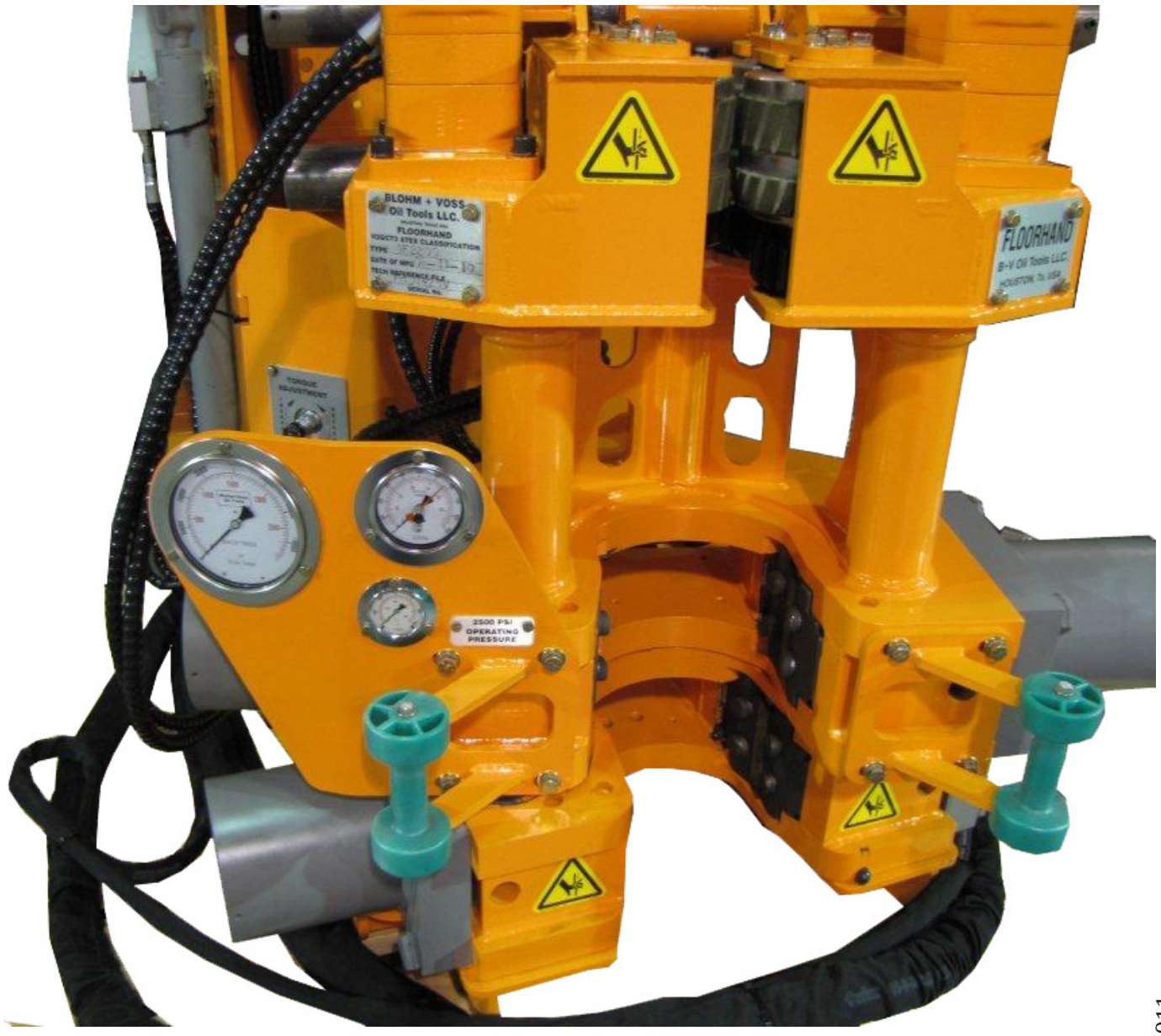
Blohm + Voss Oil Tools, LLC

9GF-2200

Technical Documentation



Manual Rev 001, October 2011

GENERAL INFORMATION

Warnings and Notes

WARNING: A "WARNING" INDICATES A DEFINITE RISK OF EQUIPMENT DAMAGE OR DANGER TO PERSONNEL. FAILURE TO OBSERVE AND FOLLOW PROPER PROCEDURES COULD RESULT IN SERIOUS OR FATAL INJURY TO PERSONNEL, SIGNIFICANT PROPERTY LOSS, OR SIGNIFICANT EQUIPMENT DAMAGE.

NOTE: A "*NOTE*" indicates that additional information is provided about the current topics.

Intended use of this manual

WARNING: THIS TECHNICAL DOCUMENTATION CONTAINS INSTRUCTIONS ON SAFETY, INSTALLATION, OPERATION AND MAINTENANCE. IT MUST BE STUDIED BEFORE WORKING WITH THE TOOL.

This manual is intended for use by field service, engineering, installation, operation, and repair personnel. Every effort has been made to ensure the accuracy of the information contained herein. Blohm + Voss Oil Tools, LLC, will not be held liable for errors in this material, or for consequences arising from misuse of this material. Anyone using service procedures or tools, whether or not recommended by Blohm + Voss Oil Tools, LLC, must be satisfied that neither personal safety nor equipment safety will be jeopardized.

Intellectual property

All information contained in this manual is based upon the latest product information available at the time of printing. Dependent on ongoing technical improvements (ISO 9001) "Blohm + Voss Oil Tools, LLC" reserves the right to change the design and specifications without announcement.
The values specified in this manual represent the nominal values of a unit produced in series. Slight deviations in the case of the individual devices are possible.

NOTE: In the event of problems that cannot be solved with the aid of this manual, please contact one of the addresses listed below.

General remarks

As with all rig equipment, the FloorHand Cantilever must be operated in accordance with accepted rig safety practices and procedures. All operators should be familiar with all safety precautions and recommended installation and operating procedures, including the information provided in this manual and any other safety publications by Blohm + Voss Oil Tools, LLC Listed on the next page are safety considerations and warnings found throughout this manual:

CE Marking

The tool complies with the Machinery Directive 2006/42/EC and the Directive 2014/34/EU "Equipment and protective systems in potentially explosive atmospheres"
The marking is as follows:
CE Ex II 2G T5

Patents

The following patent numbers apply:
U.S. 11/404,317
U.S. 11/890,582
U.S. 11/732,813

Limited Warranty

The warranty provided will be void if the FloorHand or cantilever is either:

1. Repaired or serviced by a service facility which was not authorized by Blohm + Voss Oil Tools, LLC.
2. Replacement parts not manufactured by Blohm + Voss Oil Tools, LLC are used.
3. Modifications were made to the FloorHand which were not approved by Blohm + Voss Oil Tools, LLC.

Manufacturer & Agents World Wide

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Phone: +65-6734-7177
Fax: +65-6734-9115
enquiries@mtqpremier.com.sg

Safety issues

WARNING: ONE SHOULD AVOID CREATING IGNITION SOURCES, LIKE HEAT, AS A RESULT OF THE USE OF THE TOOL WITH OTHER TOOLS OR EQUIPMENT.

WARNING: THE WARNING PLATES, SIGNS AND LABELS MUST BE PRESENT ON THE TOOL. DO NOT REMOVE THE LABELS. IF THEY ARE MISSING, REPLACING IS MANDATORY.

WARNING: ALL WARNING PLATES, SIGNS AND LABELS ATTACHED TO THE EQUIPMENT MUST BE OBSERVED.

WARNING: DO NOT USE THE TOOL FOR ANY OTHER PURPOSE THAN MAKING UP AND BRAKING OUT WITHIN ITS SPECIFICATION.

WARNING: FAILURE TO CONDUCT ROUTINE MAINTENANCE COULD RESULT IN EQUIPMENT DAMAGE OR INJURY TO PERSONNEL.

WARNING: THE TOOL MUST ONLY BE SERVICED BY TRAINED B+V PERSONNEL OR BY AUTHORIZED PERSONNEL.

WARNING: WEAR PERSONAL PROTECTION EQUIPMENT WHILE WORKING WITH THE EQUIPMENT.

WARNING: IF ANY SAFETY ELEMENTS (LIKE SAFETY ROPES, WIRE, SAFETY SHEETS, PLATES OR WASHERS) WERE DISASSEMBLED DUE TO MAINTENANCE WORK, DO NOT RE-USE THEM. ALWAYS REPLACE THEM WITH NEW SAFETY ELEMENTS.

WARNING: KEEP HANDS AND ARMS CLEAR OF ALL MOVING PARTS WHEN CONNECTING, DISCONNECTING OR OPERATING THE UNIT.

WARNING: ALWAYS WEAR PROTECTIVE GEAR FOR EYES, HEAD, HANDS AND FEET.

WARNING: WHEN SERVICING UNIT, BE SURE ALL POWER IS OFF AND SUPPLY LINES ARE DISCONNECTED AND INTERNAL PRESSURE IS BLED FROM THE TOOL.

WARNING: LUBRICATE UNIT ONLY WHEN SUPPLY LINES ARE DISCONNECTED AND H.P.U IS OFF AND TAGGED OUT. VERIFY THAT SYSTEM PRESSURE IS -0- PSI.

WARNING: ALWAYS USE LIFTING APPARATUS (SLINGS, CABLES, SHACKLES AND THE LIKE) THAT HAVE BEEN INSPECTED AND ARE IN GOOD CONDITION AND ARE PROPERLY SIZED. ENSURE THAT ALL RIGGING AND LIFTING PROCEDURES ARE IN ACCORDANCE WITH ACCEPTED OILFIELD PRACTICES AND STANDARDS.

WARNING: ALWAYS CHECK THE UNIT FOR LOOSE FASTENERS AND HYDRAULIC CONNECTIONS AS WELL AS ANY OTHER DAMAGE PRIOR TO TURNING ON THE POWER UNIT.

Figure 1

Figure 2

Revision History Table

REV.	SECTION	SUB-SEC.	PARA.	CHANGE REQUEST #	DATE	AUTHORIZED BY
Draft	All	All	All	N/A	10/01/10	KJ
0	All	All	All	N/A	03/19/12	KJ

TABLE OF CONTENTS

DESCRIPTION

General Components

The Blohm + Voss Oil Tools, LLC. Floorhand is a combination torquing and spinning tool designed for quick installation on a variety of drilling rigs. This manual covers the basic FloorHand GF-2200. The 9GF-2200 is a hanging, remote contorlled FloorHand.

The FloorHand can make and break all tool connections from 4 ¼" to 8 ½" outside diameter, and can handle nominal drill pipe from 3 ½" up to 6 ⅝" without any modification. (To handle 2 ⅞" drill pipe, Blohm + Voss is able to provide an optional adapter kit assembly. Please contact Blohm + Voss Oil Tools, LLC for prices on the 9FH-10703 adapter kit. The FloorHand can also make and brake stabilizers, spiral collars and other bottom hole assembly (BHA) components with sufficient connection length.

Wrench

The FloorHand utilizes an upper and a lower wrench designed to apply torque when making up or breaking out tool connections. Each wrench contains an opposing set of clamp cyclinders and die block assemblies that self adjust to varying pipe sizes. The FloorHand is capable of 65,000 ft/lbs (88128.16 Nm) of make up torque and 80,000 ft/lbs (108465.4 Nm) of break out torque.

Spinner

The FloorHand is equipped with a spinner that consist of two halves, a right and left hand assembly each containing a set of urethane drive rollers. The spinner uses direct drive gears, eliminating the need for expensive transmissions. The FloorHand spinner is designed to be field servicable and easily maintained by rig personell.

Frame

The pipe frame is designed to support and house the wrench and spinner assemblies.

Controls

The all-hydraulic controls for the Floorhand and manipulator are mounted conveniently on the front of the unit for easy acces as well as maximum visibility for the operator.

Specifications

Hydraulic Requirements

Hydraulic supply pressure (max.)	2,800 PSI *(19.30 MPa)* - 193 bar
Hydraulic supply pressure (min.)	2,500 PSI *(17.23 MPa)* - 172 bar
Hydraulic flow rate required	23 - 28 gpm *(87 - 106 lpm)*
Supply connection (min.)	1" hose with ¾" MNPT at FloorHand end
Return connection (min.)	1 ¼" hose with 1" MNPT at FloorHand end

The FloorHand is equipped with a Closed Center Hydraulic System. The unit should only be operated in coordination with a pressure compensated variable displacement Hydraulic Power Source.

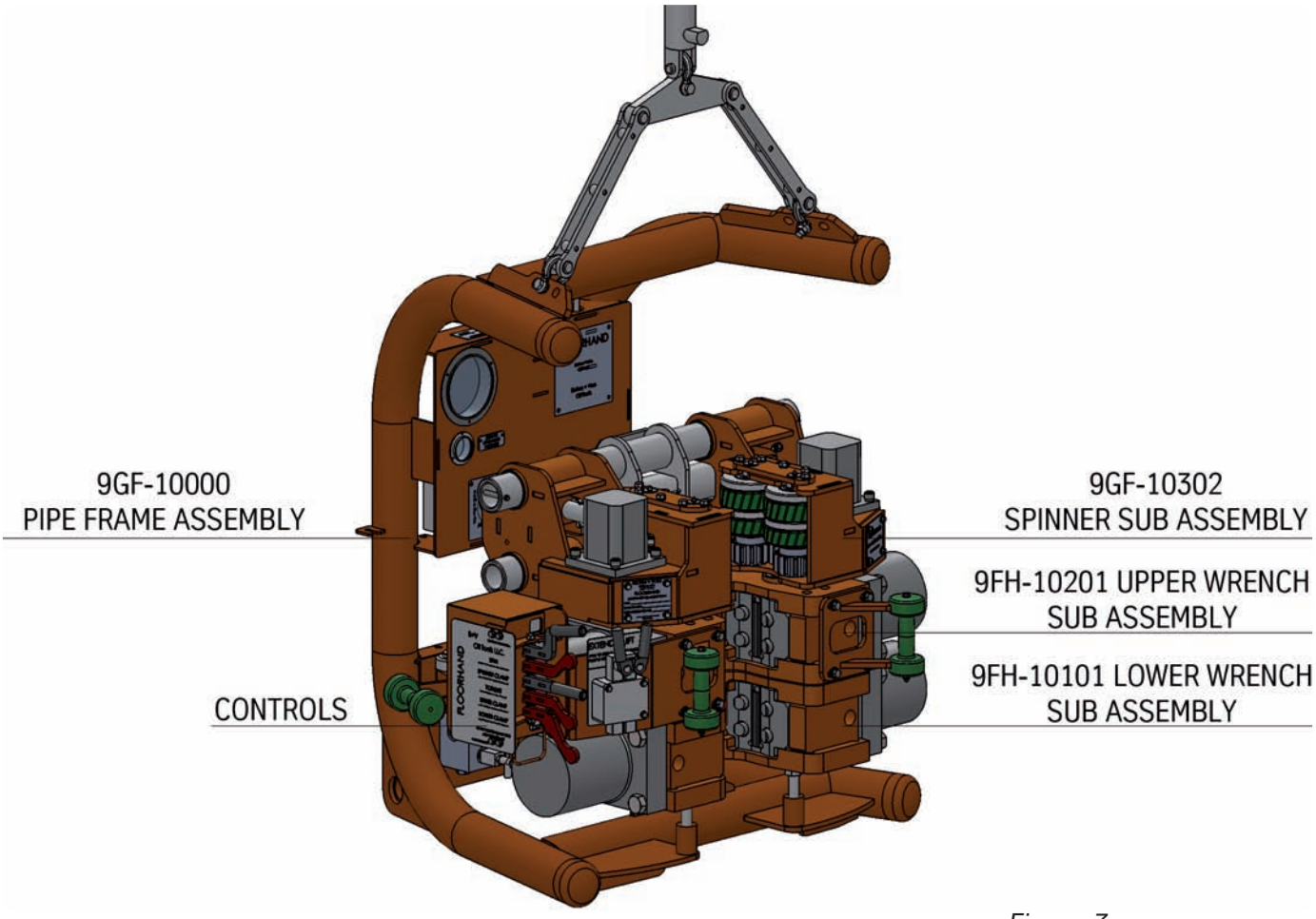


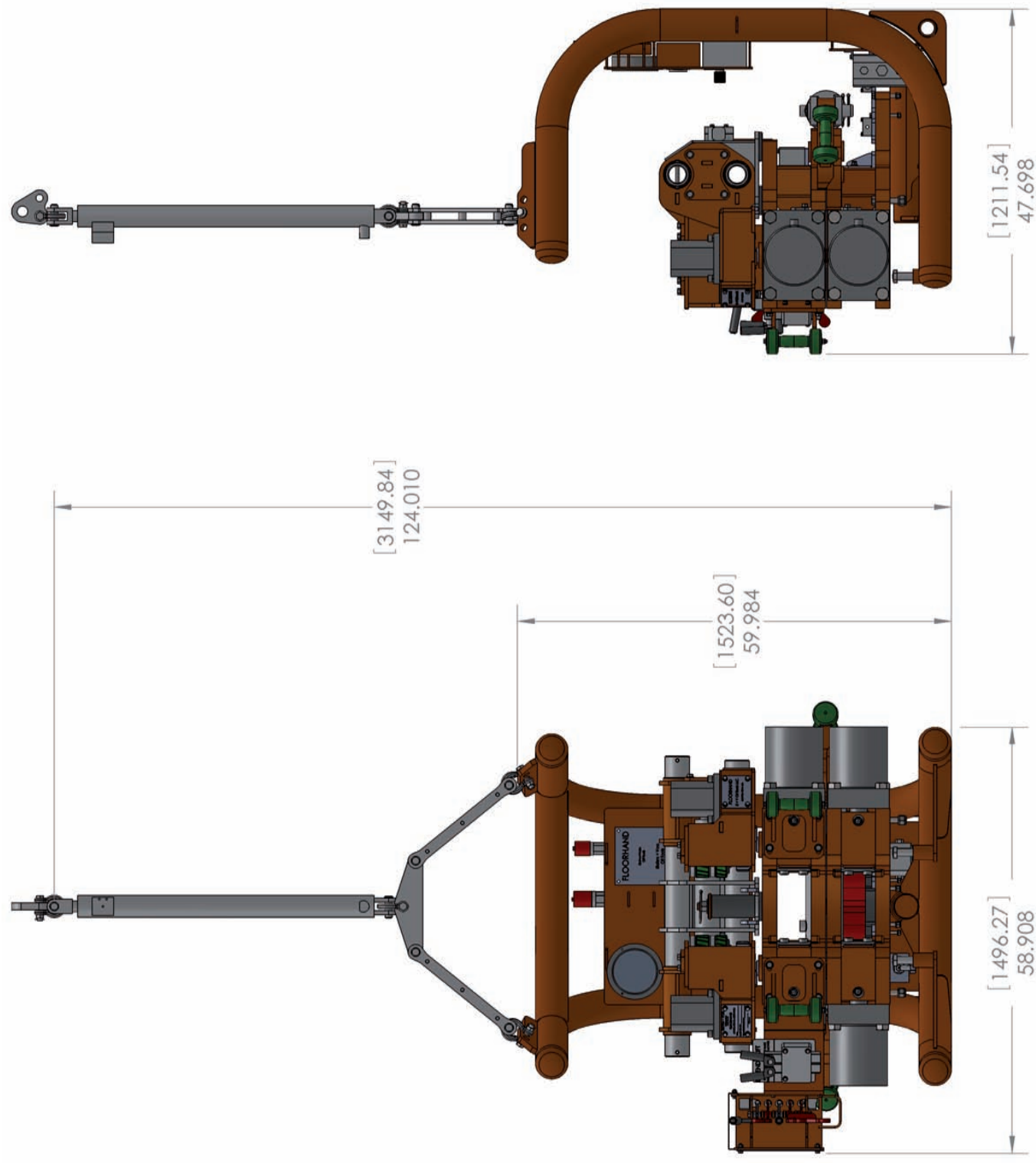
Figure 3

Wrench Assembly

Motor spinning roller ratio	1 : 1.25
Spin speed *(rollers)*	105 - 110 RPM
Spin speed *(8 ½" O.D.)*	80 - 100 RPM
Make up torque	11,000 ft/lb. min. *(w/o optional low torque system) (14,913 Nm)*
	65,000 ft/lb. max. *(88,128.16 Nm)*
Break out torque	80,000 ft/lb. max. *(108,465.40 Nm)*

Shipping Data (approx. allowing crate or pallet):

Length	50 inches	*(1270mm)*
Width	60 inches	*(1524mm)*
Height	60 inches*	*(1524mm)*
Weight	4550 lbs	*(2068.18)*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47.698
[3149.84]
124.010
[1523.60]
59.984
[1496.27]
58.908
FLOORHAND

Figure 4

Blohm + Voss Oil Tools, LLC

Blohm+Voss

EG-Konformitätserklärung
EC-Declaration of Conformity

Wir (we)

Blohm + Voss Oil Tools, LLC
11355 FM 830
Willis, TEXAS 77318
USA

erklären in alleiniger Verantwortung, dass das Produkt
hereby declare in our sole responsibility, that the product

BVOT hydraulic make-up/break-out wrench and spinner combination

2-7/8" DP (min. 4" TJ) - 8-1/2" DC Make-up Torque: 65,000 Ft Lbs

auf das sich diese Erklärung bezieht, mit der/den folgenden Norm(en) oder normitativen Dokumenten übereinstimmt

which is the subject of this declaration, is in conformity with the following standard(s) or normative documents

Bestimmungen der Richtlinie:

terms of the directive:	Title and/or No. and date of issue of the standard
Richtlinie 2006/42/EG des Europäischen Parlaments und des Rates vom 17 Mai 2006 über die Angleichung der Rechtsvorschriften von 2006 der Mitgliedstaaten für Maschinen.	**Maschinenrichtlinie 2006/42/EG 17 Mai 2006**
Directive 2006/42/EG of the European Parliament and of the Council of 17 May 2006 on the approximation of the laws of 2006. The Member States relating to machinery.	Machinery Directive 2006/42/EG 17 May 2006
Sicherheit von Maschinen. - Teil 1 und 2 Safety of machinery, part 1 and 2	**DIN EN ISO 12100:2009.10** DS EN ISO 12100:2009.07
Sicherheit von Maschinen - Leitsätze zur Safety of machinery, Risk assessment	**DIN EN ISO 14121-1:2007.12** DS EN ISO 14121-1:2007.12
Ausrüstung für Bohr- und Bohrlocharbeiten Petroleum and natural gas industries-Drilling and well-servicing equipment	**DIN EN ISO 14693:2005.07** ISO 14693 / API 7K 5th Edition:2010.06
Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen	**EG Richtlinie 94/9/EG (ATEX 95)**
Devices and protection systems fot intended use in explosive	EG Richtlinie 94/9/EG (ATEX 95)
Nicht-elektrische Geräte für den Einsatz in explosionsgefährdeten Bereichen	**DIN EN 13463-1:2009-07**
Non–electrical equipment for use in potentially explosive atmospheres	DIN EN 13463-1:2009-07

Das Gerät „FLOORHAND hydraulisch betrieben" erfüllt die Maschinenrichtlinie 2006/42/EC und erfüllt die EG Richlinie 94/9/EG.

The product „FLOORHAND hydraulic operated" complies with the Machinery Directive 2006/42/EC and complies with the EC Guideline 94/9/EG.

Kennzeichnung:
Mark: CE Ex II 2G T5

Willis, Texas 12/2/10
Location and Date

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COMMISSIONING

Document Front Page

0	11/04/2010	FloorHand Shop Test/ Commisioning Procedure	DT	CT	MT
Draft	10/28/1020	Issued	DT	CH	MT
Rev./Status	Date	Description	Made by	Checked By:	Approved:

	Suppiler References:
	Procurement References:
	TAG NO:

Date:	Signature:	SDRL Code:	Area:	System:	Pages:	Encl:

Company:	Document Title/ Equipment: Commissioning Check Sheet for FloorHand (Iron Roughneck)
Rig/Vessle/Customer Order:	Equipment Serial No:
Supplier: Blohm + Voss Oil Tools, LLC	Document No:

FloorHand Commissioning Procedure

This test procedure is to be performed by authorized B+V personnel only!

