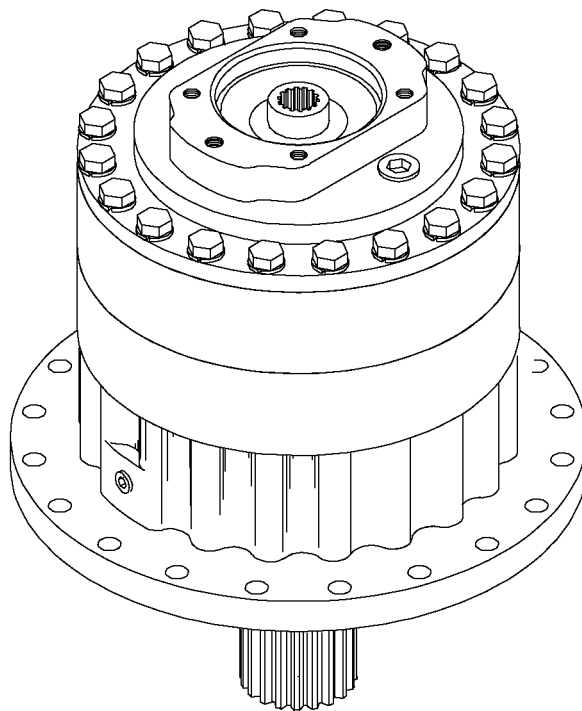




SERIES 252 PLANETARY GEAR DRIVE SERVICE AND REPAIR MANUAL



Example Part Number

252	A	D1	C	4	–	51	–	Z
Model	Gear Drive Mounting	Output Shaft	Input Mounting	Input Spline		Ratio		Options

THIS SERVICE MANUAL IS EFFECTIVE
FROM:..... S/N 28500
TO: CURRENT
SM252KD2_0126

SERIES 252 SERVICE MANUAL

DOUBLE STAGE PLANETARY GEAR DRIVE

This manual will assist in disassembly and assembly of the above model planetary gear drives. Item numbers, indicated in parentheses throughout this manual, refer to the exploded parts breakdown drawing. Individual customer specifications (mounting case, output shaft, brake assembly, etc.) may vary from exploded drawing and standard part numbers shown; please refer to individual customer drawings for details.

For any spare or replacement parts, contact your distributor or equipment manufacturer. Always try to have available the gear drive unit part number, serial number and date code from the serial tag; this information may be necessary for verification of any component part numbers. Component part numbers and/or manufacturing lot numbers may be stamped on individual parts; this information may also be helpful in identifying replacement components.

LUBRICATION & MAINTENANCE

Change oil after the first 50 hours of operation. Oil should be changed at 500 hour intervals thereafter. Use a GL-5 grade EP 80/90 gear oil (EP=Extreme Pressure). The gear drive should be partially disassembled to inspect gears and bearings at 1000 hour intervals.

If your unit was specified "shaft up" or with a "-Z" option, a grease zerk was provided in the base housing. For shaft up operation, the output bearing will not run in oil and must be grease lubricated. Use a lithium base or general purpose bearing grease sparingly every 50 operative hours or at regular maintenance intervals. Over greasing the output bearing tends to fill the housing with grease and thicken the oil.

Operating Position

Horizontal Shaft
Vertical Shaft

Oil Capacity

6.75 pints / 3.2 liters
12.75 pints / 6.0 liters

Oil Level

To horizontal centerline of gear drive
To midway on upper/primary gear set



WARNING: While working on this equipment, use safe lifting procedures and wear adequate clothing and hearing, eye and respiratory protection.

