



Chelsea PTO 230/231 Parts Manual

Pro Gear Chelsea 230/231 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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For parts or service contact the Chelsea specialists at Pro Gear & Transmission, Inc.

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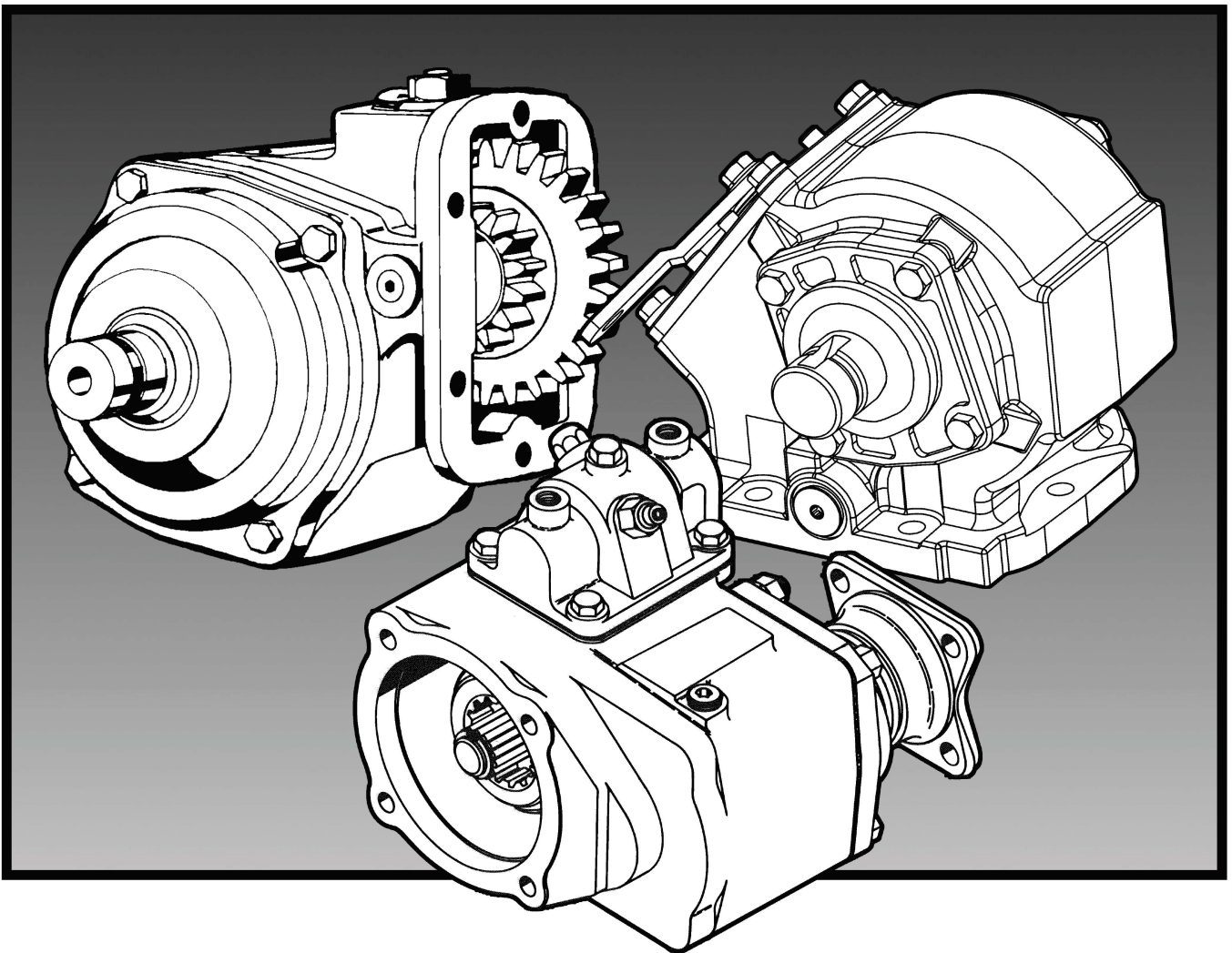
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CHELSEA[®] **Replacement Parts List** **230/231 Series Manual**

Bulletin HY25-2230-M1/US

Effective: January 15, 2009

Supersedes: HY25-2230-M1/US Dated July 2007



 **WARNING**

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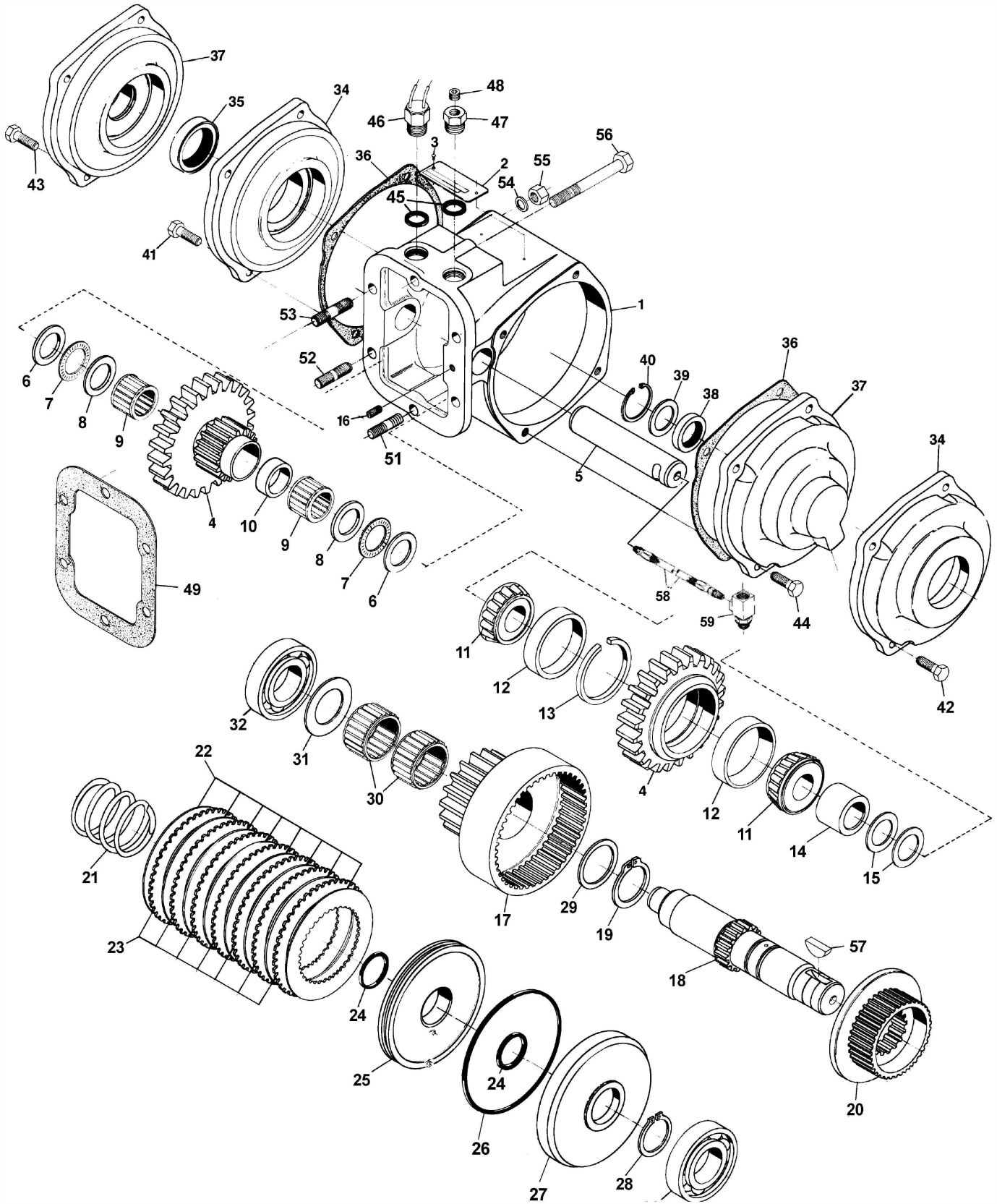
Offer of Sale

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".

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Item	Part Number	Description	Quantity
1	1-P-437	Housing	1
2	68-P-2	Name Plate	1
3	378422	Drive Screw.....	2
4	See Chart Pg. 9	Gear, Input	1
5	9-P-55	Idler Shaft (Standard No pressure Lube)	1 or
	9-P-54	Idler Shaft (Pressure Lube)	
6	31-P-61	Thrust Washer (Idler Shaft .031")	2
7	560920	Needle Thrust Bearing (Idler Shaft)	2
8	31-P-62	Thrust Washer (Idler Shaft .125")	2
9	550886	Needle Bearing Assembly (Idler Shaft)	2
10	14-P-54	Spacer, Needle Bearing (Idler Shaft)	1
(Items 11 thru 15 used in "U" Ratios Only)			
11	560968	Bearing Cone.....	2
12	550221	Bearing Cup	2
13	379313	Lockring	1
14	4-P-143	Spacer, Input Gear.....	1
15	14-P-65-1	Bearing Adjusting Spacer (.054"-.056")	A.R.
	14-P-65-2	Bearing Adjusting Spacer (.059"-.061")	A.R.
	14-P-65-3	Bearing Adjusting Spacer (.064"-.066")	A.R.
	14-P-65-4	Bearing Adjusting Spacer (.069"-.071")	A.R.
	14-P-65-5	Bearing Adjusting Spacer (.074"-.076")	A.R.
16	378452-7	Set Screw (.250"-20 x .500").....	1
17	See Chart Pg. 9	Gear, Output	1
	See Chart Pg.19	Driveshaft and Clutch Assembly (Includes items 18 thru 28)	1
	328926-1X	"XD" Output/Ass'y 4 & 6 (1.250" round)	
	328926-2X	"XD" Output/Ass'y 3 & 5 (1.250" round)	
18	3-P-677	Output Shaft ("XD" Ass'y 4)	1 or
	3-P-679	Output Shaft ("XD" Ass'y 5)	1
19	379746	Snap Ring	1
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	28-P-244	O-Ring	2
25	380057	Piston	1
26	28-P-178	O-Ring	1
27	379323	Clutch Back-up Cylinder	1
28	378576	Snap Ring	1
29	14-P-49	Spacer	1
30	560918	Roller Bearing	2
31	31-P-57	Thrust Washer.....	1
32	550010	Ball Bearing	2
34		Bearing Cover, Open End	1
	21-P-451	For 3 & 5 Assembly	
	21-P-297	For 4 & 6 Assembly	
35	28-P-225	Oil Seal, Output	1
	28-P-230	Oil Seal, Output ("XY")	1
36	22-P-53	Gasket, Bearing Cover.....	2
		Bearing Cover Assembly, Closed End	1
	328806-1X	For 3 & 5 Assembly (Includes items 37 thru 40)	
	328807-1X	For 4 & 6 Assembly (Includes items 37 thru 40)	
37		Bearing Cover, Closed End	1
	21-P-295	For 3 & 5 Assembly	
	21-P-449	For 4 & 6 Assembly	
38	28-P-179	Oil Seal	1

