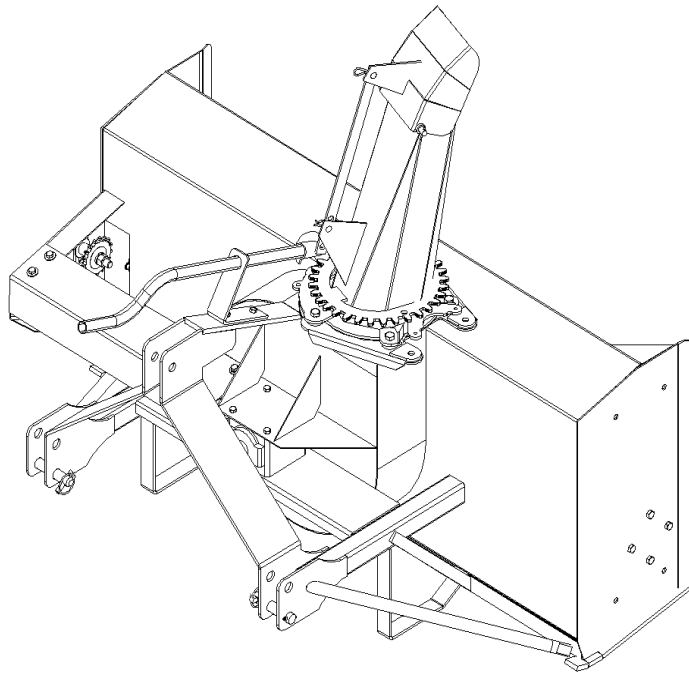


Snowblowers



Owners Manual
Parts List for 51-60 Snowblower
2009



M K Martin Enterprise

3950 Steffler Rd Elmira Ont N3B 2Z3
(519) tel 664-2752 / fax 664-3695
E-mail: sales@mkmartin.ca

New for 2009 Meteor Snowblower

Manual hood turner -- changed from a crank operated cable to a worm running on the chute ring-gear.

Chute hold-down clamp redesigned to accommodate worm mount, *clamp bearing shifted off-center*).

New gear shield for power turner.

51-60 Meteor Snowblower
Table of Contents

1. Registration and Warranty
2. Safety Introduction
3. Safety
4. Decal Location
5. Assembly Information
6. Operation
7. Main Parts
8. Gearbox Parts
9. Canimex PTO Instructions
10. Bolt Torque
11. Maintenance – Lubrication - Storage – Notes

Welcome to our lineup of Meteor Snowblowers

M K Martin Enterprise Inc has been building the Meteor Snowblowers since 1985. With proper care and maintenance the Meteor Snowblower will give you years of reliable service. The most common damage to a Snowblower is from foreign objects. Please ensure that the area to be cleared of snow has been cleared of articles before the first snow falls. This gives you peace of mind and the assurance that you won't get damaging objects into your blower. Please read this manual to become familiar with the Meteor Snowblower and the safe operation of the Meteor Snowblower.

Warranty and Limitation Of Liability

All equipment is sold subject to mutual agreement that it is warranted by M K Martin Enterprise Inc. (hereafter called the company) to be free of any defects of material and workmanship. But the company shall not be liable for special, indirect or consequential, damages of any kind under this contract or otherwise. The company's liability shall be limited exclusively to replacing or repairing without charge, at it's factory or elsewhere, at it's discretion, any material, or workmanship defects, which becomes apparent within one year from the date of purchase. The company will have no liability for damages of any kind. The buyer by the acceptance of the equipment will assume all liability for any damages, which may result from the use or misuse by his employees or others.

Warranty coverage is null and void unless the Warranty Registration form has been completely filled in and is on file at

M K Martin Enterprise Inc
3950 Steffler Road
Elmira Ont. Ca.
N3B 2Z3

For your record

Purchase Date Y20 M

Model # _____

Serial # _____

Please cut at dotted line and return this registration form to the company via Mail Fax (519-664-3695) e-mail sales@mkmartin>ca

M K Martin Inc
3950 Steffler Road
Elmira Ont. Ca.
N3B 2Z3

Buyers

Purchase Date Y20 M

Model # _____

Serial # _____

Name _____

Address _____

Postal Code _____

Safety

Take Note! This safety symbol is found throughout this manual to call your attention to instructions involving yourself and others working around the machine.

- **Failure to follow these instructions can result in injury or death!**



This symbol means

**--Attention!
--Become Alert!
--Your Safety is involved!**

Signal words are used in this book.

Caution: Indicates a potentially hazardous situation that may result injury.

Warning: Indicates a potentially hazardous situation that could result in serious injury or death.

Danger: Indicates a hazardous situation that needs to be avoided. It is you the operator that needs to be aware of these dangers.

If you have any questions not answered in this manual, please contact your dealer or M K Martin Enterprise Inc.

3950 Steffler Rd

Elmira On Ca

N3B 2Z3

Tel; 519-664-2752

Fax; 519-664-3695

e-mail; sales@mkmartin.ca



Safety – It's in your interest.



Safety Guidelines.

Safety of the operator is one of our main concerns, however it is up to the operator to practice caution.

To avoid personal injury, study the following precautions and insist that those working with you to follow them.

The Meteor Snowblower has only 2 shields, one shield is the PTO drive shield and the other is a shield for the hydraulic hood turner if used. **Do not** use the blower with the auger drive cover removed, as this is part of the blower frame.

Replace any decals that may be missing or not readable. Location of decals are indicated elsewhere in this manual.

Do not use this machine while under the influence of drugs or alcohol.

Review the safety instructions with all users annually.

This equipment should not be operated by children: or those unfamiliar with the operation of the Meteor® Blower. **Do not allow persons to operate this machine until they have read this manual and/or were instructed by a qualified person.**

Do not paint over, remove or deface any safety signs or warning decals on the Meteor® Blower. **Observe all safety signs and practice the instructions on them.**

Do not use this machine to push snow as this can result in the augers to be broken or bent.

