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Introduction

This guide has been produced to assist you in the installation of your new Worldwide Diagnostic System, WDS.

You should read and understand the important safety information contained in this guide before you install and use WDS. You are advised to keep this guide with WDS for reference and troubleshooting.

You must assemble and prepare WDS for use by following the instructions. You should read and understand the instructions before assembling and preparing WDS, and before using the equipment.

This guide contains clear instructions on assembling, connecting and preparing the system for use. It also contains details on fault diagnosis and maintenance procedures. These instructions show you how to proceed should a failure occur.

WDS provides Ford vehicle diagnostic procedures and tools. It also contains on-line help software that will assist you in operating the system.

The information in this guide, and the on-line help software, are supplementary to any Ford WDS Training Courses.

The heart of the system is the Portable Test Unit (PTU), which is a powerful computer and measurement system with a touchscreen and user friendly interface. WDS includes a set of Cables, Adaptors and Transducers (CATS), that allow the PTU to be connected to various vehicle systems and components.

The batteries in the PTU require an initial conditioning operation. This is essential for accurate indication of WDS battery status. It is suggested that the procedure is left to complete overnight as it will take approximately 5 to 9 hours and the system will be completely locked during this operation. Software within the PTU will instruct you when it is subsequently necessary to run this procedure. Remember to condition the batteries overnight, following receipt of a new or replacement PTU.

This function is available under System Utilities described later.

All the diagnostic and on-line help software is held on the hard disk drive of the PTU. The software is loaded from a CD in the Docking Station while the PTU is docked. The PTU is normally used and stored in position on the Docking Station.

The PTU can be used away from the Docking Station. During this time the PTU is powered by its own battery supply, or by the vehicle battery if the PTU is connected to a vehicle. The PTU battery is provided to power the unit for up to 20 minutes.

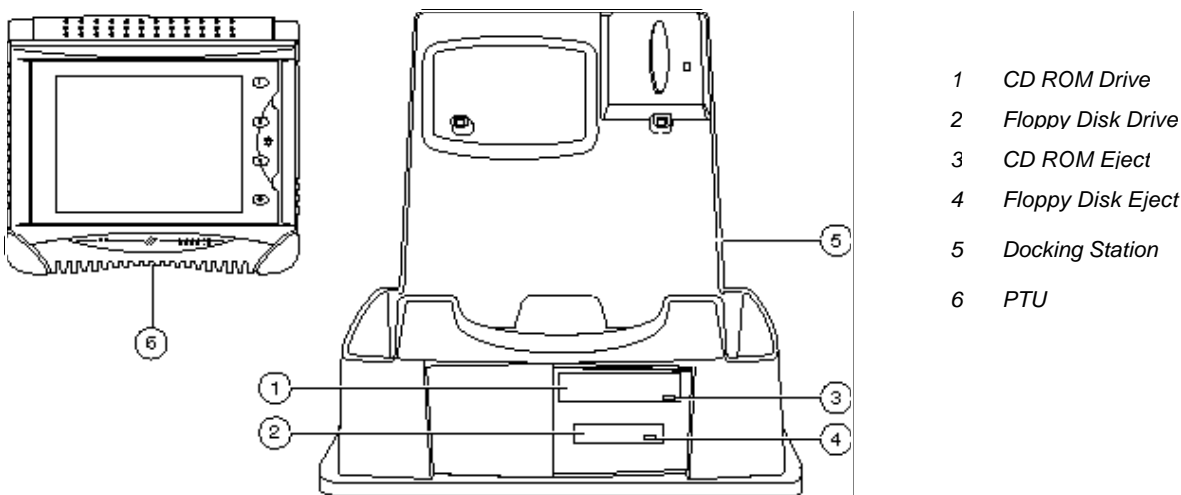


Figure 1 PTU and Docking Station

System Components

These WDS components are listed for information only. Some of these items may be standard or optional based on the configuration appropriate to your market – please check contents against the manifest list supplied with your system. Some items have a Cable Identifier (CATS ID) that is displayed during vehicle diagnostic sequences to indicate the appropriate cable, adaptor or transducer for that diagnostic operation. The following information will help you identify the system components.

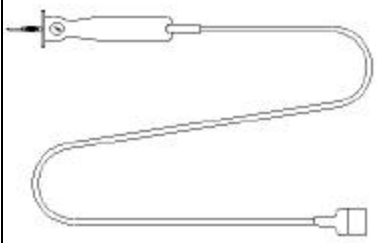
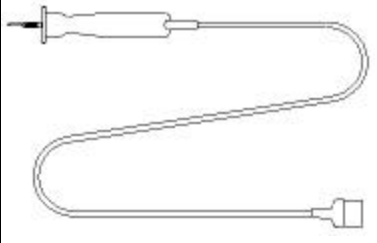
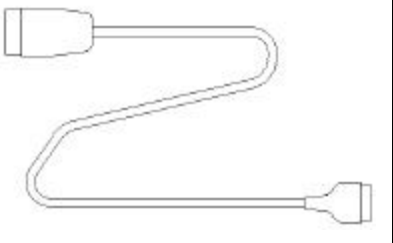
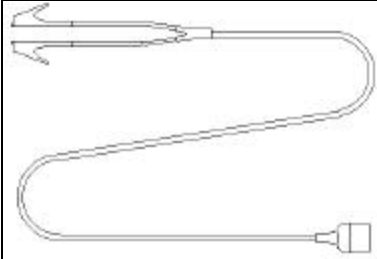
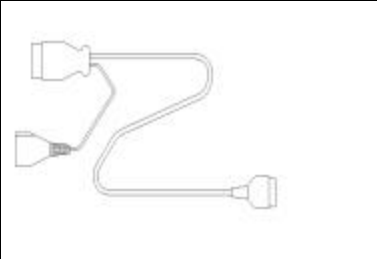
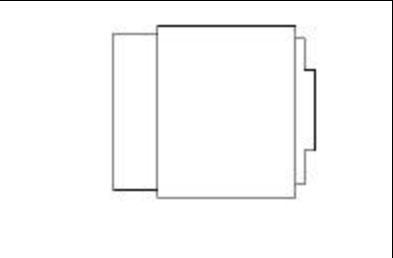
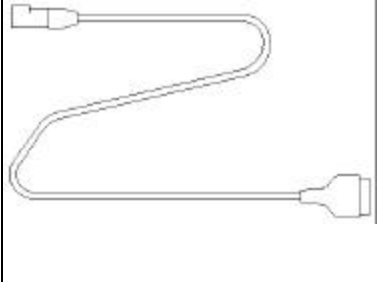
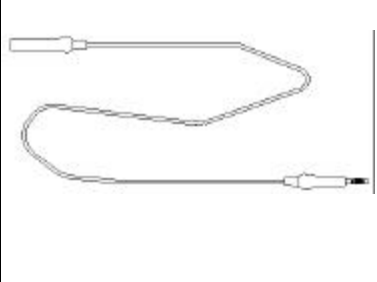
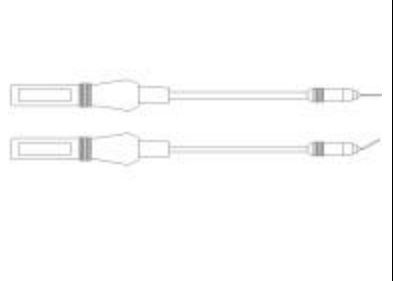
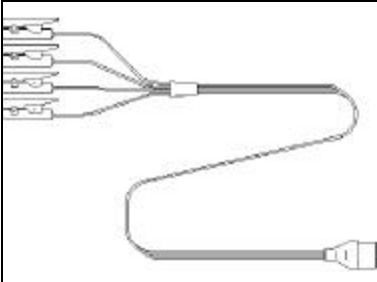
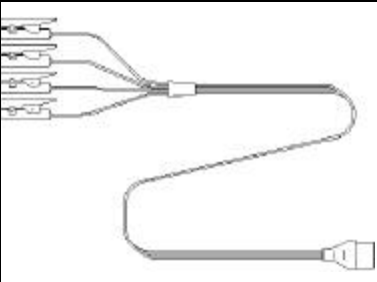
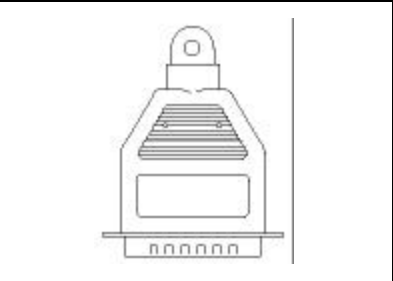
		
Red Probe 418-F229 (C-201)	Black Probe 418-F230 (C-202)	16 Pin DLC Cable Including MS-CAN (418-F557 B-259 or 418-F558 B-280)
		
PTU Battery Cable 418-F232 (A-204)	14 and 16 Pin DLC Cable 418-F241 (B-241)	NGS Cable Adaptor 418-F234 (B-206)
		
2 Pin DLC Cable 418-F235 (B-207)	Probe Extension Cable 418-F236 (C-208)	Typical Probe Tip Adaptors
		
Secondary Ignition Transducer (A-D) 418-F238 (C-214)	Secondary Ignition Transducer (E-H) 418-F239 (C-224)	Typical PTU Self Test Adaptor

Figure 2 System Components

	Language Kit	WDS Operating System CD (Red)	Installation & Service Guide		Language Kit	WDS Operating System CD (Red)	Installation & Service Guide
Brazilian Portuguese	418-F340	FCS-12986-PTB	418-F308	Italian	418-F336	FCS-12986-ITA	418-F304
Chinese	418-F325	FCS-12986-CHI	418-F294	Japanese	418-F337	FCS-12986-JAP	418-F305
Czech	418-F326	FCS-12986-CZK	418-F295	Norwegian	418-F338	FCS-12986-NOR	418-F306
Danish	418-F327	FCS-12986-DAN	418-F296	Polish	418-F339	FCS-12986-POL	418-F307
Dutch	418-F328	FCS-12986-DUT	418-F297	Portuguese	418-F341	FCS-12986-PTE	418-F309
English	418-F329	FCS-12986-ENG	418-F227	Russian	418-F342	FCS-12986-RUS	418-F310
Finnish	418-F330	FCS-12986-FIN	418-F298	Slovenian	418-F343	FCS-12986-SLO	418-F311
French	418-F332	FCS-12986-FRE	418-F300	Spanish	418-F344	FCS-12986-SPA	418-F312
French Canadian	418-F331	FCS-12986-FRC	418-F299	Swedish	418-F345	FCS-12986-SWE	418-F313
German	418-F333	FCS-12986-GER	418-F301	Thai	418-F346	FCS-12986-THI	418-F314
Greek	418-F334	FCS-12986-GRK	418-F302	Turkish	418-F347	FCS-12986-TUR	418-F315
Hungarian	418-F335	FCS-12986-HUN	418-F303				

Power Cord

CEE 7/7 (Europe)	418-F281	Israel	418-F288
Australia	418-F282	Italy	418-F283
United Kingdom	418-F279	Japan	418-F287
Denmark	418-F285	Nema 5-15 (North America)	418-F280
India/South Africa (Old British)	418-F286	Switzerland	418-F284

WDS Components Description

Global Number (CATS ID)

