

SMITHCO

Wayne, Pennsylvania 19087

OPERATOR'S MANUAL

**V-STAR
MODEL # 94-201 & 94-401**

**For Customer Service
Call: (888) 422-5173**

Starting Serial # V192

Revised March, 2003

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INTRODUCTION

Thank you for purchasing a **SMITHCO** V-Star.

The SMITHCO V-STAR is a field developed tool designed to condition the surface of putting greens, lawn bowling greens, and tee boxes

Carefully read this manual and the engine manual as they include safety, operating, assembly and maintenance instructions. Failure to do so could result in personal injury or equipment damage.

Keep manuals in a safe place after operator and maintenance personnel have read them.

All **SMITHCO** machines have a Serial Number and Model Number. Both numbers are needed when ordering parts. The serial number plate on the 94-201 & 94-401 V-Star is located by the battery.

For easy access, record your Serial and Model numbers here.

SMITHCO		DATE OF MFG.
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SERIAL NO.	kw/hp	
<input type="text"/>	<input type="text"/>	
MODEL NO.	kg/lb	
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Information needed when ordering replacement parts:

1. Model Number of machine.
2. Serial Number of machine.
3. Name and Part Number of part.
4. Quantity of parts.

SPECIFICATIONS

ELECTRIC V-STAR SPECIFICATIONS

MODEL **94-201 & 94-401**

Weights and Measurements

Width	35.75"	(90.8 cm)
Length	58"	(147 cm)
Height	44"	(118 cm)
Weight	340 lbs.	(154 kg)

Engine

13 hp Vanguard Electric Start 12V f/94-201

13 hp Honda Electric Start f/94-401

Drive

Hydrostatic – Forward and reverse variable speed

Wheels

Front – 15 x 6.00 x 6 tube type, Rear – 8" x 2.75 solid rubber

Blades

Steel – Tip style WA. Conventional – Grade-C2 tungsten Carbide Tips .062

Blade Width

.062" (.157 cm)

Blade Depth

Variable from 0" to 1.5" (0 – 3.81 cm)

Cutting Width

16" (40.64 cm)

Features Include

Electric Start

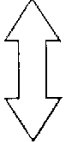
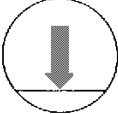
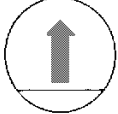

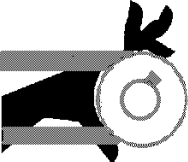
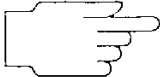


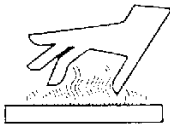
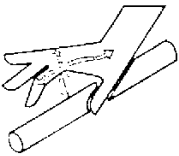
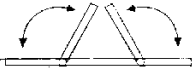
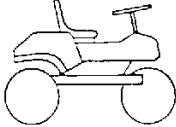
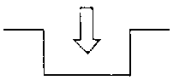

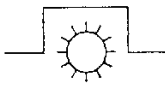
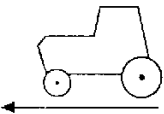



Electric actuator to lift and lower the unit

Forward & Reverse hand control

Single knob height adjustment

Push-Pull cables on all controls

SYMBOLS

	Up/Down Arrow		Down/Lower		Up/Raise
	No Smoking		Moving Parts		Manual Operation
	Pinch Point		Step		Hot Surface
	Hydraulic Fluid Penetration		Lift Arm		Tractor
	Engage		Disengage		PTO
	Ground Speed		Fast		Slow
H	High	L	Low	F	Forward
R	Reverse	N	Neutral		Warning Danger Caution

SYMBOLS

	Read Operator's Manual		Electrical Power		No Electrical Power
	Engine - Stop		Engine - Start		Engine - Run
	Engine Oil		Temperature Light		Water Temperature
	RPM 1000/mi		Gasoline		Diesel
	Glow Plug - On		Glow Plug - Off		Glow Plug
	Hour Meter		Hour Meter		Fuse
	Hand Throttle		Choke - Closed		Choke - Open
	Park Brake		Park Brake Release		Hydraulic Oil Level

