



## Eaton tube fittings provide leak-free connections on Stoll front loaders

**Location:**

Lengede, Germany

**Segment:**

Material handling

**Challenge:**

Supplying tube fittings that provide precise assembly reliability.

**Solution:**

Eaton® Walterscheid™ WALFORMplus metric tube fittings.

**Results:**

WALFORMplus fittings provide leak-free connections and reduce assembly time and cost.

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*"We form approximately 100,000 tube assemblies each year. Eaton WALFORMplus fittings have enabled us to achieve complete reliability in assembly, and user experience demonstrates that the fittings really are leak-proof."*

*Konrad Willenborg, quality management leader at Stoll*

**Background**

When Wilhelm Stoll Maschinenfabrik GmbH of Lengede, Germany, began development of a new generation of premium front loaders, the OEM began its search for leak-free hydraulic connectors that would match the loaders' high performance and robust design.

Engineers at Stoll were looking for high-quality metric fittings for steel tube hydraulic lines in the loading arms of its new ProfiLine FZ/FS loaders for tractors ranging from 50-300 horsepower.

"Lines made of steel tubing have proven to be more durable than hydraulic hose lines on our front loaders," said Uwe Ockert, Stoll design engineer. "They are a big advantage over competitive loaders that primarily feature a flexible hydraulic hose, which

has a hard time standing up to extreme environmental conditions."

**Challenge**

In contrast to hose connections that grant some leeway in assembly, steel tube connections have firm cutting, deburring, shaping and bending requirements that are as rigid as the steel tubing itself. Stoll knew from past experience that precise work was even more critical when using tube fittings with a two-edge cutting ring and a captive seal.

"In theory, we were very satisfied with the cutting ring design," said Stoll's Konrad Willenborg, quality management leader, "but the human error factor had to be taken into account. Since the cutting rings require a manual installation process, there is no such thing as an absolute,



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reproducible process with assembly reliability. That was a primary reason that we decided to contact Eaton and other tube fitting suppliers for an alternative connection."

Willenborg also pointed out that cutting-ring-style tube connections were prone to hydraulic fluid leakage when subjected to extreme dynamic stresses such as vibration, high mechanical forces and pressure fluctuations that are common occurrences on Stoll front loaders.

#### Solution

In its search for an optimum line connection, Stoll examined several tube reshaping systems and ultimately decided on Eaton's Walterscheid WALFORMplus

tube fitting system that consists of a mechanically reshaped tube end, which is positively connected by a conventional DIN body with a 24-degree cone and a DIN nut. The only possible leakage path is sealed off by a captive elastomeric ring that optimally fills the chamber between the tube and the cone. The patented WALFORMplus "nose" provides additional metal-to-metal sealing.

Since Stoll production personnel can distinctly feel the end of the assembly, there is far less risk of excessive or insufficient tightening than with other tube fittings, further guarding against leakage.

"The WALFORMplus system's machine technology met our

prerequisites for maximum process reliability in our just-in-time tube production operations," Ockert said.

The reliable, positive fit of the tubes ensures that proper fitting torque is maintained, even when subjected to extreme stresses. The fittings' precise assembly reduces production time and cuts costs by eliminating the need for retightening or repeat assembly. This benefit is particularly important on Stoll front loaders, since installation space for some tube fittings is so confined that repeat assembly would entail a major effort.

#### Results

Both Stoll design engineers and its quality management

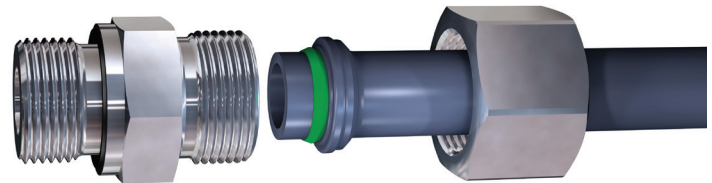
team are well-pleased with the performance of Eaton Walterscheid fittings.

"We form approximately 100,000 tube assemblies each year," Willenborg said. "Eaton WALFORMplus fittings have enabled us to achieve complete reliability in assembly, and user experience demonstrates that the fittings really are leak-proof."

"Feedback from our distribution partners and users indicates that WALFORMplus fittings are a high-performance, functionally reliable system that more than proves its worth in practice," added Ockert, "even when subjected to severe stresses and operating under very tough environmental conditions."



Stoll front loaders make it easy for tractors to maneuver pallets and bulk material.



The robust design of Eaton WALFORMplus fittings withstands the front loaders' continuous use on tractors that are subject to vibration, high mechanical forces and pressure fluctuations.

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