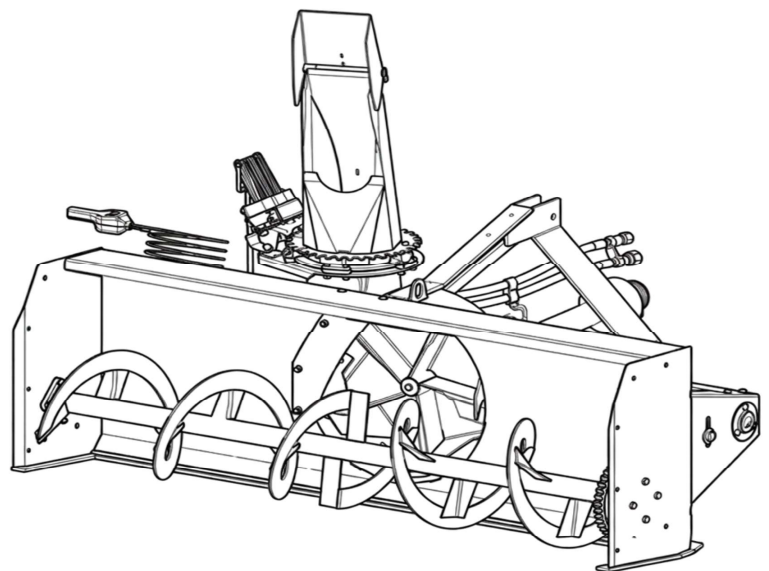




OPERATOR'S MANUAL

Single Auger Snowblower

SB78





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WARRANTY

7 Year Warranty

Effective on products retailed
on or after October 1st, 2022.



Seven Year Limited Consumer Warranty.
90 Day Limited Commercial Warranty, including Gearboxes.
Commercial warranty includes rental and industrial applications.

Keep your registration copy in a safe place, it is required as proof of warranty activation.

This new and unused product is warranted by MK Martin Enterprise Inc., to be free from defects in material and workmanship under normal use and regular service as described in the instruction manual.

Warranty coverage:

- Consumer period of 7 years from the date of delivery
- Commercial period of 90 days, including gearboxes, from the date of delivery
- Warranty is limited to the replacement of parts and/or repair of the product

If issues develop with the product within the warranty period, contact the local dealer from which you purchased the unit. Only MK Martin authorized dealers may make repairs to the product or affect the replacement of defective parts, unless otherwise approved by MK Martin. Repairs or replacement will be done at no charge within a reasonable time after the receipt of the product. This warranty does not cover the following items:

1. Normal replacement of service items.
2. Normal maintenance or adjustments.
3. Machines or parts lost or damaged during shipment.
4. Accessory items/parts not supplied by MK Martin.
5. Damages resulting from:
 - a. misuse, negligence, accident, theft, or fire.
 - b. use of improper or insufficient fuel, fluids, or lubricants.
 - c. use of aftermarket parts or accessories, unless approved by MK Martin.
 - d. modifications, alteration, tampering, or improper repair.
 - e. any device or accessories installed, other than by an authorized dealer.
6. Tires are covered by the manufacturer of the tire and the warranty period specified by the manufacturer.
Please contact the manufacturer named on your tires for warranty on these items.

MK Martin Enterprise Inc. shall not, in any event, be liable for any losses, damages or costs; to include profits, travel, transportation, pick up, delivery, towing cost, tow vehicle, or loss of use, whether special, incidental, consequential, or otherwise, in any way. Unit or parts are returned at the customer's expense. Include a copy of your completed Warranty Registration form with any claim as proof of warranty activation.

There are no warranties, expressed or implied, other than those specified herein. No agent, employee or other person has any authority to vary any of the foregoing provisions.

Warranty coverage is null and void unless the Warranty Registration form has been completed in full and is on file at MK Martin Enterprise Inc. Warranty begins at the time of customer delivery and is activated upon Warranty Registration receipt at MK Martin Enterprise Inc.

INTRODUCTION

Thank you for purchasing your new MK Martin snowblower. Your snowblower has been designed and manufactured to give you many years of dependable service. It was built with a manual chute deflector, adjustable skid shoes, 3PH quick attach compatibility, a single auger with high-tensile steel flighting, a 5-blade fan, and a gearbox to help you complete your snow clearing tasks safely and efficiently.

All hardware is grade #5 unless otherwise specified.



Anyone who will be assembling, operating, maintaining or working with this product, must read and completely understand the information and instructions contained in this manual.

Keep this operator's manual available for reference by the operator and to pass on to new owners and operators.

INTENDED USE

The snowblower was designed to clear snow from surfaces such as driveways, sidewalks, and parking lots. It uses PTO power when attached and pulled along with the 3PH tractor. The auger breaks up the snow, and the 5-blade impeller throws it through the chute in the direction in which it is pointed.

GENERAL INFORMATION

The purpose of this manual is to assist you in operating and maintaining your snowblower in a safe manner. Read this manual carefully to obtain valuable information and instructions that will help you achieve safe and dependable service.



SPECIAL NOTE

The illustrations and data used in this manual are current at the time of printing, but due to possible engineering and/or production changes, this product may vary slightly in detail. MK Martin Enterprise Inc© reserves the right to update and/or change components as necessary without notification.

OPERATOR ORIENTATION

The directions left, right, front and rear, as mentioned throughout this manual, are determined when sitting in the power unit's driver's seat and facing in the direction of travel.

SERIAL NUMBER LOCATION

The model and serial number are located on the front of the blower above the fan housing.

Please record them here as a handy reference. In case of warranty issues, your dealer will ask for the serial number to verify your warranty.

MADE IN CANADA	
	
MANUFACTURED BY MK MARTIN ENTERPRISE INC.	
PRODUCT	
MODEL	
SERIAL #	

SAFETY

 This symbol alerts you to hazards that could cause damage, injuries, or possible death.
The Safety Alert symbol identifies important safety messages on the implement and in the manual. When you see this symbol, read and understand the message, be alert to the potential hazard in the message. Follow the instructions in the safety message.

SAFETY MESSAGES

Throughout this manual, signal words are used to indicate the degree of hazard to personnel if proper safety procedures and guidelines are not followed. The appropriate term for each message has been selected using the following guidelines:

 **DANGER** - Indicates an imminently hazardous situation that, if not avoided, could result in death or serious injury, and includes most extreme situations typically for implement 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.

 **IMPORTANT** - Indicates a situation that could result in damage to the implement or other property.

The safety information given in this manual does not replace any safety codes, insurance needs, government and local laws.

ACCIDENT PREVENTION

The best accident prevention is a careful operator.
MK Martin and your dealer ask that you be that careful, responsible equipment operator.

You are responsible for the safe operation and maintenance of your implement. You must ensure that you and anyone else who is going to use, maintain, or work around the implement be familiar with the work and maintenance procedures and related safety information contained in this manual.

Be certain that EVERYONE using this implement is familiar with the recommended maintenance and work procedures and follow all the safety precautions. Accidents can be prevented.

YOU ARE THE KEY TO SAFETY:

- Read and understand the safety labeling which appears on the implement.
- Have a first-aid kit and fire extinguisher available for use should the need arise and know how to use them.
- Do not allow passengers on the implement, loaded or empty.
- Do not operate this implement under the influence of drugs or alcohol
- Wear appropriate personal protective equipment (PPE). This list includes, but is not limited to:
 - Hard hat
 - Heavy gloves
 - Hearing protection
 - Protective footwear
 - Protective eye wear
 - Safety vest

SAFETY GUIDELINES

In addition to the design and configuration of this implement, including safety labels and safety devices, hazard control and accident prevention are dependent upon the awareness, concern, and proper training of personnel involved in the operation, transport, maintenance, and storage of the implement. Pay close attention to the safety labeling affixed to the implement.

- In order to provide a better view, certain illustrations in this manual may show an assembly with a safety device removed. However, equipment should never be used in this condition. Keep all safety devices in place, if removal becomes necessary for repairs, replace the device prior to use.
- Replace any safety or instruction label that is unreadable or is missing.
- Do not operate this implement under the influence of drugs or alcohol. Consult your doctor about using this implement while taking prescription medications.
- Under no circumstances should children be allowed to work with this implement.
- This implement is dangerous to persons unfamiliar with its operation. Do not allow persons to use or assemble this unit until they have read this manual and have developed a thorough understanding of the safety precautions and of how it works. Review the safety instructions with all users annually.
- If another adult is assisting with work, their physical limitations need to be recognized and accommodated. Assistants should be a responsible, properly trained and physically able person familiar with machinery and trained in this implement's operations.
- Never exceed the limits of the implement. If its ability to do a job, or to do so safely, is in question - DON'T TRY IT.
- Do not modify the implement in any way. Unauthorized modification may result in serious injury or death and may impair the function and life of the implement.

SAFETY TRAINING

- Train all new personnel with the instructions alongside the implement. Be certain only a properly trained and physically able person will use the machinery.
- Working with unfamiliar equipment can lead to injuries. If this implement is used by any person other than the owner, or is loaned or rented, it is the owner's responsibility to make certain that the operator, prior to using:
 - Reads and understands the instruction manuals
 - Is instructed in safe and proper use of the implement.
- Make certain that all operators and maintenance personnel have complete understanding of the safety labeling.
- Information contained in this manual and labeling on the implement must be conveyed CLEARLY and FULLY, in order to be able to operate safely and knowledgeably.

SAFE WORK AREA

Not all workspaces are the same, but the principles presented here can be applied to any workspace.

Survey the work site, remove debris and make note of nearby or overhead obstructions.

Where possible, avoid operating near ditches, embankments, and holes. Mark off any steep slopes, hills, or icy areas before operating your snowblower. Unstable land can be extremely dangerous and cause you to lose control of your implement, resulting in property damage, personal injury, or death.

