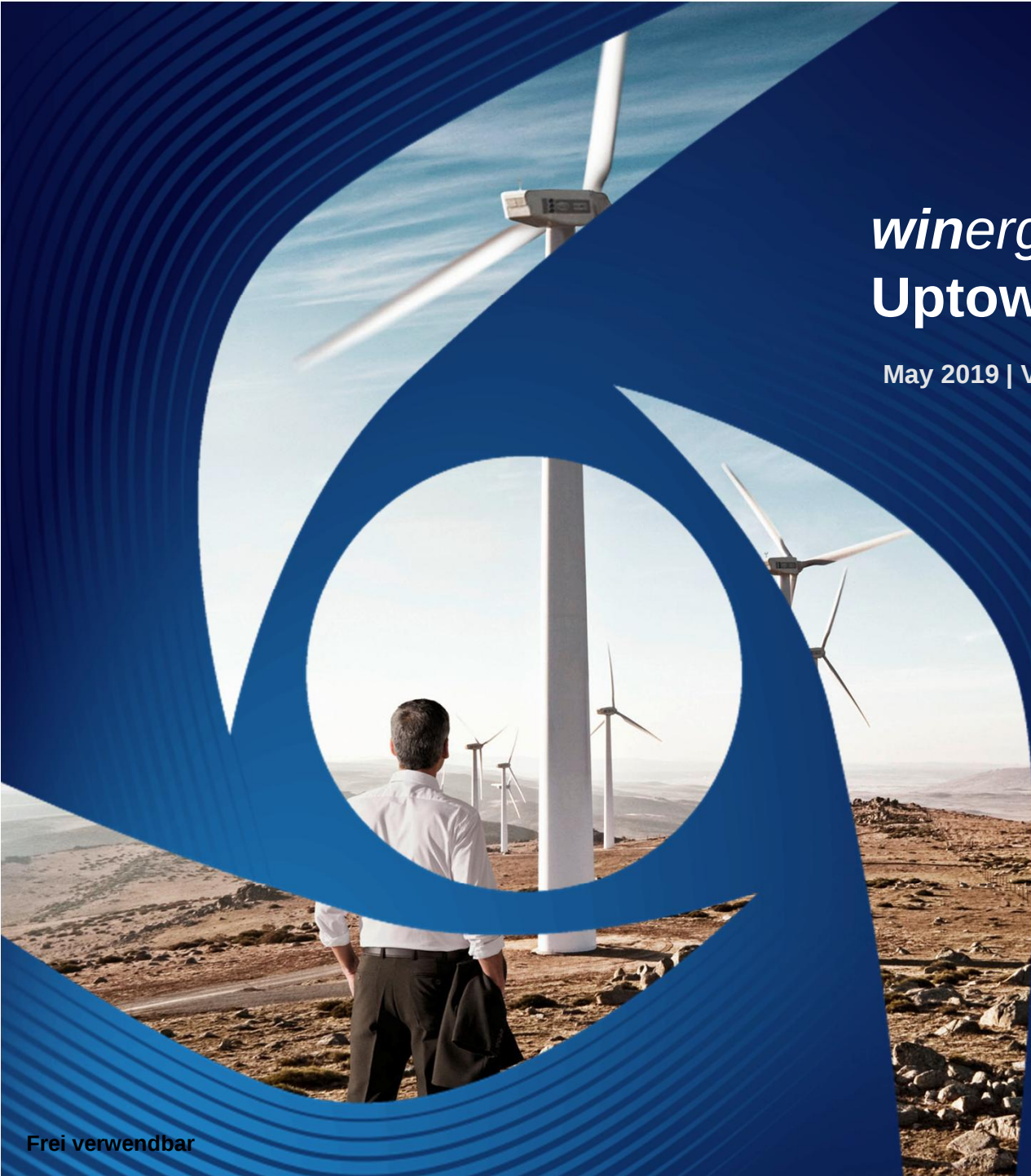




winergy Uptower repair overview

May 2019 | Voerde, Germany



Frei verwendbar

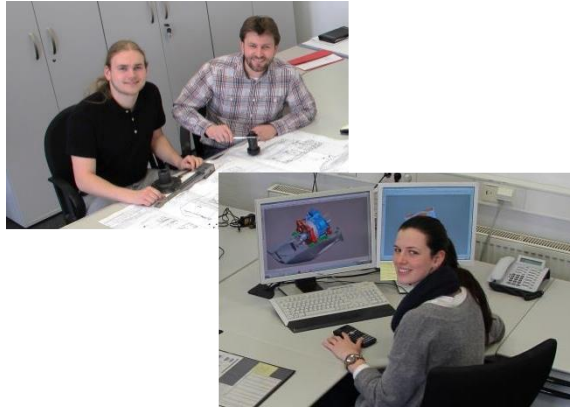
Winergy gearboxes are designed with highest focus on serviceability.

- § Winergy's design guidelines require the possibilities of up-tower repairs.
- § Service concepts incl. special tools for up-tower repairs are an integral part of new gearbox developments.

To secure the optimum results the gearbox repair work should be performed by Winergy trained / authorized personnel only.



Serviceability @ Winergy gearboxes



Our engineering experts are developing upgrade solutions and new up-tower repairs constantly for the huge fleet of more than 100.000 Winergy gearboxes and 150 GW worldwide.

The special tools are designed with long-term experiences with respect to:

- Ø Simple tool handling**
- Ø Optimized weight**
- Ø Highest safety during work**

These special-repair tools are duly tested in the field and “CE” – labeled. Work instructions can be provided in German & English language.



In general most of the auxiliary components* outside the gearbox can be maintained and replaced up-tower as required – e. g.:

- § Components of oil supply
- § Heating elements
- § Sensors for temperature
- § Sensors for speed & vibration
- § Indicators for oil pressure
- §

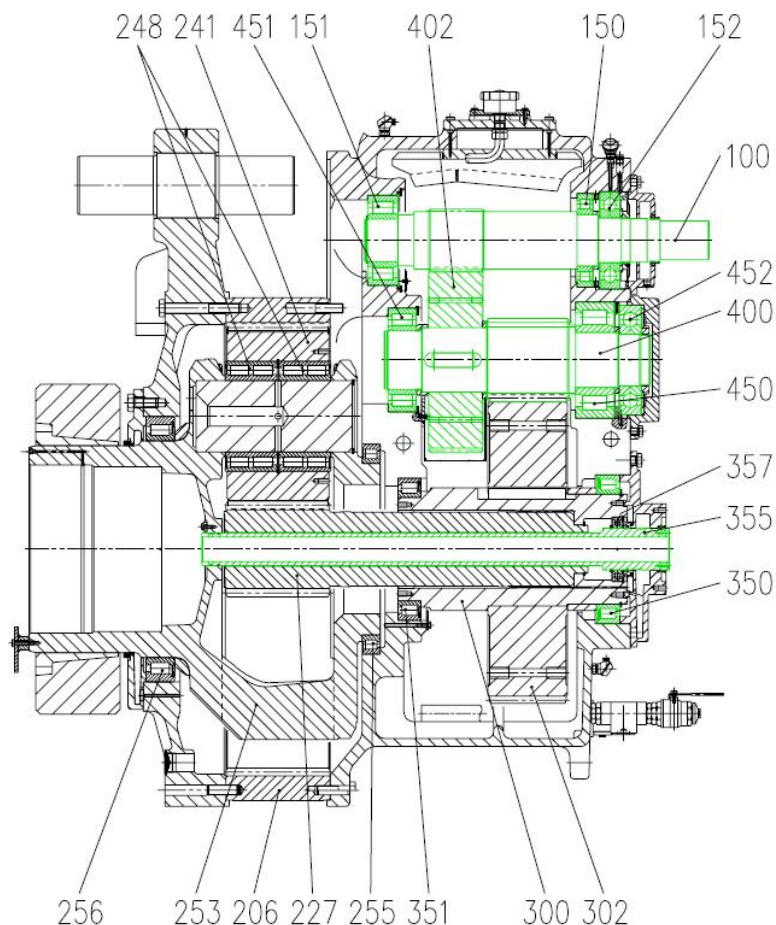
*Scope of components depends on the gearbox design



Following pages provide an overview of up-tower repair possibilities depending on gearbox types and referring to turbine models.



