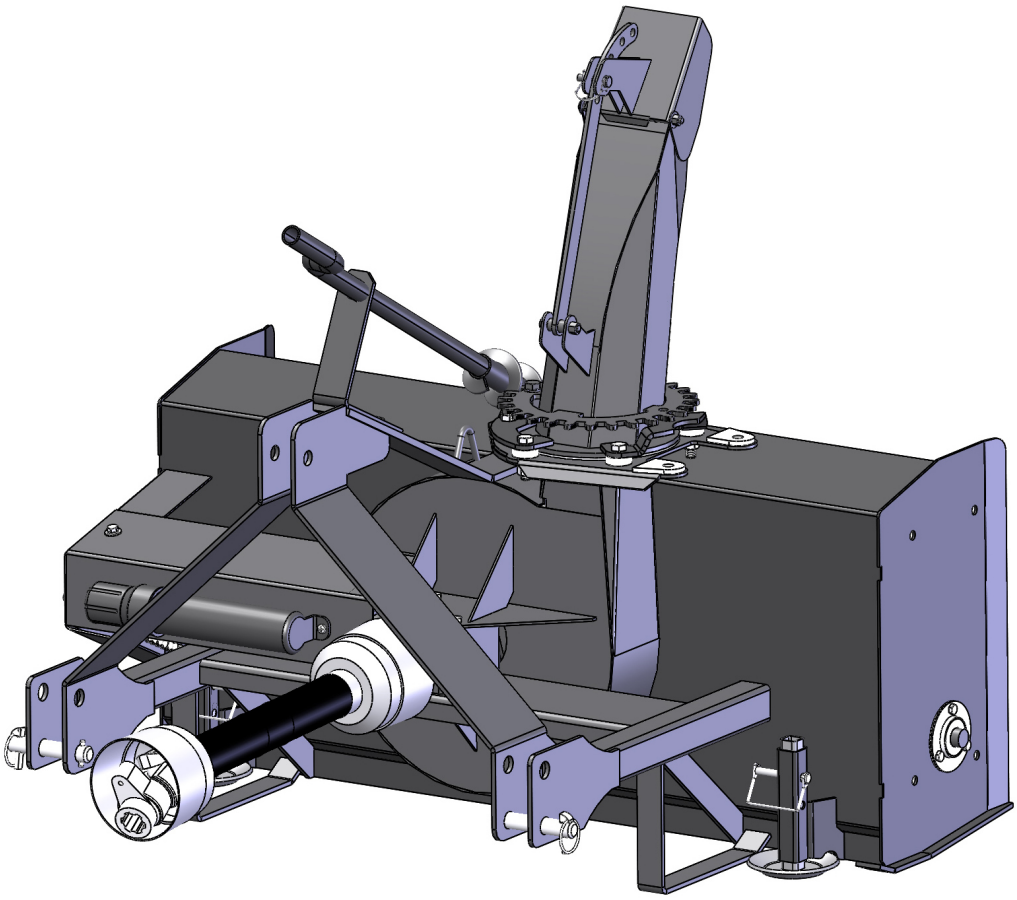
MK MARTIN ENTERPRISE Inc.
1-855-664-2752 www.mkmartin.ca

METEOR

46 Meteor Snowblower Operator's / Parts Manual



M K Martin Enterprise Inc
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rev:1-13

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Warranty Regeneration

Please Cut and Return to M K Martin Enterprise Inc

Fold And Tape here ***Do not tape all edges or use staples***

Fold Here

Postage Stamp

M K Martin Enterprise Inc
3950 Steffler Rd
Elmira ON CA N3B 2Z3

M K Martin Enterprise Inc
3950 Steffler Rd
Elmira On Ca N3B 2Z3

Purchaser's warranty protection equipment is valid only when this completed form or a copy of this form is on file at M K Martin Enterprise Inc. By filling out this form the purchaser has acknowledged delivery of equipment and owner's / operator's manual and has accepted the condition of the equipment.

Date of delivery to purchaser ----------

Type of Equipment ----------

Model # ---------- Serial # ----------

Retailer's Signature Indicates

- *Equipment was properly assembled as directed by manufacturer*
- *Equipment was tested for functionally and operates properly*
- *Purchaser was instructed in safe and proper operating procedures*
- *Warranty was explained to purchaser*
- *Purchaser was given the operators manual*

Retailer

Signature ----------

Company ----------

Address ----------

Purchaser's signature indicates

- *Acceptance of equipment fully assembled*
- *Received operator's manual*
- *Clearly understands conditions of warranty*
- *Received instructions of safe and proper operation of equipment*

Purchaser

Signature ----------

Company ----------

Mailing address ----------

City ---------- Prov/State -------- Postal Code/Zip ----------

Available phone number ----------

Warranty is valid only when it has been received by manufacturer at address

Warranty and Limitation of Liability

All equipment is sold subject to mutual agreement that it is warranted at M K Martin Enterprise Inc. (Hereafter called the company), to be free of any defects of material and workmanship. The company shall not be liable for special, indirect consequential, damage of any kind under this contract or otherwise. The company's liability shall be limited exclusively to replacement or repairing without charge at it's factory or elsewhere, at it's discretion, any material, or workmanship defects, which become apparent within one year from the date of purchase. In no event shall M K Martin Enterprise Inc. be liable for special, direct, incidental or consequential damages of any kind. The purchaser by the acceptance of the equipment will assume all liability for any damage which may result from the use or misuse by the employees or others. The purchaser shall maintain and service the equipment as recommended in this Operators Manual.

This warranty does not cover **Rental/Commercial or Industrial** use of this equipment. This equipment is rated as agricultural.

For **Rental/Commercial or Industrial** use, Warranty is for defects in material and workmanship for a period of 90 days from the date of purchase.

Warranty coverage is null and void unless the Warranty Registration form has been completed and is on file at

M K Martin Enterprise Inc
3950 Steffler Rd
Elmira On Ca N3B 2Z3

For your Record

Purchase Date ----------

Model # ----------

Serial # ----------

Please contact your retailer

Manufactured by

M K Martin Enterprise Inc
3950 Steffler Rd
Elmira On Ca N3B 2Z3
Tel:(519)-664-2752
(855)-664-2752
Fax: 519-664-3695
e-mail: sales@mkmartin.ca

www.mkmartin.ca

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 <u>injury or death!</u>**

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.

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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.**

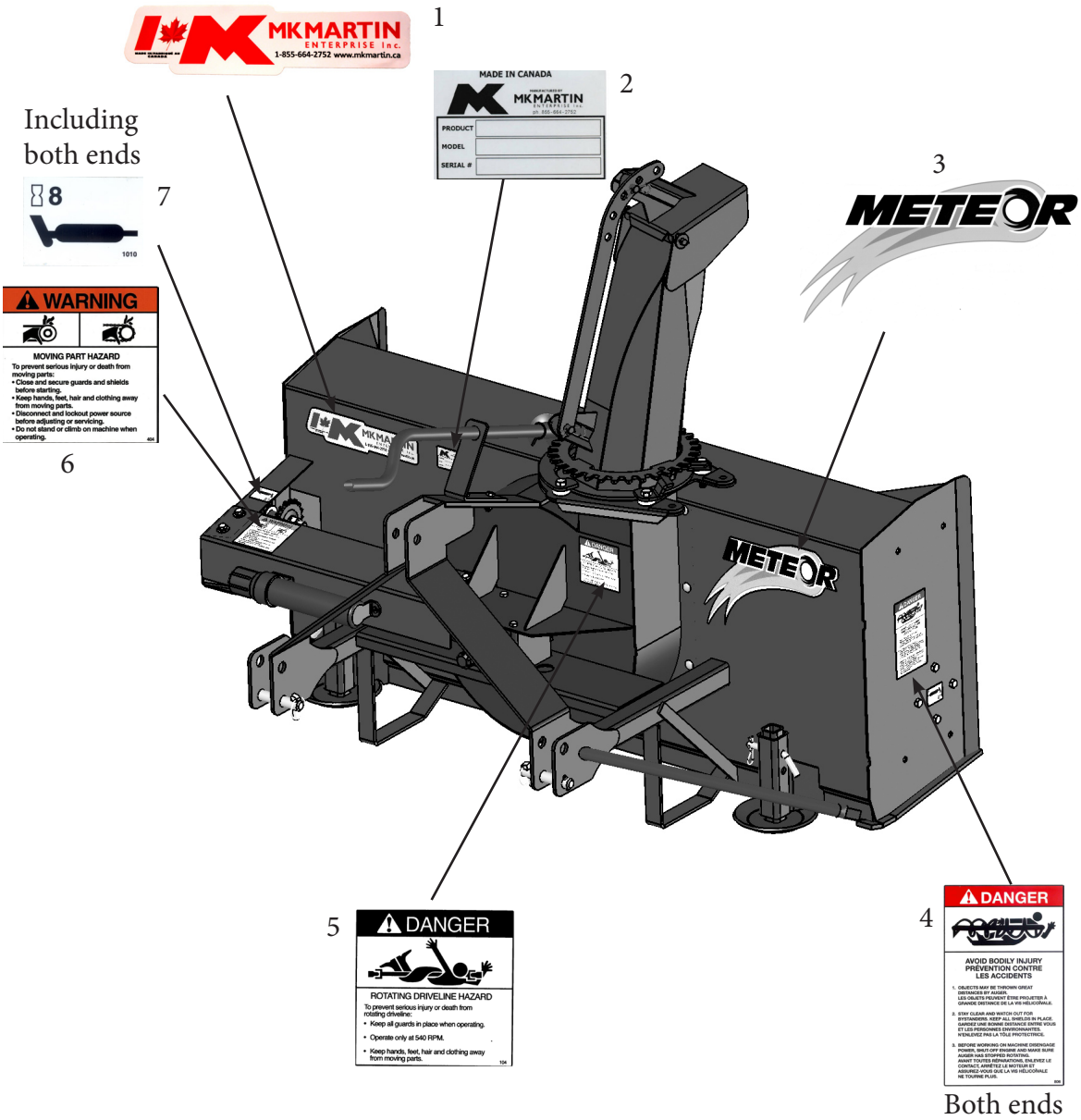
Do not paint over, remove or deface any safety signs or warning decals on the Meteor® Blower. **Observe all safety signs and practice the instructions on them.**

