Chelsea PTO 270/271 Parts Manual

Pro Gear Chelsea 270/271 Series PTO parts manual to assist in identifying the parts for your Chelsea Power Take Off unit.

If you need any assistance identifying the correct Power Take Off unit for your truck and equipment, contact your Chelsea replacement part specialists at Pro Gear and Transmission.

Pro Gear stocks every part for your Parker Chelsea PTO including: PTO housings, mounts, driveshafts, gears, bearings, gaskets, cable shift cover assembly, post and plate assembly, brackets, stud kits, seal kits, lever control assembly, air shift cover assembly, direct mount pump conversion kits, stud kits including English and metric references, CAT D&H parts and much more.

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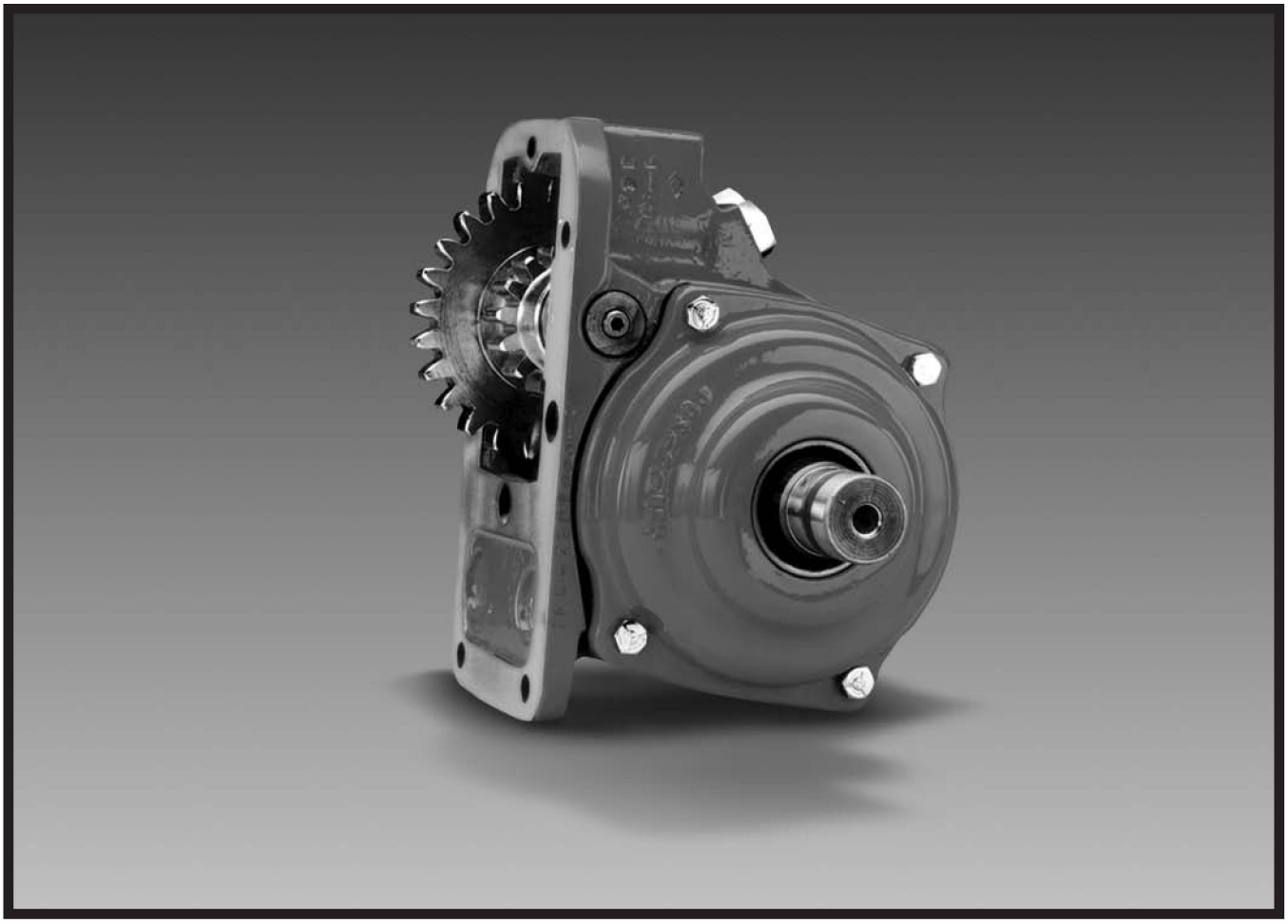
CHELSEA®
Parts List
270/271 Series

Effective: September 18, 2014
Supersedes: January 15, 2009

Bulletin HY25-2270-M1/US



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⚠ WARNING

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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.

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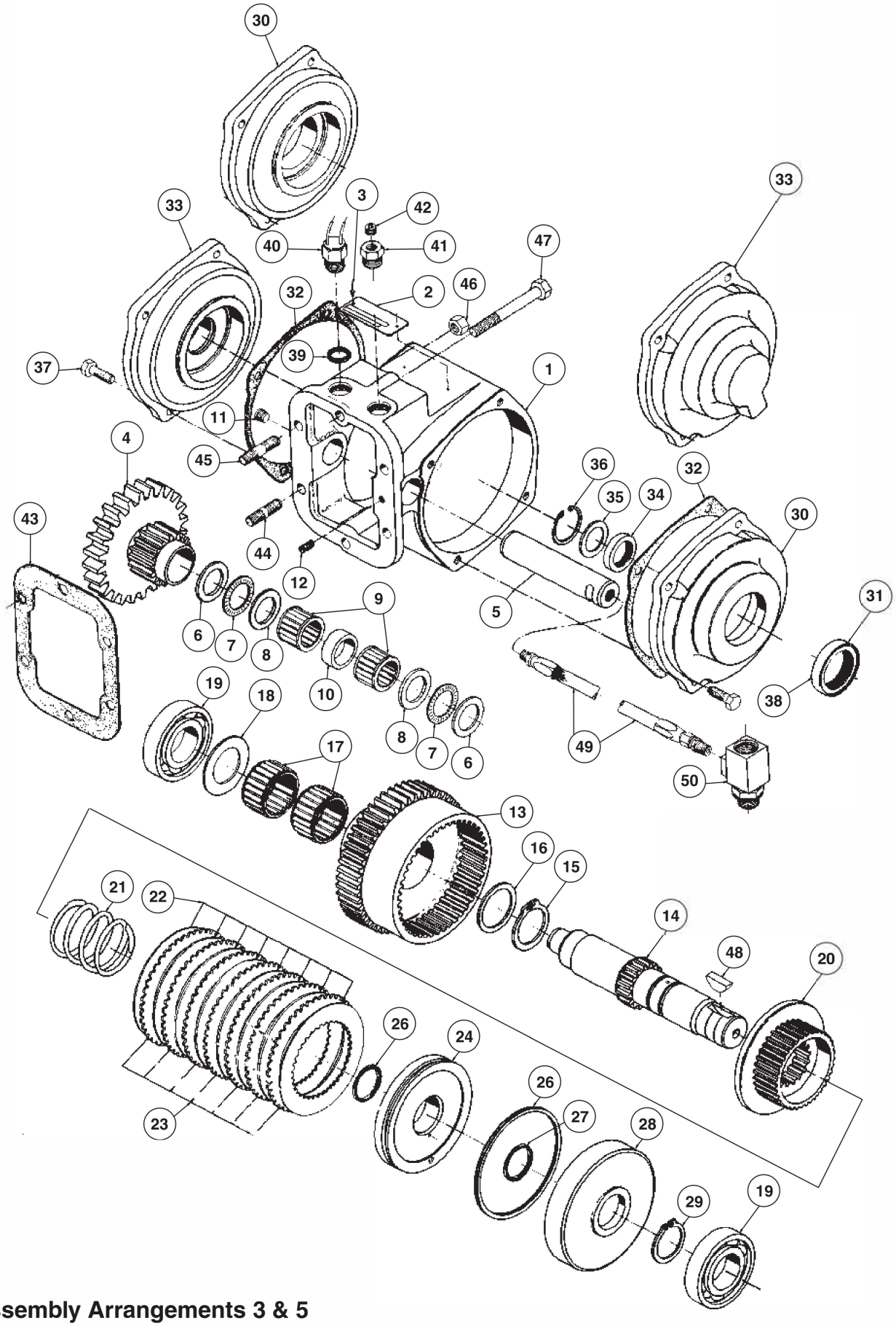

