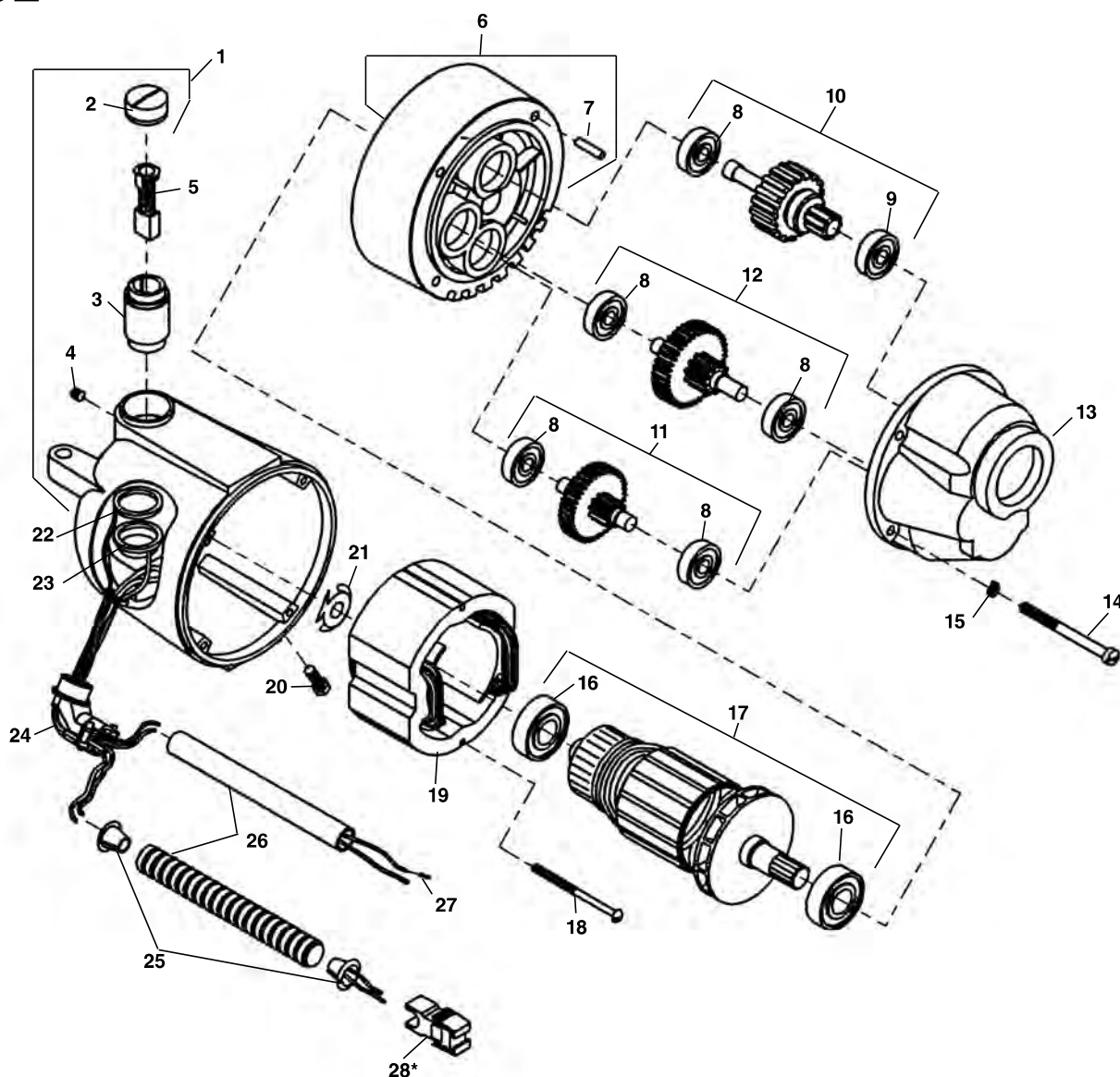


3177  
3277  
3177-CE  
3277-CE

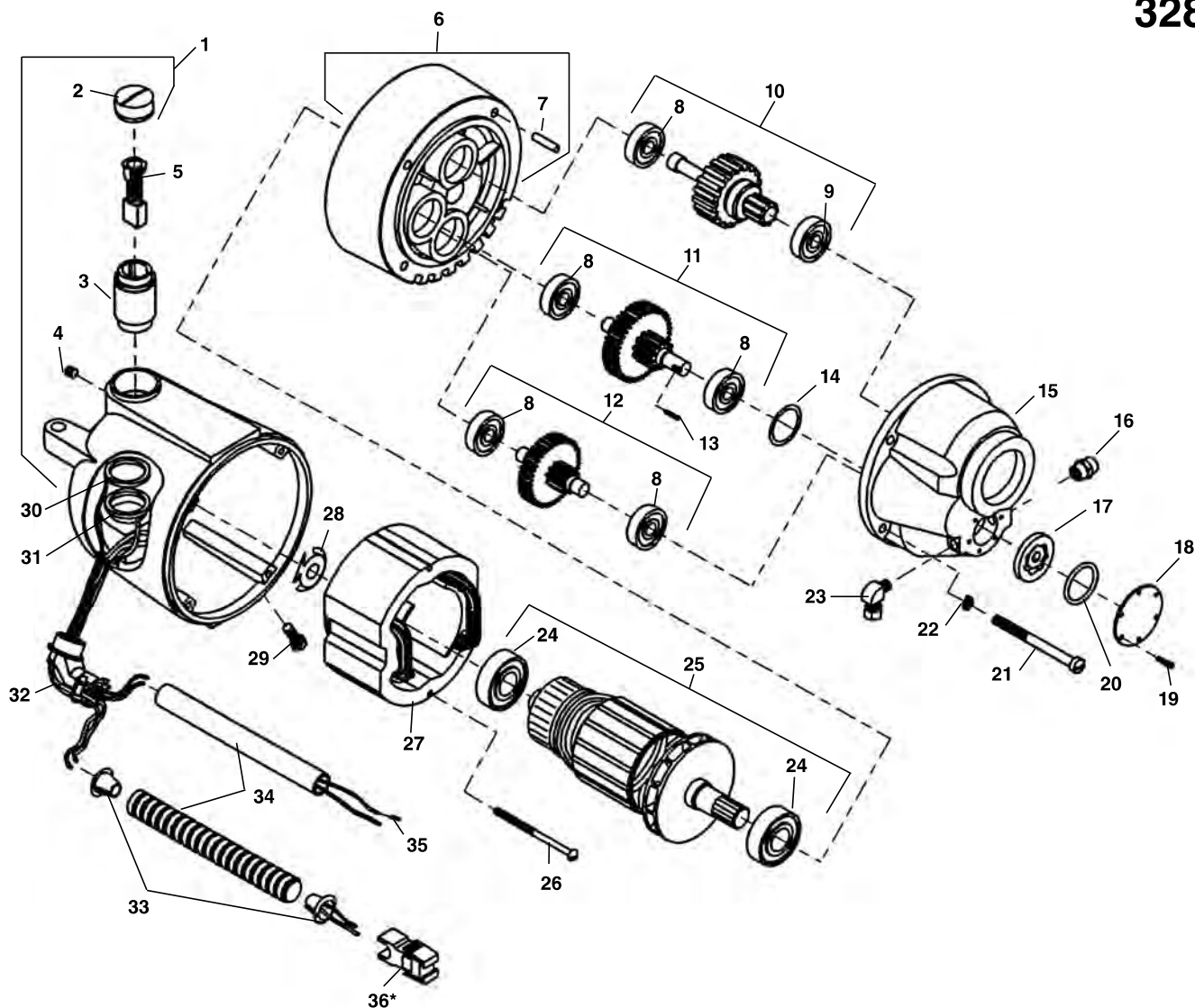


**NOTE: Order parts by Catalog Number only.  
DO NOT order by Reference Number.**

| Ref. No. | Catalog No. | Description          | Ref. No. | Catalog No. | Description          | Ref. No. | Catalog No. | Description                               |
|----------|-------------|----------------------|----------|-------------|----------------------|----------|-------------|-------------------------------------------|
| †        | 87740       | 3177 Motor 115V      | 10       | 45370       | Drive Gear           | 20       | 83500       | Locking Screw                             |
| †        | 87780       | 3277 Motor 230V      | 11       | 44985       | 1st Gear Assembly    | 21       | 44580       | Loading Spring                            |
| †        | 61202       | 3177-CE Motor 115V   | 12       | 45005       | 2nd Gear Assembly    | 22       | 86680       | White Upper Lead                          |
| †        | 61207       | 3277-CE Motor 230V   | 13       | 42875       | Gear Housing         | 23       | 86685       | Red Lower lead                            |
| 1        | 43160       | Housing Assembly     | 14       | 45075       | Screw (4)            | 24       | 46900       | Connector 90 Degree                       |
| 2        | 44545       | Brush Cap Set        | 15       | 45150       | Lock Washer          | 25       | 46890       | E-918 Insulator (2)                       |
