Instruction Manual

HuckSpin 1, 3
AND 8 TOOL
Computer Controller

Makers of Huck®, Marson®, Recoil®
Brand Fasteners, Tools & Accessories
This instruction manual must be read with particular attention to the following safety guidelines, by any person servicing or operating this tool.

1. Safety Glossary

- Product complies with requirements set forth by the relevant European directives.
- Read manual prior to using equipment.
- Eye protection required while using this equipment.
- Hearing protection required while using this equipment.

**WARNINGS** - Must be understood to avoid severe personal injury.

**CAUTIONS** - show conditions that will damage equipment and or structure.

**Notes** - are reminders of required procedures.

**Bold, Italic type and underlining** - emphasizes a specific instruction.

2. Huck equipment must be maintained in a safe working condition at all times and inspected on a regular basis for damage or wear. Any repair should be done by a qualified repairman trained on Huck procedures.

3. Repairman and Operator must read manual prior to using equipment and understand any Warning and Caution stickers/labels supplied with equipment before connecting equipment to any primary power supply. As applicable, each of the sections in this manual have specific safety and other information.

4. See MSDS Specifications before servicing the tool. MSDS Specifications are available from you Huck representative or on-line at www.huck.com. Click on Installation Systems Division.

5. When repairing or operating Huck installation equipment, always wear approved eye protection. Where applicable, refer to ANSI Z87.1 - 1989

6. Disconnect primary power source before doing maintenance on Huck equipment.

7. If any equipment shows signs of damage, wear, or leakage, do not connect it to the primary power supply.

8. Make sure proper power source is used at all times.

9. Never remove any safety guards or pintail deflector.

10. Never install a fastener in free air. Personal injury from fastener ejecting may occur.

11. When using an offset nose always clear spent pintail out of nose assembly before installing the next fastener.

12. If there is a pinch point between trigger and work piece use remote trigger. (Remote triggers are available for all tooling).

13. Do not abuse tool by dropping or using it as a hammer. Never use hydraulic or air lines as a handle. Reasonable care of installation tools by operators is an important factor in maintaining tool efficiency, eliminating downtime, and in preventing an accident which may cause severe personal injury.

14. Never place hands between nose assembly and work piece.

15. Tools with ejector rods should never be cycled with out nose assembly installed.

16. When two piece lock bolts are being used always make sure the collar orientation is correct. See fastener data sheet of correct positioning.
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1. GETTING STARTED

The Huckspin software was designed to provide an easy-to-use operator interface for best performance of the Huckspin tools. This software is very easy to learn, and you can quickly become an expert at the tasks you are normally required to do. The software is also very powerful, allowing you to do more with it beyond what you normally need to do each day. This greater capability means there is more to learn, so this manual is provided to keep the learning task easy. Following the System Overview section, this manual describes the start up tasks and the day-to-day operation of the system, and goes into more detail about using all the features and functions of the software.

1.1 System Overview

The Huckspin system comes in three models:

- 8-Tool (see Figure 1)
- 3-Tool (see Figure 2)
- 1-Tool (suitcase, see Figure 3)

Figure 1  8-Tool Huckspin System
For purposes of using the Huckspin operator interface (software), all the models have the following components:

- Controller
- Serial Cable
- Computer
- Screen
- Keyboard
- Modem (optional for smaller systems)
- Printer (optional)

Although all the models have the key components, the 8-Tool system is really the production version. The smaller systems are intended primarily for maintenance, but they can also be used for production when appropriate.

Figure 2. The 3-Tool HUCKSPIN System

1.1.1 Controller

The heart of the Huckspin system is an intelligent controller that performs the detailed operation of the tool. This controller can be considered to be a very special computer. Figures 3, 4, and 5 show the locations of the controller in each model of the system.
1.1.2 Serial Cable

A 9-pin serial cable, having one end male and one end female, provides the data communication between the computer and the controller. It is required for the controller to tell the computer (therefore the operator) about the pressures, warning conditions, etc., of the tool. It is also needed for the computer (as told by the operator) to tell the controller what pressures, timing, etc., to use. The controller can run continuously without an interface computer, but when you change settings or want to collect data, you must connect a computer, with the Huckspin interface software, via this cable. Figure 6 shows the connection of the male end of the serial cable to the controller. The adjacent switch, shown in the diagram of the controller, should be set to DCE. Also shown in Figure 6 is the connection of the female end to the back of a computer. See Section 1.1.3.2, Page 3, for more information about Figure 6 and serial connections.

1.1.3 Computer

An IBM compatible computer running the Huckspin interface software provides the operator interface (the means by which the operator tells the Huckspin system what settings to use).

1.1.3.1 Minimum Hardware for the Computer

The computer must have a hard disk drive, a 3.5" floppy drive (high density), an available serial port (not taken up by a mouse or modem, etc.) and a VGA (video graphics array) style video adapter.

1.1.3.2 Obtaining a Computer

The 8-Tool model comes standard with a 386 mini-tower computer that meets all the requirements. For the 3-Tool and 1-Tool models, you must obtain a computer separately. Since the separate computer may need to be moved around, it is typically a portable, laptop, or notebook computer. Unfortunately, these smaller computers are not as standardized as the larger versions, so before you obtain a computer to use with the Huckspin system, contact Huck International for recommendations. Be especially aware of differences in the video (must be VGA) and serial port specifications. Figures 4 and 5 show the computers in relation to the 8-Tool and 3-Tool models of the Huckspin system. In the 3-Tool system, a serial cable runs from the controller to an external connector, and another serial cable runs from the external connector to the computer. You provide the external serial cable and computer. In the 1-Tool system and the 8-Tool system, the serial cable runs directly from the controller to the computer. In the case of the 8-Tool system,
the entire serial cable path is inside the box, and the cable and the computer are supplied. Figure 6 illustrates running a serial cable from a controller to the back of a typical notebook computer. Notice the slider switch is set to DCE. The male end of the serial cable plugs into the female RS232 connector at the bottom of the controller, and the female end of the cable plugs into the male 9-pin connector on the back of the computer. If your computer has more than one serial port, you will need to choose the one appropriate for the combination of equipment present on that computer. Where possible, use the connector associated with Com1.

1.1.3.3 Special Requirements for the Serial Port

The Huckspin software can adapt to several serial configurations. These configurations are numbered Com1, Com2, Com3, and Com4. Each of these is a "port"; but, on a given computer, not all of them have an external connection where a serial cable can be connected. Most computers will have only one or two of these ports. Rarely will one computer have all four. There are two different "interrupt levels" used by serial ports. The odd number ports use one, and the even-numbered ports use the other. If you have a built-in mouse (or trackball) using an odd-numbered port, either the mouse must be disabled, or the serial cable must be connected to an externally available even-numbered port. If the mouse or trackball is even, then it must be disabled or the cable must be odd.
Similarly, if a built-in modem is even or odd, the serial cable must be connected to the other kind. If the chosen computer has a built-in mouse or trackball and a built-in modem, at least one of them will definitely have to be disabled. If you choose a computer that requires such devices to be disabled, contact your computer dealer for instructions on disabling the equipment and preventing associated driver software from being loaded.

Figure 5 3-Tool Huckspin System with Computer

Figure 6 Controller, Computer, and Serial Cable

1.1.4 Screen

The screen gives you a visual presentation of the data available from the Huckspin system and shows you the operational choices which you can select by means of the keyboard. VGA compatibility is required of both the screen and the video adapter (in the
computer) that drives it. The 8-Tool model comes with a built-in VGA-style LCD screen, as shown in Figure 1. Notebook and laptop computers typically have the screen attached to the computer as seen in Figure 5.

1.1.5 Keyboard

The keyboard is the means by which you enter settings (such as pressures and timers), select choices, and enter commands. The Huckspin interface software is "mouse aware," so you could perform many actions with a mouse or trackball instead of the keyboard. However, the serial communications requirements limit the circumstances in which you can use a mouse. See Section 1.1.3.3, Page 4, for an explanation. Figures 1, and 5 show the keyboard in relation to the rest of the system. Like that of the 3-Tool system in Figure 5, the 1-Tool system keyboard is part of an external computer.

1.1.6 Modem

A modem provides the means by which data can be sent to Huck International for analysis to give you the best performance of your tools. It comes standard with the 8-Tool model. You simply plug a telephone wire into the receptacle on the right side of the box. A modem may not be practical for use with the other models (Section 1.1.3.3, Page 4).

1.1.7 Printer

A printer is an optional component which would be obtained separately. Use the printer to make paper copies of the most recent swage curves. The printer must be an Epson-compatible dot-matrix printer. You will need a standard printer cable to connect the printer to the computer. The printer "port" on the computer is a 25-pin female connector. The printer connection for the 8-Tool model is on the right side below the telephone jack. On other computers look for the connector on the back of the computer.

1.2 Turning on the System

After making sure the system is connected to power, turn the Off/On switch to the right (On). In an 8-Tool system, the computer is turned on at the same time, and it automatically starts the Huckspin interface software.

In smaller systems, when you need to use a computer, use the following steps:

1. Connect the computer to power.
2. Connect the serial cable from the computer to the Huckspin box (Section 1.1.2, Page 3).
3. Turn the computer on separately with its own power switch.
4. Start the Huckspin software (Section 1.5, Page 24).
1.3 The Main Screen

Once the Huckspin operator interface software is started, the screen will look like Figure 7. The top line is the Menu Bar (or Main Menu). The bottom line is the Status Line. All the space between the top and bottom lines is called the Desktop. All the "windows" you will open to do your work will be on the Desktop.

![Figure 7 The Main Screen](image)

1.3.1 The Main Menu

The bar at the top of the screen is the Main Menu. Notice that each item on the menu bar has an emphasized letter. That letter is the Shortcut Letter for that menu item.

If there is no highlight in the menu bar, you can select the menu by pressing $\text{Esc}$. The most recently used menu item will be highlighted (shaded). When one of the items on the menu is highlighted...

- you can press $\text{Enter}$ to choose the highlighted menu item, or
- you can press $\text{Up}$ and $\text{Down}$ arrow keys to move the highlight, or
- you can press a letter that is the same as the emphasized letter of a menu item. The highlight will move to that menu item and the menu item will be chosen at the same time.
1.3.2 Sub Menus

Most menu items on the Main Menu are for access to other (drop down) menus. Choosing such a menu item activates the drop down menu. Operating a drop down menu is the same as the Main Menu except that...

- most, but not all, of these menu items have Shortcut Letters, and
- you do not use [Alt] plus these Shortcut Letters, and
- choosing a menu item hides the drop down menu, and
- you use the \[ \] and \[ \] arrow keys to move the highlight to a different menu item within the drop down menu. (The \[ \] and \[ \] arrow keys will still highlight a different Main Menu item.)

1.3.3 The Status Line

The bar at the bottom of the screen is the Status Line. The first part of the Status Line reminds you of certain keys you can press on the keyboard. The remainder of the Status Line gives you a hint about the current menu item or focused item in a data entry window. Check the hints often. On screens that do not give you enough contrast so that you can see clearly where the Focus is, the hints will reveal where the Focus lies. Section 5.37, Page 152, explains Focus.

1.3.4 The Desktop and Windows

All the work you do with the Huckspin software will be on the Desktop, which is the space between the Menu Bar and the Status Line. More specifically, you will work in "windows" on the Desktop. A window is a bordered rectangular region. There are three basic types of windows: the Data Display, the Data Entry and the Help windows.

1.3.4.1 Data Display Windows

In the Data Display windows, current data values are shown, but the system does not allow you to type anything in their place. Figure 8 is an example.
**1.3.4.2 Data Entry Windows**

With the Data Entry windows you can...

- type information in input fields (*Section 2.5, Page 31*).
- select from lists (*Section 2.8, Page 32*).
- press buttons to perform certain actions (*Section 2.3, Page 30*).

See Figure 9 for a typical data entry window. Some data entry windows will have some "display-only" data as well.
1.3.4.3 Help Windows

Help windows contain detailed information about the operation of the Huckspin software. Like a data display window, you cannot type in a Help window. However the information contained in a Help window is not dynamic data from the hardware, but is fixed text. Essentially, it is an on-screen manual with automatic cross-references. See Figure 10 for an example.
The Help system is keyed to the position of the cursor or highlight. Just press the [F1] key to bring up a window containing information about the operation you are performing.

The [↑] and [↓] arrow keys and [←] and [→] keys let you scroll through a Help window too large to be seen all at once. Cross-references allow you to move to a related Help topic from the Help topic you are currently viewing. Such topics are emphasized or highlighted on your screen within the current Help topic. If more than one cross-reference shows, use the [Tab] key to move the highlight from topic to topic. Press [Enter] to bring up the highlighted Help topic. See Section 2.1, Page 27, to learn more about using various keys. [Esc] or [F2] will close a Help window.
1.4 First Tasks

After you turn on the system and start the software, you may need to perform several tasks before you start using the tools. If you are installing or updating the software, see Section 3, Page 35.

1.4.1 Adding Tools

When you first install the Huckspin system, or when you receive additional tools, you need to put the tool into the system's inventory. From the Main Menu select "NewTool". From the Sub-menu choose "Add" (Figure 11). This will open a data entry window (Figure 12) in which you can add the new serial number to the inventory. You can close the window without storing anything by pressing [Esc].

Figure 11. Add Tool Menu

1.4.1.1 Inventory List

Scroll down this list to make sure that the serial number you are about to add is not already in the inventory. If it is, just close the window, otherwise tab twice to get to the serial# field.

1.4.1.2 Serial Number to Add

Type the serial number in this field. Start with 37 or 52. Then type four more digits. Then type the Tool Assembly Revision Letter.
1.4.1.3 Add Button

Press this button to make the new serial number become part of the inventory stored on disk.

![Add Serial to List](image)

Figure 12. Add Serial Number List

You can press the Add Button by using its Shortcut Letter, [A]. You can also press Add by using [A], since Add is the default button. The focus will move to the button, so the hint in the Status Line will say, "Save Added Serial Number". Tab once to move to the Serial Field. Enter the next number, etc.

Once you are finished, press [Esc] to close the window.

1.4.2 Deleting Tools

When you select this item from the menu (Figure 13), then, in a data entry window (Figure 14), you can select a tool by serial number from a list of serial numbers. You will remove the selection from the list of available serial numbers by pressing the Del Serial button. Only serial numbers not shown to be plugged in will be in the list. Do this when a tool is removed from inventory. See Section 1.4.4, Page 18, Connecting Tools, for the different kinds of serial number lists.

You can, instead, remove all data stored for a particular bolt size for that serial number by selecting a size from the Bolt Selector list and pressing the Del Bolt button. The serial number will remain in inventory.
1.4.2.1 Serial Selector

This is a scrollable list of serial numbers appropriate for this data entry window. You can move the highlight with the ^ and _ arrow keys. Highlight the appropriate serial number and tab to the next item in the data entry window. The selected serial number will remain emphasized.

Figure 13. New Tool-Delete

1.4.2.2 Bolt Selector

This is a list of the bolt sizes. Select the appropriate bolt size by highlighting it. You can move the highlight with the ^ and _ arrow keys.

When you have highlighted your selection, tab to the next item in the data entry window. The selected bolt size will remain emphasized. If you are deleting the serial number, the bolt size selection does not matter.

Figure 14. Delete Menu
1.4.2.3 Code

In order to perform a deletion, whether of just the records of a particular bolt size for a given tool, or to delete the serial number completely from inventory, you need to enter a code to authorize that action. See Section 2.7, Supervisory Codes, Page 32. Press [Tab] when you have entered the code. You can come back to this field by pressing its Shortcut Letter, [Alt] [E].

1.4.2.4 Del Serial Button

Press this button to delete the selected serial number from the inventory list and close the window. Either tab to this button and press [Enter] or press its Shortcut Letter, [Alt] [R]. You can identify that the button has the Focus (that is, you have tabbed to it) by the hint that says, "Remove the Serial# from List".

1.4.2.5 Del Bolt Button

Press this button to delete the selected combination of serial number and bolt size. The window will remain open. Since this is the default button, you can simply press [Enter] as long as the other button does not have the Focus. You can also press it by its Shortcut Letter, [Alt] [B]. You will delete only the given bolt size data from that serial number; all other data for that serial number will remain in place.

1.4.3 Hydraulic Start Up

The purpose of this operation is to insure a more consistent hydraulic performance after the hydraulic lines have been sitting idle in cold temperatures for an extended period. From the Main Menu, choose "Pressures". From the Sub-menu, choose "Hydraulic Start" (Figure 15).
This will open a window (Figure 16) in which you can view or change the hydraulic start up parameters, and by pressing a button, you begin the process. When the process begins, all hydraulic valves will open for a specified time to build up pressure.

After this, all the valves will close for a specified time to release pressure. This process will be repeated the specified number of times. You can close the window without starting anything by pressing [Esc].

1.4.3.1 Pump Time

In this field you specify how long the pressure is to build before being released in each cycle. Press [Tab]. You can return to this field by pressing its Shortcut Letter, [Alt][U].
SECTION I.

GETTING STARTED

Times are in full seconds and tenths of a second. Type two numeric digits, a decimal point and another numeric digit.

1.4.3.2 Rest Time

In this field you specify how long to wait after pressure is built up and released in each cycle. Press [Tab]. You can return to this field by pressing its Shortcut Letter, [Alt][L].

Times are in full seconds and tenths of a second. Type two numeric digits, a decimal point and another numeric digit.

1.4.3.3 How Many

In this field you specify how many cycles of pressure build-up and release to perform. Press [Tab]. You can return to this field by pressing its Shortcut Letter, [Alt][M].

1.4.3.4 OK Button for Hydraulic Start Up

Press this button to begin the Hydraulic Start Up operation. This is the default button, so you can press it by pressing [Enter]. You can also press it by pressing its Shortcut Letter, [Alt][K].

1.4.3.5 Stop

Note: As soon as you have successfully pressed the OK button, a message will appear below it saying "Press Enter to Abort." The focus will now be on the Stop button, so all you have to do to Abort the operation in an emergency is to press [Enter]. A similar message appears in the Hint area. Figure 9, Page 9, illustrates the window at this point. Press the Stop button to abort a Hydraulic Start Up in progress.
1.4.4 Connecting Tools (PLUG)

When you connect a tool to a station, you need to tell the computer the identity of the tool. From the Main Menu, choose "NewTool". From the Sub-menu, choose "Plug" (Figure 17). There is a complete list of serial numbers in the inventory. It can be viewed in its entirety, (Section 1.4.5, Page 20), as individual tools associated with particular stations, or in a list of available serial numbers (those not yet associated with a particular station), which is the list used here. In a data entry window (Figure 18) you can select a tool by serial number to identify the tool that has just been plugged in. You also identify the bolt size. The computer then notifies the controller that the tool can now be used. You can close the window without starting anything by pressing [Esc].
SECTON 1.

1.4.4.1 Station for Select Connected Serial #

Enter the appropriate station number (Section 2.6, Page 32) and press [Tab]. You can come back to this field by pressing its Shortcut Letter, [Alt][F].

1.4.4.2 Counts for Select Connected Serial #

**Summary:** If the computer counts are correct, enter Y, otherwise enter N.

Both the controller and the computer keep track of counts for the tools. The controller has no way of knowing which tool has just been connected, so the computer can notify it of the counts belonging to the tool you are identifying. Put Y in this field if you want this to happen, otherwise enter N. The main situation in which you would not want to send counts to the controller would be in a smaller system in which the computer was not connected during some of the use of the tool, so its counts are not up to date. The way to avoid this problem is to connect the computer before you unplug the tool and edit the computer version of the counts to match the controller version of the counts. Then, when the computer is reconnected to identify the same tool being plugged in, the computer counts are current and ready to be sent to the controller. After entering the Y or N, press [Tab]. You can come back to this field by pressing its Shortcut Letter, [Alt][O].

1.4.4.3 List of Serial #s for Select Connected Serial #

Use the [↑] and [↓] arrow keys to select the appropriate serial number. Press [Tab] and go to the next list.

1.4.4.4 List of Bolt Sizes for Select Connected Serial #

Use the [↑] and [↓] arrow keys to select the appropriate bolt size. [Tab] to the Plug In button.

1.4.4.5 Plug In Button for Select Connected Serial #

Press this button to activate the selections you have made. The data (about what serial number and bolt size combination is connected to the indicated station) is recorded on the disk, and (if you entered Y) the associated counts are sent to the controller. You can press this button by pressing [Enter], since it is the default button. You can also press it by pressing its Shortcut Letter, [Alt][J]. This will close the window.
1.4.5 Adjusting Pressure Settings

Normally you can use the default pressure settings that are associated with each tool and bolt size combination. If you need to deviate from the default values, use this procedure. Note that every time you plug in a tool and identify it to the computer, the setting will revert to the default values.

From the Main Menu, choose "Pressures". From the Sub-menu, choose "Current Settings" (Figure 19). A data entry window will open that will allow you to set the hydraulic cutoff pressures for a station, both full swage and snub (Figure 20). These values are stored on disk and also sent to the controller. Whenever you bring up this window, you will see the values previously stored on disk. You can press the UseDefault button to bring up the default values for a given tool/bolt size combination. You will also see a reminder of the current tool/bolt size combination (with serial number) associated with the given station. You can see how to define these default values in Section 4.3.2. You can close the window without starting anything by pressing [F2].
1.4.5.1 Station for Setting Current Pressures

Enter the appropriate station number (Section 2.6, Page 32) and press \[ \text{Tab} \]. You can come back to this field by pressing its Shortcut Letter, \[ \text{Alt} + \text{T} \].

1.4.5.2 Full Pressure Setpoint

Type the pressure to be reached before the hydraulic valve closes when doing a full swage at this station. Take into account the particular tool and bolt size involved. Press \[ \text{Tab} \] to go to the next field. You can come back to this field by pressing its Shortcut Letter, \[ \text{Alt} + \text{F} \].

1.4.5.3 Snub Pressure Setpoint

Type the pressure to be reached before the hydraulic valve closes when doing a snub cycle at this station. Take into account the particular tool and bolt size involved. Press \[ \text{Tab} \] to go to the next field. You can come back to this field by pressing its Shortcut Letter, \[ \text{Alt} + \text{B} \].
1.4.5.4 Hold

Enter the amount of time (in tenths of a second) you want to hold the hydraulic valve open after Full Cutoff pressure has been reached. Normally you would leave this value as 0, but if you do enter a Hold Time, be sure to reduce the Full Cutoff pressure accordingly. Unless you have the maximum rig pressure set to a value just above the Full Cutoff pressure.

1.4.5.5 Code for Setting Current Pressures

Enter the appropriate level of supervisory code to proceed with this operation. Press Tab to go to the Save button. Note, the Save button will not work unless you have entered the appropriate code. You can come back to this field by pressing its Shortcut Letter, Alt E.

1.4.5.6 Save Button for Setting Current Pressures

Press the Save button to store the cutoff pressures for this station on disk and send them to the controller. In order for the values you have entered to take effect, you must press the Save button. You can press it by pressing its Shortcut Letter, Alt V.

You can also tab to it, then press Enter. Note, if you press Enter without having this button focused, you are pressing the UseDefault button instead. You can tell that you have "arrived at" (focused) the Save button by the hint in the Status Line. The hint will say, "Save as Current Cutoffs".

1.4.5.7 UseDefault Button for Setting Current Pressures

Press this button to put default values from the configuration files into the Input Fields. You can press this button by pressing its Shortcut Letter, Alt U. You can also press UseDefault by pressing End, as long as the Save button does not have the Focus, because UseDefault is the default button (Section 2.3.2, Page 31.), which has nothing to do with the button's name. The window remains open so you can set pressures for several stations. When you are done, press F2 to close the window.

1.4.5.8 Serial Number for Setting Current Pressures

When this window first appears, it will have the recently used station number showing in the first field. The tool serial number identified for that station will show in the next to the last field. If you type a new station number and tab to the next field, the values appropriate for that station will show, including the serial number. The field is "display-only" (protected). If the field is empty, do not bother saving new settings, first you need to follow the procedure for Connecting Tools (Section 1.4.4, Page 18).
1.4.5.9 Bolt Size for Setting Current Pressures

When this window first appears, it will have the recently used station number showing in the first field. The bolt size identified for that station will show in the last field. If you type a new station number and tab to the next field, the values appropriate for that station will show, including the bolt size. The field is display-only (protected). If the field is empty, do not bother saving new settings, first you need to follow the procedure for Connecting Tools (Section 1.4.4, Page 18).
1.5 Starting the Software

While an 8-Tool system automatically starts the Operator Interface Software when you turn on the power, there are times when you will need to start the software manually; such as, when you exit the program, when you have just finished an update (see Section 3, Page 35), or when you are using a separate computer. First, make sure you are at a DOS prompt. If you are running a menu system or other program, exit to DOS.

