



The  **lectric** RANGE

The word 'The' is in a grey, sans-serif font. The 'Electric' part is stylized, with the 'E' being a large, green, circular icon containing a white lightning bolt. The 'lectric' part is in a grey, sans-serif font. 'RANGE' is in a grey, sans-serif font.

**SOLUTIONS FOR
MODERN RAIL LOGISTIC**

**DJIBOUTI 19-21/03/2019
INTERMODAL AFRICA**



History and Evolution



ZEPHIR was founded in 1969, designing and manufacturing heavy duty towing vehicles for industrial applications, from steelworks to intermodal terminals and airports.

ZEPHIR's close working relationship with its customers, promoted the concept to design and build an alternative to rail shunting locomotives and in 1977, the first rail-road shunting vehicle was built and the LOCOTRACTOR was born!

Since 1991 the range of the ZEPHIR rail dedicated vehicles includes also the revolutionary Electric Battery powered CRAB range rail-road vehicles, and the shunting locomotives of the KUBO range. All these vehicles are designed for high versatility and extremely low running costs.

ZEPHIR produced more than 2750 vehicles.

Zephir Quality System is certified ISO 9001

Zephir Environmental Management System is certified ISO 14001





DEDICATED DESIGN FOR RAIL SHUNTING YARDS



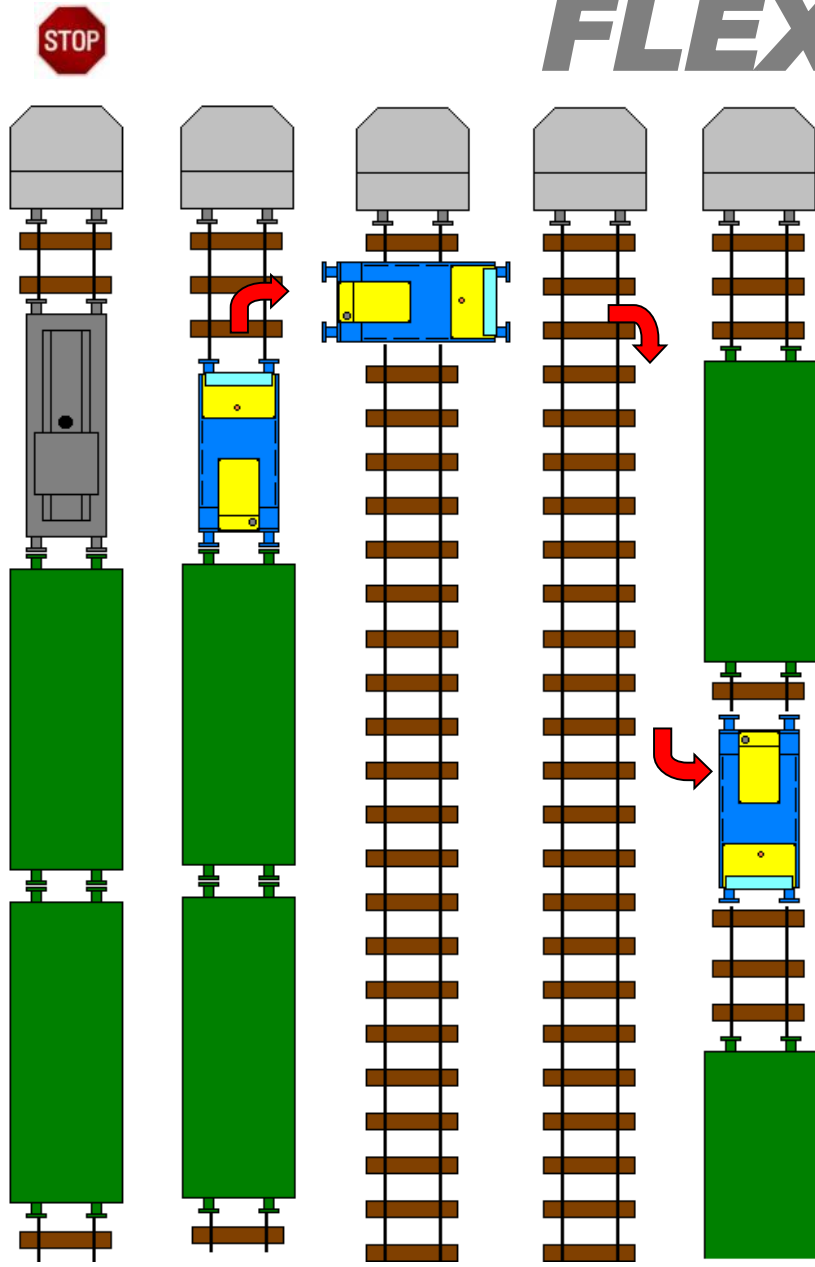
Since the beginning ZEPHIR LOCOTRACTORS were designed as rail vehicles intended to be used in rail yards.

