



PULL DIRT SCRAPER

MODELS
DSP8, DSP10, DSP12

Published 05/21

Part No. 50072308

OPERATOR'S MANUAL



This Operator's Manual is an integral part of the safe operation of this machine and must be maintained with the unit at all times. READ, UNDERSTAND, and FOLLOW the Safety and Operation Instructions contained in this manual before operating the equipment. C01-Cover



FC-DS-0001

BUSH HOG®
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Selma, AL 36703
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www.bushhog.com

Bush Hog Web Page



www.algqr.com/bwe

¡ATENCIÓN!

LEA EL INSTRUCTIVO



Si No Lee Ingles, Pida
Ayuda a Alguien
Que Se Lo Lea Para Que le
Traduzca Las
Medidas de Seguridad



\$0.00

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To the Owner/Operator/Dealer

All implements with moving parts are potentially hazardous. There is no substitute for a cautious, safe-minded operator who recognizes the potential hazards and follows reasonable safety practices. The manufacturer has designed this implement to be used with all its safety equipment properly attached to minimize the chance of accidents.

BEFORE YOU START! Read the safety messages on the implement and shown in your manual. Observe the rules of safety and common sense!

For future reference, record your Bush Hog product model number and serial number.

Dealer		Telephone		Model Number	
Owner		Purchase Date		Serial Number	



FC-DS-0001

WARRANTY INFORMATION:

Read and understand the complete Warranty Statement found in this Manual. Fill out the Warranty Registration Form in full and return it to within 30 Days. Make certain the Serial Number of the Machine is recorded on the Warranty Card and on the Warranty Form that you retain.

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SAFETY SECTION

Safety Section 1-1

SAFETY

SAFETY

General Safety Instructions and Practices

A careful operator is the best operator. Safety is of primary importance to the manufacturer and should be to the owner/operator. Most accidents can be avoided by being aware of your equipment, your surroundings, and observing certain precautions. The first section of this manual includes a list of Safety Messages that, if followed, will help protect the operator and bystanders from injury or death. Read and understand these Safety Messages before assembling, operating or servicing this Implement. This equipment should only be operated by those persons who have read the manual, who are responsible and trained, and who know how to do so responsibly.



The Safety Alert Symbol combined with a Signal Word, as seen below, is used throughout this manual and on decals which are attached to the equipment. The Safety Alert Symbol means: "ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!" The Symbol and Signal Word are intended to warn the owner/operator of impending hazards and the degree of possible injury faced when operating this equipment.

Practice all usual and customary safe working precautions and above all---remember safety is up to YOU. Only YOU can prevent serious injury or death from unsafe practices.



Indicates an imminently hazardous situation that, if not avoided, WILL result in DEATH OR VERY SERIOUS INJURY.



Indicates an imminently hazardous situation that, if not avoided, COULD result in DEATH OR SERIOUS INJURY.



Indicates an imminently hazardous situation that, if not avoided, MAY result in MINOR INJURY.



Identifies special instructions or procedures that, if not strictly observed, could result in damage to, or destruction of the machine, attachments or the environment.

NOTE: Identifies points of particular interest for more efficient and convenient operation or repair. (SG-1)

READ, UNDERSTAND, and FOLLOW the following Safety Messages. Death or serious injury may occur unless care is taken to follow the warnings and instructions stated in the Safety Messages. Always use good common sense to avoid hazards. (SG-2)



Si no lee inglés, pida ayuda a alguien que si lo lea para que le traduzca las medidas de seguridad. (SG-3)



SAFETY

DANGER

There are obvious and hidden potential hazards in the operation of this Implement as in all power-driven or pulled equipment. REMEMBER! This machine is often operated in rough terrain conditions that include grass, weeds, gullies, holes, slopes, hidden obstructions and the like. Serious injury or even death may occur unless care is taken to assure the safety of the operator and bystanders in the area. Do not operate this machine with anyone in the immediate area. Stop operating if anyone comes within 25 feet of the equipment. (STL-4)

Operator Safety Instructions and Practices

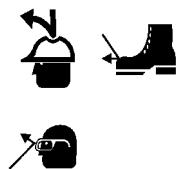
DANGER

Never operate the Tractor or Implement until you have read and completely understand this Manual, the Tractor Operator's Manual, and each of the Safety Messages found in the Manual or on the Tractor and Implement. Learn how to stop the tractor engine suddenly in an emergency. Never allow inexperienced or untrained personnel to operate the Tractor or Implement without supervision. Make sure the operator has fully read and understood the manuals prior to operation. (SG-4)



WARNING

The operator and all support personnel should wear hard hats, safety shoes, safety glasses, and proper hearing protection at all times for protection from injury including injury from items that may be thrown by the equipment. (SG-16)



CAUTION

PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS! Tractors with or without an Implement attached can often be noisy enough to cause permanent hearing loss. We recommend that you always wear hearing protection if the noise in the Operator's position exceeds 80db. Noise over 85db over an extended period of time will cause severe hearing loss. Noise over 90db adjacent to the Operator over an extended period of time will cause permanent or total hearing loss. **NOTE:** Hearing loss from loud noise [from tractors, chain saws, radios, and other such sources close to the ear] is cumulative over a lifetime without hope of natural recovery. (SG-17)



WARNING

Always read carefully and comply fully with the manufacturer's instructions when handling oil, solvents, cleansers, and any other chemical agent. (SG-22)



DANGER

Never allow children to play on or around Tractor or Implement. Children can slip or fall off the Equipment and be injured or killed. Inadvertent contact with controls can cause the Implement to shift or fall crushing themselves or others. (SG-25)

SAFETY

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DANGER

DO NOT use drugs or alcohol immediately before or while operating the Tractor and Implement. Drugs and alcohol will affect an operator's alertness and coordination and therefore affect the operator's ability to operate the equipment safely. Before operating the Tractor or Implement, an operator on prescription or over-the-counter medication must consult a medical professional regarding any side effects of the medication that would hinder their ability to operate the Equipment safely. NEVER knowingly allow anyone to operate this equipment when their alertness or coordination is impaired. Serious injury or death to the operator or others could result if the operator is under the influence of drugs or alcohol. (SG-27)



WARNING

Prolonged operation may cause operator boredom and fatigue affecting safe operation. Take scheduled work breaks to help prevent these potentially impaired operating conditions. Never operate the Implement and Tractor in a fatigued or bored mental state which impairs proper and safe operation. (SG-32)

WARNING

Use extreme caution when getting onto the Implement to perform repairs, maintenance and when removing accumulated material. Only stand on solid flat surfaces to ensure good footing. Use a ladder or raised stand to access high spots which cannot be reached from ground level. Slipping and falling can cause serious injury or death. (SG-33)

WARNING

Avoid contact with hot surfaces including hydraulic oil tanks, pumps, motors, valves and hose connections. Relieve hydraulic pressure before performing maintenance or repairs. Use gloves and eye protection when servicing hot components. Contact with a hot surface or fluid can cause serious injury from burns or scalding. (SG-34)

WARNING

Avoid contact with hot surfaces of the engine or muffler. Use gloves and eye protection when servicing hot components. Contact with a hot surface or fluid can cause serious injury from burns or scalding. (SG-38)

WARNING

Repeated or substantial breathing of hazardous dusts, including crystalline silica, could cause fatal or serious respiratory disease including silicosis. Concrete, masonry, many types of rock, and various other materials contain silica sand. California lists respirable crystalline silica as a substance known to cause cancer. Operation of this equipment under certain conditions may generate airborne dust particles that could contain crystalline silica. In those conditions, personal protective equipment including an appropriate respirator must be used. If excessive dust is generated, a dust collection or suppression system should also be used during operation. (SG-41)



SAFETY

WARNING

Be sure you have adequate knowledge of the property you will be working on. Take time to make yourself aware of any area underwater or underground lines or cables. Contact with buried lines or cable could result in serious injury or death. (STL-1)

WARNING

In wet conditions where there is a likelihood of material collecting on the Implement, make certain that this material is removed before traveling on public roadways. (STL-7)

DANGER

Never crawl under a raised Implement supported solely by the Tractor 3-Point hitch. Release of the control lever or mechanical failure will result in the Implement falling and possible injury or death. Always securely block up the Implement before crawling underneath to perform repairs and service. (S3PT-19)

SAFETY

Equipment Operator Safety Instructions and Practices

WARNING

Operate this Implement only in conditions where you have clear visibility in daylight or with adequate artificial lighting. Never operate in darkness or foggy conditions where you cannot clearly see at least 100 yards in front and to the sides of the tractor and implement. Make sure that you can clearly see and identify passersby, steep slopes, ditches, drop-offs, overhead obstructions, power lines, debris and foreign objects. If you are unable to clearly see these types of items discontinue operating this equipment. (S3PT-21)

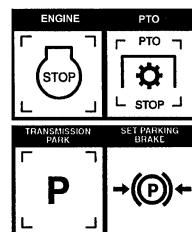
WARNING

Operate this Equipment only with a Tractor equipped with an approved roll-over-protective system (ROPS). Always wear seat belts. Serious injury or even death could result from falling off the tractor, particularly during a turnover when the operator could be pinned under the ROPS. (SG-7)



DANGER

BEFORE leaving the tractor seat, lower the implement, set the parking brake and/or set the tractor transmission in parking gear, disengage the PTO, stop the engine, remove the key, and wait for all moving parts to stop. Place the tractor shift lever into a low range or parking gear to prevent the tractor from rolling. Never dismount a Tractor that is moving or while the engine is running. Operate the Tractor controls from the tractor seat only. (SG-9)



DANGER

Never allow children or other persons to ride on the Tractor or Implement. Falling off can result in serious injury or death. (SG-10)



SAFETY

SAFETY



Never allow children to operate, ride on, or come close to the Tractor or Implement. Usually, 16-17 year-old children who are mature and responsible can operate the implement with adult supervision, if they have read and understand the Operator's Manuals, been trained in proper operation of the tractor and Implement, and are physically large enough to reach and operate the controls easily. (SG-11)



Do not mount or dismount the Tractor while the tractor is moving. Mount the Tractor only when the Tractor and all moving parts are completely stopped. (SG-12)



Start tractor only when properly seated in the Tractor seat. Starting a tractor in gear can result in injury or death. Read the Tractor operators manual for proper starting instructions. (SG-13)



Never run the Tractor engine in a closed building or without adequate ventilation. The exhaust fumes can be hazardous to your health. (SG-23)



Operate the Tractor and/or Implement controls only while properly seated in the Tractor seat with the seat belt securely fastened around you. Inadvertent movement of the Tractor or Implement may cause serious injury or death. (SG-29)



Do Not operate this equipment in areas where insects such as bees, may attack you and/or cause you to lose control of the equipment. If you must enter in such areas, use a tractor with an enclosed Cab and close the windows to prevent insects from entering. If a tractor cab is not available, wear suitable clothing including head, face, and hand protection to shield you from the insects. Attacking insects can cause you to lose control of the tractor, which can result in serious injury or death to you or bystanders. Never dismount a moving tractor. (SG-40)



Many varied objects, such as wire, cable, rope, or chains, can become entangled in the rotating parts of the Implement. These objects could then swing outside the housing at great velocity. Such a situation is extremely hazardous and could result in serious injury or even death. Inspect the area for such objects before working in the area. Remove any such objects from the site. Never allow the implement to contact such objects. (STL-6)