1.5.1 The Correct Drive

ALWAYS run the software from a Hard Drive. NEVER run it from an installation or update floppy disk. (See Section 3, Page 35 for information on Installation and Updates.) Normally you will run from Drive C. Your DOS prompt may look like C:\> or C:\HUCKSPIN> or something similar. If the Huckspin software is on Drive C and the first letter is not "C", then type C: and press [Enter]. If the interface software on your computer is on Drive D and the first letter in the DOS prompt is not "D", then type D: and press [Enter].

1.5.2 The Correct Path

In most cases the path to the software will be "\HUCKSPIN". In situations where one separate computer is used for more than one Huckspin box in the same facility, the path may be different. (See Section 3.1.1, Page 35 for an explanation.) If the path portion of the DOS prompt (that part after the ":" and before the ">") does not match the path to the Huckspin software, then you must issue a "change directory" command. You would do this by typing CD followed by the correct path, then press [Enter]. Examples...

    CD \HUCKSPIN

or

    CD \HUCK1

1.5.3 Launch

Type TESTFONT and press [Enter]. This prepares the VGA screen for Huckspin graphs. Type HUCKSPIN and press [Enter]. This will run the software properly for computers configured according to Huckspin standards. If the computer is not one that was mounted in a Huckspin box, you may need to give the interface software additional information. You can give information to the software to tell it how to start. This information is called parameters.
1.5.3.1 Palette

The first parameter is the palette:

- **C** for Color
- **M** for Monochrome
- **B** for Black/White

For example, if you have a color screen, you can type **HUCKSPIN C** and press **Enter** to make it run in color. The Black/White palette is optimized for best appearance on a black and white LCD screen. It will be used if you give no parameters, or if the first parameter is not **C** or **M**. Upper or lower case does not matter here. If you use a second or third parameter you must specify the first parameter.

1.5.3.2 Serial Port

The second parameter is the serial port. Specify **1** for Com1, **2** for Com2, etc.

For example, type **HUCKSPIN B 2** and then press **Enter** to tell it to use the Black/White palette and use Com2 for the serial port by which it communicates with the controller. If you do not give it a second parameter, it assumes Com1. If you use a third parameter, you must specify the first and second.

1.5.3.3 Modem Port

The third parameter is the modem port. Specify **1** for Com1, **2** for Com2, etc. Use **0** to mean "do not use a modem". For example, type **HUCKSPIN C 1 0** and **Enter** to tell it to use the Color palette, use Com1 to talk to the controller, and not use the Modem.
2. DETAILED OPERATIONS

This section gives detailed explanations of small steps in using the software that apply in multiple situations. Mastering the information given here will speed your use of the entire operator interface.

2.1 Using the Keyboard

Most of the keyboard is just for typing letters, numbers, and various symbols, just like with a typewriter. There are some keys that have special functions.

2.1.1 Enter

Press Enter to bring up a highlighted Help topic, to activate the highlighted menu item, or to press the highlighted button.

2.1.2 Tab

Press the Tab key to move the Focus forward from place to place in a data entry window and from cross-reference to cross-reference in a Help window.

2.1.3 Shift + Tab

Press the Shift and the Tab keys to move the Focus backward from place to place (back tab). To do this, you hold down the Shift key and press the Tab key. Then release both keys.

2.1.4 Backspace

Press the backspace key in an input field to delete the character to the left of the cursor. This keystroke moves the cursor to the left.

2.1.5

Press the key in an input field to delete the character where the cursor lies.

2.1.6

Press the key in an input field to toggle between insert and overtype modes.
SECTION 2

DETAILED OPERATIONS

2.1.7 (Escape)

Press the \( \text{Esc} \) key to close the Help window.

2.1.8 \( \text{F1} \)

Press \( \text{F1} \) to open a Help window pertaining to where the Focus is.

2.1.9 \( \text{Alt} + \text{F1} \)

To back out of a Help cross-reference to the previous Help topic, hold down the \( \text{Alt} \) key while pressing \( \text{F1} \). Then release both keys.

2.1.10 \( \text{Ctrl} + \text{F1} \)

To see an index of all the Help topics, hold down the \( \text{Ctrl} \) key while pressing \( \text{F1} \). Then release both keys. Each topic in the index can be accessed as a cross-reference.

2.1.11 \( \text{F2} \)

Press \( \text{F2} \) to close any window that has the Focus.

2.1.12 \( \text{F3} \)

If you want a "clean slate" in a scrolling swage curve window to show the next swage curve without the confusion of all the previous curves on the screen, press the \( \text{F3} \) key. This will clear the screen of all the swage curves and reset the retrieval point so that the most recent swage curve will be retrieved if you press the \( \text{F3} \) key.

2.1.13 \( \text{F4} \)

Use this key combination to clean away accumulated swage curves without resetting the retrieval point like the \( \text{F3} \) key does. If you press the \( \text{F4} \) key, the swage curve prior to the last one you retrieved will be the one retrieved now, as if you had not cleared the screen. This operation is useful if you want to look at a specific swage curve from the past, and you do not want the clutter of the other swage curves you retrieve on the way to the curve you desire.
2.1.14 \[F_4\]

In a scrolling swage curve window, if you want to retrieve the last swage curve sent for the given station, press the \[F_4\] key. Press it again to get the curve prior to that one, etc.

2.1.15 \[F_5\]

Press \[F_5\] to see the code level required by a given window, or to change it.

2.1.16 \[F_6\]

Press \[F_6\] to see the Message History window.

2.1.17 \[F_9\]

Press \[F_9\] to make the Main Menu active so that you can use the arrow keys to move around in it and press \[Enter\] to make a selection.

2.1.18 \[F_10\]

Press the \[F_10\] key to move the highlight (shading) to the top of the visible part of a scrollable list, or the cursor to the beginning of an input field.

2.1.19 \[F_11\]

Press the \[F_11\] key to move the highlight (shading) to the bottom of the visible part of a scrollable list, or the cursor to the end of what has been typed in an input field.

2.1.20 \[PgUp\], \[PgDn\]

Use these keys to scroll a section at a time in a scrollable list.
2.1.21 (Left Arrow), (Right Arrow)

These keys will move the highlight (shading) in the Main menu and the cursor in an input field.

2.1.22 (Up Arrow), (Down Arrow)

These keys will move the highlight (shading) in a drop down menu and in a scrollable list.

2.2 Shortcut Letters

Shortcut letters may be identified by a difference in shading or color of a single letter within a label or menu item. Buttons and input fields have labels. In a Sub-menu, or when the Main menu has the Focus, just pressing the indicated letter activates the menu choice. In all other circumstances, to use a Shortcut Letter, hold down the key, and while holding it down, press the indicated letter. Then release both keys. You can use shortcut letters to activate a menu choice, press a button, or jump to an input field.

2.2.1 Activate a Menu Choice

You can activate a choice on the Main Menu no matter what has the Focus. For example, you could have several windows open at the same time (the latest one opened has the Focus), and use a shortcut key to activate a menu choice that leads to opening still another window on top of the previous ones.

2.2.2 Press a Button

Many times this will be more convenient than tabbing to the button to press it, and will insure that you press the correct button.

2.2.3 Jump to an Input Field

This can be much faster that multiple tabs to go to a field to change something when the information in the fields between is already correct.

2.3 Buttons

Most actions in the operator interface are started by pressing a button. A button looks like a small, dark rectangle with a label in it and shadow to its lower right. There are several ways you can press a button.

2.3.1 Pressing a Button via its Shortcut Letter

Most buttons have a Shortcut Letter, which is one letter that is more emphasized in appearance than the other letters in the label. If you hold down the key, and while holding it down, you press the Letter, then release both, you will have pressed the button that has that Shortcut Letter.
2.3.2 Default

In some data entry windows, there is a default button. The default button has its entire label emphasized, even when the Focus or tab position is in an input field. Press Enter to press the button.

2.3.3 Pressing a Button using Enter

In all cases you can tab to the button you want to press. Once the button has the Focus or tab position, its entire label is emphasized and you can press the button by pressing the Enter key. If some other button is a default button, the default will not have an emphasized label and will not be pressed while a non-default button has the Focus.

2.4 Tab Key

Press the Tab key to move the Focus forward from place to place in a data entry window. Press the Shift and Tab keys to move the Focus backward from place to place (back tab). To do this, you hold down the Shift key, and while holding it down you press the Tab key. Then release both keys.

2.5 Input Fields

An input field is a one-line rectangular area in which you can type (in a data entry window), if it has the Focus. You can tell that an input field has the Focus if its label is emphasized, (Section 2.1, Page 27, Using the Keyboard).

2.5.1 Cursor Movement

You can move around in an input field using the and arrow keys to move the cursor to the spot where you want to type.

2.5.2 Home and End

The Home key will erase the character where the cursor lies. You can also move to the left with the backspace key, and it will erase characters the cursor passes over. The End key will toggle you between insert mode and overtype mode. In overtype mode, what you type replaces whatever was at the cursor, and the cursor itself is a block ( ). In insert mode, what you type just pushes other text farther to the right, and the cursor is like

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an underscore (_). In insert mode, if the input field is full (even if it is just full of spaces),
you cannot type at all. Either use the key to toggle to overtype mode, or use the and backspace keys to remove unwanted characters.

2.5.3 Arrival

When an input field first receives the Focus, its contents are shaded and the first character you type will replace the entire contents. If you do not want this to happen, just move the cursor with the arrow keys, and the input field will no longer be shaded.

2.6 Station Numbers

Many windows ask you for a station number. Press a single numeric digit. The input fields allow you to type any number from through 8, however, you should use or less on a 3-Tool system and only enter a 1 on a 1-Tool model. In any case, make sure you type a number corresponding to the actual station involved.

2.7 Supervisory Codes

Many windows require a code before you can save the data you have entered. If you do not save the data, then the data you entered has no effect. Codes can be up to seven (7) characters long. All codes must start with a capital letter from A through H. A smaller letter gives a higher "level" code. (See Section 4.8, Page , for further information.) Each window that requires a code has a particular minimum level. Only a code of that level or higher will work for that window. A person with an A level code can use any window in the system, while a person with an H level code may be limited to only a few of them. A person with an A code level can change a window's code level by pressing while that window has the focus. Data display windows do not have a code level.

2.8 Selection Lists

In certain data entry windows, rather than typing in a piece of information, you simply select it from a list of possible values. The list is a rectangular area with data arranged in a vertical column.

2.8.1 Focus and Selection

If the list has the Focus, you can tell by the fact that one of the items in the list is surrounded by a shaded horizontal bar, as in Figure 14. That item in the list is the selected item. If you tab off the list, the selected item remains selected, but it is simply a different color or darker text than the other items. You can see an example of this in the second list in Figure 14. While the list has the Focus, you can change which item in the list is selected by means of the and arrow keys.
2.8.2 Scrolling

Selection lists are scrollable. If there are more items in the list than you can see at one time, the portion of the list that is visible will scroll by as you change the selection to a point beyond the currently visible items. You can consider the visible part of a list as a small view port into the complete list. You can scroll through entire view ports of items by means of the $\uparrow$ and $\downarrow$ keys.
3. INSTALLATION AND UPDATES

A new Huckspin 8-Tool system comes with the interface software already installed, however, smaller systems will require separate installation onto your computer(s). Certain extraordinary circumstances may require installation onto an 8-Tool system. Sometimes new features may be developed, requiring an update procedure. **Note:** NEVER run the Huckspin software directly from an installation or update disk. The Huckspin software creates certain data files and fills them with data as time goes on. If you run the software on the floppy disk, the data files are created on it. If you subsequently update a Huckspin system by means of that disk, the created files are copied onto the system, thus destroying the existing data on the updated system. If you DO NOT run the interface directly from the floppies, data on updated systems will be safe.

3.1 Installation to a Separate Computer

Turn on the computer. Exit to DOS if any menu systems or other programs are active. Insert the installation disk in Drive A. Type **A:INSTALL** and press **Enter**.

3.1.1 Choose a Path

The Install program will ask you where to put the Huckspin software on your hard drive. It will refer to this location as a Path. If you just press **Enter**, the suggested path will be used.

3.1.1.1 The Suggested Path

The program recommends that you install to "C:\HUCKSPIN" and you should use that Path unless you have reason not to. This Path translates to mean "put the software on the C Drive, in a directory called "HUCKSPIN", which is directly off the root directory. It will create the directory before putting the software in it. Perhaps your hard drive is partitioned into several logical drives, such as D and E. To tell the install program to use, for example, the D Drive, but keep the rest of the path the same, you should type **D:\HUCKSPIN** and press **Enter**. Note that although the drive and path is specified together here, when you start the software, you will deal with the drive and the path separately, if needed.

3.1.1.2 Other Paths

One situation that would require using a different path from the recommended one is using the same computer for more than one Huckspin box. For example, if the same computer attaches to three different boxes at a facility, be sure to install the software three separate times, using a different path each time. Each Huckspin box needs its own place to store data, and you do not want the data from one box to overwrite data from another box. For example, if your facility has three Huckspin systems, run the Install program
three times. You might give "C:\HUCK1" as the path the first time, "C:\HUCK2" the second time, and "C:\HUCK3" the third.

3.1.2 DOS System Files

The Install program will ask you "Install DOS system files (Y/N)?". Type N and press Enter. A separate computer will already have the appropriate DOS system files and the DOS system files on the install disk may not be the right version for your computer. Furthermore, if you answered Y, the install program would replace your AUTOEXEC.BAT and CONFIG.SYS files with its own, which are appropriate only for a computer that is dedicated to Huckspin and nothing else.

3.1.3 Completion

The Install program will finish copying files to the designated path and will stop in that same directory. See Section 1.5, Page 24, for starting the interface software.

3.2 Updates

If new features have been added to the Huckspin software and you receive an update disk, turn on the computer. Exit to DOS if any menu systems or other programs are active. Insert the update disk in Drive A. Type A:UPDATE and press Enter.

3.2.1 Choose a Path

The Update program will ask you where to put the Huckspin software on your hard drive. It will refer to this location as a Path. If you just press Enter, the suggested path will be used. Be sure to use the same drive and path you used for installation. If you installed on several paths, be sure to update the same number of times, using the same paths. See Sections 3.1.1.1 and 3.1.1.2, Page 35, for explanations.

3.2.2 Completion

The Update program will finish copying files to the designated path and will stop in that same directory. See Section 1.5, Page 24, for starting the interface software.

3.3 A New Hard Drive (Or Newly Formatted)

If you have just put a new Hard Drive into the Huckspin box, follow these procedures. If you simply need to re-format the existing hard drive (a drastic step - contact Huck International before proceeding), start these procedures at Section 3.3.1 and skip to 3.3.3.
3.3.1 Power On

Insert the install disk in Drive A and turn on the power. The computer should "boot" from the floppy disk. **DO NOT** run the Operator Interface software while logged onto this disk.

3.3.2 Partition the Disk

Type `CD \DOS` and press Enter. Type `FDISK` and press Enter.

3.3.3 Format the Disk

Type `CD \DOS` and press Enter. Type `FORMAT C: /S /U` and press Enter.

3.3.4 Install the Operator Interface

Follow the steps of Section 3.4.

3.4 Total Installation

Turn on the computer. Exit to DOS if any menu systems or other programs are active. Insert the installation disk in Drive A. Type `A:INSTALL` and press Enter.

3.4.1 Choose a Path

The Install program will ask you where to put the Huckspin software on your hard drive. It will refer to this location as a Path. Press Enter to use the suggested path.

3.4.2 DOS System Files

The Install program will ask you "Install DOS system files (Y/N)?". Type Y and press Enter.

3.4.3 Completion

The Install program will finish copying files to the designated path and will stop in that same directory. *See Section 1.5 for starting the interface software.*
4. REFERENCE

The following section will show each operation you can perform with the operator interface and is organized by the menu structure. Some of the items covered are discussed in earlier sections, especially First Tasks, Section 1.4. That material is repeated in this reference section for your convenience.

4.1 Help

4.1.1 Getting Help

The Help system is keyed to the position of the cursor or highlight. Just press the \[F1\] key to bring up a window containing information about the operation you are performing. For instant information on the Help System itself, Choose Help from the Main menu. When you first start Huckspin, the Help Menu item is already selected. Just press [Enter] to bring up Help on Help. \[F1\] or \[F2\] will close a Help window.

4.1.2 The Help Windows

Help windows contain detailed information about the operation of the software. A Help window is fixed text in which you cannot type, essentially an on-screen manual with automatic cross-references. Figure 21 shows a Help window.

![Figure 21. Help Window](image-url)
4.1.3 Navigating The Help System

4.1.3.1 Moving within a Help Window

The ↑ and ↓ arrow keys and ← and → keys let you scroll through a Help window too large to be seen all at once.

4.1.3.2 Cross-References

Cross-references allow you to move to a related Help topic from the Help topic you are currently viewing. Such topics are emphasized or highlighted on your screen within the current Help topic. If more than one cross-reference shows, use the Tab key to move the highlight from topic to topic. Press Enter to bring up the highlighted Help topic. See Section 2.1, Page 27, to learn more about using various keys. The Help window in Figure 21 is scrolled and shows several cross-references. The word "Tab" is highlighted, so if you pressed Enter you would see help on use of the Tab key.

4.1.3.3 Help Index

Press [Ctrl]+[Enter] while in any Help window to bring up an alphabetical index of all the available Help topics. This is just another Help window in which every line is a cross-reference. See Figure 22.
4.2 NewTool

Choose this menu item to see a drop down menu of choices relating to the connection of a particular tool to a given station.

- "Add" will allow you to add a new serial number to the list of available serial numbers. This is used when a new tool is added to inventory.
- "Delete" will allow you to remove a serial number from the list of ones available. This is used when a tool is removed from inventory.
- "Edit" will allow you to edit the counts associated with a particular serial number, and even correct typographical mistakes in the serial number itself.
- "Plug" will allow you to identify the tool that has just been plugged into a station by selecting from a list of available serial numbers.
- "Unplug" will allow you to cause a serial number to be disassociated from a given station and returned to the available list. This is normally not required because a signal from the controller will perform this automatically when you unplug a tool. However, if you are using a separate computer, you may not have it connected at the time. In this case, you may need to perform several unplug and plug operations with the interface.
- "Maintenance" allows you to record maintenance actions by selecting from a list of serial numbers and selecting from a list of actions.

Figure 23. New Tool-Add
4.2.1 Add

When you first install the Huckspin system, or when you receive additional tools, you need to put the tool into the system's inventory. From the Main Menu select "NewTool". From the Sub-menu choose "Add" (Figure 23). This will open a data entry window (Figure 24) in which you can add the new serial number to the inventory. You can close the window without storing anything by pressing ☐.

![Add Serial # to List Window](image)

Figure 24. Add Serial # to List Window

4.2.1.1 Inventory List

Scroll down this list to make sure that the serial number you are about to add is not already in the inventory. If it is, just close the window, otherwise tab twice to get the serial field.

4.2.1.2 Serial Number to Add

Type the serial number in this field. Start with 37 or 52. Then type four more digits. Then type the Tool Assembly Revision Letter.

4.2.1.3 Add Button

Press the Add button to make the new serial number become part of the inventory stored on disk. You can press Add by using its Shortcut Letter, [A]. You can also press Add by pressing ☐, since it is the default button. The focus will move to the button, so the hint in the Status Line will say, "Save Added Serial Number". Tab once to move to the Serial field. Enter the next number, etc.
4.2.2 Delete

When you select this item from the menu (Figure 25), then, in a data entry window (Figure 26), you can select a tool by serial number from a list of serial numbers. You will remove the selection from the list of available serial numbers by pressing the Del Serial button. Only serial numbers not shown to be plugged in will be in the list. Do this when a tool is removed from inventory. See Section 1.4.4, Page 18, Connecting Tools, for the different kinds of serial number lists.

You can, instead, remove all data stored for a particular bolt size for that serial number by selecting a size from the Bolt Selector list and pressing the Del Bolt button. The serial number will remain in inventory.

4.2.2.1 Serial Selector

This is a scrollable list of serial numbers appropriate for this data entry window. You can move the highlight with the ↑ and ↓ arrow keys. Highlight the appropriate serial number and tab to the next item in the data entry window. The selected serial number will remain emphasized.

4.2.2.2 Bolt Selector

This is a list of the bolt sizes. Select the appropriate bolt size by highlighting it. Move the highlight with the ↑ and ↓ arrow keys. When you have highlighted your selection, tab to the next item in the data entry window. The selected bolt size will remain emphasized. If you are deleting the serial number, the bolt size selection does not matter.

Figure 25. Selecting Delete from New Tool Sub-Menu
4.2.2.3 Code

In order to perform a deletion, whether of just the records of a particular bolt size for a given tool, or to delete the serial number completely from inventory, you need to enter a code to authorize that action. (See Section 2.7, Supervisory Codes.) Press [Tab] when you have entered the code. You can come back to this field by pressing its Shortcut Letter, [Alt][E].

![Figure 26. Delete Serials/Bolts Window](image)

4.2.2.4 Del Serial Button

Press this button to delete the selected serial number from the inventory list and close the window. Either tab to this button and press [Enter] or press its Shortcut Letter, [Alt][F]. You can identify that the button has the Focus (that is, you have tabbed to it) by the hint that says, "Remove the Serial# from List".
4.2.2.5 Del Bolt Button

Press this button to delete the selected combination of serial number and bolt size. The window will remain open. Since this is the default button, you can simply press Enter.

Figure 27. Selecting Edit from New Tool Sub-Menu as long as the other button does not have the Focus. You can also press it by its Shortcut Letter, [Alt][B]. You will delete only the given bolt size data from that serial number; all other data for that serial number will remain in place.

4.2.3 Edit

When you select this item from the menu (Figure 27), then, in a data entry window (Figure 28), you can select a tool by serial number from the complete list and you can see and/or edit the full swage and snub counts. You can also correct typographical errors in the serial number itself. Note that if no serial numbers have been added to the inventory, you will just see a window that reads, "No Tools Available". Press [Esc] or [F2] to close the window.

Figure 27. Selecting Edit from New Tool Sub-Menu
4.2.3.1 Serial Selector

This is a scrollable list of serial numbers appropriate for this data entry window. See Section 1.4.4, Connecting Tools, Page 18, for the way serial numbers are listed. You can move the highlight with the ▲ and ▼ arrow keys. Highlight the appropriate serial number and tab to the next item in the data entry window. The selected serial number will remain emphasized.

![Figure 28. Edit a Tool Menu](image)

4.2.3.2 Bolt Selector

This is a list of the bolt sizes. Select the appropriate bolt size by highlighting it. You can move the highlight with the ▲ and ▼ arrow keys. When you have highlighted your selection, tab to the next item in the data entry window. The selected bolt size will remain emphasized.

4.2.3.3 Serial

If you have pressed the Show button, you will see the serial number that has been selected from the list. If there has been a typographical mistake in this serial number, you can edit it in this input field.

4.2.3.4 Tool Full

Type the number of full swages the tools as a whole has experienced.

4.2.3.5 Tool Snub

Type the number of snubs the tools as a whole has experienced.

4.2.3.6 Thim Full

Type the number of full swages the thimble for this tool has experienced.
4.2.3.7 Thin Snub
Type the number of snubs the thimble for this tool has experienced.

4.2.3.8 Swage Cav
Type the number of swages the swage cavity for this tool has experienced, whether full or snub.

4.2.3.9 Code
In order to save the results of your editing, you must enter a code to authorize this action. See Section 2.7, Page 32, Supervisory Codes. Tab to the next position in the data entry window. You can come back to this field by pressing its Shortcut Letter, $\text{An}$ $\text{E}$.

4.2.3.10 Save Button
Press this button to save the results of your editing to disk. You can tab to it and press $\text{Enter}$, or you can use its Shortcut Letter, $\text{Alt}$ $\text{V}$. The window will close. You can identify that the button has the Focus (that is, you have tabbed to it) by the hint that says, "Save Edited Serial#". If the selected serial number has been associated with a station (Section 1.4.4, Page 18), then the counts will also be sent to the controller to update its counts for that station.

4.2.3.11 Show Button
Press this button AFTER you have selected the serial number and bolt size, BEFORE you start editing, and BEFORE you save, to bring the current values for your selected serial number and bolt size into the input fields making them available for edit. Neglecting this step could result in saving unintended values. This is the default button, so you can just press $\text{Enter}$ as long as the Focus is not on the save button. You can also press it by its Shortcut Letter, $\text{Alt}$ $\text{O}$.

4.2.4 Plug
When you connect a tool to a station, you need to tell the computer the identity of the tool. From the Main Menu, choose "NewTool". From the Sub-menu, choose "Plug" (Figure 29). In a data entry window (Figure 30) you can select a tool by serial number to identify the tool that has just been

Figure 29. Selecting Plug from New Tool Sub Menu
Huckspin Operator Interface Software
plugged in. You also identify the bolt size. The computer then notifies the controller that
the tool can now be used. You can close the window without starting anything by
pressing $F2$.

