



**UTCIS-VTM and UTCIS-PTTM Regulator
Engine Management System**

UnwiredTools, LLC
2200 East Cedar #1
Flagstaff, AZ 86004
www.unwiredtools.com
info@unwiredtools.com

Installation Guide and Owner's Manual

*For UTCIS-VTM and UTCIS-PTTM
Replacement Warm-up Regulator and
Engine Management System for CIS-K Fuel Injection*

Important Note to Installers:

This UTCIS requires the use of version 2.0.0.11 or higher of the UT Engine Management Software. Using any other previous version may damage the UTCIS controller. Register for the software at no charge at www.unwiredtools.com.



For quick start notes regarding the features of this version, please see the next page.

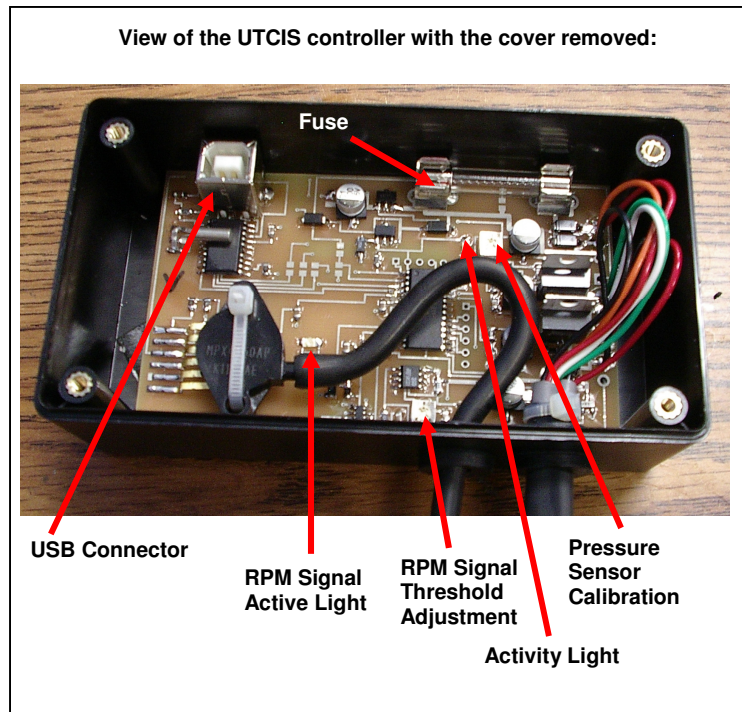


UTCIS-V™ and UTCIS-PT™ Regulator Engine Management System

UnwiredTools, LLC
2200 East Cedar #1
Flagstaff, AZ 86004
www.unwiredtools.com
info@unwiredtools.com

Quick Start Notes for This Version:

1. The USB connector is now located inside the case to better protect the USB connection from dirt and grime. Leave the case open if you intend to tune your fuel delivery curve, then install the cover and mount the box when you're done.
2. There is now an internal fuse. If your car will not start check the fuse. The activity light will flash once per second when the controller is getting power.
3. There is now a threshold adjustment for the RPM input signal. This feature is only used on UTCIS-PT models. This adjustment is used to accommodate RPM signals with an unusual waveform, for example Lotus or Delorean.
4. There is now a calibration adjustment for the pressure sensor. This adjustment is only needed if the pressure sensor is replaced.



Note: The 50mm mounting bolts in the hardware Kit are provided for vehicles which can accept the UTCIS body bolted directly to the Warmup Regulator mounting flange. Some applications with a Tecelan (pressure accumulator type) inlet line, such as Mercedes, require a spacer to match the same height as the factory fuel fittings. To use the full height of the provided spacer use included M6x1.0x80mm bolts. Bolting the UTCIS directly to the WUR mounting bracket will lower the plane of the fuel fittings by 25mm.



**UTCIS-VTM and UTCIS-PTTM Regulator
Engine Management System**

UnwiredTools, LLC
2200 East Cedar #1
Flagstaff, AZ 86004
www.unwiredtools.com
info@unwiredtools.com

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.