| 3        | 45025       | Brush Holder Set     | 16       | 44565       | Armature Bearing (2) | 26       | 47407       | Flexible Conduit                          |
| 4        | 39770       | Set Screw (2)        | 17       | 44010       | Armature (115V)      | 27       | 46880       | Plastic Tube (CE Only)                    |
| 5        | 44540       | Brush Assembly Set   | 18       | 44030       | Armature (230V)      | 28       | 88402       | Wire Terminal (4) (CE Only)               |
| 6        | 43165       | Fan Housing Assembly | 19       | 44555       | Mounting Screw (2)   | 28*      | 50552       | Plug (Included in Switch Box Assy. 91187) |
| 7        | 45165       | Dowel Pin            |          | 44015       | Field (115V)         |          |             |                                           |
| 8        | 45060       | Gear Bearings (5)    |          | 44035       | Field (230V)         |          |             |                                           |
| 9        | 45315       | Front Bearing        |          |             |                      |          |             |                                           |

† Refer to Speed Change Chart for Optional Speeds on Page 25

**3181**  
**3281**  
**3181-CE**  
**3281-CE**



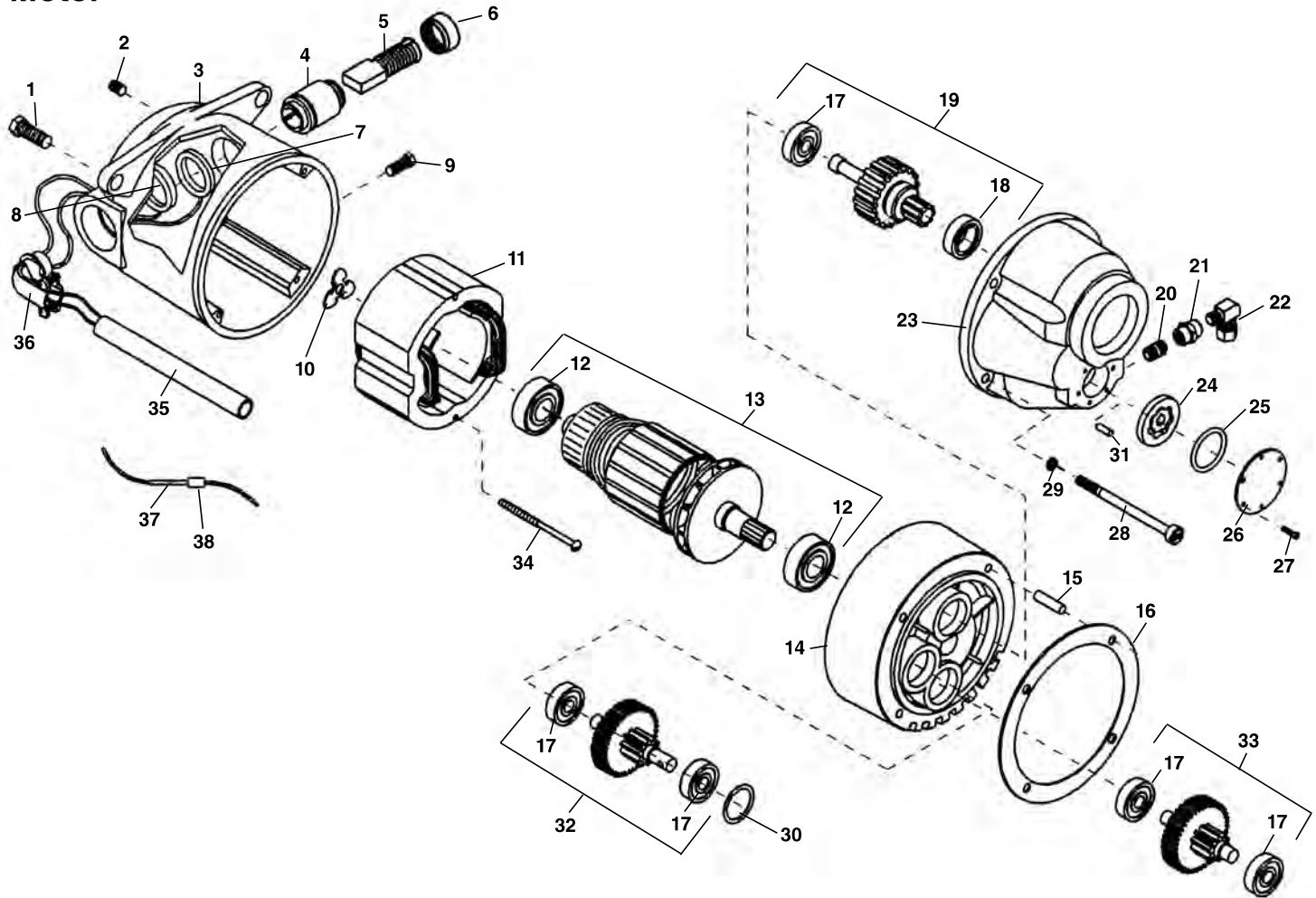
**NOTE: Order parts by Catalog Number only.  
DO NOT order by Reference Number.**

