

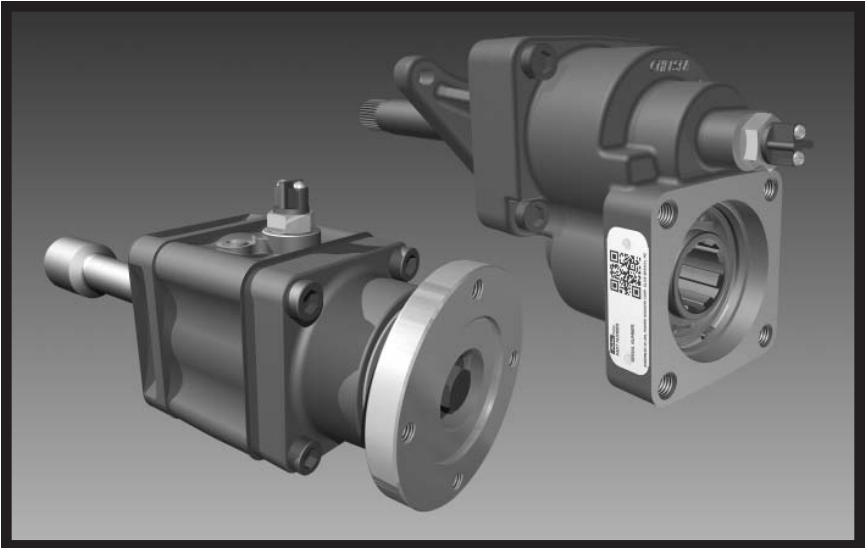
**CHELSEA<sup>®</sup>**

Bulletin HY25-1500-M1/US

# Owner's Manual Power Take-Offs

Effective: October 2014  
Supersedes: HY25-1500-M1/US  
September 2014

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**511 Series  
523 Series**

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## **WARNING — User Responsibility**

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS 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 or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

## **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:

7,159,701    7,007,565    6,962,093    1,326,036    60,321,840.7

Other patents pending.

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## **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.



**This symbol warns of possible personal injury.**

## Safety Information (Continued)

### 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.

### 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 drive 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.



**This symbol warns of possible personal injury.**

## Safety Information (Continued)

### 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.



**This symbol warns of possible personal injury.**

## **Direct Mount Pump Support Recommendations**

### **Pump Installation Pre-calculations – General Rules**

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

- The pump weighs 18.1 Kg [40 pounds] or more.
- The combined length of the P.T.O. and pump is 457 mm [18 inches] or more from the P.T.O. centerline to the end of the pump.

### **CAUTION: Ensure 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 18.1 Kg [40 pounds].
- 2) The combined length of the P.T.O. and pump is 457 mm [18 inches] or more from the P.T.O. centerline to the end of the pump.

## Foreword

Since it is our major objective to show you how to get additional and more profitable miles from truck, tractor, and trailer components, we want to provide you with information on the installation of Chelsea Power Take-Offs.

We all realize that an inadequate transmission will overwork any Power Take-Off in a very short period of time. In addition, a mismatched transmission/P.T.O. combination can result in unsatisfactory performance of the equipment right from the start.

Before you order new trucks, be sure that you're getting the right transmission/P.T.O. combination. This is vital for efficient performance and adequate power. To help you select the proper type, size, and design of P.T.O., discuss your specific requirements with a Chelsea P.T.O. specialist. They know their products and have easy access to equipment, transmission, and Power Take-Off manufacturers. They can tell you everything you need to know about power, at the right time, before you specify components.

### Chelsea P.T.O. Safety Label Instructions

1. The two black and orange on white 5" x 7" pressure sensitive vinyl labels, part number 379274; must be placed on the vehicle frame rails (one (1) on each side), in a position that would be HIGHLY visible to anyone that would go under the truck near the P.T.O. rotating shaft. If the vehicle is to be painted after these labels are installed, cover them with two-(2) blank masking covers. Remove the masking covers after painting.
2. Place the one (1) black and orange on white 3.5" x 5" pressure sensitive vinyl label, part number 379275, on the visor nearest the operator of the vehicle, this must be placed near the P.T.O. visor label.
3. Place the one (1) red and white with black lettering 3.5" x 7.5" sensitive vinyl label, part number 379915, on the opposite side of the visor from the above label # 379275.
4. Place the one (1) white and black heavy duty card, part number 379276, in the vehicle glove box. Again in a position highly visible to the operator, for example: try to place this card on top of whatever may be in the glove box.

If you require additional labels, please order part number 328946X at no charge from your local Chelsea Warehouse or send request direct to:

Parker Hannifin Corporation  
Chelsea Products Division  
8225 Hacks Cross Road  
Olive Branch, MS 38654  
Customer Service: (662) 895-1011



## **For P.T.O. Mounted Manual Transmissions with Countershaft**

### **P.T.O. Shifting Procedure & Precautions**

**CAUTION: This vehicle is equipped with a POWER TAKE-OFF. Shut engine off before working on POWER TAKE-OFF or getting below vehicle. Consult Operating Instructions Before Using. (See Sun Visor)**

#### **POWER TAKE-OFF OPERATION – VEHICLE STATIONARY**

- A. To Engage the Countershaft P.T.O.
1. Disengage the vehicle clutch and stop the vehicle.
  2. Set the parking brakes and place the main transmission in neutral.
  3. Engage the Countershaft P.T.O.
  4. The light mounted next to the P.T.O. control will light when the P.T.O is engaged.
  5. Slowly engage the clutch. The Countershaft P.T.O. will now start to rotate.
- B. To Disengage the P.T.O.
1. Disengage the vehicle clutch and wait for the Countershaft to stop rotating.
  2. Disengage the Countershaft P.T.O.
  3. The light mounted next to the P.T.O. control will be "Off" when the P.T.O is disengaged.

**IMPORTANT: Failure to follow proper shifting or operating sequences will result in premature P.T.O. failure with possible damage to other equipment.**

## Overview

The 511 and 523 Series are modular designed Power Take-Offs (P.T.O.) that will install on a wide variety of global transmissions. The basic units are a gear section with indicator switch, gaskets and stud kits for mounting as a countershaft P.T.O. They can also be configured as Thrushaft P.T.O.s by the use of adapter kits. The output section is also modular and bolts directly to the basic unit.

Always consult the current Chelsea application book (HY25-3000/US) for your Power Take-Off requirements or contact Chelsea customer service or your local sales engineer.

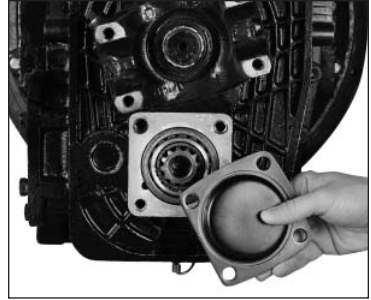


Figure 1

## 511 Series General Installation Instructions

1. Remove drain plug and drain oil from transmission. After oil is drained, immediately re-install drain plug.

**WARNING:** Oil may be hot. Use extreme caution to assure that you do not accidentally come in contact with hot oil.

2. Remove extended countershaft bearing cover and gasket from transmission. Clean aperture surface and threaded holes.
3. Install the four studs to the transmission and torque to 22-32 N.m. [16-24 Lbs. ft.]
4. Install the P.T.O. to the transmission with the four studs and mounting gasket supplied with the P.T.O.

**NOTE:** Some transmissions may require an input adapter plate or quill shaft for mounting the P.T.O. to the transmission, this will be supplied with the P.T.O. adapter kit.

5. Install direct mount pump or output flange and gasket supplied with the P.T.O. to the P.T.O.
6. Torque the four locknuts to 80-90 N.m. [59-66 Lbs. ft.]

**NOTE:** After P.T.O. installation is complete, fill transmission to the proper oil level per transmission manufacture's instructions.

7. Install the male air fitting to the P.T.O. air shift port (.125" NPT) and plumb air circuit per sketch. See [pages 38-39](#).

## 523 Series General Installation Instructions

1. Remove drain plug and drain oil from transmission. After oil is drained, immediately re-install drain plug.

**WARNING:** Oil may be hot. Use extreme caution to assure that you do not accidentally come in contact with hot oil.

2. Remove extended countershaft bearing cover and gasket from transmission. Clean aperture surface and threaded holes.
3. Secure the P.T.O. to the transmission with the four bolts and mounting gasket supplied with the P.T.O.

**NOTE:** Some transmissions may require an input adapter plate or quill shaft for mounting the P.T.O. to the transmission, this will be supplied with the P.T.O. kit.

4. Torque the four bolts to 80-90 N.m [59-66 Lbs. ft.]

**NOTE:** 523 Series - Any duty cycle longer than 5 minutes is classed as continuous. For continuous applications a lubrication hose must be supplied between the transmission oil cooler return line and the P.T.O.

5. If the P.T.O. must have a constant oil supply connected to the bottom of the P.T.O., remove the S.A.E. #6 plug on the bottom of the P.T.O. Using fittings and hoses supplied by the installer, connect one end of the hose to the bottom of the P.T.O. and the other to a transmission drain port or a tee fitting installed in the return line from the hydraulic transmission cooler.

**NOTE:** After P.T.O. installation is complete, fill transmission to the proper oil level per transmission manufacture's instructions.

6. Install the male air fitting to the P.T.O. air shift port (.125" NPT) and plumb air circuit per sketch. See [pages 38-39](#).

## P.T.O. Shifting Procedure & Precautions

### Overview:

Connection to Volvo/Mack system is required for Volvo I-Shift or Mack mDrive, the vehicle needs to be ordered with P.T.O. prep package. Vehicle ECU must be programmed by dealer for P.T.O. operation.

**Reliable engagement is carried out by a pneumatic system controlled by the Transmission Management System (TMS).**

Speed and output are governed by the engine's speed and the transmission's gear ratio in low and high split, which varies between Overdrive and Direct Drive transmissions. Splitter position in P.T.O. mode is controlled by customer parameter GJG:

1. Auto low split
2. Auto high split
3. Driver selectable (Requires the premium shifter and bodybuilder module)

**CAUTION:** This vehicle is equipped with a POWER TAKE-OFF. Shut Engine Off Before Working On POWER TAKE-OFF Or Getting Below Vehicle. Consult Operating Instructions Before Using. (See Sun Visor).

