

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

Dayton® Speed Reducers

Description

These Dayton Speed Reducers are in-line drive type units suitable for general purpose applications involving shop equipment, conveyors, etc. Each unit is equipped with heavy duty steel helical gears, tapered roller bearing, lip-type seals and cast iron housing.

NOTE: The speed reducer is built for direct drive with a 1/4, 1/3, or 1/2 HP NEMA 56C face, 1725 RPM (maximum) motor, purchased separately. For additional information pertaining to a specific model in this series refer to Specifications.

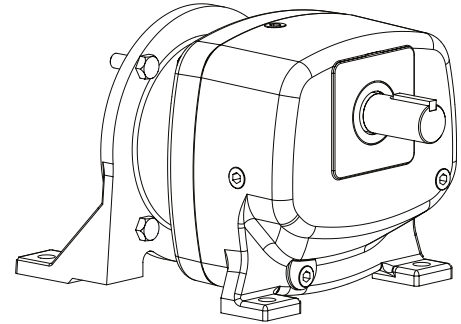


Figure 1

Dimensions

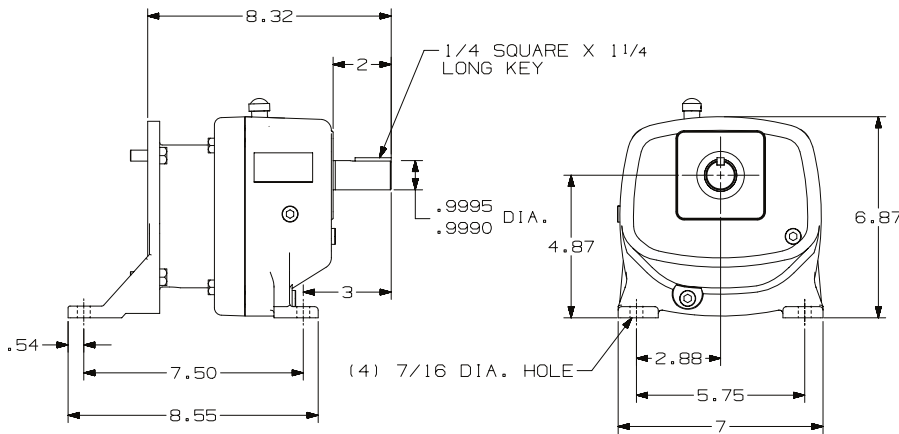


Figure 2

General Safety Information

1. Follow all local electrical and safety codes, the United States National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).
2. Motor (not included with this unit) must be securely and adequately grounded. This can be accomplished by wiring with a grounded, metal-clad raceway system, by using a separate ground wire connected to the bare metal of the motor frame, or other suitable means. Refer to United States NEC Article 250 (Grounding) for additional information.
3. Always disconnect power source before working on or near a motor or its connected load. If the power disconnect point is out of sight, lock

Specifications

Model	Nominal Output RPM*	Nominal Ratio	1/4 HP Torque In-Lbs*	1/3 HP Torque In-Lbs*	1/2 HP Torque In-Lbs	Finish
2Z932F	30	57.5:1	470	638	955	Gray
2Z933F	44	39:1	320	435	651	Gray
2Z934F	60	29:1	235	318	478	Gray
2Z935F	91	19:1	160	217	326	Gray

(*) At 1725 RPM (maximum) motor input speed.

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it in the open position and tag it to prevent unexpected application of power.

4. All moving parts should be guarded.
5. Be careful when touching the exterior of an operating motor; it may be hot enough to be painful or cause injury. Modern-design motors run hot when operated at rated load and voltage.
6. Protect the power cable from coming in contact with sharp objects.
7. Do not kink the power cable and never allow the cable to come in contact with oil, grease, hot surfaces, or chemicals.
8. Make certain that the power source conforms to the requirements of your equipment.
9. Before energizing the motor which drives the speed reducer, be sure that the reducer output shaft key is either fully captive, or is removed.
10. Clean electrical or electronic equipment with approved cleaning agent such as dry cleaning solvent.

