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# R 9150 E

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## Job report: Mining excavator

The Liebherr R 9150 E excavator JCS Mining limestone quarry in Zhenjiang, China

# LIEBHERR

Mining excavator

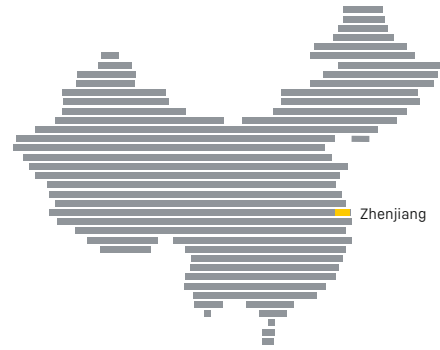




# Situation



China



JCS Mining is operating the quarry located in southern Zhenjiang, China, which produces four different qualities of limestone used within the concrete and steel industries, as well as for road construction. As the site directly contributes to regional development, operators move approximately 50,000 tonnes / 55,116 tons of material daily, representing 4,200 operating hours and 15 million tonnes / 16.5 tons of production per year.

Since 2019, JCS Mining has been progressively replacing their fleet of six electric rope shovels (WK-4C) with Liebherr mining full electric shovels to load their twenty-seven 45 tonnes / 50 tons trucks (Sany SRT45).

## R 9150 E performances

Compared to the WK-4C electric motor that generates 250 kW / 335 HP and 450 kN of lifting force, the R 9150 E has a power output of 565 kW / 757 HP which generates 779 kN crowd force and 720 kN breakout force (ISO 6015). Its electrical 3-phase AC squirrel cage motor has a target

lifetime three times longer than a conventional diesel engine and is designed to face tough 24 / 7 mining operations. Providing high levels of efficiency and productivity, the R 9150 E enables fast cycle times and precise machine motions with still zero emission.