![Figure 30. Select Connected Serial #](image)

4.2.4.1 Station for Select Connected Serial #

Enter the appropriate station number (see Section 2.6, Page 32) and press $[Tab]$. You can come back to this field by pressing its Shortcut Letter, $[Alt][T]$. 

Huckspin Operator Interface Software
4.2.4.2 Counts for Select Connected Serial #

**Summary:** if the computer counts are correct, enter Y, otherwise enter N.

Both the controller and the computer keep track of counts for the tools. The controller has no way of knowing which tool has just been connected, so the computer can notify it of the counts belonging to the tool you are identifying. Put Y in this field if you want this to happen, otherwise enter N. The main situation in which you would not want to send counts to the controller would be in a smaller system in which the computer was not connected during some of the use of the tool, so its counts are not up to date. The way to avoid this problem is to connect the computer before you unplug the tool and edit the computer version of the counts to match the controller version of the counts. Then, when the computer is reconnected to identify the same tool being plugged in, the computer counts are current and ready to be sent to the controller. After entering the Y or N, press Tab. You can come back to this field by pressing its Shortcut Letter, Alt O.

4.2.4.3 List of Serial #s for Select Connected Serial #

Use the Up and Down arrow keys to select the appropriate serial number. Press Tab and go to the next list.

4.2.4.4 List of Bolt Sizes for Select Connected Serial #

Use the Up and Down arrow keys to select the appropriate bolt size. Tab to the Plug In button.

4.2.4.5 Plug In Button for Select Connected Serial #

Press this button to activate the selections you have made. The data (about what serial number and bolt size combination is connected to the indicated station) is recorded on the disk, and (if you entered Y) the associated counts are sent to the controller. You can press this button by pressing Enter, since it is the default button. You can also press it by pressing its Shortcut Letter, Alt L. This will close the window.

4.2.5 Unplug

When you select this item from the menu (Figure 31), you can disassociate a serial number from a given station and return it to the available list from a data entry window (Figure 32).
4.2.5.1 Station

Enter the appropriate station number (Section 2.6, Page 32) and press \texttt{Tab}. You can come back to this field by pressing its Shortcut Letter, \texttt{Alt} + \texttt{F}.

![Figure 31. Selecting Unplug from New Tool Sub-Menu](image1)

4.2.5.2 Code

To perform this operation, you must enter a code to authorize it (Section 2.7, Page 32). Tab to the next position in the data entry window. You can come back to this field by pressing its Shortcut Letter, \texttt{Alt} + \texttt{E}.

![Figure 32. Disconnect Serial # from station Window](image2)
4.2.5.3 Disconnect Button

The interface software keeps track of which tools are connected to which stations by serial number. You may want to tell it that a certain serial number is not connected to a certain station. Press this button to indicate that no tool is plugged into the given station. Since it is the default button, you can use [Enter], or its Shortcut Letter, [Alt]. The window will close. Normally you will not need to use this disconnect procedure since the controller will send that notification to the interface program a few seconds after a tool is physically unplugged. However, if the interface computer is disconnected from the controller, then this notification would not be received.

4.2.6 Maintenance

When you select this item from the menu (Figure 33), then, in a data entry window (Figure 34), you can select from a list of the maintenance actions that might be performed on a tool. First, you will be able to select from a scrolling list of the serial numbers of the various tools with the system. Then you will be able to select from the scrolling list of maintenance action. Press the Save button to record that maintenance.

4.2.6.1 Serial Selector

This is a scrollable list of serial numbers appropriate for this data entry window. You can move the highlight with the ↑ and ↓ arrow keys. Highlight the appropriate serial number and tab to the next item in the data entry window. The selected serial number will remain emphasized.
4.2.7 Maintenance Selector

This is a scrollable list of possible maintenance actions for the tools. Highlight the appropriate action and tab to the next item in the data entry window. The action will remain emphasized.

4.2.8 Save Button

Press this button to record the selected maintenance on the selected tool. This is the default button, so you can just press Enter. You can also press it by its Shortcut Letter, [Alt V].
4.3 Pressures

Figure 35. Selecting Current Settings from Pressures Sub-Menu

Choose this menu item to see a drop down menu of choices relating to the cut-off pressures (set points) for each station.

- "Current Settings" will allow you to set the current cut-off pressures for each station.
- "Default Settings" will allow you to define a set of standard pressures for a given Tool/Bolt size combination, which can be called up with the UseDefault button when doing current settings.
- "SnubOnly" will allow you to set a given station to do only snubs or full swages.
- "Hydraulic Start" will allow you to cause the hydraulic lines to be pressurized and released for a number of cycles after the lines have gotten cold so that they will give consistent performance.

4.3.1 Current Settings

Normally you can use the default pressure settings that are associated with each tool and bolt size combination. If you need to deviate from the default values, use this procedure. Note that every time you plug in a tool and identify it to the computer, the setting will revert to the default values.

From the Main Menu, choose "Pressures". From the Sub-menu, choose "Current Settings" (Figure 35). A data entry window will open that will allow you to set the hydraulic cutoff pressures for a station, both full swage and snub (Figure 36). These values are stored on disk and also sent to the controller. Whenever you bring up this window, you will see the values previously stored on disk. You can press the UseDefault button to bring up the default values for a given tool/bolt size combination. You will also see a reminder of the current tool/bolt size combination (with serial number) associated
with the given station. You can see how to define these default values in Section 4.3.2, Page 56. You can close the window without starting anything by pressing $F2$.

Figure 36. Set Current Cutoff Pressures Window
4.3.1.1 Station for Setting Current Pressures

Enter the appropriate station number (Section 2.6, Page 32) and press \texttt{tab}. You can come back to this field by pressing its Shortcut Letter, \texttt{Alt} \texttt{T}.

4.3.1.2 Full Pressure Setpoint

Type the pressure to be reached before the hydraulic valve closes when doing a full swage at this station. Take into account the particular tool and bolt size involved. Press \texttt{tab} to go to the next field. You can come back to this field by pressing its Shortcut Letter, \texttt{Alt} \texttt{F}.

4.3.1.3 Snub Pressure Setpoint

Type the pressure to be reached before the hydraulic valve closes when doing a snub cycle at this station. Take into account the particular tool and bolt size involved. Press \texttt{tab} to go to the next field. You can come back to this field by pressing its Shortcut Letter, \texttt{Alt} \texttt{U}.

4.3.1.4 Hold

Enter the amount of time (in tenths of a second) you want to hold the hydraulic valve open after Full Cutoff pressure has been reached. Normally you would leave this value as 0, but if you do enter a Hold Time, be sure to reduce the Full Cutoff pressure accordingly, unless you have the maximum rig pressure set to a value just above the Full Cutoff pressure.

4.3.1.5 Code for Setting Current Pressures

Enter the appropriate level of supervisory code to proceed with this operation. Press \texttt{tab} to go to the Save button. Note, the Save button will not work unless you have entered the appropriate code. You can come back to this field by pressing its Shortcut Letter, \texttt{Alt} \texttt{E}.

4.3.1.6 Save Button for Setting Current Pressures

Press the Save button to store the cutoff pressures for this station on disk and send them to the controller. In order for the values you have entered to take effect, you must press the Save button. You can press it by pressing its Shortcut Letter, \texttt{Alt} \texttt{V}.

You can also tab to it, then press \texttt{Enter}. Note, if you press \texttt{Enter} without having this button focused, you are pressing the UseDefault button instead. You can tell that you have "arrived at" (focused) the Save button by the hint in the Status Line. The hint will say, "Save as Current Cutoffs".
4.3.1.7 UseDefault Button for Setting Current Pressures

Press this button to put default values from the configuration files into the Input Fields. You can press this button by pressing its Shortcut Letter, $\text{Alt} + \text{U}$. You can also press UseDefault by pressing $\text{Ctrl}$, as long as the Save button does not have the Focus, because UseDefault is the default button (Section 2.3.2, Page 31), which has nothing to do with the button's name. The window remains open so you can set pressures for several stations. When you are done, press $\text{F2}$ to close the window.

4.3.1.8 Serial Number for Setting Current Pressures

When this window first appears, it will have the recently used station number showing in the first field. The tool serial number identified for that station will show in the next to the last field. If you type a new station number and tab to the next field, the values appropriate for that station will show, including the serial number. The field is "display-only" (protected). If the field is empty, do not bother saving new settings, first you need to follow the procedure for Connecting Tools (Section 1.4.4, Page 18).

4.3.1.9 Bolt Size for Setting Current Pressures

When this window first appears, it will have the recently used station number showing in the first field. The bolt size identified for that station will show in the last field. If you type a new station number and tab to the next field, the values appropriate for that station will show, including the bolt size. The field is display-only (protected). If the field is empty, do not bother saving new settings, first you need to follow the procedure for Connecting Tools (Section 1.4.4, Page 18).

4.3.2 Default Settings

When you select this item from the menu (Figure 37), then, in a data entry window (Figure 38), you can define a set of standard full swage and snub cutoff pressures that are to be used for a given tool/bolt size combination. These standard values are called defaults and will be used automatically whenever you identify a tool for a given station (Section 1.4.4, Page 18). They can be accessed by the UseDefault
button in the Current Settings window. Before you enter any new values, you should call up the existing defaults with the Get Defaults button. After you have edited them, you can save them back with the Save button.

![Set Default Cutoff Pressures Window](image)

Figure 38. Set Default Cutoff Pressures Window

### 4.3.2.1 Bolt Selector

This is a list of the bolt sizes. Select the appropriate bolt size by highlighting it. You can move the highlight with the ↑ and ↓ arrow keys. When you have highlighted your selection, tab to the next item in the data entry window. The selected bolt size will remain emphasized.

### 4.3.2.2 Size 37 Snub Default

For the selected bolt size, you can type the default snub cutoff pressure for a size 37 tool. You should enter the value that would most commonly be used for this combination.

### 4.3.2.3 Size 37 Full Default

For the selected bolt size, you can type the default full swage cutoff pressure for a size 37 tool. You should enter the value that would most commonly be used for this combination.

### 4.3.2.4 Size 52 Snub Default

For the selected bolt size, you can type the default snub cutoff pressure for a size 52 tool. You should enter the value that would most commonly be used for this combination.
4.3.2.5 Size 52 Full Default

For the selected bolt size, you can type the default full swage cutoff pressure for a size 52 tool. You should enter the value that would most commonly be used for this combination.

4.3.2.6 Code

In order to save the default values you have defined, you need to enter a code to authorize that action. See Section 2.7. Tab to the next position in the data entry window. You can come back to this field by pressing its Shortcut Letter, \[\text{Alt}\] [E].

4.3.2.7 Save Button

Press this button to save your entries for a given bolt size to disk. You can tab to it and press \[\text{Enter}\], or you can use its Shortcut Letter, \[\text{Alt}\] [Y]. The window will remain open, so you can modify defaults for several bolt sizes in one session. You can identify that the button has the Focus (that is, you have tabbed to it) by the hint that says, "Save Default Pressures". When you are done, close the window with \[\text{Esc}\].

4.3.2.8 Get Defaults Button

Press this button AFTER you have selected the bolt size, BEFORE you start editing, and BEFORE you save, to bring the existing default values for your bolt size into the input fields making them available for edit. Neglecting this step could result in saving unintended values. This is the default button, so you can just press \[\text{Enter}\] as long as the Focus is not on the Save button. You can also press it by its Shortcut Letter, \[\text{Alt}\] [T].
Figure 39 - Selecting Snub Only from Pressures Sub Menu

Figure 40 - The Snub Only or Full Swage Window
4.3.3 Snub Only or Full Swage

When you select this item from the menu (Figure 39), then, in a data entry window (Figure 40), you can select whether a given station will allow full swages or only allow snubs, by pressing the appropriate button.

4.3.3.1 Snub Only Button

Press this button to tell the controller to do only snubs at the given station. You can tab to it and press [Enter], or you can use its Shortcut Letter, [Alt][F]. The window will close. You can identify that the button has the Focus (that is, you have tabbed to it) by the hint that says, "Make this Tool Snub Only".

4.3.3.2 Full Swage Button

Press this button to tell the controller to allow full swages at the given station. This is the default button, so you can press it by pressing [Enter] as long as the Snub Only button does not have the Focus. You can also press the button by pressing its Shortcut Letter, [Alt][F].

4.3.3.3 Station

Enter the appropriate station number (see Section 2.6) and press [Tab]. You can come back to this field by pressing its Shortcut Letter, [Alt][T].

4.3.3.4 Swage

This "display-only" field shows you the current state (full swage or snub only) that the interface has on record.

4.3.4 Hydraulic Start

The purpose of this operation is to insure a more consistent hydraulic performance after the hydraulic lines have been sitting idle in cold temperatures for an extended period. From the Main Menu, choose "Pressures". From the Sub-menu, choose "Hydraulic Start" (Figure 41). This will open a window (Figure 42) in which you can view or change the hydraulic start up parameters, and by pressing a button, you begin the process. When the process begins, all hydraulic valves will open for a specified time to build up pressure. After this, all the valves will close for a specified time to release pressure. This process will be repeated the specified number of times. You can close the window without starting anything by pressing [Esc].
Figure 41 - Selecting Hydraulic Start from Pressures Sub Menu

Figure 42 - The Hydraulic Start Up Window
4.3.4.1 Pump Time

In this field you specify how long the pressure is to build before being released in each cycle. Press \textit{Tab}. Return to this field by pressing its Shortcut Letter, \textit{Alt}U. Times are in full seconds and tenths of a second. Type two numeric digits, a decimal point and another numeric digit.

4.3.4.2 Rest Time

In this field you specify how long to rest after pressure is built up and released in each cycle. Press \textit{Tab}. Return to this field by pressing its Shortcut Letter, \textit{Alt}R. Times are in full seconds and tenths of a second. Type two numeric digits, a decimal point and another numeric digit.

4.3.4.3 How Many

In this field you specify how many cycles of pressure build-up and release to perform. Press \textit{Tab}. Return to this field by pressing its Shortcut Letter, \textit{Alt}M.

4.3.4.4 OK Button for Hydraulic Start Up

Press this button to begin the Hydraulic Start Up operation. This is the default button, so you can press it by pressing \textit{Enter}. You can also press it by pressing its Shortcut Letter, \textit{Alt}K.

4.3.4.5 Stop

\textbf{Note: As soon as you have successfully pressed the OK button a message will appear below it saying "Press Enter to Abort."} The focus will now be on the Stop button, so all you have to do to Abort the operation in an emergency is to press \textit{Enter}. A similar message appears in the Hint area. Figure 9, Page 9, illustrates the window at this point.

Press this button to abort a Hydraulic Start Up in progress.

4.4 Display

Choose this menu item to see a drop down menu of choices relating to the display of controller and computer settings and counts.

\begin{itemize}
  \item \textbf{"Calibrate"} will allow you to make displayed pressures match a measured pressure of the appropriate scale such as psi or deci-bar.
  \item \textbf{"Show"} will allow you to see a window into controller and computer settings and counts.
\end{itemize}
Figure 43 - Selecting Calibrate from Display Sub Menu

Figure 44 - The Calibration Window
4.4.1 Calibrate

When you select this item from the menu (Figure 43), then, in a data entry window (Figure 44), you can determine the scale factor that will apply to the pressure readings sent from the given station. This can be used to calibrate the displayed pressure with a known pressure reading, or even to change the unit of measure. You can also use this window in place of a gauge to set the rig pressure. For this, the All Status Display window should be showing just under this window.

4.4.1.1 Station

Type in the station number you want to calibrate (Section 2.6) and press [Tab]. This must be done as the first step in the calibration process. You can come back to this field by pressing its Shortcut Letter, [Alt]T.

4.4.1.2 Code

To proceed with the calibration, you need to enter a code to authorize that action (Section 2.7). Tab to the next position in the data entry window. This must be done as the second step of the process. You can come back to this field by pressing its Shortcut Letter, [Alt]C.

4.4.1.3 Start Button

Press this button to start the calibration process. You can press it by pressing its Shortcut Letter, [Alt]A. You can also tab to it and press [Enter]. You can identify that the button has the Focus (that is, you have tabbed to it) by the hint that says, "Make Station Send All Pressures". The controller will be notified to start sending all pressures for the given station, rather than just those above a certain threshold (Section 4.7.5.2). The pressures will show in the All Status Display window, if it is visible under the current window and the raw readings from the controller will show in the current window.

4.4.1.4 Q (Calibration Pressure or Scale)

Note, the constant updating of this screen with new readings from the controller make typing in this field very difficult, so when the Focus is in this field, updates to this window are suspended to allow you to type the appropriate value. When you move off this field, the rapid updates resume. You can return to this field by pressing its Shortcut Letter, [Alt]O.

When your pressure gauge is showing a steady pressure, type that value into this input field, enter P in the Kind field and immediately press the Save button. When dealing with large units, such as Bar, use tenths of the unit. Rather than entering 204 for 204.1 Bar, enter 2041 (deci-Bar). Smaller units, such as psi, should be entered "as is", so 3000 psi should be entered as 3000.

Alternatively, you can enter the scale factor and put S in the Kind field. The default scale factor is 3.0525. The pressure transducer normally outputs 4 to 20 milliamps
(ma), with 4 ma corresponding to 0 psi and 20 ma corresponding to 10000 psi (about 6803 deci-bar). The analog module is scaled from 0 to 4095 units, with 0 corresponding to 0 ma and 4095 to 20 ma. Since 4 ma is 0 pressure, an offset of 4/20 (1/5) of the range of 0 to 4095 is required. The controller sends pressure readings with this offset of 819 already subtracted, so the range of values is 0 to 3276. Divide the top pressure at 20 ma by 3276 to get the scale. A scale of 2.07653 would be appropriate for deci-bar.

Do not type fractions in this field. Enter a 6-digit number. Enter 2.07653 as 207653, 3.0525 as 305250, etc. While you are in the calibration window and the Start button has been pressed, you can see what the current scale factor is for the indicated station in the scale field.

Sometimes the pressure reading on the gauge may seem very steady, while the pressure showing on the All Status Display is jumping around + or - 20 psi. Such fluctuations would be difficult to detect on the gauge when the next small mark on the gauge is 100 psi. If you are calibrating at a fairly high pressure, the effect of the fluctuations on the calibration accuracy will be trivial, but if you are calibrating at a lower pressure, the effect may be significant. You may find it better to use the scale factor and raw value approach for calibrating. For example, suppose you read 3000 on your gauge and the average raw value you see in the Cnttrlr Value field is 997. Divide the gauge reading by the average Cnttrlr Value to get the appropriate scale value. In this case 3000/997 gives approximately 3.009027, so enter 300903 in the Q field, and S in the Kind field and press the Save button.

4.4.1.5 Cnttrlr Value

This is a "display-only" field where you will see the raw pressure readings from the controller updated rapidly.

4.4.1.6 Scale

In this "display-only" field you can see the current scale factor for the given station.

4.4.1.7 Kind

Type in the letter indicating the kind of calibration you are performing. This determines the interpretation of the Q field. Type in P for Pressure or S for Scale Factor.

4.4.1.8 Save Button

Press this button to save the results of your calibration to disk. You can tab to it and press [Enter], or you can use its Shortcut Letter, [Alt]Y. The window will remain open, so you can calibrate several stations in one session, or, more importantly, you can see the results of your calibration. You can identify that the button has the Focus (that is, you have tabbed to it) by the hint that says, "Save Scale (direct or press compare)". When you are done, close the window with [Esc].

If you put P in the Kind field, then what you have typed in the Q field will be compared with the last pressure transmission to calculate a new scale factor, and the scale
factor is saved to disk. If you put S in the Kind field, then what you have typed in the Q field is interpreted directly as the new scale factor, which is saved to disk.

4.4.2 Show

When you select this item from the menu (Figure 45), then, in a data display window (Figure 46), you will be able to see in one location the main settings and values that apply to the controller and to the computer (which is the operator interface). The window is divided into two parts vertically and eight parts horizontally.

The very top line of the window shows the current date and time. It is updated about every 30 seconds and whenever information is received from the controller. The controller sends information about every second, and also whenever new pressure readings are available. The LastRecv field is also updated each time data is received from the controller. If the time shown in this field is much different from the Time field (more than 30 seconds difference), then either communication is lost, or the controller is not working. Also on the top line are two unlabeled fields. The first shows the station number for which information has been received. The second shows the amount of backlog in the communications buffer (normally 0).

![Figure 45 - Selecting Show from Display Window](image-url)
SECTION 4

Except for the top line, the upper half of the screen is devoted to controller information, and the lower half of the screen is devoted to computer information. The divider for the two regions is a row of numbers (1 through 8). This row begins with the word "Settings". Everything below the word "Settings" applies to settings on the computer, except for the last two lines, which are for error messages and modem status information.

The numbers correspond to the eight (8) possible stations. The values displayed above or below the 1 apply to Station 1, the values displayed above or below the 2 apply to Station 2, and so forth. Since the controller sends a new piece of information about every second, and there are seven (7) rows of data, and eight (8) possible stations, and some information is intended for another screen, it takes about a minute and a half for a complete cycle of information to be received.

♦ Connected. On this line 4 characters show for each station. If the first character is Y, then there is a tool plugged in at that station. If the second character is Y, then the tool is "on". If it is N, then a supervisory code is needed to activate the tool. The third character is a number. 0 is for a regular bolt. Any other number indicates that the station is set to drive U-bolts. The value of the number indicates how many drives are needed to complete a U-bolt Swage. The fourth character is S if the controller has the station set for Snub Only, or F for Full Swage.

Figure 46 - The Show (All Status Display) Screen
**SECTION 4.**

- **Cutoff Full.** On this line you will see the controller's cutoff pressure setting for a full swage. It should agree closely (within 9 units) with the corresponding display for the computer. The values may not match exactly since the display is rounded to the nearest unit after being "scaled." Each time a setting is received from the controller that does not agree closely enough with the computer, then the computer sends a new setting command to the controller. If the values continue to disagree for more than 5 minutes, then there may be a communication problem.

- **Cutoff Snub.** On this line you will see the controller's cutoff pressure setting for a snub. The same agreement and update rules for Cutoff Full apply to Cutoff Snub.

- **Last Press.** On this line you will see the pressures that have been transmitted during swages and during calibration.

- **Tool.** On this line you will see the controller's record of how many swage counts (or the equivalent in snubs) the tool at each station has experienced. Compare this value with the corresponding computer's count.

- **Thim.** On this line you will see the controller's record of how many swage counts (or the equivalent in snubs) the thimble of the tool at each station has experienced. Compare this value with the corresponding computer's count.

- **Swage.** On this line you will see the controller's record of how many swages (full or snub) the swage cavity of the tool at each station has experienced. Compare this value with the corresponding computer's count.

At the extreme right of each of these rows is a parenthesis. When information that applies to that row has been received, a dot appears after the parenthesis. When you see that dot and the station number (in the unlabeled field at the top), you can see what the last piece of information from the controller was.

The bottom half of the screen are settings or values in the computer. Except for the last 2 rows, there is a value for each station.

- **Cutoff Full.** On this line you will see the computer's cutoff pressure setting for a full swage. It should agree closely (within 9 units) with the corresponding display for the controller. The values may not match exactly since the controller display is rounded to the nearest unit after being "scaled." Each time a setting is received from the controller that does not agree closely enough with the computer, then the computer sends a new setting command to the controller. If the values continue to disagree for more than 2 minutes, then there may be a communication problem.

- **Cutoff Snub.** On this line you will see the computer's cutoff pressure setting for a snub. The same agreement and update rules for Cutoff Full apply to Cutoff Snub.

- **Serial.** On this line you will see the serial numbers associated with each station. Any time the controller sends "N" for its connected status for a given station, the serial number will show blank.

- **Bolt.** On this line you will see the computer's record of the bolt size used by the tool connected to the given station.
SECTION 4.

- **Tool.** On this line you will see the computer's record of how many swage counts (or the equivalent in snubs) the tool at each station has experienced. Compare this value with the corresponding controller's count.
- **Thim.** On this line you will see the computer's record of how many swage counts (or the equivalent in snubs) the thimble of the tool at each station has experienced. Compare this value with the corresponding controller's count.
- **Swage.** On this line you will see the computer's record of how many swages (full or snub) the swage cavity of the tool at each station has experienced. Compare this value with the corresponding controller's count.

### 4.5 Graph

Choose this menu item to see a drop down menu of choices relating to swage curves and distribution graphs. For each graph type you have 8 choices, one for each possible station number. The ?'s below represent a station number in a menu selection. There are eighteen (18) menu choices available, 8 for Current, 8 for Distribution, 1 for Settings, and 1 for Print Swage.

- "Current?" will allow you to see a scrolling swage curve graph for the selected station.
- "Distribution?" will allow you to see a distribution curve for the top pressures reached for the selected station.
- "Settings" will allow you to adjust the way dots are spread in the graphs.
- "Print Swage" will allow you to print the swage curves on paper.

