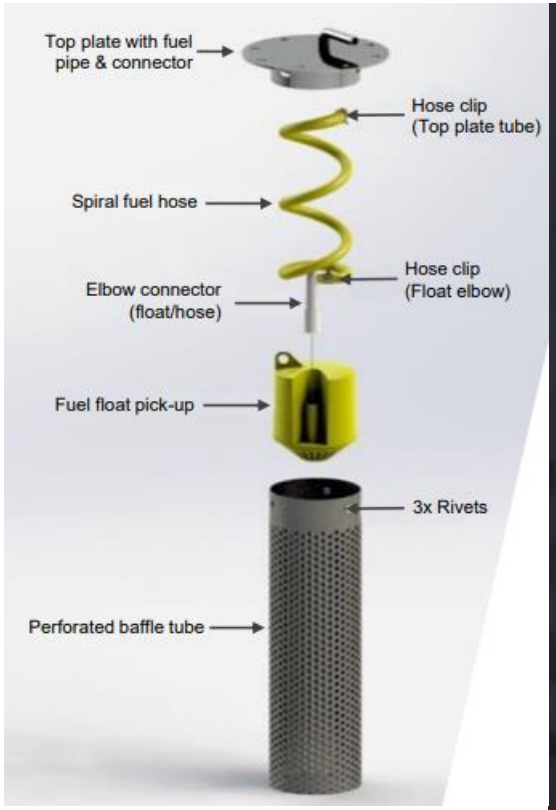
Fuel Active – Floating Fuel Pick-up



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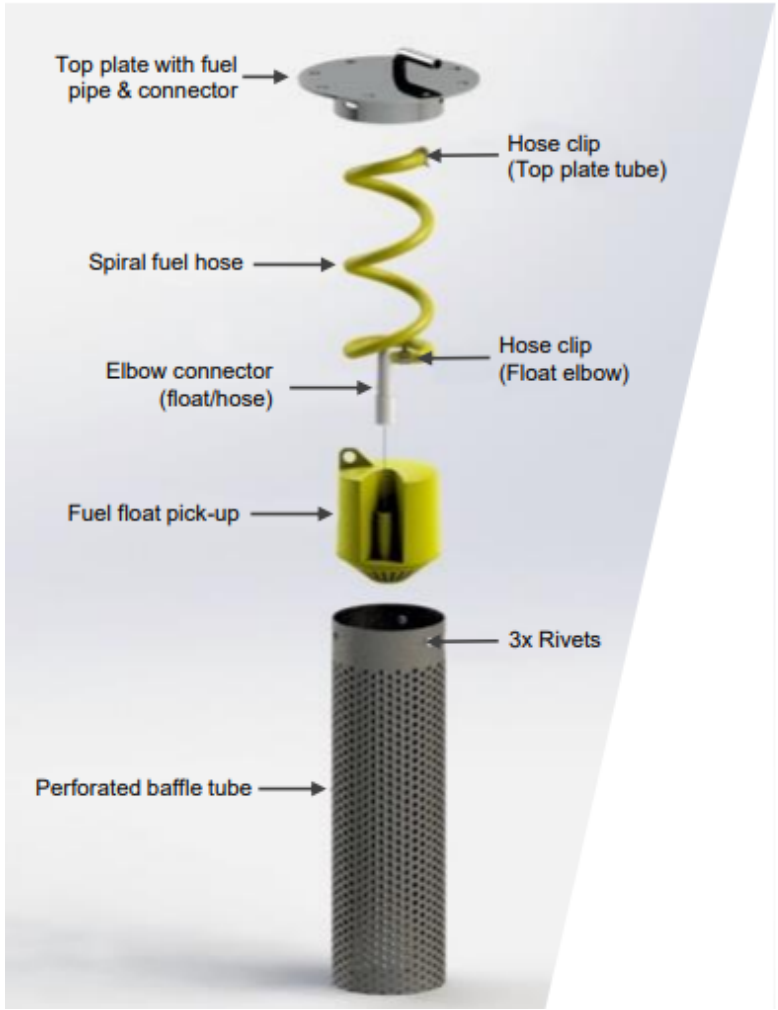
Presented By: Ross Wert – President Rosco Mining Solutions

Fuel Active – Floating Fuel Pick-up

Simple design, no maintenance



It is not a **Filter**

Design philosophy:

- ✓ **No maintenance** required
- ✓ **Simple & Robust**, with only functional parts
- ✓ **Long operational life 5 Year standard warranty**

Key components:

- ✓ Float – to **place the fuel pick-up** in the optimum strata
- ✓ Fuel hose – **spiral construction**, provides resistance response to changing fuel height
- ✓ Baffle tube – to **guide the float**, dampen agitation and protect the hose

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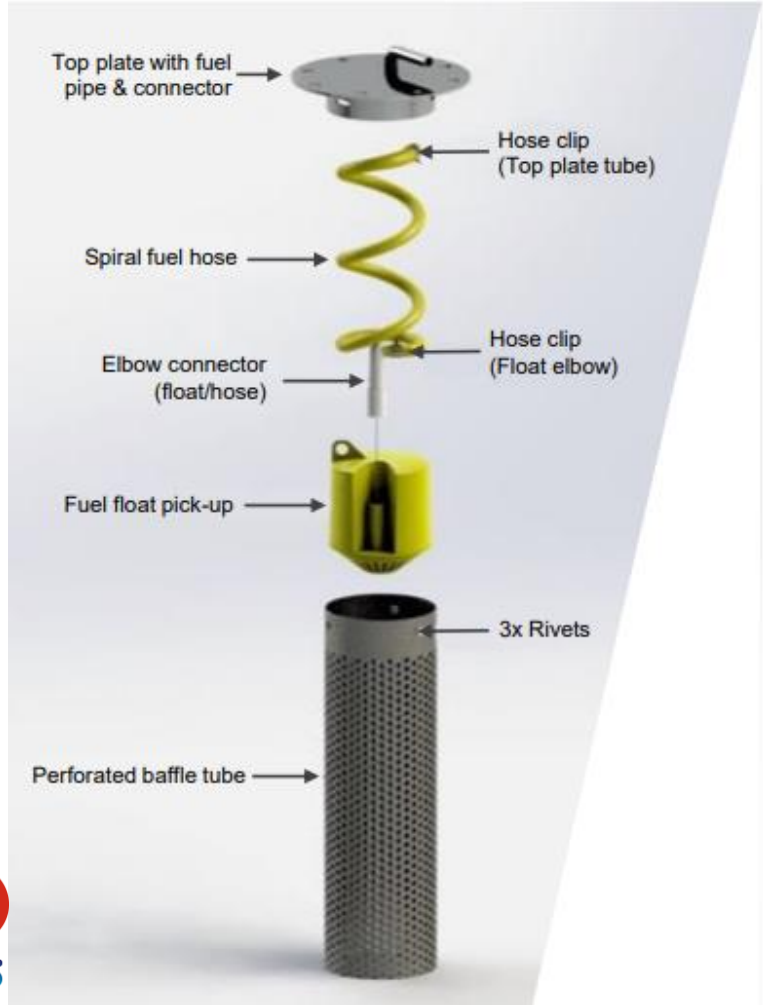
Fuel Active – Floating Fuel Pick-up

Components – engineered to last



Top Plate:

- Stainless Steel 304

Spiral Fuel Hose:

- Tygon. Plastic Hydrocarbon resistant

Fuel Float Pick Up:

- Plastic Hydrocarbon resistant, remains pliable when immersed in fuel (*Global Patent*)

Perforated Baffle Tube:

- Stainless Steel 304

Gasket – BS Nitrile / Klingersil

Operational Temperature: -50°C to + 50°C

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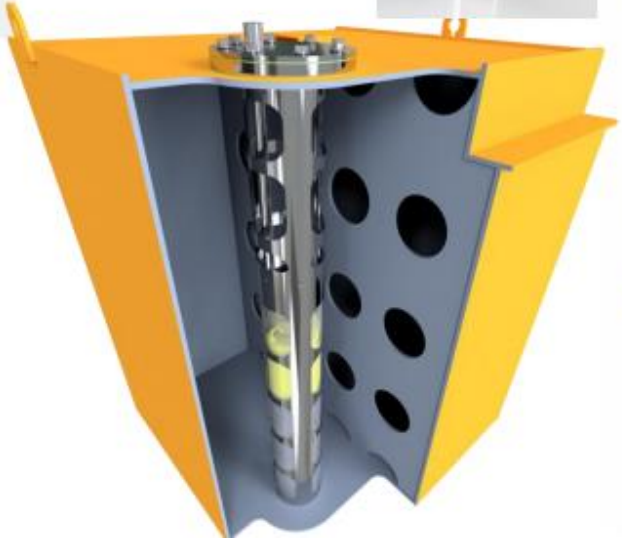
Fuel Active – Floating Fuel Pick-up

Core Mining Product

Komatsu 730e

CAT777 /
KOM 785



KOM 930

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Fuel Active – Floating Fuel Pick-up

The problem with fuel contamination

Water, Particles and Microbial Growth

- Fuel contaminated through the supply chain
- **Water** is the killer and hard to avoid
- **Particles** are ever present (EN590 / ISO4406)
- Water + FAME = **Diesel Bug**

195 DMU – Inside the tank (black dust)

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Fuel Active – Floating Fuel Pick-up

What are the consequences?

