

MOTORIZED SWEEP

**OPERATOR'S MANUAL
AND PARTS BOOK**

NORSTAR INDUSTRIES LIMITED WARRANTY

Norstar Industries expressly warrants each new Bin Unloader to be free from defects in material and workmanship under normal use and service for a period of one year after delivery to the original retail purchaser or first user of the product.

Our obligation under this warranty is limited to repairing and/or replacing, at our option, any part or parts within the applicable one year period, as set out above, which shall be returned by the owner to any authorized dealer or to the factory and which upon examination shall disclose to our satisfaction to be defective.

We may, as an option, elect to grant adjustments in the field through an authorized representative and may thereby elect to waive the requirement that parts be returned to our factory.

A new warranty period is not established for replacements. Replacements are warranted for the remaining portion of the one-year original warranty period. The repair or replacement of defective parts under this warranty will be made without charge to the owner except for transportation.

The provisions of this warranty do not apply to any product or parts, which have been subject to misuse, negligence or accident, or which have been repaired or altered outside of an authorized dealer in any way so as in the judgment would adversely affect its performance and reliability. Neither does this warranty apply to normal maintenance service and parts, or to normal deterioration due to wear and exposure.

The foregoing is in lieu of all other warranties, expressed or implied, including any warranty of merchantability is expressly excluded.

**WARRANTY VOID IF NOT REGISTERED
WITHIN 30 DAYS OF PURCHASE DATE**

**NORSTAR INDUSTRIES
BIN UNLOADER**

WARRANTY REGISTRATION FORM & INSPECTION REPORT

WARANTY REGISTRATION

This form must be filled out by the dealer and signed by both the dealer and the customer at the time of delivery.

Customer's Name _____ Dealer's Name _____

Address _____ Address _____

City, Prov./State, Code _____ City, Prov./State, Code _____

Phone Number (___) _____

Unloader Model _____

Bin Size _____

Delivery Date _____

DEALER INSPECTION REPORT

- ___ All Fasteners Tight
- ___ Center Drive Secured
- ___ Power Head Secured To Machine
- ___ Flighting Turns Freely
- ___ Lubricate Machine
- ___ Oil In Gearboxes

SAFETY

- ___ Belt Guards Installed
- ___ All Decals Installed
- ___ Review Operating and Safety Instructions

Form must be completed with dealer inspection and signature as well as owner's signature. By not completing the form, you may be voiding the warranty.

I have thoroughly instructed the buyer on the above described equipment which review included the Operator's Manual content, equipment care, adjustments, safe operation and applicable warranty policy.

Date _____ Dealer's Rep. Signature _____

The above equipment and Operator's Manual have been recieved by me and I have been thoroughly instructed as to care, adjustments, safe operation and applicable warranty policy.

Date _____ Owner's Signature _____

TABLE OF CONTENTS

SECTION	DESCRIPTION	PAGE
1	Introduction	6
2	Safety	7
2.1	General Safety	8
2.2	Operating Safety	9
2.3	Bin Safety	9
2.4	Lock-Out Tag-Out Safety	9
2.5	Maintenance Safety	10
2.6	Safety Signs	10
3	Safety Sign Locations	11
4	Operation.....	12
4.1	To the New Operator or Owner.....	13
4.2	Installation	14
4.3	Machine Break-In	15
4.4	Pre-Operation Checklist	15
4.5	Controls	16
4.6	Operating.....	16
4.7	Storage	19
5	Service and Maintenance.....	20
5.1	Service.....	20
5.1.1	Fluids and Lubricants	20
5.1.2	Greasing	20
5.1.3	Servicing Intervals	20
6	Trouble Shooting	21
7	Bolt Torque.....	22
8	Parts List	23
9	Index	28

1 INTRODUCTION

Congratulations on your choice of a Norstar Industries Motorized Sweep to complement your grain handling and storage system. This equipment has been designed and manufactured to meet the needs of the farm and commercial users for the efficient cleaning out of grain bins.

Safe, efficient and trouble free operation of your Motorized Sweep requires that you and anyone else who will be operating or maintaining the Unloader, read and understand the Safety, Operation, Maintenance and Trouble Shooting information contained within the Operator's Manual.



This manual covers the Motorized Sweep distributed by Norstar Industries. Use the Index or Table of Contents to find specific information.

Keep this manual handy for frequent reference and to pass on to new operators or owners. Call your Norstar dealer or distributor if you need assistance, information or additional copies of the manual.

OPERATOR ORIENTATION - The directions left and right as mentioned throughout the manual, are as seen when standing at the power head and looking toward the center of the bin.

2 SAFETY

SAFETY ALERT SYMBOL

This Safety Alert symbol means
ATTENTION! BECOME ALERT!
YOUR SAFETY IS INVOLVED!



The Safety Alert symbol identifies important safety messages on the Norstar Bin Unloader and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

3 Big Reasons

Accidents Disable and Kill
Accidents Cost
Accidents Can Be Avoided

SIGNAL WORDS

Note the use of the signal words **DANGER**, **WARNING** and **CAUTION** with the safety messages. The appropriate signal word for each message has been selected using the following guide-lines.

DANGER - Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations typically for machine components which, for functional purposes cannot be guarded.

WARNING - Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION - Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

If you have any questions not answered in this manual or require additional copies or the manual is damaged, please contact your dealer or Norstar Industries, P.O. Box 119, Morris, Manitoba, Canada, R0G 1K0. Phone (204) 746-8200; Toll Free (855) 746-8200 Fax (204) 746-8074.

