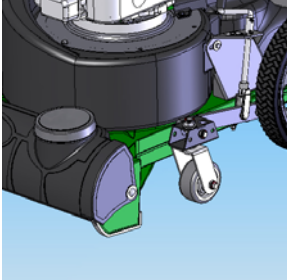
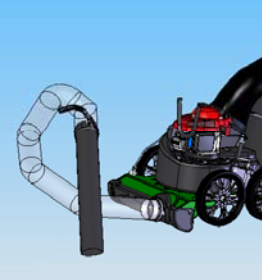

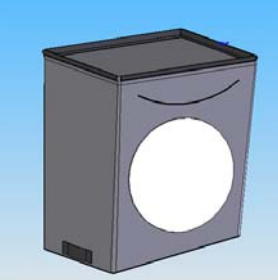


BILLY GOAT[®] MV650H PUSH Vacuum Owner's Manual

Accessories

| <i>Caster Kit</i> | <i>Hose Kit</i> | <i>Bag Liner Kit</i> | <i>Felt Bag Kit</i> |
|---|---|--|---|
| <i>Use on hard surface for maneuverability.</i> | <i>For vacuuming hard to reach areas.</i> | <i>To collect leaves, thatch, and grass.</i> | <i>Use on all dusty conditions.</i> |
|  |  |  |  |
| <i>P/N 840129</i> | <i>P/N 840116</i> | <i>P/N 840134</i> | <i>P/N 840194</i> |



ABOUT THIS MANUAL

THANK YOU for purchasing a BILLY GOAT® *MV Vacuum*. Your new machine has been carefully designed and manufactured to provide years of reliable and productive service. This manual provides complete operating and maintenance instructions that will help to maintain your MV Vacuum in top running order. Read this manual carefully before assembling, operating, or servicing your equipment.

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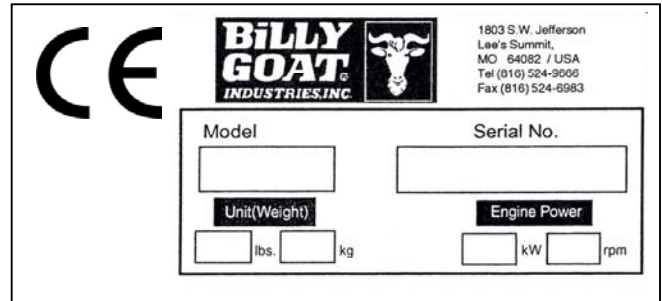


SERIAL PLATE DATA

Record the model number, serial number, date of purchase, and where purchased.

Purchase Date: _____

Purchased From: _____



MV 650 SERIES SPECIFICATIONS

| | MV650 |
|----------------------------|------------------------------------|
| Engine Type | Honda GSV190AA1A |
| Horsepower | 6.5 (4.85 kW) |
| Fuel Capacity | 1.6 qt (1.5 L) |
| Oil Capacity | 0.69 qt (0.65L) |
| Engine Weight | 28 lbs (12.7 kg) |
| Unit Weight | 157 lbs (71.2 kg) |
| Shipping Weight | 180 lbs (81.7 kg) |
| Overall Dimensions | 28" Wide x 62.5" Long x 45.5" High |
| Maximum Operating Slope | 20° |
| Lw(a) at Operator position | 103 dB(a) at 3320 rpm |
| Lp(a) at Operator position | 83 dB(a) at 3320 rpm |

COMMON REPLACEMENT PARTS

- Bag. P/N 840189. Original equipment replacement bag.
- Skid. P/N 840041. Nozzle wear guard skid.



GENERAL SAFETY INSTRUCTIONS and SYMBOLS

The safety symbols shown below are used throughout this manual. You should become familiar with them before assembling, operating or servicing this equipment.



WARNING: This symbol indicates important information that will prevent injury to yourself or others.



This symbol indicates ear protection is recommended when operating this equipment.



This symbol indicates eye protection is recommended when operating this equipment.



This symbol indicates gloves should be worn when servicing this equipment.



This symbol indicates that this manual and the engine manufacturer's manual should be read carefully before assembling, operation, or servicing this equipment.



CAUTION: This symbol indicates important information that will prevent damage to your BILLY GOAT[®] MV Vacuum.



This symbol indicates the engine oil level should be checked before operating this equipment.

Read and make sure you thoroughly understand the following safety precautions before assembling, operating or servicing this equipment:



READ this manual and the engine manufacturer's manual carefully before assembling, operating, or servicing this equipment.



EAR PROTECTION is recommended when operating this equipment.



EYE PROTECTION is recommended when operating this equipment.





WARNING: **EXHAUST** from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.


DO NOT operate this equipment on any unimproved forested, brushy, or grass covered land unless a spark arrester is installed on the muffler as required by Section 4442 of the California Public Resources Code. The arrester must be maintained in good working order. Other states may have similar laws. Federal laws apply on federal lands.


DO NOT run engine in an enclosed area. Exhaust gases contain carbon monoxide, an odorless and possibly fatal poison.





WARNING:  **DO NOT** run this equipment indoors or in any poorly ventilated area. Refueling outdoors is recommended.


 **DO NOT** refuel this equipment while the engine is running. Allow engine to cool for at least two minutes before refueling.


 **DO NOT** store gasoline near an open flame.


 **DO NOT** remove gas cap while engine is running.


 **DO NOT** start or operate engine if strong odor of gasoline is present.


 **DO NOT** start or operate engine if gasoline is spilled. Move equipment away from spill until gasoline has completely evaporated.


 **DO NOT** smoke while filling the fuel tank.

 **DO NOT** check for spark with spark plug or spark plug wire removed. Use an approved spark tester.

 **DO NOT** operate engine without a muffler. Inspect muffler periodically and replace if necessary. If equipped with muffler deflector, inspect deflector periodically and replace if necessary.


 **DO NOT** operate engine with grass, leaves or other combustible material near the muffler.

 **DO NOT** touch muffler, cylinder, or cooling fins when hot. Contact with hot surfaces may cause severe burns.


 **DO NOT** leave equipment unattended while in operation.


 **DO NOT** park equipment on a steep grade or slope.

 **DO NOT** operate equipment with bystanders in or near the work area.

 **DO NOT** allow children to operate this equipment.

 **DO NOT** operate equipment with guards removed.

 **DO NOT** operate equipment near hot or burning debris or any toxic or explosive materials.

 **DO NOT** operate equipment on slopes greater than specified in Specifications section of this manual.

ALWAYS remove spark plug wire when servicing equipment to prevent accidental starting.

ALWAYS check fuel lines and fittings frequently for cracks or leaks. Replace if necessary.

ALWAYS keep hands and feet away from moving or rotating parts.

ALWAYS store fuel in approved safety containers.



SOUND DATA



L_{WA}

SOUND LEVEL 103 Dba at Operator Position
103 dB

Sound tests were conducted in accordance with 2000/14/EC, as well as ISO 11094, and were performed on 5-17-2005 under the conditions listed below.

NOTE

Sound power level listed is the highest value for any model covered in this manual. Please refer to serial plate on the unit for the sound power level for your model.

| | |
|----------------------|----------------------|
| General Conditions: | Sunny |
| Temperature: | 66.2°F (19°C) |
| Wind Speed: | 8.5 mph (13.7kph) |
| Wind Direction: | South Southwest |
| Humidity: | 59% |
| Barometric Pressure: | 29.9" Hg (101.35kPa) |

VIBRATION DATA

VIBRATION LEVEL 1.43g(14.00m/s²)

Vibration levels at the operator's handles were measured in the vertical, lateral and longitudinal directions using calibrated vibration test equipment. Tests were performed on 5-24-2006 under the conditions listed below.

| | |
|----------------------|------------------------|
| General Conditions: | Sunny |
| Temperature: | 73.7°F (23.2°C) |
| Wind Speed: | 8.05 mph (3.6m/s) |
| Wind Direction: | South |
| Humidity: | 83.5% |
| Barometric Pressure: | 29.91" Hg (101.31 kPa) |

INTENDED USE

Your BILLY GOAT® *MV Vacuum* is designed for vacuuming leaves, grass clippings, and other types of organic litter, as well as, debris mixed with cans, bottles and small amounts of sand; however, vacuuming cans, bottles and sand will affect the longevity of your machine.

Like all mechanical tools, reasonable care must be used when operating the machine.



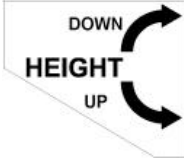




Do not operate if excessive vibration occurs. If excessive vibration occurs, shut engine off immediately and check for damaged or worn impeller, loose impeller bolt, loose impeller key, loose engine or lodged foreign



objects. Note: See parts list for proper impeller bolt torque specifications. (See trouble shooting section on page 25).

