Instruction Manual
HS52 Series
Huck-Spin®
Hydraulic Installation Tools and Equipment
EC Declaration of Conformity

Manufacturer:
Huck International, LLC, Industrial Products Group, 1 Corporate Drive, Kingston, NY, 12401, USA

Description of Machinery:
Models HS52 and HSSFT-M## family of hydraulic installation tools and specials based on their design (e.g. PR####).

Relevant provisions complied with:
British Standard related to hand held, non-electric power tools (ISO 11148-1:2011)

European Representative:
Rob Pattenden, Huck International, Ltd. Unit C Stafford Park 7, Telford Shropshire TF3 3BQ, England, United Kingdom

Authorized Signature/date:
I, the undersigned, do hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).

Signature:

Full Name: Robert B. Wilcox
Position: Engineering Manager
Location: Huck International, LLC d/b/a Arconic Fastening Systems and Rings
          Kingston, New York, USA
Date: 01/11/2016  (November 1, 2016)

Declared dual number noise emission values in accordance with ISO 4871

A weighted sound power level, LWA: **80** dB (reference 1 pW)  Uncertainty, KWA: 3 dB
A weighted emission sound pressure level at the work station, LpA: **69** dB (reference 20 µPa)  Uncertainty, KpA: 3 dB
C-weighted peak emission sound pressure level, LpC, peak: **97** dB (reference 20 µPa)  Uncertainty, KpC: 3 dB
Values determined according to noise test code ISO 3744. The sum of a measured noise emission value and its associated uncertainty represents an upper boundary of the range of values which is likely to occur in measurements.

Declared vibration emission values in accordance with EN 12096

| Measured Vibrations emission value, a: | 0.21 m/s² |
| Uncertainty, K:                  | 0.20 m/s² |

Values measured and determined according to ISO 28662-1, ISO 5349-2, and EN 1033

Test data to support the above information is on file at:
Arconic Fastening Systems and Rings, Kingston Operations, Kingston, NY, USA.
Safety Instructions

I. GENERAL SAFETY RULES:

1. A half hour long hands-on training session with qualified personnel is recommended before using Huck equipment.
2. Huck equipment must be maintained in a safe working condition at all times. Tools and hoses should be inspected at the beginning of each shift/day for damage or wear. Any repair should be done by a qualified repairman trained on Huck procedures.
3. For multiple hazards, read and understand the safety instructions before installing, operating, repairing, maintaining, changing accessories on, or working near the assembly power tool. Failure to do so can result in serious bodily injury.
4. Only qualified and trained operators should install, adjust or use the assembly power tool.
5. Do not modify this assembly power tool. This can reduce effectiveness of safety measures and increase operator risk.
6. Do not discard safety instructions; give them to the operator.
7. Do not use assembly power tool if it has been damaged.
8. Tools shall be inspected periodically to verify all ratings and markings required, and listed in the manual, are legibly marked on the tool. The employer/operator shall contact the manufacturer to obtain replacement marking labels when necessary. Refer to assembly drawing and parts list for replacement.
9. Tool is only to be used as stated in this manual. Any other use is prohibited.
10. Read MSDS Specifications before servicing the tool. MSDS specifications are available from the product manufacturer or your Huck representative.
11. Only genuine Huck parts shall be used for replacements or spares. Use of any other parts can result in tooling damage or personal injury.
12. Never remove any safety guards or pintail deflectors.
13. Never install a fastener in free air. Personal injury from fastener ejecting may occur.
14. Where applicable, always clear spent pintail out of nose assembly before installing the next fastener.

II. PROJECTILE HAZARDS:

1. Risk of whipping compressed air hose if tool is pneudraulic or pneumatic.
2. Disconnect the assembly power tool from energy source when changing inserted tools or accessories.
3. Be aware that failure of the workpiece, accessories, or the inserted tool itself can generate high velocity projectiles.
4. Always wear impact resistant eye protection during tool operation. The grade of protection required should be assessed for each use.
5. The risk of others should also be assessed at this time.
6. Ensure that the workpiece is securely fixed.
7. Check that the means of protection from ejection of fastener or pintail is in place and operative.
8. There is possibility of forcible ejection of pintails or spent mandrels from front of tool.

III. OPERATING HAZARDS:

1. Use of tool can expose the operator’s hands to hazards including: crushing, impacts, cuts, abrasions and heat. Wear suitable gloves to protect hands.
2. Operators and maintenance personnel shall be physically able to handle the bulk, weight and power of the tool.
3. Hold the tool correctly and be ready to counteract normal or sudden movements with both hands available.
4. Maintain a balanced body position and secure footing.
5. Release trigger or stop start device in case of interruption of energy supply.
6. Use only fluids and lubricants recommended by the manufacturer.
7. Avoid unsuitable postures, as it is likely for these not to allow counteracting of normal or unexpected tool movement.
8. If the assembly power tool is fixed to a suspension device, make sure that fixation is secure.
9. Beware of the risk of crushing or pinching if nose equipment is not fitted.

Continued on next page...
IV. REPETITIVE MOTION HAZARDS:
1. When using assembly power tool, the operator can experience discomfort in the hands, arms, shoulders, neck or other parts of the body.
2. When using tool, the operator should adopt a comfortable posture while maintaining a secure footing and avoid awkward or off balanced postures.
3. The operator should change posture during extended tasks to help avoid discomfort and fatigue.
4. If the operator experiences symptoms such as persistent or recurring discomfort, pain, throbbing, aching, tingling, numbness, burning sensations or stiffness, these warnings should not be ignored. The operator should tell the employer and consult a qualified health professional.

V. ACCESSORIES HAZARDS:
1. Disconnect tool from energy supply before changing inserted tool or accessory.
2. Use only sizes and types of accessories and consumables that are recommended. Do not use other types or sizes of accessories or consumables.

