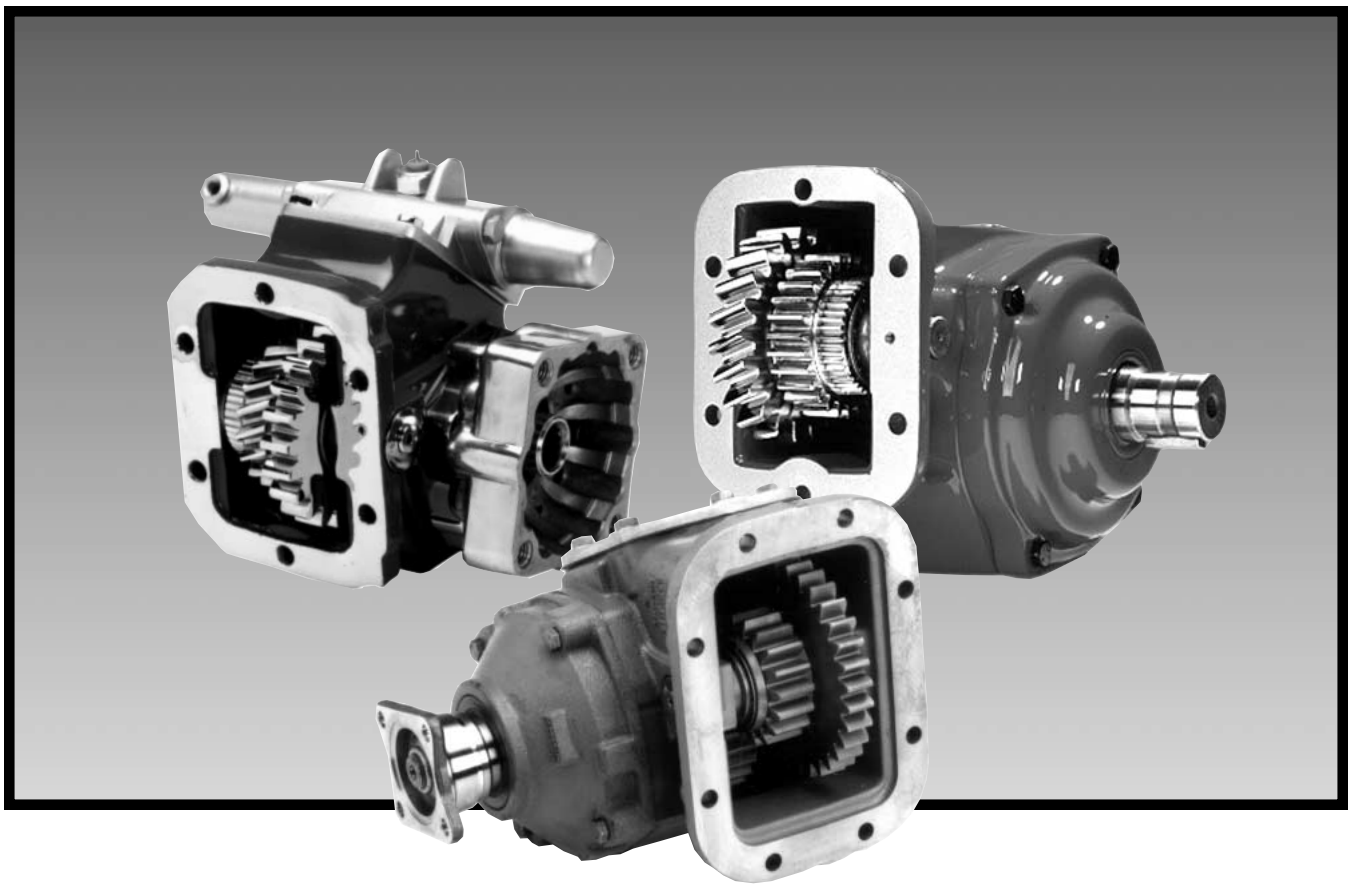
CHELSEA®

Bulletin HY25-1770-M1/US

Owner's Manual
Power Take-Offs

Effective: March 2002
Supersedes: 379770 March 1999



243A Series

Parker Hydraulics

⚠ WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Offer of Sale

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated in the "Offer of Sale".

Patent Information

The Chelsea® Power Take-Off or its components shipped with this owner's manual may be manufactured under one or more of the following U.S. patents:
4610175 5228355 4597301 5645363 6151975 6142274 6260682
Other patents pending.

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

Safety Information

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

Safety Information

These instructions are for your safety and the safety of the end user. Read them carefully until you understand them.

General Safety Information

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 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 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.

This symbol warns of possible personal injury.

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

Safety Information

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 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.

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

Some Power Take-Offs may be operated while 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 permanent 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 Pre-calculations

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.

Increased torsional vibrations found in high torque low R.P.M. engines can lead to premature wear of the mating shafts and is accelerated if the shafts are not lubricated. Each Chelsea P.T.O. that features a female pump shaft will include a packet of lubricant. Apply this to the male end of the pump shaft before installing the pump to the P.T.O.

This symbol warns of possible personal injury.

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

Mounting the P.T.O. to the Transmission

CAUTION: When installing a P.T.O., always wear protective clothing and safety glasses.