*Since **the average speed recorded in rail shunters used in rail yards is usually around 5-10 km/h** the LOCOTRACTOR is designed to perform the maximum capacity in this range of speeds. As a consequence the engine size is always much smaller than the equivalent standard locomotive, which has usually an oversized engine, able to perform “high speed” shunting that are not achievable in the shunting yards.*



BIMODAL RAIL AND ROAD

FLEXIBILITY



*The LOCOTRACTOR can be on and off-tracked in most areas, in one quick and easy manoeuvre. Therefore, it **can cross tracks to perform cross terminal movements quickly and efficiently.***

These additional freedom degrees are a revolution in railway handling that allow to radically change the shunting logistics with a drastic increase of productivity.

It's not necessary any more to plan railway logistic in the traditional way, with complicated and time wasting manoeuvres. Even on a dead rail with the train behind the LOCOTRACTOR can be off-tracked, moved rapidly in road mode to the next train to handle, and eventually on-tracked in between two trains, to move them from the centre of the composition.



ZEPHIR PRODUCTION



ZEPHIR designs and produces its products in 2 modern workshops situated in Modena (Italy), the famous area well known for its excellence in mechanics.

The location is also known as “Land of Motors”, and is home for companies like Ferrari, Maserati, Lamborghini and Ducati.

Thanks to the location ZEPHIR have state of the art components supplied by highly specialized suppliers situated in the same area.





E-RANGE BENEFITS

The E-range machines are all battery powered, completely emission free, and extremely silent.

Possibility to work indoor

Better Environment

Possibility to work near residential areas even during nighttime

Well tested heavy duty technology

Better implementation of Possible future savings from eventual Carbon related taxes

Extremely low running costs:

NO fuel consumption

No complex and expensive maintenance for engine and transmission

Maintenance free, brushless, AC electric motors

Enhanced safety and productivity thanks to the wide list of options:

Remote Control

Pneumatic train brake system

Interlock safety systems

Data Logger

Frequency	Elements	Operations	Cost for material	Manpower
EVERY WEEK	Hydraulic circuit	Check the level.	No cost	1h
	Battery	Check the level.	No cost	
	Brake pump	Check efficiency.	No cost	
	Joints and suspension	Grease the pivots. Test the screws.	No cost	
	Cardan shafts	Grease the joints. Test the screws.	No cost	
EVERY 500 HOURS OF OPERATION	Hydraulic system	Check fluid level	No cost	
	Axle differential	Check the level. Test the screws	No cost	
	Rubber bandages	Check for abrasion.	No cost	
	Undercarriage, wheels	Test the screws and nuts for their tightening.	No cost	
	Accumulators	Check precharge pressure.	No cost	4h
EVERY 1500 HOURS OF OPERATION	Parking brakes	Test the Bowden cable for corrosion, cracks and tightening.	No cost	
	Street wheels	Check and grease the joints.	No cost	
	Hydraulic circuit	Replace the oil.	280,00 €	8h
EVERY 3000 HOURS OF OPERATION	Hydraulic circuit filter	Replace the suction and back filter.	75,00 €	
	Street axles	Replace the oil	10,00 €	
	Rail axles	Replace the oil	140,00 €	
	Reduction Gear	General check and clean Drain	No cost	
	Brakes	Test the brake pads for thickness.	No cost	
	Railway/road lights	Check	No cost	4h
REPLACE WHEN WEARED (more than 6000 hours in normal conditions)	Rail rubber wheels	Replace	3.200,00 €	