Printed in the U.S.A.
Copyright © 2011 *UnwiredTools, LLC*
All Rights Reserved.

NOTICE REGARDING WARRANTIES

The *UnwiredToolsTM* UTCISTM 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

UnwiredToolsTM, UTCISTM, UTCIS-GTM, UTCIS-VTM, and UTCIS-PTTM are trademarks of UnwiredTools, LLC. All other trademarks referred to herein are the marks of their respective companies, and not of UnwiredTools.



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

UnwiredTools, LLC
2200 East Cedar #1
Flagstaff, AZ 86004
www.unwiredtools.com
info@unwiredtools.com

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.*



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

UnwiredTools, LLC
2200 East Cedar #1
Flagstaff, AZ 86004
www.unwiredtools.com
info@unwiredtools.com

Table of Contents

Contents of the UTCIS TM Product	5
Product Description	6
Theory of Operation	7
Installation	8
UTCIS Connection Diagram.....	14
Starting and monitoring	15
UT Engine Management Software.....	16
Revision History	17
Warranty.....	18



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

UnwiredTools, LLC
2200 East Cedar #1
Flagstaff, AZ 86004
www.unwiredtools.com
info@unwiredtools.com

Contents of the UTCISTM 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. UTCISTM CPU Module
- B. UTCIS Valve Body
- C. Hardware Kit

The hardware kit includes the following:

- 2 ea M6 x 50 mm Socket head bolts
- 1ea 1/8" vacuum "T"
- 2 each 25mm spacers

Note: The 50mm mounting bolts are provided for vehicles which can accept the UTCIS body bolted directly to the Warmup Regulator mounting flange. Some applications with a Tecelan (pressure accumulator type) inlet line, such as Mercedes, require a spacer to match the same height as the factory fuel fittings. To use the full height of the provided spacer use M6x1.0x80mm bolts (Not Included). Trim the spacer as needed, if needed, to adjust the mounting height.



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

UnwiredTools, LLC
2200 East Cedar #1
Flagstaff, AZ 86004
www.unwiredtools.com
info@unwiredtools.com

UTCISTM Product Description

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

The features of UTCISTM 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
- 1 year warranty

The UTCISTM is installed by removing the OEM Warm-up Regulator, then bolting the UTCISTM 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 UTCISTM does not just set Control Pressure, the control pressure is now regulated. A pressure sensor on the UTCISTM monitors the Control Pressure and an injector is used as a frequency valve to vary the Control pressure. The warmup and running cycles can be easily and quickly programmed using the UT Engine Management Software.

Note 1: The UTCISTM 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.



UTCIS-VTM and UTCIS-PTTM Regulator Engine Management System

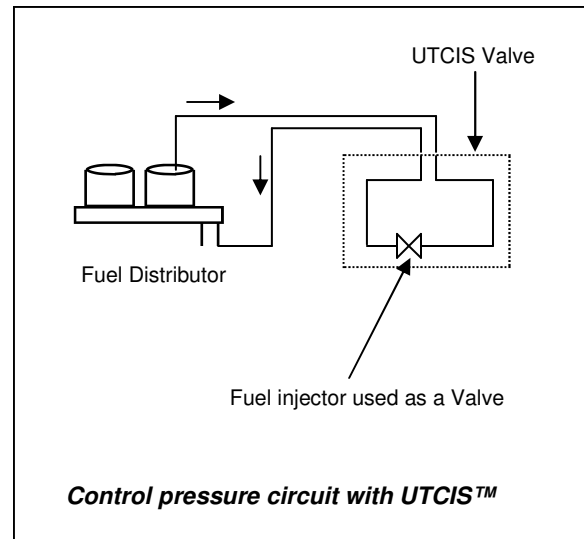
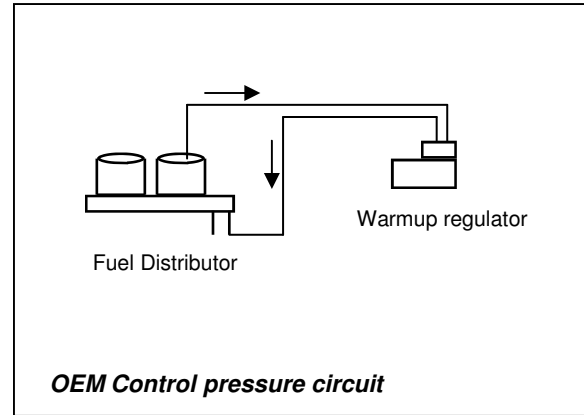
UnwiredTools, LLC
2200 East Cedar #1
Flagstaff, AZ 86004
www.unwiredtools.com
info@unwiredtools.com

