USER'S MANUAL

SSW30

Spinning Wrench

REFERENCE Spinning wrenches	REFERENCE DESCRIPTION Wrenches

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Phone +31-76-5083000
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DOCUMENT NUMBER	REV
50006034-MAN-001	**B** March 2013

www.nov.com

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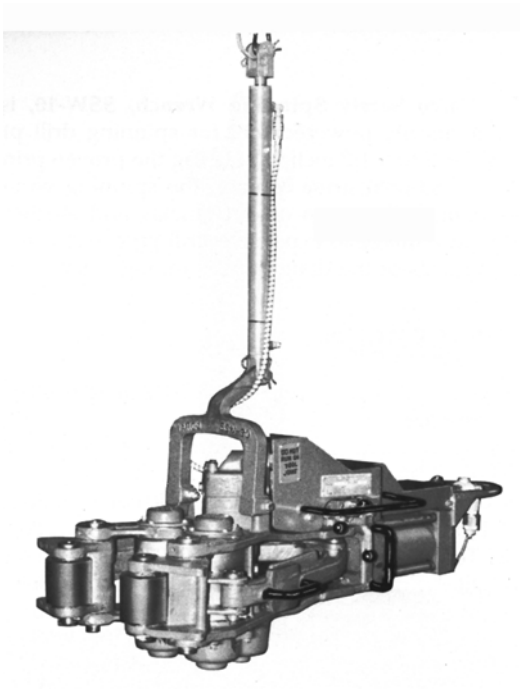

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	VarcoBJ BV Nijverheidsweg 45 4879AP Etten-Leur Tel: +31-76-5083000 Fax: +31-76-5046000
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Revision History

Rev	Date	Reason for issue
B	March 2013	Update
A	08.09.2009	Update
-	01.08.2006	Issued for Implementation

Change Description

Revision	Change Description
-	First Issue
A	New style
B	Chapter Lubrication and maintenance: Recommended grease/hydraulic fluid added
B	Chapter Appendixes: Reception, storage, transport & decommissioning added.
B	Added chapter Spare Parts
B	All chapters: small changes

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General Information

Instructions

Original Instructions are published in English; in the event the end-user may wish to obtain a translation of these in the official language of the country in which the machinery is to be used please contact your local NOV representative. Please note that this service may not be free of charge. Original Instruction can be downloaded from www.NOV.com/drilling

Оригиналните инструкции са публикувани на английски език; в случай, че крайният потребител желае да получи превод на тези инструкции на официалния език на държавата, в която се използва оборудването, моля, свържете се с вашия местен представител на NOV. Моля, имайте предвид, че тази услуга може да не е безплатна. Оригиналните инструкции могат да бъдат изтеглени от: www.NOV.com/drilling

Původní návod je zveřejněn v angličtině; pokud si koncový uživatel přeje získat překlad návodu v úředním jazyce země, ve které se zařízení bude používat, může se obrátit na místního zástupce společnosti NOV. Upozorňujeme, že tato služba nemusí být zdarma. Původní návod je k dispozici ke stažení na adrese www.NOV.com/drilling

Juhendi originaal on avaldatud inglise keeles. Kui lõppkasutaja soovib tõlget selle riigi ametlikus keeles, kus seadmeid kasutatakse, palume pöörduda NOV-i kohaliku esindaja poole. Palume silmas pidada, et see teenus ei pruugi olla tasuta. Juhendi originaali saab alla laadida veebisaidilt www.NOV.com/drilling.

Instrukcijų originalas yra skelbiamas anglų kalba. Jei galutinis vartotojas norėtų gauti šių instrukcijų vertimą į šalies, kurioje įrengimai turi būti naudojami, oficialiąją kalbą, reikėtų kreiptis į vietinį NOV atstovą. Prašome atkreipti dėmesį, kad ši paslauga gali būti mokama. Instrukcijų originalą galima parsisiųsdinti iš tinklalapio www.NOV.com/drilling

Šo norādījumu oriģinālvaloda ir angļu valoda; gadījumā, ja jūs kā gala lietotājs vēlaties saņemt norādījumu tulkojumu tās valsts oficiālajā valodā, kurā šī mašīna tiks lietota, lūdzu, sazinieties ar vietējo „NOV" pārstāvi. Lūdzu, ņemiet vērā, ka šis var nebūt bezmaksas pakalpojums. Norādījumus oriģinālvalodā varat lejupielādēt no vietnes www.NOV.com/drilling

A használati utasítások eredetileg angol nyelven kerülnek kiadásra. Amennyiben a végfelhasználó meg szeretne kapni azon ország hivatalos nyelvén készült fordításukat, ahol a gépet használni fogják, akkor kérjük, vegye fel a kapcsolatot a NOV helyi képviselőjével. Kérjük, vegye figyelembe, hogy ezt a szolgáltatást esetleg nem tudjuk díjmentesen nyújtani. Az eredeti használati utasítás a www.NOV.com/drilling oldalról tölthető le.

Oryginalne instrukcje zostały wydane w języku angielskim. Aby uzyskać tłumaczenie tych instrukcji na język kraju, w którym urządzenie ma być używane, należy skontaktować się z lokalnym przedstawicielem firmy NOV. Należy pamiętać, że taka usługa jest płatna. Oryginalną instrukcję można pobrać na stronie www.NOV.com/drilling

As Instruções Originais são publicadas em inglês; se o utilizador final pretender obter uma tradução destas instruções no idioma oficial do país onde a maquinaria vai ser utilizada, deverá contactar o representante local da NOV. Chamamos a atenção para o facto de este serviço poder não ser gratuito. As Instruções Originais podem ser transferidas a partir do site www.NOV.com/drilling

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De originale anvisninger er udgivet på engelsk. Måtte slutbrugeren ønske at få en oversættelse af disse i det officielle sprog af det land, hvor maskineriet skal bruges, henvises der til den lokale NOV-repræsentant. Bemærk venligst at denne service måske ikke er gratis. De originale anvisninger kan downloades fra www.NOV.com/drilling

Die Originalanleitung erscheint in englischer Sprache. Wünscht der Endverbraucher eine Übersetzung dieser Anleitung in der offiziellen Sprache des Landes, in dem die Maschine benutzt werden soll, dann wenden Sie sich bitte an Ihren örtlichen NOV-Vertreter. Bitte beachten Sie, dass diese Dienstleistung möglicherweise nicht kostenlos ist. Die Originalanleitung können Sie unter folgendem Link herunterladen: www.NOV.com/drilling.

Las instrucciones originales son publicadas en inglés. En el caso de que el usuario final quiera obtener una traducción en el idioma oficial del país donde la maquinaria será utilizada, debe ponerse en contacto con su representante local de NOV. Tenga en cuenta que este servicio puede conllevar gastos. Es posible descargar las instrucciones originales desde www.NOV.com/drilling.

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Les consignes originales sont publiées en anglais; dans le cas où l'utilisateur final demande une traduction de ces consignes vers la langue officielle du pays dans lequel la machine doit être utilisée, veuillez contacter le représentant NOV sur place. Le service de traduction peut être payant. Les consignes originales peuvent être téléchargées du site www.NOV.com/drilling.

Foilsítear Treoracha bunúsacha sa Bhéarla; i gcás ar mian leis an úsáideoir aistriúchán a fháil i dteanga oifigiúil na tíre ina bhfuil an t-innealra le húsáid déan teagmháil le d'ionadaí áitiúil NOV le do thoil. Bíodh a fhios agat gur féidir nach bhfuil an tseirbhís sin saor in aisce. Is féidir Treoir Bhunúsach a íoslódáil ag www.NOV.com/drilling

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De oorspronkelijke instructies zijn in het Engels gepubliceerd. Als de eindgebruiker een vertaling van de instructies wil ontvangen in de officiële taal van het land waar de machine zal worden gebruikt, neem dan contact op met uw plaatselijke NOV vertegenwoordiger. Let op dat er kosten aan deze service verbonden kunnen zijn. De oorspronkelijke instructies kunnen worden gedownload op www.NOV.com/drilling.

Originalinstruktionerna publiceras på engelska. Om slutanvändaren önskar en översättning av dessa till det officiella språket i det land där utrustningen ska användas, kontakta den lokala NOV-representanten. Observera att denna tjänst eventuellt inte är kostnadsfri. Originalinstruktionerna kan laddas ned från www.NOV.com/drilling

How to use this manual

This manual is divided into 10 Chapters. When applicable, each chapter includes:

1. A table of contents, or an illustrated view index showing:
   - Major assemblies, system or operations
   - Page references to descriptions in text
2. Disassembly / assembly information and tools
3. Inspection information
4. Testing / trouble shooting information
5. Repair information
6. Adjustment information
7. Torque values

Intended audience

This manual is intended for use by field engineering, installation, operation, and repair personnel. Every effort has been made to ensure the accuracy of the information contained herein. NOV, Varco® 2013, Varco LP, will not be held liable for errors in this material, or for consequences arising from misuse of this material.

Special information

Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. Please note that this may manual contain warnings about procedures which could damage equipment, make it unsafe, or cause PERSONAL INJURY. Please understand that these warnings cannot cover all conceivable ways in which service (whether or not recommended by NOV) might be done, or the possible hazardous consequences of each conceivable ways. Anyone using service procedures or tools, whether or not recommended by NOV, must be thoroughly satisfied that neither personal safety nor equipment safety will be jeopardized.

All information contained in this manual is based upon the latest product information available at any time of printing. We reserve the right to make changes at any time without notice.

Illustrations

Illustrations (figures) represent a graphical representation of equipment components for use in identifying parts or establishing nomenclature. These figures may or may not be drawn to scale.

For more specific component information pertinent to your rig configuration, see the technical drawings that accompany your NOV documentation.

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.**

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.

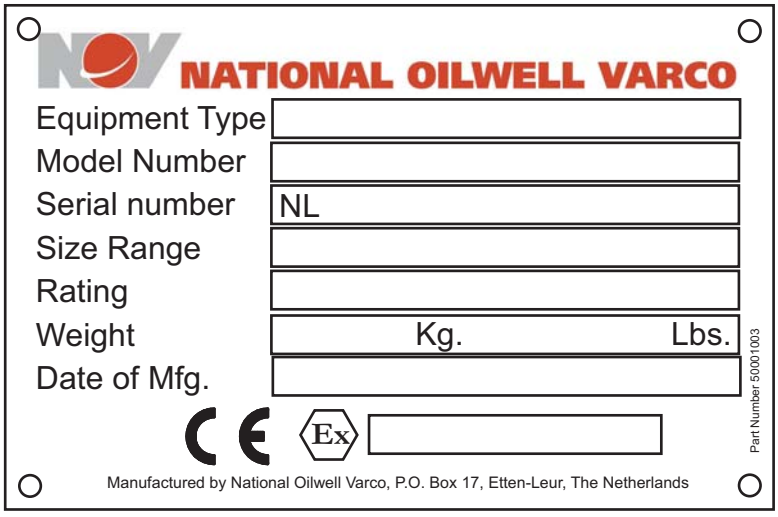
Limited warranty

The warranty will be void if the SSW30 or parts were either:

- unauthorized modified, repaired or serviced
- replacement parts not manufactured by NOV were utilized
- not properly stored or maintained

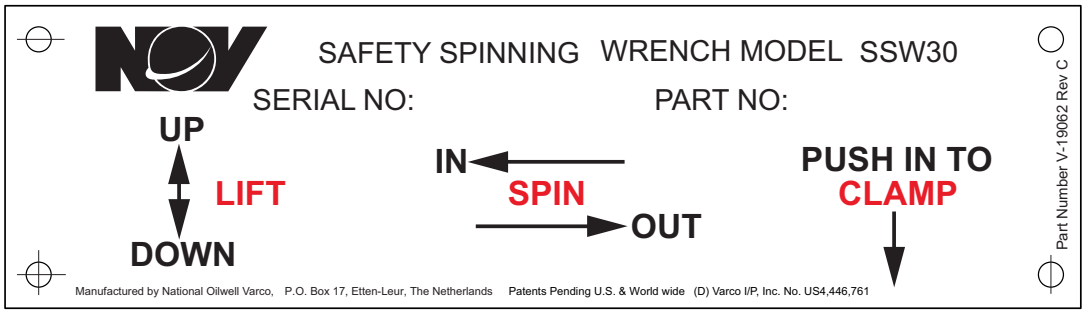
Warning plates and labels

⚠ **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.**

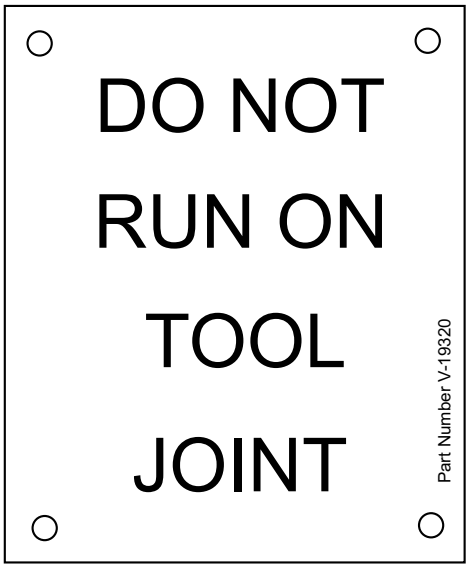


Universal nameplate part no. 50001003

Information plate part no. 50000125. URL to user's manuals and read manual prior to use.



Controls plate part no. V-19062



Caution Label Part no. V-19320

CE marking

The marking is as follows:

CE Ex II 2G T4 Tamb 55°

⚠ **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.**

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General specifications

General description

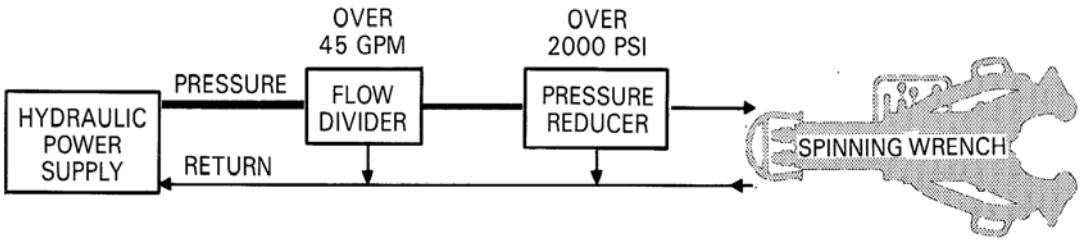
The NOV SSW30 spinning wrench is a hydraulically powered tool capable of spinning drill pipe and drill collars from 2.7/8” to 9.1/2” (73 - 241 mm) OD.

