CONTENTS

CONTENTS ...........................................................................................................1

SAFETY ..............................................................................................................2

PRINCIPLE OF OPERATION ........................................................................3

GENERAL GUIDELINES

SYSTEM COMPONENT ......................................................................................4

FACILITY REQUIREMENTS ...........................................................................4

FACILITIES DRAWING ....................................................................................5

SPECIFICATION

USPIN UNIT WITH TOOLS .............................................................................6

918 POWERIG ...................................................................................................7

INSTALLATION AND START-up OF USPIN SYSTEM

GENERAL INSTALLATION .................................................................................8

START-up ..........................................................................................................8

CHECKING SET UP AND INSTALLING FIRST SET OF U-BOLTS ..................9

PLC PROGRAM MENUS & DEFINITIONS

MENU FLOW DIAGRAM ...................................................................................10

PROGRAM MENUS ..........................................................................................11 - 22

PLC AND PROGRAM WITH EEPROM CHIP

PROGRAMMING PLC WITH EEPROM CHIP ..............................................23

PLC WITHOUT EEPROM CHIP ..................................................................24

EEPROM CHIP ...............................................................................................24

PLC WITH EEPROM CHIP INSTALLED ......................................................25

ELECTRICAL AND ASSEMBLY DRAWINGS SECTION

HUCK WORLD-WIDE LOCATIONS

1
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 your 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 deflectors.

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 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 without 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.
PRINCIPLE OF OPERATION

Push and hold triggers, air motors will turn in the clockwise direction. When all 4 limit switch 2 lights are on, the air motors will stop and the hydraulic power rig will start the swage cycle. When the rig reaches the full swage pressure the valve will reverse and push the collars out of the anvils. Once the anvils are off the collars the air motors will start counter clockwise and thread off the bolts completing the cycle. 

Note: If the operator releases the triggers at any point in the cycle the tools will reverse.

U-BOLT HUCK-SPIN PROGRAM CYCLE

START

PULL & HOLD TRIGGER

RUN ALL FOUR AIR MOTORS CW
START 10 SEC. TIMER, TD-1

LS-2 TRIPPED ALL FOUR TOOLS

Y

N

TD-1 TIMMED OUT

ENERGIZE COMBINATION VALVE
START 20 SECOND TIMER, TD-3
START 5 SECOND TIMER, TD-2

PRESSURE OF 500 PSIG ATTAINED

Y

N

TD-2 TIMMED OUT

PRESSURE OF 7000 PSIG ATTAINED

Y

N

TD-3 TIMMED OUT

DE-ENERGIZE COMBINATION VALVE
START 10 SECOND TIMER, TD-4

Y

N

TD-4 TIMMED OUT

RUN ALL FOUR AIR MOTORS CCW
START 60 SECOND TIMER, TD-5

LS-1 UNTrippEd ALL FOUR TOOLS?

Y

N

START 4 SECOND TIMER, TD-6
IF NOT ALREADY TIMING
(A timer for each air mtr.)

TD-6 TIMMED OUT?

Y

N

TD-5 TIMMED OUT?

Y

N

END
General Guide Lines

This is a General guide for the requirements to set-up of the Uspin tooling with the 918 PoweRig. Detail information tools and controller maybe obtained from the Uspin service manual.

**SYSTEM COMPONENT**

- 918 Powerig
- PR2697-20 power supply
- 118309-52 Hose Kit
  (Consists or one -118308-52 control cable and two - 123740-52 noses)
- PR-2697 spin unit
- 127726 male two port coupler
- 127727 female two port coupler
- 127728 wire harness

**FACILITY REQUIREMENTS**

**Electrical Power For:**
- 918 power rig - 440 3 Phase 12.5 amps
- 507454 Power supply - 120 vac 3 amps

**Overhead System:**
- Counterbalancer rated at 500 lbs minimum
- Height enough for tool to clear work area

**Air Supply:**
- 90 to 100 psi. ? cfm (Oiler and Filter Required)

**Hydraulic Hoses:**
- 10,000 lbs operating with 40,000 burst rating.
**Specifications U-Spin Unit with Tools**

- **Weight:** 500lbs
- **Hyd. Pull Pressure:** 5,000 - 8,000psi.
- **Hyd. Return Pressure:** 3,000 - 6,000psi.
918 & 918-5 Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>918</th>
<th>918-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>25.0 (635 mm)</td>
<td>29.0 inches (737 mm)</td>
</tr>
<tr>
<td>Length</td>
<td>44.0 (1118 mm)</td>
<td>44.0 (1118 mm)</td>
</tr>
<tr>
<td>Height</td>
<td>30.0 (762 mm)</td>
<td>30.0 (762 mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>585 lbs. (265 kg)</td>
<td>601 lbs. (272 kg)</td>
</tr>
<tr>
<td>(Operational)</td>
<td>708 lbs. (321 kg)</td>
<td>724 lbs. (328 kg)</td>
</tr>
</tbody>
</table>

Model 918 system: Two open center circuits with 8,400 psi max. operating pressure.
Model 918-5 system: Three open center circuits with 8,400 psi max. operating pressure.

