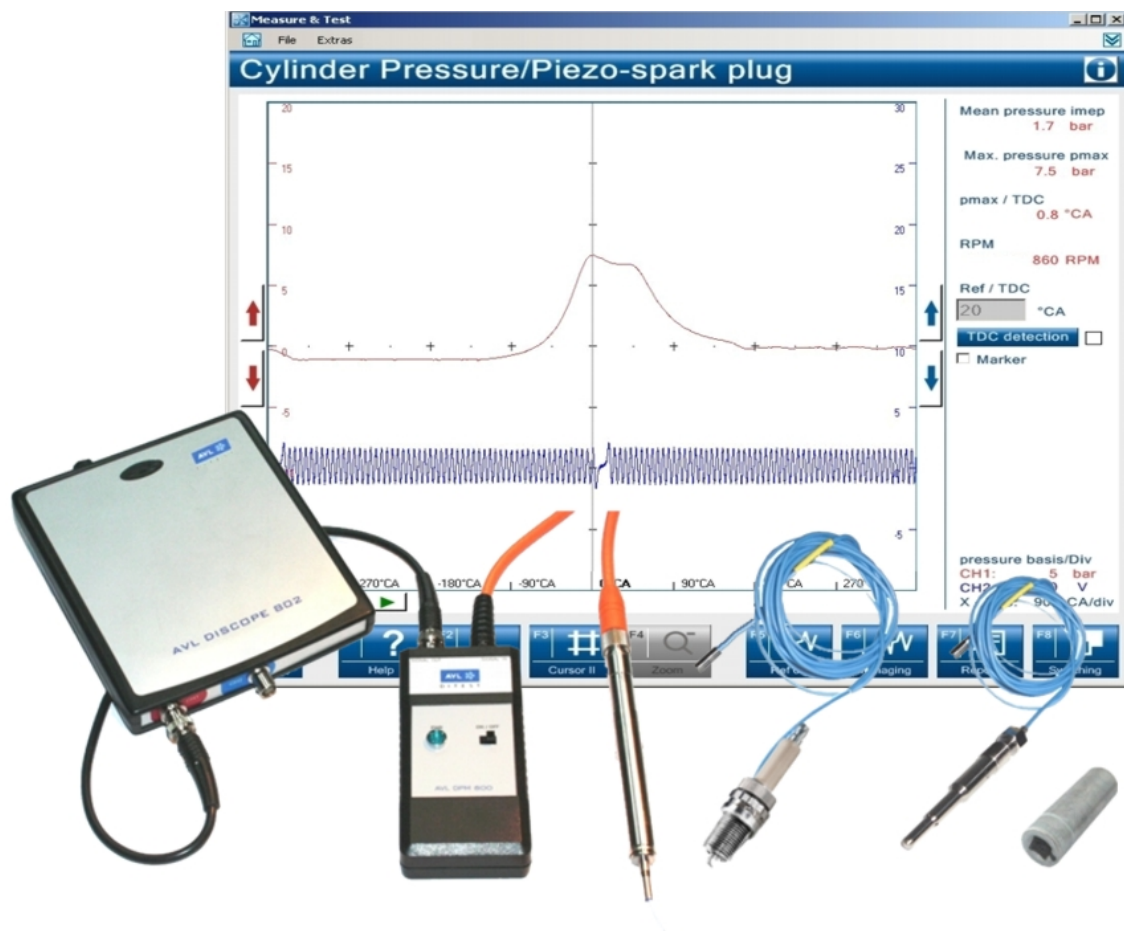


USER MANUAL

AVL DITEST DPM 800



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data valid at time of printing.

FUTURE SOLUTIONS FOR TODAY

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Warnings and safety information

This equipment manual contains important **warnings and safety information** which must be observed by the user.

The product is only intended for a very specific application described in the equipment manual. Furthermore, the most important prerequisites and safety measures required for the use and operation of the product are explained to ensure smooth operation.

We do not accept any warranty and liability for applications other than the application described and without observing the required preconditions and safety measures.

The product may only be used and operated by personnel that due to its professional qualification is able to observe the required safety measures when using and operating the equipment. It may only be operated with the accessories and consumables supplied by DITEST or approved by DITEST. Since with this product the measuring results not only depend on proper functioning of the product, but also on a number of further conditions, it is necessary to have the results generated by the product checked (e.g. plausibility check) by an expert prior to implementing further measures based on the generated measured value.

Adjustments and maintenance of live, opened devices may only be carried out by qualified personnel trained for that purpose and that is aware of the risks involved.

The product may only be repaired at the supplying factory or by the qualified personnel trained for that purpose.

When using the product, a specialist must ensure that neither the test object nor the test facility can operate in such a manner that it might damage property or put personnel at risk.

Summarized safety instructions



DANGER



Risk of fatal injury from electric current on vehicles with high-voltage systems.

Dangerous high voltages capable of delivering fatal electric shocks are present on the HV energy store (HV battery) and the components connected to it.

Make sure that nobody comes into contact with the connections of the HV battery, the connecting leads or any other components connected to the high-voltage power supply.



WARNING



Danger of electric shock on the ignition system

The ignition system is under life-threatening high voltage!

Do not touch the ignition system while engine is running!



WARNING



Danger of electric shock on vehicles with xenon headlight

The lighting system with xenon headlight is under life-threatening high voltage!

Do not touch any component while the xenon light is switched on!



WARNING

Danger due to harmful or irritating substances

Tests with engine running in closed rooms (workshops, test halls, etc.), the exhaust emission has to be vented to the outside and the space should be adequately ventilated!



WARNING

Risk of burns due to hot components

Perform measurements at normal engine operating temperature or follow the respective test specification!

Do not touch any hot components such as engine, engine mountings and the entire exhaust system! If necessary, use cooling fans!

**WARNING****Risk of injury due to rotating parts**

Perform any work in the engine compartment while engine and ignition are turned off!

Do not touch any rotating parts, such as, assemblies of electric generator, radiator fan and their drives (e.g. V belt)!

With running engine ensure a safe installation of the measuring cables!

**WARNING****Risk of injury due to unsecured vehicle**

Apply the hand brake or place the selector lever to P (automatic transmission)!

Secure vehicle adequately against rolling!

**WARNING****Explosion hazard due to pyrotechnic installation and restraint system**

Test and installation work should only be carried out by trained personnel!

Under no circumstances should the igniter be tested with the multimeter!

System verification only with approved testing device!

Disconnect the battery when working on the airbag system!

When disconnecting the battery the ignition has to be switched off and there should be nobody in the passenger compartment!

Always store dismounted airbag unit with discharge area up or according to the storage instructions!

Airbag unit should never be left unattended!

Protect airbag unit against flying sparks, open fire and temperatures above 100°C!

Do not transport airbag unit in the passenger compartment!

Do not bring airbag unit in contact with oil, grease and cleaning agents!

Airbag unit that dropped more than 0.5m has to be replaced!

Dispose of untriggered airbag units!

Do not open or repair airbag unit!

NOTICE

Observe the applicable manufacturer's specifications when holding the cutoff speed of diesel engines!

NOTICE

Always switch off the ignition first before connecting and disconnecting the OBD plugs or the different AVL vehicle adapters!

