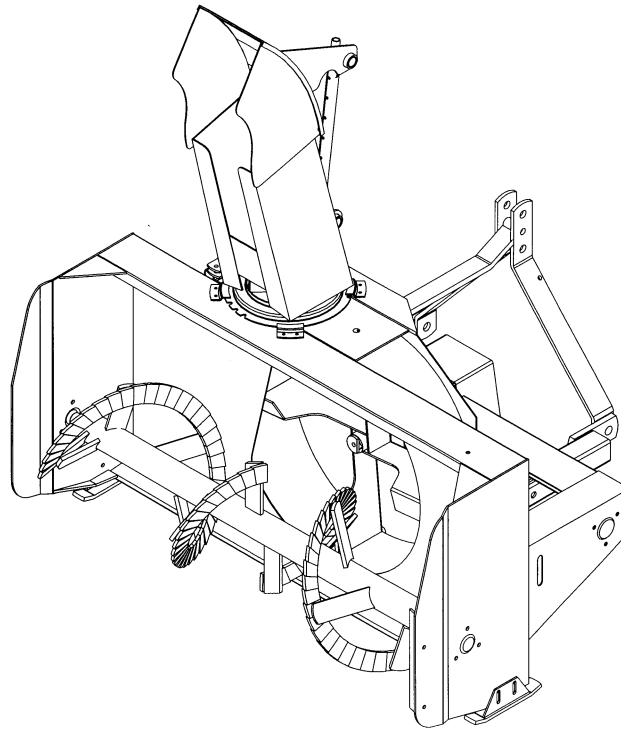


OPERATOR'S AND PARTS MANUAL



SNOWBLOWER SA52 & SA62 MODELS

**SERIAL NO. 9900108 AND UP for SA52
NO. 2006858 AND UP for SA62**

**OM 0274-A
09/00**

BER-VAC
by RAD Technologies Inc.

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INTRODUCTION

TO THE PURCHASER

All BER-VAC products are designed to give safe, dependable service if they are operated and maintained according to instructions. **Read and understand this manual before operation.**

This manual has been prepared to assist the owner and operators in the safe operation and suitable maintenance of the implements. The information was applicable to products at the time of manufacture and does not include modifications made afterwards.

Read and understand this operator's manual before attempting to put an implement into service. Familiarise yourself with the operating instructions and all the safety recommendations contained in this manual and those labelled on the implements and on the tractor. Follow the safety recommendations and make sure that they are followed by those with whom you work.

To assist your dealer in handling your needs, please record hereafter the model number and serial number of your implement and tractor. It is also advisable to supply them to your insurance company. It will be helpful in the event that an implement or tractor is lost or stolen.

Illustrations

The illustrations may not necessarily reproduce the full detail and the exact shape of the parts or depict the actual models, but are intended for reference only

Direction Reference

Right Hand and Left Hand are determined by those seen by the conductor looking at the machine while operating.

MODEL :

SERIAL NUMBER :


DATE OF PURCHASE :


SAFETY PRECAUTIONS




SAFETY FIRST

This symbol, the industry's "Safety Alert Symbol", is used throughout this manual and on labels on the machine itself to warn of the possibility of personal injury. Read these instructions carefully. It is essential that you read the instructions and safety regulations before you attempt to assemble or use this unit.

 **DANGER :** Indicates an immediately hazardous situation which, if not avoided, will result in death or serious injury.

 **WARNING :** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION :** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

IMPORTANT : Indicates that equipment or property damage could result if instructions are not followed.

NOTE : Gives helpful information.

All products are designed to give safe, dependable service if they are operated and maintained according to instructions. **Read and understand this manual before operation.** It is the owner's responsibility to be certain anyone operating this product reads this manual., and all other applicable manuals, to become familiar with this equipment and all safety precautions. Failure to do so could result in serious personal injury or equipment damage. If you have any questions, consult your dealer.

BEFORE OPERATION

Children

Tragic accidents can occur if the operator is not alert to the presence of children. Children are generally attracted to machines and the work being done. Never assume children will remain where you last saw them.

1. Keep children out of the operating area and under the watchful eye of another responsible adult.
2. Be alert and turn machine off if children enter the work area.
3. Before and when backing, look behind and look for small children.
4. Never carry children while operating the machine. They may fall off and be seriously injured or interfere with safe operation of the machine.
5. Never allow children to play on the machine or attachment even when turned off.
6. Never allow children to operate the machine even under adult supervision.
7. Use extra care when approaching blind corners, shrubs, trees, or other obstructions that might hide children from sight.

SAFETY PRECAUTIONS - Continued

NOTICE

A safe operator is the best insurance against accidents. All operators, no matter how experienced they may be, should read this Operator's Manual and all other related manuals before attempting to operate an implement. Please read the following section and pay particular attention to all safety recommendations contained in this manual and those labelled on the implements and on the tractor.

THE SNOWBLOWER

Before Operation

1. Read and understand this operator's manual and tractor operator's manual. Know how to operate all controls and how to stop the unit and disengage the controls quickly.
2. Never wear loose, torn, or bulky clothing around the tractor and implement. It may catch on moving parts or controls, leading to the risk of accident.
3. Before the snow season, thoroughly inspect the area where the equipment is to be used and remove all door mats, sleds, boards and other foreign objects.
4. Disengage clutch and shift into neutral before starting the engine.
5. Do not operate equipment in winter time without wearing adequate winter garments.
6. Never attempt to make any adjustments while engine is running. Read this manual carefully to acquaint yourself with the equipment as well as the tractor operator's manual. Working with unfamiliar equipment can lead to accidents. Be thoroughly familiar with the controls and proper use of the equipment. Know how to stop the unit and disengage the controls quickly.
7. Keep all shields in place and properly tighten all mounting hardware.
8. Periodically, inspect all moving parts for wear and replace with authorised service parts if an excessive amount of wear is present.
9. Replace all missing, illegible, or damaged safety and warning decals. See list of decals in the operator's manual.
10. Do not modify or alter this equipment or any of its components, or any equipment function without first consulting your dealer.
11. Keep safety decals clean of dirt and grime.

SAFETY PRECAUTIONS - Continued

Snowblower Operation

1. In case of a belt-driven equipment, make sure drive belt is routed properly before operation.
2. Before leaving the tractor unattended, take all possible precautions. Disengage the drive belt if so equipped, stop the engine and remove the ignition key. Lower the implement to the ground.
3. Before starting the snowblower, remove any ice that has accumulated in the auger/impeller.
4. Watch carefully for foreign objects that could enter the blower while operating.
5. Be sure the clutch switch/lever is in OFF position before starting engine.
6. Do not put hands or feet near rotation parts. Keep clear of discharge opening at all times.
7. Exercise extreme caution when operating on or crossing a gravel drive, walks, or roads. Stay alert for hidden hazards or traffic. Do not carry passengers.
8. Adjust collector housing height to clear gravel or crushed rock surface.
9. Stop the engine, remove the key, and allow the rotating parts to stop before unclogging the collector/impeller housing or chute, and making any repairs, adjustments or inspections. Use only a 36" long piece of wood to unclog blower.
10. If the snowblower starts to vibrate abnormally, stop the engine immediately and check for cause. Excessive vibration is generally a sign of trouble.
11. Do not run the engine indoors except when starting engine and transporting attachment in or out of building. Carbon monoxide gas is colourless, odourless and deadly.
12. Exercise extreme caution when changing direction on slopes. Do not attempt to operate on steep slopes.
13. Never operate snowblower without guards, and other safety protective devices in place.
14. Never operate snowblower near glass enclosures, automobiles, window wells, embankments, etc., without proper adjustment of snow discharge angle.
15. Never operate machine at high transport speeds on a slippery surface.
16. Use extra caution when backing up.
17. Do not direct discharge at bystanders or animals. Ejected objects may cause injury.
18. Disengage power to auger/impeller when transporting or when not in use.
19. Never operate the snowblower without good visibility and lighting.
20. Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable noises

SAFETY PRECAUTIONS - Continued

THE TRACTOR

General Information

1. Read the operator's manual carefully before using tractor. Lack of operating knowledge can lead to accidents.
2. Do not permit anyone but the operator to ride on the tractor. There is no safe place for extra riders.

Operating the Tractor

1. Never run the tractor engine in a closed building without adequate ventilation as the exhaust fumes are very dangerous.
2. Never allow an open flame near the fuel tank or battery.
3. Make sure the belt shield is installed when using a belt-driven equipment and always replace the belt shield if damaged.
4. Always bring the tractor to a complete stop, shut off the engine, lower the implement to the ground and remove the ignition key before leaving the tractor.
5. Never park the tractor on a steep slopes.
6. Do not attempt to operate on steep slopes.
7. Use of tire chains for better traction and stability is recommended.
8. Always drive the tractor at speeds compatible with safety, especially when operating over rough ground, crossing ditches, or when turning.
9. Handle fuel with care as it is highly flammable.
10. Use approved fuel container.
11. Never add fuel to a running engine or a hot engine.
12. Fill fuel tank outdoors with extreme care. Never fill fuel tank indoors. Replace fuel cap securely and wipe up spilled fuel.

13. Never allow anyone to operate the snowblower until they are thoroughly familiar with basic tractor and snowblower operation.

14. Make sure the tractor is counterweighted as recommended by your dealer. Weights provide the necessary balance to prevent tip-over or loss of traction or steering.

15. Always make sure all snowblower components are properly installed and securely fastened BEFORE operation.

During Operation

1. Do not allow anyone to ride on the tractor/snowblower at any time. There is no safe place for passengers on this equipment. The operator MUST sit in the tractor seat.

2. Eye and hearing protection is recommended when operating the snowblower.

3. Operate only during daylight hours, or when the area is well lit with bright artificial light.

4. Disengage the PTO (turn to "OFF"), place the transmission in neutral, set the parking brake, shut off the engine and remove the key, and make sure rotating components have stopped BEFORE leaving the operator's seat.

5. Inspect the snowblower after striking any foreign object to assure that all snowblower parts are safe and secure and not damaged.

SAFETY PRECAUTIONS - Continued

MAINTENANCE

1. Park the tractor/snowblower on level ground, set the parking brake, disengage the PTO, shut off the engine, remove the key, and lower the implement to the ground BEFORE making any snowblower adjustments.
2. To avoid injury, do not adjust, unclog or service the snowblower with the tractor engine running. Making sure rotating components have completely stopped before leaving the operator's seat
3. Keep the tractor/snowblower clean. Snow and ice build-up can lead to malfunction or personal injury from thawing and refreezing in garage.
4. Always wear eye protection when cleaning or servicing the snowblower.
5. Do not work under any part of the tractor or snowblower, unless it is securely supported by safety stands.
6. Make sure all shields and guards are securely in place following all service, cleaning, or repair work.
7. Do not modify or alter this equipment or any of its components or operating functions. If you have questions concerning modifications, consult with your dealer.

TRANSPORTING

1. If the tractor/snowblower is to be driven on public roads, it must be equipped with an SMV (Slow Moving Vehicle) sign. Check local traffic codes that may apply to unit usage on public roads and highways in your area.
2. Be alert for all other traffic when driving the tractor/snowblower on public roads or highways.

STORAGE


Before storing the snowblower, certain precautions should be taken to protect it from deterioration.

