PREMIER DIAGNOSTICS LTD

ELITE MICRO EMISSION ANALYSER

OPERATING MANUAL

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INDEX

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DECLARATION

The Premier Elite Exhaust Emission Analyser is accredited for statutory testing in the MOT scheme for both catalyst equipped vehicles and non-catalyst equipped vehicles. This includes Class IV and Class VII vehicles fuelled by Petroleum Spirit, Liquid Petroleum Gas (LPG) and Compressed Natural Gas (CNG)

SOFTWARE VERSION 10.2

INTRODUCTION

Congratulations on the purchase of your Premier Elite Exhaust Emission Analyser. Premier Diagnostics Ltd would like to thank you for placing your business with us.

The Premier Elite has been developed to meet or exceed 1996 UK MOT legislation. The analyser complies with the Organisation International De Metrologie Legale "Instruments for testing vehicle exhaust emissions" O.I.M.L. R99 (Class 1 Instruments) and Physikalisch Technische Bundesanstalt (PTB) to the German Abgasuntersuchung (AU2) requirements for the performance of the Oxygen (O_2) channel.

The Premier Elite has been carefully designed to ensure easy operation, simple maintenance and maximum flexibility.

Based on an IBM^{tm} compatible PC platform, your Premier Elite can perform many other workshop functions, ensuring maximum profitability. Should you wish to know more about other facilities available for your Premier Elite, please do not hesitate to contact us.

Before using your new analyser, please read this manual carefully. Cautions and warnings in this manual must be followed.

CAUTIONS

BEFORE USING YOUR ANALYSER

Please read the following carefully to ensure the safe operation of your equipment and the implementation of safe working practices.

POWER SUPPLY: The Premier Elite must be plugged into a suitable AC power socket. This socket must have an Earth connection. If the analyser's power cord is not long enough to reach the socket, do not be tempted to use an extension lead. Arrange for your workshop mains supply to be extended to the location where the analyser will be sited.

MOISTURE: Keep your analyser dry at all times. Should your analyser become wet - DO NOT OPERATE. Call your service provider immediately to arrange a thorough inspection and safety check.

Your analyser is designed to operate in temperatures ranging from 5°C to 40°C. Relative humidity should not exceed 90% RG (Non-Condensing).

EXHAUST FUMES: **Inhalation of exhaust fumes is highly dangerous. Never use your emission analyser in a closed workshop without using professionally installed exhaust extraction equipment. Alternatively, use the equipment in an area of your workshop which is fully open to the atmosphere.**

LOOSE CLOTHING: Never wear loose clothing when working on a vehicle.

HOT SURFACES: When working on vehicles there are many excessively hot surfaces such as manifolds and heat shields. Avoid all skin contact with these surfaces and ensure the analyser's harnesses do not touch excessively hot areas.

MOVING PARTS: Avoid contact with any moving parts (Pulleys and Drive Belts, etc). Never allow the analyser's harnesses to touch these components.

PETROL FUMES and VAPOUR: Petrol fumes and Vapour are often present when working on a vehicle. Never smoke or use naked flames when working on any vehicle. Always repair fuel and vapour leaks before commencing any test sequence.

ABOUT YOUR PREMIER COMBI

Keyboard and Mouse may be wireless

1. COLOUR MONITOR

The SVGA full colour monitor displays all the test routines, screen prompts and results. Test routines and screen selections are displayed as a "Menu". Make the selection you require by moving the "Highlight Bar" to the item of your choice, (using the cursor keys) and then press the "Enter" key.

2. KEYBOARD

The full size 'Qwerty keyboard' is used to select the different test routines you wish to run. All screen selections are made using just 6 keys. The four cursor keys (up, down, left and right) move the highlight bar accordingly, the 'Enter' key enters the selection chosen on the screen and the 'Escape' key displays a menu giving you various options to change your entries or return to the main menu. The 'Alpha/Numeric' keys are used to enter customer, vehicle and workshop details.

3. KEYBOARD CABLE ROUTING

The keyboard cable passes through an opening in the keyboard shelf and then passes through the front of the cabinet (just below the keyboard shelf). The cable is then 'fed' down the "back edge channel" into the PC compartment. Attach plug to the keyboard socket on the back of the PC.

4. FLOPPY DISC DRIVE (Where Fitted)

The floppy disc drive is used to update your Premier Elite with the latest software and to load additional programmes should you wish to expand the analyser's capabilities. Your analyser DOES NOT RUN on the FDD. This device is used purely to load software onto the hard drive and is located behind the front flap in the Pc compartment.

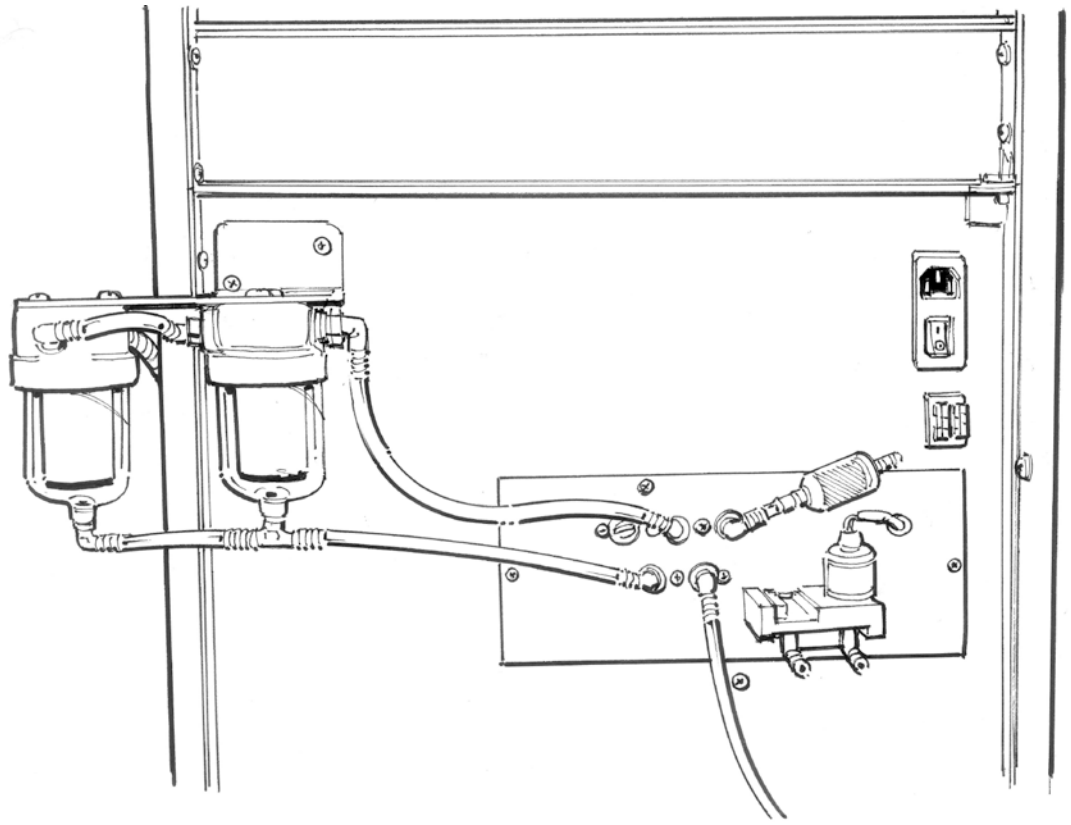
5. CD ROM

The CD Rom is supplied to allow you to run programmes of your choice and is located behind the flap in the Pc compartment.