Global problem eroding capital efficiency

- Blocked filters
- Fuel pump failure
- Injectors degrade and fail
- Increased cost throughout supply chain

Reduced Fuel Economy	Increased Emissions
Increased R&M Costs	Loss of Productivity

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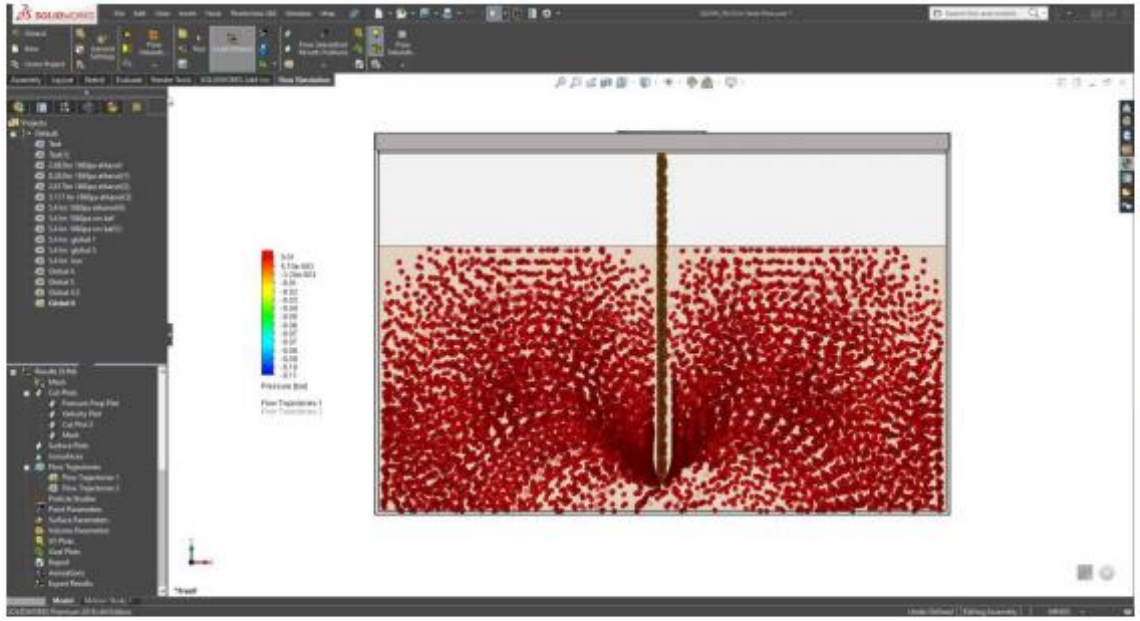
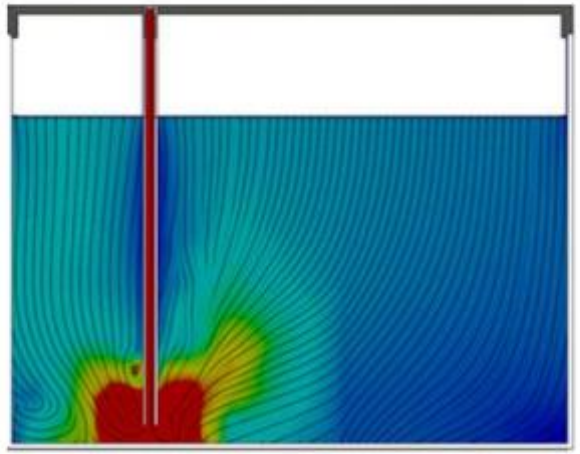
Fuel Active – Floating Fuel Pick-up

Standard pick up pipe fluid dynamics





- Fluid dynamics of standard pickup pipe in B7 Diesel
- Narrow bore pipe creates a vacuum (low pressure / high velocity)
- In proximity to contaminated – ingestion of poorest quality fuel to the fuel lines

