Use caution to ensure that bracket does not pre-load pump/P.T.O. mounting

Chelsea strongly recommends the use of pump supports (Support Brackets) in all applications. P.T.O. warranty will be void if a pump bracket is not used when:

1) The combined weight of pump, fittings and hose exceed 120 pounds [54.43 kg].

2) The combined length of the P.T.O. and pump is 18 inches [45.72 cm] or more from the P.T.O. centerline between rear mounting brackets to the end of the pump.

Always refer to current Owners Manual for updated information.

This symbol warns of possible personal injury.
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Safety Information Statements</td>
<td>1.1 thru 1.5</td>
</tr>
<tr>
<td>How to use the Catalog</td>
<td>1.6 thru 1.9</td>
</tr>
<tr>
<td>Power Take-Off Work Sheet</td>
<td>1.10</td>
</tr>
<tr>
<td>Transmission Opening Chart</td>
<td>1.11</td>
</tr>
<tr>
<td>Input Gear Designator</td>
<td>1.14</td>
</tr>
</tbody>
</table>
The following instructions are for your safety and the safety of the end user. Read them carefully and make sure you understand them thoroughly.

**To Prevent Injury to Yourself and/or Damage to the Equipment:**
- Read carefully all owner’s manuals, service manuals, and/or other instructions.
- Always follow proper procedures, and use proper tools and safety equipment.
- Be sure to receive proper training.
- Never work alone while under a vehicle or while repairing or maintaining equipment.
- Always use proper components in applications for which they are approved.
- Be sure to assemble components properly.
- 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.
- Never operate the controls of the Power Take-Off (P.T.O.) or other driven equipment from any position that could result in getting caught in the moving machinery.

**Proper Matching of P.T.O.**

**WARNING:** A Power Take-Off must be properly matched to the vehicle transmission and to the auxiliary equipment being powered. An improperly matched Power Take-Off could cause severe damage to the vehicle transmission, the auxiliary driveshaft, and/or the auxiliary equipment being powered. Damaged components or equipment could malfunction causing serious personal injury to the vehicle operator or to others nearby.

To avoid personal injury and/or equipment damage:
- Always refer to Chelsea catalogs, literature, and owner’s manuals and follow Chelsea recommendations when selecting, installing, repairing, or operating a Power Take-Off.
- Never attempt to use a Power Take-Off not specifically recommended by 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.

**Cold Weather Operation of Powershift P.T.O.s**

**WARNING:** During extreme cold weather operation [32°F (0°C) and lower], a disengaged Powershift Power Take-Off 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 Power Take-Off clutch plates, the oil will rapidly heat up and the viscous drag will quickly decrease.

The Power Take-Off output shaft rotation could cause unexpected movement of the driven equipment resulting in serious personal injury, death, or equipment damage.

To avoid personal injury and/or equipment damage:
- 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.
Rotating Auxiliary Driveshafts

**WARNING:** Rotating auxiliary driveshafts are dangerous. You can snag clothes, skin, hair, hands, etc. This can cause serious injury or death.

- 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 must be guarded.

Guarding Auxiliary Driveshafts

**WARNING:** We strongly recommend that a Power Take-Off and a directly mounted pump be used to eliminate the auxiliary driveshaft whenever possible. If an auxiliary driveshaft is used and remains exposed after installation, it is the responsibility of the vehicle designer and P.T.O. installer to install a guard.

Using Set Screws

**WARNING:** Auxiliary driveshafts may be installed with either recessed or protruding set screws. If you choose a square head set screw, you should be aware that it will protrude above the hub of the yoke and may be a point where clothes, skin, hair, hands, etc. could be snagged. A socket head set screw, which may not protrude above the hub of the yoke, does not permit the same amount of torquing as does a square head set screw. Also a square head set screw, if used with a lock wire, will prevent loosening of the screw caused by vibration. Regardless of the choice made with respect to a set screw, an exposed rotating auxiliary driveshaft must be guarded.

Important: Safety Information and Owner’s Manual

Chelsea Power Take-Offs are packaged with safety information decals, instructions, and an owner’s manual. These items are located in the envelope with the P.T.O. mounting gaskets. Also, safety information and installation instructions are packaged with some individual parts and kits. Be sure to read the owner’s manual and safety information before installing or operating the P.T.O. Always install the safety information decals according to the instructions provided. Place the owner’s manual in the vehicle glove compartment.