6. USB PORTS

4 USB ports are fitted to the back of the PC with an additional 2 ports fitted to the front panel. Only the 2 ports on the front panel are available for use.

REAR PANEL



Please Refer To Page 10 For Descriptions

1. WATER TRAP

The water trap is fitted to prolong filter life and prevent "heavy moisture" entering the gas sampling chamber. The Water Trap is Auto Drain and should have a filter change monthly.

2. FRESH AIR PORT

Fresh air is drawn into your analyser through this port during the zero bench procedure. A carbon filter is fitted to this port to remove hydrocarbons from the air.

3. CALIBRATION PORT

Used to calibrate your analyser

4. **FILTER HOUSING**

The Filter Housing contains two filters, one water separator and one particulate. Filter maintenance is covered under 'Routine Maintenance' (see page 36).

5. OXYGEN (0_2) CELL

The O_2 Cell is externally mounted to allow easy replacement without the need for a Service Engineer. Replacement procedures are covered under 'Routine Maintenance'.

6. RPM Sensor Input Socket (Only fitted with Vibration RPM)

Attach the RPM Sensor to this input.

7. **OIL TEMPERATURE INPUT (Only fitted to NON-PDCOM versions)**

Attach the oil temperature probe to this input.

8. COMBINED MAINS SWITCH and INPUT SOCKET

The mains switch turns your analyser on and off. The combined inlet socket supplies power to your analyser. Plug the power cord into this socket, and the 13 amp plug into a suitable 13 amp wall socket.

Note: Your Analyser incorporates an IBM™ compatible PC. The equipment should be provided with a dedicated power supply and fully earthed. If in doubt consult a qualified electrician.

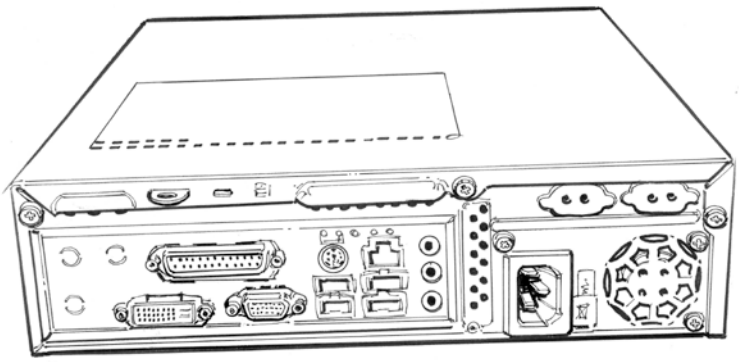
9. Smoke Meter Fuse Block

2 x 7.5Amp automotive blade fuses are fitted to protect the Smoke Meter (where fitted). *Never replace these with over-rated fuses.*

10. WATER DRAIN

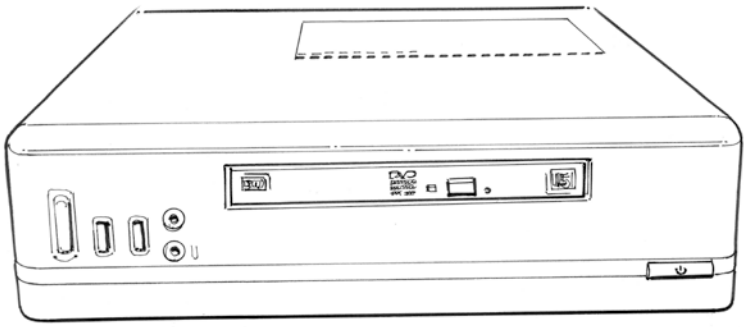
The Outlet Hose allows water to drain clear of the sample bench.

PC BACK PANEL CONNECTIONS



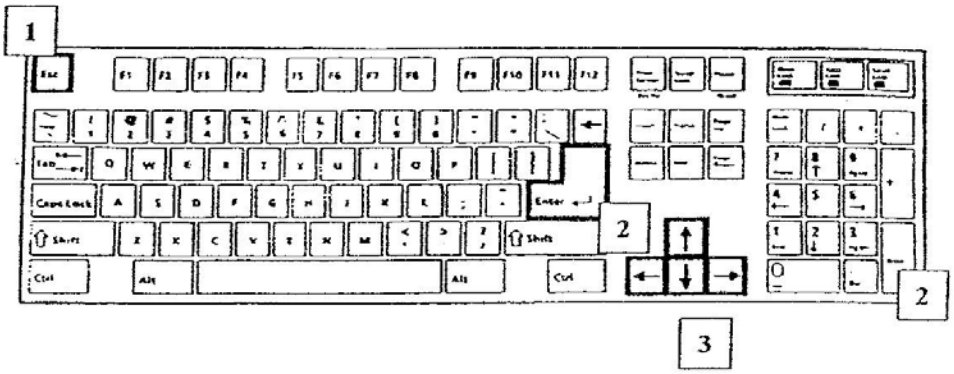
The above schematic shows the location of the various rear panel inputs to your computer. This drawing has been produced for your specific PC platform and should be retained for future reference.

BN 02.01.30



The above shows the front panel with 2 x USB ports, CDROM and audio.

KEYBOARD



The keyboard is used to select the test sequences and enter the various options required to run test routines. All Alpha/Numeric entries are made from the keyboard. The operation of the analyser is controlled by just six keys (except Alpha/Numeric). The locations of these keys are:-

1. ESCAPE KEY

Pressing this key displays a menu giving various options to change your entries, cancel your test or return to the main menu.

2. ENTER KEY

The "Enter" key inputs the information you have selected into the computer.

3. CURSOR KEYS

The Cursor keys move the Highlight Bar over the selections displayed on the screen.

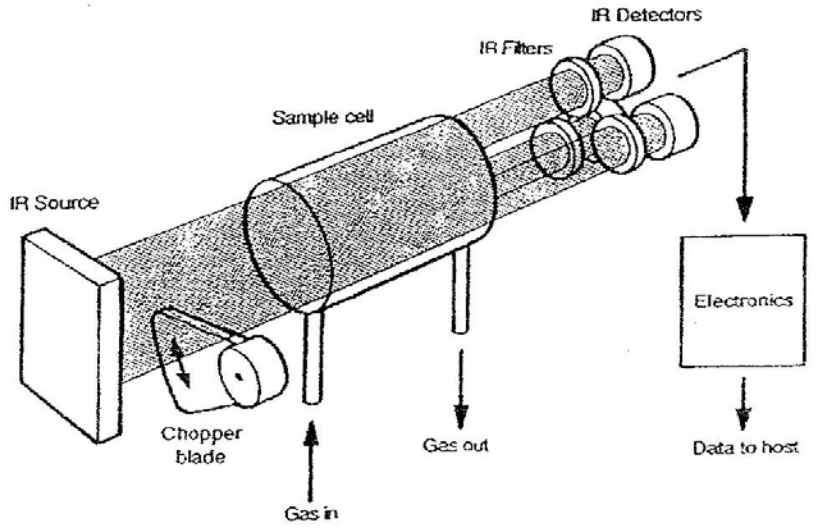
PRINTER

Your Premier Analyser is supplied with a quality printer. It is ready for use with drivers and software fully loaded onto the PC. Please refer to the manufacturer's manual for Service Operations.

REFER TO PRINTER MANUAL

THEORY OF OPERATION

A sample of the Vehicle's Exhaust Emissions is drawn into the Emission Analyser's Infra Red (IR) Sample Bench. The diagram shows a beam of infra red light passing through the sample cell containing the emissions sample. At the other end of the sample cell are three infra red detectors with narrow band optical filters placed over each detector. When IR energy in the bands of interest (CO; CO_2; HC) strikes the detector, the detector generates an analogue signal.