### POWER TAKE-OFF OPERATION – VEHICLE STATIONARY

Engagement and disengagement is done with the OE provided switch on the instrument panel. The sequence below explains how the I-Shift/mDrive PTO is engaged.

1. Engine Running and transmission in Neutral or in Gear
2. TMS ( Transmission Management System) receives command on the J1939 link to activate the P.T.O. (OE Supplied P.T.O. switch = ON)
3. TMS disengages the clutch, activates the counter shaft brake to stop the counter shaft from rotating, selects the correct split ratio and engages the P.T.O.
4. TMS engages the clutch slowly
5. P.T.O. off = OE Supplied Switch off

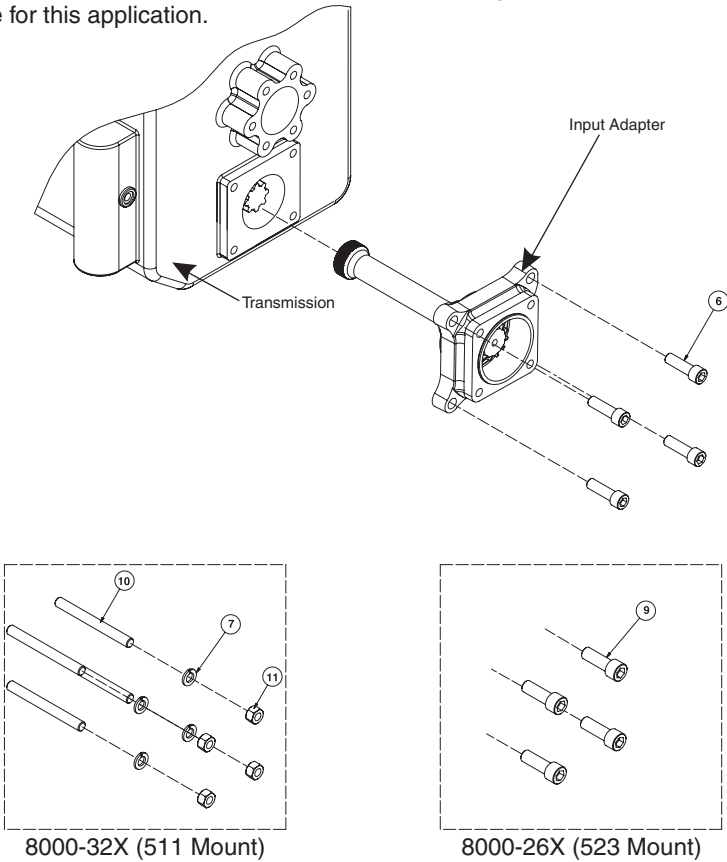
## 329735X – Input Adapter Assembly Volvo I-Shift & Mack mDrive w/o Intarder

**Transmissions:**

AT2412 / V2412AT, AT2512 / V2512AT, AT2612, AT2812 / V2812AT,  
 ATO2512 / VO2512AT, ATO2612, ATO3112 / VO3112AT

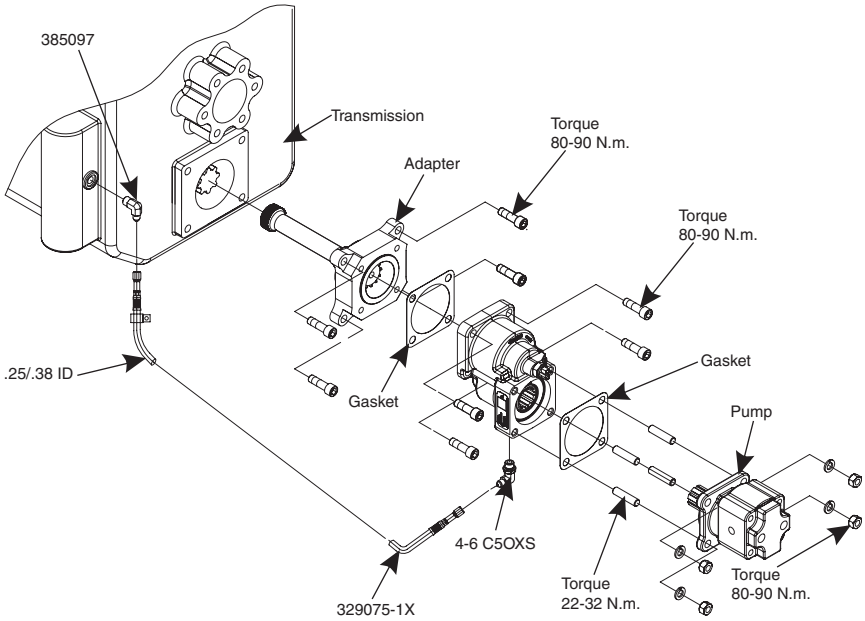
**Kit Designator: "AS"**

**NOTE:** 511 and 523 P.T.O.'s require interface coupling with a 45mm - 12 Tooth Spline for this application.



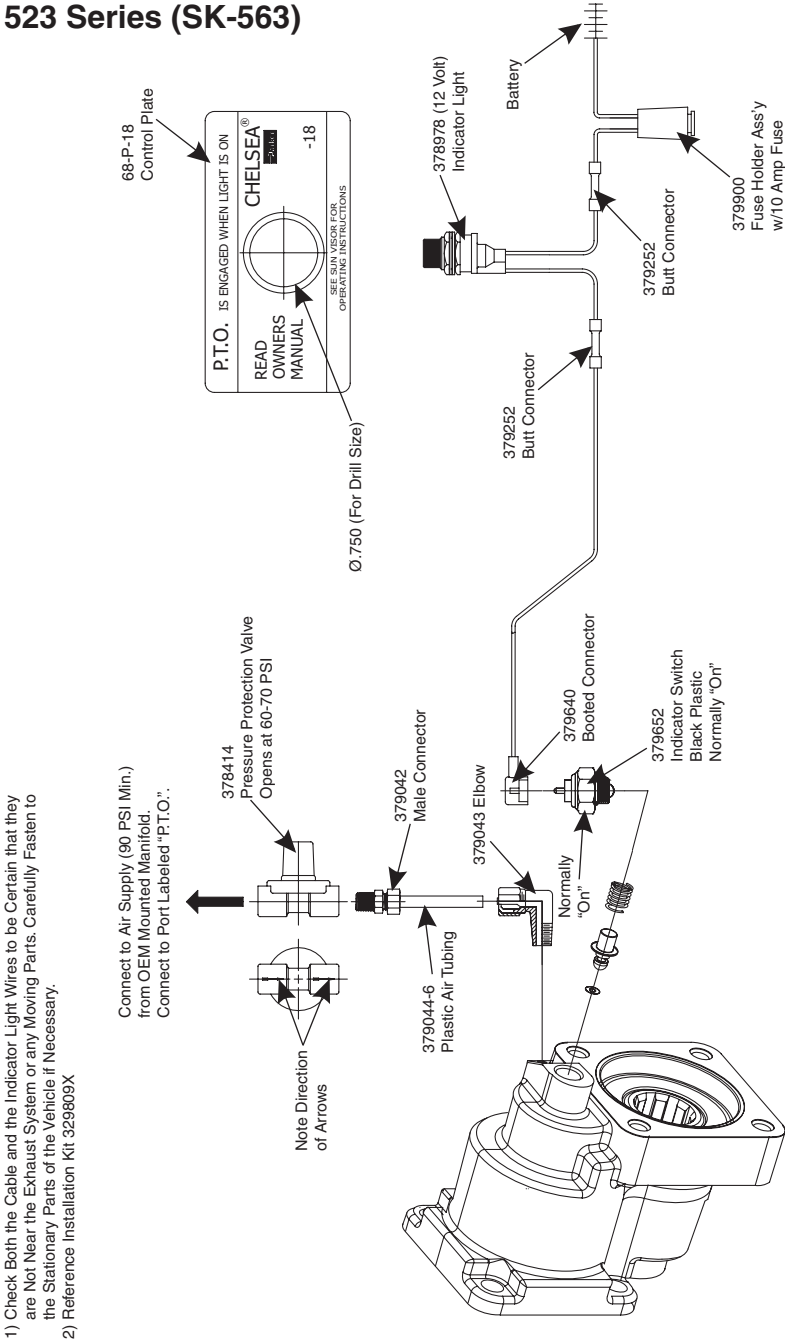
Item	Description	Torque
6	Socket HD. Capscrew - M12 x 1.75" x 40mm Lg	80-90 N.m.
7	Lockwasher - M12	
9	Socket HD. Capscrew - M12 x 1.75" x 35mm Lg	80-90 N.m.
10	Stud - M12 x 1.75" x 120mm Lg	22-32 N.m.
11	Nut - M12 x 1.75"	80-90 N.m.

## Installation 523 Series Volvo I-Shift and Mack mDrive Transmissions (SK-585)



**CAUTION:** Hose is required for Supplementary Cooling of P.T.O.

# Volvo I-Shift & Mack mDrive Shift Installation Sketch for 523 Series (SK-563)



- 1) Check Both the Cable and the Indicator Light Wires to be Certain that they are Not Near the Exhaust System or any Moving Parts. Carefully Fasten to the Stationary Parts of the Vehicle if Necessary.
- 2) Reference Installation Kit 329809X

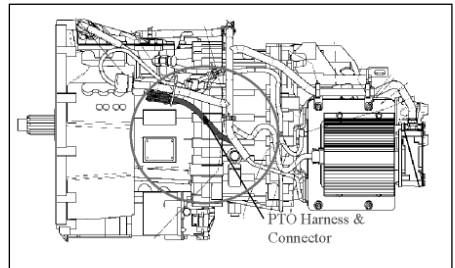
## Overview of ZF AS-tronic/FreedomLine™ Transmissions

FreedomLine™ transmissions are designed to operate in automatic or manual mode through a two -pedal driving system (brake and accelerator). Clutch actuation and transmission shifts are pneumatically powered and electronically controlled using a TCU (ZMTEC). P.T.O. installers must ensure that P.T.O.s are integrated in a manner that permits proper transmission control of P.T.O. engagement and P.T.O. disengagement. FreedomLine™ transmissions are designed to communicate transmission – P.T.O. activity to drivers via the transmission display in the vehicle.

**CAUTION:** To prevent damage to components: P.T.O. interface with FreedomLine™ transmissions must be in accordance with P.T.O. manufacturer guidelines, any attempt to bypass transmission-control may result in damage to FreedomLine™ transmissions.