INSTRUCTION LABELS

The labels shown below were installed on your BILLY GOAT® MV Vacuum. If any labels are damaged or missing, replace them before operating this equipment. Item numbers from the Illustrated Parts List and part numbers are provided for convenience in ordering replacement labels. The correct position for each label may be determined by referring to the Figure and Item numbers shown.

| | | |
|--|--|--|
|  <p>PN 400268 (See Figure 3 Item 55)</p> |  <p>PN 890254 (See Figure 4 Item 162)</p> |  <p>PN 840054 (See Figure 1 Item 34)</p> |
|  <p>PN 400424 (See Figure 1 Item 11)</p> |  <p>PN 810736 (See Figure 4 Item 174)</p> |  <p>PN 890301 (See Figure 4 Item 163)</p> |
|  <p>PN 840080 (See Figure 4 Item 175)</p> | | |

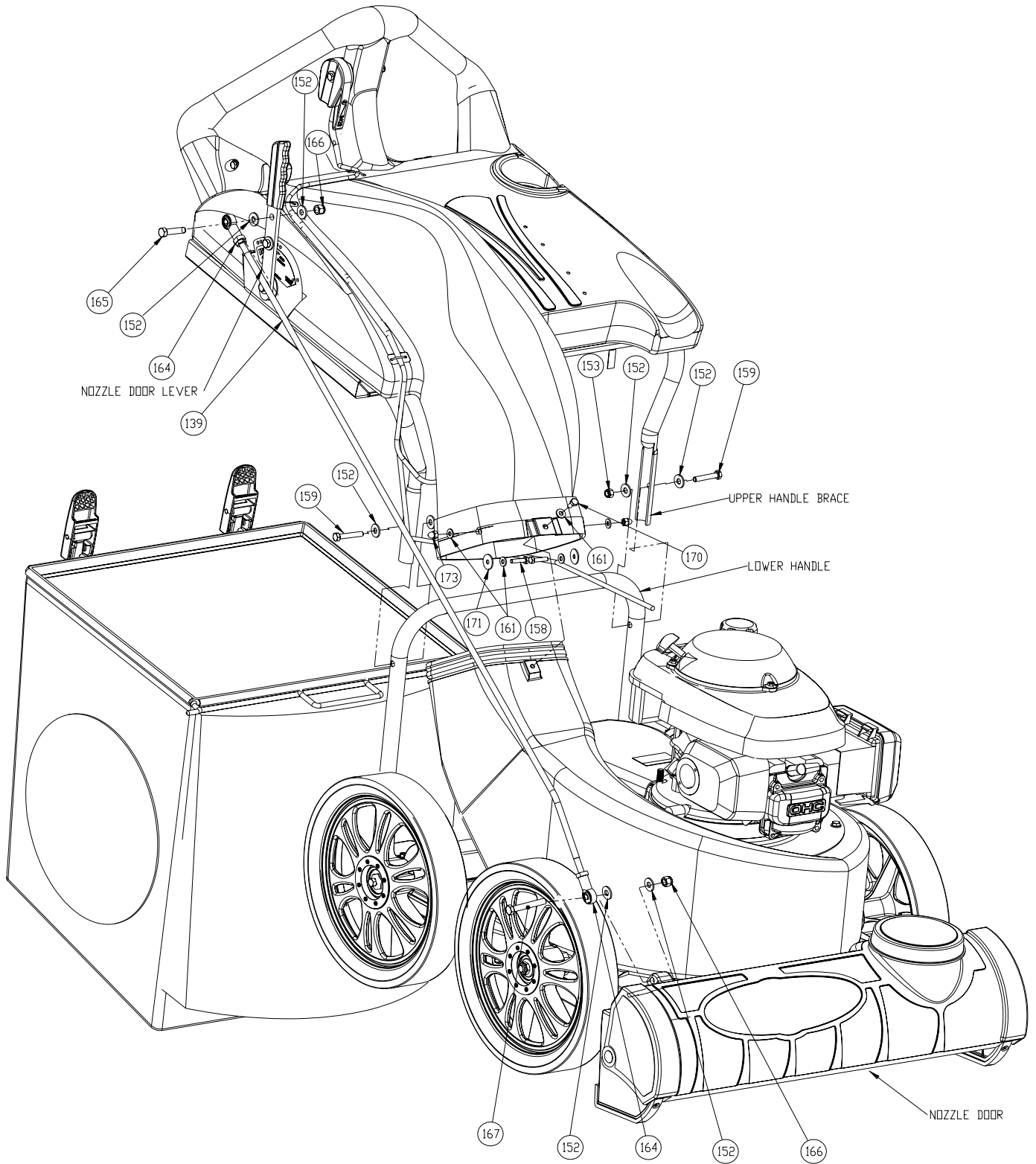
ENGINE LABELS



CONTROLS



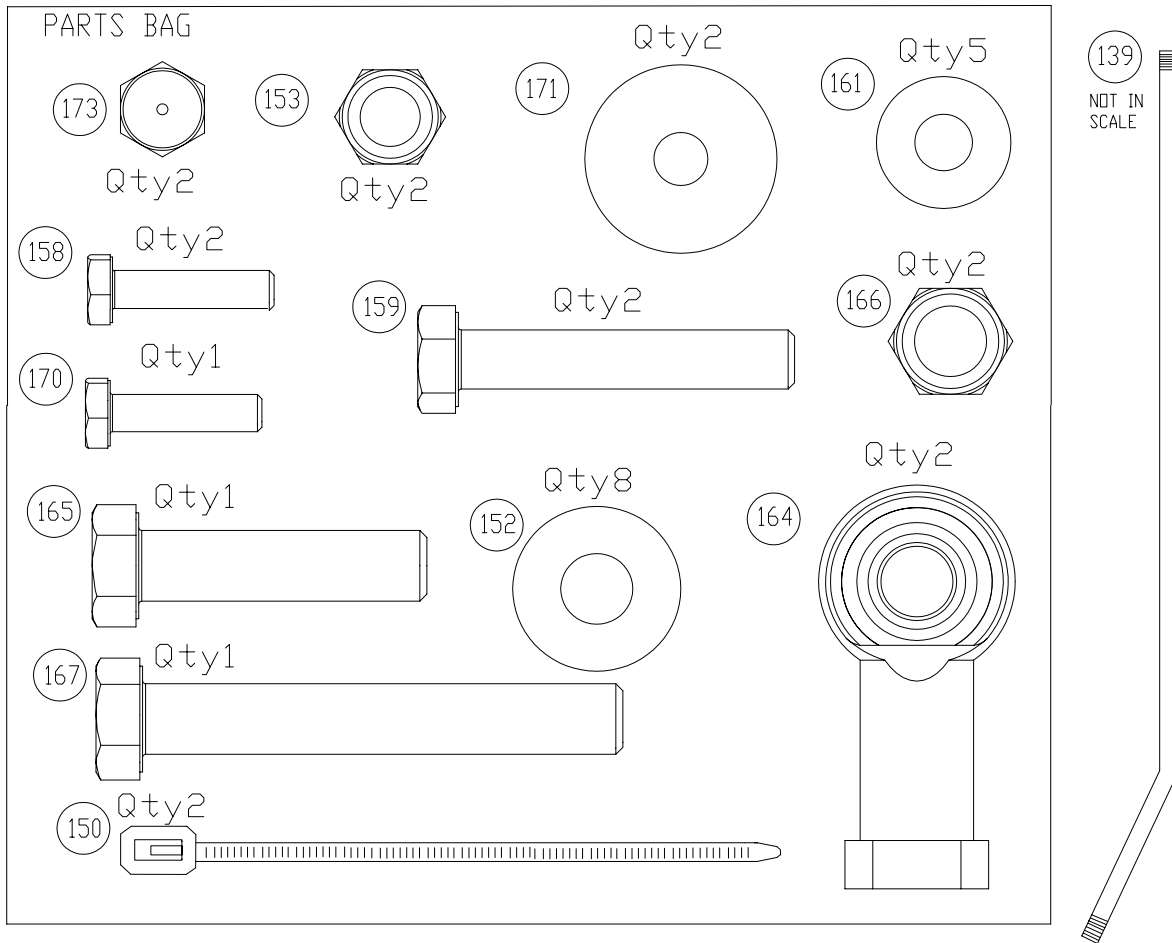
PN 840045
(See Figure 3 Item 57)



MV Vacuum Assembly Drawing

PARTS LIST

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|-------------|------------------------------|------|
| 139 | 840061 | ROD LIFT NOZZLE DOOR | 1 |
| 150 | 900407 | TY-WRAP | 2 |
| 152 | 8171003 | WASHER 5/16 FLATWASHER Z/P | 8 |
| 153 | 8160002 | LOCKNUT 5/16-18 | 2 |
| 158 | 8041006 | SCREWCAP 1/4-20 X 1" ZP | 2 |
| 159 | 8041031 | SCREWCAP 5/16-18 X 1.75 ZP | 2 |
| 161 | 8172007 | WASHER 1/4 SAE ZP | 5 |
| 164 | 400886 | ROD END BALL JOINT 3/8 NF | 2 |
| 165 | 8041052 | SCREW CAP 3/8-16X1 1/2 ZP | 1 |
| 166 | 8160003 | LOCKNUT 3/8-16 | 2 |
| 167 | 8041056 | SCREWCAP 3/8"-16X2 1/2" ZP | 1 |
| 170 | 8041004 | SCREWCAP 1/4"-20X3/4" HCS ZP | 1 |
| 171 | 8172019 | WASHER, FENDER, 1/4 ZP | 2 |
| 173 | 840071 | NUT ACORN 1/4-20 | 2 |





ASSEMBLY INSTRUCTIONS

Your BILLY GOAT® MV Vacuum was shipped in one carton, completely assembled except for the Hood/Upper Handle Assembly. Mounting hardware for the Hood/Upper Handle Assembly is temporarily installed on the lower handle and the Housing assembly.



READ all safety instructions before assembling unit.

TAKE CAUTION when removing the unit from the box the Hood/Upper Handle Assembly is attached to the unit by cables.

