

MIIRA

A CAF GROUP COMPANY



WHEELSETS 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**

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 multi-tude of geographies.



CERTIFICATIONS

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

PRODUCT & MANAGEMENT SYSTEM

<p>QUALITY</p> <ul style="list-style-type: none">• ARR• ISO 9000• IRIS• ISO 1725• RISAS• VPI	<p>ESG</p> <p><i>Sustainability & Environment</i></p> <ul style="list-style-type: none">• CDP• EPD• ISO14001• ISO26000• RAILSPONSIBLE• ECOVADIS PLATINUM <p><i>Labour health & safety</i></p> <ul style="list-style-type: none">• 45001	   
<p>SAFETY</p> <ul style="list-style-type: none">• UNE		
<p>TSI</p> <ul style="list-style-type: none">• TSI		

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.

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 ECOonomy

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.



WHEELSETS

COMPLETE WHEELSETS SOLUTIONS

We are the only supplier in the market that can design, manufacture, and assemble complete wheelsets.

Manufacturing the main elements of the wheelset internally allows us to ensure traceability of each of the parts throughout the assembly process, subsequently allowing the customer to perform more versatile service monitoring of its parts.

The integral design, supply, and maintenance of wheelsets and gearboxes reduce the final total cost to our customers by:

- Reducing lead times and increasing the efficiency of planning and logistics
- Reducing the total weight of the complete solution more significantly than by addressing each component separately
- Reducing the carbon footprint generated by the complete wheelsets

We have the most modern facilities to control critical processes for safety, such as the application of torque, which ensures and records the values obtained in 100% of the assemblies made.

Being part of CAF Group is an advantage due to the access we have to the knowledge and experience of all Group companies that can design and manufacture different train components such as traction, communication, simulation, etc. We can get the required support from them to improve our own solutions.

We design, manufacture, and maintain wheelsets for all train applications (passenger and freight), including portal axles for 100% low-floor trams or complete wheelsets for refurbished locomotives.

WHEELSETS FOR HIGH SPEED, EMU'S, LOCOMOTIVES AND METROS:

We can provide the following type of wheelsets:

- Wheelsets for engines and trailers
- Wheelsets for shrink fitting
- Wheelsets with cylindrical and conical bores
- Wheelsets of variable gauge
- Wheelsets with internal bearings
- Wheelsets with brake disc pressed into the axle
- Wheelsets with brake disc assembled on the wheel
- Wheelsets with brake disc tied to the axle
- Wheelsets with complete fully suspended gearbox
- Wheelsets with semi-suspended gearbox
- Wheelsets with canon box suspended gearbox

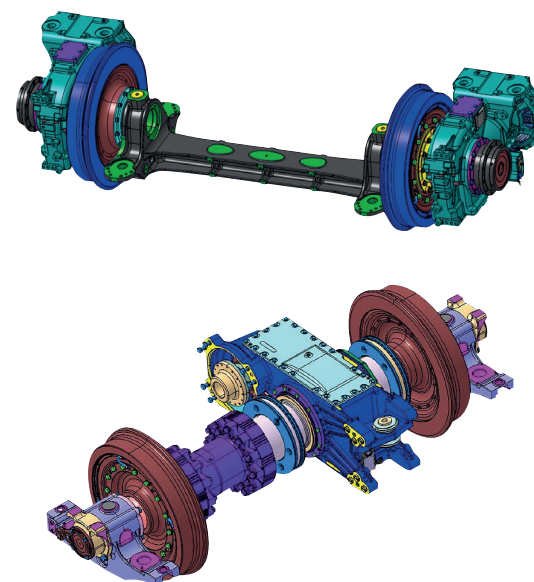




The CAF Group is a leader in the tram and LRV segments, which has allowed CAF MiRA to accumulate extensive experience in this field, having developed its own solutions for all types of trams and LRV's.

CAF MiRA designs, manufactures and maintains state-of-the-art axle-bridge sets 100% tested by CAF that meet the most demanding specifications.

Our trams solutions are easily adaptable to all tram and LRV solutions in the market. CAF stands out among its competitors thanks to its experience in such demanding application that require large investments and new technological developments. A look at the future with smart advanced solutions that develop more sustainable environments.



WHEELSETS



CAF MiRA's experience in this field enables us to offer the most appropriate solution to each customer while being well aware that this is a key sector in the development of railways, communications and business in the 21st century.

