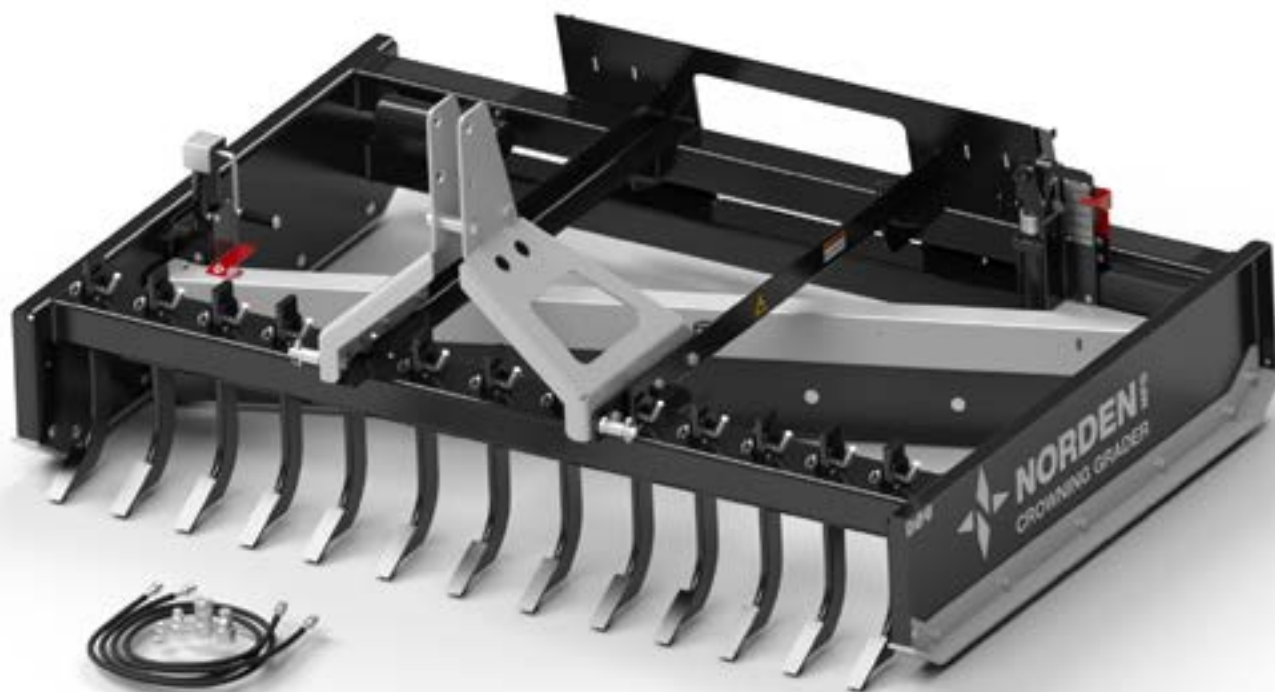




Operator Manual

Crowning Graders

2024 Revision



MADE IN THE USA 

Read, Understand, and Follow this manual which provides information and procedures to safely operate and maintain the Crowning Grader.



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1. Introduction



The Crowning Grader is an attachment that mounts to a skid steer loader or small utility tractor with 3-Point capabilities. It is designed to level, contour, and grade gravel and dirt surfaces, including roadways, dirt ditches, and field/yard surfaces.

Note: The specific term “Crowning Grader” will be referred to simply as “grader” throughout the rest of this manual. The term skid steer loader or small utility tractor will be referred to as “machine” throughout this manual.

Read, understand, and follow the manual carefully to become familiar with your new Norden Crowning Grader. Ultimately it is our desire that you will be operating your grader as a seasoned professional in very little time!

This manual is intended for all models, but will show specific pictures and diagrams of the CG84 Crowning Grader. If any specifications are different than the model shown, it will be noted.

1.1 Intended Usage

Do not use this grader for any other purpose than its intended use of grading and contouring dirt and gravel surfaces.

Do not use an oversized machine; the CG84 grader is intended to be used on machines rated up to 110 HP or a 3000 pound lift capacity.

1.2 Operator Orientation

The directions left, right, front, and rear, as mentioned throughout this manual, are as seen from the operator's seat, facing in the direction of travel.

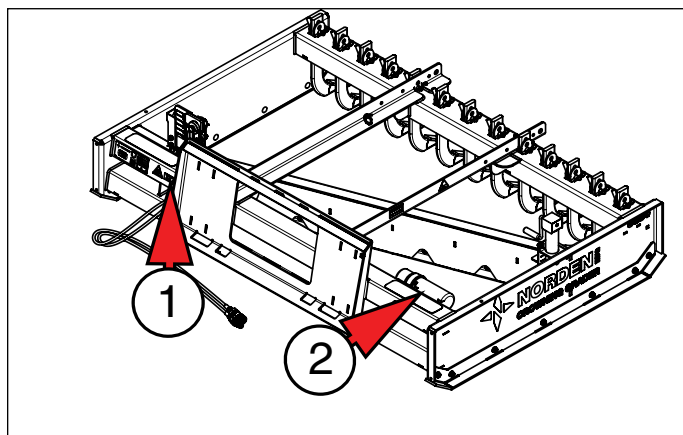
1.3 Specifications

Overall Width	85"
Overall Length	60"
Overall Height	23"
Overall Height with 3-Point Hitch	42"
Overall Weight	1064 lb.

Specifications subject to change without notice.

1.4 Serial Number Location

The grader's serial number and model number decal (1) is located on the rear, upper left of the grader frame. Please use these numbers when requesting service, seeking information, or ordering parts.



Record the serial and model numbers in the space provided for easy reference when contacting Norden Mfg LLC with questions.

Serial Number _____

Date of Purchase _____

1.5 Owner/Operator Manual Storage

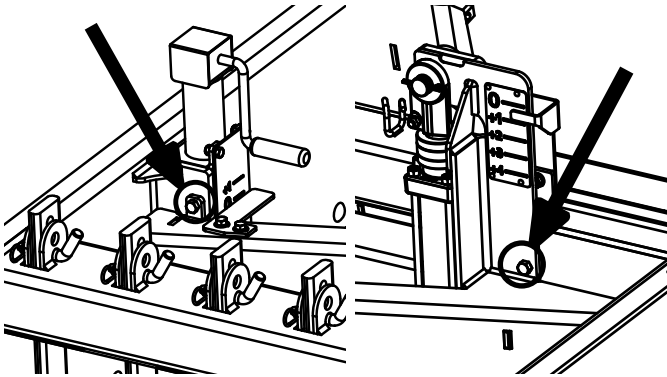
Store this Operator Manual and other operating materials in the document storage tube (2), located inside the rear frame.



WARNING Failure to follow these instructions **WILL** result in damage to the grader.

1.6 Dealer Set-Up Instructions

CG84 Crowning Grader comes fully assembled and is shipped with two (2) shipping bolts (one on the jack side and one on the cylinder side) that must be removed and discarded prior to operation.



1.7 Product Improvements

Because Norden Mfg LLC maintains an ongoing program of product improvement, we reserve the right to make improvements in design or changes in specifications without incurring any obligation to install them on graders previously sold.

1.8 Disposal of Equipment at End of Useful Life

The Norden Mfg LLC Crowning Graders are designed for the specific purpose of leveling, grading, and contouring gravel and dirt surfaces, such as roadways, dirt ditches, or field/yard surfaces. When this grader is no longer capable of performing its intended use, it should be dismantled and scrapped. Do not use any materials or components from this grader for any other purpose.

1.9 Unanswered Questions

If you have any questions not answered in this manual, require additional copies, or the manual is damaged, please contact your dealer or:

Norden Mfg LLC
4210 Kinsman Road NW
North Bloomfield, OH 44450

Phone: (877) 296-5851
Fax: (440) 693-4336
E-mail: parts@nordenmfg.com

The manual is also available for download at:
www.nordenmfg.com

2. Safety

2.1 General

Most work-related accidents are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. As you operate and maintain the grader you must be alert to potential hazards.

Improper operation and/or maintenance of this grader could cause a dangerous situation that results in property damage, personal injury, or death.

