



**UTCIS-V™ and UTCIS-PT™ Regulator
Engine Management System**

UnwiredTools, LLC
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Installation Guide and Owner's Manual

*For UTCIS-V™ and UTCIS-PT™
Replacement Warm-up Regulator and
Engine Management System*

Approximate installation time = 1 hr

Important Note to Installers:

Before connecting the UTCIS to a PC read through page 16 of this manual. This UTCIS requires the use of version 2.0.0.5 or higher of the UT Engine Management Software. Using any other previous version may damage the UTCIS controller.



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WARNING: THE STATE OF CALIFORNIA MAY NOT CONSIDER THIS PRODUCT TO BE LEGAL FOR USE OR SALE IN CALIFORNIA, OR IN A CAR REGISTERED IN THAT STATE, DEPENDING ON SUCH THINGS AS HOW THE VEHICLE IS USED, THE SPECIFIC INSTALLATION AND OTHER FACTORS. IF YOUR VEHICLE IS REGISTERED IN CALIFORNIA OR YOU WILL USE IT THERE, PLEASE CONTACT UNWIREDTOOLS BEFORE PROCEEDING.

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NOTICE REGARDING WARRANTIES

The *UnwiredTools™* UTCIS™ comes with a Limited Warranty, a copy of which appears on the back of this Manual. With regard to this Manual and the information in it (the “Manual”), please note that, although UnwiredTools has endeavored to make it as accurate and informative as possible, the variability of vehicles, the circumstances of installation, changes from year to year, and other factors make it impossible for UnwiredTools to guarantee that this information is accurate and/or directly applicable for your vehicle and your particular circumstances. The information in this Manual therefore is provided as a general guide or illustration. It is your responsibility and not that of UnwiredTools to ensure that this Product is suitable for your vehicle and that it meets your needs or requirements. This Manual is provided “as is” and without any warranties of any kind. UnwiredTools makes no representations or warranties with respect to this Manual, e.g., as to its accuracy, completeness or appropriateness to any particular vehicle or situation. UNWIREDTOOLS HEREBY DISCLAIMS ANY AND ALL WARRANTIES AS TO THIS MANUAL, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. UNWIREDTOOLS ALSO DISCLAIMS ANY LIABILITY FOR YOUR USE OF THE MANUAL. PLEASE USE IT AT YOUR OWN RISK. This Manual may be updated from time to time. Users are encouraged to visit our Web site at www.unwiredtools.com to obtain the latest version, to obtain information about the Product, and to obtain other support information.

NOTICE REGARDING TRADEMARKS

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WARNING: READ BEFORE BEGINNING INSTALLATION

The *UnwiredTools* TM UTCIS TM installs into vehicles for which it is designed, and couples into the fuel and electrical systems. Please be aware that improper handling, installation or use can cause damage to your vehicle, other property, and even injury, grave harm or worse to you and others. Please follow the instructions set out in this Manual where they are applicable to your vehicle. If you are in doubt or have questions, contact a qualified service representative.

1. Read this entire Manual before beginning installation.
2. Check all kit components to make sure that all appear undamaged.
3. Make sure your vehicle is off, and is cool. Ensure that it is immobilized, e.g., in park with the emergency brake engaged.
4. Disconnect the negative lead from the battery.
5. Ensure that your work area is free of any circumstances that could result in electrical shock or fire. All power tools and electrical cables should be properly grounded. Keep floors and other areas dry if electrical equipment is being used.
6. Ensure that there is nothing loose or unconnected before the vehicle is started

Important Note:

*The UTCIS TM products install into a pressurized part of the fuel system. These products require **professional** installation. A trained technician will have the documentation, tools, and training needed to handle high-pressure fuel and related systems and equipment. Improper installation may lead to destruction of property, severe injury, or death. Professional installers may be found under the Support section of www.unwiredtools.com.*



