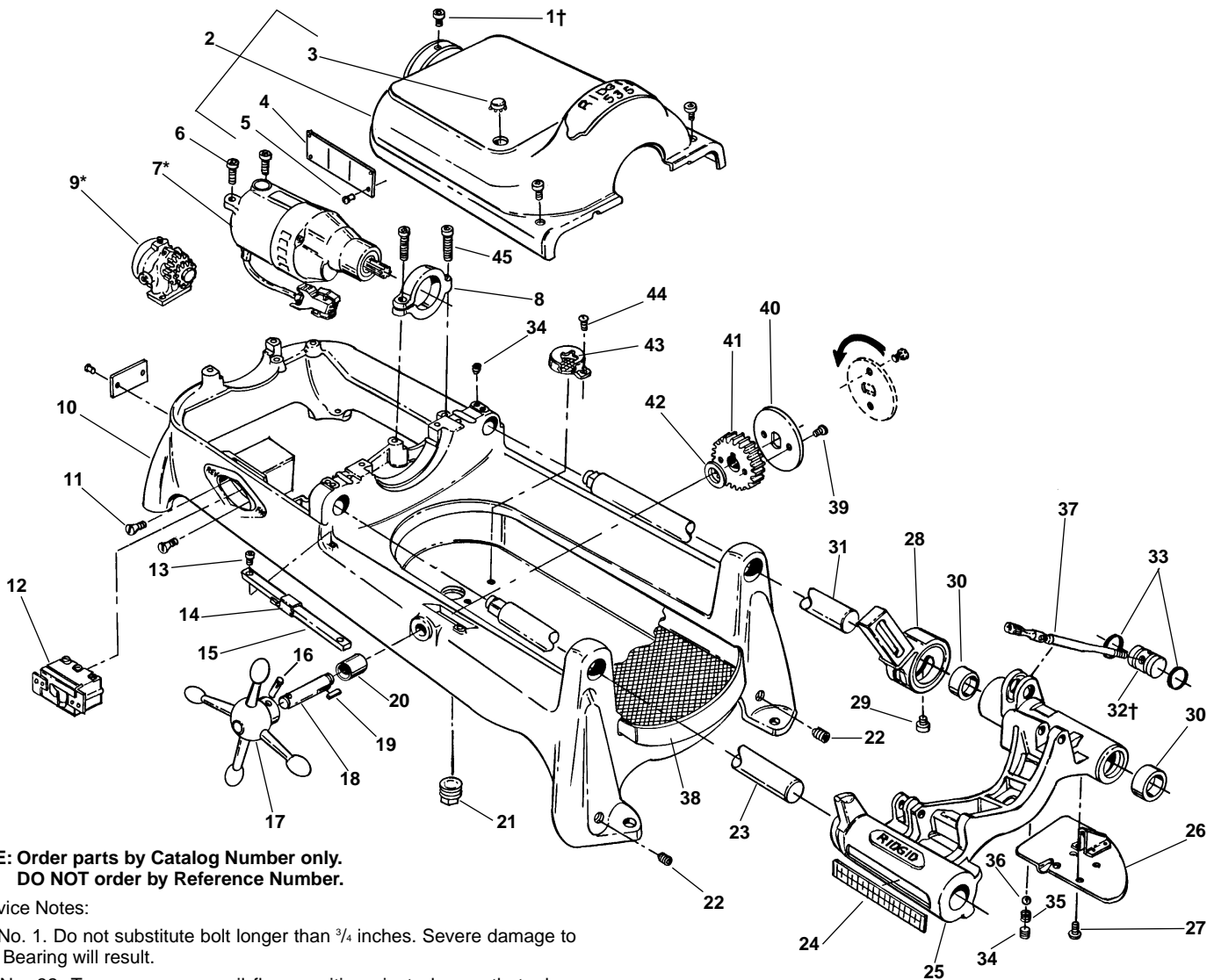


Main Components – Early Style



**NOTE: Order parts by Catalog Number only.
DO NOT order by Reference Number.**

†Service Notes:

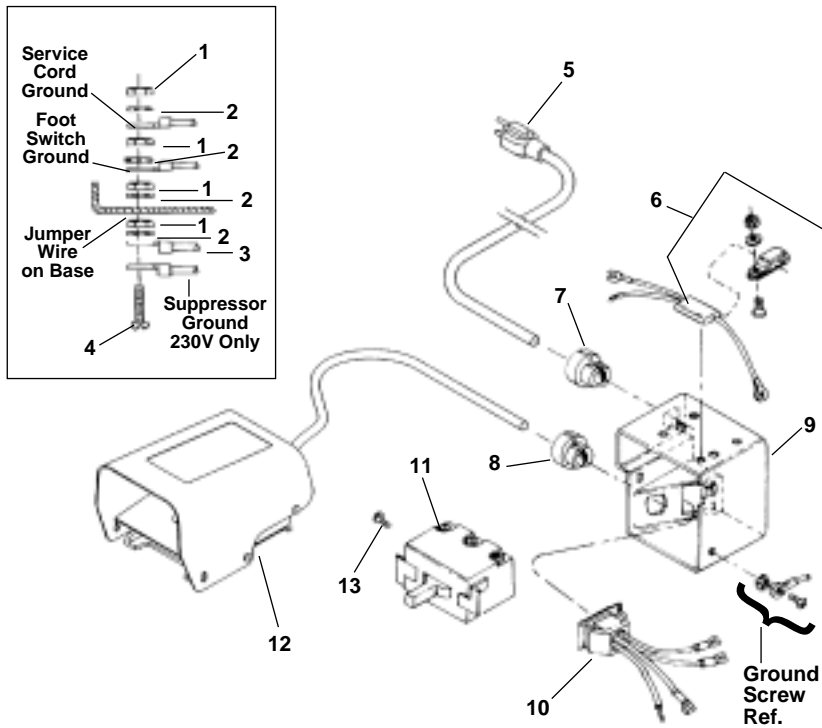
Ref. No. 1. Do not substitute bolt longer than 3/4 inches. Severe damage to Rear Bearing will result.

Ref. No. 32. To assure proper oil flow, position pivot plug so that when spout is in up position, oil flow hole is visible in carriage slot below spout.