### FreedomLine™

3. For installation of the 523 Series on the ZF Meritor Freedomline™ transmissions a wiring harness must be used to connect the transmission control to the P.T.O.
4. Connect Chelsea wiring harness 75-P-9 to the ZF Meritor P.T.O. harness connector. (**Fig. 7**)
5. See SK-564 for complete FreedomLine™ wiring installation



Side View  
Figure 7

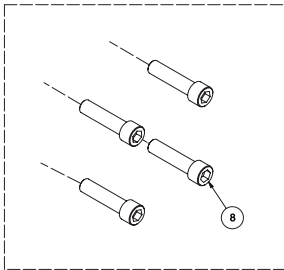
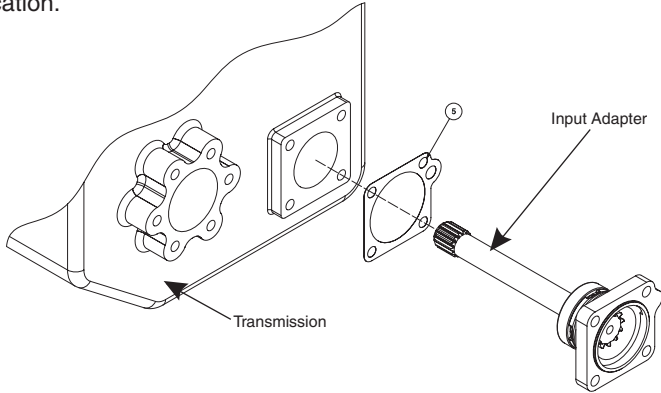
### 329755X – Input Adapter Assembly “ZF”

**Transmissions:**

12AS-2301, 12AS1930TO, 12AS2130TO, 12AS2330TO, 12AS2530TO,  
12AS-2301, 12AS1630TD, 12AS1930TD, 12AS2130TD, 12AS2330TD,  
12AS2530TD, 16AS-2601, 16AS2630TO, 16AS-2601, 16AS2230TD

**Kit Designator: “AC”**

**NOTE:** 523 P.T.O.'s require interface coupling with a 45mm - 12 Tooth Spline for this application.



8000-23X (523 Mount)

Item	Description	Torque
5	Gasket	
8	M12 x 1.75" x 45mm	80-90 N.m.

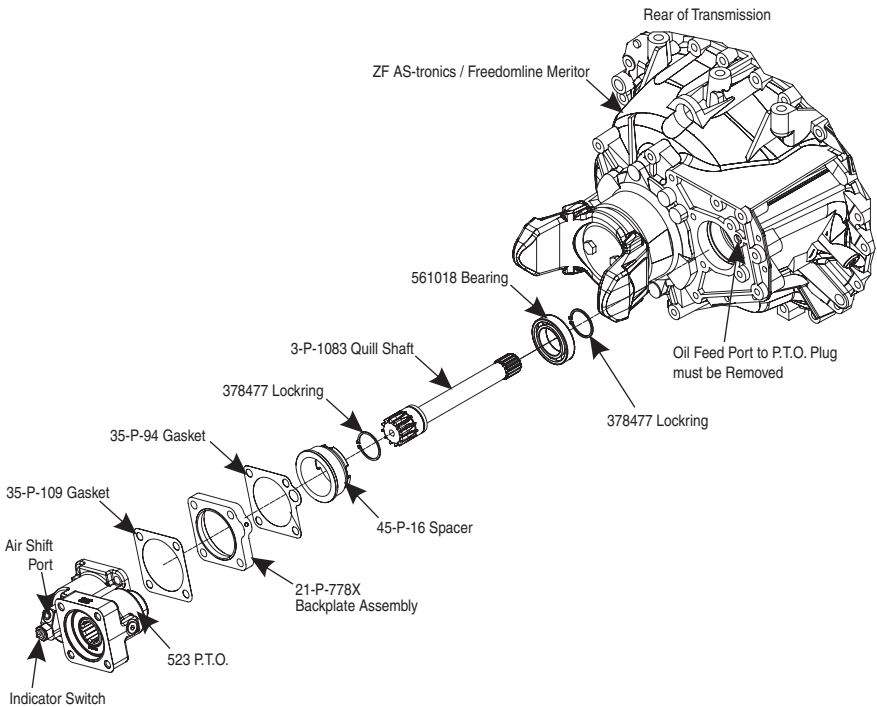
## ZF AS-tronic/FreedomLine™ Transmissions Installation Instructions

1. Installation of the 523 Series on the AS-tronic & Freedomline™ transmissions is the same as the standard installation instructions found on [page 7](#) except for the following.

### AS-tronic & FreedomLine™

2. The 523 must be positioned as shown in **Fig. 6**. This will allow for proper lubrication of the P.T.O. The oil feed port on the transmission and the P.T.O. oil feed port must line up for proper operation. Also there may be a transmission end yoke swing diameter clearance issue if not mounted in this position.

**NOTE:** Remove plug in oil feed port before installing P.T.O.

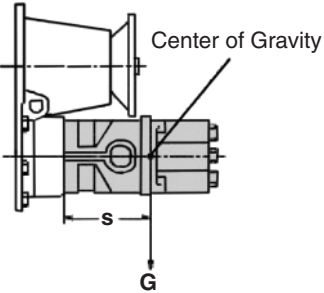


## Direct Mount Pump Support Recommendations

### Pump Limits

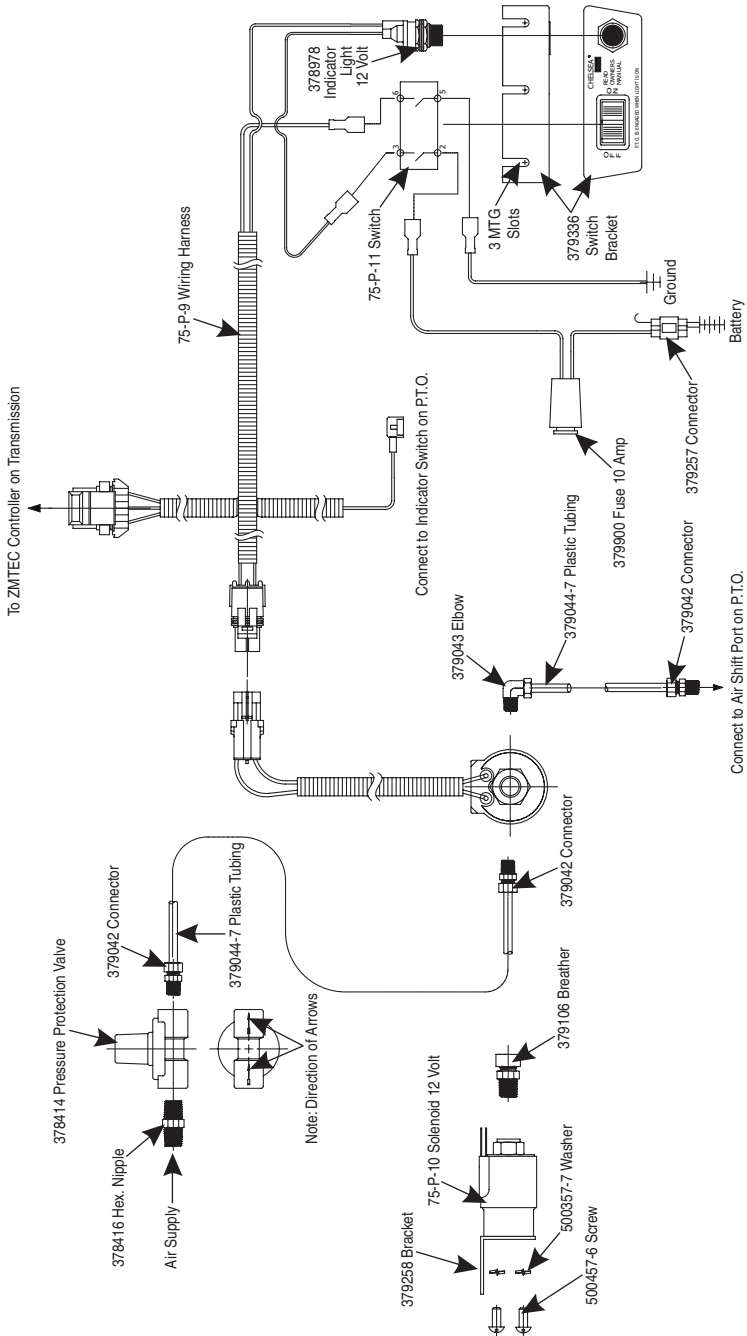
P.T.O. Weight (From ZF Meritor Installation Instructions G-105)

Limit - The FreedomLine™ transmission P.T.O. flange will accommodate a maximum combined gravity torque of 37 foot-pound (50 Newton-meter), taking into account all accessories (i.e. P.T.O., pump, fittings, etc) attached directly to the transmission P.T.O. flange.

Gravity Torque Equation	Parameters
<p style="text-align: center;"><math>M = s \cdot G</math></p>  <p style="text-align: center;">Center of Gravity</p> <p style="text-align: center;"><math>G</math></p> <p style="text-align: center;"><math>s</math></p>	<p><math>G</math> = Combined weight of all accessories (i.e. P.T.O., pump, fittings, etc.)</p> <hr/> <p><math>M</math> = Gravity torque</p> <hr/> <p><math>s</math> = Distance between the center of gravity of all accessories (i.e. P.T.O., pump, fittings, etc.) and the flange mounting face</p>

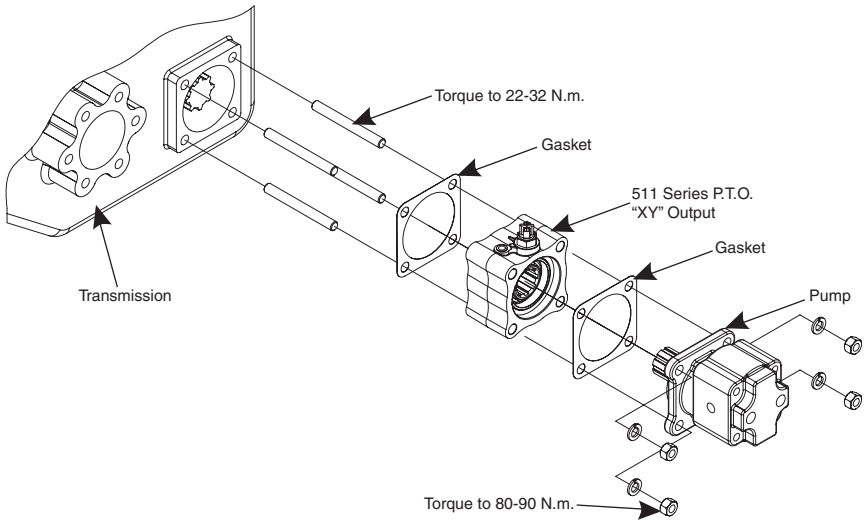
P.T.O. Driveshaft Angle – The P.T.O. driveshaft angle must not exceed 7 degrees at the transmission.