SAFETY

Connecting or Disconnecting Implement Safety Instructions and Practices

DANGER

There are obvious and hidden potential hazards in the operation of this Implement as in all power-driven or pulled equipment. REMEMBER! This machine is often operated in rough terrain conditions that include grass, weeds, gullies, holes, slopes, hidden obstructions and the like. Serious injury or even death may occur unless care is taken to assure the safety of the operator and bystanders in the area. Do not operate this machine with anyone in the immediate area. Stop operating if anyone comes within 25 feet of the equipment. (STL-4)

Maintenance and Service Safety Instructions and Practices

WARNING

Always maintain the safety signs in good readable condition. If the safety signs are missing, damaged, or unreadable, obtain and install replacement safety signs immediately. (SG-5)

WARNING

Do not modify or alter this Implement. Do not permit anyone to modify or alter this Implement, any of its components or any Implement function. (SG-8)

DANGER

Never work under the Implement, the framework, or any lifted component unless the Implement is securely supported or blocked up to prevent sudden or inadvertent falling which could cause serious injury or even death. (SG-14)

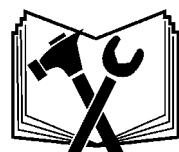
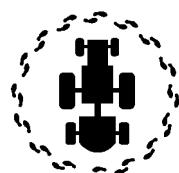


WARNING

Never attempt to lubricate, adjust, or remove material from the Implement while it is in motion or while tractor engine is running. (SG-20)

WARNING

Periodically inspect all moving parts for wear and replace when necessary with authorized service parts. Look for loose fasteners, worn or broken parts, and leaky or loose fittings. Make sure all pins have cotter pins and washers. Serious injury may occur from not maintaining this machine in good working order. (SG-21)



WARNING

Cancer and Reproductive Harm www.P65Warnings.ca.gov

SAFETY

SAFETY

WARNING

Perform service, repairs and lubrication according to the maintenance section. Ensure the unit is properly lubricated as specified in the lubrication schedule and all bolts and nuts are properly torqued. Failure to properly service, repair and maintain this Implement in good operating condition could cause component failure and possible serious injury or even death. (SG-35)

WARNING

Use caution and wear protective gloves when handling sharp objects such as blades, knives, and other cutting edges. Be alert to worn component surfaces which have sharp edges. Sharp surfaces can inflict severe laceration injuries if proper hand protection is not worn. (SG-37)

WARNING

Ensure any remote starting system is inoperative before servicing or cleaning the machine. Inadvertent engine start up could result in entanglement or runover causing serious injuries or death. (SSB-17)

WARNING

Use extreme care when climbing onto the Equipment to perform repairs, maintenance, and cleaning. Use proper stands and ladders to access areas that cannot be reached from ground level. Slipping and falling off the Equipment can cause serious injury or death. (SSB-25)

WARNING

Exercise care when handling the discs. Disc blades are SHARP and HEAVY. Wear gloves at all time to protect your hands. (STL-10)

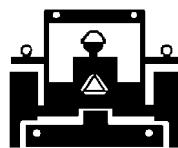
WARNING

Do not use your hands or feet to clean the disc gangs. The discs are sharp and serious injuries could result from inadvertent contact with the discs. Never attempt to stand on the discs, tires, or frame members of the implement. (STL-11)

Transporting Safety Instructions and Practices

WARNING

Make certain that the "Slow Moving Vehicle" (SMV) sign is installed in such a way as to be clearly visible and legible. When transporting the Equipment use the Tractor flashing warning lights and follow all local traffic regulations. (SG-6)



SAFETY

WARNING

Transport only at speeds where you can maintain control of the equipment. Serious accidents and injuries can result from operating this equipment at high speeds. Understand the Tractor and Implement and how it handles before transporting on streets and highways. Make sure the Tractor steering and brakes are in good condition and operate properly.

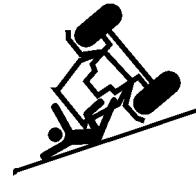


Before transporting the Tractor and Implement, determine the proper transport speeds for you and the equipment. Make sure you abide by the following rules:

Test the tractor at a slow speed and increase the speed slowly. Apply the Brakes smoothly to determine the stopping characteristics of the Tractor and Implement. As you increase the speed of the Tractor the stopping distance increases. Determine the maximum transport speed not to exceed 20 mph (30 kph) for transporting this equipment.

Test the equipment at a slow speed in turns. Increase the speed through the turn only after you determine that the equipment can be operated at a higher speed. Use extreme care and reduce your speed when turning sharply to prevent the tractor and implement from turning over. Determine the maximum turning speed for you and this equipment before operating on roads or uneven ground.

Only transport the Tractor and Implement at the speeds which allow you to properly control the equipment.



Be aware of the operating conditions. Do not operate the Tractor with weak or faulty brakes or worn tires. When operating down a hill or on wet or rain slick roads, the braking distance increases: use extreme care and reduce your speed. When operating in traffic always use the Tractor's flashing warning lights and reduce your speed. Be aware of traffic around you and watch out for the other guy. (SG-19)

DANGER

Be particularly careful when transporting the Implement using the tractor. Turn curves or go up or down hills only at a low speed and at a gradual steering angle. Make certain that at least 20% of the tractor's weight is on the front wheels to maintain safe steerage. Slow down on rough or uneven surfaces. (STI-01)

WARNING

Only tow the Implement behind a properly sized and equipped Tractor which exceeds the weight of the Implement by at least 20%. DO NOT tow the Implement behind a truck or other type of vehicle. Never tow the Implement and another Implement connected in tandem. Never tow the Implement at speeds over 20 MPH. (STI-06)



SAFETY

WARNING

Your driving vision may be reduced or impaired by the tractor, cab, or implement. Before driving on public roadways identify any limited vision areas, and make adjustments to your operating position, mirrors, and the implement transport position so that you can clearly see the area where you will be traveling, and any traffic that may approach you. Failure to maintain adequate vision of the public roadway and traffic can result in serious injury or even death. (STI-10)

WARNING

Lock the disc gangs in the raised position before transporting the Implement. Serious Implement and/or road damage could result from unintentional dropping of the discs gangs. Be sure to pin the tractor drawbar rigid in the center position and properly attach the Implement safety tow chain. (STL-9)

SAFETY

Concluding Safety Instructions and Practices

In addition to the design and configuration of this Implement, including Safety Signs and Safety Equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of the machine. Refer also to Safety Messages and operation instruction in each of the appropriate sections of the Tractor and Equipment Manuals. Pay close attention to the Safety Signs affixed to the Tractor and Equipment. (SG-18)

Parts Safety Instructions and Practices

PARTS INFORMATION

Bush Hog products are designed utilizing specifically matched system components to ensure optimum equipment performance. These parts are made and tested to Bush Hog specifications. Non-genuine "will fit" parts do not consistently meet these specifications. The use of "will fit" parts may reduce equipment performance, void warranties, and present a safety hazard. Use genuine Bush Hog parts for economy and safety. (SPBH-2)

SEE YOUR BUSH HOG DEALER

Operator's & Parts Manuals

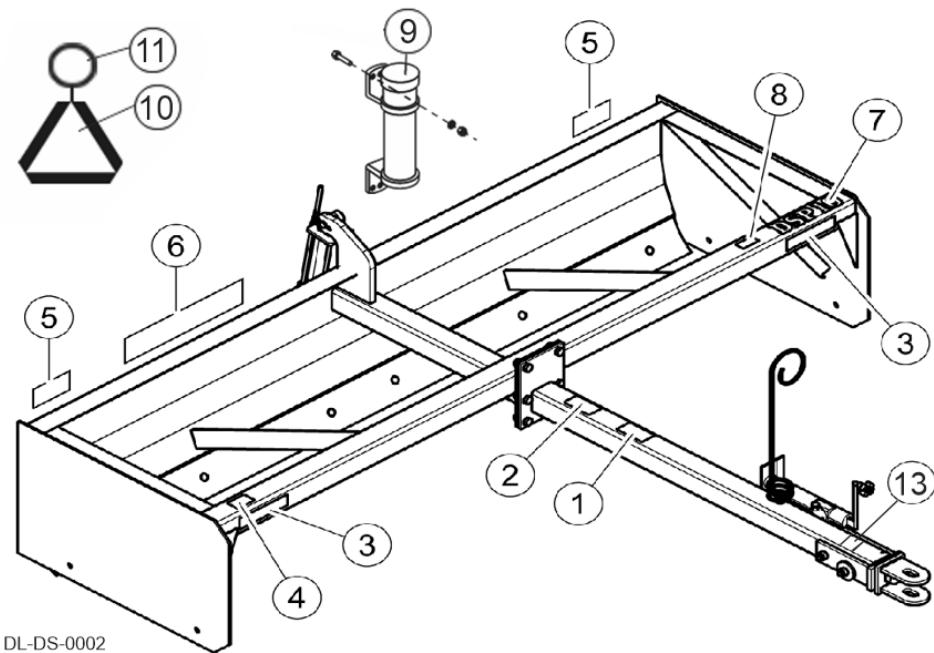


www.algqr.com/bpm

SAFETY

Decal Location

NOTE: Bush Hog supplies safety decals on this product to promote safe operation. Damage to the decals may occur while in shipping, use, or reconditioning. Bush Hog cares about the safety of its customers, operators, and bystanders, and will replace the safety decals on this product in the field, free of charge (Some shipping and handling charges may apply). Contact your Bush Hog dealer to order replacement decals.

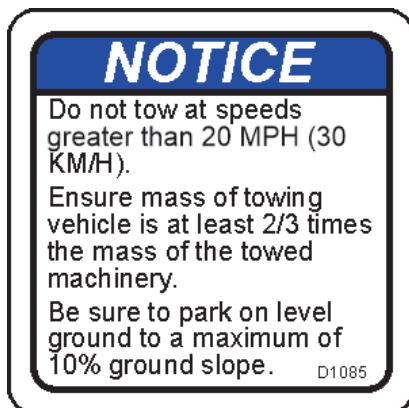
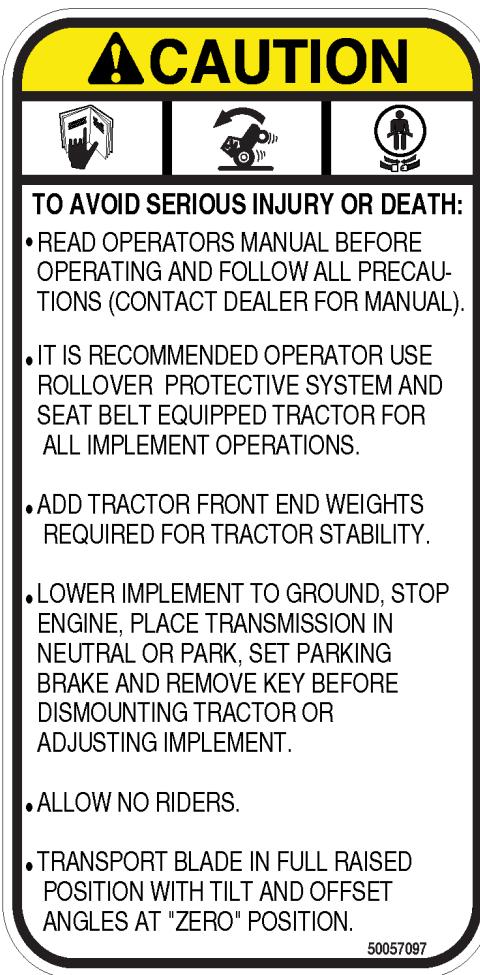


ITEM	PART NO.	QTY	LEVEL	DESCRIPTION
1.	90960BH	1	WARNING	Rake Hazard
2.	50057097	1	CAUTION	Read Operator's Manual
3.	50031212	2	REFLECTOR	Amber Reflector
4.	00725746	1	PELIGRO	Spanish Translation
5.	50031214	2	REFLECTOR	Red Reflector
6.	50065309	1	LOGO	Bush Hog Logo
7.	50074753	1	NAME	DSP8 Model Name
	50072051	1	NAME	DSP10 Model Name
	50072044	1	NAME	DSP12 Model Name
8.	nfs	1	SER PLT	Serial Plate
9.	00789040C	1	_____	Canister (Operator's Manual Inside)
10.	94359	1	REFLECT	SMV Sign
11.	D1064	1	IMPORTANT	20 MPH Speed
12.	D960	1	WARNING	Proposition 65 (Not Shown)
13.	D1085	1	-----	Park on Level Ground Max 10% Ground Speed

SAFETY

Decal Description

SAFETY



SAFETY

SAFETY

FEDERAL LAWS AND REGULATIONS

This section is intended to explain in broad terms the concept and effect of federal laws and regulations concerning employer and employee equipment operators. This section is not intended as a legal interpretation of the law and should not be considered as such.