Be aware of:

Bystanders, or any one not directly involved with the work, should not be in the work area.

Workers helping the operator must wear the appropriate PPE and must always make eye contact with the operator before entering the work area.



DANGER -If solid objects such as rocks, gravel, wire, chains, ice chunks, or other debris come into contact with the auger, they can cause damage to the implement and create a hazard. At high speeds, the thrown objects are extremely dangerous and can cause injury or death to any bystanders or animals. Avoid this by marking objects that can not be removed. Keep distance from machine and keep deflector pointing away from yourself and others.

PREPARATION

1. Inspect implement for shipping damage. If damage does exist, do not use. Notify your dealer immediately to have damaged parts replaced or repaired.
2. Inspect all fasteners to ensure that they are not loose or missing. Ensure fasteners are torqued according to the torque chart at the back of this manual.
3. Ensure that all applicable safety decals are installed and legible.
4. Visually inspect hydraulic system for leaks. Ensure all hydraulic hoses are properly secured.
5. Personal Protective Equipment (PPE) including hard hat, safety glasses, safety shoes, and gloves are recommended during assembly, installation, operation, adjustment, maintaining, repairing, removal, cleaning, or moving the unit. Do not allow long hair, loose fitting clothing or jewelry to be around equipment.
6. **PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS!** Gas or diesel powered equipment can often be noisy enough to cause permanent hearing loss. We recommend that you wear hearing protection while using the equipment. Noise over 85dB on a long-term basis can cause severe hearing loss. Noise over 90dB on adjacent to the operator over a long-term basis may cause permanent, total hearing loss.
7. When not attached to the power unit, block the implement to prevent movement.

ROTATING DRIVELINE HAZARD

To prevent serious injury or death from rotating driveline:

- Keep all guards in place when operating
- Operate only at 540 RPM
- Keep hands, feet, hair, and clothing away from moving parts

TRANSPORT SAFETY



DANGER - Do not drive the tractor on public roads with your implement. Doing so could result in damage to your equipment, serious injury or death.



DANGER - Do not tow a load that is more than double the weight of the vehicle towing the load.

1. The safest way to transport the implement from job to job with the use of a trailer attached to a motor vehicle.
2. Use a towing vehicle and trailer of adequate size and capacity. Do not tow your equipment with a truck or passenger car. Do not tow a load that is more than double the weight of the vehicle towing the load.
3. Secure the attachment to your trailer using tie downs and chains.
4. The snowblower is not designed for travel on public roads or highway speeds. Loss of control resulting in death, serious injury or property damage could occur.
5. Adhere to all federal, state, and local laws when transporting equipment. When applicable, ensure slow moving vehicle (SMV) sticker and lights are working properly. Stay alert for overhead objects such as tree and wires.
6. Drive at a lower speed if your trailer is not equipped with brakes. Sudden braking could cause the trailer to swerve or tip causing an accident or damage to the blower.

Consult with local laws when transporting.

MAINTENANCE SAFETY

1. Good maintenance is your responsibility, follow the maintenance schedule.
2. 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.
 - Allow equipment to cool before working on it.
3. Wait until all motion has stopped and the implement is securely blocked up before removing material, performing service, and making repairs. Contact with the rotating auger and fan could result in serious injury or death.
4. Use PPE such as eye, hand and hearing protectors.
5. Never adjust, service, clean or lubricate the implement when attached to the tow unit, until all power is shut off.
6. Ensure all hardware is torqued according to the torque chart at the back of this manual.
7. Wait until all motion has stopped and the implement is securely blocked up before removing material, performing service, and making repairs. Contact with the rotating auger and fan could result in serious injury or death.

HYDRAULIC SAFETY

1. Securely support or block hydraulic equipment when conducting service or maintenance to the implement. Hydraulic equipment can accidentally lower or leak which can result in severe injury or death. Always avoid working under hydraulic equipment.
2. All hydraulic work must be done by qualified personnel.
3. Make sure that all components in the hydraulic system are kept in good, clean, condition. Turn off the power unit and relieve pressure on hydraulic system before maintaining or working on system.
4. Ensure that all components, lines, hoses, connections, and couplings are not damaged and leak-free. Before applying pressure to the system, visually inspect for leaks. Wear proper hand and eye protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak.
5. Do not attempt any makeshift repairs to the hydraulic lines, fittings, or hoses by using tapes, clamps, or cements. The hydraulic system operates under extremely high pressure. Such repairs could fail suddenly and create a hazardous and unsafe condition.
6. If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing through the skin.

STORAGE SAFETY

1. Store the unit in a dry, level area, away from human activity, work areas, livestock, or where children may be playing. Cover if outside.
2. Guard any sharp corners. Sand down and repaint any chipped or scraped areas to prevent rust and corrosion.
3. Ensure components and safety features are in good condition before storing the implement.
4. Secure the implement to prevent unwanted movement. Cover hydraulic hose ends to prevent contamination.

OPERATION SAFETY

1. NEVER allow helpers or bystanders under or near the machine.
2. Ensure the implement is securely attached to the power unit before moving.
3. Inspect all fastening devices, do not use if worn or damaged.
4. Make sure that bystanders are clear before using or moving the implement.
5. NEVER position yourself between the power unit and the implement while the power unit is running.
6. Avoid distractions and always give undivided attention to the machine, the job at hand and your surroundings. Wait until it is safe to operate mobile communication equipment such as cell phones, text messaging devices, pagers or two-way radios.
7. Do not place any part of your body near or under rotating parts.
8. Watch for traffic when operating near roadways.
9. Do not permit passengers on this implement.
10. Exercise extreme caution when on or crossing drives, walks, or roads. Where possible, avoid operating near ditches, embankments, and holes.
11. Operate the machine up and down the face of slopes. Exercise extreme caution when changing direction on slopes.
12. NEVER operate on slopes greater than 20 degrees, or wet or slippery slopes.
13. NEVER park the power unit on a steep grade or slope.
14. Always wear the seat belt in the tow unit, if one is equipped. Sudden contact with a hidden object can result in serious personal injury.
15. Before beginning the job, inspect areas of operation for potential hazards, and mark obstructions with stakes or flags that will be seen in deep snow.
16. Never dismount from your power unit while it is moving and never leave your implement unattended when the engine is running. Wait at least 60 seconds before dismounting your power units so that all moving parts on the snowblower come to a complete stop.
17. Keep all shields and guards in place.
18. Do not grease or oil attachment while it is in operation.
19. Avoid operating your snowblower when there is a layer of ice below the snow, unless your unit is properly equipped for those conditions. Do not exceed 15 km/hr (10 mph) when clearing snow. Higher speeds can lead to losing traction and steering control or encountering hidden objects with extreme force. Both situations can result in damage to the implement, personal injury, and death.
20. Obey all federal and local laws related to snow removal. Never pile up snow near handicap parking areas, electrical boxes, fire hydrants, water drains, shut-off valves, or mailboxes, and never pile snow on sidewalks, streets, or other's property.
21. Never operate your Snowblower in the dark or when visibility is compromised. Ensure there is adequate light, and that you can see at least 300 feet away. STOP operating immediately if bystanders are within 200 feet of you.
22. Ensure chute is never blowing snow towards bystanders, buildings, or vehicles. Ice, tough snow, or hidden objects can be propelled from the Snowblower and cause severe injury.
23. Shut down the power unit immediately if the machine is making any unusual noises, or if there is excessive vibration. This can be an indication that there are hidden objects underneath the snowblower, that parts of your implement have been damaged, broken or clogged. Wait five (5) minutes for the engine to cool and rotating parts to be at a complete stop before dismounting your power unit. When it is safe to do so, inspect the machine for clogs, loose parts, or damages.
24. Turn off the power unit immediately if the fan blades are broken or the auger begins to make contact with the housing. Broken or bent blades can break free while operating and can be a serious safety hazard. Continue operating only when all broken or damaged parts have been repaired or replaced.

SAFE PRACTICES

- Make sure that objects and other workers are out of the area before operating.
- Never disconnect any of the safety features.
- Do not travel faster than 8 km/h (5 miles/h). Traveling faster is dangerous and could result in loss of control of the equipment and serious injury.
- Never put hands, face, feet, or clothing around the implement with the tow vehicle engine running.
- Never leave a running machine unattended.
- Never exit the tow vehicle with the engine running.

GAS MOTOR SAFETY

Before starting engine, read and understand the operating and maintenance instructions that came with your engine.

- DO NOT run engine in an enclosed area. Exhaust gases contain carbon monoxide, an odorless and deadly poison.
- DO NOT place hands or feet near moving or rotating parts.
- DO NOT store, spill, or use gasoline near an open flame, or devices such as a stove, furnace, or water heater, which use a pilot light or devices which can create a spark.
- DO NOT refuel indoors where area is not well ventilated. Outdoor refueling is imperative.
- DO NOT refuel while engine is running. Allow engine to cool for 5 minutes before refueling. Store fuel in approved safety containers.
- DO NOT remove fuel tank cap while engine is running.
- DO NOT operate engine if gasoline is spilled. Move machine away from the spill and avoid creating any ignition until gasoline has been cleaned up.
- DO NOT smoke while filling fuel tank.
- DO NOT choke carburetor to stop engine. Whenever possible, gradually reduce engine speed before stopping.
- DO NOT run engine above rated speeds. This may result in injury.
- DO NOT tamper with governor springs, governor links or other parts which may increase the governed speed.
- DO NOT check for spark with spark plug or spark plug wire removed.
- DO NOT crank engine with spark plug removed. If engine is flooded, crank until engine starts.
- DO NOT operate engine without a muffler. Inspect periodically and replace, if necessary.
- DO NOT operate engine with an accumulation of grass, leaves, dirt or other combustible materials in the muffler area.
- DO NOT touch hot muffler, cylinder or fins as contact may cause burns.

