

Cylinder repair guide



Revisions and changes

Rev:	Prepared by	Summary of changes
00	EJ	New document

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1 SCOPE

This instruction can be used for these toolkits / spare part repair kits:

9515140	Tool kit for cylinder 5082487 [MVOW cylinder 300024225]	
5272214R	Stuffing box with seals ø95	For 5082467 (3000024225)
5272214L	Repair kit Light spare part sales 160/95	For 5082467 (3000024225)
5272214H	Repair kit Heavy spare part sales 160/95	For 5082467 (3000024225)

2 DISASSEMBLY

Drive the cylinder complete out and engage the blade lock.

Before disassembly, the system must be in safe mode, pressureless and the cylinder drained for oil.
Prepare for oil collection when oil transfer tubes and cylinder enclosure are disassembled.

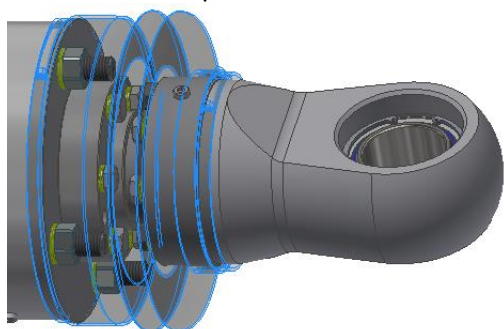
2.1 POSITIONS SENSOR

If HEAVY and LIGHT repair: Unscrew the position sensor(if there) from the endcap and pull it out of the cylinder.

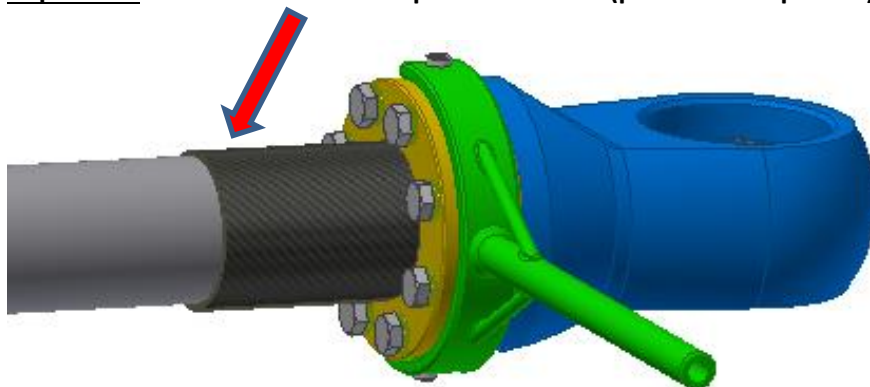
2.2 BEARING HEAD

Prevent the cylinder from pivoting by installing support(could be tightening straps) at the endcap.

Loosen the clamps in both ends of the rod protection cover, open the velcro seam, and remove the cover.



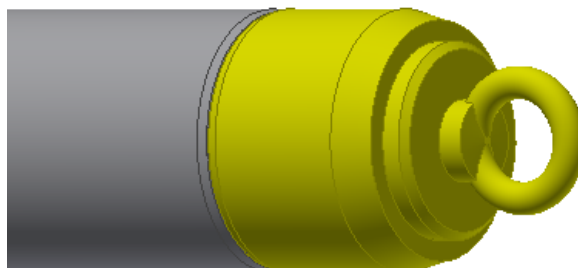
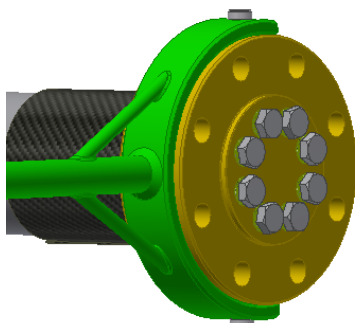
Important: Mount the velcro rod protection band(part of the repair kit) around the rod next to the flange.



Mount the installation key to the rod end flange with the 2 pcs. M10 bolts present in the flange.

Unscrew all 8 M16x80 bolts that holds the bearing head to the rod end flange[Discard bolts – new in repair kit].