CAF MiRA is in the forefront of innovation in Freight applications, with different projects in the pipeline with the following objectives:

- **Weight reduction**
- **Increased load capacity**
- **Reduction of noise emissions**
- **Reduction of operational costs**
- **Digitalization**
- **Safety**

We are part of Shift2Rail who has established the following objectives, fostering a modal shift in the EU transport network:

- **Reduction of Green House Gases**
- **Improved services and customer quality until 2030.**
- **Market growth and modal shift.**
- **Cost reduction.**

CAF MiRA has developed new designs that meet the objectives above:

- **Light and Thermostable wheel (LiTheS).**
- **Ultra Load Wheel (uLLoW).**
- **Silent Wheelset (SiSet).**

WHEELSETS

CAF MIIRA, YOUR PARTNER ALONG THE ENTIRE LIFE-CYCLE



COMPLETE WHEELSET ENGINEERING

CAF MIIRA has its own engineering department dedicated to developing different products to comply with specific needs and requirements of each customer. In addition to the latest development and simulation programs, CAF Mi-IRA has its own design tools, which enable it to offer the most complete service possible.

A highly qualified team works focused on improving and optimizing not only the projects but also the design and calculation methods used for them.

Belonging to CAF Group provides us with the required knowledge about in service performance of our products as well as the knowledge needed of the complete bogie system.

CUSTOMER SUPPLY CHAIN INTEGRATION

The “Lean Manufacturing” strategy allows us to continually optimize eliminating waste with our skilled people and leveraging in our state-of-the-art facilities. Thus, we offer a high-value, competitive service with reduced lead times.

We respond to requests with the desired amounts and conditions, in the right place at the right time.

- **Adaptation according to demand**
- **Minimum stock at the customer**
- **Small delivery batches**
- **Minimum lead time**
- **Fewer emergencies, with immediate attention and resolution**
- **Integration into the management system for customer traceability**

TECHNOLOGICAL ASSESSMENT

CAF MIIRA is a world reference in the supply of critical and integrated solutions highlighted by a highly experienced engineering team and the provision of technology support adapted to each project.

We supply the following solutions:

- **Analysis of requirements and identification of customized solutions.**
- **Assistance in the definition and/or improvement of existing designs.**
- **Definition of specific material and processes for each specific application.**
- **Engineering services for the analysis and improvement of the performance of the material in service.**
- **Definition of maintenance operations, including the development of NDT and inspection procedures.**



