Electronics & Software

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Engine Peak Meter

Type 2516A...

Cylinder Pressure Measuring Instrument for Gas and Diesel Engines

Handy peak-pressure measuring instrument is designed for measuring the cylinder pressure of combustion engines with a speed range of up to 4 000 min^{-1}.

- Immediate on-site data evaluation
- 2x20 memory locations
- Software for data evaluation included
- Easy to operate

Description

The battery-operated measuring instrument measures between 1 and 100 successive pressure cycles from which it calculates the arithmetic average values of the peak pressure, standard deviation, maximum gradient of the pressure curve as well as the average pressure curve. The numeric data are shown on the LC display and can be saved as required. The average pressure curve plotted can be analyzed with the software for data evaluation contained in the included accessories.

An additional measuring function allows the peak pressure to be displayed without time limitation and sending the analog sensor signal at the monitor output. For continuous monitoring it is recommended to use the power adapter Art. No. 5.510.293 which is optionally available.

The cylinder pressure is measured with a pressure sensor e.g. type 7613C (2516A1) or Type 6613C ... (2516A2), depending on the version used, at the engine indicator valve. Since long indicator pipe cause gas oscillations which falsify the measuring signal, the cylinder pressure signal can be smoothed with an adjustable low-pass filter.

Application

The 2516A ... is a rugged measuring instrument for monitoring engines with a speed of up to 4 000 min^{-1}. The software for data evaluation contained in the included accessories allows changes in peak pressure to be shown graphically and recorded.

The measurement data can be stored in two areas of the memory, each of which holds 20 records ("As found"/"As left"). This enhanced functionality makes the new engine peak meter ideal for balancing the cylinders of gas and diesel engines.

Technical Data

Measuring range		
Type 2516A1	bar	0 ... 250
Type 2516A2	bar	0 ... 250[1]
Input voltage range		
Type 2516A1	V	1 ... 15
Type 2516A2	V	1 ... 7
Sensor sensitivity (adjustable)	mV/bar	4 ... 40
Accuracy of the pressure value display	%	≤±0,5
Resolution	bar	0,1
Range of engine speed	min^{-1}	25 ... 4 000
Operating temperature range	°C	0 ... 50
Number of pressure cycles (adjustable)	–	1 ... 100
Low-pass filter (5th order Butterworth)	Hz	300, 500, 1 500, 5 000
Number of data memories		2
Memory capacity per memory	Data record[2]	20
Sampling rate per revolution	–	720
LCD graphic display	Dots	128x64
Monitor output	–	BNC neg.
Output (Monitor)	V	5
RS-232C interface	–	D-Sub 9 pol. female
Dimensions	mm	62x92x45
Weight	g	350
Battery	Type 3	9 V/EC6LR61
Life expectancy	h	>10

[1] in combination with Type 6613CA

[2] A data record consists of numerical measurands, curve trace, number, date and time of the memory location

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Measuring Functions

p_{max}	Maximum peak pressure
p_{min}	Minimum peak pressure
p_{av}	Average peak pressure
S_{dev}	Standard deviation of the peak pressure
dp/ca	Maximum gradient of the pressure curve
r/min	Speed
p_{peak}	Current peak-pressure; measuring function unlimited in time
p_{comp}	Compression pressure (pressure at the firing point) calculated from the reversal point of the pressure curve. Possible only when the reversal point can be analyzed.

Auxiliary Function

p_{av} Average cylinder peak pressure value p_{av} of the engine This value is calculated from p_{av} stored in the memory block 1. The calculated value is displayed and instantly updated as new data is entered.

Pressure Curve

Average pressure curve with a resolution of 720 measuring points per revolution, which can be printed out via the RS-232C interface (ASCII file).

Software

These pressure curves can be displayed graphically by means of Windows Software contained in the included accessories. The pressure curves of all cylinders can be overlapped – a feature for verifying the cylinder balancing of the engine.

Auxiliary Functions

Setting of all measuring parameters with keyboard via LCD menu.

Monitoring Functions

Battery display with symbol; the Engine Peak Meter switches off automatically 4 minutes after the last button actuation unless this function is deactivated.
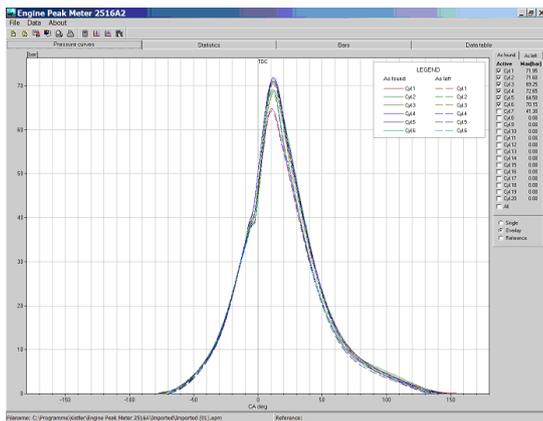
Fig. 1: Cylinder pressure curves of a 6-cylinder gas engine, before and after the maintenance work ("as found"/"as left")

Fig. 3: Cylinder peak pressure deviation p_{av} of each individual cylinder compared to the calculated average peak pressure of the engine, before and after the maintenance work ("as found"/"as left")

Fig. 2: Data table with the numeric values, before and after the maintenance work ("as found"/"as left")

Fig. 4: Zoomed range of a pressure curve

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Accessories Included	Type/Art.No.
Engine Peak Meter Type 2516A1	
(without sensor and measuring set in case)	
• Software for data evaluation	7.642.025
• RS-232C cable for data transfer	5.590.250
Engine Peak Meter Type 2516A2	
(without sensor and measuring set in case)	
• Software for data evaluation	7.642.025
• RS-232C cable for data transfer	5.590.250
• Adapter cable	5.590.270
Engine Peak Meter Type 2516A10	
(with sensor and measuring set in case)	
• Cylinder pressure sensor with Piezotron amplifier	7613C
• Adapter for connection to indicator valve	7513A
• Tubular socket wrench	1377
• Special spanner wrench	1300A1
• Software for data evaluation	7.642.025
• RS-232C cable for data transfer	5.590.250
• Case	3.070.219
Engine Peak Meter Type 2516A20	
(with sensor and measuring set in case)	
• Cylinder pressure sensor with charge amplifier	6613CA
• Adapter for connection to indicator valve	7513A
• Adapter M14x1,25 – M10x1	6582A1
• Special spanner wrench	1300A1
• Software for data evaluation	7.642.025
• RS-232C cable for data transfer	5.590.250
• Case	3.070.219
Optional Accessories	
• Power adapter	5.510.293

Ordering Key

Type 2516A ☐ ☐

Engine Peak Meter for Cylinder Pressure Sensor	
with Piezotron amplifier Type 7613C	1
with charge amplifier Type 6613CA	2

without sensor, without measuring set in case	–
with sensor, with measuring set in case	0

Fig. 5: Scope of delivery Type 2516A10, 2516A20

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