



## Installation Instruction for TDC Pickup

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## 1. Introduction

All systems of the new Doc (e-line) as well as the earlier THE DOCTOR systems, whether the single nor the multi cylinder systems, do not require a TDC pulse from the shaft or flywheel. The software can automatically determine the correct TDC position.

Nevertheless, for a better synchronisation and in situations for example of early injection we recommend the installation of TDC pickups on the flywheel. Crank synchronisation pulses are obtained by fitting one or two inductive pickups to the flywheel mostly as permanent installation.

The signal cabling is mostly terminated in a local splitter plate (old junction box or a flying cable) as shown in the diagram below as general arrangement for a 2-stroke engine





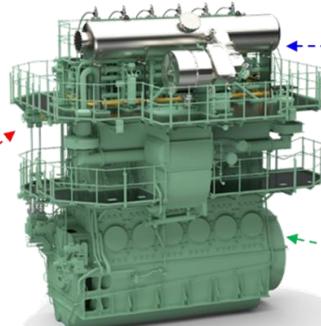
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## DocPad3 e-633 USB



- Cylinder Pressure
- Fuel Pressure / Acoustic Emissions
- Crank Angle (TDC)



### PORTABLE FUEL PRESSURE

FUEL PRESSURE SENSOR 100302001  
KISTLER 6729A SENSOR 2000 BAR



QUICK COUPLING  
FAST SENSOR CONNECTION  
TO FUEL VALVE



FUEL ADAPTER  
FUEL OIL ISOLATION VALV  
INJECTION PRESSURE  
RTA 3500 BAR

INSTALLATION ON  
DISTRIBUTION BLOC

### ONLINE CYLINDER PRESSURE

CYLINDER PRESSURE SENSOR 100301002  
KISTLER 6613CG1 PIEZO SENSOR  
TEMP 300°



INDICATOR COCK ADAPTER 101000001  
THOMPSON ADAPTER

FOR ALL  
ENGINES



### ACCURATE CRANK ANGLE

TDC SPLITTER  
SPLITTER FOR CRANK  
ANGLE INSTALLATION



INDUCTIVE SENSOR  
FOR CRANK ANGLE  
INSTALLATION ON  
FLYWHEEL



Different splitter plate (old J-Boxes) configurations are available for medium and low speed engines. Main engine and Auxiliary engines require a single TDC pickup attached to the flywheel. The flywheel pickup arrangement for each revolution is divided by equal intervals of 3600 to achieve a resolution of 0.1°.

### Inductive Pickups

Inductive pickups are used for longer term regular measurement of engines. As TDC reference a bolt is normally used on the flywheel.



### Optical Pickups

To move easily from engine to engine in a service situation an optical pickup can be used for maximum portability. However, it's not recommended for permanent or long-term installation. An optical pickup uses a reflective tape attached to the flywheel.



Both types of pickups are powered by the system directly as soon as its connected (running instrument). The LED indicator on the rear of the pickup illuminates when it is powered and moves on bolt (or by wiping a metal in front of the sensor surface to check).

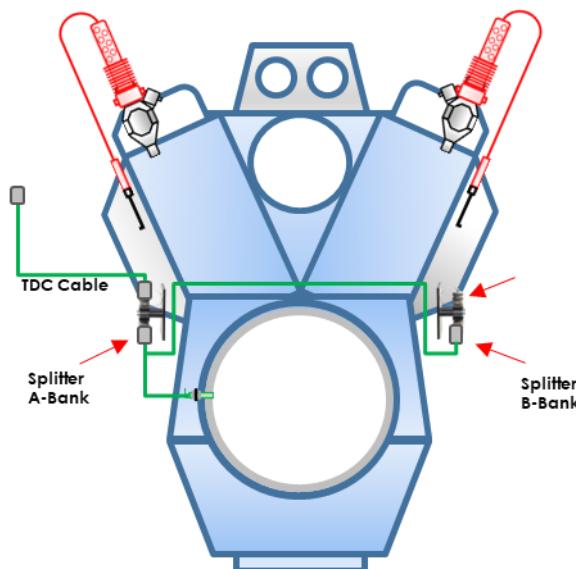


## Crank Angle Splitter

There is one type of Crank Angle Splitter available for Pick up installations measuring TDC.