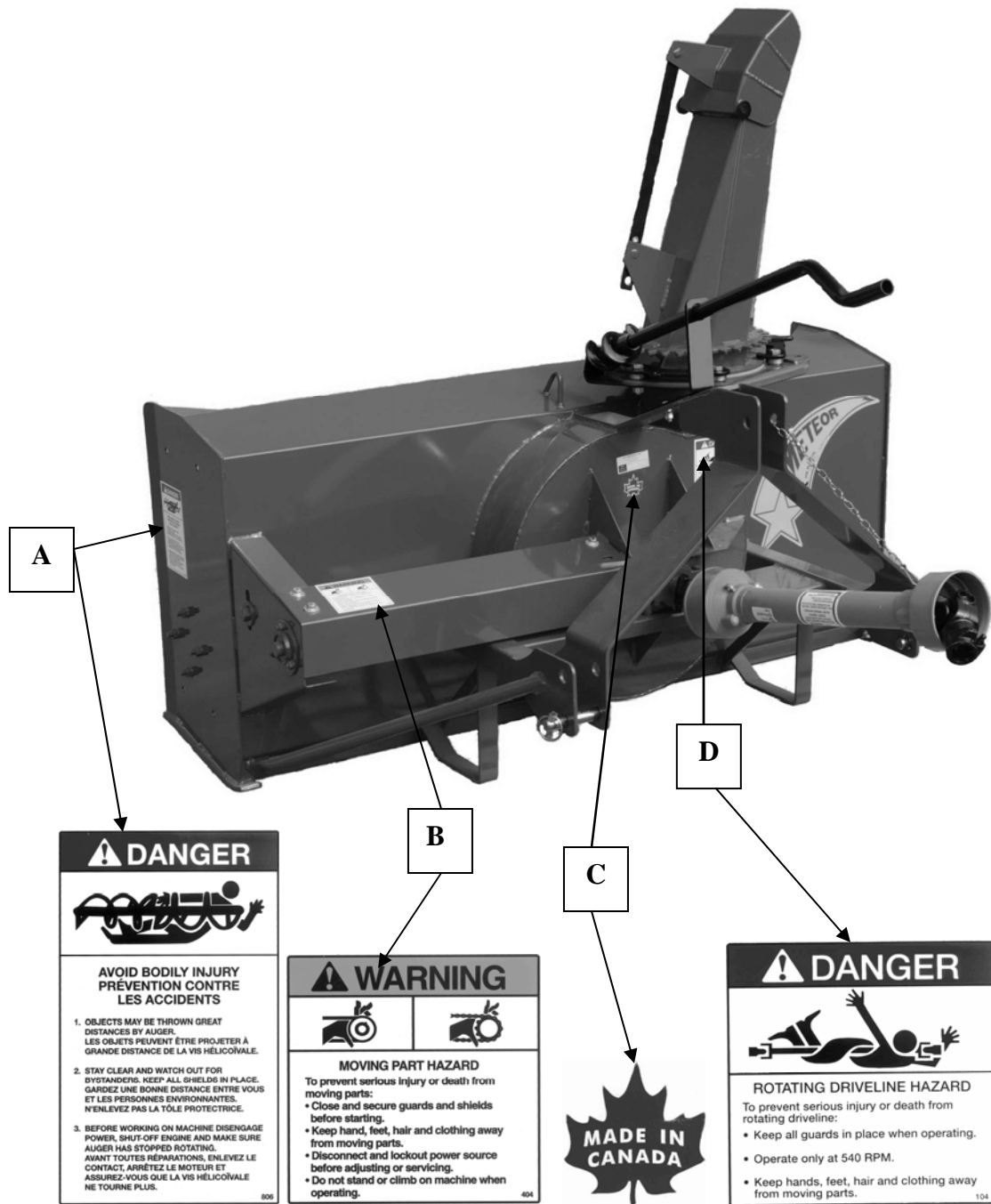


Please be careful with the extra weight on the back of the tractor. It may be necessary to add weights on the front of the tractor to keep it balanced properly.



When changing shearpins or removing ice or snow from the machine **Please stop the engine on the tractor!** This will reduce the possibility of the blower to be started and cause personal injury.

Meteor Decal Location



“A” Decal is located on both ends of the Meteor® Snowblower
 The Serial Plate is located above the Made In Canada Decal

51-60 Meteor Snowblower Assembly Information

Parts list in component package

1	2 pc 3/8x11/4 bolts	8	2 pc 1/2-20 lockwasher, nut
2	2 pc 3/8 lockwasher	9	1 pc 2 hole Chute Clamp
3	2 pc 3/8 nut	10	2 pc Cat #1 Hitch Pin c/w 7/16 Lynch Pin
4	2 pc Chute Bearing	11	1 pc Hand Crank Assembly
5	2 pc 1/2" SAE washer	12	5/16x1 1/2 Spring Pin
6	2 pc 1/2" Thin wave washer		
7	2 pc 1/2-20 x 1 3/4 bolt		

Upon receiving the Meteor Blower

The blowers are shipped in a packaged state

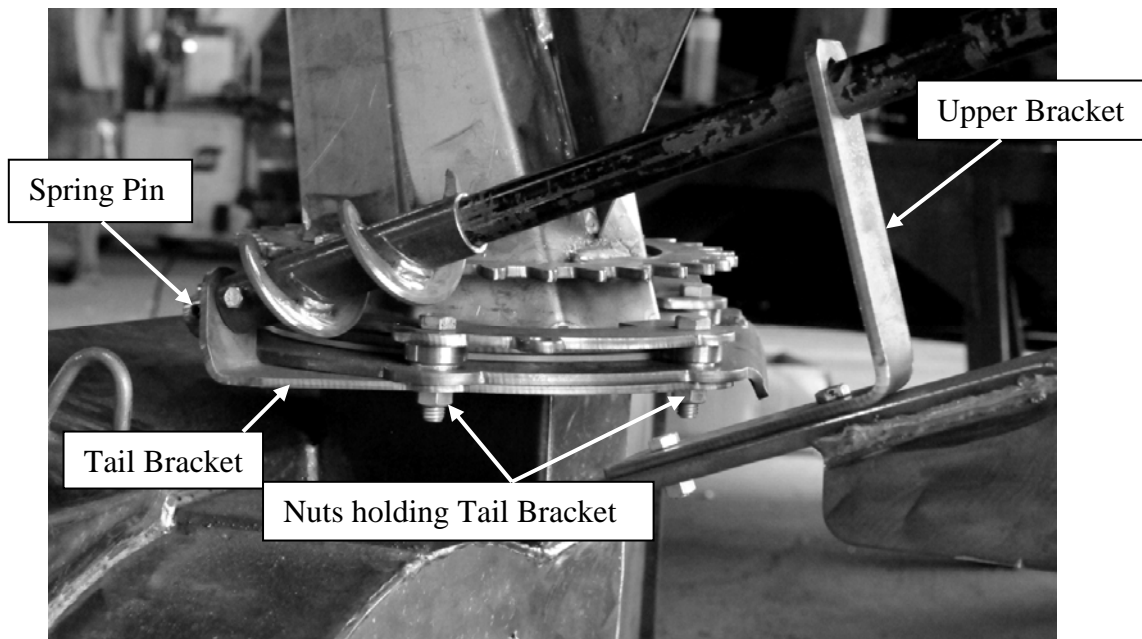
Carefully remove the chute and PTO shaft from the area of the auger and set them aside. Locate the bag or package of small components.

Remove the ties that hold the plastic ring on the blower, apply a light coat of grease to both sides of ring and replace. Place the base of the chute on top of the plastic ring, the base of the chute will now slide under the clamp with the 3 hold-down bolts.

Place a 1/2" SAE washer and a bearing on the 2 holes of the chute support, place a thin wave washer on top of the bearing, place the 2 hole clamp on the washers and bearing with the off-set facing up and out. Secure with 1/2-20 x 1 3/4 bolts. *The thin wave washer is to ensure the bearing race dose not drag on the clamp.*

Install the hand crank.