Installation

▲WARNING When an installation involves a holding or overhauling application (such as a hoist or conveyor), a separate magnetic brake or other locking device should be used. Do not depend on gear friction to hold the load.

1. Locate the speed reducer in a clean and dry area with access to adequate motor cooling air supply. If installation is outdoors, make certain that the unit is protected from the weather.
2. Mount unit to a rigid surface, preferably metallic using largest bolts that will fit through the base holes.

NOTE: The speed reducer is intended for horizontal floor, wall, or ceiling mounting only. (The output shaft must be horizontal).

3. For shipment, 4 pipe plugs are packed separately. After mounting unit in position as instructed in step 2, remove pipe plug located in highest position, and install vent plug in its place. (Correct oil level for mounted unit is just below pipe plug in side position).
4. Attach motor to speed reducer. (See Figure 3).

▲CAUTION Do not exceed motor HP and torque rating indicated on nameplate in Specifications.

- a. Speed reducer is to be used with any NEMA Frame 56C face mounted, 1725 RPM electric motor (max. 1/3 HP) without feet. Make sure motor shaft is clean and free of dirt. Lubricate input shaft bore with heavy grease or anti-seize compound provided with reducer.

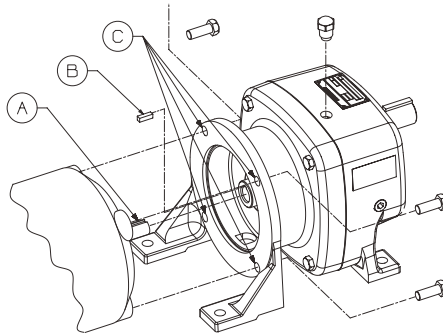


Figure 2 - Attaching the Motor

▲CAUTION Do not use key supplied with motor. Use short key supplied with reducer. (Failure to use short key makes assembly impossible).

- b. Insert short key (B in Figure 3) into

reducer shaft sleeve. Line up keyway in 5/8" diameter motor shaft (A in Figure 3) with keyway in reducer shaft sleeve. Carefully insert motor shaft until C face of motor fits into place against reducer, with four mounting holes in reducer (C in Figure 3) lined up with tapped holes in motor C face.

▲CAUTION Do not force shaft into

coupling.

- c. Four screws to fit the tapped holes in the motor face are supplied for mounting. Insert two screws in the two upper holes, but do not tighten completely. Insert lower two screws finger-tight and then back off 3/4 turn. Tighten upper two screws. Then tighten lower two screws.
- d. Run motor momentarily and then turn off. Motor should coast freely to indicate no binding in motor shaft.
- e. To reverse direction of reducer rotation, reverse motor leads.

5. Attaching (coupling) the load:

NOTE: To determine output torque capacity for operating conditions other than a normal 8 hour day and shock free operation, multiply the rated output torque (see Specifications) by the applicable load factor listed below. Shock loads should be avoided,

Load Factor Chart

Type of Load	Load Factor
8 to 10 hour Day Service	0.85
With Moderate Shock Loads	
24 Hour Day Service	0.93
With No Shock Load Involved	
24 Hour Service	0.81
With Moderate Shock Loads	

Models 2Z932F thru 2Z935F

Installation (Continued)

CAUTION Maximum momentary or starting torque is not to exceed 375% of 1/2 HP @ 1725 RPM for applications involving four or fewer starts per hour.

- a. When connecting a load to the speed reducer output shaft, care should be taken to avoid excessive tension when either belt or chains with chain sprocket are used. Overhung load should not exceed limits shown in chart, at 1" from the oil seal. See Detailed Overhung Load Calculations for additional information.

