

Neles™ High performance heavy duty hydraulic actuator (scotch yoke type)

Series N1-Hydraulic actuator

Installation, maintenance and
operating instructions

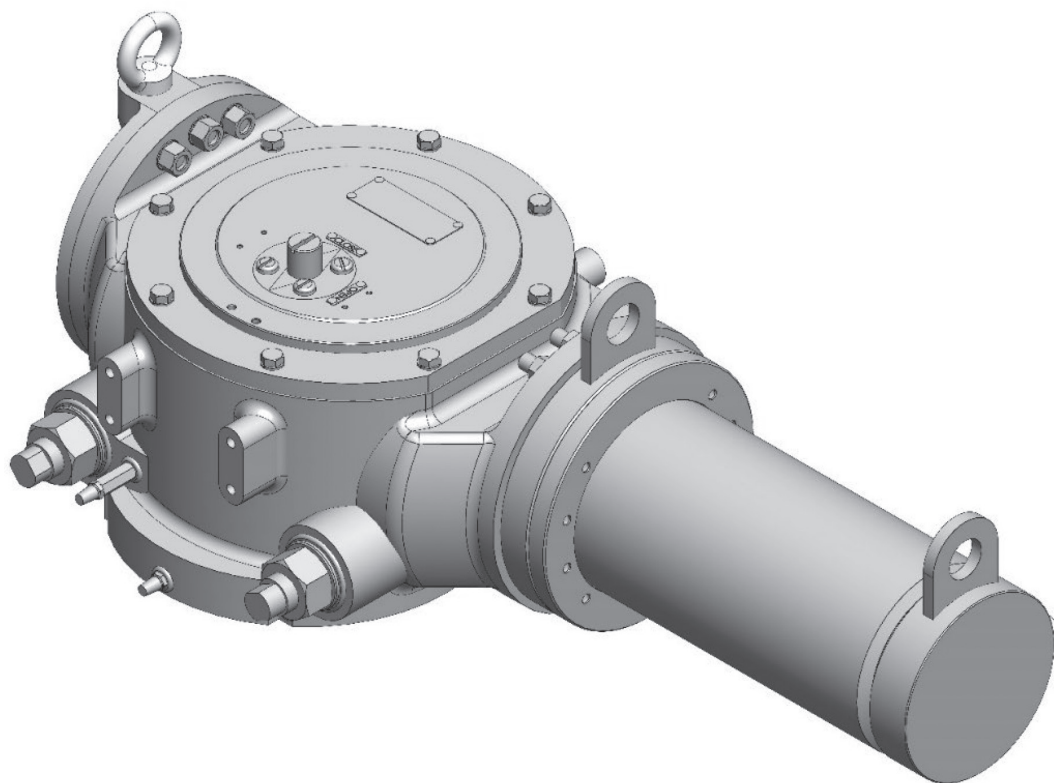


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READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the valve.

If you require additional assistance, please contact the manufacturer or manufacturer's representative.

SAVE THESE INSTRUCTIONS!

Addresses and phone numbers are printed on the back cover.

1. GENERAL

1.1 Scope of the manual

This instruction manual contains important information regarding the installation, operation, and maintenance of N1- Hydraulic actuators. Please read these instructions carefully and save them for future reference. The manual can be changed or revised without any prior notice. Any changes in product's specification, structure, and/or any components may not result immediate revised version of the manual.

1.2 Structure and operation

The N1- Hydraulic series actuators are quarter turn cylinder actuators designed for on-off service. Ductile cast iron center body, fabricated carbon steel hydraulic cylinder provides rugged actuator construction.

The mounting face dimensions of the N1 hydraulic actuator comply with the ISO 5211 standard.

1.3 Actuator markings

The actuator is provided with an identification plate, see Fig. 1.

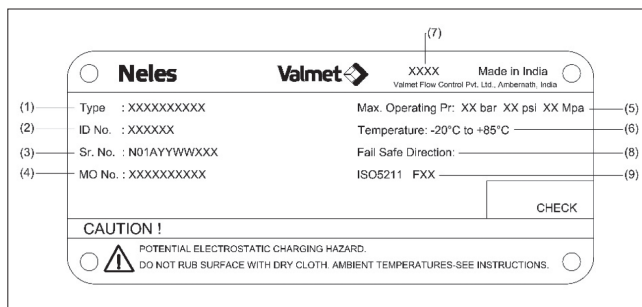


Fig. 1

Identification plate markings are:

1. Type
2. ID Code
3. Sr No
4. MO No
5. Max operating pressure
6. Temperature range: -20° to 85° C
7. Manufacturing year
8. Fail safe direction
9. Mounting Face

1.4 Specifications

- Actuator connections in accordance with ISO 5211 and VDI/VDE3845
- Action: Double acting
- Pressure containing parts as per ASME SECTION VIII
- Torque output range: 100 Nm - 400000 Nm.
- Temp range: -20 to +85 °C
- Design pressure: Up to 230 bar
- Working pressure: Up to 210 bar
- External corrosion protection in compliance with ISO 12944-2 class C3; Optionally available class C5M.
- Manufactured and tested as per ISO 9001, and EN 15714-4
- Adjustable travel stops from 85° to 95° (+/- 5°)
- Minimum hydraulic fluid cleanliness shall be in accordance with SAE AS4059 Tab 2, class 6, or ISO 4406 15/13/1
- Please consult Valmet for torque details and sizing.

Table 1 Stroke volume. dm³ - Double acting for 90° stroke of N1- Hydraulic actuator

Cyl.dia.	63	80	100	125	160	200	250	300	350	400	450
Actuator	Stroke volume, dm ³										
N1A	0.4	0.6	0.9	1.4	2.3	-	-	-	-	-	-
N1B	0.5	0.75	1.2	1.8	3	4.7	-	-	-	-	-
N1C	-	0.9	1.4	2.2	3.6	5.6	8.8	-	-	-	-
N1D	-	1.1	1.7	2.6	4.3	6.8	10.6	-	-	-	-
N1E	-	1.4	2	3.2	5.2	8.2	12.8	18.4	25	32.7	-
N1G	-	-	2.6	4	6.4	10	15.7	22.6	30.8	40.2	50.9
N1H	-	-	-	5	8	12.4	19.4	28	38.1	49.8	63

Table 2 Maximum operating pressure for N1- Hydraulic actuator

Cyl.dia.	63	80	100	125	160	200	250	300	350	400	450
Actuator	Maximum operating pressure, bar										
N1A	158	85	50	30	19	-	-	-	-	-	-
N1B	210	100	70	45	25	15	-	-	-	-	-
N1C	-	167	87	49	28	17	10.5	-	-	-	-
N1D	-	210	100	70	40	24	15	-	-	-	-
N1E	-	210	100	100	100	75	50	30	25	20	-
N1G	-	-	210	210	100	95	60	40	30	20	15
N1H	-	-	-	210	210	100	85	55	40	30	25

1.5 Recycling and disposal

Most of the actuator parts can be recycled if sorted according to material. Most parts have material marking. A material list is supplied with the actuator. In addition, separate recycling and disposal instructions are available from the manufacturer. An actuator can also be returned to the manufacturer for recycling and disposal against a fee

CAUTION:

Don't dismantle a pressurized actuator!

Dismantling a pressurized actuator leads to uncontrolled pressure release. Shut off the supply pressure and release pressure from the cylinder before dismantling the actuator. Otherwise, personal injury and damage to equipment may result.

CAUTION:

Follow the instructions given on the actuator warning plates!

CAUTION:

Take the weight of the actuator or valve combination into account when handling it!

Lifting lugs on the actuator are meant only for lifting actuator and not complete valve assembly.

Do not lift the valve combination from the actuator, positioner, limit switch or their piping. Lift the actuator as directed in Section 2, lifting ropes for a valve combination should be fastened around it. The weights are shown in Section 6.4 & 6.5. Dropping may result in personal injury or damage to the equipment.

CAUTION:

Actuator should not be operated beyond MOP.

We recommend using Filter-Regulator and Pressure Relief Valve for better functioning with safety.

Maintenance cycle should be followed for better working and safe operation.

1.6 Definitions

WARNING:

If not observed, user incurs a high risk of severe damage to the product and/or fatal injury to personnel.

CAUTION:

If not observed, user may incur damage to the product and/or injury to personnel.

NOTE:

Advisory and information comments provided to assist maintenance personnel to carry out maintenance procedures.

1.7 Safety precautions

User Safety

CAUTION:

Don't exceed the permitted values!

Exceeding the permitted pressure value marked on the actuator may cause damage and lead to uncontrolled pressure release in the worst case. Damage to the equipment and personal injury may result.

2. TRANSPORTATION AND STORAGE

Make sure that the actuator and associated equipment have not been damaged during transportation. Store the actuator carefully before installation, preferably indoors in a dry place. Do not take it to the installation site or remove the protective caps of ports for piping until just before installation.

Lift the actuator as shown in Fig. 2: in a horizontal position from the lifting lugs. Refer to Section 6.4& 6.5 for weights.

Upon receiving the product check the actuator and the accompanying devices for any damage that may have occurred during transport.

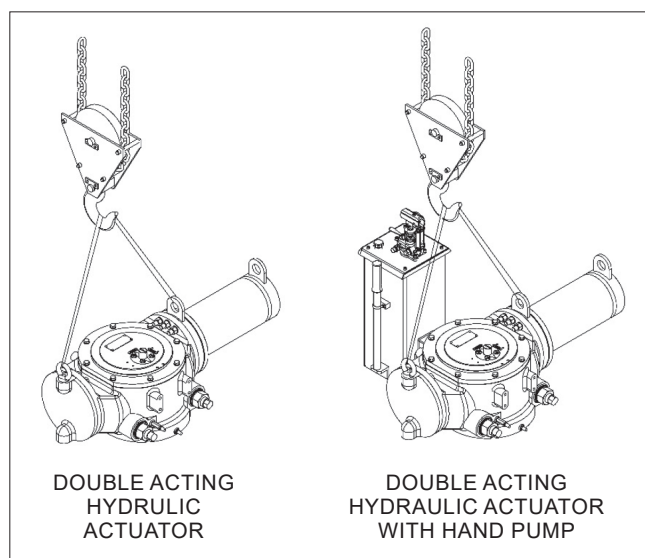


Fig. 2 Lifting of actuator

WARNING:

DO NOT USE THE DEVICE IF IT IS DAMAGED DURING TRANSPORTATION!

IF THE DEVICE HAS SUFFERED DAMAGE DURING TRANSPORTATION. DO NOT INSTALL AND USE IT. IN CASE OF DAMAGE TO THE DEVICE UPON RECEIVING IT PLEASE CONTACT THE SUPPLIER.

Store the actuator carefully. Storage indoors in a cool, dry place. Temperature limit for the storing is from 4 °C to 40 °C. The actuator should be left in its original packing until it is required for the use. Do not remove protective plugs until installing the actuator.