The above is a simplified view of the Emissions Analyser.

The detector/filter assembly consists of three optical filters and three IR detectors, one for each gas to be measured (CO; CO2; HC). The three detectors measure the absorption of IR light and different wavelengths of CO, CO2 and HC, thereby measuring the concentration of each gas in the sample.

THE CHOPPER: A stepper motor is used to actuate the chopper blade, which interrupts the infra red beam and provides a pulsed IR signal required by the signal processing electronics. The alternating blade approach results in less mechanical noise, longer motor life and improved signal processing.

THE SAMPLE CELL: The sample cell is a closed tube with an inlet port at one end and an outlet port at the other. IR-transparent windows allow the passage of infra red light through the cell. As the concentration of a given gas increases, more infra red energy is absorbed.

THE SOURCE: The source is a piece of ceramic containing a resistive element that is heated electrically and emits infra red energy.

O_2 (Oxygen) is measured using a fuel cell. This cell generates low voltages which vary according to the amount of Oxygen present in the sample. By measuring the voltage, an accurate calculation of the volume of Oxygen can be made.

SAMPLING SYSTEM

SAMPLE PROBE

A high quality sample probe is supplied with your analyser. This consists of a Swan Neck Handle and Flexible Tip. The Sample Probe should always be inserted into the Exhaust Pipe as far as possible. The probe is held in place by the 'Spring Wings'.

SAMPLE HOSE

The Sample Hose connects the Sample Probe to the Water Trap. This hose is carefully selected to prevent HC residue building up in the hose walls. Should you damage this hose, do not be tempted to use rubber hosing to replace it. Hydrocarbons penetrate rubber surprisingly quickly and your Analyser will not pass the HC Hang-Up Check and will 'lock you out' from Legislative Testing.

WATER TRAP

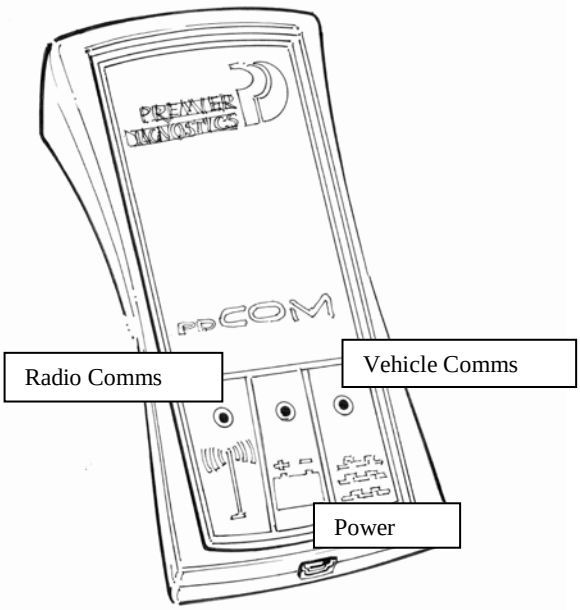
An additional Water Trap is supplied with your analyser to remove the majority of water vapour from the exhaust sample. This greatly extends the life of the particulate filter. The Water Trap is auto-draining.

EMISSIONS FILTER

The filter is located on the rear panel of your analyser. This filter must be checked daily and changed when the element becomes dirty. Do not wait for a permanent "Low Flow" warning to appear on the screen. The filter is fitted to protect your analyser from Carbon, Soot and other detrimental contaminates. Trying to extend the filter's life to its extreme is false economy. Only use approved filters, they form part of the equipment's accreditation.

Bench errors caused by dirty filters is NOT a warranty item.

PD COM RPM and OIL TEMPERATURE MODULE

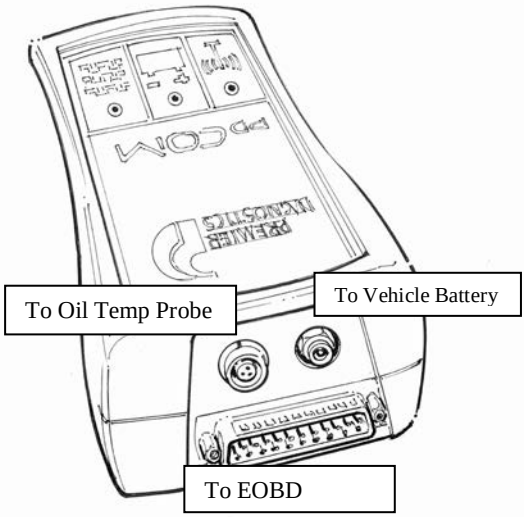


The PD COM® Module is designed to give fast and accurate measurement of engine speed and temperature. It can be attached to either the vehicles EOBD Socket on post 2001 Models, or for pre 2001 Models, to the vehicles battery and features a Dipstick Probe to measure temperature.

The Module is powered by the EOBD Socket or the vehicles battery. When powered, the 'Centre LED' will glow. PD COM® uses radio communication so there are no cables attached to the analyser. When radio communications is established, the Radio Comms LED will flash.

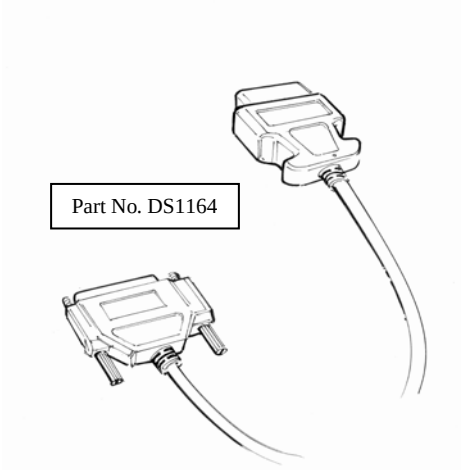
EOBD. When PD COM® is attached to the vehicles diagnostic socket, it will search for the manufacturers' protocol and when communications is established, the Vehicle Comms LED will flash. (This could take up to 20 seconds depending on the systems age and comms' speed).

When communications is established with the vehicle, your analyser will automatically display the readings without further input from the operator.



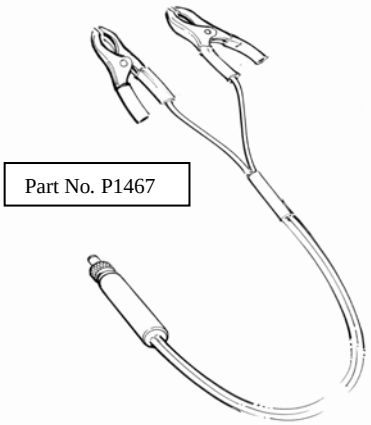
There are three sockets on the top of the PD COM® Module, as shown on the left, one for each of the harnesses. PD COM® auto detects whether it is powered by the vehicle battery or via the EOBD Port. When powered by the vehicle battery, the modules logic will 'Advise' the analyser software and during the set-up procedure the operator will be asked to 'Enter the Number of Cylinders'. Simply follow the prompt and press 'Enter'. If you enter the incorrect number of cylinders, pressing the 'Escape' key in virtually any part of the program will display an option to 'Change RPM Settings'. When using the Oil Temperature Probe, ensure the probes length is accurately measured against the length of the vehicles Dipstick using the adjustable toggle. DO NOT insert the Probe without measuring, this could result in Probe damage caused by the 'Crank' hitting the probe.
Remember, if you are NOT using the EOBD harness, the Vehicle Comms LED will NOT flash.