Ref. No.	Catalog No.	Description	Ref. No.	Catalog No.	Description
1†	46760	E-900 Screw 3/8" - 16 x 3/4" (3)	24	46370	E-591 Scale
2	43190	B-947 Cover (Incls. Ref. No. 3, 4, 5)	25	62057	Carriage Assy. (Includes Ref. Nos. 24, 26, 27, 28, 29, 30, 34, 35, 36)
3	89310	E-3082 Plug Button	26	45195	E-2963 Drip Plate
4	88690	E-1238 Warning Plate	27	46270	E-5228 Screw 1/4" - 20 x 1/2" Pan Head (4)
5	85920	E-10006 Pop Rivet (8)	28	43690	D-224-2 Cutter Arm
6	46745	E-891 Screw 3/8" - 16 x 1 1/4" (2)	29	44930	E-2398 Screw, 5/16" x 3/32"
7*	88125	Motor Model 1177, 115V	30	46720	E-887 Oil Seal (2)
	88165	Motor Model 2377, 230V	31	45220	E-3027 Support Bar - Rear
8	43795	D-400 Motor Bracket	32†	44340	E-1228 Pivot Plug
9*	47195	Model A Oil Pump	33	44470	E-1373 O-Ring (2)
10	43030	B-268X Base (Incls. Ref. No. 20, 21, 22, 44)	34	46800	E-902 Set Screw 3/8" - 16 x 3/8" (3)
11	45280	E-3144 Screw #8-32 x 5/8" Flat Head (2)	35	46680	E-879 Spring
12	44505	E-1417 Switch	36	46925	E-928 Ball
13	45615	E-4251 Screw #10-32 x 1/2" Flat Head (2)	37	44495	E-1409 Oil Spout Assembly
14	47110	F-636 Indicator Slide	38	43355	B-474 Chip Tray
15	47105	F-635 Indicator Bar	39	46785	E-899 Screw #10-32 x 3/8"
16	47165	F-744 Pin	40	47120	F-639 Lock Plate
17	46510	E-632 Handwheel	41	45430	E-354 Pinion
18	47115	F-638 Pinion Shaft	42	47145	F-677 Spacer
19	46930	E-929 Key 3/16" Square	43	46655	E-856-1-X Filter
20	46540	E-666 Bushing	44	45420	E-3467 Screw #10-24 x 3/8"
21	44485	E-1376-1 Drain Plug	45	44220	E-1088 Screw 3/8" - 16 x 1 1/2"
22	42037	Set Screw 1/2" - 13 x 1/2" (4)			
23	45440	E-356-X Support Bar - Front			

*Refer to Motor Model No./Refer to Model "A" Oil Pump for Component Parts

Electrical Components – Early Style

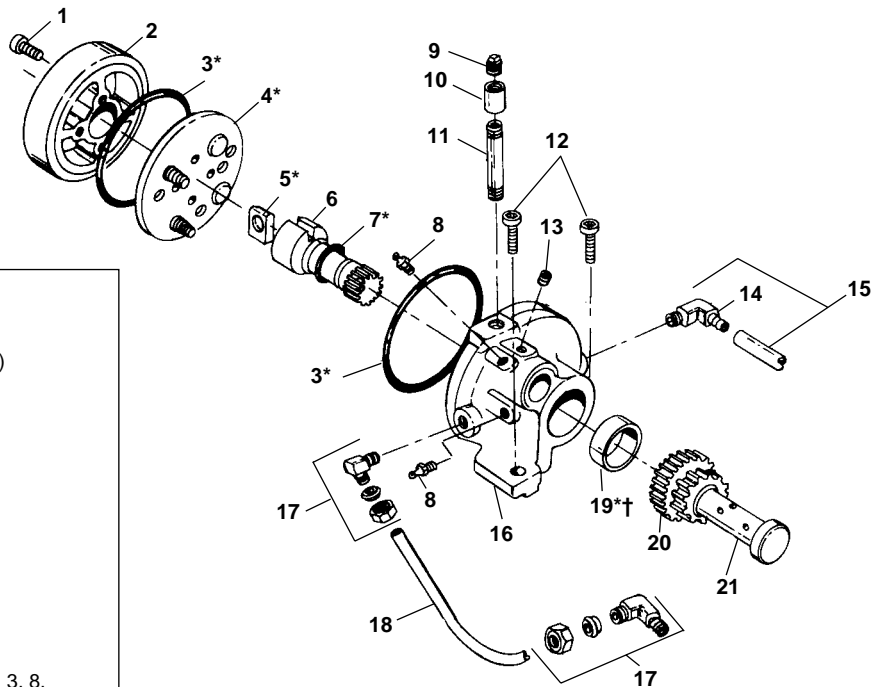


**NOTE: Order parts by Catalog Number only.
DO NOT order by Reference Number.**

Ref. No.	Catalog No.	Description
1	44695	Hex Nut #10 - 24 (4)
2	46985	Ext. Tooth Washer #10 (4)
3	85925	Jumper Wire
4	92455	Screw #10 -24 x 3/4"
5	46740	Power Cord w/Plug (115V)
	46410	Power Cord w/Plug (230V)
	75045	Power Cord less Plug (230V Europe/S. Africa)
6	46320	Suppressor Kit (230V Europe)
	99170	Suppressor (230V S. Africa)
7	46735	Cord Grommet
8	46730	Cord Grommet (230V Europe/S.Africa)
8	46735	Cord Grommet
9	50612	Switch Box
10	50617	Outlet Jumper Assembly
11	44505	Switch
12	36642	B-294 Foot Switch
13	44180	Screw

† Refer to Page 21 for Wiring Diagram.

