

# SSW40

## Spinning Wrench



REFERENCE SSW40	REFERENCE DESCRIPTION Spinning Wrenches
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# NATIONAL OILWELL VARCO



## User's Manual

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<b>50000835-MAN-001</b>	<b>A</b>



**NATIONAL OILWELL VARCO**

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-	First Issue

## Table of Contents

<b>General Information</b> . . . . .	5
<b>Conventions</b> . . . . .	5
Notes, Cautions, and Warnings . . . . .	5
Illustrations . . . . .	5
<b>Safety Requirements</b> . . . . .	5
Personnel Training . . . . .	6
Recommended Tools . . . . .	6
General System Safety Practices . . . . .	6
Replacing Components . . . . .	6
Routine Maintenance . . . . .	6
Proper Use of Equipment . . . . .	6
Identification numbers . . . . .	6
Warning plates and labels . . . . .	7
CE marking . . . . .	7
<b>General specifications</b> . . . . .	9
Description . . . . .	9
Theory of operation . . . . .	9
Specifications . . . . .	9
<b>Lubrication and maintenance</b> . . . . .	11
Recommended General Purpose EP grease . . . . .	11
Procedure maintenance & lubrication (in use) . . . . .	12
Lubrication . . . . .	12
Inspection . . . . .	12
Lubricator . . . . .	13
Filter . . . . .	14
Maintenance DO's and DONT's . . . . .	14
Drive Roller Replacement . . . . .	15
Procedure . . . . .	16
Lower drive roller bearing replacement . . . . .	16
<b>Installation and commissioning</b> . . . . .	17
Installation procedure . . . . .	17
Connecting air line. . . . .	17
<b>Operation</b> . . . . .	19
Normal usage . . . . .	19
Tips on operation . . . . .	21
Handling the drill stem; tips and tricks . . . . .	21
<b>Assembly and dis-assembly</b> . . . . .	23
Gear train . . . . .	23
Control Valves . . . . .	24
Adjustment Screw . . . . .	25
Removal . . . . .	25
Installation . . . . .	26
Motor Removal . . . . .	27
Motor maintenance . . . . .	30

## Table of Contents

Clearance .....	30
Torque specifications .....	30
Bellows assembly & maintenance .....	32
<b>Trouble shooting</b> .....	33
Initial checks, solves most problems .....	33
Solutions .....	34
<b>Appendixes</b> .....	35
Storage, transport & decommissioning. ....	35
Storage .....	35
Returning to service .....	35
Transport .....	35
Scrapping .....	35
Torque values (US) for bolts .....	37
Torque values (metric) for bolts .....	38
ATEX information .....	39
<b>Drawings &amp; Parts</b> .....	41
Parts lists .....	42
Hanger assembly .....	42
Hanger assembly .....	43
Gear train .....	44
Controls and left body .....	46
Controls and left body .....	47
Filter, regulator, lubricator assembly .....	48
Bellow assembly .....	49
Manifold assembly .....	50
Pneumatic system assembly .....	52
Air motor assembly .....	54
Control valves .....	56
Lift cylinder .....	57


## General Information


This manual contains installation, operation, maintenance and parts information. Information in this manual should enable qualified personnel to install, operate and troubleshoot this system. Every effort has been made to ensure the accuracy of the information contained herein. National Oilwell Varco (NOV) will not be held liable for errors in this material, or for consequences arising from misuse of this material.


## Conventions

### Notes, Cautions, and Warnings

Notes, cautions, and warnings provide readers with additional information and advise the reader to take specific action to protect personnel from potential injury or lethal conditions. They may also inform the reader of actions necessary to prevent equipment damage. Please pay close attention to these advisories

**Note:**  The note symbol indicates that additional information is provided about the current topics.

**Caution:**  *The caution symbol indicates that potential damage to equipment or injury to personnel exists. Follow instructions explicitly. Extreme care should be taken when performing operations or procedures preceded by this caution symbol.*

**Warning:**  **The warning symbol 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.**


## Illustrations

Illustrations (figures) provide a graphical representation of equipment components or screen snapshots for use in identifying parts or establishing nomenclature, and may or may not be drawn to scale.

For component information specific to your application, see the technical drawings included with your NOV documentation.

## Safety Requirements

NOV equipment is installed and operated in a controlled drilling rig environment involving hazardous situations. Proper maintenance is important for safe and reliable operation. Procedures outlined in NOV manuals are the recommended methods of performing operations and maintenance.

 *Caution: To avoid injury to personnel or equipment damage, carefully observe requirements outlined in this section.*

## Personnel Training

All personnel performing installation, operations, repair, or maintenance procedures on the equipment, or those in the vicinity of the equipment, should be trained on rig safety, tool operation, and maintenance to ensure their safety.



*Caution: Personnel should wear protective gear during installation, maintenance, and certain operations.*

## Recommended Tools

Service operations may require the use of tools designed specifically for the purpose described. NOV recommends that only those tools specified be used when stated. Ensure that personnel and equipment safety are not jeopardized when following service procedures or using tools not specifically recommended by NOV.

## General System Safety Practices

The equipment discussed in this manual may require or contain one or more utilities, such as electrical, hydraulic, pneumatic, or cooling water.



*Caution: Read and follow the guidelines below before installing equipment or performing maintenance to avoid endangering exposed persons or damaging equipment.*

- Isolate energy sources before beginning work.
- Avoid performing maintenance or repairs while the equipment is in operation.
- Wear proper protective equipment during equipment installation, maintenance, or repair.

## Replacing Components

- Verify that all components (such as cables, hoses, etc.) are tagged and labeled during assembly and disassembly of equipment to ensure correct installment.
- Replace failed or damaged components with genuine NOV parts. Failure to do so could result in equipment damage or injury to personnel.

## Routine Maintenance

Equipment must be maintained on a routine basis. See the service manual for maintenance recommendations.



*Caution: Failure to conduct routine maintenance could result in equipment damage or injury to personnel.*

## Proper Use of Equipment

NOV equipment is designed for specific functions and applications, and should be used only for its intended purpose.

## Identification numbers

You will find the serial number of the tool stamped into the body.

## Warning plates and labels



**WARNING:** Warning plates and labels must be present on the Spinning Wrench. Do not remove them. When a label or warning plate has disappeared, it must be replaced.

## CE marking

The SSW40 complies with the Machinery Directive 98/37/EC and Directive 94/9/EC “Equipment and protective systems in potentially explosive atmospheres”.

The marking is as follows:



**WARNING:** Care should be taken to avoid creating possible ignition sources, like sparks, due to improper use of the tool in combination with other equipment.





## General specifications

### Description

The Varco SSW-40 spinning wrench is a pneumatically-powered tool capable of spinning drill pipe and collars from 3 1/2" to 9 1/2" (89 - 241 mm) OD.

### Theory of operation

A typical spinning procedure is as follows:

First, position the wrench vertically with the vertical positioning control to a point about one foot above the tool joint, or just above the pipe upset.

The spinning wrench is now swung onto the pipe and the clamp control pushed to clamp the drive rollers against the pipe. Next, the throttle control is pushed to spin in or pulled to spin out.

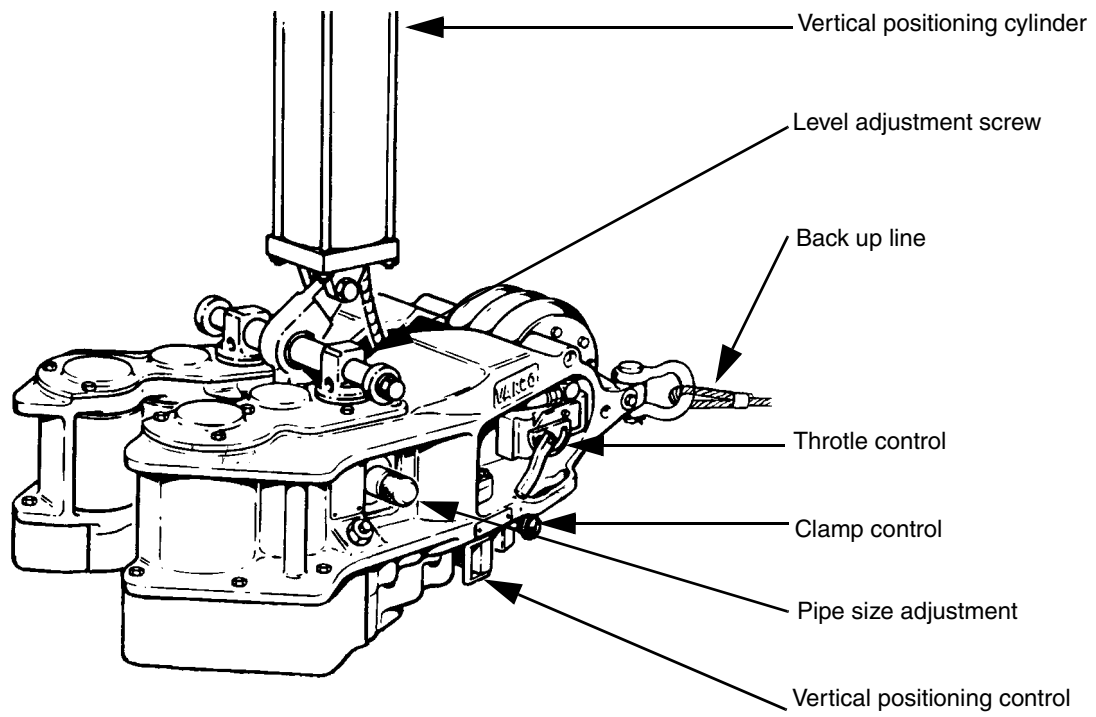
### Specifications

#### Part numbers

	10246 (less rollers)
	12035 (3 1/2" rollers)
Partnumbers Roller assemblies	12045 (4 1/2" rollers)
	12050 (5" rollers)
	12055 (5 1/2" rollers)

#### Specifications

Range	3 1/2" to 9 1/2" (89-241 mm) O.D.
Type	Drill pipe and collars
Air pressure	90-125 psi. (650-860 KPa)
Air consumption	250cfm (118 dm <sup>3</sup> / s)
RPM (5" O.D. pipe)	0-120
Stall torque (5" O.D. pipe)	1,100 ft-lbs (1,493 Nm)
Weight:	780 lbs. (353 kg)
Height	17.2" (437 mm)
Length	55" (1397 mm)
Width	22.2" (564 mm)



SSW40 Fig 1-1

## Lubrication and maintenance

### Recommended General Purpose EP grease

Lube code description	Above -20° C	Below -20° C
Castrol	MP grease	n/a
Chevron	Avi-Motive	Avi-Motive W
Exxon	Lidok EP2	Lidok EP1
Gulf	Gulfcrown EP2	Gulfcrown EP1
Mobil	Mobilux EP2	Mobilux EP1
Shell	Alvania EP2	Alvania EP1
Texaco	Multifak EP2	Multifak EP1
Union	Unoba EP2	Unoba EP1



**WARNING:** Make sure that all pneumatic supply is isolated before ANY work is carried out to the Spinning Wrench. Shut off the Power Unit / Close the valves.



**WARNING:** Do not use casing and tubing lubricant for lubricating the SSW40. Thread compound (pipe dope) must be applied to the tooljoint every time it is made up.

## Procedure maintenance & lubrication (in use)

### Lubrication

Item	Description	Lube points	Lubricant	Frequency
(See fig.3.4)				
1	Lubricator	1	SAE 10 oil	every trip
2	Air line	1	SAE 10 oil	every rig-up
3	Gear case	2	Drain and refill with SAE 90 oil*	3 months
4	Drive roller bearings	8	Multipurpose grease	every trip
5	Adjustment screw	2	Multipurpose grease	every trip
6	Air hose swivel	1	Multipurpose grease	every trip
7	Adjustment handle	1	Multipurpose grease	every trip

\*Below 32° F / 0° C, use SAE 10 oil

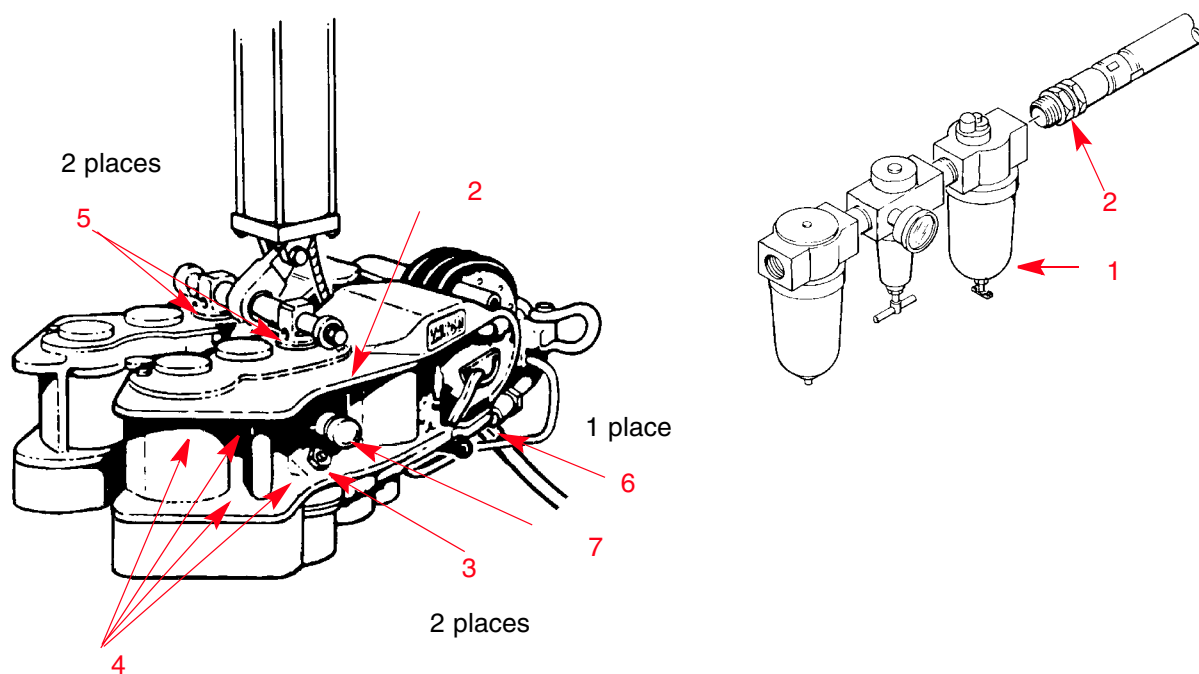


Figure 3.4

### Inspection

Item	Description	Action	Frequency
1	Drive rollers	Check adjustment	Monthly
2	Drive rollers	Check for wear. With the tool clamped on the pipe, see that there is no contact between the bodies and the pipe.	Daily
3	Quick exhaust valve	Clean muffler	When required

## Lubricator

### Procedure

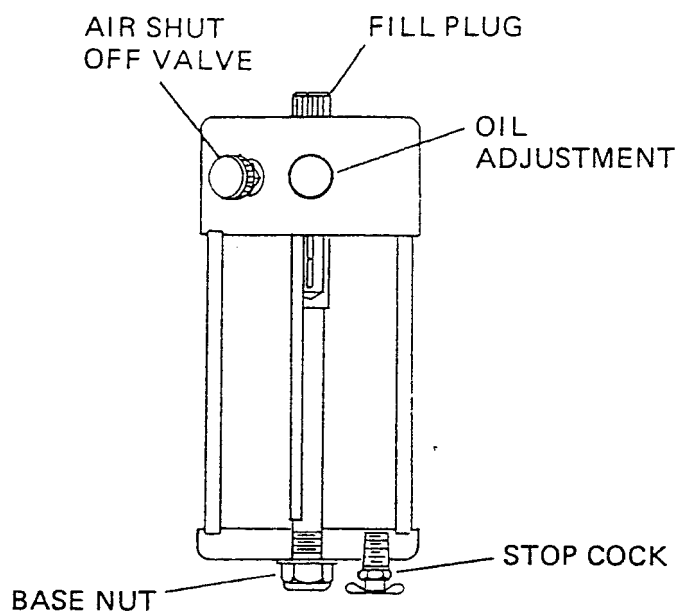
- Fill lubricator with SAE 10 oil

Reservoir can be filled with-out turning of the inlet supply pressure as follows:

- Close air shut-off valve by turning clock wise
- Remove self venting fill plug
- Fill to bottom of sight tube with lubricating oil (appr. 80 to 150 SSU at 10°F e.g. SAE 5 or 10)
- Drip rate is factory set and must not be changed
- Replace fill plug hand tight and fully open air valve
- **If replacing filter, set drip rate according to instructions given with unit.**



*CAUTION: Avoid exposing plastic bottles to any chemicals that would deteriorate plastic, such as solvents, thinners and carbon tetrachloride.*



## Filter

### Procedure

- ❑ Shut off power supply and open cock valve to vent pressure
- ❑ Remove hex nut, base and bowl.
- ❑ Bowl can be cleaned with mild soap and water or kerosene
- ❑ Do not use solvents, thinner or carbon tetrachloride.
- ❑ Unscrew baffle nut and baffle plate and remove element and element retainer.
- ❑ Install new element and element retainer.
- ❑ Screw baffle plate up hand tight and secure with baffle nut, wrench tight.