Safety information

AVL DiTEST DPM800 Piezo-electric pressure-sensing sparkplug

NOTICE

Choice of piezo-electric pressure-sensing sparkplug:

Using the wrong piezo-electric pressure-sensing sparkplug can lead to electrical and mechanical damage extending even to major engine damage.

Make sure that you choose the right piezo-electric pressure-sensing sparkplug to suit the engine being tested.

(Physical dimensions, seal seat (tapered or flat), etc.)

NOTICE

Electrode gap:

The electrode gap is an important criterion for the production of a proper ignition spark. Please note that the sparking section of the piezo-electric pressure-sensing sparkplug is a very slim design due to the small amount of space available.

Because of that, the ignition voltages should not be as high as with normal sparkplugs in order to prevent damage to the insulator. The correct choice of electrode gap substantially affects the ignition voltage required.

NOTICE

Turbocharged/supercharged engines:

When turbocharged/supercharged engines are operating at very high boost pressures the required ignition voltage is higher. This can be counteracted by reducing the electrode gap (approx. 0.5 mm).

(Due to the special construction of the piezo-electric pressure-sensing sparkplug, the insulation can break down if the electrode gap is too large.)

AVL DiTEST DPM800 Piezo-electric glow plug pressure sensor adaptor

NOTICE

Choice of piezo-electric glow plug pressure sensor adaptor:

Using the wrong piezo-electric glow plug pressure-sensor adaptor can lead to electrical and mechanical damage extending even to major engine damage.

Make sure that you choose the right piezo-electric glow plug pressure sensor adaptor to suit the engine being tested.

NOTICE

The glowplug adaptor is used only to hold the pressure sensor. Preheating the cylinder with the piezo-electric glowplug pressure sensor adaptor when starting the engine is not possible.

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1 General introduction

1.1 General description

The AVL DiTEST DPM 800 (DPM = dynamic pressure measurement) enables the progression of the relative internal cylinder pressure to be measured using a sparkplug with an integral pressure sensor (piezo-electric pressure-sensing sparkplug) or, on diesel engines, using a glow plug adaptor with integral pressure sensor.

(Piezo-electric glow plug pressure sensor adaptor).

The AVL DiTEST DPM 800 includes a signal converter/amplifier which conditions the signal from the piezo-electric pressure-sensing sparkplug (piezo-electric glow plug pressure sensor adaptor) for the AVL DiScope 802.

The data readings are processed by the AVL DiScope 802.

When doing so, it tracks the pressure progression in relation to the crankshaft position with the aid of the on-board TDC engine speed sensor.

Measurement of the internal cylinder pressure can provide the following relative readings:

- indicated mean pressure of the cylinder tested (pmi)
- maximum pressure of the cylinder tested (pmax)
- position relative to engine TDC at which maximum pressure is achieved in the cylinder tested (pmax/TDC)
- engine speed at which readings were taken

The product specifications also include an adaptor socket for fitting the piezo-electric pressure-sensing sparkplug/glow plug pressure sensor adaptor.

Please note that Version 2.0 of AVL DiX is required to operate the AVL DiTEST DPM 800.

For general guidance on using the AVL DiScope 802, please refer to the AVL DiScope 802 device manual.

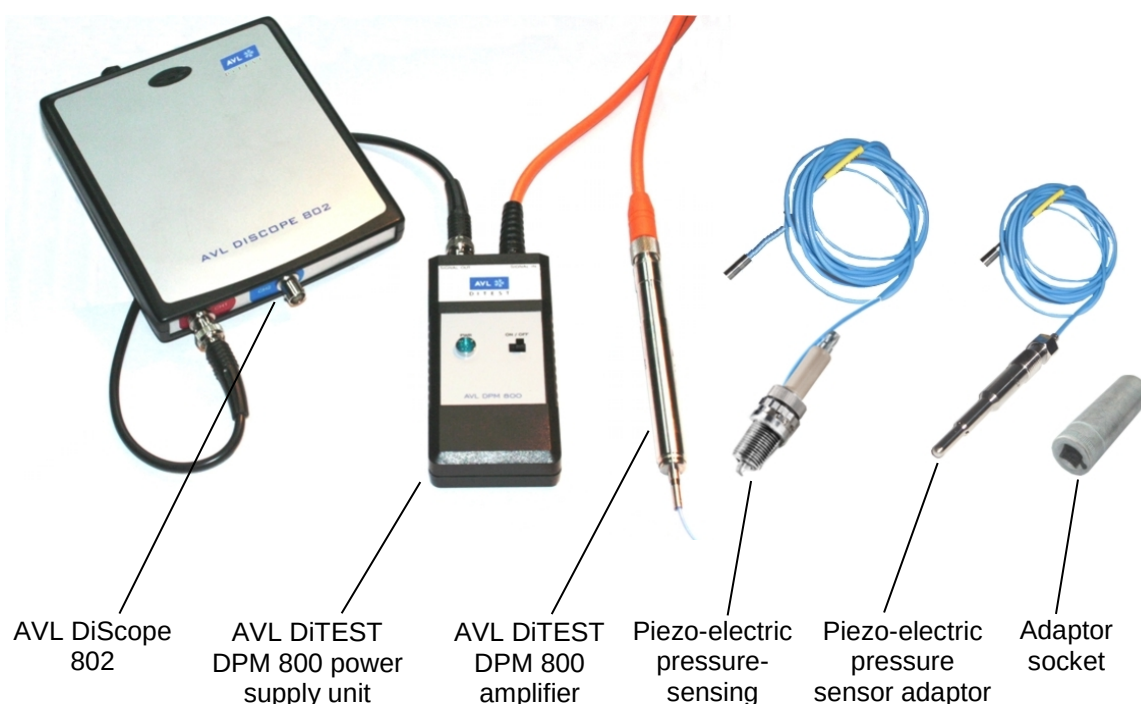


Fig. 1-1

1.2 Safety instructions

This documentation contains important warnings and safety instructions which have to be observed by the user. Only through compliance with these requirements and safety measures it is possible to ensure correct and safe operation.

Please note the safety instructions on the screen.

1.3 Typographical conventions

Safety instructions:



DANGER

Indicates an **extremely dangerous** risk which - if not prevented - leads to death.



WARNING

Indicates an imminent danger - if not prevented - can result in death or serious injury.



CAUTION

Indicate a danger that may lead to moderate or light injuries.

Additional danger signal:



Danger due to electrical current.

Notice:

NOTICE

This text draws attention to situations or operating error that can lead to property damage or loss of data.

Information:

Information

This text indicates important information or instructions. Failure to comply with these instructions prevents or significantly hampers a successful finalization of the operations described in this documentation.

Standard text formats:

bold	Important text/text passages, parameter
<i>italic</i>	On screen dialogs and messages
CAPITAL LETTERS	Device designation and operating conditions
Menu Menu item	Selection of menu command through tapping on buttons

List formats:

1. 2.	Step-by-step instructions in a specified sequence
•	Instructions, consisting of only one step
▪	Listings without a specific order
-	

1.4 Operation of PC programs

This manual assumes basic knowledge of Microsoft Windows.

