

# **PNEUMATIC HAMMER INSTRUCTION MANUAL**

# NPH HAMMERS

### **NPH-4500L** NPH-3500

"Use Genuine NPK Parts"



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### SAFETY



Safety notices in NPK Instruction Manuals follow ISO and ANSI standards for safety warnings:

### **DANGER**

DANGER (red) notices indicate an imminently hazardous situation which, if not avoided, **will result in death or serious injury**.



WARNING (orange) notices indicate a potentially hazardous situation which, if not avoided, **could result in death or serious injury.** 



CAUTION (yellow) notices indicate a potentially hazardous situation, which, if not avoided, **may result in minor or moderate injury.** 



ATTENTION (blue) notices in NPK Instruction Manuals are an NPK standard to alert the reader to situations which, if not avoided, **could result in equipment damage**.

WARNING and BASIC OPERATING INSTRUCTIONS decals are included with each NPK hammer and installation kit. Decals must be installed in the cab, visible to the operator while operating the hammer.

STAY CLEAR and TOOL SHARPENING decals are installed on all NPK hammer models. Keep them clean and visible. NPK will provide decals free of charge as needed.

### 

- 1. Operator and Service personnel must read and understand the *NPK INSTRUCTION MANUAL* to prevent serious or fatal injury.
- 2. FLYING DEBRIS CAN CAUSE SERIOUS OR FATAL INJURY.
  - Keep personnel and bystanders clear of hammer while in operation.
  - Do not operate HAMMER without an impact resistant guard between HAMMER and operator. NPK recommends LEXAN® or equivalent material, or steel mesh. Some carrier manufacturers offer demolition guards for their machine. Check with the carrier manufacturer for availability. If not available, please call NPK.
- Do not hardface or sharpen the tool point with a cutting torch. Excessive heat from torching or welding can cause embrittlement, breakage, and flying pieces. Resharpen by milling or grinding only, using sufficient coolant.

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### SAFETY

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- 4. Operate HAMMER from operator's seat only.
- 5. Match HAMMER size to carrier according to NPK recommendations. The carrier must be stable during hammer operation and during transport.
  - See CARRIER MACHINE COMPATIBILITY section of the NPK instruction manual.
- 6. Do not make any alterations to the TOOL without authorization from NPK Engineering.
- 7. Use proper lifting equipment and tools when handling or servicing the HAMMER.
- 8. Wear ear protection and safety glasses when operating the hammer. Consult OSHA/MSHA regulations when applicable.
- 9. Beware of flying metal pieces when driving mounting pins.
- 10. If modifications are to be made, *do not alter the HAMMER without authorization from NPK Engineering!*
- 11. Use only genuine NPK replacement parts. NPK specifically disclaims any responsibility for any damage or injury that results from the use of any tool or parts not sold or approved by NPK.
- 12. All air line components must be rated 150% greater than maximum system pressure.
- 13. Never attempt to do any maintenance work on the compressor while it is running.
- 14. Keep compressor well ventilated, do not cover the compressor during use.
- 15. Drain tank daily and after use. Internal rust causes tank failure.
- 16. Do not use the air hose to move the compressor.
- 17. Release the pressure in the tank before moving.



18. Do not, under any circumstances, point air at or in the direction of someone. Discharging air pressure is capable of putting out eyes, bursting eardrums, causing serious skin burns, and other injuries.

## INTRODUCTION

This comprehensive instruction manual contains instructions for repairing and maintaining NPK PNEUMATIC HAMMERS. This manual includes helpful information for obtaining the full potential and efficiency from NPK PNEUMATIC HAMMERS. Please read this manual thoroughly to understand the NPK PNEUMATIC HAMMER and its operating principles before using it.

For additional information or help with any problem encountered, please contact your NPK authorized dealer.

Whenever repair or replacement of component parts is required, only NPK parts should be used. NPK is not responsible for failures resulting from substitution of parts not sold or approved by NPK.

### **BASIC OPERATING INSTRUCTIONS**

#### • READ OPERATORS MANUAL

Do not pry with tool. Apply down force perpendicular to work surface.

#### Important:

It is imperative that grease is maintained in the tool bushing contact area at all times. This may require hourly greasing depending on job conditions.