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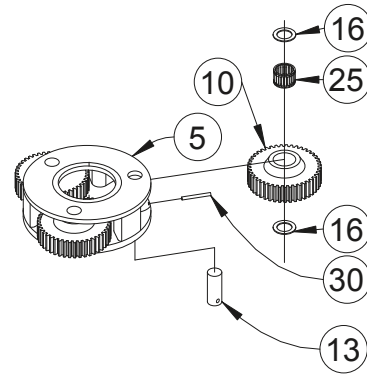
Unit Disassembly Procedure

(Refer to exploded view drawing on Page 6)

- 1) Scribe a diagonal line across the outside of the unit from the cover (4) to the base (1) before disassembly to assure proper positioning of pieces during reassembly.
- 2) Remove magnetic draining plug (33) and drain oil from unit. Maximum drainage occurs when oil is warm.
- 3) Remove twenty hex-head capscrews (29) and lockwashers (32).
- 4) Remove the cover (4), thrust washer (28), input gear (11) and carrier thrust washer (14). Inspect o-ring (15); discard if damaged or if it has taken a set.
- 5) Lift the primary planet carrier assembly out of the unit. (Includes Items 5, 10, 13, 16, 25 & 30)
- 6) If sun gear (9) has not been removed from the gearbox, do so now. (Sometimes the sun gear remains in the primary carrier (5).)
- 7) Remove primary ring gear (2). Inspect second o-ring (15) as before; discard if damaged.
- 8) Remove carrier thrust washer (14). Lift the secondary planetary assembly (Includes Items 6, 8, 12, 23, 24 & 31) out of the unit; use a puller if necessary.
- 9) Remove secondary ring gear (3). Inspect third o-ring (15) as before; discard if damaged.
- 10) The unit is now disassembled into groups of parts. The area(s) requiring repair should be identified by thorough inspection of the parts after cleaning and drying.

Primary Planet Carrier Subassembly

(Items 5, 10, 13, 16, 25 & 30)



Disassembly and Repair

Rotate planet gears (10) to check for abnormal noise or roughness in bearings (25) or planet shafts (13). If further inspection or replacement is required, proceed as follows.

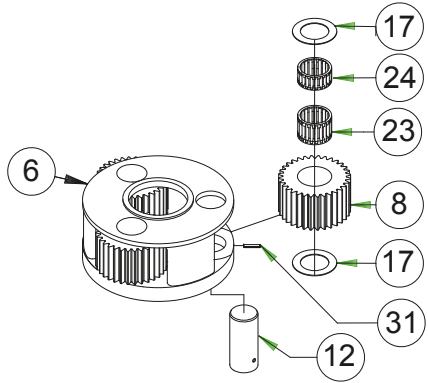
- 1) Drive roll pins (30) completely into the planet shafts (13).
- 2) Press or drive planet shafts (13) out of carriers (5).
- 3) Remove planet gears (10) and planet washers (16) from the carrier (5).
- 4) If the planet bearings (25) require replacement, press them out of the planet gears (10) and replace with new parts.
- 5) Check primary planet shafts (13) for any abnormal wear, especially where bearings needed to be replaced. If any abnormal wear is found, replace the planet shaft.

Reassembly

- 1) Use 3/16 inch pin punch to remove roll pins (30) from planet shafts (13).
- 2) With planet washers (16) on both sides of the planet gear (10) and with bearings (25) installed, slide gear into the carrier (5). Insert the planet shaft (13) through the carrier, washers and planet gear.
- 3) Planet shafts (13) should be installed with chamfered end of 3/16 inch hole toward outside diameter of the carrier (5). This will aid in alignment of holes while inserting roll pins (30).
- 4) Drive a roll pin (30) through the carrier hole and into the planet shaft to retain the parts. Repeat for other planet gears.

Secondary Planet Carrier Subassembly

(Items 6, 8, 12, 17, 23, 24 & 31)

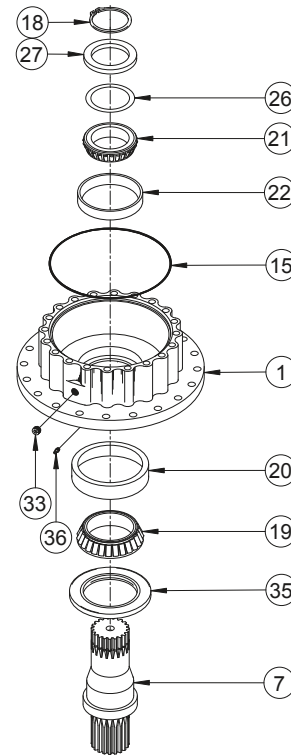


Disassembly and Repair

Follow the same procedure as that for the primary planetary assembly. Substitute items as indicated: planet gears (8), planet bearings (23 & 24), planet shafts (12), roll pins (31), carrier (6) and washers (17).