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 Snowblower Decal Locatin



Item #	Part #	Description	Qty
1	decalMKlogomadeincanada	M K Martin Logo	1
2	No Replacement	Serial Plate	1
3	decalmeteorlarge2012	Meteor Logo	1
4	101	Danger Decal	2
5	104	Danger Decal	2
6	404	Warning	1
7	decal1010	Grease	3

46-54-60 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		
5	2 pc 1/2" SAE washer	11	1 pc Hand Crank Assembly
6	2 pc 1/2" Thin wave washer	12	5/16x1 1/2 Spring Pin
7	2 pc 1/2-20 x 1 3/4 bolt		

Upon receiving the Meteor Blower

The blowers are shipped in a packaged state

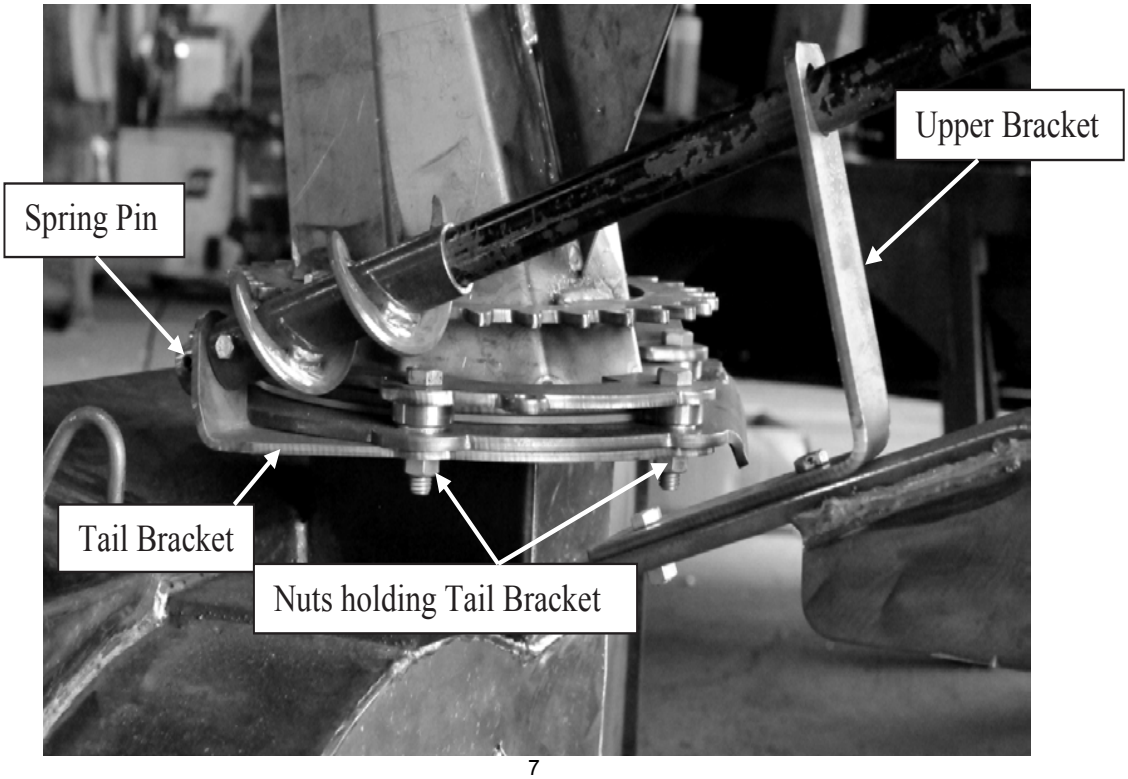
Carefully remove the chute and PTO shaft from the area of the auger and set them aside.Locate the bag or package of small components.

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 2 bolts. *The thin wave washer is to ensure the bearing race does 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.



Installing the PTO Shaft

The PTO Shaft has one end that fastens to the blower gearbox and the other end fastens on the tractor PTO.

To install the PTO Shaft to the blower; first place key stock in the keyway on the blower shaft, slide PTO shaft onto the gearbox shaft, secure the PTO to the gearbox with 1/4x2 1/2 bolt, finally secure the Keystock with a hexkey wrench.

After the PTO is installed on the blower.

Ensure that the PTO can be attached to the tractor when the blower is raised so the PTO on the tractor is level with the input on the gearbox. By doing this the PTO will not jam the tractor or gearbox. (The PTO can be shortened by sawing the ends off both sections of shaft). After cutting the shaft remove the saw burrs with a fine file and wash all the grit off before lightly oiling the pieces and reassembling them. They should slide freely.

Lift blower to the upper limit of the hitch and measure the shaft overlap "it should be at least 2" to keep it sliding straight.

46 Meteor® Snowblower

This Blower is ideal for small tractors 12 HP Cat #1 3PH.

Attaching 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 get 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 then 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 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.

Snowblower performance will vary greatly due to ambient temperature and type of snow.

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 backed 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.