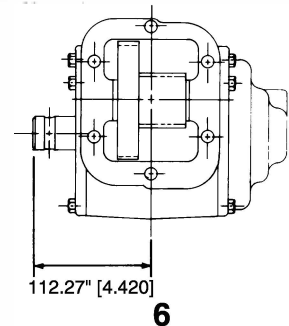
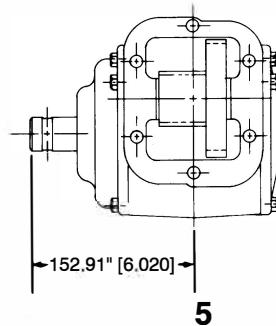
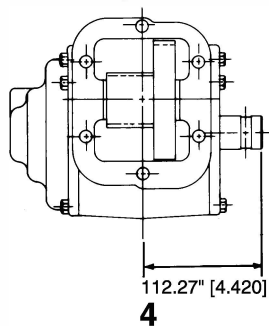
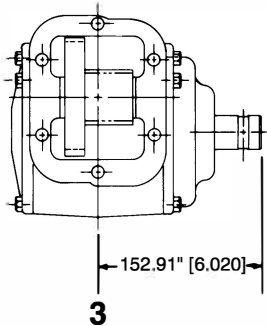
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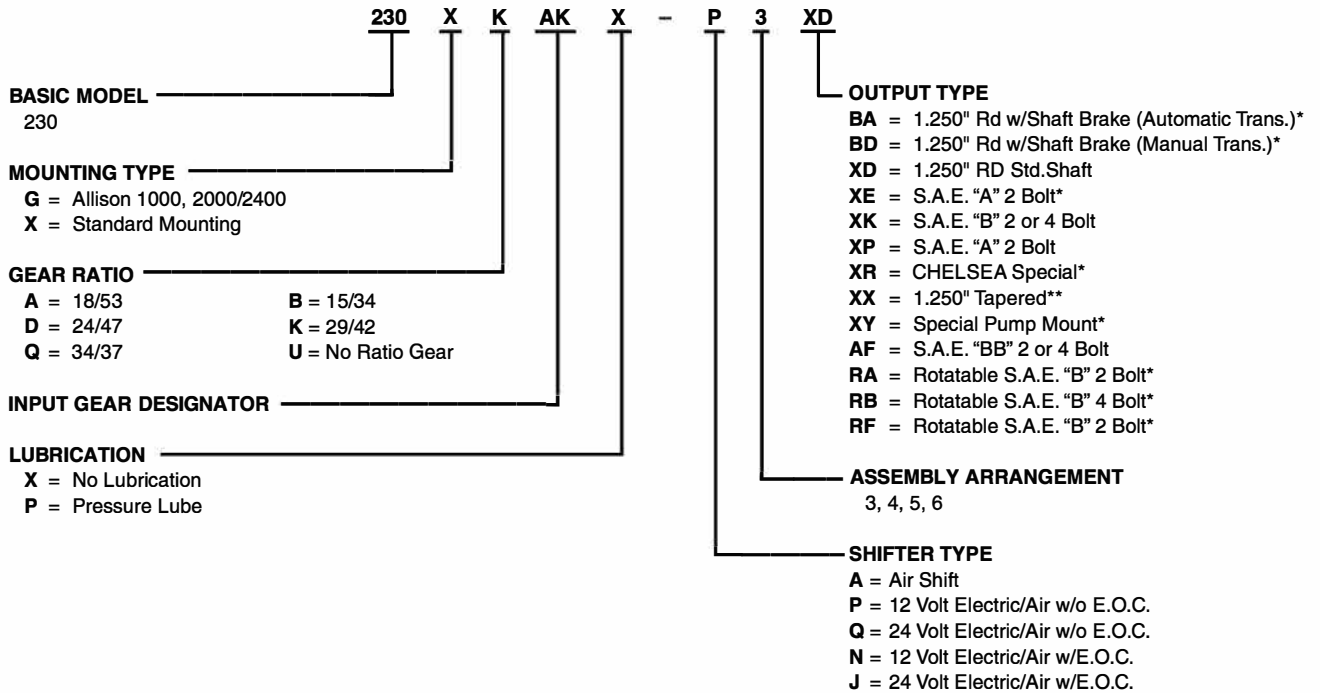
Item	Part Number	Description	Quantity
39	378811	Back-up Plate.....	1
40	378849	Snap Ring.....	1
41	378430-10	Capscrew, Hex Head (.3125" - 18 x 1.000") (Ass'y 4 & 6, Standard Shaft).....	4
42	378430-12	Capscrew, Hex Head (.3125" - 18 x 1.250") (Ass'y 3 & 5, Standard Shaft).....	4
43	378430-10	Capscrew, Hex Head (.3125" - 18 x 1.000") (Closed Ass'y 3 & 5).....	4
44	378430-12	Capscrew, Hex Head (.3125" - 18 x 1.250") (Closed Ass'y 4 & 6).....	4
45	28-P-171	O-Ring.....	2
46	379243	Speed Sensor (Transducer) Included w/optional Overspeed Control.....	1 or
	379917	Speed Sensor (Transducer) Included w/optional Overspeed Control (Allison 1000, 2000/2400).....	1
47	379242	Adapter Plug With Speed Limiter.....	1
		Without Speed Limiter.....	2
48	379231	Pipe Plug (.125" - 27 N.P.T.F.) With Speed Limiter.....	1
		Without Speed Limiter.....	2
LOOSE PARTS			
49	328950-6X	Mounting Gasket and Installation Instructions	
	35-P-9-1	Mounting Gasket (.010").....	2
	35-P-9-2	Mounting Gasket (.020").....	2
N.S.	7170-103X	Mounting Parts Kit (Allison 1000, 2000/2400).....	1 or
	328170-101X	Mounting Parts Kit (Includes items 51 thru 56).....	1
51	379457-13	Shoulder Stud (.375"-16, .375"-24 x 1.750").....	1
52	379423-16	Stud (.375"-16, .375"-24 x 1.875").....	2
53	379423-14	Stud (.375"-16, .375"-24 x 1.750").....	2
54	379224	Tab Lockwasher (.438").....	1
55	379744	Flange Nut (.375"-24).....	5
56	378935	Capscrew, Hex Head (.375"-16 x 3.125").....	1
57	500007-29	Woodruff Key.....	1
58	328075X	Pressure Lube Hose.....	1
59		For Item 59 see application pages for correct fittings	
	378840	Street Tee, Allison AT Series and 1000 Series w/ #3 Bell Housing.....	1
	378880	Street Tee, Allison MT Series 1975 & After.....	1
	378970	Street Tee, Allison AT Series 1974 & Before and 1000/2000/2400 w/ #2 Bell Housing.....	1
	378897	Street Tee, Allison CLT, CLBT & HT Series.....	1
SERVICE KITS			
	329043-1X	Service Kit for Bearing, Seal, Gasket & Clutch Pack Replacement Kit.....	1
	329043-2X	Service for Bearing, Seal, Gasket & Clutch Pack with Piston and Backup Cylinder Sub Ass'y.....	1
	329043-3X	Service Kit for Seal, Gasket and Clutch pack w/Piston and Backup Cylinder.....	1
	329043-11X	Overhaul Kit, "BD" 3 & 5 Ass'y, Brake Section Only.....	1
	329043-13X	Gasket & Seal Kit, "BD".....	1
	329043-20X	Overhaul Kit, "BA" 3 & 5 Ass'y.....	1
	328356-55X	Gasket & Seal Kit.....	1