#### Important:

The hammer must be in a vertical position with downforce applied to push the tool all the way in. This prevents grease from entering piston impact area. USE A GOOD QUALITY, HIGH TEMPERATURE EP #2 GREASE CONTAINING ANTIWEAR ADDITIVES. If machine is equipped with an AUTO LUBE System, check grease reservoir daily.

### PERFORM VISUAL INSPECTIONS DAILY

Do not operate with loose or missing fasteners, tie rods, etc.

#### • DO NOT SUBMERGE HAMMER UNDERWATER

## PRECAUTIONS FOR USING THE NPK PNEUMATIC HAMMER

- Perform daily inspections.
- Do not hammer continuously in the same position for more than 30 seconds.



- Do not use the hammer to move material, pry material, or as a pick on material.
- Do not use the hammer underwater.



• Operate the hammer carefully. Do not hit the boom of the carrier with the hammer.



• Operate the hammer in a safe manner.

## CARRIER MACHINE COMPATIBILITY

These carrier weight ranges are intended as a guideline only. Other factors, such as stick length, counterweights, undercarriage, etc., must be taken into consideration.

### 

Mounting a PNEUMATIC HAMMER that is too heavy for the carrier machine can be dangerous and damage the machine. Verify carrier stability with hammer before transport or operation.

Mounting a PNEUMATIC HAMMER that is too small for the carrier machine can damage the PNEUMATIC HAMMER, cause tool breakage, and void Warranties. Please consult NPK Engineering for specific detailed information.

HAMMER	MOUNTING	RECOMMENDED RANGE		
MODEL	STYLE	lbs.	(kg)	
NPH-3500	EXCAVATOR	12,000 - 18,000	(5,500 – 8,200)	
NPH-4500L	EXCAVATOR	20,000 - 32,000	(9,000 - 14,500)	

### CARRIER WEIGHT lbs. (kg)

\*Specifications are subject to change without notice.

## HAMMER SPECIFICATIONS

HAMMER	NUMBER OF		PISTON					LENG	TH W/O
MODEL	BLOWS	dia	meter	str	oke	we	ight	СНІ	SEL
	b.p.m.	in	(mm)	in	(mm)	lbs	(kg)	in	(mm)
NPH-3500	530	4.5	(116)	7.87	(200)	55	(25)	47.3	(1202)
NPH-4500L	500	5.1	(130)	9.65	(245)	66	(30)	54.8	(1392)

HAMMER	NET WEIGHT		MA	X AIR	Α	IR	H	OSE
MODEL	WITH	TOOL CO		CONSUMPTION		SURE	DIA	<b>IETER</b>
	lbs	(kg)	cfm	(m3/min)	psi	(bar)	in	(mm)
NPH-3500	537	(260)	177	(5)	9	(1)	1	(25)
NPH-4500L	1070	(485)	254	(7)	9	(1)	2	(38)

\*Specifications subject to change without notice. \*Working weights may vary with bracket configuration.

## STRUCTURE

### STRUCTURAL DRAWING



5	EXHAUST
6	INLET
Α	MAIN BODY
AT	COLLAR
С	TOOL HOLDER
CF	FITTING ELBOW
D	RETAINING PIN
F	UPPER BUSHING
HH	TOOL
J	IMPACT RING
Ν	PISTON
PB60	FILTER ELEMENT
ph11	INLET BUSHING
ph3	VALVE
ph4	VALVE CAP (UPPER)
ph5	VALVE CAP (LOWER)
ph6	COTTER PIN
ph7	HEAD
Q	TIE ROD
R	NUT (TOP)
S	LOCK PLATE
TT	RUBBER PLUG
U	WASHER
U1	ASSISTANT COLLAR
V	NUT (BOTTOM)

## HAMMER SERIAL NUMBER LOCATION

### SERIAL NUMBER LOCATION (sn1)











### (4) **PISTON DOWN**

The compressed air of the lower chamber exhaust and compressed air is supplied to the upper chamber of the piston (N) through ports #3, #4, #5, and #15 so that the piston goes down.



### (5) PISTON DOWN – VALVE DOWN

After the piston goes down, it opens the upper chamber to port #17. Compressed air of the upper chamber is supplied to the valve upper chamber #21 through ports #18, #19, and #20 so the valve goes down. Before the valve goes down completely, the piston (N) hits the tool (HH).