1. Clean the snowblower thoroughly.
2. Make all the necessary repairs.
3. Replace all Safety Signs that are damaged, lost, or otherwise become illegible. If a part to be replaced has a sign on it, obtain a new safety sign from your dealer and install it in the same place as on the removed part.
4. Repaint all parts from which paint has worn or peeled.
5. Lubricate the snowblower as instructed under "**Lubrication**" section.
6. When the snowblower is dry, oil all moving parts. Apply oil liberally to all surfaces to protect against rust.
7. Store in a dry place.

DECALS

Replace immediately if damaged.

! DANGER



ROTATING DRIVELINE
CONTACT CAN CAUSE DEATH KEEP PEOPLE AND CLOTHING WELL CLEAR

DO NOT OPERATE WITHOUT

- ALL DRIVELINE, TRACTOR AND EQUIPMENT SHIELDS IN PLACE
- DRIVELINES SECURELY ATTACHED AT BOTH ENDS
- DRIVELINE SHIELDS THAT TURN FREELY ON DRIVELINE

TRANSMISSION ROTATIVE À CARDAN
TOUT CONTACT PEUT CAUSER LA MORT

TENIR LES VÊTEMENTS ET PERSONNES À L'ÉCART

NE PAS OPÉRER SANS

- QUE TOUS LES PROTECTEURS DU TRACTEUR, DE L'ÉQUIPEMENT ET DE L'ARBRE À CARDAN SOIENT EN PLACE.
- L'ARBRE À CARDAN FIXÉ SOLIDEMENT À CHAQUE BOUT
- QUE LES PROTECTEURS TOURNENT LIBREMENT SUR L'ARBRE À CARDAN

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! DANGER



TO AVOID SERIOUS INJURY: KEEP HANDS OUT OF THIS DISCHARGE CHUTE WHILE ENGINE IS RUNNING

POUR ÉVITER DES BLESSURES GRAVES: GARDER LES MAINS ÉLOIGNÉES DE CETTE GOULOTTE LORSQUE LE MOTEUR EST EN MARCHÉ.

89

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! DANGER



AVOID INJURY FROM ROTATING AUGER KEEP HANDS, FEET AND CLOTHING AWAY

POUR ÉVITER DES BLESSURES GRAVES: GARDER LES MAINS, LES PIEDS ET LES VÊTEMENTS ÉLOIGNÉS DES VIS SANS FIN

87

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! MISE EN GARDE

NÉGLIGER DE SUIVRE LES PROCÉDURES SÉCURITAIRES D'UTILISATION PEUT ENTRAÎNER DES BLESSURES.

- POUR UNE UTILISATION SÉCURITAIRE, SUIVRE TOUTES LES INSTRUCTIONS D'UTILISATION ET PRÉCAUTIONS SÉCURITAIRES DANS LE MANUEL DE L'OPÉRATEUR.
- PORTER DES LUNETTES DE SÉCURITÉ EN TOUT TEMPS.
- GARDER MAINS, PIEDS ET VÊTEMENTS ÉLOIGNÉS DES PIÈCES MOTRICES.
- ARRÊTER LE MOTEUR AVANT DE QUITTER LA POSITION DE L'OPÉRATEUR.
- ATTENDRE QUE TOUS LES MOUVEMENTS SOIENT ARRÊTÉS AVANT D'AJUSTER, LUBRIFIER, NETTOYER OU DÉBLOQUER LA MACHINE.
- GARDER L'ENDROIT D'UTILISATION DÉGAGÉ DE TOUTES PERSONNES ET ANIMAUX.
- GARDER TOUS LES ÉCRANS PROTECTEURS EN PLACE.
- JAMAIS DIRIGER L'ÉVACUATION VERS DES PIÉTONS, BÂTIMENTS, AUTOMOBILES, ETC.
- TOUJOURS UTILISER UN MASQUE À POUSSIÈRE DANS UN ENVIRONNEMENT POUSSIÉREUX.
- GARDER TOUTES LES MATIÈRES PLASTIQUES ÉLOIGNÉES DE LA CHALEUR INTENSE ET DES FLAMMES.
- NE JAMAIS PERMETTRE DE PASSAGERS SUR CETTE MACHINE.

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! WARNING

FAILURE TO FOLLOW SAFE OPERATING PROCEDURES MAY RESULT IN INJURY.

- FOR SAFE OPERATION FOLLOW ALL OPERATING INSTRUCTIONS AND SAFETY PRECAUTIONS IN OPERATOR'S MANUAL.
- EYE PROTECTION MUST BE WORN AT ALL TIMES.
- KEEP HANDS, FEET AND CLOTHING AWAY FROM POWER DRIVEN PARTS.
- STOP ENGINE BEFORE LEAVING OPERATOR POSITION.
- WAIT FOR ALL MOVEMENTS TO STOP BEFORE STARTING TO ADJUST, LUBRICATE, CLEAN OR UNCLOG THE MACHINE.
- KEEP THE AREA OF OPERATION CLEAR OF ALL PERSONS AND ANIMALS.
- KEEP ALL GUARDS AND SHIELDS IN PLACE.
- NEVER DIRECT DISCHARGE TOWARD BYSTANDERS, BUILDINGS, CARS ETC.
- ALWAYS USE A DUST MASK WHEN WORKING IN DUSTY CONDITIONS.
- KEEP PLASTIC MATERIALS AWAY FROM INTENSE HEAT AND OPEN FLAME.
- NEVER ALLOW PASSENGERS ON THE ATTACHMENT.

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ASSEMBLY

Figure 1

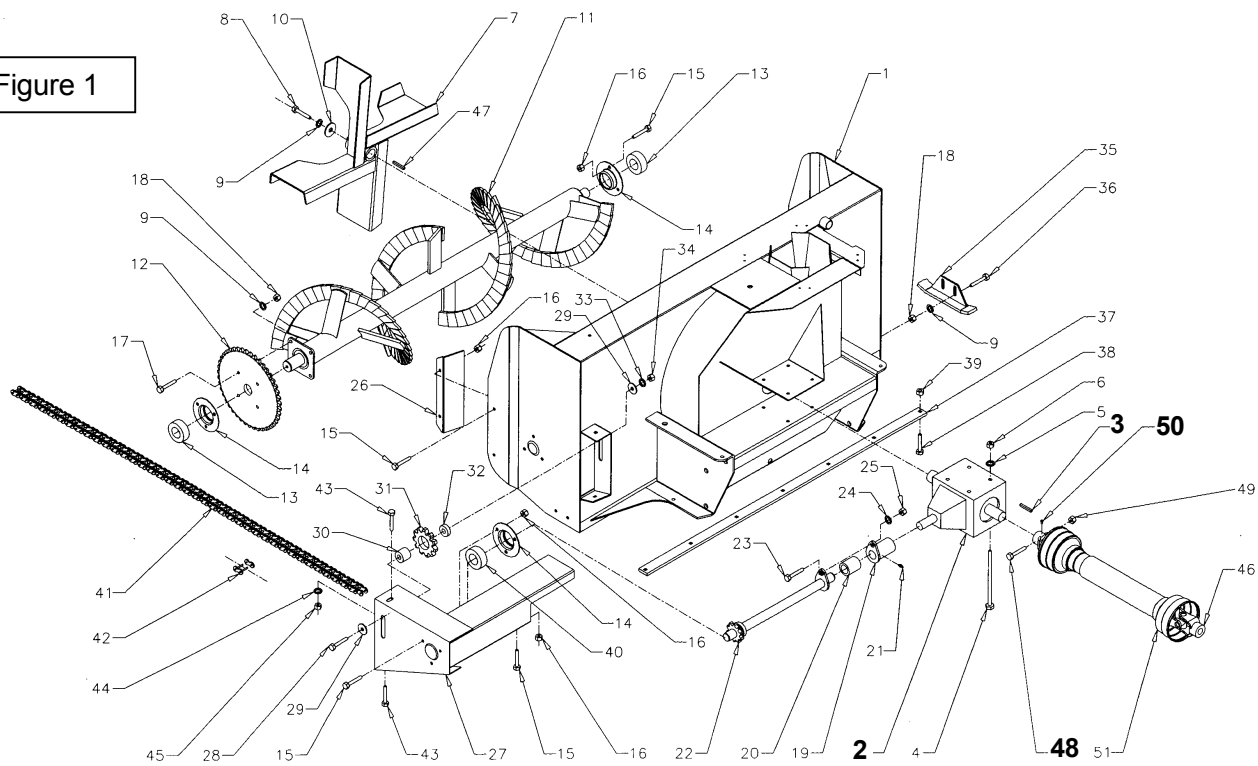
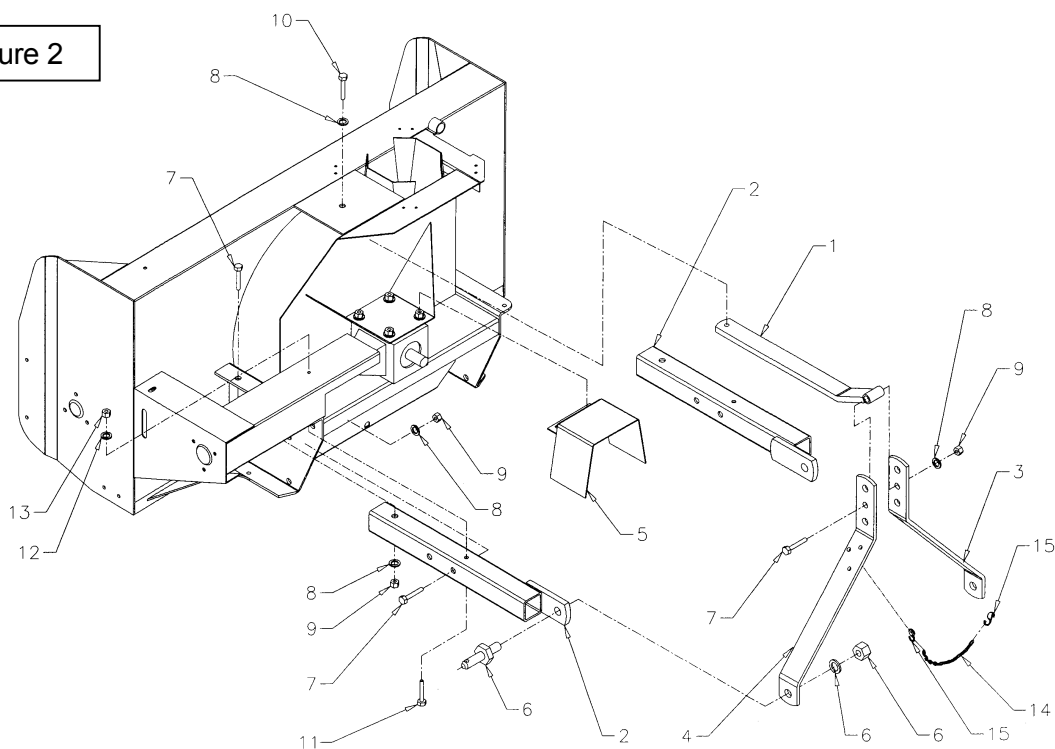


Figure 2



ASSEMBLY

SNOWBLOWER ASSEMBLY

The snowblower is assembled at the factory, however, snowblower kits must be assembled. Use the present manual and lay out all parts for assembly. Separate bolts and nuts into various sizes. After assembly, torque all the bolts according to the Torque Specification Table enclosed at the end of the manual.

