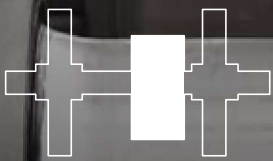


MIIRA

A CAF GROUP COMPANY

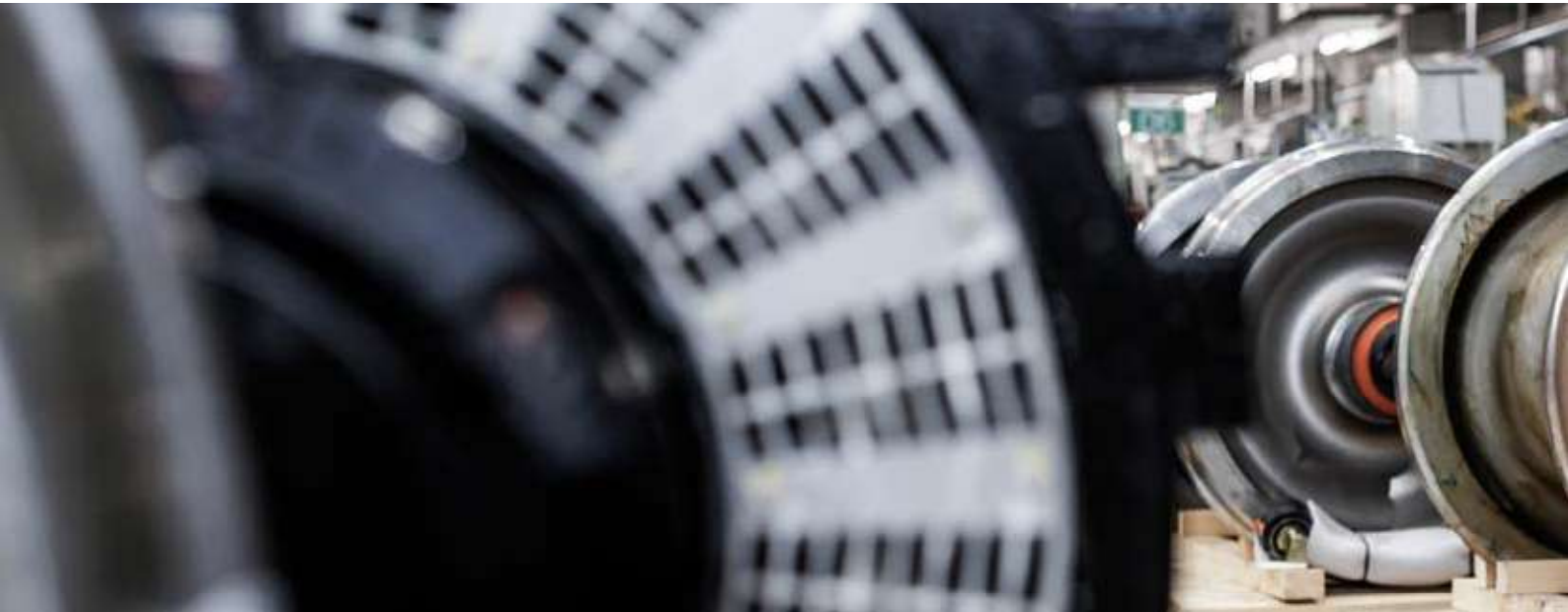


GEARBOX SOLUTIONS

www.cafmiira.com

Beyond
wheelset
solutions

Your partner for wheelset solutions



INTEGRAL WHEELSET SOLUTIONS

At CAF MIIRA, we are dedicated to being your global leader in providing cutting-edge Integral Wheelset Solutions. Our commitment extends from the heart of the rail industry, offering innovative engineering, manufacturing, and maintenance solutions for complete wheelsets and portal axles, for all type of trains.

Our solutions are designed to streamline supply chain management and reduce the carbon footprint, contributing to a greener and more sustainable future.

By designing and manufacturing the main elements of the wheelset internally, we ensure full traceability throughout the assembly process.

A committed and highly qualified team, with strong leadership capabilities, focuses on customer satisfaction, continuously driving innovation and excellence in every project. Together, we strive to exceed expectations and achieve shared success.

Forward together.



WHY CHOOSE CAF?

- **Reduced lead times** and improved logistics efficiency
- **Reliability, efficiency, and cost-effectiveness**
- **Decreased total weight** of the complete solution
- **Minimized carbon footprint**

CAF GROUP

The CAF Group is a multinational group with over 100 years’ experience offering integrated transport systems at the forefront of technology that provide high value-added sustainable mobility for our customers.

We are international leaders in the implementation of comprehensive rail and bus mobility solutions, with extensive experience addressing projects throughout the entire project life cycle in a multitude of geographies.

CAF continues towards the challenge of decarbonisation as the main axis of its strategy, with a commitment to sustainable growth focused on the environment, and leading the transition towards net zero emissions mobility.

Our strategic commitment to decarbonisation and the energy transition is reflected in the 2021 accession to SBTi (Science Based Targets Initiative) and Race to Zero, international alignment initiatives in the fight against climate change and Paris Agreement.



CERTIFICATIONS

Our quality systems are rigorously tested and currently comply with major international standards and regulations.

PRODUCT & MANAGEMENT SYSTEM

QUALITY • ARR • ISO 9000 • IRIS • ISO 1725 • RISAS • VPI	ESG <i>Sustainability & Environment</i> • CDP • EPD • ISO14001 • ISO26000 • RAILSPONSIBLE • ECOVADIS PLATINUM	 
SAFETY • UNE	<i>Labour health & safety</i> • 45001	 
TSI • TSI		

Lead the way with CAF MIIRA's Eco-Approved solutions



Green e-Energy

100% renewable certified e-Energy, produced by wind turbines.

Sustainable. Infinite.

ECO design

More efficient designs that are lighter, require less maintenance and offer longer lifetimes.

Complete wheelset and gearbox designs that eliminate compatibility related problems, maximizing the reduction of total weight.

Efficient. Lightweight.

ECOmmited

Part of SBTi (Science based targets initiative) and Race to Zero initiatives against climate change aligned with the Paris Agreement.

Focus on continuous improvement to reduce carbon footprint throughout the entire life cycle of our products.

Endless improvement.

ECOnsumption

Lightweight designs that require less material and generate less waste.

Production and supply of complete wheelsets generate less carbon footprint: we avoid unnecessary operations and transports.

Integral. Clean.

Circular ECOnomy

100% of the scrap generated by our products is used to produce the steel we use. No additional external resources needed.

Reusable packaging system.

Recyclable.

Green Steel

Green Steel wheels and axles. Our steel is below Standards in terms of generated GHG intensity and below industry average.

Responsible. Green.

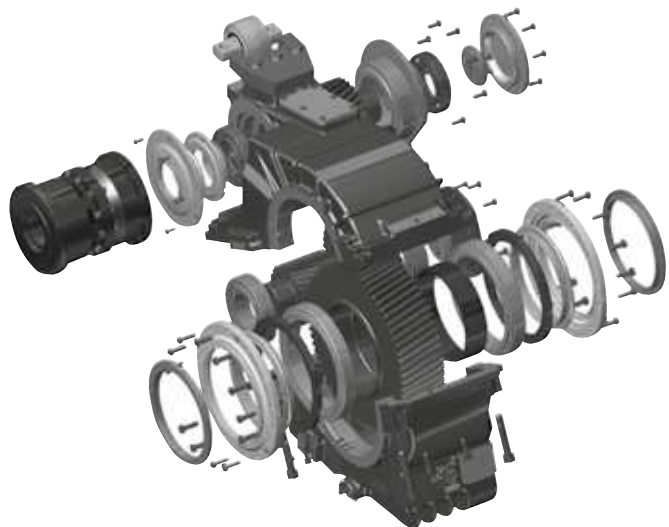


GEARBOXES

With more than 50 years experience in gear-box design, manufacture and supply, CAF MIIRA faces rolling stock upcoming challenges with a tailor-made customer approach, supported by a vaste list of proven references.

Supported by unrivalled design, test and manufacturing capabilities, and our knowledge in complete wheelset systems, CAF MIIRA gearboxes optimize life cycle cost, by means of light, reliabale and low noise solutions.

Backed by a strong Rolling Stock Group, a worldwide service network gets us closer from customers.

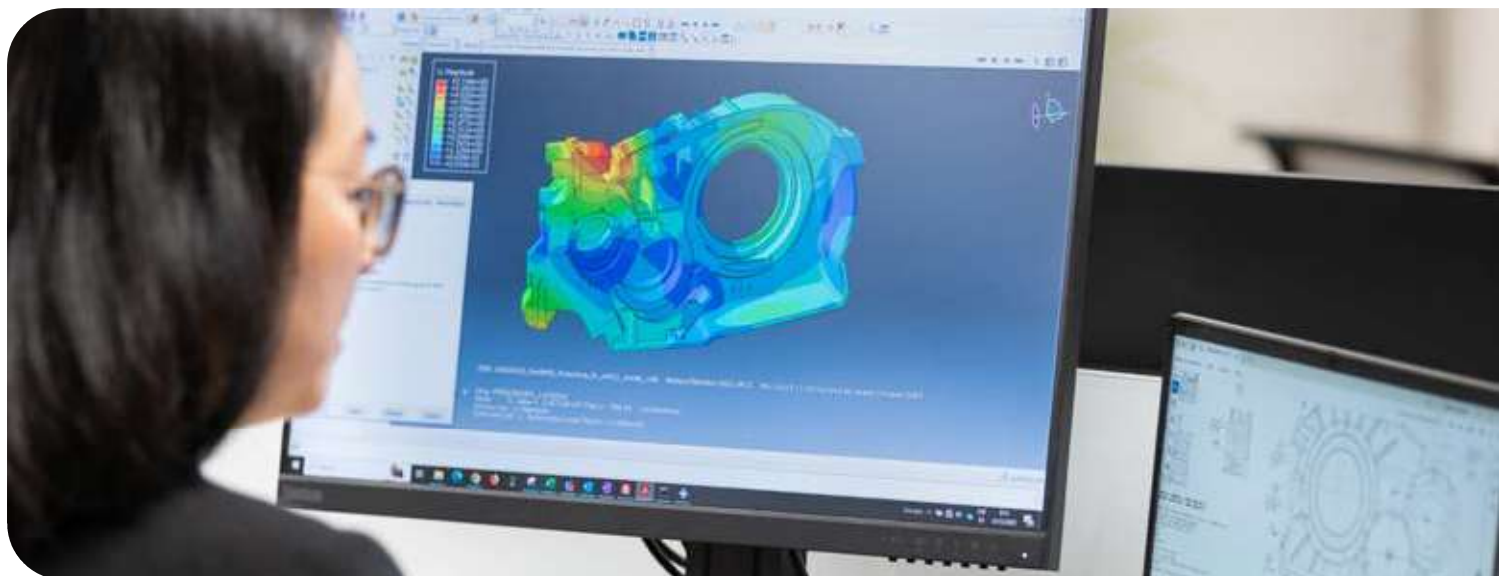




CAF MIIRA'S APPLICATIONS

CAF MIIRA's Gearbox solutions cover a wide range of applications for locomotives, metros, high speed, regional and trams. All of them could be served as part of a complete wheelset solution.

	CONFIGURATION	GEARING	NUMBER OF STAGES
Metro/D-EMU/HS	Semi suspended	Bevel-Helical	1&2
	Fully suspended	Bevel-Helical	1&2
		Bevel	1
Locomotive	Semi suspended	Helical	1&2
	Fully suspended	Helical	1&2
	Cannon-box	Helical	1&2
Trams / LRV	Semi suspended	Helical	1&2
	Fully suspended	Bevel	1
		Bevel-Helical	2



TESTING & MANUFACTURING

CAF MIIRA's gearboxes are manufactured in our flexible production cells. Highly trained workforce accompanies the gearbox along the whole assembly process, under LEAN manufacturing philosophy and KAIZEN methodology.

Quality Assurance team works daily hand in hand with our in-house Laboratory of Materials and Metrology in order to assess the highest levels of quality of our supply chain.

Type tests are carried out in our in-house laboratory, while our end-of-line test bench and quality control routines, strictly defined for market highest standards and requirements, guarantee a flawless performance and reliability for gearboxes life cycle.

This rigorously standardized testing and manufacturing procedure allows us to supply best "fit-to-customer" gearboxes.





DESIGN & ENGINEERING

When expertise, experience and innovation merge

Reliability, performance, and life of CAF MIIRA gearboxes lay on a rigorous and optimized design.

A flawless understanding of customer requirements, preferences and expectations is the key factors when starting a new project, and co-development with customer and key components suppliers becomes crucial at this stage. As a part of a Rolling Stock Group, CAF MIIRA has a huge return of experience, and to apply it systematically in the development of next generation gearboxes.

The aim being to achieve a light but robust, competitive, efficient and low-noise product, we use latest engineering software and simulation tools.

Our engineering resources and capabilities provide with a continuous communication and support to our customers at every stage of the project, so engineering never ends, as there is always room for improvement.

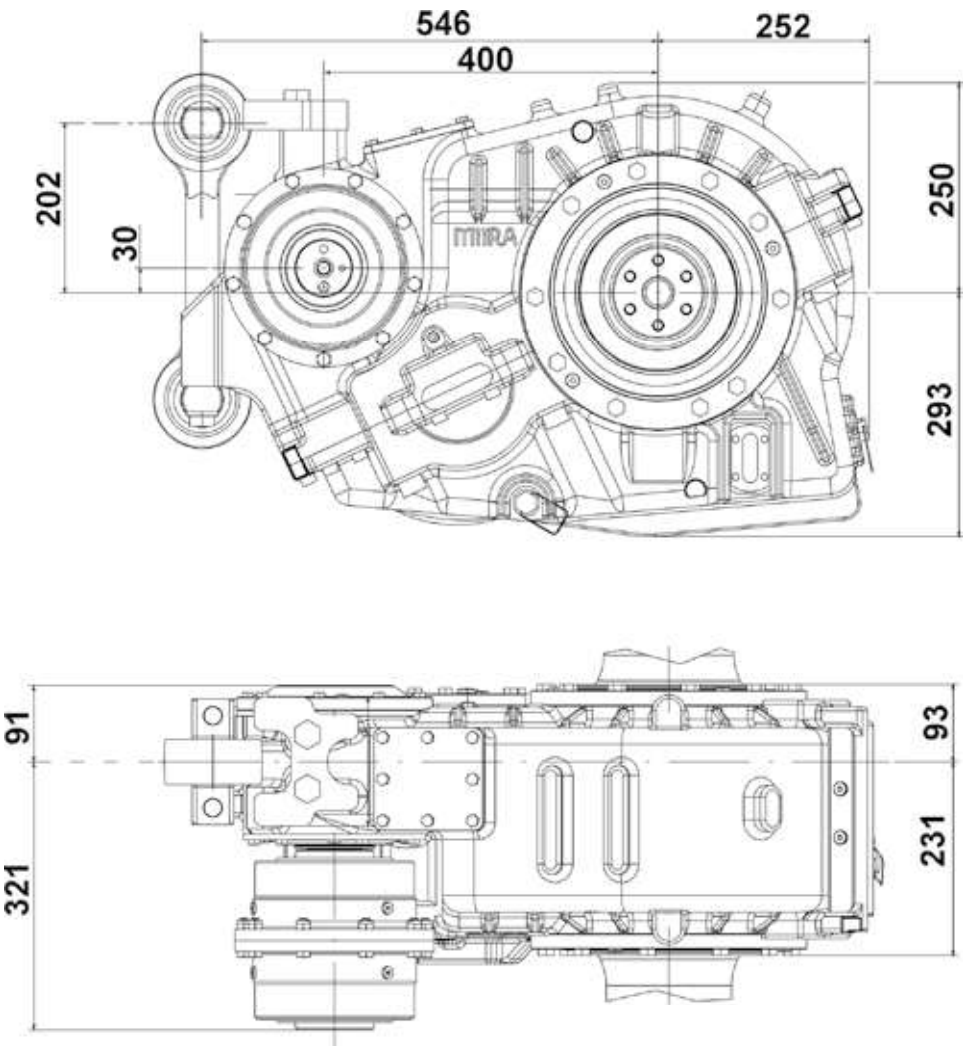


TECHNICAL SPECIFICATIONS

AHHD-400-7.84-1



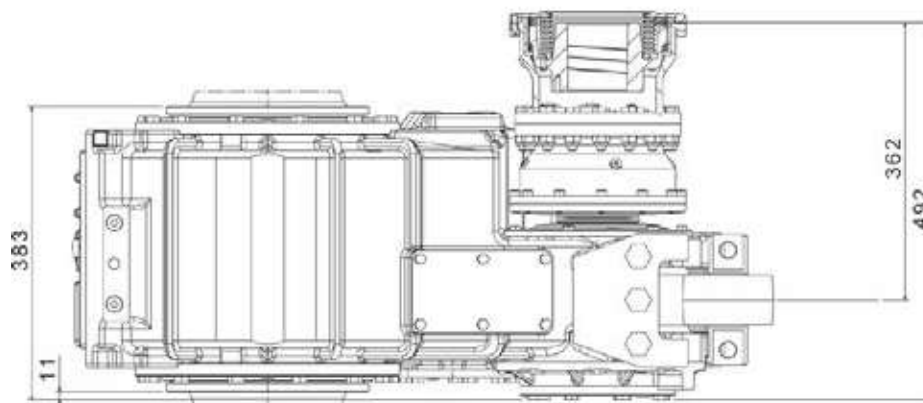
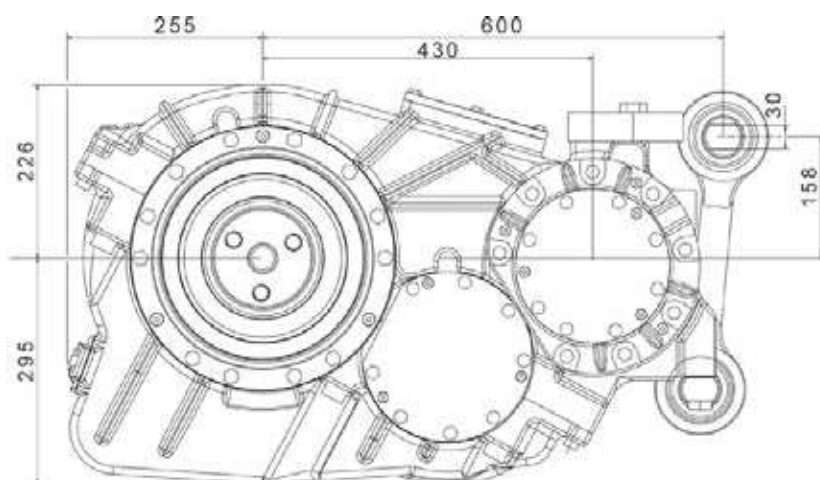
Gearbox type		AHHD-400-7.84-1	
Maximum axle load	13.500	kg	
Ratio	7,84		
Maximum service speed	90	Km/h	
Wheel diameter (worn/new)	850/750	mm	
Maximum tractive torque	1452	Nm	
Nominal power	220	kW	
Motor-Gearbox Coupling	TEETH		
Reference projects	METRO NÁPOLES		



AHHD-430-4.822-1



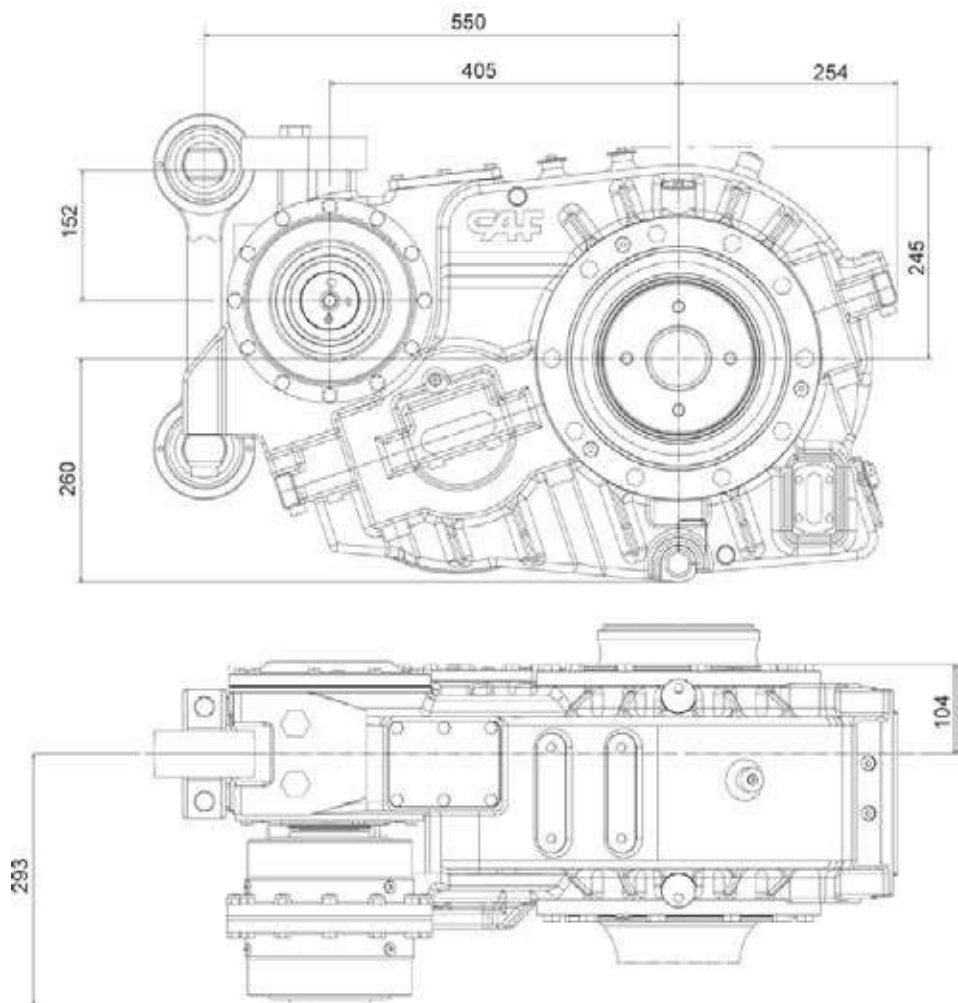
Gearbox type		AHHD-430-4.822-1
Maximum axle load	21.000	kg
Ratio	4.82	
Maximum service speed	160	Km/h
Wheel diameter (worn/new)	850/780	mm
Maximum tractive torque	3180	Nm
Nominal power	401	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	NS SPRINTER TOLUCA	



AHHD-405-4.71-1



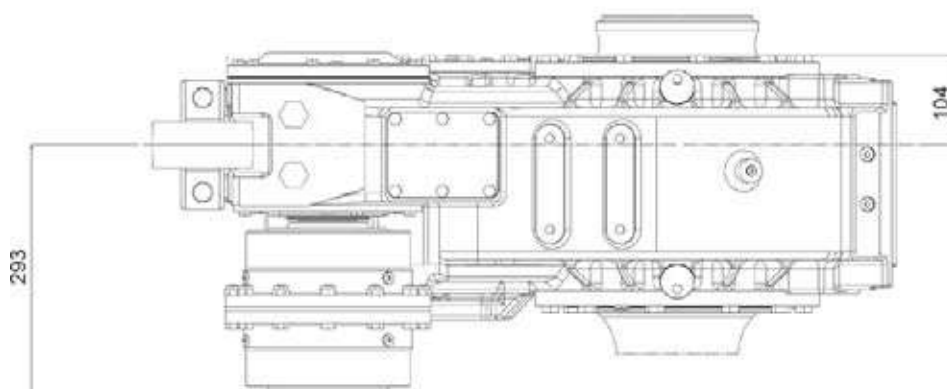
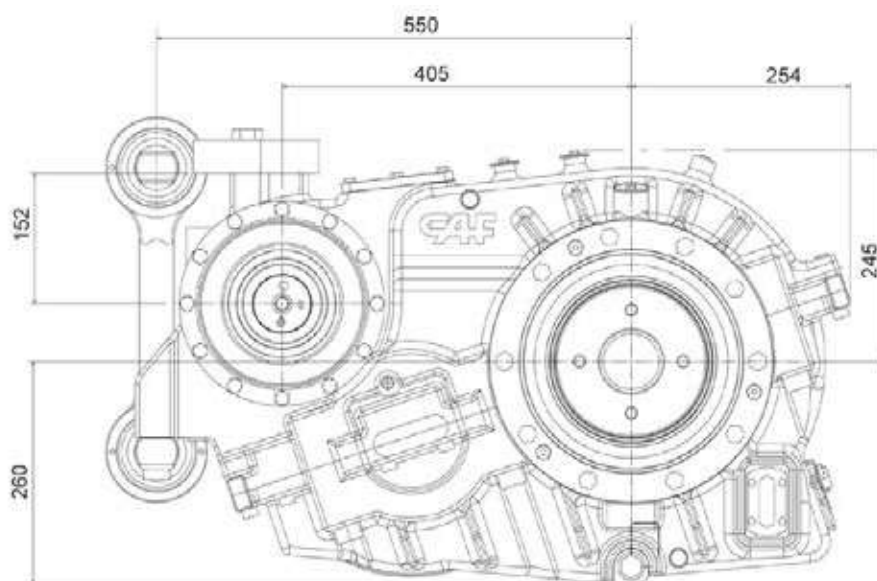
Gearbox type		AHHD-405-4.71-1
Maximum axle load	15.000	kg
Ratio	4.707	
Maximum service speed	160	Km/h
Wheel diameter (worn/new)	780/710	mm
Maximum tractive torque	2192	Nm
Nominal power	220	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	ARRIVA TRANSPENNINE	