Assembly Arrangements 3 & 5

Item	Part Number	Description	Qty.
1	**1-P-437**	Housing, Standard Mount ("X", "A" & "G" Mounting)	1
2	**68-P-2**	Name Plate	1
3	**378422**	Drive Screw	2
4	**See Chart Pg. 5**	Gear, Input	1
5	**9-P-54**	Shaft, Input Idler (Pressure Lube "P")	1
	9-P-55	Shaft, Input Idler (No Pressure Lube "X")	1
6	**31-P-61**	Thrust Washer (0.031" Thick)	2
7	**560920**	Bearing, Needle Thrust	2
8	**31-P-62**	Thrust Washer (0.125" Thick)	2
9	**550886**	Roller Bearing (Idler Pin)	2
10	**14-P-54**	Spacer, Needle Bearing (Idler Shaft)	1
11	**379231**	Pipe Plug (0.125" - 27 N.P.T.F.)	
		With E.O.C. "P" Lube	2 or
		Without E.O.C. "P" Lube	3 or
		With E.O.C. "X" Lube	3 or
		Without E.O.C. "X" Lube	2
12	**378452-7**	Set Screw (0.250" - 20 x 0.500")	1
13	**See Chart Pg. 5**	Gear, Output	1
14	**3-P-679**	Shaft, Output 1.250" Rd. ("XD" Assemblies 3 & 5)	1
	NOTE: See Page 16 for Driveshaft and Clutch Assembly Numbers		
N.S.	**3-P-677**	Shaft, Output 1.250" Rd. ("XD" Assemblies 4 & 6)	1
N.S.	**3-P-678**	Shaft, Output 0.875" - 13 Tooth Internal Spline ("XK" & "XP" Assemblies 4 & 6)	1
N.S.	**3-P-686**	Shaft, Output 0.875" - 13 Tooth Internal Spline ("XK" & "XP" Assemblies 3 & 5)	1
N.S.	**3-P-703**	Shaft, Output 0.875" - 13 Tooth Internal Spline ("RA" & "RB" & "XR" Assemblies 3 & 5)	1
N.S.	**3-P-787**	Shaft, Output 1.250 Tapered w/.312" key way ("XX" Assemblies 3 & 5)	1
N.S.	**3-P-788**	Shaft, Output 1.250 Tapered w/.312" key way ("XX" Assemblies 4 & 6)	1
N.S.	**3-P-896**	Shaft, Output 1.0" - 15 Tooth Internal Spline ("AF" Assemblies 3 & 5)	1
N.S.	**3-P-895**	Shaft, Output 1.0" - 15 Tooth Internal Spline ("AF" Assemblies 4 & 6)	1
N.S.	**3-P-957**	Shaft, Output 1.0" - 15 Tooth Internal Spline ("RF" Assemlies 3 & 5)	1
N.S.	**3-P-964**	Shaft, Output .625" - 9 Tooth Internal Spline ("XE" Assemblies 3 & 5)	1
N.S.	**3-P-970**	Shaft, Output 1.250" Rd. ("BA" Assemblies 3 & 5)	1
	NOTE: For "BA" Option See Page 10 for Bill of Material		
15	**379746**	Snap Ring	1
16	**14-P-49**	Spacer, Needle Bearing (Drive Shaft)	1
17	**560918**	Roller Bearing (Output Shaft)	2
18	**31-P-57**	Thrust Washer (Output Shaft), All Except "BA"	1
19	**550010**	Ball Bearing (Output Shaft)	2
	328925X	Clutch Piston & Back-up Cylinder (Includes Items 15, 20 thru 29)	1
	329179-1X	Assembly, Piston Back-up Cylinder (Includes Items 24, 27 & 28)	
20	**2-P-458**	Inner Clutch Gear	1
21	**37-P-39**	Clutch Spring	1
22	**379485**	Friction Disc	8
23	**379595**	Clutch Plate	7
24	**380057-1**	Piston	1
26	**28-P-244**	O-Ring	2
27	**28-P-178**	O-Ring	1
28	**379323-1**	Clutch Back-up Cylinder	1
29	**378576**	Snap Ring	1
30	**21-P-451**	Bearing Cover, Open End (Assemblies 3 & 5) "XX", "XD" & "BA" Options.	1
	21-P-297	Bearing Cover, Open End (Assemblies 4 & 6) "XX" & "XD" Options.	1
31	**28-P-225**	Oil Seal	1
32	**22-P-53**	Gasket, Bearing Cover	2

N.S. — Not Shown

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Item	Part Number	Description	Qty.
	328806X	Bearing Cover Assembly, Closed End (Assemblies 3 & 5), All Except "BA"	1
	328988X	Bearing Cover Assembly, Closed End (Assemblies 4 & 6)	1
		(Includes items 33 thru 36)	
33	**21-P-295**	Bearing Cover, Closed End (Assemblies 3 & 5)	1
	21-P-449	Bearing Cover, Closed End (Assemblies 4 & 6)	1
34	**28-P-119**	Oil Seal	1
35	**378811**	Back-up Plate	1
36	**378849**	Snap Ring	
	328988-1X	Bearing Cover Assembly, Closed End (Assemblies 3 & 5), "BA"	
	NOTE: For "BA" Option See Page 10 for Bill of Material		
37	**378430-10**	Capscrew, Hex Head (.312" - 18 x 1.0") "XX" & "XD" Assemblies 4 & 6, Open End	4
	378430-10	Capscrew, Hex Head (.312" - 18 x 1.0") Assemblies 3 & 5, Closed End / Except "BA"	4
38	**378430-12**	Capscrew, Hex Head (.312" - 18 x 1.250") "XX" & "XD" Assemblies 3 & 5, Open End	4
	378430-12	Capscrew, Hex Head (.312" - 18 x 1.250")	
		Assemblies 4 & 6 ("BA" Ass'y 3 & 5), Closed End	4
39	**28-P-171**	O-Ring, w/Speed Sensor	1
40	**379243**	Speed Sensor (Transducer) Included w/Electronic Overspeed Control	1
	379917	Speed Sensor (Allison 1000, 2000/2400)	
41	**379242**	Adapter Plug with E.O.C.	1 or
		Adapter Plug without E.O.C.	2
42	**379231**	Pipe Plug (.125" - 27 N.P.T.F.) with E.O.C.	1 or
		Pipe Plug (.125" - 27 N.P.T.F.) without E.O.C.	2
	328951-6X	Mounting Gasket & Installation Instructions	1
43	**35-P-41**	Gasket, Mounting	1
		LOOSE PARTS	
	328170-101X	Mounting Parts Kit (Items 44 thru 47)	1 or
44	**379457-13**	Shoulder Stud (.375" - 16 & .375" - 24 x 1.75")	1
N.S.	**379423-14**	Stud (.375" - 16 & .375" - 24 x 1.75")	2
45	**379423-16**	Stud (.375" - 16 & .375" - 24 x 1.875")	2
N.S.	**379224**	Tab-lock Washer	1
46	**379744**	Flange Nut (.375" - 24)	5
47	**378935**	Capscrew (.375" - 16 x 3.250")	1
	328170-205X	Mounting Parts Kit, Aisin A445 Only	1 or
	7170-87X	Mounting Parts Kit, Jatco 270J	1 or
	7170-103X	Mounting Parts Kit, Allison 1000, 2000/2400	1
N.S.	**379111**	Square Key ("XX" Output)	1 or
48	**500007-29**	Woodruff Key	1
49	**328075X**	Pressure Lube Hose, Allison	1
	329087X	Pressure Lube Hose, Jatco 270J	1
50	**378840**	Street Tee, Allison AT Series	1
	378970	Street Tee, Allison MT Series 1975 & After	1
	378880	Street Tee, Allison MT Series 1974 & Before	1
	378897	Street Tee, Allison CLT, CLBT & HT Series	1
N.S.	**329049X**	Fitting Kit, Jatco	1
N.S.	**329297X**	Fitting Kit, Allison 1000, 2000/2400 (High Pressure Port)	1
N.S.	**329246X**	Fitting Kit, Aisin	1
	328748X	Pump Mounting Kit ("XR" Output Only)	1
		SERVICE KITS	
	328356-21X	Gasket & Seal Kit	1
	328933-12X	Housing Conversion Kit w/E.O.C. 12 Volt	
	328933-24X	Housing Conversion Kit w/E.O.C. 24 Volt	1
	328935-12X	Field Conversion Kit / 12 Volt	1
	328935-24X	Field Conversion Kit / 24 Volt	1

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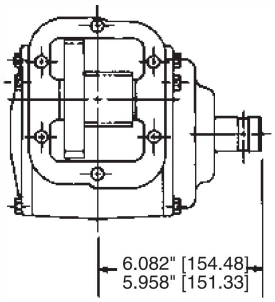
Item	Part Number	Description	Qty.
	328938-12X	270 to 271 Conversion Kit w/E.O.C. 12 Volt	1
	328938-24X	270 to 271 Conversion Kit w/E.O.C. 24 Volt	1
	328970X	Service Kit, for Bearing, Seal, Gasket and Clutch Pack	1
	328971X	Service Kit, for Bearing, Seal, Gasket and Clutch Pack w/Piston & Back Up Cyclinder Sub Ass'y	1
	329043-16X	Gasket & Seal Kit, "BA" Option	1
	329043-18X	Repair Kit, "BA" Ass'y 3 & 5, Brake Section Only	1
	329366-12X	Housing Conversion Kit w/E.O.C. 12 Volt, Allison 1000, 2000/2400	
	329366-24X	Housing Conversion Kit w/E.O.C. 24 Volt, Allison 1000, 2000/2400	
	329367-12X	E.O.C. Field Installation Kit 12 Volt, Allison 1000, 2000/2400	
	329367-24X	E.O.C. Field Installation Kit 24 Volt, Allison 1000, 2000/2400	
	329368-12X	270 to 271 Conversion Kit w/E.O.C. 12 Volt, Allison 1000, 2000/2400	
	329368-24X	270 to 271 Conversion Kit w/E.O.C. 24 Volt, Allison 1000, 2000/2400	

Assembly Arrangements - 270/271 Series



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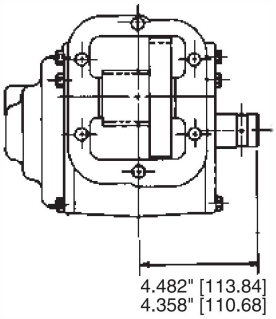

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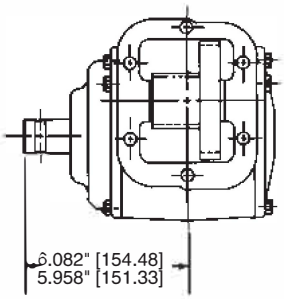

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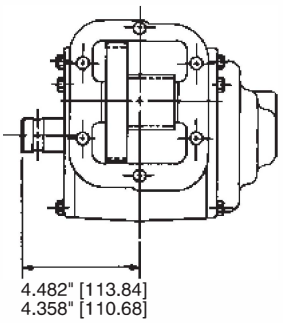