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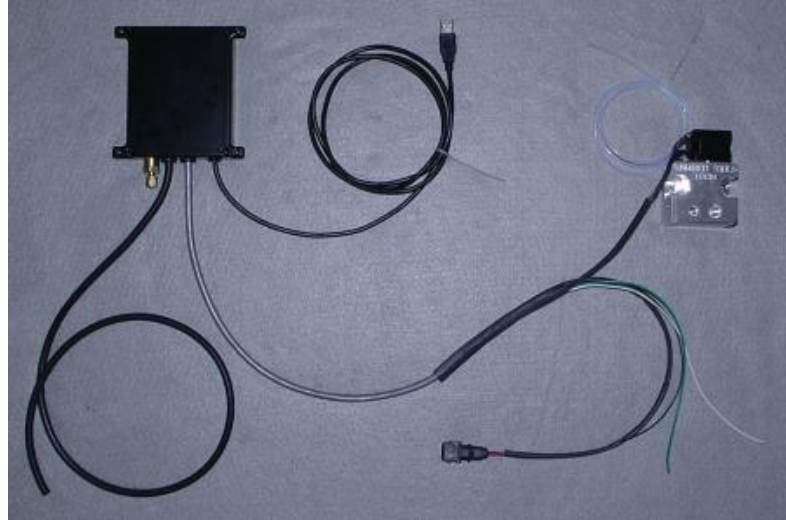
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Contents of the UTCIS™ Kit:

Please check the contents of this package to make sure it is complete. In addition to this manual your kit should include the following:

- A. UTCIS™
- B. Hardware Kit



The hardware kit includes the following:

- 4 ea tie wraps 3" long
- 2 ea Nylon spacers
- 2 ea M6 x 45 mm Socket head bolts
- 2 ea small copper sealing washers
- 2 ea large copper sealing washers
- 1ea 1/8" vacuum "T"
- 4 ea #6 self-drilling mounting screws





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UTCIS™ Product Description

The UTCIS™ Regulators are designed to replace the Warm-up Regulator in Bosch CIS fuel injection systems. The UTCIS™ is a cost-effective, and easy to install, replacement for the OEM part¹. The UTCIS™ regulates the Control Pressure and air fuel ratio circuit with modern, reliable digital controls including a digital microprocessor and sensor system.

The features of UTCIS™ include:

- Robust and reliable electronic controls, replaces inaccurate mechanical controls
- Easier cold and hot starts²
- Easy installation procedure
- Cost effective replacement
- Brings digital precision to older analog CIS injection systems
- Retains OEM fittings for superior fit
- Engine management software
- Live data and diagnostics
- 5 year warranty

The UTCIS™ is installed by removing the OEM Warm-up Regulator, then bolting the UTCIS™ into its place. The OEM electrical connector is retained so the electrical connection is as simple as plugging it in and connecting an additional ground. The air/fuel ratio in a CIS injected engine is regulated by the Control Pressure. The UTCIS™ does not just set Control Pressure, the control pressure is now regulated. A pressure sensor on the UTCIS™ monitors the Control Pressure and a stepper-motor driven needle valve continuously adjusts it. The Control Pressure is adjustable using a standard PC and a free copy of the UT Engine Management Software.

Note 1: The UTCIS™ replaces Warm-up Regulators for Mercedes, Porsche, VW, Audi and other vehicles, including European models.

Note 2: Warm-up Regulator failure is a common cause of starting problems. Other factors unrelated to the Warm-up Regulator may adversely affect engine startup. Consult a trained technician for an accurate diagnosis.