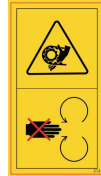
SAFETY LABELS

Safety labeling is an important part of the overall safe use of the implement. Safety labeling can alert and warn you against potential injury or death, and is important to follow these points to help keep your implement safe for you and others who may be using it.

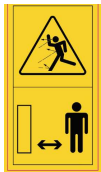
- Keep safety labels clean and legible at all times, and replace as necessary.
- Replaced parts that displayed a safety label should also display the current label.
- Safety labels are available from your authorized distributor.



CAUTION : read and understand ALL safety and operating instructions in the manual, read and understand ALL safety labels located on the machine.



WARNING : Keep hands and limbs away from rotating parts. Do not operate machine without shields in place. If shield is removed, replace it before operating machine. Risk of crushing or amputation could result.



WARNING : Risk of injury from flying objects. Stay clear of the snowblower auger and chute while it is in use. Machine can expel objects fast enough to cause injury. Impact or impalement could result.



WARNING : Keep hands and limbs away from rotating parts. Do not operate machine without shields in place. If shield is removed, replace it before operating machine. Risk of crushing or amputation could result.



WARNING : Shut off engine and remove key before performing maintenance or repair work.



WARNING : Crushing hazard. Stay clear of draft link lifting range while operating rock shaft controls.



WARNING : Hydraulic leaks could develop without warning! Never check for leaks with your hands or fingers while the system is pressurized. Hydraulic fluid under pressure may cause serious injury if it comes in direct contact with the skin or eyes. Any hydraulic maintenance or repairs must be done by a qualified professional.



WARNING : Do not open or remove safety shields while engine is running.



NOTICE : This label is required by California Proposition 65 (Prop 65), which is meant to notify California residents of exposures to Prop 65-listed chemicals.



CAUTION : Personal Protective Equipment (PPE) is required when operating or maintaining this machine. Failure to wear PPE could result in personal injury.

IF LABELS NEED TO BE REPLACED

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

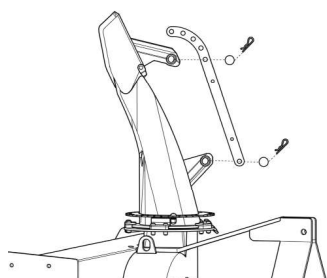
ASSEMBLY & INSPECTION

Depending on how you ordered your machine, some minor assembly may be required. Before beginning assembly or putting the snowblower into service the first time, inspect the machine for shipping damage. If damage does exist, do not use. Notify your dealer immediately to have damaged parts replaced or repaired.

If you received your machine assembled, inspect machine for damaged or loosened parts. If damaged or loosened parts exist, do not use. Notify your dealer immediately to have affected parts replaced or repaired.

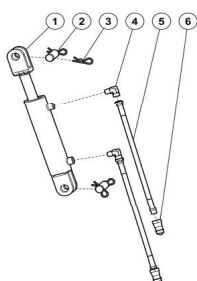
This snowblower model is designed to fit a variety of tractors. Although the size of our models may differ, assembly instructions remain consistent. The chute, PTO, and deflector are packaged separately and require assembly. If you purchased optional features such as the electric or hydraulic rotator, these items may also require assembly. Follow the instructions that apply to your implement and power unit in the order they are presented.

ATTACH THE MANUAL DEFLECTOR

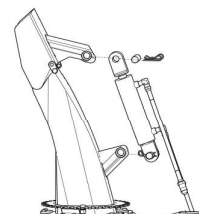


Attach the deflector bar to the chute using the lock pin.
Bolt the bottom of the deflector bar using the adjuster pins and hair pins.

ATTACH THE HYDRAULIC DEFLECTOR



Attach the deflector bar (3) to the chute using the adjuster pins (2) and the hair pins (1).

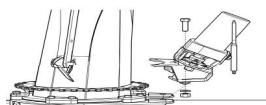


OPTIONAL ELECTRIC ROTATOR ASSEMBLY

Depending on how you purchased your snowblower, the optional electric rotator may require assembly.

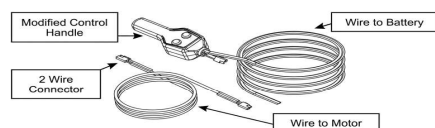
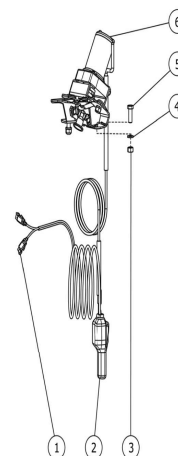
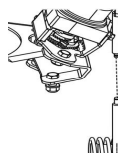


WARNING - The electric rotator can be hooked up to a battery or a 12 Volt power source. If connecting to 12 Volt power source, ensure it supports at least 15 AMP to prevent overheating and damaging equipment or creating a safety hazard.



1. **BOLT ROTATOR.** Place the rotator (6) onto the hood base. Secure with 1/2"-13 bolts (5), 1/2" lock washers (4) and 1/2"-13 lock nuts (3).

2. **MOTOR WIRE TO CONNECTOR.** Plug one end of the motor wire into the motor connector and secure the wire along the blower top



3. **MOTOR WIRE TO CONTROLLER HANDLE.** Plug the other end of the motor wire into the control handle. To attach wire to battery, see Attaching Electric Harness to 3PH Tractor.

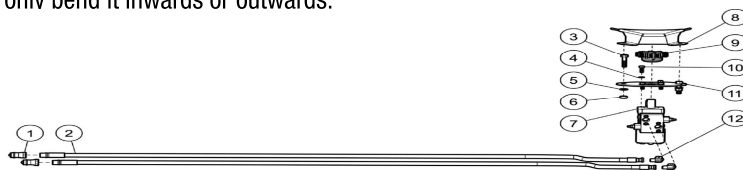
OPTIONAL HYDRAULIC ROTATOR ASSEMBLY

The hydraulic rotator uses a hydraulic motor, controlled by the tractor hydraulics, to rotate the chute.

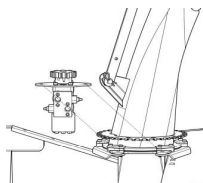
The hydraulic rotator's shield has rods that act as guides for the deflector. All shields are manufactured with straight rods. However, rods may need to be bent in for smaller blowers and bent out for larger blowers.

To bend the rod: use a short piece of 3/8 pipe for a lever, or an adjustable wrench to bend the rod. Do not use a hammer as it has less control of the bend. Keep the height of the rod the same, only bend it inwards or outwards.

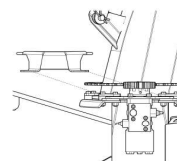
The rods should be slightly inside the root of the gear teeth.



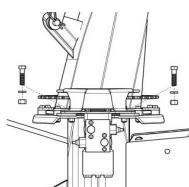
1. **PLACE ROTATOR.** Place the hydraulic rotator (7) so its holes line up with the holes on the hood base.



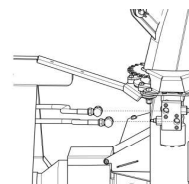
2. **PLACE SHIELD.** Place the shield (8) on top of the gear (9).



3. **BOLT ROTATOR.** Attach the hydraulic rotator (7) and shield (8) to the hood base using the 1/2" - 20 x 2 bolts (3), 1/2" lock washers (5) and 1/2" - 20 gr.2 nuts (6).



4. **ATTACH HOSES TO ROTATOR.** When installing the hydraulic elbows (12), turn them "no more than 4 rounds", then tighten the jam-nut to secure the elbow in the direction you want it to go in.

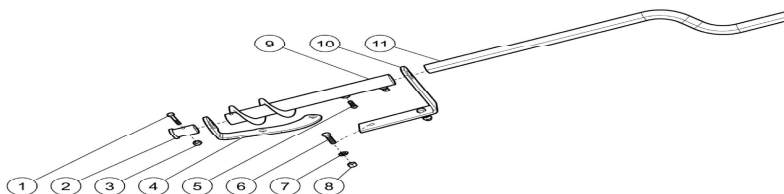


OPTIONAL MANUAL ROTATOR ASSEMBLY

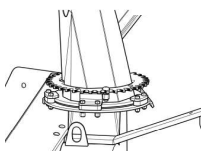
Depending on how you purchased your snowblower, the rotator may require assembly.



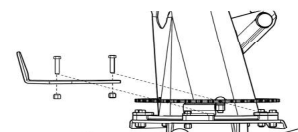
CAUTION - When the blower is raised, the Manual Rotator will be closer to the tractor and could damage the cab or cause injury to the operator.



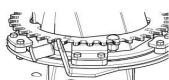
1. **REMOVE BOLTS.** Remove the two bolts and nuts from the chute slides and holders.



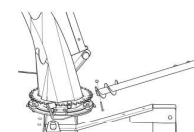
2. **BOLT TAIL BRACKET.** Place the tail bracket (4) underneath the hood base so the holes are aligned. Re-insert the bolts with a washer and nut.



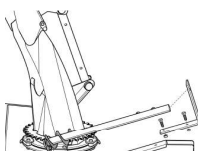
3. **PLACE RETAINER PIN.** Insert the retainer pin (2) onto the slot on the tail bracket (4).



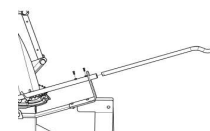
4. **ATTACH LOWER HAND CRANK TUBE.** Slide the end of the lower hand crank tube (9) into the retainer pin (2). Secure the crank tube (9) with the 1/4 x 1 3/4" bolt (3) and 5/16"-18 nut (1).



5. **BOLT CRANK BRACKET.** Slide the crank bracket (11) onto the lower crank tube (5). Attach the crank bracket (11) to the top of the A-frame using the 3/8 x 1 1/4" bolts (6), with 3/8" lock washers (7) and 3/8" lock nuts (8).