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Gear Chart

P.T.O MODEL NO	PART NUMBER	NO TEETH IN CLUSTER (Lg)-(Sm)	APPLICATION & GEAR TYPE	OUTPUT GEAR ITEM 13	
				PART NO.	NO TEETH
270*AAJ	5-P-567	25-18	Allison, Spur	2-P-473	53
270*AAK	5-P-548	25-18	Allison, Spur	2-P-473	53
270*AHV	5-P-1295	27-18	Allison 1000, 2000/2400, Spur	2-P-473	53
270*AKU	5-P-1353	36-18	Aisin MY600 & Dodge AS68RC, Spur	2-P-473	53
270*BAJ	5-P-568	25-15	Allison, Spur	2-P-481	34
270*BFR	5-P-961	35-15	Fuller Ceemat	2-P-481	34
270*BHV	5-P-1296	27-15	Allison 1000, 2000/2400, Spur	2-P-481	34
270*DAJ	5-P-695	25-24	Allison, Spur	2-P-606	47
270*DAK	5-P-807	25-24	Allison, Spur	2-P-606	47
270*DFR	5-P-960	35-24	Fuller, Spur	2-P-606	47
270*DHV	5-P-1297	27-24	Allison 1000, 2000/2400, Spur	2-P-606	47
270*DKU	5-P-1355	36-24	Aisin MY600 & Dodge AS68RC, Spur	2-P-606	47
270*KAK	5-P-881	25-29	Allison, Spur	2-P-638	42
270*KFR	5-P-949	35-29	Fuller, Spur	2-P-638	42
270*KKU	5-P-1356	36-29	Aisin MY600 & Dodge AS68RC, Spur	2-P-638	42
270*QKU	5-P-1359	36-34	Aisin MY600 & Dodge AS68RC, Spur	2-P-639	37
271*AAJ	5-P-567	25-18	Allison, Spur	2-P-473	53
271*AAK	5-P-548	25-18	Allison, Spur	2-P-473	53
271*AHV	5-P-1295	27-18	Allison 1000, 2000/2400, Spur	2-P-473	53
271*BAJ	5-P-568	25-15	Allison, Spur	2-P-481	34
271*BHV	5-P-1296	27-15	Allison 1000, 2000/2400, Spur	2-P-481	34
271*BKU	5-P-1354	36-15	Aisin MY600 & Dodge AS68RC, Spur	2-P-481	34
271*DAJ	5-P-695	25-24	Allison, Spur	2-P-606	47
271*DAK	5-P-807	25-24	Allison, Spur	2-P-606	47
271*DHV	5-P-1297	27-24	Allison 1000, 2000/2400, Spur	2-P-606	47
271*KAK	5-P-881	25-29	Allison, Spur	2-P-638	42
271*KAJ	5-P-769	25-29	Allison, Spur	2-P-638	42

Model Number Designation

270 X A AJ P – B 3 RA

Basic Model
270

Mounting Option
- **A** = Aisin
- **D** = Dodge/AISIN
- **G** = Standard Mounting with Metric Studs
- **X** = Standard Mounting
- **R** = RAM/Aisin

Gear Ratio
- **A** = 18/53
- **B** = 15/34
- **D** = 24/47
- **K** = 29/42
- **Q** = 34/37

Input Option
AH, AJ, AK, HV, KU

Lube Option
- **P** = Pressure Lube
- **X** = No Pressure Lube

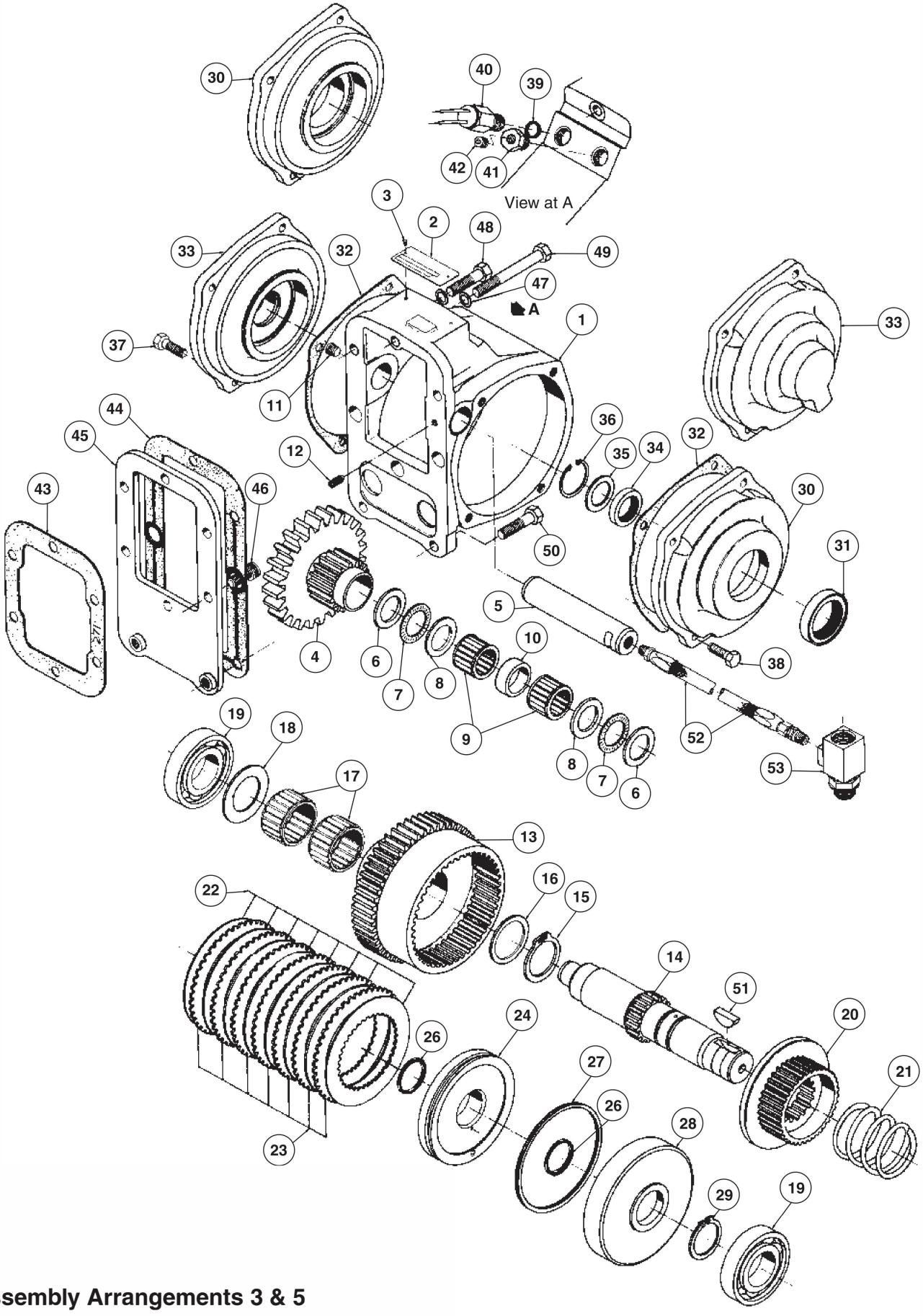
Output Option
- **AF** = S.A.E. "BB" 2 or 4-Bolt 1" - 15T
- **BA** = 1-1/4" Rd Standard Shaft w/Brake
- [3] **RA** = Rotatable S.A.E. "B" 2-Bolt 7/8" - 13T
- [3] **RB** = Rotatable S.A.E. "B" 4-Bolt 7/8" - 13T
- **XD** = 1-1/4" Rd Standard Shaft
- **XE** = S.A.E. "A" 2-Bolt 5/8" - 9T
- **XK** = S.A.E. "B" 2 or 4-Bolt 7/8" - 13T
- **XP** = S.A.E. "A" 2-Bolt 7/8" - 13T
- [3] **XR** = CHELSEA Special 7/8" - 13T
- **XX** = 1-1/4" Tapered Output Shaft
- [3] **XY** = Meiller Pump

Assembly Arrangement
3, 4, 5, 6

Shift Option
- [1] **B** = 12 Volt Hydraulic Valve
- [1] **D** = 24 Volt Hydraulic Valve
- **K** = 12V Electronic Overspeed Ctrl
- **L** = 24V Electronic Overspeed Ctrl
- **S** = P.T.O. & Combo Valve
- **T** = P.T.O. & Combo Valve less Kickout & Neutral Spring Return

[1] Includes mounting parts
[3] Available assembly 3 & 5 only

Notes



Assembly Arrangements 3 & 5

Item	Part Number	Description	Qty.
1	**1-P-436**	Housing, Standard Mount	1
2	**68-P-2**	Name Plate	1
3	**378422**	Drive Screw	2
4	**See Chart Pg. 5**	Gear, Input	1
5	**9-P-54**	Shaft, Input Idler (Pressure Lube)	1
	9-P-55	Shaft, Input Idler (No Pressure Lube)	1
6	**31-P-61**	Thrust Washer (Idler Shaft 0.031" Thick)	2
7	**560920**	Bearing, Needle Thrust	2
8	**31-P-62**	Thrust Race (Idler shaft 0.125" Thick)	2
9	**550886**	Roller Bearing (Idler Pin)	2
10	**14-P-54**	Spacer, Needle Bearing (Idler Shaft)	1
11	**379231**	Pipe Plug (0.125" - 27 N.P.T.F.)	1
12	**378452-4**	Setscrew (0.250" - 20 x 0.312")	1
13	**See Chart Pg. 5**	Gear, Output	1
	NOTE: See page 16 for Driveshaft and Clutch Assembly Numbers		
14	**3-P-679**	Shaft, Output 1.250" Rd. ("XD" Assemblies 3 & 5)	1 or
N.S.	**3-P-677**	Shaft, Output 1.250" Rd. ("XD" Assemblies 4 & 6)	1
N.S.	**3-P-678**	Shaft, Output 0.875" - 13 Tooth Internal Spline ("XK & XP" Assemblies 4 & 6)	1
N.S.	**3-P-686**	Shaft, Output 0.875" - 13 Tooth Internal Spline ("XK & XP" Assemblies 3 & 5)	1
N.S.	**3-P-703**	Shaft, Output 0.875" - 13 Tooth Internal Spline ("RA & RB & XR" Assemblies 3 & 5)	1
N.S.	**3-P-787**	Shaft, Output 1.250 Tapered w/.312" key way ("XX" Assemblies 3 & 5)	1
N.S.	**3-P-788**	Shaft, Output 1.250 Tapered w/.312" key way ("XX" Assemblies 4 & 6)	1
N.S.	**3-P-896**	Shaft, Output 1.0" - 15 Tooth Internal Spline ("AF" Assemblies 3 & 5)	1
N.S.	**3-P-895**	Shaft, Output 1.0" - 15 Tooth Internal Spline ("AF" Assemblies 4 & 6)	1
N.S.	**3-P-957**	Shaft, Output 1.0" - 15 Tooth Internal Spline ("RF" Assemlies 3 & 5)	
N.S.	**3-P-964**	Shaft, Output .625" - 9 Tooth Internal Spline ("XE" Assemblies 3 & 5)	
N.S.	**3-P-970**	Shaft, Output 1.250" Rd. ("BA" Assemblies 3 & 5)	1
	NOTE: For "BA" Option See Page 10 for Bill of Material		
15	**379746**	Snap Ring	1
16	**14-P-49**	Spacer	1
17	**560918**	Roller Bearing	2
18	**31-P-57**	Thrust Washer (Output Shaft), All Except "BA"	1
19	**550010**	Ball bearing	2
	328925X	Clutch Piston & Back-up Cylinder (Includes Items 15, 20 thru 29)	1
	329179-1X	Assembly, Piston Back-up Cylinder (Includes Items 24, 27 & 28)	
20	**2-P-458**	Inner Clutch Gear	1
21	**37-P-39**	Clutch Spring	1
22	**379485**	Friction Disc	8
23	**379595**	Clutch Plate	7
24	**380057-1**	Piston	1
26	**28-P-244**	O-Ring	2
27	**28-P-178**	O-Ring	1
28	**379323-1**	Clutch Back-up Cylinder	1
29	**378576**	Snap Ring	1
30	**21-P-451**	Bearing Cover, Open End (Assemblies 3 & 5) "XX", "XD" & "BA" Options	1
	21-P-297	Bearing Cover, Open End (Assemblies 4 & 6) "XX" & "XD" Options	1
31	**28-P-225**	Oil Seal	1
32	**22-P-53**	Gasket, Bearing Cover	2
	328806X	Bearing Cover Assembly, Closed End (Assemblies 3 & 5), All Except "BA"	1
	328988X	Bearing Cover Assembly, Closed End (Assemblies 4 & 6) (Includes items 33 thru 36)	1
33	**21-P-295**	Bearing Cover, Closed End (Assemblies 3 & 5)	1
	21-P-449	Bearing Cover, Closed End (Assemblies 4 & 6)	1
34	**28-P-119**	Oil Seal	1