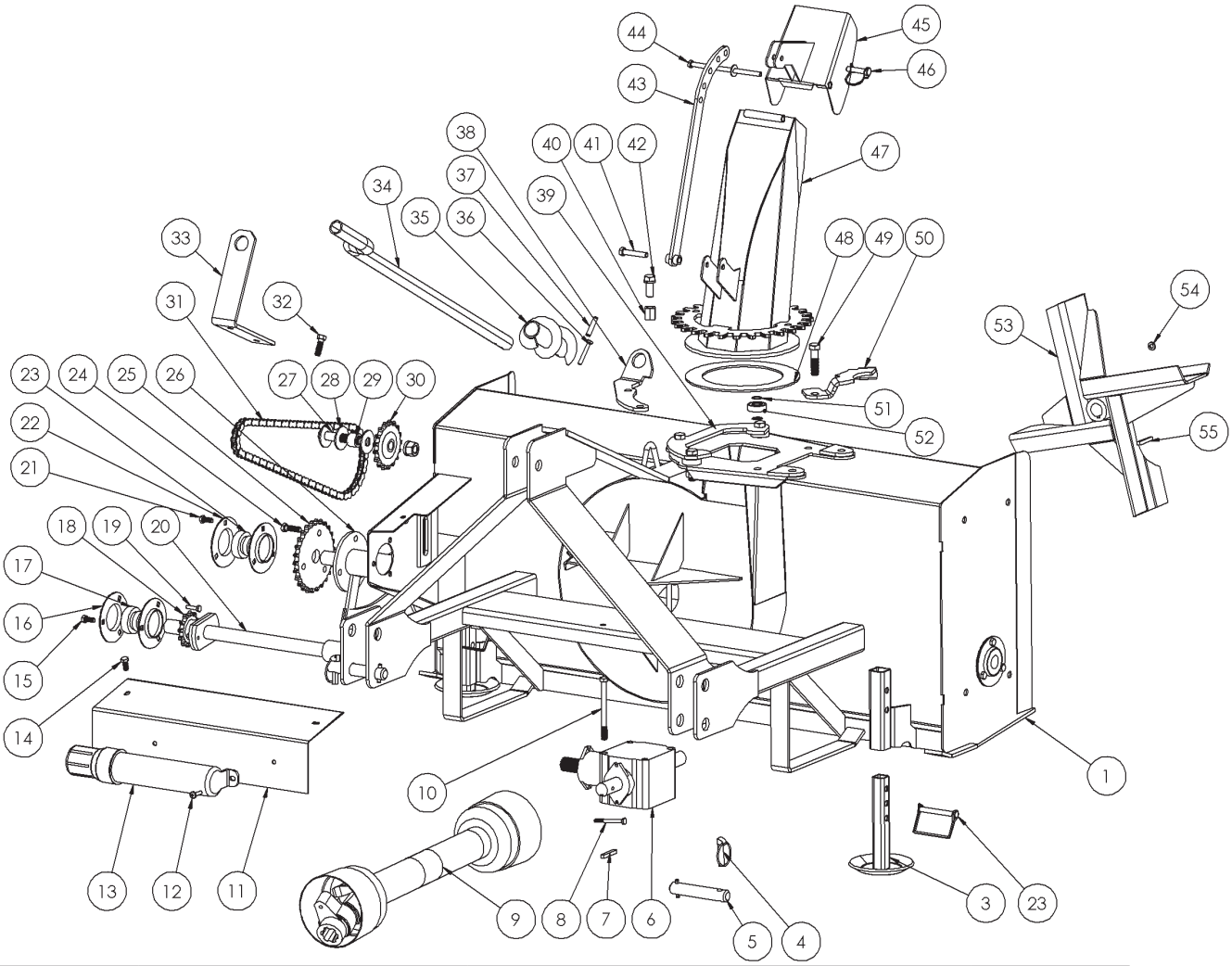
The auger is protected with a safety shear bolt that will shear off if the auger becomes jammed.

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.

46 Meteor Snowblower
Parts



Item #	Part #	Description	Qty
1	519-31602	Main Body	1
2	519-461172	PTO Style Pin	2
3	519-22451	Skid Shoe	2
4	OL	Lynch Pin	2
5	519-752096	HitcH Pin	2
6	519-511186	Gearbox	1
7	519-5111062	Key 1/4 sq x 1 3/4	1
8	OL	Bolt 1/4x2 1/2 c/w ln	1
9	PTO Assembly	519-511187	1
10	OL	Bolt 3/8x4 1/2 c/w lw, n	4
11	519-461055	Auger Drive Shield	1
12	OL	RH 1/4x1 c/w ln	2
13	DJA70111	Operator Manual Tube	1
14	OL	Flange Bolt 5/16x3/4	2
15	OL	Bolt 5/16x1 c/w lw, n	3
16	519-511174	Flangette	2

Item #	Part #	Description	Qty
17	519-511175	Bearing	1
18	519-513025	Shear Sprocket	1
19	OL	Shearbolt 1/4x1 1/2 gr2 c/w ln	1
20	519-461184	Auger Drive Shaft Compete	1
21	OL	Bolt 5/16x1 c/w lw, n	6
22	519-511174	Flangette	4
23	519-511175	Bearing	2
24	OL	Bolt 3/8x 1 1/2 c/w lw, n	3
25	519-461165	Auger Drive Sprocket	1
26	519-461164	Auger	1
27	OL	Bolt 5/8x3 c/w lw, n	1
28	OL	Flatwasher 5/8”	3
29	519-461028	Spacer	1
30	519-512029	Idler Sprocket	1
31	519-462026	Auger Drive Chain #50 x 41”	1
32	OL	Bolt 3/8x1 1/4 c/w lw, n	2
33	519-31583	Crank Base	1
34	519-5110919	Hand Crank	1
35	519-51719209	Crank Worm Gear	1
36	OL	Bolt 1/4x1 3/4 c/w ln	1
37	OL	Spring Pin 5/16x1 1/2	1
38	519-31584	Crank Tail Bracket	1
39	519-46116209	3 Hole Chute Clamp	1
40	519-51171009	Chute Stop Nut	1
41	OL	Bolt 3/8x2 c/w, ln	1
42	OL	Bolt 1/2x1 1/4 c/wln	1
43	23907	Deflector Adjuster Link	1
44	OL	Bolt 5/16x6 c/w 2fw, ln	1
45	10720	Deflector	1
46	519-461172	PTO Style Pin	1
47	10717	Chute	1
48	519-461161	Anti Frictio Ring	1
49	OL	Bolt 1/2-20 x 1 3/4 c/w ln	5
50	519-46116309	2 Hole Chute Clamp	1
51	1/2” Wave Washer (thin)	519-511702	10
52	Bearing	519-510710	5
53	Fan	519-46115208	1
54	OL	Bolt 5/16x1 c/wlw	1
55	519-5111062	Fan Key 1/4sqx1 3/4	1

OL - Obtain Localy
c/w - complete with
fw - flatwasher
lw- lockwasher
ln - locknut
n - nut

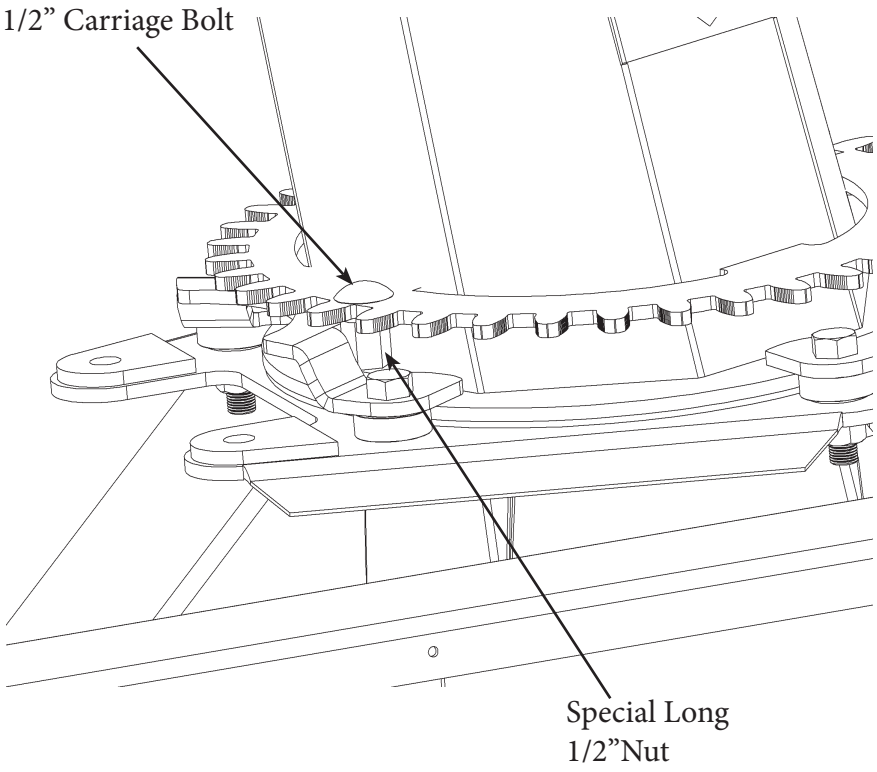
Chute Stop

The Chute Stop is standard on all Meteor Snowblowers.

It prevents the chute from being rotated straight back to the operator.

It prevents the Hydraulic hoses (*if used*) form getting wound around the chute.

On the smaller blowers with electric deflector actuator th Chute Stop prevents the wires from geeting wound up.