Operating the P.T.O. with the Vehicle in Motion

**WARNING:** Some Power Take-Offs may be operated when the vehicle is in motion. To do so, the P.T.O. must have been properly selected to operate at highway speeds and correctly matched to the vehicle transmission and the requirements of the driven equipment.

If in doubt about the P.T.O.s specifications and capabilities, avoid operating the P.T.O when the vehicle is in motion. Improper application and/or operation can cause serious personal injury or premature failure of the vehicle, the driven equipment, and/or the P.T.O.

Always remember to disengage the P.T.O. when the driven equipment is not in operation.
Pump Installation Precautions

Use a bracket to support the pump to the transmission if:

- The pump weighs **40 pounds** or more.
- The combined length of the P.T.O. and pump is **18 inches** or more from the P.T.O. centerline to the end of the pump.

Also remember to pack the female pilot of the P.T.O. pump shaft with grease before installing the pump on the P.T.O. See page 1.4.

Power Take-Off Maintenance

Due to the normal and sometime severe torsional vibrations that Power Take-Off units experience, operators should follow a set maintenance schedule for inspections. Failure to service loose bolts or Power Take-Off leaks could result in potential auxiliary Power Take-Off or transmission damage.

Periodic P.T.O. MAINTENANCE is required by the owner/operator to ensure proper, safe and trouble free operation.

**Daily:** Check all air, hydraulic and working mechanisms before operating P.T.O. Perform maintenance as required.

**Monthly:** Inspect for possible leaks and tighten all air, hydraulic and mounting hardware, if necessary. Torque all bolts, nuts, etc. to Chelsea specifications. Ensure that splines are properly lubricated, if applicable. Perform maintenance as required.

With regards to the direct mounted pump splines, the P.T.O. requires the application of a specially formulated anti-fretting, high pressure, high temperature grease. The addition of the grease has been proven to reduce the effects of the torsional vibrations, which result in fretting corrosion on the P.T.O. internal splines as well as the pump external splines. Fretting corrosion appears as a “rusting and wearing” of the pump shaft splines. Severe duty applications, which require long P.T.O. running times and high torque may require more frequent regreasing. Applications such as Utility Trucks that run continuously and are lightly loaded also require frequent regreasing due to the sheer hours of running time. It is important to note that service intervals will vary for each and every application and is the responsibility of the end user of the product. Chelsea also recommends that you consult your pump owner's manuals and technical services for their maintenance guidelines. Fretting corrosion is caused by many factors and without proper maintenance the anti-fretting grease can only reduce its effectiveness on components.

Chelsea offers the grease to our customers in two packages. The first is a 5/8 fluid ounce tube (379688), which is included with every applicable P.T.O., and the second is a 14-ounce grease cartridge (379831). Chelsea also offers greaseable shafts for most all output designators.

Warranty: Failure to comply entirely with the provisions set forth in the appropriate Owner's Manual will result in voiding of ALL Warranty consideration.
Direct Mount Pump Support Recommendations

Chelsea strongly recommends the use of pump supports (Support Brackets) in all applications. P.T.O. warranty will be void if a pump bracket is not used when:

1) The combined weight of pump, fittings and hose exceed 40 pounds.
2) The combined length of the P.T.O. and pump is 18 inches or more from the P.T.O. centerline to the end of the pump.

**ALSO:** Remember to pack the female pilot of the P.T.O. pump shaft with grease before installing the pump on the P.T.O. (reference Chelsea grease pack 379688)

**NOTE:** For Proper Bracketing Attach at 2 or more Transmission Bolt Locations and 2 or more Pump Locations. Contact Transmission Manufacture for Proper Bracket Mounting Locations.

Use caution to ensure that bracket does not pre-load pump/P.T.O. mounting

Always refer to current Owners Manual for updated information.

This symbol warns of possible personal injury.
Direct Mount Pump Support Recommendations (890 Series)

Use caution to ensure that bracket does not pre-load pump/P.T.O. mounting

Chelsea strongly recommends the use of pump supports (Support Brackets) in all applications. P.T.O. warranty will be void if a pump bracket is not used when:

1) The combined weight of pump, fittings and hose exceed 120 pounds [54.43 kg].

2) The combined length of the P.T.O. and pump is 18 inches [45.72 cm] or more from the P.T.O. centerline between rear mounting brackets to the end of the pump.

Always refer to current Owners Manual for updated information.

