

**TWO AXLE BOGIE DRRS-EFD,  
THE BEST BOGIE FOR THE EUROPEAN FREIGHT RAILWAY WAGONS-  
IN EUROPE AND IN THE WORLD  
WITH DOUBLE RUBBER ROLLING SPRING SYSTEM  
ADVANTAGES OF BOGIE FAMILY Y25**

The following requirements and targets have been ordered in the development of this two axle bogie with double rubber rolling spring.

After the first production of the DRRS-EFD Bogies in the years 1990 to 1992, the further development of this family DRRS-EFD Bogie have been created by Kombibahn Europe TBT GmbH in Germany. Kombibahn Europe TBT GmbH has further developed the Bogies with the same installation space as a Rigid Axle Bogie in accordance with UIC MB-510-1 for Y25 Bogies. These Bogies' axle has the capacity to carry more than 18t of axleload and can be driven from a speed of 100 to 160km/h. This DRRS-EFD Bogie has very low wearing parts such as hooks, hook stones and bolt etc. in the wheel set guidance. This significantly reduces the cost and maintenance of the Bogie.

The double rubber rolling springs of the DRRS-EFD steering axle Bogie are installed in parallels both horizontally and vertically of both sides the wheelset . Thus, the Bogie is named so:

**DRRS-EFD - Double Rubber Rolling Spring-Elastomer Feder (Spring)  
Drehgestell (Bogie).**

The advantages of the double arrangement of the Rubber Rolling Springs are: first, the loading-power is shared by the two rolling springs, second, the cardanic movement of the central mandrel housing, clamped between the two rubber rings, causes the rubber roll suspension to be transversely soft to

the main spring direction, as it is required to guide the wheel-sets like the steering axle in the bogie frame. In the transverse direction, the spring characteristics are roughly the same as a conventional Leaf-Spring structures. In the longitudinal direction, the spring rate is approximately 4 times higher than ordinary steel spring structures. This flexible longitudinal joints of the wheel sets is necessary to keep them running smoothly while driving at higher speed. It allows a sufficient adjustment of the wheel sets (radial position) while travelling (the journey) on the curved rails, therefore considerably lowers the tendency of the wheels to slip from the rail and likewise the loss of friction on the flange and rail head as compared to the rigid axle Bogie Y25.

**( Diese steife Längsanlenkung der Radsätze ist für höhere Fahrgeschwindigkeiten erforderlich, um den Radsatzlauf ruhig zu halten. Sie lässt aber beim Bogenlauf eine ausreichende Einstellung der Radsätze (Radialstellung) zu, wodurch die Schlupfwerte zwischen Rad und Schiene und damit die Reibleistung bzw. der Verschleiß am Spurkranz und Schienenkopf gegenüber dem Starrachs Bogie Y25 erheblich geringer sind.)**

A friction-damper is used as additional damping (see Figure 1), which is made with a spring plunger that pushes on the friction plate on both sides of the wheelset bearing housing and the mandrel housing. The pre-tensioning of the damping-power system is generated by the transverse and vertical loading of the rubber roll springs. This friction-dampers are therefore proportional to the load and speed.

**(Als zusätzliche Dämpfung kommt ein Reibungsdämpfer zum Einsatz (siehe Abbildung 1), der aus einem auf die beidseitigen Reibplatten des Radsatzlagergehäuses und der Dorngehäuse wirkenden Stößel besteht. Die Vorspannung der prismatischen Dämpfung wird durch die Quer- und Vertikalbeanspruchung erzeugt. Diese Reibungsdämpfung wirkt damit Last- und Geschwindigkeitsproportional).**

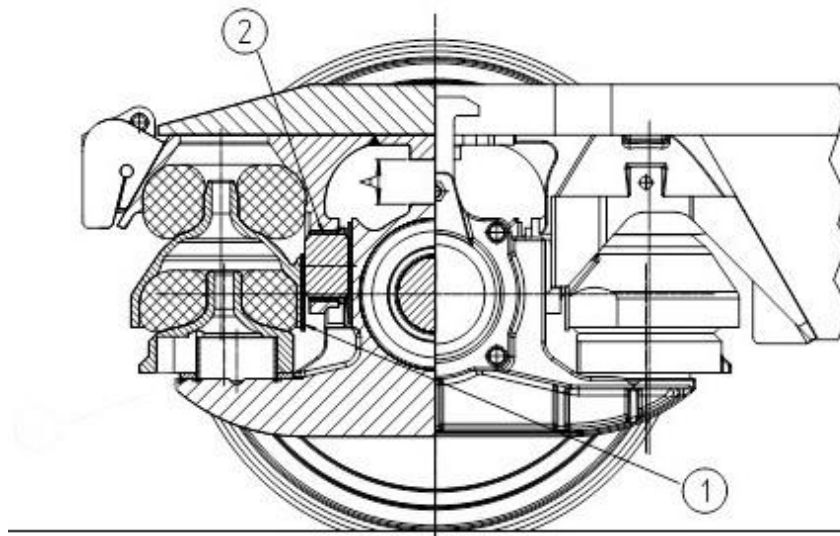


Figure 1. Wheelset guiding with damping function in Bogie DRRS-EFD.:

Pos1 sliding plate    Pos2 friction bolt

The operational experiences and field tests in the years 1980 to 1982 by the railway-firms SBB, DBAG, ÖBB, BLS showed the reliability of the technology used.

**(Die Betriebserfahrungen und Betriebsversuche in den Jahren 1980 bis 1982 bei den Bahnen SBB, DBAG, ÖBB und BLS zeigten die Zuverlässigkeit der angewandten Technik)**

Further field tests at SBB in 1992:

Protokoll from railway DBAG and SBB from 21.02.1992

An operational tests were performed on the rail tracks of the north-south connection of Germany-Gotthard-Italy with 60 ft container wagons to compare the Bogie Y25 and the Bogie DRRS-EFD, both using wheel profile UIC/ORE S 1002 at a mileage of about 300,000 km without reprofiling.

Wear-controlling on the wheel flange.

The result showed: The radially adjustable-wheelsets of the Bogie DRRS – EFD has an unequivocal improvement against the wear situation. This can be seen from the comparison with the guided wheelsets on the Bogie Y25. This improvement is noticeable after 80,000 km which increases significantly as

the mileage increases. For more information you may watch our powerpoint presentation about the DRRS-EFD Bogies on our website:  
[www.Kombibahn.de/bogies](http://www.Kombibahn.de/bogies).

Due to the double rubber rolling spring system, it is now possible to reduce the noise significantly of the freight wagons on the rails.

The DRRS-EFD Bogie fulfills all specifications, regulations, and recommendations of the UIC MB 518-VE and is more economical than the Bogie Y25 in terms of maintenance and servicing due to the design with few wearing parts.

Both bogies are registered at TSI-wag 2006 and at OTIF 2010.

The following are descriptions of the Bogie Y25:

- It is a rigid wheel-set;
- It is not suitable for operations of speed of more than 100 km/h;
- Its Y / Q does not meet the requirements of UIC MB-518VE without suitable measures
- Due to its many wearing parts and its rigid axle principle, the low noise limit cannot be achieved and is therefore less economical than the DRRS-EFD Bogie.

**(Durch die vielen Verschleißteile und das Y25 Starrachs-Prinzip ist das low noise- limit nicht erreichbar und somit unwirtschaftlicher als das DRRS-EFD Bogie).**

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English Version