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New Design Gives 'Four Wheel Drive' to Amphibious Excavator Tracked Pontoons

BY JUDITH POWERS

Malaysian manufacturer EIK Engineering is marketing a new system for amphibious excavators that replaces a single chain drive with four direct-drive hydraulic motors mounted on the axles. Sales and Marketing Director C.Y. Wong and Branch Manager Pavel Syrtsov introduced the system at WODCON XXI in Miami.

EIK manufactures and markets mechanical excavating equipment, cranes, digging tools and parts.

The motors at the front and rear of each pontoon, are synchronized by a patented (US8894452) direct drive system for a full-time pull and push drive, giving the machine power and maneuverability similar to a four-wheel-drive vehicle. The increased power makes for better tracking in marshlands, uneven surfaces (climbing slopes), as well as reduced stress on the track chains, spreading the stress to both ends of the chains.

The hydraulic motors are safely placed inside the axles, where they are well protected to minimize the risk of damage, and require less maintenance than exposed motors. And eliminating the intermediate mechanism between motors and track chains results in higher drive efficiency. The EIK design allows the excavator to be mounted at the center of the undercarriage, where it provides maximum stability, and the absence of obstructions between the pontoons provides increased working range for the operator.

The track cleats are formed from a high strength polymer, which is lightweight and lasts longer than aluminum. The polymer has been found to be more efficient when tracking in swamps, and more effective on upslopes, especially on slippery surfaces. The large adjacent surface of the polymer cleats provides more bite, and will not slip out of the mud, as shallow aluminum track cleats can.

The official company warranty on polymer track cleats is 24 months or 2,400 working hours.

"We have customers running on the same polymer track cleats for over 7,000 working hours in various environments such as marsh, sand, hard ground and stones - impossible for aluminum track cleats," said Pavel Syrtsov, manager of the company's new branch in Cypress, Texas, near Houston.

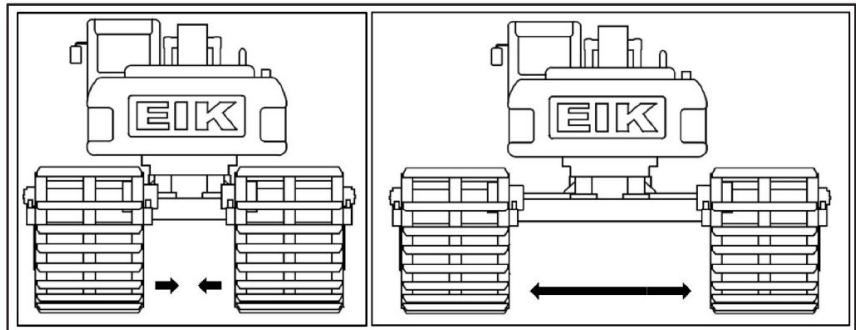
The Houston branch is EIK International Corporation, a wholly owned subsidiary of EIK Engineering in Malaysia.

The EIK pontoons have three positions – narrow retracted for shipping, wide extended for working, and an intermediate width specified by the customer, which allows 360 degree use of an excavator with a shorter crane.

Retraction and extension are achieved either hydraulically by the operator using a pedal inside the cabin, or mechanically with the help of a crane to move the pontoons into a new



This EIK model AM200-3E undercarriage holding a CAT 323D2 excavator in the retracted position of 15 feet nine inches is a stable load on a trailer eight feet six inches wide. The distance between the pontoons is four feet one inch. The extended width is 20 feet seven inches, which would require a special trailer and special permits to transport by road. Photo location is in Turkey.



The pontoons can be retracted a total of five feet, five inches for the 28- to 30-ton class excavators down to two feet, seven inches for the eight metric ton class.

position. An eight metric ton excavator on EIK pontoons can be transported with a width in retracted position of nine feet 10 inches, while a 15-metric ton excavator would be within the 12-foot limit at 11 feet six inches.

"It is crucial for an amphibious excavator to

touch bottom at all times," Syrtsov said. They are designed to work in swamps, soft ground and shallow water," he said.

Amphibious equipment manufacturers, including EIK, limit operation to a maximum water-depth of about 1.5 meters for stability and



A CAT329D on an EIK AM300 undercarriage working an ash pond dewatering in Kansas City, Missouri.



C.Y. Wong, left, and Pavel Syrtsov in the EIK booth at WODCON in Miami.

safety. For certain occasional works requiring work in deeper water - up to 13 feet (~4 meters) - EIK provides side pontoons equipped with spuds. The main pontoons keep an excavator floating on the open water as an added safety feature, Syrtsov said.

In one application on the Black Sea in Russia, an amphibious excavator was equipped with side pontoons and spuds for a cable trenching job in the surf that required digging at the depth of one to 10 feet, providing safety in waves.

Patented in the U.S. in 2014, the pontoon undercarriage system has OEM qualified status with a number of major excavator manufacturers.

Steve Rutherford, manager of Diversified

Solutions Industry Solutions at Caterpillar said "Our team has worked with EIK for many years, jointly providing customer focused solutions in several markets. We value this relationship, as it enables Caterpillar to extend our offerings to customers, with much of the same focus on innovative solutions, and customer value. We believe that this drive system, developed by EIK, is a great example of EIK's dedication to the needs of customers."

Pavel Syrtsov, a mechanical engineer, left his native Russia for Singapore in 2011 and joined EIK in 2013. After three years with the company, he was assigned to start and develop the U.S. branch, and manage the technical side of

sales. He arrived in the Houston area this past May. The staff consists of himself and marketing manager Jonathon Goo. Besides office space, the compound includes an open-air yard for large equipment, and a warehouse to store spare parts.

EIK booked a booth at WODCON XXI in Miami in May, where Syrtsov was joined by C.Y. Wong, sales and marketing director from Singapore. EIK's headquarters are in Johor Bahru, Malaysia, and it has three branch offices in Malaysia, one in Singapore, one in Hanoi, Vietnam, and a sales representative in Tokyo. The Houston-area branch is EIK's first venture outside Southeast Asia. ↵

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