SWEEPER

OPERATORS
AND
PARTS MANUAL

MANUFACTURED BY:
SMYTH WELDING & MACHINE SHOP LTD.
37452 GLEN'S HILL RD.
R.R.#2
AUBURN, ONTARIO
N0M 1E0
TEL: (519) 529-7212
FAX: (519) 529-3277
www.smythwelding.com
Email: info@smythwelding.com

INTRODUCTION

Thank you for choosing a *Smyth Welding* sweeper. We are confident this equipment will meet your requirements in terms of quality, performance and reliability.

This manual was made to help you in the safe operation of your new sweeper. It contains important information which will help you operate your sweeper and help it perform to its fullest capabilities.

Please read this manual completely before operating your sweeper and keep it for future reference.

Before starting the machine, you or any other person who will be operating the sweeper must familiarize yourself with the safety recommendations and the operating instructions. Please read carefully and be sure to understand and follow all recommendations and procedures.

If you require additional information on your sweeper, please contact your *Smyth Welding* dealer.

Now take this moment to enter the serial number (on the silver sticker on the back of the unit) and date of purchase of your sweeper on the "important information" sheet.

When ordering parts from your dealer, please refer to these numbers. Use *Smyth* parts for replacements.

Important Information

This manual has been prepared to provide the owner with the information required to properly operate and maintain their unit. It is important that you, the owner or operator read this manual prior to operating or performing any maintenance work on the unit. This manual is for all sweeper models.

Date of purchase:
_____

Serial Number: _____

Information needed for ordering parts:

Model Number: _____

Special Options: _____

_____

_____

_____

_____

Warranty Information

Smyth Welding Ltd. products are warranted for a period of (12) months from the original date of purchase, by the original purchaser, to be free from defects in material and workmanship under correct and normal use and proper applications.

Smyth Welding Ltd. 's obligations under this warranty shall be limited to the repair or exchange at Smyth Welding's option, of any Smyth Welding product or part which proves to be defective as provided. The customer will return his unit to his dealer where it was purchased and if the dealer agrees with the warranty, they must then notify Smyth Welding to get authorization.

The equipment must be installed (when applicable), operated and maintained in accordance with Smyth Welding's instructions.

This warranty does not extend to goods damaged or subject to accident, abuse or misuse after shipment from Smyth Welding, nor to goods altered or repaired by anyone other than an authorized Smyth Welding representative, nor to bolt on cutting edges.

Smyth Welding shall in no event be responsible for any consequential damages of any nature whether special or general, direct or indirect.

Any warranty or claim which differs from that set out is unauthorized by Smyth Welding Ltd. and is the warranty only of the party making it. Smyth Welding Ltd. makes no other warranty express or implied and the original user's sole remedy for breach thereof is as set forth.

To obtain warranty a copy of original bill of sale is required and all claims must be submitted within a thirty (30) day period from date of failure repair.

SAFETY SECTION

Read this manual before attempting to operate this equipment.

The operator's manual should be regarded as part of the sweeper. Suppliers of both new and secondhand sweepers are advised to keep documentation indicating that this manual was provided with the sweeper.

The manual contains information regarding installation, operation and maintenance required for this sweeper and optional equipment. It also includes detailed parts lists.

Obey all safety instructions listed in this section and throughout this manual. Failure to obey instructions in this section could result in death or serious injury.

BEFORE ATTEMPTING ANY TYPE OF ASSEMBLY, OPERATION, MAINTENANCE OR OTHER WORK ON OR NEAR THIS PRODUCT

- **READ & COMPLETELY UNDERSTAND THIS MANUAL**
- **READ & COMPLETELY UNDERSTAND THE MANUALS PROVIDED WITH YOUR POWER-UNIT, LOADER AND QUICK-ATTACH**

Purpose of Sweeper

This sweeper is designed solely for use in grounds maintenance, road, driveway and parking lot maintenance, certain farm applications and similar operations. Use in any other way is considered contrary to the intended use. Compliance with and strict adherence to operations, service and repair conditions, as specified by the manufacturer, are also essential elements of the intended use.

Know all your controls and know how to quickly stop all power unit movement and the sweeper movement.

Accident prevention regulations, all other generally recognized safety regulations and all road traffic regulations must be observed at all times.

Any modifications made to this sweeper may relieve the manufacturer of liability for any resulting damage or injury.

This sweeper should be operated, serviced and repaired only by persons who are familiar with its characteristics and acquainted with relevant safety procedures.

Know and follow good work practices when assembling, mounting, maintaining, repairing, removing and storing this product:

- **Wear appropriate protection equipment (i.e. hard hat, safety glasses, work gloves, respirator, ear protection and protective shoes)**
- **Does not wear loose clothing, loose or uncovered hair, or any accessories (jewellery, necktie, scarf, wrist watch, etc) that can catch in moving parts**
- **Has annually reviewed all safety instructions**
- **Work on a level surface in a well lit area**
- **Keep area dry and clean**
- **Use properly ground electrical outlets and tools**
- **Use the right tool for the job to be done**
- **Make sure that your tools are in good condition for performing the deserved function**
- **When using tools, wear the protective equipment specified by the tool manufacturer**

When your power unit is used during any type of assembly, operation, maintenance or other work on or near this product, make sure:

- **Before leaving the operator's station or before beginning any type of work on this product, lower this product to the ground, apply your power unit's parking brake, stop the engine, remove the starter key, wait for all moving parts to stop and then relieve the pressure in the hydraulic lines (refer to your power unit's**

operator's manual for instructions on how to relieve hydraulic pressure in lines)

