Wheel Press Gage

A component of the Wheel Shop Management Suite (WSMS)

User Guide



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Introduction

Wheel Press Gage

The Wheel Press Gage is used to record force/distance graphs on a wheel mounting press. Additional data may be entered, such as operator name, serial number, wheel type, and wheel diameter. The operator sets the values for minimum and maximum force limits. The program will automatically recognize a misfit caused by not reaching the minimum force or exceeding the maximum force and mark the graph as a misfit; however, wheel shop personnel **must review each chart for correctness** per Association of American Railroad (AAR) requirements.

By installing and/or using the Wheel Press Gage, you indicate that you have read, understand, and accept the <u>Software License Agreement found in Appendix B</u>.

System Requirements

This application has minimum system requirements as described below. These requirements must be met in order for the application to operate as designed.

This application supports the following Microsoft Windows operating systems.

- Windows 7¹
- Windows Server 2008/2008 R2 1
- Windows Vista Business/Ultimate 1
- Windows Server 2003 SP2 1
- Windows XP SP3 1

The application requires the Microsoft .Net Framework 3.5 Full which can be obtained from Microsoft at http://www.microsoft.com/en-us/download/details.aspx?id=17718

The application requires the following hardware at a minimum.

- 2.0 GHz Processor
- 1 GB installed RAM
- 100 MB available disk space
- Ethernet Card

¹ When installed on a 64 bit operating system, the application will run in a subsystem of Windows called WOW64 (Windows-on-Windows 64 bit). WOW64 is included on all 64 bit versions of Windows and is designed to make differences between the operating systems transparent to the user.

Installing#Wheel Press Recorder

You will need Administrator rights to install Wheel Press Recorder .

Make sure you have the latest version of our Wheel Press Recorder Setup program. <u>Contact</u> our support team for assistance. To install Wheel Press Recorder , run the setup program and follow the on screen prompts as described below:



Accept the license agreement and click Next.

H Wheel Press Recorder Setup	x						
End-User License Agreement Please read the following license agreement carefully	wpr						
WHEEL SHOP MANGEMENT SUITE END USER LICENCSE AGREEMENT	^						
IMPORTANT NOTICE: Read Before Installing or Using Software							
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I accept the terms in the License Agreement							
Print Back Next Ca	ancel						

Select the location where you would like to install Wheel Press Recorder to and click Next.

闄 Wheel Press Recorder Setup	_
Destination Folder Click Next to install to the default folder or click Change to choose another	wpr
Install Wheel Press Recorder to:	
C:\Program Files (x86)\Wheel Shop Automation\Wheel Press Recorder\ Change	
Back Next	Cancel

Click Install to being the installation.

時 Wheel Press Recorder Setup	x
Ready to install Wheel Press Recorder	wpr
Click Install to begin the installation. Click Back to review or change any o installation settings. Click Cancel to exit the wizard.	fyour
Back 🛞 Install	Cancel

You may be asked to allow the setup program to install Wheel Press Recorder on your computer. Select Yes.

?	Do yo softwa	u want to allow are on this com	the following program to install puter?
		Program name: Verified publisher: File origin:	Wheel Shop Automation Arkansas Industrial Computing, Inc. Network drive
e) si	now <u>d</u> eta	ils	Yes No

	When the ins	tallation has com	pleted, click Finish	n to close the setu	o application.
--	--------------	-------------------	----------------------	---------------------	----------------

😸 Wheel Press Recorder Setup		
	Completed the Wheel Press Recorder Setup Wizard	
Wpr	Click the Finish button to exit the Setup Wizard.	
	Back Finish Cancel	

Setup

To enter the setup mode of the WPG, a numeric password must be supplied. Enter the numbers on the touchpad and press the Enter key. The default password is 9540. The password may be changed by editing the Password parameter in the C:\WPG\wpg.ini configuration file.

En	ter Setup Password										
	А	В	С	D	E	F	G	Н	7	8	9
		J	К	L	M	Ν	0	Ρ	4	5	6
	Q	R	S	Т	U	\vee	W	Х	1	2	3
	Y	Z	-		BS	CLR	EN	TER		0	

Initial Setup

The initial setup mode is normally used to provide a rough calibration if the press dimensions are known prior to shipment. If the parameter InitialSetupComplete is set to false in the C:\WPG\wpg.ini configuration file and the WPG program is restarted, then the following screen will appear. Fill in values for the prompts to set some default calibration values. Pressure transducer max range will normally be 3000 psi. Press bore diameter depends on the press. Distance transducer max stroke is normally 60 inches.

0.00		265.0						
INCH	2/16/2	2/16/2006 3:42:10 PM						
	INITIAL	PROGRAM SETUP						
Pressure Transd	ucer Max Range (PSI)							
Press Bore I	Diameter (Inches)							
Max To Gain = 0.0647	ons = 265.07 1 Offset = 0.00000							
Distance Transduc	cer Max Stroke (Inches) 一一一							
WHEEL PRESS GA	Ve Ve	rsion 1.0.0.7	ARKANSAS INDUSTRIA	L COMPUTING, INC.				