WARNING



Do not use the grader until you read, understand, and follow the information contained in this manual and all related equipment manuals. Do not use the grader for anything other than its intended purpose.



Safety precautions and warnings are provided in this manual and on the grader. If these precautions and warnings are not followed, bodily injury or death could occur to you or to other persons.

Norden Mfg LLC cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this manual and on the product are, therefore, not all-inclusive. If a method of operation not specifically recommended by us is used, you must satisfy yourself that it is safe for you and for others. You should also ensure that the grader will not be damaged or be made unsafe by the operating or maintenance methods that you choose.

The information, specifications, and illustrations in this manual are based on the information that was available at the time this material was written and can change at any time.

2.2 Safety Alert Symbol



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. The symbol is followed by a signal word such as “WARNING” or “CAUTION” depending on the severity of the potential hazard. Obey all safety messages that follow this symbol to avoid possible injury or death.

This manual contains WARNINGS, CAUTIONS, NOTICES, SAFETY INSTRUCTIONS, and NOTES. Warnings, Cautions, and Safety Instructions must be followed to prevent the possibility of personal injury or death due to improper operation. Notices and Notes help prevent grader or property damage.

WARNING

Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

CAUTION

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

NOTICE

Indicates that grader or property damage can result if instructions are not followed.

SAFETY INSTRUCTIONS

Indicates specific safety-related instructions or procedures.

Note: Contains additional information important to operation or a procedure.



2.3 Safety Icons Nomenclature

This manual and the grader has numerous safety icons. These safety icons provide important operating instructions which alert you to potential personal injury hazards.

2.3.1 Personal Protection / Important Information

-   *Read the manual*
-  *Maintenance procedure*
-  *Eye protection*
-  *Hearing protection*
-  *Hand protection*
-  *Foot protection*
-  *First aid kit*
-  *Use proper tools*
-  *Use OEM parts*
-  *Use ROPS and seat belt*
-  *Maintain safety signs*
-  *Place in park*
-  *Remove key*
-  *Stop engine*
-  *Visibility - slow moving vehicle (SMV)*
-  *Set parking brake*

2.3.2 Prohibited Actions

-  *Do not alter or modify*
-  *Do not leave out tools*

-  *Do not weld*
-  *No riders*
-  *No children*
-  *No alcohol*
-  *No drugs*

2.3.3 Hazard Avoidance

-  *Crushing hazard*
-  *Crushing hazard*
-  *Slipping hazard*
-  *Tripping hazard*
-  *Falling hazard*
-  *Hose damage hazard*
-  *Explosive separation hazard*
-  *Safety alert symbol*
-  *Release all pressure (zero pressure)*
-  *Trapped air pressure hazard*
-  *Trapped pressure hazard*
-   *High-pressure fluid hazard*
-  *Defective or broken part*
-  *Falling hazard*
-  *Maintain safe distance*
-   *Pinch point hazard*
-  *Crush hazard*
-  *Rollover hazard*

2.4 General Safety

WARNING



Read, Understand, and Follow Manual

To prevent personal injury or even death, be sure you read, understand, and follow all of the instructions in this manual and other related OEM equipment manuals! This grader was designed for a specific application; **DO NOT** modify or use this grader for any application other than that for which it was designed. Graders operated improperly or by untrained personnel can be dangerous! Inexperienced operators should receive instruction from someone familiar with the grader and the machine before being allowed to operate the grader.



Do Not Operate

Do not use the grader if it is in need of repair. If you believe the grader has a defect which could cause injury or death, you should immediately stop using the grader.



Fall Hazard

Do not use the grader as a platform. Do not stand on top of the grader at any time. Do not ride on the grader or allow others to ride on it.



Pinch Point Hazard

Keep hands and feet away from any moving parts to prevent them from getting pinched.



Impaired User Hazard

Do not attempt to operate or maintain the grader under the influence of drugs or alcohol. Consult your doctor before using the grader while taking prescription medications.



Falling Hazard

Do not allow riders on the machine or grader at any time. Falling can result in severe injuries or death.



Stay Clear

Clear the area of people, especially small children, before using the grader. Under no circumstances should young children be allowed to work with or around the grader.

WARNING



Not A Lifting Device

Do not use the grader to lift other objects.

2.5 Hydraulic Safety

WARNING



High-Pressure Fluid Hazard

Hydraulic fluid escaping under pressure can penetrate the skin. Openings in the skin and minor cuts are susceptible to infection from hydraulic fluid. If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Without immediate medical treatment, serious infection or toxic reaction can develop if hydraulic fluid penetrates the surface of the skin.



Visual Inspection

Before applying pressure to the system, make sure all components are tight and that the hydraulic lines, hoses, and couplings are not damaged. Replace any worn, cut, abraded, flattened, or crimped hoses.



Personal Protective Equipment

Wear proper hand and eye protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to identify and isolate a leak.



Trapped Air Hazard

When installing, replacing, or repairing hydraulic system cylinders or parts, make sure that the entire system is charged and free of air before resuming operations. Failure to bleed the system of all air can result in improper machine operation, causing severe injury.



Explosive Separation Hazard

Do not make any temporary repairs to the hydraulic lines, fittings, or hoses using tape, clamps, or adhesives. The hydraulic system operates under extremely high pressure and temporary repairs may fail suddenly and create a hazardous/dangerous situation.

NOTICE

Make sure components in the hydraulic system are kept clean and in good working condition. The most common reason for hydraulic component failure is contamination of the oil.

Keep all hydraulic fittings completely clean.

Repair any fittings, hoses, or other components where leakage is observed.

Clean up any spilled hydraulic oil.

2.6 Safety Signs

Refer to section “3. Safety Signs and Labels” on page 11 for safety recommendations related to using the grader.

2.7 Operation Safety

Refer to section “5.1 User Safety” on page 14 for safety recommendations related to using the grader. All applicable safety recommendations in other sections should also be followed.

2.8 Transporting Safety

Refer to “6. Transporting” on page 21 for safety recommendations related to transporting the grader. All applicable safety recommendations in other sections should also be followed.

2.9 Storage Safety

Refer to section “7. Storage” on page 22 for safety recommendations related to storing the grader. All applicable safety recommendations in other sections should also be followed.

2.10 Maintenance Safety

Refer to section “8. Maintenance” on page 23 for safety recommendations related to maintaining the grader. All applicable safety recommendations in other sections should also be followed.

2.11 Training

Norden Mfg LLC follows the general Safety Standards specified by the Farm Equipment Manufacturers Association (F.E.M.A.), and the American National Standards Institute (ANSI). Anyone who will be using and/or maintaining the grader must read and clearly understand ALL safety, operation, and maintenance information presented in this manual, other related OEM manuals, and the safety signs.

If you do not understand any information in this manual, see your dealer or contact Norden Mfg LLC before proceeding.

Do not use or allow anyone else to use this grader until all information has been reviewed. Annually review this manual before the season start-up.

Make periodic reviews of SAFETY and OPERATION a standard practice. An untrained operator is not qualified to use this grader.

2.12 Authorization / Training Sign-Off Form

The authorization and training sign-off form is provided for your records to show that all personnel who will be working with the grader have read and understand the information in this Operation Manual and have been trained in the operation of the grader. The user and the owner should both sign and date the form to indicate acceptance of the risk of using the grader.

Authorization / Training Sign-Off Form

[illegible]

3. Safety Signs and Labels

3.1 General Information

The types of safety signs (hazard labels) and instructional labels, along with their locations on the grader, are shown in the following illustrations. Good safety practices require that you familiarize yourself with the various safety signs, the type of warning, and the area or particular operation related to that area that requires your SAFETY AWARENESS.



Think SAFETY!

Work SAFELY!

Pay close attention to the safety signs and instructional labels attached to the machine and grader. The safety signs attached to the grader are reproduced in this section. If the grader is missing a label or one is unreadable, replace the label before using the grader.