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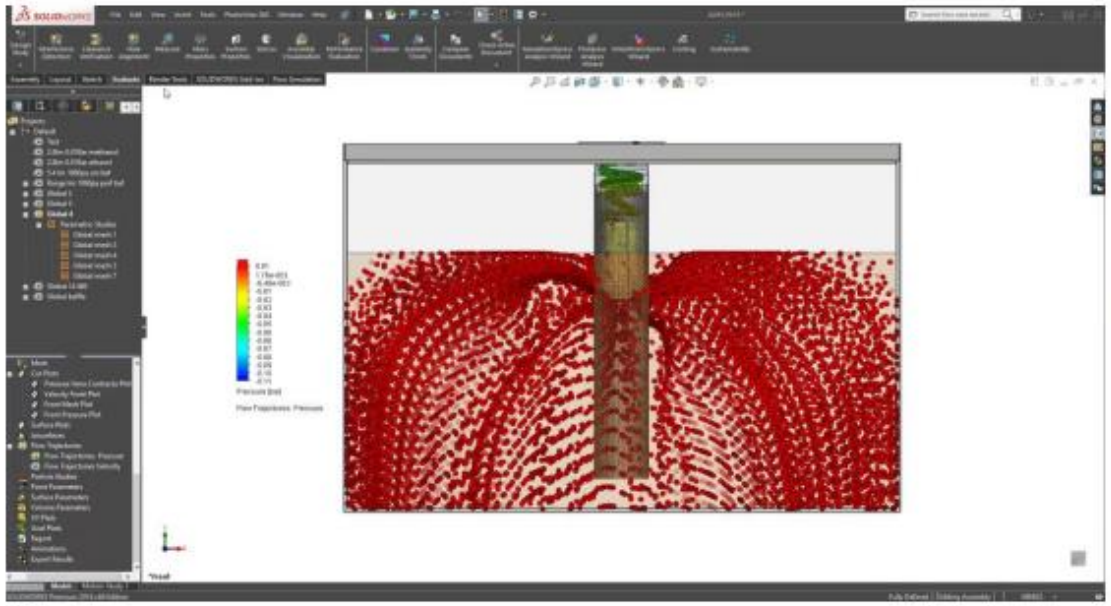
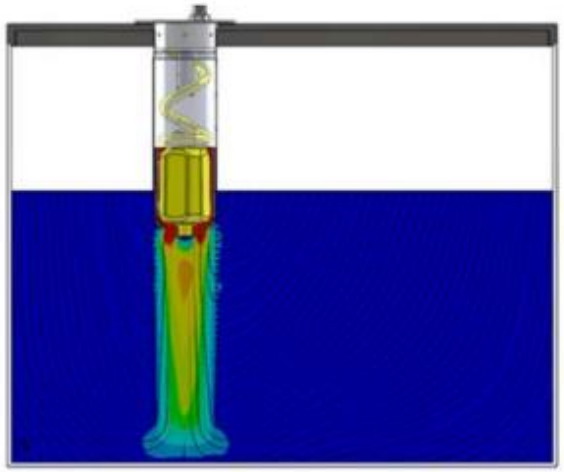
Fuel Active – Floating Fuel Pick-up

FuelActive fluid dynamics





- Fluid dynamics of FuelActive in B7 Diesel
- Float creates a unique flow dynamic – diffusing localized pressure
- Operates across normal tank level, avoiding poor quality / contaminated fuel at bottom of tank

