

BOX BLADES

BB2048L

BB2048

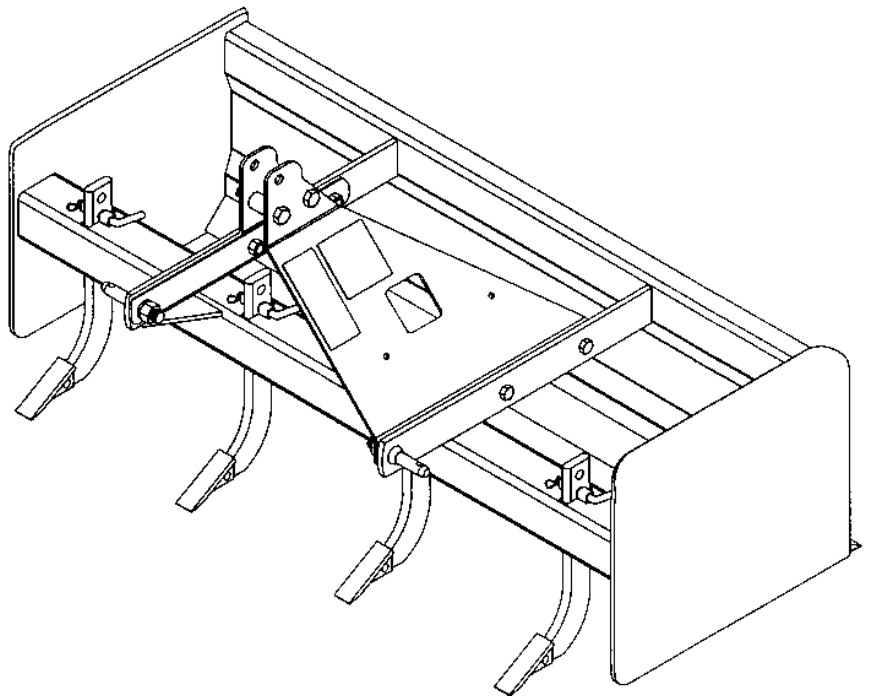
BB2060

BB2065

BB2072

BB2172

BB2184



FRONTIER™

TO THE DEALER:

Assembly and proper installation of this product is the responsibility of the Frontier dealer. Read manual instructions and safety rules. Make sure all items on the Dealer's Pre-Delivery and Delivery Check Lists in the Owner's/Operator's Manual are completed before releasing equipment to the owner.

The dealer must complete the Warranty Registration located on the Frontier website.

TO THE OWNER:

Read this manual before operating your Frontier equipment. The information presented will prepare you to do a better and safer job. Keep this manual handy for ready reference. Require all operators to read this manual carefully and become acquainted with all the adjustment and operating procedures before attempting to operate. Replacement manuals can be obtained from your selling dealer.

The equipment you have purchased has been carefully engineered and manufactured to provide dependable and satisfactory use. Like all mechanical products, it will require cleaning and upkeep. Lubricate the unit as specified. Observe all safety information in this manual and safety decals on the equipment.

For service, your authorized Frontier dealer has trained mechanics, genuine Frontier service parts, and the necessary tools and equipment to handle all your needs.

Use only genuine Frontier service parts. Substitute parts will void the warranty and may not meet standards required for safe and satisfactory operation. Record the model number and serial number of your equipment in the spaces provided:

Model: _____ **Date of Purchase:** _____

Serial Number: (see Safety Decal section for location) _____

Provide this information to your dealer to obtain correct repair parts.

Throughout this manual, the term **IMPORTANT** is used to indicate that failure to observe can cause damage to equipment. The terms **CAUTION, WARNING** and **DANGER** are used in conjunction with the Safety-Alert Symbol, (a triangle with an exclamation mark), to indicate the degree of hazard for items of personal safety.



This Safety-Alert Symbol indicates a hazard and means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**



Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.



Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed.



Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.



Indicates that failure to observe can cause damage to equipment.

Indicates helpful information.

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¡LEA EL INSTRUCTIVO!

Si no lee Ingles, pida ayuda a alguien que si lo lea para que le traduzca las medidas de seguridad.

GENERAL INFORMATION

The purpose of this manual is to assist you in operating and maintaining your Box Blade. Read it carefully. It furnishes information and instructions that will help you achieve years of dependable performance.

These instructions have been compiled from field experience and engineering data. Some information may be general in nature, due to unknown and varying operating conditions. However, through experience and these instructions, you should be able to develop procedures suitable to your particular situation.

The illustrations and data used in this manual were current at the time of printing. However, due to possible inline production changes, your machine may vary slightly in detail. We reserve the right to redesign and change the machines as may be necessary without notification.

Throughout this manual, references are made to right and left direction. These are determined by standing behind the tractor facing the direction of forward travel.

SPECIFICATIONS

	BB2048L	BB2048	BB2060	BB2065
Working Width	48" (122 cm)	48" (122 cm)	60" (152 cm)	66" (165 cm)
Height (Total)	29 ¹ / ₂ " (75 cm)	33 ¹ / ₂ " (85 cm)	33 ¹ / ₂ " (85 cm)	33 ¹ / ₂ " (85 cm)
Length	26" (66 cm)	31" (79 cm)	31" (79 cm)	31" (79 cm)
Moldboard Height	14" (36 cm)	17" (43 cm)	17" (43 cm)	17" (43 cm)
End Plate Thickness	³ / ₁₆ " (4.8 mm)	³ / ₈ " (9.5 mm)	³ / ₈ " (9.5 mm)	³ / ₈ " (9.5 mm)
No. Cutting Edges	2	2	2	2
Cutting Edge Size	¹ / ₂ " x 6" (12.7 x 152 mm) Reversible			
Approximate Weight	275 lbs (125 kg)	355 lbs (161 kg)	425 lbs (193 kg)	460 lbs (209 kg)
Number of Shanks	3	4	4	4
Rear Moldboard	Fixed	Fixed	Fixed	Fixed
Moldboard Thickness	³ / ₁₆ " (4.8 mm)	³ / ₁₆ " (4.8 mm)	³ / ₁₆ " (4.8 mm)	³ / ₁₆ " (4.8 mm)
Tractor HP Req.:	This box blade should be mounted on tractors with a max. engine rating of 25 hp (18.7 kw) and not exceed 2250 lb (1020 kg)			
2-Wheel Drive – Min.		17 hp	19 hp	23 hp
Max.		45 hp	55 hp	55 hp
4-Wheel Drive – Min.		17 hp	19 hp	23 hp
Max.	40 hp	40 hp	40 hp	
Hitch Category	Limited Cat 1 Optional Cat 0	Cat 1	Cat 1	Cat 1

	BB2072	BB2172	BB2184
Working Width	72" (183 cm)	72" (183 cm)	84" (213 cm)
Height (Total)	33 ¹ / ₂ " (85 cm)	33 ¹ / ₂ " (85 cm)	33 ¹ / ₂ " (85 cm)
Length	31" (79 cm)	31" (79 cm)	31" (79 cm)
Moldboard Height	17" (36 cm)	17" (43 cm)	17" (43 cm)
End Plate Thickness	³ / ₈ " (9.5 mm)	³ / ₈ " (9.5 mm)	³ / ₈ " (9.5 mm)
No. Cutting Edges	2	2	2
Cutting Edge Size	¹ / ₂ " x 6" (12.7 x 152 mm) Reversible		
Approximate Weight	494 lbs (225 kg)	585 lbs (265 kg)	667 lbs (303 kg)
Number of Shanks	5	6	7
Rear Moldboard	Fixed	Floating	Floating
Moldboard Thickness	³ / ₁₆ " (4.8 mm)	³ / ₁₆ " (4.8 mm)	³ / ₁₆ " (4.8 mm)
Tractor HP Req.:			
2-Wheel Drive – Min.	27 hp	30 hp	35 hp
Max.	55 hp	70 hp	70 hp
4-Wheel Drive – Min.	27 hp	30 hp	35 hp
Max.	40 hp	55 hp	55 hp
Hitch Category	Cat 1	Cat 1	Cat 1

2 Introduction



SAFETY RULES



ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by an operator's single careless act.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, judgement, and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It has been said "The best safety device is an informed, careful operator." We ask you to be that kind of operator.