Please turn to your Windows manual for details.

If necessary, contact your PC support/system administrator.

2 Initial use

2.1 Installing the software

Information

To install the software you must have administrator permissions.
You must have Version 2.0 of AVL DiX installed on your AVL DiX station.
If necessary, update AVL DiX to Version 2.0.

2.2 Installing the AVL DiX 2.0 software

1. All connected modules must be switched off
(set AVL DiLink 480 master switch on rear panel to "0") as the current drivers are not available at the point of installation.
2. Insert the DVD "AVL DiX 2.X BO7340" in the DVD drive.
3. The screen "AVL DIX SETUP" appears.
(If the screen does not appear, start Windows Explorer, right-click on your DVD drive and click **Autoplay** (WIN XP) or **Install or run program** (Win Vista/Win 7)).
4. Click **English** and then **AVL DiX Installation**.
5. If not previously installed, install **Windows Installer 4.5** for your operating system (Vista or XP).
6. Restart the AVL DiX PC.
7. Repeat steps 3 and 4.
8. If not previously installed, install **.NET Framework 3.5**.
9. Restart the AVL DiX PC.
10. Repeat steps 3 and 4.
11. Click **English** and then **AVL DiX Installation**.
12. Click **DiX Installation**.
13. Accept the licence agreement.
14. Select the version for your country.
15. Select **Measuring and testing**.
16. Confirm each step by pressing **Next** or **OK**.
17. Restart the AVL DiX PC.
18. After completing installation, switch on all AVL DiX modules.
(Set power switch on back of AVL DiLink 480 to "1".)
19. Plug the AVL DiX dongle (silver) into a USB socket.
20. The operating system will automatically detect the new hardware and install the appropriate drivers.
Click **OK** when asked to confirm installation of unsigned drivers.
The summary of the system update is then displayed.
Press **F8 Confirm** to finish the system update.

2.3 Updating AVL DiX 1.0 to AVL DiX 2.0

1. All connected modules must be switched off
(set AVL DiLink 480 master switch on rear panel to "0") as the current drivers are not available at the point of installation.
2. Insert the DVD "AVL DiX 2.X BO7340" in the DVD drive.
3. The screen "AVL DiX SETUP" appears.
(If the screen does not appear, start Windows Explorer, right-click on your DVD drive and click **Autoplay** (WIN XP) or **Install or run program** (Win Vista/Win 7)).
4. Click **English** and then **AVL DiX Installation**.
5. If not previously installed, install **Windows Installer 4.5** for your operating system (Vista or XP).
6. Restart the AVL DiX PC.
7. Repeat steps 3 and 4.
8. If not previously installed, install **.NET Framework 3.5**.
9. Restart the AVL DiX PC.
10. Repeat steps 3 and 4.
11. Click **DiX Installation**.
12. Accept the licence agreement.
13. Select the version for your country.
14. Select **Measuring and testing**.
15. Confirm each step by pressing **Next** or **OK**.
16. Select **Update**.
17. Restart the AVL DiX PC.
18. After completing installation, switch on all AVL DiX modules.
(Set power switch on back of AVL DiLink 480 to "1".)
19. The operating system will automatically detect the new hardware and install the appropriate drivers.
Click **OK** when asked to confirm installation of unsigned drivers.
The summary of the system update is then displayed.
Press **F8 Confirm** to finish the system update.

2.4 Activating the AVL DiTEST DPM 800 with the AVL DiScope 802 present

1. Restart the AVL DiX PC.
2. Start AVL DiX.
3. The screen "*Licence Update*" appears.
4. Click **Extras | Update system | Licence**.
5. Click **F2 File**.
6. Insert the disk/CD in the drive.
7. Select the licence file (.lic) for the dongle.
8. Click **Open**.
9. The screen "*Licence Update*" appears.
Click **Transfer licence to dongle**.
10. Clicking **Shows the contents of the dongle** shows the contents of the dongle, which should include the following entries:
LIC SCOPE [XA7003]
LIC DIX SCOPE DPM [XA7038]
11. Finish activation of the AVL DiTEST DPM 800 by clicking **Next**.

3 Measuring

3.1 Taking a reading

1. Switch off the vehicle's engine.
2. Unscrew the sparkplug (glow plug).
3. Carefully feed the lead for the piezo-electric pressure-sensing sparkplug (glow plug pressure sensor adaptor) through the adaptor socket (A).

In the adaptor socket there is a slot (B) through which the lead can pass through the socket **without being damaged**.

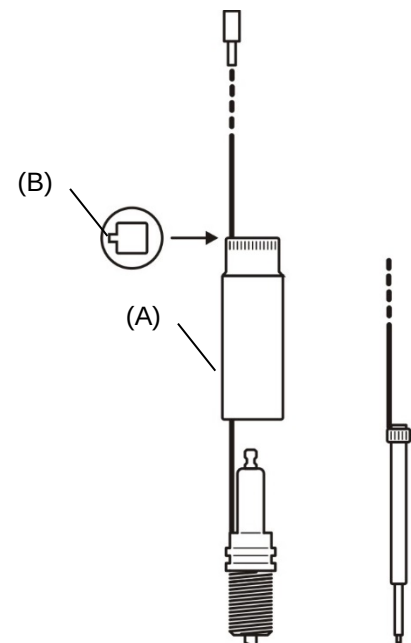


Fig. 3-1

4. Carefully screw the piezo-electric pressure-sensing sparkplug (glowplug pressure sensor adaptor) carefully into the engine.
Take care not to damage the lead.
5. Carefully route the lead for the piezo-electric pressure-sensing sparkplug (glow plug pressure sensor adaptor) through the engine compartment.

NOTICE

Route the leads so that they

- do not come into contact with any hot parts
- are not close to any hot parts (radiant heat)
- do not come into contact with any rotating parts
- are not kinked or damaged

6. Carefully screw the lead (C) for the piezo-electric pressure-sensing sparkplug (glow plug pressure sensor adaptor) to the AVL DiTEST DPM 800 amplifier (D), see Fig. 3-2.

Take care not to cross the thread when screwing on the lead.

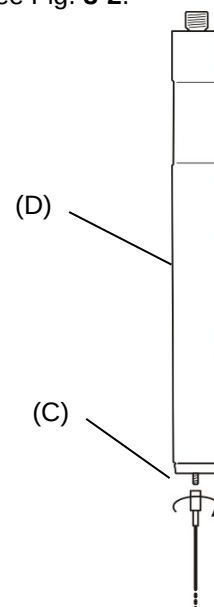


Fig. 3-2

7. Screw the lead from the AVL DiTEST DPM 800 power supply unit **SIGNAL OUT** connection (E) to the AVL DiTEST DPM 800 amplifier (D), see Fig. 3-3.

Take care not to cross the thread when screwing on the lead.

