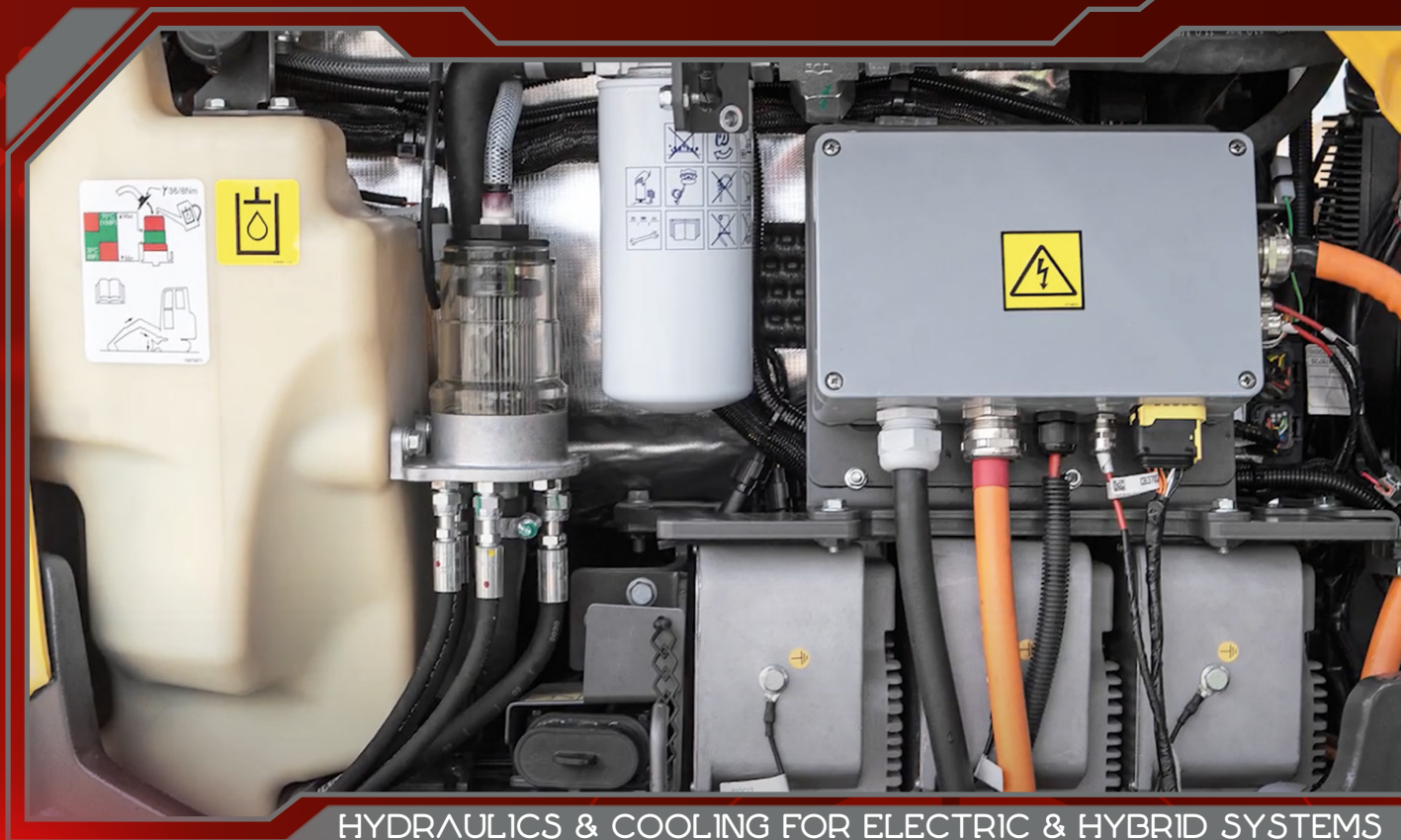


# ELECTRO-HYDRAULIC SYSTEM PRODUCTS



HYDRAULICS & COOLING FOR ELECTRIC & HYBRID SYSTEMS

## THE NEXT GENERATION OF OFF-HIGHWAY EQUIPMENT

As people and businesses have started becoming more environmentally aware in recent years, there has been a global trend towards hybrid and fully-electric vehicles. Requiring less energy to run and producing drastically fewer harmful emissions, the question is not “will hybrid and electric vehicles supersede fossil-fuel driven vehicles?”, but “when?”.

Compact off-highway vehicles such as mini excavators, forklifts and tele-handlers are just some of the equipment that is evolving due to this new trend, and one of the main enablers is the development of more efficient and more powerful batteries for powering the electrical components.

However, these batteries and the associated components require far more space within the vehicle frame than a typical diesel engine. This means that in order to keep the vehicle footprint compact and equivalent to that of a diesel vehicle there is going to be significantly less space available to house the hydraulic systems.

