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## Turbine Series Fuel Filter/Water Separators

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### On and Off Highway Turbine Series Links:

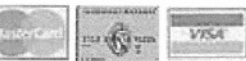
- [On and Off Highway Turbine Series Introduction \(this page\)](#)
- [On and Off Highway Turbine Series Specifications](#)
- [Turbine Series 500FG Assembly View/Parts Breakout](#)
- [Turbine Series 900FG Assembly View/Parts Breakout](#)
- [Turbine Series 1000FG Assembly View/Parts Breakout](#)
- [On and Off Highway Turbine Series Assemblies](#)

Racor Turbine Series Fuel Filter / Water Separators have been protecting engines from water, dirt, foulants and other contaminants for over 30 years using a patented three-stage process:

- (1) Separation - The turbine centrifuge separates solids and 'free' water through centrifugal action. Although the turbine has no moving parts, over 30% of the contaminants are removed here.
- (2) Coalescing - Smaller water droplets and solids coalesce on the specially designed conical baffle and fall to the collection bowl.
- (3) Filtration - Engines benefit from near 100% water separation and fuel filtration with Racor's proprietary Aquabloc water repelling media.

### RACOR Products

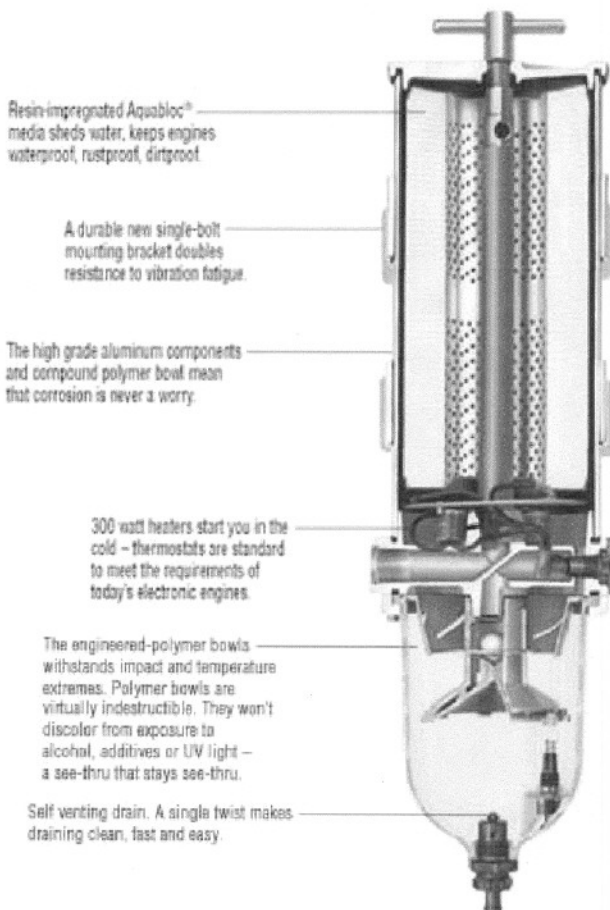
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- [Turbine Series \(On/Off Highway\)](#)
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- [P Series](#)
- [Diesel Spin-On Series](#)
- [Gasoline Spin-On Series](#)
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- [Fuel Dispensing Filters](#)
- [Fuel Additives](#)
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Resin-impregnated Aquabloc® media sheds water, keeps engines waterproof, rustproof, dirtproof

A durable new single-bolt mounting bracket doubles resistance to vibration fatigue.

The high grade aluminum components and compound polymer bowl mean that corrosion is never a worry.

300 watt heaters start you in the cold - thermostats are standard to meet the requirements of today's electronic engines.

The engineered-polymer bowls withstands impact and temperature extremes. Polymer bowls are virtually indestructible. They won't discolor from exposure to alcohol, additives or UV light - a see-thru that stays see-thru.

Self venting drain. A single twist makes draining clean, fast and easy.