VI. WORKPLACE HAZARDS:
1. Be aware of slippery surfaces caused by use of the tool and of trip hazards caused by the air line or hydraulic hose.
2. Proceed with caution in unfamiliar surroundings; there could be hidden hazards such as electricity or other utility lines.
3. The assembly power tool is not intended for use in potentially explosive environments.
4. Tool is not insulated against contact with electrical power.
5. Ensure there are no electrical cables, gas pipes, etc., which can cause a hazard if damaged by use of the tool.

VII. NOISE HAZARDS:
1. Exposure to high noise levels can cause permanent, disabling hearing loss and other problems such as tinnitus, therefore risk assessment and the implementation of proper controls is essential.
2. Appropriate controls to reduce the risk may include actions such as damping materials to prevent workpiece from ‘ringing’.
3. Use hearing protection in accordance with employer’s instructions and as required by occupational health and safety regulations.
4. Operate and maintain tool as recommended in the instruction handbook to prevent an unnecessary increase in the noise level.
5. Select, maintain and replace the consumable / inserted tool as recommended to prevent an unnecessary increase in noise.
6. If the power tool has a silencer, always ensure that it is in place and in good working order when the tool is being operated.

VIII. VIBRATION HAZARDS:
1. Exposure to vibration can cause disabling damage to the nerves and blood supply to the hands and arms.
2. Wear warm clothing when working in cold conditions and keep hands warm and dry.
3. If numbness, tingling, pain or whitening of the skin in the fingers or hands, stop using the tool, tell your employer and consult a physician.
4. Support the weight of the tool in a stand, tensioner or balancer in order to have a lighter grip on the tool.

X. HYDRAULIC TOOL SAFETY INSTRUCTIONS:
1. Carry out a daily check for damaged or worn hoses or hydraulic connections and replace if necessary.
2. Wipe all couplers clean before connecting. Failure to do so can result in damage to the quick couplers and cause overheating.
3. Ensure that couplings are clean and correctly engaged before operation.
4. Use only clean oil and filling equipment.
5. Power units require a free flow of air for cooling purposes and should therefore be positioned in a well ventilated area free from hazardous fumes.
6. Do not inspect or clean the tool while the hydraulic power source is connected. Accidental engagement of the tool can cause serious injury.
7. Be sure all hose connections are tight.
8. Wipe all couplers clean before connecting. Failure to do so can result in damage to the quick couplers and cause overheating.

Where the following trade names are used in this manual, please note:

**DEXRON** is a registered trademark of General Motors Corporation.
**Loctite** is a registered trademark of Henkel Corporation, U.S.A.
**LUBRIPLATE** is a registered trademark of Fiske Brothers Refining Co.
**Quintolubric** is a registered trademark of Quaker Chemical Corp.
**Slic-tite** is a registered trademark of LA-CO Industries, Inc.
**Teflon** is a registered trademark of E. I. du Pont de Nemours and Company.
**Threadmate** is a registered trademark of Parker Intangibles LLC.
**TRUARC** is a trademark of TRUARC Co. LLC.
System Matrix

This instruction manual covers the installation tools listed below. Where components other than installation tools are mentioned, such as the Single Tool Controller and the Powerig, refer to those individual instruction manuals.

**TOOLS**
Where pictorial examples are given, the tool used is the HS52RM. See individual tool assembly drawings in this manual for other configurations.
- HS52RM
- HS52-21-0-3-0
- HS52-81-0-2-0
- HS52-81-0-3-0
- HS52-81-0-3-50
- HS52RM-1-1-0
- HS52RM-1-1-50

**SINGLE TOOL CONTROLLER**
- 125725 Instruction Manual (P/N HK998)

**POWERIGS**
Where pictorial examples are given, the Powerig used is model 918. See individual Powerig instruction manuals for pressure settings and component identification.
- 940HS Instruction Manual (P/N HK943)
- 940-220HS Instruction Manual (P/N HK943)
- 918 series Instruction Manual (P/N HK786)

**POWER SUPPLY**
- 125727-2 Instruction Manual (P/N HK1001)

Huck-Spin Part Numbers Structure

HS52 - X X - X - X - X

- Custom Options: such as special hose length, etc.
- 0, 1, 2, 3: Trigger Option (•)
- 0, 3, 5, 7: Handle Location
- 0, 1: Air Motor Type (••)
- 2, 4, 5, 6, 8: Air Motor Location (see figure below)

(•) NOTE:
-0 Option: No Trigger mounted on Hose Guard.
-1 Option: Trigger located on front side of Hose Guard.
-2 Option: Trigger located on rear side of Hose Guard.
-3 Option: Triggers located on both front and rear sides of Hose Guard.

(••) NOTE:
-0 Option: Standard Air Motor used. *(NO LONGER AVAILABLE)*
-1 Option: Optional high-torque Air Motor used.

**HS52 Air Motor Locations**

REF: HS52-81-0-3-0 shown
**Specifications**

- **MAX OPERATING TEMP:** 125° F (51.7° C)
- **MAX FLOW RATE:** 2 gpm (7.6 l/m)
- **MAX INLET PRESSURE:** 5700 psi (393 BAR)
- **MAX RETURN PRESSURE:** 2400 psi (165 BAR)
- **WEIGHT:** 17.5 lbs (7.94 kg)
- **STROKE:** 1.808 in. (4.6 cm)
- **POWER SOURCE:** Huck Powerrig® Hydraulic Unit

- **HOSE KITS:** Use only genuine HUCK Hose Kits rated @ 10,000 psi (689.5 BAR) working pressure.
- **HYDRAULIC FLUID:** Hydraulic fluid shall meet DEXRON® III, DEXRON VI, MERCON®, Allison C-4 or equivalent Automatic Transmission Fluid (ATF) specifications. Fire-resistant fluid may be used if it is an ester-based fluid such as Quintolubric® HFD or equivalent. Water-based fluid shall NOT be used as serious damage to equipment will occur.

**Dimensions:**

- 4.7 in. (12.1 cm)
- 8.9 in. (22.6 cm)
- 12.6 in. (32 cm)
- 4.4 in. (11.2 cm)
- 7.5 in. (19 cm)
- 13.2 in. (33.5 cm)

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**Principle of Operation**

**PULL PRESSURE (PULL CYCLE)**

During a typical full-pressure cycle, with the Huck-Spin fastener in place and the collar threaded on, the operator positions the tool nose assembly over the fastener pintail and presses the trigger.

