Webasto
Feel the Drive

Cost-Effective and Idle Reducing Technology

Engine-Off Heating & Air Conditioning for Off-Highway Machines

Optimum Temperature Equals Optimum Performance

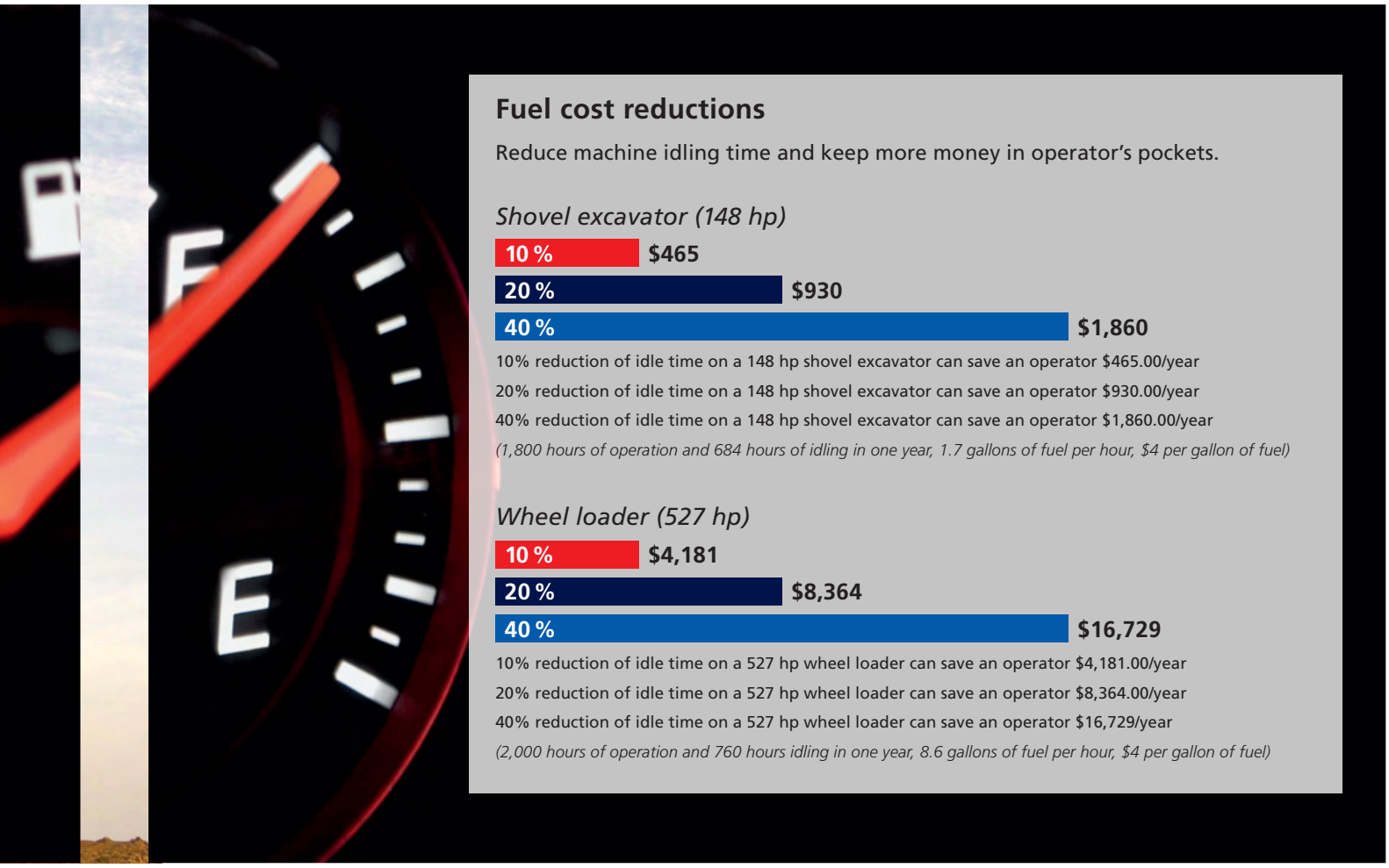
Benefits at a glance:

- Less overall engine hours
- Reduced emissions on cold start-up
- Extend the life of DPF's
- Reduced cost of ownership
- Increase resale value
- Reduced engine idling for lower fuel consumption

Get the job done – more efficiently

Today's competitive market demands that projects get done quickly and professionally. Webasto products are designed to improve machine performance and increase operator comfort. When combined, machines and operators are able to perform at their optimal level.