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SAFETY

YOU are responsible for the **SAFE** operation and maintenance of your Norstar Industries Bin Unloader. **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the Bin Unloader be familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual. This manual will take you step-by-step through your working day and alerts you to all good safety practices that should be adhered to while operating the Unloader.

Remember, **YOU** are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that **EVERYONE** operating this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- Bin Unloader owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually thereafter per OSHA (Occupational Safety and Health Administration) regulation 1928.57.
- The most important safety device on this equipment is a **SAFE** operator. It is the operator's responsibility to read and understand **ALL** Safety and Operating instructions in the manual and to follow them. All accidents can be avoided.
- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.
- Think SAFETY! Work SAFELY!

2.1 GENERAL SAFETY

1. Read and understand the Operator's Manual and all safety signs before operating, maintaining, adjusting or unplugging the Unloader.
2. Only trained competent persons shall operate the Unloader. An untrained operator is not qualified to operate the machine.
3. Have a first-aid kit available for use should the need arise and know how to use it.
4. Do not allow children, spectators or bystanders within hazard area of machine.
5. Wear appropriate protective gear. This list includes but is not limited to:
 - A hard hat
 - Protective shoes with slip resistant soles
 - Heavy gloves
 - Hearing protection
 - Respirator or filter mask
6. Stop the motor, turn off all controls and wait for all moving parts to stop before servicing, adjusting, repairing, or unplugging.
7. Establish a lock-out tag-out policy for the work site. Be sure all personnel are trained in and follow all procedures.
8. Review safety related items annually with all personnel who will be operating or maintaining the Unloader.

2.2 OPERATING SAFETY

1. Read and understand the Operator's Manual and all safety signs before using.
2. Stop the motor, shut off power at master power panel and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
3. Clear the area of all bystanders, especially children, before starting.
4. **Do not enter bin unless motor is OFF and the power locked out at the master panel. Never enter bin while sweep auger is operating. Keep others out.**
5. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
6. Stay away from rotating flighting. Keep others away.
7. Have a qualified electrician provide power to the unit.
8. Do not operate machine when any guards are removed.
9. Establish a lock-out tag-out policy for the work site. Be sure all personnel are trained in and follow all procedures.

2.3 BIN SAFETY

1. **Entering a Bin should be avoided at all times.**
2. **Do not enter a BIN when it has stored material in it. There can be many hidden dangers including but not limited to grain dust and explosions, bridging that can cave in and lead to suffocation, etc.**
3. **Grain dust can cause explosions. Keep all flames, sparks and smoking material out of the bin.**
4. **Do not enter bin unless motor is OFF and the power locked out at the master panel. Never enter bin while sweep auger is operating. Keep others out.**

2.4 LOCK-OUT TAG-OUT SAFETY

1. Establish a formal Lock-Out Tag-Out program for your operation.
2. Train all operators and service personnel before allowing them to work around the Bin.
3. Provide tags at the work site and a sign-up sheet to record tag out details.

2.5 MAINTENANCE SAFETY

1. Review the Operator's Manual and all safety items before working with, maintaining or operating the Unloader.
2. Stop the motor, turn off all controls and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
3. Follow good shop practices:
 - Keep service area clean and dry.
 - Be sure electrical outlets and tools are properly grounded.
 - Use adequate light for the job at hand.
4. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
5. Clear the area of bystanders, especially children, when carrying out any maintenance and repairs or making any adjustments.
6. Before resuming work, install and secure all guards when maintenance work is completed.
7. Establish a lock-out tag-out policy for the work site. Be sure all personnel are trained in and follow all procedures.

2.6 SAFETY SIGNS

1. Keep safety signs clean and legible at all times.
2. Replace safety signs that are missing or have become illegible.
3. Replaced parts that displayed a safety sign should also display the current sign.
4. Safety signs displayed in Section 3 each have a part number in the lower right hand corner. Use this part number when ordering replacement parts.
5. Safety signs are available from your authorized Distributor or Dealer Parts Department or the factory.

How to Install Safety Signs:

- Be sure that the installation area is clean and dry.
- Be sure temperature is above 50°F (10°C).
- Determine exact position before you remove the backing paper. (See Section 3).
- Remove the smallest portion of the split backing paper.
- Align the sign over the specified area and carefully press the small portion with the exposed sticky backing in place.
- Slowly peel back the remaining paper and carefully smooth the remaining portion of the sign in place.
- Small air pockets can be pierced with a pin and smoothed out using the piece of sign backing paper.

3 SAFETY SIGN LOCATIONS

The types of safety signs and locations on the equipment are shown in the illustration below. Good safety requires that you familiarize yourself with the various safety signs, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS.

A



C



REMEMBER - If safety signs have been damaged, removed, become illegible or parts replaced without signs, new signs must be applied. New signs are available from your authorized dealer.

The types of safety signs and locations on the equipment are shown in the illustration below. Good safety requires that you familiarize yourself with the various safety signs, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS.



B

⚠ WARNING

**ROTATING PART HAZARD
KEEP AWAY**

To prevent serious injury or death from rotating parts:

- Close and secure all guards before operating.
- Stop motor, shut off and lock out/tag out power at master power panel and wait for moving parts to stop before servicing, adjusting, repairing or unplugging.
- Keep hands, feet, hair and clothing away from moving parts. Keep others away.

NI-16

REMEMBER - If safety signs have been damaged, removed, become illegible or parts replaced without signs, new signs must be applied. New signs are available from your authorized dealer.