TRAINING

■ **Safety instructions are important! Read all attachment and power unit manuals; follow all safety rules and safety decal information. (Replacement manuals are available from selling dealer.) Failure to follow instructions or safety rules can result in serious injury or death.**

■ **If you do not understand any part of this manual and need assistance, see your dealer.**

■ **Operators must be instructed in and be capable of the safe operation of the equipment, its attachments, and all controls. Do not allow anyone to operate this equipment without proper instructions.**

■ **Never allow children or untrained persons to operate equipment.**

■ **Train all new personnel and review instruction's frequently with existing workers. A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.**

PREPARATION

■ **Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.**

■ **Make sure attachment is properly secured, adjusted, and in good operating condition.**

■ **Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in "locked up" position at all times.**

■ **A minimum 20% of tractor and equipment weight must be on the tractor front wheels when attachments are in transport position. Without this weight, tractor could tip over, causing personal injury or death. The weight may be attained with a loader, front wheel weights, ballast in tires or front tractor weights. Weigh the tractor and equipment. Do not estimate.**

TRANSPORTATION

■ **Always comply with all state and local laws governing highway safety and lighting and marking requirements.**

■ **Never allow riders on power unit or attachment.**

■ **Do not operate or transport on steep slopes.**

■ **Use extreme care and reduce ground speed on slopes and rough terrain.**

■ **Do not operate or transport equipment while under the influence of alcohol or drugs. Consult your doctor about operating this machine while taking prescription medications.**

OPERATION

■ **Never go underneath equipment (lowered to the ground or raised) unless it is properly blocked and secured. Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off. Hydraulic system leak down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death.**

■ **Always comply with all state and local laws governing highway safety and lighting and marking requirements.**



SAFETY RULES



ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

OPERATION (cont'd from previous page)

- Operate only in daylight or good artificial light.
- Keep bystanders away from equipment.
- Keep hands, feet, hair, and clothing away from equipment while engine is running. Stay clear of all moving parts.
- Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in “locked up” position at all times.
- Never allow riders on power unit or attachment.
- Always sit in power unit seat when operating controls or starting engine. Securely fasten seat belt, place transmission in neutral, engage brake, and ensure all other controls are disengaged before starting power unit engine.
- Look down and to the rear and make sure area is clear before operating in reverse.
- Use extreme care when working close to fences, ditches, other obstructions, or on hill-sides.
- Do not operate or transport on steep slopes.
- Do not stop, start, or change directions suddenly on slopes. Always cut down slopes; never across the face.
- Use extreme care and reduce ground speed on slopes and rough terrain.
- Keep alert and watch the front as well as the rear when working with the box blade.
- Use extreme caution when backfilling deep holes or trenches.
- When using the box blade in a reverse position, use extra care. **DO NOT RAM** box blade into obstructions (including hard packed snow and dirt piles)! Tractor lift arms and the box blade are not built to take high impact loads in this position. Ramming backwards can also dislodge operator from seat and/or tractor controls, resulting in possible serious injury or death.
- Watch for and avoid hidden obstructions, i.e., buried pipes, rocks, concrete piers, uneven concrete slabs, stumps, etc., when operating.

■ Stop power unit and equipment immediately upon striking an obstruction. Turn off engine, remove key, inspect, and repair any damage before resuming operation.

■ Before leaving operator's seat, lower lift arms and put attachment on the ground. Engage brake, stop engine, remove key, and remove seat belt.

MAINTENANCE

■ Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.

■ Never go underneath equipment (lowered to the ground or raised) unless it is properly blocked and secured. Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off. Hydraulic system leak down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death.

■ Make sure attachment is properly secured, adjusted, and in good operating condition.

■ Before leaving operator's seat, lower lift arms and put attachment on the ground. Engage brake, stop engine, remove key, and remove seat belt.

■ Never perform service or maintenance with engine running.

■ Keep all persons away from operator control area while performing adjustments, service, or maintenance.

■ Tighten all bolts, nuts, and screws to torque chart specifications. Check that all cotter pins are installed securely to ensure equipment is in a safe condition before putting unit into service.

STORAGE

■ Block equipment securely for storage.

■ Keep children and bystanders away from storage area.

SAFETY & INSTRUCTIONAL DECALS




ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



Replace Immediately If Damaged!

WARNING



CRUSHING AND PINCHING HAZARD

- Be extremely careful handling various parts of the machine. They are heavy and hands, fingers, feet, and other body parts could be crushed or pinched between tractor and implement.
- Operate tractor controls from tractor seat only.
- Do not stand between tractor and implement when tractor is in gear.
- Make sure parking brake is engaged before going between tractor and implement.
- Stand clear of machine while in operation or when it is being raised or lowered.

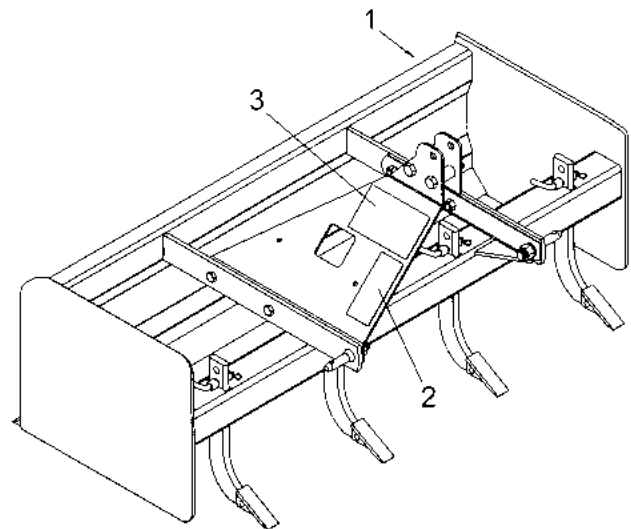
FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS INJURY OR DEATH.

2

#5WS101212



1 - Serial Number Plate



WARNING

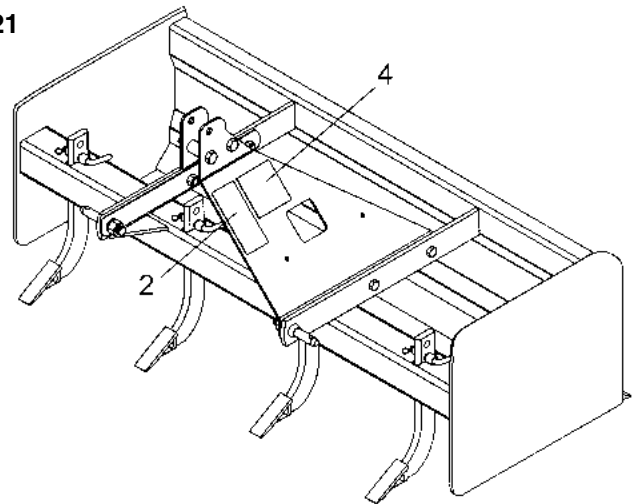
TO AVOID SERIOUS INJURY OR DEATH:

- Read Operator's Manual before operating, servicing or repairing equipment. Follow all safety rules and instructions. (Manuals are available from your selling dealer.)
- Never allow riders.
- Keep bystanders away from equipment during operation.
- Operate from tractor seat only.
- Keep all shields in place and in good condition.
- Lower equipment to ground, stop engine, remove key and set brake before dismounting tractor.
- Never allow children or untrained persons to operate equipment.

FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.

4

#5WS101221




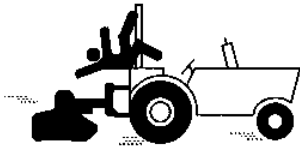
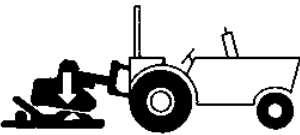


SAFETY & INSTRUCTIONAL DECALS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!
Replace Immediately If Damaged!



(safety decals continued from previous page)

 WARNING	
	<p>FALLING OFF CAN RESULT IN BEING RUN OVER.</p> <ul style="list-style-type: none">▪ Tractor must be equipped with ROPS (or ROPS CAB) and seat belt. Keep foldable ROPS systems in "locked up" position at all times.▪ Buckle Up! Keep seat belt securely fastened.▪ Allow no riders.
	<p>RAISED IMPLEMENT CAN DROP AND CRUSH.</p> <ul style="list-style-type: none">▪ Never go underneath raised implement which can drop from equipment or tractor 3-point hitch hydraulic leak down, hydraulic system failures, movement of control levers or mechanical linkage failures.▪ Service work does not require going underneath implement. Read manual instructions. <p>FALLING OFF OR GOING UNDERNEATH IMPLEMENT CAN RESULT IN SERIOUS INJURY OR DEATH.</p>

3 - #5WS101220

BE CAREFUL!