AHHD-405-3.77-1



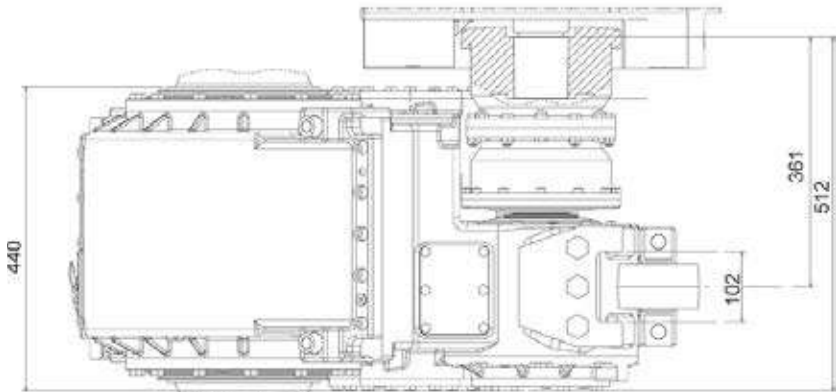
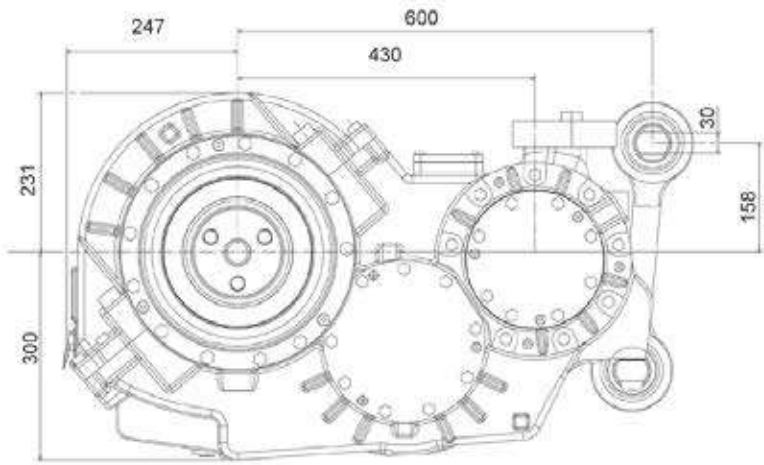
Gearbox type		AHHD-405-3.77-1
Maximum axle load	15.250	kg
Ratio	3.77	
Maximum service speed	200	Km/h
Wheel diameter (worn/new)	780/710	mm
Maximum tractive torque	3028	Nm
Nominal power	280	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	ARRIVA TRANSPENNINE	



AHHD-430-4.82-1



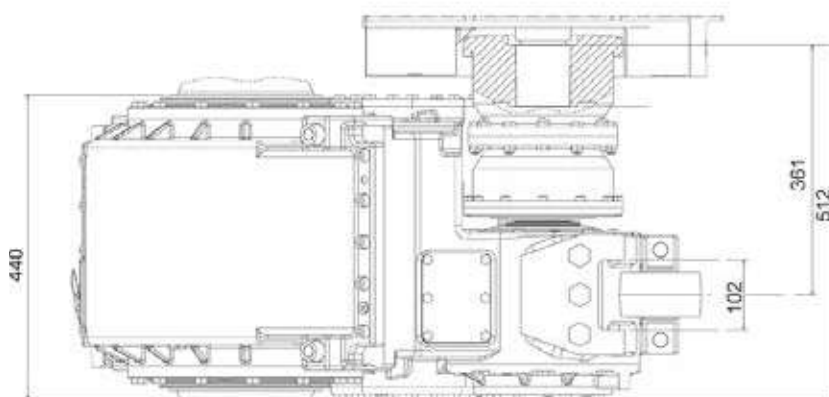
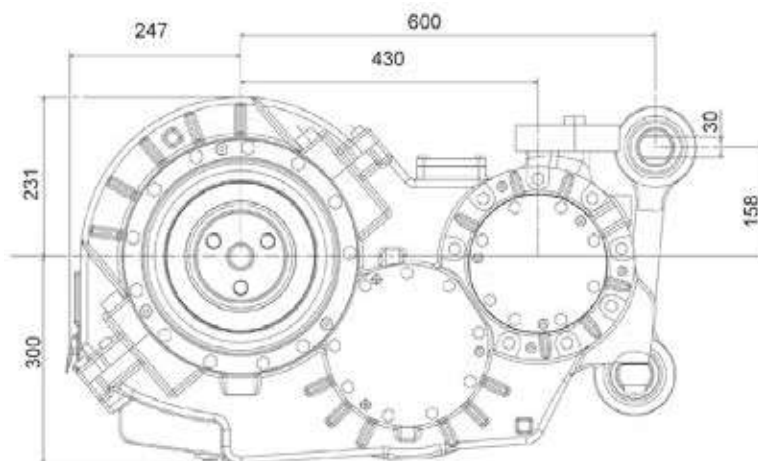
Gearbox type		AHHD-430-4.82-1	
Maximum axle load	21.000	kg	
Ratio	4.82		
Maximum service speed	160	Km/h	
Wheel diameter (worn/new)	750/780	mm	
Maximum tractive torque	4543	Nm	
Nominal power	537	kW	
Motor-Gearbox Coupling	TEETH		
Reference projects	TRIESTE MONTENEGRO AUSTRIA BARI		



AHHD-430-3.96-1



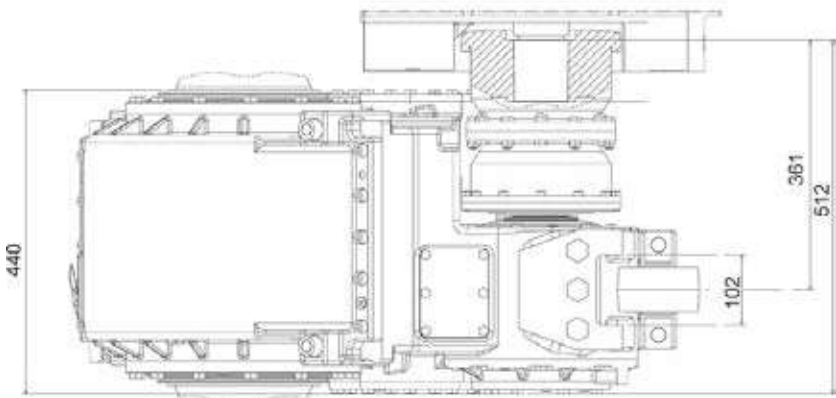
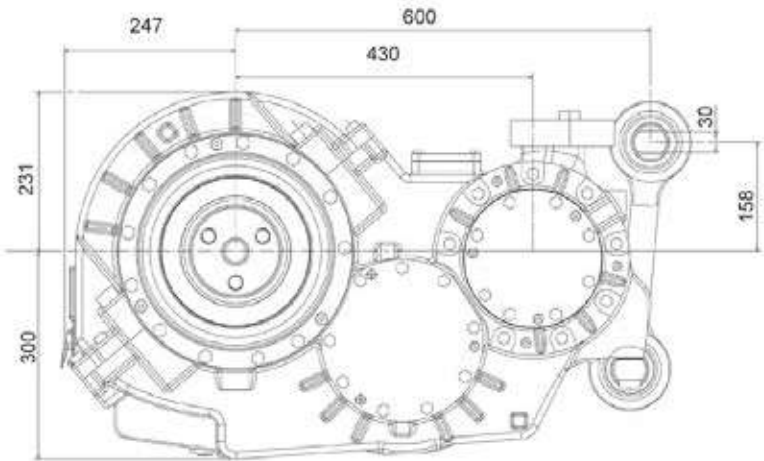
Gearbox type		AHHD-405-3.96-1
Maximum axle load	20.500	kg
Ratio	3.96	
Maximum service speed	200	Km/h
Wheel diameter (worn/new)	880/800	mm
Maximum tractive torque	4904	Nm
Nominal power	550	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	TRIESTE MONTENEGRO AUSTRIA BARI	



AHHD-430-5.53-1



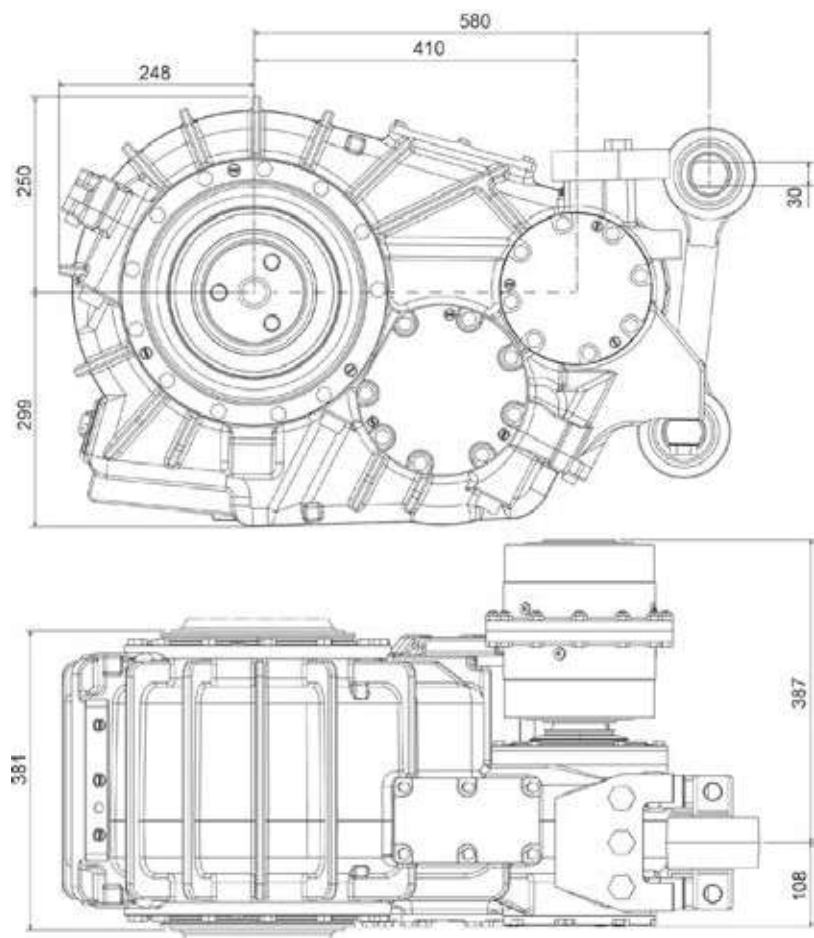
Gearbox type	AHHD-405-5.53-1	
Maximum axle load	20.000	kg
Ratio	5.53	
Maximum service speed	140	Km/h
Wheel diameter (worn/new)	880/810	mm
Maximum tractive torque	2868	Nm
Nominal power	550	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	TRIESTE MONTENEGRO AUSTRIA BARI	



AHHD-410-7.52-2



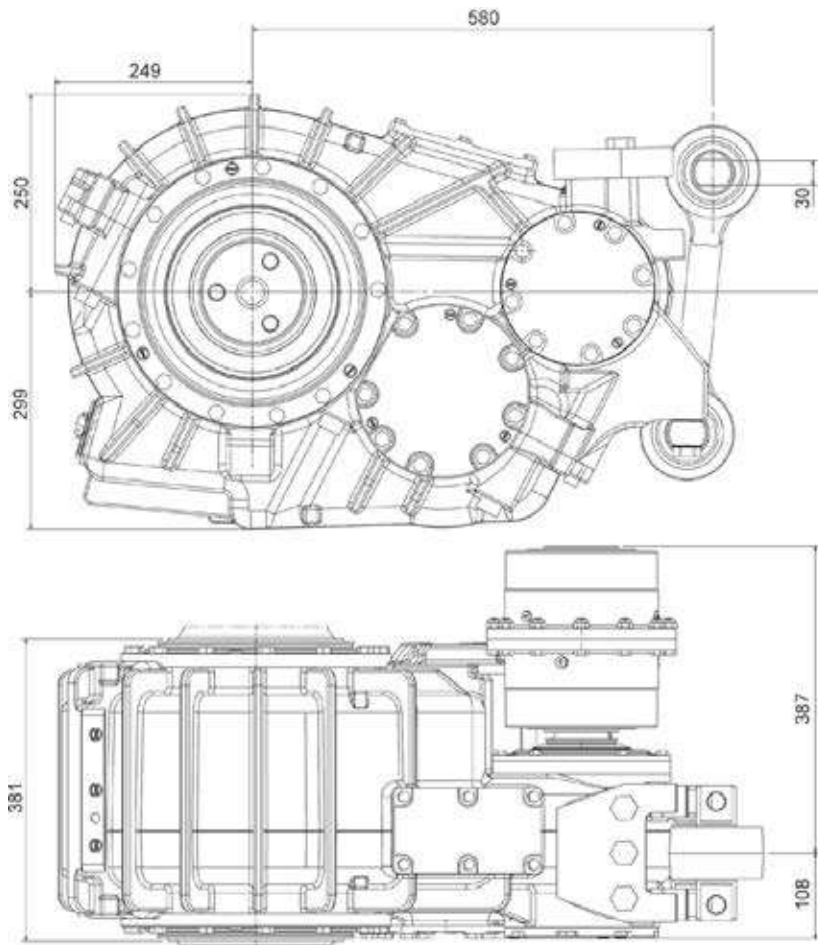
Gearbox type		AHHD-410-7.52-2	
Maximum axle load	16.000	kg	
Ratio	7.52		
Maximum service speed	80	Km/h	
Wheel diameter (worn/new)	780/870	mm	
Maximum tractive torque	1319	Nm	
Nominal power	185	kW	
Motor-Gearbox Coupling	TEETH		
Reference projects	METRO SAO PAULO		



AHHD-410-5.17-1



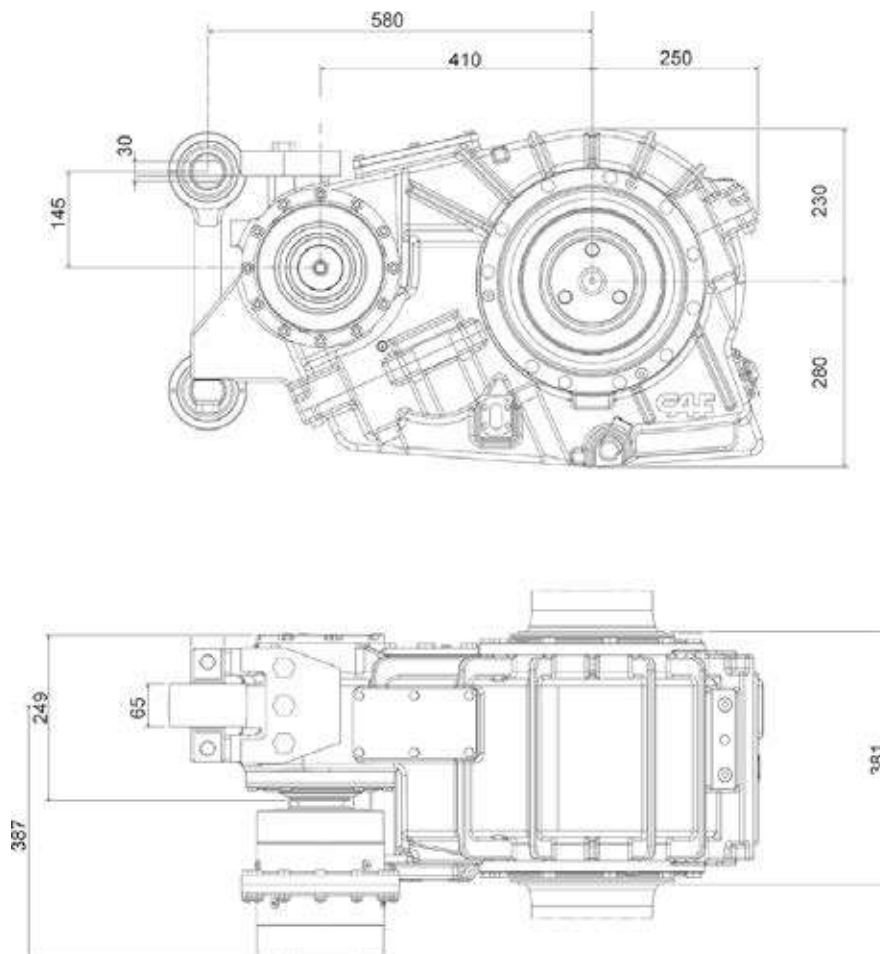
Gearbox type		AHHD-410-5.17-1
Maximum axle load	18.000	kg
Ratio	6.312	
Maximum service speed	140	Km/h
Wheel diameter (worn/new)	860/780	mm
Maximum tractive torque	2.320	Nm
Nominal power	300	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	IZMIR	



AHHD-410-4.37-1



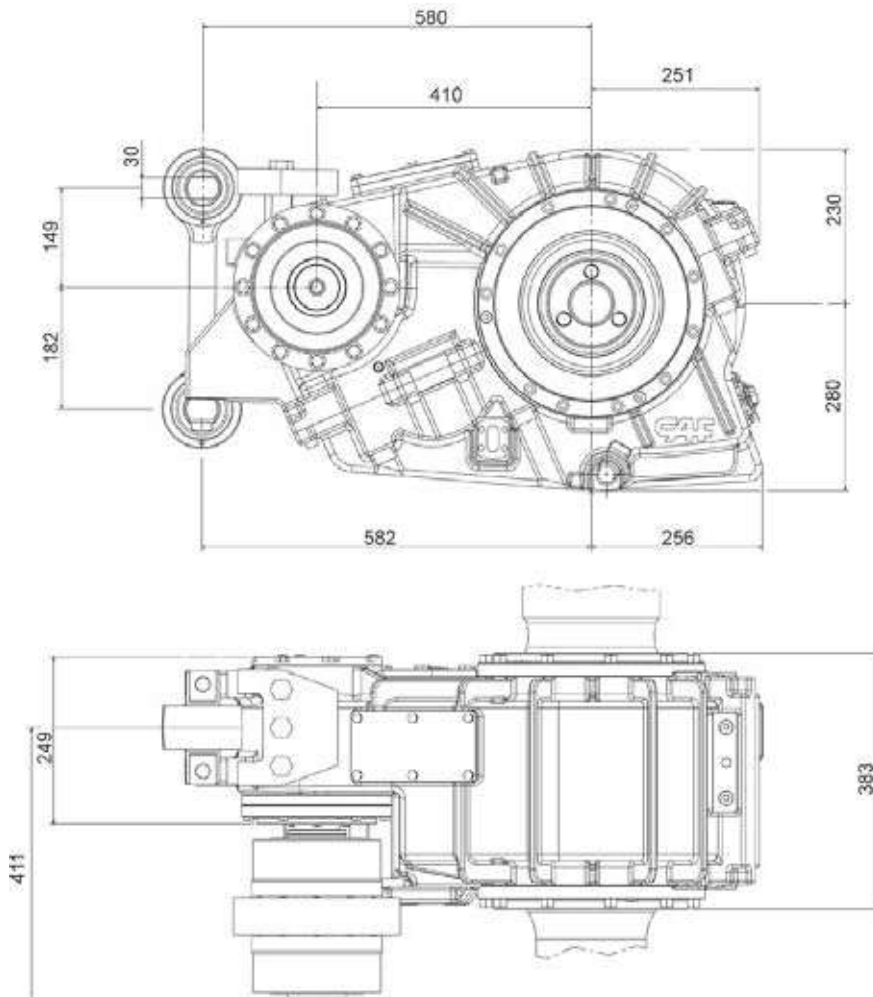
Gearbox type		AHHD-410-4.37-1
Maximum axle load	18.000	kg
Ratio	4.365	
Maximum service speed	160	Km/h
Wheel diameter (worn/new)	800/740	mm
Maximum tractive torque	2001	Nm
Nominal power	300	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	ASTRA	



AHHD-410-4.37-2



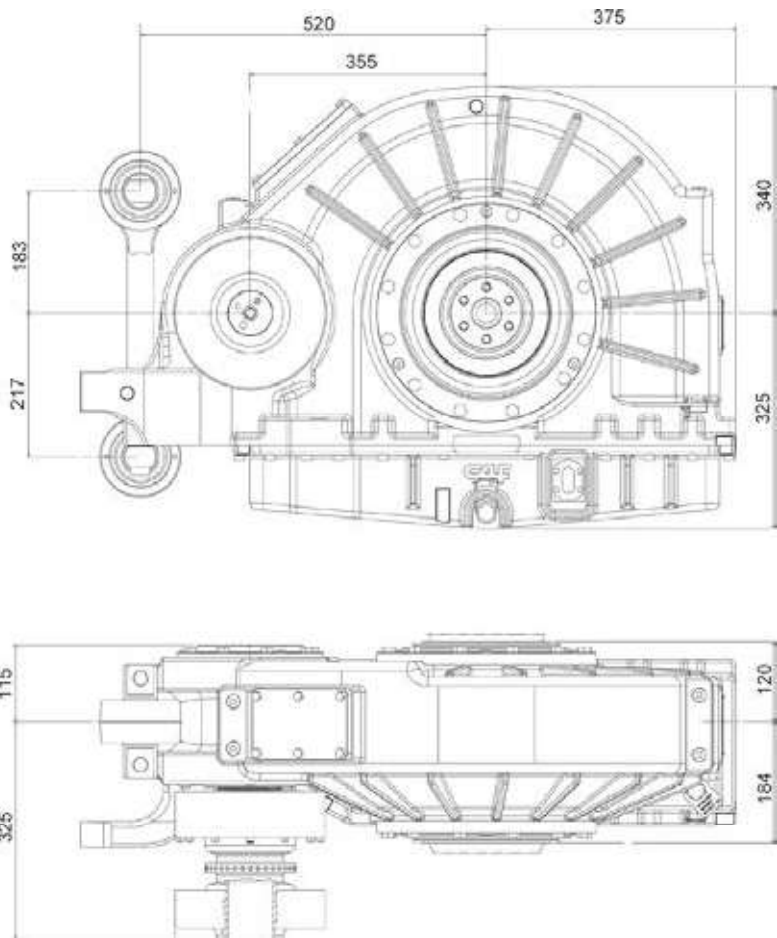
Gearbox type		AHHD-410-4.37-2
Maximum axle load	17.750	kg
Ratio	4.365	
Maximum service speed	160	Km/h
Wheel diameter (worn/new)	850/780	mm
Maximum tractive torque	2459	Nm
Nominal power	220	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	NEW SOUTH WALES	



AHM-355-7.44-1



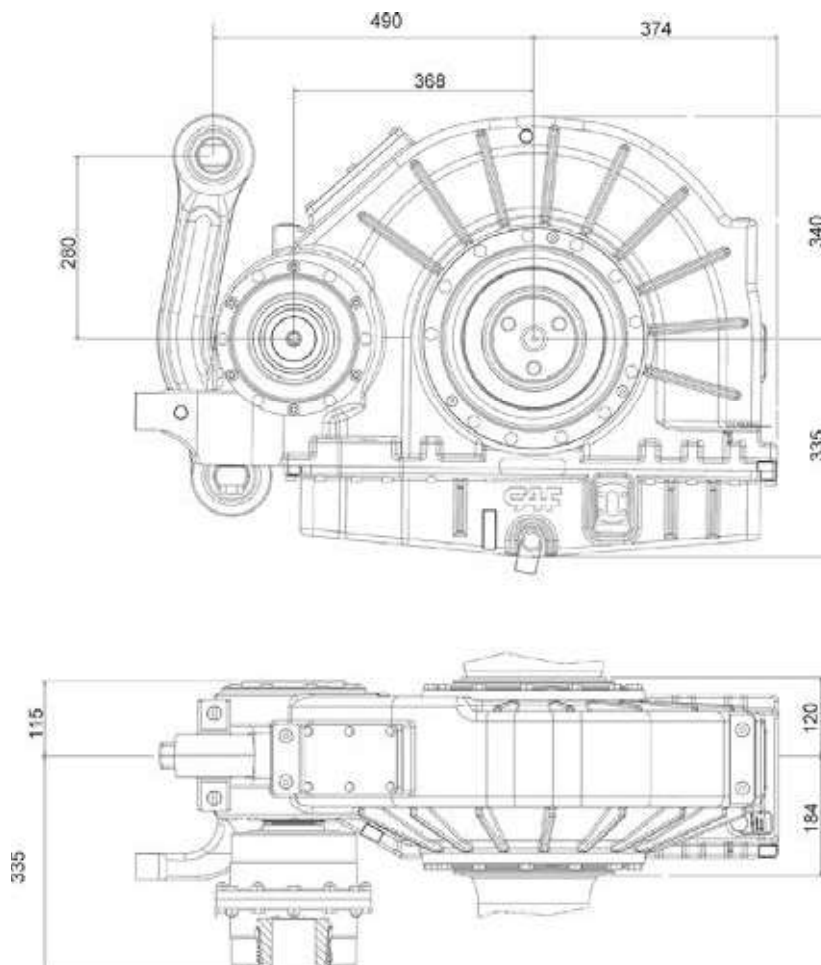
Gearbox type		AHM-355-7.44-1	
Maximum axle load		14.000	kg
Ratio		7.44	
Maximum service speed		80	Km/h
Wheel diameter (worn/new)		880/830	mm
Maximum tractive torque		1486	Nm
Nominal power		175	kW
Motor-Gearbox Coupling		TEETH	
Reference projects		BUCAREST	



AHM-368-6.8-1



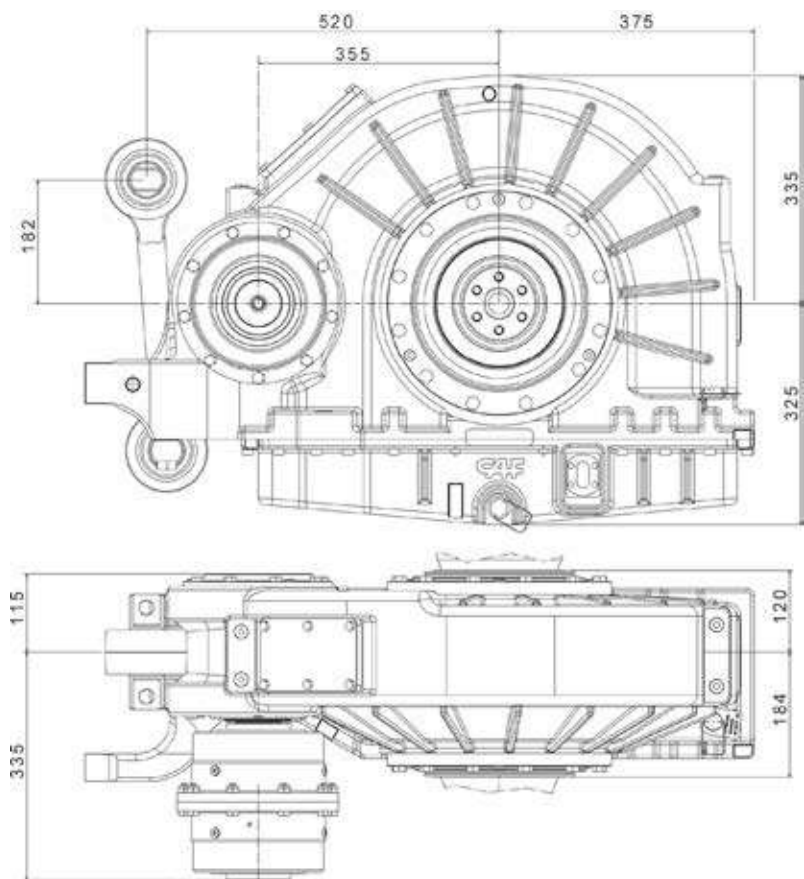
Gearbox type		AHM-368-6.8-1
Maximum axle load	16.500	kg
Ratio	6.8	
Maximum service speed	80/110	Km/h
Wheel diameter (worn/new)	860/790	mm
Maximum tractive torque	1467	Nm
Nominal power	232	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	AUCKLAND	