4 OPERATION



OPERATING SAFETY

1. Read and understand the Operator's Manual and all safety signs before using.
2. Stop the motor, shut off power at master panel and wait for all moving parts to stop before servicing, adjusting, repairing, or unplugging.
3. Clear the area of all bystanders, especially children, before starting.
4. **Do not enter bin unless motor is OFF and the power locked out at the master panel. Never enter a bin while sweep auger is operating. Keep others out.**
5. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
6. Stay away from rotating flighting. Keep others away.
7. Have a qualified electrician provide power to the unit.
8. Do not operate machine when any guards are removed.
9. Establish a lock-out tag-out policy for the work site. Be sure all personnel are trained in and follow all procedures.

4.1 TO THE NEW OPERATOR OR OWNER

The Norstar Industries Bin Motorized Sweep system is designed to remove remaining grain from a round storage facility. 70% to 80% is removed by the unload auger through the center and intermediate sumps. The sweep auger then moves the remaining grain to the sumps for removal. Electrical power is used to drive the systems. Be familiar with the machine before starting.

It is the responsibility of the owner or operator to read this manual and to train all other operators before they start working with the machine. Follow all safety instructions exactly. Safety is everyone's business. By following recommended procedures, a safe working environment is provided for the operator, bystanders and the area around the work site. Untrained operators are not qualified to operate the machine.

Many features incorporated into this machine are the result of suggestions made by customers like you. Read this manual carefully to learn how to operate the machine safely and how to set it to provide maximum efficiency. By following the operating instructions in conjunction with a good maintenance program, your Motorized Sweep will provide many years of trouble-free service.

4.2 INSTALLATION

The Motorized Sweep system can be installed in a new or an existing facility. Be familiar with the complete instructions before starting the installation.

1. Install pivot bracket to center of bin. Either bolt to flange, anchor into cement or in ground installation.
2. Secure all bolts.
3. Mount sweep to the pivot bracket by inserting the sweep pivot pin into the receiving coupler on the pivot bracket.
4. Use bolts to set the height of the power-head to the desired height.
5. On electric systems, install the electric motor and belt guards. **Refer to Table 1 for power requirements.**
6. Have a qualified Electrician provide power to the unit.

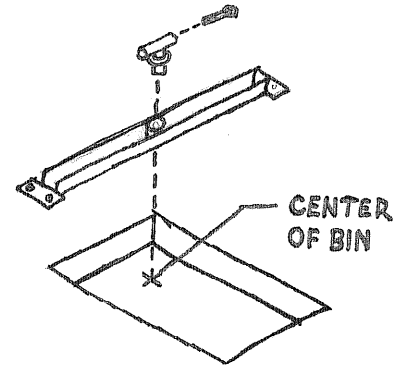


Fig. 1 PIVOT PLACEMENT



Fig. 2 PIVOT PIN



MAINTENANCE SAFETY

1. Review the Operator's Manual and all safety items before working with, maintaining or operating the sweep.
2. Stop the motor, turn off all controls and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
3. Follow good shop practices:
 - Keep service area clean and dry.
 - Be sure electrical outlets and tools are properly grounded.
 - Use adequate light for the job at hand.
4. Keep hands, feet, hair and clothing away from moving and/or rotating parts.
5. Clear the area of bystanders, especially children, when carrying out any maintenance and repairs or making any adjustments.
6. Before resuming work, install and secure all guards when maintenance work is completed.

Motor Sweep Horsepower

Bin Diameter	5"	7 1/4"	9"
15/16	3/4	1	1 3/4
18/19	3/4	1	1 3/4
21/22	1	1 1/4	2
24/25	1	1 1/4	2
27	1	1 1/2	2 1/2
30/31	1 1/2	1 3/4	2 1/2
33/34	1 1/2	1 3/4	3
36/37	2	2	3
40	2	2 1/4	5
42	2	2 1/2	5
48	2 1/2	3	5

Table 1
HORSEPOWER REQUIREMENTS

4.3 MACHINE BREAK-IN

Although there are no operational restrictions on the motorized sweep when used for the first time, it is recommended that the following mechanical items be checked:

A. After operating for 1/2 hour:

1. Retorque fasteners and hardware.
2. Check that all safety decals are installed and legible. Apply new decals if required.
3. Check that no power lines are pinched or rubbing on moving parts. Re-align as required.
4. Check that all guards are installed and working as intended.
5. Check drive belt tension and alignment. Adjust as required.
6. Lubricate u-joint on auger flighting.

B. After operating for 5 hours and 10 hours:

1. Retorque all fasteners and hardware.
2. Check power line routing.
3. Check that all guards are installed and are working properly.
4. Check safety decals. Install new ones if required.
5. Check drive belt tension and alignment.

4.4 PRE-OPERATION CHECKLIST

Efficient and safe operation of the Norstar Industries motorized sweep requires that each operator reads and understands the operating procedures and all related safety precautions outlined in this section. A pre-operation checklist is provided for the operator. It is important for both the personal safety and maintaining the good mechanical condition of the Bin Sweep that this checklist is followed.

Before operating the Sweep and each time thereafter, the following areas should be checked off:

1. Lubricate the u-joint.
2. Use only an electric motor of adequate power to operate the machine.
3. Check that the power line to the electric motor is secure and away from moving parts.
4. Check that all guards are installed, secured and functioning as intended. Do not operate with missing or damaged shields.
5. Check worksite. Clean up working area to prevent slipping or tripping.

4.5 CONTROLS

1. Sweep Auger Stop:

Each system is designed with a sweep auger stop that will prevent the auger from moving around the bin. The position of the stop is controlled by a cable that extends outside the bin. Pull on the cable and secure on the anchor bracket on the outside of the bin to allow the sweep to move around the bin. Unlatch the cable and release it to move the stop into position to prevent the sweep auger from moving.

