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Diesel Engine Fuel Filtration Requirements

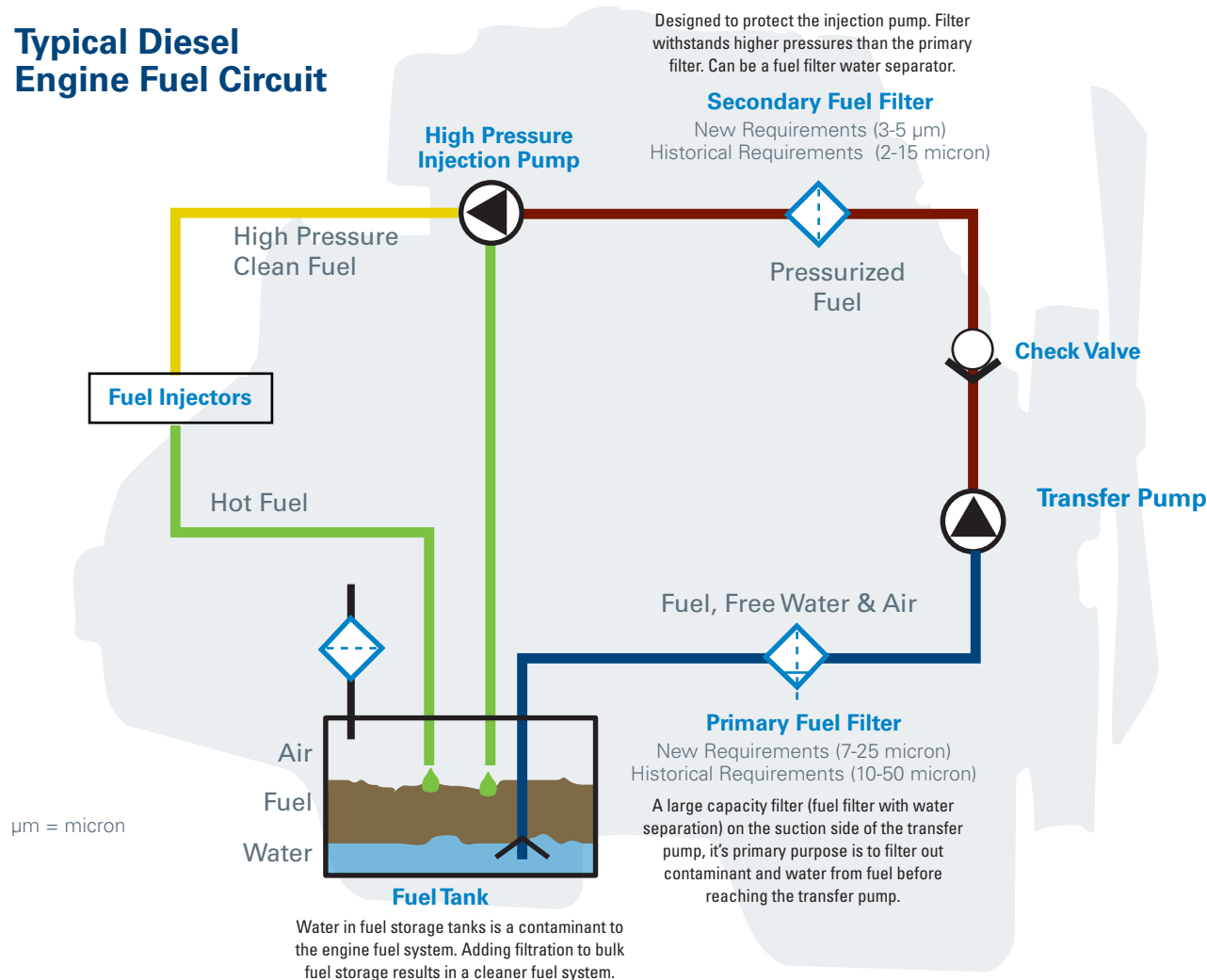
Diesel fuel and diesel fuel systems have proven to be ever-changing technologies and no more so than today. Over the past decade, numerous emission standards and engineering achievements have come together to provide some of the most advanced, clean, and yet flexible engine designs. The changes have also included the acceptance of alternative forms of fuels such as biodiesels. The next decade is likely to see more change and improvements as diesel engines remain the work horse behind today's industrialized world.

Fuel filter performance and technology have also been challenged by these rapid advancements. Today it is common to demand secondary filtration of 3-5 μm absolute efficiency, while matching with an upstream primary filter of 7-25 μm . These changes come with the expectation that water separation, filtration life, and packaging space remain constant or are improved upon. Donaldson engineers have proven to be up to this challenge through the advancement of media technologies.

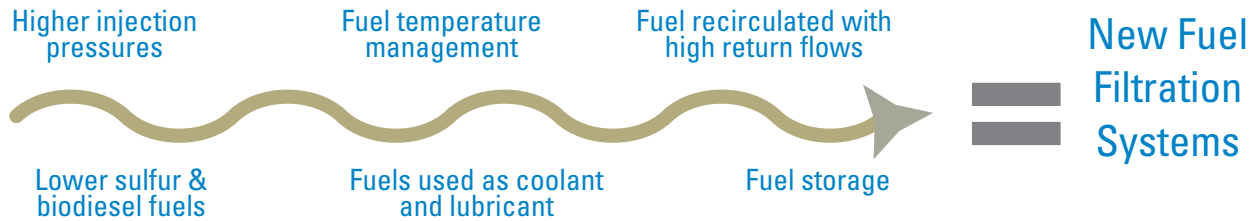
Fuel filtration today is an integral part of the complete fuel system. A well designed fuel system takes contamination control into account from the beginning. Water separation, particulate and non-traditional contaminants need to be controlled. Engineers must be conscious of the relationship between the fuel circuit design and overall system cleanliness.

Finally, global companies must understand global fuel quality concerns and end user needs. Documentation such as the World Wide Fuel Charter exists to promote convergence of various regional practices. Auxiliary user needs such as design type, preferred alternate fuel base stocks, and maintenance practices must also enter the design process. Understanding your customer and delivering fuel filtration solutions is our commitment to you.

Typical Diesel Engine Fuel Circuit



Trends Driving Fuel System Technology Changes



Harmful Contaminants Found in Fuel Systems

Particulate & Debris

Enters when fuel is transferred between storage tanks. Particulate in the fuel can disrupt engine combustion and cause wear on injectors.



Water

Water in the fuel causes corrosion and reduces the lubricity of fuel. It can negatively affect the combustion process and consequently damage system components. Water enters the fuel from storage tanks.



Wax/Paraffin

Drop out of fuel in cold weather conditions.

Microbes (Bacteria)

Can grow in the water at the fuel interface.

Fuel Degradation Products (FDP)

Fuel by-products result from the thermal and oxidative instability of fuel prior to combustion.

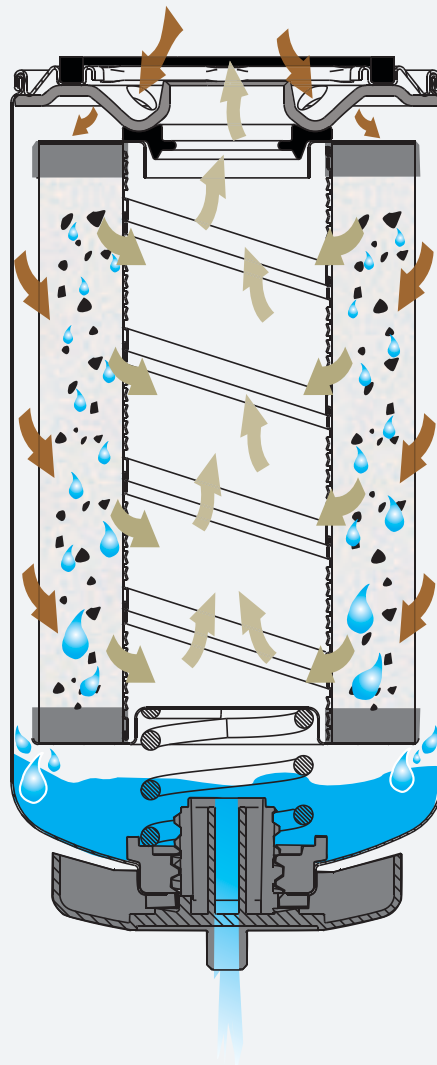
Asphaltenes

Found naturally in crude oil and can be found in refined fuel.

Air

Enters the system from leaks in the fuel line or system connections.

How Particulate and Water Are Removed



Clean fuel enters the filter through holes in the baffle/thread plate.

Contaminants and debris are removed from the fuel as they pass through the filter.

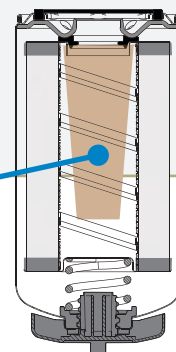
Specialized filter media in the cartridge removes water from the fuel.

Water coalesces into large drops that drain into a lower cavity of the spin-on unit or drain bowl.

Water requires daily draining by the operator. Choice of manual or water-in-fuel (WIF) sensors.

What is a Standpipe?

Found in some applications, a standpipe is built in to the filter to prevent loss of system prime to reduce or eliminate air from reaching the fuel injection system.





Filter Media

Filtration media represents the central point of any filter design. Mastering this science is a key focus at Donaldson. While our users may not need to share this same level of understanding, some basics are always helpful. With the media representations below, we hope to educate our customers on some of the more commonly used media types in this ever-changing industry.

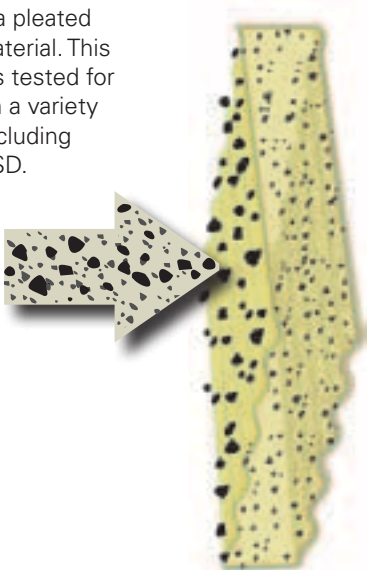
Today's engines are built to more stringent specifications and finer tolerances. Fuel systems, pumps and injectors require cleaner fuel to achieve better combustion and lower emissions. That's why the latest advances in filter media can make the difference between engine power and engine problems.

Cellulose (traditional media)

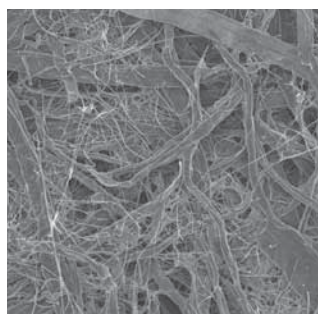
Engine fuel filter media is most commonly a pleated cellulose base material. This fuel filter media is tested for compatibility with a variety of diesel fuels, including biodiesel and ULSD.

Larger particulate are trapped on outer layer, while finer particles are held deeper in the media.

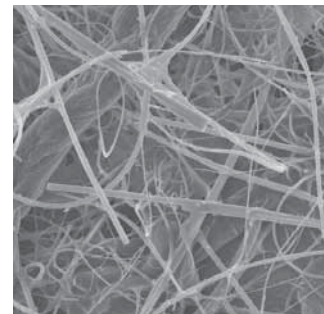
How it Works



SEM 100x



SEM 600x



Media Image

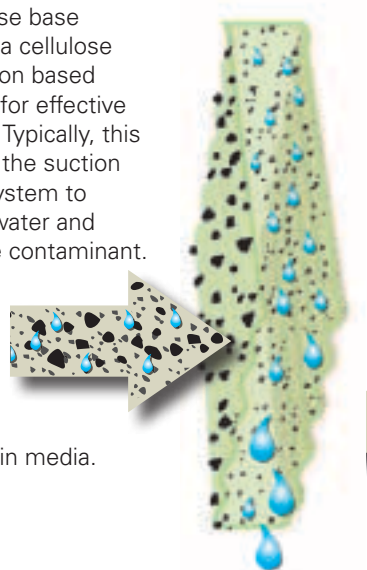


Treated Cellulose (Fuel Filter Water Separator Media)

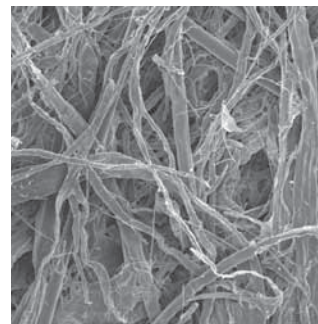
This fuel filter water separator media is a cellulose base material. Treating a cellulose media with a silicon based treatment allows for effective water separation. Typically, this media is used on the suction side of the fuel system to remove harmful water and coarse particulate contaminant.

Water coalesces on media and drains to bottom of can/bowl. Particulate is trapped and held in media.

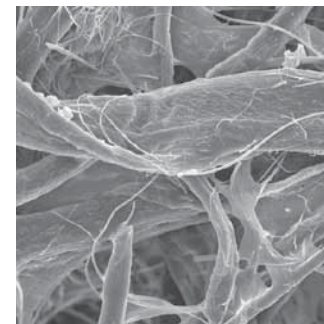
How it Works



SEM 100x



SEM 600x



Media Image



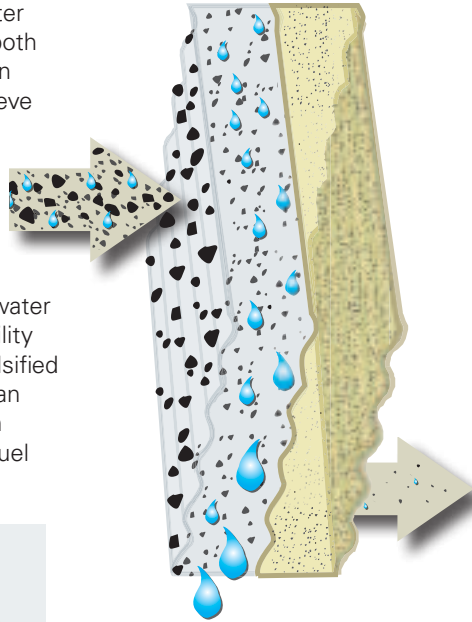
Synteq™ Fuel Filter Water Separator Media (meltblown + cellulose)

Donaldson's third generation of Synteq fuel filter water separator media uses both cellulose and meltblown synthetic layers to achieve the highest levels of fuel filtration performance. This double-layered media increases particulate holding capacity and is a high performance water separator. It has the ability for high efficiency emulsified water separation and can be used in both suction and pressure sides of fuel systems.

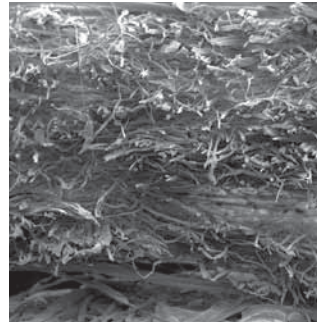


The polyester layer improves water separation and dirt holding capacity performance. This media is ideal for critical applications or extended service intervals.

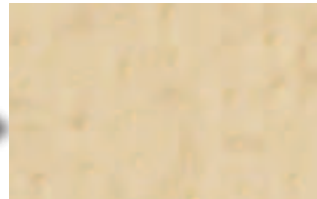
How it Works



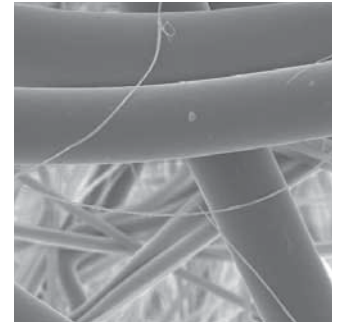
SEM 100x



Media Image



SEM 600x



Donaldson Synteq™ fuel media enhances the performance of fuel water separators. The brand below will be applied to filters with Synteq filter media.





Fuel System Profile

At the end of this publication is a "tear-out" profile form for you to use to convey your system needs to Donaldson engineers.

The system profile has a list of all the design considerations required for proper engineering review to determine which Donaldson fuel system would be the optimum solution.

- Fuel System Characteristics - fuel grade, reservoir capacity, fuel flow rates, and temperature
- Filter change interval
- System functions - including water separation, fuel heating, drain, priming pumps, and venting
- Mechanical performance requirements - pressure, fatigue and vibration
- Filtration performance and test conditions
- Fitting and servicing considerations

As with most manufacturers, custom solutions require minimum annual production volumes and a design and development phase.

Fuel Filtration Design Considerations

To properly apply fuel filter systems there must be careful consideration of many different factors. Mainly, there needs to be an understanding of what is being protected and what level of protection is required. Also, there needs to be a general understanding of the fuel system, where the filters are going to be placed and what the operating parameters are. Most fuel filters used in the engine fuel filter market are located in one of two positions, primary (pre-filter) or secondary (main filter). The illustration below shows the location and function of these two separate filters. When applying fuel filters to engines the fuel filters need to be thought of as a filter system and how they work together instead of two stand-alone filters.

Primary filters are most commonly utilized on the suction side of the fuel transfer pump. This placement allows for protection of the pump while simultaneously taking advantage of easier fuel water separation conditions. Water is typically in larger droplets in the suction side of the system (called coarse water). If water

travels through the transfer pump it becomes mixed in with the fuel in smaller droplets (called emulsified water). Typical micron (μ) ratings for suction side primary filters vary over a wide range. Depending on the vehicle, engine and operating environment, primary filters rated as low as 7μ to over 25μ may be employed. The efficiency of the primary filter, at a minimum, is determined by the pump requirements, but is usually selected to help balance filter system life.

Secondary filters are usually placed between the transfer and high pressure injection pump. These filters protect the high pressure fuel pump and sensitive fuel injection components from damage due to particle wear and erosion. Typical ratings for secondary filters in high pressure common rail fuel systems are in the $4\text{--}7\mu$ range.

ENGINE FUEL FILTRATION SYSTEM APPLICATION DESIGN WORKSHEET

This form is intended to be filled out by an engineer or buyer that interested in a custom FUEL filtration design system.

For proper development/design engineering solution, we ask you to provide details about your engine, project due dates, fuel system and performance (mechanical and filtration), system mounting, service, final packaging and product markings.

Upon receipt of the form, Donaldson will assess your requirements and get back to you within three working days.

When completed, please forward to Donaldson. Email: engine@donaldson.com Fax: 800-480-2009

Company Name:	Revision:
Project Name:	Title:
Contact Name:	Email:
Phone:	Fax:
Current Donaldson Model Used (if applicable):	Your Part Number:

Engine Information

Manufacturer: _____

Model: _____

Displacement: _____

Number of Cylinders: _____

Annual Volume: _____

Key Project Dates

Design Proposal: _____

Prototype Delivery: _____

Design Freeze: _____

PPAP: _____

Start of Production: _____

Fuel System Profile

☐ Primary Filtration ☐ Secondary Filtration

Fuel Type: ☐ Standard grade ☐ Biodiesel and max. content ☐ Alternative _____

Fuel Delivery System Brand: _____

Fuel Flow Rates: ☐ gpm or ☐ gph

Minimum _____ Normal _____ Maximum _____

Fuel System Pressure (PSI):

Minimum _____ Normal _____ Maximum _____

Temperature: ☐ °C or ☐ °F

Fuel: Min _____ Normal _____ Max _____

Ambient: Min _____ Normal _____ Max _____

Fuel Heating: ☐ Yes ☐ No

Priming Pump: ☐ Yes ☐ No

Air Relief Valve: ☐ Yes ☐ No

Water Separation

Volume (oz): _____

Water Collection: ☐ Bowl ☐ No-bowl

Water Sensor: ☐ Analog ☐ Digital

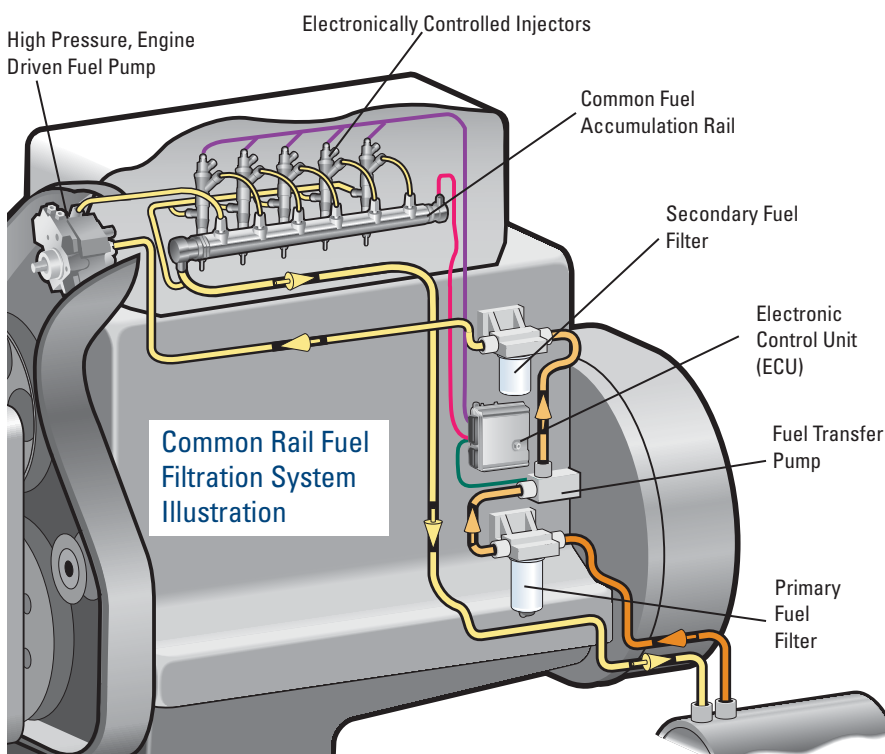
Performance Parameters

Hydraulic Pressure Resistance (Burst):

Test Method: _____

Minimum Value: _____

More on next page





What's Right For Your Engine?

As you develop the future design of your engine or application, it is important to consider the filtration system. Depending on your objectives, it may be beneficial to choose from a catalog offering or partner with Donaldson for a filtration solution tailored to your needs.