Employer-Employee Operator Regulations

U.S. Public Law 91-596 (The Williams-Steiger Occupational and Health Act of 1970) OSHA

This Act Seeks:

"...to assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources..."

DUTIES

Sec. 5 (a) Each employer-

- (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
- (2) shall comply with occupational safety and health standards promulgated under this Act.
- (b) Each employee shall comply with occupational safety and health standards and all rules, regulations and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA Training Requirements

Title 29, Code of Federal Regulations Part 1928.57(a)(6). www.osha.gov

Operator instructions. At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee who operates an agricultural tractor and implements in the safe operating practices and servicing of equipment with which they are or will be involved, and of any other practices dictated by the work environment.

Keep all guards in place when the machine is in operation;

Permit no riders on equipment

Stop engine, disconnect the power source, and wait for all machine movement to stop before servicing, adjusting, cleaning or unclogging the equipment, except where the machine must be running to be properly serviced or maintained, in which case the employer shall instruct employees as to all steps and procedures which are necessary to safely service or maintain the equipment.

Make sure everyone is clear of machinery before starting the engine, engaging power, or operating the machine.

Employer Responsibilities:

To ensure employee safety during Tractor and Implement operation, it is the employer's responsibility to:

1. Train the employee in the proper and safe operation of the Tractor and Implement.
2. Require that the employee read and fully understand the Tractor and Implement Operator's manual.
3. Permit only qualified and properly trained employees to operate the Tractor and Implement.
4. Maintain the Tractor and Implement in a safe operational condition and maintain all shields and guards on the equipment.
5. Ensure the Tractor is equipped with a functional ROPS and seat belt and require that the employee operator securely fasten the safety belt and operate with the ROPS in the raised position at all times.
6. Forbid the employee operator to carry additional riders on the Tractor or Implement.
7. Provide the required tools to maintain the Tractor and Implement in a good safe working condition and provide the necessary support devices to secure the equipment safely while performing repairs and service.
8. Require that the employee operator stop operation if bystanders or passersby come within 300 feet.

Child Labor Under 16 Years of Age

Some regulations specify that no one under the age of 16 may operate power machinery. It is your responsibility to know what these regulations are in your own area or situation. (Refer to U.S. Dept. of Labor, Employment Standard Administration, Wage & Home Division, Child Labor Bulletin #102.)

INTRODUCTION SECTION

Introduction Section 2-1

INTRODUCTION

The DSP8/10/12 are designed with care and built with quality materials by skilled workers. Proper assembly, maintenance, and operating practices, as described in this manual, will help the owner/operator get years of satisfactory service from the machine.

The purpose of this manual is to familiarize and instruct. The Assembly Section instructs the owner/operator in the correct assembly of the Implement using standard and optional equipment.

Careful use and timely service saves extensive repairs and costly downtime losses. The Operation and Maintenance Sections of the manual train the owner/operator how to work the Implement correctly and attend to appropriate maintenance. The Troubleshooting Guide helps diagnose difficulties and offers solution to the problems.

Safety is of primary importance to the owner/operator and to the manufacturer. The first section of this manual includes a list of Safety Messages, that, if followed, will help protect the operator and bystanders from injury or death. Many of the Safety Messages will be repeated throughout the manual. The owner/operator/dealer should know these Safety Messages before assembly and be aware of the hazards of operating this implement during assembly, use, and maintenance. The Safety Alert Symbol combined with a Signal Word, as seen below, is intended to warn the owner/operator of impending hazards and the degree of possible injury faced when operating this machine.



DANGER Indicates an imminently hazardous situation that, if not avoided, WILL result in DEATH OR VERY SERIOUS INJURY.



WARNING Indicates an imminently hazardous situation that, if not avoided, COULD result in DEATH OR SERIOUS INJURY.



CAUTION Indicates an imminently hazardous situation that, if not avoided, MAY result in MINOR INJURY.



Important Identifies special instructions or procedures that, if not strictly observed, could result in damage to, or destruction of the machine, attachments or the environment.

INTRODUCTION

INTRODUCTION



FC-DS-0001

Once you have familiarized yourself with the Operator's Manual, completed the operations checklist, and properly attached your Bush Hog Pull Type Drag Scraper to your tractor, you are now almost ready to begin work. Make sure you have checked out your work site for any buried utility cables, pipelines or other obstacles that you wouldn't want to damage or encounter.

Pull Type Drag Scrapers are ideal for moving large quantities of material, leveling, finish grading, and removal of material on an angle. They have applications on feedlots, outdoor arenas, building sites, maintenance operation on farms, private roadways, sloping ground, building terraces, and making ditches. The scraper's primary purpose is grading and leveling. If tilt axle is used, it can also do angle work. These functions are best done at an approximate ground speed of 2 to 4 mph, simply lower the scraper to the ground and proceed forward. The grader blade should immediately begin shaving the soil surface or aggregate material and accumulating it in the box. You can transfer this material by dragging it to a nearby location and then raising the scraper to deposit your load. You can also achieve uniform distribution and leveling of scraped material by setting the scraper to shave off high spots and allowing accumulated material to flow out under the grader blade in low spots. If the ground or surface material is very hard, you may want to add weights in the weights box in order for the scraper blade to be effective. Achieving the desired effect will require a little experimentation and experience. Pull Type Drag Scrapers generally perform better in dry to slightly damp soil conditions.

Your Bush Hog Pull Type Drag Scraper can also be used for making slopes, terracing and ditching if the tilt axle is used. Just simply extend the tilt cylinder to lower the right side of the grader blade. Fully retract the tilt cylinder to return the grader blade to level.

With a little practice you should become a very good operator and consistently achieve the desired results you expect with your Bush Hog Pull Type Drag Scraper. Please visit www.bushhog.com for more information on this products and our complete line of landscape and skid steer product.

Literature Page



www.algqr.com/ble

INTRODUCTION

Equipment Specifications

	<u>DSP8</u>	<u>DSP10</u>	<u>DSP12</u>
Drawbar HP Rating	70 to 125	70 to 125	70 to 125
Transport Width	97"	121"	145
Working Width	96-3/16"	120-3/16"	144-3/16"
Capacity	1-3/4 cu. yds.	2-1/4 cu yds.	2-3/4 cu yds.
Weight with weight box			
Tilt Axle (lbs)	1525	1645	1700
No Tilt Axle (lbs)	1405	1525	1580
Depth of Box	39"	39"	39"
Maximum Cutting Depth	5" below grade	5" below grade	5" below grade
Dump Clearance	21"	21"	21"
Maximum Tilt Depth to the Right	7"	7-5/8"	8-1/4"
Maximum Tilt Angle	3-1/2"	3-1/2°	3-1/2°
Tongue/Cross Tube Construction	----- 4" x 4" x 1/4" tubing -----		
Side Plate Construction	----- 3/8" x 24-5/6" high x 39-3/4" deep -----		
Replaceable Skids	----- 1/2" x 4" x 32" -----		
Moldboard Construction	----- 1/4" x 24-1/4" high when formed -----		
Cutting Edge	----- 1/2" x 6" reversible & replaceable -----		
Cutting Edge Reinforcement	3" x 3" x 5/16" angle plus a 1/4" mold board = 9/16" at the cutting edge		
Tires	New 9.5L x 15 8 PLY RIB TL on 5-Bolt Rim with 5.5" bolt center		
Maximum Transport Speed	----- 20 MPH -----		
Lift Cylinder	----- 3-12" x 8 ASAE -----		
Tilt Cylinder	----- 3-12" x 8 ASAE -----		

INTRODUCTION

LIMITED WARRANTY



Bush Hog warrants to the original purchaser of any new Bush Hog equipment, purchased from an authorized Bush Hog dealer, that the equipment be free from defects in material and workmanship for a period of one (1) year for non-commercial, state and municipalities' use and ninety (90) days for commercial use from date of retail sale. The obligation of Bush Hog to the purchaser under this warranty is limited to the repair or replacement of defective parts.

Replacement or repair parts installed in the equipment covered by this limited warranty are warranted for ninety (90) days from the date of purchase of such part or to the expiration of the applicable new equipment warranty period, whichever occurs later. Warranted parts shall be provided at no cost to the user at an authorized Bush Hog dealer during regular working hours. Bush Hog reserves the right to inspect any equipment or parts which are claimed to have been defective in material or workmanship.

DISCLAIMER OF IMPLIED WARRANTIES & CONSEQUENTIAL DAMAGES

Bush Hog's obligation under this limited warranty, to the extent allowed by law, is in lieu of all warranties, implied or expressed, **INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE** and any liability for incidental and consequential damages with respect to the sale or use of the items warranted. Such incidental and consequential damages shall include but not be limited to: transportation charges other than normal freight charges; cost of installation other than cost approved by Bush Hog; duty; taxes; charges for normal service or adjustment; loss of crops or any other loss of income; rental of substitute equipment, expenses due to loss, damage, detention or delay in the delivery of equipment or parts resulting from acts beyond the control of Bush Hog.

THIS LIMITED WARRANTY SHALL NOT APPLY:

1. To vendor items which carry their own warranties, such as engines, tires, and tubes.
2. If the unit has been subjected to misapplication, abuse, misuse, negligence, fire or other accident.
3. If parts not made or supplied by Bush Hog have been used in connection with the unit, if, in the sole judgment of Bush Hog such use affects its performance, stability or reliability.
4. If the unit has been altered or repaired outside of an authorized Bush Hog dealership in a manner which, in the sole judgment of Bush Hog, affects its performance, stability or reliability.
5. To normal maintenance service and normal replacement items such as gearbox lubricant, hydraulic fluid, worn blades, or to normal deterioration of such things as belts and exterior finish due to use or exposure.
6. To expendable or wear items such as teeth, chains, sprockets, belts, springs and any other items that in the company's sole judgment is a wear item.