N.S. — Not Shown

Continued on next page

Item	Part Number	Description	Qty.
35	378811	Back-Up Plate	1
36	378849	Snap Ring	1
	328988-1X	Bearing Cover Assembly, Closed End (Assemblies 3 & 5), "BA"	
	NOTE: For "BA" Option See Page 10 for Bill of Material		
37	378430-10	Capscrew, Hex Head (.312" - 18 x 1.0") "XX" & "XD" Assemblies 4 & 6, Open End	4
	378430-10	Capscrew, Hex Head (.312" - 18 x 1.0") Assemblies 3 & 5, Closed End / Except "BA"	4
38	378430-12	Capscrew, Hex Head (.312" - 18 x 1.250") "XX" & "XD" Assemblies 3 & 5, Open End	4
	378430-12	Capscrew, Hex Head (.312" - 18 x 1.250")	
		Assemblies 4 & 6 ("BA" Ass'y 3 & 5), Closed End	4
39	28-P-171	O-Ring, Speed Sensor	1
40	379243	Speed Sensor (Transducer) Included w/Electronic Overspeed Control	1
	379917	Speed Sensor (Allison 1000, 2000/2400)	
41	379242	Adapter Plug with E.O.C.	1 or
		Adapter Plug without E.O.C.	2
42	379231	Pipe Plug (0.125" - 27 N.P.T.F.) with E.O.C.	1 or
		Pipe Plug (0.125" - 27 N.P.T.F.) without E.O.C.	2
	328948-5X	Mounting & Installation Instructions (Includes 43 & 44)	1
43	35-P-69	Gasket	1
44	35-P-84	Gasket	1
45	329150X	Adapter Plate Assembly (6 Bolt)	1
		LOOSE PARTS	
	7170-74X	Mounting Parts Kit (Items 46 thru 50)	1
46	379433-6	Socket Head Capscrew (0.375" - 18 x 1")	3
47	378774	Tab-Lock Washer	5
48	378431-15	Hex Capscrew (0.375" - 16 x 1.625")	2
49	378431-27	Hex Capscrew (0.375" - 16 x 3.250")	1
50	378431-11	Hex Capscrew (0.375" - 16 x 1.250")	2
	7170-104X	Mounting Parts Kit, Allison 1000,2000/2400	1
51	500007-29	Woodruff Key	1
52	328075X	Pressure Lube Hose, Allison	1
53	378840	Street Tee, Allison AT Series	1
	378970	Street Tee, Allison MT Series 1975 & After	1
	378880	Street Tee, Allison MT Series 1974 & Before	1
	378897	Street Tee, Allison CLT, CLBT & HT Series	1
N.S.	329297X	Fitting Kit, Allison 1000, 2000/2400 (High Pressure Port)	1
		For Item 53 or Allison 1000,2000/2400, see application pages for correct fittings	1
N.S.	328748X	Pump Mounting Kit	1
		SERVICE KITS	
	328356-22X	Gasket & Seal Kit	1
	328933-12X	Housing Conversion Kit w/E.O.C. 12 Volt	1
	328933-24X	Housing Conversion Kit w/E.O.C. 24 Volt	1
	328935-12X	Field Conversion Kit / 12 Volt	1
	328935-24X	Field Conversion Kit / 24 Volt	1
	328938-12X	270 to 271 Conversion Kit w/E.O.C. 12 Volt	1
	328938-24X	270 to 271 Conversion Kit w/E.O.C. 24 Volt	1
	328970X	Service Kit, for Bearing, Seal, Gasket and Clutch Pack	1
	328971X	Service Kit, for Bearing, Seal, Gasket and Clutch Pack	1
	329043-16X	Gasket & Seal Kit, "BA" Option	1
	329043-18X	Repair Kit, "BA" Ass'y 3 & 5, Brake Section Only	1
	329366-12X	Housing Conversion Kit w/E.O.C. 12 Volt, Allison 1000, 2000/2400	1
	329366-24X	Housing Conversion Kit w/E.O.C. 24 Volt, Allison 1000, 2000/2400	
	329367-12X	E.O.C. Field Installation Kit 12 Volt, Allison 1000, 2000/2400	
	329367-24X	E.O.C. Field Installation Kit 24 Volt, Allison 1000, 2000/2400	
	329368-12X	270 to 271 Conversion Kit w/E.O.C. 12 Volt, Allison 1000, 2000/2400	
	329368-24X	270 to 271 Conversion Kit w/E.O.C. 24 Volt, Allison 1000, 2000/2400	

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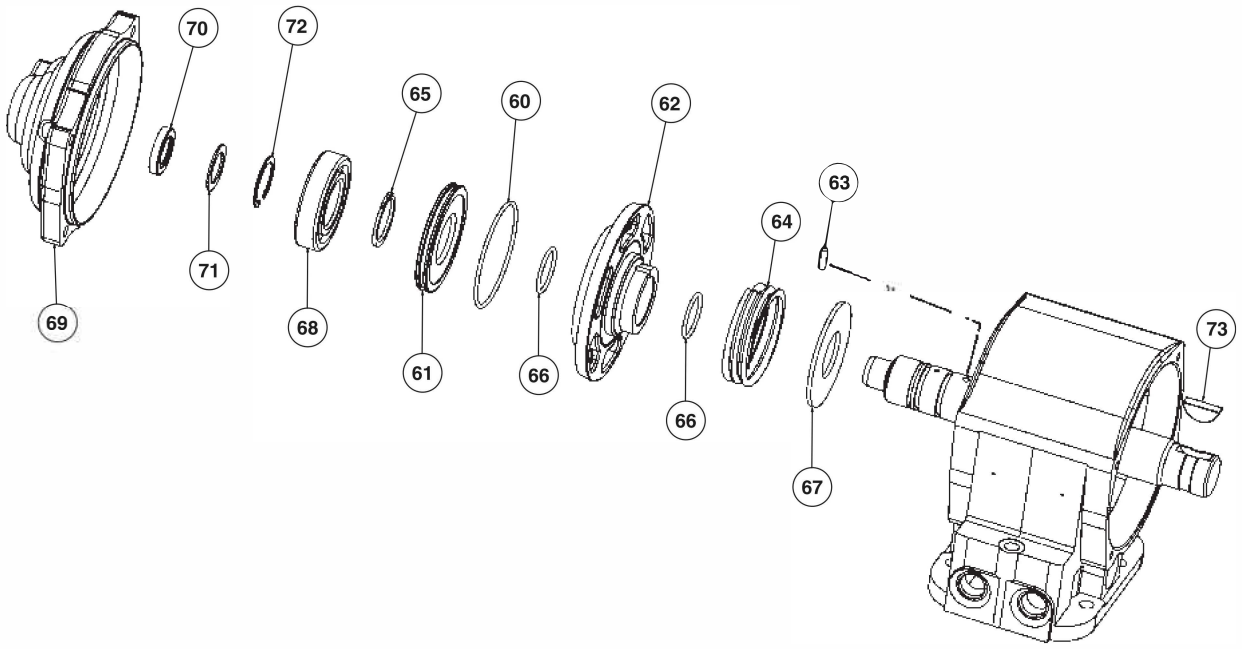
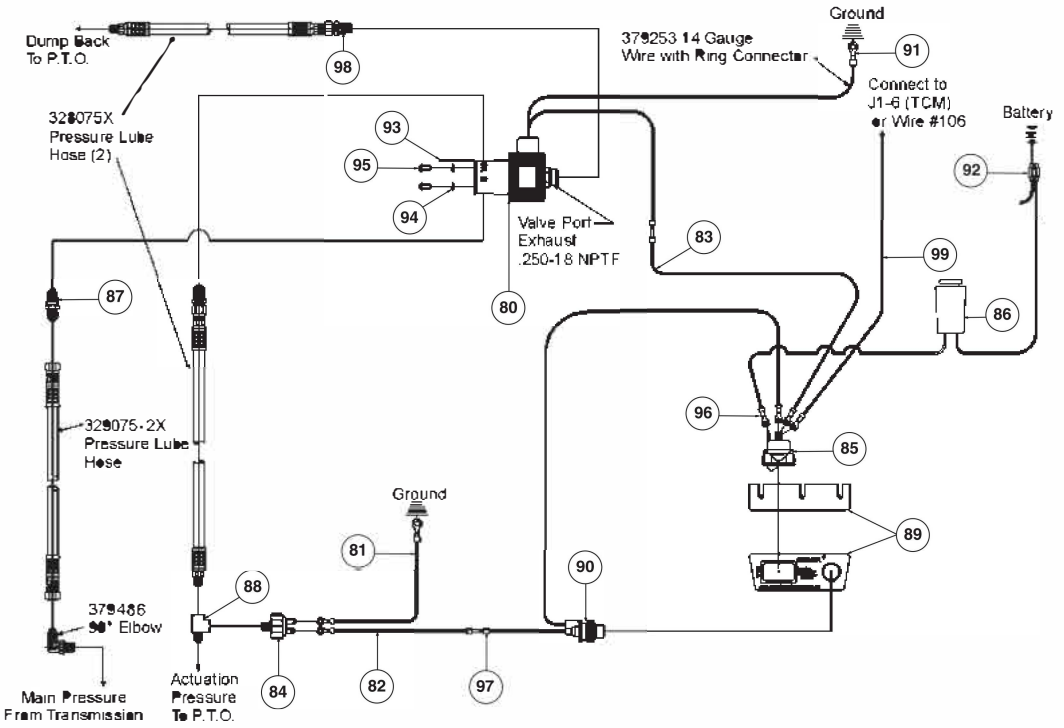