Detailed Overhung Load Calculations

$$\frac{\text{Full Load Torque of Speed Reducer} \times 2}{\text{Pitch Diameter}} = \text{Speed Reducer Pounds of Load on Center of Output Shaft}$$

Multiply pounds of load (obtained from above formula) by the correct factor listed below to determine actual overhung load in "pounds" on center of speed reducer output shaft.

Drive Factors

- Sprocket1.0
- Pulley1.5
- Gear1.25

Overhung Load Chart

Model	Max. Overhung Load
2Z932F	660 Lbs
2Z933F	660
2Z934F	660
2Z935F	660

Locate the center line of the sprocket, pulley or gear as close to the oil seal as practical to minimize overhung load and increase bearing life.

- b. On direct-coupled installations, carefully check shaft and coupling alignment as motor is being bolted

down, Shim as required. Do not depend on a flexible coupling to compensate for misalignment..

Thrust Capacity Chart

Model	Thrust Capacity
2Z932F	399 Lbs
2Z933F	382
2Z934F	295
2Z935F	247

- c. Maximum axial thrust; see chart, above.

NOTE: Chart ratings are calculated at Full Catalog Output Torque for 1/2 HP input at 1725 RPM input. These ratings are in addition to Full Catalog Overhung Load assuming all worst conditions of loading.

- 6. Make wiring connection. (Consult nameplate on motor).

Maintenance

WARNING Make certain that the power supply is disconnected before attempting to service or remove any components! If the power disconnect point is out-of sight, lock it in the open position and tag it to prevent unexpected application of power.

Cleaning

Properly selected and installed electric motors are capable of operating for long periods with minimal maintenance. Periodically cleaning dirt accumulations from open-type motors, especially in and around vent openings, preferably by vacuuming (avoids embedding dirt in windings). At the same time, check that electrical connections are tight.

Lubrication

The Dayton speed reducer was filled with oil at the factory to operate within +25° to +125° F ambient temperature. After 2000 hours of operation, drain

and refill with AGMA #4 gear oil. If AGMA #4 gear oil is not available, use multi-purpose gear oil SAE #90 for ambient temperatures from +40° F to +120° F. For temperatures below +40° F use SAE #80 multipurpose gear oil.

For Repair Parts, call 1-800-323-0620

24 hours a day - 365 days a year

Please provide the following information:

- Model number
- Serial number (if any)
- Part description and number as shown in parts list

Address parts correspondence to:

Grainger Parts
P. O. Box 3074
1657 Shermer Road
Northbrook, IL 60065-3074 U.S.A.