Three Point Hitch Installation

1. Remove paint from snowblower gear box drive shaft (fig.1, item 2).
2. Grease driveline sliding surfaces and yoke.
3. Install a 3/8" x 3/8" x 2 3/4" key (fig.1, item 3) in the blower drive shaft and slide driveline yoke (round yoke) over drive shaft. Do not use a hammer, use the sliding action of the driveline to set yoke on drive shaft.
4. Secure driveline yoke to blower drive shaft using a 5/16" x 3" bolt (fig.1, item 48) and nylon lock nut. Securely tighten the bolt and the 3/8" x 5/16" set screw (fig.1, item 50) in the driveline.
5. Install driveline guard (fig.2, item 5) on blower using two bolts, lockwashers and nuts which are securing the gear box.
6. Replace the 3/8" x 3/4" bolt securing the auger drive shaft guard through the lower hitch tubes, with a 3/8" x 3 1/2" (fig.2, item 11) bolt.
7. Install the lower hitch (fig.2, item 2) on snowblower using five 5/8" x 3 3/4" bolt (fig.2, item 7), lockwashers and nuts for each hitch (welded flat bar must be toward the inside).
8. Attach upper hitch (fig.2, item 1) to snowblower using a 5/8" x 1 1/4" bolt and a lockwasher (lockwasher on top side).
9. Install the two attaching plates (fig.2, item 3-4) to the upper hitch through middle holes using a 5/8" x 3 3/4" bolt, lockwasher and nut (fig.2, item 7, 8, 9).
10. Fasten each attaching plate (fig.2, item 3-4) inside the hitches (fig.2, item 2) using the hitch pins, lockwashers and nuts (7/8") (fig.2, item 6).

11. Install the driveline storage chain (fig.2, item 14) in the small hole of each hitch arm (fig. 2, item 3-4) using the "S" hooks (fig.2, item 15). Using pliers, close "S" hooks, leaving one side of "S" hook open to be able to attach and detach.

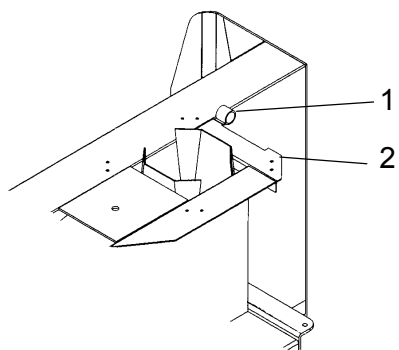
Note: We recommend you install the storage chain (fig.2, item 14) only when you intend storing your snowblower. Operating your snowblower with it attached may be hazardous.

12. Attach driveline shield safety chain in same hole position as the "S" hook.
13. Torque all bolts according to the torque specification table (end of manual).

Manual Chute Rotation

1. Place the plastic anti-friction insert (fig.3, item 4) over the chute base, placing the raised part upside and toward the center of the frame.
2. Insert the 1 11/16" plastic bushing (fig.4A, item 11) in the worm rotation bracket (fig.4A, item 6). Grease the two ends of the rotation worm (fig.4A, item 5) and insert the rotation worm in the bushing (fig.4A, item 11).
3. Insert the 1 5/16" plastic bushing (fig.4A, item 10) in the tube welded behind blower (fig.4B, item 1).
4. Install the assembly by placing the worm rotation bracket (fig.4A, item 6) under the right upper plate of snowblower (fig.4B, item 2).
5. Install the adjusting pipe (fig.3, item 3) in the chute lower hole and the adjusting rod (fig.3, item 2) in the chute upper hole, and secure with two 1/4" x 2" cotter pin (fig.3, items 7). Insert a 5mm x 100m hair pin (fig.3, item 6) in the adjusting pipe hole.
6. Install the chute (fig.3, item 1) over the plastic insert (fig.3, item 4), applying grease in between, and place the four retaining plates (fig.3, item 5). Secure using eight 1/4" x 3/4" bolts (fig.3, item 8), lockwashers and nuts (fig.3, item 9-10). Tighten all bolts securely.

ASSEMBLY



HOUSING
Figure 4B

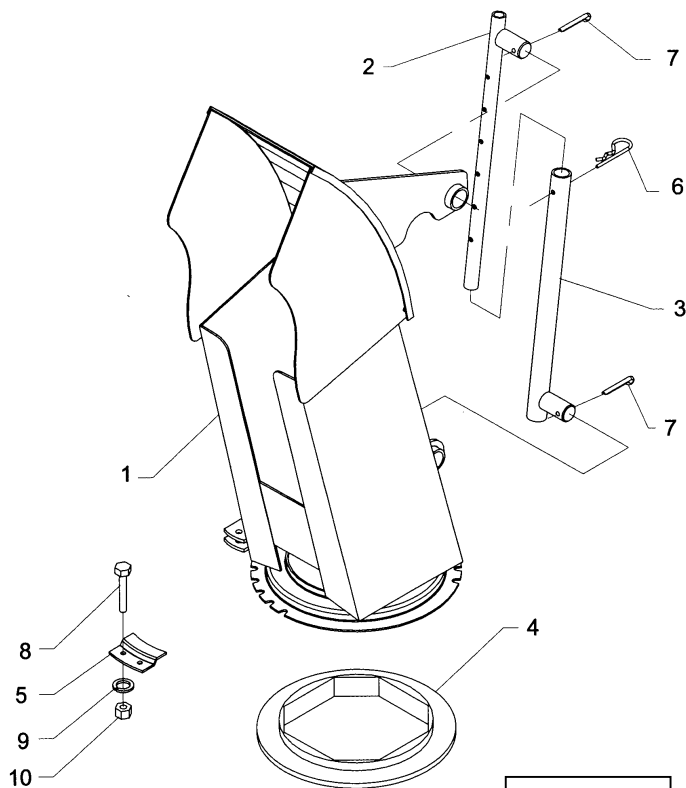


Figure 3

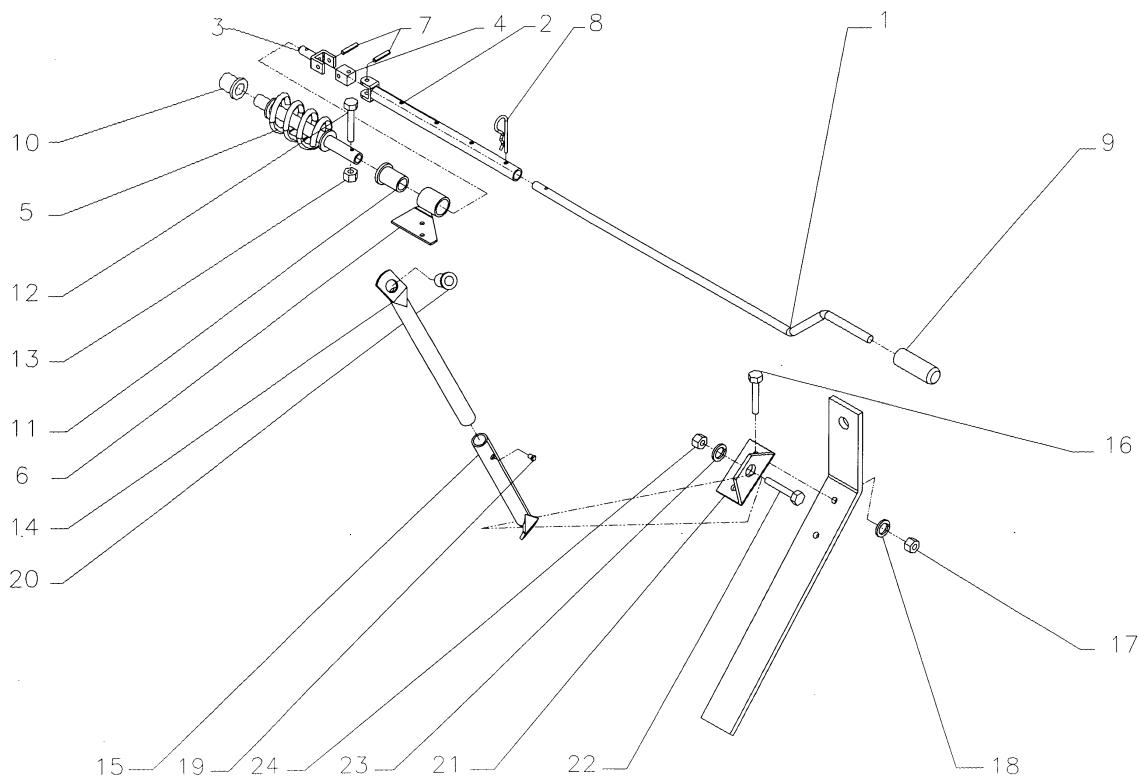


Figure 4A

ASSEMBLY

7. Install the support angle (fig.4A, item 21) on the left attaching plate (fig.2, item 4) using two 3/8" x 1 1/4" bolts, lockwashers and nuts. Tighten securely.
8. Install anchor tube (fig.4A, item 15) on angle (fig.4A, item 21) so that tube leans toward snowblower using a 3/4" x 1 1/2" bolt, lockwasher and nut.
9. Insert handle bracket (fig.4A, item 14) inside anchor tube (fig.4A, item 15). Secure loosely with a 3/8" x 5/16" set screw.
10. Assemble rotation tube (fig.4A, item 2) with U-joint inside rotation worm. Align holes and insert a 10-24 x 1" capscrew (fig.4A, item 12) from larger hole side of worm so that capscrew sinks in worm. Secure with a nylon lock nut.
11. Install the plastic grommet (fig.4A, item 20) in the handle support.
12. Insert the handle (fig.4A, item 1) inside the grommet and inside the rotation tube (fig.4A, item 2). Select length, align nearest holes and secure with a 5mm x 100mm hair pin.
13. Adjust handle position and height to a comfortable and safe operating position after the snowblower has been mounted to the tractor. Tighten set screw on anchor tube and the 3/4" x 1 1/2" bolt securely.



CAUTION: To avoid personal injury, check the full lifting range of the snowblower, to ensure that the chute rotation handle is clear of the operator's area when the snowblower is in raised position.

14. Install plastic handle (fig.4A, item 9) over rotation handle.
15. Tighten all bolts according to the torque specification table (end of manual).

NOTE: To convert the manual deflector to an **HYDRAULIC DEFLECTOR:** substitute the adjusting rod and tube by a 2" x 6" cylinder.

Snowblower installation

1. Attach tractor lower hitch arms (fig.5, item 1) to snowblower attaching plates using the hitch pins and secure with roll pins (fig.5, item 2).
2. Install the tractor upper hitch (fig.5 item 3) on the upper hole of snowblower attaching plates using tractors pins and linchpins (fig.5, items 4).
3. Adjust snowblower so that it runs level using the tractor upper hitch.
4. Set the tractor anti-sway turnbuckles so the snowblower does not sway.



- CAUTION:** Before connecting snowblower driveline to tractor drive shaft, make sure driveline is not too long in raised, lowered and middle position. If the driveline is too long it must be shortened, to avoid damaged to tractor.
5. Connect driveline to tractor drive P.T.O., make sure that the driveline yoke pin is properly engaged.
 6. Secure driveline safety chain to tractor master shield to prevent driveline shield from rotating.