3. MOUNTING AND DEMOUNTING

3.1 Actuator Oil supply

Hydraulic oil can be used as supply medium. The maximum supply pressure is depending on the selected model.

3.2 Installation information

Before installation please, take care of the safety precautions.

Ensure that the actuator will not be exposed to pressure in excess to the maximum rating as indicated on the actuator nameplate or technical documents.

Ensure that throughout the installation that there are no leaks of the supply media.

The maximum operating temperature for the actuator depends on individual build of actuator. Refer nameplate for operating temperature range.

Ensure that the maximum operating temperature as indicated on the nameplate is not exceeded during operation, transportation, or storage of the actuator.

The environment and surrounding should not affect or limit the operational safety of the product.

Ensure the product is protected against impact, vibration, or any kind of movement during operation, transportation and storage.

Product should not be installed in hazardous area that is not compatible with the gas group and temperate class indicated on the nameplate.

N1 hydraulic actuators can be mounted on valve in any desired position. However, it is recommended to align the centerline of the Hydraulic cylinder module along the pipeline.

Ensure proper tightening of fasteners and mounting accessories to avoid loosening during operation.

All the tubing, fitting and actuation media should be free from contamination and filtered to the desired level. Quality of media should be as per ISO 4406 15/13/10 For additional information consult Valmet.

Ensure proper adjustments of the stopper bolt to desired opening and closing of the valve.

NOTE:

Flow may be restricted by undersize tubing or fitting. These may throttle the flow resulting in reduce pressure or volume causing intermittent or undesired movement.

3.3 Mounting the actuator on the valve

Install the actuator so that the shaft of the valve or any other device to be actuated goes into the shaft bore of the actuator.

If the bore is larger than the shaft diameter, use a keyed shaft adapter, sleeve or bushing. There are two keyway slots in the shaft bore of the actuator at an angle of 90°. These allow the installation position of the actuator to be changed in relation to the valve. Neles valves have a bevel at the end of their shafts to facilitate installation.

The installation position can be selected freely. Double acting version can be installed at any position. The actuator is thus best protected against damage due to supply oil impurities. When the installation position of the actuator is altered, the arrow indicating the operating direction must be turned to correspond with the actual operation of the valve.

When necessary, lubricate the actuator bore and collar with grease or anti-corrosive agent to prevent it from jamming due to rust.

The actuator must not be allowed to come in contact with the pipework, because the vibrations may damage it or cause unsatisfactory operation.

If the actuator is used with devices other than Neles valves, any additional parts attached to the actuator must be properly protected.

Remove all piping and mounted accessories that will interfere with the module that are to be worked on.

When removing seals from seal grooves; use a commercial seal removing tool or a small screwdriver with sharp corners rounded off use a non-hardening thread sealant on all pipe threads.

CAUTION:

Apply the thread sealant as per the manufacturer's instructions.

All parts should be thoroughly inspected for excessive wear, stress cracking and pitting. Attention should be directed to threads, sealing surfaces and areas that will be subjected to sliding and rotating motion. Actuator parts that reflect any of the above listed characteristics should be replaced with new parts.

Valmet recommends that disassembly of the actuator modules should be done in a clean area on a workbench.

After reassembly, the actuator needs to be stroke for several times to ensure the desired function and safety.

If you remove the stop screw, adjust the limits after lubrication or grease filling!

Before doing maintenance, check actuator for leakage at inlet, outlet and cover.

3.4 Demounting the actuator on the valve

CAUTION:

Depressurize the actuator before starting demounting!

The actuator must be de-pressurized, and the supply oil disconnected. Unscrew the actuator-side screws of the bracket and pull the actuator off the valve shaft. This is best done by lifting the actuator from lifting lugs by crane. Note the mutual positioning of the valve and the actuator to ensure correct functioning after reassembly.

NOTE:

To ensure safe and effective operation, always use original spare parts to make sure that the actuator functions as intended.

NOTE:

When sending goods to the manufacturer for repair, do not disassemble them.

NOTE:

For safety reasons, replace bolting if the threads are damaged, have been heated, stretched or corroded.

CAUTION:

Don't dismantle a pressurized actuator!

4. MAINTENANCES

4.1 Maintenance general

CAUTION:

Depressurize the actuator before starting demounting!

Although Valmet actuators are designed to work under severe conditions, proper preventative maintenance Can significantly help to prevent unplanned downtime and in real terms reduce the total cost of ownership. Neles recommends inspecting the actuators at least every five (5) years. The inspection and maintenance interval depend on the actual application and process condition. The inspection and maintenance intervals can be specified together with your local Neles experts.

During this periodic inspection the parts detailed in the Spare Part Set should be replaced. Time in storage should be included in the inspection interval.

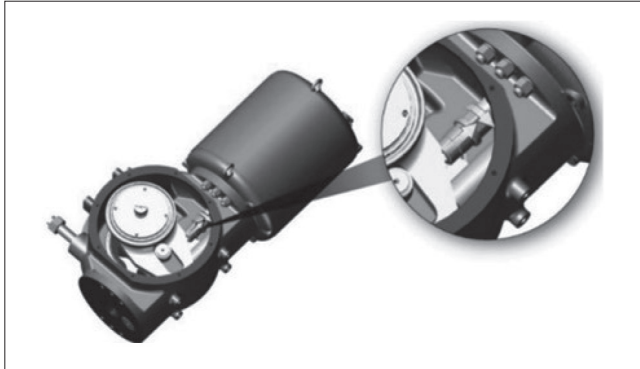
If maintenance assistance is required, please contact your local Neles office. The part numbers in parentheses () in the text refer to the exploded view and the parts list, unless otherwise stated.

This procedure is applicable with the understanding that all hydraulic pressure has been removed from the actuator.

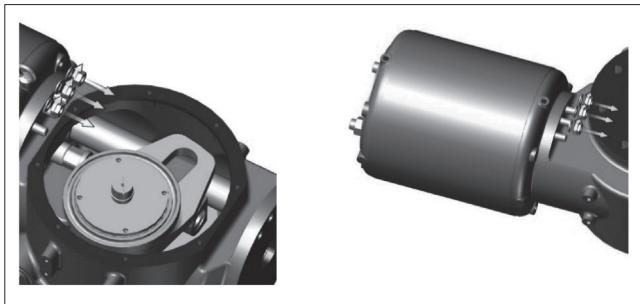
4.2 Module removal and installation

4.2.1 Hydraulic Cylinder Module Removal

Step 1. Apply oil pressure towards cylinder side to rotate actuator by 45 degrees.



Step 2. Unscrew connecting nut (2) to dismantle piston rod from carrier of central block assembly.



Step 3. Remove six studs (41), Hydraulic cylinder assembly sides with lock washer (40) from central block housing.

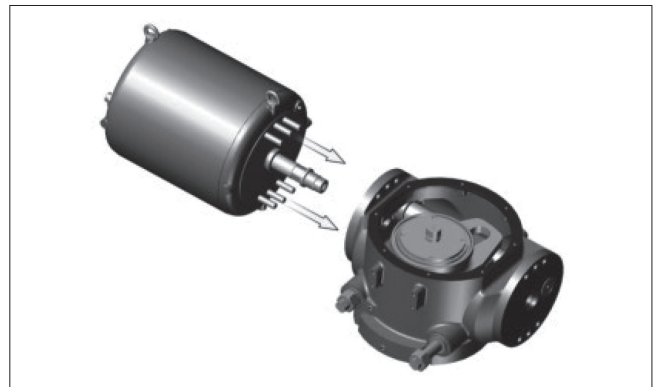


Step 4. Remove Hydraulic cylinder module from actuator assembly

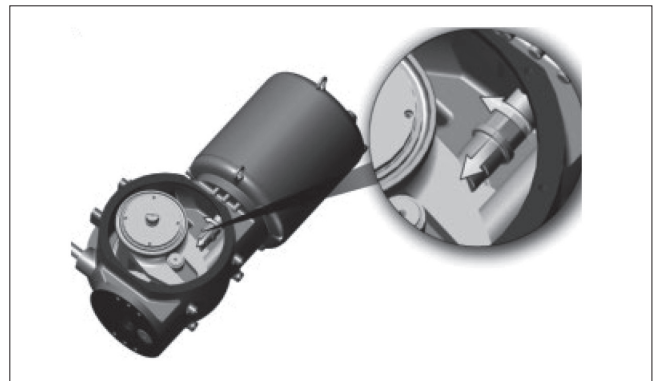


4.2.2 Hydraulic Cylinder Module Installation

Step 1. Check & verify that O-ring seals are properly fitted in its seal groove on the front cover of cylinder and guide rod respectively.



Step 2. Using lifting equipment move the Hydraulic cylinder module up to central block module and align the piston rod to the center of central block housing.



Step 3. Align piston rod, connecting nut (2) and connecting bolt (3) assembly with carrier and screw it in carrier.

Step 4. Install hex cap screw / nut with spring washer to install cylinder module on central block module.



4.3 Actuator Disassembly

4.3.1 General Disassembly

WARNING:

DO NOT USE THE DEVICE IF IT IS DAMAGED DURING TRANSPORTATION!

IF THE DEVICE HAS SUFFERED DAMAGE DURING TRANSPORTATION DO NOT INSTALL AND USE IT. IN CASE OF NOTICING DAMAGE TO THE DEVICE UPON RECEIVING IT PLEASE CONTACT THE SUPPLIER.

Actuator disassembly is written to either completely disassemble the entire actuator or can be used to disassemble individual Units as needed (Center block, hydraulic cylinder).

For Hydraulic cylinder module disassembly -hydraulic cylinder unit is to be removed. it should be removed from the central block unit prior to the oil cylinder unit removal or disassembly. Then rotate actuator by 45 degrees for cylinder assembly removal or disassembly.

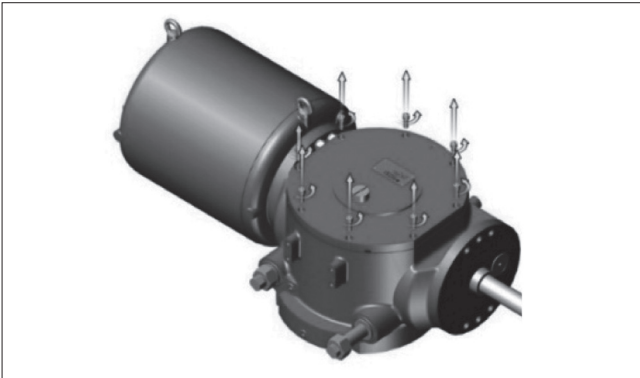
To ensure correct reassembly, mark or tag mating surfaces. Actuator central block base should be rigidly mounted before disassembly of any component.

