

SCAG[®]

POWER EQUIPMENT

OPERATOR'S MANUAL

SPRAYER/ SPREADER

Models: STS60-23BV



Congratulations on owning a Scag Sprayer/Spreader! This manual contains the operating instructions and safety information for your Scag Sprayer/Spreader. Reading this manual can provide you with assistance in maintenance and adjustment procedures to keep your machine performing to maximum efficiency. The specific models that this book covers are listed on the inside cover. Before operating your machine, please read all the information enclosed.



WARNING

FAILURE TO FOLLOW SAFE OPERATING PRACTICES MAY RESULT
IN SERIOUS INJURY OR DEATH.

- Read this manual completely as well as other manuals that came with your sprayer/spreader.
- DO NOT operate on steep slopes. To check a slope, attempt to back up it. If the machine can back up the slope without the wheels slipping, reduce speed and use extreme caution.
- Under no circumstances should the machine be operated on slopes greater than 15 degrees. ALWAYS FOLLOW OSHA APPROVED OPERATION.
- Weight in the storage tanks and hopper will transfer when on a slope, this may cause a loss of traction or increased risk of a roll-over.
- When operating with a heavy load, reduce speed and allow sufficient braking distance. Use extra caution on slopes.
- Liquid loads shift during operation, especially while turning, going up or down slopes, sudden changes in speed or while driving over rough surfaces. Shifting loads can cause the machine to tip over.
- Stay two machine widths away from slopes, drop offs, ditches, water, retaining walls, avoid any slope exceeding 15 degrees.
- DO NOT operate on wet grass. Wet grass reduces traction and steering control.
- Keep all shields in place.
- Before performing any maintenance or service, stop the machine, remove the spark plug wire(s), and remove the ignition key.
- If a mechanism becomes clogged, stop the engine before cleaning.
- Keep hands, feet, and clothing away from power-driven parts.
- Keep others off the machine (only one person at a time).

REMEMBER - YOUR SPRAYER/SPREADER IS ONLY AS SAFE AS THE
OPERATOR!

HAZARD CONTROL AND ACCIDENT PREVENTION ARE DEPENDENT UPON THE AWARENESS,
CONCERN, PRUDENCE, AND PROPER TRAINING OF THE PERSONNEL INVOLVED IN THE
OPERATION, TRANSPORT, MAINTENANCE, AND STORAGE OF THE EQUIPMENT.

This manual covers the operating instructions and illustrated parts list for:

STS60-23BV

with a serial number of

V9800001 to V9899999

Always use the entire serial number listed on the serial number tag when referring to this product.

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LIMITED WARRANTY - TURF STORM SPRAYER/SPREADER INSIDE BACK COVER

NOTES

GENERAL INFORMATION

1.1 INTRODUCTION

Your sprayer/spreader was built to the highest standards in the industry. However, the prolonged life and maximum efficiency of your sprayer/spreader depends on you following the operating, maintenance and adjustment instructions in this manual.

If additional information or service is needed, contact your Scag Power Equipment Dealer.

We encourage you to contact your dealer for repairs. All Scag dealers are informed of the latest methods to service this equipment and provide prompt and efficient service in the field or at their service shop. They carry a full line of Scag service parts.

THE REPLACEMENT OF ANY PART ON THIS PRODUCT BY OTHER THAN THE MANUFACTURER'S AUTHORIZED REPLACEMENT PART MAY ADVERSELY AFFECT THE PERFORMANCE, DURABILITY OR SAFETY OF THIS PRODUCT.

USE OF OTHER THAN ORIGINAL SCAG REPLACEMENT PARTS WILL VOID THE WARRANTY.

When ordering parts, always give the model and serial number of your sprayer/spreader. The serial number plate is located where shown in Figure 1-1.

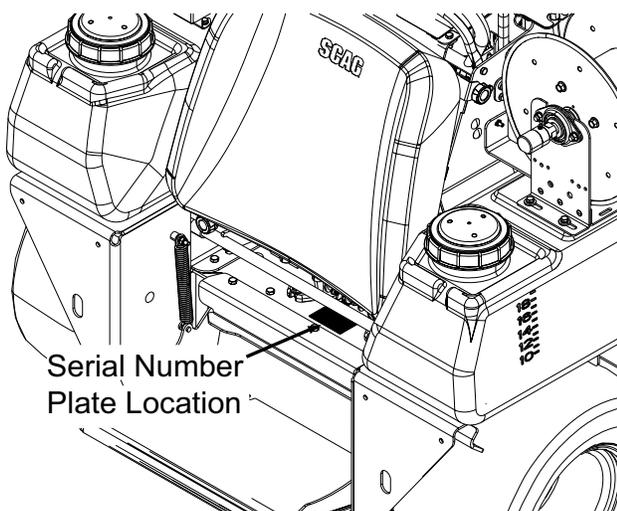


Figure 1-1. Sprayer Spreader Serial Number Location

USE ONLY SCAG APPROVED ATTACHMENTS AND ACCESSORIES.

Attachments and accessories manufactured by companies other than Scag Power Equipment are not approved for use on this machine. See Section 8, Paragraph 7-1. Be aware that using attachments with the mower may affect stability. Be sure to follow the directions found in the operator's manual.

WARNING

For pictorial clarity, some illustrations and figures in this manual may show shields, guards or plates open or removed. Under no circumstances should your sprayer/spreader be operated without these devices in place.

All information is based upon product information available at the time of approval for printing. Scag Power Equipment reserves the right to make changes at any time without notice and without incurring any obligation.

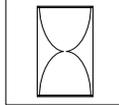
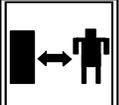
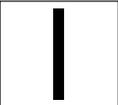
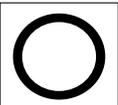
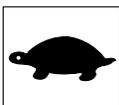
1.2 DIRECTION REFERENCE

The "Right" and "Left", "Front" and "Rear" of the machine are referenced from the operator's right and left when standing in the normal operating position and facing the forward travel direction.

1.3 SERVICING THE ENGINE AND DRIVE TRAIN COMPONENTS

The detail servicing and repair of the engine, hydraulic pumps, and sprayer pumps are not covered in this manual; only routine maintenance and general service instructions are provided. For service of these components during the limited warranty period, it is important to contact your Scag dealer or find a local authorized servicing agent of the component manufacturer. Any unauthorized work done on these components during the warranty period may void your warranty.

1.4 SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	Choke		Hour meter/Elapsed Operating Hours
	Parking Brake		Keep Bystanders Away
	On/Start		Transmission
	Off/Stop		Spring Tension on Idler
	Falling Hazard		Oil
	Fast		Thrown Object Hazard
	Continuously Variable - Linear		Slow
	Pinch Point		Read Operator's Manual

SAFETY INFORMATION

2.1 INTRODUCTION

Your machine is only as safe as the operator. Carelessness or operator error may result in serious bodily injury or death. Hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of the personnel involved in the operation, transport, maintenance and storage of the equipment. Make sure every operator is properly trained and thoroughly familiar with all of the controls before operating the machine. The owner/user can prevent and is responsible for accidents or injuries occurring to themselves, other people or property.

READ THIS OPERATOR'S MANUAL BEFORE ATTEMPTING TO START YOUR MACHINE. MAKE SURE THAT EVERYONE KNOWS WHERE THE MANUAL IS LOCATED AND KEEP A RECORD OF EACH EMPLOYEE THAT HAS READ THE MANUAL.

A replacement manual is available from your authorized Scag Service Dealer or by contacting Scag Power Equipment, Service Department at P.O. Box 152, Mayville, WI 53050 or contact us via the Internet at www.scag.com. The manual for this machine can be downloaded by using the model and serial number or use the contact form to make your request. Please indicate the complete model and serial number of your Scag product when requesting replacement manuals.

2.2 SIGNAL WORDS



This symbol means "Attention! Become Alert! Your Safety is Involved!" The symbol is used with the following signal words to attract your attention to safety messages found on the decals on the machine and throughout this manual. The message that follows the symbol contains important information about safety. To avoid injury and possible death, carefully read the message! Be sure to fully understand the causes of possible injury or death.

SIGNAL WORD:

It is a distinctive word found on the safety decals on the machine and throughout this manual that alerts the viewer to the existence and relative degree of the hazard.

The signal word "DANGER" denotes that an extremely hazardous situation exists on or near the machine that could result in high probability of death or irreparable injury if proper precautions are not taken.

The signal word "WARNING" denotes that a hazard exists on or near the machine that can result in injury or death if proper precautions are not taken.

The signal word "CAUTION" is a reminder of safety practices on or near the machine that could result in personal injury if proper precautions are not taken.

Your safety and the safety of others depends significantly upon your knowledge and understanding of all correct operating practices and procedures of this machine.

2.3 BEFORE OPERATION CONSIDERATIONS

Check all hydraulic connections for tightness. Inspect all hydraulic hoses and / or lines to ensure they are in good condition before operating.

1. NEVER allow children to operate this machine. Do not allow adults to operate this machine without proper instructions.
2. Do not operate without the required state fertilizer applicator license or other applicable licenses (vary by state).

3. Do not spray when children and/or others are present. Keep children out of the spraying area and in the watchful care of a responsible adult other than the operator. Be alert and turn machine off if a child enters the area.
4. DO NOT allow children to ride or play on the machine, it is not a toy.
5. Keep keys stored in a safe location when the mower is not in use; i.e. where they are inaccessible to children.
6. Clear the area to be sprayed of objects that could be contaminated with chemicals.
7. DO NOT carry passengers.
8. DO NOT operate the machine under the influence of alcohol or drugs.
9. If the operator(s) or mechanic(s) cannot read English, it is the owner's responsibility to explain this material to them.
10. DO NOT wear loose fitting clothing. Loose clothing, jewelry or long hair could get tangled in moving parts. Do not operate the machine wearing shorts; always wear adequate protective clothing including long pants. Wear eye protection, gloves and any other personnel protection equipment (PPE) that are required by some local ordinances and insurance regulations.

WARNING

Always wear hearing protection. Operating this machine over prolonged periods of time can cause loss of hearing.

11. Keep the machine and attachments in good operating condition. Keep all shields and safety devices in place. If a shield, safety device or decal is defective or damaged, repair or replace it before operating the machine.
12. Fuel is flammable; handle it with care. Fill the fuel tank outdoors. Never fill it indoors. Use a funnel or spout to prevent spillage. Clean up any spillage before starting the engine.
13. DO NOT add fuel to a running or hot engine. Allow the engine to cool for several minutes before adding fuel. Never fuel indoors or inside enclosed trailers.

14. DO NOT start the engine until any spilled fuel has been cleaned up or has evaporated.
15. Keep flammable objects (cigarettes, matches, etc.), open flames and sparks away from the fuel tank and fuel container. Use only approved containers.
16. Equipment must comply with the latest requirements per SAE J137 and/or ANSI/ASAE S279 when driven on public roads.
17. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before starting the machine.

WARNING

This machine is equipped with an interlock system intended to protect the operator and others from injury. This is accomplished by preventing the engine from starting unless the parking brake is engaged, the steering control levers are in the neutral position and the operator is in the operator position. The interlock system shuts off the engine if the operator leaves the operator platform with the steering control levers not in the neutral position and the parking brake not engaged.

18. Be sure the interlock switches are functioning correctly.
19. Make sure to handle all chemicals according to the manufacturers directions.
20. Use proper protective equipment to protect yourself from chemical exposure (rubber boots, respirator, chemical resistant gloves, and safety glasses/goggles). Do not store protective equipment with or near chemicals.
21. Do not operate this machine if the proper chemical safety information/equipment is not present.
22. When preparing to work on the sprayer or spreader system, make sure to thoroughly flush the system (refer to manufacturer's recommendations for neutralizing the chemical).
23. Always follow the chemical manufacturer's instructions for application and safety.

Section 2

2.4 TESTING THE SAFETY INTERLOCK SYSTEM

The safety interlock system should be tested each time before using the machine. If the safety interlock system does not operate as described below, contact your local Authorized Scag Power Equipment Dealer immediately to have the safety interlock system repaired.

-NOTE-

The machine will not start with the operator off of the platform. For all test procedures listed below, the engine must be started with the operator standing on the platform unless specified otherwise.

1. Place the spreader switch to the OFF (down) position, release the parking brake. Stand on the operator platform in the operating position. Try to start the engine; the engine should not start.
2. Place the steering control levers in the neutral position, engage the parking brake, move the spreader switch to the OFF (down) position, and start the engine. Stand on the operator platform in the operating position with the engine running, engage the spreader switch to the ON (up) position, and step backwards off of the operating platform. The spreader should shut off and the engine should stay running.
3. Stand on the operator platform in the operating position, place the steering control levers in the neutral position, engage the parking brake, move the spreader switch to the OFF (down) position, and start the engine. With the engine running, release the parking brake, and step backwards off of the operating platform. The engine should shut off.
4. Stand on the operator platform in the operating position, place the steering control levers in the neutral position, engage the parking brake, move the sprayer switch to the OFF (down) position, and start the engine. With the engine running, move the sprayer switch to the ON (up) position, release the parking brake, and step backwards off of the operating platform. The engine should shut off and the sprayer pump should stay running.

5. Stand on the operator platform in the operating position, place the steering control levers in the neutral position, engage the parking brake, move the sprayer switch to the OFF (down) position, and start the engine. With the engine running, move the sprayer switch to the ON (up) position, and step backwards off of the operating platform. The engine and sprayer pump should stay running.

2.5 OPERATION CONSIDERATIONS

1. Know the function of all controls and how to stop quickly.



WARNING

DO NOT operate on steep slopes. Under no circumstances should the machine be operated on slopes greater than 15 degrees. See Figure 2-3, Page 11 to determine approximate slope of area to be sprayed. ALWAYS FOLLOW OSHA APPROVED OPERATION.

2. Reduce speed and exercise extreme caution on slopes and in sharp turns to prevent tipping or loss of control. Be especially cautious when changing directions on slopes.
3. Stay two machine widths away from slopes, drop offs, ditches, water, retaining walls avoid any slope exceeding 15-degrees.
4. To prevent tipping or loss of control, start and stop smoothly, avoid unnecessary turns and travel at reduced speed.
5. Immediately apply the parking brake if you lose steering control while operating. Inspect the machine and correct the problem before continuing to operate.
6. When using any attachment, never direct the chemical and/or material toward bystanders or allow anyone near the machine while in operation.
7. Start the engine with the operator in the operating position, the sprayer/spreader disengaged, parking brake is engaged, and the neutral lever is in neutral.
8. If the machine sprayer/spreader system ever plugs, shut off the engine, remove the ignition key, and wait for all movement to stop before removing any obstructions. (use proper personnel protective equipment (PPE) while working with any chemicals.)

WARNING

DO NOT use your hand to dislodge a clogged hopper dump chute. Use a stick or other device to remove clogged material after the engine has stopped running and the impeller has stopped turning.

9. Be alert for holes, rocks, roots and other hidden hazards in the terrain. Keep away from any drop offs. Beware of overhead obstructions (low limbs, etc.), underground obstacles (sprinklers, pipes, tree roots, etc.). Cautiously enter a new area. Be alert for hidden hazards.
10. Be sure to keep the machine away from water or other hazards (avoid spraying any chemicals near water to avoid water contamination).
11. Be aware that spreader material and liquid material may shift while turning or suddenly changing speed. This can cause the unit to tip over or lose control.
12. Disengage power to the sprayer/spreader before backing up. Do not spray/spread in reverse unless absolutely necessary and then only after observation of the entire area behind the machine. If you must spray/spread in reverse, maintain a constant lookout to the rear of the machine and spray/spread carefully.
13. DO NOT turn sharply. Use care when backing up.
14. Disengage power to the sprayer/spreader before crossing roads, walks or gravel drives.
15. Spray/spread only in daylight or good artificial light.
16. Take all possible precautions when leaving the machine unattended, such as disengaging the machine, stopping the engine, and removing the key.
17. Disengage power to the attachments when transporting or when not in use.
18. Always point spray wand in a safe direction, spray wand can become highly pressurized and cause injury if not handled safely.
19. Do not disconnect the spray wand while system is still pressurized.
20. Do not direct spray nozzles or spreader toward people, pets, or electrical equipment. When draining do not let chemicals come in contact with organic material or your skin.

21. The machine and attachments should be stopped and inspected for damage after striking a foreign object, and damage should be repaired before restarting and operating the machine.

CAUTION

Do not touch the engine or the muffler while the engine is running or immediately after stopping. These areas may be hot enough to cause a burn.

DANGER

DO NOT run the engine inside a building or a confined area without proper ventilation. Exhaust fumes are hazardous and contain carbon monoxide which can cause brain injury and death.

22. Keep hands and feet away from moving parts. Contact can injure.
23. Transport the machine using a heavy duty trailer or truck. Ensure the trailer or truck has all of the necessary lighting and markings as required by laws, codes, and ordinances. Secure a trailer with a safety chain.
24. Be cautious when loading and unloading onto trailers or trucks. Use only a full width ramp. Always back on and drive off a trailer.
25. When transporting the machine, make sure the neutral lock lever is in neutral lock position, the engine is off with the key removed, the parking brake is engaged and the wheels have been blocked.
26. Tie the machine down securely using the tie down points located on the front and rear of the machine. See Figure 2-2 and 2-3. Secure using straps, chains, cables, or ropes. Both front and rear straps must be directed down and outward from machine.

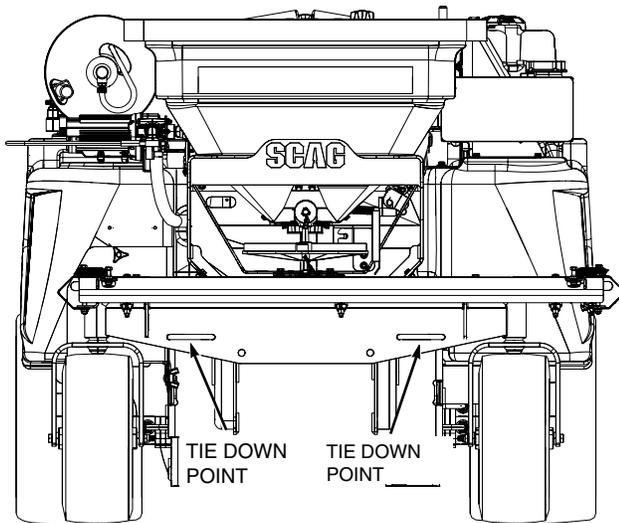


Figure 2-2. Front Tie Down Points

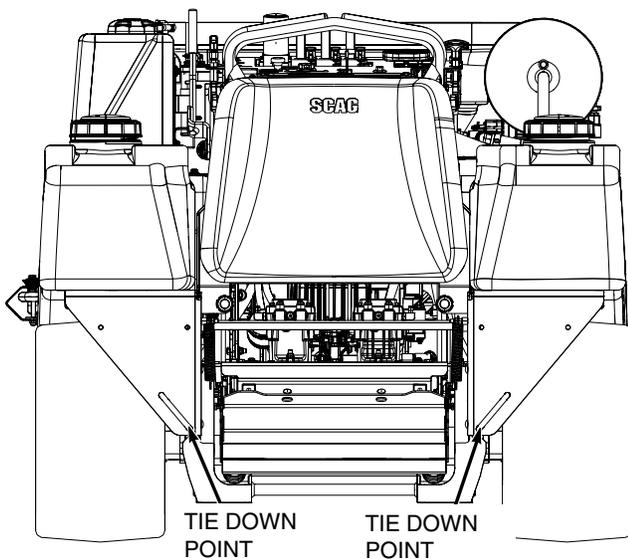


Figure 2-3. Rear Tie Down Points

27. Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
28. NEVER leave the machine running unattended.
29. Always wash your hands or exposed areas after contact with chemicals.
30. If a chemical spill occurs, make sure to refer to the chemical manufacturer's recommendations for clean up / neutralization.
31. When changing chemicals, always make sure to rinse the system thoroughly, following the chemical manufacturer's instructions for neutralizing the chemical.

2.6 MAINTENANCE CONSIDERATIONS & STORAGE

1. Never make adjustments to the machine with the engine running unless specifically instructed to do so. If the engine is running, keep hands, feet, and clothing away from moving parts.
2. Place the control levers in the neutral position, engage the parking brake, stop engine and remove key or disconnect spark plug wire(s) to prevent accidental starting of the engine when servicing or adjusting the machine. Wait for all movement to stop before adjusting, cleaning or repairing.
3. Remove spark plug wire(s) before making any repairs.
4. Keep all nuts, bolts and screws tight, to ensure the machine is in safe working condition. Check spray nozzles and hoses frequently to be sure they are tight.
5. Do not change the engine governor settings or overspeed the engine. See the engine operator's manual for information on engine settings.
6. To reduce fire hazard, keep drives, muffler, and engine free of grass, leaves, excessive grease, oil and dirt.
7. Park the machine on level ground.
8. NEVER allow untrained personnel to service the machine.
9. Use care when checking the sprayer/spreader system, make sure to use proper protective equipment when working with areas that are exposed to chemicals.
10. Keep all parts in good working condition. Replace all worn or damaged decals.
11. Use jack stands to support components when required.
12. Carefully release pressure from components with stored energy.

WARNING

The spray system traps liquid under high pressure, even when the engine is off. High pressure discharge could cause serious injury or death.

 **WARNING**

Hydraulic fluid is under high pressure and can penetrate skin causing injury. If hydraulic fluid is injected into the skin, it must be surgically removed within a few hours by a doctor or gangrene may result.

Keep body and hands away from pinholes or nozzles that eject hydraulic fluid under high pressure. Use paper or cardboard and not hands to search for leaks.

Safely relieve all pressure from the hydraulic system by placing the control levers in the neutral lock position and shutting off the engine before performing any work on the hydraulic system.

If you need service on your hydraulic system, please see your authorized Scag dealer.

13. Let the engine cool before storing.
14. DO NOT store the machine near an open flame.
15. Shut off fuel while storing or transporting.
16. DO NOT store fuel near flames or drain indoors.

2.7 USING A SPARK ARRESTOR

The engine in this machine is not equipped with a spark arrestor muffler. It is in violation of California Public Resource Code Section 4442 to use or operate this engine on or near any forest covered, brush covered or grass covered land unless the exhaust system is equipped with a spark arrestor meeting any applicable local or state laws. Other states or federal areas may have similar laws. Check with your state or local authorities for regulations pertaining to these requirements.

2.8 SPARK IGNITION SYSTEM

This spark ignition system complies with Canadian ICES-002.

2.9 CHEMICAL HAZARDS

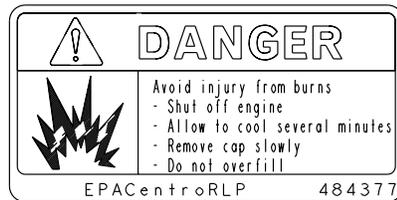
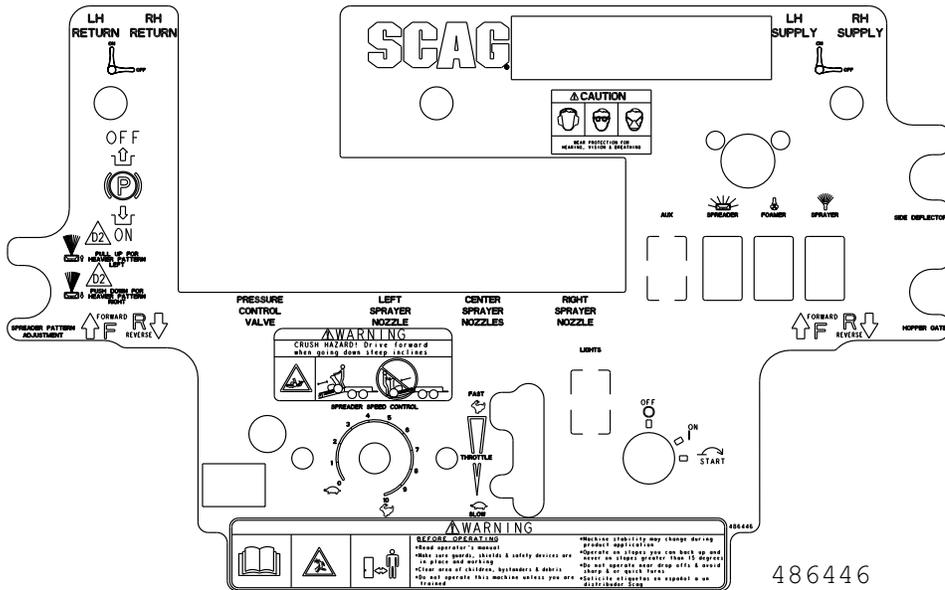
Chemical substances used in the Turf Storm sprayer / spreader may be hazardous to the operator, bystanders, animals, soils, plants or other property.

1. Carefully read and follow the chemical warnings and the MSDS (Material Safety Data Sheets) for each chemical being used and protect yourself according to the chemical manufacturer's recommendations.
2. Make sure as little skin as possible is exposed while using chemicals.
3. Make sure to wear proper protective equipment (PPE) when handling chemicals to guard against personal contact such as;
 - Safety glasses, goggles and/or face shield
 - Chemical resistant gloves
 - Rubber boots or substantial footwear
 - Hearing protection
 - Respirator or filtered mask.
4. Keep a clean change of clothes, soap, and disposable towels on-hand in the event of a chemical spill.
5. Maintain a source of clean water to rinse off in case of a spilled chemical.
6. Obtain proper training before using or handling chemicals.
7. Use the correct chemicals for the job.
8. Follow the chemical manufacturer's instructions for the safe application of the chemical being used. Do not exceed the recommended system application pressure.
9. Always make sure to dispose of chemicals according to the manufacturer's disposal directions.
10. Have clean water available, especially when filling the sprayer tanks.
11. Always handle chemicals in a well ventilated area.
12. Do not eat, drink, or smoke while working with or handling chemicals.
13. Wash your hands and other exposed areas as soon as possible after finishing the work.
14. Keep the chemicals in their original packaging and in a safe location.

Section 2

15. Do not blow the spray nozzles out with your mouth, nozzles should not be placed in or near your mouth at any time. (nozzles may have chemical residue.)
16. Make sure the machine is always rinsed off thoroughly before working on it.
17. Do not put your mouth or face over the spray tank openings. Chemicals and fumes are dangerous
18. If you are using more than one (1) chemical, read the information for each. Refuse to operate or work on the sprayer / spreader if the information is not available.
19. Before working on the sprayer / spreader system, ensure that the system has been properly cleaned, rinsed (See Sections 6.11 and 6.12) and neutralized according to the manufacturer(s) recommendations.
20. Verify there is an adequate supply of clean water and soap nearby and immediately wash if any chemicals come in contact with you.