NO EMPLOYEE OR REPRESENTATIVE OF BUSH HOG IS AUTHORIZED TO CHANGE THIS LIMITED WARRANTY IN ANY WAY OR GRANT ANY OTHER WARRANTY UNLESS SUCH CHANGE IS MADE IN WRITING AND SIGNED BY BUSH HOG'S SERVICE MANAGER, 2501 GRIFFIN AVE., SELMA, ALABAMA 36703.



Record the model number, serial number and date purchased. This information will be helpful to your dealer if parts or service are required.

MODEL NUMBER _____

SERIAL NUMBER _____

MAKE CERTAIN THE WARRANTY
HAS BEEN FILED WITH BUSH HOG
SELMA, ALABAMA

DATE OF RETAIL SALE _____

ASSEMBLY SECTION

Assembly Section 3-1

ASSEMBLY

Tractor Requirements

Tractor horsepower range should be between 70 to 125 HP and must be capable of controlling the Pull Type Drag Scraper under all operating conditions. Tractors outside this horsepower range must not be used.

Important

Your tractor may require additional ballast to maintain steering control. Refer to your Tractor's Operator's Manual and machine weights in Operation Section to make this determination.

The number of required hydraulic duplex outlets at the tractor is dependent upon how the Pull Type Drag Scraper is set-up.

One hydraulic duplex outlet is required if the scraper is equipped with the standard axle.

Two hydraulic duplex outlets are required if the scraper is equipped with the tilt axle.

Dealer Preparations

This Pull Type Drag Scraper has been partially assembled at the factory. Additional assembly will be required before the unit can be attach to the customer's tractor. Make sure the intended tractor conforms to the "Tractor Requirements" above.

Read and understand the Operator's Manual. An understanding of how the unit works will aid in the assembly and setup.

Torque Requirements

Refer to "Torque Values Chart" in the Maintenance Section to determine correct torque values when tightening hardware.

WARNING

Always secure heavy components with a hoist or other lifting device before removing hardware and bands that secure the components. Heavy components can fall suddenly causing serious injury or death.

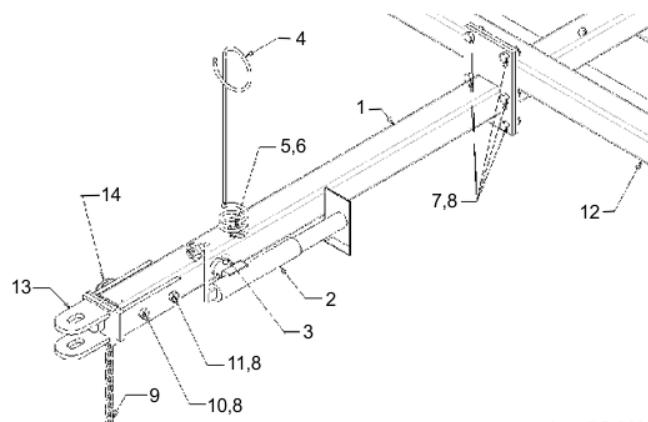
Important

Be sure to retain all uncrating hardware for assembly and set-up.

ASSEMBLY

Tongue Assembly

1. Mount the tongue weldment (#1) to the Drag frame (#12) using six 3/4" x 2" (#7) hex bolts and 3/4" nylock nuts (#8).
2. Mount the 10" tubular jack (#2) to the tongue weldment (#1) and secure with the locking pin (#3).
3. Fasten the hose spring (#4) to the tongue weldment (#1) using the 1/2" nut welded to the frame and one 1/2" x 1" hex bolt (#5) and two 1/2" washers (#6).
4. Attach the hitch assembly (#13) to the tongue weldment (#1) with a 3/4" x 7-1/2" hex bolt (#10) and one 3/4" x 6-1/2" hex bolt (#11) and two 3/4" nylock nuts (#8). Make sure the 3/4" x 7-1/2" bolt is used for the first hole closest to the hitch. This bolt is used for the safety chain (#9) and 3/8" x 3" safety chain washer (#14).

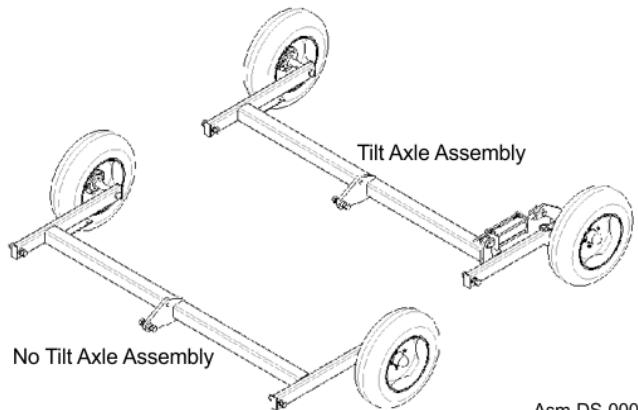


Asm-DS-0001

Axle Assembly

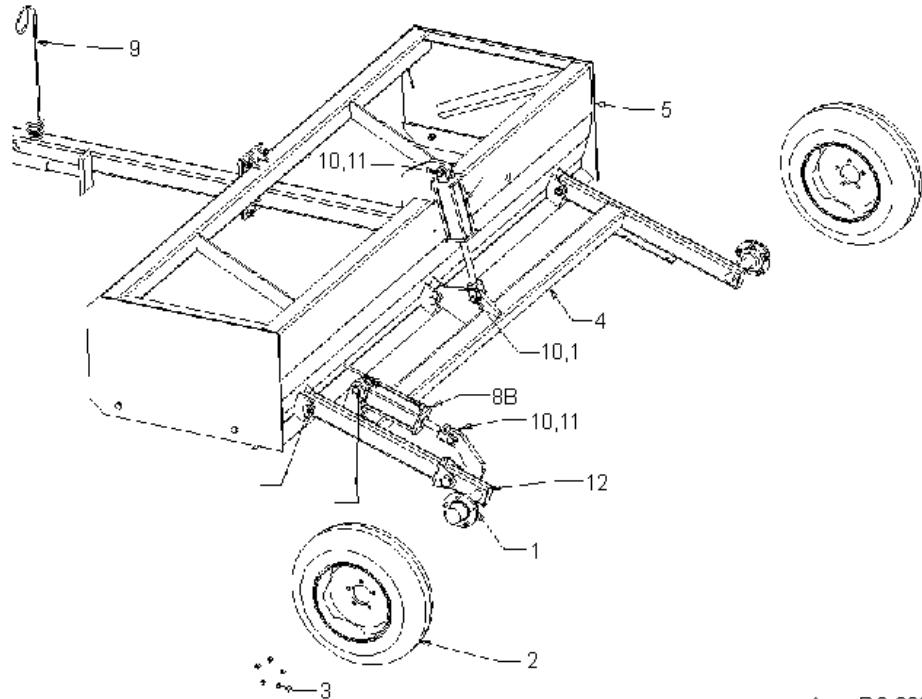
The Bush Hog pull type drag scraper is offered with a tilt or no tilt axle option. Use the drawing to the right to determine which axle you have because assembly is slightly different for each type of axle.

1. If you have a no tilt axle, skip to Step 2. Attach the gauge wheel adjuster weldment (#12) to the axle tilt frame (#4) using a 1-1/4" x 5" hex bolt (#9) and a 1-1/4" hex nut (#10).
2. Mount the wheel/tire assemblies (#2) to the hubs (#1) using six 1/2" lug nuts (#3).
3. Attach the axle frame (#4) to the Drag Frame (#5) using three 1" x 4-1/2" hex bolts (#6) and 1" nylock nuts (#7).
4. Hook up the 3-1/2" x 8" ASABE axle cylinder (#8) to each cylinder lug using a 1" x 3-1/4" cylinder pin (#10) and secure with a hair pin (#11). Attach two 90° elbow fittings to the up/down cylinder (#8) so that both are pointing up toward the sky when the cylinder is installed. Run the 150" axle cylinder hose (not shown) from the elbow fittings up and over the Drag frame and through the hose spring (#9).
5. For tilt axle only. Attach the 3-1/2" x 8 ASABE tilt cylinder (#8B) to each tilt lug with two 1" x 3-1/4" cylinder pins (#10) and secure with hair pins (#11). Attach two 90° elbow fittings to the up/down cylinder (#8B) so that both are pointing forward, toward the tractor when the cylinder is installed. Run the 200" hoses from the fittings up and over the Drag frame (#5) and through the hose spring (#9).



Asm-DS-0002

ASSEMBLY

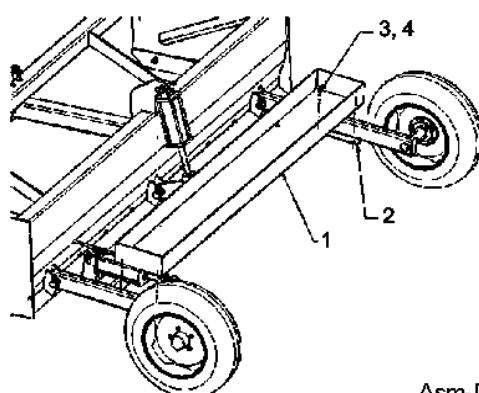


Asm-DS-0003

Weight Drag Option Assembly

Bush Hog offers an optional weight Drag that will work for a tilt or no tilt axle gauge wheel.

1. Lower the weight Drag (#1) on to the two weight Drag plates (#2) found on the gauge wheel frames.
2. Secure the weight Drag (#1) with four 1 1/2" x 1 1/4" hex bolts (#3) and four 1 1/2" nylock nuts (#4).
3. Add optional weight blocks into the weight Drag.



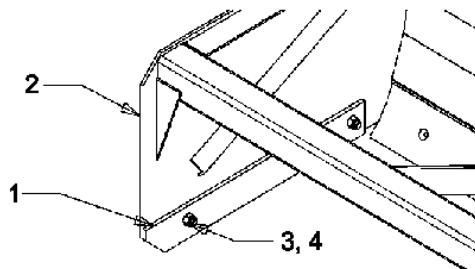
Asm-DS-0004

ASSEMBLY

Wear Plate Option

Bush Hog offers an optional wear plate located on the lower ground engaging surface of each side plate.

1. Bolt one wear plate (#1) to the right and left side plate (#2) facing the inside of the Drag using two 3/4" x 2" hex bolts (#3) and nylock nuts (#4).



Asm-DS-0005

Tractor Hook-up

DANGER

Crushing hazard between tractor and implement. Do not allow anyone to stand between tractor and implement while backing up to an implement. Do not operate hydraulic controls while someone is directly behind the tractor or near the Pull Type Drag Scraper.

CAUTION

Always make sure the hitch pin is secured with a keeper clip and the safety chain is attached to the tractor. Not doing so can result in the unit becoming unhitched and out of control.

CAUTION

Always secure the scraper in the up position with the cylinder transport lock when transporting. Hydraulics can seep or burst dropping the scraper blade resulting in loss of control.

CAUTION

Always engage parking brake, shut off tractor and remove key before dismounting from tractor to hook up equipment.

1. Back tractor within close proximity of clevis.
2. Shut off tractor and operate control arms back and forth to release all hydraulic line pressure.
3. Attach scraper hoses to the tractor hydraulic system.
4. Return to tractor, start tractor and operate control lever to raise rear wheels up until the scraper hitch aligns with tractor drawbar.
5. Back tractor up to the hitch until hitch holes align with drawbar hitch hole.
6. Engage parking brake, shut off tractor and remove key before dismounting from tractor to hook up equipment.
7. Attach scraper hitch to tractor with customer supplied hitch pin and safety chain to tractor. Make sure hitch pin is secured with a hitch pin keeper and safety chain is secure to the tractor hitch frame.