ASSEMBLY

Figure 5

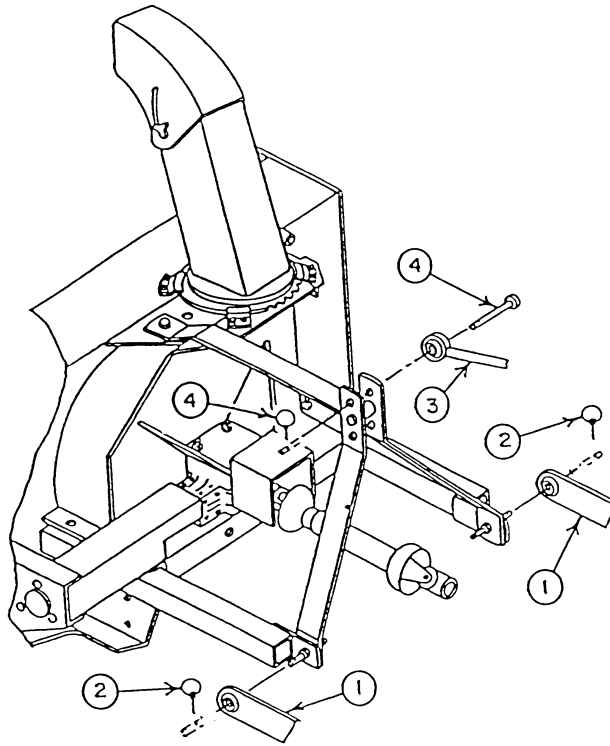


Figure 5

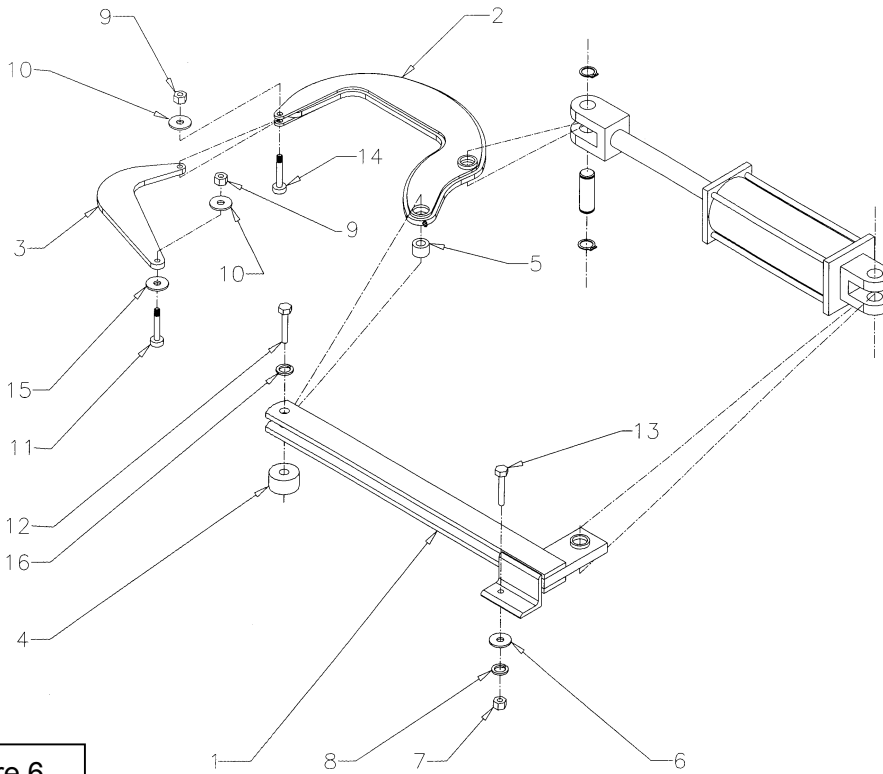


Figure 6

ASSEMBLY

Hydraulic Rotation with Cylinder- 8056

1. Place the plastic bushing (fig.3, item 4) over the chute base, placing the raised part upside and toward the center of the frame.
2. Install the adjusting pipe (fig.3, item 3) in the chute lower hole and the adjusting rod (fig.3, item 2) in the chute upper hole, and secure with two 1/4" x 2" cotter pin (fig.3, items 7). Insert a 5mm x 100mm hair pin (fig.3, item 6) in the adjusting pipe hole.
3. Install the chute (fig.3, item 1) on the plastic insert (fig.3, item 4), applying grease in between, and place the four retaining plates (fig.3, item 5). Secure using eight 1/4" x 3/4" bolts (fig.3, item 8), lockwashers and nuts (fig.3, item 9-10). Tighten all bolts securely.
4. Remove the 5/8"NC x 1 1/4" Hex.bolt securing the tractor upper 3 point hitch. Install the cylinder bracket (fig. 6, item 1) through the $\varnothing 13/32$ " hole on the frame by inserting a 3/8" NC x 1" bolt (fig. 6, item 13), then tighten with a flat washer ($\varnothing 7/16$ " hole), a lockwasher and a nut (items 6-7-8).
5. Install the bell crank (fig.6, item 2) on the frame by sliding a spacer (fig. 6 item 4) under the cylinder bracket, opposite the $\varnothing 11/16$ "hole. Insert a bushing (fig.6, item 5) in the $\varnothing 1 1/8$ " hole of the bell crank and slide the bell crank between the flat bars of the cylinder bracket. Fasten everything by inserting a 5/8" NC x 3 1/2" bolt (fig.6, item 12) and a lockwasher (item 16).
6. Install the push arm (fig.6, item 3) by sliding it between the bell crank plates, greasing generously.
7. Insert a 3/8" x 3/4"NC shoulder screw (fig.6, item 14) under the part and tighten with a flat washer ($\varnothing 3/8$ " hole) (fig.6, item 10) and a 5/16"NC stover.nut (fig.6, item 9), leaving some movement to the push arm.
8. Slide the other push arm end between the flat bars welded on the chute base. Inserting a nylon flat washer ($\varnothing 7/16$ " hole) (fig.6, item 15) under the push arm. Tighten with a $\varnothing 3/8$ " hole flat washer (fig.6, item 10) and a 5/16"NC stover.nut (fig.6, item 9), leaving some movement to the mechanism.
9. This system works with a 8" hydraulic cylinder extension and a 20 1/4" centre-to-centre pin retracted.

Detaching Snowblower from Tractor:

1. Set snowblower completely on the ground to release all pressure from the three point. Set parking brake and turn engine off.
2. Detach upper link by removing linch pin and pin (fig.5, items 4).
3. Disconnect driveline from tractor P.T.O. shaft and set driveline on support chain.
4. Carefully detach lower links (fig. 5, items 1) by removing linch pins (fig.5, items 2) and loosen anti-sway turnbuckles.

IMPORTANT: To avoid damage to the snowblower, retorque all bolts after the first 10 hours of operation.

OPERATION

GENERAL PREPARATION

1. Read the operator's manual carefully before using the tractor and snowblower. Be thoroughly familiar with the controls and proper use of the equipment. Know how to stop the unit and disengage the controls quickly.
2. Make sure the snowblower is clear of snow before engaging the driveline.
3. Make sure the auger and fan operate freely.
4. Check the oil level in the worm gear box and if necessary, add 90 SAE gear oil.
5. Check the three shearbolts, one on each auger section and one between the fan and gearbox for proper tightness.
6. Adjust so that the snowblower skid shoes run level.
7. Wear adequate winter outer garments while operating equipment.

OPERATING CONTROLS

Work and Travel Speed

Working ground speed will depend on the depth and density of the snow to be cleared. Normally, ground speed will range from 4 to 7 MPH for light, dry snowfalls 3 to 6 inches, and 1 to 3 MPH for heavy, wet or drifted snow. To transport, disengage the driveshaft and raise the snowblower to full transport height.

Raising and Lowering the Snowblower

Move the three point lever on right hand side of seat down or forward to lower, and up or rearward to raise.

Drive Shaft Operation

The mid drive shaft is activated by pulling up the drive shaft lever on left side of seat. Push down to disengage.

Manual Rotation (if so equipped)

Turning the handle clockwise turns the chute in a clockwise direction.



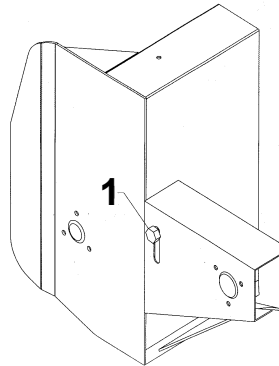
WARNING: To avoid personal injury, be sure the tractor engine is off, the drive shaft disengaged, and all movement has stopped before making any adjustments.

Manual Deflector Adjustment

Set the angle of deflection according to the distance the snow must be thrown. To set the deflector angle, remove the adjusting pipe hair pin and adjust the adjusting rod to the desired deflector angle. Secure with the adjusting pipe hair pin.

Reduction Chain Tension Adjustment

The premature wear of the chain may be caused by tension being too tight. It is therefore important not to tighten chain to its maximum.



- To adjust the tension on the drive chain, loosen the bolt (see figure below, item 1), securing the idler sprocket to the snowblower housing.

- To tighten the chain, lower the bolt. Leave approximately 1/8" deflection in one span of the chain. Retighten securely the bolt holding the idler sprocket.

Skid Shoes Adjustment (if so equipped)

Adjust the snowblower so that the skid shoes run level and according to the surface conditions so that stones are not thrown with the snow. Adjust both skid shoes to the same height to keep the cutting edge level and adjust upwards for smooth surfaces.

Loosen skid shoe bolts and adjust according to instructions below, and securely tighten bolts:

Clearance between cutting edge and surface


- Level paved surface : Adjust to 1/16" to 1/8"
- Uneven or gravel surface: Adjust to 1/2" to 5/8"

OPERATION

SNOW REMOVAL METHODS

When removing snow, do not use the snowblower as a dozer blade to push snow. Let the snowblower work its way through deep drifts. If the speed of your tractor is too fast, the snowblower may become overloaded and plug. For best results, raise the snowblower and remove a top layer of snow. A second pass with the snowblower will remove the remaining snow.

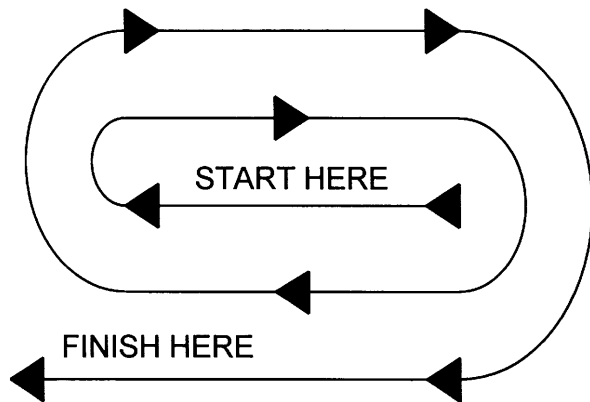
IMPORTANT : Use full RPM power when removing wet, sticky snow. Low RPM power will tend to plug the chute.

 **WARNING:** Do not use hands or feet to unplug chute. Do not attempt to clear plugged chute of snow while tractor engine is running. If the chute plugs, disengage the drive shaft, shut off the tractor engine, remove the ignition key, wait for all movement to stop, and then clear the snow from the chute.