General specifications, requirements & sizes

Item	Subject	Description
Dimensions	L x W x H	62.8 x 27 x 26.5 inch (1,595 x 686 x 673 mm)
	Weight	850 lbs (385 kg)
Torque	5” pipe	900 - 1,000 ft.lbs (1,215 - 1,350 Nm)
Speed	5” pipe	100 rpm
Hydraulic system	Minimum working pressure	1,800 psi (12,410 kPa) and 29 gpm (110 l/min) flow
	Maximum working pressure	2,000 psi (13,789 kPa) and 45 gpm (170 l/min) flow
	Tbg. and hose sizes	All Tbg. and hoses that connect the SSW30 to the power unit main ring need to have a minimum nominal size of 1/2” diameter
	Hydraulic fluid contamination class	SAE AS 4059 class 9 ISO 4406: 1999 Class 19/17/14 NAS 1638 class 8
	Filter to be applied in the hydraulic supply line	50 micron
Power Unit	Pressure requirement	1,800 - 2,000 psi (12,410 - 13,789 kPa)
	Flow	29 - 45 gpm (110 - 170 l/min)
Design temperatures*	Ambient temperature range	-4°F (-20°C) up to 131°F (+55°C)
	Working / operational / oil temp	Recommended 104°-122°F / 40°- 50°C Maximum 140°F / 60°C
	Surface temperature (ATEX T4)	Maximum 275°F / 135°C
*It is up to the user to ensure the temperatures as indicated will not be exceeded		
Environment	Maximum Humidity:	100% RH
	IP Rating:	IP66
Explosion safety	ATEX Category:	2
	ATEX Gas Group:	IIB
	ATEX T Class:	T4
	ATEX EPL:	Gb
Limits	Use Limits:	Trained persons only (Users responsibility)
	Space Limits:	External limits defined by Defined in the Users Instructions
	Time Limits:	Design life = 20 years

Power Unit

When the hydraulic power unit output is over 45 gpm (170 l/min) and/or over 2,000 psi (13,789 kPa), a flow divider and/or a pressure reducer is required (use Flow Kit part no. 71057)

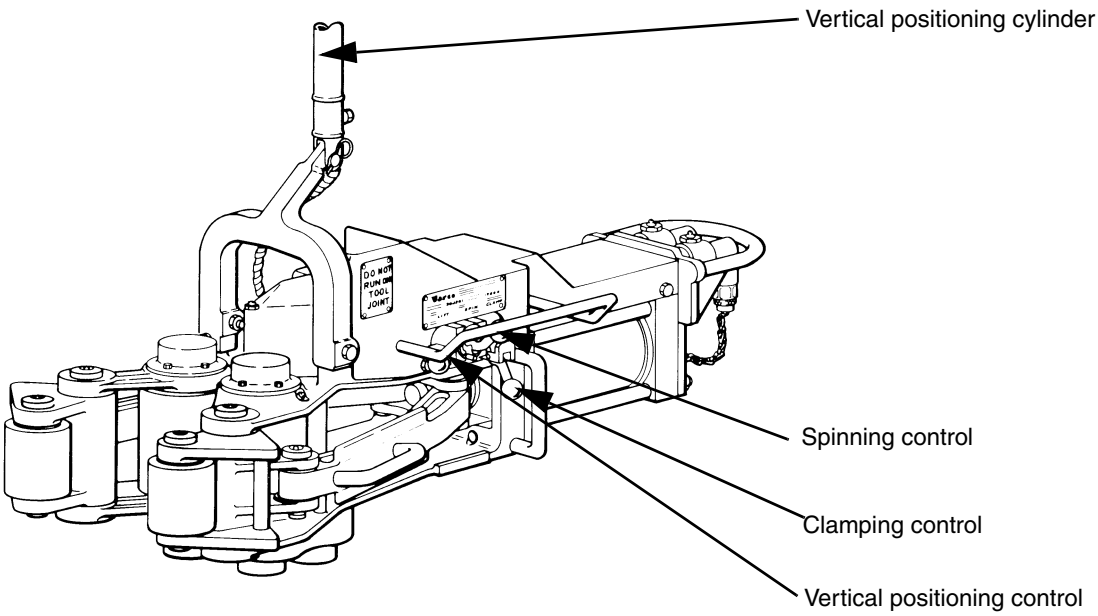


Theory of operation

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.



SSW30

Closed or Open Center Systems

The SSW30 is shipped from the factory equipped for operation with a closed center hydraulic center system unless specified otherwise in the order.

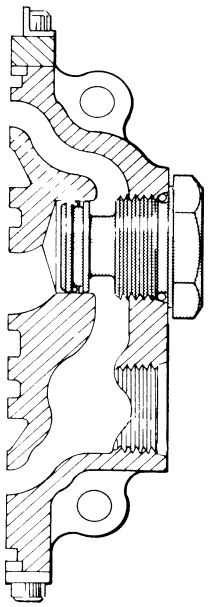
Part numbers

Closed Center	19000-6
Open Center	19000-7

Closed center system

In the closed center system, flow through the valve is blocked in the center position; therefore, it is called ‘closed center’.

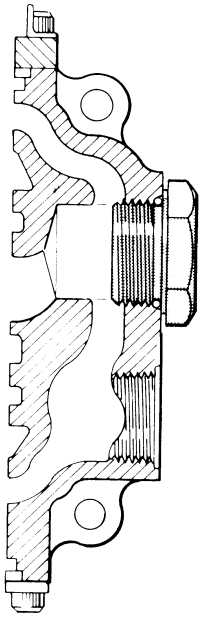
The flow is restricted by the closed center system. The power unit pump will develop pressure up to its relief valve setting and the flow will be diverted back to the reservior through the relief valve at high pressure.



Open center system

In the open center system, flow through the valve in the center position is open to the power unit pump, therefor, it is called ‘open center’.

The pump flow circulates through the valve and returns to the reservoir at low pressure.



Whenever any one of the valves is operated the flow will go to the cylinder or hydraulic motor which has been selected.

Lubrication and maintenance

Safety

⚠ **WARNING: It is not allowed to weld on SSW. Please contact an authorized NOV repair facility.**

⚠ **WARNING: Ensure that all hydraulic lines are disconnected before ANY work is performed on the SSW. It's not always sufficient to isolate the hydraulic lines by using a ball valve, as the hoses might function as an accumulator, which could generate movement of the SSW. The ball-valve is installed to ease connecting and disconnecting the QD with pressure still on the line and for disconnecting the SSW from the power source.**

⚠ **WARNING: SSW's which have experienced wear or are found to have cracks must be replaced or repaired by a NOV authorized repair facility.**

⚠ **WARNING: Only original NOV OEM parts must be used. SSW's are produced from certified high strength steel and must not be welded in the field. Improper welding can cause cracks and brittleness in heat-affected areas which can result in dramatic weakening of the part and possible failure. Repairs involving welding and/or machining should be performed only by a NOV authorized repair facility. Using a SSW that has been improperly welded or repaired is dangerous.**

⚠ **WARNING: Do not use casing and tubing lubricant for lubricating the SSW30.**

Recommended hydraulic fluid

The requirements for the hydraulic oil are based upon the best performance of the actuators at specific temperatures / viscosity.	
Recommended oil type	Mineral oil type HVLP (DIN 51502), HV (ISO 6743-4) or equivalent

Determination of the required viscosity class regarding the working temperature

Viscosity class	Working temperature (acc. ISO 3448) ° C
32	30 up to 50 ° C (86° F up to 122° F)
46	40 up to 60 ° C (104° F up to 140° F)
68	50 up to 70 ° C (122° F up to 158° F)

Recommended grease

Use extreme pressure, lithium based, multi purpose grease classification according to ISO 6743-9:2003 Lubricants, industrial oil and related products (class L) - Classification - Part 9: Family X (greases) or equivalent.

Minimum requirements:

Operating temperature range	Grease type
Temp. above -20° C	EP2: L-XBAFB, NLGI grade 1 or 2
Temp. below -20°C	EP1: L-XCAFB, NLGI grade 1 or 2

Recommended gearbox fluid

The requirements for the gearbox oil are based upon:	
Recommended oil type,temp. above -20° C	Mineral oil type CLP 150 (DIN 51517-3), CKC 150 (ISO 6743-6) or equivalent

Procedure maintenance & lubrication (in use)

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

Lubrication

Procedure

Item	Description	Lube points	Lubricant	Frequency
1	Pressure rollers	2	Grease	Every trip
2	Pressure roller pivots	2	Grease	Every trip
3	Clamp beam pivots	2	Grease	Every trip
4	Drive roller bearings	2	Grease	Every trip
5	Clamp cylinder link pivots	2	Grease	Every trip
6	Hose connection swivel fittings	2	Grease	Every trip
-	Gear case (not drawn)	1	Drain, flush and refill (0.75 gallon)	Every 3 months

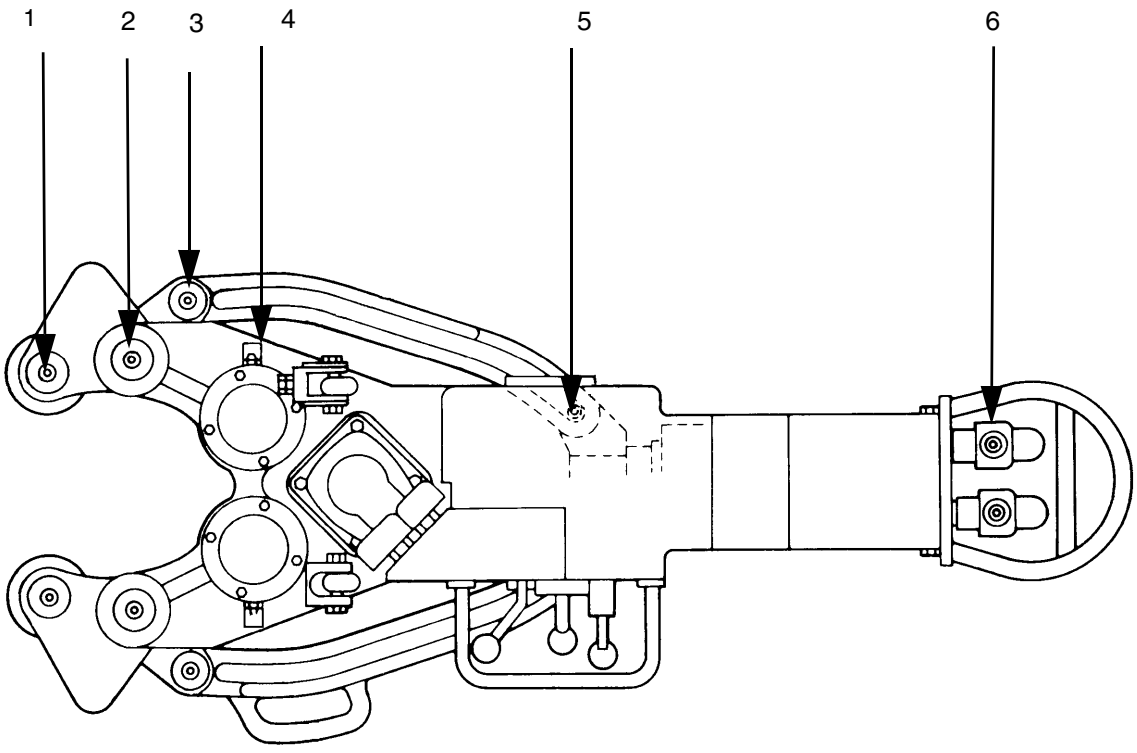


Figure 3.1: Lubrication

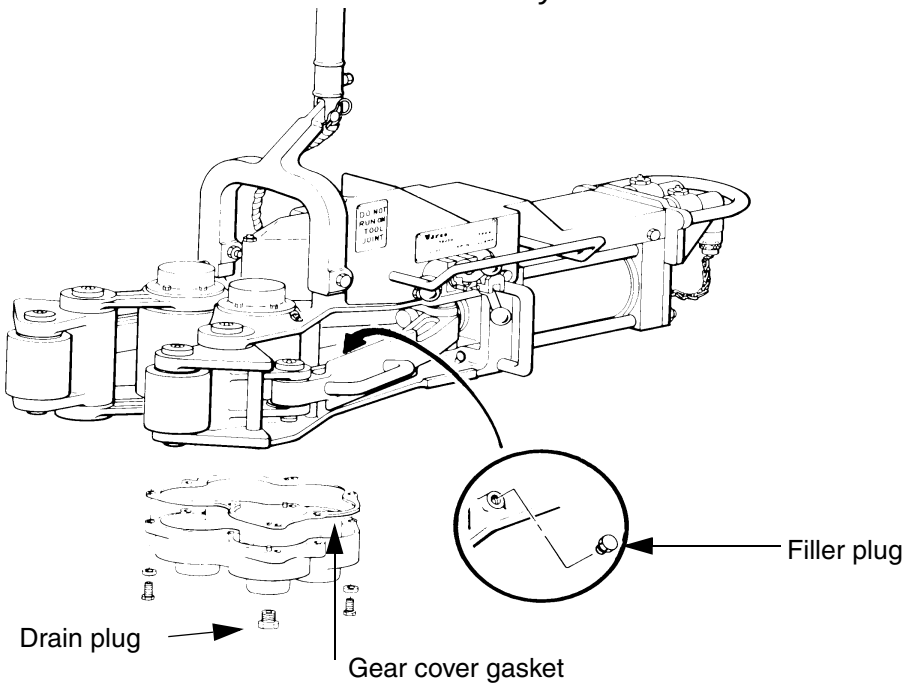
Inspection

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

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 roller in adjustment acc. to procedure	Avoid dry over-oiled lubricator
	Never use equipment that is not operating properly

Preventive maintenance every three months



1. Drain the oil from the gear case and remove the gear case cover
2. Check the torque of the motor mounting bolts for 140 to 150 ft-lb. (190 to 203 Nm)
3. Check the gear train for any signs of unusual wear. Note the condition of the intermediate shafts and bearings. If any unusual wear is noted in the gear case, determine the cause and correct.
4. Reinstall the gear case cover with a new gasket.
5. Fill the gear case with 0.75 gallon (2.84 l) flushing oil.
6. Run the SSW30 idle for 15 minutes.
7. Drain the flushing oil from the gear case.
8. Fill the gear case with 0.75 gallon (2.84 l) gearbox fluid.
9. Check hydraulic power supply per applicable service manual.

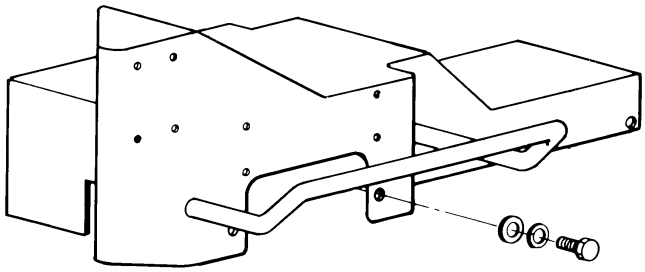
Control Valve assembly repair / replacement

Repair of the control valve assembly is limited to replace the O-rings. If the valve detents do not hold the pressure roller control in the clamp or unclamp position, or if other damage occurs, change-out the complete valve assembly.