NOTE

The stop is normally in the down position. Pull on handle and hold to allow the sweep to go past the stop. Release handle and the stop will return to its down position.



Fig. 3 SWEEP STOP AND CABLE

4.6 OPERATING

Norstar Industries Motorized Sweeps are designed with the inherent flexibility of working well in any kind of round grain storage facility. However, the operator has the responsibility of being familiar with all the operating and safety precautions and following them.

Each operator should review this section of the manual prior to using the machine and as often as required to be familiar with the machine. Before filling the bin, follow this procedure:

1. Review and follow the pre-operation checklist.
2. Be sure the bin unloader has been set appropriate for the operating cycle.
3. If the machine will be used for the first time, refer to the Installation instructions to be sure it has been properly installed and set.
4. **Preparation:**
 - a. Position the sweep auger over the unloading sumps to minimize the start-up loads on the sweep auger.

5. When the sweep auger is over the sumps, fill the bin.
6. When emptying the bin, the following procedure must be followed:
 - a. Install an auger or other conveyor under the outlet of the power head to remove the grain.
 - b. Check the condition of the grain on the top surface in the bin. Remove any crust material, trash or other debris that could plug the sump while unloading the bin. If the sump gets plugged, it is difficult to unplug unless the bin is emptied in another way.
7. **Starting Unloading Auger:**
 - a. Check that the sweep auger gearbox is disengaged.
 - b. Plug the power cord in to the unloading auger motor.

IMPORTANT

Do not start unit unless all the lock-out tags have been cleared.

- c. Turn the power on at the master panel.
- d. Slowly open the slide gate to the center or required sump and empty the bin.

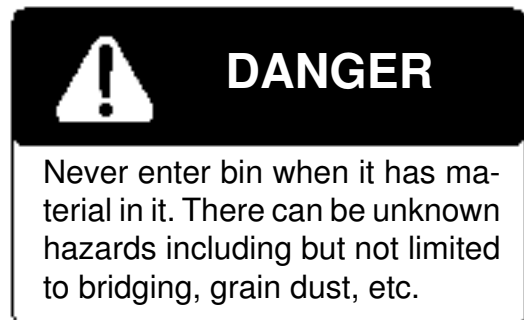
IMPORTANT

Empty the bin by removing grain **ONLY** from the center to prevent damaging the bin structure. Removing grain from an intermediate sump will place an uneven load on the sides of the bin and can cause the bin to collapse.

- e. Close the slide gate to stop the flow of grain and empty the unloading tube.

8. **Stopping Unloading Auger:**

- a. Close the slide gate to stop the flow of grain into the sump.
- b. Run unloading auger until the tube is empty.
- c. Turn motor off or unplug power cord and turn off at master panel.



9. Starting sweep auger:

- a. Close sumps, empty unloading tube and stop unloading auger.
- b. Engage sweep auger gearbox shifter.
- c. Start unloading auger motor.
- d. Open center sump slide gates for desired capacity.

10. Stopping Sweep Auger:

- a. Close sumps and empty unloading tube.
- b. Unplug or turn off motor and turn off at the master panel.
- c. Disengage shifter and padlock if bin is empty.

11. Start unloading the bin through only the center sump until the grain stops flowing.

12. Only after the center sump has stopped flowing do you open the gate(s) to the intermediate sump(s).

13. Unplugging:

- a. The only time the system will plug is when crust material, trash or debris from the top of the bin gets stuck in the sump. Since the sump is on the bottom of the bin, the obstruction can not be removed. The bin will have to be emptied using another method until the sump is uncovered.
- b. The system can be overloaded by opening slide gates too far. If this occurs, shut off power, loosen belt and turn flight manually using a pipe wrench on pulley end of flight. If it still doesn't turn, remove powerhead mounting bolts and pull powerhead and flighting out. Screw out and then slowly screw back in bringing grain out as you screw it in. If incline powerhead plugs, open trap at bottom end of incline and remove plug.

15. Sweep Auger:

- a. The sheet metal panel behind the sweep auger provides a frame for the assembly and acts as a backstop or stripper for the moving grain. Keep it straight and free of debris.
- b. The outer segment of the sweep auger is designed with double flighting that can be extended or retracted to allow the length to fit variations in bin size. Loosen jam nuts and set screws on the sweep frame and extend or retract flighting as required. Retighten set screws and jam nuts when sweep is at the required position.

16. Sweep Auger Drive Wheel:

A wheel at the outer end of the sweep auger drives the auger into the pile of grain remaining in the bin.

17. Operating Hints:

- a. Remove all grain clumps, trash or debris from the top surface of the grain before starting to empty the bin.
- b. Remove grain only from the center sump using the slide gates until the grain flow has stopped. Then use the intermediate sump(s).



Fig. 4 SWEEP WHEEL

- c. Do not enter the bin unless the power to the augers has been turned off at the master panel.
- d. Place the sweep auger over the intermediate sump(s) before filling the bin with grain.
- e. Have a qualified electrician provide power to the unloader. It is recommended that a switch or plug-in be located at the unloader and on the master power panel.

4.8 STORAGE

After the season's use, the machine should be thoroughly inspected and prepared for storage. Repair or replace any worn or damaged components to prevent any unnecessary down time at the start of next season. To insure a long, trouble free life, this procedure should be followed when preparing the unit for storage:

1. Remove all residual grain from the bin and unloading auger. Open each access door to clean out the tube. Close and latch each access door after cleaning.