2.10 SAFETY AND INSTRUCTIONAL DECALS



Molded in Futak

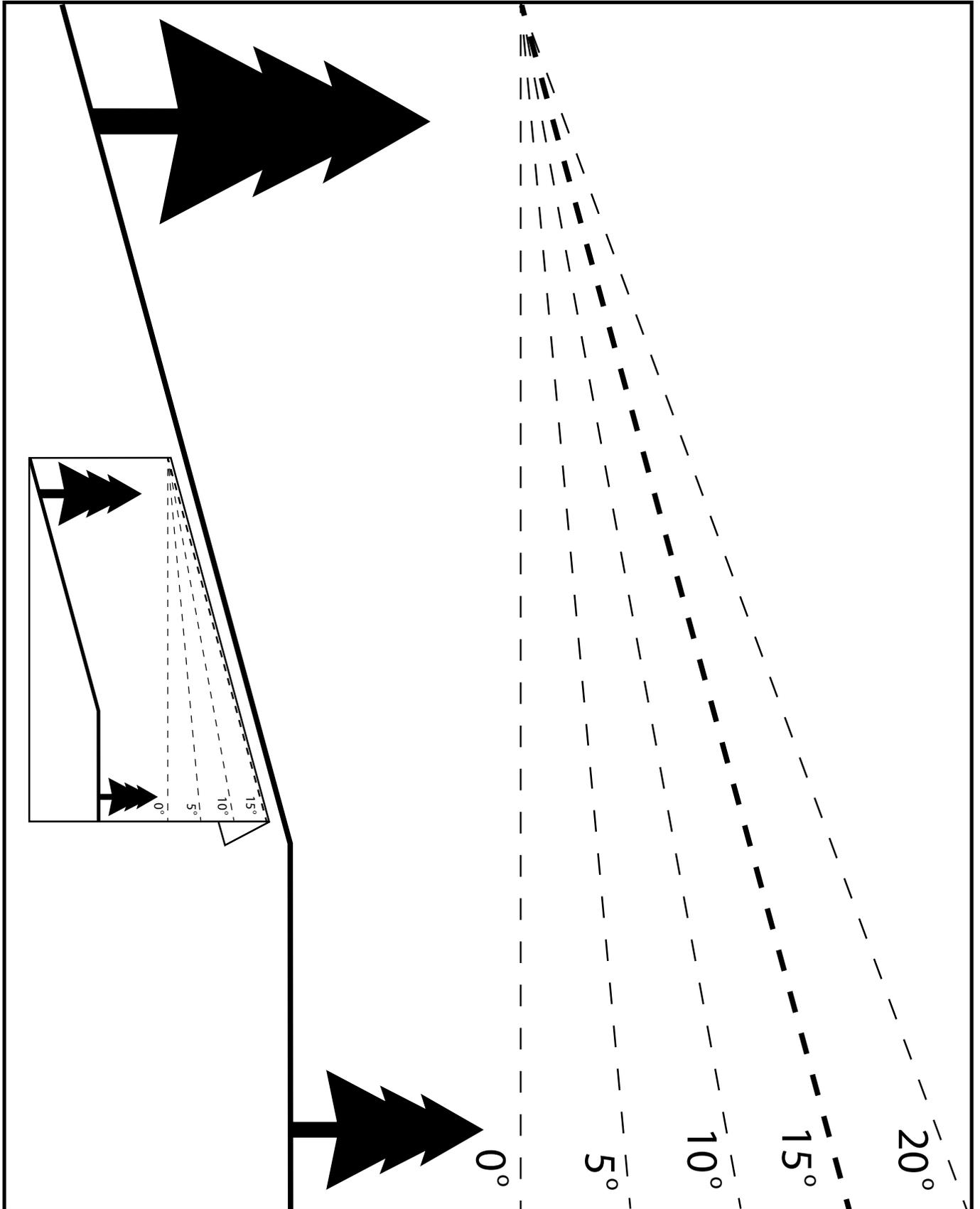


Figure 2-4. Slope Angle Graph

Section 3**3.4 HYDRAULIC SYSTEM**

Hydraulic Oil Filter.....	10 Micron Spin-on Element Type
Hydraulic Expansion Reservoir.....	Nylon

3.5 WEIGHTS AND DIMENSIONS

Overall Length.....	67"
Width (spray booms in).....	54"
Max Width (spray booms Out).....	82"
Overall Height.....	60"
Weight:	
Sprayer Tanks and Hopper Empty (dry wieght).....	965#
Sprayer Tanks Filled Only.....	1483#
Hopper Filled Only.....	1203#
Sprayer Tanks and Hopper Filled.....	1688#

3.6 PRODUCTIVITY

Sprayer Width.....	10'
Spreader Width.....	20'

OPERATING INSTRUCTIONS

WARNING

Do not attempt to operate this machine unless you have read this manual. Learn the location and purpose of all controls and instruments before you operate this machine.

Before operating the machine, familiarize yourself with all machine and engine controls. Knowing the location, function and operation of these controls is important for safe and efficient operation of the machine.

The Digital Display is standard equipment on all Turf Storm sprayer/spreader machines. The display has three (3) different screen options to chose from. For more information on the different screen displays, refer to the display's owners manual supplied with this product. See Figure 4-1. If additional information or service is needed, contact your Scag Power Equipment Dealer.

4.1 DIGITAL DISPLAY INSTRUMENT IDENTIFICATION

1. Speed Indicator (Figure 4-1). Indicates the current speed of the machine. Refer to Sections 5.7 & 5.8 for calibration procedure.
2. Clock Indicator (Figure 4-1). Indicates the current time.
3. Trip Distance Indicator (Figure 4-1). Indicates the distance traveled by the machine, can be used to calculate a test path during calibration.
4. Voltage Indicator (Figure 4-1). Indicates the current voltage of the machine.
5. Engine Temp. Indicator (Figure 4-1) Not Used. Indicates the current temperature of the engine.
6. Ride Time Indicator (Figure 4-1). Indicates the current operating time since the last trip data reset. Ride time only registers while the machine is moving.
7. Stop Watch Indicator (Figure 4-1). Indicates when the stop watch feature is in use, can be paused, stopped, and reset with a trip data reset.
8. Air Temp. Indicator (Figure 4-1). Indicates current ambient temperature.

9. Odometer Indicator (Figure 4-1). Indicates the total distance the machine has driven.
10. Accum. Ride Time Indicator (Figure 4-1). Indicates the total amount of time the machine has been operated.
11. Max / Min Voltage Indicator (Figure 4-1). Indicates the minimum and maximum voltage of the machine. This feature rotates between maximum and minimum voltage every 2 seconds.
12. Avg / Max Speed Indicator (Figure 4-1). Indicates the average and maximum speed of the machine. This feature rotates between average and maximum speed every 2 seconds.

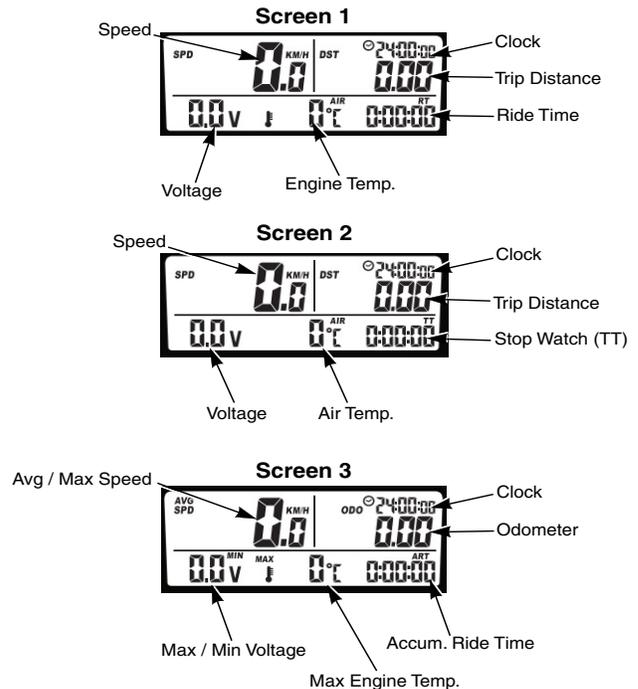


Figure 4-1. Digital Display

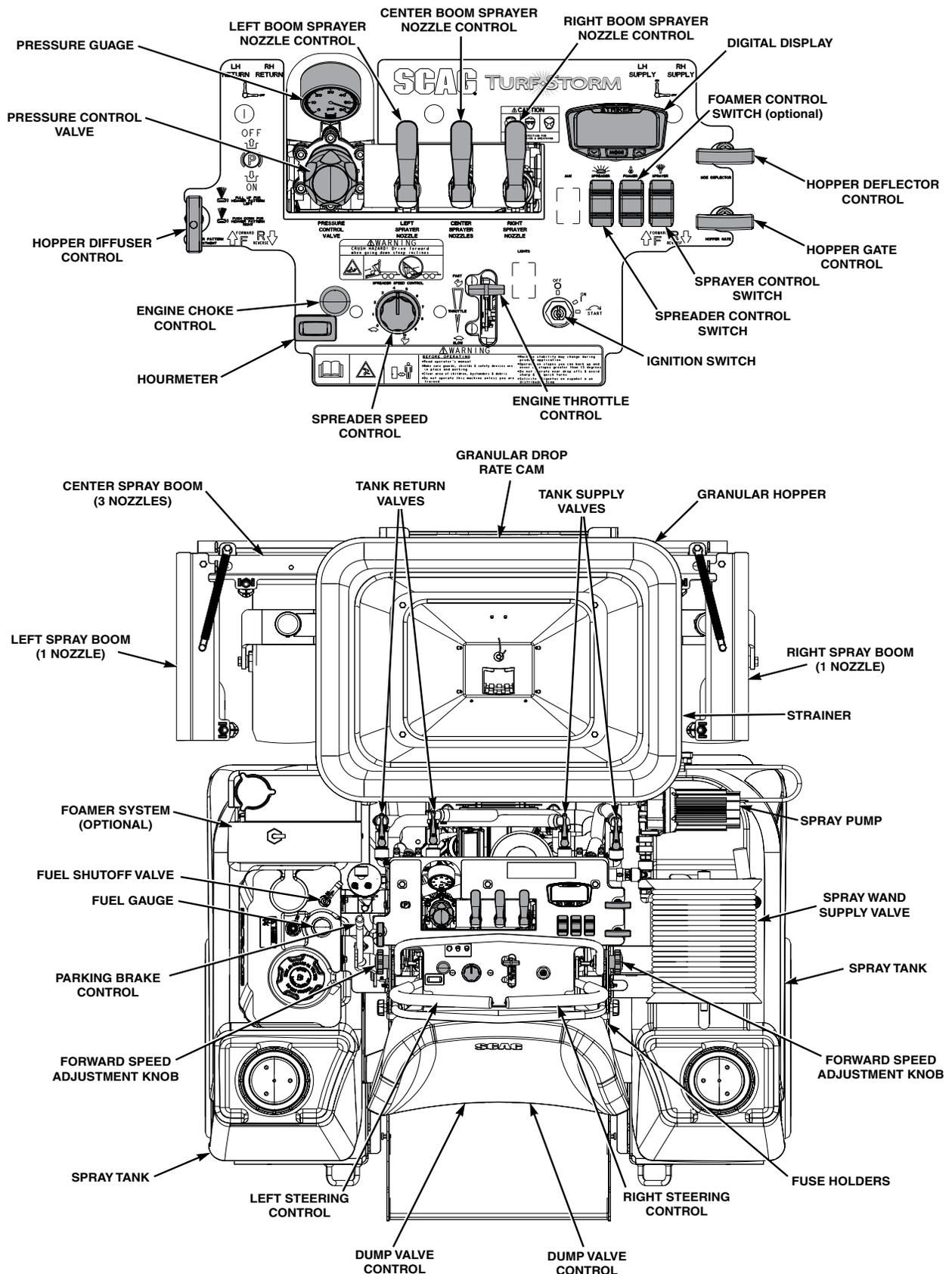


Figure 4-2. Controls and Instruments

4.2 CONTROLS IDENTIFICATION

1. Ignition Switch (Figure 4-2). The ignition switch is used to start the engine and has three positions; OFF, ON, and START.
2. Engine Choke Control (Figure 4-2). Used to start a cold engine.
3. Engine Throttle Control (Figure 4-2). Used to control the engine speed. Pushing the lever forward increases engine speed. Pulling the lever back decreases engine speed. Full back position is the IDLE position. Full forward is the driving position.
4. Left Steering Control (Figure 4-2). Used to control the machine's left wheel when traveling forward or reverse. See Section 4.7 for further details regarding the machine's travel controls.
5. Right Steering Control (Figure 4-2). Used to control the machine's right wheel when traveling forward or reverse. See Section 4.7 for further details regarding the machine's travel controls.
6. Parking Brake Control (Figure 4-2). Used to engage and disengage the parking brakes and lock the steering handles in neutral. Pull the lever back to engage the parking brakes. Push the lever forward to disengage the parking brakes.
7. Fuel Tank Gauge (Figure 4-2). Indicates the amount of fuel in the fuel tank.
8. Fuse Holders (Figure 4-2). Three (3) 20-amp fuses protect the machine's electrical system. To replace fuses, pull fuse out of the socket and install a new fuse.
9. Fuel Shutoff Valve (Figure 4-2). Located on top of the fuel tank. Used to shut off fuel supply to the engine. Rotate the valve counter clockwise to supply fuel from the tank to the engine. Rotate the valve clockwise to shut off the fuel supply to the engine.
10. Dump Valve Controls (Figure 4-3). Located on the hydraulic pumps, used to "free-wheel" the machine. Rotating clockwise until they stop, allows the unit to move under hydraulic power. The levers must be in this position and torqued to 7-10 lb-ft during operation of the machine. Rotating counter-clockwise allows the machine to be moved by hand (free-wheeling). See Figure 4-3.
11. Hourmeter (Figure 4-1). Indicates the number of hours the engine has been operated. It operates whenever the engine is running. Has preset maintenance reminders for engine and hydraulic system oil changes. Will start flashing scheduled maintenance 2 hours before preset time and continue flashing until 2 hours after. Automatically resets.

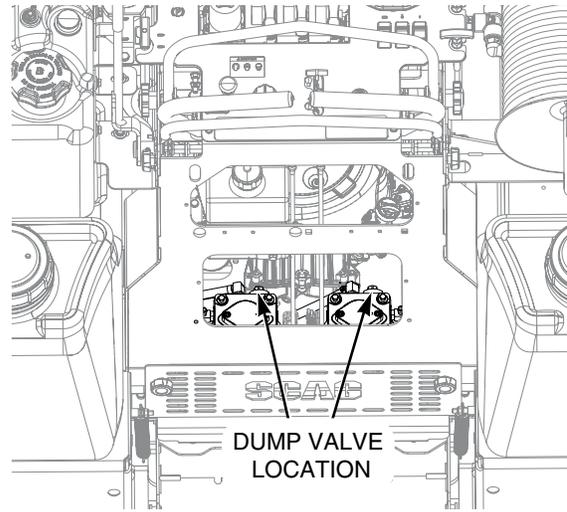


Figure 4-3. Dump Valve Controls

12. Pressure Control Valve (Figure 4-2). Located in the control panel cut out, the sprayer pressure adjuster is used to adjust the spray system pressure.
13. Pressure Gauge (Figure 4-2). Located in the control panel cut out, is used to display the sprayer systems pressure. When the spray nozzles are open, the sprayer system pressure will decrease slightly. Adjust the Pressure Control Valve to compensate for the loss in pressure.
14. Left Boom Sprayer Nozzle Selector (Figure 4-2). Located in the control panel cut out, allows the operator to turn the left hand spray boom nozzle on or off.
15. Center Boom Sprayer Nozzle Selector (Figure 4-2). Located in the control panel cut out, allows the operator to turn the center spray boom nozzles on or off.
16. Right Boom Sprayer Nozzle Selector (Figure 4-2). Located in the control panel cut out, allows the operator to turn the right hand spray boom nozzle on or off.
17. Strainer (Figure 4-2). Located next to the pump, the strainer filters the sprayer system and traps debris inside of the system before reaching the sprayer pump.

Section 4

18. Tank Supply Valves (Figure 4-2). Located in front of the control panel, these valves control the draw from the tanks and supply the sprayer system.
19. Tank Return Valves (Figure 4-2). Located in front of the control panel, these valves control the return flow to the tanks from the sprayer system.
20. Hopper Diffuser Control (Figure 4-2). Located on the control panel, the hopper diffuser control allows the user to equalize the the material spread from side to side.
21. Spreader Speed Control (Figure 4-2). Located on the control panel, the spreader speed control, controls the speed of the spreader motor and should be adjusted to control the width of the spread pattern.
22. Granular Drop Rate Cam (Figure 4-2). Located in front of the machine below the hopper, is used to control the drop rate of the granular product from the hopper.
23. Granular Hopper (Figure 4-2). Located at the front of the machine, the granular hopper has a 220# (100 kg) capacity.
24. Spreader Control Switch (Figure 4-2). Located on the control panel, the spreader control switch activates / deactivates the spreader motor. Stepping off the operator platform will also shut off the spreader motor.
25. Digital Display (Figure 4-1). Located on the control panel, the display allows the operator to see various functions of the machine including ground speed, hours, distance, and many other important metrics for the machine. See Section 4.1
26. Hopper Deflector Control (Figure 4-2). Located on the control panel, the hopper deflector control activates / deactivates the side deflector for the spreader system.
27. Hopper Gate Control (Figure 4-2). Located on the control panel, the hopper gate control opens / closes the hopper gate.
28. Sprayer Control Switch (Figure 4-2). Located on the control panel, the sprayer control switch activates / deactivates the pump for sprayer system.
29. Foamer Control Switch (Figure 4-2). (optional accessory). Located on the control panel, the foamer control switch activates / deactivates the foamer system.
30. Left / Center / Right Spray Booms (Figure 4-2). Located on the front of the machine, the spray boom is divided into 3 sections (left, right, and center) and are controlled by each boom's Sprayer Nozzle Control lever.
31. Nozzles (Figure 4-2). Located on the spray boom, the nozzles produce a fine mist for proper application of product.
32. Spray Wand Supply Valve (Figure 4-2). Located by the hose reel, the valve controls the draw from the tanks and supplies the hose reel with chemicals.
33. Spray Tank (Figure 4-2). Located on both sides of the machine, are used to mix and supply chemicals to the sprayer system.
34. Forward Speed Control (Figure 4-2). Located on the sides of the control panel, used to set the maximum forward speed needed when applying product. Speed will vary depending on application rate of the product being applied.

4.3 SAFETY INTERLOCK SYSTEM

The machine is equipped with a safety interlock system intended to protect the operator and others from injury. This is accomplished by preventing the engine from starting unless the sprayer/spreader is disengaged, the parking brake is engaged, the steering control levers are in the neutral position and the operator is in the operator position. The interlock system shuts off the engine if the operator leaves the operator platform with the steering control levers not in the neutral position and/or the sprayer/spreader is engaged and the parking brake not engaged.

4.4 TESTING THE SAFETY INTERLOCK SYSTEM

The safety interlock system should be tested each time before using the machine. If the safety interlock system does not operate as described below, contact your local Authorized Scag Power Equipment Dealer immediately to have the safety interlock system repaired.

-NOTE-

The machine will not start with the operator off of the platform. For all test procedures listed below, the engine must be started with the operator standing on the platform unless specified otherwise.

1. Place the spreader switch to the OFF (down) position, release the parking brake. Stand on the operator platform in the operating position. Try to start the engine; the engine should not start.
2. Place the steering control levers in the neutral position, engage the parking brake, move the spreader switch to the OFF (down) position, and start the engine. Stand on the operator platform in the operating position with the engine running, engage the spreader switch to the ON (up) position, and step backwards off of the operating platform. The spreader should shut off and the engine should stay running.
3. Stand on the operator platform in the operating position, place the steering control levers in the neutral position, engage the parking brake, move the spreader switch to the OFF (down) position, and start the engine. With the engine running, release the parking brake, and step backwards off of the operating platform. The engine should shut off.
4. Stand on the operator platform in the operating position, place the steering control levers in the neutral position, engage the parking brake, move the sprayer switch to the OFF (down) position, and start the engine. With the engine running, move the sprayer switch to the ON (up) position, release the parking brake, and step backwards off of the operating platform. The engine should shut off and the sprayer pump should stay running.
5. Stand on the operator platform in the operating position, place the steering control levers in the neutral position, engage the parking brake, move the sprayer switch to the OFF (down) position, and start the engine. With the engine running, move the sprayer switch to the ON (up) position, and step backwards off of the operating platform. The engine and sprayer pump should stay running.

WARNING

Never operate the machine with the interlock system disconnected or malfunctioning. Do not disengage or bypass any switch; injury to yourself and others or property damage could result.

4.5 INITIAL RUN-IN PROCEDURES

FIRST DAY OF USE OR APPROXIMATELY 20 HOURS

1. Check all belts for proper alignment and wear at 2, 4 and 8 hours.
2. Change the engine oil and oil filter after the first 20 hours of operation. See Section 7.4.
3. Check oil level in the hydraulic system reservoir. See Section 7.3.
4. Check for loose hardware. Tighten as needed.
5. Check interlock system for proper operation. See Section 4.4.
6. Check tire pressure. Adjust pressure if necessary. See Section 7.10.

4.6 STARTING THE ENGINE

CAUTION

DO NOT USE STARTING FLUIDS. Use of starting fluids in the air intake system may be potentially explosive or cause a "runaway" engine condition that could result in engine damage and/or personal injury.

1. Be sure the fuel shutoff valve, located by the fuel tank, is completely open. See Section 7.5.
2. Place the steering control levers in the neutral position and disengage the sprayer/spreader.
3. Engage the parking brake.
4. If the engine is cold, choke the engine as needed.
5. Move the engine throttle control to about half engine speed.
6. Turn the ignition key to the start position and start the engine.
7. Allow engine to warm before operating the machine.

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4.7 GROUND TRAVEL AND STEERING

- IMPORTANT -

If you are not familiar with the operation of a machine with lever steering and/or hydrostatic transmissions, the steering and ground speed operations should be learned and practiced in an open area, away from buildings, fences, or obstructions. Practice until you are comfortable with the handling of the machine before attempting to spray/spread. Learn the operation on flat ground before operating on slopes.

- IMPORTANT -

Start practicing with a slow engine speed and slow forward travel.

Learn to feather the steering controls to obtain a smooth operating action.

Practice operating the machine until you are comfortable with the controls before proceeding.

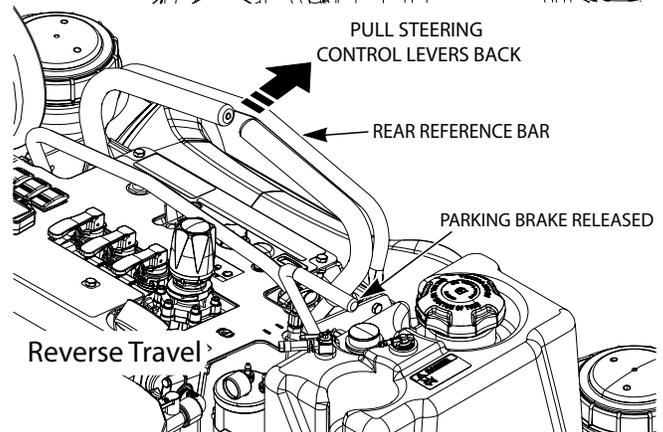
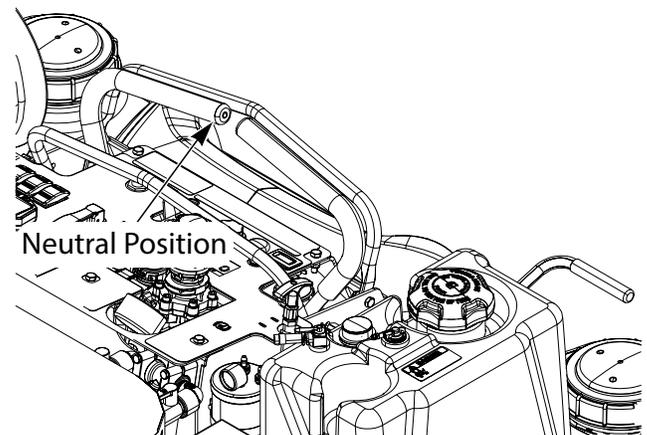
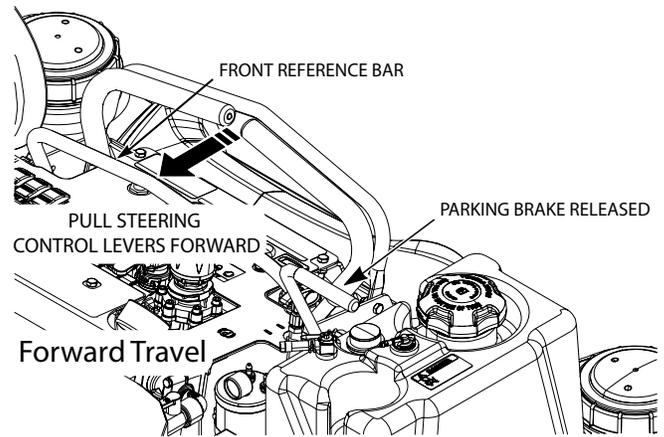


Figure 4-4. Travel Controls

FORWARD TRAVEL

To travel forward with the machine, disengage the parking brake, use the front reference bar as an anchor point for your hands, and slowly pull the levers forward an equal distance. The further the steering control levers are pulled forward, the greater the forward speed will be. To increase the speed, pull the steering control levers forward. To decrease speed, slowly let the steering control levers return toward the neutral position. See Figure 4-4.

To steer the machine to the left while traveling forward, allow the left steering control lever to move back toward the neutral position. The further the steering control lever is allowed to move back, the quicker the machine will turn left.

To steer the machine to the right while traveling forward, allow the right steering control lever to move back toward the neutral position. The further the steering control lever is allowed to move back, the quicker the machine will turn right.

To stop the forward travel completely, allow the steering control levers to return to the neutral position. If the machine is to be parked, engage the parking brake.

- NOTE -

Smooth operation of the steering control levers will produce smooth machine operation. While learning the operation of the steering controls, keep the travel speed low.

- IMPORTANT -

Do not travel forward over a curb. The machine will hang up on the curb. Travel backwards over a curb at a 45 degree angle.

REVERSE TRAVEL

 CAUTION
Disengage power to the spraying/spreading system before backing up. Do not spray/spread in reverse unless absolutely necessary and then only after observation of the entire area behind the machine.

 CAUTION
Before backing up, observe the rear for persons and obstructions. Clear the area before backing up. Possible injury or property damage could occur.

To travel in reverse, pull both steering control handles back. Keep the travel speed low while traveling in reverse.

- NOTE -

The machine may not travel straight in reverse. Slight adjustments may need to be made using the steering controls.

To steer left while traveling in reverse, allow the left steering control lever to move forward. The further the control is allowed to move forward, the quicker the machine will turn left.

To steer right while traveling in reverse, allow the right steering control lever to move forward. The further the control is allowed to move forward, the quicker the machine will turn right.

To stop the reverse travel, allow the steering control levers to return to the neutral position. If the machine is to be parked, engage the parking brake.

4.8 OPERATING THE SPRAYER

Use the sprayer to disperse liquid pesticides, fertilizers, herbicides and/or other chemical substances. Before using the sprayer, the sprayer tanks, valves, hoses, pump and nozzles should be cleaned and flushed before adding any chemicals. See Section 6.11, Paragraph A for proper flushing procedure.

 CAUTION
Chemicals are hazardous and can cause personal injury.
Read the chemical manufacturer's directions on the label before handling the chemical.
Follow all manufacturer's recommendations and precautions.
Keep chemicals away from skin. Should contact occur, wash affected area thoroughly with soap and clean water.
Wear eye protection, gloves and any other personnel protection equipment (PPE) recommended by the chemical manufacturer.

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1. Fill the spray tanks first, then apply the chemical solution.
2. When the operator has finished spraying, the sprayer system should be cleaned and flushed as outlined in Section 6.11.
3. Do not mix chemicals in the spray tanks and store over night for use the following day. This could lead to chemical separation resulting in damage to the machine and/or components.

4.9 OPERATING THE SPRAYER TANK VALVES

A. SELECTING THE LEFT SPRAY TANK

1. To use the left tank only, rotate and close the right side supply and return valves
2. Rotate the left side supply and return valve to the open position.

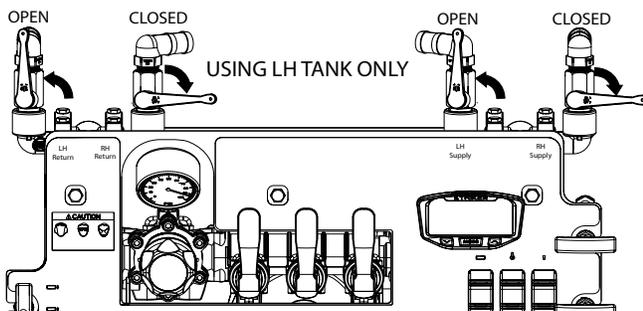


Figure 4-5. LH Tank Supply Valve Position

B. SELECTING THE RIGHT SPRAY TANK

1. To use the right tank only, rotate and close the left side supply and return valves
2. Rotate the right side supply and return valve to the open position.

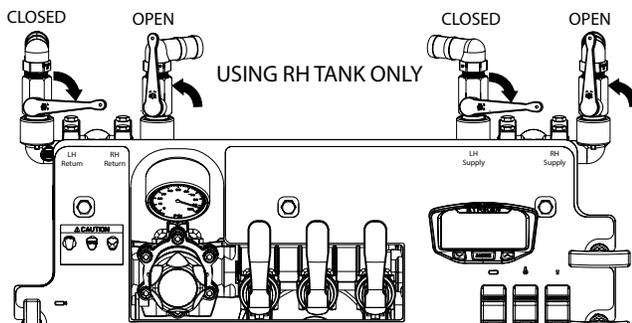


Figure 4-6. RH Tank Supply Valve Position.