# ZF Meritor FreedomLine™ Wiring Installation (SK-564)



Reference Kit: 328388-82X for 12V Installation

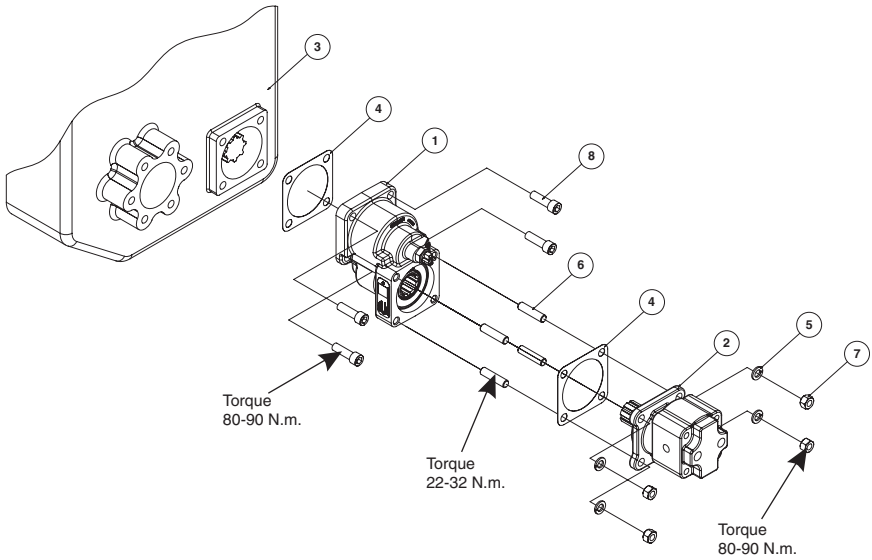
**Input "AA" & "AH" w/"XY" Output DIN5462**



Transmission	Kit Designator	P.T.O. 511	Mounting Kit
ZF S6-36	AA	57-P-42 Coupling (40MM-SPLINE)	8000-29X
ZF 6S-850	AA		
ZF 6S-700	AA		
ZF S6-65/66/70/75/80/90	AH	57-P-41 Coupling (45MM-SPLINE)	
ZF 6S-800	AH		
ZF 6S-1000	AH		
ZF 6S-1200	AH		

Continued on Next Page

**Input “AA” & “AH” w/“XY” Output DIN5462**



**NOTE:** 523 Series - Any duty cycle longer than 5 minutes is classed as continuous. For continuous applications a lubrication hose must be supplied between the transmission oil cooler return line and the P.T.O.

Transmission	Kit Designator	P.T.O. 523	P.T.O. Mounting Kit
ZF S6-36	AA	3-P-1073 Coupling (40MM-SPLINE)	8000-22X
ZF 6S-850	AA		
ZF 6S-700	AA		
ZF S6-65/66/70/75/80/90	AH	3-P-1064 Coupling (45MM-SPLINE)	
ZF 6S-800	AH		
ZF 6S-1000	AH		
ZF 6S-1200	AH		

Item	Description
1	Assembly (523 Series)
2	Pump
3	Transmission
4	Gasket
5	Lockwasher - M12
6	Stud M12 x 1.75"
7	Nut M12 x 1.75"
8	Capscrew M12 - 1.75" x 40mm Lg

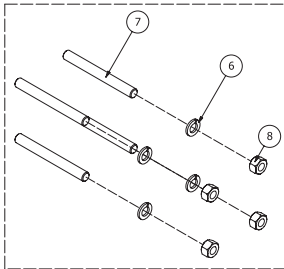
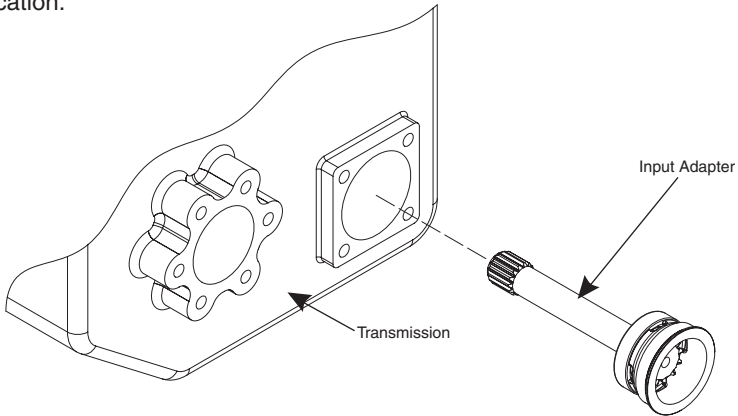
## 329780X – Input Adapter Assembly ZF w/o Intarder

**Transmissions:**

8S-151, 16S-151/181/221, 16S1620TD, 16S1920TD, 16S2220TD, 16S2320TD, 16S1820TO, 16S2220TO, 16S2520TO, 16S2720TO

**Kit Designator: "AZ"**

**NOTE:** 511 P.T.O. requires interface coupling with a 45mm - 12 Tooth Spline for this application.



8000-29X (511 Mount)

Item	Description	Torque
6	Lockwasher - M12	
7	Stud - M12 x 1.75" x 113mm Lg	22-32 N.m.
8	Nut - M12 x 1.75"	80-90 N.m.

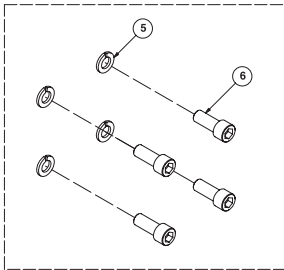
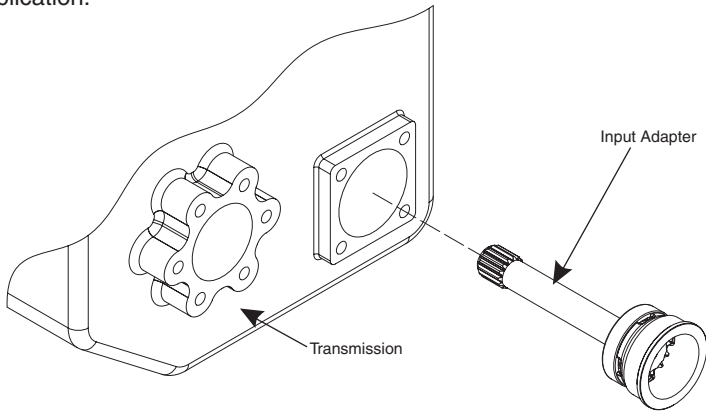
**329732X – Input Adapter Assembly ZF w/o Intarder**

**Transmissions:**

8S-151, 16S-151/181/221, 16S1620TD, 16S1920TD, 16S2220TD, 16S2320TD, 16S1820TO, 16S2220TO, 16S2520TO, 16S2720TO

**Kit Designator: “AD”**

**NOTE:** 523 P.T.O. requires interface coupling with a 45mm - 12 Tooth Spline for this application.



8000-22X (523 Mount)

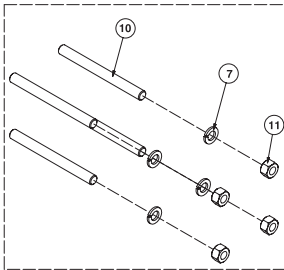
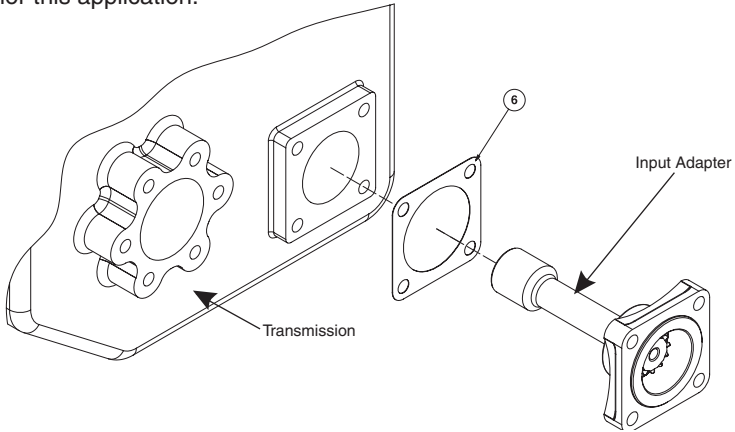
Item	Description	Torque
5	Lockwasher - M12	
6	Socket HD. Capscrew M12 x 1.75" x 30mm Lg	80-90 N.m.

## 329733X – Input Adapter Assembly EATON FULLER

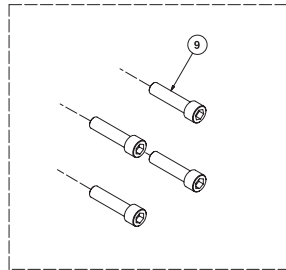
**Transmissions:**  
 FS-6209A

**Kit Designator: "AR"**

**NOTE:** 511 and 523 P.T.O.'s require interface coupling with a 40mm - 12 Tooth Spline for this application.



8000-31X (511 Mount)



8000-24X (523 Mount)

Item	Description	Torque
6	Gasket	
7	Lockwasher - M12	
9	Socket HD. Capscrew - M12 x 1.75" x 50mm Lg	80-90 N.m.
10	Stud - M12 x 1.75" x 133mm Lg	22-32 N.m.
11	Nut - M12 x 1.75"	80-90 N.m.