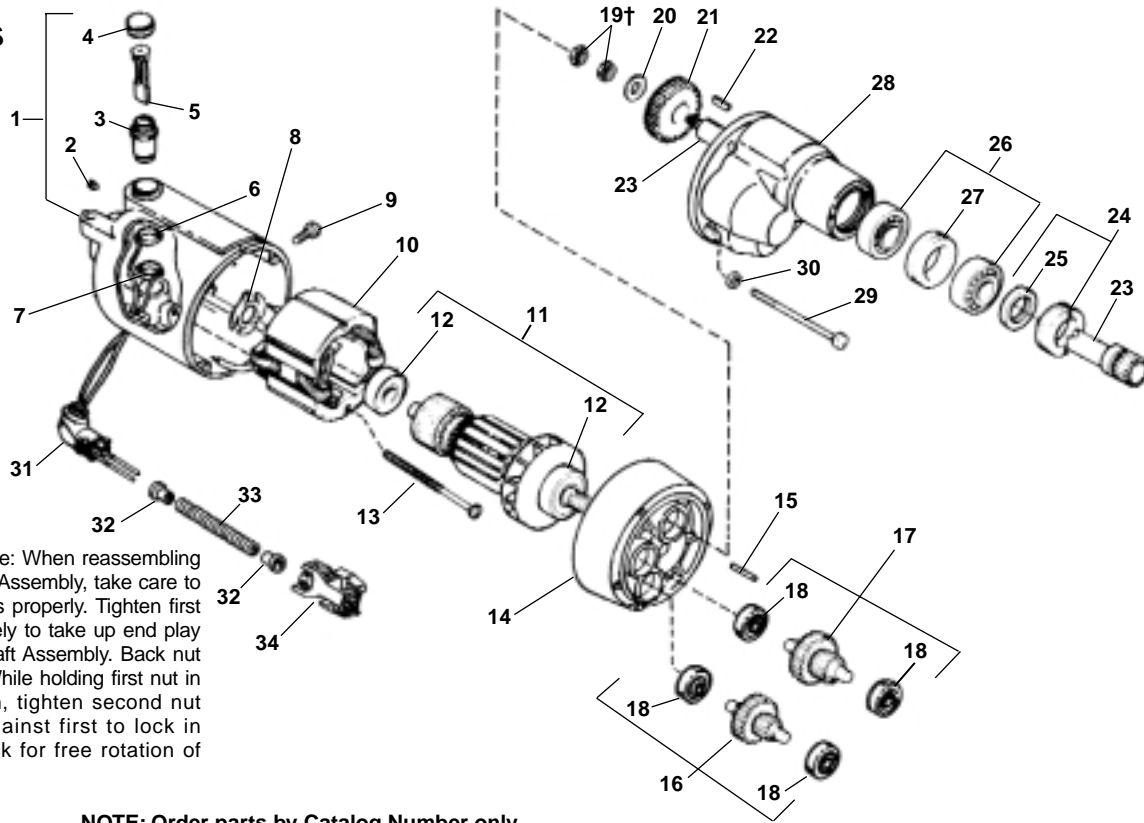
Model "A" Pump



Ref. No.	Catalog No.	Description
—	47195	Pump Complete
1	46770	E-896 Screw #10-32 x 1" SHCS (4)
2	46350	E-557-1 Cover
3*	44650	E-1552 O-Ring (2)
4*	46645	E-850-1X Valve Assembly
5*	47100	F-610 Rotor Blade
6	46355	E-557-2 Pinion Shaft
7*	44645	E-1551 O-Ring
8	46860	E-912 Grease Fitting
9	46815	E-904 Pipe Plug
10	89725	E-1159 Coupling
11	89730	E-3246 Nipple
12	46750	E-892 Screw 3/8"-16 x 1" SHCS (2)
13	44455	E-1370 Set Screw 5/16" x 3/8"
14	87945	E-1325 90° Fitting
15	75065	E-1326X Intake Line
16	43470	C-445-1X Pump Body (Incls. Ref. Nos. 3, 8, 16, 19, Roller Bearing)
17	46840	E-907-1 90° Fitting (2)
18	44105	D-864 Feed Line
19*†	46715	E-886-1 Oil Seal
20	44350	E-1266 Idle Gear
21	44345	E-1265-1 Gear Shaft
—	91055	E-10484 Repair Kit (Includes items marked with *)

†Service Note: When replacing Oil Seal, open side should face towards outside of Pump Body. Use care in installing Seal so that lip is not damaged.

Motors



1157
1177
2357
2377

†Service Note: When reassembling Drive Pinion Assembly, take care to set Jam Nuts properly. Tighten first nut moderately to take up end play in Pinion Shaft Assembly. Back nut off 1/2 turn. While holding first nut in this position, tighten second nut securely against first to lock in place. Check for free rotation of Drive Pinion.

**NOTE: Order parts by Catalog Number only.
DO NOT order by Reference Number.**

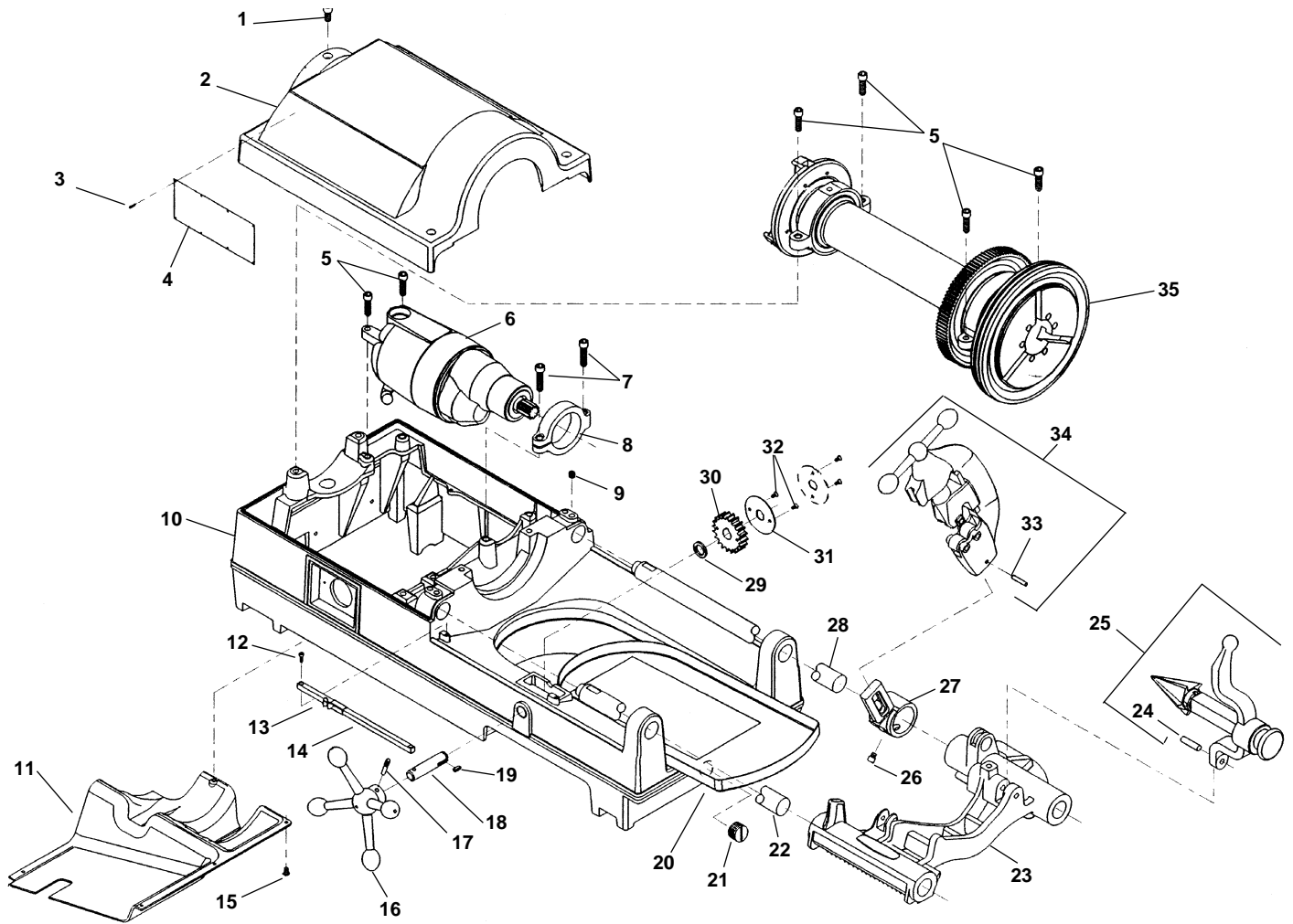
Ref. No.	Catalog No.	Description	Ref. No.	Catalog No.	Description
1	43160	B-822-1X Housing	18	45060	E-2630 Gear Bearing (4)
2	39770	E-3145 Set Screw 1/4" - 20 x 1/4" (2)	19†	40350	E-1721 Lock Nut 3/8" - 24 (2)
3	45025	E-2606 Brush Holder Set	20	45035	E-2610 Washer
4	44545	E-1493-1 Brush Cap Set	21	See Chart	Main Drive Gear
5	44540	E-1491-X Brush Set	22	45015	E-2604 Key 5/32" Sq.
6	87865	E-10144 White Upper Lead	23	44960	E-2596 Drive Pinion
7	87870	E-10145 Red Lower Lead	24	45010	E-2603X Lock Nut w/Seal
8	44580	E-1501 Loading Spring	25	45085	E-2753 Seal
9	83500	E-1749 Screw 1/4" - 20 x 3/4"	26	45040	E-2616-X Bearing Set w/Spacer
10	44015	D-733 Field - 115V	27	45045	E-2618 Spacer
	44035	D-740 Field - 230V	28	43170	B-824 Housing
11	44010	D-696-X Armature - 115V	29	45075	E-2748 Screw 1/4" - 20 x 3"
	44030	D-739-X Armature - 230V	30	45150	E-2887 Lock Washer (4)
12	44565	E-1497 Armature Bearing (2)	31	46900	E-923 Connector 90°
13	44555	E-1495 Mounting Screw (2)		46905	E-923-1 Connector 45°
14	43165	B-823-1X Fan Housing Assembly	32	46890	E-918 Insulator (2)
15	45165	E-2893 Dowel Pin	33	47412	Flexible Conduit
16	See Chart	1st Gear Assembly	34	50552	Plug
17	See Chart	2nd Gear Assembly			