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 UTCISTM replaces this complex mix of sensitive parts with a simple, robust system. The UTCISTM uses a rugged and very accurate fuel injector as a variable valve to regulate the control pressure.

The fuel injector is used in much the same way as a Bosch frequency valve. The injector opens to lower the control pressure, and closes to raise control pressure. The control pressure is varied by the UTCISTM 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.





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

UnwiredTools, LLC
2200 East Cedar #1
Flagstaff, AZ 86004
www.unwiredtools.com
info@unwiredtools.com

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.

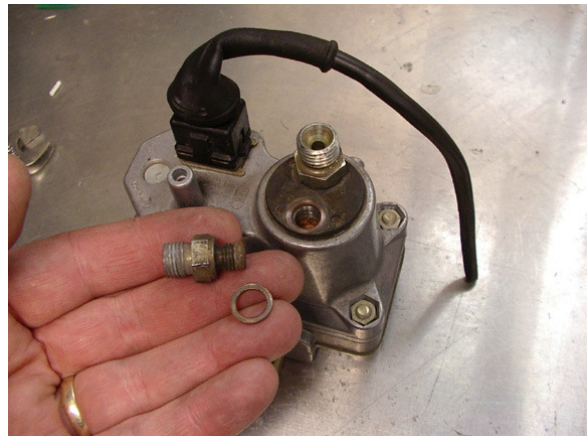
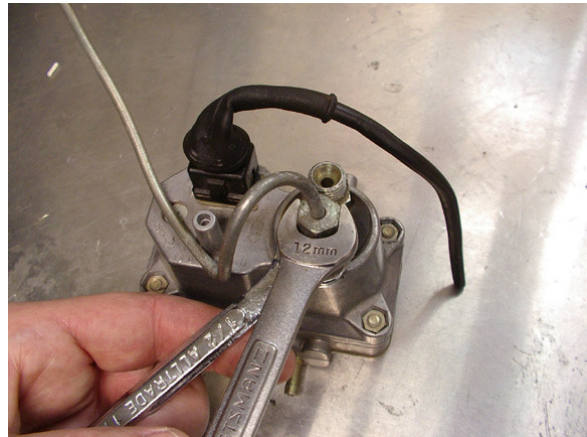
On some vehicles banjo fittings are used instead of separate ball fittings. In this case keep track of the 2 banjo bolts. They will be needed later to re-install the fittings on the UTCIS™.

The height of the UTCIS is 25mm lower than the height of the OEM Warmup-Regulator. Access to the UTCIS is easier with the lower height. Use the M6x50 mounting bolts if you are able to mount the UTCIS directly to the mounting bracket.

If the vehicle has rigid fuel lines or a Tecalan type fuel line (i.e. Mercedes) which does NOT allow for a lower mounting height then use the included 25mm spacers with M6x80 mounting bolts.

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.





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

UnwiredTools, LLC
2200 East Cedar #1
Flagstaff, AZ 86004
www.unwiredtools.com
info@unwiredtools.com

Installing the UTCIS™ Valve Body

Transfer the old fittings (if they are the ball type) to the body of the UTCIS™. Note: Do Not Overtighten the fuel fittings. If the fuel fittings leak then replace the copper washer.

