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**REFERENCE DRAWINGS:**

- 1/4” Powerfeed Tool Assembly ..................................PR3070
- Tool Assembly ........................................................PR3070-3
- Power Source for Powerfeed ......................................PR3070-EPS4
- Rod with Arm Assembly ..............................................PR3070-20
- Nose Assembly ........................................................PR3070-50
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- Modified Cylinder ..................................................PR2948-24-MAN
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- Hose Assembly .............................................................HA1 DASH

**REFERENCE INSTRUCTIONS:**

- Parker Pneumatic Division Pressure Switch (2M400F) .PR2948-52
- BIMBA Band Mount Switch (HSKQCX04) .................PR2948-54
- VACCON Vacuum Switch/Sensor (VDS-1000) ............PR2948-53

**REFERENCE INSTRUCTION MANUALS:**

- Ebbert Power Source EPS4 ..........................................HK1036
- Ebbert Rivet Tool ERT1,2,3,4S ............................HK1038
This page is intentionally blank.
### SYSTEM SET-UP

1. Unpack all equipment and check for damage.

2. Connect Tool **PR3070-70** to Hose Assembly **HA1X25A** if not already connected.

3. Connect opposite end of Hose Assembly **HA1X25A** to Power Source **PR3070-EPS4** and Collection Assembly **PR2948-60**.

4. Connect Air Lines on Tool marked “VAC-BLOW”, “ARM OUT” and “ARM BACK” to Control Valves (not supplied). Reference **PR2948-101** pneumatic schematic.

5. Connect Regulator Outlet **507750** to 3/8” Tube Fitting **507739** on Collection Assembly with Tubing (not supplied).

6. Connect Regulators from Power Source and Collection Assembly to a clean 90 psi minimum air supply.

7. Connect pressure switch **PR2948-52** on Power Source to system control (not supplied).

8. Connect Vacuum Switch **PR2948-53** on Collection Assembly to System Control (not supplied).

9. Complete all necessary plumbing and wiring per **PR2948-100** and **PR2948-101**.

### ADJUSTMENTS AND SETTINGS

#### Fastener Insertion in Pulling Head **PR3070-50**

1. The rivet mandrel must easily pass into Pulling Head and Driving Anvil **109319**.

#### DELIVERY ARM ADJUSTMENTS AND SETTINGS

**RDD Home Position:**
Reference **PR3070-70 & PR3070-20**

1. When the Delivery Arm Bushing **PR3070-21** is in the home position it should nest snugly in the RDD Receiver Bushing **PR3070-43**.

2. If there is a mismatch between the two, loosen the locking screws and rotate the RDD assembly until proper nesting is achieved. Tighten locking screws.

**Delivery Arm Transfer Gap:**
Reference **PR2948-70 & PR2948-20**

1. When the Delivery arm transfers the rivet in front of the pulling head, there should be approximately a 1/16”-3/32” gap from the end of the rivet mandrel to the face on the Driving Anvil.

2. If this gap needs to be increased or decreased, loosen the screw that locks front RDD bracket **PR3070-41** on pulling head **PR3070-50**.

3. Slide the RDD and bracket to the front or back of the tool to gain the proper gap. Tighten the locking screws.

**Delivery Arm Transfer Gap:**
Reference **PR3070-70, PR2948-24-MAN, & PR3070-20**

1. When the Delivery arm transfers the rivet in front of the pulling head, it should be aligned to achieve transfer of rivet into the pulling head on tool.

2. To adjust the amount of rotation, refer to **PR2948-24-MAN**.

3. Remove the two Button Head Screws (Item 6) and slide the End Cap (Item 7) out of the back of the cylinder.

4. Thread the Piston (Item 5) in or out to achieve correct rotation.

5. Reassemble the End Cap and Button Head Screws.

6. Recheck and readjust if necessary.
AIR PRESSURE SETTINGS

**Power Source PR3070-EPS4**

1. Set air pressure on regulator to 90 psi.

**Collection Assembly PR2948-60**

1) With system set up and connected to control, fully power up system including control.

2) Adjust regulator pressure on Collection Assembly up and down until the maximum reading is indicated on vacuum switch display PR2948-53 on Collection Assembly. This value should be approx 13.4 @ 50 psi.

PRESSURE, VACUUM AND POSITION SWITCH SETTINGS

**Pressure Switch on Power Source PR3070-EPS4**

1) With system set up and connected to control, fully power up system including control.

2) Press trigger on tool and hold.

3) Adjust Pressure Switch PR2948-52 until Switch closes and signal is received.

4) Release Trigger. Switch should open and signal should be lost.

5) Repeat several times to verify function.

**Vacuum Switch on Collection Assembly PR2948-60** - Use the same process for “rivet in receiver” vacuum switch (not included).

1) With system set up and connected to control, fully power up system including control.

2) Familiarize yourself with the function and control of Vacuum Switch PR2948-53. Read enclosed information on how to change settings. Use the Hg setting for units.

3) Insert a fastener in nose of tool. Read measurement on Vacuum Switch. The reading should be approx. 17.5.

4) Turn off air to Collection Assembly.

5) Change switch setting of Vacuum Switch to be approximately 1 in hg below the reading in step 3, approx. 16.5. set the hysteresis to .5 and the response time to 25ms.

6) Check the signal on the tool control. The signal should be gained and lost when a fastener is placed in the nose and removed.

**Position Switch on RDD of Tool Assembly PR3070-70**

1) With system set up and connected to control, fully power up system including control.

2) The tools control system should see the arm retracted signal from Switch PR2948-54 on tool assembly PR3070-70.

3) As the arm extends the signal should be lost.

4) If signal can not be gained and lost as described above, adjust the position of Switch on the RDD Assembly PR3070-20 until it can.
NOTES:

1. REFER TO PR2948-100 FOR ELECTRICAL SCHEMATIC.
2. REFER TO PR2948-101 FOR PNEUMATIC SCHEMATIC.
3. REFER TO DOCUMENT PR3070-103 FOR SETTINGS AND ADJUSTMENTS.
4. NOT INCLUDED ARE FASTENER FEEDER AND FEED TUBE, PLC CONTROL, PNEUMATIC CONTROL VALVES, VACUUM TRANSDUCER FOR RDD RECEIVER AND VACUUM SWITCH FOR RDD RECEIVER.

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>QTY</th>
<th>DESCRIPTION</th>
<th>ITEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>HA1X25A</td>
<td>1</td>
<td>HOSE ASSEMBLY</td>
<td>4</td>
</tr>
<tr>
<td>PR3070-70</td>
<td>1</td>
<td>TOOL ASSEMBLY</td>
<td>3</td>
</tr>
<tr>
<td>PR3070-EP</td>
<td>1</td>
<td>POWER SOURCE</td>
<td>2</td>
</tr>
<tr>
<td>PR2948-60</td>
<td>1</td>
<td>COLLECTION ASSEMBLY</td>
<td>1</td>
</tr>
</tbody>
</table>

HUCK INTERNATIONAL, INC., L.S.D.
1 CORPORATE DR, P.O. BOX 2270
KINGSTON, NEW YORK 12401

ASSY, 1/4" POWERFEED TOOL
ERBERT STYLE

FOC. FAC. A PR3070
USE TEFLOM STICK 50.3237 OR EQUIVALENT ON THREADS.
NOTES:

- INSTALL SWITCH AS SHOWN, FEED CABLE THROUGH SLEEving WITH HOSES.
- PLACE SHRINK TUBE (HOBART) MARKED "HAC" OR "BLOW" ON BOTH ENDS OF FEED TUBE, FEED TUBING THROUGH TOOL SLEEving WITH HOSES.
- PLACE SHRINK TUBE (HOBART) MARKED "ARM OUT" ON BOTH ENDS OF FEED TUBE, FEED TUBING THROUGH TOOL SLEEving WITH HOSES.
- PLACE SHRINK TUBE (HOBART) MARKED "ARM BACK" ON BOTH ENDS OF FEED TUBE, FEED TUBING THROUGH TOOL SLEEving WITH HOSES.