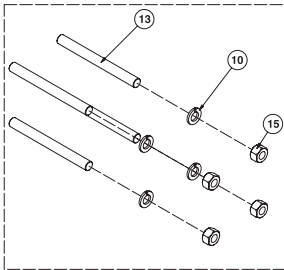
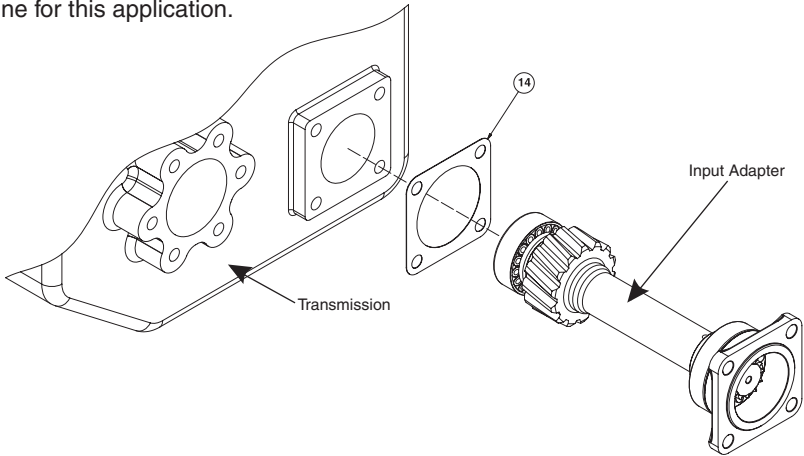
## 329743X – Input Adapter Assembly ZF

**Transmissions:**

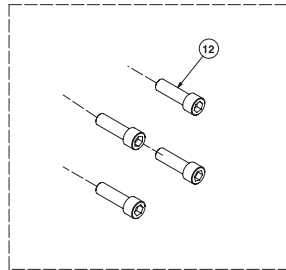
9S-1110TO (9.48 - 0.75), 9S-1310TO (9.48 - 0.75)

**Kit Designator: “AQ”**

**NOTE:** 511 and 523 P.T.O.'s require interface coupling with a 40mm - 12 Tooth Spline for this application.



8000-30X (511 Mount)



8000-23X (523 Mount)

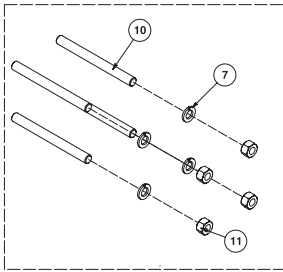
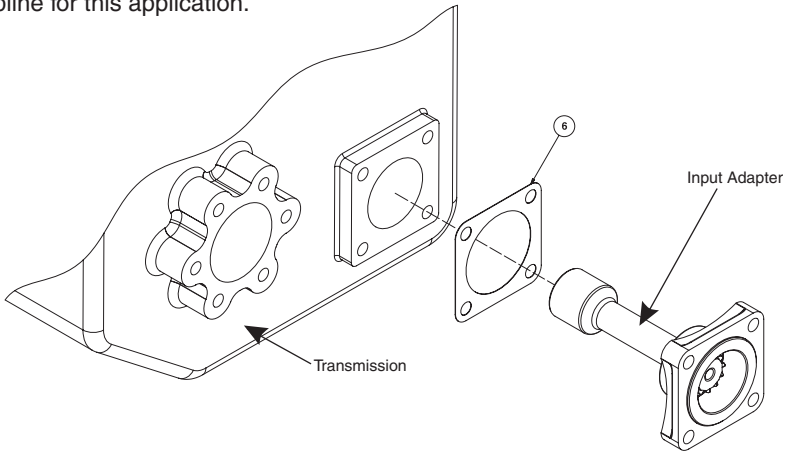
Item	Description	Torque
10	Lockwasher - M12	
12	Socket HD. Capscrew - M12 x 1.75" x 45mm Lg	80-90 N.m.
13	Stud - M12 x 1.75" x 128mm Lg	22-32 N.m.
14	Gasket	
15	Nut - M12 x 1.75"	80-90 N.m.

## 329745X – Input Adapter Assembly EATON FULLER

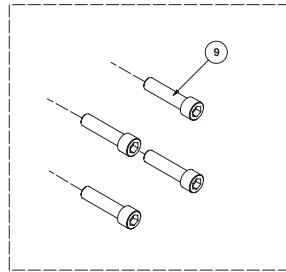
**Transmissions:**  
 FS-10309

**Kit Designator: “AK”**

**NOTE:** 511 and 523 P.T.O.'s require interface coupling with a 40mm - 12 Tooth Spline for this application.



8000-31X (511 Mount)



8000-24X (523 Mount)

Item	Description	Torque
6	Gasket	
7	Lockwasher - M12	
9	Socket HD. Capscrew - M12 x 1.75" x 50mm Lg	80-90 N.m.
10	Stud - M12 x 1.75" x 133mm Lg	22-32 N.m.
11	Nut - M12 x 1.75"	80-90 N.m.

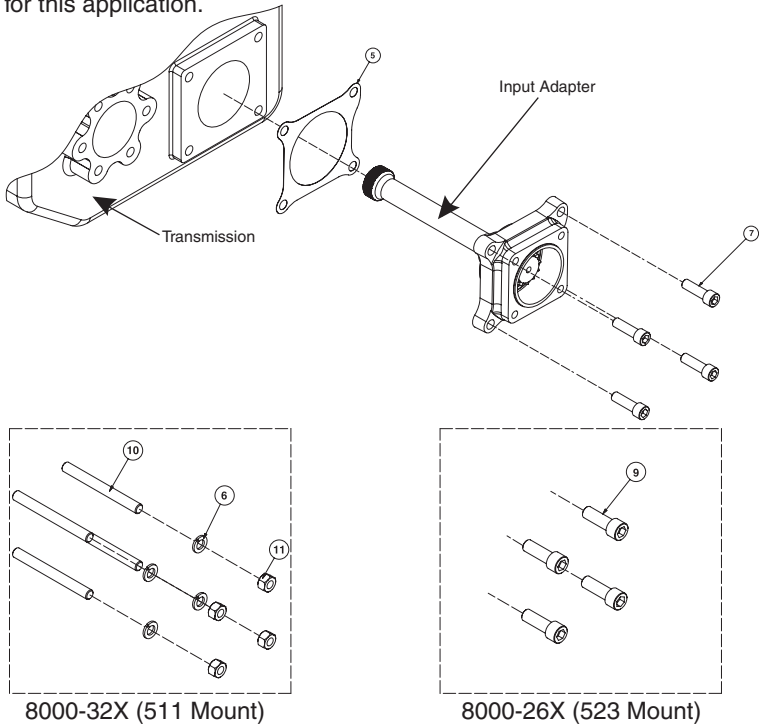
## 329746X – Input Adapter Assembly Volvo

**Transmissions:**

R1000, R1400, R1700, VT1708, VT2009B, SR1400, SR1700, SR1900, GEARTRONIC, VT2014, VT2214B, VT2514B, SR2000

**Kit Designator: “AG”**

**NOTE:** 511 and 523 P.T.O.'s require interface coupling with a 40mm - 12 Tooth Spline for this application.



Item	Description	Torque
5	Gasket	
6	Lockwasher - M12	
7	Socket HD. Capscrew - M12 x 1.75" x 40mm Lg	80-90 N.m.
9	Socket HD. Capscrew - M12 x 1.75" x 35mm Lg	80-90 N.m.
10	Stud - M12 x 1.75" x 120mm Lg	22-32 N.m.
11	Nut - M12 x 1.75"	80-90 N.m.

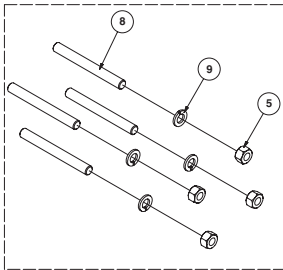
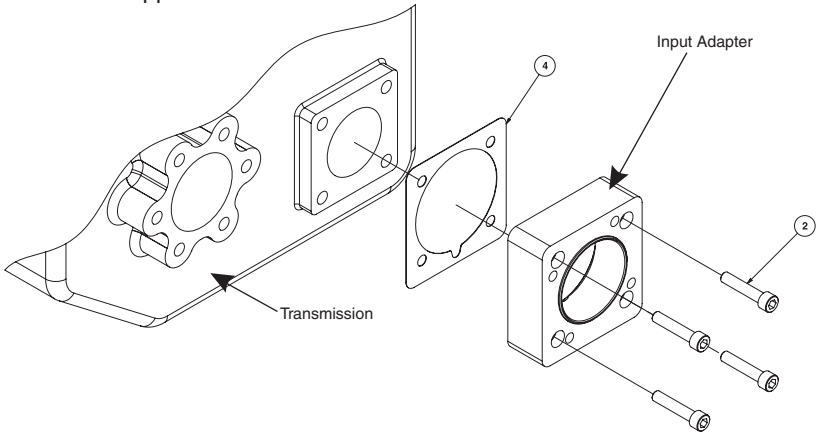
## 329748X – Input Adapter Assembly EATON FULLER

**Transmissions:**

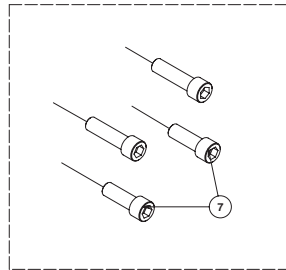
FS-6306, FS-6206, FS-6406

**Kit Designator: "AL"**

**NOTE:** 511 and 523 P.T.O.'s require interface coupling with a 33mm - 26 Tooth Spline for this application.



8000-29X (511 Mount)



8000-25X (523 Mount)

Item	Description	Torque
2	Cap Screw, SH M10 x 1.5" x 50mm Lg	
4	Gasket	
5	Lockwasher - M12	
7	Socket HD. Capscrew - M12 x 1.75" x 35mm Lg	80-90 N.m.
8	Stud - M12 x 1.75" x 113mm Lg	22-32 N.m.
9	Nut - M12 x 1.75"	80-90 N.m.