Base Subassembly

(Items 1, 7, 18, 19, 20, 21, 22, 26, 27, 33, 35 & 36)



Disassembly and Repair

- 1) Remove the lock ring (27) using a heel bar or a puller. If using a heel bar, do not pry against the cage of the inner output shaft bearing (21). Remove the split ring segments (18) and shims (26).

CAUTION: Output shaft is no longer retained. Care should be taken not to injure feet, as output shaft can fall out. Care should also be taken not to damage output shaft when shaft is pressed through base.

- 2) Output shaft removal. Base (1) should be set pinion side down, as shown, on a plate or table with output shaft (7) protruding through a hole in the table. Press output shaft out bottom of the base by applying a load to top end (internal end) of shaft until it passes through inner shaft bearing cone (21).
- 3) If outer bearing cone (19) (on the shaft) needs to be removed, a gear puller may be used; otherwise, skip to Step 6. If re-using old bearing cone, neither pull or damage the roller cage. Remove the shaft seal (35) for inspection or replacement.
- 4) Lubricate inner lip of new shaft seal (35) and slide the seal onto the shaft (7) until it fits snugly over shaft seal diameter with the open side toward the inside of the gearbox.

NOTE: Press bearing cone onto putput shaft by pressing on inner race only. Do not press on roller cage, as it may damage bearing.

- 5) Press outer bearing cone (19) (large end down, as shown) onto the shaft until it seats against the shoulder. Bearing cone (19) may be reused if it was removed only to replace the seal (35).
- 6) Inspect inner and outer bearing cups (20 & 22). Replace if necessary.

Base Assembly

- 1) Clean all foreign material from magnetic oil plug **(33)** located on side of base **(1)**. Add a small amount of pipe thread compound to pipe plug before installing back into base.
- 2) Place the base **(1)** (output side up, opposite shown) on the press table.
- 3) Apply a layer of lithium or general purpose bearing grease to surface of outer bearing cup **(20)**. Insert the shaft into the base (bearing cone down) and use a soft hammer to install the shaft seal **(35)** into the mounting base.

CAUTION: Output shaft is no longer retained.

- 4) Invert this assembly on the press table, so that is it standing on the shaft.

NOTE: Press bearing cone onto output shaft by pressing on inner race only. Do not press on roller cage, as it may damage bearing.

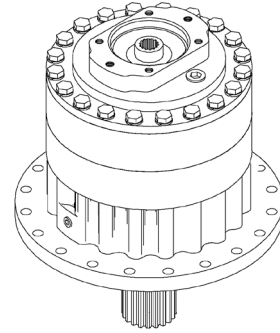
- 5) Apply a layer of lithium or general purpose bearing grease to the surface of the inner bearing cup **(22)**. Press the inner bearing cone **(21)** (large end up, as shown) onto the shaft **(7)** until it is just seated against inner bearing cup **(22)**. A slight preload of less than 100 in-lbs rolling torque should be obtained.
- 6) Relieve the press and slide the shim(s) **(26)** onto the shaft. Coat the split ring **(18)** with anti-sieze compound and begin installing ring in groove of shaft. Tap the segments into the groove of the shaft until you can drive the lock ring **(27)** over the segments. Be sure the lock ring **(27)** "clicks" over the detent, which helps keep the Load-n-Lock™ in place. Measure the rolling torque of the output shaft; torque is the product of the force (lbs) multiplied by the distance from the gearbox centerline (in). The rolling torque should be 50-100 in-lbs. If the rolling torque is too high, remove the Load-n-Lock™ and remove a shim. Reinstall the Load-n-Lock™ and measure again. If torque is too low, add a shim and measure again.