| Ref. No. | Catalog No. | Description          | Ref. No. | Catalog No. | Description          | Ref. No. | Catalog No. | Description                               |
|----------|-------------|----------------------|----------|-------------|----------------------|----------|-------------|-------------------------------------------|
| †        | 96810       | 3181 Motor 115V      | 12       | 45005       | 2nd Gear Assembly    | 26       | 44555       | Mounting Screw (2)                        |
| †        | 96975       | 3281 Motor 230V      | 13       | 96885       | Pin                  | 27       | 44015       | Field (115V)                              |
| †        | 61197       | 3181-CE Motor 115V   | 14       | 96880       | Oil Seal             |          | 44035       | Field (230V)                              |
| †        | 61192       | 3281-CE Motor 230V   | 15       | 96830       | Gear Housing         | 28       | 44580       | Loading Spring                            |
| 1        | 43160       | Housing Assembly     | 16       | 46830       | Male Connector       | 29       | 83500       | Locking Screw (2)                         |
| 2        | 44545       | Brush Cap Set        | 17       | 96870       | Gerotor Set          | 30       | 86680       | White Upper Lead                          |
| 3        | 45025       | Brush Holder Set     | 18       | 96840       | Cover Plate          | 31       | 86685       | Red Lower lead                            |
| 4        | 39770       | Set Screw (2)        | 19       | 96890       | Screw (6)            | 32       | 46900       | Connector 90                              |
| 5        | 44540       | Brush Assembly Set   | 20       | 96875       | O Ring               | 33       | 46890       | E-918 Insulator (2)                       |
| 6        | 43165       | Fan Housing Assembly | 21       | 45075       | Screw (4)            | 34       | 47407       | Flexible Conduit                          |
| 7        | 45165       | Dowel Pin            | 22       | 45150       | Lock Washer          |          | 46880       | Plastic Tube (CE Only)                    |
| 8        | 45060       | Gear Bearings (5)    | 23       | 96910       | Male Elbow           | 35       | 88402       | Wire Terminal (4) (CE Only)               |
| 9        | 45315       | Front Bearing        | 24       | 44565       | Armature Bearing (2) | 36*      | 50552       | Plug (Included in Switch Box Assy. 91187) |
| 10       | 45370       | Drive Gear           | 25       | 44010       | Armature (115V)      |          |             |                                           |
| 11       | 97000       | 1st Gear Assembly    |          | 44030       | Armature (230V)      |          |             |                                           |