Remove unit from carton. Make sure the following items that have been packed with unit:

Parts bag P/N 840190

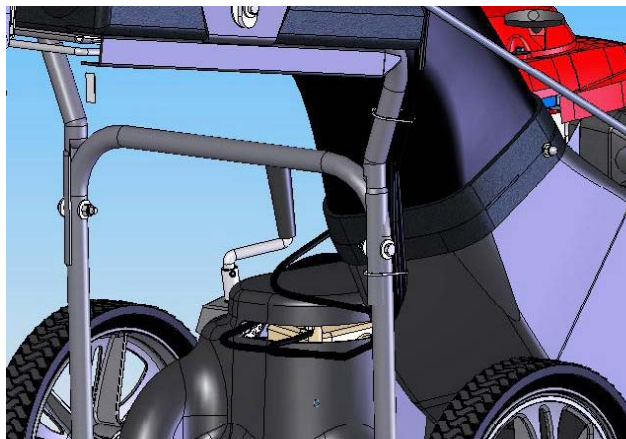
- Owner's Manual, P/N 840186
- Declaration of Conformity, P/N 840204
- Honda Engine Manual
- Warranty Card, P/N 400972
- Ty-Wraps (2 ea)
- Hardware Bag P/N 840190



WARNING: **DISCONNECT** spark plug wire before assembling unit.

1. Attach hood assembly to the housing then hold in place during the step 2.

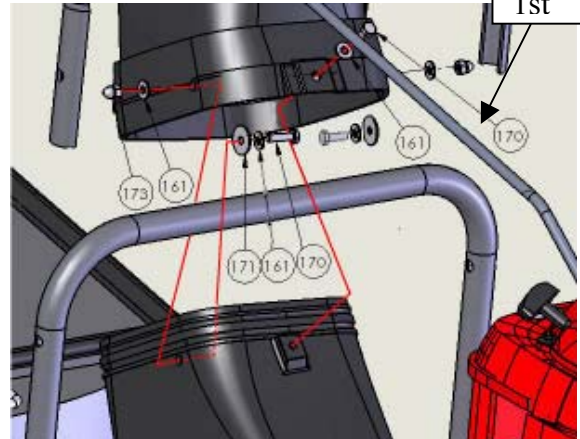
NOTE: BE SURE ALL CABLES ARE ROUTED ON THE UNDERSIDE OF THE HOOD AND HOUSING.



2. Install item #170 center bolt first when aligned with a nut on the housing.

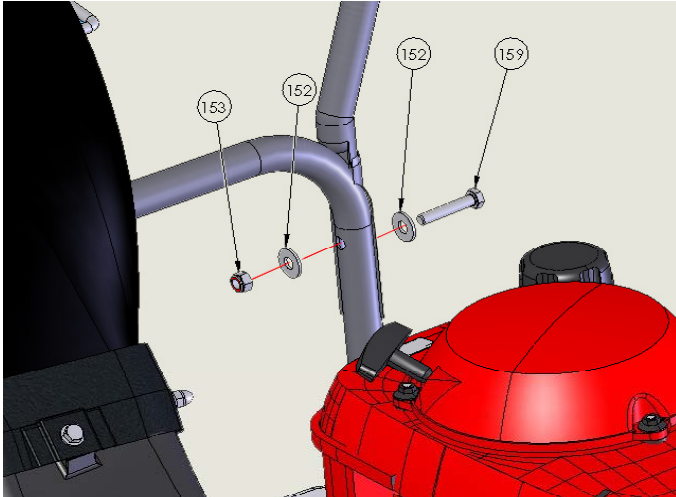
3. Attach rest of hood assembly to the housing using corresponding hardware.

NOTE: You will have to insert the bolt/washer from the inside by reaching through the hood.



- Two 7/16" wrenches.

4. Attach upper handle brace to lower handle using corresponding hardware. Then repeat this step on the other side.

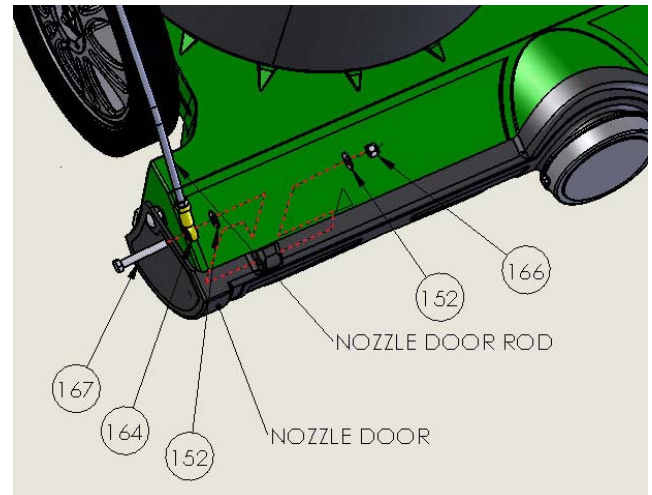


- Two 1/2" wrenches.

5. Attach rod end (164) to the nozzle door rod then secure in place by tightening jam nut.

6. Attach nozzle door rod to the nozzle door using corresponding hardware.

NOTE: It is easier to do this with nozzle door closed.

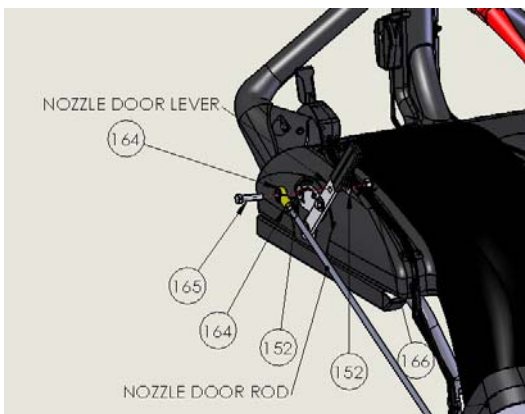


- Two 9/16" wrenches.

7. Attach rod end to rod (as in step 5).

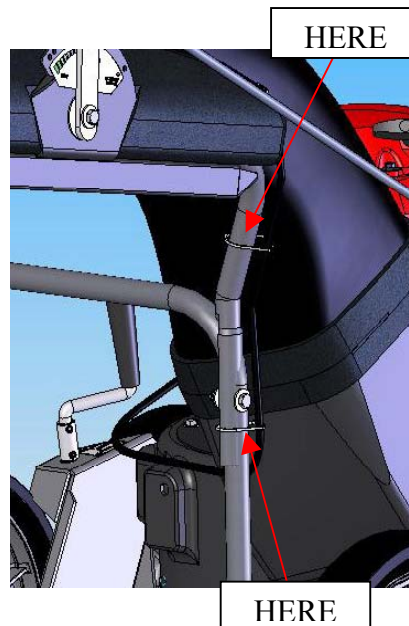
8. Attach nozzle door rod to the lever with nozzle door closed and lever in hose kit position.

NOTE: Check to see nozzle door open and close all the way (see page 15). Tighten or loosen the rod end (164) for any adjustments.



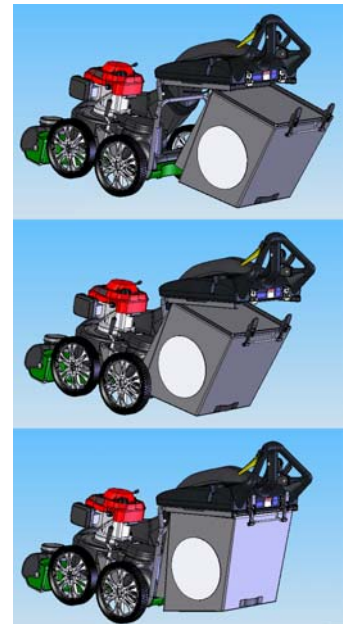
Two 9/16" wrenches.

9. Install cable ty wraps.



10. Reconnect spark plug wire.













11. Attach the bag.



OPERATION



WARNING:

-  **DO NOT** run engine in an enclosed area. Exhaust gases contain carbon monoxide, an odorless and possibly fatal poison.
 -  **DO NOT** start or operate engine if strong odor of gasoline is present.
 -  **DO NOT** start or operate engine if gasoline is spilled. Move equipment away from spill until gasoline has completely evaporated.
 -  **DO NOT** operate engine without a muffler. Inspect muffler periodically and replace if necessary. If equipped with muffler deflector, inspect deflector periodically and replace if necessary.
 -  **DO NOT** operate engine with grass, leaves, or other combustible material near the muffler.
 -  **DO NOT** touch muffler, cylinder or cooling fins while engine is running. Contact with hot surfaces may cause severe burns.
 -  **DO NOT** operate equipment with bystanders in or near the work area.
 -  **DO NOT** operate equipment with guards removed.
 -  **DO NOT** operate equipment in areas containing rock, glass, string-like material, wire, rags, cans, metal, or other non-organic material.
 -  **DO NOT** operate equipment on slopes greater than specified in Specifications section of this manual.
 -  **DO NOT** operate equipment near hot or burning debris or any toxic or explosive materials.
 -  **DO NOT** allow children to operate this equipment.
- ALWAYS** keep hands and feet away from moving or rotating parts.



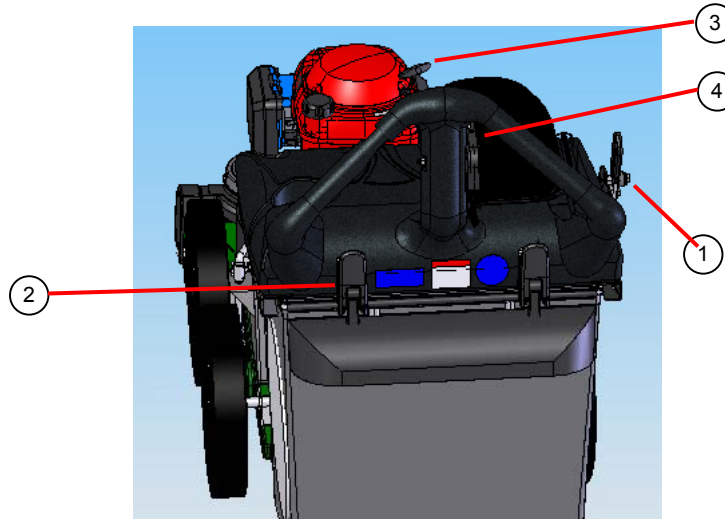
EAR PROTECTION is recommended when operating this equipment.