A definite pattern of operation is required to thoroughly clean the snow area. These patterns will avoid throwing snow in unwanted places as well as eliminating a second removal of snow

PATTERN 1

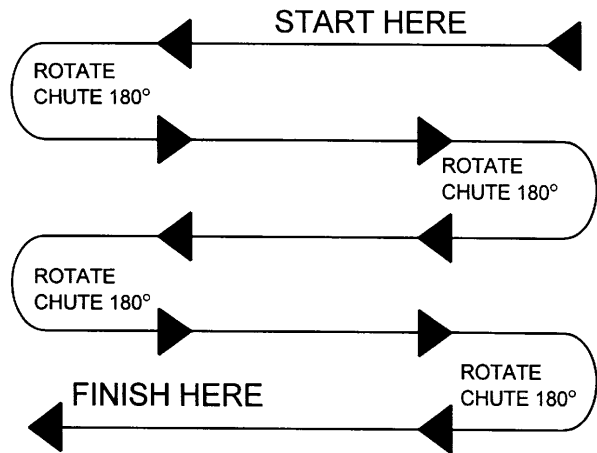
DISCHARGE SNOW BOTH SIDES



Where it is possible to throw the snow to the left and right (above), as on a long driveway, it is advantageous to start in the middle. Plow from one end to the other, throwing snow to both sides without changing the direction of the discharge guide

PATTERN 2

DISCHARGE SNOW THIS SIDE ONLY



If the snow can only be thrown to one side of the driveway or sidewalk (above), start on the opposite side. At the end of the first pass, rotate the discharge guide 180 degrees for the return pass. At the end of each succeeding pass, rotate the discharge guide 180 degrees to maintain direction of throw in the same area.

MAINTENANCE

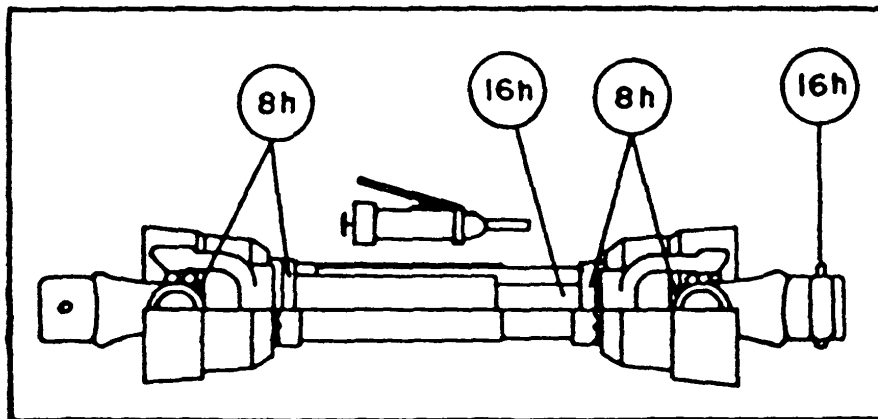
MAINTENANCE

Storage

1. Check the shear bolts at frequent intervals for proper tightness to be sure the blower is in safe working condition.
2. Never store the tractor with fuel in the fuel tank inside a building where open flame or sparks are present. Allow the engine to cool before storing in any enclosure.
3. Run the snowblower a few minutes after blowing snow to prevent freeze up of the auger and the impeller.
4. Provide adequate blocking before working under the snowblower when in the raised position.

Lubrication (see figure below)

1. **GEAR** : Check the oil level in the worm gear drive every month. If necessary add SAE 90 gear oil.
2. **AUGER SECTIONS** : Grease the fitting on each auger sections every 24 hours of operation or once a year.
3. **REDUCTION CHAIN** : Lubricate with chain saw lubricant every 4 hours of operation and after each use.
4. **ROTATION SHAFT** : Grease the shaft each 8 hours of operation.
5. **DRIVELINE (S)** : Grease each u-joint fitting every 8 hours of operation. Slide drive shaft apart and coat sliding surfaces with grease every 8 hours of operation.



PARTS

INTRODUCTION

All parts are illustrated in "exploded views" which show the individual parts in their normal relationship to each other. Reference numbers are used in the illustrations. These numbers correspond to those in the "Reference Number" (REF) column, and are followed by the description and quantity required.

O/L - "Obtain Locally" in the part number column indicates common hardware that is available at your local hardware supply.

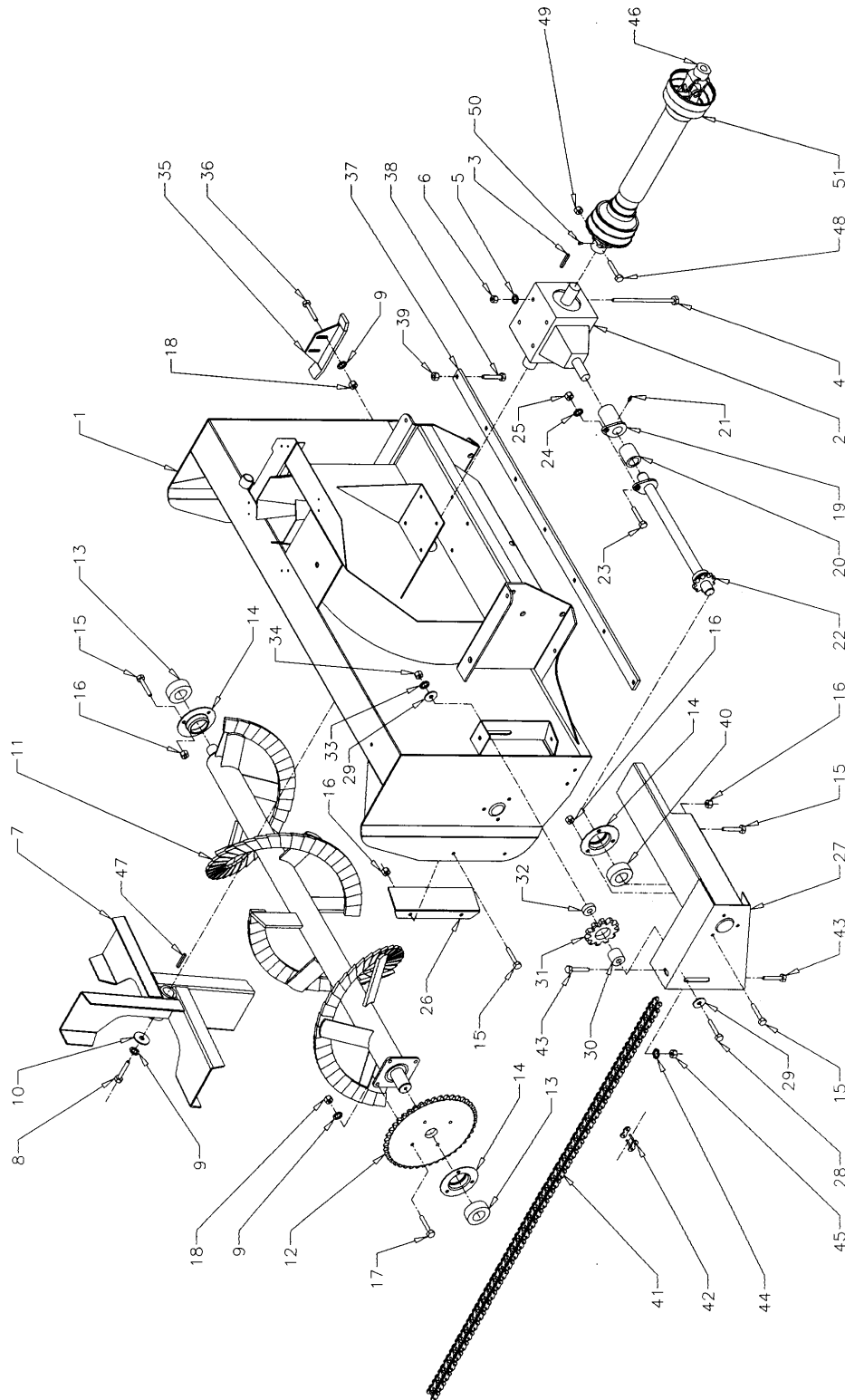
"Right Hand" and "Left Hand" sides of the machine are determined by those seen by the conductor looking at the machine while operating.

Orders must give the complete description, correct part number, the total amount required, the serial number, the method of shipment and the shipping address.

Your dealer reserves the right to change, modify, or eliminate from time to time, for technical or other reasons, certain or all data, specifications, or the product or products themselves, without any liability or obligation.

PARTS

SNOWBLOWER ASSEMBLY SA52 & SA62



PARTS

SNOWBLOWER ASSEMBLY SA52 & SA62

| REF. | DESCRIPTION | QTY. | PARTS NUMBER | |
|------|--|------|--------------|--------|
| | | | SA52 | SA62 |
| 1 | Housing | 1 | 664460 | 664461 |
| 2 | Gear Box | 1 | 663485 | 663485 |
| 3 | Key 3/8" x 3/8" x 2 3/4" | 1 | 654174 | 654174 |
| 4 | Hex. Bolt (3/8" NC x 5") | 4 | O/L | O/L |
| 5 | Lockwasher 3/8" | 4 | O/L | O/L |
| 6 | Hex. Nut (3/8" NC) | 4 | O/L | O/L |
| 7 | Fan | 1 | 664400 | 664400 |
| 8 | Hex. Bolt (3/8" NC x 1 1/2") | 1 | O/L | O/L |
| 9 | Lockwasher 3/8" | 9 | O/L | O/L |
| 10 | Flat washer | 1 | 661554 | 661554 |
| 11 | Auger | 1 | 659810 | 660314 |
| 12 | Sprocket 1 1/4" dia., trou | 1 | 654167 | 654167 |
| 13 | Bearing 1 1/4" dia., w/locking collar | 2 | 654170 | 654170 |
| 14 | Bearing Flange | 3 | 655282 | 655282 |
| 15 | Shoulder Hex. Bolt (3/8" NC x 3/4") | 12 | O/L | O/L |
| 16 | Shoulder Hex. Nut (3/8" NC) | 12 | O/L | O/L |
| 17 | Hex. Bolt (3/8" NC x 1 1/4") | 4 | O/L | O/L |
| 18 | Hex. Nut (3/8" NC) | 8 | O/L | O/L |
| 19 | Shear Plate | 1 | 659522 | 659522 |
| 20 | Bushing | 1 | 659834 | 659834 |
| 21 | Grease fitting 1/4" NF | 1 | 654106 | 654106 |
| 22 | Auger Drive Shaft | 1 | 665588 | 665589 |
| 23 | Hex. Bolt (5/16" NC x 1 1/4") | 1 | O/L | O/L |
| 24 | Lockwasher 5/16" | 1 | O/L | O/L |
| 25 | Hex. Nut (5/16" NC) | 1 | O/L | O/L |
| 26 | Chain Guard | 1 | 654650 | 654650 |
| 27 | Drive Shaft Support | 1 | 664403 | 664419 |
| 28 | Hex. Bolt (5/8" NC x 4") | 1 | O/L | O/L |
| 29 | Flat Washer 11/16" | 2 | O/L | O/L |
| 30 | Idler Bushing | 1 | 659833 | 659833 |
| 31 | Idler CA60, 15 dents | 1 | 654010 | 654010 |
| 32 | Idler Bushing | 1 | 662049 | 662049 |
| 33 | Lockwasher 5/8" | 1 | O/L | O/L |
| 34 | Hex. Nut (5/8" NC) | 1 | O/L | O/L |
| 35 | Skid Shoe | 2 | 659493 | 659493 |
| 36 | Carriage Bolt (3/8" NC x 1") | 4 | O/L | O/L |
| 37 | Cutting Edge | 1 | 659813 | 660317 |
| 38 | Plow Bolt | 7 | O/L | O/L |
| 39 | Hex. Nut Stover (3/8" NC) | 7 | O/L | O/L |
| 40 | Bearing 1 1/8" dia., with locking collar | 1 | 659811 | 659811 |
| 41 | Chain #60 x 71 links | 1 | 659143 | 659143 |
| 42 | Connecting Link #60 | 1 | 654839 | 654839 |

