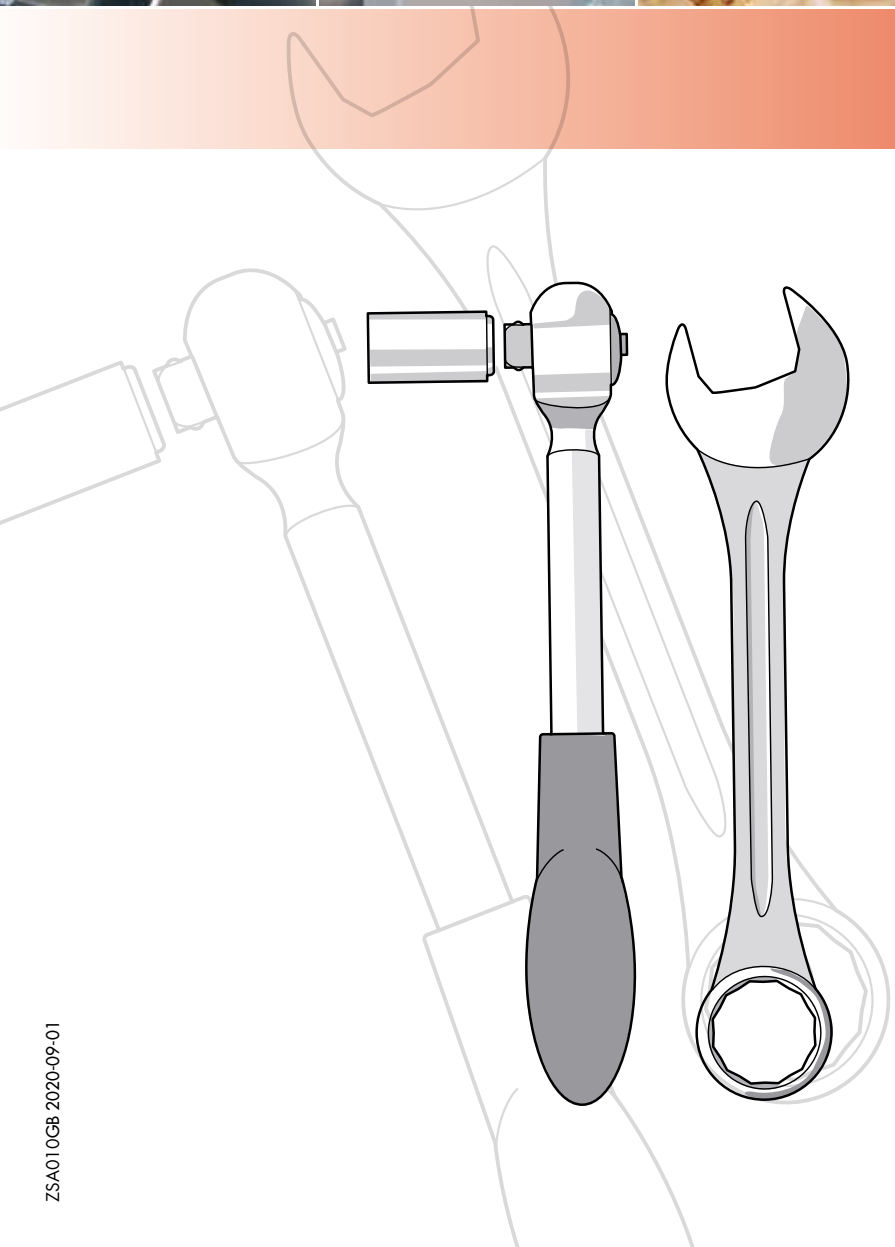
SKANDIA
ELEVATOR

MAINTENANCE INSTRUCTIONS
L/I/H-LINE

Elevators



ZSA010GB 2020-09-01

Thank you for choosing Skandia Elevator!

Your conveyor system must be assembled correctly and maintained thoroughly if it is to operate satisfactorily. These maintenance instructions and the separate assembly instructions for each machine must be followed for the warranty to apply.

We hope you will be pleased with your Skandia conveyor equipment for a long time.

The owner of the transport equipment is responsible for these assembly instructions always being available to the fitters, electricians, maintenance technicians and engineering technicians concerned.

Inadequate maintenance and/or defective handling may lead to personal injury or damage to the conveyor equipment and/or other equipment. It can also cause malfunctions or a reduction in capacity.

Read these maintenance instructions carefully before maintenance or operation commences. If any part of these instructions should be difficult to comprehend, please get in touch with your reseller for assistance.

The safety information is presented and interpreted as follows:

⚠ **WARNING!**
Disregarding instructions given in warnings can cause serious personal injury or death.

⚠ **IMPORTANT!**
Ignoring the instructions given in important texts may cause damage to the conveyor equipment and/or other equipment. It can also cause malfunctions or a reduction in capacity.

NB! indicates that the text contains information that will simplify the assembly process.

General

⚠ **WARNING!**

- Ensure that everyone responsible for assembly, electrical connection, maintenance and operation of the conveyor equipment has read and understood the instructions and safety information.
- Use protective gloves, helmet, steel-toed boots, ear defenders, protective goggles and high-vis vest when carrying out assembly, electrical connection, maintenance and operation of conveyor equipment.

⚠ WARNING!

- Stop the machinery and turn off electric power before attempting any type of assembly, electrical connection or maintenance work.
- Do not start the machinery without the elevator hood and all hatches, covers, lids and guards fitted in such a way they can only be opened with tools.
- Ensure the back stop and its touch guard are fitted at all times.
- Connections to, from and between machinery must be permanently mounted and fully enclosed. If the design of the installation does not allow this at an outlet, finish off with a 1 m pipe.
- Ensure the machine is anchored and braced as described in the assembly instructions.

⚠ IMPORTANT!