![Figure 47 - Selecting Current 1 from Graph Sub Menu](#)
4.5.1 Current

When you select this item from the menu for a given station number (Figure 47), then, in a scrollable data display window (Figure 48), you can see current pressures received from the chosen station. The station number shows near the upper right corner and the serial number of the tool attached to that station shows in the top center.

The pattern of dots displayed constitutes a Swage Curve Graph. The vertical scale is pressure in whatever units you have calibrated for that station. The horizontal scale is time, with the interval simply the amount of time the controller requires to read and transmit a pressure during a swage. You can change the horizontal spread between future dots for 1 time interval in the Settings window (Section 4.5.3, Page 74). There will be a horizontal line for the Full Cutoff value in the computer for the given station. Since data accumulates in the window while the interface is running, whether or not the window is currently visible, the graph could become rather cluttered after a number of drives. To clear the window, press the F3 key. This gives you a "clean slate" to show the next swage curve without the confusion of all the previous curves in the window. You will then see only those drives for that tool that took place after you cleared the screen.

After you have cleared a window, you might want to retrieve the curves for earlier drives. Press the F4 key to retrieve the most recent drive before you cleared. Press it again to see the drive prior to that. You can keep going back to earlier drives with each successive press of F4. When you clear the window, you "reset" the pointer for that station to the most recently completed drive.
If you are retrieving past swage curves with \[ \text{[Down Arrow]} \], you may want to clean off a build up of swage curves on the way to the desired curve. You would not want to use \[ \text{[Up Arrow]} \], since you would then have to start over retrieving curves. Press \[ \text{[Alt]} \text{[Page Down]} \] to clean off piled up curves without resetting the pointer.

The \[ \text{[Up Arrow]} \] key and \[ \text{[Down Arrow]} \] keys will allow you to scroll down in the window to see lower pressures. The \[ \text{[Up Arrow]} \] key and \[ \text{[Page Up]} \] keys will allow you to scroll back up to see higher pressures. The \[ \text{[Right Arrow]} \] arrow key will allow you to scroll to the right to see data points that went past the edge of the screen. This will only be needed if the pressure rose slowly enough to give a larger than usual number of data points in a swage. The \[ \text{[Left Arrow]} \] arrow key will allow you to scroll back left again.

Once you have opened this window with a menu choice, you can cover it with other windows, and bring it back to the top by just pressing \[ \text{[Alt]} \text{[Alt]} \] plus the station number.

That is, you hold down the \[ \text{[Alt]} \] key, and while holding it down, press one of the number keys (\( 1, 8 \)), then release both keys. If you have not opened the Swage Curve window for a given station, or you have since closed it, you need to open it from the menu, rather than just "bring it to the top". You can see a summary of keystrokes used for this window in Section 2.1, Page 27.
4.5.2 Distribution

When you select this item from the menu for a given station number (Figure 49), then, in a data display window (Figure 50), you can see a distribution graph of the top pressures reached for swages at that station. The serial number and the station number show in the top center.

Before the window actually appears, the interface program must scan through the available data in a disk file called HSPIN.FIL, using only the top pressure in each swage curve, and only those swage curves for the chosen station. In a large data set several minutes may pass during data collection. You can see that it is working because a small window will appear with the message "Scanning" and the increasing count of data points that were found.

When it has finished collecting data, the small window will disappear and the data display window will fill the screen. In the first data line you will see values for count, average, and sigma (standard deviation). Data points are ranges of pressures reached and are represented with plus signs (+). The ones closer to the top are the most frequent occurrences of the given range. See Section 4.5.3.2, Page 74, for the way data is grouped into a particular range. The count is the number of data points used to form those ranges. On the bottom data line you will see a caret (^) marking the position of the average data value, about in the center, and on the left and right you will see a bar (|) marking the average -sigma and average +sigma positions.

Figure 50 - The Distribution Curve Window
Figure 51 - Selecting Settings from Graph Sub Menu

Figure 52 - The Graph Settings Window
4.5.3 Settings

When you select this item from the menu (Figure 51), then, in a data entry window (Figure 52), you can set the Swage Dot Spread and the Distribution Dot Grouping.

4.5.3.1 Swage Dot Spread

Type a number (1 to 6) to determine the number of horizontal spaces from one dot to the next on a Swage Curve Graph (Section 4.5.1, Page 70). Once you change and save this setting, future curves will be steeper (for smaller settings) or flatter (for larger settings). This is strictly for ease of viewing and has no effect on Swage Analysis (Section 4.6.3, Page 79).

4.5.3.2 Distribution Dot Grouping

Type a number (1 to 9) to determine the grouping in a Distribution Curve. For example, if you enter a 4, then on a Distribution Graph, the frequency count for a given pressure will include the counts for all pressures within 4 raw units of that value. The count for a pressure of 1000 will be the sum of all counts for maximum pressures from 996 to 1004. So, if 997 happened three times on a given station, 999 occurred two times, 1000 one time, 1001 four times, 1002 two times, and 1004 one time, the frequency count for 1000 would be reported as 13. Note that these are raw units. In this example, the 1000 would correspond to 3053 psi and the range would be 3040 psi to 3065 psi. In deci-bar, the values would range from 2068 to 2085, centered on 2077 deci-bar.

4.5.3.3 Save Button

Press this button to save to disk the Distribution Dot Grouping and Swage Dot Spread values you entered. Since it is the default button, you can press it by pressing $\text{Alt} + V$, or you can use its Shortcut Letter, $\text{Alt} + V$.

4.5.4 Print Swage

When you select this item from the menu (Figure 53), then, in a data entry window (Figure 54), you can cause the printout of the swage curves for a given station. You specify how many swage curves you want to print, starting from the most recent and progressing to earlier curves, then press the Print button.

4.5.4.1 Station

Enter the appropriate station number (Section 2.6, Page 32) and press $\text{Tab}$. You can come back to this field by pressing its Shortcut Letter, $\text{Alt} + I$.

4.5.4.2 How Many Curves

Enter the number of swage curves you want to print, starting from the most recent one at the given station, back toward the earliest curve at that station.
Figure 53 - Selecting Print Swage from Graph Sub Menu

Figure 54 - The Print Swage Window
4.5.4.3 Print Button

Press this button to start the printing of the specified number of swage curves from the specified station. Since it is the default button, you can press it by pressing Enter, or you can use its Shortcut Letter, ALT[R]. The window will close.

4.6 Supervisor

Choose this menu item to see a drop down menu of choices relating to certain supervisory functions.

- "Allow Tool" will enable you to enter a code to allow a tool to operate that was previously shut down due to hydraulic problems.
- "Code Replacement" will enable you to replace an existing supervisory code with a new code of an appropriate level.
- "Set Swage Analysis" will enable you to specify parameters by which the interface can identify swages that indicate a worn swage die.

4.6.1 Allow Tool

When you select this item from the menu for a given station number (Figure 55), then, in a data entry window (Figure 56), you can turn on a tool that has been shut down due to too many hydraulic problems (Section 4.7.6, Page 93.)

Figure 55 - Selecting Allow Tool from Supervisor Sub Menu
4.6.1.1 Station

Enter the appropriate station number (Section 2.6, Page 32) and press Tab. You can come back to this field by pressing its Shortcut Letter, ALT-T.

4.6.1.2 Code

To proceed with enabling the tool, you need to enter a code to authorize that action (Section 2.7, Supervisory Codes). Tab to the next position in the data entry window. You can come back to this field by pressing its Shortcut Letter, ALT-E.

4.6.1.3 OK Button

Press this button to tell the controller to re-enable a tool that was shut down due to hydraulic problems. Since it is the default button, you can press it by pressing Enter, or you can use its Shortcut Letter, ALT-K. The window will close.

Figure 56 - The Tool Restart Window
Figure 57 - Selecting Code Replacement from Supervisor Sub Menu

Figure 58 - The Code Replacement Window
4.6.2 Code Replacement

When you select this item from the menu for a given station number (Figure 57), then, in a data entry window (Figure 58), you can replace a supervisory code with a new one. This should be done periodically to help insure that only the intended people know the supervisory codes.

4.6.2.1 Change From Code

Type the existing supervisory code to be changed and press [Tab]. You can come back to this field by pressing its Shortcut Letter, [Alt] F.

4.6.2.2 Change To Code

Type what the existing supervisor code is to be changed to and press [Tab]. You can come back to this field by pressing its Shortcut Letter, [Alt] T.

4.6.2.3 Your Code

To proceed with the code change you need to enter your current code to authorize that action (Section 2.7, Page 32). Tab to the next position in the data entry window. You can come back to this field by pressing its Shortcut Letter, [Alt] Y.

4.6.2.4 OK Button

Press this button to change the existing specified supervisory code into the new specified supervisory code. Since it is the default button, you can press it by pressing [Enter], or you can use its Shortcut Letter, [Alt] K. The window will close.

4.6.3 Set Swage Analysis

When you select this item from the menu for a given station number (Figure 59), then, in a data entry window (Figure 60), you can set up Swage Analysis. You will specify for each station, a range of pressures in which to analyze, and the minimum required number of data points (dots) within that range. If the actual number of dots is less than the minimum, then an error message will appear. Close it by pressing [Esc]. If several such messages have accumulated, it will be necessary to press [Esc] several times. If the error message appears because no dots appeared in the region, the message will start with A., otherwise it will start with B.

Example: B.Steep slope, station#3

In some cases a message might not appear if not enough data arrived from which to make calculations, or if two swage curves were merged because the cutoff signal did not arrive.
Figure 59 - Selecting Set Swage Analysis from Supervisor Sub Menu

Figure 60 - The Swage Analysis Window
The window is arranged in a grid with all the station numbers in columns. The rows are the parameters for each station. Swage analysis can be set up for all stations at once (with different values) in one window.

4.6.3.1 Low Pressure

For the indicated station, enter the low end of the pressure range for which swage analysis will be performed. Enter 0 to disable. Be sure the controller threshold (Section 4.7.5.2) is lower than the lowest (non-zero) setting for any station. You can return to the first input field in this row with the Shortcut Letter, \[\text{Alt} \text{L}\].

4.6.3.2 High Pressure

For the indicated station, enter the high end of the pressure range for which swage analysis will be performed. You can return to the first input field in this row with the Shortcut Letter, \[\text{Alt} \text{Tab}\].

4.6.3.3 Minimum Count

For the indicated station, enter the minimum number of dots inside the pressure range required for an acceptable swage curve. You can return to the first input field in this row with the Shortcut Letter, \[\text{Alt} \text{M}\].

4.6.3.4 Code

To save the data you have entered and make it effective, you need to enter a code to authorize that action (Section 2.7, Page 32). Tab to the next position in the data entry window. You can come back to this field by pressing its Shortcut Letter, \[\text{Alt} \text{F}\].

4.6.3.5 Save Button

Press this button to save the Swage Analysis set up to disk and make any changes effective. Remember that 0 for the Low pressure disables Swage Analysis for the given station. Otherwise the Low pressure must be higher than the threshold and less than the high. It is up to you to make sure all values entered make sense. Since it is the default button, you can press it by pressing \[\text{Enter}\], or you can use its Shortcut Letter, \[\text{Alt} \text{V}\]. The window will close.
Figure 61 - Selecting Modem from Configure Sub Menu

Figure 62 - The Modem Configuration Window
4.7 Configure

Choose this menu item to see a drop down menu of choices relating to certain configuration options.

- "Modem" will allow you to define where and when data is sent over the telephone line.
- "Warning/SnubFactor" will allow you to define the amount of wear (in terms of swage counts) on a tool, thimble, or swage cavity that is allowed before a replacement warning is generated.
- "Add/Delete BoltSize" will allow you to add a new bolt size to the bottom of the list of bolt sizes, or to remove the most recently added bolt size from the bottom of the list.
- "Commands to Controller" will allow you to send commands to the controller to change certain configuration settings in it.

4.7.1 Modem

When you select this item from the menu (Figure 61), then, in a data entry window (Figure 62), you can define when and where to send accumulated data over the telephone lines. All the files whose file name is HSPIN (with any extension) will be sent.

4.7.1.1 Waco A #

Type the complete telephone number for the computer to dial Data Collection (Huck International) in Waco, TX, and press Tab. You can come back to this field by pressing its Shortcut Letter, Alt V.

4.7.1.2 Other

Type in an optional, additional phone number where data can be sent via modem, and press Tab. You can come back to this field by pressing its Shortcut Letter, Alt O.

4.7.1.3 Interval

Enter the number of minutes between each transmission of data (if Kind is greater than 1). You can come back to this field by pressing its Shortcut Letter, Alt I.

4.7.1.4 Kind

Enter a number (0 to 9) to determine the schedule of sending data.

- 0 means no dialing out performed. The interface will only send data if someone else dials in to the system.

- 1 means send data once per day, at the time indicated in the Time field.

- 2 or more means send data several times per day
  - The first transmission will be at the time in the Time field.
• The number of transmissions per day is in this Kind field (2 to 9).
• The number of minutes between transmissions is in the Interval field.

You can come back to this field by pressing its Shortcut Letter, Alt+K.

4.7.1.5 Time

Enter the time of day (using a 24 hour clock) for the first (or only) dialing out and transmission of data via modem.

4.7.1.6 Save Button

Press this button to save the modem configuration data to disk. Since it is the default button, you can press it by pressing Enter, or you can use its Shortcut Letter, Alt+V. The window will close.

4.7.2 Warning/SnubFactor

When you select this item from the menu (Figure 63), then, in a data entry window (Figure 64), you can define how much wear a snub contributes toward replacement need, compared to a full drive, and what the count level can reach for a tool or thimble before a message is given in All Status (Section 4.4.2, Page 66). Also, in this window you can set the number of partial drives needed to complete a U bolt.

Figure 63 - Selecting Warning/SnubFactor from Configure Sub Menu
4.7.2.1 Tool37
Enter the cumulative count Warning Level for the size 37 tool.

4.7.2.2 Sw37
Enter the cumulative count Warning Level for the swage cavity of a size 37 tool.

4.7.2.3 Tool52
Enter the cumulative count Warning Level for the size 52 tool.

4.7.2.4 Sw52
Enter the cumulative count Warning Level for the swage cavity of a size 52 tool.

4.7.2.5 Thim37
Enter the cumulative count Warning Level for the thimble of a size 37 tool.

4.7.2.6 Snub Factor
Enter the number of snubs to count for the wear of one full swage.

4.7.2.7 Thim52
Enter the cumulative count Warning Level for the thimble of a size 52 tool.

Figure 64 - The Warning Level Window
4.7.2.8 **U**

Enter the number of drives required for a U-Bolt. For example, if 4 partial drives on each side are required for a properly balanced U-Bolt, enter **8**.

4.7.2.9 **Save Button**

Press this button to save the warning levels for the different sized tools and thimbles, as well as the Snub Factor and the U-Bolt drives. Since it is the default button, you can press it by pressing **Enter**, or you can use its Shortcut Letter, **Alt-V**. The window will close.

4.7.3 **Add/Delete BoltSize**

When you select this from the menu (Figure 65), then, in a data entry window (Figure 66), you can add and delete new bolt sizes.

4.7.3.1 **New Bolt Size**

Type in the new bolt size you want to add to the list of available bolt sizes. Enter metric sizes in millimeters and put a space and "mm" after the number, (for example, 25 mm). Enter English sizes in inches as just a whole number and a fraction (for example, 1 1/8).

![Figure 65 - Selecting Add/Delete BoltSize from Configure Sub Menu](image)
4.7.3.2 Save Button

Press this button to save the new bolt size you added. Since it is the default button, you can press it by pressing [Enter] and as long as the DeleteLastBolt button does not have the Focus, or you can use its Shortcut Letter, [Alt] [L]. The window will close.

4.7.3.3 DeleteLastBolt Button

Press this button to delete the bolt size that is at the bottom of the list. Normally this would be the last bolt size you added. Either tab to this button and press [Enter] or press its Shortcut Letter, [Alt] [L]. You can identify that the button has the Focus (that is, you have tabbed to it) by the hint that says, "Remove Last Added Bolt Size".

4.7.4 Snooze/Thresh/Delay

When you select this item from the menu (Figure 67), then, in a data entry window (Figure 68), you can see certain controller settings and change them. These include the pressure transmission threshold, how often to save settings to the RAMdisk, and the "snooze" setting for controllers with a reset button.
Figure 67 - Selecting Snooze/Thresh/Delay from Configure Sub Menu

Figure 68 - The Snooze/Thresh/Delay Window
4.7.4.1 Snooze Max

When a 3-Tool or 1-Tool controller sounds an alarm because a tool or part has exceeded the number of swages allowed before maintenance or replacement, a reset switch can be used to silence the alarm for a while. SnoozeMax is the number of swages allowed before the alarm starts sounding again. This is not used by the 8-Tool system because in that system the computer is constantly monitoring the counts.

4.7.4.2 Thresh

The pressure threshold is the minimum pressure the controller is allowed to send to the interface computer. Pressures below this value are ignored. Set this pressure to no lower than 366 psi or 249 deci-bar.

4.7.4.3 Save Delay

Periodically the controller flushes its permanent data to a file on the RAMDISK (Pres.Sav on Drive B). How much time passes between saves is the SaveDelay. The default value is 600 (tenths of a second) or 1 minute.

4.7.4.4 Three Display-Only Fields

Here you will see the values received from the controller for SnoozeMax, Thresh, and SaveDelay. These values are also copied into the edit fields when you first open this window. The controller sends updates to the computer for various values about every second. These values have a low priority for sending updates, so a number of minutes will pass between updates for them. If any values are 0, then the value has not yet been received from the controller. If you save changes in this window, then open it again a few seconds later, you should see the new values echoed back from the controller. If you suspect communication loss, check the All Status Display (See page 66). If communication is active you will see something change in that window within 15 seconds. If communication is active but your new values were not updated after you saved them and looked at them again, then that one message to the controller may have been scrambled; re-save the values.

4.7.4.5 Code

To save the data you have entered and make it effective, you need to enter a code to authorize that action (Section 2.7, Page 32). You can come back to this field by pressing its Shortcut Letter, [Alt] F.

4.7.4.6 Save Button

Press this button to send the new settings to the controller. Since it is the default button, you can press it by pressing [Enter], or you can use its Shortcut Letter, [Alt] V. The window will close.
Figure 69 - Selecting Hydraulic Warnings from Configure Sub Menu

Figure 70 - The Hydraulic Warning Window
4.7.5 Hydraulic Warnings

When you select this from the menu (Figure 69), you will see a data entry window (Figure 70) in which you can change the conditions under which you will receive a warning about hydraulic problems, and the conditions under which the tool at a given station will be shut down because of hydraulic problems.

4.7.5.1 Hydraulic Warnings
If hydraulic problems occur, warnings can happen according to the schedule specified in this field and the next one. Warnings are defined as a specified number of hydraulic problems out of a specified number of swages that will produce an alarm. In the Hydraulic Warnings field you specify how many hydraulic problems to look for in a given run of drives. A value of 0 here will disable Hydraulic Warning.

4.7.5.2 Out Of (for Hydraulic Warnings)
In the Out Of field you specify the maximum size of a run of drives in which to count hydraulic problems. A value of 10 in this field and 23 in this field means that if 10 hydraulic problems occur in any 23 or fewer drives then an alarm will sound.

4.7.5.3 Hydraulic Shutdown
If hydraulic problems occur, shut downs can happen according to the schedule specified in this field and the next one. Shut downs are defined as a specified number of hydraulic problems out of a specified number of swages that will shut down the tool. In the Hydraulic Shutdown field you specify how many hydraulic problems to look for in a given run of drives. A value of 0 here will disable Hydraulic Shutdown.

4.7.5.4 Out Of (Hydraulic Shutdown)
In the Out Of field you specify the maximum size of a run of drives in which to count hydraulic problems. A value of 16 here, and 21 here means that if 16 hydraulic problems occur in any 21 or fewer drives then the tool will shut down, requiring Allow Tool (Section 4.6.1, Page 76).
4.7.5.5 Code

To save the data you have entered and make it effective, you need to enter a code to authorize that action (Section 2.7, Page 32). You can come back to this field by pressing its Shortcut Letter, [ALT F].

4.7.5.6 Four Display-Only Fields

Here you will see the values received from the controller for Hydraulic Warnings, Shutdowns, and Out Of. The controller sends updates to the computer for various values about every second. These values have a low priority for sending updates, so a number of minutes will pass between updates for them. If values below the Out Of fields are 0 the values have not yet come from the controller. If you save changes in this window, then open it again a few seconds later, you should see the new values echoed back from the controller. Note that the controller will lower any Out Of (Shutdown) value received that is greater than its Out of (Warnings) value. If you suspect communication loss, check the All Status Display (See page 66). If communication is active you will see something change in that window within 15 seconds. If communication is active but your new values were not updated after you saved them and looked at them again, then that one message to the controller may have been scrambled; re-save.

4.7.5.7 Save Button

Press this button to send the new settings to the controller and close the window.

It is the default button; press [F9], or use its Shortcut Letter, [ALT V].

Figure 71 - Selecting Timers from Configure Sub Menu
4.7.6 Timers

By making this menu selection (Figure 71) you will be able to adjust the values of the various timers that affect tool operation in a data entry window (Figure 72). As you can see from Figure 72, the window is mostly laid out in rows and columns; each row applies to a different timer, and each column applies to a different station. With this layout you can use different sets of values for different stations, because sometimes settings need to be changed for the tool to work well with a given model of hydraulic pump and hose length. Only do this under the advice of Huck International; improper values for these timers will prevent the proper operation of the tool. Note that each field discussion below applies to eight fields each, in a single row, one for each possible station.

4.7.6.1 Timer 0

Change this value only on the advice of Huck International. This value is in tenths of a second. The default value is 8 for 0.8 seconds. Timer 0 is the delay, while in the snub cycle, from releasing hydraulic pressure to expected completion of hydraulic eject. The controller does not start looking for limit switch #2 until this time has passed.

4.7.6.2 Timer 1

Change this value only on the advice of Huck International. This value is in tenths of a second. The default value is 20 for 2.0 seconds. Timer 1 or TD1 is the maximum time allowed to reach Limit Switch 1 at the start of a cycle.
SECTION 4.

4.7.6.3 Timer 2

Change this value only on the advice of Huck International. This value is in tenths of a second. The default value is 5 for 0.5 seconds. Timer 2 or TD2 is the maximum time allowed to reach Limit Switch 2 after reaching Limit Switch 1. The tool will try a snub cycle if the time is exceeded.

4.7.6.4 Timer 3

Change this value only on the advice of Huck International. This value is in tenths of a second. The default value is 30 for 3.0 seconds. Timer 3 or TD3 is the maximum time allowed to reach the cutoff pressure once the hydraulic valve is opened.

4.7.6.5 Timer 4

Change this value only on the advice of Huck International. This value is in tenths of a second. The default value is 12 for 1.2 seconds. Timer 4 is the delay from closing the hydraulic valve to starting the air motor in reverse.

4.7.6.6 Timer 5

Change this value only on the advice of Huck International. This value is in tenths of a second. The default value is 60 for 6.0 seconds. Timer 5 or TD5 is the maximum time allowed to run the air motor in reverse at the end of a swage.

4.7.6.7 Timer 6

Change this value only on the advice of Huck. This value is in tenths of a second. The default value is 5 for 0.5 seconds. Timer 6 or TD6 is the maximum time allowed to run the air motor in a snub cycle hunting for limit switch 2. If, during this run of the air motor, Limit Switch 2 is detected, then the tool will switch to full swage, otherwise an alarm will sound timed by Timer 7 or TD7, and the tool will spin off the fastener.

4.7.6.8 Timer 7

Change this value only on the advice of Huck International. This value is in tenths of a second. The default value is 1 for 0.1 seconds. Timer 7 or TD7 is the time the alarm will sound when Timer 6 or TD6 is exceeded.

4.7.6.9 Timer 8

Change this value only on the advice of Huck International. This value is in tenths of a second. The default value is 5 for 0.5 seconds. Timer 8 or TD8 is the maximum time to run the air motor in reverse at the end of a swage after Limit Switch 1 is detected (on the way out). If Timer 5 or TD5 runs out of time first, the air motor will stop.

4.7.6.10 Code

To save the data you have entered and make it effective, you need to enter a code to authorize that action (Section 2.7, Page 32). You can come back to this field by pressing its Shortcut Letter, E.
4.7.6.11 Save Button

Press this button to send the new timer values to the controller and save them on disk. Since it is the default button, you can press it by pressing \[\text{Enter}\], or you can use its Shortcut Letter, \(\text{Alt}[V]\). The window will close.