EYE PROTECTION is recommended when operating this equipment.

OPERATOR CONTROLS

The operator's position is at the rear of the machine between the handlebars. The operator should STAND in a position to allow both handlebars to be grasped firmly, which allows sufficient leverage to steer the machine. Operator's controls are shown below.



Operator Control Locations

- | | | | |
|---|----------------------|---|------------------|
| 1 | Nozzle Door Adjuster | 4 | Throttle Control |
| 2 | Bag Latch | | |
| 3 | Pull Starter | | |

STARTING



CHECK engine oil level before operating machine.

1. Place equipment on a level, firm surface that is free of rocks or other debris.
2. Place throttle in CHOKE position.



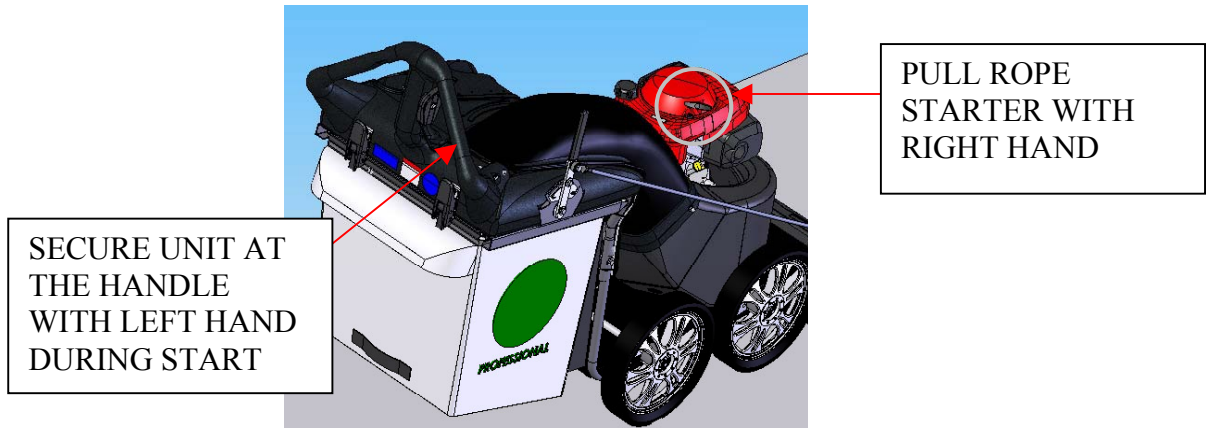
Throttle



WARNING: DO NOT START equipment without the debris bag in place.



- Secure the unit with left hand at the handle then pull starter rope with right hand to start engine.

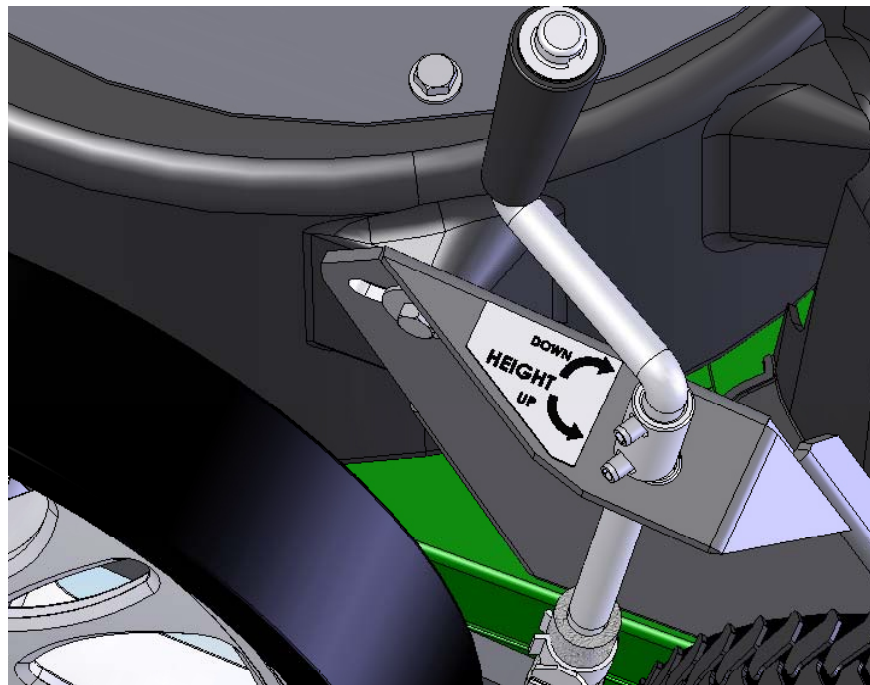


WARNING: PULL STARTER CORD slowly until resistance is felt. Then pull cord rapidly to avoid kickback.

- Move throttle control back to RUN position and allow engine to reach correct operating speed.

VACUUM NOZZLE HEIGHT ADJUSTMENT

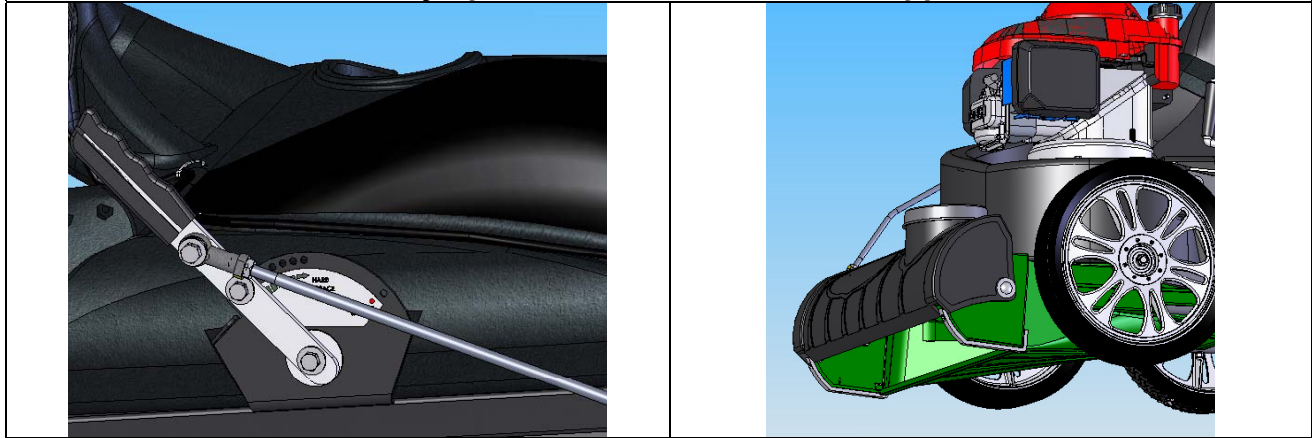
FOR MAXIMUM PICKUP: Adjust nozzle height as close to debris as possible, but without blocking airflow into the nozzle. **NOTE:** Never bury nozzle into debris. The vacuum nozzle is raised and lowered by turning the crank handle clockwise and counter-clockwise.



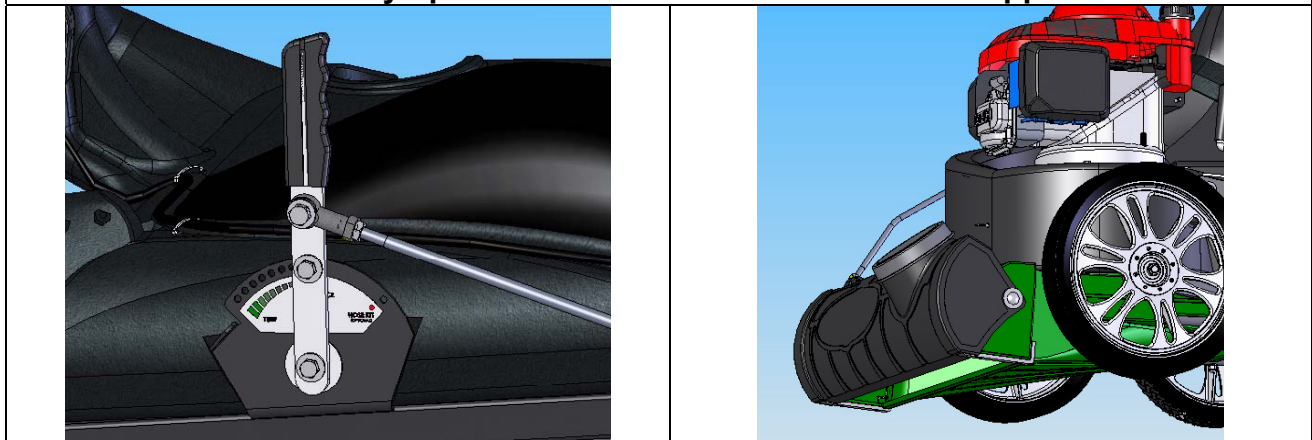
VACUUM NOZZLE DOOR ADJUSTMENT

The vacuum nozzle door adjusts for the maximum performance under various applications.