Pump: Dynex/Rivet constant displacement hydraulic piston pump direct mounted to motor. Pump has six axial pistons. Flow is split; three pistons per circuit in the 918, and two pistons per circuit in the 918-5.

Oil Control: Four way solenoid operated directional valve, pressure relief valve, and idler valve on each circuit.

Reservoir Capacity: 22 gallons (center of sight gauge).

Cooler: Fan and radiator air/oil heat exchanger.

Remote Control: 24 volt AC control circuit.

Power Source: 10 HP Reuland electric motor 220, 440, or 550 volts AC, 3 phase; 60 Hertz, or 8.3 HP Reuland electric motor 380 volts AC, 3 phase; 50 hertz.

FOR OTHER VOLTAGES AND FREQUENCIES:
Contact Huck International, Inc. at Kingston.

Hydraulic Fluid: DEXRON III, or equivalent, fire resistant hydraulic fluid (SUS 230@ 100°F and SUS 40@ 21°F).

Output Pressure: PULL range: 5,800 psi (400 bar) - 8,400 psi (648 bar).
                 RETURN range: 800 psi (55 bar) - 7,000 psi (482 bar).

Flow Rate: 918: 2 gallons per minute (per circuit).
           918-5: 1.33 gallons per minute (per circuit).
**General Installation:**

- Locate the 918 close to the work area to limit hose length. If the rig is to be located overhead, a drip pan with 22 gallon capacity is recommended.
- Fill the rig with Dextron III (22 gallons) prime the pump and start the rig. Check that the motor is rotating in the proper direction (see 918 manual for procedure).
- Adjust pull to 5800psi and return to 3800psi rig pressure on both valves (Refer to 918 manual for proper procedure)
  
  *Note: Pull and Return pressure on both valves must be set identical*
- Attach two port couplings to Powrig. (127726 & 127727)
- Locate the power supply within 8 ft of Powrig.
- Hang the Uspin tool from the counter-balancer.
- Attach the hydraulic hoses to the to the power rig.
- Turn on power rig.
- Install the ‘Y’ wire harness (127728) to the power rig.
  
  *Note: If the combination valves energize reverse one plug.*
- Turn Powerig off.
- Connect the trigger cable to the harness.
- Connect the control cable to the power supply.
- Connect the hydraulic hoses to the U-Spin top plate.
- With the hydraulic hoses and electrical cables attached to the top plate and power supply, bundle the hoses and cable together.
- Connect the Hydraulic hoses, air line and control cable to the ‘U’ spin unit. Add the air line to the hoses and control cable bundle and connect to overhead rail as required.
- Check to insure that all the hydraulics and electrical connections are made.

**Start-up:**

- Pull the Emergency stop button to turn the unit on.
- When the screen comes up touch the Hydraulic warm up button.
- Next select the Set Up Screen, select log in and type in the required code and push next.
- Push New Tool.
  - Select HS52 or HS70
  - Select bolt diameter to be installed and exit.
- Select HS52 or HS70 set up:
  - Select the bolt diameter to be installed, touch the screen and enter the required pressure and exit.
- Select Pressure settings:
  - Enter the high and low pressures and exit.
- Select Timers:
  - Set the timers to the required values.
- Select Position Set up:
  - Touch X axis for position 1 and enter the required value.
  - Touch Y axis for position 1 and enter the required value.
  - Repeat the steps for positions 2 through 5.
  - Push the Home Seq Start button, the tools will travel out to their furthest point. X position will be 7-3/8" and Y position will be 9-3/8".
- Exit from Main Set Up screen.
- Log in/out Screen push Main.
- From Main screen push the Run Screen.
  - You are now in the Run Mode Screen.
  - Select the X Y position (1 thru 5) and press index.

**CAUTION:** Bottom plate must be removed from the U-Spin unit before the X and Y axis setting can be changed.

Attach the proper bottom plate.
Checking Set Up and Installing First Set of U-bolts:

- Align the U spin tool to the U bolts, bring the tool down so that the thimbles are touching the end of the U bolt. Depress and hold the triggers to swage the collars.

- During the installation as the tools are backing off the collars, watch to make sure that the anvils are completely off the collars before the air motors start in reverse.