AHM-355-7.44-2



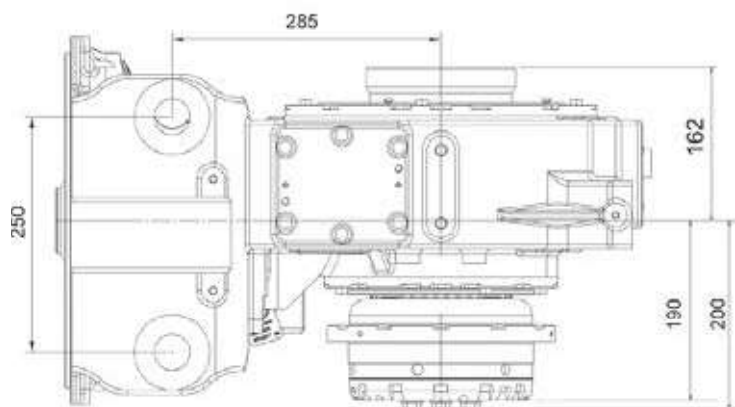
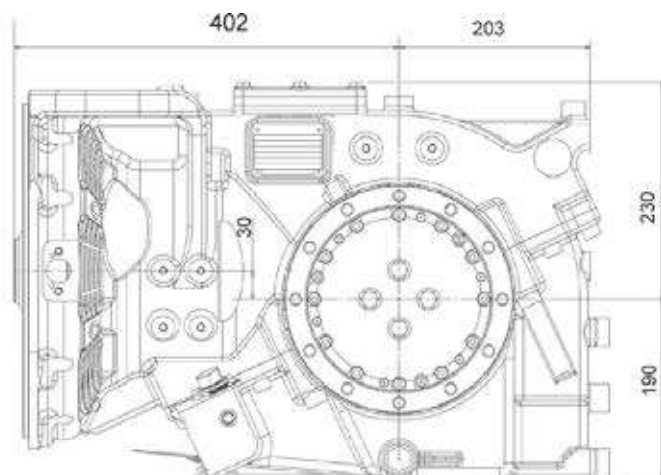
Gearbox type		AHM-355-7.44-2
Maximum axle load	14.820	kg
Ratio	7.44	
Maximum service speed	80	Km/h
Wheel diameter (worn/new)	840/760	mm
Maximum tractive torque	1326	Nm
Nominal power	229	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	ESTAMBUL QUITO	



FBD-361-5.44-2



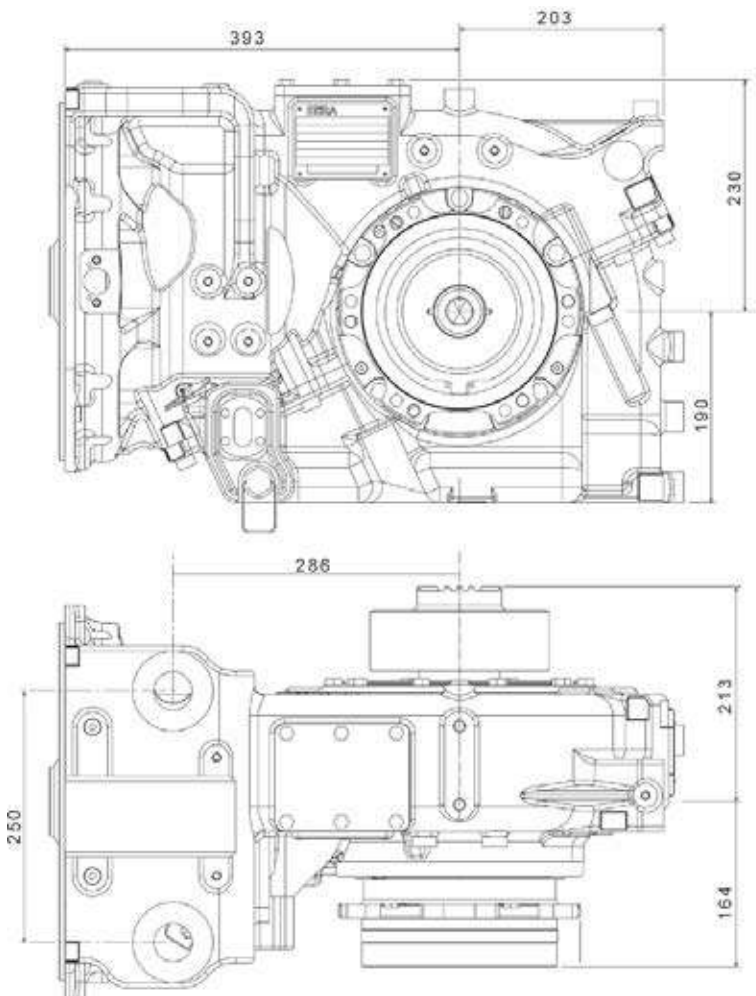
Gearbox type		FBD-361-5.44-2
Maximum axle load	12.640	kg
Ratio	5.44	
Maximum service speed	70	Km/h
Wheel diameter (worn/new)	590/510	mm
Maximum tractive torque	600	Nm
Nominal power	70	kW
Motor-Gearbox Coupling	ROTEX® 65	
Gearbox-Axle Coupling	TEETH COUPLING	
Reference projects	BUDAPEST GRANADA KAOHSIUNG CINCINNATI SIDNEY CUIABA BIRMINGHAM BESANCON DEBRECEN NANTES BELGRADO	



FBD-361-5.44-3



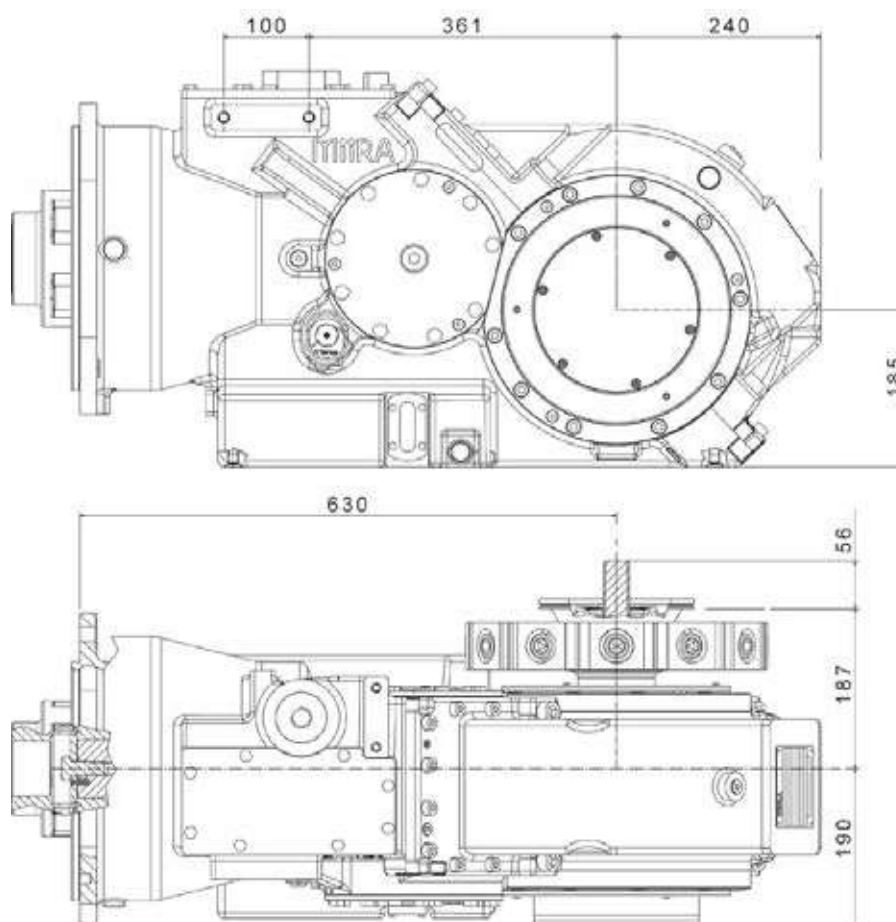
Gearbox type		FBD-361-5.44-3
Maximum axle load	12.600	kg
Ratio	5.44	
Maximum service speed	70	Km/h
Wheel diameter (worn/new)	590/510	mm
Maximum tractive torque	600	Nm
Nominal power	70	kW
Motor-Gearbox Coupling	EZX 65-2	
Gearbox-Axle Coupling	TEETH COUPLING	
Reference projects	FRIBURGO CAGLIARI KANSAS SAINT ETIENNE UTRECHT LUXEMBURGO CANBERRA NEWCASTLE MARYLAND AMSTERDAM KANSAS MAURICIO VITORIA LUND LIEJA PARRAMATTA BIRMINGHAM JERUSALEM	



FBHD-381.1-6.253-1



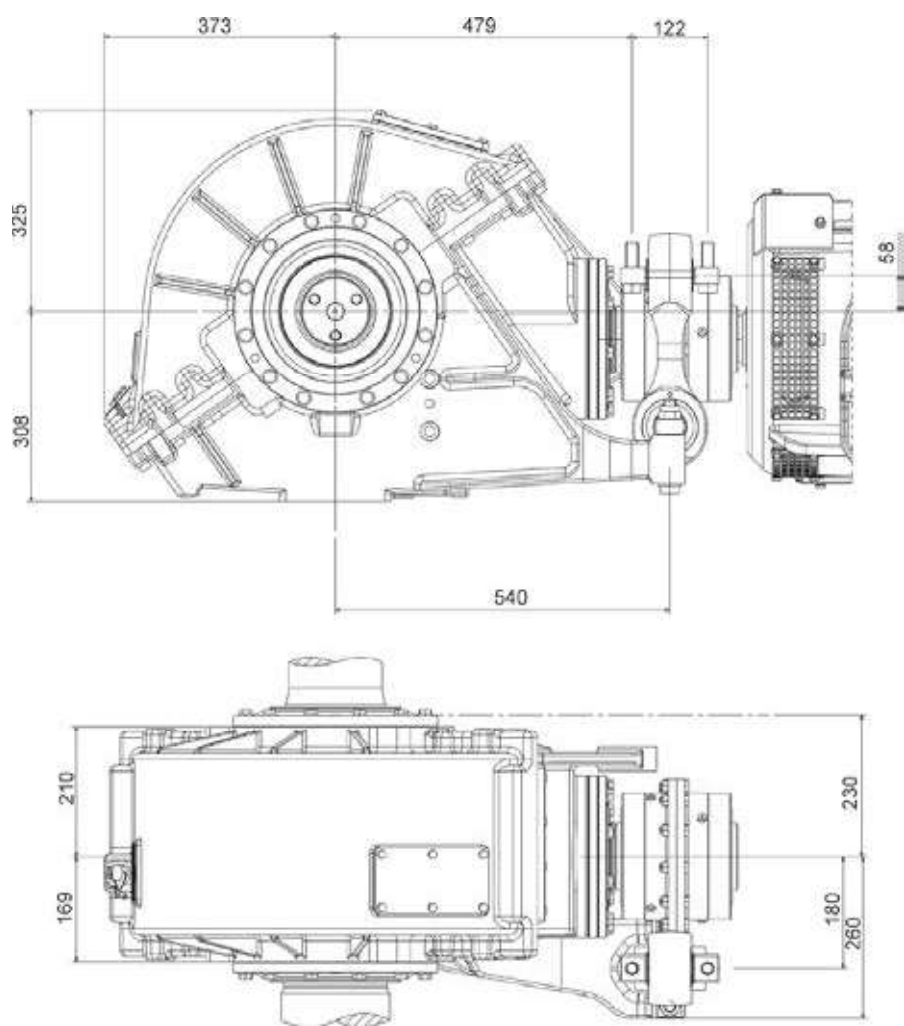
Gearbox type		FBHD-381.1-6.253-1	
Maximum axle load	360	kg	
Ratio	6.253		
Maximum service speed	70	Km/h	
Wheel diameter (worn/new)	640/580	mm	
Maximum tractive torque	1174	Nm	
Nominal power	140	kW	
Motor-Gearbox Coupling	FLEXIBLE JAW		
Gearbox-Axle Coupling	TEETH-RUBBER WEDGE COMBINATION		
Reference projects	LIJN AMBERES		



ABD-570-5.9-1



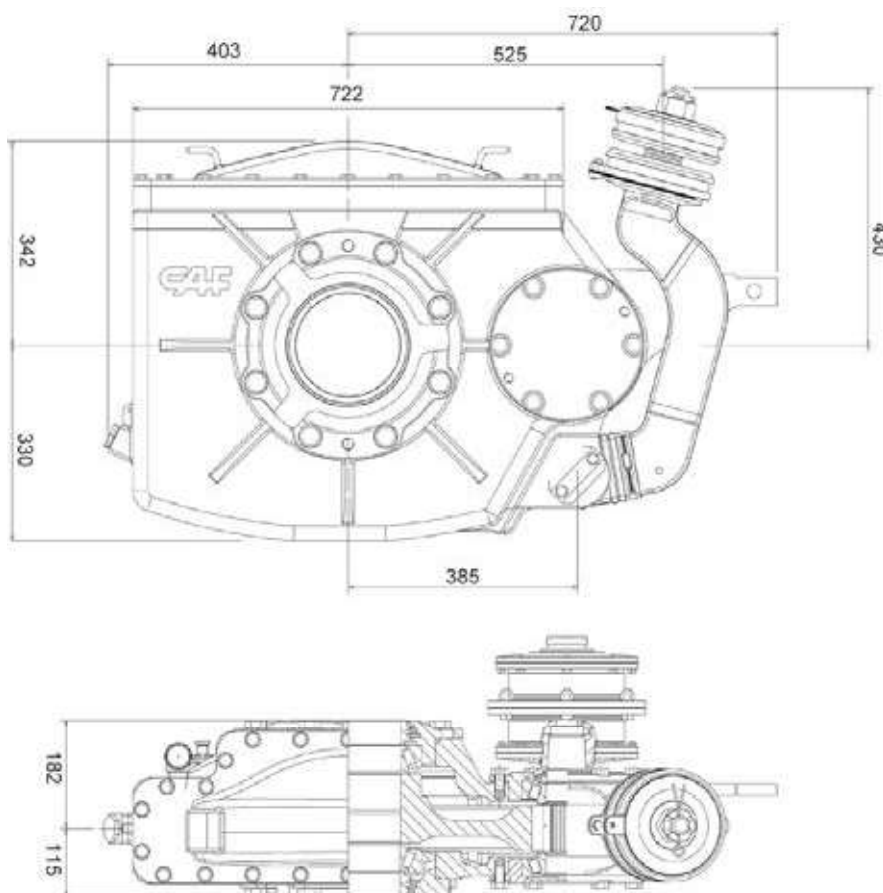
Gearbox type		ABD-570-5.9-1
Maximum axle load	12.000	kg
Ratio	5.9	
Maximum service speed	90	Km/h
Wheel diameter (worn/new)	850/790	mm
Maximum tractive torque	1976	Nm
Nominal power	312.25	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	EUSKOTREN	



RCP1-367/01



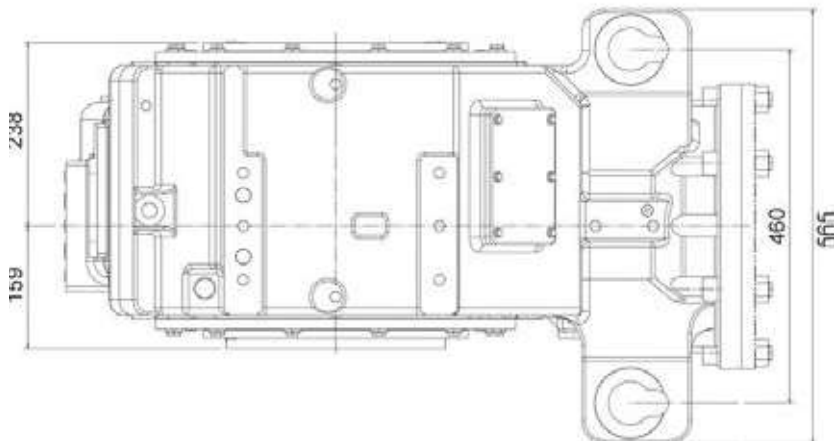
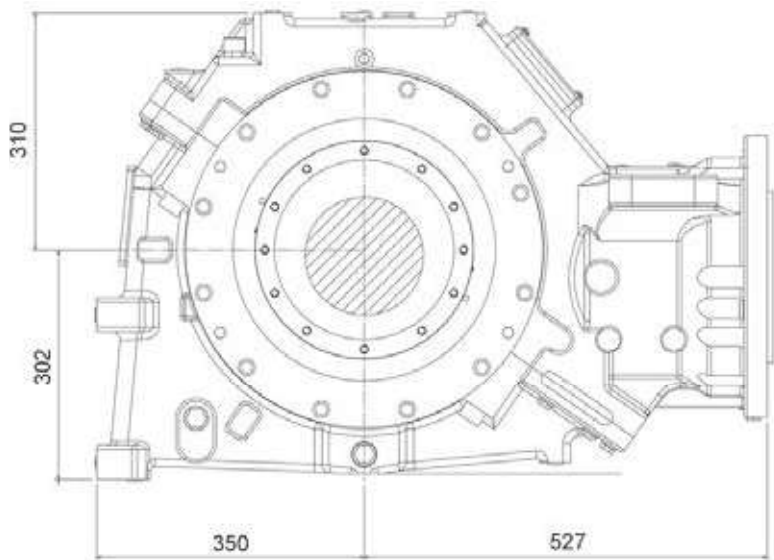
Gearbox type		RCP1-367/01
Maximum axle load	10.440	kg
Ratio	6.188	
Maximum service speed	100	Km/h
Wheel diameter (worn/new)	860/796	mm
Maximum tractive torque	1300	Nm
Nominal power	211	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	MEXICO LINEA A	



FBD-565-6.125-1



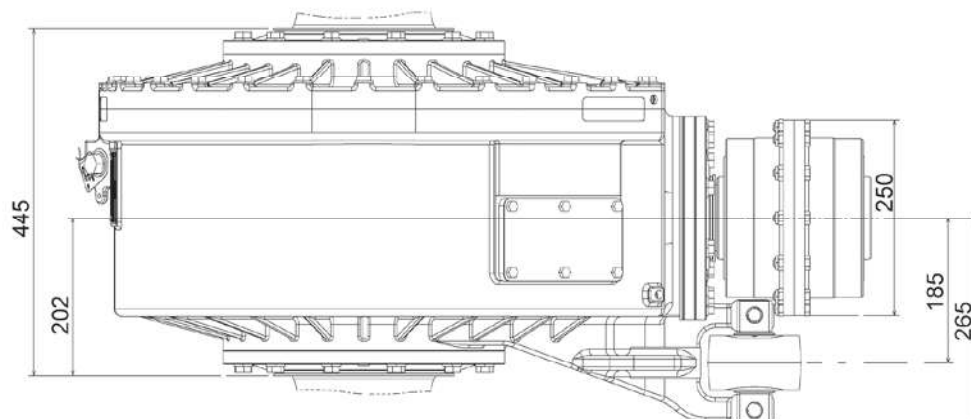
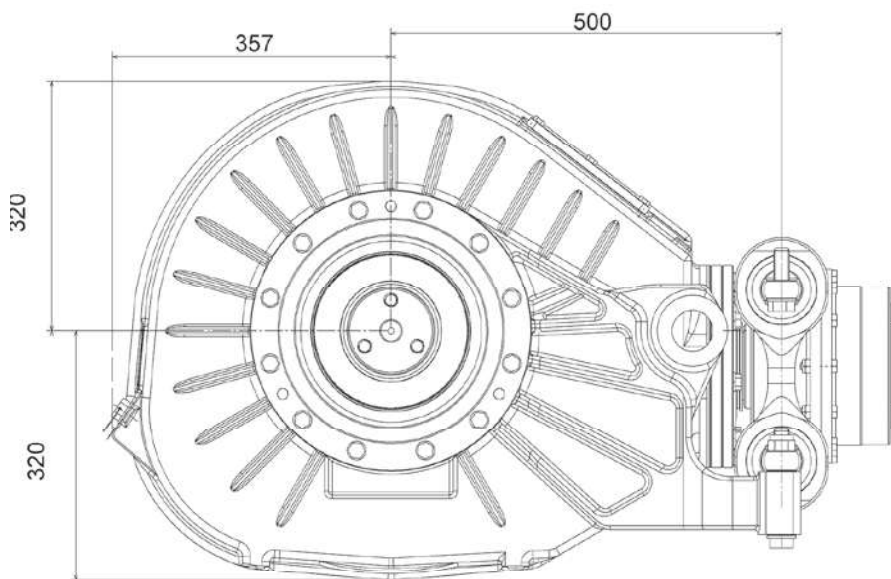
Gearbox type		FBD-565-6.125-1
Maximum axle load	14.375	kg
Ratio	6.125	
Maximum service speed	110	Km/h
Wheel diameter (worn/new)	860/790	mm
Maximum tractive torque	1800	Nm
Nominal power	210	kW
Motor-Gearbox Coupling	FLEXIBLE JAW COUPLING	
Gearbox-Axle Coupling	LINK COUPLING	
Reference projects	MADRID S.8000	



ABV-570-5.9-1



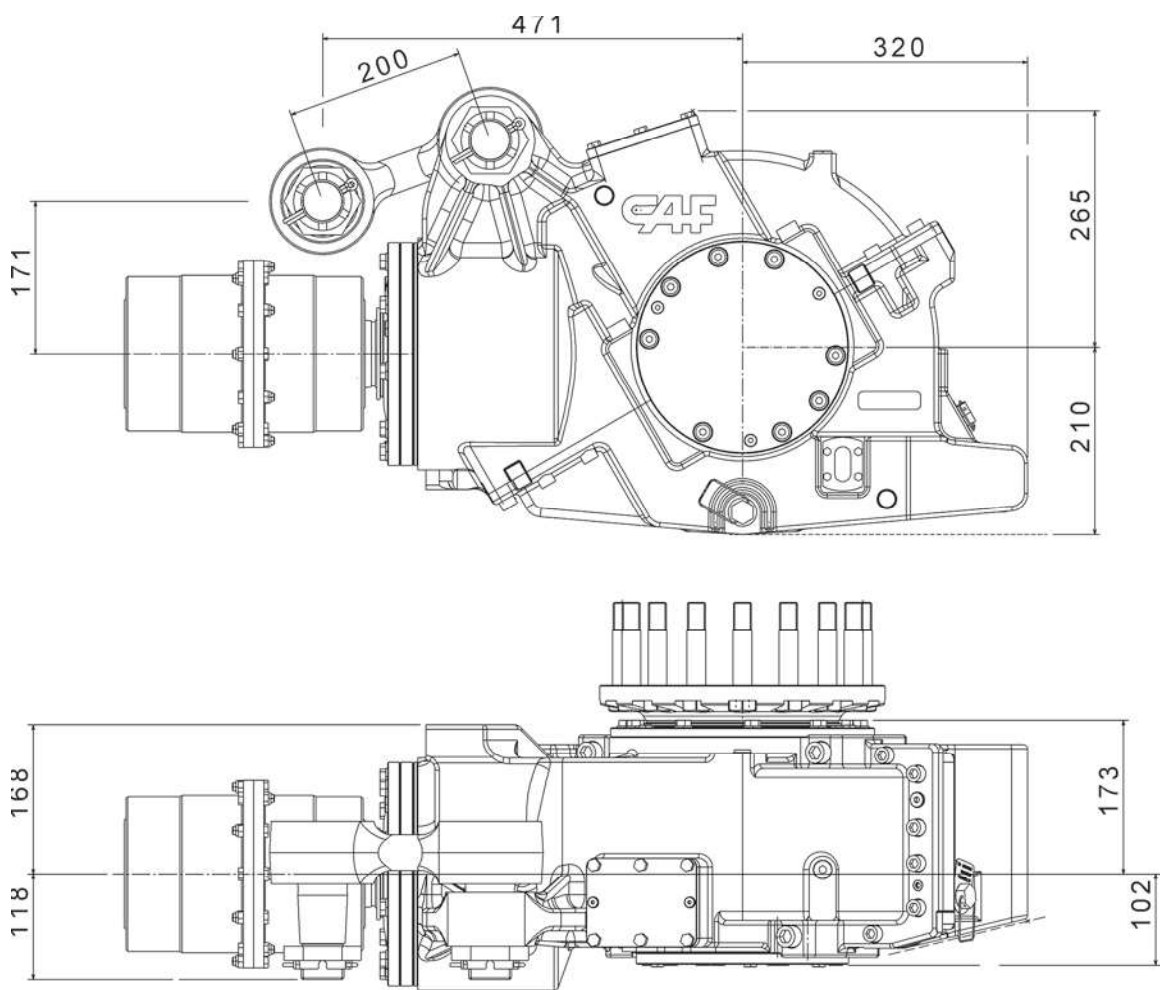
Gearbox type		ABV-570-5.9-1
Maximum axle load	15.000	kg
Ratio	5.9	
Maximum service speed	90	Km/h
Wheel diameter (worn/new)	840/780	mm
Maximum tractive torque	1541	Nm
Nominal power	150	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	FGC	