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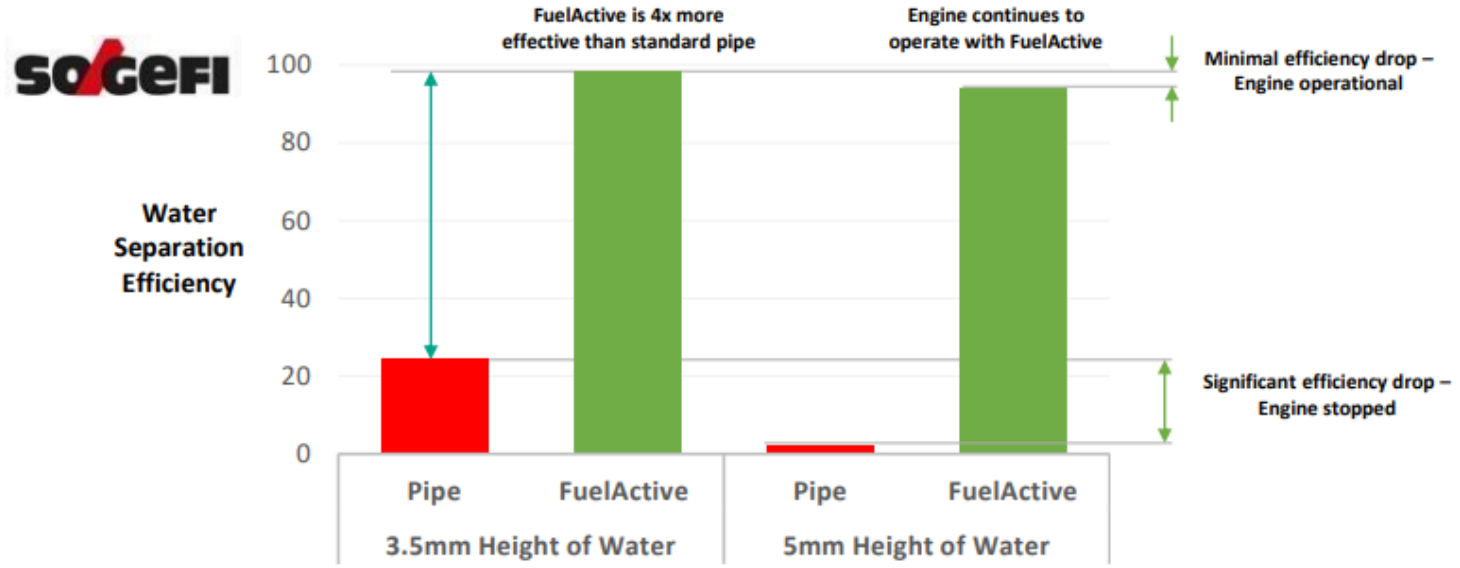
Fuel Active – Floating Fuel Pick-up

4 x more effective in the presence of water

- At 3.5mm water, standard **straight pick up pipe water separation efficiency is only 24.4%** compared with **98.6% for FuelActive**
- **FuelActive is 4x more efficient** in water separation and offers the fuel filters significant protection
- When the **water height was increased to 5mm**, FuelActive achieved 94.2% efficiency, with the **engine stopping with the standard pipe**



Notes:

1. Test performed by Sogefi, in laboratory conditions
2. Evaluation of the effectiveness of the FuelActive float pick-up system compared with the conventional straight pipe fuel pick up
3. Water separation efficiency tests using various fuel and water volumes, with the test rig simulating the slosh conditions in a fuel tank
4. Both pick up points were connected to identical pumps via two separate high efficiency water separators. The efficiency of the fuel pick ups was calculated by comparing the water carry over with the total volume pumped through the water separators in a specific time. Flow rate of the pump 430ml per minute

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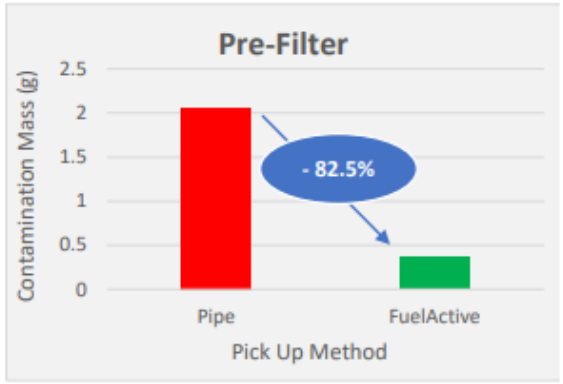
Fuel Active – Floating Fuel Pick-up

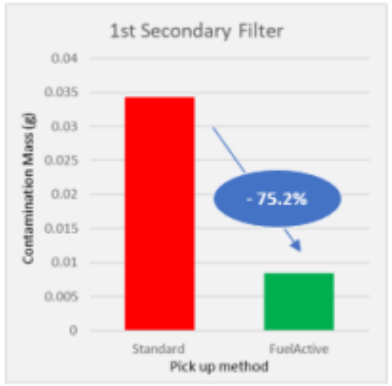
4 x more effective in reducing filter contamination

- For the same fuel line architecture, **FuelActive reduces filter contamination by 82.5% in pre-filters and 66.8% in secondary filters** compared to a conventional pick up pipe
- Across the filtration system **FuelActive reduces contamination by 1.727 grams or 82.2%** when compared to a conventional pick up pipe
- Fuel filters are not 100% effective, **FuelActive reduces the contamination sent to the filters and as such the engine which protects sensitive engine components, particularly injectors**

NORTHERN

CAF





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Notes:

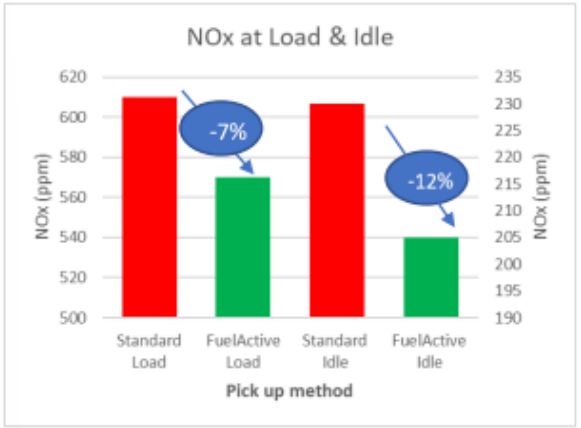
1. Filters provided from CAF Civity 195 DMU, provided by Northern Rail. Pre filters were mislabelled in transit but agreed by Northern Rail to revert after analysis by MTD
2. Filters were changed on both tanks when FuelActive was installed at one end. Filters were removed during next standard maintenance
3. For each system there is one Pre-Filter (R90P) and two Secondary Filters (KC102) which run in series
4. Test performed by MTD, in laboratory conditions, with contamination is extracted by soaking samples in methanol for extended periods of time.
5. Test results show aggregate result from 3 samples from each individual filter for both systems (1 Pre-Filter and 2 Secondary Filters per system)

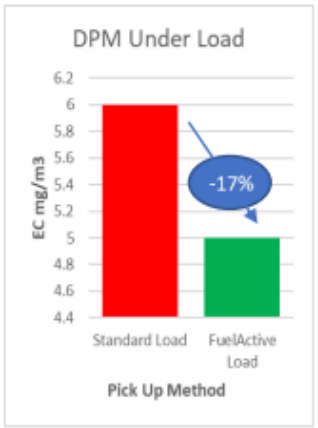
MTD | MINTON, TREHARNE & DAVIES GROUP

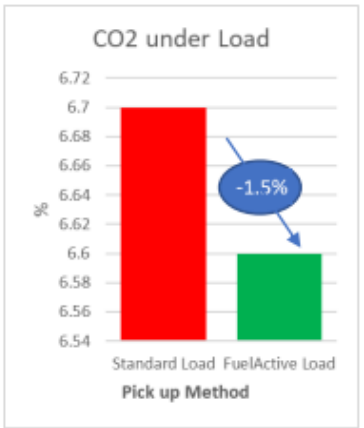
Fuel Active – Floating Fuel Pick-up

Reduces Harmful Emissions

- FuelActive pilot targeting reduction of harmful emissions in Underground mining with International mining company
- **Diesel Particulate Matter (DPM),** the 'silent killer' reduced by **17%**
- **NOx** reduced by an average of **10%**
- **CO2** reduced by **1.5%**







Notes:

1. Top 5 Australian mining company installed FuelActive MA10 unit on Torque Enterprises Titan
2. Testing carried out on same machine, pre installation and 8 days later after FuelActive was installed. No operational hours added between testing (Hr Meter Reading 10576 at both tests)
3. Testing carried out at load & idle
4. Testing carried out by Coal Mine Technical Services, a NATA accredited independent testing company in New South Wales
5. Results were presented by customer at the NSW Underground Mining Seminar in March 2023
6. Certification of testing available by request

