

# MPOQ

MUNCIE POWER QUARTERLY



## *Eyes on the road: Tactile controls & smooth operation*

Omni-System



Omni-System Plus



**ALSO INSIDE:**

Showing who we are

Keep your oil clean

# Showing who we are

Muncie Power Products has long understood the philosophy that if you take care your people, your people will take care of the customer.

We view ourselves as much more than a manufacturer; we are a customer service organization at the core, striving each and every day to serve our customers the best that we possibly can. We are privileged to serve an industry that is critical to the growth and sustainability of our communities and our world.

Our products play a critical role in society as they provide the power for vocational trucks of all types to get work done. Simply put, if our products and customer service are not exceptional, critical work may not get done.

We recently released new videos that remind us of our roots and feature our people. Our intent was to remind ourselves of why we exist and how we view our relationships as we live out our lives together. As we watch these videos, we thought about our own stories, our teamwork, and how we take pride in what we do.

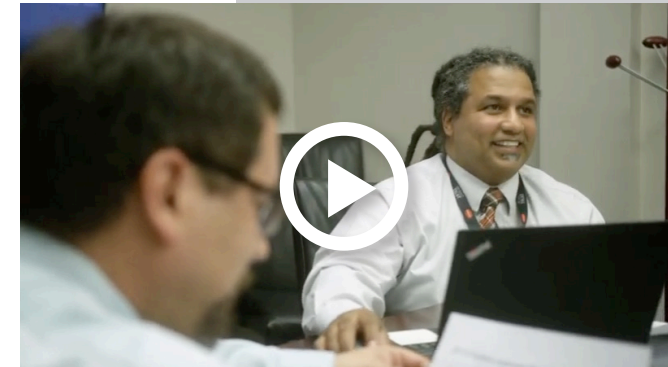
This is our story and we are proud of it. Our success is, and always has, been driven by our people.



**Ray L. Chambers**  
Chairman, CEO & President

**View our new videos here:  
[munciepower.com/videos](http://munciepower.com/videos)**

Hear directly from employees to learn about the culture at Muncie Power and what it is like to work here. We understand that our success is driven by the people who work here and our people always come first.



**CULTURE**

Muncie Power is more than just a manufacturer of power take-offs and hydraulic components. We are an innovative leader in the vocational truck industry. We provide the power that enables the trucks to do the work at hand.



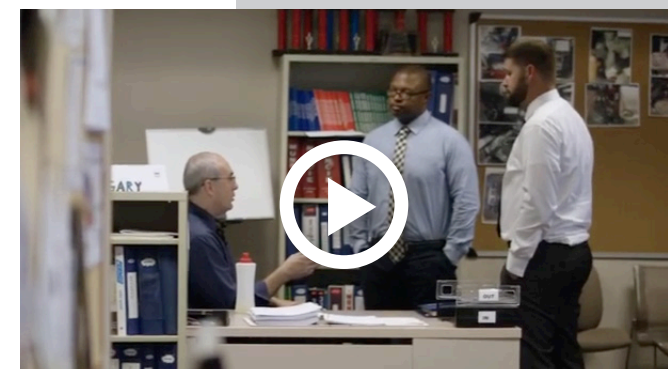
**WHAT WE DO**

A cinematic story of Muncie Power Products, a manufacturer of power take-offs and hydraulic components. Hear directly from the employees about who we are, what our brand represents, and how we do business.



**BRAND STORY**

Muncie Power Products continues to grow and always looking to add new talent. Check out [munciepower.com/careers](http://munciepower.com/careers) to view current opportunities.



**JOIN OUR TEAM**



# New snow and ice control solutions offer optimum fleet operation

**S**now and ice systems continually evolve to meet the demands of the market. Fleet managers look for systems that meet these criteria:

- **Dependable** – reliable, repeatable performance
- **Supportable** – either locally or through remote access
- **Versatile** – interchangeability of equipment to maximize efficiency
- **Expandable** – the ability to add future options (anti-ice, wing plows, etc.)
- **Affordable** – cost must equal value
- **Manageable** – consistently provide reliable data on system performance

Adhering to these principles, Muncie Power Products Snow & Ice Division introduces the Omni-System™ and Omni-System™ Plus.

These two systems replace the Advantage and Advantage+® from Muncie Power with new technology, better hydraulic setups, and more tactile controller designs.

Both new systems work with numerous small or large mobile truck applications, allowing for increased capability and customization.

## Omni-System

The Omni-System Controller provides the ultimate balance between performance, economy, convenience, and safety while being intuitive and extremely easy to set up and operate.