Assembly Arrangements

N.S. — Not Shown

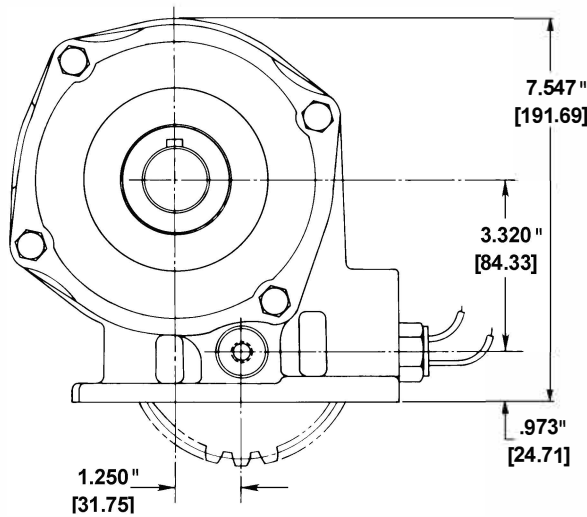


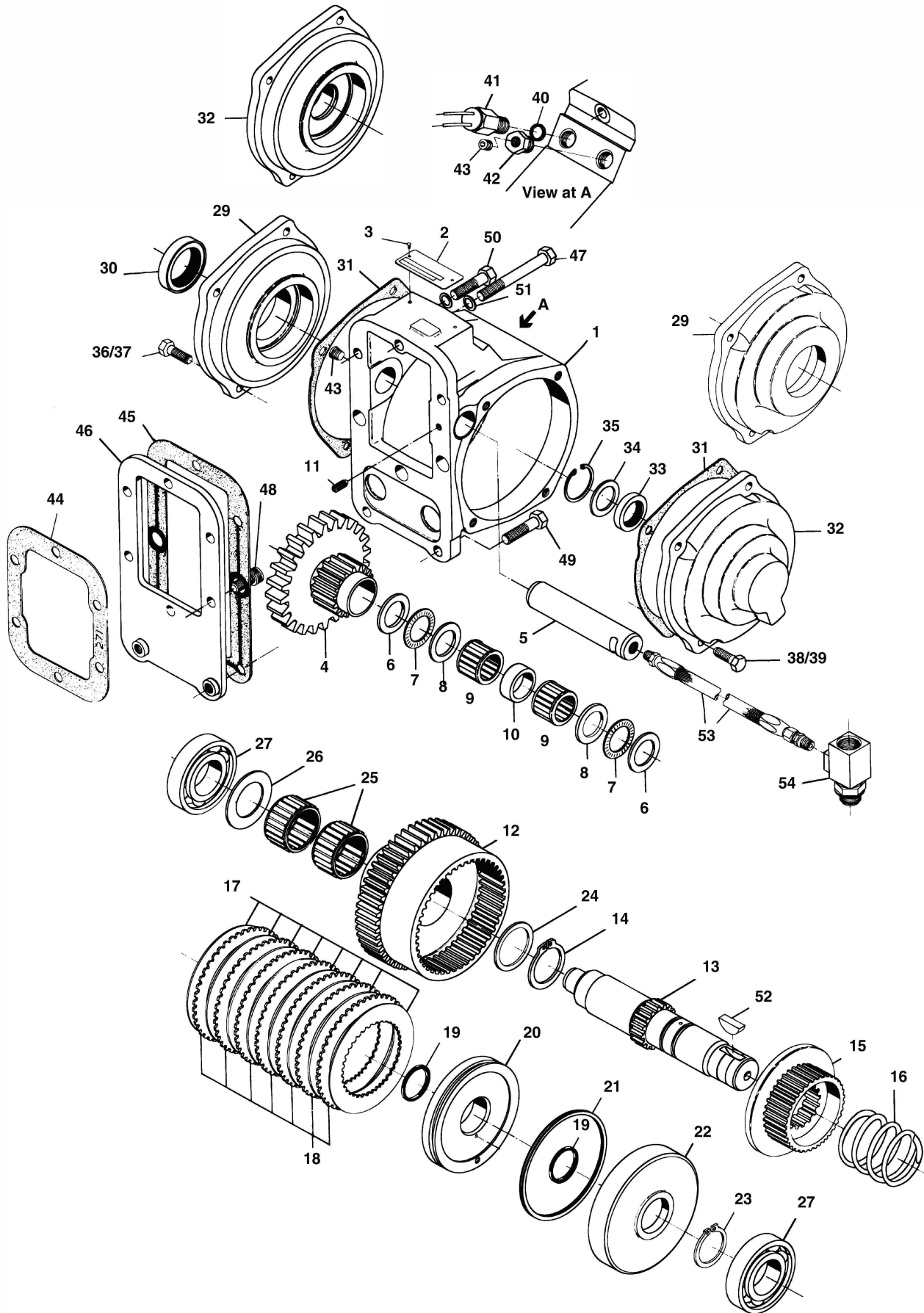
230 Model Number Designation



* Only available in 3 & 5 assembly arrangements
** Uses Spicer® 3-1-604 Companion Flange

Case Dimensions





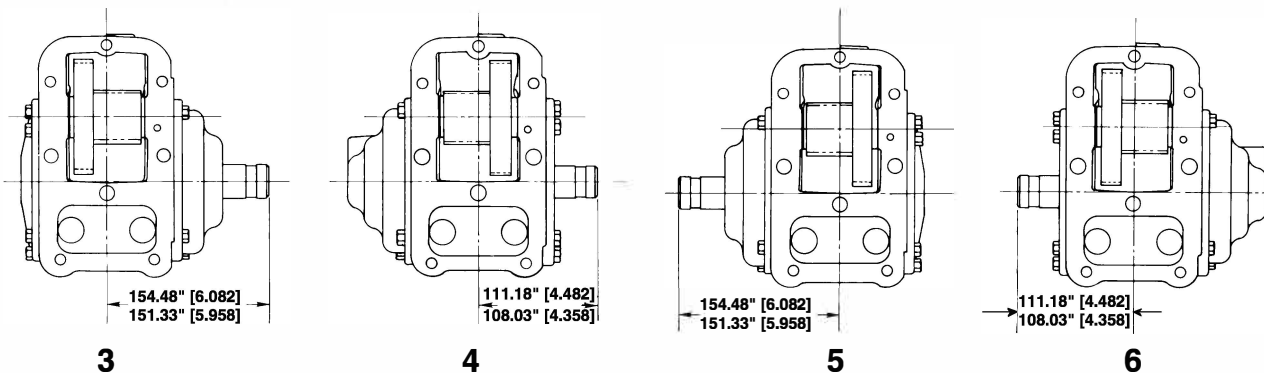
Item	Part Number	Description	Quantity
1	1-P-436	Housing	1
2	68-P-2	Name Plate	1
3	378422	Drive Screw	2
4	See Chart Pg. 9	Gear, Input	1
5	9-P-55	Idler Shaft (Standard No Pressure Lube).....	1 or
	9-P-54	Idler Shaft (Pressure Lube)	
6	31-P-61	Thrust Washer (Idler Shaft .031").....	2
7	560920	Roller Bearing (Idler Shaft).....	2
8	31-P-62	Thrust Washer (Idler Shaft .125").....	2
9	550886	Needle Bearing Assembly (Idler Shaft).....	2
10	14-P-54	Spacer, Needle Bearing (Idler Shaft)	1
11	378452-4	Set Screw (.250" - 20 x .312")	1
12	See Chart Pg. 9	Gear, Output.....	1
	See Chart Pg. 19	Driveshaft and Clutch Assembly (Includes items 13 thru 23)	1
	328926-1X	"XD" Output/Ass'y 4 & 6 (1.250" round)	
	328926-2X	"XD" Output/Ass'y 3 & 5 (1.250" round)	
13	3-P-677	Output Shaft ("XD" Ass'y 4).....	1 or
	3-P-679	Output Shaft ("XD" Ass'y 5).....	1
14	379746	Snap Ring	1
15	2-P-458	Inner Clutch Gear.....	1
16	37-P-39	Clutch Spring.....	1
17	379485	Friction Disc.....	8
18	379595	Clutch Plate.....	7
19	28-P-244	O-Ring.....	2
20	380057	Piston	1
21	28-P-178	O-Ring.....	1
22	379323	Clutch Back-up Cylinder.....	1
23	378576	Snap Ring	1
24	14-P-49	Spacer, Needle Bearing	1
25	560918	Roller Bearing	2
26	31-P-57	Thrust Washer.....	1
27	550010	Ball Bearing.....	2
29		Bearing Cover, Open End	1
	21-P-451	For 3 & 5 Assembly	
	21-P-297	For 4 & 6 Assembly	
30	28-P-225	Oil Seal, Output.....	1
	28-P-230	Oil Seal, Output ("XY")	1
31	22-P-53	Gasket, Bearing Cover.....	2
		Bearing Cover Assembly, Closed End	1
	328806-1X	For 3 & 5 Assembly (Includes items 32 thru 35)	
	328807-1X	For 4 & 6 Assembly (Includes items 32 thru 35)	
32		Bearing Cover, Closed End	1
	21-P-295	For 3 & 5 Assembly	
	21-P-449	For 4 & 6 Assembly	
33	28-P-179	Oil Seal.....	1
34	378811	Back-up Plate	1
35	378849	Snap Ring	1
36	378430-10	Capscrew, Hex Head (.312" - 18 x 1.000") (Ass'y 4 & 6, Standard Shaft)	4
37	378430-12	Capscrew, Hex Head (.312" - 18 x 1.250") (Ass'y 3 & 5, Standard Shaft)	4
38	378430-10	Capscrew, Hex Head (.312" - 18 x 1.000") (Closed Ass'y 3 & 5)	4
39	378430-12	Capscrew, Hex Head (.312" - 18 x 1.250") (Closed Ass'y 4 & 6)	4
40	28-P-171	O-Ring (Speed Sensor)	2
41	379243	Speed Sensor (Transducer) Included w/optional Overspeed Control	1 or
	379917	Speed Sensor (Transducer) Included w/optional Overspeed Control	1

