



# ALPHABOX – the smart diagnostic system for engines powered by VIB360™

ALPHABOX only requires the input signal from a crankshaft speed sensor to analyze torsional vibrations as an early indication of mechanical failure in your engine.

## Designed for

- Quick return on your investment
- A cost efficient solution
- Easy to install and commission
- Maintenance-free use
- Remote and local access to data
- Ideally suited for retrofit engines
- Continuous monitoring and reporting
- Cylinder-by-cylinder diagnostics
- Early detection of engine problems
- Extension of engine lifespan
- Clear and concise report
- Entire fleet installation

## No more unexpected breakdowns

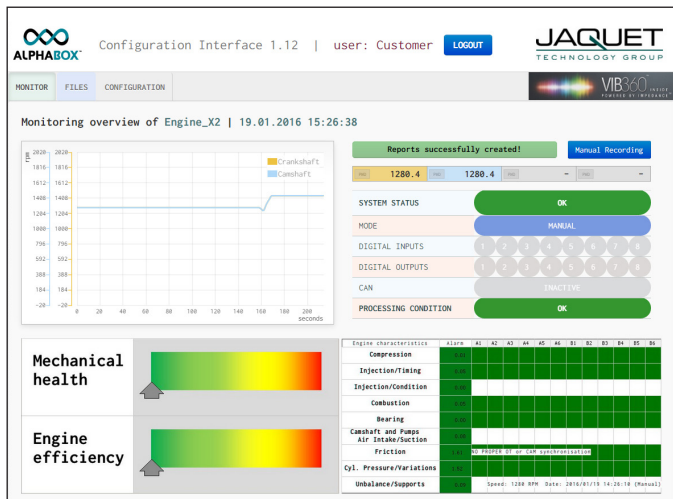
Transport and logistic companies using diesel engine fleets are highly dependent on reliable and on timely delivery of the goods. Breakdowns of trains, vessels or trucks can lead to significant economic losses. JAQUET can help fleet owners to prevent such economic losses during its operation, by monitoring the engine with an ALPHABOX diagnostic system. The system is able to detect engine problems well in advance and gives you time to plan a maintenance cycle to prevent mechanical breakdowns.

## Extended engine lifetime and quick return on your investment

ALPHABOX is a cost-effective engine diagnostic system with powerful functionality. It is easy to retrofit to combustion engines, providing a complete picture of the engine health including the effects of the whole power train. The ALPHABOX is based on analysis of the torsional vibration of the crankshaft. The system helps fleet owners to optimize maintenance cycles, extend engine life, avoid expensive breakdowns and reduce operational and maintenance costs.

## Easy to install and put into operation

Only a single speed sensor is necessary to obtain the general engine health status. For a detailed cylinder-specific health analysis, two speed sensors are required, one on the crankshaft and one on the camshaft. The built in webserver allows easy configuration by a standard web browser (no software installation on your PC or other devices required).



## Clear diagnostic reports

Major engine and power train parameters (combustion, compression, injection, bearings, ...) are indicated in green/yellow/red colors for clear interpretation. Green means “all ok”, yellow highlights a condition that might need a follow-up in the next maintenance cycle and red indicates a severe problem which requires immediate intervention.

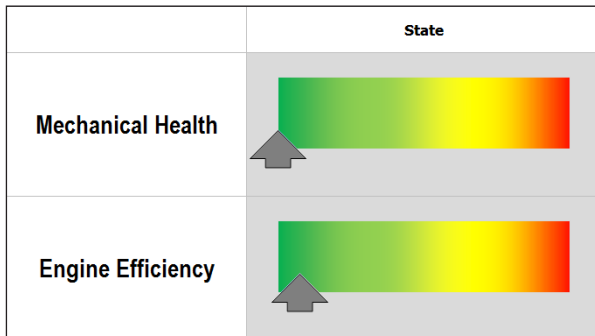
## A modular concept

The ALPHABOX can be configured with various hardware modules (GSM and GPS, memory extension, I/O modules, bus connections etc.) to make it easy to integrate the diagnostic unit in an existing environment.

## Features and Benefits

| Product features   | Customer benefits   |
|--|---|
| Quick return of initial investment                           | Extended and optimized fleet lifetime<br>Significant cost reduction by better targeted maintenance  |
| Easy to install  | Combustion engines can be easily retrofitted<br>No special training required<br>Suitable for continuous or single measurements  |
| Versatile usage  | Used for inline, V-type and radial engines<br>2 stroke or 4 stroke engines<br>Diesel or gasoline engines  |
| Online data access   | On-demand diagnostic results from control room possible<br>Early detection of impending engine failures   |
| Detailed diagnostics including cylinder-specific information | Easy for maintenance team to track down failures<br>Only identified parts need to be replaced<br>Customer can prioritize maintenance according to the seriousness of the engine condition |