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. The M6 cap screws included in the hardware kit thread into the same mounting points as the OEM Warm-up Regulator.

Note: The orientation of the injector requires that you first remove the injector clamp and rotate the injector to gain access to the right-side mounting bolt. **Do not remove the injector, just rotate it out of the way.**

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!!





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

UnwiredTools, LLC
2200 East Cedar #1
Flagstaff, AZ 86004
www.unwiredtools.com
info@unwiredtools.com

Mounting the CPU

The CPU is the brains of the system and must be mounted securely and away from severe engine heat. For example, do not place the CPU directly above exhaust pipes or manifolds. Orient the CPU Module so that the pressure fitting and wires exit out the bottom or horizontally to prevent the possibility of water entering the case. Use the 4 each of self-drilling screws to fasten the case to chassis sheet-metal.

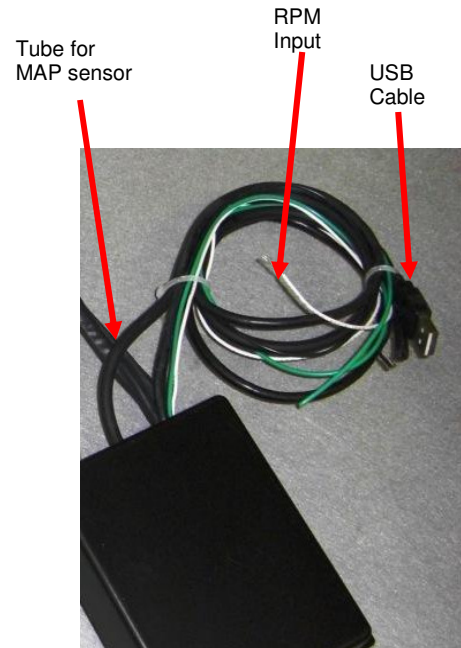
For Porsche applications, we suggest the driver's side of the engine compartment toward the rear above where the ignition controls are located. For Mercedes 126 chassis applications we suggest mounting on the false firewall next to the battery. For 107 and 123 chassis vehicles mount the CPU behind the passenger side headlight.

Connect the CPU module as follows:

BLACK = GND This wire supplies a ground connection to the CPU. The CPU ground is NOT supplied by the WUR connector.

WHITE = RPM This wire is used for the UTCIS-PT only. If you have a UTCIS-V then leave this wire unconnected. The RPM input wire is usually best connected to the same signal which drives the dash tachometer.

Connect the MAP sensor line to any direct connection to the intake manifold.