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



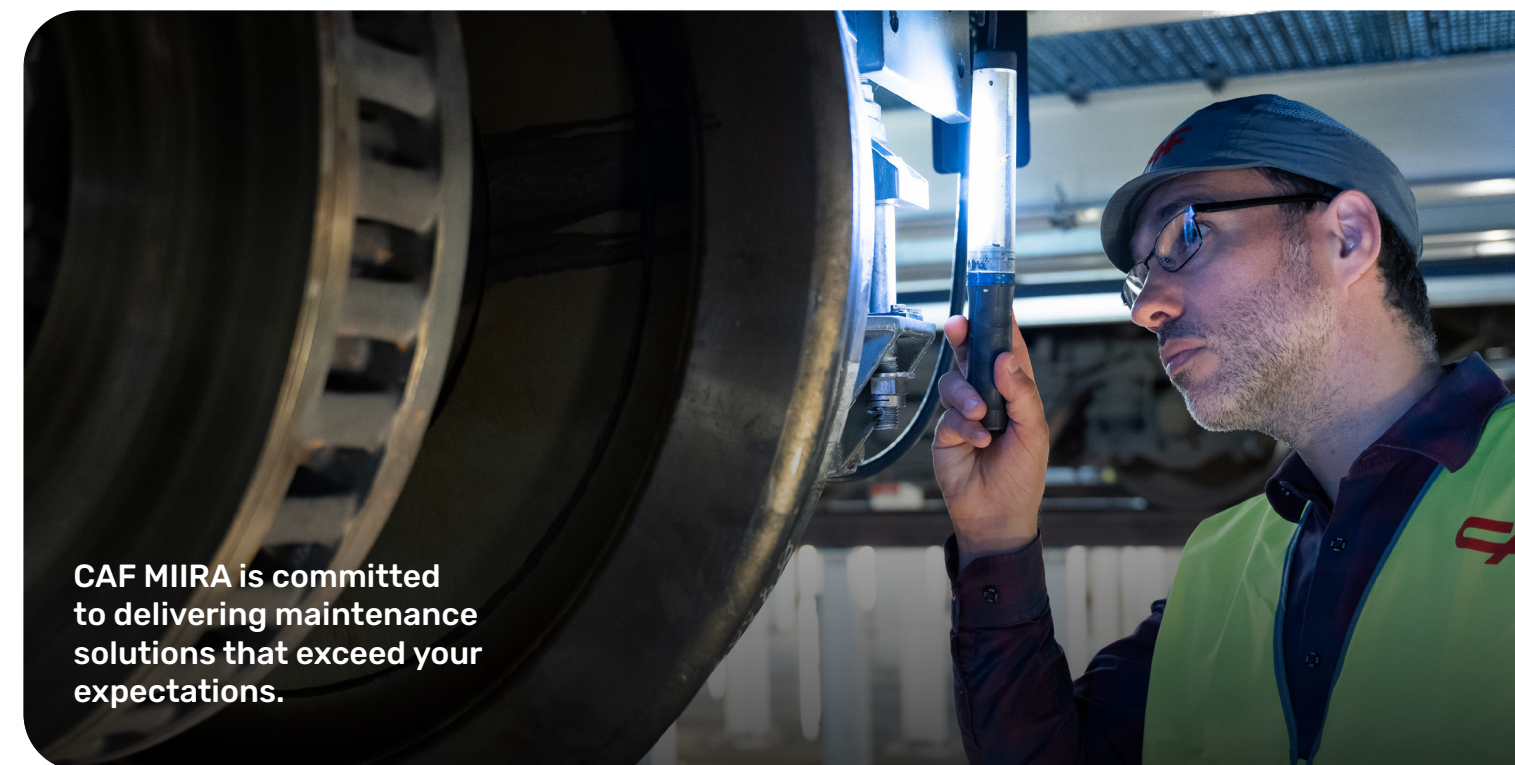
Routine Inspections

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.



WHEELSET COMPONENTS

CAF MIIRA creates solutions that are sustainable, rapid, clear ad-hoc responses for each customer and each project.

WHEELS & AXLES

CAF MIIRA has vast expertise in the design of wheels, axles and wheelsets. CAF MiRA's products have been operating in main operators and OEMs since 1929. Heritage in Steel production for decades provides us superior expertise in wheels and axles metallurgy.

GEARBOXES

With more than 50 years experience in gearbox design, manufacture and supply, CAF MIIRA faces rolling stock upcoming challenges with a tailor-made customer approach, supported by a vast 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, reliable and low noise solutions.

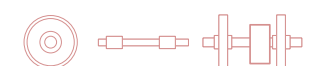
Backed by strong Rolling Stock Group, a world-wide service net gets us closer from customers.