PD COM RPM and OIL TEMPERATURE MODULE
Harnesses



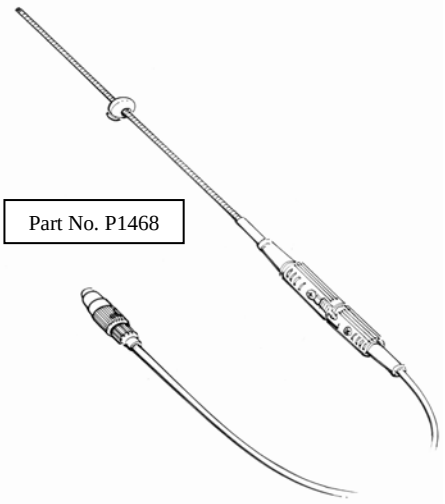
Part No. DS1164

EOBD Harness. Connect the 25 Pin D Type Connector to PD COM® and attach to vehicles Diagnostic Socket. (J1962 Connector)



Part No. P1467

Battery Harness. Connect the Jack Plug to
PD COM® and attach the Crock' Clips to the Vehicles Battery. **NOTE: When powering PD COM® from the Battery, the Analysers Software will request the number of cylinders is selected. Follow the 'Prompt' and Press 'ENTER'**



Part No. P1468

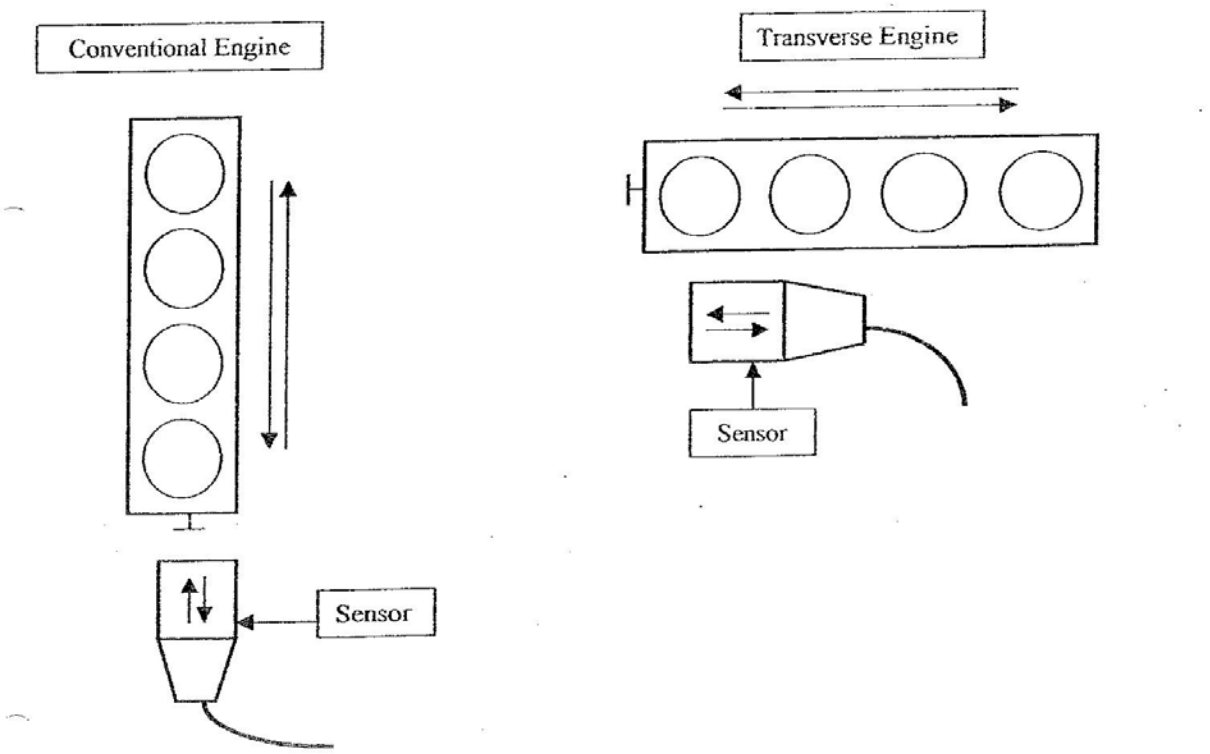
Oil Temperature Harness. Connect the Harness to PD COM® and Insert into the Dipstick Tube. **NOTE: ENSURE you measure and adjust the length of the Probe against the Dipstick, adjusting the insertion length using the Toggle. FAILURE to do so could result in damaging the probe and possibly Engine Damage. It is the operators responsibility to ensure these instructions are followed in FULL. Warranty is Expressly Excluded from these eventualities.**

HARNESSES AND ATTACHMENTS

VIBRATION RPM SENSOR (Where Fitted)

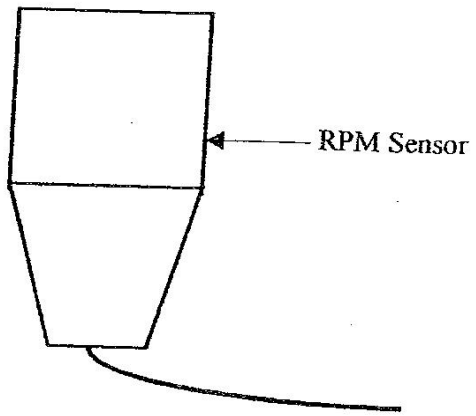
Modern engine are often fitted with engine covers, making it difficult and time consuming to attach conventional RPM measuring devices. To overcome this problem, we have incorporated a unique acoustic sensor which measures the vibration of the engine, and by means of complex logarithms, records the RPM. The Sensing Device is fitted with two button magnets. One holds the sensor vertical, the other holds it horizontal. To use the Sensor, simply attach it to any magnetic point on the engine such as cylinder head bolts, brackets or any other steel component. *Caution: Avoid excessively hot surfaces such as Exhaust Manifolds.* The sensor is fitted with two devices measuring vibration on both the 'x' and 'y' axis increasing accuracy and response time.

To obtain the most accurate results, attach the Sensor **'In Line'** with the crankshaft. Please see diagrams below for correct positioning.



RPM Continued.

When attaching the RPM Sensor, virtually any magnetic point will give accurate readings. Very occasionally you may have to move the Sensor to different locations until you obtain accurate readings. This is due to unusual acoustic properties associated with that particular engine design. In these cases remember where you placed the Sensor to obtain accurate readings because you will need to use the same location on all these specific engine types.



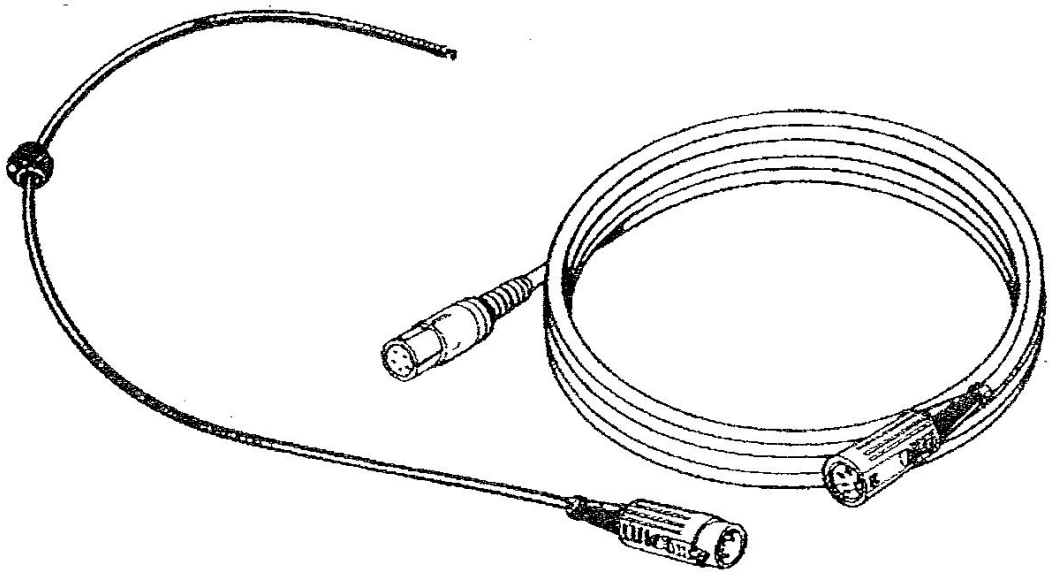
ALTERNATIVE RPM SOURCE

You do not always have to attach the Sensor onto the engine. Very often a stable signal can be obtained from the Gearbox, Engine Mounts and even from the Chassis. REMEMBER that whatever position you choose, the Sensor should always be 'In Line' with the Crankshaft as illustrated on page 18.