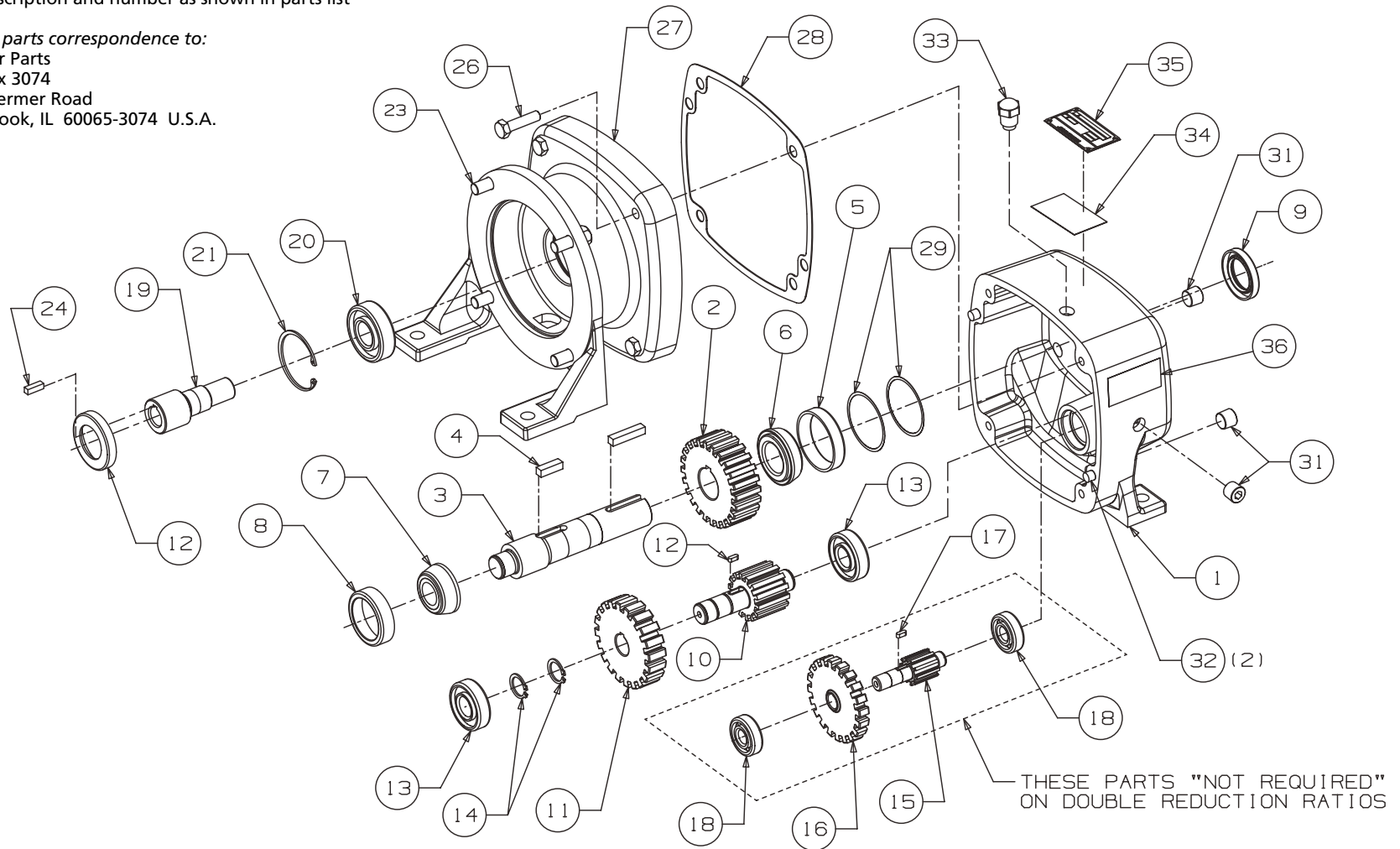


Figure 3 - Repair Parts Illustration

Repair Parts List

Ref. No.	Description	Model 2Z932F Part No.	Qty	Model 2Z933F Part No.	Qty	Model 2Z934F Part No.	Qty	Model 2Z935F Part No.	Qty
1	Gear housing	X2Z-1	1	X2Z-1	1	X2Z-1	1	X2Z-1	1
2	Output gear	46T (Kit 84396)	1	46T (Kit 84396)	1	41T (Kit 84399)	1	48T (Kit 84395)	1
3	Output shaft	XG2Z-3A	1	XG2Z-3A	1	XG2Z-3A	1	XG2Z-3A	1
4	Key - output gear	XK4-4-13-101	1	XK4-4-13-101	1	XK4-4-13-101	1	XK4-4-13-101	1
5	Output shaft bearing cup front	L44610	1	L44610	1	L44610	1	L44610	1
6	Output shaft bearing cone front	L44643	1	L44643	1	L44643	1	L44643	1
7	Output shaft bearing cone back	LM11949	1	LM11949	1	LM11949	1	LM11949	1
8	Output shaft bearing cup back	LM11910	1	LM11910	1	LM11910	1	LM11910	1
9	Oil seal-output	XOS-16-26-4	1	XOS-16-26-4	1	XOS-16-26-4	1	XOS-16-26-4	1
10	Third reduction pinion	19T (Kit 84396)	1	19T (Kit 84396)	1	21T (Kit 84399)	1	17T (Kit 84395)	1
11	Second reduction gear	54T (Kit 84394)	1	54T (Kit 84394)	1	64T (Kit 84397)	1	-----	-
12	Key-second reduction gear	XKF3-3-8	1	XKF3-3-8	1	XKF3-3-8	1	XKF3-3-8	1
13	Ball bearing-second reduction	XBB-17-40-12M	2	XBB-17-40-12M	2	XBB-17-40-12M	2	XBB-17-40-12M	2
14	Snap ring	XTR5100-66	2	XTR5100-66	2	XTR5100-66	2	XTR5100-66	2
15	Second reduction pinion	15T (Kit 84394)	1	15T (Kit 84394)	1	19T (Kit 84397)	1	-----	-
16	First reduction gear	85T (Kit 84393)	1	58T (Kit 84391)	1	58T (Kit 84391)	1	85T (Kit 84392)	1
17	Key - first reduction gear	XKF2-2-5.5	1	XKF2-2-5.5	1	XKF2-2-5.5	1	-----	-