SAFETY INSTRUCTIONS



Safety Signs and Instructional Labels

1. **Keep safety signs or instructional labels clean and legible at all times. Use a clean, damp cloth to clean safety decals.**
2. **Replace any missing or hard-to-read safety signs or instructional labels.**
3. **Use care when washing or cleaning the grader not to remove or damage the labels. When using a pressure washer to clean the grader, avoid spraying too close to decals; high-pressure water can enter through very small scratches or under edges of decals causing them to peel or come off.**
4. **Locations for the labels and replacement part numbers are shown in this section.**
5. **Replacement parts must have replacement labels attached before the grader is used.**
6. **Labels are available from your authorized dealer or from Norden Mfg LLC at no charge.**

3.2 Contact Information

For replacement decals, contact:

Norden Mfg LLC
4210 Kinsman Road NW
North Bloomfield, OH 44450

Phone: 877-296-5851
Fax: 440-693-4336
E-mail: parts@nordenmfg.com

3.3 How to Install Replacement Safety Signs

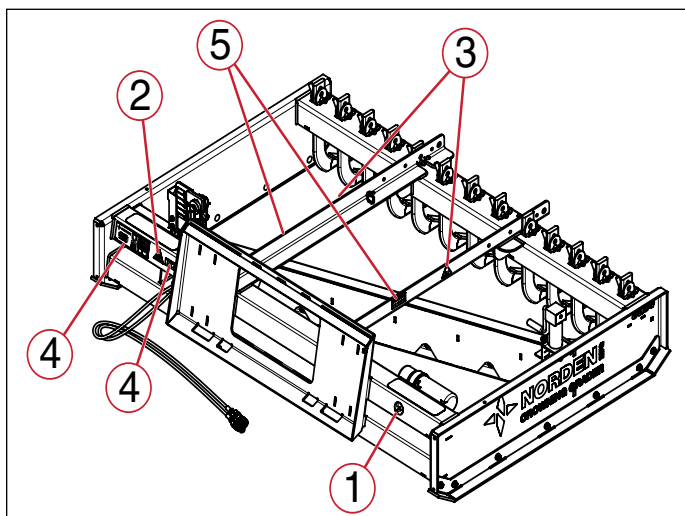
1. Clean and dry the installation area.

Note: Do not install the signs if the temperature is below 50°F.

2. Determine the exact position before you remove the backing paper.
3. Remove the backing paper.
4. Align the sign over the specified area and carefully press the sign to the part/frame.

Note: Small air pockets can be pierced with a pin and smoothed out using the piece of backing paper.

3.4 Safety Sign Locations



Item	Type	Description	Qty.
1	INFORMATIONAL	Read the Manual	1
2	WARNING	High-Pressure Fluids	1
3	CAUTION	Pinch Point	2
4	INFORMATIONAL	Serial Number	1
5	WARNING	No Riders	2
6	INFORMATIONAL	Manufacturing	1



3. CAUTION — Pinch Point



4. Serial and Model Number Identification Label



5. WARNING — No Riders

3.5 Safety Signs



1. Read the Manual

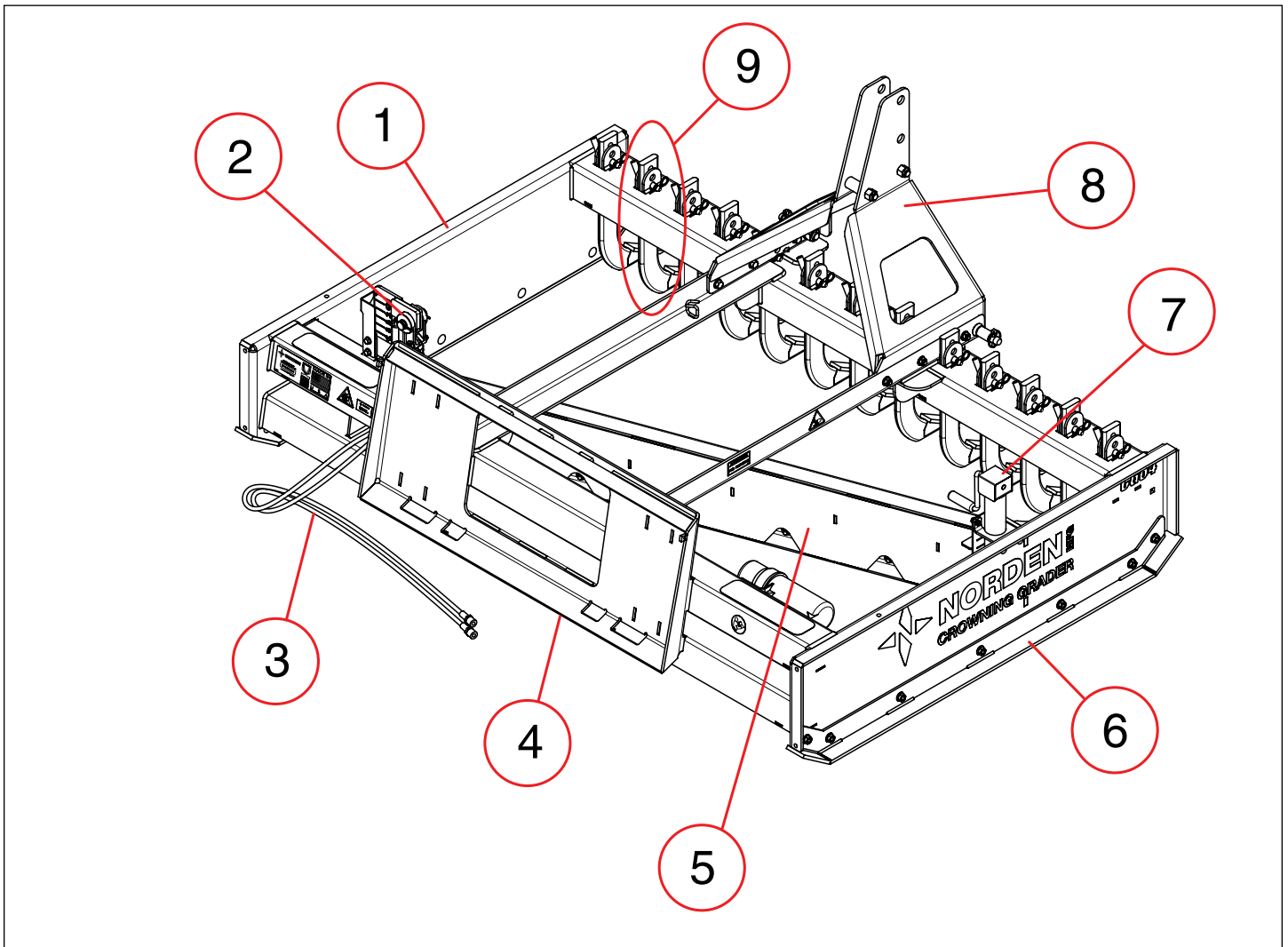


2. WARNING — High-Pressure Fluids



6. Manufacturing Information

4. Nomenclature



Item	Description
1	Frame
2	Hydraulic Cylinder
3	Hydraulic Hoses
4	Skid Steer Bracket
5	Grader Blade
6	Skid Bar
7	Cutting Height Jack
8	3 Point Hitch
9	Ripper Tooth

5. Operation

5.1 User Safety

Refer to “2.4 General Safety” on page 8 for additional safety information.

WARNING



Roll Away Hazard

Before leaving the operator's seat, make

sure the engine is stopped, the transmission is placed in park, the key is removed, and the parking brake is set.



Crush Hazard

The weight of the machine, plus the grader, if it rolls onto a person, could cause serious crushing injury or death.



Crush Hazard

If using a small compact or utility tractor, it must be equipped with a Roll Over Protective Structure (ROPS) and a seat belt. A crushing hazard could occur if the operator is ejected from the seat while the tractor is in motion. Fasten the seat belt whenever the tractor is moving.



Entanglement Hazard

If using a small compact or utility tractor, keep hands and clothing clear of any rotating parts. Stay clear of the grader while it is moving.

SAFETY INSTRUCTIONS

The following safety instructions are provided to help prevent injury or limit grader damage.



It is the owner's responsibility to make sure any person using the grader, especially if it is loaned or rented, has been thoroughly trained on its proper and safe use.



Be certain only physically-able persons will use the grader.