Note: When performing the following steps, appropriate PPE will be used and standard safety practices must be followed at all times.

Note: When commissioning, H.P.U Commissioning must be completed prior to FloorHand commissioning. If installing FloorHand to customer supplied hydraulics, hoses must be flushed completely before connecting to FloorHand.

1. ___ Connect FloorHand (using flow meter) to Hydraulic power source of 2500-2800 PSI and 25-28 Gpm. If pressure is above 2800 PSI, a Pressure Release Valve (PRV) should be used. _____If flow rate is above 28 gpm, a pressure compensated flow control should be used._____
2. ___ H.P.U should be powered up a minimum of 20 minutes before moving to next step, to bring all oil to required operating oil temperature, record oil temp._____

Note: Throughout entire test, observe FloorHand for leaks, and or malfunctions, repair as necessary.

3. ___ Run spinner motors in make direction for 20 seconds, check that rotation of all four rollers are correct, check for leaks. Monitor flow meter, record max flow. _____ See step 1.
4. ___ Run spinner motors in break direction for 20 seconds, check for leaks.

Note: After making fresh hydraulic connections, or a rig move, it is best to always run the spinner before anything else. The spinner is the only system that is close to a direct system. For example, there are no PRV's, check valves, shuttle valves, diverter valves, pilot operated check valves, etc. in the spinner motor system, only a flow divider. This means, by running the spinner first, any small trash or contaminants that may be in the lines, will be flushed through with minimal to no damage. If there were trash in the lines, and the torque, or clamp system were operated first, there is a chance of contaminants getting lodged in a small orifice, in one or more of the many valves in the other systems.

5. ___ Without pipe, clamp and unclamp lower wrench 10 times, check that die blocks extend and retract evenly, check for leaks.

Note: This helps to remove air from the lower clamp system so that the flow divider may work correctly.

6. ___ Without pipe, clamp lower wrench.
7. ___ Clamp and unclamp upper wrench 10 times, check that die blocks extend and retract evenly, check for leaks.
8. ___ Unclamp lower wrench.
9. ___ Without pipe, clamp and unclamp spinner 10 times, check for leaks.

Note: spinner may, or may not close evenly, this is normal.

10. ___ Back torque adjustment knob out completely, then turn in (clockwise) 4 turns, Blohm + Voss Oil Tools, LLC.
11. ___ Actuate torque cylinder 10 complete strokes in each direction, check for leaks.
12. ___ Adjust make up speed flow control for a 5 second stroke. Verify during commissioning.
13. ___ Install test gauge on lower clamp cylinder outboard test port.
14. ___ Clamp lower wrench.
15. ___ Observe test gauge on lower wrench clamp cylinder, and Pressure Release Valve (PRV) if applicable.

16. ___ Set Pressure Release Valve (PRV) output to obtain 600 PSI at lower clamp cylinder. Verify during commissioning.
17. ___ Clamp upper wrench, ensure that system pressure is now present on lower clamp cylinders also (PRV reading should not change), unclamp upper wrench, unclamp lower wrench.
18. ___ Mock up test pipe, with torque, at end of stroke, check that gauge dump valve functions correctly.
19. ___ Stall spinner in make direction and hold for 5 seconds, check for leaks.
20. ___ Stall spinner in break direction and hold for 5 seconds, check for leaks.
21. ___ Operate manipulator / lift cylinder full up & down 10 times to remove all air from cylinder and counterbalance valve, check for leaks. If commissioning, inform rig crew that this should be done after every rig-up.
22. ___ Raise manipulator / lift cylinder to mid stroke, check that counterbalance valve holds.
23. ___ If applicable, extend and retract manipulator full out and in 5 times, check for proper function, check for leaks.
24. ___ WARNING: Clamp lower wrench, verify that manipulator functions do not operate.
25. ___ Unclamp lower wrench.
26. ___ Connect test gauge to return system test port, run spinner motors and hold while checking pressure filter bypass indicator (if applicable), and monitoring system back pressure, not to exceed 250 PSI. Record back pressure _____
27. ___ If applicable, check shutoff valve for proper function.
28. ___ Remove test gauges, and reattach the cap ports.
29. ___ Install any panels / covers removed for test.
30. ___ Ensure rig personnel fully understand all functions and basic maintenance of the FloorHand, including but not limited to: Importance of keeping fresh dies installed, proper make up torque adjustment, proper breakout procedure. Demonstrate how to remove and install the following: Dies, die blocks, and drive rollers.

Tech: _____
Signature: _____
Date: _____

Technician:

Signature:

Date:

Record of Training

Name:	Areas of Training: (Lubrication/Frequency/PM,etc.)	Signature:	Date:
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My signature above indicates that I have read and understand the opening instructions and have been trained to use the above machine by Blohm + Voss Oil Tools, LLC Technicians.			

Acknowledgement of Rig Superintendant / Tool Pusher

Name	Signature	Date

My signature above indicates acceptance of commissioning and the above personnel training.

INSTALLATION

Normal Rig Move Removal and Installation

Lifting

The FloorHand 9GF-2200 incorporates two lifting points on the uppermost area of the toeque arm. The unit should always be lifted using a two part bridle, one leg of each bridle attached to one of the lifting points. Never lift the unit by a single leg.

WARNING: ALWAYS USE LIFTING APPARATUS (SLINGS, CABLES, SHACKLES AND THE LIKE) THAT HAVE BEEN INSPECTED AND ARE IN GOOD CONDITION AND ARE PROPERLY SIZED. ENSURE THAT ALL RIGGING AND LIFTING PROCEDURES ARE IN ACCORDANCE WITH ACCEPTED INDUSTRY PRACTICES AND STANDARDS.

WARNING: NEVER STAND UNDER A LOAD BEING LIFTED.

WARNING: NEVER ALLOW PERSONNEL TO BE IN THE DIRECTION THAT THE EQUIPMENT MAY SWING WHEN BEING INSTALLED OR REMOVED.

Locating the HPU and attaching the Hydraulic Lines

The Hydraulic Power Unit ("HPU") may be located some distance away from the rig floor and, unless the electric components on the HPU are explosion proof, MUST be located off of the rig floor and away from the danger zone. The supply and return hoses from the HPU are normally ran up through the rig floor near the socket. The optional supply and return hoses are equipped with self-closing quick disconnect fittings. They attach to the mating quick disconnect fittings mounted on the back of the manipulator. Care must be taken during installation to minimize chafing of the hoses during rig up/rig down as well as during operation of the FloorHand. If the hoses chafe against the rig structure when the manipulator is moved, particularly when being slewed, chafe protection should be used. The remote start stop switch included with the Blohm+Voss 9PU-7200 HPU is explosion proof and may be located anywhere that is convenient to the Driller.

Attaching the Hydraulic Lines

When replacing these fittings, it is imperative to use exactly the same fitting in exactly the same orientation consistent with the factory installation. Always ensure that the quick disconnect fittings are fully engaged and locked (if appropriate to the type of fitting used).

1. Attach the pressure line quick disconnect fitting from the manipulator to the pressure line fitting that is connected to the Emergancy Shut Off Valve at the top of the unit.

2. Attach the return line from the manipulator to the fitting (the lower fitting) at the top of the unit.

3. Attach the four smaller lines from the manipulator to the appropriate lines on the unit.

4. Bleeding the system prior to use.

WARNING: THE QUICK DISCONNECT FITTINGS ARE CONFIGURED FROM THE FACTORY BY THE SIZE, AND ORIENTATION OF THE FITTING SO THERE IS LITTLE POSSIBILITY OF ATTACHING THE LINES INCORRECTLY.

WARNING: ALWAYS MAKE SURE THAT ALL OF THE CONTROL VALVE HANDLES FOR CLAMP (LOWER WRENCH, UPPER WRENCH AND SPINNER CLAMP) FUNCTIONS ARE IN THE FULLY RETRACTED ("PULLED BACK") POSITION PRIOR TO TURNING ON THE POWER UNIT. STAND CLEAR OF THE UNITS WHEN POWER IS APPLIED.

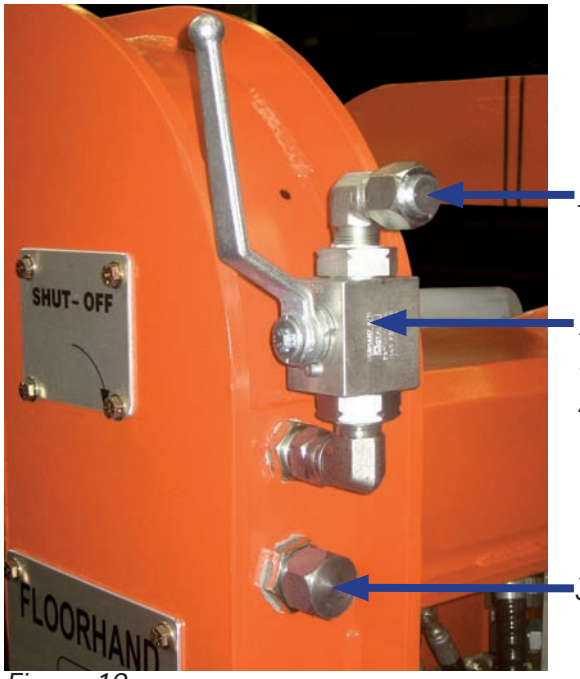
WARNING: PRIOR TO USE OF CANTILEVER ALWAYS ENSURE NO AIR EXIST IN THE HYDRAULIC CIRCUITS OF NEITHER THE FLOORHAND NOR THE CANTILEVER MANIPULATOR. AIR IN THE HYDRAULIC CIRCUIT CAN CAUSE UNEXPECTED MOVEMENT OF FLOORHAND AND CANTILEVER.

Procedure:

1. Operate all handles for a number of times; allow the tool to move completely to its hard stops.

2. Spin and torque a piece of pipe.

Note: If the Emergency Shut Off Valve is activated, no harm will come to the system. However, when the Emergency Shut Off Valve is reengaged; open the valve slowly and incrementally. Opening the valve suddenly could cause damage to the hydraulic lines and system.



1. Pressure line

2. Emergency Shut Off Valve Assembly

3. Return line

Figure 12

Make Up Torque Adjustment

To make up a connection for the first time, it is necessary to set the make up torque to the proper setting for the given tool joint, as per appropriate specifications from either the well plan or from the drill pipe manufacturer. Referring to normal make up procedures, it is assumed that the unit is engaged with the lower wrench clamped on the box and the pin has been spun up and shouldered. The make up torque adjustment is as follows:

Figure 7

1. Locate the "Torque Adjustment" control knob on the control panel below the torque gauge and break free the lock knob. Then rotate the adjustment knob counterclockwise until it stops. This decreases the available pressure in the torque circuit to a minimum.

2. With the upper wrench unclamped, move the "torque" handle on the main control valve to rotate the upper wrench fully to the break out position (that is, where the torque cylinder is fully extended).

3. Push the "upper clamp" handle on the main control valve to clamp the upper wrench on the pin end of the tool joint.

Figure 8

4. Pull and hold the "torque" handle on the main control valve. The upper wrench may or may not begin to move in the direction of make up. While holding the "torque" handle, rotate the "Torque Adjustment" control knob on the control panel clockwise to increase the torque until the reading on the torque gauge reaches the desired setting and stops moving. Hold for 3 seconds. Do not over torque the joint.

5. Lock in torque adjustment by gently tightening the locking knob. Do not over tighten. Once the unit has been properly adjusted, it is usually not necessary to re-adjust under normal conditions. At each connection, the operator should verify that the torque gauge stops at the proper setting for the particular tool joint. If it does not, the unit must be re-adjusted.

Rig-Up/ Rig-Down

1. Attach the shackles of a two-part lifting bridle to the lift eyes of the Torque Arm.

2. Lift the FloorHand aligns the bottom of the Bearing Housing with the socket.

3. Remove lifting bridle.

FloorHand Wrench Torque Chart

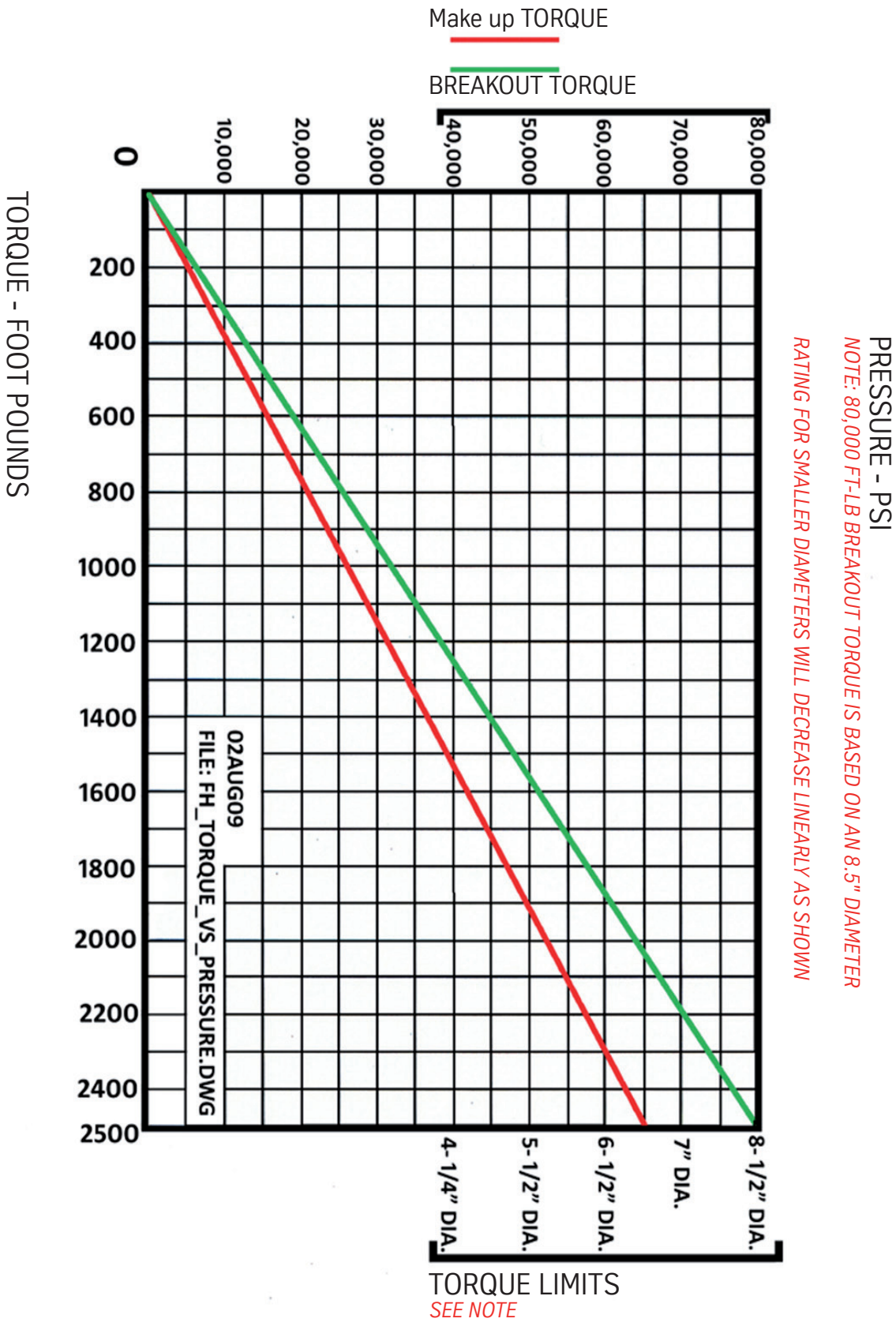


Figure 16

OPERATIONS

Controls

The controls for the wrenches and lift cylinder are situated on the front left corner of the upper wrench.

Figure 11

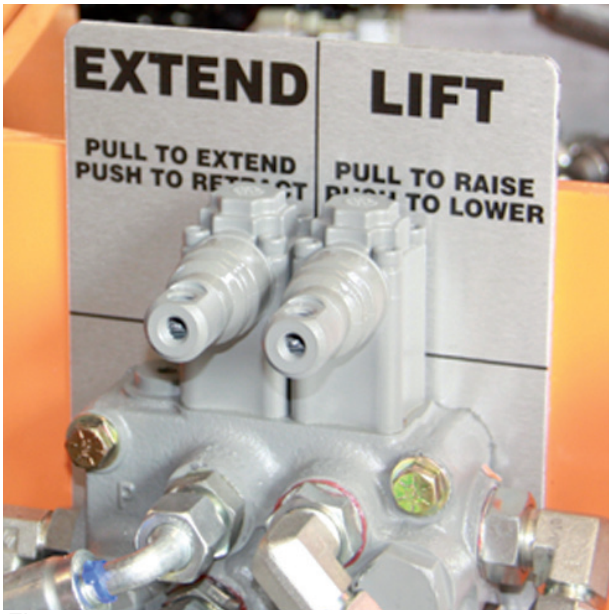


Figure 12

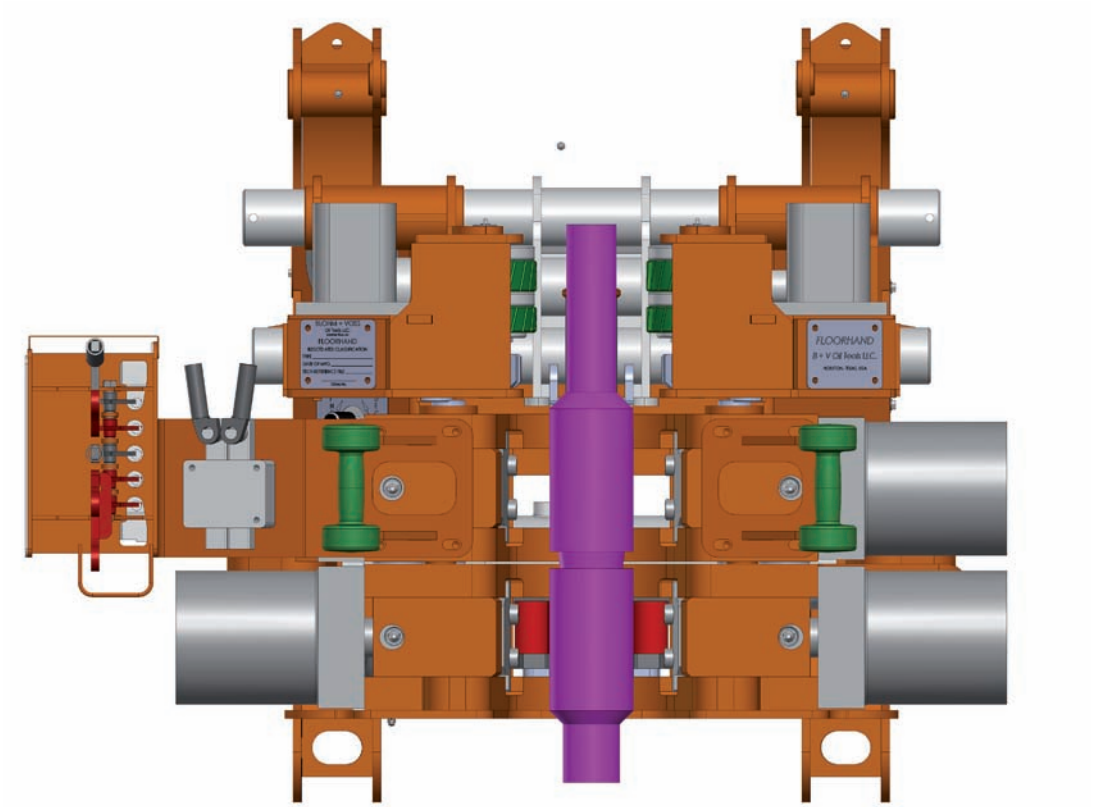


Figure 11

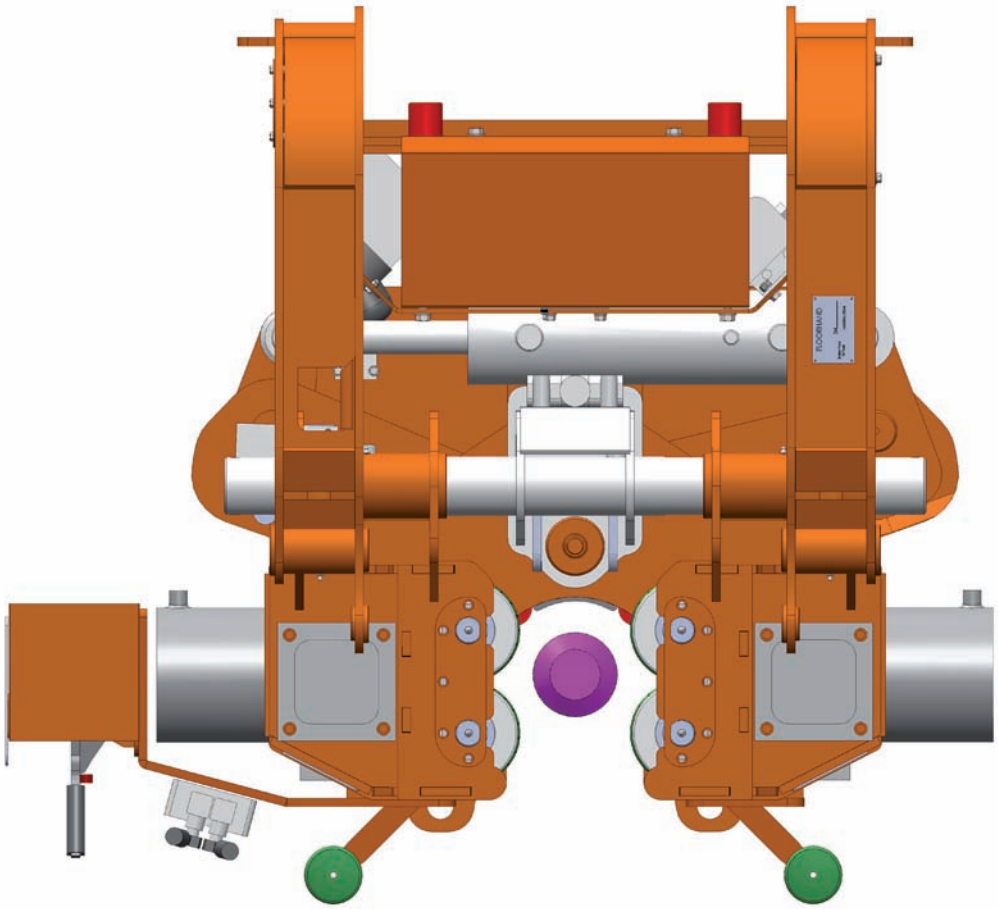


Figure 12

These two images show where the pipe needs to be positioned within the FloorHand.

Making a Connection

WARNING: BEFORE OPERATING THE UNIT, MAKE SURE THAT YOU HAVE READ AND UNDERSTAND THIS ENTIRE MANUAL AND HAVE BEEN PROPERLY TRAINED IN THE OPERATION OF THE UNIT. ALSO VERIFY THAT THE UNIT HAS BEEN PROPERLY INSPECTED, ADJUSTED AND LUBRICATED BEFORE EACH USE.

WARNING: ALWAYS CLAMP THE LOWER WRENCH BEFORE CLAMPING THE UPPER WRENCH OR SPINNER.

WARNING: DO NOT CLAMP THE FLOORHAND ONTO THE PIPE BEFORE THE PIN HAS BEEN STABBED.

Figure 15

1. Slowly pull the “Lift” handle to raise the FloorHand approximately two to three feet from the rig floor.

NOTE:
REMEMBER TO ALWAYS KEEP YOUR FREE HAND ON THE GREEN SAFETY HANDLE.

Figure 16

2. If equipped with a winch (see photo insert), it is necessary to pull the extend handle to allow the wrench to move toward the tool joint.

Figure 17

3. Guide the FloorHand and release the "Extend" handle when the tool approaches the pipe center.

If not equipped with a winch, manually move the tool to the tool joint.