Reasons to Select a Standard System

- No or low budget for engineering collaboration, development time or cost or component tooling
- Prefer to have parts readily available – want to avoid manufacturing lead times (8-12 weeks) and not interested in warehousing service parts
- Have a need mix and match head assemblies with various filter performance choices
- End users who prefer an established brand for filtration



Reasons to Consider a Custom, Integrated System

- Engine design team is integrating new components that require a higher degree of filtration
- Looking for a system that does more; may include sensors, pumps, and/or heaters
- Have budget for engineering collaboration, development time/cost
- Interest in component / supplier consolidation – solutions that bridge a wide range of engine/vehicles
- Offering a unique solution with ease of maintenance



Liquid Filter Selector Process

Donaldson offers a full line of engine liquid products for a wide variety of applications and operating environments. There are different steps and considerations depending if you're looking for a filtration system for a new application or if you're looking to upgrade or improve on an existing application. Follow the path which best matches your objective.

New System

Refer to our pages that feature our heads/filters to select standard line products that best suit your requirements and considerations

1. Determine flow range requirements.
2. Determine port size requirements.
3. Determine application filtration efficiency requirements.
4. Evaluate other system design considerations (refer to the filtration

Existing Application

Filter application selection for an existing application is best determined by OEM part number cross reference or OEM application make and model. Follow these steps only if the OEM part number or make and model catalog record is not available.

1. Determine filter category e.g. Lube, Fuel.
2. Determine filter type e.g. spin on, cartridge.
3. Determine family e.g. spin on 93 MM diameter, cartridge or competitive housing.
4. Determine other characteristics e.g. spin on thread size, inline fuel inlet/outlet diameter
5. Determine other requirements e.g. anti drain, bypass valve and it's opening pressure.
6. Determine available gasket sealing diameter dimensions.
7. Verify filtration efficiency requirements.



Frequently Asked Questions

Q1: Please explain the difference(s) between the primary and secondary fuel filters in terms of the type of medium used, micron rating, and so forth.

Differences between primary and secondary filters vary from system to system, but in general, primary filters are used to separate water and larger particles (7-25 μm efficiency). Secondary filters are for final filtration (3-5 μm efficiency). Primary filters usually will have treated media to provide water separation performance. This can be either cellulose or a multi-layered synthetic media called melt-blown coupled with cellulose like Donaldson's Synteq™ media. Secondary filters have untreated, multi-layered cellulose or purely synthetic media. These differences mainly have to do with the water separation requirements placed on primary fuel filters.

Q2: Have micron (μm) ratings become smaller and smaller as injection technology has advanced? When replacing filters, how do you make sure you have the micron rating that's appropriate for your generation of engine and its injection system?

As injection technology has advanced and injection system pressures have increased the filtration requirements have become more demanding. These systems have required filtration technology to be more and more efficient. When replacing your filters be sure you use an OEM approved replacement or a direct cross from a reputable filter manufacture to ensure you are using a filter that is appropriate for your engine.

Q3: Some truckers used to use a fine primary filter to avoid changing the secondary, while the original equipment concept was to use a coarse primary (on the suction side) and a fine secondary (on the pressure side). This took extra changes, but they liked the idea of avoiding changing the secondary. Is doing this impractical on modern engines?

Primary and secondary filters are usually balanced to provide the required engine protection and the optimum filter life. Placing a fine filter in a primary (suction) filter location is impractical because they can not tolerate as much pressure drop and will need to be changed very often. Generally, fine filters do not contain the require water separation in a primary filter.

Q4: How have new engine designs affected fuel filtration?

In the past, diesel engines had either mechanical fuel injectors or unit injectors. The drive to develop engine that meet emissions regulations has led to the application of common rail fuel injection systems. The higher pressures of common rail systems enables more precise control of fuel delivery and control of the combustion process. The goal of the new technology is to reduce the particulate matter and NOx coming out of an engine system, thereby reducing the burden on after treatment systems.

The very high pressures in the common rail systems require tighter tolerances, elevating the requirements for cleanliness and efficiency on new and future fuel systems. This has created the need for increasingly better fuel filtration technology. Donaldson offers a range of products for those demanding conditions and is developing solutions for tomorrow's requirements.

Q5: Will common rail systems bring any changes in terms of fuel filter requirements? If so, can you say what will they be?

Most fuel injection systems today are already common rail or close derivatives. The technology itself does not drive specific changes, the injection pressures and desired filter service intervals are more influential.

Q6: How important is filtering fuel stored in bulk tanks?

It's becoming very important and can reduce future vehicle maintenance downtime. If you're using a bulk fuel tank, filtering the fuel BEFORE putting in your vehicle is another great practice that can reduce contaminant and water from the fuel before refilling your vehicle tank. Over times, tanks can corrode, water condensation can build up, contaminant could enter the tank opening during fills.



What You Should Know

Biodiesel is a clean burning, renewable, alternative fuel created specifically for diesel engines. It's produced from domestic renewable sources, including animal fats and plant oils. Biodiesel blends are created by combining biodiesel with petroleum diesel - allowing it to be used in most diesel engines without any modifications.

The blend percentage can vary quite drastically between regions. For example, diesel fuel purchased in Illinois is commonly 11% biodiesel where other states are in the 2% to 5% range. The U.S. Federal Trade Commission (FTC) no longer requires percentage disclosure to the public for biodiesel blends less than 5%. This may be important for customers experiencing fuel filter life issues.

All biodiesels are not created equal.

Know your suppliers and ensure they are providing good biodiesel. The adoption of biodiesel is still in its infancy. Fuel stations are learning how to specify and store biodiesel properly. Industry specifications ASTM 6751, BQ-9000 and EN 14214 exist for your protection, but alone these do not ensure proper storage. Consider keeping a fuel log to trace issues to specific suppliers.

For more tips http://www.biodiesel.org/pdf_files/FuelQualityandPerformanceGuide.pdf

First time users are often most affected. Older equipment may have built up deposits or certain contaminants throughout the vehicle's fuel system (i.e. tanks, lines, etc.). Even quality biodiesel blends will tend to act as a system solvent. The first time user may experience a period of cleaning and short filter life due to this effect. Rest assured that these filters are removing the harmful contaminant and the plugging will subside. The most harmful thing one can do during this period is find a more "open" filter that would allow the filter to last longer but would let larger contaminant to pass through to fuel injectors.

Switching from ordinary diesel to biodiesel - flush or clean system first!

When first used in an engine, biodiesel has a cleaning solvent effect. The hydrocarbon deposits that have accumulated throughout your fuel system will be cleaned out. These deposits will become trapped in your fuel filter - shortening overall filter life. This issue will resolve itself as you continue to use biodiesel blends.

We recommend cleaning areas of the fuel system located downstream of the filters. There is no filtration protection for the injectors if a deposit breaks free after the secondary filter system. This type of cleaning is similar to changing to organic coolant. All scale, for example, will flush away and often end up with leaks.

All Donaldson fuel filters can be used with up to 20% biodiesel blends (B20). If your customer is looking for a fuel filter that works with up to B20 biodiesel and also offers extended service options, see our Donaldson Endurance™ fuel filters - such as our popular EFF7917 for Detroit Diesel engines - to meet their needs for longer filter life. For more information about our standard life or extended life fuel filters, contact your Donaldson Representative or our Customer Support Team.

Key Points – Impact on Fuel Filtration

- Fuel filters used today are generally compatible with biodiesel blends up to B20
- Most plugging problems can be traced back to the fuel quality
- Recommendations to minimize plugging problems include:
 - Applying bulk filtration on storage tanks.
 - Implementing a preventative maintenance program.
 - Requesting compliance documentation from your fuel supplier.
 - Adding a fuel water separator to older vehicles not already equipped.

Common Causes of Fuel Filter Plugging and Shortened Filter Life

Using the wrong fuel for your operating climate will also shorten filter life. Fuels used in cold climates contain additives to help counteract the effects of the temperature. When using a fuel not intended for a cold climate, the fuel can gel or thicken, plugging the filter and greatly reducing filter life.



Fuel Filter Problems in Cold Weather

Encountering poor quality or unconditioned fuel is inevitable, so some precautions should be made when operating in cold weather. Depending on the severity of winter operating conditions, many operators may choose to protect their equipment through the use of fuel additives, fuel heaters, and fuel water separators.

Most fuel related winter problems can be avoided using a #1 diesel or a winterized diesel blend.

Engine Power Loss

Diesel engine power loss during winter operation is a common occurrence and source of complaint. Unless there is a component failure within the engine, the problem can usually be traced back to paraffin crystal formation in the fuel which restricts flow through fuel filters. Freezing temperatures can also cause any emulsified water to form a fuel/ice slush, further restricting filters. Frequently, fuel filters are blamed for the problem when, in fact, the problem is caused by the effect of cold weather on summer grade #2 diesel.

Cloud Point

The Cloud Point is the temperature at which paraffin or wax, which is naturally present in diesel fuel, begins to form cloudy wax crystals. When the fuel temperature reaches the cloud point, these wax crystals flowing with the fuel coat the filter and quickly reduce the fuel flow, starving the engine. Typical cloud point temperatures range from: -18°F (-28°C) to +20°F (-7°C), but may occasionally be as high as +40°F (4.4°C). #1 diesel fuel (or kerosene) contains very little paraffin, and therefore has a cloud point near -40°F (-40°C).

Re-printed with permission of the Filters Manufacturer's Council : Technical Service Bulletin 91-1R3

Filtration Systems - Standard or Modular Designs

The following pages present Donaldson's catalog product offering for Fuel Assemblies with and without water separation. Within each range there are multiple head assembly and filter choices - including performance and water removal/drain options. Additional combinations are available, consult Donaldson for a customized solution.

Use the matrix below to determine the filtration system that best matches up with our fuel flow requirements and the key features for design and mounting on your engine.

There are multiple filter choices (with and without water separation) within the families. The flow range values are for fuel filter water separator filtration systems. The flow range would be higher if applying a non-water separating filter. Families identified as "modular" should be considered if you're interested in priming pumps and other add-on components.

Donaldson recommends multiple assemblies in parallel for engine applications with higher flow ranges and horsepower (kilowatt).



Fuel Filtration System Application Matrix

Mix and Match Fuel Filter Systems		
Families by Filter Diameter ϕ	Flow Range	Features
76 mm / 3.00"	up to 30 gph / 114 lph	Standard design, side mount, single port heads, spin-on filters
80 mm / 3.15"	up to 60 gph / 227 lph	<i>Modular design, side mount, dual port heads, spin-on filters</i>
93 mm / 3.54"	up to 90 gph / 340 lph	<i>Modular design, side mount, dual port heads, spin-on filters</i>
		Standard design, top mount, single port heads, spin-on filters
	up to 160 gph / 606 lph	Standard design, side mount, single port head, spin-on filter (no water sep)
108 mm / 4.25"	up to 180 gph / 881 lph	Standard design, side mount, three port head, spin-on filters
118 mm / 4.65"	up to 250 gph / 946 lph	Standard design, side mount, single port heads, spin-on filters

Filter Performance Choices

The filter tables provide you with the separate filters that fit the same head assembly -- these differ by length and filter styles (spin-on fuel or fuel filter water separators).

- Synteq Fuel Filtration Media filters have 95% water removal efficiency per SAE 1488 and 3x the capacity compared to competitive silicone treated media



Design Versatility -

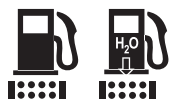
Twist&Drain Style Filter Drain Options

The majority of fuel filter water separators offered will feature our standard Twist&Drain valve.

Donaldson Twist&Drain Spin-on Filters have a connection that accommodates three additional types of drain valves and a clear bowl.



Details on the other drain valves and bowl can be found on page 50.



Fuel Heads & Filters

Filter Dia. 76 MM (3.0") x M16-1.5



Fuel Flow Range: up to 30 gph / 114 lph

Operating Pressure

0-100 psi (690 kPa) without bowl

Temperature Range

-40° to 250°F (-40° to 121°C)

Flow Rate

Up to 30 gph / 114 lph

See table for filter flow rates

Fuel Compatibility

#1 or #2 Diesel, Kerosene, Biodiesel up to B20 and JP8

Mounting

Engine or Chassis

Clean Pressure Drop (Restriction) @ Recommended Flow Rate

Δ kPa \leq 6.9

Δ PSI \leq 1.0

Water Removal @

Recommended Flow Rate

SAE J1488 Emulsified: 95% efficiency

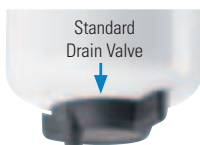
SAE J1839 Free Water: 95% efficiency

Air Bleed Vent

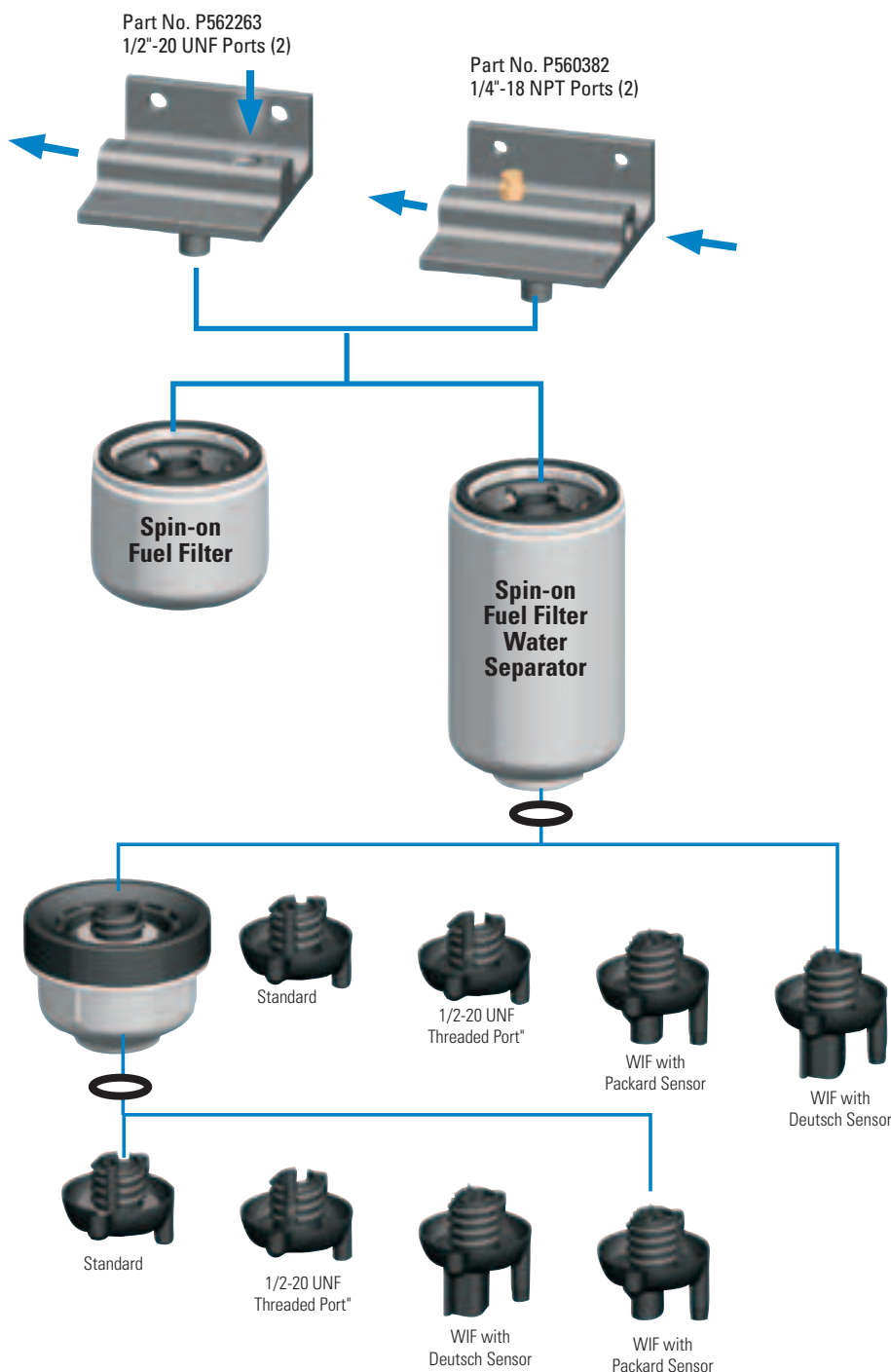
Bleed options available

For water drain flexibility, Donaldson Twist&Drain Spin-on Filters have a connection that accommodates four types of drain valves and one clear bowl.

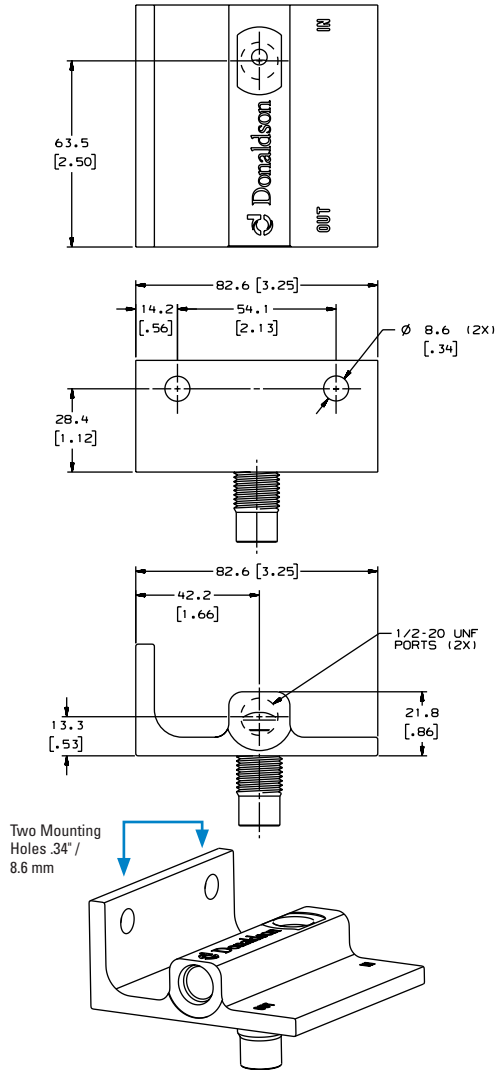
The filter selection tables shows which drain style is on the filter you're ordering.



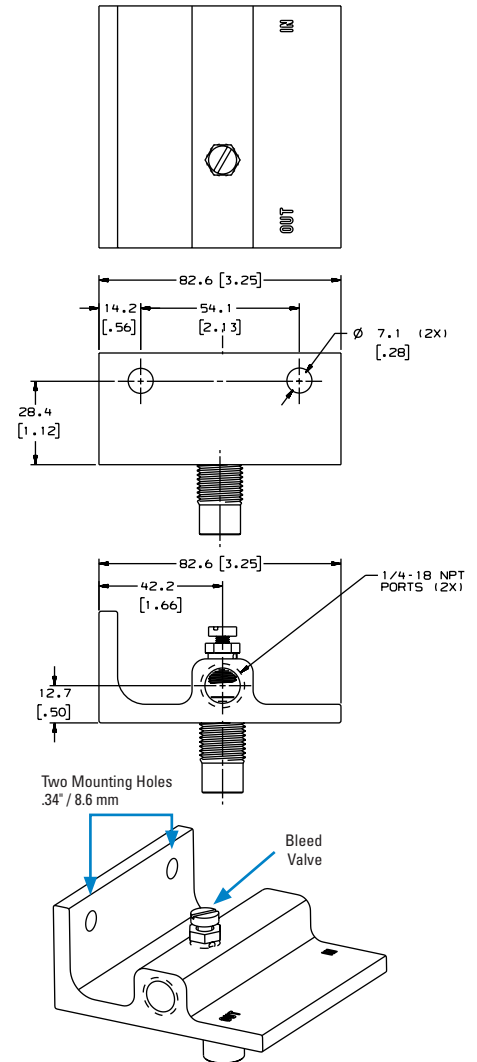
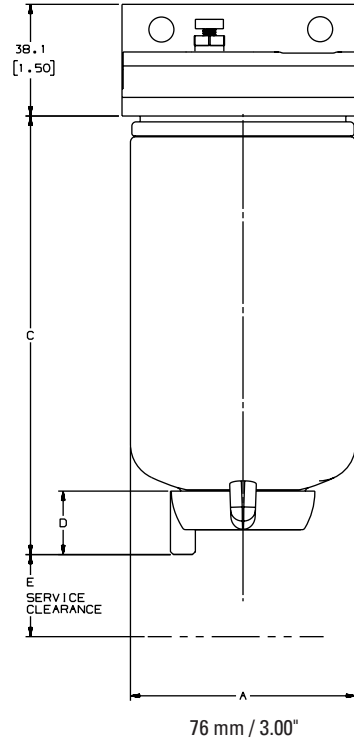
Accessories for Twist&Drain filters can be found on page 50.



Dimension Specifications





Part No. P562263
1/2"-20 UNF Ports (2)

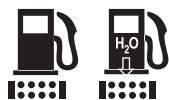


Part No. P560382
1/4"-18 NPT Ports (2)

Filter Selection Chart

Filter Style	Max. Recommended Flow Rate		(C) Filter Length* (includes standard drain)		Efficiency @ Micron	Stand Tube	Dia. 3.00" / 76 mm Item No.	(E) Service Clearance	
	gph	lph	inches	mm				inches	mm
	15	57	4.01	102	99% @ 15	No	P551039	.93	24
	30	114	5.81	148	99% @ 11	No	P550588	.93	24
	30	114	5.81	148	99% @ 25	Yes	P550248	.93	24
	15	57	3.26	83	99% @ 16	No	P550345	.93	24
	15	57	3.26	83	99% @ 9	No	P555095	.93	24
	25	95	4.72	120	99% @ 16	Yes	P553004	.93	24
	25	95	4.72	120	99% @ 9	No	P550943	.93	24
	30	114	4.72	120	99% @ 16	Yes	P550440	.93	24

* Considering Drain Bowl? Add 1.98" / 50 mm to filter length.