Be sure to unplug the power cords or shut the power off at the master panel before cleaning.

Lock-out tag-out unit before entering bin.

2. Inspect all moving or rotating parts to see if anything has become entangled in them. Remove the entangled material.
3. Lubricate all grease fittings.
4. Unplug the power cords or shut off at the master panel.
5. Touch up all paint nicks and scratches to prevent rusting.
6. Check condition of safety signs. Replace any that are damaged or illegible.
7. Position the sweep auger so it is directly over the unloading sumps.
8. Check the oil level in the gearbox and top up as required.

5 SERVICE AND MAINTENANCE

5.1 SERVICE

5.1.1 FLUIDS AND LUBRICANTS

1. **Grease:**

Use an SAE multi-purpose high temperature grease with extreme pressure (EP) performance. Also acceptable is an SAE multi-purpose lithium based grease.

2. **Gearbox Oil:**

Use an SAE food grade gear oil for all operating conditions.

Gearbox Capacity: 1 U.S. quart (0.85 liter)

3. **Storing Lubricants:**

Your machine can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture and other contaminants.

5.1.2 GREASING

Use the Maintenance Checklist provided to keep a record of all scheduled maintenance.

1. Use a hand-held grease gun for all greasing.
2. Wipe grease fitting with a clean cloth before and after greasing, to avoid injecting dirt and grit.
3. Replace and repair broken fittings immediately.
4. If fittings will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

5.1.3 SERVICING INTERVALS

Each Time Bin Is Emptied

1. Check drive belt tension and alignment.
2. Grease universal joint.

6 TROUBLE SHOOTING

The Norstar Industries Bin Unloader uses an auger in the base and a pivoting sweep auger to remove all the grain from a bin. It is a simple and reliable system that requires minimal maintenance.

In the following section, we have listed many of the problems, causes and solutions to the problems that you may encounter.

If you encounter a problem that is difficult to solve, even after having read through this trouble shooting section, please call your local Norstar Industries dealer or distributor. Before you call, please have this Operator's Manual and the serial number from your machine ready.

PROBLEM	CAUSE	SOLUTION
Auger(s) will not start.	No power.	Turn on at master panel. Check fuses at master panel.
	Locked-Out.	Clear tag and turn on.
<hr/>		
No grain flow.	Sump plugged.	Empty bin and clean out sump. Remove trash from top of grain before starting.
	Sump empty.	Open other sump(s).
	Bin empty.	Start sweep auger.
	Sump closed.	Open slider gates.
<hr/>		

7 BOLT TORQUE

CHECKING BOLT TORQUE

The tables shown below give correct torque values for various bolts and capscrews. Tighten all bolts to the torques specified in chart unless otherwise noted. Check tightness of bolts periodically, using bolt torque chart as a guide. Replace hardware with the same strength bolt.

ENGLISH TORQUE SPECIFICATION

Bolt Diameter "A"	Bolt Torque*					
	SAE 2		SAE 5		SAE 8	
	N.m.	(lb-ft)	N.m.	(lb-ft)	N.m.	(lb-ft)
1/4"	8	(6)	12	(9)	17	(12)
5/16"	13	(10)	25	(19)	36	(27)
3/8"	27	(20)	45	(33)	63	(45)
7/16"	41	(30)	72	(53)	100	(75)
1/2"	61	(45)	110	(80)	155	(115)
9/16"	95	(70)	155	(115)	220	(165)
5/8"	128	(95)	215	(160)	305	(220)
3/4"	225	(165)	390	(290)	540	(400)
7/8"	230	(170)	570	(420)	880	(650)
1"	345	(225)	850	(630)	1320	(970)



Torque figures indicated above are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or capscrews unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

* Torque value for bolts and capscrews are identified by their head markings.

8 PARTS LIST

The manual contains a parts list for your machine. It is divided into major sections which correspond to the groups shown in the Table of Contents and the accompanying illustration.

The first page of each major section lists the contents of that section, each of which consists of exploded views and related tabular listings.

WHEN ORDERING PARTS

Always give your dealer the model and Serial Number of your machine to assist him in ordering and obtaining the correct parts. Use the exploded view and tabular listing of the area of interest to exactly identify the required part.

USING THE MANUAL

Parts data consists of exploded view illustrations and associated parts list tables which are read as follows:

ITEM

The item number is the identifier number from the illustration. For example, number 3 on an illustration points to a component which is item 3 on the accompanying table.

PART NUMBER

The part number is the number by which the component may be identified and ordered from your dealer.