The system includes intuitive controls for simple operator interface and integrated CAN BUS communication between the in-cab controls and hydraulic valves, which means minimal conductors are required to be routed externally to the cab.

“Due to the corrosive nature of deicing agents, eliminating wires, and wire bundles is critical to reliable and failsafe operation,” said Sales Director – Technology Solutions Group Randy Fowler.

## Omni-System Plus

The Omni-System Plus Controller is extremely versatile for numerous snow and ice applications. Its capacitive 7” touch display and processor provide vivid, easy-to-read graphics for day-to-day operation. It’s also equipped with STM processor technology for improved response time.

Because of this enhanced set up, users will be able to notice a more responsive and smoother operation with the controller.

The Omni-System Plus allows for controller customization such as simple push buttons, multi-function dual axis joystick, or discreet joystick setups. This customizable set up—driven

by customer feedback—meets all equipment requirements on a single platform.

“We ultimately decided to maintain the tactile controls for optimum operator safety,” said Group Manager – Technology Solutions Group Kevin Woehler. Maintaining these controls helps maintain the goal of keeping the operator’s eyes on the road, according to Woehler.

The Omni-System Plus Controller comes equipped with remote diagnostic capabilities via Wi-Fi, including a remote diagnostic support application, which allows Muncie Power to provide immediate technical support without being on-site.

The Omni-System Controller features a tactile, easy-to-use layout and provides limited data logging for extracting directly from the controller or through “live” streaming capability to third party providers.

Group Manager – Technology Solutions Group Kevin Woehler said, “The new controller, paired with an enhanced hydraulic setup, supports flow sharing among functions and optimum motion control.”

# Omni-System™



## Applications

- Class 5 to Class 8 Chassis
- V-box / Tailgate Spreaders
- Underbody Scrapers / Wings
- Hoists (Telescopic / Rod)
- Front Plow Options
- Hydraulic / Electric Pre-wet Systems

MEETING THESE NEEDS



## Key Features

### IMPROVED INTERFACE

New rigid construction better protects electrical hardware

### CARTRIDGE VALVE DESIGN

Premium solution for hydraulic circuits: reduces rear hose connections for simpler install, easier to service, and includes flow sharing to keep all functions operating

### ENHANCED ELECTRICAL

Improved operator performance and processing capability

### INTUITIVE CONTROL SETUP

Turnkey ready system is an ease to setup and operate

### JOYSTICK CONTROL OPTIONS

Multiple joystick configurations available for optimum cylinder control



“The diagnostic application on the controller provides unparalleled customer support,” said Woehler. “Our engineering team has the ability to observe all critical system information

and remotely support our customers when they launch the application from the controller.” Muncie Power can reset a passcode, increase actuator speeds,

and diagnose an issue remotely through this application.

With GPS enhanced datalogging, fleet managers can monitor where a truck has traveled, spreader

rates, salt usage, plow up or down, localized air and road temperatures, and much more. Fleet managers are able to change bodies on the fly with no problem when utilizing the

Omni-System Plus Controller. With its versatility and technological advances, the Omni-System Plus Controller works for you, instead of the other way around.

Whether it’s a simple setup or a bit more advanced, Muncie Power has the snow and ice control solution for your fleet operation with the release of the Omni-System and Omni-System Plus. ♦

# Omni-System™ Plus



## JOYSTICK CONTROL OPTIONS

Multiple joystick configurations available for optimum cylinder control



## IMPROVED INTERFACE

New rigid construction better protects electrical hardware

## ENHANCED ELECTRICAL

Improved operator performance and processing capability

## LARGER 7" TOUCHSCREEN

Vivid, easy-to-read capacitive touchscreen

## REAL-TIME SUPPORT

Integrated with Wi-Fi connectivity

## INTERNAL GPS ANTENNA

Prevents operators from disconnecting GPS tracking

## REMOTE DIAGNOSTICS

Remotely connect to Muncie Power for setup and diagnostic assistance

## INTUITIVE CONTROL SETUP

Turnkey ready system is an ease to setup and operate

## CARTRIDGE VALVE DESIGN

Premium solution for hydraulic circuits: reduces rear hose connections for simpler install, easier to service, and includes flow sharing to keep all functions operating

## Applications

- Class 5 to Class 8 Chassis
- V-box / Tailgate Spreaders
- Underbody Scrapers / Wings
- Hoists (Telescopic / Rod)
- Front Plow Options
- Hydraulic / Electric Pre-wet Systems
- Tow Plow Setups
- Plow Power Float
- Swap Loader / Hooklift - Configurations
- Directional Spinner Systems
- Anti-Ice
- Multiple Body Applications

MEETING THESE NEEDS





# Keep your oil clean: Contamination and its many forms

By Breanna Daugherty, Marketing Communications Specialist

Note: In this article, we will use the word “contamination” rather than “dirt” because contamination can take many forms, whereas dirt is a type of contamination.