LOCOMOTIVES



PUSH-PULL - SAUDI ARABIA



WHEELS - AXLES - GEARBOXES
WHEELSETS



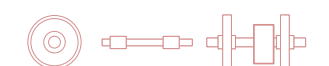
BITRAC - SPAIN



WHEELS - AXLES - WHEELSETS



DASH 9 - USA

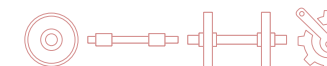


WHEELS - AXLES - GEARBOXES

FREIGHT WAGON OPERATOR



TRANSFESA - SPAIN



WHEELS - AXLES - WHEELSETS -
MAINTENANCE



HUPAC - ITALY



WHEELS - WHEELSETS -
MAINTENANCE



SAR - SAUDI ARABIA

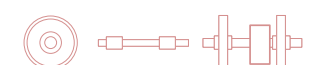


WHEELS - WHEELSETS

HIGH SPEED AND INTERCITY



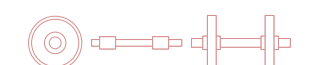
OARIS FLYTOGET - NORWAY



WHEELS - AXLES - GEARBOXES
WHEELSETS



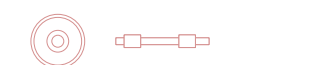
CHANGCHUNG - CHINA



WHEELS - AXLES - WHEELSETS



AVRIL II - SPAIN



WHEELS - AXLES

COMMUTER AND REGIONAL TRAINS



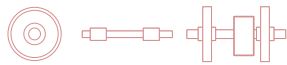
PHD - SNCF - FRANCE



WHEELS - AXLES - WHEELSETS



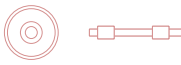
CIVITY NS - NETHERLAND



WHEELS - AXLES - GEARBOXES
WHEELSETS



SNCF REGIOLIS - FRANCE



WHEELS - AXLES

METRO



WMATA - USA



WHEELS



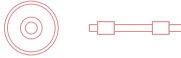
METRO HELSINKY - FINLAND



WHEELS - GEARBOXES



METRO MADRID - SPAIN

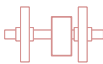


WHEELS - AXLES

TRAMS



FREIBURG - GERMANY



WHEELSETS



HOUSTON - USA



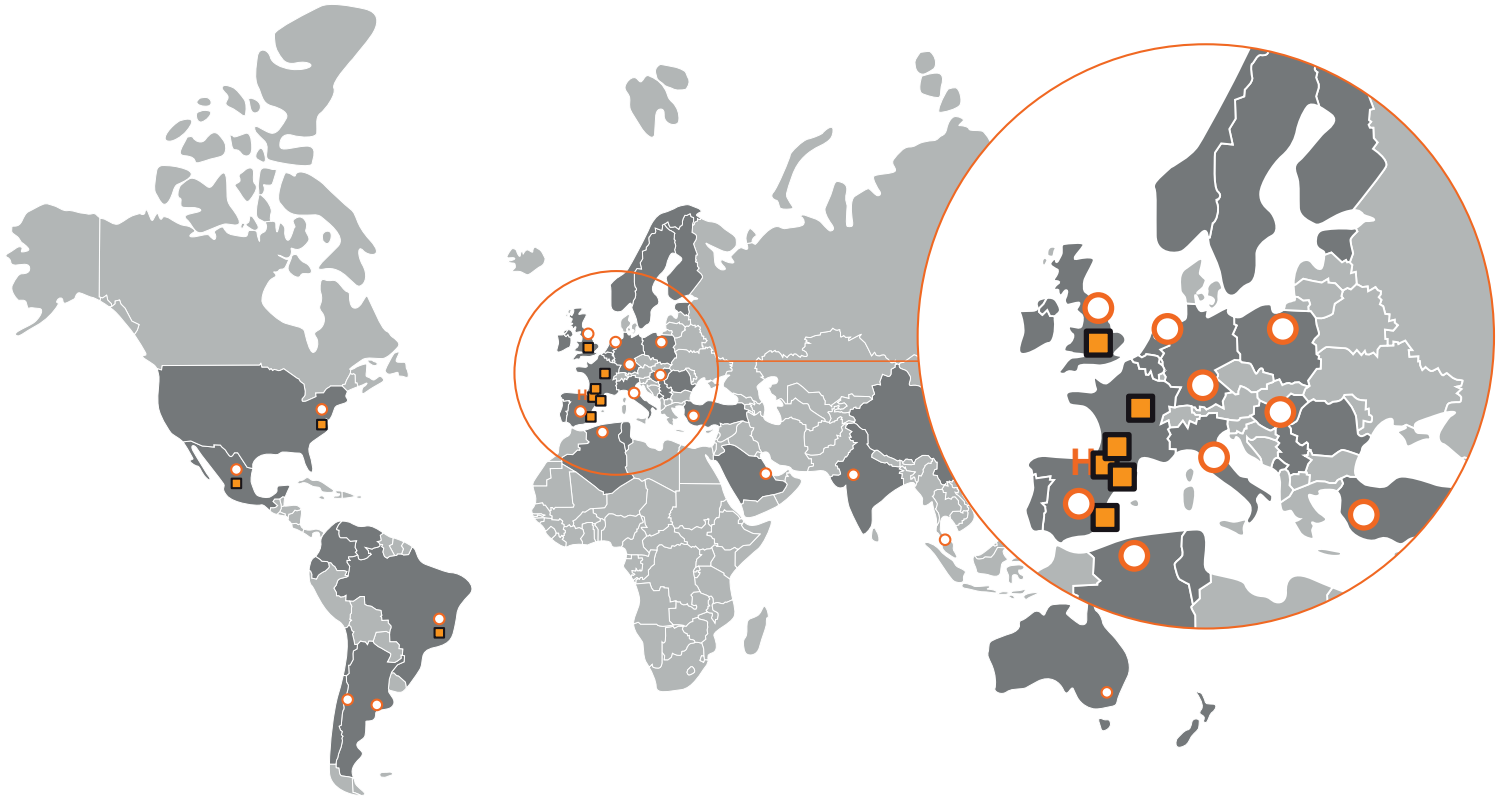
RESILIENT WHEELS - GEARBOXES



BUDAPEST - HUNGARY



RESILIENT WHEELS



- 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
- DOHA • KUALA LUMPUR
- SANTIAGO DE CHILE
- BUDAPEST

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