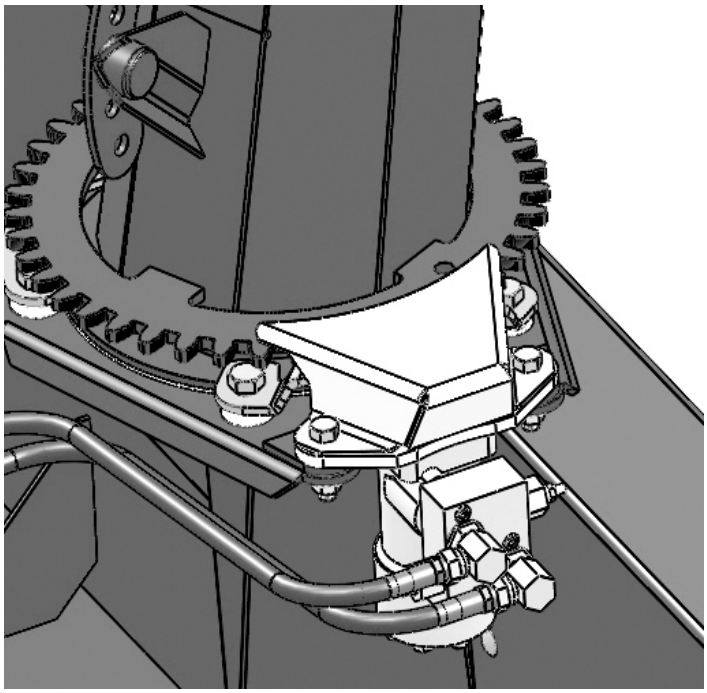


Motor Hydraulic Rotator Installation

The Hydraulic Chute Rotator uses a hydraulic motor, controlled by the tractor hydraulics to rotate the chute. The kit includes a safety shield, 2 pc 1/2-20 UNF bolts, hydraulic fittings, hoses and tractor couplings. When installing the hydraulic elbows, turn them in **"no more than 4 rounds"** then tighten the jam-nut to secure the elbow in the direction that you want the hoses to go *as shown.*

The relief valves are factory preset at 900 PSI.

Route the hoses and tie them to the top "A" frame support, away from moving parts, Ensure that the hoses do not get too tight or rub on the frame when the blower is raised or lowered.



First set the motor with the bracket on top of the Chute Plate and then place the shield on top of the motor bracket and secure with 1/2-20 UNF bolts

Please ensure that the gear does not jam or bind during the rotation of the chute. The bolt holes are slightly oversize, allowing you to adjust the clearance somewhat. You should be able to move the chute back and forth slightly.

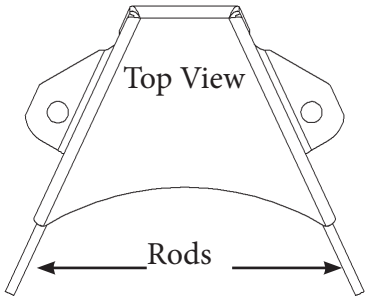
Meteor Snowblower

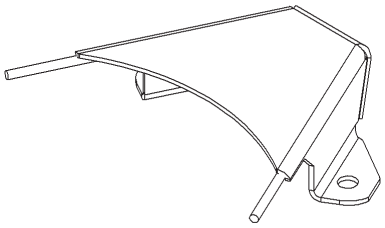
Installing Hydraulic Chute Rotator Safety Shield with Hose Guide

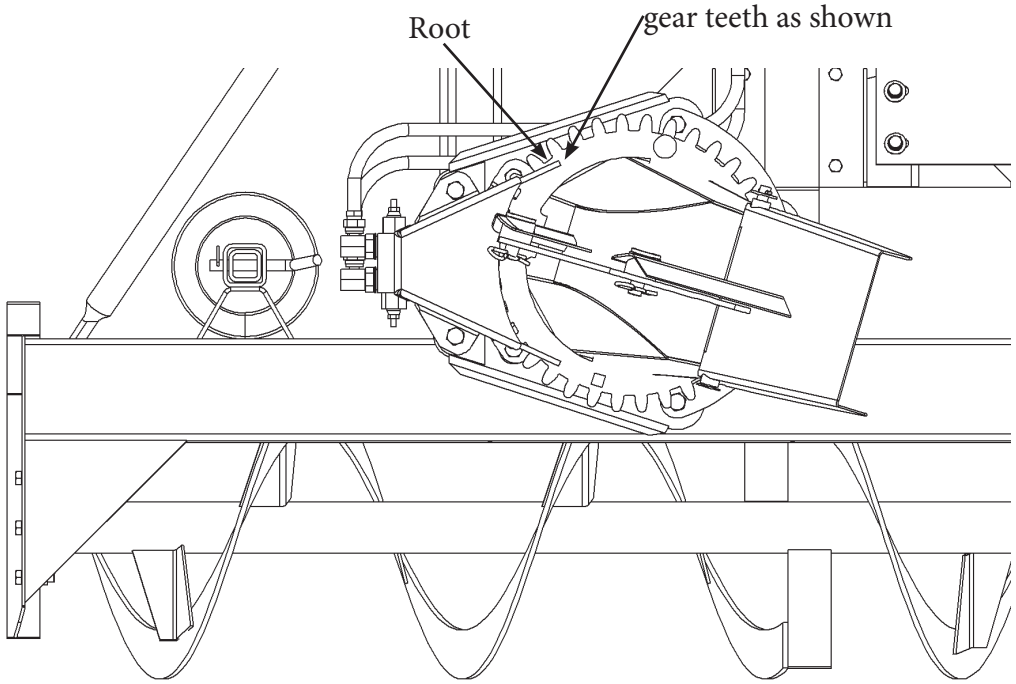
The Meteor Hydraulic Chute Rotator has rods that act as guides to guide the Deflector Hydraulic Hose (i*f used*) to the outside of the shield.

All Shields are manufactured with the Rods straight.

They may need to be bent in or out for smaller or larger blowers.







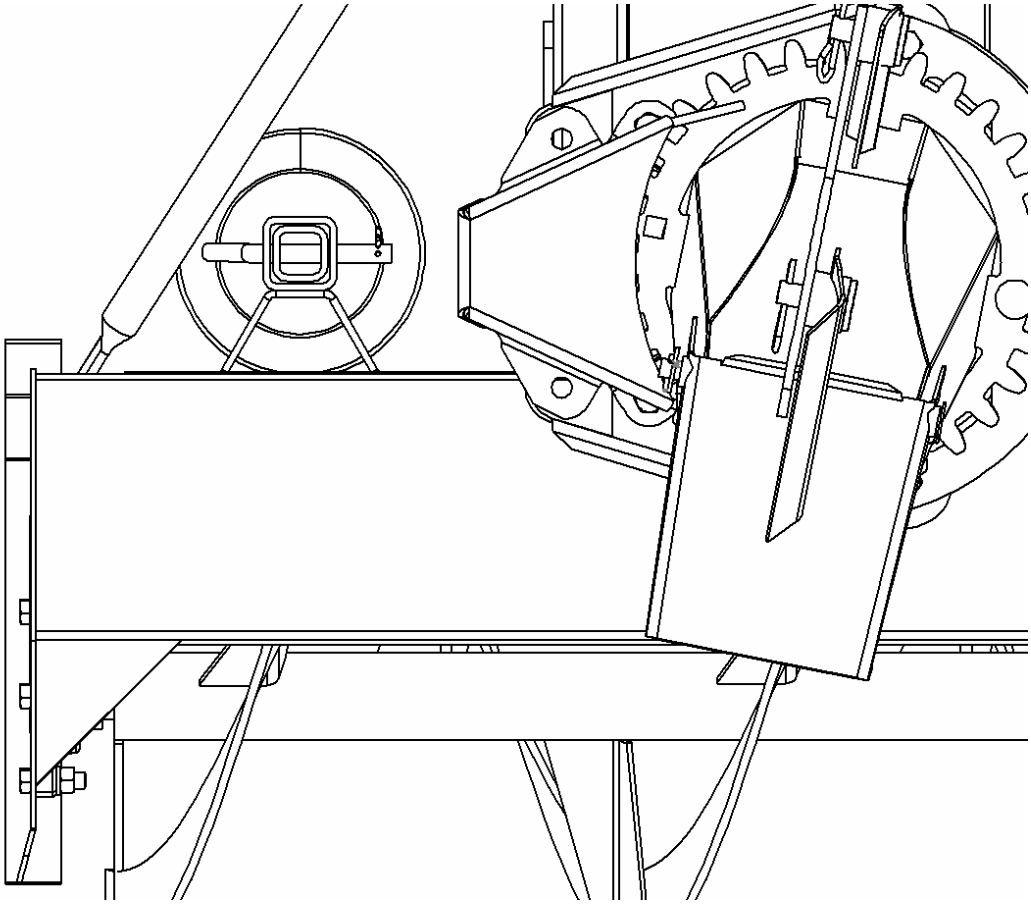
To bend the rod, you can use a short piece of 3/8 pipe for a lever, or an adjustable wrench to bend the rod.

Do not use a hammer as it has less control of the bend.