The 243A P.T.O.'s installation will be faster and easier if several steps are completed before mounting the unit to the transmission. On a clean secure work surface complete the following steps:

1. Using a 9/16" wrench, install the 90° O-Ring elbow (379486) in the three-bolt plate on the side of the P.T.O. as shown in **Figure 1**.

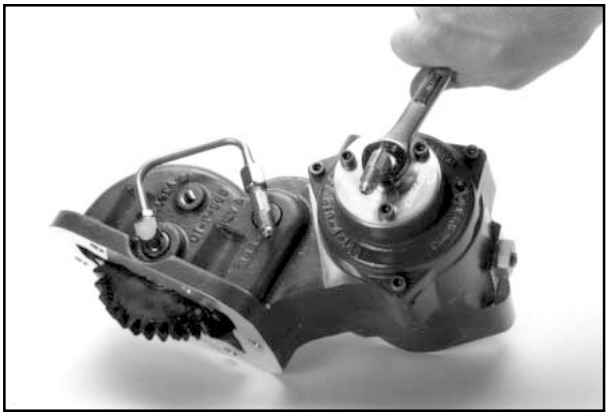


Figure 1

2. Install the 90° swivel elbow (379703) with a 9/16" wrench on to the branch tee as shown in **Figure 2.**

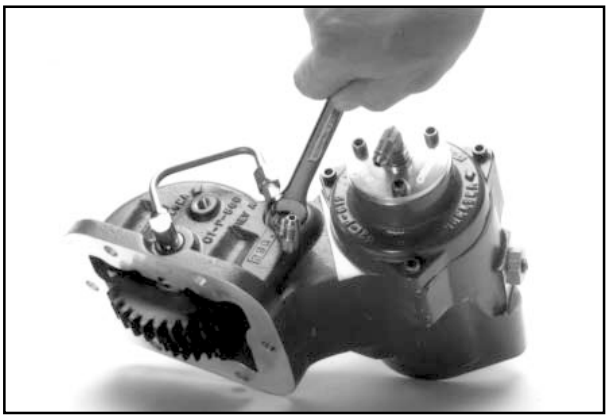


Figure 2

3. Hose 329087X is approximately 35" long from end of fitting to end of fitting. Install the rigid .125"-27 NPTF end into the port on the side of the P.T.O. housing as shown in **Figure 3**. On page 11 of this manual is a sketch of all the hose assemblies used for this installation. This will assist you in identifying which hose assemblies are used in the installation process.

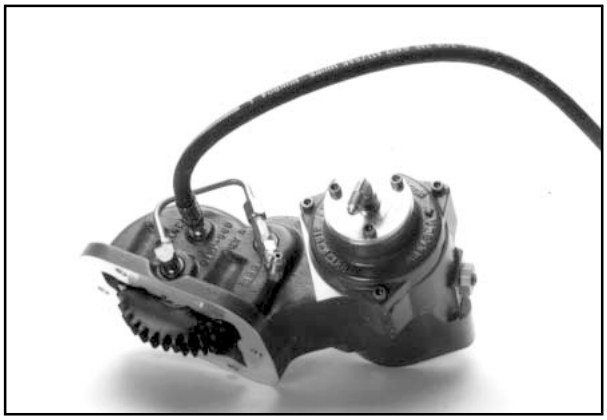


Figure 3

4. Starting with the solenoid, install the screened adapters (379449) in the solenoid ports marked **"IN"** with the screened end into the solenoid. Install the flare adapter (379280) in the port marked **"EXH"**. Then install the adapter fitting (379710) into the solenoid port marked **"CYL"**. Now install the female branch tee (379711) onto the fitting (379710) in the "CYL" port. Install the pressure switch (379502) in the female port of the branch tee (379711). See **Figure 4** for this step.

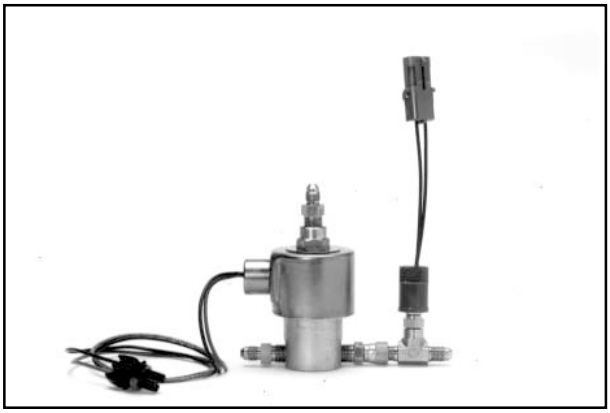


Figure 4

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

We can move on to the installation of the P.T.O. and pump assembly to the transmission. The P.T.O. aperture provision is on the left or drivers side of the vehicle.

5. Drain the oil from the transmission. Next remove the P.T.O. aperture cover plate (**Figure 5**). **WARNING: Oil may be hot. Use extreme caution to assure that you do not accidentally come in contact with hot oil.** Remove the cover plate gasket, it will not be used when mounting the P.T.O. to the transmission.