Users who have not read and understood all operating and safety instructions are not qualified to use the grader.



If the elderly are assisting with the work, their physical limitations need to be recognized and accommodated.



Never allow children to operate the grader.



Be especially observant of the operating area and terrain – watch for loose fill, holes, rocks or other hidden hazards. Always inspect the area prior to operation.



Be careful at the edge of ditches or gullies. Be careful when working on inclines.



Do not use excessive speed when grading.



Allow for grader length when making turns.

5.2 Machine Requirements

WARNING



Machine Operator Manual

Always refer to the Machine's manual to ensure compatibility and maximum safety.

SAFETY INSTRUCTIONS



Do not use an oversized machine.



Operating the grader with a machine that does not meet the specified requirements may cause machine or grader damage and be a potential danger to the operator or bystanders.



Always review the “controls” section of the machine's Operator Manual to be familiar with the location, settings, and function of the controls. Be familiar with all controls before using this grader.

5.2.1 Machine Specifications

The machine must be equipped with a universal quick-attach system on a skid steer loader or a tractor front-end loader with quick-attach adapter rated to lift the grader which weighs approximately 1000 pounds.

The machine must be equipped with a Roll Over Protective Structure (ROPS) (cab or roll bar) and seat belt to protect the operator.

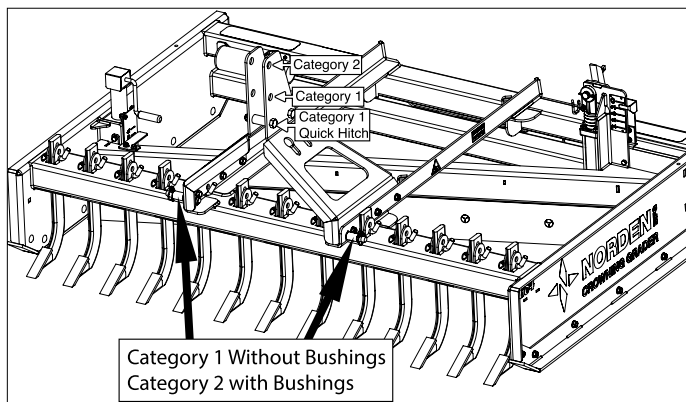
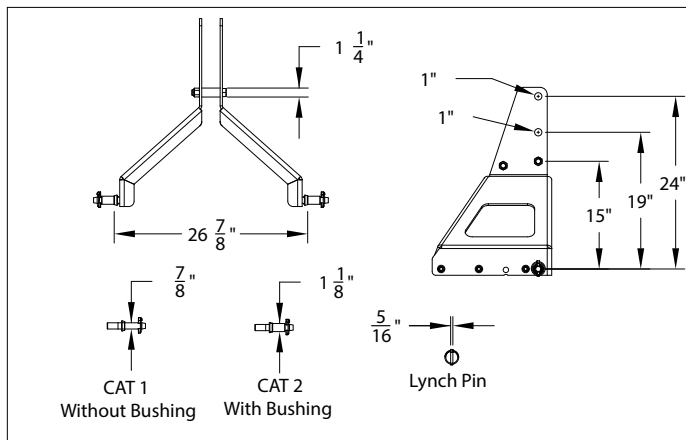
The machine must be equipped with an auxiliary hydraulic system with a maximum 3,000 PSI pressure rating.

5.2.2 3-Point Hitch Specifications

1. The CG84 3-Point Hitch option can be attached to CAT 1 or CAT 2 tractor hitches.
2. Compatible with CAT 1 Quick Hitch.
3. CAT 1 hitch uses 7/8" lower and 3/4" upper diameter hitch pin. CAT 2 hitch requires 1 1/8" lower and 1" upper diameter hitch pin.

NOTICE

If the hitch does not conform to ASAE CAT1 or CAT2 dimensions, the blade may not fit or raise properly. Consult an authorized dealer for possible modification procedures to mount nonconforming hitches.



5.2.3 Tractor Specifications

WARNING



Rollover Hazard

To avoid serious injury or death from falling, runover, rollover, or crushing, the tractor must have an approved Roll-Over Protective Structure (ROPS) or ROPS cab and seat belt.

4. The tractor must be equipped with an approved Roll-Over Protective Structure (ROPS) or ROPS cab and seat belt.
 - a. Keep ROPS locked in the UP position.
 - b. Only operate the tractor when seated in the tractor seat.
 - c. Always fasten seat belt whenever the tractor is moving.
 - d. Use caution when transporting over uneven terrain and slow down for turns.
5. If working around dry grass or vegetation, to reduce the risk of fire, do not use a tractor with an under-frame exhaust.
6. Whenever traveling on 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 tractor.
7. Maintain all manufacturer's safety shields and guards.
 - a. Always replace shields and guards that were removed for access to connect the grader.
 - b. Never operate the tractor PTO with the PTO master shield missing or in the raised position.

5.3 Initial Setup and Attachment

IMPORTANT— Make sure shipping bolts are removed and discarded prior to use. Refer to "1.6 Dealer Set-Up Instructions" on page 5

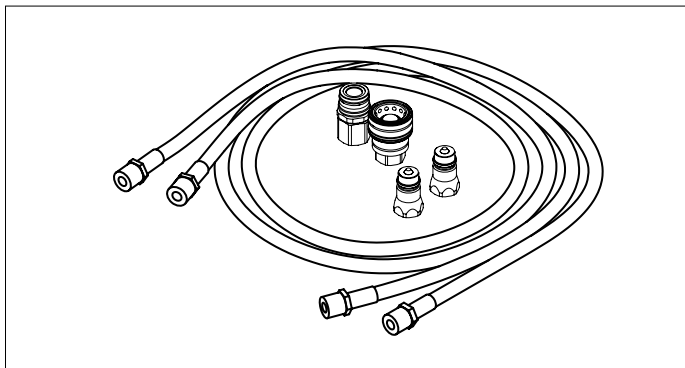
CAUTION



Pinch Point Hazard

Use caution when connecting the grader to the machine. Keep hands and feet from under the grader and clear of pinch points. Do not allow anyone to stand between the machine and grader during attachment.

1. Attach the grader to the machine using the quick-attach Skid Steer plate or to a tractor using a 3-point hitch.
2. The grader is supplied with two, male Pioneer-style hydraulic quick connect hose couplings and one each of male and female flat face skid steer style quick disconnect couplings. Install the appropriate fittings for the type of machine being used.



3. Connect the hydraulic hoses to the desired auxiliary hydraulic ports on the machine.

CAUTION



Stay Clear

Stay clear of the grader and the blade when it is raised and lowered.

4. Operate the cutting blade lift cylinder throughout the entire range of travel, several times, to purge air from the hoses and cylinder.
5. Place the blade in the "0" position and check the level of the reservoir. Fill if necessary.

Note: The grader does not have a hydraulic reservoir and therefore can deplete the machine's oil reservoir during initial charging of the cylinder and hoses. The grader uses the least amount of oil in the "0" position and the level should be checked in this position to prevent overfilling.

5.4 Pre-Operation Checklist

Before each use of the grader, the following areas should be checked.

Checklist Before Each Use	
✓	Task
	Make sure the grader is positively attached to the machine. Refer to "5.3 Initial Setup and Attachment" on page 15
	If the machine uses tires, make sure they are inflated properly and the lug nuts are tight.
	Visually inspect the grader for any loose bolts, worn parts, or cracked welds. Make necessary repairs before using the grader.
	Make sure all retainer clips and pins are in place.
	Check all hydraulic hoses and connections for damage or evidence of leaks.
	Make sure the operating area is clear, especially of children and animals.
	Check that ripper teeth are not worn out, replace if necessary.