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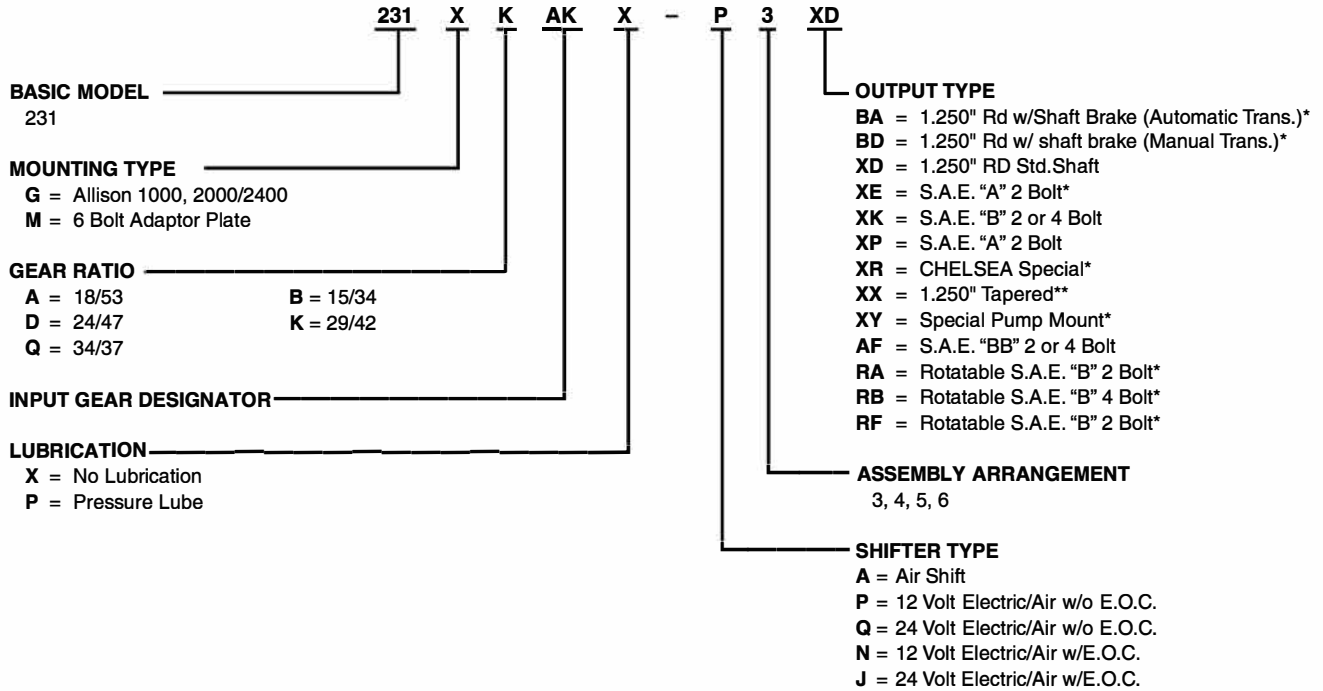
Item	Part Number	Description	Quantity
42	379242	(Allison 1000, 2000/2400) O-Ring Boss Plug With Speed Limiter.....	1
		Without Speed Limiter.....	2
43	379231	Pipe Plug (.125" - 27 N.P.T.F.) With Speed Limiter.....	1
		Without Speed Limiter.....	2
		LOOSE PARTS	
	328948-5X	Mounting Gasket and Installation Instructions	
44	35-P-69	Mounting Gasket	1
45	35-P-84	Mounting Gasket	1
N.S.	N.S.S.	Caution Label Kit.....	1
N.S.	N.S.S.	Owners Manual	1
	329150X	Adapter Plate Assembly (6 Bolt)	1
46	26-P-56	Adapter Plate	
N.S.	379608	Caution Tag	
N.S.	378448-5	Capscrew, Socket Head (.375" - 16 x .875") (Adapter Plate).....	3
N.S.	7171-104X	Mounting Parts Kit (Allison 1000, 2000/2400).....	1 or
	7170-74X	Mounting Parts Kit (Includes items 47 thru 51).....	1
47	378431-27	Capscrew, Hex Head (.375"-16 x 3.250").....	1
48	379433-6	Capscrew, Socket Head (.375"-16 x 1.000")	3
49	378431-11	Capscrew, Hex Head (.375"-16 x 1.125").....	2
50	379286-15	Capscrew, Hex Head (.375"-16 x 1.625").....	2
51	378774	Tab Lockwasher.....	5
52	500007-29	Woodruff Key.....	1
53	328075X	Pressure Lube Hose	1
54		For Item 54 see application pages for correct fittings	
	378840	Street Tee, Allison AT Series and 1000 Series w/ #3 Bell Housing	1
	378880	Street Tee, Allison MT Series 1975 & After	1
	378970	Street Tee, Allison AT Series 1974 & Before and 1000/2000/2400 w/ #2 Bell Housing	1
	378897	Street Tee, Allison CLT, CLBT & HT Series.....	1
	328748X	Pump Mounting Kit (XR output only).....	1
		SERVICE KITS	
	329043-1X	Service Kit for Bearing, Seal, Gasket & Clutch Pack Replacement Kit.....	1
	329043-2X	Service for Bearing, Seal, Gasket & Clutch Pack with Piston and Backup Cylinder Sub Ass'y	1
	329043-3X	Service Kit for Seal, Gasket and Clutch pack w/ Piston and Backup Cylinder	1
	329043-11X	Overhaul Kit, "BD" 3 & 5 Ass'y, Brake Section Only	1
	329043-13X	Gasket & Seal Kit, "BD"	1
	329043-20X	Overhaul Kit, "BA" 3 & 5 Ass'y.....	1
	328356-56X	Gasket & Seal Kit	1

N.S. — Not Shown

Assembly Arrangements

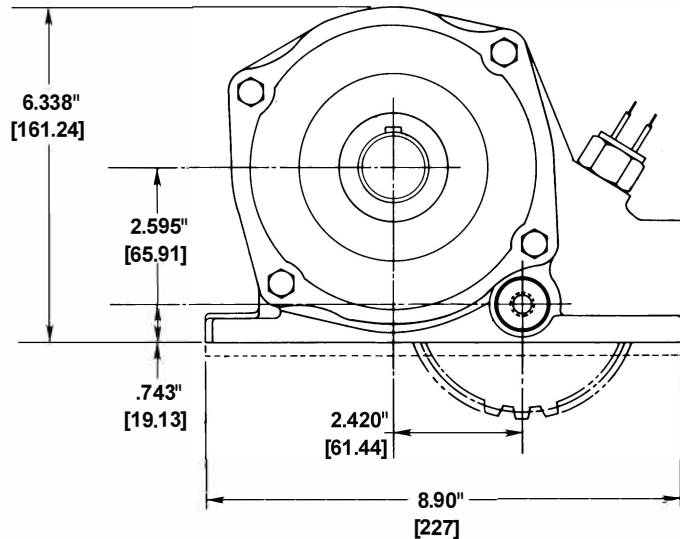


231 Model Number Designation



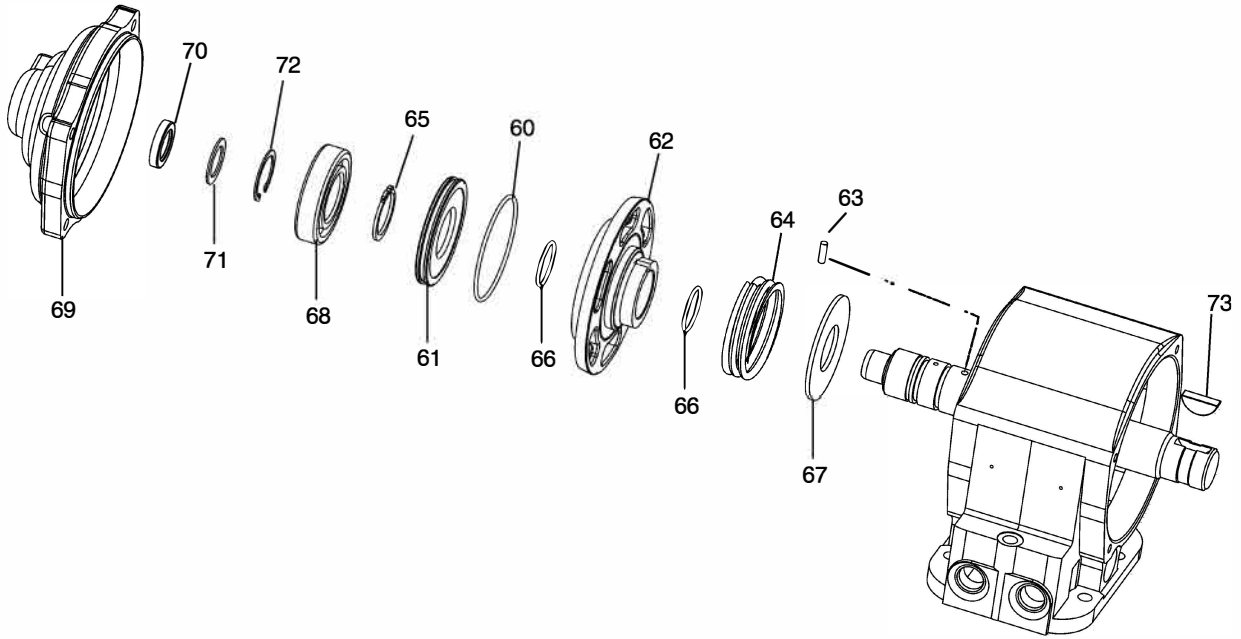
* Only available in 3 & 5 assembly arrangements
** Uses Spicer® 3-1-604 Companion Flange