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>QTY</th>
<th>DESCRIPTION</th>
<th>ITEM</th>
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</thead>
<tbody>
<tr>
<td>507676</td>
<td>30</td>
<td>TUBING, .156 X .033 RED</td>
<td>17</td>
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<tr>
<td>507675</td>
<td>30</td>
<td>TUBING, .156 X .033 GREEN</td>
<td>16</td>
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<tr>
<td>507672</td>
<td>20</td>
<td>LACING .156 X .166 GREEN</td>
<td>15</td>
</tr>
<tr>
<td>507674</td>
<td>1</td>
<td>ROD RECEIVER BUSHING</td>
<td>14</td>
</tr>
<tr>
<td>507671</td>
<td>1</td>
<td>FEED TUBE NUT</td>
<td>13</td>
</tr>
<tr>
<td>507670</td>
<td>1</td>
<td>STRAIN RELIEF, BRYANT #242234</td>
<td>12</td>
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<tr>
<td>507669</td>
<td>1</td>
<td>ADJUSTING PLATE</td>
<td>11</td>
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<tr>
<td>507668</td>
<td>1</td>
<td>BUSHING, .832 X 3/8</td>
<td>10</td>
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<tr>
<td>507661</td>
<td>1</td>
<td>BUSHING, .832 X 1/4</td>
<td>9</td>
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<tr>
<td>507660</td>
<td>1</td>
<td>ROD ASSY</td>
<td>8</td>
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<tr>
<td>507659</td>
<td>1</td>
<td>NUT ASSY, 1/4&quot; THERMATIC</td>
<td>7</td>
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<td>507658</td>
<td>1</td>
<td>BUSHING, .832 X 3/8</td>
<td>6</td>
</tr>
<tr>
<td>507657</td>
<td>1</td>
<td>FRONT ROD BRACKET</td>
<td>5</td>
</tr>
<tr>
<td>507656</td>
<td>1</td>
<td>TOOL ASSY</td>
<td>4</td>
</tr>
<tr>
<td>507655</td>
<td>2</td>
<td>BUSHING, .832 X 1/2</td>
<td>3</td>
</tr>
<tr>
<td>507654</td>
<td>1</td>
<td>FRONT ROD BRACKET</td>
<td>2</td>
</tr>
<tr>
<td>507653</td>
<td>1</td>
<td>SWITCH, 810, 5.952001X4</td>
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<tr>
<td>PART NO.</td>
<td>QTY</td>
<td>DESCRIPTION</td>
<td>ITEM</td>
</tr>
<tr>
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<td>-----</td>
<td>-------------</td>
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</tr>
<tr>
<td>C</td>
<td>1</td>
<td>PR3070-70</td>
<td>1</td>
</tr>
</tbody>
</table>
PRESS Ø .086 X .25 LG. GAUGE PIN
4 PLACES, EVENLY SPACED ON A
Ø .562-.563 BOLT CIRCLE
TOOL TRIGGER

INSERT IN TOOL

ARM RETRACTED

INSERT IN RECEIVER

DC COM

DC COM OUT

V53 - 1

V53 - 2

BLUE

V51

SOL 1

SOL 2

SOL 3

HYD. PUMP ON

ARM EXTEND

TRANSFER INSERT TO TOOL BLOW

TO SOLENOID VALVE ON HUCK POWERING

24 VAC FROM HUCK POWERING

24 VAC FOR INSERT SYSTEM

3 INSERT IN RECEIVER LAMP (24VDC FOR INSERT SYSTEM)

OUTPUT TO SEND INSERT (24VDC FOR INSERT SYSTEM)

CONTACTS:

MATERIAL:

SPEC:

TECHNICAL criteria:

SPECS:

PERFORMANCE:

SPEC:

TEST:

EFFECTIVE:

SPEC:

DATE:

MATERIAL:

SPEC:

TECHNICAL criteria:

SPECS:

PERFORMANCE:

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DATE:
Installation & Operation Instructions:
2M400F
Pressure Switch

ISSUED: November, 2003
Supersedes: January, 2002
Doc.# 2M400, ECN# 030539, Rev. 6

Introduction
Follow these instructions when installing, operating, or servicing the product.

Application Limits
These products are intended for use in general purpose compressed air systems only.

Adjustment Range

<table>
<thead>
<tr>
<th>Operating Inlet Pressure</th>
<th>kPa</th>
<th>PSIG</th>
<th>bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Styles Pressure Max.</td>
<td>2067</td>
<td>300</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Adjustment Range</th>
<th>kPa</th>
<th>PSIG</th>
<th>bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flying Lead Pressure</td>
<td>172 / 689</td>
<td>25 / 100</td>
<td>1.7 / 6.8</td>
</tr>
<tr>
<td>DIN Connector Pressure</td>
<td>207 / 1034</td>
<td>30 / 150</td>
<td>2.1 / 10.3</td>
</tr>
</tbody>
</table>

(All shipped preset at 90 PSIG - 6.2 bar)

 Ambient Temperature Range
-40°C to 80°C (-40°F to 180°F)

Symbol

Installation Instructions
1. The pressure switch should be installed with reasonable accessibility for service. Pipe joint compound should be applied sparingly, and only to the male threads, never to the female threads. Do not use PTFE tape to seal joints - pieces have a tendency to break off and lodge inside the unit, possibly causing malfunction.
2. Install pressure switch in gauge ports, manifold blocks, or any airline application. Mounting may be in any position.
3. Installing a filter upstream of the pressure switch will provide added protection against rust, pipe scale, and other foreign matter.

Operation
1. Description:
The pressure switch monitors air pressure and provides an electrical output when the pressure drops below or exceeds an adjustable preset pressure.

2. Adjustment:

Flying Lead
A. Remove screw from top of switch.
B. Using a 1/8" (3mm) hex wrench, turn the adjustment screw clockwise to increase set point or counterclockwise to decrease set point.
C. Replace screw.

DIN Connector
Using a 1/8" (3mm) hex wrench, turn the adjustment screw clockwise to increase set point or counterclockwise to decrease set point. One complete revolution of the adjusting screw covers the complete adjustment range.

Kits and Accessories
Bushing 1/4" to 3/8" ...................................................... 209P-6-4
Bushing 1/4" to 1/2" ...................................................... 209P-8-4

WARNING
To avoid unpredictable system behavior that can cause personal injury and property damage:
- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer’s specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

Failure or improper selection or improper use of the products and/or systems described herein or related items can cause death, personal injury and property damage.

This document and other information from The Company, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by The Company and its subsidiaries at any time without notice.

EXTRA COPIES OF THESE INSTRUCTIONS ARE AVAILABLE FOR INCLUSION IN EQUIPMENT / MAINTENANCE MANUALS THAT UTILIZE THESE PRODUCTS. CONTACT YOUR LOCAL REPRESENTATIVE.
CONTENTS: 1 switch 1 screw
1 washer 1 nut

SWITCH MOUNTING INSTRUCTIONS

Notice: New Wire Colors in Effect

<table>
<thead>
<tr>
<th>Color Code</th>
<th>Signal</th>
<th>Old</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input (positive)</td>
<td>Red</td>
<td>Brown</td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>White</td>
<td>Black</td>
<td></td>
</tr>
<tr>
<td>Ground (negative)</td>
<td>Black</td>
<td>Blue</td>
<td></td>
</tr>
</tbody>
</table>

The new wire colors conform to the CENELEC EN 50 044 standard.

CAUTION: Shorting black output wire to blue wire (common/ground) or brown wire (positive/input) will damage the switch.
SOLID STATE SWITCH for
ORIGINAL LINE STYLE BAND MOUNT
Assembly Instructions
Side 2

ELECTRICAL SPECIFICATIONS

Output Type .................... Current sinking or sourcing
Input Voltage .................... 5 to 30 V DC
Input Current .................... 10 mA max.
"On" Voltage Drop
  Sinking .................... 0.4 Volts max.
  Sourcing .................... 1.5 Volts max.
Output Current .................... 150 mA max.
Power Dissipation ................. 300 mW max.