The batteries and the other electrical components also generate a lot of heat and therefore require additional cooling, not typically required on diesel vehicles, which further compounds the space issue.

Manuli Hydraulics has decades of experience providing practical solutions to problems such as this, and are therefore able to offer a complete package of connectors to suit this type of situation.

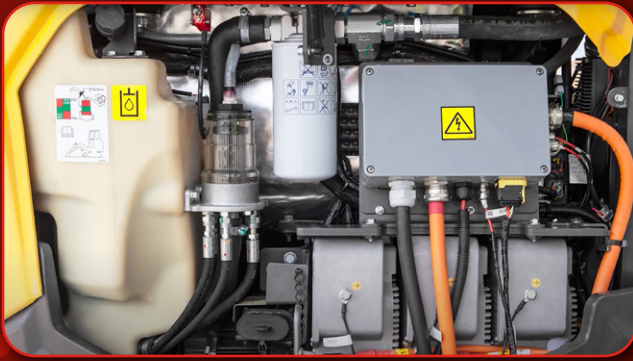
The Manuli Hydraulics package consists of:

- A full range of low- and medium-pressure, compact wire-braid hoses with excellent flexibility and very low minimum bend radii
- Push-to-connect fitting solutions for easy connection in space-limited situations
- Dedicated cooling system hoses suitable for water-glycol coolants



## WHY IS SPACE SUCH A BIG ISSUE?

The images below illustrate the difference between the available space in the power-train enclosures of two identical mini-excavator models, one electric version and one traditional diesel powered.



*Electric powered version*



*Diesel powered version*

## ADVANCED HYDRAULIC SOLUTIONS

Manuli Hydraulics is globally recognised for the outstanding quality and performance of its hydraulic hoses. Our range of Premium and Hi-Grade hoses offers some of the most reliable, flexible and technically advanced solutions on the market today.

The hoses listed below all share the common features of being compact, lightweight and highly flexible, making them ideal for use in the space-restricted power-train enclosures of hybrid and electric off-highway vehicles.

## GENERAL & SPECIALIST HYDRAULIC LINES

**ForeMaster** - Outstanding abrasion and scratch resistance, with isobaric working pressures of 21MPa and 28MPa (and small bore sizes at 35MPa).

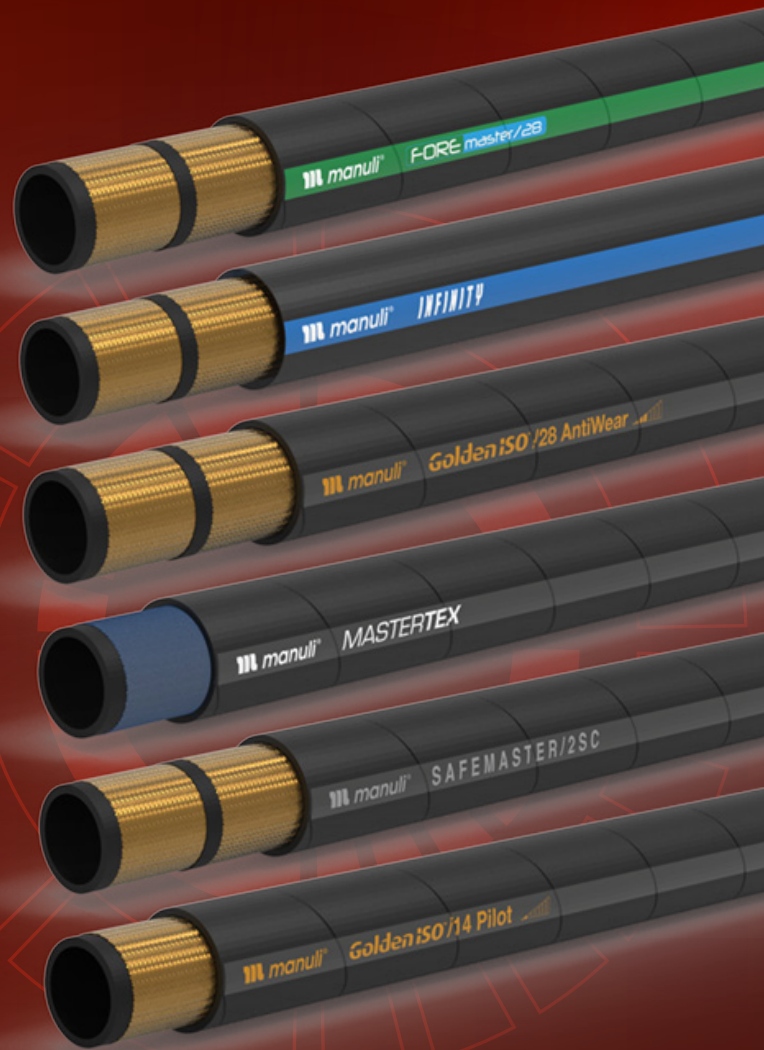
**Infinity** - High-performance hose with superb fatigue resistance for an extended working life, making it ideally suited to use by OEMs.