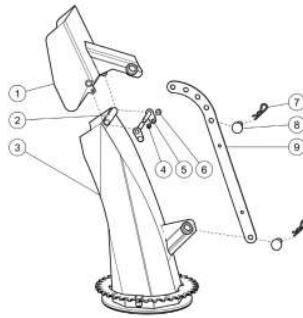
6. **ATTACH HOOD TURNER CRANK.** Slide the crank bracket (11) into the crank tube (5) and secure it by screwing the 5/16" x 3/4 square head screws (9) into the welded 5/16"-18 square nuts (10).



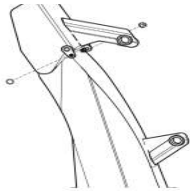
OPTIONAL MULTI-HINGED DEFLECTOR ASSEMBLY

Depending on how you received your multi-hinged deflector, certain steps may have been completed for you.

TO REMOVE THE SINGLE DEFLECTOR:



1. REMOVE DEFLECTOR. Remove the manual or hydraulic deflector from your chute.

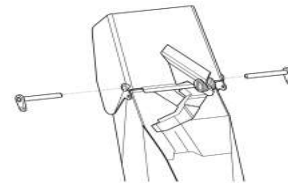


2. REMOVE HINGE PIN BOLTS. Remove bolts (6) and nuts (4) from both sides of the single deflector (1).

3. REMOVE HINGE PINS. Remove the hinge pins (5) from both sides of the hinge tube (2).

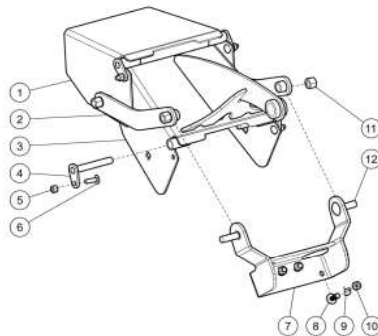


4. REMOVE SINGLE DEFLECTOR. Remove the single deflector (1) from the chute (3).



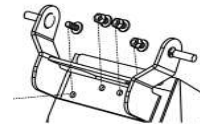
TO ATTACH THE MULTI-HINGED DEFLECTOR:

NOTE - If you purchased the multi-hinged deflector with manufacturing of your snow-blower, the bracket may already be welded to the chute and no drilling is required. Proceed to step 3.



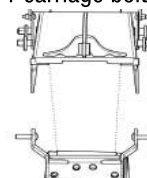
1. PLACE AND DRILL BRACKET. Place the hinge bracket (7) right below the hinge tube. Use a power drill to drill 4 holes into the bottom of the bracket (7) and through the chute.

2. BOLT BRACKET TO CHUTE. Bolt the bracket (7) to the chute, using the 3/8 x 1 truss head machine screws (8), 3/8 lock washers (9), and 3/8 nuts (10).



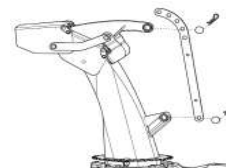
3. REMOVE HINGE PINS. Remove the hinge pins (4) along with their 5/16 x 1 carriage bolts (6) and 5/16-18 nylon lock nuts (5) from the end deflector (3).

4. PLACE MULTI-HINGED DEFLECTOR. Slide the hinge tie plates (2) that are connected to the end deflector (3) onto the bracket's welded bolts (12). Secure the hinge tie plates (2) with the 12-13 nylon lock nuts (11).



5. RE-INSERT HINGE PINS. Re-insert the hinge pins (4) through the hinge tube and secure them with 5/16 x 1 carriage bolts (6) and 5/16-18 lock nuts (5).

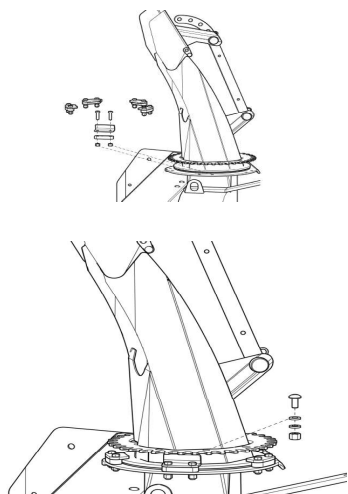
6. RE-ATTACH DEFLECTOR. Re-attach your manual or hydraulic deflector.



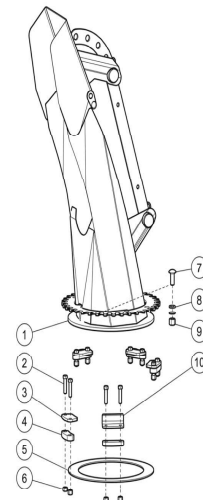
CHUTE ASSEMBLY

IMPORTANT - Follow the chute assembly steps table in the order they are presented. The chute stop is a safety feature that prevents the chute from over rotating. If installed incorrectly, it could damage the machine or cause a safety hazard.

NOTE - Two of the bolts will be longer than the rest. This is intentional for the assembly of the manual rotator.

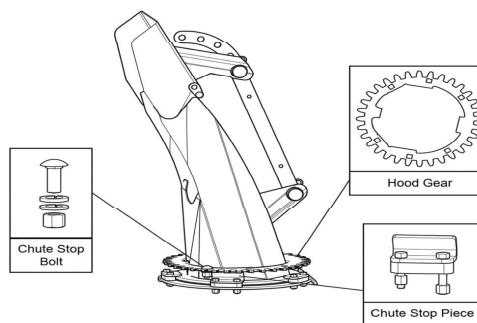


1. **PLACE RING.** Set the ring (5) down on the hood base.
2. **PLACE CHUTE.** Place the chute (1) directly on top of the ring (5).
3. **BOLT CHUTE.** Place the chute holders (3) on top of the chute slides (4) so that they attach the chute to the hood base. Make sure the chute slides (4) and chute holders (3) are aligned with the holes on the hood base. Start by bolting the chute stop piece (10) to the side facing opposite of the rotator. Use the 3/8-16 x 1 1/2 bolts (2) and secure with the 3/8-16 nylon lock nuts (6).
4. **BOLT CHUTE STOP.** Make sure the chute stop bolt is bolted on the opposite side of the chute stop piece. Use the 1/2 x 1 1/4" carriage bolt (7), 1/2" lock washers (8) and 1/2" nylon lock nut (9).

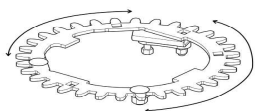


CHUTE STOP ASSEMBLY

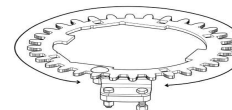
The chute stop bolt(s) can be used to limit or increase the amount of rotation.



FULL ROTATION. As shown in step 4 of the Chute Assembly Steps, place the bolt on the left side of the chute stop piece for full rotation of the chute.



RESTRICTED ROTATION. Place the chute stop bolts one hole apart from each other on the same side as the chute.

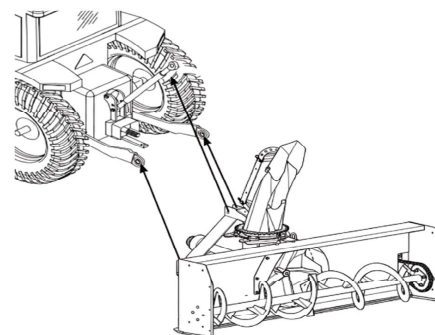


OPERATION

DANGER - Attaching the snowblower will add extra weight to your power unit. It is necessary that a minimum 20% of tractor weight be put on the front wheels of your tractor to keep the machine balanced. If the tractor is unbalanced, there is a risk of tipping over, or losing steering control which could result in property damage, personal injury, or death.

ATTACHING SNOWBLOWER TO 3PH TRACTOR

1. Back the tractor up to the snowblower that is on level ground.
2. Line up the tractor's lift arms so that they are sitting between the snowblower's A-frame.
3. Turn off the power unit before proceeding.
4. Fasten the lower 3PH link to the lower hitch mount.
5. Lengthen or shorten the top link until the link can be pinned onto the top hitch mount.
6. Insert the lift pins and use the lynch pins to secure the tractor's lift arms to your implement.



INSTALLING PTO SHAFT

Once the snowblower's A-frame is secured to the tractor, you will be able to determine the length and angle of the PTO shaft. The length of the PTO shaft on the pull-type snowblower is standard to fit a variety of tractors. However, the instructions demonstrate how to adjust the length and angle of your PTO when needed.

- Check length of PTO shaft
- Alter length of PTO shaft, if needed
- Alter angle of PTO shaft, if needed
- Attach PTO shaft
- Remove Park Stand



NOTE - Any malfunctions upon altering the length of the PTO shaft will not be covered under warranty. See a qualified professional to replace broken parts or to perform service and maintenance on your PTO.

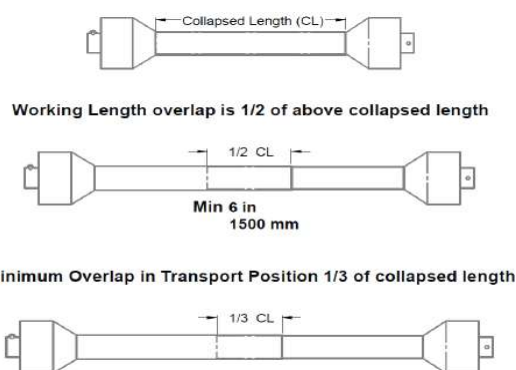


WARNING -Do not allow anyone to stand in between the snowblower and the tractor when securing the attachment. Doing so could result in damage to equipment, injury, and death.

A. CHECK LENGTH OF PTO SHAFT

The length of the PTO shaft may be too short or too long, depending on the type of tractor you are using. Only make alterations to the length of the PTO shaft if absolutely necessary.