† Refer to Speed Change Chart for Optional Speeds on Page 25

2192  
2292  
2192R  
2292R

## Motor

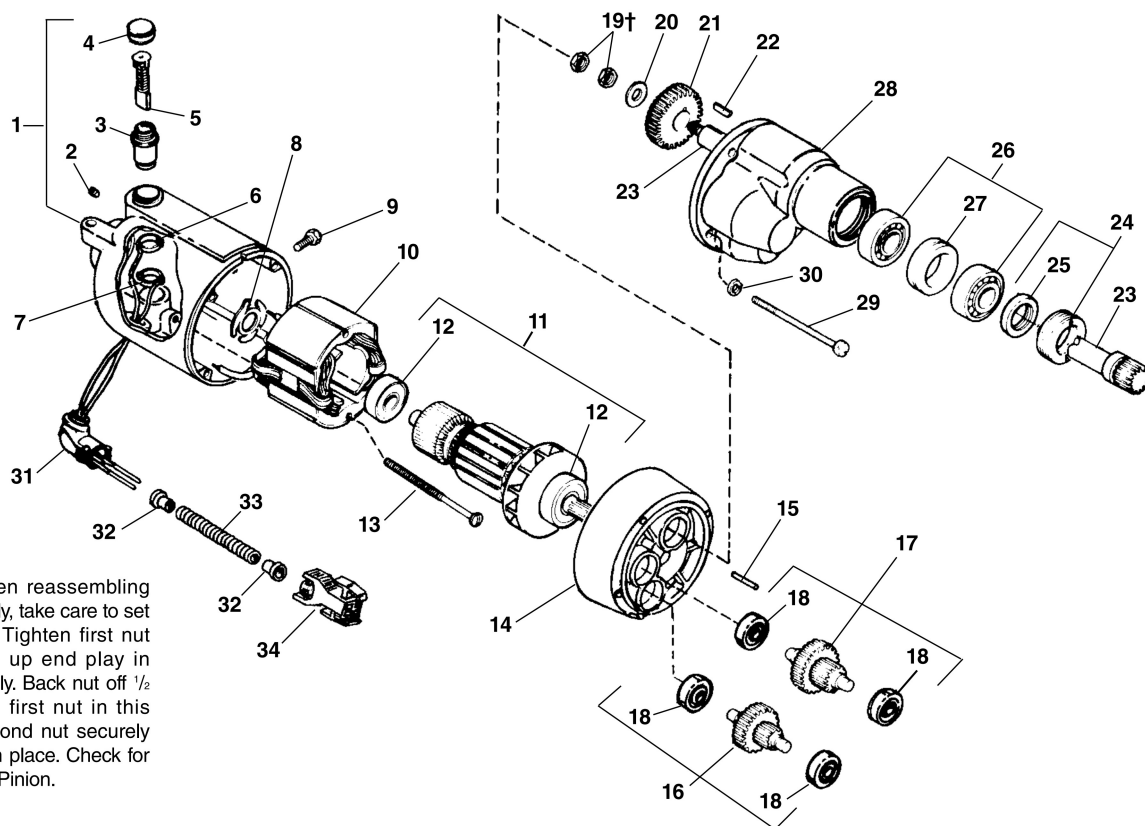


**NOTE: Order parts by Catalog Number only.  
DO NOT order by Reference Number.**

| Ref. No. | Catalog No. | Description                    | Ref. No. | Catalog No. | Description                   | Ref. No. | Catalog No. | Description           |
|----------|-------------|--------------------------------|----------|-------------|-------------------------------|----------|-------------|-----------------------|
| —        | 72127       | Motor Model 2292, 230V         | 12       | 44565       | Armature Bearing (2)          | 26       | 96840       | Cover Plate           |
| —        | 54797       | Motor Model 2192R, 115V        | 13       | 52497       | 115V Armature                 | 27       | 96890       | Screw #4 x 3/8" (6)   |
| —        | 54802       | Motor Model 2292R, 230V        | 14       | 54542       | 230V Armature                 | 28       | 45075       | Screw 1/4" - 20       |
| 1        | 85915       | Motor Mounting Bolt (2)        | 15       | 54552       | Fan Housing Assembly          | 29       | 45150       | Lock Washer 1/4"      |
| 2        | 39770       | Set Screw 1/4" - 20 x 1/4" (2) | 16       | 45165       | Dowel Pin                     | 30       | 96880       | Oil Seal              |
| 3        | 52482       | Motor Housing                  | 17       | 52502       | Gasket                        | 31       | 96885       | Pin                   |
| 4        | 45025       | Brush Holder Set (2)           | 18       | 44760       | Gear Bearing                  | 32       | 52522       | 1st Gear Assembly     |
| 5        | 44540       | Brush Assembly Set (2)         | 19       | 45315       | Front Bearing                 | 33       | 54547       | 2nd Gear Assembly     |
| 6        | 44545       | Brush Cap Set (2)              | 20       | 54537       | Main Drive Gear Assembly      | 34       | 44555       | Screw 10 - 24 x 3"    |
| 7        | 86685       | Red Brush Lead                 | 21       | 52507       | 1/8" NPT Close Nipple (2)     | 35       | 63382       | Plastic Tube          |
| 8        | 86680       | White Brush Lead               | 22       | 52512       | 1/8" Coupling (2)             | 36       | 46900       | 90 Connector          |
| 9        | 83500       | Field Locking Screw            | 23       | 52517       | Elbow Compression Fitting (2) | —        | 47412       | Male Wire Connector   |
| 10       | 44580       | Loading Spring                 | 24       | 96830       | Gear Case                     | —        | 52537       | Female Wire Connector |
| 11       | 44015       | Field 100/115V                 | 25       | 96870       | Gerotor Set                   | 37       | 16946       | Male Connector        |
|          | 44035       | Field 230V                     |          | 96875       | "O" Ring                      | 38       | 16956       | Female Connector      |

1157  
1177  
2357  
2377

## Motors



†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       | Housing                        | 18       | 45060       | Gear Bearing (4)       |
| 2        | 39770       | Set Screw 1/4" - 20 x 1/4" (2) | 19†      | 40350       | Lock Nut 3/8" - 24 (2) |
| 3        | 45025       | Brush Holder Set               | 20       | 45035       | Washer                 |
| 4        | 44545       | Brush Cap Set                  | 21       | See Chart   | Main Drive Gear        |
| 5        | 44540       | Brush Set                      | 22       | 45015       | Key 3/32" Sq.          |
| 6        | 87865       | White Upper Lead               | 23       | 44960       | Drive Pinion           |
| 7        | 87870       | Red Lower Lead                 | 24       | 45010       | Lock Nut w/Seal        |
| 8        | 44580       | Loading Spring                 | 25       | 45085       | Seal                   |
| 9        | 83500       | Screw 1/4" - 20 x 3/4"         | 26       | 45040       | Bearing Set w/Spacer   |
| 10       | 44015       | Field - 115V                   | 27       | 45045       | Spacer                 |
|          | 44035       | Field - 230V                   | 28       | 43170       | Housing                |
| 11       | 44010       | Armature - 115V                | 29       | 45075       | Screw 1/4" - 20 x 3"   |
|          | 44030       | Armature - 230V                | 30       | 45150       | Lock Washer (4)        |
| 12       | 44565       | Armature Bearing (2)           | 31       | 46900       | Connector 90°          |
| 13       | 44555       | Mounting Screw (2)             |          | 46905       | Connector 45°          |
| 14       | 43165       | Fan Housing Assembly           | 32       | 46890       | Insulator (2)          |
| 15       | 45165       | Dowel Pin                      | 33       | 47412       | Flexible Conduit       |
| 16       | See Chart   | 1st Gear Assembly              | 34       | 50552       | Plug                   |
| 17       | See Chart   | 2nd Gear Assembly              |          |             |                        |