## **RACOR.**

Parker Hannifin Corporation  
Racor Division  
P.O. Box 3208, 3400 Finch Road  
Modesto, CA 95353  
209/521-7860



Fax 209/529-3278  
800/344-3286  
800/342-6686 CA  
800/366-3286 Canada

This kit includes the following:

- 1) 4.7" diameter lid gasket P/N 11-1759. (Used on all 900/1000 units).
- 2) .750" diameter T-handle gasket P/N 11004-B. (Used on all 900/1000 units except 900/1000FG).
- 3) .620" diameter T-handle o-ring P/N 11350-B. (Used only on 900/1000FG units).

To install replacement element:

- 1) Remove T-handle and lid.
- 2) Using element bail, carefully remove contaminated element with a twisting motion and discard.
- 3) Install replacement element by positioning element over 1144.
- 5) Replace lid gasket and T-handle o-ring. Lubricate with clean diesel fuel.
- 6) Replace lid, T-handle and hand tighten.

Chamber has to be cleaned out.

These 2 illustrations show in detail an area where a fuel contamination problem will shut down an engine without any prior warning. If this chamber is filled with rust, it will prevent fuel from flowing when at low engine RPM. The engine will stop and will not re-start until cleaned and engine re-primed. The next page explains how to clean this particular part in the filter. The steel ball in the center has to be moving freely for proper fuel metering to the system.

## Turbine Series Heater & Water Probe Retrofit Kits

FOR A REPLACEMENT HEATER AND WATER PROBE THAT USES 'BULLET-TYPE' BOWL TERMINALS, OR TO ADD A HEATER AND WATER PROBE TO A UNIT THAT DOES NOT HAVE A HEATER FEED-THRU PORT IN THE BODY, USE THE SELECTION GUIDE BELOW.

900 and 1000 Series			
Kit Part No.	Description / Notes		
RK11-1737	Retrofit Kit. Includes See-thru Bowl with two 'bullet-type' water probes and self-venting drain, Heater Feed-thru for bowl port, crimp terminals related seals and instructions. Order Heater below.		
RK11-1767-01	12 vdc, 300 watt Heater Kit. Includes T-handle O-ring, Lid and bowl gasket. (Max. power draw 25 amps).		
RK11-1767-02	24 vdc, 300 watt Heater Kit. Includes T-handle O-ring, Lid and bowl gasket. (Max. power draw 13 amps).		
<b>TOOLS</b>			
11-1708	Heater Feed-thru Wrench		

87

This is the replacement kit for the original bowl that had 4 bullet type water probes / terminals. The upper pair were terminals for the heater + the lower pair were water probes. That bowl is no longer available but the probe / terminal is available:

### 'BULLET-TYPE' PROBES FOR OLDER TURBINE SERIES MODELS.

RK11741	Water Probe/Terminal Kit. Bullet 'thru-bowl' type, includes 11-1393 connector (1 each).	500 / 900 / 1000 early <u>see-thru</u> bowls	 RK11741	 11-1393
RK11972	Water Probe/Terminal Kit. Bullet 'thru-bowl' type, includes 11-1393 connector (1 each).	500 / 900 / 1000 early metal bowls	 RK11972	

The next page is the instruction sheet for the bowl kit and the last 4 pages have general information on the current 900 series filter.

#### RACOR COLLECTION BOWL.

Unscrew the T-handle from the top of the filter housing and loosen the lid. Drain the fuel from the filter and remove the filter element. Discard the o-ring on the T-handle and the gasket for the lid.

Using a 3/8 inch wrench or screwdriver remove the 4 bolts or screws holding the bowl ring to the filter base. Pull the bowl off the housing and disconnect the heater wires that are connected to it. Discard the gasket that goes between the bowl and base and the bowl.

Put the bowl ring on the new bowl (turn so recess is up).

Take each water probe and lubricate the o-ring with clean fuel.

From the inside of the bowl, pass the threaded end of the probes through the bowl. Tighten the probe nut (Caution: Over tightening may crack the bowl.)

Install the bowl drain and heater feedthru.

Cut off the terminals on the ends of the heater wires as close to the terminals as possible and strip off 1/4 inch of the insulation from these ends.

Slide one of the two gaskets over the yellow and red wires on the new bowl kit. This is important to do before the following step.