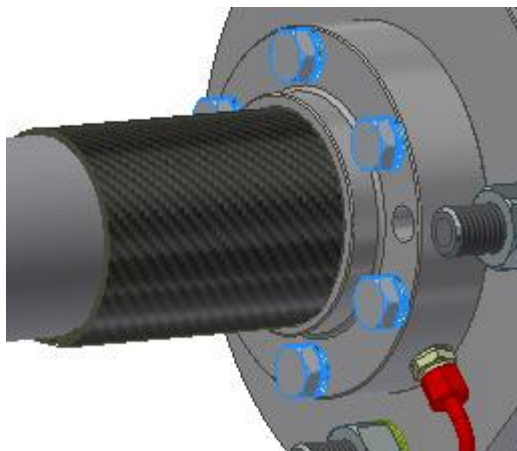
Retract the rod and unscrew all 8 M12x100 bolts that holds the flange to the rod[Discard bolts – new in repair kit].



Remove flange(leave installation key on), and mount assembly bush with eye on the rod end.

2.3 STUFFING BOX

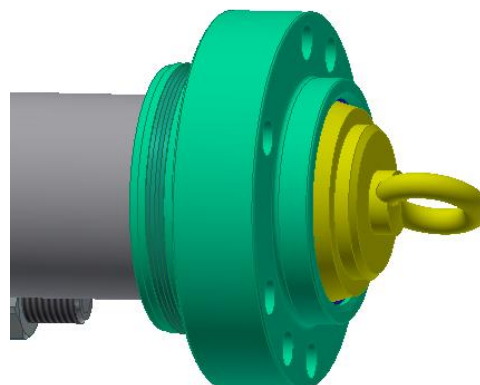
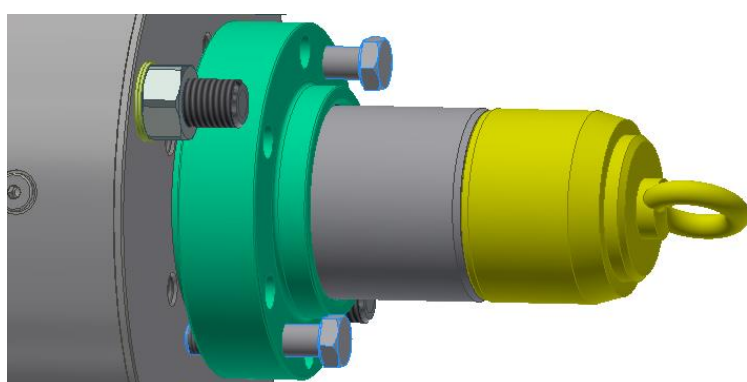
Slide the rod protection band to the stuffing box and dismount the drainpipe and fitting from the stuffing box.



Unscrew all 6 M16x70 bolts that holds the stuffing box to the intermediate part.

Use 2 of the bolts to pull out the stuffingbox, by screwing them in to the M16 tapped holes in the stuffing box.

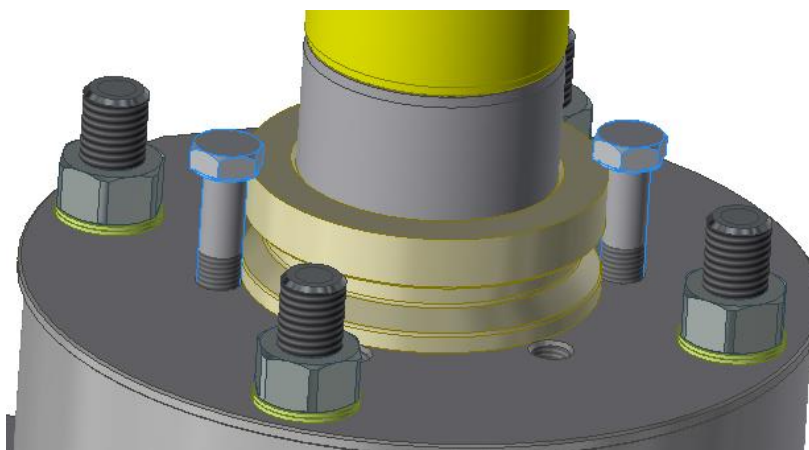
[Discard stuffing bolts and bolts – new in repair kit].