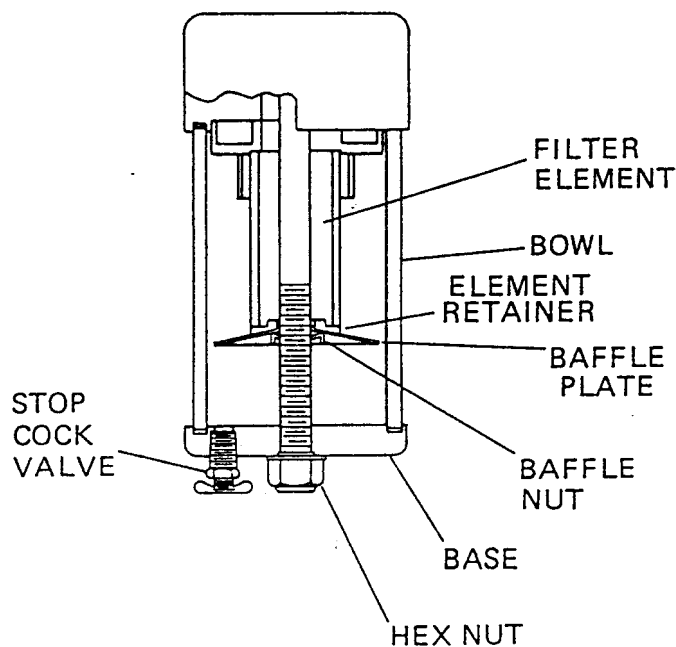


FIGURE 4-4

## Maintenance DO's and DONT's

DO's	DONT's
Lubricate as indicated acc. to procedures	Never paint over moving parts or grease fittings.
Keep adequate air pressure on system	Avoid contamination of air lines
Keep roller in adjustment acc. to procedure	Avoid dry over-oiled lubricator
	Never restrict air flow
	Never use equipment that is not operating properly

### Drive Roller Replacement

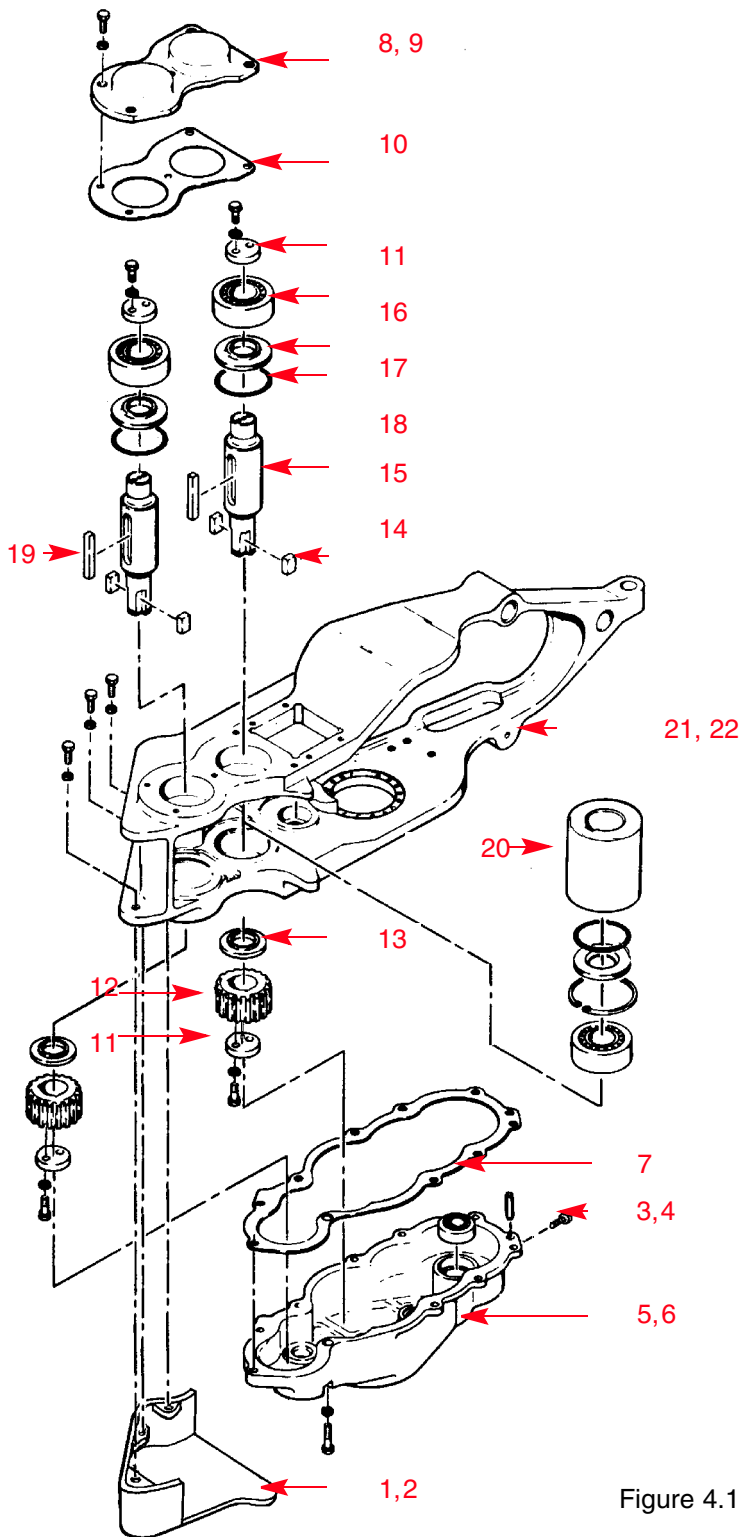


Figure 4.1



## Procedure

1. Remove cover (1) right hand or (2) left hand.
2. Only for right side, Disconnect hoses from valve assembly and remove manifold.
3. Remove drain plug (3) right hand or (4) left hand with gear case (5) right hand or (6) left hand and gasket (7).



NOTE: All gears are retained by bearing retainers, allowing removal of the gear case with the tool in any position.

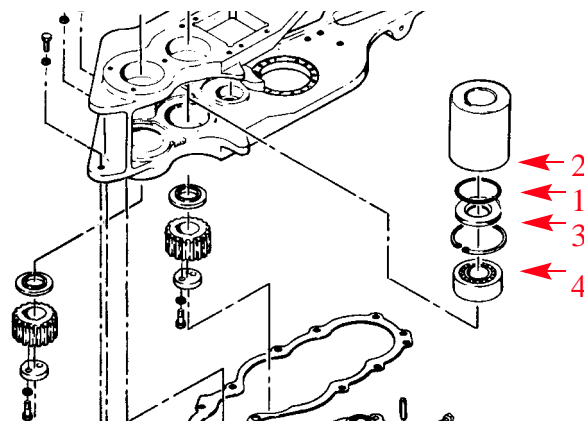
4. Remove bearing cover (8) right hand or (9) Left hand and bearing cover gasket (10).
5. Remove bearing retainer (11) on top and bottom, this releases roller gear (12), spacer shield (13), and drive roller gear keys (14) from bottom of drive roller shaft (15).
6. Push drive roller shaft (15) upwards along with upper roller bearing (16), spacer/shield (17), O-ring (18), and drive roller key (19), using a soft mallet if necessary.
7. Slide drive roller (20) out from inside body (21) right hand or (22) left hand.
8. Repeat steps 5. thru 7. for secondroller in each side.
9. Reverse procedure to re-assemble, using care to avoid damaging bearing seals. Torque bolts for bearing retainer (11) to 15-20 ft. Lbs.



NOTE: Always use new O-rings and gasket upon Re-assembly.

## Lower drive roller bearing replacement

10. Repeat steps 1. thru 7.
11. Remove lower spacer/shield (1) with O-ring (2).
12. Remove internal retaining ring (3) and push roller bearing (4) upward to remove.
13. Reverse procedure to re-assemble. Use care to avoid damaging the bearing seals



## Installation and commissioning

### Installation procedure

- ❑ Attach a 1/2" or 5/8" cable to the mast that will allow a free, easy swing around the wellbore. The higher the fixed line, the easier it will be to move the wrench onto the pipe.
- ❑ Attach the cable at a cross member about 2,5 feet from the drill pipe centerline (as shown in fig. 2.1) and position the wrench across from the driller where the chainman would normally stand.
- ❑ With the lift cylinder at the midpoint of its stroke, suspend the SSW-40 approximately 5 feet above the floor. This will allow 12" of vertical travel up or down.
- ❑ Attach TWO back-up cables to the shackles provided at the rear of the wrench to restrict rotational movement to 12" in either direction. Do not cross cables.



**WARNING: If only one back-up line is attached, the wrench can swing into the operator causing injury.**

### Connecting air line.

The SSW-40 requires approximately 250 cfm air flow at 90 to 125 psi air pressure.

An air regulator is included with the tool to prevent damage from excessive air pressure.



**NOTE:** During installation, use as few fittings as possible and route the air line direct from the air supply, keeping distance as short as possible.

- ❑ Run a 1 1/5" air supply line up to the rig floor in a protected area easily accessible for maintenance.
- ❑ Install a 1 1/5" shutt-off valve to the air supply line (as shown) to allow maintenance of the tool.
- ❑ Attach the filter end of the filter/regulator/ lubricator assembly to shutt-off valve.
- ❑ Connect the 25 foot air hose assembly provided, to the lubricator end of the filter/regulator /lubricator assembly.
- ❑ Blow out air line to remove any trapped moisture and debris.
- ❑ Pour 1/2 pint of SAE 10 oil into 25 foot hose, then connect to spinning wrench swivel fitting.
- ❑ Level tool with the rig floor using the hanger adjustment screw provided.

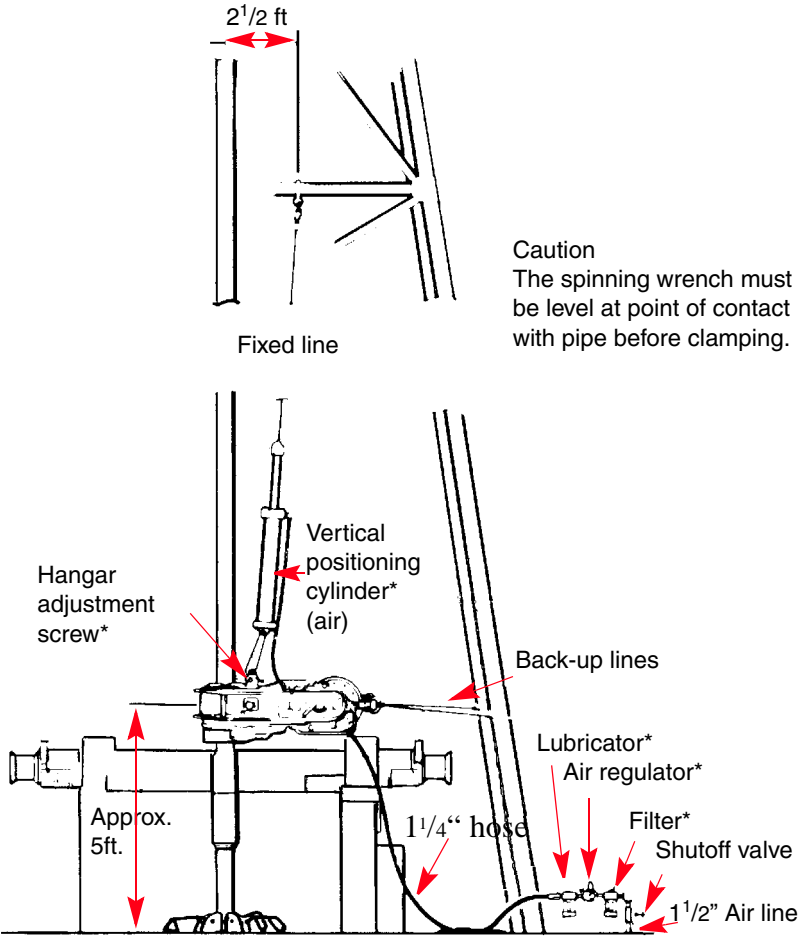


Figure 2.1 \* Supplied with spinning wrench

## Operation

### Normal usage

The spinning wrench is designed to:

- Spin in and spin out various types of tubing and casing



**CAUTION:** Back up lines must be attached to limit rotational movement to 1 foot (0.3m) in each direction.

- Adjust the SSW-40 to the appropriate pipe size by pulling the adjustment screw and turning it to engage the socket. Turn the adjustment handle counterclockwise to open the bodies or clockwise to close the distance between the bodies.
- Proper clearance is 1/2" between the front rollers and the pipe or collar being used.



**NOTE:** Check to be sure that back-up lines are properly attached (see Section 2)

- Swing the SSW-40 onto the pipe about 12" above the tool joint. Do not run the tool on the pipe upset or tool joint.
- To clamp onto the pipe: push the clamp control.
- To spin pipe, position lockout to spin in or spin out as required. The lockout prevents spinning pipe in the wrong direction. Push the throttle control to spin in or pull to spin out.
- To unclamp from pipe, pull the clamp control and swing wrench away.
- To position the SSW-40 vertically, push the vertical positioning control to move the tool up or pull to move down.