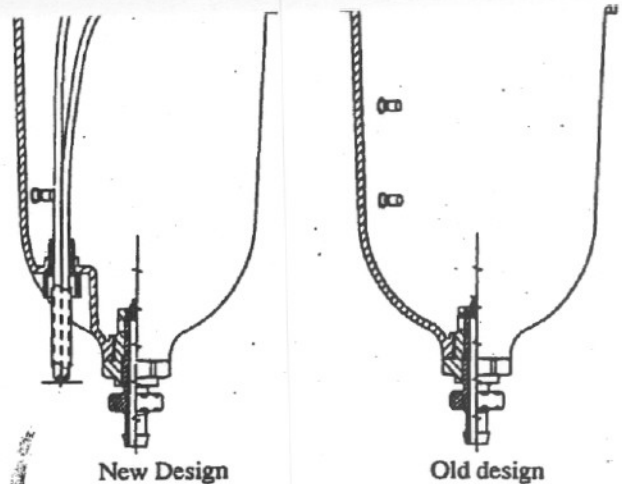
Using two of the blue butt-splice connectors, crimp one of the heater wires to the yellow wire in the new bowl kit and crimp the remaining heater wire to the red wire in the new bowl.

Make the power and ground connections to the feedthru using the remaining two butt-splice connectors.

Once all of the electrical connections are made, use a heat gun or hair dryer to shrink fit the connectors to the wires. Just turn on the heat gun and aim it directly at the connectors. The connectors will automatically shrink fit themselves around the wires.

After the wires have been connected and shrunk, the bowl can be reattached to the base. Tuck the remaining lengths of wires into the bowl. Tighten the bolts or screws until they fit snugly.

Put the filter element back into the filter housing and fill with clean fuel. Using the remaining gasket and o-ring, tighten the lid onto the filter housing. Do not forget to reattach the battery cable. Start engine and check to see that there are no leaks. Correct if necessary.





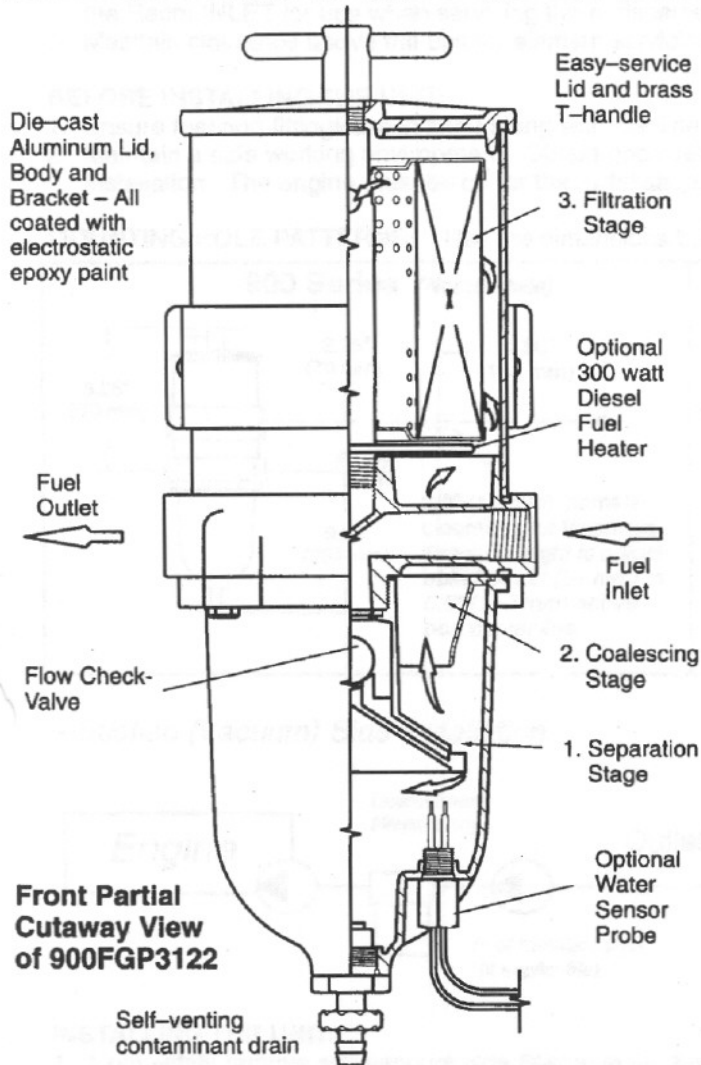
# 900FG – 1000FG Series Fuel Filter / Water Separators for Diesel Powered Engines

