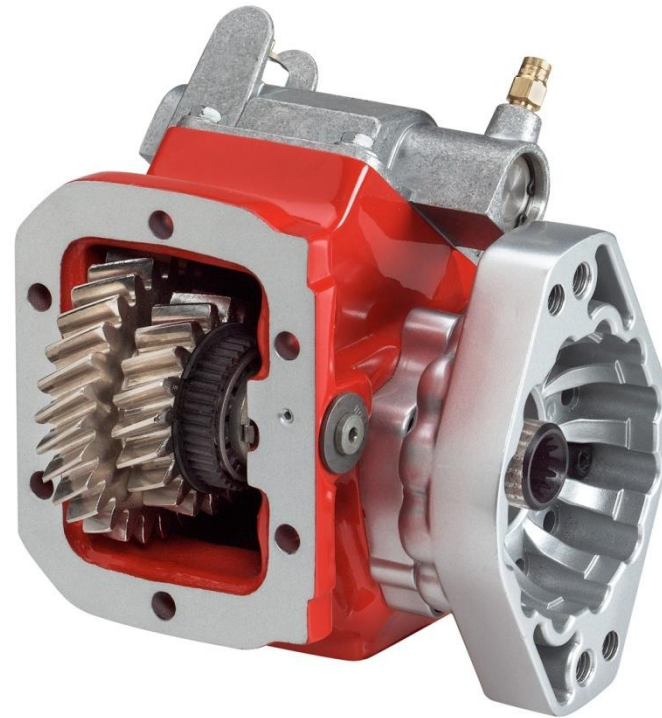


Chelsea Kit Program



ENGINEERING YOUR SUCCESS.

May 6, 2011

What is the KIT program?

- The Kit program provides you certain PTO's less the **input gear** or **shift cover**.
- It's purpose is to provide you with improved product coverage.
- Lowers your inventory investment.
- Improves stock turns
- Improves service to your customer.



What units are available in KIT's?

PTO Series	Less Input Gear	Less Shift Cover	Uses 442 Series Gears
100	Yes	Yes	Unique
236	Yes		Yes
238	Yes		Yes
340	Yes		Unique
352	Yes		Yes
442	Yes	Yes	Yes
447	Yes	Yes	Unique
452	Yes		Yes
489	Yes	Yes	Yes
880	Yes	Yes	Unique
Geared Adapters			
626	Yes		Yes
628	Yes		Yes
630	Yes		Yes
645	Yes		Yes

How do I order Kit PTO's?

- Chelsea's smart model number system allows you to order the PTO less the input gear and shift cover if applicable.

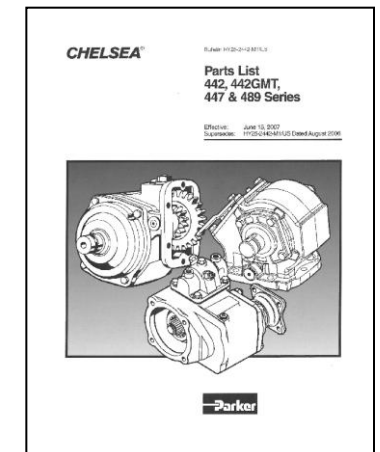
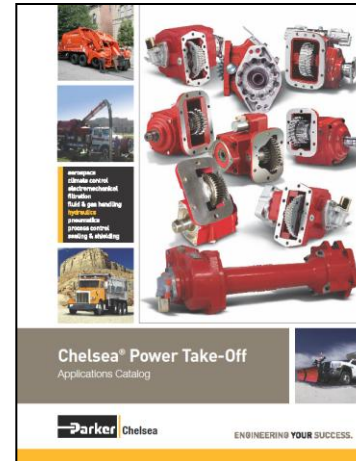
The "IT" designator in this position
Indicates the PTO is shipped less the
Input Gear.

442 X Q **IT** X - **H** 3 XD

The "H" designator in this position
Indicates the PTO is shipped less the
Shift Cover. Check your Price Sheet to
see if this option is available.