## ✓ Healthy engine

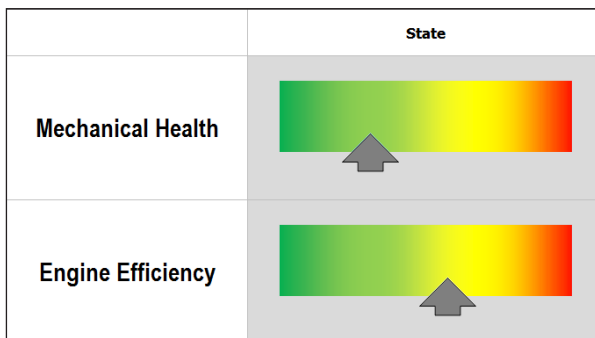


| Curve | Indicator                | Alarm | 1     | 5     | 3     | 6     | 2     | 4     |
|-------|--------------------------|-------|-------|-------|-------|-------|-------|-------|
|       | Compression/Variations   | 0.00  | Green | Green | Green | Green | Green | Green |
|       | Injection/Timing         | 0.33  | Green | Green | Green | Green | Green | Green |
|       | Injection/Condition      | 0.00  | Green | Green | Green | Green | Green | Green |
|       | Combustion               | 0.00  | Green | Green | Green | Green | Green | Green |
|       | Bearings MovingParts     | 0.00  | Green | Green | Green | Green | Green | Green |
|       | Cam&Pumps/Regulation     | 0.20  | Green | Green | Green | Green | Green | Green |
|       | Air Intake/suction       | 1.94  | Green | Green | Green | Green | Green | Green |
|       | Stresses                 | 1.72  | Green | Green | Green | Green | Green | Green |
|       | Cyl. Pressure/Variations | 0.12  | Green | Green | Green | Green | Green | Green |
|       | Unbalance/Supports       |       |       |       |       |       |       |       |

### 6 Cylinder Volvo Diesel engine

This engine shows all indicators in the normal range.

## ✗ Problematic engine



| Curve | Indicator                | Alarm | 1     | 5     | 3     | 6      | 2      | 4     |
|-------|--------------------------|-------|-------|-------|-------|--------|--------|-------|
|       | Compression/Variations   | 0.08  | Green | Green | Green | Green  | Green  | Green |
|       | Injection/Timing         | 0.79  | Green | Green | Green | Orange | Yellow | Green |
|       | Injection/Condition      | 0.79  | Green | Green | Green | Orange | Yellow | Green |
|       | Combustion               | 0.03  | Green | Green | Green | Green  | Green  | Green |
|       | Bearings MovingParts     | 0.00  | Green | Green | Green | Green  | Green  | Green |
|       | Cam&Pumps/Regulation     | 0.22  | Green | Green | Green | Green  | Green  | Green |
|       | Air Intake/suction       | 2.15  | Green | Green | Green | Green  | Green  | Green |
|       | Stresses                 | 1.99  | Green | Green | Green | Green  | Green  | Green |
|       | Cyl. Pressure/Variations | 0.12  | Green | Green | Green | Green  | Green  | Green |
|       | Unbalance/Supports       |       |       |       |       |        |        |       |

### 6 Cylinder Volvo Diesel engine

This report shows the effect of a defective fuel injector.

## Technical data

|  |   |
|--|---|
| Supply voltage range:                              | Nominal : 24 VDC<br>Range: 17 to 33 VDC (according to EN50155)  |
| Maximum Power:                                     | 20 W  |
| Communication interfaces:                          | CAN 2.0B, Ethernet 10/100 Mbit/s, IEEE 802.3, USB   |
| Operating system:                                  | Linux   |
| Number of digital input channels:                  | 8   |
| Number of digital output channels:                 | 7   |
| Number of speed sensor inputs:                     | 4   |
| Operating temperature:                             | -40°C to +70 °C   |
| Protection rating:                                 | IP20  |
| Max number of engines to be measured with one box: | 2   |
| Certificates:                                      | CE, cULus, Ex EU 94/9/EC Zone 2, FCC, IECEx Zone 2, LR, UL HAZLOC Class I Division 2 (Zone 2)<br>Fully compliant with RoHS and REACH, EN50155 |



## Swiss know-how and quality matched to your demands

JAQUET manufactures speed sensors in quantities from 1 to millions per project per year. These typically customer specific solutions add value through being matched to individual applications. **Since 1889, a spirit of excellence complementing tradition and innovation.**



### Automotive turbochargers

Turbocharger for trucks, passenger cars, construction equipment

- Speed of VG/VNT turbochargers
- Gearbox shaft and retarder speed



### Railway systems

- Optimum traction control
- WSP (wheel slide protection) systems
- Speed information for automatic train control



### Power generation

Gas, hydro, steam and wind turbines

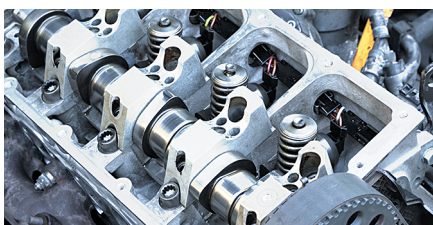
- Overspeed protection
- Speed measurement and control



### Hydraulics

Agricultural machinery, construction and mining equipment, cranes, ROV – remote operated vehicles

- Motors and pumps, flowrate measurement
- Position measurement, traction synchronization



### Diesel and gas engines

Large diesel and gas engines in marine, rail, off-road applications and power production.

- Cam and crank shaft for dynamic position
- Turbocharger speed, engine diagnostics

#### Quality systems

ISO TS 16949  
ISO 9001  
AS 9100  
IRIS

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