- If the machine is being assembled outdoors, the motors and transmissions must be fitted with a weather cover.
- If a machine or part thereof in any way needs moving/dismantling, follow the directions given in the assembly instructions.
- The machine can be stopped and restarted when full of material but this option must not be used for intermittent operation.
- In the event of stoppage in operation, troubleshoot as described in these maintenance instructions and ensure the elevator boot is free of material before restarting.
- If a short circuit should occur, ensure that the electrical equipment is in working order before continuing operation.
- Ensure that the electrical equipment is kept free from dirt, dust, moisture and electrostatic charge.

Electrical connection

Incorrect electrical connection may lead to personal injury or damage to the conveyor equipment and/or other equipment. It can also cause malfunctions or a reduction in capacity.

⚠ WARNING!

- All electrical equipment is to be connected by a qualified electrician. See separate connecting directions for electronics.
- The power switch must be permanently mounted and located to allow easy access when carrying out maintenance work.
- Ensure that sensors and switches for speed, seed boot hatch, belt alignment and explosion relief panel are active when in operation. NB! Certain sensors/switches are optional accessories only on certain machines.

⚠ IMPORTANT!

- Ensure the motor protection is set to the correct ampere setting for the motor.
- Read the "Back stop" section in the elevator's assembly instructions before test starting the motor for the first time.

Safety decals

⚠ WARNING!

The machine is supplied with safety decals on delivery. They must not be removed or defaced. If a safety decal becomes damaged, you can order a new one free of charge from Skandia Elevator AB. Specify the part number of the decal. See the section below and the previous chapter Machine Overview.

There are safety decals for:

- Mandatory (white symbol on round blue background).

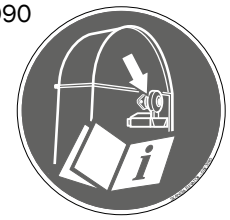
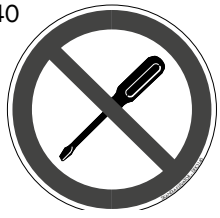
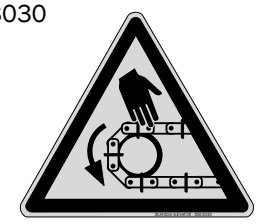
- Forbidden (black strike-through symbol on round white background with red surround).

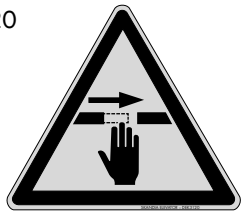
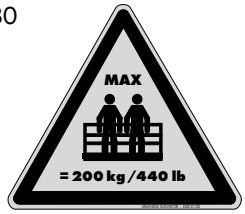
- Warning (black symbol on triangular yellow background with black surround).

⚠ WARNING!

The mandatory instruction, forbiddance or warning given on all safety decals must be considered or serious injury or death may follow.

Skandia Elevator machines have the following safety decals:

Part number/Safety decal Refer to the "Machine Overview" chapter for placement.	**Written definition**
DEK3090 	Read the "Back stop" section in the elevator's assembly instructions before test starting the motor for the first time.
DEK3100 	Do not place the valve with the motor side face down.
DEK3140 	Changing settings and equipment is prohibited.
DEK3030 	Warning for conveyor chain!

DEK3060 	Warning for bucket belt!
DEK3040 	Warning for chain drive!
DEK3070 	Warning for rotating conveyor drive shaft!
DEK3080 	Warning for rotating elevator drive shaft!
DEK3110 	Warning for moving machinery!
DEK3120 	Warning for moving machinery!
DEK3010 	Warning for dust explosion!
DEK3130 	Warning, a maximum of 2 people = 200 kg/440 lbs may be on the platform and ladders simultaneously!

⚠ **IMPORTANT!**
All maintenance instructions in this chapter must be considered as important texts.

General

Check annually that the bolts are securely in place, that no components are missing and that there is no rust on the machinery. Replace damaged components.

Bearings

NB! All bearings are greased-for-life and do not require additional lubrication.

Plastic wearing surfaces, H-line

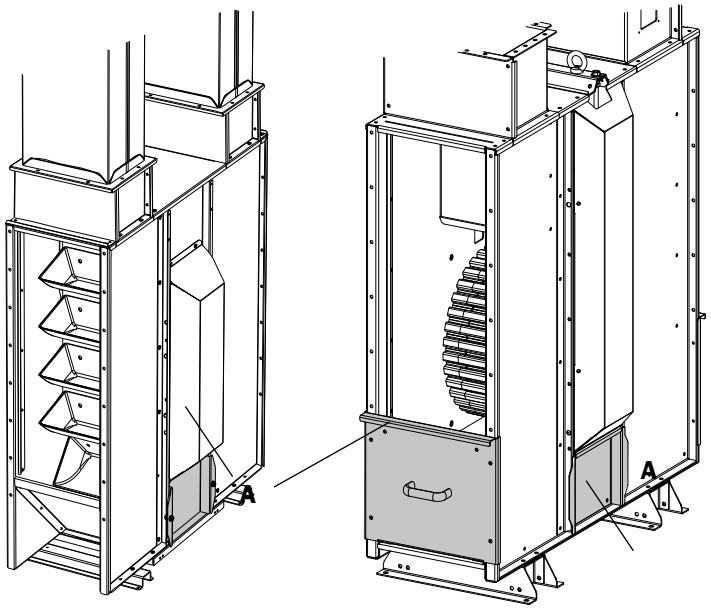
Check the plastic wearing surfaces in the elevator boot (only applies to the new generation H-line elevators) and the elevator head once a year and always replace if necessary.

Elevator boot

Clear the elevator boot from grain after a completed drying season and make sure there is nothing left that has started to grow before a new season starts.