2.4 TUBE ASSEMBLY

Only if HEAVY and LIGHT repair.

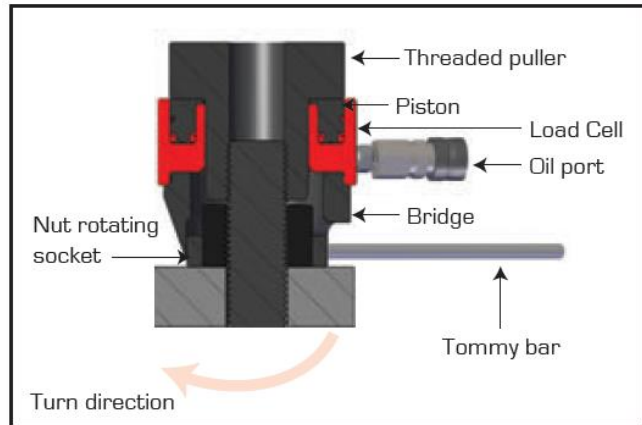
Mount the nylon “dummy” stuffing box and hold it in place by mounting two of the old M16x70 bolts in the tapped holes farthest away from the tie rods as shown below.



Unscrew the oil transfer tubes from the SAE ports(4 x M12 allen screws).

Fasten lifting tool to the eye in rod assembly bush and/or intermediate part .

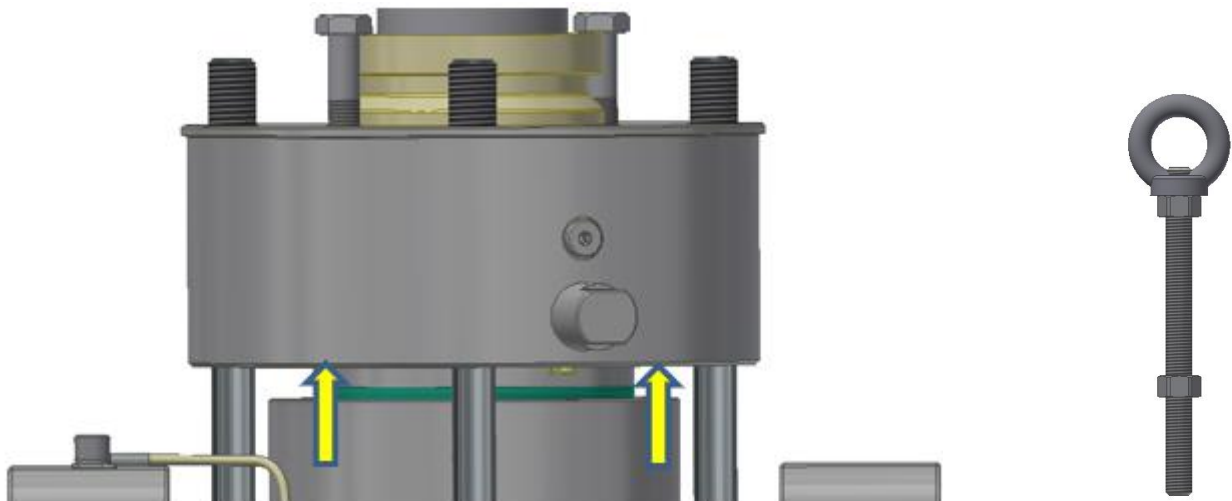
Mount 4 hydraulic tensioner cylinders on the 4 protruding M24 tie rod thread ends. ***Tensioner NOT part of tool kit***



Pull ca. 200 kN in the tie rods → loosen the nuts → release pressure and dismount tensioner cylinders.
[Alternatively, loosen the nuts incrementally by 180 ° per nut per time.]

Remove M24 nuts and keep them for reuse[Discard Nord-Lock washers – new in repair kit].

Hold the eye in rod assembly bush and/or intermediate part with lifting tool, and pull it out of the cylinder tube.
(A wooden block and crowbar between trunnion block and intermediate part can be used).