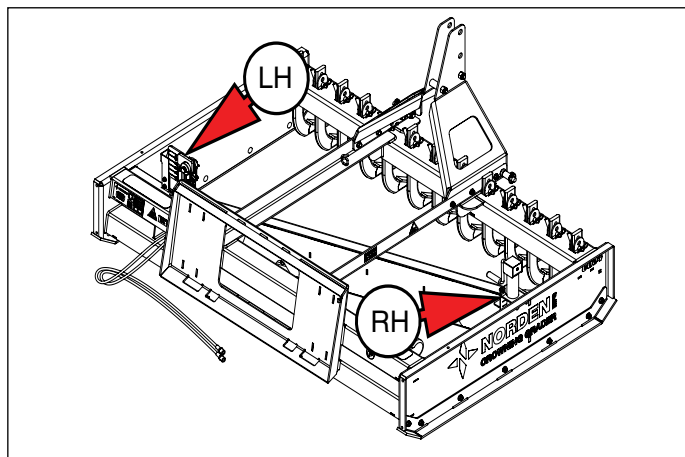
5.5 Operation

The Norden Crowning Grader (grader) works best when the roadway material is relatively loose before leveling or grading begins. The grader is designed to create a crown in the middle of the road or move the berm material on the side of the road back into the center. Built-in ripper teeth are used to loosen packed material prior to grading.

Note: The ripper teeth and the blade should never be used at the same time.

5.5.1 Standard Blade Adjustment

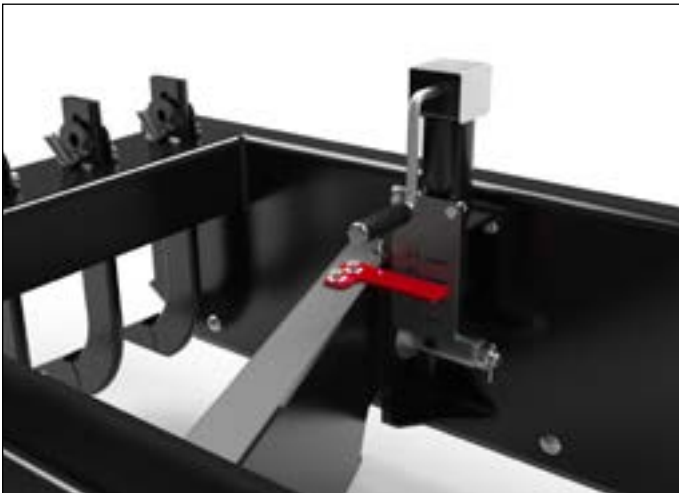
The grader is equipped with depth indicators, left-hand and right-hand, to show the height of the blade relative to the skid plates.



(LH) Left-hand adjustment. (RH) Right-hand adjustment.



Left-hand — “Grade Height” adjustment (0 through 4).



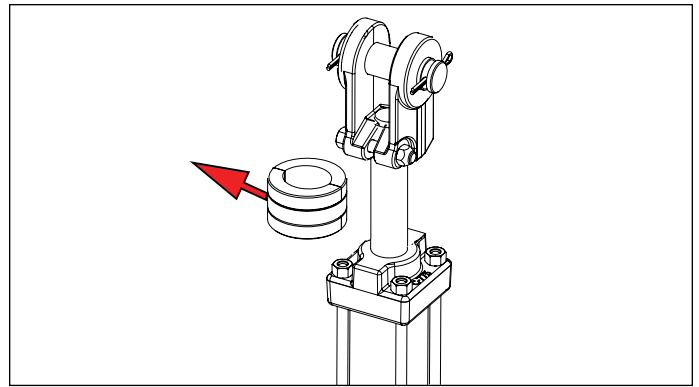
Right-hand — “Cutting Height” adjustment (+1 through -2).

5.5.2 Below Grade Blade Adjustment

Depending on the roadway surface condition (adequate loose material or base does not have enough cover material), grading works best by starting with the blade set lower than the skid shoes.

To set the blade below the skid plate on the left-hand side:

1. Place the grader skid plates on blocks.
2. Use the auxiliary hydraulics, at low idle, to raise the spacer off the cylinder body.
3. Remove the cylinder spacer and store it in a safe place.



4. Using the auxiliary hydraulics lower the grader blade to the desired depth.
5. Raise the grader and remove the blocks.
6. Follow the Level Grading or the Crown Grading procedure.

5.5.3 Level Grading

Whenever grading loose material be aware of the possibility of mounding or humping. This condition occurs whenever the grader is loading up and emptying. The goal is to load up the blade with material and keep it consistently full.

It may be necessary to raise the grader off of the skid plates at certain times to prevent waves or ripples.

If the grader overfills with loose material, either raise the grader blade or back drag the material back into place.

For level grading:

1. Make sure the grader skid plates are level to the ground.
2. Set left and right-hand sides of the cutting blade to the same height. Start somewhere between 0” and +1” on both sides.
3. It may be necessary to raise the grader slightly off the ground to make the adjustments. Before making any adjustments, place blocks under the skid plates and lower the grader onto the blocks.

⚠ WARNING



Roll Away Hazard
Before leaving the operator’s seat, make sure the engine is stopped, the transmission is placed in park, the key is removed, and the parking brake is set.

4. Under normal circumstances, place the loader hydraulics in the “float” position to allow the skid plates to follow the ground. If there is no float position available, attempt to keep the skid plates flat on the ground.
5. The grader can also be dragged backwards for a level and more consistent finish.
6. Once the grading is complete, the roadway material should be packed into place. Packing is important to prevent the surface material from quickly being moved, resulting in ripples, waves, or tire channels.

5.5.4 Crowning

The goal of crowning a roadway is to allow rainwater to flow off of both sides of the roadway. Allowing a buildup of water creates the opportunity for puddles that develop into potholes.

It is common for gravel roadways to have berms of gravel on each edge. The grader can be used to redistribute this loose material back into the center of the roadway. If the soil content of the berm is too high, it can be easily graded farther from the edge of the roadway.

When working on a curve, bank the roadway in the direction of travel and do not crown the surface.

For crowning:

1. Make sure the grader skid plates are level to the ground.
2. Set the right-hand side lower than the left-hand side and allow material to flow to the left, toward the center of the roadway. The indicator marks are set for 1 inch spacing.
3. If the right-hand side of the cutting blade is set to -1 or -2, the grader will need to be lifted off the ground.
 - a. Raise the grader slightly off the ground and place blocks under the skid plates. Lower the grader onto the blocks.

WARNING



Roll Away Hazard
Before leaving the operator's seat, make

sure the engine is stopped, the transmission is placed in park, the key is removed, and the parking brake is set.

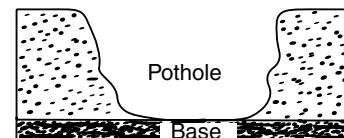
- b. Once the blade is set, remove the blocks.

4. Under normal circumstances, place the loader hydraulics in the “float” position to allow the skid plates to follow the ground. If there is no float position available, attempt to keep the skid plates flat on the ground.
5. The grader can also be dragged backwards for a level and more consistent finish.
6. Once the grading is complete, the roadway material should be packed into place. Packing is important to prevent the surface material from quickly being moved, resulting in ripples, waves, or tire channels.

5.5.5 Setting Ripper Teeth Depth

The ripper teeth can be used whenever the roadway surface is too hard for the grader blade to move the material. Also, use the ripper teeth when there is not enough loose material above base to uniformly grade the surface.

The ripper teeth should also be used whenever potholes are present. To restore a consistent surface, is important to disturb or cut into the roadway material deeper than the depth of the pothole. If the pothole goes deeper than the topping surface, a spot disturbance is recommended in order to avoid disturbing roadway base material.



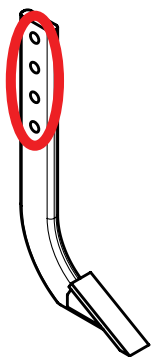
The unique design of the grader allows the ripper teeth to be set at different heights depending on roadway surface conditions. The thirteen ripper teeth can be independently set to one of three settings: 1", 2", or 3".

NOTICE

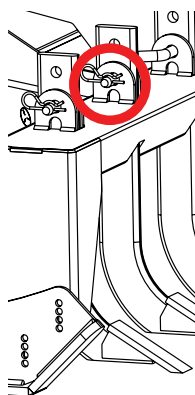
Do not use the ripper teeth and grader blade in the same pass.