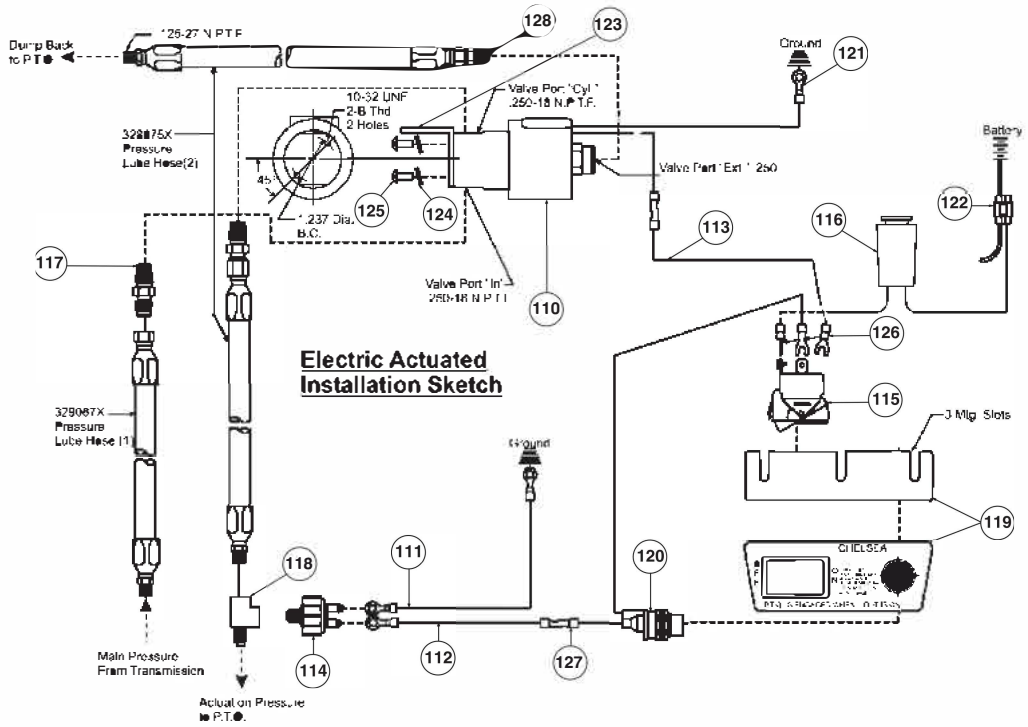
Item	Part Number	Description	Qty.
	329410X	Brake Assembly (“BA” Output)	1
60	**28-P-252**	O-Ring	1
61	**66-P-49**	Piston	1
62	**379976**	Brake Disk	1
63	**379977**	Pin (.187" x .625"), (“BA” Output)	1
64	**37-P-60**	Spring, Automatic Transmissions (“BA” Output)	1
65	**378576**	Retaining Rin Output)	1
66	**28-P-244**	O-Ring, (“BA” Output)	2
67	**31-P-113**	Thrust Washer (“BA”Output Shaft)	1
68	**550010**	Ball Bearing	1
69	**328988-1X**	Bearing Cap Sub Assembly (Closed End 3 & 5, “BA”)	1
70	**21-P-670**	Bearing Cap	1
71	**28-P-119**	Oil Seal	1
72	**378811**	Back-up Plate	1
73	**378849**	Retainer Ring	1
74	**500007-29**	Woodruff Key (“XD”, “BA” Outputs Only)	1

Shift Installation Kits 12 & 24 Volt without E.O.C. (Allison 1000, 2000/2400) (SK-329)



Item	Part Number	Description	Qty
	328715X	12V SHIFT INSTALLATION KIT	1
		(Includes items 80 thru 98)	
	328749X	24V SHIFT INSTALLATION KIT	1
		(Includes items 80 thru 98)	
80	**379686-1**	Solenoid Valve, 12 Volt for 328715X Kit	1
	379686-2	Solenoid Valve, 24 Volt for 328749X Kit	1
81	**379254-14**	Wire, Black w/Two Ring Connectors	1
82	**379254-13**	Wire, Blue w/One Ring Connector	1
83	**379254-3**	Wire, Green w/One Butt Connector	1
	328963X	Parts Bag, 12 Volt Kit (328715X)	1
	328964X	Parts Bag, 24 Volt Kit (328749X)	1
		(Includes items 84 thru 98)	
84	**379547**	Pressure Switch	1
85	**378881**	Rocker Switch	1
86	**379900**	Fuse Holder, 10 Amp	1
87	**379449**	Screened Adaptor, 1/4" - 18 NPT	1
88	**378966**	Street Tee, Screened	1
89	**379336**	Bracket	
90	**378978**	Indicator Light, 12V (Kits 328963X & 328715X)	1
	379005	Indicator Light, 24V (Kits 328964X & 328749X)	1
91	**379253**	Ring Connector	2
N.S.	**379061**	Wire Ties	6
92	**379257**	Splice Connector	1
93	**379258**	Bracket, Solenoid Mounting	1
94	**500357-7**	Lock Washer .188 I.D	2
95	**500457-6**	Screw, Mounting .190" - 32 x .438"	2
96	**379306**	Fork Connector	3
97	**379252**	Butt Connector	1
98	**379280**	Adaptor Fitting	2
	329336-1X	Allison 1000, 2000/2400 Series Wire Kit (not part of installation kits)	1
99	**379254-17**	Blue Wire 14 Gauge w/Fork Terminal	1

Shift Installation Kits 12 & 24 Volt without E.O.C. (Allison) (SK-225)



Item	Part Number	Description	Qty.
	328715X	12V SHIFT INSTALLATION KIT	1
		(Includes items 110 thru 128)	
	328749X	24V SHIFT INSTALLATION KIT	1
		(Includes items 110 thru 128)	
110	**379686-1**	Solenoid Valve, 12 Volt for 328715X Kit	1
	379686-2	Solenoid Valve, 24 Volt for 328749X Kit	1
111	**379254-14**	Wire, Black w/Two Ring Connectors	1
112	**379254-13**	Wire, Blue w/One Ring Connector	1
113	**379254-3**	Wire, Green w/One Butt Connector	1
	328963X	Parts Bag, 12 Volt Kit (328715X)	1
	328964X	Parts Bag, 24 Volt Kit (328749X)	1
		(Includes items 114 thru 128)	1
114	**379547**	Pressure Switch	1
115	**378881**	Rocker Switch	1
116	**379900**	Fuse Holder, 10 Amp	1
117	**379449**	Screened Adaptor, 1/4 - 18 NPT	1
118	**378966**	Street Tee, Screened	1
119	**379336**	Bracket	1
120	**378978**	Indicator Light, 12V (Kits 328963X & 328715X)	1 or
	379005	Indicator Light, 24V (Kits 328964X & 328749X)	1
121	**379253**	Ring Connector	2
N.S.	**379061**	Wire Ties	6
122	**379257**	Splice Connector	1
123	**379258**	Bracket, Solenoid Mounting	1
124	**500357-7**	Lock Washer .188" I.D.	2
125	**500457-6**	Screw, Mounting .190" - 32 x .438"	2
126	**379306**	Fork Connector	3
127	**379252**	Butt Connector	1
128	**379280**	Adaptor Fitting	2

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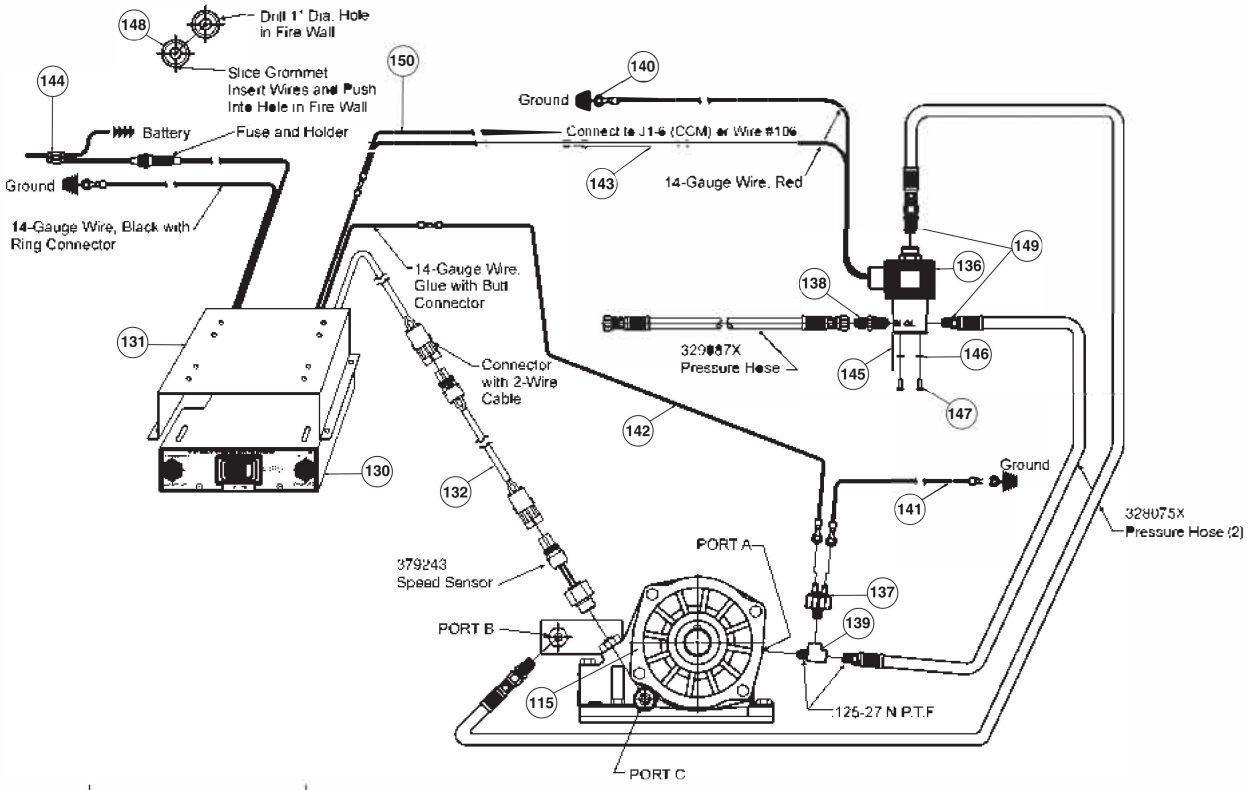
Shift Installation Kits 12 & 24 Volt with E.O.C (Allison1000, 2000/2400) (SK-328)