(Lifting eye from tool kit can be used for handling the intermediate part(M16 fits in tapped holes for stuffing box)

Find balance in the complete rod/intermediate part/damping bush assembly while pulling the piston out of the cylinder tube.



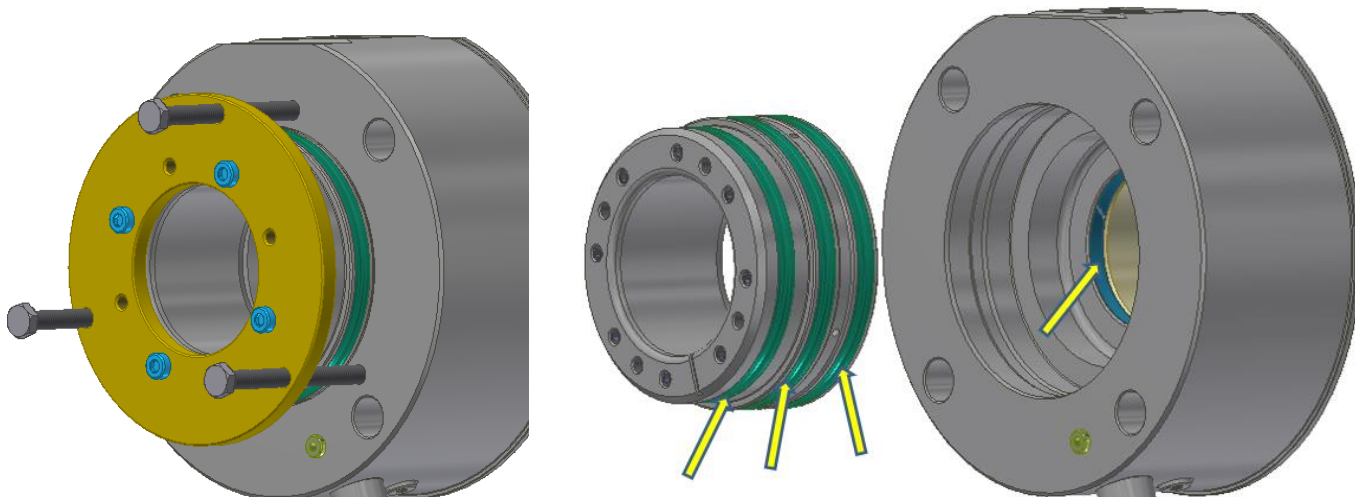
2.5 DAMPING BUSH

Only if HEAVY and LIGHT repair.

Remove the intermediate part from the rod, and the damping bush from the intermediate part.

Fasten the pull tool(orange) to the damping bush with 4 x M10 screws.

Pull the bush out by turning in the 3 x M12 long screws.



Remove all dual seals from the damping bush and the guide ring from the intermediate part.

2.6 PISTON

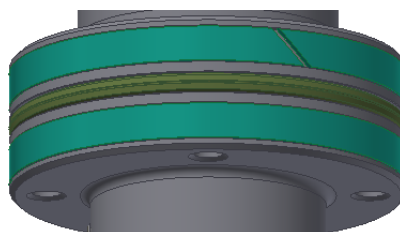
If HEAVY repair kit:

Remove assembly bush from rod end and discard complete rod with piston.

If LIGHT repair kit:

Cut the piston seal with a Stanley knife.
(be carefully not to damage the piston)

Remove guide rings and piston seal.



2.7 ENDCAP

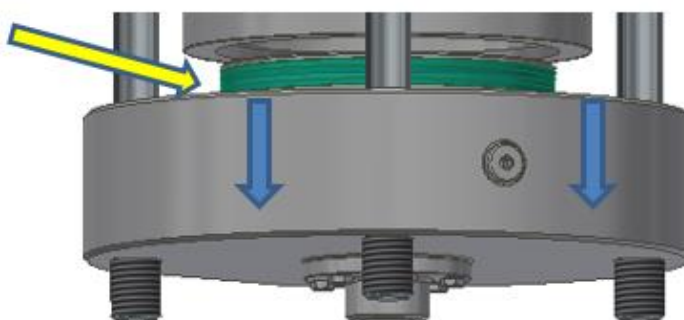
Only if HEAVY and LIGHT repair.