Temperature Range ............ -20° to +185°F
  -25° to +85°C
Turn ON Time .................... 1 μs (microsec.)
Turn OFF Time .................... 1 μs (microsec.)
OFF State Leakage ............... 10 μA max.

LED Color: Red for sinking
  Yellow for sourcing
Reverse Polarity Protected
Over Voltage Protected

Note: Specifications subject to change without notice

CIRCUIT DIAGRAMS

Typical Sinking Configuration
(NPN)

Typical Sourcing Configuration
(PNP)

Basic Circuit Layout for Programmable Controllers and Normally Off Relays and Solenoids

CAUTION: Shorting black output wire to blue wire (common/ground) or brown wire (positive/input) will damage the switch.

QUICK CONNECT PIN AND WIRE ASSIGNMENTS

8mm Female Connector

Model "C" - 2m Cable
Model "CX" - 5m Cable

Face View of Male Connector

Bimba Manufacturing Company
Monee, IL 60449
708/534-8544
FAX: 708/235-2014
Technical Assistance: 1-800-44-BIMBA
Website: www.bimba.com

Form SSS-201-A
Operating Instructions – Vaccon VDS-1000 Solid State Combination Vacuum Switch/Sensor w/ Digital Display

The VDS-1000 combines either two (2) low voltage, high side or low side, switched outputs and one (1) analog transducer output with a 3-digit LED digital display.

Installation

The VDS-1000 has two 1/8” NPT sensing ports for ease of connection. The unused port must be plugged for proper operation. The wiring diagram below shows the proper input/output connections. Note: All ground connections should be common to the source to reduce the opportunity for short or open circuits, or erroneous readings caused by peripheral noise.

See the separate section for alternate mounting configurations.

![Wiring Diagram](image)

Installation Notes

- Maximum pressure allowed at the VDS 1000 for a vacuum break is 500kPa (72.5 PSI).
- For stability, use a regulated DC power supply.
- With inductive loads, use surge absorbing diodes or varistors. If using a switching power supply, the FG terminal should be earthed. Do not run wires parallel to high tension cables or power lines.
- DO NOT crimp cable or wires during handling.
- DO NOT put any pressure on the body of the sensor when tightening fitting.
- DO NOT use pointed objects such as pens to press the setting buttons.
- USE pH neutral detergent to clean the body. DO NOT use solvents such as thinners.
- DO NOT use for the detection of flammable gases.
- Protect fittings from damage to ensure good seals.
- Enclosure is dust proof and drip proof (to IP65 IEC standards) and is not suitable for environments requiring higher standards.
- When analog output is supplied to a noise-sensitive device use a low-pass filter in the line.
- DO NOT insert any object into the vacuum/pressure port, as it will damage the internal diaphragm and cause the VDS-1000 to malfunction.
## Specifications

### Dimension

![Diagram showing the dimensions of the VDS-1000, VDS-1000-N, and VDS-1000-L models.]

### Performance

<table>
<thead>
<tr>
<th>Specification</th>
<th>VDS-1000</th>
<th>VDS-1000-N</th>
<th>VDS-1000-L</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated Vacuum Range</strong></td>
<td>-14.5 to 14.5 PSI (-982 mbar to 1 bar)</td>
<td>-1.5 to 1.5 PSI (-101.5 mbar to .10 bar)</td>
<td></td>
</tr>
<tr>
<td><strong>Proof Pressure</strong></td>
<td>29 PSI (2 bar)</td>
<td>2.9 PSI (.20 bar)</td>
<td></td>
</tr>
<tr>
<td><strong>Burst Pressure</strong></td>
<td>72.5 PSI (5 bar)</td>
<td>7.25 PSI (.50 bar)</td>
<td></td>
</tr>
<tr>
<td><strong>Media</strong></td>
<td>Non-Corrosive, Dry Gases</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Supply Voltage</strong></td>
<td>10.8 to 30 VDC</td>
<td></td>
<td></td>
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<tr>
<td><strong>Current Consumption</strong></td>
<td>70 mA Max</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Switch Type</strong></td>
<td>Transistor Open Collector</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sensing/Switching Material</strong></td>
<td>Single Crystal Silicon</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Outputs</strong></td>
<td>(2) PNP Switched, (1) 1-5 VDC Analog</td>
<td>(2) NPN Switched, (1) 1-5 VDC Analog</td>
<td>(2) PNP Switched, (1) 1-5 VDC Analog</td>
</tr>
<tr>
<td><strong>Electrical Connection</strong></td>
<td>5-Wire -26 AWG - 7’(2m), Optional 5 Pin, M12 Quick Disconnect</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hysteresis</strong></td>
<td>Adjustable - 0 to 300 Digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Repeatability</strong></td>
<td>+/- 0.2% Full Scale, 1 Digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response Time</strong></td>
<td>5 ms Max</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Circuit Protection</strong></td>
<td>Exists</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max. Switched Voltage Load</strong></td>
<td>30 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max. Switched Current Load</strong></td>
<td>100 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Thermal Error</strong></td>
<td>+/- 3% Full Scale/ 121°F (50°C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Thermal Compensation</strong></td>
<td>NONE</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td>Full 3 Digit LED (sampling rate: 4/sec)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Switch Indication</strong></td>
<td>SW1–Green LED ON (Switched Output ON)</td>
<td>SW2–Red LED ON (Switched Output ON)</td>
<td></td>
</tr>
<tr>
<td><strong>IP Protection</strong></td>
<td>IP65</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating Temperature</strong></td>
<td>15°F to 125°F (-10°C to 52°C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating Humidity</strong></td>
<td>35 to 85% RH (No Condensation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Construction</strong></td>
<td>ABS/ Aluminum Die-Cast/ Buna</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fitting/Connection</strong></td>
<td>2 - 1/8” NPT (Female) - Back and Bottom</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Net Weight</strong></td>
<td>3.7 oz. (105g)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Safety and Environmental Compliance</strong></td>
<td>CE, RohS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
VDS 1000 Initial Setup

STEP 1 - Calibration
- Press both arrow buttons simultaneously for more than one second to calibrate/zero the unit to atmospheric pressure.
- Display will show 0ad.
- Release buttons when the display flashes.
- The VDS 1000 is now calibrated/zeroed to atmosphere.

STEP 2 - Selecting the Scale
- Press the down arrow and the mode button simultaneously to enter the scale mode.
- Using the down and up arrow buttons set the 3rd digit to the appropriate scale factor (SEE TABLE 1).
- Once desired setting is selected press the mode button to move to the 2nd digit.
- SW1 LED will be flashing.

STEP 3 - Select the Analog Output Mode
- Skip this step if NOT using ANALOG outputs.
- The LED under SW1 should be flashing.
- If LED is not flashing press the mode button until LED is illuminated.
- Using the down and up arrow buttons set the 2nd digit to the desired analog output mode (SEE TABLE 2).
- Once desired setting is selected press the mode button to move to the 1st digit.

STEP 4 - Select the Switch Output Mode
- The LED under SW2 should be flashing.
- If LED is not flashing press the mode button until LED is illuminated.
- Using the down and up arrow buttons set the 1st digit to the desired switch output mode (SEE TABLE 3). Tables 4 and 5, on page 4, provide additional detailed information on the Switch Output Modes.

STEP 5 - Return to Operation Mode
- Once desired setting is selected press the mode button for more than one second to return to the operation mode.
**VDS 1000 Setpoint, Hysterisis, and Filter Mode Setup**

**STEP 1**
- Press the up arrow and the mode buttons simultaneously to enter the pressure settings mode.
- The LED under SW1 should be flashing.

**STEP 2 – Setting SW1**
- Using the down and up arrows, set SW1 to the desired pressure level.

*NOTE: When setting VDS-1000 switch, the LED under +/- is NOT illuminated for positive pressure setting. The LED IS illuminated when setting negative (vacuum) pressure. If the state of the LED needs to be changed, press the down arrow until the LED changes state.*

*For this example we are setting SW1 to 10"Hg.*
- When desired level is set, press the mode button to set SW2.

