

Liebherr LTR 1060 telescopic crawler crane proves its off-road credentials in high Alpine terrain

- Crane operator Clausen uses LTR 1060 at an altitude of 2020 meters
- LTR 1060 handles tight bends with steep gradients of up to 40 percent with ease
- Technical assistance from Liebherr for planning the job

Ehingen / Donau (Germany) October 2014 – A Liebherr LTR 1060 was driven around tight bends and on gradients of up to 40 percent to the site at an altitude of 2020 meter to extend a tunnel on the Gornergrat railway in Zermatt in the Swiss Canton of Wallis. A superb team from Clausen Kran AG with technical assistance from Liebherr in advance and perfect crawler crane technology made the extremely difficult approach possible.

A tunnel on the Gornergrat rack railway, the second-highest mountain railway in Europe, is currently being extended to allow a downhill ski run to be run over the tunnel so that in the future it can stage FIS skiing events. The LTR 1060 telescopic crawler crane of Wallis-based crane operator Clausen has already proven its qualities in high Alpine terrain on several occasions in the past. But the challenges for this job were drastically greater than usual. Gravel tracks with tight bends and steep slopes plus gradients of up to 40 percent had to be overcome on the 920 meter route with an ascent of 180 meter.

This is why Clausen turned to crane manufacturer Liebherr to discuss the feasibility of this difficult task. General manager design department Hans-Dieter Willim and his team provided all the support required. The overall centre of gravity of the machine was calculated to ensure that it would not tip over and would remain manoeuvrable when travelling around the bends and up the gradients. The results showed that the LTR 1060 would be able to travel along the route without ballast at a gross weight of 38 tonnes and the boom at an angle of 20 degrees. In addition the hook block had to be secured to prevent it swinging.

Another special challenge was the fact that as a result of the narrowness of the track the crawler crane would only be able to negotiate the snaking route with its crawler

chassis retracted. The narrow crawler track meant, however, that the steerability of the crane was severely restricted as a result of the poor ratio between the crawler length and the track width. To allow the vehicle to be steered in the tight bends, one meter lengths of square timber were placed under the inner crawler chains to act as pivots. Another recommendation from Liebherr was that the direction of travel of the crawler chassis should be selected so that the chain drives were at the rear to ensure that the crawler chain remained taut on the ground at all times.

Another challenge for using the LTR 1060 in the Alps was the heat development in the gearbox and rollers due to the high loads caused by the long, steep route. Hans-Dieter Willim was at the site himself to check the temperature of the critical components using a thermal camera. The company had talked to the gearbox manufacturer, Liebherr in Biberach in advance of the job and decided to reduce the oil level slightly in the gearboxes to reduce splashing losses caused by the oil being swirled around. The result was definitely positive. The temperatures remained well below the maximum values.

The entire job was very exciting for everybody involved. The narrow access route to the site on a low loader through Zermatt in the early morning was also difficult. To cross a narrow bridge with a low weight capacity, the LTR 1060 had to be unloaded just before reaching the crossing. The vehicles were then driven across the bridge singly. The LTR 1060 was then driven back on to the low loader which took it up to an altitude of 1840 meter above sea level. At this point company owner Geri Clausen himself got into the crane cab and started the two-hour journey in the crane up the mountain. The final few metres had to be driven in reverse to enable the crane to access the site more easily.

Geri Clausen is completely happy with his Liebherr telescopic crawler crane. He commented, "We have lots of sites where this highly manoeuvrable crane is simply perfect."

Clausen Kran AG is a family company which first opened for business in 1972 in Brig in Wallis. The company characteristics include its many years of experience and competent, motivated team. Its modern, well maintained fleet consists of four Liebherr

cranes and two heavy transport vehicles. The smallest crane is an LTC 1055-3.1 compact crane, the largest an LTM 1220-5.2.

Captions

liebherr-LTR-1060-clausen-01.jpg:

The most difficult point: Geri Clausen manoeuvres his crane around a tight, steep bend with great skill.

liebherr-LTR-1060-clausen-02.jpg:

Three-centimetre clearance: Geri Clausen checks the small gap to the bridge in Zermatt.

liebherr-LTR-1060-clausen-03.jpg:

The LTR 1060 handled gradients of up to 40 percent going uphill to the site.

liebherr-LTR-1060-clausen-04.jpg:

The final section had to be driven in reverse to enable the crane to access the site more easily.

liebherr-LTR-1060-clausen-05.jpg:

There at last – the LTR 1060 works on the roof of the mountain railway tunnel with the Matterhorn in the background.

liebherr-LTR-1060-clausen-06.jpg:

Taken off the low loader the crawler crane passed this bridge on its own. The weight limit of the bridge was too low for the laden transporter.

liebherr-LTR-1060-clausen-07.jpg:

The LTR 1060 worked its way up the steep snaking road.

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Published by

Liebherr-Werk Ehingen GmbH

Ehingen / Donau, Germany

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