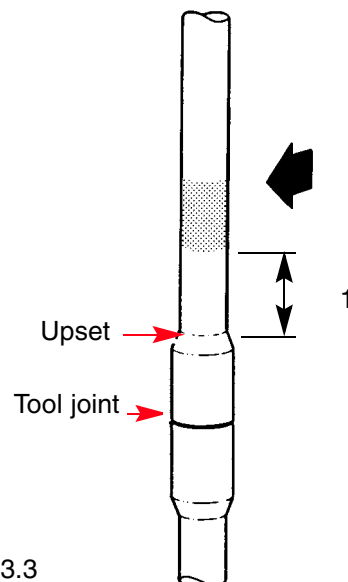
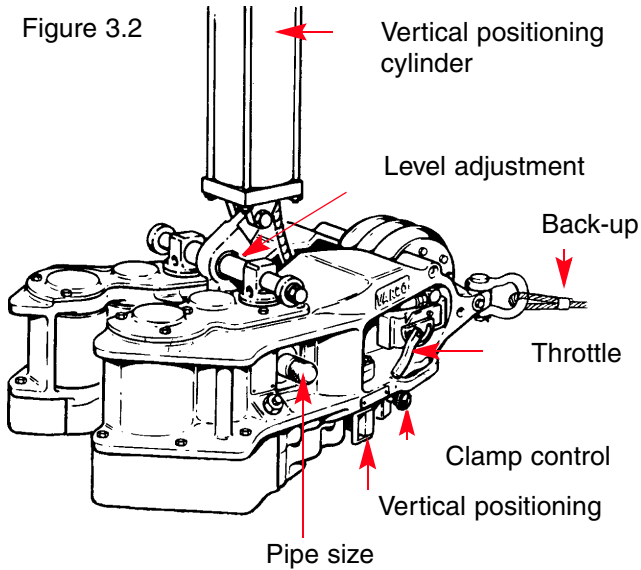
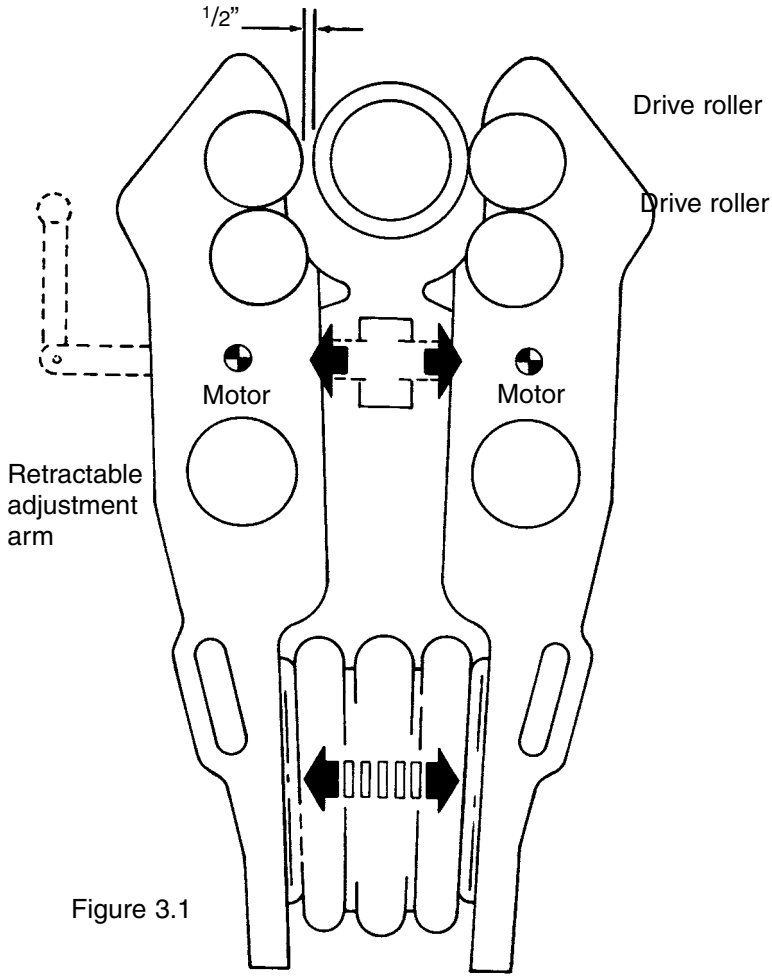


Figure 3.3



## Tips on operation

1. Pin should be stabbed into the box as vertical as possible. Spinning wrench can not spin an improperly aligned connection
2. Spin pin into box until pin and box are just shouldered together; at this point stop and torque joint with the torque wrench. Do not use the spinning wrench to torque joints.
3. Keep clamping arms adjusted. Slipping rollers will cause rollers to wear. If drive rollers start to slip on the pipe, check the pressure roller adjustment and adjust equally on both sides. See adjustment procedure.
4. Replace worn Drive rollers. If the drive rollers start to slip and the roller arms have been adjusted to maximum, this may indicate drive rollers require replacement.

## Handling the drill stem; tips and tricks

### Picking up and laying down the drill stem

- Use thread protectors when available. When threads and shoulders are unprotected, do not permit the tool joints to strike steel surfaces such as walks, stairs, steel floors, or machinery. Use wood surfaces where the tool joint may hit.

### Cleaning and lubrication (thread compounds)

- Pin and box threads and shoulders should be thoroughly cleaned.
- Use solvent and wipe dry with a clean rag.
- Inspect carefully for any burrs or nicks on the shoulders or threads.
- Damaged connections should never be run in the hole.
- After cleaning, apply tool joint thread compound to threads and shoulders with a round, stiff bristle brush.
- Use thread compounds containing 40% to 50% by weight of finely powdered metallic zinc.



*CAUTION: Never, under any circumstances, use casing and tubing lubricant. Thread compound must be applied to the tool joint every time it is made up.*

### Stabbing and spinning the drill stem

- Do not allow the ends of the pin to strike the box shoulders. the shoulder must not be nicked or other wise damaged.
- Before spinning the pipe, make sure connections are in alignment.
- Do not rotate the pipe too fast, especially when wobbling or binding occurs.
- Extra care is necessary when a power operated spinner is used.

### Making up the drill stem (torque)

- Torque measuring equipment must be used.
- When using tongs, it is important that line pull be measured when the line is at right angles or 90° to the tong handle.
- When applying line pull, do not jerk the tongs.
- Over-torque can be just as damaging as under-torque.
- Use both tongs (when tongs are used) when making up tool joints.
- Do not make up pipe using spinners only. Torquing devices must be used.

---

### **Breaking in new connections**

- Initial make up is most critical and extra care is essential for long trouble-free service. Follow these steps:
  - Inspect threads and shoulder for any damage.
  - Clean and lubricate as indicated above.
  - Walk in or slowly rotate joints together.
  - Makeup to recommended torque.
  - Breakout and slowly spin out.

### **Breaking and spinning out the drill stem**

- When breaking out the joint, use both tongs (when using tongs). Always follow these steps:
  - Do not let the end of the pipe strike the box shoulder.
  - Come out of the hole on a different break each trip so that every connection can be periodically broken and its condition and torque checked.
  - When standing the pipe back, be sure the set back area is clean where the pin will rest.

## Assembly and dis-assembly



**WARNING:** Make sure that all pneumatic lines are isolated before ANY work is performed on the Spinning wrench



**NOTE:** All assembly and disassembling should be performed in a dry, clean area.



**NOTE:** For assembly, use all new O-rings, seals and gaskets and lubricate at time of assembly only. When applying Loctite to threaded surfaces, all threads must be clean and free of grease and grit.

### Gear train

The Gear Train on the SSW-40 is simple in design requiring only a pair of snap ring pliers to remove gear retaining rings and a bearing press to change needle bearings. Idle gear shafts are screwed into the body.



**NOTE:** Do not use hammer to install needle bearings

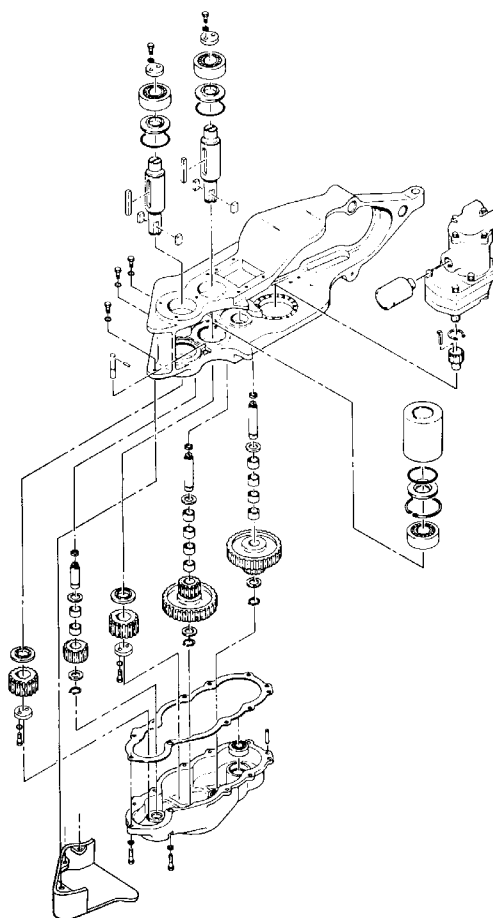
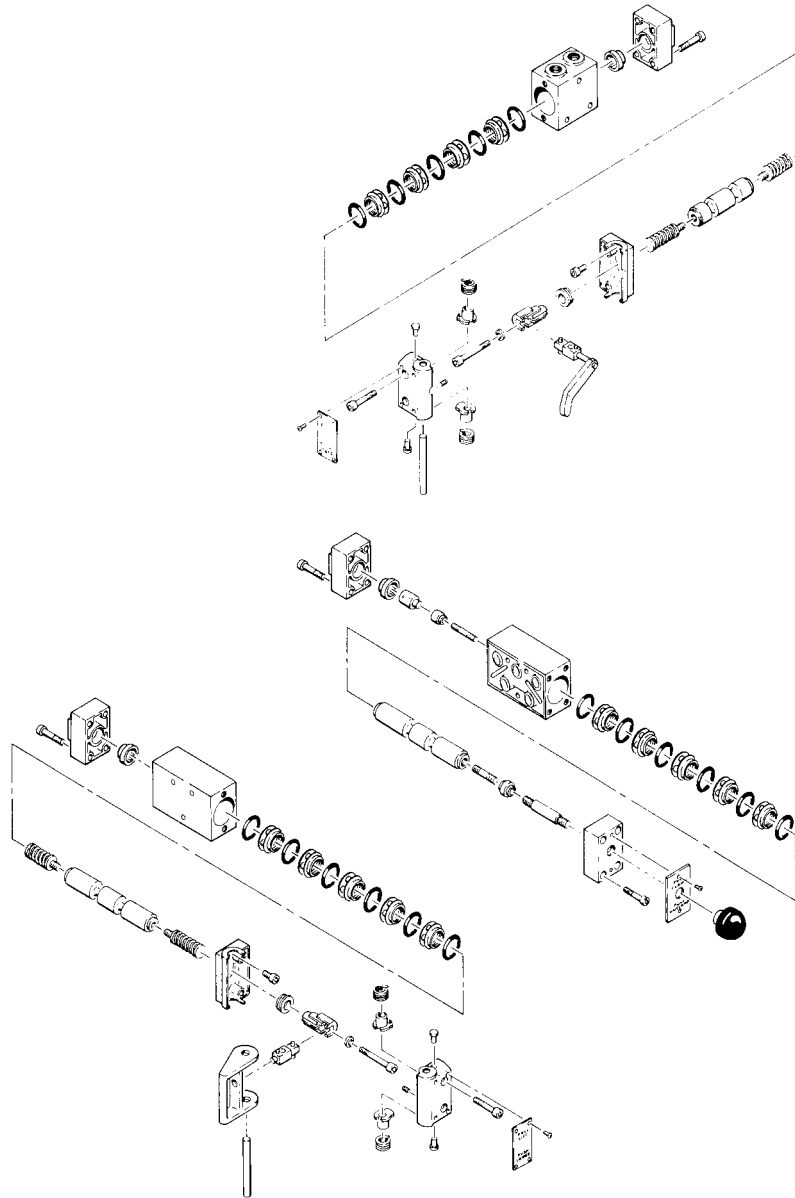


Figure 4.3



### Control Valves

The control valves are all of the same basic type requiring no special tools or instruction to service. Use the exploded drawing below and the parts list at the back of the book to replace seals and gaskets.



## Adjustment Screw

### Removal

1. Remove extension spring (1).
  - Obtain a 6" to 8" piece of  $\frac{3}{8}$ "-16" allthread with a hex nut, to use as a tool.
  - Using tool, relax tension on extension spring (1). Pass threaded end of tool through eye of bracket (2) and screw into  $\frac{3}{8}$ " thread on end of the Extension spring (1).
  - Run nut on tool up to bracket (2).
  - Remove screw (3).
  - Loosen nut on tool until extension spring (1) is Relaxed. Now remove remaining hardware.
  - See figure 6.3, remove bellows bolt (18) of Right side, untight screw on bottom of bellow.
  - Disconnect hose from valve quick exhaust muffler.
2. Place the entire tool on bench or where the work has to be done. Remove the 8 screw holding the pivot block covers (4) in place.
3. Remove the hanger rod (5), hanger (6), and lift cylinder (7) as an assembly with their attaching hardware.

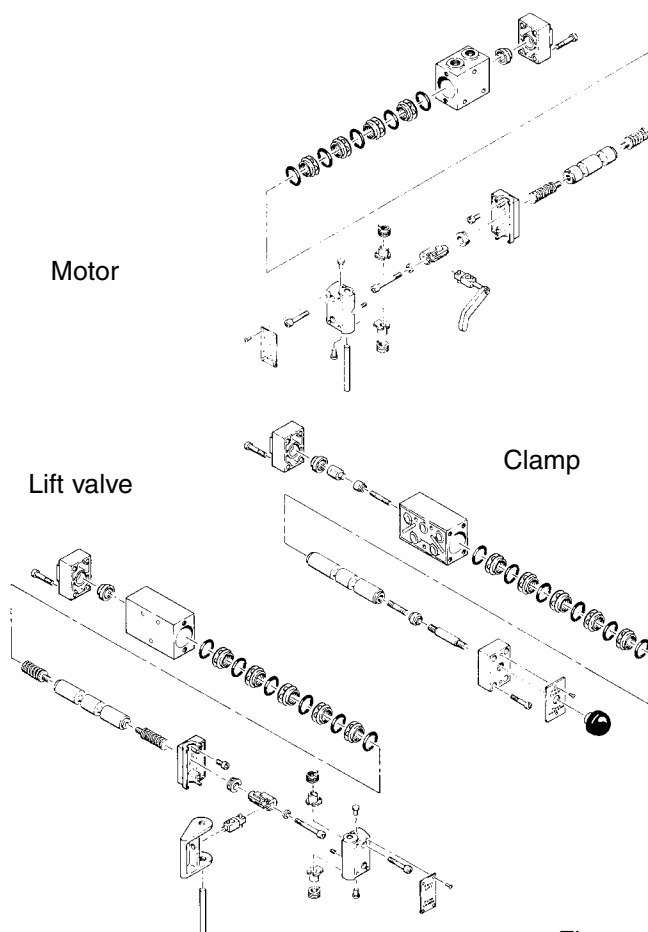


Figure 4.4

4. Unfasten capscrew (8) and grease seal cap(9).
5. Remove knurled knob(10).
6. Disconnect hoses of airmotor right side.
7. Using the adjustment handle (11), turn the adjustment screw (12) counterclockwise until it is free of the right pivot block (13).
8. Separate the bodies and continue to turn the adjustment screw (12) until it is free (approx.2 turns).