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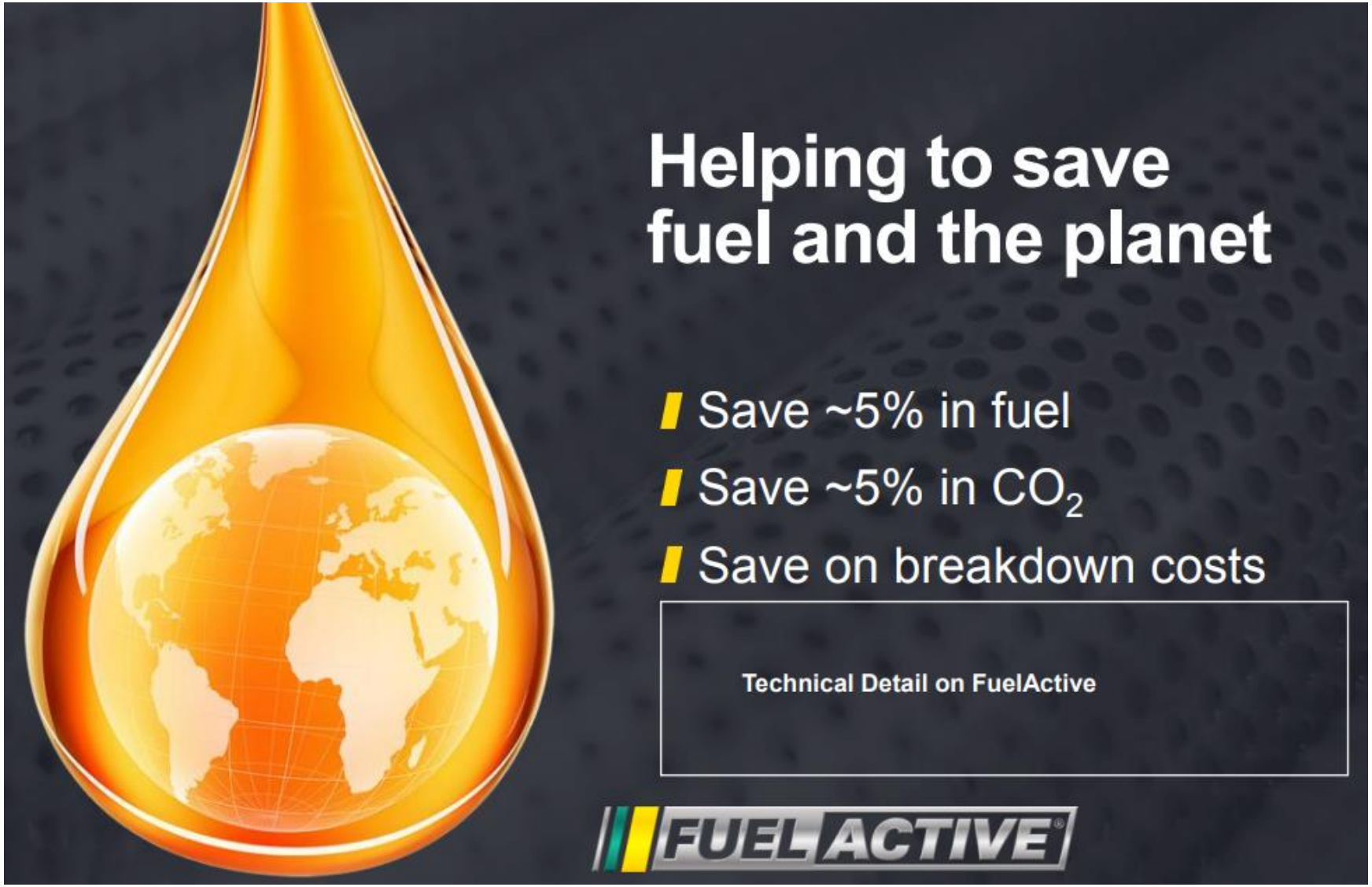
Fuel Active – Floating Fuel Pick-up



