
MIGHTY MAC

Safety & Operating Instructions

Vacuum: Multi-Surface

VMS25 & VMS25E



Serial No. _____

P/N 805-0411

⚠ WARNING

Read and understand this manual and all instructions before operating the Multi-Surface Vacuum.

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Conventions used in this manual

DANGER

This indicates a hazardous situation, which, if not avoided, **will** result in death or serious injury.

WARNING

This indicates a hazardous situation, which, if not avoided, **could** result in death or serious injury.

CAUTION

This indicates a hazardous situation, which, if not avoided, **could** result in minor or moderate injury.

NOTICE

This information is important in the proper use of your machine. Failure to follow this instruction could result in damage to your machine or property.

Serial Number

A Serial Number is used to identify your machine and is located on the Serial Number Label on your machine. For your convenience and ready reference, enter the Serial Number in the space provided on the front cover of this manual.

Additional Information and Potential Changes

MackKissic Inc. reserves the right to discontinue, change, and improve its products at any time without notice or obligation to the purchaser. The descriptions and specifications contained in this manual were in effect at printing. Equipment described within this manual may be optional. Some illustrations may not be applicable to your machine.

California Proposition 65

 **WARNING**
CANCER AND REPRODUCTIVE HARM - www.P65Warnings.ca.gov.

Chapter 1: General Safety Rules

WARNING

Read this safety & operating Instructions manual before you use the MULTI-SURFACE VACUUM. Become familiar with the operation and service recommendations to ensure the best performance from your machine. If you have any questions or need assistance, please contact us at www.MacKissic.com or call toll-free 1-800-348-1117 and one of our Technical Support Representatives will be happy to help you.

Labels

Your Multi-Surface Vacuum carries prominent labels as reminders for its proper and safe use. Shown below are copies of all the Safety and Information labels that appear on the equipment. Take a moment to study them and make a note of their location on your Multi-Surface Vacuum as you set up and before you operate the unit. Replace damaged or missing safety and information labels immediately.



Label Included with Collection Bag #805-0345



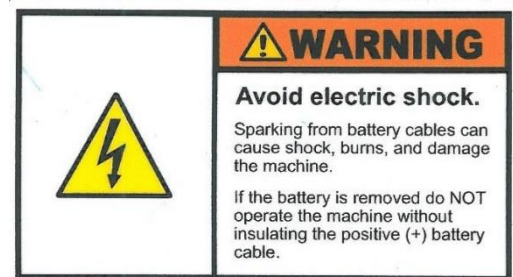
#805-282971



#091-0043



#930-0002



#930-0006
(Electric Start Models Only)

Protecting Yourself and Those Around You

WARNING

This is a high-powered machine, with moving parts operating with high energy at high speeds. Use proper clothing and safety gear when operating this machine to prevent or minimize the risk of severe injury. You must operate the machine safely. Unsafe operation can create a number of hazards for you, as well as anyone else in the nearby area. Always take the following precautions when operating this machine:

- Always wear protective goggles or safety glasses with side shields while operating this vacuum system to protect your eyes from possible foreign objects thrown from the machine.
- Wear shoes with non-slip treads when using your Multi-Surface Vacuum. If you have safety shoes, we recommend wearing them. Do not use the machine while barefoot or wearing open sandals.
- Avoid wearing loose clothing or jewelry, which can catch on the machine's moving parts.
- We recommend wearing gloves while using your Multi-Surface Vacuum. Be sure your gloves fit properly and do not have loose cuffs or drawstrings.
- Always wear gloves when emptying the debris bag.
- After vacuuming glass, bottles or cans, dispose of this waste properly, never in a compost pile.
- We recommend changing the debris bag after vacuuming glass and other debris and before using the system to vacuum material that may be used for compost or mulch.
- Wear long pants while operating the machine.
- Use ear protectors or ear plugs rated for at least 20 dba to protect your hearing.
- Never allow people who are unfamiliar with these instructions to use the vacuum. Allow only responsible individuals who are familiar with these rules of safe operation to use your machine.
- Never place your hands, feet, or any part of your body near or under any moving part while the machine is running.
- Keep bystanders away from your work area at all times. To be safe, do not operate the machine near small children or pets, and never allow children to operate the vacuum. Stop the engine when another person or pet approaches.
- Never use the machine with the debris bag removed.
- Never operate the engine with the air cleaner or cover over the carburetor air-intake removed, except for adjustment. Removal of such parts could create a fire hazard. Do not use flammable solutions to clean air filter.
- The muffler and engine become very hot and can cause a severe burn; do not touch.
- Clear the work area of objects such as rock, string-like material, wire, rope, or rags. Ingesting these objects into the vacuum could damage the machine and/or cause injury.
- Never, under any conditions, remove, bend, cut, fit, weld, or otherwise alter standard parts on the multi-surface vacuum. This includes all shields and guards. Modifications to your machine could cause personal injuries and property damage and will void your warranty.

Safety for Children and Pets

WARNING

Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the machine and the vacuuming activity. **Never** assume that children will remain where you last saw them.

- Keep children out of the work area and under the watchful care of a responsible adult.
- Be alert and always turn off the Multi-Surface Vacuum engine if children enter the work area.
- Before, and while moving backwards, look behind, and **down** for small children.
- Never allow children to operate the vacuum.
- Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure your vision.

Safety with Gasoline-Powered Machines

WARNING

Gasoline is a highly flammable liquid. Gasoline also gives off flammable vapor that can be easily ignited and cause a fire or explosion. Never overlook the hazards of gasoline. Always follow these precautions:

- Never run the engine in an enclosed area or without proper ventilation as the exhaust from the engine contains carbon monoxide, which is an odorless, tasteless, and deadly poisonous gas.
 - Store all fuel and oil in containers specifically designed and approved for this purpose and keep away from heat and open flame, and out of the reach of children.
 - Fill the gasoline tank outdoors with the engine off and allow the engine to cool completely. Do not handle gasoline if you or anyone nearby is smoking, or if you are near anything that could cause it to ignite or explode. Replace the fuel tank and fuel container caps securely.
 - If you spill gasoline, do not attempt to start the engine. Move the machine away from the area of the spill and avoid creating any source of ignition until the gas vapors have dissipated. Wipe up any spilled fuel to prevent a fire hazard and properly dispose of the waste.
 - Allow the engine to cool completely and empty the debris bag before storing the Multi-Surface Vacuum in any enclosure. Remember, decomposing material generates heat and could start a fire. Never store the machine with gas in the tank or a fuel container, near an open flame or spark such as a water heater.
 - Never make adjustments or repairs with the engine running. Disconnect the spark plug wire and keep the wire away from the spark plug to prevent accidental starting.
 - Never check for an ignition spark with the spark plug or spark plug wire removed. Use an approved spark tester.
 - Never tamper with safety devices. Check their proper operation regularly.
 - Never change the engine governor settings or modify the engine speed. Modifications will void your warranty.
 - To reduce fire hazard, keep the engine and muffler area free of debris build-up such as leaves, grass, oil, grease, or any other combustible material. Clean the engine area after each use.
 - Never operate the engine without the muffler. Inspect the muffler periodically and replace if necessary. If equipped with a muffler deflector, inspect the deflector periodically and replace if necessary.
 - Never operate the engine with the air cleaner or the cover over the carburetor air-intake removed, except for adjustment. Removal of such parts could create a fire hazard.
 - Always check fuel lines and fittings frequently for cracks or leaks, replace if necessary.
-

Safety on Slopes

WARNING

Slopes are a major factor related to slip and fall accidents, which can result in severe injury. All slopes require caution. If you feel uneasy on a slope, do not vacuum it. Always take the following precautions when using this machine on slopes:

Always:

- Vacuum across the face of slopes; never up and down. Exercise extreme caution when changing direction on slopes.
- Remove objects such as stones, wire, rope, or rags.
- Watch for holes, ruts, or bumps in the landscape.

Never:

- **Never** vacuum near drop-offs, ditches, or embankments; you could lose your footing or balance.
 - **Never** vacuum on slopes greater than 20 degrees, or any excessively steep slopes.
 - **Never** vacuum on wet, or slippery slopes; reduced traction could result in slipping.
 - **Never** park the vacuum on a steep grade or slope.
-

General Safety

WARNING

Operating this vacuum safely is necessary to prevent or minimize the risk of ***death or serious injury***. Unsafe operation can create a number of hazards for you. Always take the following precautions when operating this vacuum:

- Keep in mind that the operator or user is responsible for accidents or hazards occurring to other people, their property, and themselves.
- Your Multi-Surface Vacuum is a powerful tool, not a plaything. Exercise extreme caution at all times. The design of this machine is to vacuum debris on turf or hard surfaces. Do not use it for any other purpose.
- Know how to stop the vacuum quickly.
- Never allow people or pets to ride on the Multi-Surface Vacuum.
- Never start the engine without the debris bag attached firmly to the discharge tube.
- Never attempt to remove the debris bag while the Multi-Surface Vacuum engine is running. Debris may exit at high velocity out of the openings created in the seams as you unlatch the debris bag.
- Empty the debris bag after each use to prevent spontaneous combustion due to decaying material.
- Do not vacuum in sandy areas where you will vacuum large quantities of sand.
- Never operate the vacuum near hot or burning debris or any toxic or explosive materials.
- If the machine should start making an unusual noise or vibration, stop the engine and wait five (5) minutes to cool. Vibration is generally a warning of trouble. Disconnect the spark plug wire and inspect for clogging, damaged, or worn impeller, loose impeller bolt, loose impeller key, or loose engine mounting bolts. Clean and repair and/or replace damaged parts.
- Always shut off the Multi-Surface Vacuum engine, wait five (5) minutes to cool, and disconnect the spark plug wire before attempting to clear any obstructions.
- Always keep the equipment in a good safe operating condition. Always make certain nuts and bolts are tight and always use the supplied self-locking hardware; do not substitute.
- Use the Multi-Surface Vacuum only in daylight.
- While using the vacuum, do not hurry or take things for granted. When in doubt about the equipment or your surroundings, stop the machine and take the time to look things over.
- Never leave the machine unattended with the engine running.
- Do not operate the machine when under the influence of alcohol, drugs, or medication.
- See manufacturer's instructions for proper operation and installation of accessories. Only use accessories approved by MacKissic Inc.

