Aerospace technology

Parker can engineer your success with off-the-shelf solutions that are cost-effective and efficient. With 100 years of experience, we offer military-grade components that meet demanding specifications without needing to be custom-manufactured. Here is a sampling of solutions that save time and money:

Aircraft engine-driven pumps
• Provide primary hydraulic power for many of today’s leading military and commercial aircraft
• Ranging in size from 0.03 to 5.5 in³/rev and capable of operation at system pressures between 1,000 and 8,000 psi
• Unmatched efficiency and reliability
• Superior power-to-weight ratio

Electric motor-driven positive-displacement pumps
• Engine oil cooling systems and military electronic cooling systems applications
• Accepts a variety of dielectric fluids
• Fixed-speed device
• Easily adjustable flow by changing width of the gerotor to meet the specific application
• Modifiable pressure relief valve for safety to control maximum discharge pressure

IndiLok™ quick-disconnect (QD) couplings
• Provide reliable performance in cooling, fuel, hydraulic, and pneumatic systems across a wide range of temperatures and pressures
• Ultra low profile design

Medium- and high-pressure PTFE hoses
• Reliable fuel, oil, and hydraulic fluid conveyance
• Most hose assemblies are available with FAA, TSO, c53a, C75, AS, and ABS approvals

Slide-Lok™ couplings
• Quick connect/disconnect action
• Self-sealing action and superior performance during operation and maintenance of fluid systems
• Push-to-connect, pull-to-disconnect style

Hydraulic accumulators
• Piston-type hydraulic accumulators meet stringent weight, volume, and performance requirements
• Double end-cap accumulators designed in accordance with MS28700 and MS28797

Bootstrap reservoirs
• Slosh-free system pressure to the reservoir connection and acts on the small piston
• Found in service on the F-22 Raptor, F-16 Fighting Falcon, F/A-18 E/F Hornet, C-17 Globemaster, V-22 Osprey, and 787 Dreamliner

Black Hawk main rotor flight control actuators
• Main rotor pitch and roll control
• Ballistic tolerant
• Jern tolerant with fail-safe operating modes
• Pressure switch for hydraulic system failure detection

Javelin control actuation system
• Missile pitch, roll, and yaw control
• Integrated control electronics
• Independent fin control

Cold plates
Thermal management
• Unique macro-laminated construction
• Transports coolant with complex liquid paths

Advanced liquid-cooled enclosures
Thermal management
• Arrow-shaped (ATR) format
• High-power, high-density, electronic connectors
• Suitable for ruggedized military, aerospace, industrial, and commercial applications

Naval technology

Electromechanical actuator
Safety barrier positioning, platform looking, door and hatch latching
• Stainless steel construction for corrosion resistance
• Improved sealing to prevent environmental moisture contamination
• Mechanical over-ride for emergency operation
• Multiple move profiles
• Absolute positioning
• Adjustable acceleration

Drive control system
High-powered variable speed drive for AC motors available as either stand-alone unit or complex multi-axis motor control system
• Power range: 160-600 hp (100-400 kW)
• Modular design, low maintenance
• Dynamic braking

Defense vehicle systems from Parker Hannifin Corporation

Parker’s industry-leading engineers draw on the corporation’s enormous breadth of technologies to create system solutions addressing the most challenging needs and optimizing platforms for weight, cost, power, and reliability. Collaborating with our customers, Parker designs advanced components and technologies more quickly and efficiently compared to other global organizations. At Parker, we engineer your success.
Vehicle actuation systems

**Armored door actuator system**
- Both passive and active systems ensure a safe egress every time
- All systems are environmentally tested for military applications
- Systems operate on demand in any vehicle orientation
- Damper is a passive speed control with locking mechanism, configurable for speed and loads
- Egress damper system (EDS) provides normal damper plus emergency egress pressure actuation
- No electrical, pneumatic, or hydraulic hookup for damper and EDS
- Active systems include both pneumatic and electrohydraulic actuator (EHA) options
- Pneumatic solutions are lightweight powered by existing vehicle pneumatic systems
- EHA solutions are self-contained, have a 24V connection, and combine electronics ease and hydraulics power densities
- System options include backup power and obstacle detection for increased operator safety
- Combat lock solutions available
- Integrated, low-resistance manual release for actuation in unpowered states
- Proven technology fielded in several military ground vehicles

**Armored window actuator system**
- Normal appearance, remarkable protection
- Single uniform compact design can be integrated into any vehicle door
- Supports armored glass sizes up to 500 pounds
- Environmentally sealed, impact-resistant drive train
- Operates in any position, including completely inverted
- EHA solution is self-contained, has a 24V connection, and combines electronics ease and hydraulics power densities

**Automated articulated trailer hitch system**
- Allows for safe trailer connection without having to leave vehicle
- Operation protection while connecting/disconnecting trailer
- Rapid connection time for improved readiness
- Single operator capability
- Tweakless articulation
- Flightlock kits available

**Central tire inflation system**
- Automatic tire-pressure adjustment system
- Allows operator to select optimal tire inflation pressure
- Rapid connection time for improved readiness
- Central tire inflation system
- No electrical, pneumatic, or hydraulic hookup for damper and EDS
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**Vehicle filtration systems**