Contaminates can cause a variety of different damages or even bring a whole system to a halt.

As the number one enemy of hydraulic systems, it's important

to understand the different types of contaminants. There are particulate contamination, chemical contamination, and biological contamination.

When talking about and analyzing contamination, two factors are considered: size and concentration. The unit of measure for particle size is the micron ( $\mu$ ). Concentration is measured in the number of particles per milliliter,  $\frac{1}{1000}$  of a liter. A milliliter of oil is about the size of a sugar cube. So, how large is a micron exactly? The visibility threshold, or the smallest object that can be seen with the naked eye, is approximately  $40\mu$ . Table salt is  $100\mu$ , a human hair has a diameter of  $70\mu$ , and a red blood cell is  $7\mu$ .

## Particulate contamination

This kind of contamination can come in a variety of large and small sizes such as silt, sand, welding splatter, metal shavings, Teflon tape, fibers from rags, bolts, hand tools, and rust particles.

Some of these particles are large enough to bring a pump to an immediate and violent stop, leading to broken gear teeth

and sheared input shafts. Large particles can also cause “phonographing” (circular scoring that resembles a record) on parts. Finer contaminants, especially in large quantities and under pressure, create a sandblasting effect on the internal parts of the hydraulic components, such as thrust plates (see photo on next page). In either case, the end result is increased wear and heat, which leads to decreasing system efficiency and component life as a whole.

## Built-in

This kind of contamination occurs during the manufacturing and assembly procedure, which includes welding slag and splatter, dust from storage, paint chips, Teflon tape particles, and contaminants from “new” oil. Other common built-in contaminants come from hydraulic hoses when they are cut to the desired length and crimped.

As a reminder, store oil drums on their sides and store designated oil handling pans, buckets, and funnels upside down in a dust free cabinet. It is also recommended that new oil is filtered as it is put into the reservoir to reduce built-in contamination. Built-in con-

## THRUST PLATE PHONOGRAPHING



Example of hydraulic pump damage.

Circular scoring on thrust plate face resembles the grooves on a record.

## CAUSES OF DAMAGE

Large particle (sand, metal shavings, etc.) contamination.

## SOLUTION

Replace thrust plates and seals. Flush entire system and replace oil and filters.

## HOW LARGE IS A MICRON ( $\mu$ )?

- 149 $\mu$  = 100 mesh screen
- 100 $\mu$  = table salt
- 90 $\mu$  = smog particle
- 74 $\mu$  = 200 mesh screen
- 70 $\mu$  = human hair
- 60 $\mu$  = pollen
- 50 $\mu$  = fog particle
- 40 $\mu$  = visibility threshold
- 25 $\mu$  = white blood cell
- 10 $\mu$  = talcum powder
- 7 $\mu$  = red blood cell
- 2 $\mu$  = bacteria
- 1 $\mu$  = 0.00003937"
- 1 $\mu$  = 10-4 cm (1/10,000 cm)

tamination is avoidable if the ports and hoses are kept clean.

## Induced

This occurs when a system is opened for service and dirt is allowed in. Pressure washing, if directed toward the reservoir, introduces water to the system. Water is the most common, and often enters through the tank breather as the oil level rises and falls during normal system operation. Try to be mindful of the location the system is being serviced in; for example, if it is windy, there could be a chance that sand or dirt can get into the system when it is open.

## Ingressed

This contamination is drawn into the system during normal operation, usually through the reservoir breather or through cylinder rod seals. Ingressed contamination is unavoidable

because the system has to be able to breathe to be able to run.

## Internally (wear) generated

Wear particles, which are generated from normal operation, come from pumps, cylinders, and hydraulic motors; rubber compounds from hoses and seals; and varnishes from the breakdown of oil additives. This type of contamination is generally avoidable when care is taken on the products. However, products do eventually need to be replaced; for example, when rust occurs on steel products. Internally generated contamination depends primarily on the type of products going on an application.

## Chemical contamination

There are a few types of chemical contamination like diesel fuel and kerosene, which are sometimes used to thin the

oil. It is common to try to thin the oil during winter months or when operating in a colder climate with diesel fuel or kerosene. It's never appropriate to use either to thin the oil; that's why it's recommended to switch to an oil with lower viscosity or using an approved thinning agent to complete the job, rather than diesel fuel or kerosene.

Additionally, two other chemical contaminants are cleaning chemicals and liquid calcium chloride, which can occur when attempting to clean out the system. The best way to prevent this from happening is to be aware of any liquid that is near the breather and not to allow fluid to be spilled on top of the reservoir.