A Note to All Users

Under California law, and the laws of some other states, you are not permitted to operate an internal combustion engine using hydrocarbon fuels without an engine spark arrester. This also applies to operation on US Forest Lands. All Multi-Surface Vacuum's shipped to California, New Mexico and Washington State are provided with spark arresters. Failure of the owner or operator to maintain this equipment in compliance with state regulations is a misdemeanor under California law and may be in violation of other state and/or federal regulations. Contact your State Park Association or the appropriate state organization for specific information in your area.

Additional Information and Potential Changes

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No list of warnings and cautions can be all-inclusive. If situations occur that are not covered by this manual, the operator must apply common sense and operate this Multi-Surface Vacuum in a safe manner. Contact us at www.MacKissic.com or call 1-800-348-1117 for assistance.

Chapter 2: Setting Up the Multi-Surface Vacuum

It may be helpful to familiarize yourself with the controls and features of your Multi-Surface Vacuum as shown in Figure 1 before beginning these procedures. If you have any questions at all, please feel free to contact us at www.MacKissic.com or call 1-800-348-1117.

Multi-Surface Vacuum Controls and Features

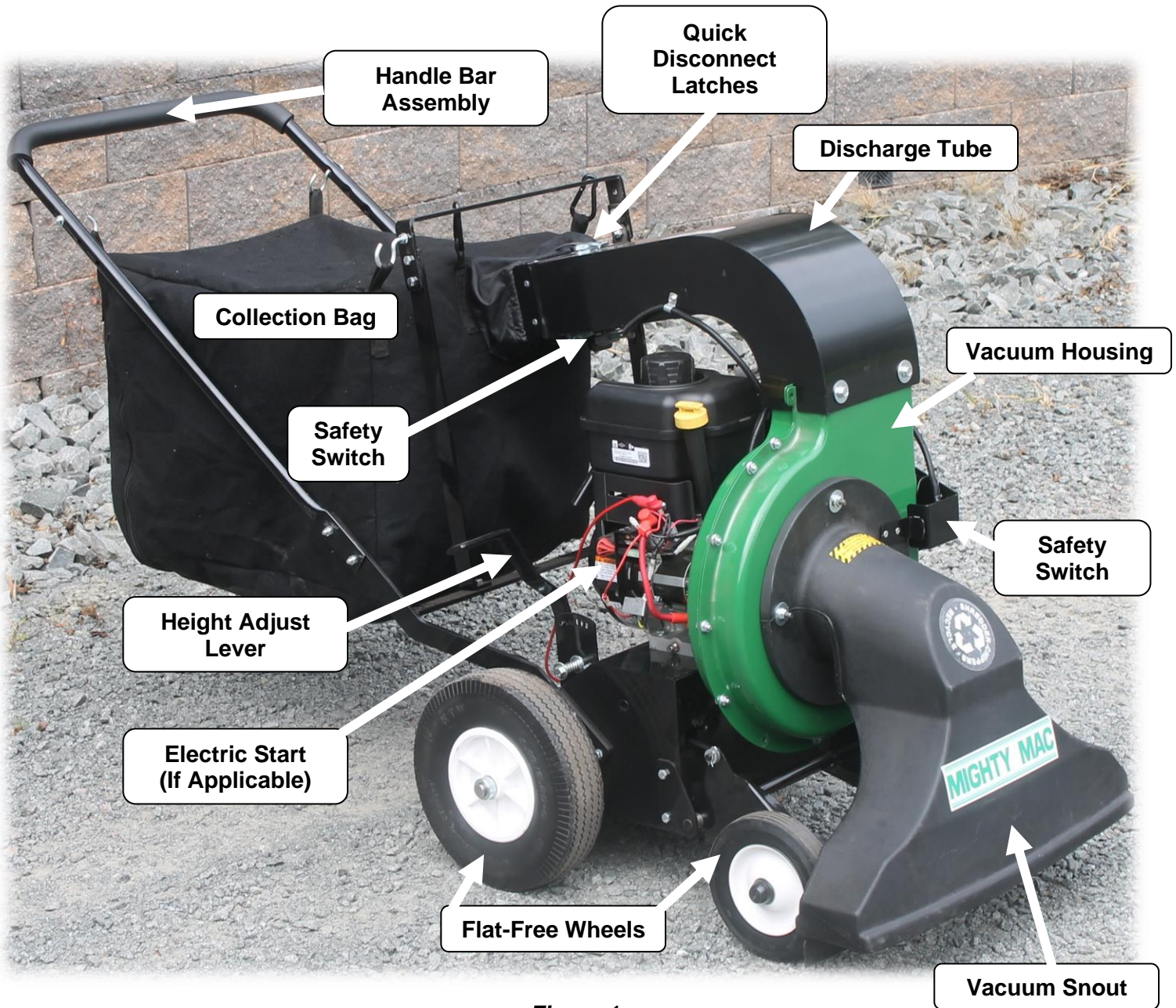


Figure 1

Specifications

	Manual Start	Electric Start
Engine	See Engine Owner's Manual	See Engine Owner's Manual
Impeller Drive Method	Direct Drive	Direct Drive
Impeller Speed	145 MPH	145 MPH
Height Adjustment Range	5/8" to 4"	5/8" to 4"
Collection Bag Volume	4 bushels	4 bushels
Overall Length	67"	67"
Overall Height	43"	43"
Width	25.5"	25.5"
Machine ship Weight	187 Lbs.	197 Lbs.

Unpacking the Multi-Surface Vacuum

Tools Needed:

- Utility Knife

1. Cut open the top of the Box with a Utility Knife and remove all loose parts and the Poly Bag.

NOTE: Some parts may be under the machine or in between the Box dividers.

Shipping Box Contents (Figure 2 and Table Below)

ITEM#	DESCRIPTION
1	VMS Machine (not shown)
2	Bag Hanger Frame, Upper
3	Upper Handle Assembly
4	Bag Hanger Frame, Sides (x2)
5	Vacuum Snout
6	Discharge Tube
7	Poly Bag
8	Collection Bag

Poly Bag Contents (Figure 3 and Table Below)

ITEM#	DESCRIPTION
1	Owner's Manual
2	Engine Manual
3	Warranty Card
4	Hardware Bag
5	Safety Glasses
6	Hearing Protection
7	Work Gloves
8	Safety Key (Electric start only)



Figure 2

Hardware Bag Contents (Figure 4 and Table Below)

ITEM#	PART#	DESCRIPTION	QTY
1	090-0502	5/16 FENDER WASHER	6
2	805-0326	CARABINEERS	2
3			
4	805-0119	BAG HANGER HOOKS	3
5	090-0088	5/16-18 X 1" HHCS	10
6	090-0418	5/16-18 WHIZ LOCKNUT	3
7	090-0460	5/16-18 NYLOCK NUT	14
8	090-0232	5/16 FLAT WASHER	2
9	090-0503	5/16-18 SELF TAPPING HHCS	4

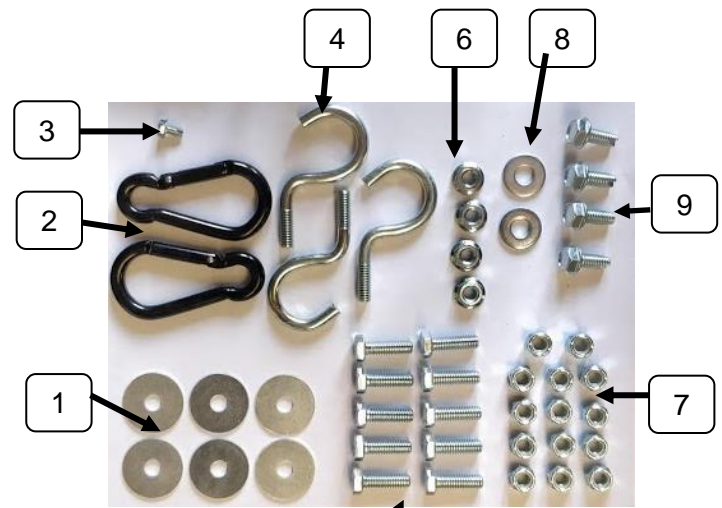


Figure 4

Compare the contents of the Shipping Box, Poly Bag and Hardware Bag with the "Contents" lists above. If you have any questions please contact us at www.MacKissic.com or call 1-800-348-1117 for assistance.

NOTE: Assembly should be done on a clean, level surface.

CAUTION

DO NOT try to lift the machine out of the box, it is very heavy and may cause severe injury.