A. Clean out hatch

SE-SEI-SEH **New generation 50/18-63/30**



Transmission

Geared motor

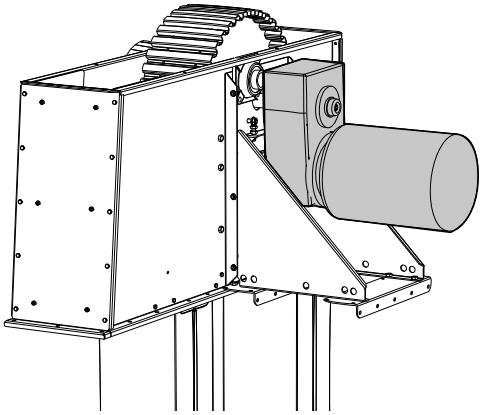
The geared motor is filled with mineral oil on delivery. For more information on oil grade on delivery, see the separate information attachment from the manufacturer Nord.

Check the oil level before taking into service and at regular intervals thereafter.

Change oil every 10,000 operating hours or at least every other year.

The interval between changes can be doubled if synthetic oil is used. When operating in severe conditions such as high humidity, aggressive environment or large temperature variations, the oil must be changed more often.

Clean the gear when changing oil.



Bucket belt

Check the tension of the bucket belt and centre it over the slatted pulleys continuously. Check the first time after 50 operating hours and then according to the table:

SE Once a season or at least every 200 operating hours.

SEI Twice a year or at least every 400 operating hours.

SEH 3 times a year or at least every 1000 operating hours.

NB! If the speed monitor or belt alignment switch stops the machine, it may be a sign that the bucket belt needs tensioning.

If the bucket belt is worn and needs changing, follow the directions given in the assembly instructions for assembling the bucket belt.

Tighten the bucket belt - Belt tensioner in belt join

1.
Remove the bucket closest to the belt tensioner.

2.
Roll off a length of bucket belt from the tensioning pulley. Use a ratchet spanner (torque wrench) in the tensioning pulley's square hole (A) and use a suitable tool for support in the pipe (B).

3.
Undo the belt tensioner and fit it in the holes for the removed bucket.

4.
Remove the buckets in the belt join.

5.
Tension the bucket belt with the belt tensioner. See recommended torque in the "Technical specifications" section.

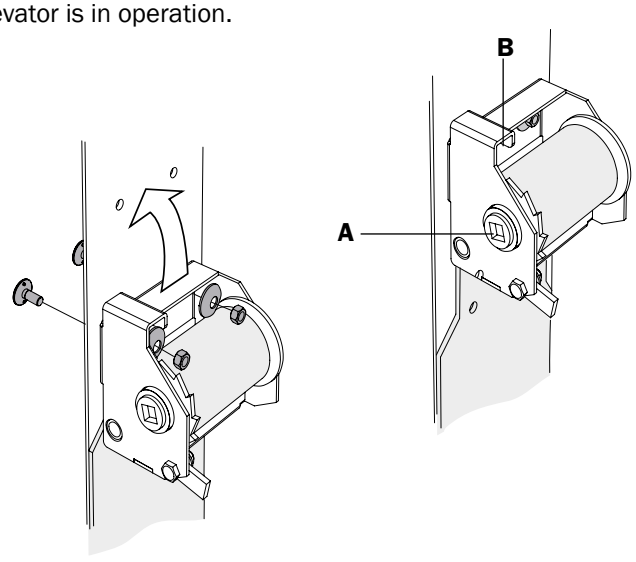
6.

⚠ **IMPORTANT!**

Join the ends of the belt by mounting 3 buckets where the ends overlap. Drill new holes through the ends of the belt if the existing holes are not aligned.

7.
Relieve the belt tensioner by releasing the ratchet one notch.

NB! The belt tensioner must remain mounted on the bucket belt when the elevator is in operation.



Tighten the bucket belt - Belt tensioner in the belt seam and tensioning bolts in the elevator boot

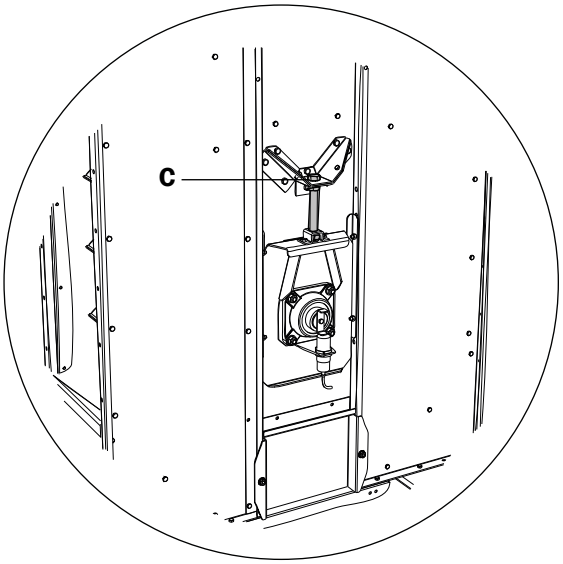
⚠ IMPORTANT!

If the adjustable slatted pulley in the elevator boot is to achieve maximum capacity, it must be in as low a position as possible after the bucket belt has been tensioned.

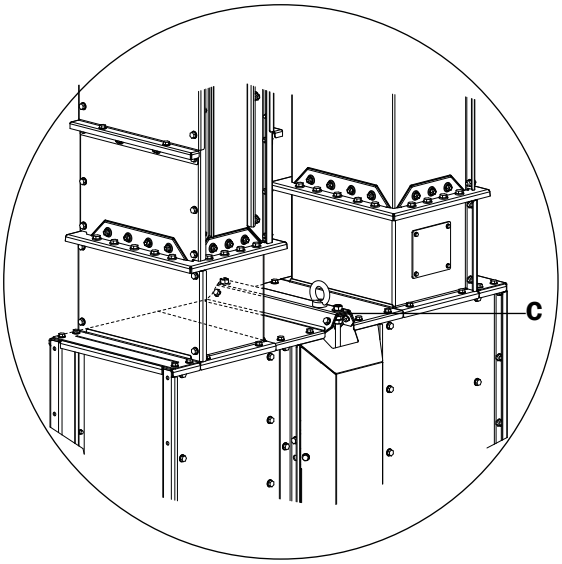
Tension the bucket belt with the belt tensioner on the bucket belt first as instructed in the previous section.