---

Table 4 – Programmable Output Modes

<table>
<thead>
<tr>
<th>Separate Mode</th>
<th>Initial SW Outputs</th>
<th>Programmed SW Outputs 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SW1 ON, SW2 OFF</td>
<td>SW1 OFF when vacuum level reaches set point</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SW2 OFF when vacuum level reaches set point</td>
</tr>
<tr>
<td>2</td>
<td>SW1 ON, SW2 OFF</td>
<td>SW1 OFF when vacuum level reaches set point</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SW2 ON when vacuum level reaches set point</td>
</tr>
<tr>
<td>3</td>
<td>SW1 OFF, SW2 ON</td>
<td>SW1 ON when vacuum level reaches set point</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SW2 OFF when vacuum level reaches set point</td>
</tr>
<tr>
<td>4</td>
<td>SW1 OFF, SW2 OFF</td>
<td>SW1 ON when vacuum level reaches set point</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SW2 OFF when vacuum level reaches set point</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Window Comparator Mode</th>
<th>Initial SW Outputs</th>
<th>Programmed SW Outputs 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>SW1 ON, SW2 ON</td>
<td>Both SW1 &amp; SW2 shutoff when vacuum reaches setting of SW2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Both SW1 &amp; SW2 turn on when vacuum reaches setting of SW1</td>
</tr>
<tr>
<td>6</td>
<td>SW1 ON, SW2 OFF</td>
<td>When vacuum reaches the setting of SW2 – SW1 shuts off and SW2 turns on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When the vacuum reaches the setting of SW1 – SW1 turns on and SW2 shuts off</td>
</tr>
<tr>
<td>7</td>
<td>SW1 OFF, SW2 ON</td>
<td>When vacuum reaches the setting of SW2 – SW2 shuts off and SW1 turns on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When the vacuum reaches the setting of SW1 – SW2 turns on and SW1 shuts off</td>
</tr>
<tr>
<td>8</td>
<td>SW1 OFF, SW2 OFF</td>
<td>Both SW1 &amp; SW2 turn on when vacuum reaches the setting of SW2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Both SW1 &amp; SW2 shutoff when vacuum reaches the setting of SW1</td>
</tr>
</tbody>
</table>

*Note #1: In the Separate mode, setting 1 = SW1, setting 2 = SW2.*

*Note #2: In Window Comparator mode, min. value for SW1 and SW2 corresponds to setting 1 and max. value corresponds to setting 2.*
STEP 3 – Setting SW 2

- The LED under SW2 should be flashing. Using the down and up arrows, set SW2 to desired level.

*For this example we are setting SW2 to 20”Hg.*

- When desired level is set, press the mode button to set hysteresis.

STEP 4 – Setting Hysteresis

- The LED under the +/- should be flashing.
- Using the down and up arrows, set the hysteresis to the desired level.

*Note: The hysteresis setting is for BOTH SW1 and SW2.*

- When desired level is set, press the mode button to set digital filtering mode.

STEP 5 – Setting the Filter Mode

- The filter mode is the sampling rate of the switch. The desired rate is based on the stability of the process.
- Using the down and up arrows, set the filtering mode (SEE TABLE 6).

STEP 6

- Once desired setting is selected press the mode button for more than one second to return to the operation mode.

### Table 6

<table>
<thead>
<tr>
<th>Digital Filtering Mode</th>
<th>Response Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-0</td>
<td>5 ms</td>
</tr>
<tr>
<td>F-1</td>
<td>25 ms</td>
</tr>
<tr>
<td>F-2</td>
<td>250 ms</td>
</tr>
<tr>
<td>F-3</td>
<td>2.5 seconds</td>
</tr>
</tbody>
</table>

**Display Options**

The VDS-1000 has three (3) display options that allow the user to temporarily turn off the display, lock the keypad, or completely turn off the display and lock the keypad.

**Temporary Mode**

- When the keys are not operated for more than 10 seconds during Operation Mode, the system will automatically select Non-Display [Temporary] Mode and the display will turn off.
- Decimal point LED shown in the figure below will blink during Non-Display [Temporary] Mode.
- Using the EEPROM, the VDS-1000 can retain preset values even if the power is turned off.
- If an error message is detected, the display will comeback and show the error message.

**Setting the Temporary Mode**

- To enable Non-Display [Temporary] Mode, press key for more than 4 seconds. will be displayed and Non-Display [Temporary] Mode will be set. After 10 seconds, display will go off.
To disable Non-Display [Temporary] Mode, press \( \text{M} \) key for more than 4 seconds. \( \text{M} \) will be displayed and Non-Display [Temporary] Mode will be canceled.

**Full Time Mode**

- In Non-Display [full-time] Mode, the display will be turned off and the Keys will be locked.
- Decimal point LED shown in the figure below will light up during Non-Display [full-time] Mode.
- Using the EEPROM, VDS-1000 can retain the preset values even if the power is turned off.
- If an error message is detected, the display will comeback and show the error message.

Setting the Full Time Mode

- To enable Non-Display [full-time] Mode, press \( \text{M} \) key for more than 4 seconds. \( \text{M} \) will be displayed and Non-Display [Full-time] Mode will be set. Display will turn off in a second.

- To disable Non-Display [full-time] Mode, press \( \text{M} \) key for more than 4 seconds. \( \text{M} \) will be displayed and Non-Display [Full-time] Mode will be canceled

**Keypad Lock Out Mode**

- Key Protection Mode is used to lock the front panel key in order to prevent preset values from being accidentally changed.
- Using EEPROM, the VDS-1000 can retain the preset values even if the power is turned off.

Setting the Keypad Lockout Mode

- To enable Key Protection Mode, press \( \text{M} \) key for more than 4 seconds. \( \text{M} \) will be displayed and the Keys will be locked.
- To disable Key Protection Mode, press \( \text{M} \) key for more than 4 seconds. \( \text{M} \) will be displayed and the keys will be unlocked.

**Error Messages**

<table>
<thead>
<tr>
<th>Message</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-1</td>
<td>CURRENT OVERLOAD. Flashing L.E.D. indicates overload on SW1 or SW2</td>
<td>Switch off the power. Check the current levels.</td>
</tr>
<tr>
<td>E-2</td>
<td>PRESSURE DETECTED when adjusting zero point</td>
<td>Press the “M” button for two (2) seconds to cancel “E-2” display. Remove the pressure source and re-zero the unit.</td>
</tr>
<tr>
<td>E-3</td>
<td>INCORRECT SETTINGS. Impossible values for detection have been selected.</td>
<td>Check the settings and reset.</td>
</tr>
<tr>
<td>E-4</td>
<td>UNRECOVERABLE FAILURE</td>
<td>Return unit to factory. Review the Vaccon Return Policy first.</td>
</tr>
<tr>
<td>---</td>
<td>PRESSURE VALUES EXCEED RANGE</td>
<td>Check applied pressure and settings.</td>
</tr>
<tr>
<td>999</td>
<td>PRESSURE VALUES EXCEED RANGE</td>
<td>Check applied pressure and settings.</td>
</tr>
</tbody>
</table>
Alternate Mounting Configurations

Bottom Mount Bracket

Rear Mount Bracket

Panel Mount Bracket
Warranty – Electronic Products (Switches, Sensors, Valves)

Vaccon Company warrants that its electronic products are free from defects in workmanship and materials for a period of 90 days after invoice. The company makes no other warranty, expressed or implied, and will not assume any liability for damages, labor or delays incidental hereto. Not intended for life support systems.