ABD-400-5.43-1



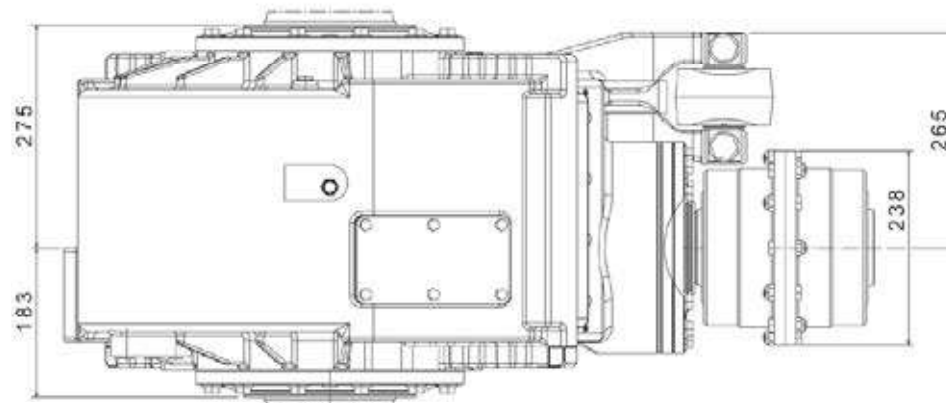
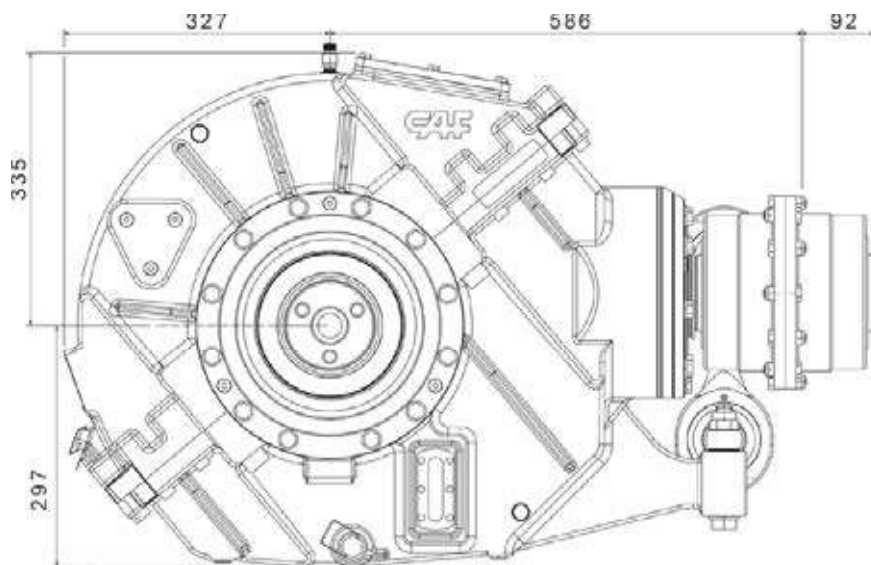
Gearbox type		ABD-400-5.43-1	
Maximum axle load	10.000	kg	
Ratio	5.444		
Maximum service speed	100	Km/h	
Wheel diameter (worn/new)	680/550	mm	
Maximum tractive torque	789	Nm	
Nominal power	105	kW	
Motor-Gearbox Coupling	TEETH		
Reference projects	STOCKHOLM		



ABD-560-4.615-1



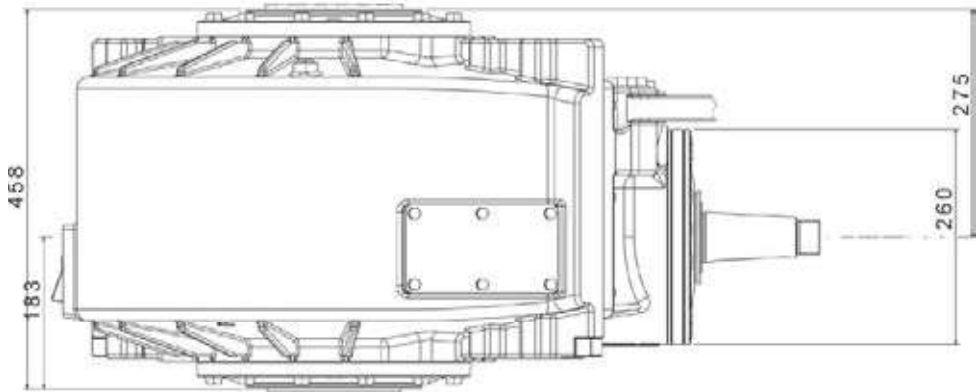
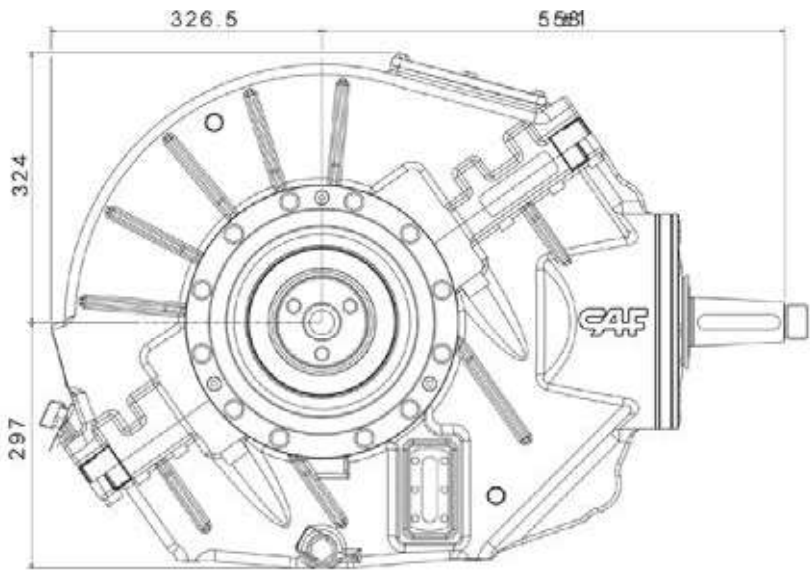
Gearbox type		ABD-560-4.615-1
Maximum axle load	12.500	kg
Ratio	4.615	
Maximum service speed	85	Km/h
Wheel diameter (worn/new)	820/760	mm
Maximum tractive torque	1923	Nm
Nominal power	110	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	MILAN	



ABD-570-5.538-1



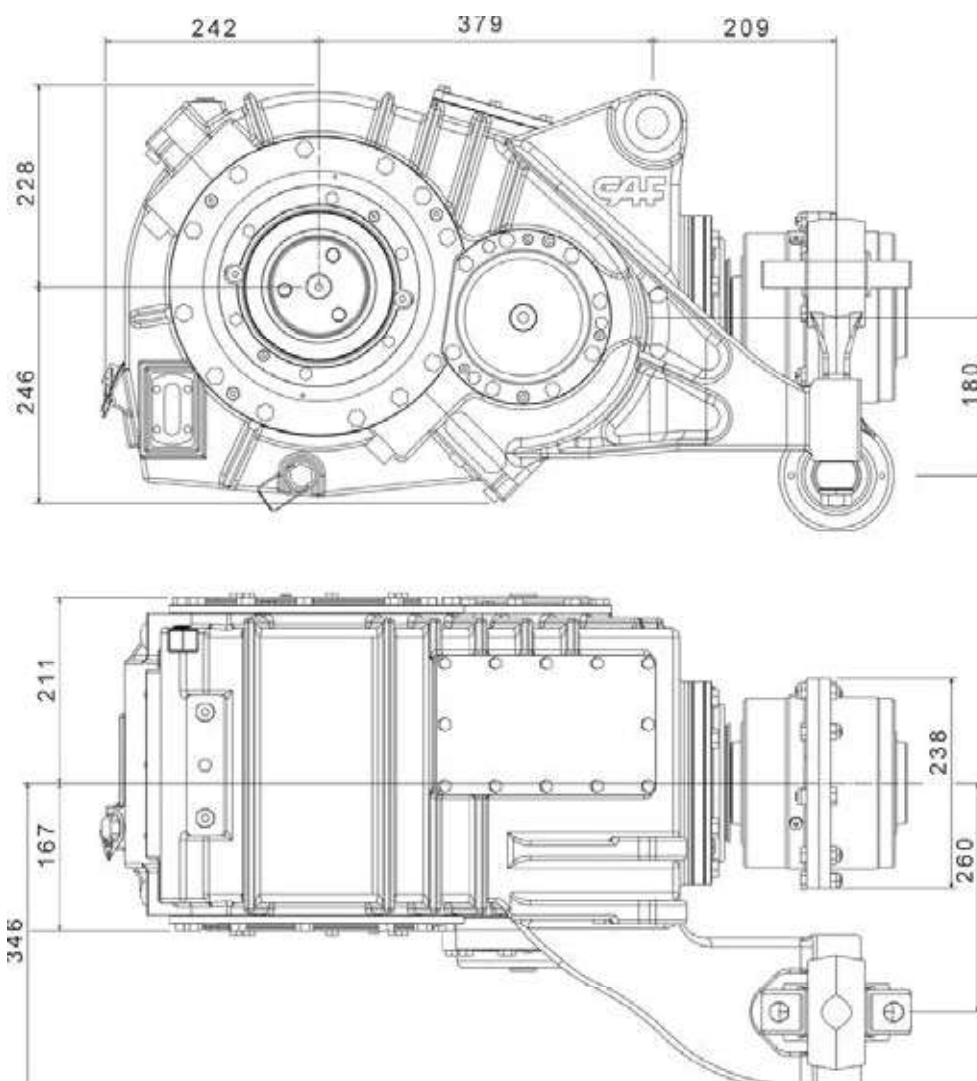
Gearbox type			ABD-570-5.538-1
Maximum axle load	12.500	kg	
Ratio	5.54		
Maximum service speed	85	Km/h	
Wheel diameter (worn/new)	820/760	mm	
Maximum tractive torque	1410	Nm	
Nominal power	90	kW	
Reference projects	MILAN		



ABHD-363.9-7.42-1



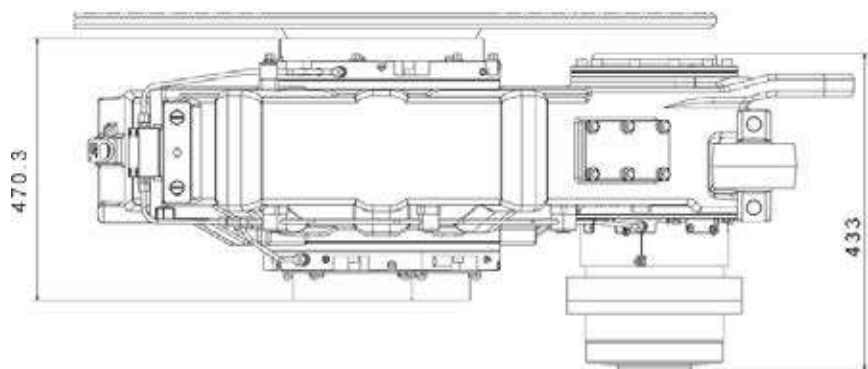
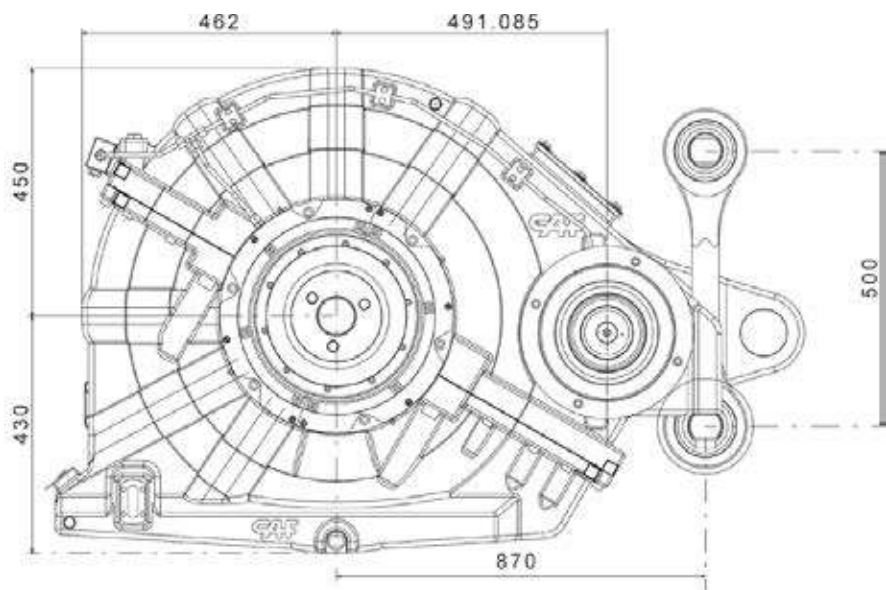
Gearbox type		ABHD-363.9-7.42-1
Maximum axle load	12.000	kg
Ratio	7,42	
Maximum service speed	90	Km/h
Wheel diameter (worn/new)	840/780	mm
Maximum tractive torque	1140	Nm
Nominal power	175	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	ROMA	



AHD-490-4.565-1



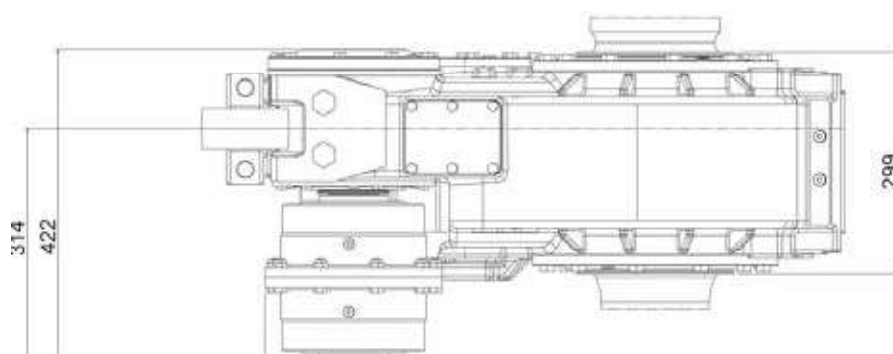
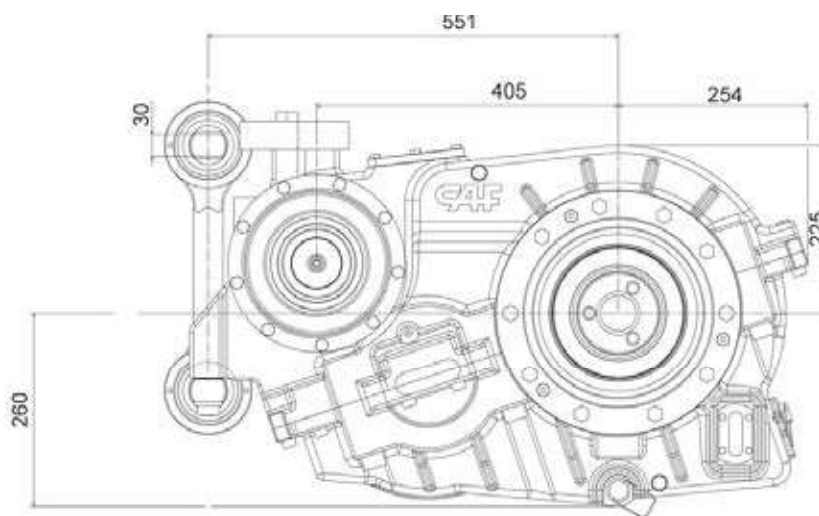
Gearbox type		AHD-490-4.565-1	
Maximum axle load	27.637	kg	
Ratio	4.565		
Maximum service speed	200	Km/h	
Wheel diameter (worn/new)	1150/1070	mm	
Maximum tractive torque	5953	Nm	
Nominal power	683	kW	
Motor-Gearbox Coupling	TEETH		
Reference projects	ARABIA SAR ETIHAD		



AHHD-405-6.79-1



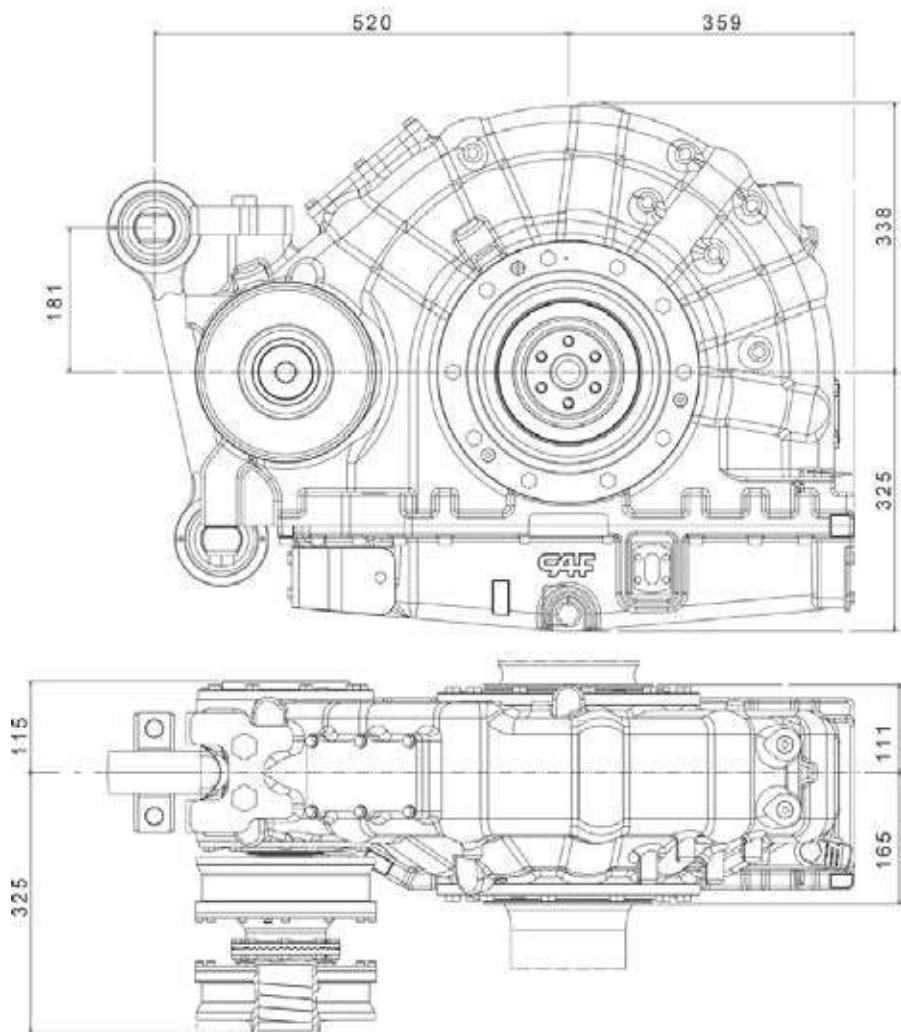
Gearbox type		AHHD-405-6.79-1
Maximum axle load	11.500	kg
Ratio	6.795	
Maximum service speed	80	Km/h
Wheel diameter (worn/new)	711.2/660,4	mm
Maximum tractive torque	1320	Nm
Nominal power	220	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	VALENCIA	



AHM-355-7.44-1



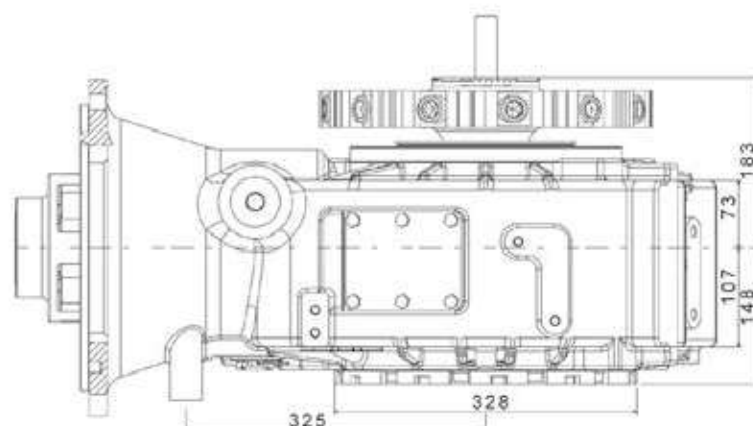
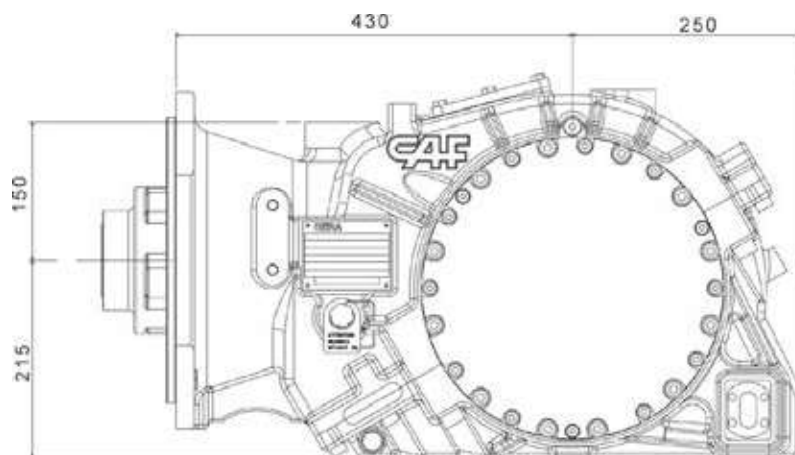
Gearbox type		AHM-355-7.44-1	
Maximum axle load	13.000	kg	
Ratio	7.44		
Maximum service speed	90	Km/h	
Wheel diameter (worn/new)	850/760	mm	
Maximum tractive torque	1342	Nm	
Nominal power	200	kW	
Motor-Gearbox Coupling	TEETH		
Reference projects	HELSINKI AMSTERDAM		



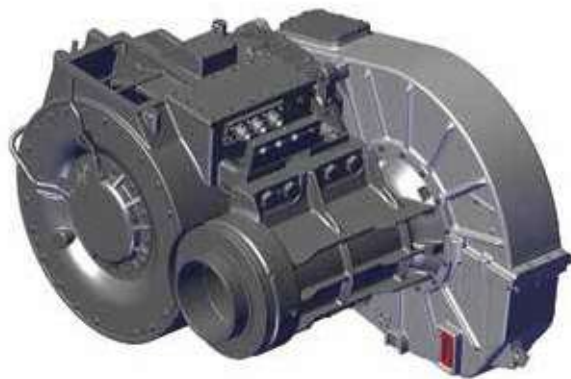
FBD-355-5.4-1



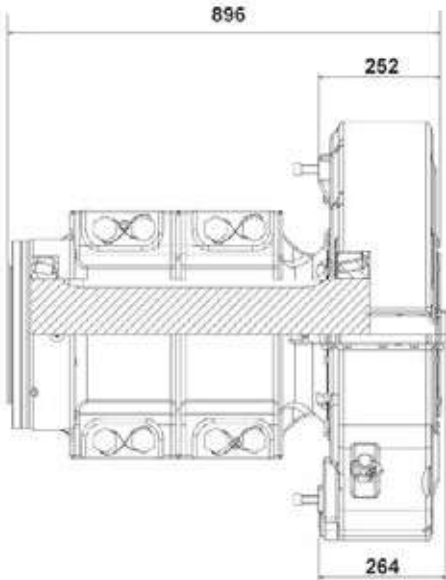
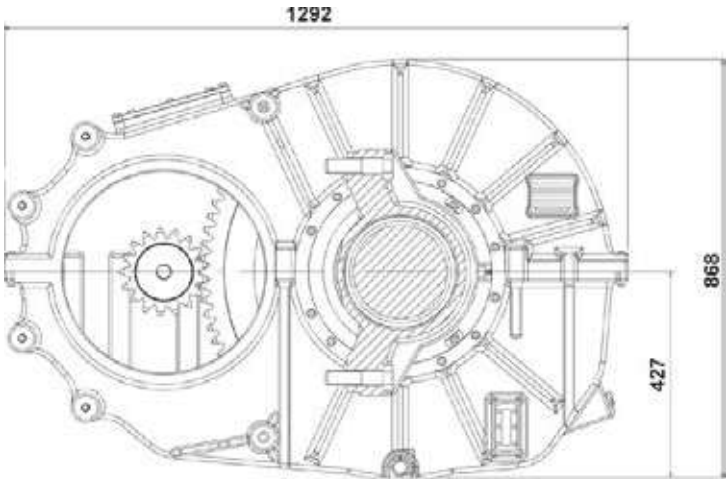
Gearbox type		FBD-355-5.4-1
Maximum axle load	10.800	kg
Ratio	5.44	
Maximum service speed	70	Km/h
Wheel diameter (worn/new)	630/570	mm
Maximum tractive torque	696	Nm
Nominal power	54	kW
Motor-Gearbox Coupling	FLEXIBLE JAW	
Gearbox-Axle Coupling	TEETH-RUBBER WEDGE COMBINATION	
Reference projects	TALLIN	