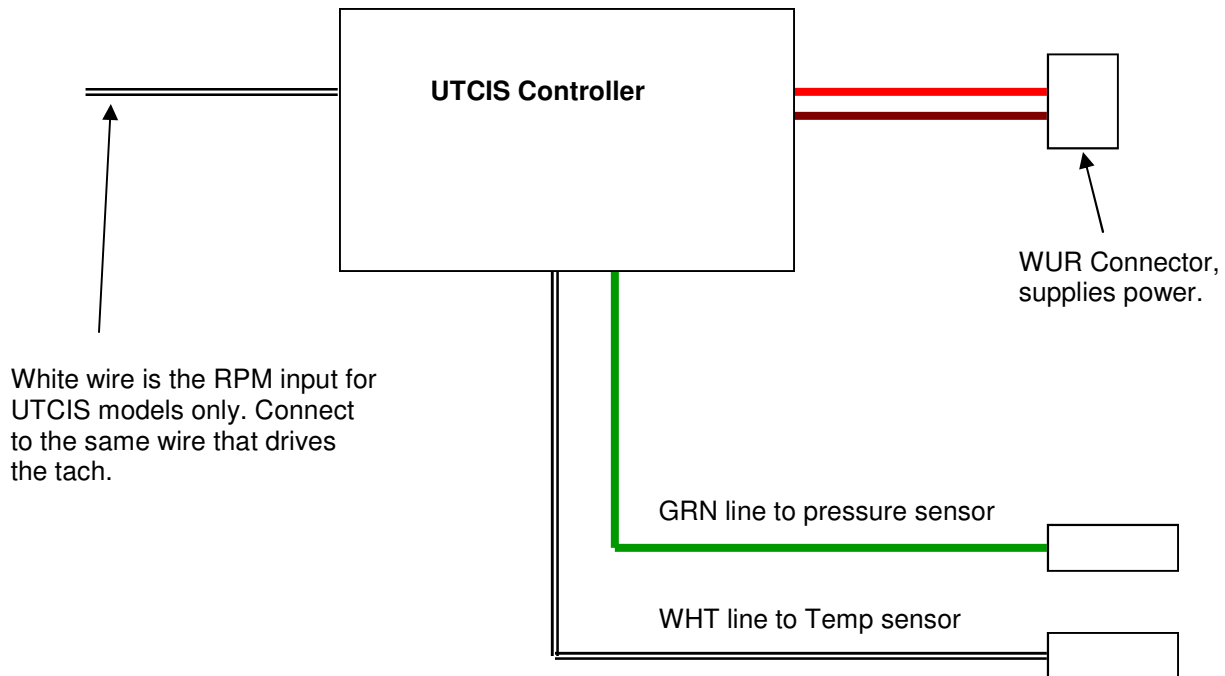




UTCIS-V TM and UTCIS-PT TM Regulator Engine Management System

UnwiredTools, LLC
2200 East Cedar #1
Flagstaff, AZ 86004
www.unwiredtools.com
info@unwiredtools.com

Summary of CPU Electrical Connections:



Note: Power and Signal ground for the UTCIS Controller is connected to the aluminum body using a ring terminal attached with an #8-32 x 3/8" screw.



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

UnwiredTools, LLC
2200 East Cedar #1
Flagstaff, AZ 86004
www.unwiredtools.com
info@unwiredtools.com

Starting and monitoring:

The UTCISTM is loaded at the factory with a warm-up table and engine control map that emulate (with 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 UTCISTM.

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 UTCISTM warm-up and engine control map.

Even if the UTCISTM 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. You should have received a link to download the USB driver when you registered for the UT Engine Management Software.
2. Download and install the UT Engine Management Software, Version 2.0.0.11 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 UTCISTM 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.



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

UnwiredTools, LLC
2200 East Cedar #1
Flagstaff, AZ 86004
www.unwiredtools.com
info@unwiredtools.com

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
07/20/10	C0	New hardware platform
04/05/11	C1	Major change to fuel injector, stepper motor no longer used
03/10/12	C3	New body with pressure sensor
06/05/12	C4	Eliminated O2 Sensor Input
06/16/12	C5	Quickstart features for major release of hardware version 3.83
10/22/12	C6	Added alternate mounting bolts

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.



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

UnwiredTools, LLC
2200 East Cedar #1
Flagstaff, AZ 86004
www.unwiredtools.com
info@unwiredtools.com

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.

OTHER THAN THE EXPRESS WARRANTIES PROVIDED HEREIN, THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED. UT HEREBY EXPRESSLY DISCLAIMS ALL SUCH OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. UT SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL, OR EXEMPLARY DAMAGES OF ANY KIND, INCLUDING BUT NOT LIMITED TO SUCH DAMAGES RESULTING FROM ANY FAILURE, DEFECT, OR MALFUNCTION OF THIS PRODUCT, EVEN IF UT IS NOTIFIED OF THE POTENTIAL FOR SUCH DAMAGES. UT'S LIABILITY UNDER THIS WARRANTY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF THE PRODUCT OR A REFUND OF YOUR ORIGINAL PURCHASE PRICE FOR THE PRODUCT. Some states do not allow limitations on how long an implied warranty lasts and some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from State to State. This warranty is valid only for Products delivered and used in the United States. Your purchase of this Product, or installing or using the Product, will be deemed acceptance of this Limited Warranty and Remedies Limitation as set forth here. If you do not accept these and do not intend to be bound by them, please return the Product in its original packaging as you received it to your original point of purchase for a full refund of your purchase price.