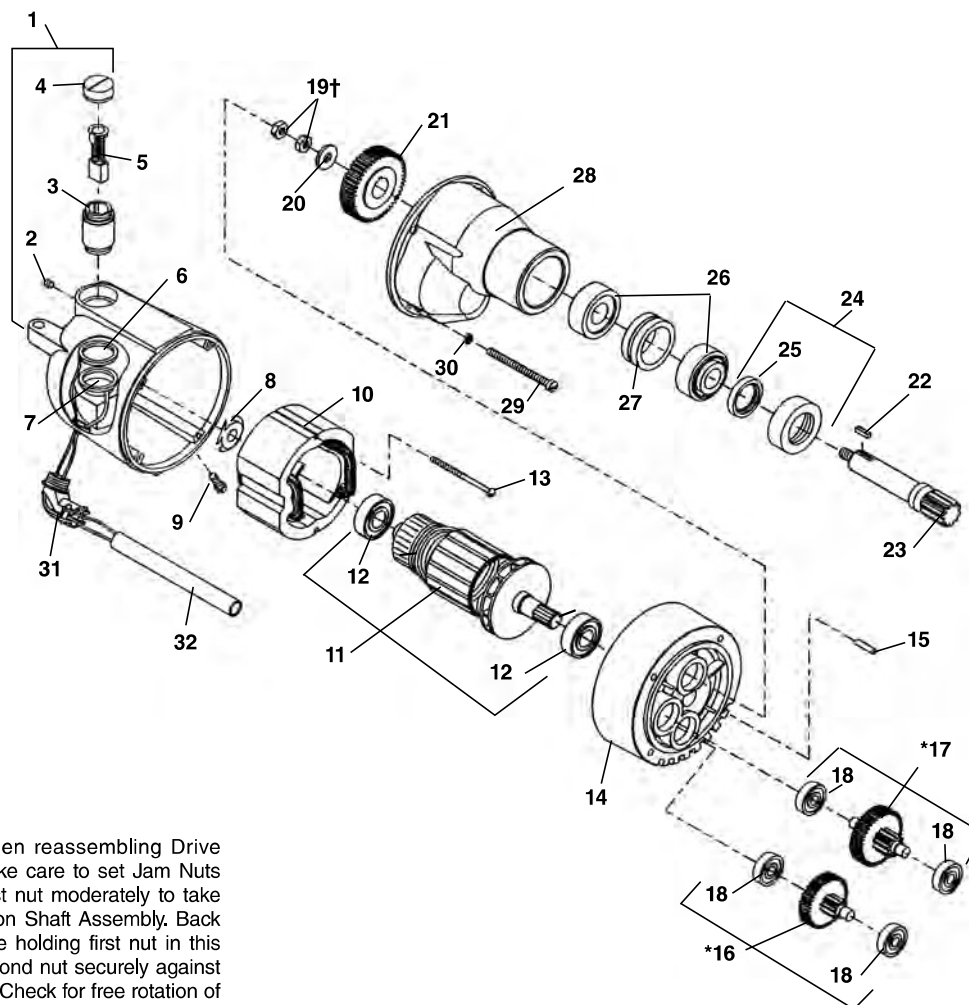
### SPEED CHANGE GEAR CHART MACHINE MODEL NO. 400A - 535 - 802

| 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              |
|----------------|--------------|-------------------|----------------------------|----------------------------------------------------------|----------------------------------------------------------|-------------------------------------|
| 1177<br>2377   | 115V<br>230V | 36 STD.           | Armature<br>Pinion - 14 T. | PART NO. 44985<br>(E-2600-X)<br>51 T. GEAR 12 T. PINION  | PART NO. 45005<br>(E-2601-X)<br>42 T. GEAR 13 T. PINION  | PART NO. 44965<br>(E-2597)<br>48 T. |
| 1177A<br>2377A | 115V<br>230V | 54 STD.<br>ON 802 |                            | PART NO. 44985<br>(E-2600-X)<br>51 T. GEAR 12 T. PINION  | PART NO. 44990<br>(E-2601-AX)<br>42 T. GEAR 18 T. PINION | PART NO. 44865<br>(E-1926)<br>43 T. |
| 1177B          | 115V         | 72                |                            | PART NO. 44975<br>(E-2600-BX)<br>51 T. GEAR 15 T. PINION | PART NO. 44995<br>(E-2601-BX)<br>39 T. GEAR 18 T. PINION | PART NO. 44865<br>(E-1926)<br>43 T. |
| 1177C<br>2377C | 115V<br>230V | 102               |                            | PART NO. 44980<br>(E-2600-CX)<br>51 T. GEAR 19 T. PINION | PART NO. 45000<br>(E-2601-CX)<br>35 T. GEAR 18 T. PINION | PART NO. 44865<br>(E-1926)<br>43 T. |