General

The current version number and date of the WPG is displayed along with the previous version (if any) of the program. If a previous version exists there will be a button allowing the user to revert to the previous program version. See THESECTIONBELOW for details on how to update the program.

0.0	S	ETUP - Record	ling Disable	d	0	.0				
INCH		2/8/2006 9:24		Т	ONS					
	Arkansas Industrial Computing, Inc. 6100 Getty Drive, Suite N Sherwood AR 72117 USA 501.834.9540 www.WheelShopAutomation.com									
	Current Version: 1.0.0.5 - 2/7/2006 3:25:42 PM Previous Version:									
GENERAL	CHART	PRESS	CALIBR	ATE	EXIT					
WHEEL PRES	SS GAGE	Version 1.0.	0.5	ARKANSAS IN	DUSTRIAL COMP	UTING, INC.				

Chart

This setup page is used to configure the displayed and printed charts. See below for a description of each setting:

- **Distance Axis Scale** Maximum scale value for Distance Axis on displayed and printed charts. Minimum scale value is 0.
- Force Axis Scale Maximum scale value for Force Axis on displayed and printed charts. Minimum scale value is 0.
- **Chart Reset Time** Time in seconds after a mount that the chart will be displayed. Set from 0 to 90 seconds.
- Distance Axis Label Distance axis label on displayed and printed charts
- Force Axis Label Force axis label on displayed and printed charts
- Wheel String Label Description for string value that operator enters for each wheel (normally should be Wheel Type)
- Wheel Number Label Description for number value that operator enters for each wheel (Wheel Diameter or Tape Size)

59.99	s	ETUP - Record	265.0	
INCH		2/16/2006 3:4	43:19 PM	TONS
DIST	TANCE AXIS SCA	LE	DISTANC	E AXIS LABEL
•	Maximu Distanc	m scale value for	INCH	Distance axis label on displayed and printed
ð	printed value is	chart. Minimum scale 0.		chart.
<u> </u>			FORCE	AXIS LABEL
FO	RCE AXIS SCAL	E	TONS	Force axis label on displayed and printed
200	Maximu	m scale value for Force		chart.
200	chart. Minin 0.	art. Minimum scale value is	WHEEL S	TRING LABEL
<u> </u>			WHEEL TYPE	Label for wheel string data field.
СН	IART RESET TIM	E		
_	Time in sec	onds after a mount that	WHEEL N	UMBER LABEL
5	the chart w from 0 · 90	ill be displayed. Set seconds.	WHEEL DIA	Label for wheel number data field
GENERAL	CHART	PRESS	CALIBRATE	EXIT
WHEEL PRES	SS GAGE	Version 1.0	0.0.7 ARKANSAS	S INDUSTRIAL COMPUTING, INC.

Press

This setup page is used to configure how the recorder reacts while mounting a wheel.

- Start Distance
 - The distance reading before recording mode starts must be greater than this value to trigger chart recording mode. This value is also set during Distance Calibration. Once the recording mode is triggered, the displayed distance value will be relative to the point at which the recording started. Thus, the chart will display only the distance moved during the mount.
- Start Pressure
 - This is the other trigger to start recording. The force must be greater than this value at the same time that the distance reading is greater than Start Distance.
- Reset Pressure
 - If the distance reading is less than Start Distance and the force reading is less than this value, then the recording chart will be reset and cleared. This allows "bumping" of the wheel prior to the mount.



- Sensitivity

- This value will alter the sensitivity of the force and distance readings. A higher value will be more sensitive to fast changes in force or distance. The value ranges from 0 to 99.
- Force Drop Percent
 - During the mount recording, the force peak is constantly evaluated. When the force decreases by this percentage from the peak, then the recording is finished. Force MUST drop by this amount to finish the recording. Also, this value may have to be increased if any force dips during the mount cause a premature ending of recording. Set the value from 5% to 90%.



Calibration

From the Calibration screen in setup, the Distance and Force calibration sequences can be started by pressing the respective Calibrate buttons. You may also print the current calibration report by pressing the Print Calibration Report button. Once you have completed a valid calibration for Distance or Force, then you may save that calibration by pressing the respective Save as Default button. If you have trouble calibrating in the future, you can restore the saved calibration by pressing the respective Restore Default button. The calibration numbers are stored in the C:\WP\wpg.ini configuration file.

Once you have completed a calibration sequence, you will be returned to this screen. You should check the calibration from this screen **before exiting setup**. If you exit setup with an invalid calibration you may not be able to operate the program. If the WPG goes into recording mode because of invalid calibration values, wait for 5 minutes and you will see a prompt asking if you want to enter setup again.

0.0 SETUP - Recording Disabled										.0
INC	4		2/8/	2006 9:25	5:49 AM	1			т	NS
	Distance Calib	oration					Force	Calibrat	ion	
Gain Offset	DEFAULT 0.005833738 -11.889158969 Restore Default >	CURRE 0.01464 0.000000 < Save as	NT 8438 0000 Default			Gain Offset	<u>DEFA</u> 0.09685 -196.6101 Restore D	AULT 2300 169492 efault >	CURR 0.0783 0.0000 < Save as	ENT 04926 00000 s Default
	Calibrat	e		Prir Calibra Repo	nt ation ort		C	alibrate	e	
GENER	RAL CH	ART	PRE	SS	C	ALIBR	ATE	EX	IT	
WHE	EL PRESS GAGE		v	Version 1.0.0.5 ARKANSAS INDUSTRIAL COMPUTING, IN				JTING, INC.		

