



# SIREN

A detailed cutaway illustration of a mechanical pump assembly. The image shows various internal components including gears, shafts, and housing parts. A prominent orange-colored gear is visible on the left side. The overall color palette is dominated by greys and metallic tones, with the orange gear providing a strong contrast. The perspective is from a slightly elevated angle, looking into the machine.

## THE FORCE BEHIND THE FIGHT

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### THE ANATOMY OF A WELL-BUILT PUMP

- Pumps on display at FDIC
- Casting in the U.S.A.
- New and Improved Products

# THE ANATOMY OF A WELL-BUILT FIRE PUMP

## CSU Single Stage Pump

By: Waterous

The crews braving the flames to protect our cities, towns and homes require strength and reliability behind their fight.

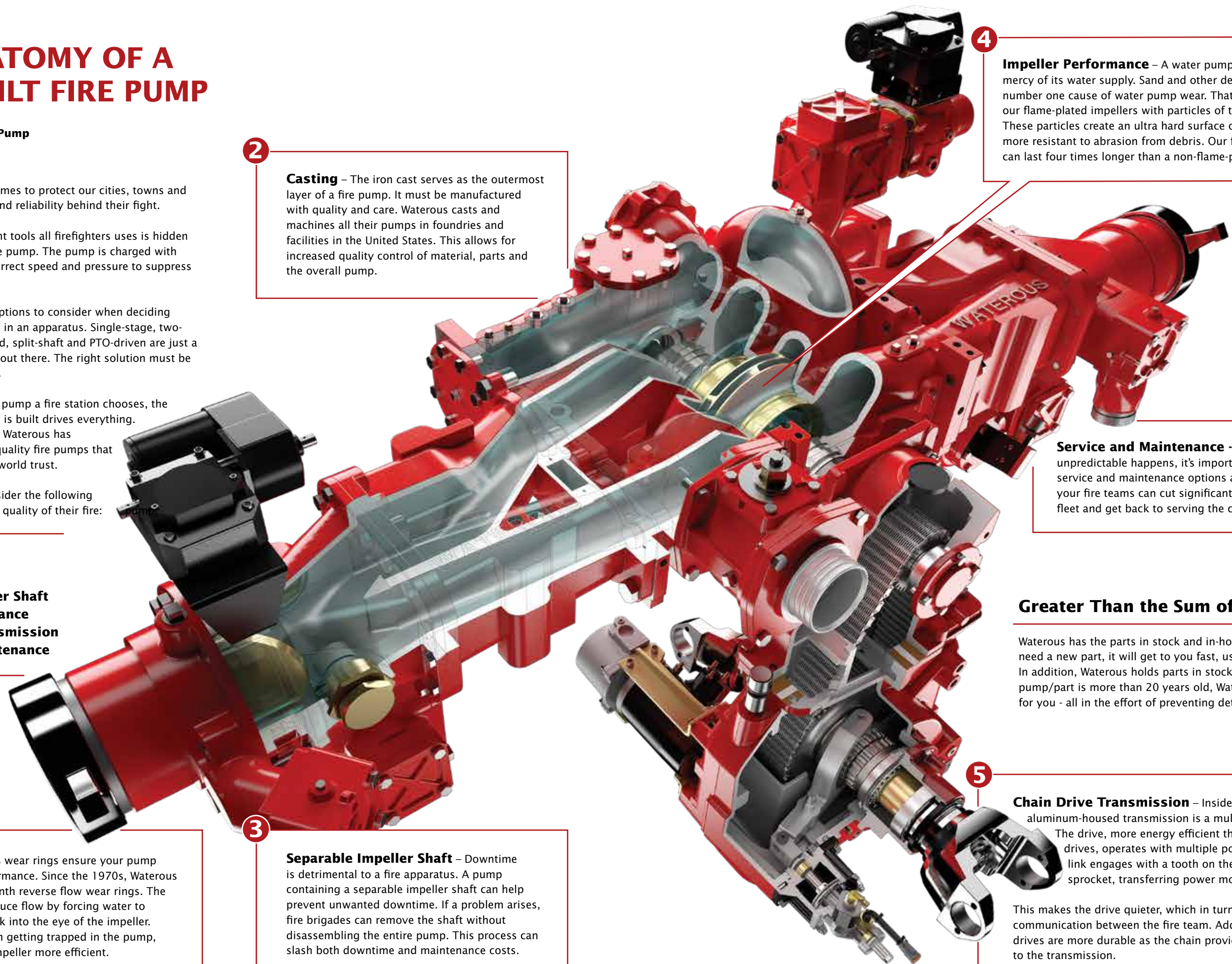
One of the most important tools all firefighters uses is hidden within the apparatus - the pump. The pump is charged with supplying water at the correct speed and pressure to suppress the flames.