4.3.2 Hydraulic cylinder module disassembly

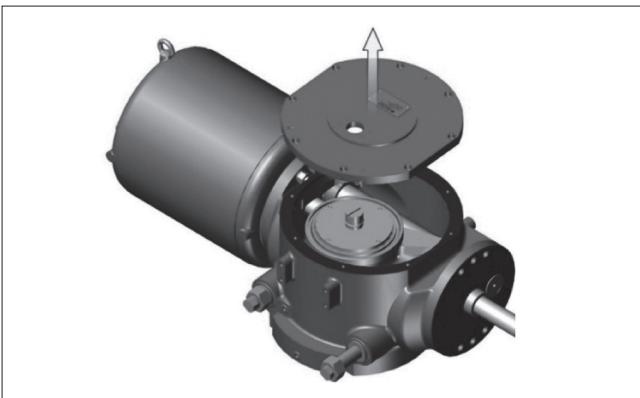
WARNING:

If not already removed disconnect all operating pressure from actuator hydraulic cylinder.

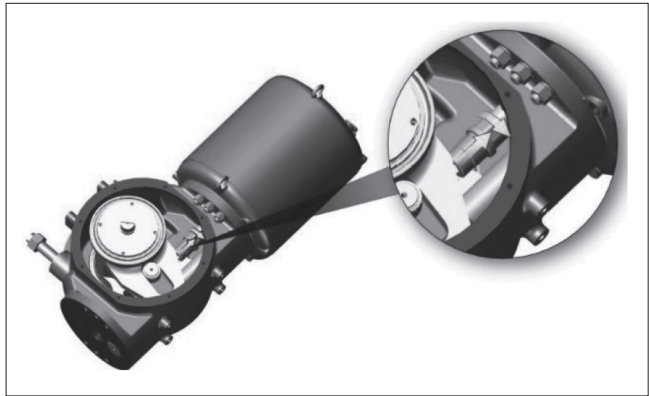
Step 1. Unscrew and remove hex. Soc. Head cap screw (20) from top cover of central block module (14).



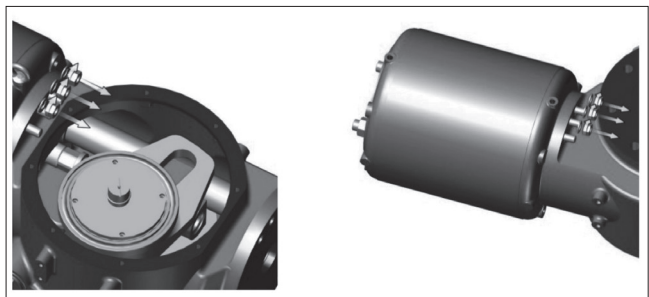
Step 2. Fitment between top cover and central block is tight, use screwdriver as crowbar and put it in slot provided on central block cover (14) to lift the cover.



Step 3. Apply oil pressure towards cylinder side to rotate actuator by 45 degrees.



Step 4. Unscrew connecting nut (2) to dismantle piston rod from carrier (8).

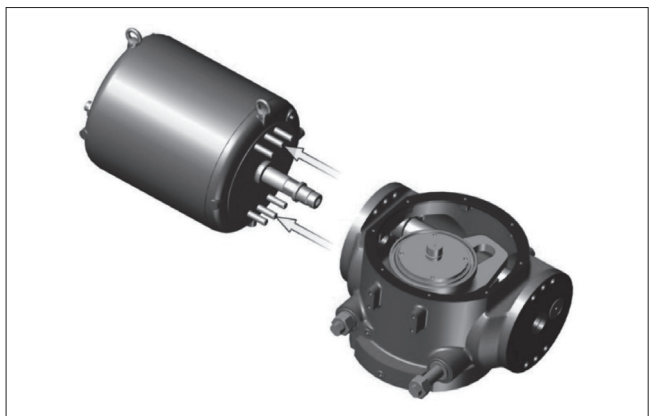


Step 5. Remove six studs/nut (41,39) Hydraulic cylinder assembly sides with lock washer (40) from central block housing.

NOTE:

When removing cylinder module from actuator assembly, be careful to lose O-ring seals.

Step 6. Remove Hydraulic cylinder module from actuator assembly.



4.3.3 Central block module disassembly

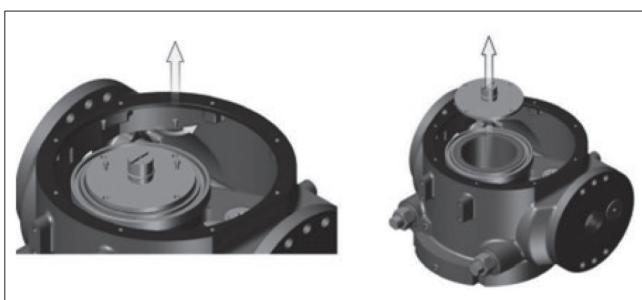
CAUTION:

Hydraulic cylinder module should be removed before starting central block module removal procedure.
The setting of stroke adjustment screw (42) should be checked and recorded before stroke adjustment screw are loosen or removed.

NOTE:

Stroke adjustment screw will be removed later in this procedure.
Refer bulletin for exploded views of central block assembly.

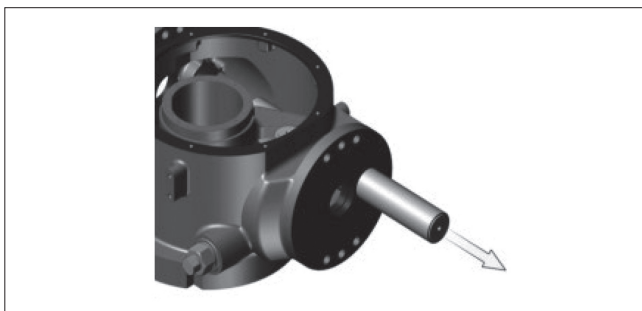
Step 1. Unscrew and remove hex. Soc. Head cap screw (24) from yoke insert (25) from yoke (28).



Step 2. Remove yoke top bearing (27) from yoke (28).



Step 3. Remove guide rod (31) from central block housing (5).



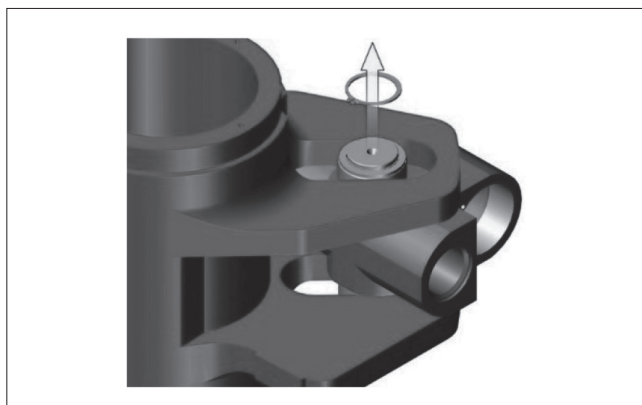
NOTE:

Tapping provided on guide rod to pull out the guide rod from central block housing. When removing guide rod from actuator assembly, be careful to lose O-ring seals.

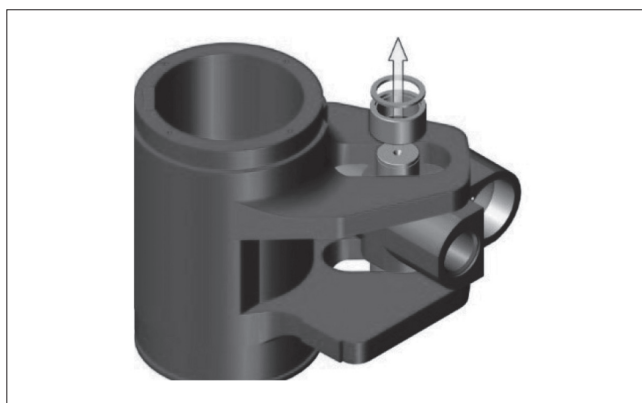
Step 4. Remove yoke (28) with carrier assembly from central block housing (5).



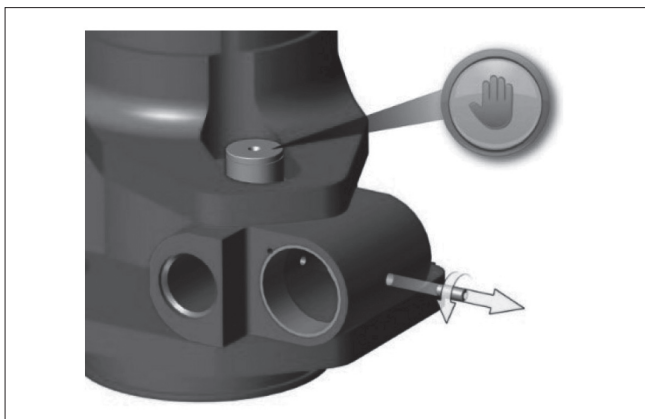
Step 5. Put the yoke assembly on clean and dry place and remove top retaining ring (6) from yoke pin (9).



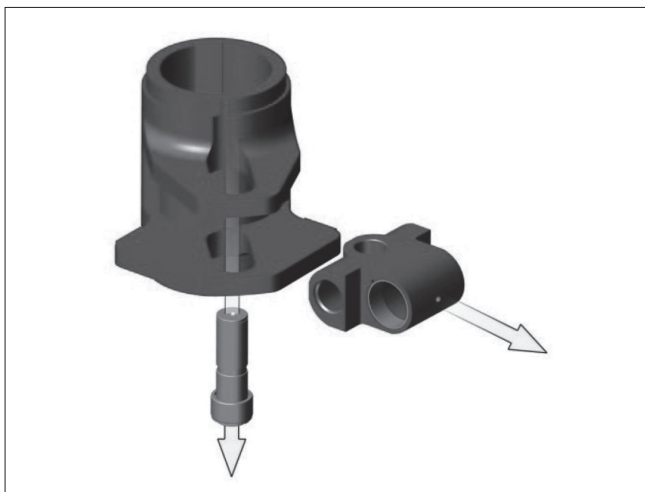
Step 6. Remove top roller (10) with yoke pin washer (7) from yoke (28) and yoke pin (9).



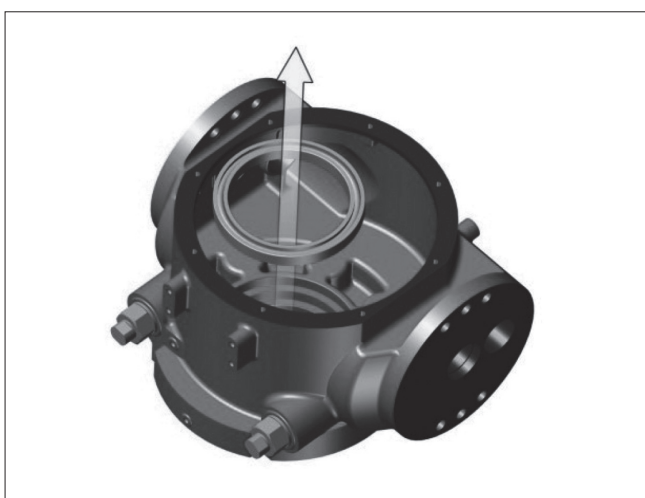
Step 7. Hold the yoke pin by hand and unscrew hex. Soc. Head set screw from carrier (8) to remove yoke pin (9) from carrier.