- **Platoon reverse osmosis water system**
  - Potable water filtered from sea, brackish, or fresh water
  - Self-contained water supply, portable and independent
  - Processes 30 gallons per hour from 12/24 volt power
  - Industry-leading technology produces more water in a smaller package than competitors
  - Patented energy-recovery device allows for more water with lower power consumption
  - Patent-pending filter design allows for filter changes external of case

- **Fuel filtration transfer system**
  - Filter fuel reliably for vehicles anywhere in the world
  - Lightweight solution fits existing portable-can vehicle brackets
  - Same flow as traditional fuel pump
  - Uses Parker filter for water separation and particulate filtration
  - 12/24V DC or AC power options
  - Parker EZ-Form suction/outlet hoses
  - Electronic and hydraulic circuit protection
  - Multi-size options available from portable cans to cars and skids
  - Portable-can threaded insert for in-field water/seawater contamination filtration

- **On-vehicle engine filtration**
  - Air, oil, and fuel filtration to ensure continuous vehicle operation
  - Two-stage diesel fuel filtering for maximum water and particulate removal
  - Fuel systems with built-in relief, water-in-fuel sensor, diagnostic valves, and cold weather heaters available
  - Pre-filtration and filter systems to extend service intervals and reduce maintenance times
  - Oil filtration systems for all engines to protect against harmful wear and contaminants

**Quick-oil-change systems**

- Simple and reliable system for improved maintenance
  - Change drivetrain fluids without removing chassis armor
  - Eliminate/hazardous spills, reduce labor hours
  - Extra storage for fluids
  - Time-saving options available for enhanced maintenance records

**Fluid conveyance systems**

- **Hoses and fittings**
  - Transport fluids and air throughout the vehicle, within integrated conveyance systems
  - Lightweight materials provide cost and fuel savings
  - Extreme abrasion resistance or flexibility available to solve plumbing challenges
  - Available in kits and subsystems
  - Complete line of hoses, tubing, fittings, adapters, quick couplers, and diagnostics
  - Applications: airbrakes, central tire inflation lines, engine coolant lines, fire suppression hoses, fuel lines, heater hoses, transmission hydraulic coolant lines, water purification systems

**Sealing systems**

- **Seals**
  - Fuel filtration – Multiprotect sealing solution with built-in filter screens to prevent foreign particles from entering key engine components
  - Picture frame gaskets – These environmental seals protect vehicles from water ingress and contamination. Door seals can be extruded and fabricated into various custom shapes and cross sections to fit any specific groove configuration
  - Oil pan seals – The Gask-O-Seal™ is a metal, plastic, or composite relay with a machined groove into which a custom-engineered rubber element is chemically and/or mechanically bonded, creating a dependable, responsive seal
  - Fabric reinforced bellows – Flame-resistant and high-temperature fuel-resistant bellows are flexible enough to allow movement in joints during vehicle travel
  - Rotary axle seals – Provide sealing and wiping functionality for rotating and swiveling movements under low pressure and high velocity
  - Turret seals – Precision-formed rubber and combination rubber/fabric sealing products are manufactured using a single-step process that molds the entire spiral length of the product at one time

**EMI shielding & grounding**

- Complete EMI seals, gaskets, mesh, paints, additives, greases, adhesives, window coatings, and any other method of providing EMI protection of vehicles and equipment

**Vehicle controls**

- **Electronic controls**
  - Hardened mobile electronic subsystems
  - Cooling fan-drive systems, both hydraulic and electric, for improved vehicle operating ranges
  - Color displays for accurate vehicle status information
  - Color displays with video capability, for hitch alignment, back-up cameras, and exterior threat assessment
  - Complete line of controllers, sensors, displays, gauge clusters, joysticks, and cameras
Vehicle actuation systems

Armored door actuator system
Both passive and active systems ensure a safe egress every time:
• All systems are environmentally tested for military applications
• Systems operate on demand in any vehicle orientation
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• System options include backup power and obstacle detection for increased operator safety
• Combat lock solutions available
• Integrated, low-resistance manual release for actuation in unpaved settings
• Proven technology failed in several military ground vehicles

Armored window actuator system
Normal appearance, remarkable protection
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Automated articulated trailer hitch system
 Allows for safe trailer connection without having to leave vehicle
• Operator protection while connecting/disconnecting trailer
• Rapid connection time for improved readiness
• Single operator capability
• “Tress”-less articulation
• Pickup truck available

Central tire inflation system
Automatic tire-pressure adjustment system
• Allows operator to select optimal tire inflation pressure
• Reduced tire pressure results in bigger footprint, providing more flotation in soft soil terrain
• Highly scalable, provide fast-in-fast-out with remote wiping
• Increased mobility in secondary or off-road conditions
• Texis as fast as construction
• Extended tire pressure operating range
• Robust operating temperature and attitude capability
• Inaccessible to vehicle installation variability