A fire station has many options to consider when deciding which water pump to use in an apparatus. Single-stage, two-stage, CAFS, rear-mounted, split-shaft and PTO-driven are just a few of the pump options out there. The right solution must be driven by the application.

Regardless of the type of pump a fire station chooses, the quality of how that pump is built drives everything. For more than 132 years, Waterous has designed and built high quality fire pumps that departments around the world trust.

Departments should consider the following items when weighing the quality of their fire pump:

- **Wear Rings**
- **Casting**
- **Separable Impeller Shaft**
- **Impeller Performance**
- **Chain Drive Transmission**
- **Service and Maintenance**



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**Casting** – The iron cast serves as the outermost layer of a fire pump. It must be manufactured with quality and care. Waterous casts and machines all their pumps in foundries and facilities in the United States. This allows for increased quality control of material, parts and the overall pump.

4

**Impeller Performance** – A water pump is always at the mercy of its water supply. Sand and other debris in the water is the number one cause of water pump wear. That's why we designed our flame-plated impellers with particles of tungsten carbide. These particles create an ultra hard surface on the impeller that is more resistant to abrasion from debris. Our flame-plated impeller can last four times longer than a non-flame-plated impeller.

6

**Service and Maintenance** - When the unpredictable happens, it's important to have all service and maintenance options at your disposal so your fire teams can cut significant downtime to their fleet and get back to serving the community.

## Greater Than the Sum of its Parts

Waterous has the parts in stock and in-house. This means if you need a new part, it will get to you fast, usually within 24 hours. In addition, Waterous holds parts in stock for 20 years. If the pump/part is more than 20 years old, Waterous will replicate it for you - all in the effort of preventing detrimental downtime.

1

**Wear Ring** – A pump's wear rings ensure your pump maintains optimal performance. Since the 1970s, Waterous has manufactured labyrinth reverse flow wear rings. The labyrinth track helps reduce flow by forcing water to pivot before flowing back into the eye of the impeller. This prevents water from getting trapped in the pump, ultimately making the impeller more efficient.

3

**Separable Impeller Shaft** – Downtime is detrimental to a fire apparatus. A pump containing a separable impeller shaft can help prevent unwanted downtime. If a problem arises, fire brigades can remove the shaft without disassembling the entire pump. This process can slash both downtime and maintenance costs.

5

**Chain Drive Transmission** – Inside every Waterous aluminum-housed transmission is a multi-point chain drive. The drive, more energy efficient than conventional drives, operates with multiple points of contact. Each link engages with a tooth on the drive and driven sprocket, transferring power more efficiently.

This makes the drive quieter, which in turn allows for easier communication between the fire team. Additionally, chain-driven drives are more durable as the chain provides increased strength to the transmission.



# PUMPS ON DISPLAY AT FDIC

Have a Waterous representative discuss your departments need for a pump demonstration.

## CXSPA Series with 21st Century Manifold

One of the most versatile pumps Waterous offers is the CX Series.

Flows up to  
**1500 GPM (5500 I/min)**

Configuration options:

- Split-Shaft**
- PTO-Driven**
- Direct-Engine Driven**
- Rear Driven**

When equipped with a PA Power Take-Off, the CX adds the functionality of pump-and-roll.

### Benefits of the CXSPA:

- Pump-and-roll capability
- Fits into a narrow pumphouse, allowing more compartment space
- Smaller size means pump can be fitted into a shorter wheelbase apparatus
- PTO-driven with a variety of gear ratios to keep engine RPM down while pumping at capacity
- Available in cast iron or bronze
- 21st Century Manifold allows multiple discharge configurations and capabilities
- Available flame-plated impellers for longer durability



## CMU Series Two-Stage Pump

The Waterous CMU Two-Stage Pump is the most used two-stage pump in the industry. This pump allows you to pump either in volume or pressure depending on the factors at the scene.

Available on Waterous pumps are Waterous **Discharge Valves**. Known

as the best valves in the fire industry, Waterous manufactures each valve to exacting standards. Waterous valves are available in various sizes and configurations.



Another feature of the CMU Two-Stage Pump is the availability of the **"Pant Leg" Suction**. This allows the drafting up to **2000 GPM (7570 I/min)** from one side of the apparatus.

The CMU Pump is completely made in the USA, with castings from foundries in the USA. All machining, assembly and testing done at the Waterous factory in South St. Paul, Minnesota.