- If the anvils are not completely off the collars then go into the program, select timers, select Spin Off Delay by touching the value window. When number pad appears increase value by 1.0 seconds, press the return arrow to accept value.

- Check the swage of the collars to insure they are fully swaged. If not, go into the program, select Pressure Settings, select Hyd Pressure by touching the value window. When number pad appears increase value by 100psi, press the return arrow to accept value.

  **Note:** For minimum swage increases, use the Time to Hold Tool at Pressure selection and increase by 0.1 seconds.

- At the end of the installation cycle check to see if the thimbles spin completely off of the U-Bolts. If not you must go into the program, select timers, select Spin Off by touching the value window. When number pad appears increase value by 1.0 seconds, press the return arrow to accept value.

- Install the next set of U bolts and recheck Back Off Time, Swage and Spin off Time, adjust as required.

  **NOTE:** If U bolts are not completely swaged, they can be reswaged.
Menu Flow Diagram
Program Menus

Main Menu

1 - Takes you to the operator run screen.

2 - Technicians access to Set-Up screens.

3 - Warm-up cycle - should be performed at the start of each shift. Tool will cycle 10 times.

4 - Cancels Warm-up cycle.
Run Mode

1 - Current Tool.
2 - Current Fastener.
3 - Actual Swage Pressure.
4 - Pre-Programmed X-Y Position.
5 - Activates X-Y Selection.
6 - Limit Switch Indicators.
7 - Actual X-Y Position.
8 - Cycles tools after 2 hours of non-use. Button will flash when purge is required.
9 - Return to Main Screen.
Log In/Out

1 - Login, user must enter password. Default password is **huck**.

2 - Logout, user must log out after setup is complete.

3 - Next, will take you to Setup Screen.

4 - Main, returns you to Main Menu Screen.
**Main Set Up Screen**

1 - New Tool - This screen allows you to enter tool and fastener size.

2 - Tool Service - This screen allows you to reset current counts and set alarm counts.

3 - Axis Control - This screen allows you to manually change the X & Y axis.

4 - HS52 Setup - This screen is for pressure data storage only (reference only)

5 - Change Timers - This screen allows you to manually adjust all cycle timers.

6 - Pressure Settings - This screen allows you to manually adjust all required pressures.

7 - Position Set Up - This screen allows you to set-up 5 pre-defined X & Y locations.

8 - HS70 Setup - This screen is for pressure data storage only (reference only)

9 - Return to Main Menu Screen.
HS70 Set up

1 - Once Pressures are established you can store the values here for future reference. Touch the corresponding grey box to change values.

2 - Exit - Returns you to Main Menu Screen.
HS52 Set up

1 - Once Pressures are established you can store the values here for future reference. Touch the corresponding grey box to change values.

2 - Exit - Returns you to Main Menu Screen.
Position Set up

1 - Position 1 thru 5 - Enter the pre-defined X axis setting for each position. Touch the corresponding grey box to change values.

2 - Position 1 thru 5 - Enter the pre-defined Y axis setting for each position. Touch the corresponding grey box to change values.

3 - Exit - Returns you to Main Menu Screen.
Program Menus (Continued)

**Axis Control**

1 - **X Axis Close** - Touch button to manually decrease X Axis dimension. (Distance between centerline of tools)

2 - **X axis readout is displayed here.**

3 - **X axis Open** - Touch button to manually Increase X Axis dimension. (Distance between centerline of tools)

4 - **Y axis Close** - Touch button to manually decrease Y Axis dimension. (Distance between centerline of tools)

5 - **Y Axis readout is displayed here.**

6 - **Y Axis Open** - Touch button to manually Increase Y Axis dimension. (Distance between centerline of tools)

7 - **Home Seq Start** - Touch this button to move all tools to maximum X & Y position.

8 - **Exit** - Returns you to Main Menu Screen.

**CAUTION:** Bottom Positioning Plate Must be Removed before any X or Y Movement. If plate is not removed equipment may be damage.
1 - Hydraulic warm up on - This timer holds the piston in the back position during the warm up cycle. Touch the grey box to change values.

2 - Hydraulic warm up off - This timer releases the hydraulic pressure and allows the piston to return to the rest position during the warm up cycle. Touch the grey box to change values.

3 - Spin on to LS2 - This is the time allowed to reach Limit Switch two during the installation cycle. Touch the grey box to change the values.

4 - Time to hold tool at pressure - Once the hydraulic pressure reaches the set pressure this time holds the pressure for the time entered. Touch the grey box to change the values.

5 - Spin off Delay - This timer allows the anvils to clear the collars before the air motors start the spin off cycle. Touch the grey box to change the values.

6 - Spin Off - This timer controls the time the air motors spin in reverse during the spin off cycle. Touch the grey box to change the values.