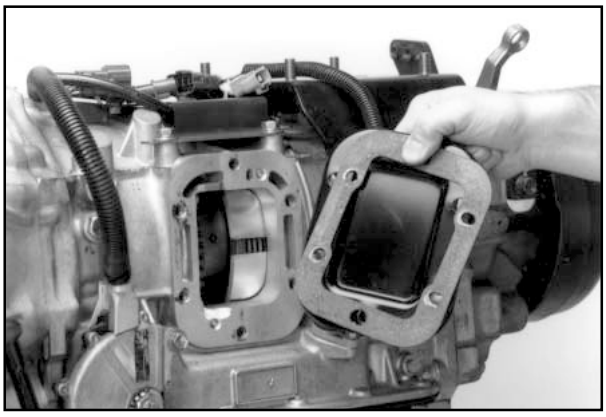


Figure 5

6. Remove the pipe plug from the transmission pressure port (**Figure 6**) and install the male adapter (379749) in the opening.

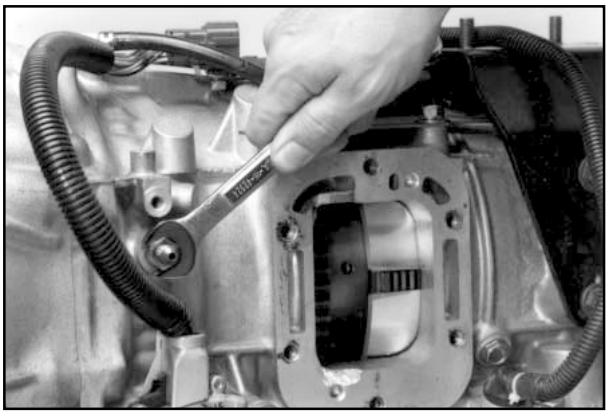


Figure 6

7. The mounting kit used to attach the P.T.O. to the transmission opening, contains 5 studs, 5 nuts, 1 capscrew and 1 O-Ring. The long bolt requires an O-Ring on it to ensure a positive seal. Slide this on now.

8. Install the 5 studs as shown in **Figure 7**. The bottom bolthole in the six-bolt pattern should be left open for the capscrew.

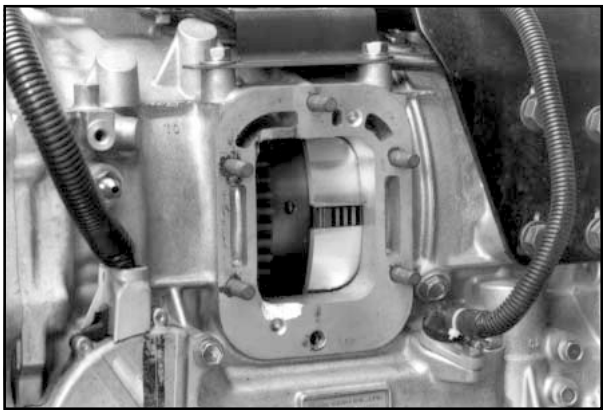


Figure 7

9. Tighten the studs securely and torque to 17 - 19 ft. lbs. or 2.35 - 2.63 kg. meters (**Figure 8**). **CAUTION:** Overtightening of the studs may damage the stud and or transmission threads. Do not force the shoulder of the stud below the surface of the bolthole.

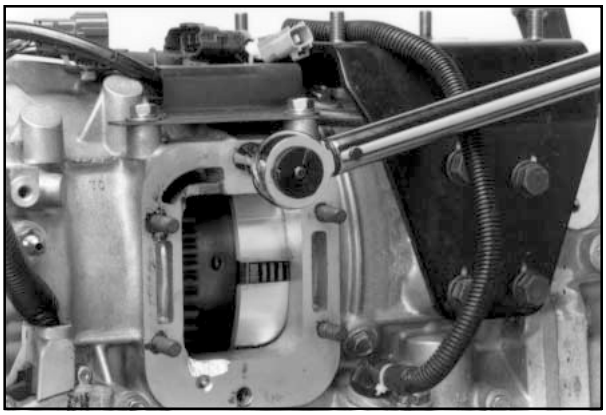


Figure 8

Mounting the P.T.O. to the Transmission

10. Slide the gasket (35-P-41) into position on the transmission opening over the studs (**Figure 9**). This is a controlled compression gasket and is used to eliminate the setting of gear backlash between the P.T.O. and transmission.

NOTE: Do not use sealing compounds because they are generally incompatible with automatic transmission fluids.

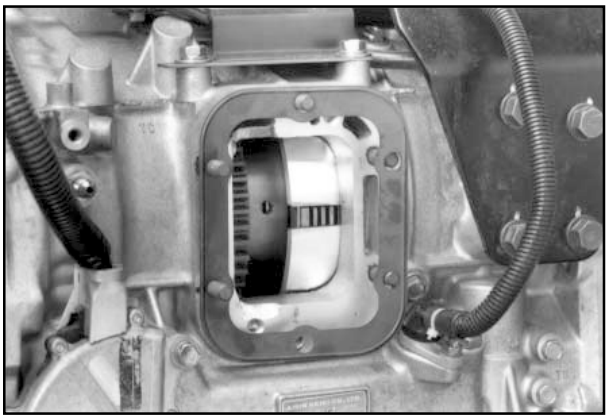


Figure 9

11. Slide the P.T.O. over the studs and install the long capscrew through the P.T.O. housing and into the transmission (**Figure 10**). **NOTE:** Make sure the O-Ring is still on this capscrew.