Capacities:  
**2250 GPM (9000 I/min) @150 PSI** in Volume Mode  
up to **600 PSI** in Pressure Mode

Configuration:

**Split-Shaft**



## CS/CSU Series Single Stage Pump

The Waterous CS Series Single Stage Pump is our best seller. It has a lower center of gravity, which provides more room for hose reels, hose beds and other equipment. The two-piece impeller shaft allows true separation of the pump and pump transmission without disassembling either unit, reducing labor time for repair work.



Flow range:  
**750 GPM - 2250 GPM (3000 I/min - 9000 I/min)**

Configuration options:

- Split-Shaft**
- PTO-Driven**
- Direct-Engine Driven**
- Rear Driven**

### Exclusive industry advantages:

- Optional flame-plated impeller(s) on capacities less than 2000 GPM. Standard on capacities over 2000 GPM.
- Chain-driven transmission for superior power transfer and durability
- Completely made in the USA



## HL1250 / HL1500 Series Pumps

Waterous offers specialized pumps that produce high and low pressures simultaneously. These pumps are ideal for Wildland and Urban Interface Vehicles.

**1250 GPM (5000 I/min)**  
**1500 GPM (6000 I/min)**

Available with:

**K Series Transmission** that will allow pump-and-roll

### Advantages:

- Corrosion-resistant anodized aluminum pump body
- Wear-resistant anodized aluminum, flame-plated hubs low pressure impeller
- Bronze high-pressure impeller
- Maintenance-free mechanical seal
- Available aluminum K Series Transmission



## PB18 Series Portable Pumps

While Waterous is best known for our quality pumps for apparatus, we also make portable and motor pumps used for smaller vehicles, primarily for wildland and forestry.

Available in four different models, each model is driven by an 18hp Briggs & Stratton V-Twin gasoline engine.

Waterous offers a rail base or no base option for pumps sold in the USA and Canada. A wrap-around frame is available for sale outside of the USA and Canada.

Performance flow options:

**75 GPM @ 190 PSI - 400 GPM @ 15 PSI** based on which model is selected

All Waterous PB18 models have a 3-gallon fuel tank that meets the EPA evaporative requirement (40 CFR Part 1060)



## Waterous After Sales Support

We offer an array of helpful tools to assist in knowing more about the products manufactured at Waterous.

### Helpful tools available at no cost:

- Cutaway posters of single and two-stage pumps - order at [www.waterousco.com](http://www.waterousco.com)
- 3D interactives - download at [www.waterousco.com](http://www.waterousco.com)
- Facebook / YouTube / Instagram Pages - keep up on current Waterous news and videos
- Water flow videos - single, two-stage and end-suction pumps
- Friction loss / smooth nozzle discharge apps for iPhone and Android
- [www.waterousco.com](http://www.waterousco.com) - Includes literature, documents, performance factors and spec sheets
- 6-Part series on pump operation and maintenance videos
- Mini-configurator - help narrow product choices
- Pump operation and maintenance classes

### Helpful Tools available at minimal cost:

- Mechanics seminar - held throughout the year. info at [www.waterousco.com](http://www.waterousco.com)

## PURCHASING CASTINGS AND RAW MATERIALS IN THE U.S.A

Waterous purchases castings from foundries in the U.S.A. In our factory, these casting and other raw stock materials are machined into gears, impeller shafts, coupling shafts and other parts that make up a fire pump.

### Waterous can control our quality

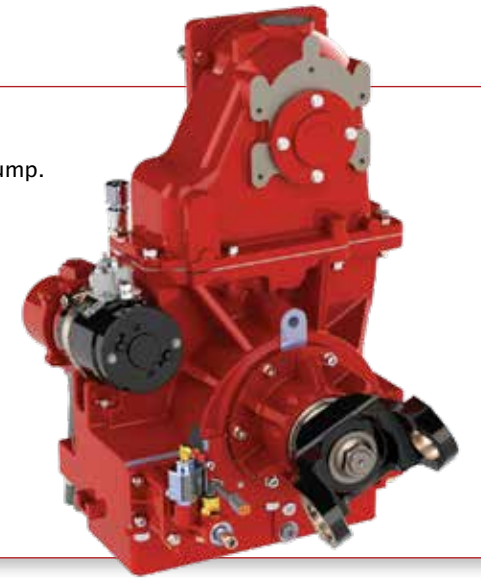
Why is this important? Waterous can control our quality internally; we are not subject to international issues that may create delays in castings and parts. We can provide you with answers on orders quickly by visiting our factory, which is located in the same building as our offices. This helps ensure the highest level of quality and customer service, and keeps jobs here in the U.S.A.