4.7.6.12 Display-Only Fields

Here you will see the values of the timer fields received from the controller. If any values are 0, then the value has not yet been received. Each value is sent separately by the controller, and a number of minutes will pass before they have all been sent. Once you have saved this data, the controller will echo back any values that have changed. If you then re-open the window, you should see the changed values in the lower half of the window. If you suspect communication loss, check the All Status Display (See page 66). If communication is active you will see something change in that window within 15 seconds.
4.7.7 Look Ahead

When the desired cutoff pressure is reached, the controller sends a signal that closes the hydraulic valve. Since there is a certain amount of time required for the electrical signals to travel, the relays to close, and the valve itself to close, the pressure will continue to climb a little after the decision is made to cut it off. Therefore, the controller actually starts the cutoff process at a somewhat lower pressure than the specified value to reduce the amount of "overshoot". How far ahead (in pressure) the controller looks to make the cutoff decision is called the "Look Ahead" pressure.

Another factor to consider in the Look Ahead is the fact that the controller is performing many different operations for the proper control of the tools, so it can not continuously monitor the pressures. Instead, every few milliseconds, the controller takes a "snapshot" of the pressures for all the tools at that particular instant. If a pressure reading is within that station's Look Ahead range, then the controller closes the valve. How close together successive pressure "snapshots" are depends on the tool size, bolt size, swage collar material, and the layout of pumps, hoses, and wires. The wider the spread between successive pressure readings, the larger the Look Ahead needs to be.

When you make this menu selection (Figure 73), then, in a data entry window (Figure 74), you will be able to adjust the Look Ahead pressures for each station. The default value is about 92 psi, or about 62 deci-bar.
4.7.7.1 Look Ahead Pressure Values

There are eight unlabeled input fields, aligned under the numbers 1 through 8 to indicate the station to which each applies. Enter the appropriate pressure value for each station. If, for example, you are measuring pressures in pounds per square inch, and at Station 1 with the current tool arrangement you know you can expect at least a 75 psi overshoot for a given cutoff pressure, enter 75 in the first field.

4.7.7.2 Save Look Ahead (OK) Button

Press this button to save the changes you have made to the Look Ahead values and send them to the controller.

4.7.7.3 Code

To save the data you have entered and make it effective, you need to enter a code to authorize that action (Section 2.7, Page 32). You can come back to this field by pressing its Shortcut Letter, [Alt].

4.7.7.4 Ctrlr (Display only)

These eight protected fields contain the last values received from the controller for the Look Ahead pressures.
4.8 Code Level (Not a Menu Item)

Some windows require a supervisory code in order to carry out their purpose. You can identify such windows by the presence of a Code input field.

You may want to set up a system in which only certain people can use certain windows. You can accomplish this by assigning "levels" of authorization for each window that requires a code. Then the code for the affected window must be of the required level or higher.

There are 8 levels of code. All codes start with a capital letter A, B, C, D, E, F, G, or H. Codes starting with A have the highest level of authorization and codes starting with H have the lowest level.

Press [Esc] while in an active window to see or change the code level for that window. This will bring up a new window (Figure 75) whose purpose is to change the code level for the previous window.

Note: The Change Code Level data entry window also requires a code of its own.

The code you enter for this window must be an A level code. Do not attempt to change the code level required for the Change Code Level window itself. This operation only works for other windows. In other words, once you have reached the Change Code Level window by pressing [Esc] in another window, pressing [Esc] again will be ignored.

4.8.1 Current Level

This is a "display-only" field showing the current Code Level required by the window that was active when you pressed [Esc]. It is a single letter (A through H) representing the first letter of the appropriate code.

4.8.2 New Level

Enter a new code level for the window from which this window was invoked, which is called the target window. You can enter a letter from A through H. This will cause the code field in the target window to accept only those codes that begin with the chosen capital letter or lower.

4.8.3 OK Button

Press this button to make the New Code Level take effect for the target window. Since it is the default button, you can press it by pressing [Enter], or you can use its Shortcut Letter, [AS]. The Change Code Level window will close.
4.9 Exit Confirmation (Not a Menu Item)

To exit from the Huckspin Operator Interface software, press \[\text{Alt} + \text{X}\]. You will see an Exit Confirmation data entry window (Figure 76). Here you enter an authorization code and press the OK button. All windows will close, as will the Desktop, Menu Bar, and Status Line. You will see the DOS prompt. If you did not want to exit, close the window with \[\text{Esc}\] instead of pressing the OK button.

4.9.1 Code

To proceed with the exit process you need to enter a code to authorize that action (Section 2.7, Page 32). Tab to the next position in the data entry window. You can come back to this field by pressing its Shortcut Letter, \[\text{Alt} + \text{F}\].

4.9.2 OK Button

After you have entered your supervisory code, press this button to complete your exit from the interface program. The interface program. The may take several seconds you will see the DOS procedure to exit from the turning off the power. the default, you can press or you can use its

Shortcut Letter, \[\text{Alt} + \text{X}\]
4.10 Message History Selector

This is a scrollable list in a data display window of all the error messages in chronological order, with a date/time stamp (Figure 77). The most recent message is on the bottom and it has the focus. You can use your $\uparrow$ and $\downarrow$ arrow keys and the $\leftarrow$ and $\rightarrow$ keys to scroll through the messages. $\left[ \right]$ will cause the window to appear. The window will also appear whenever a new error message is generated. Close the window with $\left[ x \right]$.

4.10.1 Communications Errors

One type of error message you may see is communications errors, of which the ones in Figure 77 are examples. You can distinguish this kind of error by the numeric code at the end of the message. The possible kinds of communications errors are too numerous to list here, but you can ignore them if they only happen on rare occasions. If they happen frequently you may have an equipment problem. The possibilities are:

- You may need to replace the serial cable from the computer to the Controller.
- You may need to replace the serial card in the computer.

You may need to replace the Controller itself if the problem is a faulty serial port in the controller.

![Message History Window](image-url)
4.10.2 Tool and Control System Errors

The following errors relate to basic components of the Huckspin system:

- "Tool 1. Before Trigger LS 1 engaged." The number after Tool could be 1-8, according to the station to which it is connected. The number after LS could be 1 or 2, depending on which limit switch is engaged. If a limit switch is engaged before you pull the trigger,
  - Bolt screwed too far into tool before start. Remove it.
  - The limit switch rod is stuck. Clean it.
  - The limit switch rod is broken. Replace it.
  - The limit switch is damaged. Replace it.

- "Tool 1. Bad Transducer or Analog Channel". The number after Tool is the station to which the tool is attached. The problem could be:
  - The Pressure Transducer. Replace it.
  - A channel of the Analog Module. Replace the appropriate Analog Module. If the station number is 1-4, replace the first Analog Module. If the station number is 5-8, replace the second Analog Module.
  - Faulty wiring or cabling from the tool to the Huckspin Control System. The number after Tool is the station in question. Use normal troubleshooting procedures to ascertain if the wiring is causing the problem.

- "Tool 1. Module error." The number after Tool is the station to which the tool is attached. The problem is the timer in the Controller. You can clear the timer by cycling power in the Controller. If possible, make sure all tools have finished their cycles before turning off the power. If you are using an 8 Tool system with its own computer, exit the Huckspin interface program before turning off the power. Report the occurrence of the problem to Huck International.

- "Tool 1. Timer 6 for LS 2 exceeded during snub." The tool went to a snub cycle because it did not detect LS 2 in time, usually because not enough thread was engaged. However, if LS 2 was still not detected after the snub, then the problem may be the Limit Switch.
  - The limit switch rod is stuck. Clean it.
  - The limit switch rod is broken. Replace it.
The limit switch is damaged. Replace it.

"#1 Thimble Exceeded Max Count." The number after # will be the station to which the tool was attached, instead of Thimble, the message could say Swage Cavity or it could say Tool. Replace the indicated part.

"Tool 1, Hydraulic Problem" The number after Tool will be the station to which the tool was attached. It took too long to reach cutoff pressure after the hydraulic valve was opened.

- Hydraulic line pinched. Straighten it.

4.11 Quick Reference

This section summarizes various operations by simply listing the steps. Menu choices are in **bold** letters and [optional actions] are in square brackets. A typical optional action would be entering new values in a window if the values entered in the window previously and saved are still the correct values. Most windows close when you save the data in them, but a few allow you to repeat steps for different values. For those windows the summary includes a step near the end that leads you to a field or selection list you were at previously and says "repeat until done." There you go back to the step that has the same field or selection list.

4.11.1 Adding Tools
- NewTool
- Add

Look at list to confirm that the tool has not already been added.

- [ ]
- [ ]

- [ ] [ ]
- Type new serial number
- [ ]
- [ ] to serial number field. Repeat until done.
- [ ] to close window when done.

4.11.2 Deleting Bolt Sizes from Tools
- NewTool
- Delete
- In list of serial numbers until desired one is highlighted.
- \( \text{Tab} \) to Bolt Size list
- In list of bolt sizes until desired one is highlighted.
- \( \text{Tab} \) to Code field. Type correct code.
- \( \text{Enter} \)
- \( \text{Tab} \) to serial number list. Repeat until done.
- \( \text{ESC} \) to close window when done.

4.11.3 Deleting Tools
- NewTool
- Delete
- In list of serial numbers until desired one is highlighted.
- \( \text{Tab} \) \( \text{Tab} \)
- In Code field type correct code.
- \( \text{Enter} \) to Delete Serial Button.
- \( \text{Enter} \)

4.11.4 Editing Tools
- NewTool
- Edit
- In list of serial numbers until desired one is highlighted.
- \( \text{Tab} \) to Bolt Size list
- In list of bolt sizes until desired one is highlighted
- \( \text{Enter} \) to press the default Show button and bring up the values for the selections.
- \( \text{Tab} \) to each field and edit as appropriate.
- \( \text{Tab} \) to Code field and type correct code.
- \( \text{Tab} \) to Save Button
- \( \text{Enter} \)

4.11.5 Connecting Tools (Plug)
- NewTool
- Plug
- Type Station#
4.11.6 Disconnecting Tools (UnPlug)
- New Tool
- Unplug
- Type Station#
- Tab
- In Code field type correct code.
- Enter

4.11.7 Maintenance
- New Tool
- Maintenance
- Tab
- to select Serial#
- Tab
- Enter

4.11.8 Current Pressure Settings
- Pressures
- Current Settings
- Type Station#
- Tab
- Enter if you want to bring up default values
- Edit Full Pressure Cutoff, Snub Cutoff, Hold time, as needed.
- Tab to Code field
- Type correct code
4.11.9 Default Pressure Settings
- **Pressures**
- **Default Settings**
  - `Tab` to select desired Bolt Size from list
  - `Enter` to bring up defaults for that bolt size
  - `Tab` and edit default pressures for snub and full for 37 and 52 tools, as needed
  - `Tab` to Code field
  - Type correct code.
  - `Tab` to Save Button
  - `Enter`
  - `Tab Tab` to Bolt Size List. Repeat until done.
  - `Esc` to close window when done.

4.11.10 Snub/Full Swage
- **Pressures**
- **Snub Only**
- **Type Station**
  - `Alt B` to make the station snub only, or `Alt F` to allow Full Swages at the station.

4.11.11 Hydraulic Start Up
- **Pressures**
- **Hydraulic Start**
  - [edit data if needed]
  - `Enter`
  - Window remains open with focus one Stop Button; abort by pressing `Enter` again

4.11.12 Abort Hydraulic Start Up
- Once you have pressed the Ok button in the Hydraulic Start Up window, you can abort by pressing `Enter` since the focus has moved to the Stop button. Of course if you moved the focus, then you must first either `Tab` back to the Stop button or press it with `Alt O`
4.11.13 Calibrate

- Set up hydraulic rig and pressure gauge as appropriate.
- Display
- Show
- Display
- Calibrate
- Type Station#

- Enter
- Type Correct Code
- Enter

- Tab to Q field

Either
- Type appropriate pressure value
  - Tab
  - P

Or
- Type appropriate scale value
  - Tab
  - S

4.11.14 Show All Status Display

- Display
- Show

4.11.15 Swage Curves

- Graph
- Current 1, or Current 2 . . . Current 8

4.11.16 Distribution Curves

- Graph
- Distribution 1, or Distribution 2 . . . Distribution 8

4.11.17 Graph Settings

- Graph
- Settings
- Type swage dot spread
- Type distribution dot grouping
4.11.18 Print Swage Curves
- Graph
- Print Swage
- Type the Station#

- Tab
- Type the number of swage curves you want to print.

- Enter

4.11.19 Allow Tool
(For a tool that was shut down because of hydraulic problems)
- Supervisor
- Allow Tool
- Type Station#

- Tab
- Type correct code

- Enter

4.11.20 Code Replacement
- Supervisor
- Code Replacement
- Type the existing code you want to replace.

- Tab
- Type the new code that is to replace the old code

- Tab
- Type the correct code to authorize this action.

- Enter

4.11.21 Swage Analysis
- Supervisor
- Set Swage Analysis
- Type the low values of the pressure windows where dots are counted for each station
- Type the high values of the pressure windows where dots are counted for each station
- Type the number of dots required in each pressure window to consider the swage OK

- Tab to code field
- Type correct code

- Enter
4.11.22 Modem Settings
- Configure
- Modem
  - Type the phone number for data collection in Waco
  - [Type the phone number for local data collection]
  - Tab
  - Type the number of minutes between each transmission of data, if data will be sent more than once per day.
  - Tab
  - Type the number of data transmissions per day
  - Tab
  - Type the time of day (24 hour clock) for the first (or only) data transmission each day.
  - Enter

4.11.23 Warning Levels
(Swage Counts for parts to consider them worn out and send replacement warning)
- Configure
- Warning/Snub Factor
  - Type the counts at which to consider various parts worn out.
  - Enter

4.11.24 Set Snub Factor
(How Many Snubs count for the wear of one full swage)
- Configure
- Warning/Snub Factor
  - Tab to the Snub Factor field
  - Type the appropriate snub factor
  - Enter

4.11.25 Set U-Bolt Drives
(How many partial drives to complete a 2-prong U-Bolt drive)
- Configure
- Warning/Snub Factor
  - Tab to the U field
  - Type the number of partial drives to complete both sides.
  - Enter
4.11.26 Add Bolt Sizes
- Configure
- Add/Delete BoltSize
- Type the new Bolt Size
- Enter

4.11.27 Delete Bolt Sizes
(Delete the last new bolt size you added.)
- Configure
- Add/Delete BoltSize
- Alt+L

4.11.28 Set Snooze Max
(1,3-tool: How many swages after reset before alarm sounds again for counts exceeded)
- Configure
- Snooze/Thresh/Delay
- Type the number of swages allowed
- Tab to the Code field
- Type the correct code
- Enter

4.11.29 Set Threshold
(Minimum pressure controller is allowed to send to computer. Lower pressures not sent.)
- Configure
- Snooze/Thresh/Delay
- Tab to the Thresh field
- Type the minimum pressure allowed to be sent.
- Tab to the Code field
- Type the correct code
- Enter

4.11.30 Set Save Delay
(How many tenths of a second pass between times the controller saves its data to the RAMdisk)
- Configure
- Snooze/Thresh/Delay
- Tab Tab to the SaveDelay field
- Type in the allowed dealy (in tenths of a second) between saves.
- Tab to the Code field

Huckspin Operator Interface Software
• Type the correct code
  
 4.11.31 Set Hydraulic Warnings
  • Configure
  • Hydraulic Warnings
  • Type the number of hydraulic problems that could cause a warning
  • Tab to the first Out Of field
  • Type the number of consecutive drives in which the count of hydraulic problems accumulates.
  • Tab to the Code field
  • Type the correct code
  • Enter

4.11.32 Set Hydraulic Shutdown
  • Configure
  • Hydraulic Warnings
  • Tab to the Hydraulic Shutdown field
  • Type the number of hydraulic problems that could cause a shutdown
  • Tab to the next Out Of field
  • Type the number of consecutive drives in which the count of hydraulic problems accumulates.
  • Tab to the Code field
  • Type the correct code
  • Enter

4.11.33 Set Timers
  • Configure
  • Timers
  • Edit the various timers for each station as appropriate
  • Tab to the Code field
  • Type the correct code
  • Enter

4.11.34 Set Look Ahead
  • Configure
  • Look Ahead
  • Edit the look ahead pressure for each station as appropriate
4.11.35 Change Code Level

- In any (other) window that requires a supervisory code, press [Esc].
- Type the capital letter of the new code level you want for the window.
- [Tab]
- Type the correct code to authorize this action beginning with the letter A.

4.11.36 See History of Error Messages

- [F6]

4.11.37 Exit

- [Alt]:x
- Type correct code
- [Enter]
5. HUCKSPIN UTILITIES

Using Huckspin Utility Programs

5.1 Introduction

Following is a list of programs that are useful in troubleshooting, and updating the HUCKSPIN Control System.

5.2 Function of Programs (List 1)

5.2.1 CM.EXE
CM.EXE is a program file used to set up the PC to communicate with another computer, (e.g., the ROM-DOS module), through the RS-232 serial port connections. With the Huckspin system, this allows the HUCKSPIN program in the PC to talk with the programs in the Controller ROM-DOS module.

5.2.2 HS.EXE
HS.EXE is a back-up copy of the program located in the “A” drive of the Controller ROM-DOS module. When running the ROM-DOS module, it is the main program which operates the Huckspin system. To do this, it processes information from the PRES.SAV file, Limit Switches and the Analog Input Module, (pressure Transducer signals). It then gives output signals to the electronic relays in the Controller which in turn cause the operation of the various tooling components.

5.2.3 HUCKSPIN.EXE
HUCKSPIN.EXE is the program used by the PC to communicate with the Controller, and is called the interface program. (It is the program seen on the screen of the PC).

5.2.4 HUCKSPIN HLP
HUCKSPIN.HLP produces notes on the screen of the PC to help the user.

5.2.5 MAINT.FIL
MAINT.FIL is used to store all maintenance data for the tools.
SECTION 5.

USING HUCKSPIN UTILITY PROGRAMS

5.2.6 CLEAN.BAT

CLEAN.BAT is a batch file that removes any data files from a diskette. Use it prior to updating any program files.

5.2.7 PRES.SAV

PRES.SAV is a back-up copy of the program located in the "B" drive of the Controller ROM-DOS module. This program saves the data entered using the HUCKSPIN.EXE program, (e.g., full and snub pressures, counts, etc.).

5.2.8 ST.EXE

ST.EXE is a back-up copy of the program also located in the "B" drive of the Controller ROM-DOS module. It is used as a trouble shooting and function test program (e.g., when setting tool Limit Switches). It is operated by the PC by using the CM program to communicate with the "B" drive.

5.3 Using the HUCKSPIN.EXE Program with a Laptop

Note: This section of the manual should be used in conjunction with the section "Controller Display".

It is usual to copy this program and related files onto the laptop hard disk ("C" Drive). Although it can be used from the diskette placed in the "A" drive, DO NOT run this program from any floppy drive, since it creates files that normally store gun information. If you want to run HUCKSPIN separate from a connected controller, copy this master diskette and use the copy. With the PC switched off, make the connection with the Controller using a serial cable. Switch the PC "ON".

To start the HUCKSPIN program running, instructions are typed on the keyboard. These instructions must format the HUCKSPIN program to suit the controller it will be communicating with and the functions required of it. (Refer to Section 1.5.3 of the Huckspin Operator Interface Software manual for a description of launching HUCKSPIN.)

The "Controller Display" section of the Huckspin Manual should now be used to proceed further.

Note: When saving any data, (e.g., pressures, serial or station numbers or "counts"), the values, etc., will be effective immediately. However, they will not be saved permanently in the battery powered RAM section of the ROM-DOS Module if the Controller is switched off before the timer preset value set in the HUCKSPIN Save Delay timer, which is user programmable. If the Controller is switched off before the Save Delay timer setting, the original data will be used, (i.e., the values present before they were changed).
5.4 Using the ST.EXE Program

This program is used to check the function of the various tooling components of the Huckspin system, (Air Valve & Motor, Trigger, Limit Switches, Alarm, Powerig Combination Valve). If the HUCKSPIN program is already being used on the PC, it is necessary to stop and exit from this before using ST. If the HUCKSPIN program is not being used, start from step "2" below.

1) If the HUCKSPIN program is already being used, press the [Alt]+[X] keys. An additional screen view will now appear on the HUCKSPIN screen, which is asking for the code. Enter the proper code to exit.

2) Since the ST program is located in the Controller ROM-DOS Module, the CM program must be used to communicate with it.

Type in CM and press [Enter]. A comm port selection will now appear in the upper left side of the screen. Select the comm port available in your PC by pressing its number. The next screen asks for a baud rate selection. The baud rate is the speed at which data is transferred between the PC and the ROM-DOS Module. Since you must stop the HS.EXE program that is running in the ROM-DOS, you may select 115,200, or, since it is the default selection, just press [Enter].

If the ROM-DOS is running HS, some characters should periodically show on the screen. Press [Esc] to stop the HS program. Note that the baud rate automatically drops to 9600 so that you can communicate with the ROM-DOS via the keyboard.

3) The "A" prompt from the ROM-DOS Module will now appear. Since the ST program is in the "B" drive of the Module, type B:; then press [Enter] to get to the "B" drive prompt.

4) To run the ST program, type ST, then press [Enter]. ST can be invoked with Scaling. The default scale is 3.05250, so to enter a different scale, type HS 2.14697, for example.

Note: If the error message "Bad Command or File Name" appears on the screen, it is possible that the ST program is not present. To check if the ST program is present, type DIR then press [Enter]; the screen will now show the files in the "B" drive, (see List 2). If the ST program is not there, then it should be up-loaded into the "B" drive. (See section "Up and Down Loading Files to & from the ROM-DOS Module".) If the error message is "ISBX Card not found", this indicates that the ROM-
DOS Module has not been configured for a 3-Tool Controller. Please call a Huckspin Systems Engineer.

5) Some text instructions will appear on the screen, beneath which is a row of numbers and letters, as follows:

```
1: t 1 2 p. f r h a x 0 0 -819 -2500 0
```

- Gun #
- Trigger
- Limit SW1
- Limit SW2
- Gun Power

Data After Scaling (normally PSI)
Raw Data with Offset Subtracted
Raw Data with High Bit Stripped Out
Analog Module Raw Data Input
Reset
Alarm
Hydraulic Combination Valve
Gun Reverse
Gun Forward

6) To check out a particular station, press the number key for that station, (e.g., for station 2, press the 2 key)

The numbers, t, 1, 2, p, and x are input signal indicators from the tool. If a signal is present, the letters of those indicators will change to upper case, (e.g., t will change to T, p will change to P, etc.). If a limit switch is made, its number will appear.

The letters f, r, h, and a show outputs to the Manifold and Powerig and are used to check the function of the components they represent. As an example, pressing the F key will operate the Air Valve to rotate the Air Motor and Thimble forward. Pressing any other key, (not the
5.5 Location of Program Files in the Controller ROM-DOS Module

The ROM-DOS Module is itself a computer and has an "A" and a "B" drive. "ROM-DOS Module" is an abbreviation for "Read Only Memory", and the "A" drive has a "ROM" type memory. This means that its contents cannot be changed, the programs only read its contents. The "B" drive has a "RAM" type memory, ("Random Access Memory"). Its contents can be changed and programs look at what it contains while they are running.

When the Module is working, it makes use of "DOS", (Disc Operating System) program commands. "DOS", sometimes known as "MS-DOS" (Micro Soft Disc Operating System), is used in computers worldwide.

List 2 shows the locations of Huckspin program files within the ROM-DOS Module. Some of these have already been mentioned previously. Explanations are given for those not previously mentioned:

COMMAND.COM, CONFIG.SYS, VDISK.SYS and AUTOEXEC.BAT. These files will also be found in most standard computers and are used to configure (make rules, etc.) how the computer should operate and what it should do when it is switched on.

XF.EXE is used when loading programs up (up-loading), or bringing programs down (down-loading), between the PC and the ROM-DOS Module.
5.6 Up and Down Loading Files to & from the ROM-DOS Module

Sometimes it may be necessary to up-load Huckspin programs from the PC connected to the Controller to the ROM-DOS Module, (e.g., if the ST program is not present in the ROM-DOS Module). It may also be necessary to down-load programs from the ROM-DOS Module into the PC connected to the Controller.

Note: The terms "up-load" and "down-load" can be misleading since the commands given for these operations only copy program files, they do not move them from one location to another. An example, if ST is up-loaded from the PC to the ROM-DOS Module, a copy of the file is placed in the ROM-DOS Module but the original file is still in the PC.

5.7 Up-Loading Program Files

The following steps explain how to up-load the ST.EXE program into the "B" drive of the ROM-DOS Module. However, the same basic steps are used to up-load other program files.

1) Make the cable connection to the Controller as described in the section "Using Huckspin Computer Programs".

2) Follow instructions 1, 2, and 3 on 115 of this section of the manual but leave the screen showing the "A" drive of the ROM-DOS Module.

3) Press the key on the keyboard.

4) The program will ask what file you want to transfer. Type ST.EXE and press .