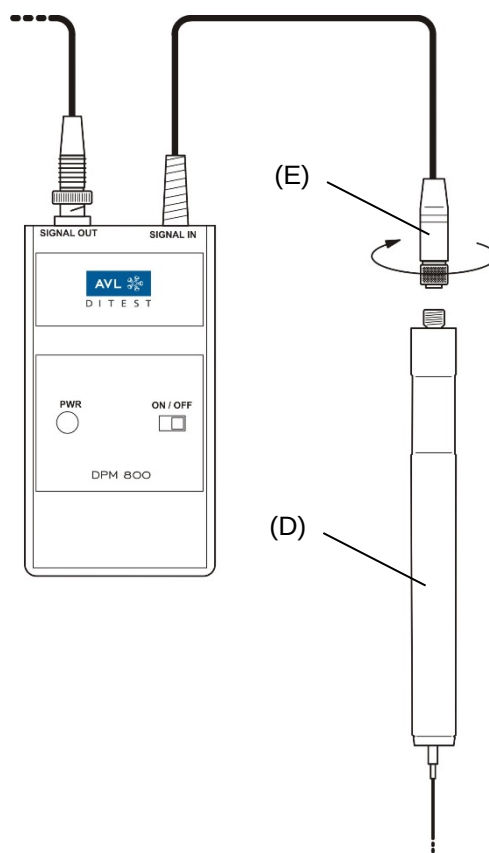


Fig. 3-3

8. Connect the **CH1** connection on the AVL DiScope 802 to the **SIGNAL OUT** socket on the AVL DiTEST DPM 800 power supply unit using the connecting lead (F), see Fig. 3-4.

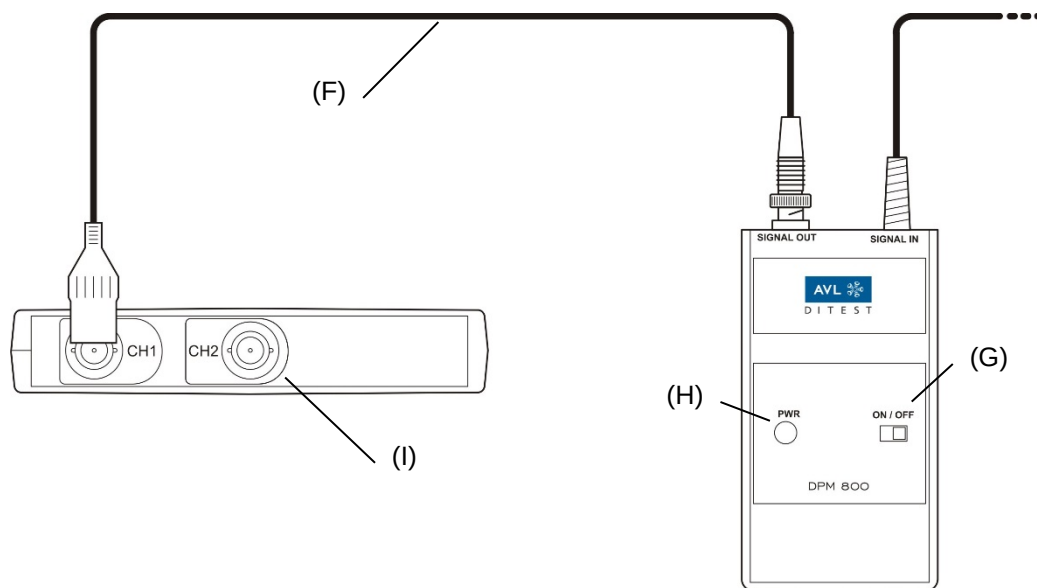


Fig. 3-4

9. Connect the on-board engine speed/TDC sensor to connection **CH2** (I) on the AVL DiScope 802.
Wire the on-board engine speed/TDC sensor connection parallel, i.e. without disconnecting the wiring loom.
10. Switch on the AVL DiTEST DPM 800 power supply unit at the **ON/OFF** switch (G).
The PWR LED (H) should show blue.

11. Start AVL DiX as described in the AVL DiScope 802 device manual.
12. Select the mode **Diagnostic | Measure & test | Enginetest | Petrol** (if testing cylinder pressure with the piezo-electric pressure-sensing sparkplug) or **Diesel** (if testing cylinder pressure with the piezo-electric glow plug pressure sensor adaptor), see Fig. 3-5.

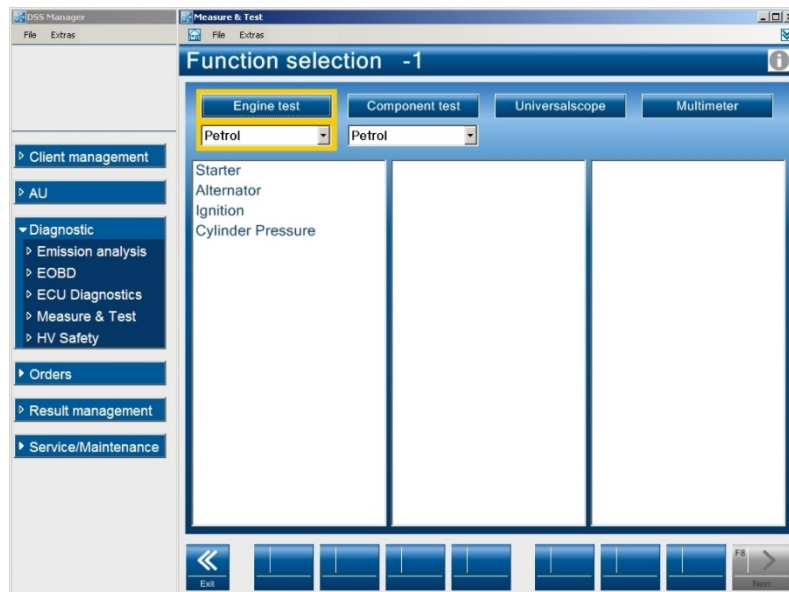


Fig. 3-5

13. Select the mode **Cylinder Pressure | Piezo-spark plug** (**Piezo- glow plug** for diesel engines), see Fig. 3-6.

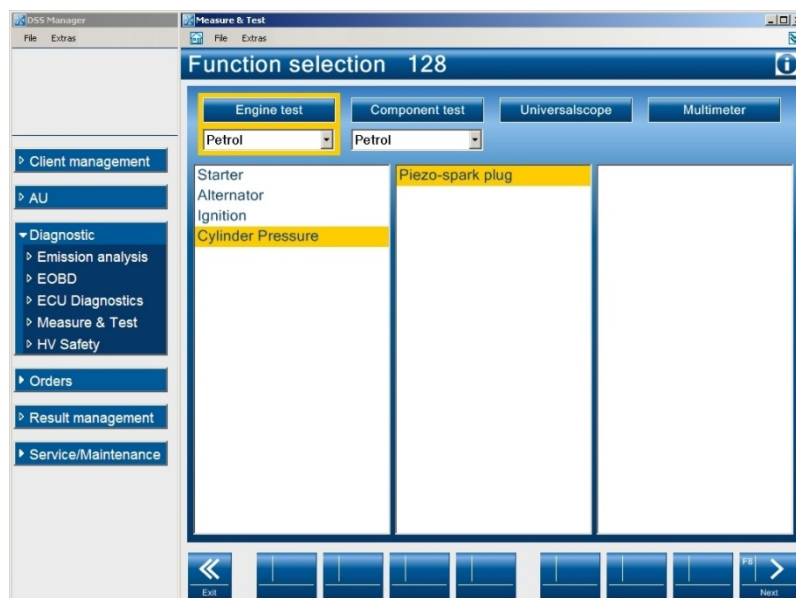


Fig. 3-6

14. Click **F8 Next**.

Enter the TDC offset, if known, and select the number of strokes per engine cycle, see Fig. 3-7.