**Torrance Casting**  
La Crosse, Wisconsin -  
Pouring 1538° iron to cast  
our CXS Split-Shaft Pump.

### C22 Chain-Driven Transmission -

The Waterous C22 Chain-Driven Transmission is a continued effort to create a smaller, yet more efficient, power transfer between the fire apparatus driveline and the Waterous fire pump. The C22 Transmissions new design features the following advances:

- **Reduced size**
  - Approximately 2" narrower than the current C20 Transmission
  - Provides additional exhaust clearance
  - Better fit for smaller apparatus
- **Reinforced case to increase strength and reduce vibration**
- **Primer location changed to mount to the side of the transmission**
  - Provides more space to fit smaller apparatus and lessens interference for the apparatus' exhaust



## NEW AND IMPROVED PRODUCTS

### Intake Relief Valve -

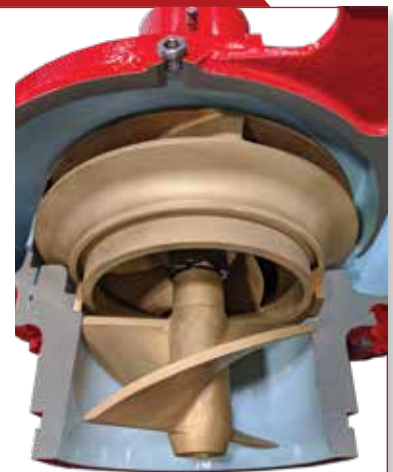
The Valve was designed by Waterous engineers that created a **spring-loaded valve** to replace the old-style pilot valve. This creates a more reliable system. It consists of a **50-250 psi setpoint**, NPT, Victaulic or NH output available and a safety feature to prevent locking the valve in the CLOSED position



The Intake Relief Valve is mounted on the pump at the Waterous factory rather than being mounted by the OEM, saving time and money.

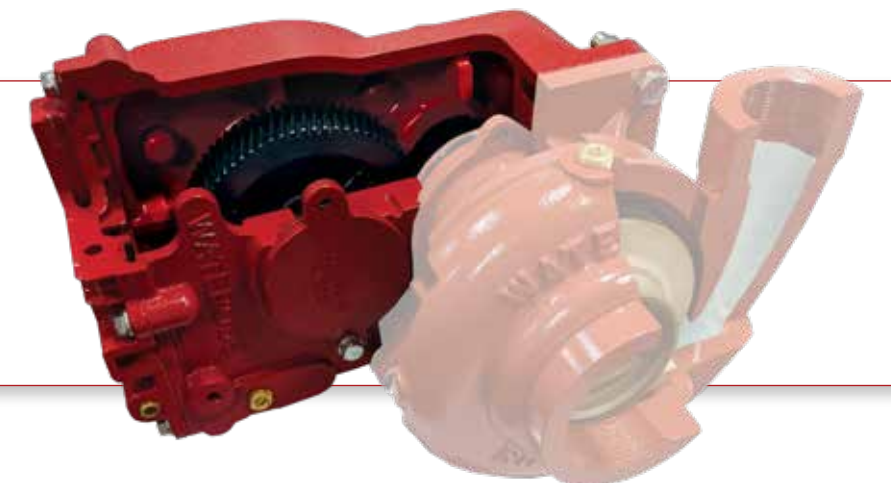
### S100 Series Pump with Inducer -

One of the fastest growing segments of fire pumps is the popularity of rear-mounted pumps. The S100 has been a choice of departments for several years. To enhance the S100 performance, **Waterous added an inducer**. The inducer provides an additional performance factor to produce the needed flows departments demand. The S100 maximum flow is rated at **2000 GPM (7500 L/min)**.



### K Series Transmission -

The Waterous K Series Transmission has been a work-horse PTO for many years. Waterous engineers improved on the venerable design by making it **lighter** and adding an **integral oil cooler**. While making it lighter, the improved K Series is a direct-fit replacement for the previous K Series Transmission.





# WAITING FOR YOUR PUMP PARTS TO ARRIVE?



FIRE PUMPS • FOAM SYSTEMS • CAFSYSTEMS™

There is no time for downtime when it comes to fighting fires. No one knows that better than Waterous. 95% of all Waterous parts are consistently in stock and ship within 24 hours. We rely on you to keep us safe – rely on us for fast, accurate pump parts.

[waterousco.com](http://waterousco.com)