C. SELECTING BOTH SPRAY TANKS

1. To use both tanks at the same time, open all valves.

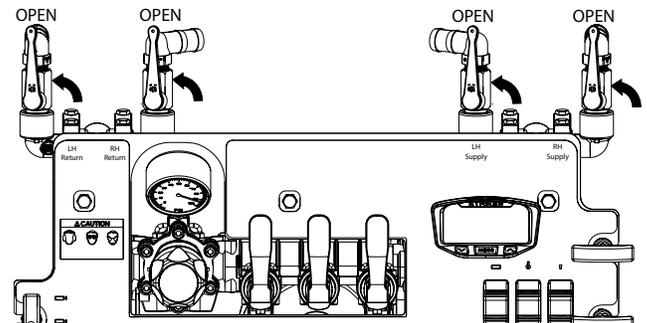


Figure 4-7. Both Tanks Supply Valve Position

D. TRANSFERRING FLUID BETWEEN TANKS

If desired, fluid can be transferred from one tank to the other by using the supply and return valves.

1. To transfer fluid from one tank to another, open the tank supply valve for the tank you want to drain and close the supply valve for the tank you want to fill
2. Open the return valve for the tank you want to fill, and close the return valve for the tank you want to empty.

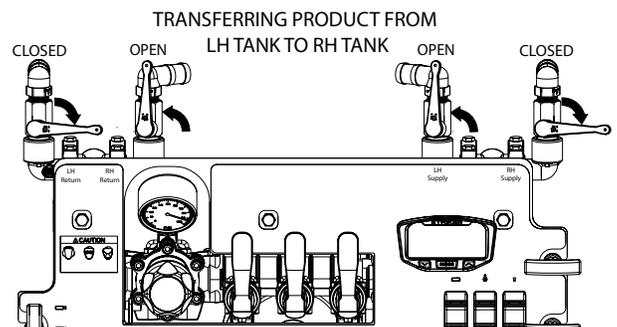
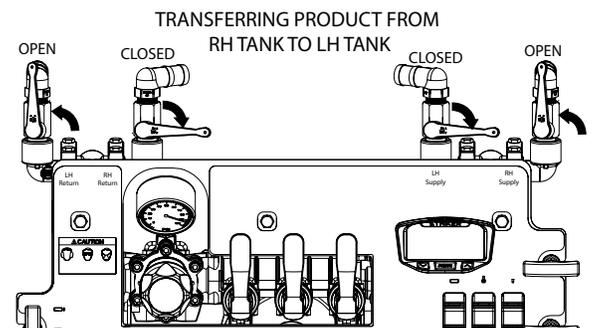


Figure 4-8. Transferring Fluid Between Tanks

4.10 OPERATING THE SPRAYER BOOM

1. Before engaging the sprayer, turn the desired spray tank(s) on. If needed, flip the booms open to the operating position.

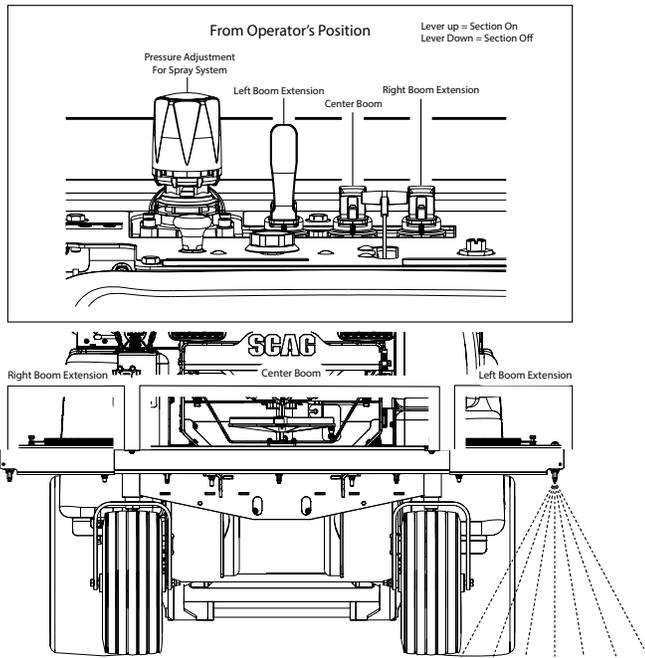


Figure 4-9. Sprayer Boom Selection Levers

2. Adjust the valves to the appropriate suction path. (refer to section 4.9 for information on operating the valves)
3. Turn on the boom sections that are going to be used. See Figure 4-9.
4. Adjust the sprayer pressure to the desired psi determined during calibration (do not exceed 60 psi) using the pressure valve (counter clock-wise to decrease pressure, clock-wise to increase pressure).

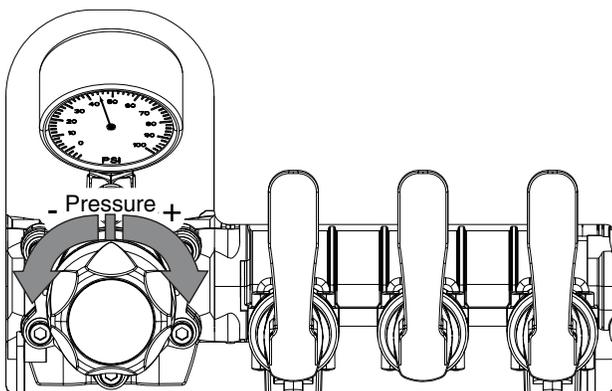


Figure 4-10. Sprayer Pressure Adjustment

5. Engage the sprayer switch to turn the sprayer on. See Figure 4-11. Sprayer pressure may change as sprayer engages, adjust pressure as needed.

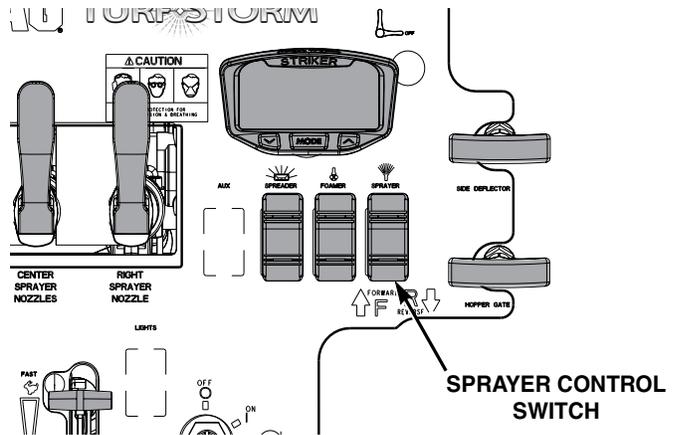


Figure 4-11. Sprayer Engage Switch

CAUTION

Do not spray in reverse unless absolutely necessary and then only after observation of the entire area behind the machine. Clear the area before backing up. Possible injury or property damage could occur.

6. To disengage the sprayer, push the switch to the disengaged position.
7. Always operate the engine at full throttle to properly maintain sprayer speed. If the engine starts to lug down, reduce the forward speed and allow the engine to operate at maximum RPM.

4.11 OPERATING THE SPRAY WAND

1. Before engaging the spray wand, turn the boom selection levers to the off position. See Figure 4-9.
2. Turn the desired spray tank(s) on using the supply and return valves. See Section 4.9
3. Firmly grasp the spray wand and point it in the direction to be sprayed.

WARNING

The spray wand traps liquid under high pressure, even when the engine is off. High pressure discharge could cause serious injury or death.

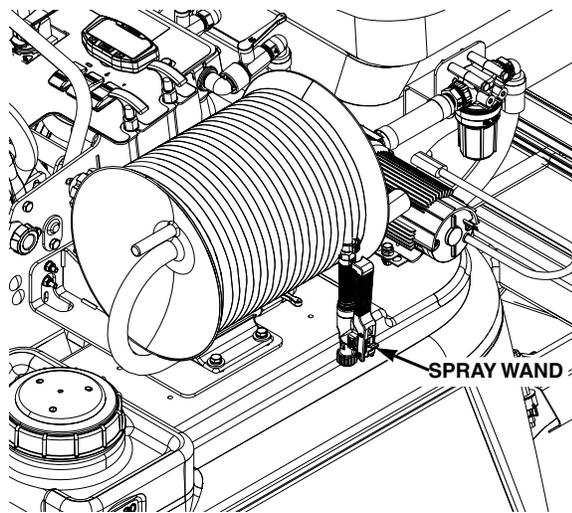


Figure 4-12. Spray Wand

4. Rotate and open the spray wand valve to supply chemicals to the spray wand.

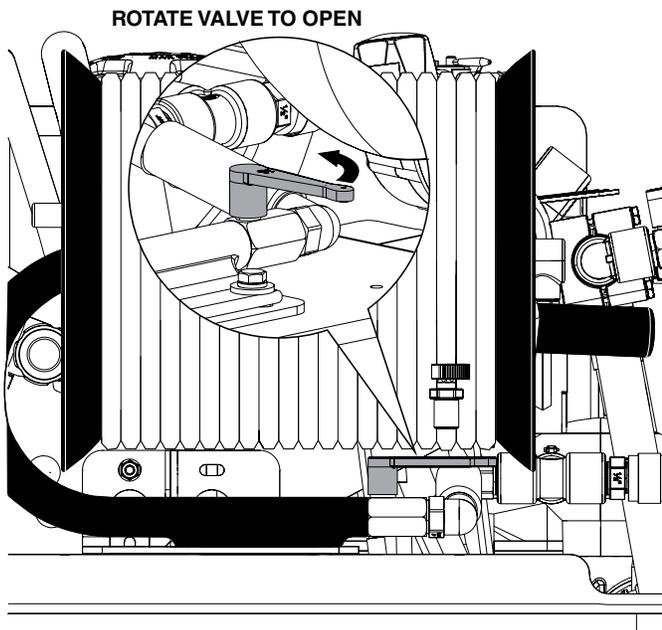


Figure 4-13. Spray Wand Supply Valve

5. Adjust the sprayer pressure to the desired psi (do not exceed 60 psi) using the pressure valve (counter clock-wise to decrease pressure, clock-wise to increase pressure). See Figure 4-10
6. Squeeze the trigger on the spray wand to begin spraying. Lock the trigger if desired.

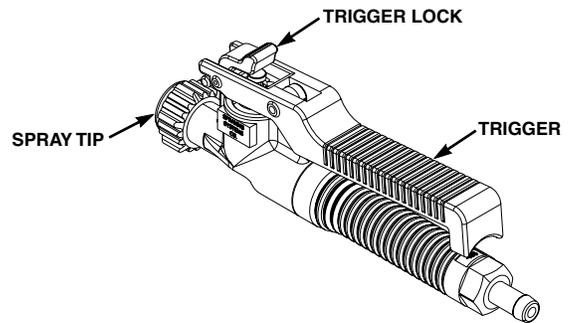


Figure 4-14. Spray Wand Components

7. Once the desired area has been sprayed, release the trigger lock (if applied) and release the trigger.
8. Rotate the spray wand valve to the off position and reel in the hose.

4.12 OPERATING THE SPREADER

Use the spreader to disperse granular materials such as fertilizers, grass seed, ice melt, etc. When using the spreader, fill the hopper and then apply the material to the work area. Clean the hopper when finished. See Section 6.12 for proper maintenance procedure.

CAUTION

Chemicals are hazardous and can cause personal injury.

Read the chemical manufacturer's directions on the label before handling the chemical.

Follow all manufacturer's recommendations and precautions.

Keep chemicals away from skin. Should contact occur, wash affected area thoroughly with soap and clean water.

Wear eye protection, gloves and any other personnel protection equipment (PPE) recommended by the chemical manufacturer.

Before engaging the spreader, make sure the spreader is calibrated. Refer to section 6-8 for proper spreader calibration.

1. To engage the spreader, push the spreader switch. Refer to section 4.11A, Figure 4-15.
2. Adjust the spreader speed to the desired speed using the spreader speed knob. Refer to section 4.11A, Figure 4-15.
3. Wait for the spreader to reach operating speed before opening the spreader door.
4. To open the hopper gate, pull the hopper gate control handle. Refer to section 4.11B, Figure 4-17.
5. If needed, engage the deflector to avoid spreading material in undesired areas. Refer to section 4.11C, Figure 4-18.
6. Use the hopper diffuser to adjust where the material falls on the spreader impeller. This will adjust the spread pattern of the spreader. (If the spreader is spreading heavily to one side this adjustment will need to be made until the spread pattern becomes centered (make adjustments in small increments). Refer to section 4.11D, Figure 4-19.
7. Close the hopper gate with the spreader at operating speed. Then disengage the spreader by disengaging the spreader switch. See Figure 4-15.

A. SPREADER SPEED CONTROL ADJUSTMENT

The spreader speed control is used to control impeller motor speed and to adjust the broadcast width.

1. Engage the spreader switch to turn the spreader motor on. See Figure 4-15.

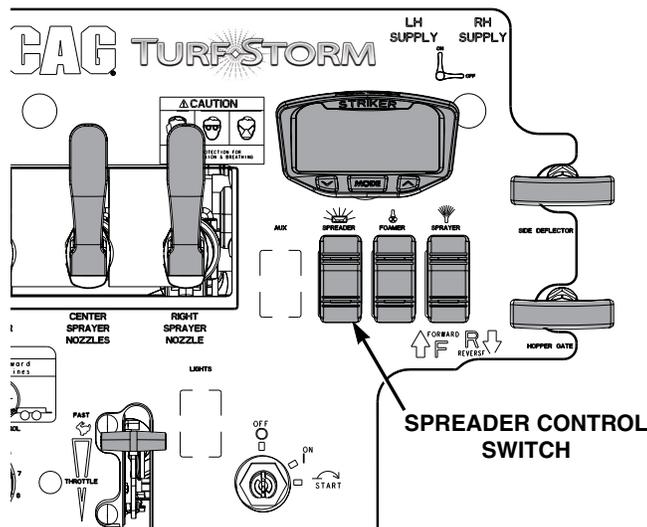


Figure 4-15. Spreader Engage Switch

2. Rotate the control knob clockwise to increase the impeller motor speed and broadcast pattern.

3. Rotate the control knob counterclockwise to decrease the motor speed and broadcast pattern.

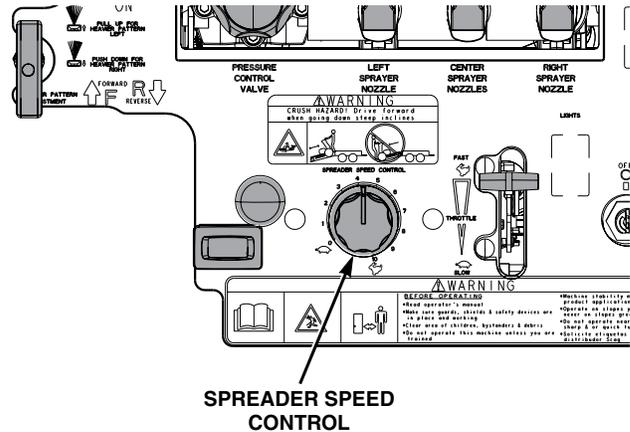


Figure 4-16. Spreader Speed Control Knob

B. HOPPER GATE ADJUSTMENT

The hopper gate control is used to open and close the hopper gate. The gate allows the granular material to flow from the hopper.

-NOTE-

The granular drop rate cam controls how far the hopper gate will open. Refer to Section 4.11E

1. To open the hopper gate and allow granular material to flow out of the hopper onto the impeller, pull up on the hopper gate control handle.
2. To close the hopper gate and stop the flow of granular material out of the hopper and onto the impeller, push down on the hopper gate control handle.

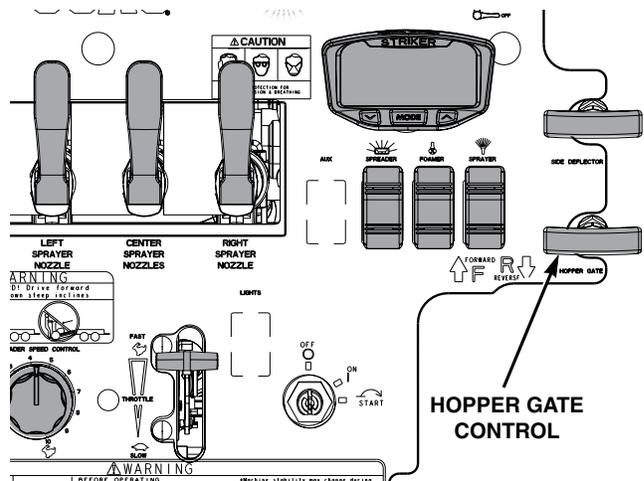


Figure 4-17. Hopper Gate Control

Section 4

C. HOPPER DEFLECTOR ADJUSTMENT

The hopper deflector control is used to control the granular product's broadcast from the left side of the impeller. The hopper deflector can be used to control the broadcast of granular product onto sidewalks, driveways, planting beds, etc. Use the deflector during normal operation as required.

1. To broadcast product from the left side of the impeller, pull up (open) on the hopper deflector control handle.
2. To block the product from broadcasting on the left side of the impeller, push down (closed) on the hopper deflector control handle.

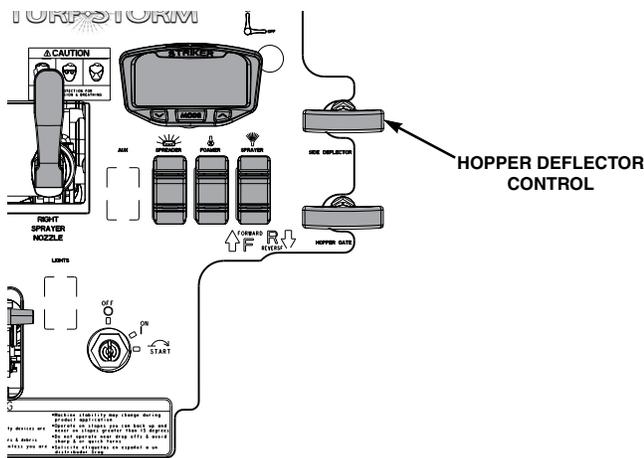


Figure 4-18. Hopper Deflector Control

D. HOPPER DIFFUSER ADJUSTMENT

The hopper diffuser control is used to control the spread of granular product from left to right across the spread pattern.

1. Rotate the hopper diffuser control handle to unlock.
2. Adjust the diffuser control as follows to control the spread pattern.
 - Pull the handle to broadcast more granular product to the right side of the impeller.
 - Center the handle to balance the granular product spread from side to side.
 - Push the handle to broadcast more product to the left side of the impeller.
3. Rotate the hopper diffuser handle to lock the control. See Figure 4-19.

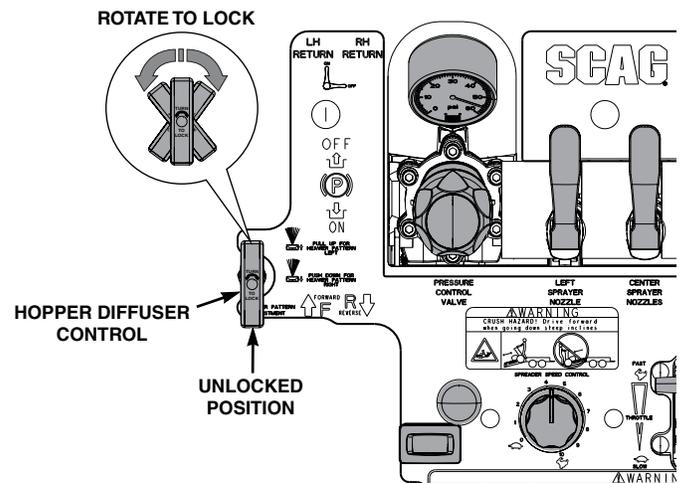


Figure 4-19. Hopper Diffuser Control

E. GRANULAR DROP RATE CAM ADJUSTMENT

The granular drop rate cam is used to control the application rate of the granular material. See Spreading Charts, Section 5.1 on page 35.

-NOTE-

The spreading charts are for reference only. The machine should be calibrate for accuracy.

1. Rotate the granular drop rate cam to the dial setting as determined by using the Spreading Charts.

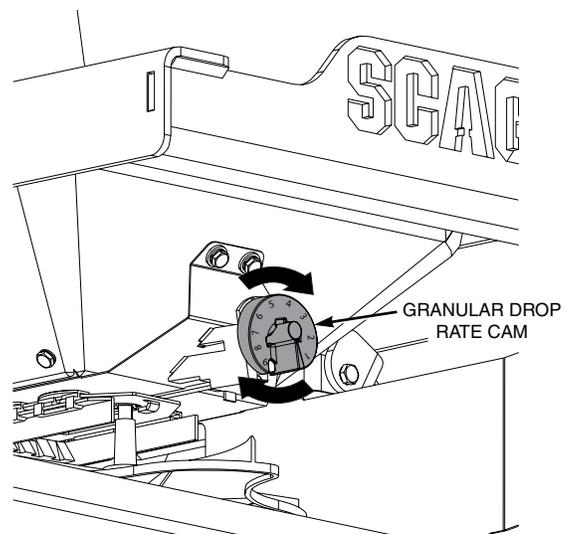


Figure 4-20. Granular Drop Rate Cam

4.13 HILLSIDE OPERATION

WARNING

DO NOT operate on steep slopes. Under no circumstances should the machine be operated on slopes greater than 15 degrees. See Figure 2-3, Page 11 to determine approximate slope of area to be sprayed. ALWAYS FOLLOW OSHA APPROVED OPERATION.

1. This machine has been designed for good traction and stability under normal spraying/spreading conditions. However, caution must be used when traveling on slopes, especially when the grass is wet. Wet grass reduces traction and steering control.
2. Stay two machine widths away from slopes, drop offs, ditches, water, retaining walls avoid any slope exceeding 15-degrees. See Figure 2-3, Page 11 and Figure 4-21.

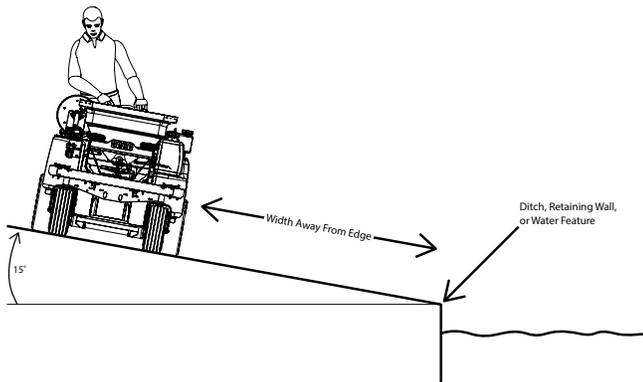


Figure 4-21. Distance From Hazard

3. Operate the machine across slopes, avoid going up and down slopes.
4. To prevent tipping or loss of control, do not start or stop suddenly, avoid unnecessary turns and travel at reduced speed. If tires lose traction, disengage the sprayer/spreader and proceed slowly off the slope.
5. Avoid sudden starts when spraying/spreading uphill. Sudden starts may cause the machine to tip backwards.
6. Loss of traction may occur when traveling down hill. Weight transfers to the front of the machine and may cause the drive wheels to slip causing loss of braking or steering.

7. Weight in the storage tanks and hopper will transfer when on a slope, this may cause a loss of traction or increased risk of a roll-over.
8. When operating with a heavy load, reduce speed and allow sufficient braking distance. Use extra caution on slopes.
9. Liquid loads shift during operation, especially while turning, going up or down slopes, sudden changes in speed or while driving over rough surfaces. Shifting loads can cause the machine to tip over.
10. Be aware that operating the machine on wet surfaces, across slopes or down hill may cause the machine to lose traction. Loss of traction to the drive wheels may result in sliding and loss of steering and braking.
11. Do not operate the machine when you are uncertain about the traction, steering, or stability.
12. Never back down a hill.
13. Keep tires properly inflated.
14. Do not suddenly apply the brakes.
15. Make sure to lean to properly transfer your weight while driving on a slope. See Figure 4-22.

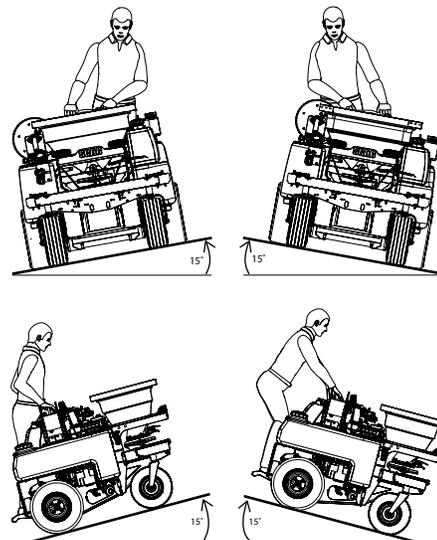


Figure 4-22. Slope Operation

Section 4

4.14 PARKING THE MACHINE

1. Park the machine on a flat, level surface only. Do not park the machine on an incline.
2. Place the steering control levers in the neutral position.
3. Disengage the sprayer/spreader.
4. Slow the engine to idle speed.
5. Engage the parking brake.
6. Turn the ignition key to the OFF position and remove the key.

4.15 AFTER OPERATION

1. Clean the entire machine after each use. Do not use high pressure spray or direct the spray onto electrical or hot components. Use compressed air while cleaning the spreader system or hydraulic system.

- IMPORTANT -

Do not wash a hot or running engine. Cold water will damage the engine. Use compressed air to clean the engine if it is hot.

2. Keep the entire machine clean to inhibit serious heat damage to the engine or hydraulic components.
3. Check the drive belts for proper alignment and any signs of wear. Correct and adjust if necessary.



DANGER

To avoid injury from burns, allow the machine to cool before removing the fuel tank cap and refueling.

4. After the machine has cooled down, fill the fuel tank with fresh, clean fuel at the end of every day of operation. See Engine Owner's Manual for proper octane requirements.
5. Frequently check for worn, deteriorated or damaged components that could create a hazard.
6. Shut off the fuel when storing or transporting the machine.
7. Check the tire pressure. Adjust pressure if necessary.

4.16 REMOVING CLOGGED MATERIAL



DANGER

NEVER PUT YOUR HANDS INTO THE HOPPER CHUTE FOR ANY REASON!

Shut off the engine and remove the key, and only then use a stick or similar object to remove material if clogging has occurred.

1. If the hopper chute becomes clogged, shut off the engine and remove the ignition key. Using a stick or similar item, dislodge the clogged material. Use personnel protective equipment (PPE) while working with areas that are exposed to chemicals.
2. Do not clean spray nozzles using your mouth or blowing through the nozzles.
3. Ensure nozzles are installed correctly.

4.17 MOVING MACHINE WITH ENGINE STOPPED

To "free-wheel" or move the machine around without the engine running, place the dump valve levers in the FREE-WHEEL position. Disengage the parking brake and move the machine by hand. The dump valve levers must be returned to the DRIVE position and torqued to 7-10 ft/lbs to drive the machine. See Figure 4-3.

4.18 RECOMMENDATIONS FOR SPRAYING

1. Before spraying make sure the area is clear of objects that may be contaminated with chemicals and ingested or used after (Ex. dog-bones and childrens toys).
2. Avoid spraying with wind speeds over 10 mph.
3. Make sure to calibrate the sprayer to the desired application rate. Refer to Calibrating The Sprayer Section 6-7 for information on calibrating the sprayer system.
4. Spray material in a slightly overlapping pattern to ensure uniform coverage.
5. Make sure to properly dispose or store all unused chemicals according to the manufacturer's directions.

6. Watch for plugged sprayer nozzles.
7. Move the sprayer boom control valves to the OFF position to stop the flow of product before stopping the forward motion of the machine.
8. Use adequate pump pressure for proper spray distribution.
9. Watch for any changes in application rate.

WARNING

DO NOT operate without the proper training or applicable licenses(vary by state). Operation without aforementioned items can result in harm/lawful action to yourself or others.

10. Replace damaged or worn nozzles (Refer to section 6-7 for determining nozzle wear/damage).

4.19 RECOMMENDATIONS FOR SPRAYING WITH THE SPRAY WAND

WARNING

The spray wand traps liquid under high pressure, even when the engine is off. High pressure discharge could cause serious injury or death.