SPEED CHANGE GEAR CHART MACHINE MODEL NO. 400A - 535 - 802

Motor No.	Model No.	Volts	Spindle Speed	Ref. #11	Ref. No. 16 - 1st Intermediate Gear Assembly	Ref. No. 17 - 2nd Intermediate Gear Assembly	Ref. No. 21 Drive Gear
88125 88165	1177 2377	115V 230V	36 STD.	Armature Pinion - 14 T.	PART NO. 44985 (E-2600-X) 51 T. GEAR 12 T. PINION	PART NO. 45005 (E-2601-X) 42 T. GEAR 13 T. PINION	PART NO. 44965 (E-2597) 48 T.
88135 88175	1177A 2377A	115V 230V	54 STD. ON 802		PART NO. 44985 (E-2600-X) 51 T. GEAR 12 T. PINION	PART NO. 44990 (E-2601-AX) 42 T. GEAR 18 T. PINION	PART NO. 44865 (E-1926) 43 T.
88145	1177B	115V	72		PART NO. 44975 (E-2600-BX) 51 T. GEAR 15 T. PINION	PART NO. 44995 (E-2601-BX) 39 T. GEAR 18 T. PINION	PART NO. 44865 (E-1926) 43 T.
88155 88195	1177C 2377C	115V 230V	102		PART NO. 44980 (E-2600-CX) 51 T. GEAR 19 T. PINION	PART NO. 45000 (E-2601-CX) 35 T. GEAR 18 T. PINION	PART NO. 44865 (E-1926) 43 T.