Remove M24 nuts and keep them for reuse [Discard Nord-Lock washers – new in repair kit].

Fasten lifting tool to the endcap and pull it out of the cylinder tube (Wooden block and hammer can be used).

Remove dual seal from the endcap.

If no position sensor, there is also a dual seal on the sensor hole plug.



3 ASSEMBLY

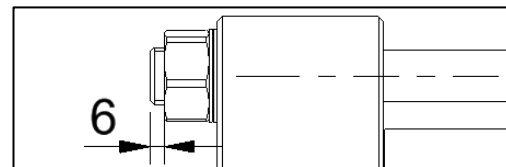
Inspect cylinder tube inside for damages. Replace cylinder if scratched or worn out.
Oil/grease all seals/mating surfaces and threads before assembling.
Be careful with the cleanliness during assembly.

3.1 ENDCAP

Only if HEAVY and LIGHT repair.

Mount new dual seal on the endcap, and push it into the tube.
If no position sensor, mount also new dual seal on the sensor hole plug.

Align it correct so that the SAE flange matches the oil transfer tubes



Mount new Nord-Lock washers and screw nuts onto tie rods until ca. 6 mm of the tie rod thread end is visible.

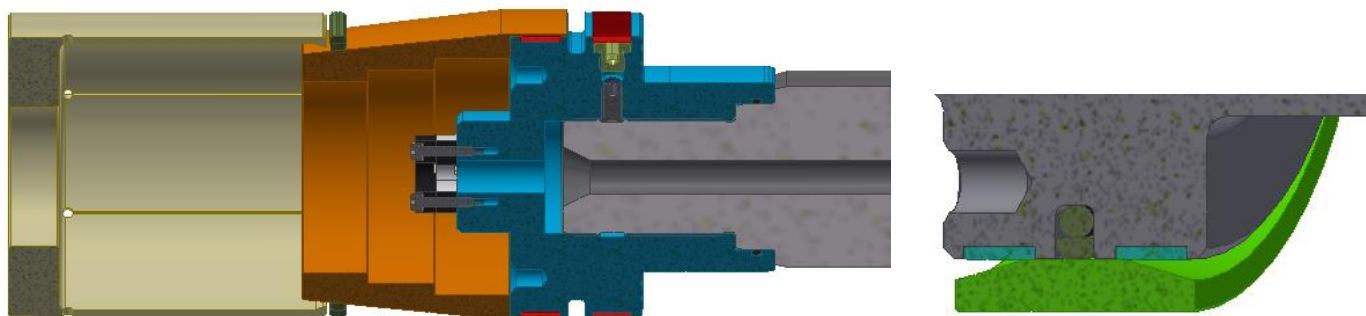
3.2 PISTON

If HEAVY repair kit:

On heavy repair kits the piston seal is pre-mounted.

If LIGHT repair kit:

Mount new guide rings and piston seal. Use the piston assembly bush as shown below.



(Illustration picture – not correct piston)

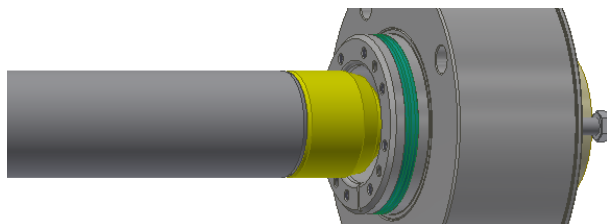
Mount calibration bushing(green on above picture) over piston seal, and keep it there for more than 15 min.

3.3 DAMPING BUSH

Only if HEAVY and LIGHT repair.

Mount a new guide ring in the intermediate part and 3 new dual seals on the damping bush.
Refer to section 2.5

Push the damping bush all way into the intermediate part.



If HEAVY repair kit: Mount assembly bush on the end of the new piston rod assembly.

Slide the intermediate part with damping bush onto the rod(with assembly bush).

3.4 TUBE ASSEMBLY

Only if HEAVY and LIGHT repair.