1. Keep clear of the nozzle and do not direct the spray wand at people, pets or non-work area.
2. Do not direct the spray towards or near electrical power sources or components.
3. Do not attach hoses or other components at the end of the spray wand.
4. Do not attempt to disconnect the spray wand from the machine while the sprayer system is pressurized.
5. Lock the spray wand to the OFF position when the job is complete.
6. Do not repair the spray wand, hoses, seals, nozzle, or other wand components, Always replace them.

4.20 RECOMMENDATIONS FOR SPREADING

1. Before spreading make sure the area is clear of objects that may be contaminated with chemicals and ingested or used after (Ex. dog-bones or children's toys).

2. Make sure to calibrate the spreader to the desired application rate. Refer to Calibrating The Spreader Section 6-8 for information on calibrating the spreader.
3. Spread material back, roughly, to the last pass' tire marks from your previous pass.
4. Make sure to properly dispose or store all unused chemicals according to the manufacturer's directions.

WARNING

DO NOT operate without the proper training or applicable licenses(vary by state). Operation without aforementioned items can result in harm/lawful action to yourself or others.

4.21 RECOMMENDATIONS FOR SPREADING AND SPRAYING AT THE SAME TIME

1. Before spreading/spraying make sure the area is clear of objects that may be contaminated with chemicals and ingested or used after (Ex. dog-bones or children's toys).
2. When spreading and spraying at the same time, the spreader will need to be calibrated to spread material at twice the spraying width. This will assure proper overlap and application rates for both systems. (Ex. If you're spraying with a 6ft spray width, your effective spread width will need to be 12ft.) Refer to Section 6-7 and 6-8 for calibration procedures.
3. The spreader should spread back to the center of the tire marks from your previous pass and the spray boom tip should be about 20" away from the previous boom pass.
4. During calibration, the speed (mph) should be determined while doing the sprayer calibration. Make sure to use the same speed while calibrating the spreader.
5. Make sure both the sprayer and the spreader are properly calibrated for the material to be spread and sprayed.

ADJUSTMENTS

5.1 PARKING BRAKE ADJUSTMENT

WARNING

DO NOT operate the machine if the parking brake is not operable. Possible severe injury could result.

The parking brake should be adjusted whenever the parking brake lever is placed in the "ON" position and the parking brake will allow the machine to move. If the following procedures do not allow you to engage the parking brake properly, contact your Scag dealer for further brake adjustments.

1. Park the machine on a flat, level surface. Block the wheels to prevent the machine from moving.

CAUTION

Adjust the brake only enough to hold the machine. Excessive force may cause damage to the machine or brake components.

2. Release the parking brake lever.
3. Look for a gap (approximately 1/4") between the left side drive tire and the brake weldment. See Figure 5-1. Loosen the hardware securing the brake weldment to the brake actuator shaft weldment. Adjust the brake weldment until there is a 1/4" gap between the tire and brake weldment. Tighten the hardware
4. Repeat this procedure on the right side drive tire.

- NOTE -

If this procedure does not achieve proper brake adjustment, please contact your authorized Scag dealer.

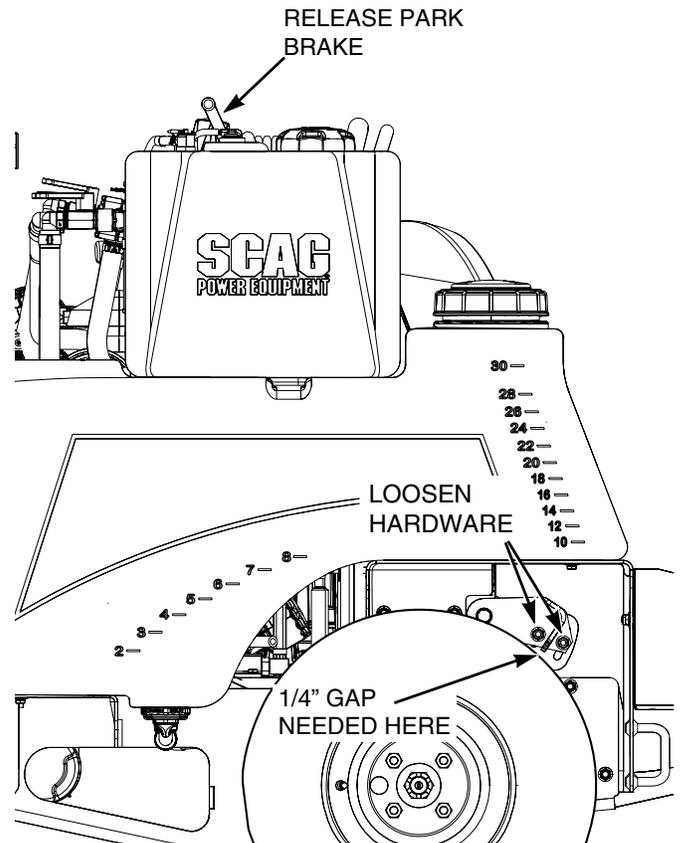


Figure 5-1. Brake Adjustment

5.2 TRAVEL ADJUSTMENT

Neutral or tracking adjustments will need to be made if:

1. The steering control is in the neutral position and the machine creeps forward or backward. (Neutral Adjustment)
2. The steering control is in the full forward position and the machine pulls to one side or the other when traveling in a forward position. (Tracking Adjustment)

NEUTRAL ADJUSTMENT

-NOTE-

Neutral has been set by your Scag dealer at the time of set up and normally does not need to be adjusted. If, however, you find that the neutral has come out of adjustment, follow the procedure below.

1. Be sure the dump valves are in the run position and the steering control levers are in the neutral position.

2. With an operator in the operating position, park the machine on a flat level surface, start the engine and disengage the parking brake.
3. Run the engine at full operating speed and check if the machine creeps forward or backwards.
4. Adjust the LH wheel by loosening the jam nuts on the steering control rod and turning the rod until the drive wheel turns in the forward direction. Turn the rod back until the drive wheel stops moving. Turn the rod an additional 1/2 turn. See Figure 5-2.

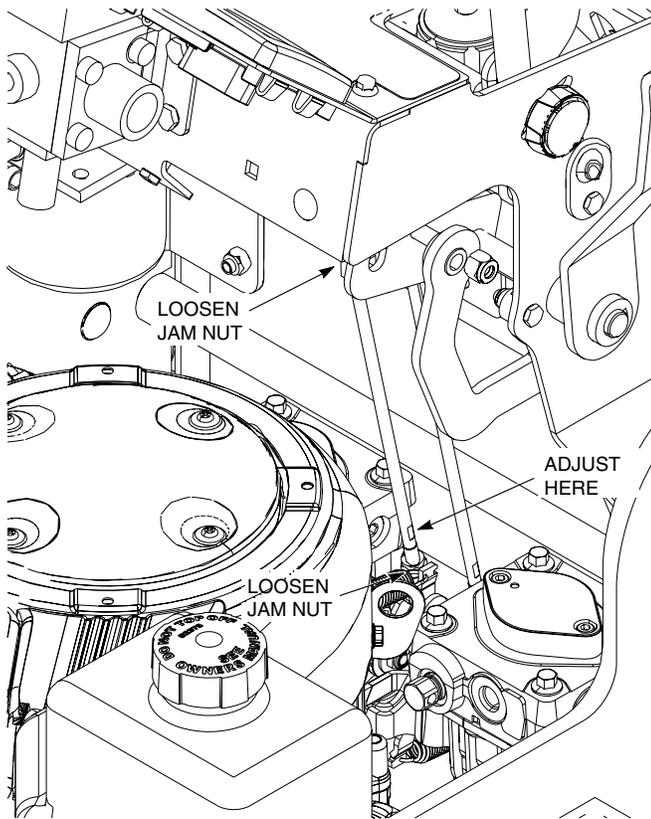


Figure 5-2. Tracking Adjustment (Left Side Shown)

5. Repeat for the RH wheel using the same adjustment procedure listed above.
6. Actuate the steering control levers forward and reverse several times and return them to the neutral position.
7. Check that the drive wheels remained in neutral and readjust if necessary.
8. Check that the steering control levers hit the stop before the pumps reach full stroke. Adjust as needed.

TRACKING ADJUSTMENT

CAUTION

Stop the engine and remove the key from the ignition before making any adjustments. Wait for all moving parts to come to a complete stop before beginning work.

CAUTION

The engine and drive unit can get hot during operation causing burn injuries. Allow the engine and drive components to cool before making any adjustments.

-NOTE-

Before proceeding with this adjustment, be sure that the caster wheels turn freely and that the tire pressure in the drive wheels is correct. If the tire pressure is not correct, the machine will pull to the side with the lower pressure.

1. If at full speed the machine pulls right, it is an indication that the left wheel is turning faster than the right wheel. To adjust this condition, proceed as follows:
 - A. Stop the machine and place the steering control levers in the neutral position. Loosen the lock nuts securing the ball joints at each end of the LH steering control rod. Rotate the control rod to lengthen the rod and tighten the lock nuts. This will cause the control rod to stroke the LH pump less, slowing down the LH wheel. See Figure 5-2.

- NOTE -

If after making the adjustment as outlined in step 1A, the machine creeps forward or backward, the neutral adjustment must be made as described on page 23-24.

2. If at full speed the machine pulls left, it is an indication that the right wheel is turning faster than the left wheel. To adjust this condition, proceed as follows:

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A. Stop the machine and place the steering control levers in the neutral position. Loosen the lock nuts securing the ball joints at each end of the RH steering control rod. Rotate the control rod to lengthen the rod and tighten the lock nuts. This will cause the control rod to stroke the RH pump less, slowing down the RH wheel. The same adjustment is used for the RH side as shown in Figure 5-2.

- NOTE -

If after making the adjustment as outlined in step 2A, the machine creeps forward or backward, the neutral adjustment must be made as described on page 23-24.

5.3 THROTTLE CONTROL AND CHOKE ADJUSTMENTS

These adjustments must be performed by your Scag dealer to ensure proper and efficient running of the engine. Should either need adjustment, contact your authorized Scag service center.

5.4 BELT ADJUSTMENTS

 WARNING
Before removing any guards, shut the engine off and remove the ignition key. Wait for all moving parts to come to a complete stop before beginning work.

All drive belts are spring loaded and self-tensioning. The belts should be checked periodically for proper alignment and wear.

 WARNING
If the pump drive belt fails, steering control will be lost which could result in serious injury or death. Replace the pump drive belt as needed or every 400 hours / 2 years, whichever occurs first.

5.5 BELT ALIGNMENT

Belt alignment is important for proper performance of your Scag machine. If you experience frequent belt wear or breakage, see your authorized Scag service center for belt adjustment.

5.6 OPERATOR CUSHION REMOVAL

The operator cushion can be easily removed to gain access to the machine for maintenance.

 WARNING
Before removing any guards, shut the engine off and remove the ignition key. Wait for all moving parts to come to a complete stop before beginning work.

To remove the operator cushion:

1. Loosen the two (2) wing nuts securing the operator cushion to the machine. See Figure 5-3.
2. Lift upward and back to remove the operator cushion. See Figure 5-3.

WARNING

Do not operate the machine without the operator cushion installed.

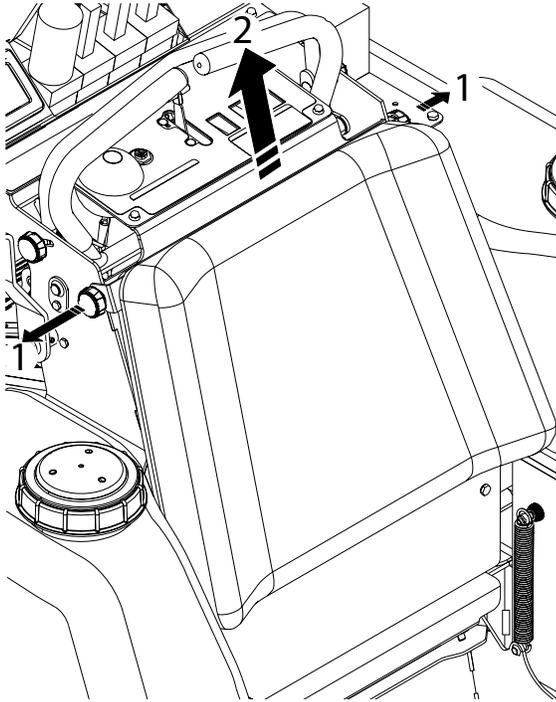


Figure 5-3. Operator Cushion and Rear Cover Removal

5.7 CALIBRATING THE SPRAYER

1. The sprayer system will need to be calibrated at the beginning of each season, when the application rate changes, and multiple times during the season (to accommodate for wear depending on the chemicals used, some chemicals are harder on nozzles than others).
2. Make sure the sprayer is properly calibrated for the desired application rate. Different chemicals may have different application rates, the machine will need to be re-calibrated for each chemical (refer to the chemical manufacturer's directions for application rate).
3. To calibrate the sprayer, first, make sure the sprayer system is clean and free from build up.
4. The sprayer should always be calibrated with the tank half full (to simulate average load weight) of clean water.

5. When calibrating the sprayer system the operator will need to know the speed of the machine, the amount of product coming out of the nozzles, and the effective spray width being used.

- NOTE -

The spray calibration work sheet on page 37 can be used to work through the calibration process and stored for future reference.

6. You should set the sprayer up to reach the desired application rate. Refer to the spray guide chart in Section 5-11 for a base setting (the spray guide chart should only be used as a base setting, MANUAL calibration is always best).
7. The first thing to calculate would be the machine speed (mph). This can be done using the machine's display, or manually, using steps 8-11. Manual calculation should be done periodically to make sure the display reads accurately.
8. To calculate this you will need to establish a test course length (ft). The test course should be a straight open and level area free of obstructions. The longer the course the more accurate it will be.

- NOTE -

The course speed may vary from asphalt to turf. It is recommended to use a turf course for speed calibration.

9. Drive this course with the machine at a spraying speed throughout the entire distance of the course, record the amount of time it takes. Repeat this process three times.
10. Take the average time to travel the distance (add up the three times and divide by 3 to get the average)
11. To calculate the ground speed, use the formula in Figure 5-4. Make sure this number is the same as the displayed mph on the machine's display.

$$\frac{\text{Course Length (ft)} \times 60}{\text{Course Time Average (Seconds)} \times 88} = \text{Ground Speed (mph)}$$

Figure 5-4. Ground Speed Formula

Section 5

12. The next step is to calculate the effective spray width. To calculate the effective spray width, take the number of nozzles you are going to be using (3 nozzles on the center boom and 1 on each end boom, 5 total) and multiply it by 20.
13. The next step is to determine the output of the nozzles on the sprayer. (Make sure the spray pressure is set correctly, refer to the spray guide chart for the recommended base pressure settings). To calculate nozzle output, gather liquid (fl oz) from each nozzle for the average amount of time it took to drive the test course (number determined in step 10). Measure (fl oz) each nozzle three times. Take these measurements and calculate the average for each nozzle (add the three test results for each individual nozzle together and divide by 3 to get its average, do this for each nozzle).
14. To check for nozzle wear, take all of the nozzle averages and add them together, then divide by the number of nozzles. This will give you the average across the boom. If any one nozzle average is more than 5% +/- from the boom average it will need to be replaced or cleaned. (if the nozzle is less than the average, it likely needs to be cleaned. If it is more than the average, it likely is worn and needs to be replaced.)
15. To calculate the amount (fl oz) that should be gathered during the test period according to the desired GPA, speed, and effective spray width being used. Use the formula in Figure 5-5 to determine the amount that should be coming out each nozzle during the test period in fl oz. If the amount determined in step 13 is more than 5% +/- off of the amount determined using the formula in Figure 5-5, the pressure, speed, or nozzles may need to be adjusted or changed to reach the desired results.

$$\frac{\text{Desired GPA} \times \text{Speed (mph)} \times 20}{5940} = \text{Gal/min per nozzle}$$

$$\frac{\text{Gal/min per nozzle} \times \text{Average Course Time(sec)} \times 128}{60} = \text{Nozzle Output During Test (fl oz)}$$

Figure 5-5. Required Fl Oz To Be Gathered

- NOTE -

If all measured nozzles produce the correct amount according to the formula in Figure 5-5, the sprayer should be properly calibrated (within 5% +/-) for the desired GPA you were aiming for. Skip the remaining steps.

16. Once you have the average flow (fl oz) for each nozzle, add all the nozzle average (fl oz) results together. It will then need to be converted to gallons (fl oz divided by 128). A flow rate in gallons per minute will then need to be calculated. Follow the formula in Figure 5-6

$$\frac{\text{Flow Rate of All Nozzles (gallons)} \times 60}{\text{Average Course Time (secs)}} = \text{Flow Rate (gal/min)}$$

Figure 5-6. Gallons Per Minute Formula

17. Application rate will then need to be calculated by using one of the formulas below. For gallons per acre see Figure 5-7. For gallons per 1000ft² see Figure 5-8.

$$\frac{\text{Flow Rate of All Nozzles (gal/min)} \times 5940}{\text{Ground Speed (mph)} \times \text{Spray Width (in.)}} = \text{Application Rate (gal/acre)}$$

Figure 5-7. Gallons Per Acre

$$\frac{\text{Flow Rate of All Nozzles (gal/min)} \times 136}{\text{Ground Speed (mph)} \times \text{Spray Width (in.)}} = \text{Application Rate (gal/1000ft}^2\text{)}$$

Figure 5-8. Gallons Per 1000ft²

18. These formulas will give you the gallons per acre or 1000ft² that your machine is applying. If this number does not match the application rate you need, the nozzles may need to be replaced or a pressure adjustment may be needed. A different nozzle size may also be needed if these numbers are off by a large margin.

Useful Conversions

$$1 \text{ Gal/Acre} = 9.35396 \text{ Liters/Hectare}$$

$$1 \text{ Gal/Acre} = 0.0229568411 \text{ Gal/1000ft}^2$$

$$1 \text{ Gal/1000ft}^2 = 43.56 \text{ Gal/Acre}$$

5.8 CALIBRATING THE SPREADER

1. Make sure the spreader is properly calibrated for the desired application rate. Each granular material will spread differently dependant on size, temperature, and moisture. The machine will need to be re-calibrated for each material(refer to the chemical manufacturer's directions for application rate).
2. To calibrate the spreader, first make sure the spreader system is clean and free from build up.
3. The first step is determining the spreaders effective spread width.

- Establish a test area (make sure this area is an area that you wouldn't mind having streaking or burning from the fertilizer, OR use a paved surface and collect all of the material after, to avoid possibility of turf damage from run off).
- Adjust the granular drop rate cam to the desired application rate. Refer to the Spreader Chart in Section 5-10 (this is a starting point).
- To determine the effective spread width for large granular items you will need 15 small pans (1ft², 1 or 2 inches high). Arrange 7 pans to the right (about 1 foot apart), 7 pans to the left (about 1 foot apart), and 1 pan in the center. Make sure to allow room for the machine to drive between the 7 left pans and 7 right pans with the center pan placed so it will miss the drive tires and go underneath the machine during the pass. See Figure 5-9

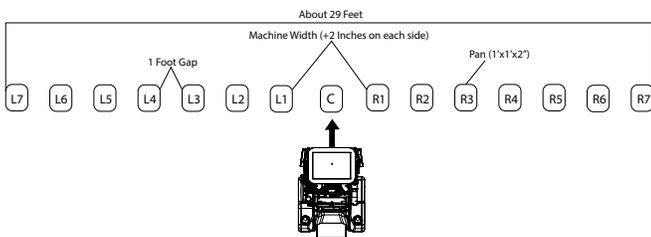


Figure 5-9. Large Granular Material

- NOTE -

Give the machine plenty of room to make the pass. Operate the machine at "application" speed while making the pass. Activate the spreader with ample time to create a constant path before getting to the pans.

To determine the effective spread width for small granular items you will need 27 small pans (1ft², 1 or 2 inches high). Arrange 13 pans to the right (no gap), 13 pans to the left (no gap), and 1 pan in the center. Make sure to allow room for the machine to drive between the 13 pans on the left and the 13 pans on the right, with the center pan placed so it will miss the drive tires and go underneath the machine during the pass. See Figure 5-10

- NOTE -

Give the machine plenty of room to make the pass. Operate the machine at "application" speed while making the pass. Activate the spreader with ample time to create a constant path before getting to the pans.

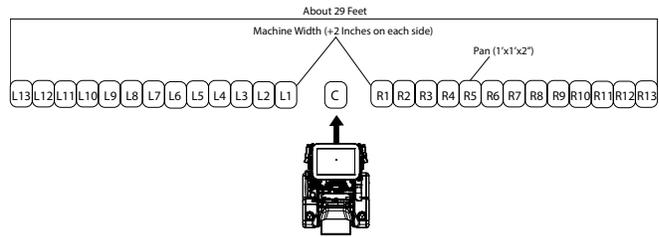


Figure 5-10. Small Granular Material

- Each pan's material should then be measured and recorded. The effective spread width is determined by taking these measurements and finding which pan on each side has half of what the center pan has. (EX. If the center pan has 16 ounces, and the 6th pan away from the machine on each side has 8 ounces. The effective spread width would be the distance between the outside of the pan with 8 ounces on the left to the outside of the pan with 8 ounces on the right.) See Figure 5-11. If the path is not equal on each side, adjust the diffuser control, and repeat the procedure until the spread pattern is even on each side.

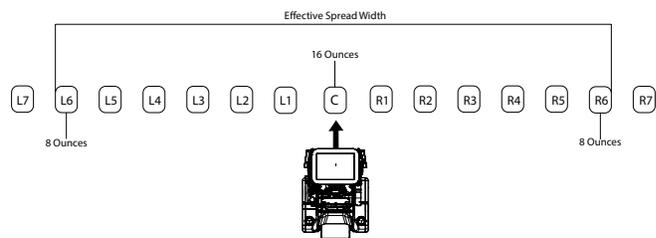


Figure 5-11. Measuring Effective Spread Width Example

- NOTE -

For less accurate spread width, the pattern can be aligned by using a cone on each side of the spreader, adjust the pattern so the material barely hits both cones with both cones equal distance from the spreader. Measure the distance between the two cones.

- The next step is to establish the desired application rate. Refer to the chemical manufacturer's recommendations for application rate (lbs/1000 ft²).

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- Once you have a desired application rate, mark a test path of 50 or 100 feet (a shorter test course can be used, but may be less accurate). Make sure the machine operates at a spreading speed. Drive the test path and record the number of seconds it takes to do the path. Repeat the test path three times and calculate the average time it takes (add all three times together and divide by 3 to get the average).

- NOTE -

Give the machine plenty of room to get to the test path, the machine should be at a speed that you would spread at while driving through the test path.

- To determine the amount of material to be applied during a test path pass use the formula in Figure 5-12.

$$\frac{\text{Desired Application Rate (lbs/1000 ft}^2\text{)} \times (\text{Effective Spread Width (ft)} \times \text{Course Length (ft)})}{1000 \text{ ft}^2} = \text{Amount During Testing (lbs)}$$

Figure 5-12. Amount That Should Be Applied During Test Path Formula

- Fill the spreader with the correct weight(lbs), determined using the formula in Figure 5-12.
- Make sure the gate setting is still set to the recommended base setting, refer to the chart in Section 5.10. (this is a base setting and may need to be adjusted based on speed, product, and moisture)

- NOTE -

Make sure the test area is an area that you wouldn't mind having streaking or burning from the fertilizer, OR use a paved surface and collect all of the material after, to avoid possibility of turf damage from run off.

- With the gate setting set and the spreader at operating speed, open the hopper door and allow the spreader to spread for the average test course time (a drop cloth can be used to deflect and catch the material for easier clean up). The hopper should empty as time expires. If it does not empty, the gate setting will need to be adjusted to increase the flow. If it empties too early, the gate setting will need to be adjusted to decrease the flow. Repeat until proper calibration/gate setting is reached.

Useful Conversions

$$1 \text{ lbs} / 1000 \text{ ft}^2 = 43.56 \text{ lbs} / \text{Acre}$$

$$1 \text{ lbs} / \text{Acre} = 0.0229568411 \text{ lbs} / 1000 \text{ ft}^2$$

5.9 ADDING SPRAY MIXTURE

- Fill each tank 1/2 to 3/4 full with clean water, before adding any chemical
- To determine the amount of chemical to add to each sprayer tank when the application rate is given in weight per acre, follow the formula in Figure 5-13 (If the entire tank is going to be filled after adding the chemical, use the total tank volume (gal) for determining the amount to add).

$$\frac{\text{Gallons of Water In Tank}}{\text{or}} \frac{\text{Total Tank Volume (gals)}}{\text{Spray Rate (Gal/Acre)}} \times \text{Chemical Application Rate (per acre)} = \text{Chemical to Add}$$

Figure 5-13. Amount To Add

- To determine the amount of chemical to add to the sprayer tanks when the application rate is given in pounds of active ingredient per acre, with a material containing a percentage of active ingredient. Follow the formula in Figure 5-14 (If the entire tank is going to be filled after adding the chemical, use the total tank volume (gal) for determining the amount to add).

$$\frac{\text{Gallons of Water In Tank}}{\text{or}} \frac{\text{Total Tank Volume (gal)}}{\text{Spray Rate (Gal/Acre)}} \times (\text{Chemical Application Rate (per acre)} / \text{Percentage of Active Ingredient in Material}) = \text{Chemical to Add}$$

Figure 5-14. Amount To Add Active Ingredient

- When adding more than one chemical, follow the W.A.L.E.S acronym for adding chemicals.

W - Wettable Powders
 A - Agitate Tank
 L - Liquid Product
 E - Emmulsifiable Concentrates
 S - Surfactants

Figure 5-15. Acronym For Adding Chemicals

- Once the chemicals are added, if needed, fill the tank the rest of the way.

5.10 SPREADING CHART

Based off of 5 mph

All dial settings should be used as a base, manual calibration is best

Product	Lbs. per 1000 Sq. Ft.	Dial Setting
Fine Pellets	1	4.75
	2	5.25
	3	5.5
Mixed Fine Pellets	2	5.0
	4	6.0
	6	6.5
Small Pellets	2	4.25
	4	5.5
	6	5.75
Med. Nitrogen Pellets	1	4.75
	2	5.5
	3	6.0
Med. Granules	2	4.75
	4	5.5
	6	6.5
Med. Pellets	2	4.75
	4	5.5
	6	6.5
Large Pellets	2	5.0
	4	6.25
	6	7.25

Section 5

5.11 SPRAY NOZZLE CHART (AI TEEJET)

A1110025 (lavendar) nozzle (0.34 US Gallons per 1,000 sq/ft) are installed as standard equipment

All calculations based off of 100" effective spray width (All 5 Nozzles Activated)

Nozzle	PSI	Capacity One Nozzle (Gal/min)	Capacity One Nozzle (Fl Oz/min)	GPA				Gallons per 1000 sq.ft.		
				4 mph	5 mph	6 mph	8 mph	3 mph	4 mph	5 mph
AIXR110015 (100)	30	0.13	17	9.7	7.7	6.4	4.8	0.29	0.22	0.18
	40	0.15	19	11.1	8.9	7.4	5.6	0.34	0.26	0.2
	50	0.17	22	12.6	10.1	8.4	6.3	0.39	0.29	0.23
	60	0.18	23	13.4	10.7	8.9	6.7	0.41	0.31	0.24
AIXR11002 (50)	30	0.17	22	12.6	10.1	8.4	6.3	0.39	0.29	0.23
	40	0.20	26	14.9	11.9	9.9	7.4	0.45	0.34	0.27
	50	0.22	28	16.3	13.1	10.9	8.2	0.5	0.37	0.3
	60	0.24	31	17.8	14.3	11.9	8.9	0.54	0.41	0.33
AIXR110025 (50)	30	0.22	28	16.3	13.1	10.9	8.2	0.5	0.37	0.3
	40	0.25	32	18.6	14.9	12.4	9.3	0.57	0.43	0.34
	50	0.28	36	21	16.6	13.9	10.4	0.63	0.48	0.38
	60	0.31	40	23	18.4	15.3	11.5	0.7	0.53	0.42
AIXR11003 (50)	30	0.26	33	19.3	15.4	12.9	9.7	0.59	0.44	0.35
	40	0.30	38	22	17.8	14.9	11.1	0.68	0.51	0.41
	50	0.34	44	25	20	16.8	12.6	0.77	0.58	0.46
	60	0.37	47	27	22	18.3	13.7	0.84	0.63	0.5
AIXR11004 (50)	30	0.35	45	26	21	17.3	13	0.79	0.6	0.48
	40	0.40	51	30	24	19.8	14.9	0.91	0.68	0.54
	50	0.45	58	33	27	22	16.7	1	0.77	0.61
	60	0.49	63	36	29	24	18.2	1.1	0.83	0.67
AIXR11005 (50)	30	0.43	55	32	26	21	16	0.97	0.73	0.58
	40	0.50	64	37	30	25	18.6	1.1	0.85	0.68
	50	0.56	72	42	33	28	21	1.3	0.95	0.76
	60	0.61	78	45	36	30	23	1.4	1	0.83
AIXR11006 (50)	30	0.52	67	39	31	26	19.3	1.2	0.88	0.71
	40	0.60	77	45	36	30	22	1.4	1	0.82
	50	0.67	86	50	40	33	25	1.5	1.1	0.91
	60	0.73	93	54	43	36	27	1.7	1.2	0.99

This sheet is to be used for the calibration of the Scag Turfstorm sprayer system. Always make sure the machine to be used is in proper operating condition and that the user is trained in the proper operation of the machine. Always make sure to follow all safety information given in the owner's manual for this machine, as well as, any chemical safety information given by the manufacturer of the chemical being used. Failure to follow safety information involving the handling of chemicals and the operation of this machine can lead to property damage or personal injury. The sprayer system should always be calibrated using a half full tank of CLEAN WATER. For more information on the sprayer calibration process, please refer to the owners manual.