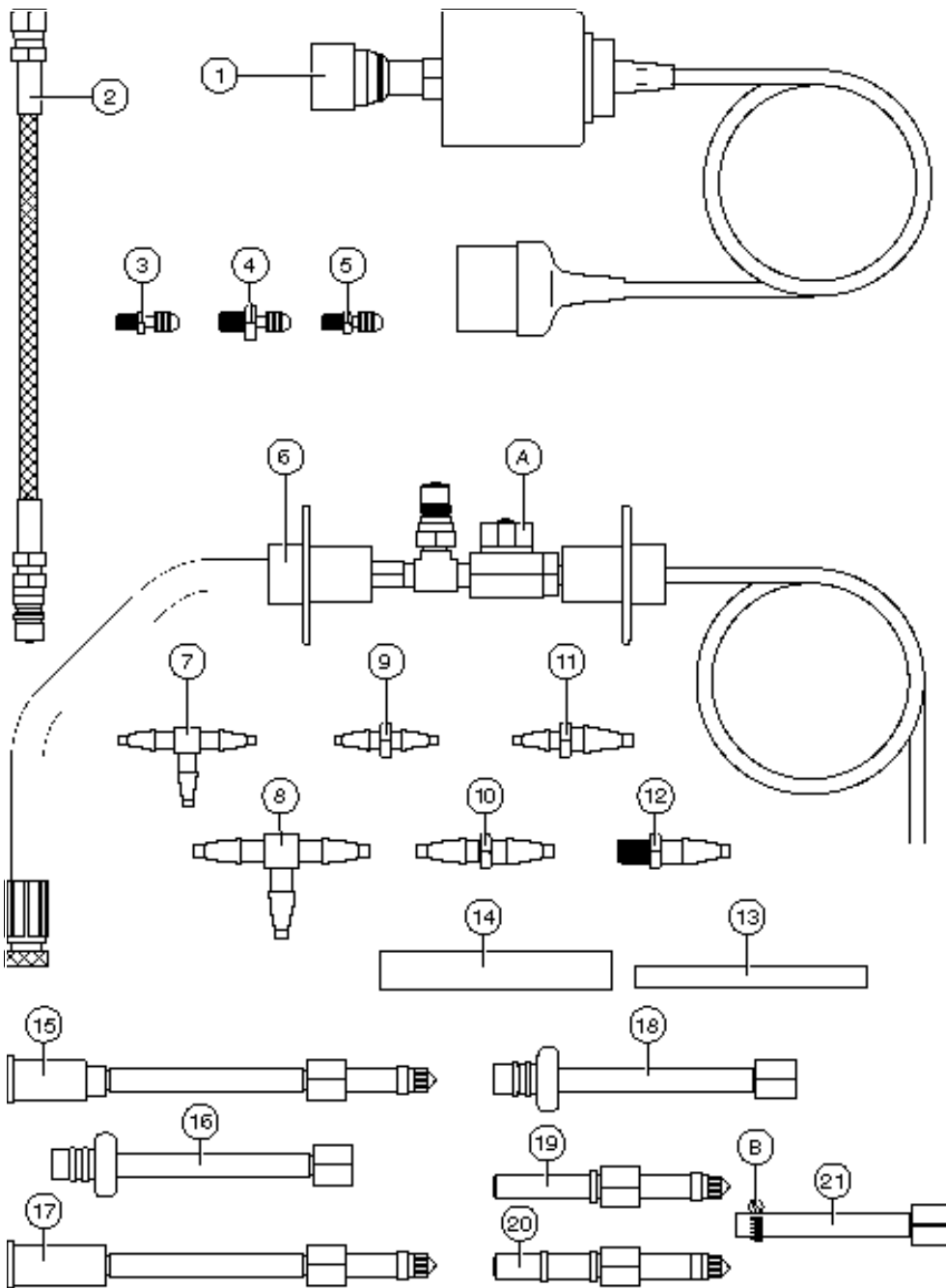
Cart (Optional)	418-F228
Locking Wheel	418-F398
Swivel Wheel	418-F399
Drainage Tube	418-F400
Worldwide Diagnostic System (Base Kit)	
Ford Diagnostic Application CD (Blue)	FCS-12987-CD-ROM
Calibration Update CD (Black)	FCS-13457-CalibrationCD
Language Kit	See Table Above
WDS Operating System CD (Red)	See Table Above
Installation and Service Guide	See Table Above
Power Cord	See Table Above
Manifest List	418-F266
Portable Test Unit (PTU)	418-F224
Docking Station (includes 3 cable bushings)	418-F225
Standard Cables Adaptors And Transducers (CATS)	
PTU Battery Cable	418-F232 (A-204)
16 Pin DLC Cable Including MS-CAN	418-F557 (B-259) or 418-F558 (B-280)
Pressure & Vacuum Transducer	418-F237 (C-209)

WDS Installation and Service Guide

Pressure & Vacuum Adaptor Kit	418-F242
Fuel Pressure Hose Assembly	(C-219)
Pressure & Vacuum Hose Adaptor Kit	418-F323
1/8" Hose "Tee"	(C-221)
7/32" Hose "Tee"	(C-222)
1/8" Hose In-Line	(C-223)
7/32" Hose In-Line	(C-225)
1/8" Hose 3 inch (2 off per kit)	(C-239)
7/32" Hose 3 inch (2 off per kit)	(C-240)
1/8" to 7/32" Reducer	(C-226)
0.305 UNS Thread to 7/32" Hose	(C-227)
Secondary Ignition Transducer (A-D)	418-F238 (C-214)
Red Probe	418-F229 (C-201)
Black Probe	418-F230 (C-202)
Probe Extension Cable	418-F236 (C-208)
PTU Self Test Adaptor Kit	418-FS263
PTU Self Test Adaptor for Port B	418-F245 (ST-210)
PTU Self Test Adaptor for Ports C	418-F246 (ST-211)
PTU Self Test Adaptor for Serial Port	418-F247 (ST-212)
PTU Self Test Adaptor for Parallel Port	418-F248 (ST-213)
Probe Tip Adaptor Kit	418-FS264
1.0mm Diameter Pin (Black)	418-F249 (T-001)
1.0mm Diameter Socket (Black)	418-F250 (T-002)
1.9mm Diameter Pin (Red)	418-F251 (T-003)
1.6mm Diameter Pin (Yellow)	418-F252 (T-007)
1.6mm Diameter Socket (Yellow)	418-F253 (T-008)
2.8mm Diameter Pin (Green)	418-F254 (T-009)
2.8mm Diameter Socket (Green)	418-F255 (T-010)
2.8mm Flat Tab (Blue)	418-F256 (T-011)
2.8mm Timer Contact (Blue)	418-F257 (T-012)
0.64mm Diameter Pin (2 off per kit) (Purple)	418-F258 (T-013)
1.5mm Flat Tab (Brown)	418-F259 (T-014)
Optional Components	
(These may or may not be included, based on Market)	
14 and 16 Pin DLC Cable	418-F241 (B-241)
2 Pin DLC Cable	418-F235 (B-207)
NGS Cable Adaptor	418-F234 (B-206)
Secondary Ignition Transducer (E-H)	418-F239 (C-224)
Transmission Extension Kit	418-F243
Transmission Extension	(C-220)
Adaptor 1/8" NPT	(C-228)
Adaptor 1/4" NPT	(C-229)
Adaptor 1/8" BSPT	(C-230)
Transmission Extension Adaptor Kit	418-F324
Fuel Line Adaptor Kit A	418-FS244
Stainless Steel 1/2" Inlet	(F-231)
Stainless Steel 3/8" Outlet	(F-232)
Plastic 1/2" Inlet	(F-233)
Plastic 3/8" Outlet	(F-234)
Fuel Line Adaptor Kit B	418-F274
8mm Inlet	(F-235)
8mm Outlet	(F-236)
SAE J2044 Inlet	(F-237)

NOTE: With the introduction of the 16 Pin DLC Cable Including MS-CAN, the 16 Pin DLC Cable will no longer be supported.

Pressure and Vacuum Equipment



- 1 Pressure & Vacuum Transducer
- 2 Transmission Extension
- 3 Adaptor 1/8" NPT
- 4 Adaptor 1/4" NPT
- 5 Adaptor 1/8" BSPT
- 6 Fuel Pressure Hose Assembly
- 7 1/8" Hose Tee
- 8 7/32" Hose Tee
- 9 1/8" Hose In-line
- 10 7/32" Hose In-line
- 11 1/8" to 7/32" Reducer
- 12 0.305 UNS Thread to 7/32" Hose
- 13 1/8" Hose 3 inch
- 14 7/32" Hose 3 inch
- 15 Stainless Steel 1/2" Inlet
- 16 Stainless Steel 3/8" Outlet
- 17 Plastic 1/2" Inlet
- 18 Plastic 3/8" Outlet
- 19 8mm Inlet
- 20 SAE Inlet
- 21 8mm Outlet
- A Purge Valve Control

Figure 3 Pressure and Vacuum Components

You should read and understand this safety information before installing, assembling and using the equipment.

DO observe the safety warnings and cautions in this document



WARNING - This indicates the presence of a hazard that can cause serious personal injury if the hazard is not avoided.



CAUTION - This indicates the presence of a hazard that can cause damage to WDS, a vehicle or other equipment connected to WDS, or that might corrupt software if the hazard is not avoided.

Proper Installation and Use of this Equipment

This equipment has been designed, manufactured and tested to meet the requirements of international standards; however, like any apparatus, care must be taken in its installation and use.

The safety standards for this equipment are only valid if the building installation conforms to IEC publication 364, (Electrical Installation of Buildings), or the equivalent national standard such as the current edition of the IEE Wiring Regulations, (BS 7671) for the UK.

This equipment has a pluggable connection to its power source and is supplied with a 2m long power cord. The electrical power source outlet socket must be located next to the equipment, be easily accessible and readily identifiable to the operator as the means of disconnection of the electrical power source to this equipment.

This equipment employs single pole protection. It is essential that this equipment is connected to the electrical power supply by a polarized connector which guarantees correct polarity of the electrical power supply in order to ensure protection against electric shock and fire hazard.

This equipment is designed for use on single phase, 3 wire electrical power supply systems with earthed (grounded) neutral conductor (TN or TT power systems in accordance with IEC 364), 115V / 230V, 50 – 60 Hz. Individual item current requirements are given later in this document. The electrical current rating for the complete system is 115V / 230V at 3A / 1.5A maximum. This equipment is not suitable for direct connection to electrical supplies having impedance grounded neutral connections (IT power systems, in accordance with IEC 364).

This equipment must be earthed (grounded) via the power cord through the electrical power outlet socket. The electrical power outlet should be close to WDS and be clearly recognizable as the power source for safety reasons. The power outlet should be left on continuously to allow the PTU to be fully recharged overnight.



WARNING – Do not allow power cords of this equipment to be positioned where they can be trapped, snagged, stretched across sharp edges, or create any potential hazard.



WARNING – This equipment must be earthed (grounded).

This equipment is Class 1. Use basic insulation, and connect the conductive parts of the equipment, which would be capable of assuming hazardous voltage if the basic insulation fails, to the protective earth (ground) conductor within a building.

DO ensure that a competently trained person checks that all the electrical connections (including the electrical plug and any extension leads), are properly made in accordance with the instructions.

For continued protection against electric shock certain parts of this equipment, including the PC-compatible signal interface connections, have been designed such that the voltage is limited to a safe value. In order to maintain this level of protection it is essential that any other equipment that is connected to this equipment shall have interface connections that are similarly protected.

Assurance must be obtained from the manufacturers and suppliers of such equipment that interfaces comply with the requirements for SELV circuits in accordance with IEC 950 (EN 60 950).

Some electronic equipment has load characteristics which will allow the current in the neutral conductor of a three phase supply feeding individual single phase loads to exceed the current flowing in any of the phase conductors. Where such equipment is extensively used it is prudent to have the individual phase and neutral currents checked by a qualified engineer.



WARNING – Do not install this equipment at any location less than 460mm (18”), above garage floor level.



CAUTION - This equipment must only be used by trained personnel.



WARNING – If the PTU is being used in a moving vehicle, ensure that the PTU and cables do not distract or interfere with the driver, or form a hazard in any way.

DO use this equipment in accordance with the operating procedures.



CAUTION - Use of this equipment in a manner not specified by the manufacturer may impair the protection provided by this equipment.



CAUTION - Do ensure that only those test probes which are required by the diagnostic procedure in use are connected to the PTU while the diagnostic is running and that all test probes are disconnected after the measurement has been taken.

DO ensure that all connections are made prior to applying voltages to the measurement system and that the lower voltage terminal connection (closest to ground) is made first and broken last.

DO NOT use this equipment to measure voltages higher than 150 V AC or DC.



CAUTION - If the system is used to measure hazardous voltages, these voltages can appear on the pins of other connectors in the measurement system.

DO switch this equipment off by unplugging the power cord at the electrical socket outlet before carrying out maintenance & cleaning operations (see Care & Maintenance section). Use only a well diluted, mild, non-abrasive cleaning agent applied using a soft, lint free cloth.

DO NOT use or apply undiluted cleaning agent directly to the equipment surface and do not soak the cloth. Take care that cleaning fluid does not enter connector receptacles.

DO NOT continue to use this equipment if you have ANY doubt that it may not be working properly or it is damaged in any way. Switch off power to the equipment, unplug the power cord from the electrical socket outlet and contact your WDS Hotline.

DO NOT connect any equipment to the PC-compatible signal interface connections of the PTU or Docking Station until you are satisfied that the equipment is safe, and that the equipment, PTU and Docking Station are powered off.



CAUTION - Assurance must be obtained from the manufacturers and suppliers of such equipment that interfaces comply with the requirements for SELV circuits in accordance with IEC 950 (EN 60 950).

DO NOT remove any fixed covers unless you are authorized/qualified to do so for the preparation of this equipment.

DO NOT obstruct the ventilation of this equipment. Obstruction can cause overheating, reduce reliability and shorten the life of this equipment.

DO NOT expose this equipment to spilled liquids.