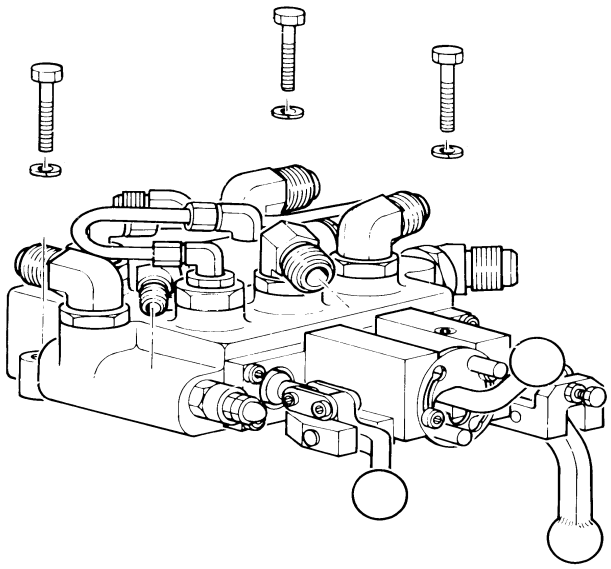
Control Vale Assembly O-ring replacement

Procedure

⚠ **WARNING : Remove hydraulic pressure from the SSW30 before preforming this procedure, or injury to personnel or damage to equipment may result.**



Top cover assembly



Control valve

Fig 1: **Top cover and control valve**

1. Remove top cover assembly and then the control valve from SSW30. See figure 1.

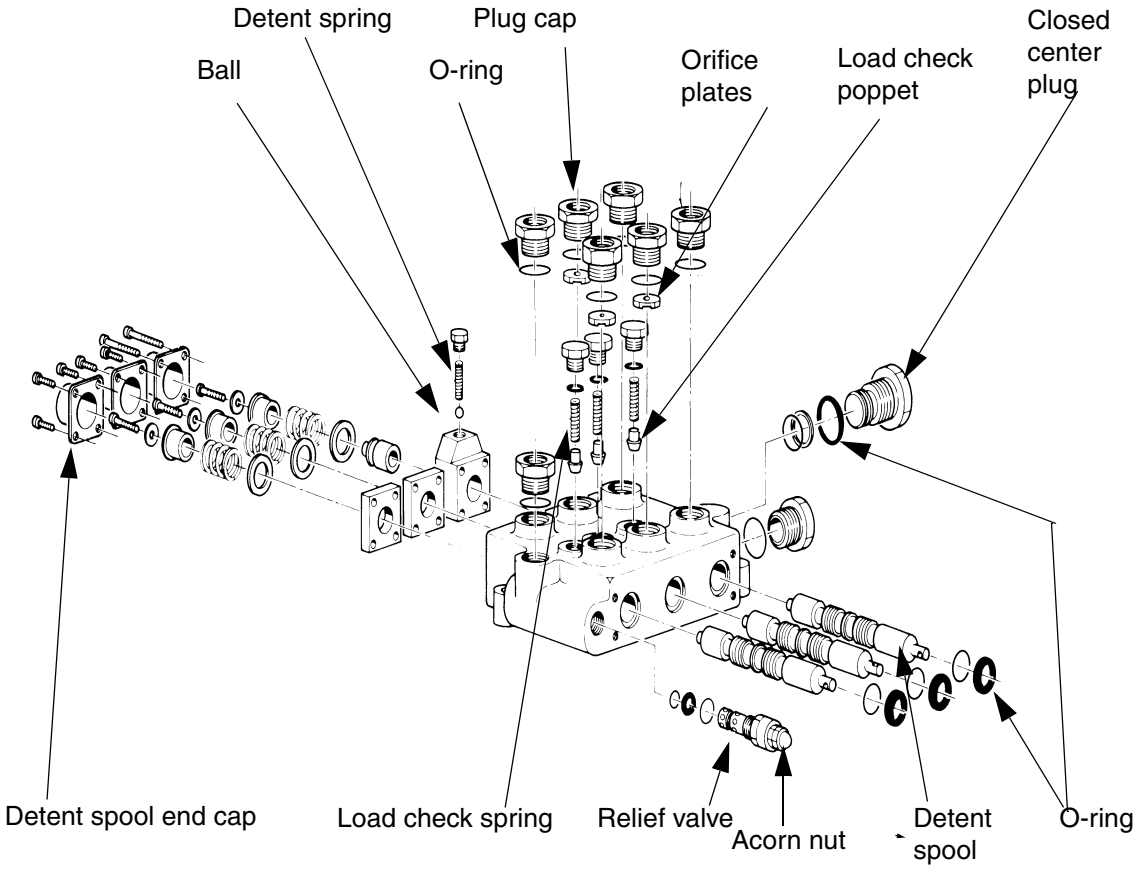


Figure 2. **Control valve exploded view**

2. Remove detent spool stop, handles and handle linkage from valve assembly. See Figure 2 and 3.
3. Remove handle bracket (see figure 3) and end caps

NOTE :When removing detent spool end cap, use extreme care not to lose the detent spring and ball.

4. Remove retainers and O-ring at each end of the spools. Install new O-rings
5. Inspect the O-ring retainers for scratches, nicks or other damage, replace as necessary, and install over the O-rings.
6. Assemble the valve per figure 2. When installing the detent spool and end cap, ensure that the spool engages the detents.
7. Should leaks occur at the relief valve or plugs, unscrew the part and replace the O-ring(s).
8. Install the valve in the reverse order of figure 1.

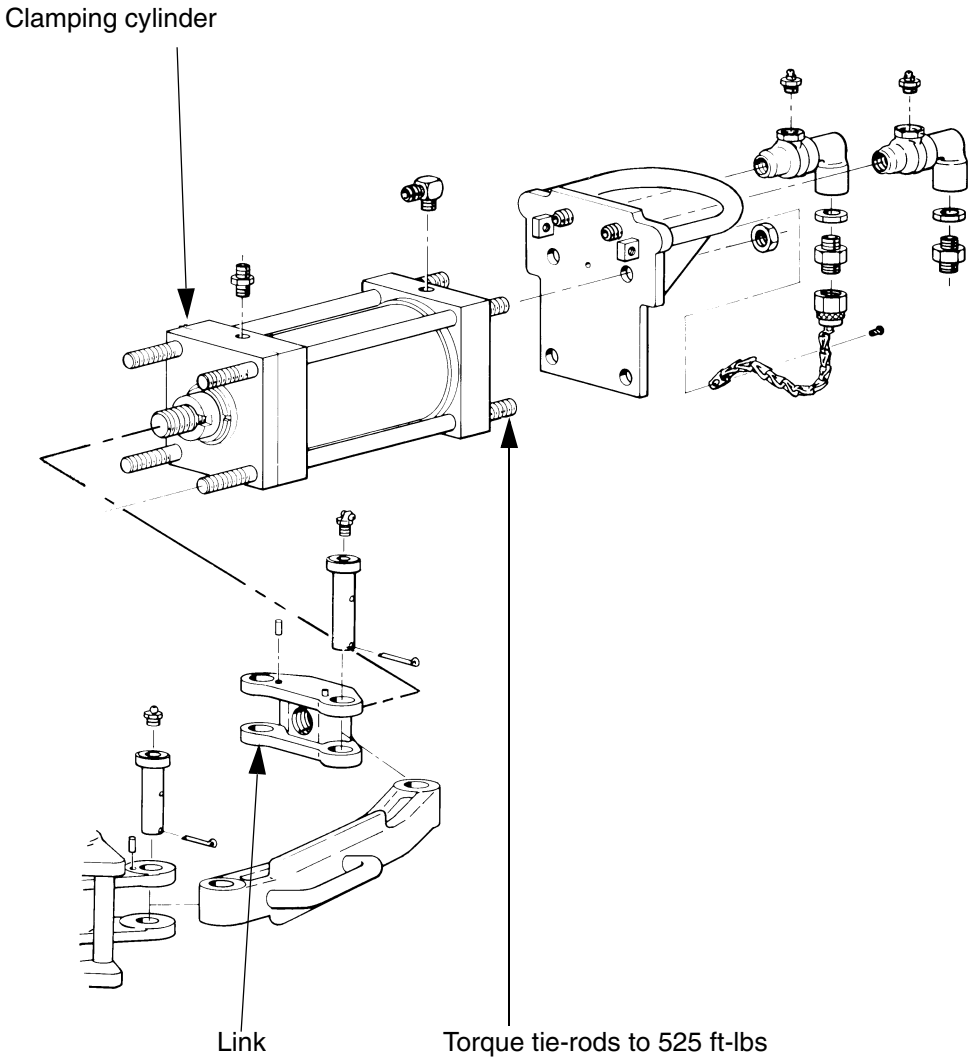


Figure 3. **Clamping cylinder repair/replacement**

Spool stop adjustment

Procedure

With the detent spool stop screw and jam nut installed, pull detent spool to the full position.

Turn screw until it barely touches the end of the spool, back out if turn and tighten jam nut.

Operate the spool several times to ensure that the stop is correctly installed and adjusted.

Relief valve adjustment

Procedure

The relief valveinstalled on the control valve is factory adjusted to 2,000 psi (13,789 kPa) and should not require further adjustment. In the event that it should become necessary to adjust the relieve valve, perform steps a through e.

a. With the hydraulic power applied to the SSW30, remove the relief valve acorn nut.
b. Push In To Clamp the clamping control lever.
c. Loosen relief valve locknut and, with a screwdriver, back out the adjusting screw until fluid flow can be heard. This will set the relief valve between 2,000 and 2,100 psi (13,789 and 14,479 kPa).(See also figure 4)
d. Tighten locknut, be careful not to change the setting.
e. Install acorn nut.

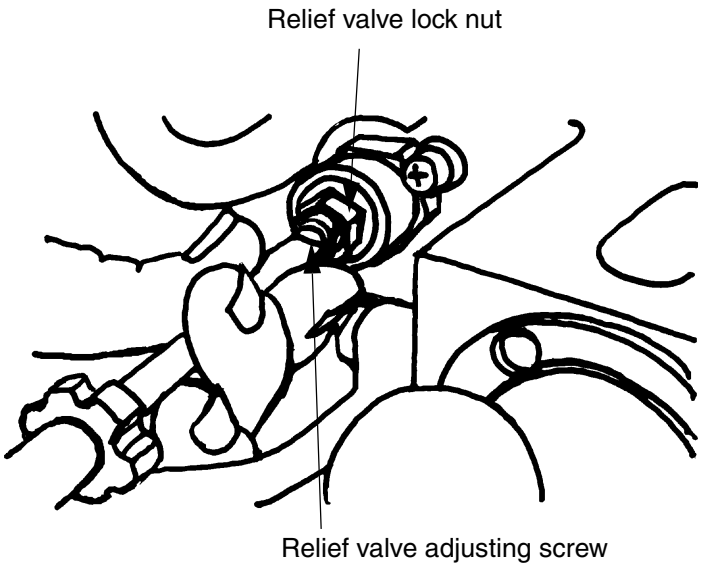


Figure 4. **Relief valve adjustment**

Clamping cylinder repair/replacement

Procedure

If the clamping cylinder shows signs of leaking, the most probable cause is faulty O-ring, or a less likely cause could be scored rod. With the cylinder fully extended, inspect rod for scoring or other damage. Changeout a cylinder with the scored rod. Replace faulty O-rings.

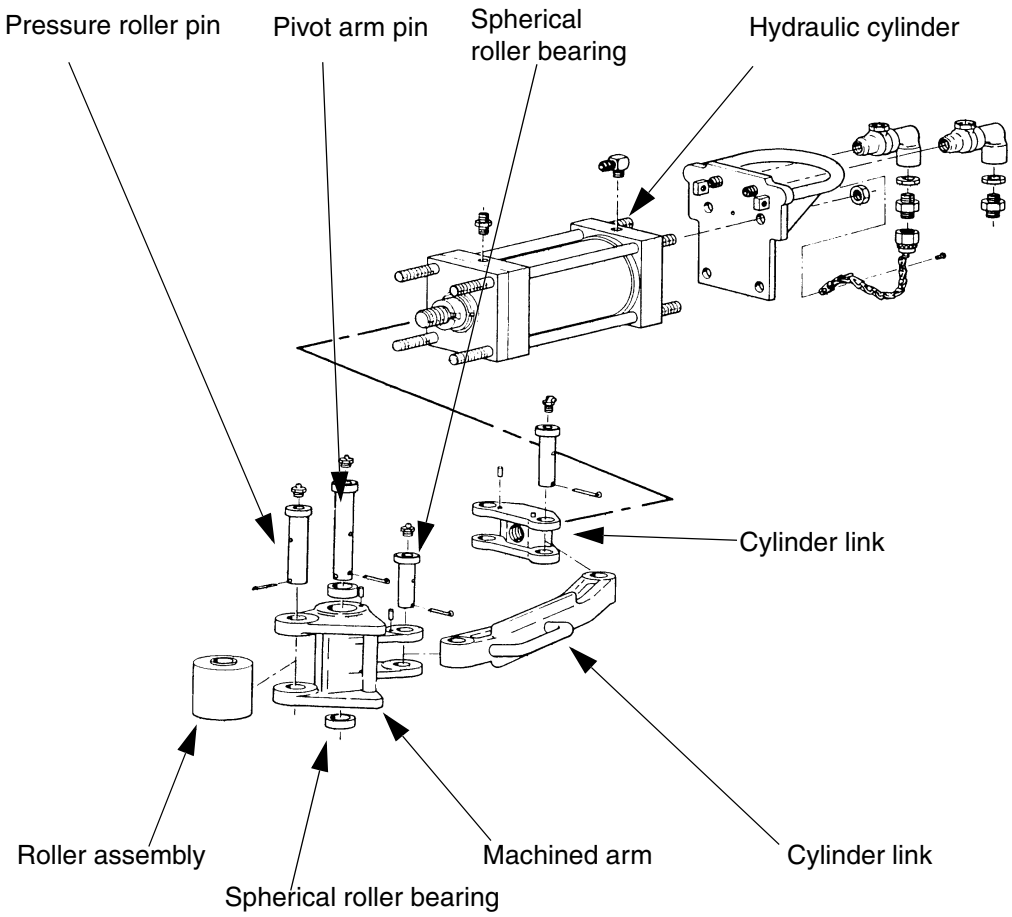


Figure 5**. Clamping system**

Clamping cylinder O-ring replacement

Procedure

⚠ **WARNING : Remove hydraulic pressure from the SSW30 before performing this procedure, or injury to personnel or damage to equipment may result.**

a. Remove clamping cylinder rom the SSW30 as per figure 5.
b. Disassemble cylinder to replace faulty O-rings (see figure 6)
c. Use NOV Part no 70109 or 74986-10 seal kit. (see figure 6 to determine which seal kit)
d. Assemble cylinder with new O-rings.
e. Apply hydraulic pressure to completed cylinder and check for leaks. Disconnect pressure from cylinder
f. Install cylinder in SSW30.

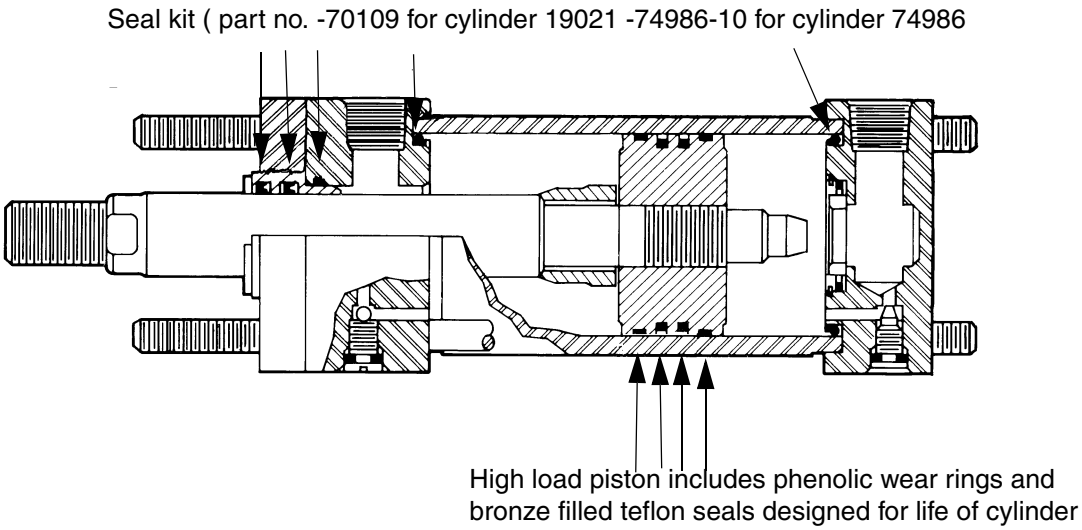


Figure 6. **Clamping cylinder seal locations**

O-ring installation

Procedure

1. Remove old O-ring.
2. Inspect old O-ring groove for burrs, dirt etc... Clean as necessary.
3. Push a tread protector (such as a plastic or metal trimble) over the treads, then push O-ring over thrimble and into groove.
4. Remove thrimble and install fitting.