SAFE PRACTICES

- 1. It is your responsibility to read this manual and all publications associated with this machine (engine and accessories).**
2. Never allow anyone to operate or service the machine or its accessories without proper training and instructions. Never allow minors to operate any equipment.
3. Learn the proper use of the machine and the locations and purpose of all the controls before you operate the equipment. Working with unfamiliar equipment can lead to accidents, personal injury, death and damage to the machine and the environment.
4. Wear all the necessary protective clothing and personal safety devices to protect your head, eyes, ears, hands and feet. Operate the machine only in daylight or in good artificial light.
5. Inspect the area where the equipment will be used. Pick up all debris you can find before operating. Beware of overhead obstructions and underground obstacles. Stay alert for hidden hazards.
6. Do not operate this machine on a side-hill. Sloped surfaces are to be approached either up-hill or down-hill
7. Use EXTREME care when operating on or traversing any sloped or uneven surfaces.
8. Never operate equipment that is not in perfect working order or without decals, guards, shields, or other protective devices in place.
- 9. Never disconnect or bypass any switch.**
10. Carbon monoxide in the exhaust fumes can be fatal when inhaled, never operate a machine without proper ventilation.
11. Fuel is highly flammable, handle with care.
12. Keep engine and all moving parts clean. Allow the engine to cool before storing and always remove the ignition key.
13. After engine has started machine must not move. If movement is evident, the neutral mechanism is not adjusted correctly. Shut engine off and readjust so the machine does not move when in neutral position.
14. Never use your hands to search for oil leaks. Hydraulic fluid under pressure can penetrate the skin and cause serious injury.
15. Before leaving operator's position for any reason:
 - A. Disengage all drives.
 - B. Shut engine off and remove the ignition key.
16. Keep hands, feet and clothing away from moving parts. Wait for all movement to stop before you clean, adjust or service the machine.
15. Keep the area of operation clear of all bystanders.

16. Stop engine before making repairs/adjustments or to check or add oil to the crankcase.

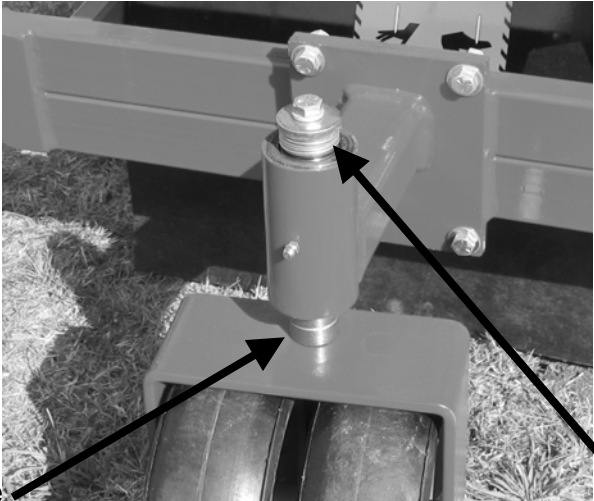
17. Use parts and materials supplied by **SMITHCO** only. Do not modify any function or part.

These machines are intended for professional maintenance by trained operators on fine turfgrass surfaces. Other use will void the warranty. Use by untrained operators may result in personal injury, death, damage to the machine and damage to the environment.

For complete set-up instructions see V-STAR SERVICE MANUAL.

CAUTION !

The V STAR is shipped to you in transport position, which will allow the blades to go into the turf only 1/2". Before operating the V Star, remove all spacers from the bottom of caster shaft and place them on top of the bearing tube.



Move spacers from here to here

Once spacers have been removed from the bottom of the caster shaft to the top of the bearing tube it is necessary to adjust the single point adjustment located on the left side of the unit to the desired depth. (Note: You must loosen the locknut, which is located on the adjustment bolt. Once this has been loosened you may proceed to turn the adjustment bolt clockwise to decrease the depth of cut or turn counterclockwise to increase the depth of cut. Once depth has been determined reset locknut.