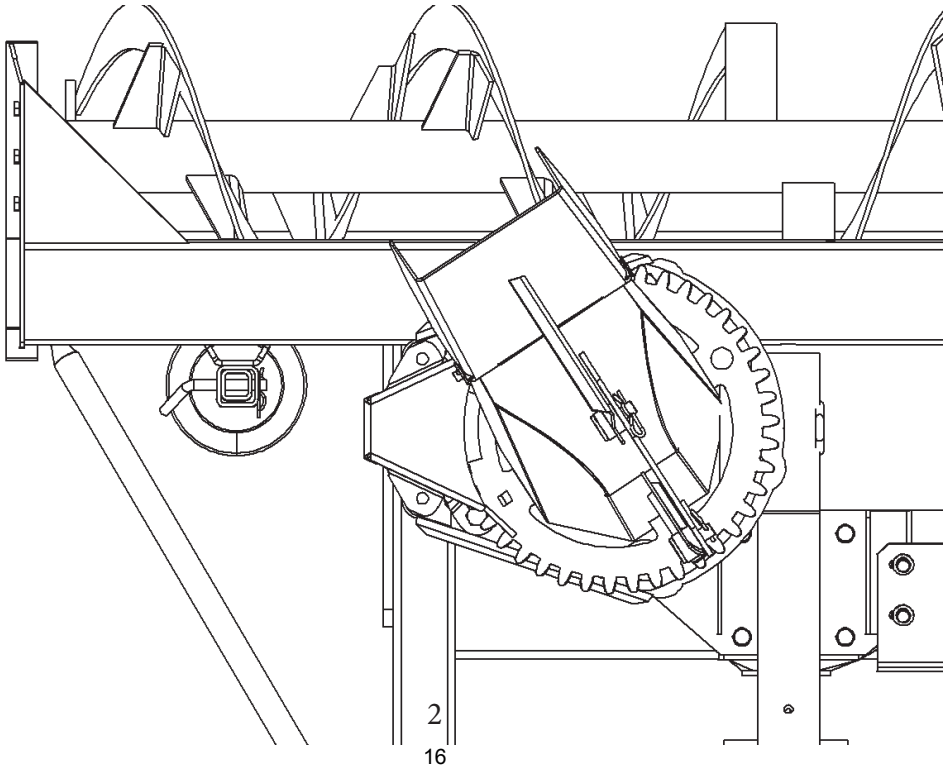
Keep the height of the rod the same, only bend it in or out.

After installation carefully rotate the chute to ensure that there is no interference or binding.

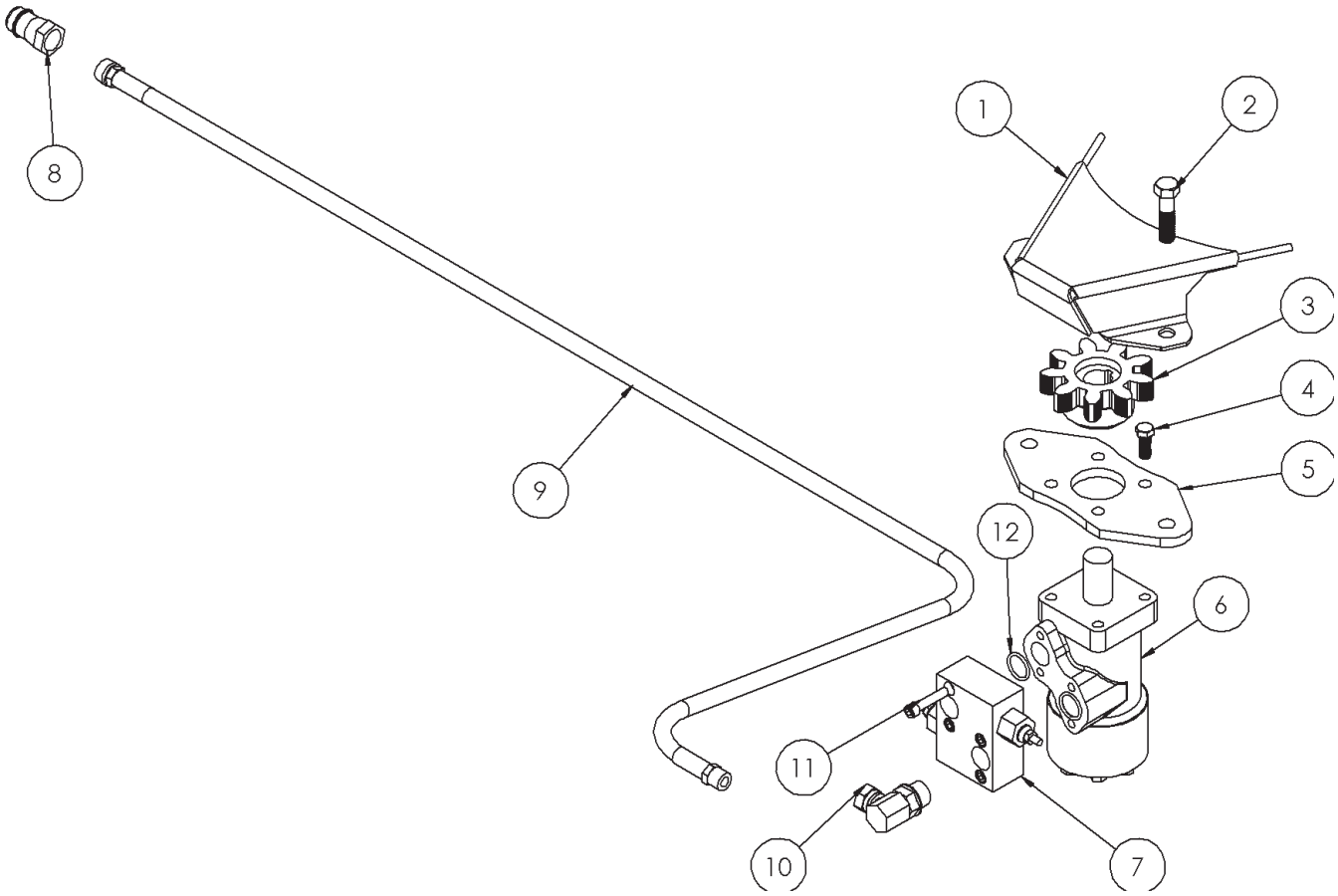
For Smaller blowers rods are bent in
as shown



For Larger Blowers rods are Bent out
as shown



Meteor Hydraulic Chute Rotator Parts



Item #	Part #	Description	Qty
1	23931	Shield	1
2	Bolt 1/2-20x2 c/w lw, n	OL*	2
3	519-511706	Small Gear	1
4	Bolt 3/8x1 c/w lw	OL*	4
5	519-511703	Motor Bracket	1
6	519-511704	Motor	1
7	519-511705	Crossover Relief Valve	1
8	S71-4	Tractor Adapter	2
9	23895	Hydraulic Hose	2
10	519-9515-10-6	Hydraulic Elbow	2
11	Socket Head Cap Screw 5/16x1 1/2	OL*	4