Case Dimensions



Gear Chart

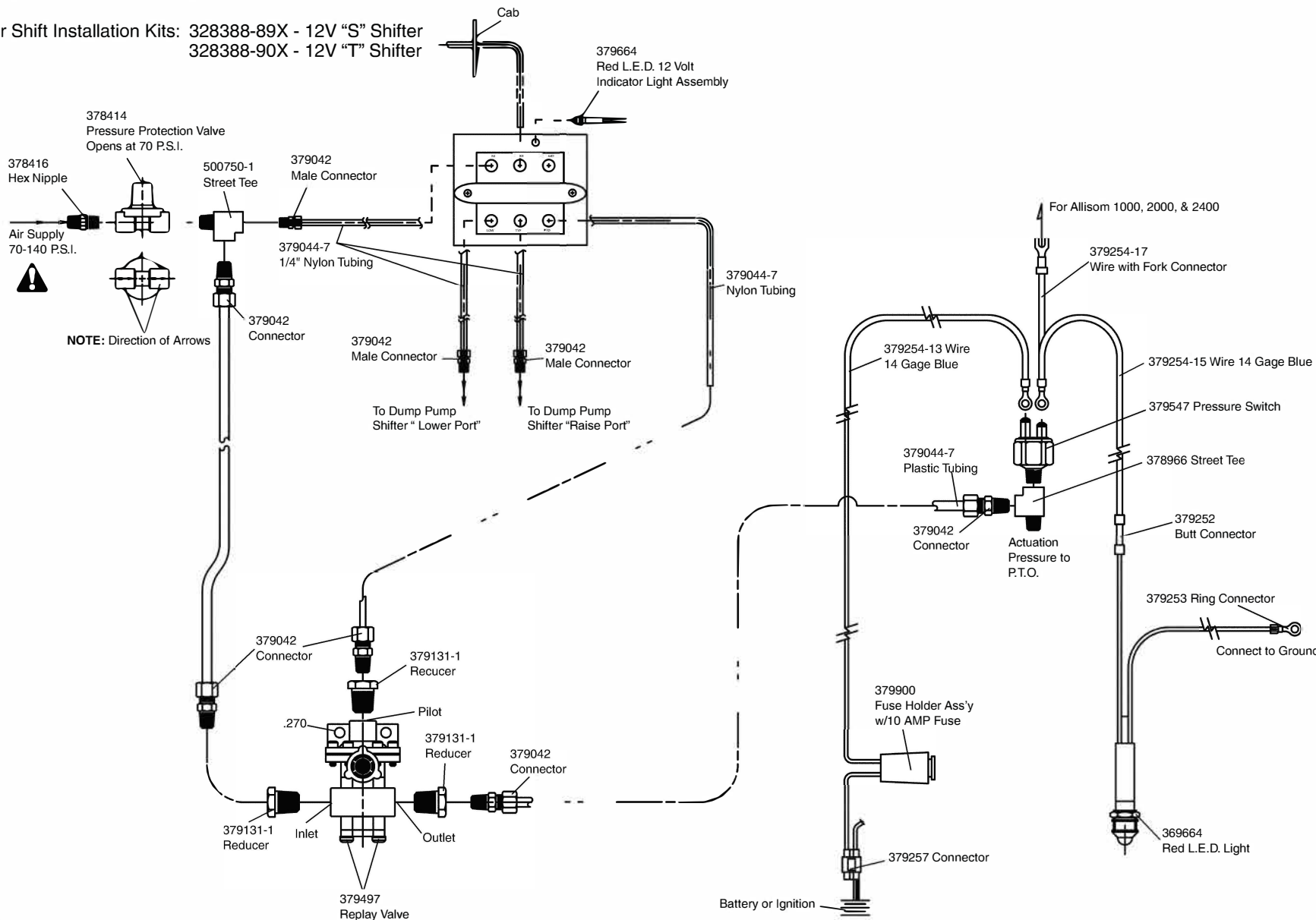
Model Number	Input Gear Item 4			Gear Type	Output Gear Item 17	
	Input Gear Part Number	No. Teeth Lg. Cluster	No. Teeth Sm. Cluster		Output Gear Part Number	No. Teeth
230*AAH	5-P-546	25	18	Spur	2-P-473	53
230*AAJ	5-P-567	25	18	Spur	2-P-473	53
230*AAK	5-P-548	25	18	Spur	2-P-473	53
230*AHV	5-P-1295	27	18	Spur	2-P-473	53
230*ADA	5-P-1370	27	18	Spur	2-P-473	53
230*BAH	5-P-547	25	15	Spur	2-P-481	34
230*BAJ	5-P-568	25	15	Spur	2-P-481	34
230*BHV	5-P-1296	27	15	Spur	2-P-481	34
230*BDA	5-P-1371	27	15	Spur	2-P-481	34
230*DAJ	5-P-695	25	24	Spur	2-P-606	47
230*DAK	5-P-807	25	24	Spur	2-P-606	47
230*DHV	5-P-1297	27	20	Spur	2-P-606	47
230*DDA	5-P-1372	27	24	Spur	2-P-606	47
230*KAJ	5-P-769	25	29	Spur	2-P-638	42
230*KDA	5-P-843	27	29	Spur	2-P-638	42
230*QAJ	5-P-770	25	34	Spur	2-P-639	37
230*QDA	5-P-844	27	34	Spur	2-P-639	37
230*UAJ	5-P-1144	25		Spur	2-P-640	17
230*UDB	5-P-995	43		Spur	2-P-748	29
231*AAH	5-P-546	25	18	Spur	2-P-473	53
231*AAJ	5-P-567	25	18	Spur	2-P-473	53
231*AAK	5-P-548	25	18	Spur	2-P-473	53
231*AHV	5-P-1295	27	18	Spur	2-P-473	53
231*BAH	5-P-547	25	15	Spur	2-P-481	34
231*BAJ	5-P-568	25	15	Spur	2-P-481	34
231*BHV	5-P-1296	27	15	Spur	2-P-481	34
231*DAJ	5-P-695	25	24	Spur	2-P-606	47
231*DAK	5-P-807	25	24	Spur	2-P-606	47
231*DHV	5-P-1297	27	24	Spur	2-P-606	47
231*KAK	5-P-881	25	29	Spur	2-P-638	42
231*KAJ	5-P-769	25	29	Spur	2-P-638	42
231*QAJ	5-P-770	25	34	Spur	2-P-639	37



Item	Part Number	Description	Quantity
	329410X	Brake Assembly ("BA" or "BD" 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" & "BD" Output).....	1
64	37-P-24	Spring, Manual Transmissions ("BD" Output)	1 or
	37-P-60	Spring, Automatic Transmissions ("BA" Output)	
65	378576	Retaining Ring, ("BA" & "BD" Output)	1
66	28-P-244	O-Ring, ("BA" & "BD" Output)	2
67	31-P-113	Thrust Washer ("BA" & "BD" Output Shaft).....	1
68	550010	Ball Bearing	1
	328807-3X	Bearing Cap Sub Assembly (Closed End 3 & 5, "BA" & "BD")	
69	21-P-670	Bearing Cap	1
70	28-P-179	Oil Seal	1
71	378811	Back-up Plate	1
72	278849	Retainer Ring.....	1
73	500007-29	Woodruff Key ("XD", "BA" & "BD" Outputs Only).....	1

Kits (Order Separately)
 329336-1X - J1-6 Feedback Kit

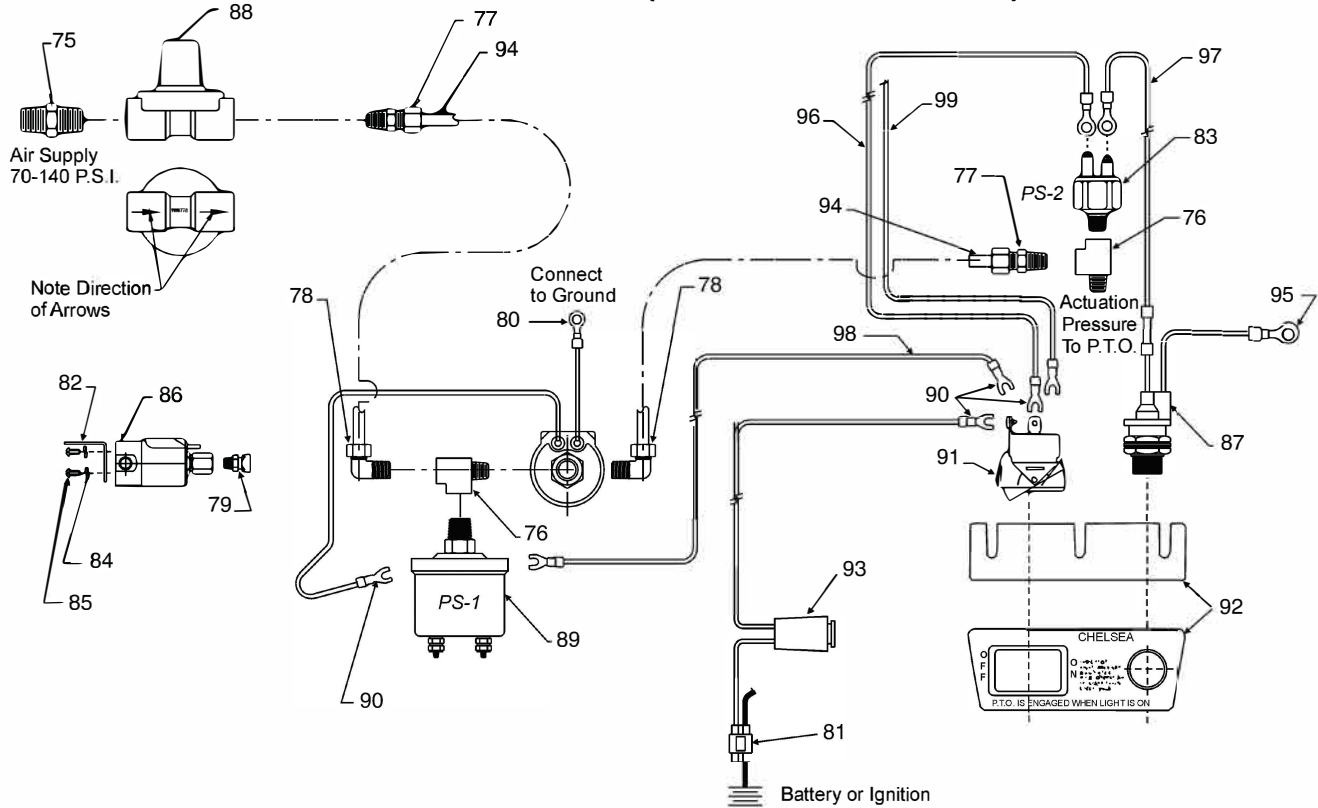
Air Shift Installation Kits: 328388-89X - 12V "S" Shifter
 328388-90X - 12V "T" Shifter