## Installation

1. Turn adjustment screw (12) 1<sup>1</sup>/<sub>4</sub> turns into the left pivot block (14).
2. Put left and right frame opposite position. Be sure that the adjustment screw (12) is centered between the pivot blocks (13&14).
3. Push right frame against adjustment screw (12). Place adjustment handle(11) in adjustment screw (8), and pull handle (11) as far tru as possible.
4. Turn knurled knob(10) in adjustment handle (11).
5. Be sure that adjustment screw not turns.
6. Turn adjustment handle(11) assembly clockwise so, left and right frame will come together.
7. Be sure that the adjustment screw (12) is centered between the pivot blocks (13&14) within 1/8" maximum.
8. Place the hanger rod (5), hanger (6) and lift cylinder (7) as an assembly with their attaching hardware. Put the 8 screws holding the pivot block covers (4) back in place. Lockwire them by 2.
9. Mount cap screw (8) and grease sealcap(9).
10. Connect hoses to airmotor right side.
11. See figure 6.3, place bellows bolt (18) of Right side , mount screw on bottom of bellow.
12. Place extension spring (1) back on frame.
13. Connect hose to valve quick exhaust muffler.

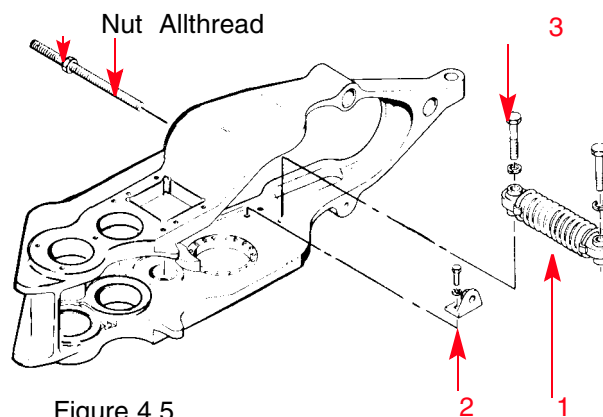


Figure 4.5

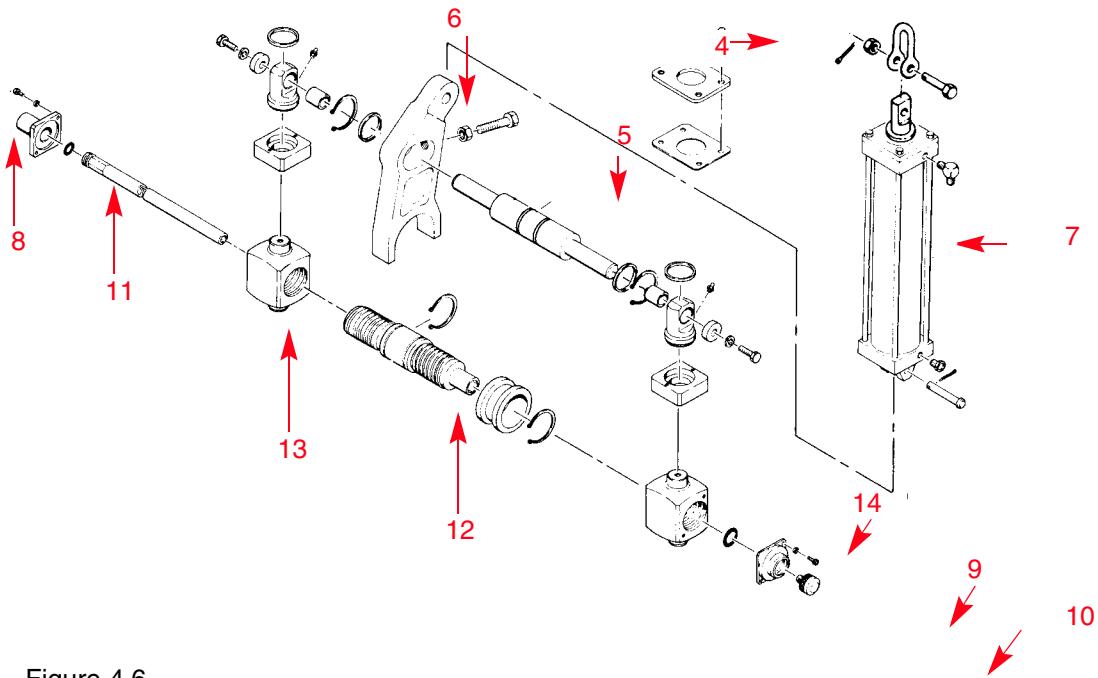


Figure 4.6

### Motor Removal

1. Refer to adjustment screw removal procedure, step 4.5.1.1, and remove extension spring.
2. Pull out adjustment handle and turn until adjustment screw is fully extended for easy access.
3. Remove and label right motor hose assembly (1) and left motor hose assembly (2).
4. If left motor (3) is to be removed, remove motor valve (4) from inboard and outboard left motor hose assemblies (5 & 6).
5. Remove cover (7) right hand or (8) left hand.
6. Only for right side, disconnect hoses from valve assembly and remove manifold.
7. Remove drain plug (9) right hand or (10) left hand with gear case (11) right hand or (12) left hand and gasket (13).
8. Remove roller compound gear (14) and
9. Motor compound gear (15). This releases motor gear (16) and motor gear key(17).



**NOTE:** Mark orientation of motor gear key (17) for re-assembly. The tab on one end should rest on top of motor gear(16).

10. Remove lockwire and 9 screws. Motor (3) is now free to come out through side opening in body, or between the bodies.
11. Reverse procedure to re-install motor (3).
12. Torque screws to 8-10 ft. lbs. Be certain to re-lockwire the 9 screws (See fig 5.3).

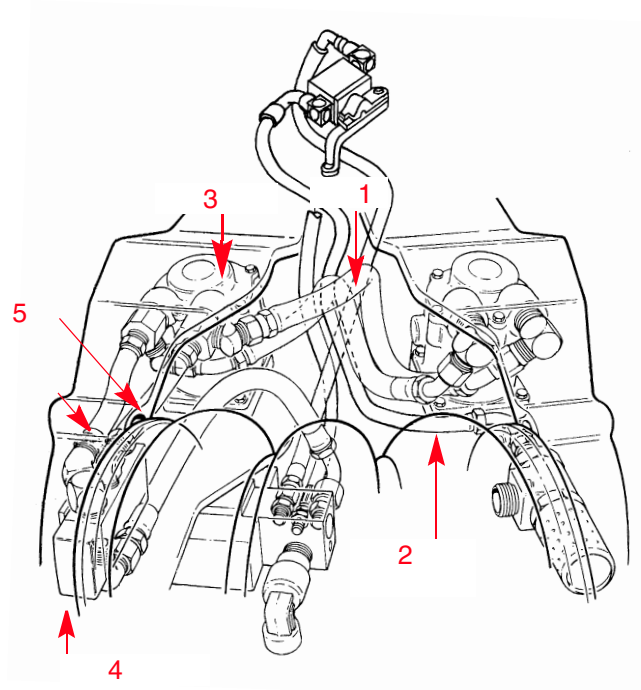


Figure 5.1

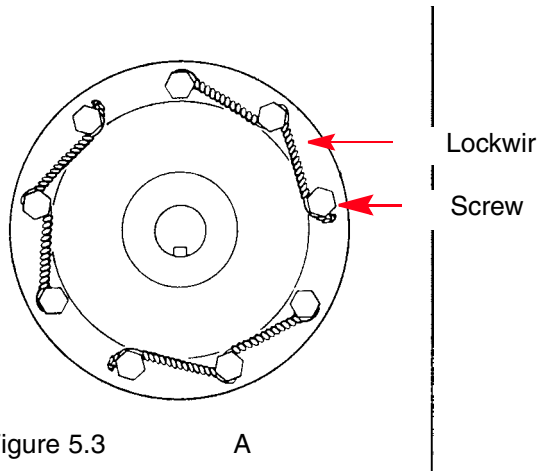


Figure 5.3

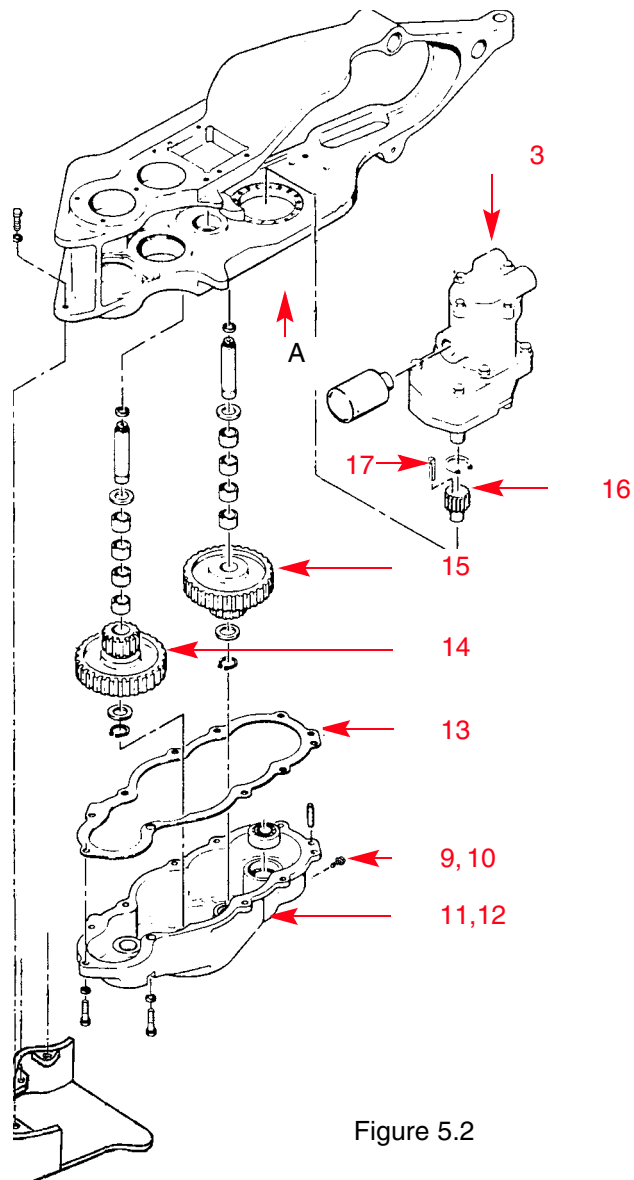


Figure 5.2

## Motor maintenance

1. Motor maintenance is straightforward and requires no special instructions other than the following:
2. The bearing clamp screw (1) has left hand threads. Do not remove unless it is necessary, as the rotor bearing (9) must then be re-shimed.
3. When replacing vanes (2), remove the rotor (3) and liner (4) as a unit, then remove the retaining ring (5), pinion gear (6). Lower end plate (7) and liner to expose the vanes.
4. If the upper end plate (8) is removed, the rotor (3) to rotor bearing (9) clearance must be checked and reset if necessary by shimming between the rotor bearing and the rotor bearing spacer (10).

## Clearance

Rotor to rotor bearing clearance is 0.0015" to 0.0020".

## Torque specifications

Item	Qty	Torque
1	1	33-38 ft-lbs / 45 - 52 Nm
11	5	150-175 in-lbs / 203-237 Nm
12	4	18-20 ft-lbs / 25.5 - 27 Nm
13	4	150-175 in-lbs / 203-237 Nm

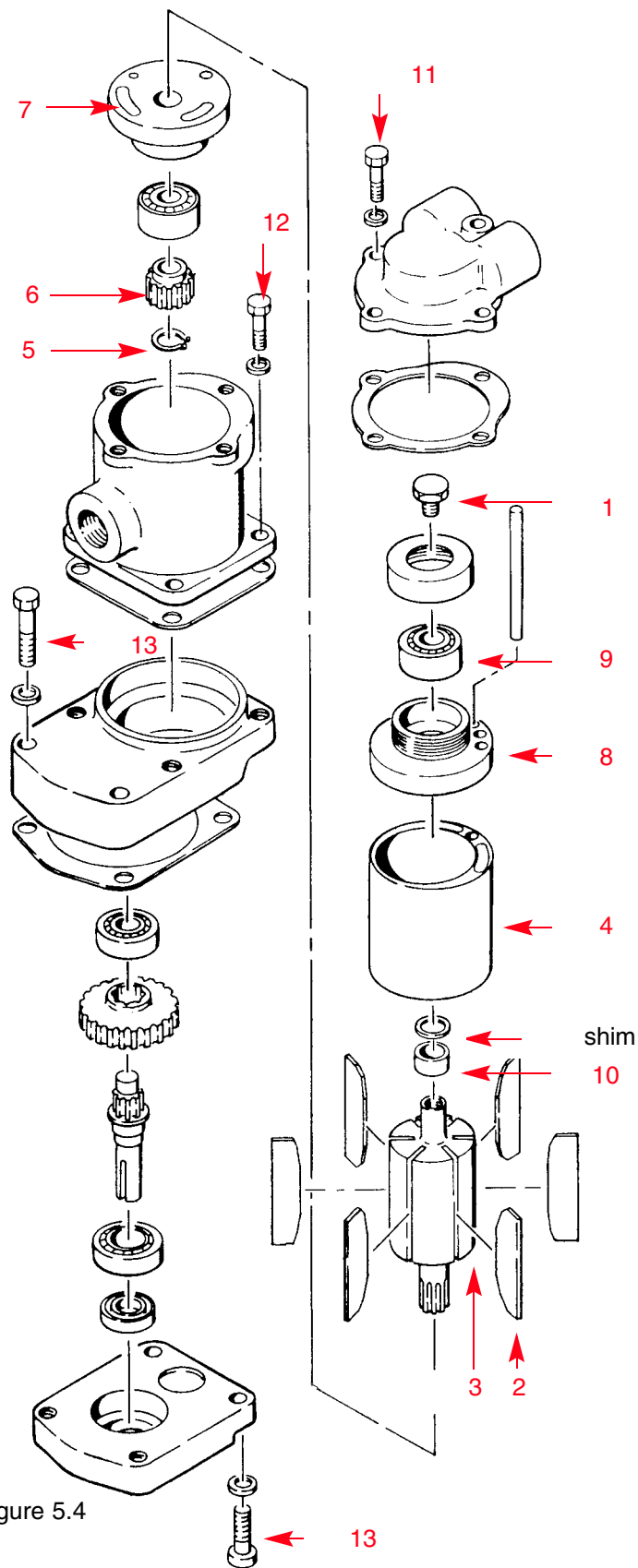


Figure 5.4



## Bellows assembly & maintenance

Follow the exploded drawing (figure 5.5) when servicing the bellows assembly.



**NOTE:** If clevis link (1) is removed, be sure to re-attach long ends to left hand cap (2).

When bolting bellows (3) to end caps, bring all nuts up fingertight, then use criss-cross pattern to tighten bellow bolts. Do not allow any nut to get more than 2 turns ahead of the rest.