CHD-490-5.17-1



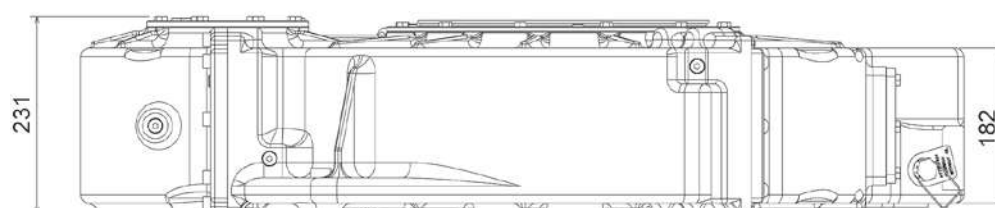
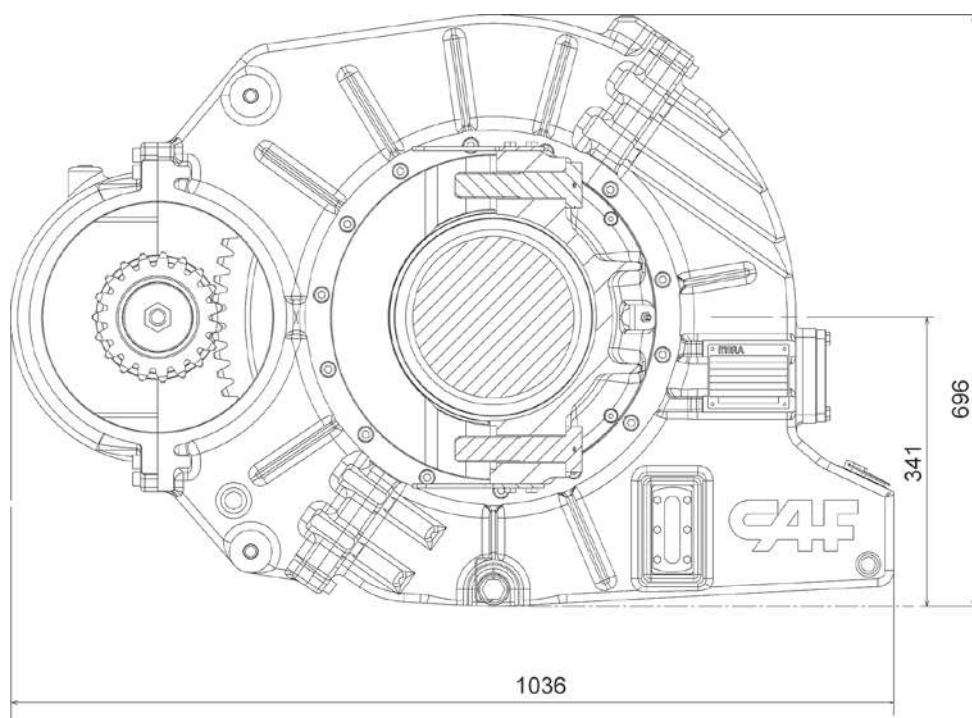
CHD-490-5.17-1		
Maximum axle load	19.000	kg
Ratio	5.17	
Maximum service speed	100	Km/h
Wheel diameter (worn/new)	1067/1003	mm
Maximum tractive torque	8853	Nm
Nominal power	400	kW
Reference projects	GRINDROD-RL30SCM	



CBH-394-4.842-1



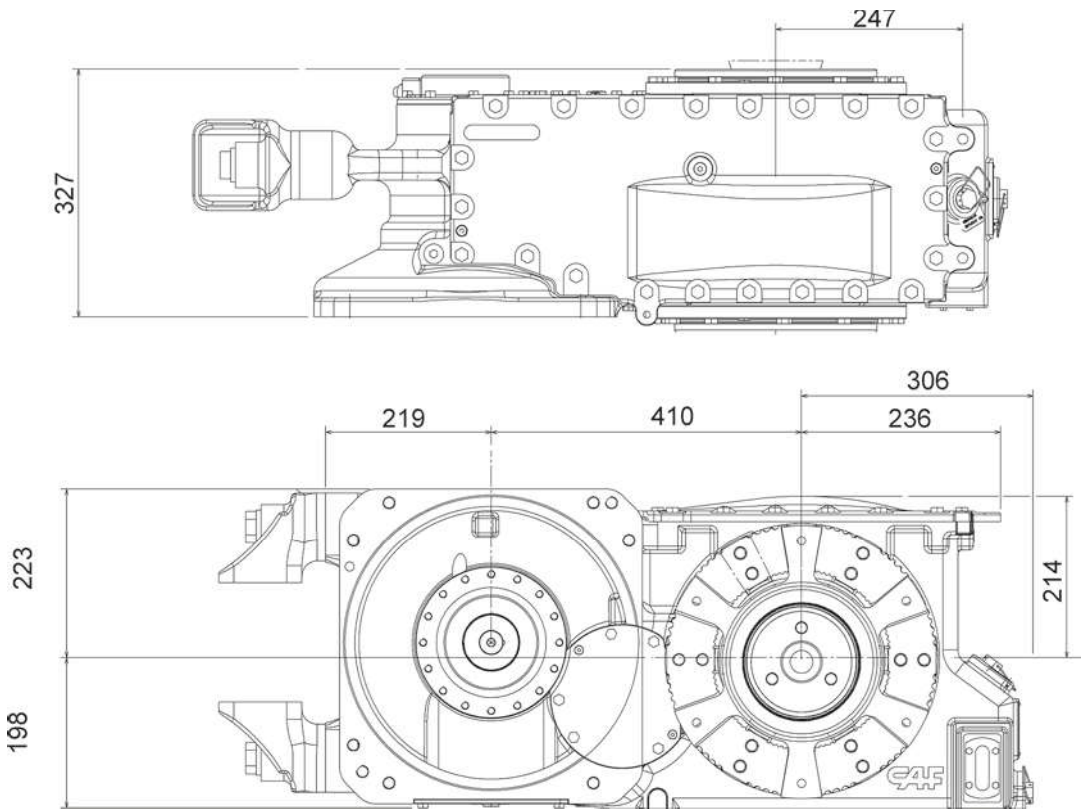
Gearbox type		CBH-394-4.842-1
Maximum axle load	18.000	kg
Ratio	4.845	
Maximum service speed	100	Km/h
Wheel diameter (worn/new)	915/831	mm
Maximum tractive torque	6883	Nm
Nominal power	310	kW
Reference projects	TRASNET	



FHHM-410-6.489



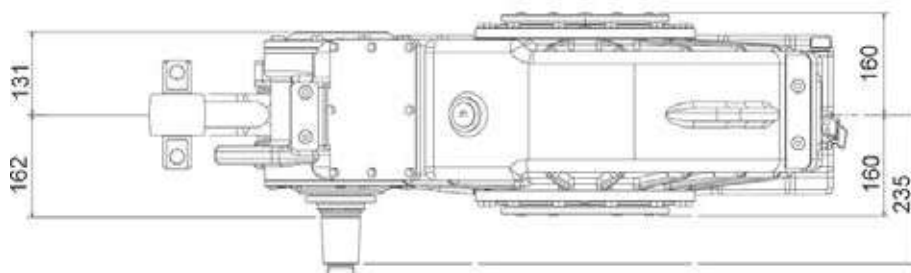
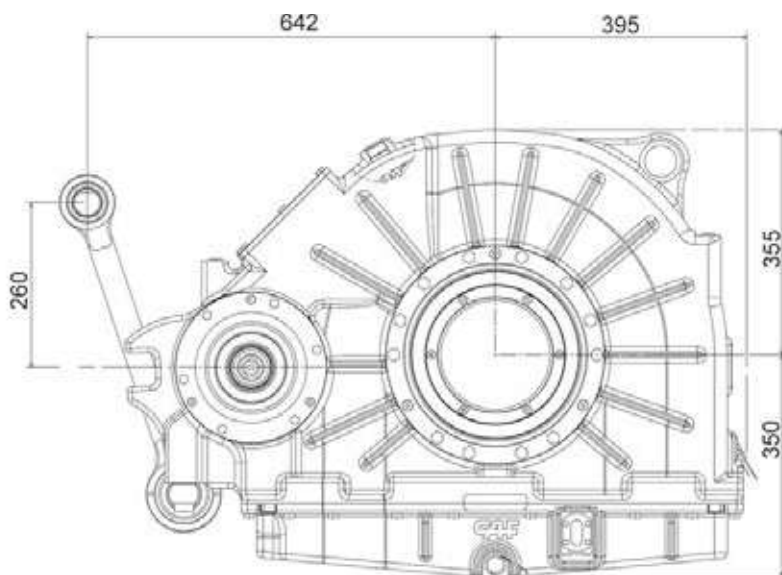
Gearbox type		FHHM-410-6.489
Maximum axle load	11.900	kg
Ratio	6.489	
Maximum service speed	88.55	Km/h
Wheel diameter (worn/new)	660/580	mm
Maximum tractive torque	945	Nm
Nominal power	166	kW
Gearbox-Axle Coupling	RUBBER WEDGE COUPLING	
Reference projects	BOSTON	



AHM-384.48-5.737-3



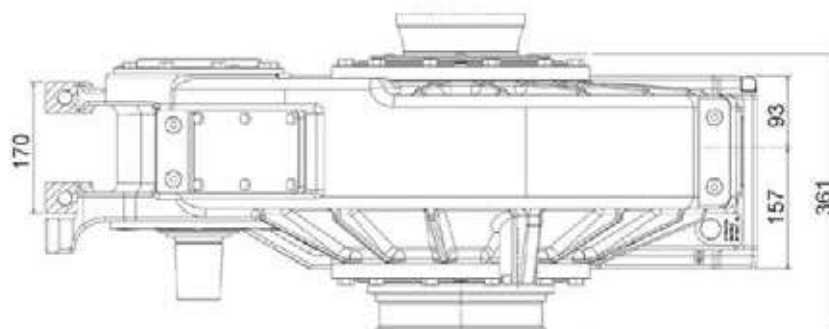
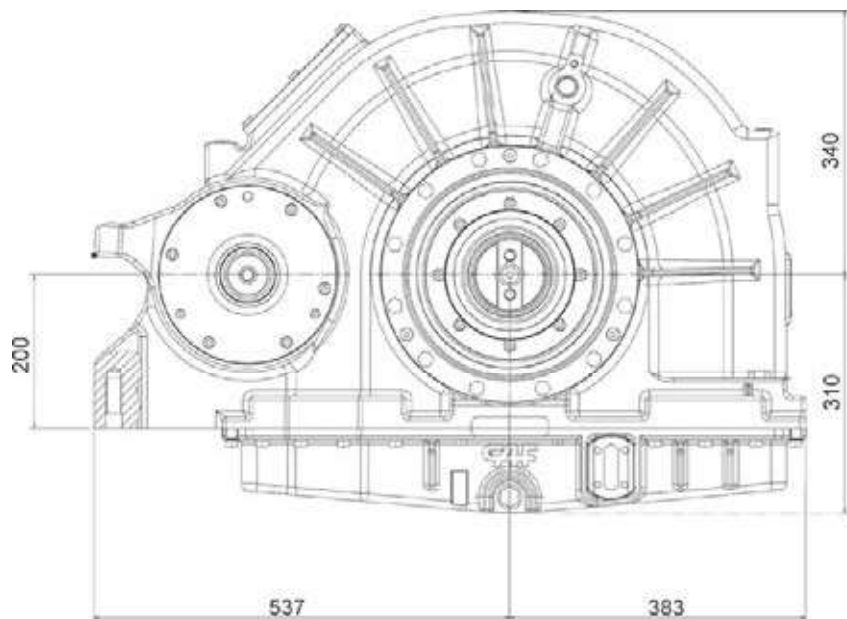
Gearbox type		AHM-384.48-5.737-3
Maximum axle load	15.000	kg
Ratio	5.737	
Maximum service speed	85	Km/h
Wheel diameter (worn/new)	860/810	mm
Maximum tractive torque	1700	Nm
Nominal power	170	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	METRO MOSCÚ	



FBD-361-5.44-2



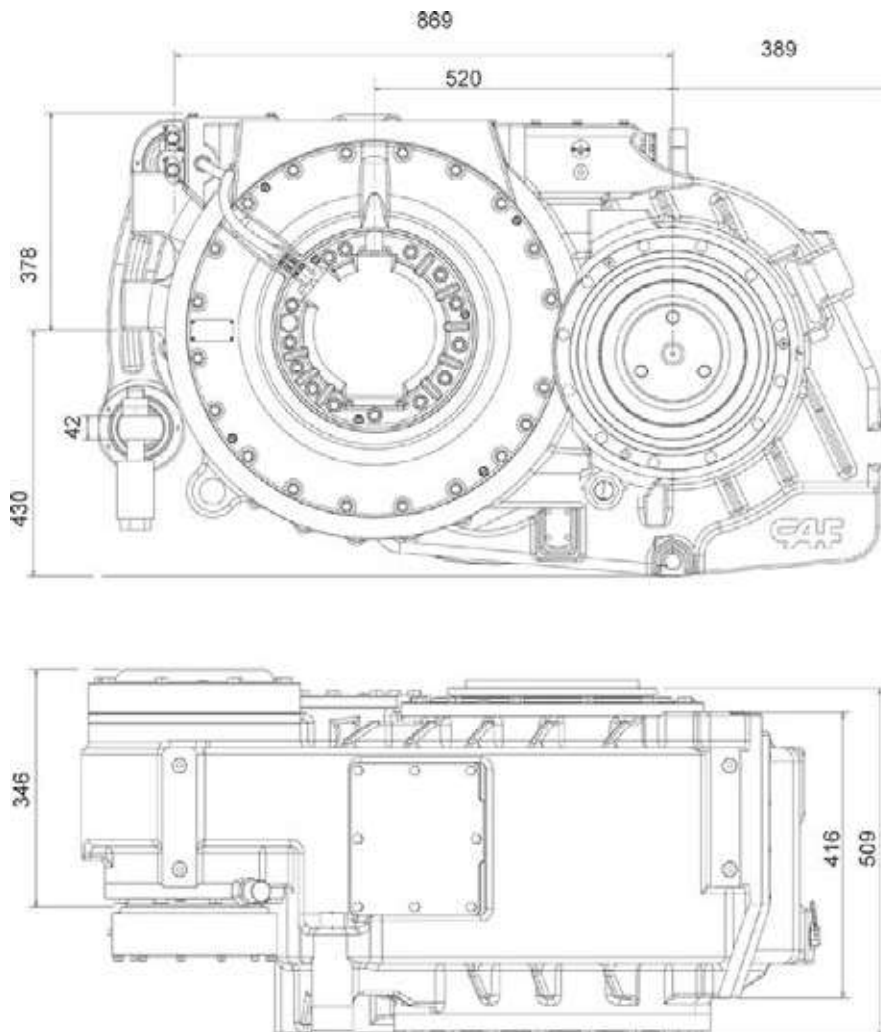
Gearbox type		FBD-361-5.44-2
Maximum axle load	13.761	kg
Ratio	5.44	
Maximum service speed	70	Km/h
Wheel diameter (worn/new)	590/510	mm
Maximum tractive torque	600	Nm
Nominal power	70	kW
Reference projects	METRO BUDAPEST	



CHHD-520-6.984-1



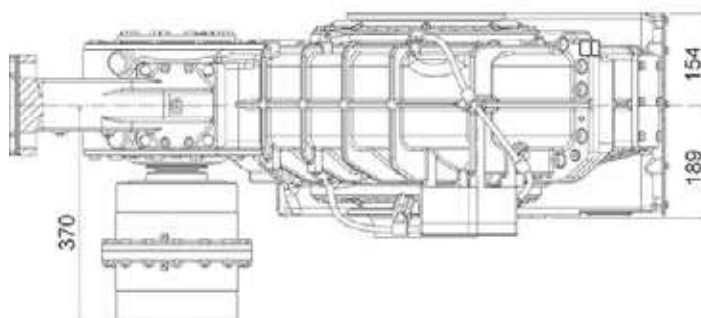
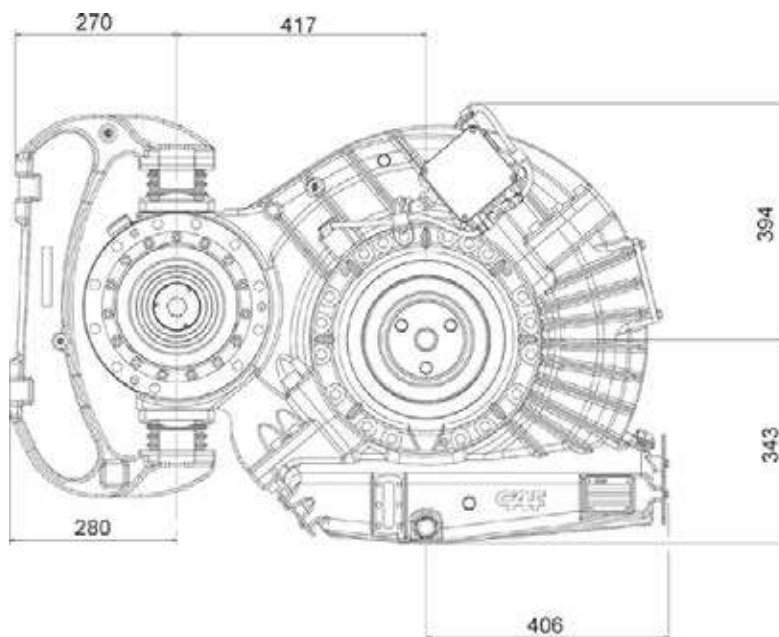
Gearbox type		CHHD-520-6.984-1
Maximum axle load	32.658	kg
Ratio	6.984	
Maximum service speed	113	Km/h
Wheel diameter (worn/new)	1092 / 965	mm
	1067 / 925	
Maximum tractive torque	11955	Nm
Nominal power	445	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	DASH 9	



AHD-417-3.464-1



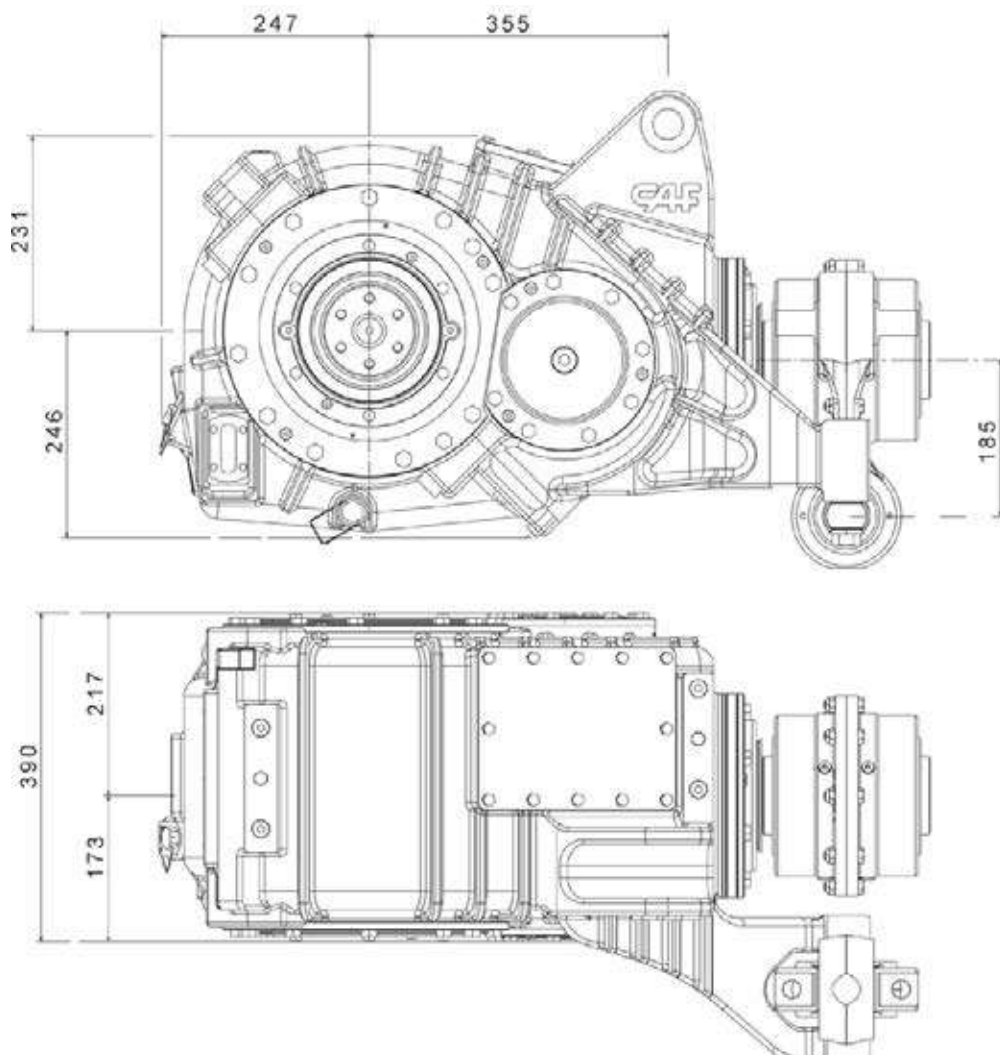
Gearbox type AHD-417-3.464-1		
Maximum axle load	18.500	kg
Ratio	2.912	
Maximum service speed	250	Km/h
Wheel diameter (worn/new)	920/850	mm
Maximum tractive torque	4998	Nm
Nominal power	459	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	OSLO Airport	



ABHD-363.9-7.42-1



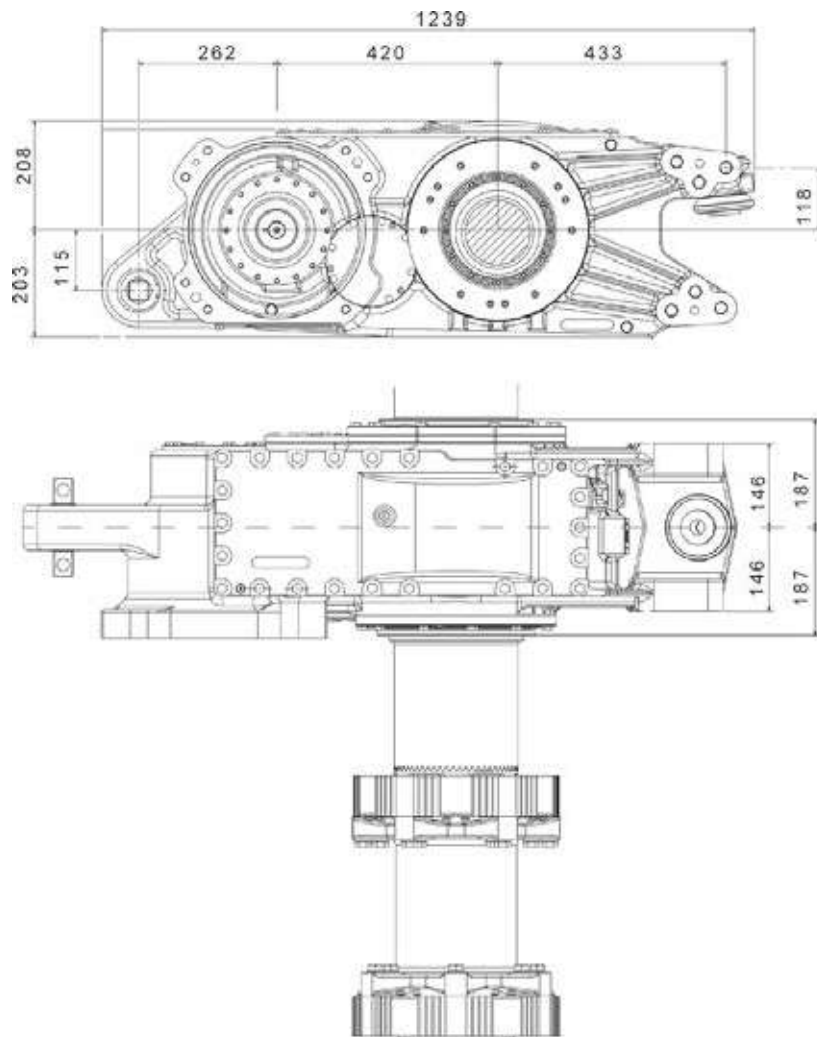
Gearbox type		ABHD-363.9-7.42-1
Maximum axle load	12.000	kg
Ratio	7.42	
Maximum service speed	72	Km/h
Wheel diameter (worn/new)	830/760	mm
Maximum tractive torque	1167	Nm
Nominal power	135	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	BRUSSELS	



FHBM-420-6.286-1



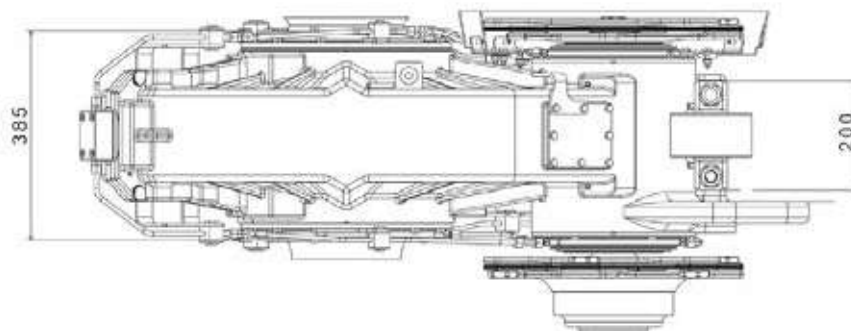
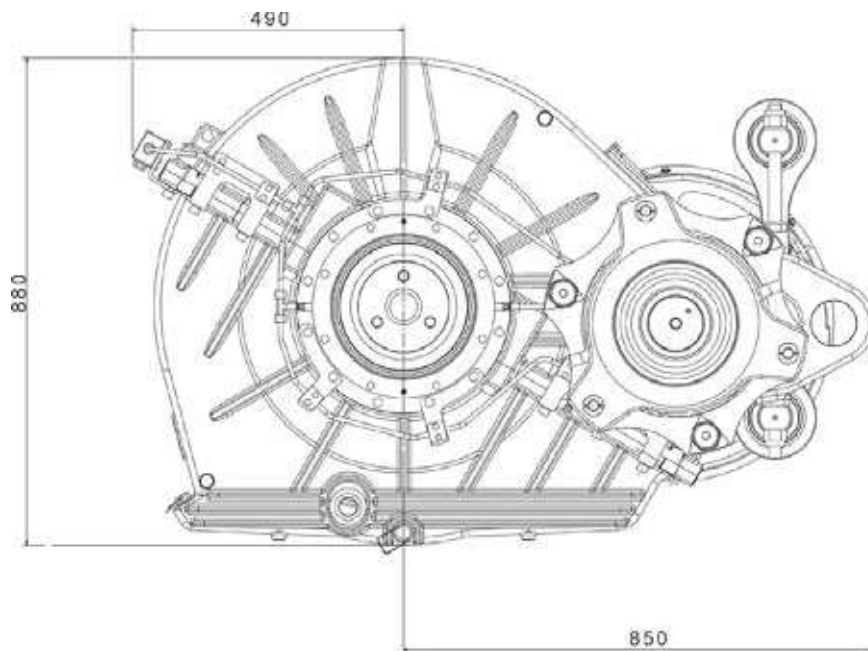
Gearbox type		FHBM-420-6.286-1
Maximum axle load	11.354	kg
Ratio	6.283	
Maximum service speed	80.5	Km/h
Wheel diameter (worn/new)	830/760	mm
Maximum tractive torque	1217	Nm
Nominal power	160	kW
Motor-Gearbox Coupling	MEMBRANE COUPLING	
Gearbox-Axle Coupling	RUBBER-WEDGE	
Reference projects	MARYLAND	