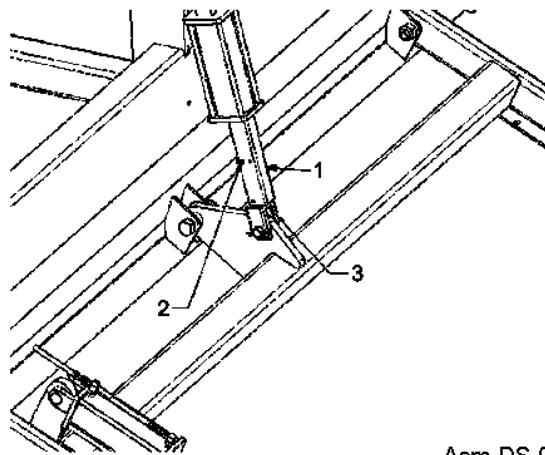
ASSEMBLY

Transporting

CAUTION

When traveling on public roads at night or during the day, use accessory lights and devices for adequate warning to operators of other vehicles. Comply with all federal, state and local laws.

1. Always raise scraper up and install cylinder transport lock (#1) on lift cylinder (#3) before traveling on roadways or long distances. Secure transport lock with wire retaining pin (#2).
2. Select a safe ground travel speed when transporting from one area to another.
3. Be sure to reduce tractor ground speed when turning; and leave enough clearance so the scraper does not contact obstacles such as building, trees or fences.
4. Shift to a lower gear when traveling over roughly or hilly terrain.
5. When traveling on roadways, transport is such that faster moving vehicles may pass you safely.



Asm-DS-0006

Field Set-up

WARNING

The following operational procedures should be carried out by the tractor operator. Other persons should be cleared of the area even during scraper set up. All scraper operation including field set up should be stepped when in the vicinity of other persons.

1. Raise scraper up to release any tension on the transport lock. Remove wire retaining pin and transport lock from lift cylinder.
2. Install transport lock on the storage gusset and secure with wire retaining pin.

Unhooking from the Tractor

CAUTION

Always engage parking brake, shut off tractor, and remove key before dismounting from tractor to unhook equipment.

1. Park Pull Type Drag Scraper on a level solid hard surface.
2. If optional tilt axle cylinder is included, fully retract cylinder to level the scraper's cutting edge.
3. Retract lift cylinder to lower scraper unit until cutting edge is resting on the ground and hitch weight is off the tractor drawbar.
4. Shut tractor off before removing hitch pin and safety chain.
5. Move tractor forward until tractor drawbar is clear of scraper hitch. Do not travel so far forward as to cause the hydraulic quick release couplings to connect.
6. Use lift control lever to lower scraper until scraper blade and side plates are resting on the ground.
7. Shut tractor engine off. Operate control arms back and forth to release all hydraulic line pressure.
8. Unhook hydraulic hoses from tractor. Store hose ends in hose support loop. Store hitch pin with scraper. If hitch pin is used with other equipment, store hitch pin with the tractor.
9. Drive tractor carefully away from scraper.

OPERATION SECTION

Operation Section 4-1

OPERATION

BUSH HOG DSP 8/10/12 PULL TYPE DIRT SCRAPER OPERATION INSTRUCTIONS

It is the Operator's responsibility to be knowledgeable of all potential operating hazards and to take every reasonable precaution to ensure oneself, others, animals, and property are not injured or damaged by the Implement, Tractor, or a thrown object. DO NOT operate the Implement if passersby, pets, livestock, or property are directly in front or to the rear of the unit.

This section of the Operator's Manual is designed to familiarize, instruct, and educate safe and proper implement use to the operator. Pictures contained in this section are intended to be used as a visual aid to assist in explaining the operation of a dirt scraper. Some pictures may show shields removed for purposes of clarity. NEVER OPERATE this implement without all shields in place and in good operational condition. The operator must be familiar with the Implement and tractor operation and all associated safety practices before operating the Implement and tractor. Proper operation of the Implement, as detailed in this manual, will help ensure years of safe and satisfactory use of the implement.

IMPORTANT: To avoid Implement damage, re torque all bolts after the first 10 hours of operation. Refer to the Torque Chart at the end of the Maintenance Section to ensure bolts are properly tightened.

READ AND UNDERSTAND THE ENTIRE OPERATING INSTRUCTIONS AND SAFETY SECTION OF THIS MANUAL AND THE TRACTOR MANUAL BEFORE ATTEMPTING TO USE THE TRACTOR AND IMPLEMENT. If you do not understand any of the instructions, contact your nearest authorized dealer for a full explanation. Pay close attention to all safety signs and safety messages contained in this manual and those affixed to the implement and tractor. OPS-U-0001

READ, UNDERSTAND, and FOLLOW the following Safety Messages. Death or serious injury may occur unless care is taken to follow the warnings and instructions stated in the Safety Messages. Always use good common sense to avoid hazards. (SG-2)



Si no lee inglés, pida ayuda a alguien que si lo lea para que le traduzca las medidas de seguridad. (SG-3)

I LEA EL
INSTRUCTIVO!



OPERATION

1. OPERATOR REQUIREMENTS

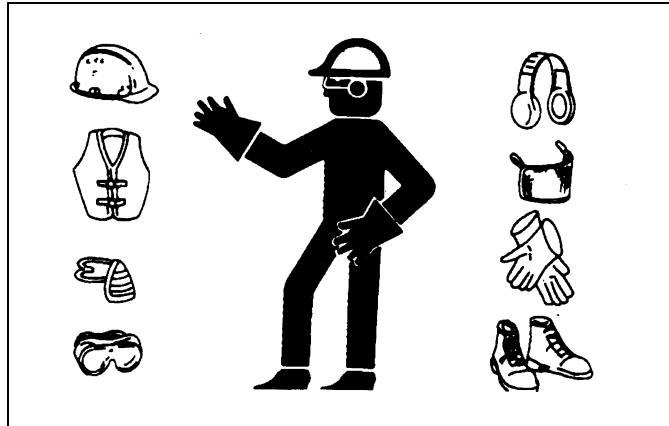
Safe operation of the unit is the responsibility of a qualified operator. A qualified operator has read and understands the implement and tractor Operator's Manuals and is experienced in implement and tractor operation and all associated safety practices. In addition to the safety messages contained in this manual, safety signs are affixed to the implement and tractor. If any part of the operation and safe use of this equipment is not completely understood, consult an authorized dealer for a complete explanation.

If the operator cannot read the manuals for themselves or does not completely understand the operation of the equipment, it is the responsibility of the supervisor to read and explain the manuals, safety practices, and operating instructions to the operator.

Safe operation of equipment requires that the operator wear approved Personal Protective Equipment (PPE) for the job conditions when attaching, operating, servicing, and repairing the equipment. PPE is designed to provide operator protection and includes the following safety wear:

PERSONAL PROTECTIVE EQUIPMENT (PPE)

- Always Wear Safety Glasses with Side Shields (marked with ANSI Z87)
- Hard Hat
- Steel Toe Safety Footwear
- Gloves
- Hearing Protection
- Close Fitting Clothing
- Respirator or Filter Mask (depends on operating conditions) OPS-U- 0002



DANGER

DO NOT use drugs or alcohol immediately before or while operating the Tractor and Implement. Drugs and alcohol will affect an operator's alertness and coordination and therefore affect the operator's ability to operate the equipment safely. Before operating the Tractor or Implement, an operator on prescription or over-the-counter medication must consult a medical professional regarding any side effects of the medication that would hinder their ability to operate the Equipment safely. NEVER knowingly allow anyone to operate this equipment when their alertness or coordination is impaired. Serious injury or death to the operator or others could result if the operator is under the influence of drugs or alcohol. (SG-27)



OPERATION

2. TRACTOR REQUIREMENTS

Tractor Requirements and Capabilities

- ASABE approved Roll-Over Protective Structure (ROPS) or ROPS cab and seat belt.
- Tractor Safety DevicesSlow Moving Vehicle (SMV) emblem, lighting, PTO master shield
- Tractor Horsepower (Max).....20 MPH
- HitchSee Model Specification Chart

2.1 ROPS and Seat Belt

The tractor must be equipped with a Roll-Over-Protective-Structure (ROPS) (tractor cab or roll-bar) and seat belt to protect the operator from falling off the tractor, especially during a roll over where the driver could be crushed and killed. Only operate the tractor with the ROPS in the raised position and seat belt fastened. Tractor models not equipped with a ROPS and seat belt should have these life saving features installed by an authorized dealer. OPS-U- 0003



Operate this Equipment only with a Tractor equipped with an approved roll-over-protective system (ROPS). Always wear seat belts. Serious injury or even death could result from falling off the tractor, particularly during a turnover when the operator could be pinned under the ROPS. (SG-7)



2.2 Tractor Safety Devices

If transporting or operating the tractor and implement near a public roadway, the tractor must be equipped with proper warning lighting and a Slow Moving Vehicle (SMV) emblem which are clearly visible from the rear of the unit. Lights and a SMV emblem must be equipped directly on implements if the visibility of the tractor warning signals are obscured.

Maintain all manufacturer equipped safety shields and guards. Always replace shields and guards that were removed for access to connect, service, or repair the tractor or implement. Never operate the tractor PTO with the PTO master shield missing or in the raised position. OPS-U- 0004

2.3 Tractor Horsepower

The power required to operate the dirt scraper is determined by the tractor PTO horsepower. For most operating conditions, implement requires a tractor with a horsepower range between 70 to 125 HP. Operating the implement with a tractor that does not have adequate power may damage the tractor engine. Exceeding required HP may cause implement damage by overpowering the unit in heavy cutting conditions.

2.4 Front End Weight

A minimum of 20% total tractor weight must be maintained on the tractor front end at all times. Front end weight is critical to maintain steering control and to prevent the tractor from rearing up while driving. If the front end is too light, add weight until a minimum of 20% total weight is reached on the front tires. Front weights and weight carriers can be purchased through an authorized tractor dealership. OPS-U-0005

OPERATION

3. GETTING ON AND OFF THE TRACTOR

Before getting onto the tractor, the operator must read and completely understand the implement and tractor operator manuals. If any part of either manual is not completely understood, consult an authorized dealer for a complete explanation. OPS-U-0007



Do not mount or dismount the Tractor while the tractor is moving. Mount the Tractor only when the Tractor and all moving parts are completely stopped. (SG-12)



3.1 Boarding the Tractor

Use both hands and equipped handrails and steps for support when boarding the tractor. Never use control levers for support when mounting the tractor. Seat yourself in the operator's seat and secure the seat belt around you.

Never allow passengers to ride on the tractor or attached equipment. Riders can easily fall off and be seriously injured or killed from falling off and being ran over. It is the operator's responsibility to forbid all extra riders at all times. OPS-U- 0008



Never allow children to operate, ride on, or come close to the Tractor or Implement. Usually, 16-17 year-old children who are mature and responsible can operate the implement with adult supervision, if they have read and understand the Operator's Manuals, been trained in proper operation of the tractor and Implement, and are physically large enough to reach and operate the controls easily. (SG-11)



Never allow children or other persons to ride on the Tractor or Implement. Falling off can result in serious injury or death. (SG-10)



3.2 Dismounting the Tractor

Before dismounting, park the tractor and implement on a reasonably level surface, apply the parking brake, idle the engine down, disengage the PTO, and lower the implement to the ground. Shut down the tractor engine according to the operator's manual, remove the key, and wait for all motion to completely stop. Never leave the seat until the tractor, its engine and all moving parts have come to a complete stop.