The Huck-Spin tool Thimble spins onto the pin threads until limit switch rod senses enough engagement, which then directs pressurized hydraulic fluid into the chamber in front of the tool's piston, forcing it back, and pushing the nose assembly’s Anvil forward to swage the collar onto the pin.

**RETURN PRESSURE (RETURN CYCLE)**

When proper swage pressure is reached, the hydraulic pressure will be redirected to the rear of the Piston, and the Anvil will automatically eject off the swaged Collar, and the Thimble counter-rotates to unscrew from the pin.

This results in all tool and nose assembly components returning to their home positions, ready to install the next fastener.
Preparation for Use

Use a Huck Powerig® Hydraulic Unit, or equivalent, that has been suitably prepared for operation. Check the PULL and RETURN pressures and, if required, adjust to pressures given in Specifications section of this manual.

NOTE: Review all WARNINGS on this page.

1. Turn OFF the Powerig and disconnect its power supply. Connect tool hoses to unit.
2. Connect tool control switch electrical cord to hydraulic unit.
3. Connect hydraulic unit to its power supply and turn it ON. Press and hold the trigger 30 seconds; then press the trigger a few times to cycle tool and to circulate the hydraulic fluid. Observe action of tool and check for leaks. Turn OFF hydraulic unit.
4. Disconnect the tool control switch electrical cord from the hydraulic unit; disconnect unit from the power supply. Select a nose assembly for the fastener to be installed.
5. Reconnect the hydraulic unit to the power supply. Reconnect the tool switch control cord to the unit. Check the operation of the nose assembly; install fasteners in test plate of correct thickness with proper size holes.

Inspect the installed fasteners. If the fasteners do not pass inspection, see Troubleshooting to investigate possible causes.

Assembly of NPTF Threaded Components

AIR FITTINGS
1) Apply TEFLOW® stick to male threads which do not have pre-applied sealant per manufacturer’s recommendations. (Proceed to All Fittings step 2)

HYDRAULIC FITTINGS
1) Apply Threadmate™ to male and female threads which do not have pre-applied sealant per manufacturer’s recommendations. (Proceed to All Fittings step 2)

ALL FITTINGS:
2) Tighten to finger-tight condition.

Hydraulic Couplings

O-ring (P/N 504438)
Back-up ring (P/N 501102)

TIP: Use a fine India stone to remove nicks and burrs from diameter A and leading edge to prevent damage to O-ring.

Installation Sequence

1. Operator positions Huck-Spin collar onto mating Huck-Spin pin threads by hand.
2. Huck-Spin tool thimble threads onto fastener. Air motor turns on and, if only Limit Switch 1 is reached, snub routine begins in which collar is partly swaged, then thimble spins on further until Limit Switch 2 is closed.
3. At full pressure, tool swages collar.
4. After swage, anvil is ejected off collar, and thimble spins off fastener, resulting in all tool components returning to their home positions.
5. Tool is ready to install next Huck-Spin fastener.
The operating efficiency of your tool is directly related to the performance of the entire system, including the tool and nose assembly, hydraulic hoses, control trigger assembly, and the Powerig® Hydraulic Unit. Therefore, an effective preventive maintenance program includes scheduled inspections of the system to detect and correct minor troubles.

**SYSTEM INSPECTION**

- Inspect the tool and nose assembly daily for damage and wear. Before each use, verify that hoses, fittings, couplings, and trigger connections are secure, and free of leaks and damage; replace when necessary. Clear air-lines of dirt and water.
- Service the tool in a clean, well-lighted area. Take special care to prevent contamination of pneumatic and hydraulic systems.
- Carefully handle all parts and components. Before reassembly, examine hoses, parts, and components for damage and wear; replace when necessary.
- Inspect the tool, hoses, and Powerig during operation to detect abnormal heating, leaks, or vibration.
- Have available all necessary hand tools (standard and special); a half-inch brass drift and wood block; an arbor press; and a soft-jaw vise. Unsuitable hand tools could cause tool damage. See Kits & Accessories.
- Follow the disassembly and assembly procedures in this manual. If Huck recommended procedures are not followed, the tool could be damaged.
- Disassemble and assemble tool components in a straight line. Do NOT bend, twist, or apply undue force.
- Apply continuous steady pressure to disassemble a component. An arbor press provides steady pressure to press a component into or out of an assembly.
- Never force a component if it is misaligned. Reverse the procedure to correct misalignment and start over.
- Max contamination level: NAS 1638 class 9, or ISO CODE 18/15, or SAE level 6.

**CAUTIONS:**
Consult the Material Safety Data Sheet (MSDS) before servicing tool.

- Keep foreign matter out of the hydraulic system. Keep separated parts away from dirty work surfaces.
- Dirt and debris in hydraulic fluid causes valve failures in tool and Powerig®.
- Always replace all seals, wipers, O-rings, and Back-up rings when the tool is disassembled for any reason.
- Do not use Teflon® tape on pipe threads. Tape can shred, resulting in malfunctions.

**STANDARD SEALANTS, LUBRICANTS**

- Use automatic transmission fluid DEXRON® III or equivalent. Fire resistant hydraulic fluid must be used to comply with OSHA regulation 1926.302 paragraph (d). An optional fire resistant fluid that may be used is Quintolubric® 822-220. Fluid viscosity 300 SUS @ 100°F and 50 SUS at 210°F is recommended for ambient temperatures 0° to 130° F.
- Apply Parker Threadmate®, Loctite® 567, or Slic-Tite® to male pipe plug threads, hose fitting threads, and quick connect fittings per manufacturer’s instructions (to ease assembly and to prevent leaks).
- Smear LUBRIPLATE® 130-AA or SUPER-O-LUBE® on rings and mating parts to ease assembly and to prevent damage on rough and sharp surfaces.