AHD-492-5.09-1



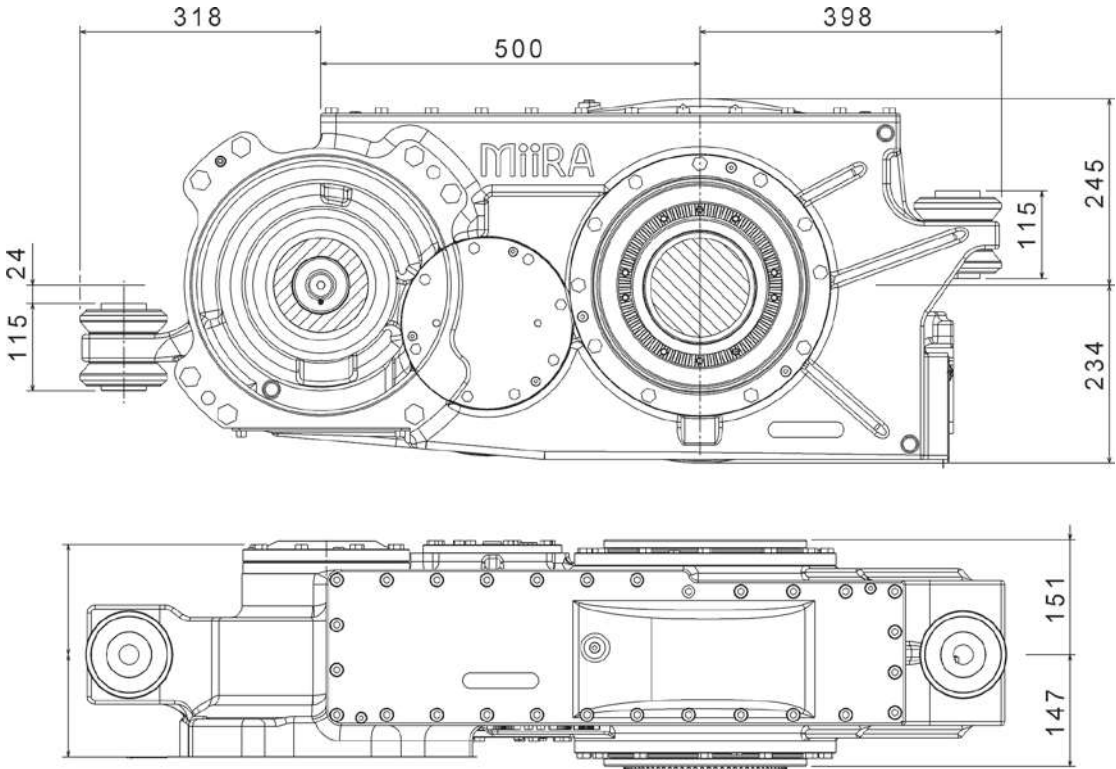
Gearbox type		AHD-492-5.09-1
Maximum axle load	22.500	kg
Ratio	5.09	
Maximum service speed	180	Km/h
Wheel diameter (worn/new)	1150/1070	mm
Maximum tractive torque	6956	Nm
Nominal power	709	kW
Motor-Gearbox Coupling	FLEXIBLE DISC COUPLING	
Reference projects	SRO	



FHHM-500-7.143-1



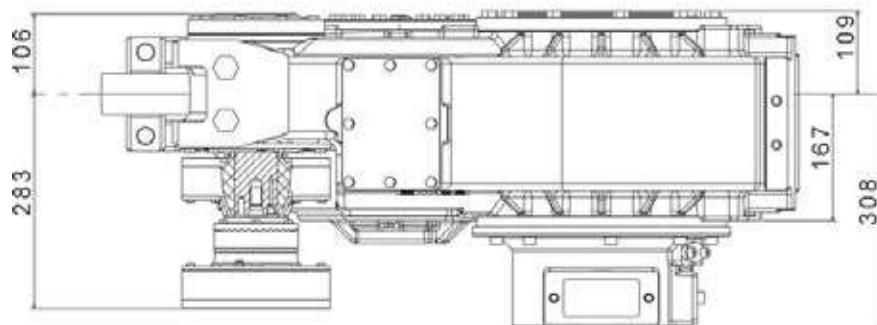
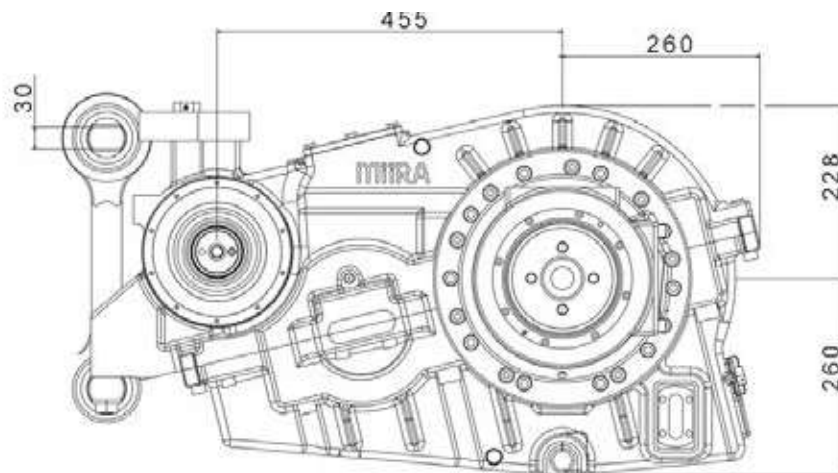
Gearbox type		FHHM-500-7.143-1
Maximum axle load	12.000	kg
Ratio	7.143	
Maximum service speed	80	Km/h
Wheel diameter (worn/new)	780/700	mm
Maximum tractive torque	966	Nm
Nominal power	100	kW
Motor-Gearbox Coupling	MEMBRANE COUPLING	
Gearbox-Axle Coupling	CARDAN JOINT COUPLING	
Reference projects	JABODEBEK	



AHHD-455-7.48-1



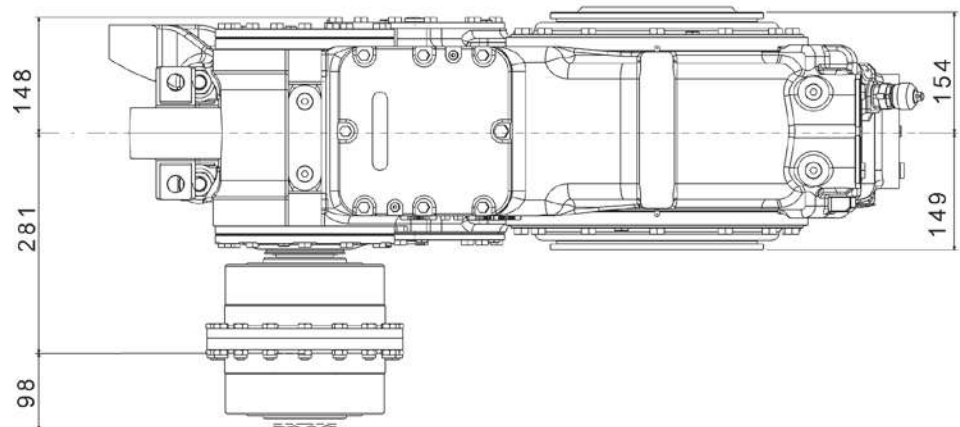
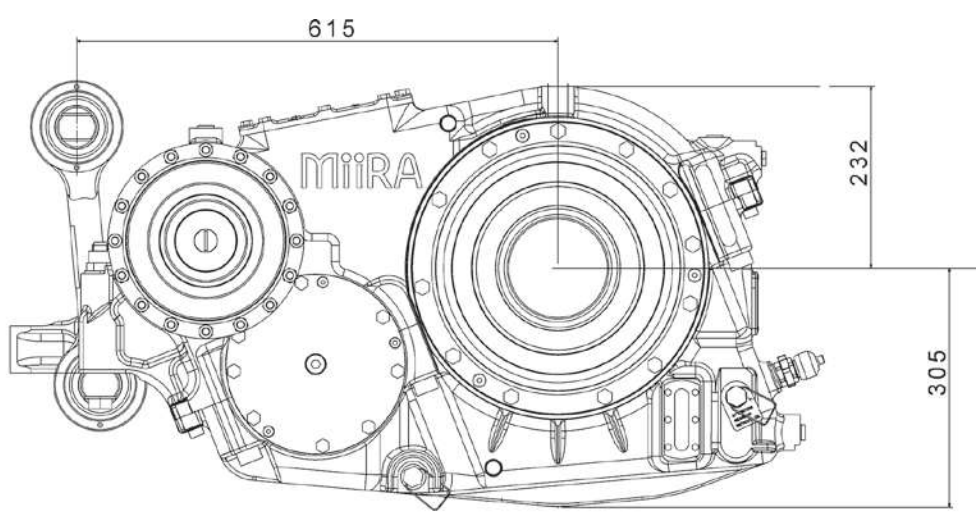
Gearbox type		AHHD-455-7.48-1
Maximum axle load	10.500	kg
Ratio	7.48	
Maximum service speed	60	Km/h
Wheel diameter (worn/new)	660/600	mm
Maximum tractive torque	3968	Nm
Nominal power	105	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	METRO MANILA	



AHHM-510-6.8-1



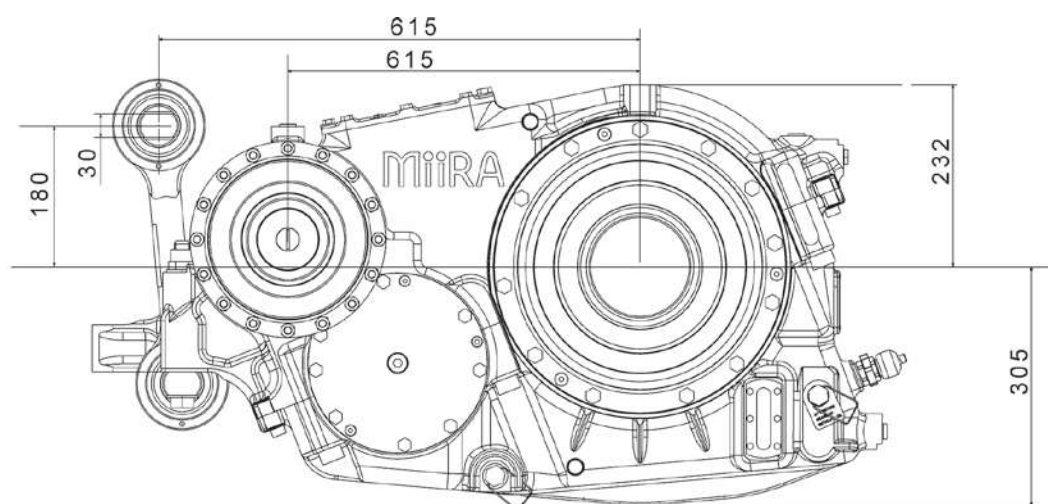
Gearbox type		AHHM-510-6.8-1
Maximum axle load	10.500	kg
Ratio	6.8	
Maximum service speed	80	Km/h
Wheel diameter (worn/new)	740/660	mm
Maximum tractive torque	1359	Nm
Nominal power	170	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	DOCKLANDS	



AHD-450-2.571-1



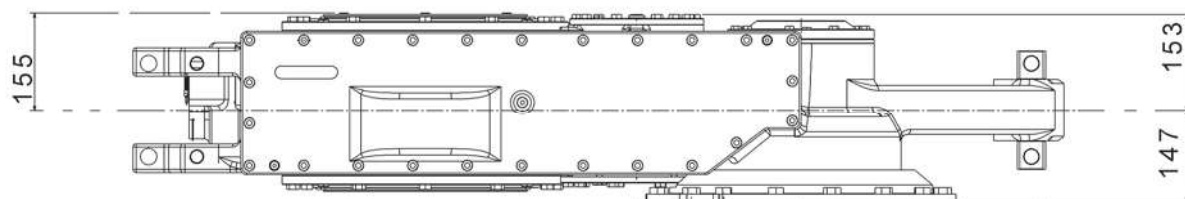
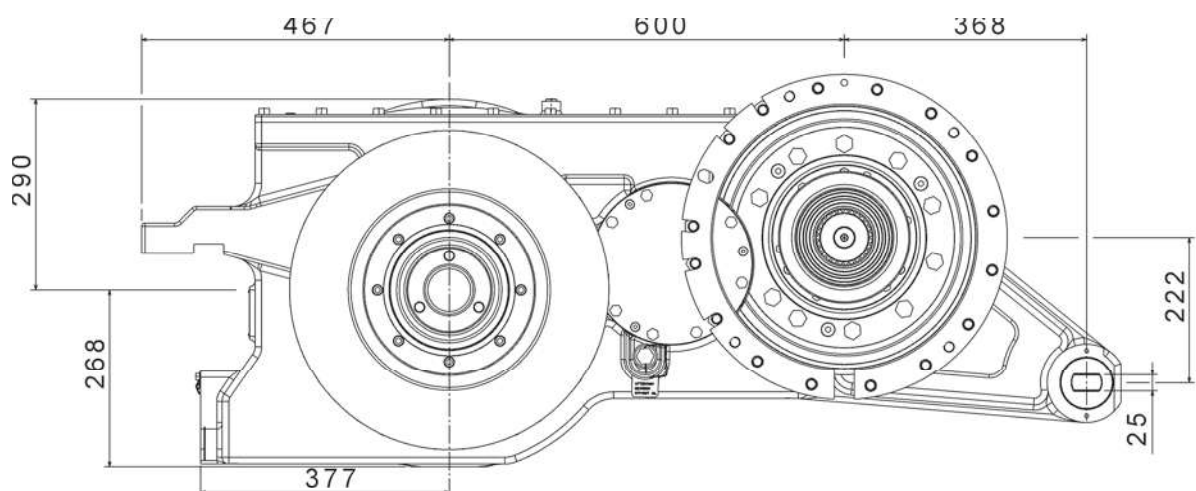
Gearbox type		AHD-450-2.571-1
Maximum axle load	18.500	kg
Ratio	2.571	
Maximum service speed	200	Km/h
Wheel diameter (worn/new)	840/770	mm
Maximum tractive torque	5036	Nm
Nominal power	335	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	SNCF AMLD	



FHHM-600-6.57-1



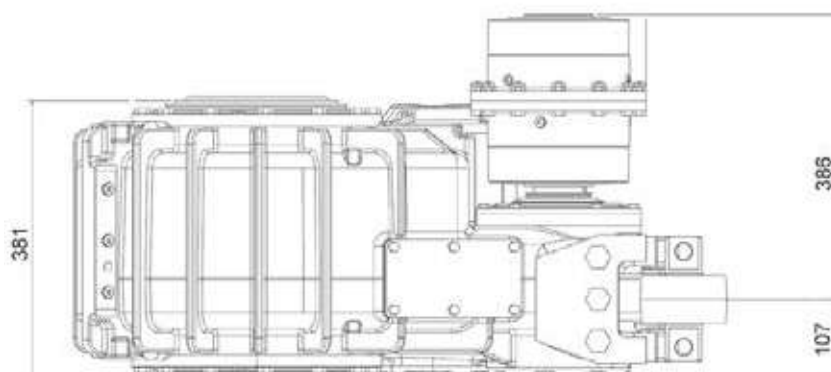
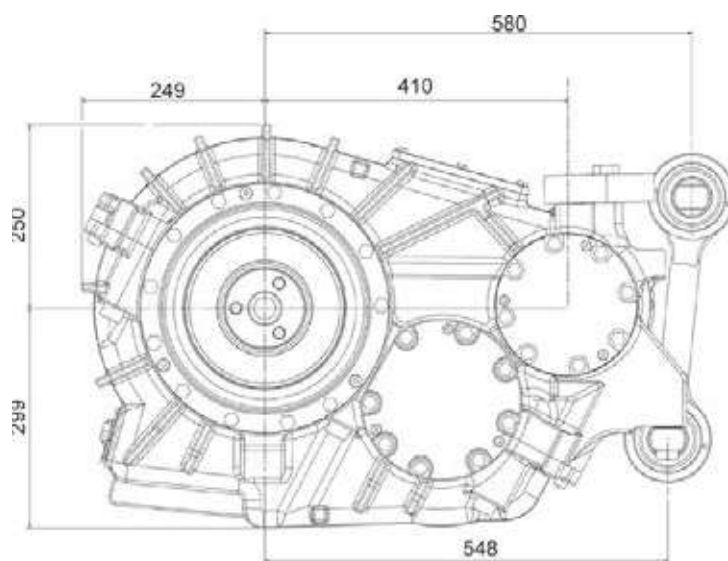
Gearbox type		FHHM-600-6.57-1
Maximum axle load	16.000	kg
Ratio	6.57	
Maximum service speed	90	Km/h
Wheel diameter (worn/new)	850/790	mm
Maximum tractive torque	1318	Nm
Nominal power	300	kW
Motor-Gearbox Coupling	FLEXIBLE JAW	
Gearbox-Axle Coupling	RUBBER WEDGE	
Reference projects	METRO CATANIA	



AHHD-430-7.84-1



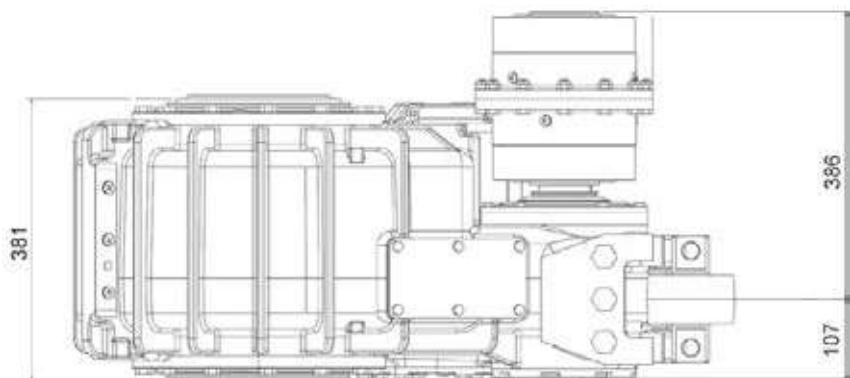
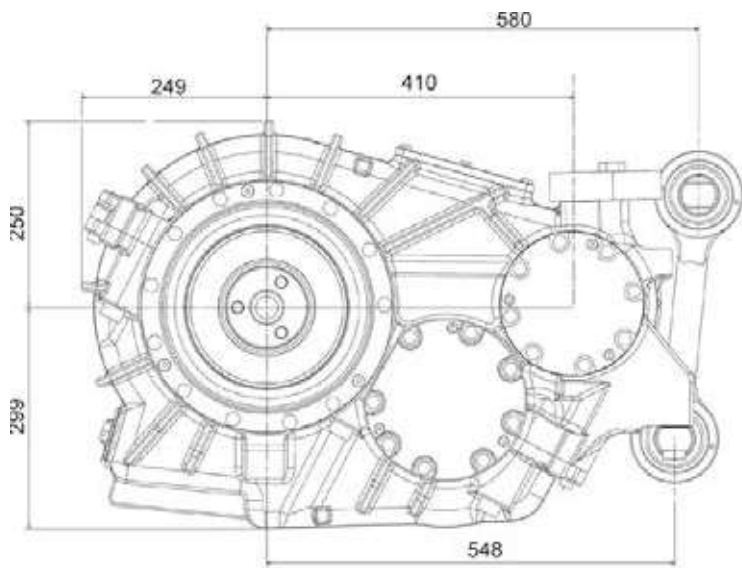
Gearbox type		AHHD-430-7.84-1
Maximum axle load	14.500	kg
Ratio	7.839	
Maximum service speed	100	Km/h
Wheel diameter (worn/new)	850/780	mm
Maximum tractive torque	1433	Nm
Nominal power	244	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	RENFE ANCHO METRICO Y ALPINO	



AHHD-410-7.52-3



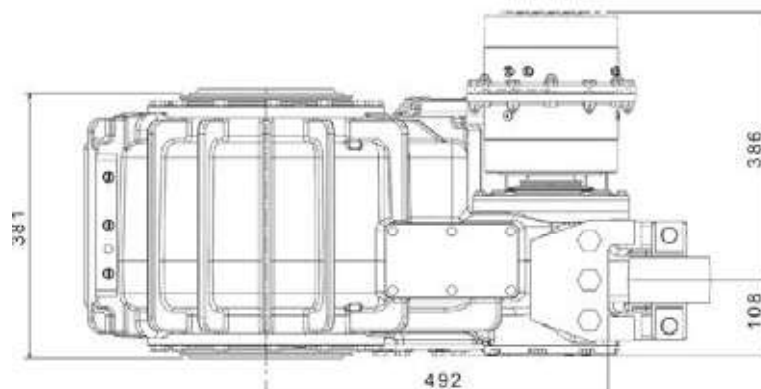
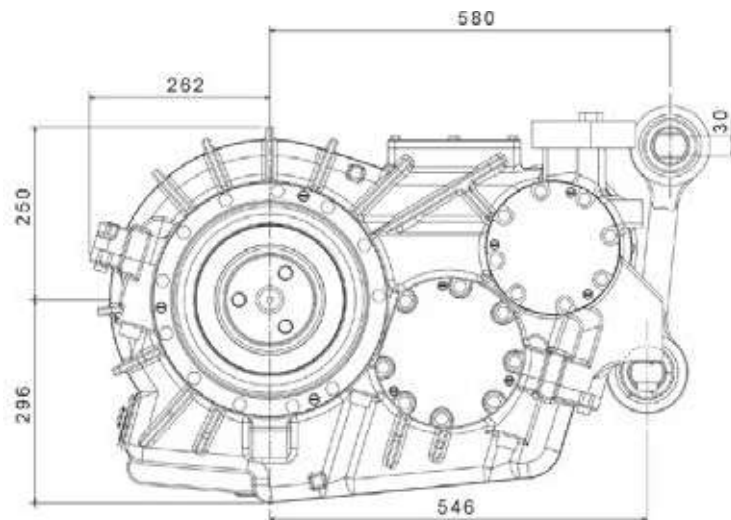
Gearbox type		AHHD-410-7.52-3	
Maximum axle load	15.000	kg	
Ratio	7.512		
Maximum service speed	80	Km/h	
Wheel diameter (worn/new)	860/790	mm	
Maximum tractive torque	2070	Nm	
Nominal power	246	kW	
Motor-Gearbox Coupling	TEETH		
Reference projects	CHILE PORTO ALEGRE DELHI		



AHHD-410-7.52-1



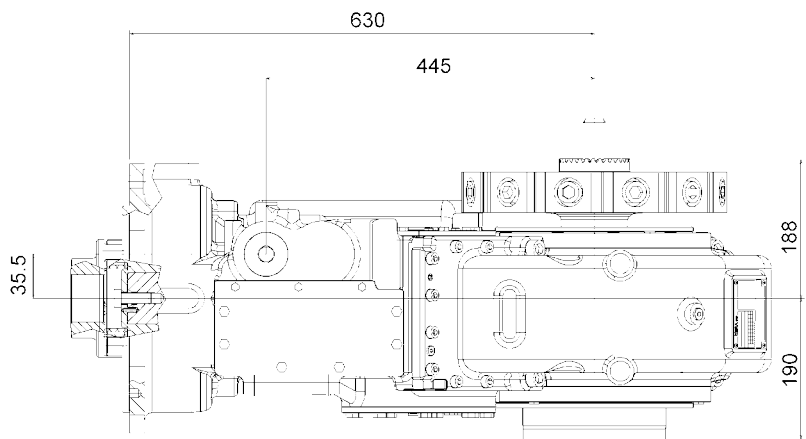
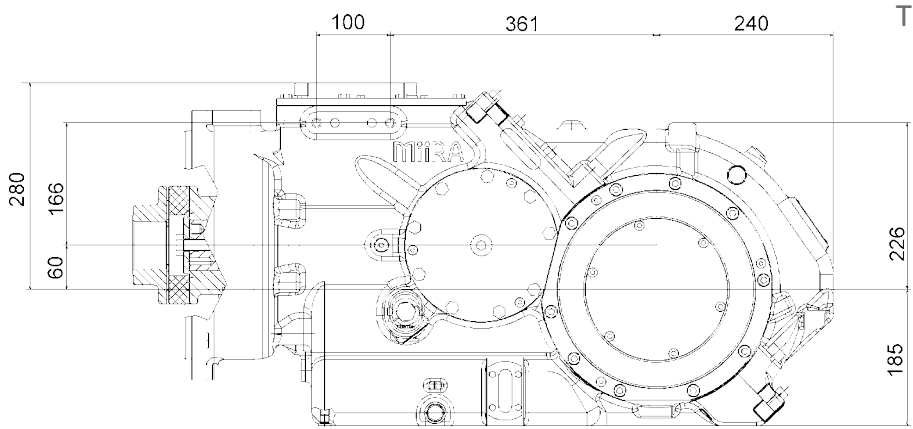
Gearbox type		AHHD-410-7.52-1
Maximum axle load	18.500	kg
Ratio	7.512	
Maximum service speed	90	Km/h
Wheel diameter (worn/new)	915/825	mm
Maximum tractive torque	1500.5	Nm
Nominal power	410	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	RECIFE BELO HORIZONTE CPTM S8500	