Use a clean, damp cloth to clean safety decals.

Avoid spraying too close to decals when using a pressure washer; high-pressure water can enter through very small scratches or under edges of decals causing them to peel or come off.

Replacement safety decals can be ordered free from your dealer.

DEALER ASSEMBLY

(Models BB2048L and BB2048, BB2060, BB2065, BB2072
after serial 1XFBB20XAB0007499)

ASSEMBLY OF MAST PLATES

Models BB2048L and BB2048, BB2060, BB2065,
BB2072 after serial 1XFBB20XAB0007499

Remove the two cartons from the pallet. Unfasten the box blades from the pallet and each other. (Note: the $\frac{5}{8}$ " bolts connecting the box blades are used to bolt the mast plates.)

Position one plate to the inside of the long hitch bar. Install the two $\frac{5}{8}$ " x $1\frac{1}{2}$ " bolts in the middle and rear holes (all nuts to the inside – do not tighten at this time).

Repeat above with the other mast plate.

Install the two $\frac{7}{8}$ " Cat. 1 pull pins to align the holes.

For Cat. 0 (Model BB2048L only) replace Cat. 1 pull pins with Cat. 0 pins. NOTE: Cat. 0 pins go to the inside.

Install the $\frac{3}{4}$ " x $3\frac{1}{2}$ " bolt and spacer bushing in the lower hole toward the top of the plates (not the top hole). This connects the plates at the top.

NOTE: (Model BB2048L only) if operating with Cat. 0 hitch tractor, move $\frac{3}{4}$ " bolt and spacer (4) (see figure 1) to top hole and use second hole down to attach toplink. (Cat. 0 Hitch operation only.)

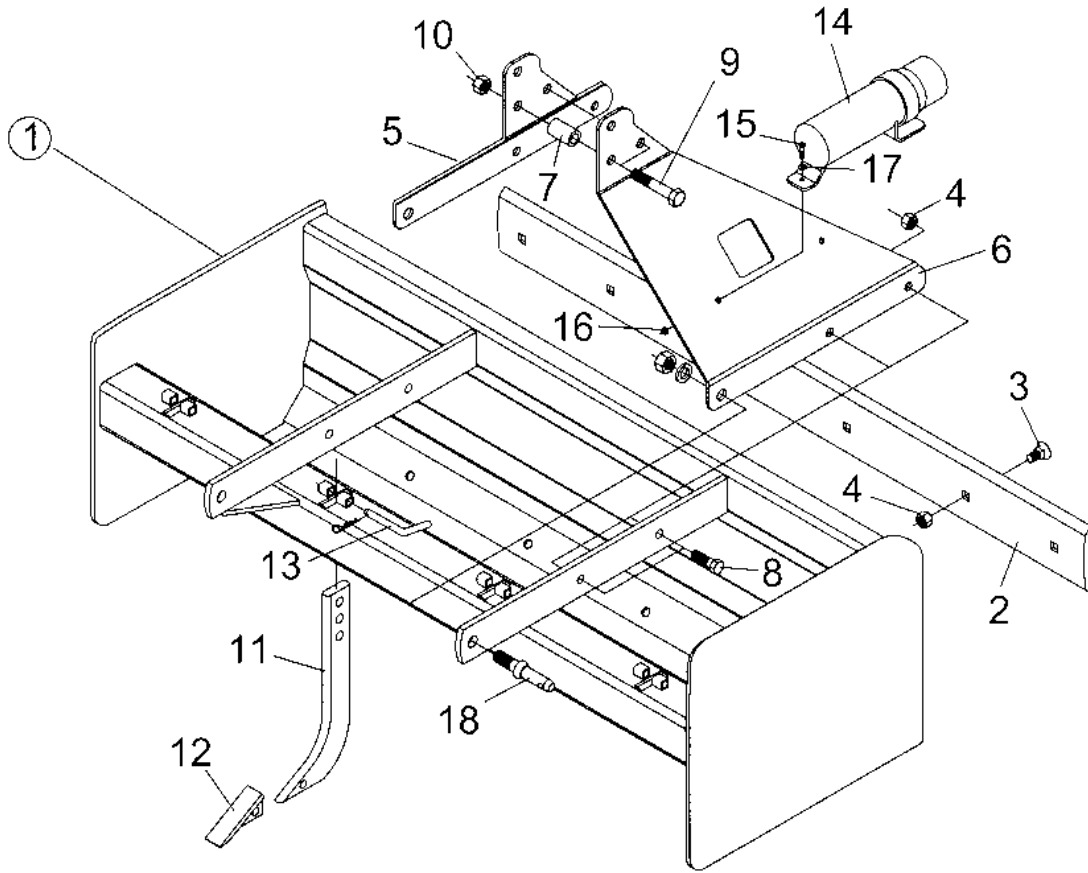
Tighten all bolts. Refer to torque chart on page 20.

Install the owner's/operator's manual tube on the side of the left mast plate using the two $\frac{1}{4}$ " x 1" bolts and hardware.

Position manual tube so cap is toward the rear.

Reverse the scarifier shanks so they point forward.

The box blade is now ready to use.



DEALER ASSEMBLY

(Models BB2048, BB2060, BB2065, BB2072 before serial 1XFBB20XAB0007499 and BB2172, BB2184)

NOTE: Models BB2048, BB2060, BB2065, BB2072

Remove the two cartons from the pallet. Unfasten the box blades from the pallet and each other. (Note: the $\frac{5}{8}$ " bolts connecting the box blades are used to bolt the mast plates.)

NOTE: Models BB2172, BB2184

One carton contains the mast plates, manual tube, and hardware bag.

Position one plate to the inside of the long hitch bar. Install the two $\frac{5}{8}$ " x 2" bolts in the middle and rear holes. Then install the $\frac{5}{8}$ " x 5" bolts through both hitch bars and the mast plate (all nuts to the inside – do not tighten at this time).

Repeat above with the other mast plate.

Install the two $\frac{7}{8}$ " x $4\frac{1}{4}$ " pull pins to align the holes.

Install the two $\frac{3}{4}$ " x 4" bolts and spacer bushings in the two holes toward the top of the plates (not the single top hole). This connects the plates at the top.

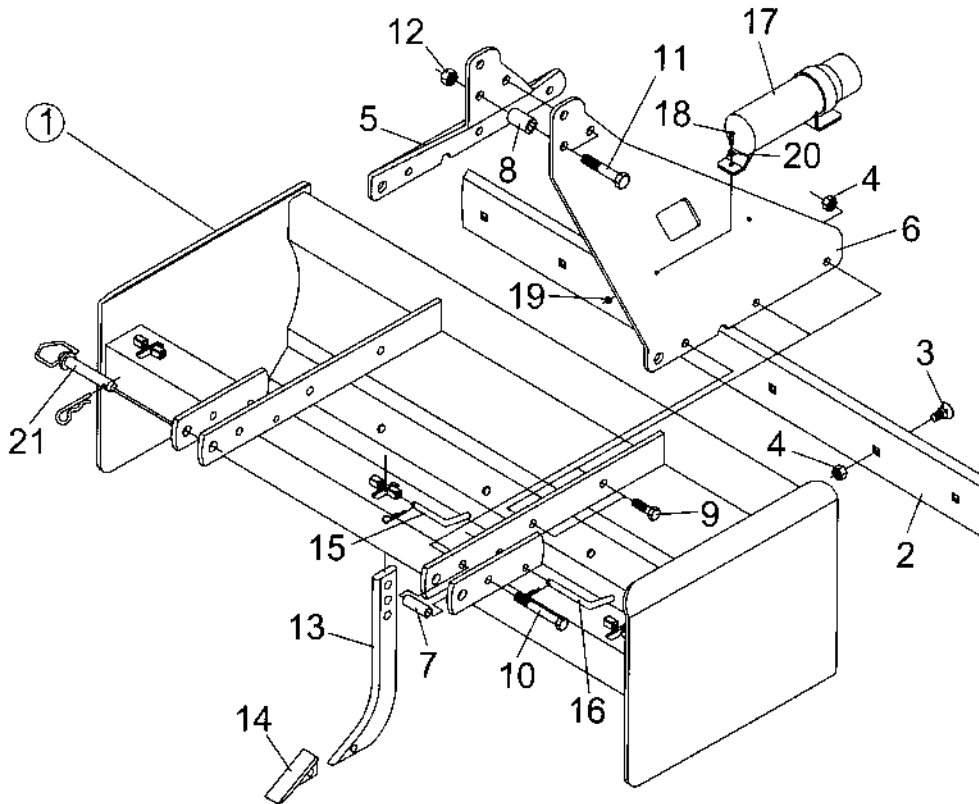
Tighten all bolts. Refer to torque chart on page 20.