\*Supplied with Motor Complete

**Motor**

**1194**  
**1194A**  
**2394**



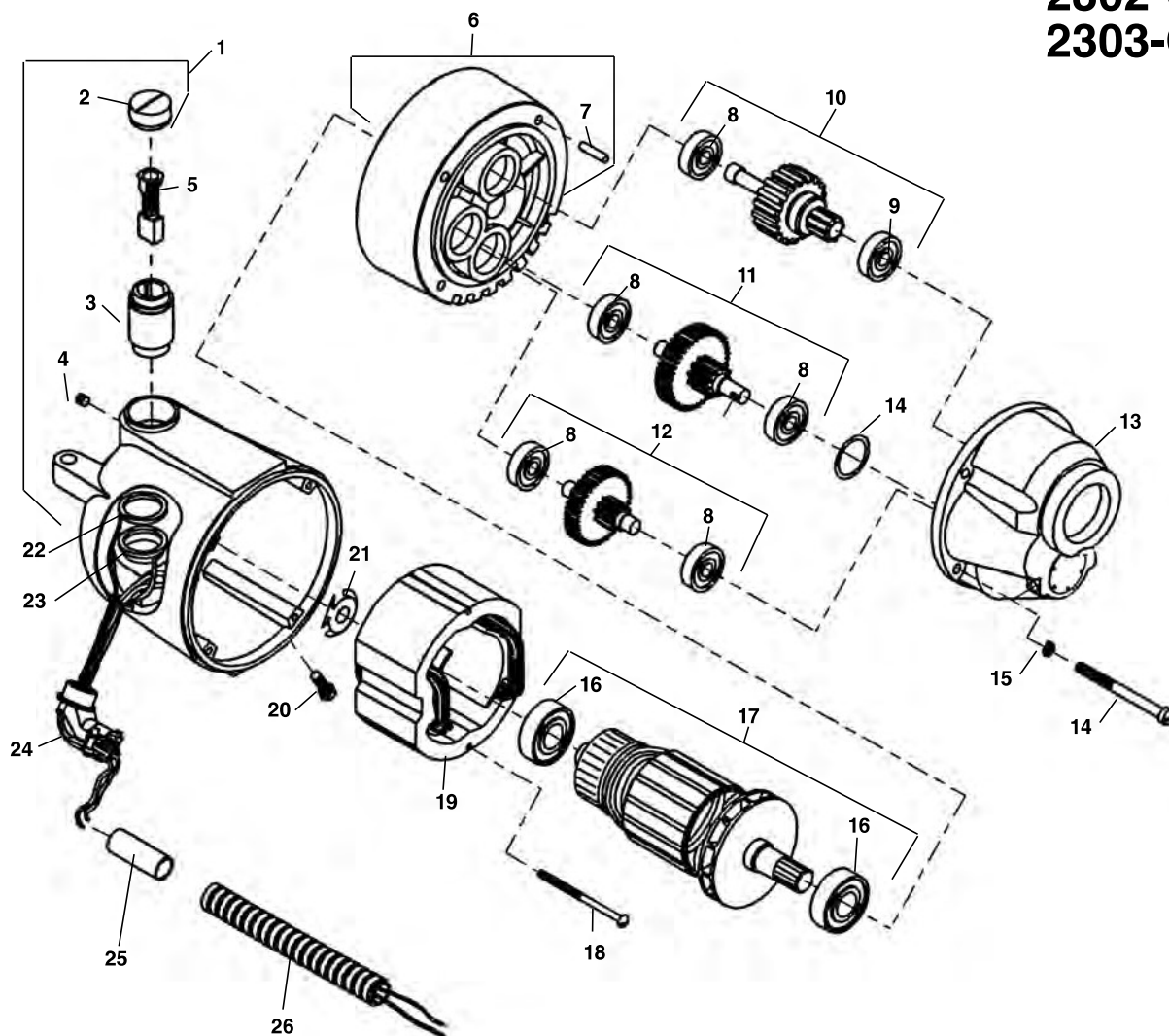
†Service Note: When reassembling Drive Pinion Assembly, take care to set Jam Nuts properly. Tighten first nut moderately to take up end play in Pinion Shaft Assembly. Back nut off 1/2 turn. While holding first nut in this position, tighten second nut securely against first to lock in place. Check for 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" — 54RPM       |
| 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 5/32" 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       | 54552       | Fan Housing Assembly           | 32       | 64462       | PVC Tubing                  |
| 15       | 45165       | Dowel Pin                      |          |             |                             |