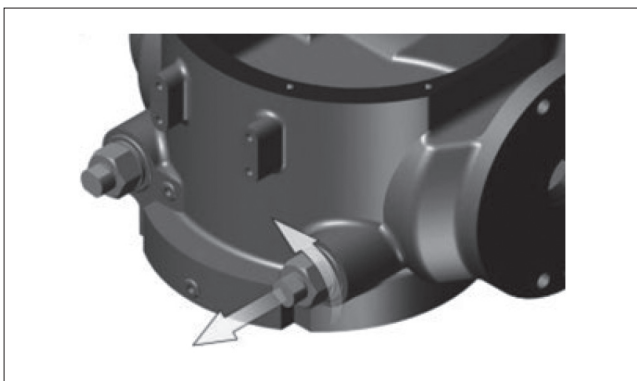
Step 8. Remove yoke pin (9) from bottom side of carrier (8) and then remove carrier (8) from yoke.



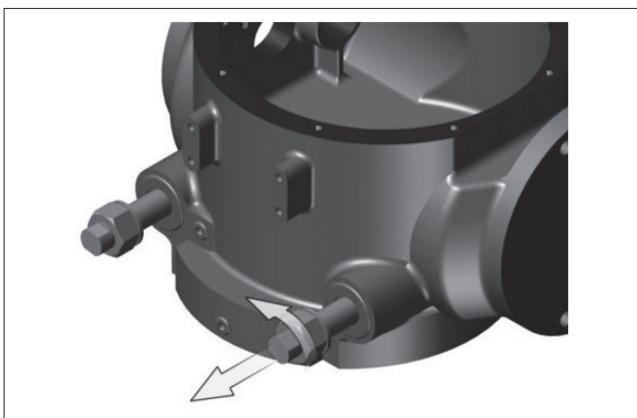
Step 9. Remove bottom side bearing (27) of yoke (28) from central block housing (1).



Step 10. Unscrew and remove two stroke adjustment screw nuts (35) from stroke adjustment screw (36).



Step 11. Unscrew and remove two stroke adjustment screws (36) from housing (5).



4.4 Actuator Reassembly

4.4.1 General reassembly

NOTE:

Only new seals, which are still within the seal's expectant shelf life, should be installed into the actuator being refurbished.

Remove and discard all old seals and gaskets.

Parts should be cleaned to remove all dirt and other foreign material prior to inspection.

Parts should be thoroughly inspected for excessive wear, stress cracking, galling and pitting. Attention should be directed to threads, sealing surfaces and areas that will be subjected to sliding or rotating motion. Sealing surfaces of the cylinder, tie bars and piston rod must be free of deep scratches, pitting, corrosion and blistering or flaking coating.



CAUTION:

Actuator parts that reflect any of the above listed characteristics should be replaced with new parts.

Before installation apply film of lubricant on all moving parts. Apply film of lubricant on all seals before installing into seal grooves.

NOTE:

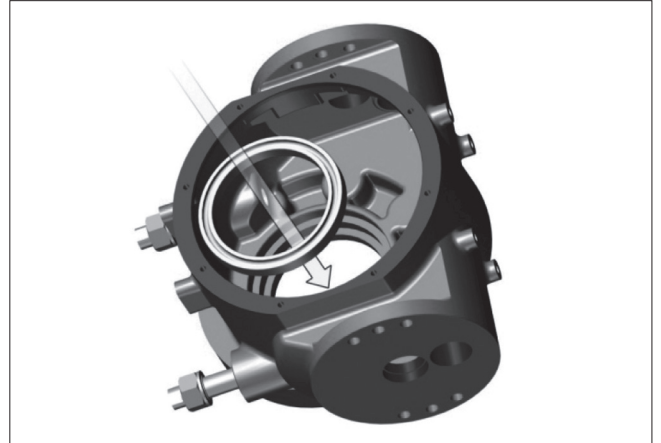
Parts and seals used in the actuator will be assembled using lubricant.

4.4.2 Central block module reassembly

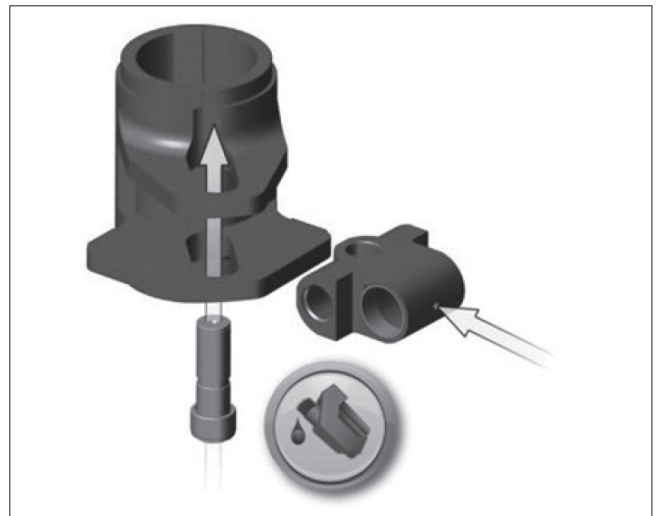
NOTE:

Before proceeding with central block Module reassembly. Refer bulletin for exploded views of central block assembly

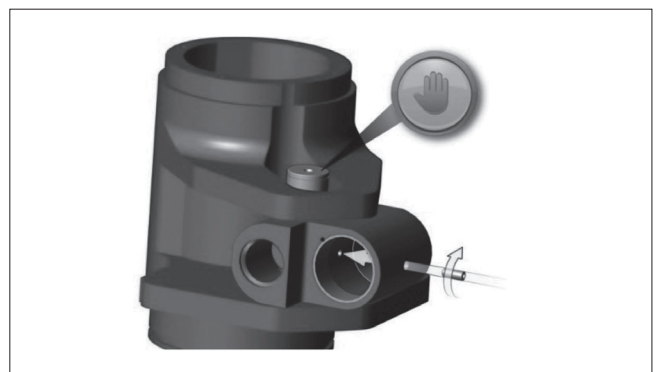
Step 1. Install bottom yoke bearing (27) in central block housing (5). Apply grease on bearing seat on central block housing for ease of assembly.



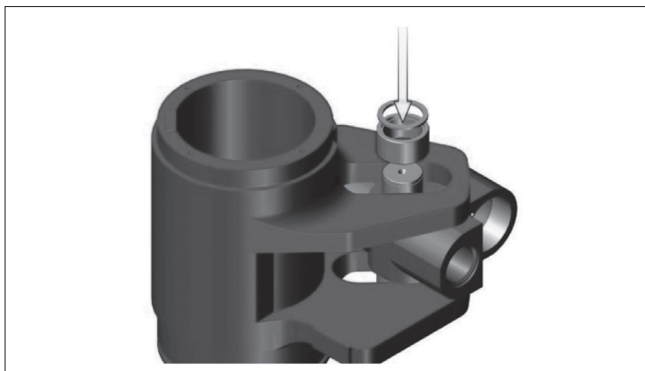
Step 2. Install carrier (8) in yoke (28) then insert yoke pin assembly (9) with roller (10) and washer (7) from bottom side for carrier.



Step 3. Install hex. Head cap screw in carrier to locate the yoke pin.



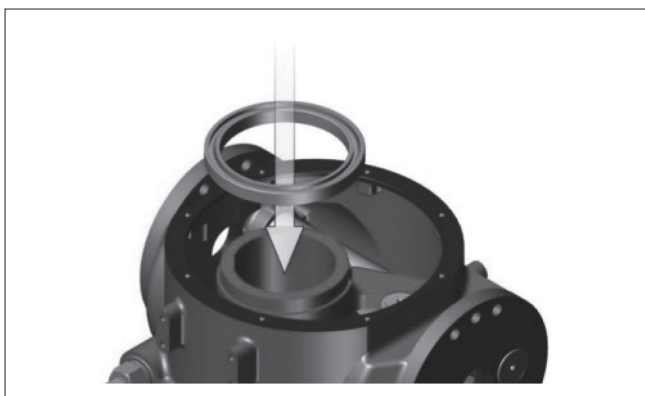
Step 4. Install top side roller (10), washer (7) and retaining ring (6) on yoke pin (9).



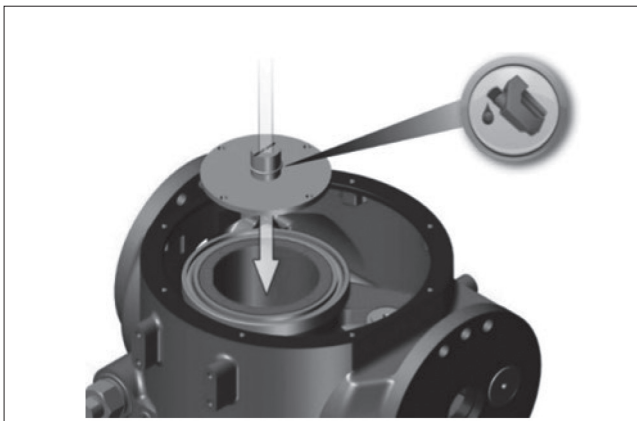
Step 5. Install the yoke assembly in the bottom bearing (27) of actuator with bottom side O-ring seal (32).



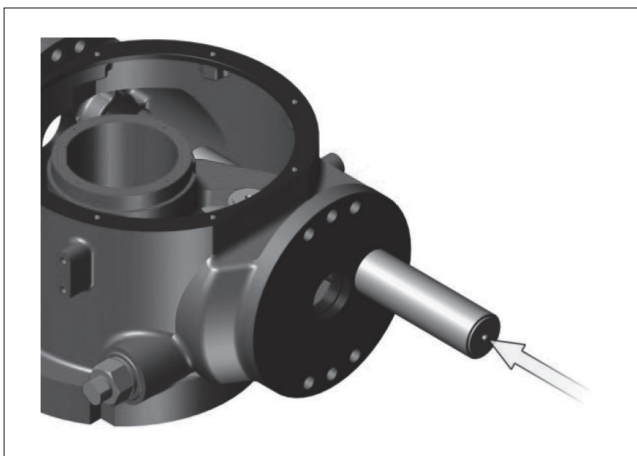
Step 6. Install top bearing (27) on yoke apply grease layer on bearing.



