



# Research, Innovation and Transfer of Technology: The experience of Talgo in Russia



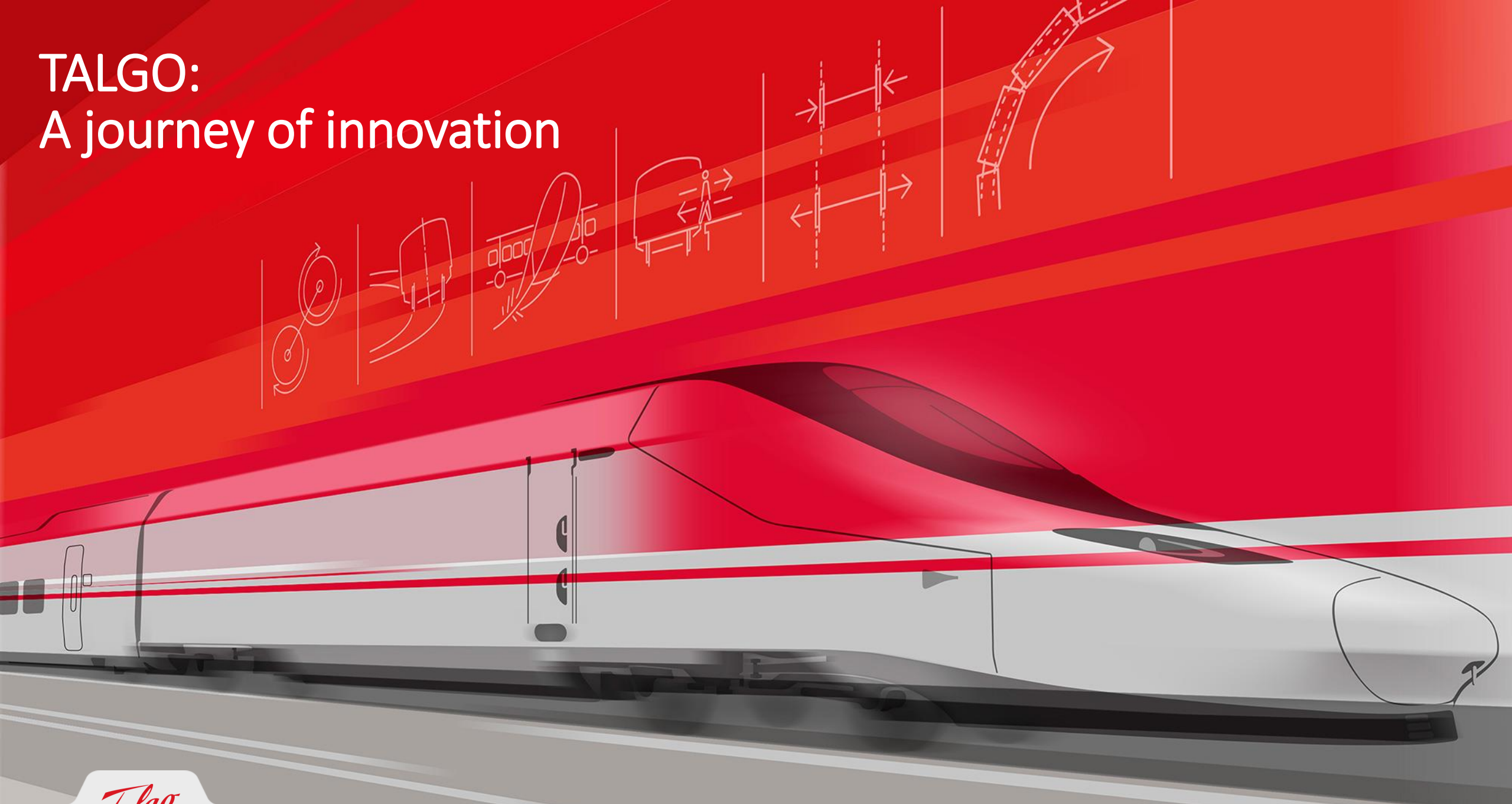
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# TALGO: A journey of innovation