Fuel Heads & Filters

Filter Dia. 80 MM (3.15") x M94-3



Fuel Flow Range: up to 60 gph / 227 lph

Operating Pressure*

0-14.5 psi (100 kPa) with hand pump
- can operate at higher pressures with the basic head design

Temperature Range*

-40° to 250°F (-40° to 121°C)

Flow Rate

Up to 60 gph / 227 lph
Flow rate can be higher in non-water separating configurations

Fuel Compatibility

#1 or #2 Diesel, Kerosene, Biodiesel up to B20 and JP8

Mounting**

Engine or Chassis

Clean Pressure Drop (Restriction)

At recommended flow rate without check-valve and priming pump

Water Removal @ Recommended Flow Rate

SAE J1488 Emulsified: 95% efficiency
SAE J1839 Free Water: 95% efficiency

Air Bleed Vent

Automatic or manual options available

Ports on Head

Custom port configuration options:
1/2 - 20 SAE
9/16 - 18 SAE
M14x1.5 mm

Hand Priming Pump

20 ml/stroke displacement

Media Options

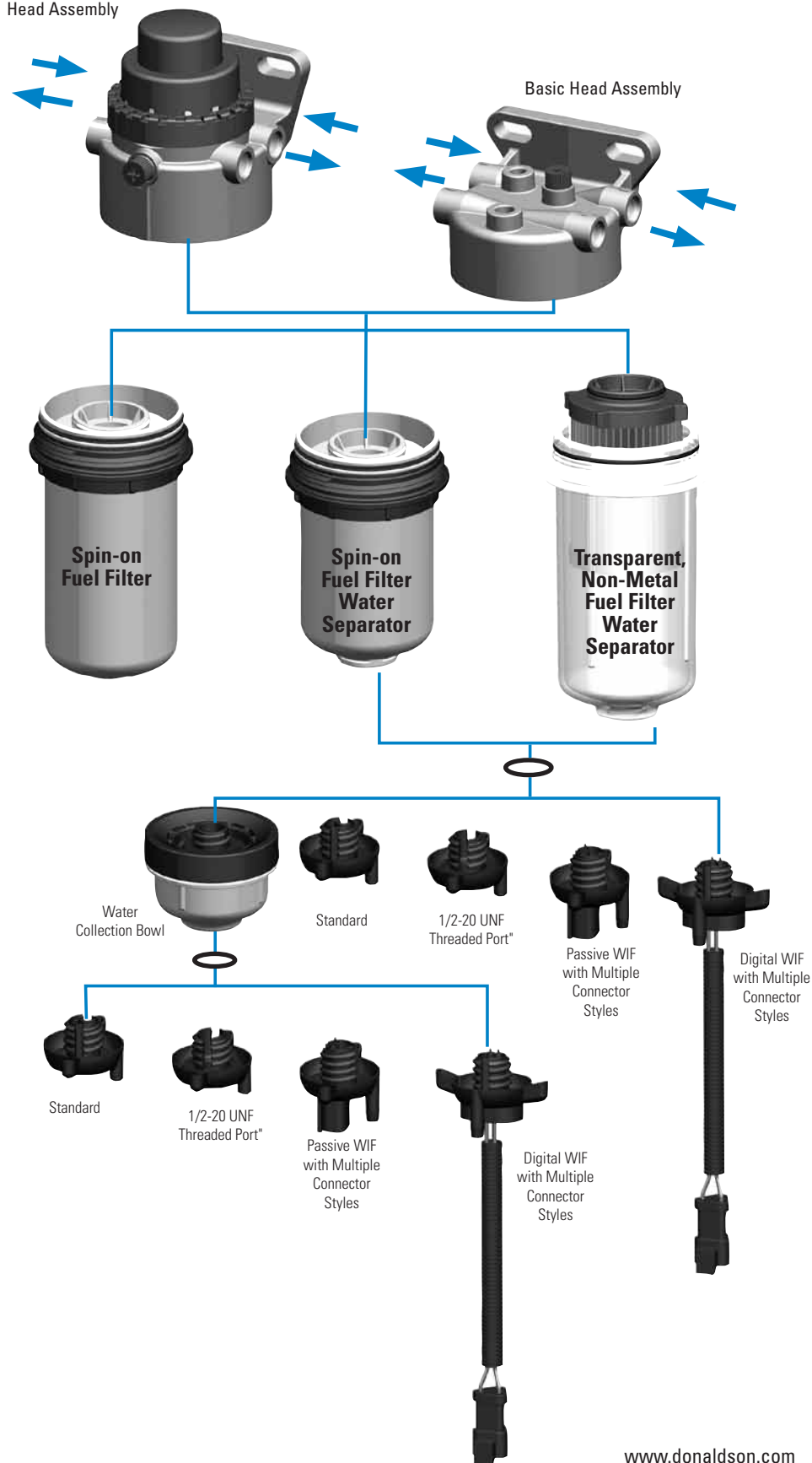
Custom media packaging with standard cellulose, synthetic Synteq™, or advanced Synteq XP™ media technology to satisfy a wide range of performance requirements

* Dependent on application and configuration

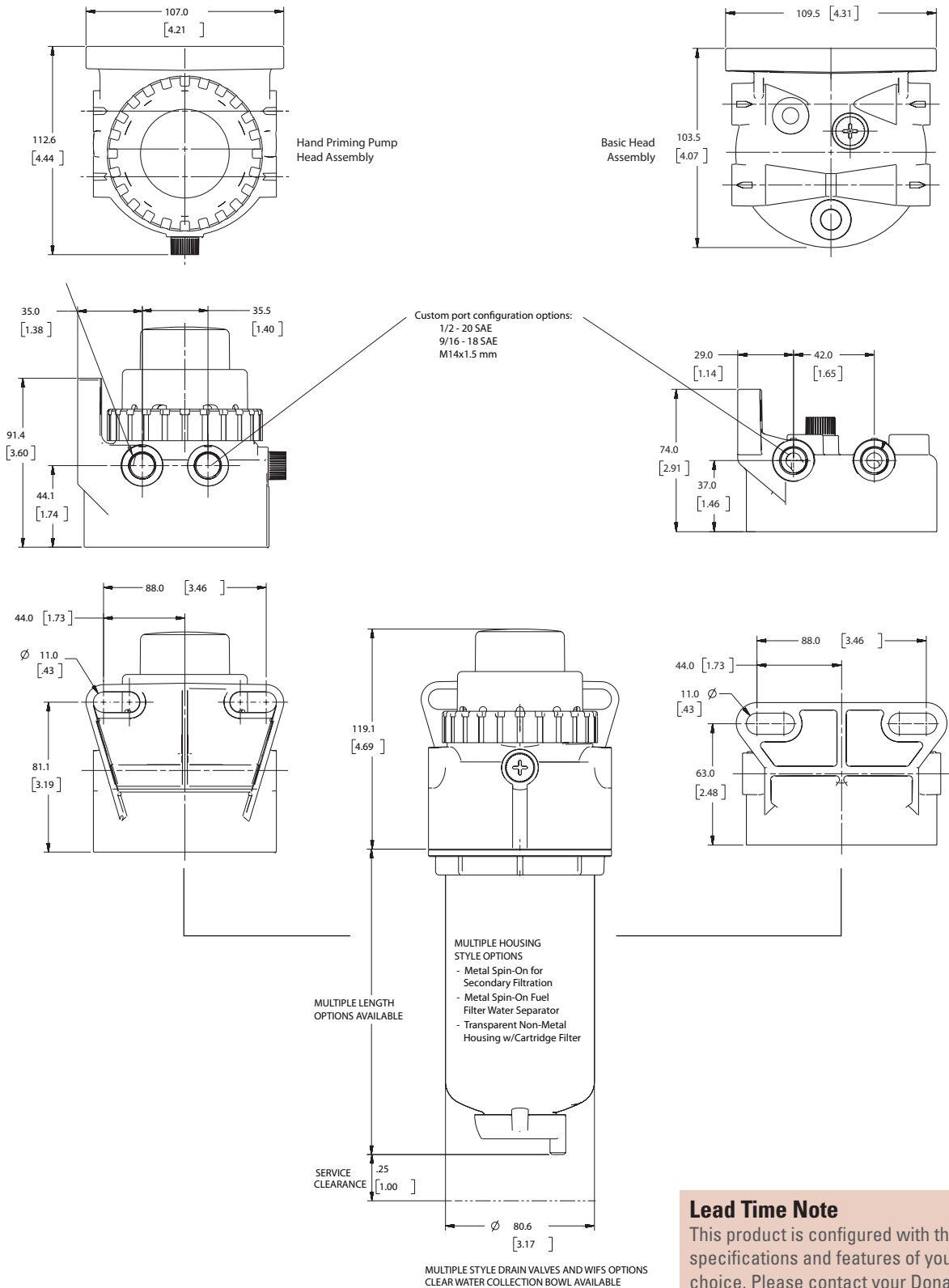
** Consult with Donaldson for vibration level capabilities

Hand Pump Head Assembly

Basic Head Assembly



Dimension Specifications



Lead Time Note

This product is configured with the specifications and features of your choice. Please contact your Donaldson representative for more details.



Fuel Heads & Filters

Filter Dia. 93 MM (3.54") x M92-2.5



Fuel Flow Range: up to 90 gph / 340 lph

Operating Pressure

Without Drain Bowl:
-40 to 100 psi (-275 to 690 kPa)

Temperature Range

-40° to 250°F (-40° to 121°C)

Flow Rate

Up to 90 gph / 340 lph

Fluid Compatibility

#1 or #2 Diesel, Kerosene, Biodiesel up to B20 and JP8

Mounting

Engine or Chassis

Clean Pressure Drop (Restriction) @ Recommended Flow Rate

Without Check Valve & Priming Pump:

0.2 psi (1.4 kPa) @ 45 gph (170 lph)

0.6 psi (4.1 kPa) @ 90 gph (340 lph)

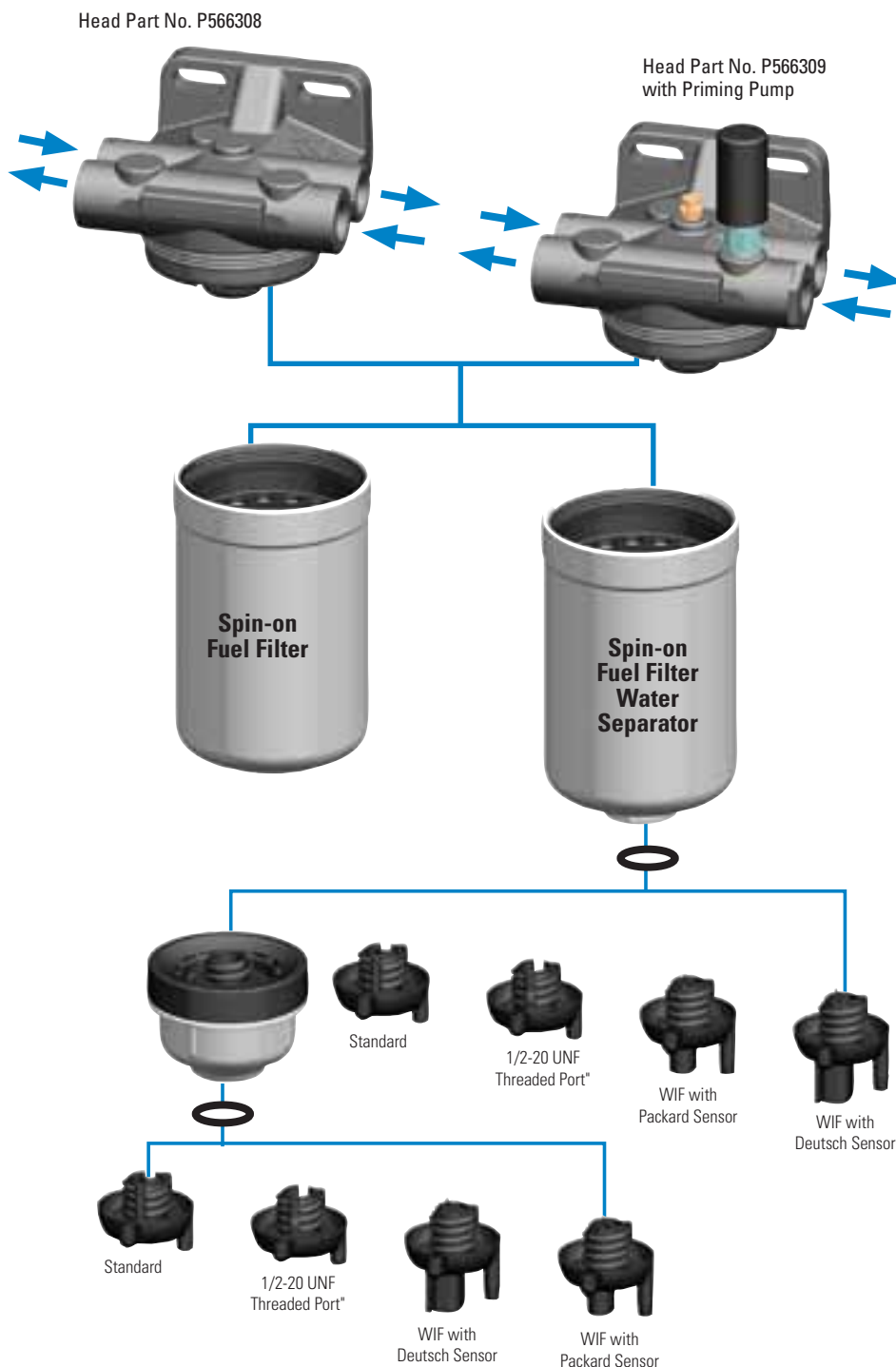
Water Removal @ Recommended Flow Rate

SAE J1488 Emulsified: 95% efficiency

SAE J1839 Free Water: 95% efficiency

Air Bleed Vent

Bleed options available



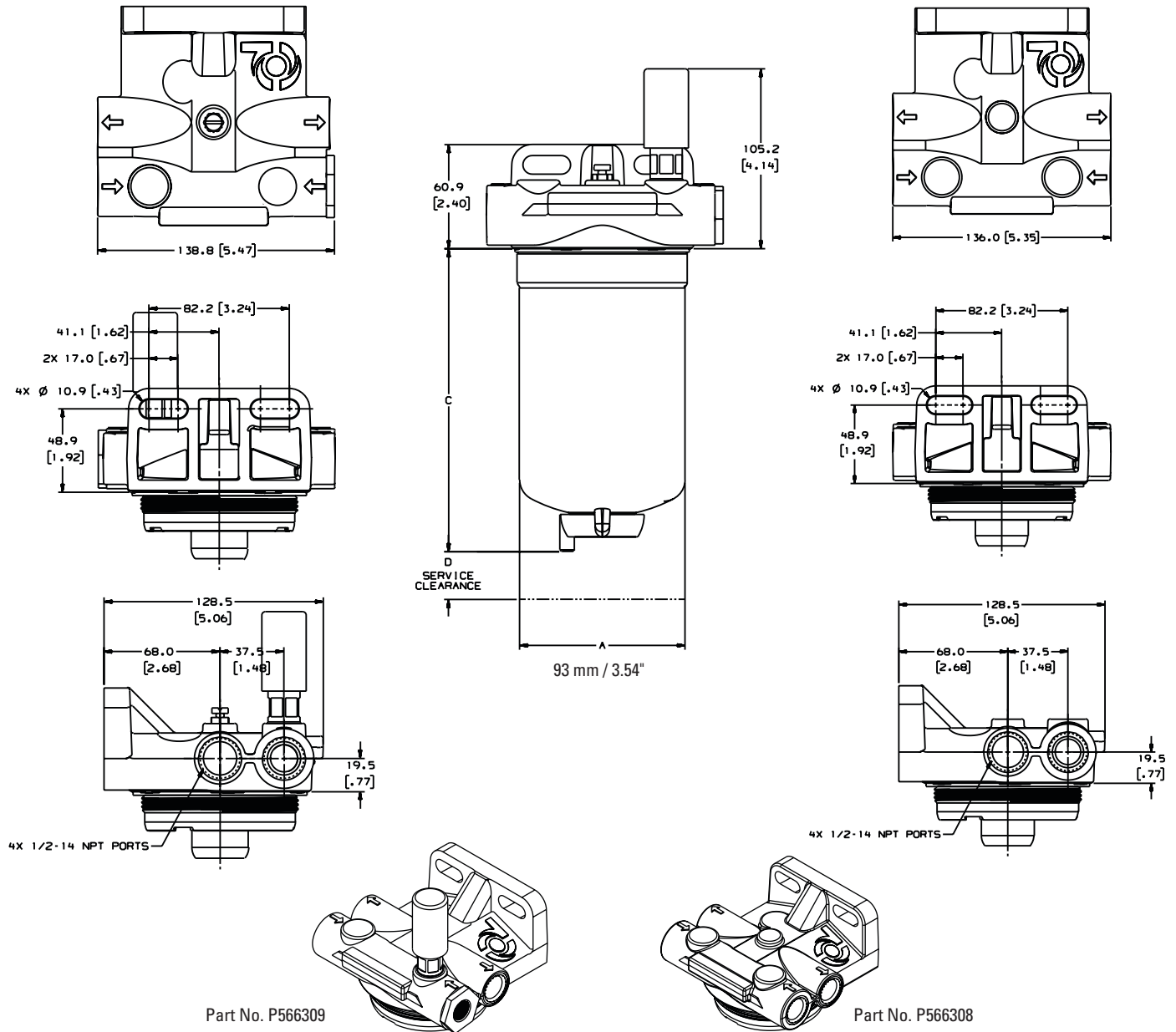
For water drain flexibility, Donaldson Twist&Drain Spin-on Filters have a connection that accommodates four types of drain valves and one clear bowl.

The filter selection tables shows which drain style is on the filter you're ordering.





Accessories for Twist&Drain filters can be found on page 50.

Dimension Specifications



Filter Selection Chart

Filter Style	Max. Recommended Flow Rate		(C) Filter Length* (includes standard drain)		Efficiency @ Micron	Stand Tube	Dia. 93 MM X M92-2.5 Item No.	(D) Service Clearance	
	gph	lph	inches	mm				inches	mm
	90	341	6.88	175	99% @ 13	N/A	P566312	1.50	38
	45	170	6.1	155	99% @ 3	N/A	P566310		
			6.1	155	99% @ 8	N/A	P566311		

* Considering Drain Bowl? Add 1.98" / 50 mm to filter length.



Fuel Heads & Filters

Filter Dia. 93 MM (3.54") x 13/16"-12



Fuel Flow Range: up to 90 gph / 340 lph

Operating Pressure

0-100 psi (690 kPA) without bowl

Temperature Range

-40° to 250°F (-40° to 121°C)

Flow Rate

Up to 90 gph / 341 lph

See table for filter flow rates

Fuel Compatibility

#1 or #2 Diesel, Kerosene, Biodiesel up to B20 and JP8

Mounting

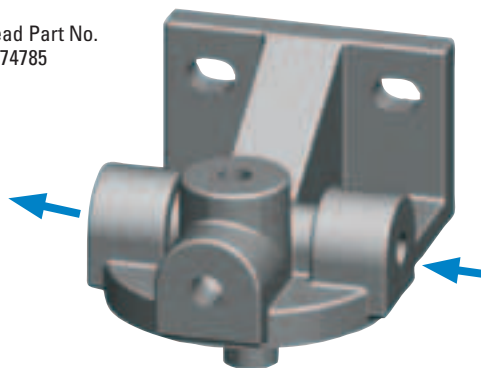
Engine or Chassis

Clean Pressure Drop (Restriction) @ Recommended Flow Rate


Δ kPA ≤ 6.9

Δ PSI ≤ 1.0

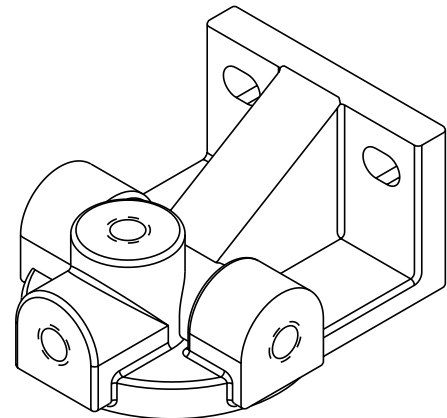
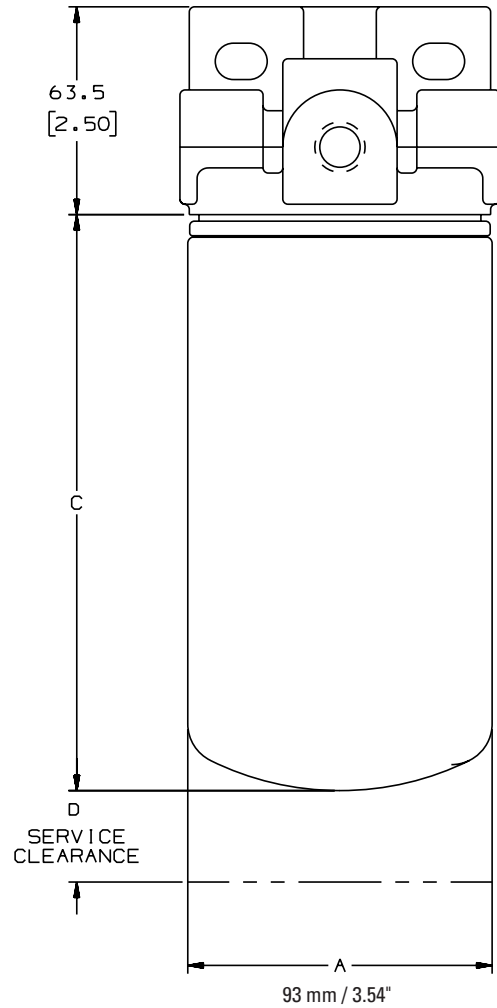
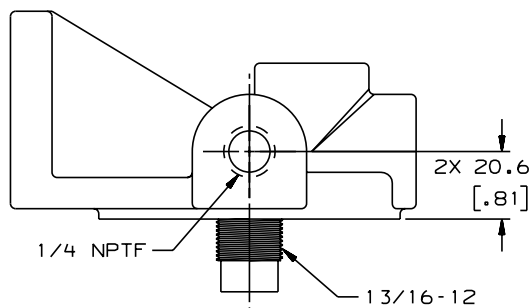
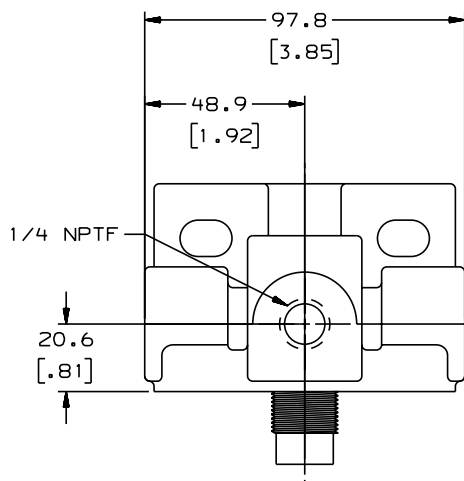
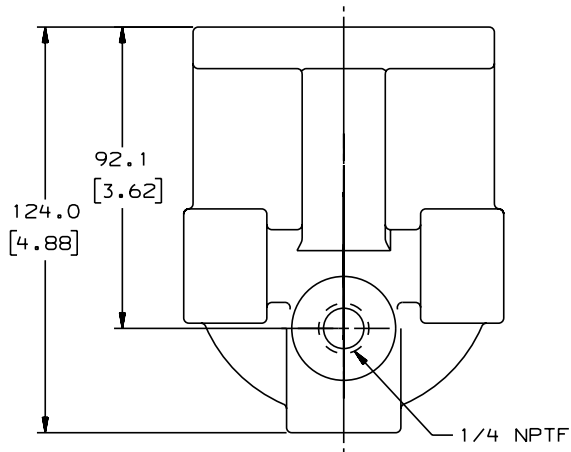
Head Part No.
P174785