Install the owner's/operator's manual tube on the side of the left mast plate using the two $\frac{1}{4}$ " x 1" bolts and hardware.

Position manual tube so cap is toward the rear.

Reverse the scarifier shanks so they point forward.

The box blade is now ready to use.



DEALER CHECK LISTS

PRE-DELIVERY CHECK LIST

(Dealer's responsibility)

Inspect the equipment thoroughly after assembly to be certain it is set up properly before delivering it to the customer. The following check list is a reminder of points to inspect. Check off each item if it is found satisfactory or after proper adjustment is made.

_____ Check that all safety decals are installed and in good condition. Replace if damaged.

_____ Check all bolts to be sure they are tight.

_____ Check that all cotter pins and safety pins are properly installed.

_____ Order package of Lower Hitch Sleeves if customer has Category I Quick Hitch.

(For BB2048L and BB2048, BB2060, BB2065, BB2072 after serial 1XFBB20XAB0007499)

ORDER Part # 5WS862500

(For BB2048, BB2060, BB2065, BB2072 before serial 1XFBB20XAB0007499 and BB2172, BB2184)

ORDER Part # 5WS590335

_____ For Model BB2048L only – order package of Cat. 0 pull pins if customer has Category 0 Hitch. (Part # 5WS590331)

DELIVERY CHECK LIST

(Dealer's Responsibility)

_____ Show customer the safe, proper procedures to be used when mounting, dismounting, and storing equipment.

_____ For mounted units, add wheel weights, ballast in front tires, and/or front tractor weight to enhance front end stability. A minimum 20% of tractor and equipment gross weight must be on front tractor wheels. When adding weight to attain 20% of tractor and equipment weight on front tractor wheels, you must not exceed the ROPS weight certification. Weigh the tractor and equipment. Do not estimate!

_____ Show customer how to make adjustments.

_____ Present Owner's/Operator's Manual and request that customer and all operators read it before operating equipment. Point out the manual safety rules, explain their meanings and emphasize the increased safety hazards that exist when safety rules are not followed.

_____ Point out the safety decals. Explain their meaning and the need to keep them in place and in good condition. Emphasize the increased safety hazards when instructions are not followed.

_____ Explain to customer the potential crushing hazards of going underneath raised equipment. Instruct customer that service work does not require going underneath unit and never to do so.

_____ Complete the Warranty Registration located on the Frontier website.

OPERATION

Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by an operator's single careless act.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, judgement, and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It has been said "The best safety device is an informed, careful operator." We ask you to be that kind of operator.

The operator is responsible for the safe operation of this equipment. The operator must be properly trained. Operators should be familiar with the equipment, the tractor, and all safety practices before starting operation. Read the safety rules and safety decals on pages pages 3 through page 6.

The box blades are designed for a wide range of applications: scarifying, scraping, leveling, grading, and backfilling.



WARNING

■ Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS systems in "locked up" position at all times.

■ Never allow children or untrained persons to operate equipment.

■ Keep bystanders away from equipment.



CAUTION

■ Stop tractor and implement immediately upon striking an obstruction. Turn off engine, remove key, inspect, and repair any damage before resuming operation.

■ Always wear relatively tight and belted clothing to avoid entanglement in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head.

OWNER/OPERATOR PRE-OPERATION CHECK LIST

(Owner's/Operator's responsibility)

____ Review and follow all safety rules and safety decal instructions on pages 3 through page 6.

____ Check that equipment is properly and securely attached to tractor.

____ Check that all safety decals are installed and in good condition. Replace if damaged.

____ Check that all hardware is properly installed and secured.

____ Do not allow riders.

____ Make sure tractor ROPS or ROPS CAB and seat belt are in good condition. Keep seat belt securely fastened during operation.

Connecting Box Blade to Tractor

The box blade is compatible with Category 1, 3 point tractors equipped with side swing-type lower lift arms and some Category 0 tractors.

1. To avoid interference with the box blade, adjust tractor drawbar to the shortest and highest position.
2. Attach the tractor's lower lift arms to the box blade and secure in place with Category 1 mounting pin (1) and lock pin (2).

For Cat. 0 (Model BB2048L only) replace Cat. 1 pull pins with Cat. 0 pins. NOTE: Cat. 0 pins go to the inside.

3. If box blade is going to be used in reverse, tractor must be equipped with stabilizer bars, adjustable sway chains, or sway blocks to keep the implement from swinging side to side.

For Category 1 Quick Hitch application, order optional bushing kit part # 5WS862500 (one pair); place bushing over draw pin and fasten with roll pin.

4. Attach the tractor's top link to the top of the box blade's mast and secure with the top link pin and retaining pin supplied with the top link.

For Quick Hitch application, top of hitch will seat into sleeve (4). This sleeve does not interfere when unit is used with a standard Category 1, 3 point hitch.

IMPORTANT

■ The 3/4" bolt and sleeve (4) in the lower hole provide the attachment point for a Category 1 quick coupler. Do not remove this bolt and sleeve when operating the box blade with Cat. 1 tractor.

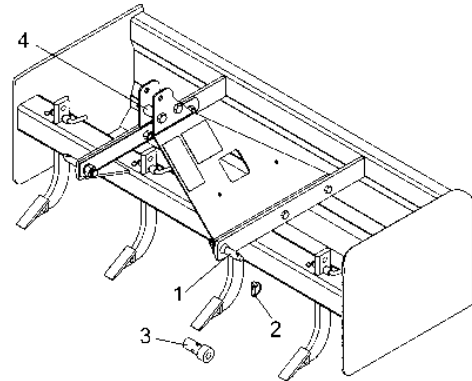


Figure 1 Connecting Box Blade to Tractor

1. Category 1 Hitch Pin
2. Lock Pin
3. Lower Hitch Sleeve (optional)
4. Upper Hitch Sleeve

Adjusting Top Link

The box blade is leveled front to rear by adjusting the length of the tractor's top link.

- Shortening the top link will deepen the scarifier tooth penetration.
- Lengthening the top link will provide better scraping and leveling action.

Experience will allow the operator to determine the best setting for the application being done.

NOTE: (Model BB2048L only) if operating with Cat. 0 hitch tractor, move 3/4" bolt and spacer (4) (see figure 1) to top hole and use second hole down to attach toplink. (Cat. 0 Hitch operation only.)

Scarifying

1. Place the scarifier shanks in position with the points facing toward the tractor.
2. Lock into position with the pins provided. The lower shank position provides the greatest ground penetration.
3. Lower the box blade and drive the tractor ahead to begin the scarifying operation.

4. Adjust the depth of the scarifier by using the middle or top hole in the shank and by tilting the unit with the tractor top link. Shortening the top link will provide deeper and more aggressive operation.

Connecting Box Blade to Tractor

The box blade is compatible with Category 1, 3 point tractors equipped with side swing-type lower lift arms.

1. To avoid interference with the box blade, adjust tractor drawbar to the shortest and highest position.
2. Attach the tractor's lower lift arms to the box blade and secure in place with Category 1 mounting pin (1) and lock pin (2).
3. If box blade is going to be used in reverse, tractor must be equipped with stabilizer bars, adjustable sway chains, or sway blocks to keep the implement from swinging side to side.

For Category 1 Quick Hitch application, place sleeve (3) over mounting pin (optional). Order Part # 5WS590335 (one pair).

4. Attach the tractor's top link to the top of the box blade's mast and secure with the top link pin and retaining pin supplied with the top link.

For Quick Hitch application, top of hitch will seat into sleeve (4). This sleeve does not interfere when unit is used with a standard 3 point hitch.

IMPORTANT

■ The 3/4" bolt and sleeve (4) in the lower hole provide the attachment point for a Category 1 quick coupler. Do not remove this bolt and sleeve when operating the box blade with Cat. 1 tractor.