CAUTION - There are no user serviceable parts under the covers unless specifically indicated. Always isolate this equipment from the electrical power source (unplug the power cord at the electrical socket outlet) before removing any covers and ensure that all covers are replaced and correctly secured before reconnecting this equipment to the electrical power source.

DO NOT replace detachable power cords with a different type (or fuse rating), from that detailed in the documentation or supplied with this equipment.



WARNING – If there is any cabling connecting this equipment to the outside of the building, then do not alter it during lightning activity.

A defective electrical earth (ground) connection to any equipment may cause an electric shock hazard. This hazard may pass through the signal cabling and to any other equipment interconnected. It is recommended that you check electrical wiring at frequent intervals and whenever alterations are made.

DO install the Docking Station and optional Cart in a suitable electrical power supply environment.

As a part of safety requirements, the manufacturer is required to define the intended operating environment.

WDS is designed for use in a Pollution Degree 2, Installation Category 2 environment.

Pollution Degree 2 – Normally only non-conductive pollution occurs. Occasionally a temporary conductivity caused by condensation must be expected.

Installation Category 2 – Local level, appliances, portable equipment etc. with smaller transient over-voltages than Installation Category 3 (Over-voltage Category).

The measurement section of the PTU is designed for use in Installation Category 1 – Signal level, special equipment or parts of equipment, telecommunication, electronic etc. with smaller transient over-voltages than Installation Category 2.

DO keep the PTU away from devices that generate radio interference.

DO avoid contact with magnetic fields as this could destroy information stored on the PTU hard disk drive.



CAUTION – Do ensure the PTU is not subjected to extreme heat or prolonged exposure to direct sunlight that may cause heating of the PTU.



CAUTION – If any liquid is spilt on this equipment switch off the power immediately and ensure that is dried out completely before restoring power.

DO ensure that this equipment is properly maintained in accordance with national legislation.

If the Docking Station is not subject to frequent disturbance, movement or vibration, inspection and test of the electrical power supply is recommended at 3 monthly intervals.



CAUTION – Do not use this equipment in close proximity to:

- **Operating mobile phones**
- **Operating mobile transceivers, such as amateur radio, taxi cabs, emergency services**
- **Mobile phone cell repeaters**
- **Broadcast radio and television transmitters**
- **Emergency medical equipment**
- **Welding equipment**

Pressure & Vacuum Equipment Precautions

The following warnings must be observed when using the Pressure, Vacuum, Fuel and Transmission related components (see *Pressure & Vacuum Components, figure 3*).



WARNING – Risk of explosion. Read all the following warnings before using the Pressure & Vacuum Transducer and related adaptor kits. Follow all safety precautions when handling fuel.

- Avoid contact with escaping fluids. Treat all leaks as though pressurised and hot enough to burn skin. Never use any part of your body to check a hose for leaks.
- If a fluid-injection accident occurs, see a doctor immediately. **DO NOT DELAY OR TREAT AS A SIMPLE CUT!** Any fluid injected into the skin must be surgically removed *within a few hours* or gangrene may result.
- Before use check the condition of the sealing O-Rings and replace if damaged or worn, and examine the fitting sealing surfaces for burrs, nicks or other damage.
- If you have any doubt about the safety of the equipment, or it has been damaged or misused – **DO NOT** use it.
- Attach the equipment (for support), only to mechanically stable parts. **DO NOT** attach the equipment to control cables (e.g. throttle etc.)
- **DO NOT** position or use the equipment near sources of fire ignition, sources of direct heat or interference sources (e.g. distributor and ignition cables), moving parts (e.g. fan, belts, pulleys), or where any part may be trapped on sharp edges or moved when the hood is closed.
- **DO NOT** attempt to dismantle any component parts of the Fuel Hose Assembly as they have been pressure tested as an assembly.
- **DO NOT** pull hose or use it for purposes that may apply external forces for which the hose or fittings were not designed.
- Avoid kinks and sharp bends in the pipes and cable of the equipment.
- When using the equipment always carry out all fuel handling safety precautions.
- Use the equipment only in a well ventilated environment.
- When connecting the Fuel Line Adaptors and during connection to a pressurized fuel line, some fuel loss is likely. Take the necessary precautions to avoid fuel spillage.
- When connecting the 8mm Outlet of Fuel Line Adaptor Kit B) to the fuel rail, ensure that the clip (see *figure 3 item B*), is tightened so that there is no fuel leak during test.
- Ensure secure connection of all quick release components before operation of the equipment.
- Before opening the purge valve, ensure that the drain hose (see *figure 3 item C*), passes safely into an approved fuel container.
- Relieve pressure before disconnecting this equipment.
- After use ensure that the equipment is cleaned and stored with all dust caps fitted.
- After use with fuel containing more than 10% Ethanol or any Methanol, it is essential that all parts that have been in contact with the fuel should be flushed and cleaned out with 100% gasoline prior to storage.

Underwriters Laboratories, the North American standards agency, require that the suppliers of all garage equipment bring the following notice to users in North America. While the requirement is specific to North America, users elsewhere are advised to follow the same precautions.

IMPORTANT SAFETY INSTRUCTIONS

1. Read all instructions.
2. Care must be taken as burns can occur from touching hot parts.
3. Do not operate equipment with a damaged cord or if the equipment has been dropped or damaged - until it has been examined by a qualified serviceman.
4. Do not let cord hang over edge of table, bench or counter or come in contact with hot manifolds or moving fan blades.
5. If an extension cord is necessary, a cord with a current rating equal to or more than that of the equipment should be used. Cords rated for less current than the equipment may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled.
6. Always unplug equipment from electrical outlet when not in use. Never use the cord to pull the plug from the outlet. Grasp plug and pull to disconnect.
7. Let equipment cool completely before putting away. Loop cord loosely around equipment when storing.
8. To reduce the risk of fire, do not operate equipment in the vicinity of open containers of flammable liquids (gasoline).
9. Adequate ventilation should be provided when working on operating internal combustion engines.
10. Keep hair, loose clothing, fingers and all parts of body away from moving parts.
11. To reduce the risk of electric shock, do not use on wet surfaces or expose to rain.
12. Use only as described in this manual. Use only manufacturers recommended attachments.
13. ALWAYS WEAR SAFETY GLASSES WHEN USING GARAGE EQUIPMENT. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.

SAVE THESE INSTRUCTIONS

Assembling the Docking Station and Cart

Optional Cart Installation

The WDS cart is an optional item and not supplied with the standard system. If a cart is not available, simply place the Docking Station on a bench at least 460mm (18”), above garage floor level and omit steps 1 to 5.

1. Remove all packaging from the cart and Docking Station. The cart door may be secured with a padlock (not supplied).
2. Turn the cart onto its side and attach the wheel assemblies securely to the cart base (locking wheel assemblies to the front of the cart).
3. Attach the four rubber tubes into the drainage holes on the underside of the Docking Station side pockets.
4. Place the Docking Station onto the cart and secure the assembly using the four type M4 screws supplied. Ensure that the rubber drainage tubes are fed into the steel channels, two on each side of the cart.
5. Connect the earthing (grounding) cable, attached to the underside of the Docking Station, to the earth (ground) stud on the rear panel of the cart, using the M5 nut and washer supplied.

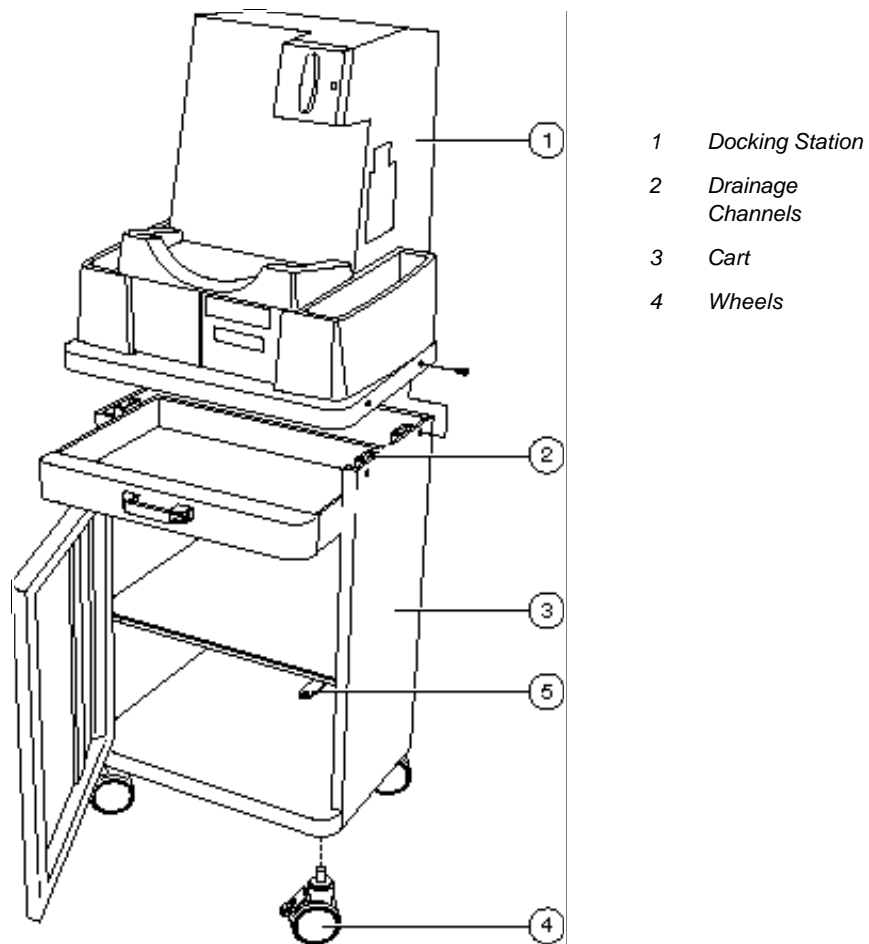


Figure 4 Cart Installation

Connecting the Power Cord

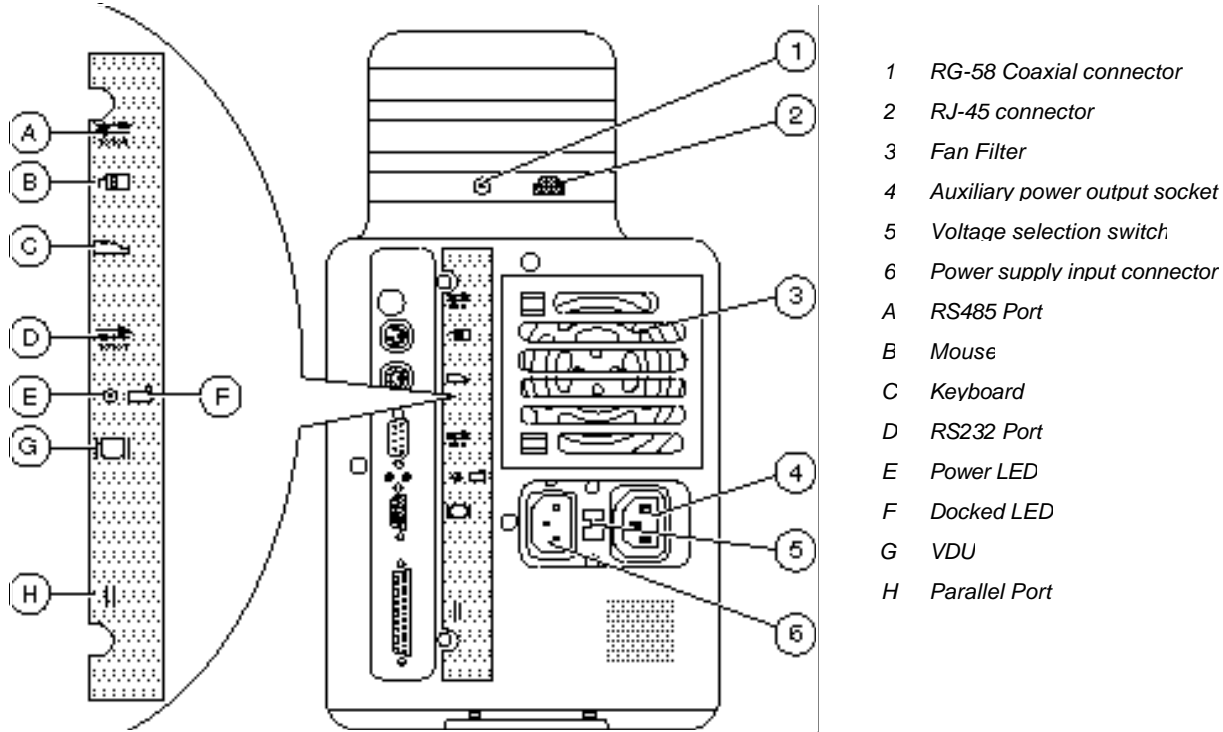


Figure 5 Connecting the Power Cord and Accessories

1. Set the voltage selection switch to the appropriate voltage for your region: 115V or 230V.
2. Remove the Voltage Selection Warning card from the power supply input connector.
3. Insert the power cord into the power supply input connector.
4. Plug the other end of the power cord into a grounded wall outlet socket, ensuring that it reaches without causing a hazard.