Nomenclature of typical gearbox internals that are replaceable up-tower for gearbox types PEAS, PEAC, PEAB 42.., 43.. and 44.. (gearboxes with single planetary stage)

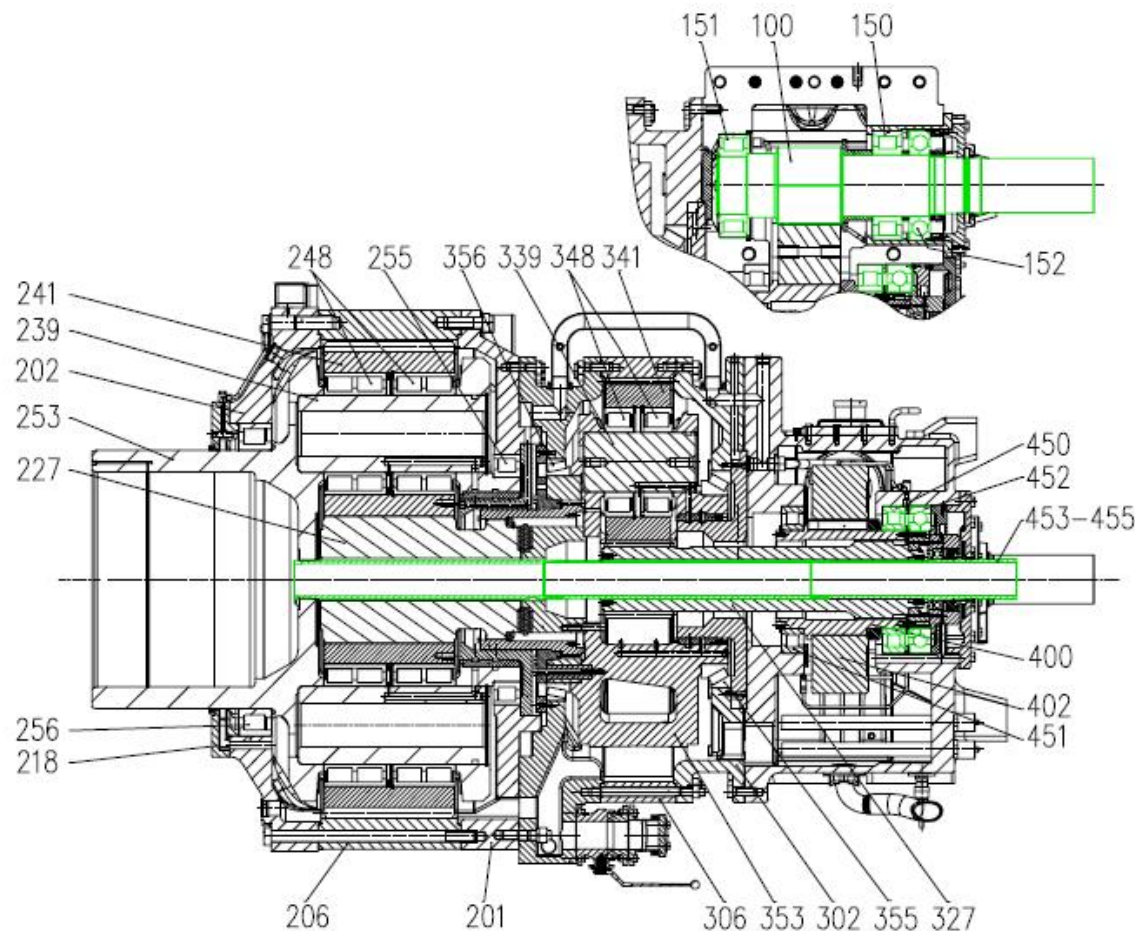


Part 100: High speed shaft HSS
Part 150: Bearing HSS – generator side
Part 151: Bearing HSS – rotor side
Part 152: Axial trust bearing HSS
Part 256: Bearing planet carrier – rotor side

Part 350: Bearing low speed shaft LSS
generator side
Part 355: Pitch tube

Part 400: Intermediate shaft IMS
incl. Part 102 – helical gear HSS
Part 450: Bearing IMS – generator side
Part 451: Bearing IMS – rotor side
Part 452: Axial trust bearing IMS

Nomenclature of typical gearbox internals that are replaceable up-tower for gearbox types PZAB, PZFB 34..., 35..., 36.. and 37.. (gearboxes with double planetary stage)



- Part 100: High speed shaft HSS
- Part 150: Bearing HSS – generator side
- Part 151: Bearing HSS – rotor side
- Part 152: Axial trust bearing HSS

- Part 450: Bearing LSS – generator side (low speed shaft)
- Part 452: Axial trust bearing LSS
- Part 455: Pitch tube

Up-tower repair solutions @ Winergy gearboxes



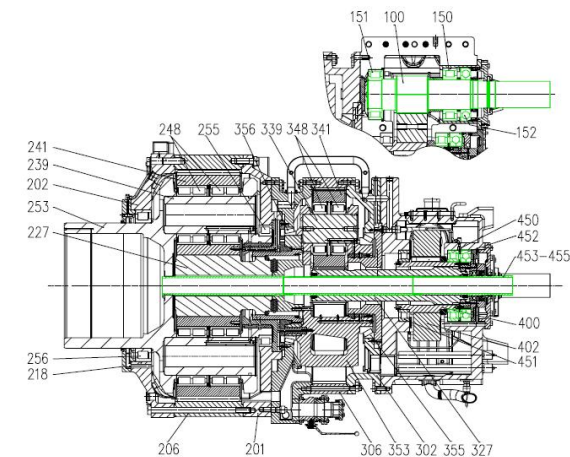
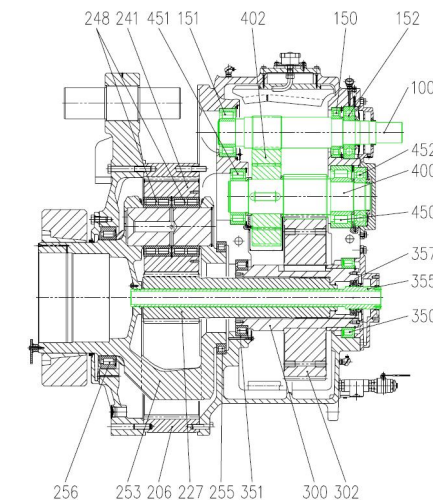
ACCIONA 1/2	ALSTOM	ENVISION	GE Wind	NORDEX	SENVION	SGRE	SUZLON	VESTAS
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Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1,5 MW AW-70/1500 AW-77/1500 AW-82/1500	PEAB	4407,0	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
3,0 MW AW-100/3000 AW-109/3000	PZAB	3535,0	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			450	bearing LSS - gs	FAG / SKF	
			455	pitch tube	-	