Where do I find the part numbers for the Gears and Shift Covers

- List price Sheet
- Applications Catalog
- Parts List
- On line www.phtruck.com



Publications Numbers

PTO Series	Price List	Apps Catalog*	Parts List
100	PLHY25-50##/US	HY25-3000/US	HY25-2100-M1/US
236	PLHY25-50##/US	HY25-3000/US	HY25-2236-M1/US
238	PLHY25-50##/US	HY25-3000/US	HY25-2238-M1/US
340	PLHY25-50##/US	HY25-3000/US	HY25-2340-M1/US
352	PLHY25-50##/US	HY25-3000/US	HY25-2352-M1/US
442	PLHY25-50##/US	HY25-3000/US	HY25-2442-M1/US
447	PLHY25-50##/US	HY25-3000/US	HY25-2442-M1/US
452	PLHY25-50##/US	HY25-3000/US	HY25-2452-M1/US
489	PLHY25-50##/US	HY25-3000/US	HY25-2442-M1/US
880	PLHY25-50##/US	HY25-3000/US	HY25-2880-M1/US
Geared Adapters		See Section 2.90	
626	PLHY25-50##/US	HY25-3000/US	HY25-2626-M1/US
628	PLHY25-50##/US	HY25-3000/US	HY25-2626-M1/US
630	PLHY25-50##/US	HY25-3000/US	HY25-2626-M1/US
645	PLHY25-50##/US	HY25-3000/US	HY25-2626-M1/US

* Input Gears can be found on the Application Page

How do I install the input gear?

After selection of the PTO, use the parts list, price sheet or **applications catalog** to select the proper input gear that matches the gear pitch designator.

EXAMPLE:
442 X Q **AH** X - H 3 XD

CHELSEA				EATON FULLER				FLR-58									
FOM-16D313E-LEP	RTAO-14710C-AC	RTLO-14713A	RTLO-14913A	RTLO-14913A	RTLO-16713A	RTLO-16913A	RTLO-16918B-AS	RTLO-19818A-AS2									
RTAO-10710C-AC	RTAO-14710C-AS	RTLO-14713A-T2	RTLO-14918A-AS2	RTLO-16713A-T2	RTLO-16913L-LHP	RTLO-16718B	RTLO-16718B	RTLO-19818B									
RTAO-10710C-AS	RTAO-16710C-AS	RTLO-14718B	RTLO-14918A-AS3	RTLO-16718B	RTLO-16918A-AS2	RTLO-16718B-T2	RTLO-16718B-T2	RTLO-19818B-AS									
RTAO-12710C-AC	RTLO-12713A	RTLO-14718B-T2	RTLO-14918B	RTLO-16718B-T2	RTLO-16918A-AS3	RTLO-19813A	RTLO-19813A	RTLO-20913A									
RTAO-12710C-AS	RTLO-12913A	RTLO-14913-T2	RTLO-14918B-AS	RTLO-16913-T2	RTLO-16918B	RTLO-19813A-T2	RTLO-19813A-T2	RTLO-20918A-AS2									
BOTTOM SIDE ONLY						RIGHT SIDE ONLY											
TRANSMISSION GEAR DATA: BOT 08-Bolt Opening Gear FORWARD of Centerline 47 Teeth - SPUR PITCH LINE TO APERTURE FACE: .8050" (20.4500MM)						TRANSMISSION GEAR DATA: R.H. 06-Bolt Opening Gear FORWARD of Centerline 45 Teeth - SPUR PITCH LINE TO APERTURE FACE: 1.0850" (27.5600MM)											
Caution: Application Approval Required for P.T.O. Output Shaft Speeds Above 2500 R.P.M.																	
BOTTOM Side P.T.O. Model			Inter. Torq.	Dir. Rot.	Engine % HI Rev	Filler Block	Adapter Assy.	Stud Kit	RIGHT Side P.T.O. Model			Inter. Torq.	Dir. Rot.	Engine % HI Rev	Filler Block	Adapter Assy.	Stud Kit
ONE SPEED - SINGLE GEAR - MECHANICAL SHIFT																	
1000RAHX-3 (1) 125 Opp 148 7-A-2000(T) 329138X Fulfilled																	
ONE SPEED - TWO GEAR - MECHANICAL SHIFT																	
4422AAHX-3 (4)	250	Opp	81	328564X	Fulfilled	3213CAHX-3	250	Eng	88	7-A-032(P)2	329138X	Fulfilled					
4422CAHX-3 (5)	250	Opp	78	328564X	Fulfilled	2213EAHX-3	250	Eng	78		329138X	Fulfilled					
4422FAHX-3 (6)	250	Opp	96	328564X	Fulfilled	2213LAHX-3	200	Eng	102		329138X	Fulfilled					
4422HAHX-3 (7)	250	Opp	111	328564X	Fulfilled	2219FAHX-3	200	Eng	124		329138X	Fulfilled					
4422IAHX-3 (8)	222	Opp	124	328564X	Fulfilled	4428BAHX-3 (2)	250	Eng	58	REQUIRED	Fulfilled						
4422JAHX-3 (8)	206	Opp	134	328564X	Fulfilled	4428AAHX-3 (4)	250	Opp	58		Fulfilled						
4422RAHX-3 (8)	178	Opp	155	328564X	Fulfilled	4428CAHX-3 (5)	250	Opp	74		Fulfilled						
4422SAHX-3 (8)	150	Opp	184	328564X	Fulfilled	4428FAHX-3 (6)	250	Opp	92		Fulfilled						
489KAHX-3 (4)	250	Opp	61	Fulfilled	4429HAHX-3 (7)	250	Opp	107		Fulfilled							
489KCAHX-3 (5)	250	Opp	78	Fulfilled	4429IAHX-3 (8)	233	Opp	119		Fulfilled							
489KFAHX-3 (6)	250	Opp	96	Fulfilled	4429JAHX-3 (8)	216	Opp	128		Fulfilled							
489KHAHX-3 (7)	250	Opp	111	Fulfilled	4429RAHX-3 (8)	187	Opp	149		Fulfilled							
489KLAHX-3 (8)	222	Opp	124	Fulfilled	680KFAHX-3 (9)	301	Opp	92		Fulfilled							
489KQAHX-3 (8)	206	Opp	134	Fulfilled	680KQAHX-3 (10)	216	Opp	128		Fulfilled							
489KRAHX-3 (8)	178	Opp	155	Fulfilled	680KRAHX-3 (11)	157	Opp	143		Fulfilled							
680KFAHX-3 (9)	288	Opp	96	Fulfilled													
680KQAHX-3 (10)	206	Opp	134	Fulfilled													
680KRAHX-3 (11)	178	Opp	155	Fulfilled													
680KSAHX-3 (12)	150	Opp	184	Fulfilled													
823KBAHX-3 (13)	423	Opp	65	Fulfilled													
823KJAHX-3 (14)	279	Opp	99	Fulfilled													
823KMAHX-3 (15)	238	Opp	116	Fulfilled													
823KRAHX-3 (16)	172	Opp	160	Fulfilled													
823KTKHX-3 (17)	142	Opp	194	Fulfilled													
				6-A-165(T)2													

