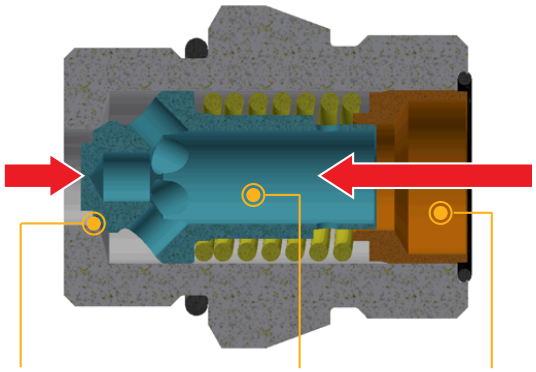
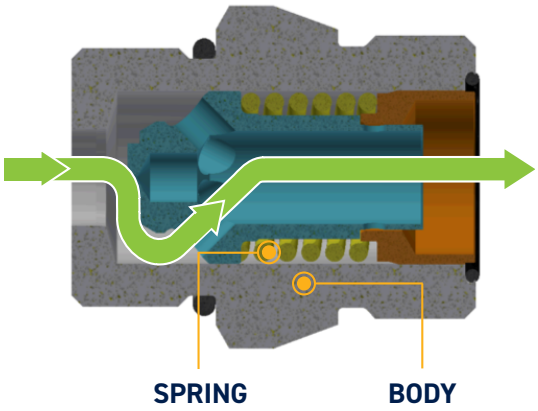
# Parker Quick Coupling Division

Check Valve Product Guide

**CLOSED POSITION**




**OPEN POSITION**




## The Basics

### What is a Check Valve?

A fitting which incorporates a valve that controls flow in a single direction.

### Check Valve Definitions:

**Hard Seat vs. Soft Seat:** Hard seats are metal to metal seals where as soft seats utilize an elastomeric seal.

**Cracking Pressure:** Pressure at which the poppet opens allowing flow through the check valve.

**Pressure Drop:** The internal components of a check valve restrict the flow and create a pressure drop across it.

**Orifice:** This is a precise hole drilled in the poppet allowing for limited flow (sometimes referred to as a standby flow) in the closed position.

**Internal Leakage:** The acceptable amount of fluid that passes across the check valve in the closed condition.

### Check Valve Options:

Ports, materials, pressure ranges, shape fittings, crack pressures, and seal variants.

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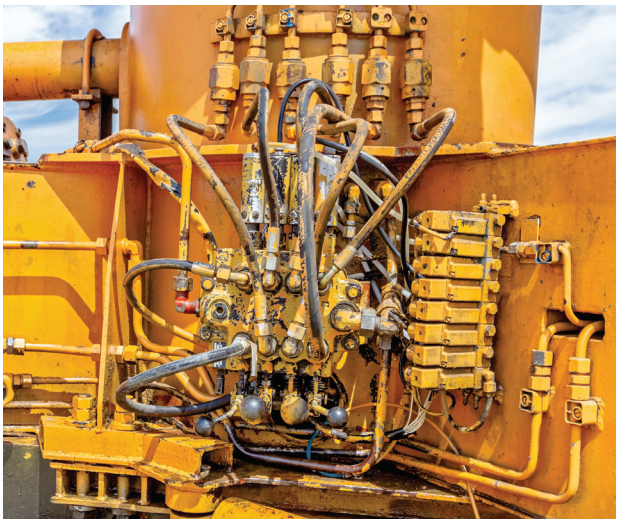
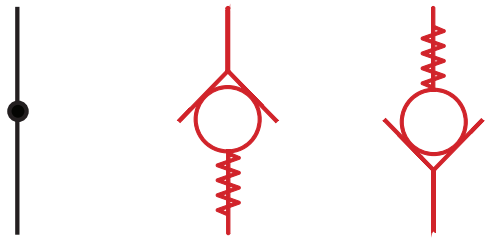


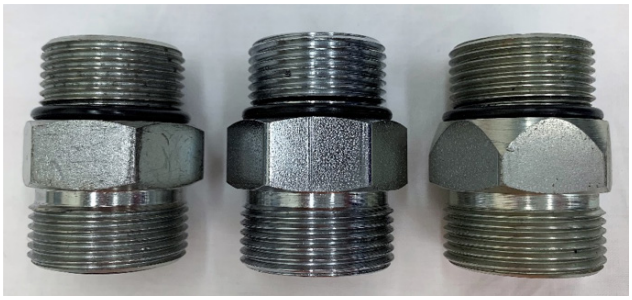
## Where to Look?

That's a tough question to answer.

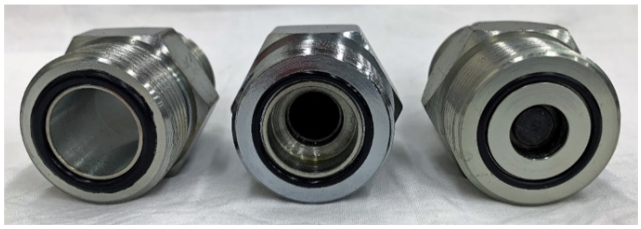
All three (A, B, C) would fit in the same space but serve three different functions. Looking only from the outside at a completed machine, it is VERY difficult to tell the difference between a fitting and a check valve.