NOTE: Direction of Arrows

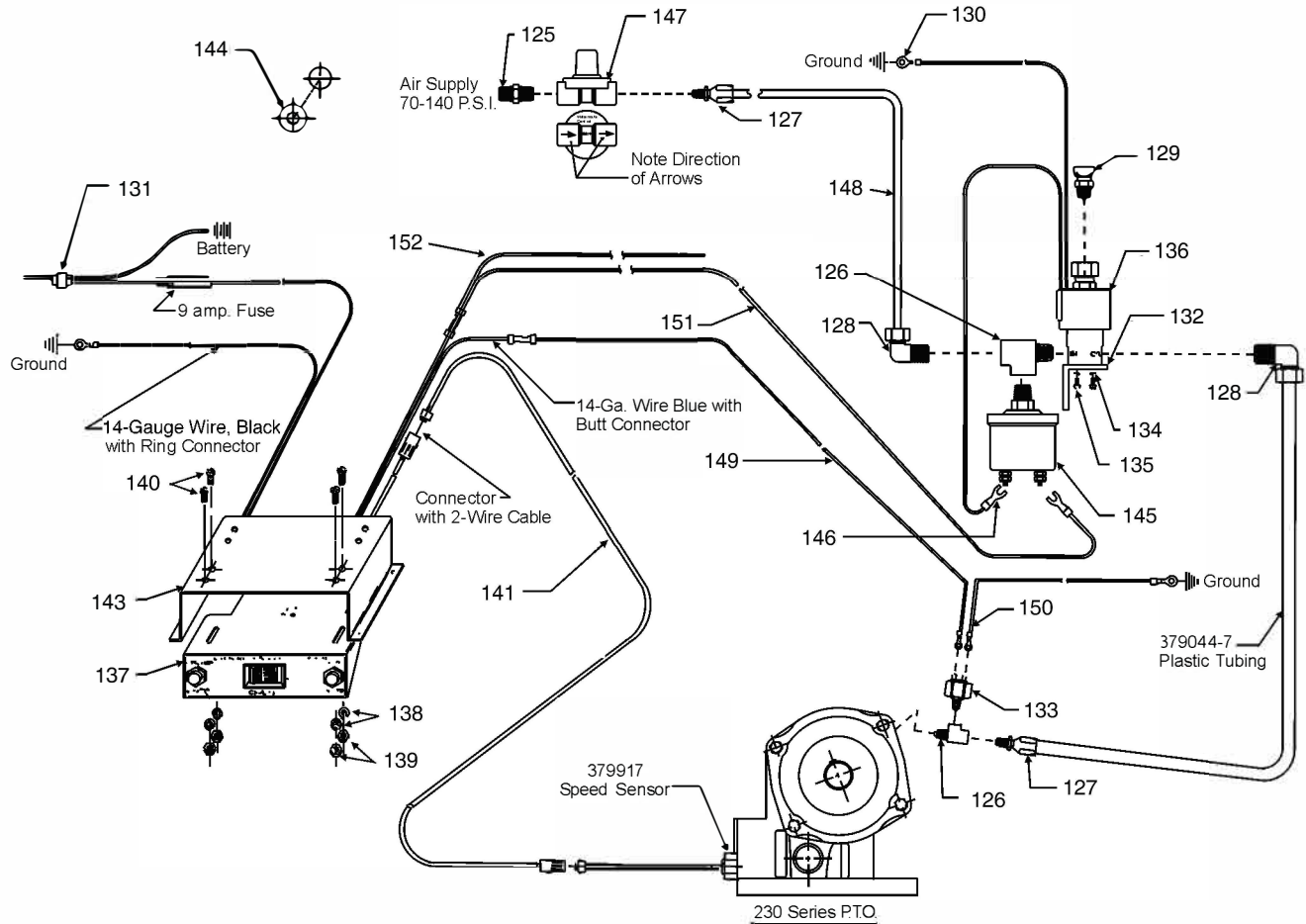
Warning: Connect directly to air supply. Do not use tubing between air supply and pressure protection valve.
Caution: When installing nylon tubing avoid sharp angles, exhaust and manifold systems.

Air Shift Installation Sketch without E.O.C. (Allison 1000, 2000/2400)



Item	Part Number	Description	Quantity
	328388-50X	12 Volt Air Shift Installation Kit without E.O.C. (Includes items 71 thru 94)1 or
	328388-51X	24 Volt Air Shift Installation Kit without E.O.C. (Includes items 71 thru 94)1
	328388-49X	Air Shift Installation Kit (includes items 71 thru 81)1
75	378416	Hex Nipple	1
76	378966	Street Tee	2
77	379042	Male Connector	2
78	379043	Male Elbow	2
79	379106	Breather Atmospheric (.125" - 27 NP).....	1
80	379253	Ring Connector	1
81	379257	Splice Connector	1
82	379258	Mounting Bracket, Solenoid.....	1
83	379547	Pressure Switch	1
84	500357-7	Lockwasher	2
85	500457-6	Mounting Screw.....	2
86	379303-1	Solenoid Valve (12 volt)	1 or
	379303-2	Solenoid Valve (24 volt)	1
87	378978	Indicator Light (12 volt).....	1 or
	379005	Indicator Light (24 volt).....	1
88	378414	Pressure Protection Valve	1
89	379305	Pressure Switch	1
90	379306	Fork Connector.....	4
91	378881	Rocker Switch.....	1
92	379336	Bracket	1
93	379900	Fuse Holder (10 amp.).....	1
94	379044-7	Nylon Tubing (35 ft.)	1
95	379253	Ring Connector	1
96	379254-13	#14 Gauge Blue Wire w/ Ring Connector.....	1
97	379254-15	#14 Gauge Blue Wire w/ Ring and Butt Connector	1
98	379254-8	#14 Gauge Green Wire w/ Fork Connector	1
	329336-1X	Allison 1000, 2000/2400 Series Wire Kit	1
99	379254-17	Wire w/ Fork Connector (Allison 1000, 2000/2400 Series)	1

Air Shift Installation Sketch with E.O.C. (Allison 1000, 2000/2400)



Item	Part Number	Description	Quantity
	328388-52X	12 Volt Air Shift Installation Kit (Includes items 120 thru 148)	1 or
	328388-53X	24 Volt Air Shift Installation Kit (Includes items 120 thru 148)	1
	328388-49X	Air Shift Installation Kit (includes items 120 thru 130)	1
125	378416	Hex Nipple	1
126	378966	Street Tee	2
127	379042	Male Connector	2
128	379043	Male Elbow	2
129	379106	Breather Atmospheric (1/8" - 27 NPT)	1
130	379253	Ring Connector	1
131	379257	Splice Connector	1
132	379258	Mounting Bracket Solenoid	1
133	379547	Pressure Switch	1
134	500357-7	Lockwasher	2
135	500457-6	Mounting Screw	2
136	379303-1	Solenoid Valve (12 volt)	1 or
	379303-2	Solenoid Valve (24 volt)	1
	328924-12X	12 Volt Speed Limiter w/ E.O.C.	1 or
	328924-24X	24 Volt Speed Limiter w/ E.O.C.	1
137	328922-12X	Speed Limiter Control Box (12 volt)	1 or
	328922-24X	Speed Limiter Control Box (24 volt)	1

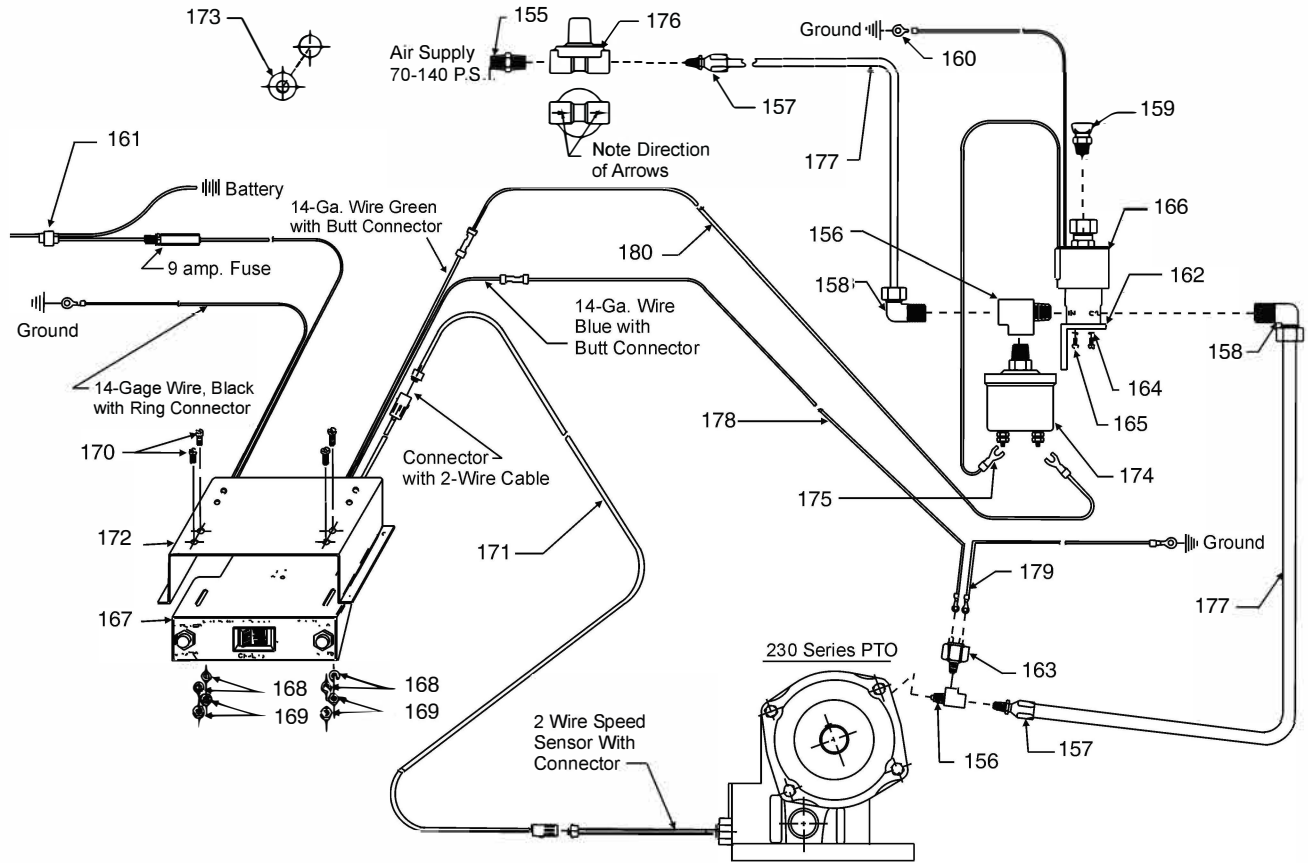
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230/231 Installation Sketch