# RACOR®

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

**Parker**

Filtration



Front Partial  
Cutaway View  
of 900FGP3122

The Racor 900/1000 Series Fuel Filter/Water Separators protect the precision components of your engine from dirt, rust, algae, asphaltines, varnishes and especially water which is prevalent in engine fuels. Racor removes contaminants using a patented three stage process:

- 1. Separation:** The turbine separates large solids and 'free' water through centrifugal action.
- 2. Coalescing:** Smaller water droplets and solids coalesce on the surfaces of the conical baffle and fall to the bottom of the collection bowl.
- 3. Filtration:** Engines will benefit from near 100% water separation and fuel filtration with Racor's proprietary **Aquabloc™** water repelling media. The replaceable filter elements are available in 2, 10 and 30 micron (nominal) ratings.

These units are designed for installation on the suction (vacuum) side of the fuel transfer pump for best efficiency.

The standard fuel ports are 7/8"-14 SAE J1926 O-ring seal type. 22mm metric ports are optional. Fittings are not supplied with this unit but are available from your Racor dealer. Please refer to the fittings chart on the back page.

The bracket is an adjustable one-piece clamp-type with grade 5 fasteners for ensured durability. The 900 series use one clamp bracket and the 1000 series use two.

The see-thru contaminant collection bowl provides for a quick visual check of water and solid accumulation.

**OPTIONAL FEATURES:** For diesel fuel applications only. See Accessories.

An in-filter 300 watt heater quickly warms the fuel providing easier starting in colder climates.

A water sensor probe alerts the operator when it's time to drain the bowl ( especially useful for models with a metal bowl). Must be used with a Racor water detection kit.

A vacuum gauge kit (not shown) is also available to inform the operator when it's time to change the element.

## PART NUMBER IDENTIFICATION

The example below illustrates how the part numbers are constructed.

900FG	-P	-324	-10
<b>Basic Model</b>	<b>Water</b>	<b>Heater</b>	<b>Element</b>
900FG = 90 GPH	<b>Sensor</b>	<b>Option</b>	<b>Rating:</b>
1000FG = 180 GPH	<b>Probe</b>	312 =12 vdc	2 micron
Call for metric ports.	<b>Add 'P'</b>	324 =24 vdc	10 micron
			30 micron

SPECIFICATIONS	900	1000
Fuel Ports, SAE J1926	7/8"-14 or 22mm	7/8"-14 or 22mm
Maximum Flow Rate	90 GPH / 341 LPH	180 GPH / 681 LPH
Replacement Element	2040 Series	2020 Series
Overhead space required	5" / 127mm, min.	10" / 254mm, min.
Clean Pressure Drop*	.34 PSI / 2.4 kPa	.49 PSI / 3.3 kPa
Height	16" / 406 mm	21" / 533 mm
Width	6" / 152 mm	6" / 152mm
Depth	7" / 178 mm	7" / 178mm
Weight, Dry	6 lbs. / 3 kgs	10 lbs. / 5 kgs
Temperature Rating	-40° / +255°F -40° / +121°C	-40° / +255°F -40° / +121°C

\* Specifications result from tests conducted at the maximum flow rate.

**Simplified Flow Rate Formula for Medium & Heavy Duty Engines**  
Horsepower X .36 = Approximate (GPH) fuel pump flow rate.  
Consult your engine manufacturer for exact specifications.

1. Because of the heater power demand: 25 amps for 12 vdc and 13 amps for 24 vdc, an additional relay is recommended for the safest method of installation.