Machine: _____
 Date: ____/____/____
 Calibrated By: _____
 Pump PSI Used: _____ PSI
 Nozzle Type Used: _____
 Chemical Calibrated For: _____

Calibrated For Ground Speed Of: _____ MPH
 Calibrated For Spray Width Of: $\frac{1}{20}$ / $\frac{2}{40}$ / $\frac{3}{60}$ / $\frac{4}{80}$ / $\frac{5}{100}$ Nozzles in. (circle)
 All Nozzles Within 5% +/- Nozzle Average: Yes / No (circle)
 Calibrated For Boom Flow Rate Of: _____ gal/min
 Final Calibration: _____ gal/acre / gal/1000ft² (circle)

Course Length (ft)	
	Course Time (seconds)
Test #1	
Test #2	
Test #3	
Average $\frac{\text{Test \#1} + \text{Test \#2} + \text{Test \#3}}{3}$	

Spray Width (inches)

$\# \text{ of Nozzles} \times 20 = \text{Spray Width (in.)}$

Ground Speed (MPH)

$\frac{\text{Course Length (ft)} \times 60}{\text{Course Time Average (Seconds)} \times 88} = \text{Ground Speed (mph)}$

Nozzle Amount Collected in (fl/oz) During Average Test Course Time (secs)	Right Nozzle (fl/oz)	Center Right Nozzle (fl/oz)	Center Left Nozzle (fl/oz)	Left Nozzle (fl/oz)
Test #1				
Test #2				
Test #3				
Nozzle Average (fl/oz) $\frac{\text{Test \#1} + \text{Test \#2} + \text{Test \#3}}{3}$				
Boom Average (fl/oz) Average of All Nozzles Added Together # of Nozzles	Boom Average (fl/oz)	Nozzle 5% +/- Boom Average x 0.95 = Min Boom Average x 1.05 = Max	Nozzle Minimum (fl/oz)	Nozzle Maximum (fl/oz)

If any of the Nozzle Averages are not within the Nozzle Minimum and Maximum ranges, the nozzle will need to be cleaned or replaced.

Boom Total (fl/oz) All Nozzle Averages Added Together	Boom Total (fl/oz)
Boom Total Converted to Gallons $\frac{\text{Boom Total (fl/oz)}}{128}$	Boom Total (gal)
Boom Flow Rate (gal/min) $\frac{\text{Boom Total (gal)} \times 60}{\text{Average Course Time (secs)}}$	Boom Flow Rate (gal/min)

Application Rate (gal/acre)

$\frac{\text{Boom Flow Rate (gal/min)} \times 5940}{\text{Ground Speed (mph)} \times \text{Spray Width (in.)}} = \text{Application Rate (gal/acre)}$

Application Rate (gal/1000ft²)

$\frac{\text{Boom Flow Rate (gal/min)} \times 136}{\text{Ground Speed (mph)} \times \text{Spray Width (in.)}} = \text{Application Rate (gal/1000ft}^2\text{)}$

Section 5

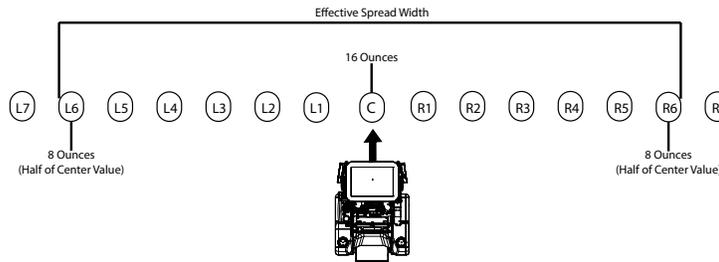
This sheet is to be used for the calibration of the Scag Turfstorm spreader system. Always make sure the machine to be used is in proper operating condition and that the user is trained in the proper operation of the machine. Always make sure to follow all safety information given in the owner's manual for this machine, as well as, any chemical safety information given by the manufacturer of the chemical being used. Failure to follow safety information involving the handling of chemicals and the operation of this machine can lead to property damage or personal injury. The spreader system should always be calibrated using a safe area that will not cause turf damage. For more information on the spreader calibration process, please refer to the owners manual.

Machine: _____
 Date: ____/____/____
 Calibrated By: _____
 Chemical Calibrated For: _____

Calibrated For Ground Speed Of: _____ MPH
 Calibrated For Spread Width Of: _____ ft
 Gate Setting Used: _____
 Application Rate: _____ lbs/1000ft²

Test Path Length (ft)	Test Path Time (seconds)
Test #1	
Test #2	
Test #3	
Average <small>$\frac{\text{Test \#1} + \text{Test \#2} + \text{Test \#3}}{3}$</small>	

Average Test Path Time _____ sec



If spreader width is not centered as depicted in the image above, use the accuway adjustment to center the spread area. For more information on how to calculate effective spread width, refer to section 6.8 in the operator's manual.

Effective Spread Width _____ ft

Desired Application Rate _____ lbs/1000ft²

$$\frac{\text{Desired Application Rate (lbs/1000 ft}^2\text{)} \times (\text{Effective Spread Width (ft)} \times \text{Course Length (ft)})}{1000 \text{ ft}^2} = \text{Amount During Testing (lbs)}$$

Weight To Be Added To Hopper For Calibration ____ lbs ____ oz During Average Test Path Time Of _____ sec

If the hopper empties as time expires, the spreader is calibrated correctly for the desired application rate.
 If the hopper does not empty during the test time, the gate setting needs to be adjusted to increase the flow.
 If the hopper empties before time expires, the gate setting needs to be adjusted to decrease the flow.

MAINTENANCE

6.1 MAINTENANCE CHART - RECOMMENDED SERVICE INTERVALS

BREAK-IN (FIRST 10)	HOURS						PROCEDURE	COMMENTS
	8	20	40	100	200	500		
X							Check all hardware for tightness	
X							Check hydraulic oil level	See paragraph 6.3
X							Check belt for proper alignment	See paragraph 6.5
	X						Clean and lubricate spreader system (after each use)	See paragraph 6.12
	X						Flush sprayer system (after each use)	See paragraph 6.11
	X						Clean the sprayer nozzles and nozzle screens	See paragraph 6.11
	X						Clean strainer	See paragraph 6.11
	X						Check Spreader Impeller	See paragraph 6.12
	X						Check hydraulic hoses for leaks	Use extreme caution when checking the hydraulic hoses. See paragraph 2.5
	X						Check engine oil level	See paragraph 7.4
	X						*Clean debris from the machine	
	X						Check tire pressure	See paragraph 6.9
	X						*Clean air filter element	See paragraph 6.6
	X						Check safety interlock system	See paragraph 4.3
		X					Change engine oil and filter	See paragraph 6.4
			X				Check spreader system	See paragraph 6.12
			X				Check strainer gasket	See paragraph 6.11
			X				Check spray system hoses	
			X				Check spray gun and spray gun tip	See paragraph 6.11
			X				Check belt for proper alignment	See paragraph 6.5
			X				Inspect pump drive belt. Replace every 400 hours or 2 years, whichever comes first.	See paragraph 5.4 & 6.8

HOURS							PROCEDURE	COMMENTS
BREAK-IN (FIRST 10)	8	20	40	100	200	500		
				X			Check belt for proper alignment	See paragraph 6.5
				X			Check condition of fuel lines	
				X			Drain hydraulic system and replace oil and filter	See paragraph 6.3
				X			*Clean engine air filter	See engine operator's manual
				X			Apply grease to fittings	See paragraph 6.2
				X			Check all hardware for tightness	
				X			Change engine oil	See paragraph 6.4
				X			*Clean air cleaner element	See paragraph 6.6
				X			Initial hydraulic system drain and replace oil and filter	See paragraph 6.3
					X		Check hydraulic oil level	See paragraph 6.3
					X		Change engine oil filter	See paragraph 6.4
						X	Replace engine fuel filter	See paragraph 6.5
						X	Drain hydraulic system and replace oil and filter	See paragraph 6.3
						X	Replace spray system pump diaphragm	See Pump Manufacturer

* Perform these maintenance procedures more frequently under extreme dusty or dirty conditions, as well as when using aggressive chemicals.

6.2 LUBRICATION

GREASE FITTING LUBRICATION CHART

LOCATION	LUBRICATION INTERVAL	LUBRICANT	NO. OF PLACES
1 - Caster Wheel Pivot	500 Hours / Yearly	Chassis Grease	2
2 - Caster Wheel Bearings	100 Hours / Monthly	Chassis Grease	2

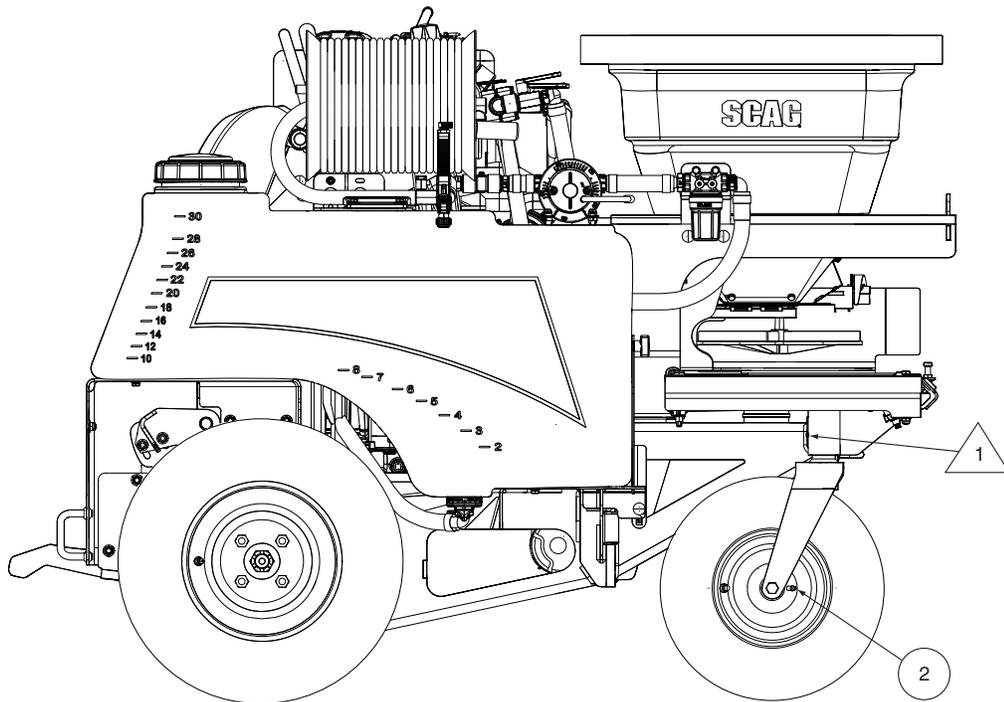
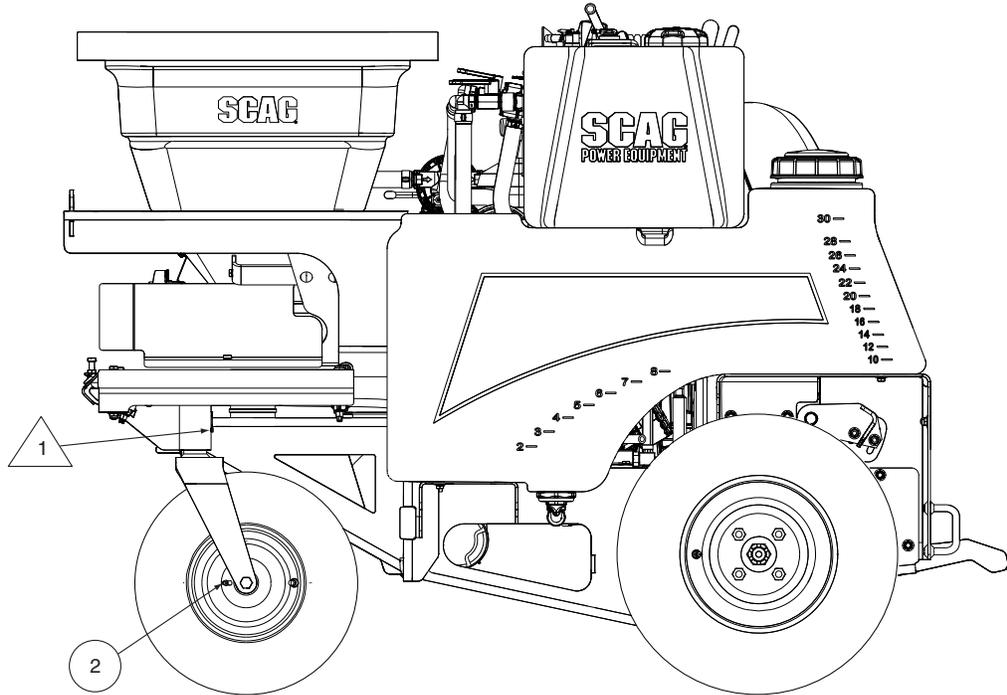
+ Compatible Greases: Scag Premium Chassis Grease p/n 486257

Figure 6-1. Lubrication Fitting Points

GREASE FITTING LUBRICATION
Lubricant Interval

○ Chassis Grease
(100 Hours/Bi-weekly)

△ Chassis Grease
(500 Hours/Yearly)



6.3 HYDRAULIC SYSTEM

A. CHECKING HYDRAULIC OIL LEVEL

The hydraulic oil level should be checked after the first 8 hours of operation. Thereafter, check the oil after every 200 hours of machine operation or monthly, whichever occurs first.

- IMPORTANT -

If the oil level is consistently low, check for leaks and correct immediately.

1. Wipe dirt and contaminants from around the reservoir cap. Remove the cap from the hydraulic oil reservoir. See Figure 6-2.
2. Visually check the level of hydraulic oil. Hydraulic oil should be at least 3" inches from top of the filler neck. If the level cannot be determined visually, use a clean tape measure to check the level. If the fluid is low, add 20W50 oil (Scag p/n 486255 - 1 Quart or p/n 486254 - 1 Gallon). DO NOT overfill; (overfilling the oil reservoir may cause oil seepage around the cap area).
3. Clean the fill cap and install it onto the reservoir.

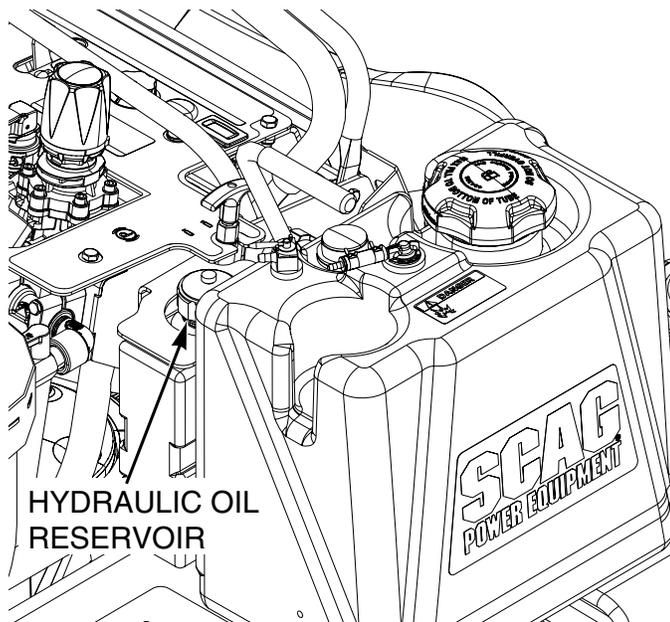


Figure 6-2. Hydraulic Oil Reservoir

B. CHANGING HYDRAULIC OIL

The hydraulic oil should be changed after the first 100 hours of machine operations and every 500 hours or annually, whichever occurs first thereafter. The oil should also be changed if the color of the fluid has become black or milky. A black color and/or a rancid odor usually indicates possible overheating of the oil, and a milky color usually indicates water in the hydraulic oil.

- IMPORTANT -

The hydraulic oil should be changed if you notice the presence of water or a rancid odor to the hydraulic oil.

1. Park the machine on a level surface, stop the engine and remove the ignition key.
2. Place a suitable container under the hydraulic oil filter. Remove the fill cap from the reservoir. Remove the drain plug. See Figure 6-3. Allow the fluid to drain into the container and properly discard it.
3. Re-install the drain and be sure it is tight.

- NOTE -

Before refilling the hydraulic oil reservoir the hydraulic oil filter should be changed as outlined in Procedure C "Changing Hydraulic Oil Filter Element".

4. Fill the reservoir to full 3" inches below the filler neck with 20W50 oil (Scag p/n 486255 - 1 Quart or p/n 486254 - 1 Gallon).
5. Replace the reservoir fill cap. Start the engine and drive forward and backward for two minutes. Check the oil level in the reservoir. If necessary, add oil to the reservoir.

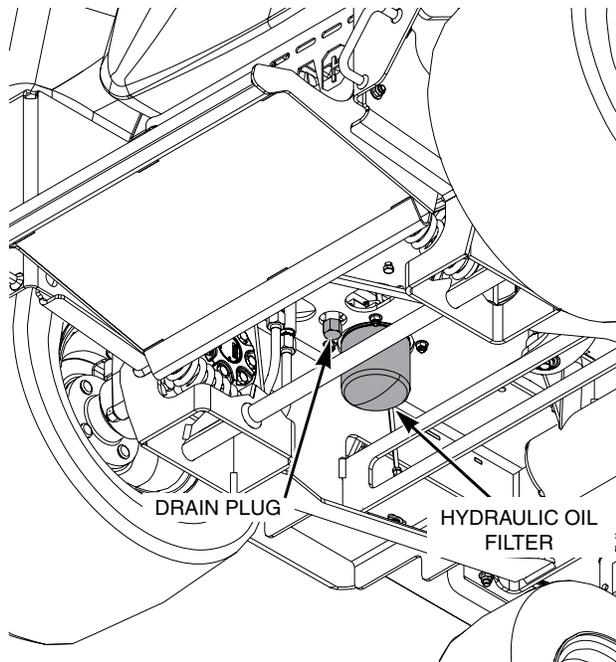


Figure 6-3. Hydraulic Oil Filter

C. CHANGING HYDRAULIC OIL FILTER ELEMENT

The hydraulic oil filter should be changed after the first 100 hours of machine operations and every 500 hours or annually, whichever occurs first thereafter..

1. Remove the oil filter element. See Figure 6-3. Properly discard the oil filter element. Fill the new filter with clean oil and install the filter. Hand tighten only.
2. Run the engine at idle speed with the speed control lever in neutral for five minutes.
3. Check the oil level in the hydraulic tank. Hydraulic oil must be at least 3" inches from top of the filler neck. If the level cannot be determined visually, use a clean tape measure to check the level. If the fluid is low, add 20W50 oil (Scag p/n 486255 - 1 Quart or p/n 486254 - 1 Gallon).

6.4 ENGINE OIL

A. CHECKING ENGINE CRANKCASE OIL LEVEL

The engine oil level should be checked after every 8 hours of operation or daily as instructed in the Engine Operator's Manual furnished with this machine.

B. CHANGING ENGINE CRANKCASE OIL

After the first 20 hours of operation, change the engine crankcase oil and replace the oil filter. Thereafter, change the engine crankcase oil after every 100 hours of operation or monthly, whichever occurs first. Refer to the Engine Operator's Manual furnished with this machine for instructions.

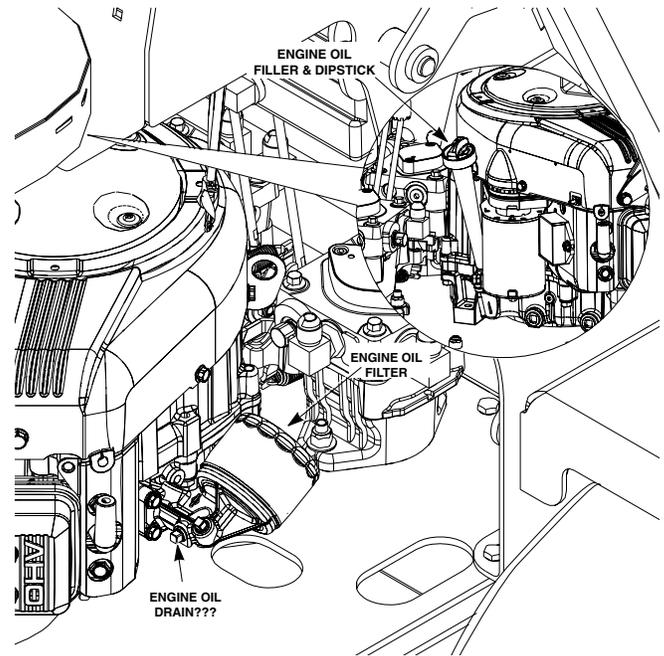


Figure 6-4. Drain Plug, Dipstick and Oil Filter Location (check)

C. CHANGING ENGINE OIL FILTER

After the first 20 hours of operation, replace the engine oil filter. Thereafter, replace the oil filter after every 200 hours of operation or every month, whichever occurs first. Refer to Engine Operator's Manual for instructions.

! DANGER

To avoid injury from burns, allow the machine to cool before changing the oil and removing the filter.

6.5 ENGINE FUEL SYSTEM

DANGER

To avoid injury from burns, allow the machine to cool before removing the fuel tank cap and refueling.

A. FILLING THE FUEL TANK

Fill the fuel tank to the bottom of the filler neck insert (approximately 6 gallons indicating Full (F) on the fuel gauge) at the beginning of each operating day. See Figure 6-5. Do not overfill. Use clean, fresh unleaded gasoline with a minimum octane rating of 87 and a maximum of 10% Ethanol.

DO NOT use E85 Fuel. Using E85 Fuel will cause severe damage to the engine.

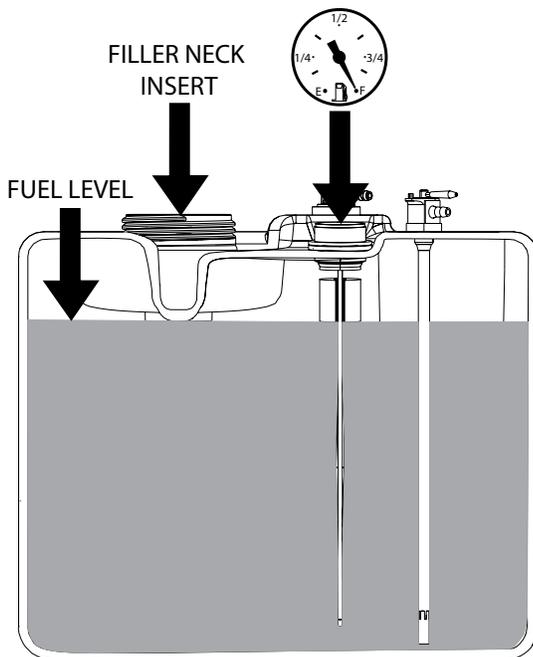


Figure 6-5. C.A.R.B. / EPA Phase 3 Fuel Level

To avoid personal injury or property damage, use extreme care in handling gasoline. Gasoline is extremely flammable and the vapors are explosive.

1. Extinguish all cigarettes, cigars, pipes and other sources of ignition.

2. Use only an approved gasoline container.
3. Never remove the gas cap or add fuel with the engine running. Allow the engine to completely cool before fueling.
4. Never fuel the machine indoors or in an enclosed trailer.
5. Never store the machine or fuel container where there is an open flame, spark or pilot light such as on a water heater or other appliances.
6. Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground away from your vehicle before filling.
7. Remove the machine from the truck or trailer and fuel on the ground. If this is not possible, then refuel the machine with a portable container, rather than from a gasoline dispenser nozzle.
8. Keep the nozzle in contact with the rim of fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock-open device.
9. If fuel is spilled on clothing, change clothing immediately and wash affected skin.
10. Replace gas cap and tighten the fuel cap until it ratchets.

B. REPLACING IN-LINE FUEL FILTER ELEMENTS

The engine fuel filter should be replaced after every 500 hours of operation or annually, whichever occurs first.

1. Close the shutoff valve. Locate the fuel filter and remove the two clamps securing the fuel filter to the fuel hose. Remove the fuel filter.
2. Install a new fuel filter. Be sure it is installed in the proper direction. Secure to the fuel hose using the two clamps.

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6.6 ENGINE AIR CLEANER

A. CLEANING AND/OR REPLACING AIR CLEANER ELEMENT

For any air cleaner, the operating environment dictates the air cleaner service periods. Inspect and clean the air cleaner element after every 100 hours of operation or monthly, whichever occurs first and replace the element if required. See Engine Owner's Manual for service information.

- NOTE -

In extremely dusty conditions it may be necessary to check the element once or twice daily to prevent engine damage.

1. Snap open the two clips securing the air cleaner cover to the air cleaner box. Remove the air cleaner cover, clean the duck bill vent of any dust or debris and set the cover aside.
2. Remove the air cleaner and inspect.
3. Clean or replace the air cleaner as recommended by the engine manufacturer. Replace the air cleaner cover and secure.
4. Replace the air filter cover and be sure to snap the two clips closed.

6.7 BATTERY - ELECTRIC START MODELS

WARNING

Lead-acid batteries produce flammable and explosive gases. To avoid personal injury when checking, testing or charging batteries, DO NOT use smoking materials near batteries. Keep arcs, sparks and flames away from batteries. Provide proper ventilation and wear safety glasses.

WARNING

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to cause cancer and reproductive harm. Wash hands after handling.

WARNING

Electric storage battery fluid contains sulfuric acid which is POISON and can cause SEVERE CHEMICAL BURNS. Avoid contact of fluid with eyes, skin, or clothing. Use proper protective gear when handling batteries. DO NOT tip any battery beyond 45° angle in any direction. If fluid contact does occur, follow first aid suggestions below.

BATTERY ELECTROLYTE FIRST AID

External Contact — Flush with water.

Eyes — Flush with water for at least 15 minutes and get medical attention immediately.

Internal — Drink large quantities of water. Follow with Milk Of Magnesia, beaten egg, or vegetable oil. Get medical attention immediately. In case of internal contact, DO NOT give fluids that would induce vomiting.

A. CHARGING THE BATTERY

Refer to the battery charger's manual for specific instructions.

Under normal conditions the engine's alternator will have no problem keeping a charge on the battery. If the battery has been completely discharged for a long period of time, the alternator may not be able to recharge the battery, and a battery charger will be required.

DO NOT charge a frozen battery. It may explode and cause injury. Let the battery warm before attaching a charger.

Whenever possible, remove the battery from the machine before charging.

WARNING

BATTERIES PRODUCE EXPLOSIVE GASES. Charge the battery in a well ventilated space so gases produced while charging can dissipate.

Charging rates between 3 and 50 amperes are satisfactory if excessive gassing or spewing of electrolyte does not occur or the battery does not feel excessively hot (over 125°F). If spewing or gassing occurs or the temperature exceeds 125°F, the charging rate must be reduced or temporarily stopped to permit cooling.