FBHD-381.1-6.253-2



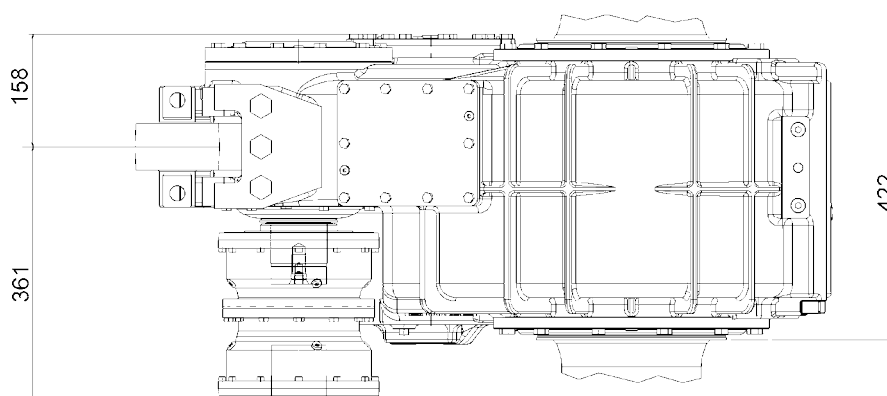
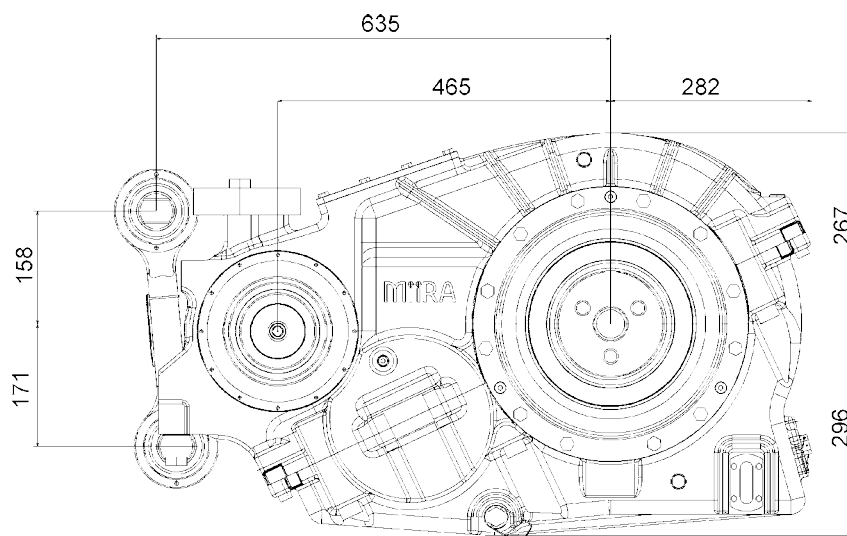
Gearbox type		FBHD-381.1-6.253-2	
Maximum axle load	12.500	kg	
Ratio	6.253		
Maximum service speed	80	Km/h	
Wheel diameter (worn/new)	510/640	mm	
Maximum tractive torque	1452	Nm	
Nominal power	140	kW	
Motor-Gearbox Coupling	FLEXIBLE JAW		
Gearbox-Axle Couplin	TEETH-RUBBER WEDGE COMBINATION		
Reference projects	CALGARY TRANVIA MONTPELIER TRANVIA MARSELLA TOURS TRANVIA GRENOBLE		



AHHD-465-4.177-1



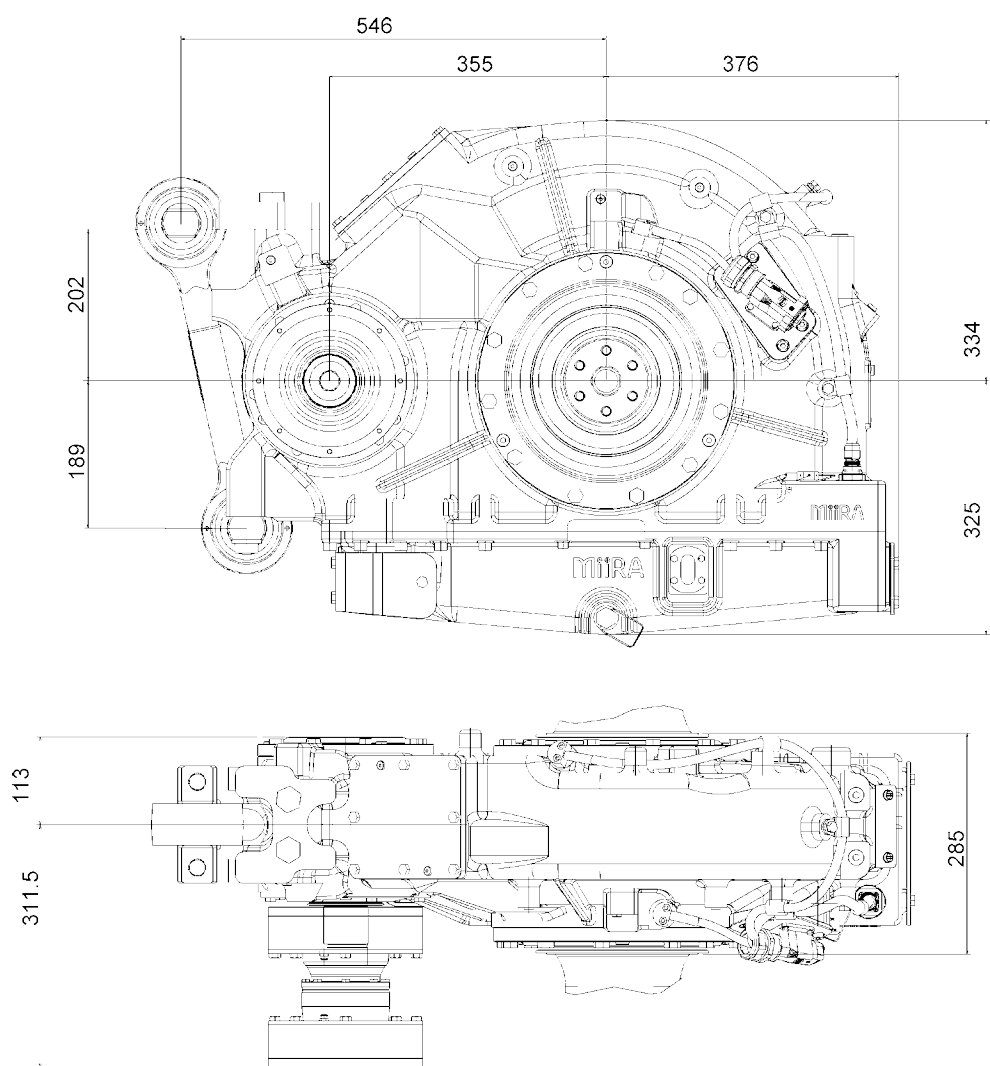
Gearbox type		AHHD-465-4.177-1
Maximum axle load	21700	kg
Ratio	4.177	
Maximum service speed	200	Km/h
Wheel diameter (worn/new)	840/910	mm
Maximum tractive torque	4825	Nm
Nominal power	600	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	RENFE MEDIA DISTANCIA RENFE CERCANIAS	



AHM-355-7.44-3



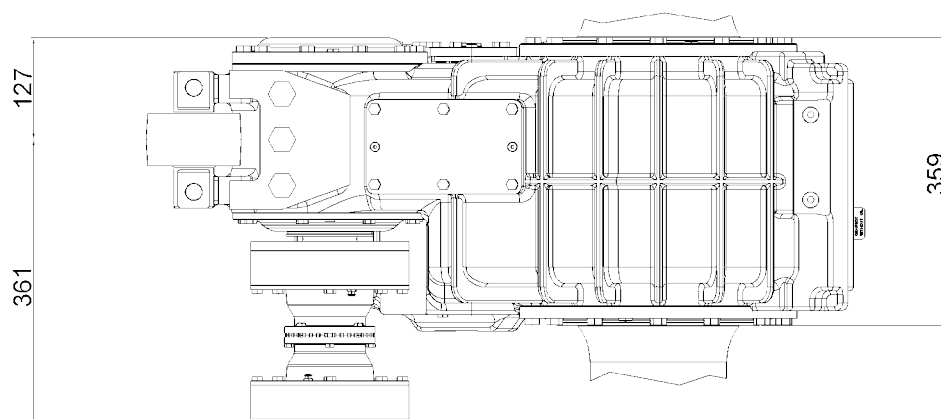
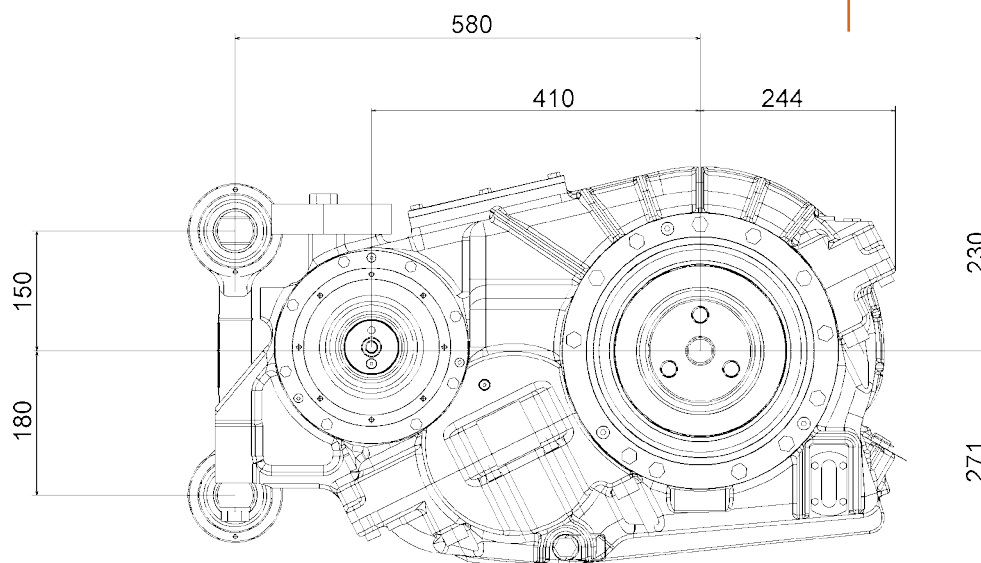
Gearbox type			AHM-355-7.44-3
Maximum axle load	13.870	kg	
Ratio	7.444		
Maximum service speed	110	Km/h	
Wheel diameter (worn/new)	790/860	mm	
Maximum tractive torque	1120	Nm	
Nominal power	190	kW	
Motor-Gearbox Coupling	TEETH		
Reference projects	METRO MADRID GALIBO ANCHO METRO OSLO		



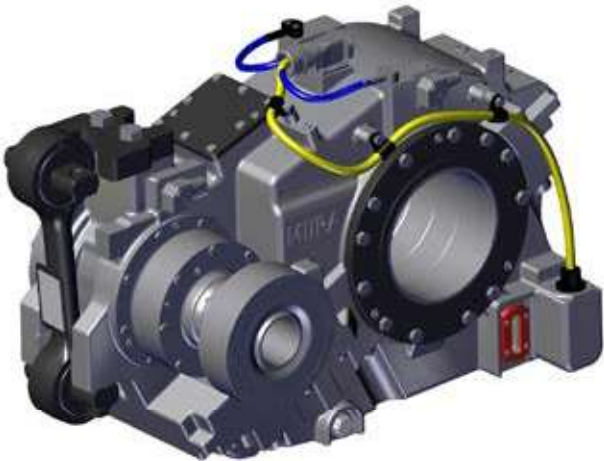
AHHD-410-4.365-3



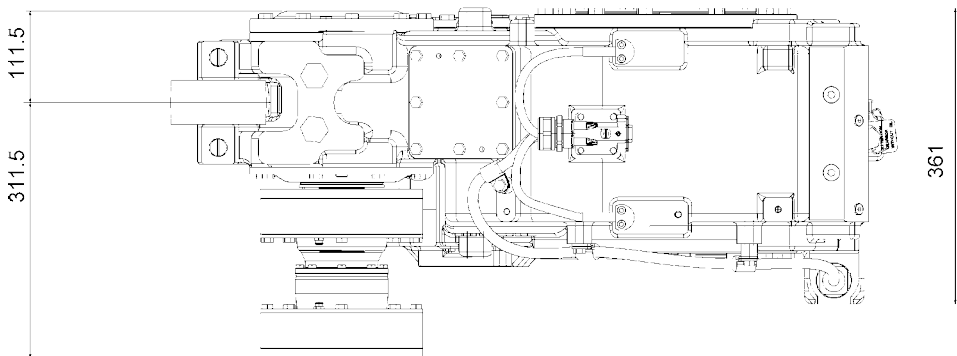
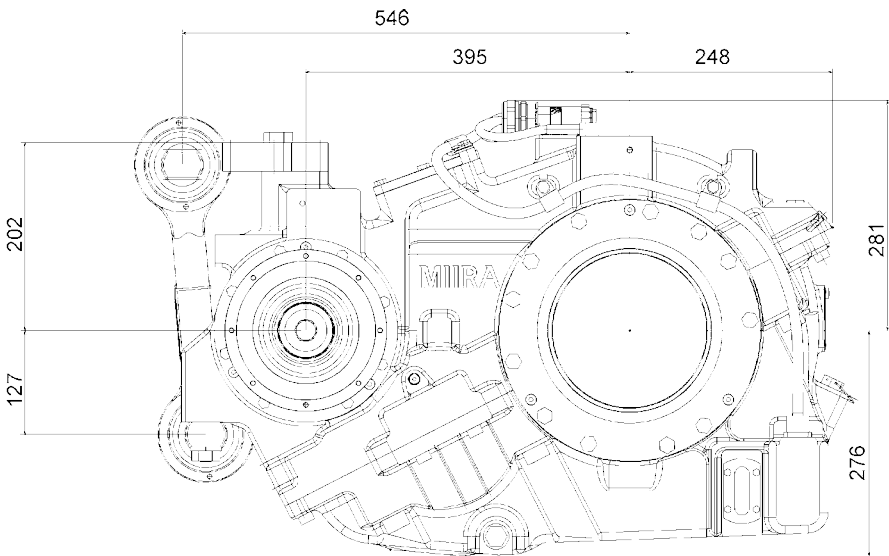
Gearbox type			AHHD-410-4.365-3
Maximum axle load	16.000	kg	
Ratio	4.365		
Maximum service speed	160	Km/h	
Wheel diameter (worn/new)	780/860	mm	
Maximum tractive torque	2550	Nm	
Nominal power	250	kW	
Motor-Gearbox Coupling	DOUBLE-TOOTHED		
Reference projects	EMU FILIPINAS		



AHHD-395-7.429-1



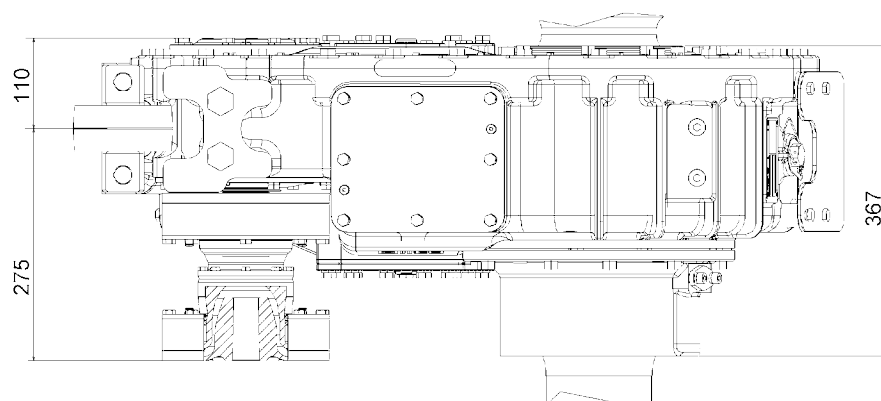
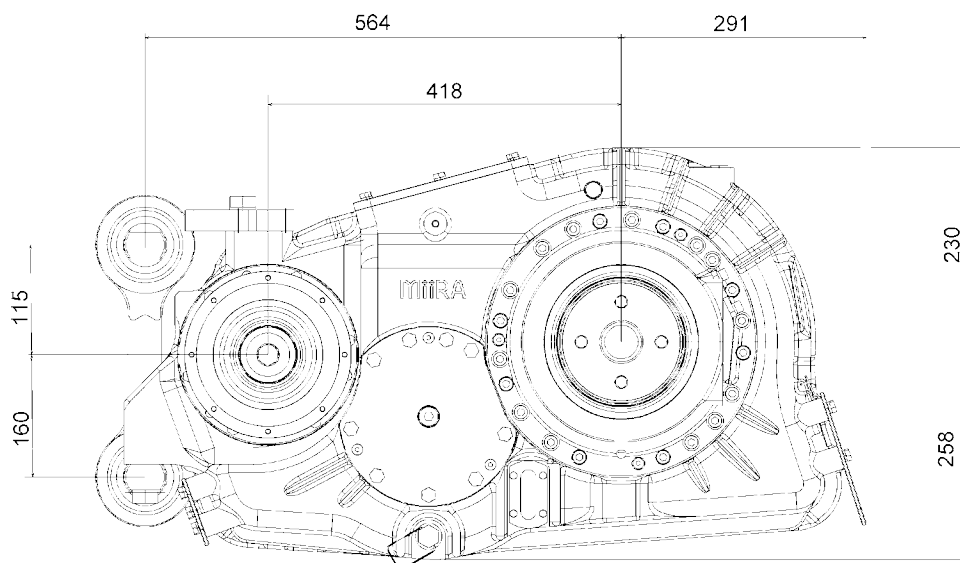
Gearbox type		AHHD-395-7.429-1	
Maximum axle load	12.000	kg	
Ratio	7.429		
Maximum service speed	90	Km/h	
Wheel diameter (worn/new)	790/860	mm	
Maximum tractive torque	1121	Nm	
Nominal power	220	kW	
Motor-Gearbox Coupling	TEETH		
Reference projects	METRO MADRID GALIBO ESTRECHO		



AHHV-418-7.404-1



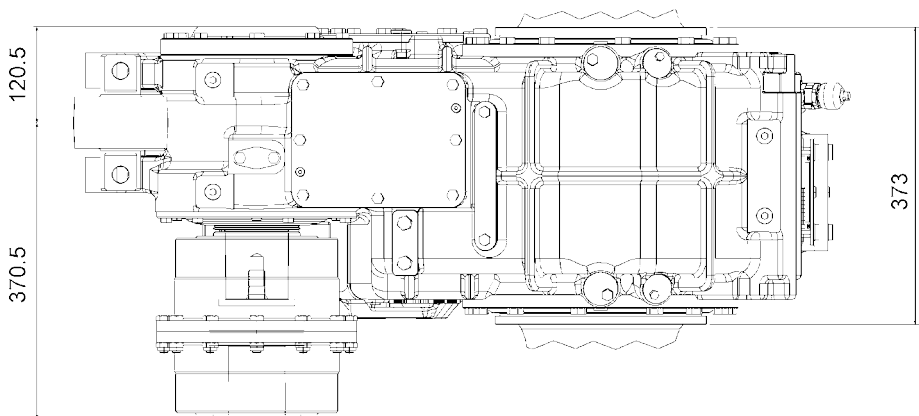
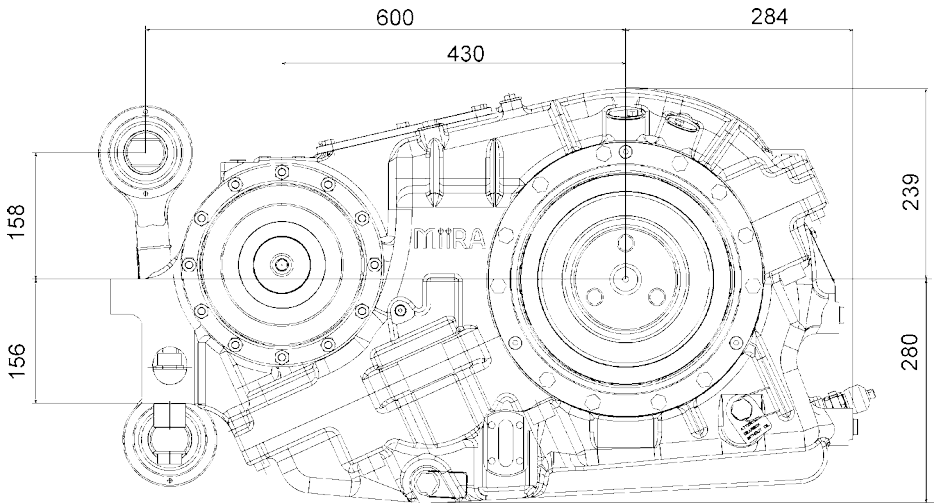
Gearbox type			AHHV-418-7.404-1
Maximum axle load	10.900	kg	
Ratio	7.404		
Maximum service speed	70	Km/h	
Wheel diameter (worn/new)	650/730	mm	
Maximum tractive torque	972	Nm	
Nominal power	105	kW	
Motor-Gearbox Coupling	TEETH		
Reference projects	HANNOVER		



AHHD-430-5.538-1



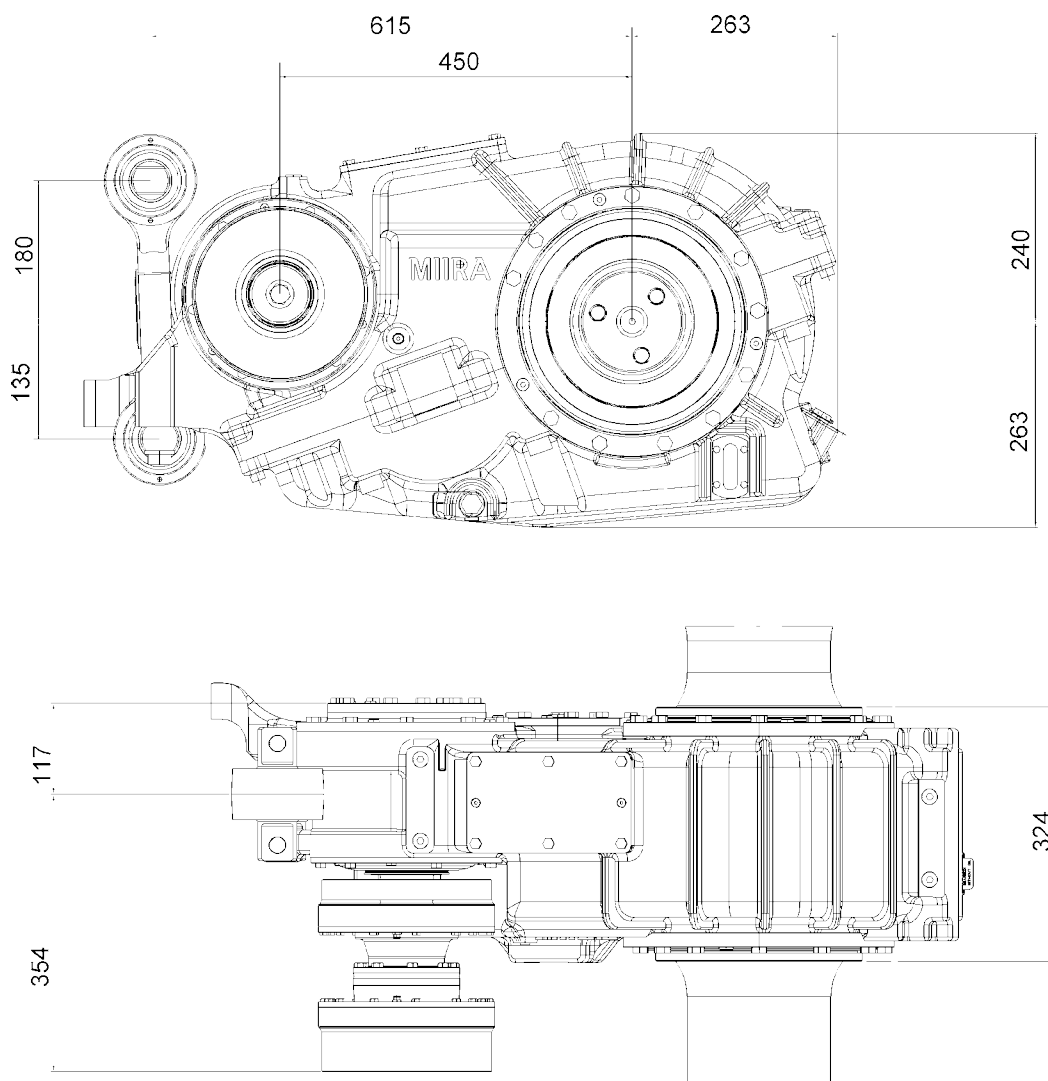
Gearbox type		AHHD-430-5.538-1	
Maximum axle load		20.000	kg
Ratio		5.538	
Maximum service speed		120	Km/h
Wheel diameter (worn/new)		810/880	mm
Maximum tractive torque		2758	Nm
Nominal power		420	kW
Motor-Gearbox Coupling		TEETH	
Reference projects		RER MING	