Information

Only by entering the correct TDC offset can meaningful readings be obtained.

You can find out the TDC offset.

Proceed as described in Section 3.1.2 "Determining TDC".

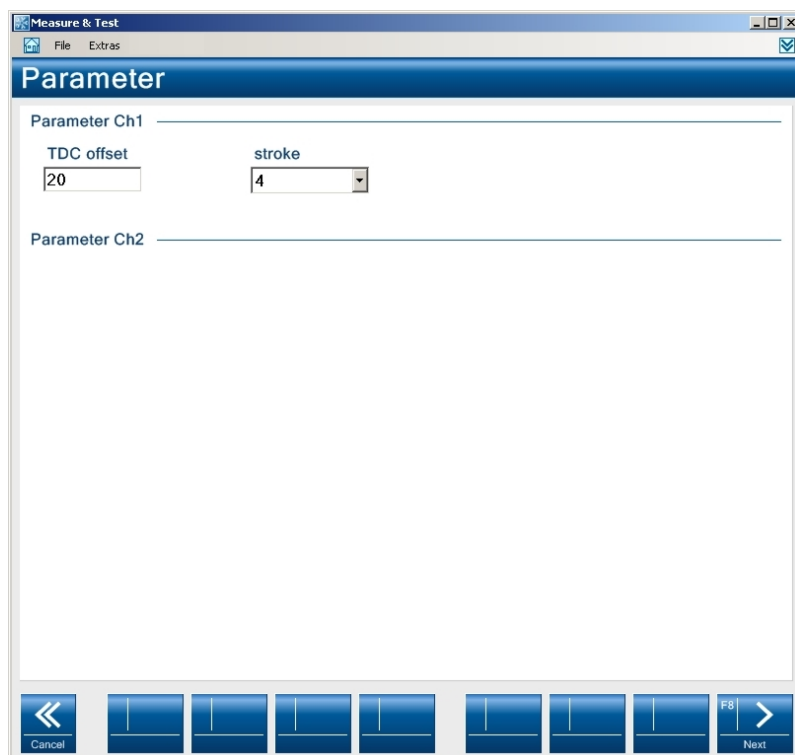


Fig. 3-7

15. Click **F8 Next**. The results of the test are shown.

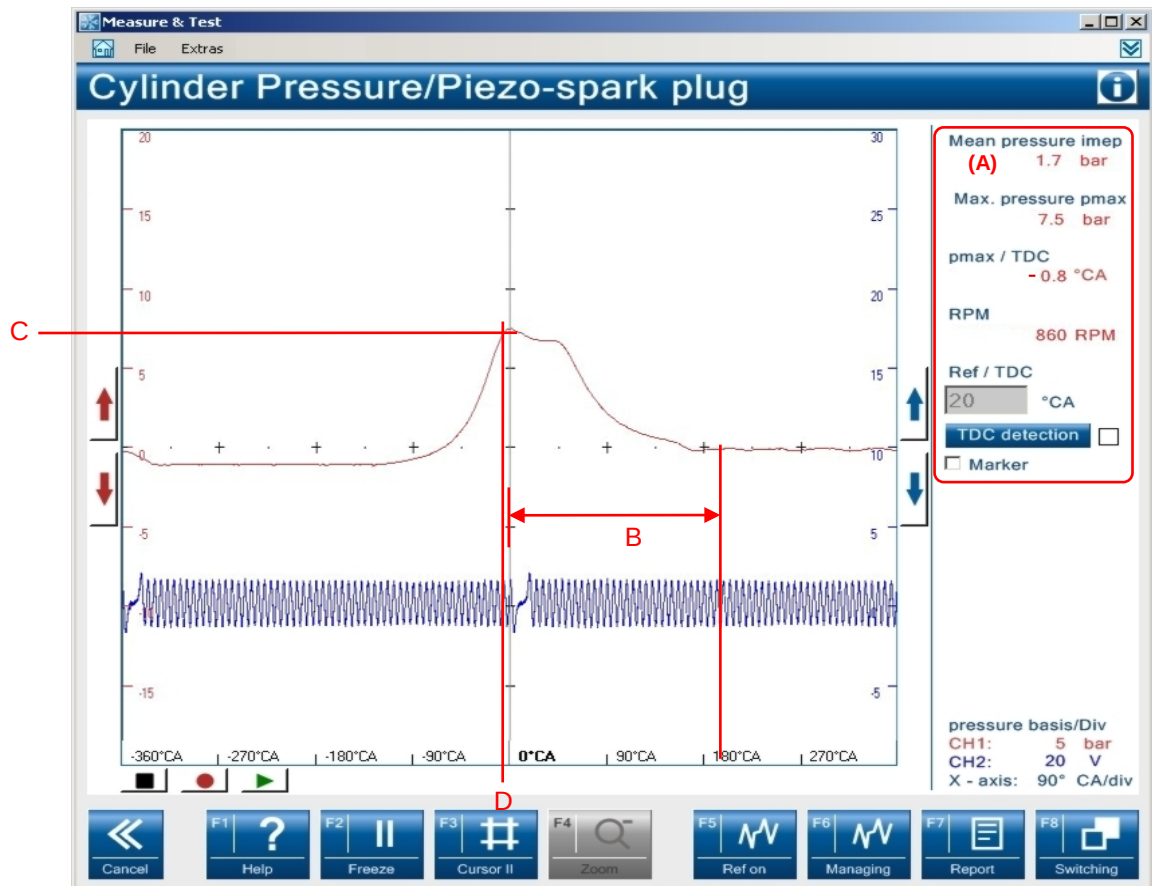


Fig. 3-8

As well as the internal cylinder pressure (red trace, channel 1) and the on-board engine speed/TDC signal (blue trace, channel 2), the following relative readings are shown in the area (A):

Mean pressure, imep:

This is the indicated mean pressure, i.e. essentially it is the averaged surplus pressure prevailing between 0° and 180° of crankshaft rotation, see (B).

Max. pressure pmax:

The maximum pressure, in the example 7.5 bar, see (C).

pmax/TDC:

The crankshaft angle at which the maximum pressure occurs relative to the engine's TDC. in the example -0.8° of crankshaft rotation, see (D).

RPM:

The engine speed while taking the pressure readings, in the example 860 rpm.

Ref/TDC:

The TDC offset entered or determined, in the example 20° of crankshaft rotation.

16. To go back, press **<< Cancel**.

3.1.1 Setting the pressure sensor sensitivity

To obtain optimum representation of the measured data, you have to set the sensitivity of the piezo-electric pressure-sensing sparkplug (glow plug pressure sensor adaptor), in the example shown:

1. The figures are printed on the top of the package containing the piezo-electric pressure-sensing sparkplug (glow plug pressure sensor adaptor), in the example shown:

Sensitivity	RT
0 – 140 BAR	16.24 pC/BAR
0 – 200 BAR	16.25 pC/BAR

see Fig. 3-9.