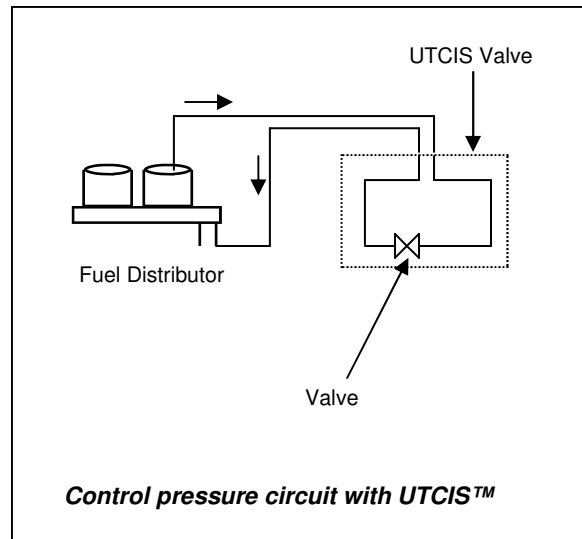
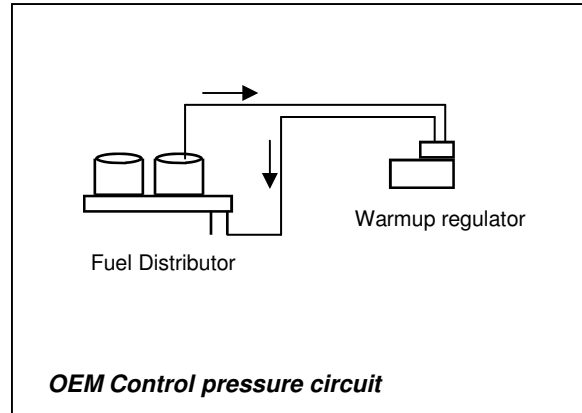


Theory of Operation

The OEM Warm-up Regulator works by allowing a small amount of fuel to flow out of the control pressure port of the Fuel Distributor. This flow determines the control pressure, which regulates the air/fuel mixture. The OEM Warm-up Regulator is a complex assembly of vacuum diaphragms and electrical bi-metallic heating elements which exert very small forces to control a small flow at high pressure. This delicate balancing act is prone to error and failure, especially over time.

The UTCIS™ replaces this complex mix of sensitive parts with a simple, robust system. The UTCIS™ uses a rugged and very accurate stepper-motor driven needle valve to regulate the control pressure.

The needle valve opens to reduce the control pressure during the warm-up cycle. The control pressure is varied by the UTCIS™ after warm-up in response to changes in manifold air pressure. The UTCIS-PT can also measure RPM and adjust control pressure in response to engine speed.





Installation:

Removal of OEM Warm-up Regulator

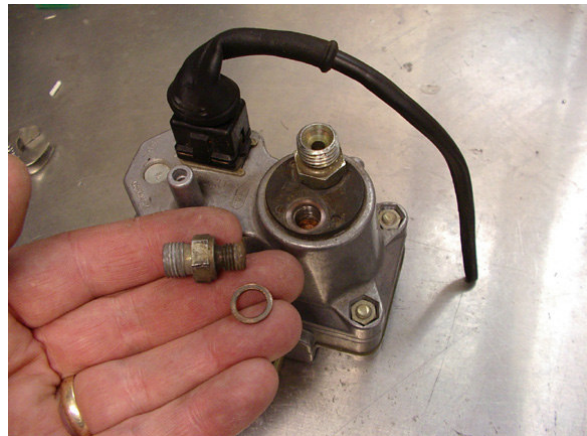
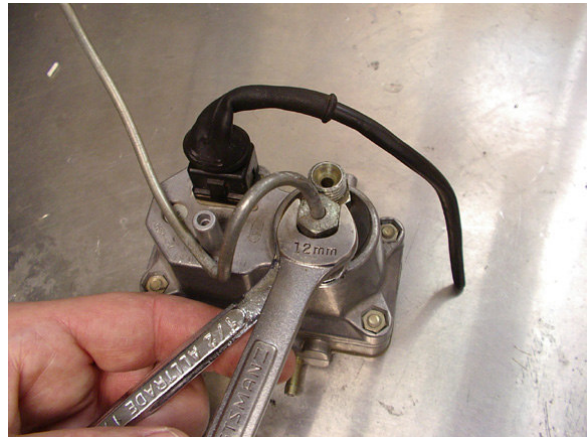
The installation of the UTCIS™ Regulator begins with careful removal of the two fuel lines connected to the top of the OEM Warm-up Regulator. Next, unplug the electrical connector and the vacuum connections from the OEM part. Be sure to plug unused vacuum connections. Remove the mounting bolts holding the OEM part to the engine. The OEM part may now be removed from the vehicle.