Eaton Fuller

The "AH" designator in the 442 Series will use a 5-P-1004 input gear.

(1) Gear and Shaft Kit No. KKA-2-P-565 (6) Input Gear Part No. S-P-1077 (11) Input Gear Part No. S-P-1441 (16) Input Gear Part No. S-P-721
 (2) 788 Input Gear Part No. S-P-1072 (7) Input Gear Part No. S-P-1084 (12) Input Gear Part No. S-P-1522 (17) Input Gear Part No. S-P-1395
 (3) Input Gear Part No. S-P-1419 (8) Input Gear Part No. S-P-1004 (13) Input Gear Part No. S-P-288 (18) Input Gear Part No. S-P-285
 (4) Input Gear Part No. S-P-1280 (9) Input Gear Part No. S-P-1242 (14) Input Gear Part No. S-P-325 (19) Input Gear Part No. S-P-383
 (5) Input Gear Part No. S-P-1387 (10) Input Gear Part No. S-P-1248



Assembly of the Ratio & Input Gear

Ratio Gear



Snap Ring



Input Gear

Place the Ratio Gear on the splined surface of the Input Gear.

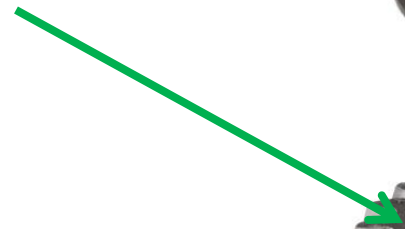
NOTE: The rounded edge of the Ratio Gear should be away from the Input Gear.