First remove the 2 nuts as shown, and insert the crank tail bracket and reinstall the nuts. bolt upper bracket to top "A" Frame brace. Test crank to make sure it rotates freely.



51-60 Meteor® Snowblower

This Blower is ideal for small tractors 15-20 HP Cat #1 3PH.

Hitching up the Meteor® Blower for the first time.

Set the blower on a level surface and back the tractor up to it. Place the lower 3PH arms of the tractor between the lower hitch plates on the blower and insert the hitch pins that came with the blower, secure these with the Lynch Pins. Next swing the top link into place and adjust the length so the top link pin can be inserted. You will have to supply the top link pin. With the top link set at this length the blower will be flat or parallel to the ground.

Do not fasten the PTO shaft to the tractor.

1. Slowly lift the blower until the gearbox shaft is at the same height as the PTO output on the tractor.
2. Push (or collapse the telescopic part of the PTO completely). If you cannot collapse it far enough to slide it on the tractor then it has to be shortened.
3. Measure the amount that the shaft is too long. Remove it from the blower and pull it apart.
4. Take a hacksaw and cut ½ of the measurement from each end, cut both the plastic tube and the metal core.
5. Use a file to remove the burrs from the cut parts, wipe any filings from the surfaces and slide the shaft together to be sure that it slides freely.
6. Make sure the plastic shield is free to rotate on the shaft before installing on the machine.
7. Reinstall the PTO on the blower and fasten it to the tractor pushing the spring-loaded pin in and sliding the yoke onto the tractor spline until the pin snaps into place.
8. Next lift the 3PH arms to the highest point, determine the overlap on the PTO shaft. It should be at least 2” if it is too short then the PTO will jam rather than collapse. This will put severe strain on the shaft and gearbox.



9. It may come apart and this will allow a spinning PTO to become an uncontrolled weapon and could severely injure or kill someone!
10. After it has been determined that the PTO is OK and will not jam or come apart, make sure any bystanders are well away from the machine.
11. Lower the blower to ground level, engage the PTO and slowly start the blower. Make sure that everything is turning freely.
12. Slowly increase the speed until you have reached 540 RPM on the PTO. This is the speed that this blower was designed for. If it turns faster the fan could be going dangerously fast. If it turns slower it will not perform very well as the snow will not get blown very far.

**In warmer conditions Heavy wet snow will not blow as well.
In colder conditions the light powder type snow will blow very well.**

Operating the Meteor® Snowblower

This blower is on the back of the tractor facing toward the rear. While blowing snow the tractor has to be backup into the snow.



Stay in the seat of the tractor all the time that the blower is running.



Make sure the area is clear of people while blowing snow.



Do not direct discharged snow toward people, cars or buildings as stones or bits of ice can go a long distance.

When you get to the place that you want clear snow, lower the blower to the ground and turn the chute to discharge the snow in the direction you want the snow to go. Engage the PTO and slowly bring the blower up to operating speed. After the blower is running use reverse gear and start backing up. The chute can be rotated from the tractor seat while blowing snow.

If your drive is paved then you may need to lengthen the top 3PH link to tilt the blower ahead so it will scrape the hard surface better.

If your drive is gravel then you may want to shorten the top 3PH link to tilt the blower back so it will not dig into the loose gravel. In colder climates where the bare ground is frozen during most of the winter the blower can be adjusted to scrape the snow off the frozen drive after freeze-up.

In areas where the gravel is not frozen most of the time we have skid shoes available to bolt on the end plates to raise the blower a few inches above the gravel.



This blower is designed to blow snow, but will blow loose gravel if care is not taken.



After the job is finished: **Disengage the PTO to stop the blower** before driving away or getting off the tractor.

The auger is protected with a safety shear bolt that will shear off if the auger becomes jammed.

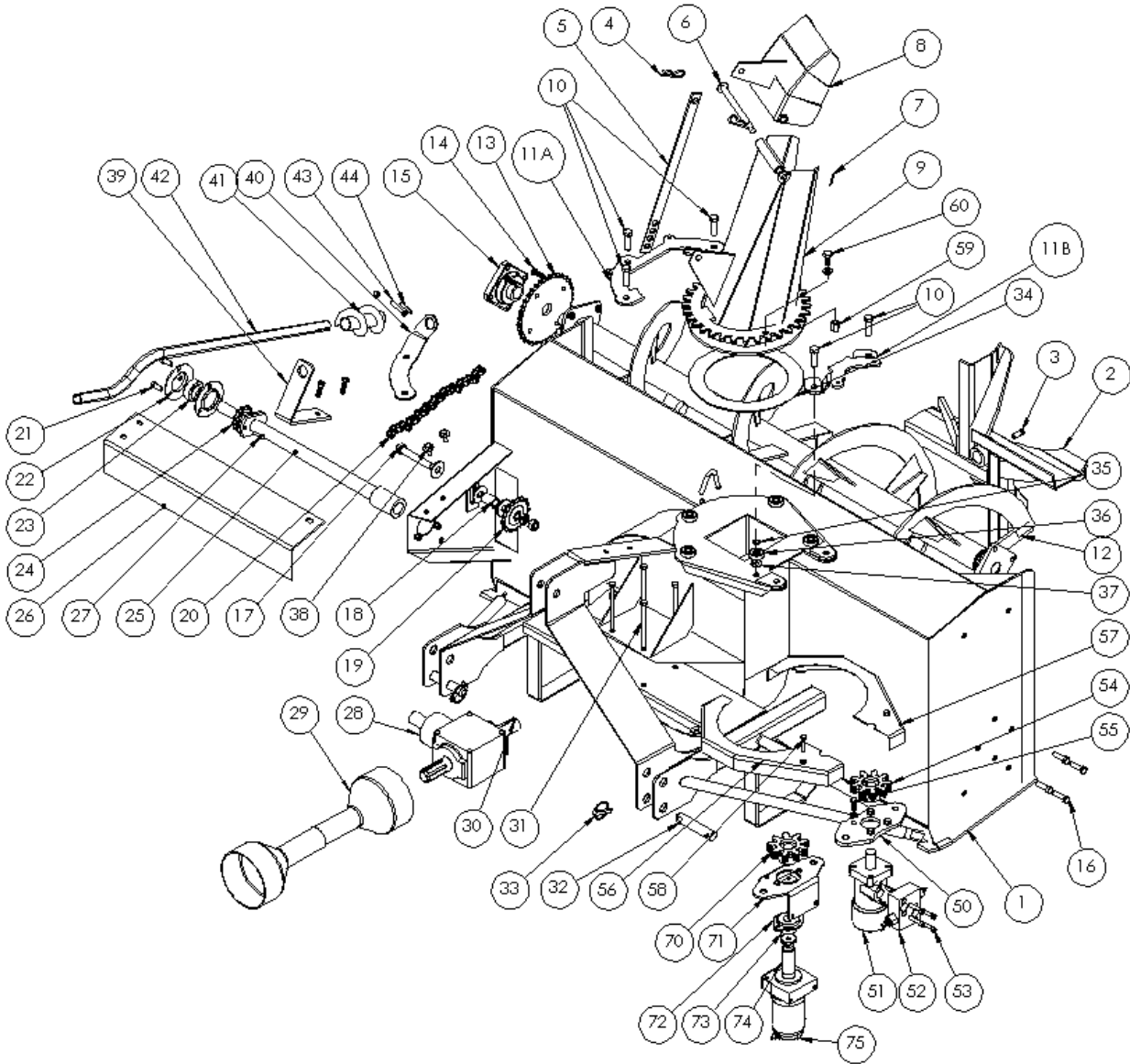
The fan is also protected with a shear bolt in the PTO shaft universal joint if the fan becomes jammed.