Working on the bench, remove the two fuel fittings and transfer them to the UTCIS™ Valve Body assembly. Note the use of a backing wrench to first remove the fuel line, then the fitting.

On some vehicles banjo fittings are used instead of separate ball fittings. In this case keep track of the 2 banjo bolts. They will be needed later to re-install the fittings on the UTCIS™.

Note: Working on high-pressure fuel systems is dangerous and requires proper tools and training.

Eye protection is highly recommended when working with pressurized fuel lines, as pressurized fuel tends to spray. When loosening fuel line connections, the joints should be covered with a rag to minimize the fuel spray. Working on fuel lines while smoking or in the proximity of a shop heater is highly discouraged.





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Installing the UTCIS™ Valve Body

Transfer the old fittings (if they are the ball type) to the body of the UTCIS™. New copper sealing washers are provided in the hardware kit.

The valve body of the UTCIS™ regulator can now be mounted in the same location as the OEM part. The white nylon spacers in the hardware kit are used to position the UTCIS™ valve body at the same height as the OEM regulator. As the valve body is placed into position keep track of the Teflon control pressure sense tube behind the stepper motor and the wire bundle attached to the motor. These will need to be routed to the controller later, avoiding heat and vibration on the way. Make sure the Teflon control pressure sense tube does not get kinked, pulled hard, or pinched during installation. The M6 cap screws included in the hardware kit thread into the same mounting points as the OEM Warm-up Regulator.

With the valve body mounted, tighten the original fuel fittings on the top of the valve assembly and then tighten the fuel lines. **Note: The fuel lines must be properly torqued, not over-torqued, to prevent leaks. Use a backing wrench as shown to properly tighten the fuel line nut onto the fitting. The body of the UTCIS™ is aluminum, DON'T STRIP THE THREADS!!**





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Mounting the Controller

The controller is the brains of the system and must be mounted securely and away from severe engine heat. It may be mounted in the engine compartment but does not have to be.

Note: Orient the controller box so that the pressure fitting and wires exit out the bottom or horizontally to prevent the possibility of water entering the case.

Before permanently mounting the controller, route the Teflon control pressure sense tube and wiring harness from the valve body over to where you plan on mounting the controller.

Route the Teflon control pressure sense tube and wiring away from moving parts, severe engine heat, and rubbing from vibration.

Verify the Teflon control pressure sense tube is long enough to easily reach the brass fitting on the controller. If the control pressure sense tube is too long it can be cut to length using a **sharp** razor tool on a hard surface.

NOTE: Be very careful not to cut the Teflon control pressure sense tube too short!





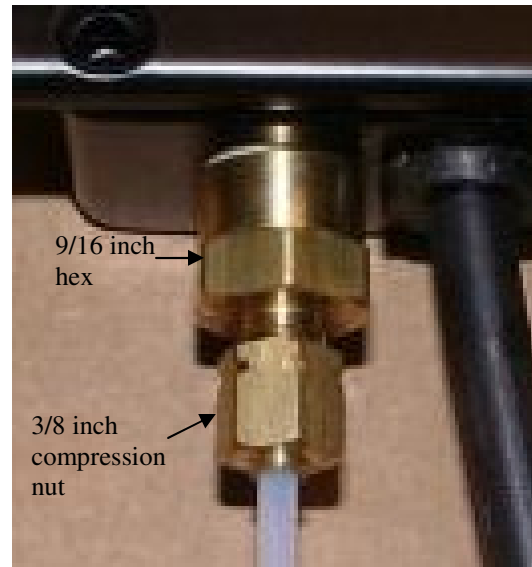
Installing the Control Pressure Sense Tube

The Teflon control pressure sense tube can now be installed into the fitting attached to the controller.

To ensure a leak free connection follow steps 1-6 very closely and read all of them before starting.