⚠ *CAUTION : Use care when installing O-rings over threaded fittings to avoid damaging the O-ring. A damaged O-ring could leak.*

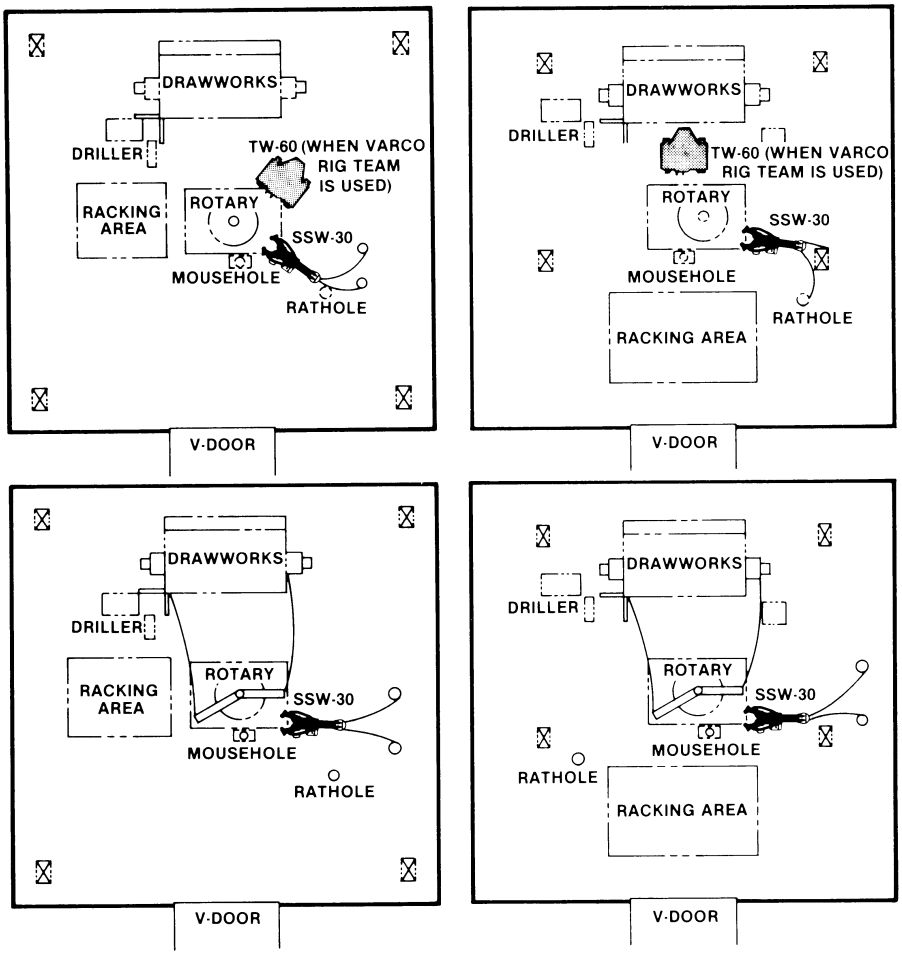
Installation and commissioning

Rig -up location

Rig-up location of the SSW30 is depending upon the type of rig and other equipment being used. Figures 4.1 en 4.2 show typical rig floor layouts and the most desirable locations for installation of the SSW30.

Two general installation cases should be considered:

- The SSW30 with the TW61 Torque wrench and
- The SSW30 alone.



Standard derricks

Jackknife derricks

Figure 4.1 **Typical rig floor layouts.**

The SSW30 with TW61 Torque wrench

Installing the SSW30 requires consideration of the movement of pipe on the rig floor, operation performed by the rig floor hands, and other equipment used on the rig floor. On each floor layout note that the TW61 is opposite the setback zone so pipe can be effectively stabbed. The SSW30 is mounted usually to the right of the TW61 at a 100° to 120° angle

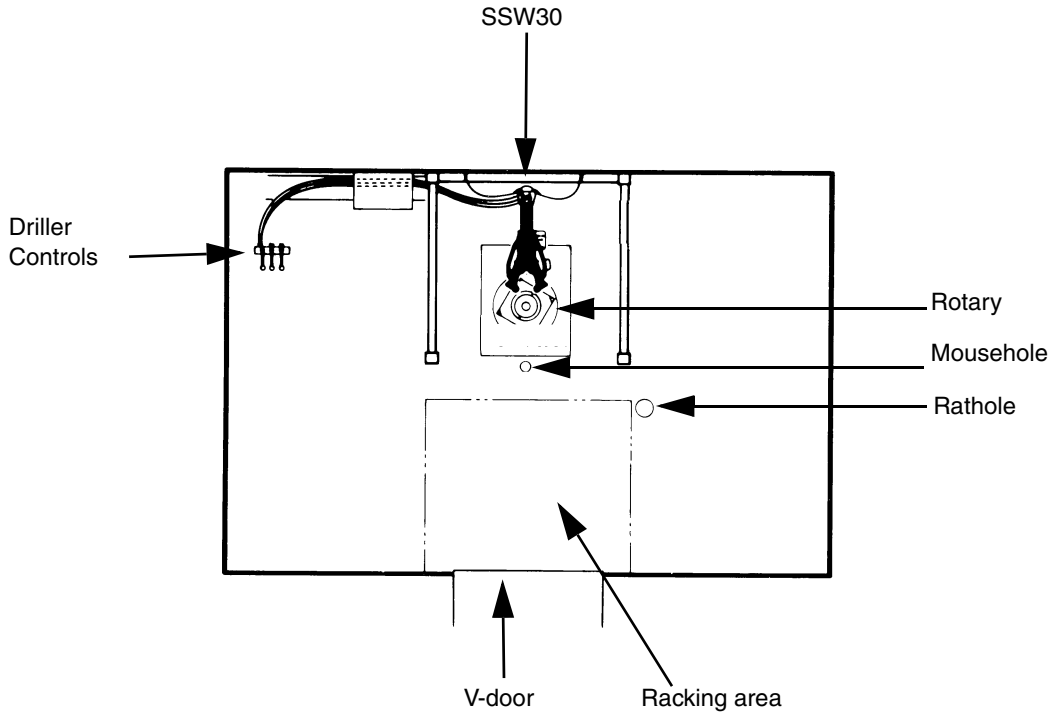


Figure 4.2 **Typical hydraulic rig.**

The SSW30 alone

On installations without the TW61, the SSW30 will be placed in the area away from the V-door and setback area in the same location as with the TW61. On a standard derrick this is in front of the drawworks near the driller but not obstructing the drillers view. On a jackknife derrick this is near the setback zone over the power end of the rotary table. On floating rigs the SSW30 is hung (when not used with the TW61) in front of the drawworks between the block guides. For power tool rig up kit see dwg. 18750.

Connecting power supply

Procedure

a. Unwind the 3/4” pressure hose and the 1” return hose and lift each onto the derrick floor.

b. Route the hydraulic hoses through the derrick floor and tie off with enough slack so as not to intefere with SSW30 movements. Eliminate all kinks and twisted sections in hoses before connecting.

c. Check hydraulic hoses and the SSW30 quick-disconnects for any mud, sand or other dirt, and clean as necessary before attempting connection.

d. Connect the hydraylic hoses to quick-disconnects mounted on the back of the SSW30. Connect the other end of the hoses to the hydraulic power supply.

⚠ *CAUTION : The 3/4" and 1" self sealing quick-disconnects must be tightened untill fully shouldered. If only partially open or not open at all. This will cause a severe pressure drop through the quick-disconnects which will cause the oil to overhead and the hydraulic power supply to overload.*

Checking operation.

Procedure

a. Check the reservoir of teh hydraulic power supply for sufficient fluid level, and then start the hydraulic power supply. Hydraulic oil must be clean

b. Cycle the pressure rollers to the clamped and unclamped positions several times to verify their proper operation and force any trapped air from the system.

c. Run the motor in the forward and reverse direction to check proper operation and to become familiar with the feel of the motor control

Adjustment

Procedure

a. Size : The pressure rollers have been set at the factory for 2.7/8" to 9.1/2" outside diameter pipe. No adjustment is necessary.

b. Speed : Roller speed is factory set in the forward and reverse directions by the orifice plates in the elbows which connect the hydraulic tubes to the control valve center spool

Hanging the SSW30

There are two methods of hanging the spinning wrench :

1. A fixed line method and
2. An alternate prefereable method using a counter balance line.

Fixed line method

Procedure

a. Attach a 5/8" (minimum cable in the derrick at a height that will allow a free easy swing. The higher the fixed line the easier it will be to move the SSW30 onto the pipe.

b. Attach the cable at across member on the crown approximately 3 to 4 feet from the drill pipe centerline as shown, and position the SSW30 as indicated in figure 4.3

c. Suspend the SSW30 approximately 4 feet above the floor measured at the bottom of the wrench.

Altenate counterbalanced method

Procedure

a. Attach pulley assembly in derrick at the same position as in the fixed line installation.

b. Attach a counterweight on free end of cable equal to the weight of the SSW30 (990 lb)

Height adjustment

Operate vertical position control to raise or lower SSW30 to correct working level (figure 4.3: Vertical lift 2 ft / 0.61 m travel).

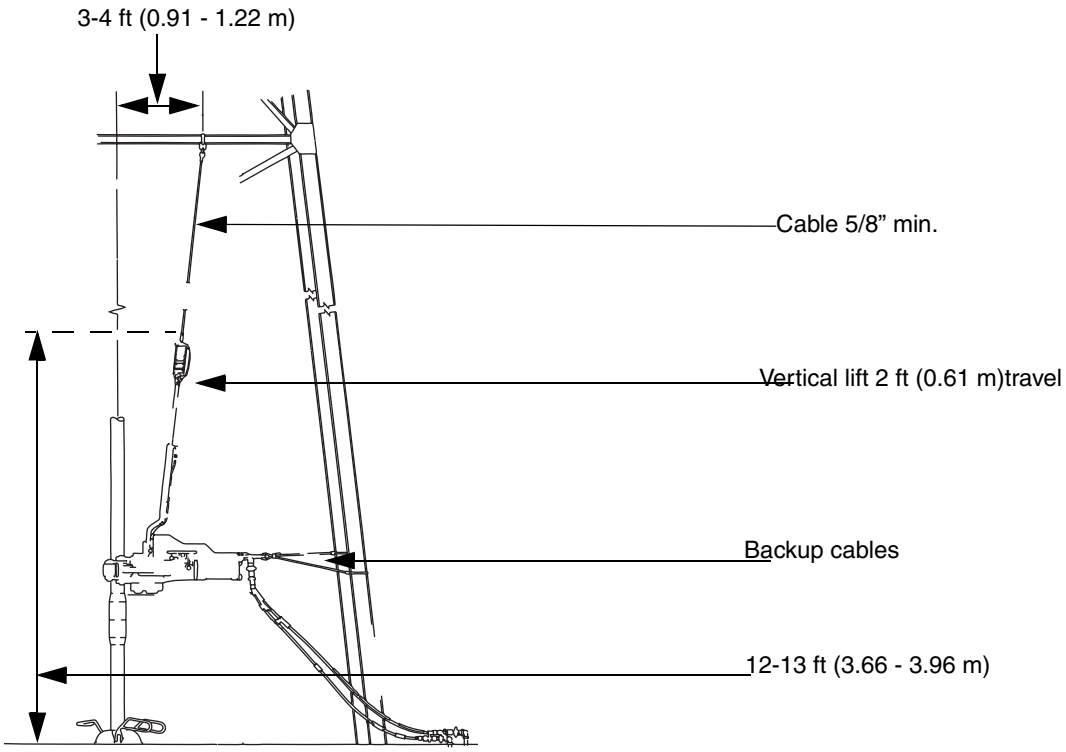


Fig 4.3 **Fixed line method.**

Attach Back-up cables

Procedure

⚠ **WARNING: Do not operate the SSW30 without cables or injury to personnel or damage to equipment could result.**

Attach two back-up cables to rear of the SSW30 to restrict movement to 1 foot (0.30 m) in either direction (figure 4.3).

Leveling the SSW30

Procedure

There is a capscrew in one leg ot the machined hanger. The capsrew can be turned in or out to adjust the SSW30 to a level position. The SSW30 should always be level to avoid damage to pipe threads or the SSW30 spinning rollers.

⚠ **WARNING:Do not operate the SSW30 without it being level or injury to personnel or damage to equipment could result.**

⚠ **WARNING : Do not operate the SSW30 without back up cables attached or injury to personnel or damage to equipment could result.**

⚠ *CAUTION : The spinning wrench must be level at point of contact with pipe before clamping. Use a bubble level to assure alignment.*

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Operation

Normal use

The SSW30 is operated by three control levers at the left center of the wrench (figure 5.1).

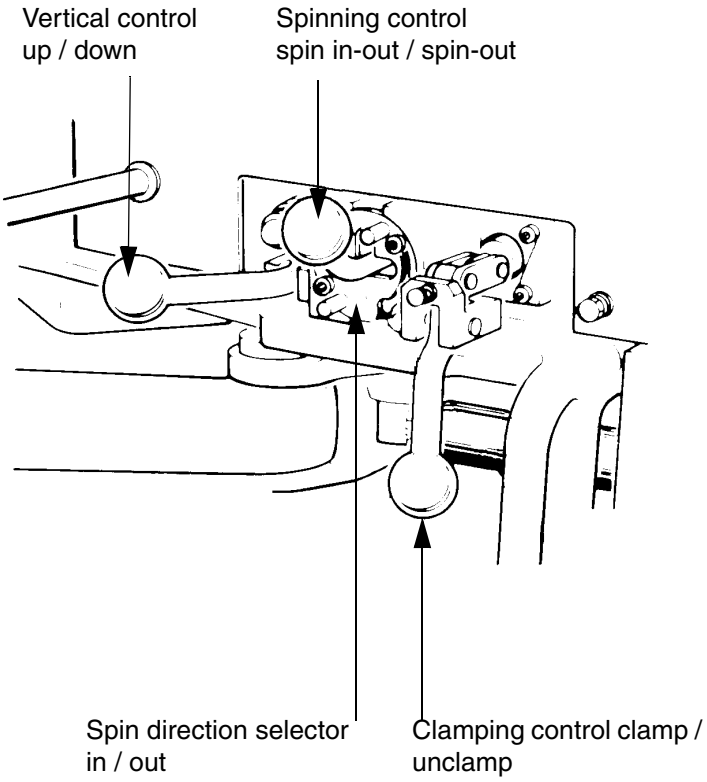

Fig. 5.1. **Control levers**

The front lever is for vertical positioning .

The center lever is for directional control. To change this control from Spin-in to Spin-Out, or vice versa, a manual interlock must be rotated. This is done by pushing the interlock in against spring pressure and rotating either right or left one-quarter turn. The control knob must be pushed foreward for Spin-In and rearward for Spin-Out.

The rear lever is for clamping and unclamping the pressure and drive rollers on the pipe. Push in to clamp the SSW30 onto the pipe. Push in to Clamp the SSW30 from the pipe. The clamping valve is detended for open, closed and neutral positions when operated in a closed center system. The clamping valve is spring loaded to center when opereted in an open center system.

Torque reaction of the SSW30 when spinning in is to the right (away from the operator) and when spinning out is to the left (toward operator)

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

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

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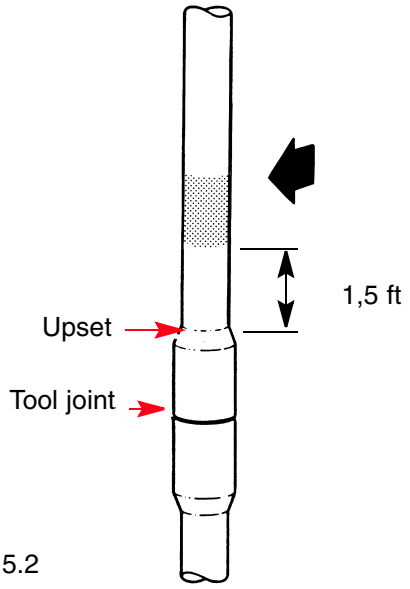


Figure 5.2

⚠ **WARNING: Do not run the tool on the pipe upset, tool joint, or on spiral groove drill collars. Tong die marks on the tool joints cause too much grip or friction and can cause damage to bearing and rollers.**

Operating sequence

Procedure

a. Swing on : Swing the SSW30, onto the drill string about 1,5 (0.45 m) feet above the tool joint. Operate the vertical position control as necessary.

b. Clamp : Push the rear control lever in to clamp the rollers on the pipe.

c. Set direction : set the manual interlock for operation in the desired direction. Spin-In or Spin-Out.

d. Spin : Operate the center control lever to run the motor. When spinning is completed, pull the rear control lever out to open the roller arms and then remove the SSW30 from the pipe. Return the clamp lever to neutral.

