

KLUTCH[®]

Series 900 Auto-Darkening Welding Helmet

Owner's Manual



⚠ WARNING: Read and understand all instructions, warnings, and cautions before using this product. Failure to follow the instructions, warnings, and cautions may result in serious personal injury and/or property damage.

Item # 48741

SAVE THESE INSTRUCTIONS

Thank you very much for choosing a Klutch product!

For future reference, please complete the owner's record below:

Serial Number/Lot Date Code: _____

Purchase Date: _____

Save the receipt, warranty, and this manual.

This product is designed for certain applications only. The distributor cannot be responsible for issues arising from modification or use of this product in an application for which it was not designed. We strongly recommend that this product not be modified and/or used for any application other than that for which it was designed.

For technical questions, please call **1-800-222-5381**.

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Intended Use

The Solar-Powered Auto-Darkening Welding Helmet is ideal for most welding applications and designed to meet the most demanding requirements.

Technical Specifications

Viewing Area	3.82" X 2.44" (97 X 62 mm)
Cartridge Size	5.25" x 4.50" x 0.35" (133 x 114 x 9mm)
Arc Sensor	4
Light State	DIN 3.5
Grind State	DIN 4
Cutting Shade	Shade no. from 5 to 8
Welding Shade	Shade no. from 9 to 13
Shade Control	Internal, Variable Shade, Digital Display Control
Power On/Off	Manual-on, Auto-off
Sensitivity Control	Low — High, Digital Display Control
UV/IR Protection	Up to Shade DIN 16 at all times
Power Supply	Solar cell. Battery replaceable 2 X CR2450 lithium battery
Switching Time	1/25,000 s. from Light to Dark
Oxyfuel Gas Welding	Yes
Oxygen Cutting	Yes
Grinding	Yes
Delay (Dark to Light)	0.1 - 1.0 s Digital Display Control
Low Amperage TIG Rated	≥ 2 amps DC; ≥ 2 amps AC
Operating Temperature	14°F - 131°F (-10°C - +55°C)
Storing Temperature	- 4°F -158°F (-20°C - +70°C)
Helmet Material	High Impact Resistance Nylon
Total Weight	17.28 oz. (490g)
Application Range	Stick Welding (DC&AC); TIG (DC,DC Pulse); TIG AC(Pulse), Excellent low amperage TIG response; MIG/MAG; MIG/MAG Pulse; Plasma Cutting/Welding; Oxyacetylene Welding/Cutting; Grinding
Tested	ANSI Z87.1, CSA Z94.3

Important Safety Information

WARNING

- The warnings, cautions, and instructions in this manual cannot cover all possible conditions or situations that could occur. Exercise common sense and caution when using this tool. Always be aware of the environment and ensure that the tool is used in a safe and responsible manner.
- DO NOT allow persons to adjust or use this product until they have read this manual and have developed a thorough understanding of how the product works.
- Industrial or commercial applications must follow OSHA requirements.

WORK AREA SAFETY

- Inspect the work area before each use. Keep the work area clean, dry, free of clutter, and well lit. Cluttered, wet, or dark work areas can result in injury.
- Do not weld where there is a risk of causing a fire or an explosion; e.g., in the presence of flammable liquids, gases, or dust. Welding can create sparks, which may ignite the flammable liquids, gases, or dust.
- Keep children and bystanders away from the work area while welding.

PERSONAL SAFETY

- Stay alert, watch what you are doing, and use common sense when welding. Do not weld while you are tired or under the influence of drugs, alcohol, or medication.
- Dress properly. Do not wear loose clothing, dangling objects, or jewelry. Keep your hair, clothing and gloves away from moving parts. Loose clothes, jewelry, or long hair can be caught in moving parts. Wear proper welding apparel including flame resistant gloves, shirts, and caps.
- Use safety apparel and equipment. Use ANSI-approved safety goggles or safety glasses with side shields. Use a dust mask in dusty work conditions. Also use non-skid safety shoes, hardhat, gloves, dust collection systems, and hearing protection when appropriate. This applies to all persons in the work area.
- Do not overreach. Keep proper footing and balance at all times.