Global Shield™ corrosion resistance
Cylinder coating technology for predictive corrosion-resistance requirements of challenging environments
• Significantly improves corrosion resistance of traditional rod coatings
• Tested to over 3,000 hours of salt spray
• Grits and tough, bends with rod
• Engineered hardness (HRC 54 minimum) for wear resistance
• Exceptional interface adhesion and impact resistance
• Less downtime due to lack of maintenance intervals
• Environmentally safe (no chromium or hexavalent)

In-hub electric motor
Electric in-hub motor provides independent drive control for traction, turn radius, reverse, and electronic chassis configuration
• Hybrid technology
• Dramatically increased ground clearance
• 600hp in a 20-inch package
• Silent run and silent watch operations
• Reduced weight and volume
• Enhanced crew safety
• Increased fuel economy
• Lower fuel consumption

Power takeoff unit
Transforms drive train mechanical power to hydraulic and/or electrical power
• Used for various vehicle auxiliary systems and components
• Alternator-generator drives
• Constant RPM regardless of single engine
• Constant high-horsepower output

Rear steering
Complete rear steering system
• Lightweight
• Power unit, PTO, or belt-drive pump capability
• Controls to isolate rear-steering circuit
• Subassembly kit means simple, fast installation
• Cylinder/rod lock assembly designed with Global Shield™ technology for absolute position feedback

Hydraulic actuators
High driving and holding torque in a compact package
• High-power density unit that fits into tight places
• Added rotation up to 360 degrees
• Ideal for severe climates and unforgiving environments
• Torque generating splines are sealed and lubricated non-hydraulic fluid inside actuator housing
• Sealed system for excellent corrosion resistance and virtually maintenance-free operation

Winch system
Winch technology to meet the most demanding requirements
• Multiple lightweight winch options
• Complete system including PTO, pump, valves, electronics, winch, ropes, and integration
• World leader in orbit-style, low-speed, high-torque, hydraulic motors
• Lightweight high-amp drive
• Integrated solutions with optimum performance over a full line of vehicle platforms
• Hydraulic options include auto-level-wind, full-line-pull capability for multiple wraps of drum

Sensoscan condition monitoring
Accurate and reliable real-time condition monitoring to keep systems healthy and operating efficiently
• Compact, energy-efficient Sensoscan® and wireless Sensoscan®II sensors
• Sensors diagnose changes in pressure, temperature, and humidity
• SCUT™ software provides an easy-to-use interface compatible with mobile devices to relay analytics line-pull capability for multiple wraps of drum

Filtration systems

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Potable water filtered from sea, brackish, or fresh water
• Self-contained water supply systems and independent
• Processes 30 gallons per hour from 12/24v DC power
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Simple and reliable system for improved maintenance
• Change only fluids without removing chassis armor
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Sealing systems

Seals
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Vehicle controls

Internal electronic controls
Handheld mobile electronic subsystems
• Cooling fin-drive systems, both hydraulic and electric, for improved vehicle operating range
• Color display for accurate vehicle status information
• Color displays with capability for pitch alignment, back-up cameras, and exterior threat assessment
• Complete line of controllers, sensors, displays, gauge clusters, joysticks, and cameras

Fluid conveyance

Hoses and fittings
Transport fluids and air throughout the vehicle, within integrated conveyance systems
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• Available in kits and subsystems
• Complete line of hose, tubing, fittings, adaptors, quick couplers, and diagnostics
• Applications: airbrakes, coolant influx line, engine coolant lines, fire suppression hoses, fuel lines, heater hose, transmission hydraulic coolant lines, water purification systems

PARKER AEROSPACE • ENGINEERED MATERIALS • FILTRATION • FLUID CONNECTORS • INSTRUMENTATION & MOTION SYSTEMS
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- Main rotor pitch and roll control
- Ballistic tolerant
- Jam tolerant with fail-safer operating modes
- Pressure switch for hydraulic system failure detection

Javelin control actuation system
- Missile pitch, roll, and yaw control
- Integrated control electronics
- Independent fin control

Cold plates
Thermal management
- Unique monolaminar construction
- Transports coolant with complex liquid paths

Advanced liquid-cooled enclosures
Thermal management
- Axial-to-radial (ATR) format
- High-power, high-densely, electronic connectors
- Suitable for ruggedized military, aerospace, industrial, and commercial applications

Naval technology

Electromechanical actuator
Safety barrier positioning, platform looking, door and hatch latching
- Stainless steel construction for corrosion resistance
- Improved sealing to prevent environmental moisture contamination
- Mechanical over-ride for emergency operation
- Multiple move profiles
- Absolute positioning
- Adjustable acceleration

Drive control system
High-powered variable speed drive for AC motors available as either stand-alone unit or complex multi-axis motor control system
- Power range: 160-600 hp (100-400 kW)
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Milton Manufacturing is Parker’s design partner for prototype vehicles. A leading supplier of metal components and critical systems and kits, Milton is a HUBZone, certified woman-owned small business. www.miltonmfg.com

TeleSwivel® Creating innovative trailering solutions, TeleSwivel® is a service-disabled, veteran-owned small business. www.teleswivel.com

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