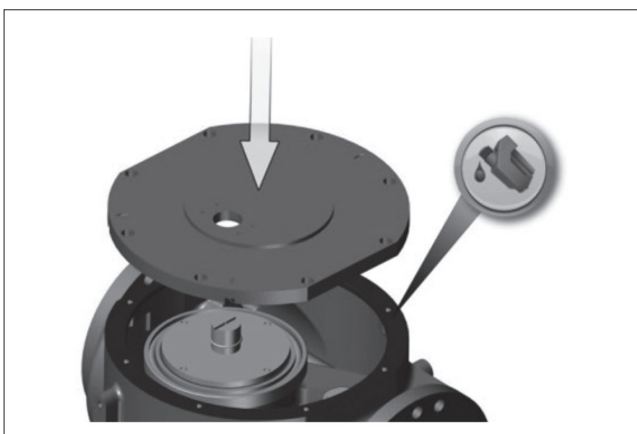
Step 7. Install yoke insert (25) with O-ring (11) on the top of yoke with the help of hex. head cap screw (24), apply grease on top side for yoke insert



Step 8. Install guide rod (31) in central block housing (5) and carrier (8).



Step 9. Install top cover (14) with O-ring (13) on central block housing (5) with the help of hex. soc. head cap screw (20) applies coat of lubricant on O-ring, and mating surfaces before installation



NOTE:
Above step should be done after installation of Hydraulic cylinder module.

4.4.3 Hydraulic cylinder module reassembly

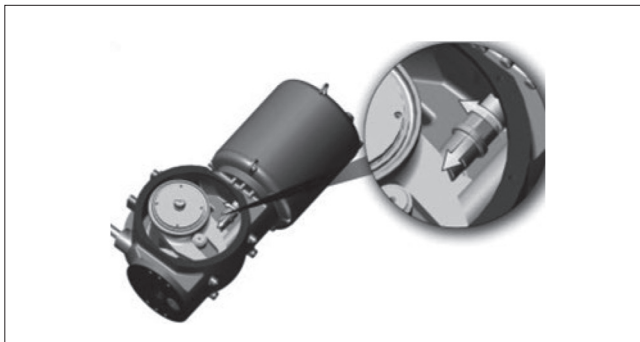
NOTE:

The actuator must be in appropriate over travel position.

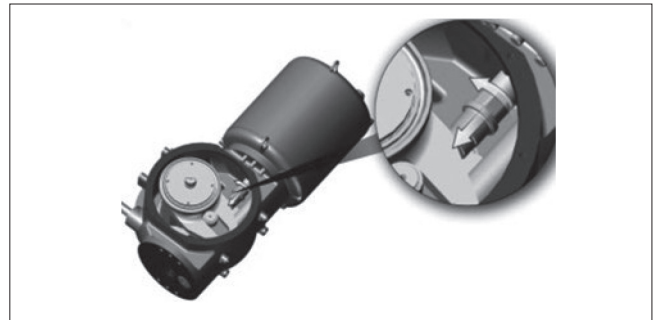
Step 1. Install O-ring (4) on front cover of cylinder, apply film of lubricant on cover O-ring then install cylinder on central block.



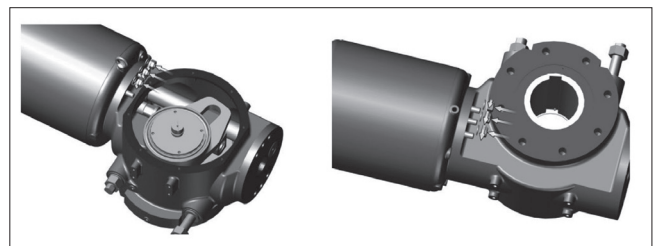
Step 2. Install connecting bolt (3) through connecting nut (2) on piston rod tapping tighten connecting bolt.



Step 3. Align piston rod, connecting nut (2) and connecting bolt (3) assembly with carrier and screw it in carrier.

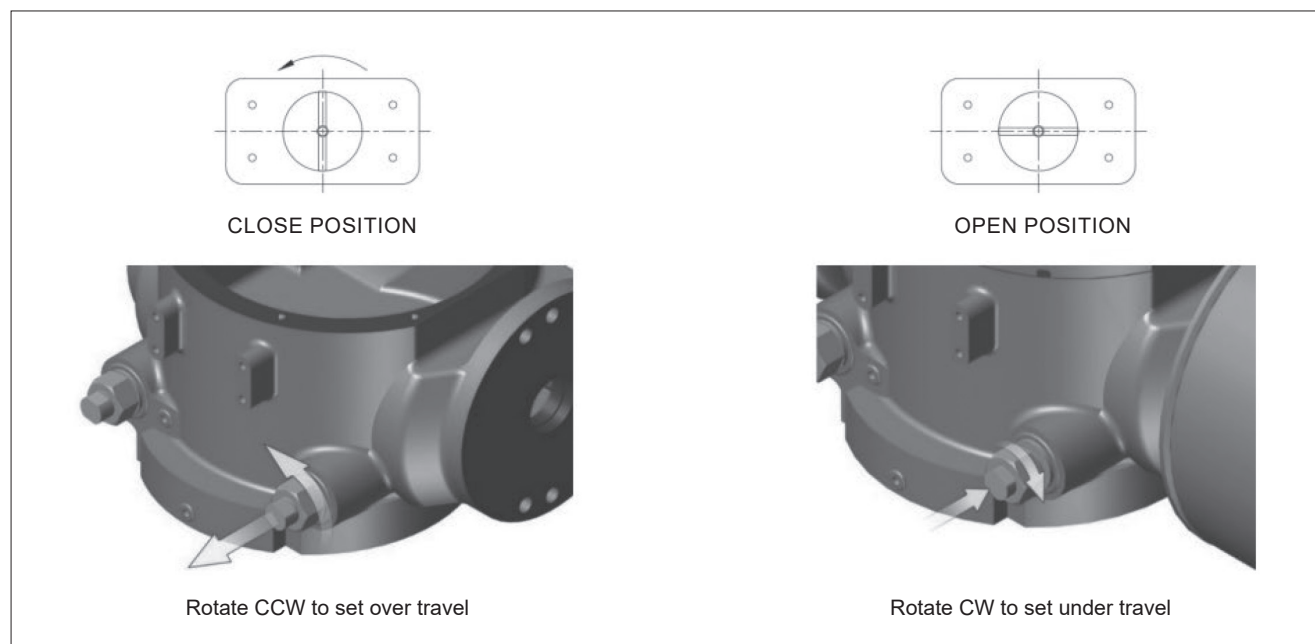


Step 4. Install studs/nuts (41,39) with spring washer (40) to install cylinder module on central block module.



4.5 Stroke screw adjustment

1. Position indicator can be adjusted to get desired close & open setting of the valve respectively.
2. With stroke adjustment screw setting of $\pm 5^\circ$ can be achieved in both positions.
3. Loosen nut & rotate stroke adjustment screw in counterclockwise (CCW) direction to set over travel and clockwise (CW) direction to set under travel.



4.6 Malfunctions

Symptom	Possible cause	Action
Irregular or slow operation	Low supply pressure	Make sure that supply pressure complies with minimum torque required by valve. Check that supply oil pipes are large enough.
	Valve fault	Check that valve functions properly without actuator.
	Incorrect actuator rating	Contact manufacturer to check rating.
	Leak in piston or piston rod seal	Replace seals.
	Cylinder damaged by impurities	Note installation position recommendation. Replace cylinder if damaged.
	Worn-out actuator bearings	Check bearings. Replace bearings when necessary.
	Moving parts corroded in harsh, humid conditions	Replace the corroded parts.
	Backlash in joint between actuator and valve	Replace parts as necessary.

4.7 Ordering spare parts

NOTE:

Use only original spare parts. This ensures proper functioning of the actuator.

When ordering spare parts, always include following information.

- Type code, sales order number, serial number
- Number of the parts list, part number, name of the part and required quantity
- This information can be found from the identification plate or documents.

4.8 FOR ORDERING SPARE SEAL KIT

SEAL KIT FOR NELES HEAVY DUTY HYDRAULIC CYLINDER

Heavy duty hydraulic cylinder

1.	2.	3.	4.
SKN1	B	H063	G

1. sign	Series
SKN1	Seal kit for neles heavy duty hydraulic cylinder

2. sign	Frame size
B	A
	B
	C
	D
	E
	G
	H

3. sign	Cylinder size
H063	H063
	H080
	H100
	H125
	H160
	H200
	H250
	H300
	H350
	H400
	H450

4. sign	Link type
G	G=Nitrile, NBR

4.9 Lifting tool table

D shackle sizes	Double acting
N1ATO N1C	1/4"
N1D	5/16"
N1E	7/16"
N1G	5/8"
N1H	5/8"

4.10 Recommended Lubricants

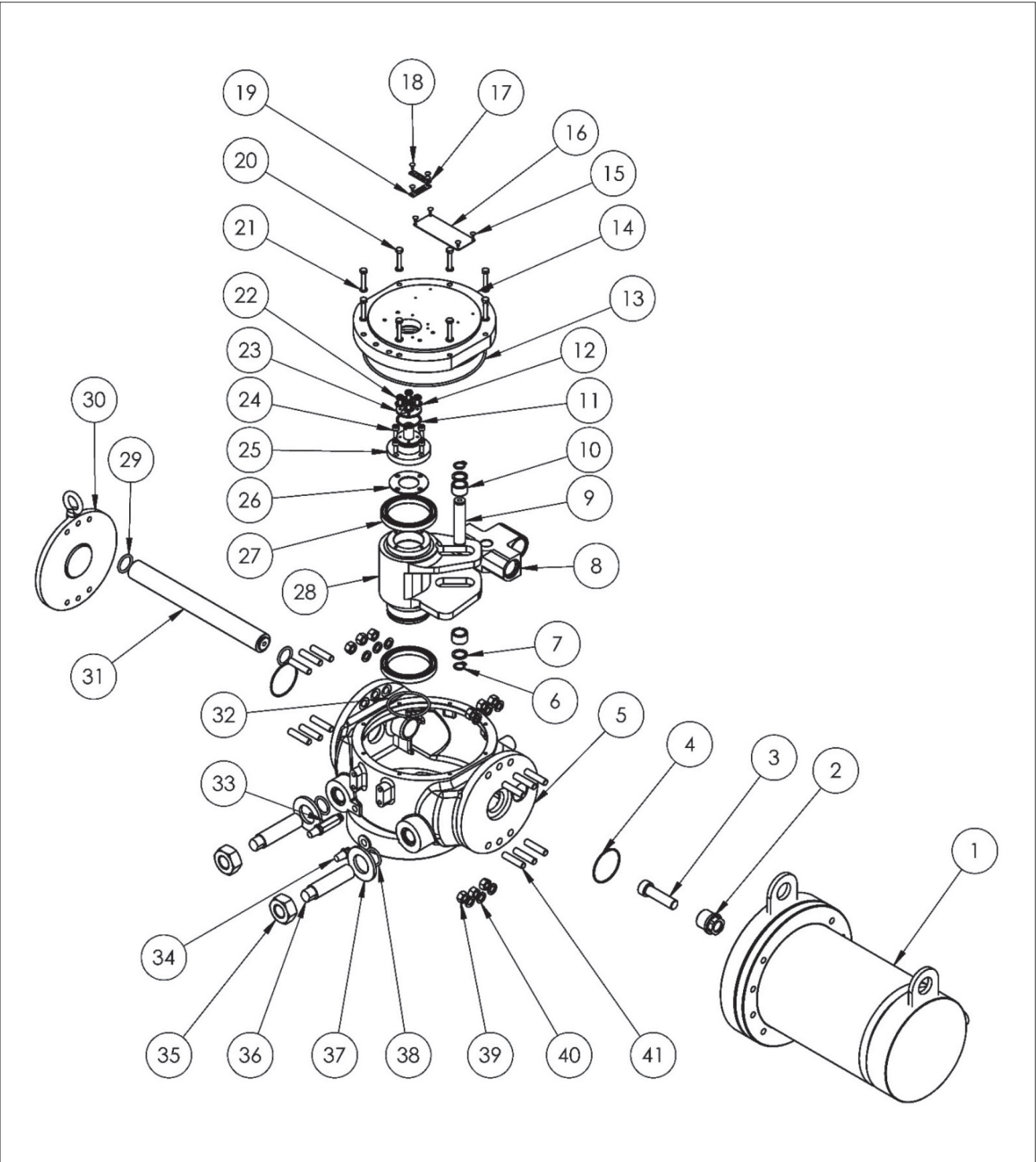
NBR & Viton seals (General use)	Velloguard VG9
---------------------------------	----------------