Assembly of the Ratio & Input Gear

Snap Ring Slide



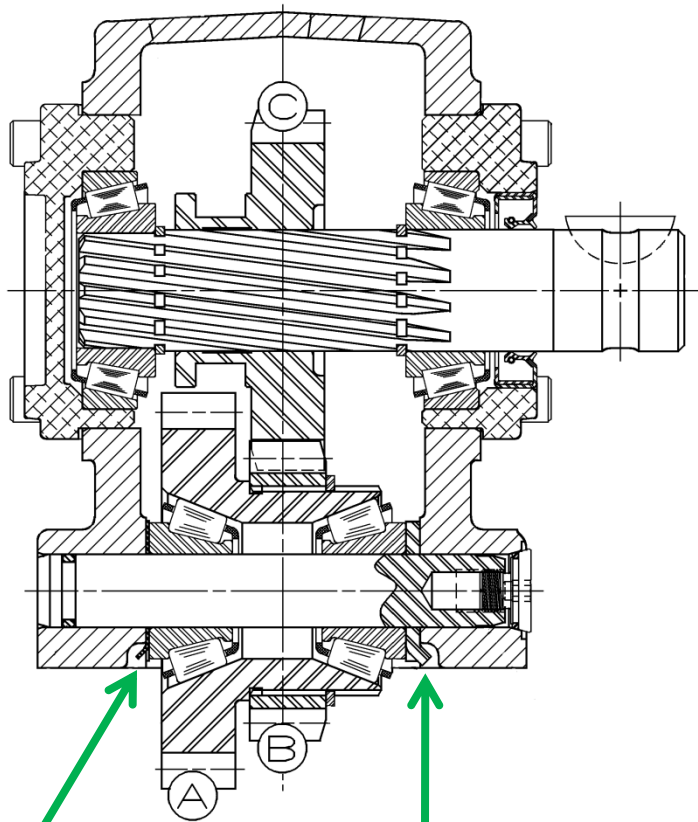
Snap Ring Groove



Use a Snap Ring Slide and Driver or Snap Ring Pliers to install the Snap Ring in the groove of the Input Gear

NOTE: Be careful to not over stretch the snap ring

Assembly of Gear into housing



A = Input Gear

B = Ratio Gear

C = Output Gear

Insert the Thrust Washer next to the Input Gear, Place Bearing shims on the same side as the Ratio Gear.

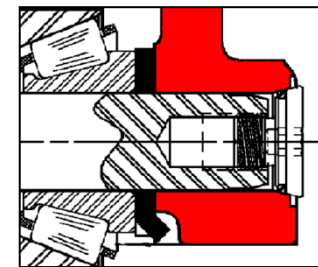
NOTE: Tabs on washer and shims are placed in pocket on housing.



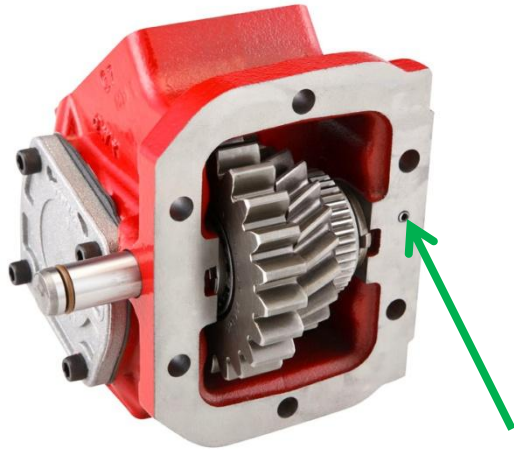
Thrust Washer



Shim

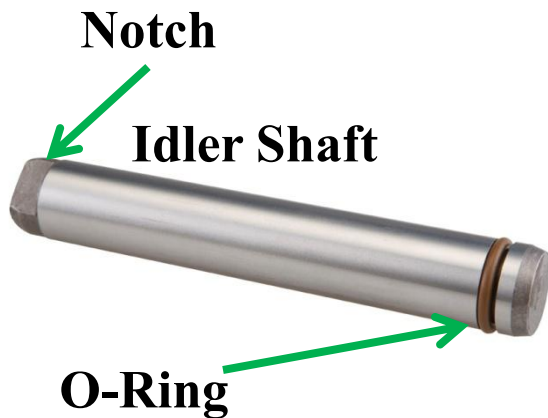
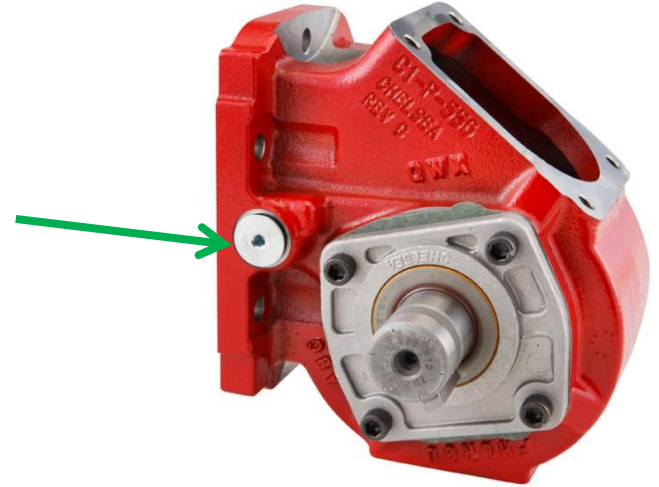