- **Know your loader's safe lifting and operating capacity and the weight of this product. See the specifications in this manual for the weight of this product and your loader's operator's manuals for safe operating limits. Lift capacity may be reduced if using a quick attach**
- **Never allow anyone, except the operator, to be around the power unit on this product when either is in motion. Do not start up unless others are clear of the work area.**
- **Do not allow riders on this product or the power unit**
- **Do not stand or climb on this unit when operating**
- **Do not place any part on your body under any part of this product unless the product is off and securely resting on adequate blocking or on the ground**
- **Do not use blocking made of concrete blocks, logs, buckets, barrels, or any other material that could suddenly collapse or shift positions. Do not use any material that is showing signs of decay or that is warped, twisted or tapered**
- **Never operate controls from the ground. Operate the controls from the operator's station only**
- **Never leave equipment unattended with the engine running or with this product raised**
- **Be aware of added weight and width of this product. Reduce travel speeds accordingly, especially when traveling on rough ground**
- **Keep this product close to the ground and under control when transporting**

Safety Alert Symbol

This safety alert symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of injury. Carefully read the message that follows and inform other operators.

DECALS

Safety Decals are affixed wherever special safety precautions are indicated.
Locate them on your machine and read them carefully. If a decal is damaged, lost or illegible, install a new one.

****Observe the correct PTO speed. DO NOT exceed the correct PTO speed. PTO speed is 540 rpm on all models**

SAFETY INFORMATION

Read all safety information in this manual. All operators must read and understand the entire contents of this manual before sweeping. General safety practices are listed on Safety Information pages and specific safety information is located throughout this manual.

OPERATION

CAUTION **A sweeper is a demanding machine. Only fully trained operators or trainee operators under the close supervision of a fully trained person should use this machine.**

BEFORE OPERATING SWEEPER:

- **Learn sweeper and power unit's controls in an off-road location.**
- **Be sure that you are in a safe area, away from traffic or other hazards.**
- **Check all hardware holding the sweeper to the power unit, making sure all is tight.**
- **Replace any damaged or fatigued hardware with properly rated fasteners. See maintenance section.**
- **Make sure all hydraulic hardware and hydraulic fittings are tight.**
- **Replace damaged or fatigued fittings or hoses.**
- **Check power unit's tire pressure before sweeping or operating.**
- **Improper tire pressure can affect sweeping performance. Check tire ratings to be sure they match the power unit load. Weigh the sweeper end of the power unit, if necessary, to insure proper tire rating**
- **Remove from the sweeping area all property that could be damaged by flying debris.**
- **Be sure all persons not operating the sweeper are clear of the sweeper discharge area.**
- **Always wear proper apparel such as a long-sleeved shirt buttoned at the cuffs; safety goggles, goggles or a face shield; ear protection; and a dusk mask.**

DURING OPERATION

- **WARNING-Never raise the sweeper more than a few feet off the ground. The sweeper can tip back or the power unit can tip over causing death or serious injury.**

- **Before leaving the operator's area for any reason, lower the sweeper to the ground.**
- **Minimize flying debris-use the slowest rotating speed that will do the job. See Operator's Manual.**
- **Keep hands, feet, hair and loose clothing away from all moving parts.**
- **Be aware of the extra weight and width a sweeper adds. Reduce travel speed accordingly.**
- **When sweeping on rough terrain, reduce speed to avoid "bouncing" the sweeper. Loss of steering can result.**
- **Never sweep towards people, buildings, vehicles or other objects that can be damaged by flying debris.**
- **Only operate the sweeper while you are in the operating position.**

HONDA ENGINE SAFETY-general

- **THE HONDA ENGINE SAFETY MANUAL SHOULD BE CONSIDERED TO BE A PERMANENT PART OF THE ENGINE AND SHOULD REMAIN WITH THE ENGINE IF RESOLD**
- **Your safety and the safety of others are very important. Honda Engines have provided important safety messages in their manual and on the engine. Please read these messages carefully in the Honda Engine Safety Manual provided with your engine powered sweeper**
- **Understand the operation of all controls and learn how to stop the engine quickly in case of emergency. Make sure the operator receives adequate instruction before operating the equipment**
- **Do not allow children to operate the engine. Keep children and pets away from area of operation**
- **Your engine's exhaust contains poisonous carbon monoxide. Carbon monoxide gas is toxic. Breathing it can cause unconsciousness and even kill you. Do not run the engine without proper adequate ventilation, and never run the engine indoors**
- **The engine and exhaust become very hot during operation. Keep the engine at least 1 meter (3 feet) away from buildings and other equipment during operation. Keep flammable materials away, and do not place anything on the engine while it is running**
- **This engine is certified to operate on unleaded gasoline. Unleaded gasoline produces fewer engine and spark plug deposits and extends exhaust system life.**
- **Gasoline is highly flammable and explosive, and you can be burned or seriously injured when refueling. Stop the engine and keep heat, sparks, and flame away. Refuel only outdoors and wipe spills immediately**
- **Improperly maintaining this engine, or failure to correct a problem before operation, can cause a malfunction in which you can be seriously hurt or killed. Always perform a pre-operation inspection before each operation, and correct any problem-SEE HONDA ENGINE SAFETY MANUAL FOR THE CHECK LIST FOR THIS PROCEDURE**

- **For engine start models- a battery can explode if near open flame, heat or smoking materials. Keep away from all of these.**

PTO SAFETY

- **Be sure there are no obstructions around the equipment and that there is no one standing near the equipment when in operation**
- **Do not operate a machine in a confined or non-ventilated area**
- **Do not perform any adjustments, cleaning, maintenance or repairs with the engine running. The engine must be stopped and the PTO disengaged. Preferably remove the key from the ignition**
- **Before operating make sure the PTO is properly installed and secured**
- **Before starting the sweeper, make sure the unit is free of all debris**
- **Put the PTO control in the neutral position before starting the engine**
- **Keep hands, feet and clothing away from the moving parts of the sweeper**
- **Before performing any maintenance or repairs, always disengage the PTO, stop the engine and relieve all hydraulic pressures**
- **Do not operate in excessive inclined areas. Be careful when turning on slopes**
- **Never operate the sweeper near buildings, windows or other vehicles**
- **Be careful when backing up, make sure you have good visibility**
- **If undue vibrations are felt, disengage the PTO, stop the engine and look for causes of vibration. Vibration is usually the indicator of a problem.**
- **At the end of operation, disengage the PTO, lower the sweeper, put the transmission in neutral, apply the parking brake, stop the engine and remove the key from the ignition**