When replacing the shear bolts STOP the engine before attempting to replace them!

There is a hydraulic hood turner available that couples into the tractor hydraulic remotes if your tractor is so equipped. This will allow you to rotate the hood without reaching back to the blower especially if you have a cab on your tractor.

51-60 Meteor Snowblower Parts

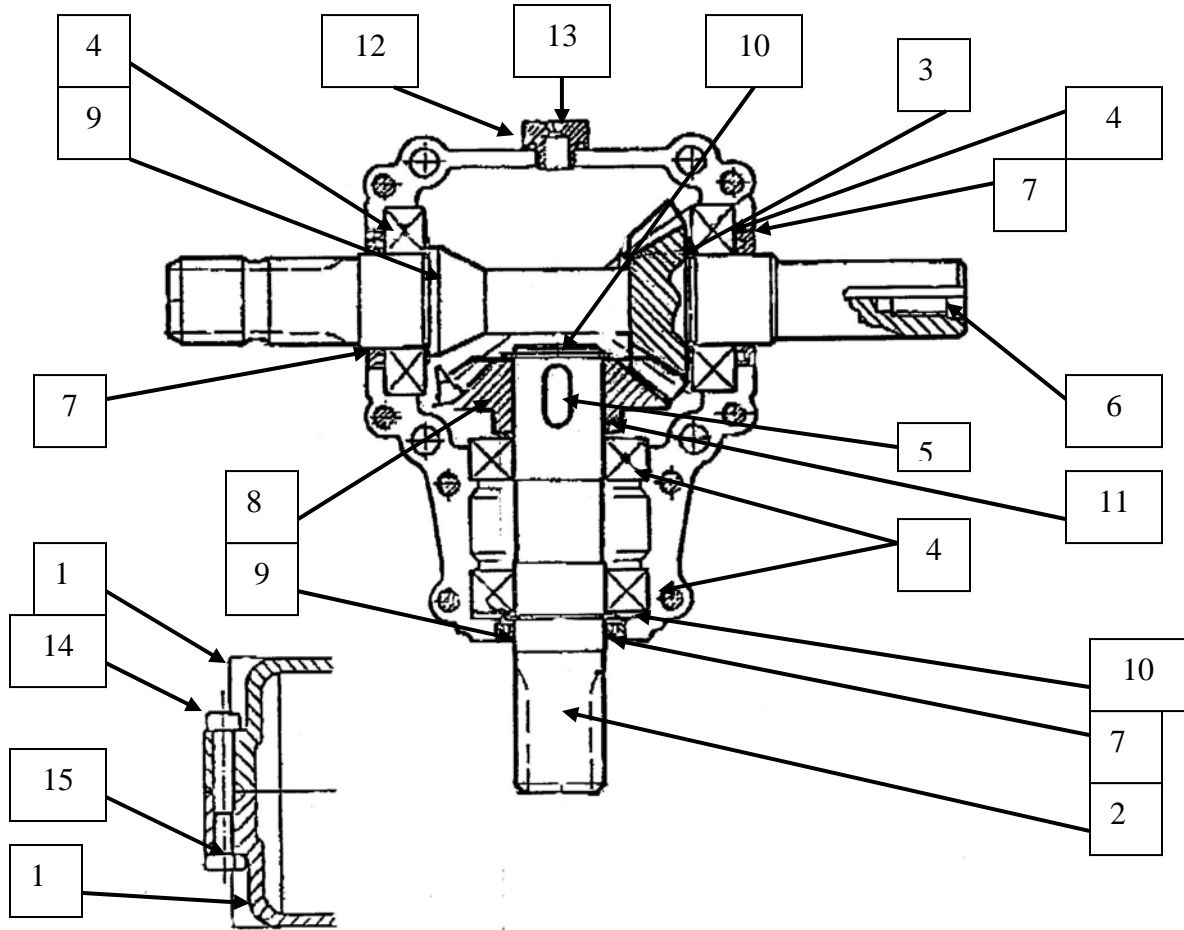


51-60 Meteor Snowblower					
Item No	Description	Model 51	Qty	Model 60	Qty
1	Main Body	519-51115009	1	519-60115009	1
2	Fan	519-51115208C	1	519-51115208C	1
3	Hexbolt 3/8x1 #5 c/w lw	OL	1	OL	1
4	Hairpin 5/32	OL	2	OL	2
5	Deflector Control	519-511081	1	519-511081	1
6	Hinge Pin	519-51108708	1	519-51108708	1
7	Cotter Pin 1/8x1	OL	1	OL	1

51-60 Meteor Snowblower					
Item No	Description	Model 51	Qty	Model 60	Qty
8	Deflector	519-51115608	1	519-51115608	1
9	Chute	519-51116009	1	519-51116009	1
10	Hexbolt 1/2-20x1 3/4 c/w n,lw	OL	5	OL	3
11A	3 Bolt Chute Clamp	519-51116209	1	519-51116209	1
11B	2 Bolt Chute Clamp	519-51116309	1	519-51116209	1
12	Auger	519-511164	1	519-601164	1
13	Auger Sprocket	519-511165	1	519-511165	1
14	Hexbolt 3/8-16x1 c/w lw,n	OL	4	OL	4
15	Complete Bearing	519-751169	2	519-751169	2
	Bearing Insert Only	519-751170	2	519-751170	2
	Cast Flange Only	519-751171	2	519-751171	2
16	Hexbolt 7/16x1 1/2 c/w lw,n	OL	8	OL	8
17	Hexbolt 5/8x4 c/w n,lw	OL	1	OL	1
18	Spacer	519-511028	1	519-511028	1
19	Idler Sprocket	519-512029	1	519-512029	1
20	Drive Chain	519-512026	1	519-512026	1
21	Hexbolt 5/16x3/4 c/w n,lw	OL	3	OL	3
22	Flange Bearing	519-511174	1	519-511174	1
23	Bearing	519-511175	1	519-511175	1
24	Shear Sprocket	519-513025	1	519-513025	1
25	Cross Shaft	519-51118408C	1	519-51118408C	1
26	Cross Shaft Shield	511105508	1	519-601005508	1
27	Shearbolt 1/4x1 #2 c/w n,lw	OL	1	OL	1
28	Gearbox	519-51118608C	1	519-51118608C	1
29	PTO	519-51118708C	1	519-51118708C	1
30	Fan Key	519-511062	1	519-511062	1
31	Hexbolt 3/8x5 c/w n,lw	OL	4	OL	4
32	Hitch Pin	519-752096	2	519-75096	2
33	Lynch Pin	OL	2	OL	2
34	Antifriction Ring	519-511161	1	519-511161	1
35	Thin wave Washer	519-511702	5	519-511702	5
36	Bearing	519-510716	5	519-510716	5
37	1/2" SAE Washer	OL	5	OL	5
38	Hexbolt 3/8x1 c/w n,lw	OL	3	OL	3
39	Hand Crank Base	519-51109009	1	519-51109009	1
40	Crank Tail Bracket	519-51719109	1	519-51719109	1
41	Crank Worm	519-51719209	1	519-51719209	1
42	Crank	519-51109109	1	519-51109109	1
43	Hexbolt 5/16x1 1/4 c/w ln	OL	1	OL	1
44	5/16x 1 1/2 Spring Pin	OL	1	OL	1