This symbol warns of possible personal injury.
How to use the Catalog

Applications

General Safety Information

Safety

How to use the Catalog

HY25-3000/US Applications

Transmission Models

• Models that apply to this application page.

Transmission Gear Data

• Location of P.T.O. opening on the transmission and opening size (S.A.E. standard or non-standard).
• Gear position within the opening - either Gear to Rear of Centerline or Gear Forward of Centerline by 1/2 inch.

Front of Vehicle Rear of Vehicle Front of Vehicle Rear of Vehicle
• Description of the P.T.O. driver gear - tooth count of the gear and description of the cut of the gear teeth (Spur, Left Hand Helix, or Right Hand Helix).

  - SPUR - teeth are cut straight across from its face from the side
  - L.H. HELIX - teeth slant upwards from left to right
  - R.H. HELIX - teeth slant upwards from right to left

**Pitch Line to Aperture Face**

• The distance between the pitch line of the transmission P.T.O. driver gear and the mounting face (aperture).

![Diagram of Pitch Line (P.L.) to Aperture Face (A.F.) Dimension]

**P.T.O. Model**

• The P.T.O.s listed are normally mounted to the transmission with the output shaft toward the rear of the vehicle, with the shaft below the center of the opening.

• To complete the model number refer to the Assembly Options charts in section 3.

![Images of different P.T.O. models]

**Intermittent Torque Rating (shown in Lbs. ft.)**

• An intermittent torque rating is when the P.T.O. operates only 5 minutes out of every 15. A P.T.O. being used more than 5 minutes at a time is considered continuous duty and should have its torque rating reduced by 30%. To do this, multiply the given torque rating by .7 (i.e. 140 Lbs. ft. x .7 = 98 Lbs. ft.).

**NOTE:** 870 and 890 Series stated torque is for continuous and intermittent duty cycles. There is no need to reduce the torque rating for continuous applications.
PV.0. Direction of Rotation

- Viewed by standing at the rear of the vehicle, looking forward at the P.T.O. shaft, with the P.T.O. shaft pointing toward the rear of the vehicle.

<table>
<thead>
<tr>
<th>P.T.O.</th>
<th>Driven Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPP (looks “clockwise”)</td>
<td>Driven equipment must rotate counterclockwise (also called left-hand rotation, “A” for anti-clockwise or C.C.W. for counterclockwise).</td>
</tr>
<tr>
<td>ENG (looks “counterclockwise”)</td>
<td>Driven equipment must rotate clockwise (also called right-hand rotation or “C” for clockwise).</td>
</tr>
</tbody>
</table>

- Remember that the P.T.O. is specified looking from the rear of the truck to the front of the truck, and the driven equipment is specified looking from the front of the truck to the rear of the truck.

Shaft Speed Percentage

- The output shaft speed percentage is based upon engine R.P.M.

  Ex: If the engine speed is 1000 R.P.M. and the P.T.O. rating is 90% of engine speed, the P.T.O. output shaft will turn 900 R.P.M. (1000 x .90). If the engine speed is 1000 R.P.M. and the P.T.O. rating is 127% of engine speed, the P.T.O. output shaft will turn 1270 R.P.M. (1000 x 1.27).

  **NOTE:** Output shaft speeds should not exceed 2500 R.P.M. without application approval from Chelsea.
**Filler Block**

- If a filler block is required to properly mount the P.T.O. or an adapter, the correct part number will be shown here. It must be ordered separately from the P.T.O.
- If a (T) is shown next to the part number, the filler block should be positioned next to the transmission.
- If a (P) is shown next to the part number, the filler block should be positioned next to the Power Take-Off.

**Adapter Assembly**

- An adapter or adapter plate listed in this column is required to mount the P.T.O. to the transmission and must be ordered separately.
- Geared Adapters - used to change the rotation of the output shaft, clear an interference problem, or reach a drive gear that may be deep within the transmission.
- Adapter Plates - used to mount a six-bolt P.T.O. to an eight-bolt opening.
- A geared adapter should not be mounted to an adapter plate.
- Do not mount two or more geared adapters together.
- A geared adapter should not be used on automatic transmissions.

**Stud Kit**

- When the word *Furnished* appears in this column, the stud kit is included with the P.T.O.
- A stud kit number listed in this column (i.e. 7170-1X) means that the stud kit must be ordered separately from the P.T.O.