Item	Part Number	Description	Qty.
	328924-12X	12V E.O.C.	1
	328924-24X	24V E.O.C.	1
130	**328922-12X**	Control Box E.O.C. 12 Volt	1
	328922-24X	Control Box E.O.C. 24 Volt	1
131	**379244**	Bracket, E.O.C. Mounting	1
132	**328923-10X**	Connector Cable, 10 ft. Standard	1 or
	328923-5X	Connector Cable, 5 ft. Optional	1
	328931X	Mounting Parts, E.O.C. Bracket	1
N.S.	**500448-9**	Screw, 10-24	4
N.S.	**500357-7**	Lockwasher	4
N.S.	**500376-6**	Nut, Hex 10-24	4
	328929-12X	12V E.O.C. Installation Kit (Includes Items 136 thru 149)	1
	328929-24X	24V E.O.C. Installation Kit (Includes Items 136 thru 149)	1
136	**379686-1**	Solenoid Valve, 12 Volt (for 328929-12X)	1
	379686-2	Solenoid Valve, 24 Volt (for 328929-24X)	1
137	**379547**	Pressure Switch	1
138	**379449**	Screened Adaptor, 1/4" - 18 NPT	1
139	**378966**	Street Tee, Screened	1
140	**379253**	Ring Connector	1
141	**379254-14**	Wire, Black w/Two Ring Connectors	1
142	**379254-13**	Wire, Blue w/One Ring Connector	1
143	**379254-3**	Wire, Green w/One Butt Connector	1
144	**379257**	Splice Connector	1
145	**379258**	Bracket, Solenoid Mounting	1
146	**500357-7**	Lockwasher .188" I.D.	2
147	**500457-6**	Screw, Mounting .190" - 32 x .438"	2
148	**379265**	Grommet	1
149	**379280**	Adaptor Fitting	2
	329336-2X	Allison 1000, 2000/2400 Series Wire Kit (not part of installation kit)	1
150	**379254-18**	Green Wire 14 Gauge	1

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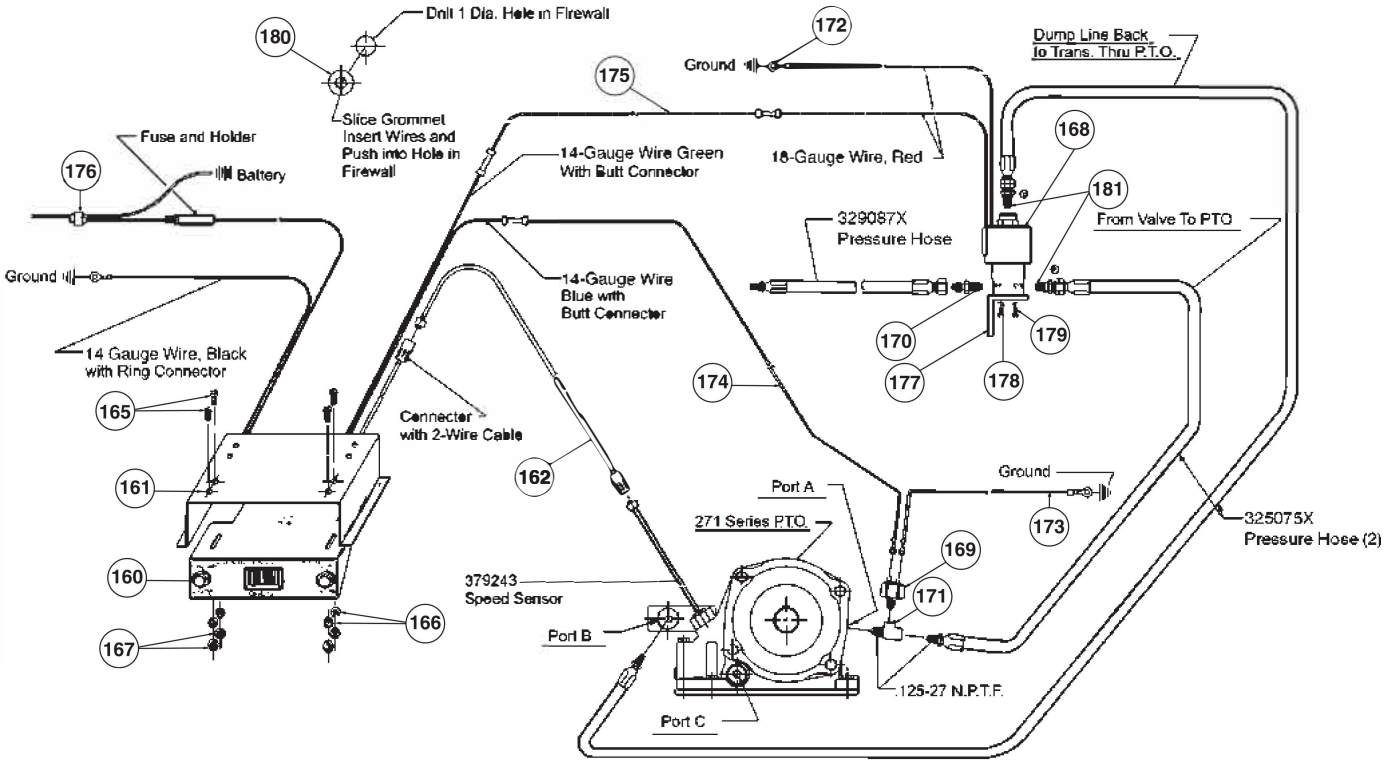
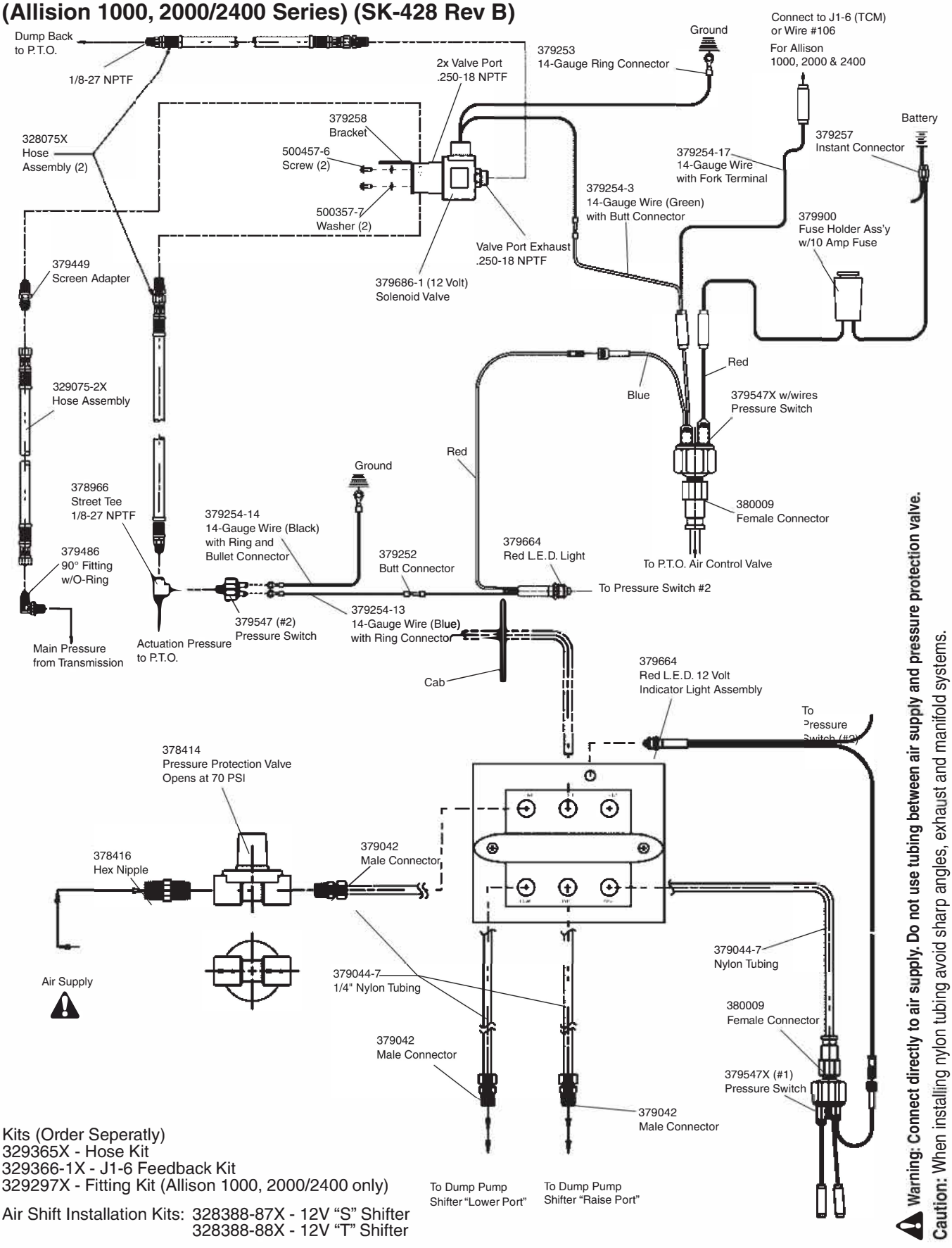
Shift Installation Kits 12 & 24 Volt with E.O.C. (Allison) (SK-224)



P.T.O./Combo Valve Installation Sketch, 270/271 Series (Allision 1000, 2000/2400 Series) (SK-428 Rev B)

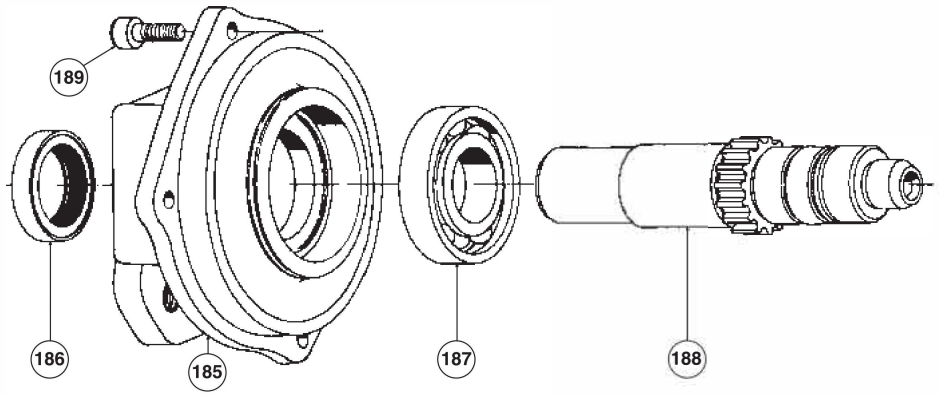


Kits (Order Seperatly)
329365X - Hose Kit
329366-1X - J1-6 Feedback Kit
329297X - Fitting Kit (Allison 1000, 2000/2400 only)

Air Shift Installation Kits: 328388-87X - 12V "S" Shifter
328388-88X - 12V "T" Shifter

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.