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. 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 hydraulic 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 Locktite to threaded surfaces, all threads must be clean and free of grease and grit.

Disassembly.

Procedure

Disassembly is presented in the next figures with the components of the SSW30 listed in the disassembly sequence. The disassembly starts with a complete assembly and ends with a bare body. It is not necessary to start at the beginning and work througt the figures for every task, lokate the part to be worked on and start at that point. Notes are provided, where applicable, to reference or explain a detail for the particular step of disassembly or assembly. When used in the reverse order the figures provide assembly information as well as disassembly information.

Assembly.

Procedure

Assembly of the SSW30 can be performed by following the reverse order of the figures.

Notes to a particular step are provided to highlight critical assembly information such as adjustment or torque values.

Vertical Positioning assembly.

Procedure

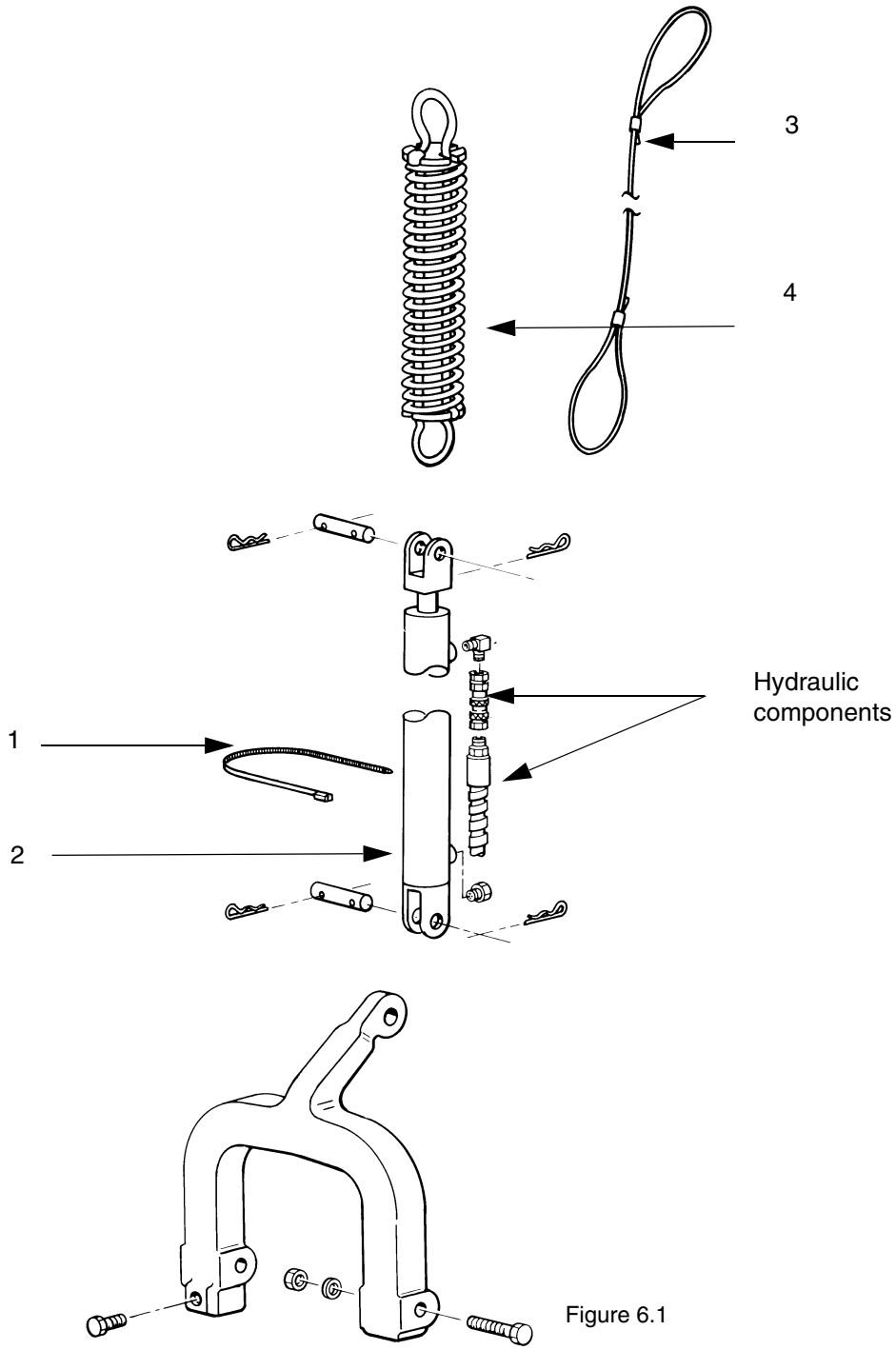


Figure 6.1

Cut and discard the cable tie (1). Tag the hydraulic fittings and hose for future use. The hydraulic cylinder (2) is supplied with attached hardware. Remove hex head plugs and install hydraulic fittings. Check the lifting sling (3) for kinks, fraying or other damage. Check the hanger spring (4) for signs for overtension. Replace hydraulic components when damaged.

Pressure/return system

Procedure

Top Cover (Figure 6.2)

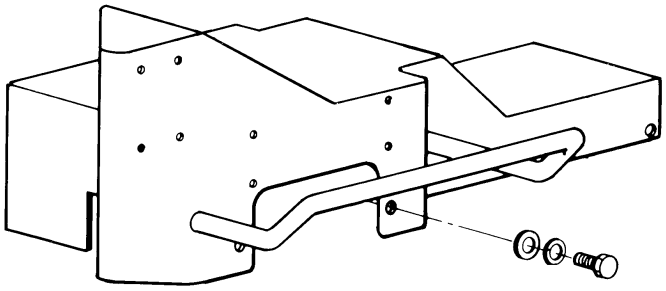


Figure 6.2

Disassembly : Remove the topcover (1) by removing the 6 bolts 3 on each side.

Assembly : Ensure tabs are lined up with holes in the cover.

Valve assembly, control 3 spool (Figure 6.3):

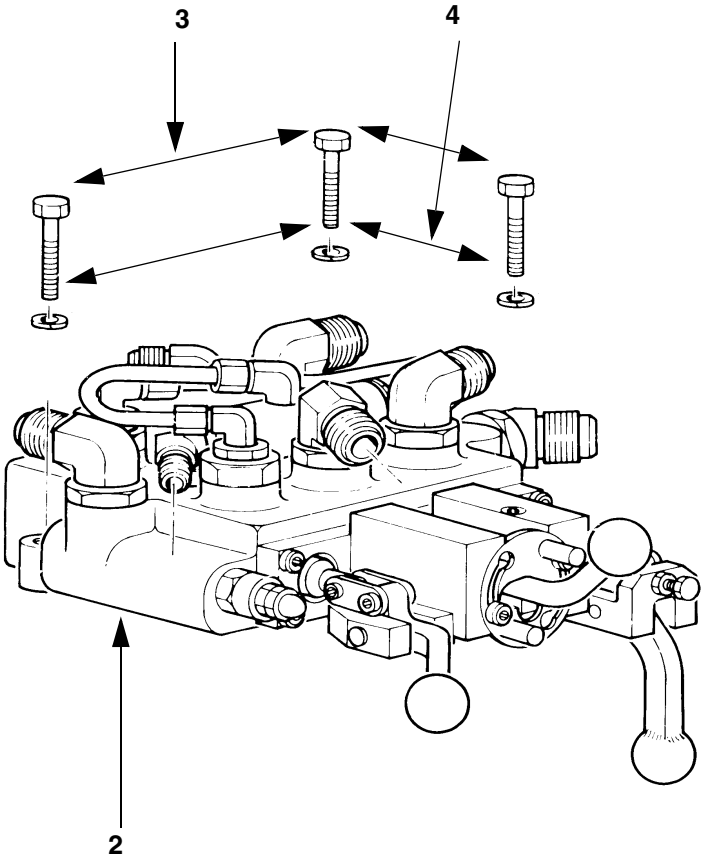


Figure 6.3

Disassembly of the control valve (Figure 6.3: 2)

Procedure

If necessary to replace a valve, remove tubes and attaching bolts. Remove center spool rear cover. Remove handles, links and brackets.

Unscrew the hex head cap screws (3) and do not forget the lock washer (4).

Assembly

Procedure

Install on wrench with 3 bolts and attached tubes. Apply locking compound to socket head screw and reassemble. Reinstall handles, links and brackets.

Hydraulic pressure/return connections

Procedure

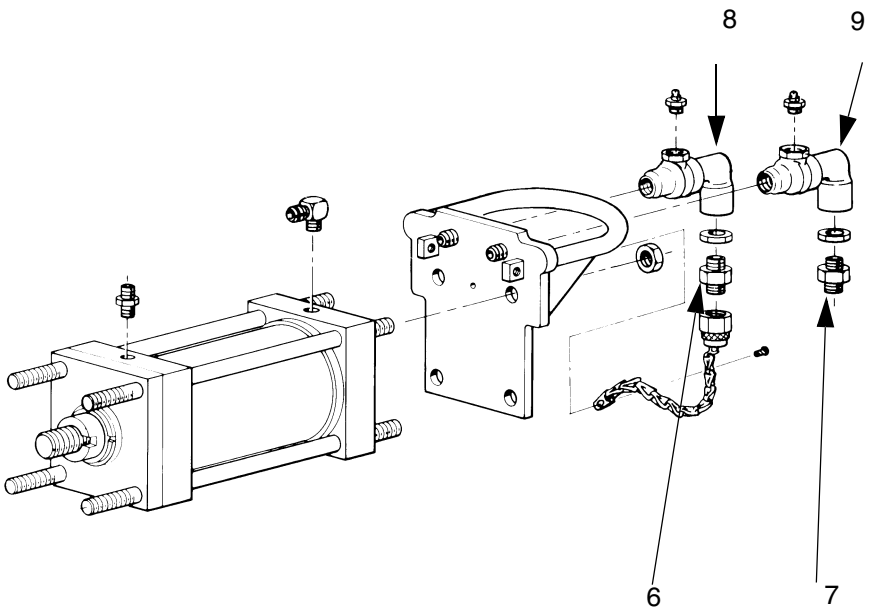


Figure 6.4

For the hydraulic quick disconnet valve nipple (6 & 7) the hydraulic pressure swivel (8) and hydraulic return swivel (9) by disassembly : if leaky, replace. By assembly : install new.

NOTE : All socket head cap srews when disassembled need to be replaced with new ones. All screws needs to be safety wired to resist unscrewing.

Converting valve to open center operation.

Procedure

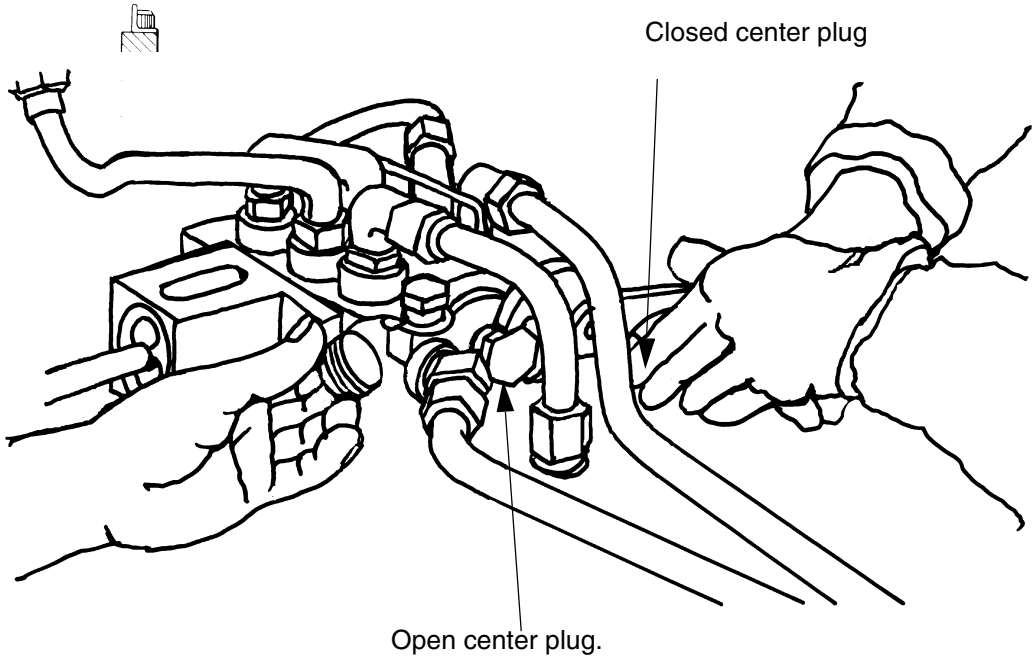
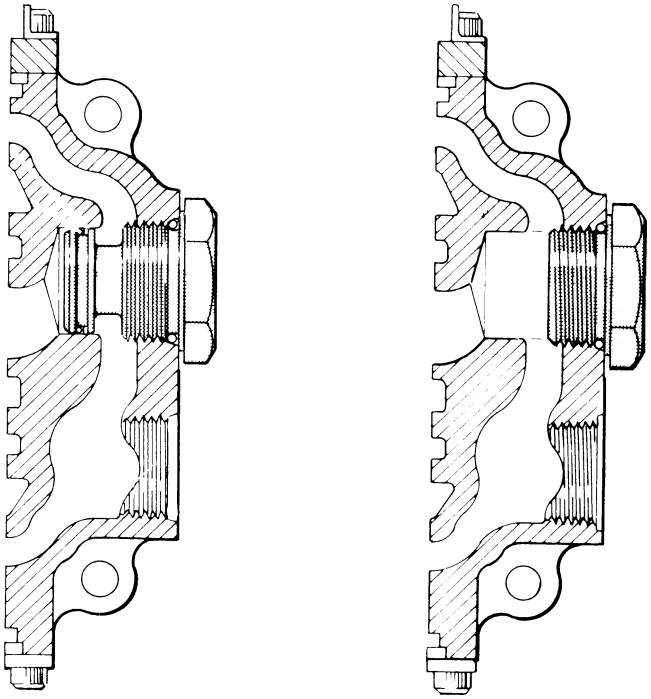


Figure 6.5

When converting from closed to open center, remove with a wrench the excisting plug and install the open center conversion plug.



Closed center

Open center

Figure 6.6

Drive roller system.