**P.T.O. Header**

- New P.T.O. headers with type of shift mechanism.
- Mechanical, Powershift (Air), Powershift (Hydraulic).
### HY25-3000/US Applications

#### General Safety Information

Parker Hannifin Corporation  
Chelsea Products Division  
Olive Branch, MS 38654  USA

#### Power Take-Off Worksheet

**Information from the Customer:**

1. Make and model of transmission.

2. Type of driven equipment.

3. Input horsepower required of driven equipment.

4. Desired operating speed of driven equipment.

5. Approximate engine speed desired during operation.

6. Direction of driven equipment shaft rotation in relation to direction of engine rotation (check one).

   - Opp.
   - Eng.

7. Type of connection between P.T.O. and driven equipment (check one).

   - Driveshaft
   - Direct mount pump flange
   - Pulleys and belts (requires eng. approval)

8. Mounting location (check all suitable locations).

   - Left
   - Right
   - Bottom
   - Top
   - Countershaft

9. Duty cycle (check one).

   - Intermittent
   - Continuous

10. Other P.T.O. speeds or reverse gear requirements.

**Using the HY25-3000/US, Find:**

11. Application page number for make and model of transmission.

12. From items 3 and 4 determine the intermittent torque requirements of the driven equipment using this formula:

   \[(\text{HP} \times 5252) \div \text{R.P.M.} = \text{Lbs. ft.}\]

   \[T=\ldots\text{Lbs. ft. (intermittent)}\]

13. If torque requirements are continuous (more than 5 minutes operation every 15 minutes) divide the torque figure by .7. The result will be the torque required for continuous operation.

14. Find the P.T.O. in the HY25-3000/US catalog that meets the torque, rotation, and speed percentage requirements of the application. Note the P.T.O. model number and all numbers for mounting parts on the lines below.

