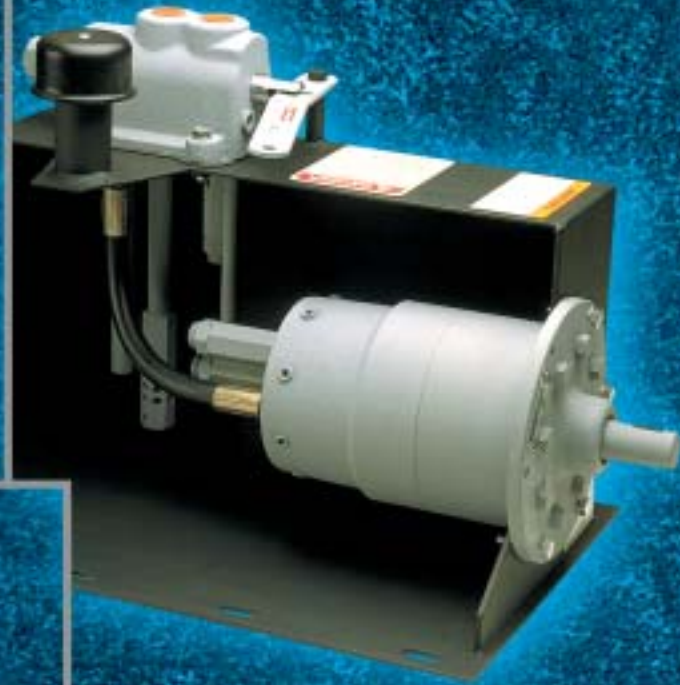


Williams[®]

MACHINE & TOOL



**YOUR
SUPERIOR
SOURCE FOR
HYDRAULIC
PUMPS,
POWER UNITS,
VALVES
& RELATED COMPONENTRY**

Williams[®] MACHINE & TOOL

AN AMERICAN SUCCESS STORY

QUALITY PRODUCTS, SUPERIOR SERVICE

The story begins in 1938 with an enterprising man, David Williams, venturing out to start his own job shop in a modest garage in Omaha, Nebraska. Thus, *Williams[®] Machine & Tool* was born, and the rest is the quintessential American success story of ingenuity, hard work, and determination. *Williams[®]* launched its first hydraulic pump design in 1948. Ever since, the company has grown steadily into one of America's leading specialty manufacturers of a wide range of hydraulic pumps, power units and related components and systems for original equipment manufacturers (OEMs) throughout the United States and Canada.

Today, *Williams[®]* makes its home together with its sister company, *Energy[®] Manufacturing Company, Inc.*, in Monticello, Iowa, with 100,000 square feet (9,290 m²) dedicated to the world-class design and manufacture of fluid power components. Since May 2004, *Williams[®]* has been owned by its management along with a private equity group, thus enhancing service and responsiveness to its customers.

Williams[®] occupies a rich place in history in the nation's heartland. During the 1970s, the company produced piston pump/reservoir combinations for approximately 80% of the light to medium duty farm trucks on the road. Today, close to important sources of raw materials and components, *Williams[®]* combines these advantages with the dedication and work ethic of a rural Midwestern community, to offer competitive pricing, superior product quality, excellent delivery, and outstanding service and technical support to customers from coast to coast.

Today throughout North America, you can find *Williams[®]* products used on machines such as:

- Material handling equipment
- Dump trucks
- Dump trailers
- Lawn and turf care equipment
- Railroad equipment
- Asphalt equipment
- Hydraulic presses
- Agricultural equipment
- Construction equipment
- Amusement rides
- Specialty trailers
- Tailgate lifts



ENGINEERING CAPABILITIES

SPECIALTY DESIGN

At *Williams*®, we've worked with hundreds of customers to meet their precise specifications and needs. Our solutions are custom designed for each OEM. *Williams*® has numerous styles of pump and valve configurations to satisfy the unique pressure and flow requirements of each individual application. We offer you nearly 60 years of experience in designing, manufacturing, and applying hydraulic components and systems to a broad range of equipment. *Williams*® is fully prepared to design and supply a hydraulic system that is the optimum solution for *your* particular application or need.