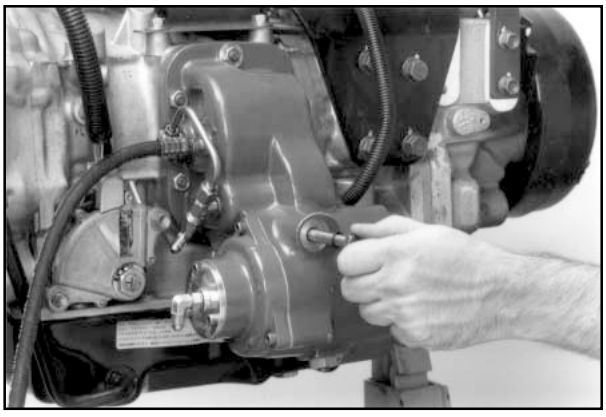


Figure 10

12. Torque the capscrews (**Figure 11**) to 25 ft. lbs. (3.4 kg). Torque the 5 nuts to 30 to 35 ft. lbs. (4.14 to 4.84 kg. meters).

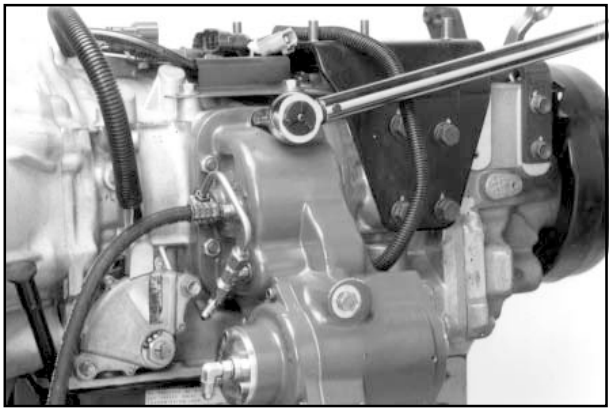


Figure 11

Hose Installation

With the P.T.O. in position and fastened to the transmission, we are now ready to attach the hoses and mount the solenoid valve to the frame or a position of your choice. Select a position that will allow the hoses to be installed under the following criteria:

- Leave room for expansion, which will occur when pressure is applied.
- Do not exceed the minimum bend radius of 3" for these hose assemblies.
- Shield hoses from heat.
- Make sure hoses are secured away from any moving or rotating parts.

13. Connect the 329130-2X hose assembly from the male adapter (379749) installed in step 5 in the high-pressure port of the transmission to the (379773) male union tee. **NOTE:** For hose identification see the installation schematics on pages 12 and 13 or the hose identification chart on page 11.

14. The next hose connection is the 329130-5X from the opposite side of the male union tee (379773) to the adapter fitting (379449) previously installed in the solenoid port marked “IN”. **NOTE:** Make sure you look at and identify the port on the solenoid.

15. The next hose connection is the 329087X hose assembly that was originally installed in the side of the P.T.O. in step number 3. Connect the female swivel end of this hose assembly to the flare adapter (379280) that is installed in the solenoid valve port marked “EXH”.

16. The next hose connection is the 329130-6X hose assembly. This connection is between the branch tee (379711) installed to the fitting in the solenoid port marked “CYL” and the 90 degree O-Ring elbow in the three bolt plate on the side of the P.T.O. installed in step number 1.

17. The last hose connection is from the P.T.O. back to the 379773 male union tee. From the 90 degree swivel elbow installed in step 2, connect one end of the 329130-4X hose assembly. The other end of the hose will connect to the remaining port on the male union tee.

After hose installation is complete and before the vehicle is placed in service, visually inspect all fittings and hose connections for leaks.

Electrical Installation

Before starting your electrical wiring installation, locate a position in the cab for the mounting of the bracket for the on/off switch and indicator light combination. For electrical installation see installation sketches on pages 12 and 13.

CAUTION: Before drilling any holes, make sure there is adequate clearance on both sides.

To ensure weather tight and secure connections, Chelsea provides a wiring harness with the Power Take-Off assembly. The connections underneath the truck at the solenoid valve, pressure switch and temperature sensor feature a Packard electrical connector. We will start with these connections first.

1. Cable assembly 379736 contains a female and male Packard connector. The female connector with the black and red wire will connect to the solenoid valve. The male connector with the black and blue wire connect to the pressure sensor.

CAUTION: Make sure the harness you just wired is secured away from any moving or rotating parts and has at least 6" clearance from the exhaust system. Always use high temperature wrap type conduit to protect the wires.

With this step completed, it is now time to run the wires inside the cab. Before starting this step, it is important to remember that a solid electrical connection is essential when installing any electrical device or option. A proper crimp is shown in **Figure 12**.