- Raise or lower the equipment until the PTO shaft out of the tractor is horizontal with the input shaft on the implement.
- Measure lock-pin groove to lock-pin groove or bolt hole on PTO and compare it with the measurement on the tractor. The difference between these two measurements needs to be cut from both halves of the PTO shaft, plus $\frac{1}{2}$ ".



B. ALTER LENGTH OF PTO SHAFT

- Use a sharp hacksaw to cut the PTO tube.
- Use a fine file to remove any sharp edges and burrs from sawing.
- Clean off all dirt and filings from tube, carefully test for smooth fit.
- Apply a light coat of grease to the outside of the small tube.
- Re-install the shields. Install on equipment and re-check.

Telescopic tubes of PTO should overlap a minimum length to meet ideal conditions and transmitting power. The table below can be used as a guide to find maximum permissible length of PTO.

PTO DESCRIPTION	OVERALL LENGTH, CLOSED	OVERALL LENGTH, OPENED MAX	TELESCOPIC TUBE OVERLAP
T20-056P	29 3/4"	41"	5"
T40-056P	30 1/2"	40 1/2"	6"
T50-071P	36 1/2"	51 1/4"	7"
T60-071P	37 3/4"	51 1/4"	7"
T80-066P	36"	47 1/4"	7"
T80-076P	40 1/2"	53"	8"
T90-071P	39"	51"	8"

C. ALTER ANGLE OF PTO SHAFT



DANGER -A tractor that is too large may overpower the implement! It is dangerous to use a tractor that is too big or too powerful. The tractor will always be able to overload the implement even when it is at maximum capacity. If the tractor is too high or the angles are too large it will result in a shortened life span for the universal joints. Reference the angles in this section to ensure the longest lifespan for your PTO and safe and smooth operation.

PTO Shafts are made to transmit power with angle at universal joints. These angles should be kept at a minimum. Larger angles shorten the life of PTO. The table below shows the correlation between the angle and PTO lifespan, using the example of an implement attached to a 60HP tractor operating at a maximum capacity of 60HP continuous.

HP : 60 @ 540 RPM

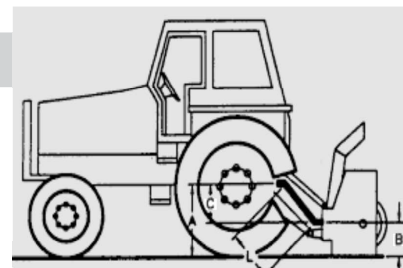
PTO ANGLES	ESTIMATED LIFE IN HOURS
5°	450 hours
10°	195 hours
15°	90 hours
20°	40 hours
25°	20 hours

To alter the PTO angle, first you have to determine the PTO angle.

1. Ensure the snowblower is level with the ground.
2. Measure A, B and L.
3. Subtract B from A (A-B = C)
4. Divide L by C (L/C = F)
5. Compare F Factor in the table below to find the PTO angle. Interpolate, if necessary.

LETTER	DESCRIPTION
A	PTO height at tractor
B	PTO height at blower
C	A-B
L	Cross center distance in working position
F	F Factor

F FACTOR	ANGLE
6	10°
3.75	15°
2.75	20°
2.15	25°
1.75	30°



The lifespan of the PTO is directly related to the universal joint angle of the PTO. Reduce the angle as much as possible by increasing the distance between the tractor and the snowblower.

If you are unable to increase the distance between tractor and snowblower: it is recommended to use a larger size PTO with a greater capacity. Contact your dealer for more details.

For snowblowers of 100HP: an additional gearbox is available that can be mounted on the existing snowblower gearbox. This increases the input shaft height and reduces the angle at PTO Joints. The additional gearbox has an input speed of 1000 RPM, greatly increasing PTO capacity.

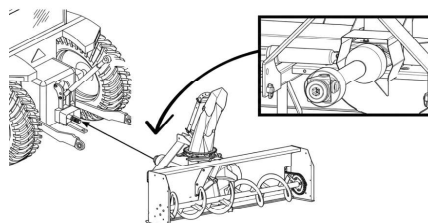


WARNING - Do not change snowblower angle to obtain a scraping affect! Always keep the tractor PTO and snowblower input shaft parallel to one another. Changing the angle of the snowblower can cause damage to the implement. If the angle is unequal at each end, it can cause a fan speed variation as well as a drastic increase of weight on the cross and bearings.

D. ATTACH PTO SHAFT

Once the snowblower's A-frame is attached to the tractor and the length and angle are acceptable for operation, you can install the PTO shaft.

1. Ensure tractor is turned off and no parts are moving.
2. Line up the splines with the notches.
3. Push the locking button down.
4. Engage the shaft and the coupler.
5. Test the connection by pulling slightly on the shaft to ensure it is properly engaged.
6. Verify that the length is accurate.



ATTACHING HYDRAULIC HOSES TO 3PH TRACTOR

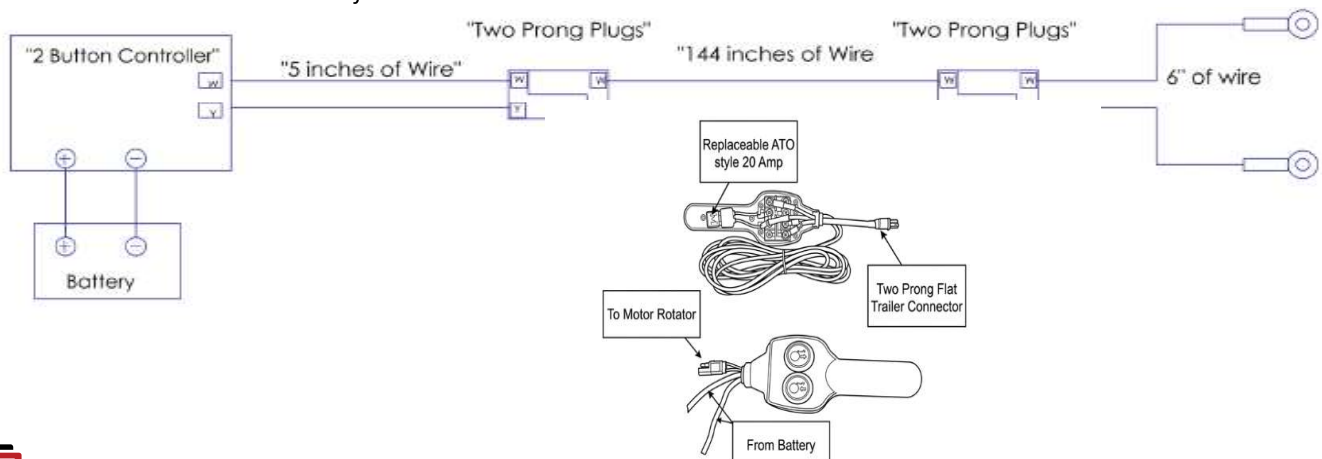
NOTE - The following instructions only apply if you have purchased hydraulic options such as the hydraulic rotator and/or the hydraulic back drag.

1. Make sure the couplers and fittings are free from debris.
2. Attach the couplers to the tractor by pushing them into the corresponding ports until they lock. If you are unsure of which ports to attach the hoses to, refer to your power unit's operator's manual.
3. Avoid twisting or crossing the hoses. Doing so could interfere with the hydraulic pressure. The hoses should remain secured under the hose clamps on the snowblower.
4. Use hose clamps or zip ties to secure the hoses to the snowblower if there is extra length after attaching.
5. Once the hoses are securely attached, turn on your power unit and test the hydraulic system. If there are abnormal noises, excessive bulging or improper functioning, turn off the power unit immediately and visually inspect the attachments before repeating these steps.

ATTACHING ELECTRIC HARNESS TO 3PH TRACTOR

Attach the battery clips to your tractor battery or 12V power source, once the electric rotator has been properly assembled.

1. Ensure tractor is turned off and no parts are moving.
2. Refer to Superwinch® Owner's Guide and note the wire to the battery connection. The in-line breaker is to protect the primary wires and the handle circuit. An additional breaker has been added inside the handle to limit power to the motor.
3. Refer to the diagram to ensure all parts of the controller assembly are securely connected.
4. When safe to do so, attach the battery clips to your tractor battery or 12V power source.
5. Use zip-ties or hose clamps to keep wires from getting entangled with moving parts and to secure the control handle in a convenient location for when you begin operating your snowblower.
6. Use the control handle to test the chute rotation, once assembly is complete. Pressing a button on the handle will cause the motor to turn in one direction, pressing the other button will reverse the rotation. To switch the orientation of the buttons, reverse the leads on the motor rather than the battery connections.

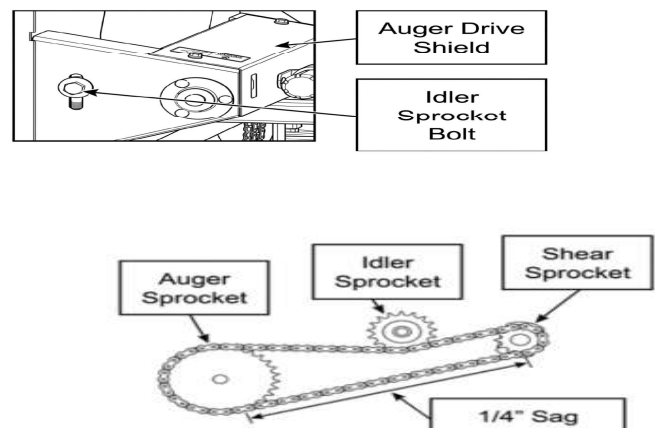


NOTE - The 20 Amp breaker is added inside the handle to prevent the rotator motor from damaging the chute.