2. Use the utility knife to cut down the two corners one end of the box, and then roll the machine out (Figure 5).

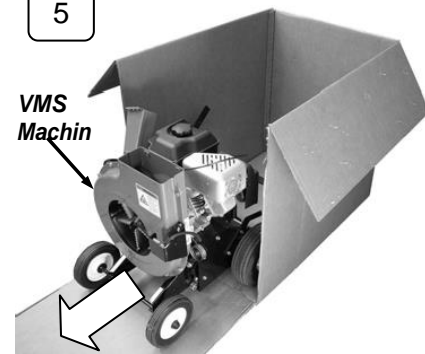


Figure 5

Assembling the Multi-Surface Vacuum

Tools Needed:

- 5/16" Wrench
- Two 1/2" Wrenches
- Two 7/16" Wrenches

1. Position the two Lower Bag Hanger Frames onto the cross member of the Lower Handle and loosely install with two 5/16-18 x 1" Bolts and two 5/16-18 Nylon Locknuts using two 1/2" Wrenches (Figure 6).
2. Position the Upper Bag Hanger Frame onto the two Lower Bag Hanger Sides with the top holes facing closer to the rear of the machine. Secure the lower two sets of holes in the Upper Bag Hanger Frame to the Lower Bag Hanger Frames with four 5/16-18 x 1" Bolts and four 5/16-18 Nylon Locknuts using two 1/2" Wrenches. Tighten the Hardware you installed in the previous step.
3. Take the Upper Handle Bar Assembly and slide the flat ends of the Upper Handle inside the Lower Handle. Secure with four 5/16-18 x 1" Bolts and four 5/16-18 Nylon Locknuts (Figure 7).

Upper Bag Hanger Frame Bolts and Locknuts



Lower Bag Hanger Frame

Bolts and Locknuts

Figure 6

4. Locate the two Carabiners, three Bag Hanger Hooks and four 5/16-18 Wiz Nuts included in the Bolt Bag. Mount the two upper Hooks through the upper holes in the Handlebar Assembly with the Hooks on the inside (**Figure 8**). Secure with a Wiz Nut on the outside of the Upper Handlebar.
5. Thread a Wiz Nut onto the one remaining Hook as far as it will go on the threads so that the flat side of the Nut is facing away from the Hook (See detail).
6. Insert the Hook into the right side of the Bag Hanger Frame and secure with a Wiz Nut.
7. Install the two Carabiners onto the Bag Hanger Frame with wider side down and clip facing the rear of the machine.
8. Place the Discharge Tube on top of the Housing (**Figure 9**). Be sure the discharge opening is directed to the rear of the machine and between the Handles. Secure the Tube to the front of the Housing with two 5/16" - 18 x 3/4" Self-Tapping Bolts and two 5/16 Fender Washers.
9. Secure the Tube and two Safety Wire Harness Cable Clamps to the rear of the Housing with two 5/16" - 18 x 5/8" Bolts and Flat Washers (not fender washers) (**Figure 10**).
10. Connect the Safety Harness onto the Terminals of the Bag Safety Switch (**Figure 11**) and secure the Cable Clamp to the hole in the side of the Discharge Tube with the Self Tapping Screw using a 5/16" Wrench.

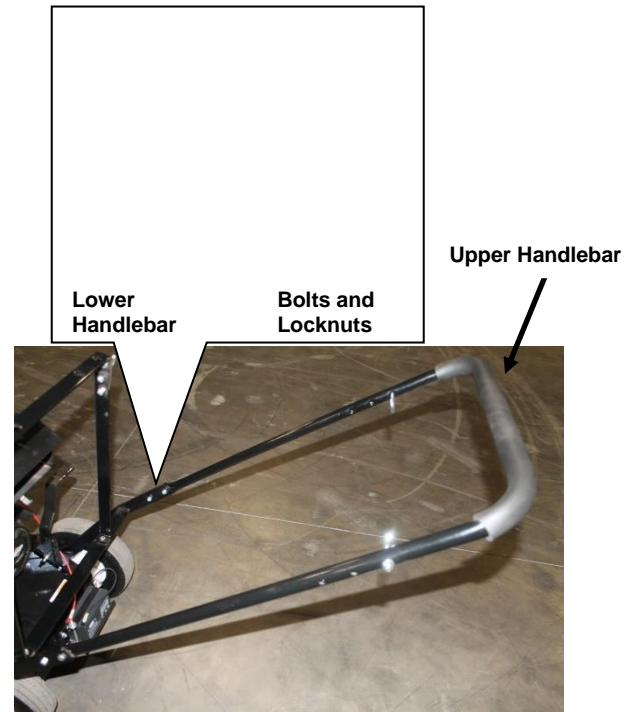


Figure 7

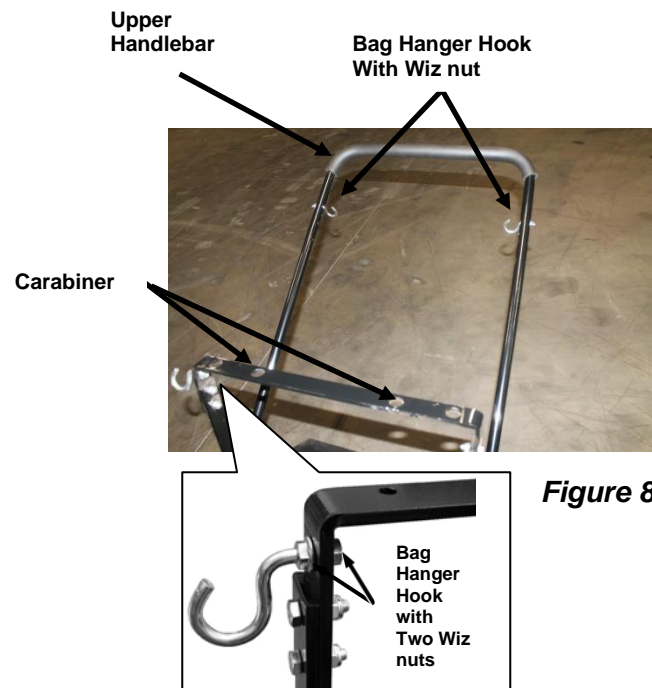


Figure 8

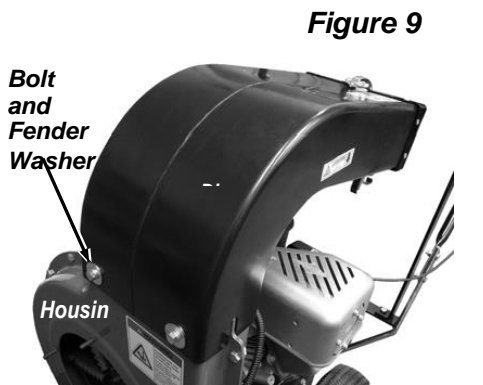


Figure 9

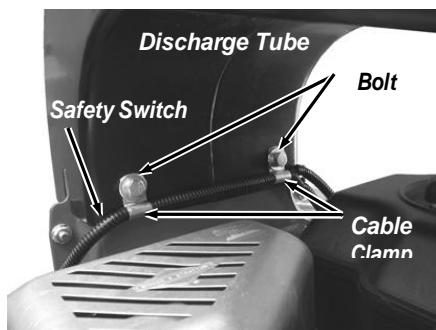


Figure 10

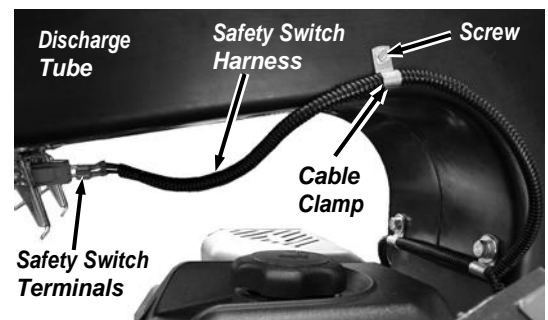


Figure 11

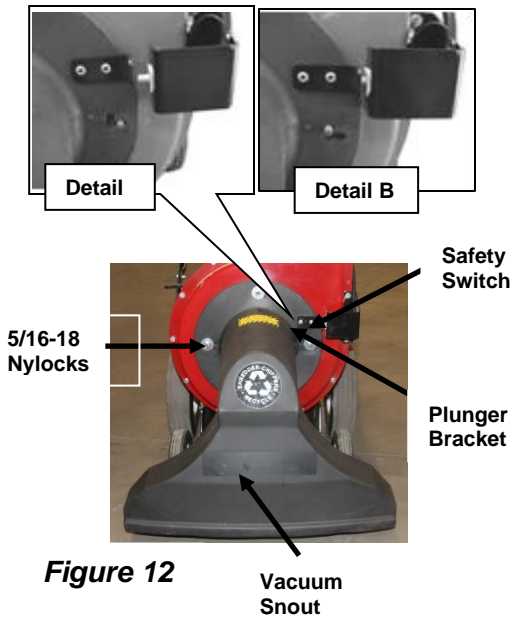


Figure 12

Note: Installation of the Vacuum Snout will be easier if the front of the machine is raised. See “Adjusting the Vacuum Snout Height” on page 16 to raise the front of the machine.

11. Place the Vacuum Snout onto the front of the Housing (**Figure 12**) so the studs are located in the right-hand side of the lower slots (**Detail A**). Slide the Snout to the right and down so the Plunger Bracket on the Snout pushes the Safety Switch in (**Detail B**).
12. Install four 5/16-18 nylon locknuts with Fender Washers onto the studs to secure the Vacuum Snout.
13. Locate the two Bag Hanger Straps on the rear (zipper end) of the Bag. Attach the two Straps to the Hooks near the top of the Handlebar (**Figure 13**).
14. Locate the three Bag Hanger Straps on the front of the Bag and hang them on the Hook on the right side and to the two Carabines at left and center of the Bag Hanger Frame.
15. Slip the Bag Inlet Neck over the Discharge Tube (**Figure 14**).
16. Hook the bottom two Latch Hooks over the Metal Ring in the Bag Inlet and latch them.
17. Hook the top Latch over the Metal Ring in the Bag Inlet and close the Latch (**Figure 15**).