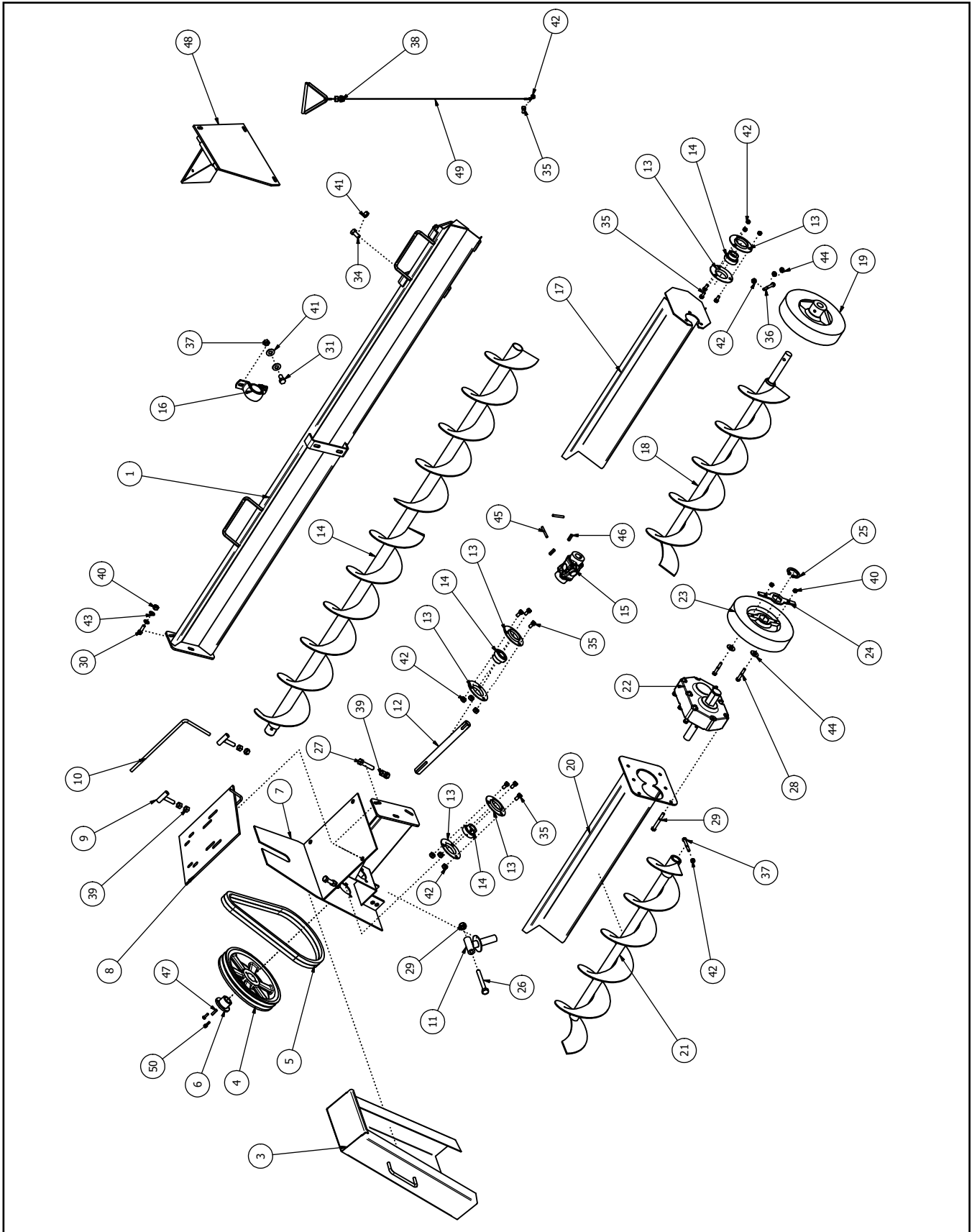
DESCRIPTION

This column contains the name and description of the part.

MOTORIZED SWEEP ASSEMBLY

#S	DESCRIPTION		5"	QTY	7 1/4"	QTY	9"	QTY		
1	PORTABLE SWEEP BACKBOARD	-MODEL 15/16	205-2-0021-15	1	205-2-0023-15	1	205-2-0025-15	1		
		-MODEL 18/19	205-2-0021-18	1	205-2-0023-18	1	205-2-0025-18	1		
		-MODEL 21/22	205-2-0021-21	1	205-2-0023-21	1	205-2-0025-21	1		
		-MODEL 24/25	205-2-0021-24	1	205-2-0023-24	1	205-2-0025-24	1		
		-MODEL 27	205-2-0021-27	1	205-2-0023-27	1	205-2-0025-27	1		
		-MODEL 30/31	205-2-0021-30	1	205-2-0023-30	1	205-2-0025-30	1		
		-MODEL 32	205-2-0021-32	1	205-2-0023-32	1	205-2-0025-32	1		
		-MODEL 33/34	205-2-0021-33	1	205-2-0023-33	1	205-2-0025-33	1		
		-MODEL 36/37	205-2-0021-36	1	205-2-0023-36	1	205-2-0025-36	1		
		-MODEL 38	205-2-0021-38	1	205-2-0023-38	1	205-2-0025-38	1		
		-MODEL 40	205-2-0021-40	1	205-2-0023-40	1	205-2-0025-40	1		
		-MODEL 42/43	205-2-0021-42	1	205-2-0023-42	1	205-2-0025-42	1		
		-MODEL 44	205-2-0021-44	1	205-2-0023-44	1	205-2-0025-44	1		
		-MODEL 48	205-2-0021-48	1	205-2-0023-48	1	205-2-0025-48	1		
		2	FLIGHTING	-MODEL 15/16	205-2-0022-15	1	205-2-0024-15	1	205-2-0026-15	1
				-MODEL 18/19	205-2-0022-18	1	205-2-0024-18	1	205-2-0026-18	1
-MODEL 21/22	205-2-0022-21			1	205-2-0024-21	1	205-2-0026-21	1		
-MODEL 24/25	205-2-0022-24			1	205-2-0024-24	1	205-2-0026-24	1		
-MODEL 27	205-2-0022-27			1	205-2-0024-27	1	205-2-0026-27	1		
-MODEL 30/31	205-2-0022-30			1	205-2-0024-30	1	205-2-0026-30	1		
-MODEL 32	205-2-0022-32			1	205-2-0024-32	1	205-2-0026-32	1		
-MODEL 33/34	205-2-0022-33			1	205-2-0024-33	1	205-2-0026-33	1		
-MODEL 36/37	205-2-0022-36			1	205-2-0024-36	1	205-2-0026-36	1		
-MODEL 38	205-2-0022-38			1	205-2-0024-38	1	205-2-0026-38	1		
-MODEL 40	205-2-0022-40			1	205-2-0024-40	1	205-2-0026-40	1		
-MODEL 42/43	205-2-0022-42			1	205-2-0024-42	1	205-2-0026-42	1		
-MODEL 44	205-2-0022-44	1	205-2-0024-44	1	205-2-0026-44	1				
-MODEL 48	205-2-0022-48	1	205-2-0024-48	1	205-2-0026-48	1				
3	STEEL BELT GUARD		205-2-0001	1	205-2-0001	1	205-2-0001	1		
4	PULLEY		BP-0032	1	BP-0032	1	BP-0032	1		
5	BELTS - B47		BP-0801	2	BP-0801	2	BP-0801	2		
6	1" HUB		BP-0031	1	BP-0031	1	BP-0031	1		
7	PORTABLE SWEEP HEAD		205-2-0018	1	205-2-0019	1	205-2-0020	1		
8	MOTOR MOUNT PLATE		205-2-0005	1	205-2-0005	1	205-2-0005	1		
9	HINGE		205-2-0003	2	205-2-0003	2	205-2-0003	2		
10	PIN		205-2-0004	1	205-2-0004	1	205-2-0004	1		
11	PIVOT PIN		205-2-0009	1	205-2-0009	1	205-2-0009	1		
12	DRIVESHAFT		205-2-0007	1	205-2-0007	1	205-2-0008	1		
13	1" BEARING FLANGETTES		PB-0006	6	PB-0006	6	PB-0006	6		
14	1" BEARING		PB-0007	3	PB-0007	3	PB-0007	3		
15	U-JOINT		205-2-0000	1	205-2-0000	1	205-2-0000	1		
16	WOOD BEARING	-MODEL 15/16-40	PB-0024	1	PB-0025	1	PB-0026	1		
		-MODEL 42-48	PB-0024	2	PB-0025	2	PB-0026	2		

