

Safety Guide

Selecting and Using Chelsea® Products and Related Accessories

Parker Safety Guide for Selecting and Using Power Take-Offs, Pumps, Reservoir Tanks, and Related Accessories



WARNING: Failure or improper selection or improper use of Parker Chelsea Power Take-Offs ("PTOs"), pumps, reservoir tanks or related accessories ("Products") can cause death, personal injury and property damage. Possible consequences of failure or improper use of these Products include but are not limited to the following:

- Operators, bystanders or equipment being crushed, impacted, or caused to fall or the like due to the sudden, inadvertent, unintended or uncontrolled movement, stopping or starting of devices such as lifts, hoists, blowers, augers or pumps which are driven by a PTO. This can occur when the PTO is improperly or unexpectedly engaged or disengaged.
- Dump bed vehicle injuries resulting from a raised dump bed hitting a bridge, overhang, or the like because the bed was left elevated or because the PTO was inadvertently or improperly engaged to raise the bed as the vehicle was being driven on a road.
- Rotating shaft injuries resulting from skin, hands, clothing, hair or the like getting caught in the rotating shaft connected to a PTO or the rotating portion of the equipment driven by the PTO.
- Explosion injury, burns, slips, falls or crashes due to overheated hydraulic fluid melting plastic portions of the equipment, exploding or catching on fire.
- Vehicles, equipment or persons crashing, slipping or falling when they encounter slippery hydraulic or other fluids which have leaked, spilled or escaped containment.
- Fire hazards from improper routing and installation of PTO, pump, hose assemblies, fittings and electrical connections.
- Unintended PTO engagement (either with Parker Chelsea or designer/installer indicators) without adequate operator warning.
- Vehicle, PTO, transmission, and driven equipment damage due to inadequate pump bracketing or vibration isolation.
- Fire, explosion, property damage and personal injury due to improper use of heat shields as leak shields.

Before selecting or using any of these Products, it is important that you read and follow product warnings and instructions including the instructions below.

1.0 GENERAL INSTRUCTIONS

- 1.1 Scope:** This safety guide provides instructions for selecting and using (including assembling, installing and maintaining) these Products. This safety guide is a supplement to and is to be used in addition to the specific Parker publications for the specific Power Take-Off, pump, reservoir tank and related accessories that are being considered for use. Parker publications are available at www.parker.com or by calling 1-800-CPARKER.
- 1.2 Fail-Safe:** Power Take-Offs, pumps, reservoir tanks and related accessories can and do fail without warning for many reasons. Design all systems and equipment with a fail-safe mode so that failure of the Power Take-Off, pump, reservoir tank or related accessory will not endanger persons or property.
- 1.3 Safety Devices:** Never disconnect, override, connect into, circumvent or otherwise disable any safety device on any system or vehicle.
- 1.4 Distribution:** Provide a copy of this safety guide to each person who is responsible for selecting or using these Products. Do not select or use Parker Power Take-Offs, pumps, reservoir tanks and related accessories without thoroughly reading and understanding this safety guide as well as the specific Parker catalogs, Owner's Manuals and other publications for the Products considered or selected.
- 1.5 User Responsibility:** Due to the wide variety of operating conditions and applications for these Products, Parker and its distributors do not represent or warrant that any particular Power Take-Off, pump, reservoir tank or related accessory is suitable for any specific system or vehicle. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing is solely responsible for:
 - Making the final selection of the Products.
 - Assuring that the user's requirements are met and that the application presents no health or safety hazards.
 - Providing all appropriate health and safety warnings on the equipment on which the Products are used.
 - Assuring compliance with all applicable government and industry standards.
- 1.6 Additional Questions:** Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com for the telephone numbers of the appropriate technical service department. For additional copies of this or any other Parker Safety Guide go to www.parker.com and click on the safety button on the opening page.

2.0 POWER TAKE-OFF SELECTION INSTRUCTIONS

- 2.1 General Selection Instructions:** Refer to Parker Chelsea publication HY25-3000/US for general instructions on how to select the correct PTO for a specific application. This publication can be obtained by calling 1-888-PH4-TRUK or by going to www.parker.com/chelsea.
- 2.2 Proper Matching of PTO:** A Power Take-Off must be properly matched to the vehicle transmission and to the auxiliary equipment being powered. To avoid personal injury and / or equipment damage:
 - Always refer to and follow the information and instructions in Parker Chelsea catalogs, literature, owner's manuals, warning labels and follow Parker Chelsea's recommendations when selecting, installing, repairing, or operating a Power Take-Off.
 - Never attempt to use a Power Take-Off not specifically recommended by Parker Chelsea for the vehicle transmission.
 - Always match the Power Take-Off's specified output capabilities to the requirements of the equipment to be powered.
 - Never use a Power Take-Off whose range of speed could exceed the maximum safe speed of the equipment to be powered.
- 2.3 Optional Ordering of PTO without Factory Approved Activation Switch, Wiring, and Engagement Warning Light:**
 - If a Power Take-off (PTO) is optionally ordered without Chelsea's activation switch, activation wiring, and activation warning light which are normally included with the PTO package, the Designer and Installer of the system assume full responsibility for proper wiring and installation of a PTO activation warning light as well as the requirements for communications with the chassis, transmission, or body controllers per the manufacturers requirements.