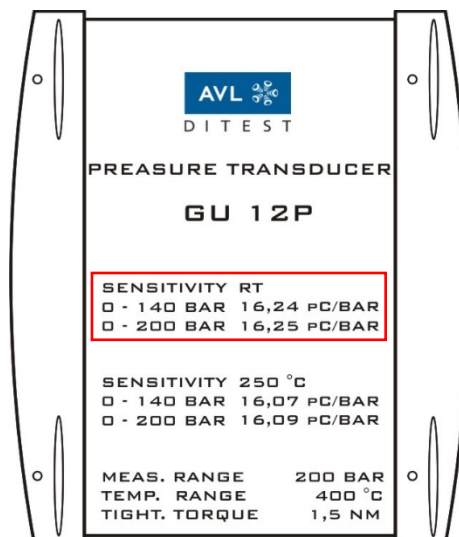


Fig. 3-9

2. On the results graph screen (display mode), see Fig. 3-8, click **F8 Switching**.
3. In the box "bar/mV" enter the rounded figure (see above), in the example shown **16mV** (16.24pC/BAR => 16mV).

Explanation:

The charge amplifier used has a signal voltage/charge ratio of 1mV per pC (pico coulomb).

□ If the pressure sensor produces a charge of 16.24 pC at 1 bar pressure and the charge amplifier connected generates a signal voltage of 1 mV/pC, then the signal voltage equates to 16.24 mV per 1 bar of measured pressure.

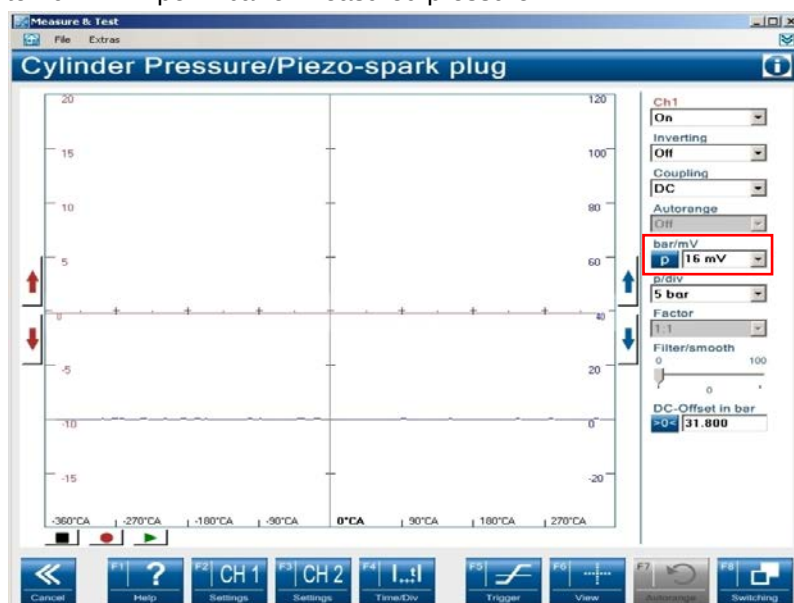


Fig. 3-10

4. To return to the results graph screen (display mode), Fig. 3-8, click **F8 Switching**.

3.1.2 Determining TDC

Information

Only by entering the correct TDC offset can meaningful readings be obtained.
See also Fig. 3-7.

Starting from the results screen (display mode), see Fig. 3-8, proceed as follows:

1. Put the engine into non-firing overrunning mode.
 - When stationary, that is done by revving the engine to a high speed and then releasing the accelerator.
 - On the road, it is done by driving downhill with your foot off the accelerator.

In addition, if possible, you can also shut off fuel injection into the cylinder being tested by electrically disabling the fuel injector, e.g. by unplugging the lead.
2. Stop the test by clicking **F2 Freeze**.
3. Using the  button, scroll back to when the cylinder was firing.

You can identify when the cylinder was firing by:

- a high cylinder pressure
- a high engine speed

see Fig. 3-11.

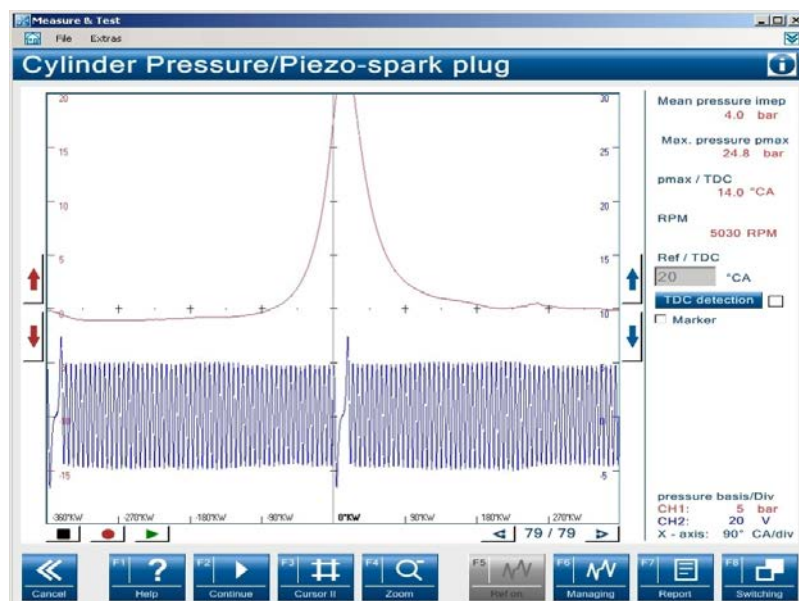


Fig. 3-11

4. Using the  button, scroll forwards to when the cylinder was overrunning.

You can identify when the cylinder was overrunning by:

- a low maximum pressure
 - a raised engine speed (>2000 rpm)
 - a distinctly evident negative pressure following gas expansion after TDC
- see Fig. 3-12.

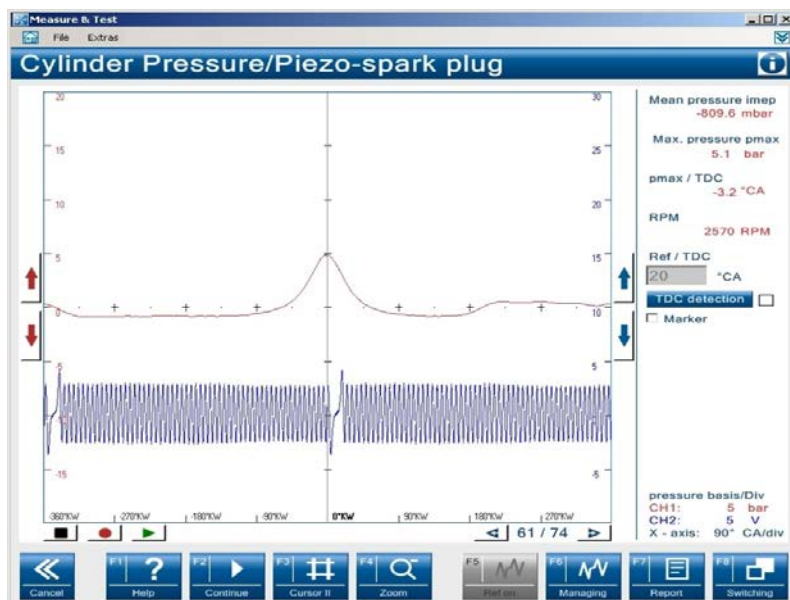


Fig. 3-12

5. Activate TDC detection by clicking  .

Green colour indicates: reference marker detected and related to TDC.