## INSTALLATION



bs10	CONTROL VALVE
ds60	LINE UNIT
g14	PINS
HH	TOOL
KK	HAMMER
LL	BRACKET
ph10	AIR HOSE
ph12	COMPRESSOR
ph9	EXHAUST PORT

# OPERATION

## LUBRICATION

Fill the oiler with oil before operation of the hammer. Lack of oil will cause premature component wear. During new hammer start-up, set the oiler knob to position 4 for the first 10 hours of operation. Oil flow numbers on the oiler knob must be aligned with the arrow on the body of the unit. Oil will not flow if the numbers are not properly aligned with the arrow.



### **WARNING**

- When refilling the line unit, the oil valve must be set to position 0 "Stop". Failure to do so will allow compressed air to blow out the fill port.
- When the oil level drops to the red mark (arrow indicates red line in drawing), refill oil immediately!



• Use the recommended oil: SAE 5W, ISO 22 Grade, or equivalent oil in quality.

### CLEANING THE AIR HOSE

Before connecting to the hammer, blow out water and contamination.

## OPERATION

### **OPERATING PROCEDURE**

- a) Place tool on the material and apply down force to the hammer.
- b) Operate the hammer with tool in solid contact with the material.
- c) Shut off hammer immediately after breaking material.



### DO NOT USE THE HAMMER TOOL AS A PRY BAR



## **OPERATION**

### **OPERATING PROCEDURE**

DO NOT USE THE HAMMER AS A HOIST



## AUTOMATIC SHUT OFF

The hammer is provided with a unique internal cushioning arrangement which absorbs energy released when blank hammering occurs. The exhaust port allows air to exit the main body which ensures the hammer from any damage caused by blank hammering.



AH6	AIR CUSHION
AH7	EXHAUST
HH	TOOL

## LUBRICATION

### NPK HAMMER GREASE

NPK now offers hammer grease specially formulated to meet severe job requirements. The grease is available in two different temperature ranges -  $350^{\circ}F$  (177°C),  $500^{\circ}F$  (260°C).

"Universal Plus" and "Super Duty" are lithium soap-based products that resist washout and contain NPK-10 additive for surface protection in friction affected areas.

"Chisel Paste" is an aluminum complex soap-base with 12% graphite and copper additives for extreme operating conditions.



350°	<b>500°</b>	<b>500°</b>
NPK UNIVERSAL PLUS LITHIUM PLUS EP2 GREASE	NPK SUPER DUTY EP2 GREASE WATER RESISTANT	NPK CHISEL PASTE EP2 GREASE EXTREME TEMP. WATER RESISTANT

UNIVERSAL PLUS	NPK PART
350 deg	NUMBER
14 oz. (.397 kg) CARTRIDGE	G000-1010
120 lb. <i>(54 kg)</i> KEG	G000-1020
35 lb. <i>(16 kg)</i> PAIL	G000-1030
400 lb. <i>(181 kg)</i> DRUM	G000-1040

SUPER DUTY	NPK PART
500 deg	NUMBER
14 oz. (.397 kg) CARTRIDGE	G000-1011
120 lb. <i>(54 kg)</i> KEG	G000-1021
35 lb. <i>(16 kg)</i> PAIL	G000-1031
400 lb. (181 kg) DRUM	G000-1041

CHISEL PASTE	NPK PART
500 deg	NUMBER
14 oz. (.397 kg) CARTRIDGE	G000-1050
*14 oz. (.397 kg) CARTRIDGE	G025-1050
35 lb. <i>(16 kg)</i> PAIL	G000-1060
400 lb. (181 kg) DRUM	G000-1070