PARTS

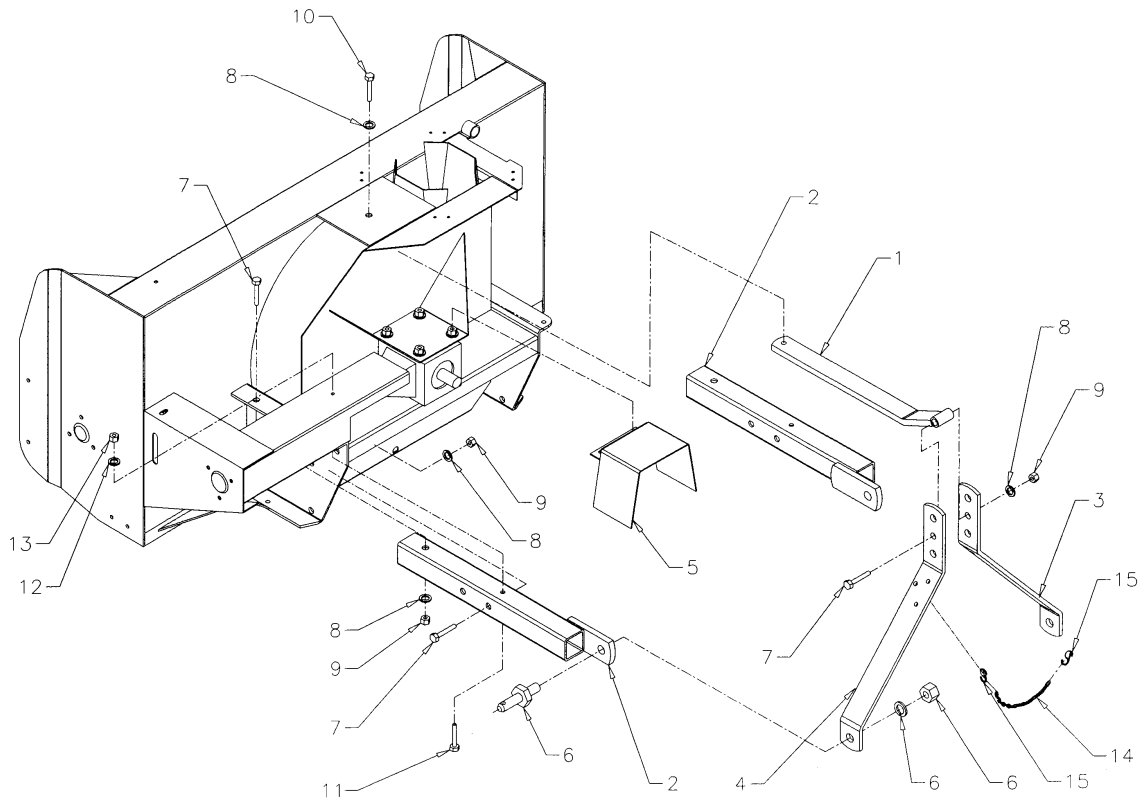
SNOWBLOWER ASSEMBLY SA52 & SA62

| REF. | DESCRIPTION | QTY. | PARTS NUMBER | QTY. | PARTS NUMBER |
|------|----------------------------------|------|--------------|------|--------------|
| | | | SA52 | | SA62 |
| 43 | Hex. Bolt (7/16" NC x 1") | 2 | O/L | 2 | O/L |
| 44 | Lockwasher 7/16" | 2 | O/L | 2 | O/L |
| 45 | Hex. Nut (7/16" NC) | 2 | O/L | 2 | O/L |
| 46 | Driveline | 1 | 665341 | 1 | 665341 |
| 47 | Key 1/4" x 1/4" x 1 1/2" | 1 | 654732 | 1 | 654732 |
| 48 | Hex. Bolt (5/16" NC x 3") | 1 | O/L | 1 | O/L |
| 49 | Nylon Hex. Nut (5/16" NC) | 1 | O/L | 1 | O/L |
| 50 | Allen Set Screw (3/8" NC x 5/16) | 1 | O/L | 1 | O/L |
| 51 | Driveline Shield | 1 | 660271 | 1 | 660271 |

PARTS

THREE POINT HITCH

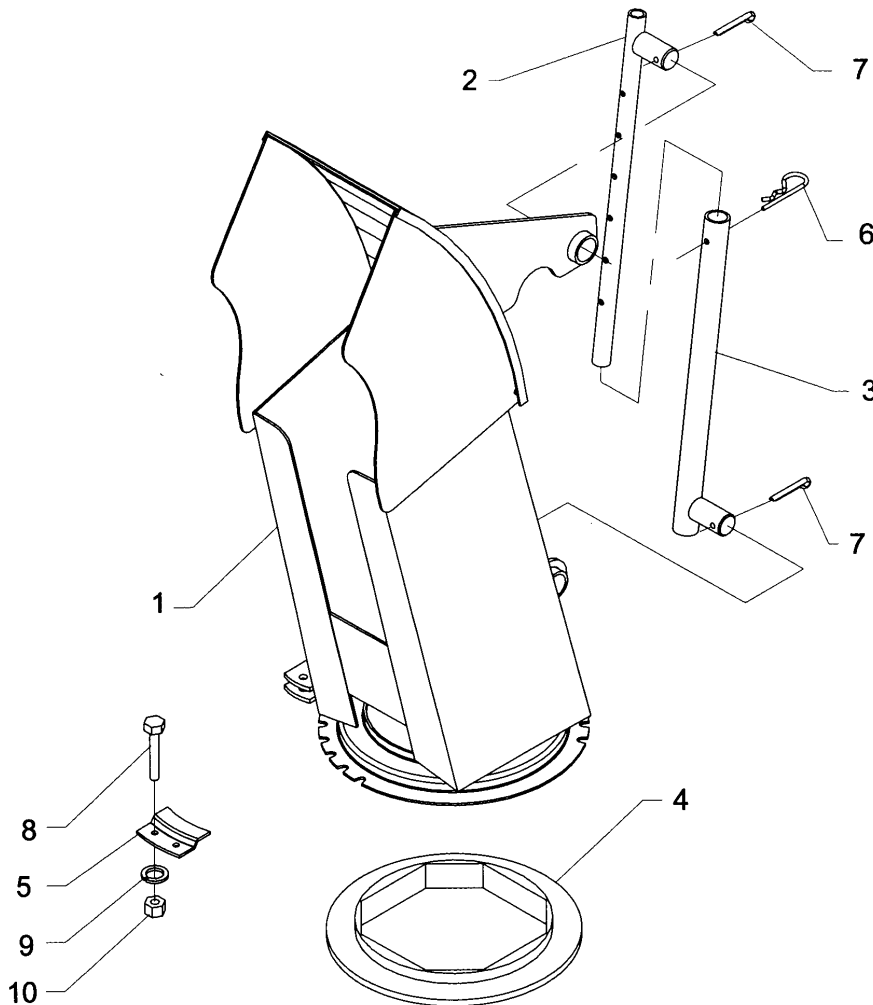
| REF. | DESCRIPTION | QTY. | PART NUMBER |
|------|-----------------------------------|------|-------------|
| 1 | Upper Hitch | 1 | 664449 |
| 2 | Lower Hitch | 2 | 659698 |
| 3 | Right Attaching Plate | 1 | 660268 |
| 4 | Left Attaching Plate | 1 | 659699 |
| 5 | Driveline guard | 1 | 660271 |
| 6 | Hitch Pin (CAT. 1) | 2 | 654196 |
| 7 | Hex. Bolt (5/8" NC x 3 3/4") | 7 | O/L |
| 8 | Lockwasher 5/8" | 8 | O/L |
| 9 | Hex. Nut (5/8" NC) | 7 | O/L |
| 10 | Hex. Bolt (5/8" NC x 1 1/4") | 1 | O/L |
| 11 | Hex. Bolt (3/8" NC x 3 1/2") | 1 | O/L |
| 12 | Lockwasher 3/8" | 1 | O/L |
| 13 | Hex. Nut (3/8" NC) | 1 | O/L |
| 14 | Storage Chain (R-1024 x 12" lg.) | 1 | 654200 |
| 15 | "S" hook (7/32" dia. x 2 1/2 lg.) | 2 | O/L |



PARTS

CHUTE WITH DEFLECTOR (664793)

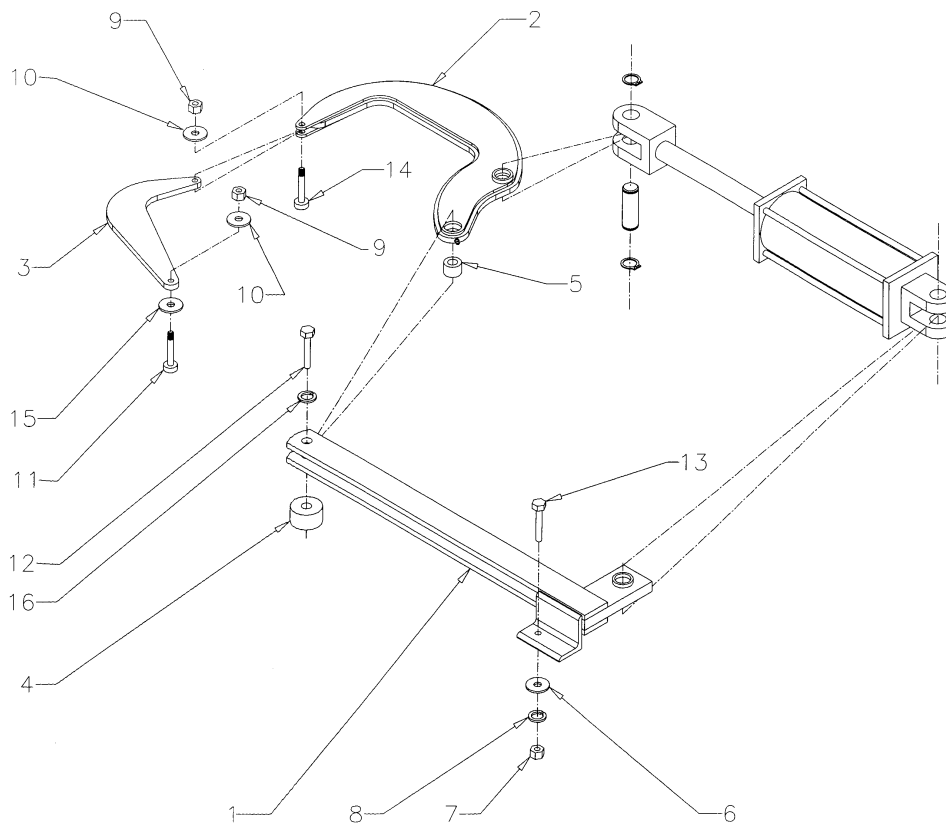
| REF. | DESCRIPTION | QTY. | PART NUMBER |
|------|---|------|-------------|
| 1 | Chute | 1 | 664792 |
| 2 | Adjusting rod 3/4" | 1 | 654074 |
| 3 | Adjusting pipe | 1 | 654076 |
| 4 | Rotation bushing | 1 | 659151 |
| 5 | Retaining Plate | 4 | 659146 |
| 6 | Hair pin 5mm x 100mm (3/16" x 3 15/16") | 1 | O/L |
| 7 | Cotter pin 1/4" x 2" | 2 | O/L |
| 8 | Hex. bolt 1/4" NC x 3/4" | 8 | O/L |
| 9 | Lockwasher 1/4" | 8 | O/L |
| 10 | Hex. Nut 1/4" NC | 8 | O/L |