schematic representation



Replaceable
To be checked
Not replaceable

Up-tower repair solutions @ Winergy gearboxes



ACCIONA 2/2

ALSTOM

ENVISION

GE Wind

NORDEX

SENVION

SGRE

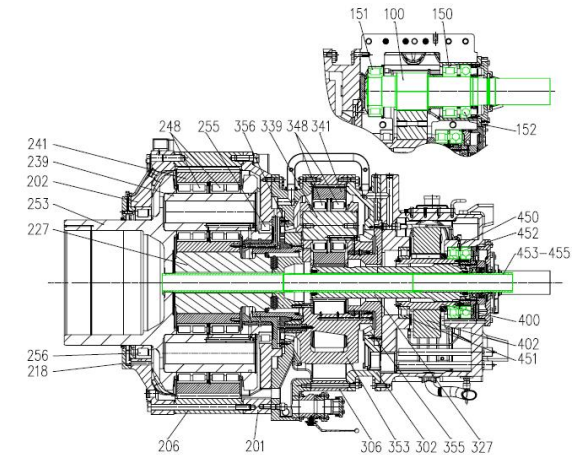
SUZLON

VESTAS

schematic representation



Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
3,0 MW AW-125 AW-132 AW-140	PZAB	3500,0	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			450	bearing IMS - gs	FAG / SKF	
			455	pitch tube	-	



Replaceable

To be checked

Not replaceable

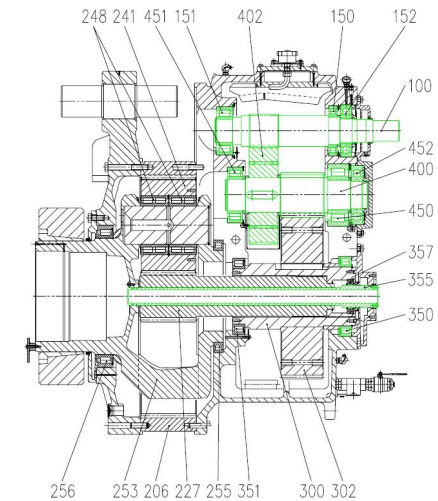
Up-tower repair solutions @ Winergy gearboxes



schematic representation

ALSTOM

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1,67 MW ECO74 ECO80	PEAB	4390	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	



Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1.67 MW ECO74 ECO80	PEAB	4418	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			452	axial bearing IMS	FAG	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

Replaceable
To be checked
Not replaceable

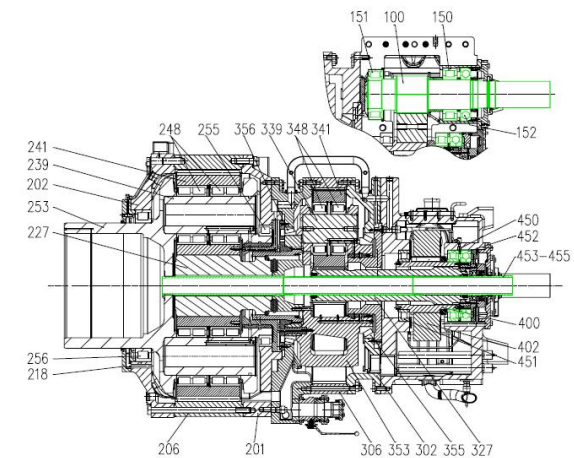
Up-tower repair solutions @ Winergy gearboxes



schematic representation

ALSTOM

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
3,0 MW ECO100 ECO110	PZFB	3495,0 3495,1 3495,2	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			450	bearing IMS - gs	FAG / SKF	
			455	pitch tube	-	



Replaceable
To be checked
Not replaceable



Up-tower repair solutions @ Winergy gearboxes



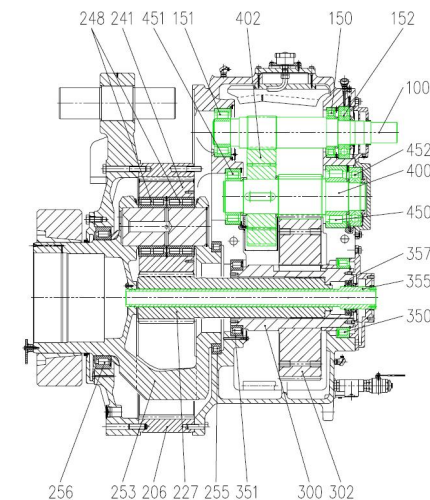
ACCIONA	ALSTOM	ENVISION1/2	GE Wind	NORDEX	SENVION	SGRE	SUZLON	VESTAS
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Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
2,1 MW E110 2,2 MW E110 2,3 MW E90 E100 E110	PEAB	4456,8	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			452	axial bearing IMS	FAG	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
2,5 MW E121	PEAB	4450	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

schematic representation



Replaceable
To be checked
Not replaceable



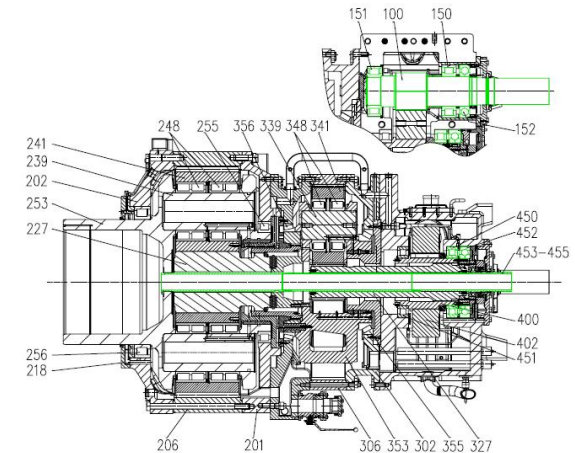
Up-tower repair solutions @ Winergy gearboxes



ACCIONA	ALSTOM	ENVISION2/2	GE Wind	NORDEX	SENVION	SGRE	SUZLON	VESTAS
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schematic representation



Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
3,6 MW E128	PZAB	3542	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			450	bearing IMS - gs	FAG / SKF	
			452	axial bearing IMS	FAG	
			455	pitch tube	-	

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
4,5 MW E148	PZAB	3548	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			450	bearing IMS - gs	FAG / SKF	
			455	pitch tube	-	