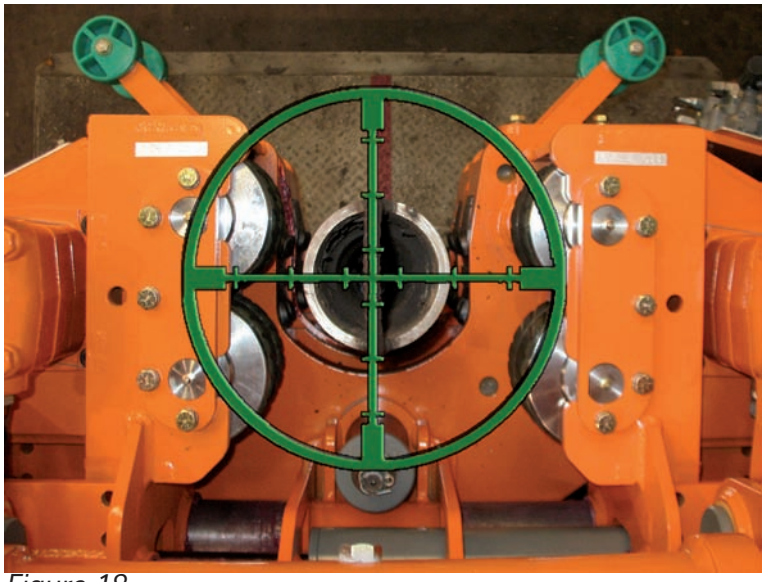


Figure 18

Center the tool In and Out first.

NOTE:
ALWAYS CENTER BY EXTENDING FIRST AND THEN CENTER BY MOVING UP AND DOWN!

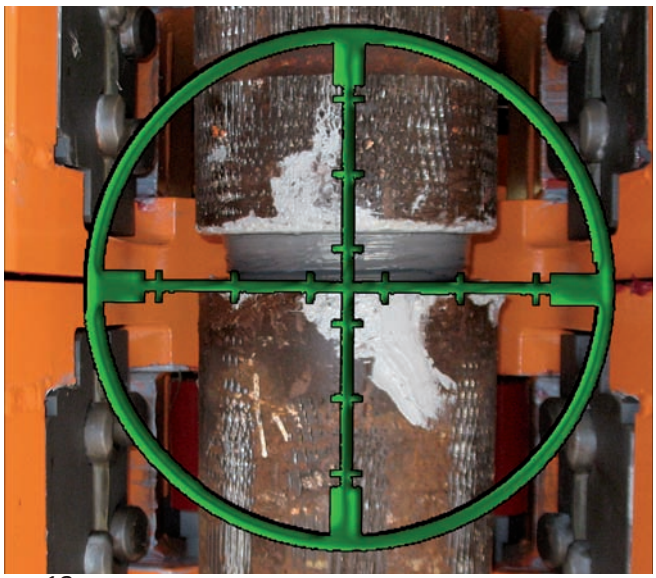


Figure 19

5. Next center the tool up and down.

Figure 20

6. Once the FloorHand is centered on the Tool Joint, clamp the lower wrench onto the box.

NOTE:
REMEMBER TO ALWAYS KEEP YOUR FREE HAND ON THE GREEN SAFETY HANDLE.

NOTE:
STAY CLEAR OF HARDBAND!

Figure 21

7. TECHNICAL NOTE: When clamped alone, the lower wrench clamps at roughly 600 PSI. This is done to prevent the box from becoming deformed before the pin is spun in.

Figure 22

8. Clamp the spinner on the pipe by pushing the clamp handle. Be sure not to clamp on the upset and/or the tool joint taper.

NOTE:
REMEMBER TO ALWAYS KEEP YOUR FREE HAND ON THE GREEN SAFETY HANDLE.

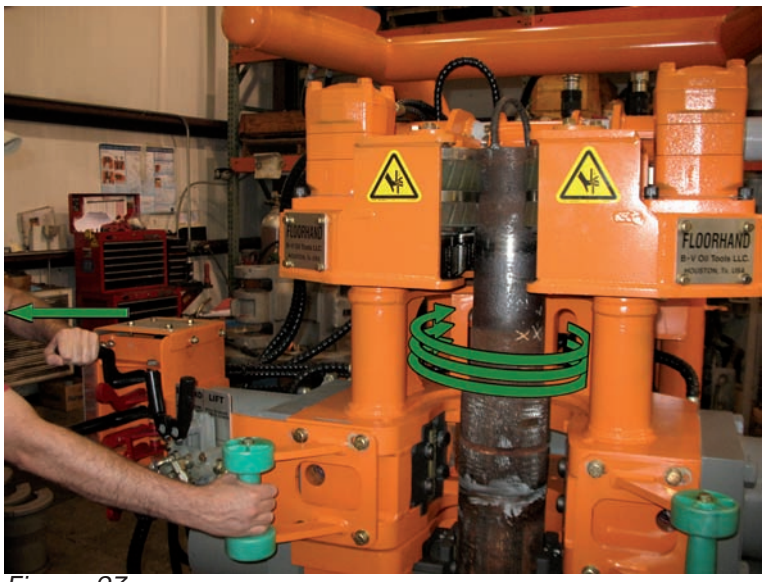


Figure 23

9. Pull the spin motor handle to spin in the pin.

Figure 24

11. Shoulder up pin with spinner.

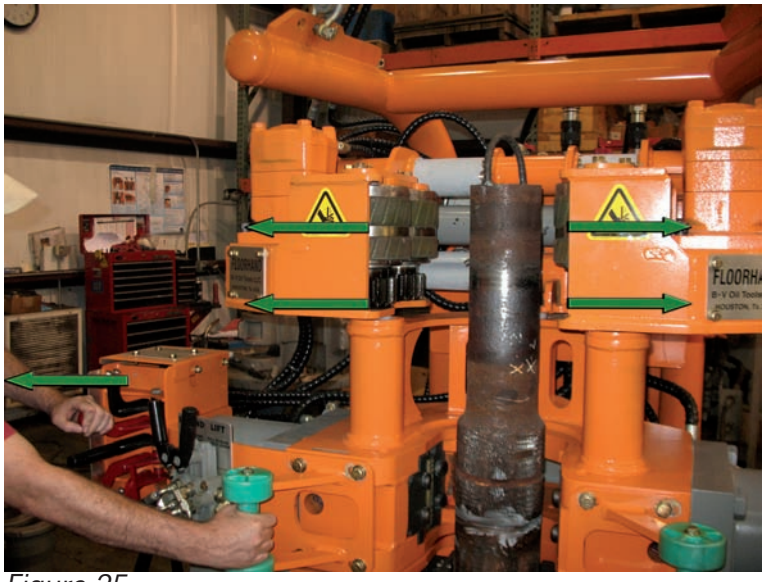


Figure 25

12. Pull the spinner clamp handle to unclamp the spinner.

NOTE:
REMEMBER TO ALWAYS KEEP YOUR FREE HAND ON THE GREEN SAFETY HANDLE.

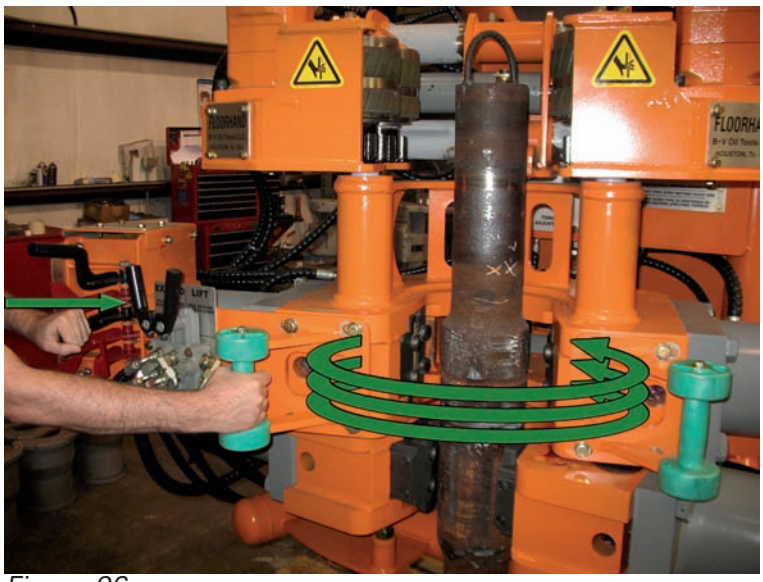


Figure 26

13. Push the torque handle to clock the upper wrench to the full break out position (counter clockwise) to ready the wrench for a full make up stroke.

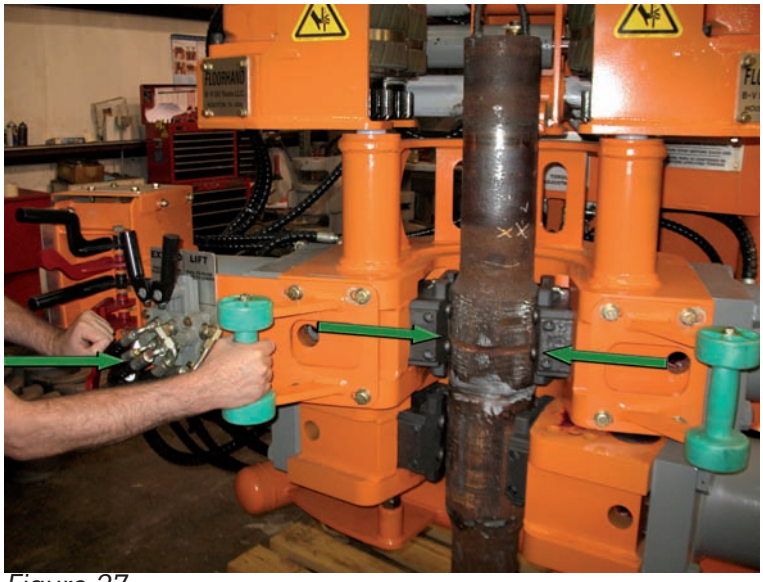


Figure 27

14. Clamp the upper wrench on the tool joint by pushing the upper wrench clamp handle.

NOTE:
REMEMBER TO ALWAYS KEEP YOUR FREE HAND ON THE GREEN SAFETY HANDLE.

NOTE:
STAY CLEAR OF HARDBAND!

Figure 28

15. Break loose the torque adjustment locking knob.

NOTE:
TORQUE ADJUSTMENT IS ONLY NECESSARY ON THE FIRST CONNECTION OF A GIVEN PIPE SIZE/TORQUE. NO OTHER ADJUSTMENT SHOULD BE NECESSARY UNLESS THE PIPE SIZE OR SPECIFIED TORQUE CHANGES. HOWEVER, TORQUE SHOULD BE MONITORED ON EVERY CONNECTION.

Figure 29

16. Rotate the torque adjustment knob full counter clockwise.

NOTE:
THIS IS THE ABSOLUTE MINIMUM SETTING, AND SHOULD ALWAYS BE USED AS THE STARTING POINT WHEN ADJUSTING THE TORQUE.

Figure 30

17. Pull and hold the torque handle in the make direction.

NOTE:
TOOL WILL NOT MOVE MUCH IF ANY, AS MINIMUM PRESSURE IS BEING SENT TO THE TORQUE CYLINDER.

Figure 31

18. While holding the torque handle fully in the make direction, slowly turn the torque adjustment knob clockwise until the desired torque (marked in black on the gauge) is reached. When torque is reached, hold for three seconds; tighten the torque adjustment lock knob to hold the torque setting. (DO NOT OVER TIGHTEN) The goal is to keep the knob from vibrating lose and ultimately changing the torque setting. So it is not necessary to lock it down with a death lock.

NOTE: THERE IS APPROXIMATELY TWO TURNS OF DEAD SPACE IN THE TORQUE ADJUSTMENT KNOB.

NOTE: IF THE TORQUE NEEDLE FALLS OFF, THE CYLINDER IS AT THE END OF ITS STROKE. IT IS NOW NECESSARY TO UNCLAMP THE UPPER WRENCH AND TAKE ANOTHER BITE. (REPEAT TORQUE CYCLE)

NOTE: TORQUE ON ALL CONNECTIONS SHOULD BE HELD AND VERIFIED FOR A MINIMUM OF 3 SECONDS.

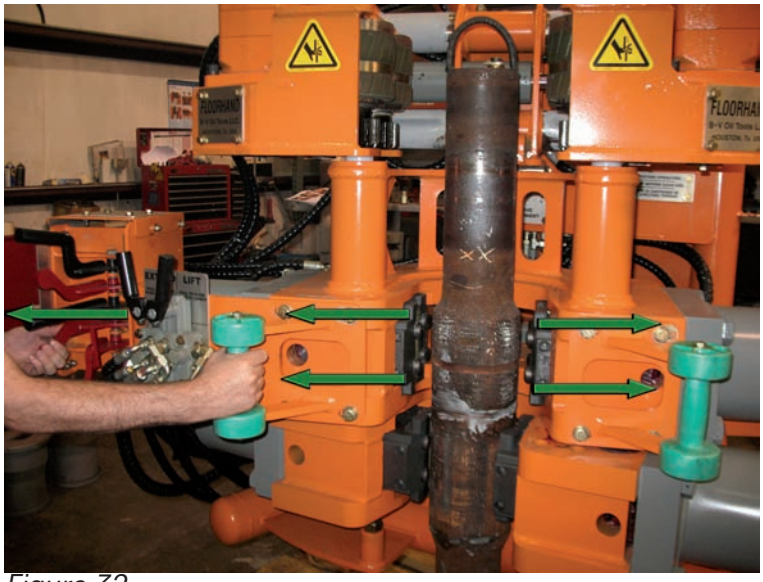


Figure 32

19. Unclamp the upper wrench by pulling the upper wrench unclamp handle.

NOTE:
REMEMBER TO ALWAYS KEEP YOUR FREE HAND ON THE GREEN SAFETY HANDLE.

Figure 33

20. Unclamp the lower wrench by pulling the lower wrench unclamp handle.

Figure 34

21. Ensure all is clear and move the tool away from the pipe to the full retracted position.

NOTE:
REMEMBER TO ALWAYS KEEP YOUR FREE HAND ON THE GREEN SAFETY HANDLE.

Figure 35

22. Lower the FloorHand to its full seated position.

NOTE:
IT IS GOOD PRACTICE TO LOWER THE TOOL COMPLETELY AFTER EVERY CYCLE TO REDUCE INTERFERENCE WITH TOP DRIVE SERVICE LOOP AND/OR KELLY HOSE.

Breaking a Connection

WARNING: BEFORE OPERATING THE UNIT, MAKE SURE THAT YOU HAVE READ AND UNDERSTAND THIS ENTIRE MANUAL AND HAVE BEEN PROPERLY TRAINED IN THE OPERATION OF THE UNIT. ALSO VERIFY THAT THE UNIT HAS BEEN PROPERLY INSPECTED, ADJUSTED AND LUBRICATED BEFORE EACH USE.

WARNING: ALWAYS CLAMP THE LOWER WRENCH BEFORE CLAMPING THE UPPER WRENCH OR SPINNER.

WARNING: DO NOT CLAMP THE FLOORHAND ONTO THE PIPE BEFORE THE PIN HAS BEEN STABBED.

Figure 36

2. If equipped with a winch (see photo insert), it is necessary to pull the extend handle to allow the wrench to move toward the tool joint.

Figure 37

2. Ensure the operating area Is clear, then pull the “Extend” handle to move the tool out to the pipe. Release the “Extend” handle when the tool approaches the pipe center.

Figure 38

3. Guide the FloorHand and release the "Extend" handle when the tool approaches the pipe center.

If not equipped with a winch, manually move the tool to the tool joint.

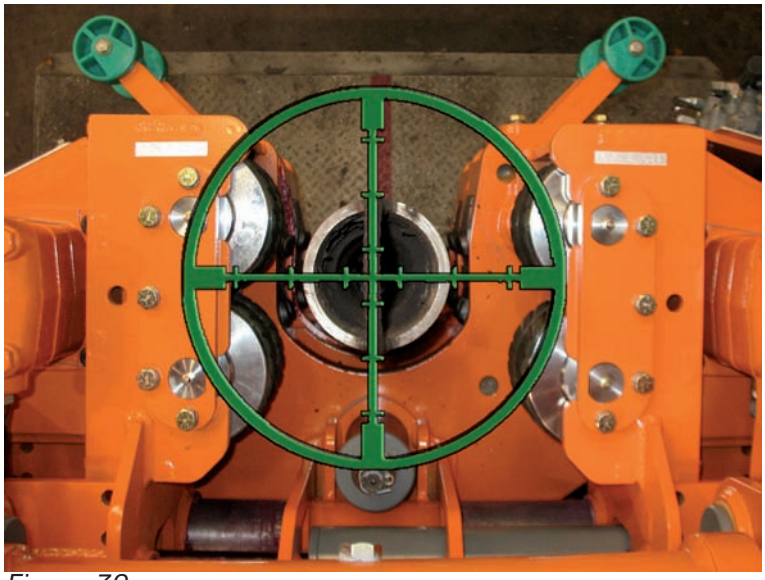


Figure 39

3. Use the "Extend" handle to center the tool In and Out first.

NOTE:
ALWAYS CENTER BY EXTENDING FIRST AND THEN CENTER BY MOVING UP AND DOWN!

Figure 40

4. Use the "Lift" handle to center the tool VERTICALLY on the tool joint.

Figure 41

5. Once the FloorHand is centered on the Tool Joint, clamp the lower wrench onto the box by pushing the lower wrench clamp handle.

NOTE:
REMEMBER TO ALWAYS KEEP YOUR FREE HAND ON THE GREEN SAFETY HANDLE.

NOTE:
STAY CLEAR OF HARDBAND!

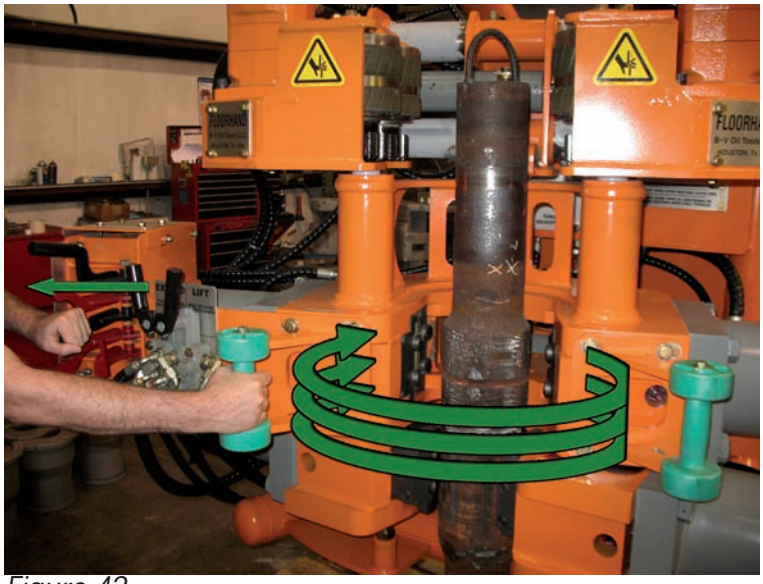


Figure 42

6. Pull the torque handle to clock the wrench to full make up position (clockwise) to ready the wrench for a full breakout stroke.

Figure 43

7. Clamp upper wrench by pushing upper wrench clamp handle.

NOTE:
REMEMBER TO ALWAYS KEEP YOUR FREE HAND ON THE GREEN SAFETY HANDLE.

NOTE:
STAY CLEAR OF HARDBAND!

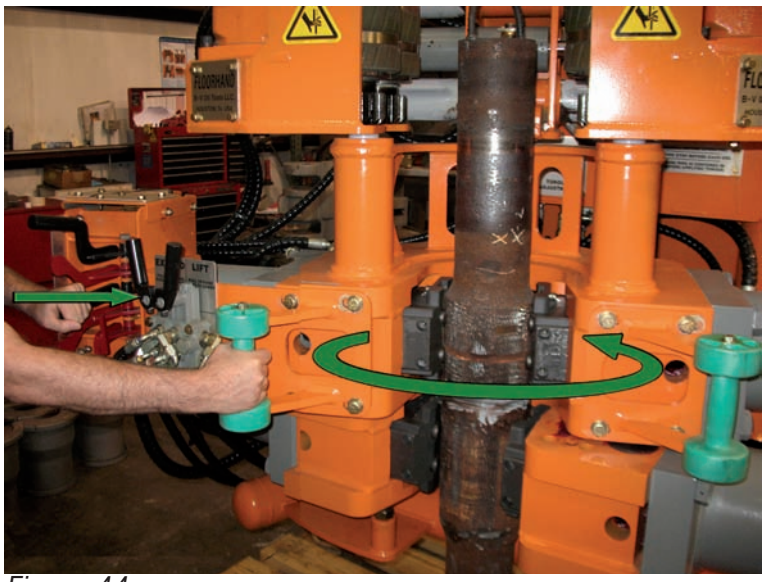


Figure 44

8. Gently move the torque handle to the right to slowly break the connection.

NOTE:
THERE IS NO ADJUSTMENT FOR BREAK OUT TORQUE PRESSURE. THEREFORE, THE BREAKOUT CYLINDER GETS FULL PRESSURE AND FLOW.

NOTE:
IN HIGH TORQUE SITUATIONS, IF THE BREAKOUT HANDLE IS SHIFTED FULLY, THE DIES MAY BREAK AND/OR THE UPPER WRENCH COULD SLIP, THUS DAMAGING THE TOOL JOINT.

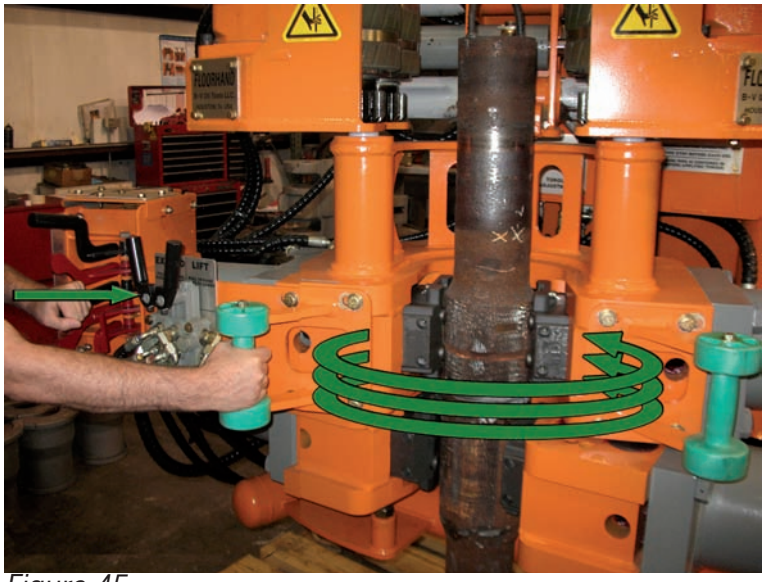


Figure 45

9. Once the connection breaks, the handle may be shifted fully to the right to finish the breakout stroke at full speed.

NOTE:
IT WILL SOMETIMES BE NECESSARY TO BREAKOUT TWICE BEFORE THE SPINNER CAN TAKE OVER.

Figure 46

10. After the breakout is complete, unclamp the upper wrench.

NOTE:
YOU MAY NOW CENTER THE UPPER WRENCH HOWEVER THIS IS NOT NECESSARY.