Red colour indicates: reference marker not detected,
reference marker could not be related to TDC
(TDC detection could not be completed).

If the reference marker is detected and related to TDC, the internal cylinder pressure is then shown in correct relation to TDC.

By selecting the option box ☐ **Marker** you can display cursors marking the maximum pressure and the detected reference marker position of the on-board engine speed/TDC sensor signal.

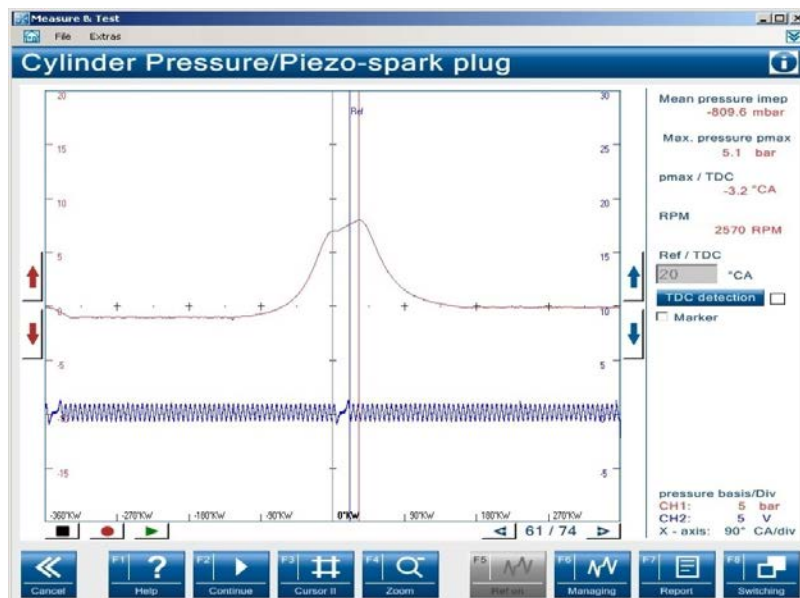


Fig. 3-13

3.1.3 Signal representation

The basic signal setting is chosen so that analysable signals are displayed at idling speed. At higher speeds and loads, the pressure conditions change and the signals behave accordingly. In order to obtain optimum signal representation for your particular application, proceed as follows:

1. On the results graph screen (display mode), Fig. 3-8, click **F8 Switching**.
2. **Channel 1 (CH1):**
Open the drop-down option box "Pressure/Div" and select a suitable pressure.
3. **Channel 2:**
Open the drop-down option box "Voltage/Div" and select a suitable voltage.

Information

In this connection please also refer to the AVL DiScope 802 device manual.

3.1.4 Markings

By selecting the option box  **Marker** you can display cursors marking the maximum pressure and the detected reference marker position of the on-board engine speed/TDC sensor signal.

3.1.5 Setting DC offset in bar

Starting from the results screen (display mode), see Fig. 3-8, proceed as follows:

1. Click **F8 Switching** to change to settings mode.
The default setting is 31.8 bar (it is based on an amplifier offset voltage of 500 mV and an average pressure sensor sensitivity).
If you take a reading under unpressurised conditions, e.g. with the pressure sensor removed from the engine but connected, the reading trace should run along the zero line.
2. If that is not the case, you can re-read the offset by clicking .
3. Clicking **F8 Switching** again returns you to display mode.

Subsequently you can fine-tune the offset while a test is in progress by clicking inside the box



and entering a suitable figure until the neutral-pressure signal status (shortly before induction pressure status) runs along the zero-bar line.

3.2 Tips on testing

During the starting sequence on petrol engines, the maximum cylinder pressure measured is distinctly higher than in idling mode.

Due to the throttle being closed and the more dynamic conditions when the engine is running, the throttle effect is greater, which in turn produces a low maximum pressure.

Example:

While the engine is being started, despite the throttle being closed, the intake air flow is not so dynamic that it produces high throttle losses.

-> The maximum cylinder pressure is equal to the known final compression.

The throttle losses are different when the engine is idling as the intake air flow is much more dynamic.

-> The maximum cylinder pressure drops to a substantial degree (e.g. 5 - 6 bar).

3.3 Testing while the car is being driven



WARNING

Risk of injury

Never take readings when driving the car alone.
(Driver drives, passenger takes readings.)

Route the leads through the car so that they

- do not come into contact with any hot parts
- are not close to any hot parts (radiant heat)
- do not come into contact with any rotating parts

Secure the leads and the AVL DiTEST DPM 800 amplifier in the car.

3.4 AVL DiTEST DPM 800 Connection Box

The AVL DiTEST DPM 800 Connection Box is equipped with a 9V PP3 battery.
Switch off the AVL DiTEST DPM 800 Connection Box after completing the test.
(See also Fig. 3-4, item G.)

4 Care and maintenance

4.1 Visual check

Regularly carry out a visual check of the AVL DiTEST DPM 800.

Examine all components for damage (e.g. breakages) and dirt contamination.

Regularly check the AVL DEM 800 amplifier, the piezo-electric pressure-sensing sparkplug, the piezo-electric glow plug pressure sensor adaptor, the adaptor socket and all leads for damage and dirt contamination.

4.2 Cleaning

Before cleaning the AVL DiTEST DPM 800, disconnect all leads and switch off the AVL DiTEST DPM 800 amplifier.

Only clean the AVL DiTEST DPM 800 with a dry cloth.

Do not use any cleaning agents or solvents.

4.3 Replacing the battery

1. Switch off the AVL DiTEST DPM 800 Connection Box at the **ON/OFF** switch (K).
2. Unscrew the lead to the AVL DiScope 802 (L) from the AVL DiTEST DPM 800 Connection Box **SIGNAL OUT** connection and the lead (M) from the AVL DiTEST DPM 800 amplifier.