### Operating weight

130 tonnes / 143 tons

### Motor output

565 kW / 757 HP

### Electric motor

6000 V / 50 Hz, 65 A

### Bucket capacity

8.3 m<sup>3</sup> / 10.9 yd<sup>3</sup>

### Max. crowd force (ISO 6015)

779 kN

### Max. breakout force (ISO 6015)

720 kN

### Max. oil flow

2,171 l / min



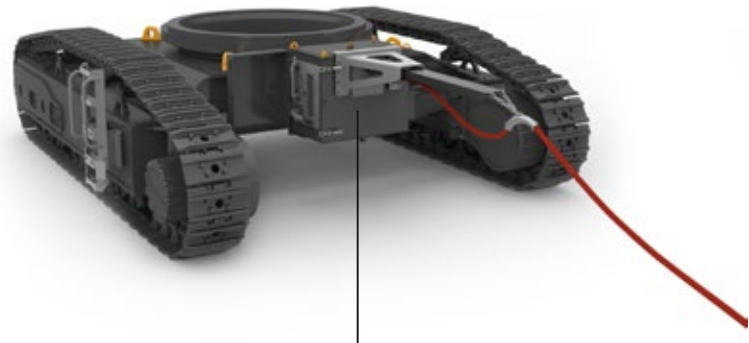
# Production test

## Test result

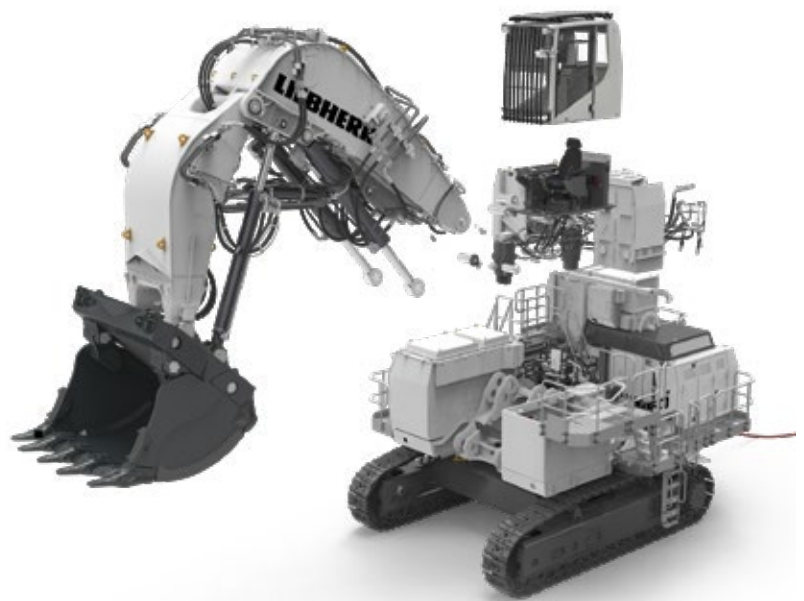
	WK-4C (4 m <sup>3</sup> / 5.2 yd <sup>3</sup> bucket)	R 9150 E (8.3 m <sup>3</sup> / 10.9 yd <sup>3</sup> bucket)
Average load per truck	45 t / 50 tons	45 t / 50 tons
Cycle time	40 sec	25 sec
Cycle per truck	7	4
Average loading time per truck	4 min 07 sec	1 min 18 sec
Truck exchange time	45 sec	45 sec
Tonnes per hour	560 t / 617 tons	1,315 t / 1,450 tons

Following a production test in the field, operators reported superior productivity with the R 9150 E. One single electric Liebherr machine achieved 30 % higher productivity than two electric rope shovels. Despite having a bucket twice the size of the WK-4C, the R 9150 E controls and motions are highly responsive and intuitive, enabling the use of selective mining techniques and other bench preparations.

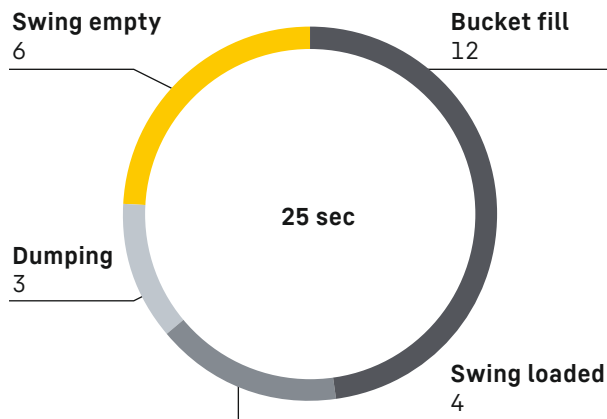
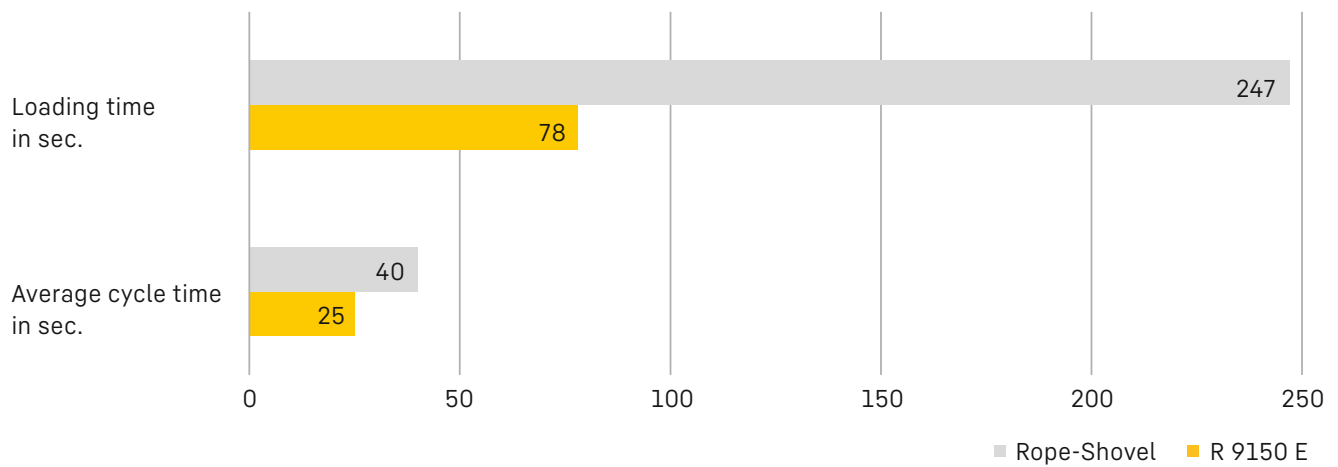
The productivity of the loading tool is of course affected by the capacity of the trucks on site. Had our test been conducted with a 60 t truck, the production results would have achieved 11 % higher productivity. However, machine performance with existing trucks is subject to improvement, as operators will become familiar with hydraulic excavators in face shovel configuration.