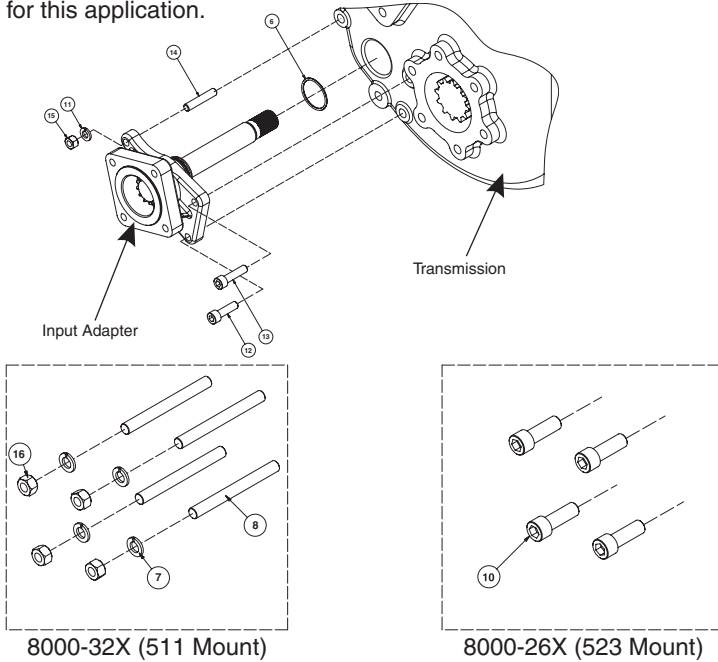
## 329751X – Input Adapter Assembly EATON FULLER

**Transmissions:**

ET-16109, ETO-16109, ETS-16409, ETSO-16409, FTS-16109A, FTSO-16109A, ET-18109, ETO-18109, ETS-18409, ETSO-18409, FTS-18109A, FTSO-18109A, ET-20109, ETO-20109, ETS-20409, ETSO-20409, FTS-20109A, FTSO-20109A

**Kit Designator: “BJ”**

**NOTE:** 511 and 523 P.T.O.'s require interface coupling with a 40mm - 12 Tooth Spline for this application.



Item	Description	Torque
6	O-Ring 1.627" x .106	
7	Lockwasher - M12	
8	Stud - M10 x 1.75" x 120mm Lg	22-32 N.m.
10	Socket HD. Capscrew - M12 x 1.75" x 35mm Lg	80-90 N.m.
11	Lockwasher - M10	
12	Socket HD. Capscrew - M10 x 1.50" x 35mm Lg	80-90 N.m.
13	Socket HD. Capscrew - M10 x 1.50" x 40mm Lg	80-90 N.m.
14	Stud - M10 x 1.50" x 53mm Lg	22-32 N.m.
15	Hex Nut - M10 x 1.50"	80-90 N.m.
16	Nut - M12 x 1.75"	80-90 N.m.

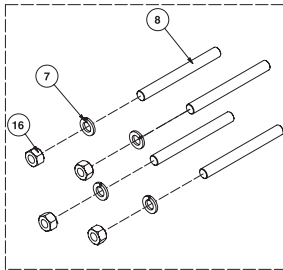
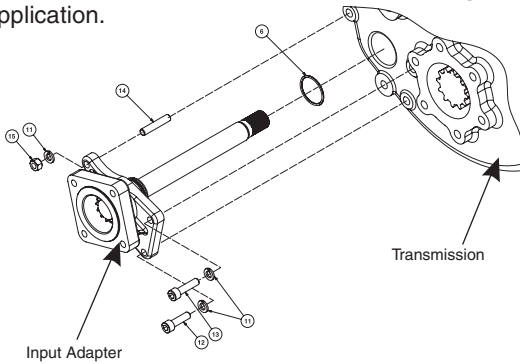
## 329752X – Input Adapter Assembly EATON FULLER

### Transmissions:

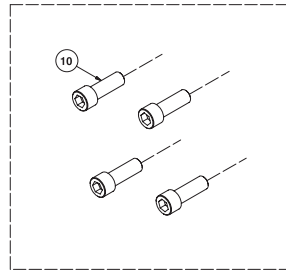
ET-16110, ETO-16110, ETS-16410, ETSO-16410, FTS-16108LL, FTSO-16108LL, ET-18110, ETO-18110, ETS-18410, ETSO-18410, FTS-18108LL, FTSO-18108LL, ET-20110, ETO-20110, ETS-20410, ETSO-20410, FTS-20108LL, FTSO-20108LL

### Kit Designator: "LG"

**NOTE:** 511 and 523 P.T.O.'s require interface coupling with a 40mm - 12 Tooth Spline for this application.



8000-32X (511 Mount)



8000-26X (523 Mount)

Item	Description	Torque
6	O-Ring 1.627" x .106	
7	Lockwasher - M12	
8	Stud - M12 x 1.75" x 120mm Lg	22-32 N.m.
10	Socket HD. Capscrew - M12 x 1.75" x 35mm Lg	80-90 N.m.
11	Lockwasher - M10	
12	Socket HD. Capscrew - M10 x 1.50" x 35mm Lg	80-90 N.m.
13	Socket HD. Capscrew - M10 x 1.50" x 40mm Lg	80-90 N.m.
14	Stud - M10 x 1.50" x 53mm Lg	22-32 N.m.
15	Hex Nut - M10 x 1.50"	80-90 N.m.
16	Nut - M12 x 1.50"	80-90 N.m.

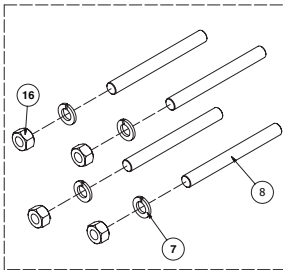
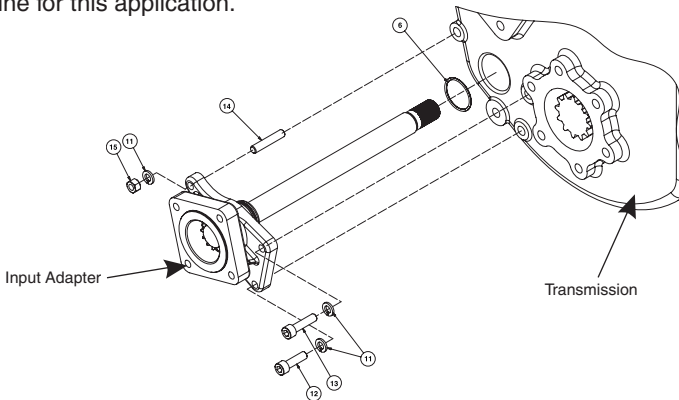
## 329753X – Input Adapter Assembly EATON FULLER

### Transmissions:

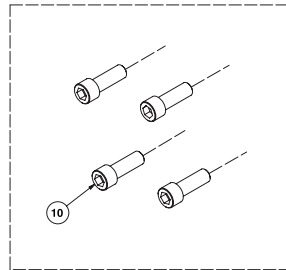
ET-16113, ETO-16113, ETS-16413, ETSO-16413, FTS-16112L, FTSO-16112L, ET-18113, ETO-18113, ETS-18413, ETSO-18413, FTS-18112L, FTSO-18112L, ET-20113, ETO-20113, ETS-20413, ETSO-20413, FTS-20112L, FTSO-20112L, ETO-22113, ETSO-22413, FTSO-22112L

### Kit Designator: "LH"

**NOTE:** 511 and 523 P.T.O.'s require interface coupling with a 40mm - 12 Tooth Spline for this application.



8000-32X (511 Mount)



8000-26X (523 Mount)

Item	Description	Torque
6	O-Ring 1.627" x .106	
7	Lockwasher - M12	
8	Stud - M12 x 1.75" x 120mm Lg	22-32 N.m.
10	Socket HD. Capscrew - M12 x 1.75" x 35mm Lg	80-90 N.m.
11	Lockwasher - M10	
12	Socket HD. Capscrew - M10 x 1.50" x 35mm Lg	80-90 N.m.
13	Socket HD. Capscrew - M10 x 1.50" x 40mm Lg	80-90 N.m.
14	Stud - M10 x 1.50" x 53mm Lg	22-32 N.m.
15	Hex Nut - M10 x 1.50"	80-90 N.m.
16	Nut - M12 x 1.75"	80-90 N.m.

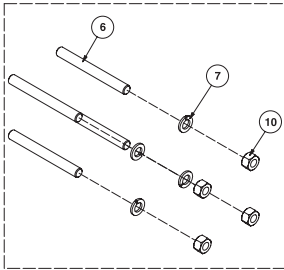
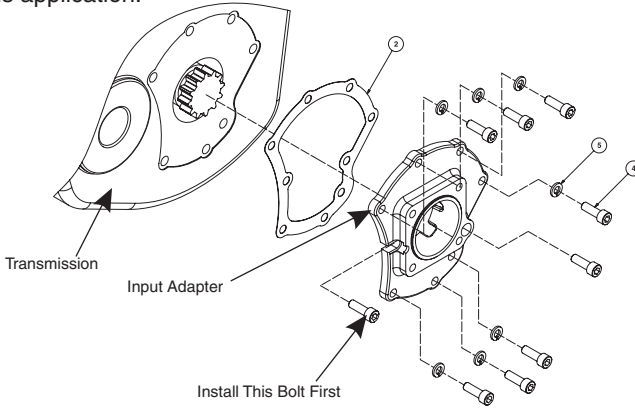
## 329761X – Input Adapter Assembly Mercedes

**Transmissions:**

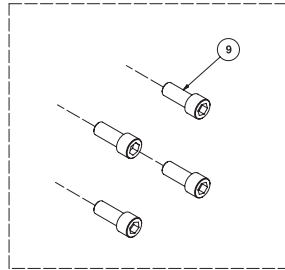
G60, G85

**Kit Designator: “AE”**

**NOTE:** 511 and 523 P.T.O.'s require interface coupling with a 34mm - 17 Tooth Spline for this application.



8000-29X (511 Mount)



8000-22X (523 Mount)

Item	Description	Torque
2	Gasket	
4	Socket HD. Capscrew - M10 x 1.50" x 30mm Lg	80-90 N.m.
5	Lockwasher - M10	
6	Stud - M12 x 1.75" x 113mm Lg	22-32 N.m.
7	Lockwasher - M12	
9	Socket HD. Capscrew - M12 x 1.75" x 30mm Lg	80-90 N.m.
10	Nut - M12 x 1.75"	80-90 N.m.