WARNING - DO NOT alter the power supply switch setting while the power is connected.



CAUTION - The electrical power outlet should be close to the equipment and easily recognizable as the power source.



WARNING - This equipment must be earthed (grounded).

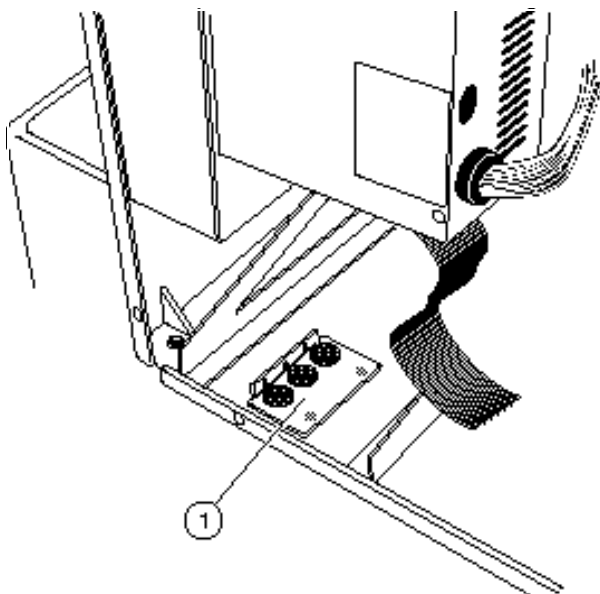
Connecting to a Printer or Local Area Network

Installing a Printer in the Optional Cart.

The optional cart includes a printer enclosure in which you can install a standard printer for use when the PTU is docked with the Docking Station. WDS is not supplied with a printer or printer cable – parallel and serial (RS232), interfaces are provided to allow connection to standard printers.

You should attach the printer cables at this stage if a printer is being installed.

1. Disconnect the Docking Station from the electrical power supply.
2. Remove the rear panel from the Docking Station.
3. Remove the cable entry panels, one beneath the electrical power input, and one inside the Docking Station.
4. Remove the blanking covers as required from the cable entry panels.
5. Plug the printer interface cable into the parallel or RS232 port as required (*see Figure 5*), on the Docking Station and route it through the cable entry holes into the cart (*see Figure 6*).
6. Plug the printer power cord into the auxiliary power output socket on the Docking Station (*see Figure 5*), and feed it through the cable entry holes into the cart.
7. Refit the cable entry panels and refit blanking covers over unused holes in the cable entry panels.
8. Place one of the plastic bushings, supplied with the Docking Station, over each of the cables and press it into each cable entry panel.
9. Replace the rear panel of the Docking Station.
10. Connect the interface cable to the printer.
11. Connect the power cord to the printer and set the printer power switch to ON.
12. Connect the Docking Station electrical power cord to the electrical outlet socket and switch ON the supply.
13. Install printer drivers if required. From the System Information screen (*see System Utilities*), select “Add Printer” and follow the on-screen instructions.



1 Cable entry panel

Figure 6 Connecting a Printer



WARNING – If a printer is being installed in the cart, it MUST be placed on the shelf located in the middle of the cart.

Installing a Printer on a Bench Mounted System.

1. Disconnect the Docking Station from the electrical outlet socket.
2. Connect the printer interface cable to the parallel or RS232 port (*see Figure 5*) on the Docking Station.
3. Connect the interface cable to the printer.
4. Connect the power cord to the printer.
5. Connect the printer power cord into the wall outlet socket or auxiliary power output socket and switch ON the supply.
6. Set the printer power switch to ON.
7. Install printer drivers if required. From the System Information screen (*see Using The System*), select “Add Printer” and follow the on-screen instructions.

Connecting to a Local Area Network (LAN)

You can connect the Docking Station to your dealers Local Area Network, giving you access to it when the PTU is docked.

There are two types of connection available:

1. 10 BASE-T Network via UST/STP cable. (Not supplied).
Plug the RJ-45 connector on the UST/STP cable to the RJ-45 connector on the docking station (*see figure 5*). Insert the other end of the UST/STP cable into a 10 BASE-T hub. The maximum length of the UST/STP cable is 100m.
2. 10 BASE-2 Network via RG-58 coaxial cable and T-connector. (Not supplied).
Plug a T-connector (not supplied), into the RG-58 connector on the docking station (*see figure 5*). Ensure that both ends of the T-connector are connected to the coaxial cable or, if the docking station is at the end of the network cable segment, attach a 50-Ohm terminator (not supplied), to one end of the T-connector.

For Dealers outside of North America, **You may require the services of your Dealer System Provider to perform this task, who may also need to add and configure any printers that are available on the LAN onto which you wish WDS to print.**

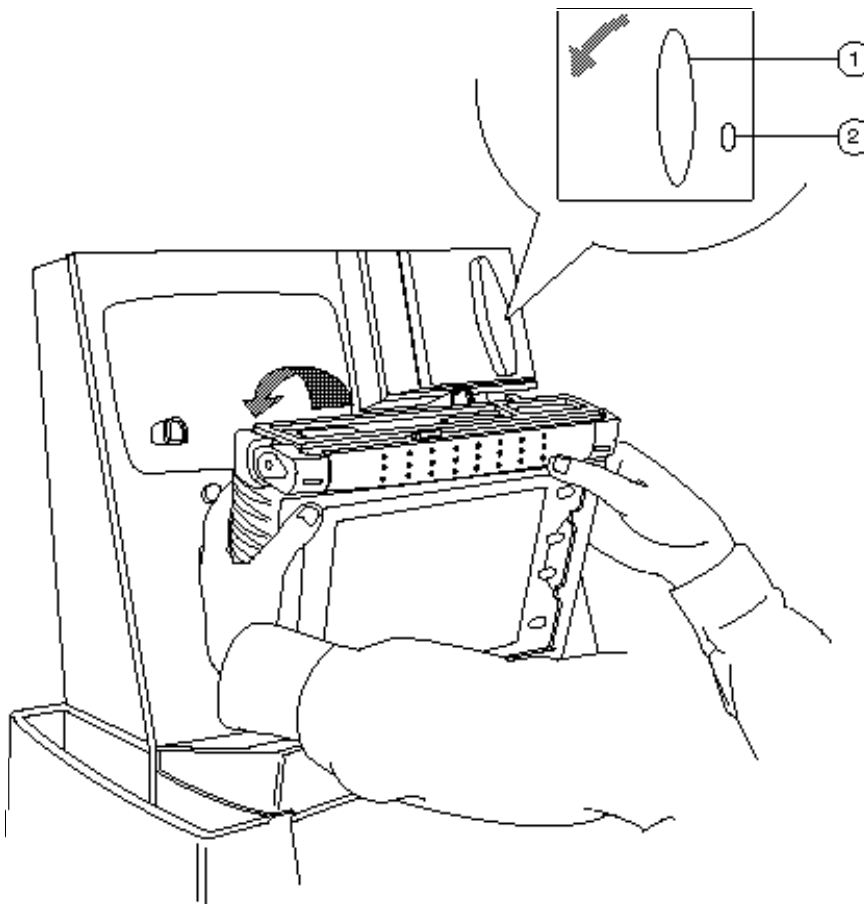
The WDS system can be configured by connecting the Docking Station and selecting “Network Options” from the System Utilities screen. User guides for the available LAN’s can be accessed from the “View WDS connectivity Activation Guide” from the System Utilities screen. The option “View WDS connectivity Activation Guide” will not be displayed if a User Guide is not available in the current language that the WDS is operating in.

Docking and Undocking the Portable Test Unit

You will only be able to use the CD-ROM drive, the floppy disk drive and connect to the external power supply when the PTU is docked (connected) with the Docking Station. You can carry out diagnostic routines away from the Docking Station as you can undock the PTU, which is able to run on its own battery supply for up to 20 minutes, or be connected to the battery of a vehicle utilizing the PTU battery cable, or be powered from the vehicle utilizing the 16 pin DLC connector.

Docking the Portable Test Unit (PTU)

1. Ensure that the docking lever is in the vertical position.
2. Place the PTU in the Docking Station recess.
3. Lean the PTU backward until it latches into position.
4. To dock the PTU, turn the docking lever counter-clockwise, until it reaches the end of its travel. The lever will now be horizontal. (The Docked LED on the side of the Docking Station and the DC Power LED on the front of the PTU will now be illuminated). If the PTU is already powered up there will be a short delay before the touchscreen will respond to presses.
5. A retaining clip is provided on the docking station which will allow a padlock to be used, securing the PTU in place. To use, simply pull the retaining clip out until the hole in the clip is visible. Secure a padlock through this hole. This will prevent the docking lever being placed in the vertical, undocked position.



- 1 Docking lever
- 2 Retaining Clip

Figure 7 Docking the PTU

Undocking the Portable Test Unit (PTU)

1. If the PTU is on, press the red **System shut-down** button and select the Undock icon (*see Figure 10*), there will be a short delay. Wait for the "OK to Undock" icon after pressing Undock (*see PTU Controls*).
2. Turn the docking lever clockwise into the vertical position until it latches. If a padlock has been fitted, remove the padlock and push the retaining clip back into the plastic housing before turning the docking lever.
3. Press the Tick button.
4. Using two hands, in order to hold both sides of the PTU, raise and lean the PTU forward until it clears the latch.
5. Remove the PTU from the docking station recess.