B. JUMP STARTING

1. The booster battery must be a 12 volt type. If a vehicle is used for jump starting, it must have a negative ground system.
2. When connecting the jumper cables, connect the positive cable to the positive battery post, then connect the negative cable to the negative battery post.

6.8 DRIVE BELTS

All drive belts are spring-loaded and self-tensioning, however after the first 2, 4, 8 and 10 hours of operation, the belts should be checked for proper alignment and wear. Thereafter, check the belts after every 40 hours of operation or weekly, whichever occurs first.

- NOTE -

If you experience frequent belt wear or breakage, see your authorized Scag service center for belt adjustment.

WARNING

If the pump drive belt fails, steering control will be lost which could result in serious injury or death. Replace the pump drive belt as needed or every 400 hours / 2 years, whichever occurs first.

6.9 TIRES

Check the tire pressures after every 8 hours of operation or daily.

Caster Wheels	20 PSI
Drive Wheels	12 PSI

6.10 BODY

CAUTION

Do not wash any portion of the equipment while it is hot. Do not wash the engine; use compressed air.

1. After each use, wash the machine. Use cold water and automotive cleaners. Do not use pressure cleaners.
2. Do not spray electrical components.
3. Repair damaged metal surfaces using Scag touch-up paint (P/N 48521 - Scag Gold - aerosol can, 484540-01 - 0.6fl.oz. Scag Gold - bottle with brush, or 486269 - Black Textured - aerosol can) available from your authorized Scag dealer. Wax the machine with an automotive paint wax for maximum paint protection.

6.11 SPRAYER MAINTENANCE

A. CLEANING THE SPRAYER

WARNING

Swallowing or inhaling chemicals could cause serious injury or death

Do not clean spray nozzles using your mouth or blowing through the nozzles

Replace all worn or damaged sprayer nozzles

Ensure the nozzles are installed correctly..

1. Park the machine in a designated cleaning area with a level surface.

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2. Do not store product in the system, it may cause build up in hoses and nozzles. It will also reduce sprayer performance and longevity.
 3. To increase sprayer performance and longevity, the spray system should be flushed daily. Refer to section 6.11B.
 4. Check hoses daily for cracks, wear, or leaks.
 5. Clogged filters, nozzles, or hoses may result in distorted spray rates.
 6. Clean and inspect all nozzles, nozzle screens, and nozzle gaskets daily to maintain proper spray performance.
 7. When nozzles are not in use, it is recommended that they be stored in a vinegar solution (1 cup vinegar per gallon of water) to reduce product build up.
 8. Clean and inspect the spray wand and spray wand nozzle weekly. Replace any damaged components.
 9. Clean the machine every day it is in use.
 10. If the machine will not be used for a period of time it is recommended that the nozzles be removed and placed in a vinegar water solution. This will help reduce build up and increase nozzle life expectancy.
 11. At the beginning of every season, or if the machine sits for a period of time, make sure to thoroughly rinse the system with clean water to clean out any dust or debris that may have built up.
3. Fill the tank with clean water, run the system. Make sure you cycle through the spray booms, spray wand (make sure to point the wand in a safe direction), and valves. Once the entire system has sprayed an adequate amount of clean water, shut the system down, drain the holding tanks again, and clean the strainer (refer to section 6.11C)
 4. The holding tanks should then be filled with a neutralizing agent for the chemical you were using (refer to the chemical manufacturer's instructions). Run the system, make sure you cycle through the spray booms, spray wand (make sure to point the wand in a safe direction), and valves. Once the entire system has sprayed an adequate amount of neutralizing solution, shut the system down, drain the holding tanks again, and clean the strainer
 5. Fill the tank with clean water, run the system. Make sure you cycle through the spray booms, spray wand (make sure to point the wand in a safe direction), and valves. Once the entire system has sprayed an adequate amount of clean water, shut the system down, drain the holding tanks again, and clean the strainer.
 6. The spray system should be stored dry, with the holding tank lids slightly ajar to allow for proper drying and to reduce potential mildew buildup.
 7. If the machine is to be stored in a climate that may reach freezing before the next use, the sprayer system will need to be winterized (if liquid is allowed to freeze in the system, serious damage can occur). Refer to section 6.11C.

B. FLUSHING THE SPRAY SYSTEM

The spray system should be flushed daily for maximum performance and longevity from the spray system.

When flushing the spray system use an area in compliance with local, state, and federal disposal guidelines.

To flush the system you will need to:

1. Empty the holding tanks (make sure you empty/neutralize any chemical mixture according to the chemical manufacturer's instructions).
2. Make sure to dispose of the rinsate according to the chemical manufacturer's instructions, as well as, local, state, and federal guidelines each time the system is flushed.

B. CLEANING THE STRAINER

-IMPORTANT-

If a wettable powder chemical was used, clean the strainer after each time the spray tank was rinsed.

1. Rotate the left and right spray tank supply and return valves to the closed position. See Figure 6-6.

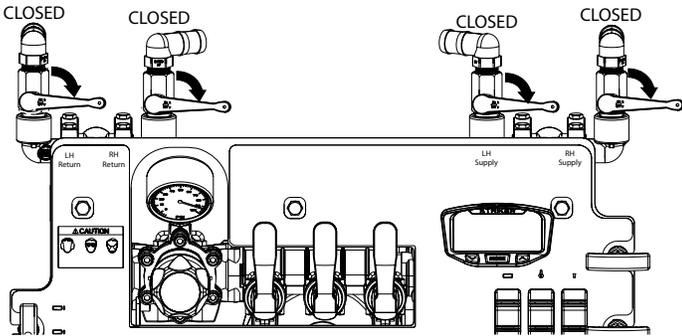


Figure 6-6. Close Supply and Return Valves

2. Place a catch pan under the strainer assembly.
3. Rotate the strainer bowl counterclockwise to remove the bowl, screen and gasket from the strainer body. See Figure 6-7.

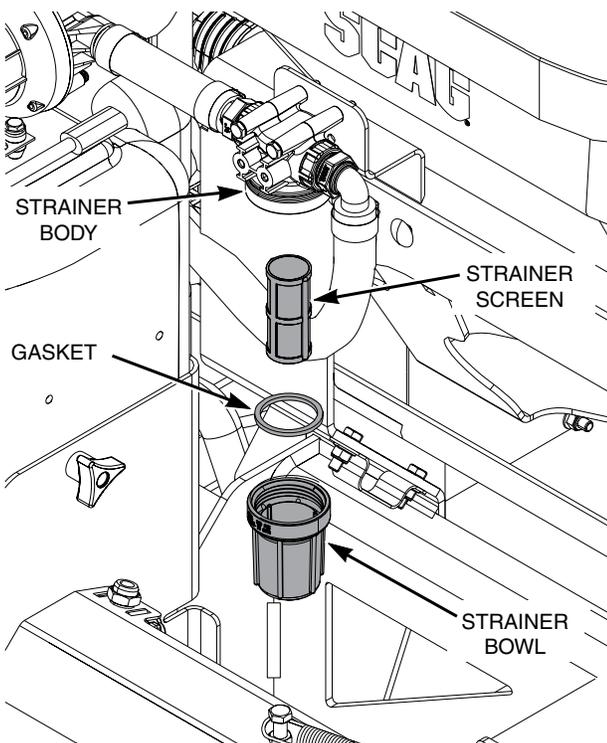


Figure 6-7. Removing the Strainer

4. Allow the chemical solution to drain from the strainer body.
5. Use a soft bristle brush and clean water to clean the screen, bowl and gasket.
6. After cleaning, install the strainer screen into the strainer body.
7. Install the gasket and strainer bowl onto the strainer. Rotate clockwise to tighten by hand.

C. CLEANING THE SPRAYER NOZZLES

1. Rotate the nozzle cap 90 degrees counterclockwise to remove from the nozzle body. See Figure 6-8.

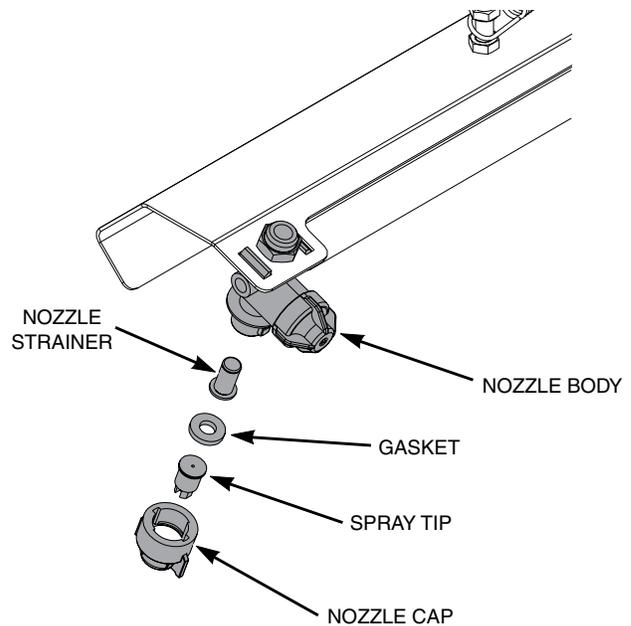


Figure 6-8. Removing the Nozzle

2. Remove the spray tip, gasket and nozzle strainer from the nozzle body.
3. Use a soft bristle brush and fresh water to clean the spray tip, gasket and nozzle strainer.
4. Install the nozzle strainer and gasket into the nozzle body.
5. Install the spray tip into nozzle cap.
6. Install the spray tip and nozzle cap into the nozzle body. Rotate 90 degrees clockwise to secure.

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C. WINTERIZING THE SPRAY SYSTEM

To winterize the machine, flush the system with clean water multiple times (make sure to spray through each nozzle, the spray gun, and to cycle all valves). Refer to section 6.11B for proper flushing procedure.

Fill the machine with an antifreeze or RV antifreeze and run it through the system long enough to fill the entire system (cycle through the spray booms, spray gun, and valves to make sure the whole system is filled). **MAKE SURE** to clean any antifreeze as soon as possible or spray into a catch container (antifreeze is poisonous to plants, animals, and people).

Antifreeze will need to be drained and the system will need to be flushed thoroughly before it can be used again the next season. (Dispose of antifreeze in a responsible way, refer to the antifreeze manufacturer's disposal instructions).

C. FLUSHING THE FOAMER SYSTEM (OPTIONAL ACCESSORY)

The foamer system should be flushed daily for maximum performance and longevity from the spray system.

When flushing the foamer system use an area in compliance with local, state, and federal disposal guidelines.

To flush the system you will need to:

1. Empty the holding tank (make sure you empty/neutralize any chemical mixture used according to the chemical manufacturer's instructions).
2. Fill the tank with clean water, run the system. Make sure you cycle through both foamer heads (make sure to dispose of the rinse according to the chemical manufacturer's instructions, as well as, local, state, and federal guidelines). Repeat this step using clean water until the foamer system is thoroughly flushed.
3. The foamer system should be stored dry, with the holding tank lid slightly ajar to allow for proper drying and to reduce potential mildew buildup.
4. If the machine is to be stored in a climate that may reach freezing before the next use, the sprayer system will need to be winterized (if liquid is allowed to freeze in the system, serious damage can occur). Refer to section 6.11D.

D. WINTERIZING THE FOAMER SYSTEM (OPTIONAL ACCESSORY)

To winterize the machine, flush the system with clean water multiple times (make sure to cycle through each both foamer heads). Refer to section 6.11C for proper flushing procedure.

Fill the machine with an antifreeze or RV antifreeze and run it through the system long enough to fill the entire system (cycle through both foamer heads to make sure the whole system is filled). **MAKE SURE** to clean any antifreeze as soon as possible or spray into a catch container (antifreeze is poisonous to plants, animals, and people).

Antifreeze will need to be drained and the system will need to be flushed thoroughly before it can be used again the next season. (Dispose of antifreeze in a responsible way, refer to the antifreeze manufacturer's disposal instructions).

6.12 SPREADER MAINTENANCE

1. Do not store product in the system, it may cause build up in the hopper and components. It will also reduce spreader performance and longevity.
2. To increase sprayer performance and longevity, the spreader system should be cleaned daily. Refer to section 6.12A.
3. Check hopper and impeller daily for cracks, wear, or build up of granular material.
4. Clogged hopper gate, granular build up or impeller wear may result in distorted spread rates.
5. Clean the machine every day it is in use.

A. CLEANING THE SPREADER

-IMPORTANT-

Do not use brackish or reclaimed water to clean the machine.

1. Park the machine in a designated cleaning area with a level surface.
2. If installed, remove the cover and empty the hopper of all remaining granular material.
3. Rotate the granular drop rate cam to allow the hopper gate to open to the maximum position. See Figure 6-9
4. Open the hopper gate.

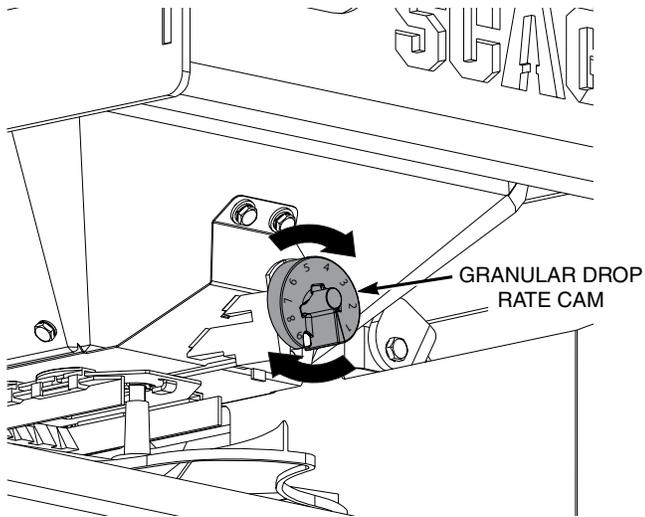


Figure 6-9. Granular Drop Rate Cam

5. Lift and remove the hopper screen from the bottom of the hopper. See Figure 6-10.

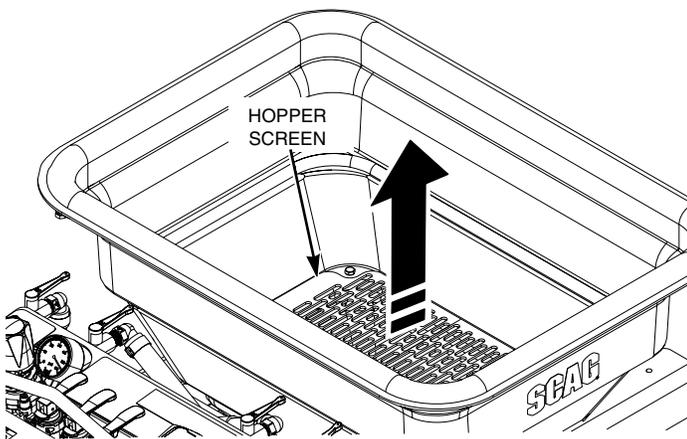


Figure 6-10. Hopper Screen

6. Remove any granular material from the bottom of the hopper.
7. Use clean water to spray the inside and outside of the hopper and components.

-NOTE-

Do not use a pressure washer to clean the machine. The high pressure water can force residual-corrosive materials into the sprayer / spreader components.

8. Do not spray water directly on the hopper motor.
9. Clean the hopper and remove build up daily..
10. Check the agitator pin daily, if agitator pin is missing or damaged material may clump.

11. Inspect the spreader impeller for wear, damage, or material build up. If needed, replace the impeller.
12. Check hopper bushing for leakage every 20 hrs. Replace if necessary.

B. LUBRICATING THE SPREADER

1. Use a water displacing lubricant to the control cables and pivot points.

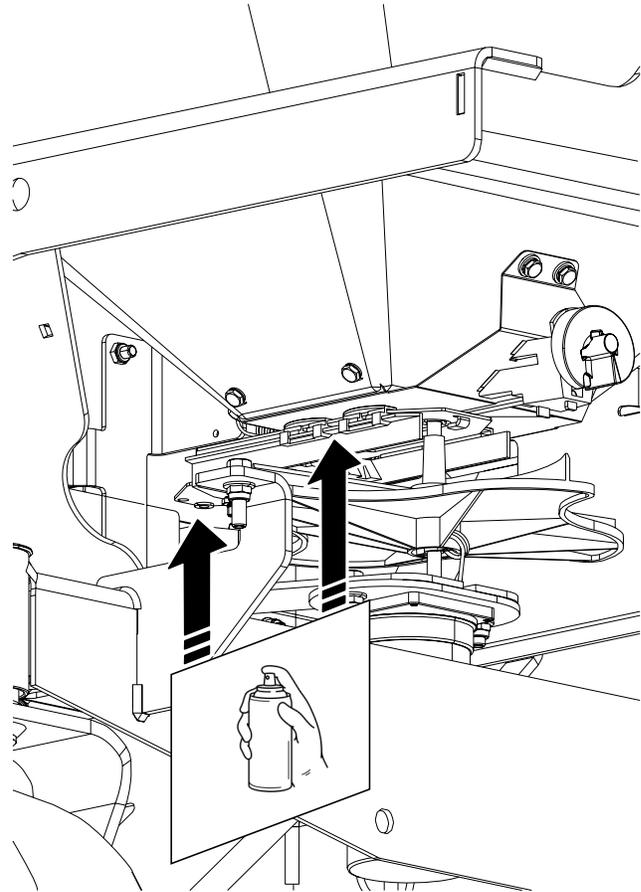


Figure 6-11. Apply Lubricant

2. Allow the hopper to completely dry before using.
3. Inspect the hopper control cables after lubricating to ensure proper function.

ILLUSTRATED PARTS LIST

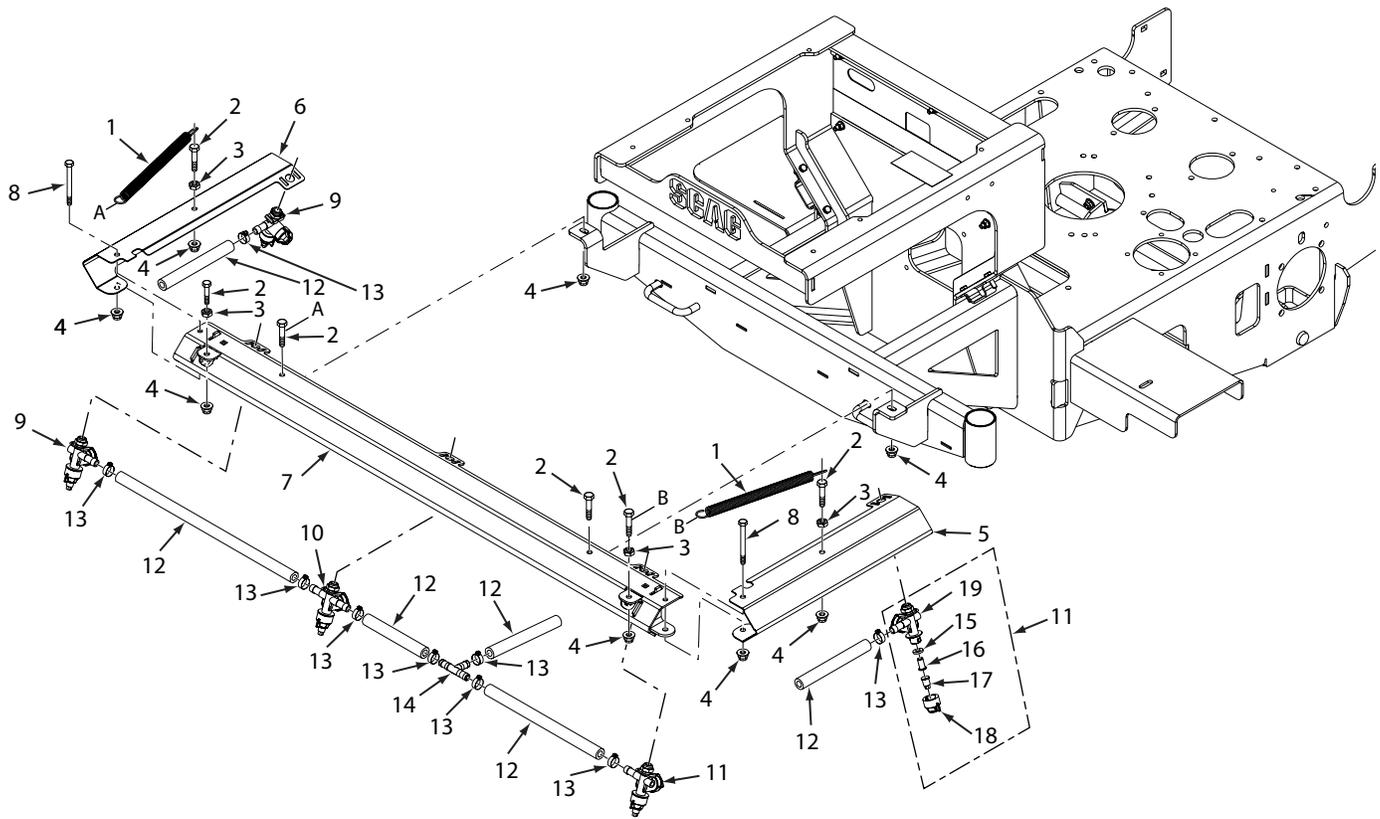
7.1 SCAG APPROVED ATTACHMENTS AND ACCESSORIES.

Attachments and accessories manufactured by companies other than Scag Power Equipment are not approved for use on this machine.

Scag approved attachments and accessories:

- STS Foamer Kit (p/n 9612)
- STS LED Light Kit (p/n 9613)
- STS 7 GPM Pump (9614)

SPRAYER BOOM ASSEMBLY



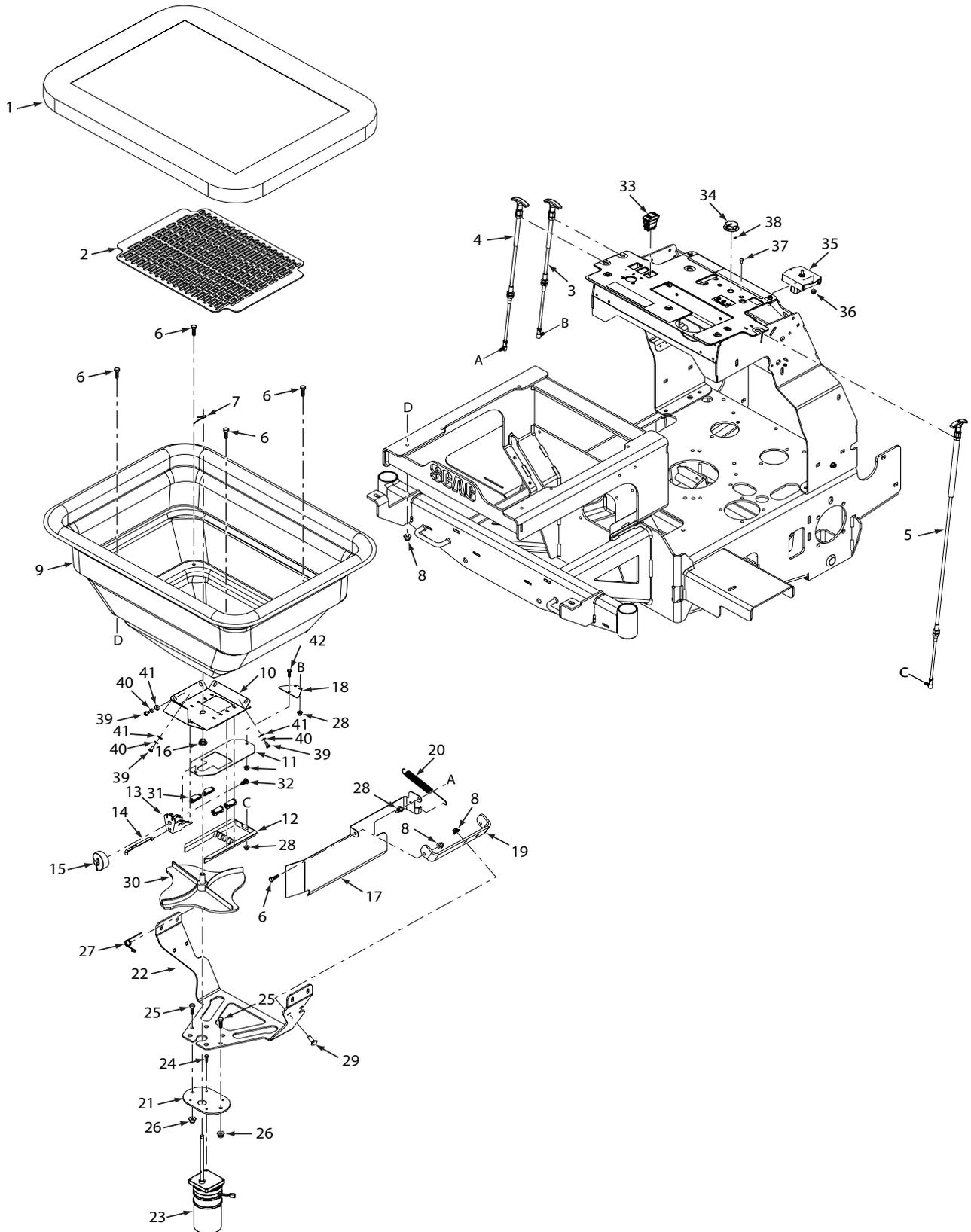
SPRAYER BOOM ASSEMBLY

Ref. No.	Part No.	Description
1	486150	Spring, Boom Arm
2	04201-30	Bolt, Hex Head 3/8 - 16 x 1.50 - Stainless Steel
3	04220-04	Nut, 3/8 - 16 - Stainless Steel
4	04317-03	Nut, Flange Elastic Stop 3/8 - 16 - Stainless Steel
5	428373	Boom, LH
6	428374	Boom, RH
7	453239	Boom, Main
8	04201-57	Bolt, Hex Head 3/8- 16 x 3.50 - Stainless Steel
9	463152	Nozzle Assembly, RH (incl. #15, #16, #17, #18, #19)
10	486699	Nozzle Assembly, Main (incl. #15, #16, #17, #18, #19)
11	463151	Nozzle Assembly, LH (incl. #15, #16, #17, #18, #19)
12	486190	Hose, 1/2" EPDM (order by the inch)
13	48136-05	Clamp, Hose
14	486082-03	Fitting, Tee 1/2" Hose Barb
15	486099	Washer, Rubber
16	486557	Nozzle, Strainer #50 Mesh
17	486100-01	Nozzle Tip
18	486098	Nozzle Cap
19	486096	Nozzle Body, Single LH (used in #11)
	486097	Nozzle Body, Single RH (used in #9)
	486700	Nozzle Body, Double Main (used in #10)

SPRAYER SYSTEM

Ref. No.	Part No.	Description
1	486606	Hose Reel Assy
2	486549	Valve, Ball 1/2" NPT
3	486084-03	Fitting, 90 Deg. 1/2 - 14 NPT X 3/4" Hose
4	48136-04	Hose Clamp
5	486191	Hose, 3/4" EPDM (Order by the inch)
6	486552	Fitting, 3/4" O-ring
7	486090	Pump, 12V Electric
8	486083-07	Hose Barb, 1/2" NPT X 3/4" Hose
9	486185	Strainer Head
10	486187	Gasket
11	486186	Screen
12	486188	Bowl
13	486084-05	Fitting, 90 Deg. 3/4 - 14 NPT x 3/4" Hose
14	486081-03	Tee Fitting, 1/2 NPT
15	486083-09	Hose Barb, 3/4 NPT x 3/4" Hose
16	486112	Cap, Sprayer
17	463276	Tank Assy, RH
18	486453	Drain Plug, 3/4"
19	486088-02	Fitting, 3/4" NPT
20	463275	Tank Assy, LH
21	486556-01	Fitting, Street Elbow 90 Deg. 1/2"
22	486155	Fitting, Valve
23	486412	Pressure Gauge
24	463267	Valve Assy (Incl.
25	486395	Mounting Bracket, Valve Assy
26	04201-13	Bolt, 1/4 - 20 x 2.75 - Stainless Steel
27	04317-01	Locknut, 1/4 - 20 Flg. Elastic Stop - Stainless Steel
28	486190	Hose, 1/2" EPDM (Order by the inch)
29	486411	Fitting, 45 Degree 1/4 NPT
30	486905	Fitting, Valve
31	48136-13	Hose Clamp
32	486860	Sprayer Gun