Vaccon Return Policy - Electronic Products (Switches, Sensors, Valves)

To return a product, whether it was ordered incorrectly or is defective, please contact your local Vaccon distributor for a Return Material Authorization number (RMA). For Vaccon distributors, please have the following information available: original invoice number, date ordered, the product part number, quantity being returned and the reason for return.

a. **Damage due to improper installation / application** - Detailed installation and operating instructions are included with every electronic product. Any installation that deviates from these instructions or any application not within these specifications voids any warranty and the product cannot be returned and credit will not be issued.

b. **Modified/Altered Product** - Any product that has been altered or modified in any way voids the warranty and the product cannot be returned and credit will not be issued.

c. **Incorrect Shipment or Defective Product** - If a shipment is incorrect (quantity, model number, etc.) please notify Vaccon within 3 business days of receipt of order. Any defective product, under warranty, that is returned to Vaccon will be repaired, replaced or credited 100% at Vaccon’s discretion. Product returned to the customer will be returned at Vaccon’s expense. Any product that is returned due to manufacturer's defect must be returned in its original condition or a credit will not be issued.

d. **Damage due to shipping/ handling** - If product is received damaged due to transportation mishandling, please contact your local Vaccon distributor. Vaccon will credit the shipping charges once a claim number has been filed and Vaccon has received a credit. Any product returned to Vaccon that is not properly packaged and results in the product being damaged will be assessed a charge based on the cost to return it to resalable condition. If the product cannot be repaired, a credit will not be issued.

For a copy of Vaccon’s complete return policy please contact your local Vaccon distributor or Vaccon customer service.

Notes:

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INSTRUCTION MANUAL

EBBERT POWER SOURCE MODELS

EPS4, EPS4MP-4 AND EPS4MP-7
SAFETY

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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GENERAL INFORMATION

This manual contains operating and service procedures for the Power Source models EPS4 series. It is suggested that close attention be directed to the recommended service procedures contained in this manual. Specific instructions for each tool are given under that tool model number heading. While they may appear to be similar, each tool contains parts not used on other models and removal and replacement methods may vary.

EPS4 SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>66 lbs.</td>
</tr>
<tr>
<td>Hydraulic Pressure Output @ 90psi</td>
<td>4,410psi</td>
</tr>
<tr>
<td>Hydraulic Pressure Output @ 80psi</td>
<td>3,290psi</td>
</tr>
<tr>
<td>Air Consumption</td>
<td>0.5 CF / Cycle</td>
</tr>
<tr>
<td>Hydraulic Fluid</td>
<td>HYDREX AW 68</td>
</tr>
<tr>
<td>Plant Air Supply</td>
<td>80/90psi non-oiled</td>
</tr>
<tr>
<td>Incoming Air Line Dimension</td>
<td>1/2 I.D. minimum</td>
</tr>
</tbody>
</table>

Power Source Model EPS4 series
PRINCIPLE OF OPERATION

1. Incoming non-oiled plant air is regulated at 80psi* through the Air Filter/Regulator to the Four-Way Valve, and also through the air supply fitting on the Manifold.

2. When a triggering air signal is introduced at the pilot input on the Manifold, the Four-Way Valve is shifted, directing air pressure through the Blue Air Line into the Power Booster.

3. As the Power Booster air/hydraulic pistons advance, hydraulic fluid is forced to the hydraulic fitting on the Manifold. With 80psi* of incoming air pressure, the hydraulic output pressure will be approximately 3,920psi*.

4. When the triggering signal is released, the Four-way Valve shifts to its normal position, allowing the air pressure to return the air/hydraulic pistons to the full back position.

*When using the single-port unit, EPS4, increase the air pressure to 90psi, which will yield approximately 4,410psi hydraulic pressure.

Fig. 1

MAINTENANCE PROCEDURES

(Figures 2, 2A, and 2B)
Periodic inspections are recommended on the Air Filter / Regulator (16) and the Oil Cup Reservoirs (18). The Air Filter / Regulator bowl should be monitored for liquid contaminates and drained at that time. This will aid in maintaining peak performance for the Four-way Valve (Figure 2A). The Hydraulic Fluid Reservoirs should be maintained at 1” level in the sight bowl. Under normal operating conditions the fluid level should remain constant. If level lowers, the hydraulic components should be checked for leaks. The power unit is shipped with HYDREX AW 68 Hydraulic Fluid. Equivalent brands must be checked for like specifications.
### PARTS LIST (Figures 2, 2A, 2B, and 2C)

<table>
<thead>
<tr>
<th>Item</th>
<th>Part No.</th>
<th>Description</th>
<th>EPS4 Qty.</th>
<th>EPS4MP-4 Qty.</th>
<th>EPS4MP-7 Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>300448</td>
<td>Enclosure Assy</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>300500</td>
<td>Manifold Assembly</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>300510-4</td>
<td>Manifold Assembly</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>300510-7</td>
<td>Manifold Assembly</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>300590</td>
<td>Power Booster Assy</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>300499</td>
<td>4-Way Valve Assy</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>5</td>
<td>300482</td>
<td>Modified 90 Deg. Elbow</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>300589</td>
<td>Pressure Tube</td>
<td>1</td>
<td>1</td>
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<tr>
<td>7</td>
<td>507859</td>
<td>Male NPT to Tube</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>8</td>
<td>504734</td>
<td>Brass Nipple</td>
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<td>9</td>
<td>507741</td>
<td>Pipe Nipple</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>10</td>
<td>507746</td>
<td>Exhaust Valve</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>507730</td>
<td>Street Elbow</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>507743</td>
<td>Muffler</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>505296</td>
<td>90 Deg. Elbow</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>507747</td>
<td>Shut-off Valve</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>15</td>
<td>507749</td>
<td>Quick Coupling</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>507750</td>
<td>Air Regulator</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>507744</td>
<td>Muffler</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>507705</td>
<td>Reservoir</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>19</td>
<td>507755</td>
<td>Red Hose 3/8 Dia.</td>
<td>2.8 ft</td>
<td>2.8 ft</td>
<td>2.8 ft</td>
</tr>
<tr>
<td>20</td>
<td>507857</td>
<td>Green Hose 3/8 Dia.</td>
<td>.67 ft</td>
<td>.67 ft</td>
<td>.67 ft</td>
</tr>
<tr>
<td>21</td>
<td>507756</td>
<td>Blue Hose 1” Dia.</td>
<td>2 ft</td>
<td>2 ft</td>
<td>2 ft</td>
</tr>
<tr>
<td>22</td>
<td>507675</td>
<td>Green Hose 5/32 Dia.</td>
<td>2.17 ft</td>
<td>2.17 ft</td>
<td>2.17 ft</td>
</tr>
<tr>
<td>23</td>
<td>508061</td>
<td>1/4 NPTF Female Tee</td>
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DETAIL F
300499 Four-Way Valve Assembly
**DETAIL G**

300500 Manifold Assembly
**NOTE:**
HOLE 3, 4, 5, 6 & 7
WHEN NOT BEING USED
MUST BE PLUGGED WITH
PIPE PLUG #502378

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**DETAIL H**
300510 dash Manifold Assembly
POWER BOOSTER SERVICE

(Figures 2 & 3)
The power booster is easy to trouble shoot. Attach Hydraulic Pressure Gauge Assembly, Huck accessory P/N 300456, to the hydraulic nipple where the hydraulic line attaches to the power unit. Depress the rivet tool trigger, hold down and monitor the gauge reading. At 80 PSI* air pressure, hydraulic pressure should stabilize at 3,920 PSI. If it doesn't, it indicates possible seal wear and rebuilding is required. The arrow “P” (Figure 3, Detail C) points to an escape port in the power unit cylinder base. If hydraulic fluid is leaking out of this port, it indicates one of the Hydraulic Seals is bypassing fluid. If air is escaping, it indicates a defective Air Seal.

*When using the single-port unit, EPS4, increase the air pressure to 90psi, which will yield approximately 4,410psi hydraulic pressure.

Disconnect all power from Power Unit prior to disassembly.

Removing the power booster: (Figure 2) Disconnect the blue Air Hose (21) and the green Air Hose (20). Loosen, but do not yet remove, Hydraulic Fluid Line (6). This will prevent fluid spillage. Remove the two nuts and washers (Figure 3, items 19, 20 & 21) which attach the Power Booster assembly to the power unit enclosure, then place a rag under the hydraulic fitting and finish removing hydraulic line.

Disassembly: (Figure 3) Remove the five Hex Head Bolts (14 & 15), and separate the end castings (3 & 12) from the fiberglass Air Cylinder (6). Both the Air Piston (11) and Hydraulic Piston (7) should be inspected for surface irregularities as well as the walls of the Air Cylinder. Remove the Piston Guide (2), and Seal Housing (18) by using the Seal Housing Remover, Huck P/N 300455, and tapping out with a hammer until they can be pushed from the Cylinder Base (3).