PARTS

HYDRAULIC ROTATION BY CYLINDER – KIT 8056

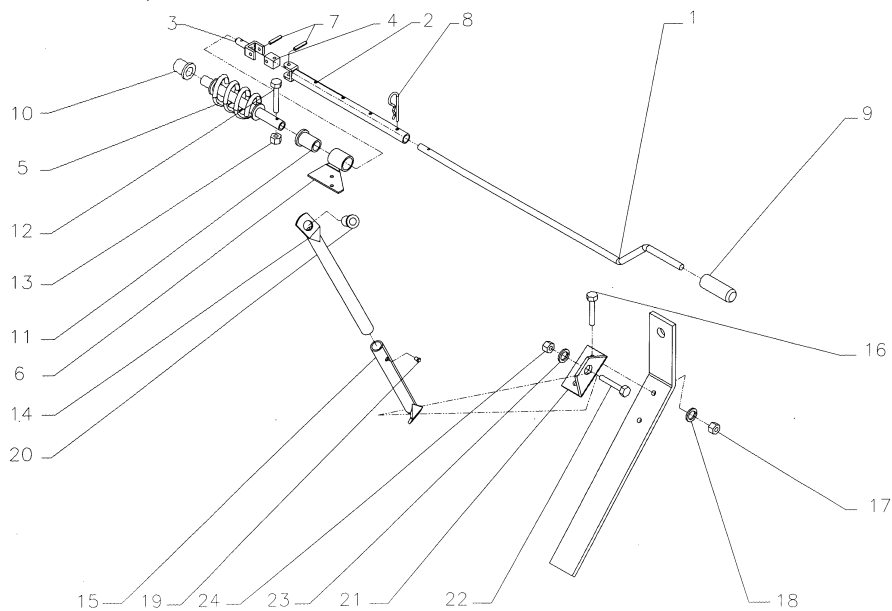
| REF. | DESCRIPTION | QTY | PART NUMBER |
|------|--------------------------------------|-----|-------------|
| 1 | Cylinder Bracket | 1 | 664450 |
| 2 | Bell Crank | 1 | 664451 |
| 3 | Push Arm | 1 | 664452 |
| 4 | Spacer | 1 | 664429 |
| 5 | Bushing | 1 | 664428 |
| 6 | Flatwasher (7/16") | 1 | O/L |
| 7 | Hex. Nut (3/8" NC) | 1 | O/L |
| 8 | Lockwasher (3/8") | 1 | O/L |
| 9 | Stover Nut (5/16" NC) | 2 | O/L |
| 10 | Flat washer (3/8") | 2 | O/L |
| 11 | Shoulder Screw (3/8" x 1", 5/16" NC) | 1 | 664583 |
| 12 | Hex. Bolt (5/8" NC x 3 1/2") | 1 | O/L |
| 13 | Hex. Bolt (3/8" NC x 1") | 1 | O/L |
| 14 | Shoulder Bolt (3/8" NC x 3/4") | 1 | 664576 |
| 15 | Nylon Flat washer (7/16") | 1 | O/L |
| 16 | Lockwasher (5/8") | 1 | O/L |



PARTS

MANUAL CHUTE ROTATION

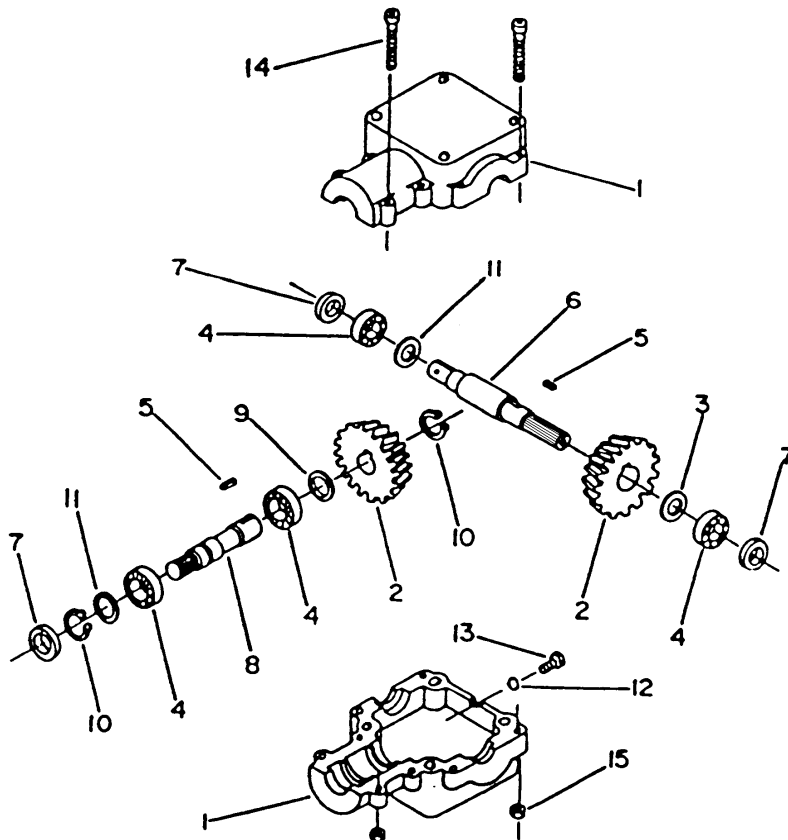
| REF. | DESCRIPTION | QTY. | PARTS NUMBER |
|------|------------------------------------|------|--------------|
| 1 | Handle | 1 | 658252 |
| 2 | Rotation Tube | 1 | 660188 |
| 3 | Rotation Yoke | 1 | 659595 |
| 4 | Universal Block | 1 | 658193 |
| 5 | Rotation Worm CCW | 1 | 659161 |
| 6 | Worm Rotation Bracket | 1 | 659145 |
| 7 | Roll Pin 1/4" x 1 1/4" | 1 | O/L |
| 8 | Hair Pin 5mm x 100mm | 1 | 659073 |
| 9 | Plastic Handle | 1 | 656797 |
| 10 | Plastic Bushing 1 5/16" | 1 | 657335 |
| 11 | Plastic Bushing 1 11/16" | 1 | 657336 |
| 12 | Capscrew 10-24 x 1" | 1 | O/L |
| 13 | Nylon Lock Nut 10-24 | 1 | O/L |
| 14 | Handle Support Bracket | 1 | 660187 |
| 15 | Anchor Tube | 1 | 660269 |
| 16 | Hex. Bolt 3/8"NC x 1 1/4" | 2 | O/L |
| 17 | Hex. Nut 3/8" | 2 | O/L |
| 18 | Lockwasher | 2 | O/L |
| 19 | Square Head Set Screw 3/8" x 5/16" | 1 | O/L |
| 20 | Plastic Grommet | 1 | 657390 |
| 21 | Support Angle | 1 | 660388 |
| 22 | Hex. Bolt 3/4"NC x 1 1/2" | 1 | O/L |
| 23 | Lockwasher | 1 | O/L |
| 24 | Hex. Nut 3/4" | 1 | O/L |



PARTS

GEAR BOX (663485)

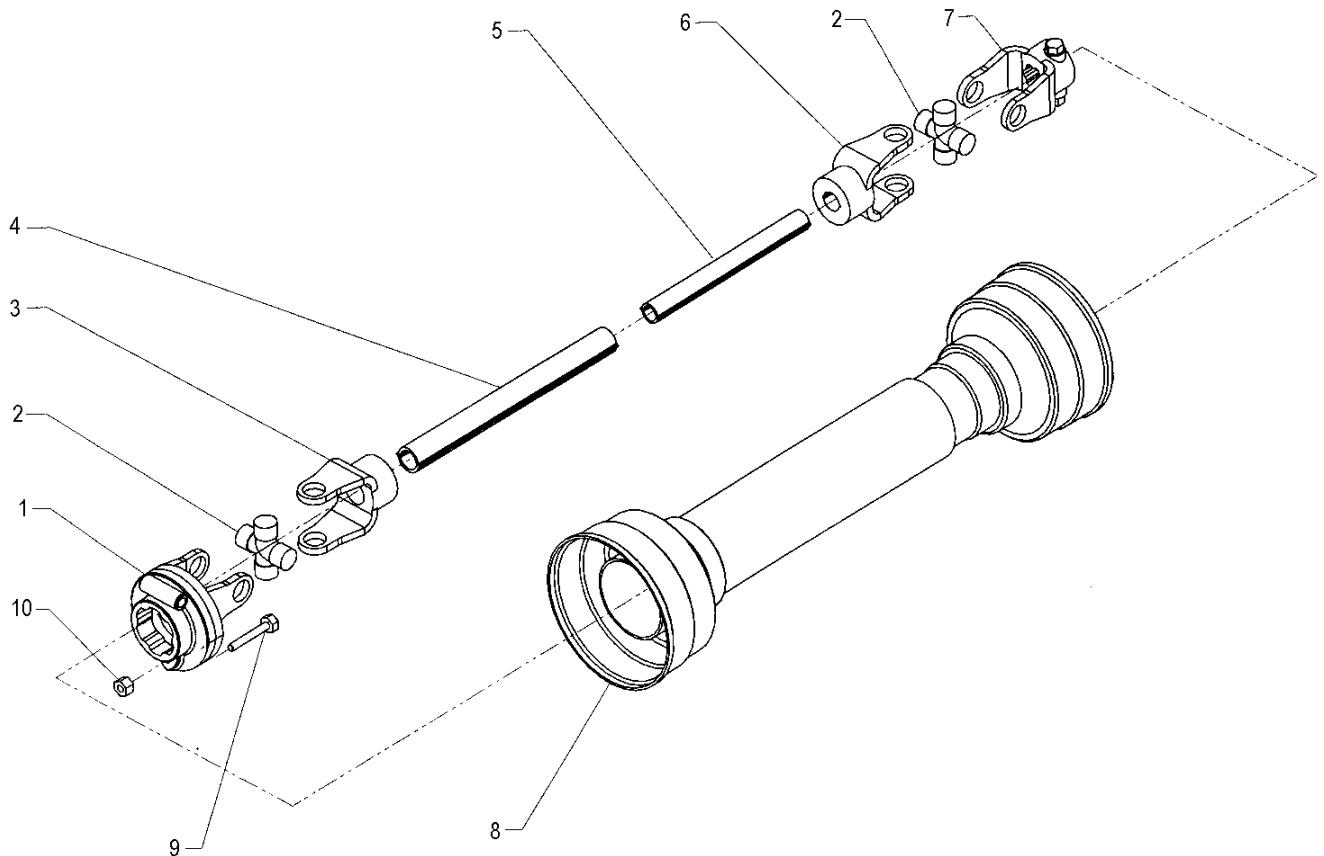
| REF. | DESCRIPTION | QTY. | PART NUMBER |
|------|-----------------------------|------|-------------|
| 1 | Casing | 2 | 659848 |
| 2 | Gear | 2 | 662236 |
| 3 | Shim | 1 | 656649 |
| 4 | Bearing | 4 | 656653 |
| 5 | Parallel Key | 2 | 659850 |
| 6 | Input Shaft | 1 | 664663 |
| 7 | Oil Seal | 3 | 659852 |
| 8 | Output Shaft | 1 | 659853 |
| 9 | Shim | 1 | 659854 |
| 10 | Snap Ring | 2 | 656652 |
| 11 | Shim | 2 | 659855 |
| 12 | O-Ring | 1 | 661144 |
| 13 | Plug | 1 | 659847 |
| 14 | Hex. Bolt (M8 x 55mm – 8.8) | 8 | O/L |
| 15 | Hex. Nut (M8, -8) | 8 | O/L |