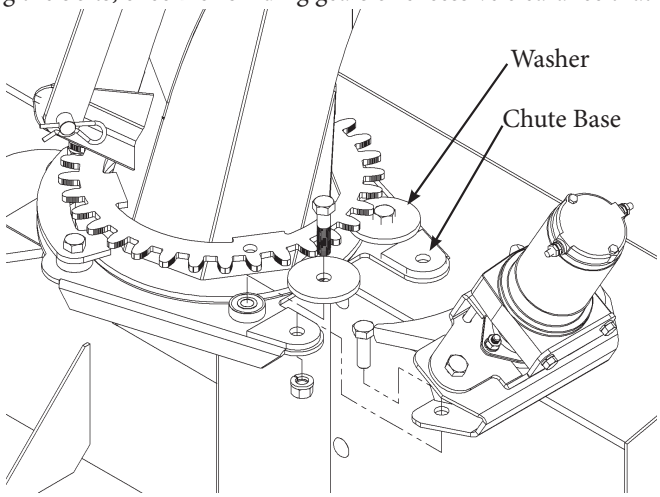
Note*

OL -- Obtain Locally

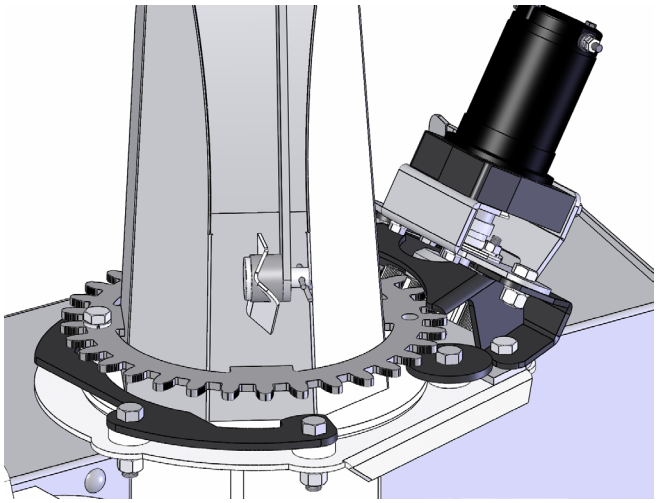
Electric Chute Rotator

Installation Instruct

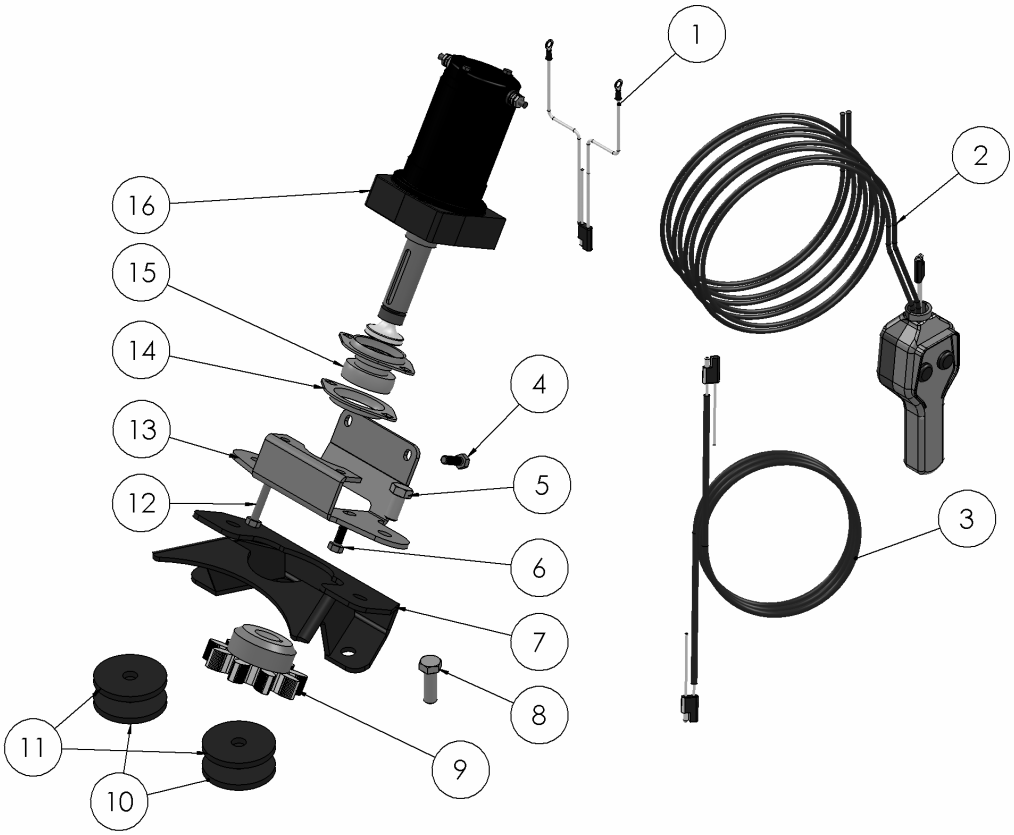
1. Replace The 2 hole Chute Clamp with the appropriate washer. (54-68 has 1/2" hole, 75- has 5/8" hole.
   Please Note: the chute bearing is between 2 washers. An SAE Washer on bottom and a thin Wave Washer on top
2. Bolt Electric Motor unit on top of Chute Base.
3. Before tightening the bolts, check for binding gears or excessive clearance that may cause the gears to



By pulling out the knob on the end of the gear shaft and giving it a 1/4 turn, the chute can be manually rotated to check for jamming.