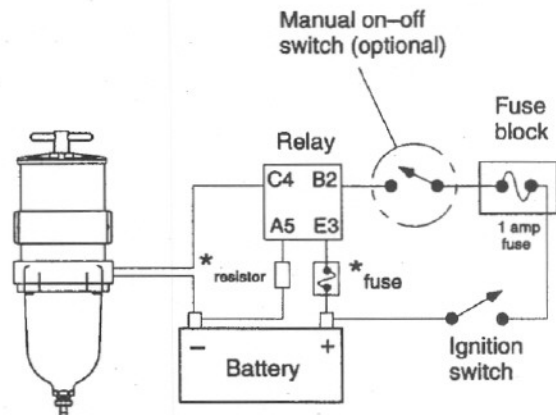
**Racor offers two relay kits available from your dealer: RK11861 (for 12 vdc) and RK11862 (for 24 vdc).**

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 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.



\*Use resistor and 15 amp fuse with 24 vdc systems.

## SERVICE

Frequency of water draining or element replacement is determined by the contamination level of the fuel. The collection bowl must be drained before contaminants reach the bottom of the turbine or when the water detector (optional) indicates it's time to 'drain water'. Inspect or drain the collection bowl of water daily and replace the element every 10,000 miles, every 500 hours, every other oil change or if a power loss is noticed, *whichever 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 Racor element as one tankful of excessively contaminated fuel can plug a filter.*

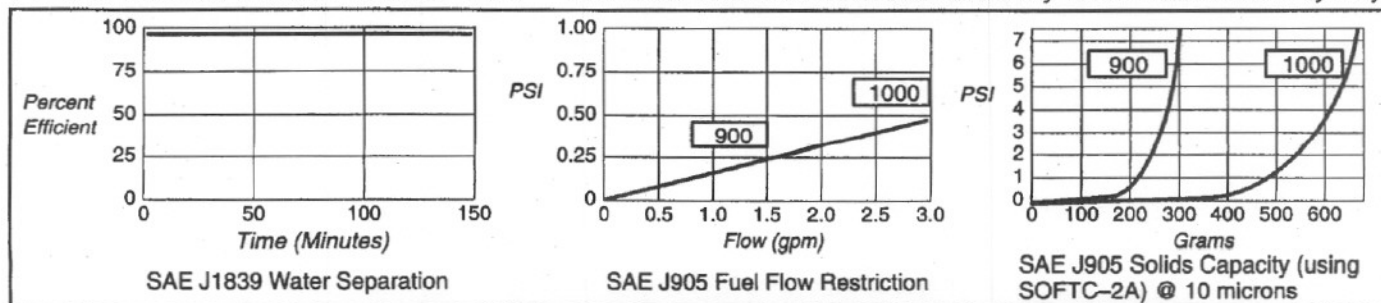
#### TO DRAIN WATER:

Open the self-venting drain to evacuate contaminants. If necessary, remove the lid and prime the unit by filling with clean fuel. Replace the lid and tighten the T-handle snugly by hand ONLY.

**TO REPLACE ELEMENT:** Only genuine Racor replacement filter elements feature specially treated **Aquabloc™** media and an exclusive seal design to resist element fuel by-pass. A convenient molded handle on the top of the element simplifies removal. Remove the lid and then remove the element by slowly pulling upward on the molded handle with a turning motion. Replace the lid gasket with the one supplied with the new element. Apply a coating of clean fuel to the seal prior to reassembly. Fill the unit with clean fuel, then replace the lid and tighten the T-handle snugly by hand ONLY. Start the engine and check for leaks. Correct any leaks with the engine off.