**GoldenISO AntiWear** - Offering extreme abrasion resistance, as well as flexibility and fatigue resistance, GoldenISO AntiWear is one of the most versatile and widely used hose brands in modern hydraulics. Available in isobaric pressure ranges of 21MPa and 28MPa.

**MasterTex** - High temperature, low pressure hose particularly suited to drain and return lines with high temperature oils.

**SafeMaster/2SC** - Specifically designed for use in applications requiring EN 45545-2 certification for low smoke density when burning.

**GoldenISO/14 Pilot** - Designed for use in low pressure pilot lines where compactness and flexibility are key factors.

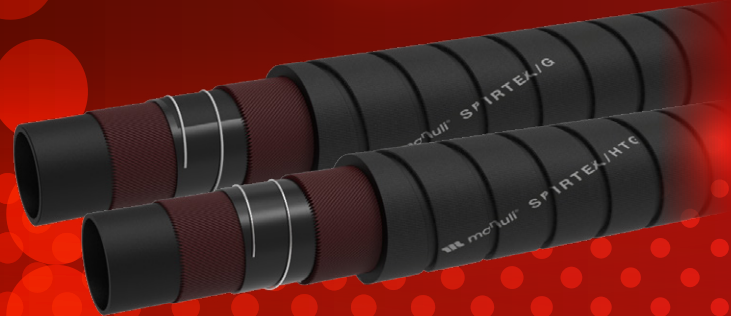
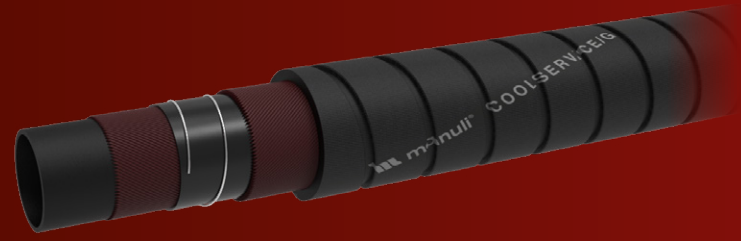


## COOLING, SUCTION & RETURN LINES

**Coolservice/G** - A dedicated cooling hose designed for use with water and water-glycol solutions. Its EPDM tube and cover offer high thermal conductivity and its grooved cover design provides an exceptionally low minimum bend radius with minimal deformation. Coolservice/G also offers a broad working temperature range of -40°C to +125°C and includes a helical body wire making it equally suitable for both suction and delivery applications

**Spirtex** - The Spirtex hose range is made up of the *Spirtex* and *Spirtex/HT* hose families. All Spirtex hoses are hydraulic specification suction and delivery hose designed to meet and exceed the requirements of SAE J517 100R4. They offer a wide range of fluid compatibility, including oils and water-glycol solutions, and the HT version also offers an extended temperature range of -40°C to +135°C.

**Spirtex/G** - The Spirtex/G hose range, comprising of *Spirtex/G* and *Spirtex/HTG*, offers the same benefits as the standard Spirtex range, with the addition of a grooved cover for even greater flexibility, which allows a minimum bend radius of as little as 25% of the SAE J517 100R4 standard, with minimal deformation. Spirtex/HTG is also well suited for use as a cooling hose.



## FITTING SOLUTIONS

All Manuli hydraulic hoses are paired with a range of fitting solutions that are designed to work flawlessly with the hoses. High- and medium-pressure solutions include multiple families of one- and two-piece crimped fittings, whilst low pressure solutions also include push-on and clamped fittings for ease of use in the field.