7 - Low Press Time - At the start of the swage cycle if the low pressure is not reached during the allotted time, tools will reverse. (No collar Safety) Touch the grey box to change the values.

8 - Exit - Returns you to Main Menu Screen.
Tool Serviced

1 - Current Counts. Touch the corresponding grey box to reset values to zero.

2 - Alarms Count Settings. Touch the corresponding grey box to set recommended number of counts to activate alarm.

3 - Status - Turn alarms on and off.

4 - Exit - Returns you to Main Menu Screen.
New Tool Added

1 - Tool Size Select - . Touch the corresponding grey box to select tool size to be used.

2 - Fastener Size Select - . Touch the corresponding grey box to select fastener size to be installed.

3 - Exit - Returns you to Main Menu Screen.

Note: Above selections will appear on Run Screen.
Pressure Setting

1 - Hyd Low Pressure Set Point - No collar safety (set at 500lbs) Touch the grey box to change the values.

2 - Hyd High Pressure Set Point - Set for required swage pressure. Touch the grey box to change the values.

3 - Hyd Pressure Zero and Span should only be modified if the original transducer is replaced by one with a different pressure span. Contact your Huck representative before making any changes.

4 - Hyd Pressure - Actual System pressure (For Reference Only).

5 - Exit - Returns you to Main Menu Screen.
Programing PLC with EEPROM Chip

The Mitsubishi PLC comes programmed from the factory. If for any reason the PLC needs to be reprogrammed Huck will send a EEPROM chip with the program loaded.

Listed below are the steps needed to reprogrammed PLC:

1. - Turn System Power off.

2. - Install Chip in PLC. (See Photos on the following pages.)

3. - Make sure the Protect Switch (SW) is turned to the on position. **Note:** *Protect Switch should be left in the on position at all times.*

4. - Turn the System Power on and the program will automatically load.

5. - Turn System Power off.

6. - Remove Chip.

7. - Refer to page 8 and follow the Start Up instructions.

8. - System is now operational.
PLC Without EEPROM

Protect Switch

EEPROM Chip
PLC With EEPROM

Protect Switch
Electrical and Assembly
Drawings Section
A Global Organization
Alcoa Fastening Systems (AFS) maintains company offices throughout the United States and Canada, with subsidiary offices in many other countries. Authorized AFS distributors are also located in many of the world’s industrial and Aerospace centers, where they provide a ready source of AFS fasteners, installation tools, tool parts, and application assistance.

Alcoa Fastening Systems world-wide locations:

**Americas**

**Alcoa Fastening Systems**
**Aerospace Products**
**Tucson Operations**
3724 East Columbia
Tucson, AZ 85714
800-234-4825
520-747-9898
FAX: 520-748-2142

**Alcoa Fastening Systems**
**Commercial Products**
**Kingston Operations**
1 Corporate Drive
Kingston, NY 12401
800-431-3091
845-331-7300
FAX: 845-334-7333
www.hucktools.com

**Alcoa Fastening Systems**
**Commercial Products**
**Carson Operations**
PO Box 5268
900 Watson Center Rd.
Carson, CA 90749
800-421-1459
310-830-8200
FAX: 310-830-1436

**Alcoa Fastening Systems**
**Commercial Products**
**Canada Operations**
6150 Kennedy Road, Unit 10
Mississauga, Ontario L5T2J4
Canada
905-564-4825
FAX: 905-564-1963

**Alcoa Fastening Systems**
**Commercial Products**
**Waco Operations**
PO Box 8117
8001 Imperial Drive
Waco, TX 76714-8117
800-388-4825
254-776-2000
FAX: 254-751-5259

**Europe**

**Alcoa Fastening Systems**
**Commercial Products**
**United Kingdom Operations**
Unit C, Stafford Park 7
Telford, Shropshire
England TF3 3BQ
01952-290011
FAX: 0952-290459

**Alcoa Fastening Systems**
**Aerospace Products**
**France Operations**
Clos D’Asseville
BP4
95450 Us Par Vigny
France
33-1-30-27-9500
FAX: 33-1-34-66-0600


NOTICE: The information contained in this publication is only for general guidance with regard to properties of the products shown and/or the means for selecting such products, and is not intended to create any warranty, express, implied, or statutory; all warranties are contained only in Huck’s written quotations, acknowledgements, and/or purchase orders. It is recommended that the user secure specific, up-to-date data and information regarding each application and/or use of such products.

HWB898 1003-5M

© 2003 Alcoa Fastening Systems
1 Corporate Drive, Kingston, NY 12401 • Tel: 800-431-3091 • Fax: 845-334-7333 • E-mail: hkitoolinfo@alcoa.com • www.alcoafasteningsystems.com