CONTROLS & INSTRUMENTS

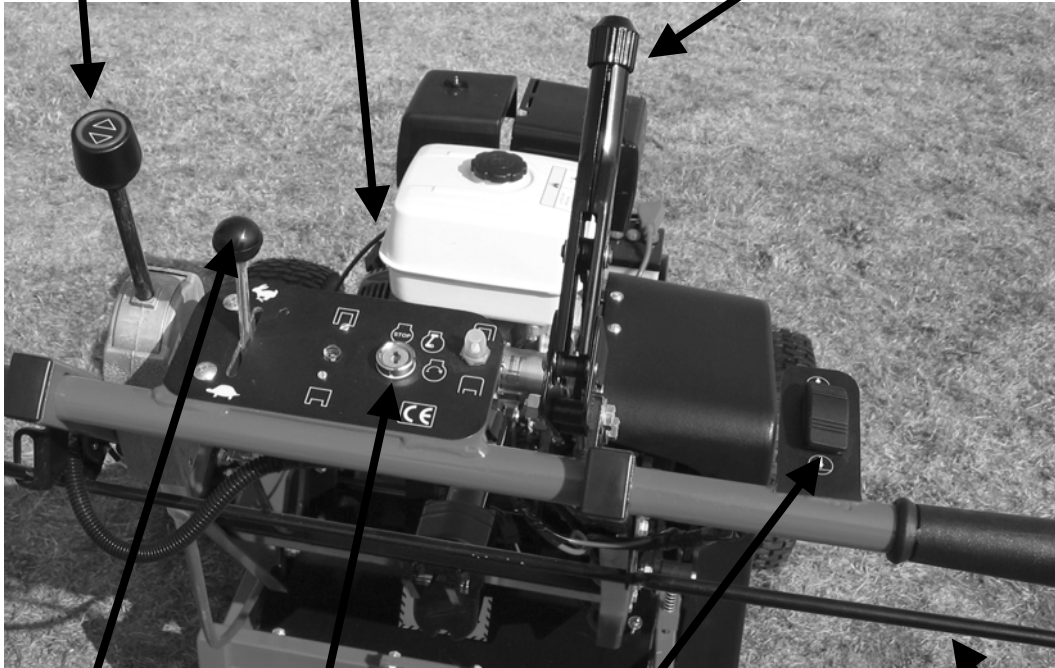
Operator Control Panel

It is vital that the operator become familiar with all functions of the machine before use.

6. DIRECTION & SPEED TRAVEL

2.a ENGINE CHOKE

4. ENGAGEMENT OF ROTATING BLADES
Push Forward (Away from Operator to Disengage) Pull Back (Towards Operator) To Engage)



3. ENGINE SPEED & BLADE ROTATION SPEED

2. ENGINE START/ STOP

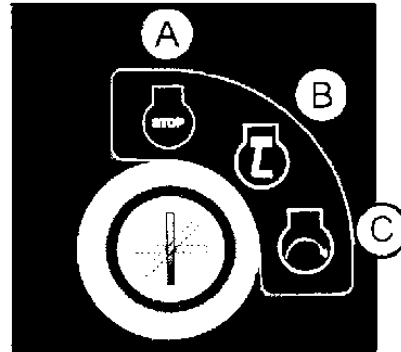
5. CUTTING HEAD (Electric Switch)
LOWER (Engage turf) RAISE (Disengage)
RAISE (Disengage from turf)

1. OPERATOR'S PRESENCE CONTROL
Grasp to start and operate
Release to stop all operation

OPERATING INSTRUCTIONS

1. OPERATOR'S PRESENCE CONTROL (On models equipped with this feature)

The Operator's Presence Control (OPC) requires engagement to start or operate this machine. Operator places hands on handlebar grips and grasps the OPC with fingers, then squeezes the OPC. This completes the electrical circuit necessary to start or operate this machine. When the OPC is released, the engine is shut down halting blade rotation and forward (or reverse) travel.



2. ENGINE SWITCH (KEY OPERATED) & 2a CHOKE

This switch turns the engine on or off and is operated with a key. Key must be removed when the machine is stored or when the operators leaves the machine. The engine choke is located at the (operator's) left hand side of the engine. Fuel cut-off valve is also located at left hand side of the engine and must be in the "Open" position for the unit to start or operate.