WHEN DEALING WITH HYDRAULICS DURING ANY TYPE OF ASSEMBLY, OPERATION, MAINTENANCE, OR OTHER WORK ON OR NEAR THIS PRODUCT:

- **Hydraulic fluid under pressure can penetrate the skin and cause serious injury or death. Hydraulic leaks under pressure may not be visible**
- **If any fluid penetrates the skin, GET IMMEDIATE MEDICAL ATTENTION. See attached MSDS.**
- **Wear safety glasses, protective clothing, and use a sound piece of cardboard or wood when searching for hydraulic leaks. DO NOT USE YOUR HANDS.**
- **Before connecting or disconnecting hydraulic hoses, read your power unit's operator's manual for detailed instructions on connecting and disconnecting hydraulic attachments.**
- **Make certain that all parts meet the specifications for this product when installing or replacing hydraulic hoses or fittings.**
- **After connecting hydraulic lines:**
  - **Slowly and carefully raise the loader and cycle the rollback/dump cylinders to check hose clearances and check for any interference.**
- **Operate the hydraulics on this product to check hose clearances and to check for any interference.**
- **Make certain that the hoses cannot interfere with or actuate the quick-attach mechanism.**
- **Make certain that hoses will not be pinched, or get tangles, in any equipment.**
- **DO not lock the auxiliary hydraulics of your power unit in the ON position,**
- **Refer to your power unit's operator's manual and this manual for procedures and intervals, then inspect and maintain the entire hydraulic system to insure that the fluid remains clean, that all devices function properly, and that there is no fluid leaks.**

Maintenance

Stop the unit, disengage the PTO drive and completely shut down the tractor engine with the sweeper set on the ground or completely unhooked from the tractor before doing any adjustments or service.

Installing New Chain

Before installing new chain carefully check the teeth on the sprocket. If the teeth are worn to a hooked shape, the sprockets should be replaced to assure full capacity performance and a satisfactory life from the new chain. Tight chain causes an additional load which increases wear on chain joints, sprockets and shaft bearings. Slack chain produces vibration, which may result in excessive chain wear, noise or shock loading.
***Tighten chain allowing ¼" sag in the bottom span as the chain wears*.**

Sprocket Inspection

Check for common sprocket problems which lead to replacement.

- **Wear on the sides, which is due to misalignment**
- **Tooth wear (indicated by hooking)**
- **Broken teeth**
- **Cracks that might lead to failure**
- **Wobbling of sprockets on shaft**

Grease – Bearings

For the best results, the grease should be pumped into the bearings slowly until a very slight bead of grease forms around the bearing seals on the shaft. This bead, in addition to acting as an indication of inadequate lubrication, provides extra protection against entry of foreign material. To prevent premature failure, always make sure the grease zerk, grease gun tip and the grease are clean and free of

any dirt, grit, paint or foreign material.

Shear Bolts

Shear bolts are built to break under shocks on the PTO. However, under certain circumstances, this security is not adequate.

If the shear bolt breaks, make sure to always replace it with a same category bolt (grade 5 for PTO series 20-40-60). It is necessary to always maintain that this bolt is very tight, in order to keep the efficiency of the shearing mechanism.

WARNING

The sweeper gearbox shafts are made with a special alloy steel. Moreover, they are case hardened to increase capacity to shock load. These shafts cannot be broken under normal loads. However, undesirable objects may enter the sweeper and either bend or break the gearbox shaft. It is understood that the gearbox cannot be built to resist every possible overload, and consequently, gearbox shafts will NOT BE REPLACED UNDER WARRANTY. Therefore, the user of the sweeper must be.

Maximum length of PTO shaft

WARNING

Telescopic tubes of PTO should overlap 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 PTO:

Description of PTO	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”
T60-086P	37:3/4”	47”1/4”	7”

SWEEPER INSTALLATION AND RUNNING PROCEDURES:

44 TA

Installation:

On a flat level surface, attach your tow vehicle to the sweeper hitch. Draw bar height of your tow vehicle should be between 6" and 14" from ground level.

Check fuel and oil levels in the motor (refer to Honda manual) and ensure that the broom is in the lift position.

Start the engine, and move to the area to be swept. With the engine warm, move the throttle to ¾ to full position and move the lever out of the lift position and immediately move forward slowly.

Sweeping conditions:

For best results, sweeping should be done when conditions are dry and soil is firm.

For asphalt or other hard surfaces, these surfaces should be dry to slightly damp to.

44 TB

Installation:

On a flat, level surface, attach your tow vehicle to the sweeper hitch. Drawbar height from your tow vehicle should be between 8" - 15" from ground level.

Loosen the two bolts in FIG. A. By sliding the first bolt up or down through its slotted hole you will adjust the attitude of the sweeper. The rubber skirt across the front of the sweeper body should be ½" – ¾" off the ground level. Once this is achieved, tighten both bolts securely.

Check fuel and oil levels in the gear box and motor (refer to Honda manual) and ensure that the broom is in the lift position.

Start the engine, and move to the area to be swept. With the engine now warm, move the throttle to the ¾ full position and pull the broom tension lever toward you and move forward slowly.

Sweeping conditions:

For best results, lawns should be dry and the soil firm.