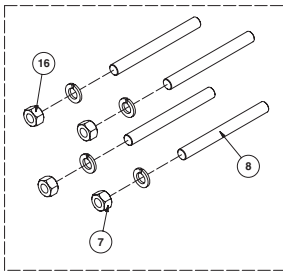
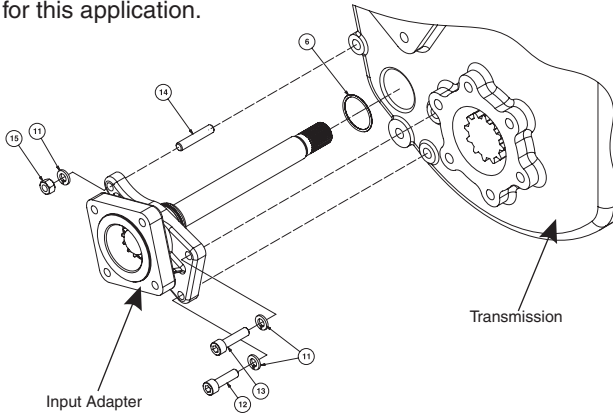
## 329767X – Input Adapter Assembly EATON FULLER

**Transmissions:**

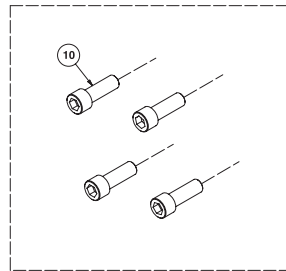
FO-16E309ALL-VMS

**Kit Designator: "BD"**

**NOTE:** 511 and 523 P.T.O.'s require interface coupling with a 40mm - 12 Tooth Spline for this application.



8000-32X (511 Mount)



8000-26X (523 Mount)

Item	Description	Torque
6	O-Ring 1.627" x .106	
7	Lockwasher - M12	
8	Stud - M12 x 1.75" x 120mm Lg	22-32 N.m.
10	Socket HD. Capscrew - M12 x 1.75" x 35mm Lg	80-90 N.m.
11	Lockwasher - M10	
12	Socket HD. Capscrew - M10 x 1.50" x 35mm Lg	80-90 N.m.
13	Socket HD. Capscrew - M10 x 1.50" x 40mm Lg	80-90 N.m.
14	Stud - M10 x 1.50" x 53mm Lg	22-32 N.m.
15	Hex Nut - M10 x 1.50"	80-90 N.m.
16	Nut - M12 x 1.75"	80-90 N.m.

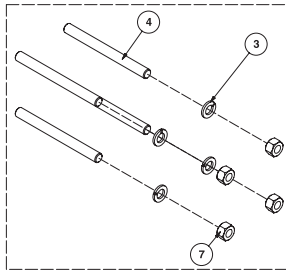
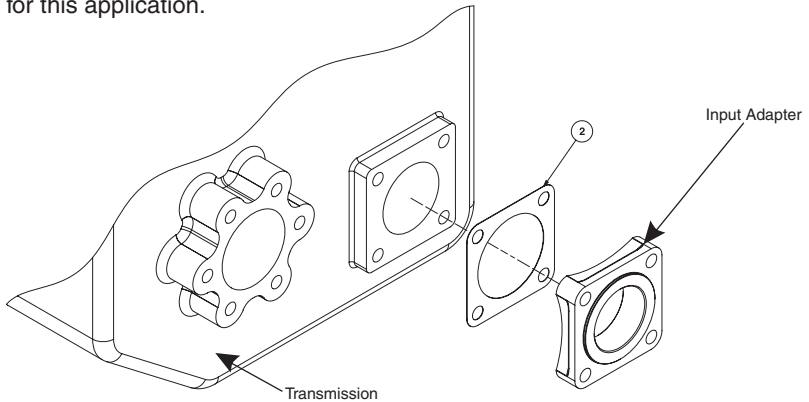
**329768X – Input Adapter Assembly IVECO, EATON FULLER**

**Transmissions:**

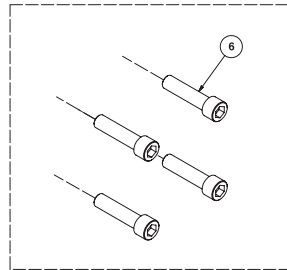
IVECO 2845.6, 2855.6  
 EATON FS-4106, FS-5206

**Kit Designator: “AB”**

**NOTE:** 511 and 523 P.T.O.'s require interface coupling with a 40mm - 12 Tooth Spline for this application.



8000-31X (511 Mount)

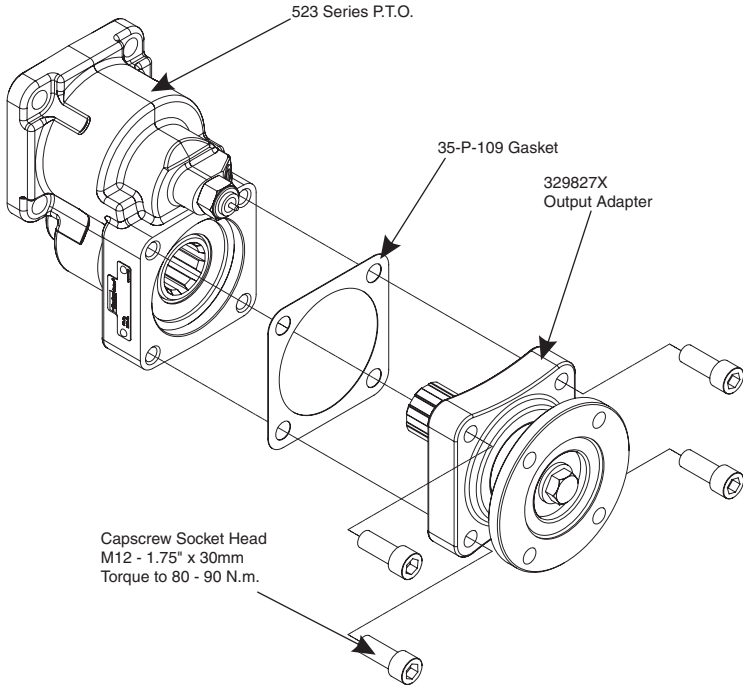


8000-24X (523 Mount)

Item	Description	Torque
2	Gasket	
3	Lockwasher - M12	
4	Stud - M12 x 1.75" x 133mm Lg	22-32 N.m.
6	Socket HD. Capscrew - M12 x 1.75" x 50mm Lg	80-90 N.m.
7	Nut - M12 x 1.75"	80-90 N.m.

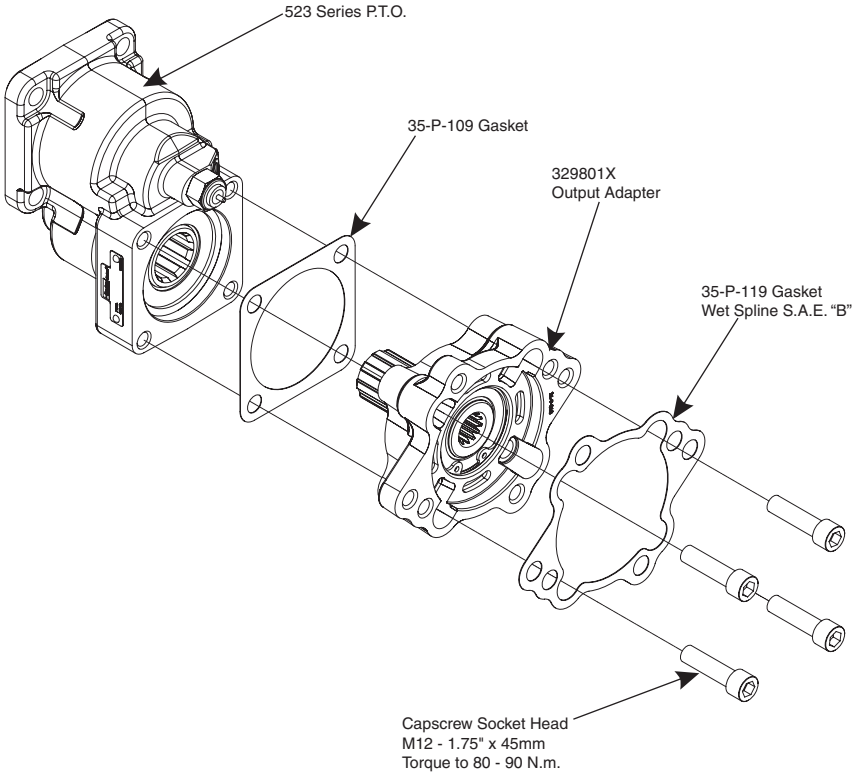
## 329827X – Output Adapter Assembly 1410 Flange

**Kit Designator: "XV"**



### 329801X – Adapter Kit S.A.E. “B” 2/4-Bolt

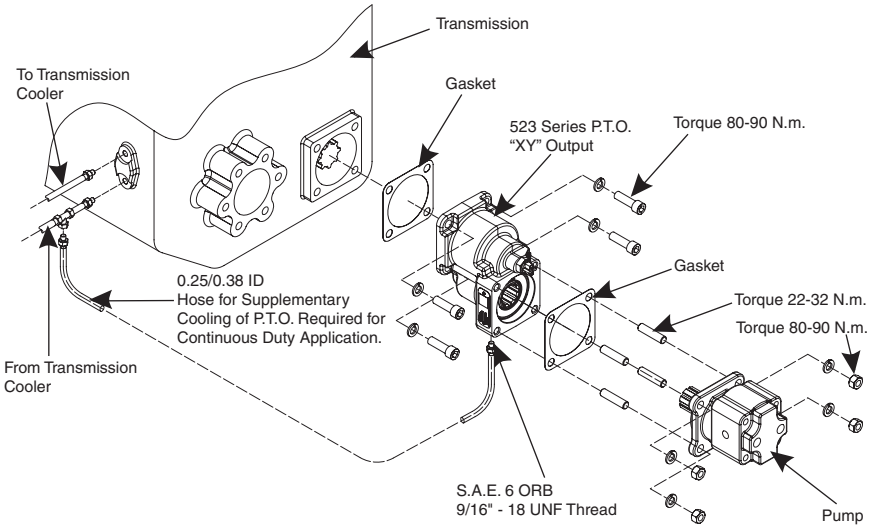
Kit Designator: “XK”