The ignition switch is a three-position. Insert key (A) and turn clockwise until engine starts (C). Release key and it will return to run position (B). Use choke, located on the left side of the engine, as necessary.

3. ENGINE SPEED (and Blade Rotation Speed) CONTROL

This controls the throttle of the engine. Engine throttle should be set approximately half way between slow and fast for starting.

TRANSPORT

Transport the V Star to the operating area using only the DIRECTION OF TRAVEL LEVER (No. 6). Do not engage the blades or lower the blades into the turf until you have arrived at the location on which the operation is to be performed.

4. BLADE ENGAGEMENT LEVER

Before engaging blades, slow engine speed to "Slow". Engage the belt drive to the blades by pulling the Blade Engagement Lever back towards the operator. Once the belt is engaged and the blades are turning, increase engine speed slowly to desired speed.

To increase tension on the drive belt, with the belt DISENGAGED, turn the knob on the top of the Blade Engagement Lever clockwise. If the Blade Engagement Lever is unreasonably tight or difficult to engage, reduce tension on the drive belt by turning the knob on the top of the Blade Engagement Lever counter-clockwise. The drive belt has proper tension when the Blade Engagement Lever requires a firm, but not difficult, motion to engage. If the blades stop spinning (cutting) once they are lowered into the ground, tension on the belt is insufficient. Raise the blades to the "UP" position, disengage the Blade Engagement Lever and increase tension on the belt as described above.

OPERATING INSTRUCTIONS (continued)

CAUTION:

- 1. NEVER PUT THE V-STAR INTO “REVERSE” TRAVEL WITH THE BLADES ENGAGED. INJURY, DEATH AND DAMAGE TO THE MACHINE MAY RESULT.**
- 2. SPINNG BLADES MAY CONTACT SOLID OBJECTS ABOVE OR BELOW THE SURFACE OF THE GROUND. INJURY OR DEATH TO THE OPERATOR OR BY-STANDERS AND DAMAGE TO THE MACHINE AND THE ENVIRONMENT MAY RESULT. ALWAYS CHECK THE AREA OF OPERATION THOROUGHLY FOR HIDDEN DANGERS.**

5. CUTTING HEAD (Electric) SWITCH

The blade cutting head is raised and lowered into the ground (at the pre-set depth of cut) using an electric actuator. This is controlled by the Cutting Head Switch. Lower (downward arrow) to put the blade cutting head into the ground, Raise (upward arrow) to remove the blade cutting head from the ground.

6. DIRECTON OF TRAVEL LEVER

Immediately after lowering the blade cutting head into the ground, begin forward travel using the Direction of Travel Lever. Push the plastic button in the head of the lever down and push the lever Forward (away from the operator) to begin the lateral aeration process in the turf. Pulling back (towards the operator) decreases then stops forward speed. The Direction of Travel Lever is equipped with a Neutral Lock which prevents accidental operation. The button in the center of the head on the lever disengages the Neutral Lock and allows the lever to be pushed forward (for forward travel) or pull back (for reverse travel). NEVER PUT THE V-STAR INTO “REVERSE” TRAVEL WITH THE BLADES ENGAGED. INJURY, DEATH AND DAMAGE TO THE MACHINE MAY RESULT.

After traveling the length of the area of operation, the operator must (1) Stop forward motion; (2) raise the blade cutting head completely out of the turf and only then, (3) Turn the unit around or otherwise re-position it for the next pass. NEVER turn the machine with the blade cutting unit in the turf. Serious damage to both the turf and the machine will result.

Once the unit is turned or re-positioned, lower the blade cutting unit, resume forward travel and repeat as necessary to accomplish the desired lateral aeration on the target area.

IMPORTANT NOTICE

Before beginning operation of this machine, the operator must fully familiarize himself with the function and affect of all controls and operations. Operate the V Star extensively using only the Forward/Reverse Travel Lever without engaging the blade cutting reel. The machine must be operated slowly until the operator is completely capable of using all controls and familiar with how the V Star handles and steers on level terrain and on uneven terrain. Failure to be completely in control of this machine may result in personal injury, death, damage to the machine and damage to the environment.