18	Ball bearing-first reduction	XBB-12-32-10M	2	XBB-12-32-10M	2	XBB-12-32-10M	2	-----	-
19	First reduction pinion	13T (Kit 84393)	1	13T (Kit 84391)	1	13T (Kit 84391)	1	13T (Kit 84392)	1
20	Ball bearing-input	XBB-20-47-14M	1	XBB-20-47-14M	1	XBB-20-47-14M	1	XBB-20-47-14M	1
21	Snap ring	XTRN5000-185	1	XTRN5000-185	1	XTRN5000-185	1	XTRN5000-185	1
22	Oil seal-input	XOS-18-29.6-5	1	XOS-18-29.6-5	1	XOS-18-29.6-5	1	XOS-18-29.6-5	1
23	Hex capscrews (3/8-16 X 1" LG)	84383	1	84383	1	84383	1	84383	1
24	Key (3/16 SQ. X 5/8 LG)	84383	1	84383	1	84383	1	84383	1
25	Label-caution	84383	1	84383	1	84383	1	84383	1
26	Hex head capscrews (Hsg/Cover)	XL518-24	4	XL518-24	4	XL518-24	4	XL518-24	4
27	Gear cover	X2Z-31	1	X2Z-31	1	X2Z-31	1	X2Z-31	1
28	Gasket	XG2Z-40	1	XG2Z-40	1	XG2Z-40	1	XG2Z-40	1
29	Output bearing cup shim	XG20-39	3	XG20-39	3	XG20-39	3	XG20-39	3
30	Key 1/4 SQ. X 1-1/4 LG	50074	1	50074	1	50074	1	50074	1
31	Pipe plugs	XSHPP-4	4	XSHPP-4	4	XSHPP-4	4	XSHPP-4	4
32	Dowel pins	XDP516-12	2	XDP516-12	2	XDP516-12	2	XDP516-12	2
33	Vent plug	XVP-4-18M	1	XVP-4-18M	1	XVP-4-18M	1	XVP-4-18M	1
34	Nameplate	XNP-335	1	XNP-335	1	XNP-335	1	XNP-335	1
35	Nameplate tape	XNP-TAPE-2	1	XNP-TAPE-2	1	XNP-TAPE-2	1	XNP-TAPE-2	1
36	Label-oil	XLAB-49	1	XLAB-49	1	XLAB-49	1	XLAB-49	1
▲	Anti-seize compound	XLT-1	1	XLT-1	1	XLT-1	1	XLT-1	1
▲	Cover-clear 2D Label	XLAB-2D-Cover	1	XLAB-2D-Cover	1	XLAB-2D-Cover	1	XLAB-2D-Cover	1
▲	2D Label-Blank	XLAB-2D-Blank	1	XLAB-2D-Blank	1	XLAB-2D-Blank	1	XLAB-2D-BLANK	1