All subassembly service or repairs should be complete at this time. Continue on through Unit Assembly to complete unit build-up.

Unit Assembly

Reassembling

(Refer to exploded view drawing on Page 6)



- 1) When all subassemblies are complete, unit is ready to be assembled.
- 2) Lubricate o-ring **(15)** and install on the O.D. pilot of the secondary ring gear **(3)**. Referring to scribe marks for proper orientation, install the secondary ring gear **(3)** onto the base **(1)**.
- 3) Install the secondary planet carrier **(6)**; assemble by rotating it until planet gears line up with ring gear teeth and shaft spline. Press until fully seated on shaft **(7)**.
- 4) Lubricate o-ring **(15)** and install on the O.D. pilot of the primary ring gear **(2)** and install the primary ring gear **(2)**. Refer to scribe marks for proper orientation.
- 5) Slide the sun gear **(9)** onto the secondary planet carrier **(6)**.
- 6) Install carrier thrust washer **(14)**.
- 7) Install primary planet carrier **(5)**; assemble by rotating it until planet gears line up with ring gear teeth and sun gear spline. Assembly should drop into place.
- 8) Slide the input gear **(11)** into the primary planetary carrier.
- 9) Install carrier thrust washer **(14)** and input gear thrust washer **(28)**.
- 10) Lubricate o-ring **(15)** and install on the O.D. pilot of the cover **(4)**. Position the cover **(4)** with the proper orientation. Install the twenty 5/8-11 capscrews **(29)** with lockwashers **(32)** and torque to 220 ft-lbs **(dry)**, 170 ft-lbs **(wet)**.
- 11) Fill to proper level, as specified on page 2, with EP 80/90 gear oil after unit is sealed with a brake and/or motor.

THE GEARBOX IS NOW READY TO USE.