Williams® offers complete CAD engineering capabilities. Electronic versions of detailed customer drawings are available in a variety of formats and can be e-mailed, saving valuable time.

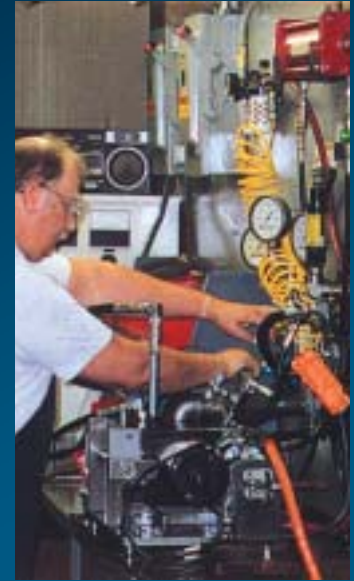
Perhaps you require exceptional efficiency in high-pressure hydraulic systems. Or, perhaps you need products that operate and perform under extreme conditions while requiring less amp draw, and offering higher flow and space-saving dimensions. Whatever the criteria may be, you can count on *Williams*® to develop the right design for you.



PRODUCT & PERFORMANCE TESTING

PRESSURE & FLOW REQUIREMENTS

Controlled lab testing is an important resource available to insure the proper fulfillment of our customers' needs. Our test facility houses state-of-the-art equipment and employs proven procedures for pressure, flow, and other testing. *Williams*® has pressure and flow capabilities to 5000 psig (345 bar) and 100 gpm (379 lpm), as well as mechanical loading capabilities to 60 tons (120,000 lbs. or 533,760 N). When you choose *Williams*® products, you can be certain the design has been thoroughly tested to assure reliable performance according to the needs of your particular application and requirements.



MANUFACTURING CAPABILITIES

EXPANDED PRODUCTION

In June 2003, *Williams*® Machine & Tool moved its operations into a much larger, high-tech manufacturing facility. This plant, located in Monticello, Iowa, greatly expands our production capabilities. Housed with our sister company, *Energy*® Manufacturing, the plant layout and machining centers are designed for superior manufacturing and process flow efficiency, from raw material receiving to finished product shipment. This centrally located, well-tooled manufacturing facility is in ideal proximity to many suppliers, enabling rapid response. Our favorable cost structure, combined with our design, manufacturing, and quality assurance practices, assures you of outstanding product value.



Poised for growth, this strategic move to Monticello, Iowa, represents a new and exciting chapter for *Williams*® Machine & Tool as we continue into our second half-century of operation.



ON-TIME DELIVERY

PROVEN PERFORMANCE

Williams® has a documented track record of delivery performance well above the industry standard. You can count on *Williams®* to supply the hydraulic pumps, power units, and affiliated products and systems you require, wherever and whenever you need them. For scheduled orders, a history of on-time delivery in excess of 95% speaks for itself. Our commitment is to be your best, low-cost, short cycle-time resource for all your hydraulic component and system needs.

PRODUCT QUALITY

STRINGENT CONTROLS

At *Williams® Machine & Tool*, beyond our computerized machining, extensive inspection equipment, and stringent quality assurance monitoring practices, there is a pride within our people, who for generations in this rural Midwestern community have shared an attitude of responsibility and customer care. Our culture is to do things right the first time. The goal for every *Williams®* product, from order to shipment, is zero defects in the end user's application. And of course, just in case, all *Williams®* products are backed by an outstanding warranty against defects in materials and workmanship.

CUSTOMER SERVICE

UNMATCHED RESPONSE

Williams® prides itself in responding with quotations and proposal drawings for standard and special products promptly. We're specialists in supplying hydraulic pumps, power units, and affiliated products and systems. Our extensive experience with many customer applications and needs over the years allows our team to quickly configure high quality custom solutions. *Williams®* is committed to customer service unmatched by our competitors. The long-standing relationships *Williams®* enjoys with many of its clients bears testimony to our uncompromising product quality and our ability to satisfy the ever-changing needs of the marketplace. Call us today and you'll find our "customer-friendly" people receptive and responsive to your needs.



PISTON PUMP/VALVE/TANK COMBINATIONS

Ideal for applications requiring a pump/valve/reservoir in an efficient, neat package. These units are rugged and heavy duty. They typically consist of a bi-rotational piston pump, valve, and reservoir in a complete, compact assembly.