AHHD-450-3.81-1



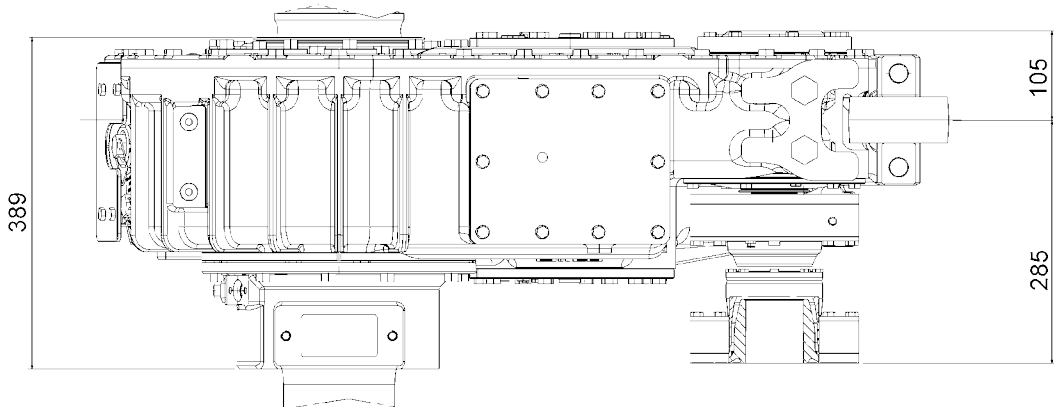
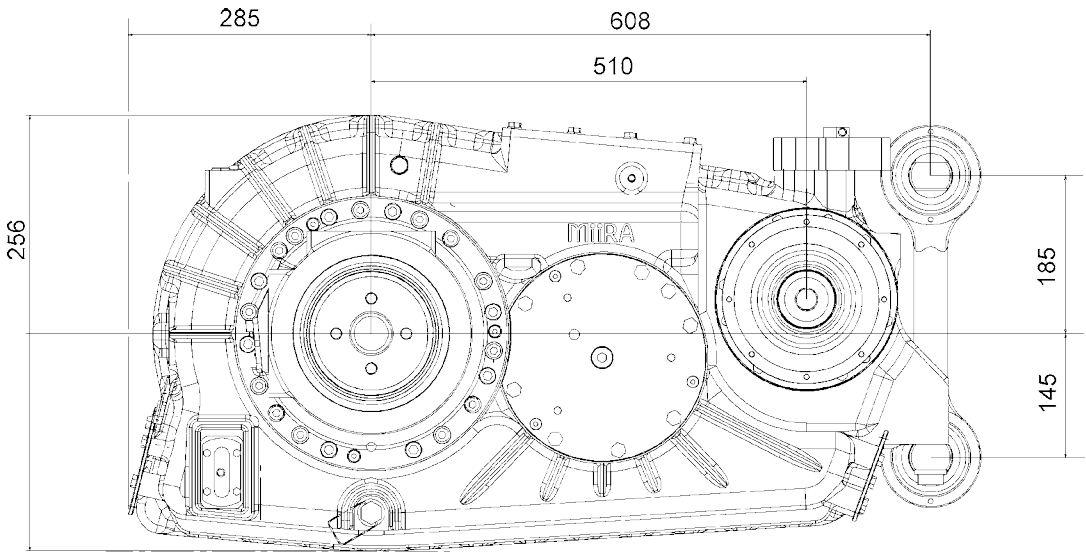
Gearbox type		AHHD-450-3.81-1
Maximum axle load	18.000	kg
Ratio	3.81	
Maximum service speed	200	Km/h
Wheel diameter (worn/new)	770/840	mm
Maximum tractive torque	3180	Nm
Nominal power	250	kW
Motor-Gearbox Coupling	DOUBLE-TOOTHED	
Reference projects	EMU ONCF (MARRUECOS)	



AHHD-450-6.8-1



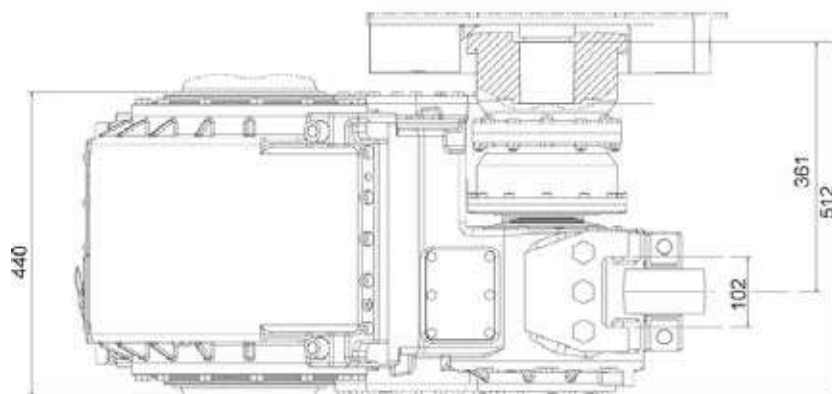
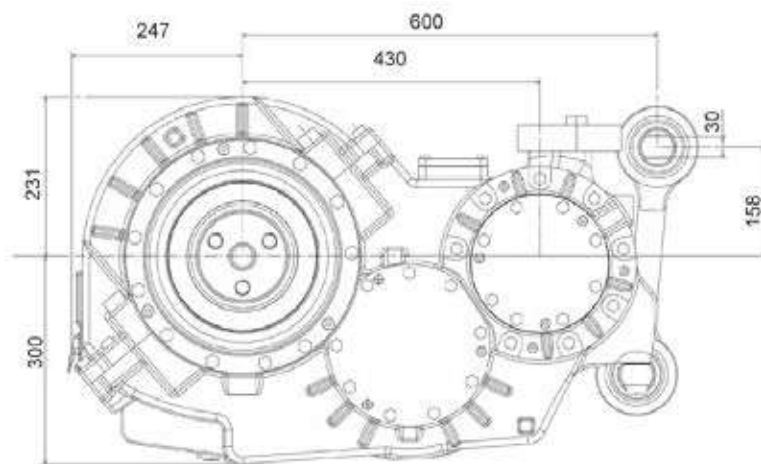
Gearbox type		AHHD-450-6.8-1
Maximum axle load	10.500	kg
Ratio	6.8	
Maximum service speed	80	Km/h
Wheel diameter (worn/new)	640/720	mm
Maximum tractive torque	1359	Nm
Nominal power	170	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	ESSEN TRANVIA BONN	



AHHD-430-4.82-1



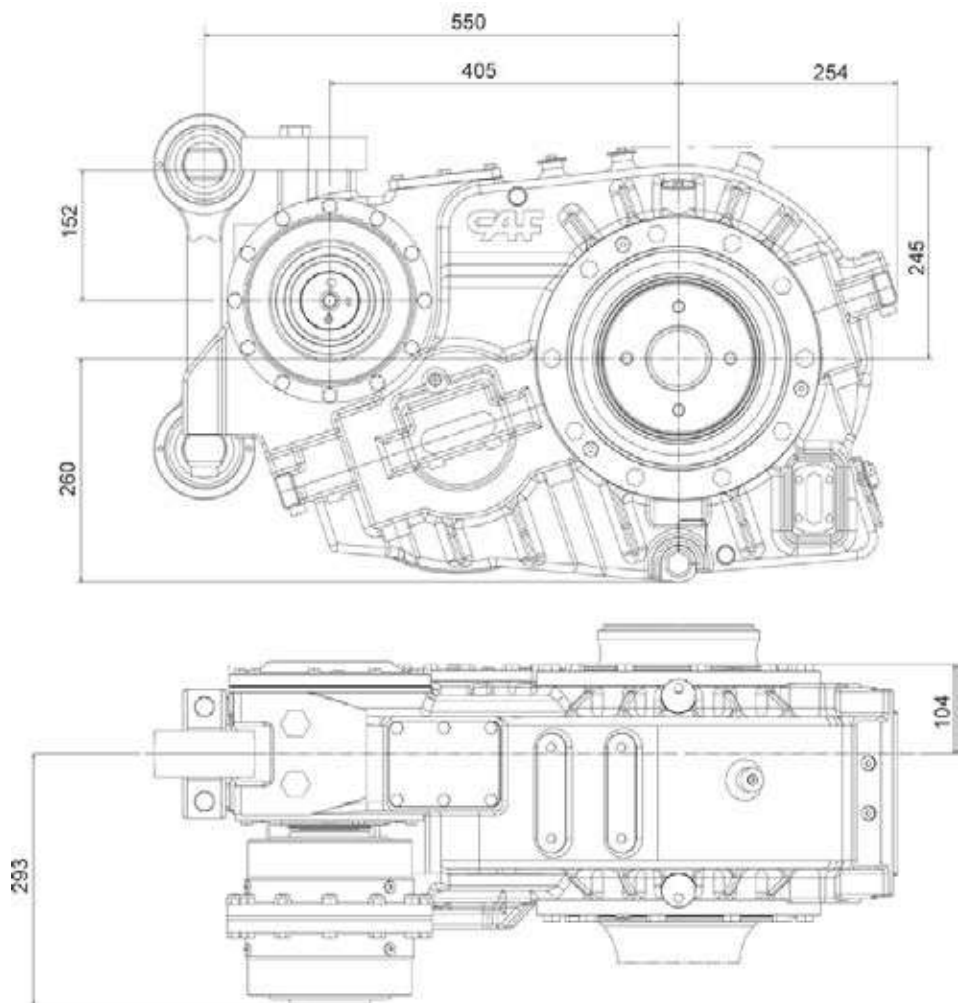
Gearbox type		AHHD-430-4.82-1
Maximum axle load	21.000	kg
Ratio	4.707	
Maximum service speed	160	Km/h
Wheel diameter (worn/new)	780/850	mm
Maximum tractive torque	4543	Nm
Nominal power	537	kW
Motor-Gearbox Coupling	TEETH	
Reference projects	TRIESTE MONTENEGRO CIVITY AUSTRIA CIVITY BARI EMU TRANSITIO AKT2 VRR SJ-AB	



AHHD-405-3.77-1



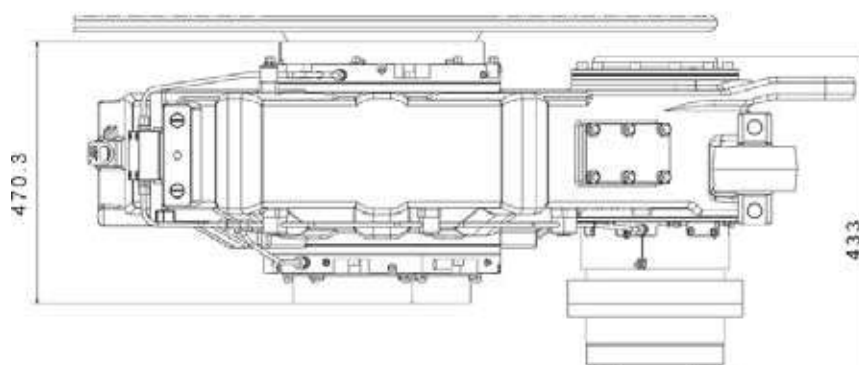
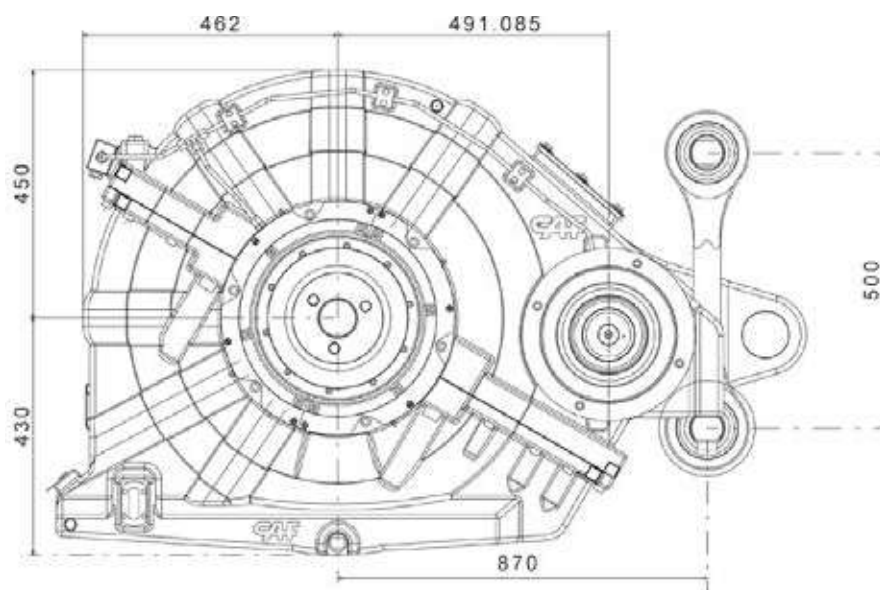
Gearbox type		AHHD-405-3.77-1	
Maximum axle load	15.000	kg	
Ratio	4.707		
Maximum service speed	160	Km/h	
Wheel diameter (worn/new)	780/710	mm	
Maximum tractive torque	2192	Nm	
Nominal power	220	kW	
Motor-Gearbox Coupling	TEETH		
Reference projects	ARRIVA TRANSPENNINE LNER		

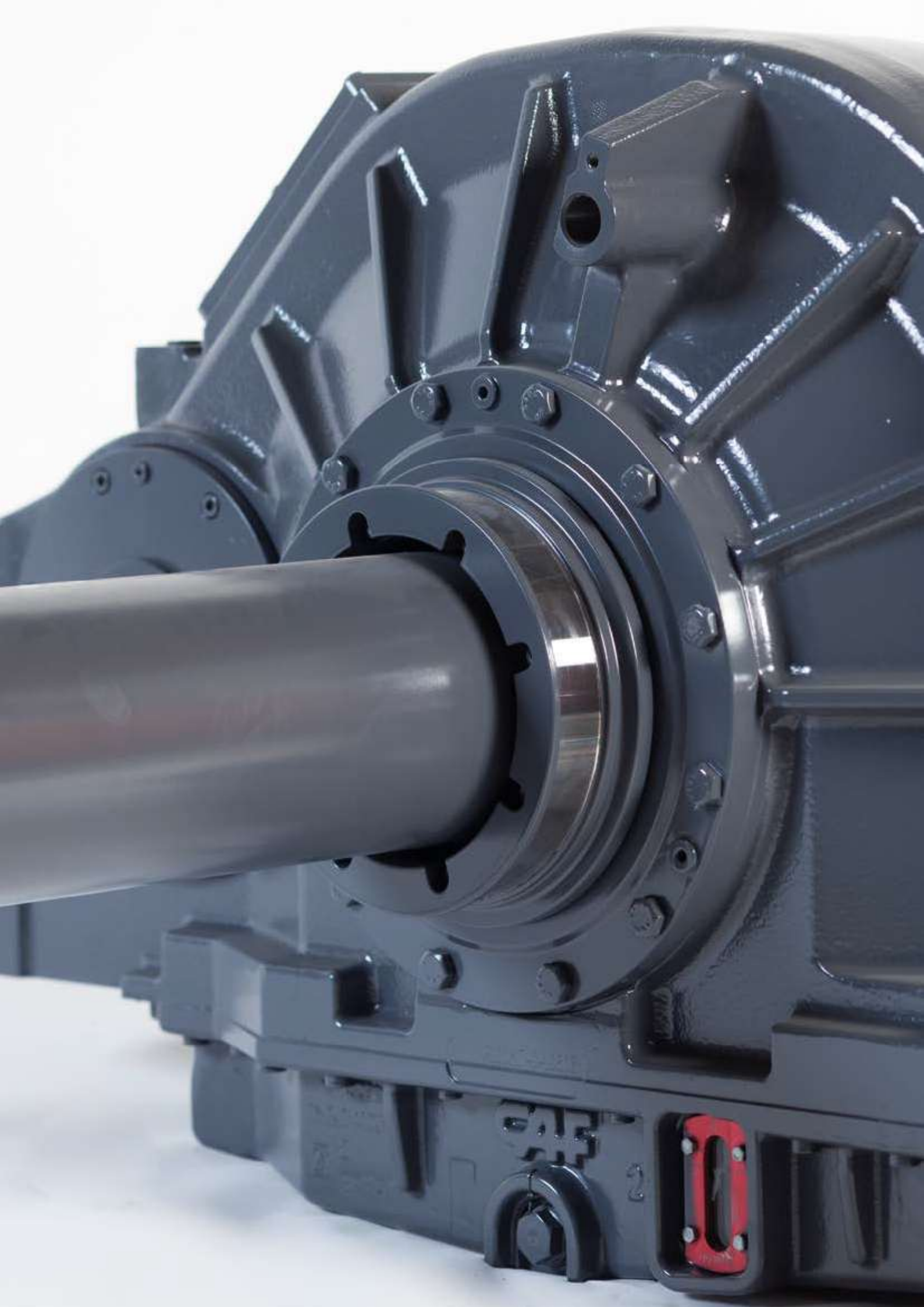


AHD-490-4.565-1



Gearbox type			AHD-490-4.565-1
Maximum axle load	27637	kg	
Ratio	4.565		
Maximum service speed	200	Km/h	
Wheel diameter (worn/new)	1150/1070	mm	
Maximum tractive torque	5953	Nm	
Nominal power	683	kW	
Motor-Gearbox Coupling	TEETH		
Reference projects	ARABIA SAR ETIHAD		







MAINTENANCE & SPARE PARTS Solutions

COMPREHENSIVE SOLUTIONS FOR RAILWAY MAINTENANCE AND SPARE PARTS

CAF MIIRA is at the forefront of delivering comprehensive maintenance and spare parts solutions tailored to meet the dynamic needs of the railway industry. Our commitment to excellence, innovation, and reliability ensures that your fleet remains operational, efficient, and safe.

We offer a wide range of services designed to minimize downtime and maximize performance, including:

- Maintenance Services
- Technical Assistance
- Spare-Parts Supply Services
- Spare-Parts Engineering Services

With a focus on quality and customer satisfaction, CAF MIIRA is your trusted partner in railway maintenance and spare parts solutions.

MAINTENANCE SERVICES

Keeping Your Fleet Running Smoothly

Our maintenance services are designed to ensure your equipment operates at peak performance, day in and day out. We provide comprehensive support through:



All-in Guarantee

Ensuring top-quality care and attention for optimal performance and longevity



Preventive Maintenance Services

Proactive maintenance to maximize uptime and reliability



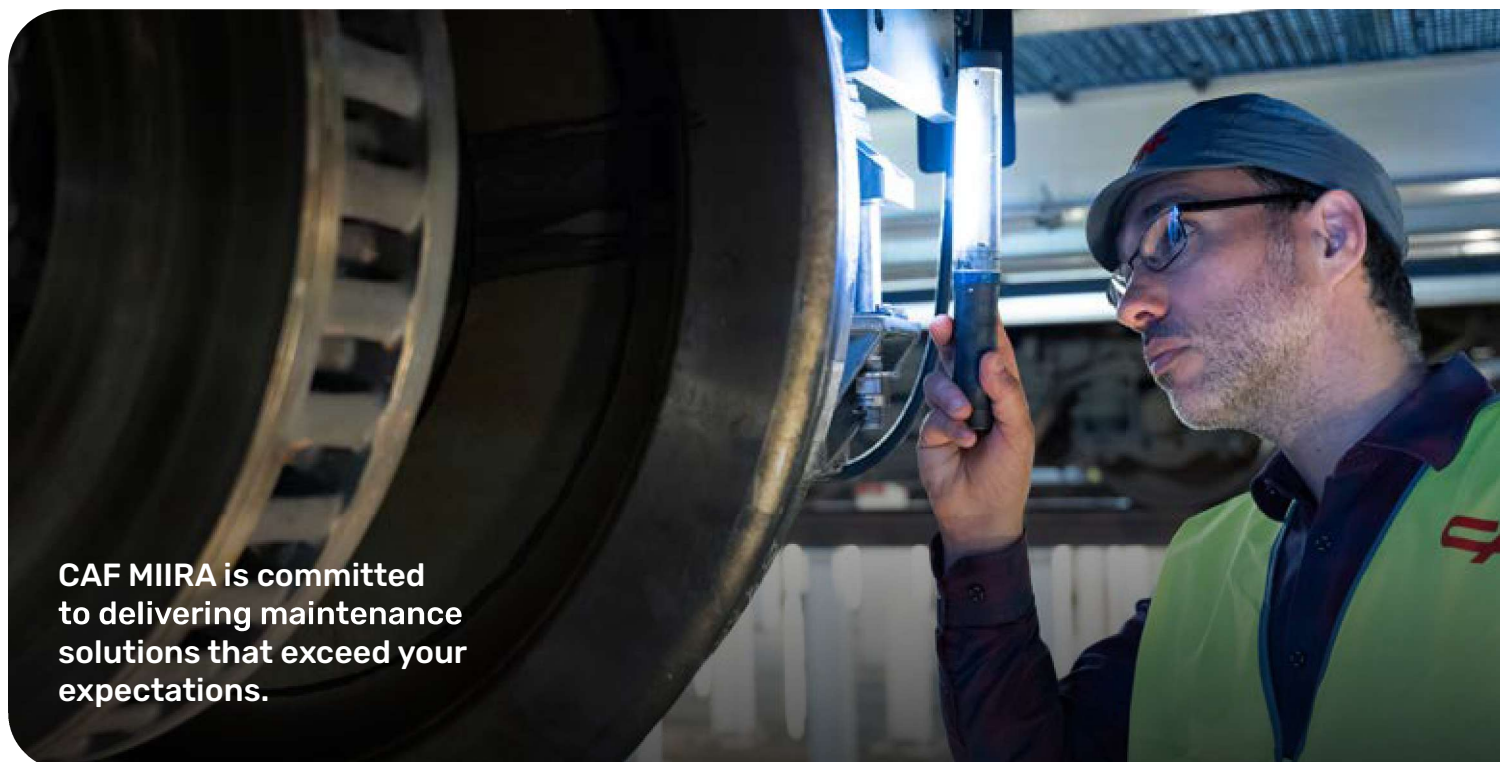
Routine Inspections

Maintaining high standards of quality and safety



Corrective Maintenance Services

Swift solutions for equipment issues or failures



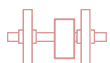
CAF MIIRA is committed to delivering maintenance solutions that exceed your expectations.



LOCOMOTIVES



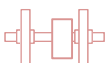
DASH-9 NS - USA



WHEELSETS



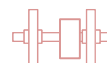
RL30SCM - SOUTH AFRICA



WHEELSETS



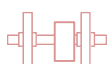
TRANS AFRICA - SOUTH AFRICA



WHEELSETS



KLV - USA

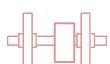


WHEELSETS

HIGH SPEED



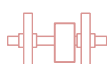
FLYTOGET - NORWAY



WHEELSETS



SAR - SAUDI ARABIA

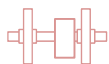


WHEELSETS

REGIONAL AND SUBURBAN



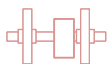
EMU CIVITY TRIESTE - ITALY



WHEELSETS



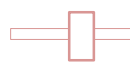
METRO HELSINKI - FINLAND



WHEELSETS



METRO CATANIA - ITALY

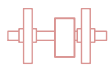


GEARBOXES

LRV



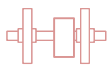
LRV MARYLAND - USA



WHEELSETS



LRT JABODEBEK - INDONESIA

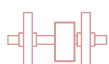


WHEELSETS

TRAMS



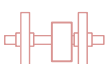
TRAM SYDNEY - AUSTRALIA



WHEELSETS



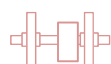
TRAM UTRECHT - NETHERLAND



WHEELSETS



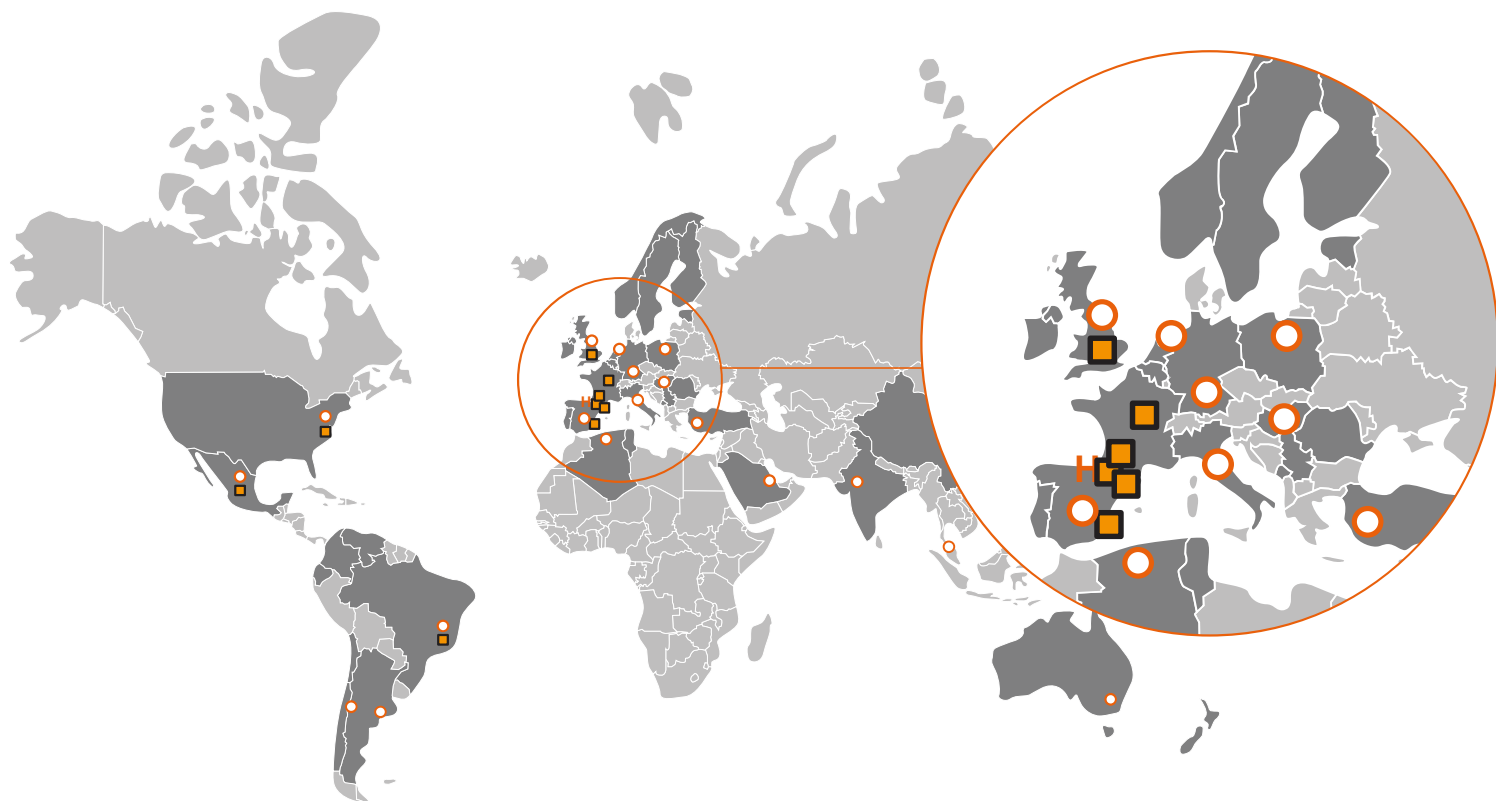
TRAM SEVILLA - SPAIN



WHEELSETS



GEARBOXES



- H** Headquarters
- Production Plants
- Offices
- Countries with ongoing projects

Headquarters:

- SPAIN

Production Sites:

- SPAIN • FRANCE
- USA • BRAZIL
- MEXICO • UK

Subsidiaries:

- MADRID • PARIS • LONDON
- MUNICH • WASHINGTON D.C.
- NEW DELHI • MEXICO D.F.
- ROME • SYDNEY • WARSAW
- SAO PAULO • BUENOS AIRES
- ISTANBUL • ROTTERDAM
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