Item	Part Number	Description	Quantity
	328931X	Parts Bag, Mounting.....	1
138	500357-7	Lockwasher	4
139	500376-6	Hex Nut	4
140	500448-9	Slotted Screw	4
141	328923-10X	Speed Switch Connector Cable (10 Ft.)	1 or
	328923-5X	Speed Switch Connector Cable (5 Ft.) Optional.....	1
143	379244	Universal Mounting Bracket.....	1
N.S.	379260	Caution Tag 12 Volt.....	1 or
N.S.	379261	Caution Tag 24 Volt.....	1
N.S.	379266	E.O.C. Owners Manual 230/231 Series.....	1
N.S.	379318	E.O.C. Screwdriver	1
N.S.	68-P-33-1	Spanish Control Plate.....	1
N.S.	68-P-33-2	French Control Plate.....	1
144	379265	Grommet	1
145	379305	Pressure Switch.....	1
146	379306	Fork Connector.....	4
147	378414	Pressure Protection Valve	1
148	379044-7	Nylon Tubing (35 ft.).....	1
149	379254-13	#14 Gauge Blue Wire w/ Ring Connector.....	1
150	379254-14	#14 Gauge Black Wire w/ 2 Ring Connectors	1
151	379254-8	#14 Gauge Green Wire w/ Fork Connector	1
	329336-2X	Allison 1000, 2000/2400 Series Wire Kit	1
152	379254-18	Wire (Allison 1000, 2000/2400 Series).....	1

N.S. — Not Shown

Air Shift Installation Sketch with E.O.C. (Allison)



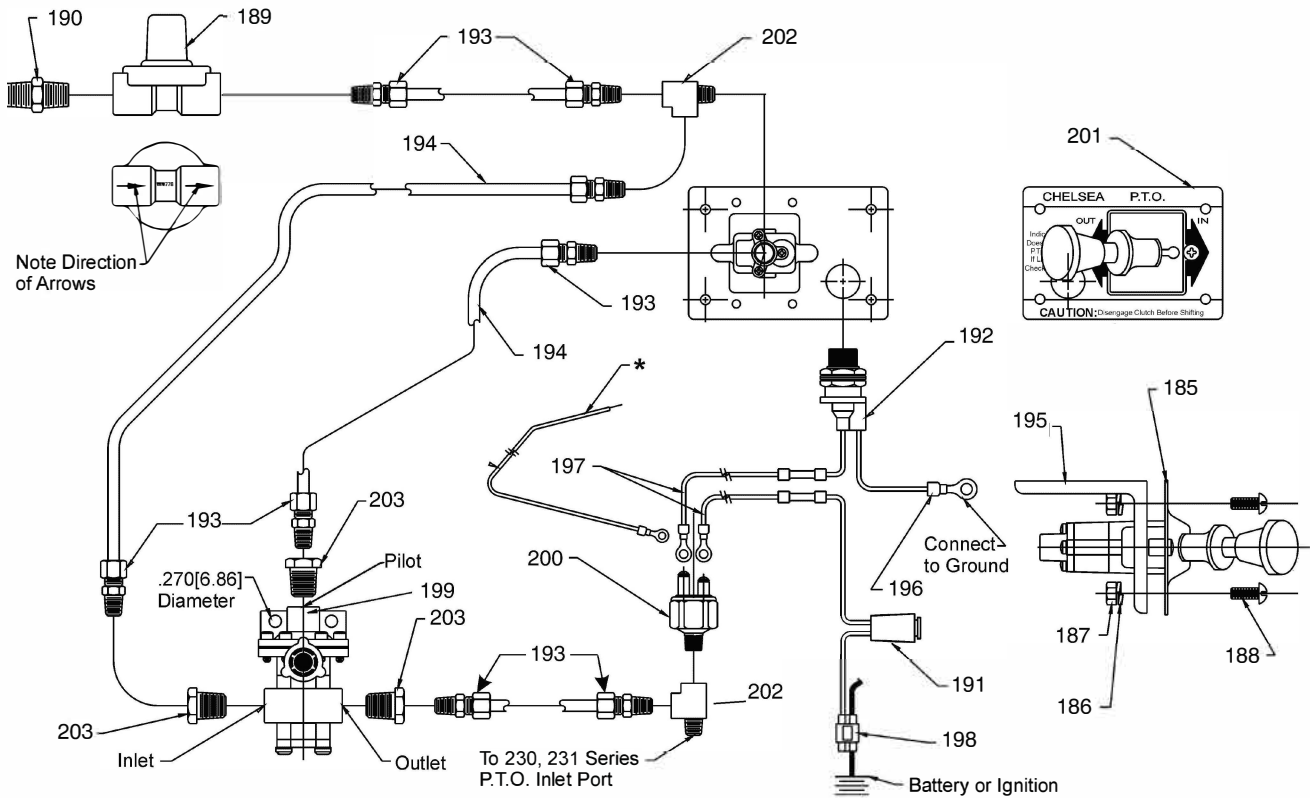
Item	Part Number	Description	Quantity
	328388-52X	12 Volt Air Shift Installation Kit (Includes items 137 thru 163)	1 or
	328388-53X	24 Volt Air Shift Installation Kit (Includes items 137 thru 163)	1
	328388-49X	Air Shift Installation Kit (includes items 137 thru 147)	1
155	378416	Hex Nipple	1
156	378966	Street Tee	2
157	379042	Male Connector	2
158	379043	Male Elbow	2
159	379106	Breather Atmospheric 1/8" - 27 NPT	1
160	379253	Ring Connector	1
161	379257	Splice Connector	1
162	379258	Mounting Bracket Solenoid	1
163	379547	Pressure Switch	1
164	500357-7	Lockwasher	2
165	500457-6	Mounting Screw	2
166	379303-1	Solenoid Valve (12 volt)	1 or
	379303-2	Solenoid Valve (24 volt)	1
	328924-12X	12 Volt Speed Limiter w/ E.O.C.	1 or
	328924-24X	24 Volt Speed Limiter w/ E.O.C.	1
167	328922-12X	Speed Limiter Control Box (12 volt)	1 or
	328922-24X	Speed Limiter Control Box (24 volt)	1
	328931X	Parts Bag, Mounting	1
168	500357-7	Lockwasher	4
169	500376-6	Hex Nut	4

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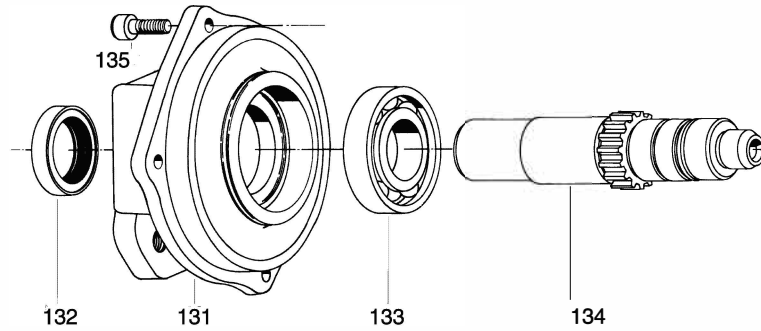
230/231 Installation Sketch

Item	Part Number	Description	Quantity
170	500448-9	Slotted Screw	4
171	328923-10X	Speed Switch Connector Cable (10 Ft.)	1 or
	328923-5X	Speed Switch Conector Cable (5 Ft.) Optional.....	1
172	379244	Universal Mounting Bracket.....	1
N.S.	379260	Caution Tag 12 Volt.....	1 or
N.S.	379261	Caution Tag 24 Volt.....	1
N.S.	379266	E.O.C. Owners Manual 230/231 Series.....	1
N.S.	379318	E.O.C. Screwdriver	1
N.S.	68-P-33-1	Spanish Control Plate.....	1
N.S.	68-P-33-2	French Control Plate.....	1
173	379265	Grommet	1
174	379305	Pressure Switch	1
175	379306	Fork Connector.....	4
176	378414	Pressure Protection Valve	1
177	379044-7	Nylon Tubing (35 ft.)	1
178	379254-13	#14 Gauge Blue Wire w/ Ring Connector.....	1
179	379254-14	#14 Gauge Black Wire w/ 2 Ring Connectors	1
180	379254-8	#14 Gauge Green Wire w/ Fork Connector	1

Air Shift Installation with Pilot Valve



Item	Part Number	Description	Quantity
	328388-57X	Air Shift Installation Kit (with Pilot Valve)	1
185	328863X	Air Valve 2 Position 2 Way	1
	328931X	Parts Bag, Mounting	1
186	500357-7	Lockwasher	4
187	500376-6	Hex Nut.....	4
188	500448-9	Slotted Screw	4
189	378414	Pressure Protection Valve	1
190	378416	Hex Nipple	1
191	379900	Fuse Holder (10 amp).....	1
192	378978	Indicator Light	1
193	379042	Male Connector	8
194	379044-7	Nylon Tubing (35 ft.).....	1
195	379130	Support Bracket.....	2
196	379253	Ring Connector.....	1
197	379254-15	Ring Wire & Butt Connector	2
198	379257	Splice Connector	1
199	379497	Relay Valve	1
200	379547	Pressure Switch.....	1
N.S.	329218X	Indicator Switch Kit.....	1
N.S.	SK-286	Indicator Light Installation Sketch	1
N.S.	379640	Booted Connector.....	1
201	68-P-27	Name Plate.....	1
202	500750-1	Street Tee	2
203	379131-1	Reducer	3
*	329336-3X	Allison 1000, 2000/2400 Series Wire Kit	1
	379254-13	Wire w/Ring Connector (Allison 1000, 2000/2400 Series)	1