For supplementary information, see Troubleshooting, the Disassembly and Assembly procedures, and the Assembly Drawings in this manual.

**POWERIG MAINTENANCE**

Maintenance instructions and repair procedures are in the appropriate Powerig Instruction Manual.

**TOOL MAINTENANCE**

Whenever disassembled, and at regular intervals, depending on use, replace all O-rings and Back-up rings. The tool-specific Spare Parts Service Kit (P/N HS52SEALKIT) should be kept on hand. Inspect cylinder bore, piston, and piston rod for scored surfaces, excessive wear, and damage; replace as necessary.

**NOSE ASSEMBLY MAINTENANCE**

Clean nose assemblies daily in mineral spirits to clear jaws and rinse metal chips and dirt. For a more thorough cleaning, disassemble the nose assembly. Use a pointed “pick” to remove embedded particles from the pull grooves of the jaws. Clean all parts of any nose with UNITIZED™ Jaws in mineral spirits or isopropyl alcohol only; do not let jaws come in contact with other solvents. Do not let jaws soak; dry them immediately after cleaning. Dry other parts before re-assembling.

2. Connect primary air source to air fitting at top of Controller.

3. Connect hydraulic hoses from Controller to the Powerig.

4. Plug electrical cable from Controller to power supply.

5. Plug power supply to Powerig.

**NOTE:** Be sure to connect “TOOL 1” from the Power Supply to the “TOOL 1” receptacle on the Powerig or “TOOL 2” to “TOOL 2”.

6. Plug the power supply into a 110V outlet.

7. Adjust tool settings on the Single Tool Controller (Figure 5) for an HS52 with a 5/8” fastener by following instructions provided in the Controller manual, then set swage pressure on Single Tool Controller to 5,800 psi.

8. Install Nose Assembly to the tool, and attach tool to the Single Tool Controller by connecting the hydraulic connectors, the air lines, and the Electric Cable Assembly. The system will then be ready for the Installation Sequence.

9. Turn on Powerig hydraulic unit.
These pressures are for Low Swage Anvils, which can be identified by a step on the inside bore. Previous designs of anvils have a straight bore without any steps and will require higher pressures.

These pressure values are only a starting point for setting the Powerig. Many factors will cause these pressures to be higher or lower which can include: tool condition, hose length, oil temperature and fasteners being installed.

<table>
<thead>
<tr>
<th>Fastener</th>
<th>Size</th>
<th>Nose</th>
<th>Style</th>
<th>Tool</th>
<th>Notes</th>
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**HS52 series Huck-Spin® Hydraulic Installation Tools (HK1076)**

**Pressure Settings**

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<td>Installation - Short</td>
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</table>

**Figure 5**

![Image of a hydraulic installation tool](Image of a hydraulic installation tool)

**Power Switch**
Start-up and Operation

INSTALLING A HUCK-SPIN FASTENER

1. Place the Huck-Spin bolt through the workpieces, ensuring that it is the proper grip length for the workpiece thicknesses to be fastened.

2. Screw a matching size Huck-Spin collar onto the bolt threads projecting through the workpieces, and hand-tighten until the flange of the collar bears against the workpiece surface.

3. Use the handles of the installation tool to guide it toward the workpiece and locate the tool's nose assembly onto the end of the bolt. (Figure 6) \textit{Do NOT force the tool onto the bolt.}

4. While maintaining alignment of the tool's nose assembly with the bolt, to avoid cross-threading the nose assembly's thimble onto the bolt, press and hold the tool trigger. The installation cycle will start. Except in an emergency or difficulty, do not release the trigger until the installation cycle is complete and the tool is released from the installed fastener. If the tool trigger is released before the installation cycle is complete, the fastener may not be properly installed and the system alarm will sound.

\textbf{NOTE: For safety reasons, whenever the trigger is released during any phase of the installation cycle, the tool automatically reverses and ejects from the fastener.}

5. Visually inspect the installed fastener for completeness of swage. Compare the measured "last pressure seen" recorded by the pressure transducer to the desired full-swage pressure setting. If the last pressure equals or slightly exceeds the default setting, a correct installation should have occurred. If unsure, measure the installed fastener with the swage gauge P/N HG-S-HS(*), or install a similar fastener into a clamp-load measuring device, such as a load cell unit, and observe the installed clamp reading.

WARNING: During fastener installation, the tool will align itself with the axis of the bolt and will move toward the workpiece surface. To avoid personal injury, keep hands clear of all spaces between the tool and the workpiece, and between the workpieces.
Limit Switch Operation & Adjustment

WARNING: When checking and adjusting limit switches, it will be necessary to insert the gauge into the nose assembly thimble by hand. Therefore, the air supply at the manifold and the Powerig electrical cord at the Powerig should be disconnected to prevent possible personal injury.

CAUTION: The limit switch cover keeps the limit switch lever in place against the compression of a small spring. Take care when removing the cover to avoid forcible ejection of the lever and spring from their typical working positions.

All current variants of HS37 and HS52 Huck-Spin Installation Tools are fitted with a type of Limit Switch Assembly which includes an electrical Printed Circuit Board (PCB). With this type of Assembly, Limit Switches 1 and 2 are permanently attached to the PCB at a fixed distance apart.

OPERATION

The fitting of the Limit Switch Assembly onto the tool is shown on the tool assembly drawing. When a Huck-Spin Bolt enters the rotating nose assembly thimble, the end of the bolt comes into contact with the Actuator Rod and Disc Assembly that is pushed toward the rear of the tool. As the disc moves, it allows the compression spring in the limit switch assembly to move the Limit Switch Lever toward the rear of the tool. Lever movement causes Limit Switch 1 to open (normally closed). Continued movement of the lever causes Limit Switch 2 (typically open) to close. The lever has a slot that is located over the rear standoff and is held in place by the cover. Clearance between the cover and the shoulder of the rear standoff allows a sliding movement of the lever to take place.