Assembly of Gear into housing



Roll Pin

Install NWD Plug on
Idler Shaft and Torque:
120 – 156 IN-LB
(13.56 – 17.53 N-M)



Notch

Idler Shaft

O-Ring

1. Install O-Ring on Idler Shaft, be careful not to nick or cut the O-Ring.
2. Slide the notched end of the shaft into the housing, aligning notch with roll pin.
3. Install and Torque NWD Plug

How do I select the Shift Cover?

After selection of the shift option use the parts list to select the proper 329106-####X kit to install & include with the PTO.

Bulletin HY25-2442-M1/US
Shifter Kits

Power Take-Offs
442, 442GMT, 447 & 489 Series

For P.T.O.'s ordered without the shifter (Shifter Type "H"), the kits shown below will provide all the components required to complete the assembly.

Part Number	Description	Quantity		
		442	447	489
329106-39X	Shifter Kit (Air Shift, "A" shift option)	1	-	1
329106-43X	Shifter Kit (Air Shift, "P" shift option)	1	-	1
329106-45X	Shifter Kit (Air Shift, "Q" shift option)	1	-	1
329106-71X	Shifter Kit (Air Shift, "A" shift option)	-	1	-
329106-75X	Shifter Kit (Air Shift, "P" shift option)	-	1	-
329106-77X	Shifter Kit (Air Shift, "Q" shift option)	-	1	-
329106-105X	Shifter Kit (Wire Control 3 & 6, "Q", "W", "X" ratio; "W" shift option)	1	-	1
329106-106X	Shifter Kit (Wire Control 4 & 5, "Q", "W", "X" ratio; "W" shift option)	1	-	1
329106-107X	Shifter Kit (Wire Control 3 & 6, "Q", "W", "X" ratio; "X" shift option)	1	-	1
329106-108X	Shifter Kit (Wire Control 4 & 5, "Q", "W", "X" ratio; "X" shift option)	1	-	1
329106-109X	Shifter Kit (Wire Control 3 & 6, "F", "L", "R", "S", "U" ratio; "W" shift option)	1	-	1
329106-110X	Shifter Kit (Wire Control 4 & 5, "F", "L", "R", "S", "U" ratio; "W" shift option)	1	-	1
329106-111X	Shifter Kit (Wire Control 3 & 6, "F", "L", "R", "S", "U" ratio; "X" shift option)	1	-	1
329106-112X	Shifter Kit (Wire Control 4 & 5, "F", "L", "R", "S", "U" ratio; "X" shift option)	1	-	1
329106-113X	Shifter Kit (Wire Control 3 & 6, "Q" & "W" ratio; "W" shift option)	-	1	-
329106-114X	Shifter Kit (Wire Control 4 & 5, "Q" & "W" ratio; "W" shift option)	-	1	-
329106-117X	Shifter Kit (Wire Control 3 & 6, "Q" & "W" ratio; "X" shift option)	-	1	-
329106-118X	Shifter Kit (Wire Control 4 & 5, "Q" & "W" ratio; "X" shift option)	-	1	-
329106-135X	Constant Mesh Kit	1	-	1
329106-143X	Shifter Kit (Wire Control 3 & 6, "A" "B" & "C" ratio; "W" shift option)	1	-	1
329106-144X	Shifter Kit (Wire Control 4 & 5, "A" "B" & "C" ratio; "W" shift option)	1	-	1
329106-145X	Shifter Kit (Wire Control 3 & 6, "A" "B" & "C" ratio; "X" shift option)	1	-	1
329106-146X	Shifter Kit (Wire Control 4 & 5, "A" "B" & "C" ratio; "X" shift option)	1	-	1
329106-151X	Shifter Kit ("V" shift option)	-	1	-
329106-153X	Shifter Kit ("V" shift option)	1	-	1
329143X	Field Conversion Kit (Shifter Shaft)	1	1	1