220# HOPPER ASSEMBLY

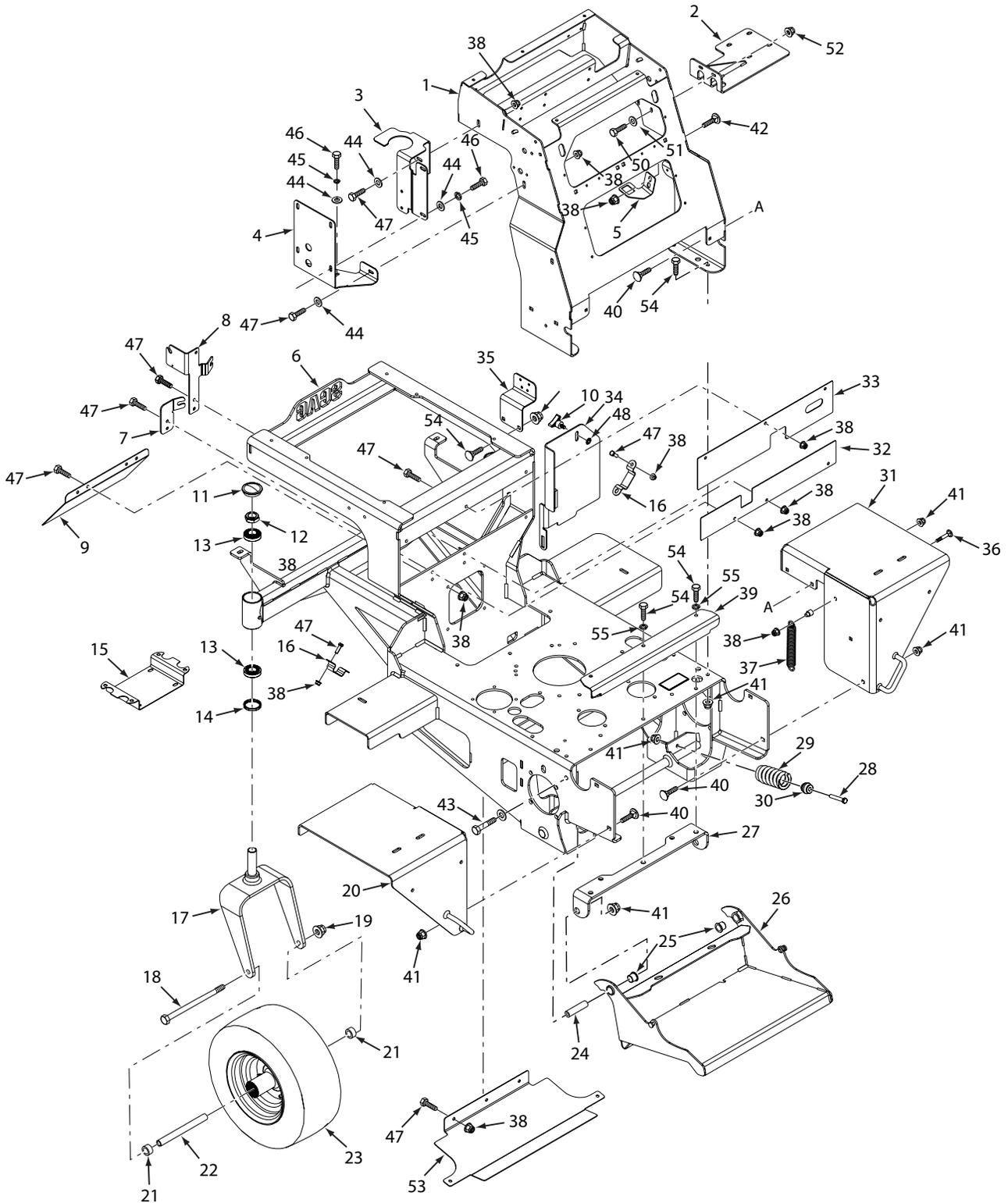


220# HOPPER ASSEMBLY

Ref. No.	Part No.	Description
1	486381	Cover, 220lb Hopper
2	427766	Grate, Spreader
3	486390	Cable, Hopper Gate
4	486439	Cable, Side Deflector
5	486544	Cable, Pattern Adjust
6	04201-17	Bolt, Hex 5/16" - .375 x 1.00- Stainless Steel
7	486375	Agitator
8	04317-02	Locknut, 5/16-18 Flg. Elastic Stop - Stainless Steel
9	463144	Hopper Assembly
10	486367	Mounting Plate, Spreader System
11	486368	Gate, Rear
12	486369	Diffuser
13	486370	Mount, Dial
14	486372	Linkage, Rate Gate
15	486373	Milled Dial
16	486374	Bearing, Hopper Bottom
17	427706	Guard Door, LH Hopper
18	428120	Door Arm
19	428368	Mounting Bracket, Deflector Door
20	486541	Spring, Door Assist
21	428367	Mounting Plate, Electric Motor
22	428040	Motor Mount Bracket
23	486440	Gear Motor, Electric
24	04201-01	Bolt, Hex #10-32 x .50 - Stainless Steel
25	04201-28	Bolt, Hex 3/8 - 16 x 1.00 - Stainless Steel
26	04317-03	Locknut, 3/8 - 16 Flg. Elastic Stop
27	486825	Spring, SS Clip
28	04221-09	Nut, 1/4-28 Elastic Stop - Stainless Steel
29	04203-17	Bolt, Carriage 5/16 - 18 x 1" - - Stainless Steel
30	486351	Impeller
31	486371	Guide, Rate Gate

Ref. No.	Part No.	Description
32	486377	Clip, Pine Tree
33	486389	Switch, Rocker
34	486833	Knob (Incl #38)
35	486455	Motor Controller
36	04221-01	Locknut, #10 - 32 Elastic Stop - Stainless Steel
37	04203-01	Bolt, Carriage #10 - 32 x .50 - Stainless Steel
38	04012-16	Set Screw, #8 - 32 x .375
39	04201-04	Bolt, Hex Head 1/4 - 20 x .50 - Stainless Steel
40	04230-02	Washer, Lock 1/4 Spring - Stainless Steel
41	04241-03	Washer, Flat 1/4-.281X.625X.080 - Stainless Steel
42	04201-02	Bolt, Hex Head #10 - 32 x 3/4" - Stainless Steel

SHEET METAL COMPONENTS



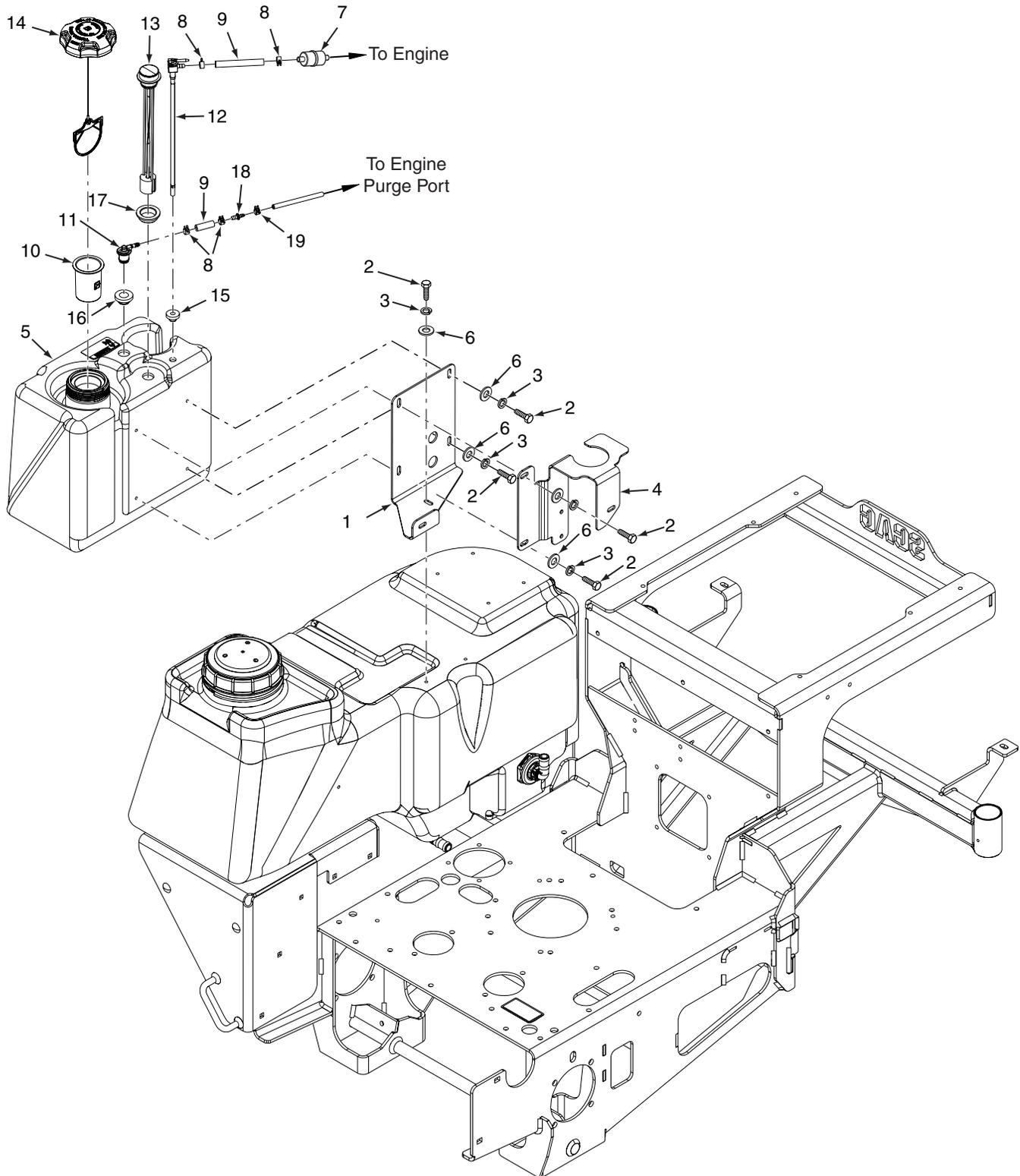
SHEET METAL COMPONENTS

Ref. No.	Part No.	Description
1	453243	Handlebar Weldment
2	453115	Mounting Bracket, Hose Reel
3	428473	Mounting Bracket, Oil Reservoir
4	428290	Mounting Bracket, Fuel Tank
5	427908	Mounting Bracket, Brake Switch
6	463564	Mainframe Weldment, STS *(Includes #11, 12, 13, 17)
7	428119	Mounting Bracket, Door Cable
8	428107	Mounting Bracket, Cable
9	428586	Cover, Vent
10	486824	Knob, w/ Stud, 5/16 - 18
11	486340	Cap, Grease
	*487582	Cap, Grease
12	04021-20	Locknut, 1.0-14 Elastic Stop
	*04021-30	Locknut 1.25-12
13	48668	Bearing w/ Race
	*487546	Bearing w/ Race
14	481025	Seal
15	428211	Mounting Bracket, Foamer Accessory (optional)
16	428089	Bracket, Hose
17	453241	Caster Yoke Weldment
	*453408	Caster Yoke Weldment
18	04001-167	Bolt, Hex 1/2-13 x 9.50
19	04117-04	Locknut, 1/2 - 13 Flange
20	453237	Fender, LH
21	43584	Spacer, Caster Wheel
22	43583	Sleeve, Caster Wheel
23	486109	Caster Wheel Assembly, 16 x 6.50 - 8
	486416	Tire, 16 x 6.5-8 4 Ply
	486715	Rim Assy. w/Valve
24	431132	Spacer
25	483453-04	Bearing, Plastic
26	463354	Footplate Assembly (Incl. #25)
27	453036	Footplate Weldment
28	04201-33	Bolt, Hex Head 3/8-16 x 2-1/4" - Stainless Steel
29	486876	Spring, Footplate
30	43867	Spring Mount
31	453238	Fender, RH
32	428198	Guard, Rear Hopper Lower
33	428032	Guard, Rear Hopper Uppler
34	427761	Battery Door
35	428619	Mounting Bracket, Strainer
36	04203-20	Bolt, Carriage 5/16-18 x 1.75 - Stainless Steel
37	48755	Spring
38	04317-02	Locknut, 5/16 - 18 Flg. Elastic Stop
39	428588	Mounting Bracket, Operator Presence
40	04203-28	Bolt, Carriage 3/8-16 x 1.0 - Stainless Steel
41	04317-03	Locknut, 3/8 - 16 Flg. Elastic Stop - Stainless Steel
42	04203-17	Bolt, Carriage 5/16 -18 x 1.00 - Stainless Steel
43	04201-58	Bolt, Hex 3/8 - 16 x 4.00 - Stainless Steel
44	04241-02	Washer, Flat 5/16 -.375 x .875 x .0547/.104 - Stainless Steel
45	04230-03	Washer, Lock 5/16 Spring - Stainless Steel
46	04201-16	Bolt, Hex 5/16 - 18 x .75 - Stainless Steel
47	04201-17	Bolt, Hex 5/16 - 18 x 1.00 - Stainless Steel
48	04224-02	Nut, Push On - Stainless Steel
49	428617	Spring Bracke, Footplate
50	04201-06	Bolt, Hex 1/4 - 20 x 1.00
51	04317-01	Locknut, 1/4 - 20 Flg. - Stainless Steel
52	04241-03	Flat Washer 1/4-.281X.625X.080 - Stainless Steel
53	428548	Muffler Heat Shield
54	04201-30	Bolt, Hex Head 3/8-16 x 1-1/2" - Stainless Steel
55	04230-04	Lockwasher, 3/8-.377 x .680 x 094

STEERING CONTROLS

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	427189	Reference Bar	26	463021	Brake Lever Assembly (Incl. #25)
2	486476	Operator Pad	27	04201-16	Bolt, Hex 5/16 - 18 x .75 - Stainless Steel
3	463155	Operator Pad Assy., w/Decal	28	04230-03	Washer, Lock 5/16 Spring - Stainless Steel
4	463015	Handlebar Assembly, LH	29	04240-02	Washer, Flat 5/16 - .349 x .750 x .050 - Stainless Steel
5	463016	Handlebar Assembly, RH	30	04203-17	Bolt, Carriage 5/16 - 18 x 1" - Stainless Steel
6	481885-07	Knob, 5/16 - 18	31	427908	Mounting Bracket, Brake Switch
7	04201-17	Bolt, Hex 5/16 - 18 x 1.00	32	483473	Switch, Double Pole Plunger
8	04317-02	Locknut, 5/16 - 18 Flg. Elastic Stop	33	04203-28	Bolt, Carriage 3/8 - 16 x 1" - Stainless Steel
9	485842	Linkage Assy, Steering	34	48100-30	Bushing
10	483453-14	Bearing	35	04208-01	Cap Screw, 3/8 - 16 x 1.25 Hex Socket - Stainless Steel
11	452957	Shaft Weldment, Control Arm	36	04201-07	Bolt, Hex 1/4 - 20 x 1.25 - Stainless Steel
12	04220-04	Nut, 3/8-16 - Stainless Steel	37	04317-01	Locknut, 1/4 - 20 Flg. Elastic Stop - Stainless Steel
13	04201-30	Bolt, Hex 3/8 - 16 x 1.50 - Stainless Steel	38	04241-06	Washer, Flat 5/16 - .349 x .750 x .050 - Stainless Steel
14	04108-02	Cap Screw, 5/16 - 18 x 1.00	39	04224-02	Nut, Push On - Stainless Steel
15	04201-31	Bolt, Hex 3/8 - 16 x 1.75 - Stainless Steel	40	04063-12	Key, Woodruff 3/16 x 5/8
16	04203-29	Bolt, Carriage 3/8 - 16 x 1.25 - Stainless Steel	41	04212-01	Set Screw, 1/4 - 20 x .25 - Stainless Steel
17	04317-03	Locknut, 3/8 - 16 Flg. Elastic Stop - Stainless Steel	42	481885-06	Knob w/ Stud, 5/16 - 18
18	453047	Bellcrank Weldment, Brake	43	452960	Weldment, Reference Bar
19	452841	Brake Paddle, LH			
20	452842	Brake Paddle, RH			
21	04241-07	Washer, Flat 5/8 - .687 x 1.00 x .078 - Stainless Steel			
22	428529	Link, Brake Engage			
23	452967	Lock Weldment, Neutral			
24	483504	Bearing			
25	48342	Grip, Parking Brake			

FUEL SYSTEM



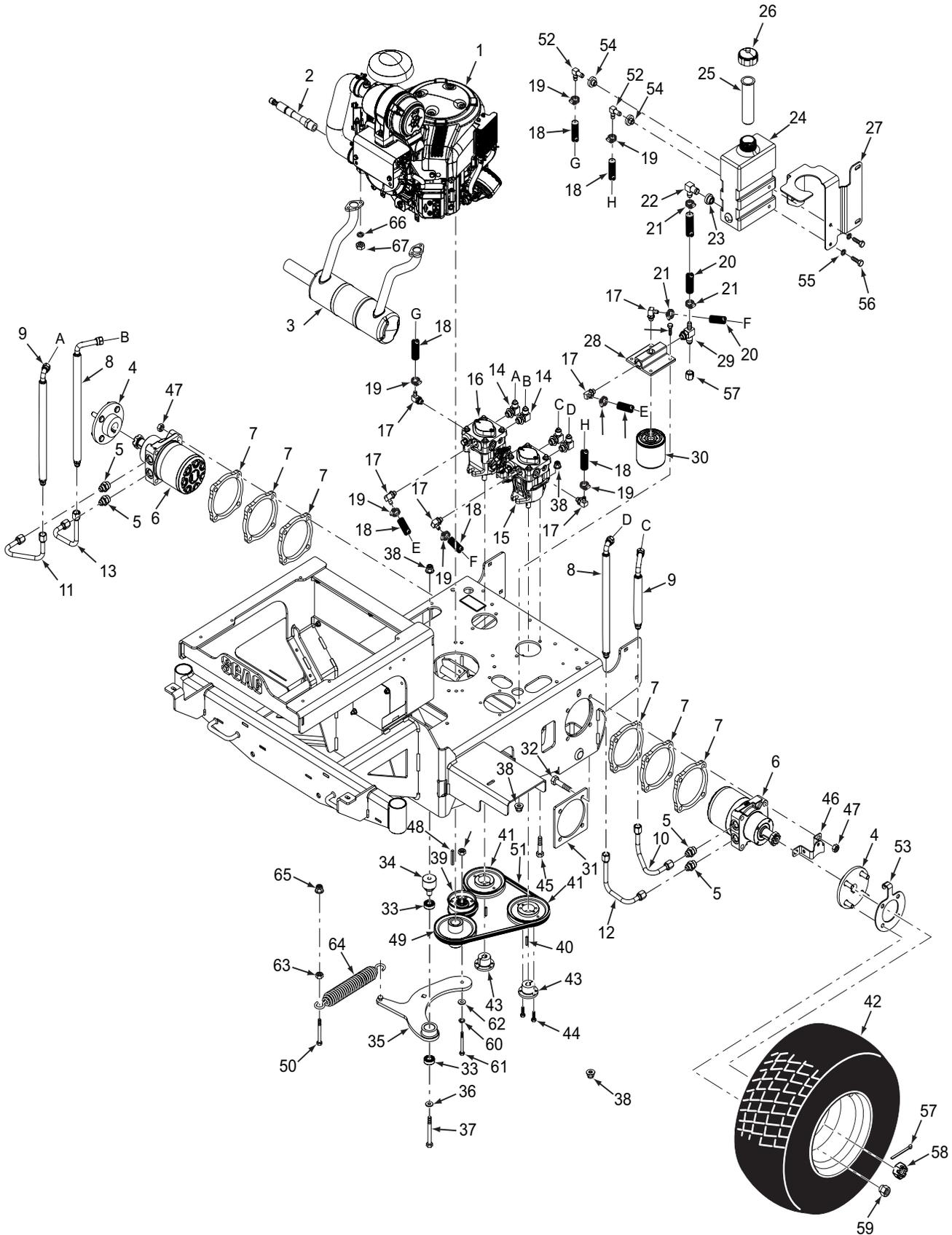
FUEL SYSTEM

Ref. No.	Part No.	Description
1	428290	Mounting Bracket, Fuel Tank
2	04201-16	Bolt, Hex Head 5/16 -16 x 3/4" - Stainless Steel
3	04030-03	Washer, Lock 5/16" - Stainless Steel
4	428473	Mounting Bracket, Oil Reservoir
5	463282	Fuel Tank Assy, (Incl. # 11,12,13,15,16)
6	04241-02	Washer, Flat 5/16" x .375 x .875 x .084 - Stainless Steel
7	*	Fuel Filter
8	48059-01	Clamp, Fuel Hose
9	484347	Hose, Vapor Recovery 1/4" (order by inch)
10	484279-03	Tube, Fuel Tank Insert
11	484333	Remote Vent w/ No Valve
12	486181	Valve, Fuel Shutoff w/ Pickup Line
13	484243	Fuel Gauge Assembly 11" (INCL. 17)
14	484286	Fuel Cap, Tethered

Ref. No.	Part No.	Description
15	482571	Bushing, 0.56 Viton
16	484285	Grommet, Kelch
17	484242	Seal, Fuel Gauge
18	484343-01	Mender, 1x4 x 3/16 w/.02 Hole
19	48059-05	Clamp, Fuel Hose 3/16" ID

* Order through Engine Manufacturer

HYDRAULICS AND ENGINE COMPONENTS

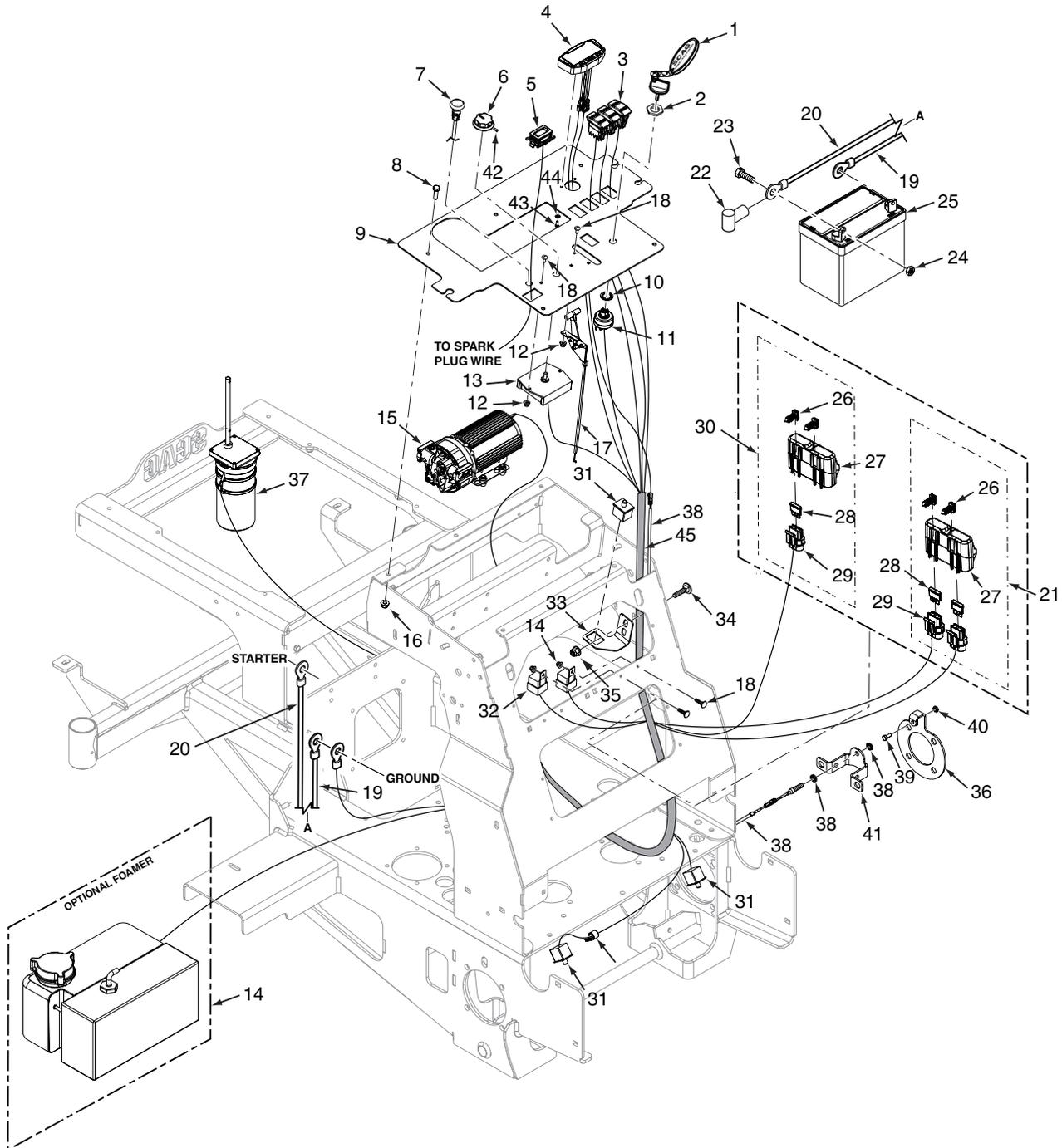


HYDRAULICS AND ENGINE COMPONENTS

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	487311	Engine, 23 HP Briggs Vanguard	47	04021-19	Locknut, 1/2" - 13 Center Lock
2	484610	Drain Hose Assy	48	04063-08	Key, 1/4" x 1/4" x 2.00
3	486470	Muffler, 21 HP BV	49	486567	Pulley 5.45 OD x 1.125 Bore
4	462999	Wheel Hub Assy.	50	04201-33	Bolt, Hex 3/8" - 16 x 2.25. - Stainless Steel
5	48572-02	Tube, Union 1/2 x 5/8	51	486111	Belt, Pump Drive
6	482639	Wheel Motor	52	482572	Fitting 90 Deg. - .38 Hose
7	428334	Spacer, Wheel Motor	53	428105	Plate, Hub Magnet Holder
8	486483	Hose Assy, 17.50"	54	482571	Bushing, .56 Viton
9	486484	Hose Assy, 16.25	55	04201-16	Bolt, Hex 5/16" - 18 x .75 - Stainless Steel
10	486654	Tube Assy, 1/2" LH Upper	56	04230-03	Lock Washer, 5/16" Spring - Stainless Steel
11	486655	Tube Assy, 1/2" RH Upper	57	04061-06	Cotter Pin, 9/64 x 1.50
12	486656	Tube Assy, 1/2" LH Lower	58	48680	Nut, Castle
13	486657	Tube Assy, 1/2" RH Lower	59	04028-02	Nut, Wheel
14	48350-02	Elbow, 90 Deg. - 1/2"	60	04230-05	Lockwasher, 7/16-.440 x .776 x .109
15	486444	Pump, LH	61	04102-13	Bolt, Hex Head 7/16-20 x 1.25"
16	486445	Pump, RH	62	04041-28	Flatwasher, 7/16-.469 x 1.750 x 1/4"
17	482266-01	Elbow, 9/16 O'ring - 3/8" Hose	63	04220-04	Nut, Hex Head 3/8-16
18	48811	3/8" Pushlock Hose (Order by inch)	64	484754	Spring
19	48136-13	Hose Clamp	65	04317-03	Nut, Elastic Flange 3/8-16
20	48351	1/2" Pushlock Hose (Order by inch)	66	*	Lockwasher
21	48136-05	Hose Clamp	67	*	Nut
22	482574	Fitting, 90 Deg. - 1/2" Hose			
23	482573	Bushing, .78 Viton			
24	463046	Hyd. Tank Assy (Incl.#			
25	481507	Insert, Filler Neck			
26	481164	Cap, Hydraulic Tank			
27	428473	Mounting Bracket, Hyd. Tank			
28	482417	Filter Head Assembly			
29	482477	Tee Fitting, 3/4" O'ring x 1/2" JIC			
30	48462-01	Oil Filter			
31	423279	Wheel Motor Backing Plate			
32	04001-194	Bolt, Hex 1/2" - 13 x 4.25"			
33	48224	Bearing			
34	43683	Idler Pivot			
35	463355	Idler Arm Assembly (incl. #33)			
36	04043-04	Washer, Flat 3/8 - .91 x .938 x 105 HD			
37	04201-57	Bolt, Hex SS, 3/8" - 16 x 3.50"			
38	04317-03	Locknut, 3/8" - 16 Flg. Elastic Stop			
39	486045	Pulley, 3.50" Idler			
40	04063-14	Key, 5.0 x 5.0 x 25MM			
41	482649	Pulley, 5.45" OD Taper Bore			
42	486399	Wheel Assembly, 20 x 12 - 10			
43	482085	Tapered Hub			
44	04001-172	Bolt, Hex 1/4" - 20 x 1.0" Gr. 8			
45	04201-30	Bolt, Hex 3/8" - 16 x 1.50" - Stainless Steel			
46	427828	Plate, Speed Sensor			