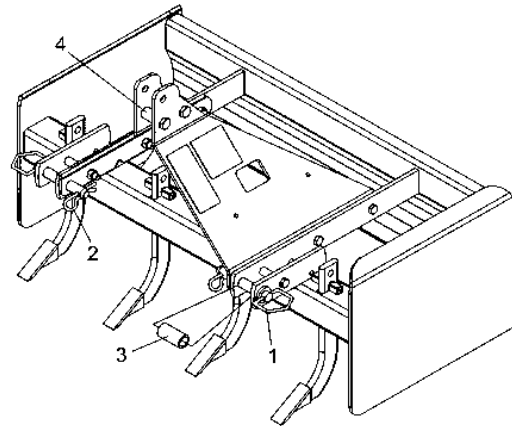


Figure 1 Connecting Box Blade to Tractor

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2. Lock Pin
3. Lower Hitch Sleeve (optional)
4. Upper Hitch Sleeve

Adjusting Top Link

The box blade is leveled front to rear by adjusting the length of the tractor's top link.

- Shortening the top link will deepen the scarifier tooth penetration.
- Lengthening the top link will provide better scraping and leveling action.

Experience will allow the operator to determine the best setting for the application being done.

Scarifying

1. Place the scarifier shanks in position with the points facing toward the tractor.
2. Lock into position with the pins provided. The lower shank position provides the greatest ground penetration.
3. Lower the box blade and drive the tractor ahead to begin the scarifying operation.

4. Adjust the depth of the scarifier by using the middle or top hole in the shank and by tilting the unit with the tractor top link. Shortening the top link will provide deeper and more aggressive operation.

Operation *Cont'd*

Scraping

1. Raise or remove the scarifier shanks. Lower the box blade and drive forward to move material.
2. Adjust the depth of the box blade by tilting the unit with the tractor top link.

Shortening the top link when scraping will transfer more weight on the front of the box blade and will raise the cutting edge to provide a more shallow cut.

NOTE: When the top link is adjusted properly, the bowl of the box blade should fill easily and material can be pulled to a desired location.

3. To change the side to side level of the box blade, shorten or lengthen the tractor lift arm tilt link to provide the correct slope.
4. Spread material by gradually raising the box blade as the tractor moves forward.

NOTE: Top link adjustment for loose or previously scarified material will differ from adjustment for hard or compacted material.

NOTE: Shanks can be stored upside down in main tube slots. Pin in position.

Backfilling

1. Raise or remove scarifier shanks.
2. Tractor must be equipped with stabilizer bars, adjustable sway chains, or sway blocks to keep the box blade from swinging side to side.
3. Lower the box blade to the ground and back up into the fill material.

4. Shorten the top link to raise the cutting edge and control how much the blade digs in.

NOTE: Shanks can be stored upside down in main tube slots. Pin in position.

Leveling

1. Raise or remove scarifier shanks.
2. Shorten the top link so the cutting edge clears the ground.
3. Drive forward with the box blade in this position and loose material will be leveled.

NOTE: Shanks can be stored upside down in main tube slots. Pin in position.

STORAGE

Storage

- Block equipment securely for storage (see Figure 2).
- Keep children, bystanders, and livestock away from storage area.
- Storage location should be level and solid to make hitching and unhitching easy.

OWNER SERVICE

The information in this section is written for operators who possess basic mechanical skills. If you need help, your dealer has trained service technicians available. For your protection, read and follow the safety information in this manual.

WARNING

■ **NEVER GO UNDERNEATH EQUIPMENT.** Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off. Hydraulic system leak down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death.

- Service work does not require going underneath.
- Read Manual for service instructions or have service performed by a qualified dealer.

WARNING

■ **Keep all persons away from operator control area while performing adjustments, service, or maintenance.**

■ **Before dismounting power unit or performing any service or maintenance, follow these steps: disengage power to equipment, lower the 3 point hitch and all raised components to the ground, operate valve levers to release any hydraulic pressure, set parking brake, stop engine, remove key, and unfasten seat belt.**

CAUTION

■ **Always wear relatively tight and belted clothing to avoid entanglement in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head.**

Blocking Up Box Blade

NOTE: To service the box blade when attached to the tractor, it must be blocked up off the ground.

1. Place two 6" x 6" (15 x 15 cm) blocks under each side frame of the box blade as shown in Figure 2.
2. Lower the box blade to rest securely on the blocks.
3. Do not block the machine any higher than needed for removing the shanks or cutting edges.

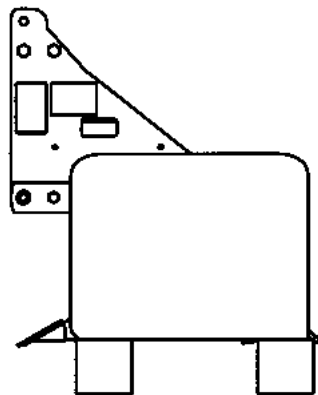


Figure 2 Box Blade Blocked Up

Removing or Adjusting Scarifier Shanks

Scarifier shanks have three positions in the box blade. They may be removed if scarifying action is not needed.

1. Block up machine by placing two 6" x 6" (15 x 15 cm) blocks under each side-frame of the box blade (see Figure 2).
2. Lower the box blade to rest securely on the blocks.

NOTE: Do not block the machine any higher than necessary to remove the shanks or cutting edges.

3. Remove the hairpin clip and hold the lower part of the shank while removing the shank position pin.
4. Raise or lower the shank as desired and reinstall the shank position pin. Secure with the hairpin clip.

5. If removing the shanks, place them upside down in the slot and install the shank position pin to hold the shank. Secure with the hairpin clip. This keeps the shanks with the box blade and ready for use when needed.

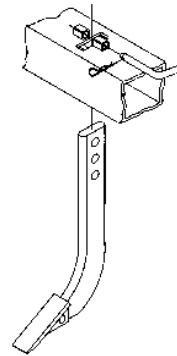


Figure 3 Scarifier Shanks

Replacing Scarifier Tooth

1. Remove scarifier shank from the scarifier bar.
2. Remove the worn tooth by driving a chisel between the shank (1) and tooth (2). Some teeth have a small weld holding the tooth to the shank. This weld must be cut.
3. Install the replacement tooth and use a welder to weld in place. One weld about 1/2" long each side will suffice.
4. Reinstall the shank in the scarifier bar.

1. Shank
2. Tooth

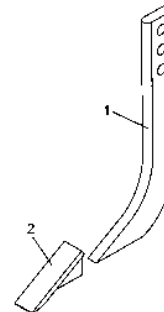


Figure 4 Scarifier Point Replacement

Replacing Cutting Edge

All box blade models use two 1/2" x 6" (12.7 x 152 mm) cutting edges. They are interchangeable and reversible.

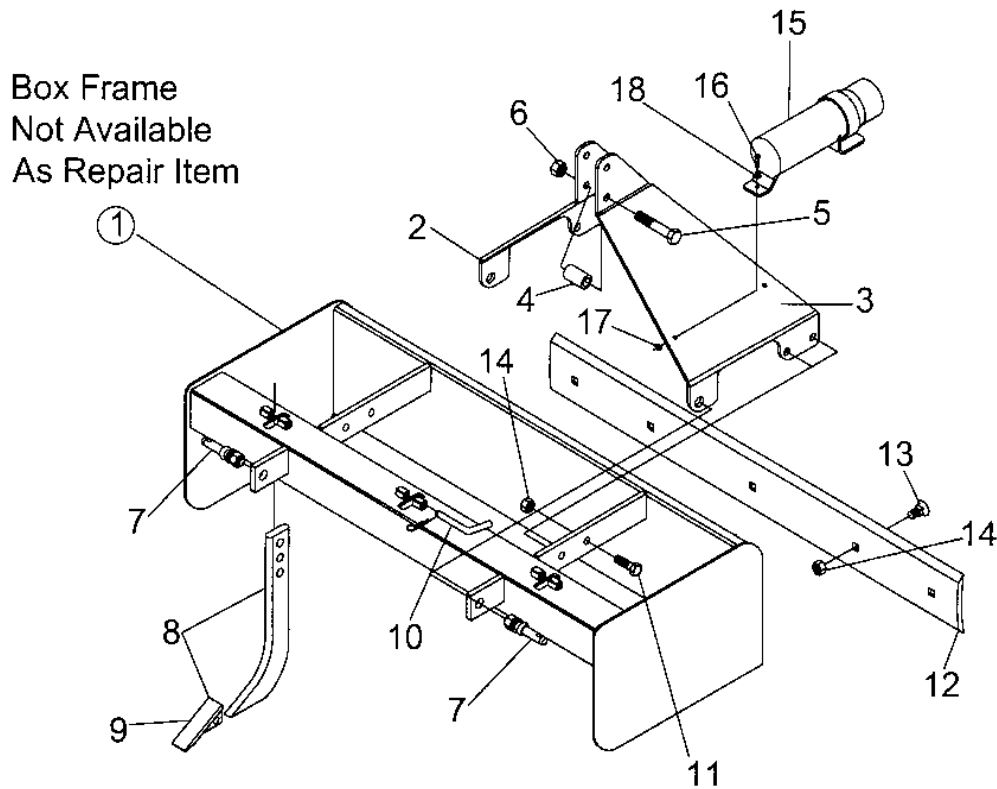
To service the box blade when attached to the tractor, it must be blocked up off the ground.