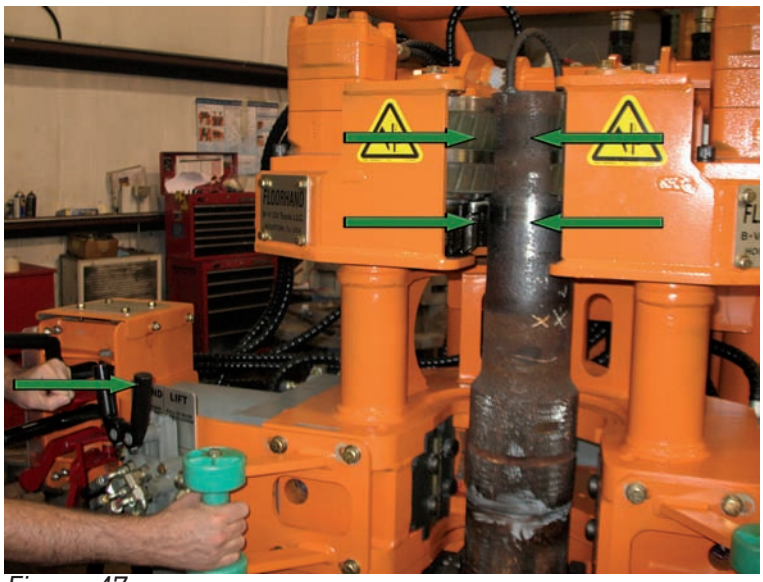


Figure 47

11. Clamp the spinner by pushing the spin clamp handle. Stay clear of the upset and/or tool joint tapper.

Figure 48

12. Push the spin motor handle to the right, fully, to spin out the pin.

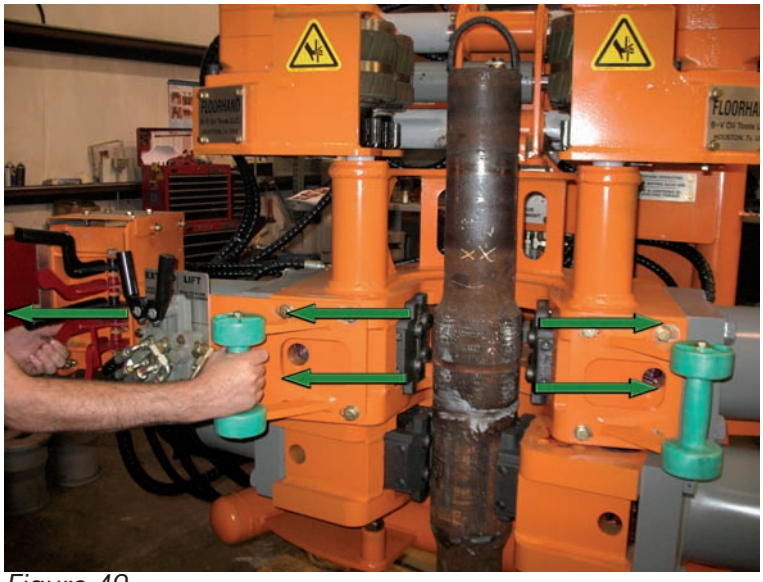


Figure 49

19. Unclamp the upper wrench by pulling the upper wrench unclamp handle.

NOTE:
REMEMBER TO ALWAYS KEEP YOUR FREE HAND ON THE GREEN SAFETY HANDLE.

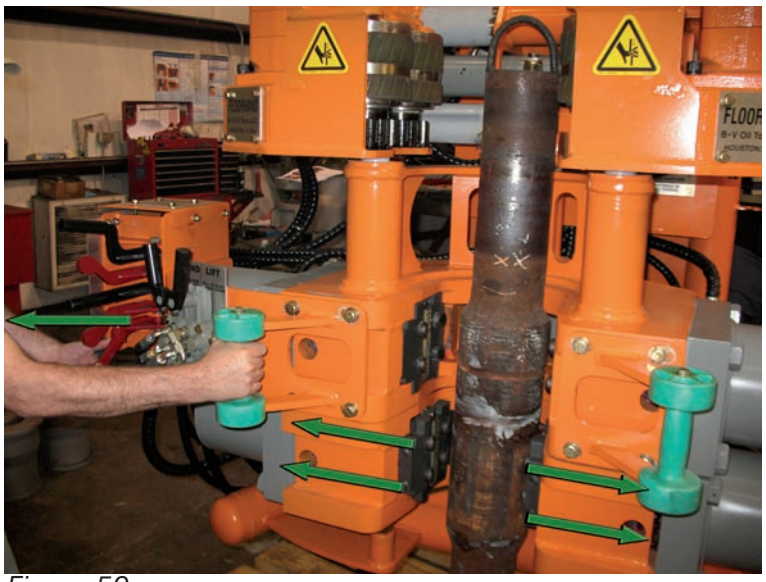


Figure 50

20. Unclamp the lower wrench by pulling the lower wrench unclamp handle.

Figure 51

15. Ensure all is clear and move the tool away from the pipe to the full retracted position

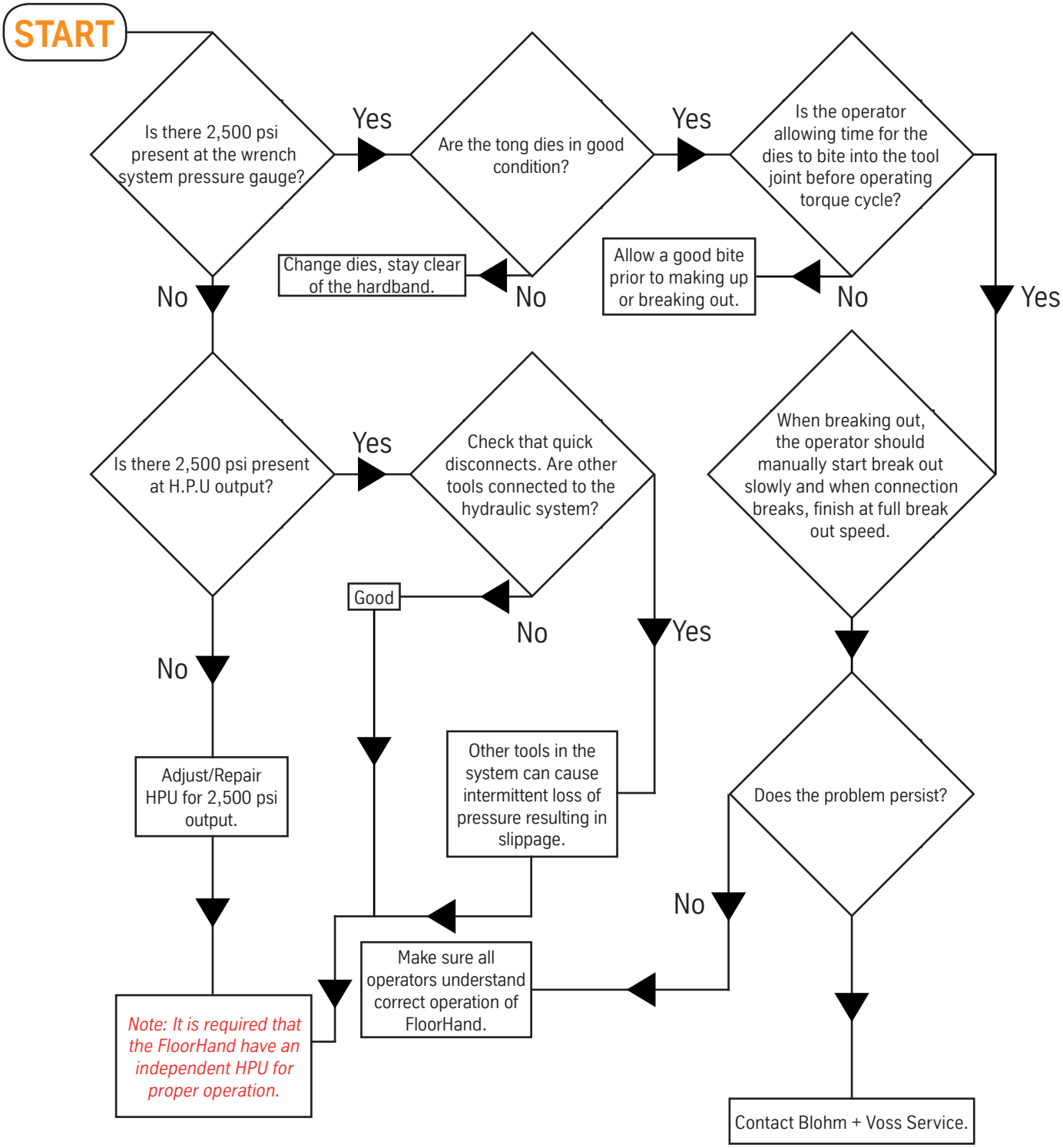
Figure 52

16. Lower the FloorHand to its full seated position.

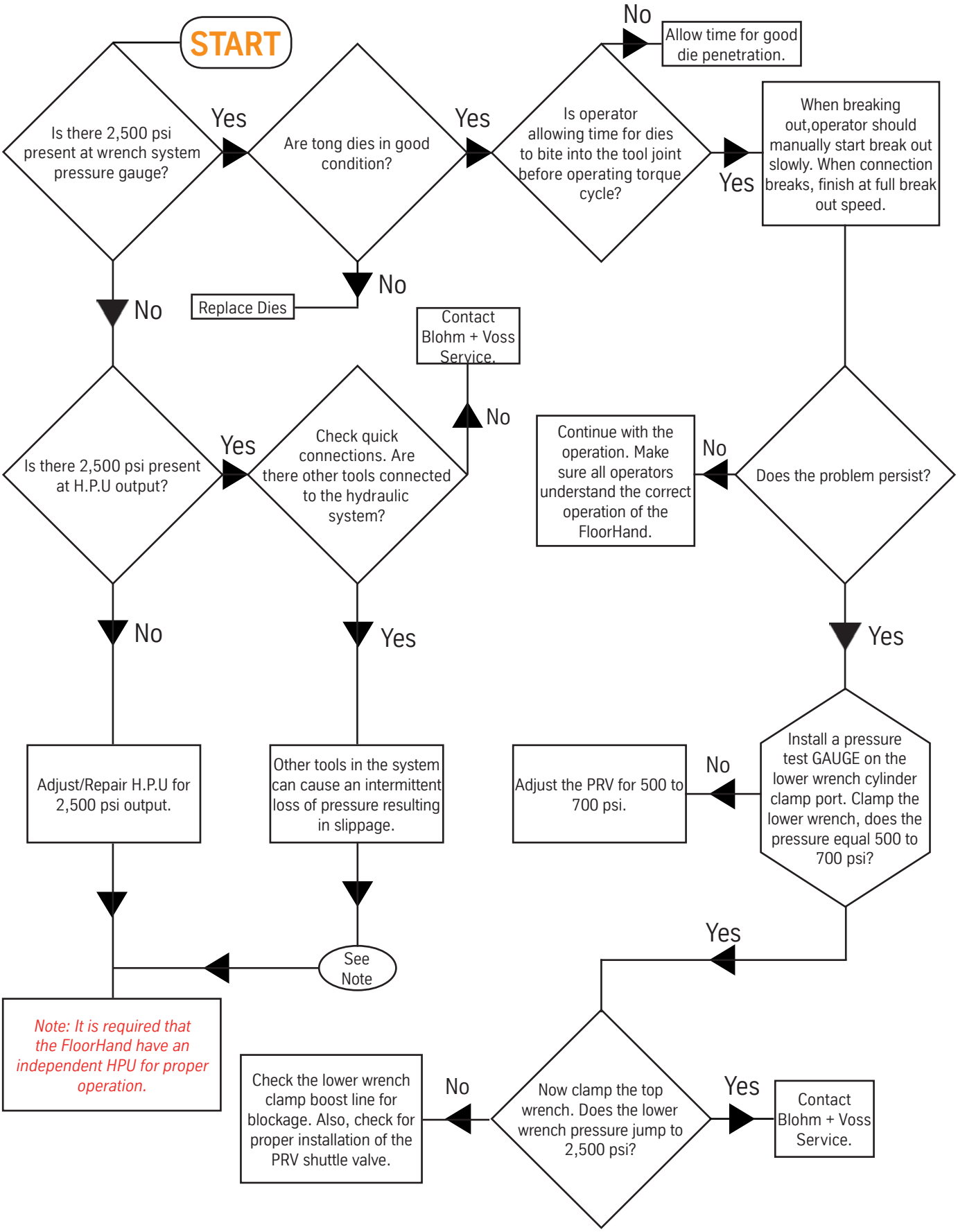
NOTE:
IT IS GOOD PRACTICE TO LOWER TOOL COMPLETELY AFTER EVERY CYCLE TO REDUCE INTERFERENCE WITH TOP DRIVE SERVICE LOOP AND OR KELLY HOSE.

Troubleshooting

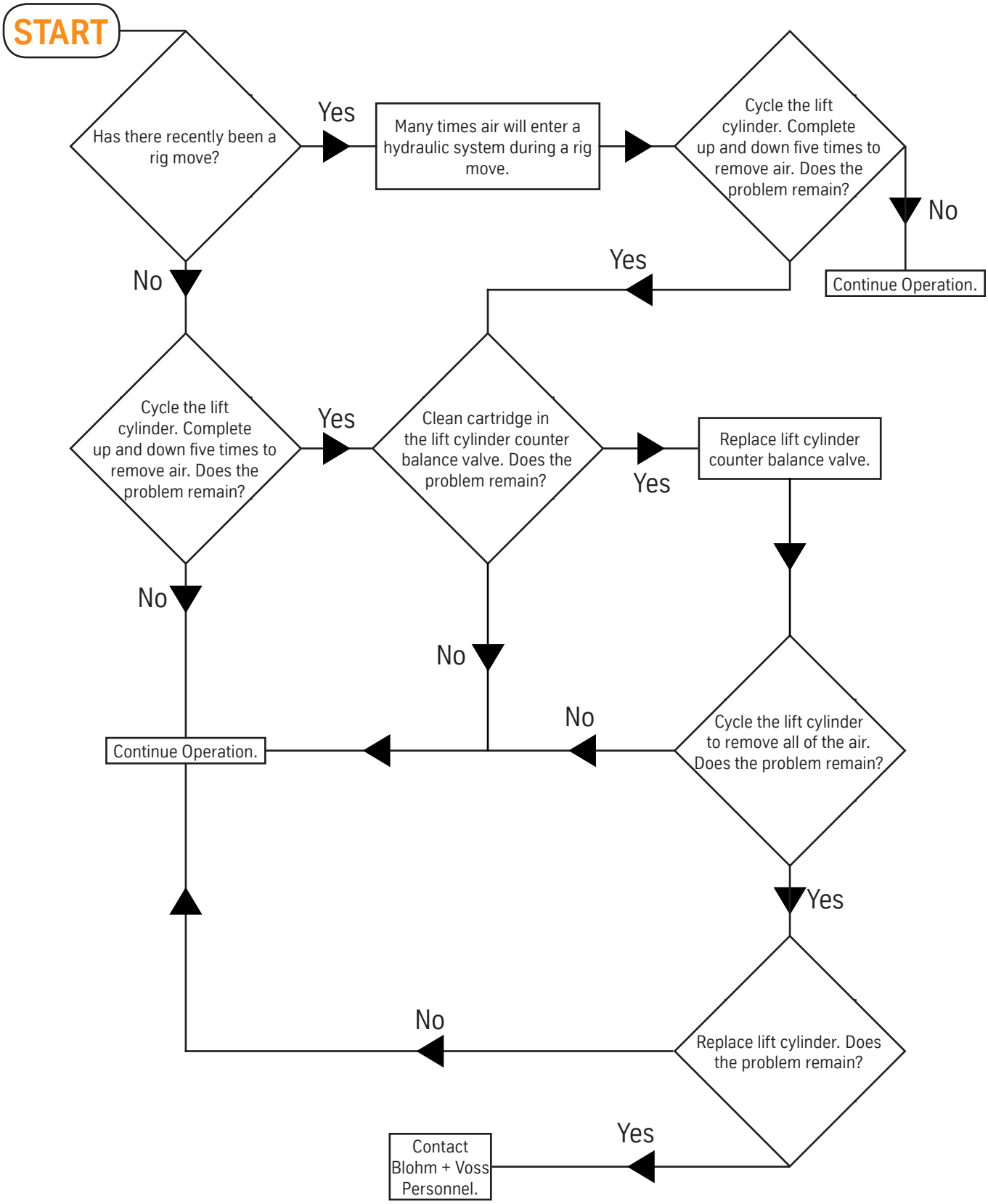
Problem: Upper wrench slips when making or breaking a connection.



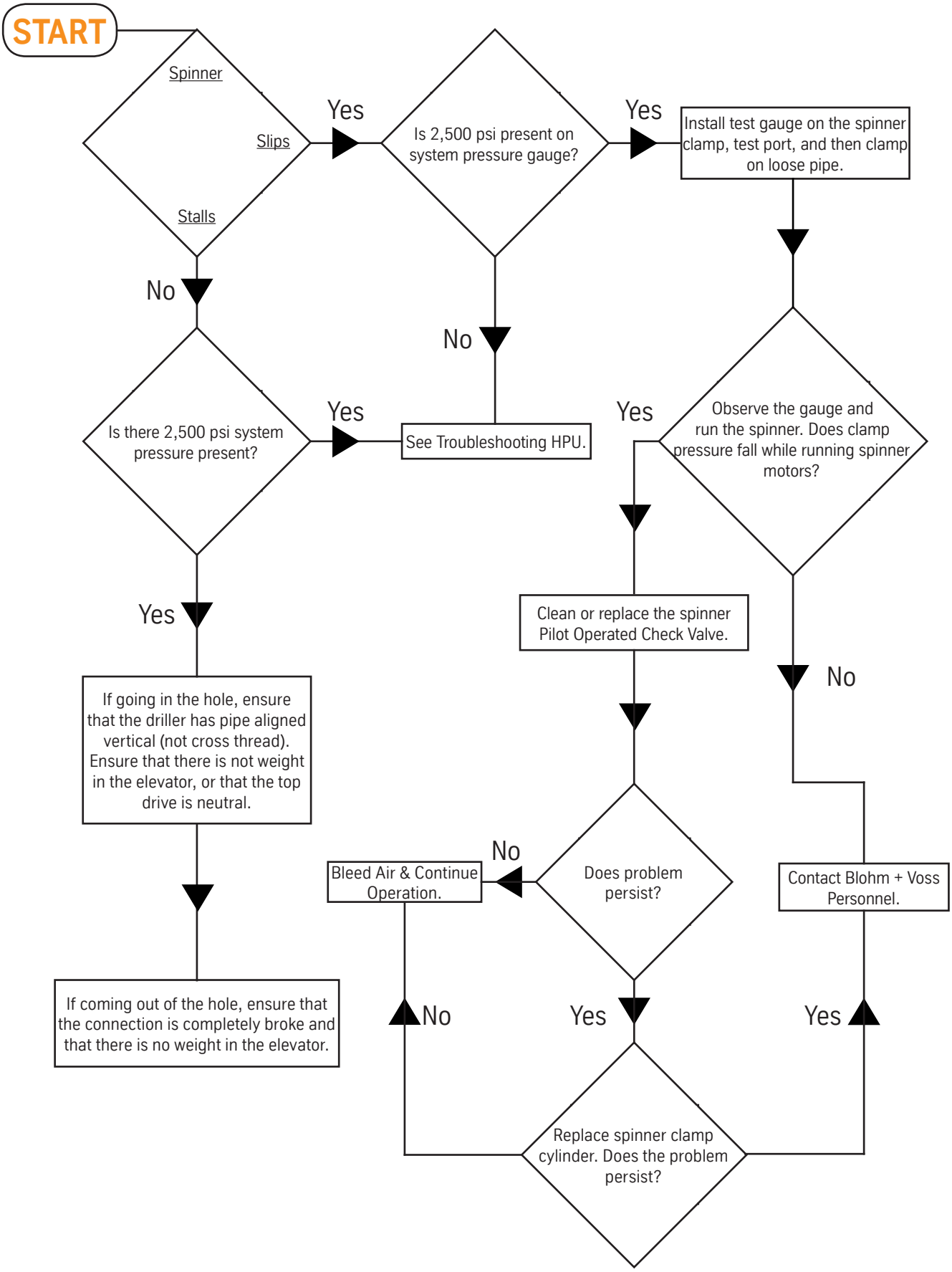
Problem: Lower wrench slips when making or breaking connections.



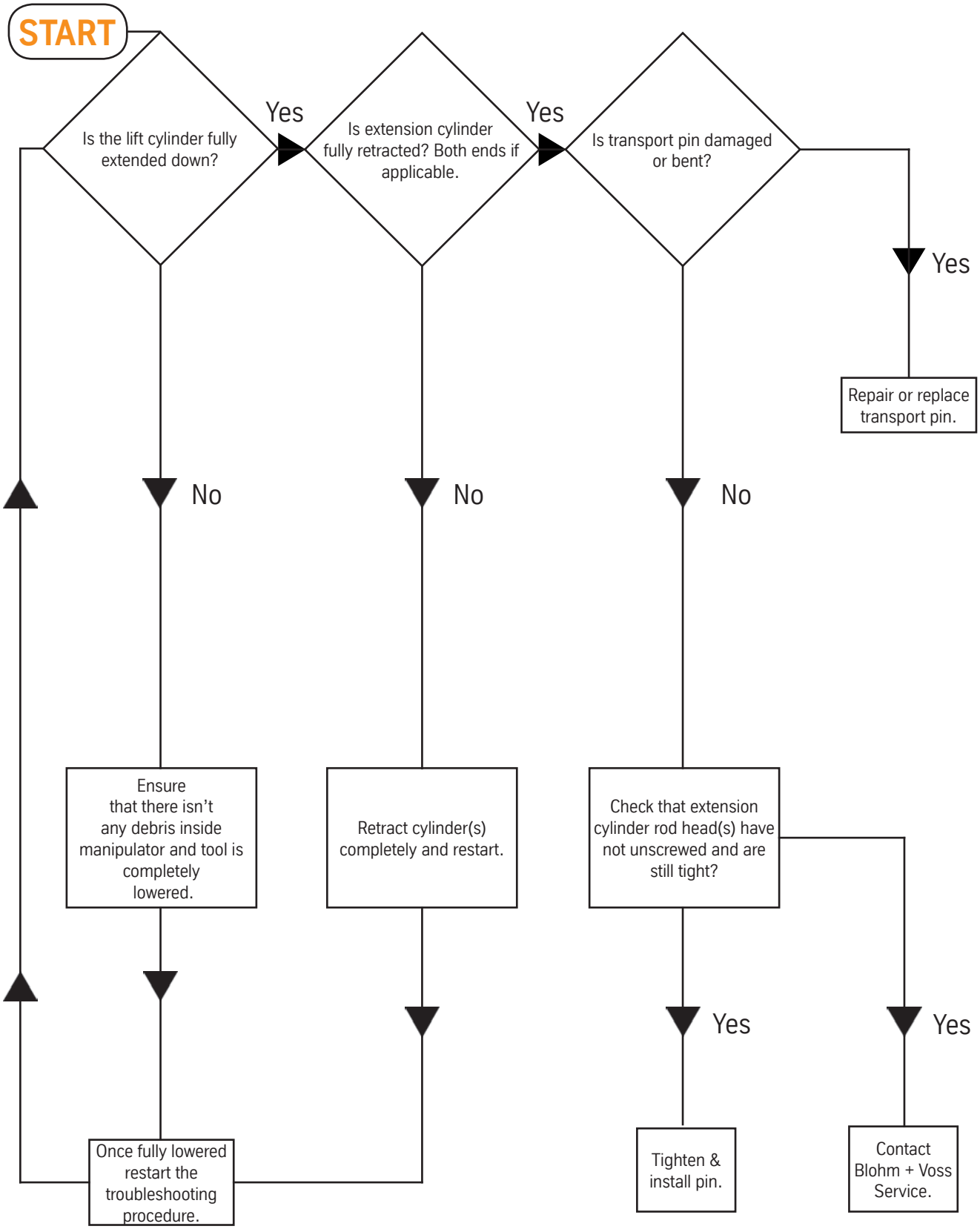
Problem: After Manipulator / Lift Cylinder is raised, FloorHand slowly drifts down.