⚠ WARNING:

HELMET USE AND CARE

- DO NOT modify the helmet in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the helmet.
- DO NOT use the helmet if the filter does not darken immediately upon striking an arc.
- DO NOT use the helmet as a hand shield. Wear the helmet correctly.
- DO NOT open or tamper with the Auto-Darkening filter. Protect the filter from contact with liquid or dirt. Do not immerse the filter in water or any other liquid. Clean the surface of the filter regularly. Do not use solvents on the filter screen or helmet components.
- DO NOT place the helmet or filter on a hot surface
- DO NOT allow children to handle or play with the helmet. Not for use by children.
- Use only at temperatures 14°F - 131°F (-10°C - +55°C).
- Store at temperatures - 4°F -158°F (-20°C - +70°C).
- Always check of damaged or worn out parts before using the helmet. Broken parts will affect the helmet's operation. Replace or repair damaged or worn parts immediately.
- Store the helmet when it is not in use. Store it in a secure, dry, cool place out of the reach of children. Remove the batteries if it will be stored for a prolonged period. Inspect it for good working condition prior to storage and before re-use.
- This helmet is not suitable for laser welding.
- This welding helmet will not protect against severe impact hazards.
- This helmet will not protect against explosive devices or corrosive liquids.
- The front cover lens is breakable and does not provide significant protection against flying particles, splash, spray, and spatter. The helmet will only protect the eyes and face from radiation and sparks.
- Wear approved safety glasses with side shields under the helmet.
- The helmet materials which may come into contact with the wearer's skin may cause allergic reactions in some individuals.
- Use protective screens or barriers to protect others from flash and glare. Warn others not to look at the arc.

Safety Labels

WARNING

This Product uses (2) Lithium CR2450 batteries. To help avoid fluid leaks or explosions please adhere to the following warning:

Do not mix old and new batteries or batteries of different types: alkaline, standard (carbon-zinc) or rechargeable (nickel-cadmium) • Insert batteries as indicated inside the battery compartment • Do not insert batteries backwards • Remove batteries during long periods of non-use. Always remove exhausted batteries from the product. Dispose of batteries safely. Do not dispose of this product in a fire. The batteries inside may explode or leak • Never short-circuit the battery terminals • Do not expose to excessive heat • Use only batteries of the same or equivalent type, as recommended • Do not charge non-rechargeable batteries

WARNING

1. Fully read and understand the manual before use.
2. Before welding or cutting, ensure the darkness range of this helmet is offers sufficient eye protection for your use.
3. Always wear ANSI approved safety glasses with the welding helmet when using this product. The front cover lens (front impact resistant plate) **CAN BREAK** and **DOES NOT** provide complete protection against flying particles, splash, spray and splatter.
4. Inspect lens before each use. Pitted or scratched lens plates reduce vision clarity, severely reduce impact protection and should be replaced immediately to prevent injury.
5. Not for use with Laser Welding Processes.
6. Inspect the helmet before each use. Do not use if damaged. Replace worn parts before using.
7. Not for use by children. Store helmet out of the reach of children.

DO NOT REMOVE THIS WARNING LABEL

Operating Instructions

This Auto-Darkening welding helmet is designed to protect the eyes and face from sparks, spatter, and harmful radiation under normal welding conditions. The auto-darkening filter automatically changes from a light state to a dark state when an arc is struck, and returns to the light state when welding stops.

Before using the helmet:

- Check that the batteries are good.
- Adjust the helmet so that it properly fits your head.
- Turn the power on.
- Set the mode.
- Set the shade number.
- Set the sensitivity.
- Set the delay time.

Power

When the low battery LED located on the lens turns red, the batteries should be replaced. To replace the batteries, slide the battery holder out of the auto darkening filter, remove the used batteries, insert new CR2450 batteries, and then put the battery holder back into the auto darkening filter. Make sure that the anode and cathode of the battery are installed correctly (See Figure.1).

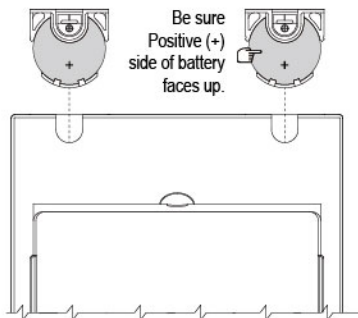


Figure.1

On-Off

Press and release the **ON/MODE** button to check if the lens is working properly and to set the lens shade number, sensitivity, and delay (See Figure.2-A). Press and hold the **ON/MODE** button to power off and return the lens to the clear state. Do not use the helmet if the lens does not function as described.