Any later adjustment is done with the tensioning bolts (C) on each side of the elevator boot.

SE-SEI-SEH



New generation 50/18-63/30



Tighten the bucket belt - Tensioning bolts in elevator boot

⚠ IMPORTANT!

If the adjustable slatted pulley in the elevator boot is to achieve maximum capacity, it must be in as low a position as possible after the bucket belt has been tensioned.

Tension the bucket belt with the tensioning bolts (C in illustration above) on each side of the elevator boot. See recommended torque in the "Technical specifications" section.

NB! It may be necessary to cut off a length of belt in order to tension it sufficiently. If this is the case, follow the directions for assembling the bucket belt in the assembly instructions.

Centre the bucket belt

⚠ IMPORTANT!

Ensure the bucket belt is centred on the drive- and slatted pulley.

Check how the bucket belt is running on the drive and slatted pulley. If it runs askew then it must be centred.

⚠ IMPORTANT!

When adjusting the position of the bucket belt on the belt wheels, only the following are permitted:

- it is only permitted to lower the drive shaft in the elevator head for all apart from the new generation SHE.
- it is only permitted to raise the drive shaft for the new generation SEH.
- it is only permitted to lower the tail end shaft in the elevator boot for SE.

NB! SEH 63/33 has tensioning bolts in the elevator boot only..

Example of elevator head:

Applies to SE, SEI and SEH apart from SEH 63/33 and the new generation SEH: Undo bolts (A) in the left-hand bearing if the bucket belt is running to the right of the slatted pulley in the elevator head. Lower the slatted pulley (B) by reducing the tension of the adjusting bolt/bolts (C) until the bucket belt runs in the centre. Retighten the bolts in the bearing.

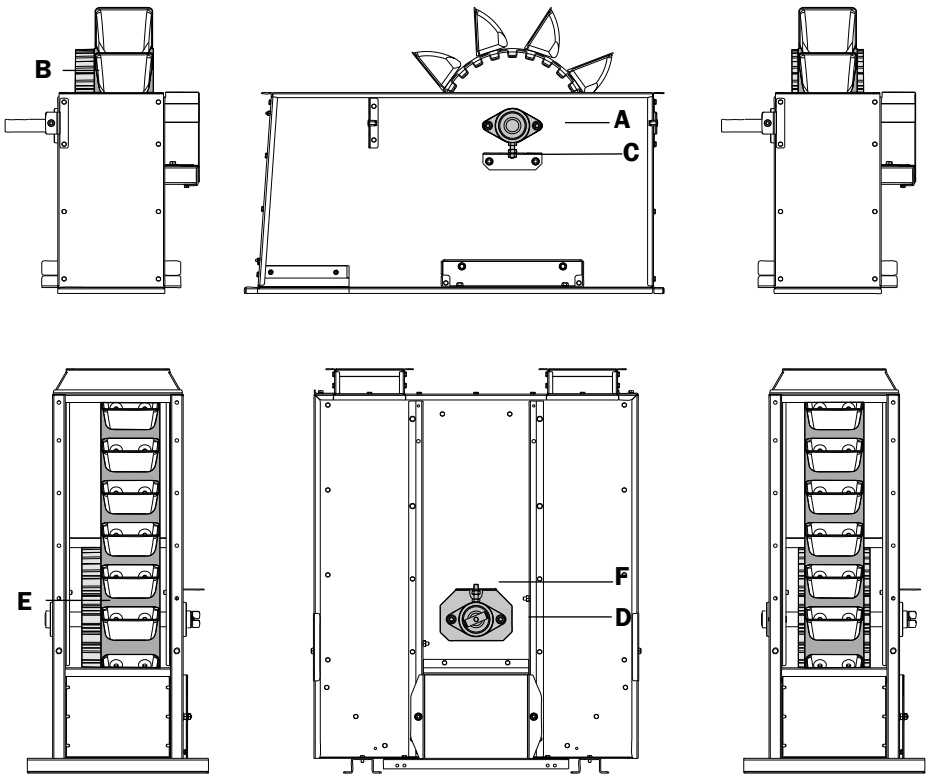
Applies to the new generation SEH:
If the bucket belt runs to the right of the drive wheel in the elevator head, loosen (not fully) the bolts (A=4 pcs) and (B=6 pcs) on the right-hand side plate. Raise the drive wheel by tightening the tensioning screws (C) using a socket wrench with extension (D) until the bucket belt runs centrally. Retighten the bolts (A=4 pcs) and (B=6 pcs).

Example of elevator boot:

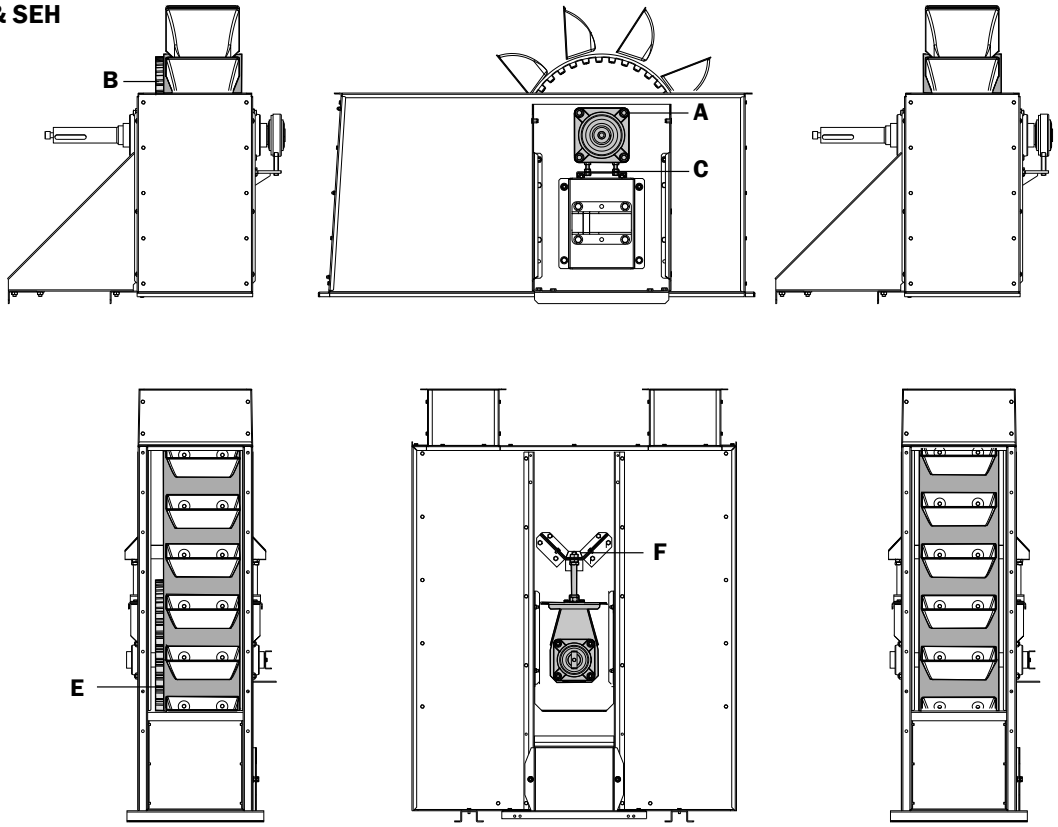
Applies to SE: Undo bolts (D) in the left-hand bearing if the bucket belt is running to the right of the slatted pulley in the elevator boot. Raise the slatted pulley (E) by reducing the tension of the adjusting bolt (F) until the bucket belt runs in the centre. Retighten the bolts in the bearing.

Applies to SEI, SEH and the new generation SEH: If the bucket belt is running to the right on the slatted pulley in the elevator boot. Raise the slatted pulley (E) on the left-hand side plate by reducing the tension of the tensioning bolt (F) until the bucket belt is running centred.

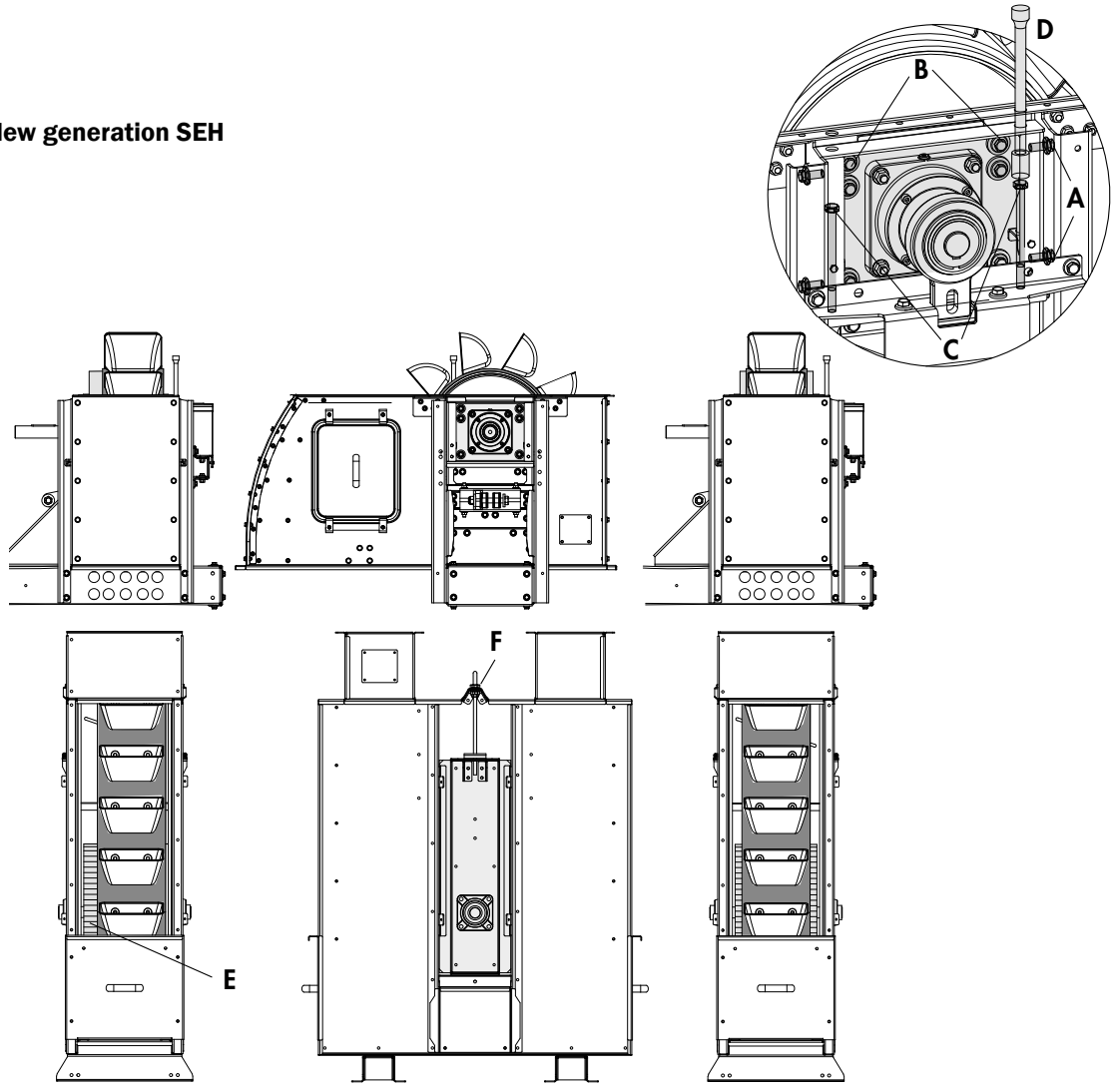
SE



SEI & SEH



New generation SEH



Poor capacity/stop

All the machines in the conveyor system must be correctly adapted to each other in order to provide the correct capacity for the given conditions.