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3.0 POWER TAKE-OFF INSTALLATION INSTRUCTIONS

- 3.1 Installation Instructions:** Refer to the specific Parker Chelsea Owner's Manual for the specific Power Take-Off to be installed. These manuals can be obtained by calling 1-888-PH4-TRUK or by going to www.parker.com/chelsea.
- 3.2 Installation Safety:** To prevent personal injury and / or damage to equipment:
- Read carefully and follow the information and instructions in all Parker Chelsea owner's manuals, service manuals, warning labels, and other instructions.
 - Always follow proper procedures and use proper tools and safety equipment.
 - Be sure to receive proper training, and allow only trained and knowledgeable personnel to install, maintain, or repair equipment.
 - Never work alone while under a vehicle or while installing, repairing or maintaining equipment.
 - Always use proper components in applications for which they are approved.
 - Be sure to assemble components properly, and test them for proper assembly and operation prior to being placed into regular use.
 - Never use worn-out or damaged components.
 - Always block any raised or moving device that may injure a person working on or under a vehicle, or trailer or other raised equipment.
 - Never operate the controls of the Power Take-Off or other driven equipment from any position that could result in the operator or bystanders getting caught in moving machinery.
 - Ensure that any hose assemblies, fittings and wirings (PTO or system related) are properly routed to minimize inherent problems (including proximity to hot objects or heat sources; kinking or twisting of the hose). Hoses and wirings should be routed with adequate clearance to or shielded from high temperature areas (engine, exhaust, etc.). The hose assembly should be routed so that if a hose failure occurs, the escaping media will not cause personal injury or come in contact with hot surfaces, open flame or sparks.
- 3.3 Safety Information and Owner's Manual:** Parker Chelsea Power Take-Offs are packaged with safety information decals, instructions, and an Owner's Manual. Also, safety information and installation instructions are packaged with some individual parts and kits. Be sure to read and understand the Owner's Manual and safety information before installing or operating the PTO. Always install the safety information decals according to the instructions provided. Place the Owner's Manual in the vehicle glove compartment and instruct operators as to its location and use.
- 3.4 Pump Installation Procedures and Guidelines:**
- Use a bracket to secure and support the pump to the transmission if:
 - The pump, fittings, hose assemblies, and oil weighs 40 pounds or more.
 - The combined length of the PTO and pump is 18 inches or more, from the PTO centerline to the end of the pump.
 - Extreme or unknown conditions of application such as, duty cycles, vehicle vibrations, engine harmonics, terrain, or driven equipment harmonics, are present.
 - Also remember to pack the female pilot of the PTO pump shaft with grease before installing the pump on the PTO.
 - Use caution to ensure that the bracket does not pre-load or stress the pump / PTO bolts or installation hardware. Brackets must be designed and manufactured to adequately eliminate deflections from weight, vibration, and truck movements.
- 3.5 Installation WITHOUT Parker Chelsea Activation Switch:** If a Power Take-off (PTO) is optionally ordered without Chelsea's activation switch, activation wiring, and activation warning light which are normally included with the PTO package, the designer/installer of the PTO assumes full responsibility for warning the operator of the truck that the PTO is Engaged or Disengaged. Failure to adequately warn the operator of PTO engagement can cause death, personal injury, and property damage.
- 3.6 Installation of Heat Shields:**
- Heat shields and heat protective materials provide thermal protection of PTO, hoses, wiring, fittings, seals, etc.
 - Do NOT use heat shields as leak shields.
 - System designers should take in account leakage protection outside of thermal shields to prevent against fire, explosion, property damage, and personal injury.