Pump Shafts & Flanges



Pump Mounting Suffix (See Note)		Flange Item 185	Bearing Cap Gasket	Seal Item 186	Bearing Item 187	Driveshaft & Clutch		Output Shaft Spacer	Hex Socket Head Screw Item 189
						Assembly Number	Output Shaft Item 188		
BA	Assembly 3 & 5	21-P-451	22-P-53 (2)	28-P-225	550010	328925-13X	3-P-970		378430-12
XE	Assembly 3 & 5	21-P-568	22-P-53 (2)	28-P-225	550010	328925-12X	3-P-964	4-P-183	378447-7
XK	Assembly 3 & 5	21-P-445	22-P-53 (2)	28-P-225	550010	328925-4X	3-P-686		378447-7
	Assembly 4 & 6	21-P-303	22-P-53 (2)	28-P-225	550010	328925-3X	3-P-678		378447-6
XP	Assembly 3 & 5	21-P-443	22-P-53 (2)	28-P-225	550010	328925-4X	3-P-686		378447-7
	Assembly 4 & 6	21-P-301	22-P-53 (2)	28-P-225	550010	328925-3X	3-P-678		378447-6
XR	Assembly 3 & 5	21-P-447	22-P-53 (2)	28-P-225	550010	328925-5X	3-P-703		378447-7
XX	Assembly 3 & 5	21-P-297	22-P-53 (2)	28-P-225	550010	328925-6X	3-P-787		378430-12
	Assembly 4 & 6	21-P-297	22-P-53 (2)	28-P-225	550010	328925-7X	3-P-788		378430-10
XY	Assembly 3 & 5	21-P-468	22-P-53 (2)	28-P-230	550010	328925-8X	3-P-825		378447-7
AF	Assembly 3 & 5	21-P-445	22-P-53 (2)	28-P-225	550010	328925-9X	3-P-896		378447-7
	Assembly 4 & 6	21-P-303	22-P-53 (2)	28-P-225	550010	328925-10X	3-P-895		378447-6
*RA	Assembly 3 & 5	21-P-628 •	22-P-53 (2)	28-P-225	550010	328925-5X	3-P-703		378447-7
*RB	Assembly 3 & 5	21-P-572 •	22-P-53 (2)	28-P-225	550010	328925-5X	3-P-703		378447-7
*RF	Assembly 3 & 5	21-P-628 •	22-P-53 (2)	28-P-225	550010	328925-11X	3-P-957		378447-7

The Rotatable Flanges attach to the 21-P-447 Flange

* - 328748X Pump to Flange Mounting Kit Must Be Used with “R” Suffix
Kit Contains: (4) 378430-11 Hex Head Capscrews (.3125" - 18 x 1.125")
(4) 378919 Washers (Special)
(4) 45-P-11 Bushing Guide

**- Assembly Includes the Pump Shaft Shown Plus Items 20 thru 29 on page 2

• Rotatable Flange Mounts to 21-P-447

NOTE: For “BA” option see page 10 for complete bill of material.

Flange Suffix	Flange Type	Shaft Type	Conversion Kit Number	
BA	"XD" Output w/ Shaft Brake (3 & 5 Ass'y)	1.25" Round w/key	XD to BA	329043-14X
XK	S.A.E. "B" 2 or 4-Bolt Flange (3 & 5 Ass'y)	S.A.E. "B" .875" - 13 Tooth	XD to XK	329160-1X
XP	S.A.E. "A" 2-Bolt (4.188 BC) w/ S.A.E. "B" 4-Bolt (5.0" BC) (3 & 5 Ass'y)	S.A.E. "B" .875" - 13 Tooth	XD to XP	329160-2X
XR	For Parker P16 "S" Flange Pumps (3 & 5 Ass'y)	S.A.E. "B" .875" - 13 Tooth	XD to XR	329160-3X
XY	DIN 5462 (3 & 5 Ass'y)	DIN 5462	XD to XY	329160-4X
XK	S.A.E. "B" 2 or 4-Bolt Flange (4 & 6 Ass'y)	S.A.E. "B" .875" - 13 Tooth	XD to XK	329160-5X
XP	S.A.E. "A" 2-Bolt (4.188 BC) w/ S.A.E. "B" 4-Bolt (5.0" BC) (4 & 6 Ass'y)	S.A.E. "B" .875" - 13 Tooth	XD to XP	329160-6X
RA	S.A.E. "B" 2-Bolt Rotatable Flange (3 & 5 Ass'y)	S.A.E. "B" .875" - 13 Tooth	XD to RA	329160-31X
RB	S.A.E. "B" 4-Bolt Rotatable Flange (3 & 5 Ass'y)	S.A.E. "B" .875" - 13 Tooth	XD to RB	329160-32X
RA	S.A.E. "B" 2-Bolt Rotatable Flange (3 & 5 Ass'y)	S.A.E. "B" .875" - 13 Tooth	XR to RA	329160-35X
RB	S.A.E. "B" 4-Bolt Rotatable Flange (3 & 5 Ass'y)	S.A.E. "B" .875" - 13 Tooth	XR to RB	329160-36X
XX	DIN 100	Round Tapered w/ key	XD to XX	329160-42X
RF	S.A.E. "B" 2-Bolt Rotatable Flange (3 & 5 Ass'y)	S.A.E. "BB" 1.0" - 15 Tooth	XD to RF	329160-47X
AF	S.A.E. "B" 2 or 4-Bolt Flange (3 & 5 Ass'y)	S.A.E. "BB" 1.0" - 15 Tooth	XD to AF	329160-52X
AF	S.A.E. "B" 2 or 4-Bolt Flange (4 & 6 Ass'y)	S.A.E. "BB" 1.0" - 15 Tooth	XD to AF	329160-53X
XE	S.A.E. "A" Pilot 2-Bolt	S.A.E. .625" - 9 Tooth	XD to XE	329160-54X

Bills of Materials for Pump Flange Conversion Kits

Part Number	Description	Qty.
329043-14X	**Conversion Kit (XD to BA) 3 & 5 Assembly**	
378576	Snap Ring	2
379746	Snap Ring	1
379977	Pin1	1
550010	Bearing, Roller	2
22-P-53	Bearing Cap Gasket	2
28-P-225	Oil Seal	1
28-P-244	O-Ring	4
31-P-113	Washer, Spacer	1
328988-1X	Bearing Cap Assembly	1
329410X	Brake Assembly	1
35-P-9-1	Gasket	2
35-P-9-2	Gasket	2
37-P-60	Spring	1
3-P-970	Pump Shaft	1
500007-29	Woodruff Key	1
329160-1X	**Conversion Kit (XD to XK)**	
378576	Snap Ring	1
378849	Retainer Ring	1
379688	Grease Packet	1
379746	Lock Ring	1
21-P-445	Bearing Cap	1
22-P-53	Bearing Cap Gasket	2
28-P-119	Oil Seal	1
28-P-121	Block Vee Ring	1
28-P-225	Oil Seal	1
28-P-244	O-Ring	2
378447-7	Socket Head Capscrew (.312" - 18 x 1.250")	4
3-P-686	Pump Shaft	1

Continued on next page

Pump Flange Conv. Kits Bills of Materials

Part Number	Description	Qty.
329160-2X	**Conversion Kit (XD to XP)**	
378576	Snap Ring	1
378849	Retainer Ring	1
379688	Grease Packet	1
379746	Lock Ring	1
21-P-443	Bearing Cap	1
22-P-53	Bearing Cap Gasket	2
28-P-119	Oil Seal	1
28-P-121	Block Vee Ring	1
28-P-225	Oil Seal	1
28-P-244	O-Ring	2
378447-7	Socket Head Capscrew (.312" - 18 x 1.250")	4
3-P-686	Pump Shaft	1
329160-3X	**Conversion Kit (XD to XR)**	
378576	Snap Ring	1
378849	Retainer Ring	1
379688	Grease Packet	1
379746	Lock Ring	1
21-P-447	Bearing Cap	1
22-P-53	Bearing Cap Gasket	2
28-P-119	Oil Seal	1
28-P-121	Block Vee Ring	1
28-P-225	Oil Seal	1
28-P-244	O-Ring	2
378447-7	Socket Head Capscrew (.312" - 18 x 1.250")	4
3-P-703	Pump Shaft	1
329160-4X	**Conversion Kit (XD to XY)**	
378576	Snap Ring	1
378849	Retainer Ring	1
378898	Flat Head Socket Capscrew (.438" - 14 x 1.00")	1
379335	Coupling, Splined	1
379688	Grease Packet	1
379746	Lock Ring	1
21-P-468	Bearing Cap	1
22-P-53	Bearing Cap Gasket	2
28-P-119	Oil Seal	1
28-P-121	Block Vee Ring	1
28-P-230	Oil Seal	1
28-P-244	O-Ring	2
378447-7	Socket Head Capscrew (.312" - 18 x 1.250")	4
3-P-825	Pump Shaft	1
329160-5X	**Conversion Kit (XD to XK)**	
378576	Snap Ring	1
378849	Retainer Ring	1
379688	Grease Packet	1
379746	Lock Ring	1
21-P-303	Bearing Cap	1
22-P-53	Bearing Cap Gasket	2
28-P-119	Oil Seal	1
28-P-121	Block Vee Ring	1
28-P-225	Oil Seal	1
28-P-244	O-Ring	2
378447-6	Socket Head Capscrew (.312" - 18 x 1.00")	4
3-P-678	Pump Shaft	1