When the Huck-Spin system is being used to install fasteners, signals from the Limit Switches are used by the controller to control the function of the tool. The signal from Limit Switch 2 is used by the controller to make the tool go into a full Collar Swage Cycle. Correct adjustment of Limit Switch 2 is essential for proper tool function. Incorrect adjustment will result in malfunction and may cause insufficient Collar Swage or failure to release the tool from the bolt at the completion of the installation cycle. Adjustment of the Limit Switches is affected by changing the angle of the Switch Arms on the Limit Switch Lever.

CHECKING PROCEDURE:

1. Check that the tool piston is in the full forward position. It will normally be in this position unless there is an hydraulic system problem or the Powerig has been switched off during a fastener installation cycle. When the piston is in the full forward position, the front of the nose assembly thimble will be approx. 0.20-Inch (5mm) inside of the swaging anvil.
2. Ensure that the air supply is disconnected at the manifold and the electrical Powerig cord is disconnected at the Powerig. Use suitable warning flags to inform other people not to reconnect those items.
3. For Huck-Spin systems that do not have switch indicator lights built into the manifold, plug the Limit Switch Light Box into the electrical socket on the side of the manifold cover.

NOTE: Not required if manifold is equipped with integral indicator lights.

4. Using the appropriate 123940-(xx) Gauge; insert the “TOUCH-OFF” side of the gauge into the thimble until it bottoms. In this position, only the Blue LS-1 lamp should be on, indicating that Limit Switch 1 is open. NOTE: The “xx” in 123940-(xx) indicates fastener size; for 1/2”, xx = -16; for 20mm, xx = -M20, etc.
5. Insert the opposite, “TOUCH-ON” end of the 123940-(xx) Gauge into the thimble until it bottoms. In this position, the blue LS-1 lamp and the yellow LS-2 lamp should be on, indicating that Limit Switch 1 is open and Limit Switch 2 is closed.

ADJUSTMENT

Typically, it is necessary to adjust the Limit Switch 2 only. However, when adjustment is complete, always check Limit Switch 1 and adjust that Switch if necessary.

TO ADJUST LIMIT SWITCH 2

1. Remove ONLY the 2 retaining screws nearest the FRONT of the tool from the limit switch cover.
2. Hold the cover in position while removing the third retaining screw.
3. Slowly lift and slide the cover toward the rear of the tool until the lever is exposed. Holding the lever in place, continue to slide the cover toward the rear of the tool and then upwards to remove it.
4. Carefully ease the lever upwards from the Switch Assembly; make sure that the spring is restrained.
5. Make the necessary adjustment to the limit switch lever arms. (Make SMALL, INCREMENTAL adjustments.) Hold the top section of the lever in a vise or wide nose grips/pliers to ensure that only the limit switch arms bend as shown on the drawing.

REASSEMBLY

6. Insert either end of the Limit Switch Setting Gauge into the front of the nose assembly to push the actuator rod rearward. Hold the spring in place on its locater tab at the end of the PCB. Place the lever’s locating tab into the opposite end of the spring. Push the lever forward and downward, compressing the spring, until it locates onto the rear standoff. Make sure that the long Lever 2 arm is located IN FRONT of the actuator disk. Remove the gauge from the nose assembly, releasing the actuator rod. The lever should be pushed forward against Limit Switch 1 by the small spring.
7. Holding the lever in place, slide the cover over the PCB from the rear of the tool towards the front of the tool. When the cover is correctly located on the three standoffs, it will hold the lever in the correct position.
8. Replace the three screws that hold the cover in place.
9. Re-check the limit switch operation as before.

NOTE: Some switch covers may have a small hole that exposes the lever (Switch Actuator Slide). This hole can ease installation of the cover by placing a small screwdriver or hex key through the hole in the cover and bearing it against the lever while sliding the cover into position.
Components Drawing HS52RM Models

Models:
HS52RM,
HS52RM-1-1-0, &
HS52RM-1-1-50

Figure 7a
NOTES:
1. Item 22, Drive Assembly, is depicted in Figure 8 along with its individual component identifications.
2. Item 23, Hydraulic Assembly, is depicted in Figure 12 along with its individual component identifications.
3. Item 27, Hydraulic Assembly, is depicted in Figure 9 along with its individual component identifications.
4. Item 32, Hydraulic Assembly, is depicted in Figure 13 along with its individual component identifications.

TOP VIEW of Bracket

Position Screw (41) to prevent rotation of bracket.

Position Suspension Bracket (40) to obtain best balance with required nose assembly.

See Figure 8

See Figure 12

See Figure 9

See Figure 13
## Tool Components Parts List (Figures 7A, 7B, 8-13)

<table>
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## Components Drawing - Drive Assembly 300292

### NOTE: Figure 8 shows the Rear Motor (RM) version of the tools. See Figure 9 on the following page for other mounting options.

* Intermediate Gear (**22u**) and Ball Bearing (**22v**) are available as assembly (P/N 121442).

** Internal Drive Gear (**22w**), Ball Bearing (**22x**), and Retaining Ring (**22y**) are available as assembly (P/N 127670).

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<th>ITEM</th>
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<td>22y**</td>
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</table>
Drive Assemblies 124490 and 124490-1 can be converted to a Rear Motor or Front Motor style by the following method:

a) Remove six screws and carefully lift the Air Motor sub-assembly.

b) Turn the Air Motor sub-assembly 180 degrees and replace the screws.
**Components Drawing - Hydraulic Assembly**

**ITEM** | **DESCRIPTION** | **PART NO.** | **QTY**
--- | --- | --- | ---
27a | Piston & Seal Assembly (see figure below) | 121452 | 1
27b* | Cylinder End Cap | 121400 | 1
27c | Cylinder | 121402 | 1
27e | Wrenching Ring | 124176 | 1
27f* | Wiper | 506068 | 1
27g* | Step Seal | 506092 | 2
27h* | Back-up Ring | 501163 | 1
27j* | O-ring | 503859 | 1
27k | GLYD Ring Seal (see figure below) | 506093 | REF
27m | Step Seal | 506094 | 2

* Items 27b, 27f, 27g, 27h, and 27j are available together as End Cap Assembly P/N **124422**.