4.11 TIGHTENING TORQUE

Table 3 Tightening torque

CENTRAL FRAME	PART NO	TIGHTENING TORQUE IN NM
N1A	3	107
	20	4
	24	4.2
	2	201
	39	20
N1B	3	200
	20	20
	24	4.2
	2	345
	39	35
N1C	3	280
	20	20
	24	4.2
	2	489
	39	35
N1D	3	580
	20	35
	24	4.2
	2	1008
	39	87
N1E	3	1250
	20	35
	24	4.5
	2	1988
	39	170
N1G	3	1210
	20	35
	24	10
	2	2441
	39	293
N1H	3	2300
	20	87
	24	10
	2	4065
	39	293

5. EXPLODED VIEW AND PARTS LIST OF HYDRAULIC ACTUATORS



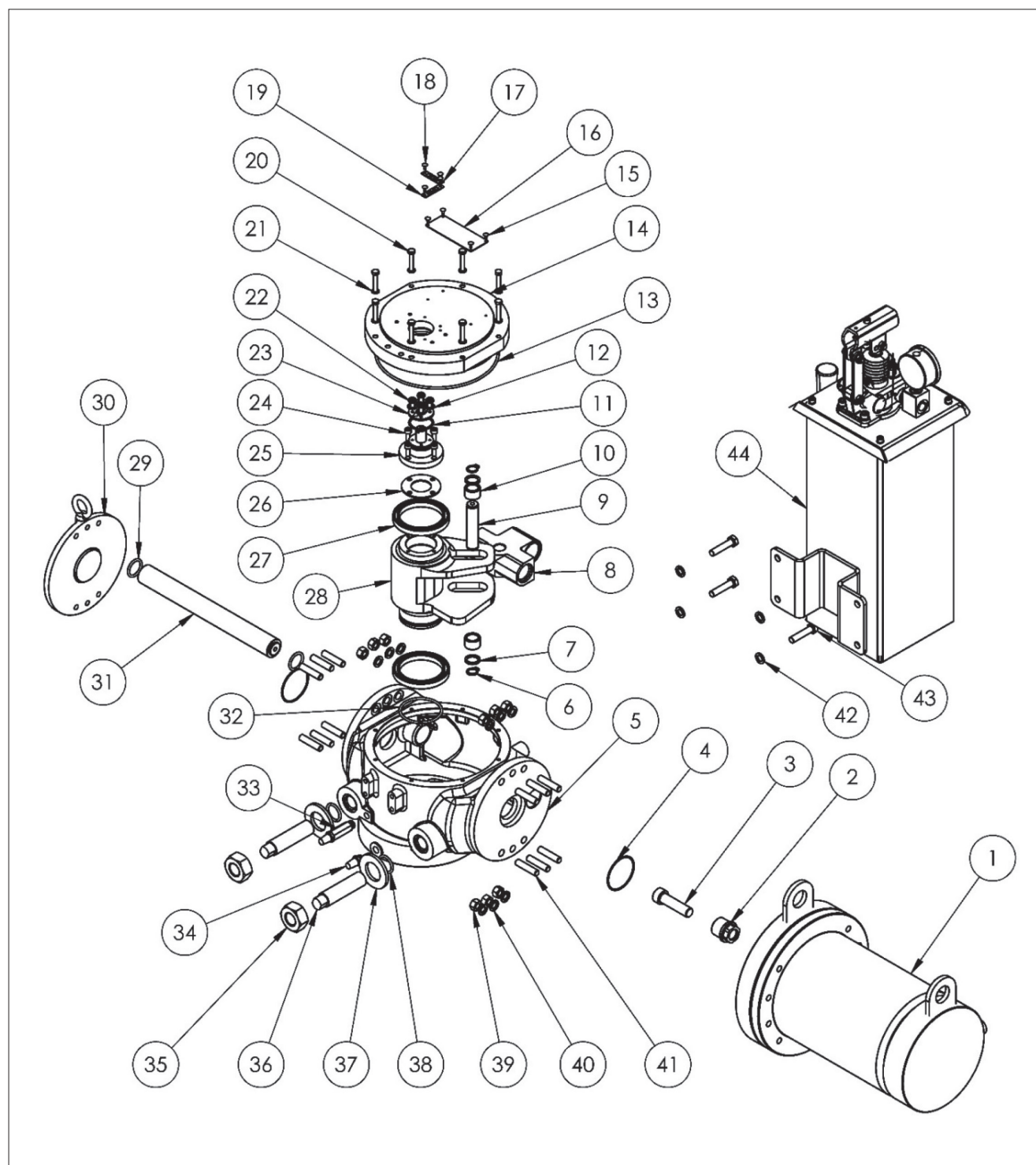
ITEM NO.	DESCRIPTION	QTY.	MATERIAL
1	HYDRAULIC CYLINDER	1	CARBON STEEL
2	CONNECTING NUT	1	ALLOY STEEL
3	CONNECTING BOLT	1	ALLOY STEEL
4*	O-RING	2	NBR
5	CENTRAL BLOCK	1	DUCTILE IRON
6	EXTERNAL CIRCLIP	2	DIN 471
7	WASHER	2	STAINLESS STEEL
8\$	CARRIER	1	DUCTILE IRON / CARBON STEEL / STAINLESS STEEL
9	YOKE PIN	1	ALLOY STEEL
10	ROLLER FOR YOKE PIN	2	ALLOY STEEL
11*	O-RING	1	NBR
12	SPRING WASHER	4	DIN 128
13*	O-RING	1	NBR
14	CENTRAL BLOCK COVER	1	DUCTILE IRON
15	RIVET	4	-
16	NAME PLATE	1	STAINLESS STEEL
17	CLOSE POSITION INDICATOR	1	STAINLESS SHEEL
18	RIVET	4	-
19	OPEN POSITION INDICATOR	1	STAINLESS STEEL
20	HEX. SOC. HEAD CAP SCREW	8	DIN 912
21	SPRING WASHER	8	DIN 128
22	SLOTTED HEAD CAP SCREW	4	IS 6101
23	POSITION INDICATOR	1	ALUMINIUM ALLOY
24	HEX. SOC. HEAD CAP SCREW	4	DIN 912
25	YOKE INSERT	1	DUCTILE IRON
26*	GASKET FOR COVER	1	NBR
27	RADIAL BALL BEARING	2	-
28	YOKE	1	DUCTILE IRON
29*	O-RING	2	NBR
30	REAR CAP	1	DUCTILE IRON
31	GUIDE ROD	1	STAINLESS STEEL
32*	O-RING	1	NBR
33	CHECK VALVE	1	STD
34	SILENCER	2	BRASS
35	HEX. NUT	2	DIN 934
36	STROKE ADJUSTMENT SCREW	2	CARBON STEEL
37	WASHER	2	CARBON STEEL
38*	O-RING	2	NBR
39	HEX. NUT	12	DIN 934
40	SPRING WASHER	12	DIN 128
41	STUD BOLT	12	ALLOY STEEL

1)* Marked component are the parts of the seal kit

2)\$ Marked components having following notes:

- Part no. 8 (Carrier) MOC is Ductile iron up to D frame and Stainless steel from E frame onwards.