**WARNING:** The unit must not be pressurized until it is installed in tool.

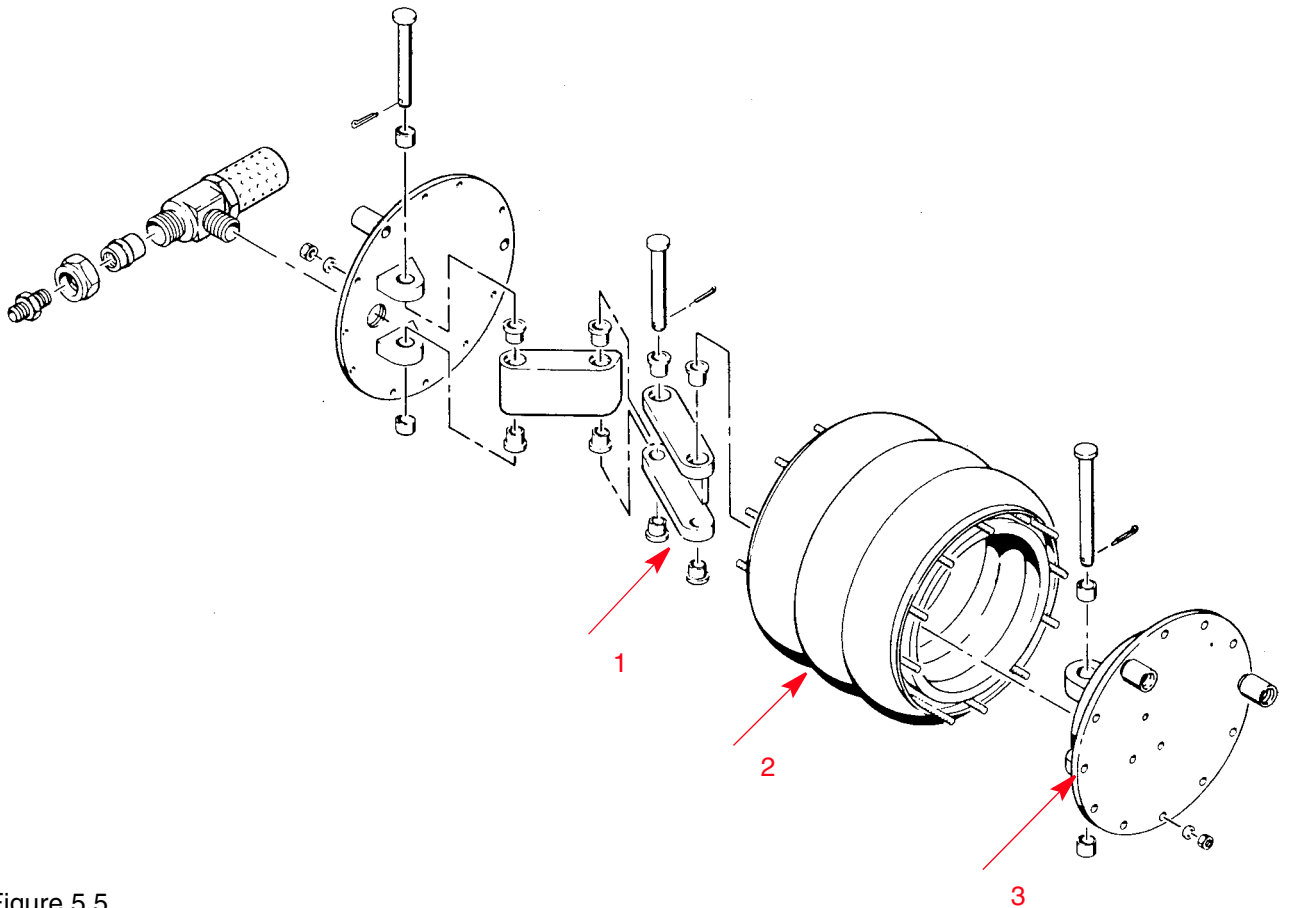


Figure 5.5

## Trouble shooting

Prior to trouble shooting a problematic Spinning wrench, carry out the following checks to prevent making loopholes in solving the problem. When problems cannot be solved please contact an authorized Varco BJ repair facility.



**WARNING: Make sure the pressure line valve is fully opened before pressurising the Spinning Wrench**

### Initial checks, solves most problems

1. Is air pressure available?
2. Check that the power supply is at least 90 Psi / 620 KPa.
3. Check the mufflers are not blocked with mud etc.
4. Check the functioning of the control valve

## Solutions

Symptom	Probable cause	Solution
Wrench fails to spin or clamp onto drill pipe	No air pressure	Check general symptoms
Wrench fails to clamp onto drill pipe.	No air pressure	Check general symptoms
	Dirty or clogged air exhaust mufflers	Clean and/or replace mufflers
	Faulty clamp valve	Replace valve or install seal kit if unit indicates leaky seals. Kit shown in parts list.
Wrench drive rollers slip on drill pipe	Pressure arms out of adjustment.	Re-adjustment arms as indicated in chapters "installation and Operations"
	Drive rollers are worn and will not contact pipe adequately	Check rollers and replace as required
	Drive roller gears, idler gears and/or gear is worn excessively	Check these gears as noted in the disassembly procedures and inspect all affected parts for excessive wear and replace as required.
	Wrench is not equipped with check valve. This valve prevents pressure decay in the air lines.	Check if wrench is equipped with check valve. If not, install.
Air motor does not operate or operates slowly and drive rollers will not rotate.	Insufficient air pressure	See general symptoms
	Throttle control handle is frozen	Lubricate control handle front and back
	Drive shaft or drive key is broken. Possible damage to drive gear and idler gear	Disassemble wrench and replace shaft and /or gears. It is recommended to replace all seals and check bearings when replacing gears at all times.
	Air motor is frozen up.	Remove air motor and check internal mechanisms and replace damaged components.
	Cap screw and lock washer used to retain main drive gear on air motor has come loose and has caused misalignment and damage.	Lower gear box as indicated in chapter "ASSEMBLY". and check drive gear. If the cap screw has come loose it is recommended that the cap screw is replaced.
Wrench slips on drill pipe but drive rollers and motor operate.	Pressure roller is worn	Replace pressure rollers and bearings
	Pressure rollers arms have a metal fatigue	Check both arms for cracks between the drive roller and pressure mounting holes.
	Spool valve has leaking seals and will not hold required pressure	Replace valve and or seals.

## Appendixes

### Storage, transport & decommissioning.

#### Storage

- ❑ Main unit should be palletized for indoor storage. A cargo container would be appropriate for indoor/ outdoor storage.
- ❑ Every attempt should be made to avoid wide variations in temperature and high humidity. The preferred environment would be clean and dry at 60°F (16° C) ambient. If high humidity is unavoidable, 70° F (21° C) is recommended.
- ❑ All exposed, not painted metal surfaces, are coated with a rust preventative at the factory prior to shipment. However, these surfaces should be checked periodically (when fulfilling the above conditions once per 3 months is recommended) to be sure that no corrosion is taking place.
- ❑ All openings should be covered to prevent water or dust from entering. We do not recommend the use of silica or a dehydrating agent.
- ❑ When the Spinning wrench is not being used for a longer period (like storage) the following steps should be carried out:
  - ❑ Clean Spinning wrench
  - ❑ Grease Spinning wrench as described.
  - ❑ Grease all blank parts.
  - ❑ Use an extreme pressure, multi-purpose, lithium based grease of No. 1 or No. 2 consistency.
  - ❑ Clean and cap pneumatic Quick Disconnect Couplings.
  - ❑ Recommended rust preventative (slushing compound) for bare metal surfaces is Valvoline Tectyl or equivalent.
  - ❑ Pour a pint (1/2 l) of SAE 10 lube oil in hose and run through air motor while actuating air cylinder, to ensure coating internal components with oil.
  - ❑ Drain gear case and replace with 2 quarts (1.9 l) of SAE30 oil.
  - ❑ Heavy application of grease at all grease nipples

#### Returning to service

- ❑ Check that the lubricator is clean and filled with SAE10 oil.
- ❑ Check filter is clean and water has been drained
- ❑ Check lubricator is located between the regulator and the wrench
- ❑ Drain and refill gear case with 2 quarts (1,9 l) SAE 90 transmission oil.
- ❑ Blow air line out before connecting to wrench

#### Transport

The best way of transporting the Spinning wrench is in its original crate. Use oiled paper and seal the box with plastic to prevent leaking when stored outside. Secure the top safely.

#### Scrapping

The tool contains grease, steel, rubbers, plastic, stainless steel or mild steel and several assembled components from undefined consistency or mixtures. The tool can be contaminated with mud. When the tool is taken out of service it is recommended to disassemble the tool in a place where drainage for waste fluids is possible



**WARNING: Any fluids, mud and grease are unsafe when touched by the skin. Always wear gloves and safety goggles when disassembling the tool.**

- Clean the tool with a steam cleaner.
- Remove all other parts.
- Carry off to proper place for final storage or destruction

**Torque values (US) for bolts**

Dia.	Threads per inch	Bolts Lubricated with Light Machine Oil Grade 8			Bolts lubricated with Anti-seize compound Grade 8		
		Min. Torque (ft lb)	Max. Torque (ft lb)	Clamp force (lb)	Min. Torque (ft lb)	Max. Torque (ft lb)	Clamp force (lb)
<b>Coarse Thread Series, UNC</b>							
1/4"	20	11.4	12.6	2860	8.6	9.5	2860
5/16"	18	24	26	3720	17.8	19.7	3720
3/8"	16	43	47	7000	32	35	7000
7/16"	14	67	74	9550	50	55	9550
1/2"	13	105	116	12750	78	87	12750
9/16"	12	143	158	16100	107	118	16100
5/8"	11	209	231	20350	157	173	20350
3/4"	10	361	399	30100	271	299	30100
7/8"	9	570	630	41600	428	473	41600
1"	8	855	945	54500	641	709	54400
1 1/8"	7	1216	1344	68700	912	1008	68700
1 1/4"	7	1729	1911	87200	1297	1433	87200
1 3/8"	6	2261	2499	104000	1696	1874	104000
1 1/2"	6	3002	3318	126500	2252	2489	126500

Tensile Strength = 150,000 psi to 1" dia. Proof Strength = 120,000 psi

Dia.	Threads per inch	Bolts Lubricated with Light Machine Oil Grade 8			Bolts lubricated with Anti-seize compound Grade 8		
		Min. Torque (ft lb)	Max. Torque (ft lb)	Clamp force (lb)	Min. Torque (ft lb)	Max. Torque (ft lb)	Clamp force (lb)
<b>Fine Thread Series, UNF</b>							
1/4"	28	13.3	14.7	3280	10	11	3280
5/16"	24	24	26	5220	17.8	19.7	5220
3/8"	24	48	53	7900	36	39	7900
7/16"	20	76	84	10700	57	63	10700
1/2"	20	114	126	14400	86	95	14400
9/16"	18	162	179	18250	121	134	18250
5/8"	18	228	252	23000	171	189	23000
3/4"	16	399	441	33600	299	331	33600
7/8"	14	627	693	45800	470	520	45800
1"	14	950	1050	59700	713	788	59700
1 1/8"	12	1368	1512	77000	1026	1134	77000
1 1/4"	12	1900	2100	96600	1425	1565	96600
1 3/8"	12	2584	2856	118400	1938	2142	118400
1 1/2"	12	3382	3738	142200	2537	2804	142200

Tensile Strength = 150,000 psi to 1" dia. Proof Strength = 120,000 psi

### Torque values (metric) for bolts

Dia meter	Threads per inch	Bolts Lubricated with Light Machine Oil Grade 8			Bolts lubricated with Anti-seize compound Grade 8		
		Min. Torque (Nm)	Max. Torque (Nm)	Clamp force (N)	Min. Torque (Nm)	Max. Torque (Nm)	Clamp force (N)
<b>Coarse Thread Series, UNC</b>							
1/4"	20	15.5	17.1	12870	11.7	12.9	12870
5/16"	18	32.6	35.4	16740	24.2	26.8	16740
3/8"	16	58.5	64	32500	43.5	47.6	31500
7/16"	14	91.1	100.6	42980	68	92.5	42980
1/2"	13	143	158	57380	106	118	57380
9/16"	12	195	215	72450	145.5	160	72450
5/8"	11	284	314	91580	213.5	235	91580
3/4"	10	491	542	135450	368	407	135450
7/8"	9	775	857	187200	582	643	187200
1"	8	1163	1285	245250	872	965	245250
1 1/8"	7	1654	1828	309150	1240	1370	309150
1 1/4"	7	2351	2598	382400	1764	1949	392400
1 3/8"	6	3075	3398	468000	2306	2549	468000
1 1/2"	6	4082	4512	569250	3062	3385	569250

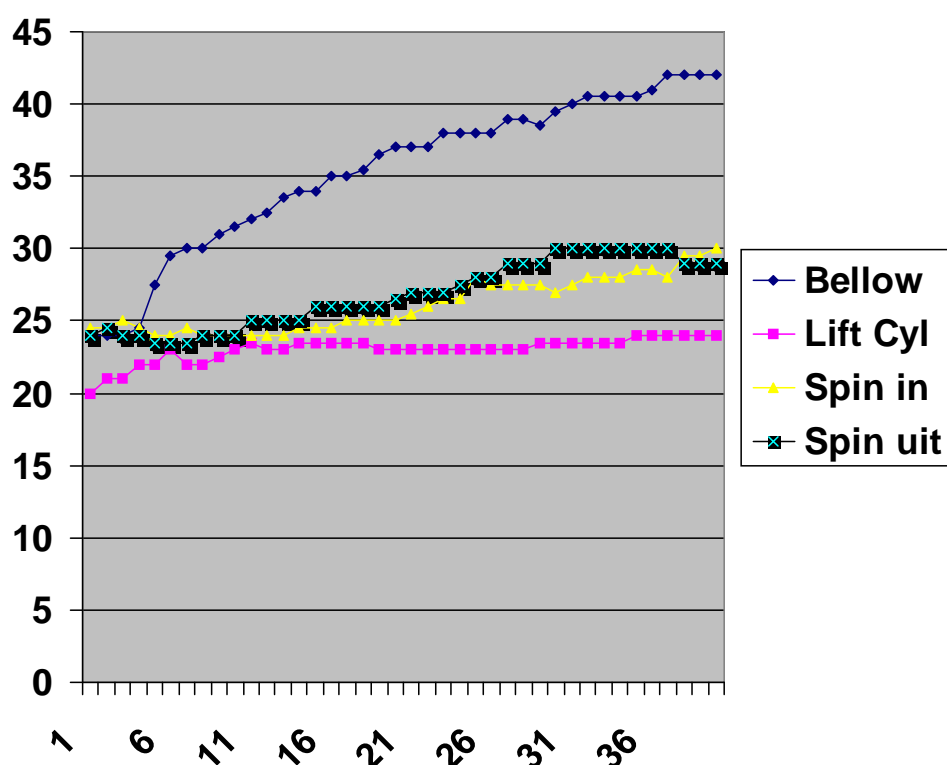
Dia meter	Threads per inch	Bolts Lubricated with Light Machine Oil Grade 8			Bolts lubricated with Anti-seize compound Grade 8		
		Min. Torque (Nm)	Max. Torque (Nm)	Clamp force (N)	Min. Torque (Nm)	Max. Torque (Nm)	Clamp force (N)
<b>Fine Thread Series, UNF</b>							
1/4"	28	18.1	20	14760	13.6	15	14760
5/16"	24	32.6	35	23490	24.2	26.8	23490
3/8"	24	65.3	72	35550	49	53	35550
7/16"	20	103	114	48150	77.5	86	48150
1/2"	20	155	171	64800	117	129	64800
9/16"	18	220	239	82130	165	182	82130
5/8"	18	310	343	103500	232	257	103500
3/4"	16	542	600	151200	406	450	151200
7/8"	14	853	943	206100	639	707	206100
1"	14	1292	1428	268650	970	1071	268650
1 1/8"	12	1860	2056	346500	1396	1542	346500
1 1/4"	12	2584	2856	434700	1938	2128	434700
1 3/8"	12	3514	3884	532800	2635	2913	532800
1 1/2"	12	4599	5083	639900	3450	3813	639900

## ATEX information

Over a limited period the temperature of the SSW 40 was measured while it was running on the test bench, under normal operation conditions.