5) The program will ask what name you want to call the copied file. If you want to keep the same name, just press .

6) The program will begin copying the file. Several characters will flow across the screen as the program is being transferred. When the transfer has been completed, the A> or B> prompt will reappear.

5.8 Down Loading Program Files

The following steps explain how to down-load the PRES.SAV file to the "C" drive of the connected computer.
SECTION 5. USING HUCKSPIN UTILITY PROGRAMS

1) Make the cable connection to the Controller as described in the section "Using Huckspin Computer Programs".

2) Follow instructions 1, 2, and 3 on 115 of this section of the manual but leave the screen showing the "A" drive of the ROM-DOS Module.

3) Press the [Esc] key on the keyboard.

4) The program will ask what file you want to transfer. Type PRES.SAV and press [Enter].

5) The program will ask what name you want to call the copied file. If you want to keep the same name, just press [Enter].

6) The program will begin copying the file. Several characters will flow across the screen as the program is being transferred. When the transfer has been completed, the A> or B> prompt will reappear.
# SECTION 5. USING HUCKSPIN UTILITY PROGRAMS

## Program Files on the Huckspin Computer Diskette

Volume in drive A has no label  
Volume Serial Number is 0610-2434  
Directory of A:\

<table>
<thead>
<tr>
<th>COMMAND</th>
<th>COM</th>
<th>47845</th>
<th>04-09-91</th>
<th>5:00a</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROOT</td>
<td>&lt;DIR&gt;</td>
<td>10-12-94</td>
<td>7:08a</td>
<td></td>
</tr>
<tr>
<td>DOS</td>
<td>&lt;DIR&gt;</td>
<td>10-12-94</td>
<td>7:08a</td>
<td></td>
</tr>
<tr>
<td>HUCKSPIN</td>
<td>&lt;DIR&gt;</td>
<td>10-12-94</td>
<td>7:08a</td>
<td></td>
</tr>
<tr>
<td>INSTALL</td>
<td>BAT</td>
<td>199</td>
<td>01-20-95</td>
<td>9:23a</td>
</tr>
<tr>
<td>INSTL</td>
<td>EXE</td>
<td>4064</td>
<td>12-21-93</td>
<td>1:40p</td>
</tr>
<tr>
<td>MADIR</td>
<td>EXE</td>
<td>3696</td>
<td>03-24-94</td>
<td>10:03a</td>
</tr>
<tr>
<td>AUTOEXEC</td>
<td>BAT</td>
<td>31</td>
<td>01-20-95</td>
<td>9:27a</td>
</tr>
<tr>
<td>CONFIG</td>
<td>SYS</td>
<td>10</td>
<td>01-20-95</td>
<td>10:00a</td>
</tr>
<tr>
<td>UPDATE</td>
<td>BAT</td>
<td>105</td>
<td>02-27-95</td>
<td>3:08p</td>
</tr>
</tbody>
</table>

Directory of A:\DOS

<table>
<thead>
<tr>
<th>FORMAT</th>
<th>COM</th>
<th>32911</th>
<th>04-09-91</th>
<th>5:00a</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODE</td>
<td>COM</td>
<td>23537</td>
<td>02-03-90</td>
<td>1:00p</td>
</tr>
<tr>
<td>MORE</td>
<td>COM</td>
<td>2618</td>
<td>02-03-90</td>
<td>1:00p</td>
</tr>
<tr>
<td>SYS</td>
<td>COM</td>
<td>13440</td>
<td>02-03-90</td>
<td>1:00p</td>
</tr>
<tr>
<td>530SET</td>
<td>EXE</td>
<td>19149</td>
<td>05-19-92</td>
<td>5:53p</td>
</tr>
<tr>
<td>CHKDSK</td>
<td>EXE</td>
<td>16200</td>
<td>02-03-90</td>
<td>1:00p</td>
</tr>
<tr>
<td>DEBUG</td>
<td>EXE</td>
<td>20634</td>
<td>02-03-90</td>
<td>1:00p</td>
</tr>
<tr>
<td>FDISK</td>
<td>EXE</td>
<td>57224</td>
<td>04-09-91</td>
<td>5:00a</td>
</tr>
<tr>
<td>LL</td>
<td>EXE</td>
<td>60800</td>
<td>11-29-93</td>
<td>4:01p</td>
</tr>
<tr>
<td>MEM</td>
<td>EXE</td>
<td>39818</td>
<td>02-03-90</td>
<td>1:00p</td>
</tr>
<tr>
<td>PRINT</td>
<td>EXE</td>
<td>15656</td>
<td>02-03-90</td>
<td>1:00p</td>
</tr>
<tr>
<td>SORT</td>
<td>EXE</td>
<td>6938</td>
<td>02-03-90</td>
<td>1:00p</td>
</tr>
<tr>
<td>UNDELETE</td>
<td>EXE</td>
<td>13924</td>
<td>02-03-90</td>
<td>1:00p</td>
</tr>
<tr>
<td>HIMEM</td>
<td>SYS</td>
<td>13824</td>
<td>03-10-92</td>
<td>3:10a</td>
</tr>
<tr>
<td>EDIT</td>
<td>EXE</td>
<td>9664</td>
<td>09-13-94</td>
<td>10:51a</td>
</tr>
<tr>
<td>EDIT</td>
<td>COM</td>
<td>413</td>
<td>02-03-90</td>
<td>1:00p</td>
</tr>
<tr>
<td>QBASIC</td>
<td>EXE</td>
<td>254799</td>
<td>02-03-90</td>
<td>1:00p</td>
</tr>
</tbody>
</table>

Directory of A:\HUCKSPIN

<table>
<thead>
<tr>
<th>HUCKSPIN</th>
<th>ASC</th>
<th>5109</th>
<th>01-20-95</th>
<th>4:28p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM</td>
<td>EXE</td>
<td>31872</td>
<td>08-05-94</td>
<td>3:18p</td>
</tr>
<tr>
<td>CLEAN</td>
<td>BAT</td>
<td>13</td>
<td>01-20-95</td>
<td>8:57a</td>
</tr>
<tr>
<td>H</td>
<td>COR</td>
<td>733</td>
<td>04-03-94</td>
<td>1:45p</td>
</tr>
<tr>
<td>MAINT</td>
<td>TXT</td>
<td>1018</td>
<td>10-31-93</td>
<td>6:51p</td>
</tr>
</tbody>
</table>

19 files(s)  
601549 bytes  
10752 bytes free
### SECTION 5. USING HUCKSPIN UTILITY PROGRAMS

<table>
<thead>
<tr>
<th>FONT</th>
<th>FL1</th>
<th>2839</th>
<th>11-03-93</th>
<th>7:17a</th>
</tr>
</thead>
<tbody>
<tr>
<td>TESTFONT</td>
<td>EXE</td>
<td>5872</td>
<td>11-03-93</td>
<td>7:22a</td>
</tr>
<tr>
<td>HOLD</td>
<td>EXE</td>
<td>292560</td>
<td>02-08-95</td>
<td>3:59p</td>
</tr>
<tr>
<td>BUFFER</td>
<td>SIZ</td>
<td>5</td>
<td>02-24-95</td>
<td>2:27p</td>
</tr>
<tr>
<td>HUCKSPIN</td>
<td>HLP</td>
<td>72799</td>
<td>01-20-95</td>
<td>4:17p</td>
</tr>
<tr>
<td>HUCKSPIN</td>
<td>EXE</td>
<td>292880</td>
<td>03-02-95</td>
<td>11:58a</td>
</tr>
</tbody>
</table>

13 file(s)  704900 bytes  10752 bytes free

Directory of A:\ROOT

- .   <DIR>       10-12-94  7:08a
- ..  <DIR>       10-12-94  7:08a
| CONFIG | SYS   | 57   | 12-15-93 | 9:10a |
| AUTOEXEC | BAT  | 79   | 12-15-93 | 12:06p|

4 file(s)  136 bytes  10752 bytes free

#### LIST 1

**Program Files in the Controller ROM-DOS Module**

Volume in drive A is ROM DISK.

Directory of A:\

<table>
<thead>
<tr>
<th>COMMAND</th>
<th>COM</th>
<th>24071</th>
<th>3-17-92</th>
<th>3:31a</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONFIG</td>
<td>SYS</td>
<td>54</td>
<td>1-16-95</td>
<td>5:44p</td>
</tr>
<tr>
<td>VDISK</td>
<td>SYS</td>
<td>4039</td>
<td>8-31-93</td>
<td>5:14p</td>
</tr>
<tr>
<td>AUTOEXEC</td>
<td>BAT</td>
<td>34</td>
<td>12-15-94</td>
<td>9:40a</td>
</tr>
<tr>
<td>XF</td>
<td>EXE</td>
<td>5504</td>
<td>5-16-94</td>
<td>9:19a</td>
</tr>
<tr>
<td>ES</td>
<td>EXE</td>
<td>27440</td>
<td>1-20-95</td>
<td>7:28a</td>
</tr>
</tbody>
</table>

6 file(s)  0 bytes free

Directory of B:\

Volume in drive B is VDISK 3.31

Directory of B:\

<table>
<thead>
<tr>
<th>PRES</th>
<th>SAV</th>
<th>532</th>
<th>1-01-80</th>
<th>12:01a</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST</td>
<td>EXE</td>
<td>7904</td>
<td>1-01-80</td>
<td>12:03a</td>
</tr>
</tbody>
</table>

2 file(s)  28672 bytes free

#### LIST 2
## HUCKSPIN TOOLING SYSTEM

Swage and Snub Cut-off Pressures for Huckspin Tools

Note: The pressures shown below are normally the same values as those shown in the Configuration Menu in the HUCKSPIN Program.

<table>
<thead>
<tr>
<th>BOLT DIA.</th>
<th>3/8:</th>
<th>1/2:</th>
<th>5/8:</th>
<th>3/4&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HS37 TOOL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FULL SWAGE</td>
<td>147(2130)</td>
<td>248(3590)</td>
<td>21(6110)</td>
<td>-</td>
</tr>
<tr>
<td>SNUB</td>
<td>44(635)</td>
<td>72(1050)</td>
<td>124(1800)</td>
<td>-</td>
</tr>
<tr>
<td><strong>HS52 TOOL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FULL SWAGE</td>
<td>-</td>
<td>170(2470)</td>
<td>290(4200)</td>
<td>356(5165)</td>
</tr>
<tr>
<td>SNUB</td>
<td>-</td>
<td>51(735)</td>
<td>86(1250)</td>
<td>107(1550)</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>BOLT DIA.</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HS37 TOOL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FULL SWAGE</td>
<td>164(2375)</td>
<td>239(3460)</td>
<td>291(4215)</td>
<td>421(6110)</td>
<td>-</td>
</tr>
<tr>
<td>SNUB</td>
<td>48(700)</td>
<td>71(1025)</td>
<td>86(1250)</td>
<td>124(1800)</td>
<td>-</td>
</tr>
<tr>
<td><strong>HS52 TOOL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FULL SWAGE</td>
<td>-</td>
<td>164(2380)</td>
<td>200(2900)</td>
<td>290(4200)</td>
<td>460(6670)</td>
</tr>
<tr>
<td>SNUB</td>
<td>-</td>
<td>48(700)</td>
<td>59(860)</td>
<td>86(1250)</td>
<td>137(1985)</td>
</tr>
</tbody>
</table>

**NOTES:**

1) Bolt diameters are in millimeters except where shown.
2) Pressures are in Bar except those in parenthesis which are in Psi.
3) Powerig "Pull" pressure should be adjusted to 28 to 34 Bar, (400 to 500 Psi), above FULL SWAGE pressure.

---

**TABLE 1**
6. Troubleshooting Guide

This Troubleshooting Guide is divided into the following four sections:

- Huckspin Common Components
- Huckspin 8-Tool Controller
- Huckspin 1-Tool and 3-Tool Controllers
- Troubleshooting Procedures

6.1 Huckspin Common Components

The Huckspin controllers have the following common components:

- Master Control Module with ISBX Interface Module
- Analog Input Module
- Power Supplies

Begin troubleshooting by deciding the most likely cause of the problem. If only one tool out of two or more is malfunctioning, the problem is PROBABLY not inside the control panel. With this kind of malfunction, the easiest way to find out if the problem is external to the control panel is to move the tool to another station and run it. If it does not run at the new station, the problem is in the tool.

If ALL the tools are malfunctioning, first check if the modules inside the control panel are getting enough power. Open the control panel and check the lights on the modules to see if they are burning brightly. If they are dim, one of the tools could be shorting out and causing the problem. Unplug one tool at a time to see if the lights return to normal brightness. If the lights go bright after a tool has been unplugged, check that tool for shorts. If the problem is not in the tool, use the following procedures.

Troubleshooting the control panel consists of checking the various modules, as follows.

6.1.1 MASTER CONTROL MODULE (ROM-DOS)

If the Huckspin tools will not operate, first check that there is power on the control system. If not, check the fuses and diagnostic lights, the power supply, and/or the battery inside the ROM-DOS Module to determine where the problem is.

6.1.2 Checking the Fuses and Diagnostic Lights

There are two fuses in the Master Control Panel, one in the ROM-DOS Module, and one at the top of the terminal strip.
6.1.3 The ROM-DOS Fuse

The ROM-DOS fuse is a round plug-in type fuse located on the ROM-DOS inverter board, and is accessed by removing the ROM-DOS cover. Unplug it (with power OFF) and check it. If it is blown, it must be replaced.

6.1.4 The Fuse at the Top of the Terminal Strip

If there is no power on the control system, check the fuse located at the top of the terminal strip. The fuse is housed in a black plug-in holder. Remove the holder by pulling it out of the terminal. Open the holder by using a small pointed object to pry open the door flap. Check the fuse inside. If it checks OK, replace the fuse and the fuse holder. If power is still not available, check the power source.

6.1.5 Checking the ROM-DOS Diagnostic Lights

The RED and GREEN LED's at the bottom of the ROM-DOS Module provide the user with a diagnostic indication of errors that might occur during normal operation of that module. The GREEN LED is connected directly to the ROM-DOS modules' watchdog circuit. The watchdog circuit provides a power up reset to the ROM-DOS when the module is initially powered. The watchdog circuit receives updates from the ROM-DOS and continuously monitors ROM-DOS supply voltage. If any of these items are missing within the jumper selected time-out period, this circuit will reset the ROM-DOS. The RED LED is directly connected to a port pin of the ROM-DOS and is controlled directly by firmware. When the ROM-DOS module is initially powered, the RED LED will come on momentarily, then the GREEN LED will come on solid.

ROM-DOS LED Diagnostic Summary

GREEN LED ON - RED LED OFF
1. Normal Operation

GREEN LED Flashing - RED LED Solid ON
1. Low voltage occurrence (Turn main power OFF, then ON again to reset.)
2. ROM-DOS local bus communications error/Bad or disconnected cable (Turn main power OFF, then ON again to reset.)
3. ROM-DOS system failure (Turn main power OFF, then ON again to reset.)
4. RS-422 port not connected and spurious characters are being received. (Check Jumper at top of ROM-DOS Module)

GREEN and RED LED Alternating ON and OFF
1. The Interbus-R module is in a continuous reset mode. Possible bad local bus cables or defective I/O communications.
6.1.6 Checking the ROM-DOS DC Power Supply

If power is ON and the tool(s) will not operate, check the operation of the ROM-DOS Master Control Module. Check to be sure that both the REC and XMT amber LED's at the top middle of the module are off. If either one or both are on continuously, dimly or bright, the module will not function properly and must be replaced. Also, be sure that there is a jumper from -FH to COM on the 9-pin green terminal connector at the top left of the module. Check that the green LED at the bottom of the module, under the flat ribbon connector, is on steadily and that the red LED is not on. If the green LED is not on, or is flashing, or if the red LED is on, or is flashing, cycle power on and off to see if the green LED stays on. If not, check the incoming power supply to the Master Control Module. If it measures less than 20VDC, the Module will not operate properly. Use a voltmeter to measure the DC voltage on terminals + and - (wires 99 and 2) on the Master Control Module green terminal plug at the lower right side of the module. (BE SURE THAT THE TERMINAL PLUG IS PLUGGED INTO THE MODULE). If less than 20VDC is measured, or more that 26VDC, repair or replace the 24VDC power supply.

6.1.7 Checking the Battery

If the power supply is OK, turn off all power to the Control Panel. The problem could be a faulty Master Control Module battery, located inside the Master Control Module. Remove the Module by first removing the green power plug, then removing the top I/O cable which is located at the top right side of the Module, and which is jumped to the first input module. Then remove the serial communications cable (if present), remove the flat ribbon cable (ISBX CABLE, present on 1 and 3 tool control systems only) and then disconnect the green ground wire at the top left of the module. On the 1 and 3 tool control systems, there is a small (22 GA) wire coming out of the bottom of the module that is hooked up to a terminal inside the control panel. Carefully disconnect this wire from the terminal strip, then remove it from the wiring duct. When all the cables and wires are removed, the module can be lifted out by pushing the module down toward the bottom of the module to release the spring actuated DIN clamp under the module. When the module has traveled enough to release the spring clamp, the module can be lifted out of the panel.

With the module out, unscrew the top two Phillips head screws holding the module lid on. These are captive screws, so just loosen them. Pull up on the lid to expose the ground wire attaching the lid to the module. This wire can be disconnected by separating it from the stab-on connector on either end. Place the module on its side and remove one of the side panels by removing three (3) Philips head screws. Remove the bottom circuit board mounting screws (usually one, but a possibility of four). Slide the circuit board out of the aluminum holder. Remove the white plastic screw from the bottom of the circuit board. (This screw holds the ISBX module in place.) Remove the DC/DC inverter assembly by removing four (4) 5.5 mm nuts. Take note of which post has the ground connector for replacement. Carefully lift the DC/DC converter. (CAUTION! The converter has a permanently installed cable on the left side of the module. The converter can only be lifted for access, and must be carefully placed while attached.
to the main circuit board.) Remove the ISBX circuit board from the Master Control Module. This exposes the battery system. Note that there are two battery holders. You can put in a new battery while the old battery is in place, as long as you remove the old battery within ONE MINUTE. If the battery was not completely dead, you might be able to save the data on the RAM disk. After installing the new battery and removing the old one, reassemble the module.

### 6.1.8 ANALOG INPUT MODULE

If you are having difficulty with pressure readings, it could be the analog module or the analog input system. Check the resistors, LED's and/or pressure transducer.

#### 6.1.8.1 Checking the Resistors

First, check the resistors at the bottom of the analog module with an OHM meter. Turn the power off, and measure each channel of the analog inputs for 50 OHMS. If you measure less than 49 OHMS or more than 51 OHMS, unplug the green terminal connector on the Analog Input Module and re-measure. If the measurement changes, replace the Analog Input Module. If the measurement remains the same, check the resistors, cabling and transducer.

#### 6.1.8.2 Checking the LED's

If the measurements are correct, check the green LED at the top of the module. If off, replace the cable between the Master Control Module and the Analog Input Module. If the green light is still off, replace the Analog Input Module. If still off, replace the Master Control Module. Check the green Power light in the windowed area at the bottom of the module. If off, use a voltmeter to check the voltage from wire #24 to #2, which should be +24VDC. If no voltage is present of if the voltage is below 20VDC, check the 24 volt power supply. Repair or replace as required.

#### 6.1.9 Checking the Pressure Transducer

If all the lights are indicating properly and there is some question about the pressure being input to the Master Control Module, a milli-ammeter can be used to check the integrity of the pressure transducer and its wiring. Check the 50 OHM precision resistor located at the bottom of the Analog Module. With power off, use an OHM meter to measure the resistance, which should be between 49 and 51 OHMS. Replace the resistor if this reading is incorrect. With the power off, remove one of the analog input wires at the Analog Input Module, either terminal #3, terminal #6, terminal #9, or terminal #12. Place a DC milli-ammeter in series with the wire removed and the terminal it was removed from, then turn power on. The DC milli-ammeter should read 4 MADC (± 2 MADC) when the tool is idling, and should increase while the tool is swaging. If the DC milli-ammeter reads less than 4 MADC (± 2 MADC), check the integrity of the wiring, or the transducer. If it reads 4 MADC, and increases upon swaging, and the system still does not respond properly to pressure, replace the module.
<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>PROBABLE CAUSE</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool spins CW*, then spins CCW**. No swage action performed. No Audible alarm.</td>
<td>Tool incorrectly aligned with pin--thimble does not engage pin.</td>
<td>Improve tool/pin alignment.</td>
</tr>
<tr>
<td></td>
<td>Incorrect nose/switch rod adjustment.</td>
<td>Reset nose/switch rod adjustment.</td>
</tr>
<tr>
<td></td>
<td>Incorrect adjustment of Limit Switch #1.</td>
<td>Adjust Limit Switch.</td>
</tr>
<tr>
<td></td>
<td>Incorrect fastener size.</td>
<td>Use correct fastener.</td>
</tr>
<tr>
<td></td>
<td>Open electrical connection in Limit Switch #1 circuit.</td>
<td>Check circuit and repair electrical open.</td>
</tr>
<tr>
<td></td>
<td>Limit Switch #1 inoperative.</td>
<td>Replace switch.</td>
</tr>
<tr>
<td>Tool spins CW, snub swage performed, tool spins CW, then spins CCW. No swage action performed. Audible alarm sounds.</td>
<td>Limit Switch #2 not activated.</td>
<td>Check switch adjustment.</td>
</tr>
<tr>
<td></td>
<td>Open electrical connection in Limit Switch #2 circuit.</td>
<td>Check circuit and repair electrical open.</td>
</tr>
<tr>
<td>Tool spins CW, swage performed, audible alarm sounds, tool spins CCW, then tool station is deactivated.</td>
<td>Swage pressure set-point point not achieved.</td>
<td>Check operation of hydraulic system, including output signal of pressure transducer.</td>
</tr>
<tr>
<td></td>
<td>Incorrect fastener grip</td>
<td>Use correct fastener</td>
</tr>
<tr>
<td></td>
<td>Locked-in gap in structure being fastened</td>
<td>Correct assembly</td>
</tr>
<tr>
<td></td>
<td>Open electrical connection in Limit Switch #2 circuit</td>
<td>Look for corresponding LED in control box while actuating limit switch rod on tool.</td>
</tr>
</tbody>
</table>
**SECTION 6. TROUBLESHOOTING GUIDE**

<table>
<thead>
<tr>
<th>All tools stop working</th>
<th>Incorrect adjustment of limit switch #2</th>
<th>Adjust limit switch (See table)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limit switch #2 inoperative</td>
<td>I/O power supply failure</td>
<td>Replace switch</td>
</tr>
<tr>
<td>Tool operates until touched to fastener in frame (or tool touched to frame then the tool stops)</td>
<td>Either the black, brown, or red wire in the wiring harness is short circuited</td>
<td>To isolate the short circuit, plug in another tool to see if the problem is eliminated. If it is, repair the original tool</td>
</tr>
<tr>
<td>Tool operates while in contact with the frame or fastener until limit switch #1 is made</td>
<td>Limit switch #1 yellow wire is short circuited somewhere in wiring harness, probably under the switch cover on the tool</td>
<td>Repair yellow wire</td>
</tr>
<tr>
<td>Tool operates while in contact with frame or fastener until limit switch #2 is made</td>
<td>Limit switch #2 green wire is short circuited somewhere in wiring harness, probably under the switch cover on the tool</td>
<td>Repair green wire</td>
</tr>
<tr>
<td>Tool thimble does not spin when trigger is activated. However, a jerking motion is witnessed from the air motor exhaust</td>
<td>Failure within nose assembly</td>
<td>Remove nose assembly and evaluate components</td>
</tr>
</tbody>
</table>

*CW-Clockwise  
**CCW-Counterclockwise*

**LIMIT SWITCH #1 ADJUSTMENT TABLE**

<table>
<thead>
<tr>
<th>Limit Switch #1</th>
<th>Adjust Limit Switch #1 such that it actuates the input (light in the control panel) after moving the Limit Switch Rod approximately 1.0-1.5mm/ 040-060 inches</th>
</tr>
</thead>
</table>

**LIMIT SWITCH #2 ADJUSTMENT TABLE**

<table>
<thead>
<tr>
<th>FASTENER SIZE</th>
<th>LIMIT SWITCH #2 ENGAGEMENT SETTING (GRADE 8/10.9)</th>
<th>LIMIT SWITCH #2 ENGAGEMENT SETTING (GRADE 5/8.8)</th>
<th>U-BOLTS &amp; SPECIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>12mm</td>
<td>10.32/.406</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>12.04/.474</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14mm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Huckspin Troubleshooting Guide
### SECTION 6.

