



## Quick Connect Couplings: A Critical Component in Hydraulic Systems

In the modern era of Hydraulic Engineering with complex system designs, there is a propensity to start with some of the more interesting parts of a hydraulic system and to build around the pump, cylinders, valves, actuators, the reservoir or even the high-tech oil inside. This poses the question; "What is the most important component in a hydraulic system?"

UNITREAD™ being largest OEM in India for Hydraulic Quick Release Couplings, has conceived and designed new applications for the Construction as well as Agricultural Machinery sector resulting in minimum down time and minimum maintenance cost. Now UNITREAD™ has placed itself on a Global bench competing with all large players in terms of Customer reach, innovations and application feasibility.

Undoubtedly, there can be arguments made to prove any number of system componentry as "the most critical". Yet, if the basics indicate that all the components are being acted on by the same internal and external forces, then the integrity of the system is truly reliant on each piece used in its construction equally. Even the most seemingly inconsequential parts of a system can greatly impact the system's overall safety, serviceability and efficiency.

The future that will surely demand even more from hydraulic systems and those that design them, it is imperative that we remember that the system is only as strong as its weakest link. We have seen and should expect to continue to see components manufactured as stronger, lighter, smaller, more powerful and more efficient. Systems will be called upon to complete more difficult tasks than their predecessors. And engineers will be tasked with designing efficient and effective systems requiring an understanding of technologies from seemingly disparate industries.

A commonly overlooked and often under-valued part of a hydraulic system is the quick connect fittings. These fittings facilitate the connection and disconnection of an attachment without the use of tools. This is obviously of value to the end user, but may not be of utmost concern to

those focused on designing for efficiencies and performance. Despite the expectation for easy future maintenance, a poor quality quick connect can slow flow, create leak points and reduce pressures. Because of the shortcomings of some quick connects, there is justifiable concern that they may act as a hindrance when trying to meet the ever-increasing power demands.



If connections in the hydraulic system never had to be removed, components could be hard-piped into the lines for a permanent seal. However, since hydraulic systems will inevitably require disconnection at critical points in order to change equipment's, attachments and implements, this is rarely an option. While the understanding of the many nuisances of these varying designs is not essential for the majority of engineers, it is important to understand the fact that the differences within the quick connect will make the size of the fitting less relevant than the flow rates and pressure drop data.



The design of the quick connect, the materials used in the build of the fitting, and manufacturer's tolerances all attribute to the compatibility of the quick connect in regards to the requirements of the system. Hydraulic systems are rarely the same, and therefore, each will demand different flow rates, maximum working pressure ratings, burst pressures, acceptable pressure drop, physical size and materials compatibility. The implementations of the optimal quick connect coupler (correctly-sized and spec'd) can provide 100% efficiency and minimum maintainability.

The flat-face quick coupling design has become a staple for adroit hydraulic engineers across a multitude of industries and disciplines. The valve on a flat face connector can connect hydraulic lines with residual pressures while allowing no more than a 0.01 ml of fluid to remain on the valve surface upon disconnection. Previous connector types used a "poppet" style valve which imposes issues stemmed from its inability to connect under pressure as well as to disconnect without losing a small amount of fluid from within the valve cavity.

The construction and componentry variants inside the analogous flat-face profile of non-drip couplers can be numerous. As the design of the inner workings of a quick connect vary, so will the manner in which the hydraulic fluid interacts with the walls and seals as it passes through the fitting. While many valve designs are employed to prevent pressure drop or flow restrictions, others are used to avoid patent issues, work around production limitations and minimize material costs. The tighter and more indirect the path through the quick connect, the higher the chances of flow restrictions and pressure drop will occur.



New products and application development is a way of life at UNITREAD™ and the team is very

proud of introducing products viz. UNITREAD™ Multicoupling, Flat Face Coupling-Connect Under Pressure Series, Poppet Type-Connect Under Pressure Series, Thermal Coupling, and High Pressure-Flat Face Coupling. Now UNITREAD™ has also re-entering into the highly used pneumatic coupling market, leveraging their team's combined experience of +80 technical years.



Top performing hydraulic systems account for even the smallest variables using robust and high-quality parts that can hold up to any and all internal and external system forces. Undersized or otherwise flow/pressure-limiting hydraulic fittings can result in pressure losses and system overheating. While the quick connect coupling may seem like a minor or secondary component, it is, in fact, a critical component with its potential to affect the entire hydraulic system significantly. When designing your system, be sure to match the specs of the quick connects to the system demands to help maximize flow, optimize performance and bolster a longer operating life for the hydraulic system and components.



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