

# Marine Turbine Series Improvements

## Product Bulletin

**Marine Turbine Series: 900MA, 1000MA, 75900MAX, 73100MA, 75100MAX, 77100MA and 79100MAV**

**Racor introduces the most significant improvements to our Marine (MA) Turbine Series fuel filter/water separators in the last 30 years!**

The redesigned MA Turbine Series provides improved filtration performance, numerous design enhancements and an overall increase in performance efficiency.

### I - Improved Filtration

#### Aquabloc II™ Filter Cartridges

The replacement filter cartridges were redesigned over two years ago and feature a “key” on the bottom cap that opens the new fuel shut-off valve. Genuine Racor replacement cartridges ensure proper valve operation, maximum filtration efficiency and superior performance. Other improvements are as follows:

1. **New Media:**

Racor is proud to introduce our new Aquabloc II cellulose media. This media has increased efficiency at separating virtually 100% of water out of fuel while filtering out a minimum of 25 percent more sediment, algae, rust, dust, and other contaminants. Additionally, primary and secondary filters have improved water emulsion

removal efficiency over the previous Aquabloc media.

2. **Printed Endcap:**

A color coded, permanently printed top endcap will feature information about the cartridge. Red lettering indicates a 30 micron element, blue is 10 micron, and brown is 2 micron.

3. **Improved Bail Handles:**

Two opposing handles make the removal of the cartridge easier during servicing.

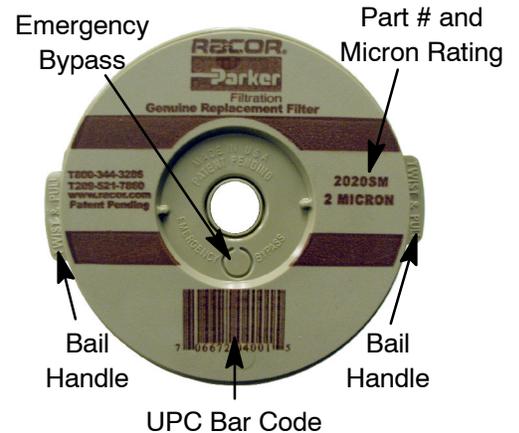
4. **Emergency Bypass Tab:**

In an emergency situation when replacing a clogged cartridge is not an option, you can easily puncture the bypass tab for a temporary solution to keep your engine running. Once this feature has been used, replace the element as soon as possible to avoid passing harmful contaminants to your engine. Racor recommends that you always keep replacement cartridges available as one tankful of excessively dirty fuel could plug a filter.

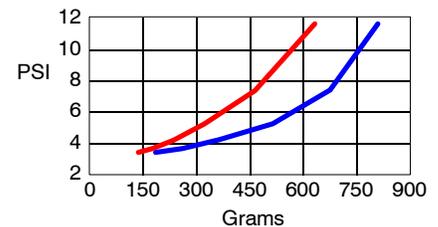
5. **UPC Bar Code:**

All cartridges are packaged for individual, retail sale and include a UPC bar code.

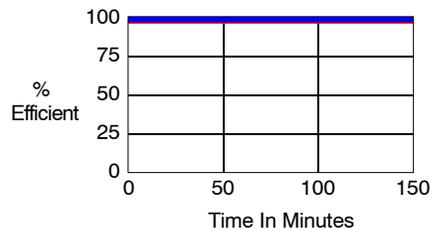
**Top View of 2020 Cartridge Element**



Performance tests on the new 10 micron media have yielded the following improved results (see graphs below). Test data for the *current design* is in **red** and the test data for the *new design* is in **blue**.



SAE J905 Contaminant Capacity (Life) (using SOFTC-2A)