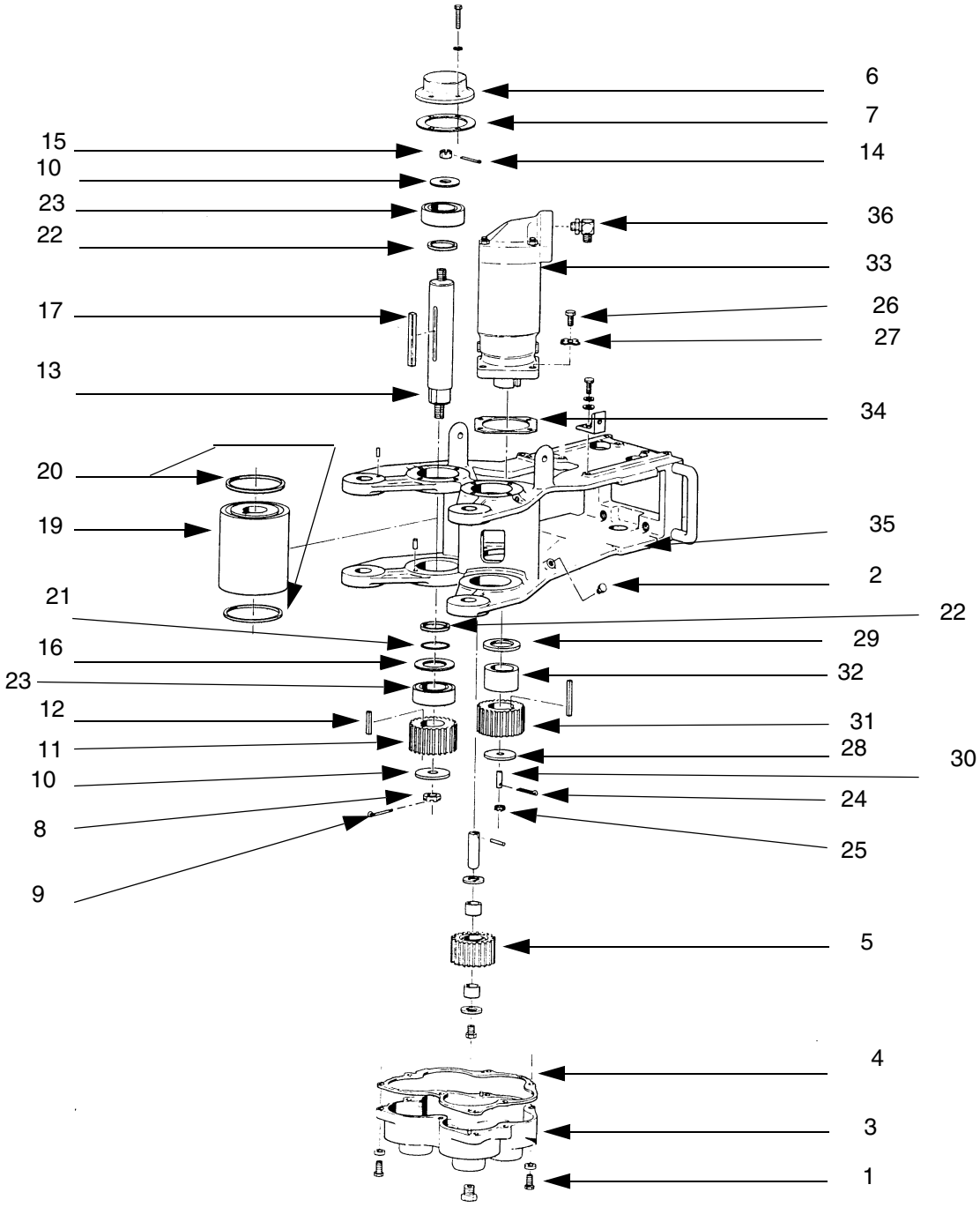


Figure 6.7: Drive rollers and hydraulic motor installation.

Disassembly

Procedure

Drain gear case (1) and clean mating surfaces of gear cover (3) and discard gasket (4).

For the Idler gear disassembly (5) see figure ??

Then remove the bearing cover (6) and clean the mating surface and discard the bearing cover gasket (7).

Remove Cotter pin 98) and slotted hex nut (9). Then remove retainer washer (10) and the driven gear (11). Following by removing the driven gear key (12).

Check both the driven gear and the driven gear key for wear.

Remove drive roller shaft (13) and check the key slots.

Remove cotter pin (14), slotted hex nut (15) and shield spacer (16). Then the drive roller key (17) can be removed and checked for wear.

Remove drive roller (19) and check the drive roller for wear (min. OD 6“). Discard the drive roller seals (20) and the O-ring (21).

Take of the drive roller spacer (22) and the spherical roller bearing (23). Check the bearing for wear.

Remove cotter pin (24), slotted hex nut (25), hex head cap screw (26), lock tab washer (27), retainer washer (28), thurst washer (28) and motor stud (30) to take out the drive gear (31). Check the drive gear for wear.

Take away the motor spacer (32) and then remove the hydraulic motor (33). Check the motor for straight, undamaged shaft and leaks.

Remove the hydraulic motor gasket (34) and discard the gasket.

Clean the hydraulic spinning wrench body (35) and check the body for nicks or other damage.

Remove,clean and inspect the 37° O-ring boss elbows

Assembly

Procedure

This is the reverse of the disassembly, but take in mind:

a. Install new O-rings where applicable
b. Use new cottor pins.
c. Fill gear case of SSW30 with 0.75 gallon (2.84 l) of recommended gear fluid.
d. For gasket: install with new coat with Permatex No.2 or equivelent.
e. Fill bearing cover (6) with multi-purpose waterproof grease.
f. Torque slotted hex nut pos 15 with 3 to 5 ft.lbs (4 to 7 Nm)
g. Install new driver roller seals (20); use care to keep seated while installing the driver roller.
h. Torque the hydraulic motor assembly mounting screws to 140 to 150 ft-lbs.
i. When installing the lock tab washer (27) bend 2 tabs down against the motor and 2 tabs up against the bolt head.
j. Apply locktite or equivelant to the motor stud (30).

Clamping system

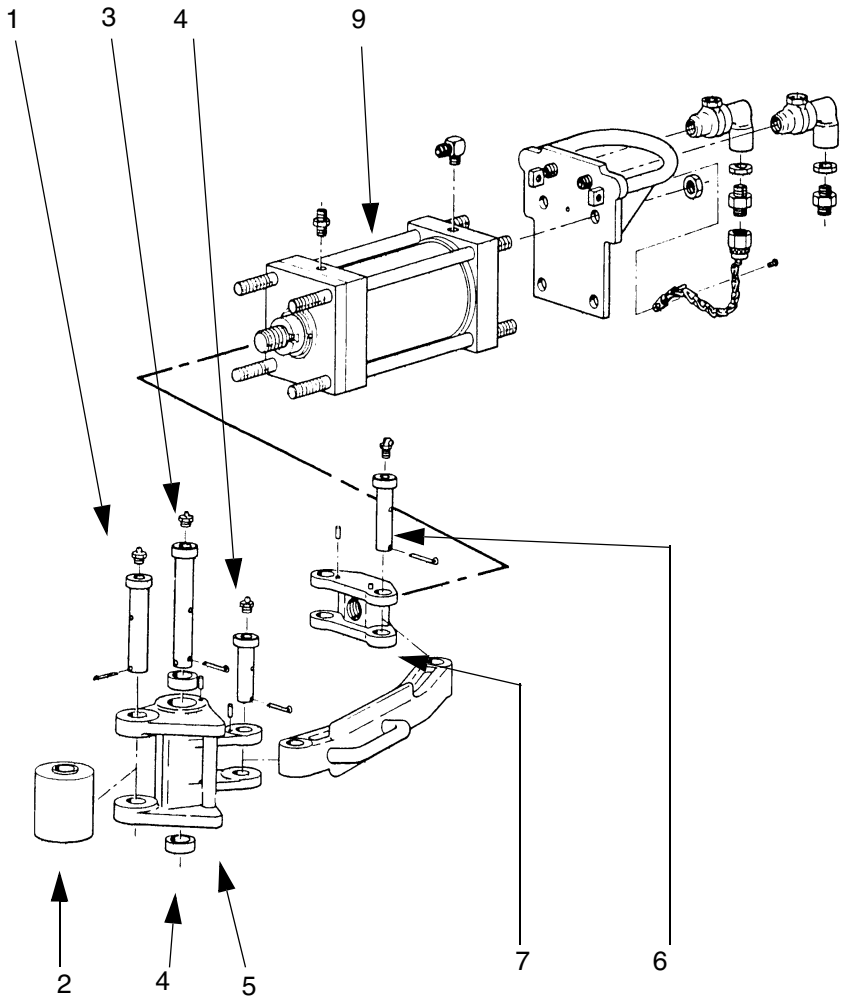


Figure 6.8

Disassembly

Procedure

By removing the pressure roller pin (1) the roller assembly (2) can be taken out.

Then the pivot arm pin (3) can be removed and the spherical roller bearing (4). The machined arm (6) is now lose. By removing the Pivot pin (6) the cylinder link (7) can be disassembled form the rod end of the cylinder.

Assembly

Procedure

This is the reverse of the disassembly, but take in mind:

a. Replace all used cotter pins with new ones.

b. Assemble the cylinder and torque the tie rods to 140-150 ft-lbs (190 - 204 Nm).

c. Hydraulic cylinder: apply locking compound to rod and link threats. Torque to 1,000-1,100 ft-lbs (1,356 - 1,920 Nm).

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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 NOV repair facility.

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

Initial checks, solves most problems

1. Is hydraulic pressure available?
2. Check that the power supply is at least 1,800 psi / 12,410 kPa.
3. Check the mufflers are not blocked with mud etc.
4. Check the functioning of the control valve

Solutions

Symptom	Probable cause	Solution
Hydraulic controls and plumbing		
Arms do not clamp or unclamp, motor does not run forward or reverse, or both	Flow restricted	Locate cause of restriction and correct.
	Power supply not operating properly	Check power supply operation.
	Valve linkage defective	Repair or replace linkage
Arms or motor creep with valve in neutral position.	Detent capscrews loose in valve, causing spool misalignment.	Tighten detent capscrews and safety wire
Motor runs too slow	Power supply pressure or flow incorrect.	Check power supply pressure and flow.
	Screw in spring centering mechanism of conrol valve loose.	Clean and tighten screw.
Leaks hydraulic oil.	Damaged tube or hose.	Replace damaged tube.
	Fittings or connections not sealed.	Tighten loose connections.
		Replace teflon sealing tape on pipe thread connections.
		Replace damaged O-rings on O-ring connections.
Arm and cylinder assemblies		
Cylinder leaks hydraulic oil.	Cylinder rod scored.	Replace cylinder.
	Faulty seals.	Replace seals.
Noise when arms are actuated.	Faulty bearing.	Lubricate, repair or replace..
Gear case		
Oil leaks from gear case.	Faulty gasket.	Clean gasket surfaces and install new gasket.
	Drain plug not properly tightened.	Tighten plug snugly.
Hydraulic oil in gear case.	Motor seal down.	Replace motor seal.
Motor assembly		
Loss of power, torque	Geroler assembly worn.	Changeout motor.
	Valve worn.	Changeout motor.
	Internal valving worn.	Changeout motor.
Motor stops.	Hydraulic oil supply to or from motor not adequate.	Locate cause of restriction and correct.

	Motor valving malfunctioning.	Changeout motor.
	Motor shaft broken.	Changeout motor.
Seal blown or leaking heavily.	Excessive internal leakage.	Replace seal.
Motor clogs.	Motor valving malfunctioning.	Changout motor.
Drive roller and shaft assemblies		
Drill pipe or collars rub against body of wrench.	Drive rollers worn excessively.	Replace drive rollers.
	New drill pipe.	Remove protective coating from drive rollers contact area.
Drive rollers slip on drill pipe.	Insufficient hydraulic pressure to cylinder.	Check power supply output for 2000 psi (13,789 kPa) output.
	Hydraulic control relief valve opens below 2000 psi (13,789 kPa).	Check relief valve opening pressure and set at 2000 psi (13,789 kPa).
Grinding noise when drive rollers are operated.	Damaged bearing.	Inspect and replace as required.
One drive roller turns, other does not.	Sheared key in driven gear.	Replace key.
	Broken idler gear shaft.	Replace idler gear shaft.
	Broken drive roller shaft.	Replace drive roller shaft.
Drive rollers both do not turn motor runs.	Sheared key in drive gear.	replace key.
	Broken drive shaft on motor.	Replace motor drive shaft.
Drive rollers do not turn, motor stalls at full torque.	Gears broken or jammed.	Inspect gears for damaged or broken teeth and replace as required.

NOTE : Motor internal components are precision parts with extremely close tolerance. Repair should be made only at an authorized service facility.

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Appendixes

Conclusion Risk Assessment EN 12100:2010

In general, crew must:

- Wear personal safety protection like safety glasses, hard hat etc.
- Follow instructions as stated in the manual.
- Have knowledge of rig procedures.
- Must have been instructed for safe use of the SSW30.
- Always use secondary retention as established and implemented by NOV.

Applicable standards:

EN-ISO 4413:2010 Hydraulic fluid power- General rules and safety requirements for systems and their components.

EN-1127-1:2011 Explosion atmospheres - Explosion prevention and protection. Part 1: Basic concepts and methodology.

EN-ISO 12100:2010 Safety of machinery - Basic concepts, general principles for design - Risk assessment and risk reduction

EN-13463-1:2009 Non electrical equipment for use in potentially explosive atmospheres. Part 1: Basic method and requirements

EN-13463-5:2011 Non electrical equipment for use in potentially explosive atmospheres. Part 5:Protection by constructional safety ‘c’

ATEX-directive 94/9/EC

Machinery Directive: 2006/42/EC

Reception, storage, transport & decommissioning

NOTE: All exposed, not painted metal surfaces, are coated with a rust preventative at the factory prior to shipment for transport only.

Immediatelly after reception*

Check the tool immediately after reception and re-preserve the tool as required (at the latest within 1 month) as per table below:.

Description	Recommended preservation
All unpainted static steel surface and flanges	Rustilo DWX 32
All unpainted dynamic steel surfaces	Rustilo DWX 32
Extended cylinder rods (retract if possible)	Rustilo DWX 32 + Denso tape*
Exposed bolts and nuts	Rustilo DWX 32
Hydraulic/pneumaticfittings.	Plugs or caps + Denso tape*
Grease fittings supplied with cap.	Cap + Denso tape*
All grease points	Lubricate

* In case long time preservation is ordered; follow procedure TSEL-0194.

Inspection and test during storage

- All accessible exposed surfaces should be checked and if needed re-preserved periodically (once per 3 months is recommended) to be sure that no corrosion is taking place.
- Test the tool annually as a minimum as per User's Manual.

Storage general recommendations

- 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 openings should be covered to prevent water or dust from entering.

Storage after use

When the tool is not being used for a longer period then 3 days the following steps should be carried out:

- Grease the tool
- Preserve the tool as per table above

Transport

WARNING: Only lift the tool at it's dedicated lifting points or ears.

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

Decommissioning

The tool may contain grease, steel, rubbers, plastic, stainless steel, mild steel and several assembled components with undefined consistency or mixtures. The tool can be contaminated with drilling fluids, hydraulic fluids and preservatives. After the tool is decommissioned, it is recommended to disassemble the tool in a place where waste fluids can be contained and properly disposed of..

⚠ **WARNING: Any fluids, mud and grease are potentially unsafe when in contact with the skin. Always wear gloves and safety goggles when disassembling the tool.**

1. Clean the tool with a steam cleaner.
2. It is recommended to disassemble the tool in a place where drainage for waste fluids is possible.
3. Remove all quick-disconnects, hoses, cylinders and manifold block and bleed off hydraulic oil.
4. Remove the parts.
5. Carry off to proper place for final storage or destruction.