1. Insert the Teflon control pressure sense tube into the fitting attached to the controller. The 3/8 inch hex compression nut does **not** need to be removed.
2. Verify the tube fully bottoms out into the fitting. **The tube must remain fully bottomed in the fitting for the remainder of these steps.**
3. Turn the 3/8 inch hex compression nut until finger tight.
4. Put a 9/16 inch wrench on the larger hex part of the fitting.
5. Put a 3/8 wrench on the smaller hex part of the fitting.
6. While holding the 9/16 wrench stationary turn the 3/8 hex compression nut 1 full turn beyond finger tight to fully seat the compression ferrule around the Teflon tube.

NOTE: Allowing the 9/16 inch hex to turn while tightening the 3/8" compression nut may damage the controller!





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Remaining connections

See page 14 for a diagram of all connections.

There are (three for PT, two for V) individual wires exiting the main wiring harness

1. Green
2. Black
3. White - PT Only.

The black wire **must be connected** to a quality ground for the unit to function.

The green wire is an analog voltage input and can be connected to the output of an oxygen sensor. This connection is **not** required for the UTCISTM to function and is only provided for tuning purposes.

The white wire is the RPM signal input to the UTCIS-PTTM and should connect to the pulsed side of the ignition coil. On older ignition systems the negative side of the ignition coil is usually the pulsed side. On later CDI and most aftermarket systems (MSD) the pulsed side is usually the positive side of the coil.

There is a male two pin Bosch style connector that exits main wiring harness. This connector mates directly to the original warm-up regulator female two pin connector.





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The UTCISTM has a vacuum connection which is the black tube exiting the controller. It must be connected to any source that carries intake manifold vacuum. **Do not connect the UTCISTM to a ported vacuum source as this will cause incorrect regulation of control pressure. A true intake manifold source should carry at least 6 inches Hg of vacuum at idle. A ported vacuum source will read close to 0 in Hg of vacuum at idle and only measures significant vacuum above idle. This can be verified with a vacuum gauge or using the UT Engine Management software.**

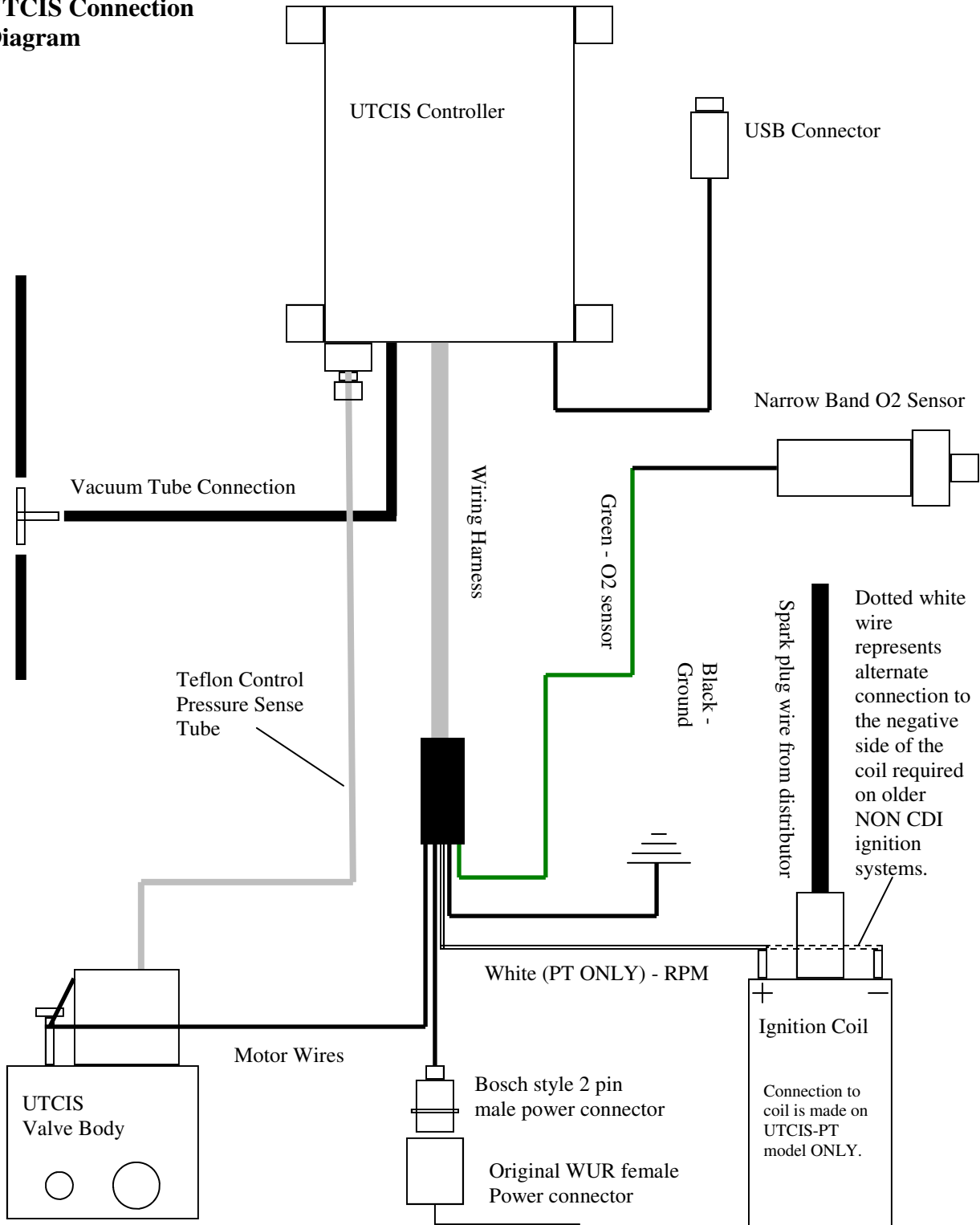
Once all connections are made, secured and double checked, reconnect the negative battery cable. The car is now ready to start and run.