AVAILABLE FEATURES & OPTIONS INCLUDE:

- Pump / reservoir only with high pressure and return fitting plate
- Single or multiple 3-way and 4-way control valves
- Cylinder port relief options to limit down pressure
- Exclusive recycle valve system, or DO3 (push button) type valve control with 15 quarts (14.3 liters) and larger reservoirs
- Reservoirs from 5.4 quarts (5.1 liters) usable, up to 50.6 quarts (47.8 liters) usable

20 SERIES

0.5 cipr (8.2 cc/rev.); maximum pressure 3500 psig (241 bar); maximum speed 1000 rpm; bi-rotational; typical performance 1.66 gpm (6.3 lpm) @ 1000 rpm and rated pressure.

40 SERIES

0.9 cipr (14.8 cc/rev.); maximum pressure 3500 psig (241 bar); maximum speed 1000 rpm; bi-rotational; typical performance 3.31 gpm (12.5 lpm) @ 1000 rpm and rated pressure.



F98 SERIES

2.6 cipr (42.6 cc/rev.); maximum pressure 5000 psig (345 bar); maximum speed 1300 rpm; bi-rotational; typical performance 10 gpm (37.9 lpm) @ 1000 rpm and rated pressure.

H98 SERIES

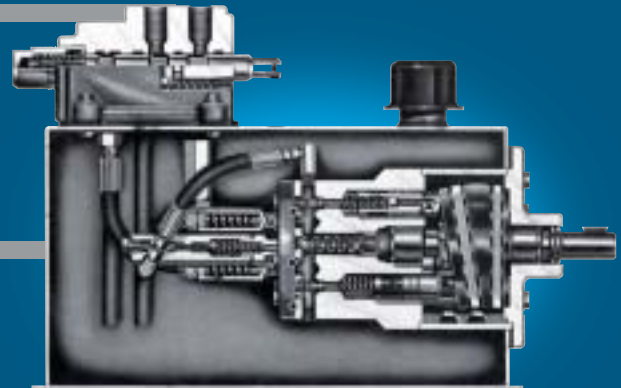
3.4 cipr (55.7 cc/rev.); maximum pressure 4000 psig (276 bar); maximum speed 1300 rpm; bi-rotational; typical performance 13.6 gpm (51.5 lpm) @ 1000 rpm and rated pressure.

F98X SERIES

2.6 cipr (42.6 cc/rev.) two-stage pump; maximum pressure 5000 psig (345 bar); maximum speed 1000 rpm; bi-rotational; outputs: high volume (low pressure) 10 gpm (37.9 lpm) @ 500 psig (34.5 bar) and 1,000 rpm; and low volume (high pressure) 2.5 gpm (9.5 lpm) @ 5,000 psig (345 bar) and 1,000 rpm.

D58X SERIES

0.9 cipr (14.8 cc/rev.) two-stage pump; maximum pressure 5000 psig (345 bar); maximum speed 1800 rpm; bi-rotational; outputs: high volume (low pressure) 6 gpm (22.7 lpm) @ 500 psig (34.5 bar) and 1,800 rpm; and low volume (high pressure) 1.5 gpm (5.7 lpm) @ 5,000 psig (345 bar) and 1,800 rpm.



POWER UNITS - GEAR TYPE (AC & DC)

Working pressures to 3500 psig (241 bar). A typical unit consists of: one of four different displacement pumps, an internal load check valve, an internal adjustable relief valve, a 12-volt motor, a start switch, and an fluid reservoir.

AVAILABLE FEATURES & OPTIONS INCLUDE:

- .097 cibr (1.6 cc/rev.), .129 cibr (2.1 cc/rev.), .194 cibr (3.2 cc/rev.), and .258 cibr (4.2 cc/rev.) displacement pumps
- Aluminum or cast iron manifold designs
- Compact DC units including bi-rotational motor design
- Externally adjustable relief valves (aluminum manifold designs only)
- 120 & 220 Volt AC motors
- Separate pump/motor assemblies
- Reservoirs from 0.95 quarts (.9 liters) to 5.6 quarts (5.3 liters) usable volume
- Various types of control valves