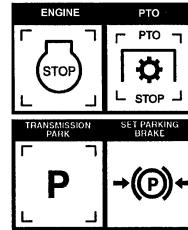
Use hand rails and steps when exiting the tractor. Be careful of your step and use extra caution when mud, ice, snow or other matter has accumulated on the steps or hand rails. Use all handrails and steps for support and never rush or jump off the tractor. OPS-U- 0009

OPERATION

OPERATION

DANGER

BEFORE leaving the tractor seat, lower the implement, set the parking brake and/or set the tractor transmission in parking gear, disengage the PTO, stop the engine, remove the key, and wait for all moving parts to stop. Place the tractor shift lever into a low range or parking gear to prevent the tractor from rolling. Never dismount a Tractor that is moving or while the engine is running. Operate the Tractor controls from the tractor seat only. (SG-9)



4. STARTING THE TRACTOR

The operator must have a complete understanding of the placement, function, and operational use of all tractor controls before starting the tractor. Review the tractor operator's manual and consult an authorized dealer for tractor operation instructions if needed.

Essential Tractor Controls:

- Locate the light control switch.
- Locate the engine shut off control.
- Locate the brake pedals and the clutch.
- Locate the PTO control.
- Locate the 3-point hitch control lever.
- Locate the hydraulic remote control levers.

Before starting the tractor ensure the following:

- Conduct all pre-start operation inspection and service according to the tractor operator's manual.
- Make sure all guards, shields, and other safety devices are securely in place.
- The parking brake is on.
- The PTO control lever is disengaged.
- The 3-point hitch control lever is in the lowered position.
- The hydraulic remote control levers are in the neutral position.
- The tractor transmission levers are in park or neutral.

Refer to the tractor owner's manual for tractor starting procedures. Only start the tractor while seated and belted in the tractor operator's seat. Never bypass the ignition switch by short circuiting the starter solenoid.

After the tractor engine is running, avoid accidental contact with the tractor transmission to prevent sudden and unexpected tractor movement. OPS-U-0028

DANGER

Never run the Tractor engine in a closed building or without adequate ventilation. The exhaust fumes can be hazardous to your health. (SG-23)

DANGER

Start tractor only when properly seated in the Tractor seat. Starting a tractor in gear can result in injury or death. Read the Tractor operators manual for proper starting instructions. (SG-13)



OPERATION

5. CONNECTING THE IMPLEMENT TO THE TRACTOR

Use extreme caution when connecting the Implement to the Tractor. The Implement should be securely resting at ground level or setting on blocks. Keep hands and feet under the Implement frame and clear of pinch points between the Tractor hitch arms and Implement pins.



Always shut the Tractor completely down, place the transmission in park, and set the parking brake before you or anyone else attempts to connect or disconnect the Implement and Tractor hitches. (S3PT-15)

5.1 Connecting the Implement

1. Shorten the tractor drawbar to avoid interference when raising and lowering the equipment.
2. Board the tractor and start the engine. Position the tractor to the equipment with the 3-Point lift arms positioned between the respective set of equipments A-frame lift lugs. **Note:** Set the 3-point lift control to "Position Control" so that the lift arms maintain a constant height when attaching the equipment. See the tractor Operator's Manual for correct settings when attaching 3-point equipment.
3. Turn off the tractor engine, set the parking brake, place the tractor in park, and dismount.



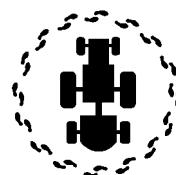
Ops-1994

6. PRE-OPERATION INSPECTION AND SERVICE

Before each use, a pre-operation inspection and service of the implement and tractor must be performed. This includes routine maintenance and scheduled lubrication, inspecting that all safety devices are equipped and functional, and performing needed repairs. DO NOT operate the unit if the pre-operation inspection reveals any condition affecting safe operation. Perform repairs and replacement of damaged and missing parts as soon as noticed. By performing a thorough pre-operation inspection and service, valuable down time and repair cost can be avoided. OPS-U-0029



Periodically inspect all moving parts for wear and replace when necessary with authorized service parts. Look for loose fasteners, worn or broken parts, and leaky or loose fittings. Make sure all pins have cotter pins and washers. Serious injury may occur from not maintaining this machine in good working order. (SG-21)



OPERATION

6.1 Tractor Pre-Operation Inspection/Service

Refer to the tractor operator's manual to ensure a complete pre-operation inspection and scheduled service is performed according to the manufacturers recommendations. The following are some of the items that require daily service and inspection:

- Tire condition/air pressure
- Wheel lug bolts
- Steering linkage
- PTO shield
- SMV sign is clean and visible
- Tractor's lights are clean and functional
- Tractor Seat belt is in good condition
- Tractor ROPS is in good condition
- ROPS is in the raised position
- No tractor oil leaks
- Radiator free of debris
- Engine oil level and condition
- Engine coolant level and condition
- Power brake fluid level
- Power steering fluid level
- Fuel condition and level
- Sufficient lubrication at all lube points
- Air filter condition *OPS-U-0030*



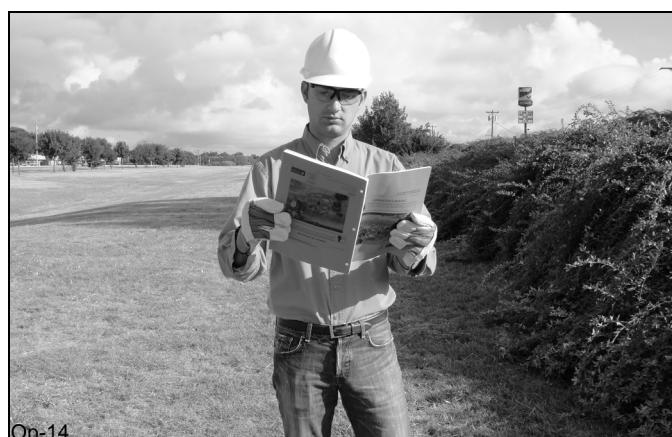
Op-13

6.2 Implement Pre-Operation Inspection/Service

Before each implement use, a complete inspection and service is required to ensure the implement is in a good and safe working condition. Damaged and/or broken parts should be repaired and/or replaced immediately. To ensure the implement is ready for operation, conduct the following. *OPS-T-0002*

The operator's manual and safety signs affixed on the unit contain important instructions on the safe and proper use of the equipment. Maintain these important safety features on the implement in good condition to ensure the information is available to the operator at all times.

- Ensure the manual canister is secured to the equipment with the operator's manual inside.
- Ensure all safety signs are in place and legible. Replace missing, damaged, and illegible decals. *OPS-U-0011*



Op-14

OPERATION

Dirt Scraper PRE-OPERATION Inspection



Scraper ID#: _____ Make: _____

Date: _____ Shift: _____

WARNING

Before conducting the inspection, make sure the tractor engine is off, all rotation has stopped and the tractor is in park with the parking brake engaged. Make sure the blade is resting on the ground or securely blocked up and all hydraulic pressure has been relieved.

Item	Condition at Start of Shift	Specific Comments if not O.K.
The Operator's Manual is in the Canister.		
All Safety Decals are in place and legible.		
The Hitch connection pins are properly retained.		
There are no cracks in Hitch.		
All bolts are in place and tight.		
All grease fittings and lubrication points have been greased.		
All wear items are not chipped, cracked or worn past intended use		

Operator's Signature: _____

DO NOT OPERATE an UNSAFE TRACTOR or IMPLEMENT

OPERATION

OPERATION

Tractor PRE-OPERATION Inspection



Tractor ID#: _____ Make: _____

Date: _____ Shift: _____

WARNING

Before conducting the inspection, make sure the tractor engine is off, all rotation has stopped and the tractor is in park with the parking brake engaged. Make sure the implement is resting on the ground or securely blocked up and all hydraulic pressure has been relieved.

Item	Condition at Start of Shift	Specific Comments if not O.K.
The flashing lights function properly		
The SMV Sign is clean and visible		
The tires are in good condition with proper pressure		
The wheel lug bolts are tight		
The tractor brakes are in good condition		
The steering linkage is in good condition		
There are no visible oil leaks		
The hydraulic controls function properly		
The ROPS or ROPS Cab is in good condition		
The seatbelt is in place and in good condition		
The 3-point hitch is in good condition		
The drawbar pins are securely in place		
The PTO master shield is in place		
The engine oil level is full		
The brake fluid level is full		
The power steering fluid level is full		
The fuel level is adequate		
The engine coolant fluid level is full		
The radiator is free of debris		
The air filter is in good condition		

Operator's Signature: _____

DO NOT OPERATE an UNSAFE TRACTOR or IMPLEMENT

OPERATION

7. DRIVING THE TRACTOR AND IMPLEMENT

Safe tractor transport requires the operator possess a thorough knowledge of the model being operated and precautions to take while driving with an attached implement. Ensure the tractor has the capacity to handle the weight of the implement and the tractor operating controls are set for safe transport. To ensure safety while driving the tractor with an attached implement, review the following. *OPS-U- 0012*



This Implement may be wider than the Tractor. Be careful when operating or transporting this equipment to prevent the Implement from running into or striking sign posts, guard rails, concrete abutments or other solid objects. Such an impact could cause the Implement and Tractor to pivot violently resulting in loss of steering control, serious injury, or even death. Never allow the Implement to contact obstacles. (S3PT-12)



Transport only at speeds where you can maintain control of the equipment. Serious accidents and injuries can result from operating this equipment at high speeds. Understand the Tractor and Implement and how it handles before transporting on streets and highways. Make sure the Tractor steering and brakes are in good condition and operate properly.



Before transporting the Tractor and Implement, determine the proper transport speeds for you and the equipment. Make sure you abide by the following rules:

Test the tractor at a slow speed and increase the speed slowly. Apply the Brakes smoothly to determine the stopping characteristics of the Tractor and Implement. As you increase the speed of the Tractor the stopping distance increases. Determine the maximum transport speed not to exceed 20 mph (30 kph) for transporting this equipment.

Test the equipment at a slow speed in turns. Increase the speed through the turn only after you determine that the equipment can be operated at a higher speed. Use extreme care and reduce your speed when turning sharply to prevent the tractor and implement from turning over. Determine the maximum turning speed for you and this equipment before operating on roads or uneven ground.

Only transport the Tractor and Implement at the speeds which allow you to properly control the equipment.