ADJUSTING CHAIN TENSION

The drive chain should be adjusted as part of your maintenance routine to check for wear and tension, and to allow a 1/4" sag in the bottom span of the chain between the shear and auger sprocket.

1. For a better view of the chain, remove the auger drive shield.
2. If the chain or sprockets are worn, replace them immediately to avoid damaging your machine.
3. Loosen the 5/8-11 nut on the idler sprocket, and move the bolt up or down to adjust the chain tension. To tighten the chain, bring the bolt down. To loosen the chain, lift the bolt up. There should always be a 1/4" sag between the shear and auger sprocket.
4. Replace the auger drive shield. Make sure bolts are tightened to the correct torque.



ADJUSTING SKID SHOES



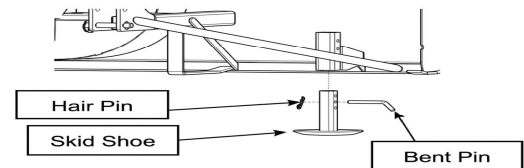
DANGER - Do not begin adjustments to the implement until it is securely attached to the power unit, and the power unit is turned off.



DANGER - Never go under the machine to make adjustments. Never take the risk of placing yourself beneath a hydraulic system. The cutting edges are heavy and sharp, use heavy gloves to avoid injury.

The skid shoes on this snowblower are designed with three holes so that you can manually adjust the height and angle of your skid shoes. Adjust one skid shoe at a time.

1. Turn off the tractor and ensure that no parts are moving.
2. Block up the snowblower and ensure that the A-frame and PTO are both securely attached to the tractor.
3. Remove bent pin and hair pin.
4. Adjust skid shoes.
5. Re-insert bent pin and hair pin.



CONDITION	ADJUSTMENT
Ground is level	Insert the bent pin and hair pin so the bottom of the skid shoe lines up with the bottom of the snowblower frame
Snow on loose gravel, soil, or rocky pathways	Adjust skid shoes down so the frame is further away from the ground. This will help avoid hitting objects or getting material other than snow in the auger, fan or chute.
Snow on paved or cement pathways	Adjust skid shoes up so frame is lower to the ground. The blower will completely clear the surface of snow and ice.

BEGIN OPERATING

1. Engage the PTO and slowly bring the blower up to operating speed.
2. Adjust the chute deflector so the snow is going in the direction you want it to go.
3. Select a slow reverse gear and start driving backwards.
4. Adjust the chute rotator as you operate your snowblower so that the snow is always pointing in the direction you want it to go, ideally in the same direction as the wind.
5. Increase speed when certain the PTO angle, skid shoes, and level of the snowblower are accurate.

Gravel Driveways:

If your snowblower is too close to the ground, there is a risk of the auger picking up loose gravel instead of snow, which could damage the equipment and become a safety hazard.

To avoid picking up loose gravel:

- Shorten the top 3ph link to tilt the blower back slightly. This will help prevent the blower from scraping the surface and scooping up gravel.
- Adjust the skid shoes to raise the blower above the gravel.
- Drive slowly to assess the operation and ensure only snow is being caught by the auger and thrown through the chute.

Paved Driveways:

- Lengthen the top 3ph link to tilt the blower forward. This will help the blower scrape the surface of your driveway. Ensure that the PTO is still in proper position when adjusting the tilt angle of your snowblower.
- Adjust the skid shoes so the frame is lower the ground to scrape away ice or frozen snow.
- Drive slowly and increase speed when certain snowblower no longer needs adjustments to continue operation.

STOP OPERATING

1. Lower any raised hydraulic equipment.
2. Disengage the PTO to stop the blower.
3. Place tractor in park on a flat surface and turn off the engine.
4. Remove switch key, wait approximately 5 minutes for machine to cool down. Do not exit the tractor until all moving parts have come to a complete stop.

SPECIFICATIONS AND DIMENSIONS

MODEL	SB78
HP (Recommended)	50 HP
Cutting Width	78"
Cutting Edge	3/8 x 1 1/2
Auger Diameter	15"
Fan Diameter	23"
Chute Diameter	10"
Chute Rotation	Hydraulic, Manual or Electric
Chute Deflector	Manual, Hydraulic or Multi-hinged
Main Body Height	29"
3PH Mount	Cat. 1 & 2
Weight	748

PRODUCT FEATURES

Single auger with high tensile steel ribbon flighting

Delivering even the heaviest wet snow to the awaiting fan, this snowblower uses machine-formed, hand welded augers made with high tensile steel ribbon flighting to provide strength and durability for years to come.

Five blade fan

Evacuates high volumes of snow quickly and increases the velocity of snow exiting the chute.

Adjustable skid shoes

Extend the life of the cutting edge and help to protect surfaces from damage commonly associated with snow removal.

Hydraulic rotator, optional

This optional feature is the ideal upgrade for tractors with cabs, or for contractors or property managers needing to make frequent adjustments.

Electric rotator, optional

The 12V electric rotator provides a hands-off approach to chute rotation when hydraulic power isn't available.

Gearbox & PTO

The gearbox transfers PTO power from the tractor into the driveline of the blower, ensuring consistent power input to the auger and fan assemblies.

3PH Compatibility

Designed to fit all Cat. 1 & 2 3-point hitch PTO driven tractors.

Manual rotator, optional

This standard feature allows you to manually direct the chute while operating your snowblower.

Manual deflector

Controls the distance and arc of the thrown snow.

Multi-hinged deflector, optional

Increases precision for where snow is blown, allowing snow to be placed closer to the blower or into a truck to be hauled away.

Hydraulic deflector, optional

The optional hydraulic deflector allows for easy control of the distance and arc of the thrown snow from inside the tractor.

SERVICE & MAINTENANCE

To keep your snowblower in good working condition and increase product life, as well as maintain ease of operation, regular maintenance is essential. This also helps to flush out moisture and dirt.

Replacement of parts should be done by qualified personnel only. Keep a record of all maintenance, to ensure scheduled inspections and maintenance are performed.

BLOCKING UP SNOWBLOWER

1. Place two 6" x 6" blocks, or a large enough skid, under each side of the snowblower.
2. Lower the snowblower until it is securely placed on the blocks to stop movement.



NOTE - To service the snowblower while it is attached to the power unit, it must be blocked up off the ground. Do not block higher than necessary.

REPLACING SKID SHOES

Replacing Skid Shoes:

Overtime the bottom of the skid shoes may wear down. When both skid shoes have lost 1/2 of their metal thickness, they need to be replaced to perform properly and to avoid damaging the frame of your snowblower.

- Block up snowblower, and remove one skid shoe at a time.
- Remove bent pin and hair pin.
- Replace the skid shoes.
- Re-insert bent pin and hair pin.

HYDRAULIC OIL

Hydraulic oil level in the power unit should be checked daily, and the quality of the oil should be inspected every 50 hours. If the oil is dirty or smells burnt, it should be replaced. Be sure to relieve the system of pressure before performing and service to the hydraulic system.



DANGER - Be aware that hydraulic leaks could develop without warning. Do not check for leaks with your hands or fingers while the system is pressurized.



DANGER - Personal injury can result from hydraulic oil pressure and hot oil. Hydraulic oil pressure can remain in the hydraulic system after the engine has been stopped. Serious injury can be caused if this pressure is not released before any service is done on the hydraulic system. Make sure all of the attachments have been lowered and the oil is cool before removing any components or lines. All hydraulic parts replacement should be performed by qualified personnel.

LUBRICATION



CAUTION - Unusual wear or noise could be an indication of worn parts. Inspect components before each use. Parts replacement should be done only by qualified personnel.

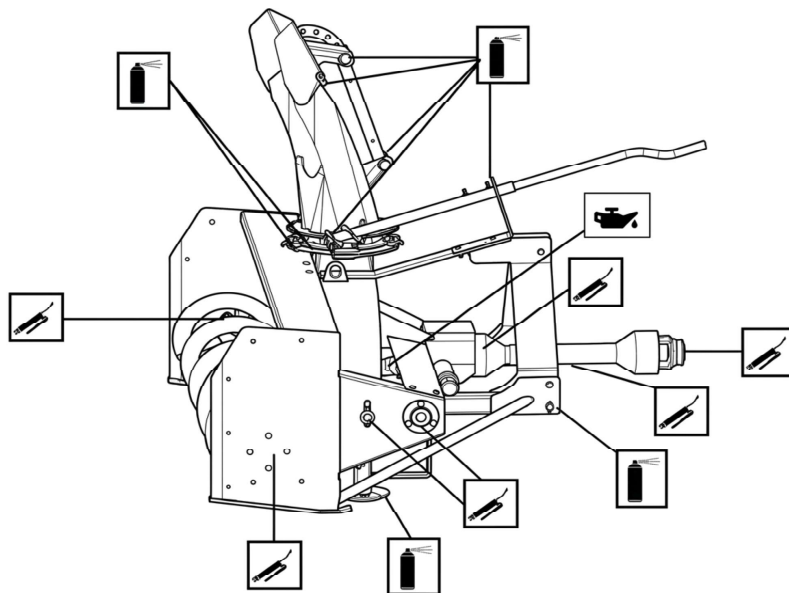
Multi-Purpose Spray Lube



Multi-Purpose Grease Lube



Multi-Purpose Oil Lube



GREASE

To prevent premature wear, use the table and images below that indicate which parts require grease lubrication and at which frequency.

- Lubricate with a good Lithium EP2 grease or equivalent.
- Use a hand-held grease gun for all greasing, one shot of grease is adequate. Damage to bearing seals may result from over-greasing parts.
- Wipe grease zerk with a clean cloth before greasing, to avoid injecting dirt and grit.
- Replace any broken zerk fittings immediately.
- If grease zerk will not take grease, remove and clean thoroughly. Clean lubricant passageway. Replace fittings, if necessary.