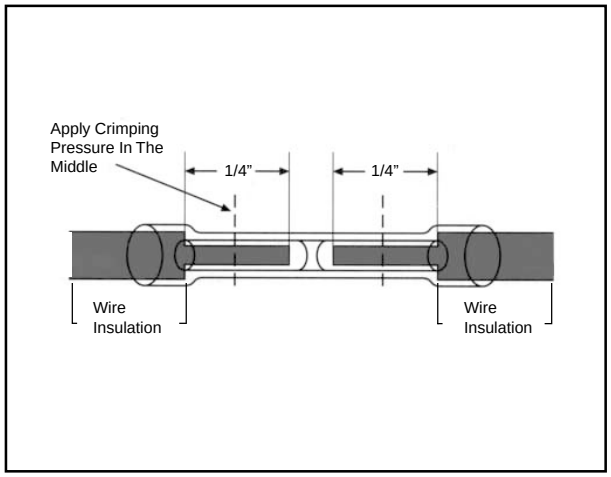


Figure12

2. Inspect the firewall to see if there is a spot to route the wires through. If nothing is available that the wires can be routed through, then drill a 1" hole in the firewall.

CAUTION: Before drilling any holes, make sure there is adequate clearance on both sides.

3. From the engine side insert the three wires from the cable assembly through the hole.

4. To install the grommet in the drilled hole, slice the grommet and place it over the wires. **NOTE:** The grommet is included in the installation kit. Position the wires in the center of the grommet and insert it in the drilled hole (**Figure 13**).

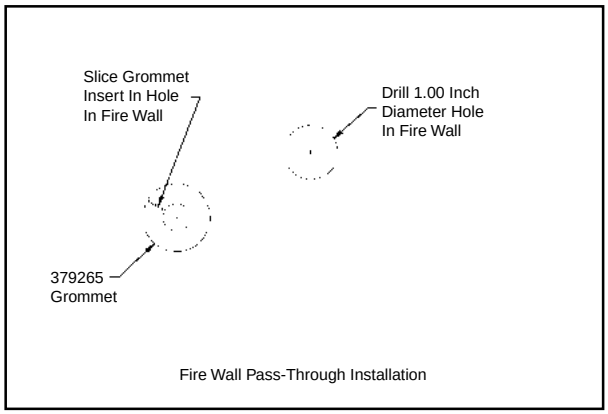


Figure13

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

CAUTION: Make sure the harness you just connected is secured away from any moving or rotating parts and has at least 6" clearance from the exhaust system. Always use a high temperature wrap type conduit to protect the wires.

This completes running the wires from outside the cab to inside. The next step is to connect the remaining wires inside the cab and the power source.

5. The black wire with the ring terminal that was just routed through the firewall is the ground wire. Make a solid connection to a ground bus or point.

6. Using a Spade connector (379306) make a solid crimp connection between the red wire from the cable to the terminal in the middle of the rocker switch.

7. Now connect the blue wire from the cable to the indicator light by using a butt connector (379252).

Device	Wire Cable Color	In Cab Connection
Solenoid	Red	Rocker Switch
Common Ground	Black	Ground Bus
Pressure Switch	Blue	Indicator Light

8. From the same screw terminal on the rocker switch that was used in step 6, connect one wire, the remaining wire from the indicator light, using a spade connector (379306).

9. Again using a spade connector (379306), attach the fuse holder (378884) to the end terminal of the rocker switch. **NOTE:** No other wire should be connected to this terminal on the rocker switch.

10. Connect the other end of the wire from the inline fuse holder to a power circuit. You can use the splice connector (379257) or connect directly to an available spot on the fuse block.

Electrical Installation with Electronic Overspeed Control

Before starting your electrical wiring installation, locate a position in the cab for the mounting of the bracket for the on/off switch and indicator light combination.

CAUTION: Before drilling any holes, make sure there is adequate clearance on both sides.

To ensure weather tight and secure connections, Chelsea provides a wiring harness with the Power Take-Off assembly. The connections underneath the truck at the solenoid valve, pressure switch and temperature sensor feature a Packard electrical connector. We will start with these connections first.

1. Cable assembly 379736 contains a female and male Packard connector. The female connector with the black and red wire will connect to the solenoid valve. The male connector with the black and blue wire connects to the pressure sensor.

2. Now connect the speed sensor shielded cable to the speed sensor installed in the bottom of the P.T.O. housing.

CAUTION: Make sure the harnesses you just connected are secured away from any moving or rotating parts and have at least 6" clearance from the exhaust system. Always use high temperature wrap type conduit to protect the wires.

With this step completed, it is now time to run the wires inside the cab. Before starting this step, it is important to remember that a solid electrical connection is essential when installing any electrical device or option. A proper crimp is shown in **Figure 14**.

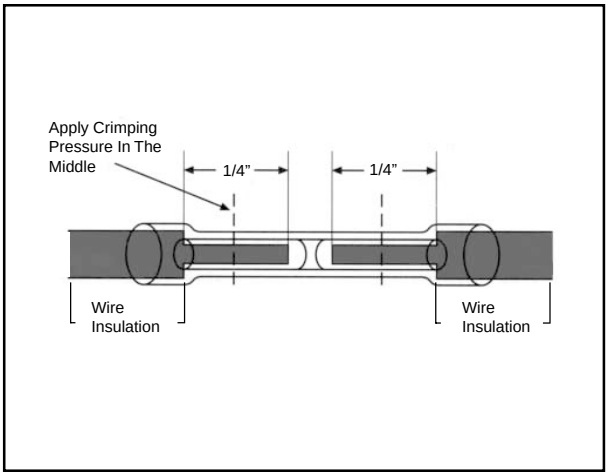


Figure14

3. Inspect the firewall to see if there is a spot to route the wires through. If nothing is available that the wires can be routed through, then drill a 1" hole in the firewall.