6. EXPLODED VIEW AND PARTS LIST OF HYDRAULIC ACTUATOR WITH HAND PUMP



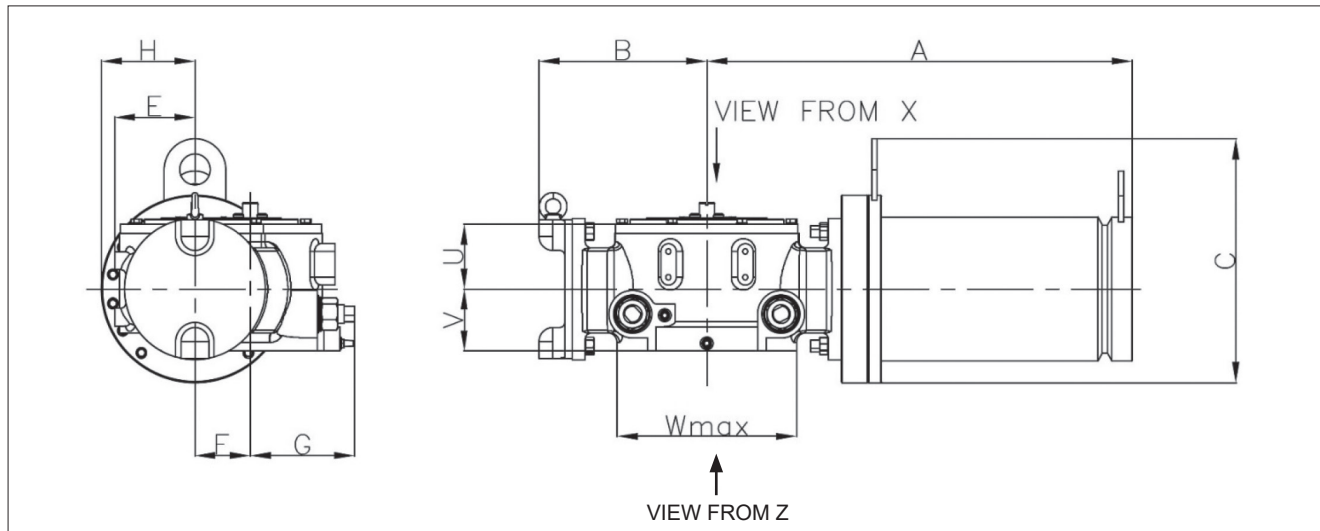
ITEM NO.	DESCRIPTION	QTY.	MATERIAL
1	HYDRAULIC CYLINDER	1	CARBON STEEL
2	CONNECTING NUT	1	ALLOY STEEL
3	CONNECTING BOLT	1	ALLOY STEEL
4*	O-RING	2	NBR
5	CENTRAL BLOCK	1	DUCTILE IRON
6	EXTERNAL CIRCLIP	2	DIN 471
7	WASHER	2	STAINLESS STEEL
8\$	CARRIER	1	DUCTILE IRON / CARBON STEEL / STAINLESS STEEL
9	YOKE PIN	1	ALLOY STEEL
10	ROLLER FOR YOKE PIN	2	ALLOY STEEL
11*	O-RING	1	NBR
12	SPRING WASHER	4	DIN 128
13*	O-RING	1	NBR
14	CENTRAL BLOCK COVER	1	DUCTILE IRON
15	RIVET	4	-
16	NAME PLATE	1	STAINLESS STEEL
17	CLOSE POSITION INDICATOR	1	STAINLESS SHEEL
18	RIVET	4	-
19	OPEN POSITION INDICATOR	1	STAINLESS STEEL
20	HEX. SOC. HEAD CAP SCREW	8	DIN 912
21	SPRING WASHER	8	DIN 128
22	SLOTTED HEAD CAP SCREW	4	IS 6101
23	POSITION INDICATOR	1	ALUMINIUM ALLOY
24	HEX. SOC. HEAD CAP SCREW	4	DIN 912
25	YOKE INSERT	1	DUCTILE IRON
26*	GASKET FOR COVER	1	NBR
27	RADIAL BALL BEARING	2	-
28	YOKE	1	DUCTILE IRON
29*	O-RING	2	NBR
30	REAR CAP	1	DUCTILE IRON
31	GUIDE ROD	1	STAINLESS STEEL
32*	O-RING	1	NBR
33	CHECK VALVE	1	STD
34	SILENCER	2	BRASS
35	HEX. NUT	2	DIN 934
36	STROKE ADJUSTMENT SCREW	2	CARBON STEEL
37	WASHER	2	CARBON STEEL
38*	O-RING	2	NBR
39	HEX. NUT	12	DIN 934
40	SPRING WASHER	12	DIN 128
41	STUD BOLT	12	ALLOY STEEL
42	SPRING WASHER	4	STEEL
43	HEXAGON HEAD CAP SCREW	4	CARBON STEEL
44	HYDRAULIC PUMP UNIT	1	-

1)* Marked component are the parts of the seal kit

2)\$ Marked components having following notes:

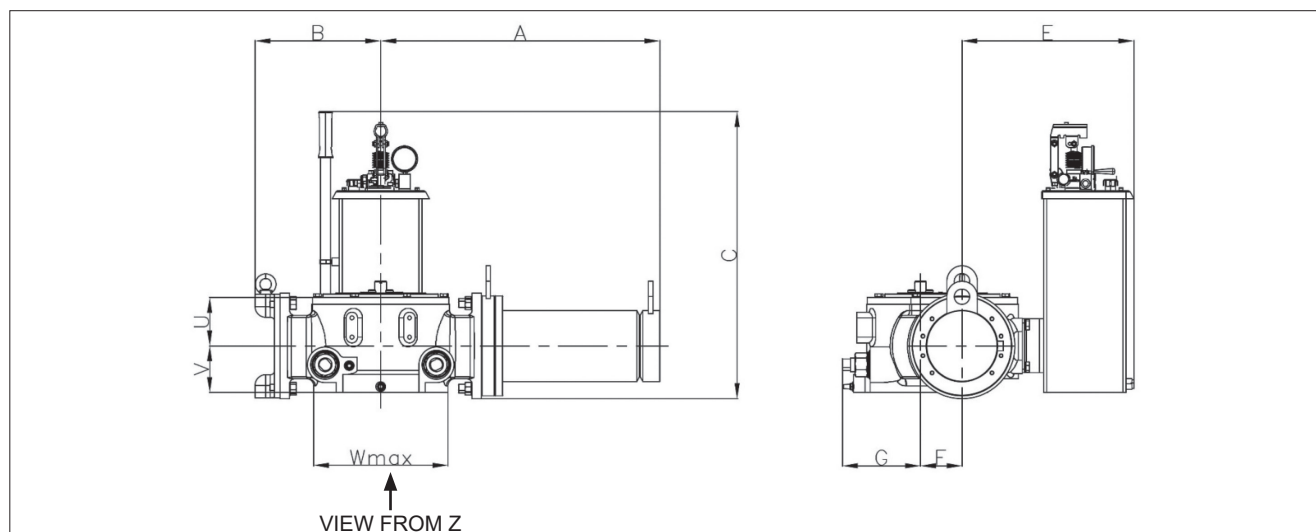
- Part no. 8 (Carrier) MOC is Ductile iron up to D frame and Stainless steel from E frame onwards.

7. DIMENSIONS: HYDRAULIC BARE ACTUATOR



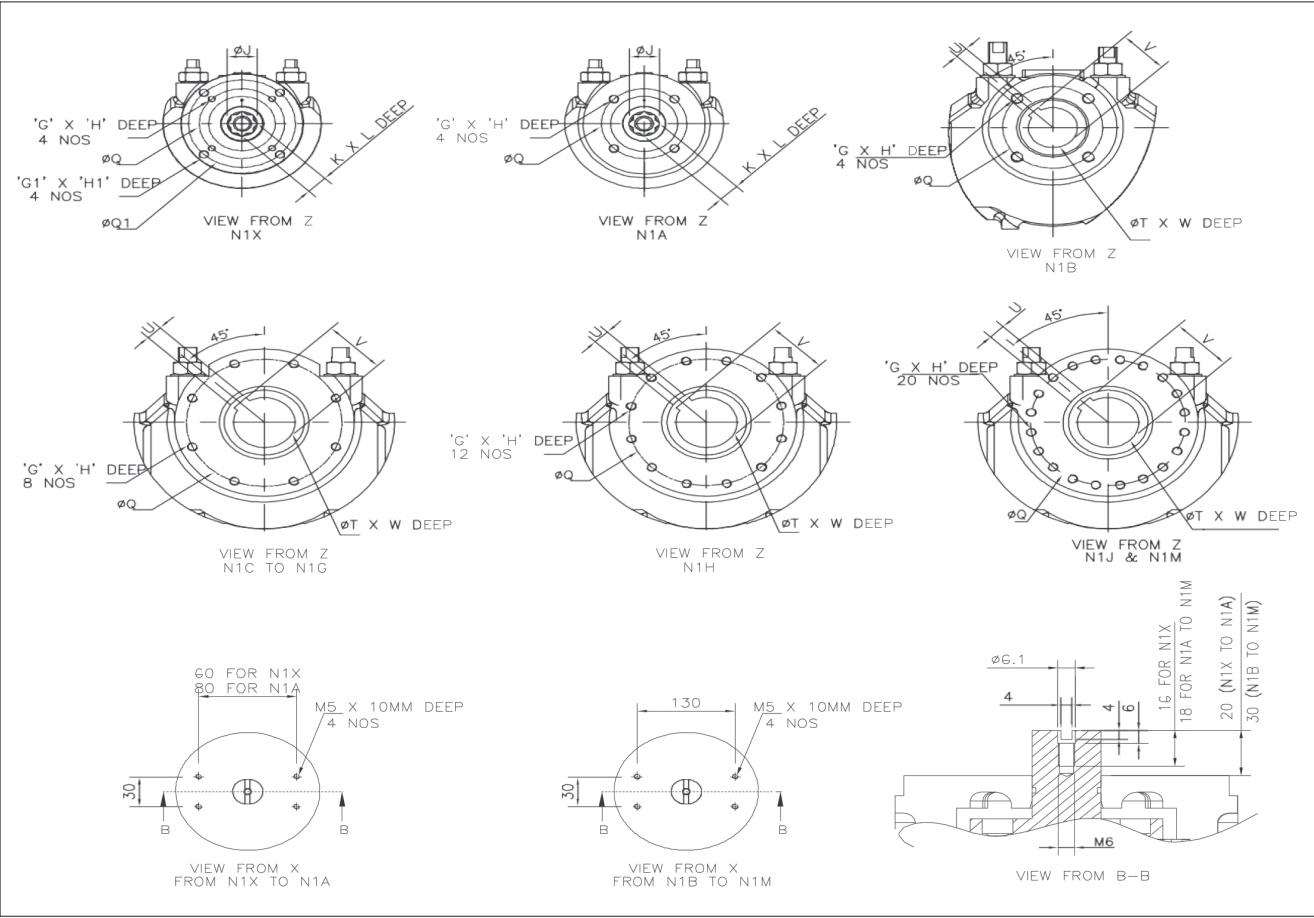
DIMENSIONS: HYDRAULIC BARE ACTUATOR												
SR NO	MODEL	A	B	C	E	F	G	H	V	U	Wmax	PORT
1	N1AH063	605	171	215	103	58	131	82.5	94	86	200	3/8" NPT
2	N1AH080	605	171	215	103	58	131	82.5	94	86	200	3/8" NPT
3	N1AH100	605	171	221	103	58	131	85.5	94	86	200	3/8" NPT
4	N1AH125	622	171	260	103	58	131	105	94	86	200	3/8" NPT
5	N1AH160	645	171	310	103	58	131	125	94	86	200	3/8" NPT
6	N1BH063	773.5	230	262	129	75	165	106	102	105	210	3/8" NPT
7	N1BH080	773	230	262	129	75	165	106	102	105	210	3/8" NPT
8	N1BH100	773	230	273	129	75	165	111.5	102	105	210	3/8" NPT
9	N1BH125	788	230	266	129	75	165	108	102	105	210	3/8" NPT
10	N1BH160	788	230	310	129	75	165	125	102	105	210	3/8" NPT
11	N1BH200	794	248	350	129	75	165	145	102	105	210	3/8" NPT
12	N1CH080	870.5	248	273	139	90	157	111.5	130	112	294	3/8" NPT
13	N1CH100	870	248	273	139	90	157	111.5	130	112	294	3/8" NPT
14	N1CH125	870	248	325	139	90	157	137.5	130	112	294	3/8" NPT
15	N1CH160	870	248	305	139	90	157	122.5	130	112	294	3/8" NPT
16	N1CH200	915	248	350	139	90	157	145	130	112	294	3/8" NPT
17	N1CH250	915	328	425	139	90	157	182.5	130	112	294	3/8" NPT
18	N1DH080	980.5	328	318	172	108	203	129	138	121	350	3/8" NPT
19	N1DH100	980	328	318	172	108	203	129	138	121	350	3/8" NPT
20	N1DH125	1003	328	320	172	108	203	130	138	121	350	3/8" NPT
21	N1DH160	1003	328	340	172	108	203	130	138	121	350	3/8" NPT
22	N1DH200	1042	328	386	172	108	203	153	138	121	350	3/8" NPT
23	N1DH250	1042	365	445	172	108	203	182.5	138	121	350	3/8" NPT
24	N1EH080	1090	365	376	188	130	235	148	199	155	425	3/8" NPT
25	N1EH100	1090	365	376	188	130	235	148	199	155	425	3/8" NPT
26	N1EH125	1090	365	378	188	130	235	149	199	155	425	3/8" NPT
27	N1EH160	1170	365	378	188	130	235	149	199	155	425	3/8" NPT
28	N1EH200	1116	365	418	188	130	235	149	199	155	425	3/8" NPT
29	N1EH250	1116	365	485	188	130	235	182.5	199	155	425	3/8" NPT
30	N1EH300	1170	365	540	188	130	235	210	199	155	425	3/8" NPT
31	N1EH350	1170	365	600	188	130	235	240	199	155	425	3/8" NPT
32	N1EH400	1170	450	670	188	130	235	275	199	155	425	3/8" NPT
33	N1GH100	1386	450	420	250	160	286	170	251	177	475	3/8" NPT
34	N1GH125	1386	450	420	250	160	286	170	251	177	475	3/8" NPT
35	N1GH160	1386	450	460	250	160	286	170	251	177	475	3/8" NPT
36	N1GH200	1386	450	465	250	160	286	172.5	251	177	475	3/8" NPT
37	N1GH250	1386	450	470	250	160	286	175	251	177	475	3/8" NPT
38	N1GH300	1386	450	560	250	160	286	220	251	177	475	3/8" NPT
39	N1GH350	1386	450	600	250	160	286	240	251	177	475	3/8" NPT
40	N1GH400	1400	450	670	250	160	286	275	251	177	475	3/8" NPT
41	N1GH450	1400	450	720	250	160	286	300	251	177	475	3/8" NPT
42	N1HH125	1606	566	425	256	198	334	172.5	222	213	600	1/2" NPT
43	N1HH160	1606	566	465	256	198	334	172.5	222	213	600	1/2" NPT
44	N1HH200	1606	566	465	256	198	334	172.5	222	213	600	1/2" NPT
45	N1HH250	1606	566	470	256	198	334	175	222	213	600	1/2" NPT
46	N1HH300	1606	566	560	256	198	334	220	222	213	600	1/2" NPT
47	N1HH350	1606	566	600	256	198	334	240	222	213	600	1/2" NPT
48	N1HH400	1606	566	670	256	198	334	275	222	213	600	1/2" NPT
49	N1HH450	1606	566	720	256	198	334	300	222	213	600	1/2" NPT