4 points where measured (degrees Celcius)

- The bellow
- The lift cylinder
- The spinners while spinning in
- The spinners while spinning out



### Conclusions:

The maximum reached temperature is 42°C / 108°C.

Most of the lines have reached the point that they are not climbing any longer.

The spin in temperature is still increasing. However, this temperature is small compared to the temperature of the bellow, which line has not increased over the 4 last measurements.

It is not expected the Spin-in temperature will exceed the Bellow temperature.





## Drawings & Parts

## Parts lists

### Hanger assembly

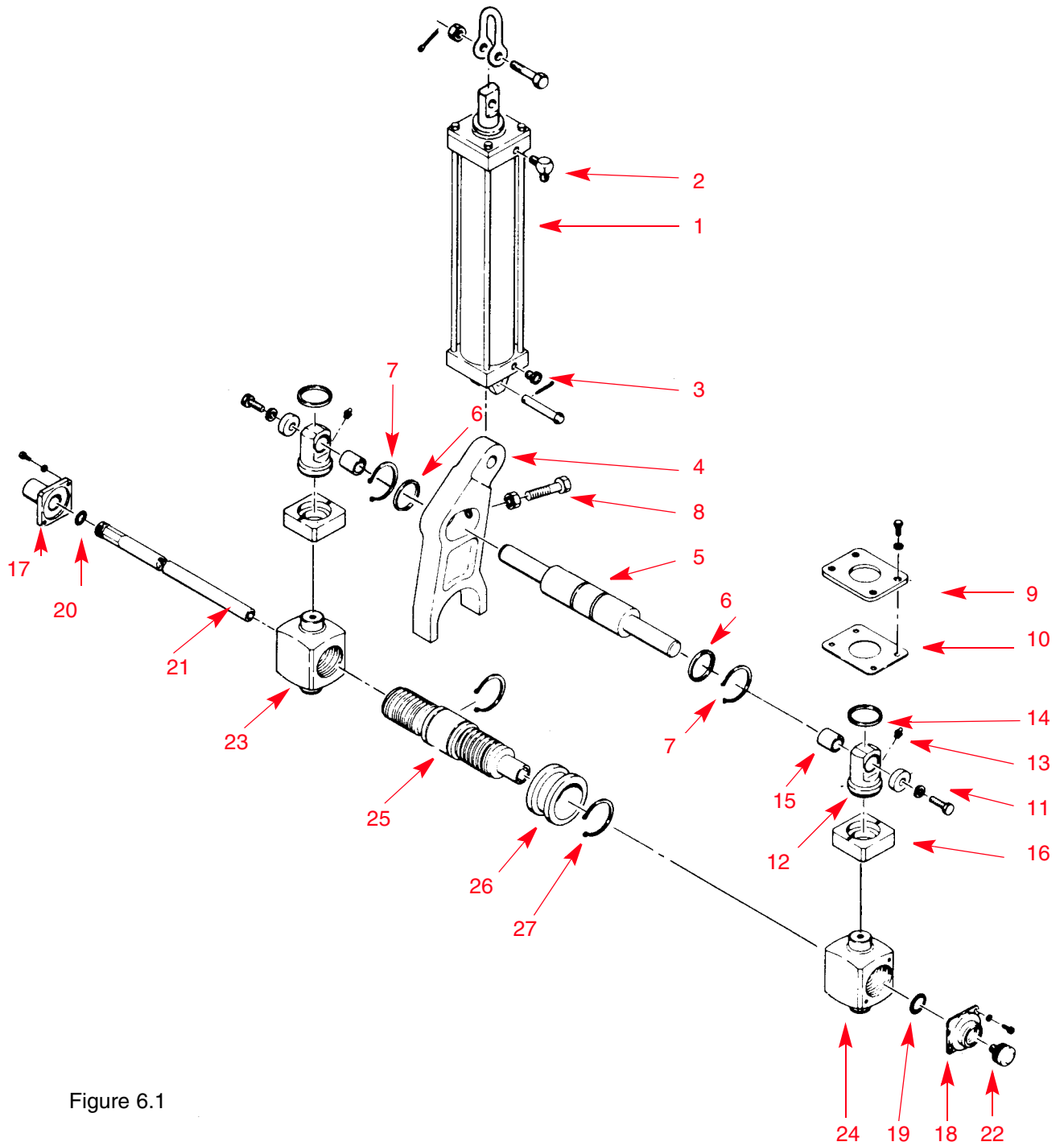
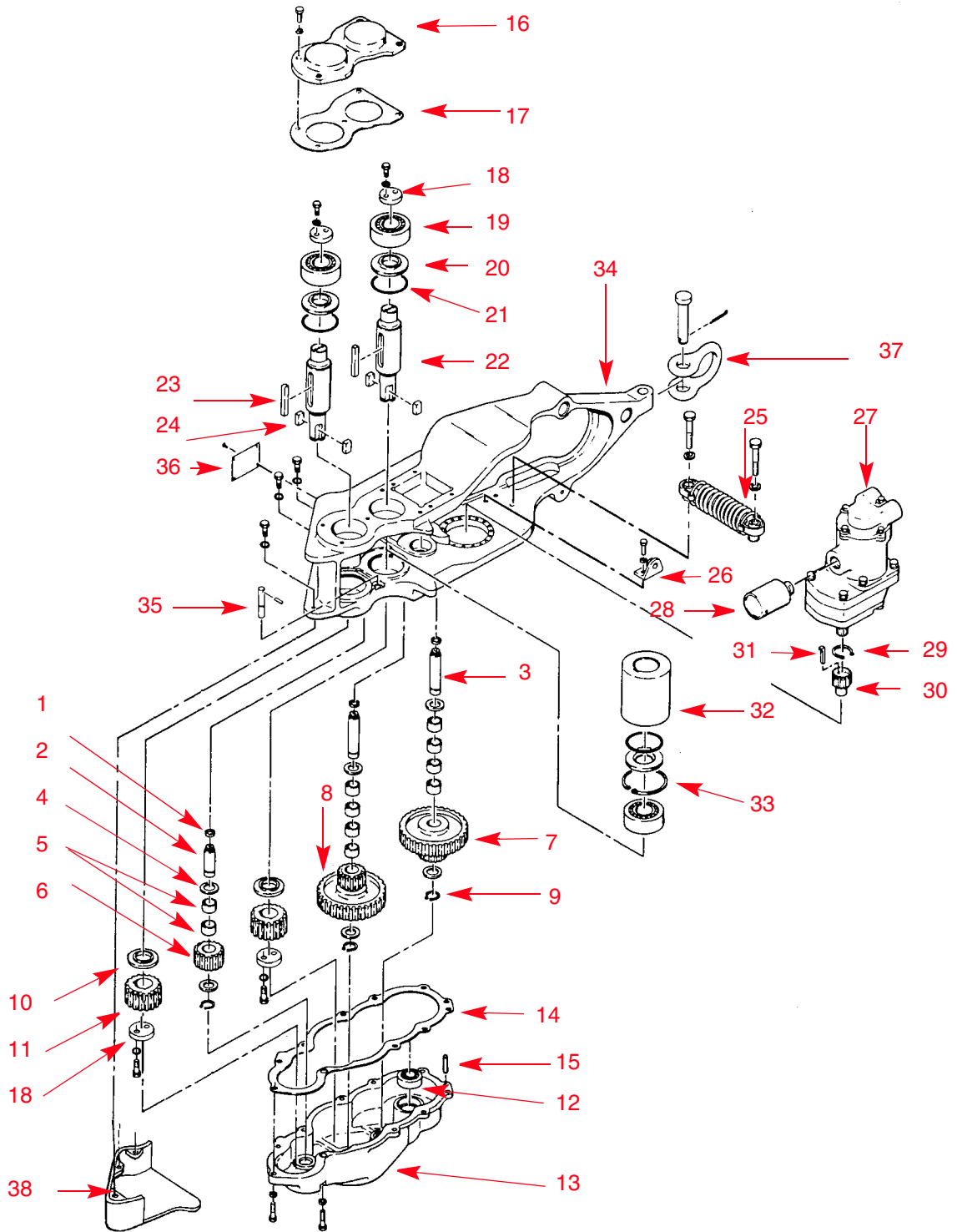


Figure 6.1

**Hanger assembly**

<b>Item</b>	<b>Qty</b>	<b>Description</b>	<b>Part no.</b>
1	1	Lift cylinder assembly	75341
2	1	Elbow, 90 <sup>0</sup> , ext. pipe/37 <sup>0</sup>	56506-8-4-5
3	1	Filter	75937
4	1	Hanger	76543
5	1	Hanger rod	74242
6	2	Support washer	76256
7	2	External retaining ring,	53600-156
8	1	Adjustment screw,	50012-24-C8
	1	Hex-jam nut	50312-C
9	2	Pivot block cover	76230
10	2	Pivot block cover gasket	76231
	8	Hex Head cap screw	50006-10-C8D
	8	Regular lock washer	50906- C
11	2	Stop	74241
	2	Hex head cap screw	50010-10-C8
	2	Regular lock washer	50910-C
12	2	Machined hanger block	74610
13	2	Straight grease fitting	53201
14	2	Thrust washer	74611
15	2	Hanger block bushing	74612
16	2	Top-Counter block	74584
17	1	Cap screw	74608
	2	Socket head cap screw	50103-6-C
	2	Regular lock washer	50903-C
18	1	Grease seal cap	74607
	2	Socket Head cap screw	50103-6-C
	2	Regular lock washer	50903-C
19	1	O-Ring	51300-224-B
20	1	O-Ring	51300-320-B
21	1	Adjustment assy. handle	75166
22	1	Knurled knob	75049
23	1	Right pivot block	76172-1
24	1	Left pivot block	76172-2
25	1	Adjustment screw	74603
26	1	Adjustment screw sleeve	74709
27	2	External retaining ring	53600-334

### Gear train



Item	Qty (per side).	Description	Part no.
1	3	Shoulder ring	75577
2	1	Idler shaft	75541
3	2	Shaft compound	75542
4	6	Thrust washer	73093
5	10	Needle roller bearing	75504
6	1	Roller idler gear	73084
7	1	Motor compound gear	74919
8	1	Roller compound gear	73085
9	3	External retainer ring	53600-100
10	2	Shield spacer	73449
11	2	Roller gear	201522
12	1	Ball bearing	73090
13	1	Right gear cover	73071 *
14	1	Gear cover gasket	73092
15	1	Dowel pin	51206-7
	7	Hex head cap screw	50006-7-C8
	3	Hex head cap screw	50006-12-C8
	10	Regular lock washer	50906-C
16 *	1	Right bearing cover	73067
17	1	Bearing cover gasket	73094-1
	5	Hex head cap screw	50006-7-C58
	5	Regular lock washer	50906-C
18	4	Bearing retainer	201523
	8	Drilled hex-head screw	50006-7-C8D
	8	Regular lock washer	50906-C
	A/R	Lock wire	947879-8
19	4	Roller bearing	73091
20	4	Shield spacer	76089
21	4	O-Ring	51300-152-B
22	2	Drive roller shaft	201521
23	2	Drive roller key	73078-1
24	4	Roller gear key	75249
25 *	1	Extension spring	73110
	1	Hex head cap screw	50010-20-C8
	1	Regular lock washer	50910-C
26 *	1	Spring mountain bracket	75752
*	2	Hex head cap screw	50008-6-C8
*	2	Regular lock washer	50908-C
27	1	Airmotor	74628
	9	Drilled hex head screw	50004-10-C8D
	9	Regular lock washer	50904-C
	A/R	Lockwire	947879-8
28	1	Muffler	74233
29	1	External retaining ring	53600-181
30	1	Motor gear	74920
31	1	Motor gear key	74194
32	2	Drive roller	76570
33	2	Internal retaining ring	53500-354
34*	1	Right body	73307
35	1	Locating pin	75821
	1	Roll pin	51604-8-C
36*	1	Nameplate	74954
*	4	U-type drive screw	53301-10-6
37	1	Shackle with pin	944514-9
38*	1	Right frame cover	200717
*	3	Hex head cap screw	50008-6-C5
*	3	Regular lock washer	50908-C