Torque values (US) for bolts

		Bolts Lubricated with Light Machine Oil Grade 8			Bolts lubricated with Anti-seize compound Grade 8		
Dia.	Threads per inch	Min. Torque (ft lb)	Max. Torque (ft lb)	Clamp force (lb)	Min. Torque (ft lb)	Max. Torque (ft lb)	Clamp force (lb)
Coarse Thread Series, UNC							
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

		Bolts Lubricated with Light Machine Oil Grade 8			Bolts lubricated with Anti-seize compound Grade 8		
Dia.	Threads per inch	Min. Torque (ft lb)	Max. Torque (ft lb)	Clamp force (lb)	Min. Torque (ft lb)	Max. Torque (ft lb)	Clamp force (lb)
Fine Thread Series, UNF							
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

		Bolts Lubricated with Light Machine Oil Grade 8			Bolts lubricated with Anti-seize compound Grade 8		
Dia meter	Threads per inch	Min. Torque (Nm)	Max. Torque (Nm)	Clamp force (N)	Min. Torque (Nm)	Max. Torque (Nm)	Clamp force (N)
Coarse Thread Series, UNC							
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

		Bolts Lubricated with Light Machine Oil Grade 8			Bolts lubricated with Anti-seize compound Grade 8		
Dia meter	Threads per inch	Min. Torque (Nm)	Max. Torque (Nm)	Clamp force (N)	Min. Torque (Nm)	Max. Torque (Nm)	Clamp force (N)
Fine Thread Series, UNF							
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

Tensile Strength = 1,034,214kPa to 1" dia. Proof Strength = 827,370 kPa

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Spare parts

Spares 19000-12

Part number	Description	Qty
56405-21-C	Pin, clevis	1
51403-12-S	Pin, cotter	4
10660	SSW30 thrust washer	4
73789	SSW30 PRESS ROLL.BRG.	4
76212	SSW30 SPACER SHIELD DRIVE ROLLER	2
75507	SSW30 BEARING COVER GASKET	2
56405-10-C	Pin, clevis	3
19990	SSW30 Compressionspring	2
19849	SSW30 clevis pin	2
19349	SSW30 bolt shoulder lock	2
19054	SSW30 gear cover gasket	4
13709	SSW30 motor gasket	1
76003	SSW30 DRIVE ROLLER	2
80582	SSW30 SPACER, S/N 330 & UP	4
80580	SSW30 BEARING ASSY.	4
51404-20-S	Pin, cotter	8
51300-149-B	O-ring I.D. 2.785/2.815 thick	4
51402-8-S	Pin, cotter	3
56403-10-C	Pin, clevis	3
80581	SSW30 RETAINER, S/N 330 & UP	4
73791	SSW30 THRUSTWASHER ASSY	4
19323	SSW30 hose ass'y.	1
55913-12-12	Valved nipple, Q/D-ext. pipe	1
73929	SSW30 PRESS ROLLER RACE	4
13712	SSW30 bearing S.AL.	4
55913-16-16	Valved nipple, Q/D-ext. pipe	1

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Drawings & Parts

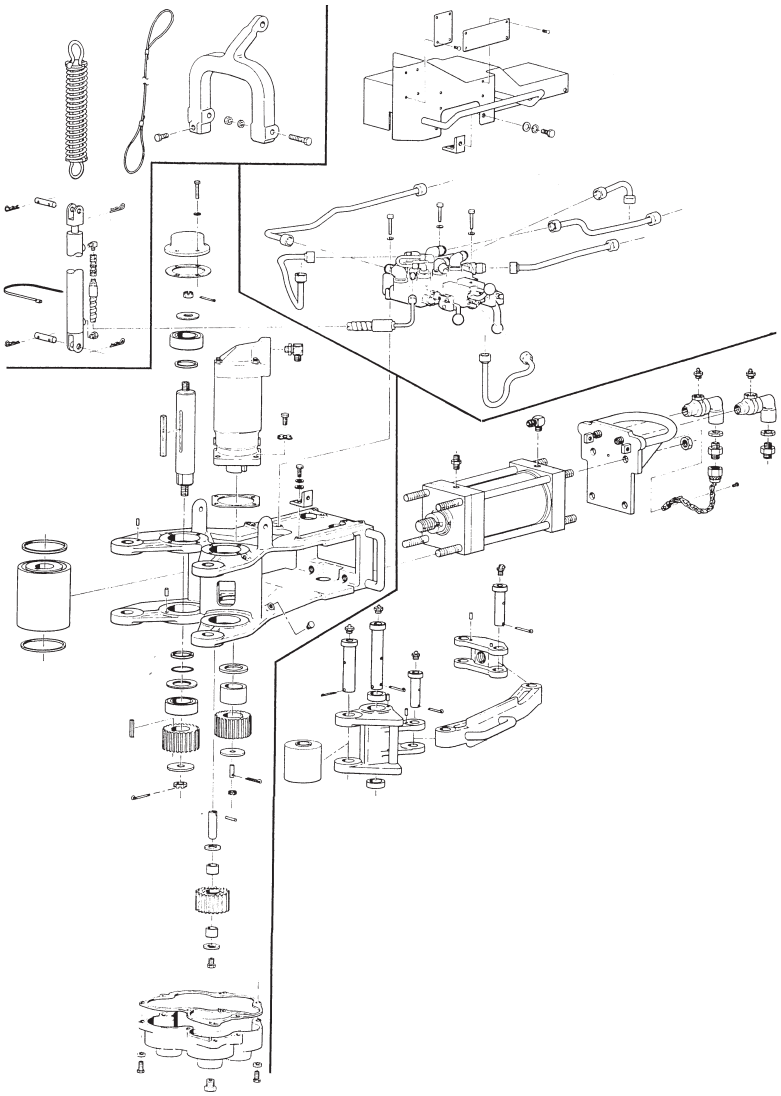
Material Safety Data Sheets

Factory applied grease and hydraulic fluid

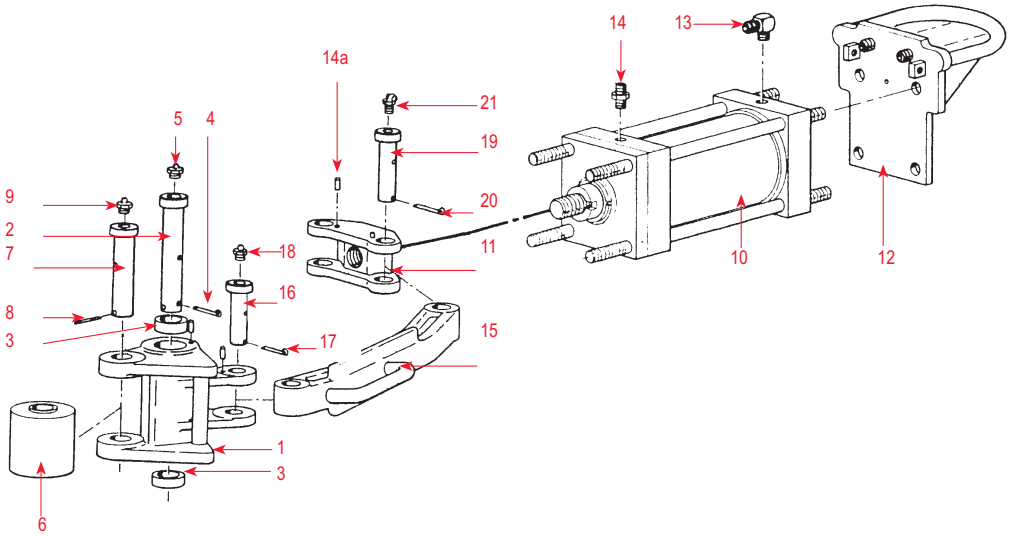
MSDS grease	Autol TOP 2000
MSDS hydraulic fluid	Castrol Hyspin AWH-M 32
MSDS gear fluid	Castrol Axle EPX 80W-90
MSDS preservation	Castrol Rustilo DWX 32
MSDS anti-corrosion coating	Denso Tape

Drawings

71964	Installation Drawing Flow Kit
71966	Flow Control Ass'y, SSW30 Open Center HPU
71965	Hydraulic Schematic SSW30 Flow Kit
18750	Power Tool Rig Up kit

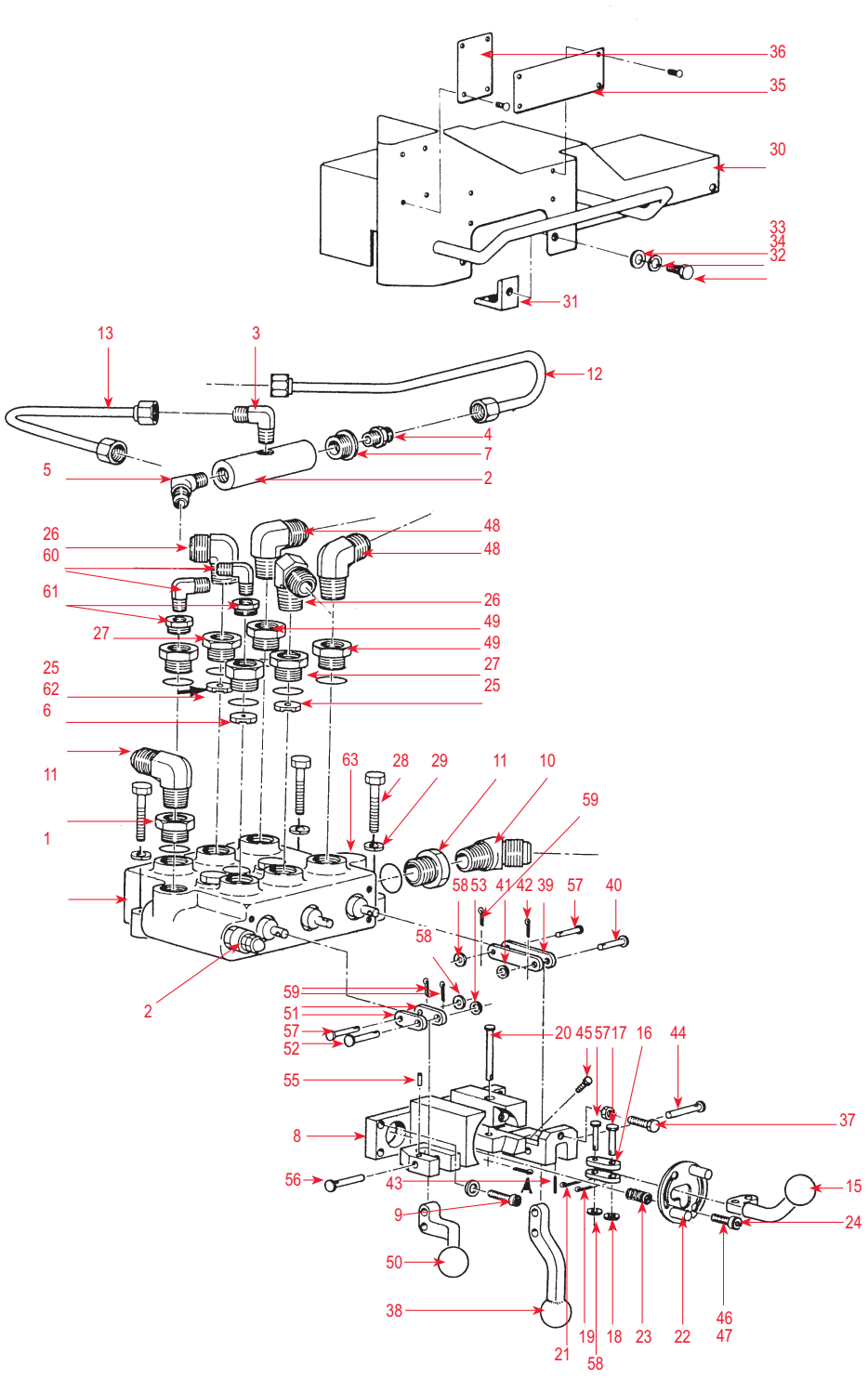


SSW30 Pivot arms, cylinders, beams and pressure rollers



Item	Qty	Description	Part no.
-	-	SSW 30	19000-6
		consisting of:	
1	2	Pivot arm	19008
2	2	Pivot pin	13714
3	3	Spherical roller bearing	13712
4	2	Cotter pin	51404-20-S
5	2	Grease fitting	53201
	2	Roll pin	51604-6-C
6	2	Pressure roller assembly	73897
	2	Plastic plug	53424
	2	Pressure roller bearing	73789
	2	Wiper ring	18297
	2	Trust washer	73790
	1	Inner spacer	73792
	1	Outer spacer	73793
	1	Pressure roller	73895
	2	Pressure roller race	73929
7	2	Pressure roller pin	15126
8	2	Cotter pin	51404-20-S
9	2	Grease fitting	53201
	2	Roll pin	51604-6-C
10	1	Cylinder assembly	19065
10	1	Hydraulic cylinder	74986
11	1	Cylinder link	19064
12	1	Back cylinder plate	19029
13	1	90° O-ring boss/37°	56519-12-12-S
14	1	O-ring boss/37°	56529-12-12-S
14a	2	Roll pin	51604-6-C
-	1	Seal kit	70109
15	1	Left beam	19009-1
15	1	Right beam	19009-2
16	2	Pivot pin	19007-1
17	2	Cotter pin	51404-20-S
-	2	Roll pin	51604-6-C
18	2	Grease fitting	53201
19	2	Pivot pin	19007
20	2	Cotter pin	51402-20-S
21	2	Grease fitting	19783

