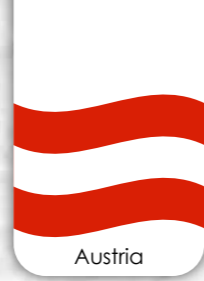


Bell B60E replaces two 40t ADTs at the Starkenbach gravel plant

Since June 2019, a Bell B60E supplied and serviced by Mörtlbauer Baumaschinen, the Tyrolean cooperation partner of German Bell dealer Kiesel GmbH, has been working in the Starkenbach gravel works in Austria. The articulated two-axle, four-wheel drive vehicle optimises the demanding topography and weather-sensitive conveyor chain in the company and, in the long term, replaces two 6x6 forty-ton trucks, to bring major economic advantages to the operation.



For more than 35 years, lime dolomite has been processed into high-quality minerals, concrete aggregates and road substructures in the Starkenbach valley, a side incision in the Inn Valley near Schönwies. The high-quality raw material stands in a natural gravel dump around 1 000m long on the southern slope of the Senffenberg and is mined directly at the foot of the slope at around 1 500m without complex covering measures or blasting.

The Starkenbach gravel plant was initially founded in 1857 as the processing division of the Streng Bau construction company and became an independent company in 2008. It complements the wide range of services offered by the family-run earthworks, civil engineering and road construction company with a total of 70 employees. The annual production in the plant is up to 500 000 tons, which is delivered in a radius of around 50km by the Streng Bau fleet and third-party trucks to the Tyrolean hinterland or to Vorarlberg. The company uses block trains nationwide and to neighbouring countries via a fully automated rail loading facility that opened directly on the Inn Valley route in 2010 (capacity: approx. 200 000t/year).

Optimisation of the conveyor chain

From around March to December the Starkenbach gravel works is mined, and a specially appointed avalanche commission monitors the heavily exposed extraction zone. The mining area is examined during winter using video monitoring and external experts. This also applies to the almost 1 000m long haul route used by the dump trucks over and along the Starkenbach creek down to the plant at an altitude of around 900m. The unpaved road has a gradient of up to 17%, which makes driving downhill with loads very demanding, even in dry weather and especially in the transition times that are difficult to predict in terms of weather.

Until July 2019, the company relied on two articulated 6x6 40-ton trucks, each with a nominal payload of 38 tons. These vehicles were subject to high wear and tear in everyday operations in Starkenbach due to their drive systems and caused high maintenance costs. Accordingly, Managing Director, Thomas Walthe, and Operations Manager, Andreas Saurer, were open to alternative replacement concepts for the upcoming renewal at the end of 2018. "Our goal was to significantly reduce operating and personnel

costs in our conveyor chain without having to make concessions in terms of transport performance, all-weather suitability, and thus availability."

One of these alternatives, as suggested by Mörtlbauer Baumaschinen and Kiesel's application specialist, was the changeover to the 60-ton Bell B60E in a solo operation. The subsidiary of the Lower Bavarian construction machinery and attachments specialist of the same name has been based in Wiesing in the Zillertal valley since 2005 and supports Kiesel sales in the western Austrian regions.

Even in the first consultations with an in-depth needs analysis, the Bell flagship was recommended as a replacement for the two existing 40t ADTs due to its large 55t payload. As an articulated four-wheel two-axle vehicle, the agile Bell B60E promised considerable advantages in the organisation and maintenance of the route as well as in dealing with very specific driving situations. With no oncoming traffic, there is no need for additional passing points. And without the typical scuffing of the rear tandem axles, which causes conventional three-axle dumpers to repeatedly loosen the ground,



The Bell B60E covers a total of around 2 000m on the cycle from the mining zone (in the background) for processing.

especially in bends, road maintenance is also reduced. In Starkenbach, another advantage of the two-axle is significant – when crossing the stream, the wheels of the rear tandem axles of the 40t trucks caused major water stagnation, which regularly led to water ingress and heavy loads on the axles. With its greater wading depth and less water accumulation on the single rear axle, the Bell B60E crosses the stream without any problems, even at higher water levels, which significantly improves availability in prolonged periods of bad weather.