Problems with capacity and stops can arise for different reasons:

General

Check:

- that capacity demands are realistic for the conditions in question. Capacity will be reduced if the water content in the grain is increased/raised. Reckon on a loss of capacity in the range 3-4% for every 1% water content above 15%. Especially installations with short trenches (2.5-4.5 m) will have problems if the water content is high.
- that connections between machines are carried out correctly. See the assembly instructions for respective machine.
- that the inlet is correctly assembled. See the assembly instructions for respective machine.
- that the ducting is sufficiently dimensioned. Ø160 mm for 30 t/h, Ø200 mm for 40 and 60 t/h, Ø250 mm for 80 and 100 t/h and Ø300 mm for 120 and 150 t/h.
- that the ducting is sufficiently inclined, greater than 45°.
- that the machines and connections are free from waste.
- that the machines work at the correct speed in relation to the intended capacity. See the section "Technical specifications".
- that the electrician has connected the motors to the correct voltage and that the motor protection is set to the right values.
- that the machine feed rate is not too high. See the section "Technical specifications".

  If the elevator is first in a chain of conveyors, fit and use inlet slide. See assembly instructions for the elevator. NB! An ammeter on the elevator leg by the slide regulator simplifies setting the inlet slide to the desired capacity.

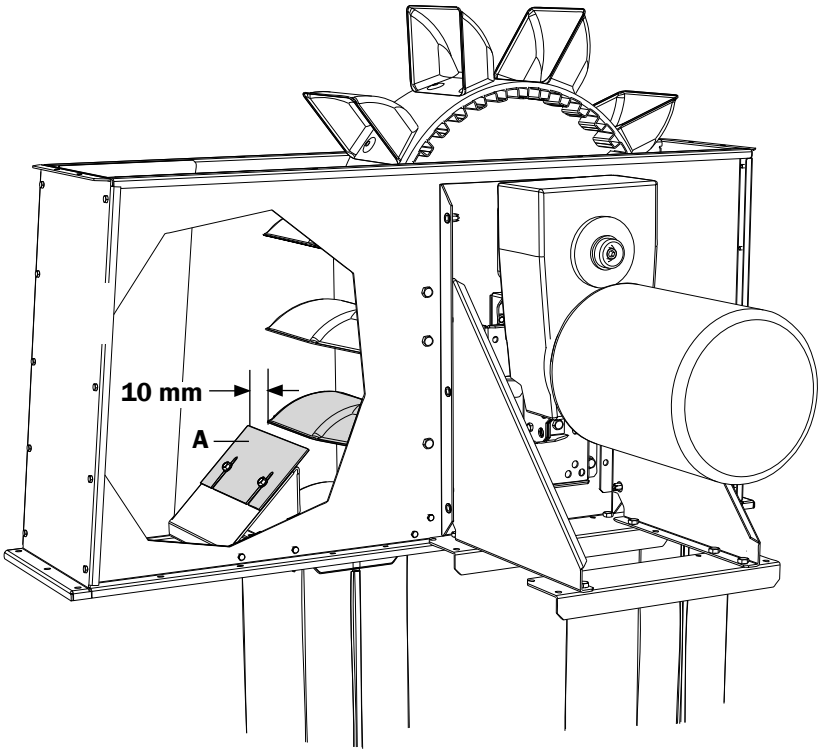
⚠ **IMPORTANT!**
If an operation stoppage is due to overfeeding, the elevator boot must be cleared of grain before the elevator can be restarted.

- that the bucket belt is tensioned correctly. See the maintenance instructions.
- that the inlet slide mounted on the ascending leg side can be opened fully. See assembly instructions for the elevator.
- that the elevator boot is free from grain from previous seasons. It may start to grow and hinder the input feeding.
- that the connecting channel and the elevator inlet for an elevator mounted in an elevator trench are the same size and that the angle of inclination is at least 45°.

If the material goes in reverse

Check:

- that the subsequent connection/machine is able to receive the capacity from the feeding elevator. See the section "Technical specifications".
- the position of the splash guard in the elevator head outlet. The distance to the bucket mounted immediately after the belt tensioner should be 10 mm.



If the elevator stops unloaded

Check:

- that the speed monitor is correctly set or the power will be cut immediately after the elevator is started. Contact your supplier for help.

Motor stoppage

If the elevator is first in a chain of conveyors, fit and use inlet slide. See assembly instructions for the elevator.

If the motor stops:

1. check the cause of the stoppage. See the previous troubleshooting directions concerning this.
2. cut the power and clear away any blockages.

⚠ **IMPORTANT!**
Do not try to remove a blockage by repeatedly attempting to restart.

3. check with the electrician that the motor has been connected to the correct voltage and that the motor protection is set to the right value.

2-3 way valve leaking

Valve is set correctly on delivery. If the setting has changed after delivery, it could cause leakage. Renew the setting in accordance with the instructions in the separate accessory assembly instructions, Replace actuator, which are available for download on the Skandia Elevator website.