Mode Control

Press and release the **ON/MODE** button to select the mode appropriate for the work activity (see Figure.2-A)

- **Weld Mode** – used for most welding applications. Press the **FUNC** button to adjust the shade number, sensitivity, and delay settings before welding (see Figure.2-C). In this mode, the lens turns dark immediately when you start welding.
- **Cutting Mode** – used for cutting applications. Press the **FUNC** button to adjust the shade number, sensitivity, and delay settings before cutting (see Figure.2-C). In this mode, the lens turns dark immediately when you start cutting.
- **Grind Mode** – used for grinding applications. In this mode the shade is fixed (shade No. 4). The shade number, sensitivity, and delay settings cannot be adjusted (See Figure.2-C).

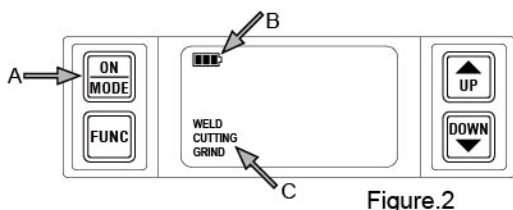


Figure.2

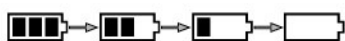


Figure.3

Battery Indicator

The battery level symbol (see Figure.2-B and Figure.3) shows the current state of the battery. The symbol first appears when 1–2 days of battery life remains. The symbol is not real-time; to update the symbol, press and release the **ON/MODE** button.

Variable Shade Control

Press the **FUNC** button to select **SHADE**, and then press the **UP** and **DOWN** buttons to set the shade value (See Figure.4a/4b/4c). The shade range for each mode is as follows:

Weld Mode: 9 - 13 (see Figure.4a)

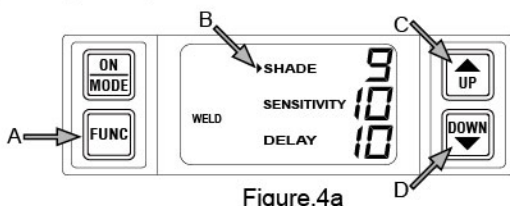


Figure.4a

Cutting Mode: 5 - 8 (see Figure.4b)

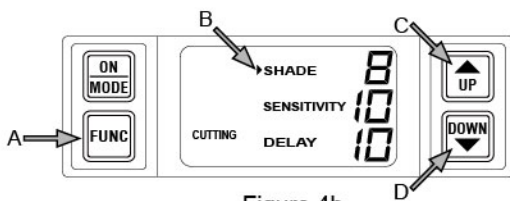


Figure.4b

Grind Mode: 4 only (see Figure.4c)

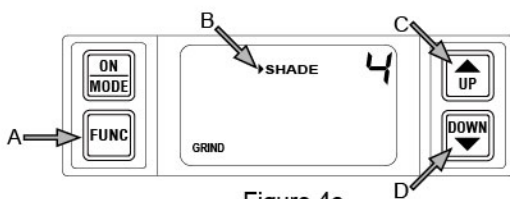


Figure.4c

Select the proper shade number for your welding/cutting process, by referring to the Shade Guide Table below.

SHADE GUIDE TABLE

GUIDE FOR SHADE NUMBERS

OPERATION	ELECTRODE SIZE 1/32 in. (mm)	ARC CURRENT (A)	MINIMUM PROTECTIVE SHADE	SUGGESTED ⁽¹⁾ SHADE NO. (COMFORT)
Shielded metal arc welding	Less than 3 (2.5)	Less than 60	7	—
	3-5 (2.5-4)	60-160	8	10
	5-8 (4-6.4)	160-250	10	12
	More than 8 (6.4)	250-550	11	14
Gas metal arc welding and flux cored arc welding		Less than 60	7	—
		60-160	10	11
		160-250	10	12
		250-500	10	14
Gas tungsten arc welding		Less than 50	8	10
		50-150	8	12
		150-500	10	14
Air carbon Arc cutting	(Light)	Less than 500	10	12
	(Heavy)	500-1000	11	14
Plasma arc welding		Less than 20	6	6 to 8
		20-100	8	10
		100-400	10	12
		400-800	11	14
Plasma arc cutting	(Light) ⁽²⁾	Less than 300	8	8
	(Medium) ⁽²⁾	300-400	9	12
	(Heavy) ⁽²⁾	400-800	10	14
Torch brazing		—	—	3 to 4
Torch soldering		—	—	2
Carbon arc welding		—	—	14
PLATE THICKNESS				
	in.	mm		
Gas welding	Light	Under 1/8	Under 3.2	4 or 5
	Medium	1/8 to 1/2	3.2 to 12.7	5 or 6
	Heavy	Over 1/2	Over 12.7	6 or 8
Oxygen cutting	Light	Under 1	Under 25	3 or 4
	Medium	1 to 6	25 to 150	4 or 5
	Heavy	Over 6	Over 150	5 or 6

⁽¹⁾ As a rule of thumb, start with a shade that is too dark, then go to a lighter shade which gives sufficient view of the weld zone without going below the minimum. In oxyfuel gas welding or cutting where the torch produces a high yellow light, it is desirable to use a filter lens that absorbs the yellow or sodium line the visible light of the (spectrum) operation

⁽²⁾ These values apply where the actual arc is clearly seen. Experience has shown that lighter filters may be used when the arc is hidden by the workpiece.