Supply cable connecting box



# Machine efficiency & productivity



## Test key facts

Total test duration	62 min
Total trucks loaded	30 trucks
Total tonnes moved	1,315 t / 1,450 tons
Electrical consumption	400 kWh
Tonnes per kWh	3.4 t / 3.75 tons
Bench height	12 m / 39'4"
Density	1.8 t / m <sup>3</sup> / 3,034 lb / yd <sup>3</sup>
Fragmentation	Good
Trucks	Sany SRT45 (45 t / 50 tons)

## Learning curve

In consequence, we have learned that to guarantee JCS Mining the best productivity possible and more tonnes per hour, shovel operators must receive and adhere to Liebherr Factory Training. These on-site trainings include reviews of operating techniques and controls of the hydraulic excavator in face shovel configuration.

To obtain optimal machine performance, bucket position and distance to the bench must be reconsidered in face shovel configuration. Truck position and digger procedures have been developed in harmony by experienced Liebherr Application Engineers, resulting in optimized performance, continuous operational efficiency, and safety on site.



# Mining responsibly without compromising performance

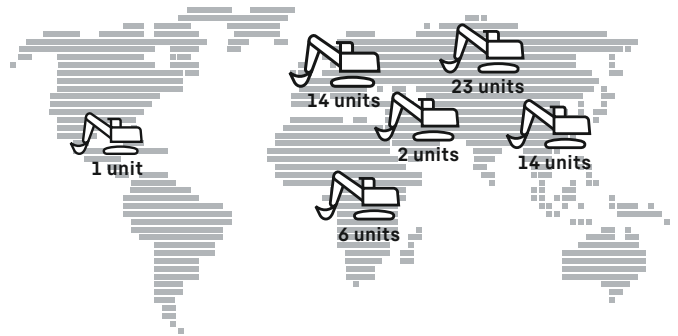
## Liebherr low emission mine

During the last 30 years, Liebherr has developed the largest 100 % electric hydraulic mining shovels range in the world, allowing customers to balance performance with environmental consciousness. Liebherr always provides continuous service to customers, taking into consideration their requirements as well as environmental issues in designing, manufacturing, and managing mining machinery.



## Electric motor

With an extended lifetime compare to diesel engine, electric motors give clear benefits to mining operations. Equipped with 3-phase asynchronous motors specially designed for heavy duty and extreme reliability, Liebherr electric excavators are capable of class-leading performances thanks to power regulation strategy.