Be aware of the operating conditions. Do not operate the Tractor with weak or faulty brakes or worn tires. When operating down a hill or on wet or rain slick roads, the braking distance increases: use extreme care and reduce your speed. When operating in traffic always use the Tractor's flashing warning lights and reduce your speed. Be aware of traffic around you and watch out for the other guy. (SG-19)

OPERATION

7.1 Starting the Tractor

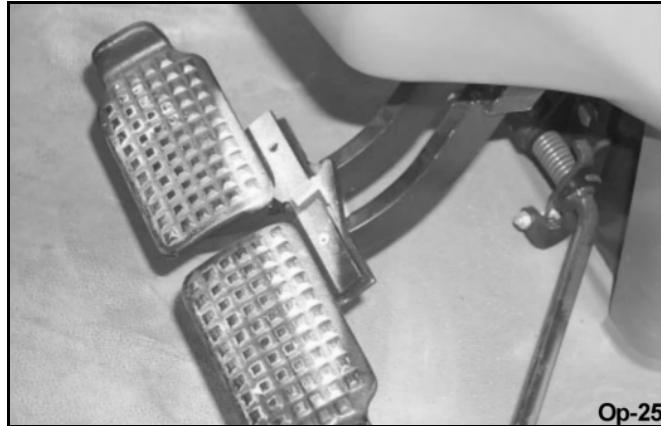
The procedure to start the tractor is model specific. Refer to the tractor operator's manual for starting procedures for your particular tractor. Consult an authorized dealer if the starting procedure is unclear. Ensure the 3-point control lever is in the lowered position and the PTO is disengaged before starting the tractor. OPS-U-0033



7.2 Brake and Differential Lock Setting

Make sure the tractor brakes are in good operating condition. Tractor brakes can be set to operate independently allowing single rear wheel braking action or locked together to provide simultaneous rear wheel braking. FOR MOST DRIVING AND OPERATING CONDITIONS, THE BRAKE PEDALS SHOULD BE LOCKED TOGETHER TO PROVIDE THE MOST EFFECTIVE BRAKING ACTION.

Always disengage the tractor differential lock when turning. When engaged the differential lock will prevent or limit the tractor from turning. During normal conditions, locking the differential provides no benefit and should not be used. OPS-U- 0013



Be aware of the operating conditions. Do not operate the Tractor with weak or faulty brakes. When operating down a hill or on wet or rain slick roads, the braking distance increases; use extreme care and reduce your speed in these conditions. When operating in traffic, always use the Tractor's flashing warning lights and reduce your speed. Be aware of traffic around you and watch out for the other guy.

Start off driving at a slow speed and gradually increase your speed while maintaining complete control of the Tractor and unit. Moving slowly at first will also prevent the Tractor from rearing up and loss of steering control. The Tractor should never be operated at speeds that cannot be safely handled or which will prevent the Operator from stopping quickly during an emergency. If the power steering or engine ceases operating, stop the tractor immediately as the Tractor will be difficult to control. If the Tractor becomes stuck or the tires are frozen to the ground, reverse the Tractor out to prevent overturning.

Perform turns with the Tractor and unit at slow speeds to determine how the Tractor with the unit handles a turn. Determine the safe operating speed to maintain proper control of the Tractor when making turns. When turning with an attached rear Implement, the overall length of the working unit is greater increased. Allow additional clearance for the Implement to swing when turning.

OPERATION

To avoid overturns, drive the tractor with care and at safe speeds, especially when operating over rough ground, crossing ditches or slopes and turning corners. Tractor wheel tread spacing should be increased when working on inclines or rough ground to reduce the possibility of tipping.

Use extreme caution when operating on steep slopes. Keep the Tractor in a low gear when going downhill. DO NOT coast or free-will downhill.

8. OPERATING THE TRACTOR AND IMPLEMENT

THE OPERATOR MUST COMPLETELY UNDERSTAND HOW TO OPERATE THE TRACTOR AND IMPLEMENT AND ALL CONTROLS BEFORE ATTEMPTING TO OPERATE. The operator must read and understand the Safety and Operation Sections of the implement and tractor operator's manuals. These manuals must be read and explained to any operator who cannot read. Never allow someone to operate the implement and tractor without complete operating instructions.

Before starting any operation, the operator must become familiar with the area to be worked in and any obstacles and hazards contained within to ensure safety to the operator, bystanders, and equipment. Special attention should be paid to foreign debris, rough terrain, steep slopes, and passersby and animals in the area.
OPS-U- 0015



Many varied objects, such as wire, cable, rope, or chains, can become entangled in the rotating parts of the Implement. These objects could then swing outside the housing at great velocity. Such a situation is extremely hazardous and could result in serious injury or even death. Inspect the area for such objects before working in the area. Remove any such objects from the site. Never allow the implement to contact such objects. (STL-6)

8.1 Disconnecting the Implement from the Tractor

Before disconnecting the Implement move the Implement to a level storage location and lower it to the ground. If the Implement is not resting securely on the ground, block the Implement up securely before attempting to disconnect it from the Tractor.

OPERATION

OPERATION

DANGER

Use extreme care to keep feet and hands from under the Implement and clear of any pinch points caused by the Tractor hitch arms and Implement pins. Never stand or allow another person to stand between a running Tractor and Implement when disconnecting the Implement from the Tractor. Always shut the Tractor off completely and set the parking brake before attempting to disconnect the Implement pins from the Tractor hitch.

DANGER

There are obvious and hidden potential hazards in the operation of this Implement as in all power-driven or pulled equipment. REMEMBER! This machine is often operated in rough terrain conditions that include grass, weeds, gullies, holes, slopes, hidden obstructions and the like. Serious injury or even death may occur unless care is taken to assure the safety of the operator and bystanders in the area. Do not operate this machine with anyone in the immediate area. Stop operating if anyone comes within 25 feet of the equipment. (STL-4)

DANGER

Always shut the Tractor completely down, place the transmission in park, and set the parking brake before you or anyone else attempts to connect or disconnect the Implement and Tractor hitches. (S3PT-15)

9. IMPLEMENT STORAGE

Properly preparing and storing the Implement at the end of the season is critical to maintaining its appearance and to help ensure years of dependable service. The following are suggested storage procedures:

- Thoroughly clean all debris off the Implement to prevent damage from rotting grass and standing water.
- Lubricate all Implement grease points as detailed in the maintenance section.
- Tighten all bolts and pins to the recommended torque.
- Check the implement for worn and damaged parts. Perform repairs and make replacements immediately so that the implement will be ready for use at the start of the next season.
- Store the implement in a clean, dry place with the implement resting securely on blocks or at ground level.
- Use spray touch-up enamel where necessary to prevent rust and maintain the appearance of the implement.

DANGER

Never allow children to play on or around Tractor or Implement. Children can slip or fall off the Equipment and be injured or killed. Inadvertent contact with controls can cause the Implement to shift or fall crushing themselves or others. (SG-25)

WARNING

Do not use your hands or feet to clean the disc gangs. The discs are sharp and serious injuries could result from inadvertent contact with the discs. Never attempt to stand on the discs, tires, or frame members of the implement. (STL-11)

OPERATION

10. TRANSPORTING THE TRACTOR AND IMPLEMENT

Inherent hazards of operating the tractor and implement and the possibility of accidents are not left behind when you finish working in an area. Therefore, the operator must employ good judgement and safe operation practices when transporting the tractor and implement between locations. By using good judgement and following safe transport procedures, the possibility of accidents while moving between locations can be substantially minimized. OPS-U- 0017



DANGER Never allow children or other persons to ride on the Tractor or Implement.
Falling off can result in serious injury or death. (SG-10)



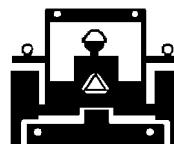
10.1 Transporting on Public Roadways

Extreme caution should be used when transporting the tractor and implement on public roadways. The tractor must be equipped with all required safety warning features including a SMV emblem and flashing warning lights to alert drivers of the tractor's presence. Remember that roadways are primarily designed for automotive drivers and most drivers will not be looking out for you, therefore, you must look out for them. Check your side view mirrors frequently and remember that vehicles will approach quickly because of the tractor's slower speed. Be extremely cautious when the piece of equipment that you are towing is wider than the tractor tire width and/or extends beyond your lane of the road.

Make sure that a proper size safety tow chain is secured between the tractor and implement before entering a public road. OPS-U- 0019



WARNING Make certain that the "Slow Moving Vehicle" (SMV) sign is installed in such a way as to be clearly visible and legible. When transporting the Equipment use the Tractor flashing warning lights and follow all local traffic regulations. (SG-6)



The SMV (Slow-Moving Vehicle) emblem is universal symbol used to alert drivers of the presence of equipment traveling on roadways at a slow speed. SMV signs are a triangular bright orange with reflective red trim for both easy day and night visibility. Make sure the SMV sign is clean and visible from the rear of the unit before transporting the tractor and implement on a public roadway. Replace the SMV emblem if faded, damaged, or no longer reflective. OPS-U- 0020



Op-43

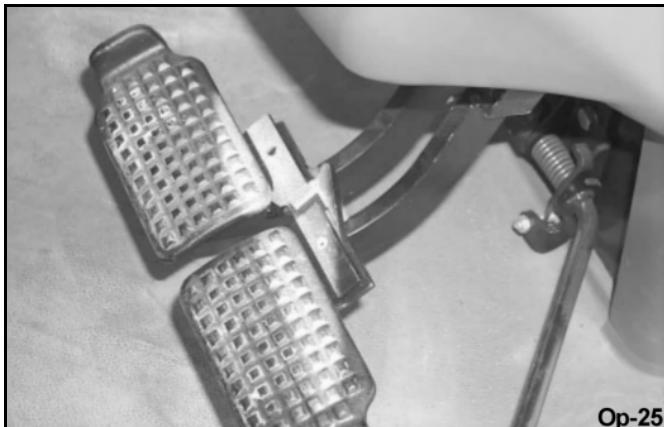
OPERATION

Make sure that all tractor flashing warning lights, headlights, and brake/tail lights are functioning properly before proceeding onto public roads. While newer model tractors have plenty of lighting to provide warning signals and operating lighting, most older models are only equipped with operating lights. Consult an authorized tractor dealer for lighting kits and modifications available to upgrade the lighting on older tractor models. OPS-U- 0021



When operating on public roads, have consideration for other road users. Pull to the side of the road occasionally to allow all following traffic to pass. DO NOT exceed the legal speed limit set in your area for agricultural tractors. Always stay alert when transporting the Tractor and Implement on public roads. Use caution and reduce speed if other vehicles or pedestrians are in the area.

Reduce speed before turning or applying the brakes. Ensure that both brake pedals are locked together when operating on public roads.



10.2 Hauling the Tractor and Implement

Before transporting a loaded tractor and implement, measure the height and width dimensions and gross weight of the complete loaded unit. Ensure that the load will be in compliance with the legal limits set for the areas that will be traveled through. OPS-U- 0024



OPERATION

Use adequately sized and rated trailers and equipment to transport the tractor and implement. Consult an authorized dealer to determine the proper equipment required. Using adequately sized chains, heavy duty straps, cables and/or binders, securely tie down both the front and rear of the tractor utilizing the proper tie down locations as specified by the tractor manufacturer. *OPS-U- 0025*



Arrange the chains so that when tightened, the chains are pulling downward and against themselves. Carefully tighten the securing chains or other fasteners using boomer or binders to apply maximum tension. Use extreme care when attaching and removing the securing devices as the extreme tension involved when released has the potential to inflict serious injury.

While hauling the tractor and implement, make occasional stops to check that the tractor and implement have not moved or shifted and that the securing chains have maintained tension. If during transport a hard braking, sharp turning, or swerving action was performed, stop at the next safe location to inspect the security of the load. *OPS-U- 0026*



MAINTENANCE SECTION

Maintenance Section 5-1

MAINTENANCE

General Maintenance Information

Proper servicing and adjustment is the key to the long life of any implement. With careful inspections and routine maintenance, you can avoid costly downtime and repair.