Figure 13

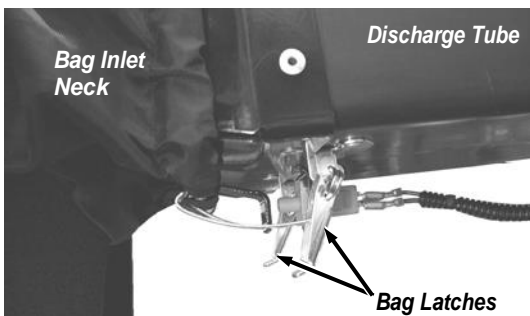


Figure 14

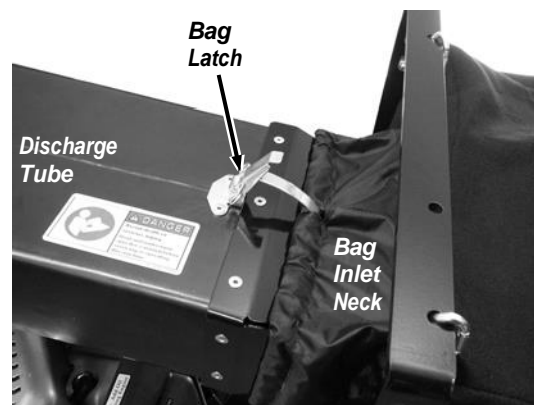


Figure 15

NOTICE

Before starting engine, always check oil level. Refer to the following section

Adding the Engine Oil and Gasoline

NOTICE

You must add oil before starting the engine. This machine is shipped without oil. Traces of oil may be in the reservoir from factory testing, but you must add oil before starting the engine. Fill the reservoir slowly, checking the level frequently to avoid overfilling.

To Add Engine Oil

1. Remove the yellow oil fill cap from the right hand side of the engine (**Figure 16**). Fill the engine with oil until the oil level is about a 1/4 inch below the top of the oil fill opening.

Note: Add oil slowly and wait several minutes for oil to settle before rechecking oil level.

2. Replace and tighten the oil fill cap.

To Add Gasoline

1. Remove the cap from the fuel tank. Insert a clean funnel into the fuel tank (**Figure 17**).
2. Fill the fuel tank with fresh, clean unleaded regular automotive gasoline to 1 inch below the bottom of the filler neck to provide space for any fuel expansion.
3. Reinstall the fuel fill cap securely and wipe up any spilled gasoline.

Hooking up the Battery

1. Slide the Negative (black) Battery Wire onto the Negative Battery Terminal (**Figure 18**).

Your machine is now ready to use.



Figure 16

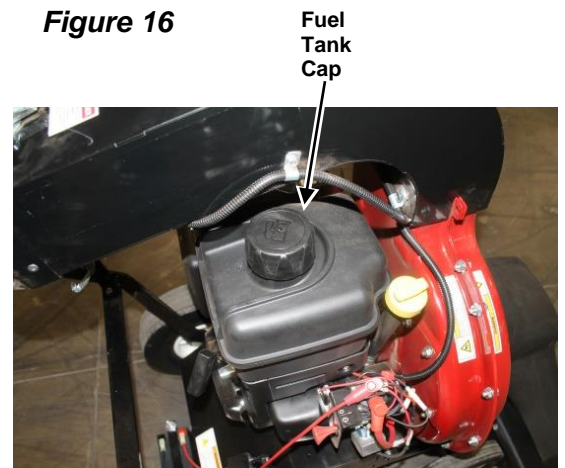


Figure 17



Figure 18

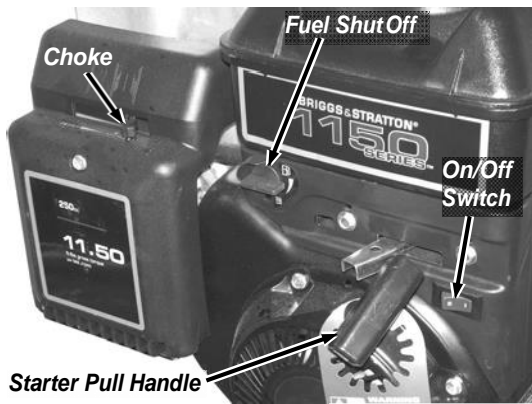


Figure 19A

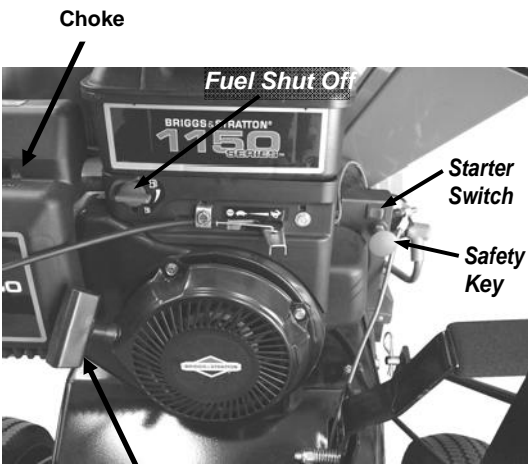


Figure 19B

It may be helpful to better familiarize yourself with the features of your Multi-Surface Vacuum by reviewing **Figure 1** in Chapter 2 before beginning the steps outlined in this chapter. Always refer to the Engine manual for more specific Engine information.

Starting the Engine (manual Start)

1. Move the Choke Control Lever to the “CHOKE” position (leave in the run position if the engine is already warm) (**Figure 19A**).
2. Move the throttle control to “FULL SPEED” (rabbit) position.
3. Turn the On/Off Switch to the ON position (if equipped)
4. Slowly pull the Starter Cord until you feel resistance, then pull quickly. The Cord will recoil back into position (**Figure 19A**).
5. As the engine warms up, slowly adjust the Choke to the Left towards the “RUN” position. Wait until the engine runs smoothly before each Choke adjustment.

Starting the Engine (Electric Start)

1. Move the Choke Control Lever to the “CHOKE” position (leave in the run position if the engine is already warm) (**Figure 19B**).
2. Move throttle control to “FULL SPEED” (rabbit) position.
3. Insert the Safety Key into the slot under the Starter Switch (**Figure 19B**).

NOTE: The Engine will not start or run with the Safety Key removed.

4. Press the Starter Switch fully to the right (start) until the Engine starts and let go of the Switch. The Switch will return to the center (run) position.
5. As the engine warms up, slowly adjust the Choke to the left towards the “RUN” position. Wait until the engine runs smoothly before each Choke adjustment.

Stopping the Engine (manual Start)

1. Slowly move the Throttle Control Lever to the “IDLE” position.
2. Turn the On/Off Switch to the OFF position (**Figure 19A**).

Stopping the Engine (Electric Start)

1. Slowly move the Throttle Control Lever to the “IDLE” position.
2. Turn the Switch to the OFF position.

Installing or Emptying the Collection Bag

! WARNING

Use the bag at all times - failure to do this could cause serious injury.

- Empty the bag as soon as it is full (check by feeling sides of bag). Overfilling the bag will cause the vacuuming performance to decrease or stop completely and could lead to clogging of the discharge tube, snout, or both.
- Empty the bag completely BEFORE storing the machine to prevent premature deterioration of the bag caused from rotting debris and the possibility of a fire occurring as a result of heat generated by decomposing debris.

Bag Maintenance

- Keep the bag clean by occasionally washing it by hand with mild soap and water. A clean bag improves air flow and results in better vacuuming performance. Do not wash the bag in an automatic washer. Do not use a cleaner which contains bleach. Allow the bag to dry thoroughly before storing.

Installation of the Bag

1. Locate the two bag hanger straps on the rear (zipper end) of the bag. Attach the two straps to the hooks near the top of the handlebar.
2. Locate the three bag hanger straps on the front of the bag and hang them on the hook and two Carabiners on the front frame.
3. Slip the neck over the discharge tube.
4. Hook the bottom two Latches over the Metal Ring in the Bag Inlet but do not close the Latches at this time.
5. Hook the top Latch over the Metal Ring in the Bag Inlet and close the Latch. Close the bottom two Latches.

Emptying the Bag

1. Shut off the engine, disconnect the spark plug wire from the spark plug, and make sure all moving parts have come to a complete stop.
2. Leave the bag in position between the handles. Unzip the back flap and let the debris fall out. You may have to scoop out the remaining debris with a stick.

Clearing the Machine of Debris, Clogs or Jams

A clog or jam in the machine can cause the vacuuming and shredding operations to decrease or even stop completely. If clogging occurs, take the following steps:

1. STOP THE ENGINE IMMEDIATELY and disconnect the spark plug wire from the spark plug. Wait for all moving parts to come to a complete stop.
2. Check (and clean, if necessary) the following areas in this order:
 - Check that the collection bag is not overfilled. Remove and empty it.
 - While the bag is removed, check the discharge chute and determine if it is clogged. Use a stick to clear this chute.
 - Next check the vacuum snout. Remove the vacuum snout by removing four 5/16-18 nylon locknuts. If clogged or jammed, use a stick to remove debris.
 - While the vacuum snout is removed, you can see if the shredding chamber is clogged. If clogged, remove the debris with a stick.