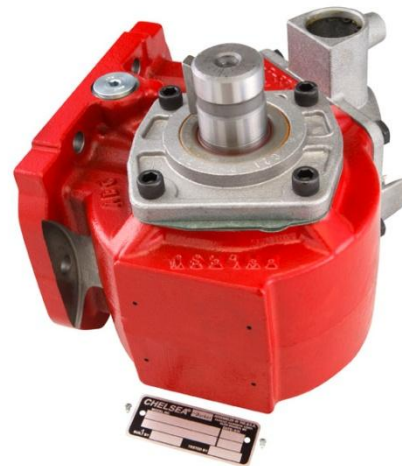
How do I install the Shift Cover?

1. Position output gear in the disengaged position.
2. Place gasket onto the shift aperture.
3. Slide the shift block or Fork onto the hub of the output gear.
4. Position gasket and shift cover onto the PTO housing.
5. Install capscrews and torque (**16-20 ft. lbs. 22 – 27 N-M**)
6. Do not over tighten you can break the shift cover or housing.
7. Last function test the shifter and indicator switch.



Final Steps

- Re-label PTO and Package
- Testing
 - Function Test Shifter
 - Test Indicator Switch
 - Check End Play of output Shaft
 - Check Input Gear Bearings
- Packaging
- Include Owners Manual and Warning Labels



Tools

The right tool makes the Job easier.

Torque Wrench

Snap Ring Pliers or

Snap ring Slide & Driver

Hex Key

Torque Specification Charts



ENGINEERING YOUR SUCCESS.

Torque Specifications

442 Family

Location	Torque (English)	Torque (Metric)
NWD Plug	120-156 In.lbs	14-18 Nm
Bearing Cap Open	24-28 Ft.lbs	33-39 Nm
Bearing Cap Pump Flange	24-28 Ft.lbs	33-39 Nm
Rotatable Flanges		
GA, GB, PA, PF, RA, RB, RE & RF (378447-6) (Qty 3)	16-20 Ft.lbs	22-27 Nm
RC, RD, RH (378446-4) (Qty 6)	8-12 Ft.lbs	11-16 Nm
RJ(Qty 6), RY(Qty 3) (379740-6)	35-40 Ft.lbs	47-54 Nm
Bearing Cap Closed	24-28 Ft.lbs	33-39 Nm
Shift Covers	16-20 Ft.lbs	22-27 Nm

Torque Specifications

236/238 Series

Location	Torque (English)	Torque (Metric)
Set Screw – Input Idler Shaft	25-30 Ft.lbs	2.8-3.4 Nm
Bearing Cap Open	16-20 Ft.lbs	22-27 Nm
Bearing Cap Pump Flange	16-20 Ft.lbs	22-27 Nm
Rotatable Flanges		
RA, RB, RF (378447-7) Qty 4	16-20 Ft.lbs	22-27 Nm
Flat Head Socket Screw (XY) (378898) for Splined Coupling	48-59 Ft.lbs	65-80 Nm
Shaft Nut (XX) 501181	75-85 Ft.lbs	102-115 Nm
Cover Plate	9-11 Ft.lbs	12-15 Nm

Torque Specifications

880 Series

Location	Torque (English)	Torque (Metric)
NWD Plug	120-156 In.lbs	14 -18 Nm
Bearing Cap Open	30-37 Ft.lbs	41-50 Nm
Bearing Cap Pump Flange	30-37 Ft.lbs	41-50 Nm
Shaft Nut (378382)		
1410 Series Flange Outputs	75-85 Ft.lbs	102-115 Nm
Bearing Cap Closed	30-37 Ft.lbs	41-50 Nm
Shift Covers	30-37 Ft.lbs	41-50 Nm

Torque Specifications

277/278 Series

Location	Torque (English)	Torque (Metric)
NWD Plug	120-156 In.lbs	14 -18 Nm
Bearing Cap Open	24-28 Ft.lbs	32-38 Nm
Bearing Cap Pump Flange	24-28 Ft.lbs	24-28 Nm
Rotatable Flanges		
PA, PF, RA, RB, RF, RG (378447-6) Qty 4	16-20 Ft.lbs	22-27 Nm
RK, RM (378447-8) Qty 4	16-20 Ft.lbs	22-27 Nm
Valve Cap Assembly	24-28 Ft.lbs	33-38 Nm
Hydraulic Valve Clamp	96-120 In.lbs	11-13 Nm
Shaft Nut (XV) 378435-7	75-85 Ft.lbs	102-115 Nm