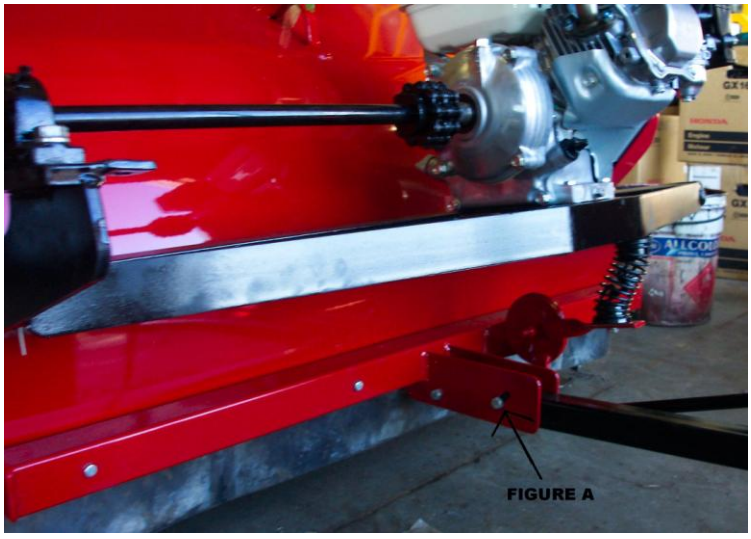


FIGURE A

Installation Instructions for Better PTO Shaft & Gearbox Operation

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

WARNING: Unfortunately, the sweeper will be faced with forgotten or hidden objects in your path, such as chain, tires, stones, pieces of wood, etc…in spite of our sweeper's strength and durability, they are not built to handle all of these conditions.

DANGER: TRACTOR TOO LARGE

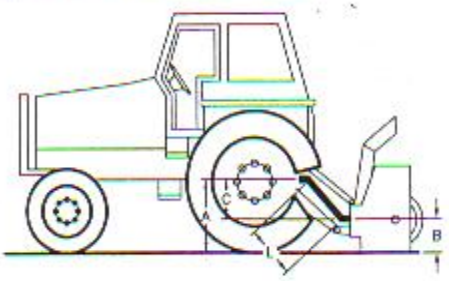
It is dangerous to use a tractor, which is too big or too powerful. The tractor may be able to overload the sweeper, even if the machine is already at maximum capacity. If the tractor is too high, extreme angles at PTO shaft universal joints will result, and the life of these U-joints will be shortened dramatically.

PTO Shaft Angles

PTO shafts are made to transmit power with angles at universal joints. However, these angles should be kept to a minimum. The angle, the the shorter the life of the PTO.

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

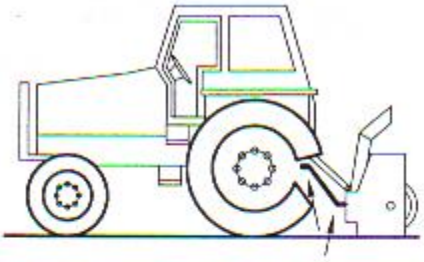


1) Lower blower on ground.
2) Take measures A, B & L
3) Subtract B of A (A - B = C)
4) Divide L by C (L ÷ C = F)
5) Compare F Factor in table below to find P.T.O. angle (interpolate, if necessary).

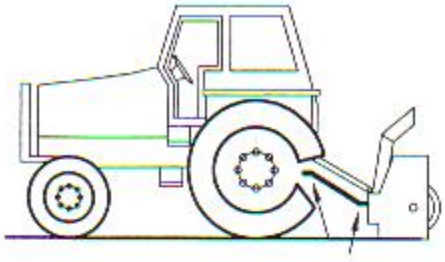
F FACTOR	ANGLE
6	10°
3.75	15°
2.75	20°
2.15	25°
1.75	30°

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

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.



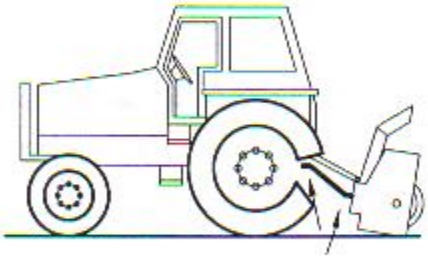
TOO LARGE ANGLES AT P.T.O. JOINTS
TO AVOID



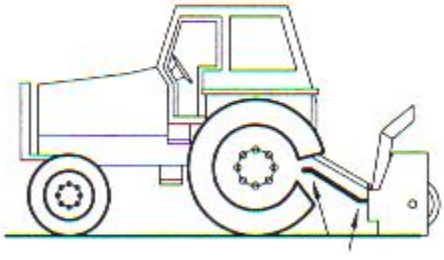
REASONABLE ANGLES AT P.T.O. JOINTS
ACCEPTABLE

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.*

Hydraulic sweeper installation and hydraulic connection

Sweeper Connection:

Place the sweeper on a firm, level surface that is large enough to accommodate this product, your power unit and all works involved in the mounting process.

Refer to your operator's manual for your power unit, loader and quick attach and follow the mounting instructions within.

Carefully raise the loader and cycle the rollback/dump cylinders to check clearances and to verify that all mounting procedures have been successfully completed.

Lubricated all grease fittings before connecting this sweeper to your power unit's hydraulic system.

Hydraulic Connection:

Disconnect the hydraulic hose quick couplers from one another and attach the quick couplers to your power unit (refer to owner's manual for power unit)

Carefully raise the loader and cycle the rollback/dump cylinders to check hose clearances and to check for any interference. Operate the hydraulic motor(s) and/or cylinders on this product to make the same checks.