CAUTION: *Do not attach the Sensor to excessively hot surfaces such as Manifolds. Ensure the harness does not tough hot surfaces or moving parts. Ensure the Sensor is firmly attached to the pickup point and will not vibrate free and fall into the engine compartment.*

OIL TEMPERATURE PROBE (NON PDCOM Versions)

The Oil Temperature Probe is designed to fit all types of Dip-Stick tube regardless of shape. The operating range is from O°C to 127.5°C. Always exercise caution when using this probe. The length of the Temperature Probe MUST ALWAYS be measured against the length of the dip-stick and adjusted to match by sliding the 'Toggle Stop' along the Temperature Probe's Insertion Tube. Failure to measure the correct length could result in damage to the probe or engine. The Temperature Probe Insertion Tube is made from highly flexible, narrow diameter tubing. This tubing is susceptible to excessively hot surfaces. Therefore avoid contact with Exhaust Manifolds and Pipes. Also, avoid contact with Manifold Heat Shields.



NOTE: *for added safety, it is recommended you reduce the insertion depth by 1 inch shorter than the dip-stick.*

WARM-UP PROCEDURE

WARM-UP TIMES

The warm-up time for your Analyser is 6 minutes from initial power on.

AUTOMATIC BENCH ZERO

The equipment automatically monitors the Infra Red Bench for drift. Should this drift exceed predetermined limits, the equipment will automatically re-zero.

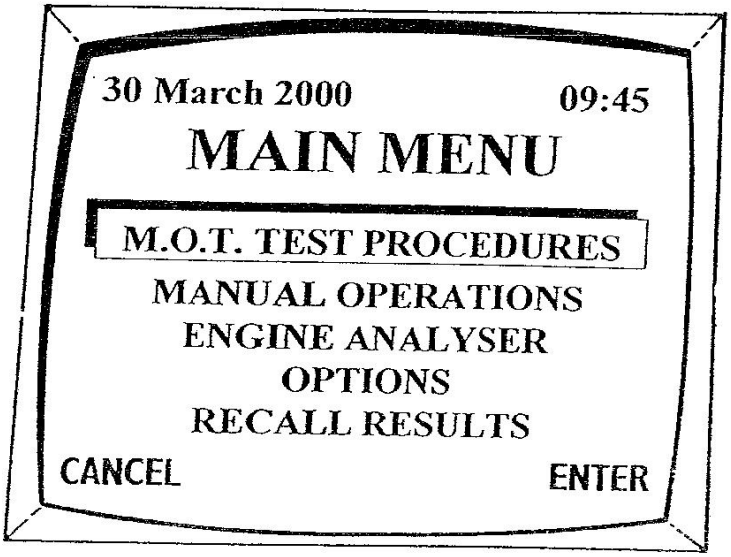
NOTE: *During the initial warm-up period the zero function will operate more frequently whilst the bench is reaching full operating temperature.*

LEAK TEST

The analyser will perform a leak test every 24 hours to ensure the integrity of the sampling system. This test checks for air leaks throughout the whole of the sampling system. Should the leak test fail, the analyser will 'lock you out' and prevent you from further testing. The Leak Test is a mandatory requirement for MOT Test equipment. Test procedures for detecting leaks are detailed under ROUTINE MAINTENANCE.

USING YOUR ANALYSER

THE MAIN MENU



The main menu is the starting point from which you select ALL tests and procedures. A highlight bar appears over the top selection. Using the cursor keys, move the highlight bar over the test of your choice. Then press the **ENTER** key. Your chosen test routine will then be displayed on the screen.

MOT TEST PROCEDURES

Selecting MOT tests will display an MOT menu. This menu identifies the various vehicle registration dates required to perform the appropriate MOT routine.

MANUAL OPERATION

The Manual Operation selection displays CO, CO_2, HC, 0_2, Lambda, RPM and Oil Temperature on the screen. This screen allows you to test and diagnose fuelling faults and to make repairs and adjustments as necessary.

OPTIONS

Selecting Options will display a menu listing additional functions available on your analyser.

Full details are listed on page 29

RECALL RESULTS

Selecting Recall Results allows you to display the results of previous MOT's completed. Full details are listed on the following pages.

***NOTE** - On software earlier than Version 5, only the last Petrol and last Diesel test results can be recalled.*

RESULTS STORAGE AND ARCHIVING

The Premier software stores every result of petrol and Diesel MOTs to the hard drive. These results can be recalled at any time by selecting 'Recall Results' from the Main Menu. When selecting this option you can retrieve results either in date order or by registration number. Choose the option you require and simply type in either the date or the registration number required.

RECALL RESULTS BY DATE

When using this option, all Mot tests completed on the selected date will be displayed in menu form. Simply select the vehicle you require. The results will be displayed and can be printed by pressing the 'PRINT SCREEN' **key.**

RECALL RESULTS BY REGISTRATION NUMBER

When using this option, type in the registration number of the vehicle required and the results will be displayed. If there is more than one result stored for this vehicle (i.e. a re-test) you will have the option of selecting the test you require. Pressing the 'PRINT SCREEN' **key will print the results.**

RESULTS ARCHIVING AND BACK UP

ARCHIVING

Over time the results storage file will become quite large. This can slow down the initial 'Start Up' sequence whilst the PC processes the files. In order to keep the processing time to the minimum, when the file becomes large, the analyser allows you the opportunity to archive some of the files. To achieve this, simply select the 'Yes' button when the analyser asks you if you wish to 'Archive Files'. After you have created an Archive File when selecting recall results you will have the option to 'Recall Results from Archive'.

BACK UP RESULTS

As you are aware it is good practice to back up any files held on a PC. This option is the customer's responsibility and is made available for you to protect your stored results in the event of hard drive failure. You will need a USB memory device. These can be purchased from any stationery or PC supplier. To back up results insert your USB stick in a spare USB port, select 'Options' from the Main Menu, select 'Back Up and Restore Results', select 'Back Up Results Data', follow the screen prompts and the analyser will write the results to the memory device. We recommend you back up at regular intervals.

RESTORE RESULTS

To restore results to the hard drive, select 'Options' from the Main Menu, select 'Back Up and Restore Results', select 'Restore Results Data' and follow the screen prompts. The analyser will load the data from the back up USB to the hard drive.

BASIC EMISSION TEST

NEW TEST ROUTINE

The Basic Emissions Test ('BET' Test) for Catalytic Equipped Vehicles was introduced during August 2001. Essentially the BET test is a simplified version of the more comprehensive 'CAT' Test. The test is designed for vehicles registered on or after 1st August 1992. This shortened test routine uses default values for the following: Emission Limits and Engine RPM Test Speeds. The test also removes the requirement to measure oil temperature. **In addition,** vehicle input information is greatly reduced.