Sensitivity Control

Press the **FUNC** button to select **SENSITIVITY**, and then press the **UP** and **DOWN** buttons to set the sensitivity (see Figure.5a/5b-A/B). A setting of 5-10 is normal for everyday use. The sensitivity range for each mode is as follows:

Weld Mode: 0 - 10 (see Figure.5a)

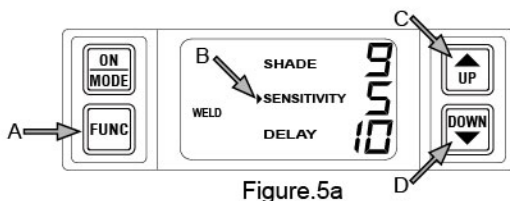


Figure.5a

Cutting Mode: 0 - 10 (see Figure.5b)

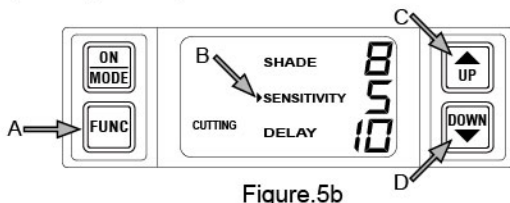


Figure.5b

Grind Mode – No sensitivity adjustment

It is recommended to set sensitivity to the maximum at the start and then gradually reduce it until the filter reacts only to the welding light flash and not to false ambient light conditions (direct sun, intensive artificial light, neighboring welder's arcs etc.).

It may be necessary to adjust the sensitivity to accommodate different lighting conditions or if the lens is flashing on and off. Adjust the sensitivity as follows:

1. Adjust the sensitivity in the lighting conditions where the helmet will be used.
2. Press the **DOWN** button to lower the setting to 0.
3. Face the helmet in the direction of use, exposing it to the surrounding light conditions.
4. Press the **UP** button repeatedly until the lens darkens, then press the **DOWN** button until the lens clears. The helmet is now ready for use. Slight readjustment may be necessary for certain applications or if the lens is flashing on and off.

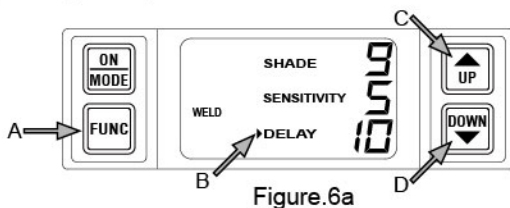
If the Sensitivity setting is ≤ 9 , the helmet will automatically turn off after 30 minutes of non-use.

If the Sensitivity setting = 10, the helmet will stay in the dark state and will not automatically turn off. To manually turn the helmet off, press and hold the **ON/MODE** button.

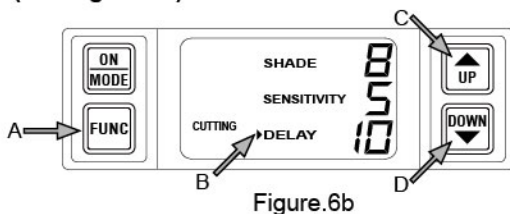
Delay Control

Press the **FUNC** button to select **DELAY**, and then press the **UP** and **DOWN** buttons to set the delay time (See Figure.6a/6b). The delay range for each mode is as follows:

Weld Mode: 0 - 10 (see Figure.6a)



Cutting Mode: 0 - 10 (see Figure.6b)



Grind Mode - No delay adjustment

The delay is particularly useful in eliminating bright after-rays present in higher amperage applications where the molten puddle remains bright momentarily after welding. Use the Lens Delay Control buttons to adjust the delay from 0 to 10 (0.1 to 1.0 second). When welding stops, the viewing window automatically changes from dark to light but with a pre-set delay to compensate for any bright afterglow on the work piece. It is recommended to use a shorter delay with spot welding applications and a longer delay with applications using higher currents. Longer delays can also be used for lower current TIG welding and TIG / MIG / MAG pulse.