SWEEPER PARTS

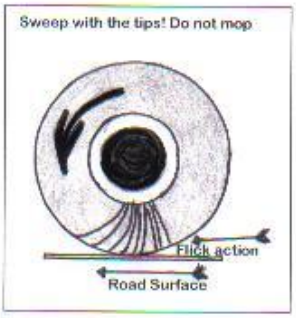
SWEEPER	CHAIN (a)	BEARINGS (b)	WHEELS (c)	SPROCKETS (d)	IDLERS (e)	BELTING (f)	SPRINGS (g)	SHOCK ABSORBERS (h)	PTO (i)	MOTOR (j)	GEAR BOX (k)
44"TA (1)	48" #50 Chain	2-1"UCFL 205 1-¾" UCP 204	410/350X4 -3/4"	5010-3/4" BORE 5020-1" BORE	50	N/A	N/A	N/A	N/A	4HP HONDA	N/A
44"TB (2)	52.5" #50 CHAIN	2-1"UCFL 205 1-¾" UCP 204	410/350X6 SAWTOOTH	5010-3/4" BORE 5020-1" BORE	50	56" OF 6" BELTING	-MOTOR SPRING -TE81	N/A	N/A	5.5HP HONDA	N/A
5'PTO WITH BIN (4)		3-1"UCFL 205	15/600-6" TURFSAVER	5014-3/4" BORE 5020-1" BORE	50	80" OF 6" BELTING	-TE81	2-MONRO MATIC 32333	T20	N/A	L25A
5'PTO-19" (5)	38-1/2" of #50	3-1"UCFL 205	410/350X4 -10" CASTER	6028-1 ¼" BORE 6016-1 ¼" BORE	60	N/A	N/A	N/A	T20	N/A	L25A
5'X19" HYDRAULIC (6)		2-1" UCP 205	410/350X4 -10" CASTER	5012-1" BORE 5020-1" BORE	50	N/A	N/A	N/A	N/A	MLHPQ 160	N/A
5'PTO-24" (7)	54.5" #60 CHAIN	3- 1 ¼" UCP 206	410/350X4 -10" CASTER	6016-1 ¼" BORE 6028- 1 ¼" BORE	60	N/A	N/A	N/A	T40	N/A	T281
SWEEPER	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
5'X24" HYDRAULIC (8)	49.5" #60 CHAIN	2-1 ¼ " UCP 205	410/350X4 -10" CASTER	6018-1" BORE 6024-1 ¼" BORE	60	N/A	N/A	N/A	N/A	MLHPQ 200	N/A
6'PTO-24" (9)	54.5" #60 CHAIN	3- 1 ¼" UCP 206	410/350X4 -10" CASTER	6016-1 ¼" BORE 6028- 1 ¼" BORE	60	N/A	N/A	N/A	T40	N/A	T281
6'X24" HYDRAULIC (10)	49.5" #60 CHAIN	2-1 ¼ " UCP 205	410/350X4 -10" CASTER	6018-1" BORE 6024-1 ¼" BORE	60	N/A	N/A	N/A	N/A	MLHPQ 200	N/A
5'X19" SKID STEER (11)		2-1"UCFL 205	N/A	5012-1" BORE 5020-1" BORE	N/A	84" OF 6" BELTING	N/A	N/A	N/A	MLHPQ 160	N/A
6' x 24" Skid Steer (12)		2 – 1 ¼" UCF 206	N/A	6018-1" BORE 6024-1 ¼" BORE	N/A	96" OF 6" BELTING	N/A	N/A	N/A	MLHPQ 200	N/A

SWEEPER BRUSHES

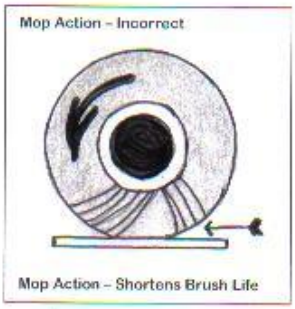
Sweeper	Quantity	Brush
-44" Tag-along -44" Tag-along with collecting bin	1	Gravely 18"x3"x44" (42 lbs) (4 1/2' of 1" cr shaft)
-5'PTO with collecting bin	28 2	21"x6 3/8" zig-zag poly 21"x6 3/8" flat poly
-5'PTO with 19" brush (fixed or adjustable) -5' hydraulic -5' skid steer with bucket	1	Super Sunvac 19"x4 ½"x58" (84 lbs for poly & 102lbs for combo) (66 ¼" of 1" cr shaft)
-5'PTO with 24" brush (fixed or adjustable) -5' hydraulic -5' skid steer	15 15 2	24"x6 3/8" zig-zag poly 24"x6 3/8" zig-zag wire 24"x6 3/8" flat poly
-6' PTO with 24" brush (fixed or adjustable) -6' hydraulic -6' skid steer -6' skid steer with bucket	18 18 2	24"x6 3/8" zig-zag poly 24"x6 3/8" zig-zag wire 24"x6 3/8" flat poly
-7' Industrial with 24" brush PTO or hydraulic	21 21 2	24"x6 3/8" zig-zag poly 24"x6 3/8" zig-zag wire 24"x6 3/8" flat poly
-7' Industrial with 32" brush Direct drive hydraulic(double) Or PTO	21 21 2	32"x10" convoluted poly 32"x10" convoluted wire 32"x10" convoluted flat
-8' Industrial with 32" brush Direct drive hydraulic (double) PTO or hydraulic	24 24 2	32"x10" convoluted poly 32"x10" convoluted wire 32"x10" convoluted flat

Down Pressure

Improper downward pressure can decrease broom life up to 95%. A broom sweeps with the tips of its bristles. When too much down pressure is applied, the broom is no longer using its tips; the broom is now working with the sides of the bristles. This limits the flicking action of the bristles, limits its sweeping effectiveness and shortens the life of the broom.