Should the vehicle being tested **fail to meet any limits at any point** during the 'BET' test, the test will automatically be terminated. The programme will then return to the standard Catalyst Test, requiring manufacturers engine specific limits and oil temperature measurement.

The most common cause of 'BET' test failures is when the operator fails to ensure the engine is at full operating temperature. It is therefore recommended that you do not proceed with the test until you are confident the vehicle is at normal operating temperature.

As with all MOT routines, the 'BET' test is fully automated. You therefore only need to follow the screen prompts and instructions to complete the test successfully.

MOT TEST PROCEDURES

MOT Test Procedures contains various Petrol Testing options according to the age of the vehicle. The most complex procedure is for vehicles first used on or after 1st August 1992 and which are fitted with a Catalytic Converter. Vehicles first used between 1st August 1986 and 31st July 1992 together with vehicles first used between 1st August 1975 and 31st July 1986 both use a simplified test. However, the CO limits for the simplified tests are different and are determined by the age of the vehicle. The last test option for vehicles first used before 1st August 1975 is a visual inspection, i.e. no connections are made to the Emission Analyser.

If the Optional Diesel Smoke Head is fitted to your Analyser, the "Diesel MOT" option will be active on the bottom of the screen. Please refer to the Diesel Operator's Manual.

All MOT Test routines are programmed into your Analyser. It will guide you through the entire sequence from start to finish. Simply follow the instructions and prompts as they appear on the screen. When the test routines are completed, the Analyser will display the results and produce a printout. It is highly recommended that you practice using the equipment and become familiar with the different test routines before you start testing. All MOT limits are programmed into the Analyser.

IMPORTANT INFORMATION
NON-PASSENGER CARS

The term *Non-Passenger Car* is slightly misleading in as much as it refers largely to vehicles which exceed 2,500 kg gross weight (such as Rolls Royce and larger Mercedes) and vehicles which carry in excess of 5 passengers excluding the driver (such as the Renault Espace). Also included within the term are Light Goods Vehicles not exceeding 3,500 kg gross weight. The term is derived from the Road Vehicles (Construction and Use) 1986 Regulations to define a passenger car.

To accommodate the above vehicles, when entering information into the Premier Elite, a screen will display two selections :-

1) Passenger cars **2**) Non-Passenger Cars

Select the entry which is appropriate for the vehicle you are testing. If you are unsure, you can either refer to the current 'In-Service Exhaust Emission Standards' book which lists all vehicles which fall within the Catalyst Testing Scheme, or to the new facility within the 'Options' menu which allows you to view the MOT database. Please remember, if you make the wrong selection, you will not find the vehicle you are testing in the database, which could result in you performing the wrong test routine.

VEHICLES FIRST USED ON OR AFTER

1st August 1992 - (CAT TEST)

Catalyst Equipped Vehicle Test. MOT procedures for the 'Cat Test' require engine RPM and Oil Temperature Measurement. Exhaust Emission Limits are held on the Vehicle Database and are 'Engine Specific.' The emission limits, minimum oil temperature and RPM test speeds are supplied by the vehicle manufacturer.

Should you be presented with a vehicle which is not listed in the database, you will find a 'Vehicle Data Not Found' selection at the bottom of each entry box. When selecting 'Vehicle Data Not Found', the equipment will automatically select the correct test routine and values for that vehicle.

NOTE *- On larger vehicles and light commercials ensure you have made the correct selection between 'Passenger Cars' and 'Non-Passenger Cars' during the initial set-up.*

As you programme the Analyser to run a 'Cat Test', various menus and instructional dialogue boxes will appear on the screen. Simply select the appropriate option or perform the instruction.

VEHICLE FIRST USED BETWEEN:-

1) 1st August 1986 and 31st July 1992 (Non-Cat Test)

2) 1st August 1975 and 31st July 1986 (Non-Cat Test)

MOT tests for the above vehicles use a simplified test routine. During these tests you do not measure Engine RPM or oil temperature. The test routine is the same for each selection. However, the emission limits are different. At the end of the test, the Analyser will display the results on the screen and produce a print-out.

VEHICLES FIRST USED BEFORE 1st AUGUST 1995
(Visual Inspection)

The above selection is a visual smoke test. During the test the operator must follow the prompt screens and enter the various screen options as they appear. At the end of the test, the Analyser will display the results and produce a print-out.

PRINTING MOT RESULTS

The Analyser automatically produces a print-out of the results at the end of every MOT test procedure, and allows additional copies to be printed if required

OPTIONS SCREEN

The Options Screen allows you to perform tests and set-up procedures which are normally only used occasionally. The selections are as follows :-

Gas Bench Service Operations

[1]Smoke Head Service Operation (if fitted)
System Set-Up

View Vehicle Data

Backup and Restore Results
Additional Options (Selects page 2 of Options)

[2]Windows Program Manager

Update Software
MOT Reminder (Switch On or Off)

Details of the above selections are on the following pages:-

1 This selection is only displayed when the optional Smoke Head Module is fitted. Details are included in your 'Diesel Operator's Manual'

2 This selection is only displayed when customers have requested access to MsWindows™ Operating System.

GAS BENCH SERVICE OPERATIONS

ZERO BENCH

During the normal course of operation, the Analyser will automatically zero the sample bench at pre-determined intervals or when drift exceeds programmed limits. Should you wish to force your own zero bench (for example, after testing a vehicle with a particularly dirty exhaust) choose this option.

LEAK TEST

The Analyser performs a statutory leak test every 24 hrs. Should a leak test fail, the programme will 'lock you out' and prevent testing. Choose this option after you have identified and repaired system leaks. Diagnosing system leaks is covered under 'Routine Maintenance'.

FIT NEW O_2 SENSOR

The O_2 sensor is a consumable item which normally has an operational life between 12 and 18 months. In order to remove the need for an Engineer's visit to replace the cell, this option allows the Customer to perform this simple task. When the O_2 cell exceeds its operational limits a dialogue box appears on the screen stating 'Replace 0_2 Cell'. Select 'Fit New 0_2 Sensor' from the Option Screen and follow the screen prompts. Full details of 0_2 cell replacement are included under 'Routine Maintenance'.

CALIBRATION

Selecting Calibration displays the next calibration due date.

SERVICE DETAILS

Selecting Service Details displays the name, address and telephone number of your Service Provider.

SYSTEM SET-UP

This section allows you to set the equipment's basic operating parameters.

SET TIME

This option allows you to adjust the Analyser's internal clock.

When selecting 'Set Time', two options are available. The top selection will either display 'Change to Summer Time' or 'Change to Winter Time'. This allows you to move the time forward or back one hour. 'Alter Time Setting' allows you to alter both hours and minutes. It is a Vehicle Inspectorate requirement that you CANNOT ALTER THE DATE.

WARNING *- Adjusting the clock beyond programmed limits will effect the calibration lock-out date and could result in the equipment preventing MOT testing. Under these circumstances, an equipment calibration will be required.*

SOFTWARE VERSION

This selection will display the following:-
Premier software version number
Gas Bench software control version number
Smoke Head software control version number (if fitted)

BUSINESS NAME ENTRY

The business name entry screen allows you to print your Company details on all reports and to include a marketing message which can be changed at will. It is MANDATORY that your Company details, including VTS number, are on all MOT print-outs. The equipment will not allow you to test until you have completed these details.