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FUEL ACTIVE

Fuel Active – MA16

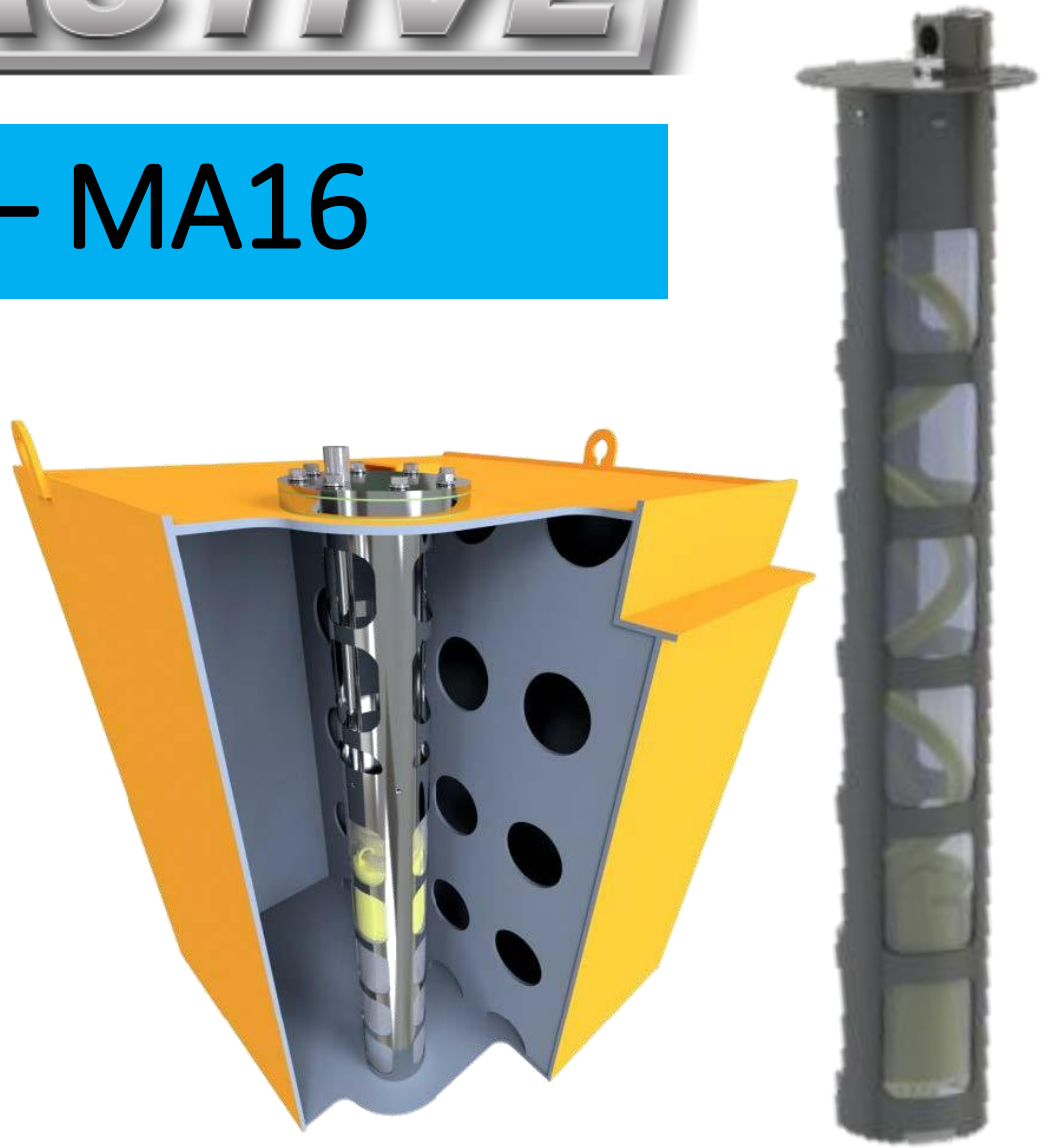
Caterpillar 777

Komatsu 785

-1350 L/HR

600 – 1400 HP

450 - 1000 KW



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Fuel Active – HHP1

Hydraulic Excavators

*2M+ Deep tanks

< 1750 HP

< 1300 KW

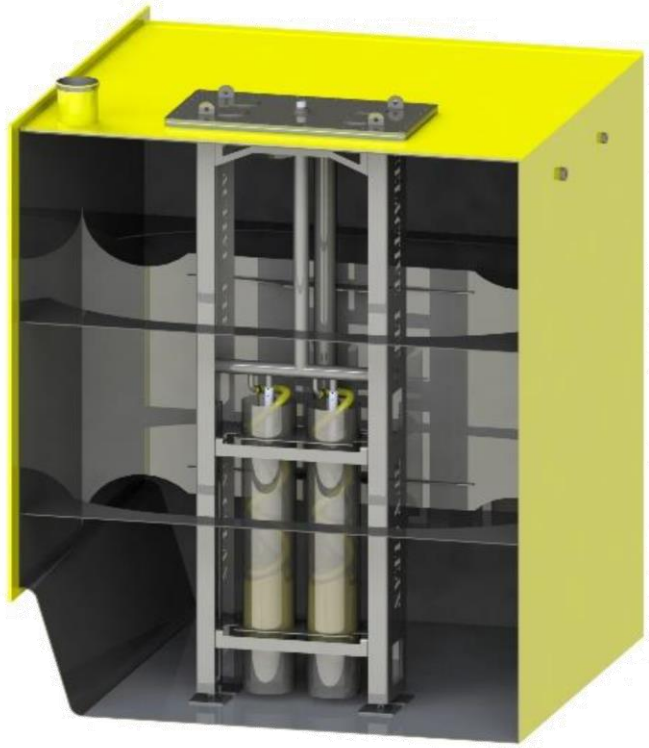
Fuel Active – HHP2

785 -789

730 -830

1750 – 3500 HP

1300 – 2600 KW



FUEL ACTIVE

Fuel Active – HHP3

793 & UP

930 & UP

3500 – 5300 HP

2600 – 4000 KW

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