Check all bolts after using the unit for several hours to be sure they are tight. Replace any worn, damaged or illegible safety labels by obtaining new labels from your Bush Hog dealer.

The parts on your Pull Type Drag Scraper have been especially designed and should only be replaced with genuine Bush Hog parts. Do not alter the scraper in anyway which will adversely affect its performance.

Tractor Maintenance

One of the most important things you can do to prevent hydraulic system problems is ensure that your tractor's reservoir remains free of dirt and contamination. Use a clean cloth to wipe hose ends before attaching them to your tractor. Replace your tractor's hydraulic filter element at the prescribed intervals. These simple maintenance will go a long way to prevent occurrence of control valve and hydraulic cylinder problems.

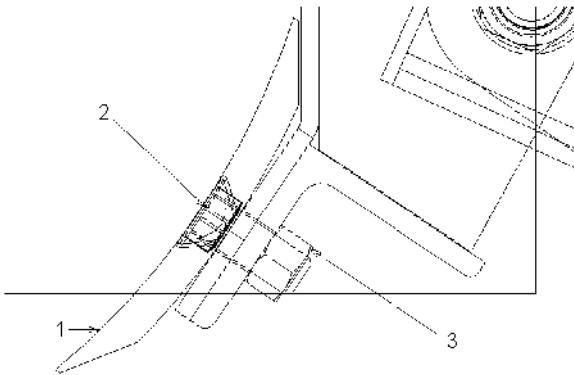
Cutting Edge

CAUTION

Always secure scraper in the up position with solid supports before servicing the underside. Never work under equipment supported by hydraulics. Hydraulics can drop equipment if controls are actuated or if hydraulic lines burst. Either situation can drop the scraper instantly even when power to the hydraulics is shut off.

Always inspect cutting blade (#1) before each use. Make certain it is properly installed and in good working condition.

1. Unbolt cutting blade (#1) and turn it over when the bottom cutting edge is worn out. Replace blade when the top and bottom edges are worn out.
2. Inspect 5/8"-11 x 1-3/4" GR5 plow bolts (#2) and hex nuts (#3) for wear. Replace if worn out.
3. Reattach blade (#1) with plow bolts (#2) and hex nuts (#3). Tighten nuts to the correct torque. (See Torque Value Chart in Maintenance Section).



Mnt-DS-0001

MAINTENANCE

Storage

Clean, inspect, service and make necessary repairs to the Pull Type Drag Scraper when parking it for long periods and when parking it at the end of a working season. This will help ensure that the scraper is ready for field use the next time you hook up to it.



Always secure scraper in the up position with solid supports before working under the scraper.

1. Scrape off compacted dirt and then wash scraper surfaces thoroughly with a garden hose.
2. Check grader blade and grader blade mounting bolts for wear. Reverse or replace grader blade if needed. Replace hardware if worn excessively.
3. Inspect scraper for loose, damaged or worn parts. Adjust and tighten loose parts or replace as needed.
4. Repaint parts where paint is worn or scratched to prevent rust. Ask your dealer for Bush Hog Aerosol touch up paint. They are also available in touch up bottles with brush, quarts and gallon sizes by adding TU, QT or GL to the end of the Aerosol part number.
5. Replace all damaged or missing decals.
6. Apply a light coat of oil or grease to the lower moldboard, side panels, grader blade and exposed hydraulic cylinder rods to minimize oxidation.
7. Store scraper on a level surface in a clean, dry place. Inside storage will reduce maintenance and make for a longer scraper file.
8. Follow all unhooking instructions in Operation Section when unhooking scraper from tractor.

Lubrication Points

Lubricate the hubs on your axle assembly before the first use and every 50 hours. These grease fittings can be found on the inside of each of your hubs.

Proper Torque For Fasteners

The chart lists the correct tightening torque for fasteners. When bolts are to be tightened or replaced, refer to this chart to determine the grade of bolts and the proper torque except when specific torque values are assigned in manual text.

Recommended Torque in Foot Pounds Unless Otherwise Stated in the Manual*

NOTE: *These values apply to fasteners as received from supplier, dry or when lubricated with normal engine oil. They do not apply if special graphited or molydisulphide greases or other extreme pressure lubricants are used. This applies to both UNF fine and UNC coarse threads.*

MAINTENANCE

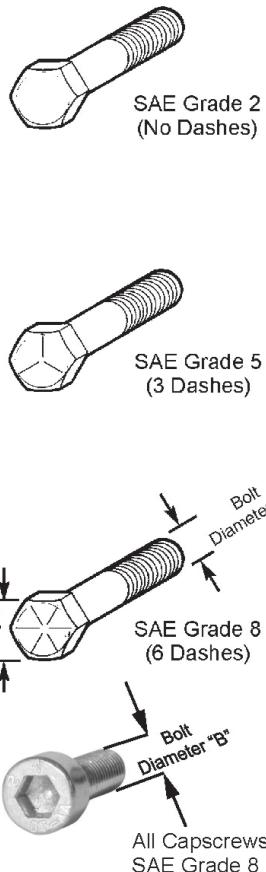
MAINTENANCE

MAINTENANCE

TORQUE SPECIFICATIONS - DRY TORQUE

AMERICAN

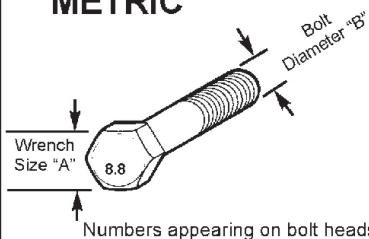
Bolt Head Markings



Proper torque for American fasteners.
Recommended Torque in Foot Pounds (Newton Meters).*

WRENCH SIZE (IN.) "A"	BOLT DIAMETER (IN.) "B" AND THREAD SIZE	SAE GRADE 2	SAE GRADE 5	SAE GRADE 8
7/16	1/4 - 20 UNC	6 (7)	8 (11)	12 (16)
7/16	1/4 - 28 UNF	6 (8)	10 (13)	14 (18)
1/2	5/16 - 18 UNC	11 (15)	17 (23)	25 (33)
1/2	5/16 - 24 UNF	13 (17)	19 (26)	27 (37)
9/16	3/8 - 16 UNC	20 (27)	31 (42)	44 (60)
9/16	3/8 - 24 UNF	23 (31)	35 (47)	49 (66)
5/8	7/16 - 14 UNC	32 (43)	49 (66)	70 (95)
5/8	7/16 - 20 UNF	36 (49)	55 (75)	78 (106)
3/4	1/2 - 13 UNC	49 (66)	76 (103)	106 (144)
3/4	1/2 - 20 UNF	55 (75)	85 (115)	120 (163)
7/8	9/16 - 12 UNC	70 (95)	109 (148)	153 (207)
7/8	9/16 - 18 UNF	79 (107)	122 (165)	172 (233)
15/16	5/8 - 11 UNC	97 (131)	150 (203)	212 (287)
15/16	5/8 - 18 UNF	110 (149)	170 (230)	240 (325)
1-1/8	3/4 - 10 UNC	144 (195)	266 (360)	376 (509)
1-1/8	3/4 - 16 UNF	192 (260)	297 (402)	420 (569)
1-5/16	7/8 - 9 UNC	166 (225)	430 (583)	606 (821)
1-5/16	7/8 - 14 UNF	184 (249)	474 (642)	668 (905)
1-1/2	1 - 8 UNC	250 (339)	644 (873)	909 (1232)
1-1/2	1 - 12 UNF	274 (371)	705 (955)	995 (1348)
1-1/2	1 - 14 UNF	280 (379)	721 (977)	1019 (1381)
1-11/16	1-1/8 - 7 UNC	354 (480)	795 (1077)	1288 (1745)
1-11/16	1-1/8 - 12 UNF	397 (538)	890 (1206)	1444 (1957)
1-7/8	1-1/4 - 7 UNC	500 (678)	1120 (1518)	1817 (2462)
1-7/8	1-1/4 - 12 UNF	553 (749)	1241 (1682)	2013 (2728)
2-1/16	1-3/8 - 6 UNC	655 (887)	1470 (1992)	2382 (3228)
2-1/16	1-3/8 - 12 UNF	746 (1011)	1672 (2266)	2712 (3675)
2-1/4	1-1/2 - 6 UNC	870 (1179)	1950 (2642)	3161 (4283)
2-1/4	1-1/2 - 12 UNF	979 (1327)	2194 (2973)	3557 (4820)

METRIC



Proper torque for Metric fasteners.
Recommended torque in Foot Pounds (Newton Meters).*

WRENCH SIZE (mm) "A"	BOLT DIA. (mm) "B"	ASTM 4.6	ASTM 8.8	ASTM 9.8	ASTM 10.9
8	5	1.8 (2.4)		5.1 (6.9)	6.5 (8.8)
10	6	3 (4)		8.7 (12)	11.1 (15)
13	8	7.3 (10)		21.1 (29)	27 (37)
16	10	14.5 (20)		42 (57)	53 (72)
18	12	25 (34)	74 (100)	73 (99)	93 (126)
21	14	40 (54)	118 (160)	116 (157)	148 (201)
24	16	62 (84)	167 (226)	181 (245)	230 (312)
30	20	122 (165)	325 (440)		449 (608)
33	22		443 (600)		611 (828)
36	24	211 (286)	563 (763)		778 (1054)
41	27		821 (1112)		1138 (1542)
46	30	418 (566)	1119 (1516)		1547 (2096)

Mnt-B-0005

*Use 75% of the specified torque value for plated fasteners. Use 85% of the specified torque values for lubricated fasteners.



TO THE OWNER/OPERATOR/DEALER

BUSH HOG®

To keep your implement running efficiently and safely, read your manual thoroughly and follow these directions and the Safety Messages in this Manual. The Table of Contents clearly identifies each section where you can easily find the information you need.

The OCCUPATIONAL SAFETY AND HEALTH ACT (1928.51 Subpart C) makes these minimum safety requirements of tractor operators:

REQUIRED OF THE OWNER:

1. Provide a Roll-Over-Protective Structure that meets the requirements of this Standard; and
2. Provide Seat belts that meet the requirements of this paragraph of this Standard and SAE J4C; and
3. Ensure that each employee uses such Seat belt while the tractor is moving; and
4. Ensure that each employee tightens the Seat belt sufficiently to confine the employee to the protected area provided by the ROPS

REQUIRED OF THE OPERATOR:

1. Securely fasten seat belt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near ditches, embankments, and holes.
3. Reduce speed when turning, crossing slopes, and on rough, slick, or muddy surfaces.
4. Stay off slopes too steep for safe operation.
5. Watch where you are going - especially at row ends, on roads, and around trees.
6. Do not permit others to ride.
7. Operate the tractor smoothly - no jerky turns, starts, or stops.
8. Hitch only to the drawbar and hitch points recommended by the tractor manufacturer.
9. When the tractor is stopped, set brakes securely and use park lock, if available.

-
- Keep children away from danger all day, every day...
 - Equip tractors with rollover protection (ROPS) and keep all machinery guards in place...
 - Please work, drive, play and live each day with care and concern for your safety and that of your family and fellow citizens.



BUSH HOG®

DSP8/10/12 -SOM - 05/21
Printed U.S.A

**DSP8/10/12
PULL TYPE DIRT SCRAPER**

P/N 50072308