4.0 POWER TAKE-OFF MAINTENANCE INSTRUCTIONS

- 4.1 Inspection:** Due to normal vibrations and occasional abnormal, severe vibrations which PTO units experience, operators should follow a set maintenance schedule and protocol for inspections and keep clear and accessible records of the performance of the inspections and maintenance. Failure to service loose bolts or Power Take-Off leaks or other observed malfunctions could result in injury, death, and potential damage to auxiliary Power Take-Off, transmission, or related components and equipment.
- 4.2 Periodic Power Take-Off Maintenance Program:** Periodic PTO maintenance by the owner / operator is required to ensure proper, safe and trouble free operation.
- **Daily:** Check all air, hydraulic and working mechanisms before operating the PTO. Perform maintenance as required.
 - **Monthly (or more often during times of heavy use):** Inspect for possible leaks and tighten all air, hydraulic and mounting hardware as necessary. Torque all bolts, nuts, etc. to Parker Chelsea specifications. Insure that splines are properly lubricated, if applicable. Perform maintenance as required. Keep clear and accessible records of the performance of such maintenance.
- 4.3 Direct Mounted Pump Splines:** With direct mounted pump splines, the PTO requires the application of a specially formulated, anti-fretting, high pressure and high temperature grease. The addition of the grease reduces the effects of torsional vibrations which result in fretting corrosion on the PTO internal splines and the pump external splines. Fretting corrosion appears as a rusting and wearing of the pump shaft splines. Severe duty applications which require long PTO running times and high torque may require more frequent re-greasing. Applications such as utility trucks that run continuously and are lightly loaded also require frequent re-greasing. Fretting corrosion is caused by many factors and without proper maintenance, the anti-fretting grease can only reduce, but not eliminate, its effect on components.
- 4.4 Service Intervals:** Service intervals will vary for each and every application. It is the responsibility of the overall application designer and the end user to determine the appropriate service interval for each application. Parker Chelsea also recommends consulting the product and equipment owner's manuals and technical bulletins for their maintenance guidelines.

5.0 POWER TAKE-OFF OPERATION INSTRUCTIONS

- 5.1 General Operating Instructions:** Refer to the specific Parker Chelsea Owner's Manual for the specific Power Take-Off being operated. These manuals can be obtained by calling 1-888-PH4-TRUK or by going to www.parker.com/chelsea.
- 5.2 Operator Position:** Never operate the controls of the Power Take-Off or other driven equipment from any position that could result in the operator or a bystander getting caught in moving machinery.
- 5.3 Cold Weather Operation of Powershift PTO:** During extreme cold weather (32° F; 0° C), a disengaged Powershift PTO can momentarily transmit high torque that will cause unexpected output shaft rotation. This is caused by the high viscosity of the transmission oil when it is extremely cold. As slippage occurs between the PTO clutch plates, the oil will rapidly heat up and the viscous drag will quickly decrease. The PTO shaft rotation could cause unexpected movement of the driven equipment resulting in injury, death or equipment damage. To avoid personal injury, death, and / or damage to equipment:
- Driven equipment must have separate controls.
 - The driven equipment must be left in the disengaged position when not in operation.
 - Do not operate the driven equipment until the vehicle is allowed to warm up.
 - PTO and driven equipment must be properly selected and matched for application and operating environment.
- 5.4 High Temperature Operation:** Operation of the PTO and driven equipment for high use applications as well as high outside temperatures can have an adverse effect on the components, assemblies, and systems on the vehicle. Degradation of the transmission oil, hydraulic oil, oil seals, sealing elements, oil tanks, bearings, gears, etc. can occur if the temperature of the system is not monitored and controlled per manufacturer's specifications. It is the responsibility of the end user and equipment builder to select the proper PTO, driven equipment, lubrication and cooling for the particular application of the vehicle and system. To avoid personal injury, death, and / or damage to equipment:
- Transmission as well as driven equipment temperature and lubrication must be properly selected, maintained, and controlled per the manufacturer's specifications.
 - Exceeding the manufacturer's temperature specifications / recommendations can cause failure of components and assemblies such as tanks, hoses, gears, bearings, transmissions, pumps, and other system components.

5.5 Rotating Auxiliary Driveshafts: Rotating auxiliary driveshafts can snag clothes, skin, hair, hands, etc. causing injury or death. To avoid this danger:

- Do not go under the vehicle when the engine is running.
- Do not work on or near an exposed shaft when the engine is running.
- Shut off the engine before working on the Power Take-Off or driven equipment.
- Exposed rotating driveshafts and moving parts must be guarded.
- Assure operator and bystanders are clear of rotating or moving parts prior to operation.
- Train operators on the risk of injury or death from exposure to rotating or moving parts, appropriate to the particular equipment.

5.6 Operating the PTO with the Vehicle in Motion: Some PTOs may be operated while the vehicle is in motion. To do so, a PTO designed for such use must have been properly selected to operate while the vehicle is in motion and it must be correctly matched to the vehicle transmission and the particular requirements of the driven equipment. If in doubt about the PTO's specifications and capabilities, do not operate the PTO when the vehicle is in motion. Instead, check the Owner's Manual to determine its specifications and capabilities. Improper application and / or operation can cause injury or death and premature failure of the vehicle, the driven equipment and / or the PTO. For PTOs suitable for use while a vehicle is in motion, Parker Chelsea recommends the equipment designer use electronic overspeed controls to prevent PTOs from being operated at excessive speeds. For PTOs not designed for use while the vehicle is in motion, the equipment designer should incorporate a fail-safe into the design to prevent any operation of the PTO while the vehicle is in motion. In addition, in equipment designs involving single acting hydraulic lift cylinders, Parker Chelsea recommends incorporation of automatic PTO shut off valves which will shut the PTO off when a down cylinder action is requested.

5.7 Disengage the PTO when Not in Operation: Always remember to disengage the PTO when the driven equipment is not in operation.