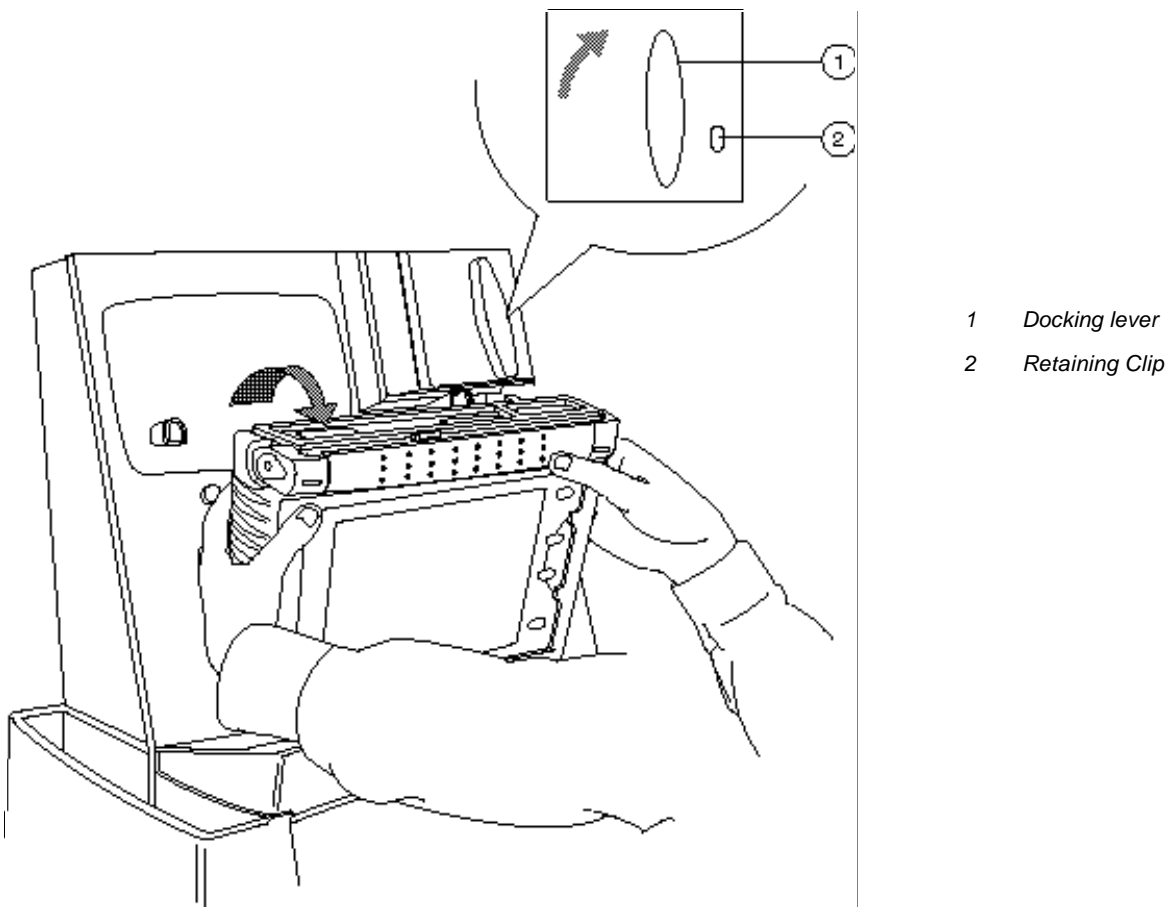


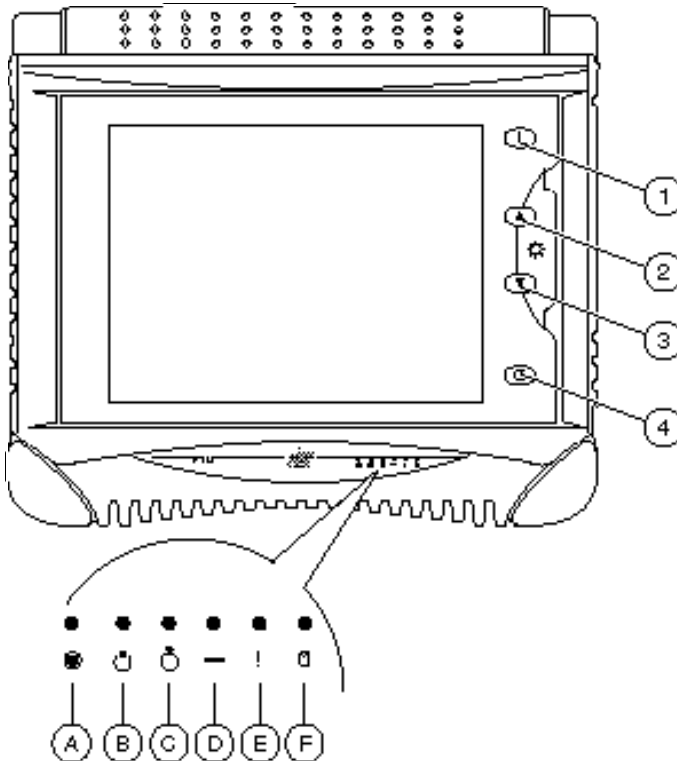
Figure 8 Undocking the PTU

Controls and Indicator Lamps

The PTU is controlled using the four control buttons and by selecting desired relevant areas of the touchscreen.



CAUTION - Using any implement other than a finger may damage the screen and buttons. Do not use measurement probes, pens, pencils, screwdrivers, awls or other sharp instruments as these will damage the screen.



PTU Indicator Lamps

- A Power On
- B Suspend
- C Sleep mode
- D DC Power
- E Diagnostic LED
- F Hard disk activity

PTU Controls

- 1 Power On
- 2 Increase screen brightness
- 3 Decrease screen
- 4 System Shut-Down

Figure 9 PTU Controls and Indicator Lamps

PTU Indicator Lamps

Power On (A)

This GREEN lamp illuminates to indicate that the PTU is switched on.

Suspend (B)

This Amber Lamp is used to indicate that the PTU has entered Suspend Mode (“Suspend to RAM”). A change to the Software in July 2001 means the PTU now enters Hybernation Mode (see details below) as opposed to “Suspend to RAM”. Therefore this lamp will never be illuminated.

Sleep Mode (C)

During normal use, to preserve battery power, the screen will shut down automatically after approximately 15 minutes without user activity. This AMBER lamp will then illuminate to indicate that the PTU is still switched on, but in sleep mode. Press any portion of the screen to reactivate the PTU.

DC Power (D)

This GREEN lamp illuminates to indicate that the PTU is being powered from an external power source rather than the internal batteries.

Diagnostic LED (E)

This RED lamp illuminates to indicate that the PTU has a fault. If this lamp flashes or illuminates, refer to the Troubleshooting section.

Hard Disk Activity (F)

This GREEN lamp illuminates to indicate activity within the PTU.

Hibernation Mode / Suspend to Disk

In order to preserve battery power, after approximately 2 hours without any activity the PTU will automatically transition to Hibernation Mode (also known as “Suspend to Disk”). In Hibernation mode the indicator lamps (A) and (B) will NOT be illuminated. Press the **Power On** button to reactivate the PTU.

PTU Controls

Power On (1)

You use the “Power On” button to start the PTU and to Reactivate the PTU from Hibernation Mode. When you press this button the GREEN “Power On” indicator lamp is illuminated.

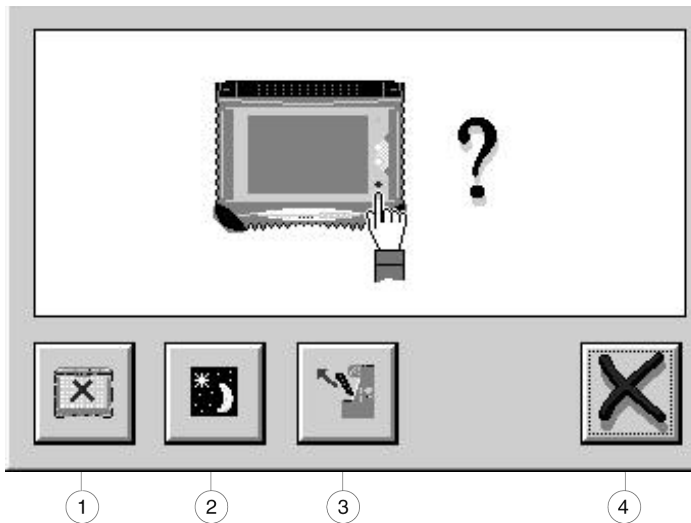
Increase / Decrease Screen Brightness (2/3)

These control buttons increase or decrease the screen brightness in stepped increments to suit user preference.

System Shut-Down (4)

When you press this button the PTU shuts down in a controlled manner and the power is disconnected to all major systems. You will be presented with four options (*see figure 10*):

- Off – this will turn off the PTU unconditionally. Data collected during the diagnostic session will be lost. You will have to restart the session after power-up.
- Hibernation Mode– this will put the PTU into a state which will preserve power. None of the session data will be lost. This method provides the quickest restart.
- Undock – this **MUST** be selected before undocking the PTU from the Docking Station, failure to do so may cause WDS System failures.
- Cancel – This cancels the shut-down operation and returns to the session.



1. Off
2. Hibernate
3. Undock
4. Cancel

Figure 10 System Shutdown Options

Using the System

Initial Software Installation

The WDS system will be delivered with an English version of the Operating system software installed in the hard disk drive of the PTU. If you have ordered a country kit other than English you will need to set up the system by installing the country kit software onto the hard disk drive in the PTU. Please follow the instructions carefully.

If the system does not respond as indicated in this manual at any time during the installation procedure, then contact a WDS Hotline.

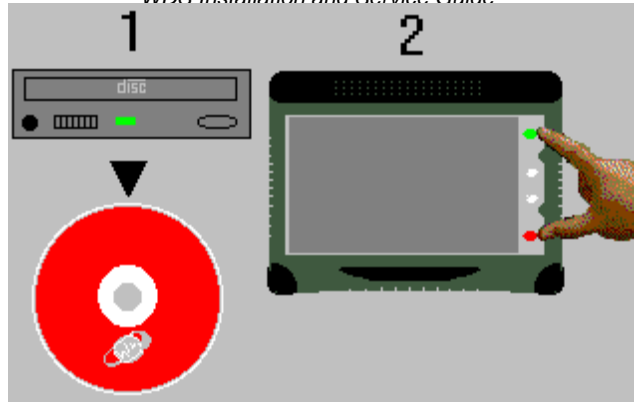
Ensure that the PTU is docked and that power is connected to the Docking Station (*see Docking and Undocking the Portable Test Unit*) as the PTU batteries have not yet been properly conditioned.

If the required WDS Operating System is English, go to item 3.

1. Insert the red-colored Operating System CD, red label side up, into the CD-ROM drive in the Docking Station.
2. **Power On** the PTU.

When you switch the PTU **Power On**, the Operating System software will run automatically and guide you through the following procedures:

- **Initial Hard Disk Setup** - the System will load the Operating System software from the CD onto the hard drive contained within the PTU. This activity will take approximately 10 minutes, and the Hard Disk Activity indicator should flash during this operation. This stage is automatic, and no user interaction is required. At completion of this load procedure you will be presented with the following screen.



Remove the red-colored Operating System CD from the CD-ROM drive in the Docking Station. Keep this safe and close to the WDS for future use. Press the green PTU button while holding down the red PTU button. This will cause the unit to power off.

3. Press the green PTU button to power up the PTU.

When the PTU is rebooted after the installation of the Operating system CD, a number of system messages boxes may be displayed. This is normal behaviour, it does not mean there is a problem with the PTU. If the PTU asks you if you to "restart your computer", press the yes button.

4. Touchscreen Calibration – follow the on-screen instructions guiding you through the procedure for calibrating the touchscreen. This is essential for accurate selection of WDS screen buttons. This facility is also subsequently available on the WDS System Utilities screen.

At the completion of the System startup procedure, you will be presented with the following screen.

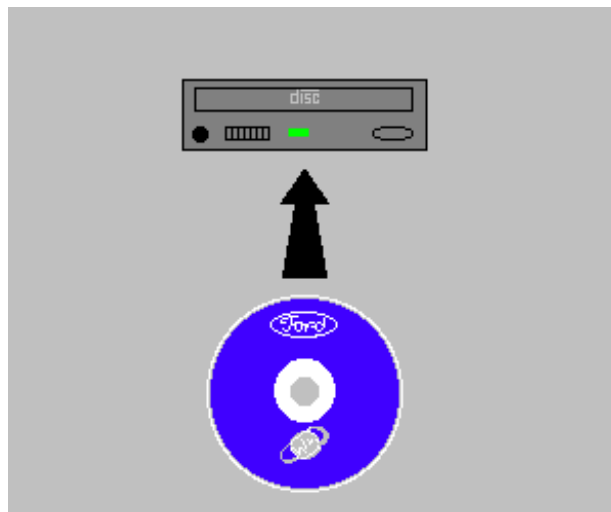


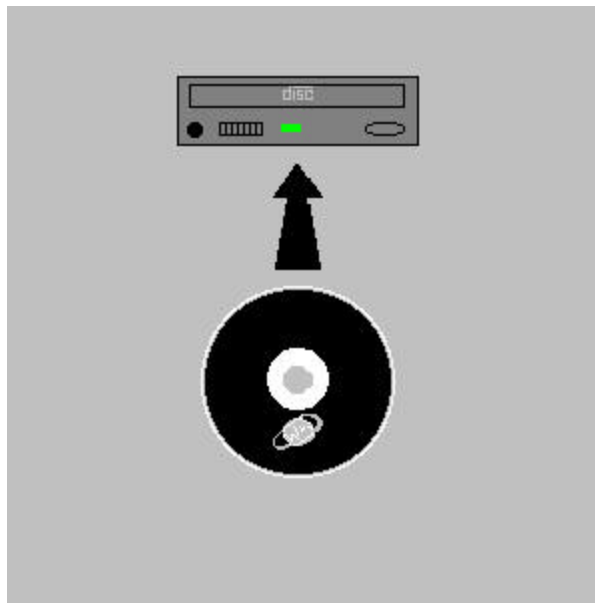
Figure 11 Insert Diagnostics Applications CD

5. Insert the blue-colored Diagnostic Applications CD, blue label side up, into the CD-ROM drive in the Docking Station.

You will then be prompted to select your chosen language for the remainder of the installation by following the on-screen instructions.

When the installation of the blue-colored Diagnostic Application CD's is complete you will be asked to remove the CD and the system will restart.

6. After the system has restarted you will be presented with the following screen.



7. Insert the latest version of black-colored Calibration files CD, black label side up, into the CD-ROM drive in the Docking Station. (Note: If you do not insert the correct CD then installation will not start and the system will display a message which states the label of the CD that should be inserted (for example C1)).

When the correct CD has been inserted you will be prompted to perform the installation by following the on-screen instructions. The system will then restart in your chosen Operating System language.

Diagnostic Applications CD Updates

Diagnostic Applications CD updates (a blue-colored CD) will be supplied at regular intervals.