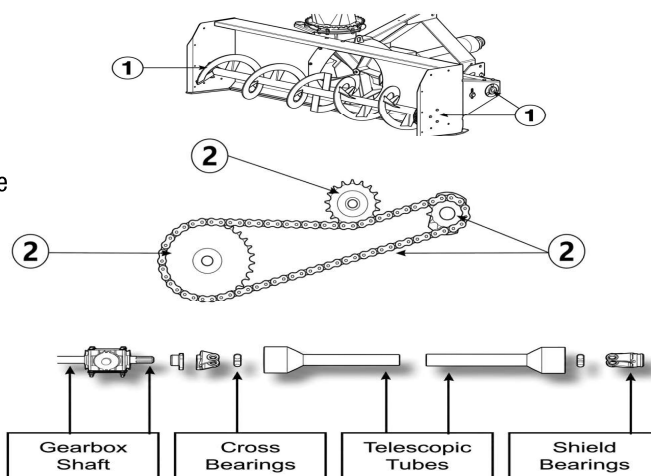
ITEM #	PART	FREQUENCY (HRS)
1	Auger bearings (x3)	16
2	Drive chain & sprockets	After every use
	Gearbox input shaft	8
	PTO shield bearings (x2)	8
	PTO cross bearings (x2)	8
	PTO telescopic tubes (x2)	16

CAUTION - Do not over-grease parts, damage to bearing seals may result.

AUGER BEARINGS : Apply grease every 16 hours, or after every use, to both auger bearings.

CHAIN & SPROCKETS : Apply grease every 50 hours or after every use, to the drive chain, auger sprocket, shear sprocket, and chain tension adjuster.

GEARBOX & PTO : Apply a light coat of grease every 8 hours to the gearbox shafts. Remove the PTO shield and separate the parts to apply lubrication. Apply grease to the shield bearings and cross bearings every 8 hours, and apply grease to the telescopic tubes every 16 hours.



LUBRICATION SPRAY

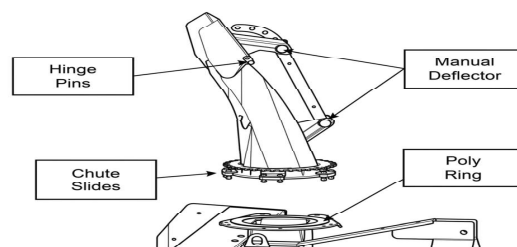
To ensure freedom of movement and prevent corrosion, use the table and images below that indicate which parts require grease lubrication and at which frequency. Use a light oil or lubricating spray.

WARNING - Lubricating spray can be harmful to eyes and skin. If contact is made, wash immediately. Wear PPE such as safety glasses and gloves to avoid personal injury.

ITEM #	PART	FREQUENCY (HRS)
1	Chute	50
2	Skid Shoes	50
3	Manual Rotator	50
4	Lift pins	50
5	PTO lock pins	16

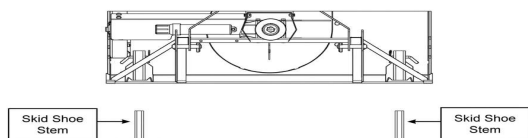
CHUTE

Before the first use, and after every 50 hours apply a light layer of lubricating spray to the following areas of the chute: poly ring, chute slides, hinge pins, and deflector.



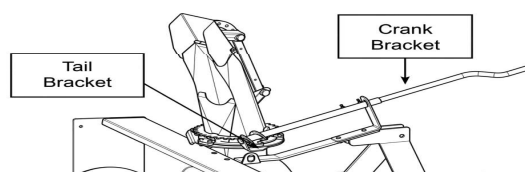
SKID SHOES

Apply a light coat of lubricating spray every 50 hours to the skid shoe stems.



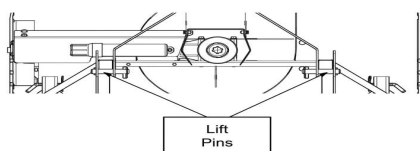
MANUAL ROTATOR

Every 50 hours, apply a light coat of lubricating spray to where the crank meets the crank bracket, and the crank tube meets the tail bracket.



LIFT PINS

Every 50 hours, apply a light coat of lubricating spray to the lift pins.



PTO LOCK PINS

Every 16 hours, apply a light coat of oil spray to the PTO lock pins that attach the PTO to the tractor and attach the tractor to the blower.



CHANGE OIL

To prevent premature wear and sludge build up, plan oil changes every 500 to 600 hours or more often with heavy use, using SAW 90 or 80-90W EP Gear Lube. Change oil at least once per year for optimal performance. Perform first oil change after 50 hours.

Plan to change your gearbox oil every 500 to 600 hours or more frequently with heavy use. Check oil level monthly, and change your gearbox oil at least once a year for optimal performance.

Remember to check the oil level while it is cold, as oil expands when it's hot. Change oil while it is still warm.

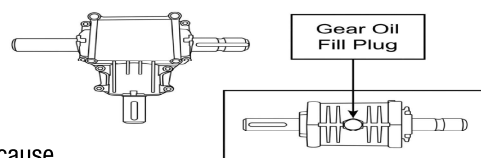
Remove the drain plug, or use a suction or siphon pump to drain gearbox of oil out of the oil level hole when there is no oil drain hole.

Note that not all models have gear oil drain plugs.

1. Remove Oil:
 - a. Ensure machine is level and blocked up securely.
 - b. Change oil while it is still warm.
 - c. Remove the oil drain plug, and drain the gearbox oil into a safe container or catch pan. If you are changing the oil for a gearbox and your gearbox does not have an oil drain plug, use a suction or siphon pump.
 - d. When oil is finished draining, replace the oil drain plug.
 - e. Dispose of oil responsibly.

 Do not overfill! Overfilling can cause damage to the gearbox, increase temperature and cause foaming.

 Never mix two different oils together. A chemical reaction could occur and cause damage to implement or personal injury.



 **NOTE** - After draining oil, If you notice large pieces of metal it is possible your machine parts are worn and require replacement. Seek assistance from qualified professionals to avoid causing damage to your implement.

2. Add Oil:
 - a. Ensure machine is level and blocked up securely.
 - b. Use a cloth to clean the oil fill area of any debris.
 - c. Remove the plug from one of the oil fill locations and add oil. Use SAW 90 or 80-90W EP Gear Lube.
 - d. Fill until oil level plug. Do not overfill.

SHEAR BOLTS

Shear bolts are built to break under shocks to the fan or the auger, as a second layer of protection. If the shear bolt breaks, it is important to replace it immediately with the same category bolt. The shear bolt must be kept tight to maintain efficiency of the shearing mechanism and to prevent damaging or enlarging the mounting holes.

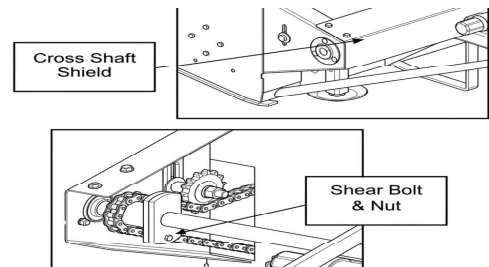


IMPORTANT - The gearbox shafts are made with special alloy steel. However, they are case hardened to increase capacity to shock load. These shafts cannot be broken under normal loads. However, undesirable objects may enter the fan and either bend or break the gearbox shaft. It is understood that the gearbox cannot be built to resist every possible overload and consequently, gearbox fan shafts will not be replaced under warranty.

AUGER DRIVE SHAFT

MODEL	SHEAR BOLT
SB78	5/16 x 1 1/4 Bolt

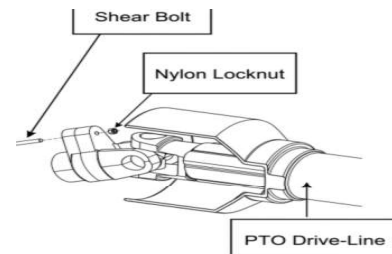
1. Follow Stop Operating instructions.
2. Ensure machine is blocked up to prevent unwanted movement.
3. Remove the cross shaft shield.
4. Align the holes on the auger sprocket with the holes on the auger drive shaft.
5. Insert the new shear bolt with a new hex nylon lock nut.
6. Tighten nylon lock nut.
7. Replace the cross shaft shield.



PTO DRIVELINE

MODEL	SHEAR BOLT
SB78	M8 x 50 cl 8.8

1. Follow Stop Operating instructions.
2. Ensure machine is blocked up to prevent unwanted movement.
3. If unable to safely reach the location of the shear bolt, you may need to separate the PTO from the tractor.
4. Remove the old hardware, if necessary.
5. Insert the new shear bolt with a new hex nylon lock nut.
6. Tighten nylon lock nut.
7. Re-attach the PTO, if separation was necessary.



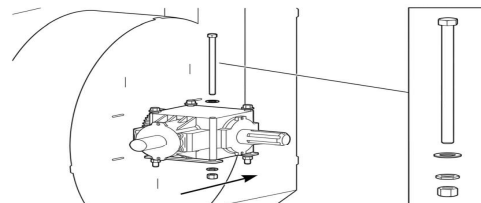
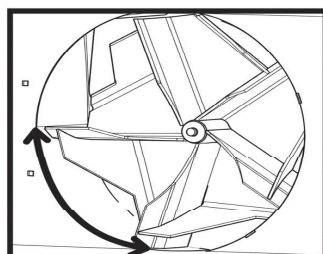
ADJUSTING FAN PLACEMENT

Adjusting the fan can improve overall performance, increase snow clearing efficiency, and improve snow deflection accuracy.

For optimal performance, the fan should always stay closest to the bottom left of the fan housing. The closer the fan is to the chute, the easier it is for the snow to go up and out the chute.