Dial in the cost savings.
Reduce Idling. Reduce Costs.



Fuel cost reductions

Reduce machine idling time and keep more money in operator's pockets.

Shovel excavator (148 hp)

10 % $465

20 % $930

40 % $1,860

10% reduction of idle time on a 148 hp shovel excavator can save an operator $465.00/year

20% reduction of idle time on a 148 hp shovel excavator can save an operator $930.00/year

40% reduction of idle time on a 148 hp shovel excavator can save an operator $1,860.00/year

(1,800 hours of operation and 684 hours of idling in one year, 1.7 gallons of fuel per hour, $4 per gallon of fuel)

Wheel loader (527 hp)

10 % $4,181

20 % $8,364

40 % $16,729

10% reduction of idle time on a 527 hp wheel loader can save an operator $4,181.00/year

20% reduction of idle time on a 527 hp wheel loader can save an operator $8,364.00/year

40% reduction of idle time on a 527 hp wheel loader can save an operator $16,729/year

(2,000 hours of operation and 760 hours idling in one year, 8.6 gallons of fuel per hour, $4 per gallon of fuel)

Idling has a price

Webasto's comfort solutions enable operators to cut costs and efficiently maintain comfort while their machine is off. Machine operators no longer need to idle equipment to maintain engine heat, reduce fuel gelling and keep cabs warm. Operating engines at a low speed (idling) causes twice the wear on internal parts, which increases maintenance costs and can even shorten the life of the engine over time. Shown above - idling can raise expenses by up to 17%. Idling causes unnecessary fuel consumption and increases machine working hours, both impacting the maintenance cycle as well as machine warranties.

Engine-Off Cabin Cooling Technology

Polar Cab ES

Machinery and operators are expected to work under the harshest conditions. Webasto offers an innovative solution for on-demand engine-off cabin cooling. Operators can turn off engines to reduce emissions, fuel costs, and maintenance costs while remaining cool and comfortable during wait/load times.

Polar Cab ES

Air Handler

Polar Cab ES is designed to fit onto a variety of machine sizes. Webasto offers two cabin air-handler options: The **Osaka** is a floor mounted air handler. The **Oakland** is a vertical over-head mounted air handler.

Compressor/Condenser Unit with evaporator

The Polar Cab ES is a battery driven electric cabin cooling system. When the engine is off, the Polar Cab ES can then be turned on (during wait/load time) to keep cabin temperatures cool and comfortable.

Benefits at a glance:

- Reduces engine hours
- Saves fuel
- Maintains cabin temperature
- Increased productivity

Technical Specifications

	Polar Cab ES with Oakland (universal overhead evaporator)	Polar Cab ES with Osaka (universal vertical floor evaporator)
Part Number	5011840A	5011850A
Max Air Flow evaporator blower	190 cfm (325 m³h)	206 cfm (350 m³h)
Cooling Capacity	7,000 btu/h (2kW)	7,000 btu/h (2kW)
Referigerant	R134a	R134a
Nominal Voltage	24 VDC	24 VDC
Power Consumption	40 amps	40 amps

NOTE: All technical data subject to change, ±10% tolerance on all Specifications.

* Dimensions do not include hose and mounting hardware.

Engine-Off Heating

Air Heaters

By drawing in ambient air, passing it over a high efficiency heat exchanger, warming it and discharging it into the cab, a Webasto air heater is able to rapidly heat the cab interior. This extends the work day and increases operator comfort and productivity.

Features & Benefits:

- Up to 22 hours of heat on a single gallon of fuel
- Saves Fuel
- Reduce emissions
- Full diagnostics with PC interface

Model	Output	Fuel Type	Fuel Consumption	Rated Voltage	Power Consumption	Dimensions (L x W x H)	Weight
Air Top 2000 ST	7,000 BTU/h *(2 kW)*	Diesel Gasoline B20	0.03 - 0.06 gal/h *(0.12 - 0.24 l/h)*	12 or 24 V	1.17 - 2.4 Amps @ 12 V 0.58 - 1.2 Amps @ 24 V	12.5 x 4.8 x 4.8 in *(311 x 120 x 121 mm)*	5.7 lbs *(2.6 kg)*
Air Top Evo 40	13,300 BTU/h *(4 kW)*		0.05 - 0.13 gal/h *(0.18 - 0.49 l/h)*	12 or 24 V	1.25 - 4.58 Amps	16.7 x 5.8 x 6.4 in *(423 x 148 x 162 mm)*	13 lbs *(5.9 kg)*
Air Top Evo 55	18,800 BTU/h *(5.5 kW)*		0.05 - 0.21 gal/h *(0.18 - 0.80 l/h)*	12 or 24 V	1.25 - 10.8 Amps	16.7 x 5.8 x 6.4 in *(423 x 148 x 162 mm)*	13 lbs *(5.9 kg)*