Geared motor rating plate

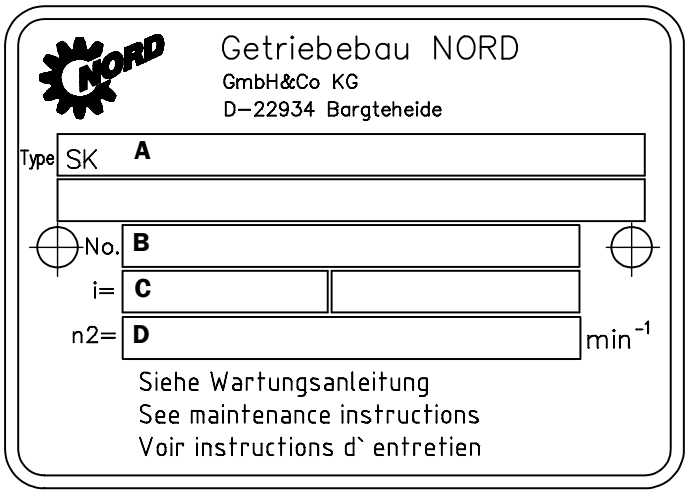
Each drive with geared motor is equipped with a rating plate that specifies:

A. type of NORD gear.

B. serial number.

C. total gear ratio.

D. nominal rpm for gear output shaft.



Elevator height

⚠ **IMPORTANT!**

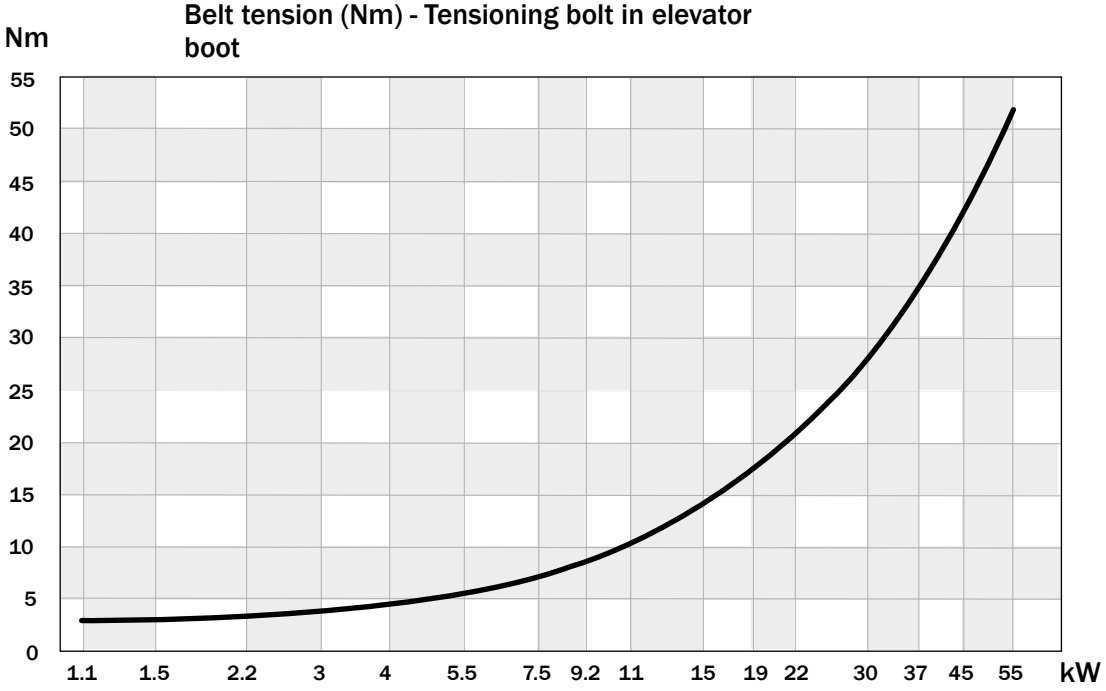
Refer to the table below for maximum permitted elevator height with standard elevator leg plate thickness. The motor must not be larger than recommended for the maximum permitted height either.

	20 t/h	30 t/h	40 t/h	60 t/h	80 t/h	100 t/h	120 t/h	150 t/h	200 t/h	250 t/h	300 t/h
SE 140	32 m	29 m	30 m	27 m							
SEI 35/14	32 m		30 m	33 m							
SEI 50/18				33 m	30 m	32 m					
SEI 50/23						32 m	33 m	32 m			
SEH 50/18				54 m	50 m	47 m					
SEH 50/23						47 m	54 m	53 m			
SEH 63/28-33									49 m	47 m	40 m
New generation SEH				70 m	70 m	58 m	70 m	66 m	70 m	70 m	67 m

Belt tension - Bucket belt

Belt tension (Nm) - Belt tensioner in belt join						
kW	**20 t/h**	**30 t/h**	**40 t/h**	**60 t/h**	**80 t/h**	**100 t/h**
1,1	11	14	15	17		
1,5	15	17	19	22		
2,2	20	24	26	29		
3,0	26	31	34	39	42	44
4,0	34	41	44	50	53	56
5,5	46	54	59	67	71	74
7,5	62	73	79	90	95	98
9,2	75	89	96	109	115	118
11,0				129	136	140

Belt tension (Nm) - Tensioning bolt in elevator boot



Density table

When transporting different material, the capacity can be converted to t/h using the volume capacity of the machine in m^3 and the density table shown below.

