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PTLOG™150

Engine Exhaust Backpressure Monitor & Alarm

v3.0

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Product Description

Overview

When installed, the Nett® PTLOG™150 engine exhaust backpressure monitor and alarm is a valuable tool to alert operators to plugging problems with diesel particulate filters (DPFs) or other exhaust emission control devices. DPFs physically trap diesel particulate matter (soot). The soot load on the filter and the associated pressure drop (backpressure) will fluctuate depending on the duty cycle of the vehicle and its exhaust temperature. The general rule is that installations with lower exhaust temperatures regenerate slower and experience higher pressure drop in the filter.

The accumulated soot is oxidized in the filter during regular operation of the engine. For about 25-30% of the engine operating time, the exhaust temperatures must be at least 275-300°C (530-575°F) for proper filter regeneration when ULSD (ultra-low sulfur diesel) fuel is used. The exact temperature requirements change with engine technology, with installations on older, dirty engines requiring higher exhaust temperatures for regeneration. For example, filters installed on older off-highway engines with high DPM emissions (e.g., >= 0.30 g/bhp-hr) may require temperatures of 325-400°C (620-750°F). The regeneration also depends on other factors, such as the vehicle duty cycle, filter sizing and type of diesel fuel used. ULSD fuel (S < 15 ppm wt.) is now widely available and should be used whenever possible with any diesel particulate filter.

Vehicles operating under light duty cycles with insufficient exhaust temperatures will experience increasing accumulation of soot leading to excessive backpressure and filter overload. That condition can result either in complete clogging of the unit or an "uncontrolled regeneration". The uncontrolled regeneration occurs when an excessive soot load ignites and rapidly burns producing an enormous heat release which can cause thermal cracking or melting of the filter material.

The Nett PTLOG™150 engine exhaust backpressure monitor and alarm continuously checks the exhaust back-pressure level of vehicles equipped with a Nett diesel particulate filter. If the engine back-pressure exceeds the PTLOG™150's pre-set levels, yellow and red LEDs will light-up to warn the operator. The monitor also has relay triggers to operate additional relay-controlled indicator lights, audible alarms or other devices if the yellow or red LEDs illuminate.

Applications

The PTLOG™150 system can monitor the backpressure of any exhaust system provided a 1/8" N.P.T. fitting (female) is installed upstream of any restrictions (exhaust emissions control device or muffler). All Nett catalytic converters, catalytic mufflers and diesel particulate filters come with a pre-installed 1/8" N.P.T. fitting suitable for use with the PTLOG™150.

An ignition switched +12V or +24V power source is required for the PTLOG™150 electronic control module.

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Item List & Part Numbers

PTLOG™150 – Engine Exhaust Backpressure Monitor & Alarm Assembly, Nett Technologies P/N: PT-00150-KT-PTLOG-00010

Items included in the PTLOG™150 kit are listed in the following table.

Item	Description	P/N	Qty
1	PTLOG150 Control Module	PT-00150-PT-MODUL-00010	1
2	Wiring Harness	PT-00150-PT-CABLE-10010	1
3	Stainless Steel Pressure Tube	PT-00150-PT-PTUBE-20010	1
4	Coupler Fitting	PT-00150-PT-FTTNG-20050	1
5	Barbed Fitting	PT-00150-PT-FTTNG-20060	1
6	Rubber Pressure Hose	PT-00150-PT-PTUBE-20020	1
7	Water separator/condenser (optional)	PT-00150-PT-H2OSP-20080	*

* Water separator is an optional item and is ordered separately.