Air Top 2000 ST

Air Top Evo 40 / Air Top Evo 55

Coolant Heaters

A Webasto coolant heater draws in cold engine coolant, then heats it and pumps it back to the vehicle's engine and HVAC system. The result is a pre-heated engine and warm interior. In extreme climates, the heater can be used with additional accessories to warm the fuel, hydraulic fluid, and batteries. Pre-heating engines significantly improves DPF performance.

Features & Benefits:

- Provides engine pre-heat & interior cab heat
- Saves fuel and eliminates cold starts
- Increases productivity & extends hours of operation
- Reduces engine hours, wear and maintenance costs
- Increase productivity
- Reduce DPF's & improves DPF performance

Model	Output	Fuel Type	Fuel Consumption	Rated Voltage	Power Consumption	Dimensions (L x W x H)	Weight
Thermo Top C	17,200 BTU/h *(5 kW)*	Diesel, B20 Gasoline	0.07 - 0.16 gal/h *(0.27 - 0.63 l/h)*	12 V	1.5 - 2.7 Amps @ 12 V	9.125 x 4.125 x 6.4 in *(232 x 105 x 193 mm)*	7 lbs *(3.2 kg)*
Thermo Pro 50	17,000 BTU/h *(5 kW)*	Diesel B20	0.08 - 0.17 gal/h *(0.27 - 0.63 l/h)*	24 V	1.4 - 2.1 Amps @ 24 V	9.125 x 4.125 x 6.4 in *(232 x 105 x 193 mm)*	7 lbs *(3.2 kg)*
Thermo Pro 90	31,000 BTU/h *(9.1 kW)*		0.05 - 0.29 gal/h *(0.2 - 1.1 l/h)*	12 or 24 V	3.1 - 7.5 Amps @ 12 V 1.53 - 3.75 Amps @ 24 V	15 x 5.5 x 9.13 in *(381 x 140 x 232 mm)*	10.8 lbs *(4.9 kg)*
DBW 2010	45,000 BTU/h *(13.1 kW)*		0.4 gal/h *(1.5 l/h)*	12 or 24 V	5 Amps @ 12 V 2.5 Amps @ 24 V	24 x 9.75 x 11.625 in *(584 x 205 x 228 mm)*	33 lbs *(15 kg)*
DBW 2020	80,000 BTU/h *(23.3 kW)*		0.79 gal/h *(3 l/h)*	12 V	10 Amps @ 12 V	26.7 x 9.5 x 10.7 in *(680 x 240 x 279 mm)*	48.5 lbs *(22 kg)*
DBW 300	104,000 BTU/h *(30 kW)*		1.05 gal/h *(4 l/h)*	12 V	10.80 Amps @ 12 V	26.7 x 9.5 x 10.7 in *(680 x 240 279 mm)*	48.5 lbs *(22 kg)*
Thermo 230	80,000 BTU/h *(23 kW)*		0.79 gal/h *(3 l/h)*	24 V	2.7 Amps @ 24 V	24 x 9.7 x 8.7 in *(610 x 246 x 220 mm)*	42 lbs *(19 kg)*
Thermo 300	104,000 BTU/h *(30 kW)*		1.05 gal/h *(4 l/h)*	24 V	4.6 Amps @ 24 V	24 x 9.7 x 8.7 in *(610 x 246 x 220 mm)*	42 lbs *(19 kg)*
Thermo 350	120,000 BTU/h *(35 kW)*		1.16 gal/h *(4.4 l/h)*	24 V	5.8 Amps @ 24 V	24 x 9.7 x 8.7 in *(610 x 246 x 220 mm)*	42 lb *(19 kg)*

Thermo Top C

Thermo Pro 50

Thermo Pro 90

DBW 2010

DBW 2020 / 300

Arctic Fox Hydraliner

PM Emissions & DPF Performance

Independant Emissions Testing Lab (IETL)* result verification on the effect of a Webasto pre-heater on the emissions performance of a diesel engine.