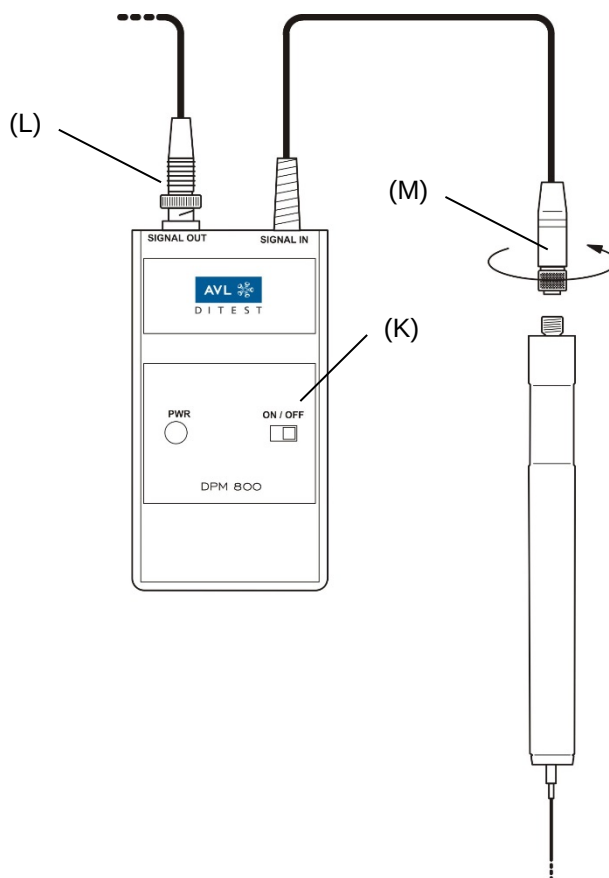


Fig. 4-1

3. Carefully slide the battery cover (N) on the back of the AVL DiTEST DPM 800 Connection Box downwards.

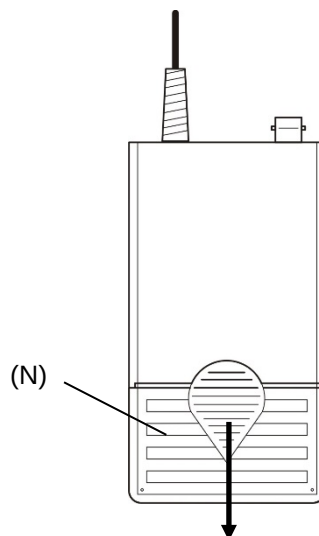


Fig. 4-2

4. Take out the battery (O) and disconnect the terminals (P). Connect a new battery and insert it in the AVL DiTEST DPM 800 power supply unit.

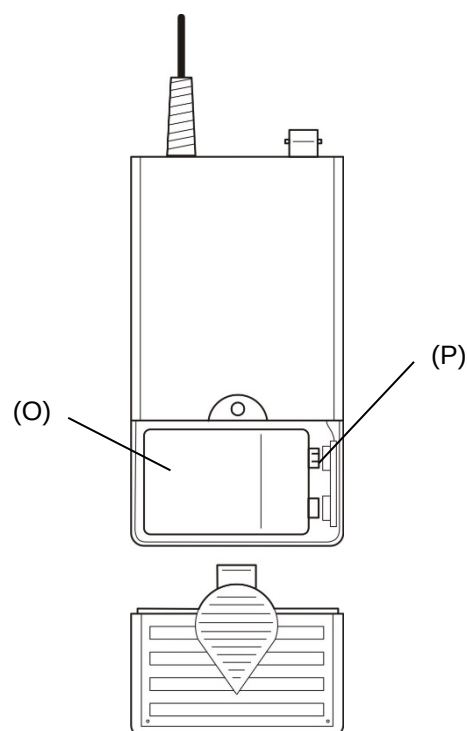


Fig. 4-3

5. Carefully replace the cover, see Section 3, Fig. 4-2.

5 Product specifications

Component	Order number
System consists of:	
Station AVL DiX 102 (if not already present)	VS8128
AVL DiTEST DPM 800	VS8755
Consisting of:	
Connection Box not including 9V PP3 battery	BO7725
Battery, 9V, PP3 E	HI0001
AVL DiTEST DPM 800 amplifier	GG1407
Adaptor socket to fit piezo-electric pressure-sensing sparkplug or glow plug pressure sensor adaptor ordered	E.g. GG7405 or WG0140 or WG0200 ...
Piezo-electric pressure-sensing sparkplug or glow plug pressure sensor adaptor ordered	
Lead, BNC 0.5m black RG 58	EX7528
DiX software CD	BO7340
DiX manual CD	VM7777

6 Warranty

6.1 New devices

New devices have a 12-month warranty period.

The batteries have a six-month warranty period.

The agreements with your supplier apply.

Principally wear parts and accessories are excluded from the warranty.

For the execution the date of the shipping note to the final customer does apply.

The warranty expires due to:

- Mechanical damage (e.g. fall, etc.)
- Penetration of moisture (e.g. water, oil, acids, etc.)
- External intervention (e.g. repairs carried out by non-authorized people)
- Improper operation (e.g. control of touch screen with sharp or pointed object, cleaning with compressed air)
- Improper storage, care and maintenance (e.g. cleaning the device with solvent-based cleaners)

6.2 Exchange or loaned devices

The agreements with your supplier apply.

For the execution the date of the shipping note to the final customer does apply.

6.3 Event of damage or loss

In the event of damage or loss, please contact the respective AVL DiTEST office / the respective AVL DiTEST partner in your country.

7 Technical data

Piezo-electric pressure-sensing sparkplug	
Piezo-electric pressure-sensing sparkplug:	Sparkplug with integral pressure sensor manufactured to customer specifications (Order form – AT7657D/E)
Piezo-electric glow plug pressure sensor adaptor	
Piezo-electric glow plug pressure sensor adaptor:	Glow plug adaptor with integral pressure sensor manufactured to customer specifications (Order form – AT7656D/E)
Adaptor socket	
Adaptor socket:	Adaptor socket for fitting the piezo-electric pressure-sensing sparkplug with slot for the pressure sensor lead
AVL DiTEST DPM 800 Connection Box	
Dimensions (WxHxD):	60x120x20mm
Weight:	Approx. 500g
Operating temperature:	+5 ... +35 °C
Transportation temperature:	-25 ... +60 °C
Power supply:	9V PP3 battery supplied
Connections:	Input: - SIGNAL IN (piezo-electric pressure-sensing sparkplug/glow plug pressure sensor adaptor) Outputs: - SIGNAL OUT (AVL DiScope 802)
Controls and displays:	Button: - ON/OFF LED: - PWR (blue)

AVL DiTEST DPM 800 amplifier	
Input range	6000 pC
Signal ratio	1mV/pC (1mV output voltage at 1pC coulomb input voltage)
Zero line	0.5 V
Signal variation	0.5 ... 4.5V
Linearity	<0.1 %
Frequency response (-3dB)	10 kHz
Error at 20°C	0.25 %
Overall error over complete temperature range	1 %
Temperature range	-10 ... 120 °C
Signal noise	<2 mVpp
Output resistance	<100 Ω
Load resistance	≤500 Ω
Power supply voltage	8 ... 32 V
Dimensions (length x dia.):	131x13.8mm
Plug	M12
Connections	Input: - Piezo-electric pressure-sensing sparkplug/glow plug pressure sensor adaptor Outputs: - AVL DiScope 802, CH1 or CH2
CE mark:	
CE mark: 	The manufacturer hereby declares that the AVL DiTEST DPM 800 complies with the provisions of the EC Directives cited below including all relevant amendments: - EN 61010-1 (Safety Requirements) - EN 61326-1 (EMC) - 2006/95/EC Low-voltage Electrical Equipment Directive
Disposal:	
Disposal 	This AVL DiTEST product is a high-quality electrical and electronic device which must not be disposed of as normal household waste. For disposal, it is essential to comply with local legal obligations!