*Supplied with Motor Complete

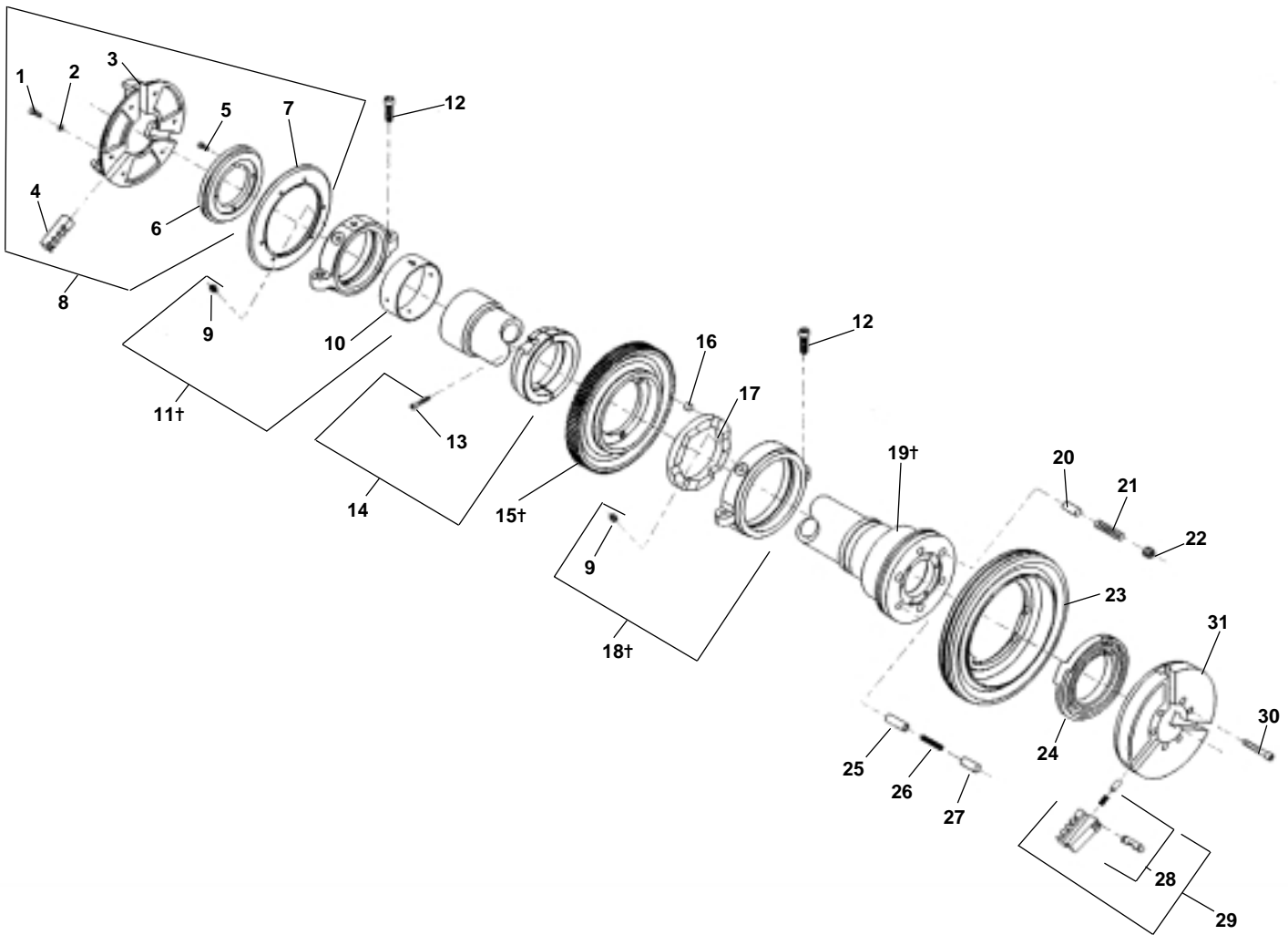
Main Components



**NOTE: Order parts by Catalog Number only.
DO NOT order by Reference Number.**

Ref. No.	Catalog No.	Description	Ref. No.	Catalog No.	Description
1	46760	Screw (3)	18	47115	Pinion Shaft
2	62062	Top Cover	19	46930	Key $\frac{3}{16}$ " Sq. x $\frac{1}{2}$ "
3	85920	Pop Rivet (8)	20	43355	Chip Tray
4	88690	Warning Plate	21	48337	Drain Plug
5	46745	Screw	22	45440	Front Support Bar
6	64447	1194 Motor, 115V, 36 RPM	23	62057	Carriage Assembly
—	64452	1194 A Motor, 115V, 54 RPM	24	47065	Hinge Pin
—	64457	2394 Motor, 230V, 36 RPM	25	42365	341 Reamer Assembly
7	44220	Screw (2)	26	44930	Stop Screw
8	43795	Motor Bracket	27	43690	Cutter Arm
9	46800	Set Screw (2)	28	45220	Rear Support Bar
10	61952	Base	29	47145	Spacer
11	61947	Bottom Cover	30	45430	Pinion Gear
12	45615	Screw (2)	31	47120	Lock Plate
13	47110	Indicator Slide	32	46785	Screw 10 - 32 x $\frac{3}{8}$ " (2)
14	47105	Indicator Bar	33	47135	Stop Pin
15	45420	Screw (5)	34	42390	820 Cutter Assembly
16	46510	Handwheel	35	47585	Drive Shaft Assembly
17	47165	Pin			

Drive Shaft



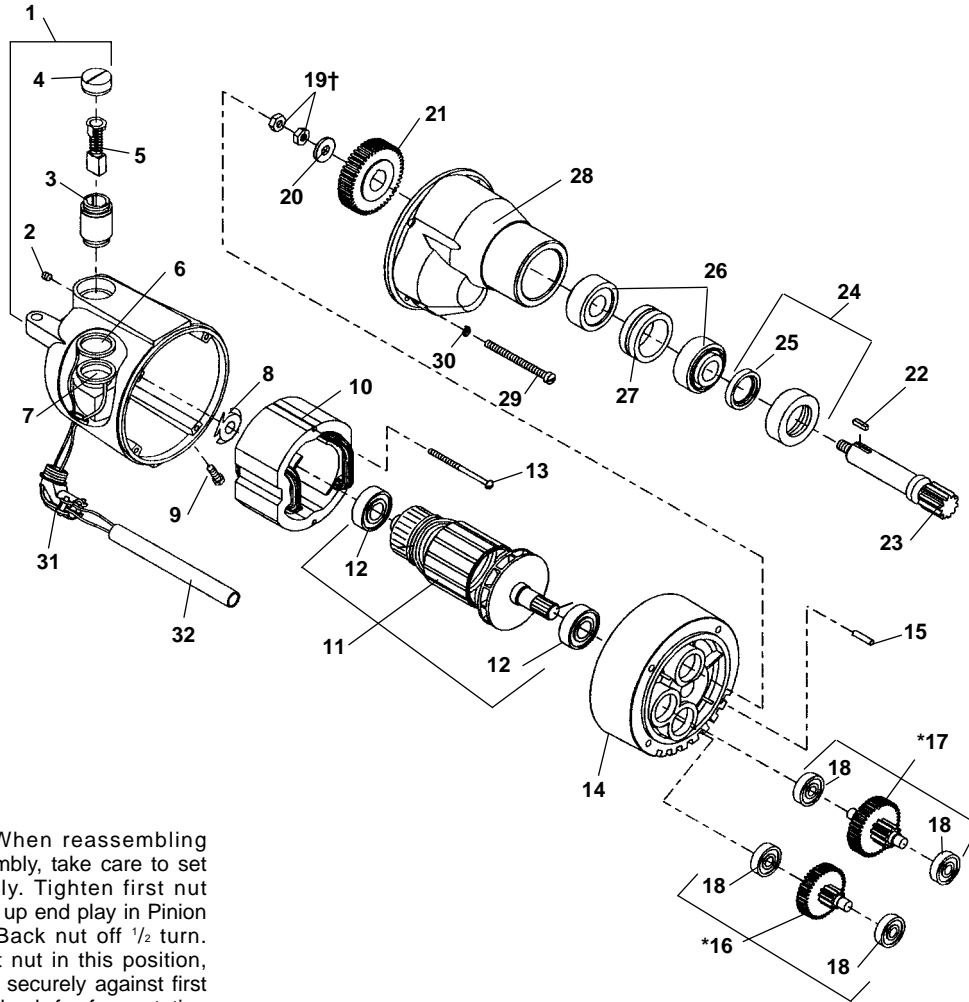
**NOTE: Order parts by Catalog Number only.
DO NOT order by Reference Number.**