Replacing Seals: When replacing seals, insure that they are positioned as shown in Figure 3, Detail C. Wipe all seals with a light seal lubricant.

When reassembling the Air Cylinder and End Castings, torque all Bolts to the specifications noted in Figure 3.

After replacing the power booster on the power unit, attach the air supply to the power unit. This will insure the air piston will be in full back position for bleeding the system of air. See AIR BLEEDING THE POWER UNIT for air bleeding instructions.
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*Note proper orientation of seals.*

Remove hole plugs prior to installation.

Torque to 12-15 ft/lbs. Stagger while tightening.
AIR BLEEDING THE POWER UNIT

⚠️ **WARNING:** Be sure to disconnect your power tool’s air hose from the power unit when air bleeding or filling the unit with hydraulic fluid. This will prevent accidental actuation of the power circuit which could cause pressurization and damage to the Bleed Pump. *NOTE: Do not run reservoir empty!!*

**Bleeding Pull Stroke Power Booster 300404**

1. **Turn air supply off.** Connect Bleed Pump 300509 to male Hydraulic Fitting on Manifold.
2. Pump Bleed Pump until air bubbles in the Reservoir disappear.
3. **Remove Bleed Pump from Manifold before turning air supply back on.** Otherwise Bleed Pump can be pressurized and can cause possible damage to Bleed Pump or injury to personnel.

**Air Bleeding Power Unit and Rivet Tool Together**

**PULL STROKE**

1. Remove red and green air lines connecting the tool to the power unit from the Power Unit end (where they connect to the Manifold).
2. Connect Bleed Pump and Bleed Port Hose to the PORT Bleed Screw of the Tool (Figure 4).
3. Pump Bleed Pump until air bubbles in reservoir disappear.
4. Remove Bleed Pump from the Tool and replace Bleed Screw.

---

**Fig. 4**

![Diagram of Tool's PORT Bleed Screw (general location)](image-url)
TROUBLESHOOTING

Always check out the simplest possible cause of a malfunction first. For example, an air hose not connected. Then proceed logically, eliminating each possible cause until the cause is located. Where possible, substitute known good parts for suspected bad parts. Use this Troubleshooting Chart as an aid in locating and correcting malfunction.

1 Slow Tool Cycle.
   a) Check air pressure and hydraulic pressure. Reference operational schematic at front of manual.
   b) Incoming air line must be 1/2” ID minimum.

2 Tool will not pull fastener.
   a) Air may be in the hydraulic system, which would require bleeding (see Air Bleeding instructions in this Manual). NOTE: Air entrapment is identifiable by sound. As the tool trigger is actuated, the normal “thud” produced by the Power Unit is replaced by a metallic “clack”.

    WARNING: Do not actuate trigger until bleed screw of tool is in place.

ACCESSORIES

The hydraulic and vacuum test gauges are essential items for maintaining your rivet equipment at peak operating efficiency. All instruments are equipped with quick connects for on-line testing.

VACUUM TEST GAUGE 300457: Remove vacuum line from vacuum generator. Install vacuum gauge. Indication should be 15 inches minimum. If lower, vacuum generator assembly should be removed, cleaned and reassembled using no lubricant.

HYDRAULIC PRESSURE TEST GAUGE 300456: Disconnect Pull Stroke hydraulic line from power unit and install gauge. Actuate tool trigger and hold depressed. Pressure gauge should indicate 3900 - 4000 PSI. This is an excellent method of isolating tool or power unit problem.

TUBE CUTTER 507889: Provides clean, true end cuts for any flexible line on the rivet station. Note: Chamfer vacuum hose ID slightly after cutting.

SEAL HOUSING REMOVAL TOOL 300455: Contains graduations which allow easy seal housing removal from the cylinder base of the power booster. Use of this tool saves time and greatly reduces damage to both the cylinder base and the seal housing.

CYLINDER WRENCH 300459: Provides a convenient method of holding Rivet Tools for disassembly and repair when a vise is not available, such as on the plant floor where the rivet tools are being used. The wrench holds firmly on the cylinder of the rivet tool and has a cushioned handle grip for comfort and safety.

FILLER / BLEED PUMP 300509: A valuable tool for maintaining Ebbert Power Units. With it, you can fill the hydraulic fluid reservoir and purge the power booster of air. This can be accomplished in a much shorter time than manually filling the reservoir or gravity bleeding the system.

RIVET TOOL BLEED PORT HOSE 300458: Included with the 300509 Bleed Pump, the Bleed Port Hose makes bleeding or filling any of the Rivet Tools a simple procedure. Merely remove the Bleed Screw 507660, attach the Bleed Port Hose, and pump until bubbles quit appearing in the Hydraulic Reservoir.
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 and 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 (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:

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Aerospace Products
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520-747-9898
FAX: 520-748-2142

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Carson Operations
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FAX: 254-751-5259

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FAX: 905-564-1963

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FAX: 03-764-5510

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FAX: 0952-290459

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FAX: 33-1-34-66-0600


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INSTRUCTION MANUAL

EBBERT RIVET TOOL MODELS

ERT1S, ERT2S, ERT3S
AND ERT4S
SAFETY

This instruction manual must be read with particular attention to the following safety guide lines, 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.

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.

产品符合欧盟相关指令要求。阅读手册之前，请参阅设备和结构的条件。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.

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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GENERAL INFORMATION

This manual contains operating and service procedures for the Ebbert Rivet Tool models ERT1S, ERT2S, ERT3S, ERT4S, and their optional tool configurations. It is suggested that close attention be directed to the recommended service procedures contained in this manual.

Specific instructions for each tool are given under that tool model number heading. While they may appear to be similar, each tool contains parts not used on other models and removal and replacement methods may vary.

PRINCIPLE OF OPERATION

Incoming non-oiled plant air is regulated at 90psi through the Air Filter/Regulator to the Four-way Valve on the Power Unit and also through the Red Air Line to the valve in the rivet tool handle.

When the tool trigger is pulled, a trigger/plunger unseats a valve ball and directs air from the tool handle back through the Green Air Line to the Four-way Valve. The Four-way Valve is shifted, directing air pressure through the Blue Air Line into the Power Booster. As the Power Booster air piston advances, hydraulic fluid is forced through the black Hydraulic Line into the tool, forcing the tool to retract. This delivers the necessary force to install the fastener and break the pintail. (In the EPS1V, the pintail would then travel through the pintail collection tube from the tool into the Pintail Collection Box.)

When the trigger is released, the Four-Way Valve shifts to its normal position, allowing the air pressure to return the Power Booster air piston to the full back position and the tool piston to the full forward position. The cycle is now completed.
ERT S Series Tooling

TOOL SPECIFICATIONS

ERT1S
Weight: 3 lbs.
Stroke: 3/4”
Rated Pull Force: 1,992 lbs.
Fastener Sizes: 3/32” through 3/16”

ERT2S
Weight: 3.25 lbs.
Stroke: 15/16”
Rated Pull Force: 4,330 lbs.
Fastener Sizes: 1/8” through 1/4”
ERT S Series Tooling

TOOL SPECIFICATIONS (CONTINUED)

ERT3S

Weight: 3.5 lbs.
Stroke: 3/4"
Rated Pull Force: 1,992 lbs.
Fastener Sizes: 3/32" through 3/16"

ERT4S

Weight: 3.5 lbs.
Stroke: 15/16"
Rated Pull Force: 4,330 lbs.
Fastener Sizes: 1/8" through 1/4"
Disassembly of ERT1S & ERT2S (Figure 2)

1. Unscrew the two Socket Head Screws for ERT1S or four screws for ERT2S which secure the Piston Rod Guide to the front of the tool, and remove the Piston Rod Guide.

2. Loosen the Hose Clamp/Sleeve at the rear of the tool, and pull it back far enough to allow clearance for the removal of the End Cap. From the rear of the tool, remove the two Socket Head Screws (ERT1S) or four screws (ERT2S) and the Support Loop Assembly.