VIEW VEHICLE DATA

The Vehicle Database can be viewed to obtain technical information relating to engine RPM and emission setting to assist you during routine service work. To access the information select the following :-

From the 'Main Menu' select 'Options' and press ENTER.

From the 'Options Menu' select 'View Vehicle Data'.

Select manufacturer, model and engine type in the same way you would perform the MOT test during a failed 'BET' test.

The relevant technical information is then displayed on the screen.

BACK UP AND RESTORE RESULTS

See page 24

WINDOWS PROGRAM MANAGER

This option only appears on the screen if it has been requested by the customer. It gives access to MsWINDOWS™ operating system allowing any software of the customer's choice to be loaded on to the PC platform.

EMISSIONS DATA RECORDING

Emissions Data Recording allows you to 'Map' the vehicles emissions over an acceleration curve or between specific RPM limits. This 'Map' allows you to identify fuelling problems at specific loads or engine speeds. The results can be printed for analysis or to retain as a hard copy for future reference.

To use Data Recording, select the Manual Emissions page, then select Options and the select 'Record Readings'. The screen will return to the manual gas page. Whilst running the engine at the required RPM limits, press the enter key on the keyboard. Each time you press the key, the readings will be stored. At the completion of the test, select 'Options' again, then select 'Display Recorded Readings'. A list will be displayed showing Time; Temp; CO; HC: CO2; 02 and Lambda. Careful analysis of these results can identify fuelling and engine management faults.

The results are printed by selecting the 'Print' button.

UPDATE SOFTWARE

The 'Update Software' option allows you to load the latest VI Database and additional test functions and facilities available from your supplier. When new software is supplied, full installation instructions are included which will 'walk you through' the installation procedure.

MOT REMINDER

MOT Reminder Letters. This software allows you to 'Automatically' remind your customers when their next MOT is due. The software records your customer details and, 6 weeks before their next test is due, your analyser prints a reminder letter that only needs posting! There is a standard letter format included within the software, but you are able to edit or completely change the letter as you wish. Additionally, why not include a special offer or promotion on the letter, it's a great way to market your business.

When you switch your analyser on in the morning, any Reminder Letters that are due to be printed will be processed, and a dialogue box will appear giving you the option to print the letters. If you decline the print, the software will retain the information and give you the option to print each time you switch on. When the Reminders have been printed, the customer details are deleted from the files. This is to prevent customer details 'Building Up' when they have possibly moved away. Naturally their details will be reinstated when they bring their cars back as a result of the reminder letter.

Each Reminder letter includes your company name and address, the customers name and address, the make, model and registration number of their vehicle and the date the MOT is due. A copy of the letter is attached. The customers address section is on the 'Left' of the letter, so that all you have to do is fold and place it into a 'window' envelope and put a stamp on.

Page 35 explains the various functions of the Reminder Letter option.

When the MOT Reminder option is selected, a 'Menu' appears as below:

MOT Reminder List. Selecting this option will display a full list of all your customers in the database in date order. This option allows you to edit your customer details, such as change of address.

MOT Reminders Due. Selecting this option will list all the customers whose MOTs are due and whose letter has NOT been printed.

Print MOT Reminders. Selecting this option allows you to print any letters that are due which had not been printed when you switched the analyser on.

Edit Reminder Letter. Selecting this option allows you to edit, add paragraphs, or completely change the reminder letter. Try to keep your letter succinct so that it prints on a single sheet. Most of the standard functions are available on your keyboard when typing. However there are three functions you should be aware of.

1. The **ESC** key escapes from the Edit Reminder Letter page **without** saving changes. This is useful if you have made mistakes and want the original letter restored.

2. The **Enter** key **STORES** any changes you have made to the letter, therefore **ONLY** press this key when you are happy with any changes you have made.

3. Pressing **Ctrl + J** places a 'Line Space' into the text. Using this command will give you spacing between paragraphs.

Set MOT Reminder ON/OFF. When your software is installed, the MOT Reminder Letter is switched on. As you enter the information to complete an MOT, an entry screen will appear allowing you to enter the customer details. If you press the 'Enter' key without completing the details, the programme will continue, but obviously no customer details will be stored. If you want to turn the Reminder function off, simply select MOT Reminder Letters from the Options page and select 'MOT Reminders Off'. If you want to re-instate this function, select MOT Reminders and from the menu select MOT Reminders On.

If you are using this function, as with all computers, it is essential you back up the database regularly to ensure you do not lose your customer details in the event of equipment failure. Please refer to the Results Storage and Archiving on page 23 for details of how to back up your database.

Sample of MOT Reminder Letter

Customers Name — Your Company Name

Customers Address — **Your Company Address**

Your Telephone Number

Date of Print Out

Your Vehicle Details: Vauxhall Omega 2.2
Registration Number: X123 ABC
The MOT is Due On: 15/09/2002

Dear Mr.

Our records show that your vehicle is due for an MOT on the date shown above. This is therefore a friendly reminder that if you are still the owner of this vehicle we would, of course, be pleased to complete this work.

Please telephone us and we will arrange a convenient appointment for you.

Our best regards,

MOT Manager

ROUTINE MAINTENANCE

MAINTENANCE SCHEDULE

Please follow the recommendations listed below. Adopting a regular preventative maintenance schedule will help ensure trouble-free service.

Description	Interval
1. Inspect Filter Element	Daily (see page 37)
2. Drain Water Trap	As required (see page 37)
3. Inspect Water Trap	Weekly (see page 37)
4. Check Sample Probe and Hose Assembly	Weekly (see page 38)
5. Check RPM and Oil Temp Harnesses	Weekly (see page 38)
6. **General Equipment Cleanliness**	**As required (see Cautions - page 38)**

FILTER ELEMENT **(**for different versions see Page 37**)**

The filter is located on the rear panel of your Analyser. This filter must be checked daily and changed when the element becomes dirty. Do not wait for a permanent 'Low Flow' warning to appear on the screen. The filter is fitted to protect your Analyser from Carbon, soot and other detrimental contaminates. Trying to extend the filter's life to its extreme is false economy. Only use approved filters in your Analyser. They form part of your Analyser's accreditation.

WATER TRAP (for drawing see page 37)

The water trap is located on the side of the equipment. It is the bowl to which the sample hose is attached. The water trap is auto-draining. The 'Condensing Element' should be changed weekly. Failure to change the element could cause water ingress which will damage the bench.

Water damage is not a warranty item.

SAMPLE HOSE and PROBE ASSEMBLY

The sample hose and probe assembly are manufactured from high quality materials. Do not leave them lying on the floor where they can be trodden on or driven over. Check the entire length of the sample system (from tip to end of filter assembly) for damage on a weekly basis. Repair or replace damaged items.

CAUTION *- Only use approved replacement parts, these form part of your Analyser's accreditation.*

RPM and OIL TEMPERATURE HARNESSES

Check the entire length of all engine harnesses for damage on a weekly basis. Repair or replace damaged items.

CAUTION - Only use approved replacement parts. These form part of your Analyser's accreditation.

GENERAL EQUIPMENT CLEANING

Keep your Analyser, Printer, Leads and attachments clean at all times. Clean equipment enhances reliability, as well as keeping your equipment "looking good". Only use water-based cleaning agents. Spray the cleaning agent ONTO A SOFT CLOTH and wipe all surfaces.

CAUTIONS:

DO NOT spray cleaning agents directly onto your Analyser. Doing so will result in polish "dribbling" into the equipment and disc drives causing POSSIBLE FAILURE.

NEVER USE SOLVENT-BASED CLEANING AGENTS.