Ref. No.	Catalog No.	Description	Ref. No.	Catalog No.	Description
—	47585	Drive Shaft Assembly	16	44490	Drive Plug (3)
1	46790	Screw (6)	17	43895	Pressure Plate
2	40270	Lock Washer (6)	18†	43455	Front Bearing Assembly
3	43735	Centering Head	19†	43105	Drive Shaft
4	19346	Centering Head (Europe)	20	44320	Pressure Plunger (3)
5	46500	Centering Jaw Set	21	44325	Pressure Spring (3)
6	46765	Screw 10 – 32 x 1/2"	22	44330	Pressure Set Screw (3)
7	43750	Scroll	23	43420	Handwheel
8	43740	Back Plate	24	43450	Scroll
9	19356	Back Plate (Europe)	25	44315	Drive Wedge
10	47570	Centering Head Assembly	26	44310	Drive Spring
11†	46860	Grease Fitting	27	44305	Drive Cap
12	46545	Bearing Sleeve	28	44715	Jaw Insert Set
13	43730	Rear Bearing Assembly	29	97365	Jaw Insert Set f/Plas. Coated Pipe
14	46745	Screw 3/8" – 16 x 1 1/4" (4)	30	43900	Chuck Jaw Set
15†	90255	Screw 10 – 32 x 1 1/4"	31	45160	Screw 5/16" – 18 x 2" (6)
	83525	Split Ring Assembly		43440	Chuck Cap
	43460	Drive Gear			

† Service Notes: Ref. Nos. 15 & 19 - When installing gear on shaft, align "O" mark on front of gear with "O" mark on the rear of the drive shaft flange.

Ref. Nos. 11 & 18 - When replacing the front or rear bearing brackets, position grease fittings toward the operator's side of the machine.

Motor



†Service Note: When reassembling Drive Pinion Assembly, take care to set Jam Nuts properly. Tighten first nut moderately to take up end play in Pinion Shaft Assembly. Back nut off 1/2 turn. While holding first nut in this position, tighten second nut securely against first to lock in place. Check for free rotation of Drive Pinion.

**NOTE: Order parts by Catalog Number only.
DO NOT order by Reference Number.**

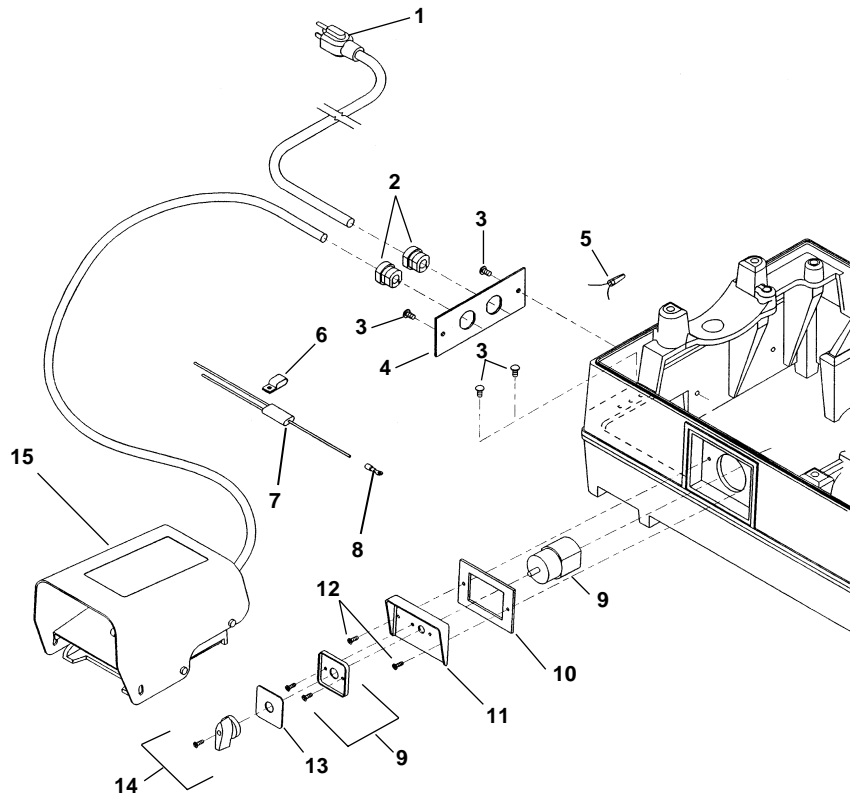
Ref. No.	Catalog No.	Description	Ref. No.	Catalog No.	Description
—	64447	1194 Motor, 115V, 36RPM	16*	62022	1st. Int. Gear Assy.— 36RPM
—	64452	1194A Motor, 115V, 54RPM		44985	1st. Int. Gear Assy.— 54RPM
—	64457	2394 Motor, 230V, 36RPM	17*	52527	2nd. Int. Gear Assy.— 36RPM
1	43160	Field Housing		44990	2nd. Int. Gear Assy.— 54RPM
2	39770	Set Screw 1/4" x 20 x 1/4" (2)	18	45060	Bearing (4)
3	45025	Brush Holder Set	19†	40350	Lock Nut 3/8" – 54
4	44545	Brush Cap Set	20	45035	Washer
5	44540	Brush Set	21	44965	Drive Gear – 36RPM
6	87865	White Upper Lead		44865	Drive Gear – 54RPM
7	87870	Red Lower Lead	22	45015	Key 3/32" Square
8	44580	Load Spring	23	44960	Drive Pinion
9	83500	Screw 1/4" x 20 x 3/4"	24	45010	Lock Nut w/Seal
10	44015	Field 115V	25	45085	Seal
	44035	Field 230V	26	45040	Bearing Set w/Spacer
11*	52497	Armature – 115V - 36RPM	27	45045	Spacer
*	52492	Armature – 230V	28	43170	Gear Housing
	44010	Armature – 115V - 54RPM	29	45075	Screw 1/4" - 20 x 3" (4)
12	44565	Armature Bearing (2)	30	45150	Lock Washer (4)
13	44555	Mounting Screw (2)	31	46900	Right Angle Connector
14	43165	Fan Housing Assembly	32	64462	PVC Tubing
15	45165	Dowel Pin			

Note: *Helical gear not interchangeable with old style 535 machines.