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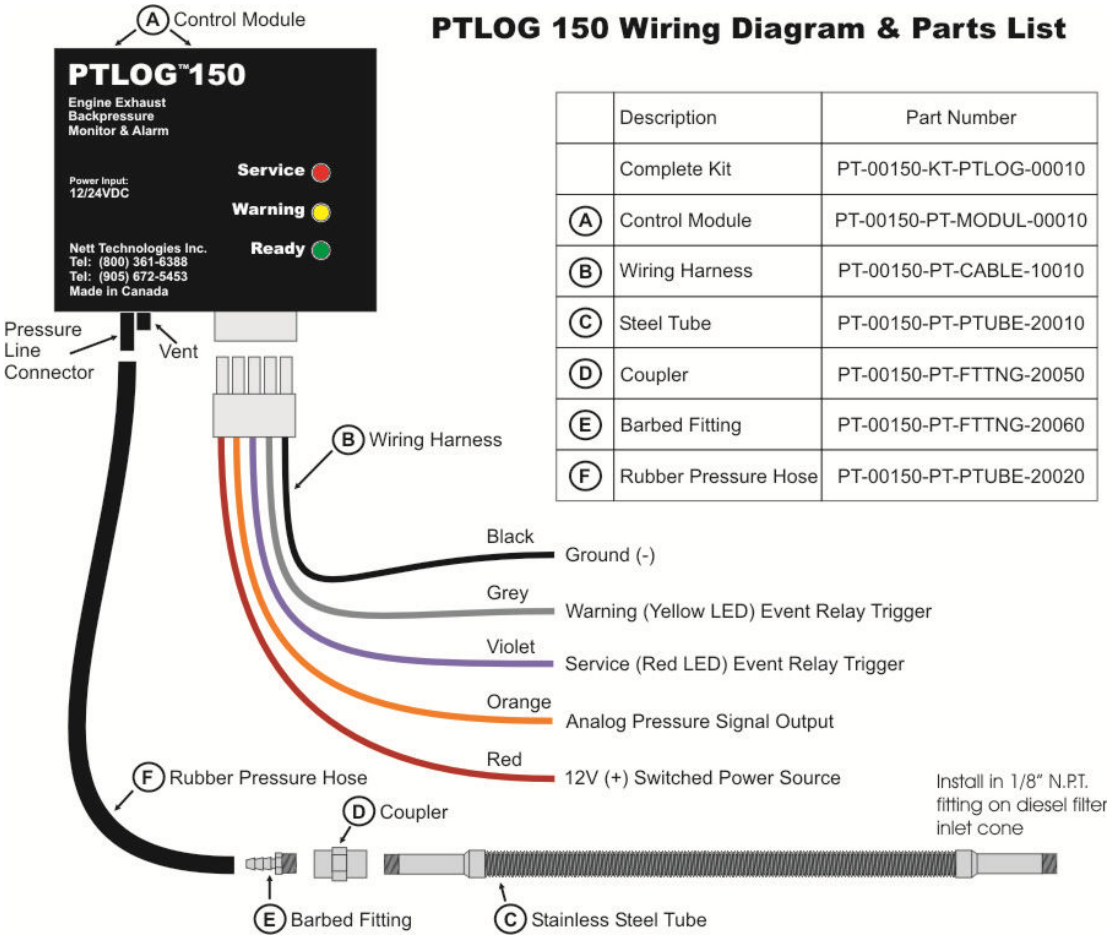

PTLOG 150 Wiring Diagram & Parts List

	Description	Part Number
	Complete Kit	PT-00150-KT-PTLOG-00010
A	Control Module	PT-00150-PT-MODUL-00010
B	Wiring Harness	PT-00150-PT-CABLE-10010
C	Steel Tube	PT-00150-PT-PTUBE-20010
D	Coupler	PT-00150-PT-FTTNG-20050
E	Barbed Fitting	PT-00150-PT-FTTNG-20060
F	Rubber Pressure Hose	PT-00150-PT-PTUBE-20020

Step 1: Install the Electronic Control Module

The PTLOG™150 control module (A) should be mounted in a location which is visible to the operator. If this is not feasible, additional lamps and/or audible alarms should be connected to the yellow and red event relay triggers and installed in a location visible to the operator.

The module mounting location should permit the wiring harness to reach the application's electrical system and the pressure line to reach the diesel particulate filter or 1/8" N.P.T. fitting in the exhaust system. The module must be mounted above the exhaust system and away from heat sources. The two tubes (pressure line connector & vent) on the bottom of the module should point downwards to minimize moisture and dirt contamination.

> **Caution:** Exposure to high temperatures can damage the module. If mounted in the engine compartment, the unit should be installed in a reasonably cool location, away from the exhaust manifold and at least 30 cm (12") away from exhaust piping.

Step 2: Install the Pressure Line

The pressure line connects the exhaust system backpressure to the pressure sensor located inside the PTLOG™150 module. Care should be taken to ensure the stainless steel tube (C) and rubber pressure hose (F) are routed so that they aren't kinked or pinched, impeding the pressure signal from reaching the module.

Assemble the coupler (D) and barbed fitting (E) to one end of the stainless steel tube (C). Tighten securely.