CAUTION: Before drilling any holes, make sure there is adequate clearance on both sides.

4. From the engine side insert the three wires from the cable assembly through the hole.

5. To install the grommet in the drilled hole, slice the grommet and place it over the wires. **NOTE:** The grommet is included in the installation kit. Position the wires in the center of the grommet and insert it in the drilled hole (**Figure 15**).

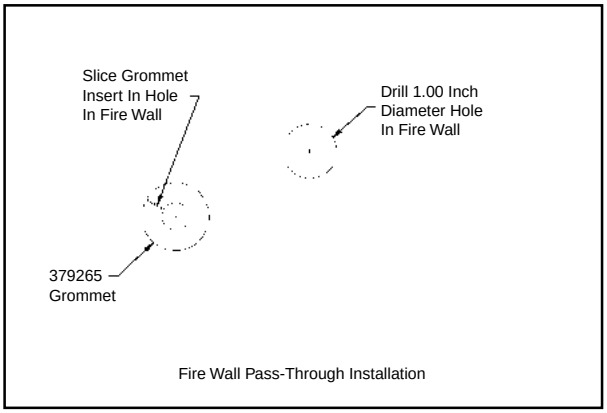


Figure15

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

This completes running the wires from the outside of the cab to inside. The next step is to connect the remaining wires inside the cab and the power source.

6. The black wire with the ring terminal that was just routed through the firewall is the ground wire. Make a solid connection to a ground bus or point.

7. Using a butt connector (379252) make a solid crimp connection between the red wire from the cable to the green wire from the E.O.C. control module.

8. Now connect the blue wire from the cable to the blue wire of the E.O.C. control module by using a butt connector (379252).

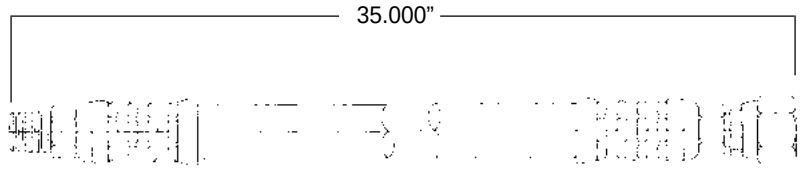
9. Finally, connect the gray shielded cable from the speed sensor to the plug in connection extending from the Electronic Overspeed Control.

Device	Wire Cable Color	In Cab Connection
Solenoid	Red	E.O.C. box green wire
Common Ground	Black	Ground Bus
Pressure Switch	Blue	E.O.C. box blue wire
Speed Sensor	Gray	E.O.C. box cable
	Cable	connector

10. The black ground wire with the ring terminal that extends from the E.O.C. should have a solid connection to a ground bus or point.

11. Connect the end of the wire from the inline fuse holder that extends from the E.O.C. to a power circuit. You can use the splice connector (379257) or connect directly to an available spot on the fuse block.