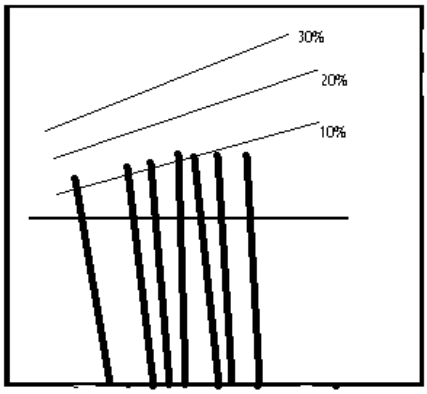


To check for correct down pressure, operate the broom on the ground and rotate at normal operating speed with the machine remaining stationary, then stop and lift the sweeping assembly. The correct sweeping path of a properly adjusted broom will clear a 2" – 4" wide pattern.

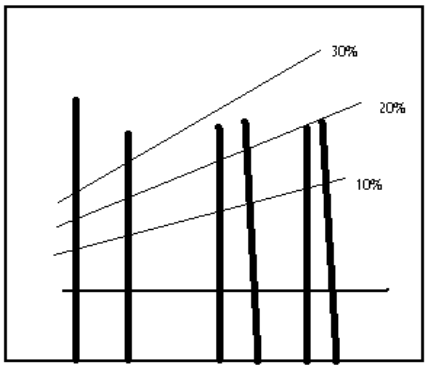


Broom Wear

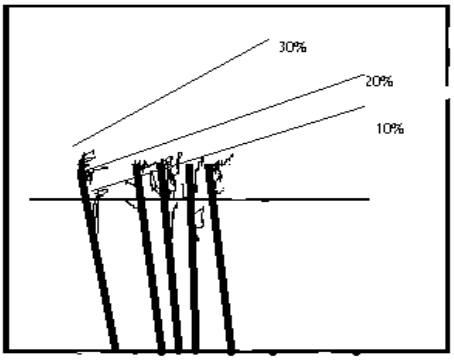
Checking the broom level adjustment every day will help with even, side to side, broom wear and extend the broom life.



-Normal bristle wear
-10 - 20% tip wear
-Bristles cleanly & evenly worn



-Heavy broom wear
-35 – 40% tip wear
-Bristles worn along side



-Abrasive wear
-Frayed tips
-Bristles chewed

If your travel speed is too fast, the debris piles up in front of the broom causing you to bulldoze instead of sweep. This can damage not only the broom, but also the core, chains, sprockets, drive lines and frame. Plowing produces side thrust and excessive stress on the broom, core and frame. While operating under plow effect, the bristles are flexed against the steel ring that holds the bristles, which could result in broom failure.

Broom Replacement

It is time to replace your broom when the filament length reaches ½ of the original outside diameter.

INSTALLATION INSTRUCTIONS
CONVOLUTED WAFERS

6-3/8" X 21"
6-3/8" X24"
10" X 32"

PLEASE FOLLOW ALL OF THE STEPS OF THE INSTALLATION INSTRUCTIONS!!

1) CHECK YOUR CORE…all drive bars should be inspected for indentations or excessive wear,

2) STAND CORE UPRIGHT…with support for safety, when installing wafer sections. Flatten or straighten end plates and secure one in place on the bottom core.

3) BEGIN INSTALLING… the wafers on the core, ensuring the drive pins of each wafer section locks the wafer over one of the wafer core's drive bar.

4) BUILD A BALANCED BROOM…install consecutive convoluted wafers rotating 180 degrees. (12 o'clock and 6 o'clock positions). The result should be a snug fit. This installation provides a broom for normal sweeping conditions. We do have an application for maximum broom density for cores with 4 drive bars. This is achieved by installing consecutive convoluted wafers rotating each 90 degrees. This application requires the purchase of more wafers.

5) REINSTALL CORE…on the sweeper. To lower and move a refilled core, attach supports directly to the metal sweeper core. Do no apply force, pressure or lift to any part of the wafer or filament during the core installation onto the sweeper.

6) TIPS AND TECHNIQUES…remember, a broom sweeps with the tips of the filament, no the sides. **DO NOT MOP!!** Keep broom level to optimize surface coverage and extend broom life. Do not exceed proper down pressure which will limit the "flick action" of the filament. Maintain steady ground speed to prevent unnecessary stress on the broom core. Rotate your broom end-over-end several times during it useful cycle to balance wear and tear.

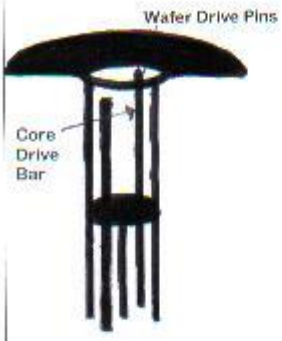
7) REPLACE WORN WAFERS…when wafers reach one half of the original outside diameter.

Spacerless Convoluted Wafers

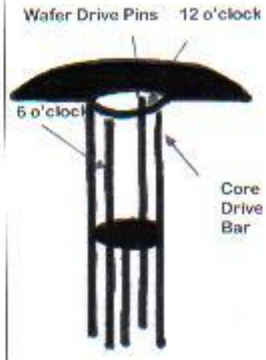
Installation Instructions

For Normal Sweeping

Install Convoluted Wafers on your Sweeper Core so the Drive Pins lock the Wafer over the Wafer Core's Drive Bar



Install consecutive wafers rotating each 180 degrees. (12 o'clock & 6 o'clock positions)

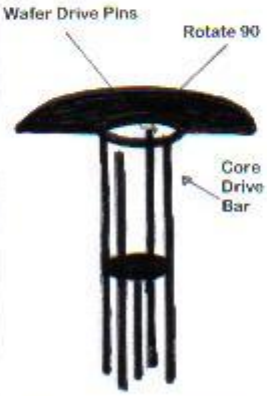


When the sweeper Core is full, Convoluted Wafers should meet high side to high side