DAILY CHECKLIST

DAILY CHECKLIST

NOTE:

**Use all procedures and parts prescribed by the manufacturer.
Read the V Star Service Manual and the engine manual before operation.**

You must adhere to guidelines established by manufacturer for warranty coverage. In adverse conditions such as dirt, mud or extreme temperatures, maintenance should be more frequent.

The following items must be checked before each use of the V Star

1. Check engine oil level. Add as needed. **DO NOT OVERFILL.**
2. Tire pressure should be inspected on a daily basis. Recommended pressure is 5 psi maximum. Inflation pressures should be checked on a weekly basis when the tires are cool.
3. Examine unit for damage or anything unusual to normal wear.
4. Inspect electrical system for loose connections or frayed wiring, including battery cables. Replace any faulty equipment or tighten if loose.
5. Check hardware for loose or missing nuts, bolts, screws, etc., and tighten or replace as needed.
6. Listen for any noise, such as rattles due to loose hardware, scraping sounds, or unusual motor noises. Be sensitive to abnormal performance.
7. Inspect blades to make sure they are not bent or loose.
8. Inspect all lubrication areas. Lubricate as necessary and as required by the V Star Service Manual
9. Assure that all switches are operating normally.
10. Check transaxle oil only if signs of leakage are detected.
11. Check controls for smooth, proper working operation. Lubricate as needed.
12. Wash accumulated dirt **daily** from motor compartment and under body around the blades.

BASIC MAINTENANCE



Before servicing or making adjustments to machine, stop engine and remove key from ignition.

NOTE:

Use all procedures and parts prescribed by the manufactures. Read the engine manual.

AIR CLEANER ON ENGINE

1. Remove the thumbscrews on top of the cover and remove the cover.
2. Carefully remove paper element to prevent debris from entering carburetor. To service, clean by tapping gently on flat surface. Do not oil paper element. Replace if very dirty or damaged.

NOTE:

Do not use petroleum solvents, e.g., kerosene, which will cause cartridge to deteriorate. Do not use pressurized air to clean cartridge. Pressurized air can damage cartridge.

3. Reinstall paper element.
4. Replace cover and reattach thumb screw.

TIRE PRESSURE

Caution must be used when inflating a low tire to recommended pressure. Over inflating can cause tires to explode. Tires should be 5 psi. Improper inflation will reduce tire life considerably.

ENGINE

Check oil and fuel levels before starting engine. Refer to V Star Service Manual and engine manual for complete service information.

BATTERY

Batteries normally produce explosive gases which can cause personal injury. Do not allow flames, sparks or any ignited object to come near the battery. When charging or working near battery, always shield your eyes and always provide proper ventilation.

Battery cable should be disconnected before using "Fast Charge".

BASIC MAINTENANCE (continued)

Charge battery at 15 amps for 10 minutes or 7 amps for 30 minutes. Do not exceed the recommended charging rate. If electrolyte starts boiling over, decrease charging.

Always remove grounded (-) battery clamp first and replace it last. Avoid hazards by:

1. Filling batteries in well-ventilated areas.
2. Wear eye protection and rubber gloves.
3. Avoid breathing fumes when electrolyte is added.

JUMP STARTING

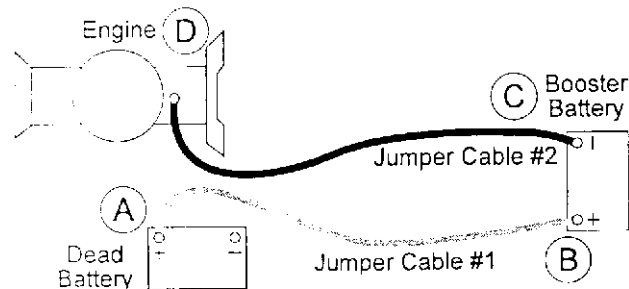


Use of booster battery and jumper cables: Particular care should be used when connecting a booster battery. Use proper polarity in order to prevent sparks.