Example for CRAB 1500E



CRAB 1500E, 1800 E, 2100 E, 3100E, 5000E with (or without) comfortable operator Cabin

Thanks to the unique rail patented wheels the CRAB is using ALL ITS WEIGHT for traction performance. This is why the CRAB is, for each draw bar pull level, the most compact vehicle available on the market.

Additionally the special design with road mode perpendicular to rail mode, and the turning on spot ability, allow the CRAB to transversally enter/exit from track side, without any maneuvering, in a quick and easy movement.



**CAPACITY UP
TO 1000t**





STATE OF THE ART TECHNOLOGY

NO SMALL RAIL GUIDING WHEELS WITH LITTLE WEIGHT APPLIED



This simple configuration is producing a lot of dangerous situations since the rail wheel which should be guiding the vehicle can easily loose completely the contact with the rail track.

Everywhere the surrounding pavement is higher than the rail head (due to the small size of the rail wheel even a few cm can literally lift the rail wheel up). Since the road wheel is larger than the rail, part of it is in contact with the pavement (specially in curves). If the pavement at the side of the track is higher than the rail head, the road wheel is loosing the contact with the rail and remaining in touch with the side pavement.



*The CRAB range uses **large diameter** (520 mm rolling diameter) Zephir patented wheels. **All the weight of the machine is equally distributed on the 4x rail wheels....MAXIMUM SAFETY!***



*The Zephir patented rail wheel is covered with a special high traction replaceable rubber...**TOP TRACTION PERFORMANCES!***





LOK 7.90E
LOK 10.90E
LOK 13.90 E
LOK 16.150 E
LOK 20.150 E

The most powerful electric battery powered Road-Rail shunting machine.

Suitable for heavy duty shunting in the rail-yard.

Multiunit capacity for improved performances.

Hybrid technology available as an optional.

Possibility to be used as a road tractor for handling trailers.



CAPACITY UP TO 4000t





....and our **DIESEL** range

- LOK 2.60 D**
- LOK 4.90 D**
- LOK 6.110 D**
- LOK 8.130 D**
- LOK 10.170 D**
- LOK 13.220 D**
- LOK 16.300 D**
- LOK 20.300 D**
- LOK 22.520 D**
- LOK 30.520 D**



**CAPACITY UP
TO 5600t**

- The most powerful electric battery powered Road-Rail shunting machine.**
- Suitable for heavy duty shunting in the rail-yard.**
- Multunit capacity for improved performances.**
- Hybrid technology available as an optional.**
- Possibility to be used as a road tractor for handling trailers.**