\* Right side only

### Controls and left body

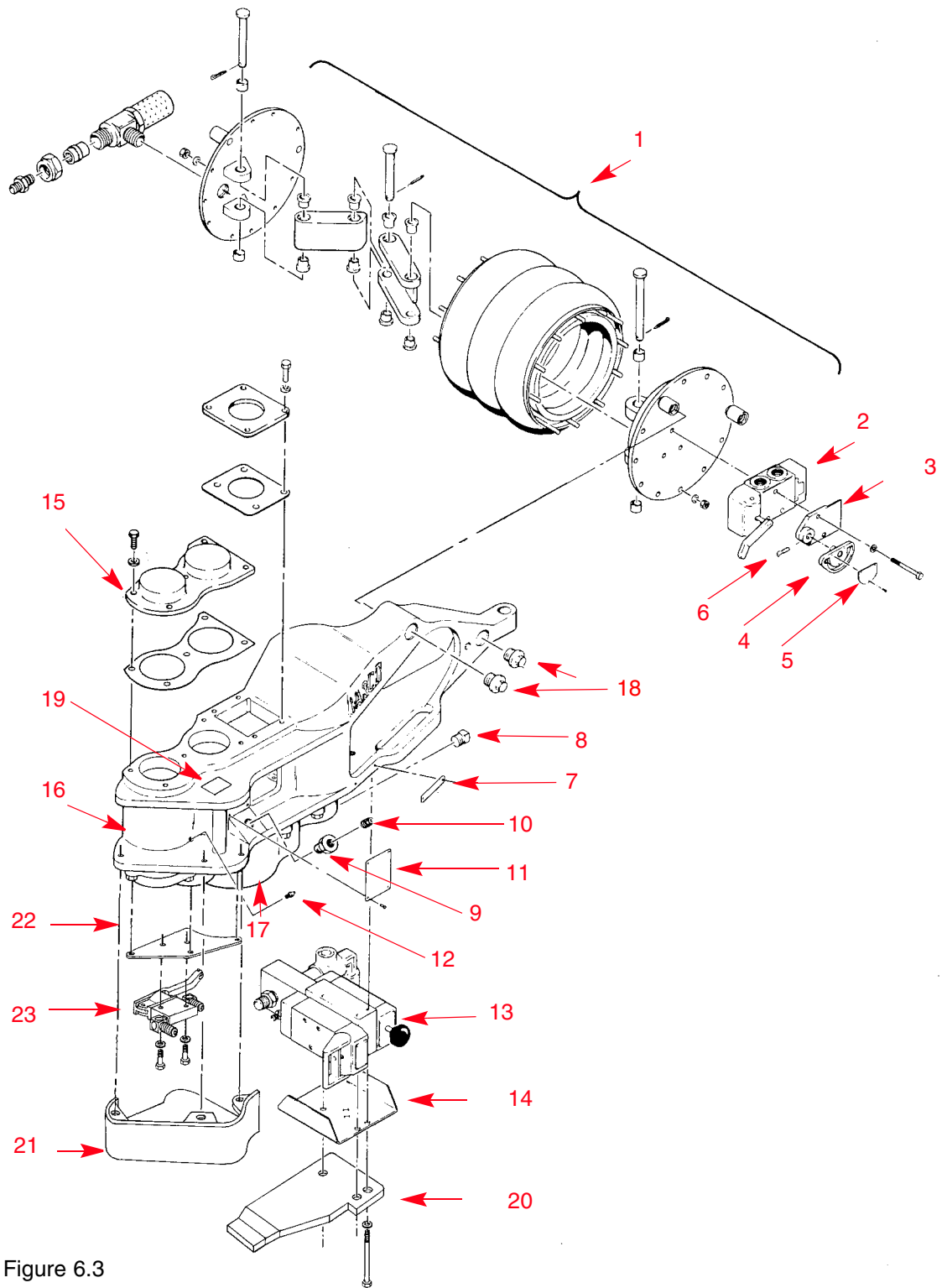


Figure 6.3

**Controls and left body**

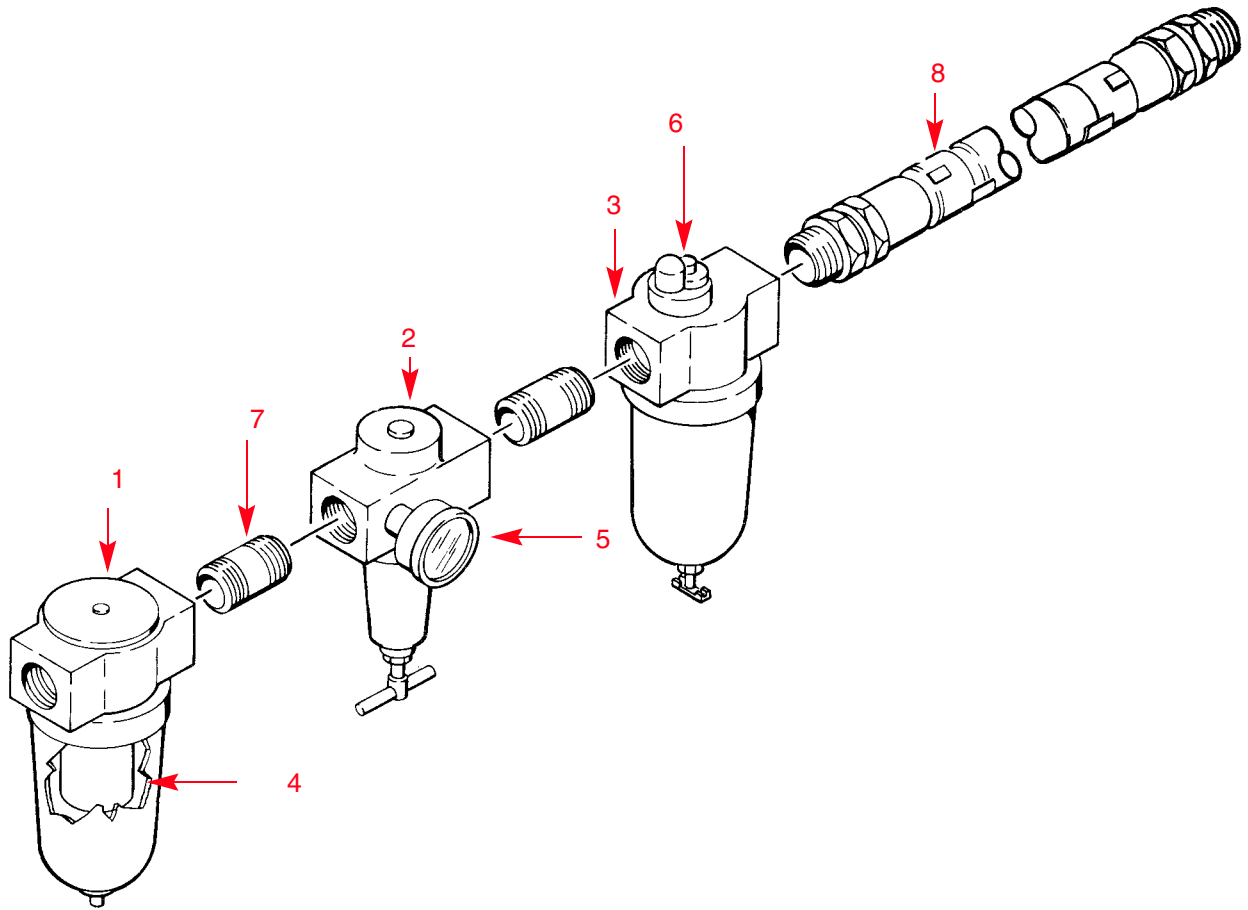
Item	Qty	Description	Part no.
1	1	Bellows Assembly	76237
2	1	Modified motor valve	76236
3	1	Lock-Out bracket assy.	76247
	3	Hex head cap screw	50004-24-C8
	3	Regular lock washer	50904-C
4	1	Lock-out arm assembly	73614
5	1	Spin in/Spin out instruction plate	75623
	3	U-type drive screw	53301-10-6
6	1	Roll pin	51604-8-C
7	1	Max. operating pressure plate	75474
	2	U-type drive screw	53301-10-6
8*	2	Drain plug	53002-12-C
9*	2	Fill plug	74565
10*	2	Check valve	74567
11	1	Caution label	19320
	4	U-type drive screw	53301-10-6
12*	8	Grease fitting	53201
13	1	Lift/clamp manifold assy.	76142
14	1	Bottom guard	76099
	3	Hex head cap screw	50008-38-C8
	3	Regular lock washer	50908-C
15	1	Left bearing cover	73066
16	1	Left body	73306
17	1	Left gear cover	73070
18*	4	Bellows bolt	74862
19	1	Storage warning decal	79227
20	1	Cover plate	200718
21	1	Left side frame cover	200716
	3	Hex head cap screw	50008-6-C5
	3	Regular lock washer	50908-C
22	1	Mounting plate	200715
23	1	Valve assembly	200712
	2	Hex head cap screw	50004-14-C8D
	A/R	Lockwire	947879-8

\* Total for both sides



**Filter, regulator, lubricator assembly**

Item	Qty	Description	Part no.
		Filter, regulator, lubricator assembly	74236
1	1	Filter	74236-1
2	1	Regulator	74236-2
3	1	Lubricator	74236-3
4	1	Filter element kit,	74236-4
5	1	Gauge	74236-5
6	1	Fill cap sight dome	74236-6
7	2	Close nipple	53920-G
8	1	25 foot air hose	76157



**Bellow assembly**

Item	Qty	Description	Part no.
1	1	Bellows actuator	73115-1
	24	Long bolt	76539
	24	Regular lock washer	50905-C
	24	Fine thread hex nut	55205-C
2	1	Quick exhaust/muffler valve	74238-2
3	1	Quick exhaust adapter	75553
4	1	Ext. pipe/37° connector	56501-6-8-S
5	1	Clevis pin	75121
	1	Cotter pin	51402-8-S
6	1	Clevis link	75828
7	1	Center link	75829
8	4	Cylindrical bushing	75874
9	8	Flanged bushing	75875
10	1	Right end cap	75830
11	2	Clevis pin	75835
	2	Cotter pin	51402-8-S
12	1	Left end cap	76234

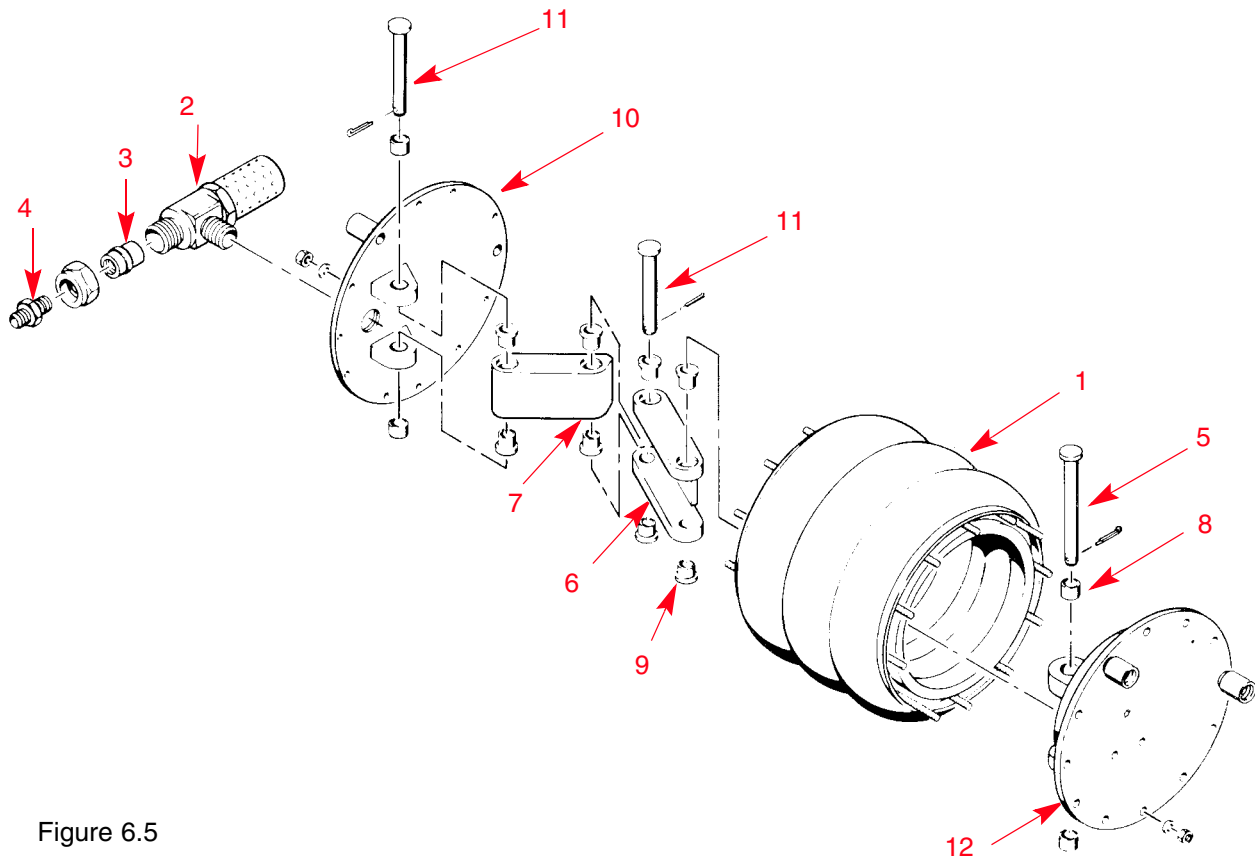


Figure 6.5

**Manifold assembly**

Item	Qty	Description	Part no.
1	1	Clamp valve	76140
	3	Socket head cap screw	50104-14-C
	3	Regular lock washer	50904-C
2	1	Lift valve	76141
	3	Socket head cap screw	50104-14-C
	3	Regular lock washer	50904-C
3	1	Manifold	76101
4	1	Check valve	74731
5	1	Ext. pipe countersunk hex plug	53000-16-C
6	2	Ext. pipe countersunk	53000-2
7	1	Ext. pipe/37 <sup>0</sup> connector	56501-4-4-S
8	1	Ext. pipe/37 <sup>0</sup> connector	56501-8-8-S
9	1	Ext. pipe/37 <sup>0</sup> connector	56501-12-12S
10	1	Lift/Lower instruction plate	76149
	4	U-type drive screw	53301-6-4
11	1	Clamp/unclamp instruction plate	76143
	2	U-type drive screw	53301-10-6
12	1	Close nipple	53916-B
13	1	Swivel joint	19159

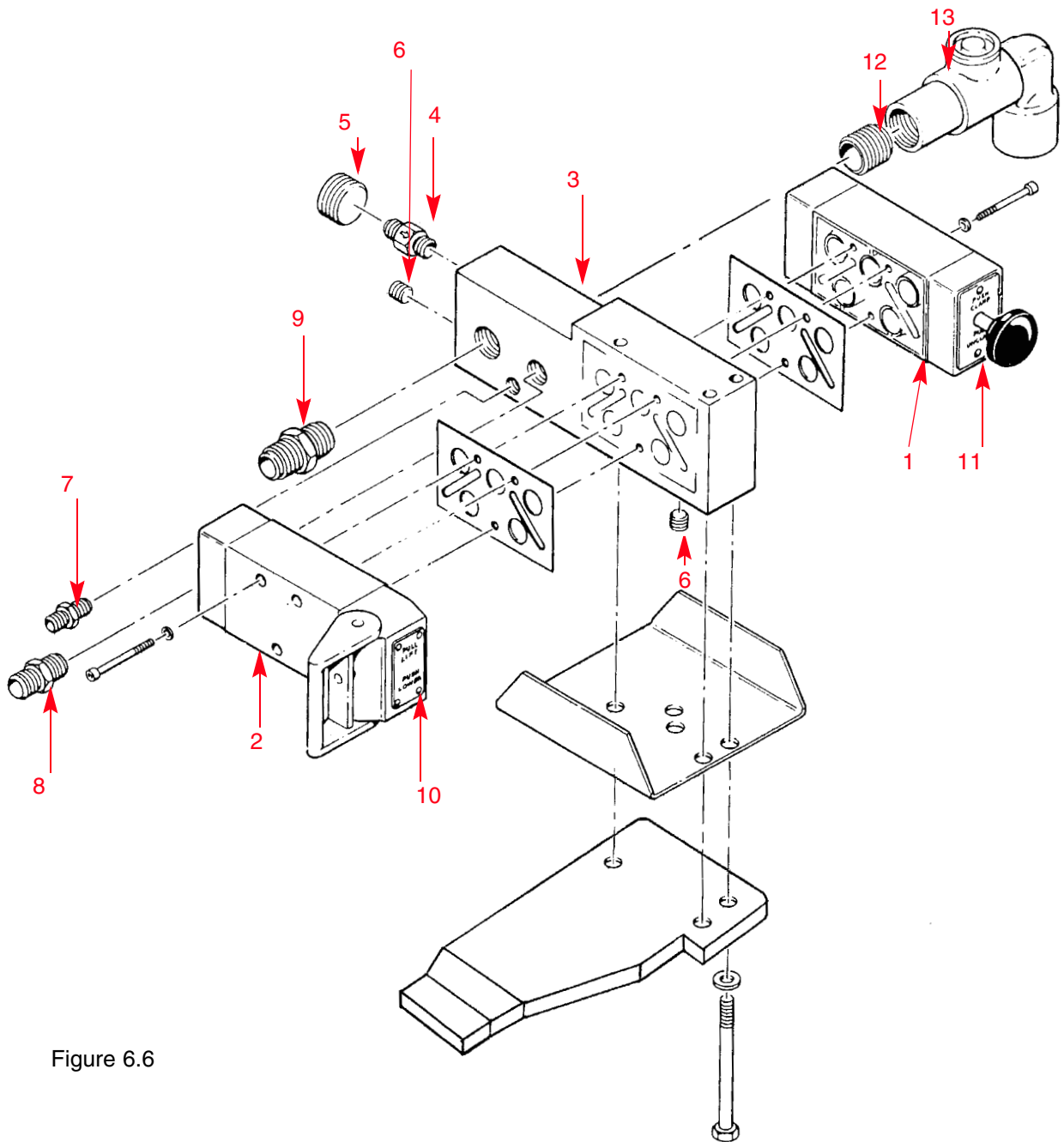


Figure 6.6

### **Pneumatic system assembly**

<b>Item</b>	<b>Qty</b>	<b>Description</b>	<b>Part no.</b>
1	1	Lift cylinder hose assembly	58572P080051
2	1	Right motor hose assembly	75924
4*	1	90° Elbow ext. pipe/37°	56506-16-12S
3	1	Left motor hose assembly	75925
4*	1	90° Elbow ext. pipe/37°	56506-16-12S
5	1	Right T-fitting	74253
6*	1	45° Elbow, ext. pipe/37°	56502-12-12S
7	1	Left T-fitting	75920
6*	1	45° Elbow ext. pipe/37°	56502-12-12S
8	1	Inboard left motor hose assembly	76261-1
9	1	Outboard left moter hose assembly	76261-2