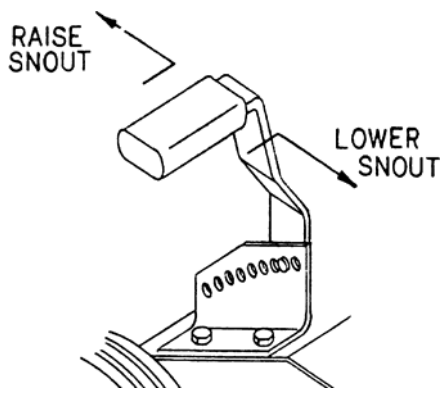


Figure 20

Adjusting the Vacuum Snout Height

1. The height of the vacuum snout can be adjusted to allow you to vary the suction to meet the surface conditions. For short turf with light leaf fall, it can be lowered to 1-1/4" off the surface. For long turf and heavy leaf fall, it should be raised to the upper setting about 2 3/4 inches.
2. For moving the machine long distances, you will avoid damage to the snout by raising it to the highest setting.
3. To raise the snout: Grasp the height adjuster handle, apply pressure away from the adjuster plate and **BACK** towards the operator's position (**Figure 20**).
4. To lower the snout: Grasp the height adjuster handle, apply pressure away from the adjuster plate and **FORWARD** away from the operator's position.

Operating Safety

WARNING

- The operation of any Multi-Surface Vacuum can result in foreign objects being thrown into the eyes, which can result in severe eye damage. Always wear the safety glasses provided with the Multi-Surface Vacuum or eye shields during use or while performing any adjustments or repairs.
 - Only operate your Multi-Surface Vacuum from the operator position. If it is necessary for any reason to inspect or repair any part of the machine where a moving part can come in contact with your body or clothing, stop the engine, allow it to cool, disconnect the spark plug wire from the spark plug and move it away from the spark plug before attempting any inspection or repairs.
-

Using the Vacuum

- The multi-surface vacuum can be used on turf or on hard surfaces, such as driveways, patios, sidewalks, and parking lots.
 - In turf applications your VMS will vacuum better on short grass. Keep the grass as short as possible for best results.
 - On hard surface applications keep the snout low. Lower it so that the snout flap lightly scrapes the surface.
 - Before leaves drop, mow your lawn to the shortest recommended height. Your VMS will vacuum better on short grass.
 - A vacuum is designed to be used frequently during periods when leaves are dropping. Do not let leaves get 4" or deeper. The drier the leaves the better.
 - The thicker the leaf layer the slower you should proceed. If leaves are wet or matted down it may be necessary to fluff up leaves before using the vac.
 - Snout height is critical. The snout should ride above the leaf layer to allow proper vacuuming... closer is not always better. The snout flap should scrape the top of the grass.
 - You should avoid vacuuming twigs and branches into the snout. This can cause clogging.
 - Avoid overfilling the vacuum snout. This will cause clogging. Wet and soggy material will also cause clogging. A steady, smaller flow of materials provides the most effective results.
 - The bag should not be removed for emptying, simply unzip and dump leaves out. If you wish to move or bag leaves, dump onto a tarp.
 - Avoid clogging when vacuuming loose, stringy material such as hay or pine straw, by picking up a small amount at a time. Check and empty the collection bag frequently.
 - Use care when vacuuming near plantings, ornamentals, mulches, especially stone and gravel.
-

CAUTION

If the machine clogs or jams, immediately shut off the engine, wait for all moving parts to come to a complete stop, and disconnect the spark plug wire from the spark plug before machine inspection.

Chapter 4: Maintaining the Multi-Surface Vacuum

Regular maintenance is the way to ensure the best performance and long life of your machine. Please refer to this manual and the engine manufacturer's owner's manual for maintenance procedures. Service intervals listed in the checklist below supersede those listed in the engine manufacturer's owner's manual.

⚠ WARNING

Before performing any maintenance procedure, shut off the engine, wait for all moving parts to come to a complete stop, and disconnect the spark plug wire from the spark plug.

Regular Maintenance Checklist

PROCEDURE	BEFORE EACH USE	EVERY 25 HOURS	EVERY 50 HOURS
Check Engine Oil Level	<input type="checkbox"/>		
Check Fuel Level	<input type="checkbox"/>		
Check General Equipment Condition	<input type="checkbox"/>		
Clean Air Filter		<input type="checkbox"/>	
Clean Engine Exterior & Cooling Fins		<input type="checkbox"/>	
Change Engine Oil	1 st time 5 hours	<input type="checkbox"/>	
Replace Spark Plug			<input type="checkbox"/>
Replace Air Filter			<input type="checkbox"/>

Changing Engine Oil

Check engine oil level regularly - WHILE THE UNIT IS IN A LEVEL POSITION. Check the oil before each usage. Stop engine and wait several minutes before checking oil level. With engine level, the oil must be about a 1/4 inch below the top of the yellow oil fill cap opening. Change oil after the first five hours of operation and every 25 hours thereafter. Refer to the engine manual enclosed with this unit for additional information on your engine.

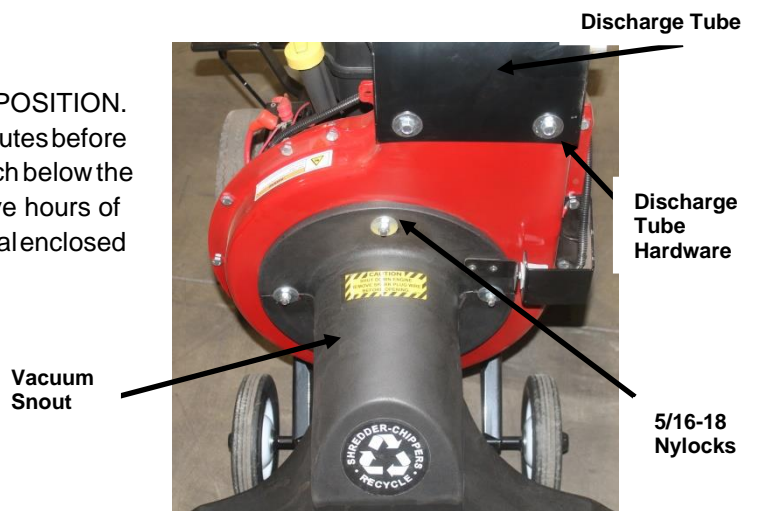


Figure 21

thoroughly before storing.

Bag Maintenance

Keep the bag clean by occasionally washing it by hand with mild soap and water. A clean bag improves air flow and results in better vacuuming performance. Do not wash the bag in an automatic washer. Do not use a cleaner which contains bleach. Allow the bag to dry



Battery Care (electric start machines)

Proper care can extend the life of a Battery. Follow these recommendations to ensure your Battery's best performance and long life:

- Do not allow the Battery charge to get too low. If the machine is not used, charge the Battery every 4–6 weeks. Operate the Engine for at least 45 minutes to maintain proper Battery charge.
- Store an unused Battery in a dry area that does not freeze.
- Do not charge an already charged Battery. In theory, you cannot overcharge our Battery with a trickle Charger; however, when a Battery is fully charged and the Charger is still on, it generates heat that could be harmful to the Battery. A fully charged Battery will read 12V-13.2V with a Voltmeter.
- Do not continue to crank the Engine when the Battery charge is low.

Disposing of the Battery Responsibly

The Battery is a sealed lead-acid Battery. Recycle or dispose of it in an environmentally sound way.

- Do not dispose of a lead-acid Battery in a fire; the Battery may explode or leak.
- Do not dispose of a lead-acid Battery in your regular, household trash. Law in most areas prohibits incinerating, disposing in a landfill, or mixing a sealed lead-acid Battery with household trash.

Charging the Battery

Operate the Engine for at least 45 minutes to maintain proper Battery charge. If the Battery loses its charge, you'll need to use a trickle Charger to recharge it. The Charger should have an output of 12 volts at no more than 2 amps.

- At 1 amp, you may have to charge the Battery for as long as 48 hours.
- At 2 amps, you may have to charge the Battery for as long as 24 hours.

Note: *The charging system of a running engine is designed to maintain a battery's present charge. Starting a machine that has a significantly discharged or dead Battery using the Recoil Starter or Jumper Cables will not recharge the Battery.*

To connect a Battery Charger to your Multi-Surface Vacuum, follow the steps listed below.

1. Detach the two (2) Battery wires going to the Battery on your Multi-Surface Vacuum.
2. Attach the black (-) Battery Charger wire to the Battery negative (-) terminal, and attach the red (+) Battery Charger wire to the Battery positive (+) terminal.
3. Plug the Battery Charger into an outlet.

NOTICE

When you are finished charging the battery, disconnect the charger from the outlet first, then disconnect the battery charger wires from the battery. If you leave the battery charger wires connected to the battery, the battery will discharge itself back into the charger.

Recycling a Used Battery

NOTICE

Please dispose of used batteries responsibly, according to your local hazardous materials regulations. Never throw away used batteries in your household trash.

Please dispose of your used Batteries responsibly by recycling them. Call your local Solid Waste Management District or your local waste handler to locate the collection site nearest you. Some collection sites recycle Batteries year-round; others collect them periodically. You can also visit the Web site of Earth 911 for more information [www.earth911.org].

For a fee, you can recycle your Batteries with the International Metals Reclamation Company. Visit them at www.inmetco.com for Battery Recycling and contact info.