The ideal distance from the fan to the fan housing is 1/16". If you notice the fan has lost some of its thickness and the fan clearance is no longer 1/16", adjust the fan placement. The fan clearance should never be larger than 1/4".

1. Loosen all four gearbox bolts (3/8 x 5 1/2 bolts and 3/8-16 gr.2 fin nuts).
2. Slide the gearbox (that is connected to the fan assembly) closer to the ideal location (see above).
3. Tighten the gearbox bolts.



SNOWBLOWER TROUBLESHOOTING

POSSIBLE CAUSE	SOLUTION
Chute won't rotate	
Hydraulic hose has a break, is obstructed or is not connected properly	See Stop Operation and Hydraulic Safety. Visually inspect hose and connection. Replace hose if needed.
Wire harness connection is loose or wires are disconnected	See Stop Operation and re-connect harness. Replace if wiring is damaged.
There is ice built-up around the base of the chute	See Stop Operation and carefully remove ice.
Chute is getting clogged	
Not enough snow coming through the fan	Increase speed. If this doesn't work, check shear bolts.
Too much heavy, wet snow is overloading the snowblower	Decrease speed.
Discharge chute throws snow at the operator	
The chute was assembled incorrectly and the chute stop is not in it's proper location	See Stop Operation and re-assemble chute. See Chute Assembly.
Skid shoes are wearing too fast	
Snowblower is not parallel to ground	See Stop Operation on and ensure blower is leveled.
Deflector does not throw snow the preferred distance	
Deflector angle has not been adjusted	Adjust manual or hydraulic deflector.
Auger and/or impeller stalls (will not turn)	
Hidden objects are stuck in auger or blower housing	See Stop Operation and carefully clear objects manually. See Work Area Safety.
Auger or PTO shear bolt has sheared	Follow instructions to replace shear bolt.

Snowblower makes intermittent clicking noise

Auger flighting or fan blades are bent or broken

Stop operation immediately See Stop Operating. Repair/replace damaged parts.

Chain tension too loose

Tighten chain.

Snow is left on the ground

Skid shoes are too low to the ground

Re-adjust skid shoes.

Snowblower makes excessive noises or vibrates excessively

Auger is making contact with the ground

Adjust snowblower so that it is level with the ground or adjust skid shoes.

Dirty or frozen snow is making contact with the auger

Wait for snow to become softer and refrain from operating in unsafe weather conditions.

Auger is making contact with hidden objects or material other than snow (ie. gravel)

See Stop Operating and carefully clear objects manually. See Safe Work Area.

Auger or fan is damaged

Stop operation immediately. Repair or replace damaged parts.

Impeller is throwing small amounts of snow

Inadequate snow to fill the impeller

This is normal when clearing shallow snow.

PTO is operating at a speed lower than 540 RPM

Operate PTO at 540 RPM.

Tractor is moving too slow

Gradually increase ground speed.

PTO TROUBLESHOOTING

POSSIBLE CAUSE	SOLUTION
Excessive shear bolts breaking	
Hidden objects in snow	Clear area of debris before snow fall.
Input hp over rated hp power	Reduce ground speed or power.
Loose or worn shear bolt holes	Replace shear sprocket components.
Breaking on startup	Ensure bolt is tight. Lower engine speed, engage PTO than build RPM.

Quick-disconnect yoke damaged or seized

Quick disconnect pin dirty (insufficient maintenance)	Clean, oil and grease telescopic tubes. See Lubrication. Replace both tubes if necessary.
Quick-disconnect pin defective (forced into place, incorrect handling)	Replace Quick disconnect-pin.
Excessive Shaft Length or Axial Load too high	Shorten shaft length. See Alter Length of PTO Shaft.



NOTE - Newer PTO shafts may have a locking collar. (Issue, Cause and Solution will still be similar).

Deformed, distorted, worn, or pounded yoke

Excessive shaft length or Axial too high	Shorten shaft length. Replace defective yokes. Clean and grease telescopic tubes. Replace both tubes if necessary.
Excessive working angle and torque	Verify compatibility between shaft and working conditions (torque vs. angle). Replace defective yokes. Engage PTO more carefully, and use appropriate safety device. Avoid excessive angle. See Alter Angle of PTO Shaft.
Overload caused by high starting and peak torque	Disengage PTO during lifting/lowering the implement. Change to a larger PTO size.

Cross arms worn on cross kit / bearing caps turning in their cross journal / overheated caps

Extreme torque peak or shock load. Axial loads too large	Use appropriate safety device. Change to a larger PTO or shorten PTO shaft. See Alter Length of PTO Shaft.
Excessive continuous torque/excessive working angle	Verify compatibility between shaft and working conditions (torque vs. angle). Replace defective bearings.
Inadequate greasing	Carefully follow greasing instructions See Lubricate.

Telescopic tube failure or twisting

Excessive torque or shock load

Use appropriate safety device and change to a larger PTO size.

Short tube engagement (overlap)

Replace the PTO drive shaft with one of adequate length. Replace defective tubes.

Accelerated wear of telescopic tubes

Extreme load when sliding

Shorten shaft length. Replace defective yokes. Clean and grease telescopic tubes. Replace both tubes if necessary.

Short tube engagement

Verify compatibility between shaft and working conditions (torque vs. angle). Replace defective yokes. Engage PTO more carefully, and use appropriate safety device. Avoid excessive angle. See Alter Angle of PTO Shaft.

Inadequate greasing

Carefully follow greasing instructions. See Lubricate.

Weather conditions or material (sand, etc.)

Replace defective tubes.

Chain failure

Incorrect chain mounting

Mount chain to allow maximum angularity.

Shield interfering with implement

Avoid shield contact with machine or tractor. Replace defective parts.

Worn chain

Replace chain.

Excessive wear of shield or bearings

Insufficient lubrication

Follow lubrication instructions.

Incorrect chain mounting

Mount chain to allow maximum angularity.

Shield interfering with implement

Avoid shield contact with machine or tractor. Replace shield bearings.

Guard cone damaged

Guard cone in contact with implement or tractor

Eliminate interference between guard cone and any part of implement or tractor.

Excessive angularity

Avoid excessive angles. Replace damaged guard cone.

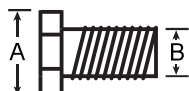
These tables are offered as the suggested maximum torque values for dry (not lubricated) threaded products and are only a general guide.

Check tightness of bolts periodically, replace hardware with the same strength bolt.

Torque specification for bolts are identified by their head markings as shown.

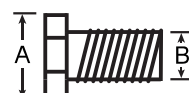
See the "Wheel Torque Specification" page for wheel bolt /nut torque settings

METRIC TORQUE SPECIFICATIONS



Wrench Size: "A"	Thread Size: "B" Fine	Class 8.8		Class 10.9		Thread Size: "B" Coarse	Class 8.8		Class 10.9	
		N-m	lbs-ft	N-m	lbs-ft		N-m	lbs-ft	N-m	lbs-ft
10 mm	6 x 0.75	---	---	---	---	6 x 1.0	11.3	8.3	16.5	12.2
13 mm	8 x 1.0	27	20	38	28	8 x 1.25	27.3	20.1	40.1	29.6
16 mm	10 x 1.25	52	38	73	54	10 x 1.5	54	40	49	36
18 mm	12 x 1.25	95	70	135	100	12 x 1.75	93	69	137	101
21 mm	14 x 1.5	150	111	210	155	14 x 2.0	148	109	218	161
24 mm	16 x 1.5	225	166	315	232	16 x 2.0	230	170	338	249
27 mm	18 x 1.5	325	240	460	339	18 x 2.5	329	243	469	346
30 mm	20 x 1.5	460	339	640	472	20 x 2.5	464	342	661	487
34 mm	22 x 1.5	610	450	860	634	22 x 2.5	634	468	904	667
36 mm	24 x 2.0	780	575	1100	811	24 x 3.0	798	588	1136	838
41 mm	27 x 3.0	---	---	---	---	27 x 3.0	1176	867	1674	1234
46 mm	30 x 2.0	---	---	---	---	30 x 3.0	1597	1178	2274	1677

SAE TORQUE SPECIFICATIONS



Wrench Size: "A"	Thread Size: "B" Fine	SAE 2		SAE 5		SAE 8		Thread Size: "B" Coarse	SAE 2		SAE 5		SAE 8	
		lbs-ft	N-m	lbs-ft	N-m	lbs-ft	N-m		lbs-ft	N-m	lbs-ft	N-m	lbs-ft	N-m
7/16"	1/4-28	6	8.1	10	13.6	14	19.0	1/4-20	5	6.8	8	10.8	12	16.3
1/2"	5/16-24	13	17.6	19	25.7	27	36.6	5/16-18	11	14.9	17	23.0	25	33.9
9/16"	3/8-24	23	31.2	35	47.4	49	66.4	3/8-16	20	27.1	31	42.0	44	59.6
5/8"	7/16-20	36	48.8	55	74.5	75	101.6	7/16-14	32	43.4	49	66.4	70	94.9
3/4"	1/2-20	55	74.5	85	115.2	120	162.6	1/2-13	49	66.4	75	101.6	107	145.0
13/16"	9/16-18	79	107.0	122	165.3	172	233.1	9/16-12	70	94.9	109	147.7	154	208.7
15/16"	5/8-18	110	149.1	170	230.4	240	325.2	5/8-11	97	131.4	150	203.3	212	287.3
1-1/8"	3/4-16	192	260.2	297	402.4	420	569.1	3/4-10	173	234.4	266	360.4	376	509.5
1-5/16"	7/8-14	184	249.3	474	642.3	668	905.1	7/8-9	166	224.9	429	581.3	606	821.1
1-1/2"	1.0-12	274	371.3	705	955.3	995	1348.2	1.0-8	250	338.8	644	872.6	909	1231.7