To install your new applications CD, please follow these instructions:

1. Ensure the PTU is docked.
2. Shut down the PTU by pressing the Red Button then the red 'X' (OFF).
3. Restart the PTU by pressing the Green Button. Wait until the Vehicle Identification screen is displayed.
4. Insert the CD in the CD drive.
5. Close the CD drive. The new software will now start loading onto the PTU.
6. Follow the on-screen instructions.
7. When installation is complete, remove the CD from the CD drive and store in a safe place.

Calibration files CD Updates

In addition to the Diagnostic Applications CD updates (a blue-colored CD) you may also be supplied with Calibration files CD updates (a black-colored CD).

If after installing the Diagnostic Applications CD updates (a blue-colored CD) the system determines that a Calibration files CD update is required then the system will display the screen shown in section 6 of the "Initial Software Installation" section of this document. If this screen is displayed then follow steps 6 and 7 in the "Initial Software Installation" section.

Other CD Updates

In addition to the Operating System CD (red-colored CD), the Diagnostic Applications CD (blue-colored CD) and Calibration files CD (black-colored CD), other CD's may be supplied. Instructions on how to load any additional CD's will be supplied with the CD's.

System Utilities

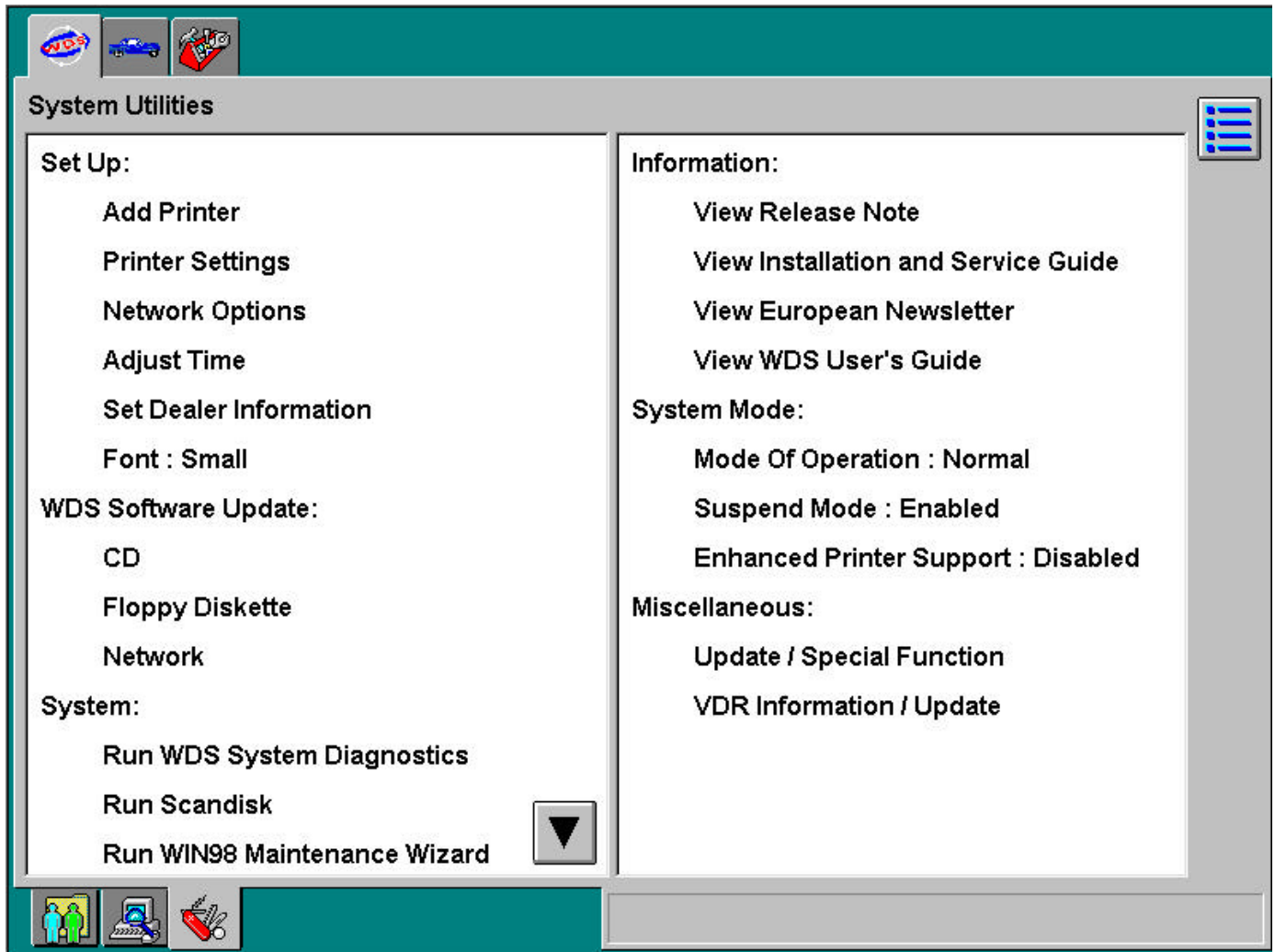


Figure 12 System Utilities Screen

You can return to this screen at any time by selecting the WDS System Utilities tab.



The System Utilities Screen shown above and the descriptions below show the options available on the B21 CD. If you have loaded a more recent CD than B21 then you may see more options. This guide is not intended to describe all the options as they become available but to give an overview of the type of functions that can be provided on this page.

From the System Utilities screen you may select the following options (not all options may be available on your system):

Set Up:

Add Printer	This allows you to add a new printer to the list of those available through WDS.
Printer Settings	This allows you to select your default printer from the list of those available and change the settings of all available printers.
Network Options	This allows you to configure WDS within your LAN system.
Adjust Time	You can adjust the system time (for daylight saving settings), by following the on-screen instructions. This is essential for accurate time-stamping of WDS log files. WDS is Year 2000 compliant.
Set Dealer Information	Follow the on-screen instructions to set the dealer details. This is essential for accurate reporting of the problems to the WDS Hotline and for operations involving connection to the dealership LAN.
Font	This allows you to select between a Small or Large font for displaying text. On selection of the font the system will restart with the new font applied.

WDS Software Update:

CD	This allows you to update the WDS software via CD.
Floppy Diskette	This allows you to patch the WDS software via Floppy diskette.
Network	This allows you to configure WDS within your LAN system.

System:

Run WDS System Diagnostics	This procedure is described later in the Troubleshooting section.
Run Scandisk	This will check the hard disk within the PTU for errors. This should only be run as instructed by the PTU software, your WDS Hotline or the Troubleshooting section in this manual.
Run WIN98 Maintenance Wizard	This allows you to run the Windows Maintenance Wizard program. This can make your programs run faster, check your hard disk for problems, and free hard disk space. This process may take several hours. Whilst the Maintenance Wizard is running, no other application should be used.
Re-calibrate Touchscreen	This allows minor adjustment to allow the set up of the PTU touchscreen for best alignment between the visible buttons on the screen, and the touchscreen that is used to select them.
Condition Battery	The batteries in the PTU require an initial conditioning operation. This is essential for accurate indication of WDS battery status. It is suggested that the procedure is left to complete overnight as it will take approximately 5 to 9 hours and the system will be completely locked during this operation. Software within the PTU will instruct you when it is subsequently necessary to run this procedure. Remember to condition the batteries overnight, following receipt of a new or replacement PTU.

Information:

These options allow you to view the various documentation that has been included with the latest Diagnostic Applications CD

System Mode:

Mode of Operation	This selects training mode allowing you to explore the functions of WDS.
-------------------	--

Suspend Mode	This allows you to Enable or Disable the PTU Power Management facility.
Enhanced Printer Support	This allows you to configure or unconfigure the printer port as an ECP port.

Miscellaneous:

Update / Special Function	This allows you to enable or disable hidden functions. This should only be used as instructed by your WDS Hotline.
NGS Software Update	This allows you to update the NGS Software.
Network Connectivity Settings Backup/Restore	This allows you to Backup/Restore selected items from the Registry.
VDR Information / Update	This allows you to run the VDR selftest, update the VDR software and view the VDR user's guide

Following initial system setup, you should create one or more system users from the User Preferences screen. Initially the list will only present "default user".

User Preferences

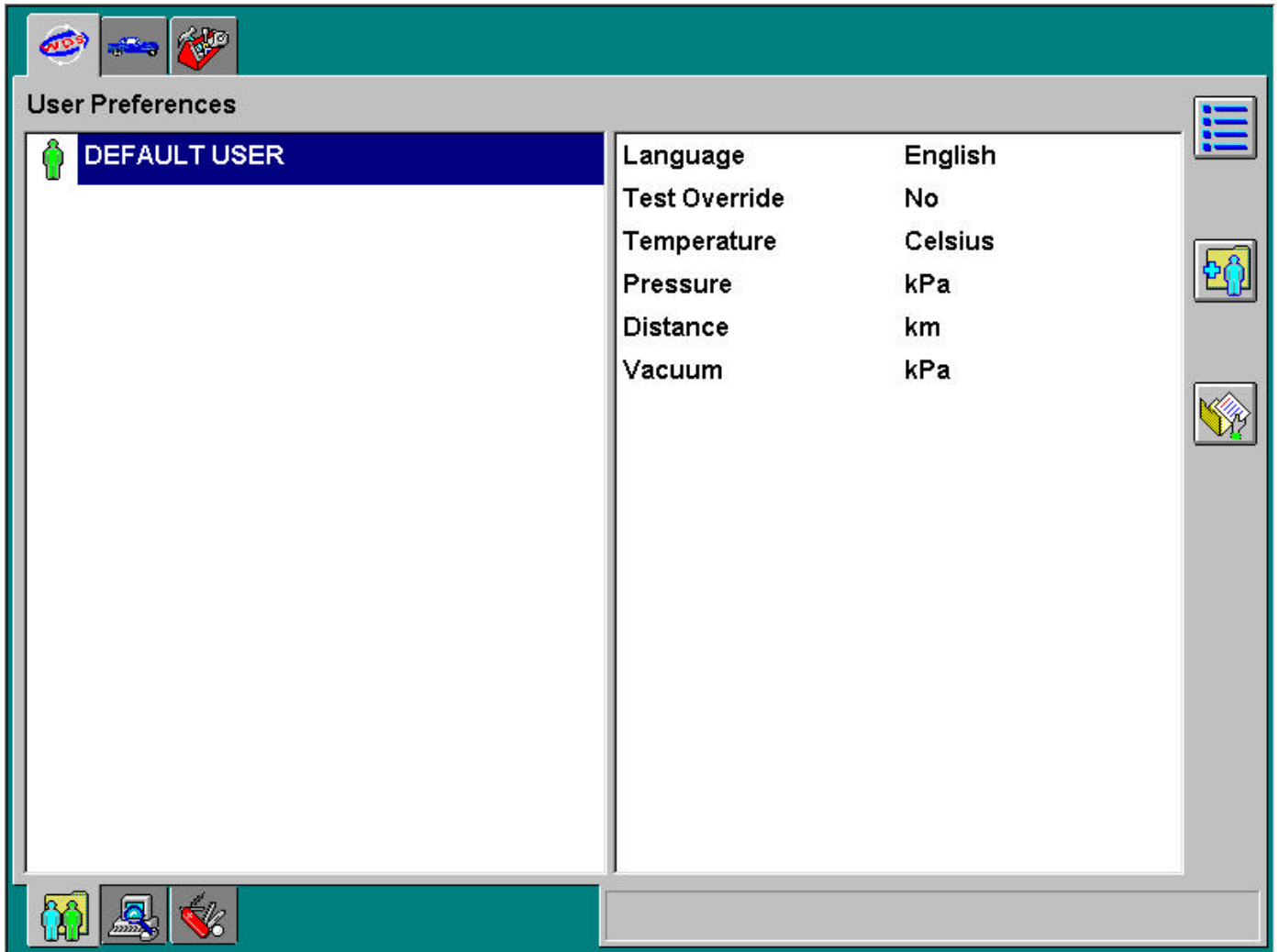


Figure 13 User Preferences Screen

You can return to this screen at any time by selecting the User Preferences tab.