To learn more about hazardous waste recycling, visit the Web site for Battery Council International [www.batterycouncil.org] or for the Environmental Protection Agency [www.epa.gov].

! WARNING

Shut down the engine, remove the spark plug wire and wait 5 minutes for parts to cool before performing before installing the Vacuum Kit.



Figure 22

Tools Needed:

- 5/16" Wrench
- 7/16" Wrench
- Short Flat Head Screwdriver
- Wire Cutters
- Utility Knife

1. Cut the Tape on the Box Flaps with a Utility Knife.
2. Remove the parts from the Box and lay them out on a flat clean area.

Shipping Box Contents (Figure 32 and Table Below)

ITEM#	DESCRIPTION
1	Hose, 6" Dia. X 8' Long
2	Adapter, Vacuum
3	Snout, Pick-up
4	Poly Bag
5	Cable Tie, 32"
6	Handle

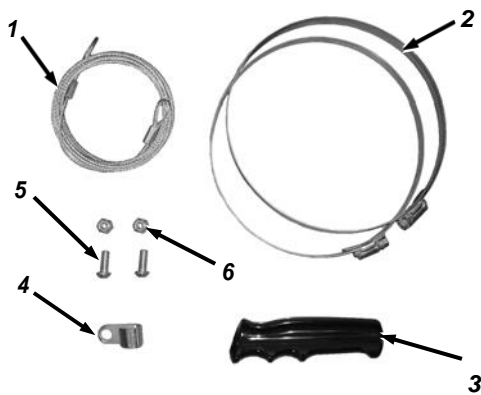


Figure 23

Poly Bag Contents (Figure 33 and Table Below)

ITEM#	DESCRIPTION
1	Tether, Wire
2	Clamp, Hose, 6-1/8"
3	Grip, Handle
4	Guide, Cable
5	Screw, Machine, Rd Hd, 1/4-20 x
6	Nut, Nylon Lock, 1/4-20

5/16-18
Nylocks



Figure 24

Vacuum
Snout

Compare the contents of the Shipping Box and Poly with the "Contents" lists above. If you have any questions please contact us at www.MacKissic.com or call 1-800-348-1117 for assistance.

NOTE: Assembly should be done on a clean, level surface.

3. Unscrew the x4 Nylon Locknuts and remove the Vacuum Snout from the machine (Figure 24).

- Place the Vacuum Adapter onto the front of the Housing (**Figure 25**) so the studs are located in the right-hand side of the lower slots (**Detail A**). Slide the Adapter to the right and down so the Plunger Bracket on the Adapter pushes the Safety Switch in (**Detail B**).
- Install four 5/16-18 nylon locknuts, with the Cable Guide under the top Knob, onto the studs to secure the Vacuum Adapter.

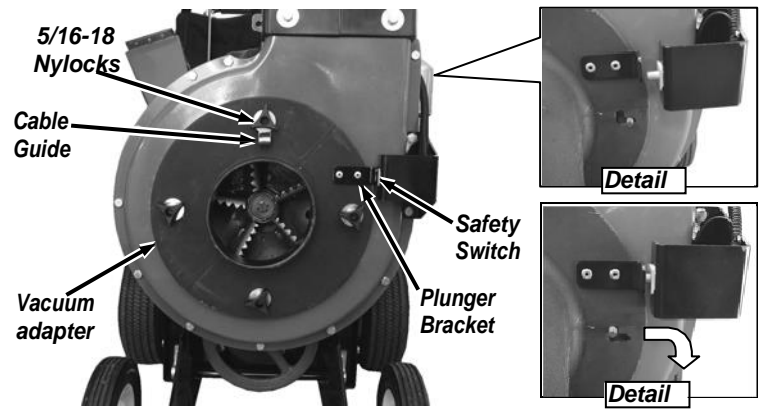


Figure 25

- Secure one end of the Hose onto the Vacuum Adapter with a Hose Clamp using a 5/16" Wrench (**Figure 36**).
- Secure the other end of the Hose onto the Pick-up Snout with a Hose Clamp using a 5/16" Wrench.
- Attach the Handle and the Pick-up Snout loosely together with a Screw (inside snout) and Locknut at the hole at the end of the Handle. Only tighten hand tight for now.
- As you install the next Screw and Locknut, insert the larger loop end of the Wire Tether between the Handle and Pick-up Snout.
- Tighten the two Screws (inside snout) and Locknuts using a Short Flat Head Screwdriver and 7/16" Wrench.
- Hook the small loop end of the Wire Tether onto the Cable Guide.
- Install the three Cable Ties to hold the Wire Tether to the Hose and cut the protruding ends with Wire Cutters.
- Slide the Grip onto the end of the Handle.

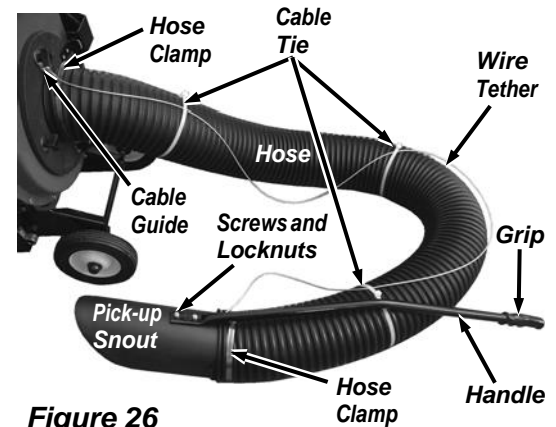


Figure 26

NOTE: The Wire Tether will prevent the Hose from being over extended.

If you have any questions please contact us at www.MacKissic.com or call 1-800-348-1117 for assistance.

Chapter 6: Troubleshooting

Most problems are easy to fix. Consult the Troubleshooting Table below for common problems and their solutions. If you continue to experience problems, contact us at www.MacKissic.com or call toll-free 1-800-348-1117 for support.

WARNING

Shut down the engine, remove the spark plug wire and wait 5 minutes for parts to cool before performing any maintenance procedure or inspection on the Machine.

Troubleshooting Table

SYMPTOM	POSSIBLE CAUSE ; CORRECTIVE ACTION
<i>Engine fails to start</i>	<ul style="list-style-type: none"> ⇒ Fuel tank empty; Fill tank with clean, fresh fuel. ⇒ Spark plug wire disconnected; Connect wire to spark plug. ⇒ Faulty spark plug; Clean, adjust gap or replace the spark plug.
<i>Loss of power, operation erratic</i>	<ul style="list-style-type: none"> ⇒ Spark plug wire loose; Connect and tighten spark plug wire. ⇒ Running on "CHOKE"; Move choke lever to "RUN" position. ⇒ Blocked fuel line or stale fuel; Clean fuel line; fill tank with clean, fresh gasoline. ⇒ Water or dirt in fuel system; Disconnect fuel line at carburetor to drain fuel tank. ⇒ Carburetor out of adjustment; contact us at www.MacKissic.com or call 1-800-348-1111 for assistance. ⇒ Dirty air cleaner; Clean or replace air filter.
<i>Engine overheats</i>	<ul style="list-style-type: none"> ⇒ Carburetor not adjusted properly; contact us at www.MacKissic.com or call 1-800-348-1117 for assistance. ⇒ Engine oil level low; Fill crankcase with proper oil. ⇒ Internal engine cooling fan not working properly due to debris buildup over engine crank cover; Clean debris away from engine crank cover for improved air circulation.
<i>Unit does not discharge</i>	<ul style="list-style-type: none"> ⇒ Discharge tube clogged; Stop engine immediately and disconnect spark plug wire. Clean inside of blower housing. See "MAINTENANCE" section of this manual. ⇒ Foreign object lodged in impeller; Stop engine immediately and disconnect spark plug wire. Remove lodged object.
<i>Excessive vibration.</i>	<ul style="list-style-type: none"> ⇒ Loose parts or damaged impeller assembly; Stop engine immediately and disconnect spark plug wire. Tighten all bolts & nuts. Make all necessary repairs. If vibration continues, contact us at www.MacKissic.com or call 1-800-348-1117 for assistance.
<i>Loss of vacuum</i>	<ul style="list-style-type: none"> ⇒ Vacuum snout clogged; Remove & clean. ⇒ Collection bag full; Remove & empty bag. ⇒ Discharge tube clogged; Remove collection bag & clean tube. ⇒ Processing chamber clogged; Remove vacuum snout to clean chamber. ⇒ Engine not reaching full RPM; contact us at www.MacKissic.com or call 1-800-348-1117 for assistance. ⇒ Fan blades bent or broken; Replace rotor.

Troubleshooting Table (Continued)

WARNING

Shut down the engine, remove the spark plug wire and wait 5 minutes for parts to cool before performing any maintenance procedure or inspection on the vacuum.

SYMPTOM	POSSIBLE CAUSE ; CORRECTIVE ACTION
<i>Loss of traction</i>	<ul style="list-style-type: none">⇒ Drive belt loose; Adjust wheel drive bail cable.⇒ Stretched or broken drive belt; Replace belt.⇒ Wheel drive bail cable tension spring broken; Reconnect spring or replace cable.⇒ Malfunction in transaxle; contact us at www.MacKissic.com or call 1-800-348-1117 for assistance.
<i>Gear shift lever does not shift</i>	<ul style="list-style-type: none">⇒ Loose gear shift lever; Check connections for loose nuts and bolts.⇒ Broken gear shift linkage; Replace linkage.⇒ Loose transaxle shifting arm; Tighten screw on shifting arm.
<i>Wheels do not stop when Wheel Drive Bail Cable is released</i>	<ul style="list-style-type: none">⇒ Wheel Drive Bail Cable tension spring broken, stretched, or disconnected; Reconnect spring or cable.⇒ Drive belt misaligned; Check that belt is properly aligned on pulleys.⇒ Wheel Drive Cable out of adjustment; Adjust cable.⇒ Unit just “creeps”; Shake talcum powder on drive belt.
<i>Product build-up in shredding chamber.</i>	<ul style="list-style-type: none">⇒ Vacuuming too fast; Clean out shredder housing and vacuum at slower speed.