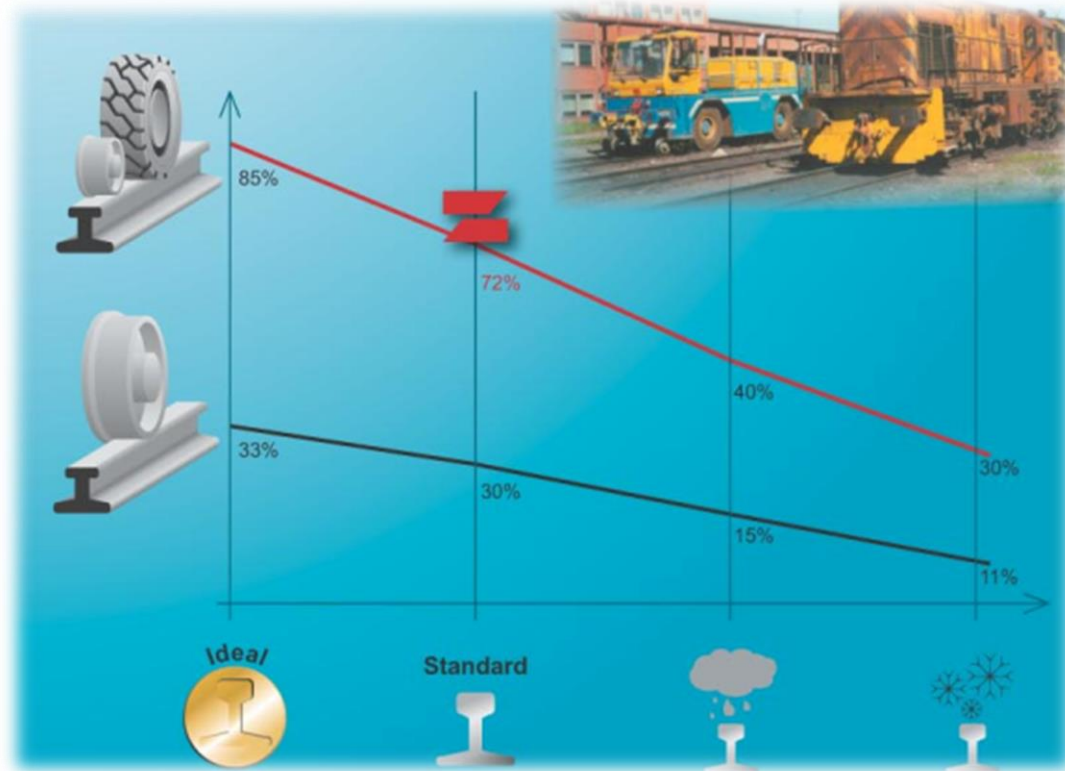
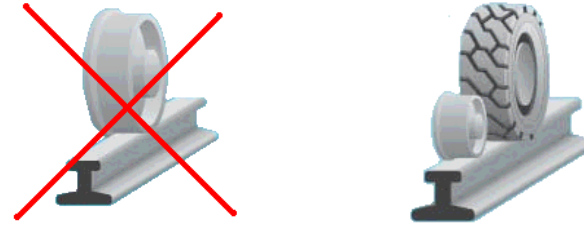


RUBBER ON STEEL TRACTION TECHNOLOGY

The design of the LOCOTRACTOR traction system incorporates Rubber on Steel technology, which produces twice the adhesion compared to conventional Steel on Steel locomotive wheels, independently from the rail condition.

*Whilst the LOCOTRACTOR has a relatively light gross weight, **the traction system has the pulling performance that are double those of an equivalent weight locomotive.***

Thanks to this ZEPHIR developed and introduced multiple advantages for the rail logistic operators.





INFRASTRUCTURE, REDUCED MAINTENANCE, MAXIMIZED USAGE AND LIFETIME



Rail wear and track maintenance costs are also reduced, due to the lighter vehicle weight, traction by the rubber wheels and the specially designed rail guide wheels of the LOCOTRACTOR.

When LOCOTRACTORs are used, the **maximum infrastructure performances can be achieved**. It's not necessary to have dedicated rail lines for fuelling or for maintenance areas, these operations are performed in road mode, and all the rail infrastructure is used for business.

The number of switches and escape lines can be greatly reduced, reducing costs and increasing the length of track used for business.





EASY TRANSPORT AND RELOCATION POSSIBILITY



The LOCOTRACTOR is easily relocated to another terminal, by truck or freight wagon, as the maximum width is standard at 2.5 metres and they have a low gross vehicle weight.

The LOCOTRACTOR doesn't need special devices to be loaded, it is driven on and off the truck directly by the driver.





References - Applications

Tram

Metro



COMPANHIA DO METROPOLITANO DE SÃO PAULO  METRÔ



दिल्ली मेट्रो रेल कॉरपोरेशन लिमिटेड
DELHI METRO RAIL CORPORATION LTD.