Electrical Components

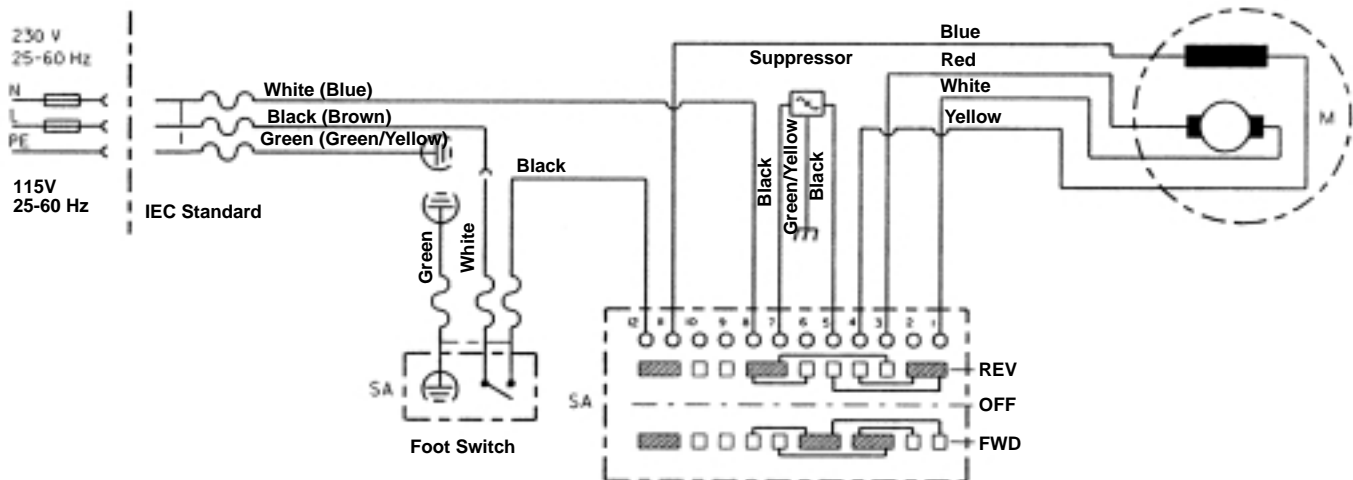
**NOTE: Order parts by Catalog Number only.
DO NOT order by Reference Number.**

Ref. No.	Catalog No.	Description
1	46740	Power Cord 115V
—	46410	Power Cord 230V
—	75045	Power Cord 230V Export
2	46735	Grommet (2)
3	45420	Screw (4)
4	62037	Cord Mounting Plate
5	44635	End Splice Connector
6	61962	Clamp (230V)
7	36502	Suppressor (230V)
8	54192	Connector (230V)
9	54157	Switch Assy. (Includes Ref. No. 14)
10	54172	Gasket
11	61917	Switch Plate
12	54162	Screw (2)
13	61967	Switch Face Plate
14	61397	Switch Knob
15	36642	B-294 Foot Switch Assembly