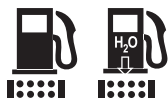


Filter Selection Chart

Filter Type	Max. Recommended Flow Rate		(C) Filter Length		Efficiency @ Micron	Stand Tube	Dia. 93 MM X 13/16"-12 Item No.	(D) Service Clearance	
	gph	lph	inches	mm				inches	mm
 Spin-on only	45	170	4.21	107	99% @ 16	N/A	P550928	.90	23
	90	341	6.85	174	99% @ 5	N/A	EFF7917		
			6.85	174	99% @ 9	N/A	P556916		
			6.85	174	99% @ 3	N/A	P556917		

Dimension Specifications





Fuel Heads & Filters

Filter Dia. 93 MM (3.54") x 1"-14



Fuel Flow Range: up to 160 gph / 606 lph

Operating Pressure

0-100 psi (690 kPa) without bowl

Temperature Range

-40° to 250°F (-40° to 121°C)

Flow Rate

Up to 160 gph / 606 lph

See table for filter flow rates

Fuel Compatibility

#1 or #2 Diesel, Kerosene, Biodiesel up to B20 and JP8

Mounting

Engine or Chassis

Clean Pressure Drop (Restriction) @ Recommended Flow Rate

Δ kPa ≤ 6.9

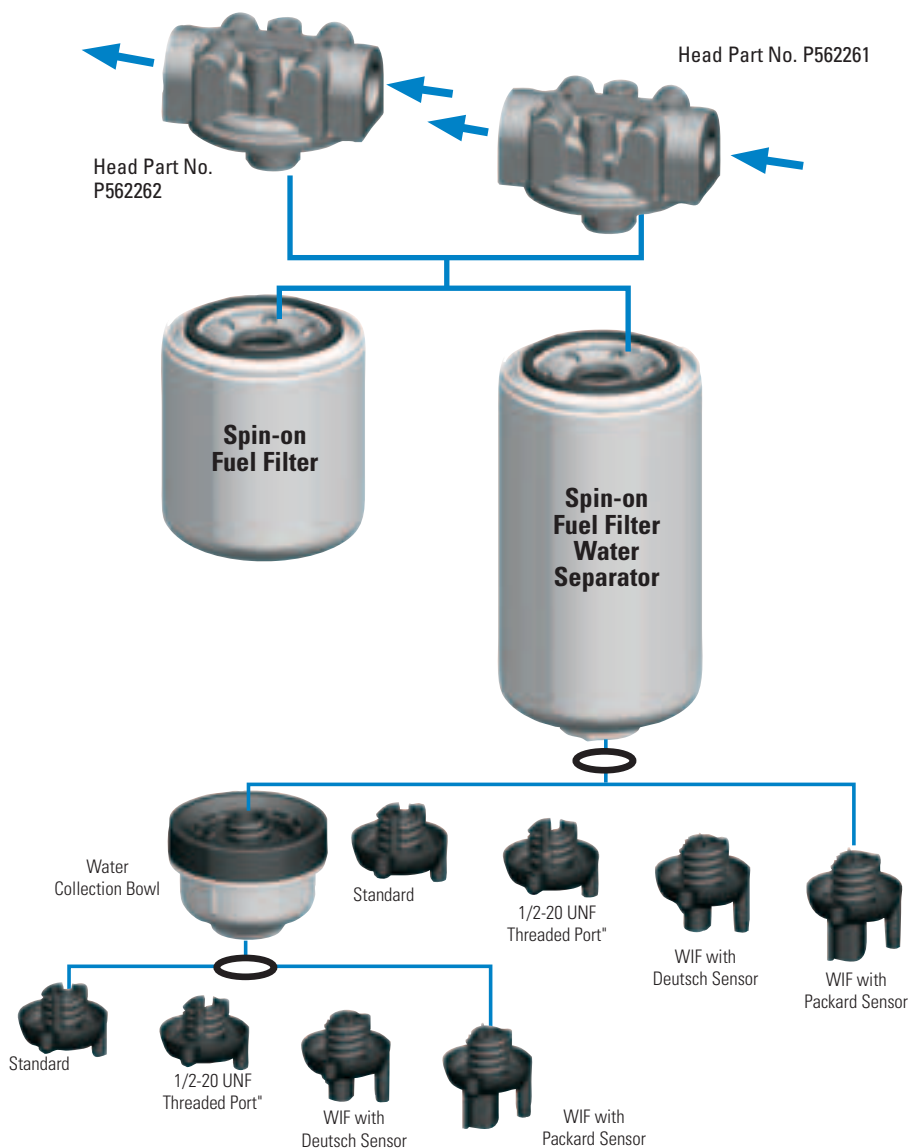
Δ PSI ≤ 1.0

Water Removal @

Recommended Flow Rate

SAE J1488 Emulsified: 95% efficiency

SAE J1839 Free Water: 95% efficiency



Filter Selection Chart

Filter Style	Max. Recommended Flow Rate		(C) Filter Length* (includes standard drain)		Efficiency @ Micron	Stand Tube	Dia. 3.66 / 93 mm Item No.
	gph	lph	inches	mm			
Standard	90	341	7.38	187	99% @ 10	N/A	P550847
			7.68	195	99% @ 15	N/A	P558000
			7.61	193	99% @ 3	N/A	P553203
	100	379	7.68	195	99% @ 10	Yes	P551001
			8.64	219	99% @ 10	N/A	P553201
			8.64	219	99% @ 35	N/A	P553204
			8.64	219	99% @ 3	N/A	P553207
	120	454	9.70	246	99% @ 10	Yes	P551000
			9.71	247	99% @ 7	Yes	P550901
			8.40	213	99% @ 10	N/A	P550848
	120	454	9.01	229	99% @ 10	Yes	P551122
			9.40	239	99% @ 10	Yes	P551103

For water drain flexibility, Donaldson Twist&Drain Spin-on Filters have a connection that accommodates four types of drain valves and one clear bowl.

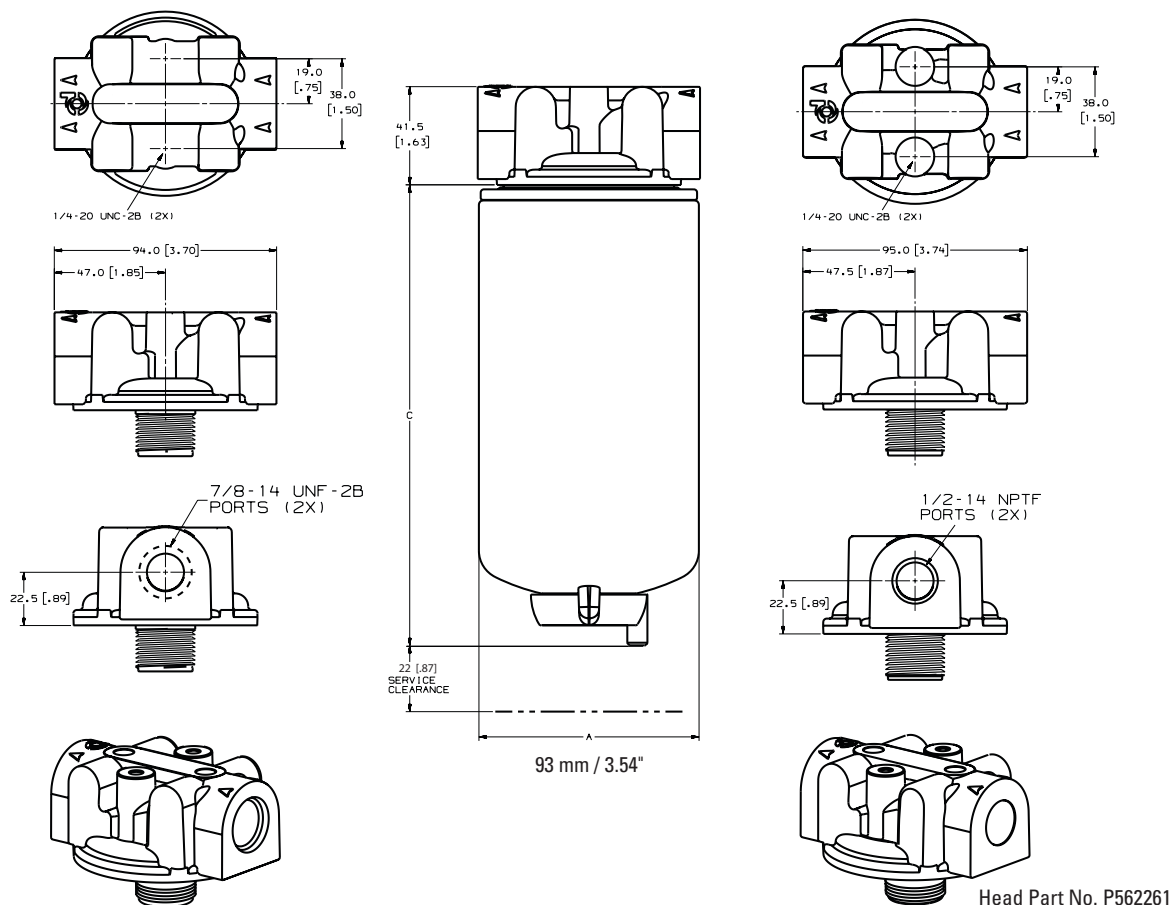
The filter selection tables shows which drain style is on the filter you're ordering.



Accessories for Twist&Drain filters can be found on page 50.

* Considering Drain Bowl? Add 1.98" / 50 mm to filter length.

Dimension Specifications



Head Part No. P562262

Head Part No. P562261

Filter Style	Max. Recommended Flow Rate		(C) Filter Length* (includes standard drain)		Efficiency @ Micron	Stand Tube	Dia. 3.66 / 93 mm Item No.
	gph	lph	inches	mm			
 1/2"-20 Threaded Port for Sensor	90	341	7.61	193	99% @ 3	N/A	P553213
			8.64	219	99% @ 10	N/A	P553211
			8.64	219	99% @ 35	N/A	P553214
			8.64	219	99% @ 3	N/A	P553217
	120	454	9.22	234	99% @ 10	N/A	P552032
	40		4.22	107	99% @ 25	N/A	P550104
	60	227	5.35	136	99% @ 25	N/A	P550105
			5.35	136	99% @ 17	N/A	P552251
			5.78	147	95% @ 140	N/A	P552203
	80	303	6.85	174	99% @ 25	N/A	P553854
			6.85	174	99% @ 9	N/A	P557440
	100	379	6.95	177	99% @ 3	N/A	P551313
			7.40	188	99% @ 25	N/A	P550106
			7.87	200	99% @ 9	N/A	P555627
	120	454	8.69	221	99% @ 15	N/A	P552253
	160	606	9.43	240	99% @ 9	N/A	P551712
			9.43	240	99% @ 3	N/A	P551311

* Considering Drain Bowl? Add 1.98" / 50 mm to filter length.



Fuel Heads & Filters

Filter Dia. 108 MM (4.25") x 1 1/4"-12



Fuel Flow Range: up to 180 gph / 881 lph

Operating Pressure

0-100 psi (690 kPA) without bowl

Temperature Range

-40° to 250°F (-40° to 121°C)

Flow Rate

Up to 180 gph / 881 lph

See table for filter flow rates

Fuel Compatibility

#1 or #2 Diesel, Kerosene, Biodiesel up to B20 and JP8

Mounting

Engine or Chassis

Clean Pressure Drop (Restriction) @ Recommended Flow Rate

Δ kPA \leq 6.9

Δ PSI \leq 1.0

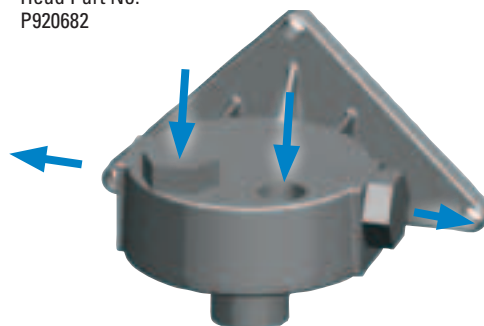
Water Removal @

Recommended Flow Rate

SAE J1488 Emulsified: 95% efficiency

SAE J1839 Free Water: 95% efficiency

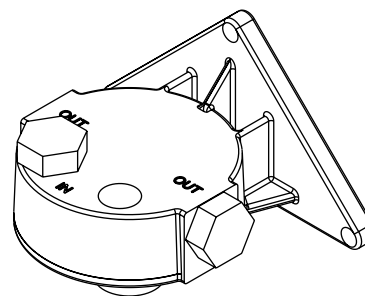
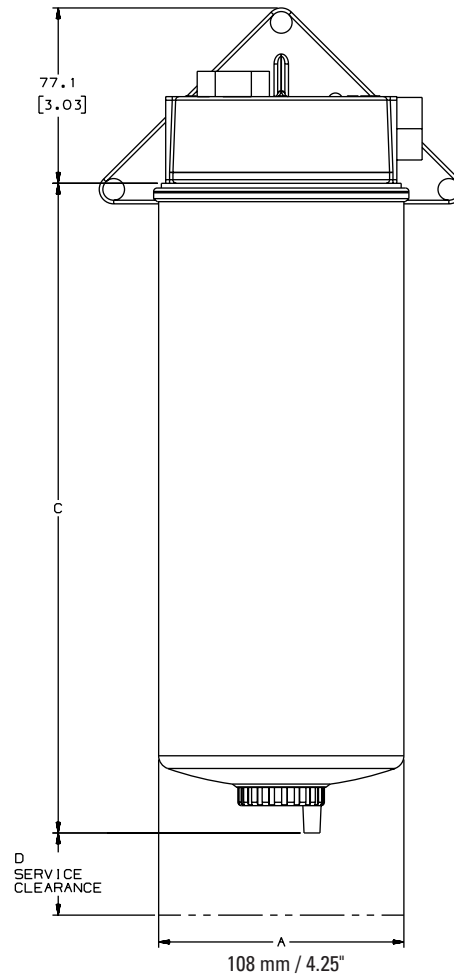
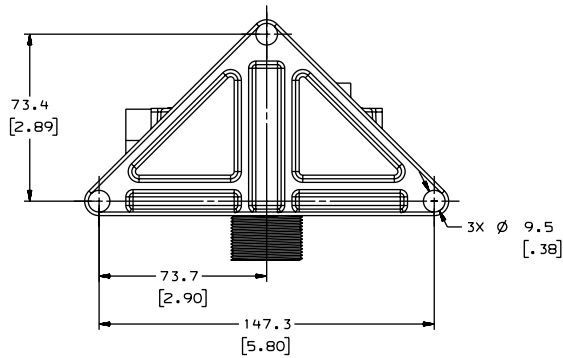
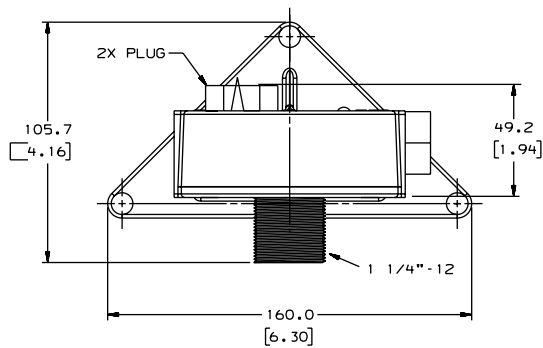
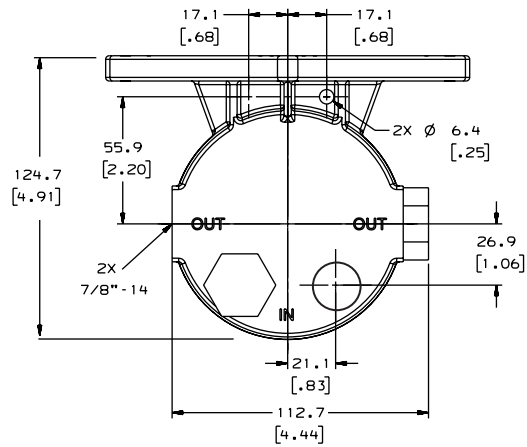
Head Part No.
P920682



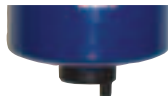
Head has two inlet ports and two outlet ports and ships with two port plugs. Allows for flexible mounting depending on fuel source.

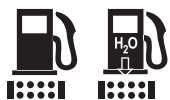


Dimension Specifications



Filter Selection Chart

Filter Style	Max. Recommended Flow Rate		(C) Filter Length (includes drain)		Efficiency @ Micron	Stand Tube	Dia. 108 MM X 1 1/4"-12 Item No.	(D) Service Clearance	
	gph	lph	inches	mm				inches	mm
	60	227	7.44	189	99% @ 15	Not applicable	P920711	1.03	26
	180	681	11.75	298	99% @ 15		P920683		



Fuel Heads & Filters

Filter Dia. 118 MM (4.65") x 1 1/4"-12



Fuel Flow Range: up to 250 gph / 946 lph

Operating Pressure

0-100 psi (690 kPa) without bowl

Temperature Range

-40° to 250°F (-40° to 121°C)

Flow Rate

Up to 230 gph / 946 lph

See table for filter flow rates

Fuel Compatibility

#1 or #2 Diesel, Kerosene, Biodiesel up to B20 and JP8

Mounting

Engine or Chassis

Clean Pressure Drop (Restriction) @ Recommended Flow Rate

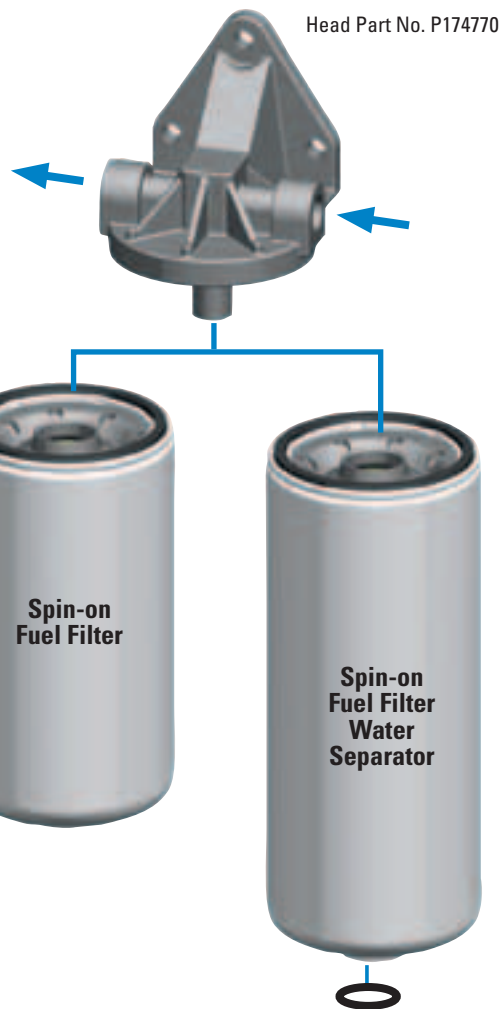
Δ kPa \leq 6.9

Δ PSI \leq 1.0

Water Removal @ Recommended Flow Rate

SAE J1488 Emulsified: 95% efficiency

SAE J1839 Free Water: 95% efficiency

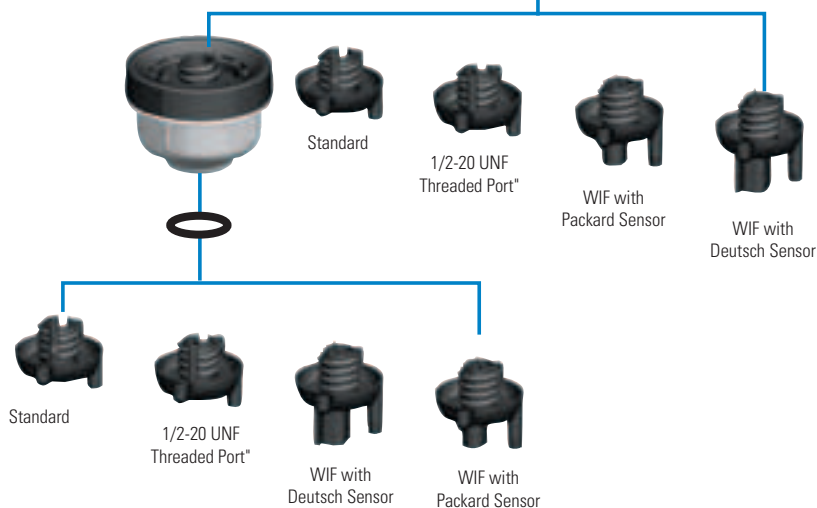


For water drain flexibility, Donaldson Twist&Drain Spin-on Filters have a connection that accommodates four types of drain valves and one clear bowl.