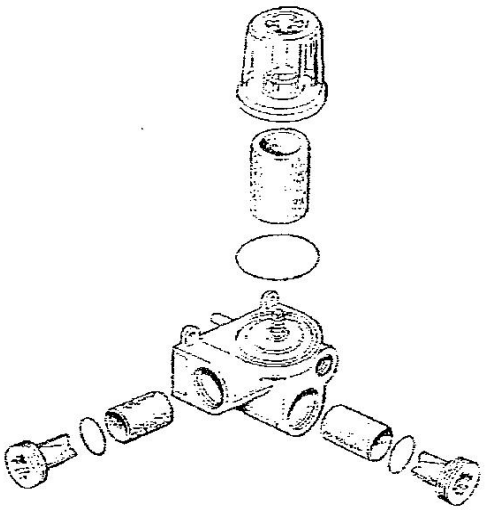
ALWAYS DISCONNECT the equipment from the MAINS SUPPLY before cleaning.

CHARCOAL FILTER (for drawing see page 37)

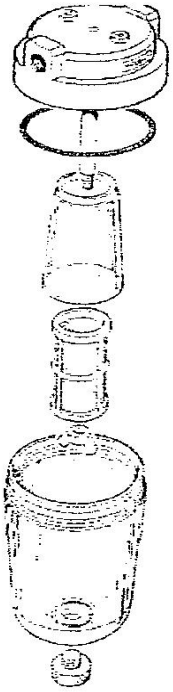
A charcoal filter is fitted to the fresh air port located on the rear of your Analyser. This filter absorbs Hydrocarbon contaminates during the "Zero Bench" routine and prevents HCs entering the Bench during the zero procedure. This filter will be replaced by your engineer during calibration visits.

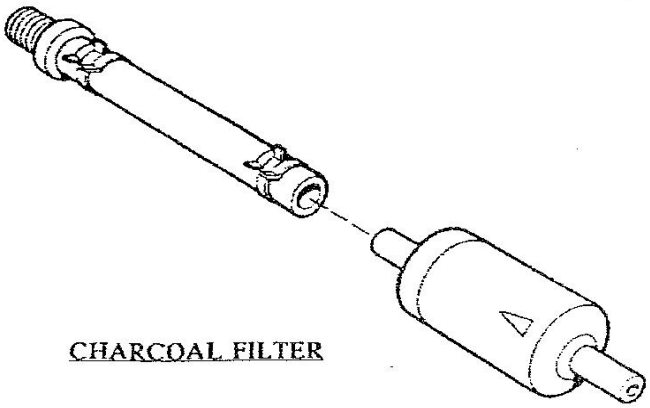
DIAGRAMS: FILTER ELEMENT, WATER TRAP, CHARCOAL FILTER

FILTER ELEMENT



WATER TRAP





CHARCOAL FILTER

ROUTINE FAULT FINDING

LOW FLOW

Your Premier Analyser monitors the flow of gasses at all times. Should a blockage occur at any point in the sample system, a dialogue box will appear on the screen stating 'Low Flow' and you will be 'Locked Out' from testing.

When 'low flow' occurs, you should perform the following :-

1. Replace the filter element - If the problem is resolved, continue testing**.** If condition persists:-

2. Remove the sample hose from the water trap. If 'low flow' disappears the blockage is between the flexible tip and the end of the sample hose
Check the hose for kinks or crushed walls.
Replace as necessary.
If OK, blow hose and sample probe out using a DRY airline

CAUTION ***- Only blow the hose assembly out if it is disconnected from the equipment and safe to do so. Only blow from the Water Trap Union End towards the flexible Tip.*** *NEVER* ***blow "Towards" the water trap union***

Refit Sample Hose assembly and continue testing.

3. 'Low Flow' continued after disconnecting Sample Hose.

   Disconnect the clear tubing between the water trap and the filter inlet at the filter end. Low flow is resolved, the blockage is in the water trap.

   Remove the water trap in its entirety, disassemble and thoroughly clean, scraping away all carbon deposits and ensuring all passages are clear. Reassemble, refit and continue testing.

4. Low Flow persists after disconnecting the clear tubing.

   Remove gauze filters from the bottom of the filter housing. Low Flow resolved, clean and refit gauze filters. Continue testing.

5. **Low Flow persists - Please Call Your Service Provider**.

CAUTION - *When removing or replacing filter or water trap housings, always ensure "O" rings and seals are replaced and in good condition.*

HC HANG-UP

Your Premier Analyser continuously monitors for Hydrocarbon contamination of the sampling system. Should the equipment detect Hydrocarbons in excess of 25 ppm whilst monitoring free air through the sampling system, a dialogue box will appear on the screen stating 'HC Hang-Up' and 'Lock You Out' from testing. This condition is usually resolved by replacing the filter element. However, should this condition persist after changing the filter, follow the diagnostic routine itemised under 'Persistent Low Flow'. During this routine with the equipment in "manual mode" watch for the 'HC Hang-Up' warning to disappear. Rectification procedures are the same as 'Low Flow'.

DETECTING A 'LEAK TEST' FAILURE

The analyser performs a mandatory leak test every 24 hours. Should a leak test fail, the following test procedures should be followed to identify the cause :-

1. Ensure the drain tap on the water trap bowl is closed.

2. **Check that all "O" rings and seals in the water trap and filter bowl are in good condition and are correctly installed.**

3. Perform another leak test. If the test passes, continue testing.

Leak Test failed **….**

4. **Remove the sample probe from the hose. Block the end of hose and perform another leak test. If the test passes, the leak is almost certainly in the flexible tip. Replace tip, retest and continue testing.**

If the leak test failed when the hose was blocked ….

5. Remove hose from water trap. Block water trap inlet.
Perform leak test. If test passes, replace hose and continue testing. If leak test fails …

6. Remove clear tubing between water trap and filter housing from the filter housing inlet. Block filter housing inlet and perform leak check. If leak test passes, double check water trap seals and drain, if necessary replace water trap. If leak test fails ….Double check filter housing seals. Retest. If retest fails, contact your service
please call your service provider.

FITTING A NEW 0_2 CELL

The O_2 sensor has an operation life of between 12 and 18 months. When this cell needs replacing a dialogue box appears on the screen stating "Replace 0_2 Cell". When this appears complete the following:-

1. Select 'Options' from the main menu

2. Select 'Fit New 0_2 Sensor' from the 'Options' menu

3. Select the make of the 0_2 cell (printed on the side of the sensor) and press 'Enter'.

4. Follow the instructions on the screen and when complete, press 'Enter'**.**

5. The equipment will now calibrate the new 0_2 sensor and return to the main menu. Continue testing.

NOTES :

When replacing the 0_2 Cell, the following points should be observed

A) Remove the Three Pin Harness Connector from the top of the 0_2 Cell CAREFULLY

B) Observe the correct position of the Connectors "Locating Shoulder"

C) Unscrew the Old Sensor and replace with the New Unit**. DO NOT OVER-TIGHTEN.** The New Sensor should be Finger Tight.

D) Carefully replace the Three Pin Harness Connector ensuring the locating shoulder is closest to the connector retaining tag located inside the Cell.

E) Recalibrate the 0_2 Cell as described above.

SERVICE INFORMATION

To obtain Service or Calibration for your Premier Elite Exhaust Emission Analyser, please contact:-

PREMIER DIAGNOSTICS LTD
Premier House
Southam Road
Banbury
OXON
OX16 2SD

Tel: SERVICE DEPT + 44 (0)1295 262688

Fax: SERVICE DEPT + 44 (0)1295 272474

Tel: SALES DEPT + 44 (0)1295 271985

Email: sales@premierdiagnostics.ltd.uk