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UTCIS Connection Diagram





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Starting and monitoring:

The UTCIS™ is loaded at the factory with a warm-up table and engine control map that emulate (with a lot more precision) an OEM vacuum enriched warm-up regulator. In many vehicles/applications the engine should start and run cold or hot with no tuning of the UTCIS™.

If the engine runs poorly or does not start you will need to download, install, and use the UT Engine Management software. This allows you to monitor and make changes to the UTCIS™ warm-up and engine control map.

Even if the UTCIS™ does not require any tuning we highly recommend that you download, install, and use the UT Engine Management Software. This allows you to check control pressure, manifold air pressure, and RPM (PT Only), to make sure all of the connections made during the installation were successful. Included on the following page are detailed instructions on how to connect a PC to the UTCIS and use the UT Engine Management Software.



Using the UT Engine Management Software to communicate with the UTCIS using your PC:

1. Install the required USB driver available online at:
<http://www.ftdichip.com/Drivers/CDM/CDM%202.04.16.exe>
2. Download and install the UT Engine Management Software, Version 2.0.0.9 or higher, available online at www.unwiredtools.com.
3. Connect the USB cable to any available USB port on your PC.
4. Open the UT Engine Management Software.
5. Login and then verify the word "DATA" is blinking in the lower left corner of the main screen. Communication is now established. Information, including version and serial number from the UTCIS, will begin to fill in on the screen.
6. If there is no data go to File>Settings> and select a different COM port using the drop down box. After selecting a different COM port, close the UT Engine Management Software and then re-open it. Repeat this process, selecting a different COM port each time, until communication is established. If you are unable to establish communication please call us at the number listed on the bottom of this page.
7. Once communication is established close the UT Engine Management Software and then unplug the USB cable from your PC.
8. Start the engine. **Always make sure the USB cable is NOT plugged when trying to start the engine.**
9. Plug the USB cable back in to the **SAME** port used earlier and then open the UT Engine Management Software.
10. With the engine at idle verify Manifold Air Pressure is below 0.7 bar absolute. If not, check the vacuum connection.
11. Verify the Target Control Pressure equals Current Control Pressure plus or minus 0.1 bar. The actual control pressure value will vary depending on temperature.
12. On UTCIS-PT models verify RPM is reading correctly with in plus or minus 250rpm.