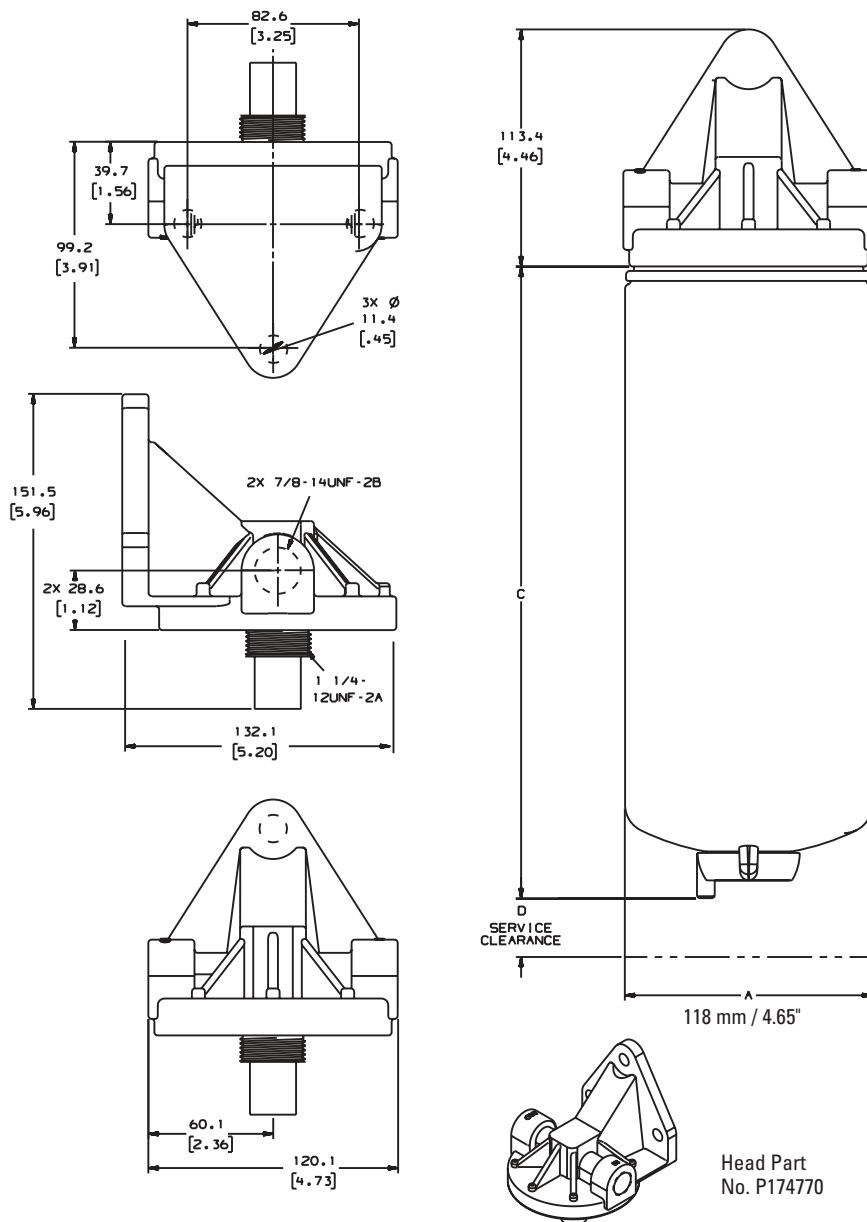
The filter selection tables shows which drain style is on the filter you're ordering.





Accessories for Twist&Drain filters can be found on page 50.



Dimension Specifications



Filter Selection Chart

Filter Style	Max. Recommended Flow Rate		(C) Filter Length* (includes standard drain)		Efficiency @ Micron	Stand Tube	Dia. 118 MM X 1 1/4"-12 Item No.	(D) Service Clearance	
	gph	lph	inches	mm				inches	mm
	205	776	12.24	311	99% @ 25	N/A	P552216	1.57	40
			12.24	311	99% @ 9	N/A	P550937		
			12.24	311	99% @ 10	Yes	P552006		
	250	946	8.94	227	99% @ 30	N/A	P550958		
			10.24	260	99% @ 9	N/A	P550202		

* Considering Drain Bowl? Add 1.98" / 50 mm to filter length.



Fuel Heads & Filters

Filter Dia. 118 MM (4.65") x 1 1/16"-16



Fuel Flow Range: up to 250 gph / 946 lph

Operating Pressure

0-100 psi (690 kPA) without bowl

Temperature Range

-40° to 250°F (-40° to 121°C)

Flow Rate

Up to 250 gph / 946 lph

See table for filter flow rates

Fuel Compatibility

#1 or #2 Diesel, Kerosene, Biodiesel up to B20 and JP8

Mounting

Engine or Chassis

Clean Pressure Drop (Restriction) @ Recommended Flow Rate

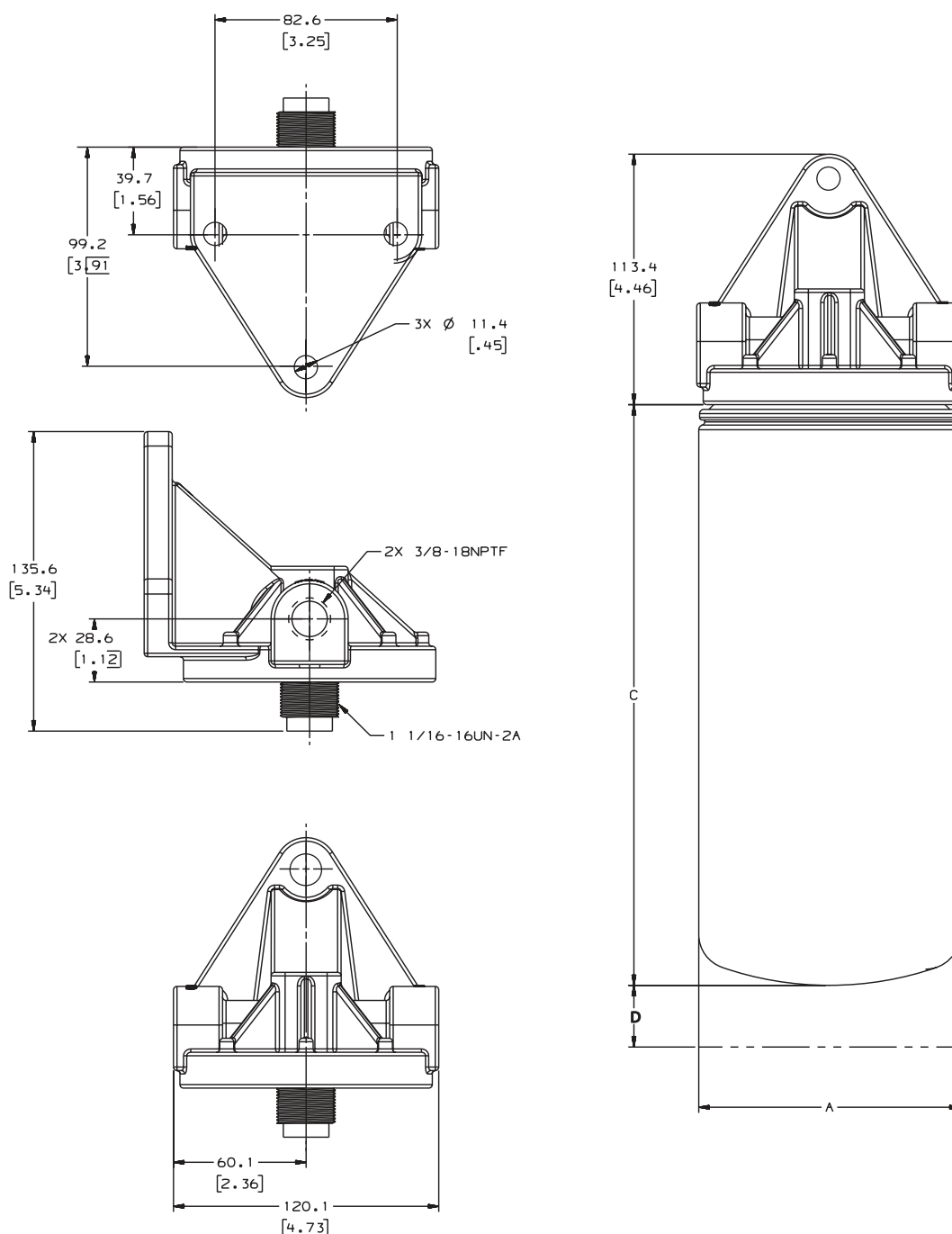
Δ kPA \leq 6.9

Δ PSI \leq 1.0


Part No. P174774

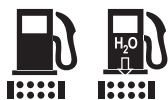


Dimension Specifications



Filter Selection Chart

Filter Style	Max. Recommended Flow Rate		(C) Filter Length		Efficiency @ Micron	Stand Tube	Dia. 118 MM X 1 1/16"-16 Item No.	(D) Service Clearance	
	gph	lph	inches	mm				inches	mm
	250	946	8.94	227	99% @ 5	N/A	EFF0047	1.14	29
					99% @ 16	N/A	P550959		



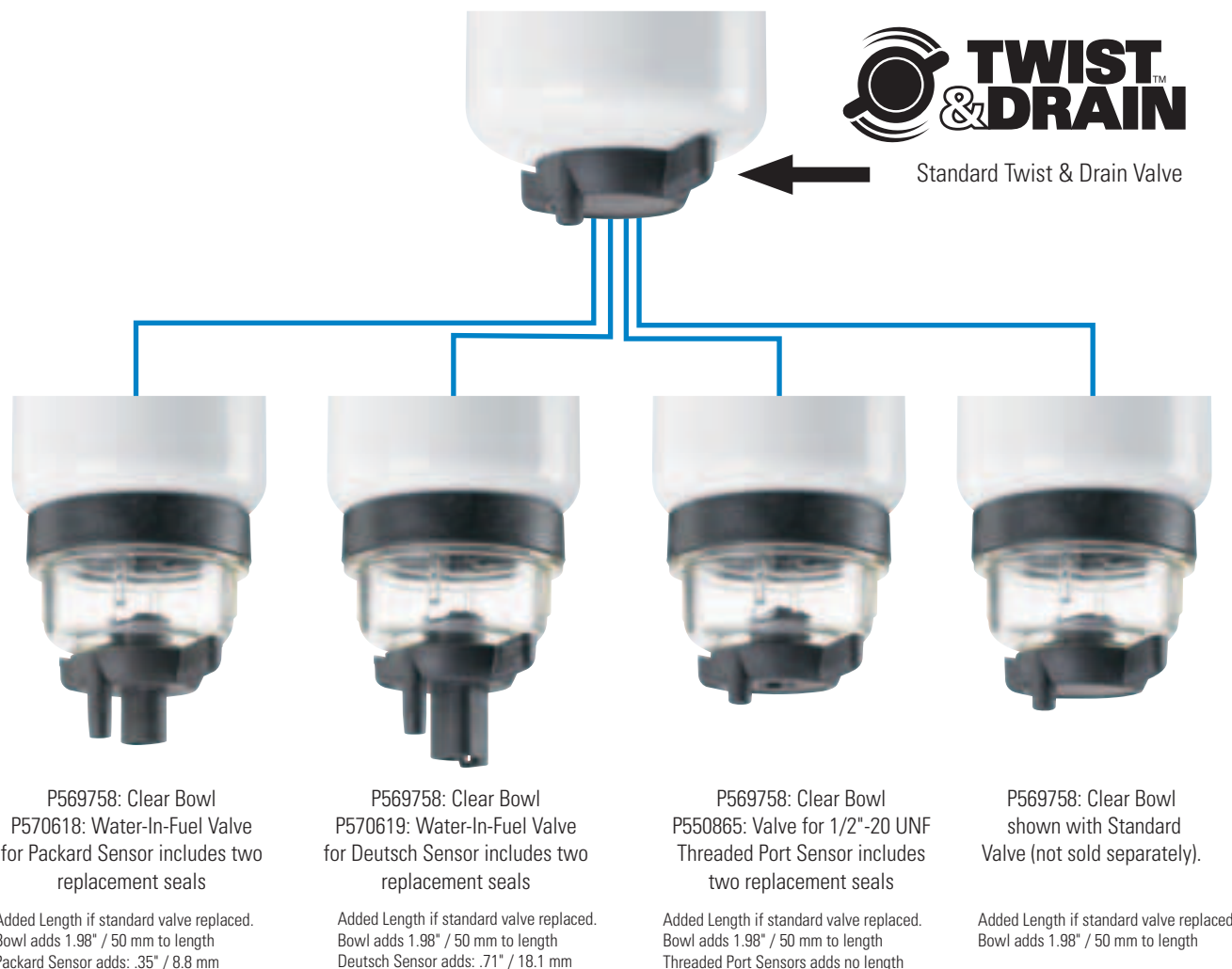
Fuel Filter Water Separators Twist & Drain Accessories Valves/Bowls



Accessory Line (Valves & Bowl)

For water drain flexibility, Donaldson Twist&Drain spin-on filters have a connection that accommodates multiple drain valve types and one clear bowl (80ml capacity).

All Twist&Drain™ filters ship with a specific drain valve. Drain valves can be ordered separately. The water collection bowl (item P569758) is a separate add-on component.



Replacement Seals for Bowl



The clear bowl ships with a single round, square cut seal. If seal shows signs of wear or deterioration, it should be replaced. The placement of the seal is between the bowl and filter connection.



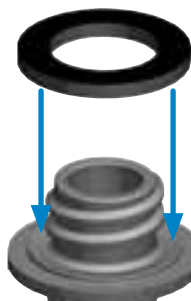
O.D. 1.38" / 35 mm
ID: .86" / 22 mm
Thickness: .13" / 3.2mm

Item Number: P570771

Replacement seal kits are available in packages of 12

Bowl Seal Replacement

1 Push seal down onto thread stem



2 Ensure seal is fully seated



Water & Draining Fuel Filters

Most primary fuel filters have drains that allow the operator to drain the water that has been separated by the filter. The frequency that the primary fuel filter needs to be drained is ultimately dependent on the quality of fuel that is being used. Most OEMs recommend draining your water separator daily. It is also recommended to pay attention to how much water is removed at each drain and adjust your frequency accordingly.

Why Remove Water in Fuel?

Water in fuel can prematurely wear and oxidize the steel components within the fuel injectors and lead to:

- Rusting and corrosion of components
- Governor/metering component failure
- Sticky metering components (both pump and nozzle)
- Injection component wear and seizure

Free or emulsified water must be removed from the fuel to prevent corrosion and damage to the fuel system. Fuel additives may claim they remove water, what they do is dissolve the water, which will pass through the filter and enter fuel injectors.

Types of water contamination in diesel fuel:

- 1) Emulsified water (water is suspended in the fuel)
- 2) Free water, (water separates from the fuel and generally collects at the bottom of the fuel or fuel storage tank)
- 3) Dissolved water (water is chemically dissolved in the fuel)

Donaldson spin-on style fuel filter water separators have water drain instructions on the can.

Maintenance Recommendations & Guidelines

- Drain water from your primary filter daily when refueling
- Carry a spare set of fuel filters in case you receive a "bad" load of fuel
- Never switch to more open filter to get longer filter life, you are trading away fuel pump and injector life
- Never use fuel to lube up the gasket. Fuel isn't as slick as oil and if you use fuel it could cause your gaskets not to slide but to bunch or pinch when it is tighten causing the filter to leak.
- If using biodiesel:
 - make sure your fuel supplier meets current fuel standards
 - make sure your engine is compatible with the concentration (or percent) biodiesel you wish to use
- When using your own fuel storage tank, remember that removing contaminants before they reach the vehicle is the first part of the best practices process. So, ensure you have effective bulk storage tank filtration.

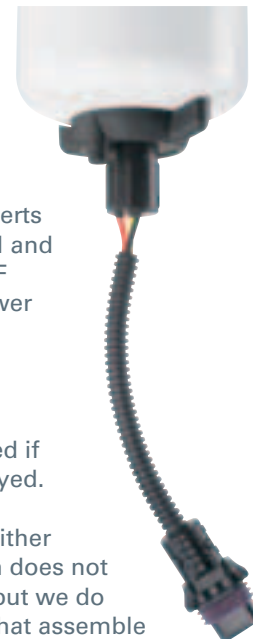
Water-in-Fuel Sensors (WIFs)

Water-In-Fuel sensors are typically chosen and installed by the engine manufacturer.

The WIF sensors connect to the fuel filter and routed to a display on the dashboard. A WIF sends an electrical signal to the in-cab display when it alerts the operator when water is in the fuel and should be drained from the filter. WIF sensors are more common in the newer common rail injection systems.

During filter service, WIF sensors are disconnected and reused on the new filter. Sensors are likely to be replaced if connectors are damaged or wires frayed.

The most common WIF sensors are either Packard or Deutsch styles. Donaldson does not offer sensors as a replacement part, but we do have filters with Twist&Drain valves that assemble into these existing popular sensors.



Twist&Drain™ Icons Installation & Water Drain

Installation



Filter will indicate if you should fill with fuel before installation.



Apply a thin film of clean motor oil to the new gasket. Do Not use Grease.



Line up the filter threads to the threaded port carefully. Screw on and tighten until gasket makes contact with base.



Number of turns

For final tightening of the filter, turn the can to the number of turns (+) indicated on the can.



Reconnect the WIF sensor.

Water Drain

Three easy steps with standard drain valve.



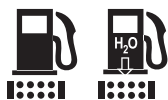
Turn to open drain valve



Let water drain



Retighten drain valve



Fuel Filters - Spin-ons by Diameter & Thread Size



Spin-on Fuel Filters

Thread	OD		Length		Drain Type	Item No	Part Description	Efficiency % @ Micron	Primary Application	GSKT O.D.		GSKT I.D.		Stand Tube
	IN	MM	IN	MM						IN	MM	IN	MM	
68 mm / 2.68" Dia. Family														
1-14	2.62	67	4.34	110	G	P551751	FUEL PRIMARY	50% @ 10	REPLACES WIX 24104	1.00	25	0.80	20	
76 mm / 3.00" Dia. Family														
7/8-14	3.05	77	5.83	148	G	P550368	FUEL PRIMARY	50% @ 5	NAVISTAR 1820749C1	5.05	128	4.71	120	
3/4-16	3.01	76	5.75	146	G	P550410	FUEL PRIMARY	99% @ 17	KOMATSU 600-311-8220	2.75	70	2.37	60	
	3.01	76	3.46	88	G	P553240	FUEL PRIMARY	99% @ 22	ISUZU 8-94414-796	2.50	64	2.16	55	
7/16-20	3.03	77	4.87	124	G	P550325	FUEL PRIMARY	50% @ 10	ONAN 122B325	3.02	77	1.75	44	
M16 x 1.5	2.99	76	4.72	120	G	P550526	FUEL PRIMARY	50% @ 10	VOLVO	2.81	71	2.48	63	
	3.02	77	2.49	63	G	P550678	FUEL PRIMARY	99% @ 25	FORD E6HZ9365B	2.81	71	2.48	63	
	3.02	77	3.26	83	G	P555095	FUEL PRIMARY	99% @ 9	FORD #E67HZ9365A (BRAZILIAN CAB FORWARD)	2.75	70	2.37	60	
	3.02	77	3.26	83	G	P550345	FUEL PRIMARY	99% @ 16	DEUTZ 1174424, MANN WK712/2	2.83	72	2.40	61	
	3.02	77	4.01	102	A	P551039	FUEL/WATER SEPARATOR	99% @ 20	BOBCAT 6667352, CNH 86504140 T&D VALVE	2.75	70	2.40	61	
	3.03	77	4.40	112	E	P550690	FUEL/WATER SEPARATOR	99% @ 25	CASE J911213	2.83	72	2.46	62	
	3.03	77	4.51	115	E	P550249	FUEL/WATER SEPARATOR	99% @ 25	CUMMINS 3912104	2.81	71	2.48	63	
	3.02	77	4.72	120	G	P550943	FUEL SECONDARY	99% @ 9	GMC 6.2L 25011214	2.75	70	2.37	60	
	3.04	77	4.72	120	G	P553004	FUEL PRIMARY	99% @ 16	VOLVO 243004	2.76	70	2.38	60	Yes
	3.02	77	4.72	120	G	P550440	FUEL SECONDARY	99% @ 16	CUMMINS 6C, 6CT SERIES	2.75	70	2.37	60	Yes
	3.02	77	5.81	148	A	P550588	FUEL/WATER SEPARATOR	99% @ 11	BOSCH 1457434056	2.76	70	2.40	61	
	3.02	77	5.81	148	A	P550248	FUEL/WATER SEPARATOR	99% @ 15	CUMMINS 3903202	2.82	72	2.46	62	Yes
	3.00	76	6.50	165	E	P550587	FUEL/WATER SEPARATOR	99% @ 25	DEUTZ 2133558, 2133943	2.75	70	2.37	60	
3.37	86	3.37	86	E	P552374	FUEL/WATER SEPARATOR	50% @ 25	Onan 149-2106; Toro 63-8300	2.74	70	2.37	60		
M18 x 1.5	3.00	76	2.37	60	E	P551768	FUEL/WATER SEPARATOR	50% @ 15	RACOR R12P	2.70	69	2.50	63	
M20 x 1.5	3.00	76	3.40	86	E	P550127	FUEL PRIMARY	99% @ 17	KUBOTA 70000-43081	2.70	69	2.33	59	
80 mm / 3.15" Dia. Family														
1-14	3.18	81	6.09	176	G	P551740	FUEL PRIMARY	99% @ 9	CATERPILLAR 1R-0740	2.91	74	2.52	64	
7/8-14	3.15	80	6.93	176	G	P551315	FUEL PRIMARY	99% @ 3	Caterpillar 1R0759	2.89	74	2.50	64	
3/4-16	3.11	79	5.59	142	E	P550550	FUEL/WATER SEPARATOR	95% @ 20	KOMATSUp554477	2.76	70	2.48	63	
	3.15	80	3.31	84	G	P502177	FUEL PRIMARY	50% @ 10	FSA FF2028, RYCO Z169A	2.48	63	1.76	45	
	3.15	80	4.50	114	G	P502163	FUEL PRIMARY	50% @ 10	NISSAN 16403-Z9000, 16403-Z9005	2.50	64	2.11	54	
	3.15	80	6.89	175	G	P502167	FUEL PRIMARY	50% @ 10	NISSAN 16405-01T70	2.59	66	2.00	51	
	3.18	81	3.39	86	G	P550057	FUEL PRIMARY	99% @ 25	TOYOTA 23303-56301	2.52	64	2.13	54	
	3.31	84	3.94	100	G	P550225	FUEL SECONDARY	50% @ 10	HINO 23401-1332, NISSAN 16403Z9003	2.48	63	2.08	53	
	3.06	78	6.74	171	E	P550688	FUEL/WATER SEPARATOR	99% @ 25	DEUTZ	2.81	71	2.46	62	
M16 x 1.5	3.14	80	4.88	124	G	P550491	FUEL PRIMARY	50% @ 25	RVI, M&H WK727	2.80	71	2.44	62	
	3.15	80	5.98	152	F	P550498	FUEL/WATER SEPARATOR	50% @ 15	M & H WDK724	2.81	71	2.46	62	
	3.18	81	6.93	176	G	P550782	FUEL PRIMARY	99% @ 10	DAVCO 210 - M16 X 1.5 - 10 MICRON	2.81	71	2.52	64	
	3.18	81	6.93	176	G	P550783	FUEL PRIMARY	99% @ 25	DAVCO 210 - M16 X 1.5 - 25 MICRON	2.91	74	2.52	64	
M20 x 1.5	3.16	80	4.72	120	G	P502142	FUEL PRIMARY	50% @ 10	MAZDA MB433425, TCM 20801-02131	3.06	78	2.48	63	
	3.15	80	3.93	100	G	P502143	FUEL PRIMARY	50% @ 10	MAZDA MB433425, TCM 20801-02131	2.76	70	2.52	64	