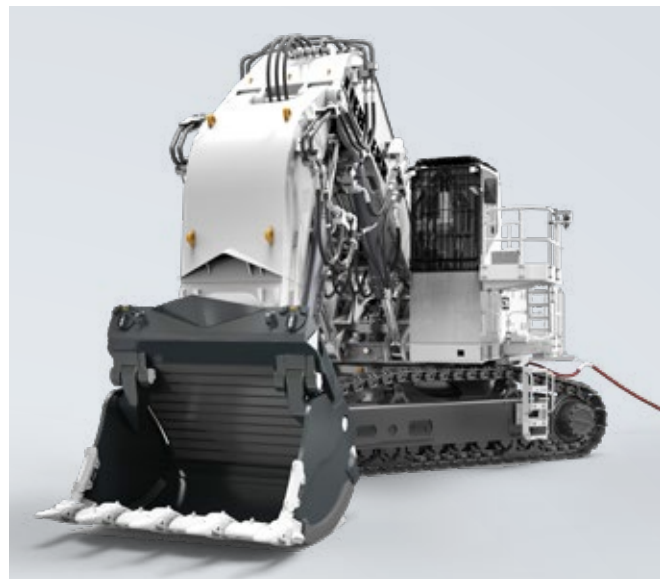
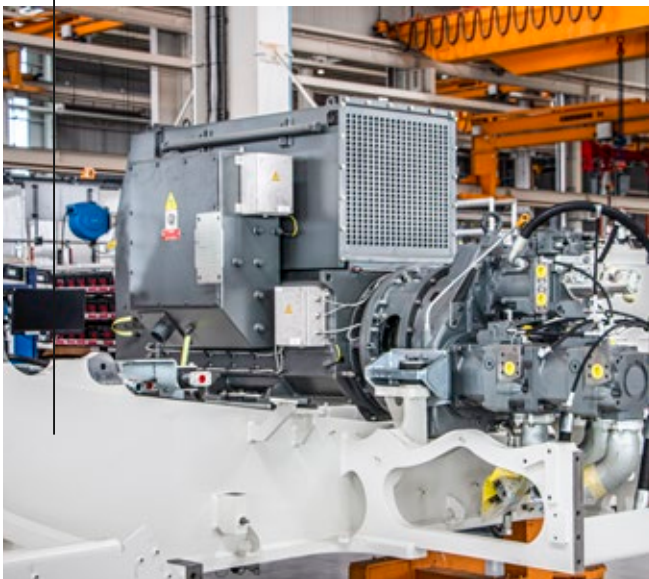


More than 60 electric hydraulic mining shovels worldwide

## Cycle time and machine motions

Like all other Liebherr mining excavators, our electric machines use a closed-loop swing circuit. The main hydraulic valves are fed by working pumps, providing unrivaled flexibility of attachment control and force distribution, by allowing by allowing full oil flow integration and fast movement. Additionally, electric motors enable +20 % more torque during the load cycle compared to diesel versions for better reactivity and faster cycle times.

R 9150 E on assembly line

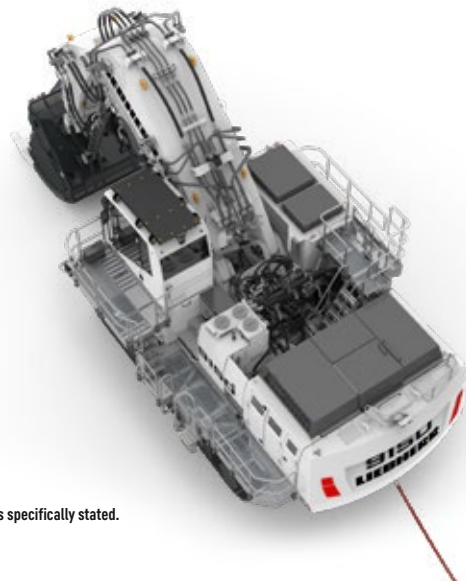






## Opportunities

With such impressive and proven results, JCS Mining immediately replaced four electric rope-shovels with two of the first R 9150 E excavators. Finalizing their fleet renewal initiated new negotiations for a third Liebherr machine, further strengthening our strategic partnership. With this last shovel soon in situ, the three R 9150 E will definitely achieve the annual objectives of the quarry and contribute to the regional development in Zhenjiang.



Subject to technical modifications. All comparisons and claims of performance are made with respect to the prior Liebherr model unless specifically stated.

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