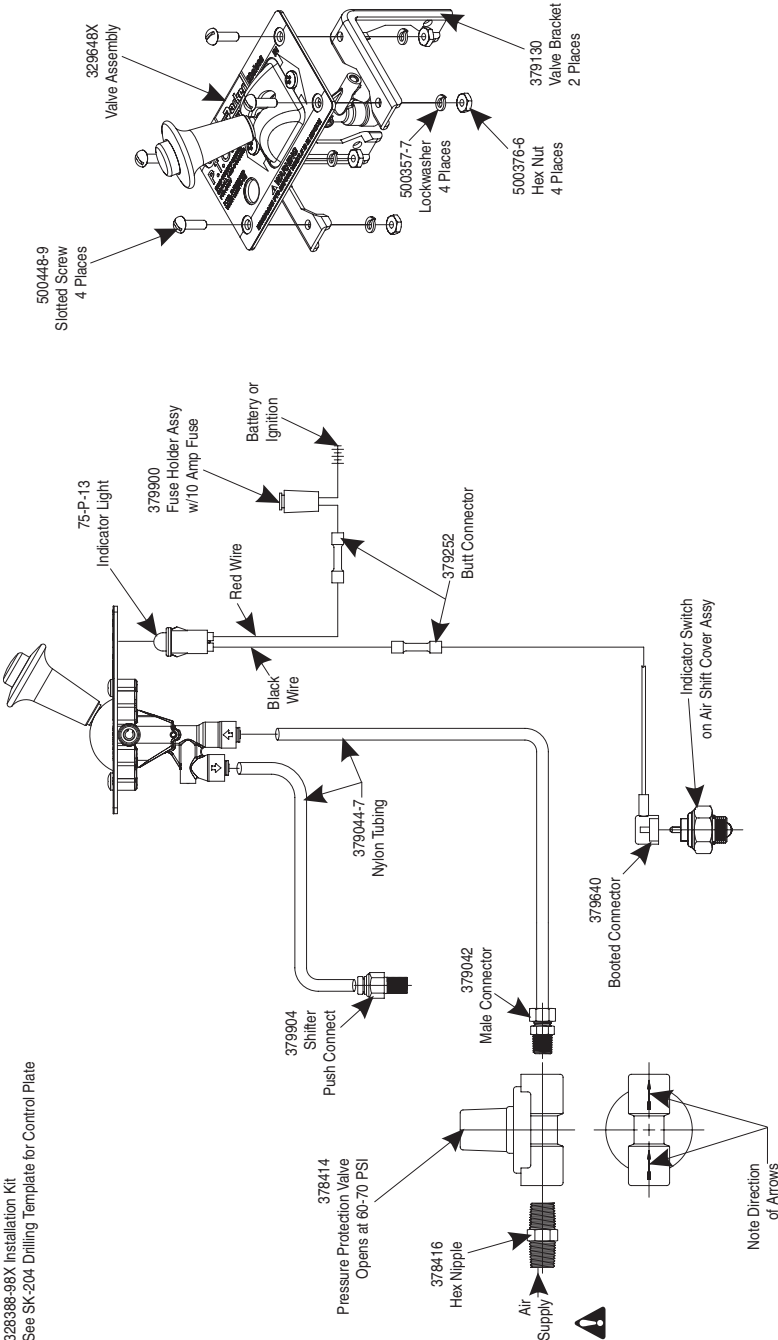
Mounting Kit – 8000-23X

Item	Description	Qty.
379676-10	M12 x 1.75" x 45mm	4

## Hose Installation 523 Series (SK-558)



**Air Shift Installation Sketch for 511/523 Series (SK-462)**

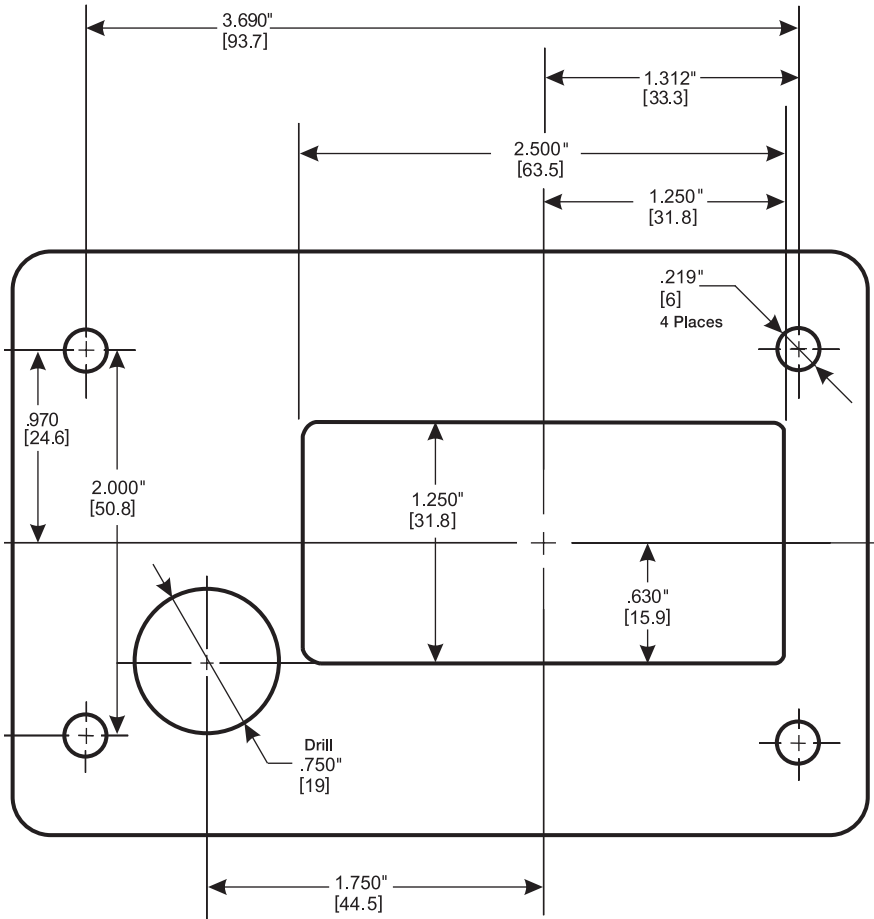


328388-98X Installation Kit  
 See SK-204 Drilling Template for Control Plate

**Warning:** Connect directly to air supply. Do not use tubing between air supply and pressure protection valve.  
**CAUTION:** When installing nylon tubing avoid sharp angles, exhaust and manifold systems.  
**NOTE:** When this installation is used on vehicles with automatic transmissions the P.T.O. drive must be stopped before shifting.



### Dash Drilling Template Air Shift Valve



## 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 owners 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 effects 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.

## Offer of Sale

The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors (“Seller”) are hereby offered for sale at prices to be established by Seller. 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 item described in its document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods, services or work described will be referred to as “Products”.

**1. Terms and Conditions.** Seller’s willingness to offer Products, or accept an order for Products, to or from Buyer is subject to these Terms and Conditions or any newer version of the terms and conditions found on-line at [www.parker.com/saleterms/](http://www.parker.com/saleterms/). Seller objects to any contrary or additional terms or conditions of Buyer’s order or any other document issued by Buyer.

**2. Price Adjustments; Payments.** Prices stated on Seller’s quote or other documentation offered by Seller are valid for 30 days, and do not include any sales, use, or other taxes unless specifically stated. Unless otherwise specified by Seller, all prices are F.C.A. Seller’s facility (INCOTERMS 2010). Payment is subject to credit approval and is due 30 days from the date of invoice or such other term as required by Seller’s Credit Department, after which Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.

**3. Delivery Dates; Title and Risk; Shipment.** All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon placement of the products with the shipment carrier at Seller’s facility. Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyers’ request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer’s acts or omissions.

**4. Warranty.** Seller warrants that all products sold, other than the 590 Series, conform to the applicable Parker Chelsea standard specification for the lesser period of 2 years (24 Months) from date of service or 2-1/2 years (30 Months) from date of build (as marked on the product name plate). Seller warrants that the 590 Series will conform to the applicable Seller standard specification for the lesser period of 2 years (24 Months) from date of service or 2000 hours of usage. The prices charged for Seller’s products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

**5. Claims; Commencement of Actions.** Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 30 days after delivery. Buyer shall notify Seller of any alleged breach of warranty within 30 days after the date the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for an amount due on any invoice) must be commenced within 12 months from the date of the breach without regard to the date breach is discovered.

**6. LIMITATION OF LIABILITY. UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER’S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER’S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.**

**7. User Responsibility.** The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.

**8. Loss to 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, will be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer ordering the items 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. Special Tooling.** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. 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 Products, 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.

**10. Buyer’s Obligations; Rights of Seller.** To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer’s behalf all documents Seller deems necessary to perfect its security interest.

**Offer of Sale (continued)**

**11. Improper use and Indemnity.** Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

**12. Cancellations and Changes.** Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.

**13. Limitation on Assignment.** Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

**14. Force Majeure.** Seller does not assume the risk 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, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller's reasonable control.

**15. Waiver and Severability.** Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

**16. Termination.** Seller may terminate this agreement for any reason and at any time by giving Buyer thirty (30) days written notice of termination. Seller may immediately terminate this agreement, in writing, if Buyer: (a) commits a breach of any provision of this agreement (b) appointments a trustee, receiver or custodian for all or any part of Buyer's property (c) files a petition for relief in bankruptcy on its own behalf, or by a third party (d) makes an assignment for the benefit of creditors, or (e) dissolves or liquidates all or a majority of its assets.

**17. Governing Law.** This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement.

**18. 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 Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("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 a Product sold pursuant to this Agreement 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 a Product 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 the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product 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 Products 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 Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

**19. Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.

**20. Compliance with Law, U. K. Bribery Act and U.S. Foreign Corrupt Practices Act.** Buyer agrees to comply with all applicable laws and regulations, including both those of the United Kingdom and the United States of America, and of the country or countries of the Territory in which Buyer may operate, including without limitation the U. K. Bribery Act, the U.S. Foreign Corrupt Practices Act ("FCPA") and the U.S. Anti-Kickback Act (the "Anti-Kickback Act"), and agrees to indemnify and hold harmless Seller from the consequences of any violation of such provisions by Buyer, its employees or agents. Buyer acknowledges that they are familiar with the provisions of the U. K. Bribery Act, the FCPA and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer shall not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political party or official thereof, any candidate for foreign political office, or any commercial entity or person, for the purpose of influencing such person to purchase products or otherwise benefit the business of Seller.

07/14

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