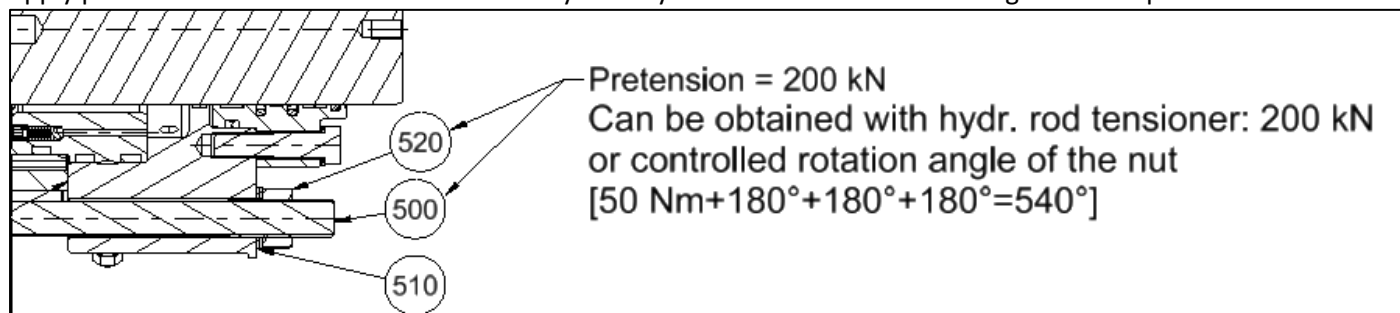
Find balance in the complete rod/intermediate part/damping bush assembly.



Slide the piston with rod into the tube – be carefull when the piston seal enters the cylinder tube.

Push intermediate part with damping bush into the tube until the intermediate part touches the tube face.
Align it correct so that the SAE flange matches the oil transfer tubes.

Mount new Nord-Lock washers on the tie rods, screw on the nuts, and cross tighten them with 50 Nm.
Apply pretension to the tie rods. Simultaneously with hydraulic tensioners or cross tighten in steps.



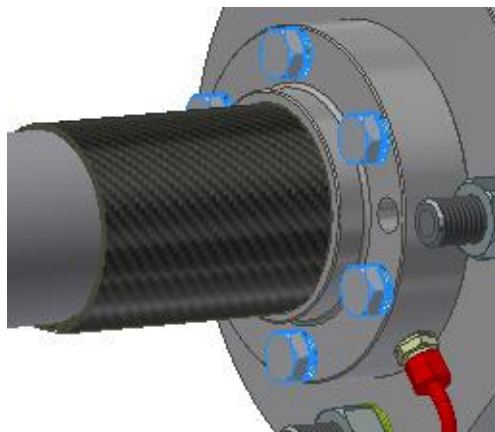
Mount the transfer tubes to the the SAE ports, with new O-rings in the flanges(supplied with repair kit)-
Tighten the M12 allen screws with 70 Nm.

Remove the nylon “dummy” stuffing box and discard the 2 old bolts holding it.

3.5 STUFFING BOX

Slide the new stuffing box(with premounted seals) onto the rod(with assembly bush) and push it in place.

Mount the rod protection band close to the stuffing box. Mount new Nord-Lock washers on 6 new M16 x 70 bolts and apply LGAF 3E anti fretting paste on the thread(small tube supplied with repair kit).
Screw in all 6 bolts and cross tighten them with 200 Nm.



Mount the fitting in the stuffingbox port and connect the drainpipe.

[All as shown in section 2.3, just in reverse order.]

3.6 BEARING HEAD

Dismount the rod end assembly bush.

Mount new Nord-Lock washers on 8 new M12x100 bolts, and apply LGAF 3E anti fretting paste on the thread.

Mount the rod end flange(with installation key) at the end of the rod and screw the M12 bolts all way in by hand.

These bolts are heavily fatigue loaded – it is important to follow tightening procedure strictly.