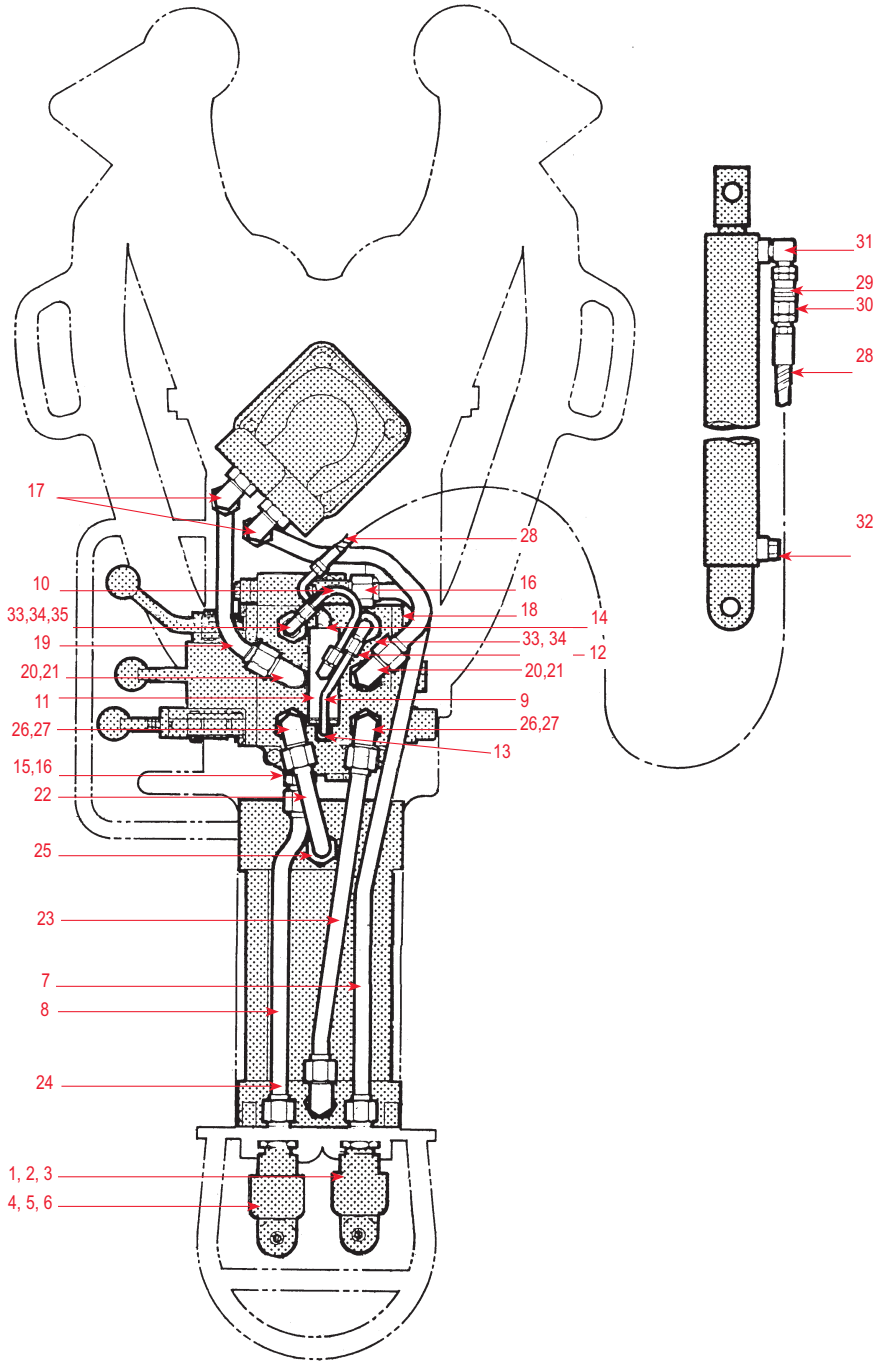
SSW30 Cover and valve



Item	Qty	Description	Part no.
-	-	SSW 30	19000
		consisting of:	
	1	Control valve assembly	19057
1	1	Hydraulic control valve	19022
2	1	Check valve	16672
3	1	90º Ext. pipe / 90º Elbow	56506-4-4-S
4	1	Ext. pipe / 37º Connector	56165-4-4-S
5	1	45º Ext. pipe / 37º Elbow	56502-4-4-S
6	1	O-ring boss / 37º Elbow	56519-12-12-S
7	1	Cap plug	53406
8	1	Handle bracket	19028
9	4	Socket head cap screw	50104-8-DA
9	4	Flat washer	50804-R-C
-	A/R	Lockwire (0.032 dia)	Z6000.8
10	1	45º O-ring boss / 37º Elbow	56557-12-12-S
11	2	Cap plug	53416
12	1	Check valve/pilot tube	19321
12	1	Tube	19321-1
12	2	Tube / 37º sleeve	56508-4-S
12	2	Short nut	56509-4-S
13	1	Check valve/valve tube	19322
13	1	Tube	19322-1
13	2	Tube / 37º sleeve	56508-4-S
13	2	Short nut	56509-4-5
15	1	Spin handle	19024
15	1	Lever	19024-1
15	1	Plate	19024-2
15	1	Knob	13634
16	2	Handle link	19019-1
17	1	Clevis pin	56405-10-C
18	1	Flat washer	50805-N-C
19	1	Cotter pin	51401-4-S
20	1	Clevis pin	56405-21-C
21	1	Cotter pin	51433-4-C
22	1	Spin handle lock	19026
23	2	Compression spring	19990
24	2	Shoulder-lock bolt	19349
25	2	Plate orifice (0.204 dia)	19797-1
26	2	O-ring boss / 37º Elbow	56519-12-12-S
27	2	Cap plug	53416
-	4	Socket head cap screw	50104-6-DA
28	3	Head cap screw	50006-14-C8D
29	3	Lock washer	50906-C
30	1	Top cover	74988
31	4	Mounting cover bracket	19879
32	10	Hex-head cap screw	50008-6-C8
33	10	Flat washer	50808-N-C
34	10	Lock washer	50908-C
35	1	Nameplate	19062
36	1	Caution label	19320
37	8	Drive screw	55301-10-6

Item	Qty	Description	Part no.
-	-	SSW 30	19000
-	-	Valve assembly	19057
		3 Spool (closed center)	
38	1	Clamp handle	19023
38	1	Lever	19023-1
38	1	Knob	13634
39	2	Handle link	19019-3
40	1	Clevis pin	56405-10-C
41	1	Flat washer	50805-N-C
42	1	Cotter pin	51401-4-S
43	1	Roll pin	51633-6-C
44	1	Clevis pin	19849
45	1	Set screw	19862
46	1	Hex-head cap screw	50006-8-C8
47	1	Hex head nut	50206-C
48	2	O-ring-boss / 37º Elbow	56519-12-12-S
49	2	Cap plug	53416
-	4	Socket head cap screw	50104-6-DA
50	1	Lift handle	19025
50	1	Lever	19025-1
50	1	Knob	13634
51	2	Link handle	19019-2
52	1	Clevis pin	56405-10-C
53	1	Flat washer	50805-N-C
54	1	Cotter pin	51401-4-S
55	1	Roll pin	51633-6-C
56	1	Clevis pin	19849
57	3	Clevis pin	56403-10-C
58	3	Flat washer	50803-R-C
59	3	Cotter pin	51401-4-S
60	2	O-ring boss / 37º	56519-6-4-S
61	2	O-ring boss reducer	56556-12-6-S
62	1	Plate orifice (0.062 dia)	19797-2
-	4	Socket head cap screw	50104-6-DA
Parts for conversion to open center operation			
-	-	Control valve assembly	19057
-	1	Detent kit	71575
63	1	Open center conv. plug	18731
-	4	Socket head cap screw	50104-14-CD

SSW30 Hydraulic installation



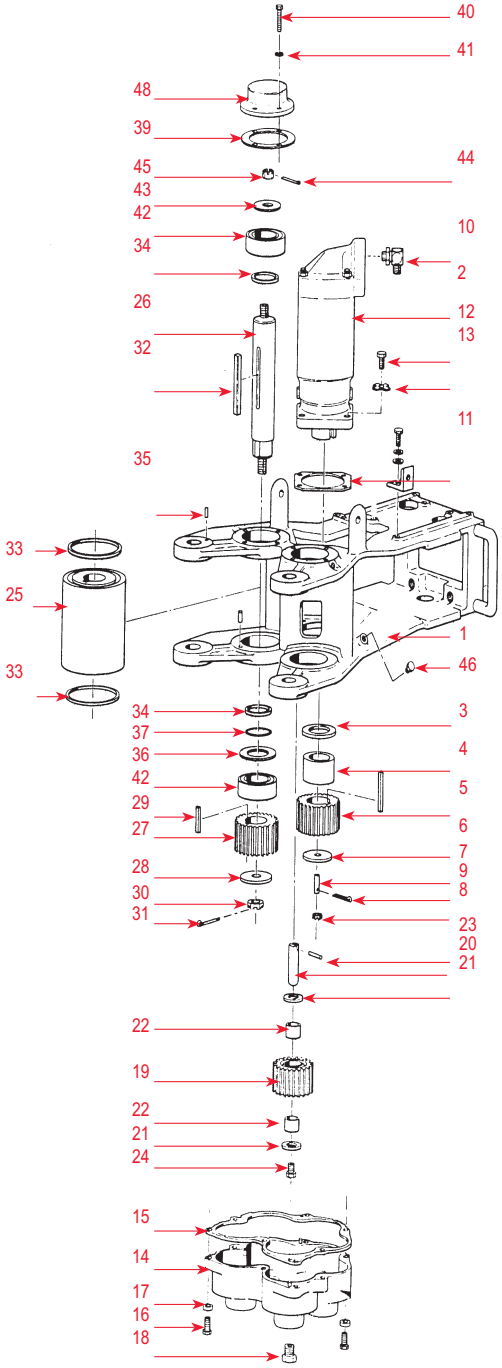
Item	Qty	Description	Part no.
PRESSURE / RETURN SYSTEM			
1	1	Quick disconnect dust cap	55915-12
2	1	Hydraulic pressure swivel	19158
3	1	Quick disconnect/pipe ext.	55913-12-12
		valved nipple	
4	1	Quick disconnect dust cap	55911-16
5	1	Hydraulic return swivel	70369
6	1	Quick disc./pipe ext. valved nipple	55913-16-16
-	1	Hex head cap screw	55003-4-C8A
7	1	Pressure tube	19031
7	1	Tube	19031-1
7	2	Tube 37º sleeve	56508-12-S
7	2	Short nut	56509-12-S
8	1	Return tube	19032
8	1	Tube	19032-1
8	2	Tube 37º sleeve	56508-12-S
8	2	Short nut	56509-12-S
CONTROL VALVE INSTALLATION			
-	-	3 Spool (closed center)	19057
		consisting of:	
9	1	Check valve/pilot tube valve assy	19321
9	1	Tube	19321-1
9	2	Tube 37º sleeve	56508-4-S
9	2	Short nut	56509-4-S
10	1	Check valve/valve tube	19322
10	1	Tube	19322-1
10	2	Tube 37º sleeve	56508-4-S

Item	Qty	Description	Part no.
10	2	Short nut	56509-4-S
11	1	Check valve	16672
12	1	90º ext. pipe/90º elbow	56506-4-4-S
13	1	Ext. pipe / 37º. Connector	56501-4-4-S
14	1	45º Pipe / 37º elbow	56502-4-4-S
15	1	45º O-ring boss/37º elbow	56557-12-12-S
16	2	Cap plug	53416
ROLLER DRIVE SYSTEM			
-	-	Hydraulic motor assembly	19055
		consisting of:	
17	2	O-ring boss / 37º Elbow	56519-16-12-S
18	1	Spin-in tube	19033
18	1	Tube	19033-1
18	2	Tube 37º sleeve	56508-12-S
18	2	Short nut	56509-12-S
19	1	Spin-out tube	19034
19	1	Tube	19034-1
19	2	Tube / 37º sleeve	56508-12-S
19	2	Short nut	56509-12-S
-	-	3 spool (closed center) valve assy	19057
20	2	O-ring-boss / 37º elbow	56519-12-12-S
21	2	Cap plug	53416

Item	Qty	Description	Part no.
CLAMPING SYSTEM			
22	1	Clamp tube	19035
22	1	Tube	19035-1
22	2	Tube / 37º sleeve	56508-12-S
22	2	Short nut	56509-12-S
23	1	Unclamp tube	19036
23	1	Tube	19036-1
23	2	Sleeve	56508-12-S
23	2	Short nut	56509-12-S
-	-	Cylinder assembly	19065
24	1	90º O-ring boss / 37º elbow	56519-12-12-S
25	1	O-ring boss 37º connector	56529-12-12-S
-		3-Spool (closed center)	19057
		Valve assembly	
26	2	O-ring boss / 37º elbow	56519-12-12-S
27	2	Cap plug	53416
VERTICAL POSITIONING SYSTEM			
-	-	Hydraulic cylinder	15632
28	1	Vertical positioning hose	19323
28	1	Low pressure hose	56103-4
28	1	Hose 90º Int. 37º swivel fitting	56255-4-4
28	1	Hose ext. pipe fitting	56258-4-4
28	2	Power clamp ferrule	56256-4
28	1	Protective coil sleeve	56121-2
29	1	Quick disc./int. pipe valved coupler	55908-4-4
30	1	Quick disc./int. pipe valved nipple	55909-4-4
31	1	90º Pipe/pipe ext. elbow	56702-6-4-S

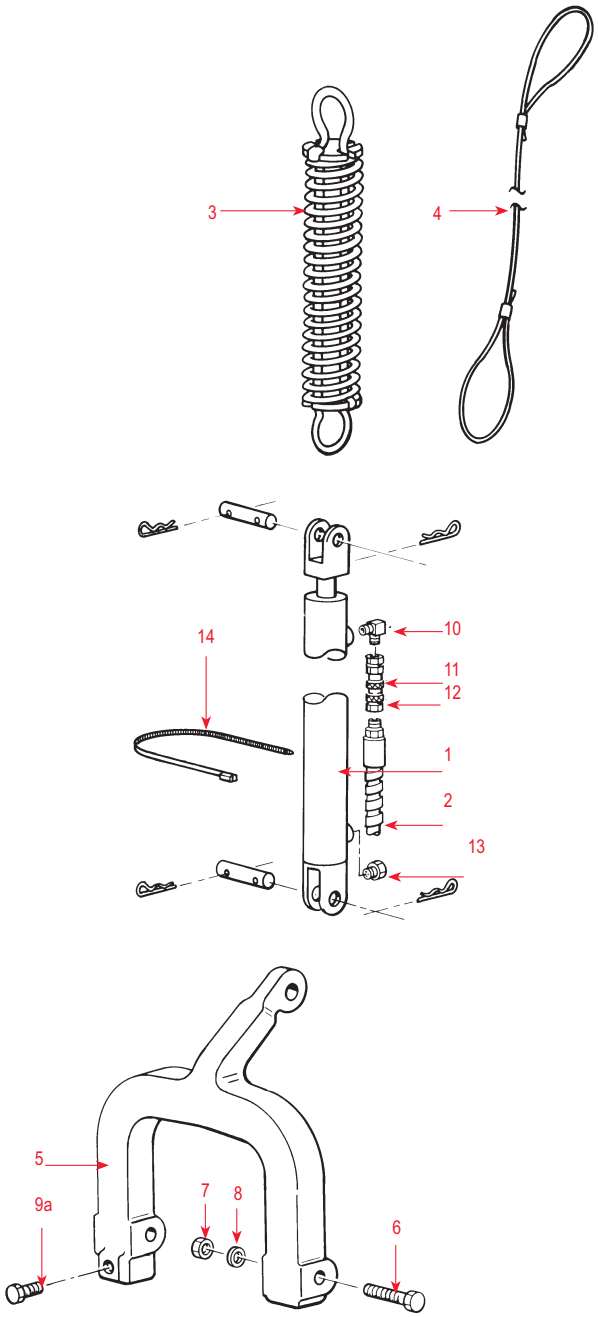
Item	Qty	Description	Part no.
32	1	Exhaust muffler	70920
-	-	3-Spool (closed center) valve assy	19057
33	2	O-ring-boss / 37º elbow	56519-6-4-S
34	2	O-ring boss reducer	56556-12-6-S
35	1	Orifice (0.062 dia.) plate	19797-2

SSW30 Drive rollers and hydraulic motor installation



Item	Qty	Description	Part no.
-	-	SSW 30	19000
1	1	Machined body	19010
2	1	Hydraulic motor assembly	19055
2	1	Hydraulic motor	19020
3	1	Thrust washer	19152
4	1	Motor spacer	19017
5	1	Drive gear	19015
6	1	Retaining washer	19153
7	1	Motor stud	19154
8	1	Hex slotted nut	55508-C
9	1	Cotter pin	51402-8-S
10	2	O-ring boss / 37º elbow	56519-16-12-S
11	1	Motor gasket	13709
12	2	Hex head cap screw	50010-14-C8
13	2	Lock tab washer	70371
14	1	Gear (machined) cover	19053
15	1	Gear cover gasket	19054
16	7	Hex head cap screw	50008-10-C8
17	7	Lock washer	50908-C
18	1	Hex head ext. pipe plug	53001-08-C
19	2	Idler gear	10629
20	2	Idler gear shaft	10630
21	4	Thrust washer	10660
22	4	Roller bearing	10658
23	2	Dowel pin	51205-11
24	2	Socket head set screw	50706-6-A-C
25	1	Driver roller assembly	80580
25	2	Drive roller	76003
26	2	Drive roller shaft assembly	75676
26	1	Drive roller shaft	19016
27	1	Drive gear	10628
28	1	Retaining washer	80581
29	1	Driven gear key	15062
30	1	Hex slotted nut	50512-C
31	1	Cotter pin	51403-12-S
32	2	Drive roller key	14560
33	4	Drive roller seal	10742
34	4	Drive roller spacer	14475
35	2	Dowel pin	51206-7
36	2	Drive roller shield spacer	80582
37	2	O-ring	51300-036-B
38	2	Bearing (machined) cover	17934
39	2	Bearing cover gasket	75507
40	8	Hex-head cap screw	50005-6-C8
41	8	Lock washer	50905-C
42	4	Spherical roller bearing	13698
43	2	Retaining washer	10664
44	2	Cotter pin	51403-12-S
45	2	Slotted hex nut	50512-C
46	1	Hex head ext. pipe plug	53001-16-C
47	2	Grease fitting	53201
48	2	Bearing cover	75492

SSW30 Vertical positioning installation



Item	Qty	Description	Part no.
-	-	SSW 30	19000
1	1	Hydraulic cylinder	15632
2	1	Vertical positioning hose	19323
3	1	Weldment hanger	15060
3	2	Spring guide	15059
3	2	Retaining plate	15057
3	1	Spring	15058
4	1	Lifting sling	16614
5	1	Machined hanger	19038
6	2	Hex head cap screw	50010-26-C8
7	2	Hex nut	50210-C
8	2	Lock washer	50910-C
9a	1	Set screw	50710-24-A-C
9b	1	Hex nut (not shown)	50310-C
10	1	90°Pipe/pipe ext.	56702-6-4-S
11	1	Quick disc/int. pipe valved coupler	55908-4-4
12	1	Quick disc/int. pipe valved nipple	55909-4-4

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