*Talgo*





# TALGO WAS FOUNDED IN 1942 WITH INNOVATION CULTURE TO IMPROVE THE TRANSPORT'S QUALITY OF RAILWAY PASSENGERS

## >> Lightweight construction

- ▮ Less maintenance costs
- ▮ More acceleration in curves



## >> Natural pendular system and independent wheel

- ▮ More acceleration in curves
- ▮ Better dynamic behaviour
- ▮ Better confort
- ▮ More safety

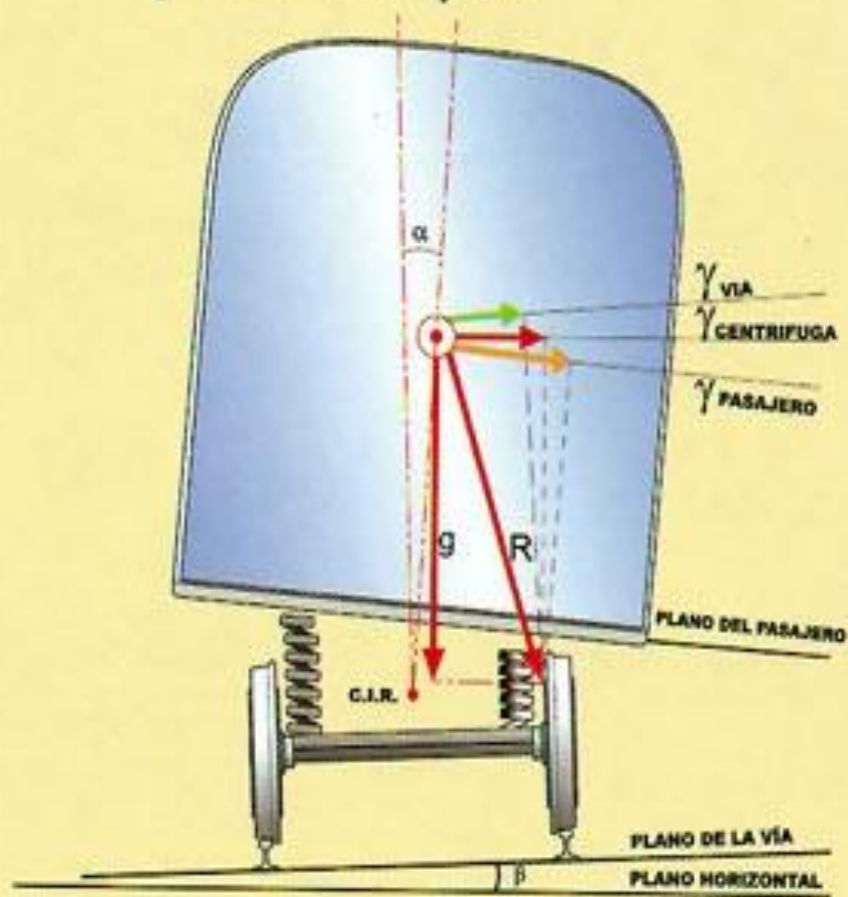
## >> Articulated coaches

- ▮ Better behaviour with infrastructures
- ▮ Better aerodynamic behaviour
- ▮ Better rail guidance
- ▮ Less maintenance operations
- ▮ Better reliability