Pump Mounting Suffix (See Note)	Flange Item 131	Bearing Cap Gasket	Seal Item 132	Bearing Item 133	Driveshaft & Clutch		Output Shaft Spacer	Hex Socket Head Screw Item 135
					Assembly Number	Output Shaft Item 134 **		
BA Assembly 3 & 5	21-P-451	22-P-53 (2)	28-P-225	550010	328926-13X	3-P-970		378430-12
BD Assembly 3 & 5	21-P-451	22-P-53 (2)	28-P-225	550010	328926-13X	3-P-970		378430-12
XE Assembly 3 & 5	21-P-568	22-P-53 (2)	28-P-225	550010	328926-12X	3-P-964	4-P-183	378447-7
XK Assembly 3 & 5 Assembly 4 & 6	21-P-445	22-P-53 (2)	28-P-225	550010	328926-4X	3-P-686		378447-7
	21-P-303	22-P-53 (2)	28-P-225	550010	328926-3X	3-P-678		378447-6
XP Assembly 3 & 5 Assembly 4 & 6	21-P-443	22-P-53 (2)	28-P-225	550010	328926-4X	3-P-686		378447-7
	21-P-301	22-P-53 (2)	28-P-225	550010	328926-3X	3-P-678		378447-6
XR Assembly 3 & 5 (Only)*	21-P-447	22-P-53 (2)	28-P-225	550010	328926-5X	3-P-703		378447-7
XX Assembly 3 & 5 Assembly 4 & 6	21-P-297	22-P-53 (2)	28-P-225	550010	328926-6X	3-P-787		378430-12
	21-P-297	22-P-53 (2)	28-P-225	550010	328926-7X	3-P-788		378430-10
XY Assembly 3 & 5	21-P-468	22-P-53 (2)	28-P-230	550010	328926-8X	3-P-825		378447-7
AF Assembly 3 & 5 Assembly 4 & 6	21-P-445	22-P-53 (2)	28-P-225	550010	328926-9X	3-P-896		378447-7
	21-P-303	22-P-53 (2)	28-P-225	550010	328926-10X	3-P-895		378447-6
RA Assembly 3 & 5	21-P-628	22-P-53 (2)	28-P-225	550010	328926-5X	3-P-703		378447-6
RB Assembly 3 & 5	21-P-572	22-P-53 (2)	28-P-225	550010	328926-5X	3-P-703		378447-6
RF Assembly 3 & 5	21-P-628	22-P-53 (2)	28-P-225	550010	328926-11X	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 19 thru 29 on page 3

Pump Flange Conv. Kits Bills of Materials 230/231 Series

Conversion Kit Number	Ass'y	Flange Type	Shaft Type
329043-9X	XD to BD	3 & 5	Shaft Brake
329043-19X	XD to BA	3 & 5	Shaft Brake
329160-11X	XD to XK	3 & 5	S.A.E. "B" 2 or 4 Bolt Flange
329160-12X	XD to XP	3 & 5	S.A.E. "A" 2 Bolt (4.188 BC) w/ S.A.E. "B" 4 Bolt (5.0" BC)
329160-13X	XD to XR	3 & 5	For Parker P16 "S" Flange Pumps
329160-14X	XD to XY	3 & 5	DI N5462
329160-15X	XD to XK	4 & 6	S.A.E. "B" 2 or 4 Bolt Flange
329160-16X	XD to XP	4 & 6	S.A.E. "A" 2 Bolt (4.188 BC) w/ S.A.E. "B" 4 Bolt (5.0" BC)
329160-33X	XD to RA	3 & 5	S.A.E. "B" 2 Bolt Rotatable Flange
329160-34X	XD to RB	3 & 5	S.A.E. "B" 4 Bolt Rotatable Flange
329160-35X	XR to RA	3 & 5	S.A.E. "B" 2 Bolt Rotatable Flange
329160-36X	XR to RB	3 & 5	S.A.E. "B" 4 Bolt Rotatable Flange
329160-43X	XD to XX	All	DI N100
329160-46X	XD to RF	3 & 5	S.A.E. "B" 2 Bolt Rotatable Flange
329160-50X	XD to AF	3 & 5	S.A.E. "B" 2 or 4 Bolt Flange
329160-51X	XD to AF	4 & 6	S.A.E. "B" 2 or 4 Bolt Flange
329160-55X	XD to XE	3 & 5	S.A.E. "A" Pilot 2 Bolt
			1.25" Round w/key
			1.25" Round w/key
			S.A.E. "B" .875" 13 - Tooth
			S.A.E. "B" .875" 13 - Tooth
			S.A.E. "B" .875" 13 - Tooth
			DI N5462
			S.A.E. "B" .875" 13 - Tooth
			S.A.E. "B" .875" 13 - Tooth
			S.A.E. "B" .875" 13 - Tooth
			S.A.E. "B" .875" 13 - Tooth
			S.A.E. "B" .875" 13 - Tooth
			Round Tapered w/ key
			S.A.E. "BB" 1.0" 15 - Tooth
			S.A.E. "BB" 1.0" 15 - Tooth
			S.A.E. "BB" 1.0" 15 - Tooth
			S.A.E. .625" 9 - Tooth

Bills of Material for Pump Flange Conversion Kits

Part Number	Description	Quantity
329043-19X	Conversion Kit (XD to BA) 3 & 5 Assembly	
378576	Snap Ring.....	2
379977	Pin	1
550010	Bearing, Roller.....	1
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
328807-3X	Bearing Cap Assembly.....	1
329410X	Brake Assembly.....	1
37-P-60	Spring	1
3-P-970	Pump Shaft.....	1
500007-29	Woodruff Key	1
379746	Snap Ring.....	1
35-P-9-1	Gasket	2
35-P-9-2	Gasket	2
329043-9X	Conversion Kit (XD to BD)	
378576	Snap Ring.....	2
379977	Pin	1
550010	Bearing, Roller.....	1
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
328807-3X	Bearing Cap Assembly.....	1
329410X	Brake Assembly.....	1
37-P-24	Spring	1
3-P-970	Pump Shaft.....	1
500007-29	Woodruff Key	1
379746	Snap Ring.....	1
35-P-9-1	Gasket	2
35-P-9-2	Gasket	2
329160-11X	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

Pump Flange Conv. Kits Bills of Materials

230/231 Series

Part Number	Description	Quantity
28-P-178	O-Ring	1
28-P-179	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-686	Pump Shaft.....	1
329160-12X	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-178	O-Ring	1
28-P-179	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-686	Pump Shaft.....	1
329160-13X	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-178	O-Ring	1
28-P-179	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-703	Pump Shaft.....	1
329160-14X	Conversion Kit (XD to XY)	
378576	Snap Ring.....	1
378849	Retainer Ring	1
378898	Flat Head Socket Capscrew (.438" - 14 x 1.000")	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-178	O-Ring	1
28-P-179	Oil Seal	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
329160-15X	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-178	O-Ring	1
28-P-179	Oil Seal	1
28-P-225	Oil Seal	1
28-P-244	O-Ring	2
378447-6	Socket Head Capscrew (.312" - 18 x 1.000")	4
3-P-678	Pump Shaft.....	1

Pump Flange Conv. Kits Bills of Materials 230/231 Series

Part Number	Description	Quantity
329160-16X	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-178	O-Ring	1
28-P-179	Oil Seal.....	1
28-P-225	Oil Seal.....	1
28-P-244	O-Ring	2
378447-6	Socket Head Capscrew (.312" - 18 x 1.000").....	4
3-P-678	Pump Shaft.....	1
329160-33X	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-178	O-Ring	1
28-P-179	Oil Seal.....	1
28-P-225	Oil Seal.....	1
28-P-244	O-Ring	2
378447-6	Socket Head Capscrew (.312" - 18 x 1.000").....	4
378447-7	Socket Head Capscrew (.312" - 18 x 1.250").....	4
3-P-703	Pump Shaft.....	1
329160-34X	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-178	O-Ring	1
28-P-179	Oil Seal.....	1
28-P-225	Oil Seal.....	1
28-P-244	O-Ring	2
378447-6	Socket Head Capscrew (.312" - 18 x 1.000").....	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 1.000").....	4
329160-36X	Conversion Kit (XR to RB)	
21-P-572	Pump Flange	1
378447-6	Socket Head Capscrew (.312" - 18 x 1.000").....	4
329160-43X	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-178	O-Ring	1
28-P-179	Oil Seal.....	1
28-P-225	Oil Seal.....	1

Pump Flange Conv. Kits Bills of Materials

230/231 Series

Part Number	Description	Quantity
28-P-244	O-Ring	2
378430-10	Hex Capscrew (.312" - 18 x 1.000")	4
378430-12	Hex Capscrew (.312" - 18 x 1.250")	4
3-P-787	Pump Shaft.....	1
3-1-604	Companion Flange (Sold Separately)	1
329160-46X	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-178	O-Ring	1
28-P-179	Oil Seal.....	1
28-P-225	Oil Seal	1
28-P-244	O-Ring	2
378447-6	Socket Head Capscrew (.312" - 18 x 1.000")	4
378447-7	Socket Head Capscrew (.312" - 18 x 1.250")	4
3-P-957	Pump Shaft.....	1
329160-50X	Conversion Kit (XD to AF)	
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-178	O-Ring	1
28-P-179	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
329160-51X	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-178	O-Ring	1
28-P-179	Oil Seal.....	1
28-P-224	Oil Seal.....	2
28-P-225	Oil Seal.....	1
378447-6	Socket Head Capscrew (.312" - 18 x 1.000")	4
3-P-895	Pump Shaft.....	1
329160-55X	Conversion Kit (XD to XE)	
378576	Snap 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-178	O-Ring	1
28-P-179	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

Offer of Sale

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

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

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

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

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

(A) All Power Take-Off units 18 months from date of sale.

(B) Except 267, 269, 277, 278, 246, 247, 250, and 859 series two (2) years from date of installation. **THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO ITEMS PROVIDED HEREUNDER. SELLER MAKES NO OTHER WARRANTY, GUARANTEE, OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED. NOTWITHSTANDING THE FOREGOING, THERE ARE NO WARRANTIES WHATSOEVER ON ITEMS BUILT OR ACQUIRED WHOLLY OR PARTIALLY, TO BUYER'S DESIGNS OR SPECIFICATIONS.**

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

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

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

discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

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

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

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

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

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

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

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