120 & 220
VOLT AC
MOTORS



COMPACT
DC
UNITS



SEVERAL
RESERVOIRS
AVAILABLE



BI-ROTATIONAL
DC MOTOR
DESIGNS



VARIOUS
TYPES OF
CONTROL
VALVES



PUMP/
MOTOR
ASSEMBLIES



12 VOLT DC POWER UNITS -PISTON TYPE

Working pressures to 5,000 psig (345 bar). These power units provide exceptional efficiency in high-pressure hydraulic systems. Depending on the operating pressure, they can offer up to 40% less amp draw than equivalent gear pump designs, resulting in improved battery life. In addition, piston units offer superior performance under extreme conditions of fluid viscosity and ambient temperature.

Each unit consists of a cast stack design, three-piston (0.09 cipr [1.48 cc/rev.]) or six-piston (0.18 cipr [2.95 cc/rev.]) pump, internal load check valve, adjustable integral relief valve, 12-volt DC motor, start switch, and fluid reservoir.

AVAILABLE FEATURES & OPTIONS INCLUDE:

- Port block only (no valves)
- Manual single or double acting valves
- Exclusive Recycle Valve feature (this permits the use of a smaller reservoir, resulting in a more compact design that is easier to install and more economical)
- Solenoid operated (push button) controls suitable for many different applications
- Reservoirs from 0.95 quarts (.9 liters) to 17 quarts (16.1 liters) usable volume

PISTON TYPE POWER UNIT



GASOLINE POWERED PORTABLE POWER PACK

Ideal for various hydraulic applications when no (or insufficient) electrical power is available. This unit includes: gasoline engine, coupler, pump, reservoir, and control valve. Typical applications include construction sites, farming operations, trailer lifts, truck hoists, rental equipment, hydraulic jacks, recycling crushers, auxiliary or backup power systems, and many more.

Advantages over conventional 12-volt electrical systems include: no batteries, cables, charger, or DC motor required; no cartridge valves sticking; higher flow capability; higher pressure capability; better efficiency; continuous duty capability; and superior operation in extreme weather conditions.

PORTABLE POWER PACK



AVAILABLE FEATURES & OPTIONS INCLUDE:

- Working pressures up to 5000 psig (345 bar)
- Low oil engine shut off
- Light-duty and heavy-duty Honda engines
- Optional cylinder port relief to limit down pressure
- One or two valves (depending on reservoir size) to operate different functions
- Reservoirs from 7 quarts (6.6 liters) to 40 quarts (37.9 liters) usable fluid volume
- Pumps with displacements of .09 cipr (1.5 cc/rev.) to .18 cipr (3 cc/rev.) resulting in output flows of up to 2.6 gpm (9.8 lpm)
- Quick disconnects
- Fitting plate for remote valve operation
- Electric engine start
- Wireless remote and cable-connected push-button controls

DIRECT MOUNT GEAR PUMP/VALVE/TANK COMBOS

Ideal for truck hoist applications that require a pump mounted directly to the power take off, and a remote valve / reservoir. *Williams®* W15 Series valve reservoir combination features our unique, space-saving recycle valve. In this configuration, the reservoir, control valve, relief valve, and filter are all one assembly. Valve options include single acting or double acting, cable actuated, air actuated, or push button control. Reservoir sizes range from 15 quarts (14.2 liters) to 60 quarts (56.7 liters) usable.

Williams® M Series valve and reservoir combinations are typically used on smaller truck hoist applications. This series offers all of the same features as the “W15” Series.

Williams® Machine & Tool has pumps for most truck PTO’s available from stock.

AVAILABLE FEATURES & OPTIONS INCLUDE:

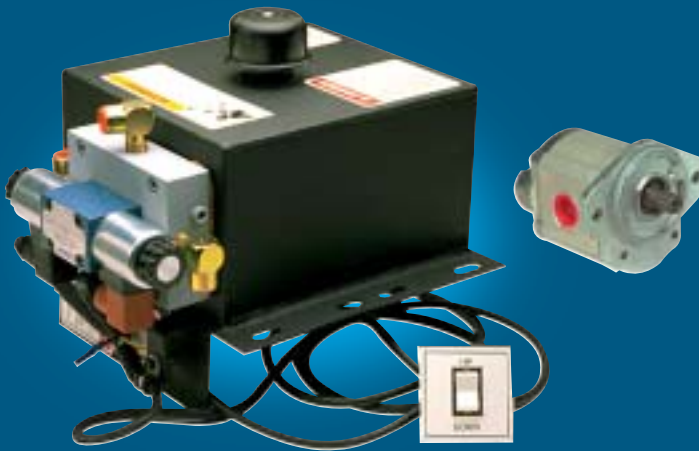
- Pump displacements from .37 cpr (6 cc/rev.) [900 Series] to 3.05 cpr (50 cc/rev.) [1500 Series]
- Single and bi-rotational designs
- Side and rear porting – facilitates easier installations
- Working pressures up to 4,000 psig (244 bar)
- Both SAE “A” and “B” mounting flanges

W15 SERIES



M SERIES PUSH-BUTTON

Low profile, space-saving.



M SERIES BONNET-STYLE

Low profile, space-saving.



CONTROL VALVES

Williams® valves are available in double-acting (4-way) or single-acting (3-way) versions. These valves are machined from a solid casting for high-pressure operation. All valves feature ground and chrome-plated spools that are fitted to the bodies by honing. All spools are pressure-balanced for smooth, positive valve actuation. Optional externally-adjustable relief valves are available for applications up to 4,500 psig (310 bar). Spool control options include three-position detented and three-position spring-centered. Valves may be used in series operation. Flow capacity is 6 gpm (22.7 lpm). Port size is 3/8 inch NPT (SAE ORB ports are available upon request). Various spool configurations are available.

DOUBLE
ACTING
4-WAY VALVE



ACCESSORIES

Williams® offers a variety of accessories and related componentry. Please call us with your specific needs if not shown below.

PUSH-ON
BREATHER
CAPS

Fits most hydraulic reservoirs with a 1-1/2" (38 mm) O.D. tube.



ELECTRICAL
VALVE WITH
TOGGLE



BONNET-
STYLE
CONTROLS



AIR-SHIFT
CONTROLS



Williams[®] MACHINE & TOOL

NOTES: _____



ENERGY[®]

Manufacturing Company, Inc.

Through Energy[®] Manufacturing Company, Inc., Williams[®]' sister company, we bring to you an expanded range of components, systems, and technology to meet and exceed your ever-changing hydraulic design needs.

STANDARD AND CUSTOM CYLINDERS

A wide range of welded, tie-rod, and ram-type cylinders are available to satisfy virtually any hydraulic application or need:

Standard Cylinders – 1.5 inch (3.81 cm) to 10 inch (25.4 cm) bores; strokes to 15 feet (4.57 m); single and double acting; up to 7,000 psig (483 bar) working pressure capability; many end mechanisms, integral valves, and other options available:

- *CHD Series Welded Cylinders* – Threaded end-cap design; 5,000 psig (345 bar) working pressure capability – special designs available for working pressures up to 7,000 psig (483 bar).
- *CSR Series Welded Cylinders* – Round retaining ring design; 3,265 psig (225 bar) working pressure capability.
- *CYR Series Welded Cylinders* – Round retaining ring design; 3,000 psig (207 bar) working pressure capability.
- *CYL Series Welded Cylinders* – Snap ring design; 2,500 psig (172 bar) working pressure capability.
- *HPTR Series Cylinders* – Tie-rod design; 3,265 psig (225 bar) working pressure capability.

Rephasing Cylinders – This design allows for the simultaneous extension and retraction of two or more cylinders connected in series. Please contact us for additional information regarding these systems.

VALVES FOR A VARIETY OF CONTROL FUNCTIONS

We offer directional control valves and accessories for a wide range of operating flows, pressures and applications:

- *CVA, DCVA, and CVR Series* – Zero to 20 gpm (76 lpm) three-position four-way single-spool directional control valves rated for 2,500 psig (172 bar) working pressure.
- *Selector Valve Series* – Zero to 30 gpm (114 lpm) two-position three-way selector valves rated for 3,000 psig (207 bar) working pressure.



Williams[®]
MACHINE & TOOL

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Williams[®] is a member of:
• **NFPA**
(National Fluid Power Association)