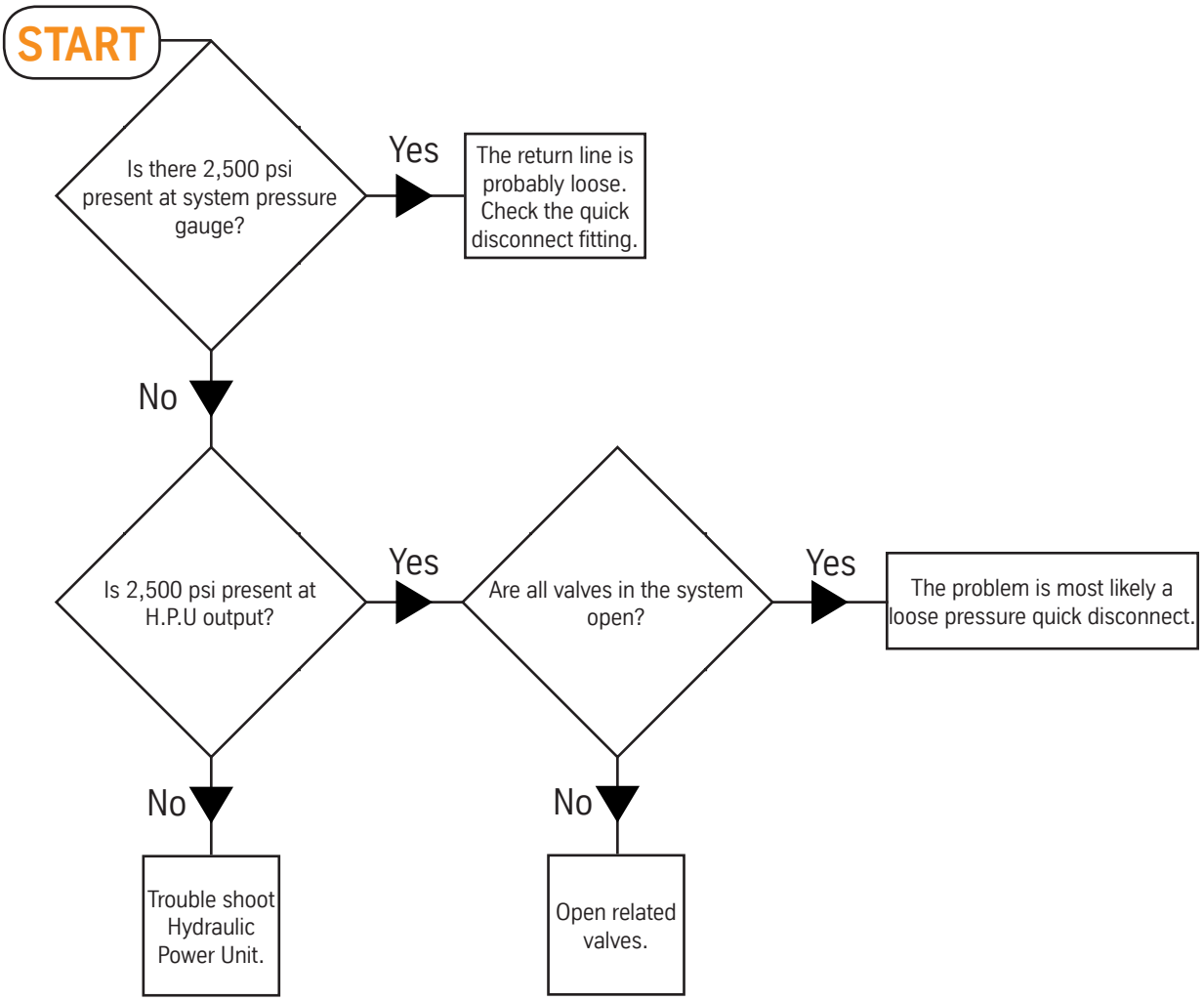
Problem: Upper wrench slips when making or breaking connection.



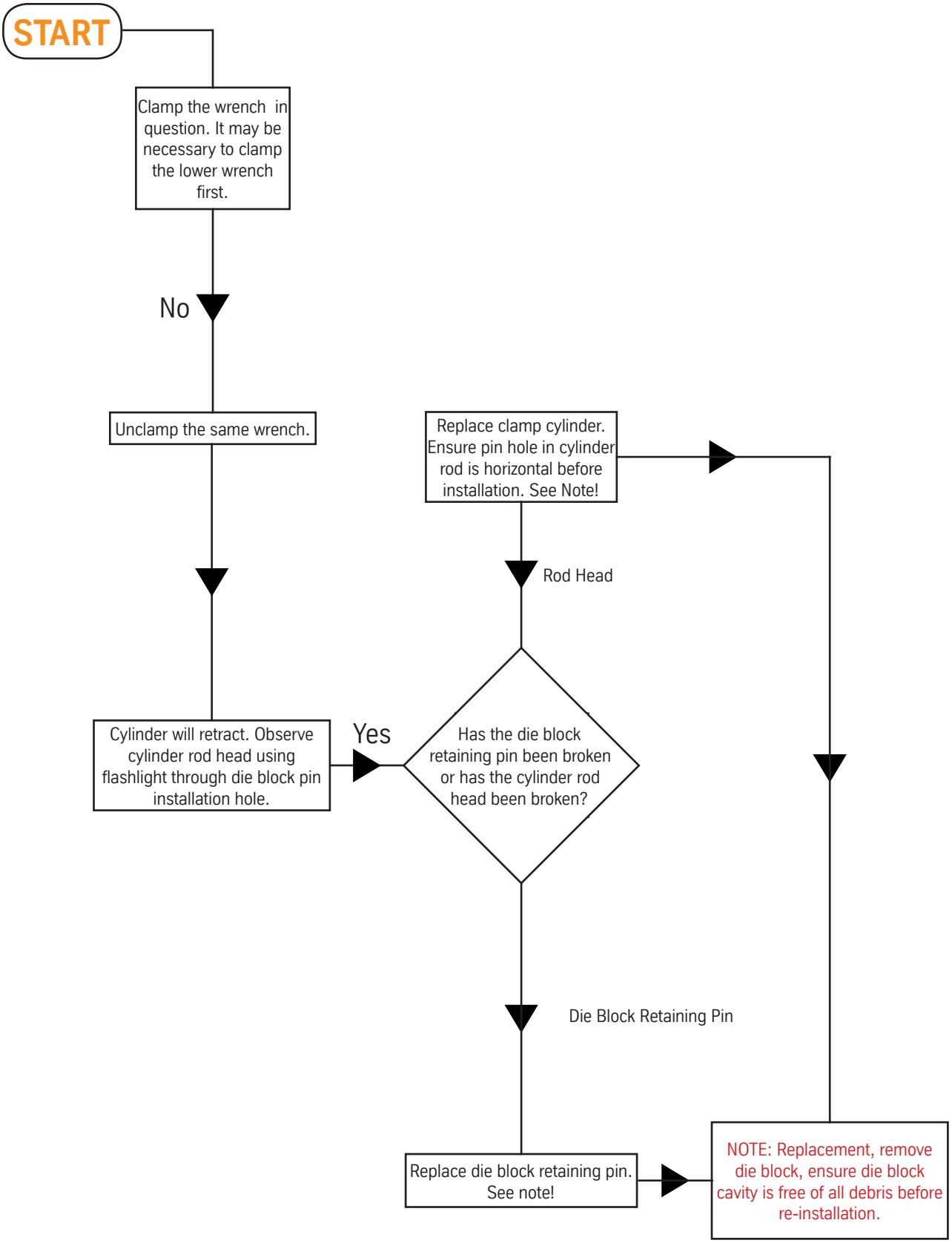
Problem: Transport pin cannot be installed, holes do not line up.



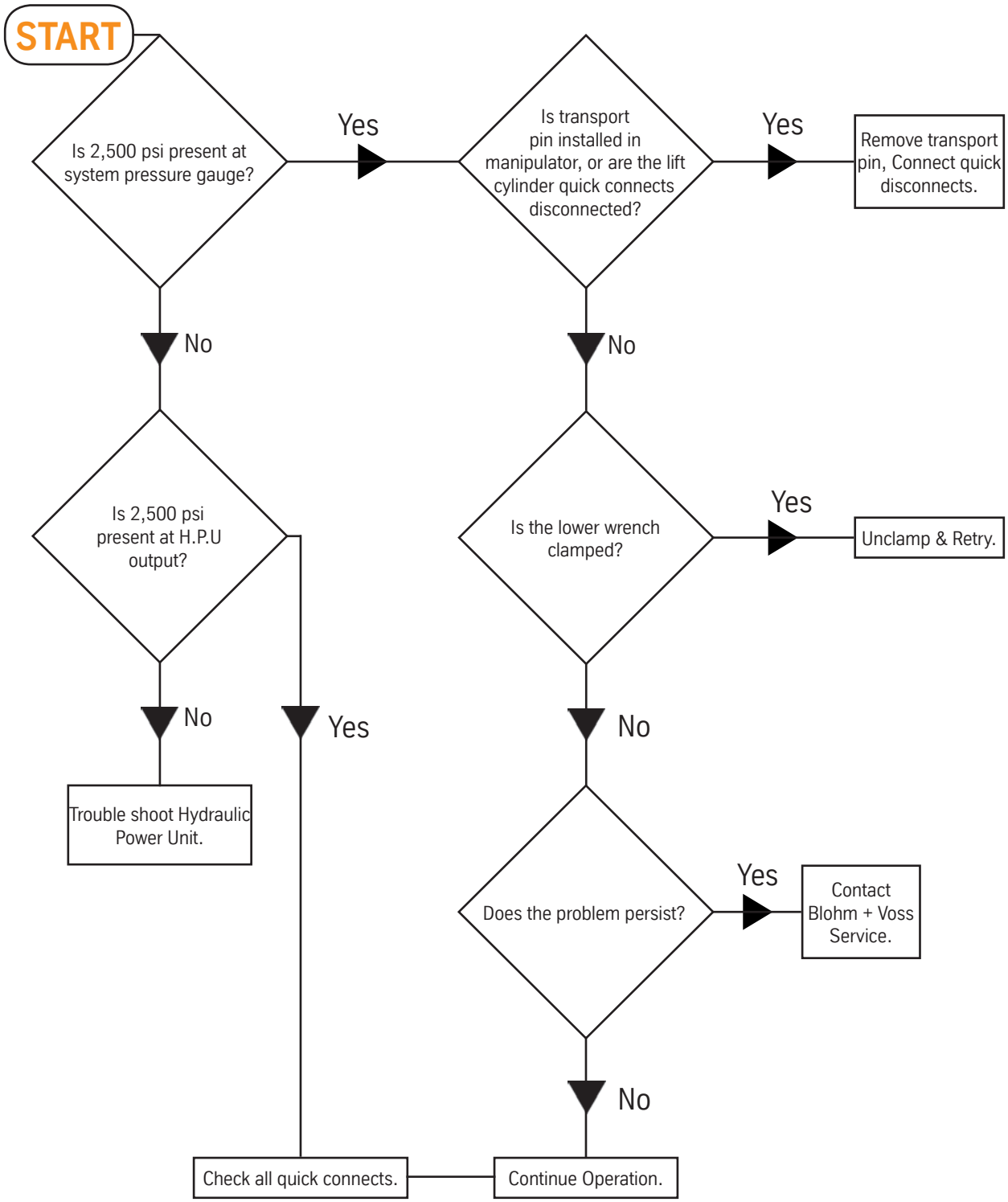
Problem: All wrench & manipulator functions are inoperative.



Problem: Die block extends, but will not retract on its own.



Problem: Manipulator / Lift Cylinder does not function.



MAINTENANCE & INSPECTION

Grease quality

In order to achieve efficient lubrication even at different environmental temperatures, we recommend that the following grease types be used:

WARNING: ALWAYS TURN OFF THE HYDRAULIC POWER UNIT, DISCONNECT THE HYDRAULIC LINES AND TAG OUT THE HPU CONTROL BEFORE LUBRICATING THE FLOORHAND. FAILURE TO DO SO MAY CAUSE INJURY TO PERSONNEL OR DAMAGE TO THE EQUIPMENT.

Multipurpose grease, e.g:
Shell Alvania RL 3
Aviaticon XRF NLGI 0

Alternatively; use EP gear lubricating grease for greasing ”non-oil tight gear trains”
NESSOS SF0
NLGI 0
DIN 51 826 GPOF-25
DIN 51 502 GPOF-25

For environments in the range of 65° to 95° Fahrenheit or 18° to 35° Celsius, we recommend using a mineral / based lubricant such as ISO 68 or equivalent.

Lubrication

The FloorHand should be inspected and greased each week. For higher ambient temperature up to 86° Fahrenheit (30° Celsius) we recommend to use NLGI grade 2. The grease points are:

The grease points are:

- Die Blocks - Actuate both lower wrench clamp and upper wrench clamp to expose the grease fittings before turning off the hydraulic power unit. Use a grease gun on each of the 4 fittings (Front and back) on each die block to lubricate the centering buttons.

- Die Blocks - With the Die Blocks extended, brush grease on the top, bottom and sides of each die block.

- Spinner gears - Brush grease onto the drive gear teeth. Take care to keep grease off of the drive rollers.

- Torque cylinder pins - Use a grease gun on the fitting on the top of each torque cylinder pin.
- Spinner clamp cylinder pins - Use a grease gun on the grease fitting on each end of the spinner clamp cylinder.
- Spinner guide tubes exterior- Brush grease on the spinner guide tubes.
- Spinner guide tubes - Use a grease gun on the grease fittings.
- Lifting bracket (2 places) - Use a grease gun on the grease fittings.
- Stabber (optional; no stabber available when welded frame in use) - Brush grease on the stabber guide rails and adjusting gear.
- Stabber (optional) - Use a grease gun on the grease fitting on the bottom of each stabber locking arm.
- Spinner clamp cylinder pins - Use a grease gun on the grease fitting on each end of the spinner clamp cylinder.
- Die dove tails groove - Brush grease in the grooves.

WARNING: ALWAYS TURN OFF THE HYDRAULIC POWER UNIT, DISCONNECT THE HYDRAULIC LINES AND TAG OUT THE HPU CONTROL BEFORE REPLACING TONG DIES ON THE FLOORHAND.

WARNING: NEVER CHANGE DIES OR OTHER PARTS OVER OPEN HOLE.

WARNING: NEVER STRIKE THE TONG DIES WITH A HAMMER OR ANY OTHER STEEL TOOL WHEN REPLACING THE TONG DIES ON THE FLOORHAND. TONG DIES ARE HIGHLY HEAT TREATED AND BRITTLE AND MAY BREAK. ALWAYS WEAR PROTECTIVE EYE WEAR WHEN CHANGING TONG DIES.

WARNING: BE AWARE OF THE FACT THERE IS A SPRING BEHIND THE PLUG WHICH MAY CAUSE INJURY. DO NOT LOOSE THE SPRING.

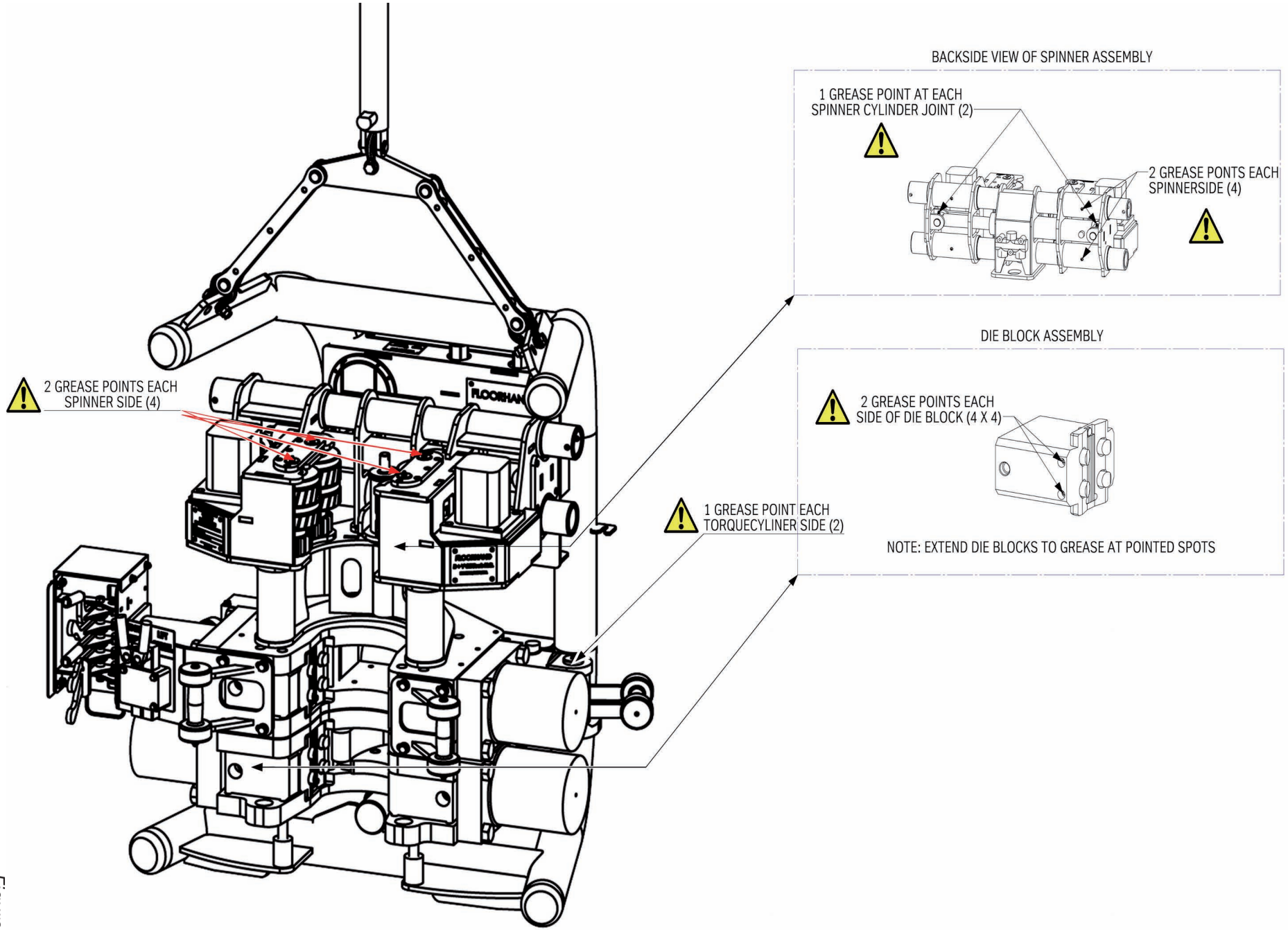

2 GREASE POINTS EACH
SPINNER SIDE (4)
1 GREASE POINT EACH
TORQUECYLINER SIDE (2)
BACKSIDE VIEW OF SPINNER ASSEMBLY
1 GREASE POINT AT EACH
SPINNER CYLINDER JOINT (2)
2 GREASE PONTS EACH
SPINNERSIDE (4)
DIE BLOCK ASSEMBLY
2 GREASE POINTS EACH
SIDE OF DIE BLOCK (4 X 4)
NOTE: EXTEND DIE BLOCKS TO GREASE AT POINTED SPOTS

Figure 53

Removal of Die-block

Procedure:

1. Remove the bolt. Number 1
2. Remove retainer. Number 2
3. Remove the retainer pin. Using the opening on the front on the wrench, push the pin through the opening on the back of the wrench. (Not shown)
4. Remove pipe stop. (Lower wrench only) Number 4
5. Remove pipe stop base. (Lower wrench only) Number 5
6. Slide out the Die Block. Number 6

Figure 54

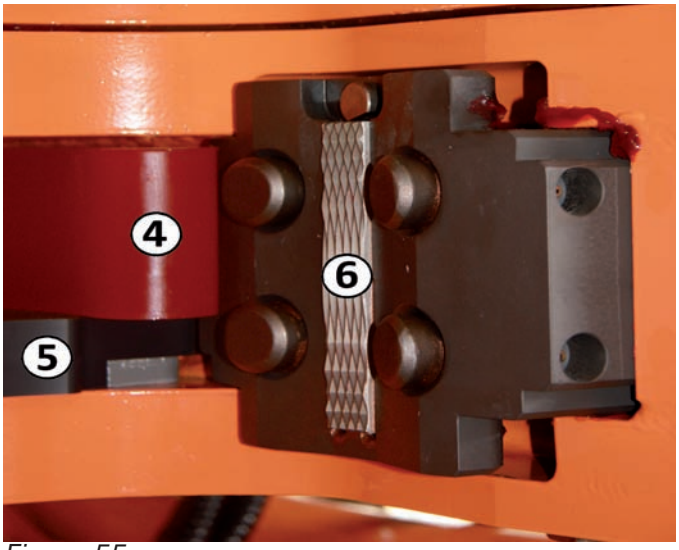


Figure 55

Replacement of Tong Dies

The tong dies should be inspected on a daily basis and replaced if damaged.

Actuate both lower wrench clamp and upper wrench clamp to expose the tong die retainer cotter pins before turning off the hydraulic power unit. All four tong dies may be replaced at the same time if the lower wrench clamp is fully extended and the upper wrench clamp is only partially extended.

1. Remove the cotter pin securing the tong die retainer.
2. Remove the tong die retainer.
3. Slide the tong die upwards to disengage from the slot in the jaw. If the die is difficult to remove, use a brass drift to tap it out from the bottom.
4. Discard old tong dies and cotter pins.
5. Clean and grease the die slot.

6. Slide in new tong dies.

7. Replace tong die retainers.

8. Insert new cotter pins and bend legs to secure.

Replacement of Centering Buttons

Procedure: Figure 56

1. Remove the die block as described on page 51.

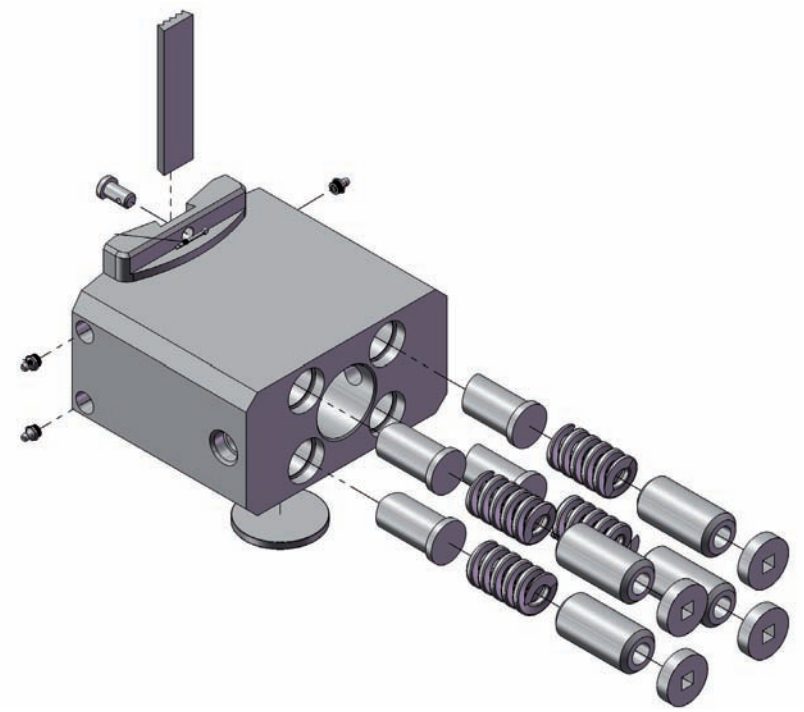


Figure 56

2. Using a ½" drive ratchet, remove the spring retainer plug, the spring spacer and the spring.

3. Now use a mallet to drive the button back through and out of the housing.

4. Remove all debris.

5. Apply lubricant and reinstall components.

6. Replace the button and assemble in reverse order.

WARNING: ALWAYS TURN OFF THE HYDRAULIC POWER UNIT AND DISCONNECT THE HYDRAULIC LINES BEFORE REPLACING SPINNER DRIVE ROLLERS ON THE FLOORHAND.

WARNING: DO NOT ATTEMPT THIS PROCEDURE OVER OPEN HOLE.

WARNING: THE BLOCK IS HEAVY

WARNING: ENSURE THE WEIGHT OF THE SPINNER HOUSING IS SUPPORTED BY A TUGGER OR CRANE (HEAVY).