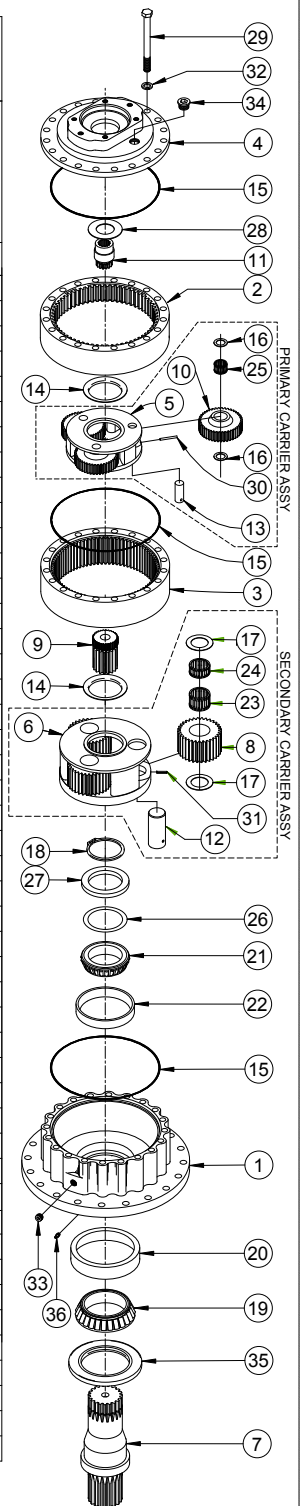
MODEL 252

ITEM	QTY	RATIO →	EFFECTIVE: FROM: S/N 28500 01/01/97 TO: CURRENT	PART NO.	PART NO.	PART NO.	PART NO.	PART NO.	PART NO.
1	1	20.25:1	4.3125:1 4.6957:1	25-004-3012	25-004-3012	25-004-3012	25-004-3012	25-004-3012	25-004-3012
		25.88:1	4.3125:1 6.00:1	25-004-3022	25-004-3022	25-004-3022	25-004-3022	25-004-3022	25-004-3022
		29.58:1	6.30:1 4.6957:1	25-004-3152	25-004-3152	25-004-3152	25-004-3152	25-004-3152	25-004-3152
		37.80:1	6.30:1 6.00:1						
2	1	40.25:1	8.5714:1 4.6957:1	25-004-1012	25-004-1012	25-004-1012	25-004-1012	25-004-1012	25-004-1012
		51.43:1	8.5714:1 6.00:1	25-004-1022	25-004-1022	25-004-1022	25-004-1022	25-004-1022	25-004-1022
				25-005-2061	25-005-2061	25-005-2061	25-005-2061	25-005-2061	25-005-2061
				25-005-2051	25-005-2051	25-005-2051	25-005-2051	25-005-2051	25-005-2051
3	1			25-004-1222	25-004-1222	25-004-1222	25-004-1222	25-004-1222	25-004-1222
				25-004-1232	25-004-1232	25-004-1232	25-004-1232	25-004-1232	25-004-1232
				25-004-1052	25-004-1052	25-004-1042	25-004-1032	25-004-1032	25-004-1032
				25-004-1072	25-004-1062	25-004-1072	25-004-1062	25-004-1072	25-004-1062
4	1			25-004-4012	25-004-4012	25-004-4012	25-004-4012	25-004-4012	25-004-4012
				25-004-4022	25-004-4022	25-004-4022	25-004-4022	25-004-4022	25-004-4022
5	1			25-004-1092	25-004-1082	25-004-1092	25-004-1082	25-004-1092	25-004-1082
				25-004-1152	25-004-1142	25-004-1152	25-004-1142	25-004-1152	25-004-1142
				25-004-1122	25-004-1122	25-004-1112	25-004-1112	25-004-1102	25-004-1102
				25-004-1202	25-004-1202	25-004-1172	25-004-1172	25-004-1162	25-004-1162
6	1			25-004-1292	25-004-1292	25-004-1282	25-004-1282	25-004-1272	25-004-1272
				25-004-1021	25-004-1021	25-004-1021	25-004-1021	25-004-1021	25-004-1021
				25-004-1031	25-004-1031	25-004-1031	25-004-1031	25-004-1031	25-004-1031
				25-004-1132	25-004-1132	25-004-1132	25-004-1132	25-004-1132	25-004-1132
7	1			01-402-0020	01-402-0020	01-402-0020	01-402-0020	01-402-0020	01-402-0020
				81-004-1561	81-004-1561	81-004-1561	81-004-1561	81-004-1561	81-004-1561
				25-004-1041	25-004-1041	25-004-1041	25-004-1041	25-004-1041	25-004-1041
				01-160-0600	01-160-0600	01-160-0600	01-160-0600	01-160-0600	01-160-0600
8	1			01-102-0240	01-102-0240	01-102-0240	01-102-0240	01-102-0240	01-102-0240
				01-103-0240	01-103-0240	01-103-0240	01-103-0240	01-103-0240	01-103-0240
				01-102-0250	01-102-0250	01-102-0250	01-102-0250	01-102-0250	01-102-0250
				01-103-0250	01-103-0250	01-103-0250	01-103-0250	01-103-0250	01-103-0250
9	1			01-105-0550	01-105-0550	01-105-0550	01-105-0550	01-105-0550	01-105-0550
				01-105-0560	01-105-0560	01-105-0560	01-105-0560	01-105-0560	01-105-0560
				01-105-0570	01-105-0570	01-105-0570	01-105-0570	01-105-0570	01-105-0570
				25-004-1051	25-004-1051	25-004-1051	25-004-1051	25-004-1051	25-004-1051
10	1			25-004-1061	25-004-1061	25-004-1061	25-004-1061	25-004-1061	25-004-1061
				81-004-2883	81-004-2883	81-004-2883	81-004-2883	81-004-2883	81-004-2883
				01-112-0030	01-112-0030	01-112-0030	01-112-0030	01-112-0030	01-112-0030
				01-150-1630	01-150-1630	01-150-1630	01-150-1630	01-150-1630	01-150-1630
11	1			01-153-0020	01-153-0020	01-153-0020	01-153-0020	01-153-0020	01-153-0020
				01-153-0190	01-153-0190	01-153-0190	01-153-0190	01-153-0190	01-153-0190
				01-166-0040	01-166-0040	01-166-0040	01-166-0040	01-166-0040	01-166-0040
				01-207-0041	01-207-0041	01-207-0041	01-207-0041	01-207-0041	01-207-0041
12	1			01-208-0030	01-208-0030	01-208-0030	01-208-0030	01-208-0030	01-208-0030
				01-405-0670	01-405-0670	01-405-0670	01-405-0670	01-405-0670	01-405-0670
				01-207-0020	01-207-0020	01-207-0020	01-207-0020	01-207-0020	01-207-0020
				01-215-0040	01-215-0040	01-215-0040	01-215-0040	01-215-0040	01-215-0040