Hose Assembly Identification Chart

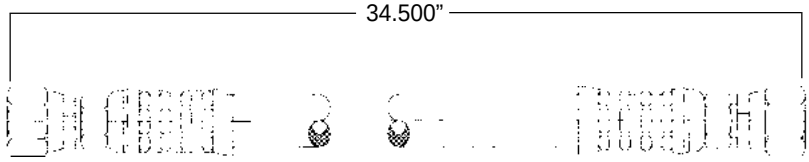


329087X

329130-2X

329130-4X

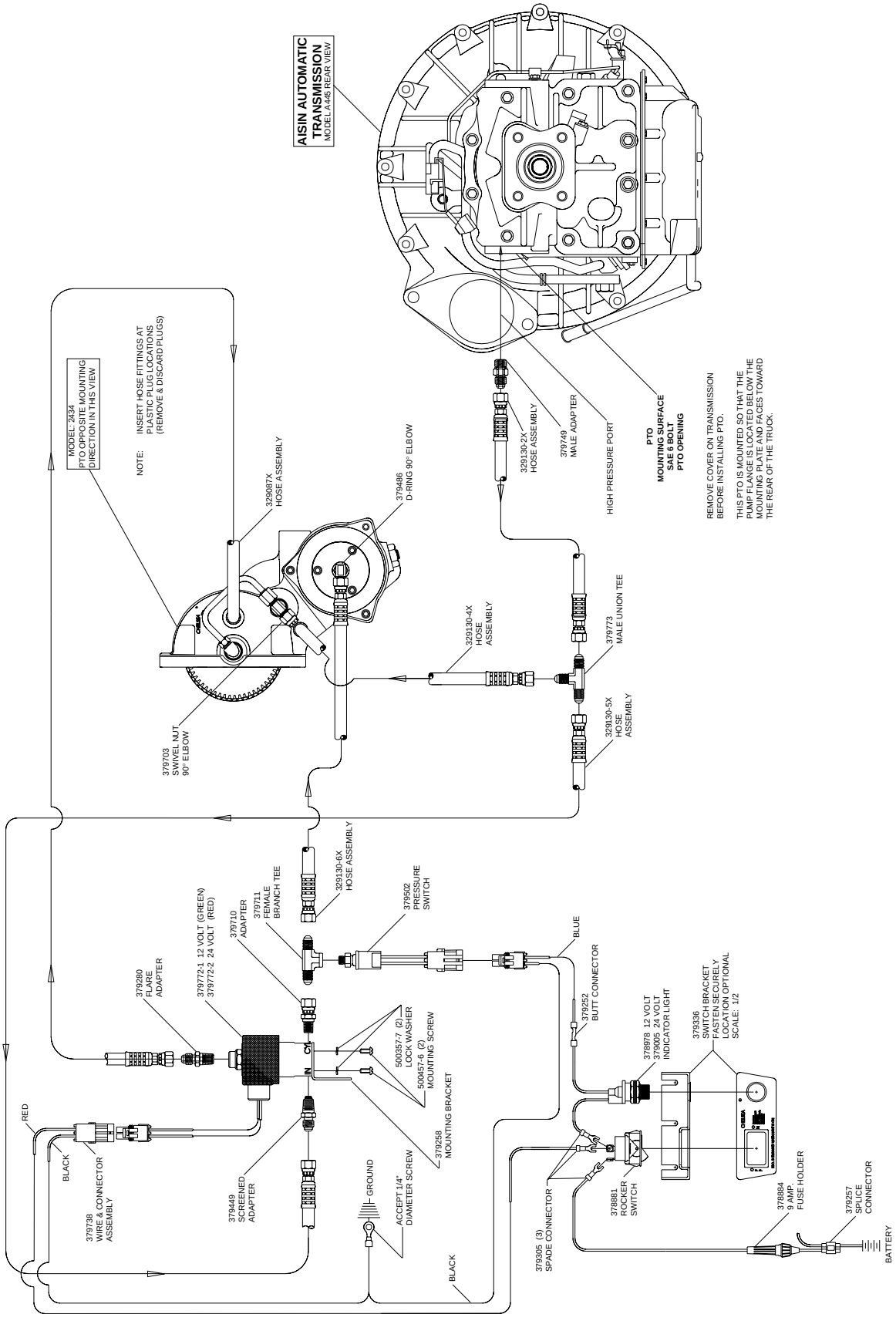
329130-5X



329130-6X

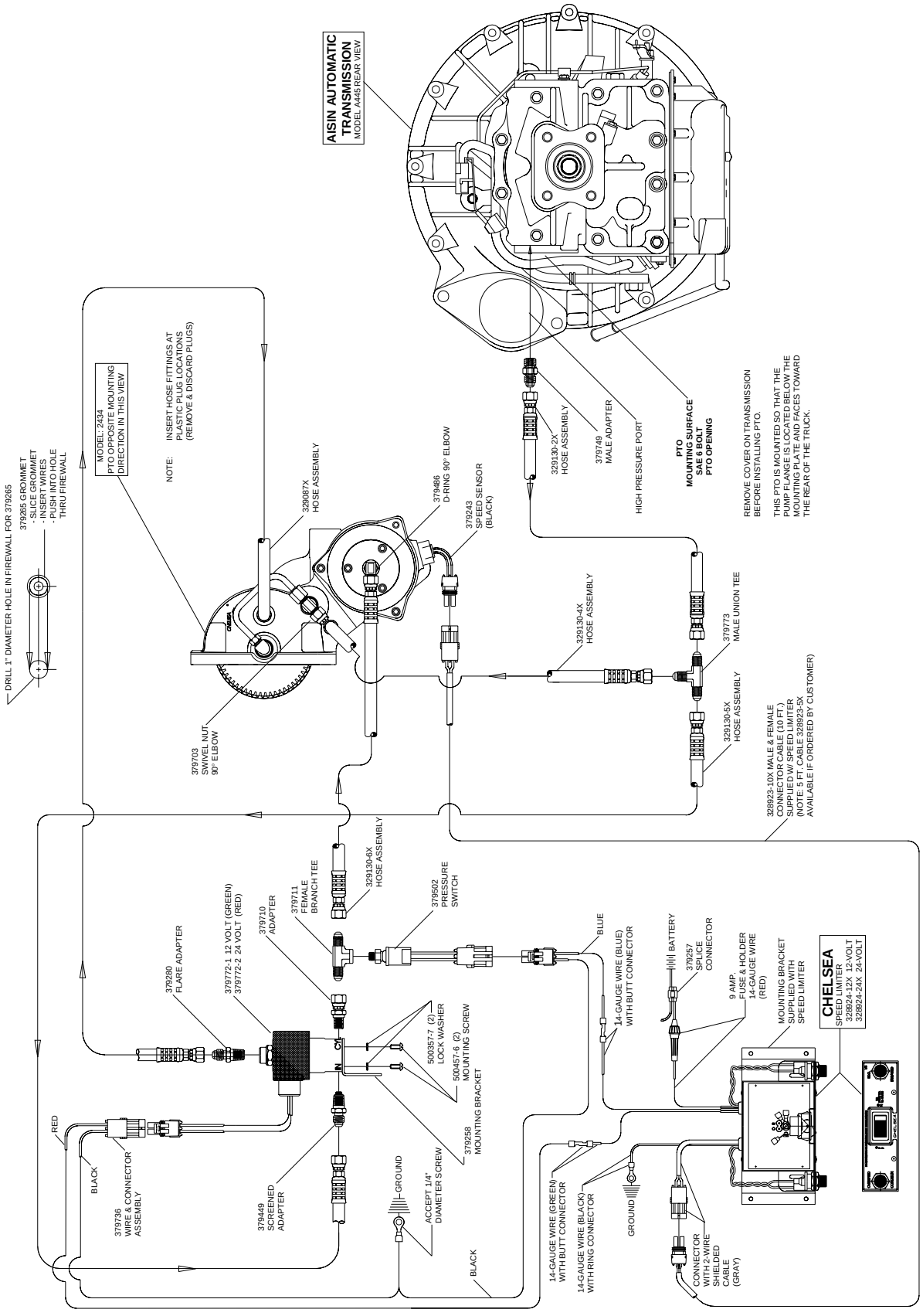
Parker Hannifin Corporation
Chelsea Products Division
Olive Branch, MS 38654 USA