Replacing Spinner Drive Rollers

The spinner drive rollers should be inspected after each trip and replaced if they show signs of deterioration or cracking. To replace the spinner drive rollers refer to Figure 57 on page 55 and follow the procedure. For additional help refer to the full size image and explanation of parts in the Drawings section of this manual, page 68:

1. Remove the five bolts securing the drive roller shaft retainer plate. (Items 40 and 41)

2. Remove the drive roller shaft retainer plate. (Item 17)

3. Pull the drive roller shaft (Item 16) upwards approximately ¾" so that the bottom end of the drive roller shaft clears the bottom plate of the spinner frame.

4. Withdraw the entire assembly from the spinner frame. Hold together the gear, roller and shaft as to not drop the parts. (Items 14, 15 and 16 respectively)

5. Remove and set aside the upper spacer for reuse. (Item 13)

6. Withdraw the drive roller shaft fully from the top of the drive roller and set aside for reuse.

7. Separate the drive roller away from the drive gear and set aside. (Items 15 and 14)

8. Clean the top of the drive roller gear to remove caked drilling mud and other debris that might keep the drive roller from fully seating in the case. (Refer to page 71, item 2)

9. Inspect the drive gear bearings and replace if they appear damaged or do not rotate smoothly.

10. Lubricate the top hex of the spinner drive gear.

11. Slide the new drive roller onto the hex portion until it seats fully.

12. Clean and lubricate the drive roller shaft. Slide it through the drive roller bearings and then through the drive gear bearings. Do not use force. If the drive roller shaft does not slide easily through the bearings with, **at most**, a light tap with a hammer handle, inspect the shaft for damage and, if necessary, replace the drive roller shaft.

13. Reposition the upper spacer (Item 13) on the assembly and position the lower end of the drive roller shaft flush with (or slightly inside) the face of the lower spacer.

14. Slide the entire assembly back into the spinner frame until the drive roller shaft contacts the back of the slot in the top plate of the spinner frame.

15. Align holes, then lightly tap the drive roller shaft (Item 16) down to engage the lower end of the drive roller shaft with the bottom plate of the spinner frame. (Items 1 or 2)

16. Orient the flat on the top of the drive roller shaft (Item 16) to properly mate with the drive roller shaft retainer. (Item 17)

17. Replace the drive roller shaft retainer (Item 17) and, Install the bolts holding it to the spinner frame and tighten.

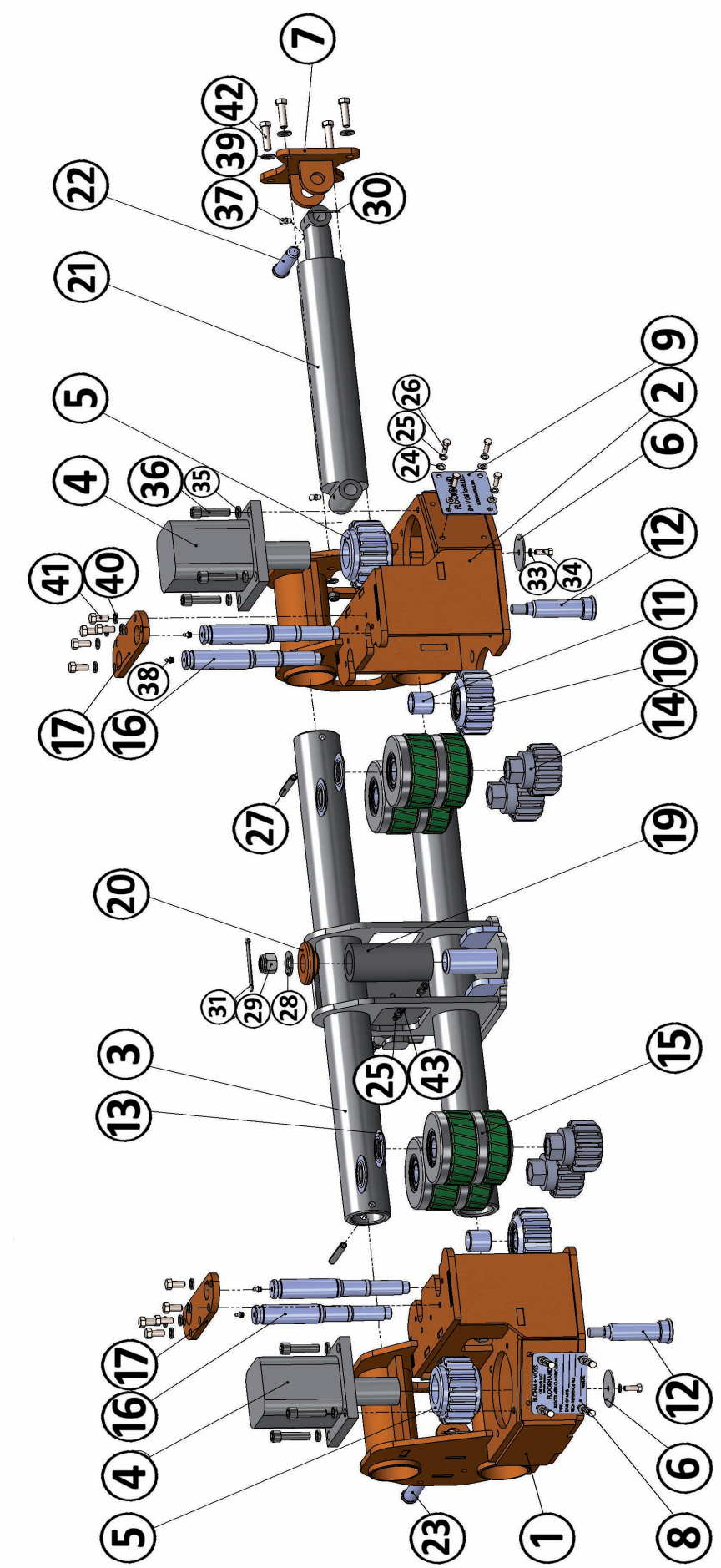

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Figure 57

Frequency

Inspection

A thorough inspection should be carried out periodically (every 3 months) or as special circumstances may require. Before starting an inspection disconnect hydraulic system and remove all foreign materials (dirt, paint, grease, oil, scale, etc) from surface by a suitable method. After a field inspection, it is advisable to record the extent of testing and testing results. The periodic or critical load inspection may be conducted in the field. If cracks, excessive wear etc are recognized, contact Blohm + Voss Oil Tools, LLC or an authorized service company.

Hydraulic System Inspection

Check for leakage every day. If an internal or external leakage reaches an unacceptable level, contact Blohm + Voss Oil Tools, LLC or an authorized service company.

Dismantling Inspection

Generally, when the equipment returns to base, warehouse, etc carry out the tool inspection, immediately. Furthermore, repair it if necessary prior to its being sent on the next job. The tool should be dismantled and inspected in a suitably equipped facility for excessive wear, cracks, flaws or deformations. Corrections should be made in accordance with recommendations which can be obtained from Blohm + Voss Oil Tools, LLC.

Check Category I (Ongoing Observation)

Observe during operation for inadequate performance

Check List Category II (Daily)

CHECK FOR THE FOLLOWING GENERAL ISSUES (but not limited to):			
	DESCRIPTION	CHECKED	SIGNATURE
1	Complete front page of check list for the records		
2	Check state of lubrication		
3	Check functioning of FloorHand as a whole		
	Remarks		

CHECK FOR LOOSE ITEMS, ESPECIALLY FOR (but not limited to):			
	DESCRIPTION	CHECKED	SIGNATURE
1	Hinge pins, bolts and retainers		
2	Any assembly of parts		
3	Screws, bolts, nuts, washers, retainers, springs and lock wire		
4	Check completeness and condition of warning plates and labels		
5	Check for presence of centring buttons and dies		
	Remarks		

CHECK FOR CRACKS, ELONGATION, DAMAGE AND CORROSION, ESPECIALLY FOR (but not limited to):			
	DESCRIPTION	CHECKED	SIGNATURE
1	Dies		
2	Hinge pins, bolts, nuts		
3	Rollers		
4	Centring buttons		
	Remarks		

SUPERVISOR _____ DATE _____

Check List Category III (Every Year)

GENERAL			
DESCRIPTION		CHECKED	SIGNATURE
1	Carry out a Category II inspection		
2	Check parts for wear according to allowable tolerances.		
	Remarks		

Check List Category IV (Every 2 years)

GENERAL			
DESCRIPTION		CHECKED	SIGNATURE
1	Carry out an Category III inspection		
	Remarks		

SUPERVISOR _____ DATE _____

Inspection Categories Acc. to API RP 8B

Category IV

This is Category III inspection plus further inspection for which the equipment is disassembled to the extent necessary to conduct NDT of all primary-load-carrying components.

Equipment shall be:

- Disassembled in a suitable-equipped facility to the extent necessary to permit full inspection of all primary-load-carrying components and other components that are critical to the equipment.
- Inspected for excessive wear, cracks, flaws and deformation.

Procedure:

- Corrections shall be made in accordance with the manufacturer's recommendations.
- Prior to inspection, all foreign material such as dirt, paint, grease, oil, scale, etc. shall be removed from the concerned parts by a suitable method (e.g. paint-stripping, steam-cleaning, grit-blasting)

Periodic Inspection

The recommended schedule for inspection of the FloorHand are as follows:

- Ongoing: Inspection category I
- Daily: Inspection category II
- Every 6 months: Inspection category III
- Every 1 year: Inspection category IV

The recommended frequencies apply for equipment in use during the specified period.

Inspection Check Lists

CHECK LIST FRONT PAGE

TYPE OF EQUIPMENT

SERIAL NUMBER

PART NUMBER

SUPERVISOR

DATE OF INSPECTION

INSPECTION CATEGORY

PLACE OF INSPECTION

SPARE PARTS

Recommended Spare Parts for one year of opperation.

Item	Qty.	Part number	Description
1	8	9FH-01407	DOUBLE DRIVE ROLLER ASSEMBLY
2	2	9FH-01408	DRIVE ROLLER GEAR ASSEMBLY
3	4	9FH-01315	UPPER SPACER (DR)
4	2	9FH-01287	IDLER GEAR ASSEMBLY
5	4	9FH-01384	DRIVE ROLLER SHAFT
6	2	9FH-01391	SPINNER IDLER SHAFT
7	2	9FH-01290	IDLER SHAFT SPACER
8	24	9FH-01216	DIE RETAINER WITH COTTER PIN
9	8	9FH-01055	DIE BLOCK RETAINING PINS
10	108	9FH-70622-1	BLUE DIAMOND TONG DIE
11	2	9FH-01023	SPINNER SLIDE BEARING
12	8	9FH-01050-1	DIE BLOCK / WRENCH SUPPORT BEARING
13	1	9FH-01149-29	TORQUE CONTROL CARTRIDGE
14	5	9FH-01149-60	CONTROL VALVE SHORT CLEVIS
15	10	9BN66004	3/16" X 3/4" CLEVIS PIN
16	10	9BN65016	1/16" X 1" COTTER PIN
17	1	9FH-01152-2	TORQUE GAUGE W/ MOUNTING RING
18	2	9FH-5LEV105000	STANDARD LEVER BOX
19	1	9FH-10023	GF1100 FRAME ASSEMBLY ORFS HOSE KIT
20	1	9FH-10123	GF1100 LWR WRENCH HOSE KIT ORFS
21	1	9FH-10223	UPPER WRENCH ORFS HOSE KIT
22	1	9FH-10323	SPINNER SUB ASSEMBLY HOSE KIT (ORFS)
23	1	9FH-10605	CONTROL VALVE HOSE KIT ORFS
24	1	9FH-10604	MISC HOSE KIT (ORFS)

DRAWINGS

9GF-2200

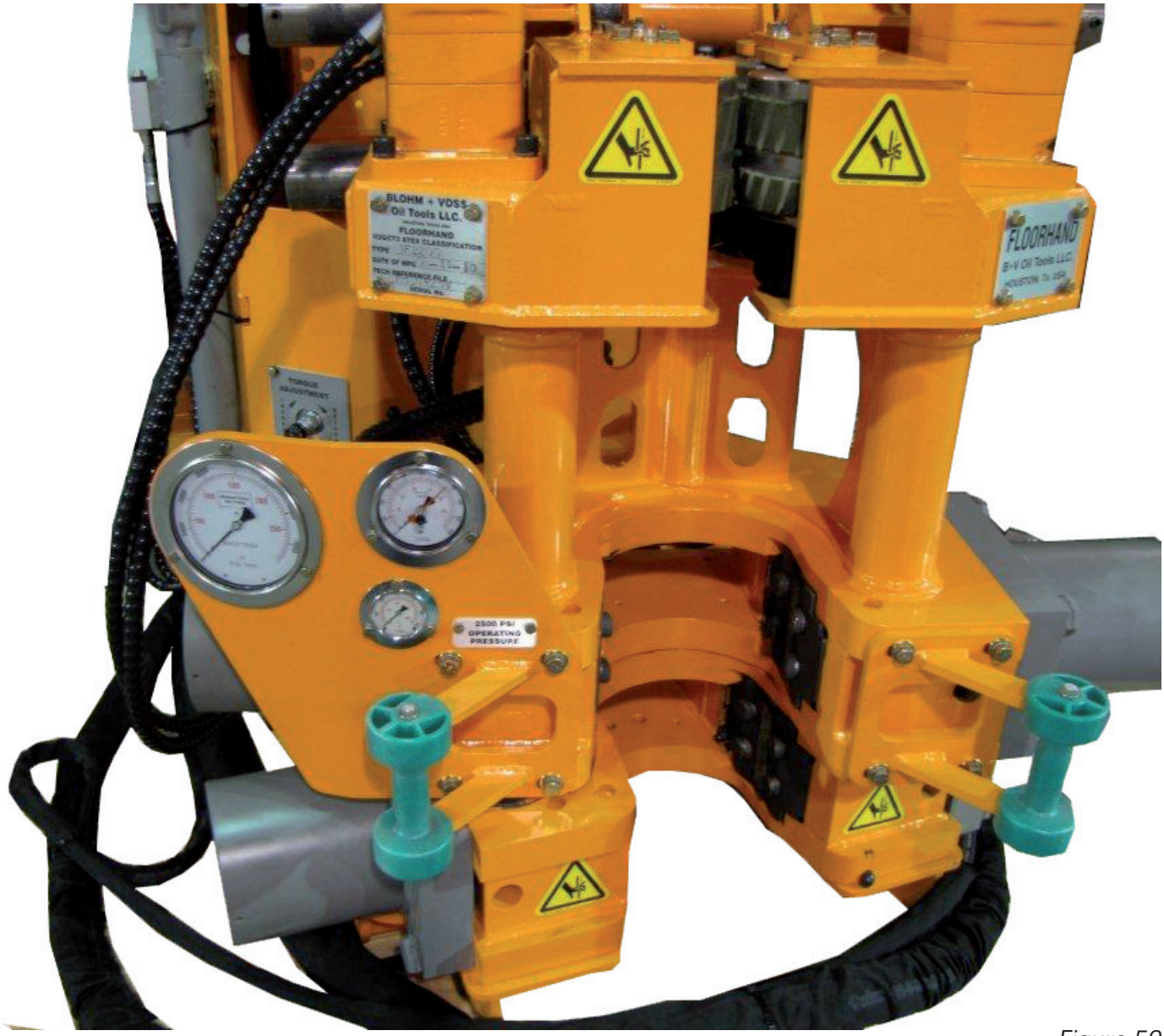

Figure 59

CANTILEVER FRAME ASSEMBLY 9FH-10001

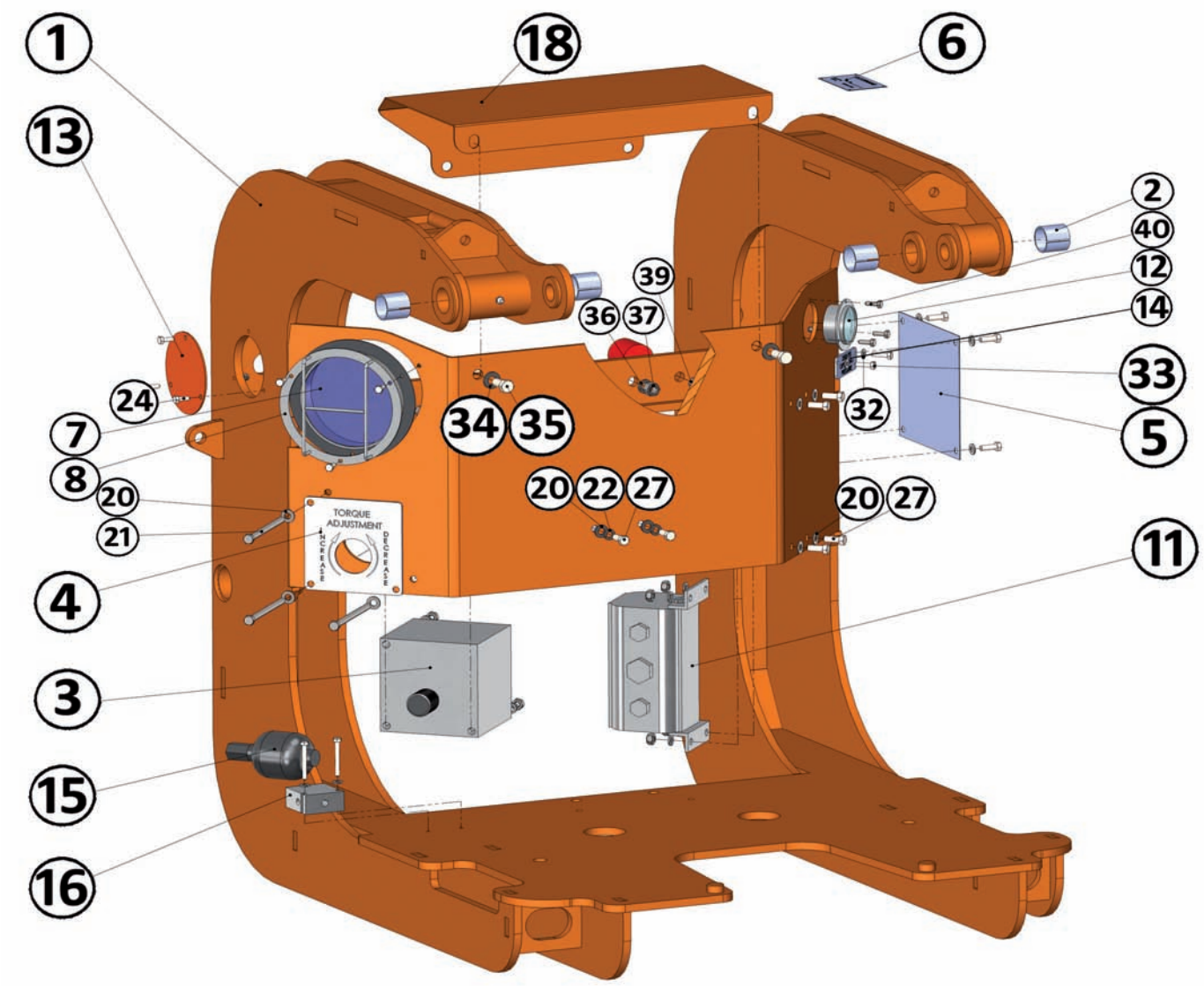

Figure 60

Item	Part number	Description	Qty.
1	9FH-01291	FRAME	1
2	9CJS2424	RBC FIBERGLIDE BEARING	4
3	9FH-01151	TORQUE CYLINDER MANIFOLD ASSEMBLY	1
4	9FH-01307-5	TORQUE MANIFOLD TAG	1
5	9FH-01018-11	SN TAG	1
6	9FH-01018-12	FLOORHAND TAG	1
7	9FH-01152-2	TORQUE GAUGE W/ MOUNTING RING	1

CANTILEVER FRAME ASSEMBLY 9FH-10001

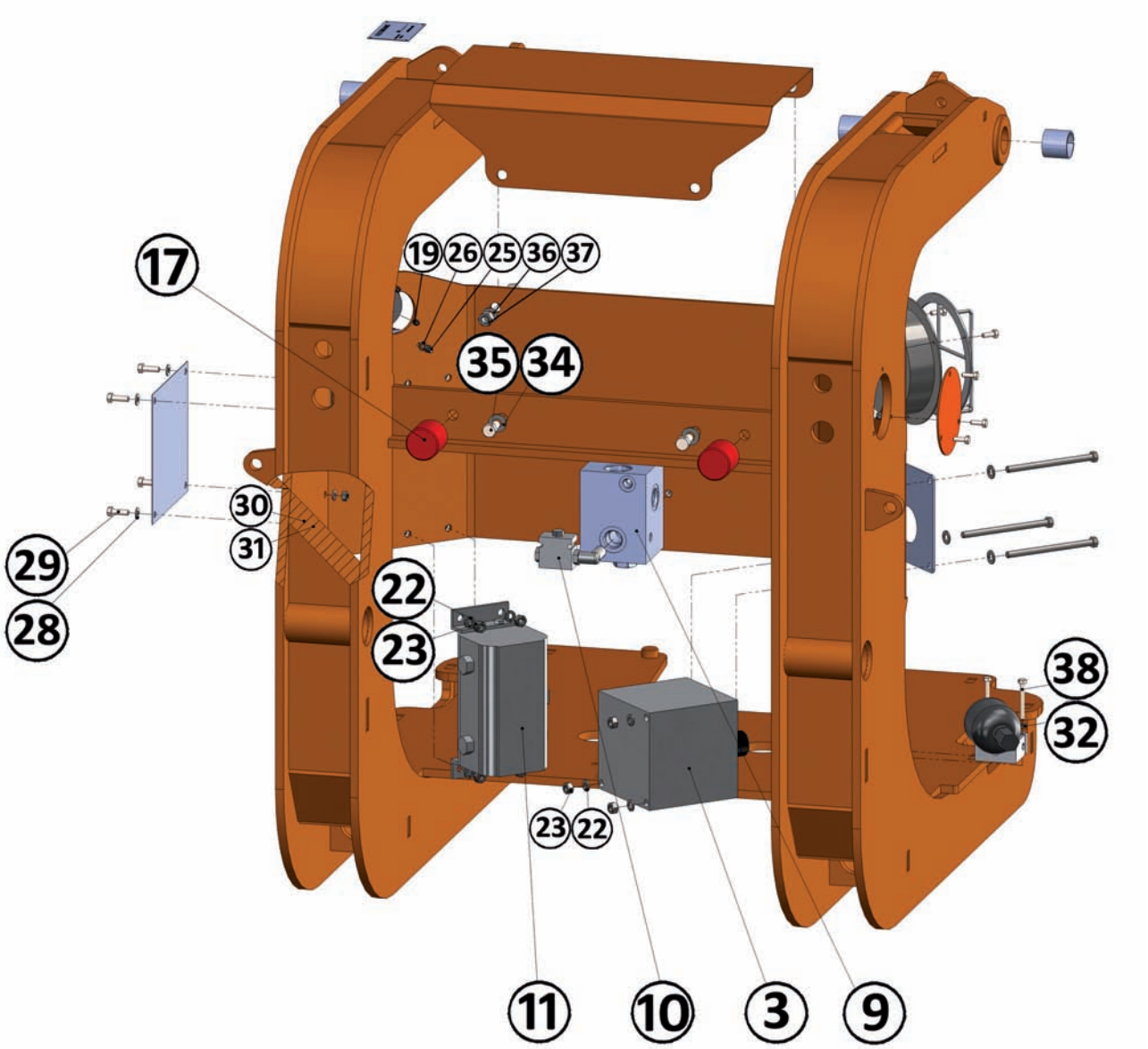

Figure 61

Item	Part number	Description	Qty.
8	9FH-01149-8	PRESSURE REDUCING VAVE ASSEMBLY	1
9	9FH-01149-9	PRV SHUTTLE VALVE	1
10	9FH-01152-1	LOWER WRENCH FLOW DIVIDER	1
11	9FH-01152-10	PRESSURE GAUGE	1
12	9FH-01424	LOW PRESSURE GAUGE COVER	1
13	9FH-01018-6	SYSTEM PRESSURE TAG	1
14	9FH-01152-11	ACCUMULATOR	1