Replaceable
To be checked
Not replaceable

Up-tower repair solutions @ Winergy gearboxes



ACCIONA

ALSTOM

ENVISION

GE Wind 1/6

NORDEX

SENVION

SGRE

SUZLON

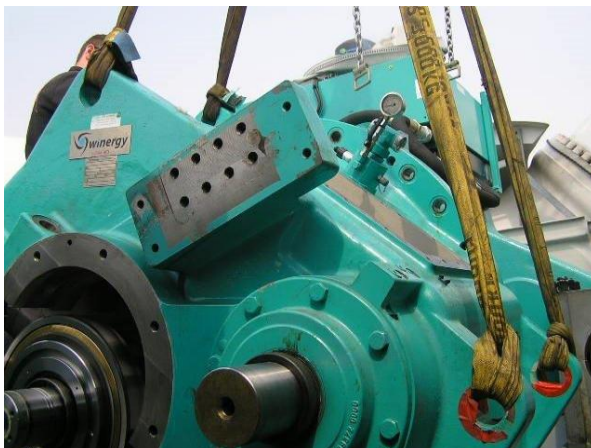
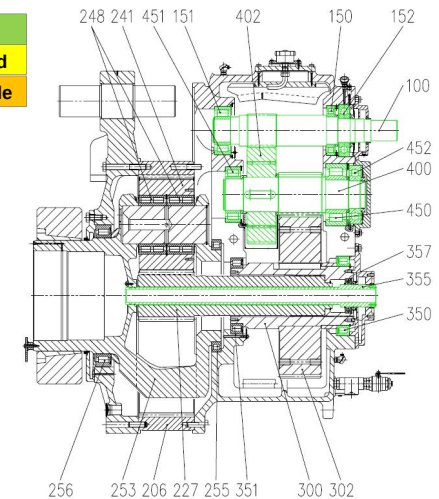
VESTAS



Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1,5 MW GE 1,5s GE 1,5sl	PEAS	4390	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

schematic representation

Replaceable
To be checked
Not replaceable



Up-tower repair solutions @ Winergy gearboxes



ACCIONA

ALSTOM

ENVISION

GE Wind 2/6

NORDEX

SENVION

SGRE

SUZLON

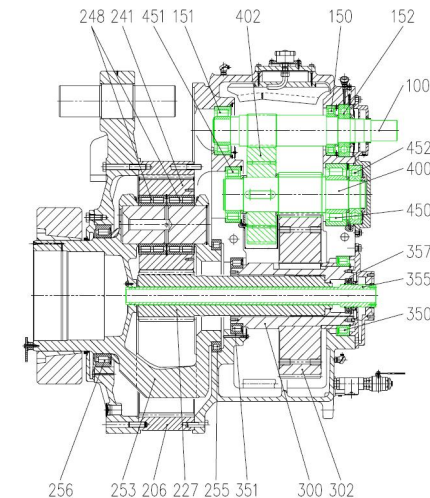
VESTAS



Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1,5 MW GE 1,5 sle GE 1,5 se	PEAB	4410,0 4410,1 4410,2 4410,4	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			452	axial bearing IMS	FAG	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1,5 MW GE 1,5 xle	PEAB	4411,0 4411,1 4411,2 4411,4	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			452	axial bearing IMS	FAG	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

schematic representation



Replaceable

To be checked

Not replaceable



Up-tower repair solutions @ Winergy gearboxes



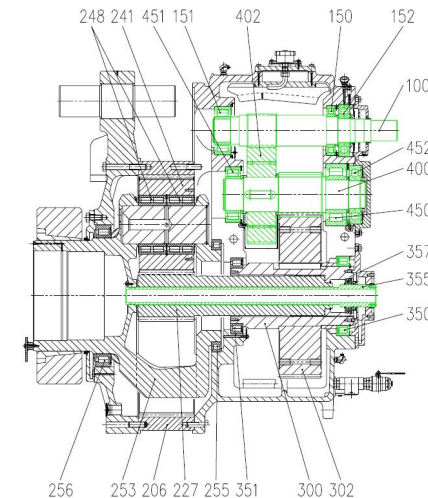
ACCIONA	ALSTOM	ENVISION	GE Wind 3/6	NORDEX	SENVION	SGRE	SUZLON	VESTAS
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Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1,5 MW	PEAB	4431	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			452	axial bearing IMS	FAG	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1,6 MW GE 1,6 xle	PEAB	4419	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			452	axial bearing IMS	FAG	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

schematic representation



Replaceable
To be checked
Not replaceable



Up-tower repair solutions @ Winergy gearboxes

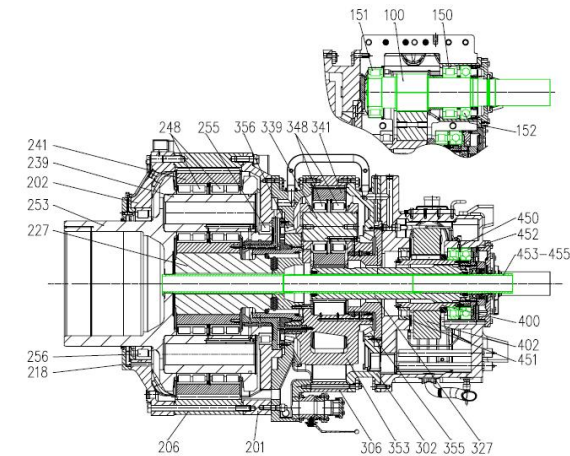


ACCIONA	ALSTOM	ENVISION	GE Wind 4/6	NORDEX	SENVION	SGRE	SUZLON	VESTAS
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Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
2,3 MW 2.3-116 2,5MW 2.5-116 2,8MW 2.8-127	PZAB	3505,0 3505,1 3505,2	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			455	pitch tube	-	

schematic representation



Replaceable
To be checked
Not replaceable

Up-tower repair solutions @ Winergy gearboxes

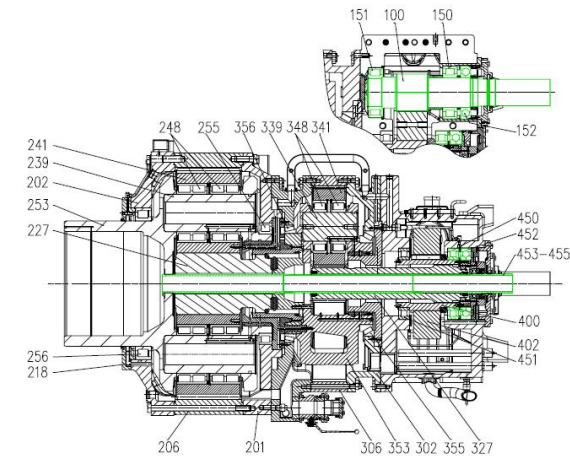


ACCIONA	ALSTOM	ENVISION	GE Wind 5/6	NORDEX	SENVION	SGRE	SUZLON	VESTAS
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Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
2,5 MW GE 2,5 xl	PZAB PZFB	3494,0	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			450	bearing IMS - gs	FAG / SKF	
			455	pitch tube	-	

schematic representation



Replaceable
To be checked
Not replaceable

Up-tower repair solutions @ Winergy gearboxes



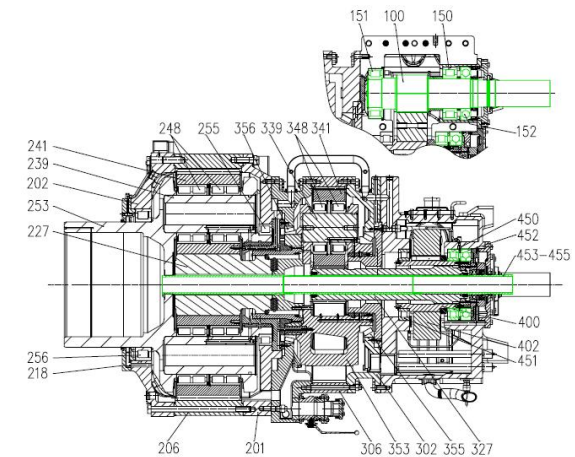
ACCIONA	ALSTOM	ENVISION	GE Wind 6/6	NORDEX	SENVION	SGRE	SUZLON	VESTAS
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Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
3,2 MW 3.x-120	PZAB	3509	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			450	bearing IMS - gs	FAG / SKF	
			455	pitch tube	-	