METRO
DE SANTIAGO



上海地铁
Shanghai Metro

Talgo



BOMBARDIER





References - Applications

Passenger and High speed trains

Depot applications



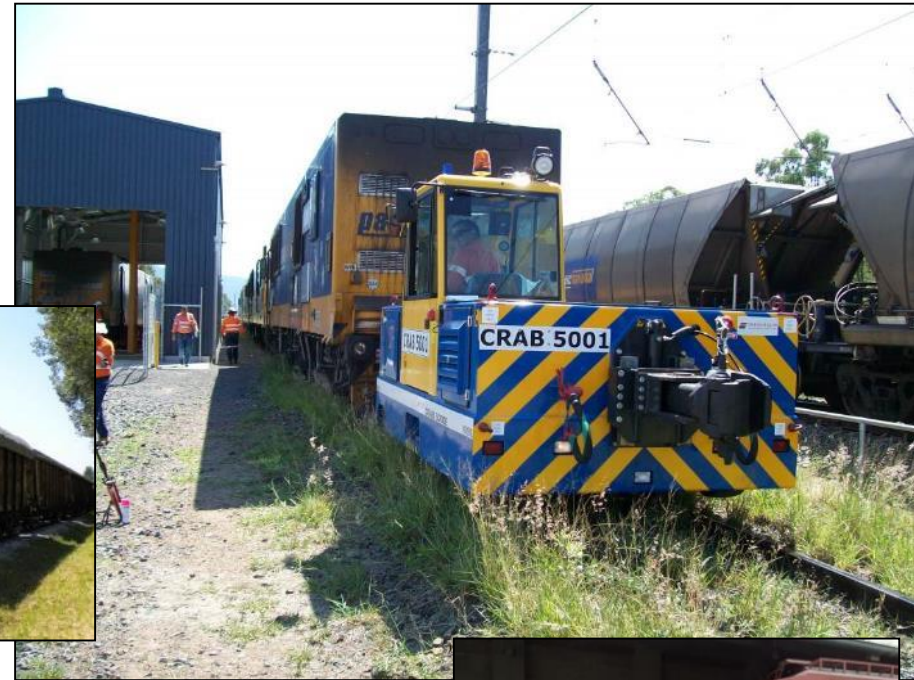


References - Applications

Freight and Cargo rolling-stock handling

Services for mines and heavy industries

Rescue and Recovery





References in African Countries

80 shunters working in African Countries since more than 25 years with great satisfaction of our Top Level customers !