Twist&Drain™ Valves



Drain Valve



Packard



Deutsch

Drain Valve with
1/2" x 20 thread
Sensor Port

Bowl to Fit Port



Other Drain Valve Styles



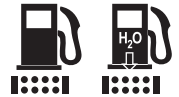
Knob Types



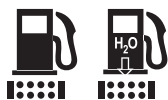
Plug



Spin-on



Thread	OD		Length		Drain Type	Item No	Part Description	Efficiency % @ Micron	Primary Application	GSKT O.D.		GSKT I.D.		Stand Tube
	IN	MM	IN	MM						IN	MM	IN	MM	
93 mm / 3.54" Dia. Family														
1-12	3.66	93	5.35	136	G	P550936	FUEL PRIMARY	99% @ 25	GMC 25011011, 8.2L	3.38	86	3.04	77	
	3.66	93	6.85	174	G	P554347	FUEL PRIMARY	99% @ 25	BULK FUEL W/O DRAIN	2.81	71	2.42	61	
	3.66	93	8.64	219	A	P553202	FUEL/WATER SEPARATOR	99% @ 35	RACOR S3202 T&D VALVE	3.39	86	3.05	78	
	3.66	93	8.64	219	c	P553212	FUEL/WATER SEPARATOR	99% @ 35	RACOR S3202 T&D INTEGRATED 1/2"-20 SENSOR PORT THD	3.39	86	3.05	78	
	3.69	94	5.37	136	G	P550115	FUEL PRIMARY	99% @ 45	FUEL DISPENSING PUMPS	2.84	72	2.47	63	
	3.69	94	5.37	136	G	P550215	FUEL PRIMARY	99% @ 22	WATER ABSORBING, FUEL DISPENSING PUMPS	2.84	72	2.46	62	
	3.69	94	7.44	189	F	P551915	FUEL PRIMARY	99% @ 22	BULK FUEL TANKS WITH SEDIMENT DRAIN	2.84	72	2.47	63	
	3.81	97	4.25	108	G	P550089	FUEL PRIMARY	50% @ 25	DETROIT DIESEL 8.2L ENG, FORD TRK & BUS	3.55	90	3.18	81	
	3.81	97	6.08	154	G	P550944	FUEL PRIMARY	99% @ 38	GMC 6.2L 25011285	3.55	90	3.18	81	
	3.81	97	7.36	187	A	P558010	FUEL/WATER SEPARATOR	99% @ 20	DETROIT DIESEL 23512317 T&D VALVE	3.55	90	3.18	81	
3.81	97	7.97	202	G	P556915	FUEL PRIMARY	99% @ 25	DET. DIESEL 23517471, AC T915D	3.38	86	3.04	77		
1-14	3.66	93	5.35	136	G	P550105	FUEL PRIMARY	99% @ 25	CUMMINS 154709	2.81	71	2.42	61	
	3.66	93	5.35	136	G	P552251	FUEL PRIMARY	99% @ 17	IHC 702250C1	2.81	71	2.42	61	
	3.66	93	6.11	155	A	P550828	FUEL/WATER SEPARATOR	99% @ 140	CUMMINS ENGINES	2.83	72	2.44	62	
	3.68	93	6.85	174	G	P551178	FUEL PRIMARY	50% @ 10	NISSAN FL40399008	2.85	72	2.47	63	
	3.66	93	6.85	174	G	P553854	FUEL PRIMARY	99% @ 25	CARRIER, IHC, THERMOKING 11.3854	2.81	71	2.42	61	
	3.66	93	6.85	174	G	P557440	FUEL PRIMARY	99% @ 9	CAT 1R-0711, 1P-2299, 6L-7440, KTSU 600-311-8290	2.81	71	2.42	61	
	3.68	93	6.95	177	G	P551313	FUEL SECONDARY	99% @ 3	Caterpillar 1R-0750	2.83	72	2.46	62	
	3.66	93	7.40	188	A	P558000	FUEL/WATER SEPARATOR	99% @ 20	CUMMINS 3308638 T&D VALVE	2.81	71	2.42	61	
	3.66	93	7.61	193	A	P553203	FUEL/WATER SEPARATOR	99% @ 3	RACOR S3203 T&D VALVE	2.83	72	2.44	62	
	3.66	93	7.61	193	A	P553205	FUEL/WATER SEPARATOR	99% @ 7	CATERPILLAR ENGINES T&D VALVE	3.39	86	3.05	78	
	3.66	93	7.61	193	C	P553213	FUEL/WATER SEPARATOR	99% @ 3	RACOR S3203 T&D INTEGRATED 1/2"-20 SENSOR PORT THD	2.83	72	2.44	62	
	3.66	93	7.61	193	D	P553215	FUEL/WATER SEPARATOR	99% @ 7	CATERPILLAR ENGINES T&D INTEGRATED 1/2"-20 SENSOR PORT THD	3.39	86	3.05	78	
	3.66	93	7.87	200	C	P555627	FUEL PRIMARY	99% @ 9	IHC 625627C1	2.81	71	2.42	61	
	3.68	93	7.98	203	A	P551001	FUEL/WATER SEPARATOR	99% @ 10	CUMMINS CELECT & QUANTUM ENGINE APPLICATIONS T&D VALVE	2.83	72	2.46	62	Yes
	3.66	93	8.40	213	B2	P550848	FUEL/WATER SEPARATOR	99% @ 10	CUMMINS ENGINES T&D INTEGRATED W/F	2.83	72	2.44	62	
	3.66	93	8.64	219	A	P553201	FUEL/WATER SEPARATOR	99% @ 10	RACOR S3201 T&D VALVE	2.83	72	2.44	62	
	3.66	93	8.64	219	A	P553204	FUEL/WATER SEPARATOR	99% @ 35	ALLIANCE ABPN12232FRT04 T&D VALVE	2.83	72	2.44	62	
	3.66	93	8.64	219	A	P553207	FUEL/WATER SEPARATOR	99% @ 3	ALLIANCE ABPN12232FRT03 T&D VALVE	2.83	72	2.44	62	
	3.66	93	8.64	219	C	P553211	FUEL/WATER SEPARATOR	99% @ 10	RACOR S3201 T&D INTEGRATED 1/2"-20 SENSOR PORT THD	2.83	72	2.44	62	
	3.66	93	8.64	219	C	P553214	FUEL/WATER SEPARATOR	99% @ 35	ALLIANCE ABPN12232FRT04 T&D INTEGRATED 1/2"-20 SENSOR PORT THD	2.83	72	2.44	62	
	3.66	93	8.64	219	C	P553217	FUEL/WATER SEPARATOR	99% @ 33	ALLIANCE ABPN12232FRT03 T&D INTEGRATED 1/2"-20 SENSOR PORT THD	2.83	72	2.44	62	
	3.66	93	9.22	234	Spec	P552032	FUEL/WATER SEPARATOR	99% @ 10	CUMMINS ISC, ISM ENGINES - CONTAINS DRAIN AND SENSOR PORT	2.81	72	2.42	62	
	3.68	93	9.43	240	G	P551311	FUEL PRIMARY	99% @ 3	Caterpillar 1R-0749	2.83	72	2.46	62	
	3.66	93	9.92	252	A	P551000	FUEL/WATER SEPARATOR	99% @ 10	CUMMINS CELECT & QUANTUM ENGINE APPLICATIONS T&D VALVE	2.81	71	2.42	61	Yes
	3.66	93	9.92	252	A	P550901	FUEL/WATER SEPARATOR	99% @ 7	CUMMINS ENGINES T&D VALVE	2.81	71	2.46	63	



Fuel Filters - Spin-ons by Diameter & Thread Size



Thread	OD		Length		Drain Type	Item No	Part Description	Efficiency % @ Micron	Primary Application	GSKT O.D.		GSKT I.D.		Stand Tube
	IN	MM	IN	MM						IN	MM	IN	MM	
1-14	3.69	94	5.52	140	E	P551744	FUEL/WATER SEPARATOR	50% @ 10	RACOR R24S	3.43	87	3.11	79	
	3.69	94	5.68	144	F	P550108	FUEL PRIMARY	50% @ 25	JOHN DEERE AR45098, AR45097	2.84	72	2.47	63	
	3.69	94	5.85	149	E	P550691	FUEL/WATER SEPARATOR	99% @ 25	CUMMINS 3843447	2.83	72	2.46	62	
	3.69	94	7.38	187	A	P550847	FUEL/WATER SEPARATOR	99% @ 10	CATERPILLAR 1752949	2.81	71	2.45	62	
	3.69	94	8.69	221	G	P552253	FUEL SECONDARY	99% @ 15	IHC 702253C1	2.84	72	2.47	63	
	3.69	94	9.38	238	B1	P551122	FUEL/WATER SEPARATOR	99% @ 10	CUMMINS ENGINES T&D INTEGRATED WIF	2.83	72	2.46	62	Yes
	3.69	94	9.71	247	B2	P551103	FUEL/WATER SEPARATOR	99% @ 10	CUMMINS ENGINES T&D INTEGRATED WIF	3.69	94	2.83	72	Yes
	3.70	94	10.75	273	G	P550625	FUEL PRIMARY	99% @ 3	CATERPILLAR 1R0762	3.60	91	3.03	77	
	3.75	95	4.12	105	Bowl Thd	P550088	FUEL/WATER SEPARATOR	50% @ 10	FORD 6.6L & 7.8L ENG #E7HZ4N184A, RACOR R26P	2.81	72	2.42	62	
	3.73	95	5.69	145	G	P550683	FUEL PRIMARY	50% @ 25	HINO 23501-1010	2.83	72	2.45	62	
	3.72	95	5.78	147	G	P552203	FUEL PRIMARY	95% @ 140	CUMMINS 4010476, FLEETGUARD FF2203	2.83	72	2.46	62	
	3.72	95	9.43	240	G	P551712	FUEL PRIMARY	99% @ 9	CATERPILLAR 1R-0712	2.81	71	2.42	61	
	3.79	96	6.22	158	E	P550553	FUEL/WATER SEPARATOR	99% @ 40	1999 FORD LIGHT TRUCK, MOTOR-CRAFT FD4597	3.59	91	3.15	80	
	3.81	97	4.22	107	G	P550104	FUEL PRIMARY	99% @ 25	CUMMINS 138627	2.81	71	2.42	61	
	3.81	97	5.70	145	G	P550109	FUEL PRIMARY	50% @ 10	FORD D3HE9176AA	3.56	90	3.17	81	
	3.81	97	7.40	188	G	P550106	FUEL PRIMARY	99% @ 25	CUMMINS D156172, 202893, FURN GSKT-P169192	2.81	71	2.42	61	
7/8-14	3.66	93	6.85	174	G	P550774	FUEL PRIMARY	99% @ 3	CUMMINS 3959612, ISC, ISL ISM ENGINES	2.83	72	2.44	62	
	3.66	93	6.85	174	G	P550879	FUEL PRIMARY	99% @ 5	CUMMINS 4940647	2.83	72	2.44	62	
	3.68	93	9.43	240	G	P551312	FUEL PRIMARY	99% @ 3	Caterpillar 1R-0753	2.83	72	2.46	62	
	3.78	96	8.70	221	G	P553855	FUEL SECONDARY	99% @ 20	IHC, THERMOKING 11.3855	2.84	72	2.46	62	
	3.81	97	5.22	133	G	P553693	FUEL SECONDARY	99% @ 20	CARRIER, THERMOKING 11.3693	2.82	72	2.42	61	
3/4-16	3.66	93	5.19	132	G	P552405	FUEL PRIMARY	50% @ 10	NISSAN 1640305D00, FL40305D00	2.83	72	2.46	63	
	3.71	94	4.92	125	G	P552564	FUEL PRIMARY	50% @ 10	ISUZU 1-13240-074-0, HITACHI 4206080	2.48	63	1.74	44	
	3.70	94	5.43	138	Spec	P550385	FUEL PRIMARY	50% @ 10	TOYOTA 2330364010	2.48	63	2.20	56	
	3.85	98	5.47	139	G	P551351	FUEL PRIMARY	50% @ 10	NISSAN 1640505E01	2.89	74	2.00	51	
1 1/2-16	3.78	96	7.35	187	Spec	P550735	FUEL PRIMARY	99% @ 25	NATURAL GAS FUELED CUMMINS ENGINES	3.47	88	2.99	76	
1 3/8-12	3.67	93	7.50	190	G	P551752	FUEL/WATER SEPARATOR	99% @ 30	AMACO A08	2.73	69	2.42	61	
13/16-12	3.66	93	4.21	107	G	P550928	FUEL SECONDARY	99% @ 16	GMC 25010959	3.38	86	3.04	77	
	3.66	93	6.85	174	G	EFF7917	FUEL SECONDARY	99% @ 5	DETROIT DIESEL 23530645	3.39	86	3.05	77	
	3.66	93	6.85	174	G	P556916	FUEL SECONDARY	99% @ 9	DET. DIESEL 23518530, AC TP916D	3.39	86	3.05	77	
	3.66	93	6.85	174	G	P556917	FUEL SECONDARY	99% @ 3	DETROIT DIESEL 23533726	3.39	86	3.05	77	
13/16-18	3.66	93	5.67	144	G	P558712	FUEL PRIMARY	99% @ 40	CASE IH A58712	2.81	71	2.42	61	
	3.76	96	6.01	153	A	P551329	FUEL/WATER SEPARATOR	99% @ 13	CASE, CUMMINS T&D VALVE	2.85	72	2.46	62	
	3.81	97	4.50	114	G	P550868	FUEL PRIMARY	99% @ 28	CASE A39868, DAVID BROWN	2.81	71	2.46	62	
15/16-16	3.66	93	5.55	141	G	P559100	FUEL PRIMARY	99% @ 23	CAT 9L-9100, 9L-8794	2.75	70	2.42	61	
	3.70	94	8.42	214	F	P552432	FUEL/WATER SEPARATOR	99% @ 25	Allis Chalmers 4321716, 4321716-5	2.83	72	2.46	63	
	3.81	97	4.75	121	G	P550110	FUEL SECONDARY	99% @ 8	CASE A39867	2.82	72	2.42	61	
	3.81	97	5.61	142	G	P551127	FUEL SECONDARY	99% @ 12	CASE A58713	2.85	72	2.46	62	
M12 x 1.5	3.50	89	8.16	207	G	P550473	FUEL PRIMARY	50% @ 25	Mercedes-Benz 10922201, 10922301	2.80	71	2.44	62	
M14 x 1.5	3.82	97	7.60	193	G	P550665	FUEL/WATER SEPARATOR	50% @ 20	Iveco 1907539 / New Holland 1931061	2.85	72	2.46	62	

Twist&Drain™ Valves



Drain Valve



Packard



Deutsch

Water-in Fuel Sensors

Drain Valve with
1/2" x 20 thread
Sensor Port

Bowl to Fit Port

Bowl Thd -- D style
without bowl

Other Drain Valve Styles



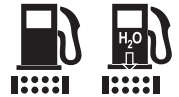
Knob Types



Plug



Spin-on



Thread	OD		Length		Drain Type	Item No	Part Description	Efficiency % @ Micron	Primary Application	GSKT O.D.		GSKT I.D.		Stand Tube
	IN	MM	IN	MM						IN	MM	IN	MM	
M16 x 1.5	3.77	96	5.66	144	G	P550494	FUEL PRIMARY	50% @ 5	DAF 1318695	2.80	71	2.44	62	
	3.78	96	5.66	144	G	P550496	FUEL PRIMARY	50% @ 10	RENAULT V.I. 5010359706	2.80	71	2.44	62	
	3.77	96	8.34	211	G	P550472	FUEL PRIMARY	50% @ 3	DAF 1328177	2.80	71	2.44	62	
	3.82	97	5.47	139	G	P554620	FUEL PRIMARY	99% @ 9	DEUTZ 1174422	2.81	71	2.42	61	
	3.82	97	8.27	210	G	P559624	FUEL PRIMARY	50% @ 5	DAF 247138	2.80	71	2.44	62	
M18 x 1.5	3.71	94	8.13	207	G	P550372	FUEL PRIMARY	99% @ 5	VOLVO 420799	2.81	71	2.46	62	
	3.78	96	5.59	142	G	P550004	FUEL PRIMARY	50% @ 10	Renault	2.80	71	2.44	62	
M20 x 1.5	3.68	93	3.94	100	G	P550049	FUEL PRIMARY	99% @ 30	mitsubishi ME016823	2.54	65	2.28	58	
	3.66	93	6.30	160	G	P550643	FUEL PRIMARY	99% @ 10	Yanmar SV series; Volvo EC/EW Series; Volvo EC55B; Volvo ECR and ECR88	2.72	69	2.32	59	
	3.66	93	6.85	174	G	P550880	FUEL PRIMARY	99% @ 5	CASE 87803200, CUMMINS 4897897	2.83	72	2.44	62	
	3.66	93	6.85	174	G	P550881	FUEL PRIMARY	99% @ 5	CUMMINS 4897833, IVECO 2992241, DAF 1399760	2.83	72	2.44	62	
	3.66	93	7.96	202	B1	P550929	FUEL/WATER SEPARATOR	99% @ 5	CUMMINS 3991498 TIER 2 QSB & 2VE ENGINES	2.84	72	2.42	62	
	3.66	94	4.21	120	G	P550932	FUEL PRIMARY	99% @ 30	mitsubishi ME035393, ME035829	3.43	87	2.42	62	
	3.69	94	5.75	146	Bowl Thd	P550549	FUEL/WATER SEPARATOR	99% @ 10	CUMMINS 3942533	2.73	69	2.46	63	
	3.74	95	3.15	80	G	P550048	FUEL PRIMARY	99% @ 30	mitsubishi ME06066	2.52	64	2.28	58	
	3.72	95	4.72	120	G	P502157	FUEL PRIMARY	50% @ 10	MAZDA	2.81	71	1.97	50	
	3.72	95	5.17	131	G	P502158	FUEL PRIMARY	50% @ 10	MAZDA 145623570A	3.62	92	2.81	71	
	3.78	96	4.65	118	Bowl Thd	P550968	FUEL/WATER SEPARATOR	95% @ 20	DODGE LIGHT TRUCK WITH CUMMINS DIESEL	2.83	72	2.46	62	
	3.90	99	5.43	138	G	P502149	FUEL PRIMARY	50% @ 10	DAIHATSU 2330387308000	2.81	71	2.19	56	
	3.90	99	5.43	138	G	P550390	FUEL PRIMARY	50% @ 10	mitsubishi MB220900	2.87	73	2.20	56	
	3.66	93	6.77	172	G	P550391	FUEL PRIMARY	99% @ 30	mitsubishi ME056280	3.54	90	2.66	68	
	3.77	96	5.66	144	G	P550495	FUEL PRIMARY	50% @ 3	Saab-Scania 1361685, 1372444	2.80	71	2.44	62	
M24 x 1.5	3.78	96	7.00	178	G	P550365	FUEL PRIMARY	99% @ 20	ROLLS ROYCE OE42873	2.84	72	2.46	63	
	3.58	91	9.00	228	G	P552200	FUEL SECONDARY	99% @ 8	CUMMINS 4088272, FLEETGUARD FF2200	3.74	95	3.10	79	
108 mm / 4.25" Dia. Family														
1-12	4.24	108	10.38	264	Spec	P550753	FUEL/WATER SEPARATOR	99% @ 5	JOHN DEERE RE509596, RE521818	4.00	102	3.56	90	
	4.24	108	8.90	226	G	P551774	FUEL PRIMARY	50% @ 10	JOHN DEERE RE519608	3.57	91	3.15	80	
1-14	4.23	107	9.60	245	A	P551025		99% @ 4	RACOR B32006	2.83	72	2.44	62	
	4.23	107	9.60	245	A	P551026	FUEL/WATER SEPARATOR	99% @ 9	MERCEDES 4771302, VOLVO 11110668	3.90	99	3.56	90	
	4.23	107	5.80	147	A	P551033	FUEL/WATER SEPARATOR	99% @ 9	RACOR R43, R50504	3.90	99	3.56	90	
	4.23	107	6.81	173	A	P551034	FUEL/WATER SEPARATOR	99% @ 9	RACOR S3226	3.90	99	3.56	90	
	4.23	107	5.80	147	A	P551055	FUEL/WATER SEPARATOR	99% @ 4	RACOR R60, S3225	3.51	89	3.17	81	
	4.23	107	5.80	147	A	P551056	FUEL/WATER SEPARATOR	99% @ 9	RACOR R60T	3.51	89	3.17	81	
	4.23	107	5.80	147	A	P551057	FUEL/WATER SEPARATOR	99% @ 25	RACOR R60P	3.51	89	3.17	81	
	4.23	107	3.82	173	A	P551065	FUEL/WATER SEPARATOR	99% @ 4	RACOR R90S, ALLIANCE	3.51	89	3.17	81	
	4.23	107	6.82	173	A	P551066	FUEL/WATER SEPARATOR	99% @ 9	RACOR R90T	3.51	89	3.17	81	
	4.23	107	6.82	173	A	P551067	FUEL/WATER SEPARATOR	99% @ 25	RACOR R90P	3.51	89	3.17	81	
	4.23	107	9.60	244	A	P551075	FUEL/WATER SEPARATOR	99% @ 4	RACOR R120S	3.51	89	3.17	81	
	4.23	107	9.60	244	A	P551076	FUEL/WATER SEPARATOR	99% @ 9	RACOR R120T	3.51	89	3.17	81	
	4.23	107	9.60	244	A	P551077	FUEL/WATER SEPARATOR	99% @ 25	RACOR R120P	3.51	89	3.17	81	
	4.25	108	3.50	89	Bowl Thd	P550746	FUEL/WATER SEPARATOR	50% @ 3	RACOR R45 SERIES	3.77	96	3.50	89	
	4.26	108	5.79	147	E	P550548	FUEL/WATER SEPARATOR	50% @ 5	NAVISTAR 1685159C1	3.60	91	3.20	81	
	4.26	108	5.90	150	G	P559125	FUEL PRIMARY	99% @ 10	CARRIER 300109000	4.00	102	3.56	90	
	4.26	108	5.93	151	G	P550448	FUEL PRIMARY	99% @ 10	CARRIER 300109001	3.54	90	3.16	80	
	4.25	108	7.91	201	G	P551335	FUEL PRIMARY	99% @ 20	DAVCO 320120	3.98	101	3.58	91	
	4.27	108	10.08	256	Spec	P550626	FUEL/WATER SEPARATOR	99% @ 20	CATERPILLAR 1R0770	4.27	108	3.68	93	
	4.25	108	10.31	262	G	EFF9092	FUEL PRIMARY	99% @ 5	CAT ENGINES	2.82	72	2.42	61	
	4.25	108	11.88	302	Spec	P550668	FUEL/WATER SEPARATOR	99% @ 10	JOHN DEERE RE522687	4.00	102	3.56	90	
	4.29	109	5.75	146	E	P550554	FUEL/WATER SEPARATOR	50% @ 12	NAVISTAR 1685159C91	3.97	101	3.59	91	