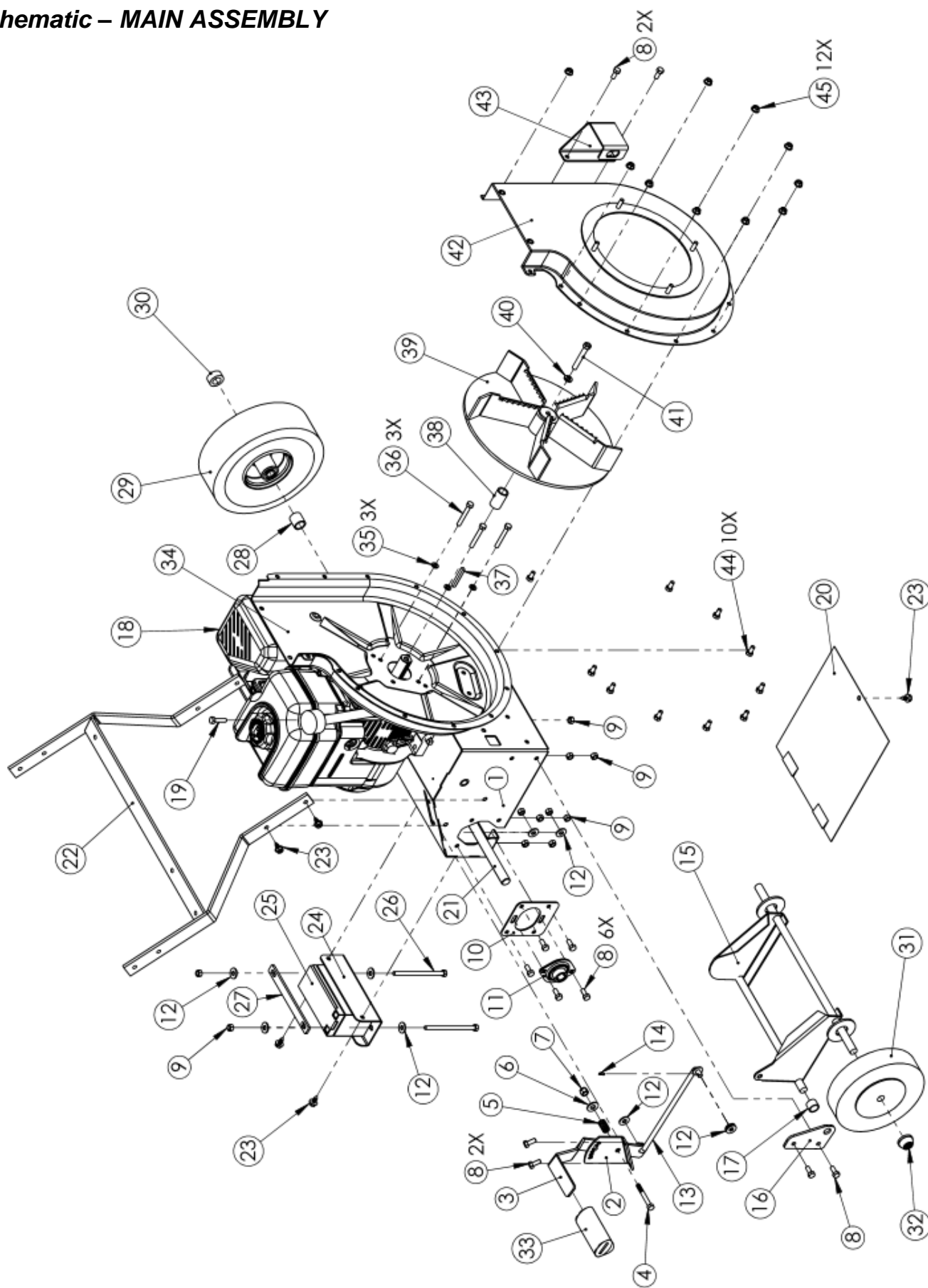
Chapter 7: Parts Lists, Schematic Diagrams and Warranty

Parts List – MAIN ASSEMBLY

NOTE: Part numbers listed are available through MacKissic Inc.

ITEM NO.	PART NUMBER	DESCRIPTION
1	805-0382	VCB BASE WLDMT
2	805-0250	HEIGHT ADJUST BASE
3	805-0387	HEIGHT ADJUST HANDLE
4	090-0115	3/8 - 16 X 2 1/2 HHCS GR5
5	712-0069	SPRING, LC-092H-6 1-1/2"
6	090-0234	WASHER, FLAT, 3/8, USS
7	090-0461	3/8-16 Nylock Nut
8	090-0066	5/16-18 X 3/4" HHCS
9	090-0460	NUT, NYLON LOCK, 5/16-18
10	805-0383	BEARING PLATE
11	030-0174	3/4" FLANGED BEARING W/ SET SCRE
12	090-0233	WASHER, FLAT, 5/16" USS
13	805-0385	Height Adjust Linkage - V2
14	090-0656	HAIR PIN - "WW" #213
15	805-0391	FRONT WHEEL FRAME WELDMENT
16	805-0384	PIVOT MOUNT PLATE
17	500-0012	7/8"OD X 0.083 WALL X 5/8"L SPACE
18	030-0507	1100 Series Engine
19	090-0089	5/16-18 X 1-1/4 HHCS GR5
20	805-0121	BOTTOM COVER
21	805-0406	AXLE - VMS
22	805-0114	LOWER HANDLE
23	090-0679	5/16-18 X 3/4 TYP 23 SELF TAP
24	805-0328	BATTERY BRACKET
25	030-0244	BATTERY
26	090-0708	5/16-18 X 5" HHCS
27	108-0414	BATTERY HOLD DOWN
28	805-0052	WHEEL SPACER
29	703-0108	4.10/3.50-4 PNEUMATIC WHEEL
30	090-0730	3/4 IN LOCKING COLLAR
31	701-0052	8X1.75X5/8 BORE SEMI-PNEUMATIC WHEE
32	090-0457	PUSH NUT CAP
33	500-0045	HANDLE GRIP
34	805-0407	VMS ENGINE HOUSING
35	090-0394	Washer Lock 7/16 Split ZP
36	090-0505	5/16-24 X 2/1/4 HHCS
37	703-0424	.25 X 2 KEY
38	805-0337	IMPELLER SPACER
39	704-0244	VAC IMPELLER
40	090-0228	3/8 MED SPLIT LOCKWASHER
41	090-0538	3/8-24 X 2-1/2" HHCS GR8
42	804-0218	VCB/LLV INLET HOUSING
43	805-0311	SNOUT INTERLOCK BRACKET
44	090-0067	BOLT, HCS, 5/16-18 X 1
45	090-0418	5/16-18 WHIZLOCK NUT