\*Hammer Mounted Auto Lube only

## LUBRICATION

### LUBRICANT TERMS AND DEFINITIONS

TERM	DEFINITION
ADHESIVE	The ability of grease, gear lubricant or oil to cling to metal.
ANTI WEAR AGENTS	Used to help combat metal-to-metal contact, thus reducing wear.
COHESIVE	The ability of grease, gear lube or oil to cling to itself, thus resisting tearing apart.
CONSISTENCY	Consistency of grease is its hardness or firmness. It is determined by the depth in millimeters to which the cone of a penetrometer sinks into a sample under specified conditions. Consistency of grease may be influenced by the type and amount of thickener, viscosity of oil, working and other factors.
CONTAMINATION	Foreign material that could damage a part.
DROPPING POINT	The minimum temperature at which the oil in a grease subjected to heat begins to actually drip and breakdown.
EXTREME PRESSURE	Additives that under extreme pressure form an adherent
AGENTS	film on metal surfaces, thus forming a film of protection.
FILM STRENGTH	Film strength is defined as the tendency of oil molecules to cling together. It is the ability of those molecules to resist separation under pressure between two metals and to hold these metal surfaces apart.
FRICTION	The resistance to fluid flow in a hydraulic system. (An energy loss in terms of power output.)
GALLING	Surface damage on mating, moving metal parts due to friction. A severe form of adhesive wear.
LUBRICATION	Use of a substance (grease, oil, etc.) to reduce friction between parts or objects that move against each other.
NLGI	A rating given to a grease from the National Lubricating Grease Institute. This rating determines the hardness of the grease and goes on from a 000 to a 6 rating. Most greases are NLGI #2 rated.
OILINESS	Oiliness is measured of the coefficient of friction of a lubricant. Oiliness or lubricity depends on the adhering characteristics of an oil. It is determined by the attraction between the molecules of the oil and the molecules of another material. Of two oils having the same viscosity but different degrees of fluid friction, the one with the lower friction index has the higher degree of oiliness.
PUMP	A device which converts mechanical force into hydraulic fluid power. Basic design types are gear, vane, and piston units.

## LUBRICATION

### LUBRICANT TERMS AND DEFINITIONS

TERM	DEFINITION		
RESERVOIR	A container for keeping a supply of working fluid in a hydraulic system.		
VIBRATION	A quivering or trembling motion.		
VISCOSITY	Is the actual SAE weight of the product. Example motor oils come in 10, 20, 30, 40, 50 and 15/40 SAE weight. The viscosity designation of a lubricant indicates its internal resistance to flow.		

### 1. FASTENERS

Inspect all fasteners and retighten as necessary.

HAMMER	BRACKET BOLTS			
MODEL	ft. Ibs.	(Nm)		
NPH-3500	220	(300)		
NPH-4500L	400	(550)		

### 2. WELDS

Check welds for cracks, repair as necessary.

### 3. TOOL AND TOOL BUSHING WEAR

Check the tool and tool bushing for damage, wear, or deformation on a weekly basis. Replace the tool and/or tool bushing when wear exceeds the maximum clearance limit.



tb1	Typical break from bending overload.
tb2	Bending overload due to excessive wear of the tool bushing.
tb3	Corner loading due to excessive wear of the tool bushings.
tb4	Bending overload from excessive prying or slant hammering.
tb5	Deformation from overheating by hammering in the same position for over 30 seconds.
tb6	Chipped due to wrong application or overheating by hammering in the same position for over 30 seconds.

### 4. HOSES

Inspect the air hose for wear, damage, and/or hose abrasion.

### 5. LUBRICATION

During the start-up of the unit, the oil must be set to the max setting for lubrication of the hammer. This will allow the hammer to receive the proper lubrication when first operating the hammer. After the first 10 hours of operation, adjust the oil valve of the line unit to no. 2, which is most suitable for normal work.

## STORAGE OF PNEUMATIC HAMMER

- 1. For short term storage between jobs, place the hammer horizontal on wood blocks. Be sure the tool is liberally greased. Cover with a waterproof tarp.
- 2. If the hammer is not to be used for a long period of time, lubricate with the recommended oil to the nipple bushing and then work the hammer for about 1-2 seconds.



3. When removing the hammer from the machine, cover the swivel nipple and the air exhaust port with a waterproof tarp to avoid contamination.



### TOOLS AND EQUIPMENT REQUIRED FOR HAMMER DISASSEMBLY AND ASSEMBLY

#### HOIST

The minimum hoist capacity should be determined by the hammer model. Refer to HAMMER SPECIFICATIONS.

SUITABLE NYLON SLING

NPK ASSEMBLY LUBRICANT

**TORQUE WRENCH** 

**HAMMER HOOK, P/N H010-7501** For removing and installing tool holder.

#### SLEDGE HAMMER AND SLUG WRENCH

Size according to hammer model.

#### SMALL HAMMER AND BRASS PUNCH

For removing the cotter pins.