1. Place two 6" x 6" (15 x 15 cm) blocks under each side-frame of the box blade (see Figure 2).
2. Lower the box blade to rest securely on the blocks.

NOTE: Do not block the machine any higher than necessary to remove the shanks or cutting edges.

3. Refer to parts drawing, page 13. Remove the lock nuts (4) and plow bolts (3) from blade. Turn cutting edge over and use new edge, or replace it if both edges have been used.
4. Attach cutting edge to box blade and secure with plow bolts and hex nuts previously removed.
5. Torque plow bolts to specifications given in Bolt Torque Chart, page 20.

BOX BLADES PARTS (Model BB2048L)

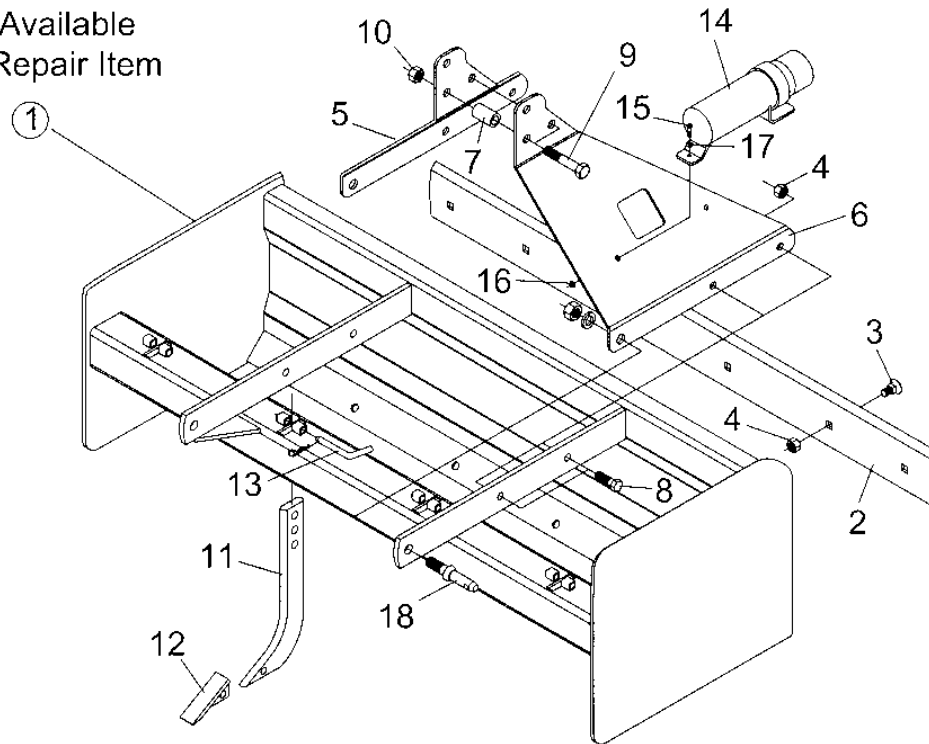


Ref. No.	Part No.	Description	No. Req'd.
2	5WS343035	Mast Plate, RH (BB2048L)	1
3	5WS343036	Mast Plate, LH (BB2048L)	1
4	5WS343058	Spacer, Mast Plate	1
5	5WS2503308	Bolt, Hex 3/4"-10NC x 3 1/2" Gr. 5	1
6	5WS2500095	Nut 3/4"-10NC Hex Stamplock Gr. 5	1
7	5WS590108	Cat. I Draw Pin (AK-578)	2
7	5WS590330	Optional Draw Pin (Cat. 0)	2
8	5WS341334	Shank, Scarifier w/Tip	3
9	5WS343064	Wear Tip	3
10	5WS343180	Pin, 1/2 x 3 w/Clip	3
11	5WS2503154	Bolt, Hex 5/8"-11NC x 1-1/2" G5	4
12	5WS350410	Cutting Edge, 1/2 x 6 x 47 1/2	2
13	5WS2503045	Bolt, Plow 5/8"-11NC x 1 1/2" G5	8
14	5WS2500094	Nut, 5/8"-11NC Hex Toplock G5	12
15	5WS2504225	Manual Holder, Plastic	1
16	5WS2503116	Bolt, Hex 1/4"-20NC x 1" G2	2
17	5WS2500008	Nut 1/4"-20NC Whiz Flange Hex	2
18	5WS2501006	Washer, 1/4" Medium Flat	2
N/S	5WS343197	Decal Set - Box Scraper (Complete)	1
N/S	5WS343198	Decal Set - Box Scraper (Safety)	1
N/S	5WS105001	Owner's/Operator's Manual - Box Blade (English)	1
N/S	5WS101371	OOM and Safety Decals - Box Blade (French Canadian)	1

16 Parts

BOX BLADES PARTS (Models BB2048, BB2060, BB2065, BB2072 after serial 1XFBB20XAB0007499)