Optional	Chute Rotator				
Item No	Hydraulic	Model 51		Model 60	
50	Hydraulic Motor Mount	519-511703	1	519-5111703	1
51	Hydraulic Motor	519-511704	1	519-511704	1
52	Hydraulic Relief Valve	519-511705	1	519-511705	1
53	Socket head cap screw 5/16x1 1/2	OL	4	OL	4
54	Small Gear	519-511706	1	519-511706	1
55	1/2-20 x1 13/4 c/w ln	OL	2	OL	2
56	Hood Turner Shield	519-51170709	1	519-51170709	1
57	Hood Turner Shield	519-51170809	1	519-51170809	1
58	Hexbolt 5/16x1 1/2 c/w n,lw	OL	2	OL	2
	Hexbolt 5/16x1 c/w n,lw	OL	2	OL	2
59	Stop Nut	519-51171009	1	519-51171009	1
60	Hexbolt 1/2x1 c/w lw	OL	1	OL	1
	Electric				
70	Electric Mount	519-511706	1	519-511706	1
71	2 Bolt Bearing Flangette	519-511707	1	519-511707	1
72	Bearing	519-511175	1	519-511175	1
73	Clutch Shaft	519-511708	1	519-511708	1
74	Electric Motor	519-511709	1	519-511709	1

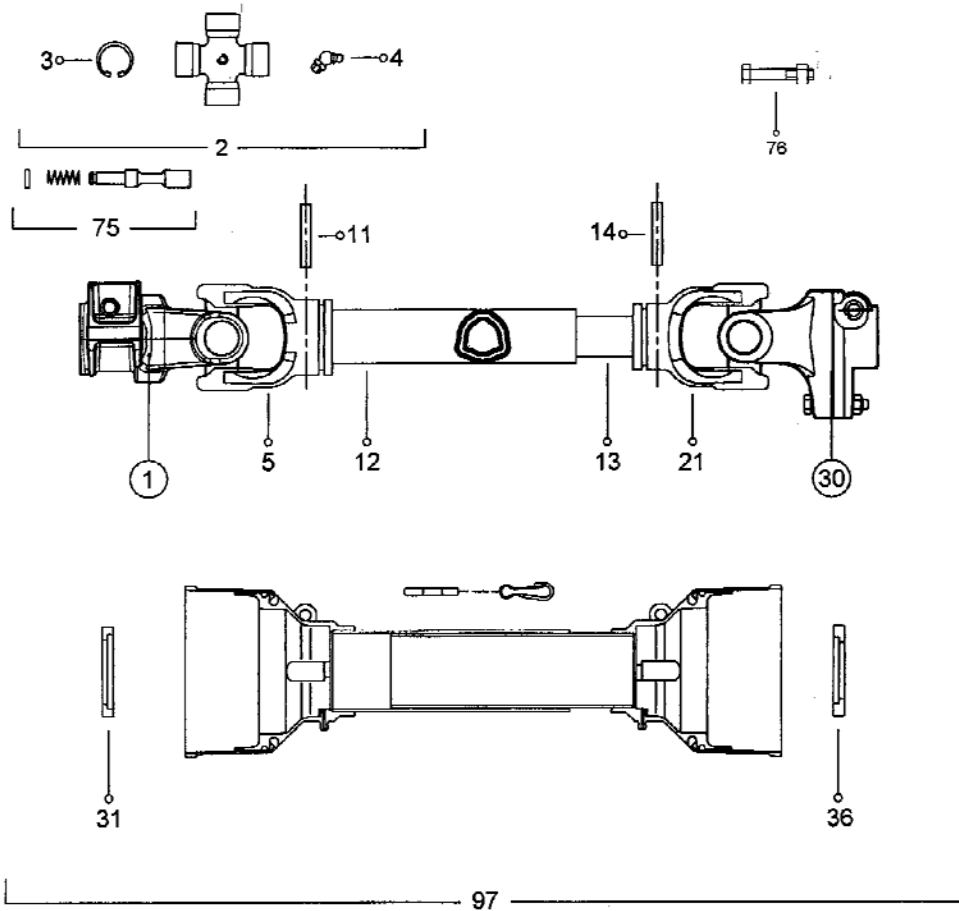
51-60 Meteor Snowblower Main Gearbox (Comer)



T281 Gearbox

Item	Description	Part 3	Req
1	Casting	519-1.281.0300.00	2
2	Shaft 1 ¼	519-0.281.2207.00	1
3	Shim 48.0	519-0.259.7500.00	1
4	Bearing 6207	519-8.0.1.00025	4
5	Parallel Key 10x8x30	519-8.4.1.00057	1
6	Pinion Shaft Z13MS	519-0.281.6200.00	1
7	Oil Seal 35x52x7	519-8.7.3.00028	3
8	Gear Z19 MS	519-0.259.6000.00	1
9	Shim 35.3x0.5	519-0.259.7505.00	2
10	Snap Ring 35 UN17435	519-8.5.1.00005	2
11	Shim 35.3x0.6	519-0.259.7506.00	1
12	O-Ring OR-3062	519-8.7.6.00191	1
13	Plug	519-0.281.7100.00	1
14	Bolt M8x55	519-8.1.2.01174	8
15	Hex Nut M8	519-8.2.1.00382	8