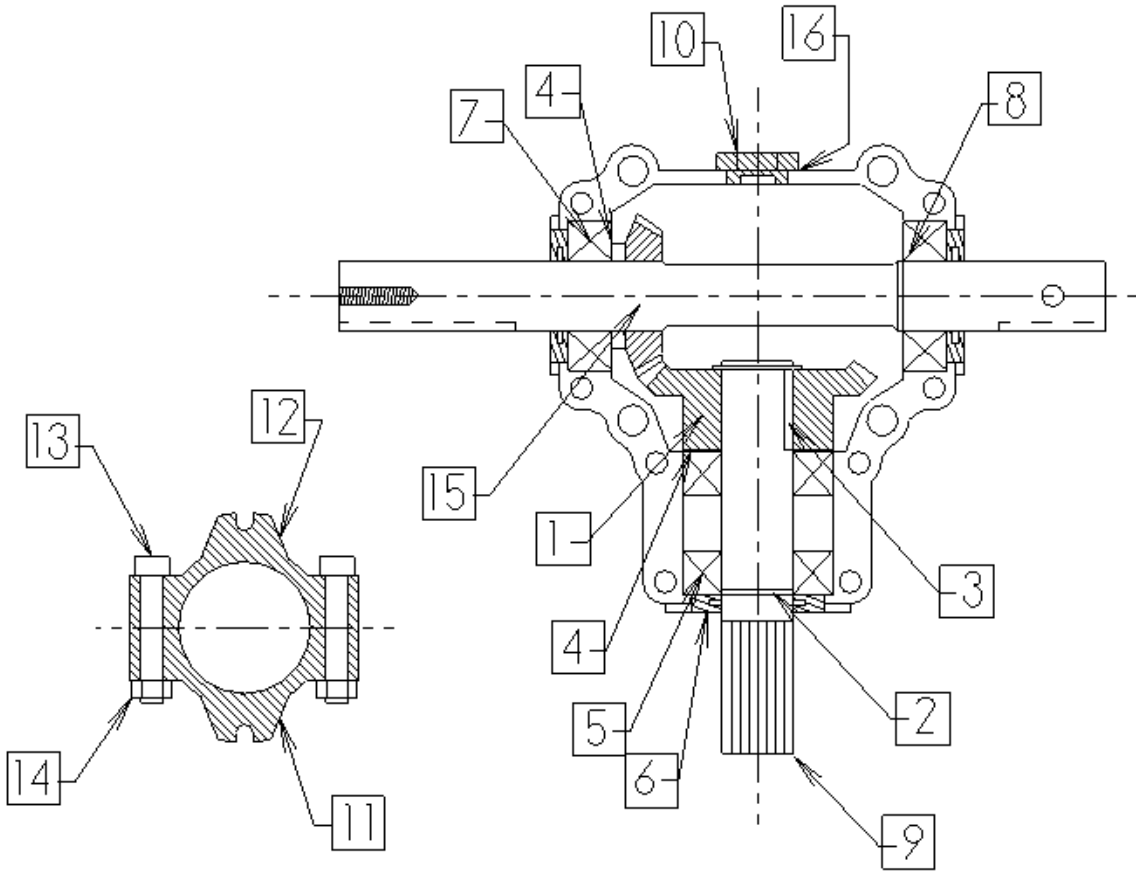


46-75 Meteor Electric Chute Rotator
Parts



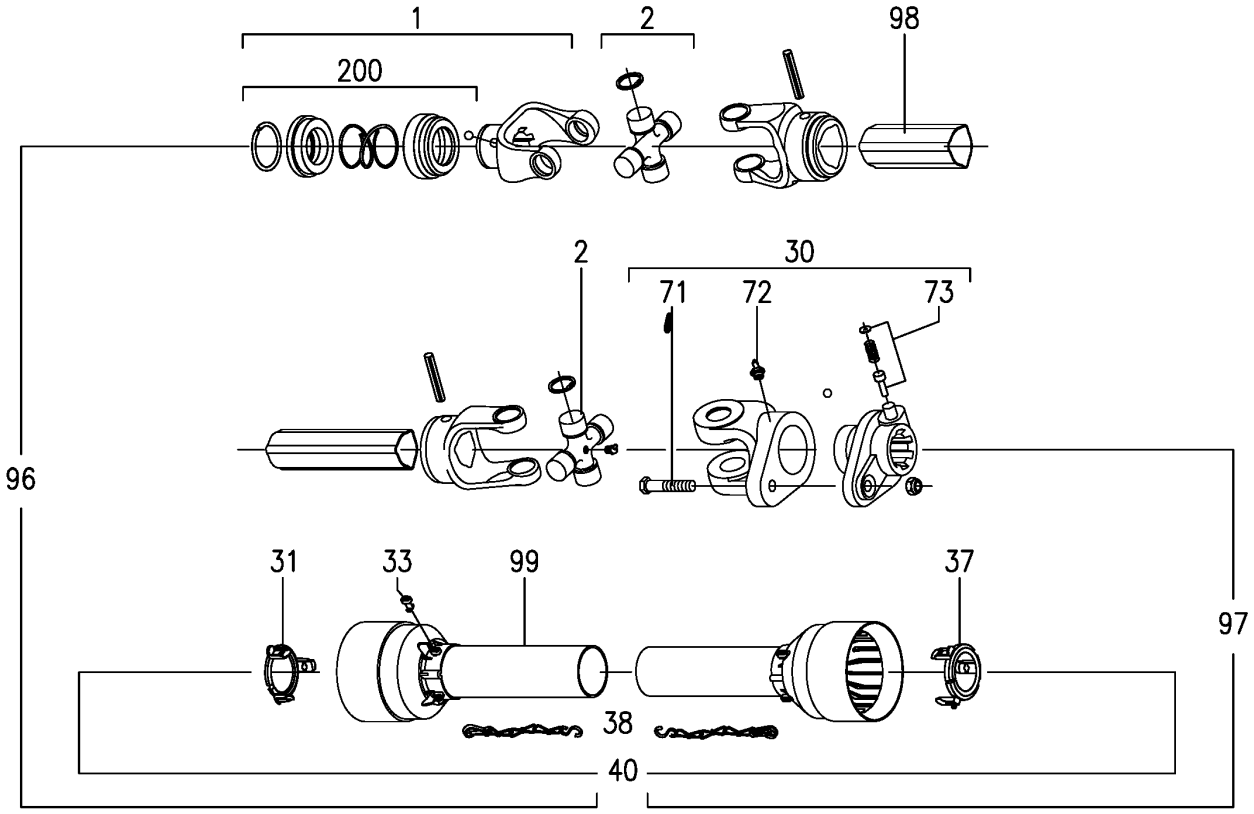
Item #	Part #	Description	Qty
1	519-6232053	Motor Connector	1
2	23589	Control Handle	1
3	10581	Control-Motor Wire	1
4	OL	Bolt 5/16x1 c/w lw	2
5	OL	Bolt 1/2x1 c/w lw, n	2
6	OL	Bolt 5/16x1 c/w lw, n	2
7	10669	Rotator Base	1
8	OL	Bolt 1/2x1 1/2 c/w lw, n	2
9	519-511706	Small Gear	1
10	23612	Large Clamp Washer 5/8”	2
11	23584	Large Clamp Washer 1/2”	2
12	OL	Bolt 5/16x2 1/2 c/w lw	2
13	31149	Motor Bracket	1
14	519-511712	Bearing Flange	2
15	519-511175	Bearing	1
16	23899	Electric Motor	1

46 Meteor Gearbox



Item No,	Description	Part No.	Req
1	Crown Wheel	519-0.124.6005.00	1
2	External Circlip 25UN17435	519-8.5.1.0004	2
3	Parallel Key 8 x 7 x 25	519-8.4.1.00015	1
4	Shim 25.6 x 0.7	519-0.100.7505.00	2
5	Bearing 6205	519-8.0.1.00590	2
6	Oil Seal 25 x 47 x 7	519-8.7.3.00257	3
7	Bearing	519-0.124.7103.00	1
8	Shim 25.6 x 6 .06	519-0.100.7506.00	1
9	Shaft 1”	519-0.124.2429.00	1
10	Plug	519-0.124.7102.00	1
11	Casing	519-1.124.0302.00	1
12	Casing	519-1.124.0303.00	1
13	Socket Head Screw M8 x 45	519-8.2.1.00382	8
14	Hex Nut M8	519-8.2.1.00382`	8
15	Bevel Pinion Z16	519-0.124.6258.00	1
16	O-ring	519-8.7.6.00191	1

Comer T20 PTO

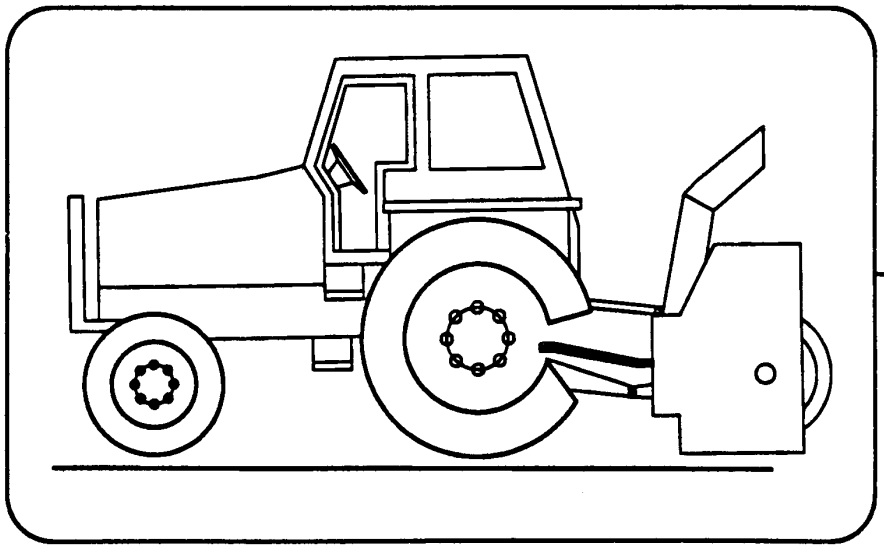


Item #	Description	Part #	Qty
1	Complete Collar Yoke	141.022.324.1	1
2	Cross Journal Assy	180.012.130	2
30	Complete Shear Yoke	143.22.003.1	1
31	Guard Retaining Collar for Outer Tube	8180.012.184	1
33	Special Plastic Bolt	8180.014.240	6
37	Guard Retaining Collar for Inner Tube	8180.012.183	1
38	Safety Chain	180.016.790	2
40	Complete Guard with Instruction Manual	142.220.252.7221	1
71	Bolt &Nut M6x40 cl 10.9	165.000.544	1
72	Grease Fitting	190.000.020	1
73	Push pin Set 1 3/8	166.026.004	1
200	Collar Kit for 1 /38 Yoke	165.000.628	1
98	Danger label for Outer Tube	190.000.216	1
99	Danger Label for outer Guard Tube	190.000.215	1
100	Instruction Manual	190.000.371	1

CANIMEX

MECHANICAL DIVISION

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... Inspite of all our efforts, machines are not built to resist all those conditions.***

Danger : Too big tractors

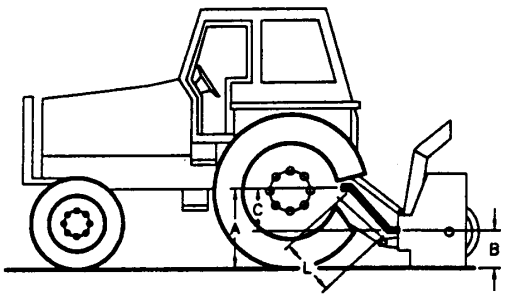
It is dangerous to use a tractor which is too big or too powerful. The tractor will always be able to overload the blower, even if the machine is already at maximum capacity. Tractor being very high, too large angles at P.T.O. universal joints will result, and life of universal joints will be shortened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

H.P.	P.T.O. angles	Estimated life in hours
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

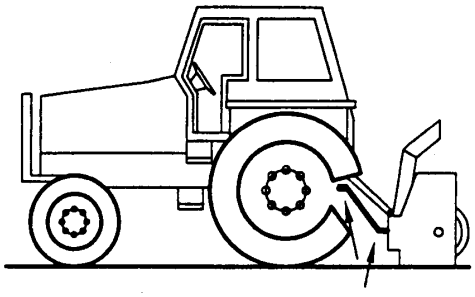


A *= P.T.O. height at tractor*
B *= P.T.O. height at blower*
C *= A - B*
L *= Cross center distance in working position*

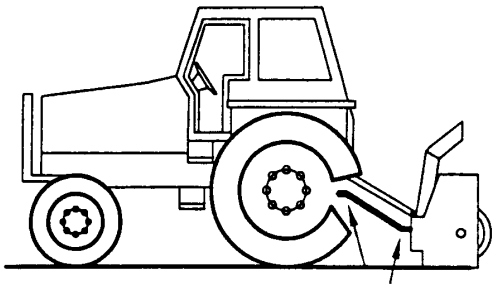
1) *Lower blower on ground.*
2) *Take measures A, B & L*
3) *Substract B of A (A - B = C)*
4) *Divide L by C (L ÷ C = F)*
5) *Compare F Factor in table below to find P.T.O. angle (interpolate, if necessary).*

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.