Plumbing and Electrical Installation Sketch Rocker Switch



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

Plumbing and Electrical Installation Sketch Electronic Overspeed Control



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

Notes

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

Notes

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

Offer of Sale

The items described in this document and other documents or descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors are hereby offered for sale at prices to be established by Parker Hannifin Corporation, its subsidiaries and its authorized distributors. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any such items, when communicated to Parker Hannifin Corporation, its subsidiary or an authorized distributor ("Seller") verbally or in writing, shall constitute acceptance of this offer.

1. Terms and Conditions of Sale: All descriptions, quotations, proposals, offers, acknowledgments, acceptances and sales of Seller's products are subject to and shall be governed exclusively by the terms and conditions stated herein. Buyer's acceptance of any offer to sell is limited to these terms and conditions. Any terms or conditions in addition to, or inconsistent with those stated herein, proposed by Buyer in any acceptance of an offer by Seller, are hereby objected to. No such additional, different or inconsistent terms and conditions shall become part of the contract between Buyer and Seller unless expressly accepted in writing by Seller. Seller's acceptance of any offer to purchase by Buyer is expressly conditional upon Buyer's assent to all the terms and conditions stated herein, including any terms in addition to, or inconsistent with those contained in Buyer's offer, Acceptance of Seller's products shall in all events constitute such assent.

2. Payment: Payment shall be made by Buyer net 30 days from the date of delivery of the items purchased hereunder. Amounts not timely paid shall bear interest at the maximum rate permitted by law for each month or portion thereof that the Buyer is late in making payment. Any claims by Buyer for omissions or shortages in a shipment shall be waived unless Seller receives notice thereof within 30 days after Buyer's receipt of the shipment.

3. Delivery: Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller's plant. Regardless of the method of delivery, however, risk of loss shall pass to Buyer upon Seller's delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

4. Warranty: Seller warrants that the items sold hereunder shall be free from defects in material or workmanship for a period of:

(A) All Power Take-Off units one (1) year from date of installation.

(B) Except 267, 277, 278, 242, 244, 250, 251 and 859 series two (2) years from date of installation.

THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO ITEMS PROVIDED HEREUNDER. SELLER MAKES NO OTHER WARRANTY, GUARANTEE, OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED. NOTWITHSTANDING THE FOREGOING, THERE ARE NO WARRANTIES WHATSOEVER ON ITEMS BUILT OR ACQUIRED WHOLLY OR PARTIALLY, TO BUYER'S DESIGNS OR SPECIFICATIONS.

5. Limitation Of Remedy: SELLER'S LIABILITY ARISING FROM OR IN ANY WAY CONNECTED WITH THE ITEMS SOLD OR THIS CONTRACT SHALL BE LIMITED EXCLUSIVELY TO REPAIR OR REPLACEMENT OF THE ITEMS SOLD OR REFUND OF THE PURCHASE PRICE PAID BY BUYER, AT SELLER'S SOLE OPTION. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND OR NATURE WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOST PROFITS ARISING FROM OR IN ANY WAY CONNECTED WITH THIS AGREEMENT OR ITEMS SOLD HEREUNDER, WHETHER ALLEGED TO ARISE FROM BREACH OF CONTRACT, EXPRESS OR IMPLIED WARRANTY, OR IN TORT, INCLUDING WITHOUT LIMITATION, NEGLIGENCE, FAILURE TO WARN OR STRICT LIABILITY.

6. Changes, Reschedules and Cancellations: Buyer may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification or cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

7. Special Tooling: A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

8. Buyer's Property: Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property, Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

9. Taxes: Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

10. Indemnity For Infringement of Intellectual Property Rights: Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. Patents, U.S. Trademarks, copyrights, trade dress and trade secrets (hereinafter 'Intellectual Property Rights'). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgments resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. Force Majeure: Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter 'Events of Force Majeure'). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

12. Entire Agreement/Governing Law: The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain there/to. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of the sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.

9/01-P

Parker Hannifin Corporation
Chelsea Products Division
8225 Hacks Cross Road
Olive Branch, Mississippi 38654 USA
Tel: (662) 895-1011
Fax: (662) 895-1019
www.parker.com/chelsea

FP 03/02 250C