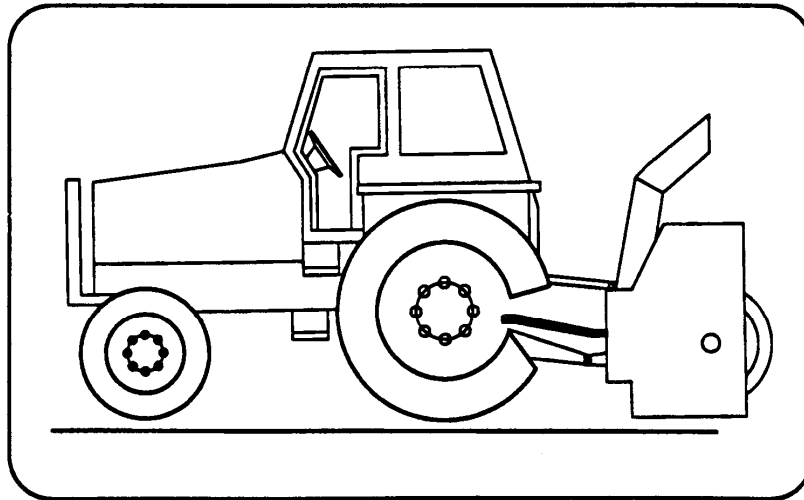
B20 Binacchi PTO (Comer Gearbox)



Item No	Description	Part No	Req
1	Tractor Yoke	0800203	1
2	Cross Journal Assy	08202	1
3	Circlip	098020224	8
4	Grease Nipple	09840081002	2
5	Outer Tube Yoke	08002021	1
11	Spring Pin	098700855	1
12	Outer Tube Shaft	09881363100	1
13	Inner Tube Shaft	09881294100	1
14	Spring Pin	098700850	1
21	Inner Tube Yoke	08002011	1
30	Shear Yoke	08802	1
31	Outer Shield Bearing	0265110007	1
36	Inner Shield Bearing	0265110008	1
75	Complete Push Pin	0986014075	1
76	Shear Bolt	0990060040B	1
97	Safety Guard	083E02076	1



INSTALLATION INSTRUCTIONS FOR SNOWBLOWER



**INSTALLATION INSTRUCTIONS FOR SNOWBLOWER
FOR A BETTER P.T.O. SHAFT & GEARBOX OPERATION**

A proper initial installation will give you years of satisfactory service on your equipment. Please read carefully following instructions which have been specially made to help you and make you satisfied of your purchase.

WARNING : Unfortunately, snowblowers will be faced with forgotten or hidden objects under the snow, such as : chain, tires, stones, pieces of wood, etc... In spite of all our efforts, machines are not built to resist all those conditions.

Danger : Too big tractors

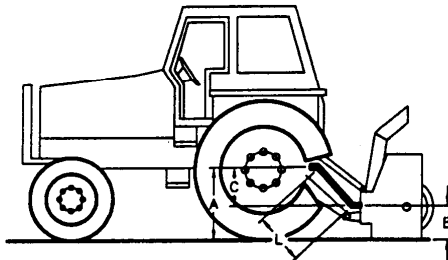
It is dangerous to use a tractor which is too big or too powerful. The tractor will always be able to overload the blower, even if the machine is already at maximum capacity. Tractor being very high, too large angles at P.T.O. universal joints will result, and life of universal joints will be shortened dramatically.

P.T.O. shafts angles

P.T.O. shafts are made to transmit power with angles at universal joints. However, these angles should be kept to a minimum. Larger the angle, shorter the life of P.T.O.. Take for example a snowblower sold for a tractor capacity of **60-75 H.P.**, which would be attached to a **60 H.P.** tractor, operating at maximum capacity (**60 H.P.** continuous).

<u>H.P.</u>	<u>P.T.O. angles</u>	<u>Estimated life in hours</u>
60 @ 540 RPM	5°	450 hours
	10°	195 hours
	15°	90 hours
	20°	40 hours
	25°	20 hours

How to determine P.T.O. angle

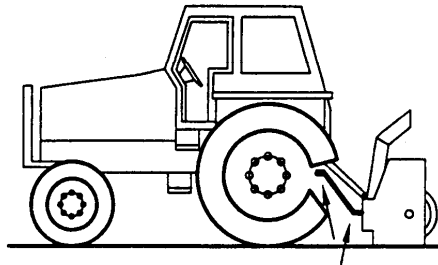


- A** = P.T.O. height at tractor
- B** = P.T.O. height at blower
- C** = A - B
- L** = Cross center distance in working position

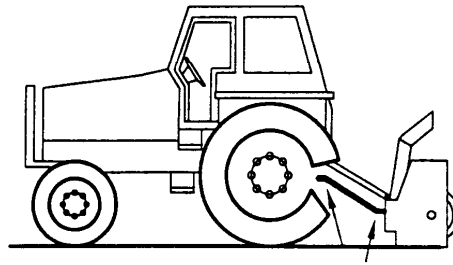
- 1) Lower blower on ground.
- 2) Take measures A, B & L
- 3) Subtract B of A ($A - B = C$)
- 4) Divide L by C ($L \div C = F$)
- 5) Compare F Factor in table below to find P.T.O. angle (interpolate, if necessary).

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

Previous examples clearly demonstrate that universal joint angle is directly related with life of P.T.O.. In order to reduce angle, it is necessary to increase the distance between snowblower and tractor.



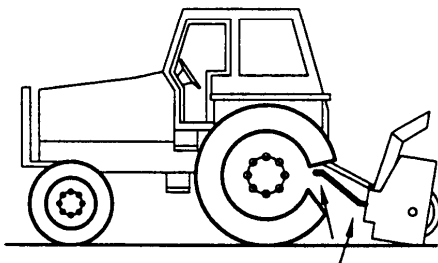
TOO LARGE ANGLES AT P.T.O. JOINTS
TO AVOID



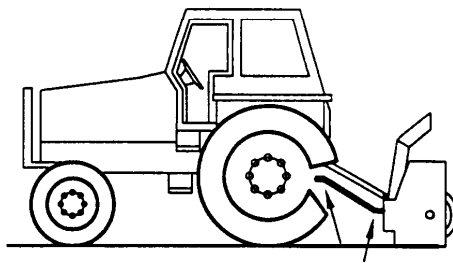
REASONABLE ANGLES AT P.T.O. JOINTS
ACCEPTABLE

If it is impossible to increase the distance between snowblower and tractor, in order to maintain a reasonable angle at P.T.O., it is recommended to use a larger size of P.T.O., that is a greater capacity P.T.O. (please refer to your dealer for more details).

For snowblowers of 100 H.P., an additional gearbox is also available that can be mounted on existing snowblower gearbox, which increases the input shaft height, reducing angle at P.T.O. joints. This gearbox also has an input speed of 1000 R.P.M., which greatly increases P.T.O. capacity.



NON-EQUAL ANGLES AT P.T.O. JOINTS
TO AVOID



EQUAL ANGLES AT P.T.O. JOINTS
RECOMMENDED

Angles at each end of P.T.O.

A popular habit is to change snowblower angle in order to obtain a better scraping effect. This practice can become harmful to the P.T.O., angle at each end being unequal. There will be a fan speed variation as well as a drastic increase of load on cross and bearings. **To avoid.** It is recommended to keep tractor P.T.O. shaft and snowblower input shaft always parallel.

Shear bolts

Shear bolts are built to break under shocks on the fan or on the auger. However, under certain circumstances, this security is not adequate. Example : A sudden high impact shock on the fan may, in some cases, break the fan shaft without breaking the shear bolt.