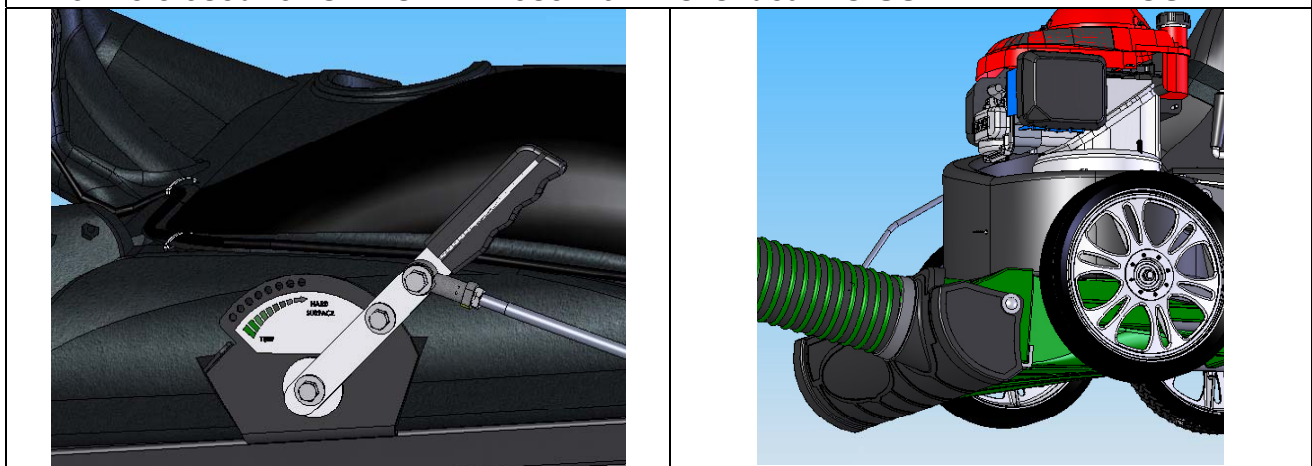
Nozzle fully opened. This is ideal for turf application



Nozzle half way opened. This is ideal for hard surface application



Nozzle closed for OPTIONAL hose kit. This is ideal TO USE WITH THE HOSE KIT.





VACUUMING OPERATION

This machine is designed for vacuuming leaves, grass clippings, and other types of organic litter. Debris mixed with cans, bottles, and small amounts of sand can be vacuumed; however, it is not this machine's primary purpose. Vacuuming cans, bottles, and sand will affect the longevity of your machine. In dusty conditions it may be necessary to purchase Felt Bag Kit (P/N 840022).

Do not operate if excessive vibration occurs. If excessive vibration occurs, shut engine off immediately and check for damaged or worn impeller, loose impeller bolt, loose impeller key, loose engine or lodged foreign objects. Note: See parts list for proper impeller bolt torque specifications. (See trouble shooting section on page 22).

SHUT DOWN

1. Pull Throttle Control all the way back to the STOP position.

CLEARING A CLOGGED NOZZLE



WARNING:

DISCONNECT spark plug wire before servicing unit.

1. Shut engine off and wait for impeller to stop completely.
2. Disconnect spark plug wire.
3. Wearing durable gloves, remove clog.



WEAR durable gloves. Clog may contain sharp materials.

4. Reconnect spark plug wire.

DEBRIS BAG

Debris bags are normal replaceable wear items.



WARNING:

Frequently empty debris to prevent bag overloading with more weight than you can lift.

Bag liners are available for use in various conditions where debris will be vacuumed. (see Bag Liner Options shown on page 1).

DO NOT place bag on or near hot surface, such as engine.



WARNING:

Be sure engine has come to a complete stop before removing or emptying bag!!.

This vacuum is designed for picking up trash, organic material and other similar debris (see Safety Warnings page 4-5).

Many vacuums are used where dust is mixed with trash. Your unit can intermittently vacuum in dusty areas. However, following these rules will help maintain your machine's ability to vacuum in dusty conditions:

- Run machine at idle to quarter throttle.
- Machine or pressure-wash debris bag if normal cleaning does not fully clean bag. Bag should be thoroughly dry before use.



Having one or more spare bags (840189) is a good way to reduce down time while dirty bags are being cleaned.

Hint!

Felt Bag (840194) accessory is great when used in dusty conditions.

HANDLING and TRANSPORTING


Using two people to lift unit is recommended. Lift holding the handle and front of nozzle. Make sure equipment is properly secured before transporting. See MV650 series specifications on page 3 for unit weight.





WARNING:  **NEVER** lift the machine while the engine is running.


STORAGE



WARNING:  **DO NOT** store engine in an enclosed or poorly ventilated area where fuel fumes may reach an open flame or spark from a furnace, water heater, clothes dryer or similar devices.

 **DO NOT** drain fuel in an enclosed or poorly ventilated area.

 **DO NOT** smoke when draining fuel.

 **DO NOT** remove gas cap while engine is running.

 **DO NOT** park equipment on a steep grade or slope.

ALWAYS remove spark plug wire when servicing equipment to prevent accidental starting.

ALWAYS keep hands and feet away from moving or rotating parts.

ALWAYS store fuel in approved safety containers.

If the equipment will not be used for 30 days or more, prepare as follows:

1. Make sure engine is cool.
2. Drain gasoline from carburetor and fuel tank to prevent formation of gum deposits.
3. Run engine until tank is empty and engine runs out of gas.

NOTE

Fuel stabilizer (such as Sta-Bil™) is an acceptable alternative for minimizing the formation of gum deposits during storage. Add stabilizer to gasoline in storage container or fuel tank. Follow stabilizer manufacturer's instructions to determine proper mix ratio. Run engine at least 10 minutes after adding stabilizer to allow it to reach carburetor.



MAINTENANCE

PERIODIC MAINTENANCE

Periodic maintenance should be performed at the following intervals:

| Maintenance Operation | Every Use | Daily or Every 5 Hours | Every 25 Hours | Every 50 Hours | Every 100-150 Hours |
|--|-----------|------------------------|----------------|----------------|---------------------|
| Inspect for worn or damaged parts. | • | | | | |
| Check for excessive vibration | | • | | | |
| Inspect for loose parts. | | • | | | |
| Clean Debris Bag | • | | | | |
| Lubricate throttle control cable and linkage. NOTE: Use white lithium grease or equivalent | | | • | | |

IMPELLER REMOVAL



READ all safety instructions before servicing unit.



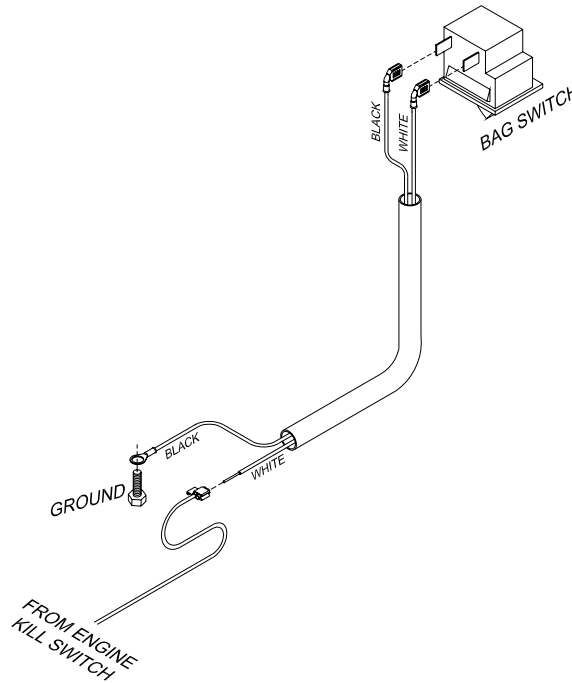
WARNING: **DISCONNECT** spark plug wire before servicing unit.

Tools required:

- 1/2" socket, 3/8" drive and 3/8" ratchet
- drive extension, 3/8" drive
- universal joint, 3/8" drive
- pry bar or long screwdriver
- jack stands or similar device adequate to support weight of machine.

1. Wait for engine to cool and disconnect spark plug.
2. Drain fuel and oil from the engine.
3. Remove engine, impeller and mounting plate by removing bolts around outside of housing.
4. Leaving engine fastened to plate, remove impeller bolt and lock washer and slide impeller off crankshaft (A puller may be required). **CAUTION:** Do not drop impeller.
5. If impeller does not slide off crankshaft, place two crowbars between impeller and housing on opposite sides. Pry impeller away from engine until it loosens. *Using a penetrating oil can help loosen a stuck impeller.*
6. If the impeller cannot be loosened, obtain a 3/8-24x3 3/4" longer bolt of the same diameter and thread type as the impeller bolt. Invert engine and impeller and support engine above ground to prevent recoil damage. Thread longer bolt by hand into the crankshaft until bolt bottoms. Using a suitable gear or wheel puller against the bolt head and the impeller back-plate (near the blades), remove impeller from shaft.
7. To reinstall impeller, use a new impeller bolt and lockwasher
8. Tighten impeller bolt. Torque impeller bolt to 50 Ft. Lbs. (68 N.m).
9. Reinstall engine, impeller, and mounting plate onto housing in reverse order of removal.
10. Before connecting spark plug wire, slowly pull engine starting rope to insure that impeller rotates freely.
11. Reconnect spark plug wire.