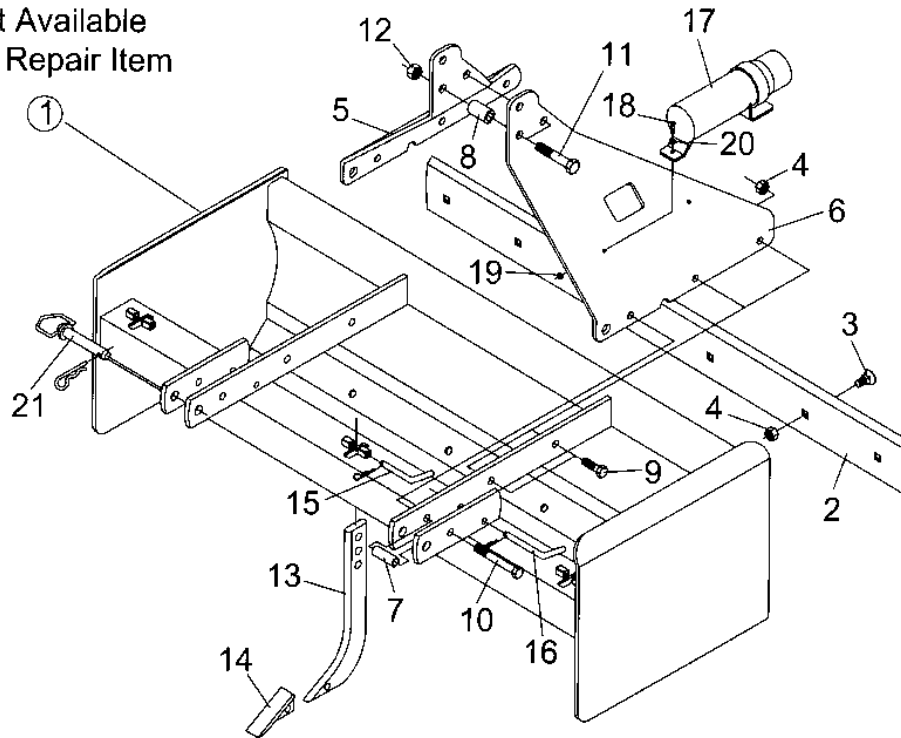
Box Frame
Not Available
As Repair Item



Ref. No.	Part No.	Description	No. Req'd.
2	5WS350410	Cutting Edge 47.5" (BB2048)	2
	5WS350415	Cutting Edge 59.5" (BB2060)	2
	5WS350417	Cutting Edge 65.5" (BB2065)	2
	5WS350405	Cutting Edge 71.5" (BB2072)	2
3	5WS2503045	Bolt, Plow 5/8"-11 NC x 1-1/2" Gr. 5	Var.
4	5WS2500094	Nut 5/8"-11NC Hex Stamplock Gr. 5	Var.
5	5WS343255	Mast Plate, RH	1
6	5WS343256	Mast Plate, LH	1
7	5WS343058	Spacer, Mast Plates (3/4" ID x 2-1/8")	2
8	5WS2503154	Bolt, Hex 5/8"-11NC x 1-1/2" Gr. 5	4
9	5WS2503308	Bolt, Hex 3/4"-10NC x 3-1/2" Gr. 5	2
10	5WS2500095	Nut 3/4"-10NC Hex Stamp lock Gr. 5	2
11	5WS341334	Shank, Scarifier w/ WearTip	Var.
12	5WS343064	Replaceable Wear Tip	Var.
13	5WS343180	Pin 1/2" x 3" w/ Clip	Var.
14	5WS2504225	Manual Holder, Plastic	1
15	5WS2503116	Bolt, Hex 1/4"-20NC x 1" Gr. 2	2
16	5WS2500008	Nut, 1/4"-20NC Whiz Flange Hex	2
17	5WS2501006	Washer, 1/4" Medium Flat	2
18	5WS590108	Cat. I Draw Pin (AK-578)	2
N/S	5WS343197	Decal Set - Box Blades (Complete)	1
N/S	5WS343198	Decal Set - Box Blades (Safety)	1
N/S	5WS105001	Owner's/Operator's Manual - Box Blade (English)	1
N/S	5WS101371	OOM and Safety Decals - Box Blade (French Canadian)	1

BOX BLADES PARTS (Models BB2048, BB2060, BB2065, BB2072 before serial 1XFBB20XAB0007499)

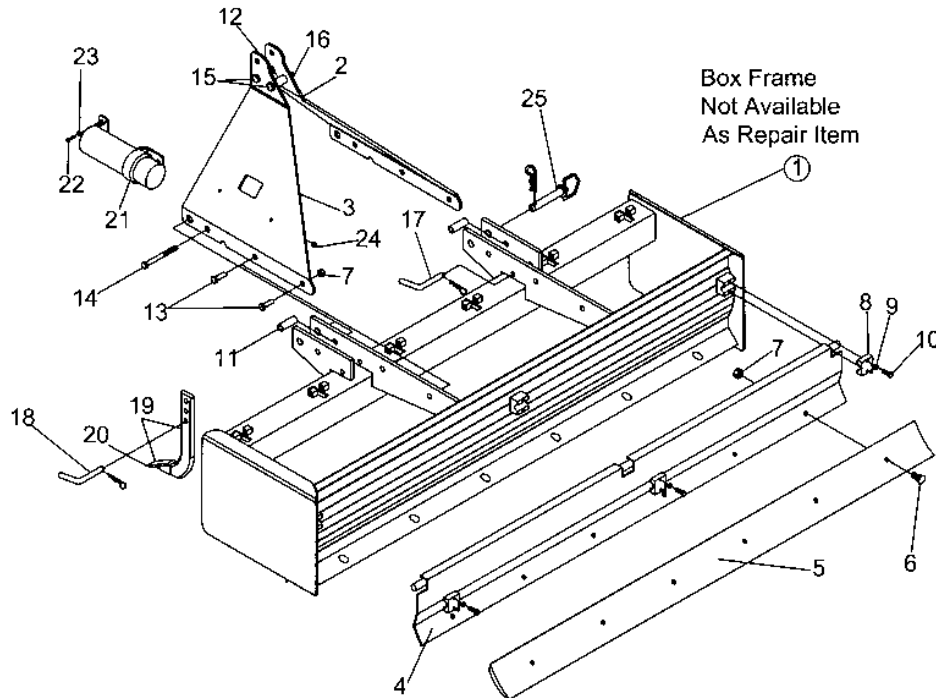
Box Frame
Not Available
As Repair Item



Ref. No.	Part No.	Description	No. Req'd.
2	5WS350410	Cutting Edge 47.5" (BB2048)	2
	5WS350415	Cutting Edge 59.5" (BB2060)	2
	5WS350417	Cutting Edge 65.5" (BB2065)	2
	5WS350405	Cutting Edge 71.5" (BB2072)	2
3	5WS2503045	Bolt, Plow 5/8"-11NC x 1 1/2" Gr. 5	Var.
4	5WS2500094	Nut 5/8"-11NC Hex Stamplock Gr. 5	Var.
5	5WS343055	Mast Plate, RH	1
6	5WS343056	Mast Plate, LH	1
7	5WS343057	Spacer, Pull Bars (5/8" ID x 2 1/2")	2
8	5WS343058	Spacer, Mast Plates (3/4" ID x 2 1/8")	2
9	5WS2503152	Bolt, Hex 5/8"-11NC x 2" Gr. 5	4
10	5WS2503305	Bolt, Hex 5/8"-11NC x 5" Gr. 5	2
11	5WS2503137	Bolt, Hex 3/4"-10NC x 4" Gr. 5	2
12	5WS2500095	Nut 3/4"-10NC Hex Stamplock Gr. 5	2
13	5WS341334	Shank, Scarifier w/Tip	Var.
14	5WS343064	Replaceable Wear Tip	Var.
15	5WS343180	Pin 1/2" x 3" w/Clip	Var.
16	5WS343185	Pin 1/2" x 4" w/Clip (BB2060 & BB2065)	2
17	5WS2504225	Manual Holder, Plastic	1
18	5WS2503116	Bolt, Hex 1/4"-20NC x 1" Gr. 2	2
19	5WS2500008	Nut 1/4"-20NC Whiz Flange Hex	2
20	5WS2501006	Washer 1/4" Flat	2
21	5WS343195	Pin 7/8" x 4 1/4" w/Lock Pin	2
N/S	5WS343197	Decal Set - Box Blades (Complete)	1
N/S	5WS343198	Decal Set - Box Blades (Safety)	1
N/S	5WS105001	Owner's/Operator's Manual - Box Blade (English)	1
N/S	5WS101371	OOM and Safety Decals - Box Blade (French Canadian)	1

18 Parts

BOX BLADES PARTS (Models BB2172, BB2184)



Ref. No.	Part No.	Description	No. Req'd.
2	5WS343055	Mast Plate, RH	1
3	5WS343056	Mast Plate, LH	1
4	5WS343132	Tailgate Weldment (BB2172)	1
	5WS343151	Tailgate Weldment (BB2184)	1
5	5WS350405	Cutting Edge, 71.5" (BB2172)	2
	5WS346731	Cutting Edge, 83.5" (BB2184)	2
6	5WS2503045	Bolt, Plow 5/8" - 11NC x 1.50" GR.5	Var.
7	5WS2500094	Nut, 5/8" - 11NC Hex Toplock GR.5	Var.
8	5WS343130	Cap, Pivot Block (21 Series)	3
9	5WS2502008	Washer, 3/8" Spring Lock	6
10	5WS2503120	Bolt, Hex 3/8" - 16NC x 1.75" Gr.2	6
11	5WS343057	Spacer, Pull Bars	2
12	5WS343058	Spacer, Mast Plate	2
13	5WS2503152	Bolt, Hex 5/8" - 11NC x 2" Gr. 5	4
14	5WS2503305	Bolt, Hex 5/8" - 11NC x 5" Gr. 5	2
15	5WS2503137	Bolt, Hex 3/4" - 10NC x 4" Gr. 5	2
16	5WS2500095	Nut, 3/4 - 10NC Hex Stamplock Gr.5	2
17	5WS343185	Pin, 1/2 x 4 w/Clip (BB2184 Only)	2
18	5WS343180	Pin, 1/2 x 3 w/Clip	Var.
19	5WS341334	Shank, Scarifier w/Tip	Var.
20	5WS343064	Wear Tip	Var.
21	5WS2504225	Manual Holder, Plastic	1
22	5WS2503116	Bolt, Hex 1/4" - 20NC x 1" G2	2
23	5WS2501006	Washer, 1/4" Medium Flat	2
24	5WS2500008	Nut 1/4" - 20NC Whiz Flange Hex	2
25	5WS343195	Pin, 7/8" x 4 1/4" w/Clip	2
N/S	5WS343197	Decal Set - Box Scraper (Complete)	1
N/S	5WS343198	Decal Set - Box Scraper (Safety)	1
N/S	5WS105001	Owner's/Operator's Manual - Box Blade (English)	1
N/S	5WS101371	OOM and Safety Decals - Box Blade (French Canadian)	1

BOLT TORQUE CHART

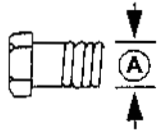
Always tighten hardware to these values unless a different torque value or tightening procedure is listed for a specific application.