CANTILEVER FRAME ASSEMBLY 9FH-10001

Item	Part number	Description	Qty.
15	9FH-01149-20	CARTRIDGE BODY	1
16	9FH-01344	FRAME BUMPER	2
17	9FH-01310	TOP COVER	1
18	9BN1170855	6-32 SS NYLON INSERT LOCK NUT	3
19	9BN1133815	3/8" SAE WASHER	9
20	9BN15127	3/8"-16 X 7 HHCS	3
21	9BN1133893	3/8" SPLIT LOCKWASHER	9
22	9BN1137264	3/8"-16 TYPE-C LOCK NUT	7
23	9BN1123203	1/4"-20 X 3/4 SHCS	6
24	9BN1137183	1/4"-20 NYLON LOCK NUT	10
25	9BN1133891	1/4" SPLIT LOCKWASHER	7
26	9BN0115105	3/8"-16 X 1 HHCS	6
27	9BN1133814	5/16" SAE FLAT WASHER	4
28	9BN0115055	5/16"-18 X HHCS	4
29	9BN133892	5/16" SPLIT LOCKWASHER	4
30	9BN1137262	5/16"-8 TYPE-C LOCKNUT	4
31	9BN1133813	1/4" SAE WASHER	4
32	9BN1123205	1/4"-20 X 1" SHCS	2
33	9BN1133817	1/2" SAE WASHER	4
34	9BN0115207	1/2"-13 X 1-1/4" HHCS	4
35	9BN1133895	1/2" SPLIT LOCKWASHER	4
36	9BN1136410	1/2"-13 HEX NUT	4
37	9BN0115012	1/4"-20 X 2-1/4" HHCS	2
38	9BN1137268	1/2"-13 TYPE C LOCKNUT	2
39	9BN0170671	6"-32 X 3/4" SS HHCS	3

SPINNER SUB ASSEMBLY 9FM-10302

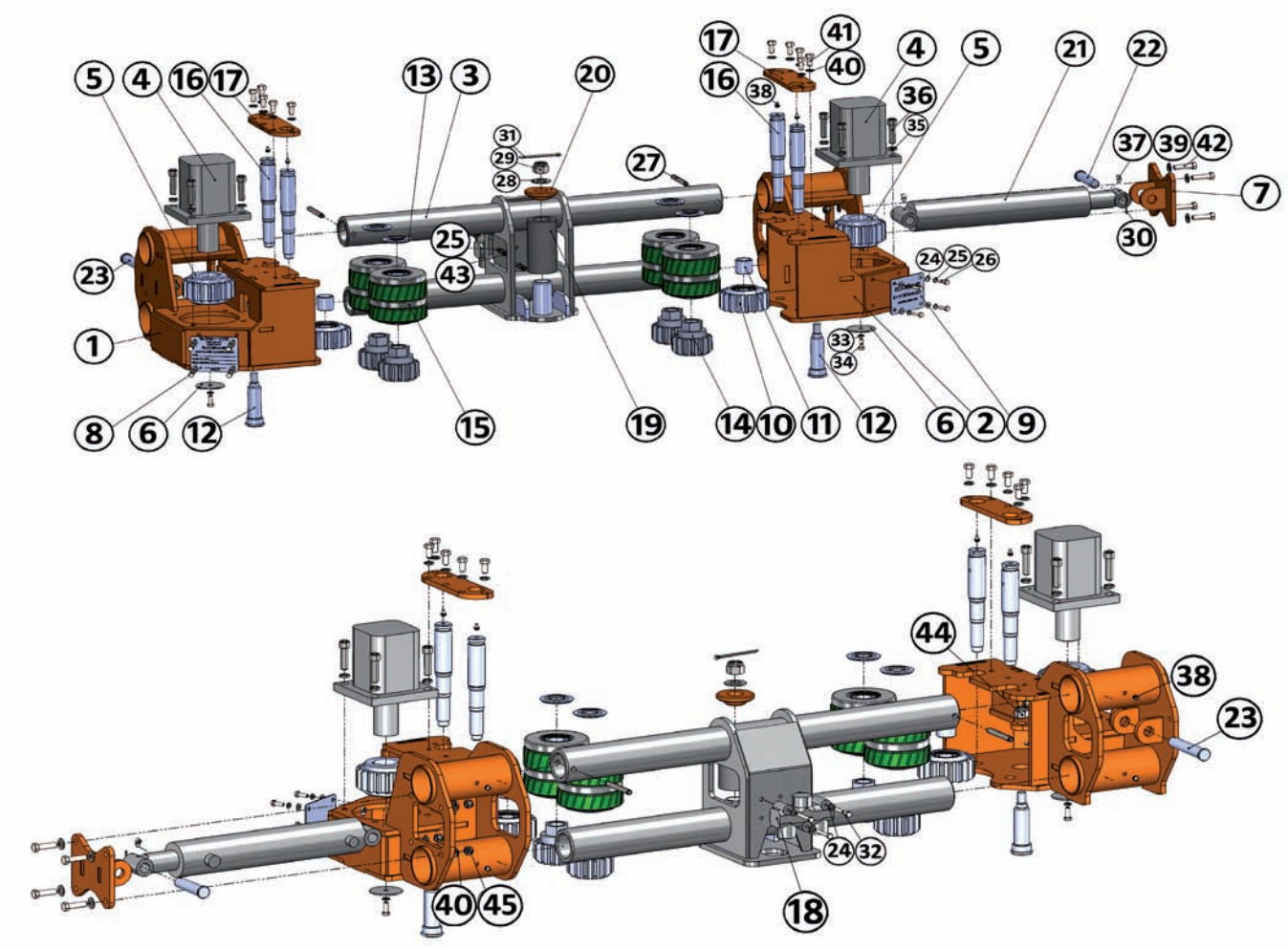

Figure 62

Item	Part number	Description	Qty.
1	9FH-01321	DR SPINNER RIGHT HALF	1
2	9FH-01320	DR SPINNER LEFT HALF	1
3	9FH-01323	SPINNER PEDESTAL CENTER SECTION	1
4	9FH-01142-1	HYDRAULIC SPINNER MOTOR	2
5	9FH-01015	DRIVE MOTOR GEAR	2
6	9FH-01399	DRIVE MOTOR GEAR CAP	2
7	9FH-01016	SPINNER CYLINDER ROD MOUNT	1
8	9FH-01018-9	ATEX TAG	1
9	9FH-01018-8	FLOORHAND TAG	1
10	9FH-01287	IDLER GEAR ASSEMBLY	2
11	9FH-01290	IDLER SHAFT SPACER	2
12	9FH-01391	SPINNER IDLER SHAFT	2

Item	Part number	Description	Qty.
13	9FH-01315	DRIVE ROLLER GEAR SPACER (UPPER)	4
14	9FH-01408	DRIVE ROLLER GEAR ASSEMBLY	4
15	9FH-01407	DRIVE ROLLER ASSEMBLY	4
16	9FH-01384	DRIVE ROLLER SHAFT	4
17	9FH-01017	DRIVE ROLLER SHAFT RETAINER	2
18	9FH-01149-46	SPINNER MOTOR FLOW DIVIDER	1
19	9FH-01045-5	URETHANE SPRING	1
20	9FH-01027	SPRING CAP	1
21	9FH-01074-1	SPIN CLAMP CYLINDER	1
22	9FH-01025	SHORT SPINNER CLEVIS PIN	1
23	9FH-01026	LONG SPINNER CLEVIS PIN	1
24	9BN1133814	5/16" SAE FLAT WASHER	11
25	9BN133892	5/16" SPLIT LOCKWASHER	11
26	9BN0115055	5/16"-18 X HHCS	8
27	9BN64363	1/2" X 4" SPRING ROLL PIN	2
28	9BN33822	1" SAE FLAT WASHER	1
29	9BN37192	1"-8 NYLON LOCK NUT	1
30	9BN65080	1/8" X 2" COTTER PIN	2
31	9BN65153	1/4" X 4" COTTER PIN	1
32	9BN0115062	5/16"-18 X 2-1/4" HHCS	3
33	9BN1133893	3/8" SPLIT LOCKWASHER	2
34	9BN0115105	3/8"-16 X 1 HHCS	2
35	9BN1133692	5/8" HI COLLAR LOCKWASHER	8
36	9BN1123512	5/8"-11 X 2-1/4" SHCS (DRILLED)	8
37	9BN60104	1/8" NPT 90 DEG ZERK	2
38	9BN60102	1/8" STRAIGHT GREASE ZERK	8
39	9BN1133817	1/2" SAE WASHER	4
40	9BN1133895	1/2" SPLIT LOCKWASHER	14
41	9BN0115205	1/2"-13 X 1" HHCS	10
42	9BN0115211	1/2"-13 X 2" HHCS	4
43	9BN1137262	5/16"-8 TYPE-C LOCKNUT	3
44	9BN1137190	3/4"-10 NYLON INSERTED LOCKNUT	2
45	9BN1137187	1/2"-13 NYLON LOCK NUT	4

DOUBLE DRIVE ROLLER ASSEMBLY 9FH-01407

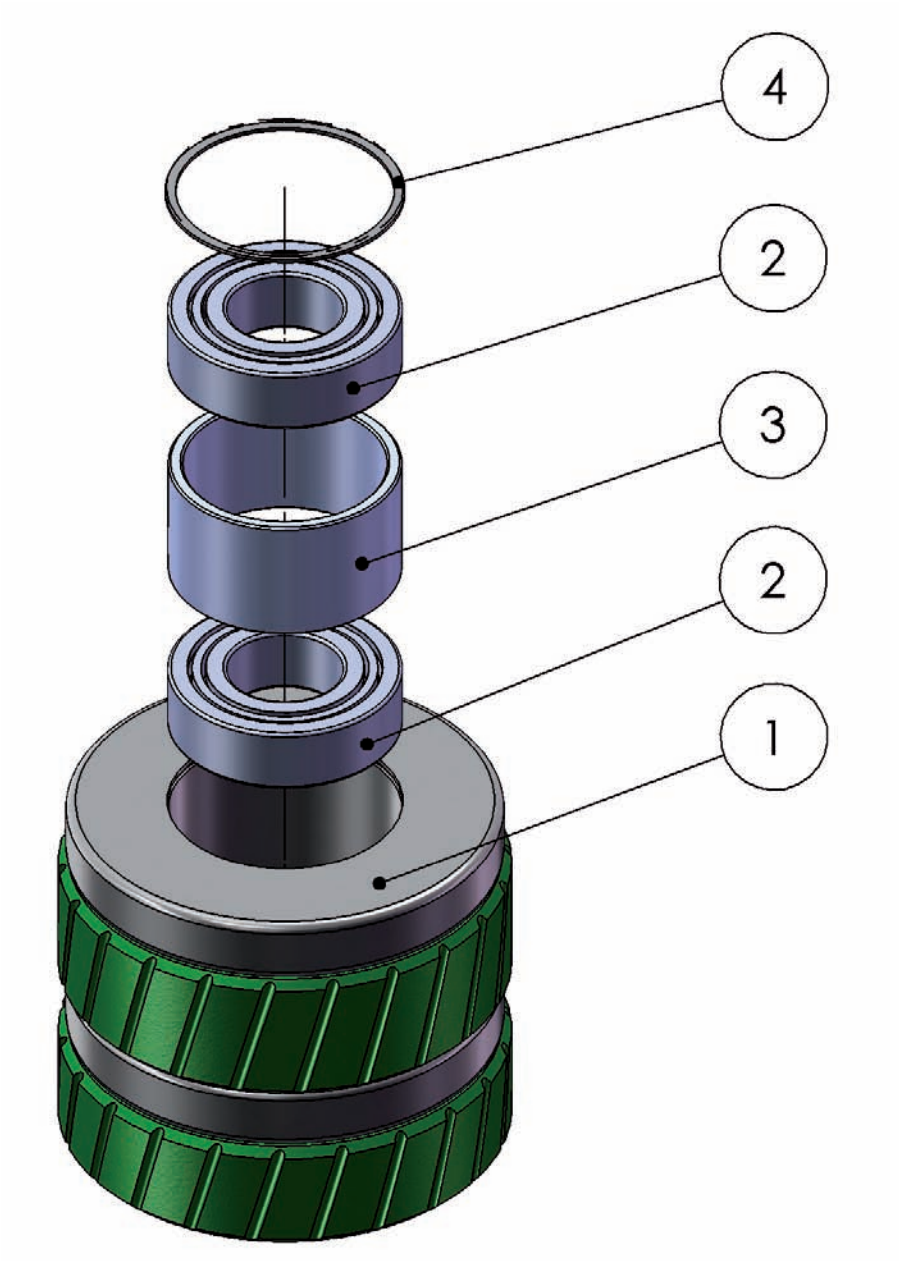

Figure 63

Item	Part number	Description	Qty.
1	9FH-01382	DOUBLE DRIVE ROLLER	1
2	9FH-22208	DRIVE ROLLER BEARING	2
3	9FH-01385	DRIVE ROLLER BEARING SPACER	1
4	9G2351-314	RETAINING RING	1

IDLER GEAR ASSEMBLY 9FH-01287

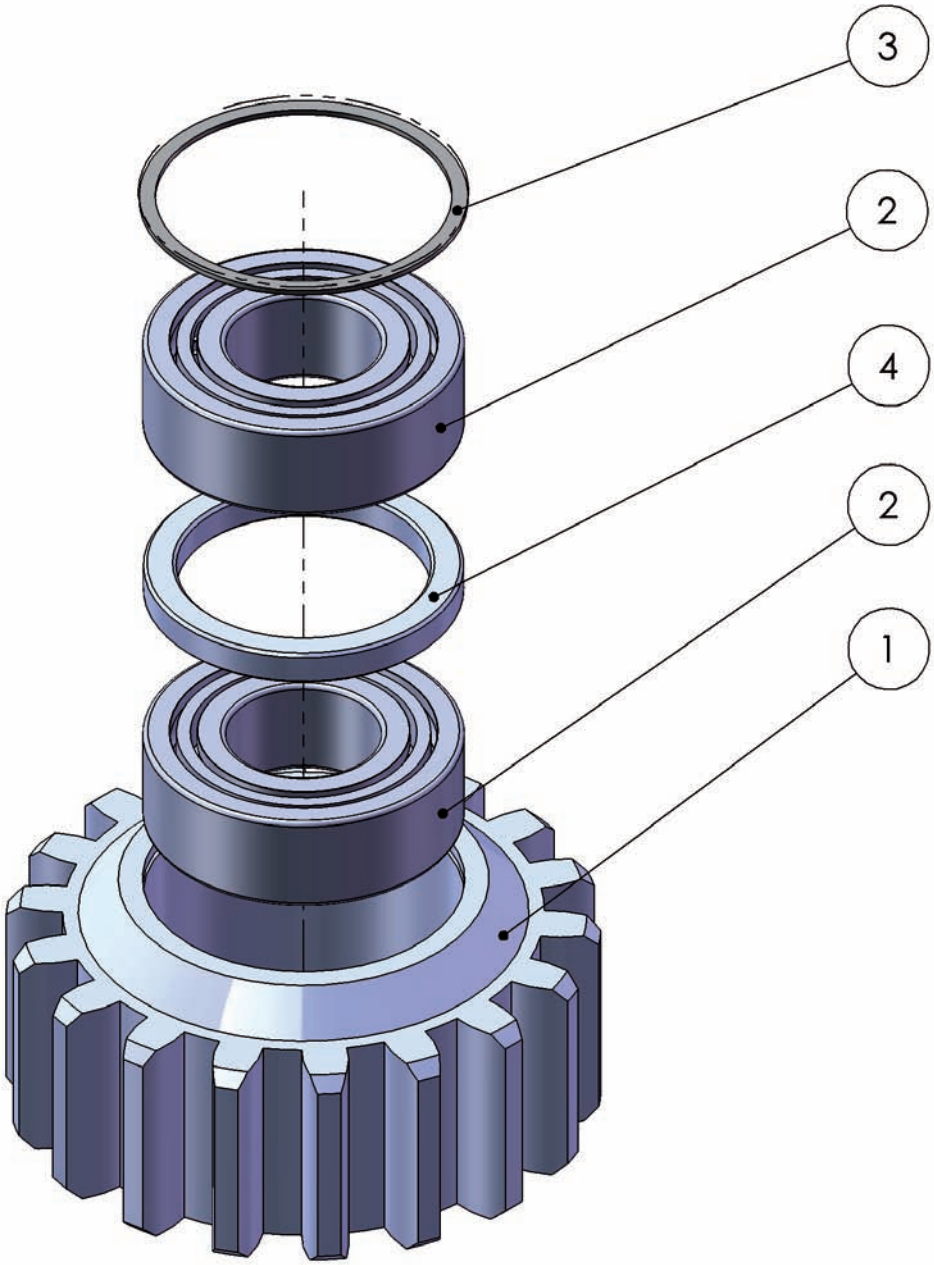

Figure 64

Item	Part number	Description	Qty.
1	9FH-01288	IDLER GEAR	1
2	9FH-22207	IDLER GEAR BEARING	2
3	9FH-WH283	IDLER GEAR RETAINING RING	1
4	9FH-01398	IDLER GEAR BEARING SPACER	1

DRIVE ROLLER GEAR ASSEMBLY 9FH-01408

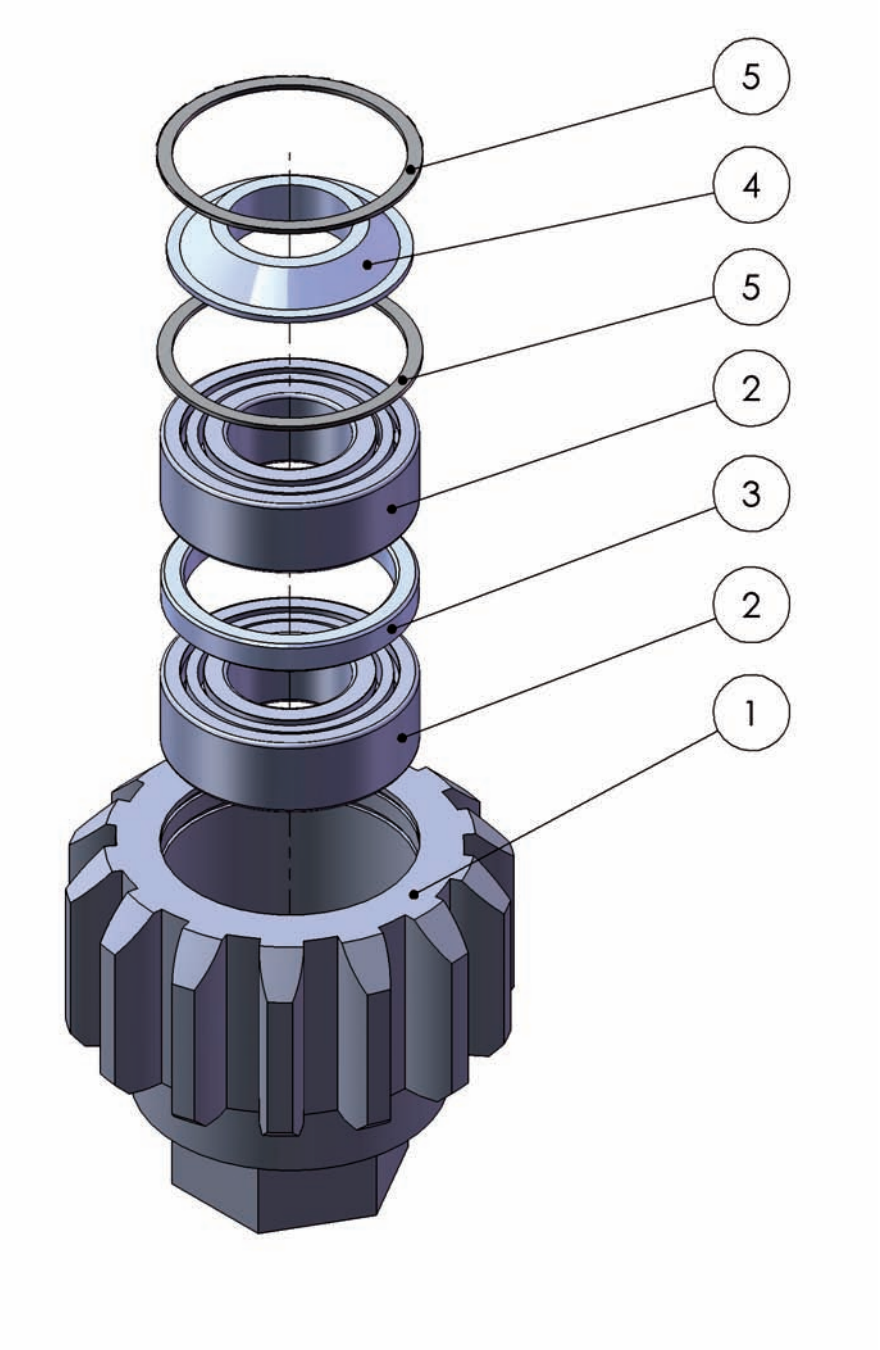

Figure 65

Item	Part number	Description	Qty.
1	9FH-01383	DOUBLE DRIVE ROLLER GEAR	1
2	9FH-22206	DOUBLE DRIVE ROLLER GEAR BEARING	2
3	9FH-01396	D/R GEAR BEARING SPACER	1
4	9FH-01314	DRIVE ROLLER GEAR SPACER (LOWER)	1
5	9FH-WH244	DRIVE ROLLER GEAR RETAINING RING	2

UPPER WRENCH SUB ASSEMBLY ORFS 9FH-10201

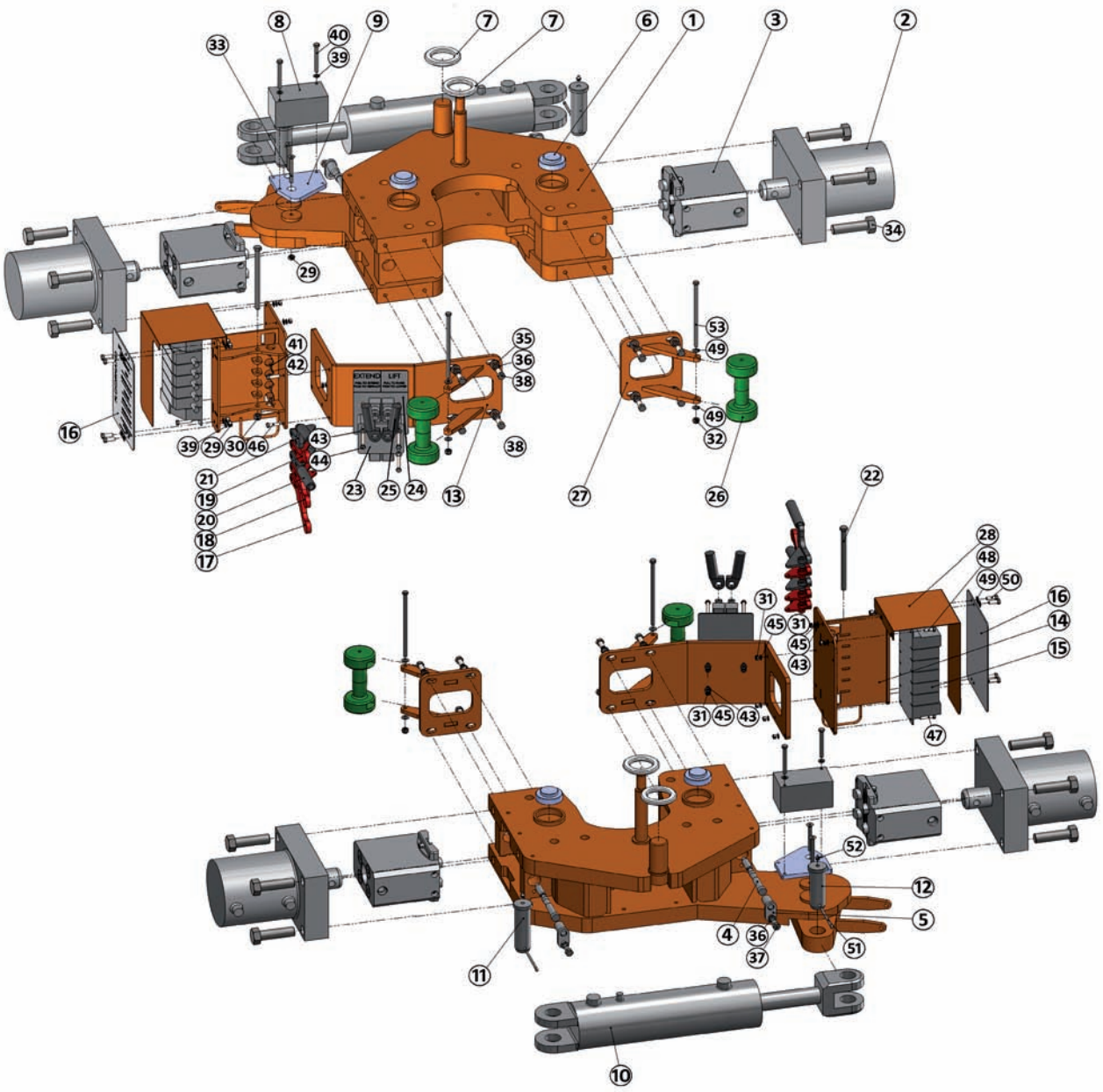

Figure 67

Item	Part number	Description	Qty.
1	9FH-01029	UPPER WRENCH WELDMENT	1
2	9FH-01074-2	CLAPM CYLINDER	2
3	9FH-01060	DIE BLOCK ASSEMBLY	2
4	9FH-01055	DIE BLOCK RETAINING PINS	2
5	9FH-01056	DIE BLOCK RETAINER	2