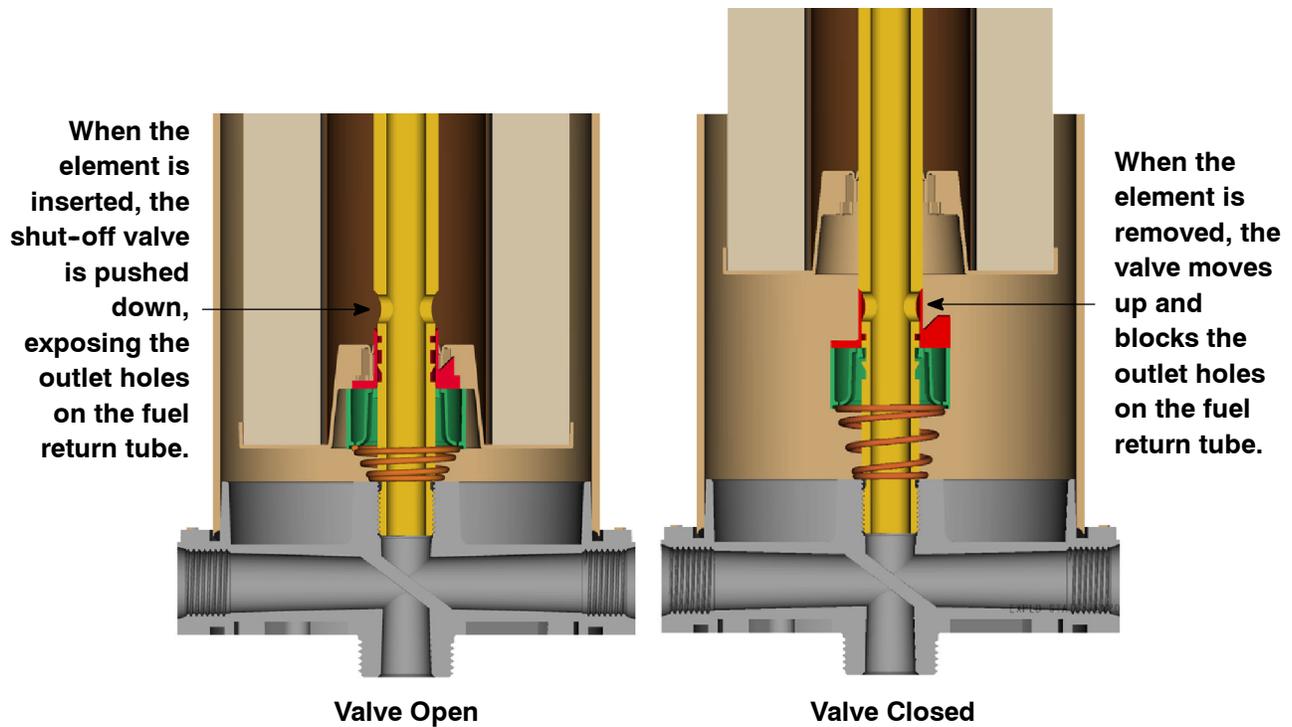
SAE J1839 Droplet Removal

## II - Design Enhancements

### Internal Fuel Shut-off Valve

An advanced, patent pending fuel shut-off valve keeps unfiltered fuel from entering clean-side passages during element removal and provides the customer with a consistent prime and less chance for trapped air to circulate through the fuel system. The valve features a steel spring that pushes up on the element to make servicing more convenient and mess free. The valve is activated by inserting or removing the replacement element. As the element is inserted into the assembly, the valve opens and allows only clean fuel to pass to the engine. If the element is removed, the valve closes and stops all fuel flow out of the assembly (see pictures below).

#### Partial Half Section and Cutaway View



### Redesigned Fuel Return Tube

The redesigned fuel return tube supports the internal fuel shut-off valve and features the outlet hole located at the bottom of the tube (see pictures above).

Note: elements other than genuine Racor cartridges will NOT open the shut-off valve and are not recommended for use with the new MA Turbine Series. This new element design will fit ALL older versions of Racor's famous Turbine Series, however, old element stock (those with full colored end-caps and the single center bail handle) will not fit or open the shut-off valve in the new MA models.

### New Lid Design

The redesigned lid features a robust design that will press the element down to activate the fuel shut-off valve. This design meets UL and marine type-approval requirements.

### Improved T-handle

The T-handle has been redesigned to enable easier element changeouts. The threaded shaft is now slightly longer than existing T-handles and is completely interchangeable with product already in the field. When an element service is required, remove the T-handle, lid and used element. Install new element and press it down until the bottom engages the internal fuel shut-off valve. Re-install the lid and T-handle and as the T-handle is tightened, the lid will press down on the element until it is in the correct position. Tighten the T-handle hand tight only.



### Color Changes

All Racor Marine Turbine (MA) assemblies will showcase a new look - the entire assembly will be white powder coated (see pictures below). This color combination presents a clean appearance that will blend and compliment the majority of installation applications. Note: MAM assemblies will also include a new white metal bowl (not shown).