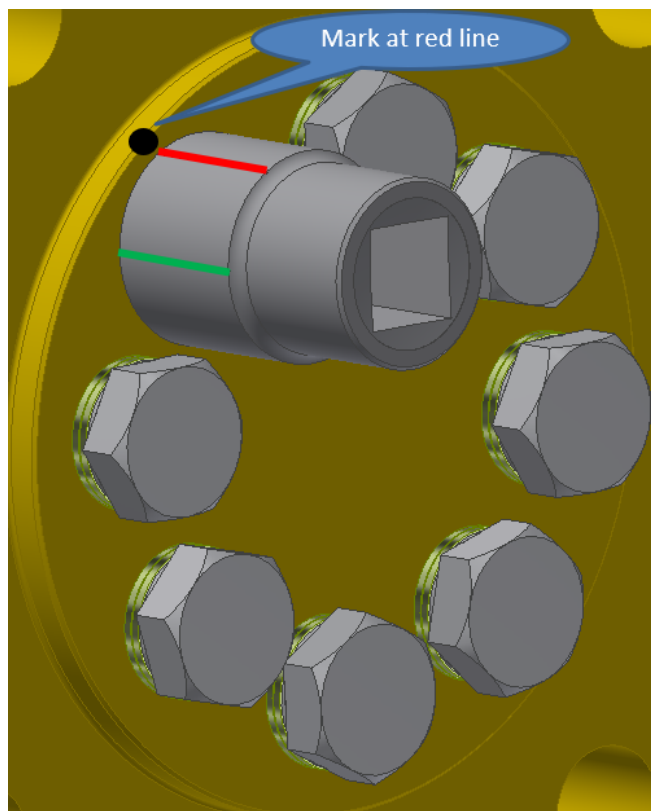
In step 1 and 6 of below tightening procedure, cross tighten the bolts in the order shown below.



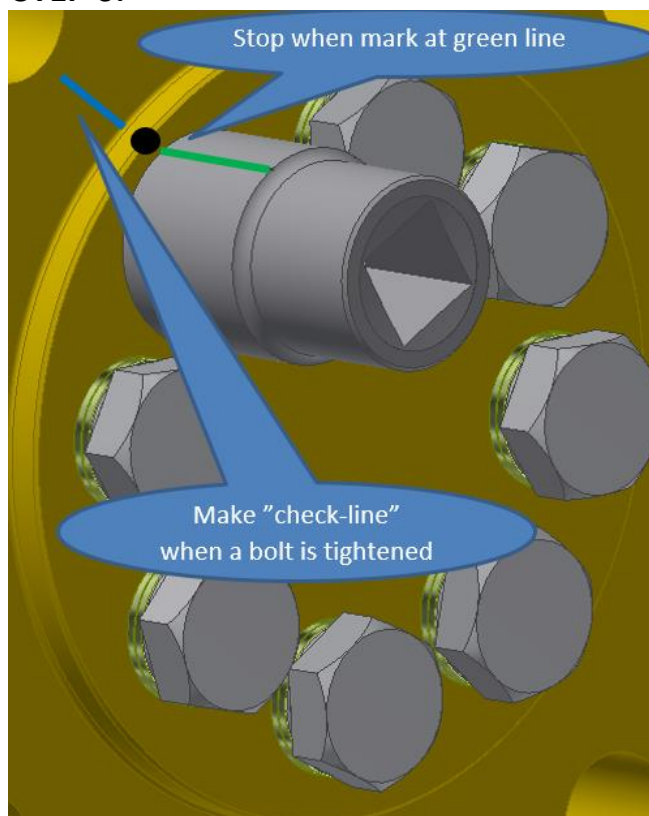
1. Apply an 35 Nm initial torque.
2. Mount the special 19mm socket from the tool kit on a torque wrench.
3. Put the socket on bolt 1 with the red mark pointing outwards.
4. Apply a low torque(<30Nm) to take up the slack between bolt head and socket.
5. Mark a point on the flange at the red line in the socket.
6. Tighten the bolt 60° until the green line on the socket has reached the point mark, and make a line as check.
7. Proceed to the next bolt until all 8 bolts are tightened(1→2→3→4→5→6→7→8).