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
3,6 MW 3.6-137 3.8-130	PZAB	3521,0 3521,1	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			450	bearing IMS - gs	FAG / SKF	
			455	pitch tube	-	

schematic representation



Replaceable
To be checked
Not replaceable

Up-tower repair solutions @ Winergy gearboxes

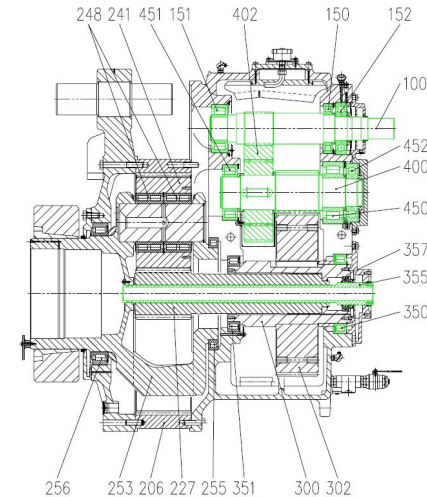


ACCIONA	ALSTOM	ENVISION	GE Wind	NORDEX 1/3	SENVION	SGRE	SUZLON	VESTAS
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Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
600 kW N43	PEAS	4280	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			450	bearing IMS - gs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

schematic representation



Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
800 kW N50	PEAS	4290	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			450	bearing IMS - gs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

Replaceable
To be checked
Not replaceable

Up-tower repair solutions @ Winergy gearboxes



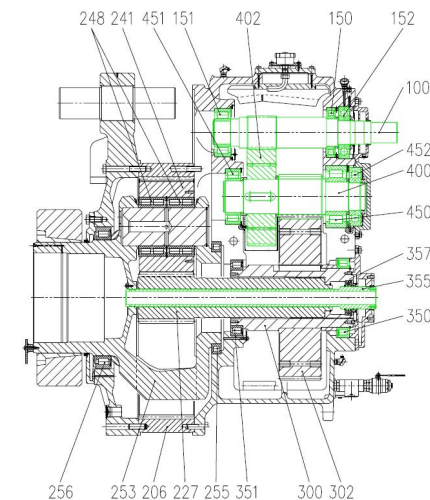
ACCIONA	ALSTOM	ENVISION	GE Wind	NORDEX 2/3	SENVION	SGRE	SUZLON	VESTAS
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Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1,3 MW N60	PEAS	4375	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1,5 MW S70 S77	PEAB	4390	100	shaft HSS	-	
			150	bearing HSS -gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			350	bearing LSS -gs	FAG	
			355	pitch tube	-	

schematic representation



Replaceable

To be checked

Not replaceable



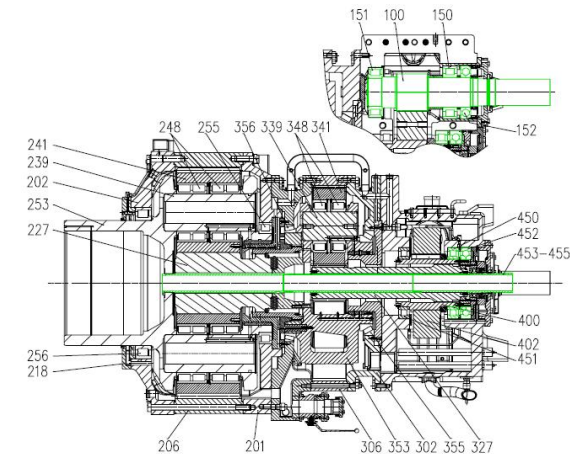
Up-tower repair solutions @ Winergy gearboxes



schematic representation



Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
2,5 MW N80 N90	PZAB	3450,0 3450,3 3450,5	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			450	bearing IMS - gs	FAG / SKF	
			455	pitch tube	-	



Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
4,2 MW N133 N149	PZAB	3600	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
455	pitch tube	-				
Complete helical stage						

Replaceable
To be checked
Not replaceable



Up-tower repair solutions @ Winergy gearboxes

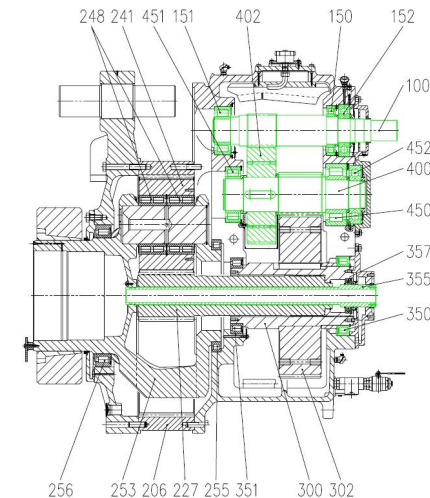


ACCIONA	ALSTOM	ENVISION	GE Wind	NORDEX	SENVION 1/3	SGRE	SUZLON	VESTAS
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SENVION
wind energy solutions

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
600 kW 48/600	PEAS	4290	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			450	bearing IMS - gs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

schematic representation



Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1,5 MW MD70 MD77	PEAB	4390	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

Replaceable
To be checked
Not replaceable

Up-tower repair solutions @ Winergy gearboxes



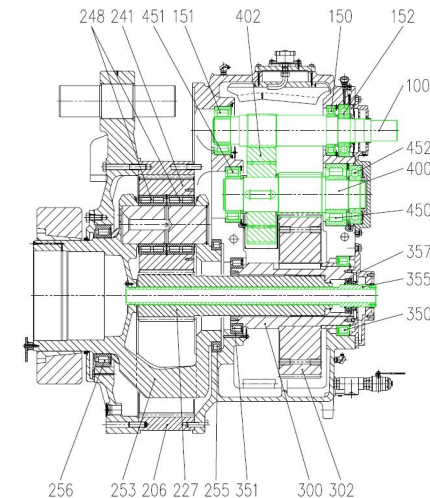
ACCIONA	ALSTOM	ENVISION	GE Wind	NORDEX	SENVION 2/3	SGRE	SUZLON	VESTAS
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SENVION
wind energy solutions