For Maximum Broom Density

Install Convoluted Wafers on your Sweeper Core so that the Drive pins lock the Wafer over the Wafer Core's Drive Bar

Rotate consecutive Wafers 90 degrees to maximize broom density



Continue installation in this fashion until your Sweeper Core is full

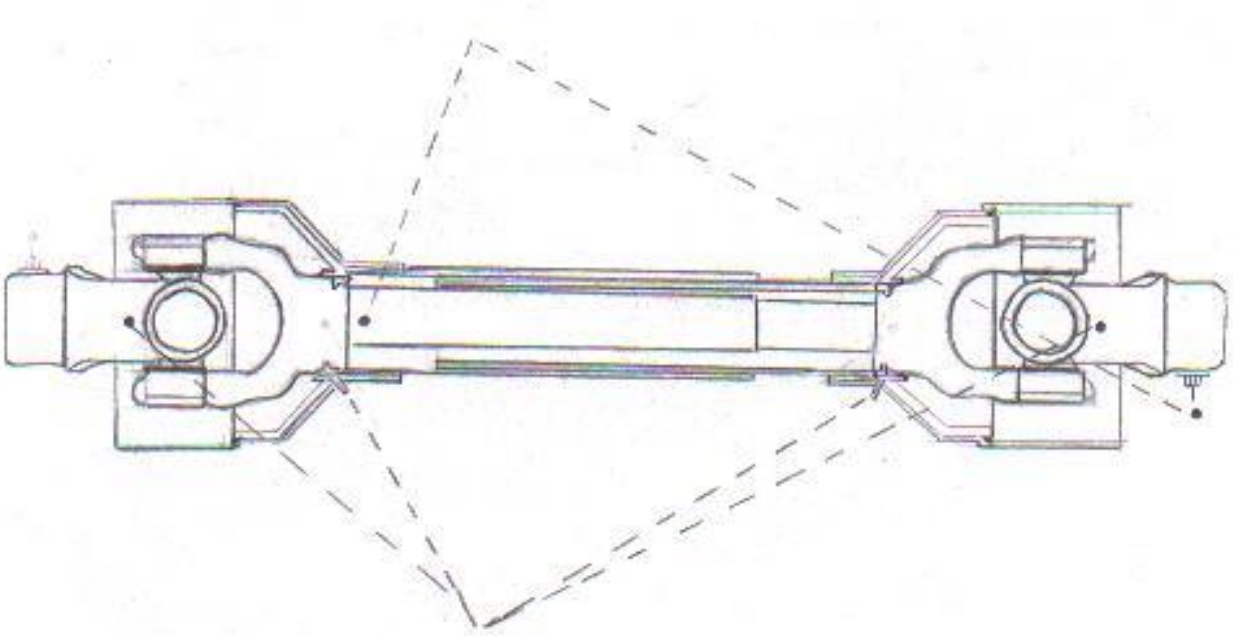
Tips & Techniques

-Keep your Broom level to optimize surface coverage and extend brush life
-Do not exceed proper down pressure which will limit the "flick action" of the brush filament
-Replace Wafer Section when the filament extends 3-5i inches from the edge of the Wafer Section Ring
-Maintain steady ground speed to prevent unnecessary stress on the Broom Care
-Rotate your Broom end-over-end several times during its useful cycle to balance wear and tear

PTO GREASE FITTINGS

****Stop the tractor engine and lubricate the suggested points at the recommended intervals. Grease after periods of inactivity.**

16 hours



8 hours

TROUBLESHOOTING

Item	Avoidable Damages	Possible Causes	Corrective Actions
QUICK-DISCONNECT YOKE	-quick disconnect pin tight or completely seized	-quick-disconnect pin dirty (insufficient maintenance)	-clean, oil and follow service instructions
	-quick-disconnect pin damaged (broken or bent)	-quick-disconnect pin defective(forced engagement, incorrect handling)	-replace quick-disconnect pin
	-quick-disconnect pin damaged in the locking portion	-excessive shaft length	-shorten shaft length(cut both telescopic tubes as well as shields and remove burrs)
		-axial loads too high	-replace 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.			

YOKE	-yoke ears deformation	-excessive shaft length	-shorten shaft length(cut both telescopic tubes as well as shields and remove burrs) -replace defective yokes
		-axial loads too high	-clean and grease telescopic tubes, and replace both tubes, if necessary
			-replace defective yokes
		-excessive working angle and torque	-verify compatibility between shaft & working conditions(torque vs. angle)
			-disengage tractor PTO during cornering or when lifting or lowering the implement
			-change to a larger PTO size
			-replace defective yokes
	-yoke ears distorted	-overload caused by high starting and peak torques	-engage PTO more carefully
			-use appropriate safety device

			-replace defective yokes
YOKE CON'T	-yoke ears worn or pounded	-excessive working angle	-avoid excessive working angle
			-disengage tractor PTO during cornering
			-replace defective yokes
CROSS KIT	-cross arms broken	-extreme torque peak or shock load	-use appropriate safety device
			-change to a larger PTO size
		-axial loads too high	-shorten PTO shaft
			-replace defective cross bearings
	-bearing caps turning in their cross journal	-excessive continuous torque and/or excessive working angle	-verify compatibility between shaft and working conditions
	-overheated bearing caps	-inadequate greasing	-carefully follow greasing instructions
			-replace defective cross bearings
	-accelerated wear of cross kit	-excessive continuous torque and/or excessive working angle	-verify compatibility between shaft and working conditions
		-inadequate greasing	-carefully follow greasing instructions
			-replace defective cross bearings
NOTE: CROSS BEARINGS MUST BE GREASED EVERY 8 WORKING HOURS			
TELESCOPIC TUBE	-telescopic tubes failure or twisting	-extreme torque peak or shock load	-use appropriate safety device
			-change to a larger PTO size
		-short tube engagement	-replace the PTO drive shaft with one having adequate length
			-replace defective tubes
	-accelerated wear telescopic tubes	-extreme load when sliding	-change to a PTO drive shaft with rilsan coated inner tube
		-short tube engagement	-replace the PTO drive shaft with one having adequate length
		-inadequate greasing	-carefully follow greasing instructions
		-contaminants(sand, etc.)	-replace defective tubes
NOTE: TELESCOPIC TUBES MUST BE CLEANED AND GREASED EVERY 16 WORKING HOURS			
SHIELD	-excessive wear of shield bearings	insufficient lubrication	-follow lubrication instructions
		-incorrect chain mounting	-mount chain to allow maximum angularity
		-shield interfering with implement	-avoid contact of the shields with fixed parts of the machine or tractor