Install the assembly (C,D,E) into the 1/8" N.P.T. fitting on the diesel filter or exhaust system. The stainless steel tube is flexible and may be bent to avoid obstacles. All Nett catalytic converters, catalytic mufflers and diesel filters come with a pre-installed 1/8" N.P.T. fitting. If there is no fitting available in the exhaust system, install one (available from Nett, part number: NP-00000-SL-00125-00010 or from any hardware store or industrial supplier).

Connect the rubber pressure hose (F) to the barbed fitting (E) and route it to the control module (A). The rubber pressure hose may be cut to length as required. There are two tubes present on the bottom of the module, the longer tube is the pressure line connector, to which the rubber pressure hose (F) is connected. The shorter tube is atmospheric port which must be left open and unobstructed.

Step 3: Connect the Wiring

Connect the black wire from the PTLOG™150 wiring harness to the negative (-) terminal of the battery in order to ensure a ground connection before any other connections are made.

Connect the red wire to an ignition switched (+12V/+24V DC) power source (power on only when ignition switch is turned on).

The orange wire carries an analog pressure signal which can be monitored with a high impedance receiver (>10K Ohms). The voltage varies with exhaust system backpressure; the output at 0 "H_2O is a nominal 0.5V (DC) and the output at 138 "H_2O (34.3 kPa) is 4.5V (DC). If the analog pressure signal is not used, it is recommended that the wire be cut off and discarded.

Optional – use the grey and violet relay trigger wires to activate additional lamps, audible alarms or other 3rd party devices to provide additional warning (or other function) for a yellow or red LED event (high exhaust backpressure). These are switched grounds designed to drive a standard automotive style relay. Connect one end of the relay coil to the +12/24V DC power source and the other to the appropriate relay trigger wire.

System Operation

The Nett PTLOG™150 backpressure monitor continuously measures the exhaust back-pressure level. If the engine back-pressure exceeds the PTLOG™150's pre-set levels, yellow and red LEDs will light-up to warn the operator. The engine exhaust pressure of a vehicle with a DPF installed will increase based on the amount of soot (particulates) trapped in the filter. The PTLOG™150's yellow and red LED's tell the operator the DPF is not regenerating properly and that the vehicle must be taken to a repair facility to have the filter serviced.

Yellow LED (Warning) - The Yellow LED is the first light to come on if exhaust temperatures are too low for proper filter regeneration. The yellow LED illuminates whenever the exhaust backpressure exceeds the pre-set "yellow level". If the yellow LED illuminates frequently, the vehicle should then be taken, at the next available opportunity, to a repair facility where the DPF can be serviced.

Red LED (Service) - The Red LED is the second light to come on under low exhaust temperature conditions. The red LED illuminates when the backpressure exceeds the pre-set "red level" (20 "H_2O above the "yellow level") constantly for at least 20 seconds indicating an over-pressure condition. The vehicle must be taken immediately to a repair facility for filter service. Due to the soot load in the filter and the resulting high backpressure, drivability problems or filter damage may occur. As a result, it is recommended that the vehicle be towed or driven at a low speed to the repair facility.

WARNING! – Continuing to drive the vehicle while experiencing an over-pressure condition may cause serious structural damage to the filter.

The red LED remains on until the engine/system is turned off and back on again.

System Information - The LED Display

The PTLOG™150 micro-controller continuously monitors exhaust pressure levels. The table below describes the LED conditions and their meaning to the user:

LED	Status	Description	Troubleshooting Tips
All	OFF	Ignition is OFF.	Normal
Green	ON	Ignition switch is ON and the PTLOG is ready. Backpressure currently below pre-set “yellow level”. Backpressure has not exceeded the pre-set “red level” for more than 20 seconds since the engine was started.	Normal
Yellow	ON	The exhaust backpressure is currently exceeding the pre-set “yellow level”. If the pressure drops below the “yellow level", the LED will turn off. Backpressure has not yet exceeded the pre-set “red level” for more than 20 seconds since the engine was started.	DPF is becoming plugged by accumulated soot. Occasional illumination of the yellow LED may not be cause for alarm if it happens infrequently. Filter maintenance recommended
Red	ON	Backpressure has exceeded the pre-set “red level” for more than 20 seconds since the engine was started. Red LED can be reset to OFF by turning ignition switch off and back on.	DPF is plugged by accumulated soot Filter maintenance required immediately – reduce exhaust backpressure by reducing speed and/or load or by turning off engine