Current 900MA Assembly

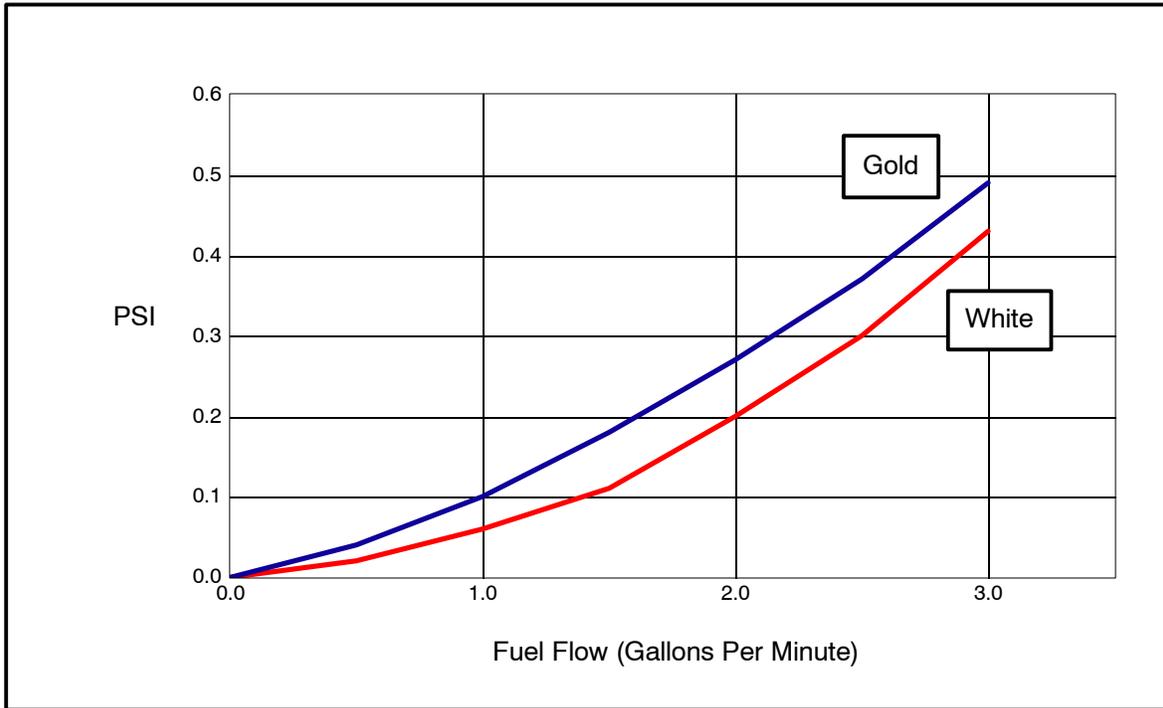


New 900MA Assembly

### III - Performance Efficiency

The modifications mentioned in this bulletin have lowered the overall fuel flow restriction in the MA models by as much as 12%. See graph below.

Test data for the **current (gold)** 1000MA assembly is in **blue** and the **new (white)** 1000MA assembly, in **red**.



SAE J905 Fuel Flow Restriction (with a 10 micron Aquabloc II element)

### IV - Available Options

#### Water Probe

The water probe is only a component in the water detection system and will not work without a Racor electronic detection module. Multiplex units must use one probe for each collection bowl but only one water detection module is needed. Wiring instructions are supplied with each water detection module. Never wire a water probe directly to voltage or another brand of detection module. Water probes can be ordered separately by ordering part number **RK 21069** or they can be installed at the factory by adding a "P" to the model number when ordering a complete assembly (see "How to Order" chart). Water detection modules must always be ordered separately.



### Water Detection Modules

Racor water detection modules are available in a wide selection for various installation requirements. Under dash, in-dash and remote mount, these solid-state units may be used with any Racor water probe. They are manufactured using the highest quality materials and are all 100% electronically tested.

An electronic detection module analyzes electrical resistance at the water probe and determines if water is present. If so, the detection module operates to indicate water, based on its features listed below. All units reset automatically after water is removed (unless specified). Below are some of our more popular modules, others are available.

| Part Number | Description   | Voltage      | Picture (no scale)   |
|-------------|---|--------------|--|
| RK 20726    | In-dash mount. Light and audio. Red <b>DRAIN</b> lamp illuminates continuously and horn sounds momentarily when water is detected. Initial power-up self diagnosis feature and circuit protection included. Plastic 2" gauge. Power draw is 3 milliamps for 12 vdc and 13 milliamps for 24 vdc. | 12 or 24 vdc |   |
| RK 20725    | Under dash mount. Light only. Green <b>ON</b> lamp illuminates with power and red <b>DRAIN</b> lamp illuminates when water is detected. Initial power-up self diagnosis feature and circuit protection included. Plastic enclosure measures 2.75" by 1" by 1.5". Power draw is 10 milliamps.    | 12 vdc       |  |
| RK 20725-24 | Same as above.  | 24 vdc       |  |

