gasket and T-handle O-ring. eplace lid and hand-tighten T-handle. refully clean any diesel fuel from the etal deflector bowl.

Open valve "A" and inspect for leaks.

When replacing one filter while another is in service on a 75/900MA, 75/1000MA, or 79/1000MA with the engine in operation:

1. Check outlet gauge. If gauge reads 4 or more inches of vacuum (inHg) close the outlet valve of the unit to be serviced. (See Figure 3.)
2. Follow Steps 2-6 for Above Ground Fuel Storage Application.
3. If outlet gauge reads less than 2 inches of vacuum or reads pressure, slowly close valve "B" until outlet gauge reads 2-4 inches of vacuum.
4. Close the outlet valve of the unit to be serviced.
5. Follow steps 2-7 for Above Ground Fuel Storage Application.

Maintenance and Trouble-Shooting Procedures

New Elements—Normal vacuum reading can be 1 to 5 inHg at full governed RPM, depending on the hose I.D., length, elbows, pump efficiency, and height of lift from tank.

Idle RPM should be near "O" reading with clean element where pump capacity is dictated by engine RPM.

If vacuum reading does not return to 1 to 5 inHg after element change, check for the following:

1. collapsed fuel lines
2. tank shut-off valves closed
3. plugged fuel lines

If the inlet to the Racor Filter/Separator is plugged, disconnect inlet line, open drain petcock, and blow out with compressed air. In case of severe stoppages, remove bowl and centrifuge unit and clean with compressed air.

If air bubbles are rising from centrifuge action in the clear bowl, the air leak is between inlet side of the Racor system and tank. Check for:

1. loose fittings
2. pin holes in lines
3. cracked tank stand pipe
4. out of fuel condition
5. O-ring not seating
6. improper flare angles on hose fittings*

If no bubbles are noted in bowl and air suction is still evident, examine outlet side of the Racor system to fuel pump. Check for:

1. loose fittings
2. pin holes in line
3. O-ring not seating
4. improper flare angles on hose fittings*
5. fuel pump seats
6. bleed-off fitting on top of Cummins fuel pump
7. top gaskets on Racor Filter/Separator

*(For example, a 37° flared female hose fitting pulled up tightly to a 45° male fitting sometimes causes a hair line crack, resulting in air suction.)

If Racor Filter/Separator is sucking air at bowl drain fitting gasket or T-handle and top, and cannot be stopped by wetting gasket with fuel and *hand tightening only*, replace gasket.

> NOTE: Methanol, ethanol and alcohol based additives will cause damage to non-metal parts in the Racor unit and the entire engine system. When use of an additive is determined to be necessary, use only genuine RACOR DIESEL FUEL ADDITIVES. RACOR DIESEL FUEL ADDITIVES provide preventive maintenance protection all year long, help cold weather starts, protect against damaging foulants, extend element life and maximize the efficiency of fuel filters and water separators.

Bleed Back — If fuel in the filter/separator bleeds back to the tank an air leak or check valve seating problem is indicated. To inspect check valve seat, remove bowl ring, bowl and turbine centrifuge, turning counter-clockwise. (See parts diagram for identification of parts.)

Inspect check ball and seat. Clean or replace seat and check ball and lubricate seat and reinstall centrifuge *hand tight*. Replace bowl ring gasket and reinstall bowl and ring. Fill unit with fuel.

Read and follow the Installation instructions carefully to insure proper performance of your Racor filter/separator.

Optional Accessories

Racor Part No.	Description
1606B	Vacuum Gauge Kit (includes 0 to 15 inHg gauge and fittings necessary for installation)
18-1104	Compound Pressure/Vacuum Gau
11619	Manual Valve-1" NPT (See Fig. 2)
18351	Manual Valve-1" NPT (See Fig. 3)
18099	Pipe Tee-1" x 1" x 1" NPT (See Fig

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