If the shear bolt breaks, make sure to always replace it with a same category bolt (**grade 5** for P.T.O. series **20-40-50-60**, and **grade 8** for P.T.O. serie **80**). It is necessary to always maintain this bolt very tight, in order to keep the efficiency of the shearing mechanism.

WARNING : *The gearbox fan shafts are made with special alloy steel. Moreover, they are case hardened to increase capacity to shock load. These shafts cannot be broken under normal snow loads. However, undesirable objects may enter the fan and either bend or break gearbox shaft. It is understood that gearbox cannot be built to resist every possible overloads, and consequently, gearbox fan shafts will not be replaced under warranty. Therefore, the user of the snowblower must be very careful.*

Maximum length of P.T.O. shaft

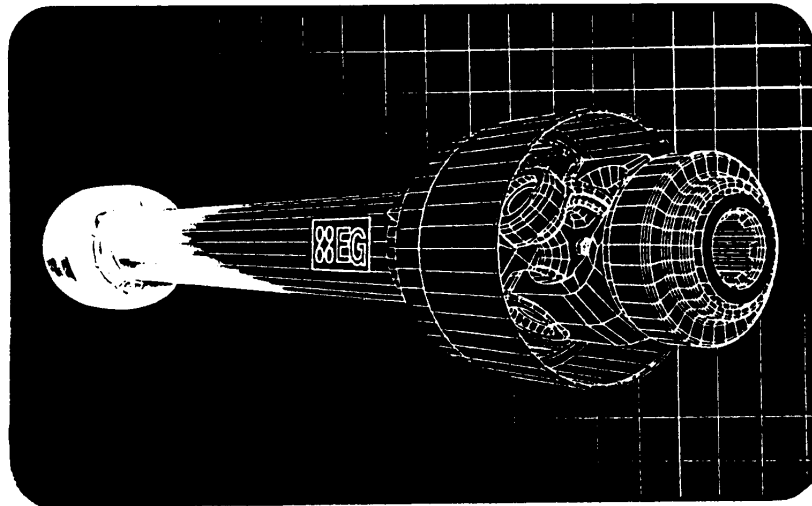
WARNING : *Telescopic tubes of P.T.O. should overlap of a minimum length to meet ideal conditions for power transmission.*

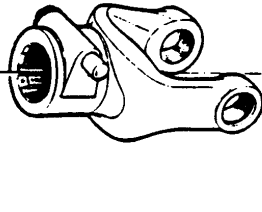
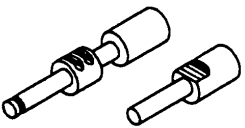
Following table could be used as a guide to find the maximum permissible length of P.T.O. :

Description of P.T.O.	Over-all length		Telescopic tubes overlap
	Closed	Opened max.	
T20-056P	29:3/4"	41"	5"
T40-056P	30:1/2"	40:1/2"	6"
T50-071P	36:1/2"	50"	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"

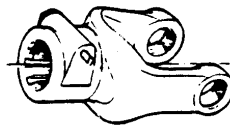
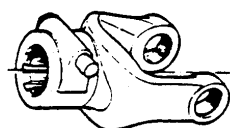
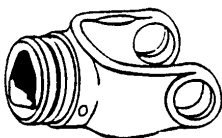
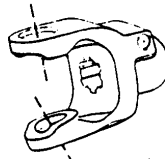
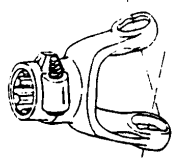
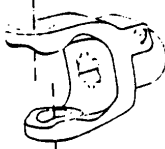
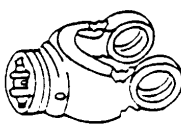


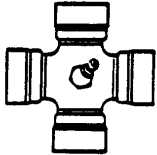
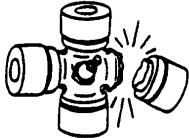
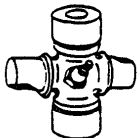
EFFECTIVE P.T.O. DRIVE SHAFT MAINTENANCE







	AVOIDABLE DAMAGES	POSSIBLE CAUSES	CORRECTIVE ACTIONS
Quick-disconnect yoke 	<ul style="list-style-type: none"> -Quick-disconnect pin tight or completely seized. -Quick-disconnect pin damaged (broken or bent). -Quick-disconnect pin damaged in the locking portion. 	<ul style="list-style-type: none"> -Quick-disconnect pin dirty (insufficient maintenance). -Quick-disconnect pin defective (forced engagement, incorrect handling). -Excessive shaft length. -Axial loads too high. 	<ul style="list-style-type: none"> -Clean, oil and follow service instructions. -Replace quick-disconnect pin. -Shorten shaft length (cut both telescopic tubes as well as shields and remove burrs). -Replace quick-disconnect pin. -Clean and grease telescopic tubes, and replace both tubes, if necessary. -Replace quick-disconnect pin.

Note: Quick-disconnect pins must be cleaned and greased every 16 working hours.

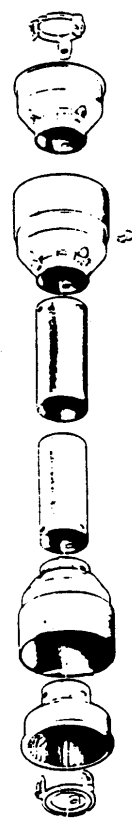
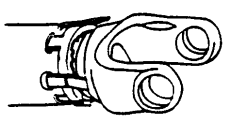
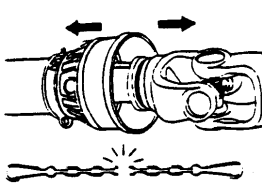
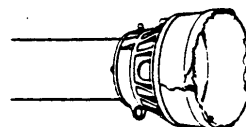
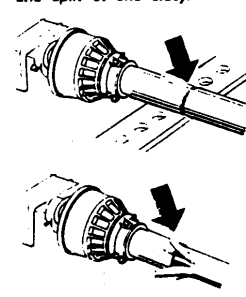
	AVOIDABLE DAMAGES	POSSIBLE CAUSES	CORRECTIVE ACTIONS
Yoke   	<ul style="list-style-type: none"> -Yoke ears deformation.  	<ul style="list-style-type: none"> -Excessive shaft length. -Axial loads too high. -Excessive working angle and torque. 	<ul style="list-style-type: none"> -Shorten shaft length (cut both telescopic tubes as well as shields and remove burrs). -Replace defective yokes. -Clean and grease telescopic tubes, and replace both tubes, if necessary. -Replace defective yokes. -Verify compatibility between shaft and working conditions (torque vs angle). -Disengage tractor P.T.O. during cornering or when lifting or lowering the implement. -Change to a larger P.T.O. size. -Replace defective yokes.
	<ul style="list-style-type: none"> -Yoke ears distorted. 	<ul style="list-style-type: none"> -Overload caused by high starting and peak torques. 	<ul style="list-style-type: none"> -Engage P.T.O. more carefully. -Use appropriate safety device. -Replace defective yokes.
	<ul style="list-style-type: none"> -Yoke ears worn or pounded. 	<ul style="list-style-type: none"> -Excessive working angle. 	<ul style="list-style-type: none"> -Avoid excessive working angle. -Disengage tractor P.T.O. during cornering. -Replace defective yokes.