(▲) Not shown

Items 2 & 10 sold as kit only

Items 11 & 15 sold as kit only

Items 16 & 19 sold as kit only

Models 2Z932F thru 2Z935F

Troubleshooting Chart

Symptom	Possible Causes(s)	Corrective Action
Unit fails to operate	<ol style="list-style-type: none"> 1. Blown fuse or open circuit breaker 2. No power 3. Defective motor 4. Excessive load 	<ol style="list-style-type: none"> 1. Replace fuse or reset circuit breaker 2. Contact power company 3. Repair or replace 4. Reduce load
Motor runs but no output	<ol style="list-style-type: none"> 1. No input key 2. Defective gear(s) 	<ol style="list-style-type: none"> 1. Install key (see installation) 2. Check and replace if necessary
Intermittent rotation of output shaft	<ol style="list-style-type: none"> 1. Poor electrical connection 2. Damaged gear assembly possibly caused by shock load 	<ol style="list-style-type: none"> 1. Check connection 2. Replace gear and if possible, avoid shock load
Excessive noise	<ol style="list-style-type: none"> 1. Bearings worn 2. Belt too tight 3. Overhung Load - exceeds rating and causes bearing wear 4. Insufficient lubrication 	<ol style="list-style-type: none"> 1. Replace 2. Adjust tension 3. Correct load and/or replace bearing 4. Check oil level
Oil leak	<ol style="list-style-type: none"> 1. Vent plug not installed 2. Gasket broken or not seated 3. Damaged or worn seal 4. Too much oil 	<ol style="list-style-type: none"> 1. Install vent plug 2. Replace or reseal gasket 3. Replace seal 4. Check oil level

Dayton® Speed Reducers

LIMITED WARRANTY

DAYTON ONE-YEAR LIMITED WARRANTY. Dayton Speed Reducers, Models covered in this manual are warranted by Dayton Electric Mfg. Co. (Dayton) to the original user against defects in workmanship or materials under normal use for one year after date of purchase. Any part which is determined by Dayton to be defective in material or workmanship and returned to an authorized service location, as Dayton designates, shipping costs prepaid, will be, as the exclusive remedy, repaired or replaced at Dayton's option. For limited warranty claim procedures, see PROMPT DISPOSITION below. This limited warranty gives purchasers specific legal rights which vary from jurisdiction to jurisdiction.

LIMITATION OF LIABILITY. To the extent allowable under applicable law, Dayton's liability for consequential and incidental damages is expressly disclaimed. Dayton's liability in all events is limited to and shall not exceed the purchase price paid.

WARRANTY DISCLAIMER. Dayton has made a diligent effort to provide product information and illustrate the products in this literature accurately, however, such information and illustrations are for the sole purpose of identification, and do not express or imply a warranty that the products are MERCHANTABLE, or FIT FOR A PARTICULAR PURPOSE, or that the products will necessarily conform to the illustrations or descriptions. Except as provided below, no warranty or affirmation of fact expressed or implied, other than as stated in the "LIMITED WARRANTY" above is made or authorized by Dayton.

PRODUCT SUITABILITY. Many jurisdictions have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Dayton attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product review the product applications, and all applicable national and local codes and regulations, and be sure that the product installation, and use will comply with them. Certain aspects of disclaimers are not applicable to consumer products, e.g., (a) some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you, (b) also, some jurisdictions do not allow a limitation on how long an implied warranty lasts, consequently the above limitation may not apply to you, and (c) by law, during the period of this Limited Warranty, any implied warranties of implied merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise disclaimed.

PROMPT DISPOSITION. Dayton will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom the product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date, and number of dealer's invoice, and describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.

Manufactured for Dayton Electric Mfg. Co., 5959 W. Howard St., Nilas, Illinois 60714 U.S.A.