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.

rev. 053105

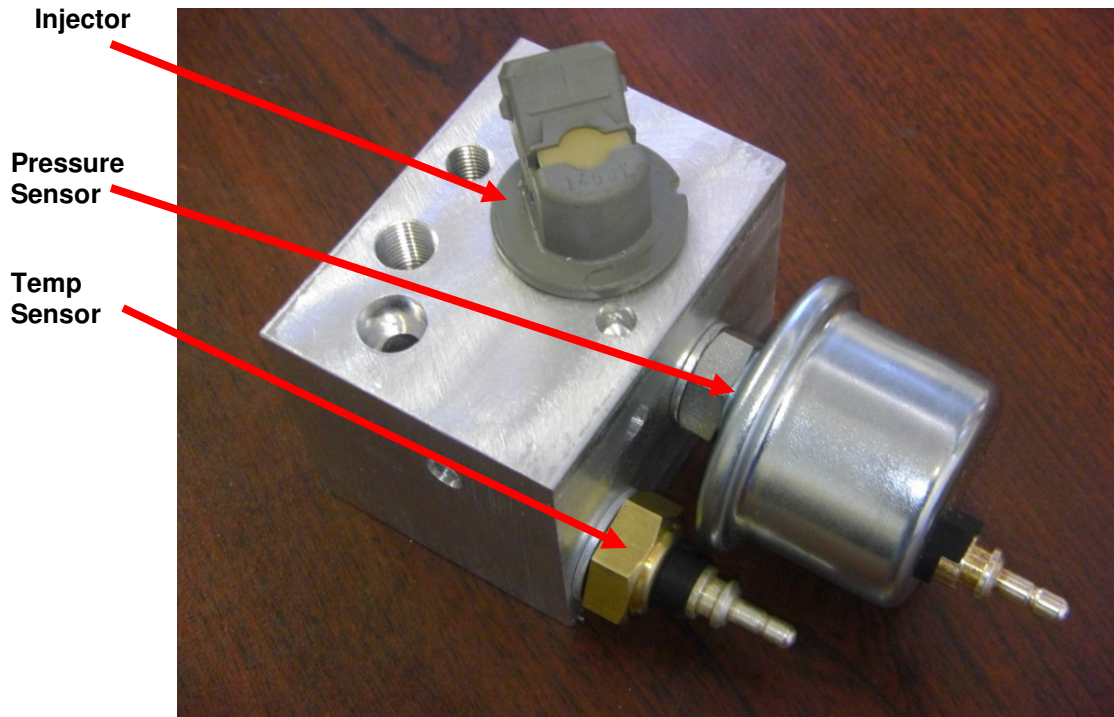


UTCIS-V™ and UTCIS-PT™ Regulator Engine Management System

UnwiredTools, LLC
2200 East Cedar #1
Flagstaff, AZ 86004
www.unwiredtools.com
info@unwiredtools.com

Replacement Parts:

The UTCIS valve body uses commonly available automotive parts. Replacements may be locally obtained in the unlikely event that one of these parts fails:



Mfr	PN	Description
Mercedes	006 542 9417	Oil Pressure Sender Unit
Echlin	OP6147	
Altrom	0065429417	
Mercedes	005 542 2617	Temperature Sensor/Sender
Echlin	TS6082	
BWD	57127	Fuel Injector
Echlin	CRB 218660	
Delphi	DEM FJ10409	
Auto-Zone	6414	Fuel Injector Connector
Echlin	CRB 218457	

Test Value for Temp Sender = 600 Ohm @ 25C, +/- 60 Ohm, Pressure sensor = 50 Ohm @ 1.0 bar, +/- 10 Ohm.