WIRING DIAGRAMS



Bag Switch Circuit Schematic Diagram

TROUBLESHOOTING

| Problem | Possible Cause | Solution |
|---|--|--|
| Will not vacuum or has poor vacuum performance. | <ul style="list-style-type: none"> · Dirty or full debris bag or filter. · Nozzle height set too high or too low. · Hose kit cap missing. · Clogged nozzle or exhaust. · Excessive quantity of debris. | <ul style="list-style-type: none"> · Clean debris bag and filter. Shake bag clean or wash. · Adjust nozzle height (see page 14). · Check for hose kit cap. · Unclog nozzle or exhaust (see page 16) · Allow air to feed with debris. |
| Abnormal vibration. | <ul style="list-style-type: none"> · Loose or out of balance impeller. · Loose engine. | <ul style="list-style-type: none"> · Check impeller and replace if required. · Check engine (see page 24). |
| Engine will not start. | <ul style="list-style-type: none"> · Throttle in off position. · Engine not in full choke position. · Out of gasoline or bad, old gasoline. · Spark Plug wire disconnected. · Gas valve off. · Dirty air cleaner. · Safety Interlock disengaged on bag plate. | <ul style="list-style-type: none"> · Check throttle control (see page 13). · Check throttle, choke position (see page 13). · Check gasoline. · Connect spark plug wire. · Turn on gas valve. · Clean or replace air cleaner. Contact a qualified service person. · Latch the bag properly or check thr bag rod to see if it's bent. |
| Engine is locked, will not pull over. | <ul style="list-style-type: none"> · Impeller plugged or clogged. · Engine problem. | <ul style="list-style-type: none"> · Remove debris (see page 16). · Contact an engine servicing dealer for engine problems. |



ENGINE MAINTENANCE AND REPAIR

Refer to the engine manufacturer's manual for maintenance and service information. Warranty coverage on the engine is the responsibility of the engine manufacturer. If your engine requires warranty repair contact your local servicing engine dealer. Have your engine model number and serial number ready when you contact the dealer. If you cannot locate a servicing dealer in your area, you may contact the manufacturer's national service organization at the following numbers:

American Honda

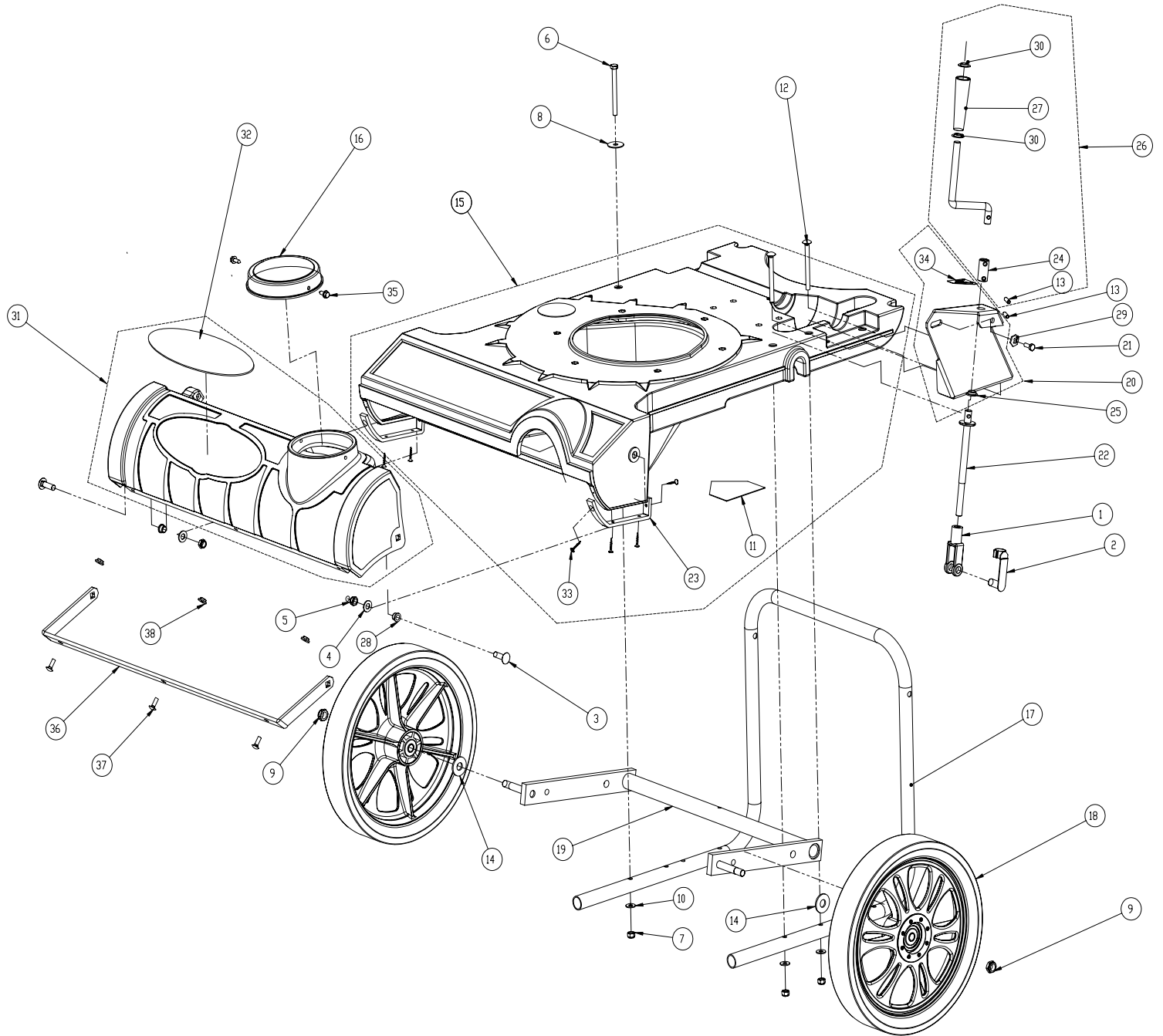
(800) 426-7701

WARRANTY CLAIM PROCEDURE

Should a BILLY GOAT[®] machine fail due to a defect in material and/or workmanship, the owner should make a warranty claim as follows:

- The machine must be taken to the dealer from whom it was purchased or to an authorized Servicing BILLY GOAT Dealer.
- The owner must present the remaining half of the Warranty Registration Card, or, if this is not available, the invoice or receipt.
- The Warranty Claim will be completed by the authorized BILLY GOAT Dealer and submitted to their respective BILLY GOAT Distributor for their territory Attention: Service Manager. Any parts replaced under warranty must be tagged and retained for 90 days. The model number and serial number of the unit must be stated in the Warranty Claim.
- The distributor service manager will sign off on the claim and submit it to BILLY GOAT for consideration.
- The Technical Service Department at BILLY GOAT will study the claim and may request parts to be returned for examination. BILLY GOAT will notify their conclusions to the distributor service manager from whom the claim was received.
- The decision by the Technical Service Department at BILLY GOAT to approve or reject a Warranty Claim is final and binding.