To jump start (negative grounded battery):

1. Shield eyes.
2. Connect ends of one cable to positive (+) terminals of each battery, first (A) then (B).
3. Connect one end of other cable to negative (-) terminal of "good" battery (C).
4. Connect other end of cable (D) to engine block on unit being started (NOT to negative (-) terminal of battery)

To prevent damage to other electrical components on unit being started, make certain that engine is at idle speed before disconnecting jumper cables.



BASIC TROUBLESHOOTING

Unit will not move:

1. Check the neutral knob located on the left side of the unit to make sure that it is not in the "N" position.
2. Check the control lever to ensure that cable is not broken.
3. Check key in axle hub for loss or broken key.
4. Check control arm on transaxle.
5. Check cable clevis pins.
6. Make sure that there are no oil leaks on the transaxle.
7. Make sure all belts are in place.

Unit will not start:

1. Check all wiring.
2. Check voltage of battery.
3. Test key switch.
4. Check solenoid.
5. Check spark plug for proper gap.
6. Check starter.

Unit will not raise or lower blades:

1. Check all wiring.
2. Check circuit breaker located by positive battery terminal.
3. Check actuator switch.
4. Check voltage of battery.
5. Check actuator.

Blades will not stop turning when shut off:

1. Check to make sure that clutch is fully disengaged.
2. Check that belt brake is adjusted properly with 1/8" clearance at the bottom of belts.
3. Check to make sure that belt guide bolt is in place.
4. Make sure belts are not damaged.

Blades will not turn when lowered into the turf:

1. Make sure belts are tightened properly.
2. Check clutch control cable for breaks or missing clevis pins.
3. Check for debris in blade area.

EC Declaration of Conformity
according to Directive 89/392/EEC

We

SMITHCO INC.

(Name of supplier)

34 West Ave. Wayne, PA 19087 USA

(Full address of the manufacture - authorized representative established in the Community must also give the business name and address of the manufacture)

declare under our sole responsibility, that the product

V-Star, Model 94-201 & 94-401

(Make, Model)

to which this declaration relates corresponds to the relevant basic safety and health requirements of the Directive 89/392/EEC,

(if applicable)

and to the requirements of the other Directives:

EN292-1

EN292-2

EN294

EN349

92/59

89/392

(Title and/or number and date of issue of the other Directives)

(if applicable)

For the relevant implementation of the safety and health requirements mentioned in the Directives, the following standard(s) and/or technical specification(s) has (have) been respected:

ISO 37-1983

PREN 836

ISO 1219-1976

SAE HS-2800

SAE J1362

(Title and/or number and date of issue of standard(s) and/or technical specification(s))

Humboldt, Kansas USA

(Place and date of issue)

LIMITED WARRANTY

SMITHCO warrants this product to be free from defects in material and workmanship under normal use for one year from the date of purchase by the original user. (60 days if product is used for rental purposes.) All warranty claims must be handled through a SMITHCO authorized dealer or by SMITHCO, INC. All transportation charges must be paid by the purchaser.

There is no further express warranty. All implied warranties, including those of merchantability and fitness for a particular purpose, are limited to one year. (60 days if product is used for rental purposes) from date of purchase by the original user, and, to the extent permitted by law any and all implied warranties are excluded and disclaimed after the expiration of such period.

All incidental and consequential damages, including pick-up and delivery of the unit, communication, mileage charges and/or rental of a replacement unit during repair, are not covered under this warranty, or is any loss of income and/or other loss resulting from the failure of the product to function due to a warranty defect.

The following items are not covered under the SMITHCO warranty and are warranted by their respective manufacturer.

- a) Engine and engine parts including starters, generators, alternator and filters.
- b) Transaxle, differentials, gear boxes, and mechanical pumps.
- c) Hydrostatic transmissions, hydraulic pumps and motors.
- d) Batteries
- e) Wheels and tires.

A copy of the warranty for the above items is furnished if necessary with each SMITHCO product.

Some states do not allow limitations on how long an implied warranty lasts, or the exclusion of limitations of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

Federal law now requires disclosure of the warranty which applies to this product prior to the sale to a consumer. Please leave this statement attached to the product and allow the buyer to remove it after purchase.

SMITHCO
Wayne, Pennsylvania 19087