1. Lower the teeth to a depth that loosens the surface material but leaves the base in place.

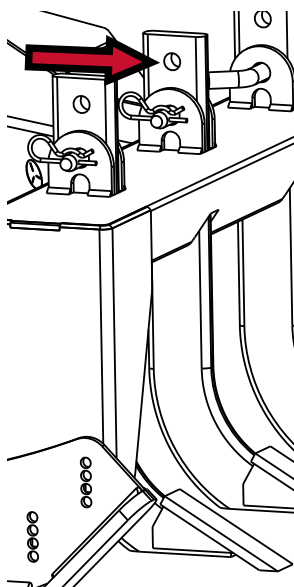
1. Each ripper tooth has 4 adjustment holes that are 2" apart from each other.



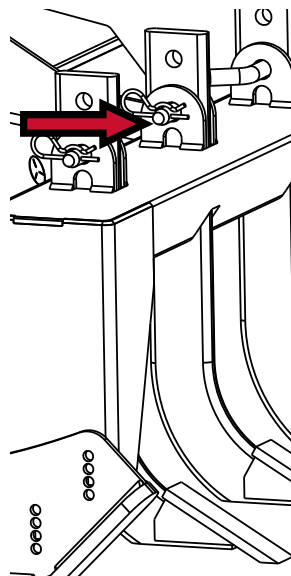
2. The grader frame has 2 adjustment holes for each ripper tooth that are 1" apart.



3. Moving the ripper tooth up or down using the same hole on the grader frame will adjust 2" at a time.



4. Using the same hole on the ripper tooth while choosing a different hole on the grader frame will adjust 1" at a time.



2. Set left and right-hand sides of the cutting blade to 0".
3. Set the ripper teeth to a depth of 1" to 2" depending on the hardness of the roadway surface.
4. Loosen the top layer of the entire area to be graded. The ripper teeth are spaced 6" apart, so several passes will be required.

NOTICE

Do not lower the ripper teeth too deeply on the first pass. Damage to the grader can result in using excessive force to loosen packed materials.

5. Before grading, raise the teeth into the storage position.



5.6 Detaching From Machine

CAUTION

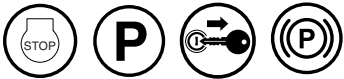


Pinch / Crush Hazard

Use caution when connecting the grader to the machine. Keep hands and feet from under the grader and clear of pinch points. Do not allow anyone to stand between the machine and grader during attachment.

1. Move the grader to a storage location.
2. Lower the grader to the ground or onto blocks.

WARNING



Roll Away Hazard

Before leaving the operator's seat, make sure the engine is stopped, the transmission is placed in park, the key is removed, and the parking brake is set.

3. Release all hydraulic pressure.
4. Disconnect the hydraulic hoses. Place the hoses on top of the grader, do not allow them to lie on the ground.
5. Board the machine and detach the grader.

6. Transporting

6.1 Highway and Transport Safety

Refer to “2.4 General Safety” on page 8 for additional safety information.

SAFETY INSTRUCTIONS

- SI** *Make sure the machine used is in good operating condition according to the OEM user's manual.*
- SI** *When transporting the grader on the highway, make sure the machine has a clearly visible “Slow Moving Vehicle” placard.*
- SI** *Use approved accessory lighting, flags, or other necessary warning devices to protect operators of other vehicles on the highway during daylight and nighttime transport. Various safety lights and devices are available from your dealer.*
- SI** *Make sure that the area is clear of children, animals, and other obstacles before moving the grader. This is particularly important with higher noise levels and quiet cabs, as you may not hear people shouting.*
- SI** *Do not allow anyone to ride on the machine or the grader.*
- SI** *Always drive at a safe speed relative to conditions, and ensure that the speed is low enough for an emergency stop. Keep speed to a minimum.*
- SI** *Reduce speed prior to turns to avoid the risk of overturning.*
- SI** *Always keep the machine in gear to provide engine braking when going downhill. Do not coast.*
- SI** *Be a safe and courteous driver. Always yield to oncoming traffic in all situations, including narrow bridges, intersections, etc. Plan your route to avoid heavy traffic.*
- SI** *Watch for overhead obstructions and side clearances while transporting.*

SI *Always operate grader in a position to provide maximum visibility at all times. Make allowances for increased length and weight of the grader when making turns, stopping, etc.*

6.2 Pre-transport Checklist

1. Before transporting, make sure the maintenance on the machine is current.
2. Check the tire pressures on the machine, and correct if necessary.
3. Make sure the grader is securely attached to the machine. Always inspect the grader for damage or abnormal wear before detaching.
4. Prior to transporting on a public road, have an observer confirm all running lights, brake lights, turn signals, and hazard lights are working on the machine.
5. Verify the brakes are operating correctly.

7. Storage

Refer to “2.4 General Safety” on page 8 for additional safety information.

SAFETY INSTRUCTIONS

SI *Do not store the grader where it will be exposed to livestock. Damage and livestock injury could result*

⚠ CAUTION



Stay Clear

Do not permit anyone, especially children to play on or around the stored grader. Store the grader in an area away from human activity.

7.1 Placing in Storage

1. Place both ends of the cutting blade to the “0” setting.
2. Thoroughly wash the grader with a pressure washer or water hose to remove all loose dirt, mud, or debris.
3. Select an area that is dry, level, and free of debris (inside a building is ideal). Move the grader to its storage area.
4. Lower the grader to the ground or onto blocks.
5. Disconnect the hydraulic couplers and detach the grader from the machine. Place the hoses on top of the grader, do not allow them to lie on the ground.

7.2 Removing from Storage

1. Attach the grader to the machine following the procedure in section “5.3 Initial Setup and Attachment” on page 15.
2. Before placing the grader back into service, replace any worn or defective parts and perform the Pre-Operation Checklist. Refer to “5.4 Pre-Operation Checklist” on page 16.

8. Maintenance

Good maintenance is the owner's and operator's responsibility. Poor maintenance shortens grader life and is an invitation for problems.

Norden Mfg LLC will not claim responsibility for use of unapproved parts and/or accessories and other damages as a result of their use.

If grader has been altered in any way from original design, the manufacturer does not accept any liability for injury or warranty.

8.1 Maintenance Safety

WARNING



Roll Away Hazard

Before working on this grader, make sure the engine is stopped, the transmission is placed in park, the key is removed, and the parking brake is set.



Personal Protection Equipment

Wear proper fitting and belted clothing to avoid getting caught in moving parts. Wear personal protection equipment (PPE), which may include safety glasses, safety shoes, gloves, etc. appropriate for the work site and working conditions.



Damaged Parts Hazard

Do not use the grader if any parts are damaged. If the grader is believed to have a defect which could cause it to work improperly, immediately stop using it and remedy the problem before continuing.



No Unauthorized Modifications

Do not modify the grader or safety devices. Do not weld on the grader.

Unauthorized modifications may impair the grader's function, or create safety hazards, and will void the warranty. If the grader has been altered in any way from the original design, the manufacturer does not accept any liability for injury or warranty.



Crush Hazard

Always set the grader on blocks or on the ground when performing maintenance.

WARNING



Good Working Condition

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts.



OEM Replacement Parts

If replacement parts are necessary, genuine factory replacement parts must be used to restore the grader to its original specifications. Unapproved parts could create a safety hazard. The manufacturer will not accept responsibility for damages as a result of the use of unapproved parts.

8.2 Practice Safe Service Procedures

CAUTION



Understand service procedures before doing any work. Keep the work area clean and dry.



Keep all parts in good working condition and properly installed. Replace worn or broken parts immediately.



A first aid kit should be readily accessible while performing maintenance on the grader.



Do not leave tools lying around the work area. Follow good shop practices. Keep service area clean and dry. Be sure electrical outlets and tools are properly grounded. Use adequate light. After servicing, be sure all tools, parts and service equipment are removed.



Use the correct tools, jacks, hoists, or other tools that have the capacity for the job.

8.3 Bolt Torque Requirements

WARNING



Equipment Failure

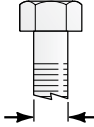



The proper torque value for bolts and cap screws is identified by their head markings. Replacing higher “grade” bolts (Grade 5) with lower grade bolts will lead to equipment failure and could result in injury or death. Always use replacement bolts with the same grade markings as the removed bolt.