### Remote Detection Units

Racor remote detection units are used in applications where a customer supplied lamp or horn is used to signal water-in-fuel instead of our standard detection units.

| Part Number | Description   | Voltage | Picture (no scale)  |
|-------------|---|---------|---|
| RK 14329    | Sends a hot (+) signal when an input ground signal (from a water probe or a vacuum switch - not included) is received. Must be used with a relay to power a horn or indicator lamp (if draw is over 1 amp). Plastic enclosure measures 3" by 2.5" by 0.75". | 12 vdc  |  |
| RK 14321    | Same as above.  | 24 vdc  |   |
| 14332       | Same as the RK 14329 but sends a ground (-) signal. Enclosure is the same size as the RK 20725 shown above.   | 12 vdc  |  |

## Vacuum and Compound Gauge Kits

Vacuum gauges are available to monitor element condition. By installing a vacuum gauge on the outlet side of the Racor filter, visual monitoring of element condition is possible at a glance. As the filter element slowly becomes clogged with contaminants, the restriction increases. As the restriction increases and the fuel pump continues to draw fuel, less fuel is sent to the engine and air is pulled from the fuel causing “de-gassing.” If restriction continues to increase and the element is not changed, the engine will eventually lose power and stall. At the first indication of decreased performance, note the dial reading or apply the ‘red line’ decal provided with most kits. This will assist in knowing when to change the filter at the next interval. Note: Intervals of element changeout may vary depending on fuel cleanliness. Always keep a spare Racor element on hand.

Compound gauges are recommended for applications where pressure may be present. These conditions are typically a result of “head” pressure which is present in overhead fuel tank installations.

| Part Number       | Description   | Application          | Picture (no scale)  |
|-------------------|---|----------------------|---|
| <b>RK 11233</b>   | Vacuum gauge. 2" dial. Silicone dampened. 0 to 30 inHg with 1/4" NPT back bracket mount.  | Suction              |    |
| <b>1606B</b>      | Vacuum gauge kit. Same gauge as RK 11233 with two fittings: 7232-4 (1/8" male NPT by 1/4" (#4) hose barb) and 7234-4 (1/4" swivel by 1/4" (#4) hose barb). 1/4" (#4) hose not included. | Suction              |   |
| <b>0102-4-2</b>   | Adaptor fitting. 1/4" male NPT by 1/8" female NPT. This adaptor is typically needed with the 1606B vacuum gauge kit.  | Suction or Pressure  |  |
| <b>RK 11-1676</b> | Vacuum gauge. 2" dial. Silicone dampened. 0 to 30 inHg with 1/4" NPT bottom boss mount.   | Suction              |  |
| <b>RK 11-1669</b> | T-handle vacuum gauge kit. Includes 11-1676 gauge and 11-1668 lid fitting (9/16"-18 SAE threads).   | Suction              |  |
| <b>RK 19476</b>   | Compound gauge. 2" dial. 0 to 25 inHg and 0 to 15 PSI. 1/4" NPT bottom boss mount.  | Suction or Pressure. |  |

## V - How to Order

The example below illustrates how part numbers are constructed.

| 1000MA   | M  | P  | 2   |
|--|--|--|---|
| Specify Model (see chart below):<br><b>500MA</b> <sup>1</sup><br><b>900MA</b> <sup>2</sup><br><b>1000MA</b> <sup>2</sup><br><b>75500MAX</b> <sup>1</sup><br><b>75900MAX</b> <sup>3</sup><br><b>751000MAX</b> <sup>3</sup><br><b>731000MA</b> <sup>4</sup><br><b>771000MA</b> <sup>5</sup><br><b>791000MAV</b> <sup>4</sup> | Add <b>M</b> for a metal bowl instead of the standard see-thru polymer bowl. (Omit if not desired) | Add <b>P</b> for a water sensor probe <sup>6</sup> (Omit if not desired) | Add a micron rating: <b>2, 10, or 30</b> (The smaller the number in micron rating, the more contaminants the filter will take out of the fuel. A 2 micron filter will take out more contaminants than a 10 micron filter will.) |
| Standard fuel ports are: <sup>1</sup> 3/4"-16 UNF (SAE J1926), <sup>2</sup> 7/8"-14 UNF (SAE J1926), <sup>3</sup> 7/8"-14 UNF (SAE J514), <sup>4</sup> 3/4"-14 NPT (SAE J476) and <sup>5</sup> 1" NPT (SAE J476). <sup>6</sup> Must be used with Water Detection Module.   |  |  |   |

Fittings are available from Racor - call technical support at 800.344.3286 for assistance.