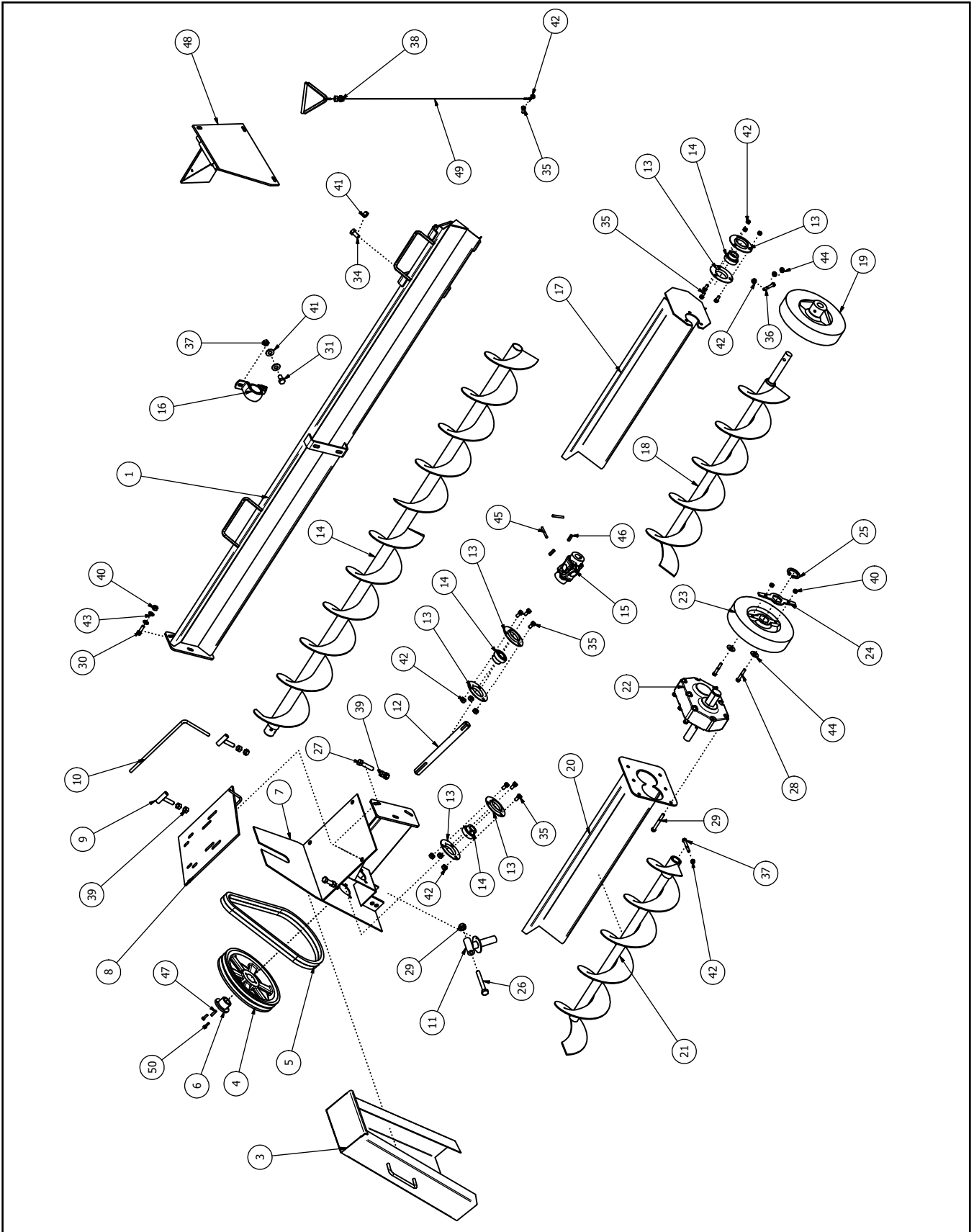
MOTORIZED SWEEP ASSEMBLY



MOTORIZED SWEEP ASSEMBLY

#'S	DESCRIPTION	5" PART #	QTY	7 1/4" PART #	QTY	9" PART #	QTY
17	SWEEP WHEEL BACKBOARD	205-2-0027	1	20-2-0637	1	20-2-0639	1
18	SWEEP WHEEL FLIGHTING	205-2-0028	1	20-2-0636	1	20-2-0640	1
19	RUBBER WHEEL	PT-0007	1	PT-0008	1	PT-0009	1
20	SWEEP GEAR DRIVE BACKBOARD (OPTIONAL)	n/a		20-2-0350	1	20-2-0340	1
21	SWEEP GEAR DRIVE FLIGHTING (OPTIONAL)	n/a		20-2-9636	1	20-2-0341	1
22	SWEEP DRIVE GEAR (OPTIONAL)	n/a		GB-0001	1	GB-0001	1
23	SWEEP GEAR DRIVE WHEEL (OPTIONAL)	n/a		20-3-0005	1	20-3-0007	1
24	WHEEL DRIVE PLATE (OPTIONAL)	n/a		20-3-0042	1	20-3-0042	1
25	1 1/4" EXTERNAL SNAP RING (OPTIONAL)	n/a		PP-0029	1	PP-0029	1
26	1/2 x 4 1/2" BOLT	NB-0067	1	NB-0067	1	NB-0067	1
27	1/2 x 4" TAP BOLT	NB-0099	2	NB-0099	2	NB-0099	2
28	3/8 x 2 1/2" BOLT	n/a		NB-0035	2	NB-0035	2
29	3/8 x 2" BOLT	n/a		NB-0032	6	NB-0032	6
30	3/8 x 1 1/4" BOLT	NB-0045	3	NB-0045	3	NB-0045	3
31	3/8 x 1 1/4" CARRIAGE BOLT	-MODEL 27-40 NB-0150	2	NB-0150	2		
		-MODEL 42-48 NB-0150	4	NB-0150	4		
	1/2 x 1 1/2" BOLT	-MODEL 27-40				NB-0021	2
		-MODEL 42-48				NB-0021	4
32	3/8" NYLON LOCKNUT	-MODEL 15/16-40 NB-0001	2	NB-0001	2		
		-MODEL 42-48 NB-0001	4	NB-0001	4		
	1/2" NYLON LOCKNUT	-MODEL 15/16-40				NB-0055	2
		-MODEL 42-48				NB-0055	4
33	3/8" FLATWASHER LG OD	-MODEL 15/16-40 NB-0031	2	NB-0031	2		
		-MODEL 42-48 NB-0031	4	NB-0031	4		
	1/2" FLATWASHER	-MODEL 15/16-40				NB-0064	4
		-MODEL 42-48				NB-0064	8