It is extremely important to apply and maintain proper torque on all bolts. Use a torque wrench to assure the proper amount of torque is being applied to the fastener.

Start all bolts or nuts by hand to prevent cross-threading.

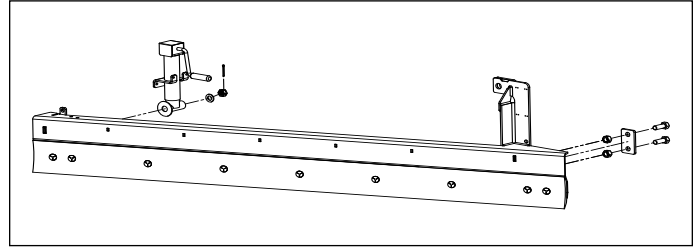
Torque figures indicated in the chart are used for non-greased or non-oiled threads unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

The chart gives correct torque values for various bolts and cap screws. Tighten all bolts to the torque specified in the chart unless otherwise noted. Check tightness of bolts periodically, using the bolt torque chart as a guide. Always replace hardware with the same grade bolt.

Bolt Diameter 	English Bolt Torque Specifications					
	Grade 5  3 Radial Lines Grade 5		Grade 8  6 Radial Lines Grade 8		ASTM A574  Socket Head Cap Screw	
	ft.lbs.	N·m	ft.lbs.	N·m	ft.lbs.	N·m
1/4"	9	12	12	17	14	18
5/16"	19	25	27	36	29	38
3/8"	33	45	45	63	51	69
7/16"	53	72	75	100	81	109
1/2"	80	110	115	155	124	168
9/16"	115	155	165	220		
5/8"	158	215	220	305	238	322
3/4"	290	390	398	540	423	573
7/8"	420	570	650	880	682	924
1"	630	850	970	1320	1022	1385

8.3.1 Blade Mounting Bolts

The cylinder side of the blade is mounted with two bolts and center-lock distorted-thread locknuts. These two bolts should be loosely tightened with a 1/16" gap. This gap allows the blade to move up and down.



8.4 Welding Repairs



Before performing any type of welding repair to the grader, contact Norden Mfg LLC for approval. Repair welding must be done with care and with procedures that may be beyond the capabilities of the ordinary welder.

WARNING



Personal Injury Hazard

Repairs or modifications to the grader could result in serious injury or death to the operator or bystander should these repairs fail.

NOTICE

Anyone performing a welding repair should be certified in accordance to the American Welding Society (AWS) standards.

8.5 Service Record

The service period recommended is based on normal operating conditions. Severe or unusual conditions may require more frequent service.

Copy this page to continue record.

Hours and Serviced By													
Maintenance													
Every 8 Hours of Use													
Make sure all retainer clips and pins are in place.													
Visually inspect the blade bolts and height adjustment linkage for wear and damage.													
Every 40 Hours of Use													
Inspect ripper teeth for wear.													
Inspect skid bars for wear.													
Inspect the mounting points of the main blade for damage.													
Annually													
Make sure all fasteners are tightened to proper torque. Refer to "8.3 Bolt Torque Requirements" on page 24.													
Inspect the lift cylinder and hoses for damage.													
Wash the grader.													
Inspect frame for cracking or damage.													

9. Parts Section

9.1 Ordering Parts

Norden Mfg LLC manufactures a quality product that requires very little maintenance or repair. However, should a part break or become damaged, our knowledgeable staff can make sure you receive the part(s) to put your grader back into operation.

9.2 Contact Information

For replacement decals, questions, or to order parts, contact:

Norden Mfg LLC
4210 Kinsman Road NW
North Bloomfield, OH 44450

Phone: 877-296-5851
Fax: 440-693-4336
E-mail: parts@nordenmfg.com

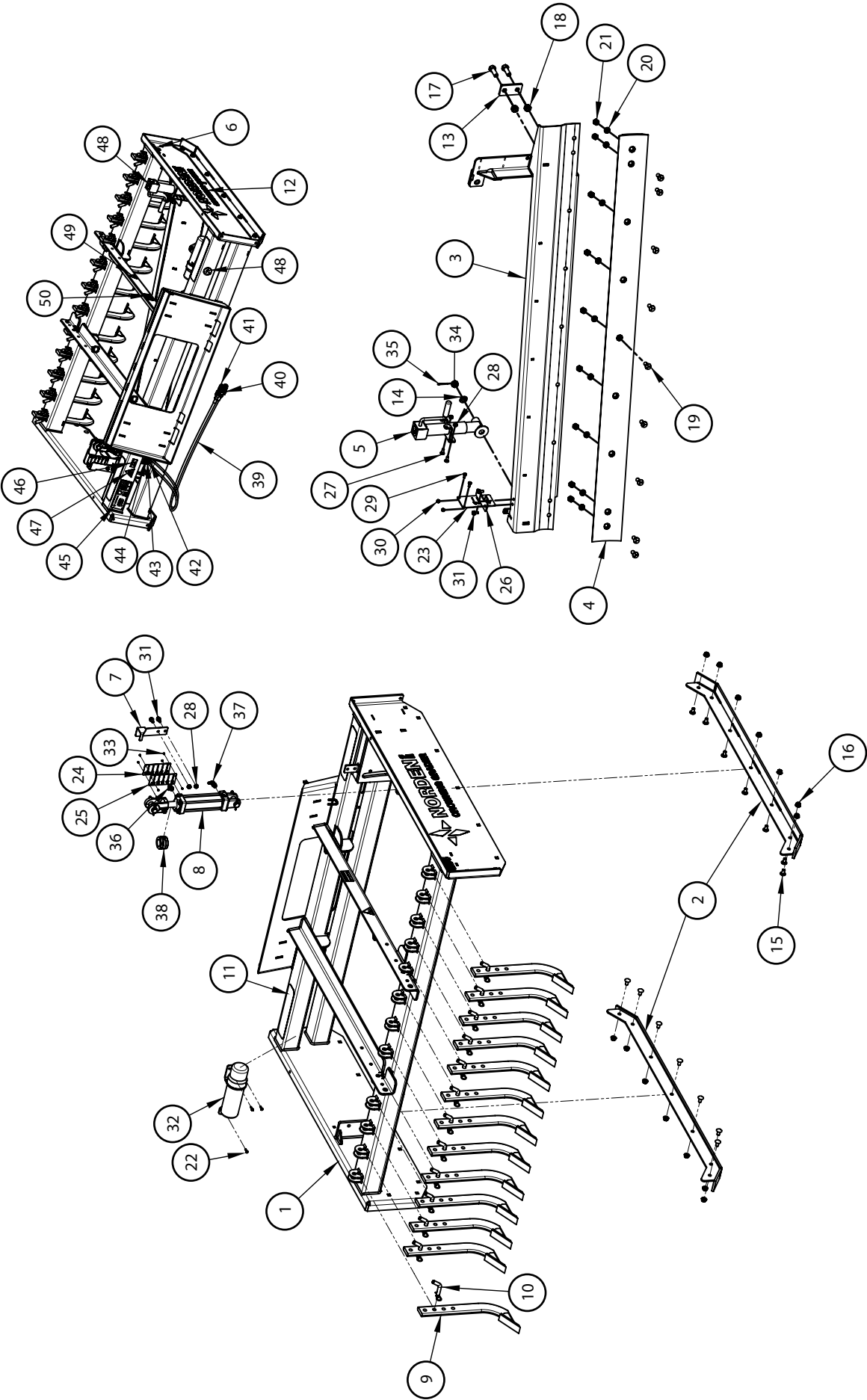
9.3 Decals

Safety decals provide a vital role in helping to reduce injuries and/or possibly even death. To ensure the greatest level of safety, all decals must be in place and legible or all warranties are void. Remember, it is the user's responsibility to maintain these decals.



To prevent serious injury or death which could result from not following posted safety instructions, make sure all decals are attached to any replacement part.