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1,5 MW MD77	PEAB	4430	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			452	axial bearing IMS	FAG	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
2,0 MW MM82 MM92	PEAB	4480 4481	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			452	axial bearing IMS	FAG	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

schematic representation



Replaceable
To be checked
Not replaceable

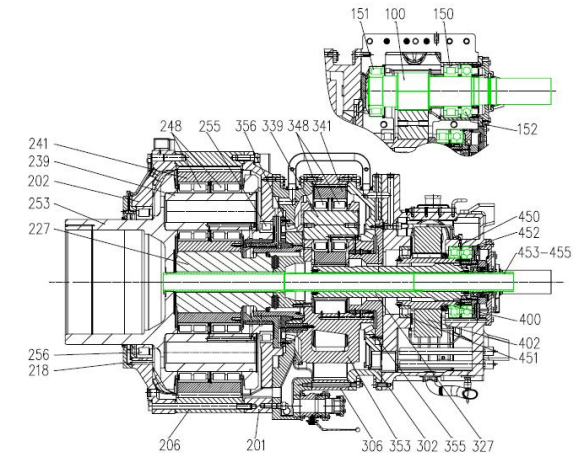
Up-tower repair solutions @ Winergy gearboxes



schematic representation

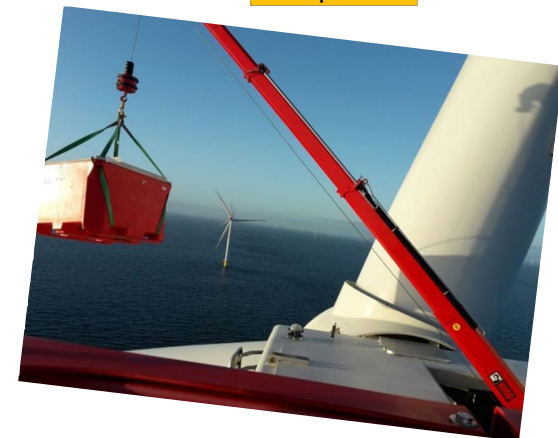
SENVION
wind energy solutions

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
5 MW 5M	PZFB	3680	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			450	bearing IMS - gs	FAG / SKF	
			455	pitch tube	-	



Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
6 MW 6.XM	PZFB	3717	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			450	bearing IMS - gs	FAG / SKF	
			455	pitch tube	-	

Replaceable
To be checked
Not replaceable



Up-tower repair solutions @ Winergy gearboxes

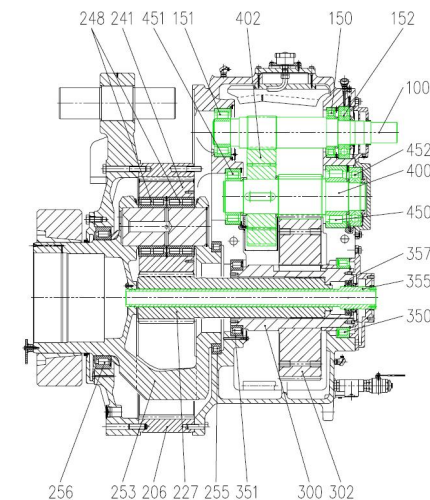


ACCIONA	ALSTOM	ENVISION	GE Wind	NORDEX	SENVION	SGRE 1/5	SUZLON	VESTAS
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Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
800 kW Made AE56 Made AE59	PEAB	4300	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			450	bearing IMS - gs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

schematic representation



Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
2,0 MW G80	PEAB	4436	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			452	axial bearing IMS	FAG	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

Replaceable
To be checked
Not replaceable



Up-tower repair solutions @ Winergy gearboxes

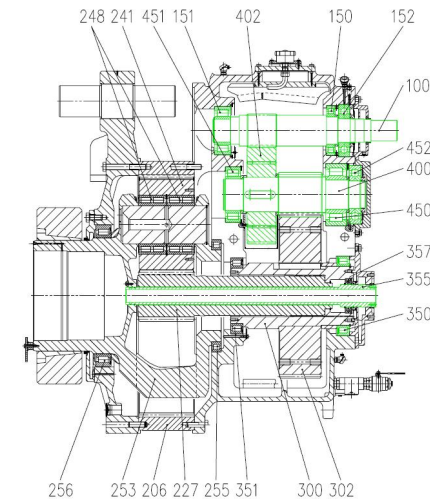


ACCIONA	ALSTOM	ENVISION	GE Wind	NORDEX	SENVION	SGRE 2/5	SUZLON	VESTAS
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SIEMENS

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1,3 MW SWT-1.3	PEAS	4375	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS		
			450	bearing IMS - gs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

schematic representation



Replaceable

To be checked

Not replaceable



Up-tower repair solutions @ Winergy gearboxes



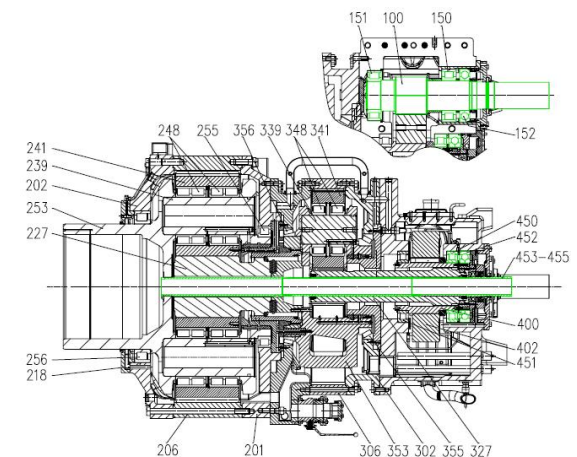
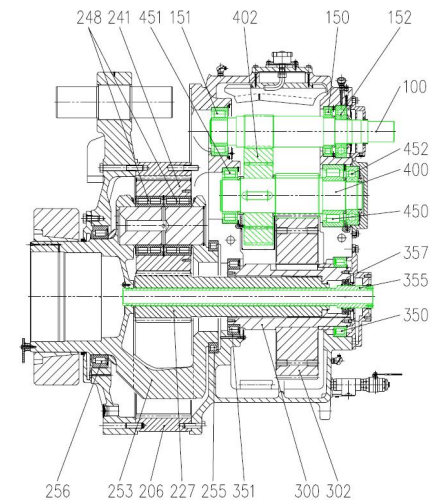
ACCIONA	ALSTOM	ENVISION	GE Wind	NORDEX	SENVION	SGRE 3/5	SUZLON	VESTAS
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SIEMENS

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
2,0 MW SWT-2.3	PEAB	4455	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
2,3 MW SWT-2.3		4456,0				
		4456,1				
		4456,2	400	shaft IMS		
		4456,5	450	bearing IMS - gs	FAG / SKF	
		4456,6	451	bearing IMS - rs	FAG / SKF	
		4456,8	452	axial bearing IMS	FAG	
		4456,9				
		4458,0	350	bearing LSS - gs	FAG	
4458,1	355	pitch tube	-			

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
2,6 MW SWT-2.5	PZAB	3489	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			450	bearing IMS - gs	FAG / SKF	
			455	pitch tube	-	

schematic representation



Replaceable

To be checked

Not replaceable

Up-tower repair solutions @ Winergy gearboxes

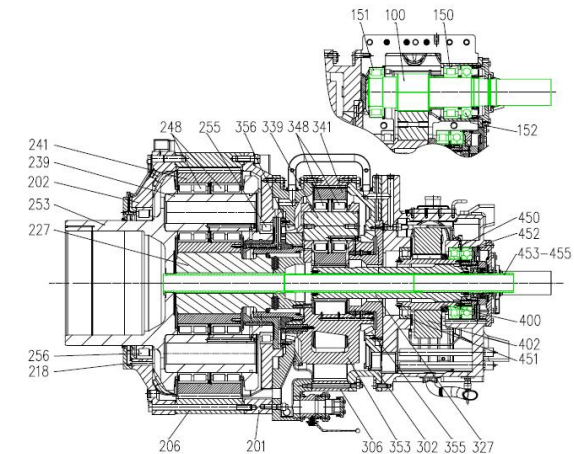


schematic representation

SIEMENS

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
3,6 MW SWT-3.6	PZAB	3541,0 3541,1 3541,4	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			450	bearing IMS - gs	FAG / SKF	
			452	axial bearing IMS	FAG	
			455	pitch tube	-	