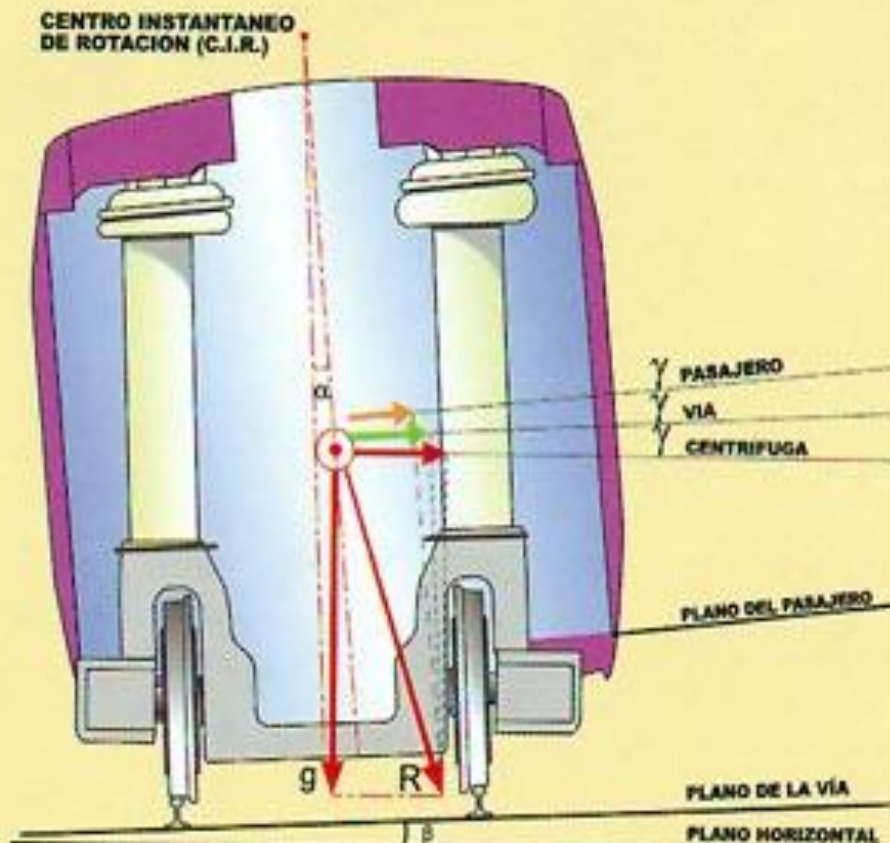
## TREN CONVENCIONAL

$$\gamma_{\text{PASAJERO}} > \gamma_{\text{VIA}}$$



## TALGO PENDULAR

$$\gamma_{\text{PASAJERO}} < \gamma_{\text{VIA}}$$



# TALGO: Innovation, Research and Transfer of Technology



*Talgo*



# TALGO: Innovation, Research and Transfer of Technology

- » Particular wheelset
- » Particular dynamic behaviour
- » Particular systems in the train

## CONSTANT INNOVATION

- More competitiveness
- Better trains with better characteristics

## RESEARCH

- Talgo I+D+I
- Universities
- Research centers

## TRANSFER OF TECHNOLOGY

- Technical Training
- Talgo's patents and know-how



# TALGO: The experience of Talgo in Russia



# MOSCOW – BERLIN “STRIZH” TRAINS

- » MOSCOW – BERLIN trains
- » THE TRIP IS 4,5H SHORTER **WITH THE SAME INFRASTRUCTURE**
- » 4 COUNTRIES
- » TALGO RD VARIABLE GAUGE SYSTEM
  - 1.520mm Russia
  - 1.435mm UIC
- » V MAX 220 km/h
- » 216 PASSENGERS
- » 20h 14 minutes