Distance

The calibration of the distance transducer is based on recording the values of 2 positions of travel: one low and one high.

Low Point

Position the ram so that it is fully retracted. Enter the Low Calibration Point value (normally 0) and press the Next button at the bottom right of the screen.

High Point

Now move the ram to the fully extended position and measure how far it has moved. Enter the measured value as the High Calibration Point below. Press the Next button while the ram is <u>still in the</u> <u>extended position</u>.

Accept Calibration

The Counts value for the Low Calibration Point and High Calibration Point should differ by at least 1000 (assuming the maximum ram stroke is greater than 14 inches). Press the Accept button to save the calibration values.



Start Distance

To finalize the distance calibration, move the press ram to the minimum distance for contacting the axle or wheel and retract another 2 inches. Press the Finish button. This will be the Start Distance point for graphing purposes. The distances must be greater than this value for the Wheel Press Gage to start recording a mounting graph.



Force

The Force calibration is accomplished by recording the signal from the pressure transducer and matching those values to the press Master Gage (dial gauge) in units of force (normally Tons). Two values of the pressure transducer are recorded, one on the low end and one of the high end of the range used during the press.

First, attach a pressure hand pump to the quick-connect valve located next to the pressure transducer. Close the hand valve to isolate the pressure transducer and Master Gage from the press hydraulic system.

Low Point

Enter a value in Force units (normally Tons) for the Force Low Calibration Point. Now pump the hand pump to produce that exact number for Force units on the Master Gage. Once the Master Gage reading matches the entered Force Low Calibration Point value exactly, press the next button.

High Point

Enter a value in Force units (normally Tons) for the Force High Calibration Point. Now pump the hand pump to produce that exact number of Force units on the Master Gage. Once the Master Gage reading exactly matches the entered Force High Calibration Point value, press the Next button.

Accept Calibration

The Counts value for the Low Calibration Point and High Calibration Point should differ by at least 1000 (assuming a properly sized press ram). Press the Accept button to save the calibration values.



Installation

There are three main components of the system to be installed.

WPG Enclosure – The WPG enclosure should be mounted as close to the press as possible so that the operator can easily view the chart while operating the press. The box should be protected from any excessive vibration or shock caused by press operation.

Distance Transducer – The distance transducer is used to record the linear position of the press ram. It uses a stainless steel cable that must be attached to the ram. The transducer itself must be mounted to the press.

Pressure Transducer – The pressure transducer must be installed into the hydraulic system lines as closely as possible to the press Master Gage (dial gauge).

Distance Transducer

The Distance Transducer cable must be attached to the end of the press ram cylinder so that the cable extends in parallel with the ram. The Distance Transducer body should be mounted to the press. The cable should be a straight as possible (both horizontally and vertically) to prevent cable guide wear and must be free from obstructions for the full length of the ram stroke.





Pressure Transduce

The pressure transducer and associated components must be installed so that it can be isolated with the master gage (dial pressure gauge) to allow for calibration. In the following picture, the fittings supplied should be inserted into the hydraulic line as closely to the master gage as possible. The Shut-Off valve should be closed <u>only during calibration</u> to isolate the Hand Pump connection, pressure transducer, and master gage from the rest of the hydraulic system.



Once the Pressure Transducer is installed into the hydraulic line, the cable must be run to the recorder. 24V DC loop power is supplied to the recorder on pin 1. The 4-20ma measurement signal is output to the recorder on pin 2.



Power Requirements

The Wheel Press Gage requires computer grade 120V AC power. Computer grade poser is defined as electricity meeting the Institute of Electrical and Electronic Engineers Standard 446-1987. This standard sets time and voltage intervals which electronic equipment must tolerate without malfunction.

A good quality Uninterruptible Power Supply is highly recommended if shop power is subject to frequent surges or sags (such as may happen when other nearby equipment starts or stops).

Appendix A: Frequently Asked Questions (FAQ)

<Insert a list of the most common problems/questions along with their solutions. >

<Example>

Q. How do I ...?

- A. Verify ... If that doesn't solve your problem you can also try...
- Q. When I do XYZ I get results PDQ. What could be wrong?
- A. You should be performing steps ABC. Try the following...

</Example>

Appendix B: License

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Appendix C: Press Settings



Notes:

1. Must meet start distance (absolute distance) and start pressure to begin recording.

2. Once recording begins, if pressure drops to below start pressure before false start distance is

reached, the recording stops and distance resets to 0. This is to prevent recording 'burnping'. 3. Once the false start distance is exceeded then the chartis stored as is.

Appendix D: Contact Information

Wheel Shop Automation 6100 Getty Drive Suite N Sherwood, AR 72117

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