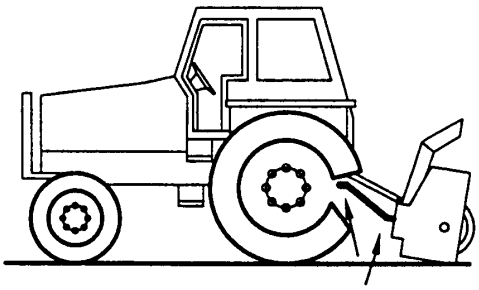
TOO LARGE ANGLES AT P.T.O. JOINTS
TO AVOID



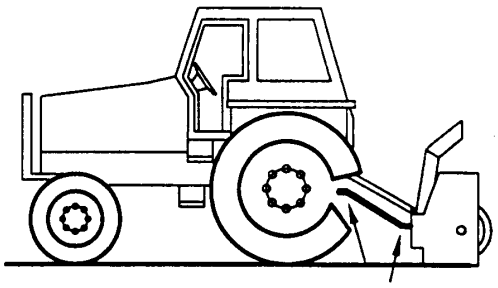
REASONABLE ANGLES AT P.T.O. JOINTS
ACCEPTABLE

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

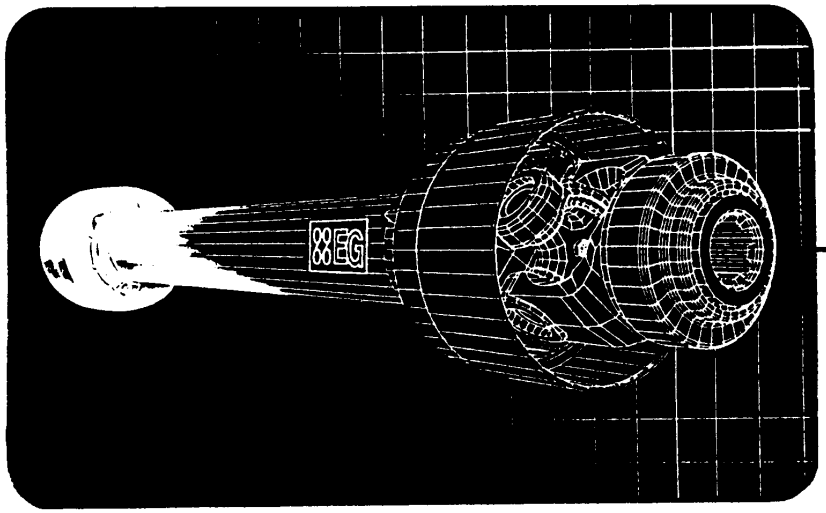
WARNING : Telescopic tubes of P.T.O. should overlap of a minimum length to meet ideal conditions for power transmission.

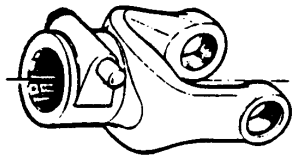
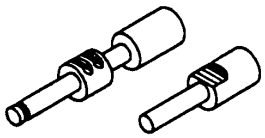
Following table could be used as a guide to find the maximum permissible length of P.T.O. :

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"

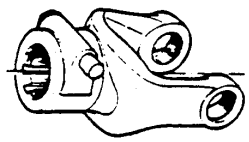
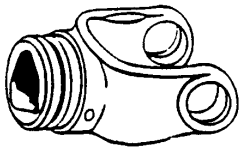
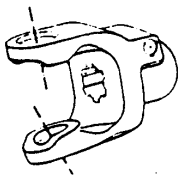
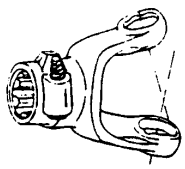
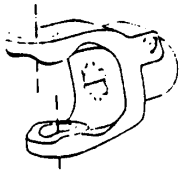
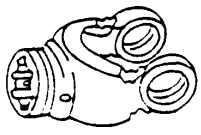
CANIMEX
MECHANICAL DIVISION

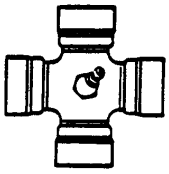
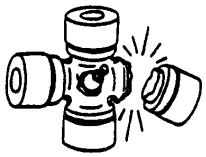
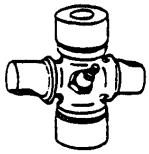
EFFECTIVE P.T.O. DRIVE SHAFT MAINTENANCE



	AVOIDABLE DAMAGES	POSSIBLE CAUSES	CORRECTIVE ACTIONS
Quick–disconnect yoke 	-Quick–disconnect pin tight or completely seized. -Quick–disconnect pin damaged (broken or bent). -Quick–disconnect pin damaged in the locking portion. 	-Quick–disconnect pin dirty (insufficient maintenance). -Quick–disconnect pin defective (forced engagement, incorrect handling). -Excessive shaft length. -Axial loads too high.	-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.

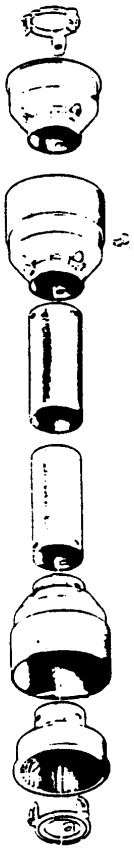
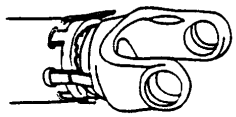
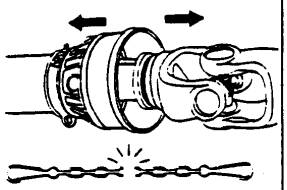
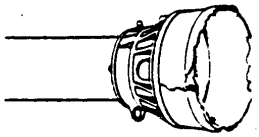
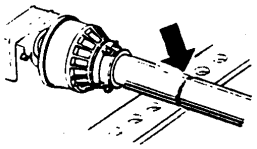
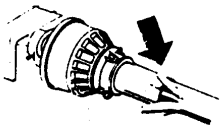
	AVOIDABLE DAMAGES	POSSIBLE CAUSES	CORRECTIVE ACTIONS
Yoke   	-Yoke ears deformation.  	-Excessive shaft length. -Axial loads too high. -Excessive working angle and torque.	-Shorten shaft length (cut both telescopic tubes as well as shields and remove burrs). -Replace defective yokes. -Clean and grease 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.
	-Yoke ears distorted. 	-Overload caused by high starting and peak torques.	-Engage P.T.O. more carefully. -Use appropriate safety device. -Replace defective yokes.
	-Yoke ears worn or pounded. 	-Excessive working angle.	-Avoid excessive working angle. -Disengage tractor P.T.O. during cornering. -Replace defective yokes.

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

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

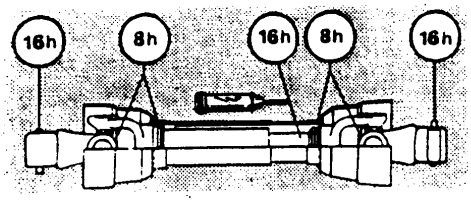
	AVOIDABLE DAMAGES	POSSIBLE CAUSES	CORRECTIVE ACTIONS
Telescopic tube 	-Telescopic tubes failure or twisting. 	-Extreme torque peak or shock load. -Short tube engagement.	-Use appropriate safety device. -Change to a larger P.T.O. size. -Replace the P.T.O. drive shaft with one having adequate length. -Replace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

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

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

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

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



Sold by:

Bolt Torque

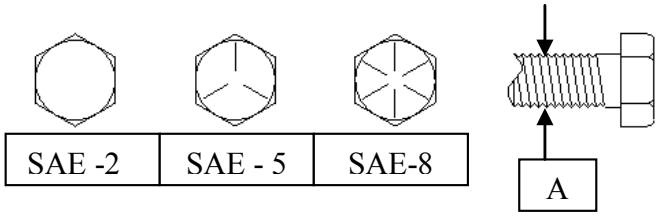
As used on this equipment

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.

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Maintenance

- PTO Shearbolt – refer to PTO assembly
- 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.
- Shear Sprocket Bearing – grease sparing every **50** hours
- PTO Shaft – grease every **10** hours. Pull apart and apply grease to he sliding members. Grease the yoke bearings at this time as well.
- Discharge chute mount – lightly oil sliding surfaces occasionally.
- 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 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.