3. To remove the End Cap/Guide Tube Assembly, Piston and Piston Forward Stop, push the Piston toward the rear of the Cylinder.

4. Remove the remaining Seal from the front of the Cylinder.

5. The Cylinder is now stripped of parts except the Retaining Ring. For normal tool service it is not necessary to remove this Retaining Ring. If it is removed, when replacing, be sure to relocate the retaining ring ears at the bottom of the Cylinder, allowing clearance for the hydraulic inlet port.

6. ERT1S
   Remove the Retaining Ring and all Seals from the Piston, and the Piston Rod Wiper from the Piston Rod Guide.

   ERT2S
   Remove the Retaining Ring, Front Seal Retainer and all Seals from the Piston, and the O-ring, Back-up Ring, Seal, and Piston Rod Wiper from the Piston Rod Guide.

   NOTE: Whenever servicing the tool to this extent, the Piston Rod Wiper must be replaced with a new one.

7. Remove the O-ring from the End Cap.

8. Clean the disassembled parts in cleaning solution. While cleaning the Piston, insure that the small hole in the "V" groove is open.
Reassembly of ERT1S and ERT2S

1. When replacing seals, make sure they are correctly positioned as shown on the Tool Schematic. Wipe all seals with a thin film of seal lubricant before reassembly.

2. It is important to inspect the cylinder wall to insure the surface is free of any gouges or nicks that will damage a new seal. Small nicks or gouges can normally be removed using a fine crocus cloth.

3. After all seals, o-rings and backup rings are replaced,

   **ERT1S**
   With the Piston Forward Stop placed on the Piston shaft, insert the End Cap Assembly into the Piston, then slide the complete assembly into the tool Cylinder.

   **ERT2S**
   Insert the End Cap Assembly into the Piston, then slide the complete assembly into the tool Cylinder.

   **NOTE:** Use caution when inserting this assembly into the cylinder to keep the piston from "cocking" in the cylinder and "nicking" the cylinder wall. This could ultimately cause a seal edge to be cut.

   Secure the End Cap and Support Loop Assembly with two screws (ERT1S) or four screws (ERT2S).

4. At this point, reposition the tool in the vice with the open front of the cylinder pointing straight up. You can choose from two options for filling the tool with hydraulic fluid:

   a) **Gravity fill:** Connect the hydraulic line to the power unit and allow hydraulic fluid to flow from the higher positioned reservoir into the tool cylinder until it is level with the front Retaining Ring, then disconnect the hydraulic line for installation of remaining components.

   b) **Optional fill:** Using the Model 300509 Bleed Pump Assembly, you can save time by pumping from the hydraulic connector thru the line, filling the tool in the same manner and to the same level as above.

5. **ERT2S**
   Replace the Front Seal Retainer by positioning the cutout section so it will clear the two ears of the Retaining Ring when it is dropped into place. If the retainer does not lay flat, tap it gently with a screwdriver until it assumes a flat position.

6. Slide the hydraulic seal down over the piston threads and wrench flats carefully to prevent "nicking" the seal edges.

7. **ERT1S**
   Insert the Piston Rod Guide and Wiper assembly, pushing the Hydraulic Seal down into the cylinder. Secure the Piston Rod Guide with two screws. Torque the screws at both ends of the tool to 12-15 ft/lbs.

   **ERT2S**
   It is not necessary to push the seal all of the way into the Cylinder. It will assume its position in the Piston Rod Guide when the guide is next installed and secured with the two Bearing Plates and four Screws. Torque the screws at both ends of the tool to 60-80 in./lbs.

8. This method of refilling the tool with hydraulic fluid relieves any further requirement for bleeding air. The tool can now be connected to the power unit and be test cycled. The pulling head assembly can now be installed.
Disassembly of ERT3S & ERT4S (Figure 3)

1. Remove the Handle from the front of the tool.

2. Loosen the Hose Clamp/Sleeve at the rear of the tool, and pull it back far enough to allow clearance for the removal of the End Cap.

3. After removing the Support Loop Assembly, the Piston and End Cap can be removed by pushing back on the front of the Piston for removal through the back of the tool.

4. Remove the O-Ring from the End Cap.

5. The Front Seal Retainer must be removed from the front of the tool. This retainer is a snug fit and generally requires a soft hammer blow to the end of a brass dowel held against the Seal Retainer.

6. The Cylinder is now stripped of parts except the Retaining Ring. For normal tool service it is not necessary to remove this Retaining Ring. If it is removed, when replacing, be sure to relocate the retaining ring ears at the bottom of the Cylinder, allowing clearance for the hydraulic inlet port.

7. ERT3S
   Remove the Retaining Ring, the Piston Forward Stop, and all Seals from the Piston.

8. ERT4S
   Remove the Retaining Ring, Piston Seal Retainer and all Seals from the Piston, and the O-ring, Back-up Ring, and hydraulic Seal from the Front Seal Retainer.

NOTE: Whenever servicing the tool to this extent, the Piston Rod Wiper must be replaced with a new one.
Reassembly of ERT3S and ERT4S

1. When replacing seals, make sure they are correctly positioned as shown on the Tool Schematic. Wipe all seals with a thin film of seal lubricant before reassembly.

2. It is important to inspect the cylinder wall to insure the surface is free of any gouges or nicks that will damage a new seal. Small nicks or gouges can normally be removed using a fine crocus cloth.

3. After all seals, o-rings and backup rings are replaced, insert the End Cap Assembly into the Piston, and insert as a combination into the tool Cylinder.

   **NOTE:** Use caution when inserting this assembly into the cylinder to keep the piston from "cocking" in the cylinder and "nicking" the cylinder wall. This could ultimately cause a seal edge to be cut.

   Secure the End Cap and Support Loop Assembly with four screws.

4. At this point, reposition the tool in the vice with the open front of the cylinder pointing straight up. You can choose from two options for filling the tool with hydraulic fluid:

   a) **Gravity fill:** Connect the hydraulic line to the power unit and allow hydraulic fluid to flow from the higher positioned reservoir into the tool cylinder until it is level with the front Retaining Ring, then disconnect the hydraulic line for installation of remaining components.

   b) **Optional fill:** Using the Model 300509 Bleed Pump Assembly, you can save time by pumping from the hydraulic connector thru the line, filling the tool in the same manner and to the same level as above.

5. **ERT3S**

   Slide the Front Seal Retainer down, using care to get it positioned straight in the Cylinder. The Retainer does not easily slide into the Cylinder; it will be drawn into place later when the Handle is secured.

6. **ERT4S**

   Making sure the cutout section will clear the ears of the Retaining Ring, slide the Front Seal Retainer down, using care to get it positioned straight in the Cylinder. The Retainer does not easily slide into the Cylinder; it will be drawn into place later when the Handle is secured.

7. Slide the hydraulic seal down over the piston threads and wrench flats carefully to prevent "nicking" the seal edges, and position it in the Cylinder (ERT3S) or Front Seal Retainer (ERT4S). Positioning this seal requires some effort to work it in. Start it down on one side and slowly work it in until the last small area may be assisted by using the flat side of a common screwdriver.

8. Install the Handle and Piston Rod Wiper down over the Piston and into contact with the Front Seal (ERT3S) or Front Seal Retainer (ERT4S). While doing this, hold the trigger in position to allow it to drop behind the lock-in pin. Install the four Screws with Bearing Plates with equal pressure to draw the Handle (and Seal Retainer - ERT4S) into position in the Cylinder. Torque the screws at both ends of the tool to 60-80 in./lbs.

9. Air Bleed the tool if necessary. The tool can now be connected to the power unit and be test cycled. The pulling head assembly can now be installed.
**RIVET TOOL HANDLE FUNCTION**

The rivet tool handle contains the air valve mechanism which, when actuated, initiates the rivet station cycle.

**Figure 4A** depicts the valve components in the “at rest” position. The steel ball is sealing air pressure within the red air line chamber.

**Figure 4B** shows how the double Quad Rings function to seal the forward section of the chamber when the Trigger is depressed, directing air pressure through the green air line back to the four-way valve.