#### SMALL ADJUSTABLE WRENCH

A sturdy work bench is recommended for the disassembly and assembly of an NPK PNEUMATIC HAMMER.



## **DISASSEMBLY PROCEDURE**

1. Place the hammer assembly w/ bracket (DR) on wood blocks (t20). Make sure the hammer is stable.



2. Remove the bracket bolts, nuts, and washers.



## DISASSEMBLY PROCEDURE

5. Remove the cotter pins (ph6) with a small hammer and brass punch, and then continue to remove the washers (U), plates (s8), and collars (AT). Loosen and remove the top nuts (R) and remove the head (ph7).



## **DISASSEMBLY PROCEDURE**



### INSPECTION

Clean all parts and measure the following I.D. with a bore gauge and O.D. with a micrometer:

#### **PISTON, MAIN BODY**

HAMMER	NAME		DIAMETER		NAME		DIAM	ETER
MODEL	PART NO.		in	(mm)	PART NO.		in	(mm)
NPH-3500	PISTON	NEW	4.5598	(116)	MAIN BODY	NEW	4.5688	(116)
	11014164	MIN	4.5582	(116)	11014149	MIN	4.574	(116)
NPH-4500L	PISTON	NEW	5.111	(130)	MAIN BODY	NEW	5.12	(130)
	11013489	MIN	5.1094	(130)	11013745	MIN	5.1251	(130)

\*MAXIMUM USEABLE LIMIT BETWEEN PISTON AND MAIN BODY IS .0157 in (0.4mm)

HAMMER	NAME				DIAMETER	
MODEL	PART NO.				in	(mm)
NPH-3500	TOOL P	TOOL E	TOOL FX	NEW	3	(86)
	11014271	11014289	11014298	MIN	3	(83)
NPH-4500L	TOOL P	TOOL E	TOOL FX	NEW	4	(106)
	11013604	11013612	11013605	MIN	4	(103)

\*USEABLE CLEARANCE BETWEEN THE TOOL AND THE TOOL HOLDER IS .3149 in (8mm)



## **REASSEMBLY PROCEDURE**



## **REASSEMBLY PROCEDURE**



## TROUBLESHOOTING

PROBLEM	CAUSE	CHECK	REMEDY
	Insufficient Air Supply	Compressor or Air Hose	Adjust Air Pressure
LOSS OF POWER	Hose Bending	Air Hose	Replace Air Hose
	Filter Contamination	Head Cap	Remove Contamination
	Clearance between the main body and piston.	Main body and piston	Have the main body honed and replace with oversized
	Usable limit is .4mm		piston.
	Clearance between the	Main body.	Replace the Piston
	Clearance between the Chisel and Bushing	Bushing	Replace the Bushing
	Valve Malfunction	Oil	Clean out Valve and use Recommended oil
	Drainage		Lubricate swivel nipple
	Dust in Hammer	Valve Complete	Remove Dust
NO HAMMERING		Main body.	Remove Dust
	Using proper viscosity oil	Oil	Replace with
			Recommended oil
	Seized Piston/main body	Piston and main body	Take piston out from the main body and grind both main body and piston.

## WARRANTY REGISTRATION FOR NEW UNITS

Complete and send to NPK after installation or complete online at <u>www.npkce.com</u>. Online warranty registration can be done by the dealer or the end user.

The registration can be done in any of the following ways:

1. Mailed to:

NPKCE 7550 Independence Dr. Walton Hills Ohio 44146

- 2. Faxed: 440-232-6294 (U.S.) (+1) (440)232-6294 (outside U.S.)
- 3. Completed online at:

### www.npkce.com

The online registration can be done by the dealer or the end user.

### Dealers:

- In the tool bar click on DEALERS.
- Using your username and password, log into the system.
- At the left of the next page click on REGISTRATION.
- Complete the fields with an orange diamond next to them.
- At the bottom of this area, click the START REGISTRATION box and continue.
- If the registration is completed online, there is no need to mail or fax the warranty registration.

### End users / non NPK dealers

- In the tool bar click on DEALERS
- You do NOT need to fill in username and password.
- In the left column, click on the REGISTRATION.
- Complete the fields with an orange diamond next to them.
- At the bottom of this area, click the START REGISTRATION box and continue.
- If the registration is completed online, there is no need to mail or fax the warranty registration.