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
4,0 MW SWT-4.0	PZAB	3546,0	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			450	bearing IMS - gs	FAG / SKF	
			455	pitch tube	-	



Replaceable
To be checked
Not replaceable



Up-tower repair solutions @ Winergy gearboxes

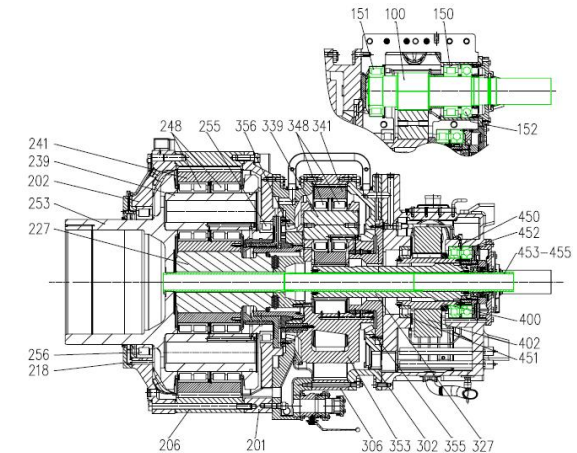


ACCIONA	ALSTOM	ENVISION	GE Wind	NORDEX	SENVION	SGRE 5/5	SUZLON	VESTAS
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Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
3,4 MW SG 3.4	PZAB	3539	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			450	bearing IMS - gs	FAG / SKF	
			455	pitch tube	-	

schematic representation



Replaceable
To be checked
Not replaceable

Up-tower repair solutions @ Winergy gearboxes

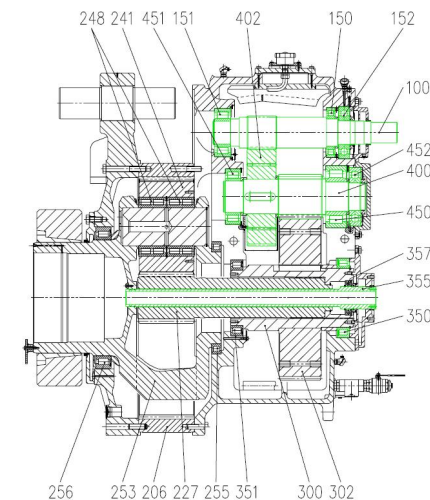


ACCIONA	ALSTOM	ENVISION	GE Wind	NORDEX	SENVION	SGRE	SUZLON 1/3	VESTAS
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Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1,25 MW S64	PEAS	4375	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			450	bearing IMS - gs	FAG / SKF	
			452	axial bearing IMS	FAG	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

schematic representation



Replaceable
To be checked
Not replaceable

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1,5 MW S78 S82	PEAB	4409	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			450	bearing IMS - gs	FAG / SKF	
			452	axial bearing IMS	FAG	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

Up-tower repair solutions @ Winergy gearboxes



ACCIONA

ALSTOM

ENVISION

GE Wind

NORDEX

SENVION

SGRE

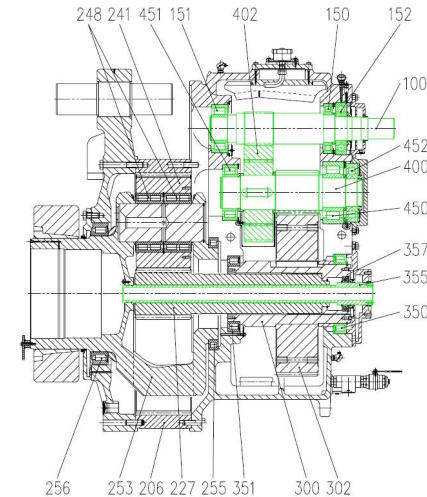
SUZLON 2/3

VESTAS



Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
2,1 MW S88 S9x	PEAB	4456 4456,5,6	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			452	axial bearing IMS ,5,6	FAG	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

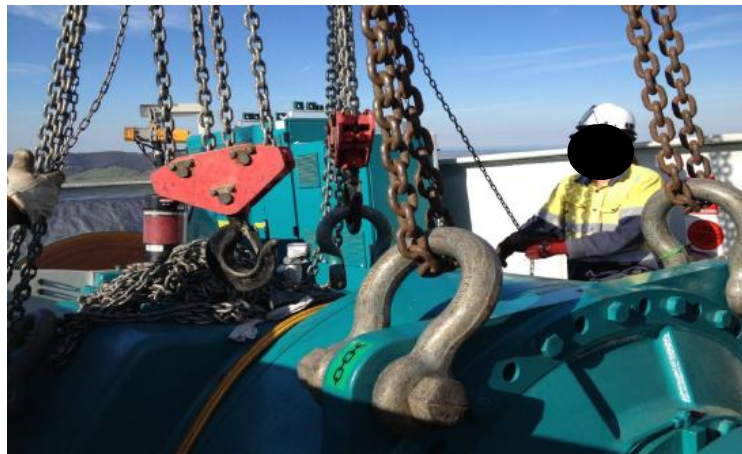
schematic representation



Replaceable

To be checked

Not replaceable



Up-tower repair solutions @ Winergy gearboxes

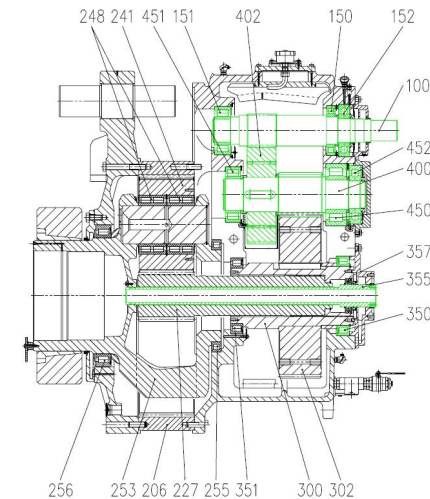


ACCIONA	ALSTOM	ENVISION	GE Wind	NORDEX	SENVION	SGRE	SUZLON 3/3	VESTAS
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Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
2,3 MW S111	PEAB	4450	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

schematic representation



Replaceable
To be checked
Not replaceable

Up-tower repair solutions @ Winergy gearboxes

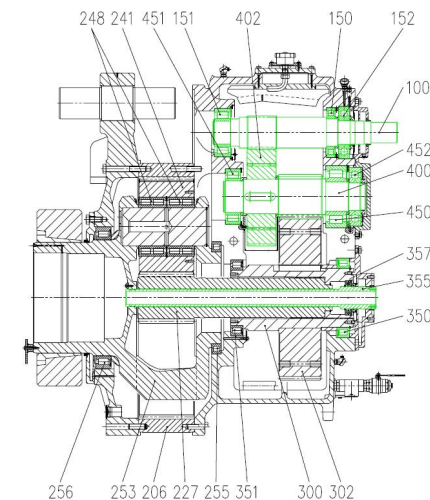


ACCIONA	ALSTOM	ENVISION	GE Wind	NORDEX	SENVION	SGRE	SUZLON	VESTAS 1/5
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Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
750 kW NM44	PEAC	4300	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			450	bearing IMS - gs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

schematic representation



Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
900 kW NM52	PEAB	4320	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			450	bearing IMS - gs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