ILLUSTRATED PARTS LIST

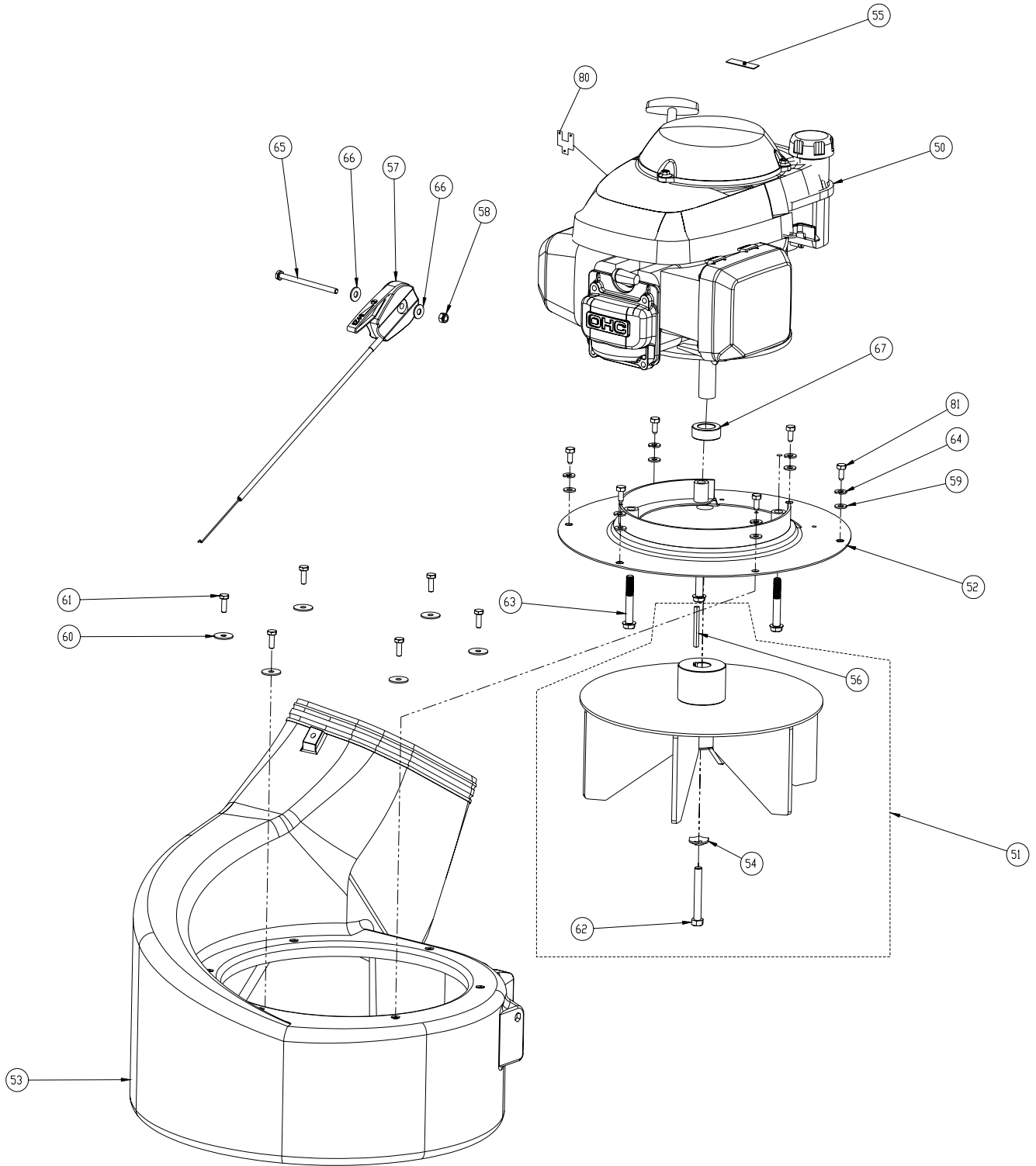


Nozzle Assembly
Figure 1



Nozzle Assembly Parts List

| ITEM NO. | PART NUMBER | DESCRIPTION | MV650H QTY. |
|----------|-------------|--|-------------|
| 1 | 350127 | YOKE 1/2 - 20 | 1 |
| 2 | 350128 | PIN YOKE 1/2" | 1 |
| 3 | 8024060 | BOLT CARRIAGE 3/8-16X1 1/2" ZP | 2 |
| 4 | 8172009 | WASHER 3/8" SAE ZP | 2 |
| 5 | 8161042 | NUT LOCK 3/8-16 LT WT THIN ZP | 2 |
| 6 | 8041038 | SCREWCAP 5/16 -18 x 3 1/2 | 1 |
| 7 | 8160002 | NYLON INSERT LOCKNUT 5/16-18 UNC | 3 |
| 8 | 8172020 | WASHER FLAT FENDER 5/16 | 1 |
| 9 | 8161044 | NYLON INSERT LOCKNUT 1/2-13 UNC THIN | 2 |
| 10 | 8171002 | WASHER 1/4" FC ZP | 3 |
| 11 | 400424 | LABEL WARNING OPEI | 1 |
| 12 | 8024050 | BOLTCARRIAGE 5/16-18X3 1/2 | 2 |
| 13 | 520156 | ROLL PIN 1/4 X 1 LONG | 2 |
| 14 | 8172011 | WASHER 1/2" SAE ZP | 2 |
| 15 | 840118 | NOZZLE MV VAC ASSEMBLY | 1 |
| 16 | 840019 | CAP 5 IN HOSE VAC | 1 |
| 17 | 840024 | HANDLE LOWER MV VAC | 1 |
| 18 | 840101 | WHEEL 14" ASSEMBLY WITH BEARING AND TIRE | 2 |
| 19 | 840104 | AXLE FRONT WA MV VAC | 1 |
| 20 | 840155 | HGT ADJ WA W/LABEL MV VAC | 1 |
| 21 | 8041004 | SCREWCAP 1/4 - 20 x 0.75 HWH | 1 |
| 22 | 840034 | LINK HGT ADJ MV VAC | 1 |
| 23 | 840041 | BRACKET NOZZLE WEAR GUARD MV VAC | 2 |
| 24 | 840029 | ROD CONNECT HGT ADJ | 1 |
| 25 | 840073 | BUSHING 0.5" ID 0.625 OD X X 0.250 | 1 |
| 26 | 840119 | ROD HANDLE CRANK ASSEMBLY | 1 |
| 27 | 840057 | HANDLE CRANK 0.5 ID X 3.72 LONG | 1 |
| 28 | 840078 | BUSHING 3/8" ID 1/2" OD X 3/8" LONG | 2 |
| 29 | 840158 | WASHER LOCK 1/4" TWISTED TOOTH | 1 |
| 30 | 840207 | NUT PAL 0.5" ID X 0.75 OD | 2 |
| 31 | 804135 | NOZZLE COVER MV VAC | 1 |
| 32 | 840055 | LABEL PRODUCT DECAL MV | 1 |
| 33 | 840035 | SCREW PLASTIC | 8 |
| 34 | 840054 | LABEL HGT ADJ MV VAC | 1 |
| 35 | 8122082 | SCREW SELF-TAP 5/16 NC X 3/4 HEX | 2 |
| 36 | 840088 | BRACKET NOZZLE COVER REINFORMENT MV | 1 |
| 37 | 8024021 | BOLT CARRIAGE 1/4-20X0.75 | 3 |
| 38 | 900455 | NUT FLANGE 1/4-20 | 3 |

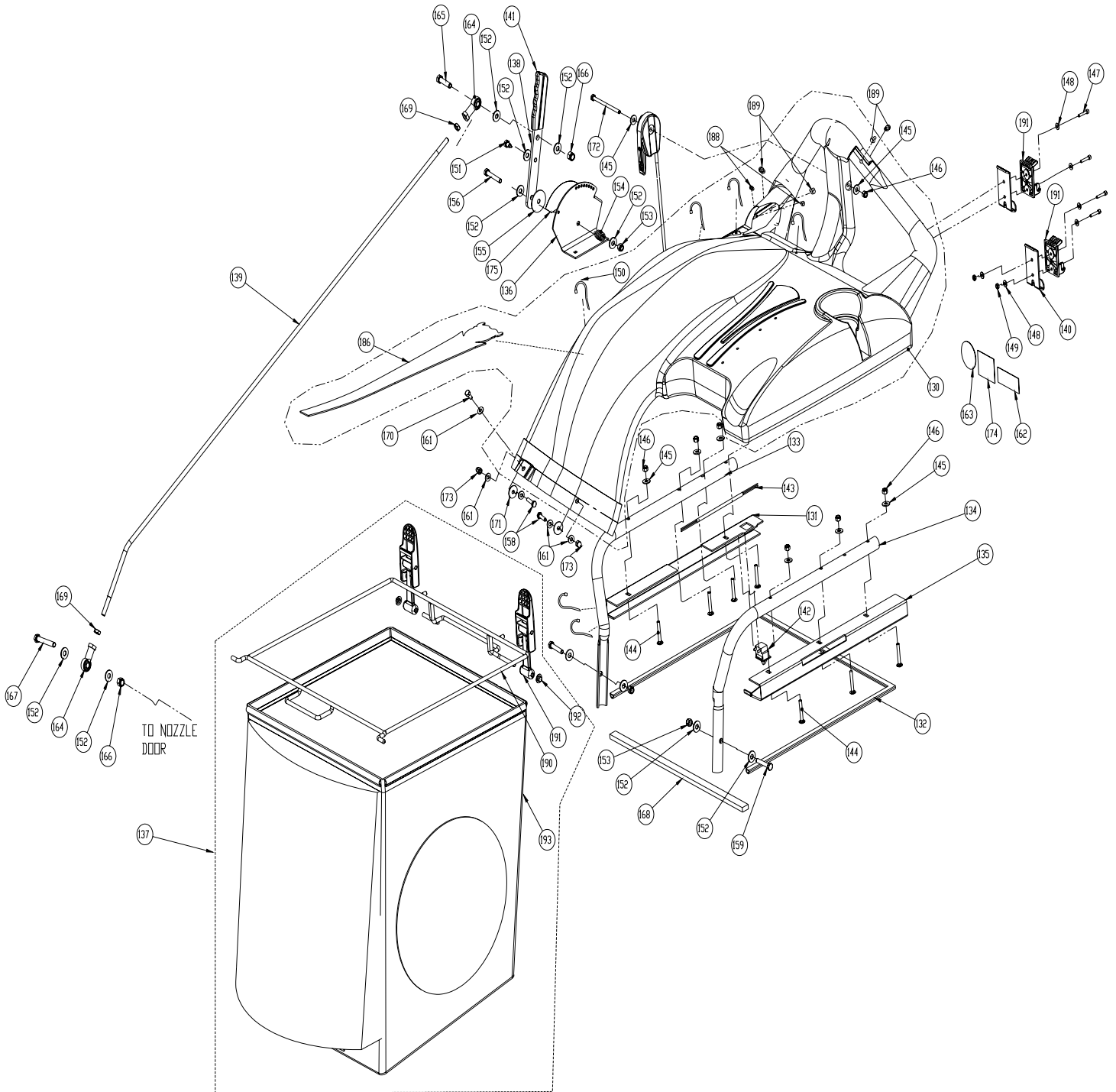


**Engine Assembly
Figure 3**



Engine Assembly Parts List

| ITEM NO. | PART NUMBER | DESCRIPTION | MV650H QTY. |
|----------|-------------|-------------------------------------|-------------|
| 50 | 840069 | ENGINE HONDA 6.5 VERTICAL GSV190 | 1 |
| 51 | 840137 | IMPELLER ASSEMBLY PUSH MV VAC | 1 |
| 52 | 840111 | PLATE TOP WA PUSH MV VAC | 1 |
| 53 | 840205 | HOUSING PLASTIC VAC | 1 |
| 54 | 400502 | WASHER LOCK 3/8 TWISTED TOOTH | 1 |
| 55 | 400268 | LABEL HOT ENGINE | 1 |
| 56 | 9201087 | SQ KEY 2.125 X .187 | 1 |
| 57 | 840045 | CONTROL THROTTLE MV VAC | 1 |
| 58 | 8160001 | NYLON INSERT LOCKNUT 1/4-20 UNC | 1 |
| 59 | 8172007 | WASHER 1/4" SAE ZP | 6 |
| 60 | 8172019 | WASHER FENDER 1/4 ZP | 6 |
| 61 | 8041004 | SCREWCAP 1/4 - 20 x 0.75 HWH | 6 |
| 62 | 790167 | SCREWCAP 3/8-24X2 3/4" W/PATCH LOCK | 1 |
| 63 | 900564 | SCREWCAP 3/8"-16X2 1/2" TAPTITE | 3 |
| 64 | 8177010 | WASHER SPLIT LOCK 1/4" | 6 |
| 65 | 8041018 | SCREWCAP 1/4"-20X4" HCS ZP | 1 |
| 66 | 8171002 | WASHER 1/4" FC ZP | 2 |
| 67 | 840083 | SPACER 1.50OD X .875ID X .5 THK | 1 |
| 80 | 890010 | PIGGY BACK TERMINAL 5/16 | 1 |
| 81 | 840213 | SCREWCAP 1/4-20X5/8 GR. 5 | 6 |