# MOSCOW – BERLIN “STRIZH” TRAINS

## » EXTREME WEATHER CONDITIONS → RESEARCH

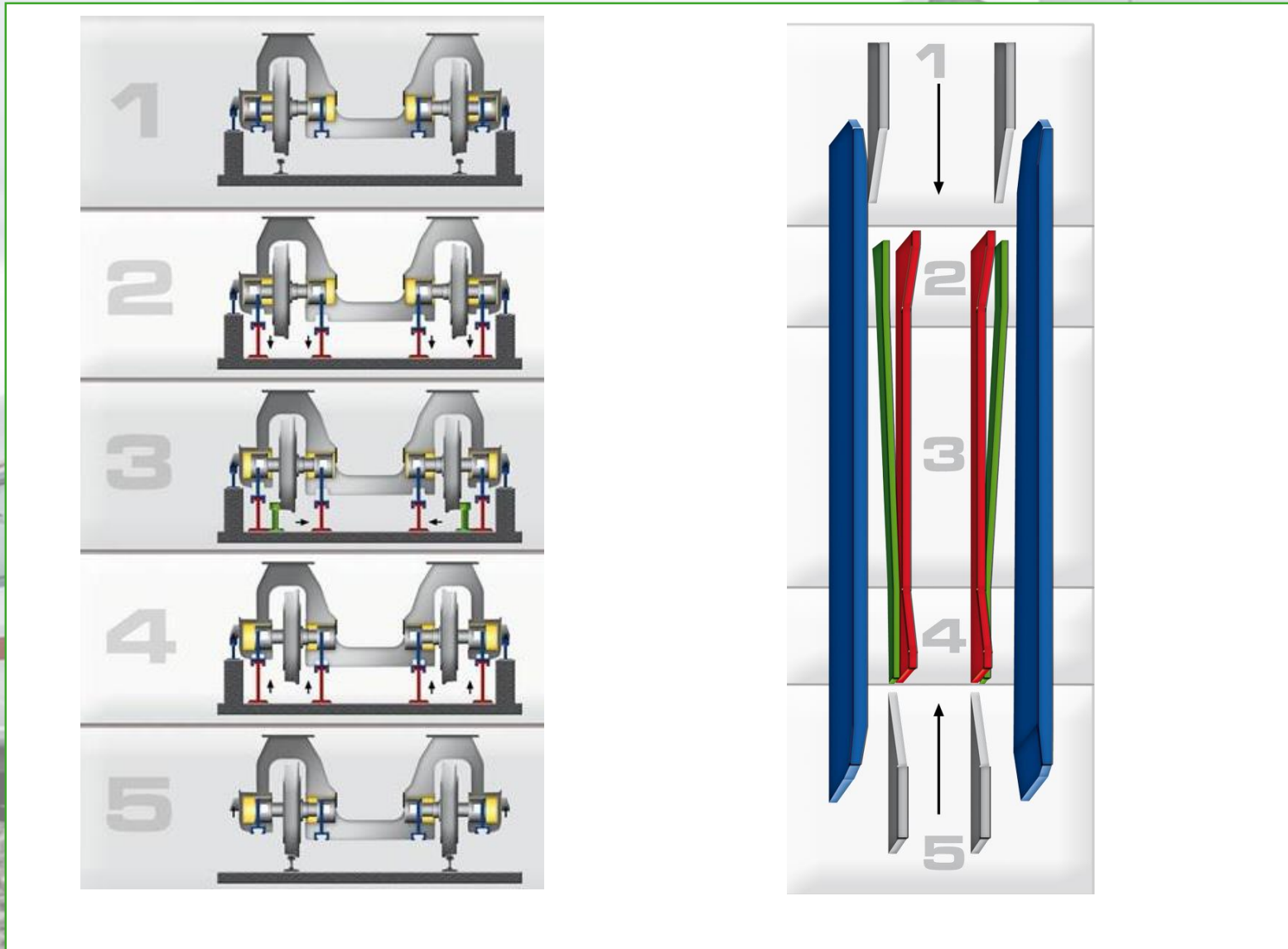
- HOT AIR AVOID THE FREEZING OF ELEMENTS IN WHEELSET
- AIR BLOW SYSTEM TO AUTOMATIC STEPS
- ANTI-FREEZING SYSTEM IN WIDTH CHANGE INSTALLATION

## » LESSONS LEARNED AND EXPERIENCE

- SNOW
- LOW TEMPERATURE



# WHEELSET AUTOMATIC WIDTH CHANGE







# Talga

*A trully great journey begins and ends on the  
railway tracks*

... Thank you for your attention..



**Pablo Garrido Martínez – Llop**  
**Talga Project Manager**