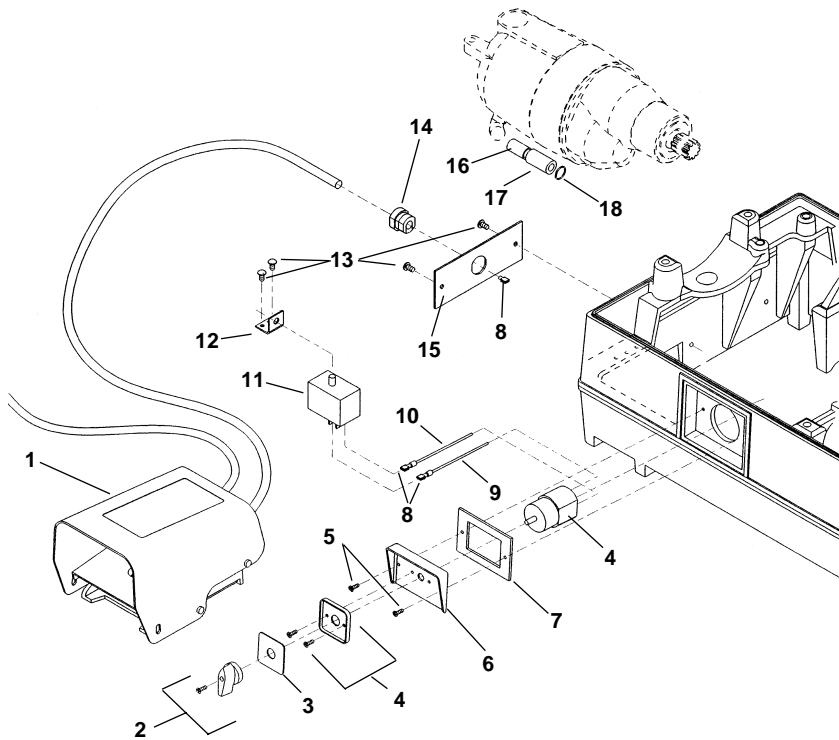


Wiring Diagram

**1194 Motor (115V)
2394 Motor (230V)
1194A Motor (115V)**



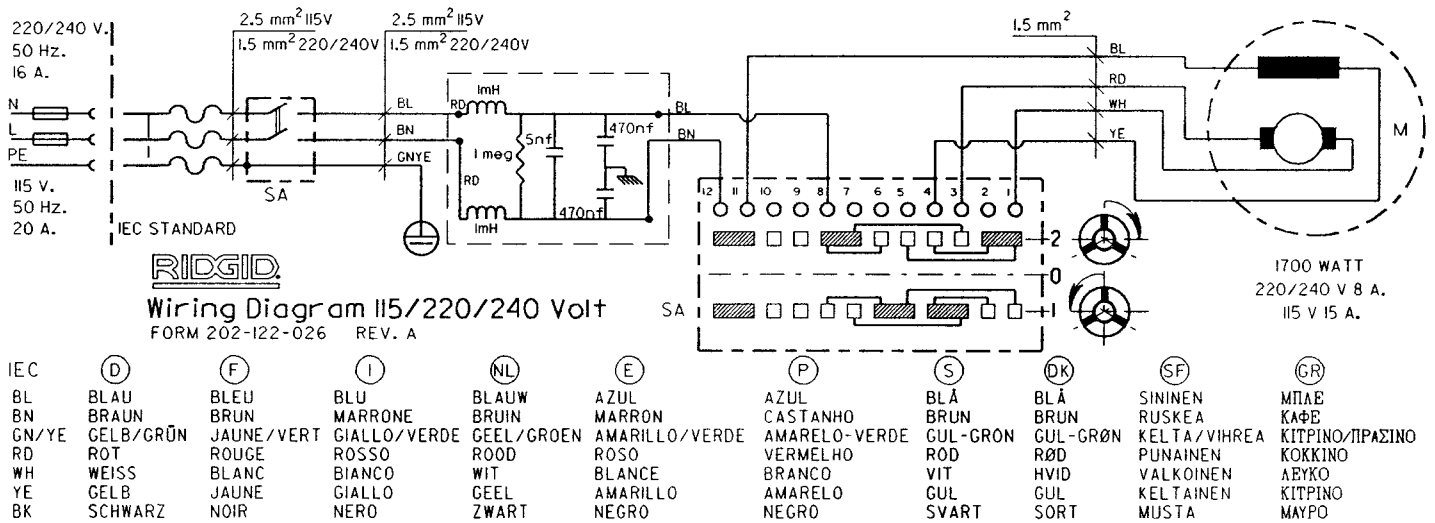
European Electrical Components



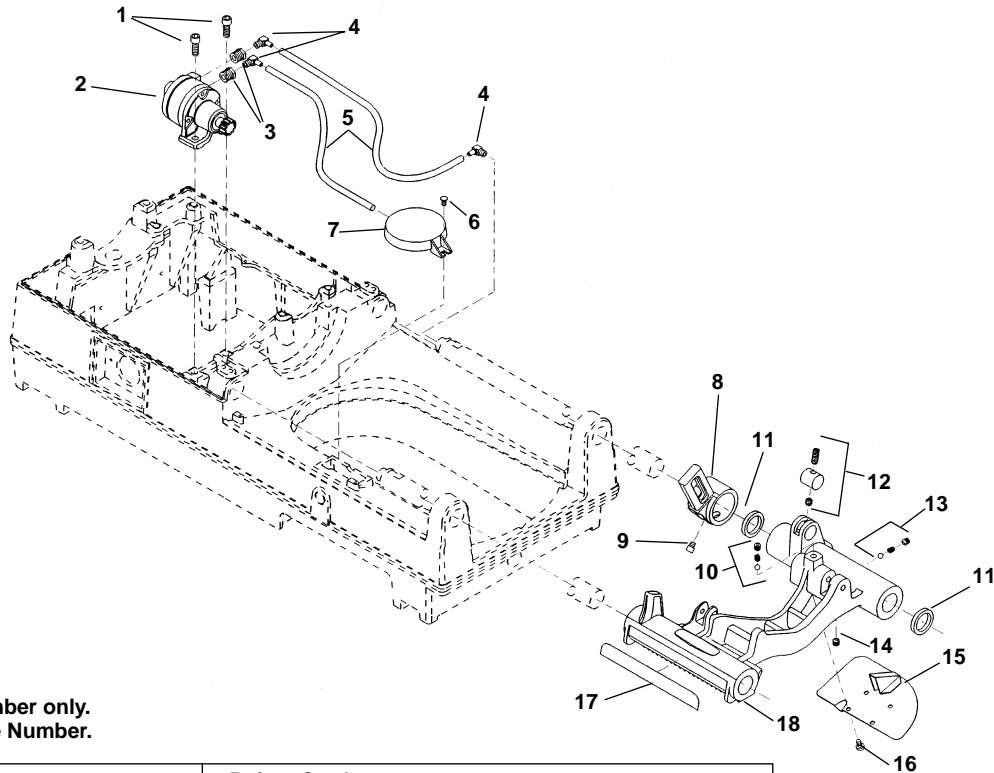
**NOTE: Order parts by Catalog Number only.
DO NOT order by Reference Number.**

Ref. No.	Catalog No.	Description
1	36652	B-296 Foot Switch
2	61397	Switch Knob
3	57517	Switch Face Plate
4	54157	Switch Assy. (includes Ref. No. 2)
5	54162	Screw (2)
6	61917	Switch Plate
7	54172	Gasket
8	89190	Quick Disconnect Terminal (4)
9	63392	Blue Wire
10	63387	Brown Wire
11	63372	Suppressor
12	61987	Mounting Bracket
13	45420	Screw (4)
14	54177	Grommet
15	62042	Cord Mounting Plate
16	64462	PVC Tubing
17	63377	Ferrite Bead
18	64467	Cable Tie

European Wiring Diagram



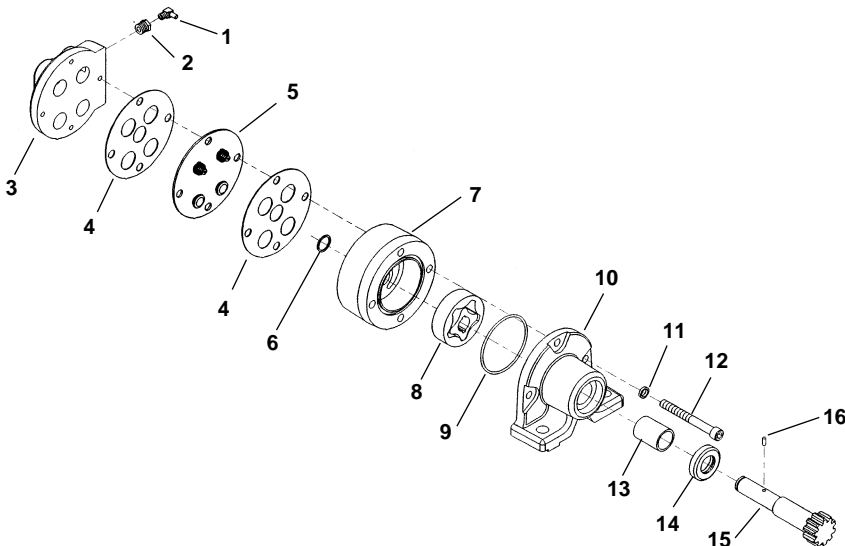
Carriage and Oiling System



**NOTE: Order parts by Catalog Number only.
DO NOT order by Reference Number.**

Ref. No.	Catalog No.	Description	Ref. No.	Catalog No.	Description
1	46750	Screw (2)	10	46810	Detente Assembly
2	62052	Model MJ Oil Pump	11	46720	Oil Seal (2)
3	62047	Reducing Bushing (2)	12	61957	Plug Assembly
4	87945	Right Angle Fitting (3)	13	35307	Pressure Relief Assembly
5	87950	Oil Line (2)	14	46815	Pipe Plug 1/8" NPT
6	45420	Screw	15	45195	Drip Plate
7	58467	Oil Filter Assembly	16	46270	Screw (4)
8	43690	Cutter Arm	17	46370	Scale
9	44930	Stop Screw	18	62057	Carriage Assy. (Includes Ref. No. 8-17)

Model MJ Oil Pump



Ref. No.	Catalog No.	Description
—	62052	Model MJ Oil Pump
1	87945	Right Angle Fitting (2)
2	62047	Reducing Bushing (2)
3	33442	Valve Body
4	33457	Gasket (2)
5	33452	Valve Body Assembly
6	61997	Retaining Ring
7	62002	Gerotor Housing
8	62007	Gerotor Set
9	33477	O-Ring
10	62012	Pump Body
11	45150	Lock Washer (3)
12	62017	Screw (3)
13	61972	Bushing
14	33472	Oil Seat
15	61982	Pump Shaft
16	26907	Drive Pin
17	61977	Pump Repair Kit (Includes Ref. No. 4-6, 9, 13, 14, and 16)