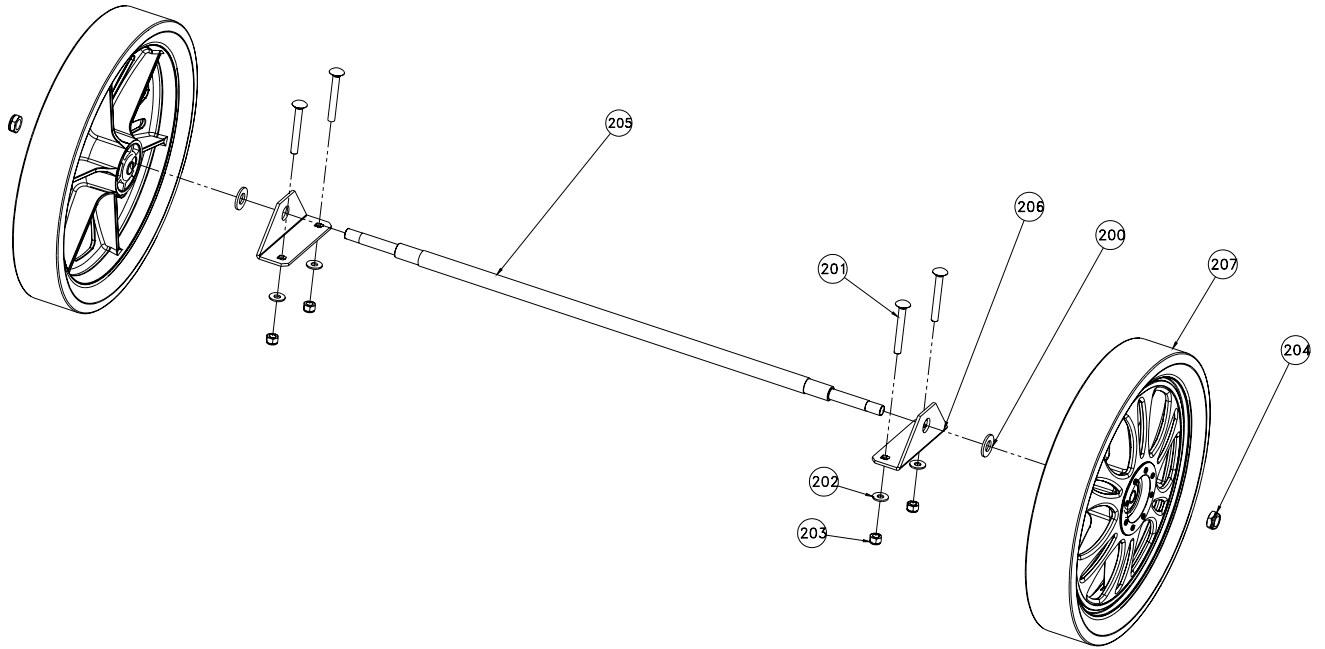


Hood Assembly
Figure 4



Hood Assembly

| ITEM NO. | PART NUMBER | DESCRIPTION | MV650H QTY. |
|----------|-------------|--|-------------|
| 130 | 840141 | HOOD ASSY W/ LABEL MV VAC | 1 |
| 131 | 840153 | BRACKET BAG CHANNEL RH W/SEAL MV VAC | 1 |
| 132 | 840196 | SEAL BAG MV VAC | 1 |
| 133 | 840037 | TUBE HANDLE BRACE RH MV VAC | 1 |
| 134 | 840038 | TUBE HANDLE BRACE LH MV VAC | 1 |
| 135 | 840154 | BRACKET BAG CHANNEL RH W/SEAL MV VAC | 1 |
| 136 | 840152 | BRACKET NOZZLE DOOR ADJ W/LABEL MV VAC | 1 |
| 137 | 840195 | BAG ASSEMBLY MV VAC | 1 |
| 138 | 840138 | BAR LIFT NOZZLE DOOR W/ GRIP MV VAC | 1 |
| 139 | 840061 | ROD LIFT NOZZLE DOOR SP VAC | 1 |
| 140 | 840062 | PLATE BAG LATCH MV VAC | 2 |
| 141 | 840191 | GRIP LEVER LIFT | 1 |
| 142 | 840058 | SWITCH INTERLOCK VAC | 1 |
| 143 | 840077 | HARNESS WIRE ASSY MV VAC | 1 |
| 144 | 8024025 | BOLT CARRIAGE 1/4-20 X 1.75 | 7 |
| 145 | 8171002 | WASHER 1/4" FC ZP | 9 |
| 146 | 8160001 | NYLON INSERT LOCKNUT 1/4-20 UNC | 8 |
| 147 | 520018 | SCREW HEX HEAD #10-24 X 1" | 4 |
| 148 | 8172005 | WASHER #10 SAE ZP | 8 |
| 149 | 8164005 | NYLON INSERT LOCKNUT 10-24 UNC | 4 |
| 150 | 900407 | TY WRAP | 6 |
| 151 | 610347 | PIN SCREW 1/4-28 | 1 |
| 152 | 8171003 | WASHER 5/16 FLATWASHER Z/P | 11 |
| 153 | 8160002 | NYLON INSERT LOCKNUT 5/16-18 UNC | 3 |
| 154 | 610429 | SPRING LEVER GZ | 1 |
| 155 | 610348 | FIBRE WASHER | 1 |
| 156 | 8041032 | SCREW CAP 5/16"-18 X 2 ZP | 1 |
| 157 | | | |
| 158 | 8041006 | SCREW CAP 1/4-20X1" ZP | 2 |
| 159 | 8041031 | SCREW CAP 5/16-18 X 1.75 ZP | 2 |
| 160 | | | |
| 161 | 8172007 | WASHER 1/4" SAE ZP | 6 |
| 162 | 890254 | LABEL EAR EYE BREATHING | 1 |
| 163 | 890301 | LABEL READ | 1 |
| 164 | 400886 | ROD END BALL JOINT 3/8 NF | 2 |
| 165 | 8041052 | SCREW CAP 3/8-16X1 1/2 ZP | 1 |
| 166 | 8160003 | NYLON INSERT LOCKNUT 3/8-16 UNC | 2 |
| 167 | 8041056 | SCREW CAP 3/8"-16X2 1/2" ZP | 1 |
| 168 | 840197 | SEAL BAG FRONT HOOD 20.5 LONG | 1 |
| 169 | 8149003 | NUT REG 3/8-24 NF | 2 |
| 170 | 8041004 | SCREW CAP 1/4"-20X3/4" HCS ZP | 1 |
| 171 | 8172019 | WASHER FENDER 1/4 ZP | 2 |
| 172 | 8041018 | SCREW CAP 1/4"-20X4" HCS ZP | 1 |
| 173 | 840071 | NUT ACORN 1/4-20 | 2 |
| 174 | 810736 | LABEL DANGER FLYING DEBRIS | 1 |
| 175 | 840080 | LABEL NOZZLE DOOR MV VAC | 1 |
| 188 | 840113 | PLUG SNAP RIVET 0.166 DIA | 2 |
| 189 | 840114 | PLUG SNAP RIVET 0.232 DIA | 2 |
| 190 | 840040 | ROD BAG WA MV VAC | 1 |
| 191 | 840139 | LATCH RUBBER ASSEMBLY MV VAC | 2 |
| 192 | 360203 | PAL NUT 0.312 | 2 |
| 193 | 840189 | BAG DEBRIS MV VAC | 1 |



Rear Axle Assembly
Figure 2

Rear Axle Assembly Parts List

| ITEM NO. | PART NUMBER | DESCRIPTION | MV650H QTY. |
|----------|-------------|--|-------------|
| 200 | 8172011 | WASHER FLAT 1/2" SAE | 2 |
| 201 | 8024046 | BOLT CARRIAGE 5/16-18X2 1/2 | 4 |
| 202 | 8171002 | WASHER 1/4" FC ZP | 4 |
| 203 | 8160002 | NYLON INSERT LOCKNUT 5/16-18 UNC | 4 |
| 204 | 8161044 | NYLON INSERT LOCKNUT 1/2-13 UNC THIN | 2 |
| 205 | 840091 | SHAFT REAR AXLE PUSH VAC | 1 |
| 206 | 840090 | BRACKET REAR AXLE MOUNT PUSH MV VAC | 2 |
| 207 | 840101 | WHEEL 14" ASSEMBLY WITH BEARING AND TIRE | 2 |