After prolonged use, the Quad Rings will wear down resulting in a poor seal when the trigger is actuated. This can slow down the cycle time of the tool due to the rivet tool operator holding the trigger in a tighter position when setting the rivet. It is easy to remedy the problem. Remove the trigger pin, trigger, and valve plunger for Quad Ring replacement.

On models ERT1S and ERT2S the handle is adjustable through a 20 degree arc. This patented design allows relief to the wrist when work heights are high or low to the operator’s normal body position.

Each tool is provided with a 5/32” hex ball driver for the handle adjustment. By loosening the socket head screw located inside the handle, the handle can be moved into the desired position and locked into that location with the hex ball driver.

In some operations requiring excessive loads on the handle, it is suggested that the clamp block be reversed, placing the flat surface into contact with the handle for higher locking force.

**NOTE:** Make sure the trigger is square to the handle slot and moves freely after tightening the clamp block.

---

**AIR BLEEDING THE RIVET TOOL**

Disconnect the Rivet Tool air line. Attach Bleed Pump 300509 to the hydraulic hose on the rivet tool. Remove the Bleed Screw from the tool. Pump the Bleed Pump until no more bubbles appear out of the bleed port of the tool.
ERTS Series Tooling

ERTS

Fig. 5

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Notes:
- Torque end screws to 12-15 ft-lbs (4 places).
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Notes:
1. Torque end Screws to 60-80 in./lbs (8 places).
**ERT3S Series Tooling**

**ERT S Series Tooling**

**ERT3S**

**Alcoa Fastening Systems**

### Item Part No. Description Qty. Item Part No. Description Qty. Item Part No. Description Qty.  
1 300050 Piston 1 14 505475 Hose Adapter 1 27 500061 Socket Head Screw 4  
2 508010 Piston Rod Wiper 1 15 300059 Seal Plug 1 28 300035 Valve Body 1  
3 300032 Handle 1 16 500776 O-Ring 1 29 507662 Male Connector 2  
4 300066 Seal 2 17 507552 Spring 1 30 507660 Bleed Screw 1  
5 300149 Piston Seal Retainer 1 18 507664 Ball 1  
6 500944 Retaining Ring 1 19 500774 O-Ring 3  
7 300143 Piston Forward Stop 1 20 504350 Quad Ring 2  
8 500650 Retaining Ring 1 21 300146 Valve Plunger 1  
9 300070 Seal 1 22 500623 Pin 2  
10 300069 Seal 1 23 300256 Trigger 1  
11 300003 Cylinder 1 24 300064 Screw Bearing Plate 2  
12 500815 O-Ring 1 25 500064 Socket Head Screw 8  
13 300138 End Cap/Guide Tube Assy 1 26 300126 Support Loop Assembly 1

---

**NOTES:**

1. **WHEN TOOL IS USED WITHOUT HANGER, TWO SCREW BEARING PLATES P/N 300064 ARE REQUIRED IN THIS LOCATION.**
2. **PISTON ASSEMBLY BULLET P/N 300072 OPTIONS AVAILABLE.**
3. **SERVICE KIT P/N 300467 OPTIONS AVAILABLE.**
4. **Torque end Screws to 60-80 in./lbs (8 places).**
NOTES:

1. WHEN TOOL IS USED WITHOUT HANGER, TWO SCREW BEARING PLATES P/N 300064 ARE REQUIRED IN THIS LOCATION.
2. PISTON ASSEMBLY BULLET P/N 300072 OPTIONALLY AVAILABLE.
3. SERVICE KIT P/N 300466 OPTIONALLY AVAILABLE.
4. TORQUE END SCREWS (8) PLACES TO 60-80 IN/LBS
OPTIONAL TOOL CONFIGURATIONS

Following are five variations of the ERT1S and ERT2S tools made available through Huck. Based on the application needed, the tools may be shipped:

- Without Handle (L series)
- Without Handle, and with “Energized” Seals (LE series)
  
  Energized Seals keep the hydraulic seal tighter when the tool is under no load.
- Without Handle, and Tool Head Assembly mounted on a Manifold Base (MQ series)
  
  The Manifold Base allows the tool to be directly mounted to an assembly machine. Also included with this series is a Quick Disconnect to allow for rapid tool removal and replacement.
OPTIONAL TOOL CONFIGURATIONS (CONT.)

ERT2SLE
Refer to ERT2S
Parts List (Figure 6)

ERT1SMQ
Refer to ERT1S
Parts List (Figure 5)
OPTIONAL TOOL CONFIGURATIONS (CONT.)

Fig. 13

ERT2SMQ
Refer to ERT2S
Parts List (Figure 6)
TROUBLESHOOTING

Always check out the simplest possible cause of a malfunction first. For example, an air hose not connected. Then proceed logically, eliminating each possible cause until the cause is located. Where possible, substitute known good parts for suspected bad parts. Use TROUBLESHOOTING CHART as an aid in locating and correcting malfunction.

1  Slow Tool Cycle:
   a) Check air pressure and hydraulic pressure. Reference Principle of Operation Schematic on page 5 of this manual.
   b) Incoming air line must be 3/8” ID minimum. If longer that 20’, air line should increase to 1/2” ID.

2  Tool will not pull rivet:
   a) Air in hydraulic system; requires bleeding.

   NOTE: Air entrapment is identifiable by sound. As trigger is actuated, the normal “thud” produced by the power unit is replaced by a metallic “clack”.

   To bleed Rivet Tool, fill the reservoir and:
   1. Unhook RED air line from power unit.
   2. Lay tool in pan and remove bleed screw.
   3. Allow fluid to flow until it is free of bubbles.
   If condition persists, seals must be replaced.

   b) 1. Unhook RED air line from power unit.
   2. Attach Filler / Bleed Pump Assembly to tool hydraulic hose.
   3. Remove bleed screw on Rivet Tool.
   4. Pump the Bleed Pump until bubbles quit coming out of the bleed port on the tool.

KITS AND ACCESSORIES

Energized Seal Service Kit  - 300473 (for ERT2SLE)
Piston Assembly Bullet     - 300072
Service Kit ERT1S, 1SL, 1SMQ -300467 also fits ERT3S
Service Kit ERT2S, 2SL, 2SMQ -300466 also fits ERT4S
Filler / Bleed Pump Assembly - 300509
**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.

**THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. HUCK MAKES NO OTHER WARRANTIES AND EXPRESSLY DISCLAIMS ANY OTHER WARRANTIES, INCLUDING IMPLIED WARRANTIES AS TO MERCHANTABILITY OR AS TO THE FITNESS OF THE TOOLING, OTHER ITEMS, NONSTANDARD OR CUSTOM MANUFACTURED PRODUCTS FOR ANY PARTICULAR PURPOSE AND HUCK SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE, DIRECTLY OR INDIRECTLY, ARISING FROM THE USE OF SUCH TOOLING, OTHER ITEMS, NONSTANDARD OR CUSTOM MANUFACTURED PRODUCTS OR BREACH OF WARRANTY OR FOR ANY CLAIM FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

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.

**Tooling, Part(s) and Other Items not manufactured by Huck.**

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The only warranties made with respect to such tool, part(s) or other items thereof are those made by the manufacturer thereof and Huck agrees to cooperate with Buyer in enforcing such warranties when such action is necessary. 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 and 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 (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 Aerspace 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

**Carson Operations**

PO Box 5268
900 Watson Center Rd.
Carson, CA 90749
800-421-1459
310-830-8200
FAX: 310-830-1436

**Waco Operations**

PO Box 8117
8001 Imperial Drive
Waco, TX 76714-8117
800-388-4825
254-776-2000
FAX: 254-751-5259

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**Commercial Products**

**Kingston Operations**

1 Corporate Drive
Kingston, NY 12401
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845-331-7300
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**Commercial Products**

**Canada Operations**

6150 Kennedy Road, Unit 10
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905-564-4825
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**Latin America Operations**

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**Australia Operations**

14 Viewtech Place
Rowville, Victoria
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**Alcoa Fastening Systems**

**Aerospace Products**

**France Operations**

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