For more information on connecting the UTCIS™ and tuning using the UT Engine Management Software on your PC please visit www.unwiredtools.com or call our support line at 928-773-0469 Ext 802.



UTCISTM Manual Revision History

Date	Revision	Description
01/31/08	A3	Initial Release
3/04/08	A4	Eliminated fill of control pressure line with red mineral oil
03/26/08	A5	Added warmup troubleshooting and system diagram.
03/31/08	A6	Added new warmup cycle to troubleshooting section.
09/22/08	A7	Added changes to cover new O2 sensor version
12/15/08	A8	Removed sections that refer to O2 sensor
12/29/08	A9	Added note to front page concerning software version
06/09/09	B0	Made changes to reflect and cover G3 version of UTCIS Removed warm-up troubleshooting Combined PT and V manual into one
06/30/09	B3	Added new pictures and description of Teflon tubing installation
07/07/2009	B5	Added additional page with UTEMS instructions.
07/14/2009	B6	Added heat shrunk connection board to wiring harness
07/30/2009	B7	Eliminated heat shrunk connection board
08/05/09	B8	Warranty Change

Support:

Please visit <http://unwiredtools.com> for the latest product and support information. You can join the UnwiredTools support forum and view the latest manuals and tech notes as well as find an installer in your area.



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UNWIREDTOOLS Limited Warranty

UNWIREDTOOLS, LLC ("UT") warrants that your new UnwiredTools™ UTCIS™ Regulator ("Product") is free from defects in materials and workmanship at the time of manufacture. This warranty extends for a period of ONE YEAR from the date of purchase of the original Product. If there is a defect in or malfunction of this Product that is covered by this warranty, UT will repair the Product free of charge as follows: PARTS: New or comparable rebuilt parts will be provided in exchange for defective parts. LABOR: You will not be charged for labor required by UT to make the necessary repairs under this warranty. UT is not responsible, however, for any other labor charges, for example, such as those attributable to removing the Product from your vehicle or reinstalling it in your vehicle. This warranty does not include normal wear and tear, tubing, wiring connector, or other parts which may wear or fail as a result of normal use. This warranty also does not include any defect or failure of any kind arising from improper installation, improper use, neglect, abuse, accident, or any cause other than defects in materials and workmanship at the time of manufacture. This warranty applies only to the original purchaser of the Product from UT or an authorized distributor or reseller. It does not apply to persons who purchased this Product second hand or used. The warranty is voided if this UTCIS™ product is not installed by a qualified mechanic.

TO OBTAIN SERVICE UNDER THIS WARRANTY, the Product must be delivered to a UT Authorized Service Center nearest to your location; or the Product must be shipped postage prepaid, insured and via a traceable shipping method to a UT Authorized Service Center or to the UT Corporate Service Center at 2200 East Cedar Avenue, Suite 1, Flagstaff, Arizona 86004. You must:

- Pack your Product in the original carton or equivalent.
- Enclose a copy of the bill of sale or invoice showing original purchase date and seller. (Please note that you should retain the original proof of purchase for your records to establish date of original purchase. Your warranty starts with the date of original purchase.)
- Enclose a card or note describing in detail the difficulty you are experiencing with the Product.
- Be sure to include your complete name, address and daytime telephone number. In addition, please include your e-mail address if you agree to permit UT to contact you through it.
- Bring or ship, prepaid and insured, via a traceable shipping method, the above Product to the nearest UT Authorized Service Center location or to the UT Corporate Service Center.

Please note that UT will NOT pay return postage, shipping or insurance, so you will need to make arrangements for this. Products repaired or replaced pursuant to this warranty will be returned to the address identified as the sender unless another address is provided. The UT and/or the Service Center cannot be held responsible for any loss or damage that occurs while in transit or outside our control.

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To find the nearest Authorized Service Centers within your local area, see our Web site at www.unwiredtools.com, or you may call the UT Corporate Service Center directly at 928-773-0469.

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