Material	Density kg/m^3	Material	Density kg/m^3
Wheat	700-800	Wheat flour	120-200
Rye	650-700	Wholemeal	400-600
Oats	500-600	Mashed cereal	300-400
Grain	600-700	Powdered milk	500-600
Rape	600-700	Grass seed	120-200
Rice	700-800	Coffee	350-450
Corn	600-700	Fishmeal	550-600
Peas	600-700	Fish pellets	500-900
Beans	700-800	Powdered lime	800-990

SE		140				140 TVM			
		20	**30**	**40**	**60**	**20**	**30**	**40**	**60**
Capacity for 750kg/m³	t/h	20	30	40	60	20	30	40	60
Capacity	m³/h	27	40	54	80	27	40	54	80
Speed/Belt speed (Nom.)	rpm	164 rpm/3.1 m/s				164 rpm/3.1 m/s			
Slatted pulley diameter	mm	360				360			
Bucket model/width	Starco	130				130			
Buckets/m belt	pcs	3.6	5.5	7.5	10.5	3.6	5.5	7.5	10.5
Max buckets/m belt	pcs	12.5				12.5			
Bucket volume, net/gross	litre	0.47/0.68				0.47/0.68			
Material thickness buckets	mm	1.5				1.5			
Belt width	mm	140				140			
Belt type/standard		EP 500/3				EP 500/3			
Leg, width/depth	mm	200 x 160				200 x 160			
Plate thickness, head/boot	mm	2.00				2.00			
Plate thickness, legs	mm	1.00				1.00			
Drive system		V-belt transmission				Geared motor (TVM)			
Speed monitor		Capacitive, 24-240V open				Capacitive, 24-240V open			

SEI		35/14			50/18			50/23		
		20	**40**	**60**	**60**	**80**	**100**	**100**	**120**	**150**
Capacity for 750 kg/m³	t/h	20	40	60	60	80	100	100	120	150
Capacity	m³/h	27	53	80	80	107	133	133	160	200
Speed/Belt speed (Nom.)	rpm	164 rpm/3.1 m/s			118 rpm/3.1 m/s			118 rpm/3.1 m/s		
Slatted pulley diameter	mm	360			500			500		
Bucket model/width	Starco	140			180			230		
Max buckets/m belt	pcs	11			11			9		
Buckets/m belt	pcs	2.8	5.6	8.4	5.4	7.2	9.0	5.2	6.2	7.8
Bucket volume, net/gross	litre	0.65/0.85			1.0/1.3			2.0/2.3		
Material thickness buckets	mm	1.5			1.5			2.0		
Belt width	mm	160			200			250		
Belt type/standard		EP 500/3			EP 630/4			EP 630/4		
Leg, width/depth	mm	200 x 160			250 x 200			300 x 220		
Plate thickness, head/boot	mm	2.00			3.00			3.00		
Plate thickness, legs	mm	1.25			1.50			1.50		
Plate thickness alternative, legs	mm	2.00			2.00			2.00		
Plate thickness, inlet hoppers	mm	3.00			3.00			3.00		

SEH		50/18			50/23		
		60	80	100	100	120	150
Capacity for 750 kg/m³	t/h	60	80	100	100	120	150
Capacity	m³/h	80	107	133	133	160	200
Speed/Belt speed (Nom.)		118 rpm/3.1 m/s			118 rpm/3.1 m/s		
Slatted pulley diameter	mm	500			500		
Bucket model/width	Starco	180			230		
Buckets/m belt	pcs	5.4	7.2	9.0	5.2	6.2	7.8
Max buckets/m belt	pcs	10.5			9.0		
Bucket volume, net/gross	litre	1.0/1.3			2.0 - 2.3		
Material thickness buckets	mm	1.5			2.0		
Belt width	mm	200			250		
Belt type/standard	EP	630/4			630/4-800/5		
Leg, width/depth	mm	250x200			300x220		
Plate thickness, head/boot	mm	3.00			3.00		
Plate thickness, legs	mm	2.00			2.00		
Plate thickness, inlet hoppers	mm	3.00+8.00 Plastic			3.00+8.00 Plastic		

SEH		63/28-33			80/28-33		
		200	250	300	400	500	600
Capacity for 750 kg/m³	t/h	200	250	300	400	500	600
Capacity	m³/h	266	334	400	533	667	800
Speed/Belt speed (Nom.)		95 rpm/3.1 m/s			72 rpm/3.0 m/s		
Slatted pulley diameter	mm	630			800		
Bucket model/width	Starco	280	330	330	280	330	330
Buckets/m belt	pcs	8.0	5.3	6.4	17.2	11.2	13.4
Max buckets/m belt	pcs	9.0	7.2	7.2	18.0	14.4	14.4
Bucket volume, net/gross	litre	3.0/2.3	5.7/4.0	5.7/4.0	2.3/3.0	4.0/5.7	4.0/5.7
Material thickness buckets	mm	2.5			2.5		
Belt width	mm	300	350	350	600	700	700
Belt type/standard	EP	630/4, 800/5, 1000/6			630/4, 800/5, 1000/6		
Leg, width/depth	mm	400/270			850/325		
Plate thickness, head/boot	mm	4.00			4.00		
Plate thickness, legs	mm	2.00			2.50		
Plate thickness, inlet hoppers	mm	3.00+8.00 Plastic			3.00+8.00 Plastic		

New generation SEH		50/18			50/23		63/30		
		60	80	100	120	150	200	250	300
Capacity for 750 kg/m³	t/h	65-69	87-92	108-116	129-138	162-173	220-230	275-287	324-339
Capacity	m³/h	87-92	116-123	144-155	172-184	216-231	293-306	366-383	432-451
Speed/Belt speed (Nom.)		119-127 rpm/3.1-3.3 m/s					95-99 rpm/3.1-3.3 m/s		
Slatted pulley diameter	mm	500			500		630		
Bucket model/width	JET	180			230		300		
Max buckets/m belt	pcs	8.5			7.4		5.9		
Buckets/m belt	pcs	4.5	6.0	7.5	5.2	6.5	4.0	5.0	5.9
Bucket volume, net/gross	litre	1.4/1.7			2.4/3.0		5.2/6.7		
Material thickness buckets	mm	1.5			2.0		2.5		
Belt width	mm	200			250		330		
Belt type/standard	EP	630/1			630/1, 800/1		630/1, 800/1, 1000/2, 1250/2		
Leg, width/depth	mm	300/230			350/250		430/310		
Plate thickness, head/boot	mm	3.0			3.0		4.0		
Plate thickness, legs	mm	2.0			2.0		2.0		

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