**V-Engine:** For easy TDC access on Bank A and Bank B on V-engines 2 Splitters can be supplied. So it's no need to cross over a long TDC cable on the engine when measuring Bank B (see fig below).



**Line Engine:** Line engine don't need 2 splitters therefore BANK A/B access is closed with a cap.



## Pick up mounting bracket for different engines:

### - TDC bracket for 2-stroke engine

- 1x bracket bars
- 1x TDC screw for the flywheel



### - TDC bracket for 4-stroke engine

- 1x bracket bar
- 1x TDC screw for the flywheel

## Splitter mounting plate

The Crank Angle Splitter mounting plate allows to mount the splitter easily with 4 screws near the engine

### Remark:

The TDC splitter plate position on cylinder head platform of the Main Engine should be located to give easy access to reach all cylinders with DocPad and pressure sensor.



## Crank Angle Splitter cabling layout

The cabling layout is shown in the picture.

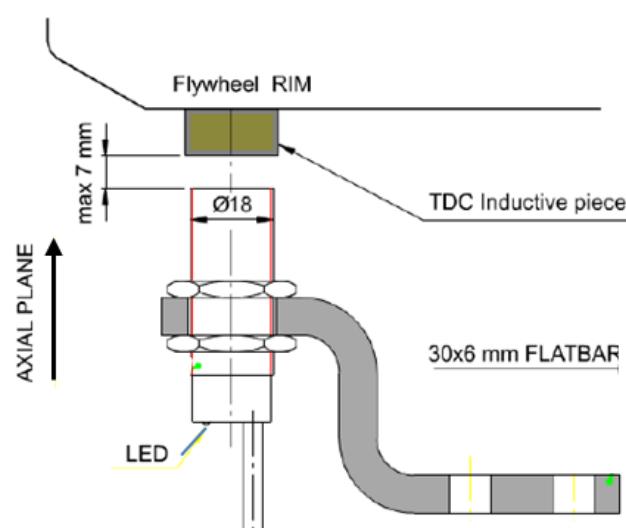




## 2. Inductive Pickup Installation

The pickup installation requires the fitting of the splitter plate and the pickup itself. First, select a suitable location for the pickup bracket and splitter plate. Different lengths of cables between splitter plates and inductive pickup are available. TDC Pickups need to be installed axial (newer system do not require a teeth Pickup installation anymore even splitter plate shows the port for teeth).

### Axial Pick up positioning



- 2.1 Find a convenient place to install the TDC position sensor on the Main Engine





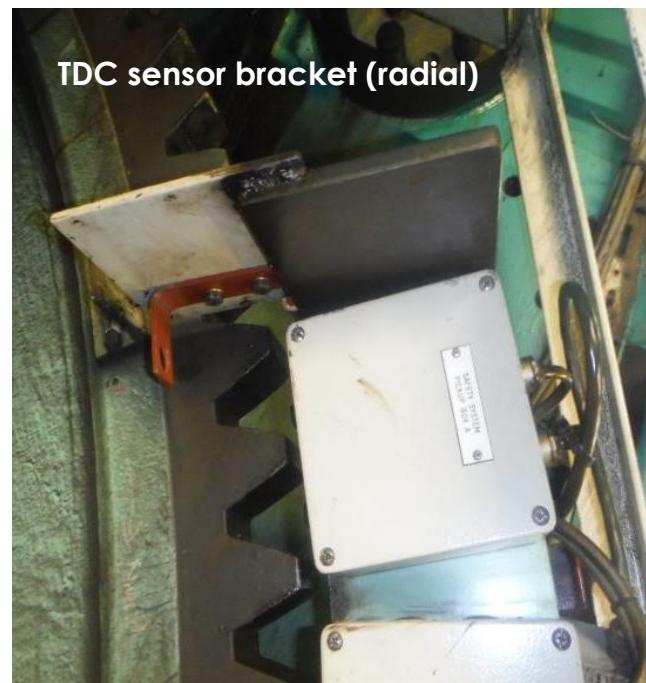
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2.2 Note: look for this item on your flywheel (TDC cylinder no. 1) for radial installation