PARTS

DRIVELINE (665341)

| REF. | DESCRIPTION | QTY. | PART NUMBER |
|------|-------------------------------------|------|-------------|
| 1 | Quick disconnect Yoke - Q.L. type | 1 | 664543 |
| 2 | Universal Joint Kit | 2 | 658094 |
| 3 | Outer Yoke | 1 | 664544 |
| 4 | Outer Tube | 1 | 659107 |
| 5 | Inner Tube | 1 | 659105 |
| 6 | Inner Yoke | 1 | 664545 |
| 7 | Yoke with Key | 1 | 665350 |
| 8 | Shield | 1 | 664547 |
| 9 | Bolt 8mm x 1.0mm x 45mm long gr.8.8 | 1 | O/L |
| 10 | Nut 8mm x 1.0mm | 1 | O/L |



WARRANTY



RAD TECHNOLOGIES INC.

RAD TECHNOLOGIES INC. warrants to the original buyer that the equipment is free from defects in material and workmanship. RAD TECHNOLOGIES INC.'s obligation, under this warranty, will be limited to the repair or replacement of any non-wear part or component, which RAD TECHNOLOGIES INC. finds to be defective within **one year** from the date of original purchase (unless otherwise-specified). The applicable warranty period for commercial or rental use shall be ninety (90) days from the date of purchase

In no event shall RAD TECHNOLOGIES INC. be liable for consequential, special, direct or indirect damages incurred by the buyer/user.

All components not manufactured by RAD TECHNOLOGIES INC. (such as motors, actuators, hydraulic components, tires, ...etc.) are covered by the original manufacturer's warranty in conjunction with RAD TECHNOLOGIES INC..

RAD's obligation under this warranty shall be limited to repairing or replacing, free of charge to the original purchaser, any part that, in RAD's judgment, shall show evidence of such defect, provided the **distributor** returns the part prepaid within thirty (30) days from date of failure.

This warranty shall not be interpreted to render RAD TECHNOLOGIES INC. liable for injuries or damages of any kind or nature to person or property. This warranty does not extend to losses because of delays, or to any expenses or losses incurred for labor, substitute machinery, rental or for any other reason.

Except as set forth above, RAD TECHNOLOGIES INC. shall have no obligation or liability of any kind on account of any of its equipment and shall not be liable for special or consequential damages. RAD TECHNOLOGIES INC. makes no other warranty, expressed or implied, and specifically, RAD TECHNOLOGIES INC. disclaims any implied warranty or merchantability or fitness for a particular purpose. **Some states or provinces do not permit limitations or exclusions of implied warranties or incidental or consequential damages, so the limitations or exclusions in this warranty may not apply.**

This warranty is subject to any existing conditions of supply, which may directly affect our ability to obtain materials or manufacture replacement parts. RAD TECHNOLOGIES INC. reserves the right to make improvements in design or changes in specifications at any time, without incurring any obligation to owners of units previously sold.

No one is authorized to alter, modify or enlarge this warranty nor the exclusions, limitations and reservations.

2835 Chemin de l'Aéroport, Thetford Mines (Québec) G6G 5R7

Tél.: (418) 338-4499 Fax: (418) 388-6090








Internet: www.radinter.com [EMAIL: radtech@radinter.com](mailto:radtech@radinter.com)

TORQUE SPECIFICATION TABLE





GENERAL SPECIFICATION TABLE

Use the following torques when special torques are not given

NOTE: These values apply to fasteners as received from supplier, dry, or when lubricated with normal engine oil. They do not apply if special graphited or moly disulfide greases or other extreme pressure lubricants are used. This applies to both UNF and UNC threads.

| SEE Grade No. | | 2 | | | | 5 | | | | 8 | | | |
|---|-------------|---|------|---------------|-------|--|-------|---------------|--------|---|------|---------------|--------|
| BOLT HEAD IDENTIFICATION MARKS AS PER GRADE NOTE: MANUFACTURING MARKS WILL VARY. | |  | | | |    | | | |    | | | |
| | | Torque | | | | Torque | | | | Torque | | | |
| BOLT SIZES | | Pounds Feet | | Newton-Meters | | Pounds Feet | | Newton-Meters | | Pounds Feet | | Newton-Meters | |
| Inches | Millimeters | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. |
| 1/4 | 6.35 | 5 | 6 | 6.8 | 8.13 | 9 | 11.0 | 12.2 | 14.9 | 12 | 15 | 16.3 | 30.3 |
| 5/16 | 7.94 | 10 | 12 | 13.6 | 16.3 | 17 | 20.5 | 23.1 | 27.8 | 24 | 29 | 32.5 | 39.3 |
| 3/8 | 9.53 | 20 | 23 | 27.1 | 31.2 | 35 | 42.0 | 47.5 | 57.0 | 45 | 54 | 61.0 | 73.2 |
| 7/16 | 11.11 | 25 | 30 | 40.7 | 47.4 | 54 | 64.0 | 73.2 | 86.8 | 70 | 84 | 94.9 | 113.9 |
| 1/2 | 12.70 | 45 | 52 | 61.0 | 70.5 | 80 | 96.0 | 108.5 | 130.2 | 110 | 132 | 149.2 | 179.0 |
| 9/16 | 14.29 | 65 | 75 | 88.1 | 101.6 | 110 | 132.0 | 149.2 | 179.0 | 160 | 192 | 217.0 | 260.4 |
| 5/8 | 15.88 | 95 | 105 | 128.7 | 142.3 | 150 | 180 | 203.4 | 244.1 | 220 | 264 | 298.3 | 358.0 |
| 3/4 | 19.05 | 150 | 185 | 203.3 | 250.7 | 270 | 324 | 366.1 | 439.3 | 380 | 456 | 515.3 | 618.3 |
| 7/8 | 22.23 | 160 | 200 | 216.8 | 271.0 | 400 | 480 | 542.4 | 650.9 | 600 | 720 | 813.6 | 976.3 |
| 1 | 25.40 | 250 | 300 | 338.8 | 406.5 | 580 | 696 | 786.5 | 943.8 | 900 | 1080 | 1220.4 | 1464.5 |
| 1 1/8 | 25.58 | - | - | - | - | 800 | 880 | 1084.8 | 1193.3 | 1280 | 1440 | 1735.7 | 1952.6 |
| 1 1/4 | 31.75 | - | - | - | - | 1120 | 1240 | 1518.7 | 1681.4 | 1820 | 2000 | 2467.9 | 2712.0 |
| 1 3/8 | 34.93 | - | - | - | - | 1460 | 1680 | 1979.8 | 2278.1 | 2380 | 2720 | 3227.3 | 3688.3 |
| 1 1/2 | 38.10 | - | - | - | - | 1940 | 2200 | 2630.6 | 2983.2 | 3160 | 3560 | 4285.0 | 4827.4 |

METRIC BOLT TORQUE SPECIFICATIONS

| Size of screw | Grade No. | Pitch (mm) | Coarse thread | | | | Fine Thread | | | | |
|---------------|--|------------|---------------|------|---------------|-------|-------------|-------------|------|---------------|-------|
| | | | Pounds Feet | | Newton-Meters | | Pitch (mm) | Pounds Feet | | Newton-Meters | |
| | | | MIN. | MAX. | MIN. | MAX. | | MIN. | MAX. | MIN. | MAX. |
| M6 | 4T  | 1.0 | 3.6 | 5.8 | 4.9 | 7.9 | - | - | - | - | - |
| | 7T  | | 5.8 | 9.4 | 7.9 | 12.7 | | - | - | - | - |
| | 8T   | | 7.2 | 10 | 9.8 | 13.6 | | - | - | - | - |
| M8 | 4T | 1.25 | 7.2 | 14 | 9.8 | 19.0 | 1.0 | 12 | 17 | 16.3 | 23.0 |
| | 7T | | 17 | 22 | 23 | 29.8 | | 19 | 27 | 25.7 | 36.6 |
| | 8T | | 20 | 26 | 27.1 | 35.2 | | 22 | 31 | 29.8 | 42 |
| M10 | 4T | 1.5 | 20 | 25 | 27.1 | 33.9 | 1.25 | 20 | 29 | 27.1 | 39.3 |
| | 7T | | 34 | 40 | 46.1 | 54.2 | | 35 | 47 | 47.4 | 63.7 |
| | 8T | | 38 | 46 | 51.5 | 62.3 | | 40 | 52 | 54.2 | 70.5 |
| M12 | 4T | 1.75 | 28 | 34 | 37.9 | 46.1 | 1.25 | 31 | 41 | 42 | 55.6 |
| | 7T | | 51 | 59 | 69.1 | 79.9 | | 56 | 68 | 75.9 | 92.1 |
| | 8T | | 57 | 66 | 77.2 | 89.4 | | 62 | 75 | 84 | 101.6 |
| M14 | 4T | 2.0 | 49 | 56 | 66.4 | 75.9 | 1.5 | 52 | 64 | 70.5 | 86.7 |
| | 7T | | 81 | 93 | 109.8 | 126 | | 90 | 106 | 122 | 143.6 |
| | 8T | | 96 | 109 | 130.1 | 147.7 | | 107 | 124 | 145 | 168 |
| M16 | 4T | 2.0 | 67 | 77 | 90.8 | 104.3 | 1.5 | 69 | 83 | 93.5 | 112.5 |
| | 7T | | 116 | 130 | 157.2 | 176.2 | | 120 | 138 | 162.6 | 187 |
| | 8T | | 129 | 145 | 174.8 | 196.5 | | 140 | 158 | 189.7 | 214.1 |
| M18 | 4T | 2.0 | 88 | 100 | 119.2 | 136 | 1.5 | 100 | 117 | 136 | 158.5 |
| | 7T | | 150 | 168 | 203.3 | 227.6 | | 177 | 199 | 239.8 | 269.6 |
| | 8T | | 175 | 194 | 237.1 | 262.9 | | 202 | 231 | 273.7 | 313 |
| M20 | 4T | 2.5 | 108 | 130 | 146.3 | 176.2 | 1.5 | 132 | 150 | 178.9 | 203.3 |
| | 7T | | 186 | 205 | 252 | 277.8 | | 206 | 242 | 279.1 | 327.9 |
| | 8T | | 213 | 249 | 288.6 | 337.4 | | 246 | 289 | 333.3 | 391.6 |

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