Fuel Filters - Spin-ons by Diameter & Thread Size



Thread	OD		Length		Drain Type	Item No	Part Description	Efficiency % @ Micron	Primary Application	GSKT O.D.		GSKT I.D.		Stand Tube
	IN	MM	IN	MM						IN	MM	IN	MM	
1-14	4.31	109	10.60	269	G	P555823	FUEL PRIMARY	99% @ 9	CAT 4N-5823	2.82	72	2.42	61	
	4.36	111	5.04	128	G	P550436	FUEL PRIMARY	50% @ 30	RACOR S3225P	4.00	102	3.56	90	
	4.36	111	5.05	128	Bowl Thd	P550729	FUEL/WATER SEPARATOR	50% @ 10	NAVISTAR 1677004C91	4.00	102	3.56	90	
	4.36	111	5.10	130	Bowl Thd	P550730	FUEL/WATER SEPARATOR	50% @ 10	FORD F1HZ9365A, CARRIER 30-01079	4.00	102	3.56	90	
	4.36	111	6.10	155	Bowl Thd	P550747	FUEL/WATER SEPARATOR	50% @ 10	RACOR R90 SERIES	3.77	96	3.50	89	
	4.38	111	8.21	209	E	P551767	FUEL/WATER SEPARATOR	99% @ 40	GM 23514654, JOHN DEERE 500186	3.77	96	3.50	89	
	4.38	111	8.50	216	Bowl Thd	P550748	FUEL/WATER SEPARATOR	50% @ 10	RACOR R120 SERIES	4.00	102	3.56	90	
	4.38	111	11.30	287	E	P551746	FUEL/WATER SEPARATOR	99% @ 5	CATERPILLAR 1335673	3.50	89	3.18	81	
	4.39	112	4.02	102	Bowl Thd	P553375	FUEL/WATER SEPARATOR	50% @ 10	FORD E8TZ-9N184-A	3.77	96	3.50	89	
7/8-14	4.23	107	4.23	107	A	P551027	FUEL/WATER SEPARATOR	99% @ 4	JOHN DEERE RE522688	3.90	99	3.56	90	
	4.23	107	9.6	244	A	P551031	FUEL/WATER SEPARATOR	99% @ 15	CASE 1808623C1	2.83	72	2.44	62	
	4.24	108	6.74	171	E	P550669	FUEL/WATER SEPARATOR	99% @ 5	JOHN DEERE RE522688	3.93	100	3.55	90	
	4.24	108	7.14	181	G	P551318	FUEL PRIMARY	99% @ 9	NAVISTAR 1822588C1	2.81	71	2.45	62	
	4.28	109	4.60	117	G	P550811	FUEL SECONDARY	99% @ 10	FORD, IHC 6.9L 1804459C1	2.83	72	2.45	62	
	4.28	109	7.98	203	G	P552603	FUEL SECONDARY	99% @ 9	IHC 672603C1	2.82	72	2.42	61	
3/4-16	4.29	109	7.20	183	G	P551605	FUEL PRIMARY	99% @ 3	IVECO 1901605	2.80	71	2.40	61	
7/8-16	4.28	109	7.89	200	G	P550218	FUEL SECONDARY	99% @ 17	MACK 483-GB-218B	2.82	72	2.42	61	
1 1/16-16	4.28	109	10.31	262	G	P550431	FUEL SECONDARY	99% @ 9	MACK 483-GB-431	3.89	99	3.55	90	
1 1/4-12	4.38	111	11.75	298	A	P920683	FUEL/WATER SEPARATOR	99% @ 15	3 GPM HIGH PERF FF/WS	4.32	110	3.85	98	
	4.38	111	7.44	189	A	P920711	FUEL/WATER SEPARATOR	99% @ 15	1 GPM HIGH PERF FF/WS	4.32	110	3.85	98	
13/16-18	4.23	107	9.60	244	A	P551030	FUEL/WATER SEPARATOR	99% @ 17	MACK 483GB465	2.83	72	2.44	62	
	4.28	109	7.89	200	G	P550219	FUEL PRIMARY	50% @ 14	MACK 483-GB-219A	2.82	72	2.42	61	
15/16-16	4.26	108	8.96	228	F	P552475	FUEL/WATER SEPARATOR	50% @ 10	LUBER-FINER LFP2100C	2.81	71	2.46	62	
	4.28	109	10.31	262	F	P552370	FUEL/WATER SEPARATOR	50% @ 10	FORD E7HZ-9N184-B, E8HT-9J288-AA	2.85	72	2.48	63	
M22 x 1.5	4.23	107	9.6	244	A	P551028	FUEL/WATER SEPARATOR	99% @ 17	MACK 483GB472M	3.90	99	3.56	90	
	4.25	108	7.95	202	G	P554470	FUEL PRIMARY	99% @ 25	MACK 483-GB-470M	3.88	99	3.54	90	
	4.25	108	10.40	264	E	P554472	FUEL/WATER SEPARATOR	99% @ 25	MACK 483GB472M	3.98	101	3.58	91	
M30 x 1.5	4.23	107	7.95	202	G	P554476	FUEL SECONDARY	99% @ 9	MACK 483GB476M	3.90	99	3.54	90	
	4.23	107	9.6	244	A	P551029	FUEL/WATER SEPARATOR	99% @ 4	MACK 483GB477M	3.9	99	3.56	90	
	4.25	108	8.34	212	E	P554477	FUEL/WATER SEPARATOR	99% @ 5	MACK ASET	3.98	101	3.58	91	
	4.25	108	10.30	262	G	P554471	FUEL SECONDARY	99% @ 9	MACK 483GB471M	3.88	99	3.54	90	
M32 x 1.5	4.43	113	10.00	254	G	P550529	FUEL PRIMARY	99% @ 5	VOLVO 20430751	4.09	104	3.66	93	
118 mm / 4.65" Dia. Family														
1 1/16-16	4.67	119	8.94	227	G	EFF0047	FUEL SECONDARY	99% @ 5	DETROIT DIESEL ENGINES	4.32	110	3.85	98	
	4.67	119	8.94	227	G	P550959	FUEL SECONDARY	99% @ 16	FORD, GMC 25011026	4.32	110	3.85	98	
1 1/4-12	4.67	119	8.94	227	G	P550958	FUEL PRIMARY	99% @ 30	DETROIT DIESEL 25011024	4.32	110	3.85	98	
	4.66	118	10.24	260	G	P550202	FUEL PRIMARY	99% @ 9	CUMMINS 299202	4.32	110	3.85	98	
	4.66	118	12.24	311	A	P552216	FUEL/WATER SEPARATOR	99% @ 17	CUMMINS 3309437	4.39	112	3.87	98	
	4.66	118	12.25	311	A	P550937	FUEL/WATER SEPARATOR	99% @ 9	Komatsu	4.33	110	3.86	98	Yes
	4.74	120	12.32	313	A	P552006	FUEL/WATER SEPARATOR	99% @ 10	CUMMINS 3089916	4.39	112	3.87	98	
1 5/8-12	4.66	118	11.73	298	G	P553500	FUEL SECONDARY	99% @ 3	Komatsu	4.33	110	3.86	98	
136 mm / 5.36" Dia. Family														
1 3/8-16	5.34	136	12.19	310	G	P551316	FUEL PRIMARY	99% @ 3	Caterpillar 1R-0755	4.28	109	3.90	99	
	5.38	137	11.77	299	F	P550348	FUEL/WATER SEPARATOR	99% @ 7	DETROIT DIESEL 23512631	4.29	109	3.92	100	
	5.38	137	12.13	308	G	P553080	FUEL PRIMARY	99% @ 9	CAT 8N-3080, 3500 SERIES ENGINE	4.31	109	3.92	100	

Twist&Drain™ Valves

Other Drain Valve Styles



Drain Valve



Packard



Deutsch

Drain Valve with
1/2" x 20 thread
Sensor Port

Bowl to Fit Port



Knob Types



Plug



Spin-on



I.D.		OD		Length		Item No	Part Description	Efficiency @ Micron	Primary Application
IN	MM	IN	MM	IN	MM				
Stanadyne FM100 System Fuel Filter Water Separators									
Stanadyne® is a registered trademark of Stanadyne Corporation									
.90	23	3.15	80	5.31	135	P551423	FUEL/WATER SEPARATOR- Standard Flow	99% @ 10	CAT, JOHN DEERE
.90	23	3.15	80	5.31	135	P551426	PRIMARY- Standard Flow	99% @ 20	AGCO, CAT, JCB
.90	23	3.15	80	5.31	135	P551429	PRIMARY- Standard Flow	99% @ 50	AGCO, CAT, PERKINS
.90	23	3.15	80	5.31	135	P551436	PRIMARY- Reverse Flow	99% @ 50	CAT
.90	23	3.15	80	6.05	154	P551421	FUEL/WATER SEPARATOR- Standard Flow	99% @ 3	IR, JOHN DEERE, LIEBHERR
.90	23	3.15	80	6.05	154	P551424	FUEL/WATER SEPARATOR- Standard Flow	99% @ 10	JOHN DEER, PERKINS, CAT
.90	23	3.15	80	6.05	154	P551427	PRIMARY- Standard Flow	99% @ 20	CAT, JOHN DEERE, JCB
.90	23	3.15	80	6.05	154	P551430	PRIMARY- Standard Flow	99% @ 50	JOHN DEERE, LIEBHERR, NEW HOLLAND
.90	23	3.15	80	6.05	154	P551432	FUEL/WATER SEPARATOR- Reverse Flow	99% @ 10	CNH, PERKINS, FORD
.90	23	3.15	80	6.05	154	P551434	PRIMARY- Reverse Flow	99% @ 20	JOHN DEERE, LIEBHERR, CASE, JCB
.90	23	3.15	80	6.05	154	P551437	PRIMARY- Reverse Flow	99% @ 50	JOHN DEERE, NEW HOLLAND
.90	23	3.15	80	7.71	196	P551422	FUEL/WATER SEPARATOR - Standard Flow	99% @ 3	JOHN DEERE, LIEBHERR
.90	23	3.15	80	7.71	196	P551425	FUEL/WATER SEPARATOR - Standard Flow	99% @ 10	CAT, CNH, JCB
.90	23	3.15	80	7.71	196	P551428	PRIMARY- Standard Flow	99% @ 20	JOHN DEERE
.90	23	3.15	80	7.71	196	P551431	PRIMARY- Standard Flow	99% @ 50	JOHN DEERE, MACK, RVI
.90	23	3.15	80	7.71	196	P551433	FUEL/WATER SEPARATOR- Reverse Flow	99% @ 10	CNH, FORD, CAT
.90	23	3.15	80	7.71	196	P551435	PRIMARY- Reverse Flow	99% @ 20	JOHN DEEERE, McCORMICK

I.D.		OD		Length		Item No	Part Description	Efficiency @ Micron	Primary Application
IN	MM	IN	MM	IN	MM				
Fuel Cartridges									
0.20	5	0.70	18	2.01	51	P550559	FUEL PRIMARY		GM 5651921
0.26	7	2.19	56	1.47	37	P550364	FUEL PRIMARY		LISTER PETTER 20113112
0.35	9	3.28	83	3.00	76	P505973	FUEL PRIMARY		TOYOTA HILUX
0.38	10	1.88	48	7.88	200	P552388	FUEL PRIMARY		BALDWIN F919C
0.38	10	2.24	57	2.99	76	P552341	FUEL PRIMARY	99% @ 45	CAT 9M2341, FOR 9M2342 USE 2 P552341
0.43	11	1.38	35	2.44	62	P502134	FUEL PRIMARY	50% @ 16	YANMAR 10450055710
0.43	11	1.38	35	3.39	86	P502166	FUEL PRIMARY	50% @ 16	YANMAR 12455055700, KUBOTA 16271-43560
0.44	11	2.14	54	3.47	88	P550214	FUEL PRIMARY	99% @ 20	CLARK, GMC, IHC, AUTO, PICKUP
0.43	11	2.44	62	2.36	60	P550038	FUEL PRIMARY	99% @ 30	HINO 23401-1060
0.43	11	2.83	72	1.73	44	P502113	FUEL PRIMARY	99% @ 30	MAZDA 3166201031
0.43	11	2.83	72	3.54	90	P550056	FUEL PRIMARY	99% @ 30	NISSAN 16444-29000
0.44	11	3.59	91	4.78	121	P550780	FUEL PRIMARY		MERCEDES A6120920001, SPRINTER VAN PRE 2004
0.47	12	1.38	35	3.43	87	P502135	FUEL PRIMARY	50% @ 12	YANMAR 10599155710
0.47	12	1.38	35	3.81	97	P502133	FUEL PRIMARY	50% @ 12	YANMAR
0.49	12	1.42	36	3.54	90	P550645	FUEL PRIMARY		Yanmar 11974055600
0.46	12	2.87	73	3.14	80	P550745	FUEL PRIMARY		YANMAR 120324-55760
0.47	12	3.30	84	5.53	140	P550349	FUEL PRIMARY		MERCEDES, MANN BF900X (FELT)
0.47	12	3.30	84	5.50	140	P550861	FUEL PRIMARY	99% @ 9	DEUTZ, MERCEDES, ATLAS-COPCO, IHC
0.52	13	1.14	29	2.27	58	P552378	FUEL PRIMARY		FORD SBA360720020
0.51	13	1.14	29	3.35	85	P502138	FUEL PRIMARY	50% @ 12	KUBOTA 15231-43563, 15231-43560
0.50	13	1.39	35	1.88	48	P550007	FUEL PRIMARY	99% @ 22	IHC, DODGE, FORD, JEEP, MELROE
0.51	13	1.87	47	1.77	45	P551769	FUEL PRIMARY		ISUZU 5878101970
0.53	13	2.22	56	4.49	114	P550860	FUEL PRIMARY		DEUTZ 1160033 (FELT)
0.52	13	2.75	70	4.52	115	P550481	FUEL PRIMARY		CLAAS, HANOMAG, LIEBHERR, MERCEDES, VOLVO
0.53	13	3.30	84	5.30	135	P550061	FUEL PRIMARY		DEUTZ 1168469
0.52	13	3.36	85	5.70	145	P550489	FUEL PRIMARY		CLAAS, DEMAG, LIEBHERR, MERCEDES
0.50	13	3.81	97	2.85	72	P550437	FUEL PRIMARY	95% @ 5	MOTORCRAFT FD4596, Ford F81Z-9N184-AA
0.55	14	2.60	66	4.30	109	P550060	FUEL PRIMARY	99% @ 9	DEUTZ, ATLAS COPCO (Pleated Paper)
0.57	14	2.83	72	3.35	85	P552563	FUEL PRIMARY	50% @ 20	ISUZU 5-878100500
0.56	14	3.56	90	3.99	101	P550966	FUEL/WATER SEPARATOR	50% @ 7	FORD NAVISTAR LIGHT TRUCK



Fuel Filters Cartridges by Inner Dia.



I.D.		OD		Length		Item No	Part Description	Efficiency @ Micron	Primary Application
IN	MM	IN	MM	IN	MM				
0.57	14	3.53	90	5.31	135	P550040	FUEL PRIMARY	50% @ 5	HITACHI 4514801, ISUZU 1878100270
0.57	14	3.54	90	5.52	140	P550044	FUEL PRIMARY	99% @ 30	DAEWOO 30062-65011
0.54	14	3.97	101	5.00	127	P551164	FUEL PRIMARY		MASSEY FERGUSON 1006543M91
0.57	14	4.00	102	6.32	161	P550042	FUEL PRIMARY	99% @ 30	ISUZU 1878102070
0.58	15	0.69	18	1.26	32	P550568	FUEL PRIMARY		FORD D7ZE9155AB
0.59	15	2.80	71	3.93	100	P550039	FUEL PRIMARY		HITACHI 4020429
0.58	15	2.93	74	2.91	74	P551339	FUEL PRIMARY	99% @ 30	TOYOTA 0423468010
0.58	15	3.33	84	2.88	73	P552470	FUEL PRIMARY		Allis Chalmers 4512207-3; Caterpillar 666-3172; Chrysler J0936407; Massey Ferguson 1069954-M91
0.59	15	3.58	91	5.43	138	P502116	FUEL PRIMARY	99% @ 30	DAEWOO ME971550, ME971553
0.59	15	3.60	91	6.38	162	P551338	FUEL PRIMARY	99% @ 30	DAEWOO 16444Z9027
0.59	15	3.62	92	4.33	110	P550054	FUEL PRIMARY	99% @ 30	DAEWOO ME036478
0.59	15	3.61	92	5.28	134	P550055	FUEL PRIMARY	99% @ 30	DAEWOO 16444-99128
0.59	15	3.62	92	5.31	135	P550023	FUEL PRIMARY	99% @ 30	DAEWOO 16444-90127
0.59	15	4.09	104	4.09	104	P550392	FUEL PRIMARY	99% @ 30	HINO 234011090
0.59	15	4.37	111	5.51	140	P550028	FUEL PRIMARY	99% @ 30	DAEWOO 16444-99028
0.62	16	2.59	66	4.47	114	P550120	FUEL PRIMARY	99% @ 20	MANN BF700X
0.62	16	2.93	74	2.20	56	P550673	FUEL PRIMARY	99% @ 25	IHC 478037C1
0.62	16	2.93	74	4.11	104	P550672	FUEL PRIMARY	99% @ 25	KOMATSU 600-311-8210
0.63	16	2.91	74	4.15	106	P550026	FUEL PRIMARY	99% @ 30	ISUZU 9-9885111940
0.63	16	2.95	75	2.60	66	P502118	FUEL PRIMARY	99% @ 30	TOYOTA 0423456010
0.63	16	3.50	89	6.42	163	P550366	FUEL/WATER SEPARATOR		FORD 844F9176CAB
0.66	17	3.82	97	7.00	178	P550757	FUEL PRIMARY	99% @ 16	DETROIT DIESEL 23521528
0.65	17	4.31	109	6.47	164	P550447	FUEL/WATER SEPARATOR	99% @ 20	FLEETGUARD FS1011 FOR OPTIGUARD SYSTEM
0.70	18	1.45	37	3.82	97	P552395	FUEL PRIMARY		WHITE 163956AS
0.72	18	3.13	80	5.44	138	P552423	FUEL PRIMARY		Service Element for Gravity Flow Service Tanks
0.69	18	4.52	115	8.10	206	P551624	FUEL SECONDARY	99% @ 30	AC TP624 w/Pleated Paper
0.75	19	2.95	75	6.97	177	P502196	FUEL PRIMARY	50% @ 20	ISUZU 13240045
0.75	19	3.37	86	4.12	105	P551748	FUEL PRIMARY		JOHN DEERE AR45678
0.74	19	3.41	87	2.80	71	P556245	FUEL PRIMARY	99% @ 14	CASE, JOHN DEERE, IHC, MF, ROOSAMASTER
0.75	19	3.44	87	3.41	87	P502169	FUEL PRIMARY	50% @ 10	LEYLAND ABU9642, MAZDA SL07-23570
0.75	19	3.50	89	2.76	70	P551168	FUEL PRIMARY		PERKINS 31938
0.75	19	3.50	89	2.80	71	P557111	FUEL PRIMARY		CAV FUEL SYSTEM APPLICATIONS
0.74	19	3.50	89	5.28	134	P550394	FUEL PRIMARY		MASSEY FERGUSON, PERKINS
0.73	19	3.62	92	5.51	140	P502114	FUEL PRIMARY	99% @ 30	DAEWOO ME046010
0.77	19	3.98	101	4.78	121	P552473	FUEL PRIMARY		Allis Chalmers BM33761; Cummins BM33761; Ford EDL-9176-A; International 3054750-R91
0.75	19	4.23	107	4.34	110	P551310	FUEL/WATER SEPARATOR	99% @ 10	CHRYSLER 0488396AA
0.79	20	1.97	50	3.50	89	P502161	FUEL PRIMARY	50% @ 16	YANMAR 12910055650, KUBOTA 15521-43160
0.78	20	4.25	108	6.73	171	P502131	FUEL PRIMARY	50% @ 20	MANN B405C,
0.81	21	2.75	70	3.37	86	P551167	FUEL PRIMARY		CHRYSLER 5037896
.82	21	3.41	87	4.10	104	P550800	FUEL/WATER SEPARATOR		DODGE LIGHT TRUCK, CHRYSLER 68001914AA
0.87	22	3.86	98	6.35	161	P502132	FUEL PRIMARY	99% @ 30	MANN EK405, P1018/1
0.87	22	4.64	118	8.39	213	P550125	FUEL PRIMARY	99% @ 20	CUMMINS 130909,299125
0.91	23	2.19	56	2.48	63	P550567	FUEL PRIMARY		PETTER 20332470
0.98	25	3.70	94	7.19	183	P550347	FUEL PRIMARY	99% @ 28	FIAT GEOTECH 1909107
0.97	25	5.00	127	9.75	248	P558600	FUEL PRIMARY		KOMATSU 6610-79-8600
0.98	25	5.83	148	8.07	205	P550316	FUEL/WATER SEPARATOR	99% @ 20	CAT, CUMMINS, GROVE
1.00	25	5.81	148	9.37	238	P550043	FUEL PRIMARY	99% @ 20	CUMMINS, HOUGH, MICH 139097, 256834
1.04	26	3.01	76	4.41	112	P550686	FUEL/WATER SEPARATOR	99% @ 25	FRAM CS1133PL SEPARATOR
1.02	26	3.00	76	6.00	152	P550522	FUEL SOCK	99% @ 40	GMC 21029
1.04	26	3.01	76	7.34	186	P550685	FUEL/WATER SEPARATOR	99% @ 25	FRAM CC1133PL COALESCER
1.03	26	2.98	76	7.81	198	P550540	FUEL SECONDARY	99% @ 22	CUMMINS, GMC 5573262
1.04	26	3.01	76	9.70	246	P551162	FUEL PRIMARY		CONTINENTAL 12395HE
1.02	26	4.33	110	7.91	201	P551337	FUEL PRIMARY	99% @ 30	DAEWOO 1644497001
1.08	27	2.99	76	7.95	202	P550627	FUEL PRIMARY		MAN TGA
1.06	27	3.19	81	4.53	115	P550201	FUEL SECONDARY	99% @ 25	MAZDA 237-GB-28
1.07	27	3.74	95	3.72	95	P502226	FUEL PRIMARY	50% @ 20	ISUZU 1132401940
1.08	27	3.78	96	6.16	156	P552390	FUEL PRIMARY		MAZDA 237GB29 237GB29-A
1.10	28	2.90	74	2.37	60	P550560	FUEL SOCK		CASE A35863, A36557