## Biological contamination

As previously mentioned, water is the most common type of contamination in a system;

however, oil can absorb up to 300 parts per million (PPM). Amounts above 300 PPM exist as emulsified water, which give the oil a milky appearance. When the water present in the system is above the saturation level (300 PPM), it becomes free water, which causes the oil and water to separate. It has been estimated that as little as 1% water in hydraulic oil can reduce pump bearing life by as much as 90%.

The presence of water also accelerates the breakdown of the additive package found in hydraulic oil and promotes the formation of acidic by-products which lead to corrosive wear. Water is also a major contributor to the process of oxidation, the reaction of oxygen to the carbon and hydrogen elements of hydraulic fluids, which results in the formation of sludge and contributes to corrosion. Additionally, water can lead to bacteria and or mold build up the system.

## Two factors to consider: concentration and size

### ISO cleanliness standard

When working with hydraulic oils, there is a cleanliness code that should be maintained that was developed by the International Organization for Standardization (ISO). ISO developed a scoring system that assigns a code, by performing an oil sampling analysis, based on parts per milliliter and establishes a minimum cleanliness level for the industry to follow (*see chart on next page*).

An oil sampling analysis is done to determine both the concentration and the composition of contaminants. In the analysis report, there are details on the types of particles found and the concentration, specifically in parts per milliliter, of 5µ and 15µ size particles. Generally, a typical oil analysis report shows the concentration of wear metals (i.e., iron, chromium, and aluminum), contaminate metals (i.e., sodium and potassium), additive metals (i.e., magnesium and calcium), and non-metallic contaminants (i.e., water and fuel). In addition, the report, by identifying the specific contaminants, helps to isolate the source of the contamination

An improvement in particle contamination of one ISO cleanliness code can result in a 10% to 30% increase in component life. The ISO recommendation for a typical

open center gear pump system operating at 3,000 PSI is 19/17/15. The first number (19) in the code reflects the allowable number of particles of a size equal to or greater than 4µ. The second number (17) reflects the allowable particle count ≥ 6µ. The third (15), ≥ 15µ, this translates to a total particle count of no more than 5,000/ml of 4µ or larger, 1,300 ml of 6µ or larger, and 320 ml of 14µ or larger particle size. The 5,000 ml would include all particles larger than 4µ.

### Oil filters

It has been estimated that between 70% and 90% of hydraulic system failures are the result of contamination. Filters, properly selected and maintained, will prevent contaminants from damaging hydraulic components and enable the system to run cooler, quieter, and longer. Filters may be located in the suction filter, pressure, or return line.

The more common on-highway vocational trucks typically use return line filters, although the type of filter and location will be determined by the hydraulic component system.

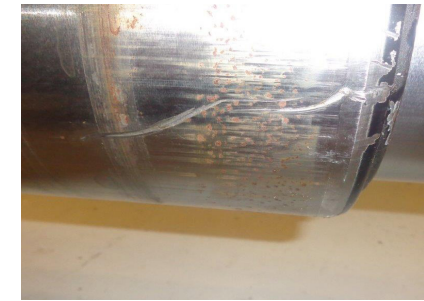
With various types, sizes, and ways contamination can get into the system, it's important to be cognizant of the system as a whole and to take care of it. ♦

## ISO CLEANLINESS CODE

Contaminant concentration (particles PER ml)	code
10,000,000	30
5,000,000	29
2,500,000	28
1,300,000	27
640,000	26
320,000	25
160,000	24
80,000	23
40,000	22
20,000	21
10,000	20
5,000	19
2,500	18
1,300	17
640	16
320	15
160	14
80	13
40	12
20	11
10	10
5	9
2.5	8
1.3	7
0.64	6
0.32	5
0.16	4
0.08	3
0.04	2
0.02	1
0.01	0.9
0.005	0.8
0.0025	0.7

## RUST/CONTAMINATION

*Example of telescopic cylinder damage.*



### CAUSES OF DAMAGE

Damage to wiper will allow the "upper" portion of a non-chrome stage to rust.



### SOLUTION

Prior to installation of cylinder, make sure to clean the hydraulic system. Do not weld near an exposed cylinder. Do not pressure wash cylinder.

## CONTAMINATION SCORING

*Internal pressure leakage. Scoring of walls of piston cup (CS series PTOs). PTO may not engage.*



### CAUSES OF DAMAGE

Contaminates in the transmission fluid get inside the PTO clutch pack.

### SOLUTION

Rebuild PTO. Flush transmission and replace automatic transmission fluid and filter.



*A Member of the Interpump Group*