8. DIMENSIONS: HYDRAULIC ACTUATOR WITH HAND PUMP UNIT



DIMENSIONS: HYDRAULIC ACTUATOR WITH HAND PUMP UNIT											
SR NO	MODEL	A	B	C	E	F	G	V	U	Wmax	PORT
1	N1AH063	605	171	680	321	58	131	94	86	200	3/8" NPT
2	N1AH080	605	171	680	321	58	131	94	86	200	3/8" NPT
3	N1AH100	605	171	680	321	58	131	94	86	200	3/8" NPT
4	N1AH125	622	171	680	321	58	131	94	86	200	3/8" NPT
5	N1AH160	645	171	680	321	58	131	94	86	200	3/8" NPT
6	N1BH063	773.5	230	680	347	75	165	102	105	210	3/8" NPT
7	N1BH080	773	230	680	347	75	165	102	105	210	3/8" NPT
8	N1BH100	773	230	680	347	75	165	102	105	210	3/8" NPT
9	N1BH125	788	230	680	347	75	165	102	105	210	3/8" NPT
10	N1BH160	788	230	680	347	75	165	102	105	210	3/8" NPT
11	N1BH200	794	248	680	357	75	165	102	105	210	3/8" NPT
12	N1CH080	870.5	248	680	357	90	157	130	112	294	3/8" NPT
13	N1CH100	870	248	680	357	90	157	130	112	294	3/8" NPT
14	N1CH125	870	248	680	357	90	157	130	112	294	3/8" NPT
15	N1CH160	870	248	680	357	90	157	130	112	294	3/8" NPT
16	N1CH200	915	248	680	357	90	157	130	112	294	3/8" NPT
17	N1CH250	915	328	680	433	90	157	130	112	294	3/8" NPT
18	N1DH080	980.5	328	680	390	108	203	138	121	350	3/8" NPT
19	N1DH100	980	328	680	390	108	203	138	121	350	3/8" NPT
20	N1DH125	1003	328	680	390	108	203	138	121	350	3/8" NPT
21	N1DH160	1003	328	680	390	108	203	138	121	350	3/8" NPT
22	N1DH200	1042	328	680	433	108	203	138	121	350	3/8" NPT
23	N1DH250	1042	365	680	449	108	203	138	121	350	3/8" NPT
24	N1EH080	1090	365	680	406	130	235	199	155	425	3/8" NPT
25	N1EH100	1090	365	680	406	130	235	199	155	425	3/8" NPT
26	N1EH125	1090	365	680	406	130	235	199	155	425	3/8" NPT
27	N1EH160	1170	365	680	406	130	235	199	155	425	3/8" NPT
28	N1EH200	1116	365	680	406	130	235	199	155	425	3/8" NPT
29	N1EH250	1116	365	680	406	130	235	199	155	425	3/8" NPT
30	N1EH300	1170	365	880	474	130	235	199	155	425	3/8" NPT
31	N1EH350	1170	365	880	474	130	235	199	155	425	3/8" NPT
32	N1EH400	1170	450	880	536	130	235	199	155	425	3/8" NPT
33	N1GH100	1386	450	680	468	160	286	251	177	475	3/8" NPT
34	N1GH125	1386	450	680	468	160	286	251	177	475	3/8" NPT
35	N1GH160	1386	450	680	511	160	286	251	177	475	3/8" NPT
36	N1GH200	1386	450	680	511	160	286	251	177	475	3/8" NPT
37	N1GH250	1386	450	680	511	160	286	251	177	475	3/8" NPT
38	N1GH300	1386	450	880	536	160	286	251	177	475	3/8" NPT
39	N1GH350	1386	450	880	536	160	286	251	177	475	3/8" NPT
40	N1GH400	1400	450	910	536	160	286	251	177	475	3/8" NPT
41	N1GH450	1400	450	910	536	160	286	251	177	475	3/8" NPT
42	N1HH125	1606	566	680	474	198	334	222	213	600	1/2" NPT
43	N1HH160	1606	566	680	517	198	334	222	213	600	1/2" NPT
44	N1HH200	1606	566	680	517	198	334	222	213	600	1/2" NPT
45	N1HH250	1606	566	880	542	198	334	222	213	600	1/2" NPT
46	N1HH300	1606	566	880	542	198	334	222	213	600	1/2" NPT
47	N1HH350	1606	566	910	602	198	334	222	213	600	1/2" NPT
48	N1HH400	1606	566	910	602	198	334	222	213	600	1/2" NPT
49	N1HH450	1606	566	910	602	198	334	222	213	600	1/2" NPT

9. MOUNTING FACE DIMENSIONS WITH ISO BORE



ACTUATOR	DIMENSIONS, MM													MOUNTING FACE
	G	G1	H	H1	ØJ	K	L	Q	Q1	T	U	V	W	
N1X	M8	-	12	-	30.5	22	25	70	-	-	-	-	-	F07
N1X	-	M10	-	15	30.5	22	25		102	-	-	-	-	F10
N1A	M16	-	24	-	48.2	36	45	140	-	-	-	-	-	F14
N1B	M20	-	30	-	-	-	-	165	-	80	22	85.4	173	F16
N1C	M16	-	24	-	-	-	-	254	-	100	28	106.4	202	F25
N1D	M20	-	30	-	-	-	-	298	-	120	32	127.4	217	F30
N1E	M30	-	45	-	-	-	-	356	-	160	40	169.4	309	F35
N1G	M36	-	54	-	-	-	-	406	-	178	45	188.4	383	F40
N1H	M36	-	54	-	-	-	-	483	-	220	50	231.4	385	F48
N1J	M36	-	54	-	-	-	-	603	-	280	63	292.4	483	F60
N1M	M42	-	75	-	-	-	-	724	-	336	80	351.4	556	-

10. N1- HYDRAULIC ACTUATOR WEIGHT

10.1 WEIGHTS OF N1- HYDRAULIC ACTUATOR

Cyl.dia.	63	80	100	125	160	200	250	300	350	400	450
Actuator	Weight, Kg										
N1A	55	55	61	72	98	-	-	-	-	-	-
N1B	85	85	91	101	127	162	-	-	-	-	-
N1C	-	115	115	124	151	185	255	-	-	-	-
N1D	-	175	175	185	215	251	311	-	-	-	-
N1E	-	265	265	273	290	335	400	450	524	620	-
N1G	-	-	310	310	310	355	445	470	550	650	670
N1H	-	-	-	357	357	408	512	541	633	748	357

10.2 WEIGHTS OF N1 HYDRAULIC ACTUATOR WITH HAND PUMP

Cyl.dia.	63	80	100	125	160	200	250	300	350	400	450
Actuator	Weight, Kg										
N1A	78	78	84	95	121	-	-	-	-	-	-
N1B	108	108	114	124	150	185	-	-	-	-	-
N1C	-	138	138	147	174	208	278	-	-	-	-
N1D	-	198	198	208	238	274	334	-	-	-	-
N1E	-	288	288	296	313	374	439	489	563	659	-
N1G	-	-	333	333	333	394	484	509	589	689	709
N1H	-	-	-	380	380	447	551	580	672	787	396

11. N1 -HYDRAULIC ACTUATOR TYPE CODE

Heavy duty hydraulic actuator

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
N1	B	H063	S	1	G	D00	D	D	/	* (NIL)

1. sign	Series
N1	Neles heavy duty hydraulic actuator

4. sign	Link type
S	Symmetric

2. sign	Frame size
B	A
	B
	C
	D
	E
	G
	H

5. sign	Cylinder type
1	Single cylinder

6. sign	Temperature range
G	-20...+85 °C

7. sign	Double acting
D00	Double acting

3. sign	Cylinder size
H063	H063
	H080
	H100
	H125
	H160
	H200
	H250
	H300
	H350
	H400
	H450

8. sign	Spring action
D	Double acting

9. sign	Shaft bore key type
D	According to ISO bore keyway

10. sign	Break
/	Type code break to be left blank if no options specified.

11. sign	Options
HP	Manual Hydraulic Pump operation

Subject to change without prior notice.

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Valmet Flow Control Oy

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www.valmet.com/flowcontrol