## TOOL WARRANTY

#### STANDARD DEMOLITION and ACCESSORY TOOLS WARRANTY (30 days)

NPK Construction Equipment, Inc. ("NPK") warrants that new Standard Demolition Tools, and other Standard Accessory Tools sold by NPK will be free from defects in material or workmanship for a period of thirty (30) days, starting from the date of installation. NPK reserves the full right to determine if, and to what extent, warranty adjustments may be made for breakage of the demolition or other accessory tools. NPK Tool Warranty does not cover labor or travel expenses.

#### THIS WARRANTY DOES NOT APPLY TO:

• Custom or special application tools which are excluded from warranty.

#### NPK RESPONSIBILITY

NPK will, at its option, replace with a new or reconditioned tool, any warranted tool that fails by reason of defective material or workmanship, free of charge, delivered at a place of business of an NPK Dealer. Tool breakage is specifically covered ONLY for straight across breakage as shown at locations A. Note: The tool to bushing gap must be verified and reported to NPK. Failure to provide this information will make this failure non-warrantable.



For warranted tool failures, a prorated credit, up to 80% maximum, will be issued for tools with tip wear greater than 50 mm on chisel and moil points, or 30 mm on blunt end tools. Note: Parts replaced under warranty become the property of NPK.

## TOOL WARRANTY

### USER RESPONSIBILITY

- Photos and all numbers from retaining pin slot must accompany all warranties submitted to NPK. These photos can be 35 mm, Polaroid, or digital.
- The installer, user, operator, repairer, assumes responsibility to read, understand and comply with NPK's written INSTALLATION, OPERATOR, and SERVICE INSTRUCTIONS.
- All labor costs.
- Any expense incurred by field repair.
- Tool failures as shown at locations tb (see NPK Operators Manual for correct operating procedures):



tb1 – Typical break from bending overload.

CAUSE<br/>OFtb2 and tb3 – repeated blank hammering.OFtb3 – bending overload due to excessive<br/>wear of the tool bushings.FAILUREwear of the tool bushings.tb4 – corner loading due to excessive<br/>wear of the tool bushings.

tb5 – bending overload from excessive prying or slant hammering.

tb6 – deformation from overheating by hammering in the same position for more than 30 seconds.

tb7 – chipped, due to wrong application, or overheating by hammering in same position for over 30 seconds.

### THESE WARRANTIES DO NOT COVER FAILURES RESULTING FROM:

- Installation, alteration, operation, maintenance, repair or storage which NPK judges improper.
- Inadequate lubrication.
- Exceeding the tool and/or tool bushing wear limit.
- Unreasonable delay in making a repair after being notified of a potential product problem.

### THESE WARRANTIES SPECIFICALLY EXCLUDE:

- Any tool which is altered, welded, hardfaced or re-sharpened.
- Replacement due to tip or shank wear.
- Installations not approved by NPK.
- Use of parts not sold by NPK. THE USE OF "WILL FIT" PARTS WILL VOID THE WARRANTIES OF ANY AND ALL PARTS DAMAGED AS A RESULT OF THE FAILURE OF THE "WILL FIT" PARTS.
- Parts shipping charges in excess of those which are usual and customary. (Air freight, unless pre-approved, will not be covered).
- Duties, brokerage fees, and local taxes.

### WARRANTY REPAIRS DO NOT EXTEND THE STANDARD WARRANTY PERIOD. LIMITATIONS AND EXCLUSIONS

Violation of any federal, provincial, state or local laws, ordinances, rules or regulations, or removal or alteration of product serial numbers void NPK's written product warranties. *Application for warranty must be made within 30 days of failure.* 

### WARRANTY STATEMENTS



## WARRANTY STATEMENTS



## WARRANTY STATEMENTS



## **NOTES AND RECORDS**

NPK HYDRAULIC HAMMER MODEL NUMBER SERIAL NUMBER

NPK INSTALLATION KIT NUMBER

CARRIER MANUFACTURER	
MODEL NUMBER	
SERIES	
SERIAL NUMBER	

DATE OF INSTALLATION \_\_\_\_\_

DATE OF 20 HOUR INSPECTION \_\_\_\_\_ WARRANTY REGISTRATION SENT



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