Continued on next page

Pump Flange Conv. Kits Bills of Materials

Part Number	Description	Qty.
329160-6X	**Conversion Kit (XD to XP)**	
378576	Snap Ring	1
378849	Retainer Ring	1
379688	Grease Packet	1
379746	Lock Ring	1
21-P-301	Bearing Cap	1
22-P-53	Bearing Cap Gasket	2
28-P-119	Oil Seal	1
28-P-121	Block Vee Ring	1
28-P-225	Oil Seal	1
28-P-244	O-Ring	2
378447-6	Socket Head Capscrew (.312" - 18 x 1.00")	4
3-P-678	Pump Shaft	1
329160-31X	**Conversion Kit (XD to RA)**	
378576	Snap Ring	1
378849	Retainer Ring	1
379688	Grease Packet	1
379746	Lock Ring	1
21-P-447	Bearing Cap	1
21-P-628	Pump Flange	1
22-P-53	Bearing Cap Gasket	2
28-P-119	Oil Seal	1
28-P-121	Block Vee Ring	1
28-P-225	Oil Seal	1
28-P-244	O-Ring	2
378447-6	Socket Head Capscrew (.312" - 18 x 1.00")	4
378447-7	Socket Head Capscrew (.312" - 18 x 1.250")	4
3-P-703	Pump Shaft	1
329160-32X	**Conversion Kit (XD to RB)**	
378576	Snap Ring	1
378849	Retainer Ring	1
379688	Grease Packet	1
379746	Lock Ring	1
21-P-447	Bearing Cap	1
21-P-572	Pump Flange	1
22-P-53	Bearing Cap Gasket	2
28-P-119	Oil Seal	1
28-P-121	Block Vee Ring	1
28-P-225	Oil Seal	1
28-P-244	O-Ring	2
378447-6	Socket Head Capscrew (.312" - 18 x 1.00")	4
378447-7	Socket Head Capscrew (.312" - 18 x 1.250")	4
3-P-703	Pump Shaft	1
329160-35X	**Conversion Kit (XR to RA)**	
21-P-628	Pump Flange	1
378447-6	Socket Head Capscrew (.312" - 18 x 1.00")	4
329160-36X	**Conversion Kit (XR to RB)**	
21-P-572	Pump Flange	1
378447-6	Socket Head Capscrew (.312" - 18 x 1.00")	4

Continued on next page

Pump Flange Conv. Kits Bills of Materials

Part Number	Description	Qty.
329160-42X	**Conversion Kit (XD to XX)**	
378576	Snap Ring	1
378849	Retainer Ring	1
379111	Square Key	1
379746	Lock Ring	1
501181	Hex Nut	1
22-P-53	Bearing Cap Gasket	2
28-P-119	Oil Seal	1
28-P-121	Block Vee Ring	1
28-P-225	Oil Seal	1
28-P-244	O-Ring	2
378430-10	Hex Capscrew (.312" - 18 x 1.00")	4
378430-12	Hex Capscrew (.312" - 18 x 1.25")	4
3-P-787	Pump Shaft	1
3-1-604	Companion Flange (Sold Separately)	1
329160-47X	**Conversion Kit (XD to RF)**	
378576	Snap Ring	1
378849	Retainer Ring	1
379688	Grease Packet	1
379746	Lock Ring	1
21-P-447	Bearing Cap	1
21-P-628	Pump Flange	1
22-P-53	Bearing Cap Gasket	2
28-P-121	Block Vee Ring	1
28-P-119	Oil Seal	1
28-P-225	Oil Seal	1
28-P-244	O-Ring	2
378447-6	Socket Head Capscrew (.312" - 18 x 1.00")	4
378447-7	Socket Head Capscrew (.312" - 18 x 1.250")	4
3-P-957	Pump Shaft	1
329160-52X	**Conversion Kit (XD to AF)**	
378576	Snap Ring	1
378849	Retainer Ring	1
379688	Grease Packet	1
379746	Lock Ring	1
22-P-445	Bearing Cap	1
22-P-53	Bearing Cap Gasket	2
28-P-121	Block Vee Ring	1
28-P-119	Oil Seal	1
28-P-225	Oil Seal	1
28-P-244	O-Ring	2
378447-7	Socket Head Capscrew (.312" - 18 x 1.250")	4
3-P-896	Pump Shaft	1
329160-53X	**Conversion Kit (XD to AF)**	
378576	Snap Ring	1
378849	Retainer Ring	1
379688	Grease Packet	1
379746	Lock Ring	1
21-P-303	Pump Flange	1
22-P-53	Bearing Cap Gasket	2
28-P-121	Block Vee Ring	1
28-P-119	Oil Seal	1
28-P-244	O-Ring	2
28-P-225	Oil Seal	1
378447-6	Socket Head Capscrew (.312" - 18 x 1.00")	4
3-P-895	Pump Shaft	1

Continued on next page

Pump Flange Conv. Kits Bills of Materials

Part Number	Description	Qty.
329160-6X	**Conversion Kit (XD to XP)**	
378576	Snap Ring	1
378849	Retainer Ring	1
379688	Grease Packet	1
379746	Lock Ring	1
21-P-568	Bearing Cap	1
22-P-53	Bearing Cap Gasket	2
28-P-121	Block Vee Ring	1
28-P-119	Oil Seal	1
28-P-225	Oil Seal	1
28-P-244	O-Ring	2
378447-7	Socket Head Capscrew (.312" - 18 x 1.250")	4
3-P-964	Pump Shaft	1
4-P-183	Spacer	1

Model Number Designation

2 7 1 M A A J P – B 3 R A

Basic Model
271

Mounting Option
- **G** = Special Mounting w/Plate & Metric Studs
- **M** = Special Mount w/Plate

Gear Ratio
- **A** = 18/53
- **B** = 15/34
- **D** = 24/47
- **K** = 29/42

Input Option
- **AJ** = Allison MT, CT, AT, HT, CLT, CLBT Series
- **HV** = Allison 1000 Series

Lube Option
- **P** = Pressure Lube
- **X** = No Pressure Lube

Output Option
- **AF** = S.A.E. “BB” 2 or 4-Bolt 1" - 15T
- **BA** = 1-1/4" Rd Standard Shaft w/Brake
- [1] **RA** = Rotatable S.A.E. “B” 2-Bolt 7/8" - 13T
- [1] **RB** = Rotatable S.A.E. “B” 4-Bolt 7/8" - 13T
- **RF** = S.A.E. "BB" 2 or 4-Bolt 1" - 15T
- **XD** = 1-1/4" Rd Standard Shaft
- **XE** = S.A.E. “A” 2-Bolt 5/8" - 9T
- **XK** = S.A.E. “B” 2 or 4-Bolt 7/8" - 13T
- **XP** = S.A.E. “A” 2-Bolt 7/8" - 13T
- [1] **XR** = CHELSEA Special 7/8" - 13T
- **XX** = 1-1/4" Tapered Output Shaft
- [1] **XY** = DIN 5462 8T

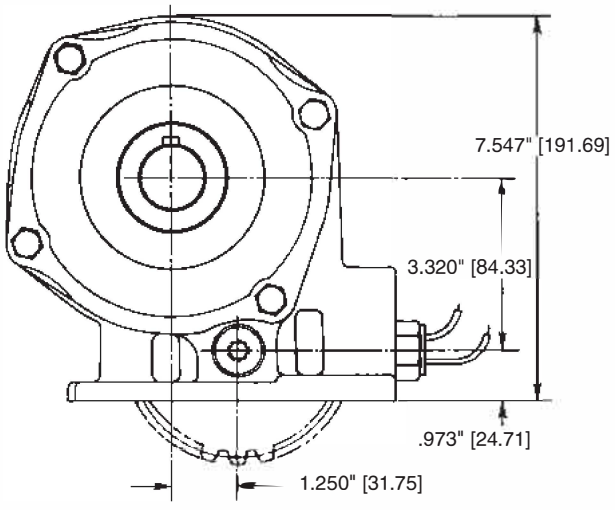
Assembly Arrangement
3, 4, 5, 6

Shift Option
- [3] **B** = 12 Volt Hydraulic Valve
- [3] **D** = 24 Volt Hydraulic Valve
- **K** = 12V Electronic Overspeed Control
- **L** = 24V Electronic Overspeed Control
- **S** = P.T.O. & Combo Valve
- **T** = P.T.O. & Combo Valve less Kickout & Neutral Spring Return

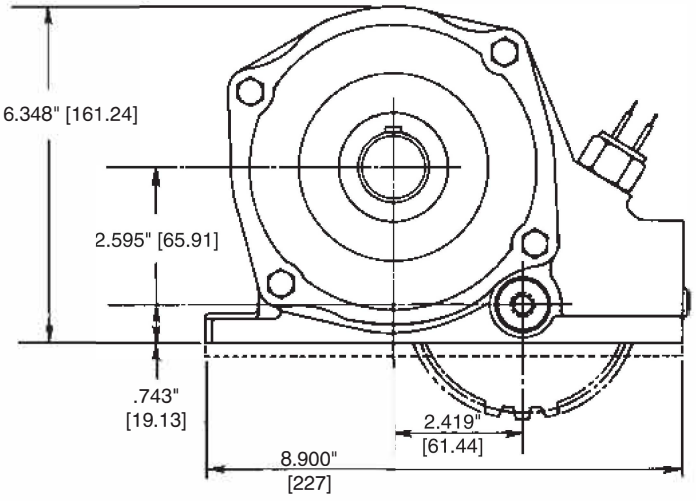
[1] Includes mounting parts
[3] Available assembly 3 and 5 only

Case Dimensions

270 Series



271 Series



Notes

Parker Hannifin Corporation – Chelsea Division

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/. 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 1 2 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 Obligation; 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.

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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