#### TROUBLESHOOTING GUIDE

<table>
<thead>
<tr>
<th>Size</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8</td>
<td>.540</td>
</tr>
<tr>
<td>16mm</td>
<td>13.76/540</td>
</tr>
<tr>
<td>18mm</td>
<td>15.48/610</td>
</tr>
<tr>
<td>3/4</td>
<td>.640</td>
</tr>
<tr>
<td>20mm</td>
<td>17.2/677</td>
</tr>
<tr>
<td>22mm</td>
<td>18.92/745</td>
</tr>
<tr>
<td>7/8</td>
<td>.750</td>
</tr>
<tr>
<td>24mm</td>
<td>20.64/813</td>
</tr>
<tr>
<td>1.0</td>
<td>.860</td>
</tr>
</tbody>
</table>

If resistance blows - suspect

E.M.F.
29 VDC across E.M.
6.2 **Huckspin 8-Tool Controller**

The following components are unique to the 8-Tool Controller:

- IBM Compatible Computer
- 32 Point Digital Input Module
- 32 Point Output Module

6.2.1 **IBM Compatible Computer**

This unit is comprised of a motherboard with a CPU and memory, a power supply, a LCD screen driver board, a multi-function card which controls the hard disk and floppy disk drives and has a serial and parallel port, along with a modem board. Should this unit appear to fail, swapping modules is the best way to troubleshoot. Note that the multi-function board has the second serial port disabled, and that the modem board is configured as COM2.

6.2.2 **32 Point Input Module**

If this module appears to fail, first check that the two green lights are lit and the red lights are NOT lit. If this checks OK, check any individual input by using a DC voltmeter to check if the input is on. Measure from any input to be checked to wire number 2. If 24VDC is measured and the corresponding yellow light on the module is not on, the module is defective and should be replaced. If the light is on, then run ST.EXE from the ROM-DOS B: drive *(See ? in Section ?.*) to see if the module is recognizing the input. If the module does not recognize the input, replace the module.

6.2.3 **32 Point Output Module**

If this module appears to fail, first check that the two green lights are lit and the red lights are NOT lit. If this checks OK, check the individual output wiring integrity by forcing the output on. Do this by first turning off power. Then place a jumper wire from 24V to the output terminal in question. When power is turned on, this output should be on. If it is not, the problem is in the wiring from the output module to the device. Check the wiring, the relays, the cables, the tool wiring, and finally the device (solenoid, alarm, etc.). If the output comes on with this test, run ST.EXE from the ROM-DOS B: drive *(See ? in Section ?.*) to energize the output. If forcing the output on with ST.EXE does not energize the output and its light, replace the output module.
6.3 HUCKSPIN 1 & 3-TOOL CONTROLLERS

6.3.1 HUCKSPIN 3-TOOL CONTROLLER

The following components are unique to the 1 & 3-Tool controller

- 24 Point Relay Module
- Input Relays
- Output Relays
- 5 Volt DC Power Supply

6.3.1.1 24 Point Relay Module

This unit provides a mounting system for the digital input/output relays, and a connection system, utilizing a 50 conductor flat ribbon cable, for the ISBX module located in the ROM-DOS Master Control Module. Troubleshooting this unit amounts to making sure the flat ribbon cable is plugged in properly on the Relay Module end, and that it is seated properly on the ISBX Module end. Check carefully on the ISBX end since it is easy to mis-align it. There are LED indicating lights for each input/output position. Use these lights to aid in troubleshooting.

6.3.1.2 Input Relays

These relays are color coded, with white being 24VDC in. If 24VDC is measured at an input, and ST.EXE indicates that the input is off, replace the relay. (NOTE: Be sure to turn off power while changing relays.)

6.3.1.3 Output Relays

These relays are color coded, with black being for AC output, and red for DC output. Use the red DC output relay for any Powerig that has a DC system which energizes the Hydraulic valve. These systems are usually found in Europe. Use the black AC output relay for any Powerig that has an AC system which energizes the Hydraulic valve. These systems are usually found in the United States. If an output does not operate properly, use ST. to force an output on. If the output is forced on and the relay does not energize, replace the relay. (NOTE: Be sure to turn off power while changing relays.)

6.3.1.4 Volt DC Power Supply

This power supply supplies 5 volts DC to the input/output relay coils. If the relays do not operate properly, first check this power supply. Check for 5 VDC (± .5) at wires 5 and 2 at the corner of the module. Replace/repair the power supply as required.

6.3.2 Huckspin 1-Tool Controller

The main difference between the 3 tool and 1 tool controller is the number of relays on the input/output rack, and the placement of the power supplies. The power supplies for the 1 tool controller are located on the underside of the mounting plate, and
require the lifting of the plate to troubleshoot. Also, the 3 tool system does not have any surge suppressors. For troubleshooting, follow the 3 Tool troubleshooting sections.

### TABLE 2 WIRING

<table>
<thead>
<tr>
<th>INPUT</th>
<th>WIRE NUMBER</th>
<th>WIRE COLOR CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool #1</td>
<td>Trigger</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>LS1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>LS2</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Power</td>
<td>7</td>
</tr>
<tr>
<td>Tool #2</td>
<td>Trigger</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>LS1</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>LS2</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Power</td>
<td>11</td>
</tr>
<tr>
<td>Tool #3</td>
<td>Trigger</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>LS1</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>LS2</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Power</td>
<td>15</td>
</tr>
<tr>
<td>Tool #4</td>
<td>Trigger</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>LS1</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>LS2</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Power</td>
<td>19</td>
</tr>
<tr>
<td>Tool #5</td>
<td>Trigger</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>LS1</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>LS2</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Power</td>
<td>23</td>
</tr>
<tr>
<td>Tool #6</td>
<td>Trigger</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>LS1</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>LS2</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Power</td>
<td>28</td>
</tr>
<tr>
<td>Tool #7</td>
<td>Trigger</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>LS1</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>LS2</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Power</td>
<td>32</td>
</tr>
<tr>
<td>Tool #8</td>
<td>Trigger</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>LS1</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>LS2</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Power</td>
<td>36</td>
</tr>
</tbody>
</table>
6.4 Troubleshooting the Control Panel

Troubleshooting the hardware consists of checking the lights on the Phoenix Contact modules inside the control panel. Check that all green lights on the windowed part of the digital input, digital output, and analog input modules are on. If any of these lights are off, it indicates that the 24V power supply to the module is off. Check all the wiring and measure the voltage at the modules input connections, wires marked 24V and wire #2. If 24VDC is present at the module connector, check that the connector is seated properly. If seated properly, and if the green lights are still not on, then replace the module.

The Master Control Module is powered from a separate 24VDC power supply. Measure the voltage on wire #99 (+) and #2 (-) at the bottom power connector on the Master Control Module. If the measured voltage is less than 20VDC, replace or repair the power supply. If 24VDC is measured, and the green light is not on at the bottom of the ROM-DOS module, replace the ROM-DOS module.

Check the green lights at the top of the digital input, digital output, and analog input modules. These lights indicate that the connecting cables that transmit the module data to the Master Module are operating properly. If any of these lights are off, check the cables to be sure they are seated properly. If necessary, switch cables to ascertain if the problem is in the cables. If the cables are seated correctly and check out properly, change the module.

If the interface program's Display All Status window has no updates of any kind for more than 15 seconds, this indicates that the Master Module, (the leftmost Phoenix Contact Module) has stopped communicating with the computer. If the tools are still operating correctly, there is a problem in the communication between the PC and the Phoenix Master Control Module. If the tools have stopped working, turn the control panel power off, wait 15 seconds, then turn the power back on. If this does not restore operation of the tools and does not clear the alarm message (after a two minute delay), change the Master Module.

More information on the Phoenix modules is available in "Vendor Supplied Information".

6.5 Troubleshooting Inoperative Tool(s)

If a tool fails to operate, first check that the proper serial number has been entered, and that the tool has been activated using the proper security code. If this has been checked, check that the Tool Power light is lit on the input module. This can be checked by looking at the light on the module, and checking the fourth light from the right for any tool position. For example, if the station in question is station #1, check the top row of lights fourth from right. If this light is on, check that the trigger light comes on when the trigger is pressed. This light is the first light from the right for any station. Also check to see that the two limit switch lights, second and third from the right, are NOT on prior to
the trigger being depressed. If either of these lights are on before the trigger is pressed, the tool will not operate.

The lights on the modules should be very bright. If they seem to be dim, this could be caused by a short in one or more of the tools, or cables. While watching the lights, unplug the connectors along the top of the panel, one at a time. If the lights become bright when one of the cables are unplugged, that cable, or the tool, has a short. Repair as required before re-connecting. If the lights remain dim after disconnecting all the tools, the problem could be inside the control panel. Check the 24VDC power supply by measuring between wires #24V and #2. If this measures under 20VDC, replace the power supply.
7. Huckspin 1 & 3-Tool Controllers

7.1 Huckspin 3-Tool Controller

In order to use a HUCKSPIN Controller to operate the tooling system, it is necessary to make a RS-232 serial port connection to a desk top or laptop computer, (PC). There may be several ports on the back of the PC but the serial port will be a 9 or 25 male pin type and should be designated by the PC operating system as COMM1, COMM2, COMM3, or COMM4. The Huckspin Interface Program and the Huckspin Utility Programs can use any of these serial ports. The connecting cable between the PC and the Controller should be of the standard type fitted with a male 9 pin plug at one end, (for connection to the Controller). The other end should have a female 25 or 9 pin plug for connection to the PC. An adapter to convert 25 pin to 9 pin can be used to make a connection to the PC, if necessary. Wires within the cable should be assembled to the plugs so that pin 1 on one plug is connected to pin 1 on the other plug, pin 2 on one plug to pin 2 on the other, and so on.

When the Huckspin system is installed, the software is provided on a double sided high density, (DS/HD), 3 1/2” computer diskette which contains all the program files necessary to run the Huckspin system. Ensure that the PC being used is able to read DS/HD diskettes, or copy the Huckspin program files onto a suitable diskette. The computer used to run the Huckspin Interface Program must have a VGA, SVGA or compatible screen.

To see the contents of the Huckspin diskette on the PC screen, follow the instruction below. It is not necessary to make a connection with the controller to do this.

1) Switch the PC "ON" and wait until the "C" prompt (e.g., "C:\>") appears on the screen (see note). Place the diskette into the "A" drive, then using the keyboard type A, then look at the diskette in drive "A". The screen will now show the "A" prompt.

   Note: The PC being used may have been set up to display some type of Menu or program handling system. It may be necessary to ask the regular PC user/owner how to get to the "C" prompt.

2) Within the main or root (\) directory of files on the diskette, there should be a smaller sub-directory that has the name "HUCKSPIN" and contains all the Huckspin files. To instruct the computer to look at that directory, type

   **CD\SPIN**, then press **Enter**.
3) To see all the files located in HUCKSPIN, type **DIR**, then press **Enter**. The screen will then show a list of files, (usually 16, see List 1).

4) It is always useful to keep a print-out of the file list. A print can be obtained by connecting the PC to a printer and using the **Print** key. On some PC's it may be necessary to press the **Shift** and **Print** keys together. This command results in the printer printing what is actually on the screen of the PC. (List 1 was produced using that method).

### 7.2 File Contents of the Huckspin PC Diskette (List 1)

The left hand column of List 1 shows the name of each file, (e.g., "HUCKSPIN"). To the right of that column are three characters, this is the file name extension, (e.g., "EXE"). These extensions are used to identify the type of file. As an example, "EXE" is used to identify a file containing an "executable" program such as HUCKSPIN. "BAT" is for batch files which can be used to invoke programs such as "EXE" and set system parameters for keyboard and printer functions. It is usual to separate the file name and its extension with a "," when writing them down and must be used during PC keyboard operations when the extension is used. (e.g., "HUCKSPIN.EXE").

The middle column shows the amount of diskette (disc) space each file occupies, (e.g., HUCKSPIN.EXE occupies 199600 bytes of space). The next two columns show the date and time when the program was written.

### 7.3 Function of Programs (List 1)

#### 7.3.1 CM.EXE

CM.EXE is a program file used to set up the PC to communicate with another computer, (e.g., the ROM-DOS module), through the RS-232 serial port connections. With the Huckspin system, this allows the HUCKSPIN program in the PC to talk with the programs in the Controller ROM-DOS module.

#### 7.3.2 HS.EXE

HS.EXE is a back-up copy of the program located in the "A" drive of the Controller ROM-DOS module. When running the ROM-DOS module, it is the main program which operates the Huckspin system. To do that, it processes information from the PRES.SAV file, Limit Switches and the Analog Input Module, (pressure Transducer signals). It then
gives output signals to the electronic relays in the Controller which in turn cause the operation of the various tooling components.

7.3.3 HUCKSPIN.EXE
HUCKSPIN.EXE is the program used by the PC to communicate with the Controller, and is called the interface program. (It is the program seen on the screen of the PC).

7.3.4 HUCKSPIN.HLP
HUCKSPIN.HLP produces notes on the screen of the PC to help the user.

7.3.5 MAINT.FIL
MAINT.FIL is used to store all maintenance data for the tools.

7.3.6 CLEAN.BAT
CLEAN.BAT is a batch file that removes any data files from a diskette. Use it prior to updating any program files.

7.3.7 PRES.SAV
PRES.SAV is a back-up copy of the program located in the "B" drive of the Controller ROM-DOS module. This program saves the data entered using the HUCKSPIN.EXE program, (e.g., full and snub pressures, counts, etc.).

7.3.8 ST.EXE
ST.EXE is a back-up copy of the program also located in the "B" drive of the Controller ROM-DOS module. It is used as a trouble shooting and function test program (e.g., when setting tool Limit Switches). It is operated by the PC by using the CM program to communicate with the "B" drive.

7.4 Using the HUCKSPIN.EXE Program

Note: This section of the manual should be used in conjunction with the section "Controller Display".

It is usual to copy this program and related files onto the hard disk ("C" Drive) of the PC. Although it can be used from the diskette placed in the "A" drive, DO NOT run this program from any floppy drive, since it creates files that normally store gun information. If you want to run HUCKSPIN separate from a connected controller, copy this master diskette and use the copy. With the PC switched off, make the connection with the Controller using the cable as described on Page 1. Switch the PC "ON". If a diskette is being used in the "A" drive, then proceed as in instructions 1) and 2) on Page 115. If the
Huckspin files have been copied onto the "C" drive, (hard disk) of the PC, proceed as in instructions 1) and 2) on Page 115, but do not instruct the PC to look at drive "A".

To start the HUCKSPIN program running, instructions are typed on the keyboard. These instructions must format the HUCKSPIN program to suit the controller it will be communicating with and the functions required of it. (Refer to Section 1.5.3 of the Huckspin Operator Interface Software manual for a description of launching HUCKSPIN.)

The "Controller Display" section of the Huckspin Manual should now be used to proceed further.

**Note:** When saving any data, (e.g., pressures, serial or station numbers or "counts"), the values, etc., will be effective immediately. However, they will not be saved permanently in the battery powered RAM section of the ROM-DOS Module if the Controller is switched off before the timer preset value set in the computer. If the Controller is switched off too soon and then switched on again, the original data will be used, (i.e., the values present before they were changed).
Using the ST.EXE Program

This program is used to check the function of the various tooling components of the Huckspin system, (Air Valve & Motor, Trigger, Limit Switches, Alarm, Powerig Combination Valve). If the HUCKSPIN program is already being used on the PC, it is necessary to stop it before using ST.EXE. If the HUCKSPIN program is not being used, start from step "2" below.

1) If the HUCKSPIN program is already being used, press the $\text{Alt} + \text{x}$ keys. An additional screen view will now appear on the HUCKSPIN screen, which is asking for the code. Enter the proper code to exit.

2) Since the ST.EXE program is located in the Controller ROM-DOS Module, the CM program must be used to communicate with it.

USING CM.EXE:

From the DOS prompt, type $\text{CM}$, and press $\text{Enter}$. A comm port selection will now appear in the upper left side of the screen. Select the comm port available in your PC by pressing its number. The next screen asks for a baud rate selection. The baud rate is the speed at which data is transferred between the PC and the ROM-DOS Module. Since you must stop the HS.EXE program that is running in the ROM-DOS, you may select 115,200, or, since it is the default selection, just press $\text{Enter}$.

If the ROM-DOS is running HS, some characters should periodically show on the screen. Press $\text{Ctrl}-\text{c}$ to stop the HS program. Note that the baud rate automatically drop to 9600 so that you can communicate with the ROM-DOS via the keyboard.

3) The "A" prompt from the ROM-DOS Module will now appear. Since the ST program is in the "B" drive of the Module, type $\text{B:}$, then press $\text{Enter}$ to get to the "B" drive prompt.

4) To run the ST.EXE program, type $\text{ST}$, then press $\text{Enter}$. ST can be invoked with Scaling. The default scale is 3.05250, so to enter a different scale, type $\text{HS 2.14697}$, for example.

**Note:** If the error message "Bad Command or File Name" appears on the screen, it is possible that the ST program is not present.
To check if the ST program is present, type **DIR** then press **Enter**; the screen will now show the files in the "B" drive. (See List 2). If the ST program is not there, then it should be uploaded into the "B" drive. (See section "Up and Down Loading Files to & from the ROM-DOS Module"). If the error message is "ISBX Card not found", this indicates that the ROM-DOS Module has not been configured for a 3-Tool Controller. Please call a Huckspin Systems Engineer.

5) Some text instructions will appear on the screen, beneath which is a row of numbers and letters, as follows:

```
1: t l 2 p. f r h a x 0 0 -819 -2500.0
```

- **Gun #**
- **Trigger**
- **Limit SW1**
- **Limit SW2**
- **Gun Power**
- **Data**
- **After Scaling**
- (normally PSI)
- **Raw Data with Offset Subtracted**
- **Raw Data with High Bit Stripped Out**
- **Analog Module Raw Data Input**
- **Reset**
- **Alarm**
- **Hydraulic Combination Valve**
- **Gun Reverse**
- **Gun Forward**
6) To check out a particular station, press the number key for that station, (e.g., for station 2, press the $2$ key).

The numbers, $t$, $1$, $2$, $p$, and $x$ are input signal indicators from the tool. If a signal is present, the letters of those indicators will change to upper case, (e.g., $t$ will change to $T$, $p$ will change to $P$, etc.). If a limit switch is made, its number will appear.

The letters $f$, $r$, $h$, and $a$ show outputs to the Manifold and Powerig and are used to check the function of the components they represent. As an example, pressing the $E$ key will operate the Air Valve to rotate the Air Motor and Thimble forward. Pressing any other key, (not the $E$ key), will stop this function. The $R$, $H$, and $A$ keys can be used in a similar way, stopping the function by pressing any other key.

The signal from the Analog Module is shown on the display as $0950$. Use a Huck Powerig jumper to cause the hydraulic pressure to rise. The rising pressure will be shown on this screen. The other four data items show the analog input as read from the analog module and the resultant pressure.

7) To stop the ST program running when the check out is complete, press $\rightarrow$. If you want to restart HS, type $\textbf{HS}$. To exit CM, hold the $\text{Alt}$ key and press $X$, which will bring you to the "C" prompt (C:->).

8) You could also restart HS by switching off the controller, waiting approximately 15 seconds and then switching it on again.

Location of Program Files in the Controller ROM-DOS Module

The ROM-DOS Module is itself a computer and has an "A" and a "B" drive. "ROM-DOS Module" is an abbreviation for "Read Only Memory", and the "A" drive has a "ROM" type memory. This means that its contents cannot be changed, the programs only read its contents. The "B" drive has a "RAM" type memory, ("Random Access Memory"). Its contents can be changed and programs look at what it contains while they are running.

When the Module is working, it makes use of "DOS", (Disc Operating System) program commands. "DOS", sometimes known as "MS-DOS" (Micro Soft Disc Operating System), is used in computers worldwide.
List 2 shows the locations of Huckspin program files within the ROM-DOS Module. Some of these have already been mentioned on Pages 2 and 3. Explanations are given for those not previously mentioned:

**COMMAND.COM, CONFIG.SYS, VDISK.SYS and AUTOEXEC.BAT.** These files will also be found in most standard computers and are used to configure (make rules, etc.) how the computer should operate and what it should do when it is switched on.

**XF.EXE** is used when loading programs up (up-loading), or bringing programs down (down-loading), between the PC and the ROM-DOS Module.

### Up and Down Loading Files to & from the ROM-DOS Module

Sometimes it may be necessary to up-load Huckspin programs from the PC connected to the Controller to the ROM-DOS Module, (e.g., if the ST program is not present in the ROM-DOS Module). It may also be necessary to down-load programs from the ROM-DOS Module into the PC connected to the Controller.

**Note:** The terms "up-load" and "down-load" can be misleading since the commands given for these operations only copy program files, they do not move them from one location to another. An example, if ST is up-loaded from the PC to the ROM-DOS Module, a copy of the file is placed in the ROM-DOS Module but the original file is still in the PC.

### Up-Loading Program Files

The following steps explain how to up-load the ST.EXE program into the "B" drive of the ROM-DOS Module. However, the same basic steps are used to up-load other program files.

1) Make the cable connection to the Controller as described in the section "Using Huckspin Computer Programs".

2) Follow instructions 1, 2, and 3 on Pages 115, but leave the screen showing the "A" drive of the ROM-DOS Module.

3) Press the Page-Up key on the keyboard
4) The program will ask what file you want to transfer. Type **ST.EXE**), then press \[Enter\]. This tells the CM program which file is to be up-loaded.

5) The program will ask what name you want to call the copied file. If you want to keep the same name, just press \[Enter\].

6) The program will begin copying the file. Several characters will flow across the screen as the program is being transferred. When the transfer is completed, the A> or B> prompt will reappear.

**Down Loading Program Files**

The following steps explain how to down-load the PRESS.SAV file from the ROM-DOS "B" drive to the laptop "C" drive. However, the same basic steps are used to down-load other files.

1) Make the cable connection to the Controller as described in the section "Using Huckspin Computer Programs".

2) Follow instructions 1, 2, and 3 on Pages 115, but leave the screen showing the "B" drive of the ROM-DOS Module.

3) Press the Page-Down key on the keyboard.

4) The program will ask what file you want to transfer. Type **PRESS.SAV**), then press \[Enter\]. This tells the CM program which file is to be up-loaded.

5) The program will ask what name you want to call the copied file. If you want to keep the same name, just press \[Enter\].

6) The program will begin copying the file. Several characters will flow across the screen as the program is being transferred. When the transfer is completed, the A> or B> prompt will reappear.
Program Files on the Huckspin Computer Diskette

Volume in drive A has no label
Volume Serial Number is OR10-2434
Directory of A:

COMMAND  COM  47845  04-09-91  5:00a
ROOT      <DIR>  10-12-94  7:08a
DOS       <DIR>  10-12-94  7:08a
HUCKSPIN  <DIR>  10-12-94  7:08a
INSTALL   BAT  199  01-20-95  9:23a
INSLT     EXE  4064  12-21-93  1:40p
MADIR     EXE  3696  03-24-94  10:03a
AUTOEXEC  BAT  31  01-20-95  9:27a
CONFIC     SYS  10  01-20-95  10:00a
UPDATE    BAT  105  02-27-95  3:08p
10 file(s)  55950 bytes
10752 bytes free

Directory of A:\DOS

.       <DIR>  10-12-94  7:08a
..      <DIR>  10-12-94  7:08a
FORMAT  COM  32911  04-09-91  5:00a
MODE     COM  23537  02-03-90  1:00p
MORE     COM  2618  02-03-90  1:00p
SYS      COM  13440  02-03-90  1:00p
S3GSET   EXE  19149  05-19-92  5:53p
CHRDISK  EXE  16200  02-03-90  1:00p
DEBUG    EXE  20634  02-03-90  1:00p
FDISK    EXE  57224  04-09-91  5:00a
LL       EXE  50800  11-29-93  4:01p
MEM      EXE  39818  02-03-90  1:00p
PRINT    EXE  15656  02-03-90  1:00p
SORT     EXE  6938  02-03-90  1:00p
UNDELETE  EXE  13924  02-03-90  1:00p
HIMEM    SYS  13824  03-10-92  3:10a
EDT      EXE  9664  09-13-94  10:51a
EDIT     COM  413  02-03-90  1:00p
QBASIC   EXE  254799  02-03-90  1:00p
19 files(a)  601549 bytes
10752 bytes free

Directory of A:\HUCKSPIN

.       <DIR>  10-12-94  7:08a
..      <DIR>  10-12-94  7:08a
HUCKSPIN  ASC  5109  01-20-95  4:28p
CM       EXE  31872  08-05-94  3:18p
CLEAN    BAT  13  01-20-95  8:57a
H        COE  733  04-03-94  1:45p
MAINT    TXT  1018  10-31-93  6:51p
SECTION 7

1 & 3 TOOL CONTROLLERS

FONT FL1 2839 11-03-93 7:17a
TESTFONT EXE 5872 11-03-93 7:22a
HOLD EXE 291760 02-08-95 3:59p
BUFFER SYZ 5 02-24-95 2:27p
HUCKSPIN HLP 72799 01-20-95 4:17p
HUCKSPIN EXE 292880 03-02-95 11:58a

13 file(s) 704900 bytes
10752 bytes free

Directory of A:\ROOT

.
..  <DIR>  10-12-94  7:08a
CONFIG SYST 57 12-15-93  9:10a
AUTOEXEC BAT 79 12-15-93 12:06p
4 file(s) 136 bytes
10752 bytes free

LIST 1

Program Files in the Controller ROM-DOS Module

Volume in drive A is ROM DISK
Directory of A:\

COMMAND COM 24071 3-17-92 3:31a
CONFIG SYS 54 1-16-95 5:44p
VDISK SYS 4039 8-31-93 5:14p
AUTOEXEC BAT 34 12-15-94 9:40a
XF EXE 5504 5-16-94 9:19a
HS EXE 27440 1-20-95 7:28a
6 File(s) 0 bytes free

Directory of B:\

Volume in drive B is VDISK 3.31
Directory of B:\

PRES SAV 532 1-01-80 12:01a
ST EXE 7904 1-01-80 12:03a
2 File(s) 28672 bytes free

LIST 2
HUCKSPIN TOOLING SYSTEM

Swage and Snub Cut-off Pressures for Huckspin Tools

Note: The pressures shown below are normally the same values as those shown in the Configuration Menu in the HUCKSPIN Program.