[End torque should reach around 120 Nm but can vary. Angular tightening is more precise and preferred]

STEP 5:



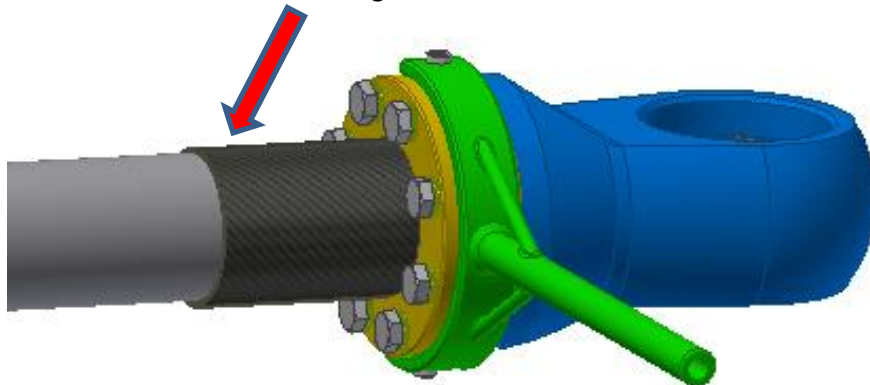
STEP 6:



Slide the rod protection band up close to the flange.

Extend the rod up to the bearing head.

Mount new Nord-Lock washers on 8 new M16x 80 bolts, and apply LGAF 3E anti fretting paste on the thread. Screw in all 8 bolts and cross tighten them with 200 Nm.



Remove the installation key from the rod end flange(leave the 2 pcs. M10 bolts in the flange and tighten 50 Nm).

Remove the rod protection band.

3.7 POSITIONS SENSOR

Reinstall position sensor, if present, in cylinder.

3.8 END ASSEMBLY / INSPECTION

Remove any lifting equipment, support at endcap etc.

Make sure screws, pipes and all other disconnected parts are mounted and tightened again.
Drive the cylinder full stroke a number of times without load, to bleed air out of the system.
Test the cylinder under full pressure and check for tightness.

Mount the rod protection cover with the clamps on intermediate part and bearing head, and close the velcro seam.



4 TOOL KIT NO. 9515140

Reservedelsliste - Spare Part List - Ersatzteilliste

Pos.	Stk. Pcs. Stück	Vare nr. Item. no. Warennr.	Beskrivelse	Description	Beschreibung
10	1	9515141	Montagenøgle til 5082467	Installation key for 5082467	Installationsschlüssel für 5082467
20	1	9515143	Montagebøsning for ø160 m-sko	Assembly bush for ø160 piston	Montagebuchse für ø160 kolben
30	1	9515160	Nylon montagebøsning for ø160 m-sko	Nylon assembly bush for ø160 piston	Nylon montagebuchse for ø160 kolben
40	1	31731	O-ring 5,7x154,3	O-ring 5,7x154,3	O-ring 5,7x154,3
50	1	9515163	Kalibreringsbøsning ø160	Calibration bushing ø160	Kalibrierung buchse ø160
60	1	45202	Stangbeskyttelsesafdækning - Vestas-V174	Rod protection cover - Vestas - V174	Stangenschutzhülle - Vestas - V174
70	1	9515142	Montagebøsning f. Ø95 mm stang	Assembly bush f. Ø95 mm stang	Montagebuchse f. Ø95 mm stab
80	2	9515144	Montage / løfte øje M16	Mounting / lifting eye M16	Montage- / Hebeöse M16
90	1	9515145	Topnøgle til 5082467	Socket wrench til 5082467	Steckschlüssel til 5082467
100	1	9515168	Pakningsholder til service (021-160/95)	Stuffing box for service (021-160/95)	Dichtungshalter für service (021-160/95)
110	1	9515169	Aftrækkerflange for dæmpebøsning	Pull flange for damping bush	Abzieh Flange für Dämpfungsbuchse
120	4	27933	Unbraco M10x 20 DIN 4762-8.8-flZnLnc720h	Allen screw M10x 20 DIN 4762-8.8-flZnLnc	Inbusschraube M10x 20 DIN 4762-8.8-flZnL
130	3	27949	Stålsætskrue M12x120 - FZV DIN 933-8.8	Setscrew M12x120 - FZV DIN 933-8.8	Schraube M12x120 - FZV DIN 933-8.8