I.D.		OD		Length		Item No	Part Description	Efficiency @ Micron	Primary Application
IN	MM	IN	MM	IN	MM				
1.10	28	3.40	86	3.27	83	P553261	FUEL SECONDARY	99% @ 20	GMC 5573261
1.12	28	3.37	86	6.50	165	P558792	FUEL PRIMARY	99% @ 10	CAT 4H-8792, 9H-4729, 6H-5932
1.12	28	4.00	102	8.75	222	P550541	FUEL SOCK	99% @ 40	GMC 5574980
1.12	28	4.81	122	9.13	232	P550547	FUEL/WATER SEPARATOR	50% @ 30	CIMTEK EHS30, 300-07
1.12	28	4.81	122	9.13	232	P550607	FUEL/WATER SEPARATOR	50% @ 10	FUEL DISPENSING PUMPS
1.24	31	2.95	75	8.38	213	P550552	FUEL SOCK		GMC 5575032
1.32	34	3.48	88	4.80	122	P550501	FUEL PRIMARY	99% @ 9	PUROLATOR F70100 HOUSING
1.50	38	3.35	85	7.11	180	P550628	FUEL PRIMARY		Scania 164 and Scania marine engines DI series
1.53	39	3.46	88	4.45	113	P556287	FUEL PRIMARY		C.A.V. 7111/792
1.61	41	3.90	99	9.23	234	P551317	FUEL PRIMARY	99% @ 3	Caterpillar 1R-0756
1.62	41	3.93	100	9.25	235	P559850	FUEL PRIMARY	99% @ 22	CATERPILLAR 8N9850, 1R0718
1.73	44	1.38	35	0.45	11	P502115	FUEL PRIMARY	99% @ 30	mitsubishi MA125373
1.81	46	3.74	95	6.79	173	P785373	FUEL PRIMARY	99% @ 5	Man TGL Series 51125030061
1.81	46	4.13	105	8.06	205	P550631	FUEL PRIMARY		CUMMINS 299631
2.22	56	2.40	61	1.97	50	P550404	FUEL PRIMARY	99% @ 30	TOYOTA 2330034100
2.46	62	5.50	140	10.00	254	P550032	FUEL SOCK	99% @ 40	DETROIT DIESEL
2.60	66	3.35	85	4.43	113	P550527	FUEL/WATER SEPARATOR		FORD 3C3Z9N184CA F SERIES PICKUP
2.73	69	3.27	83	5.23	133	P550352	FUEL/WATER SEPARATOR	50% @ 5	GM 10154635, 6.2L DIESEL
3.39	86	3.58	91	3.94	100	P550808	FUEL		MERCEDES 6460920501
3.75	95	4.37	111	5.25	133	P564393	FUEL/WATER SEPARATOR	50% @ 2	SERVICE FILTER FOR DONALDSON K031011 FUEL MANAGER
3.75	95	4.37	111	9.25	235	P564278	FUEL/WATER SEPARATOR	50% @ 5	SERVICE FILTER FOR DONALDSON K031005, K031008 FUEL MANAGER
3.75	95	4.37	111	9.25	235	P564392	FUEL/WATER SEPARATOR	50% @ 2	SERVICE FILTER FOR DONALDSON K031010 FUEL MANAGER
3.75	95	4.37	111	9.25	235	P564430	FUEL/WATER SEPARATOR	50% @ 30	SERVICE FILTER FOR DONALDSON K031012 FUEL MANAGER
6.47	164	4.62	117	0.65	17	P550752	FUEL/WATER SEPARATOR		Fleetguard FS19559
NA	NA	0.64	16	0.79	20	P552373	FUEL SECONDARY	50% @ 40	Ford D9PZ-9155-A; GMC 5651924
G 8-36	NA	1.12	28	2.72	69	P502136	FUEL PRIMARY		CAT 557645
1/4-18	NA	2.38	60	37.25	946	P552383	FUEL PRIMARY		MURPHYMD13924A
Davco Fuel System Filters DAVCO® and EleMax® are registered trademarks of DAVCO Technology, LLC.									
0.66	17	3.45	88	4.44	113	P550460	FUEL/WATER SEPARATOR	99% @ 7	DAVCO 230/232 SERIES DETROIT DIESEL
0.66	17	3.82	97	6.74	171	P550463	FUEL/WATER SEPARATOR	98% @ 7	DAVCO 380/382 SERIES DETROIT DIESEL ENGINES
0.66	17	3.82	97	6.74	171	P550467	FUEL/WATER SEPARATOR	98% @ 7	DAVCO 380/382 SERIES ELEMEX FUEL PROCESSORS
0.66	17	3.82	97	7.00	178	P550736	FUEL/WATER SEPARATOR	98% @ 25	DAVCO 380/382 SERIES ELEMEX FUEL PROCESSORS
0.66	17	3.82	97	7.00	178	P550737	FUEL/WATER SEPARATOR	99% @ 50	DAVCO 380/382 SERIES ELEMEX FUEL PROCESSORS
0.66	17	3.81	97	7.03	179	P550796	FUEL/WATER SEPARATOR	99% @ 10	DAVCO 380/382 and CUMMINS FH230 FUEL PRO
0.66	17	4.21	107	6.74	171	P550510	FUEL/WATER SEPARATOR	99% @ 7	DAVCO 102011, 102012
.66	17	4.21	107	7.04	179	P550849	FUEL/WATER SEPARATOR	98% @ 7	DAVCO PLUS SIZE ELEMEX 7 MICRON
.66	17	4.21	107	7.04	179	P550851	FUEL/WATER SEPARATOR	98% @ 25	DAVCO PLUS SIZE ELEMEX 25 MICRON
.66	17	4.21	107	7.04	179	P550852	FUEL/WATER SEPARATOR	99% @ 5	DAVCO PLUS SIZE ELEMEX 5 MICRON
.66	17	4.21	107	7.04	179	P550853	FUEL/WATER SEPARATOR	99% @ 50	DAVCO PLUS SIZE ELEMEX 50 MICRON
1.04	26	5.83	148	7.61	193	P550854	FUEL/WATER SEPARATOR	98% @ 7	DAVCO 482 SERIES 7 MICRON
Metal Free Fuel Filters									
NA	NA	3.54	90	6.22	158	P550908	FUEL PRIMARY		CHRYSLER 68061633AA, CUMMINS 5257769
0.55	14	3.74	95	7.97	202	P550762	FUEL PRIMARY	99% @ 15	MERCEDES 5410900151
0.83	21	3.39	86	4.09	104	P550785	FUEL/WATER SEPARATOR	99% @ 10	CHRYSLER 5015581AD
0.82	21	3.74	95	5.59	142	P550657	FUEL/WATER SEPARATOR	99% @ 7	IH DT466 2004 ON
1.06	27	3.62	92	3.98	101	P550632	FUEL PRIMARY	99% @ 8	MERCEDES 0000901551
Racor Turbine System Filters Racor® is a registered trademark of Parker Hannifin Corporation									
0.50	13	1.78	45	2.68	68	P552000	FUEL/WATER SEPARATOR	99% @ 30	RACOR 2000 SERIES
0.63	16	3.25	83	2.44	62	P552010	FUEL/WATER SEPARATOR	99% @ 30	RACOR 2010 SERIES
0.81	21	4.28	109	4.63	118	P552040	FUEL/WATER SEPARATOR	99% @ 30	RACOR 2040 SERIES
0.81	21	4.28	109	9.63	245	P552020	FUEL/WATER SEPARATOR	99% @ 30	RACOR 2020 SERIES



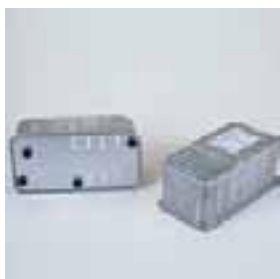


Fuel Box-Style Cartridges

Width		Length		Height		Item No	Part Description	Efficiency @ Micron	Primary Application
IN	MM	IN	MM	IN	MM				
Fuel Box-Style Cartridges									
2.64	67	4.38	111	2.59	66	P552387	FUEL BOX PRIMARY	99% @ 22	GMC 25010487
2.83	72	4.61	117	2.46	62	P550955	FUEL BOX PRIMARY	99% @ 22	GMC 6.2 DIESEL, STANADYNE 23775
2.83	72	4.62	117	2.46	62	P556285	FUEL BOX PRIMARY	99% @ 10	THERMOKING 116285
2.83	72	4.62	117	2.46	62	P556286	FUEL/WATER SEPARATOR BOX	99% @ 30	THERMOKING 116286
2.83	72	4.62	117	2.46	62	P557264	FUEL/WATER SEPARATOR BOX	99% @ 30	THERMOKING 117264
3.28	83	6.31	160	2.64	67	P551049	FUEL BOX PRIMARY	99% @ 22	GMC V8-379, STANADYNE 27611
3.71	94	4.95	126	3.15	80	P551130	FUEL BOX PRIMARY	99% @ 22	JOHN DEERE AR50041, STANADYNE 20014
3.71	94	5.04	128	3.28	83	P556745	FUEL BOX PRIMARY	99% @ 22	JOHN DEERE AR86745, STANADYNE 26667
3.71	94	4.95	126	3.34	85	P559803	FUEL BOX PRIMARY	99% @ 22	CAT 8N-9850, STANADYNE 21167



P550955



P551049



P551130



P552387



P556285



P556286



P556745



P557264



P559803

In-Line Fuel Filters (images & tables in part number order)

Item No	Primary Application	Outer. Dia.		Inlet Size	Length		Outlet Size	Efficiency @ Micron
		IN	MM		IN	MM		
P550012	PICKUPS AND CARS -- UNIVERSAL 5/16" 2 HOSES 4 CLAMPS	1.94	49	5/16	4.17	106	5/16	99% @ 40
P550016	FORD D7TE9155A, MOTORCRAFT FG778 (1 HOSE 2 CLAMPS INCLUDED)	1.33	34	5/16	2.71	69	1/8-27	99% @ 100
P550090	FORD, GMC -- 2 HOSES 4 CLAMPS INCLUDED	1.94	49	3/8	3.88	99	3/8	99% @ 22
P550091	FORD, MOTORCRAFT FG14 -- 1 HOSE 2 CLAMPS INCLUDED	1.06	27	5/16	2.86	73	1/8-27	99% @ 100
P550094	UNIVERSAL 1/4" O.D. LINES,	1.94	49	1/4	4.06	103	1/4	99% @ 22
P550126	FORD E3FZ9155C	2.90	74	5/16	5.82	148	5/16	50% @ 23
P550209	GM Light Truck	2.17	55	M16 x 1.5	4.29	109	M16 x 1.5	50% @ 23
P550433	CASE IH D145357	1.94	49	3/8	3.88	99	3/8	99% @ 150
P550446	JOHN DEERE AR103220, CUMMINS 3318919	1.89	48	5/8-24	3.54	90	5/8-24	99% @ 150
P550454	FORD D3FZ9155A, D2RY9155A -- 2 HOSES 4 CLAMPS INCLUDED	0.94	24	5/16	2.87	73	5/16	99% @ 100
P550457	JOHN DEERE T19743	2.00	51	1/8-27	2.38	60	1/2-20	50% @ 23
P550504	GM LIGHT TRUCK, AC GF624, G580	2.28	58	3/8	6.38	162	3/8	50% @ 23



P550012
PICKUPS AND CARS -- UNIVERSAL
5/16" 2 HOSES 4 CLAMPS



P550016
FORD D7TE9155A, MOTORCRAFT FG778
(1 HOSE 2 CLAMPS INCLUDED)



P550090
FORD, GMC -- 2 HOSES 4
CLAMPS INCLUDED



P550091
FORD, MOTORCRAFT FG14 -- 1 HOSE
2 CLAMPS INCLUDED



P550094
UNIVERSAL 1/4" O.D. LINES,



P550126
FORD E3FZ9155C



P550209
GM Light Truck



P550433
CASE IH D145357



P550446
JOHN DEERE AR103220, CUMMINS
3318919



P550454
FORD D3FZ9155A, D2RY9155A --
2 HOSES 4 CLAMPS INCLUDED



P550457
JOHN DEERE T19743



P550504
GM LIGHT TRUCK, AC GF624, G580



In-Line Fuel Filters (images & tables in part number order)

Item No	Primary Application	Outer. Dia.		Inlet Size	Length		Outlet Size	Efficiency @ Micron
		IN	MM		IN	MM		
P550508	AC LIGHT DUTY, GF645, G645	2.28	58	M16 x 1.5	5.35	136	3/8	
P550556	MOTORCRAFT FG1036	2.22	56	3/8	7.00	178	3/8	50% @ 23
P550593	FORD MOTORCRAFT FG19B	0.78	20	5/16	2.17	55	7/8-20	99% @ 100
P550967	FORD LIGHT TRUCK	3.08	78	5/16	6.77	172	5/16	50% @ 23
P550974	CUMMINS 3826094, CASE IH STX	1.94	49	3/8	3.93	100	3/8	99% @ 150
P551759	CHRYSLER 4554040	2.16	55	3/8	6.37	162	5/16	50% @ 23
P551760	ISUZU 825053640, 8251217780	2.32	59	5/16	5.47	139	5/16	50% @ 23
P551770	KOMATSU 20704A1100	1.88	48	1/2	4.34	110	1/2	99% @ 150
P551771	GM 25055347	2.00	51	1/2	4.35	110	1/2	50% @ 23
P551772	FORD F89Z9155A	2.30	58	5/16	7.00	178	5/16	
P552366	GM 5651944	2.28	58	5/8-18	4.75	121	3/8	50% @ 23
P552371	GMC 25121293	2.17	55	3/8	5.47	137	M16 x 1.5	50% @ 23



P550508
AC LIGHT DUTY, GF645, G645



P550556
MOTORCRAFT FG1036



P550593
FORD MOTORCRAFT FG19B



P550967
FORD LIGHT TRUCK



P550974
CUMMINS 3826094, CASE IH STX



P551759
CHRYSLER 4554040



P551760
ISUZU 825053640, 8251217780



P551770
Komatsu 20704A1100



P551771
GM 25055347



P551772
FORD F89Z9155A



P552366
GM 5651944



P552371
GMC 25121293

Item No	Primary Application	Outer Dia.		Inlet Size	Length		Outlet Size	Efficiency @ Micron
		IN	MM		IN	MM		
P552376	AMC 8933000076	3.07	78	3/8	6.06	154	5/16	50% @ 23
P552392	BMW 13321270038 13329063165	3.19	81	5/16	6.26	159	5/16	50% @ 23
P552394	GMC 25175542; Nissan 16400-D0100, Toyota	4.05	103	9/32	2.31	59	9/32	50% @ 23
P552397	GMC 25121472	2.28	58	3/8	6.47	164	3/8	50% @ 23
P552398	Mitsubishi MB504753, MB658689; Toyota 23030-74020, 23300-19045	2.80	71	M14 x 1.5	4.37	111	M12 x 1.25	50% @ 23
P552399	GMC 25010487	2.05	52	5/16	2.11	54	5/16	
P552400	Chrysler MB504732, MB504750; Suzuki 15410-61A00	2.80	71	M12 x 1.25	5.04	128	M12 x 1.25	50% @ 12
P552401	Mitsubishi MB433774	2.07	53	5/16	2.82	72	5/16	
P552403	Chrysler 4443452, 4443454, 4549712	2.18	55	5/16	4.74	120	5/16	50% @ 11
P552437	Nissan 16400-72L00	2.50	64	5/16	5.00	127	5/16	50% @ 23
P552439	Chrysler 4708317, 52019023, 52020016	2.15	55	5/16	6.22	158	5/16	50% @ 23
P552442	Audi 893133511; Ferrari 117792; Volkswagen 447133511; Volvo 13895628	3.46	88	M14 x 1.5	5.86	149	M12 x 1.5	50% @ 23



P552376
AMC 8933000076



P552392
BMW 13321270038 13329063165



P552394
GMC 25175542; Nissan 16400-D0100, Toyota



P552397
GMC 25121472



P552398
Mitsubishi MB504753, MB658689; Toyota 23030-74020, 23300-19045



P552399
GMC 25010487



P552400
Chrysler MB504732, MB504750; Suzuki 15410-61A00



P552401
Mitsubishi MB433774



P552403
Chrysler 4443452, 4443454, 4549712



P552437
Nissan 16400-72L00



P552439
Chrysler 4708317, 52019023, 52020016



P552442
Audi 893133511; Ferrari 117792; Volkswagen 447133511; Volvo 13895628



In-Line Fuel Filters (images & tables in part number order)

Item No	Primary Application	Outer. Dia.		Inlet Size	Length		Outlet Size	Efficiency @ Micron
		IN	MM		IN	MM		
P552448	GMC 25121978	2.28	58	3/8	6.37	162	3/8	50% @ 23
P552482	JOHN DEERE RE38818	1.94	49	9/16-18	3.65	93	9/16-18	99% @ 150



P552448
GMC 25121978



P552482
JOHN DEERE RE38818

Filter Wrenches

Band-Type Wrenches for Truck & Tractor Applications

Extra heavy-duty band-type wrenches available in small, medium and large sizes. Each model has a heavy-duty yoke and a 1-1/2" wide steel band for high torque requirements. Use with 1/2" square drive tools.

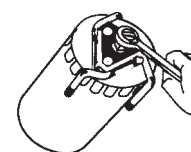
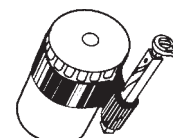
Range		Part Number
Inches	Millimeters	
4-1/8" - 4 5/8"	104mm - 118mm	P172973
4-5/8" - 5-1/8"	118mm - 131mm	P172974
5-1/8" - 5-5/8"	131mm - 141mm	P172975



Universal Wrenches

Donaldson carries two styles that fit practically all oil filters. The "Spider" design features three heavy-duty grooved legs driven by a gear mechanism. The strap design is constructed of strong nylon web, which acts as a belt for a non-slip grip - this model can also fit large truck filters.

Range		Part Number
Inches	Millimeters	
2-3/8" - 4-3/4"	61mm-121mm	P172969 Spider
Up to 6"	Up to 152mm	P172970 Strap



Adjustable, Slot-Design Wrench

This wrench adjusts to a relatively wide range of filter diameters.

Range		Part Number
Inches	Millimeters	
2-3/4" - 4-1/4"	70mm - 108mm	P172972