Schematic – MAIN ASSEMBLY

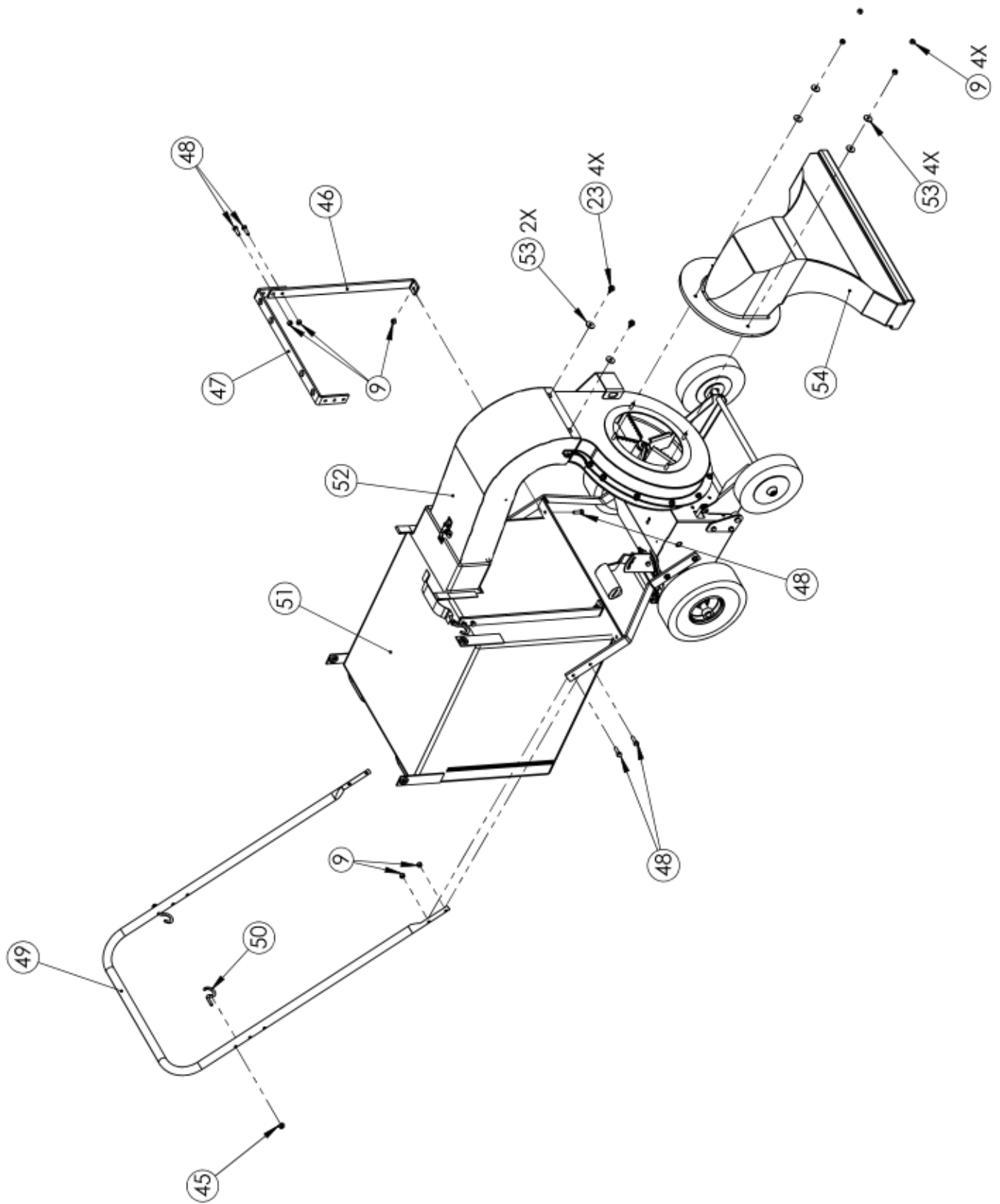


Parts List – FINAL ASSEMBLY

NOTE: Part numbers listed are available through MacKissic Inc.

ITEM NO.	PART NUMBER	DESCRIPTION
9	090-0460	NUT, NYLON LOCK, 5/16-18
23	090-0503	5/16-18 X 3/4" SELF TAPPING HHCS
45	090-0418	5/16-18 WHIZLOCK NUT
46	805-0339	SIDE BAG HANGER
47	805-0367	TOP BAG HANGER
48	090-0088	BOLT, HHCS, 5/16-18 X 1
49	805-0098	UPPER HANDLE BAR
50	805-0119	BAG HANGER HOOK
51	805-0354	VCB BAG - BLACK W/ GROMMITS
52	805-0356	J-TUBE ASSEMBLY
53	090-0502	5/16 FENDER WASHER
54	805-0347	SNOUT ASSEMBLY
55	090-0679	5/16-18 X 3/4 TYP 23 SELF TAP

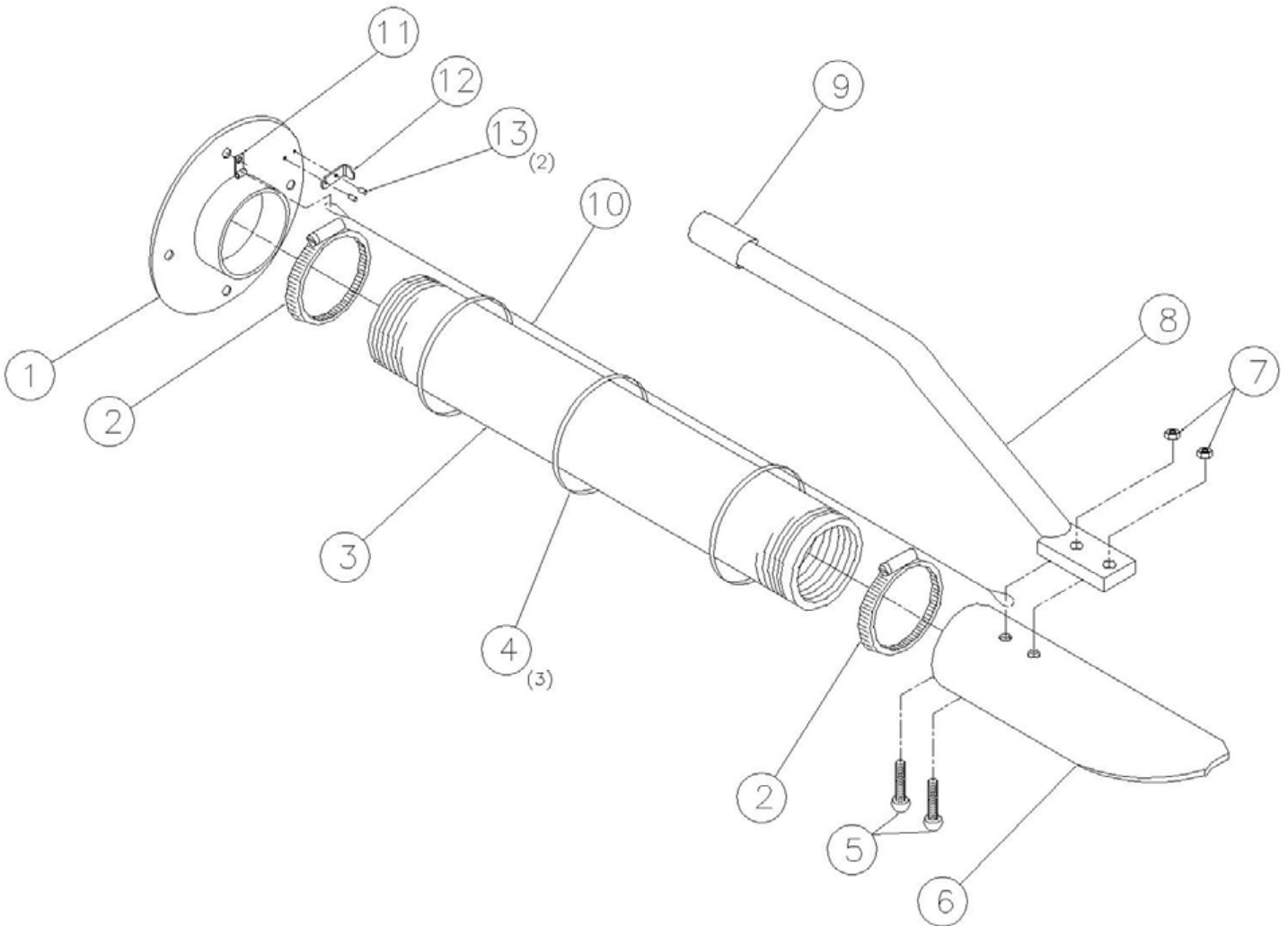
Schematic – FINAL ASSEMBLY



Parts List – OPTIONAL VACUUM KIT #805-0129

NOTE: Part numbers listed are available through MacKissic Inc.

Ref#	Part#	Description	Ref#	Part#	Description
01	805-0338	Adapter, Vacuum	08	804-0078-BL	Handle
02	32412	Clamp, Hose, 6-1/8"	09	500-0041	Grip, Handle
03	32027-B	Hose, 6" Dia. X 8' Long	10	704-0197	Tether, Wire
04	900-0074A	Cable Tie, 32"	11	706-2243	Guide, Cable
05	090-0179	Screw, Machine, Rd Hd, 1/4-20 x 3/4"	12	285621	Contact, Interlock
06	704-0117	Snout, Pick-up	13	284581	Rivet, 3/16"
07	090-0470	Nut, Nylon Lock, 1/4-20	NS	080-0970	Shut Down Eng.



Daily Checklist for the Multi-Surface Vacuum

To help maintain your Multi-Surface Vacuum for optimum performance, we recommend you follow this checklist each time you use your machine.

! WARNING

Shut down the engine, remove the spark plug wire and wait 5 minutes for parts to cool before performing any maintenance procedure or inspection on the Machine.

- Check the engine oil level.
- Check Fuel Level
- Check the general condition of the Vacuum, e.g.; nuts, bolts, welds, etc.
- Check that the Debris Bag is connected at all Hangers, Latches are closed and zipper is fully zipped.
- Check for and clean accumulated debris in the Snout.
- Check and clean Engine Fins and controls of Debris.

End of Season and Storage

! WARNING

Shut down the engine, remove the spark plug wire and wait 5 minutes for parts to cool before performing any maintenance procedure or inspection on the Machine.

- If your Multi-Surface Vacuum will be idle for more than 30 days, we recommend using a gas stabilizer. This will prevent sediment from gumming up the Carburetor. If there is dirt or moisture in the gas or tank, remove it by draining the tank. Completely fill the tank with fresh, unleaded gas and add the appropriate amount of stabilizer or gasoline additive. Run the Engine for a short time to allow the additive to circulate.
- Change Engine Oil.
- Clean dirt and debris from the Cylinder Head Cooling Fins, Impeller Housing, Debris Screen, and Muffler area of the Engine.
- Remove the Spark Plug and pour about 1 ounce of motor oil into the Cylinder hole. Replace the Plug and pull the Recoil Starter Rope until you feel strong resistance. This will coat the piston and seat the valves to prevent moisture buildup.
- Empty and clean the Debris Bag and ensure it is dry.
- Clean or replace the Air Filter.
- Clean the exterior of the unit to remove all dirt, grease, and any other foreign material. To prevent rust, touch up painted surfaces that have been scratched or chipped.
- For Electric-Start models, store the Battery in a dry area that will not freeze. If you will not use the machine over a long period, charge the Battery every four to six weeks.
- If possible, store the machine in a dry, protected place. If it is necessary to store the machine outside, cover it with a protective material (especially the Engine and Housing).

1189 Old Schuylkill RD Parker Ford, Pennsylvania 19457