Year	S/N	Customer	Model	Final Destination Country
1994	1235	Manu Afric	MODELLO 450	Morocco
1994	1236	Manu Afric	MODELLO 450	Morocco
1994	1237	Manu Afric	MODELLO 450	Morocco
1994	1238	Manu Afric	MODELLO 450	Morocco
1994	1239	Manu Afric	MODELLO 450	Morocco
1994	1240	Manu Afric	MODELLO 450	Morocco
1994	1241	Manu Afric	MODELLO 450	Morocco
1994	1242	Manu Afric	MODELLO 450	Morocco
1994	1243	Manu Afric	MODELLO 450	Morocco
1994	1244	Manu Afric	MODELLO 450	Morocco
1995	1336	S.T.A.M.	RORO 20TB25	Tunisia
1995	1337	S.T.A.M.	RORO 20TB25	Tunisia
1995	1338	S.T.A.M.	RORO 20TB25	Tunisia
1995	1339	S.T.A.M.	RORO 20TB25	Tunisia
1995	1340	S.T.A.M.	RORO 20TB25	Tunisia
1996	1432	S.T.A.M.	RORO 20TB25	Tunisia
1996	1433	S.T.A.M.	RORO 20TB25	Tunisia
1996	1434	S.T.A.M.	RORO 20TB25	Tunisia
1996	1435	S.T.A.M.	RORO 20TB25	Tunisia
1996	1436	S.T.A.M.	RORO 20TB25	Tunisia
1999	1586	Tetracom	MODELLO 650	Ethiopia
1999	1587	Tetracom	MODELLO 650	Ethiopia
2001	1735	Manu Afric	MODELLO 450	Morocco
2004	1870	Holdtrade GmbH	Trattore modello 800 NC (4x4)	Tanzania
2004	1868	HIMHEX	LOK 4.90	Madagascar
2004	1869	HIMHEX	LOK 4.90	Madagascar
2005	1927	Maritime and Transit Services Ent.	Trattore modello 650 NC (4x4)	Ethiopia
2005	1944	Holdtrade GmbH	Trattore modello 800 NC (4x4)	Tanzania
2005	1945	Holdtrade GmbH	Trattore modello 800 NC (4x4)	Tanzania
2006	2019	MPO Lisboa Maquinas Para Obras LDA	LOK 16.300	Cape Verde - Africa
2006	2004	Manu Afric	Trattore modello 650 NC	Morocco
2006	2009	Manu Afric	Trattore modello 650 NC	Morocco
2006	2007	Manu Afric	Trattore modello 650 NC	Morocco
2006	2011	Manu Afric	Trattore modello 650 NC	Morocco
2006	2005	Manu Afric	Trattore modello 650 NC	Morocco
2006	2013	Manu Afric	Trattore modello 650 NC	Morocco
2006	2010	Manu Afric	Trattore modello 650 NC	Morocco
2006	2008	Manu Afric	Trattore modello 650 NC	Morocco
2006	2006	Manu Afric	Trattore modello 650 NC	Morocco
2006	2012	Manu Afric	Trattore modello 650 NC	Morocco
2006	2014	Manu Afric	Trattore modello 650 NC	Morocco
2007	2085	MPO Lisboa Maquinas Para Obras LDA	Trattore modello 650 NC	Cape Verde - Africa
2007	2086	MPO Lisboa Maquinas Para Obras LDA	Trattore modello 650 NC	Cape Verde - Africa
2007	2087	MPO Lisboa Maquinas Para Obras LDA	Trattore modello 650 NC	Cape Verde - Africa
2007	2088	MPO Lisboa Maquinas Para Obras LDA	Trattore modello 650 NC	Cape Verde - Africa
2007	2089	MPO Lisboa Maquinas Para Obras LDA	Trattore modello 650 NC	Cape Verde - Africa
2007	2093	MPO Lisboa Maquinas Para Obras LDA	Trattore modello 650 NC	Cape Verde - Africa
2007	2094	MPO Lisboa Maquinas Para Obras LDA	Trattore modello 650 NC	Cape Verde - Africa