34	3/8 x 1 1/4" SETSCREW	NB-0083	4	NB-0083	4	NB-0083	4
35	5/16 x 1" BOLT	NB-0014	10	NB-0014	10	NB-0014	10
36	5/16 x 2 1/2" BOLT	NB-0033	1	NB-0033	1	NB-0033	1
37	5/16 x 2" BOLT	n/a		NB-0009	1	NB-0009	1
38	1/2" NYLON LOCKNUT	NB-0055	2	NB-0055	2	NB-0055	2
39	1/2" REG NUT	NB-0016	2	NB-0016	2	NB-0016	2
40	3/8" NYLON LOCKNUT	NB-0001	5	NB-0001	5	NB-0001	5
41	3/8" REG NUT	NB-0005	8	NB-0005	8	NB-0005	8
42	5/16" NYLON LOCKNUT	NB-0017	11	NB-0017	11	NB-0017	11
43	3/8" FLATWASHER LG OD	NB-0031	6	NB-0031	6	NB-0031	6
44	3/8" FLATWASHER SM OD	n/a		NB-0002	2	NB-0002	2
45	5/16" FLATWASHER	NB-0012	2	NB-0012	2	NB-0012	2
46	5/16 x 2" SPRING PIN	NB-0082	2	NB-0082	2	NB-0082	2
47	1/4 x 1" KEY	NB-0008	3	NB-0008	3	NB-0008	3
48	SWEEP STOP	20-2-0632	1	20-2-0632	1	20-2-0632	1
49	SWEEP STOP CABLE ASSEMBLY	20-2-0800	1	20-2-0800	1	20-2-0800	1
50	1/4 x 3/4" BOLT	C/W HUB	2	C/W HUB	2	C/W HUB	2

MOTORIZED SWEEP ASSEMBLY



9 INDEX

I

Introduction.....4

O

Operation..... 11
 Controls 14
 Installation 12
 Machine Break-In 13
 Operating..... 14
 Pre-Operation Checklist 13
 Storage 17
 To the New Operator or Owner..... 11

P

Parts List21

S

Safety5
 Bin Safety7
 General Safety6
 Lock-Out Tag-Out Safety7
 Maintenance Safety8
 Operating Safety7
 Safety Signs8
 Safety Sign Locations.....9
 Service and Maintenance18
 Service18
 Fluids and Lubricants18
 Greasing18
 Servicing Intervals18
 Bolt Torque20

T

Trouble Shooting19

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