* Order through Engine Manufacturer

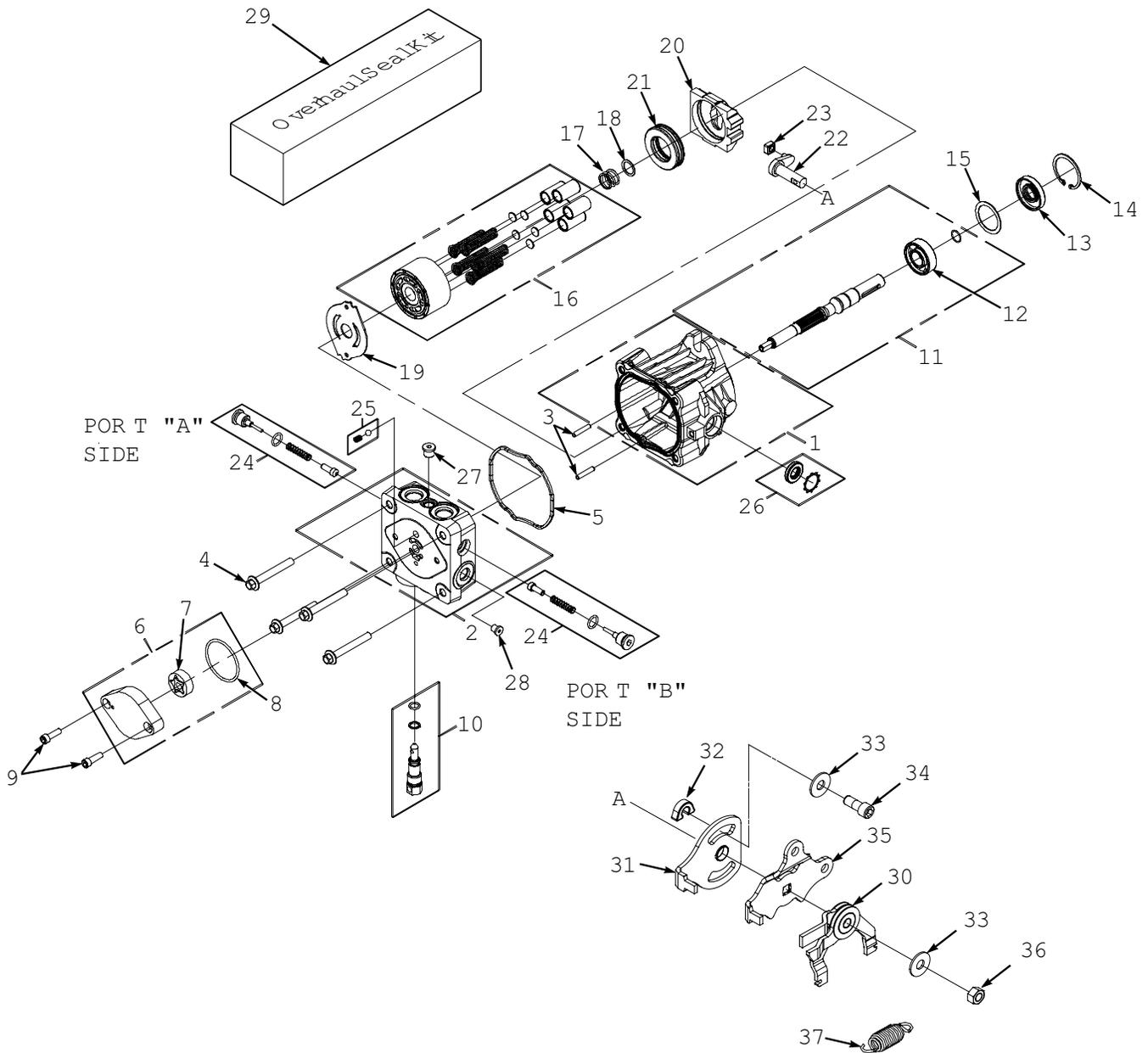
ELECTRICAL SYSTEM



ELECTRICAL SYSTEM

Ref. No.	Part No.	Description
1	462069	Key Assembly w/ FOB
2	48017-04	Nut, Special 5/8"-32
3	487039	Switch, Rocker - Lighted
4	486621	Display, Trail Tech
5	484565	Hourmeter
6	486833	Dial
7	483976	Choke Control
8	04201-17	Bolt, Hex 5/16"-18 x 1" - Stainless Steel
9	463337	Instrument Panel w/ Decal
10	48017-03	Lockwasher, 5/8" Internal Tooth
11	48798	Key Switch (Incl. #2, #10)
12	04221-01	Locknut, 10-32 Elas. Stop - Stainless Steel
13	486455	Motor Controller
14	9612	Foamer Accessory (optional)
15	486090	Pump, 12V Electric 5.0 GPM
16	04317-02	Locknut, 5/16" - 18 Flg. Elas. Stop - Stainless Steel
17	483975	Throttle Control
18	04203-01	Bolt, Carriage 10-32 x .50"
19	48029-14	Battery Cable, Black
20	48029-32	Battery Cable, Red
21	483642	Double Fuse Assy., (incl.#26, #27, #28, #29)
22	48126	Rubber Boot
23	04001-01	Bolt, Hex 1/4"-20 x .75"
24	04020-02	Nut, 1/4"-20
25	483665	Battery, (Not avail. through Scag)
26	482588	Clip, Wire
27	483571	Sealed Fuse Cover, Double
28	48298	Auto Fuse, 20 Amp
29	483629	Fuse Holder, Sealed
30	483642	Double Fuse Assy., (incl.#26, #27, #28, #29)
31	483473	Switch, Double Pole Plunger
32	483013	Relay Switch w/ Diode
33	427908	Mounting Bracket, Brake Switch
34	04203-17	Bolt, Carriage 5/16-18 x 1" - Stainless Steel
35	04317-02	Nut, 5/16-18 Flg. Elas. Stop
36	428105	Plate, Hub Magnet Holder
37	486440	Gear Motor, Electric
38	486614	Wire Harness, Display
39	486611	Bolt, Magnetic
40	04225-01	Nut, M6 x 1.00
41	427828	Plate, Speed Sensor
42	04012-16	Set Screw, #8 - 32 x .375
43	04202-01	Bolt, Hex Head M4-.7 x 10
44	04233-01	Lockwasher, M4-1.1 x 7.6 x .8
45	487069	Wire Harness, STS

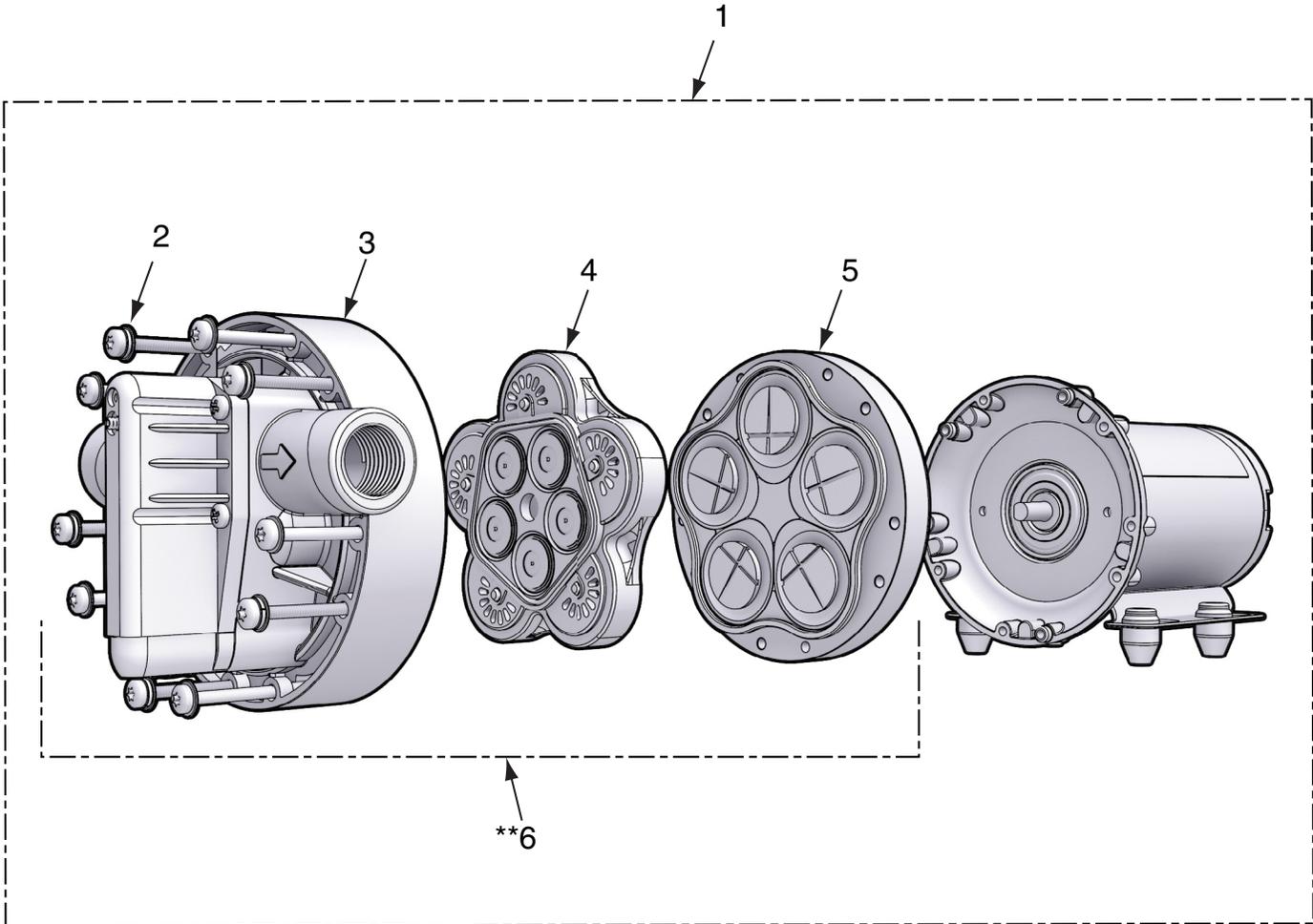
HYDRAULIC PUMP



HYDRAULIC PUMP

Ref. No.	Part No.	Description
1	HG72267	Kit, Housing
2	HG70517	Kit, End Cap
3	HG50641	Pin, .219 x 1.000
4	HG50969	Bolt, M8 X 1.25 mm
5	HG54022	Gasket, Housing
6	HG2513027	Kit, Charge Pump
7	HG50273	Gerotor Assembly
8	HG9004101-1340	O-Ring
9	HG5095	Screw, Socket Head M6 X 1.0 - 20mm
10	HG2513030	Kit, By-Pass
11	HG70521	Kit, Shaft
12	HG50315	Bearing
13	HG51161	Seal, 17 x 40 x 7 Lip
14	HG50329	Ring, Retaining .156 Internal
15	HG50951	Washer, 1.23 x 1.57 x .04
16	HG70331	Kit, Block 10cc
17	HG2003014	Spring, Block
18	HG2003017	Washer, .59 x .79 x .04
19	HG51444	Plate, Valve 10cc
20	HG53998	Swashplate
21	HG53502	Bearing, Thrust
22	HG52866	Arm, Trunion
23	HG2000015	Slot Guide
24	HG70743	Kit, Shock Valve (.031 Orifice)
	HG70744	Kit, Shock Valve (.044 Orifice)
25	HG70402	Kit, Charge Relief
26	HG2513043	Kit, Seal
27	HG9005110-4400	Plug, 7/16-20
28	HG9005110-5600	Plug, 9/16-18
29	HG70525	Seal Kit
30	HG71716	RTN Assembly
31	HG51391	Arm, Return
32	HG51561	Spacer
33	HG44130	Washer
34	HG51400	Screw, 5/16-24 x 3/4" w/Patch
35	HG51394	Control Arm
36	HG52506	Nut, Center Lock 5/16-24 UNF
37	HG52401	Spring, External

SPRAYER PUMP



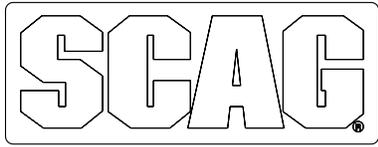
SPRAYER PUMP

Ref. No.	Part No.	Description
1	486090	Pump. 12v - 5 GPM
2	486901	Screw Kit, Remco (all pumps)
3	486897	Bypass, Upper Housing (5.3 GPM)
4	486898	Valve Housing (5.3 GPM)
5	486899	Lower Housing (5.3 GPM)
6	**486902	Pump Head Assembly (7 GPM -Optional Accessory)
*	486900	Outlet Check Valve (5 GPM & 7 GPM)

* Not Shown

** Only available as an assembly for the optional 7GPM pump

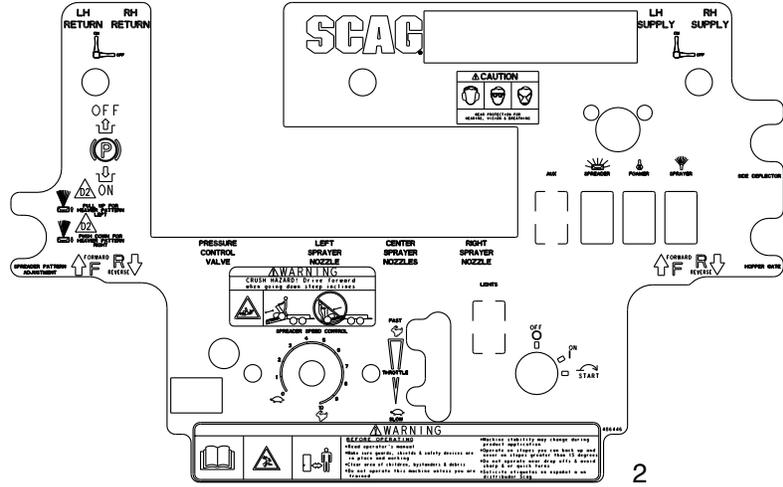
REPLACEMENT DECALS AND INFORMATION PLATES



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Spreader / Sprayer Information

Make sure to follow the chemical manufacturer's recommendations for application rates and use of appropriate personal protective equipment while mixing.

When spreading and spraying at the same time, make sure to set the spreader's effective spread width to twice the sprayer's effective coverage. Ex. If you are spraying with all 4 or 5 nozzles depending on the model used (80 inches or 100 inches of effective coverage), you will need to set the spreader to have an effective spread width of 160 inches or 200 inches depending on model used.

The spreader should spread back to around the center of the last passes tire marks. The end of the sprayer boom should pass about 20 inches from the last passes sprayer boom end or foam marker if equipped.

When mixing multiple items, make sure to follow the W.A.L.E.S system for mixing.

W - Wettable Powders
A - Agitate Tank
L - Liquid Product
E - Emulsifiable Concentrates
S - Surfactants

*These tables are an approximate calibration and should only be used as a base setting for calibration. Refer to the owners manual for precise calibration procedures.

Approximate Calibration for Spraying

Nozzle	PSI	Capacity (Gals)	Density (lb./cu.ft.)			Application Rate (Gals/1000 Sq. Ft.)				
			1.0	1.2	1.4	1.0	1.2	1.4		
AVAIL/LOAN (D)	30	0.15	12	11.1	9.7	9.4	5.6	0.54	0.56	0.57
	40	0.17	22	12.6	10.1	8.4	6.3	0.59	0.59	0.59
	50	0.18	32	13.6	10.0	8.6	6.6	0.60	0.60	0.60
AVAIL/LOAN (D)	30	0.17	22	12.6	10.1	8.4	6.3	0.59	0.59	0.59
	40	0.20	28	14.8	11.1	9.0	6.9	0.63	0.63	0.63
	50	0.24	36	17.6	12.0	9.9	7.6	0.66	0.66	0.66
AVAIL/LOAN (D)	30	0.22	28	14.8	11.1	9.0	6.9	0.63	0.63	0.63
	40	0.25	32	16.7	11.4	9.4	7.0	0.65	0.65	0.65
	50	0.28	36	18.7	11.7	9.7	7.3	0.67	0.67	0.67
AVAIL/LOAN (D)	30	0.22	28	14.8	11.1	9.0	6.9	0.63	0.63	0.63
	40	0.25	32	16.7	11.4	9.4	7.0	0.65	0.65	0.65
	50	0.28	36	18.7	11.7	9.7	7.3	0.67	0.67	0.67
AVAIL/LOAN (D)	30	0.26	33	15.8	11.4	9.0	6.7	0.65	0.64	0.65
	40	0.30	38	17.6	11.6	9.3	7.0	0.66	0.66	0.66
	50	0.34	44	20	12.6	10.0	7.6	0.70	0.69	0.69
AVAIL/LOAN (D)	30	0.26	33	15.8	11.4	9.0	6.7	0.65	0.64	0.65
	40	0.30	38	17.6	11.6	9.3	7.0	0.66	0.66	0.66
	50	0.34	44	20	12.6	10.0	7.6	0.70	0.69	0.69
AVAIL/LOAN (D)	30	0.35	45	21	13.3	10	7.3	0.70	0.68	0.68
	40	0.40	52	25	15.2	11.2	8.4	0.75	0.72	0.72
	50	0.45	58	29	17.2	12.5	9.5	0.79	0.75	0.75
AVAIL/LOAN (D)	30	0.35	45	21	13.3	10	7.3	0.70	0.68	0.68
	40	0.40	52	25	15.2	11.2	8.4	0.75	0.72	0.72
	50	0.45	58	29	17.2	12.5	9.5	0.79	0.75	0.75
AVAIL/LOAN (D)	30	0.48	55	27	15	11	8.0	0.80	0.76	0.76
	40	0.55	64	32	17.5	12.5	9.5	0.85	0.80	0.80
	50	0.64	72	37	20	14.5	11	0.90	0.84	0.84
AVAIL/LOAN (D)	30	0.55	64	32	17.5	12.5	9.5	0.85	0.80	0.80
	40	0.64	72	37	20	14.5	11	0.90	0.84	0.84
	50	0.75	82	41	23	17	12	0.95	0.88	0.88
AVAIL/LOAN (D)	30	0.55	64	32	17.5	12.5	9.5	0.85	0.80	0.80
	40	0.64	72	37	20	14.5	11	0.90	0.84	0.84
	50	0.75	82	41	23	17	12	0.95	0.88	0.88

Approximate Calibration for Spreading

Product	lbs. per 1000 Sq. Ft.	Star Setting
Fine Pellets	1	4.75
	2	5.25
	3	5.5
Med Fine Pellets	2	5.0
	4	6.0
	6	6.5
Small Pellets	2	4.25
	4	5.5
	6	5.75
Med Nitrogen Pellets	1	4.75
	2	5.5
	3	6.0
Med Granules	2	4.75
	4	5.5
	6	6.5
Med Pellets	2	4.75
	4	5.5
	6	6.5
Large Pellets	2	5.0
	4	6.25
	6	7.25

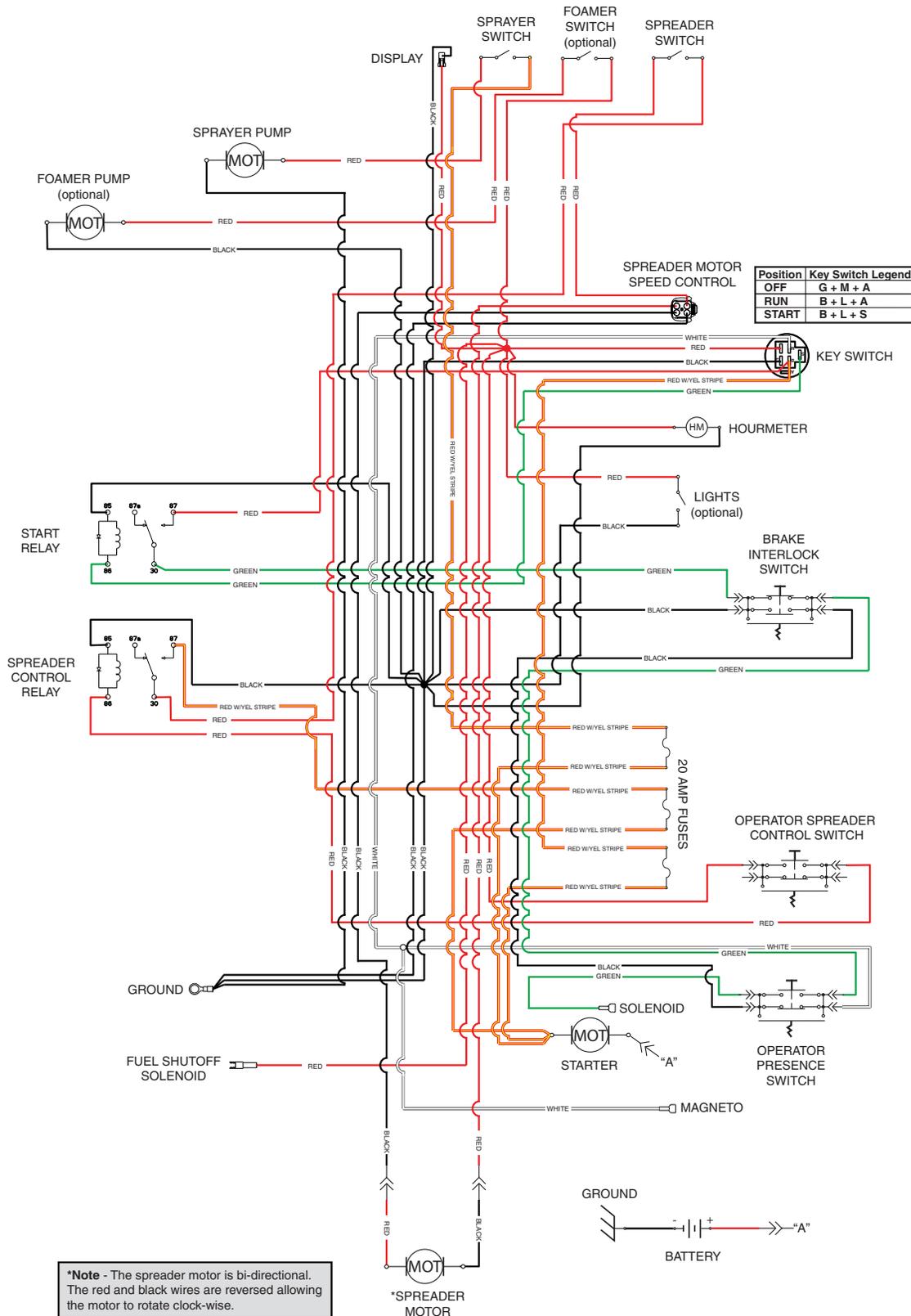
** Calculated using 1 mph

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REPLACEMENT DECALS AND INFORMATION PLATES

Ref. No.	Part No.	Description
1	486197	Decal, Scag
2	486446	Decal, Instrument Panel - Turf Storm
3	486755	Decal, Scag Power Equipment (Fuel Tank)
4	486689	Decal, Hopper Front - Turf Storm
5	486687	Decal, LH Spray Tank - Turf Storm
	486688	Decal, RH Spray Tank - Turf Storm
6	485403	Decal, Metalcraft - USA
7	486733	Decal, Stray & Spread Instructions - Turf Storm

STS ELECTRICAL SCHEMATIC (shown with Key Off, PTO Off, Park Brake Applied, OPC Disengaged)



LIMITED WARRANTY - TURF STORM SPRAYER/SPREADER

Any part of the Scag Turf Storm sprayer/spreader manufactured by Scag Power Equipment and found, in the reasonable judgment of Scag, to be defective in materials or workmanship, will be repaired or replaced by an Authorized Scag Service Dealer without charge for parts and labor during the periods specified below. This warranty is limited to the original purchaser provided the product was purchased from an Authorized Scag Power Equipment Dealer and is not transferable. Proof of purchase will be required by the dealer to substantiate any warranty claims. All warranty work must be performed by an Authorized Scag Service Dealer.

This warranty is limited to the following specified periods from the date of the original retail purchase for defects in materials or workmanship:

- Wear items including spray nozzles, o-rings, granular spinner, springs, bearings and bushings are not included in this warranty.
- Other wear items including drive belts, sprayer hoses, hydraulic hoses, control cables (such as throttle, choke, hopper diffusor, hopper deflector, hopper gate), and tires are warrantied for ninety (90) days.
- Batteries are covered for ninety (90) days.
- Valve body, pressure valves and supply / by-pass control valves (excluding all o-rings) are warrantied for two (2) years (parts and labor) for commercial use.
- Frame and structural components including oil reservoir and oil coolers are warrantied for two (2) years (parts and labor) for commercial use. This warranty does not cover any sprayer/spreader that has been subject to misuse, neglect, negligence, or accident, or that has been operated in any way contrary to the operating instructions as specified in the Operator's Manual.
- Engines and electric starters are covered by the engine manufacturer's warranty period.
- Major drive system components are warrantied for two (2) years (parts and labor) for commercial use by Scag Power Equipment. The repair or replacement of the hydraulic pumps or hydraulic motors will be at the option of Scag Power Equipment. This warranty does not cover any sprayer/spreader that has been subject to misuse, neglect, negligence, or accident, or that has been operated in any way contrary to the operating instructions as specified in the Operator's Manual.
- Electric pumps and motors have a Limited Warranty for two (2) years (parts and labor) for commercial use.
- Any Scag product used for rental purposes is covered by a 90 day warranty.

The Scag Turf Storm sprayer/spreader, including any defective part must be returned to an Authorized Scag Service Dealer within the warranty period. The expense of delivering the sprayer/spreader to the dealer for warranty work and the expense of returning it to the owner after repair will be paid for by the owner. Scag's responsibility is limited to making the required repairs and no claim of breach of warranty shall be cause for cancellation or rescission of the contract of sale of any Scag Turf Storm sprayer/spreader.

This warranty does not cover any sprayer/spreader that has been subject to misuse, neglect, negligence, or accident, or damage or deterioration due to normal use or that has been operated in any way contrary to the operating instructions as specified in the Operator's Manual. The warranty does not apply to any damage to the sprayer/spreader that is the result of improper maintenance, or to any sprayer/spreader or parts that have not been assembled or installed as specified in the Operator's Manual and Assembly Manual. The warranty does not cover any sprayer/spreader that has been altered or modified, changing performance or durability. In addition, the warranty does not extend to replacements or repairs made necessary due to normal wear, or by the use of parts or accessories which, in the reasonable judgment of Scag, are either incompatible with the Scag Turf Storm sprayer/spreader or adversely affect its operation, performance, or durability.

Scag Power Equipment reserves the right to change or improve the design of any sprayer/spreader without assuming any obligation to modify any sprayer /spreader previously manufactured. All other implied warranties are limited in duration to the two (2) years for commercial use, or ninety (90) days for sprayer/spreaders used for rental purpose. Accordingly, any such implied warranties including merchantability, fitness for a particular purpose, or otherwise, are disclaimed in their entirety after the expiration of the appropriate two (2) years for commercial use, or ninety (90) day warranty period. Scag's obligation under this warranty is strictly and exclusively limited to the repair or replacement of defective parts and Scag does not assume or authorize anyone to assume for them any other obligation. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Scag assumes no responsibility for incidental, consequential, or other damages including, but not limited to, expense for gasoline, expense of delivering the sprayer/spreader to an Authorized Scag Service Dealer and expense of returning it to the owner, mechanic's travel time, telephone or communication charges, rental of a like product during the time warranty repairs are being performed, travel, loss or damage to personal property, loss of revenue, loss of use of the machine, loss of time or inconvenience. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion 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.