## PERFORMANCE GRAPHS

*These results are from controlled laboratory tests. Field results may vary.*

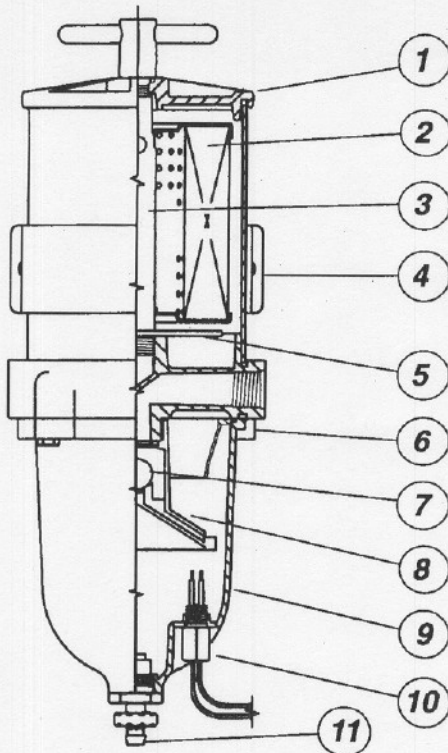


## 900/1000 REPLACEMENT PARTS LIST

Item	Part No.	Description (quantity is one each)
1	RK11005/A RK11-1778	T-handle / Lid Assembly One piece Lid Assy. (not shown)
2	2040SMOR 2040TMOR 2040PMOR	900 Rpl. Element, 2 micron Rpl. Element, 10 micron Rpl. Element, 30 micron
	2020SMOR 2020TMOR 2020PMOR	1000 Rpl. Element, 2 micron Rpl. Element, 10 micron Rpl. Element, 30 micron
3	RK19474 RK11-775	900 Return Tube 1000 Return Tube
4	RK11815-101	Body Clamp Bracket
5	RK11-1767-01 RK11-1767-02 RK21067	Heater, 12 vdc, 300 watt Heater, 24 vdc, 300 watt Heater feed-thru Connector
6	RK11037A	Bowl Ring for See-thru Bowls
7	RK11028B	Check Ball and Seal Kit
8	RK11026D	Turbine and Centrifuge Kit
9	RK11-1606	See-thru Bowl & Water Sensor Port
10	RK21069	Water Sensor Probe*
11	RK30488	Self-Venting Drain Valve
12	RK11-1404	Seal Service Kit (all models)

\*For see-thru bowl, must be used with Dection Module.

Front  
Cutaway  
View of  
900FGP312



## ACCESSORIES

### Water Detection Kit # RK20725

12 vdc underdash module which illuminates an LED when water is detected. Measures 2 3/4" X 1" X 1 1/2". Hardware and instructions included. Wire and terminals are customer supplied.



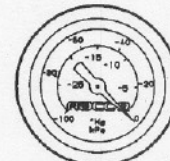
### Water Detection Kit # RK20726

12 or 24 vdc gauge type module which illuminates an LED and sounds a momentary buzzer when water is detected. Fits 2 1/16" diameter panel openings. Hardware and instructions included. Wire and terminals are customer supplied.



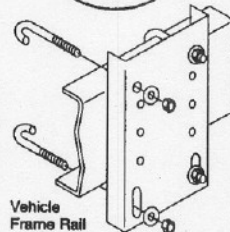
### Element Restriction Gauge Kit #1606B

Plumbed on the outlet side of the filter, the gauge monitors element restriction. Helps in determining when it's time for a filter change. Most hardware and instructions included.



### Frame Rail Mounting Kit #RK11-1518.

Adjustable to fit frame rail up to 10" in height by 4" in depth and 3/4" in thickness. No drilling or welding of the frame rail is necessary. Hardware shown and instructions included.



## FITTINGS CHART

PLATED STEEL FITTINGS FOR 7/8"-14 SAE J1926 PORTS \*

Description	T2	Part Number	
SAE 37° Elbow	3/4"-16	9010-10-8	
	7/8"-14	9010-10-10	
SAE 37° Straight	3/4"-16	9020-10-8	
	7/8"-14	9020-10-10	
NPT Female	3/8" NPT	9040-10-6	
	1/2" NPT	9040-10-8	
	3/4" NPT	9040-10-12	
Description	Hose Inside Diameter Typical SAE100R5		Part Number
Barbed Elbow	3/8" (#6)	13/32" (#8)	9010HF-10-8
	1/2" (#8)	1/2" (#10)	9010HF-10-10
	5/8" (#10)	5/8" (#12)	9010HF-10-12
Barbed Straight	3/8" (#6)	13/32" (#8)	9020HF-10-8
	1/2" (#8)	1/2" (#10)	9020HF-10-10
	5/8" (#10)	5/8" (#10)	9020HF-10-12

\* Order metric fittings from your PARKER dealer. Call 1-800-C-PARKER for the dealer nearest you.

**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."  
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