Year	S/N	Customer	Model	Final Destination Country
2008	2150	CTE	CRAB 2000 E	South Africa
2008	2171	Transwerk Bloem	LOK 6.110	South Africa
2008	2179	DOD De Aar	LOK 6.110	South Africa
2008	2184	S.A. Railways	LOK 2.60	South Africa
2008	2186	S.A. Railways	LOK 2.60	South Africa
2009	2192	S.A. Railways	LOK 2.60	South Africa
2009	2193	S.A. Railways	LOK 2.60	South Africa
2009	2203	Matola Coal Terminal	LOK 4.90	Mozambique
2009	2204	Matola Coal Terminal	LOK 4.90	Mozambique
2009	2226	Versarail Pty Ltd	CRAB 2000 E	South Africa
2009	2208	Matola Coal Terminal	LOKOM 16.300	Mozambique
2009	2227	Transnet Durban	CRAB 2000 E	South Africa
2009	2211	Naftal S.p.A.	LOK 10.170	Algeria
2009	2212	Naftal S.p.A.	LOK 10.170	Algeria
2009	2214	Naftal S.p.A.	LOK 10.170	Algeria
2009	2215	Naftal S.p.A.	LOK 10.170	Algeria
2009	2217	Naftal S.p.A.	LOK 10.170	Algeria
2009	2218	Naftal S.p.A.	LOK 10.170	Algeria
2009	2255	Transnet Durban	CRAB 2000 E	South Africa
2009	2246	Versarail Pty Ltd	LOK 10.170	South Africa
2009	2219	Naftal S.p.A.	LOK 10.170	Algeria
2009	2220	Naftal S.p.A.	LOK 10.170	Algeria
2010	2289	Versarail Pty Ltd	CRAB 500 E-S	South Africa
2010	2300	Sasol	LOK 10.170 S	South Africa
2010	2301	Sasol	LOK 10.170 S	South Africa
2010	2334	Port of Saldanha	LOK 6.110	South Africa
2011	2335	Port of Saldanha	LOK 6.110	South Africa
2011	2336	Port of Saldanha	LOK 6.110	South Africa
2011	2345	Versarail Pty Ltd	LOK 6.110	South Africa
2011	2347	Mondi Paper	LOK 6.110	South Africa
2011	2346	Versarail Pty Ltd	LOK 6.110	South Africa
2011	2344	Versarail Pty Ltd	LOK 10.170	South Africa
2011	2348	Versarail Pty Ltd	LOKOM 16.300	South Africa
2012	2387	Versarail Pty Ltd	LOK 13.180	South Africa
2013	2426	Versarail Pty Ltd	CRAB 1500 E	South Africa
2013	2427	Versarail Pty Ltd	CRAB 2100 E	South Africa
2014	2494	Egyptalum	LOKOM 10.170	Egypt
2014	2527	Versarail Pty Ltd	LOK 10.170	South Africa
2014	2529	Rafamet S.A.	CRAB 1500 E	Morocco
2015	2583	Cital Spa	CRAB 2100 ES	Algeria
2015	2578	SAFOP S.p.A.	CRAB 2100 E	Morocco
2016	2646	Versarail Pty Ltd	LOK 6.110	South Africa
2016	2629	GICEP	LOK 1400	Algeria
in production	2771	GEAT	LOK 1400	Algeria



MOZAMBIQUE

Year	S/N	Customer	Model	Final Destination Country
2009	2203	Matola Coal Terminal	LOK 4.90	Mozambico
2009	2204	Matola Coal Terminal	LOK 4.90	Mozambico
2009	2208	Matola Coal Terminal	LOKOM 16.300	Mozambico





ALGERIA

Year	S/N	Customer	Model	Final Destination Country
2009	2211	Naftal S.p.A.	LOK 10.170	Algeria
2009	2212	Naftal S.p.A.	LOK 10.170	Algeria
2009	2214	Naftal S.p.A.	LOK 10.170	Algeria
2009	2215	Naftal S.p.A.	LOK 10.170	Algeria
2009	2217	Naftal S.p.A.	LOK 10.170	Algeria
2009	2218	Naftal S.p.A.	LOK 10.170	Algeria
2009	2219	Naftal S.p.A.	LOK 10.170	Algeria
2009	2220	Naftal S.p.A.	LOK 10.170	Algeria
2015	2583	Cital Spa	CRAB 2100 ES	Algeria
2016	2629	GICEP	LOK 1400	Algeria
in production	2771	GEAT	LOK 1400	Algeria