9.4 Parts Detail

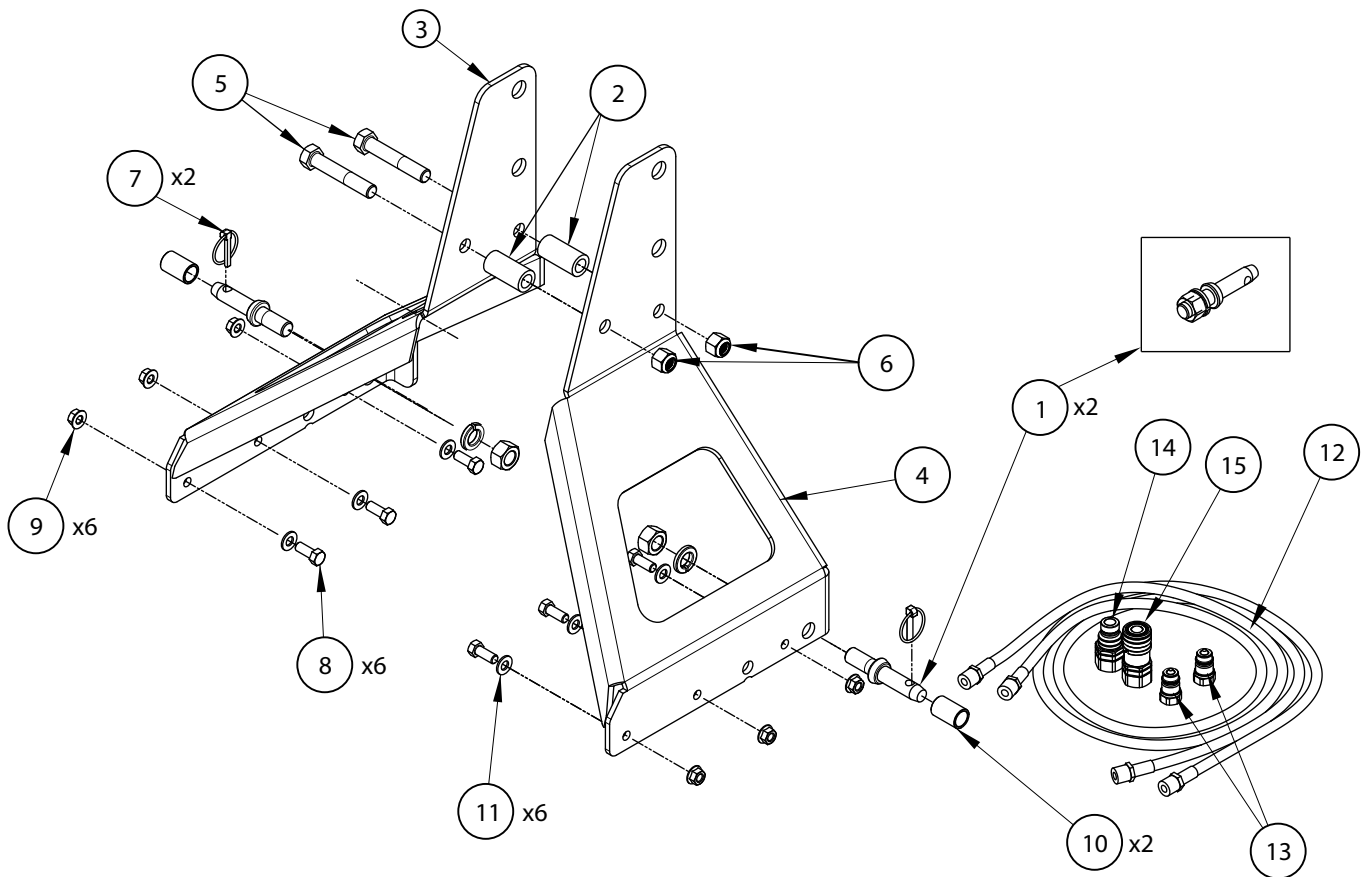


Item	Part number	Name	Qty
1	* 1032810	Frame Weldment, CG84	1
2	1023480	Skid Bar Weldment, 56.5"	2
3	1032800	Grader Blade Weldment	1
4	1023240	Cutting Edge, 84"	1
5	1032290	Jack, CG84 Sidewind	1
6	1024430	Decal - CG84 Model Number	2
7	1031490	Crown Indicator Left	1
8	1023100	Hydraulic Cylinder 2x6	1
9	1023250	Scarifier Shank 3/4" x 2.5" x 18" with HT Point	13
10	1032310	Pin & Clip 5/8" x 2"	13
11	1024380	Anti-Slip Tape	2
12	1023970	Decal - Crowning Grader	2
13	1023600	Left Slider Bracket	1
14	1022730	Type A Flat Washer 3/4"	1
15	1007520	Carriage Bolt 1/2"-13 x 1"	14
16	1006210	Hex Flange Nut 1/2"-13	14
17	1024130	Hex Bolt 3/4"-10 x 2"	2
18	1024120	Lock Nut Reversible 3/4"-10	2
19	1024010	Plow Bolt 5/8" x 2"	9
20	1010790	Spring Lock Washer, Extra-Duty 5/8"	9
21	1010800	Hex Nut 5/8" -11	9
22	1007480	Driller Screw #12 x 7/8"	3
23	1031750	Right Indicator Plate	1
24	1032180	SS Left Back Indicator Plate	1
25	1032190	SS Left Front Indicator Plate	1
26	1031790	Indicator Right	1

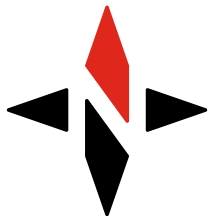
Item	Part number	Name	Qty
27	1006310	Carriage Bolt 3/8"-16 x 1	2
28	1006190	Hex Flange Nut 3/8"-16	4
29	1006290	Hex Bolt 5/16"-18 x .75"	2
30	1006080	Nylock Nut 5/16"	2
31	1006330	Hex Flange Bolt 3/8"-16 x .75"	4
32	1006430	Document Canister	1
33	1027680	U-Drive Screw #6-7 x .25"	8
34	1032260	Castle Nut Medium 3/4" -10	1
35	1003720	Cotter Pin 5/32" x 1.75"	1
36	1014980	4MJ-6MB90 Adapter	1
37	1031890	4MJ-6MB90 Orifice Adapter, 0.062"	1
38	1023940	Cylinder Stroke Control Spacer 1.125" x 1.5"	1
39	1023920	Grader Skid Steer Hose 6'	2
40	1017110	Skid Steer End, Male	1
41	1017120	Skid Steer End, Female	1
42	1024000	Hose Clamp Body 1/4"	2
43	1008810	Cover Plate, 2D Group	1
44	1008790	Hex Bolt 5/16" x 1.375" (Grade 5)	1
45	1024360	Decal - Manufacturing	1
46	1024370	Decal - Serial Number	1
47	1024350	Decal - Burst Warning	1
48	1024330	Decal - Read Manual	1
49	1024340	Decal - Crush Warning	2
50	1028630	Decal - Warning No Riders	2

* Not available as service part

9.5 3-Point Grader Kit



Item	Part Number	Description	Qty
1	1023390	Lift Arm Pin, Forged Universal Draw Pin, Cat. 1 Adjustable With Lock Washer And Nut	2
2	1023880	Quick Hitch Spacer	2
3	1023890	Left 3-Point Plate	1
4	1023900	Right 3-Point Plate	1
5	1033530	Hex Bolt 3/4-10 x 4.25", Grade 5	2
6	1024310	3/4" Nylock Nut	2
7	1006850	5/16" Lynch Pin	2
8	1006230	Hex Bolt 1/2-13 x 1.25"	6
9	1006210	Hex Flange Nut 1/2-13	6
10	1023990	Lift Arm Bushing, 1-1/8" OD x 7/8" ID x 1-3/4" long	2
11	1006170	Type A Flat Washer 1/2"	6
12	1024040	Grader Hose, 3-Point Hitch	2
13	1015840	Male Pioneer Ends - Stucchi-M-BIR 12 NPT-G21	2
14	1017110	Male Flat Face End - Stucchi-M-A13 1/2 NPT-J21	1
15	1017120	Female Flat Face End - Stucchi-F-FIRG 12A NPT-L21	1



NORDEN MFG

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