Replaceable

To be checked

Not replaceable



Up-tower repair solutions @ Winergy gearboxes



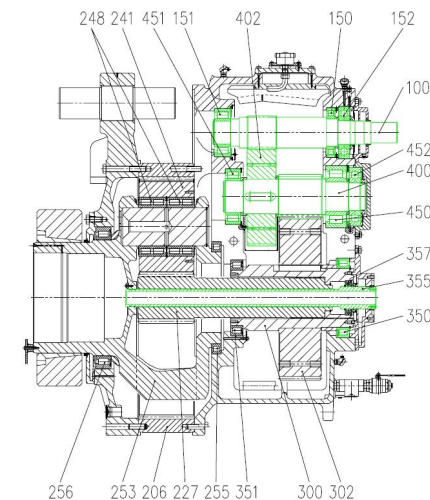
ACCIONA	ALSTOM	ENVISION	GE Wind	NORDEX	SENVION	SGRE	SUZLON	VESTAS 2/5
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Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1,65 MW NM64 NM72	PEAS	4390,5 4390,6	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1,65 MW V82	PEAB	4420	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	-	-
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

schematic representation



Replaceable
To be checked
Not replaceable



Up-tower repair solutions @ Winergy gearboxes

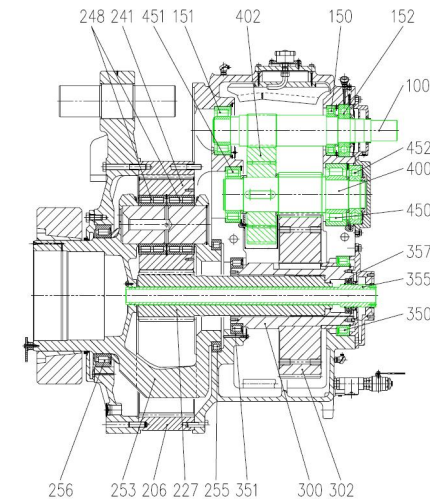


ACCIONA	ALSTOM	ENVISION	GE Wind	NORDEX	SENVION	SGRE	SUZLON	VESTAS 3/5
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Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
1,65 MW 1,75 MW V66	PEAS PEAB	4395	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

schematic representation



Replaceable
To be checked
Not replaceable



Up-tower repair solutions @ Winergy gearboxes



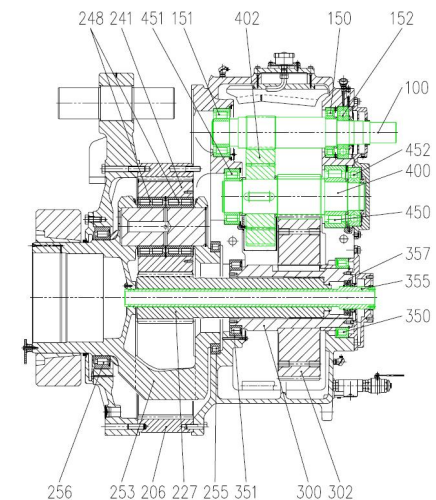
ACCIONA	ALSTOM	ENVISION	GE Wind	NORDEX	SENVION	SGRE	SUZLON	VESTAS 4/5
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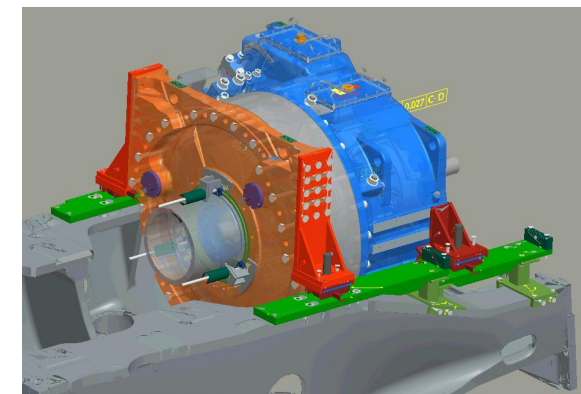
Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
2,0 MW V80 V90 V100	PEAB	4435,0 4435,2 4435,4 4435,6	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			350	bearing LSS - gs	FAG	
			352	axial bearing LSS	FAG	
			355	pitch tube	-	
			256	Bearing LSS - rs	FAG	see 3D-pict.

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replaceable Up-tower
2,0 MW V 90 V100	PEAB	4440	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			152	axial bearing HSS	FAG	-
			400	shaft IMS		
			450	bearing IMS - gs	FAG / SKF	
			451	bearing IMS - rs	FAG / SKF	
			452	axial bearing IMS	FAG	-
			350	bearing LSS - gs	FAG	
			355	pitch tube	-	

schematic representation



Replaceable
To be checked
Not replaceable



Up-tower repair solutions @ Winergy gearboxes



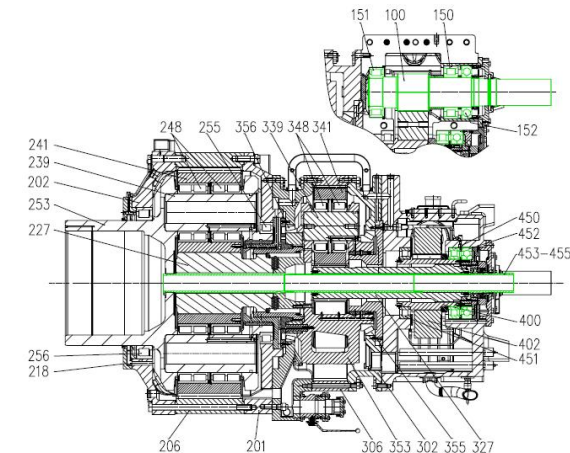
ACCIONA	ALSTOM	ENVISION	GE Wind	NORDEX	SENVION	SGRE	SUZLON	VESTAS 5/5
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schematic representation



Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replacable Up-tower
3,0 MW 3,3 MW V112 V123	PZAB	3530	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			450	bearing IMS - gs	FAG / SKF	
			455	pitch tube	-	
			Complete helical stage			

Turbine Type	Gearbox Type	Size / Version	Part No.	Parts Description	Bearing Brand	Replacable Up-tower
3,45 MW V136	PZAB	3580	100	shaft HSS	-	
			150	bearing HSS - gs	FAG / SKF	
			151	bearing HSS - rs	FAG / SKF	
			450	bearing IMS - gs	FAG / SKF	
	455	pitch tube	-			
				Complete helical stage		



Replaceable
To be checked
Not replaceable



**You did not find a suitable solution for your need?
.... or you have more questions?**

**For more information please contact our
service engineering team:**

Winergy Service – Technical Support

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+49 (0) 28 71 / 92 - 2293**

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