**NOTE:** The piston and the GLYD Ring are available separately, along with GLYD Ring Compressor (P/N 123496). The GLYD Ring must be compressed into the piston groove with the GLYD Ring Compressor if parts are purchased separately.
Components Drawing - Switch Assembly

**Figure 12**

![Switch Assembly Diagram]

<table>
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124240
SWITCH ASSEMBLY

Components Drawing - Actuator Disk and Rod Assembly

**Figure 13**

![Actuator Disk and Rod Diagram]

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<td>Actuator Disk</td>
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121441
ACTUATOR DISK AND ROD ASSEMBLY

Apply two drops of Loctite part no. 505802 to Actuator Rod threads before assembly.
Models:
HS52-21-0-3-0,
HS52-81-0-2-0,
HS52-81-0-3-0, & HS52-81-0-3-50

Position Screw (41) to prevent rotation of Bracket.

Position Suspension Bracket (40) to obtain best balance with required nose assembly.

Position of motor on HSS2-21-3-0
<table>
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<th>ITEM</th>
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<th>HS52-21-0-3-0</th>
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Disassembly Procedure

Carefully read all precautions in Safe Operation Section. This includes how to safely disconnect the tool from the power source before starting any maintenance. Refer to the appropriate Assembly Drawings and MAINTENANCE.

This procedure is for the complete disassembly of the tool. Disassemble only those components necessary to replace damaged rings and worn or damaged components.

CAUTION: Always replace all seals, wipers, O-rings, and Back-up rings when the tool is disassembled for any reason.

INITIAL DISASSEMBLY PREPARATION

Figures 7b, 14, & 15
1. Disconnect the tool from the power source.
2. Slide the sleeve off the split ring. Open the split ring and remove the anvil adapter. (Figure 15)
3. Remove the nose assembly from the tool, including the retaining ring (Item 30, Figures 7b & 14).

continued...

Figures 15 & 16

4. Point the housing in a safe direction and, while firmly pushing against the end plate and conical spring, remove the retaining ring. (Figure 16)

WARNING: Unless the End Plate is held in firmly, severe personal injury may occur when the Conical Spring forcibly ejects from the housing.

5. Remove the end plate and spring from the central gear housing.
6. Pull the Actuator Disc and Rod Assembly from the rear of the tool. (Figure 15)
7. Pull the drive shaft from the front of the tool. (Figure 15)

continued...
Disassembly Procedure (continued)

LIMIT SWITCH
Figure 17
8. Insert a screwdriver in the access hole to hold down the Switch Actuator Slide. Unscrew the three screws from the switch assembly cover.
9. Carefully lift the cover just enough to enter from the side to hold down the Switch Actuator Slide and spring and prevent them from suddenly ejecting.
10. Use a screwdriver to disconnect the wires.
11. Unscrew the three standoffs.
12. Remove the circuit board and spacers.

continued...

DRIVE MOUNTING FLANGE
Figures 18–20
13. Disconnect the air tubes from the fittings (Item 15 on front motor models, Item 16 on rear motor models). (Figure 18)
14. With a hex key, remove both cap Screws that hold the drive mounting flange to the cylinder; separate the two main subassemblies.

AIR MOTOR DRIVE
15. Remove the three gear cover screws and two motor mount screws.

continued...
16. Remove the gear cover, and push the drive gear bushing out of the cover. (Figure 19)
17. Unscrew the four remaining motor mount screws, and lift the motor mount away from the central housing.
18. Insert a large screwdriver through the bottom of the motor mount and carefully pry the drive gear off the motor shaft. (Figure 20)
19. Slide the spacer off the motor shaft.
20. Unscrew the four screws that hold the motor to the motor mount.

continued...

REAR MOTOR MODELS

Figure 21
21. Use a hex key to remove the Trigger Switch Assembly from the motor.
22. Loosen the set screw, and remove the trigger switch from the switch holder. Use a screwdriver to remove the wires from the switch.

continued...
Disassembly Procedure (continued)

HOSE GUARD/HANDLE
Figures 22 & 23
23. Use an Allen wrench to remove the two screws holding the handle to the cylinder, and the two screws holding together the two halves. (Figure 22)
24. Remove the cable suspension assembly from the handle, and separate the handle halves.
25. Unscrew the couplers from the hoses. Drain the fluid, and then remove the hoses from the cylinder and drain the cylinder. (Figure 23)

INTERMEDIATE GEAR & BEARING; DRIVE MOUNTING FLANGE
Figures 24 & 25
26. Use the hex key to unscrew the four screws that hold the drive mounting flange to the central gear housing; then unscrew the four screws that hold the motor boss on the central gear housing. (Figure 24)
27. Lift off the motor boss and remove the shaft locking screw.
28. While pulling the shaft out of the motor boss, lift out the intermediate gear and spacers, and remove both ball bearing assemblies from the intermediate gear. (Figure 25)

continued...
Disassembly Procedure (continued)

INTERNAL DRIVE GEAR & BEARING

Figure 26

29. Using a hex key, remove two Screws holding Actuator Disk Key within Central Housing.

30. With TRUARC pliers, remove the larger of the two Retaining Rings; the one which holds the Drive Gear Assembly in the Housing.

31. With a soft dowel, tap/push Internal Drive Gear out of Housing.

32. Remove the smaller Retaining Ring and the Ball Bearing from the Drive Gear.

continued...

CYLINDER

Figures 27 & 28

33. Remove the locking disc from the piston, and screw the Piston Assembly Tool (P/N 124178) onto the end of the piston. (Figure 27)

34. Slide the Pin Spanner Assembly (P/N 123607) over the Piston Assembly Tool, and align the dowels with the holes at face of the cylinder end cap. Press the spanner assembly into the end cap. (Figure 28)
Disassembly Procedure (continued)

CYLINDER (continued)

35. Screw the two socket head cap screws (supplied with the Pin Spanner Assembly) into the end cap.

36. Unscrew the cylinder end cap with the Pin Spanner Assembly, sliding it over the piston and Piston Assembly Tool; drain the fluid.