SHIELD CON'T	-chain moving or failure	-shield interfering with implement	-avoid contact of the shields with fixed parts of the machine or tractor
		-incorrect chain mounting	-mount chain to allow maximum angularity
			-replace defective parts
	-guard cone damaged	-guard cone in contact with components on the tractor and/or implement	-eliminate interference between guard cones and any part on the tractor and/or implement
			-replace damaged guard cones
	-guard tubes damaged(deformed and split at one end)	-guards in contact with components on the tractor and/or implement	-eliminate interference between guard cones and any part on the tractor and/or implement
			-replace damaged tubes
		-guard tubes overlap too short or no overlap at all with extended PTO drive shaft	-adjust guard tubes length with longer tubes
NOTE: SHIELD BEARING MUST BE GREASED EVERY 8 WORKING HOURS			

TROUBLESHOOTING

ITEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Motor for broom will not operate	-Auxiliary hydraulics control on power unit is activated in the wrong position -Hoses improperly connected to power unit -Hoses on power unit are obstructed -Hoses on broom are obstructed -The motor has failed	-Verify controls. See power unit manual -Connect hoses correctly to power unit - Clear obstruction on power unit -Clear obstruction on broom -Replace the motor
Sluggish broom operation	-Insufficient oil flow from the power unit -One or more seals have failed in the motor -Hydraulic filter on power unit is dirty	-Increase engine RPM -Replace the seals or motor -Replace filter

The motor runs but the broom does not run	-Motor shaft has sheared key	-Replace key
-Oil leaks in the motor	-One or more of the seals have failed -Seals on the fittings are damaged -Fittings are loose or damaged -Hydraulic hoses are loose or damaged	-Replace seals or motor -Replace seals or fittings -Tighten or replace fittings -Tighten or replace hoses
Brush rotates in the wrong direction	-Hoses installed incorrectly	-Switch hose connections
Brush slows or stops when sweeping	-Brush pattern too wide -Travel speed too fast -Trying to sweep too much material at once -Relief pressure is set too low -Pump has failed -Filter plugging -Hydraulic motor is failing	-Adjust brush pattern -Reduce travel speed -Reduce amount of material being swept, make more passes -Set relief pressure to 2000 psi -Contact dealer to repair or replace -Change or clean filter -Replace motor
Brush wears very quickly	-Brush pattern is too wide -Brush downward pressure is too much	-Adjust brush pattern -Adjust downward pressure
Brush head bounces during sweeping	-Travel speed too fast and/or brush speed too low -Core is bent -Shock absorber is not working -Height adjustment is incorrect	-Find correct combination of ground and brush speeds: do not travel more that 8 km/hr -Replace core -Change shock absorber -Change height adjustment

Brush wears into cone shape	-Sweeper is not level -Tires on power unit at different pressures or are different sizes	-Level sweeper before each use -Check tire sizes and rating: make corrections as necessary
Honda Engine will not start	-	
Check control positions	-Fuel valve OFF -Choke open -Engine switch OFF	-Move lever to ON position -Move lever to CLOSED position unless the engine is warm -Turn engine switch to ON position
Check engine level oil	-Engine oil level low (Oil alert models)	-Fill with the recommended oil to the proper level (See Honda manual)
Check fuel	-Out of fuel -Bad fuel; engine stored without treating or draining fuel, or refueled with bad fuel	-Add fuel -Drain fuel tank and carburetor. Refuel with fresh fuel
Remove and inspect spark plug	-Spark plug faulty, fouled or improperly gapped -Spark plug wet with fuel (flooded engine)	-Gap or replace spark plug -Dry and reinstall spark plug. Start engine with throttle lever in MAX. position
Take engine to an authorized Honda servicing dealer or refer to shop manual	-Fuel filter restricted, carburetor malfunction, ignition malfunction, valves stuck, etc.	-Replace or repair faulty components as necessary
Engine Lacks Power		
-Check air filter	-Filter elements restricted	-Clean or replace filter elements
-Check fuel	-Bad fuel; engine stored without treating or draining gasoline, or refueled with bad gasoline	-Drain fuel tank and carburetor. Refuel with fresh gasoline
-Take to an authorized Honda servicing dealer, or refer to shop manual	-Fuel filter restricted, carburetor malfunction, ignition malfunction, valves stuck, etc.	-Replace or repair faulty components as necessary
Hydraulic system overheats	-Hydraulic oil level too low -Restriction in hoses	-Add hydraulic oil to tank until it comes to 2 inches from top -Remove bends in hoses; remove obstructions inside hoses

Hydraulic quick couplers leak	-Quick coupler poppet is unseated	-Reseat poppet; replace quick coupler if poppet is beyond repair
Hydraulic motor seals leak	-Flow rate exceeds 18 gpm. Hydraulic pressure exceeds 3000 psi -Motor is failing	Contact Smyth Welding Ltd. -High number of hours on motor; Contact dealer to rebuild or replace
Hydraulic oil flows from breather cap on hydraulic tank	-Hydraulic tank too full	-Drain hydraulic tank until level is 2 inches from top