1 FOR 13T, 8/16 INPUT SPLINE, USE P/N 01-112-0030 THRUST WASHER. (USE ONLY WITH 'D' COVER).

* QUANTITY OF SHIMS DETERMINED BY BEARING PRELOAD.

OPTIONS SEAL KIT P/N 25-016-2011
INCLUDES 1 EA. OF ITEMS 35
AND A QTY 3 OF ITEM 15



E.C.N. 2325
X252KD2-AE DATE: 06-13-05

ESKRIDGE FINISHED PRODUCT LIMITED WARRANTY

1.1 **Scope of Warranty Coverage.** Upon the terms and subject to the conditions set forth in this limited warranty:

(a) ESKRIDGE (referred to herein as “**ESKRIDGE**” or the “**Manufacturer**”) warrants to each initial end user customer (a “**Purchaser**”) of a new finished product together with any accessories manufactured and sold directly from ESKRIDGE (the “**Product**”) that the Product shall be free from defects in material and workmanship, under normal working and service conditions, for a period of eighteen (18) months from the date the Product is shipped from ESKRIDGE. (the “**Warranty Term**”). A Purchaser shall be eligible for an additional eighteen (18) months of coverage in addition to the Warranty Term (also referred to as the “**Standard (+) PLUS benefit**”) only if the Purchaser (i) complies with Section 1.2(a) and (ii) registers the Product during the Warranty Term at myproduct.eskridgeinc.com.

(b) Notwithstanding the foregoing, this warranty does not cover components damaged by accident, abuse, misuse, neglect, untrained operators, collision, overloading, modification, disassembly, rework, misapplication, improper installation, lack of lubrication or maintenance, or improper service. This warranty does not cover the paint or material finish, removal or reinstallation of the Product, or normal wear and tear and loss of functionality due to aging of the Product (which may include but is not limited to bearings, bushings, seals, O-rings, gaskets, brake material, motor brushes, electrical cables and more).

1.2 **Eligibility of Warranty Coverage.**

(a) A Purchaser shall be eligible for warranty coverage under this Limited Warranty during the Warranty Term only if:

(i) Prior to placing a Product in service, and throughout use of the Product during the Warranty Term, the Purchaser provides (or causes to be provided) proper storage such that foreign objects (e.g. rain or debris) cannot enter any Product through entry ports which are normally closed during operation.; and

(ii) The Purchaser maintains, or causes to be maintained, the Product according to commercially reasonable standards and utilizes the Product for the purposes for which it was created; and

(iii) No repairs or alterations have been made by any party other than ESKRIDGE, including Purchaser, unless otherwise authorized in writing by ESKRIDGE.

1.3 **Transferability of Warranty.**

(a) This warranty is transferable only from the Purchaser to the first subsequent transferee (the “**Transferee**”) of the Product from Purchaser upon (i) written notification to ESKRIDGE and (ii) registration of the transfer, both within 30 days of such Product transfer.