The currently selected user is identified by the green body icon:



You can also view system information from the following screen:

System Information

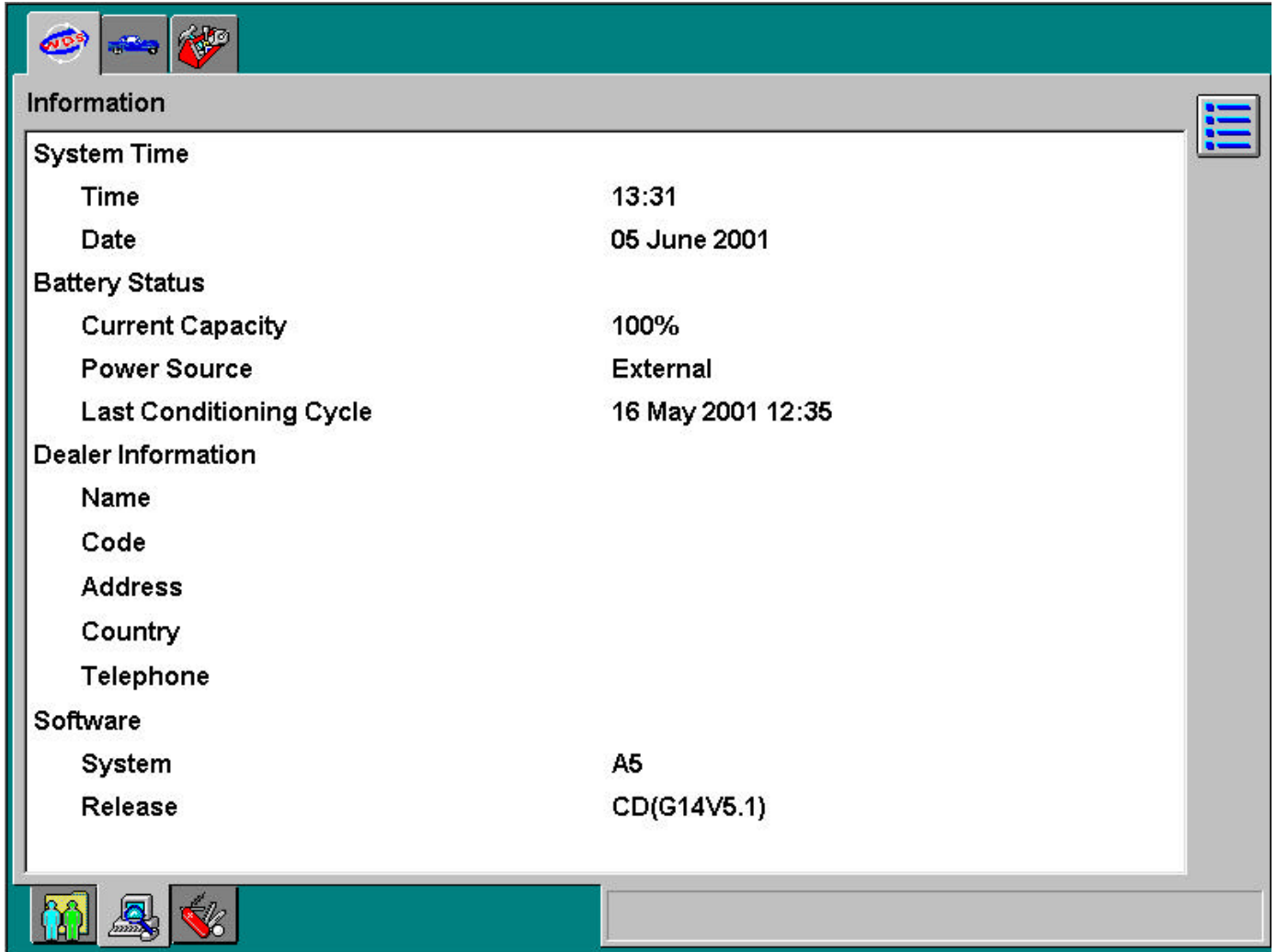


Figure 14 System Information Screen

You can return to this screen at any time by selecting the System Information tab.



Once you have set up and selected a user you will be allowed to proceed to the Vehicle Identification screen. This screen allows you to select a vehicle and then access any WDS facilities and run vehicle diagnostics.

Vehicle Identification

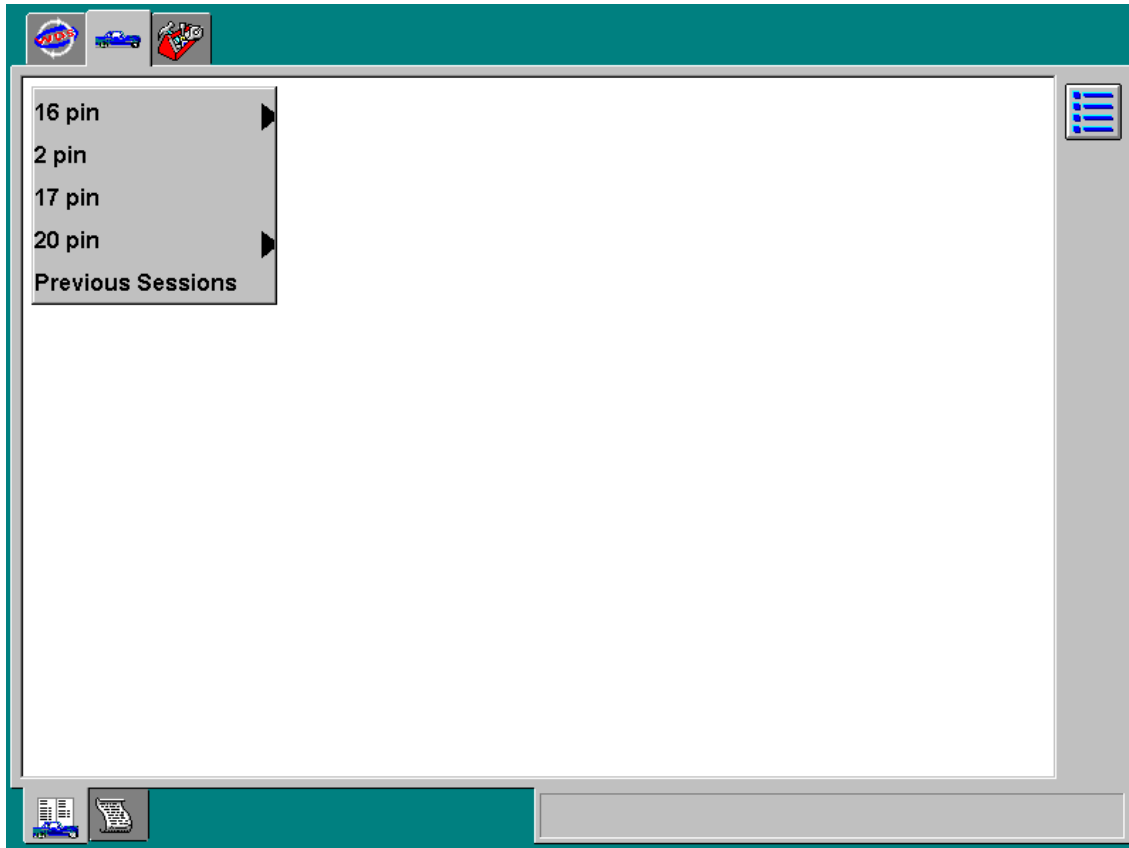


Figure 15 Vehicle ID Screen

You can return to this screen at any time by selecting the Vehicle Identification tab.



Using the Measurement and Test Equipment

Connecting to the Vehicle

You can connect the PTU to the vehicle using the cable between the connector on the rear of the PTU and the diagnostic connector on the vehicle.

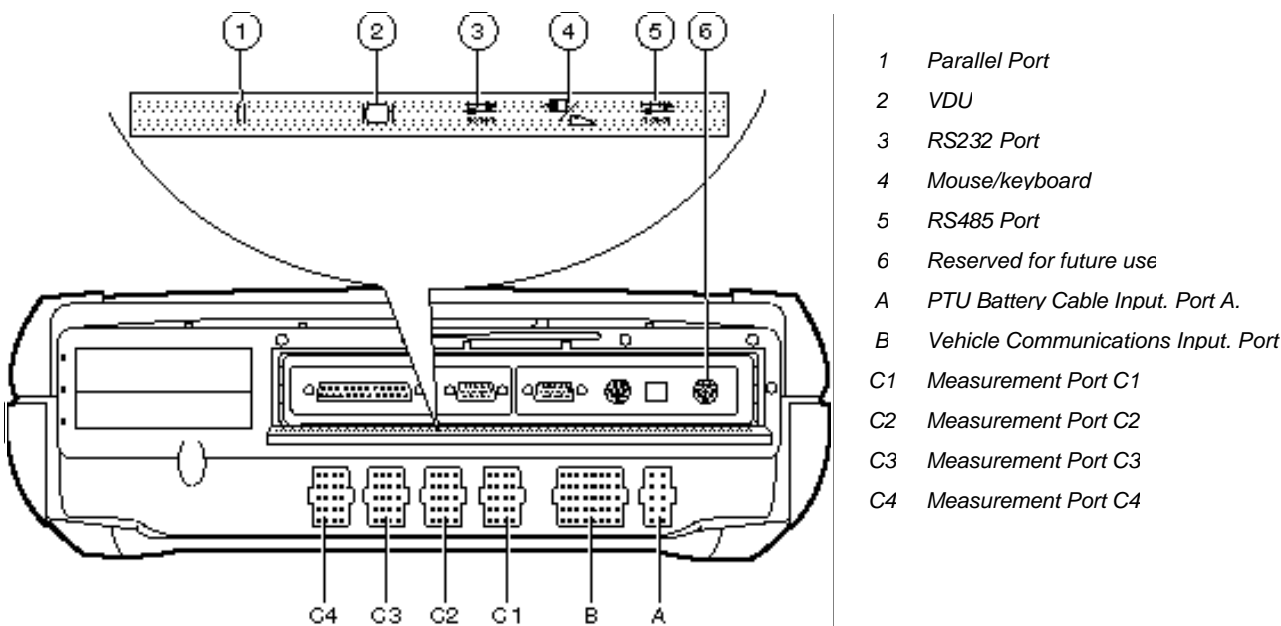


Figure 16 Connecting the Measurement and Test Equipment

Using Test Probes to Take a Measurement

You must only connect the Red and Black Probes to the PTU when instructed to do so by the diagnostic routine you are running. The Red and Black Probes can only be connected into Measurement Ports C1 or C2.

You should always use the probe tip adaptors, as specified in the diagnostic routine, to ensure that the correct contact is applied to the vehicle harness or component. This will ensure that a good connection is made, and will prevent damaging the connector pins.

The Red Probe has an integral button which allows you to remotely activate the tick button on the screen during a probing operation.

The Secondary Ignition Transducers can only be connected into Measurement Ports C3 or C4.

The Pressure & Vacuum Transducer may be plugged into any available Measurement Port C1 to C4.

The PTU Battery Cable can only be plugged into the connector labelled A.

The vehicle communications cables (16 Pin DLC Cable including MS-CAN, 14 and 16 Pin DLC Cable, NGS Cable Adaptor, and 2 Pin DLC Cable), can only be plugged into the connector labelled B.

Technical Specification

Portable Test Unit (PTU)

Dimension	Specification
Width	340 mm (13.4")
Length	297 mm (11.7")
Height	106 mm (4.2")
Weight	6 kg (13.2 lb)

Interface	Connection
Parallel Port	D 25-pin socket
Color Monitor (VDU)	Mini Dsub 15-pin socket
RS232 Port	Mini Dsub 9-pin socket
Mouse / Keyboard	Mini DIN 6-pin socket (PS/2)
RS485 Port	3 way Hirose RP39
PCMCIA	1 x Type III or 2 x Type II or 2 x Type I
Parallel Docking	To the Docking Station

Power Source	Specification
Rechargeable battery	3.5 Ah NiMH
Parallel Docking Port	Nominal 16 VDC from Docking Station
Vehicle Battery	12V DC power input from vehicle under test

Environmental Specifications

Parameter	Specification
Operating Temperature	+5 °C to +42 °C (41°F to 107 °F)
Storage Temperature	-20 °C to +60 °C (-4°F to 140 °F)
Operating humidity	+15 % to +85% RH., non-condensing
Altitude Operating	-300 m to +2000 m. (-984 ft to +6561 ft)
Altitude Non-operating	-300 m to +2500 m. (-984 ft to +8202 ft)
Shipping vibration	1.35g rms., 1E10-3 gE2/Hz PSD., range 10 Hz to 1 kHz., x, y and z, 90min
Non-operating shock	20g., 11 ms., duration, half sine wave
Operating shock	10g., 11 ms., duration, half sine wave
Non-operating drop	Less than 500mm base down (19.6")
Operating drop	Less than 300mm base down (11.8")

Measurement Interface

Parameter	Specification
DC Voltage max.	-150 VDC to +150 VDC
AC Voltage max.	150 V peak
Input impedance Port C1/C2	1 M Ω / 160 pF
Input impedance Port C3/C4 (2.5V)	1 M Ω / 160 pF
Input impedance Port C3/C4 (40V)	1 M Ω / 160 pF

Vehicle Communications Link Interface

Protocol	
ISO Ford	CAN
ISO 9141-2	DDL
UBP	DCL
SCP	

Docking Station

Parameter	Specification
CD-ROM Drive	Minimum 8x ATAPI
Floppy Disc Drive	1.44 Mbyte 3.5"
Electrical input - switched	110 VAC or 240 VAC at 50 - 60 Hz
Electrical input - current	3/1.5 A; 50 - 60 Hz

Dimension	Specification
Width	620 mm (24.5")
Length	457 mm (18")
Height	607 mm (24")
Weight	16 kg (36 lb)

Interface	Connection
Parallel Port	D 25-pin socket
Color Monitor (VDU)	Mini Dsub 15-pin socket
RS232 Port	Mini Dsub 9-pin socket
Mouse	Mini DIN 6-pin socket (PS/2)
Keyboard	Mini DIN 6-pin socket (PS/2)
RS485 Port	3 way Hirose RP39

Optional Cart

Dimension	Specification
Width	620 mm (24.5")
Length	457 mm (18")
Height	890 mm (35")
Weight	46 kg (102 lb)

Care and Maintenance

Cleaning the Portable Test Unit (PTU)

Switch OFF the power and unplug the power cord at the electrical socket outlet before cleaning the equipment.