Adjusting the Fit of the Helmet

See Figure.7. The overall circumference of the headband can be made larger or smaller by rotating the knob (Y) on the back of the headband. This can be done while wearing the helmet and allows just the right tension to be set to keep the helmet firmly on the head without it being too tight.

If the headband is riding too high or too low on your head, adjust the strap which passes over the top of your head (W). To do this, release the end of the band by pushing the locking pip out of the hole in the band. Slide the two portions of the band to a greater or lesser width as required and push the locking pip through the nearest hole.

Test the fit of the headband by lifting up and closing down the helmet a few times while wearing it. If the headband moves while tilting, re-adjust it until it is stable.

Adjusting the Distance between the Helmet and your Face

See Figure.7. Undo the block nut (T) to adjust the distance between the helmet (in the down position) and your face. Loosen the block nut on either side of the helmet and slide it nearer or further from your face (Z). It is important that your eyes are each the same distance from the lens. Otherwise the darkening effect may appear uneven. Re-tighten the block nut when adjustment is complete.

Adjusting the View Angle

See Figure.8.

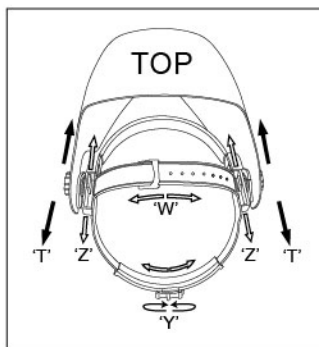


Figure.7

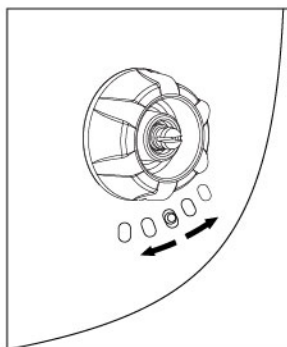


Figure.8

Maintenance

REPLACING FRONT COVER LENS

Replacing the front cover lens if it is damaged (cracked, scratched, soiled or pitted) (See Figure.9).

REPLACING THE INSIDE COVER LENS

If it is damaged (cracked,scratched, soiled or pitted).

CHANGING THE SHADE CARTRIDGE

(See Figure.10).

FITTING NEW CARTRIDGE

(See Figure.11).

CLEANING

Clean helmet by wiping with a soft cloth. Clean cartridge surfaces regularly. Do not use strong cleaning solutions. Clean sensors and solar cells with methylated spirit and a clean cloth and wipe dry with a lint-free cloth.

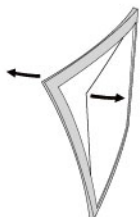


Figure.9

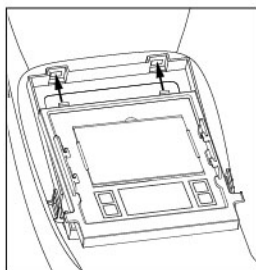


Figure.10

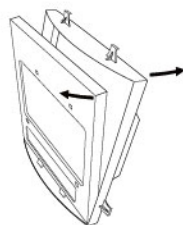
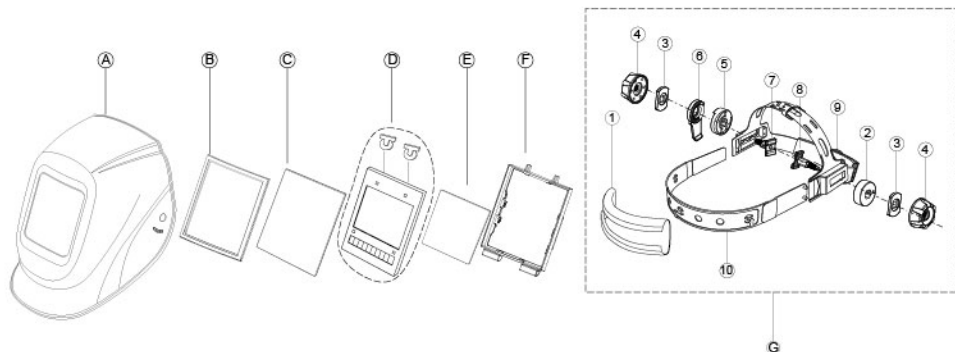