	AVOIDABLE DAMAGES	POSSIBLE CAUSES	CORRECTIVE ACTIONS
<p>Cross kit</p> 	<p>-Cross arms broken.</p> 	<p>-Extreme torque peak or shock load.</p> <p>-Axial loads too high.</p>	<p>-Use appropriate safety device.</p> <p>-Change to a larger P.T.O. size.</p> <p>-Shorten P.T.O. shaft.</p> <p>-Replace defective cross bearings.</p>
	<p>-Bearing caps turning in their cross journal.</p> <p>-Overheated bearing caps.</p>	<p>-Excessive continuous torque and/or excessive working angle.</p> <p>-Inadequate greasing.</p>	<p>-Verify compatibility between shaft and working conditions.</p> <p>-Carefully follow greasing instructions.</p> <p>-Replace defective cross bearings.</p>
	<p>-Accelerated wear of cross kit.</p> 	<p>-Excessive continuous torque and/or excessive working angle.</p> <p>-Inadequate greasing.</p>	<p>-Verify compatibility between shaft and working conditions.</p> <p>-Carefully follow greasing instructions.</p> <p>-Replace defective cross bearings.</p>

Note: Cross bearings must be greased every 8 working hours.

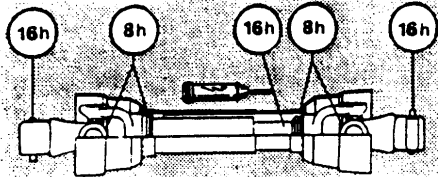
	AVOIDABLE DAMAGES	POSSIBLE CAUSES	CORRECTIVE ACTIONS
<p>Telescopic tube</p>  	<p>-Telescopic tubes failure or twisting.</p> 	<p>-Extreme torque peak or shock load.</p> <p>-Short tube engagement.</p>	<p>-Use appropriate safety device.</p> <p>-Change to a larger P.T.O. size.</p> <p>-Replace the P.T.O. drive shaft with one having adequate length.</p> <p>-Replace defective tubes.</p>
	<p>-Accelerated wear of telescopic tubes.</p> 	<p>-Extreme load when sliding.</p> <p>-Short tube engagement.</p> <p>-Inadequate greasing.</p> <p>-Contaminants (sand, etc.).</p>	<p>-Change to a P.T.O. drive shaft with rilsan coated inner tube.</p> <p>-Replace the P.T.O. drive shaft with one having adequate length.</p> <p>-Carefully follow greasing instructions.</p> <p>-Replace defective tubes.</p>

Note: Telescopic tubes must be cleaned and greased every 16 working hours.

	AVOIDABLE DAMAGES	POSSIBLE CAUSES	CORRECTIVE ACTIONS
<p>Shield</p> 	<p>-Excessive wear of shield bearings.</p> 	<p>-Insufficient lubrication.</p> <p>-Incorrect chain mounting.</p> <p>-Shield interfering with implement.</p>	<p>-Follow lubrication instructions.</p> <p>-Mount chain to allow maximum angularity.</p> <p>-Avoid contact of the shields with fixed parts of the machine or tractor.</p> <p>-Replace shield bearings.</p>
	<p>-Chain moving or failure.</p> 	<p>-Shield interfering with implement.</p> <p>-Incorrect chain mounting.</p>	<p>-Avoid contact of the shields with fixed parts of the machine or tractor.</p> <p>-Mount chain to allow maximum angularity.</p> <p>-Replace defective parts.</p>
	<p>-Guard cone damaged.</p> 	<p>-Guard cone in contact with components on the tractor and/or implement.</p> <p>-Excessive angularity.</p>	<p>-Eliminate interference between guard cones and any part on the tractor and/or implement.</p> <p>-Avoid excessive angle during cornering or when lifting or lowering the implement.</p> <p>-Replace damaged guard cones.</p>
	<p>-Guard tubes damaged (deformed and split at one side).</p> 	<p>-Guards in contact with components on the tractor and/or implement.</p> <p>-Guard tubes overlap too short or no overlap at all with extended P.T.O. drive shaft.</p>	<p>-Eliminate interference between guard cones and any part on the tractor and/or implement.</p> <p>-Replace damaged tubes.</p> <p>-Adjust guard tubes length with longer tubes.</p>

Note: Shield bearings must be greased every 8 working hours.

For any additional details (capacity, angle, length), please refer to catalogue.



Sold by:

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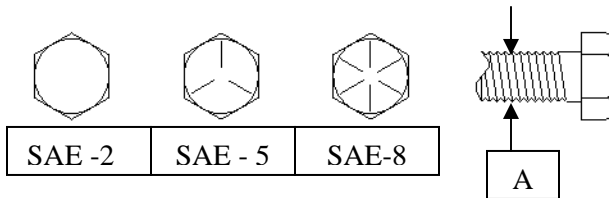
Bolt Torque
As used on this equipment

Bolt torque table shown below gives torque values for the various bolts used.
This chart is for non-lubricated threads.
Replace with the same strength bolt.

Torque Specifications. Torque values are identified by their head markings

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

Allen head cap screws are similar to SAE 8 quality.



These torques are for a reference only. Not all these sizes and grades are necessarily used in this machine. Bolts that are used as a pivot or hinge have to be used with a locknut, therefore only tighten enough to secure the bolt and still allowing the part to rotate freely.

51-60 Meteor Snowblower

Maintenance

- PTO Shearbolt – M6x40 - 8.8
- Auger Shearbolt – ¼ x 1” Gr #2
- Auger Drive Chain Tightener – tighten chain allowing ¼” sag in the bottom span of chain (between drive and driven sprocket).

Lubrication

- Gearbox- check oil level every **50** hours. Fill to oil level plug (middle of gearbox) with SAE 90 gear oil. SAE 80W90 gear oil may also be used.
- Auger and Shear Sprocket Bearing – grease sparingly every **50** hours. (By using too much grease you will push the seals off the bearing).
- PTO Shaft – grease every **10** hours. Pull apart and apply grease to the sliding members. Grease the yoke bearings at this time as well.
- Discharge chute mount – slides on a plastic ring and roller bearings retain side play. If lubrication is desired oil can be injected on plastic to prevent sticking.
- Auger Chain – apply oil on a regular basis especially after using the snowblower.

Storing the Meteor Snowblower in the off season

- At the end of the season lubricate the Bearings, PTO shaft, Discharge chute mount and Auger chain before storing it.

Notes

Part numbers – Abbreviations

O/L – obtain locally

N --- Nut

LW- Lockwasher

- All fasteners are Grade #2 unless otherwise specified.