(b) Upon satisfaction of transfer requirements set forth in Section 1.3(a), the Transferee shall succeed to all the rights and obligations of the Purchaser set forth in this Limited Warranty.

1.4 **Certain Limitations on Scope of Warranty Service.**

(a) Any obligation of ESKRIDGE under this warranty, statutory or otherwise, is limited to the repair of the Product, at its factory or Authorized Service Centers. Notwithstanding the foregoing, if field service or repair is performed by ESKRIDGE at the request of the Purchaser and no defect is found with material or workmanship of the Product, the Purchaser shall compensate ESKRIDGE for its time and expenses within thirty (30) days of delivery of an invoice relating to the same. If repair is determined by ESKRIDGE in its sole, absolute and uncontrolled discretion to be impossible or impractical, then ESKRIDGE may satisfy this warranty by replacing the Product. ESKRIDGE will not provide any cash payment or credits for defective materials or workmanship.

(b) Purchaser shall be responsible for any and all freight charges for any Product receiving warranty service under this limited warranty. Any travel time, transportation charges, freight charges, or similar costs incurred by ESKRIDGE in connection with the replacement or repair of defective parts, shall, be the responsibility of the Purchaser. If applicable, ESKRIDGE shall invoice Purchaser for the total amount of such charges within sixty (60) days of fulfilling its duties under this warranty, payable within thirty (30) days of delivery of such invoice. In no event shall ESKRIDGE be liable for bills for service, labor or other expenses that have been incurred by the Purchaser without approval or prior authorization by ESKRIDGE for inspection, maintenance, or repair of the Product.

(c) If a Product is found to be operable upon inspection, the Product, at Purchaser's election, may be either (1) returned to the Purchaser with a service charge from ESKRIDGE for inspection, cleaning, and routine replacement of all rubber components and any other parts that show wear; or (2) ESKRIDGE can dispose of the product safely.

1.5 Limitations of Liability. ESKRIDGE shall in no event be liable for punitive, special or consequential damages relating to the Product or this Warranty. ESKRIDGE makes no warranty in respect to third-party accessories, upgrades, or additions to the Product.

1.6 Improving Product. ESKRIDGE reserves the right to improve the Product through changes in design or materials as it may deem desirable or necessary without being obligated to incorporate, upgrade, or otherwise modify previously manufactured products.

1.7 Limitations of Warranty.

(a) THE WARRANTY SET FORTH ABOVE IS THE ONLY EXPRESS WARRANTY. ESKRIDGE HEREBY DISCLAIMS AND EXCLUDES ANY OTHER EXPRESS, IMPLIED, OR STATUTORY WARRANTIES, ARISING BY OPERATION OF LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE, OF TRADE, OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND INTELLECTUAL PROPERTY RIGHTS OF A THIRD PARTY.

(b) ANY IMPLIED WARRANTY WHICH BY LAW MAY NOT BE EXCLUDED IS LIMITED IN DURATION TO ONE (1) YEAR FROM THE DATE OF ORIGINAL RETAIL PURCHASE OF THE PRODUCT.

(c) This warranty gives you specific legal rights, and you may also have other rights which vary from jurisdiction to jurisdiction.

(d) This warranty is valid only in the U.S.A. and Canada. For warranty outside the U.S.A. and Canada contact your nearest Eskridge Distributor.

1.8 No Modifications to Warranty. No ESKRIDGE dealer, distributor, agent or employee is authorized to make any modification, extension or addition to this warranty.

1.9 How to Apply for Warranty Coverage.

All claims are handled by contacting your nearest Eskridge Distributor. For questions, please contact customer support: eskcustomersupport@ramseyindustries.com.

Visit [Dealer Locator - Eskridge](#) for Eskridge Distributor locations and contact information.

Additional warranty, service support, product information, and parts information can be found on www.eskridgeinc.com.