<table>
<thead>
<tr>
<th>BOLT DIA.</th>
<th>3/8:</th>
<th>1/2:</th>
<th>5/8:</th>
<th>3/4&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HS37 TOOL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FULL SWAGE</td>
<td>147(2130)</td>
<td>248(3590)</td>
<td>21(6110)</td>
<td>-</td>
</tr>
<tr>
<td>SNUB</td>
<td>44(635)</td>
<td>72(1050)</td>
<td>124(1800)</td>
<td>-</td>
</tr>
<tr>
<td><strong>HS52 TOOL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FULL SWAGE</td>
<td>-</td>
<td>170(2470)</td>
<td>290(4200)</td>
<td>356(5165)</td>
</tr>
<tr>
<td>SNUB</td>
<td>-</td>
<td>51(735)</td>
<td>86(1250)</td>
<td>107(1550)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BOLT DIA.</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HS37 TOOL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FULL SWAGE</td>
<td>164(2375)</td>
<td>239(3460)</td>
<td>291(4215)</td>
<td>421(6110)</td>
<td>-</td>
</tr>
<tr>
<td>SNUB</td>
<td>48(700)</td>
<td>71(1025)</td>
<td>86(1250)</td>
<td>124(1800)</td>
<td>-</td>
</tr>
<tr>
<td><strong>HS52 TOOL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FULL SWAGE</td>
<td>-</td>
<td>164(2380)</td>
<td>200(2900)</td>
<td>290(4200)</td>
<td></td>
</tr>
<tr>
<td>SNUB</td>
<td>-</td>
<td>48(700)</td>
<td>59(860)</td>
<td>86(1250)</td>
<td></td>
</tr>
</tbody>
</table>

NOTES,
1) Bolt diameters are in millimeters except where shown.
2) Pressures are in Bar except those in parenthesis which are in Psi.
3) Powerig "Pull" pressure should be adjusted to 28 to 34 Bar, (400 to 500 Psi), above FULL SWAGE pressure.

**TABLE 1**
8. GLOSSARY

8.1 Bar

◆ On the Huckspin interface screen, a bar is a one-line strip of information.
◆ In the metric system of pressure measurement, 1 Bar is the standard pressure
   of the earth’s atmosphere at sea level. This unit of measure is so large that a
   tenth of a bar (deci-bar) is more useful in the Huckspin interface, which uses
   whole numbers for pressures.

8.2 Boot

Start the computer running "from scratch". A historical/literary reference to
"picking oneself up by one’s own bootstraps" because of the way that modern
computers do most of the work of starting themselves up. A "Cold Boot" or a
"Hard Boot" refers to starting the computer by turning the power ON from the
OFF state. A "Warm Boot" or "Soft Boot" refers to pressing the computer's Reset
switch, or pressing [command][alt][space] all at the same time on the keyboard while the
computer is already on.

8.3 Button

Most actions in the operator interface are started by pressing a button. A button
looks like a small, dark rectangle with a label in it and shadow to its lower right.
There are several ways you can press a button (Section 2.3, Page 30).

8.4 Characters

Letters, numbers, punctuation marks, and special symbols you can type on a
computer keyboard, display on a computer screen and store on a computer disk
are called characters. Their purpose usually is to form words to be read or written
by the operator.

8.5 Code

Letters and numbers used to tell the Huckspin interface that the individual is
authorized to perform a certain action. A supervisory code (or just code) is a
password that is supposed to be known only by persons who are authorized to
perform the associated actions with the Huckspin interface.

8.6 Configuration

Initial settings used by the Huckspin software. These include such things as what
Com port to use for serial communications with the controller, what Com port to
use for modem communications, modem baud rate, etc., which can be passed as
parameters. Also there are a number of initial values that are stored in a file (called a configuration file) and can be changed within the software.

8.7 Controller
In hardware discussions, this term may refer to the entire Chuckspin box, but in the context of the Chuckspin Operator Interface Software, controller refers to the ROM-DOS module where the precise control logic for the tools is programmed. This module receives pressure readings via the Analog modules and receives information about the trigger and limit switches and power connections from the digital input module. The ROM-DOS module, called here the controller, operates the air motor and hydraulic valve and alarm via the digital output module. In small boxes, the functions of the digital input and output modules are replaced by an ISBX card positioned inside the ROM-DOS module.

8.8 Cross Reference
When viewing a particular topic in the Help System, you can move the Focus to certain highlighted topics within the given discussion. When you press \[\text{Enter}\], the focused topic becomes the current topic which you can read. While viewing a cross-reference you can return to the previous topic by pressing \[\text{Alt}+\text{F1}\].

8.9 Cursor
On a computer screen, a cursor is a mark, usually a blinking underscore or a blinking block, that indicates where the next character will appear if you type.

8.10 Cycle
A repeating event, such as a pressure rise for a specific time, then release for a specific time, during hydraulic start up. Cycle may also refer to a complex collection of events, such as a snub cycle.

8.11 Data
Information.

8.12 Data Display Window
A window where you can only view data, but not change it.

8.13 Data Entry Window
A window where you can enter data and make selections.
8.14 Data File

In a computer, data can be stored on a disk (so that the data remains until you deliberately erase or replace it). The space where the data is stored is given a name by which it can be retrieved at a future time. This named portion of disk space where your data is stored is called a data file.

8.15 Data Point

During operation of Huckspin tools, the controller monitors hydraulic pressure values and sends them to the computer. A collection of pieces of information about the pressure value consists of:

1. The identity of the station (1 through 8).
2. The sequence number for the swage or drive (whether it is the first, fourth, eighteenth, etc., pressure reading in the particular swage).
3. The amount of hydraulic pressure at the instant the reading was taken.

This collection of pieces of information about a pressure reading is called a data packet as it travels through the serial cable, but as the data is used by the interface software, it is called a data point, especially in the context of swage curve graphs, where each such collection of information is represented as a spot or point on the graph. In the case of distribution curves, a spot on the graph (or point) may represent a summary of many pressure readings.

8.16 Data Set

All the pressure readings taken so far and stored in a data file.

8.17 DCE

An acronym for Data Communications Equipment. The switch setting you should use for the serial port on the controller. The other position of the switch is DTE (Data Terminal Equipment), which is not appropriate for the Huckspin system.

8.18 Deci Bar

A metric unit of pressure measurement. One tenth of a Bar. See Section 5.1, "Bar", Page 147.

8.19 Default

The value or action that will automatically be used unless you deliberately specify something different.
8.20 Default Button

The default button has its entire label emphasized, even when the Focus or tab position is in an input field and will be activated upon pressing [Enter] (Section 2.3.2, Page 31).

8.21 Desktop

The Desktop is the area on the computer screen where you will open windows to do your work. See Sections 1.3, Page 7, and 1.3.4 for further information.

8.22 Digits

The numeric characters: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

8.23 Directory

A computer disk may be divided into regions and each region can have a name. Such a named region is called a directory. The portion of disk space that does not get a name is the starting point for locating a file, so it is called the root directory. The named directories are considered to be subdivisions of the root. In turn, each directory can be further divided into named regions (called subdirectories). The root directory can contain files, as can each directory that is a division of the root, as well as their subdirectories (and sub-subdirectories, etc.). The term directory is also used to refer to the list of files and directories contained by a given directory.

8.24 Disk

A round platter (or disk) with a magnetic coating that can be used for electronically storing data.

8.25 Disk Drive

A long-term data storage device. A disk drive reads and writes data on a disk. Data stored via a disk drive can be considered permanent unless the disk is damaged or deliberate actions are taken to erase or replace the data.

8.26 Display Only

Information (data) in a field that can be read only and not changed by the user. See Section 5.34, "Field", Page 152.

8.27 DOS

An acronym for Disk Operating System. A computer has to have equipment to communicate with the outside world. Without such equipment (peripherals), a computer is useless. Some of the most common peripherals are screens, keyboards, and printers. The computer software that "knows" how to
communicate with the common peripherals is called the operating system. An operating system that knows how to communicate with disk drives is a Disk Operating System (DOS). The most popular DOS is called MS-DOS because it is marketed by a company called Microsoft.

8.28 Dot-Matrix Printer

Some printers have a print head that moves over the paper and makes dots on the paper. The print head has a number of tiny rods (pins) that are electrically pushed against an inked ribbon and the paper underneath. Each pin that is pushed (fired) makes a tiny dot on the paper. The pattern of dots that is formed (a dot-matrix) as different combinations of pins are fired while the print head moves horizontally, gives the appearance of characters forming words that you can read. The paper is advanced forward (vertically) after each horizontal pass of the print head. Printers designed this way are called dot-matrix printers.

8.29 Driver Software

The DOS (Disk Operating System) does not include complete instructions for operating certain special devices, such as a mouse or trackball. The instructions for such devices are loaded separately, if they are loaded at all. The software for running such devices is called driver software or device drivers. Sometimes you have to choose not to load certain device drivers to avoid conflict with other software.

8.30 Drop Down Menu

A sub-menu that hangs below (drops down) from the Menu Bar.

8.31 Emphasized

When an item on the screen has the Focus, the text will appear somewhat different from the surrounding text. On an LCD screen, the text usually appears heavier, so it is said to be "emphasized". On a color screen, the text usually appears brighter, so it is said to be "highlighted". When the focused item is in a list of items, the Focus is shown by shading or color surrounding the focused item, and the selection from the list is shown by emphasized or highlighted text, even after the Focus moves off the list.

8.32 Epson

A brand name of printers. Although there are many models of Epson printers, among the dot-matrix printers there are some basic features in common that are activated by the same commands through the printer cable. There are other brands of printers that use the same features and the same commands to activate them. These printers are said to be Epson-compatible. The Huckspin software uses Epson printer commands when it sends data to a printer. Therefore the printer used with Huckspin must be an Epson dot-matrix printer, or another printer that
uses the same commands for setting characters-per-inch in horizontal spacing and setting lines-per-inch in vertical spacing.

8.33 Extension

The computer locates files on the disk by the name of the file. The first part is just called "name". The second part, if present, is called the "extension". The file name consists of a "name" part of one to eight characters optionally followed by a period and an extension of one to three characters, (for example, HUCKSPIN.ASC, HSPIN.FIL, etc.).

8.34 Field

An information area on the computer screen. If you can type in it, it is an input field. If you cannot type in it, you can only look at the data, but not change the data. Such a field is called display-only and is said to be protected (from typing).

8.35 Floppy Disk

Also called "diskette". An inexpensive, removable computer disk. Often used for installing computer software and for backups (storage of computer data away from the computer to protect against possible loss of data if the computer is damaged). Distinguished from a "hard disk" or "fixed disk" which stays in the computer.

8.36 Floppy Drive

A disk drive for reading and writing floppy disks. Distinguished from a "hard drive". Hard drive and hard disk are often used interchangeably, since a hard disk (or fixed disk) normally is not removed from a hard drive.

8.37 Focus

Focus is "where the action is" within a data entry window. If an input field has the Focus, then you can type in it. If a button has the Focus, then you can press the Enter key to press the button. If a button or input field has the Focus, then its label has more emphasis. When you open a data entry window, one of the input fields will automatically have the Focus. You can move the Focus from place to place with the Tab key. If a list has the Focus, the selected item in the list is highlighted, otherwise it is just emphasized.

8.38 Format

The process of preparing the magnetic surface of a disk to receive data. **Caution!** If a disk already has data, and you format it again, you erase all the existing data on that disk.
8.39 Hard Disk Drive
Same as "Hard Drive".

8.40 Hard Drive
A disk drive for reading and writing data to a fixed disk (hard disk). A hard drive differs from a floppy drive in that it typically keeps the same disk inside at all times, and reads and writes data much faster than a floppy drive. Also, the hard disk holds much more data than a floppy disk.

8.41 Help System
The arrangement of capabilities in the Huckspin software to provide help information to the user on demand. See Sections 1.3.4.3, Page 10, 2.1.8, 2.1.9, and 2.1.10, Page 28, for further information.

8.42 Help Windows
Help windows contain detailed information about the operation of the Huckspin software to assist the user as needed. See Section 1.3.4.3, Page 10, for further information.

8.43 High Density
Floppy disks vary in the amount of data that can be stored in a given amount of surface. The amount of data per unit of area is called density. A floppy disk may be:

- Single Density (rarely used any more).
- Double Density (twice the amount of data than a single density disk).
- High Density (still more data than a double density disk). This is the kind of disk that a computer must be able to read in order to install the Huckspin software.

8.44 Highlight
When an item on the screen has the Focus, the text will appear somewhat different from the surrounding text. On an LCD screen, the text usually appears heavier, so it is said to be "emphasized". On a color screen, the text usually appears brighter, so it is said to be "highlighted". When the focused item is in a list of items, the Focus is shown by shading or color surrounding the focused item, and the selection from the list is shown by emphasized or highlighted text, even after the Focus moves off the list.

8.45 Hint
The right hand side of the Status Line contains a few words of text that explain the Focused item. This miniature help is called a hint. On some screens some Focused
items do not have a different enough appearance to be readily identified as Focused. In such situations, the hint is very useful in identifying the Focus.

8.46 Huckspin Operator Interface Software
A computer program that enables an operator to see data from the controller and to send settings to the controller.

8.47 Huckspin Software
Same as "Huckspin Operator Interface Software".

8.48 IBM Compatible Computer
A computer that can run the same software as a personal computer manufactured by IBM.

8.49 Input Field
An information area on the computer screen that you can type in. See Section 5.34, "Field", Page 152.

8.50 Interface
Same as "Huckspin Operator Interface Software".

8.51 Interface Program
Same as "Huckspin Operator Interface Software".

8.52 Interrupt Level
A special means of access by which certain computer equipment can notify the computer that the equipment has data available (or otherwise needs attention). If more than one device uses the same interrupt level (or interrupt request line), the computer cannot tell which device needs attention.

8.53 LCD
An acronym for Liquid Crystal Display. A data display device that can be made very thin compared to a regular computer monitor. An LCD screen is used instead of a regular monitor when available space is limited, even though an LCD does not usually give as clear an image as a regular monitor.

8.54 Logged On
The computer's operating system gives its primary attention to one disk drive at a time. You tell the DOS which disk drive to give its attention by typing the letter of the drive and a colon, followed by pressing Enter. When you have done so, you have "logged on" to the chosen drive. Within the chosen drive, attention can be
given to a particular path (arrangement of directories and sub-directories), by means of the "CD" or "CHDIR" (Change Directory) command. So, not only can you log on to a drive, you can also log on to a directory.

8.55 Logical Drive
When computer software accesses a hard drive, it does not access the "Physical Drive" directly. Instead, it accesses its representation that is called a "Logical Drive". When a hard drive is installed in a computer, the data storage space can be partitioned so that the DOS sees it as if it were several drives, each with its own drive letter. In this situation there would be one Physical Drive, but several Logical Drives.

8.56 Menu
A list of available choices.

8.57 Menu Bar
One-line strip displayed at the top of the Huckspin interface screen that contains the Main Menu. See Section 1.3, Page 7 for further information.

8.58 Menu Structure
The arrangement of menu items in the software.

8.59 Mini-Tower
A Tower case that is shorter than a regular Tower.

8.60 Modem
A device that translates between computer data and telephone signals. The term is built from fragments of the two words "MOdulate" and "DEModulate."

8.61 Mouse
A special pointing device for communicating with a computer. The Huckspin software can use a mouse quite well, but a mouse may interfere with serial communication with the controller (Section 1.1.3.3, Page 4). When you move the mouse, you also move the mouse cursor, which is a rectangular block on the screen. You can "click" on an item by moving the mouse cursor to the item and pressing and releasing the left mouse button. When you click on an item, you either move the Focus to it, or activate it, or both. If you click on...

- a menu item, you move the Focus and select.
- a list item, you move the Focus.
- a button, you press the button just as if you used its Shortcut Letter.
an input field, you move the Focus. Once the Focus is in an input field, by
clicking you can use the mouse cursor to position the regular cursor (Section
5.9, "Cursor", Page 148) at the precise spot you want within the field.

8.62 Operator Interface
Same as "Huckspin Operator Interface Software".

8.63 Palette
The combination of colors used in the Huckspin software.

8.64 Parameters
You can give information to the software to tell it how to start. This information
is called parameters. In general, any information that is passed to something, to tell
it how to start or what initial values to use, is called parameters. See Section 1.5.3,
Page 24, for further information.

8.65 Path
A file on a computer disk is located and used by its name, but the computer really
needs more information to find the file. Each file has an "address" that tells the
computer where to find it. The address for finding the file is a name, made up of
smaller names rather than numbers. The complete name is called a path because it
leads the computer from a standard starting point (the "root" of the chosen disk
drive) through various layers until the desired file is reached. The complete name
(path) for a file includes the letter of the disk drive, and the names of all the
directories and subdirectories on the way to the file. The drive letter is followed
by a colon, and the other names are separated by backslashes (\).

8.66 Port
This is a general term for the part of the computer by which data passes between
the computer and some external device. Usually each separate external device
attaches to a separate port.

8.67 Prompt
A symbol the DOS displays to signal that it is ready to accept and process a
command. The computer can be set up to display a wide variety of prompts, but
the most commonly used prompt, and the one that is assumed in this manual
consists of the drive letter, a colon (:), the current (logged on) path, and a greater-
than (>) symbol, also called a right angle bracket, (for example, C:\HUCKSPIN>)

8.68 PSI
Acronym for Pounds per Square Inch. The English system unit of pressure
measurement. See Section 5.1, "Bar", Page 147.
8.69 **RAMdisk**

The controller's equivalent of a disk. Instead of a spinning platter, the controller uses an integrated circuit chip.

8.70 **Save**

To store the data you have entered.

8.71 **Scrollable List**

If there are more items in the list than you can see at one time, the portion of the list that is visible will scroll by as you change the selection to a point beyond the currently visible items. See Section 2.8.2, Page 32, for further information.

8.72 **Serial Cable**

The cable by which data passes between the serial port of the computer and the serial port of the controller. See Section 1.1.2, Page 3, for further information.

8.73 **Serial Port**

A computer port through which serial data passes. Such data consists of bits (individual electric pulses) traveling one after the other (in series or serially).

8.74 **Shortcut Letter**

In many parts of the Huckspin interface, pressing a single letter or pressing \[\text{Alt}\] plus the letter can move the Focus, make a selection, or perform an action. Such a letter is emphasized more than the surrounding text and is called a Shortcut Letter. See Section 2.2, Page 30 for further information.

8.75 **Sigma**

The Greek letter commonly used in statistics to represent 1 Standard Deviation.

8.76 **(The) Software**

Same as "Huckspin Operator Interface Software".

8.77 **Status Line**

The bar at the bottom of the screen. See Section 1.3.3, Page 8, for further information.

8.78 **SubMenu**

A menu that becomes available (opens) when another menu item is chosen.
8.79 **Supervisory Code**

Letters and numbers used to tell the Huckspin interface that the individual is authorized to perform a certain action. A supervisory code (or just code) is a password that is supposed to be known only by persons who are authorized to perform the associated actions with the Huckspin interface.

8.80 **Tower**

A computer case that is small horizontally, but large vertically.

8.81 **Threshold**

The pressure threshold is the minimum pressure the controller is allowed to send to the interface computer. Pressures below this value are ignored. Set this pressure no lower than 366 psi or 249 deci-bar.

8.82 **Trackball**

A device that operates like a mouse, except that you roll a ball (in place) that is attached on or near the keyboard, instead of pushing a mouse.

8.83 **Update**

To load the changes to the Huckspin software onto your computer. *See Section 3.2, Page 36, for further information.*

8.84 **VGA**

A particular standard method of encoding and displaying visual data on IBM compatible computers. There are several video standards, each with different levels of ability in color and resolution (how small a dot it can show). The VGA standard must be used by the monitor and video adapter attached to your computer in order for your computer to use the Huckspin software.

8.85 **Video Adapter**

An electronic device that is placed inside your computer to control the display on your monitor.

8.86 **Window**

A bordered rectangular region in which you view or enter data or make certain selections.
SERVICE NOTES:
LIMITED WARRANTIES

Tooling Warranty: Huck warrants that tooling and other items (excluding fasteners, and hereinafter referred as "other items") manufactured by Huck shall be free from defects in workmanship and materials for a period of ninety (90) days from the date of original purchase.

Warranty on "non standard or custom manufactured products": With regard to non-standard products or custom manufactured products to customer's specifications, Huck warrants for a period of ninety (90) days from the date of purchase that such products shall meet Buyer's specifications, be free of defects in workmanship and materials. Such warranty shall not be effective with respect to non-standard or custom products manufactured using buyer-supplied molds, material, tooling and fixtures that are not in good condition or repair and suitable for their intended purpose.

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Huck's sole liability and Buyer's exclusive remedy for any breach of warranty shall be limited, at Huck's option, to replacement or repair, at FOB Huck's plant, of Huck manufactured tooling, other items, nonstandard or custom products found to be defective in specifications, workmanship and materials not otherwise the direct or indirect cause of Buyer supplied molds, material, tooling or fixtures. Buyer shall give Huck written notice of claims for defects within the ninety (90) day warranty period for tooling, other items, nonstandard or custom products described above and Huck shall inspect products for which such claim is made.

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Huck shall not be liable for any loss or damage resulting from delays or nonfulfillment of orders owing to strikes, fires, accidents, transportation companies or for any reason or reasons beyond the control of the Huck or its suppliers.

Huck Installation Equipment

Huck International, Inc. reserves the right to make changes in specifications and design to discontinue models without notice.

Huck Installation Equipment should be serviced by trained service technicians only.

Always give the Serial Number of the equipment when corresponding or ordering service parts.

Complete repair facilities are maintained by Huck International, Inc. Please contact one of the offices listed below.

Eastern
One Corporate Drive Kingston, New York 12401-0250
Telephone (845) 331-7300 FAX (845) 334-7333

Canada
6150 Kennedy Road Unit 10, Mississauga, Ontario, L5T2J4, Canada.
Telephone (905) 564-4825 FAX (905) 564-1963

Outside USA and Canada
Contact your nearest Huck International Office, see back cover.

In addition to the above repair facilities, there are Authorized Tool Service Centers (ATSC's) located throughout the United States. These service centers offer repair services, spare parts, Service Parts Kits, Service Tools Kits and Nose Assemblies. Please contact your Huck Representative or the nearest Huck office listed on the back cover for the ATSC in your area.
A Global Organization
Alcoa Fastening Systems (APS) maintains company offices throughout the United States and Canada, with subsidiary offices in many other countries. Authorized APS distributors are also located in many of the world's industrial and Aerospace centers, where they provide a ready source of APS fasteners, installation tools, tool parts, and application assistance.

### Alcoa Fastening Systems world-wide locations:

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<th>Region</th>
<th>APS Locations</th>
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<tbody>
<tr>
<td></td>
<td>Alcoa Fastening Systems Commercial Products Canada Operations 6150 Kennedy Road, Unit 10 Mississauga, Ontario L5T7A4 Canada 905-564-4825 FAX: 905-564-1963</td>
</tr>
<tr>
<td>Far East</td>
<td>Alcoa Fastening Systems Commercial Products Australia Operations 14 Viewtech Place Rowville, Victoria Australia 3178 03-764-5500 Toll Free: 008-335-030 FAX: 03-764-5510</td>
</tr>
<tr>
<td>Europe</td>
<td>Alcoa Fastening Systems Commercial Products United Kingdom Operations Unit C, Stafford Park 7 Telford, Shropshire England TF3 3BQ 01952-290011 FAX: 0952-290459</td>
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