Spiracle™ Crankcase Filtration Technology for Open (OCV) and Closed (CCV) Systems

- Standard and custom design options
- Proprietary Synteq™ XP media technology
- High overall efficiency (>95%)
- Very high efficiency on small particles
- Low and stable pressure drop
- Filter service interval up to 2000 hours
- No moving parts and no electric or hydraulic power requirements
A Serviceable Filter System provides the greatest efficiency...

with our new proprietary Synteq™ XP Filter Media

Crankcase filtration choices for today’s manufacturers include serviceable systems and non-serviceable systems, open crankcase ventilation (OCV) or closed crankcase ventilation systems (CCV).

While we have design and manufacturing experience for serviceable and non-serviceable filtration systems for both open and closed crankcase vents, we believe the design features and performance of the serviceable Spiracle makes it an ideal choice.

You can eliminate 100% of the crankcase emissions with a CCV design and up to 95% (5% of filtered aerosol emitted) with a Donaldson OCV design AND Synteq™ XP media.

Medium Standard Housing Part No.: S040020

Operating Range: Blow-by Airflow Rate: 150 – 300 lpm (5.3 – 10.6 cfm)
Blow-by Mass Flow Rate: 0 – 15 gms/hr

- Integrated pressure regulator prevents excess vacuum in the crankcase
- Optional third port for visual or electrical filter condition indicator
- Pressure relief by-pass valve
- Latched service cover simplifies filter service
- Self-draining, serviceable filter with Synteq™ XP filtration technology
- Filter life up to 2000 hours *
- Mounting band with 360º rotation included
- Plugs and adapters for standard pipe connections
- Optional third port for visual or electrical filter condition indicator
- Plastic housing - lightweight, non-metal

Tailpipe and Crankcase Emissions Contributions

Crankcase emissions levels in diesel engines have remained relatively constant up to 2006. However, with a reduction in tailpipe emissions, the crankcase emissions will account for a greater share of the total engine emissions.

% Tailpipe Contribution % Crankcase Contribution

US Pats 6,530,964; 7,182,804 and other U.S. and international patents pending

* Engines produce varying levels of contaminant; maximum filter life will vary by engine.
### High efficiency filtration

**for crankcase aerosol and submicron particulate**

** ~95% on proposed ISO 20564-1 aerosol

### Synteq™ XP Characteristics

Patent-pending, Synteq XP is a revolutionary new media that has a lower operating pressure drop, higher efficiency and longer filter life compared to traditional media.

- Improved oil drainage
- Improves efficiency for a given pressure loss
- Maintains efficiency over time
- Improves filter life
- Non-shedding

### Operating Range

<table>
<thead>
<tr>
<th>Part No.: S040033</th>
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</thead>
<tbody>
<tr>
<td><strong>Operating Range</strong></td>
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</tr>
<tr>
<td>Blow-by Airflow Rate</td>
<td>0-150 lpm (0 to 5.3 cfm)</td>
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<tr>
<td>Blow-by Mass Flow Rate</td>
<td>0 to 5 gms/hr</td>
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</tbody>
</table>

### Part No.: S040033

- Latched and threaded service cover simplifies filter service
- Integrated pressure regulator
- Outlet port back to engine intake for CCV or to clean air exhaust to the environment for OCV
- 3/4" ID Hose Connection
- Self-draining, serviceable filter with Synteq™ XP filtration technology
- Filter life up to 2000 hours *

### Part No.: S040035

- Inlet port from engine crankcase, 3/4" ID Hose Connection
- Mounting band with 360º rotation
- Plastic housing - lightweight, non-metal
- Oil drain connection returns coalesced oil to the engine sump with remote check valve
- (extended body length compared to S040033)

**Better oil drainage means less pressure drop, improved efficiency and filter life.**

Oil soaked area is blocked or plugged media.

**Steady State Oil Line Height Comparison after 16 hours**

**Competitive filter**

**Synteq XP filter**

**Synteq™ XP SEM x300**
We understand the challenges of crankcase filtration pressure, efficiency and size
... and we have the technical know-how and development tools in place to help you with both first-fit and retrofit solutions

Donaldson engineers have a number tools available for the design, development and testing of crankcase filtration systems.

This crankcase gas test bench is used to verify design concepts by rapidly and accurately measuring filter performance under simulated engine flows, temperatures and aerosols.

Donaldson has the capability to measure blow-by gas particulate size distribution at various engine conditions to develop optimized crankcase filtration solutions. The chart below is the result from 5.9L 260 HP engine.

Spiracle crankcase filtration system is efficient over a broad range of oil mist sizes. The oil mist from engine blow-by ranges typically from 30 nanometers to 6 microns in size.

Over 14,000 Spiracle systems installed!
As part of U.S. EPA and CARB regulatory agency initiatives, buses, trucks and municipal fleets throughout the United States are equipped with our crankcase filtration system.