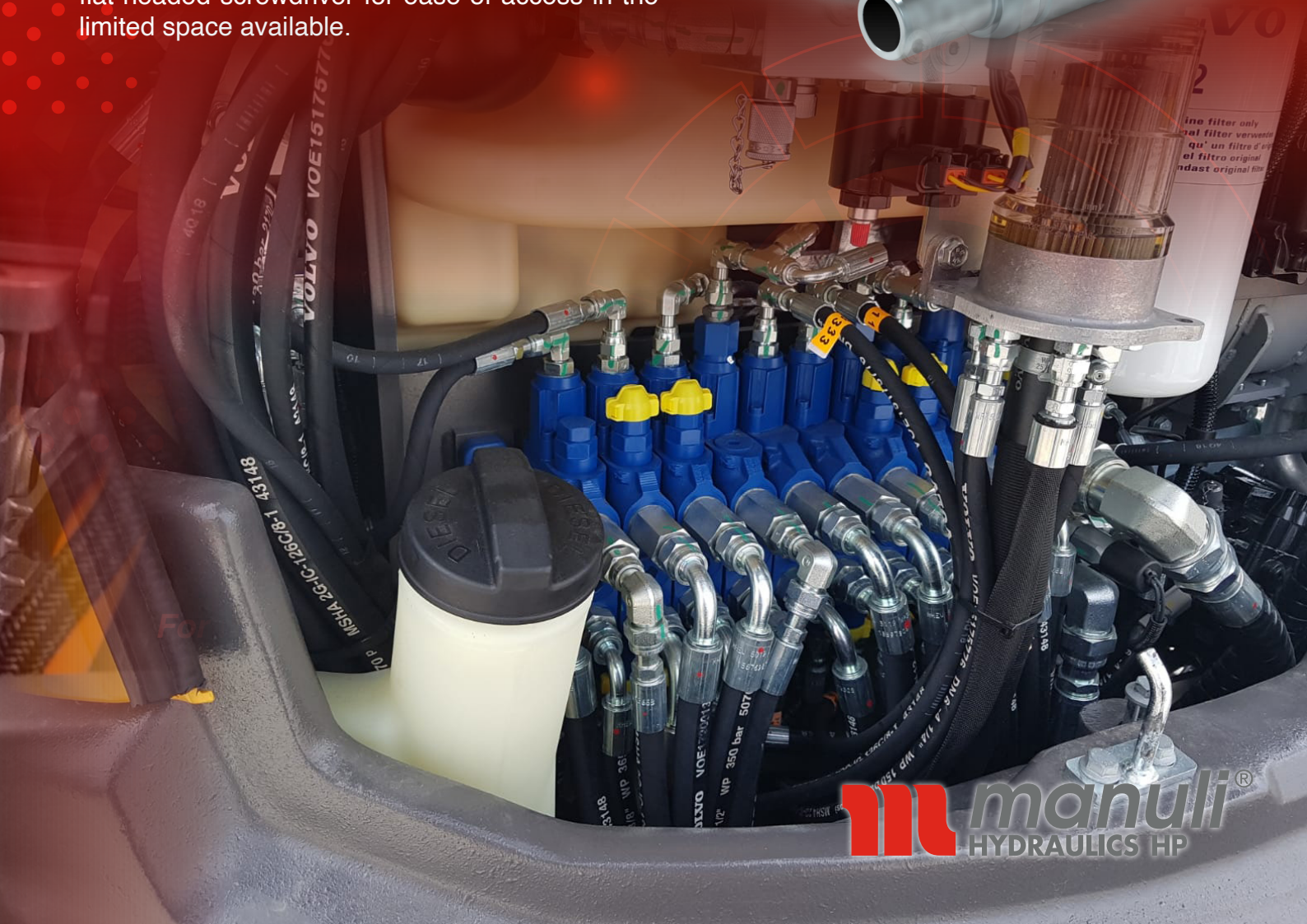
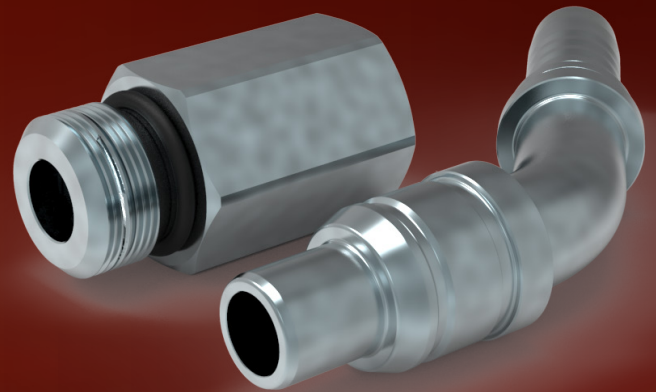
### PUSH-TO-CONNECT FITTINGS

**FastFit** and **FastFit Disconnectable** are a unique connection solution which operates on a simple push-to-connect premise with no tools necessary for connection.

This tool-free connection, alongside the slimline profile of the fittings, make them suitable for use on reduced size manifolds, which have much tighter groupings of ports making access with a spanner difficult or even impossible.

The innovative design of **FastFit** and **FastFit Disconnectable** make them secure against accidental disconnection, whilst also allowing the hoses to find their own optimum orientation once fitted.

**FastFit Disconnectable** also allows quick and easy disconnection of the hoses using a simple flat-headed screwdriver for ease of access in the limited space available.





[www.manuli-hydraulics.com/hp-hydraulics](http://www.manuli-hydraulics.com/hp-hydraulics)



Global Marketing Office  
Email: [marketing@manuli-hydraulics.com](mailto:marketing@manuli-hydraulics.com)

© Copyright 2021 Manuli Hydraulics. All rights reserved.  
All product names are either trademarks or registered trademarks of  
Manuli Hydraulics or Manuli Rubber Industries unless otherwise stated.