37. Remove the piston from the cylinder.

38. Remove all seals from the piston.
Assembly Procedure

1. Inspect and clean out the seal grooves at base of the cylinder.

2. Liberally apply lubricant to O-rings and step seals, and install as shown in Figure 29. **NOTE:** Before installing the step seals, be sure that the notch of the seal is oriented toward the inside of the cylinder, as shown.

3. Inspect and clean out the piston seal groove. (Figure 30)

4. Liberally apply lubricant to O-ring, and install in the groove.

5. Slightly stretch the GLYD Ring seal (no more than needed for installation), liberally apply lubricant to it, then install it over the O-ring in the piston groove.

6. Slide the Glyd Ring Compressor (P/N 123496) completely over the piston to compress the GLYD Ring into the piston groove. (Figure 30)

8. Install the Piston Insertion Plug (P/N 123494) in the back end of the piston. (Figure 31)

9. Install the GLYD Ring Insertion Tool (P/N 121694-HS52) in the cylinder. (Figure 31)

10. Push the piston into the cylinder so that the Piston Insertion Plug protrudes from the rear of the cylinder. (Figure 31)

11. Remove the GLYD Ring Insertion Tool and Piston Insertion Plug. (Figure 31)

12. Inspect and clean the internal and external grooves of the cylinder end cap. (Figure 32)

13. Liberally apply lubricant to the O-rings, Back-up Ring, wiper, and step seals, and install as shown in Figure 32. **NOTE:** Before installing step seals, be sure that notch of seal is oriented toward inside of end cap, as shown.

14. Screw the Piston Assembly Tool onto the piston, and slide the cylinder end cap over the Piston Assembly Tool. (Figure 28)
Assembly Procedure (continued)

15. Using the Pin Spanner Assembly, screw the cylinder end cap onto the cylinder, and tighten until the cap bottoms on the cylinder. (Figure 28)

16. Remove the Piston Assembly Tool and Pin Spanner Assembly.

17. Thread the hoses onto the cylinder as shown in Figures 7A, 7B, and 14. (Screw the hose with the male nipple into port “P” of cylinder, and the hose with the female coupler into port “R”.) Apply Parker Threadmate®, Loctite® 567, or Slic-Tite® to male pipe threads per manufacturer’s instructions to prevent leaks and for ease of assembly.

**CAUTION:** Do not use Teflon® tape on pipe threads. Tape can shred, resulting in malfunctions.

**INTERNAL DRIVE GEAR & BEARING ASSEMBLY**

18. Pack the bearing with bearing grease, press it into the shoulder of the internal drive gear, and install the retaining rings. (Figure 33)

19. Grease the bearing and gear assembly, and press it into the gear housing.

20. Install the Actuator Disk Key in the housing. Apply Loctite® to both screws and tighten to specification.

**INTERNAL DRIVE GEAR & BEARING ASSY; DRIVE MOUNTING FLANGE**

Figure 33

21. Pack the bearings with bearing grease and press flush into the intermediate gear.

22. While pushing the shaft through the motor boss, install the intermediate gear and spacers, and tighten the shaft locking screw against the shaft.

23. Attach the drive mounting flange to the central housing with eight screws. Apply blue Loctite to the threads and tighten to specification.

*continued...*
Assembly Procedure (continued)

INTERMEDIATE DRIVE GEAR & BEARING ASSY; DRIVE MOUNTING FLANGE (continued)

24. Apply Parker Threadmate®, Loctite® 567, or Sli- Tite® to the male threads of the air motor elbows and muffler, then screw the components into the air motor and tighten.

**NOTE**: Flat on the base of the motor must be positioned for intermediate gear clearance. Flat is parallel with the base of the motor mount and shows in mount.

25. Place the motor mount over the motor, apply Loctite to four remaining screws, and tighten to specification.

26. Apply Loctite to the four air motor retaining screws and tighten to specification.

27. Slide the white spacer over the air motor shaft.

28. After applying bearing grease to the teeth of the external drive gear and lubricating the gear shoulder and bore, align the key with the key way, and press the drive gear onto the motor shaft.

29. Push the shoulder of the drive gear bushing into the gear cover until it snaps in place.

30. Slide the assembled bushing and cover over the drive gear shoulder.

31. Align the gear cover mounting holes with the motor mount holes, apply Loctite to the gear cover retaining screws, and tighten to specification.

32. Place the assembled air motor and mount on the drive gear and bearing assembly, apply Loctite to the motor mount retaining screws, and tighten to specification.

continued...

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**Figure 34**

- **Elbows and Muffler**: Apply SLICTITE to threads before assembly.
- **Motor Mount Retaining Screws**: Apply Loctite to threads before assembly.
- **Gear Cover with Drive Gear Bushing**: Snapped in place.
- **External Drive Gear**: Apply bearing grease to teeth, and lubricate shoulder and bore prior to assembly.
- **Motor Mount Retaining Screws**: Apply Loctite to threads before assembly.
- **Air Motor Retaining Screws**: Apply Loctite to threads before assembly.

(Front Motor model shown)
Assembly Procedure (continued)

HANDLE AND CYLINDER ASSEMBLY
33. Attach one handle half to the cylinder. Where used, position the optional secondary switch and wiring in the handle.
34. Attach the other handle half to the cylinder, and install the remaining handle screws.
35. Attach the suspension bracket to the handle. (Figure 35)
36. Install the Handle And Cradle Assembly.

CYLINDER AND GEAR HOUSING/DRIVE MOUNTING FLANGE ASSEMBLY
37. Carefully slide the electrical cord through the appropriate slot of the drive mounting flange.

! CAUTION: Be careful not to pinch the electrical cord.
38. When the cord is properly routed, engage the pilot bore of the flange, and align the bolt holes of the cylinder and the flange in the required orientation.
39. Apply one drop of removable Loctite to both retaining screws, and tighten to specification.