Parker QCD check valves have a flow arrow printed on the wrench flats and chamfered wrench flats as on C. Both B and C are check valves shown but allow the free flow in opposite directions. A is a standard fitting.





A B C





## Problem:

Back pressure or backflowing to hydraulic pumps can cause damage or failure to these components.

## Solution:

Integrate a check valve near the pump outlet.

## Why:

Integrating a check valve provides pump protection from backflow with minimal pressure drop.

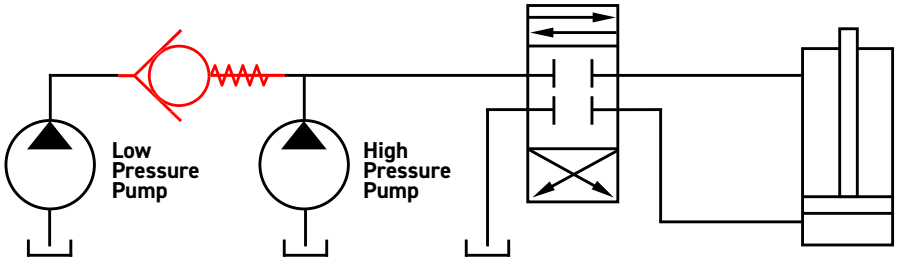
## Where to Look:

High/low dual pump systems will need to protect the low pressure pump in order to extend pump life on applications, such as log splitters or rescue tools.

Systems with emergency pumps, such as aerial work platforms. A check valve allows the circuit to be isolated from the rest of the system.

Systems with vane pumps, as these are uniquely sensitive to damage from back pressure.

## High/Low Pump Circuit Example



# Cooler & Filter Protection

## Problem:

High viscosity oil during cold start up conditions or other pressure spikes can cause the cooler or filter to fail catastrophically.

## Solution:

Integrating a check valve to create a cooler or filter bypass.

## Why:

The check valve will divert this pressure spike, bypassing and protecting the cooler or filter.

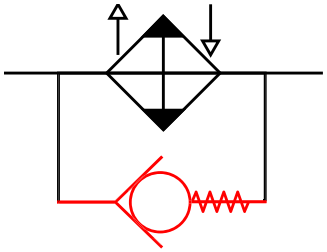
## Where to Look:

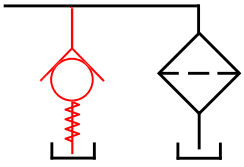
Any mobile applications with oil coolers, OEM's that struggle to diagnose where system pressure spikes originate or OEM's that manufacture special 'cold weather' kits for their equipment.

## Alternative Product to Consider:

QCD offers the TH Series Thermal Bypass Valves that integrate a thermal element and check valve for additional control of flow to coolers.

## Cooler and Filter Circuit Examples







## Problem:

Uncontrolled speed of motor/cylinder or a desired speed control in one direction.

## Solution:

Integrate an orificed check valve into the system.

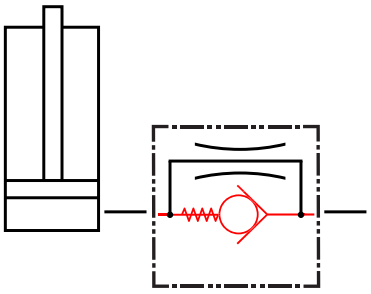
## Why:

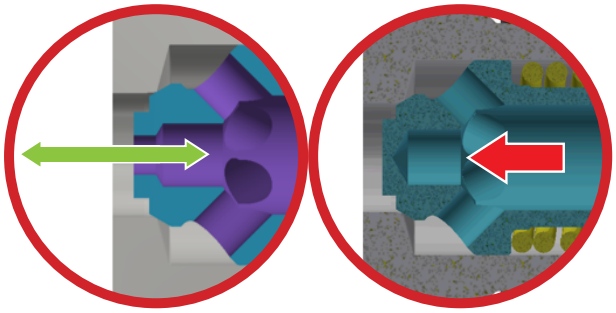
Placing a check valve in the motor/cylinder circuit allows full flow in one direction but limits the flow through the orifice in the opposite, checked direction. This can offer better operator control of the machine and reduce uncontrolled movement.

## Where to Look:

Any time a cylinder or actuator is lowering, a heavy load or speed control is needed for operator safety. Applications such as forklifts, aerial work platforms, winches or hood systems on large equipment.

## Overhanging Load Circuit Example





**Orificed vs Standard Closed Position**

# Maintaining Pressure

## Problem:

Systems losing pressure during downtime causing damage upon startup. Commonly found in fuel and hydraulic systems.

## Solution:

Integrate a check valve in order to maintain pressure during downtime.

## Why:

By limiting return flow through the system, pressure is held and system readiness is maintained. This solution can also be used to maintain actuator position acting as a locking circuit.