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

**1102-CE**  
**1103-CE**  
**2302-CE**  
**2303-CE**

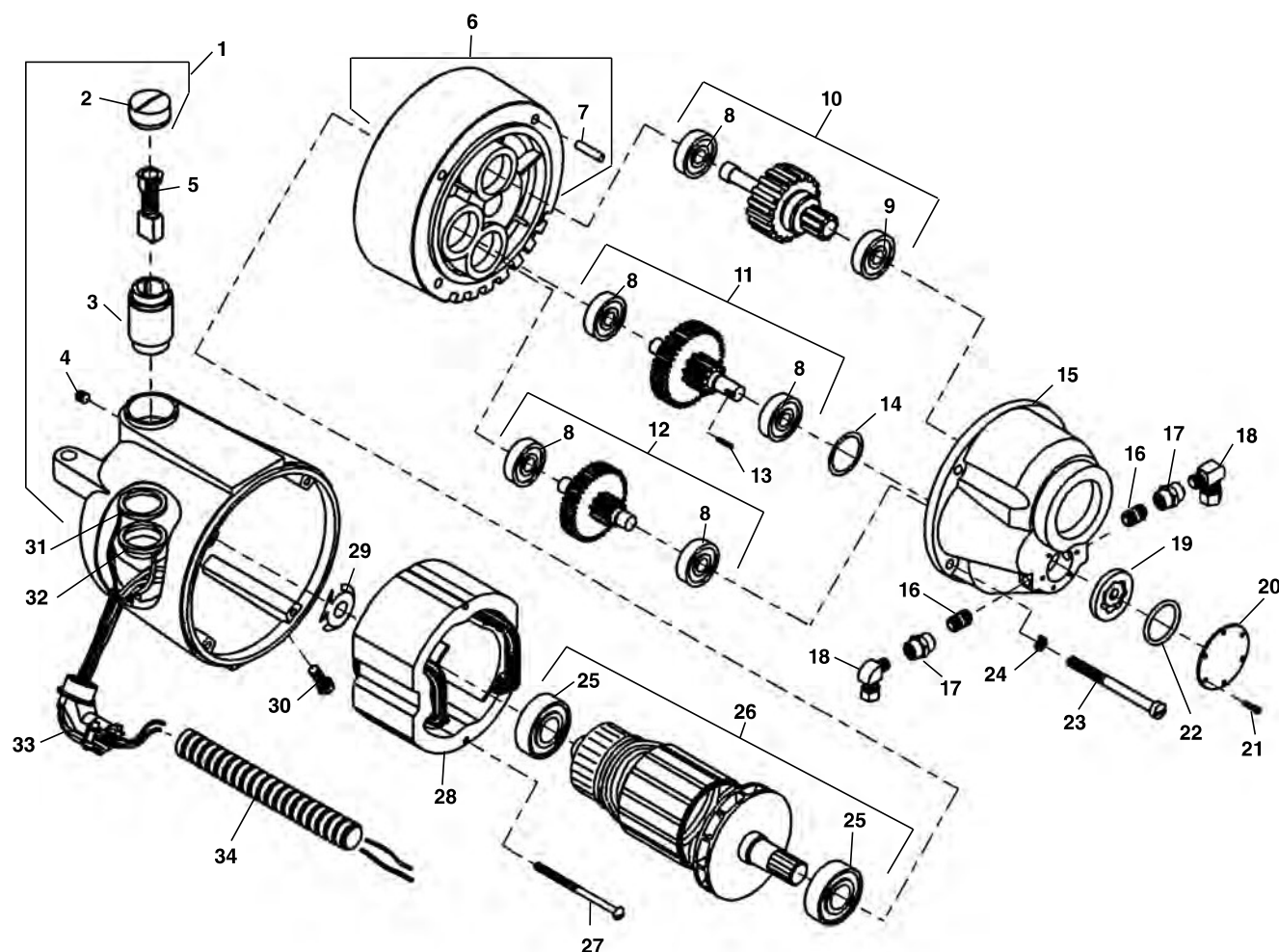


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DO NOT order by Reference Number.**

| Ref. No. | Catalog No. | Description          | Ref. No. | Catalog No. | Description          | Ref. No. | Catalog No. | Description             |
|----------|-------------|----------------------|----------|-------------|----------------------|----------|-------------|-------------------------|
| 1        | 43160       | Housing Assembly     | 11       | 44985       | 1st Gear Assembly    | 17       | 44010       | Armature 1103-CE (115V) |
| 2        | 44545       | Brush Cap Set        |          |             | 1103-CE and 2303-CE  |          | 44030       | Armature 2303-CE (230V) |
| 3        | 45025       | Brush Holder Set     |          | 62022       | 1st Gear Assembly    |          | 52497       | Armature 1102-CE (115V) |
| 4        | 39770       | Set Screw (2)        |          |             | 1102-CE and 2302-CE  |          | 52492       | Armature 2302-CE (230V) |
| 5        | 44540       | Brush Assembly Set   | 12       | 45005       | 2nd Gear Assembly    | 18       | 44555       | Mounting Screw (2)      |
| 6        | 43165       | Fan Housing Assembly |          |             | 1103-CE and 2303-CE  | 19       | 44015       | Field (115V)            |
|          | 54552       | Fan Housing Assembly |          | 52527       | 2nd Gear Assembly    |          | 44035       | Field (230V)            |
|          |             | 1102-CE and 2302-CE  | 13       | 42875       | Gear Housing         | 20       | 83500       | Locking Screw (2)       |
| 7        | 45165       | Dowel Pin            | 14       | 45075       | Screw (4)            | 21       | 44580       | Loading Spring          |
| 8        | 45060       | Gear Bearings (5)    | 15       | 45150       | Lock Washer          | 22       | 86680       | White Upper Lead        |
| 9        | 45315       | Front Bearing        | 16       | 44565       | Armature Bearing (2) | 23       | 86685       | Red Lower lead          |
| 10       | 45370       | Drive Gear           |          |             |                      | 24       | 46900       | Connector 90 Degree     |
|          |             |                      |          |             |                      | 25       | 63377       | Ferrite Bead            |
|          |             |                      |          |             |                      | 26       | 95690       | Flexible Conduit        |