Torque Specifications

277/278 Series

Location	Torque (English)	Torque (Metric)
Straight Thread Connector 90° 379486	120-156 In.lbs	14 -18 Nm
Speed Sensor Port		
With EOC (379243)	25-30 Ft.lbs	34 Nm-41 Nm
With Out EOC		
O-Ring Boss Plug (379242)	25-30 Ft.lbs	34-41Nm
Pipe Plug (379231)	8-12 Ft.lbs	11-16 Nm

Corrected Torque with a Plus Dimension

- When using a torque wrench adapter which changes the distance from the torque drive to the adapter drive, apply the following formula to obtain torque rating

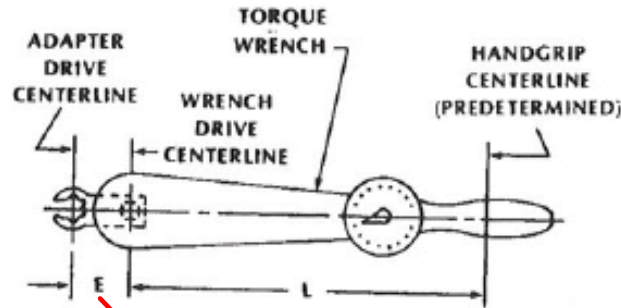
T = Actual (desired) Torque

Y = Apparent (indicated) Torque

L = Effective Length Lever

E = Effective Length of Extension

FORMULA:
$$\frac{T \times L}{L + E} = Y$$



E



SHORT OPEN END ADAPTERS



SET SCREW ADAPTER



HOSE CLAMP ADAPTER

Corrected Torque with a Minus Dimension

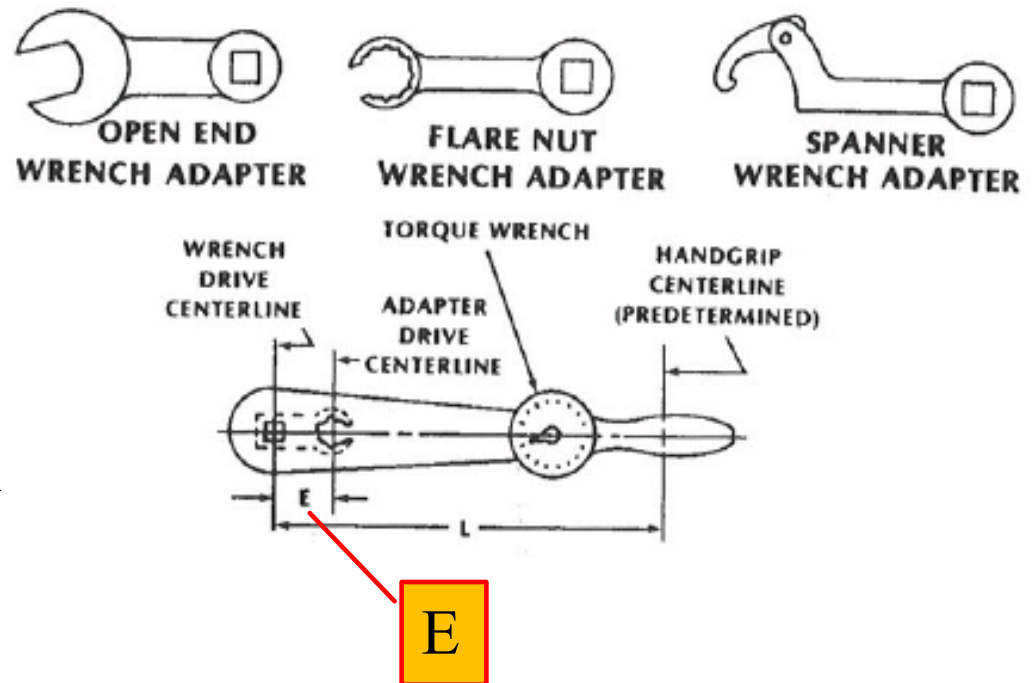
- When using a torque wrench adapter which changes the distance from the torque drive to the adapter drive, apply the following formula to obtain torque rating

T = Actual (desired) Torque

Y = Apparent (indicated) Torque

L = Effective Length Lever

E = Effective Length of Extension



FORMULA:
$$\frac{T \times L}{L - E} = Y$$