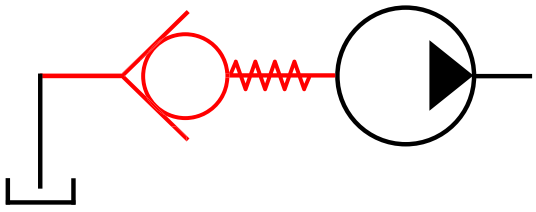
## Where to Look:

Common on fuel systems in order to maintain prime and for ease of maintenance.

Used on hydraulic systems to prevent pump oil starvation at startup.

Used to supplement mechanical locks in applications such as outrigger cylinders.

## Suction Line Circuit Example





## Problem:

Piston motors may fail or have reduced life without proper back pressure.

## Solution:

Integrate a low cracking pressure check valve into the drain line.

## Why:

The check valve maintains the needed back pressure, which ensures the motor case is fully flooded with oil, lubricating the components and extending service life.

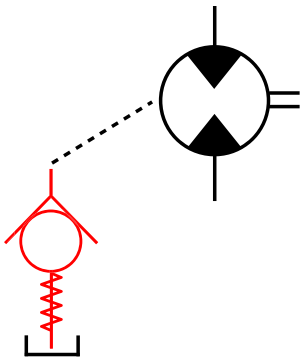
## Where to Look:

Cranes, combines and subsystems such as fan motors.

## Alternative Product to Consider:

Integrating a tee-shaped check valve may simplify the number of fittings and connections needed in more complex systems.

## Motor Drain Line Circuit Example



## Problem:

Incorrect connection of an attachment can cause the implement to be run in reverse, causing accessory failure.

## Solution:

Integrate a check valve into the implement circuit to further protect the hydraulic components.

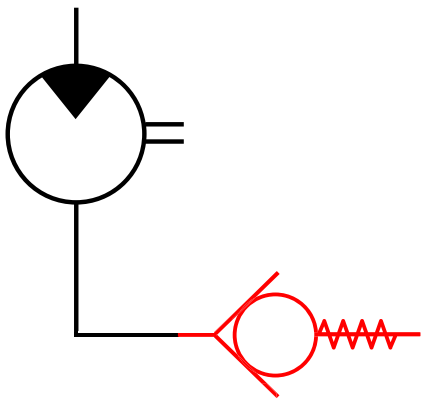
## Why:

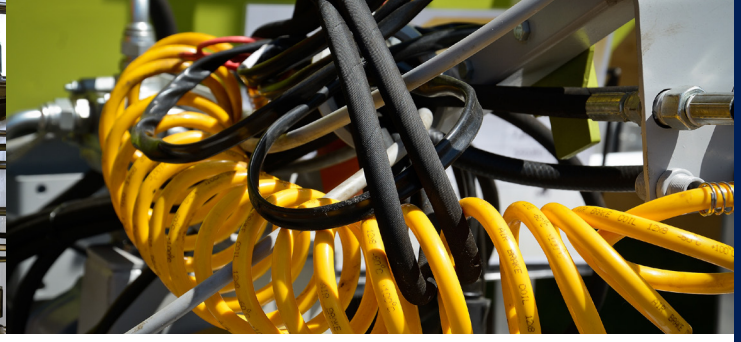
Reverse flow will damage certain hydraulic actuators. Preventing reverse flow from incorrect connection can lower warranty costs for OEMs and lower end user downtime.

## Where to Look:

Skid steer, excavator and tractor attachments such as impact hammers and pile drivers.

## Motor Circuit Example







## Problem:

Unintended and uncontrolled movement or actuation in a secondary function.

## Solution:

Integrate check valves to each subsystem to prevent crossflow issues.

## Why:

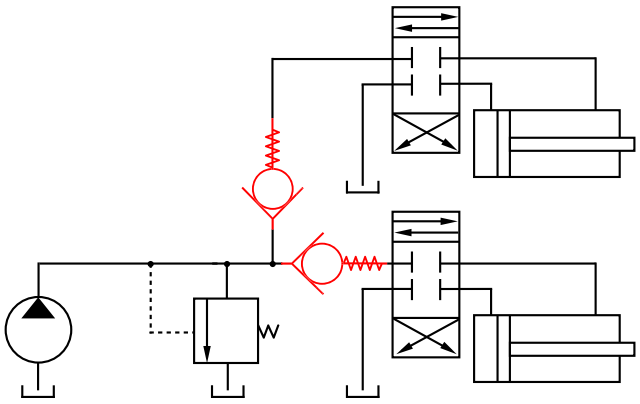
Relatively high backflow from actuators can undesirably flow into other portions of the parallel system, causing unintended movement or actuation.

## Where to Look:

Multiple cylinder systems, multifunctional systems and systems with multiple combined returned flows.

Applications such as a single pump system that controls steering, lift and actuation.

## Multi-Function Circuit Example



# Check Valve Product Guide


**When you think of Check Valves…**

**Think Parker Quick Coupling Division**

**Bring us your opportunities!**




ENGINEERING YOUR SUCCESS.