UPPER WRENCH SUB ASSEMBLY ORFS 9FH-10201

Item	Part number	Description	Qty.
6	9FH-01023	SPINNER SLIDE BEARING	2
7	9FH-01022	POST WASHER	2
8	9FH-01150	UPPER CLAMP MANIFOLD ASSEMBLY	1
9	9FH-01058	UPPER MANIFOLD BRACKET	1
10	9FH-01074-5	TORQUE CYLINDER FLOORHAND	1
11	9FH-01051	LONG TORQUE CYLINDER PIN	1
12	9FH-01052	SHORT TORQUE CYLINDER PIN	1
13	9FH-01378	VALVE MOUNT	1
14	9FH-01062	CONTROL VALVE MOUNTING BRACKET	1
15	9FH-01149-1	5 BANK CONTROL VALVE	1
16	9FH-01018-1	5 SECTION CONTROL VALVE TAG	1
17	9FH-01064	VALVE HANDLE, LOWER WRENCH (A)	1
18	9FH-01065	VALVE HANDLE, UPPER WRENCH (B)	1
19	9FH-01066	VALVE HANDLE, SPINNER CLAMP (C)	1
20	9FH-01067	VALVE HANDLE, TORQUE (D)	1
21	9FH-01068	VALVE HANDLE, SPINNER SPIN (E)	1
22	9FH-01071	VALVE HANDLE SHAFT	1
23	9FH-01149-21	MANIPULATOR VALVE (2 BANK)	1
24	9FH-01307-23	EXTEND, LIFT TAG	1
25	9FH-01069	VALVE HANDLE, MANIPULATOR (F)	2
26	9BV70751	SAFETY HANDLE	2
27	9FH-01096	HANDLE BRACKET WELDMENT	1
28	9FH-01101	CONTROL VALVE COVER	1
29	9BN1137264	3/8"-16 TYPE-C LOCK NUT	6
30	9BN1137187	1/2"-13 NYLON LOCK NUT	1
31	9BN1137262	5/16"-8 TYPE-C LOCKNUT	9
32	9BN1137185	3/8"-16 NYLON LOCK NUT	2
33	9BN24295	3/8"-16 X 3-1/2" 9FHSCS	2
34	9BN18519	1-1/8"-12 x 4" HHCS DRILLED (CYL)	8

UPPER WRENCH SUB ASSEMBLY ORFS 9FH-10201

Item	Part number	Description	Qty.
35	9BN1133817	1/2" SAE WASHER	8
36	9BN1133895	1/2" SPLIT LOCKWASHER	10
37	9BN0115205	1/2"-13 X 1" HHCS	2
38	9BN0115207	1/2"-13 X 1-1/4" HHCS	8
39	9BN1133893	3/8" SPLIT LOCKWASHER	6
40	9BN24295	3/8"-16 X 3-1/2" 9FHSCS	2
41	9BN66004	3/16" X 3/4" CLEVIS PIN	5
42	9BN65016	1/16" X 1" COTTER PIN	5
43	9BN1133814	5/16" SAE FLAT WASHER	8
44	9BN0115065	5/16"-18 X 3" HHCS	3
45	9BN133892	5/16" SPLIT LOCKWASHER	9
46	9BN0115057	5/16"-18 X 1-1/4" HHCS	2
47	9BN0115059	5/16"-18 X 1-1/2" HHCS	2
48	9BN0115055	5/16"-18 X 1" HHCS	2
49	9BN1133815	3/8" SAE WASHER	8
50	9BN0115105	3/8"-16 X 1 HHCS	4
51	9BN65153	1/4" X 4" COTTER PIN	2
52	9BN60102	1/8" STRAIGHT GREASE ZERK	2
53	9BN11130	3/8"-16 x 8-1/2" HHCS	2

LOWER WRENCH SUB ASSEMBLY ORFS 9FH-10101

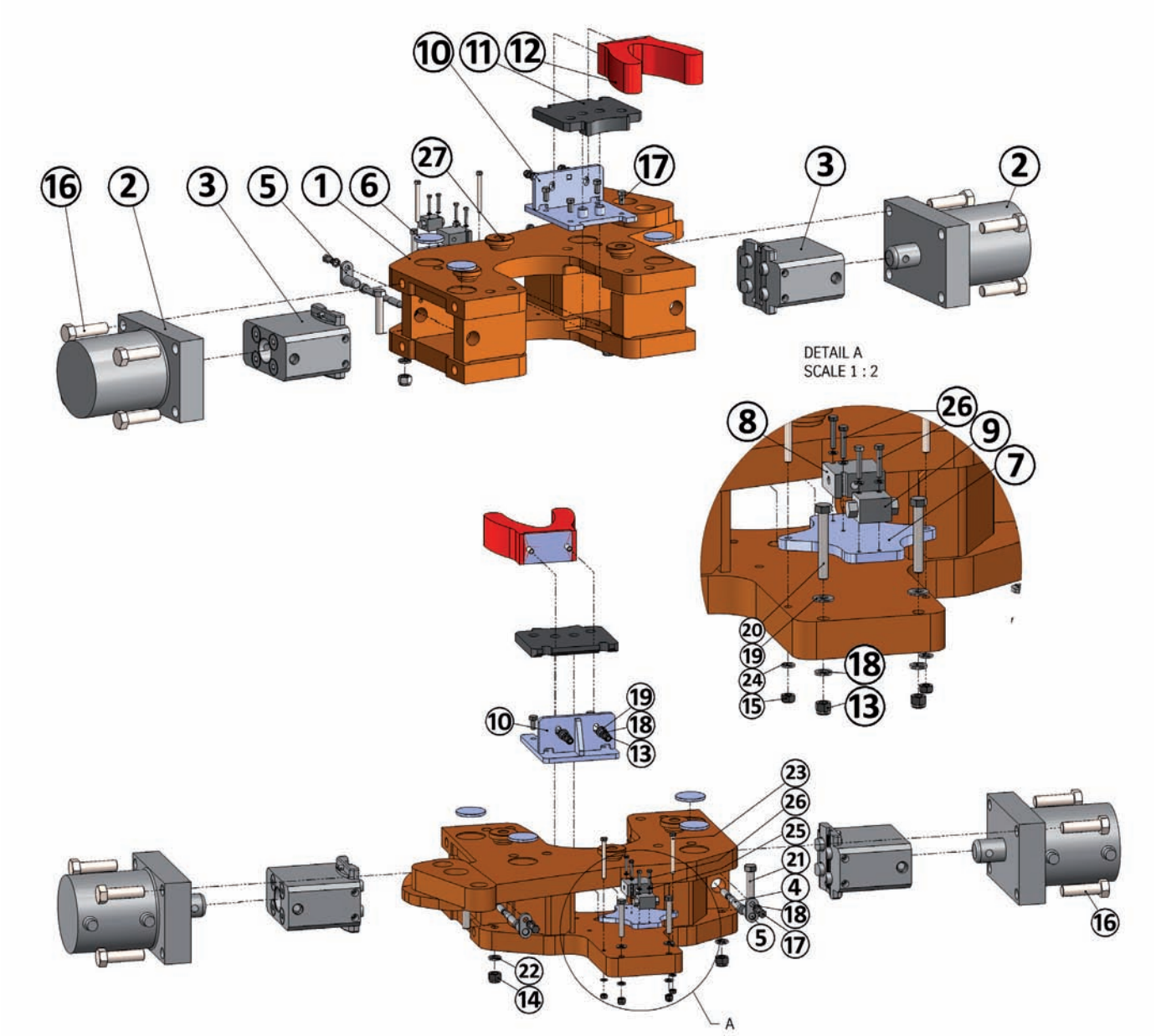

Figure 66

Item	Part number	Description	Qty.
1	9FH-01061	LOWER WRENCH WELDMENT	1
2	9FH-01074-2	CLAPM CYLINDER	2
3	9FH-01060	DIE BLOCK ASSEMBLY	2
4	9FH-01055	DIE BLOCK RETAINING PINS	2
5	9FH-01056	DIE BLOCK RETAINER	2
6	9FH-01050-1	DIE BLOCK / WRENCH SUPPORT BEARING	4

LOWER WRENCH SUB ASSEMBLY ORFS 9FH-10101

Item	Part number	Description	Qty.
7	9FH-01102	MOUNTING BRACKET	1
8	9FH-01149-11	LOWER DIVERTER VALVE ASSEMBLY	1
9	9FH-01149-10	TORQUE MANIFOLD SHUTTLE VALVE	1
10	9FH-01329	PIPE BUMPER BASE	1
11	9FH-01330	BUMPER	1
12	9FH-01331	PIPE CLAW	1
13	9BN1137187	1/2"-13 NYLON LOCK NUT	4
14	9BN1137190	3/4"-10 NYLON INSERTED LOCKNUT	2
15	9BN1137264	3/8"-16 TYPE-C LOCK NUT	2
16	9BN18519	1-1/8"-12 x 4" HHCS DRILLED (CYL)	8
17	9BN0115205	1/2"-13 X 1" HHCS	6
18	9BN1133895	1/2" SPLIT LOCKWASHER	6
19	9BN1133817	1/2" SAE WASHER	4
20	9BN0115217	1/2"-13 X 3-1/2" HHCS	2
21	9BN0115369	3/4"-10 X 4" HHCS	2
22	9BN1133898	3/4" SPLIT LOCKWASHER	2
23	9BN0115119	3/8"-16 X 4" HHCS	2
24	9BN1133893	3/8" SPLIT LOCKWASHER	2
25	9BN1133891	1/4" SPLIT LOCKWASHER	4
26	9BN0115009	1/4"-20 X 1-1/2" HHCS	4

DIE BLOCK ASSEMBLY 9FH-01060

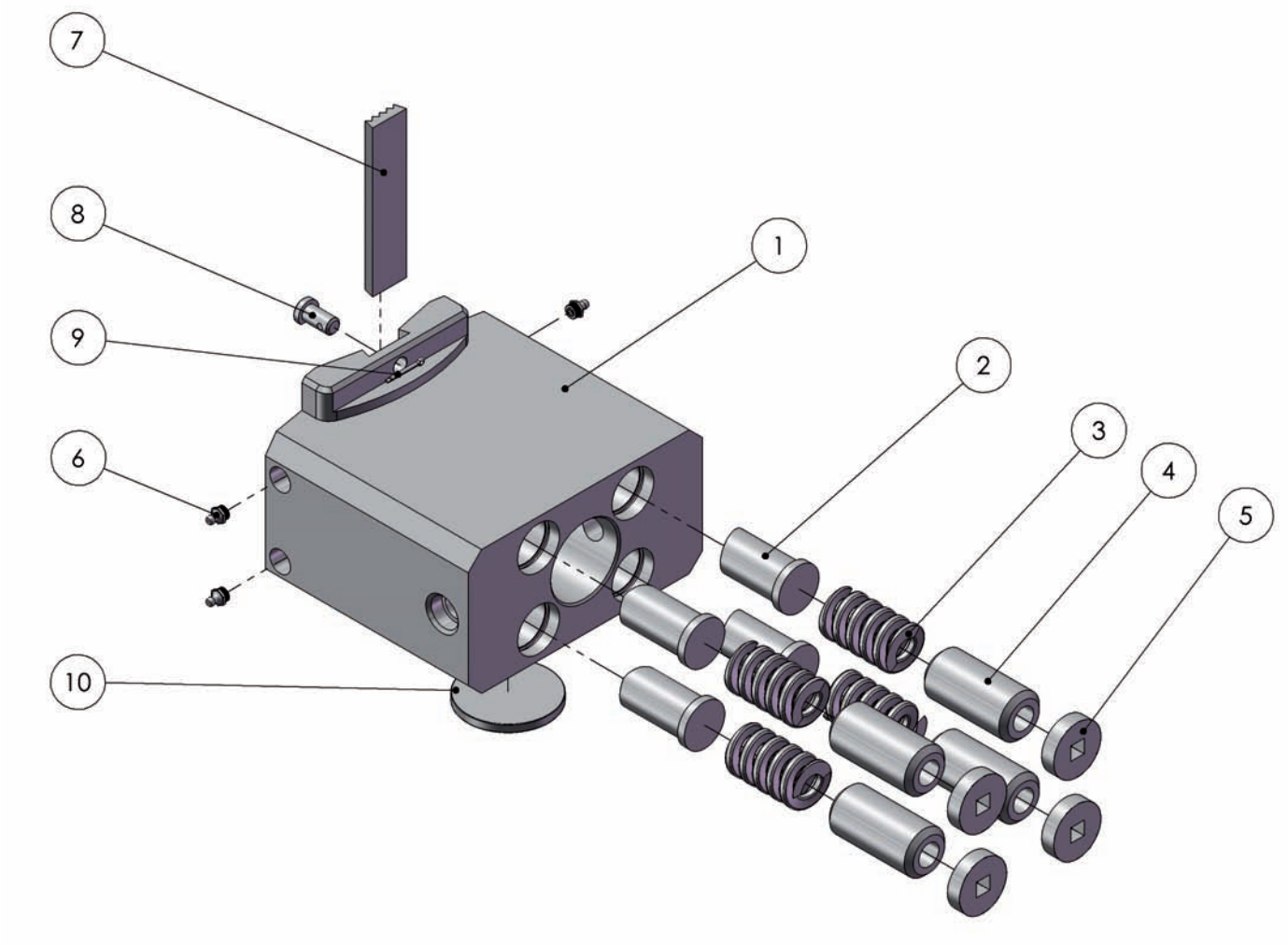

Figure 68

Item	Part number	Description	Qty.
1	9FH-01059	DIE BLOCK	1
2	9FH-01053	CENTERING BUTTON	4
3	9FH-01045-2	DIE BLOCK SPRING	4
4	9FH-01057	CENTERING BUTTON SPRING SPACER	4
5	9FH-01054	SPRING RETAINER PLUG	4
6	9BN60105	1/4"-28 GREASE ZERK STRAIGHT	4
7	9FH-70622-1	BLUE DIAMOND TONG DIE	1
8	9FH-01216-1	DIE RETAINER PIN	1
9	9BN65076	1/8" X 1" COTTER PIN	1
10	9FH-01050-1	DIE BLOCK / WRENCH SUPPORT BEARING	1

2-7/8 DIE BLOCK ADAPTER ASSEMBLY 9FH-01445

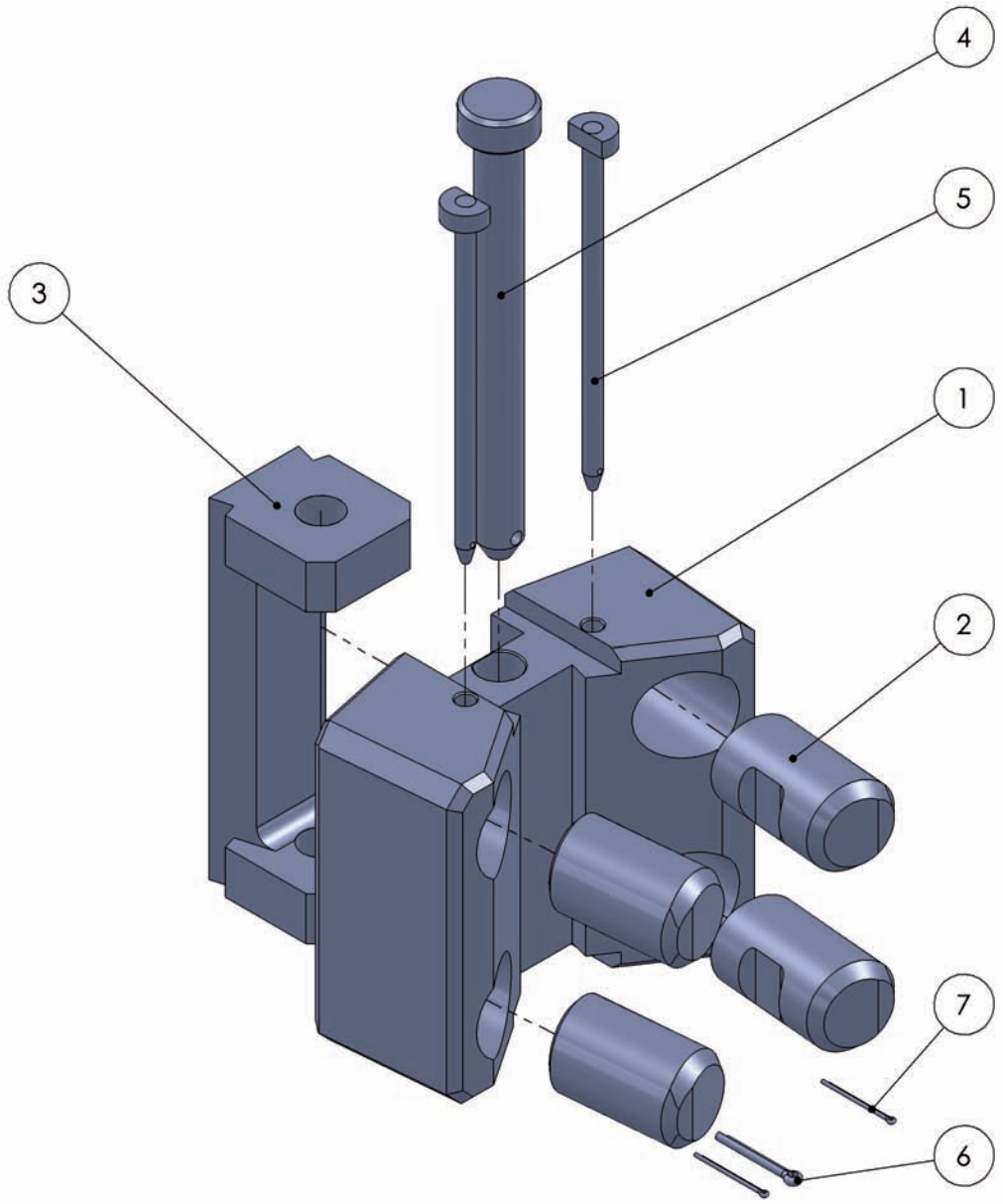

Figure 69

Item	Part number	Description	Qty.
1	9FH-01446	2-7/8" ADAPTER	1
2	9FH-01448	CENTERING BUTTON	4
3	9FH-01447	ADAPTER RETAINER	1
4	9FH-01449	2-7/8" ADAPTER PIN	1
5	9FH-01445-1	2-7/8" BUTTON RETAINING PIN	2
6	9BN65076	1/8" X 1" COTTER PIN	1
7	9BN65016	1/16" X 1" COTTER PIN	2

FLOORHAND COMPLETE HYDRAULIC SCHEMATIC

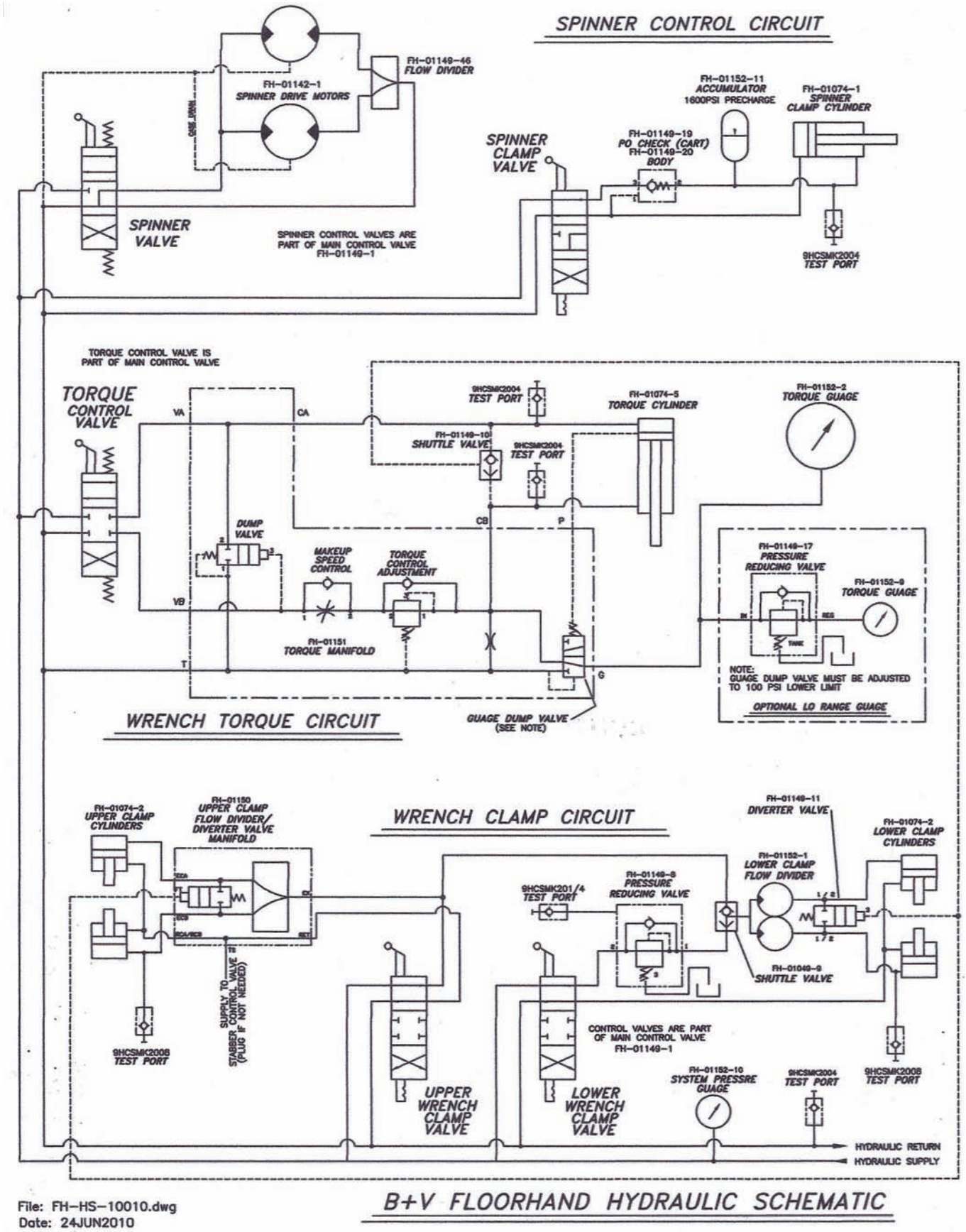

Figure 70

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World Wide Representatives for Service, Stocking and Repair

Head Office	Agent & Distributor	Agent & Distributor with Service Station	Service Station
Germany / Hamburg	Dubai Hungary Algeria India Italy	U.S.A. Egypt Singapore	Scotland / U.K. Norway Brazil Azerbaijan

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