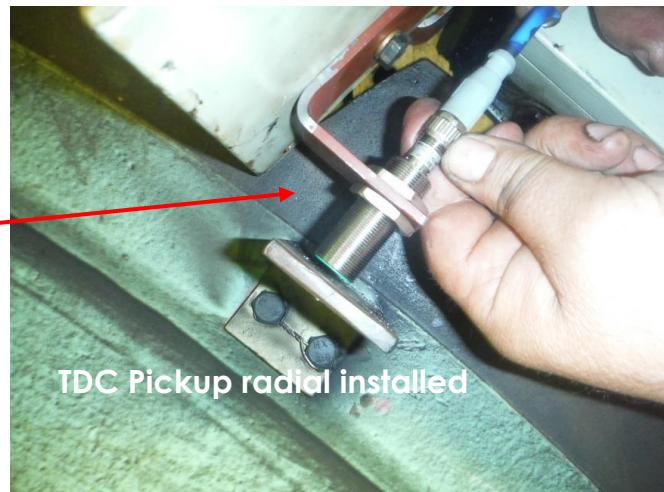
2.3 Install the bracket for TDC pickup.



2.4 Install the pickup sensor for TDC position (radial solution).

(If an axial solution is convenient please refer to point 3)

**Note:**  
Distance between  
The pickup and the  
flywheel teeth must  
be 5 - 6mm.





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2.5 Connect and layout the pickup cable up to the splitter



## 3. Axial TDC Pick up installation

3.1 Installation with bolt  
(Please use supplied M8 bolt  
with 3 star washer)





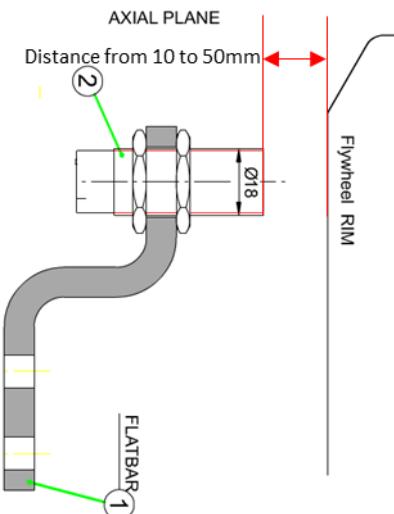
## 4. Optic Sensor Installation (alternative to inductive pickup)

### 4.1 Bracket

Please prepare bracket (1) for Optic Sensor (2) in axial direction to flywheel

### 4.2 Sensor distance

The distance of the sensor to the flywheel can flexibly be chosen between 10 to 50mm



### 4.3 Mark Flywheel

Easy use white color as shown on picture.

Notice:

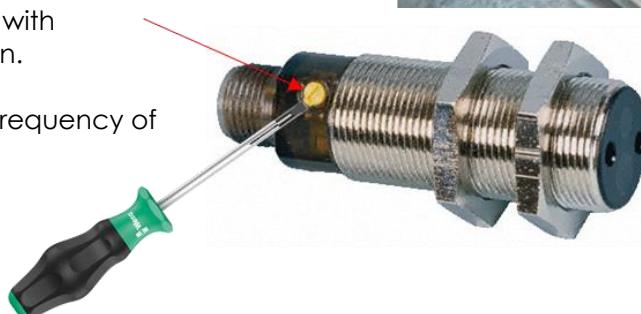
The white mark should face optic pick up when cylinder one is in TDC (top dead center) position (final adjustment will be done in software).



### 4.4 Adjust optic sensor sensitivity

During operation connect optic sensor with cable your system and power system on.

Turn screw until the LED is blinking with frequency of engine rpm.



Notice:

If adjustment is done when engine is not running, use turning gear to see If LED is lightning only during passing the mark. Remove disturbing marks if any or paint with dark color.

### 4.5 Optic Extension

In case optic extension is used

**(this extension is not needed!)**

fitting the nuts, tightening the nut on the pickup body. Note the two pins on the surface. These must align into their sockets on the fiber optic extension if one is in use.