Figure.11

Troubleshooting

Problem	Solution
Helmet slips.	<ul style="list-style-type: none"> • Headband is not adjusted properly. Adjust the headband.
Irregular darkening or dimming.	<ul style="list-style-type: none"> • The distance from each eye to the filter lens is not the same. Adjust the headband so that the distance from each eye to the filter lens is the same.
Auto-darkening filter does not darken or it flickers.	<ul style="list-style-type: none"> • Front cover lens is soiled or damaged. Replace the front cover lens. • Sensors are soiled. Clean the surface of the sensors. • Welding current is too low. Increase the sensitivity level. • Check the batteries and verify that they are in good condition and installed properly. Also, check the battery surfaces and contacts and clean if necessary.
Slow response.	<ul style="list-style-type: none"> • Operating temperature is too low.
Poor vision.	<ul style="list-style-type: none"> • Front/inside cover lens and/or filter soiled. Change the front/inside cover lens and/or filter. • Insufficient ambient light. Increase the ambient light. • Shade number is incorrectly set. Reset the shade number.

Parts Diagram



Part List

ITEM	DESCRIPTION	QTY
A	Shell (Welding Mask)	1
B	Rubber Holder	1
C	Front Cover Lens	1
D	Auto-Darkening Filter	1
E	Inside Cover Lens	1
F	Lens Holder	1
G*	Headgear Assembly (Including Sweatband)	1

Part List of G*

ITEM	DESCRIPTION	QTY
1	Sweatband	1
2	Washer	1
3	Washer	2
4	Block Nut	2
5	Limitation Washer	1
6	Angle Limitation Washer	1
7	Right Boot Screw	1
8	Left Boot Screw	1
9	Adjustable Headband	1
10	Front Headgear	1

Replacement Parts

- For replacement parts and technical questions, please call Customer Service at **1-800-222-5381**.
- Not all product components are available for replacement. The illustrations provided are a convenient reference to the location and position of parts in the assembly sequence.
- When ordering parts, the following will be required: Model Number, Serial Number/Lot Date Code, and Description.
- The distributor reserves the rights to make design changes and/or improvements to product lines and manuals without notice.

Limited Warranty

Northern Tool and Equipment Company, Inc. ("We" or "Us") warrants to the original purchaser only ("You" or "Your") that the Klutch product purchased will be free from material defects in both materials and workmanship, normal wear and tear excepted, for a period of **two years** from date of purchase. The foregoing warranty is valid only if the installation and use of the product is strictly in accordance with product instructions. There are no other warranties, express or implied, including the warranty of merchantability or fitness for a particular purpose. If the product does not comply with this limited warranty, Your sole and exclusive remedy is that We will, at our sole option and within a commercially reasonable time, either replace the product without charge to You or refund the purchase price (less shipping). This limited warranty is not transferable.

Limitations on the Warranty

This limited warranty does not cover: (a) normal wear and tear; (b) damage through abuse, neglect, misuse, or as a result of any accident or in any other manner; (c) damage from misapplication, or improper installation of product or components; (d) improper maintenance and repair; and (e) product alteration in any manner by anyone other than Us, with the sole exception of alterations made pursuant to product instructions and in a workmanlike manner.

Obligations of Purchaser

You must retain Your product purchase receipt to verify date of purchase and that You are the original purchaser. To make a warranty claim, contact Us at 1-800-222-5381, identify the product by make and model number, and follow the claim instructions that will be provided. The product and the purchase receipt must be provided to Us in order to process Your warranty claim. Any returned product that is replaced or refunded by Us becomes our property. You will be responsible for return shipping costs or costs related to Your return visit to a retail store.

Remedy Limits

Product replacement or a refund of the purchase price is Your sole remedy under this limited warranty or any other warranty related to the product. We shall not be liable for: service or labor charges or damage to Your trailer incurred in removing or replacing the product; any damages, including, without limitation, damages to tangible personal property or personal injury, related to Your improper use, installation, or maintenance of the product or components; or any indirect, incidental or consequential damages of any kind for any reason.

Assumption of Risk

You acknowledge and agree that any use of the product for any purpose other than the specified use(s) stated in the product instructions is at Your own risk.

Governing Law

This limited warranty gives You specific legal rights, and You also may have other rights which vary from state to state. Some states do not allow limitations or exclusions on implied warranties or incidental or consequential damages, so the above limitations may not apply to You. This limited warranty is governed by the laws of the State of Minnesota, without regard to rules pertaining to conflicts of law. The state courts located in Dakota County, Minnesota shall have exclusive jurisdiction for any disputes relating to this warranty.



Distributed by
Northern Tool and Equipment Company, Inc.

Burnsville, Minnesota 55306

NorthernTool.com

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