In early 2019, after a detailed assessment of the Bell B60E, the Starkenbach gravel works decided to use the large Bell two-axle vehicle as the first vehicle in its class in Austria. Using Kiesel's 'Test

& Buy' programme, Mörtlbauer configured the B60E to the customer's requirements and rented it out for a test period of 12 months, providing the customer time to decide whether to purchase or return the truck.

"Over the test period the 60t truck had to adhere to strictly defined operating and maintenance goals. The focus was clearly on the reliability and ease of maintenance of the Bell retarder technology," recalls Mörtlbauer's Customer Advisor, Manfred Lübke. The loaded Bell B60E, which weighs almost 100t, had to prove itself with its electronically controlled combination of engine valve braking and wet-disc brakes. "And not only directly on the slope, but also in the ongoing and final assessment of wear behaviour,"

continues Manfred Lübke, whose colleagues in Mörtlbauer Service also ensure regular maintenance.

Safe and fast in operation

Today, under normal conditions, the 430kW Bell B60E handles the daily target of around 2 000t with up to 35 cycles per nine-hour shift. The 60t truck is loaded with a 3,0m³ bucket on a 40t excavator, the driver of which always has a clear view of the filling level of the 35m³ bin thanks to the load lights.

Shortly after leaving the loading point, driver Christian Fink reduces speed on the downhill slope and the electronically controlled Bell retarder system takes over automatically. A maximum of 983kW braking force is available on the auxiliary brake. The retarder effect can be preselected in six

stages - if necessary, the vehicle decelerates to walking speed under all load conditions without using the service brake. The articulated joint ensures that all wheels stay in contact with the ground, which is a major safety plus over two-axle rigid vehicles and, together with the 7-speed Allison automatic transmission and inter-axle limited-slip differential, ensures efficient traction. This benefits the Bell B60E in Starkenbach when it comes to fast empty trips to the mountain (empty weight: 42,5t) and when manoeuvring on the dumps or on the primary crushers. The great manoeuvrability of the two-axle vehicle (turning radius: 9 216mm) did not require any structural changes and is partly responsible for the short turnaround times of around 20 minutes.

Fully met expectations

"The Bell B60E has been integrated seamlessly into our operation and has met all of our expectations," says Managing Director, Thomas Wattle, after more than 2 000 hours of operation. "One machine does the same thing today as two vehicles did before, and at significantly lower maintenance and operating costs."

The 60t truck, using 250 to 270 litres of diesel per 9-hour shift, has a consumption comparable with one of its 40t predecessors and scores points in terms of cost-critical tyre wear. "On our roads with tight bends, the tyres on the 6x6s only lasted between 3 000 and 3 500 operating hours," says Andreas Saurer, quantifying the typical wear and tear on three-axle earthmoving vehicles in

intensive quarrying work. The Bell B60E, on the other hand, shows no excessive wear on the 875/65 tyres at the front or the 24.00 R35 twin tyres at the rear after more than two thirds of the comparison period.

The targeted assessment of the wet brakes, which are equipped with their own cooled oil circuit and are virtually maintenance-free in daily operation, did not reveal any significant stress despite the specific load. Thus, in July 2020, the last requirement for the final takeover of the Bell B60E into the Starkenbach fleet was successfully fulfilled.

Publication courtesy of Kiesel GmbH



The large Bell two-axle vehicle weighs almost 100 tonnes when loaded.



Happy about the Austrian premiere of the Bell 60-tonner (from left): Mörtlbauer Customer Advisor Manfred Lübke, Operations Manager Walter Mörtlbauer, Managing Director Thomas Wattle, Operations Manager Andreas Saurer and Driver Christian Fink.

Photo credit: Kiesel GmbH