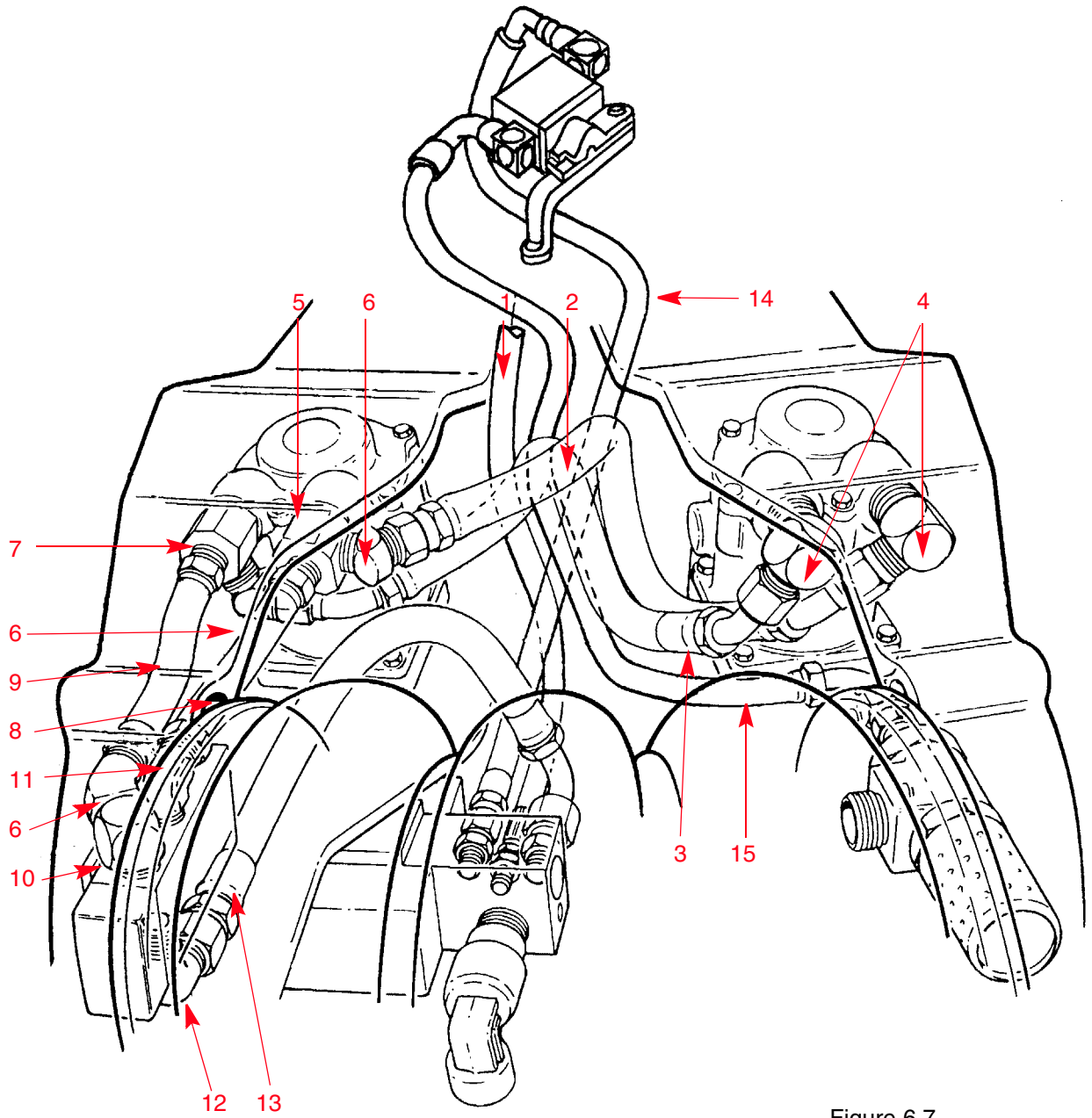
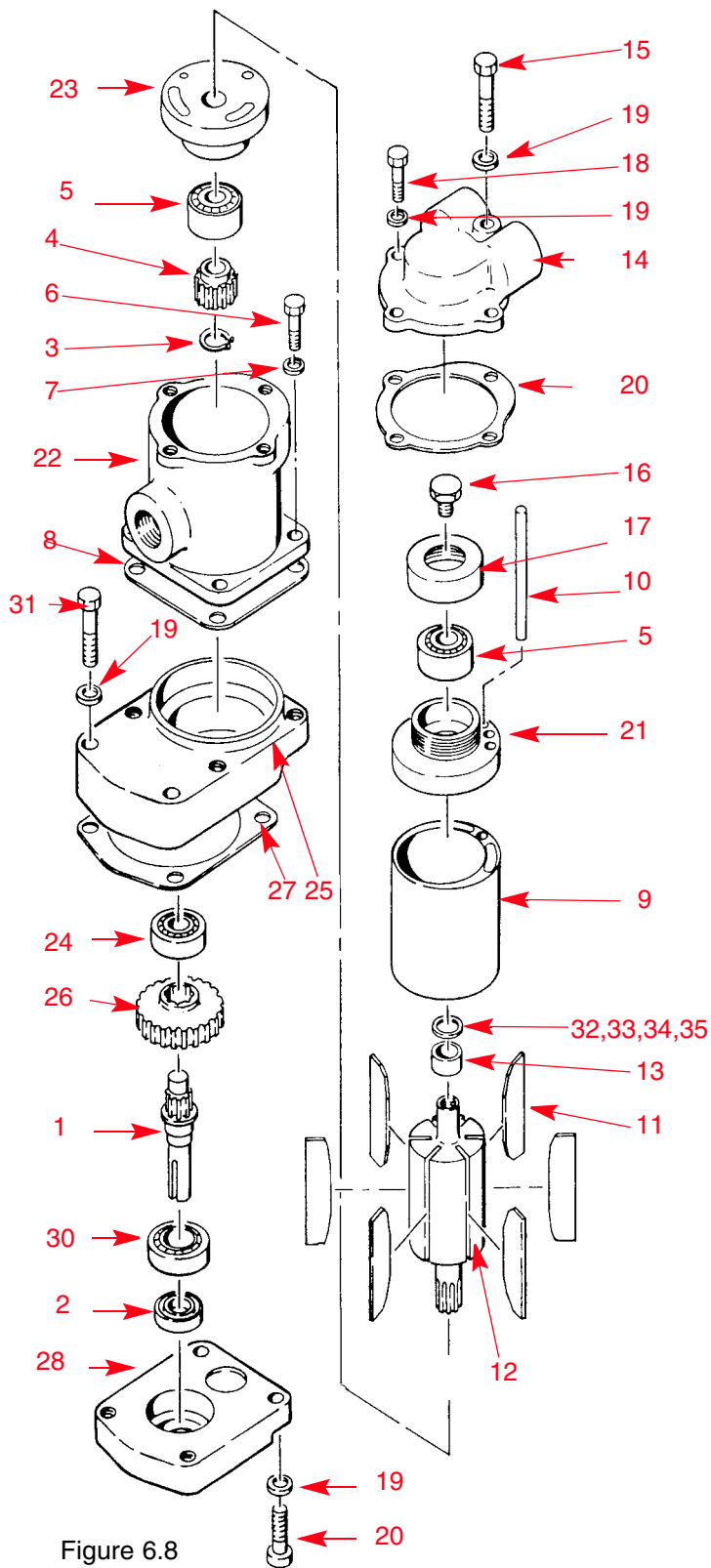


Figure 6.7

**Air motor assembly**

Item	Qty	Description	Part no.
1	1	Output shaft	74555-1
2	1	Seal	74555-2
3	1	Ext retaining ring	74555-3
4	1	19 Teeth gear pinion	74555-4
5	2	Ball bearing	14694-37
6	4	Hex head cap screw	50006-8-C5
7	4	Regular lock washer	50906-C
8	1	Motor to gear housing gasket	74555-8
9	1	Liner	14694-35
10	1	Dowel	76187-1
11	6	Rotor blade	14694-39
12	1	Rotor	76187-2
13	1	Bearing spacer	14694-40
14	1	Motor housing cover	76187-3
15	1	Hex head cap screw	50005-18-C5
16	1	Bearing clamp screw	14694-32
17	1	Bearing clamp nut	14694-34
18	4	Hex head cap screw	50005-9-C5
19	9	Regular lock washer	50905-C
20	1	Cover gasket	74555-20
21	1	Upper end plate	14694-33
22	1	Motor housing	76187-4
23	1	Lower end plate	14694-41
24	1	Ball bearing	74555-24
25	1	Gear housing	74555-25
26	1	50 Teeth gear	74555-26
27	1	Housing to cover gasket	74555-27
28	1	Gear housing cover	74555-28
29	2	Hex head cap screw	50005-7-C5
30	1	Ball bearing	74555-30
31	2	Hex head cap screw	50005-20-C5
32	A/R	Rotor .001 shim	14694-42
33	A/R	Rotor .002 shim	14694-43
34	A/R	Rotor .003 shim	14694-44
35	A/R	Rotor .005 shim	14694-45

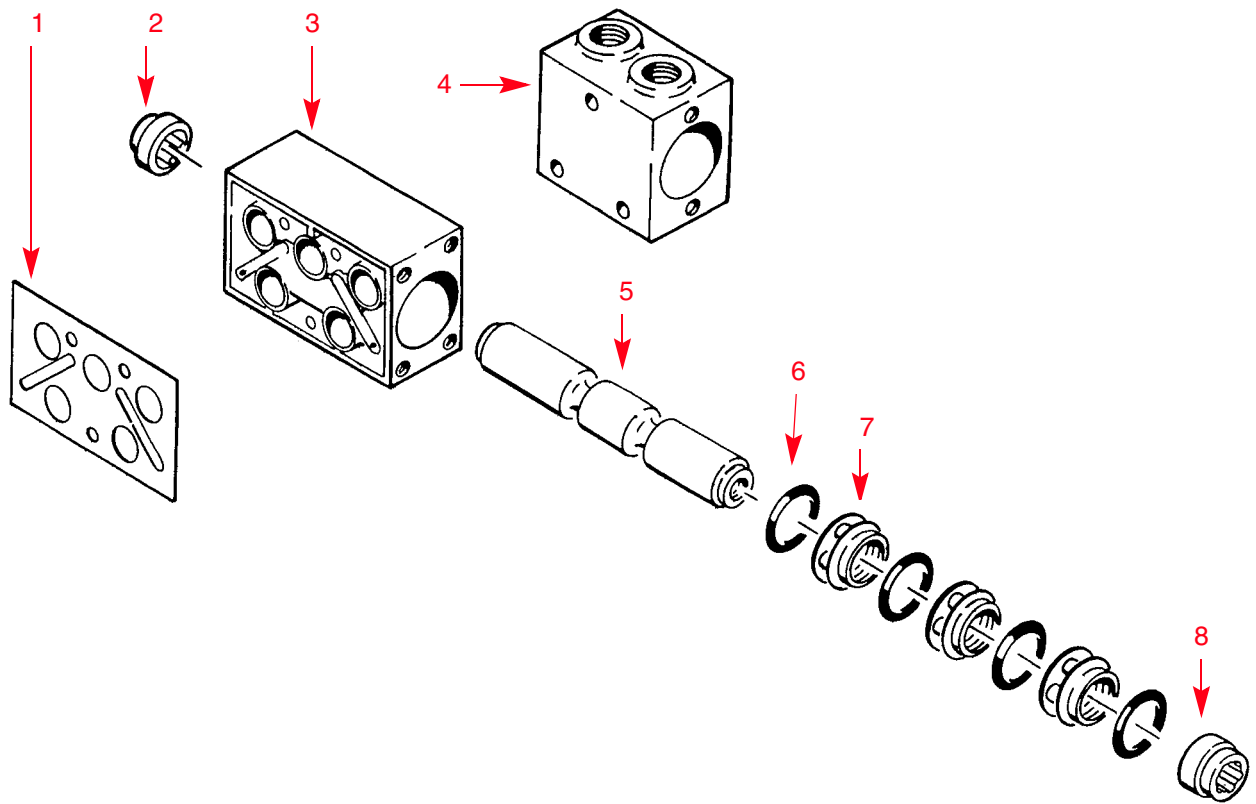




### Control valves

Seal kit, motor valve	13001
Seal kit, lift or clamp valve	75803

Item	Description
1	Gasket
2	End guide
3	Valve body lift or clamp valve (requires gasket)
4	Valve body motor valve (no gasket)
5	Spool
6	Seal ring (6 in kit)
7	Spacer (1 in kit)
8	End guide



**Lift cylinder**

Item	Qty	Description	Part no
1	1	Shackle with pin	944515-2
2	1	Piston rod	75341-1
3	8	Tie rod nut	75341-2
4	1	Retainer	75341-3
5	1	Rod end head	75341-4
6	4	Tie rod	75341-5
7	1	Gland	75341-6
8	1	Gland wiper	75341-7 *
9	1	Gland back-up washer	75341-8 *
10	1	Gland lipseal	75341-9 *
11	1	Gland O-ring	75341-10 *
12	2	Piston lipseal	75341-11 **
13	2	Piston back-up washer	75341-12
14	1	Piston	75341-13
15	1	Body	75341-14
16	2	Body O-ring	75341-15 **
17	1	Cap end head	75341-16
18	1	Drilled shank bolt	76925
19	1	Hex-slotted nut	50512-C
20	1	Cotter pin	51402-10

\* Included in seal kit part no. 75802-1

\*\*Included in seal kit part no. 75802-2