1101  
2301

## Motor

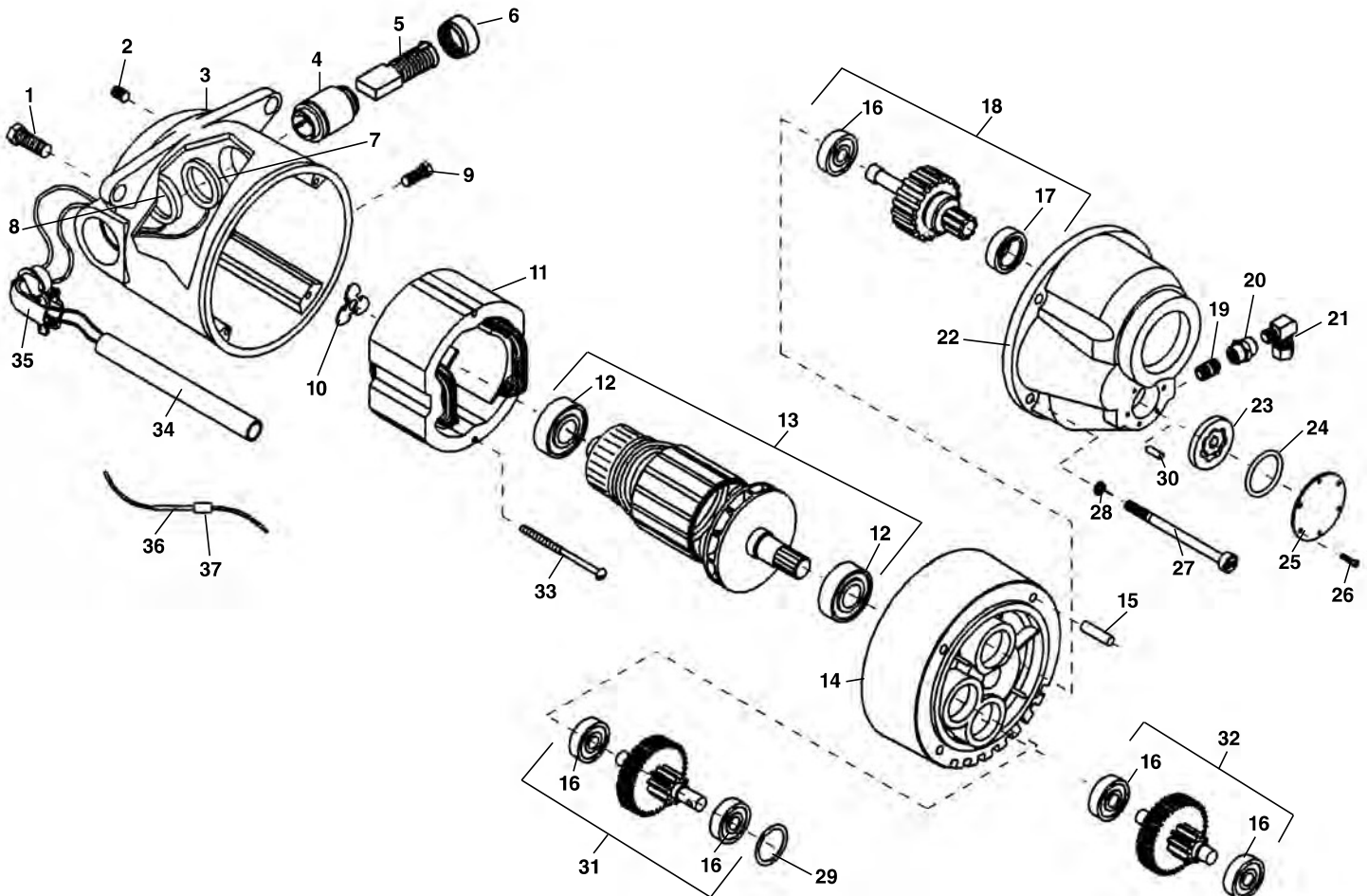


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| Ref. No. | Catalog No. | Description             | Ref. No. | Catalog No. | Description              | Ref. No. | Catalog No. | Description          |
|----------|-------------|-------------------------|----------|-------------|--------------------------|----------|-------------|----------------------|
| —        | 96442       | 1101 Motor 115V         | 11       | 52522       | 1st Gear Assembly        | 24       | 45150       | Lock Washer          |
| —        | 21208       | 2301 Motor 230V         | 12       | 52527       | 2nd Gear Assembly        | 25       | 44565       | Armature Bearing (2) |
| —        | 25353       | 1101A Motor 115V 54 RPM | 13       | 96885       | Pin                      | 26       | 52497       | Armature (115V)      |
| 1        | 43160       | Housing Assembly        | 14       | 96880       | Oil Seal                 |          | 52492       | Armature (230V)      |
| 2        | 44545       | Brush Cap Set           | 15       | 96830       | Gear Housing             | 27       | 44555       | Mounting Screw (2)   |
| 3        | 45025       | Brush Holder Set        | 16       | 52507       | Pipe Nipple 1/8" NPT (2) | 28       | 44015       | Field (115V)         |
| 4        | 39770       | Set Screw (2)           | 17       | 52512       | Coupling 1/8" NPT (2)    |          | 44035       | Field (230V)         |
| 5        | 44540       | Brush Assembly Set      | 18       | 52517       | 90° Elbow Fitting (2)    | 29       | 44580       | Loading Spring       |
| 6        | 54552       | Fan Housing Assembly    | 19       | 96870       | Gerotor Set              | 30       | 83500       | Locking Screw (2)    |
| 7        | 45165       | Dowel Pin               | 20       | 96840       | Cover Plate              | 31       | 96942       | White Upper Lead     |
| 8        | 45060       | Gear Bearings (5)       | 21       | 46130       | Screw (6)                | 32       | 96492       | Red Lower lead       |
| 9        | 45315       | Front Bearing           | 22       | 96875       | O Ring                   | 33       | 46900       | Connector 90         |
| 10       | 96437       | Drive Gear              | 23       | 45075       | Screw (4)                | 34       | 96482       | Flexible Conduit     |

**Motor**

**3092**  
**3192**  
**3292**  
**3192R**  
**3292R**



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| Ref. No. | Catalog No. | Description                    | Ref. No. | Catalog No. | Description                   | Ref. No. | Catalog No. | Description           |
|----------|-------------|--------------------------------|----------|-------------|-------------------------------|----------|-------------|-----------------------|
| —        | 52457       | Motor Model 3092, 100V         | 11       | 44015       | Field 100/115V                | 23       | 96870       | Gerotor Set           |
| —        | 52462       | Motor Model 3192, 115V         | —        | 44035       | Field 230V                    | 24       | 96875       | O-Ring                |
| —        | 52467       | Motor Model 3292, 230V         | 12       | 44565       | Armature Bearing (2)          | 25       | 96840       | Cover Plate           |
| —        | 52472       | Motor Model 3192R, 115V Rev.   | 13       | 52487       | 100V Armature                 | 26       | 96890       | Screw #4 x 3/8" (6)   |
| —        | 52477       | Motor Model 3292R, 230V Rev.   | —        | 52497       | 115V Armature                 | 27       | 45075       | Screw 1/4" - 20       |
| 1        | 85915       | Motor Mounting Bolt (2)        | —        | 52492       | 230V Armature                 | 28       | 45150       | Lockwasher 1/4"       |
| 2        | 39770       | Set Screw 1/4" - 20 x 1/4" (2) | 14       | 54552       | Fan Housing Assembly          | 29       | 96880       | Oil Seal              |
| 3        | 52482       | Motor Housing                  | 15       | 45165       | Dowel Pin                     | 30       | 96885       | Pin                   |
| 4        | 45025       | Brush Holder Set (2)           | 16       | 44760       | Gear Bearing                  | 31       | 52522       | 1st Gear Assembly     |
| 5        | 44540       | Brush Assembly Set (2)         | 17       | 45315       | Front Bearing                 | 32       | 52527       | 2nd Gear Assembly     |
| 6        | 44545       | Brush Cap Set (2)              | 18       | 45370       | Main Drive Gear Assembly      | 33       | 44555       | Screw 10-24 x 3"      |
| 7        | 86685       | Red Brush Lead                 | 19       | 52507       | 1/8" NPT Close Nipple (2)     | 34       | 63382       | Plastic Tube          |
| 8        | 86680       | White Brush Lead               | 20       | 52512       | 1/8" Coupling (2)             | 35       | 46900       | 90 Connector          |
| 9        | 83500       | Field Locking Screw            | 21       | 52517       | Elbow Compression Fitting (2) | 36       | 16946       | Male Wire Connector   |
| 10       | 44580       | Loading Spring                 | 22       | 96830       | Gear Case                     | 37       | 16956       | Female Wire Connector |