Results Summary

1. Engine start-up temperature has a huge impact on the emissions levels emitted by the engine

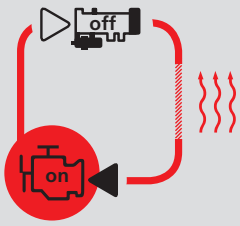
2. The test results show a 29% reduction in CO during winter conditions, and a 62% reduction during normal ambient conditions.

3. Pre-heating the engine does not have a significant effect on the Hydrocarbon emissions.

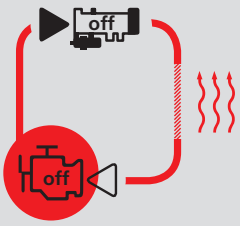
4. NO_x emissions were reduced by around 40% by pre-heting the engine to 155°F.

5. PM emissions have a significant effect and were reduced by 66% by pre-heating the engine during the cold weather conditions. Pre-heating also provided a 27% reduction in PM emissions during normal ambient conditions. This will help in longevity of the DPF life and can avoid more frequent regenerations and cleaning intervals.

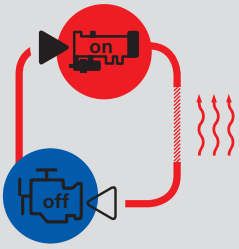
How Engine-Off Heating technology works



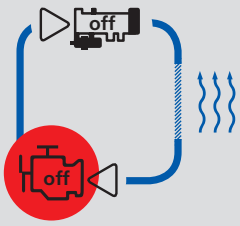
1. Engine running:
The engine generates heat, which is circulated via the heater core.



2. With Engine-Off Heating technology – Quick stop:
Residual heat in the engine is used by the heater, as the Webasto circulation pump keeps residual heat moving through the cooling system. The temperature in the cabin interior remains stable.



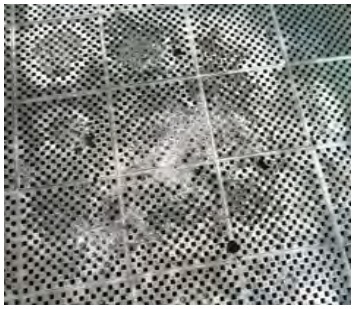
3. With Engine-Off Heating technology – Longer stop:
If the engine continues to cool down, the webasto coolant heater also switches on automatically. The temperature of the engine and cabin remain stable.



4. Without Engine-Off Heating technology – Engine off:
When the engine is switched off, heat is no longer distributed to the cabin interior through circulating coolant. The thermal energy stored in the engine is lost; the cabin interior and engine cool down.

Engine *Coolant heater* ▶ *Pump on* ▷ *Pump off* *Cabin interior heat exchange system*

DPF Solutions for the Off-Highway Market



Independent testing shows that using a Webasto coolant heater to pre-heat an engine can significantly improve DPF performance.

- Up to 66% reduction in PM during startup
- Up to 40% reduction in NOX
- Up to 62% reduction in CO during startup based on ambient temperature
- Increases exhaust temps rapidly, aiding in catalyst activity
- Emission reduction at high ambient temperature
- Emission benefit to pre-heat year round

How to extend the life of DPFs

Diesel particulate filters are necessary to adhere to existing and future emission regulations. But they're also an additional expense. When an engine is idling, the combustion temperature is too low for the DPF to run efficiently. The system has to be cleaned more frequently and parts wear more quickly. Automated Engine-Off heating therefore also helps extend the life of particulate filters.

- Reduce Face Plugging
- Reduce Wet Stacking
- Reduce Filter Overloading
- Reduce Costly DPF Maintenance
- Reduce Component Failures
- Reduce DEF Tank and Injector Issues
- Reduce Emission Burdens
- Reduce Fuel Costs
- Eliminates Cold Starts

▪ Webasto representations worldwide

For over a century, Webasto has continued to set new technological standards – in both the original equipment sector and the aftermarket. As one of the 100 biggest suppliers in the automotive industry worldwide, we develop and produce roof systems, including convertible solutions, as well as heating, cooling and ventilation systems. Our products help provide a better operator and driving experience on the road, more comfort and security, as well as increased efficiency for cars, commercial and special vehicles, off-highway machinery, motor homes and boats. An outstanding network of production facilities and dealers guarantees high-quality products, installation standards and services worldwide.

Part Number 909474 • 5/17 • Errors and omissions excepted • Printed in USA • © Webasto Thermo & Comfort North America, Inc. 2017

Webasto Thermo & Comfort North America, Inc.

15083 North Road

Fenton, Michigan 48430

USA

Toll Free: 800-860-7866

Phone: 810-593-6000

webasto.com