The PTU should only be cleaned using non-abrasive, mild cleaning agent such as a windshield wash fluid, which can be ordered through your local Ford parts department.

Note: This fluid has to be diluted with clean water in the ratio 1 part fluid to 5 parts water. Dust and other particles should be lightly brushed from the surface before being cleaned. Cleaner should be applied to a soft lint free cleaning cloth and never directly to the PTU. Do not soak the cleaning cloth and take care not to allow cleaning fluid to enter connectors.

Care of the CD-ROM Disk

Ensure that the CD-ROM disk is free from dirt or contamination before use and stored in the protective casing when not in use.

Avoid exposing the disk to direct sunlight or high temperatures.

If necessary, clean CD-ROM disks with an approved cleaner and a smooth, clean, lint-free cloth, wiping from the center to the edge.



CAUTION - Never clean CDs with abrasive cleaning agents.

Using the Controls

The Power ON, System shut-down and contrast control buttons on the PTU are easily operated with light finger pressure.



CAUTION - Using any implement other than a finger may damage the screen and buttons. Do not use measurement probes, pens, pencils, screwdrivers, awls or other sharp instruments as these will damage the screen.

Care of Cables

It is good practice to always return the cables and probes to their appropriate storage place. The cables have been manufactured to high standards but can be damaged by driving vehicles over them or exposing them to excessive temperatures. Avoid stretching the cables. DO NOT allow cables to be positioned where they can be trapped, snagged, stretched across sharp edges, or create any potential hazard.

Vehicle interface cables

You MUST take care when using these cables as they are capable of passing high current.

Short-circuits are a fire risk.

Replacing the Fan Filter

Occasionally, a replacement fan filter will be supplied with the Ford Diagnostic Application CD kit. To fit it, simply disconnect the Docking Station from the electrical power supply, slide the old fan filter out of its holder and replace it with the new one. (See Figure 5 for location of fan filter.)

Troubleshooting

Users should perform the following simple checks to determine if they can resolve any problems or concerns with WDS. There is a WDS System Diagnostics routine that will resolve most of the more complex WDS problems.

Simple Checks

PTU will not power on

1. Plug in the Docking Station and switch on at the electrical power supply. (*See Connecting the Power Cord*).
2. Test the electrical power outlet and switch position, power cord, and electrical fuse. (*See Connecting the Power Cord*).
3. If there is power on the docking station (**Power LED** on Docking Station will be illuminated), check that the PTU is correctly docked (**Docked LED** on Docking Station will be illuminated). (*See Connecting the Power Cord*).
4. Check that the external **DC Power** indicator lamp on the PTU is illuminated. (*See Controls and Indicator Lamps*).
5. If the Lamps are illuminated and the PTU will not switch on, undock the PTU then remove all power from the Docking Station. Next restore power to the Docking Station and then dock the PTU in the Docking Station.
6. Switch the PTU off by holding down the **System Shut-Down** button while depressing and releasing the **Power On** button. Switch the PTU on by pressing the **Power On** button.
7. If the PTU still will not power on, then contact a WDS Hotline.

PTU powers on but Operating System software will not run correctly

If the PTU powers on but the operating System software does not run correctly, then the system software may be corrupt. The system must be completely initialised. Follow the Initial Software Installation procedure using the WDS Operating System CD (*see Using The System*).

Note, this may take longer than the original initialisation as the software will attempt to repair the corrupt System Software.

Blank display on the PTU

A blank display may be caused by the PTU going into sleep or suspend mode. If the AMBER Sleep Mode indicator lamp is illuminated, touch the screen to reactivate the PTU. If the AMBER Suspend indicator lamp is illuminated, press the **Power On** button to reactivate the PTU. If neither indicator lamp is illuminated the PTU may be in suspend to disk mode or power off mode. Switch the PTU on by pressing the **Power On** button.

If the PTU does not respond as indicated, contact a WDS Hotline.

Screen fails to respond to touch controls

The PTU will not respond to the touch controls if the operating system has locked up. Switch the PTU off by holding down the **System Shut-Down** button while depressing and releasing the **Power On** button. Switch the PTU on by pressing the **Power On** button. If the PTU still does not respond to a touch on the screen, follow the procedure for 'PTU powers on but Operating System Software will not run correctly'

If the PTU still does not respond to a touch on the screen, contact a WDS Hotline.

PTU will not power off

The PTU will not switch off if the operating system has locked up. Switch the PTU off by holding down the **System Shut-Down** button while depressing and releasing the power on button. Switch the PTU on by pressing the **Power On** button. If the PTU still does not power off and on when using the control buttons, contact a WDS Hotline.

Diagnostic LED flashes or illuminates

Switch the PTU off by holding down the **System Shut-Down** button while depressing and releasing the power on button. Switch the PTU on by pressing the **Power On** button. If the Diagnostic LED is still illuminated or flashing, note whether the LED is constantly illuminated or flashing, and contact a WDS Hotline.

CD drive will not operate

1. Check that there is power to the PTU and Docking Station, and that the PTU is correctly docked, as described in the procedure for 'PTU will not power on'
2. Place a CD on the CD drive tray, with the printed CD label on top, and close the drawer.
3. Check that the CD indicator flashes and remains illuminated for a short period of time.
4. If this does not happen, contact a WDS Hotline.

Software will not load

Ensure that the PTU is switched OFF before docking with the Docking Station to enable the CD drive. Check that the CD drive operates correctly as described in the procedure for 'CD drive will not operate'.

Touchscreen misaligned

If it is difficult to accurately select items on the screen, you may need to correctly calibrate the touchscreen. Select the 'Recalibrate Touchscreen' item on the System Utilities screen and follow the on-screen instructions.

PTU Enters Safe Mode

If the PTU enters safe Mode when it Powers On, switch the PTU off by holding down the **System Shut-Down** button while depressing and releasing the power on button. Switch the PTU on by pressing the **Power On** button.

The system will then execute Scandisk to check for Software errors. If the system then does not operate correctly, follow the procedure for 'PTU powers on but Operating System Software will not run correctly'.

Power-on self test failure

When WDS powers up, various internal system functional tests are run. Any failure will be reported by displaying a fault code for the problem area on the display, and may possibly be accompanied by a sequence of audible tones. Record any fault codes with their associated descriptions, and contact a WDS Hotline.

WDS hardware failures

The system software will check the measurement and vehicle communications hardware automatically during normal use. If any failures are discovered they will be reported to the user using a simple pop-up scheme.

1. Before contacting a WDS Hotline, record any fault codes, descriptions and associated actions which cause the failure.
2. Restart the PTU then restart the application. If the problem is repeatable, run the WDS System Diagnostics. If any fault codes are produced, record these and contact a WDS Hotline.
3. If no fault codes are produced by the WDS System Diagnostics, contact a WDS Hotline and provide the information recorded in step 1.

WDS System Diagnostics

The WDS System Diagnostics is a guided diagnostic application designed for you to test the system hardware and identify faulty components. You should only use this procedure after you have carried out the previous checks which will eliminate simple faults. The WDS System Diagnostics routine should be run periodically even if there are no apparent problems with the system to help identify problems before they impact your productivity.

WDS System Diagnostics Components

The WDS System Diagnostics software directs you through a series of test procedures to diagnose problems with the WDS system.

When the WDS System Diagnostics routine is running, you can select the full system test, which will guide you through the testing of the complete system to locate any faults. If you suspect a particular area of the system to be at fault, for example the instrumentation, then you can test this section alone.

As the software tests the system, you will be instructed to connect various items to the PTU. Many of these items will be the PTU Self Test Adaptors, which are for use only in WDS System Diagnostics. You should not use them for any other purpose, and you should only connect and disconnect them when instructed to do so. You must remove all PTU Self Test Adaptors at the end of the WDS System Diagnostics procedure.

You should always use the adaptors, as specified in the diagnostic routine, to ensure that the correct contact is applied to the pin or socket being tested. This will ensure that a good connection is made, and will prevent damaging the connector pins.

Procedure

1. Disconnect all probes and any other external devices or cables from the PTU and the Docking Station.
2. Ensure that the PTU is docked with the Docking Station.
3. Switch on the PTU and wait until the System screen appears.
4. Select the System Tab. Then select the WDS System Diagnostics item from the menu and follow the instructions on the screen.
5. WDS System Diagnostics will not run if another diagnostic application is running. In this situation a message will appear instructing you to close down that diagnostic application.
6. Follow the instructions on the screen.
7. Record any fault codes with their associated descriptions, and contact a WDS Hotline.

GenRad Warranty

GenRad warrants WDS hardware to be free of defects in design, assembly, material or workmanship and, when properly used, the WDS hardware will perform in accordance with GenRad's published specifications. If WDS hardware is found not to meet this standard it will be repaired or, at the option of GenRad, replaced.

The warranty covers all WDS hardware defects incurred during normal use of the product. It does not include replacement when the alleged defect arises from:

- 1) Failure to use the WDS in accordance with GenRad's or Ford's written instructions, including but not limited to the failure to use the WDS System Diagnostics facility, failure to provide and use a proper power supply, or the use of WDS with vehicles other than those for which it was designed.
- 2) Neglect or misuse of the WDS
- 3) Any alteration, modification or maintenance of the WDS or any part thereof by a party other than GenRad or without GenRad's prior written consent.
- 4) The use of parts or accessories which are not supplied by GenRad or otherwise approved by GenRad including but not limited to cables and transducers; and
- 5) Any damage to the WDS arising from any accident or disaster, including but not limited to fire, flood, water, wind, lightning, transportation, vandalism, or burglary.

NEITHER GENRAD, OR ANY THIRD PARTY LICENSOR, MAKES ANY OTHER REPRESENTATION OR WARRANTY REGARDING THE WDS HARDWARE OR SOFTWARE, INCLUDING EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT. USER RETAINS FULL CONTROL OVER AND RESPONSIBILITY FOR THE PROPER USE OF THE WDS HARDWARE AND SOFTWARE IN THE TESTING SERVICE USER PROVIDES AND GENRAD DOES NOT WARRANT THE MERCHANTABILITY OF TESTED PRODUCTS OR THE RESULTS OF USER TESTING SERVICES THROUGH THE USE OF THE WDS HARDWARE AND SOFTWARE.

North America
South America
Japan

WDSNorthAmerica@GenRad.com
WDSSouthAmerica@GenRad.com
WDSJapan@GenRad.com

Ford Technical Hotlines

Argentina	+34 9 6 179 7088
Australia	+61 3 9359 8725
Austria	0800 298493
Belgium (French)	0800 18995
Belgium (German)	0800 17172
Brazil	+34 9 6 179 7084
Canada	1 800 862 4694
Czech Republic	+49 221 947 00774
Denmark	8001 8155
Finland	9800 14664
France	+33 134 261313
Germany	+49 221 947 00711 (00722, 00733)
Hungary	+49 221 947 00774
Italy	+39 06 9114 0299
Japan	+81 3 5477 5142
Netherlands	0800 022 91 84
Norway	8001 0185
Poland	+49 221 947 00774
Portugal	0800 834006
S. Ireland	+1 800 535 001
Spain	+34 96179 7088
Sweden	+46 8444 5500
Switzerland (French)	0800 55675
Switzerland (German)	0800 557973
Switzerland (Italian)	0800 556 890
UK	+44 1206 732200

Americas: 1 800 826 4694 (USA)

Monday – Thursday 9am – 8pm EST
Friday 9am – 6pm EST