

Talgo Changing the Way America Moves.™

Talgo Technological Principles (TTP)

The first Talgo Train was designed in the early 1940s. This innovative train revolutionized rail manufacturing by debuting the same technological principles that today make Talgo trains the safest, most innovative and reliable passenger rail trains around. Talgos technology has constantly been advanced over the years, enhancing its winning features and developing exciting new ones.

Independent Wheels... and Fewer of Them!

A Acquisition and maintenance costs for steel wheels are greatly reduced on Talgo cars. Talgo wheel sets are located between adjoining cars instead of "under the cars" as in conventional equipment. Conventional cars have two trucks with a total of 8 wheels on each. Each Talgo car is equipped with a single wheel set located at one end and is suspended from the adjacent car at the other end in Talgo's Automatic Steering System (TASS). Coupled with Talgo's independent wheels (no solid axles), this allows the cars to follow the centerline of the track at all times. Designed to allow wheels to rotate at different speeds on straight lines and when negotiating curves, dangerous hunting movements and excessive wheel-track interaction are greatly reduced. Consequently, the cars are "guided" over the track, thus eliminating the contact between the wheels flange and the track when negotiating a curve.

(See Figure A)

Talgo Automatic Steering System (TASS)

A The Talgo Automatic Steering System allows for increased safety as wheels are kept parallel to the track at all times. TASS works naturally by connecting each wheel axle to the adjacent cars via two solid guiding devices formed by steel articulated bars. There are no engines or electronic devices involved in the operation. Wheel-track interactions are reduced to a minimum. (See Figure A)

Short-Length Cars and Lightweight Construction

Short and lightweight is a beautiful thing. Really. Talgo cars are approximately 42 feet long and are somewhat wider than conventional cars. The lightweight design and construction offers key advantages to acceleration, braking and the amount of stress placed on steel rails. Did we mention that we're short? We're short and we're proud. Short lengthwise design provides egress opportunities that exceed FRA requirements because roughly two Talgo cars are in place for one conventional car. The low-platform height keeps the center of gravity low and allows Talgo to be the most ADA-friendly passenger rail cars around.

Articulated Connection Between Adjacent Cars

Talgo trains keep it together, and do it quietly. Talgo's multiple connection points mean increased safety, increased reliability and increased passenger comfort. Talgo cars are strongly connected to one another with several connection devices. In addition to a stronger connection, anti-overriding mechanisms are located between each car. Thus, the risk of overturning individual cars and "piling-up" is significantly reduced. Noise and vibrations are also reduced to a minimum, as there are no trucks located underneath passenger areas. The location of shock-absorbers (four lateral and one longitudinal) and springs (on top of the car body structure) also helps to reduce noise and vibrations.



Talgo Technological Principles & Benefits

Lightweight Aluminum Construction

- Less energy consumption
- Lower traction costs
- Higher acceleration and braking capability

Articulated Connection Between Adjacent Cars

- Increased safety and passenger comfort

Independent Wheels

- Increased safety – no hunting movement
- Reduced wheel and track wear
- Lower maintenance costs

Talgo Automatic Steering System (TASS)

- Increased safety
- Reduced wheel and track wear
- Lower maintenance costs

Talgo Natural Tilting System (TNTS)

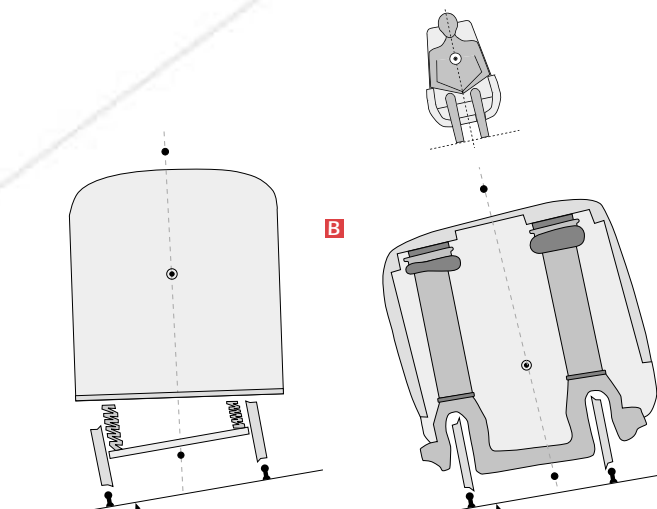
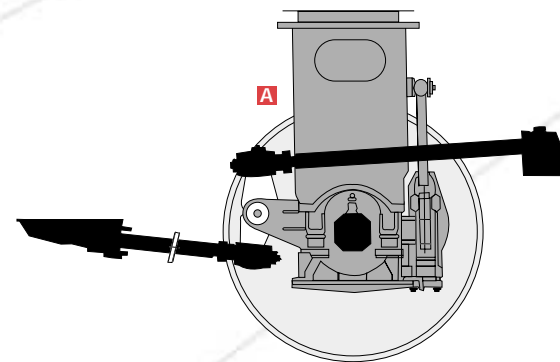
- Higher speeds in curves
- Greater passenger comfort
- No additional maintenance costs
- Fail-safe system
- No energy consumption

Short-Length Cars

- Stronger mechanical resistance
- Lower center of gravity for increased safety and comfort

Low Center of Gravity and Reduced Transversal Profile

- Higher dynamic stability
- Less energy consumption



Conventional Train

Pendular Train



Talgo Natural Tilting System (TNTS)

B

In a Talgo tilting car, suspension springs are located above the center of gravity of each car. As the train enters a curve, centrifugal force makes the car-body tilt toward the interior of the curve (as a pendulum), allowing for faster speeds and higher passenger comfort. TNTS' operation

does not consume energy and is virtually fail safe because it does not use computers, engines or electronic devices. TNTS is part of each Talgo design and is provided at no extra cost. For further cost savings, TNTS operation requires no specialized maintenance. (See Figure B)



We're **different**.
 We've always been **different**.
 And that is what **makes us the best**.

Talgo

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