15. Determine what options are needed and change model number prefix and suffix to obtain correct options. (See Model Number Construction in section 3).
<table>
<thead>
<tr>
<th>Input Gear Designators</th>
<th>Applications</th>
<th>General Safety Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB Universal</td>
<td>DU Eaton Fuller</td>
<td>HD Ford</td>
</tr>
<tr>
<td>AC Fiat</td>
<td>DX Chevrolet</td>
<td>HE Adapter Gear</td>
</tr>
<tr>
<td>AD Spicer</td>
<td>DY Clark</td>
<td>HF Adapter Gear</td>
</tr>
<tr>
<td>AG Spicer</td>
<td>EF New Process</td>
<td>HG Adapter Gear</td>
</tr>
<tr>
<td>AH Universal</td>
<td>EC ZF</td>
<td>HH Adapter Gear</td>
</tr>
<tr>
<td>AJ Allison</td>
<td>ED ZF</td>
<td>HJ Adapter Gear</td>
</tr>
<tr>
<td>AK Universal</td>
<td>EL Isuzu</td>
<td>HK Adapter Gear</td>
</tr>
<tr>
<td>AL Eaton Fuller</td>
<td>EP Warner</td>
<td>HM Adapter Gear</td>
</tr>
<tr>
<td>AP Spicer</td>
<td>ER Isuzu</td>
<td>HP Adapter Gear</td>
</tr>
<tr>
<td>AQ Spicer</td>
<td>ES Eaton Fuller</td>
<td>HR Adapter Gear</td>
</tr>
<tr>
<td>AR Spicer</td>
<td>ET Eaton Fuller</td>
<td>HY Mack</td>
</tr>
<tr>
<td>AU Chelsea</td>
<td>EV Eaton Fuller</td>
<td>JU Spicer</td>
</tr>
<tr>
<td>AW New Process</td>
<td>EW Eaton Fuller</td>
<td>JV Eaton Fuller</td>
</tr>
<tr>
<td>AX Eaton Fuller</td>
<td>FA Jatco/Isuzu</td>
<td>KD ZF</td>
</tr>
<tr>
<td>BA Navistar</td>
<td>FC Dodge</td>
<td>KE Adapter Gear</td>
</tr>
<tr>
<td>BC Eaton Fuller</td>
<td>FE Getrag</td>
<td>KE Eaton Fuller</td>
</tr>
<tr>
<td>BE Chevy</td>
<td>FI Allison</td>
<td>KE Adapter Gear</td>
</tr>
<tr>
<td>BF Warner</td>
<td>FL ZF</td>
<td>KE Mercedes</td>
</tr>
<tr>
<td>BG Spicer</td>
<td>FN Eaton Fuller</td>
<td>LF Adapter Gear</td>
</tr>
<tr>
<td>BH Spicer</td>
<td>FP Mack/Renault</td>
<td>LG Adapter Gear</td>
</tr>
<tr>
<td>BJ Chevy</td>
<td>FQ Mack/Renault</td>
<td>LH Eaton</td>
</tr>
<tr>
<td>BK New Process</td>
<td>FR Eaton Fuller</td>
<td>LM Eaton</td>
</tr>
<tr>
<td>BL New Process</td>
<td>FS Hino</td>
<td>MN Adapter Gear</td>
</tr>
<tr>
<td>BM Eaton Fuller</td>
<td>FT Mitsubishi</td>
<td>MO Adapter Gear</td>
</tr>
<tr>
<td>BN New Process</td>
<td>FW Eaton Fuller</td>
<td>MP Adapter Gear</td>
</tr>
<tr>
<td>BP Chevy/Sprinter</td>
<td>FW Eaton Fuller</td>
<td>MQ Adapter Gear</td>
</tr>
<tr>
<td>BQ Chevy/Sprinter</td>
<td>FW Eaton Fuller</td>
<td>MR Adapter Gear</td>
</tr>
<tr>
<td>BR Hino</td>
<td>FX Hino</td>
<td>MS Adapter Gear</td>
</tr>
<tr>
<td>BS New Process</td>
<td>FY Isuzu</td>
<td>MT Adapter Gear</td>
</tr>
<tr>
<td>BU Eaton Fuller</td>
<td>GJ Isuzu</td>
<td>MV Adapter Gear</td>
</tr>
<tr>
<td>BY Warner</td>
<td>GK German</td>
<td>MW Adapter Gear</td>
</tr>
<tr>
<td>BZ Warner</td>
<td>GH German</td>
<td>MX Adapter Gear</td>
</tr>
<tr>
<td>CB New Process</td>
<td>GI German</td>
<td>MY Adapter Gear</td>
</tr>
<tr>
<td>CC New Process</td>
<td>GJ German</td>
<td>MZ Adapter Gear</td>
</tr>
<tr>
<td>CD Warner</td>
<td>GK German</td>
<td>N0 Adapter Gear</td>
</tr>
<tr>
<td>CJ Saab/Scania</td>
<td>GH German</td>
<td>N1 Adapter Gear</td>
</tr>
<tr>
<td>CM New Process</td>
<td>GK German</td>
<td>N2 Adapter Gear</td>
</tr>
<tr>
<td>CR Spicer</td>
<td>GX Mitsubishi</td>
<td>N3 Adapter Gear</td>
</tr>
<tr>
<td>DA Mack</td>
<td>GX Adapter Gear</td>
<td>N4 Adapter Gear</td>
</tr>
<tr>
<td>DB Eaton Fuller</td>
<td>GY Adapter Gear</td>
<td>N5 Adapter Gear</td>
</tr>
<tr>
<td>DC Hino/Nissan</td>
<td>GZ Adapter Gear</td>
<td>N6 Adapter Gear</td>
</tr>
<tr>
<td>DD Spicer</td>
<td>GZ Eaton Fuller</td>
<td>N7 Adapter Gear</td>
</tr>
<tr>
<td>DH Renault</td>
<td>HA Adapter Gear</td>
<td>N8 Adapter Gear</td>
</tr>
<tr>
<td>DJ Renault</td>
<td>HA Mitsubishi</td>
<td>N9 Adapter Gear</td>
</tr>
<tr>
<td>DK Renault</td>
<td>HB Adapter Gear</td>
<td>NA Adapter Gear</td>
</tr>
<tr>
<td>DM Eaton Fuller</td>
<td>HB Mitsubishi</td>
<td>NB Adapter Gear</td>
</tr>
<tr>
<td>DN Eaton Fuller</td>
<td>HC Mitsubishi</td>
<td>NC Adapter Gear</td>
</tr>
<tr>
<td>DQ Saab/Scania</td>
<td>HD Adapter Gear</td>
<td>ND Adapter Gear</td>
</tr>
<tr>
<td>DS Warner</td>
<td>HD Mitsubishi</td>
<td>NE Adapter Gear</td>
</tr>
</tbody>
</table>

HY25-3000/US

General Safety Information

Parker Hannifin Corporation
Chelsea Products Division
Olive Branch, MS 38654 USA