Fasteners must always be replaced with the same grade as specified in the manual parts list.

Always use the proper tool for tightening hardware: SAE for SAE hardware and Metric for metric hardware.

Make sure fastener threads are clean and you start thread engagement properly.

All torque values are given to specifications used on hardware defined by SAE J1701 & J1701M JUL96.



SAE SERIES TORQUE CHART



SAE Bolt Head Identification

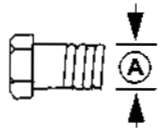


SAE Grade 5
(3 Radial Dashes)



SAE Grade 8
(6 Radial Dashes)

A Diameter (Inches)	Wrench Size	MARKING ON HEAD					
		SAE 2		SAE 5		SAE 8	
		lbs-ft	N-m	lbs-ft	N-m	lbs-ft	N-m
1/4"	7/16"	6	8	10	13	14	18
5/16"	1/2"	12	17	19	26	27	37
3/8"	9/16"	23	31	35	47	49	67
7/16"	5/8"	36	48	55	75	78	106
1/2"	3/4"	55	75	85	115	120	163
9/16"	13/16"	78	106	121	164	171	232
5/8"	15/16"	110	149	170	230	240	325
3/4"	1-1/8"	192	261	297	403	420	569
7/8"	1-5/16"	306	416	474	642	669	907
1"	1-1/2"	467	634	722	979	1020	1383



METRIC SERIES TORQUE CHART

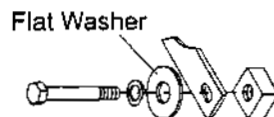
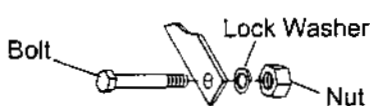


Metric Bolt Head Identification



A Diameter & Thread Pitch (Millimeters)	Wrench Size	COARSE THREAD				FINE THREAD				A Diameter & Thread Pitch (Millimeters)
		MARKING ON HEAD				MARKING ON HEAD				
		Metric 8.8		Metric 10.9		Metric 8.8		Metric 10.9		
		N-m	lbs-ft	N-m	lbs-ft	N-m	lbs-ft	N-m	lbs-ft	
6 x 1.0	10 mm	8	6	11	8	8	6	11	8	6 x 1.0
8 x 1.25	13 mm	20	15	27	20	21	16	29	22	8 x 1.0
10 x 1.5	16 mm	39	29	54	40	41	30	57	42	10 x 1.25
12 x 1.75	18 mm	68	50	94	70	75	55	103	76	12 x 1.25
14 x 2.0	21 mm	109	80	151	111	118	87	163	120	14 x 1.5
16 x 2.0	24 mm	169	125	234	173	181	133	250	184	16 x 1.5
18 x 2.5	27 mm	234	172	323	239	263	194	363	268	18 x 1.5
20 x 2.5	30 mm	330	244	457	337	367	270	507	374	20 x 1.5
22 x 2.5	34 mm	451	332	623	460	495	365	684	505	22 x 1.5
24 x 3.0	36 mm	571	421	790	583	623	459	861	635	24 x 2.0
30 x 3.0	46 mm	1175	867	1626	1199	1258	928	1740	1283	30 x 2.0

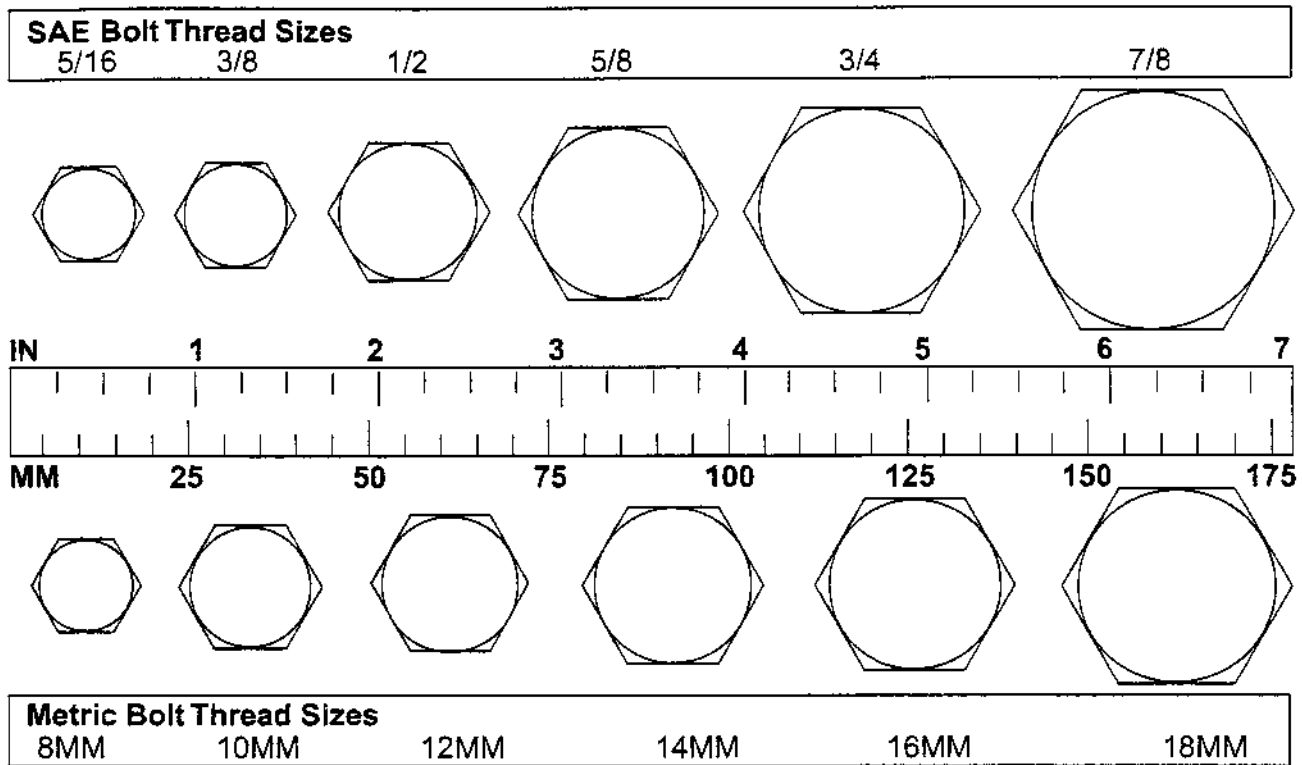
Typical Washer Installations



8/9/00

BOLT SIZE CHART

NOTE: Chart shows bolt thread sizes and corresponding head (wrench) sizes for standard SAE and metric bolts.



ABBREVIATIONS

AG.....	Agriculture	NC.....	National Coarse
ATF.....	Automatic Transmission Fluid	NF.....	National Fine
BSPP.....	British Standard Pipe Parallel	NPSM.....	National Pipe Straight Mechanical
BSPTM.....	British Standard Pipe Tapered Male	NPT.....	National Pipe Tapered
CV.....	Constant Velocity	NPT SWF.....	National Pipe Tapered Swivel Female
CCW.....	Counter-Clockwise	ORBM.....	O-Ring Boss - Male
CW.....	Clockwise	P.....	Pitch
F.....	Female	PBY.....	Power Beyond
GA.....	Gauge	psi.....	Pounds per Square Inch
GR (5, etc.).....	Grade (5, etc.)	PTO.....	Power Take Off
HHCS.....	Hex Head Cap Screw	QD.....	Quick Disconnect
HT.....	Heat Treated	RH.....	Right Hand
JIC.....	Joint Industry Council 37° Degree Flare	ROPS.....	Roll Over Protective Structure
LH.....	Left Hand	RPM.....	Revolutions Per Minute
LT.....	Left	RT.....	Right
m.....	Meter	SAE.....	Society of Automotive Engineers
mm.....	Millimeter	UNC.....	Unified Coarse
M.....	Male	UNF.....	Unified Fine
MPa.....	Mega Pascal	UNS.....	Unified Special
N.....	Newton		

PART NO.
5WS105001

 FRONTIER™