TRIGGER CORD AND POWER CORD TO TERMINAL BLOCK; LIMIT SWITCH COVER
40. Place spacers and the circuit board in position, and attach the three standoffs.
41. Connect the wires of the trigger cord and the wires of the power cord to the appropriate terminals of the terminal block.
42. Place the switch actuator slide and spring in position, holding in place while attaching the cover.
43. While holding down the cover to avoid losing spring, attach the limit switch cover with the three screws.

FRONT AIR MOTOR DRIVE; AIR LINES
44. Press on fitting with thumb; push tubing in; then release thumb pressure.

ACTUATOR DISK AND ROD ASSEMBLY
45. Apply 2 drops of Loctite to the threads of the actuator rod.
46. Screw the actuator disk onto the actuator rod until the rod shoulder seats tightly against the disk face. Follow the directions on the bottle, and allow Loctite to “set” for best results.

ACTUATOR ROD ASSEMBLY; CONICAL SPRING; DRIVE SHAFT
47. From the rear, slide actuator rod through the internal drive gear.
   NOTE: The “keyway” of the actuator disk must be aligned with the actuator disk key.
48. Slide the conical spring into the central gear housing against the actuator disk. Place the end cap against the spring and push into the counterbore of housing. Use TRUARC® pliers to install the retaining ring.
49. Apply grease to both ends of the drive shaft and the piston counterbore. Slide the drive shaft through the bore of the piston, and engage the shaft drive with the internal drive gear.

! CAUTION: Be sure to grease the area of the piston that has the counterbore.
Troubleshooting

Always check the simplest possible cause (such as a loose or disconnected trigger line) of a malfunction first. Then proceed logically, eliminating other possible causes until the cause is discovered. Where possible, substitute known good parts for suspected defective parts. Use this troubleshooting information to aid in locating and correcting trouble.

1. **Tool fails to operate when trigger is pressed.**
   a. Inoperative Powerig® Hydraulic Unit. See applicable instruction manual.
   b. Loose electric connections.
   c. Damaged trigger assembly.
   d. Loose or faulty hydraulic hose couplings.

2. **Tool operates in reverse.**
   a. Reversed hydraulic hose connections between hydraulic unit and tool.

3. **Tool leaks hydraulic fluid.**
   a. Defective or worn O-rings or loose hose connections at tool.

4. **Hydraulic couplers leak fluid.**
   a. Damaged or worn O-rings in coupler body. See Coupler Body.

5. **Hydraulic fluid overheats.**
   a. Hydraulic unit not operating properly; see unit’s manual.
   b. Powerig running in reverse (918 & 918-5 only). See unit’s manual.

6. **Tool operates erratically and fails to properly install fastener.**
   a. Low or erratic hydraulic pressure supply; air in system.
   b. Damaged or excessively worn piston O-ring.
   d. Excessive wear on or scoring of sliding surfaces of tool parts.

7. **Pull grooves on fastener pintail stripped during PULL stroke.**
   a. Operator not sliding anvil completely onto fastener pintail.
   b. Incorrect fastener grip.
   c. Worn or damaged jaw segments.
   d. Metal particles accumulated in pull grooves of jaw segments.
   e. Excessive sheet gap.

8. **Collar of fastener not completely swaged.**
   b. Scored anvil in nose assembly.

9. **Tool “hangs-up” on swaged collar of HUCKBOLT fastener.**
   b. RETURN pressure too low.
   c. Not enough collar lubricant.
   d. Nose assembly incorrectly installed.

10. **Pintail of fastener fails to break.**
    b. Pull grooves on fastener stripped. See Trouble 7.
    c. PULL pressure too low.

11. **Nose will not release broken pintail.**
    a. Nose assembly incorrectly installed.
Limited Warranties

Limited Lifetime Warranty on BobTail® Tools:

Huck International, Inc. warrants to the original purchaser that its BobTail® installation tools manufactured after 12/1/2016 shall be free from defects in materials and workmanship for its **useful lifetime**. This warranty does not cover special order / non-standard products, or part failure due to normal wear, tool abuse or misapplication, or user non-compliance with the service requirements and conditions detailed in the product literature.

Two Year Limited Warranty on Installation Tools:

Huck International, Inc. warrants that its installation tools and Powerigs® manufactured after 12/1/2016 shall be free from defects in materials and workmanship for a period of two years from date of purchase by the end user. This warranty does not cover special order / non-standard products, or part failure due to normal wear, tool abuse or misapplication, or user non-compliance with the service requirements and conditions detailed in the product literature.

90 Day Limited Warranty on Nose Assemblies and Accessories:

Huck International, Inc. warrants that its nose assemblies and accessories shall be free from defects in materials and workmanship for a period of 90 days from date of purchase by the end user. This warranty does not cover special clearance noses, or special order / non-standard product, or part failure due to normal wear, abuse or misapplication, or user non-compliance with the service requirements and conditions detailed in the product literature.

**Useful lifetime** is defined as the period over which the product is expected to last physically, up to the point when replacement is required due to either normal in-service wear, or as part of a complete overhaul. Determination is made on a case-by-case basis upon return of parts to Huck International, Inc. for evaluation.

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

HUCK makes no warranty with respect to the tooling, part(s), or other items manufactured by third parties. HUCK expressly disclaims any warranty expressed or implied, as to the condition, design, operation, merchantability, or fitness for use of any tool, part(s), or other items thereof not manufactured by HUCK. HUCK shall not be liable for any loss or damage, directly or indirectly, arising from the use of such tooling, part(s), or other items or breach of warranty or for any claim for incidental or consequential damages.

Huck shall not be liable for any loss or damage resulting from delays or non-fulfillment 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

**Outside USA and Canada**
Contact your nearest Huck International location (see reverse).

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 Tool Kits and Nose Assemblies. Please contact your Huck Representative or the nearest Huck International location (see reverse) for the ATSC in your area.
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800-421-1459  
310-830-8200  
FAX: 310-830-1436

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

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Tucson, AZ 85714  
800-234-4825  
520-747-9898  
FAX: 520-748-2142

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11508 Centre Road  
Clayton, Victoria  
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