SOUTH AFRICA

Year	S/N	Customer	Model	Destination C
2008	2150	CTE	CRAB 2000 E	South Africa
2008	2171	Transwerk Bloem	LOK 6.110	South Africa
2008	2179	DOD De Aar	LOK 6.110	South Africa
2008	2184	S.A. Railways	LOK 2.60	South Africa
2008	2186	S.A. Railways	LOK 2.60	South Africa
2009	2192	S.A. Railways	LOK 2.60	South Africa
2009	2193	S.A. Railways	LOK 2.60	South Africa
2009	2226	Versarail Pty Ltd	CRAB 2000 E	South Africa
2009	2227	Transnet Durban	CRAB 2000 E	South Africa
2009	2255	Transnet Durban	CRAB 2000 E	South Africa
2009	2246	Versarail Pty Ltd	LOK 10.170	South Africa
2010	2289	Versarail Pty Ltd	CRAB 500 E-S	South Africa
2010	2300	Sasol	LOK 10.170 S	South Africa
2010	2301	Sasol	LOK 10.170 S	South Africa
2010	2334	Port of Saldanha	LOK 6.110	South Africa
2011	2335	Port of Saldanha	LOK 6.110	South Africa
2011	2336	Port of Saldanha	LOK 6.110	South Africa
2011	2345	Versarail Pty Ltd	LOK 6.110	South Africa
2011	2347	Mondi Paper	LOK 6.110	South Africa
2011	2346	Versarail Pty Ltd	LOK 6.110	South Africa
2011	2344	Versarail Pty Ltd	LOK 10.170	South Africa
2011	2348	Versarail Pty Ltd	LOKOM 16.300	South Africa
2012	2387	Versarail Pty Ltd	LOK 13.180	South Africa
2013	2426	Versarail Pty Ltd	CRAB 1500 E	South Africa
2013	2427	Versarail Pty Ltd	CRAB 2100 E	South Africa
2014	2527	Versarail Pty Ltd	LOK 10.170	South Africa
2016	2646	Versarail Pty Ltd	LOK 6.110	South Africa





MOROCCO

Year	S/N	Customer	Model	Destination C
1994	1235	Manu Afric	MODELLO 450	Morocco
1994	1236	Manu Afric	MODELLO 450	Morocco
1994	1237	Manu Afric	MODELLO 450	Morocco
1994	1238	Manu Afric	MODELLO 450	Morocco
1994	1239	Manu Afric	MODELLO 450	Morocco
1994	1240	Manu Afric	MODELLO 450	Morocco
1994	1241	Manu Afric	MODELLO 450	Morocco
1994	1242	Manu Afric	MODELLO 450	Morocco
1994	1243	Manu Afric	MODELLO 450	Morocco
1994	1244	Manu Afric	MODELLO 450	Morocco
2001	1735	Manu Afric	MODELLO 450	Morocco
2006	2004	Manu Afric	Trattore modello 650 NC	Morocco
2006	2009	Manu Afric	Trattore modello 650 NC	Morocco
2006	2007	Manu Afric	Trattore modello 650 NC	Morocco
2006	2011	Manu Afric	Trattore modello 650 NC	Morocco
2006	2005	Manu Afric	Trattore modello 650 NC	Morocco
2006	2013	Manu Afric	Trattore modello 650 NC	Morocco
2006	2010	Manu Afric	Trattore modello 650 NC	Morocco
2006	2008	Manu Afric	Trattore modello 650 NC	Morocco
2006	2006	Manu Afric	Trattore modello 650 NC	Morocco
2006	2012	Manu Afric	Trattore modello 650 NC	Morocco
2006	2014	Manu Afric	Trattore modello 650 NC	Morocco





ZEPHIR SUCCESS STORIES

- **CRAB 1500E**



- **Chicago, USA**

- **Shunting of various rolling stock**



- ***LOK 6.110 with multiple couplers and snow removing turbine***



- ***Lithuania***
- ***Shunting of complete trains, and snow removing in road and rail mode***



- ***Crab 5000 E***



- ***Copenhagen, DK***
- ***No. 8 units of Shunting vehicles in 8 Depos***



- **CRAB 5000E**

ALSTOM

- **Poland**

- **Shunting of complete High Speed trains on underfloor wheel lathe and in the external yard**



- ***LOK 14.240 and LOK 20.300***



ArcelorMittal

- ***Netherlands***
- ***Shunting of wagons full of coils in steelworks***



- **LOK 10.170 D**



- **ALGERIA**

- **No. 8 units for shunting of wagons in different terminals**



- **LOK 1400**
- **INDONESIA**
- **No. 10 units for shunting of wagons for a copper and gold mine**





***Thank you for your
attention!***



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www.zephir.eu***